

# Introduction to Electronic Music

183, 184

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## Electronic Music 183, Mr. Alvin Lucie

Much more [war-aid] given to German, and other European countries by U.S. ~~com~~ while U.S. composers were unsupported in studio equipment.

Electronic Music? Electronic environment. Any thing recorded or surrounded by, electronic environment [air conditioners].

Brahms makes object: beginning, middle, end.  
Art and artists predict what's going to happen, predict and understand change

Understanding "electronic change" before it came about, was made practical: John Cage. —

Tape did not exist before WWII ~~and~~ could not explore electronic sounds before. Around turn of century (1889-1905) began to experiment with electronic sound producers — Theremin, ondes martenot.

— In 1937, Cage predicted recording electronic music. Wrote a piece ('39?) for electronic instrument — oscillator — and piano, in traditional notation.

Then a piece for L.P. oscillator recording, oscillator, and piano.

Then tape arrived. Whole medium opened up. Can record any sound on tape. Idea of piece not limited by orchestral instrumental sounds. Opened up sound world: direct access to sound. Now could use ~~any~~ any noise at all. Collage.

Lucier <sup>undergraduate</sup> in school 1950-1954. Worst time in 100 years for education: Anti-intellectualism, anti-university — McCarthyism, Constricted, technical, uptight. Big thing was Schoenberg [Austria], 12 tone scales; dark, depressing and of the world stuff. Students all writing boring, stupid, lurid, imitations of Schoenberg.

Ignored Cage's concert, went on Fulbright to Italy; Young composers writing Schoenberg in/after 20 years. But Cage showed up and shook them up. Didn't need to dig into another (French-German) culture ~~movement~~ for music. Total opening up to wonderful, terrifically fantastic music.

1965 opened up to Alpha/Brain wave work. Invited Cage to participate in concert that spring. Electrodes, high gain amplifiers [DC], twelve speakers that stimulated percussive instruments [Alpha is low frequency, event] Cage worked amps, mixing. Very quiet piece, in the dark. Chairman of Music dept. gave a hotfoot to the other jerk — had no enthusiasm at all. Cage had impulse — do it now!

Cage had problem of how to explain his pieces. Was a funny man; thought art should be funny. How should he give a talk? Would tell jokes, stories, anecdotes. Found David Tudor, best <sup>young</sup> pianist in the world. Could play anything. Fantastic collaboration.

Once ~~was~~ electronically realized accompaniment for Cage's stories at one talk he gave.

"An old shoe would look beautiful in this room."

Everything has its place in art. Everything opens up.

Taking in environmental sounds - playing piano piece with street noise coming through window.

Anechoic room. No silence; high and low  $\#$  sounds (nervous system, bloodstream).

No silence. If you are open, you hear, begin to hear sounds of the environment. No such thing as no sound.

What you don't learn in school. An emptying.

Silence, by John Cage

A Year from Monday, by John Cage.

~~5 books to read~~

→ Cage, Christian Wolff, post-war composers, Europeans, contemporaries // // // projects →

9/6 Electronic music or electronic inspired. Electronic/electric environment.

Origin of electronic music: John Cage

Before WWII, center of Art [visual] was France, both culturally, and economically. During and after war, painting boomed in U.S.A. — abstract, N.Y. artists. Discovered an energy that didn't have to rely on Europeans. Ideas of painting — how you paint — were totally different. Action Painters — act of painting as important as the final product. Different environment. Pollack. Very physical. Painting [product] is what happened because of the process.

N.Y. School. Had done other, European-style painting. Then big change. Terrific energy. Located in East Village. Cage and Morton Feldman were also working down there with Pollack, Kline, De Kooning, Guston.

Artists can do what they want. Can throw away [to an extent] the past. ~~then~~

Composers can't be as physical as artists, painters. Except with tape. So it becomes more closely involved with Action Painters.

Christian Wolff. Son of editor, high class German family. Was a pianist, wanted to be a composer. Found Cage (around 1950) and studied composition with him. Very strange. Then one day Wolff's father published German edition of I Ching, ~~the~~ Chinese book of Oracles. Chance leads to account of the way things are. Idea of chance and simultaneous, non-cause and effect events. Somewhat similar to action painting.

Check it out:

overtone series on wolf-cries.

altering for purposes of communication.

wolfs can hear large overtone series, extended series,  
can identify each other by overtone structure.

Cage wrote a piece where decisions about "certain things" — pitch, timbre, instrumentation, rhythm, etc. — were made found in I Ching. Aleatory music or "indeterminacy." Composer takes himself out of the position of composer; anti-imperialist point of view — art comes from where it is. Expands experience, areas to be experienced, because of the removal of personal choice, and replacement with chance.

### Europe:

Here musicians were getting more determinate, rather than indeterminate. Schoenberg and 12-tone system, all notes are equal. Opposite of tonality; atonality. In order to maintain equalness of notes, ~~the~~ [atonality], had to organize. Tone row and permutations. Organization of pitch, rhythm, rest, instrumentation, technique, <sup>octave</sup> <sub>timbre.</sub> Pre-determined, pre-planned before actual process of composition. Total organization.

So: Cage, U.S.A. and indeterminacy vs. European Determinacy.

### Recording: Indeterminacy

In electronic world, you can listen to many things at once. More complicated people. Air conditioning, his talk and the sounds [Tudor electronically realized an early, indeterminate work of Cage, done with concrete sounds.

No such thing as boredom.



9/12 Cage functions in a non-linear way.

Classic era (Haydn, Mozart) produced clear linear pieces.  
Form of the sonata: Had a key, chose it for a reason — E $\flat$  is strong, D $\flat$  quiet and soft, F is neither here nor there —; starts and ends in that key. Important relationships: the ~~III~~, V, IV.

→ that civilization based on conquering natural world; don't let sound stand on its own, exist naturally. "Colonialism." Build the art. ←

so don't let the tonic drop down [naturally] a fifth to the subdominant, but go up to IV, conquer the natural force.

Theme A, often repeated, then theme B, then repeat both. Then development of ideas of A and B in any keys. Then return to A and B, but both in the tonic — recapitulation. Can add a coda; descent to IV, then back up to tonic. A B: || development | recapitulation | coda. Very linear!

Cage and others say we are in our environment, perceive more than one thing at once. Because of media, electronic environment, we think in a non-linear ~~sideways~~ way.

I Ching. Non-cause-and-effect. Occurs at a certain point in time, influenced by other things going in on at the same time. No thing has nothing to do with something going on at the same time. Sideways. Instantaneous.

The pieces: some of them you can start anywhere — instantaneous, non-linear; no sense of time, sound is more important.  
"Zero-time"

I Ching, Zen, electronic media: main problem people have

listening to music is that of Zero-time. New thinking.  
You don't conquer sound.

Story: Lucien performs Cage piece for ~~amplified~~ amplified  
by piano's. Indeterminate score — transparencies  
to be superimposed and drawn on for various parameters.  
Made it 20 minutes long — stopwatch, Had an attack of  
guilt, anxiety, in the middle of the piece. <sup>actually, after just one minute</sup> Caught in time and  
space [sound was mixed all over hall]....

→ No sense of home. No anxiety to return home  
[tonic] in contemporary environment ←

was embarrassed, wanted to leave but kept going. Not  
improvisation — improvisation is recalling the past, patterns —,  
but stuck to the score. Maintain the indeterminacy. Got into  
the material so deeply that time sensed changed completely,  
19 minutes went by as 1.

Art is not on the page, length of real time of the LP, but rather  
is the question of psychological time [Information theory]

Cage is very pure

Lucie: random belongs to Cage. Lucie works with giving  
players a practical situation to work with/in.

Cage was a beautiful pianist. California born and raised;  
dropped out of Pomona. Tried out architecture school in  
France — didn't want to draw cathedrals, dropped  
out. Studied with Schoenberg, who said he was a great  
student but no composer. He 35-38 became interested  
in East, but blew it sometimes by writing for  
the instruments but not the thought philosophy.

Then began working with instruments without determinate

pitch - drums, percussion, ?...

→ Amores, ~~with prepared piano and percussion~~ [tom-toms, pod rattle] 1943\*

→ I prepared piano

→ II percussion - 9 tom-toms, pod rattle

→ III wood blocks (not chinese)

→ IV prepared piano

Somewhat  
exotic

complex rhythmic schemes. linear [before I Ching]

precise score, conventional ←

→ Double Music (with Lou Harrison) 1941

metal

Water buffalo bells

Exotic. Javanese influences

Brake drums

Thunder sheets

once again, complex rhythmic patterns: duration/structure  
of smallest segment of piece is model of entire structure - old  
idea, but new material. No 19<sup>th</sup> century emotional, romantic  
quality. ←

\* from Concert Percussion for orchestra, Cage, Cowell, Harrison  
Riddan, Russell  
Time 5/8000



9/14 Staggering. Opens things up. Irritation. Destruction of pre-conceived ideas. Continual surprise.

→ Baker's Biographical Dictionary ←

Studied with Schoenberg, but "had no ear for traditional music."  
Pushed him into other things.

→ Cage always does the most efficient thing. ←

Oriental influence. Used percussion. Didn't want to carry around all the percussion — inefficient — so used prepared piano. Became his gamelan. Then used electronic sound (most efficient).

No studios in America, unlike Germany and Italy. So started with some tape machines. Found objects — Duchamp; musique concrète. Paris 1948.

Cage defined some sounds for a piece: City, country. Within each, several categories: sounds made by: air, hard objects, etc. Made a visual score — X axis in respect to time. 6 channel piece. How to slice the sounds.

→ Irony in tape: permits electronic work, but is dead.

Cage anticipated this problem. Made a score so the piece could be rerecorded, told people how to splice (attach and decay) ←

Working with tape allows greater exploration of sound characteristics, opening up of sounds.

William's Mix — wait! <sup>1937-39</sup> ~~1937-39~~ Imaginary Landscape # 1  
used oscillators + tapes of Bell telephone discs [Stockhausen said that he invented ~~that~~ electronic music] Rather crude piece. Recorded live, 1953.

now → Williams Mix Paul Williams. Stony point,  
N.Y. "Artist colony," 1951 on 52 ←

→ Fontana Mix. Transparent overlay score gave him splicing  
outline. Incredible splicing work. Used as accompaniment for  
Aria. Supersaturation of sound inputs. Recorded in  
Milan. ←

Art doesn't have to please, make you happy or sad.

9/19

# I Ching:

Simultaneous occurrences are bound to have something to do with each other; non-cause-and-effect, non-linear. In composition, no A-B-A. Anything/any sound can go with any other thing/sound.

→ Musical instruments no better for producing sound than anything else ←


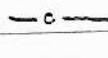
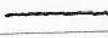

→ Merce Cunningham dance company, Simultaneous occurrences. Music did not have to accompany dance. Somehow great accidents ←

When Cage began using the I Ching, he brought in eastern philosophy, and left the timbre (Double Music) behind

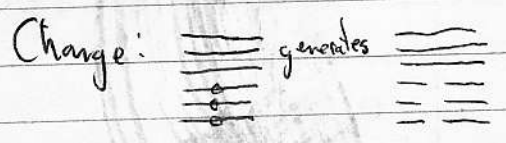
# I Ching:

64 Hexagrams (combinations of lines) - 2 trigrams in each  
6 lines: straight is positive, broken is negative. Each line can be in state of rest (remains the same) or change, generates another hexagram, with

Done with stalks (traditionally), but can be done with coins. (3)  
Heads = Yin = 2 } ex: all tails = 9 (positive, change); all heads = 6 (negative, change)  
Tails = Yang = 3 }

- 9 = positive, change 
- 6 = negative, change 
- 7 = positive, rest 
- 8 = negative, rest 

Build from bottom up.  
Find diagram in I Ching



# Cage decided:

Didn't use much of the imagery [one thing with imagery was Wonderful Widow of 18 Springs], as he saw it as exoticism, stealing; rather was interested in the indeterminacy. Wrote . . . .

10 TRANSPARENT SHEETS WITH POINTS. 10 DRAWINGS HAVING SIX DIFFERENTIATED CURVED LINES, A GRAPH (HAVING 100 UNITS HORIZONTALLY, 20 VERTICALLY) AND A STRAIGHT LINE, THE TWO LAST ON TRANSPARENT MATERIAL.

PLACE A SHEET WITH POINTS OVER A DRAWING WITH CURVES (IN ANY POSITION). OVER THESE PLACE THE GRAPH. USE THE STRAIGHT LINE TO CONNECT A POINT WITHIN THE GRAPH WITH ONE OUTSIDE.

MEASUREMENTS HORIZONTALLY ON THE TOP AND BOTTOM LINES OF THE GRAPH WITH RESPECT TO THE STRAIGHT LINE GIVE A 'TIME BRACKET' (TIME WITHIN WHICH THE EVENT MAY TAKE PLACE) (GRAPH UNITS = ANY TIME UNITS).

MEASUREMENTS VERTICALLY ON THE GRAPH WITH RESPECT TO THE INTERSECTIONS OF THE CURVED LINES AND THE STRAIGHT LINE MAY SPECIFY ACTIONS TO BE MADE. THUS, IN THE CASE OF (FONTANA MIX) TAPE MUSIC, THE THICKEST CURVED LINE MAY GIVE SOUND SOURCE(S) WHERE THE LATTER HAVE BEEN CATEGORIZED AND RELATED QUANTITATIVELY TO 20. (IN THIS CASE, THE 2 POINTS CONNECTED BY THE STRAIGHT LINE MUST PERMIT THE LATTER TO INTERSECT THE THICKEST CURVED LINE.) INTERSECTIONS OF THE OTHER LINES MAY SPECIFY MACHINES (AMONG THOSE AVAILABLE) FOR THE ALTERATION OF ORIGINAL MATERIAL. AMPLITUDE, FREQUENCY, OVERTONE STRUCTURE MAY BE CHANGED, LOOPS AND SPECIFIC DURATIONS INTRODUCED.

MEASUREMENTS MADE MAY PROVIDE ONE OF A NUMBER OF PARTS TO BE PERFORMED ALONE OR TOGETHER. IN MAKING TAPE MUSIC, AVAILABLE TRACKS MAY BE LESS IN NUMBER THAN THE TIME BRACKETS GIVEN BY MEASUREMENTS. FRAGMENTATION IS THEN INDICATED.

THE USE OF THIS MATERIAL IS NOT LIMITED TO TAPE MUSIC BUT MAY BE USED FREELY FOR INSTRUMENTAL, VOCAL AND THEATRICAL PURPOSES. THUS, AFTER A PROGRAM OF ACTION HAS BEEN MADE FROM IT, IT MAY BE USED TO SPECIFY A PROGRAM FOR THE PERFORMANCE OF THE OTHERWISE UNCHANGING MATERIAL. WHERE POSSIBLE TECHNICALLY THIS CAN BE NOT ONLY SIMPLE CHANGES OF TIME (STARTING, STOPPING) BUT ALSO ALTERATIONS OF FREQUENCY, AMPLITUDE, USE OF FILTERS AND DISTRIBUTION OF THE SOUND IN SPACE.



Music of Changes [I Ching: Book of Changes]. Not thinking of variation, development, A-B, etc., but of Changes. Profound idea. Principles. 40 difficult minutes.

Composed on staves, with pitches. But ordering, duration, silences determined by I Ching. Instead of Imagery, gave numbers 1 to 64 to Hexagrams, used numbers to determine the parameters/qualities

Indeterminacy; also: imperfections in paper, transparencies  
~~Unrepeatable~~ Unrepeatability of the art.

→ Fontana Mix, by John Cage, performed by Max Nechaus, for feedback on percussion (contact mikes).....

## Enharmonic series

Musical changes / T changes / I changes  
of various development A.A. etc. out of changes  
ideas principles to difficult matters.

(compared our steps with plates by ordering, better  
determined to T and I instead of I and T, good number  
to get the responses, used numbers to determine the  
parameters/qualities

I and T, also important in paper, transposition  
theoretical understanding of the art

→ Fontainebleau, John Cage, performed by Max Weber  
for feedback on exercises (constant notes)

9/21 Using sine wave generators, build artificial timbres, enharmonic series on fundamental.

9/26 Synthesizers as small contained studio

→ Arp hours: Ron Goldman is There: Mon 4-6:30,

Room 227 Sci. Tower.

Wed. 8-10 P.M.,

Box 78

Fri. 4-6:30.

Think about Cage.

Do a piece.

→ ~~to~~ Solo for Voice 2, by John Cage, transparency overlay score, as realized by Alvin Lucier, for 4 pairs of voices, electronically processed. 1968  
"How odd," said Cage, during the mix.

→ piece to do:

Cartridge Music (1960) — phono cartridge as an electronic instrument

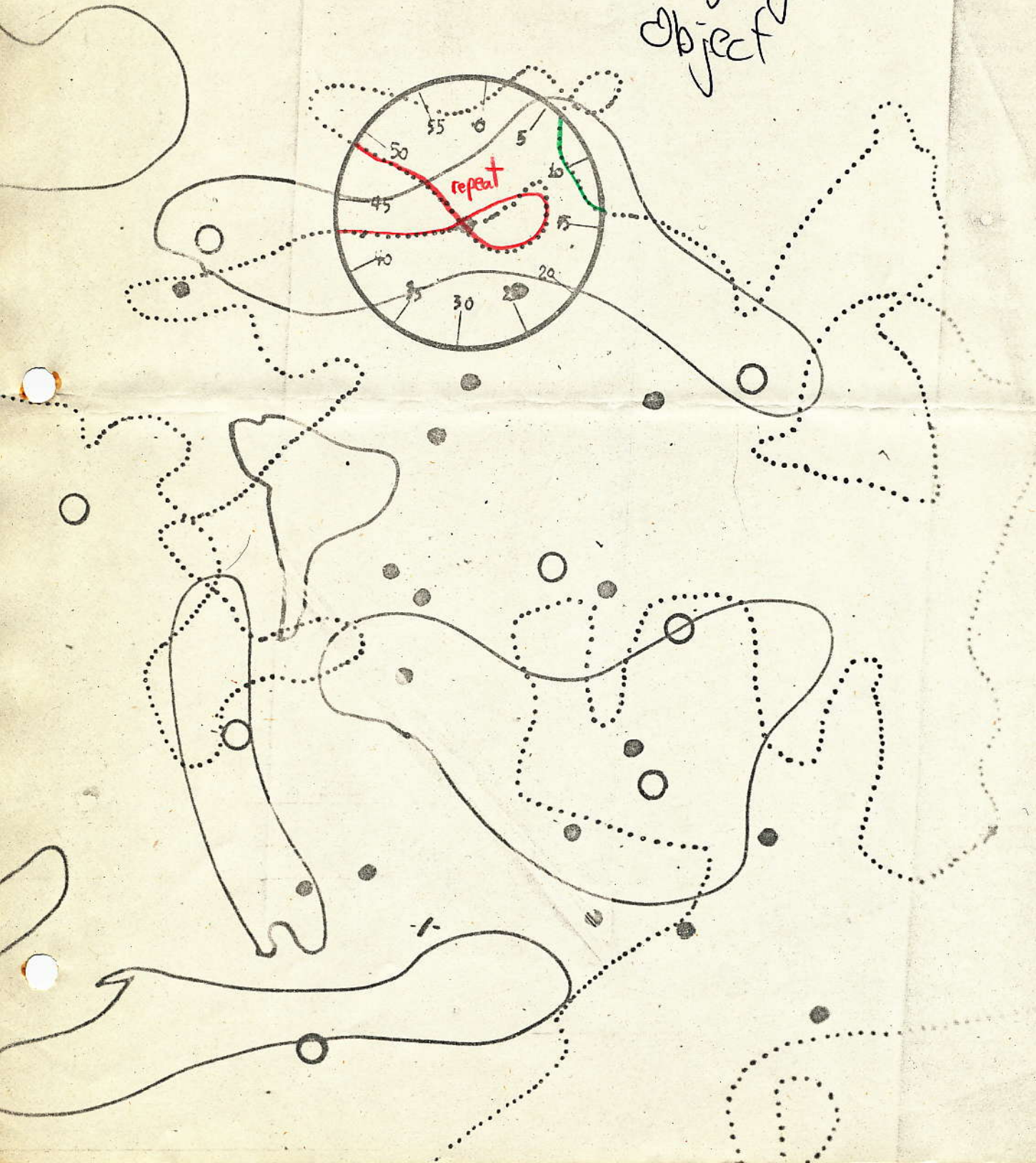
→ Hpscd — 5 letter limit in computer title — John Cage, Lejaren Hiller  
Computer at University of <sup>Illinois?</sup> Indiana. Commissioned by  
Analyzed envelope of harpsichord. For instrument(s) accompanied by  
tape; 1-6 instruments, 1-51 tapes and channels. I-VI separate  
pieces. Intro. to composition of waltzes by means of dice - Mozart.  
6 solos based on various methods. Tapes generated by computer  
imitating ~~attack~~ envelope of harpsichord; octaves with up to  
64 ~~pitch~~ discrete pitches. I Ching used.

The version on record: 3 musicians, 13 tapes, score for home listener  
(every one different) to control amp by [computer printout].

→ Source, on reserve in Sci. Library. Cage + Hiller

# CHANGE

Change of  
Object



9/28

## Planning Cartridge Music

How to notate: U

Amplitude: line intersection with clock. Move gradually from one amplitude to another - free choice of which first - ~~doing for~~ duration of sound.

Tone: | intersection for treble, | for bass control.

Realize the part for Tuesday.

pipe cleaners



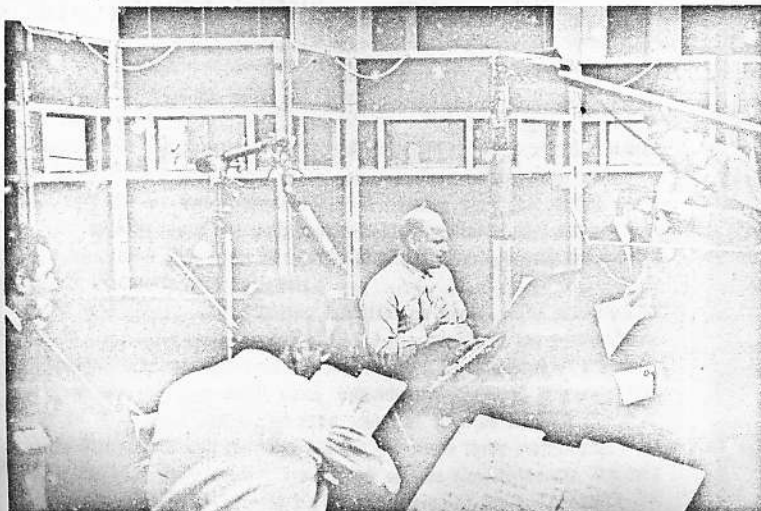
MORTON

1926

# FELDMAN

My earliest recollection of music—I couldn't have been more than five—is my mother holding one of my fingers and picking out "Eli Eli" with it on the piano. Like almost everyone else, my early teachers were very bad. At the age of twelve, however, I was fortunate enough to come under the tutelage of Madam Maurina-Press, a Russian aristocrat who earned her living after the revolution by teaching piano and by playing in a trio with her husband and brother-in-law. In fact, they were quite well known in those days. It was because of her—only, I think, because she was not a disciplinarian—that I was instilled with a sort of vibrant musicality rather than musicianship.

I realize now that that image of Madam Press—a non-professional with all the ability and brilliance of the "pro"—that "dilletantism"—has always remained with me. She was a close friend of the Scriabines and so I played Scriabine. She studied with Busoni, and so I played Busoni transcriptions of Bach, and spent more time reading his footnotes than playing.



DAVID SOYER MATTHEW RAIMONDI DON HAMMOND DAVID TUDOR MORTON FELDMAN

The years passed almost identically, and with the same random quality of these opening sentences. I composed little Scriabine-esque pieces, gave up practising the little that I did, eventually abandoned my teacher and found myself at fifteen studying with Wallingford Riegger, who was equally lax with me.

I must have had a secret desire to leave this dream-like attitude to music, and to become a "musician," because at eighteen I found myself with Stefan Wolpe. But all we did was argue about music, and I felt I was learning nothing. One day I stopped paying him. Nothing was said about it. I continued to go, we continued to argue, and we are still arguing eighteen years later.

My first meeting with John Cage was at Carnegie Hall when Mitropoulos conducted the Webern Symphony. I believe that was the winter of 1949-50, and I was about twenty-four years old. The audience reaction to the piece was so antagonistic and disturbing that I left immediately afterwards. I was more or less catching my breath in the empty lobby when John came out. I recognized him, though we had never met, walked over and as though I had known him all my life said, "Wasn't that beautiful?" A moment later we were talking animatedly about how beautiful the piece sounded in so large a hall. We immediately made arrangements for me to visit him.

John at that time lived on the top floor of a tenement overlooking the East River on Grand Street. It was a magnificent view, four rooms were made into two. A large expanse of the East River, just a few potted plants, a long low marble table and a constellation of Lippold sculptures along the wall. (Lippold lived next door.)

The reason I linger at the memory of how John lived is because it was in this room that I found an appreciation and an encouragement more extravagant than I had ever before encountered. It was here also that I met Philip Guston, my closest friend who has contributed so much to my life in art.

At this first meeting I brought John a String Quartet. He looked at it a long time and then said, "How did you make this?" I thought of my constant quarrels with Wolpe, and also that just a week before, after showing a composition of mine to Milton Babbitt and answering his questions as intelligently as I could he said to me, "Morton, I don't understand a word you're saying." And so, in a very weak voice I answered John, "I don't know how I made it." The response to this was startling. John jumped up and down, and with a kind of high monkey squeal screeched, "Isn't that marvelous. Isn't that wonderful. It's so beautiful, and he doesn't know how he made it." Quite frankly, I sometimes wonder how my music would have turned out if John had not given me those early permissions to have confidence in my instincts.

In a few months I too moved into that magic house, except that I was on the second floor, and with just a glimpse of the East River. I was very aware at the time of how symbolically I felt that fact.

I had already become friends with David Tudor while I was with Wolpe. Now I introduced him to John. Soon afterward Christian Wolff appeared, and then Earle Brown, who met John while he was on tour in the middle-west and decided to make a new life in New York in order to be with the new music.

There was very little talk about music with John. Things were moving too fast to even talk about. But there was an incredible amount of talk about painting. John and I would drop in at the Cedar Bar at six in the afternoon and talk until it closed and after it closed. I can say without exaggeration that we did this every day for five years of our lives.

The new painting made me desirous of a sound world more direct, more immediate, more physical than anything that had existed heretofore. Varese had elements of this. But he was too "Varese." Webern had glimpses of it, but his work was too involved with the disciplines of the twelve-tone system. The new structure required a concentration more demanding than if the technique was that of still photography, which for me is what precise notation has come to imply.

"Projection #2" for flute, trumpet, violin and cello—one of the first graph pieces—was my first experience with this new thought. My desire here was not to "compose," but to project sounds into time, free from a compositional rhetoric that had no place here. In order not to involve the performer (i.e. myself) in memory (relationships), and because the sounds no longer had an inherent symbolic shape, I allowed for indeterminacies in regard to pitch. In the "Projections" only register, (high, middle or low) time values and dynamics (soft throughout) were designated. Later in the same year (1951) I wrote "Intersection #1" and "Marginal Intersection," both for orchestra. Both these graph pieces designated only whether high middle or low register of the instrument were to be used within a given time structure. Entrances within this structure, as well as actual pitches and dynamics were freely chosen by the performer.

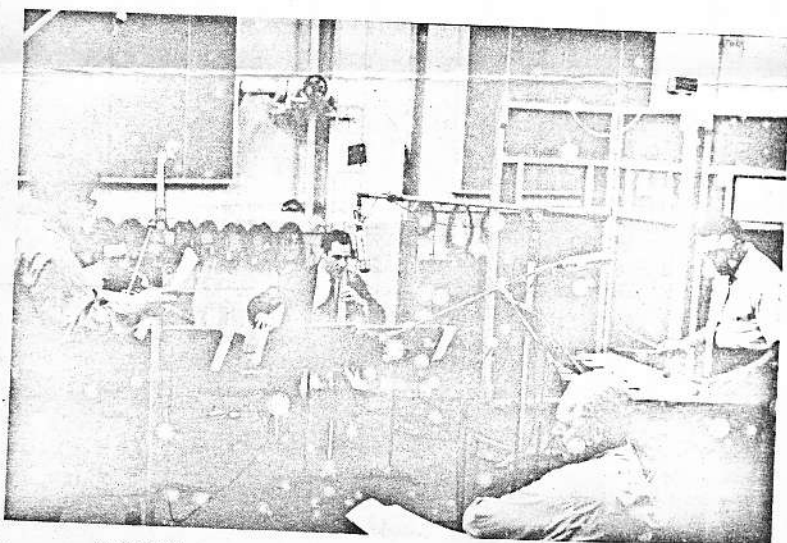


DON BUTTERFIELD

After several years of writing graph music I began to discover its most important flaw. I was not only allowing the sounds to be free—I was also liberating the performer. I had never thought of the graph as an art of improvisation, but more as a totally abstract sonic adventure. This realization was important because I now understood that if the performers sounded bad it was less because of their lapses of taste than because I was still involved with passages and continuity that allowed their presence to be felt.

Between 1953 and 1958 the graph was abandoned. I felt that if the means were to be imprecise the result must be terribly clear. And I lacked that sense of clarity to go on. I hoped to find it in precise notation, i.e. "Extensions For Three Pianos," etc. But precision did not work for me either. It was too one-dimensional. It was like painting a picture where at some place there is always a horizon. Working precisely, one always had to "generate" the movement—there was still not enough plasticity for me. I returned to the graph with two orchestral works. "Atlantis" (1958), and "Out of Last Pieces" (1960), using now a more vertical structure where soloistic passages would be at a minimum.

This brings us to **DURATIONS**—a series of five instrumental pieces, four of which are recorded here. In "Piece for Four Pianos" and others like it, the instruments all read from the same part—and so what you



MORTON  
FELDMAN

MATTHEW  
RAIMONDI

DAVID  
SOYER

DON  
HAMMOND

PHILIP  
KRAUS

have there is like a series of reverberations from an identical sound source. In **DURATIONS I** arrive at a more complex style where each instrument is living out its own individual life in its own individual sound world.

In each piece the instruments begin simultaneously, and are then free to choose their own durations within a given general tempo. The sounds themselves are designated.

The pieces, while looking identical on paper, were actually conceived quite differently. In **DURATIONS I** the quality of the particular instruments together suggested a closely written kaleidoscope of sound. To achieve this I wrote each voice individually, choosing intervals that seemed to erase or cancel out each sound as soon as we hear the next. In the **DURATIONS** with the tuba, the weight of the three instruments used made me treat them as one. I wrote all sounds simultaneously, knowing that no instrument would ever be too far behind or too far ahead of the other. Through thinning and thickening my sounds I kept the image intact. In **DURATIONS IV** there was a combination of both. Here I was a little

10/5

Morton Feldman b. 1926

Free spirit. No college. Tough life in a pants factory. Composed at night. Early 50's incredible school of art. Went around with these guys - that was his school. Very bad vision.

Doesn't change. His music for the past 20 years hasn't changed. Has a "set thing." His vision.

Pieces since 1950 have all been quiet. Very quiet. Because his eyes are bad?

Most composers use pianissimo for contrast, effect. For Feldman, it is his world. His pieces change your whole environment: "as quiet as possible" on the score.

Cage as a knife: Feldman as a mirror: Wolff as a labyrinth.

↳ imagery

Nice wonderful pieces for piano, two pianos. Indeterminate speed or rather: same score for each player, each player determines his own speed. Complexity from a simple score.

→ Christian Wolff in Cambridge, Morty Feldman, 1967 or 68  
written for Lucier and his chorus.

Form is simple and beautiful: A A'. His two trips to Cambridge to see Wolff, who had changed so little. Two events. Two teeny changes: a A at the beginning of A', and a small  $\langle \rangle$ . Mirror

No text given. Lucier used "open mouth n." Conservative range, but did a lot of changing weight and texture in the harmony. No continuity in chords. Conductor chooses lengths durations — feeling out energies; pay terrific attention to the sound, rather than continuity. Chorus turns inward. Such a beautiful piece. ←





# NEW DIRECTIONS IN MUSIC 2/

*Extensions 1 for Violin and Piano (1951)*

*Structures for String Quartet (1951)*

*Projection 4 for Violin and Piano (1951) (graph)*

*Extensions 4 for Three Pianos (1952-1953)*

*Intersection 3 for Piano (1953) (graph)*

*Two Pieces for Two Pianos (1954)*

*Three Pieces for String Quartet (1954-1956)*

*Piece for Four Pianos (1957)*

The last ten years have seen American composers, painters and poets assuming leading roles in the world of international art to a degree hitherto unexpected. Led by the painters, our whole cultural milieu has changed and is still changing. The "climate" for receptivity to the new in art has improved correspondingly, and one of the most important aspects of this change has been the inter-involvement of the individual arts with one another. Public interest in the emergence of a major composer, painter or poet has, in recent years, almost invariably been preceded by his recognition among other painters, poets and musicians. The influence of esthetic ideas has also been mutual: the very extremity of the differences between the arts has thrown their technical analogies into sharp relief. As an example of what I mean by this, we find that making the analogy between certain all-over paintings of Jackson Pollock and the serial technique of Webern clarifies the one by means of the other—a seemingly "automatic" painting is seen to be as astutely controlled by the sensibility of Pollock in its assemblage of detail toward a unified experience as are certain of Webern's serial pieces. And it is interesting to note that initial public response to works by both artists was involved in bewilderment at the seeming "fragmentation" of experience. Although these analogies cease to be helpful if carried too far, it is in the framework of these mutual influences in the arts that Morton Feldman could cite, along with the playing of Fournier, Rachmaninoff and Tudor and the friendship of John Cage, the paintings of Philip Guston as important influences on his work. He adds, "Guston made me aware of the 'metaphysical place' which we all have but which so many of us are not sensitive to by previous conviction."

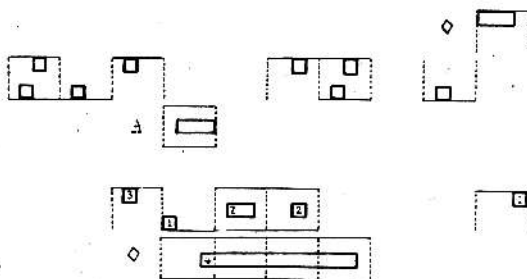
I interpret this "metaphysical place," this land where Feldman's pieces live, as the area where spiritual growth in the work can occur, where the form of a work may develop its inherent originality and the personal meaning of the composer may become explicit. In a more literal way it is the space which must be cleared if the sensibility is to be free to express its individual preference for sound and to explore the meaning of this preference. That the process of finding this metaphysical place of unpredictability and possibility can be a drastic one is witnessed by the necessity Feldman felt a few years ago to avoid the academic ramifications of serial technique. Like the artists involved in the new American painting, he was pursuing a personal search for expression which could not be limited by any system.

This is in sharp contrast to the development of many of Feldman's European contemporaries, for example Boulez and Stockhausen, whose process has tended toward elaboration and systematization of method. Unlike Feldman's their works are eminently suited to analysis and what they have lacked in sensuousness they invariably may regain in intellectual profundity and in the metaphysical implications of their methods. But if we speak of a metaphysical place in relation to Feldman, it is the condition under which the work was created and which is left behind the moment a given work has been completed.

Feldman's decision to avoid the serial technique was an instinctive attempt to avoid the

clichés of the International School of present day avant-garde. He was not to become an American composer in the historical-remembrance line, but to find himself free of the conceptualized and self-conscious modernity of the international movement. Paradoxically, it is precisely this freedom which places Feldman in the front rank of the advanced musical art of our time.

A key work in the development away from serial technique is the *Intersection 3 for Piano* (1953). A graph piece, it is totally abstract in its every dimension. Feldman here successfully avoids the symbolic aspect of sound which has so plagued the abstract works of his contemporaries by employing unpredictability reinforced by spontaneity—the score indicates "indeterminacy of pitch" as a direction for the performer. Where others have attempted to reverse or nullify this aural symbolism (loud-passion, soft-tenderness, and so on) to free themselves, Feldman has created a work which exists without references outside itself, "as if you're not listening, but looking at something in nature." This is something serialism could not accomplish. This freedom is shared by the performer to the extent that what he plays is not dictated beyond the graph "control"—the range of a given passage and its temporal area and division are indicated, but the actual notes heard must come from the performer's response to the musical situation. To perform Feldman's graph pieces at all, the musician must reach the metaphysical place where each can occur, allying necessity with unpredictability. Where a virtuoso work places technical demands upon the performer, a Feldman piece seeks to engage his improvisatory collaboration, with its call on musical creativity as well as interpretative understanding. The performance on this record is proof of how beautifully this can all work out; yet, the performer could doubtless find other beauties in *Intersection 3* on another occasion.



*Projection 4 for Violin and Piano* (1951) explores an entirely different area of musical experience. A graph piece also (see illustration), its marvellous austerity is achieved mainly through touch, and I will quote the note to the performer as an example of how the individual area of experience in these graph pieces is indicated to the performers:

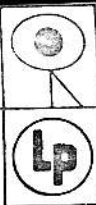
#### NOTE:

the violin part is graphed above that for the piano. Dynamics are throughout equal and low.

For the violinist:

Timbre is indicated:  $\diamond$  = harmonic; P =

*This Columbia High Fidelity recording is scientifically designed to play with the highest quality a new stereophonic system, this record will play with even more brilliant true-to-life fidelity.*



# MORTON FELDMAN

*David Tudor, Russell Sherman, Edwin Hymovitz, Pianists;  
 Matthew Raimondi and Joseph Rabushka, Violinists;  
 Walter Trampler, Violist; Seymour Barab, Cellist*

pizzicato; A = arco. Relative pitch (high, middle, low) is indicated: □ = high; ▣ = middle; ▢ = low. Any tone within the ranges indicated may be sounded. The limits of these ranges may be freely chosen by the player. Multiple stops are indicated by numbers within the squares. Duration is indicated by the amount of space taken up by the square or rectangle, each box (: :) being potentially 4 icti. The single ictus or pulse is at the tempo of 72 or thereabouts. **For the pianist:**

The ◊ indicates playing without sounding (for the release of harmonics). Pitches, their number and duration are indicated as for the violinist.

A comparison of these two graph pieces, whose ambiances are so totally dissimilar, gives an idea of the great compositional flexibility possible with graph notation.

Unpredictability is used in a different way still in the *Piece for Four Pianos* (1957). This work, scored in notation rather than graph, begins simultaneously for all four pianos, after which the following notes may be played to the end by each of the pianists at time intervals of their mutual or individual choice. Feldman has said, "The repeated notes are not musical pointillism, as in Webern, but they are where the mind rests on an image—the beginning of the piece is like a recognition, not a motif, and by virtue of the repetitions it conditions one to listen." As we proceed to experience the individual time-responses of the four pianists we are moving inexorably toward the final image where the mind can rest, which is the end of the piece. In this particular performance it is as if one were traversing an enormous plain at the opposite ends of which were two huge monoliths, guarding its winds and grasses.

In all of Feldman's recent work the paramount image is that of touch—"the use of the instrument must be as sensitive as the application of paint on canvas." (Which brings us back to Rachmaninoff, Fournier and Tudor.) In some pieces the entrance into the rhythmic structure is left entirely to the performer, and it is in this area that unpredictability enters and the performer must create the experience within the limits of the notation.

On the other hand, one of the most remarkable pieces recorded here is *Structures for String Quartet* (1951). It is a classical string quartet without sonata development, without serial development, in general without benefit of clergy. Like Emily Dickinson's best poems, it does not seem to be what it is until all questions of "seeming" have disappeared in its own projection. Its form reveals itself after its meaning is revealed, as Dickinson's passion ignores her dazzling technique. As with several other Feldman pieces, if you cannot hear *Structures*, I doubt that studying the score would be a help, though it is a thoroughly notated field of dynamic incident, whose vertical elements are linked by a sort of shy contrapuntal stimulation of great delicacy and tautness.

In an oeuvre which so insistently provides unpredictability with opportunities for expansion and breath, the question of notation at all arises, for the graph would seem to provide an adequate control for the experience and a maximum of differentiation. But differentiation is not Feldman's point, even in the graph music: the structure of the piece is never the image, nor in eschewing precise notation of touch is Feldman leaving the field open for dramatic incident whereby the structure could become an image (as in Boulez). Notation is, then, not so much a rigid exclusion of chance, but the means of preventing the structure from becoming an image in these works, and an indication of the composer's personal preference for where unpredictability should operate. As John Cage remarked in this connection, "Feldman's conventionally notated music is himself playing his graph music." And of course the degree of precision in the notation is directly related to the nature of the musical experience Feldman is exposing. This notation can be very precise, as in *Extensions 1 for Violin and Piano* (1951), which indicates an increasing tempo of inexorable development from beginning to end by metronomic markings, as well as the dynamics and expressive development.

Although the traditionally notated works are in the majority on this record (*Extensions 1, Structures for String Quartet, Extensions 4, Two Pieces for Two Pianos, Three Pieces for String Quartet*), I have gone into the use of unpredictability in this music at such length in order to reach a distinction about its use in much contemporary music. In Feldman's work unpredictability involves the performer and the audience much in the same way it does the composer, inviting an increase of sensitivity and intensity. But in much of the extreme vanguard music in America and Europe, particularly that utilizing tape and electronic devices along with elements of unpredictability, the statistical unpredictability has occurred in the traditional manner during the making of the piece; it has been employed preconceptually as a logical outgrowth of serial technique, and it is dead by the time you hear it, though the music is alive in the traditional sense of hearing. What Feldman is assuming, and it is a courageous assumption, is that the performer is a sensitive and inspired musician who has the best interests of the work at heart. This attitude leaves him free to concentrate on the main inspiration area where the individual piece is centered.

What he finds in these centers—whether it is the sensuousness of tone and the cantilena-like delicacy of breathing in *Three Pieces for String Quartet* (1954-56), or the finality of the "dialogues" in *Extensions 4 for Three Pianos* (1952-53)—is on each occasion a personal and profound revelation of the inner quality of sound. The works recorded here already are an important contribution to the music of the 20th Century. Whether notated or graphed, his music sets in motion a spiritual life which is rare in any period and especially so in ours.

FRANK O'HARA

\* \* \*

Library of Congress catalog card number R59-1329 applies to this record.

→ For Chorus and Instruments II, with Tuba and chimes, 1967 or 8  
really nice. ←

→ Piece for Four Pianos, 1957  
phase as electronic concept (vs. "rhythmic disjunction"); reverberation. ←

10/10

More music. Morty Feldman.

4 guys in old American Avant Garde: Cage, Feldman, Earl Brown, Christian Wolff.  
Feldman and Brown very closely connected with art, the painters.

Feldman and Philip Guston.

Touch. On instrument.

Passions of the 19<sup>th</sup> century are kind of funny now.

Cage: Diverge: acceptance: contemporary idea

Emotional value of intervals: Work like mad to avoid it/them.

Feldman and graphic scores.

→ Intersection #3 for Piano, graph piece, 1953. David Tudor.  
last loud piece →

→ Structures for String Quartet, 1951

→ Projection #4, graph piece, 1951, for piano and violin.

◇ harmonic; Pizzicato: □ hi, ▣ middle, ▢ lo; numbers for # of stops; space for duration (in  
ict; (beat); 72 per min) ←

Attack and decay are so important.  
Metaphysical place. vs. stealing

8. Check it out:

Canon:

A | A<sup>m</sup>2 | whole note | A<sup>m</sup>3

→ place as electronic concept (as rhythmic displacement) →

10/10  
More music: M.A. Edgerton  
Folklore and folk music: (see Edgerton Folklore, Christian Wolff)  
Folklore and folk music: closely connected with the practice  
Folklore and folk music: (see Edgerton)  
Tonal Organization  
Progression of the 12<sup>th</sup> century: one kind of folk music  
Case: Dances, dances, contemporary  
Folklore and folk music: what is this song to mean it?  
Folklore and folk music: across

→ Introduction 7.3 for piano, 1983 David T. Lewis  
last part piece

→ Structures for string quartet, 1981

→ Projection #1, 1981  
→ Projection #2, 1981  
→ Projection #3, 1981  
→ Projection #4, 1981  
→ Projection #5, 1981  
→ Projection #6, 1981  
→ Projection #7, 1981  
→ Projection #8, 1981  
→ Projection #9, 1981  
→ Projection #10, 1981  
→ Projection #11, 1981  
→ Projection #12, 1981

Metaphorical place of starting  
Attack and decay are complementary

10/12 → The Swallows of Salangan, inspired by passage by Boris Pasternak  
chorus + orchestra (lots of winds, no violins or violas, two pianos, vibraphones)  
everybody goes at own speed, B<sup>b</sup> in the center of the piece; everyone  
has to play/sing it. 35 instruments. Thick. Alvin and the  
Brandeis chorus. <sup>6-7</sup> minutes or so. 1963 performance. Written c. 1960 ←

→ King of Denmark, 1964, percussion and finger tips  
[contrast it to Zyklus, by Stockhausen] Introverted

10/17 Slide show 8 minutes

Jackson Pollack

Franz Kline

Willem de Kooning

Jasper Johns

Arshile Gorky

Barnett Newman

Famous guys who were

earning a lot of money

NYC city action painters

tremendous output

Paris in the 20<sup>s</sup>

with the exception of Jasper

Johns, hit the new style in →

their "middle age", after more "traditional" painting

Earle Browne:

Denver, Colorado, jazz musician. John Cage came and  
freed him out. Moved to N.Y.C.

Close connection to art - Alexander Calder; Mobiles;  
Moving, changing art.

Compose a score whose parts could change. Improvisatory. Started  
with graphs. December '52

→ December '52, Earl Browne,

Alvin and the chorus at Town Hall 1963 (Swallows)

Whoops — Earl Browne conducted it. Spontaneity, Strange ←



→ Available Forms

1 | 2 | 3 | etc... forms available. Director selects which forms to take elements (pitch, timbre, density, etc.) from and conducts them ←



0888 10 10 10

→ From here (1963)

Chorus and orchestra. Alvin and Brown conduct. Score?  
Tone clusters. Musical gestures. Fade acts/ins. Director as a Prima Donna — MGM, iy ←

10/19 I cut for Tabla. 5 5 5

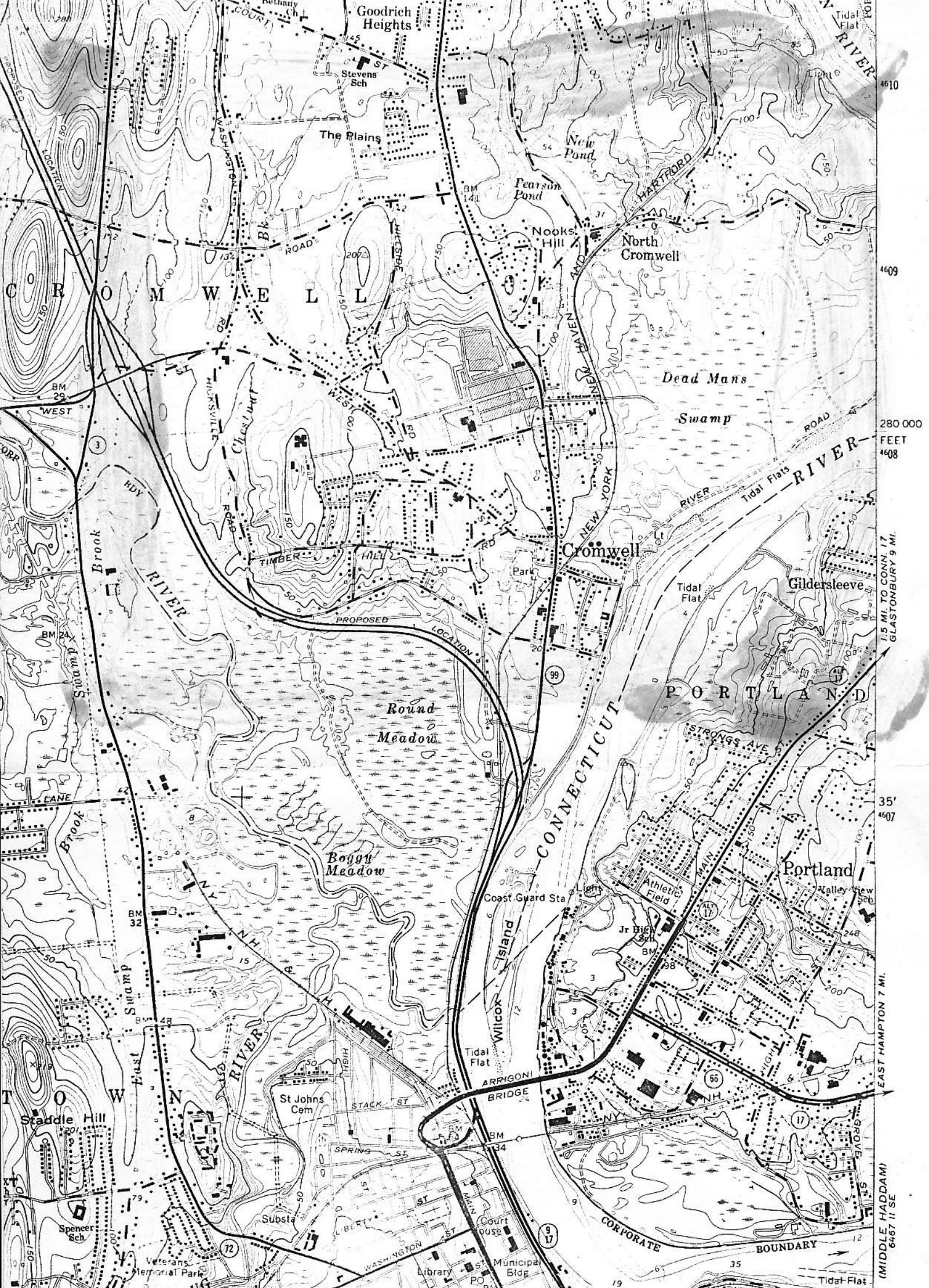


10/24 Jax: that's where the problems of electronic music performance are found. Connections/misconnections/deconnections. System meeting system. Component into component.

Thinking in terms of parts, separation of. Electronic environment in plugging things together, assembling components.

Interpretation of Earl Browne score — visual, with physicality, whole world with no distinctions or exploitations. Take it into a different realm, no associations with reality here — another planet.

Superimpose systems, one on the other: no connections  
Artificial superimposition of ideas on sound. Visual control of art —  
written music. Dance (Adzenya last Friday night)  
Purposes.



4610  
4609  
280 000  
FEET  
4608  
1.5 MI. TO CONN. 17  
GLASTONBURY 9 MI.  
35'  
4607  
EAST HAMPTON 7 MI.  
(MIDDLE, HADDAM)  
6467 11 SE



Instruments as physical objects from environment. Audible sounds on things that exist anyway

→ now: map as a score.

Connecticut river: very strong, old, important, influential, Intellectualizing, because it doesn't mean that on the page. Alvin once explored the source of it: taped the pitch + tone of the stream at different places; tuned it with dams. We are alienated ←

→ Project: grocery list blues. Deal with every visual symbol. Voice. Also look at map(s)

10/26 Alan Kaprow — happenings:

10/31 Computer Cookbook

Energy recipes

Taste

Texture

→ → Design something for TV thing pre-thanksgiving...:

Nam June Paik - documentary on Cage with Alvin stuttering for 30 minutes as the interviewed-academic.

Shigeko Kubota - Cage thing and some other stuff (5 or 6)s.

→ last of the old Avant-Garde, the hard-to-like: Christian Wolff  
16 years old when he met Cage; wanted to study composition — early 1950's, Greek expert, considers himself an amateur composer. Cage assignment: make a 20 minute piece with three notes.

Complex relationships — extension of ~~sen~~ German/Austrian serialists.

Made real chamber music — more personal, complex than orchestral stuff. Entwined. New idea though — cybernetics (organism self-control by feedback) — of group control, removal of composer. Also: Zero time: no time continuum (A → B), but point to point. Combined effect: example to explain: play short high note when you here a short low note >> or the idea of: rules in piece, listening, reacting, self-control.

Score: for two, four, or eight players — Pairs. Eight parts composed vertically (8 part "harmony") but can be played (by 2 or 4) in a more linear fashion.

Real chamber music — players can control it, within a framework.  
→ For one, two, or three players, Christian Wolfe. for one player.

David Tudor, on a little detuned baroque organ. Prepared.

Superimposition of two performances: 1 he played the organ, 1 he crawled around inside it. ←

The realization: David Tudor broke down the barriers between composer and performer. At one time, the greatest pianist in the world, could play stuff that was technically impossible — Boulez' Sonata. Helped Cage enormously.

11/2

a piece by Alvin, with television/video  
physical phenomena: bowing a plate of metal, plate vibrates, sand shows  
the vibration, demonstrates sound, the harmonics.

players: self-created scope — aim for an image, try to create it,  
or improvise — image is their collective image.

alchemy: base idea: transform low material into gold, essences, material.  
something to do with the way we compose, exploring physical phenomena,  
essences. Alchemy  $\longleftrightarrow$  marxism.

plate . 4 transducers [Lafayette wall things] . sound connected to physical reality.  
does work, moves sand into images.

has been done with singer(s), violinist.

electronic instruments because: capable of producing very simple sounds,  
continual sounds, better explanation of images.

fantastic. The Queen of the South — alchemical expression

f pl  
There are ten parts, one to a page. A performance may consist of any number of them, repeating none, or of any one, through more than ten times.

Each part, or page, is a score, and each player should have a copy of it.

Play all that **FOR 1, 2 OR 3 PEOPLE** in any convenient sequence, not repeating anything, except in 12, where any of the events may be played or omitted any number of times.

Black notes are variously short, up to about one second. With stems as sixteenth notes (e.g. in III, etc.) they are very short. White notes are of any length, sometimes determined by the requirements of coordination (see further on).

A dynamic indication may stand by itself: (as at left top of page) assume a note to go with it or apply it to any note given on the page. However > or <, standing by themselves, should always be applied to a note already given.

David Tudor's prepared organ

(continued from page 2)

met = a sound using metal (generally of low resonance;  
met<sup>2</sup> = a higher resonance)

wd = a sound using wood (generally of low resonance; wd<sup>2</sup> =  
a higher resonance)

t = a sound made by tapping or touching or tracing or the like

b = a sound made by breathing or blowing or the like (but not singing)

fr = a sound involving friction

pl = a sound involving plucking or pulling

sn = a sound involving snapping

stret = a sound involving stretched material

In parts V-X notations such as the following not standing by a note are to be applied to any sound on that page, whether produced by oneself or another player.

~ = a slight alteration of a sound

^ = cut off a sound

→ = extend a sound

↗ = raise a sound in some respect

↘ = lower it in some

Christian Wolff

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There are ten parts, one to a page. A performance can be made of any number of them, repeating none, or of any one, repeated no more than ten times.

Each part, or page, is a score, and each player should have his copy of it.

Play all that is notated on a page, in any convenient sequence, not repeating anything; except in IX, where any of the events can be played or omitted any number of times.

Black notes are variously short, up to about one second. With stems as sixteenth notes (e.g. in III, etc.) they are very short. White notes are of any length, sometimes determined by the requirements of coordination (see further on).

A dynamic indication may stand by itself (as at left top of I): assume a note to go with it or apply it to any note given on the page. However  $>$  or  $<$ , standing by themselves, should always be applied to a note (any one) already given.

A diagonal line towards a note = play that note directly after a preceding one. A diagonal line away from a note = that note must be followed directly by another.

A vertical line down from a note = play simultaneously with the next sound (both attack and release).

A small number at the end of a line (e.g. at left top of I) = coordinate with the second (if the number is 2; third, if 3; etc.) sound, preceding (if diagonal line towards note), following after one has begun one's note (if diagonal line away from it), or play simultaneously with the second next sound (if the line is vertical).

If a line to a note is broken by a number followed, after a colon, by a zero (—2:0—) (e.g. top middle of III), that number of seconds of silence intervene before the required coordination.

An  $\alpha$  at the end of a line (e.g. middle left in I) = coordination must be with a sound made by another player. If only one person is playing, he must coordinate either with a sound he hears in the environment or with a sound he has himself made unintentionally.



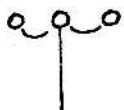
= play after a previous sound has begun, hold till it stops.



= start anytime, hold till another sound starts, finish with it.



= start at the same time (or as soon as you are aware of it) as the next sound, but stop before it does.



= start anytime, hold till another sound starts, continue holding anytime after that sound has stopped.

Horizontal lines joining two notes = a legato from the one to the other (both played by the same person).

If no line leads to a note or drops vertically from it, one can start to play at any time. If no line leads away from a white note, it can last as long or as short as you like.

One, two or three people can play. If one plays alone, he must realize all "open" coordinations (lines with notes at only one end) himself, that is, he must use other notes given on a page, as he can, to provide something to coordinate with: or, sometimes, he may use sounds from the environment [as he must when there is an  $\alpha$  at the end of a line]). (He may in some cases have to rearrange the material on a page and consider a disposition of it which will ensure that all the required coordinations can be managed.) All the material on a page can be freely superimposed, so long as the requirements of coordination are met.

If two or three play, the material on a page should be distributed between them, in any way (in VII a distribution for two players is indicated); but no material marked off for one player should be played by another (note: this holds for IX too). Coordination, then, for each player can be either with his own material (as if he were playing alone)--unless there is an  $\alpha$ --or with whatever sound(s) he hears next from another player (or both).

Players can use any ways of making sounds, allowing for the following specifications:

Some notes are on staves: play the indicated pitch (reading either bass or treble clef; sound at pitch; if pitch not available in range, transpose at least two octaves; short lines off a pitch at an angle = fraction of a tone less than half up where line angles up, down where down). *a little over a tone*

Where no pitches specified, they are free (recognizable or not).

Larger numbers directly over a note: if black = that number of tones (not necessarily played together unless bracketed, 2); if red number = that number of timbres. No number = one (e.g.  $\frac{2}{0}$  = two tones, one timbre;  $0$  = one tone, two timbres).

Larger numbers on a line between notes: if black = that number of changes of some aspect(s) of the sound before reaching the next note; in red = that number of changes of the timbre of the first note before reaching the next one.

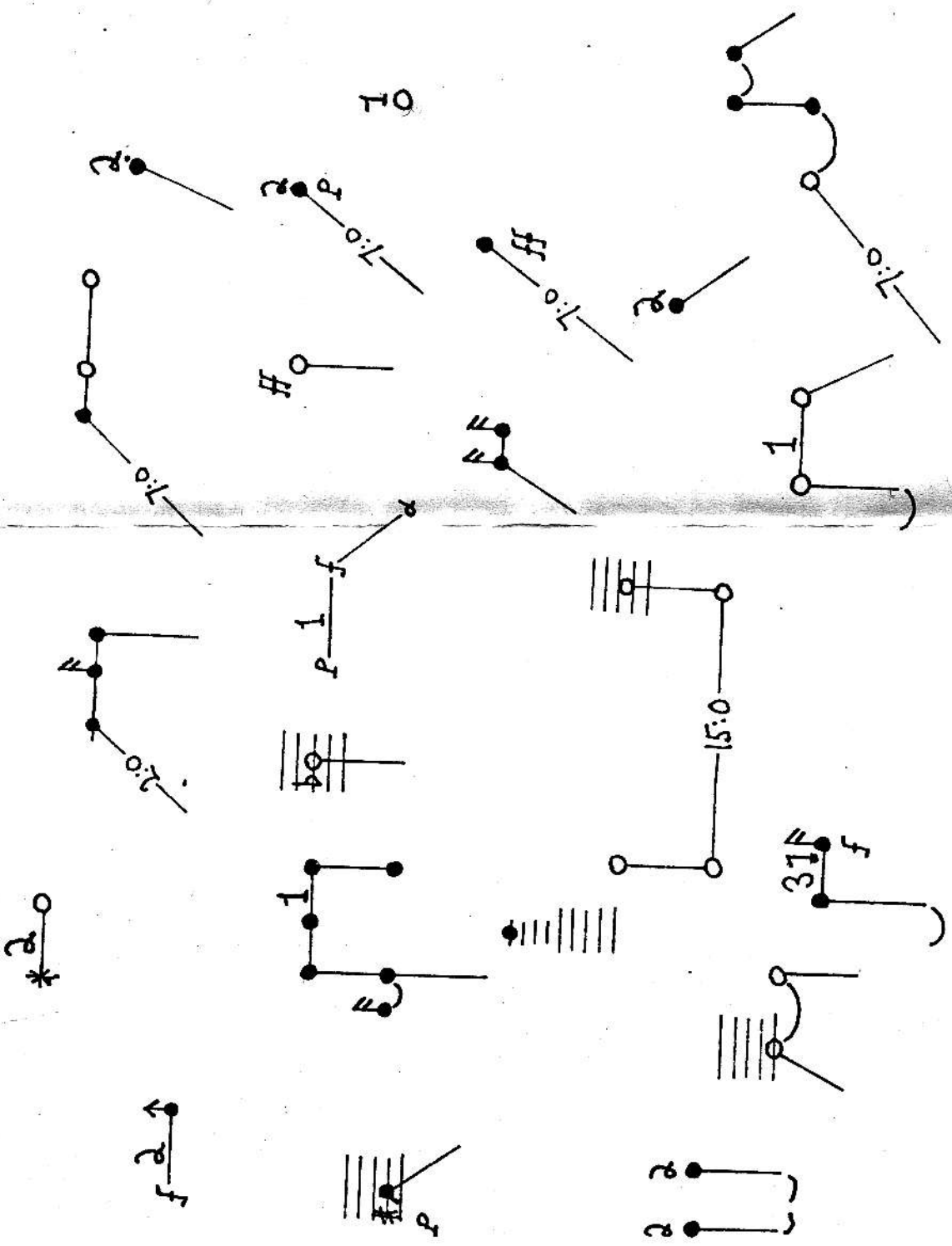
A red number 1 over a note = use a different timbre from the one immediately preceding.

- $x$  = anything       $\frac{*}{*}$  = a noise       $\curvearrowright$  = change the direction in space of a sound
- $\uparrow$  = a high in some aspect       $\downarrow$  = a low in some aspect       $\ominus, \oplus$  = a sound in a middle place, in some respect, of the sounds around it.
- $\Delta, \blacktriangle$  = a sound in some respect dissonant with what immediately precedes       $\diamond$  = a harmonic       $\text{asp.}$  = 'as possible'
- $\oplus$  = a sound as far away as possible, in some aspect, from what immediately precedes it

*extreme*

(continued on title page)

III



11/7

Christian Wolff

difficult, complex instruments — chamber music — notes  
electronics, intimacy + interplay.

interested in situation, cues, dependent decisions, intricate interplay.

Cybernetics — feedback control.

Distillation of all the things people ~~have~~ learn as instrumentalists/musicians.

→ Duo for Violin and Piano ←

→ Duo for Piano and Horn ←

Prose pieces — for normal people it seems. Prepare the  
score for Thursday. Sticks, Stones, Play — bring objects

Think about cartridge music + objects of it.



## Play

Play, make sounds, in short bursts, clear in outline for the most part; quiet; two or three times move towards as loud as possible, but as soon as you cannot hear yourself or another player / stop directly. Allow various spaces between playing (2, 5 seconds, indefinite); sometimes overlap events. One, two, three, four or five times play a long sound or complex or sequence of sounds.. Sometimes play independently, sometimes by co-ordinating: with other players (when they start or stop or while they play or when they move) or a player should play (start or, with long sounds, start and stop or just stop) at a signal (or within 2 or five seconds of a signal) over which he has not control (does not know when it will come). At some point or throughout use electricity.

### Color version:

red; blue; white; green; yellow; black; silver; sharp, short sound; flat; silence; simpler relationships (1:2, 2:3, 3:4) mixed with less simple (5:6, 7:8); with breath or air; soft; long; thin or flourished.

### Variable shades.

Colors need not be symbols for sounds, nor sounds for colors.

Consider making, sometime, a fabric with some design in it, but not in two dimensions.

Or, allow for the possibility of periodicities appearing, and disappearing (for instance, shortly on being identified, or immediately on being imitated, or within 3 or 7 seconds of a signal).

At some point drop two of the colors and two of the descriptions listed above; and shortly before finishing introduce five new ones.

*Are musical sounds to other sounds as black and white is to color?*

*Are the colors necessary? Lights, painting confetti, the colors already there.*

*What about texture? Smooth, lumpy, gritty; streaks, powdered, smeared, even edged, trailing.*

*Colors are not to objects one sees as a sound quality to sounds one hears.*

*Or are they?*

## **Stones**

**Make sounds with stones, draw sounds out of stones, using a number of sizes and kinds (and colours); for the most part discretely; sometimes in rapid sequences. For the most part striking stones with stones, but also stones on other surfaces (inside the open head of a drum, for instance) or other than struck (bowed, for instance, or amplified). Do not break anything.**

done for  
art school

## Sticks

Make sounds with sticks of various kinds, one stick alone, several together, on other instruments, sustained as well as short. Don't mutilate trees or shrubbery; don't break anything other than the sticks; avoid outright fires unless they serve a practical purpose.

You can begin when you have not heard a sound from a stick for a while; two or three can begin together. You may end when your sticks or one of them are broken small enough that a handful of the pieces in your hands cupped over each other are not, if shaken and unamplified, audible beyond your immediate vicinity. Or hum continuously on a low note; having started proceed with other sounds simultaneously (but not necessarily continuously); when you can hum no longer, continue with other sounds, then stop. With several players either only one should do this or two or two pairs together (on different notes) and any number individually.

You can also do without sticks but play the sounds and feelings you imagine a performance with sticks would have.

11/9 we listen again: For...

→ For one, two, or three players, David Tudor - prepared organ.  
(baroque like), two versions simultaneous. ←

more on Tudor

→ Improvisation A Jante, Mauricio Kagel, for Organ. A huge difficult piece. Tudor started in choir, then organ, then met Cage, started contemporary music new music. Phantom of the opera. Exploits the instrument but this could be a sort of bad thing. Nifty thought. ←

11/14

→ Summer, for string quartet

[Benjamin Franklin's string quartet  
Ruth Crawford Seeger]

like for 1, 2, or 3 players (score) (principles) 1961

Complex coordinations, connections. extension and distillation of Bach:  
how to put musical materials together (The Musical Offering of Bach).  
figure out the first couple of sounds. f pl i i

Bring scores and materials for practice for cartridge

→ Studio 1 - Shellharren, graph score, envelopes, outtouch

→ Studio 2 - electronic sounds and the soprano "A" in

→ Studio 3 - electronic sounds and the soprano "A" in

→ Studio 4 - electronic sounds and the soprano "A" in

→ Studio 5 - electronic sounds and the soprano "A" in

→ Studio 6 - electronic sounds and the soprano "A" in

→ Studio 7 - electronic sounds and the soprano "A" in

WESLEYAN UNIVERSITY

DEPARTMENT OF MUSIC

presents

An Evening of Video Art and Electronic Music with Alvin Lucier, and  
Guest Artists Nam June Paik and Shigeko Kubota.

Tuesday, November 21, 1972 8:00 P.M.

Downey House Ballroom

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Simultaneous performances of

Video Birthday Party of John Cage, No. 3

Shigeko Kubota

Europe on 1/2 inch a day

Impasse of Infidelity

Marcel Duchamp and John Cage

---

Video Art

Nam June Paik

---

The Green of the South (1972)

Alvin Lucier

for players, responsive surfaces, strewn material  
and closed-circuit television monitor system. As  
the strewn material responds to the musical sounds  
in the vibrating medium, making patterns, the performers  
either make pre-determined figures or discover their  
collective imagery.

---

Cartridge Music (1960)

John Cage

(amplification of small sounds)

Video Consultant: Bob White

Technical Consultant: Ron Goldman

Performers:

Alexander, Steven  
Bohn, David H.  
Bohoranon, Kenneth W.  
Button, Terry F.  
Celeste, Michael J.  
Coff, Richard S.  
Coker, Edwin L.  
Collins, Nicolas B.  
Cruickshanks, Donald A.  
Driscoll, Ellen  
Duncan, Ann S.  
Duncan, Bruce C.  
Eager, George B.  
Forster, James R.  
Fusci, Raymond A.  
Gilmore, Samuel L.  
Gorn, Steve  
Greenberg, Laurence P.

Grilli, Stephen J.  
Hackett, Raymond A.  
Judge, Tom S.  
Leganza, Richard L.  
Lehrhoff, Michael B.  
Lewis, Barbara A.  
Litwak, Howard D.  
Mcardle, Peter D.  
Monfort, Jose A.  
Montalvo, Daniel J.  
Plettner, David H.  
Richardson, Robert K.  
Rousseau, Thomas J.  
Sanchez, Edwin R.  
Smith, Steven A.  
Suleske, Robert T.  
Whiting, David S.  
Young, David B.

JOHN CAGE

on nam june paik's "Zen for Film"(1962-64)

On the nature of silence: Well now, you know that I've written a piece called 4'33", which has no sounds of my own making in it, and that Robert Rauschenberg has made paintings which have no images on them--they're simply canvases, white canvases, with no images on them--and Nam June Paik, the Korean composer, has made an hour-long film which has no images on it. Now, offhand, you might say that all three actions are the same. But they're quite different.

The Rauschenberg paintings, in my opinion, as I've expressed it, become airports for particles of dust and shadows that are in the environment.

My piece, 4'33", becomes in performance the sounds of the environment.

Now, in the music, the sounds of the environment remain, so to speak, where they are, whereas in the case of the Rauschenberg painting the dust and the shadows, the changes in light and so forth, don't remain where they are but come to the painting. In the case of the Nam June Paik film, which has no images on it, the room is darkened, the film is projected, and what you see is the dust that has collected on the film. I think that's somewhat similar to the case of the Rauschenberg painting, though the focus is more intense. The nature of the environment is more on the film, different from the dust and shadows that are the environment falling on the painting, and thus less free.

University of Cincinnati. 1968

"Cinema Now"

(edited by H. Currie and M. Porte)

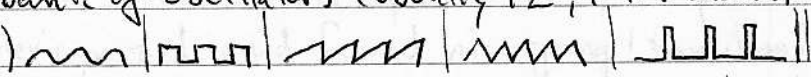
N.B. Dear John:

The nature of environment is much much more on TV than on film or painting. In fact, TV (its random movement of tiny electrons) IS the environment of today.

N.J.P. (1971)

11/28 European tradition in America (orchestra, symphony) countered by American music of Cage, Feldman, Brown.

1952 - Cage's first tape piece, *Colon* (Köln) first real classic electronic studio ( ). Paris 1958, *Musique Concrète*, lots of film music, Pierre Schaeffer, Pierre Henry — state supported [Symphony for One Man Solo]

Köln - electronic instruments (sound sources) and processing. Classic studio: bank of oscillators (usually 12, 1 for each note of the scale yep)  filters: high pass, low pass, band pass, notch (band reject) — band pass was most important; all-pass filter - multi-band. White noise generator.

Tape. Mike. Record... Sound sources. Processing: reverb — very boring except... Envelope generator. Ring modulator. Tape recorders.

Making material for piece. Tune the oscillators to your own timbre, harmonic/enharmonic series, tape segments. Then do the same with filters and other stuff. Put the pieces together, generate nifty things. Change speeds. Thousands of splices.

Karlheinz Stockhausen — study with sine tones/waves only:

→ Studie I — Stockhausen, graph score, envelopes and reverb abound, enharmonic constructions, variable speed tape ←

Then did Studie 2, with other sounds, *The Gesang der Junglinge 1* — electronic sounds and boy soprano. "Quite spectacular." Voice, filter, reverb, electronic sounds, apocalyptic text, five channels, confusion between elements.

→ Gesang der Junglinge 1 ←

11/30 a book: Pavilion, published E.P. Dutton.

Experiments in Art and Technology - E.A.T. - designed audio-visual pavilion for Pepsi at Expo in Japan. 20 artists and 20 engineers. Programming for a month. New artists every week. Lots of money from Pepsi, but they didn't like it changing all the time

Stockhausen. From the strict German studio thing. The most popular word was "control", don't rely on performance. Then was Americanized and found his gang (tam-tam) wrote Mikrofonie I: 6 players: two players, two directional-microphones, two bandpass-potentiometers. At first improvised, then scored with following ideas: halfway between strict score and indeterminacy - he still has control; relationships/tension (between groups) makes art (unlike Cage); notation for ① similarity ② opposites ③ starts similar, then go far away

→ Mikrofonie I ←

Cage in Landscape #3, used three AM radios, 6 players, score, director/conductor - like going through a dense urban environment or beach. Stockhausen did Shortwave.

→ kurzwellen, for radios and instrumentalists, shortwave. ←

→ Telemusik. Tape collage, of all different music, done in Japan. ~~was~~. Processed a lot ←

Luciano Berio. Started electronic studio in Milan.

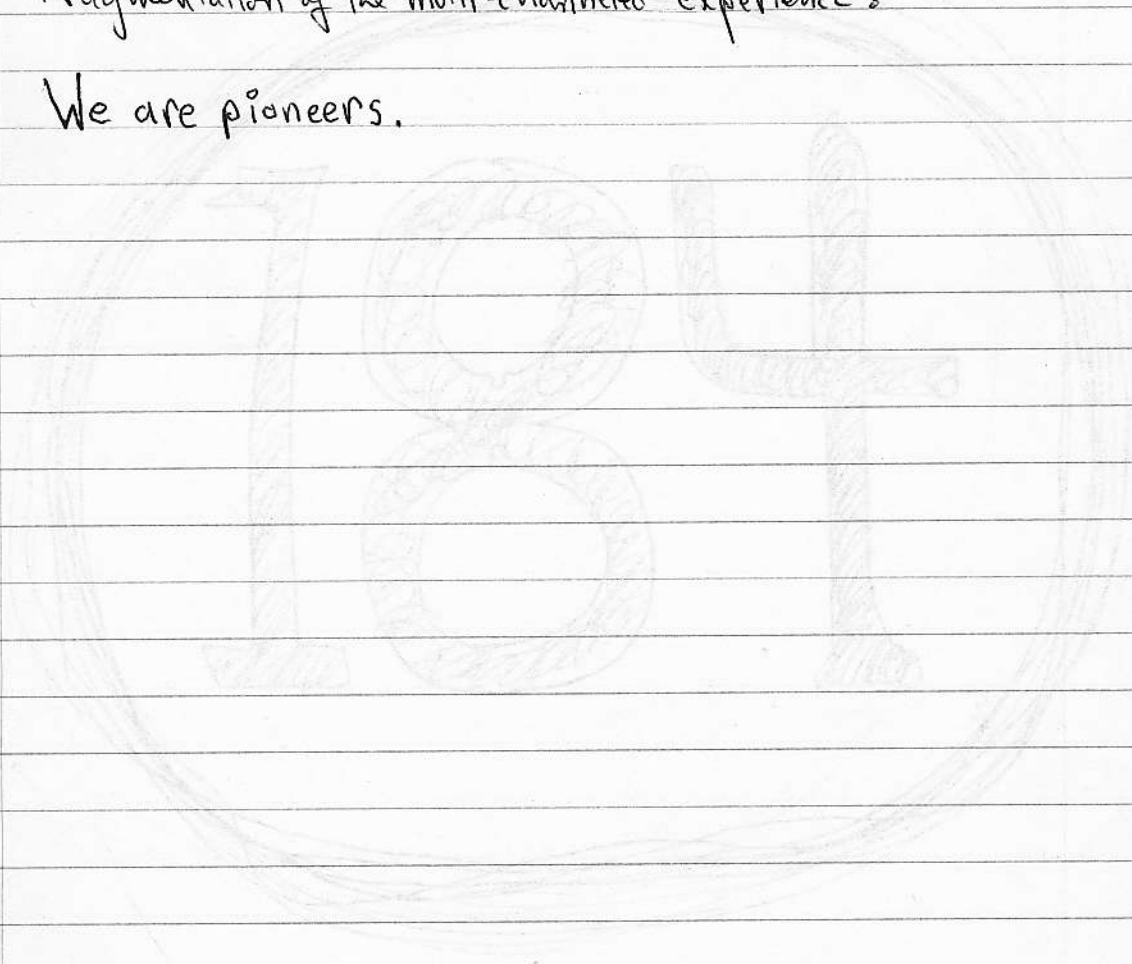
→ Circles, soprano, harp, drums, <sup>percussion</sup> Text of E.E. Cummings. ←

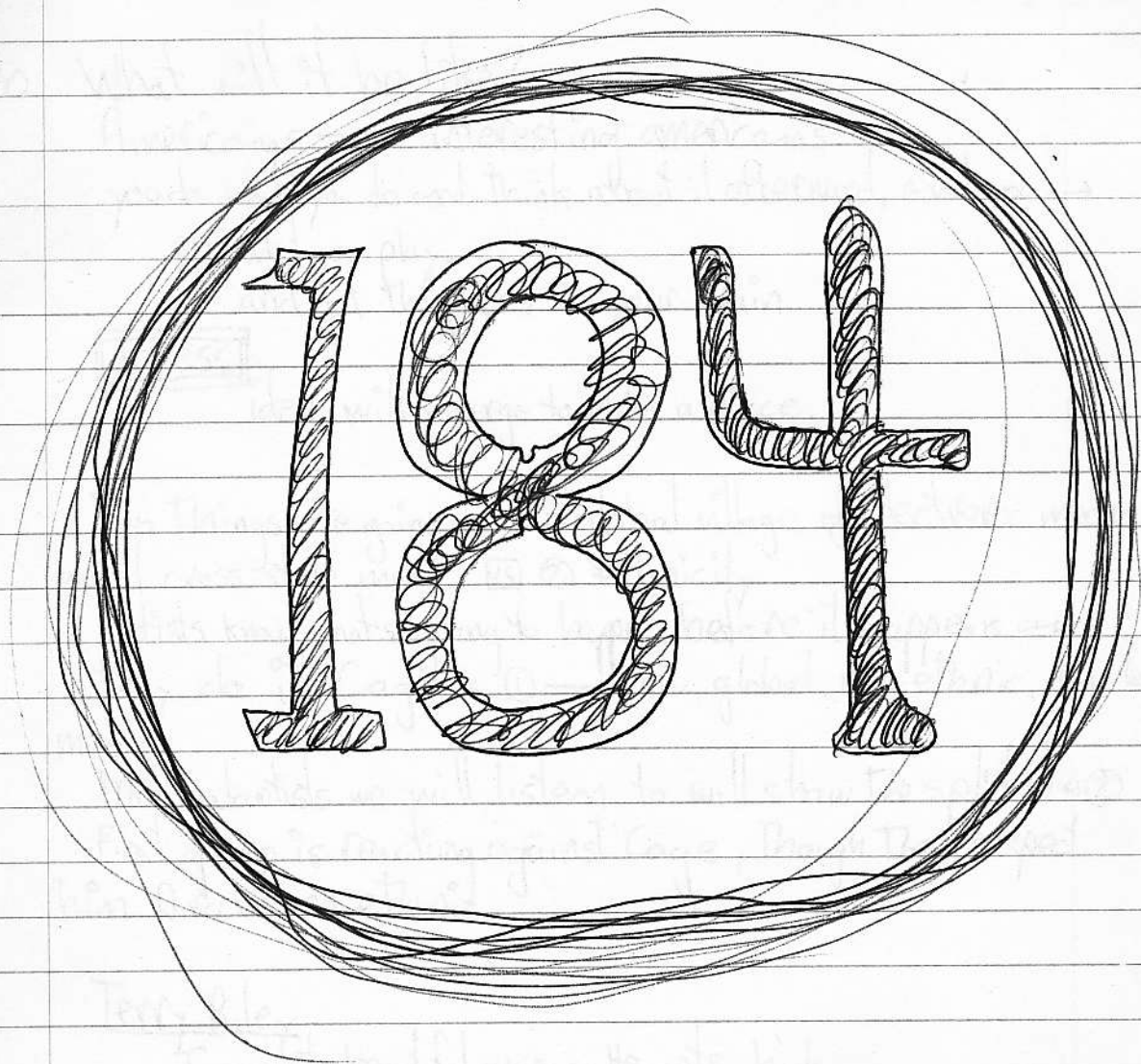
James Joyce splices words and phrases. Composers (electronic) love him.



Fragmentation of the multi-channelled experience.

We are pioneers.





1/30 What will it be like?

Americans — interesting americans.

you do what you do and think about it afterward, and you →  
play what you play.  
and get the pieces in your brain.

access

idea will emerge to make a piece.

Two things are going on: ① global village of electronic media;  
global cross style music vs ② ethnicity

Artists know what's going to happen before it happens and  
they do it. Cage is ① — new, global, non-ethnic, random  
music

Musical artists we will listen to will show the split ① + ②  
First group is reacting against Cage, though they respect  
him. Draw on ethnic.

Terry Riley

I want beautiful music. He gets high.

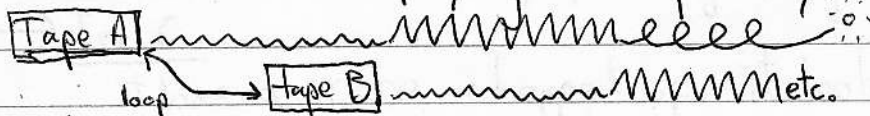
Played jazz, studied Indian and Japanese music. He wants  
to play, he wants to improvise, where as Cage did not but  
wanted to produce an idea.

Modal, which backtracks to...

Harmony in western music, Order and direction in time, vertical  
space. Indian, eastern (+ earlier western) music focus <sup>entirely</sup> on horizontal  
network, melodic line — differences in mode, Harmony distracts  
from melody, limits it Each mode had its own feeling  
and meaning. Chordal harmony made modes too complex.

reduced them to two - major ("c") minor ("a" of sorts)  
Riley and others say that they can't find spiritual value  
in my culture/surroundings. Went to India and absorbed  
and studied and rejected harmony. Modal improvisation,  
static (no harmonic motion).

Electronic. Started playing with tape delay. one guy two parts.



right there like Bach.

→ Terry Riley, A Rainbow in Curved Air

electric keyboards, tape delay, percussion → dumberc

↳ organ, piano, harpsichord

multiple track recording. improvisation, studio realization  
of real-time performance with tape delays (multiple instruments  
in imitation instead of delay on single instrument)

2/1 "Young composers I like" so it's no survey course.

### Terry Riley

Turned away from random chance. Studied Indian music but "doesn't do it" — not a blatant influence. Jazz, improvisation, electric but instrumental, dope, all night, high fantasy music.

→ In C

it has a score, chopped up. it looks like every tune that you ever heard in that key — short motifs, 1-53 of them. Any number of players, any instruments. Everyone starts by playing first motif as many times as she/he wants, then go to the next, play as long as you/he/she wants, then go on to the next and so on — hocket-hiccup style of medieval music, Java, and elsewhere: phrases together form other phrases. Compose it and take the composition out — withdrawing the preciseness, adding something else, improvisation. Phrase overlap — phase shift: an electronic idea. [Morton Feldman, 2, 3, or 4 pianos, first phase piece]. What keeps everybody together is the pulse, played by piano trumpet, flute, oboe, clarinet, viola, trombone, vibes, piano 10 instruments in all, recorded twice so so really.

PHASE →

a little complex, too much. Perhaps only one recording, not too. ←

Brahms and Beethoven as developers — industrial, capitalistic idea: urban development, utilization of raw materials, etc.; a parallel

3/6  
Movement in the arts. Terry Riley is not doing this — he is not pushing the music around. An image of the way life could be: no one pushing anyone else around.

Symphony orchestra grew up when the mills did: assembly line image.

→ Poppy Nogood and his Phantom Band

Terry plays everything — his girl-kid calls him "Poppy Nogood."

Different quality from Rainbow.

electronic switch + phase aspects.

soprano sax and tape loops against organ drone

PHASE music mmmm...

a guy a little dopey nothing too heavy

come back next time

2/6

on the board:

La Monte Young.

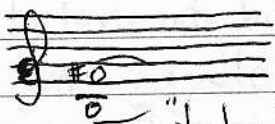
The Tortoise, His Dreams and Journeys.

"Map of 49's Dream ~~and~~ The Two Systems of Eleven Sets of Galactic Intervals Ornamental Lightyear's Tracery"

31 VII 69 10:26-10:49 PM

La Monte Young was the most extreme musician of the 60's. Studied with Cage. Went to Darmstadt, Germany 1960. 1960 published a magazine, An Anthology, of composers, extremists (on reserve) — paragraph scores, ideas.

Composition 1960 #7



perfect fifth

"to be held for a very long time"

Idea. Is it dumb? If so why? P5, not any other interval. ah — overtones, harmonic series — like oxygen, it's there, a natural phenomenon: c, c, g, c, e etc.: from whence all the intervals arise, mathematical ratios. Harmony, implied in any pitched musical sound. Combination tones: two notes produce/generate ~~an~~ a third tone; one kind is a difference tone (300 cps and 350 cps produce a 50 cps tone). All this is done with sine waves.

Standing waves (sine) — constructive and destructive interference, in and out of phase. Hyperbolas of peaks and troughs. In tune, hyperbolas are stable; if ~~two~~ two oscillators are slightly out of tune, hyperbolas will move toward source of higher frequency along elliptical path.





In functional terms, the Fifth is the strongest, most fundamental interval (oh the history!). Doing La Monte Young's piece, you learn that a Fifth is not a constant stable thing — it is always changing in small ways, unnoticed in most music, but in this piece..... By staying on it and in it, you experience it, pay attention to the movement/shifting. Like the painting of 100 Green Stamps, or Warhol — it can save you but making you see that your culture is not infinitely boring but everything is different. Very beautiful

He is a secretive man. Expensive, too.

He reads: in some other cultures, there a fundamental frequency. Birds tune to it; in America, power lines hum at 60 cps. He wants to tune into his environment. Tunes an oscillator to 60 cps. Live a 24 hour cycle (I should meet this man).

Tortoise: This piece is a huge piece, made up of lots of pieces, that he will play until he dies. "Map" is part of this Tortoise. It is a drone piece — something of other cultures. Lock into spiritual thing.

Try to hear. Things happen that aren't in the drone or notes: difference tones, other combination tones. A place for this music he calls a Dream House.

2/8 on the board:

La Monte Young and Marian Zazeela

"Map of 49's Dream of the Two Systems of Eleven Sets of Galactic Intervals Ornamental Lightyears Tracery"  
(begun 1966)

Complexity of music, Viennese school: Webern, Schoenberg, Berg, Freud, Decay of Austro-Hungarian empire. German expressionism in painting. Dark, painful, torturous, introverted. Cosmos I do not understand.

Studied in America ~~in America~~. What the hell did it have to do with American culture? American artists (painters) predict, are 10 years ahead. Post-war isolation from Europe produced amazing movement/school of painting, surge of art.

Painting — an idea comes, that you don't have to do something complicated: minimal art. Taken into music, by such as La Monte Young.

Amplifying and focus. John Cage — "give me all the speakers in the university" — wants to unfocus the audience, out of electronic multiples culture — this is Cage, this is old American. La Monte Young takes the opposite view: sine wave oscillator and voice, and play it until you have absolute focus/understanding — minimal thing, an experience.

Artist Bob Morris makes objects (metal). Made a gong-like object which he gave to La Monte Young.

→ Studies for Bowed Disc

gong as opposite of ~~single~~ tone — most complex sound.

# Computer score for Recordmusic!

- random points, lines, waves, functions
- superimpose paper over record + scribe,
- different color pens for intensity (multiple track plotter recording) (this with Amy)
- for 1 or more record players.

amplifier as basic electronic instrument. gong is amplified, brings you inside the sound. does not use electronics superficially. can be played at any speed. A strong piece. It shakes speakers.  
2:50 AM - 3:11 AM 1964 ←→

Sine and voice piece. Decided to do a piece with waves instead of ocean instead of with sine wave/60 cps environment

Drone: where is it done? why? how?

play with filters on waves:

- 1) trimming harmonics,  $V_c$ , random or wave controlled low pass
- 2) drop down through high harmonics to two fundamental waves using/using high pass or band pass. try it with all waves

2/13

performing a La Monte Piece: composition #7 1960



to be held for a very long time

and we go very out of tune.

amplifying the interval by playing it for a long time.

art as an image of how you would like things to be.

tuning — two people in tune ~~can~~ is the most beautiful thing.  
harmony of the spheres/planets, no contrasts, conflicts.  
generating beautiful, natural harmonic series.  
universe

### → 2 Sounds (1960)

minimal art — if you are an artist, you love that chalk;  
if you just write with it you don't. art is what artists do, that  
is art.

image of PHASE: basic essential electronic idea.

tape loops of <sup>2</sup> different sounds, different lengths, different screens.

Cunningham uses it ~~for~~ and the audience leaves a  
lot.

try high-pass or band pass on harmonics of a chord

stt slow sample  $1/c$  of two oscillators; envelope and parallel filter.

# MUSIC AS A GRADUAL PR

I do not mean the process of composition, but rather pieces of music that are, literally, processes.

The distinctive thing about musical processes is that they determine all the note-to-note (sound-to-sound) details and the overall form simultaneously. (Think of a round or an infinite canon.)

I am interested in perceptible processes. I want to be able to hear the process happening throughout the sounding music.

To facilitate closely detailed listening, a musical process should happen extremely gradually.

Performing and listening to a gradual musical process resembles:

pulling back a swing, releasing it, and observing it gradually;

turning over an hour glass and watching the sand slowly run through to the bottom;

placing your feet in the sand by the ocean's edge and watching, feeling, and listening to the waves gradually bury them.

Though I may have the pleasure of discovering musical processes and composing the musical material to run through them, once the process is set up and loaded, it runs by itself.

Material may suggest what sort of process it should be run through (content suggests form), and processes may suggest what sort of material should be run through them (form suggests content). If the shoe fits, wear it.

As to whether a musical process is realized through live, human performance or through some electro-mechanical means is not, in the final analysis, very important. One of the most beautiful concerts I ever heard consisted of four composers playing their tapes in a dark hall. (A tape is interesting when its an interesting tape.)

It's quite natural to think about musical processes if one is frequently working with electro-mechanical sound equipment. (All music turns out to be ethnic music.)

Musical processes can give one a direct contact with the impersonal and also a kind of complete control, and one doesn't always think of the impersonal and complete control as going together. By "a kind" of complete control I mean: by running this material through this process I completely control all that results, but also I accept all that results without changes.

John Cage has used processes and has certainly accepted their results, but the processes he used were compositional ones that could not be heard when the piece was performed. The process of using the *I Ching* or imperfections in a sheet of paper to determine musical parameters can't be heard when listening to music composed that way. The compositional processes and the sounding music have no audible connection. Similarly in serial music, the series itself is seldom audible. This is a basic difference between serial (basically European) music and serial (basically American) art, where, in the latter, the perceived series is usually the focal point of the work.

What I'm interested in is a compositional process and a sounding music that are one and the same thing.

James Tenney said in conversation, "Then the composer isn't privy to anything." I don't know any secrets of structure that you can't hear. We all listen to the process together since it's quite audible, and one of the reasons it's quite audible is because it's happening extremely gradually.

The use of hidden structural devices in music never appealed to me. Even when all the cards are on the table and everyone hears what is gradually happening in a musical process, there are still enough mysteries to satisfy all. These mysteries are the impersonal, unintended, psycho-acoustic by-products of the intended process. These might include sub-melodies heard within repeated melodic patterns, effects due to listener location, slight irregularities in performance, harmonics, difference tones, etc.



# PROCESS

Steve Reich

Listening to an extremely gradual musical process opens my ears to it, but *it* always extends farther than I can hear, and that makes its interesting to listen to that musical process again. That area of every gradual (completely controlled) musical process, where one hears the details of the sound moving out away from intentions, occurring for their own acoustic reasons, is *it*.

I begin to perceive these minute details when I can sustain close attention, and a gradual process invites my sustained attention. By "gradual" I mean extremely gradual; a process happening so slowly and gradually that listening to it resembles watching the minute hand on a watch — you can perceive it moving after you slay with it a little while. Several surrenly popular model musics, such as Indian Classical and drug-oriented rock and roll, may make us aware of minute sound details; because in being modal (constant key center, hypnotically droning and repetitious) they naturally focus on these details rather than on key modulation, counterpoint, and other peculiarly Western devices. Nevertheless, these modal musics remain more or less strict frameworks for improvisation. They are not processes.

The distinctive things about musical processes is that they determine all the note-to-note details and the overall form simultaneously. One can't improvise in a musical process — the concepts are mutually exclusive.

While performing and listening to gradual musical processes one can participate in a particularly liberating and impersonal kind of ritual. Focusing in on the musical process makes possible that shift of attention away from *he* and *she* and *you* and *me* outwards towards *it*.



Source  
10

3/15 Steve Reich

from California

his whole life style based on phase — got the idea from Terry Riley but don't tell him.

### PHASE

From electronics to The study of the music of Africa.

His first pieces:

Speech, tape loops. Sound of a young black guy speaking about encounter ~~for~~ with police. Two loops of same phrase, started in sync.; then he squeezed one tape a bit so that little by little it goes out of sync. Gradual Process; two loops, two machines, delay. — then copied and added the copy. Only possible because of tape; an electronic piece: tape, phase, sync., speech processing.

→ Come Out  
into noise ←

→ Violin Phase

violinist records 12 <sup>(beats)</sup> ~~note~~ phase on one channel  
next <sup>2</sup> channels out of phase each by 4 beats the same thing

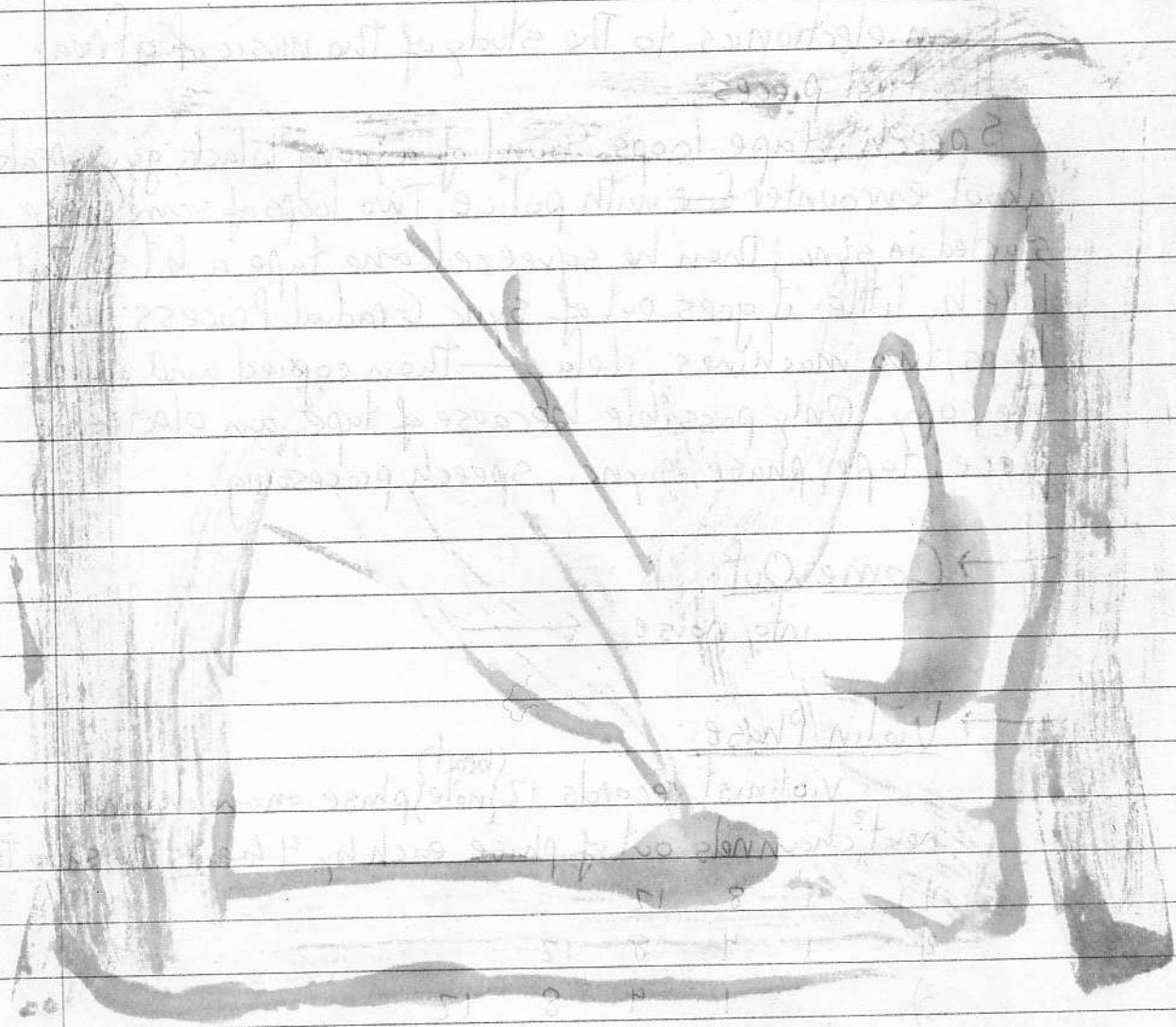
1) 1 4 8 12

2) 1 4 8 12

3) 1 4 8 12

live violin 4) starts in phase with 1, with 2+3 attenuated. Moves out of phase until in sync. with channel 2. Then 1 faded out and 2 faded in. ~~the~~ other channels brought in out of phase when he has reached 3.

phase: put waves through inverter,  
through reverb and inverter — stretch in and out.  
bring out of phase signal up and down with Vca.



# PENDULUM MUSIC

FOR MICROPHONES, AMPLIFIERS,  
SPEAKERS AND PERFORMERS

2, 3, 4 or more microphones are suspended from the ceiling by their cables so that they all hang the same distance from the floor and are all free to swing with a pendular motion. Each microphone's cable is plugged into an amplifier which is connected to a speaker. Each microphone hangs a few inches directly above or next to its speaker.

The performance begins with performers taking each mike, pulling it back like a swing, and then in unison releasing all of them together. Performers then carefully turn up each amplifier just to the point where feedback occurs when a mike swings directly over or next to its speaker. Thus a series of feedback pulses are heard which will either be all in unison or not depending on the gradually changing phase relations of the different mike pendulums.

Performers then sit down to watch and listen to the process along with the audience.

The piece is ended sometime after all mikes have come to rest and are feeding back a continuous tone by performers pulling out the power cords of the amplifiers.

Violinist improvises; take from both and create another figure.

This piece must be very difficult to perform.  
beautiful

Starts on 1, moves to phase of 2; 2 brought in, violinist improvises, then moves to phase of 3; 3 brought in; violinist improvises on all.

2/20 Who is John Cage?

Nam June Paik, Video

Russell Connor, interviewer of Alvin  
WNET, N.Y.C.

Nam June Paik

Korean composer, studied in Japan, then Cologne;  
shifted to video art; built the first video synthesizer with  
a Japanese engineer. Built a robot.

A documentary on John Cage. Alvin The academician.  
Stutter on "m", "s", and others. Cue cards. It went on and  
on....

visionary aspect of art ↔ pre-echo on tape.

Moebius score

Also Who is John Cage?  
Rusell Connor Interview  
WNET, NY

John Cage  
Cage's response stated in John Cage  
shifted to video art, but the first video experiment was  
a Japanese experiment with a video  
A documentary on John Cage from the 1960s  
Cage on "in a" and others (we could do work on this)  
a primary aspect of art -> presence on stage



2/22 Phil Glass

lumped with Terry Riley, Steve Reich, and (to a lesser extent) LaMonte Young.

Glass and Reich don't like to release scores — they assemble groups and perform. ~~Minimum~~ Reich: group improvises on basic structure, sketch out piece — Reich controls them. Very different from Cage. Ego

Reich and Glass were pals; discovered phase thing at the same time; are not such good pals any more. Their music sounds similar. After college, Glass went to Paris, studied with Nadia Boulanger — American inferiority complex —: solfege, elementary four-part harmony (hundreds of rules) (motion of two parts: ① similar ② opposite/contrary ③ oblique; intervals: unison,  $m2^{nd}$ ,  $M2^{nd}$ ,  $m3^{rd}$ ,  $M3^{rd}$ ,  $P4$ , tritone,  $P5$ ,  $m6^{th}$ ,  $M6^{th}$ ,  $m7^{th}$ ,  $M7^{th}$ , 8 — octave is mirror of root, no similar/parallel motion because it sounds like one voice, same with unison,  $5^{th}$ .

Soprano  
Alto  
Tenor  
Bass

you want I-V-I in C major  
want it strong, G in bottom

I-V-I motion takes dominance over the interval itself) and was disturbed. Studied Indian music, wrote some pieces...

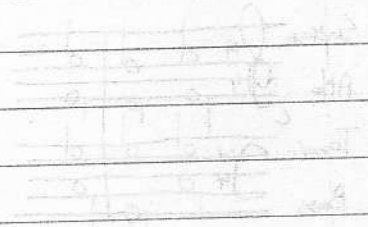
→ Music in Similar Motion

Violin, Viola, Electric Organ, Soprano saxophone, cello,  
all amplified. Recorded at The Guggenheim, 1971 ←

Phil Class

444343

Explore <sup>my length & -</sup>  
 Use first the shortest possible tape loop. Play as long as you wish  
 Stop/pause <sup>and to</sup> Change to the longest practical tape loop (offering  
 a minimum of 5 seconds of delay between speakers). Play as  
 long as you wish



Phil class all the still  
 action tape dance over the  
 interval itself (and was checked out to  
 music while some pieces

→ Music in similar motion ←

Val's Viole (and some other  
 all completed recorded at the Cunningham

Gregorian chant started as unison melody. Around 12<sup>th</sup> century, began ~~parallel~~ part motion — Alvin thinks that cathedral architecture was conducive to producing/inspiring combination tones — organum, the beginning of polyphonic western music; lead/led to similar, contrary, oblique motion.

Bach: in one line you can imply more than one line. This is in Phil's piece; Phil plays, other players accentuate particular fragments, creating

→ Music in Fifths ←

2/27

## PHIL GLASS

→ Music with Changing Parts →

Time for a project. These four composers (Riley, Reich, Young, Glass) have all moved from experimental electronic to "a more traditional sort of thing" because they became interested in/studied music of other cultures. Electronic instruments, ensemble music. Everybody (do a lot of work); extract fundamental principles (terms) and inquire into other cultures that use them — choose one: La Monte Young — drone (has not existed or focused in western culture for a long time) — how, why, where is it done, physical and psychological why; Terry Riley — phase (in and out of) — is it only electronic or does it occur someplace else and why; interlocking/hocket/? — Reich; cycling (patterns and repetition, thematic return of western classical — you can do things and they return, tal); mode — ~~Reich~~ Riley (vs. harmony); tuning — La Monte Young (tuning up to fundamental combination tones), one two three four five six; choose one of the six. Do it for two weeks. from

→ Barbara Benary: Performed 1971. 3 electric organ, electric piano, two soprano saxophones, trumpet, flutes, electric piano. Score in notes. Six lines of 3 notes falling into different chords. Each measure is infinitely repeatable until a nod from the leader. Every six measures there is a changing point — change to another of the six lines — textural change. Process music — logic as to why one measure follows another.

phase — music of the planets : force of gravitational attraction  
between planets — energy, voltage conversion (direct) —  
all around the sun. Wait — little pull between planets —  
try sun/planet pull, instead of (spheres I and II) angular  
velocity.

yawning timbre

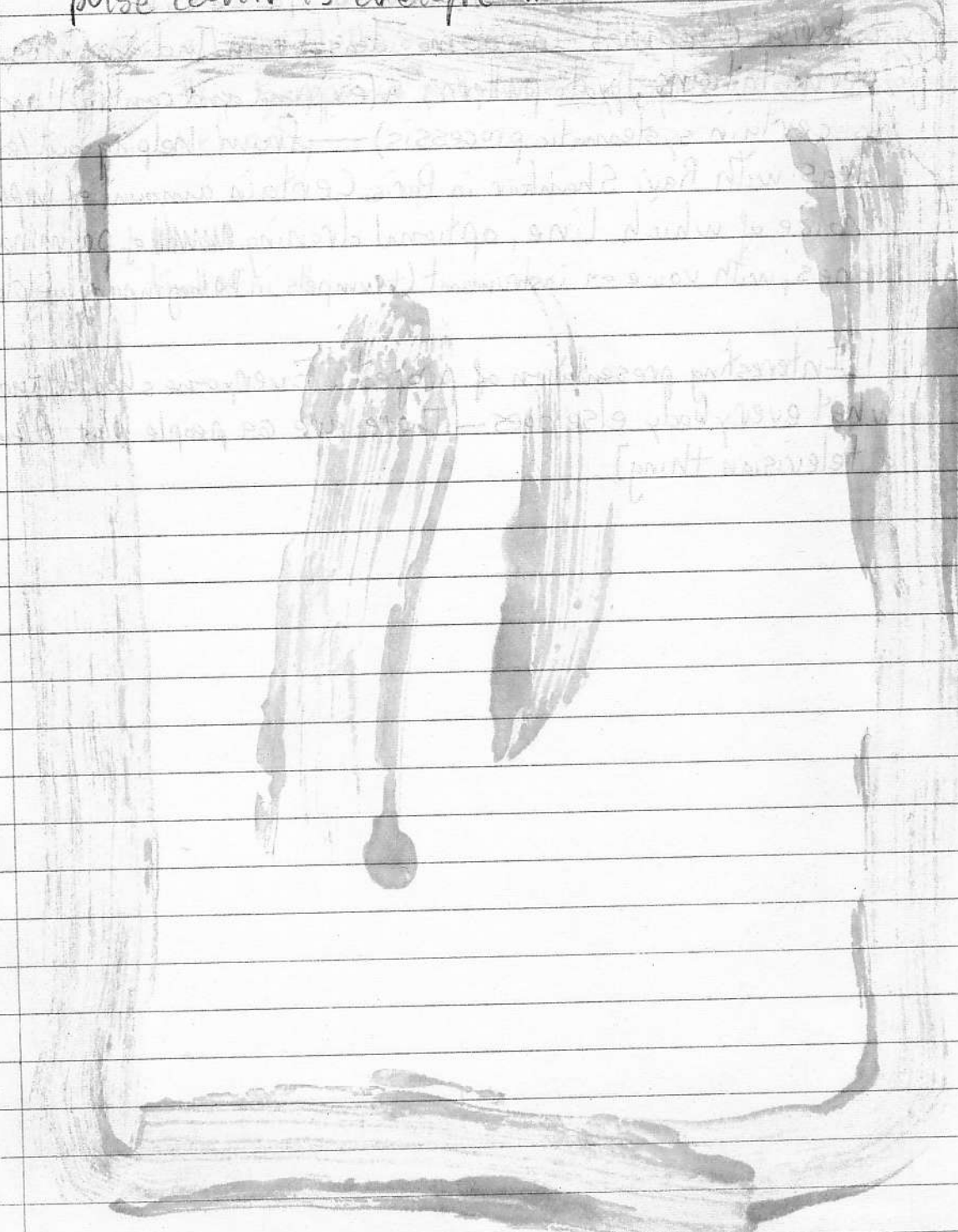
Only two parts heard at first, each having two patterns

1) a a b b 2) a b 2 a 2 b 3) 2 a b a 2 b 4) a 2 b 2 a b

Later a C comes in. Some ideas from Indian music — permutations, yati patterns (expand and contract according to certain systematic process) — from helping out/exchanging ideas with Ravi Shankar in Paris. Certain amount of improvisation; choice of which line, optional droning ~~amount~~ of prominent tones, with voice on instrument (trumpets in the beginning, flutes) ←

[Interesting presentation of project. Everyone should know what everybody else does — there are 69 people plus Alvin — a television thing]

Vc pulse width, frequency,  
pulse controls envelope with noise



AVIN LUCIER

# THE QUEEN OF THE SOUTH (1972)

for players, responsive surfaces, strewn material and closed-circuit television monitor systems

Sing, speak or play electronic or acoustic musical instruments in such a way as to activate metal plates, drumheads, sheets of glass or any wood, copper, steel, glass, cardboard, earthenware or other responsive surfaces upon which is strewn quartz sand, silver salt, iron filings, lycopodium, granulated sugar, pearly barley or grains of other kinds or other similar materials suitable for making visible the effects of sound.

Surfaces may be excited by making sounds either directly on or very near the vibrating media, through the use of loudspeakers or directly-coupled audio transducers.

As the strewn material responds to the disturbances caused by the musical sounds in the vibrating media, observe, while playing, continuous variations of concentric radial patterns in round surfaces, parallel diagonal patterns in rectangular surfaces, increases in the number of elements with increases in frequency, whole movements or migrations with increases in amplitude, interference phenomena, visible beats and imperfectly formed patterns caused by the peculiarities of both the musical sounds and the vibrating media.

Make musical activity either to discover in real time the visual images characteristic of the identity of the performing ensemble with respect to the time and place of the performance, or make pre-determined patterns including lattices, networks, labyrinths, flows, currents, rotations, bridges, streams, beams, heaps, eddies, dunes, honeycombs, imbrications, cells, textures, turbulences, vortices, layers, figure-eights, lemniscates, spirals, rings, rivulets, trees,

branches, pools, dendrites, bushes, balls, pigeon eggs, quadrants, tetragons, pentagons, hexagons, flowers, hollows, ramparts, figurines, walls, peaks, pillars, columns, volutes, annuli, fissures, plates, rams' horns, crypts, spicules, worms, webs, clouds, storms, spherules, zebras, plumes, embryos, rills, buttes, mesas, grooves, fountains, swastikas, mandalas, crowns, crosses, scapulas, beads, medallions, topologies of near or far environs, plaids, tweeds, road signs, floor plans, tapestries, diamonds, stars of David, gardens, corals, sunbursts, faces, angels' wings, fans, berms, gullies, washes, mosses, daisies, weaves, signs of the zodiac, almonds, clock faces, calendars, moons, planets, mirrors, demons, gems, stigmata, sanctuaries, playing fields, wheels, whales, palms, ferns, cypresses, blindfolds, ladders, urns, Adams and Eves, cisterns, sepulchres, tongues, dragons, toads, eagles, swans, fishes, plumes, rooms, tombs, hosts, hats, animal tracks, fossils, footprints, rugs, bones and ghosts.

From time to time, apply fire and ice to the vibrating surfaces to change their temperature environment and thereby alter their characteristics.

Make liquid versions using water, glycerine, mercury, plasma, heated rosin paste or other viscous liquids to bring about hydrodynamic phenomena including frequency-dependent site locations, constant directions of eddy-rotations, amplitude-dependent rotation speeds, the creation of *lissajous* figures and anti-gravitation effects which occur if sounds remain constant and the vibrating media are tilted or held vertically.



Take sounds from the vibrating media by contact, vibration or air microphones in order to discover and amplify changes in the original sounds due to the physical characteristics of the media through which they travel and for purposes of single or multi-channelled playback during performance or recording on electro-magnetic tape.

Use closed-circuit television monitor systems in fixed close-up positions with rear-screen projectors to verticalize and enlarge for the players and audience the visual images made by the players' sounds on the material-strewn surfaces.

All musical considerations including pitch, timbre, lengths of sounds, texture, density, attack and decay and continuity are determined only by the real-time decisions necessary to the image-making processes.

Do not touch the vibrating surfaces except at points through which nodal lines pass.

Thanks to E.F.P. Chladni (1756-1827) and Hans Jenny (1904-). (Commissioned by and dedicated to Gerald Shapiro and the New Music Ensemble, under a grant from the Rhode Island Council on the Arts.)

Alvin Lucier  
January 20, 1972  
Middletown, Connecticut

Source

10

3/1 | Queen of the South, May 1972

Chladni - sound vibrates in a medium: thin steel/metal, sand sprinkled, bowed - sand disperses, nodes and anti-nodes.

Play into a plate and a visual image occurs, imagery defines player(s). Social mystical idea. Improvise or pre-determine pattern you want. Plate becomes a score: feedback loop (change or continue), action score. Television so the audience can see.

plywood, galvanized metal, plexiglass - 4x4. Best with electronic instruments, simple continuous sound.

Jung: Alchemy, imagery, Marx and Mao, ideas in art: material, physical reality, wisdom, in touch. Putting the players in touch with physical reality. Queen of the South - alchemy is about transforming, with fire, continual repetitive operations; queen of the south is female image for "sapiencia dei," wisdom which can be found anywhere, material rising.  
amazing!

March 5,  
1973

## GOING OUT Guide

**SHOW AND TELL** At least two media will mix tonight and tomorrow at 8 in the Kitchen, that chamber of electronic wonderment in the Mercer Arts Center, 240 Mercer Street. The work to be performed is Alvin Lucier's "The Queen of the South," a last year's piece by the composer, who will also be one of the six performers playing it. Mr. Lucier, who has been associated with the Sonic Arts Union and Wesleyan University, is an old-guard avant-garde music man who has long been searching for the esthetic in unusual sources.

This piece is billed "for players, responsive surfaces, strewn material and closed-circuit television monitor systems." What happens is this: Six synthesizers are connected, two each, to three plates; on the plates are sand and other material that jiggle to the tune of the synthesizers. The result can be heard by the audience and also seen (the strewn stuff's patterns, that is) on TV in the room.

Admission, \$2. Information: 475-9865 (after 2).

March 7, 73

## 'QUEEN OF SOUTH' STAGED AT MERCER

Multimedia Music Is Based  
on Vibration Principles

Most music of the past has dealt with the shaping of time. Audiences could go to a musical performance and expect it to begin, to assume a recognizable structure, perhaps to point toward a climax, and to end. But a good deal of contemporary music, particularly of the multimedia variety, comes closer to an environment in an art gallery: the music is steady-state, and the audience may come and go as it pleases.

Alvin Lucier's "The Queen of the South" was staged at the Kitchen, Mercer Arts Center, 240 Mercer Street, Monday evening (with a repeat last night), and it managed to seize one's attention unassertively and appealingly. But once begun, it was the kind of piece that could (and perhaps did) go on for days.

What Mr. Lucier has done—his title alludes to alchemical transformation—is bend an old acoustical principle to new esthetic uses. The principle is that loose particles on an even, flat surface will arrange themselves into patterns if the surface is vibrated by sound. Mr. Lucier offers three surfaces, of wood, metal and plastic, and particles of different size, weight and color (sand, seed, Tang, etc.). The surfaces are agitated by transducers linked to several synthesizers. The synthesizers also feed directly into loudspeakers, and television monitors give the viewers another, rather lunar, perspective on the surfaces.

The over-all impression was rather like a junior-high science fair, with areas devoted to different project-demonstrations and parents strolling proudly about, savoring the gentle cacophony. The sounds blended in a sweet Cageian flux, the particles danced with the illusion of life and the resultant patterns emerged with an intriguingly asymmetrical complexity.

JOHN ROCKWELL




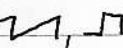
3/6 nada

3/8 Robert Ashley

~~Mills College~~ Once Festivals, 1959-1965, in The VFW [Ann Arbor?] ballroom. Out of this came the Once Group, 6-8 expandable people. Continual party, every single night of the year, talk and drink - musicians, filmmakers, architects. Created some staggering beautiful total pieces.

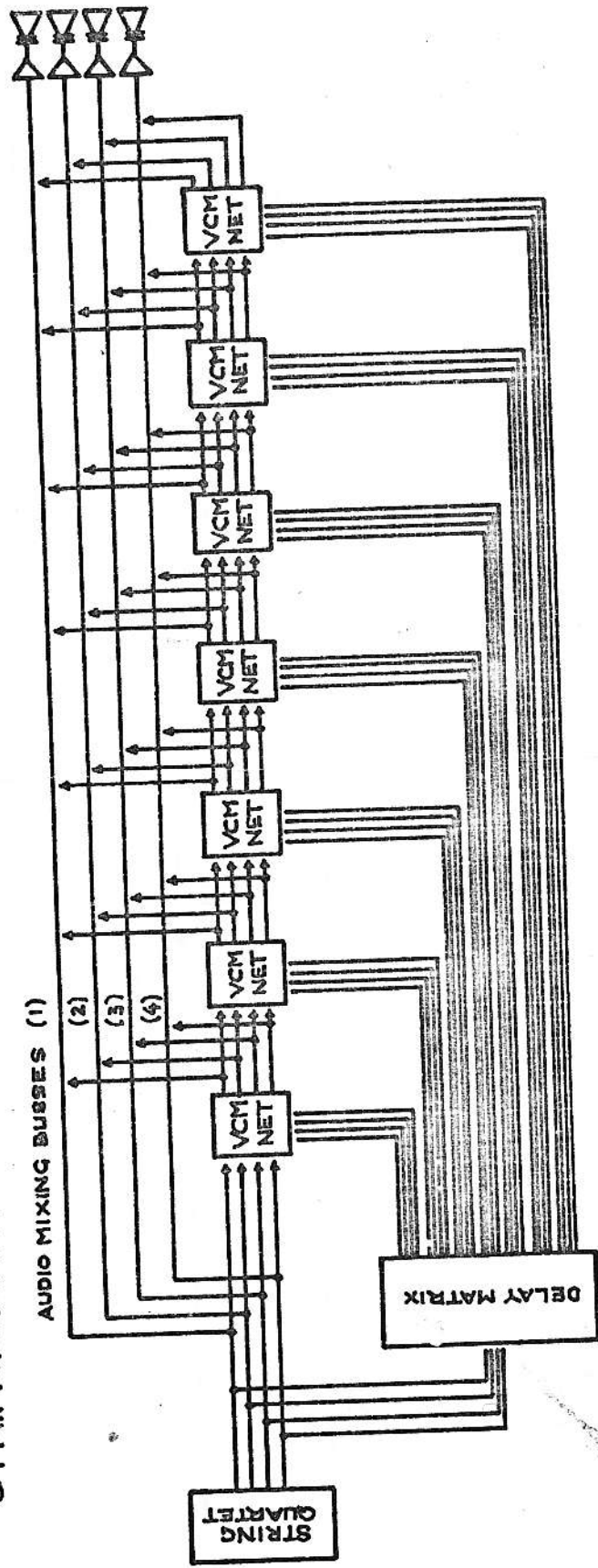
[Left Detroit/Ann Arbor for Mills College.] For Alvin, the most interesting composer - complicated ideas that don't always succeed.

Started one of the first electronic studios in US, in Ann Arbor; homemade, cheap, 1958. Working with junk, you have an aversion to polished studios. Bob Ashley wrote performance pieces that were not hi-fi, using cheap equipment - speech, voice amplification, etc. Age of 39 he gets his first job at Mills, with moog synthesizer, which "we all hated" because it is "a package deal" - now they're getting better....

What a synthesizer is? A box, of any size. 800-50,000 dollars. A package filled with electronic components. Ours an Arp 2600: 3 oscillators (  ,  ,  ,  ); 1 noise source (white, pink); 2 mic input - those are sound sources; processors: low pass filter; envelopes (ADSR, AR); sample and hold; voltage controlled filter; keyboard. Ah the idea of voltage control: everything in the box is voltage; programmable, things can control each other. Where does the signal go?

signal  $\left\{ \begin{array}{l} \rightarrow \text{sound} \\ \rightarrow \text{control} \end{array} \right.$

# STRING QUARTET DESCRIBING THE MOTIONS OF LARGE REAL BODIES

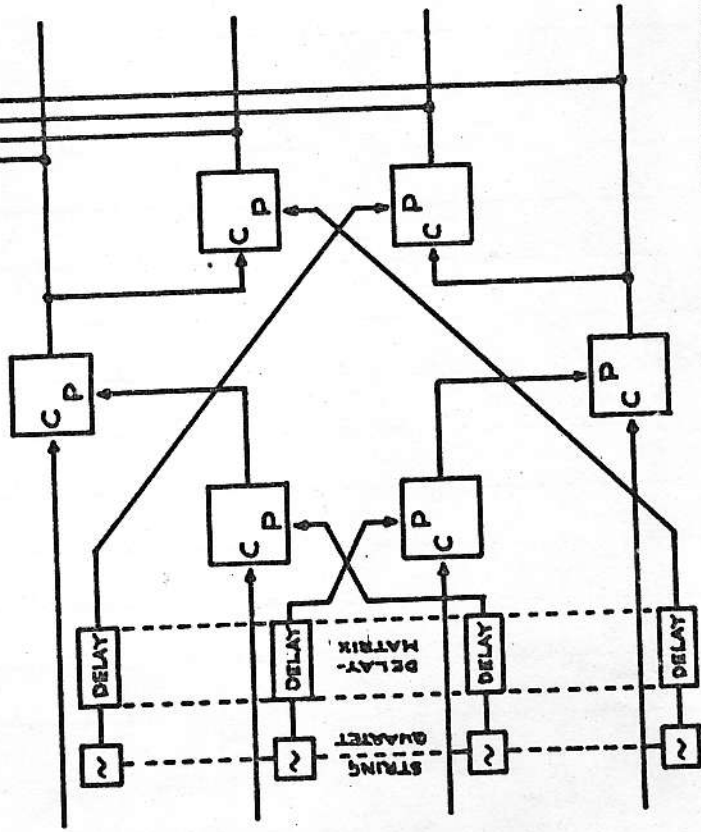


THE BOW IS DRAWN CONTINUOUSLY BUT SO SLOWLY AND WITH SUCH GREAT PRESSURE ON THE STRING THAT THE STRING RESPONDS IN RANDOMLY OCCURRING SINGLE "PULSES." IN THIS MANNER OF PLAYING THERE IS MORE SILENCE THAN SOUND. TYPICALLY, A SINGLE DIRECTION OF THE BOW MAY TAKE 10 MINUTES. INSTRUMENTS SHOULD BE TUNED UNIFORMLY LOW. USE DIRECTIONAL MICROPHONES EXTREMELY CLOSE (WITHIN 3 INCHES) TO THE SOUND-HOLES OF THE INSTRUMENTS. THE DELAY MATRIX SHOULD PROVIDE DIFFERENT SIGNAL DELAY TIMES IN A RANGE BETWEEN 5 MILLISECONDS AND 250 MILLISECONDS FOR EACH OF THE SEVEN GROUPS OF OUTPUTS. DELAY TIME IS THE SAME FOR ALL OUTPUTS IN A GROUP. WITHIN EACH VOLTAGE - CONTROLLED-MODIFIER NET ANY VC DEVICES MAY BE USED (WITHOUT REGARD TO SYMMETRY). USE AT LEAST ONE, OR AS MANY AS SEVEN, VCM NETS, ALTERNATING A-TYPE AND B-TYPE IN SERIES. ALWAYS OBSERVE THE SYMMETRY OF CONTROL-SIGNAL AND PROGRAM-SIGNAL ROUTINGS. IDEALLY, THE SUM OF THE SIGNALS AT THE LOUDSPEAKERS SHOULD BE NO LOUDER THAN THE UNAMPLIFIED SOUND OF THE STRINGED INSTRUMENTS.

# VOLTAGE-CONTROLLED-MODIFIER NETS

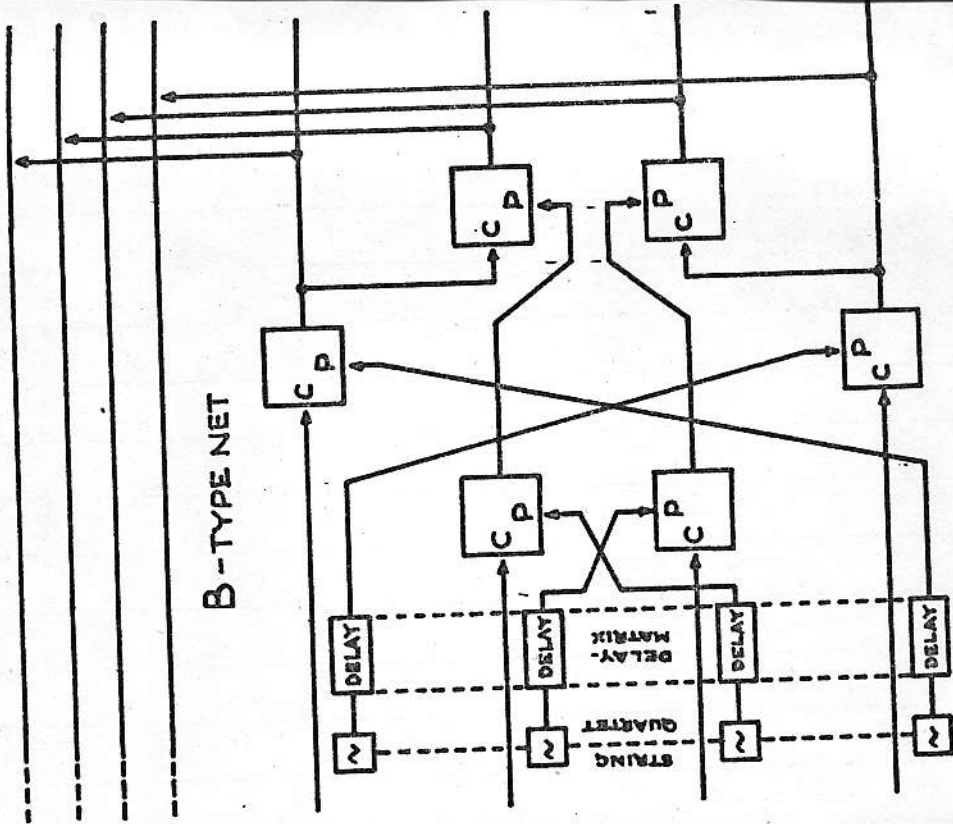
AUDIO MIXING BUSES (1)  
(2)  
(3)  
(4)

## A-TYPE NET



C= CONTROL SIGNAL INPUT P= PROGRAM SIGNAL INPUT

## B-TYPE NET



→ String Quartet Describing the Motions of Large Bodies <sup>Real</sup>

any strings, tuned low, complex sounds — oscillator  
sounds are too simple. Input to any voltage controlled devices  
(modifiers) after delay 5-250 mil. sec. P is program signal,  
C is control signal — everybody controls everybody else,  
complex. Delay adds the sound to the sound, process.  $\frac{1}{200}$  -  $\frac{1}{4}$  sec.  
When Worlds Collide: phenomena out of our scale we observe in discrete  
moments. — too big, small, slow, fast. A live piece, often with  
programming a large body.



TRACK 1 Voice  
 TRACK 2 "ERRR PATCH" - Sub audio state: brought to audio range by manual trigger immediately after a "miss-pronounced" word.

TRACKS 3 } "intermittent sounds (sub audio or supra audio) brought to audio range by  
 4 } trigger pulses  
 5 }

TRACKS 6 } continuously heard sounds: change of activity/sampling/mute/range/etc  
 7 } by trigger pulses  
 8 }

in all cases (tracks 2-8) the patch is operative, but "unstable". The trigger pulses alter the condition (relationships) of the patch (as opposed to a modification of the audio aspects of the voice track)

4-track version: Voice and "continuously heard" tracks mixed to even-distribution matrix  
 "ERRR" and "intermittent" tracks through panning matrix activated by "falling whistle" sound.

2-track version: normal stereo mix-down with panned "falling whistle" sound.



3/13 projects due 1 week from thurs. 1 page of interesting information.  
thurs: David Behrman.  
tues: preparation for Pauline Oliveros  
thurs: Pauline Oliveros

### Robert Ashley

Talking about synthesizers: an American phenomena, a package deal, successor to the classic electronic studios of Europe. What Alvin finds interesting [~ democracy in music, performer interfaced with instrument ~]: electronic instrument as instrument, with relation to performer — instrument as source and/or control voltage through synthesizer.

This piece: moog with speech [speech is very interesting to Bob Ashley]:

→ In Sara, Mencken, Christ, and Beethoven, There were men and women, poem by John Barton Wolgamot, 1944.  
8 channels: recitation recorded ch. 1; ~~the~~ ch 3-8 use voice as trigger for components/patches; ch. 2 is error patch, manually gated sound. This to Alvin is a gigantic epic, big art, being hit hard, not made for being polite.

MOVE  
NOBS QUIETLY

Until x after

10 12 17 18

INITIAL TUNINGS

TIME 7 7 3 10 2 12 5 17  
START

Kathy

B-16

1,191  
792  
596  
Low 64

#13 off  
gliss max  
slow

(A)

(B)

(C)

(D)

TUNE (gliss 71)  
#16: 192  
#15: 160

#14 out  
TUNE  
LO #196  
(gliss 71)

7-12

632  
530  
477  
457

no gliss fast shallow  
gliss max slow

↑ oboobo  
no gliss

5-8

593  
530  
177  
148

↑ 9: 0 0 0 0  
together

1-4

199  
165  
98  
66

↑ 0 0 0 0

David

A B C D

3-16

1,191  
792  
596  
Low 63

↑ 0 0 0 0  
#13 off  
gliss max  
slow

↑ 0 0 0 0  
#14 out

7-12

1,191  
792  
596  
Low 62

↑ 0 0 0 0  
#9 off

↑ 0 0 0 0  
#14 out

5-8

1,191  
792  
596  
528 low 67

↑ 0 0 0 0

TUNE  
200  
167  
100  
67

speed depth  
↑ 0 0 0 0

1-4

195  
163  
97 1/2  
65

↑ 0 0 0 0

MOVES  
NOBS  
QUIETLY

25 38

less th!  
depth!

max

Kathy

(E) (F) (G) (H) (I) (J) (K)

16 9: ↑ 8  
↓ 8

TUNE (gliss. off)  
183  
153  
91  
61

gliss. on max  
gliss. spread depth

switch to high #15 & 16  
switch to high #11 & 12  
switch others

TUNE  
180  
150  
90  
60

↑ 8  
↓ 8

E F G H I J K

TUNE (gliss. off)

#16: 188  
#15: 157  
(#14: 94)  
(#13: 63)

gliss off

TUNE  
#12: 186  
#11: 155  
(#10: 93)  
#9: 62)

Switch to high #15 & 16  
switch to high #11 & 12  
switch others

↑ 8  
↓ 8

D

TUNE #14: 94  
TUNE #10: 93

↓

↓

E F G H I J K

take but

964  
766  
572  
501

1002  
854  
572  
428

644  
430  
390  
323

320  
215  
162, 160

3/15 David Behrman and Katherine Morton are here, as is  
Home-made synthesizer  
Music with Sliding Pitches

[Next project: make a patch on the arp, one phrase of electronic sound]

### → Music with Sliding Pitches

It does not use a normal synthesizer, but a specialized configuration, built for this piece but works for others. 2 elements in it (vs. 12-18); oscillators, vca's; 32 oscillators (vs 3-12 of most synthesizers), 8 vca's, 8 sub audio oscillators (40 oscillators in all) cps - 1 per 1/2 minutes; triangle wave oscillators. Cycle becomes event in sub audio range, control signal/voltage. Some of control oscillators hard wired to oscillators (vcf).

Thick sonorities. Cost per oscillator: about \$7. Frequency analyzer. Wavering impression of homemade equipment is something, gives something to the sound.

Initial tunings - many oscillators tuned to same pitch; some are stable, some move away or towards pitch (vcf). Move on to next tuning when you feel like it - ~~sound off~~ attenuate audio, retune, bring up again for each group of oscillators.

Triangle wave can be ~~neatly~~ controlled with simple bass and (especially) treble controls

[difference frequency as beat frequency  $\frac{3000}{2000} \rightarrow 1000$  cps.]

→ an early simple tape, November 72, Mills college studio

3/20 Pauline Oliveros

she will be here Thursday to perform Sonic Meditations, her new piece in progress.

Born in west, wrote instrumental music, she is a player, worked in first tape studio in California, now at UC at San Diego. Tai Chi - deep breathing, self-defense using other person's energy, making positive out of what originally isn't (the clumpy sound system example). Tuning into environment, reinforcing aspects, listen to breathing, make it audible.

The ♀ (mirror of venus) Ensemble - energy between and among people, spiritual connections can be observed. Sonic Meditation done trans-continental, Pauline in California, Alvin in Connecticut, with students. String piece where you play what you think another player will play, project your next note by thought.

Prepare: as you fall asleep, think of a sound and a visual image, both nights - Pauline will do the same and ask.

Early works:

→ Sound Patterns, for chorus (1965?)

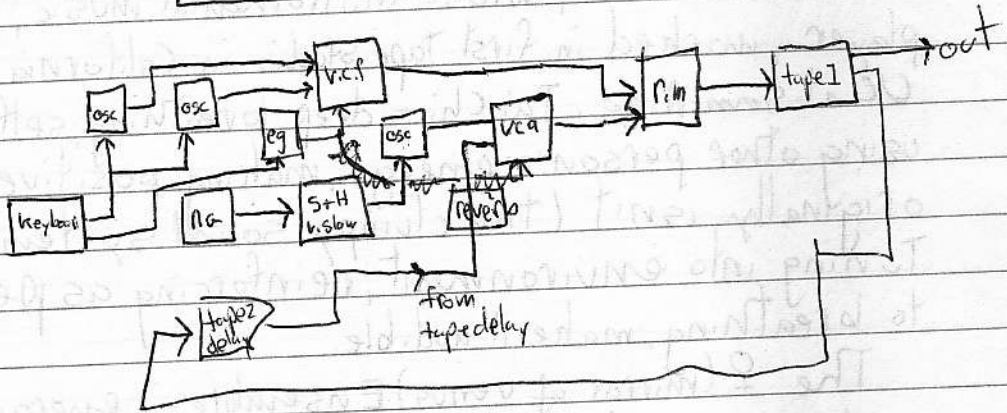
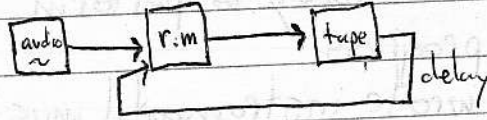
Hard piece to perform; almost conventional score: particular notes and approximate notes (x, ↑, x, etc), which generate tone clusters. Speed up, slow down - pitches easy to get but continuity, exposure, beauty were problems. Recorded measure by measure. Very nice. Electronic. ←

Went...

Went to Toronto studio to learn electronic music - conservative European studio technique, tape production/splicing

real time! tape delay processing

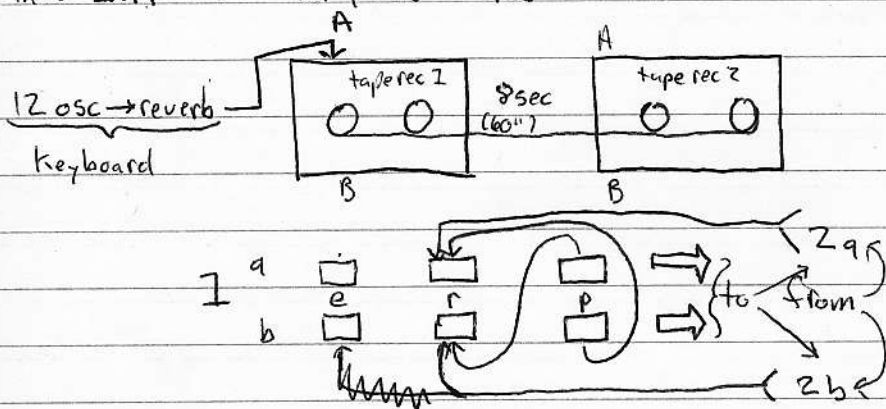
ex:



Tape alone, tape with instrument, tape(s) with instrument live.  
 Pauline wanted to work in real time, no editing, incorporating variables.

→ I of IV

12 sine and square wave oscillators - 11 tune above audio, 1 tuned below audio. Combination tones (summation, difference).  
 Oscillators played against bias frequency of tape recorder, producing audible sounds, though her materials are inaudible.  
 Low oscillator acted as a pulse/gate. Record ch 1a, playback 8sec delay ch. 2a, ch 1a playback into 1b playback, back again into 1a, 2a → 1a, 2b → 1b





3/22 Pauline Oliveros is here

sound in time

organized

10 more classes

so pretty amazing

→ She likes a

group but not

sh. & or. &

3/22/23

① ② ③ ④

puts sound

people in a

one ———

whole piece

Alvin Lucier

Mark? speaks

group 2... etc

7/10/73


To whom it may concern:

Nicholas Collins, my student in Electronic Music, has the right to access to my office, 227 Science Tower. He may borrow any key.

Alvin Lucier

4/10 make a patch, a sound, a complex, that can be put on a tape  
sound in time ~ a sound block ~ from point to point, electronically  
organized.

10 more classes. go back to Bob Ashley, early pieces which  
are pretty amazing and we can perform one (She was a visitor)

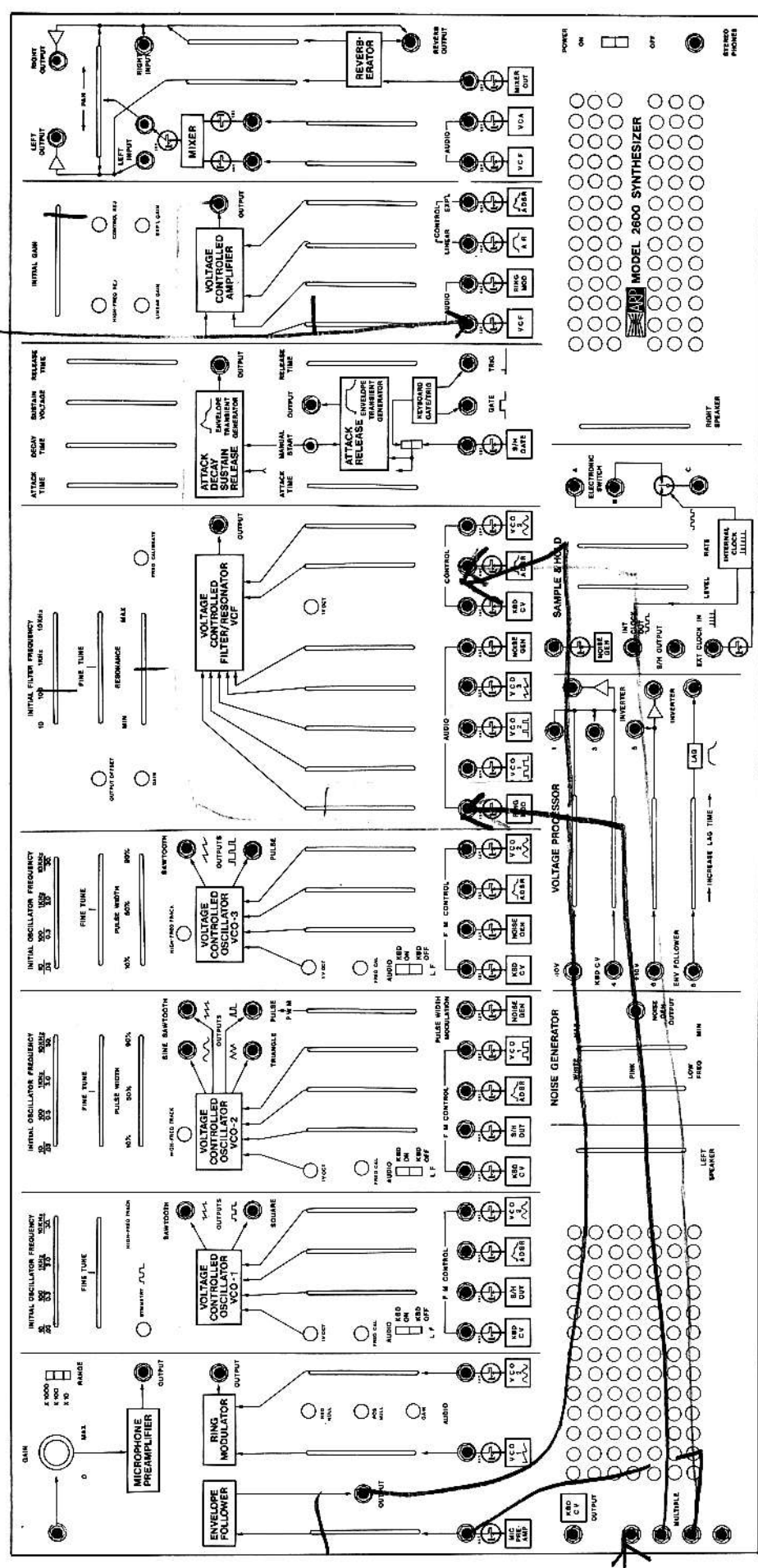
→ She Was a Visitor, for a large group of people who  
sing but don't have to, anyone who can talk. The sounds:  
sh e oo a z a v i z i t e r . only t cannot be sustained  
 $\frac{3}{4}$   pulse of piece - 1 person recites  
line in this rhythm.

① ② ③ ④ four (4) groups, each with leader; leader  
picks sound in time of speaker and sustains it quietly;  
people in group sustain it when they perceive it, each  
one — delay, spacial movement within group. so  
whole piece is like a wierd chant.

Alvin Lucier and Brandeis chorus — multiple track recording;  
track 1 speaker; track 2 whole chorus (38) did group 1; track 3  
group 2, etc.

Instrument process  
 1 channel: straight (vca)  
 2 channel: delay, res. filter

Envelope



THE ARP\* SERIES 2600 ELECTRONIC MUSIC SYNTHESIZER

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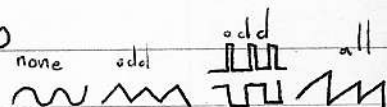
the European studio - equipment was not designed for musical composition

the synthesizer - an American idea and invention. ~~it~~  
it all began with RCA wanting to synthesize expensive music cheaply. The name stuck, the idea stuck, and it's a bad idea.  
produce and process electronic sounds, decisions.

Sources: preamp (mike, tape, lp, electronic instrument, any sound source, radio, etc.)

3 voltage controlled oscillators - VCO

energy distribution of overtones



noise - white  $\rightarrow$  pink

Processors: voltage controlled low pass filter - vcf

voltage controlled amplifier - vca

ring modulator, voltage processors, lag, invert

Controls: envelope generators - ADSR, AR.

anything else.

ring mod - difference tone and combination (additive) tone.

audio  $\rightarrow$  distinct event with changing voltage/amplitude  
oscillator become control signal.

Wesleyan University and the Music Department present

Z A J - esther ferrer, juan hidalgo, walter marchetti

The Wesleyan Memorial Chapel

Wednesday, April 18th at 4 P.M.

mandala

6 minutes for 2 performers & 3 positions  
with bodily contact

40th parallel

speculations in "v"

arprocrate sitting on the lotus flower 8 & 7  
plus "red, green or yellow"

intimate & personal

black & white

the nine sevens

closing the eyes

the japanese tour

arms up 1, 2 & 3

blood & champagne

mask

music for a glass not too big

the gentleman with the hand on the breast

visible music

the secret

chair is a thing

## Vespers (1968)

for any number of players who would like to pay their respects to all living creatures who inhabit dark places and who, over the years, have developed acuity in the art of echolocation, i.e., sounds used as messengers which, when sent out into the environment, return as echoes carrying information as to the shape, size and substance of that environment and the objects in it.

Play in dark places indoors, outdoors or underwater; in dimly-lit spaces wear dark glasses and in lighted spaces wear blindfolds. In empty spaces objects such as stacked chairs, large plants or human beings may be deployed.

Equip yourselves with Sondols (sonar-dolphin), hand-held echolocation devices which emit fast, sharp, narrow-beamed clicks whose repetition rate can be varied manually.

Accept and perform the task of acoustic orientation by scanning the environment and monitoring the changing relationships between the outgoing and returning clicks. By changing the repetition rate of the outgoing clicks, using as a reference point a speed at which the returning clicks are halfway between the outgoing clicks, distances can be measured, surfaces can be made to sound and clear signatures of the environment can be made. By changing the angle of reflection of the outgoing clicks against surfaces, multiple echoes of different pitches can be produced and moved to different geographical locations in the space. Scanning patterns should be slow, continuous and non-repetitive.

Move as non-human migrators, artificial gatherers of information or slow ceremonial dancers. Discover routes to goals, find clear pathways to center points or outer limits and avoid obstacles.

Decisions as to speed and direction of outgoing clicks must be made only on the basis of usefulness in the process of echolocating. Any situations that arise from personal preferences based on ideas of texture, density, improvisation or composition that do not directly serve to articulate the sound personality of the environment should be considered deviations from the task of echolocation.

Silences may occur when echolocation is made impossible by the masking effect on the players' returning echoes due to the saturation of the space by both the outgoing and returning clicks, by interferences due to audience participation or by unexpected ambient sound events. Players should stop and wait for clear situations or stop to make clear situations for other players.

Endings may occur when goals are reached, patterns traced or further movement made impossible.

For performances in which Sondols are not available, develop natural means of echolocation such as tongue-clicks, finger-snaps or footsteps or obtain other man-made devices such as hand-held foghorns, toy crickets, portable generators of pulsed sounds, thermal noise or 10,000 cps pure tones.

Dive with whales, fly with certain nocturnal birds or bats (particularly the common bat of Europe and North America of the family Vespertilionidae) or seek the help of other experts in the art of echolocation.

Activities such as billiards, squash and water-skimming may be considered kindred performances of this work.

Note: a kit of four Sondols is available on rental from either GPE or the composer.

Thanks to Donald R. Griffin.

Alvin Lucier



4/17 i am digging, supposedly a Gordon Mumma day, with Hornpipe.

4/19 Gordon Mumma

Hornpipe - a classical dance but Gordon uses the French horn, with oboe reed and normal reed, electronic processing which responds to acoustical nature of the room.

Space as a problem or space included in piece, environment taken into consideration/integration. In Gordon's piece, improvisation with the space, interaction: player, instrument, electronics, space — feedback quite literally.

Alvin himself Lucier

→ Vespers, by Alvin Lucier

A catholic church evening service but he did not want that just evening and anyway he was a choirboy. Spaces - architects think of space but few others do; people get caught in terrible spaces; thinking about spaces. A dream - on the outside, an alien environment, another planet; he saw beams moving through darkness with stylized electronic instruments, sending sound out and receiving information, collecting it in central unit/brain. Discovered a guy working on sound, underwater dolphins; company designed sondols (sonar dolphins) for blind to echo locate. A book: Donald R. Griffin, Echoes of Bats and Men, science of echo-location. If you live in the dark you have to move around; sound emitted and returned carry information and environment. Wavelength has to be one half size of object to be located - high/supersonic" pitch → short wavelength. Human hearing:

20-20,000 hz; bats up to at least 150,000 hz. Objective aspects (versus emotional/romantic) — not exploiting bats by "recording and slowing down," but survival aspects. American exploitation of dolphins. Learning from the bats, crude imitation.

Bat sounds are pulses (1 1) — lots of harmonics, momentary; by received sound they can ① distance 1130 cps space in time ② quality by harmonic alteration. In awe of the bat, the purely physical thing.

The sondol is beautifully built, light, but crude in relationship to bats, who change sound from idle while cruising to scanning frequency range while searching/testing/hunting.

Alvin wrote a piece. Invited to Once Group, University of Michigan ballroom, which is huge. Didn't want anyone's personality in the piece, wanted to cut art out. Reality of the situation; bats are blinded — performer wore dark sunshades because of that and "because they look good" and all the weirdness associated with them. Idea was to articulate the environment, hear the space — an objective piece, getting the emotions out of the piece so something else will come in. Teach someone about the environment. Personal decisions interfered with articulating.

Performers placed in corners of room, obstacles set up (plants, bodies); choreographic situation: movement from outer extremities to inside core of space, imperceptible micro-movement (mechanical), stop if you get into complex situation and cannot monitor echo [a series of solos, duets, trios, quartets]. Audience hears acoustic signature of room. A musical piece, a dance piece. An audience can sense screwing around — use non-musicians.

Music as a social situation — players have to help each other; is quiet, serene

Binaural recording — very spacial, listen with earphones.  
oh and vespers is part of the latin name for the American bat (family Vespertilionidae).

2/2 Tom Lehrer: "Aren't you his standing waves"

3/3 Computer music — go to the next page

4/24 i am digging. Alvin and Mary perform i am sitting in a room

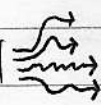
4/26 Brandenburg concerto !? a guest lecturer with his oral project.  
and Walter Carlos

5/1 i am digging. Alvin does his standing waves.

5/3 Computer music — go to the next page —————→

### 5/3 Computer Music

Computers help people solve problems; They can count and do simple things very fast. They are involved in everything we do. "A computer is electronic and it can count therefore it can be an electronic instrument."

There are two ideas: analog, digital — analog/measure, digital/count — musicians have always been concerned with both. Synthesizers are analog, voltage measuring, not discrete; most musical instruments themselves are only analog, the player is digital. Counting — speed — fast sampling can outline a wave — computer generated audio: analyze wave, program, run, digital to analog conversion — complex, time consuming — interface digital to analog so that d-to-a out voltages control Vc devices. The PDP 10 now has four D/A converters, 1-10 volts by a few thousand steps, interfaced with arp. 

Also: computer as an aid, non-subjectivity, high speed. Example: get all the music in the world, input, let the computer mix and change styles over real time, programmed style ratios, score output.

John Cage/Eric Satie:: interface. Satie made wierd music, Cage liked it. I Ching (which answers problems by psychic interface, tuning in) recomposed Eric Satie piece, reordered it, and it still was Satie. Then, for Boston philharmonic, did Cheap Imitation, computer/I Ching generated <sup>or</sup> orchestration of Satie piano piece (already processed with I Ching); consulted the I Ching to find out if he should use the computer, and it said go ahead.

→ Hpschd — John Cage hated the harpsichord. Commissioned,

play sine tone, record, playback, picks up with mike at a distance, put through synthesizer. Random VCA, filtering

These are two ideas: analog of digital - analog  
digital (count) - musicians have always been concerned with  
both & there are analog voltage measuring not digital  
most musical instruments transducers are only analog to  
player is digital (counting) - speed - fast sampling  
can capture a wave - computer generated audio samples  
wave, program, etc. digital to analog conversion - complex  
time consuming - interface digital to analog so that  
other not voltage control is chosen. The 80910 now has  
four V/A converters, 1-10 volts by a few thousand steps, interfaced  
with a PC

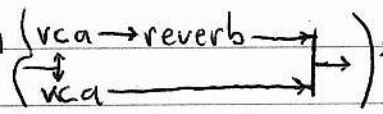
Also: computer as an aid, non-substantive, high speed & sample  
get all the music in the world, input, let the computer mix and change  
styles over real time, programmed styles, rates, cross output  
John Cage/Eric Satie interface. Satie made weird music  
Cage liked it. I think which answers problems by psychic interface  
turning in (recomposed) Eric Satie piece, recorded it, and it  
still was Satie. Then for Boston Philharmonic, did (re)mixing  
computer (I think generated a variation of Satie piece, piece  
(already processed with I Ching), could be the I Ching to  
find out. It should use the computer, and it said it should

→ He said - John Cage noted the hierarchical command

went to Illinois on invitation from Miller. First six columns of IBM cards are for title; changing the language. Plucked strings, analysis of envelope, simulated by computer, deviations (artificial instruments) - programmed with tremendously small points in time, artificially created scales (80 tones per octave) (simulation and deviation to extremes). Output recorded, 57 channels; 7 scores for 1-7 harpsichordists, using Mozart dice piece, collages of Beethoven, Schubert, Schumann, Schoenberg. Two channel record; 12 channels of tape, a few harpsichords, computer generated score for two player modulating controls of amplifier (every score is different) so you can perform the piece

## 5/8 Computers

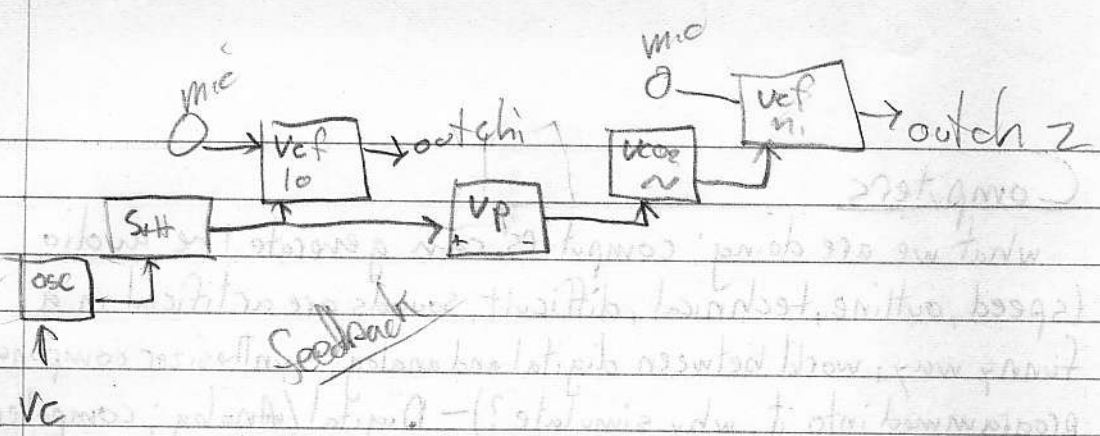
what we are doing: computers can generate the audio (speed, outline, technical, difficult, sounds are artificial in a funny way; world between digital and analog, synthesizer components programmed into it, why simulate?) - Digital/Analog; computer can be an extremely accurate, flexible voice control voltage source; computer as an aid

A piece by Alvin, computer as a Vc device. Environment is a popular word, frequent. - computer generated video environment by Bell for landing patterns, philosophy of simulations. Vespers - articulation of space → computer controlled environmental simulation. Each room has its ambient sounds; moving from one room to another sounds like moving through filters, bandpass filters. Take a microphone, put it in a room, input to simple configuration of electronic components that can simulate changes in room dimensions: reverberation (vca → reverb → ), filter (center frequency, resonance);  


bird flying through computer program (60 beats per sec), wing height gives room height, wingspan gives width, random length (wing beats are sine waves); very long rooms, relative to travel time (1130 feet per second); reverb vca according to coefficient of absorption I-VII in 70 steps for different resonant frequencies, derived from speed and volume. Four simultaneous outputs from Vcf, mixed down (this take) to 2 channel stereo.

→ Rmsim I, The Bird of Bremen Flies Through the Houses of The Burglers  
amazing





The diagram illustrates a control system with two parallel paths. The first path starts with a voltage controller (VC) driving an oscillator (osc), which feeds into a sampler-and-hold (S/H) block. The S/H block's output is split: one branch goes to a controller (Vc10), and the other goes to a plant (VP). The output of Vc10 is 'outch1', which is fed back to the oscillator. A microphone (mic) input also feeds into Vc10. The second path starts with the plant (VP) outputting to a controller (Vc20), which then feeds into another controller (Vc11). A microphone (mic) input also feeds into Vc11. The final output of Vc11 is 'outch2'.

The text below the diagram discusses the system's characteristics and the role of the feedback loop. It mentions that the system is a feedback control system and that the feedback loop is essential for stability and performance. The text also notes that the system is a discrete-time system due to the presence of the S/H block.

The text further explains that the system is a multi-input, multi-output (MIMO) system. It mentions that the system is a linear system and that the feedback loop is essential for stability and performance. The text also notes that the system is a discrete-time system due to the presence of the S/H block.

The text concludes by stating that the system is a feedback control system and that the feedback loop is essential for stability and performance. It also notes that the system is a discrete-time system due to the presence of the S/H block.

WESLEYAN UNIVERSITY  
MIDDLETOWN, CONNECTICUT 06457  
DEPARTMENT OF MUSIC

presents

A CONCERT OF COMPUTER MUSIC AND FILMS

RMSIM 1, The Bird Of Bremen Flies Through The Houses Alvin Lucier  
Of The Burghers (1972)

An imaginary bird, its wings flapping 60 times per second, flies through a digital computer (program) at the speed of sound. Via digital/analog converters, filters, voltage-controlled amplifiers and a reverberation unit, the computer simulates changes in the size and acoustic characteristics of a source room in which is deployed an omni-directional microphone. The positions of the bird's wings, at sampled moments, determine the width, length and height of the newly generated rooms plus the reflective and absorptive qualities of the materials of which the rooms are made.

RMSIM 1 is conceived as a real-time environmental sound control system. The present version is a stereo mix of a 4-channel recording.

CIRCLES  
music by Morton Subotnick

Doris Chase

POEM FIELD NUMBER 1

Stan Vanderbeek

SEE SAW SEEMS

Stan Vanderbeek

CYBERNETIK 5.3

John Stehura

LAPIS - solar + tabla

James Whitney

Wednesday, May 9, 1973  
150 Science Tower  
5 PM  
Admission Free

5/10 Computer films

music - live electronic music -

something happens when you play together, improvisation

Musica Electronica Viva (MEV) - Rzewski, Curran, Bryant, Teitelbaum.

They thought of it as an image of what the world could be.

a good place to end.

ok goodbye

# SONIC ARTS UNION

WBAI Studio C  
May 25, 26, 27, 2973

The Sonic Arts Union is an electronic music ensemble. Its members are Robert Ashley, David Behrman, Alvin Lucier, and Gordon Mumma. Their purpose is to make possible the performance of musical ideas that lie outside the scope of ordinary concert situations and to explore resources of sound production which result from the broadest application of electronic technology.

During their three days at WBAI the group will provide a variety of sonic experiences throughout the afternoon and evening. The situation is informal so that the audience can come and go at will, at any time during the day. The Sonic Arts Union presentation makes the process of electronic music accessible in a more informal atmosphere than is usually associated with the traditional concert situation.

Robert Ashley is director of the Tape Music Center of Mills College, Oakland, California.

David Behrman is a composer and musician with the Merce Cunningham Dance Company, and producer of contemporary music recordings in New York City.

Alvin Lucier is on the music faculty of Wesleyan University, Middletown, Connecticut, and music director of the Viola Farber Dance Company.

Gordon Mumma is a composer and musician with the Merce Cunningham Dance Company, and an author and electronic designer in New York City.

Music by the Sonic Arts Union is recorded on Mainstream MS 5010.

Administration: Artservices  
463 West St.  
New York, N.Y. 10014  
(212) 989-4953

This program is made possible by a grant to the Sonic Arts Union from the New York State Council on the Arts.

Gordon Mumma: notes for CYBERSONIC CANTILEVERS

CYBERSONIC CANTILEVERS is a process of music. Anyone may participate.

CYBERSONIC CANTILEVERS is related to other processes in which people participate in discovery, perceptual and intellectual challenge, and entertainment. Among these processes are satellite communication, data processing, bio-medical telemetry, and space exploration. These are processes in which information is electronically transformed.

The electronic sound transformations of CYBERSONIC CANTILEVERS range from very simple to extremely complex. The most extreme processing of CYBERSONIC CANTILEVERS transforms the original sounds into entirely new sounds, which may have no perceptible resemblance to the original.

The process is in five stages. All are stereophonic. The first stage consists of sound sources (for example, microphones, cassette recorders, electronic circuits.) Stages two, three, and four are electronic transformations which change the pitch, articulation, and timbre of the sound sources. The last stage presents the transformations in a quadraphonic environment.

Participants are invited to monitor any stage of the process. At electronic monitoring stations participants may hear (with stereophonic headphones) and see (with stereophonic oscilloscopes) any stage of the process they choose. Also, participants are invited to add to the sounds of the process, and may bring their own pre-recorded sounds on cassette tapes, or produce sound live through microphones.

A word about the words:

CYBERSONIC: Cyber --from the Greek "kybernan" to steer or guide. (Cybernetics, the science of control and communication, is concerned with interactions between automatic control and living organisms.)

Sonic --pertaining to sound.

In CYBERSONIC CANTILEVERS some of the electronic transformations are automatically derived from the sounds themselves, and some from the interaction of people with the electronic system.

CANTILEVERS: Cantilever --a projecting beam, anchored at one end, and supporting a load along its length by means of tensions and compressions which are distributed within the beam. (Typical cantilevers; flagpoles, airplane wings, diving boards, certain bridge structures, and the seesaw.)

Anchored in the original sounds, or in parts of the modification process, the sonic transformations of CYBERSONIC CANTILEVERS are projected through the supporting stages of the electronic system.

David Behrman: notes for HOME MADE SYNTHESIZER MUSIC WITH SLIDING PITCHES

Many people are now working directly with the raw materials of electronic technology to make sounds, lights, or video images. The availability of cheap integrated circuits and paper-back how-to books has made it possible for a self-styled musician to design his or her own electronic music synthesizer; just as, in the stone age, the availability of the chisel made it possible to fashion one's own hand-hewn wood-log drum. The practice of making one's own instrument is a venerable one, though it may have been inhibited during the past industrial centuries.

Although several brands of commercial music synthesizers have been around for half a decade, they tend, when used alone, to produce sounds which are quickly used up by our culture (become clichés.) This is probably because they are designed as general-purpose, saleable packages adept at producing everything from TV commercial sound effects to imitation of conventional instruments.

The instrument used in "Home Made Synthesizer Music" is incapable of making most kinds of electronic sound. But it does make one variety (extremely dense, slowly shifting harmony) more easily than even three or four of the largest, most expensive commercial synthesizers. It cost about one-tenth of its equivalent in store-bought units and is small and light enough to be packed into two suitcases.

Programmed initially and then left to itself, it can provide a sound environment of indefinite duration. It can also be played by one or two people. A flashlight photocell signal distribution system may be added for a third or fourth player. Or it can be used by an improvisatory ensemble--such as the one currently making music coincident with the Merce Cunningham Dance Company.

Its hardware consists of 32 stable voltage-controllable oscillators, eight envelope generators, eight voltage-controlled amplifiers, and mixers. Tuning during performance can be done with frequency counters. The sound is best heard surrounding its listeners via a four channel loudspeaker system.

Robert Ashley; notes for IN SARA, MENCKEN, CHRIST AND BEETHOVEN  
THERE WERE MEN AND WOMEN (1972)

Text by John Barton Wolgamot (1944). Printed privately in two editions (of which this reading is the latter), differing in title and, reputedly --- though I have not had the opportunity to confirm this ---length (one page.) A poem of 128 stanzas, each stanza the same sentence with four variables, three of which are names or name groups or name constructions, the fourth, the adverb of the active verb. To my mind one of the most unusual and beautiful (and memory-defying) sentences in English.

"In its very truly great manners of Ludwig van Beethoven very heroically the very cruelly ancestral death of Sara Powell Haardt had very ironically come amongst his very really grand men and women to Rafael Sabatini, George Ade, Margaret Storm Jameson, Ford Madox Hueffer, Jean-Jacques Bernard, Louis Bromfield, Friedrich Wilhelm Nietzsche and Helen Brown Norden very titanically."

The permutation of the four variables over the 128 stanzas give the poem a clear musical form (suggesting both fugue and sonata), binding together groups of names and adverbs into "themes" that are as obvious and as difficult to paraphrase as music. Fourteen names (seven each men and women) reappear in various number hierarchies throughout the poem. These I understand to be the heroes and heroines of the story. Other names are repeated, apparently as secondary "themes." And finally there are hundreds of names that occur only once (all of the great names of Western culture since the Greek philosophers, with the list becoming more comprehensive and enigmatic as it includes the American literary and musical culture of the early 20th century), whose poetic function I have not deciphered.

My score suggests an alternative of two electronic settings in which the poem may be read. These are distinguished by reading speed and by the effect of the electronic devices on the vocal sounds. The setting from which this realization is derived allows for the possibility of any number of thickenings that follow the stanza structure of the poem synchronously, and includes instrumental accompaniment, vocal embellishments, and elaboration of the physical environment in visual, temperature and tactile modes.

In this realization the sounds of the voice are analyzed by means of filtering to plot the frequency of occurrence of seven different sound components (plosive attacks, fundamental frequencies, and five harmonics), each of which guides the synthesizer in synchronization with the reading of the poem. The seven tracks of synthesizer activity are mixed together with the voice and distributed over the four channel matrix.

(realization for Moog synthesizer by Paul DeMarinis and Robert Ashley, January, 1973)

Robert Ashley: notes for STRING QUARTET DESCRIBING THE MOTIONS OF LARGE REAL BODIES (1972)

For the past few years I have been interested in the phenomenon of the identity of sounds--how we distinguish among sounds by their causes or origins or meanings. These interests were expressed in various ways in the form of four pieces, called ILLUSION MODELS, which were designs for hypothetical, computer-controlled sound environments. In an attempt to illustrate the ideas of the ILLUSION MODELS I designed performance pieces that were based on the same principles as the hypothetical models, hoping to suggest through technical concepts how the aural illusions might occur in the time domain of music.

From the technical solution to the requirement of one of the performance pieces (extremely precise synchronization of very short sounds) came the ideas of the STRING QUARTET DESCRIBING THE MOTIONS OF LARGE REAL BODIES, in which, through the process of mixing together short sounds from different points of origin in time, a single "line" of sounds of different "identities" is synthesized from each instrument.

There are two kinds of sound in the STRING QUARTET DESCRIBING THE MOTIONS OF LARGE REAL BODIES, quasi-random, discrete pulses from the string instruments (from a particular manner of playing) and those same pulses delayed and electronically modified. The two kinds of sounds (identities) are intermingled, because of the delay mechanism operating on one of them, to form a series of pulses, some of which are "original" and others of which have had their identity changed electronically.

The ensemble factor of the work (a "quartet") is composed not in the actions of the performers---each instrumentalist carries out the requirements of the score independently---but in the interconnection of the electronic components, where the alteration of the sound materials is dependent upon the coincidence of events from the various instruments.

The title comes from the images that kept occurring to me while I was reading Worlds in Collision (Immanuel Velikovsky) for the first time, which coincided with working on the STRING QUARTET DESCRIBING THE MOTIONS OF LARGE REAL BODIES.

Realization by Robert Sheff and Robert Ashley, January, 1972



Robert Ashley: notes for REVISED, FINALLY (APRIL, 1961-APRIL, 1973),  
FOR GORDON MUMMA

For any number of pairs of players of similar sounds. The idea of the composition has been to provide a situation where the player's sense of tempo is used in a way that is similar to the use of his sense of pitch relations in part-singing. The title refers to my problem of finding a musical representation of this idea and to the time when so many of my musical thoughts were inspired by my association with Gordon Mumma. I think this revision is final.

Robert Ashley: notes for QUARTET (1965) for any number of wind  
or string instruments

A program of sound-actions for any number of players acting independently, not a time schedule of ensemble events. Each action has its own duration, based on the mechanics of sound production for the instrument involved (breath length for wind instruments, bow length for strings.) The score suggests optional actions for performances by more than one player that recognize the ensemble situation without restricting the individual player's freedom, including the possibility that the players may develop an ensemble silence of indefinite length. The title refers to the design of the score and to the fact that the program was derived from an earlier work, in memoriam...ESTEBAN GOMEZ (quartet.)

Alvin Lucier: notes for RMSIM 1, THE BIRD OF BREMEN FLIES THROUGH  
THE HOUSES OF THE BURGHERS (1972)

An imaginary bird, its wings flapping 60 times per second, flies through a digital computer (program) at the speed of sound. Via digital/analog converters, filters, voltage-controlled amplifiers and a reverberation unit, the computer simulates changes in the size and acoustic characteristics of a source room in which is deployed an omni-directional microphone. The positions of the bird's wings, at sampled moments, determine the width, length and height of the newly generated rooms plus the reflective and absorptive qualities of the materials of which the rooms are made.

RMSIM 1 is conceived as a real-time environmental sound control system. The present version is a 4-channel recording.

RMSIM 1 was commissioned by Radio Bremen for the 1972 Pro Musica Nova Festival. It was composed and recorded at the Wesleyan University Computer Arts Studio.

CP 315