

## **Chapter 17. Meeting 17, Practices: Approaches to Composing Improvisations**

### **17.1. Announcements**

- Due today: Controller/Interface/Instrument Design 2 Proposal
- Quiz on Monday
- Due Wednesday 13 April: Performance Frameworks Draft
- Please test and practice Work II for next Wednesday

### **17.2. Approaches to Composing Improvisations**

- Scripts: partitioned sections (scenes) with verbal instructions
- Games: encouraging interaction through play, desire to win
- Graphic Scores: directly or indirectly represent or suggest musical parameters

### **17.3. Approaches to Composing Improvisations: Scripts**

- Problem of using natural language
- John Cage: 4'33"

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Paragraph of text instructions to performers from John Cage's *4' 33"* (Tacet, any instrument or combination of instruments) removed due to copyright restrictions.



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## 17.4. Approaches to Composing Improvisations: Games

- Iannis Xenakis
  - Works using game theory
  - Duel (1958-59): Two conductors and two orchestras, with each conductor back to the other
    - 6 categories of events, where certain combinations from each group produce quality scores
    - Event types are given to each orchestra without the other's knowledge
    - An orchestra wins by playing the best strategy
  - Strategie (1962): two orchestras with conductors back to back
    - 6 classes of textures

MATRIX OF THE GAME

		Conductor Y (columns)																				
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19		
Conductor X (rows)	1	11	6	10	8	4	0	-5	-6	-4	0	13	-4	0	-3	-2	1	-1	13	13	-3	1
	2	-1	9	4	-4	-2	-2	5	-7	-7	2	2	4	-1	-2	-2	-1	-1	-2	-2	-2	4
	3	-1	-2	9	4	2	0	4	-5	-2	-2	4	-5	-2	-2	-2	-2	-2	-2	-2	-2	4
	4	0	-2	2	0	0	-1	1	-1	-1	-1	0	0	0	0	0	0	0	0	0	0	0
	5	-1	-1	-1	-1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	6	2	4	1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
	7	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
	8	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
	9	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
	10	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
	11	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
	12	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
	13	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
	14	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
	15	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
	16	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
	17	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
	18	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
	19	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1

Fig. IV-5. Strategy  
Two-person Game. Value of the Game = 0.  
▲ Woodwinds  
● Normal percussion  
┆ Strings striking sound-boxes  
\* Strings pizzicato  
⊖ Strings glissando  
≡ Strings sustained  
● Combinations of two and three different tactics

		Conductor Y (columns) Strategy for X		
		1	2	3
Conductor X (rows) Strategy for Y	1	3	0	-1
	2	3	-3	3
	3	-5	4	-3

Fig. IV-6  
Two-person Zero-sum Game. Value of the Game = 1/11. This game is not fair for Y.  
Two-person Zero-sum Game. Value of the Game = 0. This game is fair for both conductors.  
▲ Combinations of two different tactics  
● Combinations of three different tactics

Simplification of the 19 x 19 Matrix  
To make first performances easier, the conductors might use an equivalent 3 x 3 matrix derived from the 19 x 19 matrix in the following manner:  
Let there be a fragment of the matrix containing row tactics  $r + 1, \dots, r + m$  and column tactics  $s + 1, \dots, s + n$  with the respective probabilities  $q_{r+1}, \dots, q_{r+m}$  and  $k_{s+1}, \dots, k_{s+n}$ .

$$\begin{matrix}
 & & k_{s+1} & & k_{s+j} & & k_{s+n} \\
 q_{r+1} & a_{r+1,s+1} & \dots & a_{r+1,s+j} & \dots & a_{r+1,s+n} \\
 \vdots & \vdots & & \vdots & & \vdots \\
 q_{r+i} & a_{r+i,s+1} & \dots & a_{r+i,s+j} & \dots & a_{r+i,s+n} \\
 \vdots & \vdots & & \vdots & & \vdots \\
 q_{r+m} & a_{r+m,s+1} & \dots & a_{r+m,s+j} & \dots & a_{r+m,s+n}
 \end{matrix}$$

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17.5. Approaches to Composing Improvisations: Graphic Scores

- What would a graphic score of the first two sections of Work II look like?
- Common assumptions about time and pitch: horizontal and vertical space
- Christian Wolff: For six players

'FOR SIX PLAYERS'  
(opening)  
Christian Wolf

All notes sound  
as written



Piccato } one  
Flute } player

$\frac{1}{4}$  =  $1b$  (1 note firm b above)  
 $2b^{\sharp}$  (transposed up a semitone)  
 $2b^{\flat}$  (in any higher octave)  
 $1x$  (any note)

**Bassoon**

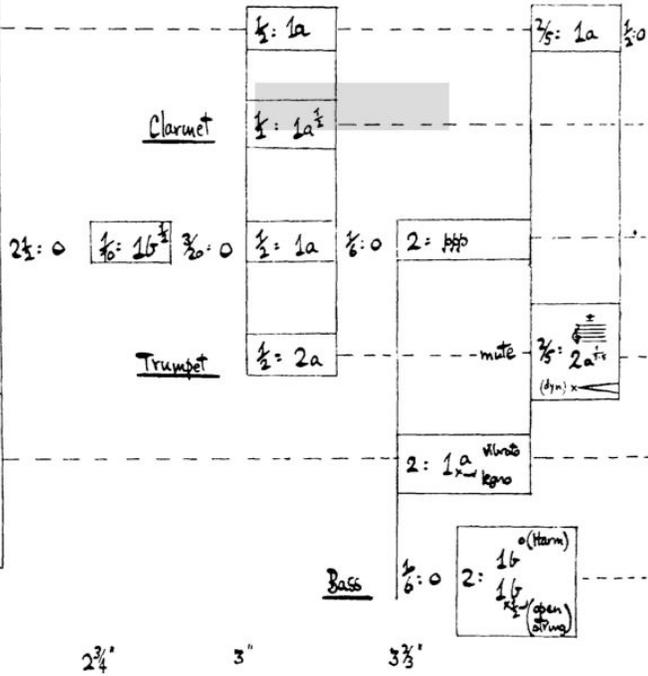
$\frac{1}{4}$  =  $2b$   
 $1b^{\sharp}$  (more or less a quarter-tone sharp)  
 $2x^{\sharp}$  Harmonics (3)  
 $2b^{\flat}$  Piccato (1)  
 $1x$

**Viola**

**Clarinet**

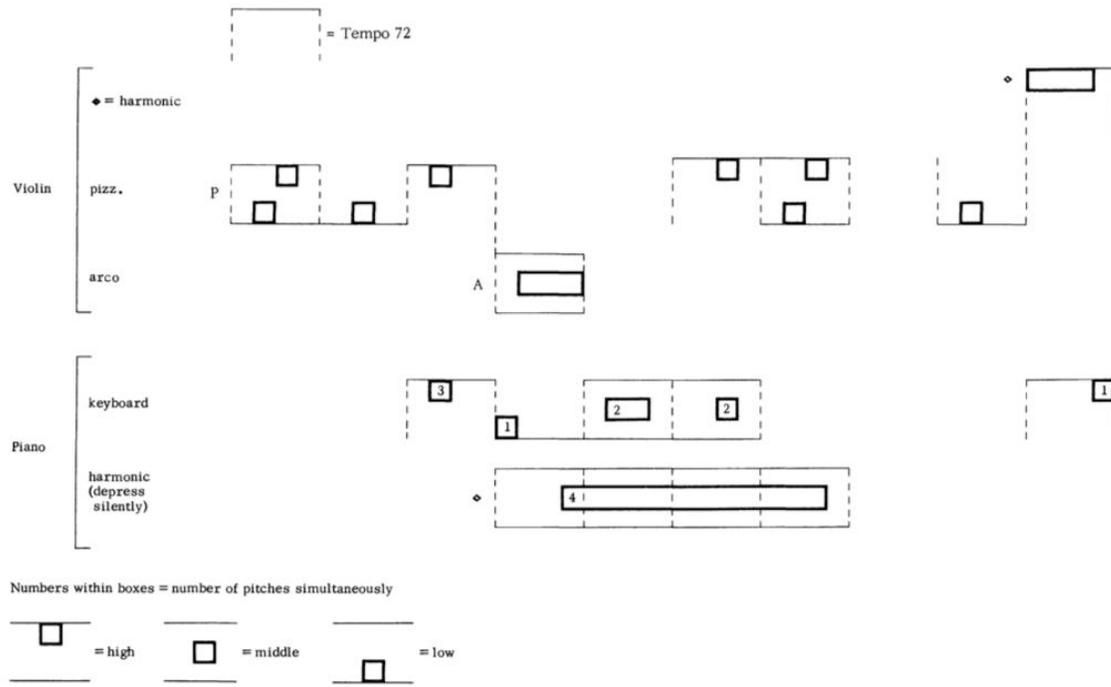
**Trumpet**

**Bass**



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- Morton Feldman: Projection IV



Ex. 4, Feldman, *Projection IV*, first page

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- Cardew (1936-81): *Treatise* (1963-67)

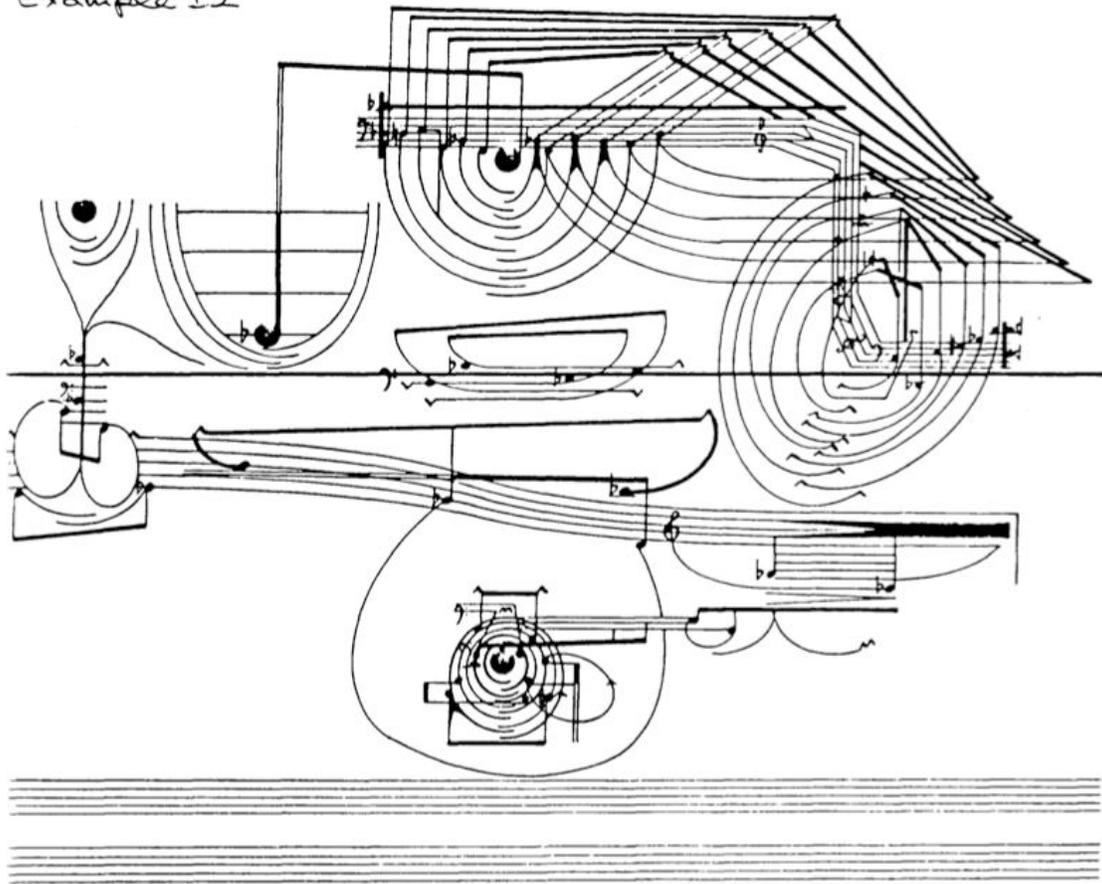
Assistant to Stockhausen at WDR Cologne from 1958 to 1960

Joined AMM in 1966

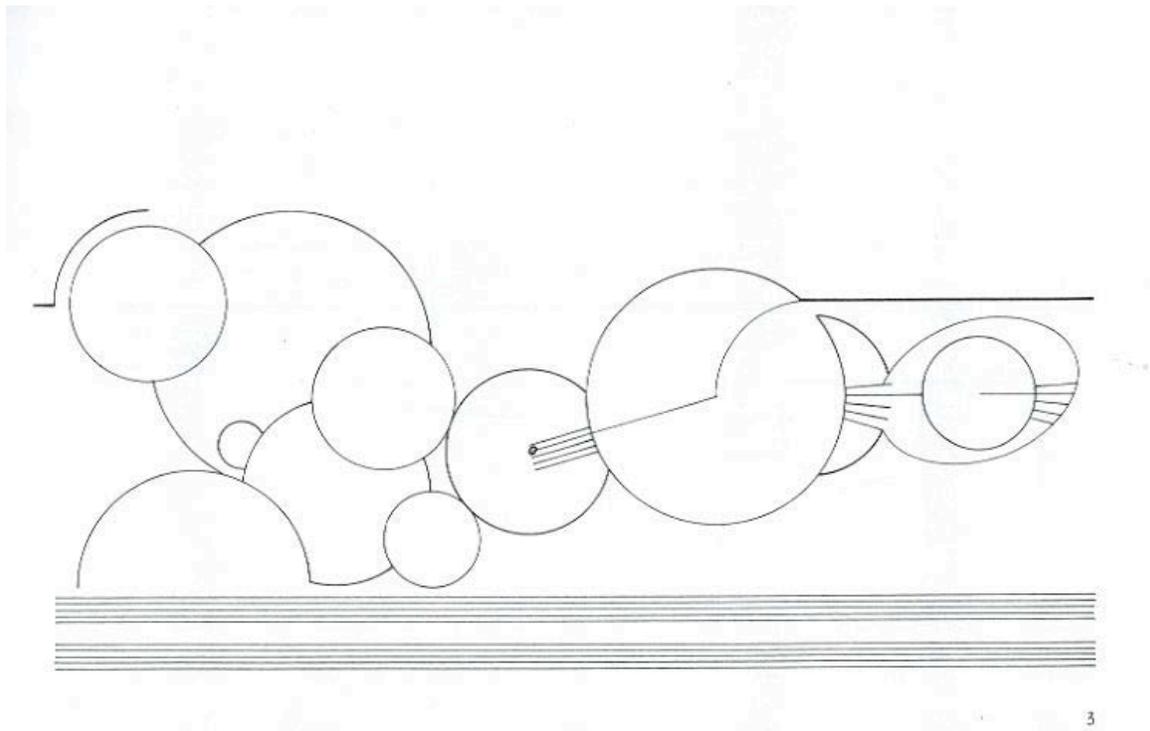
Stated that space does not correspond to sound; stated that goal was musicalness in the notating

Score is 193 pages

Example 12

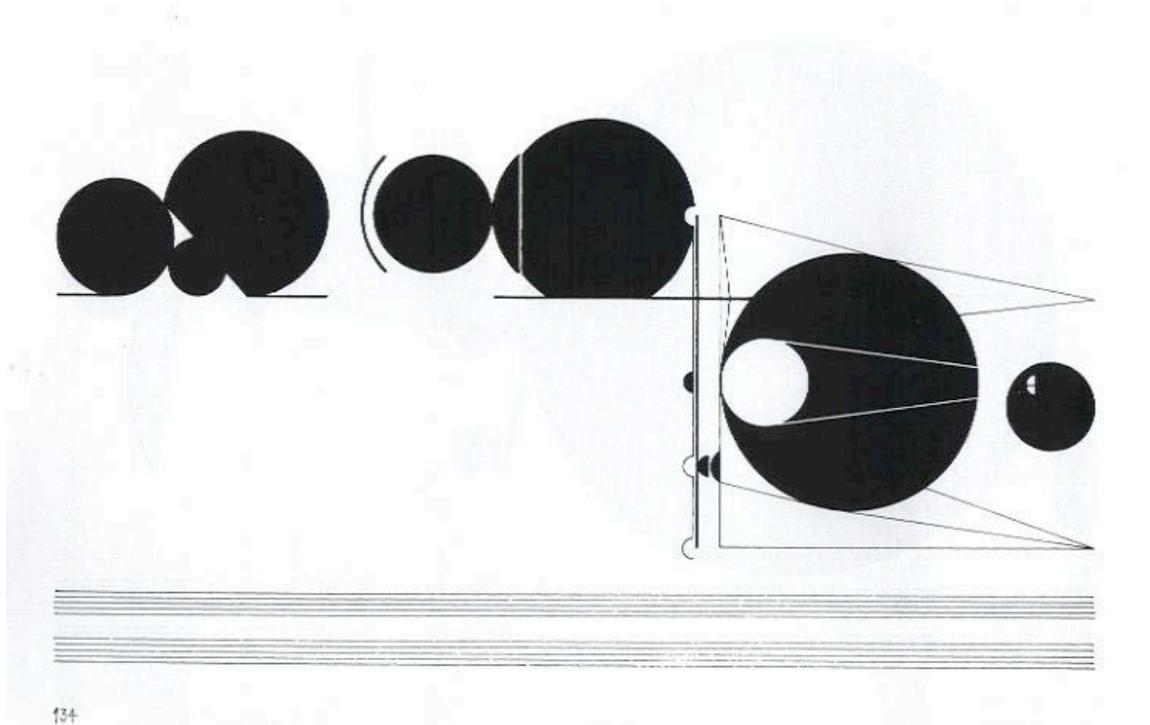


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## 17.6. Reading: Dennis, Cardew's Treatise

- Dennis, B. 1991. "Cardew's 'Treatise' (Mainly the Visual Aspects)." *Tempo* 177: pp. 10-16.

- What are the main elements of the score to Treatise?
- What elements from standard western notation are maintained?
- What criteria did Cardew look for in people performing this work?
- Listening: Cornelius Cardew, Treatise

Audio: [http://ubu.artmob.ca/sound/cardew\\_cornelius/memorial\\_concert/Cardew-Cornelius\\_Memorial-Concert\\_1-03\\_Treatise.mp3](http://ubu.artmob.ca/sound/cardew_cornelius/memorial_concert/Cardew-Cornelius_Memorial-Concert_1-03_Treatise.mp3)

## 17.7. Listening: Cardew

- Listening: Cornelius Cardew, “Paragraph 2,” *The Great Learning*, 2000
- Scratch orchestra formed in 1968: a large, experimental improvisatory ensemble for interpreting *The Great Learning*
- *Great Learning* score

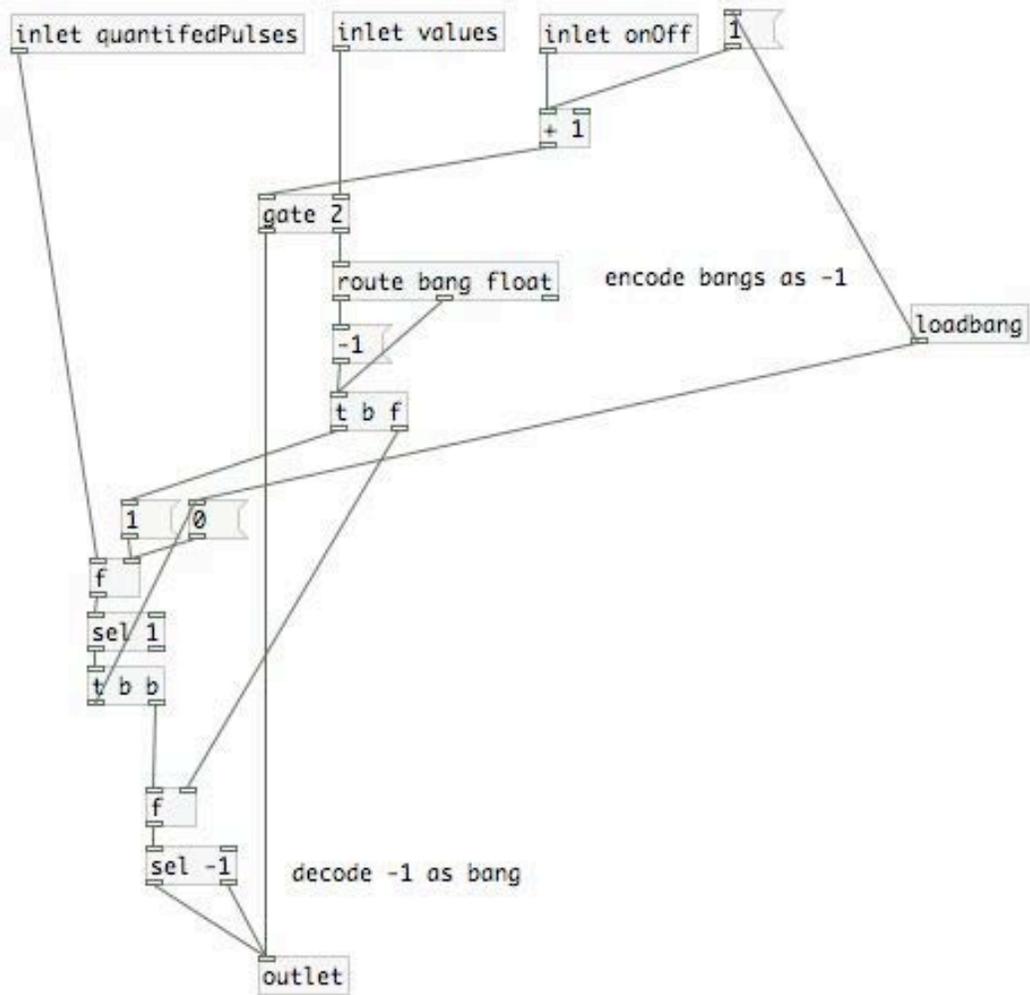
<p>Contents</p> <p><u>The Great Learning, paragraph 1</u> 2 pages For chorus (speaking and playing whistles and stones) and organ. Duration about 30 minutes Composition dated 31.4.68 Content: WHAT THE GREAT LEARNING TEACHES IS— TO ILLUSTRATE ILLUSTRIOUS VIRTUE; TO RENOVATE THE PEOPLE; AND TO REST IN THE HIGHEST EXCELLENCE.</p> <p><u>The Great Learning, paragraph 2</u> 1 page For singers and drummers Duration about 1 hour Composition dated January 1969 Content: THE POINT WHERE TO REST BEING KNOWN, THE OBJECT OF PURSUIT IS THEN DETERMINED; AND THAT BEING DETERMINED, A CALM UNPERTURBABLENESS MAY BE ATTAINED TO, TO THAT CALMNESS THERE WILL SUCCEED A TREMENDOUS DEPOSE; IN THAT DEPOSE THERE MAY BE CAREFUL DELIBERATION, AND THAT DELIBERATION WILL BE FOLLOWED BY THE ATTAINMENT (OF THE DESIRED END).</p>	<p><u>The Great Learning, paragraph 3</u> 1 page For large instruments and voices Duration about 45 minutes Composition dated 14.7.70 Content: THINGS HAVE THEIR ROOT AND THEIR BRANCHES. AFFAIRS HAVE THEIR END AND THEIR BEGINNING. TO KNOW WHAT IS FIRST AND WHAT IS LAST WILL LEAD NEAR TO WHAT IS TAUGHT (IN THE GREAT LEARNING).</p> <p><u>The Great Learning, paragraph 4</u> 5 pages For chorus (shouting and playing ridded or notched instruments, sonorous substances, rattles or jingles) and organ. Duration about 40 minutes Composition dated 10.4.70 Content: THE ANCESTERS WHO WISHED TO ILLUSTRATE ILLUSTRIOUS VIRTUE THROUGHOUT THE KINGDOM, FIRST ORDERED WELL THEIR OWN STATES. WISHING TO ORDER WELL THEIR STATES, THEY FIRST REGULATED THEIR FAMILIES. WISHING TO REGULATE THEIR FAMILIES, THEY FIRST CULTIVATED THEIR PERSONS. WISHING TO CULTIVATE THEIR PERSONS, THEY FIRST RECTIFIED THEIR HEARTS. WISHING TO RECTIFY THEIR HEARTS, THEY FIRST SOUGHT TO BE SINCERE IN THEIR THOUGHTS. WISHING TO BE SINCERE IN THEIR THOUGHTS, THEY FIRST EXTENDED TO THE UTMOST THEIR KNOWLEDGE. SUCH EXTENSION OF KNOWLEDGE LAY IN THE INVESTIGATION OF THINGS.</p>	<p><u>The Great Learning, paragraph 5</u> 12 pages For a large number of untrained musicians making gestures, performing actions, speaking, chanting, and playing a wide range of instruments, plus, optionally, 60 singers singing (Ode Machines) which may also be performed separately. Duration about 2 hours Composed 1969-70 Content: THINGS BEING INVESTIGATED, KNOWLEDGE BECAME COMPLETE. THEIR KNOWLEDGE BEING COMPLETE, THEIR THOUGHTS WERE SINCERE. THEIR THOUGHTS BEING SINCERE, THEIR HEARTS WERE THEN RECTIFIED. THEIR HEARTS BEING RECTIFIED, THEIR PERSONS WERE CULTIVATED. THEIR PERSONS BEING CULTIVATED, THEIR FAMILIES WERE REGULATED. THEIR FAMILIES BEING REGULATED, THEIR STATES WERE RIGHTLY GOVERNED. THEIR STATES BEING RIGHTLY GOVERNED, THE WHOLE KINGDOM WAS MADE PEACEFUL AND HAPPY.</p> <p><u>The Great Learning, paragraph 6</u> 3/2 page For any number of untrained musicians Duration about 30 minutes Composition dated October 1969 Content: FROM THE SON OF HEAVEN DOWN TO THE MASS OF THE PEOPLE, ALL MUST CONSIDER THE CULTIVATION OF THE PERSON THE ROOT (OF EVERYTHING BESIDES).</p>	<p><u>The Great Learning, paragraph 7</u> 1/2 page For any number of untrained voices Duration about 90 minutes Composition dated 8.4.69 Content: IT CANNOT BE, WHEN THE ROOT IS NEGLECTED, THAT WHAT SHOULD SPRING FROM IT WILL BE WELL ORDERED. IT NEVER HAS BEEN THE CASE THAT WHAT WAS OF GREAT IMPORTANCE HAS BEEN SLIGHTLY CARED FOR, AND, AT THE SAME TIME, THAT WHAT WAS OF SLIGHT IMPORTANCE HAS BEEN GREATLY CARED FOR.</p>
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Second printing June 1971  
Third printing June 1974

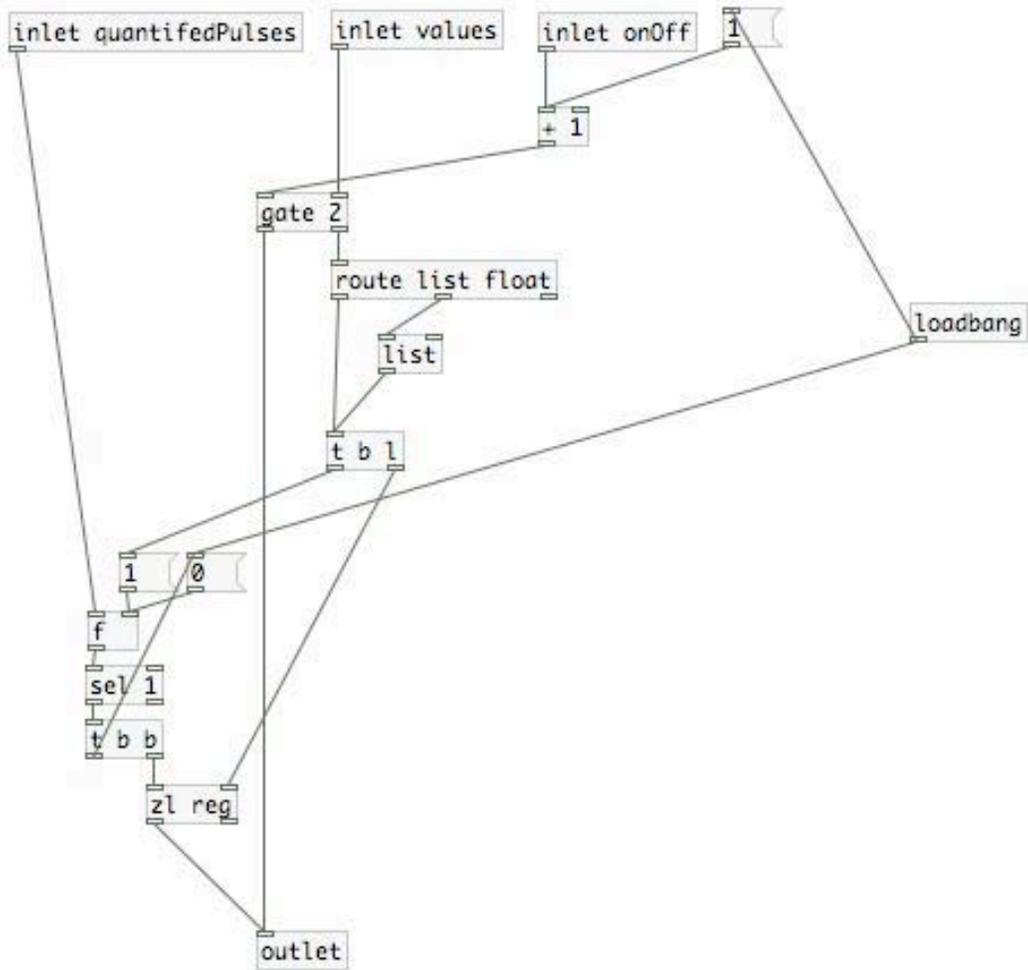
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## 17.8. Quantizing a Real-Time Pulse Stream

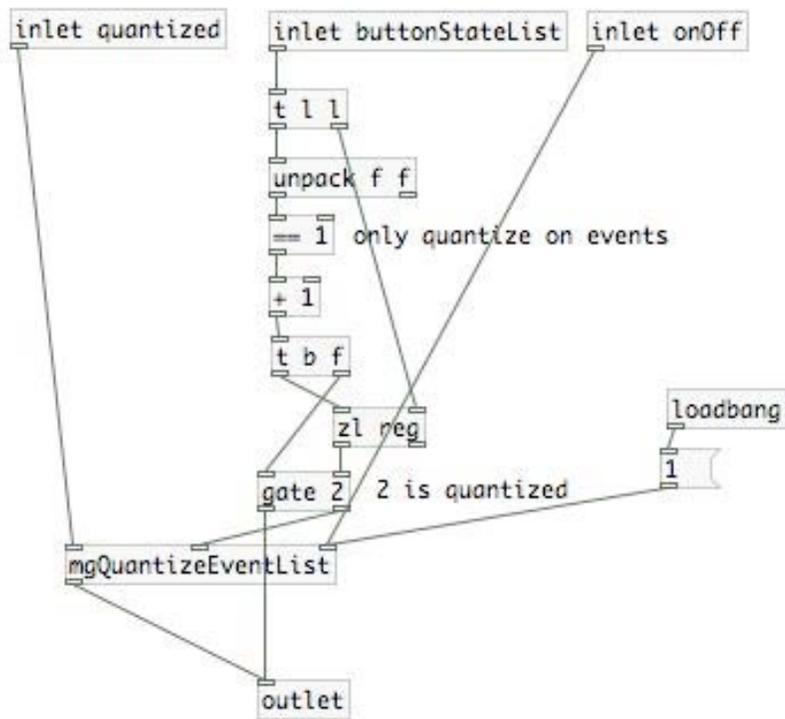
- [mgQuantizeEventFloat]



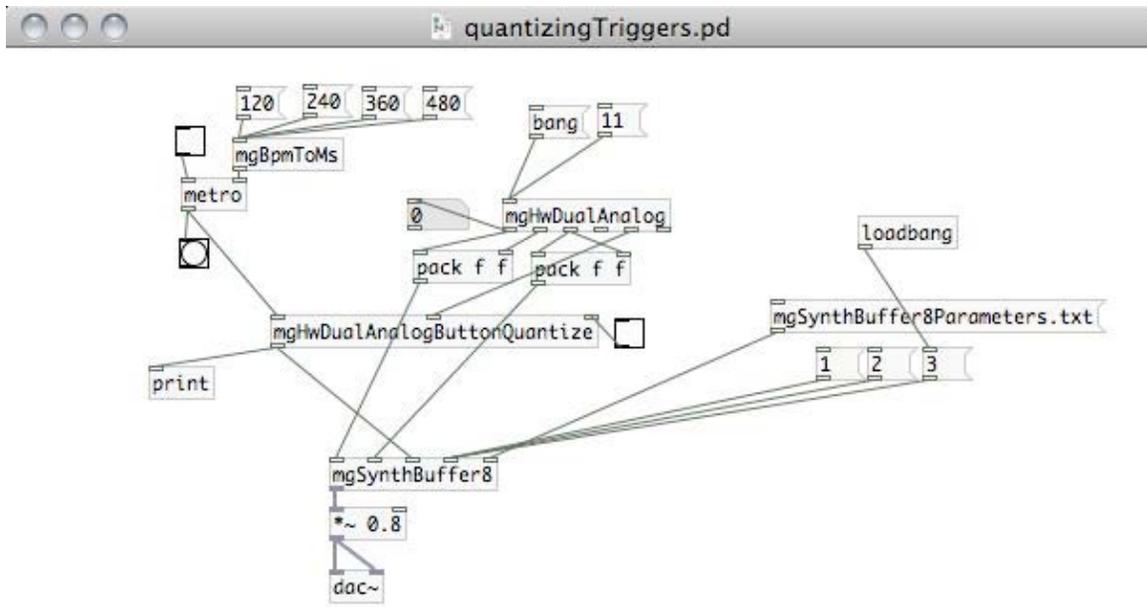
- [mgQuantizeEventList]



- [mgHwDualAnalogButtonQuantize]

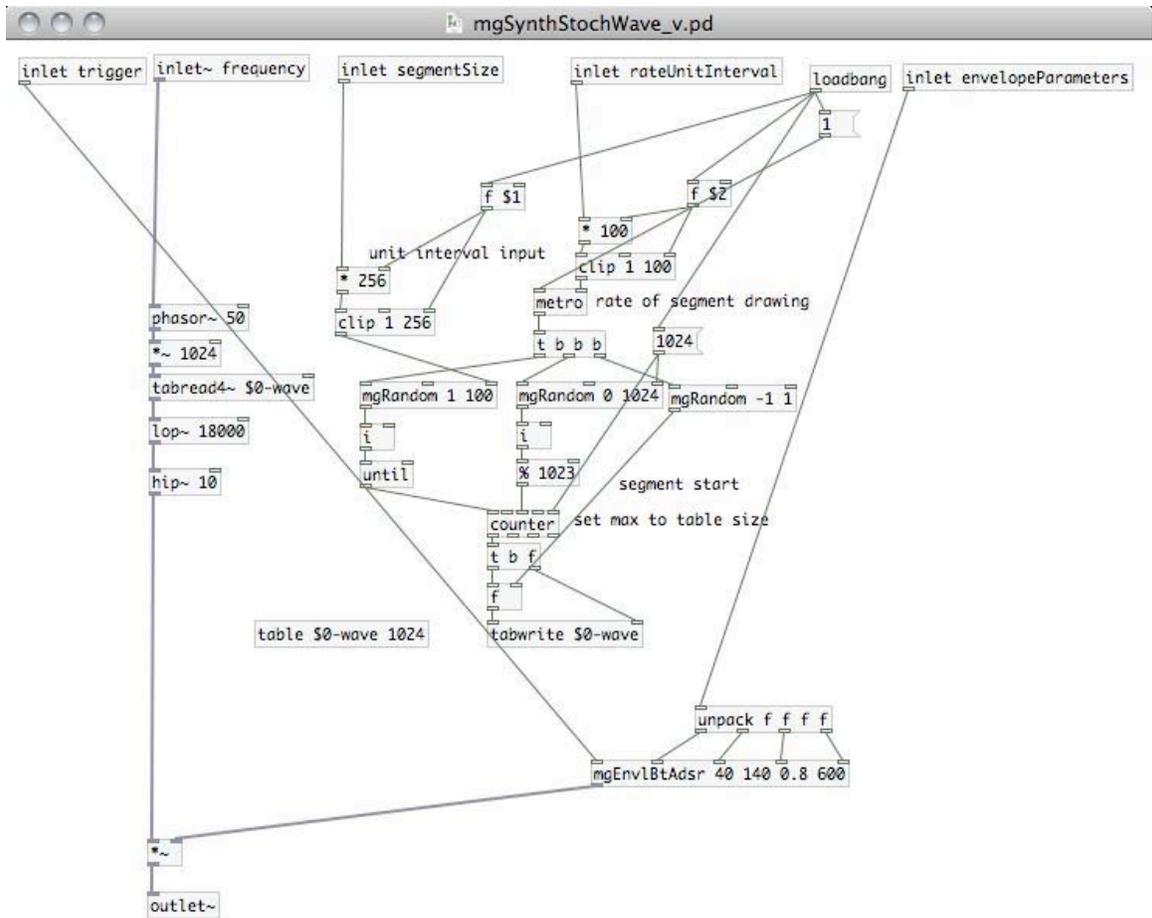


- Example: quantizingTriggers.pd

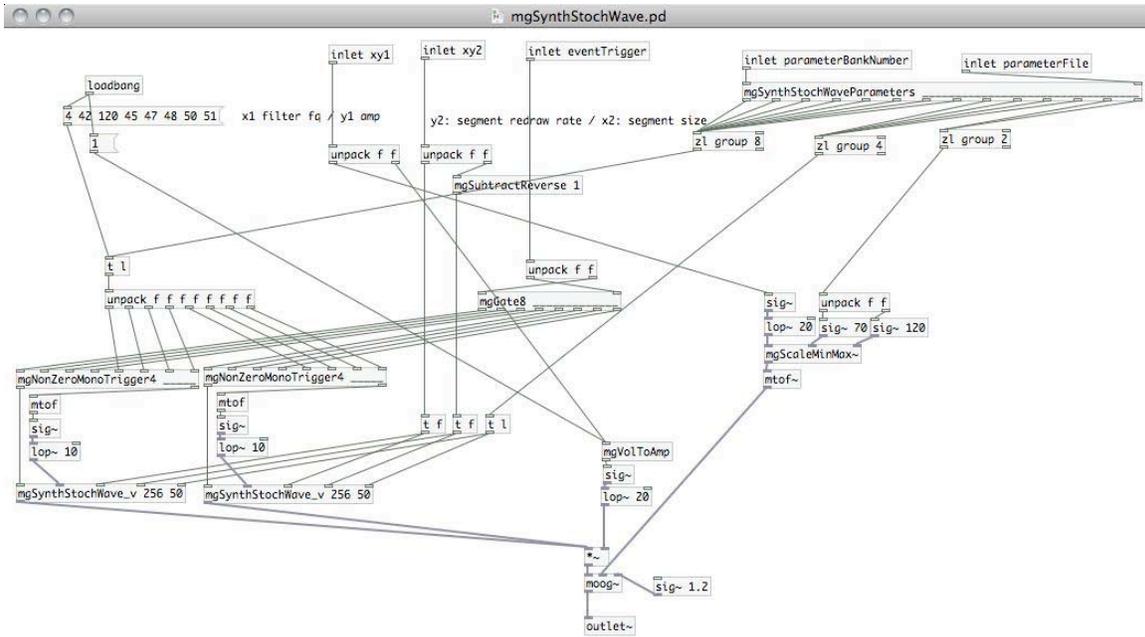


## 17.9. Dynamic Stochastic Synthesis

- Technique of algorithmic waveform construction developed by Xenakis
- [mgSynthStochWave\_v]

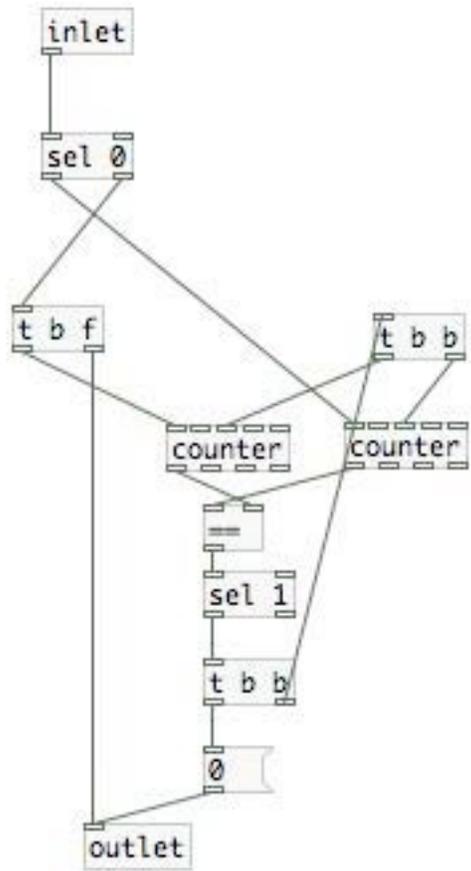


- [mgSynthStochWave]

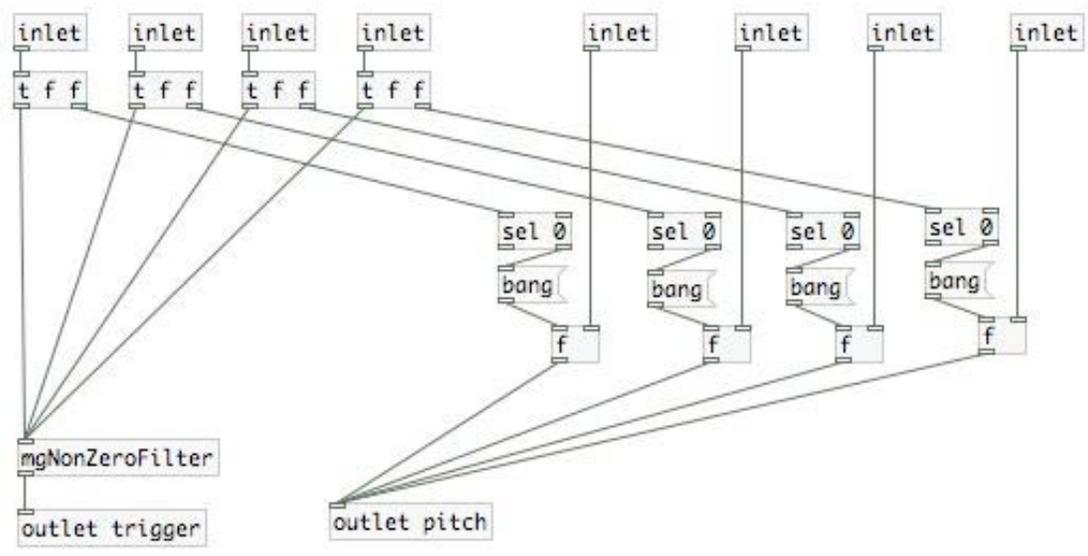


## 17.10. Producing a Monophonic Instrument

- Efficiency of using a single oscillator
- Challenge of triggering
- [mgNonZeroFilter]



- [mgNonZeroMonoTrigger4]



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