

*Digital Rainbow (2009)*

*computer-generated tape 8'24"*

*Sergio Granada Moreno*

Digital Rainbow (2009): A Visual Score based on Stéphane Roy's Functional Analysis.

## GLOSSARY

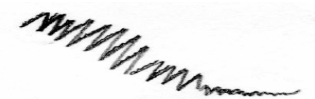
### Typologies of Sound:



Sound objects generated by MCFM<sup>1</sup> and sustained envelopes.



Sound objects generated by MCFM and exponential attack/decay envelopes.



Sound objects generated by Phase Modulation.



Mixed sound objects.

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<sup>1</sup> Multiple Carrier Frequency Modulation. Frequency Modulation is achieved as a way of Waveshaping and implemented as described by Miller Puckette on his book "The Theory and Technique of Electronic Music", Chapter 5 [2]. Amplitude and modulation values are controlled by envelope generator objects on Pd [3].

## Functional Grid:

### 1. Orientation Category

 Introduction

 Triggering

 Transition

 Engendering

 Suspension

 Conclusion


 Interruption

 Extension

### 2. Stratification Category

 Figure

 Forefront

 Accompaniment

 Movement

 Bottom

### 3. Rhetoric Category

?P>

Question

>A>

Announcement

>!

Affirmation

>v

Deflection

<i>

Sign

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Articulation

△

Spatialization

↔

Retention

<?>

Break

▴

Accumulation

▴

Acceleration

>R!

Answer

<R<

Reminder

→→→

Reiteration

>-->

Anticipation

( )

Digression

▾

Dispersion

▾

Deceleration

#### 4. Process Categeory

E. 

Manipulation of the spectrum in sound objects employing digital filters.



Delays in between 20 and 50 ms with variable feedback level.



Spatial progression.

R. 

Delays in between 60 and 100 ms with variable feedback level.

## NOTES

Digital Rainbow is a piece fully generated by the computer, employing Pd (Extended version 0.39) mostly as a sound synthesis tool. The musical material of the work is entirely generated upon a Pd patch, employing a multiple carrier FM synthesizer and random sequences of events. Different kinds of musical material evolved, and then a musical structure was set. Different musical materials were exported as audio files from Pd, and then mixed on an audio sequencer (Logic express 7).

Once the music was complete, a visual score was made by drawings and symbols based on functional analysis developed by Canadian musicologist and composer, Stéphan Roy.

Composed on 2009 at Bogotá, Colombia.

-Tape (stereo) file may be download for public reproduction by writing to the composer at::

sergiogranadamoreno@gmail.com

-Visual Score and Work Image can be download at:

<http://sergiogranadamoreno.wordpress.com/digital-rainbow-2009/>

-Digital Rainbow can be listen without download at:

<http://sergiogranadamoreno.wordpress.com/digital-rainbow-2009/>

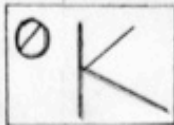
(mp3 only)

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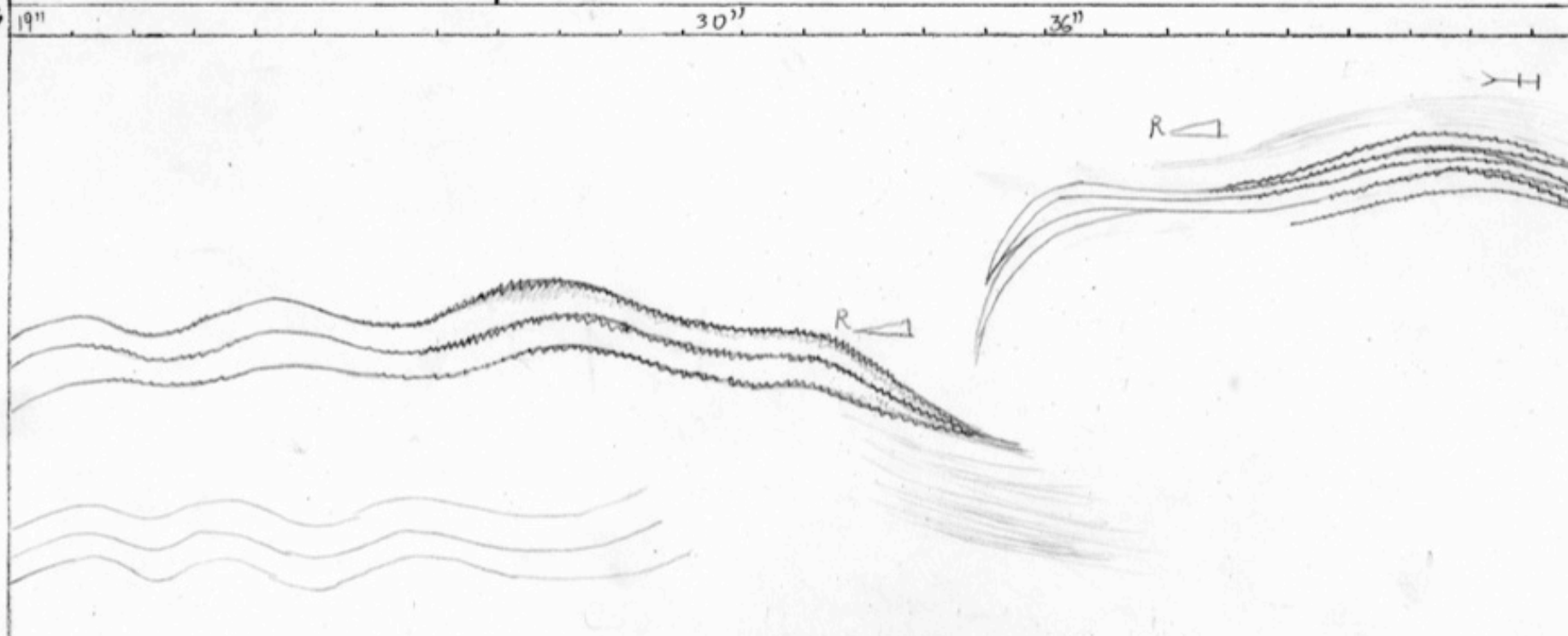
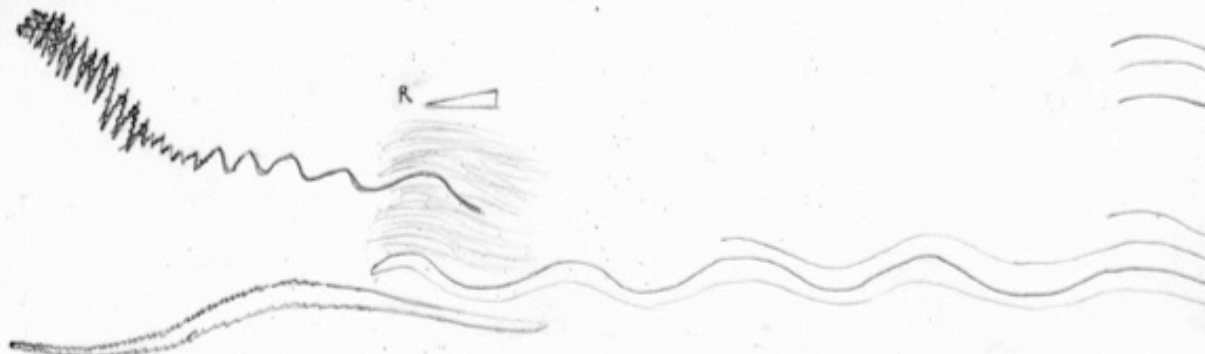
## REFERENCES

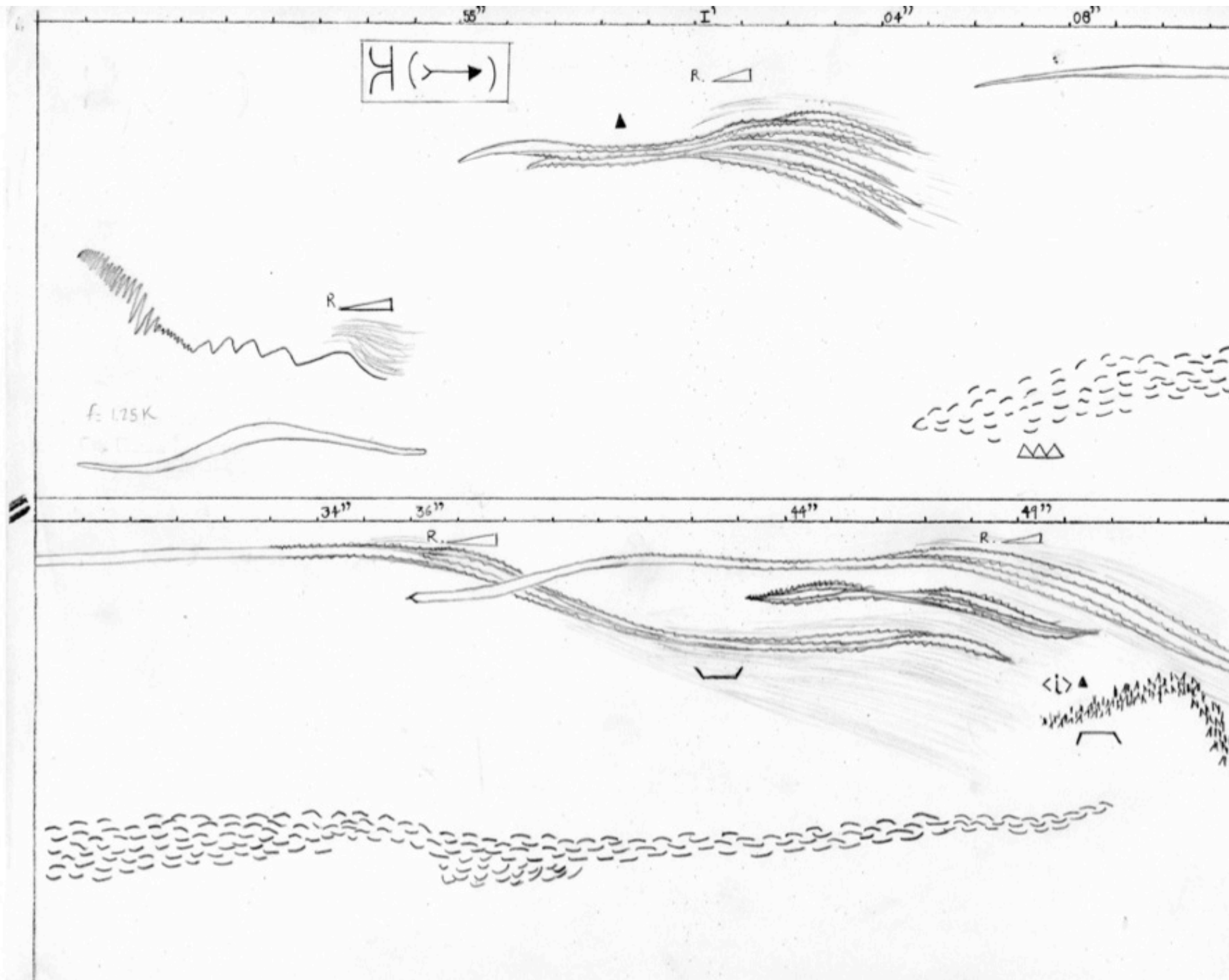
- [1] Roy, S. *L'analyse des musiques électroacoustiques: Modèles et propositions*, Paris, L'Harmattan, Univers Musical, 2003.
- [2] Miller Puckette. *The Theory and Technique of Electronic Music*. World Scientific Publishing Co. Pte. Ltd 2007
- [3] Pd version 0.42.5-extended, an implementation environment for computer music and multimedia works.  
For more information, please see:  
Miller Puckette and developers.  
<http://crca.ucsd.edu/~msp/> (\*)  
<http://puredata.info/dev> (\*)  
<http://puredata.org> (\*)

D I G I T A L  
R A I N - B O W .

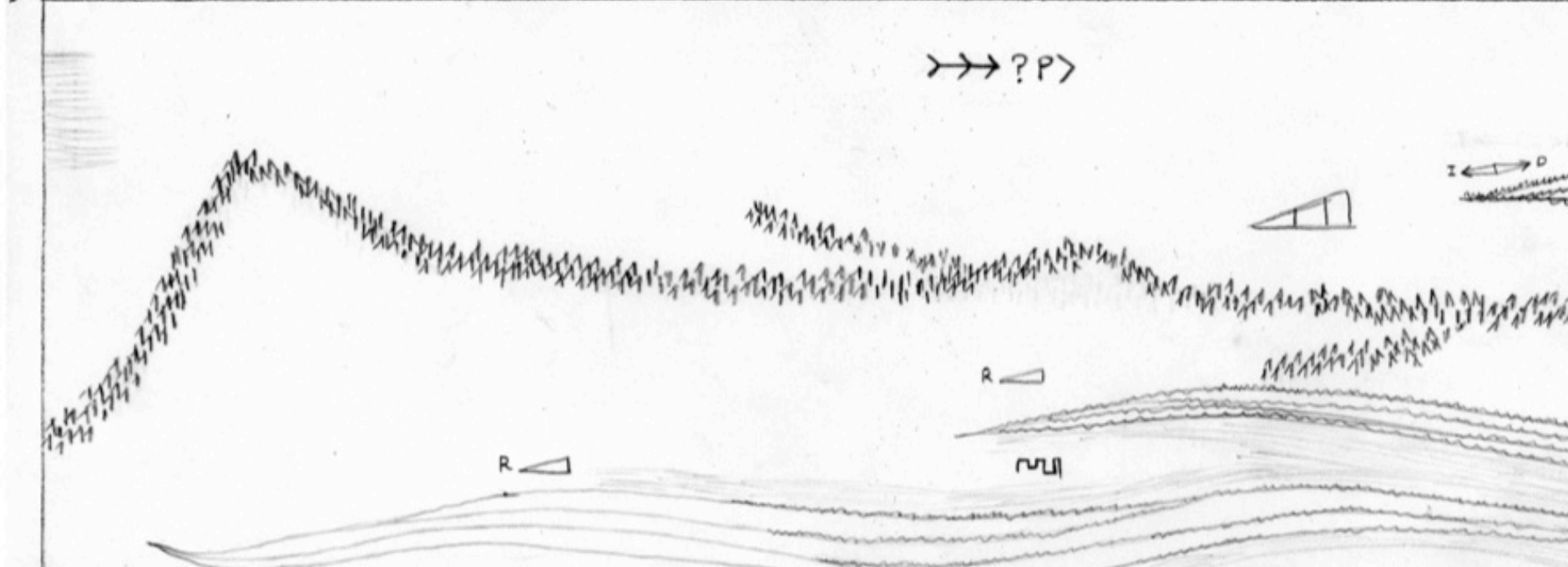
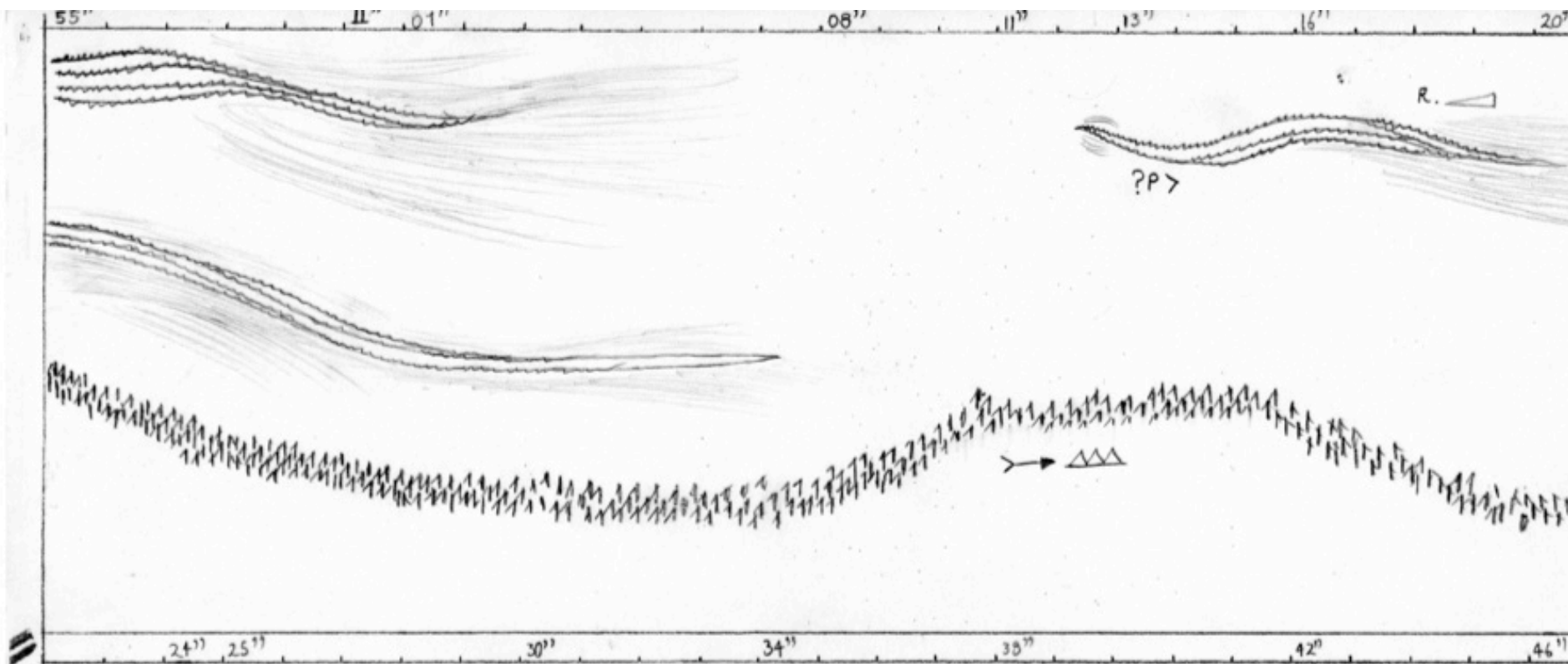


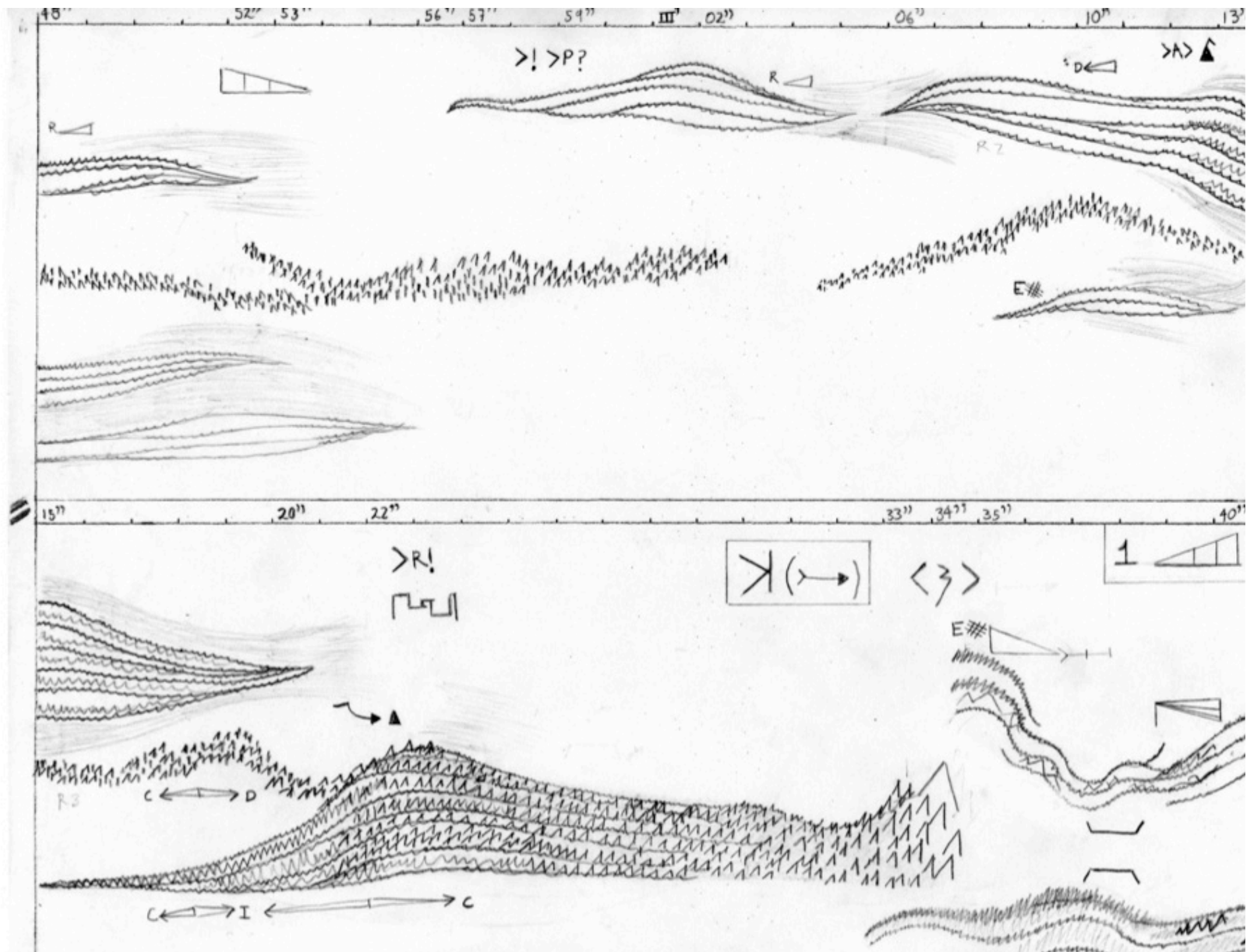
Sergio Granada Moreno  
Feb-May 2009

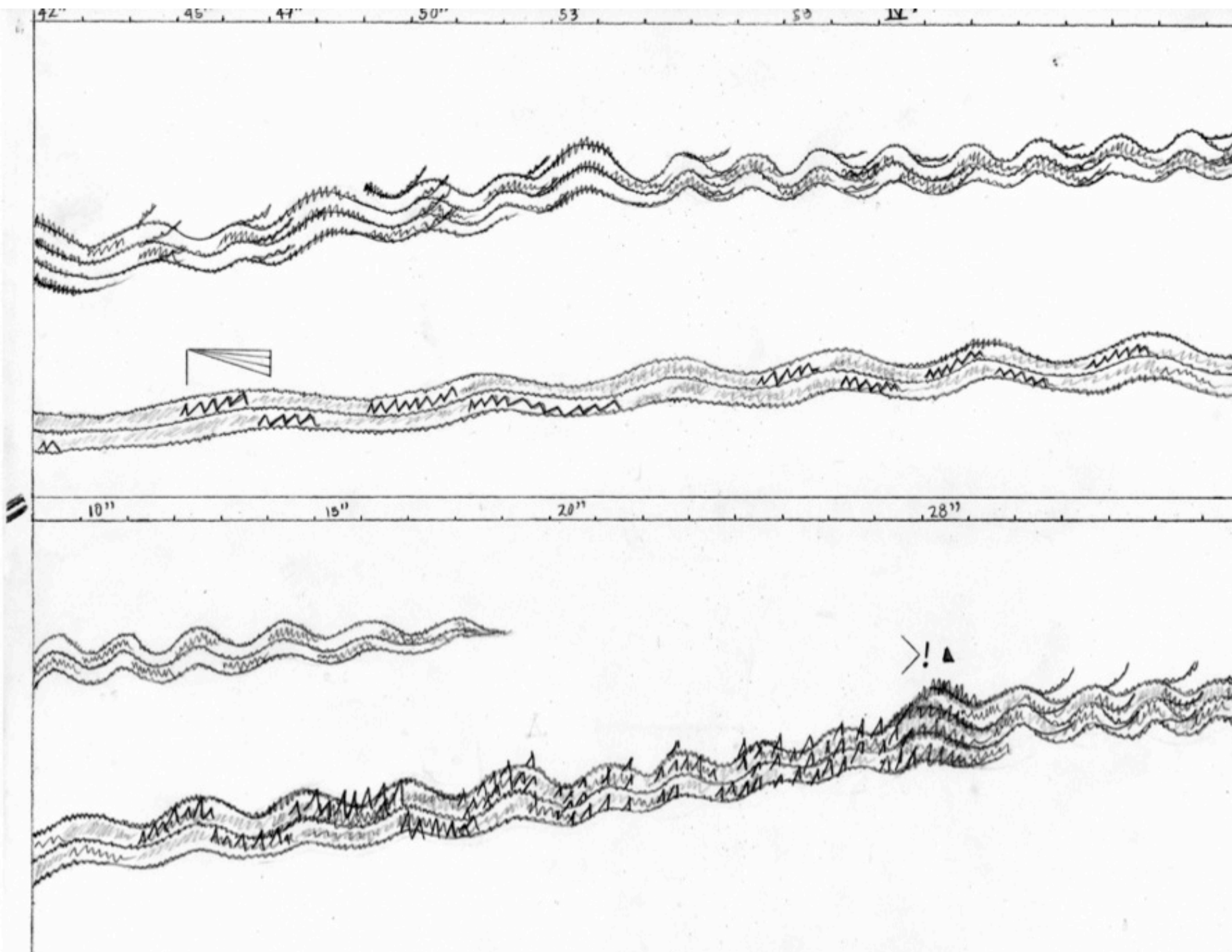




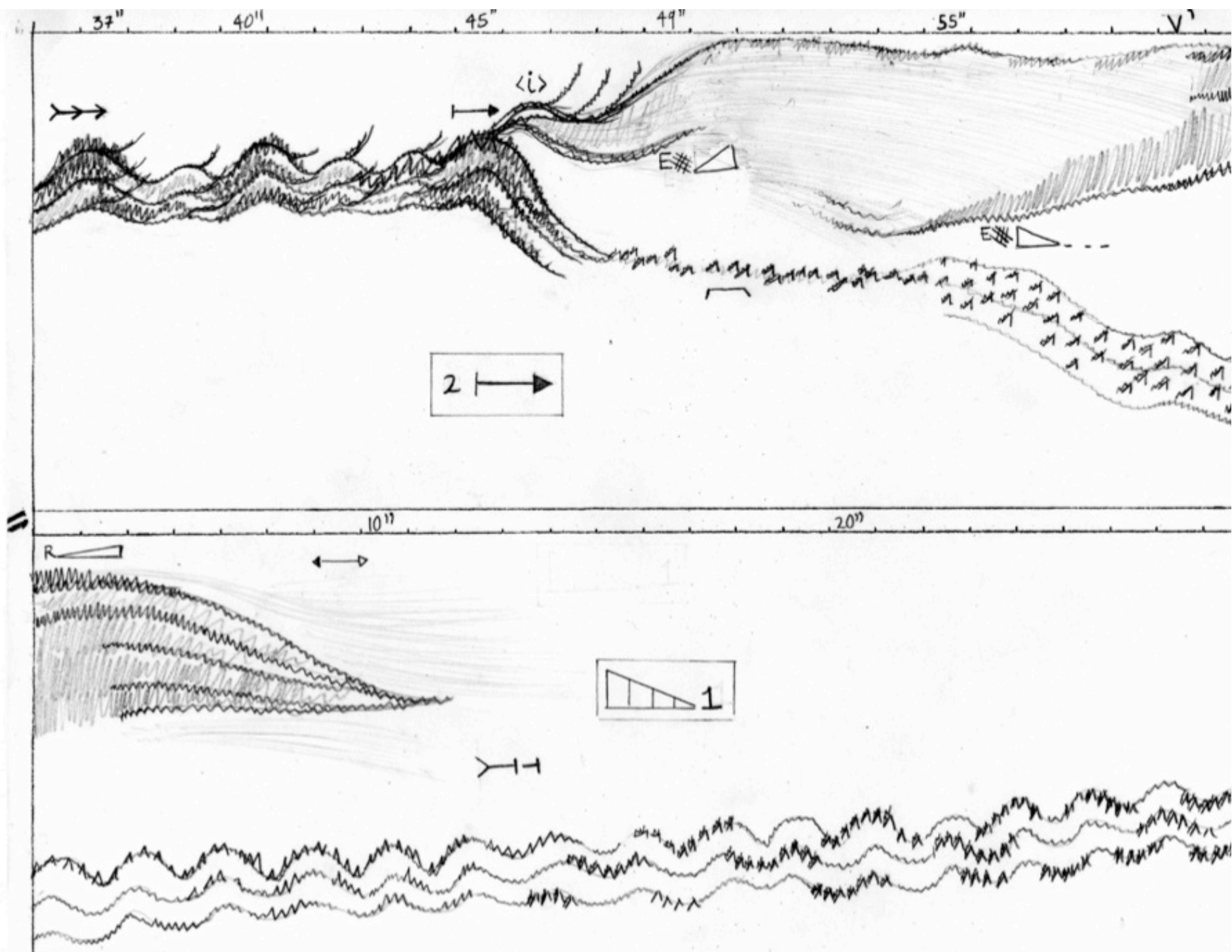




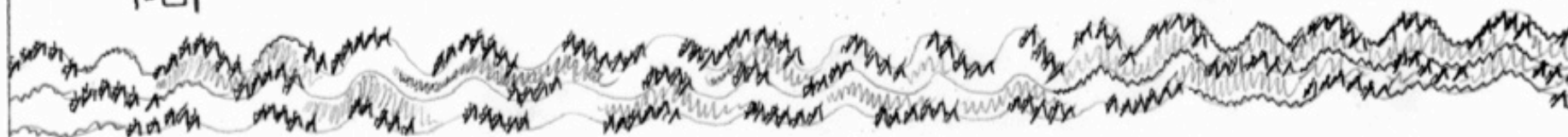




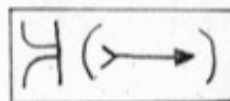




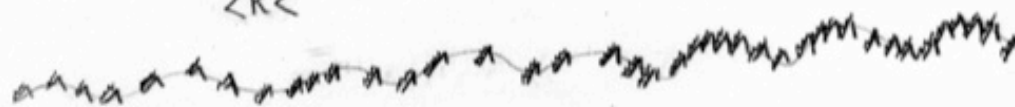
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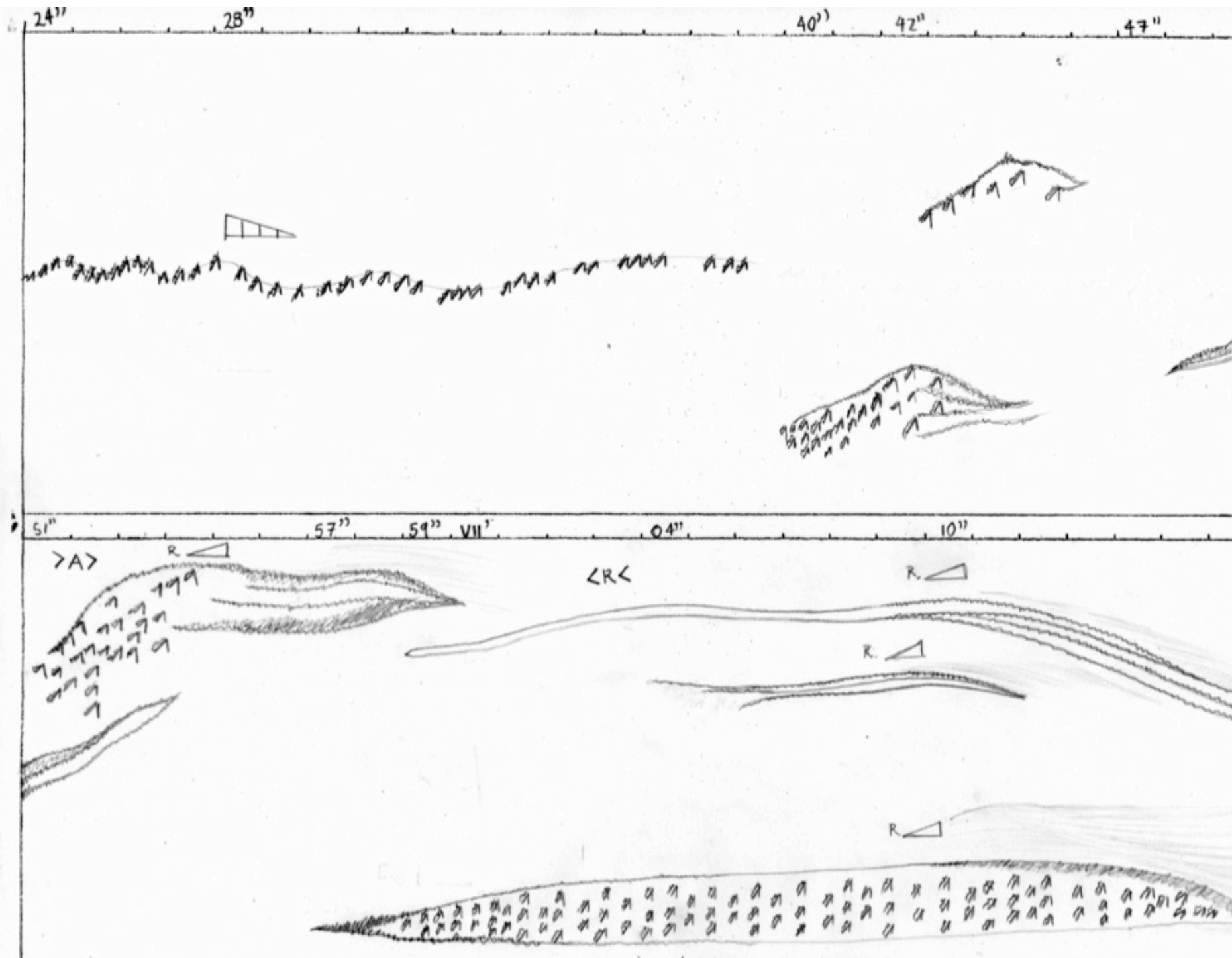


VI'' 02'' 12''



<R<





18"

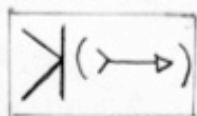
23"

28"

32"

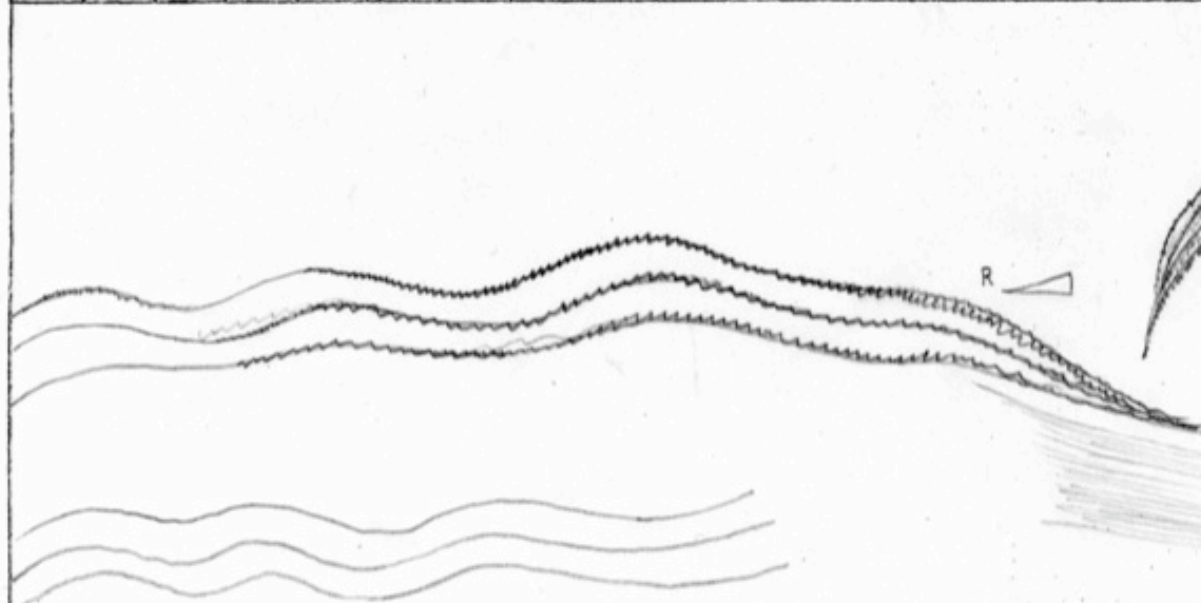
33"

42"



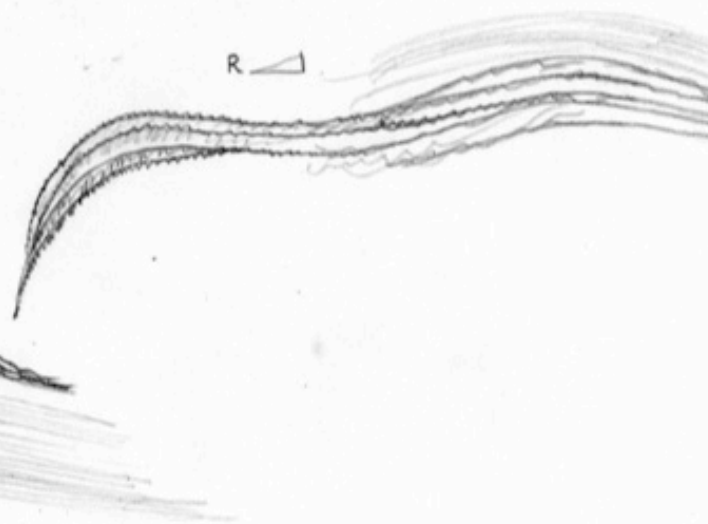
50"

VIII" 01"



R

R





12"

20"

30"

DIGITA  
RAIN-BO

<R<

R

E#

Sergio Granada Moreno  
2009



