

*An Analysis of Horacio Vaggione's
Consort for Convolved Violins*

Deepak Edakkattil Gopinath

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Introduction and background:

I first came across Horacio Vaggione's *Consort for Convolved Violins* when I began exploring granular synthesis during the summer of 2012. Since then I spent considerable time listening to his other works, reading and studying about them and I learned a lot about Horacio Vaggione's creative thought. But, this was the piece that had the greatest emotional and intellectual impact on me and was critical in expanding my musical horizons, making me realize what is possible as a composer. I resonate with this piece so much and I continue to draw inspiration from this. *Consort for Convolved Violins* is a relatively new work by Horacio Vaggione and was written in 2011. Vaggione dedicates this composition to the Father of computer music Max Mathews. What struck me hard was not only the esoteric soundscapes in the piece, but also the compositional rigor and ingenuity that was obvious in it. No other piece of computer music has ever had such a strong impact on me before and therefore I decided to look into the piece a little closer. To me, this piece has been conceived in such a way that it is like a living organism. The organic unity achieved between sound and structure, material and form is probably one of the reasons why this is such a powerful piece. I find that the process of analyzing a piece of music makes me a better composer. Not only are we trying to understand the creative processes of another composer, but we are also becoming more mindful and aware of our own cognitive mechanisms in the process. I think, 'sense-making' mechanisms play a prominent role in music analysis as we are trying to comprehend a vast amount of information and make logical connections between different aspects of it.

Vaggionian Compositional Processes and Techniques:

Horacio Vaggione was not just a composer but also a theoretician and a great writer about compositional concepts and thoughts. His writings have appeared in numerous prestigious journals such as *Computer Music Journal*, *Contemporary Music Review* etc. Vaggione has written extensively on his general compositional approach as well as on specific pieces such as *Octour*, *Till* etc. Horacio Vaggione's compositional approach is best summed up by Makis Solomos in his article "*An Introduction to Horacio Vaggione's Musical and Theoretical Thought*" [*Contemporary Music Review*, Vol 24, No. 4/5 August/October 2005, pp 311-325]. Solomos remarks in his article, "Vaggione's thought is characterized by its capacity to integrate multiple references into a complexly woven fabric by proposing a 'locus of intersection' for numerous disciplines ranging from theorization on instrumental music to computer music research, and from science to philosophy."

Solomos also tries to bring the most important aspects of Vaggione's musical explorations: Interaction, Time, Morphology, Singularities. Let us look into these concepts briefly.

Interaction: For Vaggione, the question of interaction exists between computers in composition and direct action (craftsmanship) from the composers. According to Vaggione, "Though it is true that formalization can be 'a powerful means of invention', 'the role that deduction plays in composition cannot be other than partial, "regional", and cannot be generalized'. According to him, there is no opposition between these two seemingly antagonistic concepts of formalization and craftsmanship, but rather a complementarity benefited by their interaction.

Time: In Vaggione's concept, time is no longer conceived in terms of repetition but as an irreversible, dynamic and energetic phenomenon. Vaggione, as is obvious from his explorations in granular synthesis, is interested in exploring the micro-time scale. Moreover, he is also concerned with the crucial question of 'articulation at this time scale'. Composers such as Henry Cowell, Karlheinz Stockhausen etc., have all been

interested in the micro-time scale, but they preferred to look at all time scales as a manifestation of a single Unity, whereas, Vaggione, sees this as an opportunity to discover pluralism of these different time scales.

Morphology: According to Vaggione, both material and form are both *composable* and can be articulated. For him, different phenomena at different time scales can be understood as ‘forms’ that evolve in a scale of time pertaining specifically to them. This comes from the basic idea that the material at hand (sound) is not neutral that is, the substructure of sound can be articulated and composed and do not just exist out there to be assembled at will.

Singularities: By morphological singularity, we mean that, as material evolves in time, at one moment or another, ‘outstanding’ characteristics are produced.

In Vaggione’s words, “The ‘saliencies’ are local qualities (forms) which emerge within the tension of the composed present and which allow a detailed morphological analysis, having them rebound as morphophoric, by creating classes which embrace and propagate their specificity: i.e. morphological details, which can be brought out and projected here and there into other regions, in the interplay of the work’s vectors”.

Techniques:

Horacio Vaggione started off as a classical composer and later on began working with the electronic medium in a very active way. Some of his other well known pieces are *Schall, Kitab, Thema etc.* In all these pieces, the electronic tape part was created by manipulating pre-recorded instrumental samples played by either the performer for which the composition was written for or by the composer himself. Vaggione usually would have the performers play melodic snippets from a score, which would later be dissected and sculpted into new soundscapes using various digital signal processing techniques such as nonlinear distortion, recursive filtering, convolution etc. Vaggione considers *space* to be a *composable* element and a part of the morphology of sound it-

self. Therefore he hardly ever uses standard spatialization techniques such as reverb, panning etc., as they are imposed on the sounds 'after' the sounds were composed. He uses techniques of phase de-correlation between sounds to create a sense of depth and space. In *Consort for Convolved Violins*, as the title itself suggests, I believe that the primary signal processing technique employed is that of convolution. Convolution can be thought of as 'mating' between two signals. It is a process by which the spectrum signature of a waveform can be superimposed on another waveform, thereby creating a third waveform which would have the characteristics of both the original sounds. It is quite possible that, Vaggione, had the violinists play some of the main motifs of the piece beforehand and used those sound samples for creating the electronic part for the piece.

Formal Analysis of *Consort for Convolved Violins*:

Consort for Convolved Violins, being a relatively new piece, I was not able to find a score or any notes regarding the realization of the piece from the composer himself. Therefore I decided to make a time-line analysis graphic score in order to help me dig deeper into the structure of the piece. The analysis score has been appended to this paper.

The piece lasts 7 minutes and 13 seconds (433 s) and Vaggione delineates the macro structure of the piece by using compositional devices such as contrasting textures, shifting tonalities, silences etc. The source violin sounds were recorded by Wan Chen, Daniel Brown and Manfred Kraemer. The electronic processing was realized at the *Centre de Recherche Informatique et Creation Musicale* at the *Universite de Paris VIII*.

For the sake of analysis the piece can be divided into an introduction followed by eight distinct sections, interjected with three interludes and finally the recapitulation and the coda.

Let us look into each one of these sections a little more closely and through this we can see the structural integrity and long range relationships present in the piece clearer.

Introduction - (0:00 - 1:12)

The introduction to this piece contains all the generating material for the rest of the composition, in other words: '*the genetic code*' for the composition. I would like to bring out the analogy of a living organism at this point. For example, a human being starts out as a single cell. That cell contains the chemical signature, the DNA, that would determine, along with other extraneous factors, how the morphology of a human being is going to be. Quite often, we hear composers and musicians talk about how '*organic*' a piece of music or a performance is. I think in saying so, we are finding a deep connection between the '*life and morphology*' of a composition and our own. This piece is a classic example.

The introduction consists of two phrases, each played twice (with variations).

The breakdown of the introduction is as follows:

Phrase I - 0:00 - 0:08

Phrase I (repeat with few new elements and variations) - 0:09 - 0:18

Phrase II - 0:18 - 0:25

Phrase II (repeat with new elements and variations) - 0:25 - 0:33

Phrase I + Phrase II (Bridge to next section) - 0:35 - 1:12

Phrase I:

Phrase I consists of 5 different important gestures, which would keep coming in a variety of morphed forms later on in the piece. These gestures, along with the one in Phrase II act as the main cohesive factors between different sections of the piece.

The opening gesture of the piece is a high, short, staccato bowed sound on the violin (D_b) followed by a Bartok pizzicato kind of low percussive sound (G_b) out of which arises a shimmering granular texture (SHM), with an extended reverberating tail, voicing an E_b minor chord. This chord becomes the center tonality for the entire piece. The high register dense grain clouds introduced in conjunction with the other sounds, become an important background texture for the rest of the piece. This opening composite gesture made up of 4 different smaller 'motifs' is followed by an 8-note ascending whole tone scalar line, spanning an octave and a second. This 8-note ascending line is to be called M_I from here onwards. This first instance of M_I starts on pitch A and ends on same D_b which opened the piece. This constitutes Phrase I and lasts from 0:00 till 0:09. The phrase is repeated at 0:09, but in a more subdued way and few new gestures are introduced. The new gestures introduced are: pizzicato (G_b), 3-note *jete* (G_b) and *col legno* sounds. These new elements are also going to be crucial in bringing out long range connections between different sections of the piece. This repetition of Phrase I ends with a screeching bowed sound at around 0:19. *The following conventions will be used hereafter. Pizzicato (P). Jete (J) and col legno (CL).*

Phrase II - (0:19 - 0:33)

Phrase II, along with its repetition, is shorter than Phrase I. The new elements introduced in Phrase II are: an upward sweeping dense texture (US_I) in the middle register, more *jete* and a descending figure ending in a big percussive low sound. In the repetition of phrase II a new element in the form of a drone, appears around 0:28. The drone becomes another important element in the piece and is effectively used later on as form markers. The pizzicato sounds heard in the repetition of phrase I is used 5 times in Phrase II repetition. Phrase II ends with a couple of upward glissandos juxtaposed against high screechy bowed sounds (similar to the one which ended phrase I). Even now, one can see that Vaggione is trying to bring connections between different sections of the piece, by repeating certain gestures at crucial struc-

tural points (such as ending two different phrases with the same screechy high sound).

Phrase I + Phrase II (Bridge) - (0:35 - 1:10)

This extended bridge contains material from both Phrase I and Phrase II but places them in different configurations. The 'drone' element introduced at the end of Phrase II is brought back right in the first few seconds of the bridge. Around 0:41, US1 is employed as the main melodic material. This melodic material is juxtaposed against more drone like sounds. Around 0:50, SHM is brought back in E_b minor and is followed by two instances of M1. Although now M1 is transposed a major second up. This interval of a second plays an important role throughout the piece as most of the harmonic structures are based on this interval. SHM is brought back again around 1:00 and fades out as the dry high screeches and some CL from Phrase II is brought back. Around 1:08 a new tonality is introduced (G) as a drone and the bridge ends with a subdued repetition of M1. Throughout both phrase II and the bridge the grainy high textures continue to be active with slight variations in dynamics around 0:50-1:00.

Section I - (1:14 - 1:30)

The section begins with M1 leading up to a low percussive sound out of which arises a drone centered on pitch class F. Pointillistic bowed figures are layered over the grainy texture and the low drone. M1 material is compressed dynamically and is used in the high register as background material along with the drone. The opening gesture of this section is brought back briefly around 1:28 to end the section.

Interlude I - (1:31 - 1:52)

This short interlude itself can be thought of as having two small subsections.

In the first subsection (1:31 - 1:39) the opening SHM in E_b minor is brought back, only now, there is an additional pitch in the chord, which is an A_b. In the second subsection (1:49 - 1:52) the high grainy texture is transformed into a rhythmic loop (LS) whose rhythm one can easily perceive (almost like a jazz ride cymbal pattern). The high, short, bowed D_b which opened the piece is played twice at around 1:49. The interlude ends with a 3-note composite gesture consisting of a high, short bowed violin sound, followed by a pizzicato sound on the right channel and another short, bowed sound in the left channel. Out of this composite gesture arises the next section.

Section II - (1:52-2:10)

A new drone element (pitch class A) is introduced at 1:52 which would last the whole duration of this section. The grainy texture which was transformed into a loop in the second subsection of *Interlude I* is recycled and used in this section. More pointillistic and rhythmic development happens in this sections used short bowed precisely articulated sounds. Around the 2:00 mark, the low percussive Bartok pizzicato sound is brought back, only now, the pitch is C as opposed to G_b. The pizzicato element is used to create short melodic fragments (B_b and A_b). The drone fades out by the end of this section, while the grainy background texture becomes slightly louder, paving way for the new section.

Section III - (2:10- 2:30)

This section commences with the pizzicato element (from phrase II) transposed down and played on pitch class G. The two-note pizzicato motif is repeated three times. The J element from Phrase II makes its appearance in this section and is used more actively. The pitch associated with the J element is still G_b. Around 2:16 the USI

element appears briefly culminating in a new drone centered on A_♭). The short melodic fragments using pizzicato in section II is brought back here with diminution. As a digression, it has to be noted that the new drone in this section is only a half step away from the drone element present in Section II. It is quite amazing to see that, some of the composition techniques employed here, can be traced back to the compositions of Mozart, Beethoven and the likes. It is just that the medium being dealt with in this case is different. The lowest sonic entity that can be 'articulated' or composed in the case of Vaggione's music is that of a digital sample, whereas in the music of Mozart or Beethoven it is a 'note'.

The activity and density of this section further increases as more thicker textures are introduced in the middle to low register. The scalar passages are used in the high register as background material. More J elements make their way into center stage and the section ends with a low, short, bowed sound and this marks the beginning of another short interlude.

Interlude II - (2:30 - 2:50)

Yet again this interlude can be thought of as having two subsections. The first one lasting from (2:30 - 2:40) and the second one (2:40-2:50).

The first sub section introduces a new gesture, a descending scalar violin figure (DESC), which can be thought of as an answer to M_I. DESC becomes an important element in the piece later on. More percussive, sharp, bowed sounds are layered against the DESC in this first subsection. This subsection ends with M_I out of which arises a new drone (centered on pitch class B) and this marks the beginning of the second subsection.

The second subsection of this interlude, is probably the least active section of the piece. A low drone centered on B acts as the backdrop against which the high D_♭ (the opening sound of the piece) are played. This subsection ends abruptly with J element in the mid register.

Section IV (2:50 - 3:18)

In this section M_I and DESC form a Q&A pair in the high register and this functions as background texture. The LS material is present in a very active way in this section, although it has been transposed down from its original pitch level. The low bowed sounds happen twice around 3:03 and 3:09 and becomes the most prominent sound (*singularities*) event of this section. To end the section, M_I is brought back at two different transposition levels. The first one being (D_b to E_b) and the second one (B to D_b).

Section V - (3:20 - 3:45)

This sections recycles lot of material from Phrase II, that is J and pizzicato elements are brought back, but in this section the pitch class associated with J is A_b. A new element is introduced in this section and it happens around 3:22 and 3:25. This is a dense element and its character is similar to the sound produced when a heavy object is dropped into water. This new element becomes the salient feature (singularity) of one of the upcoming sections. The tail of the sound resembles water bubbles. This new element is to be labelled B from now on.

The U_{S_I element and its inversions are brought back around 3:30 and a sense of compression of energy and activity is created by piling these gestures on top of each other in quick succession. This section ends with a B element.}

Interlude III - (3:45 - 3:58)

This brief interlude starts of with M_I at a new transposition level (A_b - B_b) and ends with a high, short bowed sound on C. A drone element appears at the same time

along with the bowed sound and the Bartok Pizz. percussive sound. The drone is at pitch class C. The only time the percussive sound was at pitch level C was in Section II and now Vaggione is trying to make that long term connection by having the drone in C. The pizzicato element is used as the melodic generator (two note motifs around E and B_b). The opening SHM in element E_b minor makes it come back at around 3:55 and just when you think the recapitulation is about to happen Vaggione breaks off into a new section.

Section VI - (3:58 - 4:45)

This section uses the B element extensively and gives it an extra dimension by supplementing it with percussive sounds. A new sound element, almost like that of a “wobble bass” (WB) is introduced in this section around 4:02 and serves the role of a response to the B gestures in this section. US_I from Phrase II comes back briefly. A new ‘airy’ looping material (LS’) is introduced around 4:17 and is similar to LS. The high register is dominated by grainy textures as well as ascending and descending melodic sweeps by the violins.

The golden mean point of this composition lies around 4:25 and precisely at this point, Vaggione introduces a new texture, an isolated pulse train (PT). These pulses are at the pitch level E_b, which is the opening tonality. E_b can be thought of the “home key” for this piece and it is not a surprise that at the golden mean point of the piece, Vaggione decided to present the tonal center in the highest register. The WB and B elements continue alongside the PT. The section ends concludes with an ascending melodic line in the high register by the violins and the percussive sounds which boosted the B element in this section.

Section VII - (4:45 - 5:30)

This section reminds me of the second subsection of Interlude II in terms of its activity levels and serenity. The dominant texture in this section is a high grainy texture. It seems as if the grains being used have longer grain duration than before and that the grain frequency is quite high. This would create a more homogenous texture as the grains would begin to overlap. The first interruption to this texture happens around 5:09 and another one happens around 5:14. The tonality B_b is introduced briefly around 5:16 and soon leads to the loudest gesture of entire piece, which sounds like a huge chromatic cluster. The cluster energy dissipates in a matter of few seconds and as the cluster dissipates various pitches are brought to the foreground.

Section VIII - (5:30 - 6:28)

As the cluster from Section VII fades away completely a new tonal region is explored [E, F#, G#]. This section is characterized by relentless repetition of elements but always juxtaposed in different configurations thereby maintaining forward momentum and excitement. Two new elements which play a major structural role in this section are : bowed violin at A_b, high register electronic beep and a 4 note-motif to be repeated 3 times(F#-E-E-F#). These 3 elements are superimposed and interspersed with J and CL elements, made to collide and intersect with each other, just like Varese would have liked it. Toward the end of the section the density and activity is reduced considerably and the opening SHM is first brought back briefly (centered on A) and then in the “home key” of E_b minor. The grainy texture on top finally stops toward the end. After a brief pause of 2 seconds, the last section begins.

Recap+Coda - (6:30 - 7:13)

The recapitulation starts off with a literal repetition of the opening gesture from Phrase 1. Soon after M1 is heard around 6:38 and the coda begins around 6:40. The coda has a new sound element, a low rumbling bass sound, which sort of gives us a

hint that the end of the piece is near. The opening sound of the piece, the high D₆ is heard 5 times. More J elements and melodic lines happen in the high register. The bass rumble and the high grainy sounds fade out around 7:00. There are 4 distinct shapes from 7:00 till the end of the piece. These shapes are a composite of many different elements such as the high screeches, the B element, J element etc. The last gesture of the piece ends on a high note.

Observations and Conclusion

This piece is a classic example of perpetual variation and theme and development in composition. Vaggione works with a constrained set of sounds (sound objects) which later gets recycled over and over again only to be presented in different forms and in different contexts (time scales, registers, pitch levels etc). It is quite clear that Vaggione is a composer who is not just interested in esoteric synthesis techniques, but also in meticulous thoughtful compositional procedures, whose musical decisions are informed by extra musical sources such as physics and philosophy. It is obvious in this composition that Vaggione's intention is to determine both the micro and macro structure of the piece as well as the interaction between local and global aspects of the composition, extended to all temporal scales and in doing so is trying to explore the pluralities of different time scales. He achieves compositional integrity by making use of the same source material to generate macro and micro sound structures. This piece is an embodiment of some of Vaggione's most important compositional concepts. As an example of *singularities*, as we have seen in the analysis, each of the different sections has its own salient features, which stand out as special sonic events as the rest of the material evolves in time.

Even before I decided to explore this piece in a closer way, there was something about the piece, which resonated in me as important and powerful. I guess it is because of the fact that the piece has been created in such a way that it is like a living organism. Although there are multiple layers functioning in a living organism in a coordinated fashion, there is a sense of unity and 'Self' that we all experience, something that makes us uniquely human, something that gives us a sense of being alive

and I think that, as human beings we resonate with anything that has similar qualities (which is why probably, there are feelings of empathy and love in this world). I think in this composition such an organic unity is achieved by abandoning the dichotomies between sound and structure, material and form. That is probably one of the main reasons why this piece is such an emotional and intellectual *tour de force*.

References:

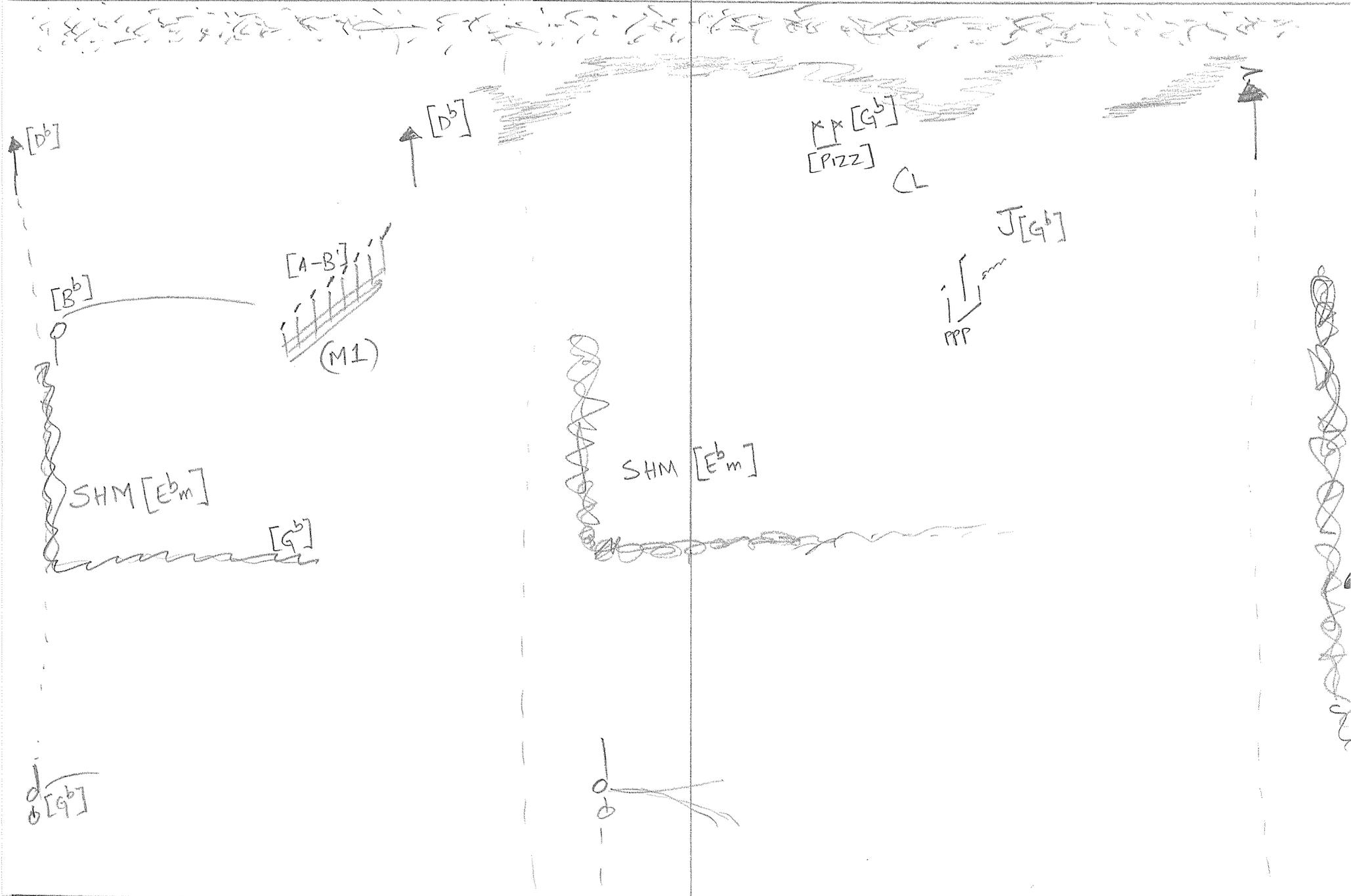
1. Composing with Objects, Networks, and Time Scales: An interview with Horacio Vaggione. Osvaldo Budon. *Computer Music Journal* 24:3, pp 9-22, Fall 2000.
2. An Introduction to Horacio Vaggione's Musical and Theoretical Thought. Makis Solomos. *Contemporary Music Review*. Vol 24, No. 4/5 August/October 2005, pp 311-325.
3. Composing, Listening. Antonio Soulez and Horacio Vaggione. *Contemporary Music Review*. Vol 24, No. 4/5 August/October 2005, pp 335-337.

CONSORT FOR

ANALYSIS SCORE BY DEEPAK E. GOPINATH

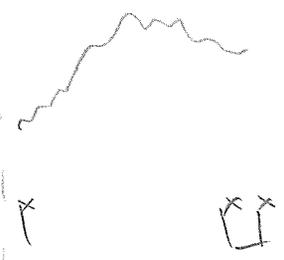
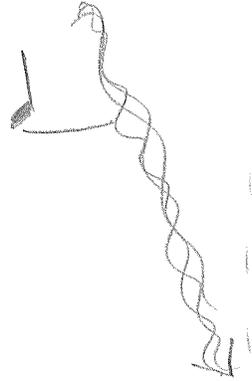
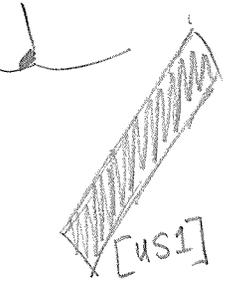
CONVOLVED VIOLINS (2011) -

HORACIO VAGGIONE

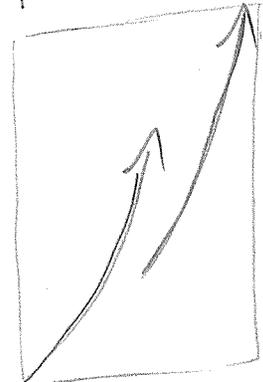


[vln
echo
to
us1]

2x
J [G^b]



J



M1



PHRASE 2

PHRASE 2 (REPEAT)

BRIDGE

0:30

0:



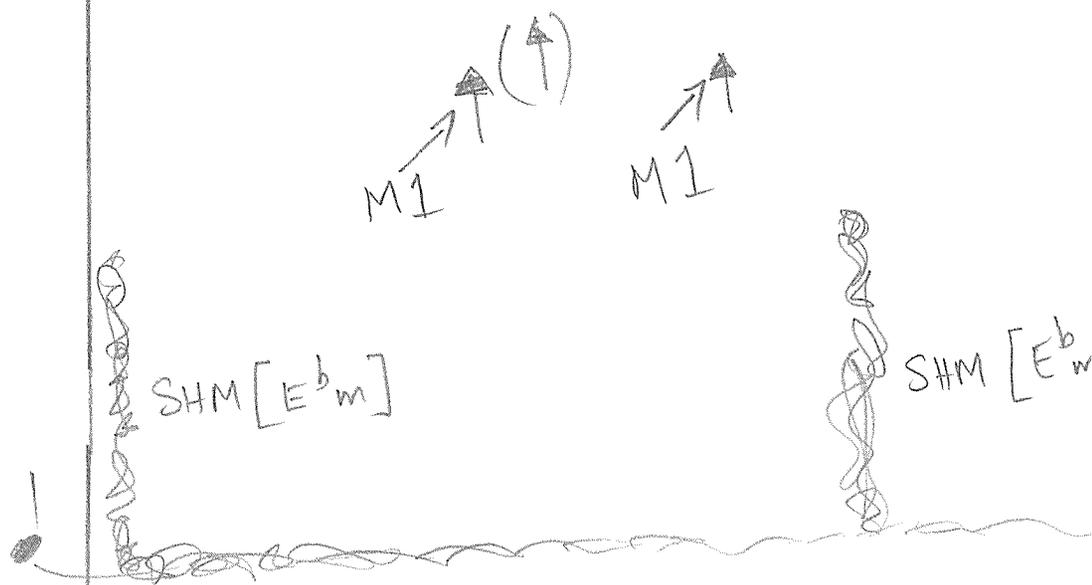
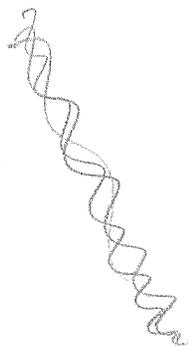
ρ $[G^b]$

$[M1]$
PPP

d

US1

US1





[arco (material)]

CL



[arco]

[BD^b]

[M1 PPP]

[G]

M1 PPP

M1 PPP

M1 PP

M1



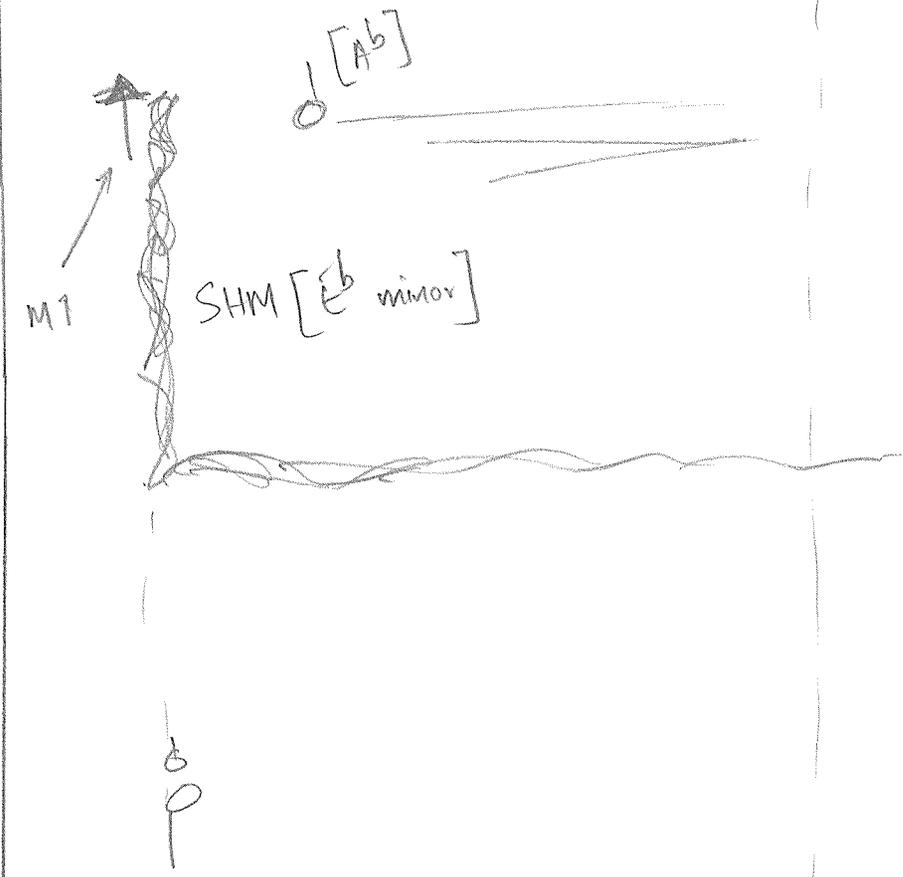
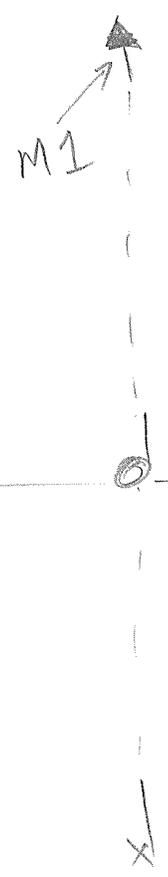
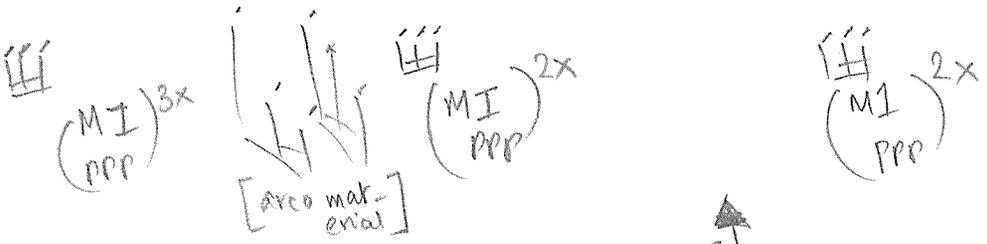
δ [F]



BRIDGE 1:10

SECTION 1 1:2

[Faint handwritten notes at the top of the page]



gram 100

[Scribbled-out text]

→ [gran loop →]



CL
CLL



(Db)
[high arco]

(arco)
x(pizz)
(left)
(arco)

(arco)
stuff

LS

PPP

LS

PPP

[A]



~~Handwritten scribbles and notes at the top of the page.~~

$$\left[\begin{array}{c} x[B^b] \\ \text{P33} \\ x[B^b] \\ \text{[A]} x[B^b] \end{array} \right]$$

$$\left[\begin{array}{c} B^b A^b B^b \\ x \quad x \\ | \quad | \\ x \quad x \\ \text{P33} \end{array} \right]$$



LS LS

J J [G^b]

J J

[A^b]

US1

[A]

[C]

$$\begin{array}{c} \text{P33} \\ x \quad | \\ x \quad x \\ \text{[G^b]} \end{array}$$

$$\begin{array}{c} \text{P33} \\ | \quad | \\ x \quad x \end{array}$$

$$\begin{array}{c} \text{P33} \\ | \quad | \\ x \quad x \end{array}$$

(E)

SECTION II

2:10

SECTION III

2:1

[violin lines

(pp)

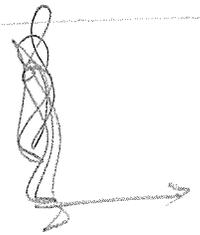
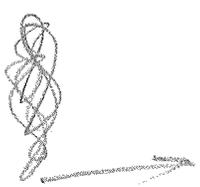
(DESC)

(DESC)

J (G^b)

J J J J

[A]



J (p)

arco

A1 arco

A1

arco

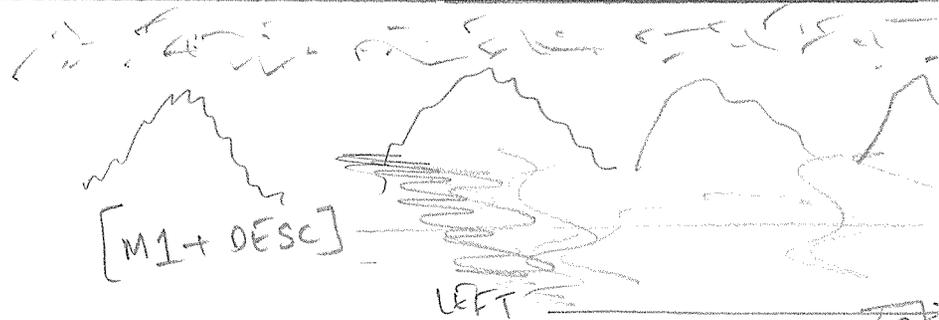
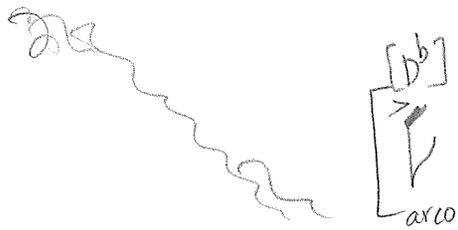
M1

SECTION III

2:30

INTERLUDE II

2:11



> []
(reverb)

o [B]

~~ms~~
mf

~~ms~~
(invertal)

o
o
|

o [E]
o

INTERLUDE II

2:50

SECTION IV

3:11



~~scribble~~
(P133)
↑

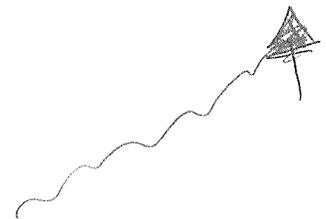
J(A^b)

(J J)
[A^b]

||||

arco
[scribble]

J[A^b]



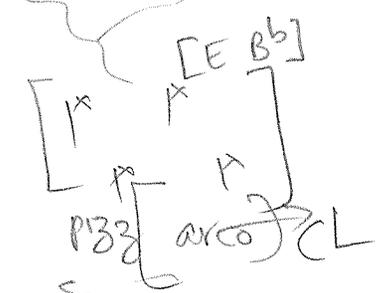
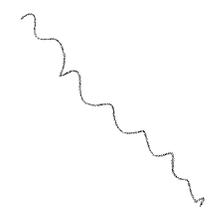
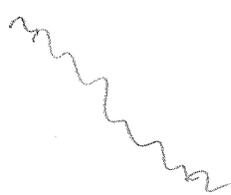
↑
↑

[scribble]
B

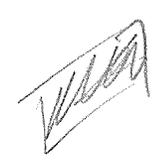
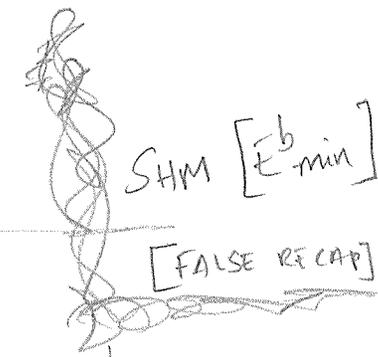
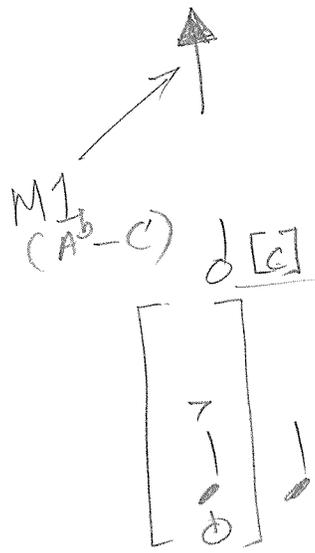
[scribble]
B

[scribble]
US1 Compressed

[scribble]
B



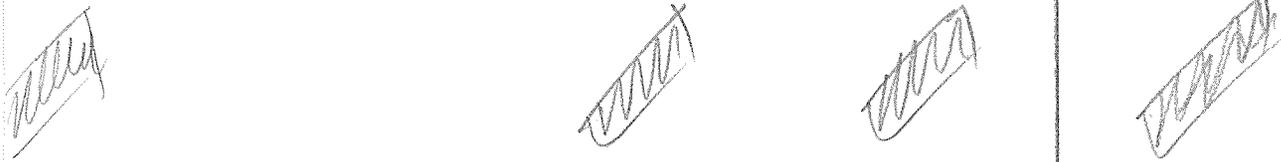
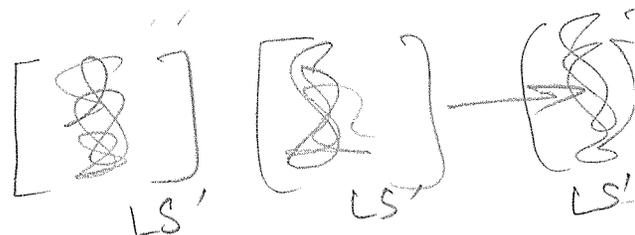
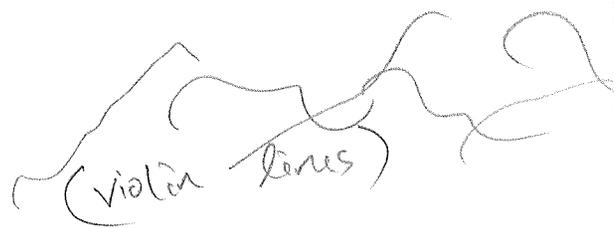
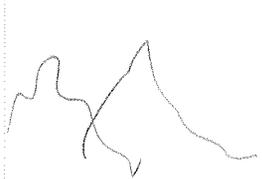
Pizz



7
o
o

J J (Eb)
o
o

B



B

⊗ (PR)
⊗
/ (percussive supplement to B)

B(PR)

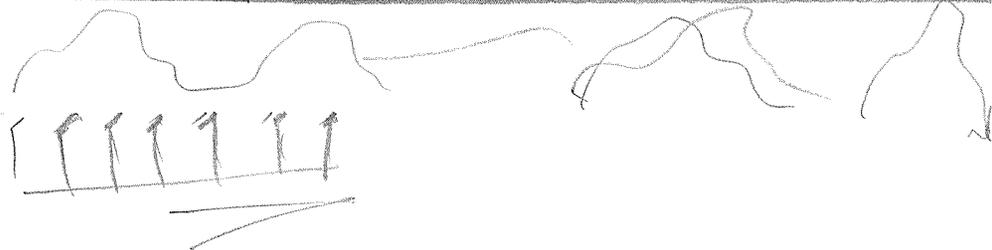
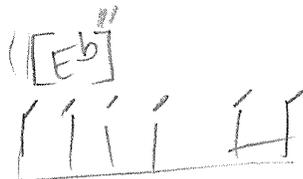
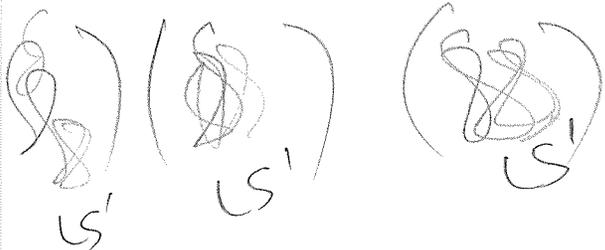
B(PR)

WB

WB

B(PR) B(PR)

WB



[GOLDEN MEAN]



[Grain spillover]

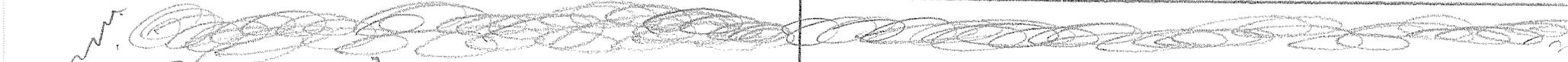


PR B(PR) B(PR) B(PR)

WB

B(PR) B(PR) PR B(PR) B

WB



(in ascend)

[long grains]

LS'

LS'

LS'

LS'

LS'



P[B^b]

cluster

fff

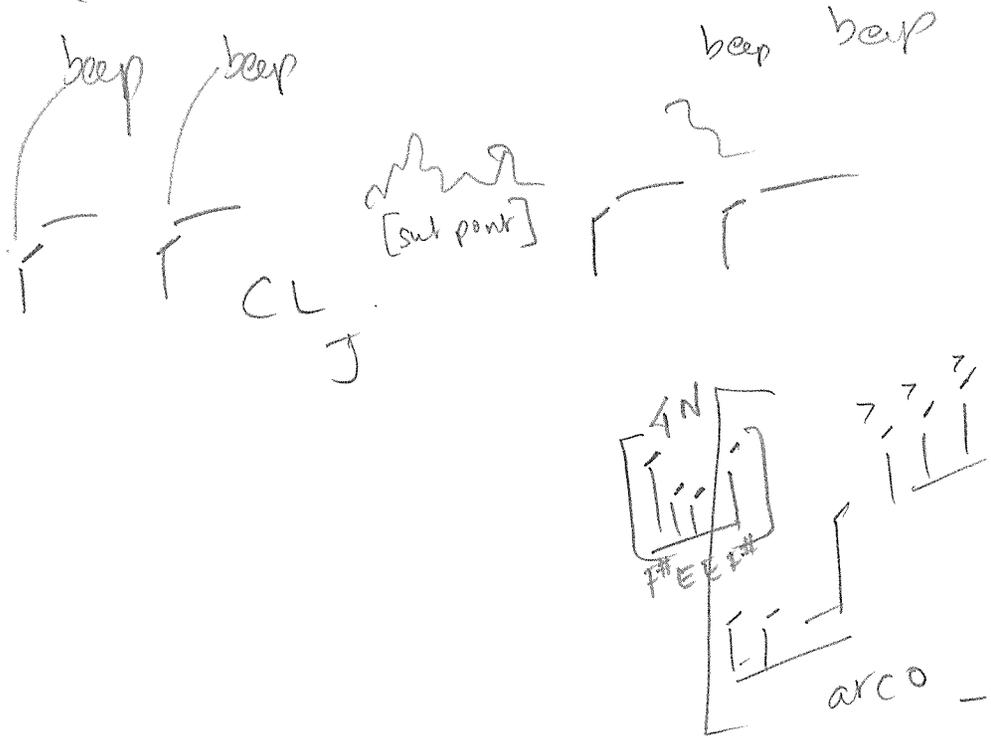
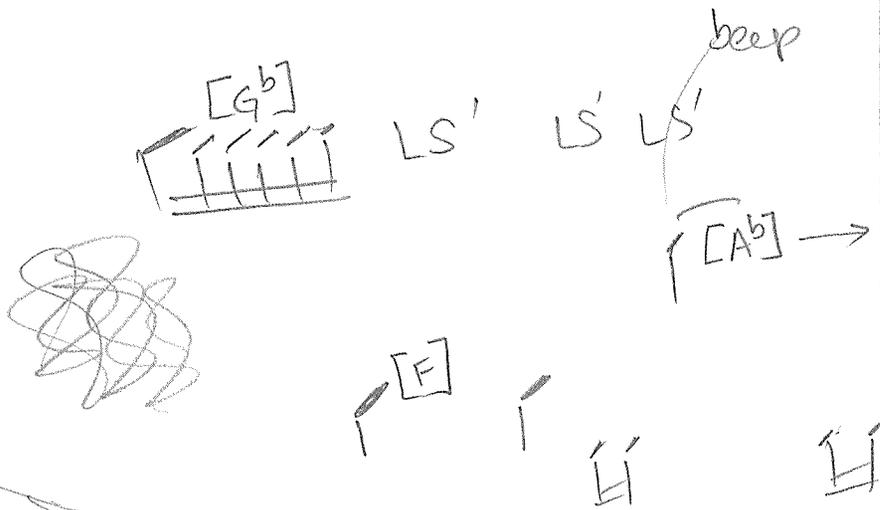
PR



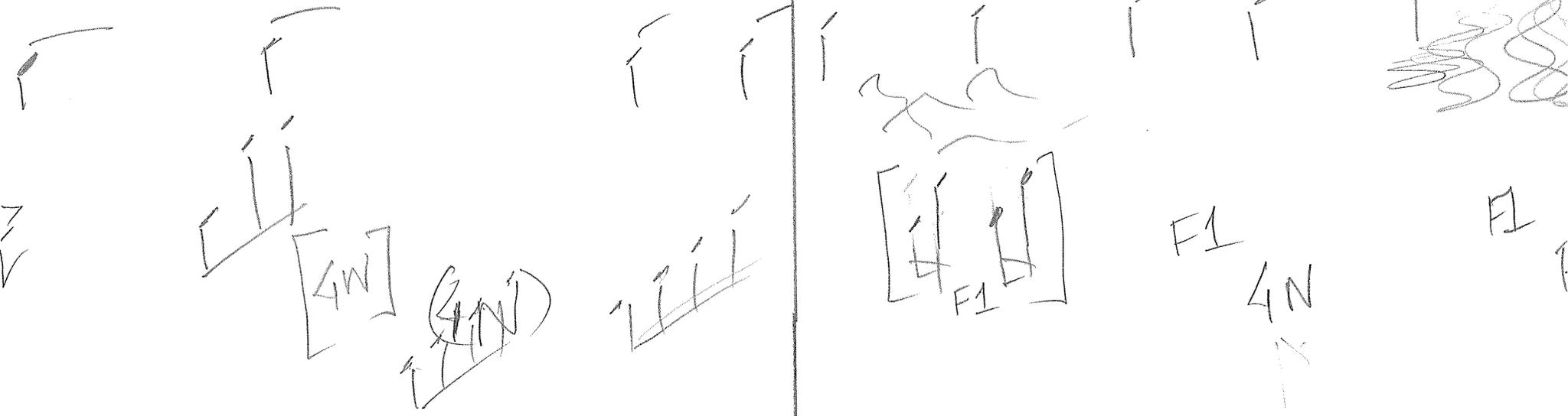
SECTION 5:10 VII

5:1

~~scribbled text~~



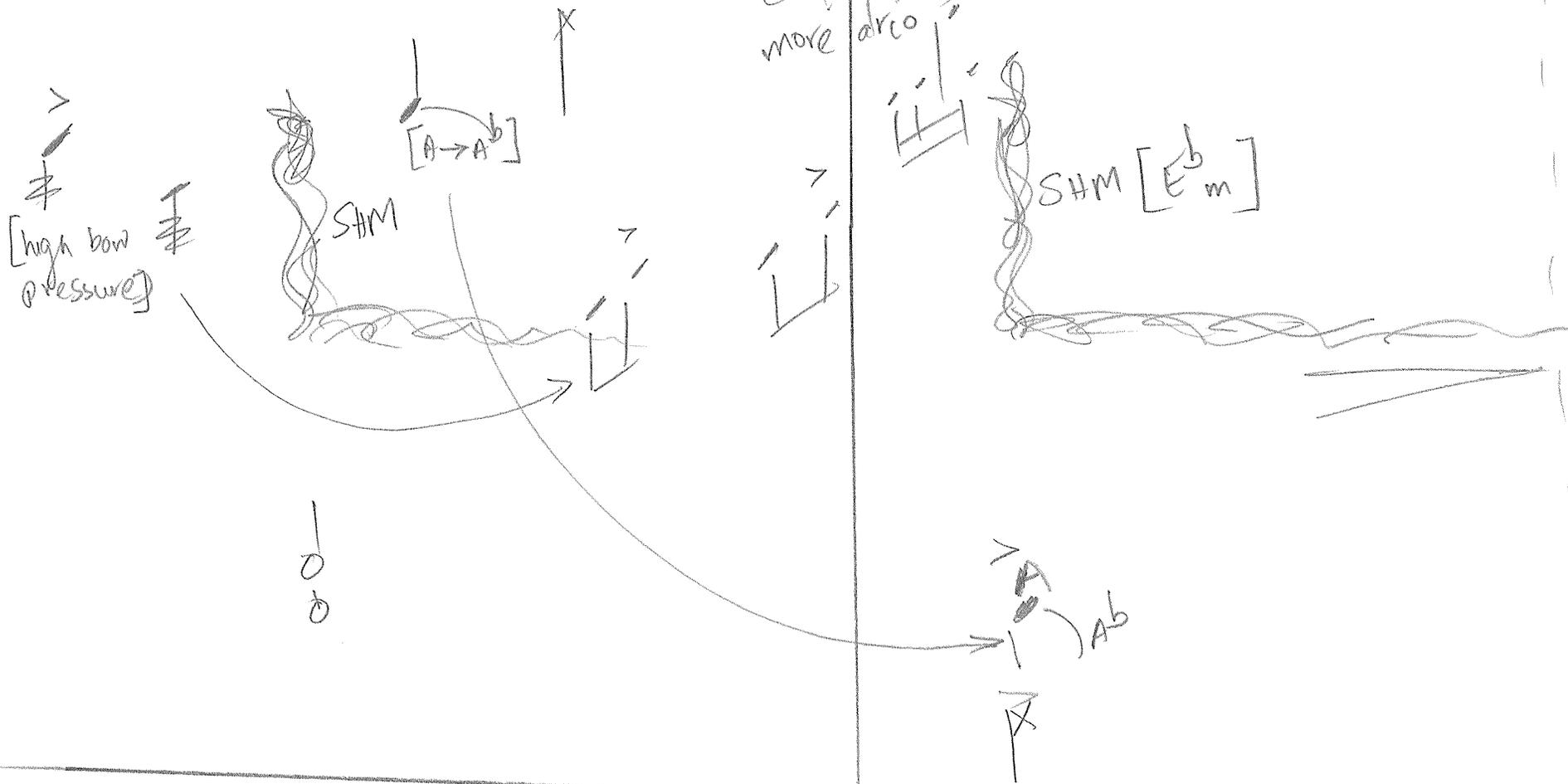
beep beep beep beep beep beep beep beep beep

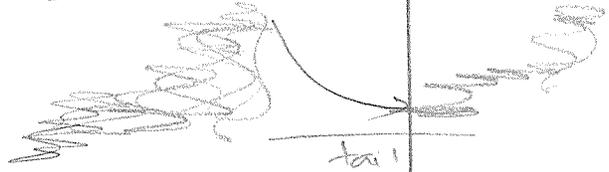


J

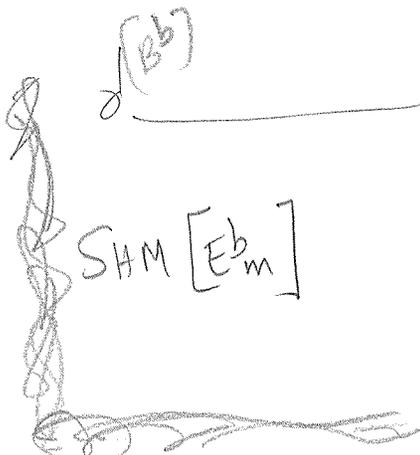
~~... ..~~

beep beep



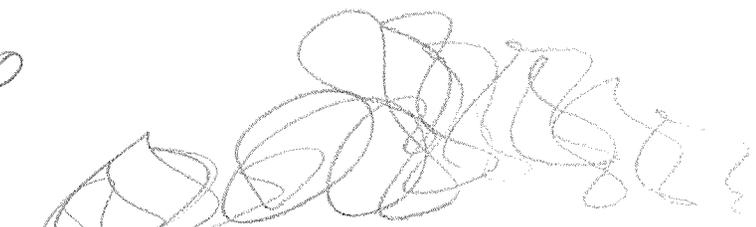


J



M1 [A-B] [D^b]

G^b



BASS RUMBLE

RECAP + 6:40 CODA



F F

(John line)

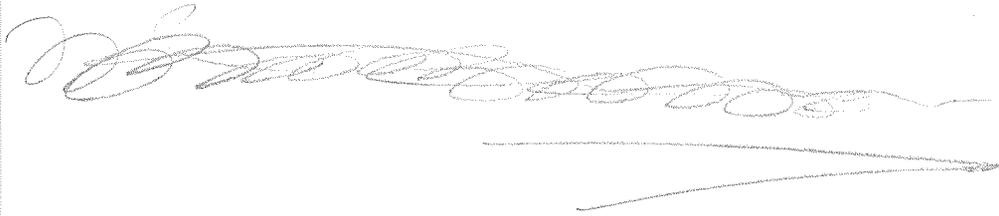
J

arco

arco

ppp
xy
(+L+)

x ↑



1:00
CODA

↑