UNIVERSITY OF CALIFORNIA SAN DIEGO

Exploring Imaginary Landscapes:
A Practice of Brushstroke and Soundscape in Compositions

A dissertation submitted in partial satisfaction of the
requirements for the degree Doctor of Philosophy

in

Music

by

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The Dissertation of Yi-hsien Chen is approved, and is acceptable in quality and Form for publication on microfilm and electronically.

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TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

LIST OF SUPPLEMENTAL RECORDINGS

Recording 1
***Sparking* (2020)**
Premiered by Palimpsest Ensemble
Conducted by Aleck Karis
Sound recorded by UCSD Department of Music

Recording 2
***Ocean Reverberation* (2020)**
Electronic: Yi-hsien Chen
Sound recorded by UCSD Department of Music

Recording 3
***Maci Lumah* (2020)**
Premiered by National Taiwan Symphony Orchestra
Conducted by Ye, De-Zheng
Sound recorded by National Taiwan Symphony Orchestra

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ABSTRACT OF THE DISSERTATION

Exploring Imaginary Landscapes:
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by

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Professor Lei Liang, Chair

This dissertation focuses on two aspects that deeply rooted in my compositional thinking. The first idea discusses the artistic quality of brushstroke and its musical equivalence in compositions. In ink painting and calligraphy, a single line consists of a series of complicated movement carefully controlled by the calligrapher, forming a rich layering in one brush. In my observation, the phenomenon of multi-dimensionality in a line is similar to the texture of

heterophony where we experience the multiple layers of simultaneous variation organized by the movement of a primary line. With the experience of calligraphy, it expands my interest of ink painting to the larger acoustic world of soundscape.

The first chapter includes the analysis of brushstroke and two compositions of Lei Liang and Chou Wen-chung that employ the techniques of ink painting. I also discuss my work, *Sparking*, for twelve instruments, to introduce how I discover the characteristics of heterophony in brushstroke, and how calligraphy relates to my musical experience of *Nanguan*.

The second chapter introduces the theoretical background of soundscape and its practice in my composition. In Murray Schafer's research, he categorizes various environmental sounds as keynote, soundmark, and signal, etc., based on their individuality, numerousness, and domination, in a physical space to provide an insight about how we perceive and interpret them, such as semantically, functionally, culturally, and historically. In this chapter, I take Schafer's work as the theoretical basis to demonstrate my use of the environmental sounds in my electroacoustic composition, *Ocean Reverberation*.

With the experience of brushstroke and soundscape, the third chapter focuses on my orchestra piece, *Maci Lumah*, in which I combine these two aspects to form my imaginary landscapes.

The last chapter concludes with the overview of my musical journey focusing on the philosophical question about line proposed by Chou Wen-chung and the artistic response about my compositional thinking in general.

INTRODUCTION

Following Chou Wen-chung (1923-2019) and Lei Liang (1972-), who are known as a composer of calligraphy, the artistic quality of brushstroke deeply inspires my compositions and my way of viewing the sound. One important element in calligraphy is its multi-dimensionality in one brushstroke. Both Chou and Liang have discovered its musical potentials and established their compositional languages to respond to this inspiration. In the first chapter, I analyze selected examples from two works, *Cursive* (1963), and *Brush-Stroke* (2004), composed by Chou and Liang respectively, to examine the practice of brushstroke in music. In the second part of this chapter, I discuss my work, *Sparking* (2020), to demonstrate how a single brush could be viewed as the texture of heterophony, or a line as organized otherness, and how calligraphy relates to my experience of *Nanguan* (南管, literally meaning Southern Pipe).

The second chapter focuses on the study of soundscape and its illumination on our compositional thinking. The theoretical concept of soundscape will be discussed based on Murray Schafer's (1933-) methodology. Following his idea, I analyze my soundscape composition, *Ocean Reverberation* (2020), to present how I cooperate the soundscape study of oceanic ecology with my compositional process. This part provides an entirely different view of environmental sound and its role in composition.

The analysis of my orchestra piece, *Maci Lumah* (2021), will be the major discussion in the third chapter. With the experience of soundscape study and calligraphy, this piece presents a broader viewpoint about the multi-dimensionality of the line in sound. In the conclusion, I provide a brief overview of my musical journey focusing on how calligraphy and soundscape transformed my compositional thinking.

Chapter 1: Chinese Calligraphy and Music

Chinese calligraphy is considered as the cultural foundation for a wide variety of art forms in Asia. The unique beauty of calligraphy lies in the sophisticated collaboration between ink and brush. When an experienced scholar views a line, he or she is able to observe its multi-dimensionality through its density and linear trajectory. The explanation of this multi-dimensionality could be found in Chiang Yee's (1903-1977) *Chinese Calligraphy* (1973) as the tradition of "Method of Three Folds:" a brush technique comprised of a series of three movement, "*Dun*" (頓, meaning crouch), "*Ti*" (提, meaning raise), and "*Dun*."[1] As shown in Figure 1, it seems that this horizontal line is formed by the primary direction from left to right. Yet, the execution of brushstroke in this stroke is not simply unidirectional. In "Method of Three Folds," before the brush initiates the rightward main line, a slight left turn with pressure has to be made to prepare and strengthen the beginning part. This is the first "fold" called "*Dun*." The second "fold," "*Ti*," indicates the rightward main line where the brush is raised slightly to move a little faster. The last "fold," "*Dun*" is used again to wrap up the entire movement, making a solid ending for this line. "Method of Three Folds" has been referred as the most basic technique of calligraphy.

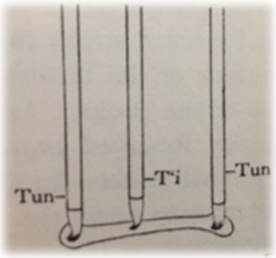

Figure 1 Method of Three Folds

[1] Chiang Yee. *Chinese Calligraphy: an Introduction to Its Aesthetic and Technique*. Cambridge, Mass.: Harvard University Press, p. 147, 1973.

1.1 The Multi-Dimensionality of Line and Its Practice in Sound

In the movement of brushstroke, some composers can perceive its rhythmic pulsation or timbral variety and treat it as materials for compositions. There are some elements shared by both music and calligraphy, so we could find some works inspired by this idea. For example, *The Points* for solo pipa (1991), composed by Chinese composer, Chen Yi (1953 -), presented the idea of the eight gestures of brushstroke in the Chinese character "*Yong*" (永). The other composer, such as Jia, Daqun (1955 -), composed *The Three Images from Ink-Wash Painting* (2005), for chamber orchestra, to depict the finer nuances of Chinese ink-painting focusing on three different techniques of ink-painting – "*Gong Bi*" (工筆, meaning the technique of highly detailed brushstroke), "*Jin Ran*" (浸染, meaning the technique of delicate dip-dye images), and "*Po Mo*" (潑墨, meaning the technique of splashed ink). [2]

Historically, Chou Wen-chung was the first composer who employs the technique of calligraphy in music. His understanding of multi-dimensionality in one line could be found in his probing question that he loved to challenge his students: "When is a line not a line?"[3] His thought of incorporating the theory of calligraphy in composition was elaborated in his letter to Yayoi Uno Everett. In this letter, Chou demonstrated the idea of his pitch theory, variable mode, and how each modal scale functioned as a stroke in music.[4] Obviously, Chou's persistent pursuit of calligraphic sound has widely influenced many composers in his following generations. Lei Liang, considered as a composer who inherited Chou's spirit, developed a highly individual technique, one-note polyphony, which opened up new possibilities of combing with the materials of calligraphy and

[2] Liner note to *Chamber Works* by Jia, Daqun, Franklin, Tennessee: Naxos Regular CD (2015).
[3] Fonseca-Wollheim, Corinna da. "Chou Wen-Chung, Composer and Calligrapher in Sound." *The New York Times*, 19 Oct. 2019.
[4] Chou, Wen-chung, Excerpts from a letter to Yayoi Uno Everett regarding Chinese calligraphy, 2006.

ink-painting.[5] Although the music of Chou and Liang were different, they both explored the idea of multi-dimensionality in a line and its practice in sound. In this part, I focus on this idea through the analysis of the works composed by Chou and Liang.

Cursive for flute and piano was composed by Chou at the suggestion of the flutist, Harvey Sollberger (1938-), and the pianist and composer, Charles Wuorinen (1938-2020), who gave its world premiere at McMillin Theater, New York City. According to Chou, he specified the musical quality in cursive style:[6]

> Cursive refers to type of script in which the joined strokes and rounded angles result in expressive and contrasting curves and loops. The cursive script represents the essence in the art of Chinese calligraphy as its expressiveness depends solely upon the spontaneous but controlled flow of ink which, through the brush-stroke, projects not only fluid lines in interaction but also density, texture, and poise. These qualities, translated into musical terms, are often found in the music for wind and string instruments of the East. In this score, the cursive concept has influenced the use of specified but indefinite pitches and rhythm, regulated but variable tempo and dynamics, as well as various timbres possible on the two instruments.

This observation made through the lens of composer's eyes and ears is original. One important characteristic of cursive style that Chou pointed out is the simultaneous interaction between spontaneous and controlled elements. The following Figure 2 shows the character of cursive style, *Mo* (墨, meaning ink), from *Autobiography* by Huai-Su (737-799). [7] Compared with the original *Mo* shown next to the Figure 2, Huai-Su created an eruptive and expressive curve while maintaining the general framework, making this character identifiable in the context. As we see, the strokes in the original character are merged together to form a huge line with Huai-Su's spontaneous and controlled movement of brush. In Chou's *Cursive*, the collaboration between

[5] Ban, Lixia. "The Compositional Technique and Artistic Characteristic in Sonic Brush of Lei Liang." *Chinese Music*, Vol. 3, 2016.
[6] Chou, Wen-chung, "preface to *Cursive*." C. F. Peters Corporation, 1963.
[7] Huai-Su, a calligrapher and monk of *Tang* dynasty (618-907), was known for his wild cursive style.

these two contrasting concepts could be found in the interplay of timbre, pitch, and rhythm. Although Chou himself never specified that Huai-Su's wild cursive was his compositional inspiration, I found that his calligraphy was a great example to demonstrate some salient features in Chou's music.

Figure 2 *Mo* in cursive style

At measure 50-72, Chou used variable tempo, but with a specified gradation of the speed change and dynamic variation, to combine with pitch progression and the extended techniques (See Figure 3).

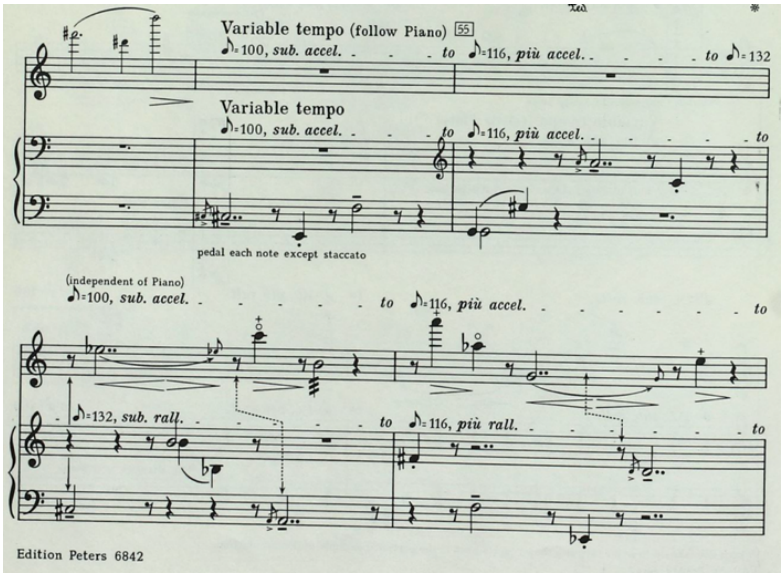

Figure 3 *Cursive*, measure 54-57

In Figure 3, we see that the pitch movement outlines a clear framework of the calligraphic line, while the tempo is varied between the range of ♪ = 100 and ♪ = 132. The timbral variety produced by the extended techniques of piano and flute is like the ink layering of the brushstroke. As a calligrapher, Chou knew that the rhythm of the brush movement was never done in a metrical way. We could also find how Huang Binhong (1865-1955), a Chinese ink-painter and calligrapher, commented the execution of brushstroke. He referred to the execution of brushstroke as following five principles: 1. *Ping* (平, smooth) 2. *Yuan* (圓, rounded) 3. *Liu* (留, remaining) 4. *Zhong* (重, heavy) 5. *Bien* (變, change). [8] The principle of *Yuan* especially indicated the concept of tempo. He wrote:

> The stroke is always moving forward with the slight motion of turning back so that the starting point and the ending part are tightly connected and supported with each other. With calmness and attentiveness, the speed of the stroke may not be too rush or too slow.[9]

In his comment, "not too rush and not too slow" indicated that a calligrapher controls the speed of brush without being too fast or slow in order to make the stroke appear as natural as "water stains on a wall."[10] Thus, the rhythm of writing should be flexible so as to adjust the flow of ink. With this idea, Chou's *Cursive* is a persuasive example that successfully demonstrates the rhythmic characteristic of brushstroke.

On the other hand, Liang's one-note polyphony seeks a different dimension to present this inner complexity of brushstroke. As he notes, the technique was inspired by the music of guqin in which one single note could be executed by a hundred ways of finger techniques. The melodic line in guqin music is not only a succession of notes but also comprised of a series of finger gestures

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[8] Huang, Binhong. *The Artistic Notes of Huang, Binhong*, edited by Nang Yu. Ho Nan: Ho Nan Fine Art Press, 1998, p. 30.

[9] The original text is : 筆有回顧，上下映帶，凝神靜慮，不疾不徐.

[10] Water stains on a wall is referred when Huang discusses "Remain." It is the metaphor that represents the highest level of calligraphy.

in various directions, which, at this point, is similar to the line of calligraphy. [11] Liang is interested in creating and resynthesizing the timbres based on the single note through instrumental colors to explore and challenge our perception of the changes and transformations in one sound. [12] While guqin serves as a strong reference to one-note polyphony, he also views this technique as a brush and brush-hairs. The concept of "one-note" is similar to the brush held by the calligrapher who controls its movement and pressure. When the brush moves, the ink in brush-hairs spreads spontaneously on the paper where we see its layering. This part corresponds to the idea of "polyphony." [13] So, the brush itself serves as the controlled material, which is the pitch as he refers, and the brush-hairs is like the timbres with variable characteristics (See the following Figure 4). [14]

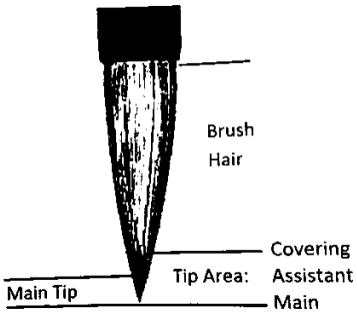

Figure 4 Diagram of Brush

Liang's *Brush-Stroke* was commissioned by Stephen Drury (1955-) and the Callithumpian Consort who gave its world premiere at the New England Conservatory of Music's Enchanted Circle Concert Series in 2005. As Yayoi writes, this piece might be inspired by two styles of calligraphy– slender gold of emperor Hui-Zong of Song (1082-1135) and the wild cursive style of

[11] Ye, Ming Mei. *The Musical Art of Guqin*. Taiwan: The Commercial Press in Taiwan, 1992.
[12] Lei Liang, "Some Vital Experiences and an Artistic Statement," *People's Music*, Vol. 585, 2012.
[13] This idea is provided by Liang in the interview, 2019.
[14] Wen Xing, *Hiding The Tip – Gateway to Chinese Calligraphy*, p. 12.

Huai-Su.[15] The title of the piece is separated by a slash to indicate two different sections – "*Brush*" and "*Stroke*," which respectively stand for these two styles of calligraphy.

In my observation, the first part, *Brush*, serves to provide the best experience of one-note polyphony since it depicts the style of slender gold through refined transformation of timbre in slow tempo. Slender gold is characterized by its thin but sturdy stroke. This name originates from the idea that it looks like the gold filament. In this style, the tip of the brush and the movement "*Dun*" are directly exposed at the starting and turning point of the stroke, making the ink appear dark and dense. On the other hand, "*Ti*," in the middle of the stroke, might be raised too high so that the ink hardly penetrates the paper and appears pale. The following Figure 5 shows the character of slender gold, *Dong* (冬, meaning Winter), from Hui-Zong's *Thousand-Character Essay*.[16]

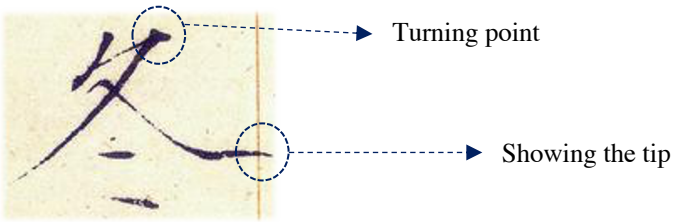

Figure 5 *Dong* in slender gold style

How does Liang interpret such sophisticated movement of brush through one-note polyphony? At mm. 2-4, the note, F, has gone through several times of timbral transformation (See Figure 6a). At m.2, the F is performed by the oboe, marimba, and vibraphone in the same register. As we could see, the tremolo of marimba and the short attack of vibraphone may serve to enhance the starting point of the F line. At the middle point, m. 3, the oboe is gently took over by the clarinet and flute.

[15] Yayoi, Uno Everett, Liner Notes to *Brushstroke* by Lei Liang, New York: Mode Records (2009).
[16] Chinese Calligraphy, translated and edited by Wang Youfen (New Heaven: Yale University Press, 2008).

And this is the moment when the composer starts layering the pitch F using violins and viola (See the reduction of Figure 6b).

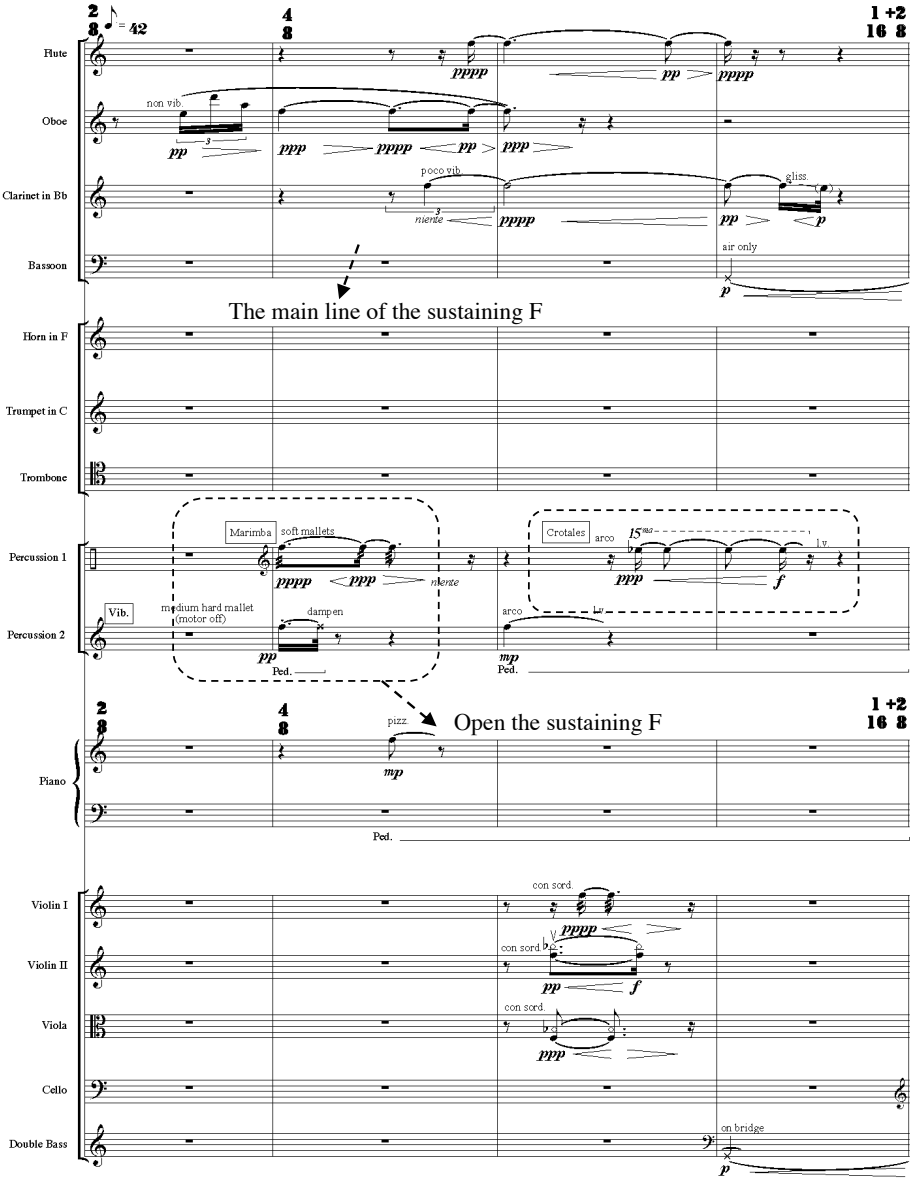

Figure 6 (a) *Brush-Stroke*, mm. 1-4

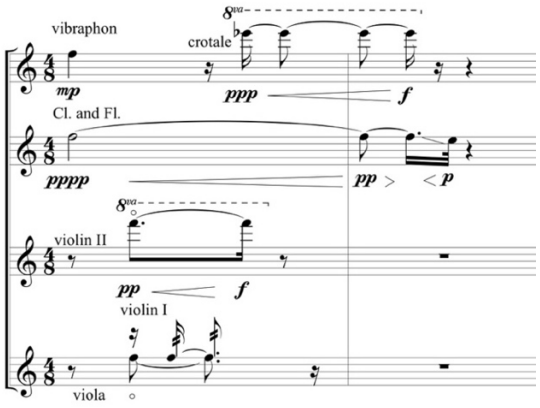

Figure6 (b) *Brush-Stroke*, score reduction, mm. 3-4

Following with the bright color of the crotale, the calligraphic line, sustaining F, is finally finished with the short glissando-gesture of the clarinet. Because the flow of pitch in the first phrase is very static, the melodic figure of the oboe at the m. 1 is relatively active. The soft attack of vibraphone and the tremolo of marimba at m. 2 further emphasize this quality, which seems to be analogous to the turning point in the style of slender gold. In addition, the high Eb of crotale, produced by bowing technique, seems like part of the F because it is the 7th partial in the overtone series of f_6. At this point, this technique highlights the 7th harmonic partial of the f6. It is as if Liang intentionally exposes this harmonic partial to make it stand out from the harmonic spectrum of f6. I observe that this idea greatly resembles the exposure of the tip of the brushstroke in slender gold style. Figure 7 shows the comparison between the character, *Dong*, in slender gold style and *Brush-Stroke* at mm. 1-4.

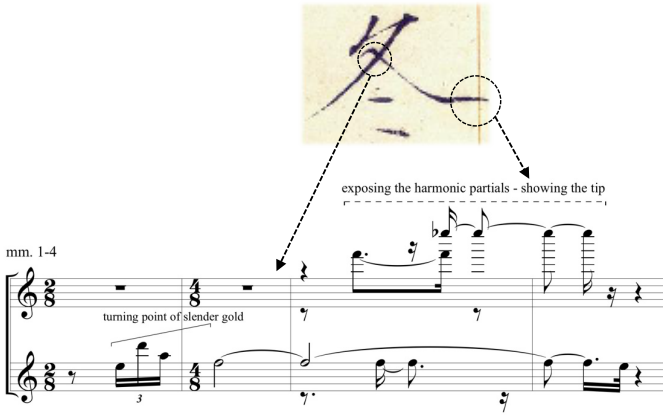

Figure 7 Slender gold style at mm. 1-4

1.2 Heterophony: A Line as Organized Otherness

Both Chou and Liang are the compositional heroes who greatly inspire me to pursue my calligraphic sound. What they reveal to us, is not simply the compositional tool but a crossing medium experience. They capture this inner beauty perceived by hearing and vision based on the aesthetic of Chinese art. Even a listener who might be unfamiliar with Chinese calligraphy is able to appreciate the unique quality they created in their music.

While they have established the compositional approaches through focusing on pitch theory, timbral development, or the interaction between controlled and variable elements, etc., I am particularly interested in the interplay of various smaller lines combined in one brush, which I found it surprisingly similar to the texture of heterophony. One of my favorite discussion of heterophony could be found in *The Wellsprings of Music* written by Curt Sachs (1881-1959), he writes as follows:[17]

[17] Curt Sachs, *The Wellsprings of Music*, edited by Jaap Kunst, The Hague: M. Nijhoff, 1962.

> Heterophony, derived from the Greek word *héteros*, different, is a vague and noncommittal expression. It covers, or should cover, all possible types of otherness in voice cooperation, between the opposite extremes of unison and of invertible counterpoint; it should designate the slightest deviation from a tolerably accurate unison as well as a Bachian quadruple fugue – they all are 'other-sounding.'

As he points out, the essential idea in heterophony is that how otherness (or different elements), are organized and cooperated together. The multi-dimensionality in a calligraphic line, in my observation, is as Sachs discussed that all different elements are carefully manipulated and organized by the primary linear force, which is produced by calligrapher's brush, to form a heterophonic cooperation. With this idea, I view the multi-dimensionality of the brushstroke as "a line as organized otherness." The example of heterophony in brushstroke could be found in Huai-Su's *Autobiography* (See following Figure 8).

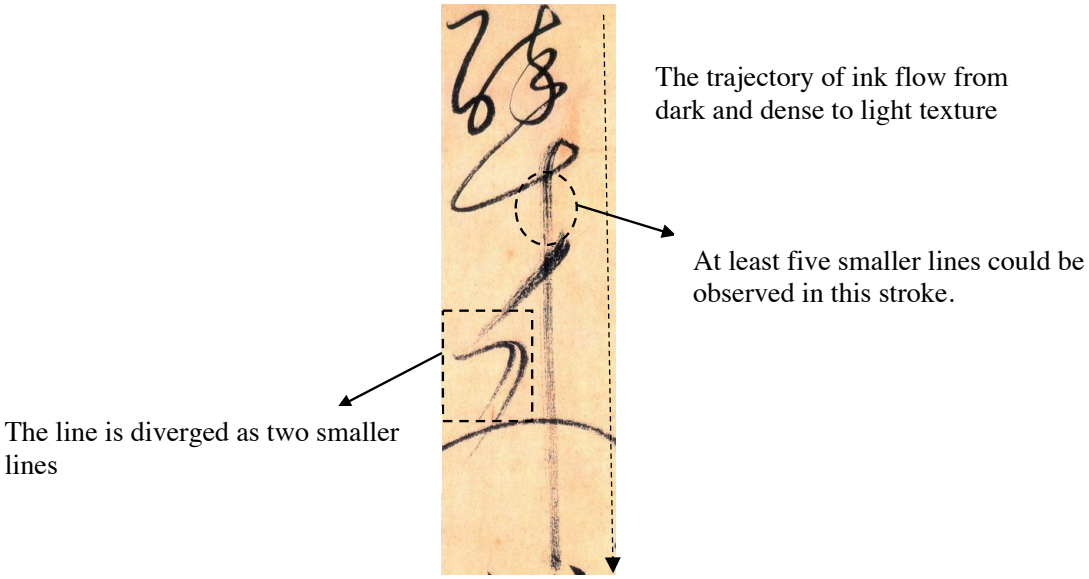

Figure 8 *Autobiography*, Huai-Su, Tang dynasty, AD. 777.

In Figure 8, the long vertical stroke consists of many smaller and thin lines since the ink in brush-hairs almost dries out, making the stroke disperse as multiple lines. Sometimes, the brush moving on the paper with specific angles may cause the line to diverge. (The curve in the lower

left is the example.) When we view the calligraphy in Figure 8, there is a beautiful trajectory of ink flow starting with dark ink at the first character and gradually down to pale ink with multiple lines as it approaches to the end of the stroke. All this transformation is done without previous draft under Huai-Su's magical control. It makes me feel that this is like the music evolving from monophony to the line of heterophonic texture where all small lines and elements are like different voices moving in an organized way.

My idea of organized otherness is inspired by the concept of "organized sound" by the composer, Edgard Varèse (1883-1965), in which he treats timbre, texture, and sonic space as separated dimensions to manipulate and create "a movement of sound-masses."[18] Apparently, we find the inheritance of Varèse in Chou's philosophical thinking about brushstroke in music as he writes:[19]

> Line, mass, and their interaction, together with such elements as articulation, duration, intensity, and timbre, are organized into an integrated body of sound that ebbs and flows – in the manner of a tonal brushstroke in space – with ever-changing motion, tension, texture, and sonority.

The idea of "different elements are organized into an integrated body of sound that ebbs and flows" reminds us of "a movement of sound-masses" and "organized sound" proposed by Varèse. Hence, following Varèse and Chou, I think the idea of a line as organized otherness could demonstrate the beauty of calligraphic line. In this part, I focus on some selected examples of my piece to present two inspirations – heterophony in one line and *Nanguan* singing.

Sparking, composed in 2020 for twelve instruments, was commissioned by Aleck Karis who conducted and gave the premiere in Conrad Prebys Concert Hall in 2020. This piece presents my observation of heterophony in brushstroke.

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[18] Edgard Varèse, "The Liberation of Sound," *Perspectives of New Music* Vol. 5, No. 1, 1966, pp. 11-19.
[19] Chou, Wen-chung, "Towards a Re-Merger in Music," *Contemporary Composers on Contemporary Music*, 1978.

This inspiration of viewing the brushstroke in heterophonic way is also associated with my experience of listening to *Nanguan*, a Chinese traditional ensemble comprised of one female vocalist and five to ten male instrumentalists.[20] According to Chui-Kuan, Lu (1952-), *Nanguan* originated in the Yellow River area of China during the third century and was performed in the rituals and the national events.[21] It was later introduced to Taiwan in the early eighteenth century and became a musical genre mostly for self-cultivation.[22] In Taiwan, *Nanguan* was classified as one of the highest musical forms that could only be appreciated and played by the elites of the high social class.[23]

In *Nanguan*, what really interests me is its singing part. For me, it echoes with the idea of "one-line heterophony" in Huai-Su's work. Traditionally, the vocalist sings the lyric, in *Minnan* dialect, in a manner that over emphasizes the vocal gesture of syllable in order to enhance the dramatic expression of the narrative content. If we look at the spectrum of its singing and compare it with Huai-Su's calligraphy, we find that the way the spectrum varies is similar to the ink flow in Figure 8 (See the Figure 10).

[20] There are five performers served as the fixed members of *Nanguan* ensemble: pipa, bamboo flute, vocalist, three-strings plucked instrument, two-string bowed fiddle, and percussion. The instrumentation is adjustable based on the need of rituals.
[21] Lu, Chui-Kuan, *Music from the Long Distance*. Taiwan: Ministry of Cultural Center, 2013.
[22] Wang, Yin-fen. "Lessons from the Past: *Nanguan/Nanyin* and the Preservation of Intangible Cultural Heritage in Taiwan." *Music as Intangible Cultural Heritage: Policy, Ideology, and Practice in the Preservation of East Asian Traditions*. *SOAS Musicology Series*, 161-80, 2012.
[23] In 2009, *Nanguan* was included in the "Representative List of the Intangible Cultural Heritage of Humanity" by United Nations Educational, Scientific and Cultural Organization.

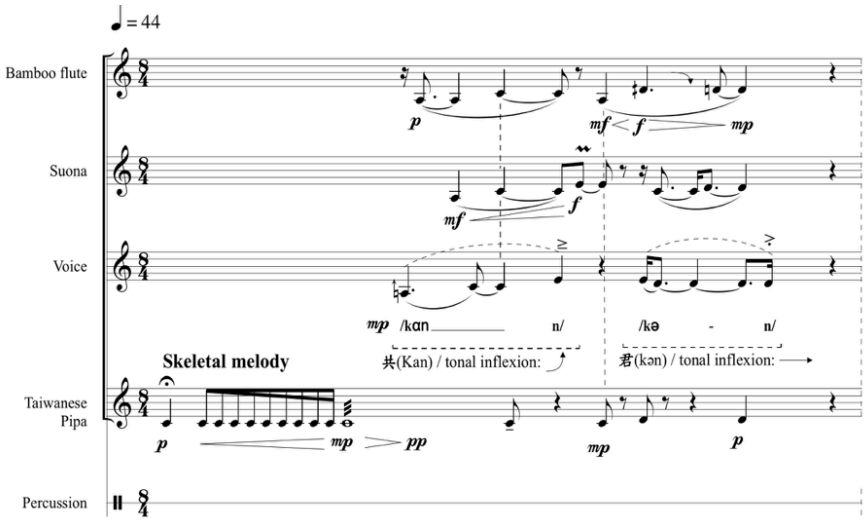


Figure 9 *Let Us Promise* for a vocalist, suona, bamboo flute, pipa, and percussion[24]

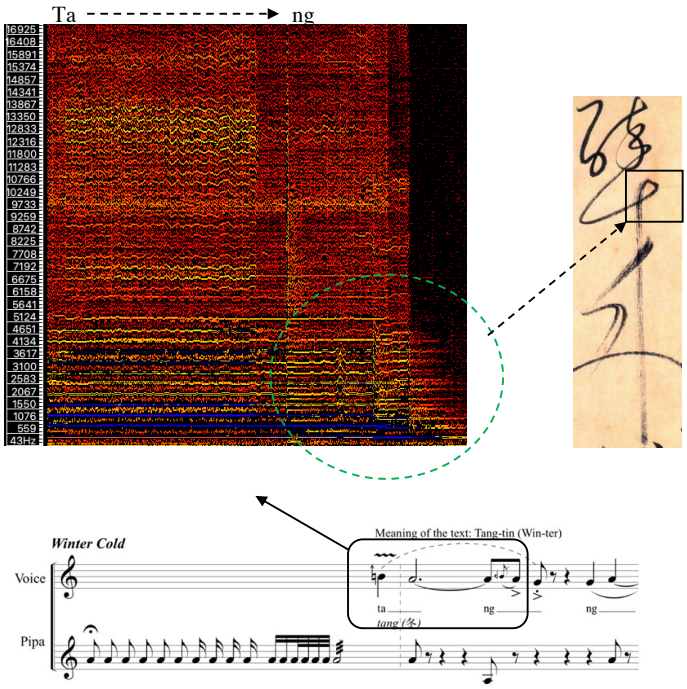


Figure 10 Spectral analysis of *Winter Cold* of *Nanguan* singing part[25]

[24] Tsai Hsiao-Yüeh (蔡小月). *Ballades chantées par Tsai Hsiao-Yüeh*. Paris: Distribution, Harmonia Mundi, 1993.
[25] The spectral analysis is done through software, Sonic Visualizer. The recording for the analysis is based on the recording of Tsai Hsiao-Yüeh.

The spectral analysis of the singing is the word, *Tang* (冬, meaning winter in *Minnan* dialect), from a piece called *Winter Cold*. The vocalist emphasizes each syllable of the word, and a word could be usually subdivided as two or three syllables. In this case, *Tang* is comprised of two syllables: "*Ta*" and "*ng*" (The latter is a nasal sound). As shown in Figure 10, "*Ta*" is an open vowel sound that produces a bright sonority with rich harmonic spectrum, whereas the nasality of "*ng*" filters most higher partials above the bin frequency of 5297-5340 Hertz. This is the reason that we could perceive such clear timbral transformation in *Tang* from a rich sound to the one with muffled quality, which is like the ink flow I discuss in Huai-Su's example in Figure 8. With the experience of calligraphy, listening to *Nanguan* gives me the impression that each syllable and word is like a brushstroke. This is, undoubtfully, a new mode of listening that I acquired after a long time of immersing myself in the sonic world created by Chou and Liang.

In *Sparking*, I choose four syllables from *Winter Cold* as the compositional materials to represent four different strokes in calligraphy. In order to make full use of them, I analyzed each syllable's sonic quality and its calligraphic characteristic (See Table 1). The use of these syllables in my piece does not serve to provide any semantic meaning or narrative content other than pure acoustic materials. What I want to do is to let my audience listen to the transformation and gesticulation of the sound itself. Any attempt to interpret these materials through extramusical ideas might only impede one to perceive and enjoy this work.

Table 1

Syllable	Sonic Quality	Stability	Type of Stroke
***Tee* (Sky)**	Thin and smooth in long duration	Very stable	"*Ti*" technique in the "Method of Three Folds."
***Tang* (Winter)** (*Ta - - ng*)	Heavy and with strong nasality in the end	Stable	"*Tang*" is featured by its ending nasality, which is similar to the ink flow as I refer in Figure 5.
***Kwuah* (Cold)** (*Kwu - - ah*)	Expanding and open gesture in long duration (See Figure 11)	Unstable	"*Kwuah*" is similar to the stroke with the ending part especially emphasized without the pressure.
Tu	Solid attack in a short duration	Stable	"*Dun*" technique in the "Method of Three Folds."

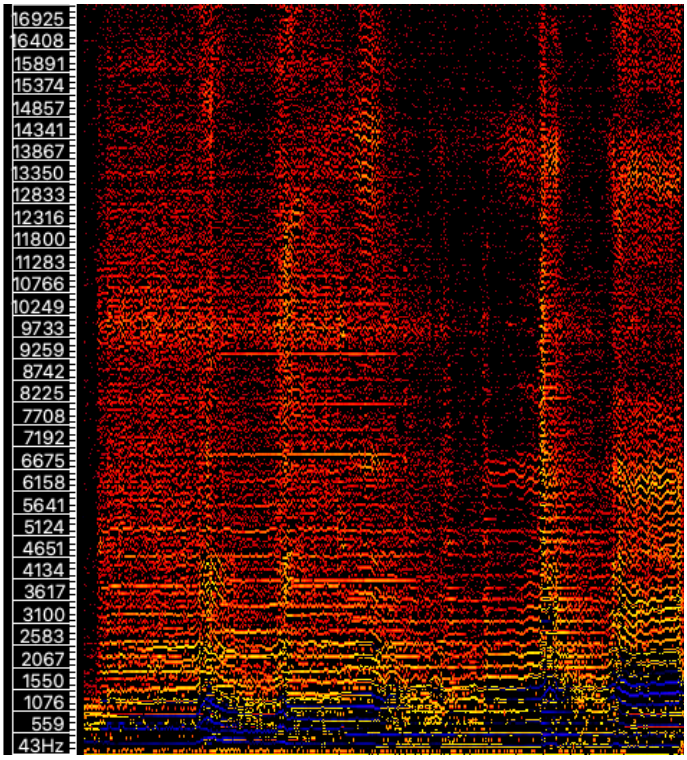


Figure 11 The Spectral Analysis of Syllable, *Kwuah*

I bring two selected examples from *Sparking* to introduce my approach of transforming the syllables into the instrumental sound. The first section of the piece, mm. 1-51, is based on a single melody. I treat it as one big brush. Each timbre and its variations in this line, is like the ink in brush-hairs that flows and expands to produce a wide variety of ink transformation. The big line is like the primary linear force of brush controlled by the calligrapher. So, the entire section presents a line as organized otherness. The following Figure 12 shows the first section in reduction score.

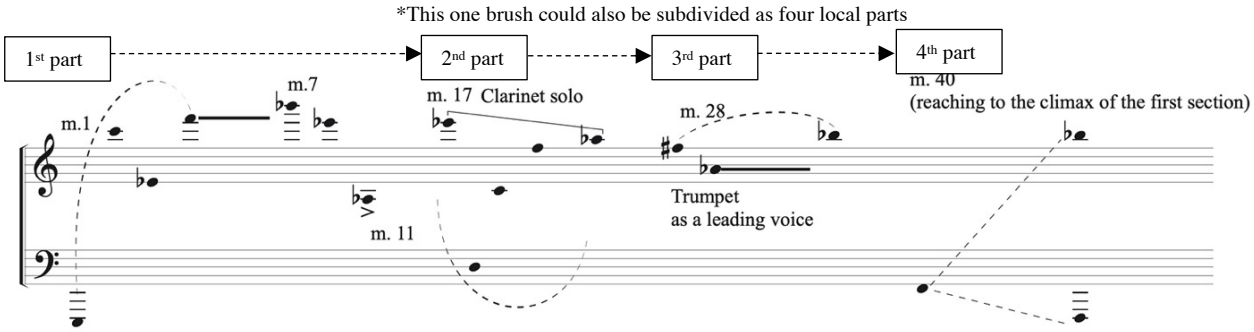
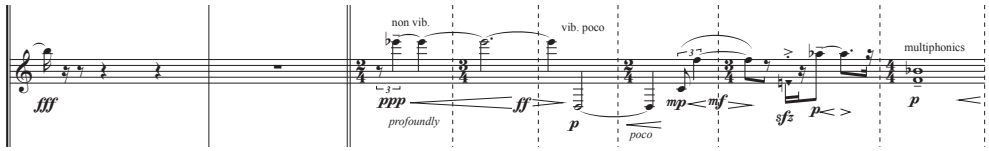


Figure 12 *Sparking*, one big brush, mm.1-40

The thought of this big brush was to challenge myself about how long the brush could sustain that might still be perceived as a complete line, and I ended up creating a three-minute-long brush which almost reached my threshold of perception.[26] About the use of syllable, the first example is *Kwuah* (寒, meaning cold in *Minnan* dialect), at mm. 17-24. It begins with large-leap line and proceeds to the technique of multiphonics played by the clarinet. In this part, the clarinet is layered by the harmonic glissandi of string part to echo with the spectral expansion of the "*ah*"

[26] This idea was inspired by one-line calligraphy, a technique of cursive that sequences of characters are written with a single line. Yet, the process of writing is maximized to zoom in the details of ink flow and linear movement, which is done in a way that I slow down and expand the entire line to three minutes.

of "*Kwuah*." The Figure 11 shows the spectral analysis of this syllable. The harmonic glissandi also serve to strengthen the overall growth of harmonic partials (As shown in Figure 13).



Open up the solo line through the technique of multiphonic

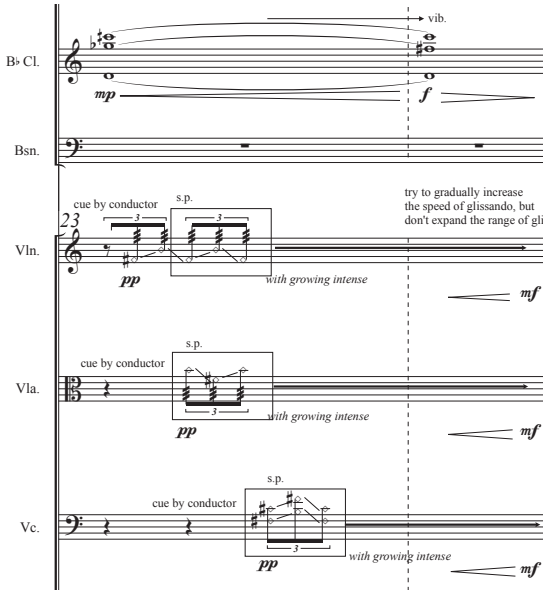


Figure 13 *Sparking*, mm. 17-24

This process also creates a heterophonic texture based on the linear interaction between violin, viola, and cello. They form a simultaneous variation based on the vibration of multiphonics. This idea is related to the heterophony of brushstroke I observe in Huai-Su's work. A similar case could also be found at mm. 28-38 where the heterophonic texture unfolds with the layering of the similar melodic fragments in strings, winds, and harp.

The next part comes with the example of *Tang*, a word with two syllables. As I refer above, it has a special sonic characteristic formed by two syllables – the first "*Ta*" with open vowel, the

second "*ng*" of nasal sound. *Tang* first appears at mm. 49-52. It is the climax where the dynamic, rhythmic activity, and the textural complexity are built up. This climax represents two ideas – the rich spectrum of the syllable "*Ta*," and the dark and dense layering of ink. What follows after this dynamic peak is the intense subharmonic sonority created by the vertical bowing of cello and double bass. This technique refers to my imagination that the ink almost dries out and cannot penetrate the paper anymore after the previous climax, yet the force of brush still continues. It also represents the quality of nasal sound of "*ng*," which is greatly similar to this way of ink flow.

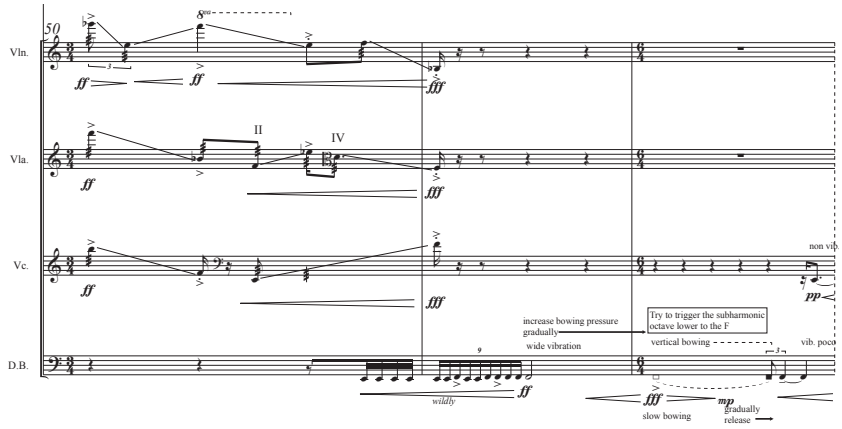


Figure 14 *Sparking*, mm. 50-52

The challenge of working on calligraphic sound always came from the struggle that how I could find my distinctive voice without laboring in the shadows of Chou and Liang, who are internationally recognized as the composer of calligraphy.[27] Thus, I searched for other sonic materials that potentially resonated with the idea of multi-dimensionality, trying to expand my compositional tools to establish my musical language. *Nanguan* singing, in this case, was one of

[27] Fonseca-Wollheim, Corinna da. "Chou Wen-Chung, Composer and Calligrapher in Sound." *The New York Times*, 19 Oct. 2019.

my answers that I found its melodic line was not just a line, but a line organized by emotional depth, expression, and timbral variety.

Needlessly to say, the attempt on adopting the technique of *Nanguan* singing in composition is common among Taiwanese composers. Pan Shyhji (1957 -), a composer and formal student of Chou, created a piece, *Clouds Flying High* (2013), for Chinese dizi, sheng, pipa, violin, viola, and cello, that combined the tonal inflection and vocal gesture to establish the texture of heterophony.[28] This piece influenced me a lot while working on *Sparking*. In Figure 15,[29] Pan transformed the descending inflection of the word of *Minnan* dialect into short glissandi of strings and two descending lines, in 16th notes of quintuplet or sextuplet, played by dizi and pipa. This example has multiple streams with different speeds. In the comparison between dizi, pipa and strings, it seems to me that the two descending lines are the variation of strings' glissandi, as if she uses these scale materials to emphasize the gradational movement of the glissandi and makes dizi and pipa sound slower. Thus, I observe that the idea of descending line serves as the primary line, leading the streams of dizi and pipa to form a heterophonic texture. In *Clouds Flying High*, Pan was good at creating this temporal and timbral stratification centered around the main vocal gesture of *Nanguan* singing.

[28] Interview with Pan, 2018.
[29] Pan Shyhji, *Clouds Flying High*, 2013.

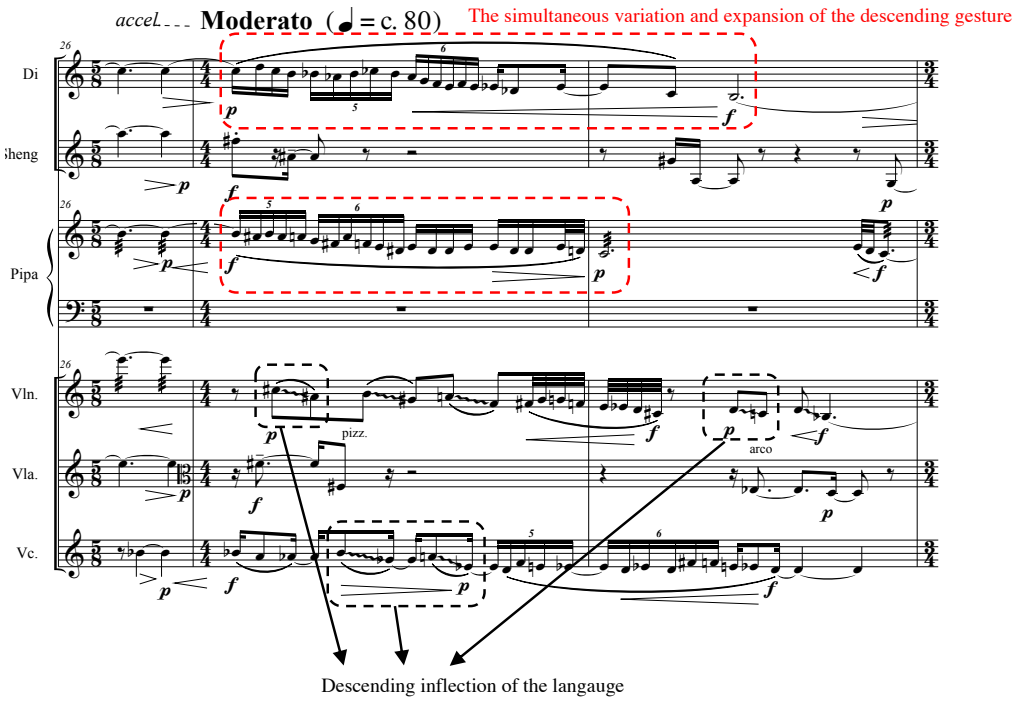


Figure 15 *Clouds Flying High*, mm. 26-28

Chapter 2: Environmental Sound and my Electroacoustic Composition

During these years, the study of calligraphy and its practice in music encourages me to pursue more diverse manifestation of sound through experimenting with unusual instrumental techniques and the environmental sounds. While composing *Sparking*, I was aware that the understanding of the physical property in *Nanguan* singing is made possible only through the assistance of technology. Of course, my experience of performing *Nanguan* music might also play part of it, but it is the spectral analysis that assists me for better understanding and finding a precise instrumental color to orchestrate the sound of syllable I used to compose. In this chapter, I discuss the concept of soundscape proposed by Murray Schafer and the use environmental sound in my composition.

2.1 Complex Sound

During the twentieth century, the development of the tools for analyzing sounds, such as recording technology, spectral analysis, and sonograms, played a crucial role in advancing our understanding of sound and encouraging more composers to search a wide variety of sonic materials. Following with Luigi Russolo's (1885-1947) manifesto, *The Art of Noise* (1913),[30] we witnessed a growing interest in the study of noise among Western composers at that time (which is still an on-going trend today), and some of them, including Russolo, addressed an imperative need of searching for new kinds of instruments that could reach beyond the capability of the traditional instruments. In my observation, this might mainly come from people's dissatisfaction of the long domination by Western traditional notation which seemed to over-simplify the entire

[30] Russolo, Luigi. "The Art of Noise: futurist manifesto 1913." New York: Something Else Press, 1967.

universe of sound and limited the composers to only work on twelve pitches of equal temperament for over the past hundred years.[31] We also saw rich resources that helped composer deliver their prophetic vision with new ways of sound making. One of the pioneers at that time, Varèse, wrote about the idea of new musical apparatus in 1936:[32]

> Today with the technical means that exist and are easily adaptable, the differentiation of the various masses and different planes as well as these beams of sound, could be made discernible to the listener by means of certain acoustical arrangements. Moreover, such an acoustical arrangement would permit the delimitation of what I call "zone of intensities." These zones would be differentiated by various timbres or colors and different loudness...The role of color or timbre would be completely changed from being incidental, anecdotal, sensual, or picturesque; it would become an agent of delineation, like the different colors on a map separating different areas, and an integral part of form.
> Moreover, the new musical apparatus I envisage, able to emit sounds of any number of frequencies, will extend the limits of the lowest and highest registers, hence new organizations of the vertical resultants; chords, their arrangements, their spacings – that is, their oxygenation.

When the electronic music became accessible beginning in the mid-twentieth century,[33] many composers worked in this direction and proved the feasibility of controlling parameters of sound. For example, Karlheinz Stockhausen (1928-2007) summarized four characteristics of electronic music that he practiced in his piece, *Kontakte* (1958-1960): 1) the correlation of the coloristic, harmonic-melodic, and metric-rhythmic aspects of composition; 2) The composition and de-composition of timbres; 3) the characteristic differentiation among degrees of intensity; 4) the ordered relationships between sound and noise.[34] With these ideas, Stockhausen was able to manipulate each parameter of a sound to create strict organization of graded transition in timbre, frequency, and volume.

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[31] Tristan Murail. "The Revolution of Complex Sound," *Contemporary Music Review*, 24:2-3, pp. 121-135. 2005.
[32] Edgard Varèse, "New Instruments and New Music," *Contemporary Composers on Contemporary Music*, edited by Elliot Schwartz and Barney Childs (New York: Holt, Rinehart and Winston, Inc., 1967), pp. 197-198.
[33] Otto Deri, *Exploring Twentieth-Century Music* (New York: Holt, Rinehart and Winston, 1968), p. 137.
[34] Karlheinz Stockhausen, "The Concept of Unity in Electronic Music," *Perspectives of New Music*, 1. 1962, pp. 39-40.

On the other hand, Pierre Schaeffer (1910-1995) carved out an entirely different path focusing on the materials from environmental sounds. In *Musique Concrète*, the use of the surrounding sounds in composition enabled us to experience its musical quality. He believed that the basic unit in music was not pitch but the "sound object," or "complex note," that contained three dimensions as follows: tessitura, dynamic, and spectrum.[35] Apparently, Schaeffer broke the barrier between the musical sound and complex sound, as well as the barrier between the concert hall and the environment, encouraging many composers to reimagine the matter of sound and its artistic manifestation in composition. Tristan Murail (1947-) referred to Schaeffer's idea of "sound object" when he talked about the concept of musical atom and our perception of sound. He believed that Schaeffer's legacy was an important part of the musical revolution of the 20th century that deeply changed people's viewpoint of the sound:[36]

> The very essential idea that the musical 'atom' is not the notehead written on staff paper. The musical atom is the perceptual atom, tantamount, perhaps, to Pierre Schaeffer's 'sonic object.' It is possible as well that there is no perceptual atom, that music is indivisible, that we perceive only flux.

Murray Schafer, who also credited Schaeffer with his study on environmental sound, expanded the idea to establish a systematic methodology on the soundscape research. While Schaeffer focused on the compositional use of environmental sound, Schafer's soundscape study provided a broader study on the environmental sound, including its historical, semantic, cultural, and natural aspects. The purpose of this study is to improve the sonic environment in Vancouver. This research encouraged an interdisciplinary collaboration that musicians, acousticians, historians, psychologists, etc., worked together to figure out how to reduce unpleasant noises and preserve good sounds in our environment. This project resonated with many scholars from different fields

[35] Pierre Schaeffer, *In Search of a Concrete Music*, translated by Christine North and John Dack (Berkeley: University of California Press, 2012), p. 192.
[36] Tristan Murail, "The Revolution of Complex Sounds," pp. 121-135.

of study in environment and ecology. For example, Juju C.S. Wang, a Taiwanese sociologist and professor at National Tsing Hua University, suggested improving the design of soundscape based on Schafer's theoretical approach to enrich our aural experience of the expression of Shin-Zhu city, making the element of soundscape as an important part in constructing the city landscape.[37] For scientists, the soundscape analysis provided the opportunities for monitoring the population and communities of oceanic species in a specific area. This was especially useful for interpreting the significance that how resources partitioning among diverse species is varied during the daytime and night.[38]

In these ideas, I am personally interested in investigating sounds from Schafer's perspective. While his acoustic design truly pioneered, the methodology of his analysis on environmental sound provided me with the great tool to compose with soundscapes. For Schafer, the purpose of this research was educational. He hoped to cultivate people's ability of making distinction between various types of sounds and their association with possible meaning in order to develop good understanding about which sound we want to preserve in the environment. Based on the experience of World Soundscape Project, he created the classification of sounds based on its physical property, referential aspects, and aesthetic qualities.[39] (See the Figure 16).

Above all these detailed classifications, there is a large category of the features of soundscape proposed by Schafer, which allows one to generally categorize some sounds. I briefly summarize and quote this category from Schafer's glossary of the soundscape as follows:[40]

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[37] Juju C.S. Wang, "Soundscape's Expression in the Two-city Case: Imagination of Environmental Society," *Journal of Building and Planning National Taiwan University,* NUMBER 10, Dec. 2001, pp. 89-98.
[38] Philip A. Hastings and Ana Širović, "Soundscapes offer unique opportunities for studies of fish communities."
[39] Murray Schafer, *Our Sonic Environment and the Soundscape the Tuning of the World* (Rochester, Vermont: Destiny Books, 1994), pp. 136.
[40] Ibid., pp. 272-274.

1. Keynote sound: it is the sound or noise heard continuously from a space to form a background, which is like the ambient noise. It is often perceived unconsciously, but keynote sound serves to provide the reference for other types of sound we heard and the perception of the space.
2. Sound signal: its quality is contrasted to the keynote sound. Sound signal draws our attention and sometimes presents messages.
3. Soundmark: it is the sound that marks the feature of the community or makes people recognize where they are. This term and its use are derived from "landmark."
4. Sound event: it is a symbolic, semantic or structural object. Event is defined in dictionary as: "something that occurs in a certain place during a particular interval of time."
5. Archetype sound: the ancient, mysterious, unknown sounds.

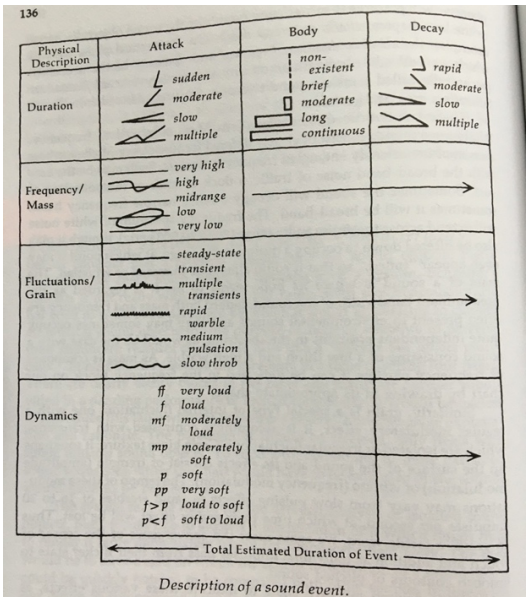


Figure 16 Murray Schafer, classification of sound based on physical property

As we can see, the general category might be derived from the concept of musical structure as we hear melody as sound signal, harmonic progression as keynote, and soundmark as style, etc. Rhythm and tempo also play an important role in soundscape analysis. Depending on what sounds we trace, there are many kinds of sounds with different rhythmic cycles occurring every day. This observation reveals many beautiful rhythmic trajectories and their interactions in a given space.

The following Figure 17 shows Schafer's recording of the rhythmic cycles of chirping frogs and birds from 6 pm to 6 am at rural site near Vancouver.[41]

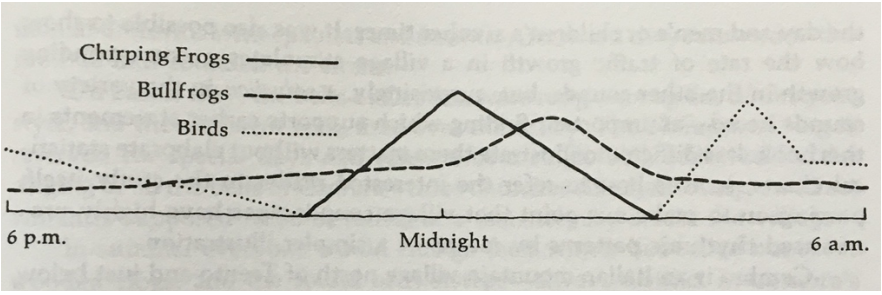


Figure 17 Murray Schafer, rhythmic cycle of natural soundscape

While Schafer never used environmental sounds in his compositions, as Barry Truax pointed out,[42] he raised our awareness of the acoustic diversity in ecology and inspired an entirely different compositional approach, which makes "Soundscape composition" different compared with those created by Schaeffer. Truax distinguished "soundscape composition" from those electronic compositions with the use of digital processing, and wrote:[43]

> The soundscape composition typically reverses the process because in a sense, the sound "uses" the composer, and ultimately the listener, in that it evokes in each wealth of difficult to verbalize images and associations, all of which guide the composition and its reception. The distinction is subtle because it involves a difference in musical process that conventional analysis of the end product (e.g, form, materials, structural organization) may not reveal.

With these fundamental features, I think the important idea in soundscape composition is to evoke listener's appreciation and understanding of the sonic ecology and to cultivate the new mode of listening (which is referred by Schafer that "listening should be musical").[44] Instead of framing

[41] Ibid., p. 231.
[42] Truax, Barry. "Soundscape, Acoustic Communication and Environmental Sound Composition," *Contemporary Music Review*, 15: 1-2, 1996, pp. 49-65.
[43] Ibid., p. 60.
[44] Murray Schafer, Our Sonic Environment and the Soundscape the Tuning of the World (Rochester, Vermont: Destiny Books, 1994), pp. 136.

the sound as a consumable product, the composers of soundscape present their selected environmental sounds with little electronic transformation, letting us "hear" a natural panorama of changing landscapes and their experience of these environments. We could actually find this equivalence in some of my favorite Chinese poems created by Wang Wei (699-759), a poet of landscape poetry in *Tang* dynasty, whose works were characterized by its simplicity and the ingenious presentation of the natural objects to evoke reader's emotive reaction to the landscapes.[45] I believe that a soundscape composition has the similar quality to inspire us to appreciate the landscapes through the artistic presentation of natural sounds.

In addition, the creator of the soundscape composition is not like the traditional composers who situate themselves at the highest position in the compositional process to control and manipulate the materials. In soundscape composition, the natural sound and composer are equally important. The way we compose with this sound (or the sound uses us, as Truax says) is based on this dynamic interaction that we are guided by the environmental sounds to compose to reveal their musical qualities. In my experience of Chinese calligraphy, we could also find this relationship between the calligrapher and rice paper. The rice paper is one of the mediums that the calligrapher uses to perform his or her artwork. The quality of rice paper, unlike the modern paper, is soft, flexible, and easy to preserve.[46] Each rice paper is made with various qualities and textures, making our painting experience different depending on the paper we choose. One factor that affects the movement of brush is the level of absorbency of the paper. Some papers with glue coating on the surface might reduce ink running, others have coarse surface that increases the possibility of ink

[45] Wang Wei, *Hiding the Universe: Poems,* translated from the Chinese by Wai-lim Yip. New York: Grossman Publishers, 1972.
[46] The rice paper is made from vegetable fibers from mulberry plants left after the silkworms eat the leaves. It is quoted from Self Caroline and Self Susan's *The Art of Chinese Brush Painting: Ink, Paper, Inspiration*. Tokyo: Rutland, Vt.: Tuttle Pub, 2009.

flow. With these different qualities, calligrapher must carefully control the speed of the brush to let ink properly penetrate the paper. This process requires us to constantly pay attention on how the paper reacts to ink absorbency and the pressure of the brush. Painting or writing on the rice paper is a dynamic interaction between the calligrapher's brush control and the reaction of the rice paper. Hence, calligraphers not only create landscapes on the rice paper, but their brushstrokes are also shaped and guided by the texture of the rice paper.

With this interactive relationship, I treat environmental sounds as the rice paper where we experience its unique texture and ever-changing nature. Through the transparent transformation and minimal edit of the sound, I borrow the environmental sound to paint an imaginary landscape to reawaken people's appreciation of the simplicity of the materials, as what I observe on rice paper and soundscape.

2.2 The Compositional Practice of Oceanic Acoustic Ecology

From 2018 to 2020, I was fortunate to participate in the seminar, Hearing Seascape, led by Lei Liang to collaborate with the scientists from Scripps Institution of Oceanography and Qualcomm Institute. In this seminar, I created a soundscape composition, *Ocean Reverberation*, based on the recordings of oceanic creatures. While this project provided the opportunity for us to develop a wide variety of collaboration, there were two particular aspects that I was interested in.

The first idea was related to the compositional use of soundscape recordings and how I responded to the data from scientist's acoustic research. The second idea, which was more personal, was inspired by the story from the scientists about their experience of snorkeling. This composition was made using the software, Audacity, and premiered simultaneously with the video of 3D model of coral reefs at California Institute for Telecommunications and Information Technology. Since

this piece does not have a score, the auxiliary materials for the following discussion are based on my graphic sketch, spectral analysis of the recordings, and the data from Scripps Institution of Oceanography. In this piece, all the oceanic recordings were generously provided by the team led by Ana Širović, a professor of Department of Marine Biology at UC San Diego. Her recording archive included diverse species of oceanic creatures, each of which were labeled with its sonic characteristics and the date of recording.

Among these materials, the sounds of the rockfish and the blue whale immediately drew my attention. Especially for the sound of rockfish, the acoustic research done by Širović provided the insight about their social behavior and distribution based on the use of passive acoustic recording.[47] (Figure 18 shows the spectral analysis of rockfish's call using Audacity. Its sonic characteristic is described as "boeing" sound by Širović.)

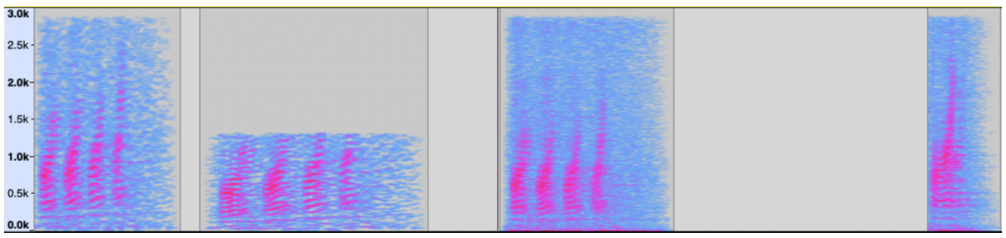
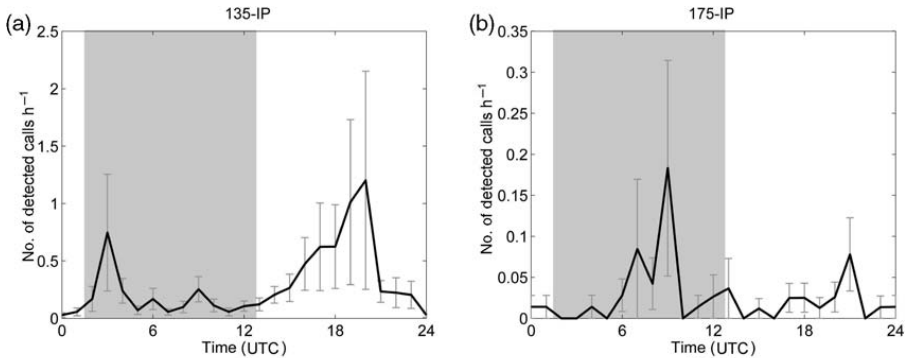


Figure 18 Spectral analysis of rockfish

One of the observations that interested me was the call rates the rockfishes made during the diel pattern. The following Figure 19 shows the results from two types of rockfish they recorded in the tank. Two peaks presented in the graphs show the times that the most active rates of call were made by rockfishes.[48]

[47] It is speculated that the rockfish makes sound for mating, foraging, and territorial defense.
[48] Ana Širović, George R. Cutter, John L. Bulter, and David A. Demer, "Rockfish sounds and their potential use for population monitoring in the Southern California Bight," ICES Journal of Marine Science, 66, 2009, pp. 981-990.



The shaded area represents the local night-time determined by United States Naval Observatory. The symbol above two graphics, 135-IP and 175-IP, indicate "individual pulses" made by rockfish. 135 and 175 mean their center frequency.

Figure 19 Acoustic pattern of rockfish

This rhythmic cycle revealed an interesting fact that different species of rockfish might be active at different time during the diel pattern, which allowed scientists to predict their community interaction.[49] At that time, I found its potentials in structuring the form of composition.

Ocean Reverberation is divided as two parts to represent daytime and the night respectively, each of which includes the sound from one of the rockfishes shown in Figure 19. The sound of rockfish in the first section is comprised of low frequency pulses with soft quality, whereas the second one is active and dense with high frequency. This way of arrangement demonstrates the possibility of designing the form of composition based on the acoustic pattern of rockfish. The following Figure 20 shows the sketch of two rockfish sounds in two sections, each of which is labeled with the day and the night.

[49] Before this research, rockfish was generally thought that they were without soniferous mechanism. It is through Širović's long-term observation that proves its highly developed system of acoustic communication.

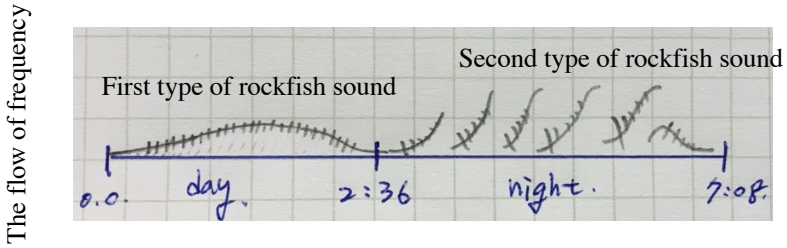


Figure 20 *Ocean Reverberation*, diel pattern and its representation in form

On the other hand, the use of recording of blue whale is based on different idea. Blue whale is the species highly relying on sound production for social communication and foraging. Its call is able to travel for very far distance in the ocean because of its low frequency and high volume.[50] In Širović's research, the frequency of blue whale call they recorded was mainly located at around 20 Hz. They used automatic detected methods to record their voices. (The following Figure 21 shows the recording of blue whale) They found that blue whale calls were active between June and January, with a peak in September.[51]

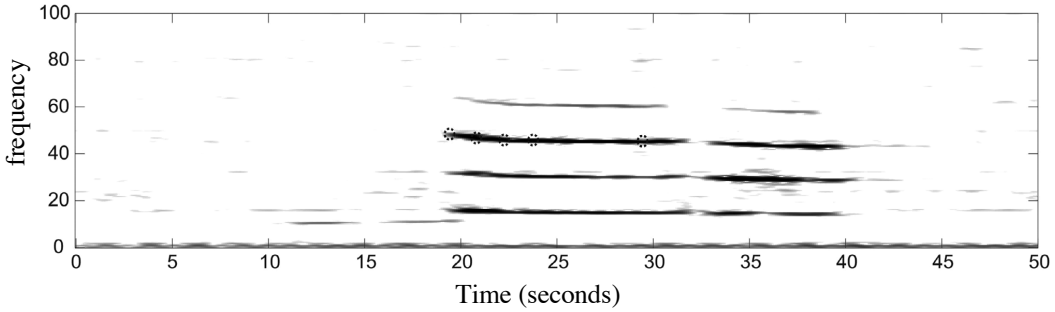


Figure 21 Spectral analysis of blue whale

With this study, I am interested in expanding the blue whale call as a long phrase that penetrates throughout the entire piece. This idea is primarily inspired by the fact that how far their

[50] Ana Širović, Ally Rice, Emily Chou, John A. Hildebrand, Sean M. Wiggins, Marie A. Roch, "Seven years of blue and fin whale call abundance in the Southern California Bight," *Endangered Species Research*, Scripps Institution of Oceanography, University of California San Diego, La Jolla, California 92093-0205, San Diego State University, San Diego, California 92182-7720, USA., Vol. 28: 61-76, 2015.
[51] Ibid., p. 63.

sounds could travel under the sea. The Figure 22 shows the sketch of blue whale call in *Ocean Reverberation*.

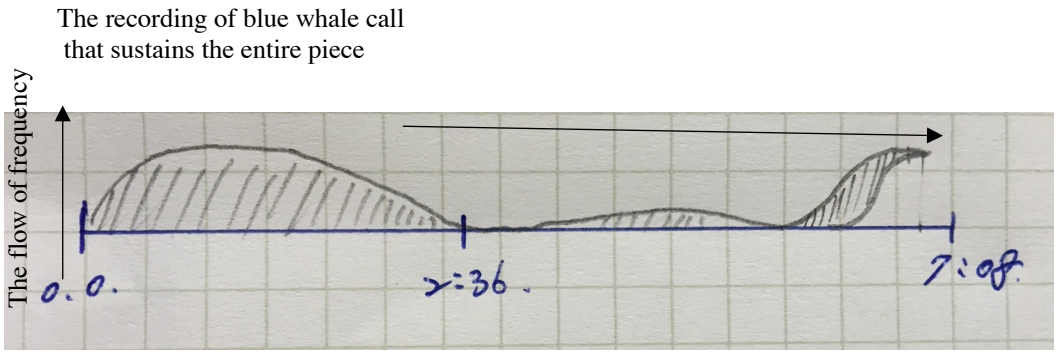


Figure 22 Blue whale sound in *Ocean Reverberation*

In the first part of the piece, the blue whale call is amplified to be the foreground sound as if we zoom in to the sound to closely observe its dynamics and energy. Following by the second part, which is where the rockfish sound with high frequency starts getting active, the blue whale call becomes softer to gradually merge with the background sound until it stands out again at the end of the piece. It is my intention to demonstrate the possibility of employing and developing the sounds of oceanic creatures based on their habitual behavior. So, the data and research paper by Širović serve as the important reference for the creative process in my composition.

The second idea about this piece was from an interesting experience shared by the scientists about how they found that all sounds were distorted and blurred due to the high pressure of deep sea when they were snorkeling. In that occasion, they realized that the seascape and its soundscape seemed to be separated as two different worlds: the one that was visible and measurable, and the other that was aurally distorted and unfathomable. In *Ocean Reverberation*, I wanted to reconstruct this underwater experience to create an imaginary landscape where listener came to feel not only physically, but also aurally.

In addition to the recordings of the rockfish and the blue whales, I included four more sonic materials in this piece. They were sounds of water flow, ocean wave, and two musical fragments borrowed from my previous works, *Dreaming Beluga* (2019) for string quartet and *KUN* (2019) for solo saxophone. To create my imaginary landscape, I organized these materials following Schafer's general category of sounds, trying to construct a virtual soundscape to make listener feel as if they were in a physical environment. Each sound was connected to one of the items in the soundscape category, such as soundmark, sound signal, keynote, etc. Yet, its category could be changed as the quality of sound was transformed either to become more individual or blurred. One example could demonstrate this idea is that I slowed down and lowered the volume of the blue whale sound, which originally appeared as a sound signal at the beginning, to make it merge with the background sound. In this way, its category was changed from sound signal to keynote. This part is analyzed using sonic visualizer in Figure 23.

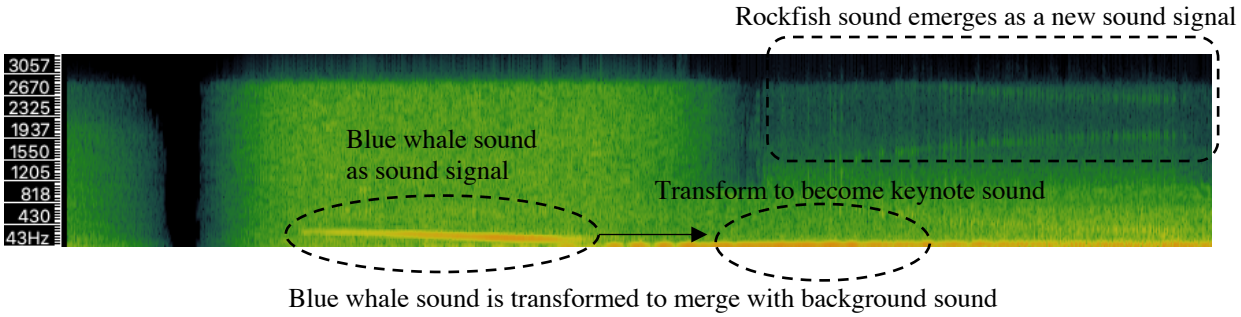


Figure 23 *Ocean Reverberation*, 1'15'' - 1'25''

Thus, this piece brings a world where the quality of the sound is constantly varying, changing our ways of perceiving these sounds. I categorize these six sounds based on Schafer's category in Table 2. Most sounds could be defined as two types of categories depending on how they develop.

Table 2

Name of sound	Description of characteristics	Category
Rockfish	Short "boeing" sound, similar to the effect of frequency modulation	Sound signal
Blue whale	Long phrase with low frequency (around 20 Hz)	Sound signal Keynote
Water flow	Bright sound with high frequency	Sound signal Keynote
Ocean Wave	Sound with low frequency, similar to the sound of blue whale	Sound signal Keynote
Dreaming Beluga (transcription of beluga whale)	Harmonic glissando, short and wave-like glissando in high register, and tremolo	Soundmark Keynote
KUN (transcription of beluga whale)	Harmonic trill in high register and long sustained pitch	Soundmark

In this piece, soundmarks are the two quotations from my previous works. The purpose of using them is to create a dynamic interaction between my voice and the environment, which is inspired by the relationship between the calligrapher and the rice paper. The Figure 24 shows the one of the quotations from *Dreaming Beluga* for string quartet, a transcription of beluga whale I did for the projects of Hearing Seascape. The Figure 25 shows the spectrogram of the part (from 3'36'' to 3'48'') where this quotation interweaves with the sounds of ocean wave and rockfish.

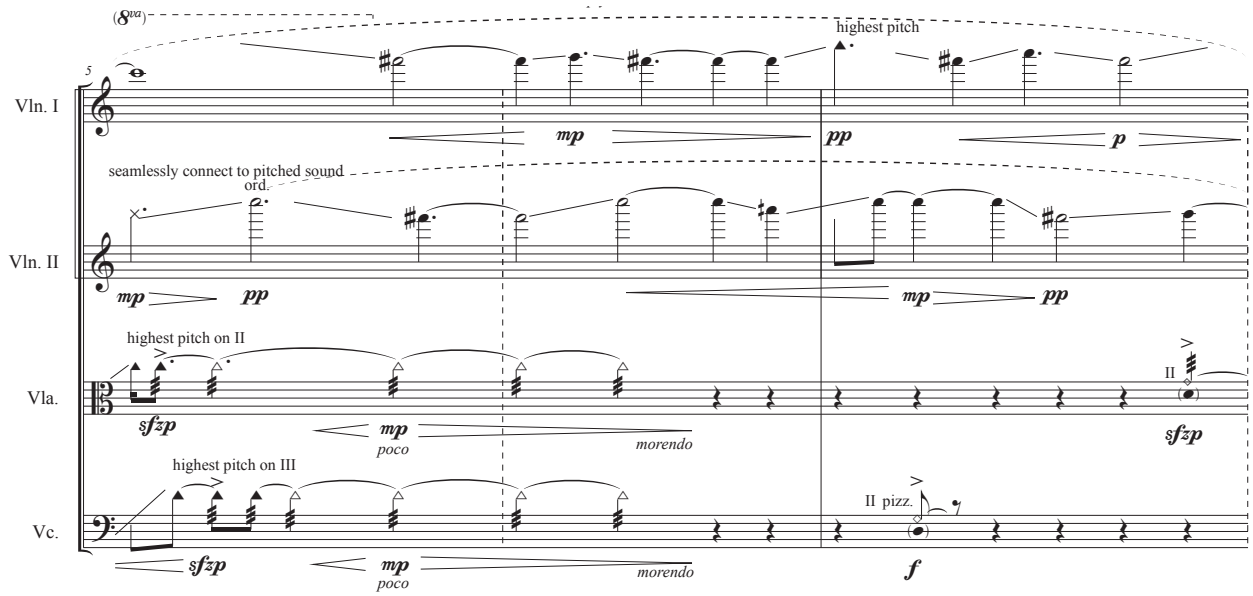


Figure 24 *Dreaming Beluga*, mm. 5-7

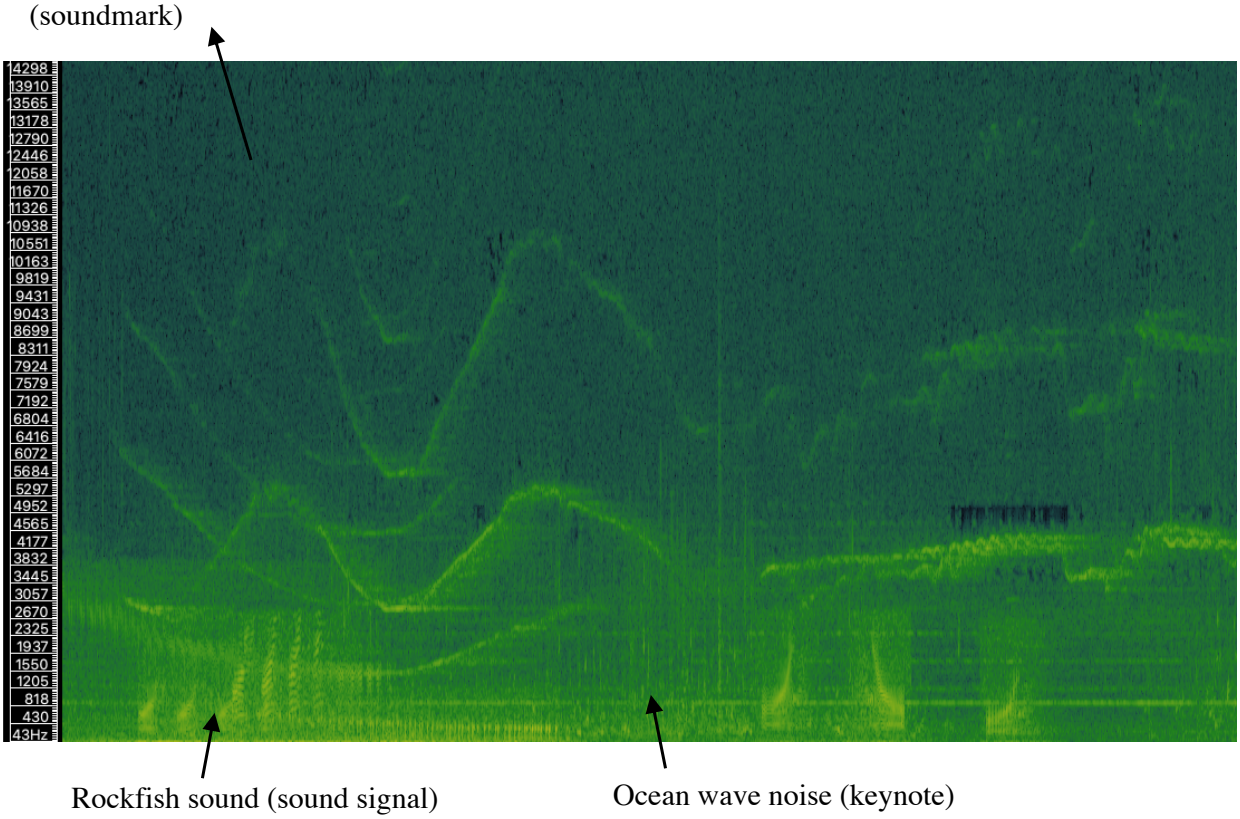


Figure 25 Spectral analysis of *Ocean Reverberation*, 3’36’’-3’48’’

Chapter 3: *Maci Lumah* for Orchestra

So far, I have discussed about how to create a complex line and soundscape texture from the perspectives of calligraphy and Schafer's approach. It seemed like a journey that we first learned drawing a line and then progressed to landscape painting with all the sonic palettes. While these two works, *Sparking* and *Ocean Reverberation*, present totally different ideas, they are centered around the main focus on how to reveal various characteristics of a sound to construct a larger sonic picture. Thus, I believe my experience from calligraphy to soundscape is not the abrupt change, but a natural development along the line of my pursuit of the multi-dimensionality of the sound.

From 2020 to 2021, I had the chance to conceive an orchestra piece, which, for me, might be a good opportunity to experiment with the idea of soundscape in a greater complexity. However, instead of building such complexity based on my previous experience of *Sparking* and *Ocean Reverberation*, I decided to multi-dimensionality in one line. Again, this idea brought me back to Chou's philosophical challenge: "When is a line not just a line?"

This piece was completed in 2020 and premiered by National Taiwan Symphony Orchestra in 2021. The title was borrowed from the name of *Bunun* song, literally meaning "*Song of Carrying Heavy Things*." *Bunun* is a Taiwanese aboriginal and is widely dispersed across central mountain area.[52] They created numerous songs based on the topics about life, the story of their ancestors, and work of harvest. One category of the most frequently performed music is called "song of labor," a type of music created to sing with each other while working together in the mountain, and "*Maci Lumah*" belongs to this type. "*Maci Lumah*" is performed when adult *Bunun* finishes his work in the mountain, he sings this song as a way to send the message telling other *Bunun* workers: it is

[52] Lu, Chui-Kwuan, *Taiwanese Traditional Music: Instrumental Music*, Taiwan: Wu Nan Tu Shu Press, 2007.

time to go home. Other people who hear the song may respond with the same melody, meaning that they have received the message.[53] In this way of performance, "*Maci Lumah*" has a beautiful heterophony that we hear many similar melodic lines echoing with each other in a mountain. Each voice is different in its timbre, tempo, and the distance.

In 2020, when I was hiking in a mountain where a large population of *Bunun* was located, I happened to hear this song from far away. There was a female voice coming from one side of the mountain and the same melodic response of a male voice approaching to us from the other side. When more and more echoes emerged from different directions, all melodies gradually merged together to form a large heterophonic texture. There was an impressive moment when the human voice got softer and vanished, which seemed to merge to be part of the natural soundscape. The process that the song merged with the soundscape shifted my focus from the song itself to the beautiful scene of the mountain. At this point, I felt that my aural and visual perception temporarily blended together, creating a sensation that I felt the landscape through listening to this song; and I experienced the song through viewing the landscape. Figure 26a shows part of my transcription of "*Maci Lumah*" based on the recording of *Bunun Lileh* Chorus.[54]

[53] *Lileh Bunun* chorus, *The Sound of Unyielded Lives: Traditional Music of the Bunun Tribe*, liner notes for "*Maci Lumah*" by Sani, Taiwan IFPI LT027, 2013, compact disc.
[54]*Lileh Bunun* chorus, *The Sound of Unyielded Lives: Traditional Music of the Bunun Tribe*, with vocalists Tiang, Langus, Biling, Tanivu, Pihu, Taiwan IFPI LT027, 2013, compact disc.

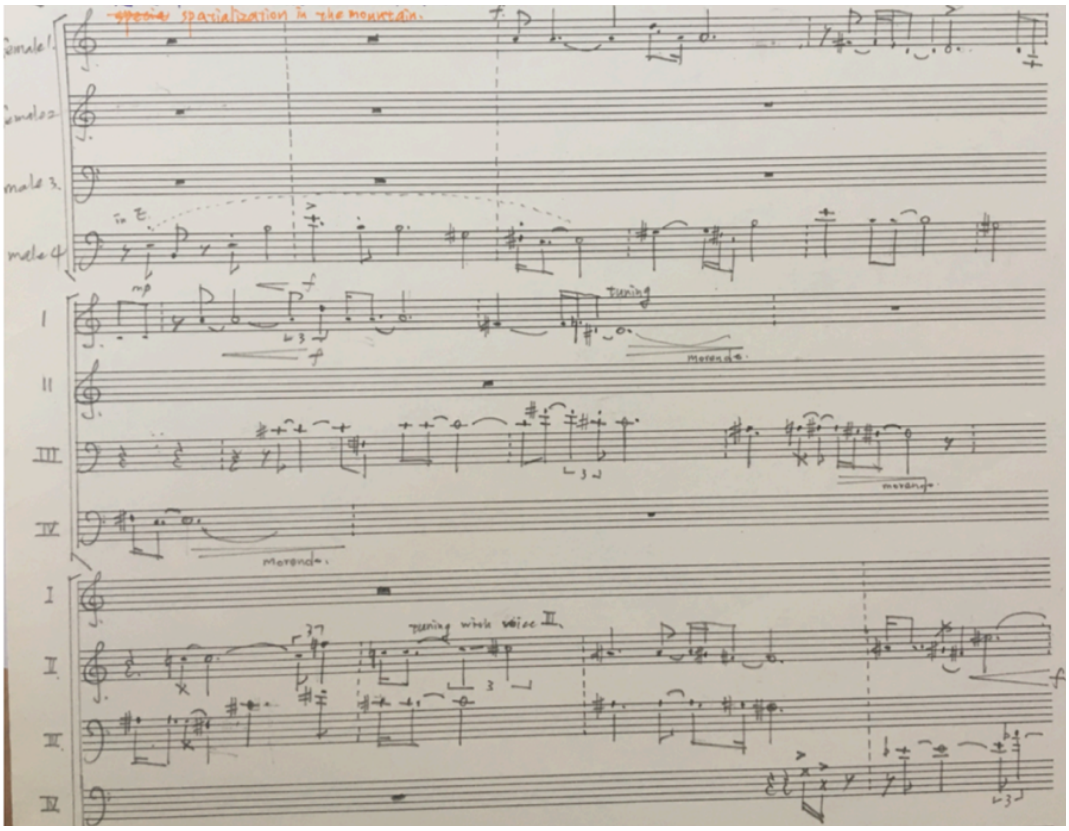


Figure 26 (a) "*Maci Lumah*," transcription in Western notation

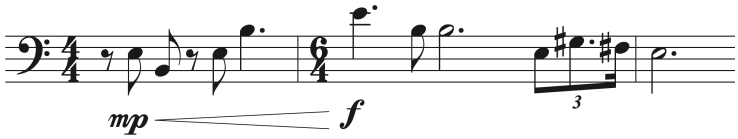


Figure 26 (b) "*Maci Lumah*," pith material of the phrase

As we see in Figure 26a, the song is based on the melodic line repeated with slight variations in each voice. Sometimes the singers transpose the melody lower or higher to fit their vocal ranges. Figure 26b shows this core melodic line of the song.

In the following section, I focus on several parts of the orchestra piece to discuss about my personal experience of "*Maci Lumah*." There are two aspects as follows: 1) the spatial

characteristics of "*Maci Lumah*," 2) the interaction of song and soundscape. As I mention above, this song is performed by a group of people locating at different places. With my experience, I summarize three different distances from which I perceive this song: a) the song that is too far away that we hardly identify its melodic contour; b) the song in a distance that we can still identify its flow of melodic line, rhythm, and the timbre; c) the song that is so close to make us immerse in the color of their voices. These three distances enable me to reveal multifaceted sides of this song in my orchestra piece, as if we can zoom in and out of it, making its spatial characteristics possible to be perceived by the audience. Taking the second distance as example, I expand the melodic contour of the song from the original vocal range to a wide pitch register of the orchestra. In this way, I could use various instrumental colors to orchestrate the human voice of different distances (See the following Figure 27a and b).

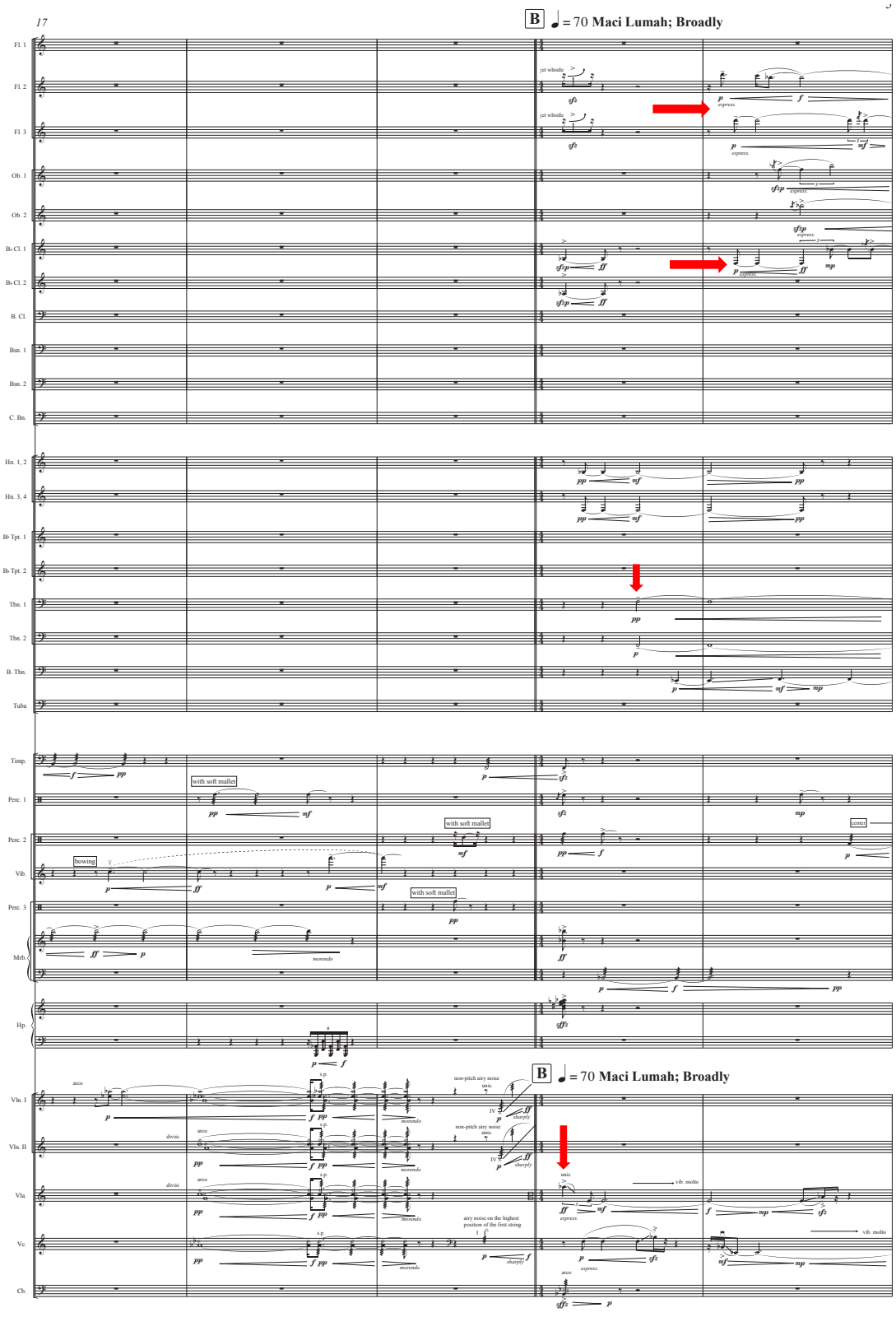


Figure 27 (a) *Maci Lumah*, mm. 20-21

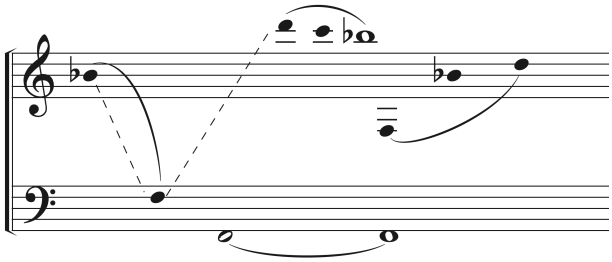


Figure 27 (b) the score reduction of the pitch distribution in different registers

For the next level of distance, I felt that the song sounded from too far away was acoustically like the effect of harmonic glissando played by string part. With this idea, I created an interaction between the harmonic glissando and the song to establish a heterophonic texture. This interaction could be found in the Figure 28.

The third type of the distance is presented at an abstract way. At mm. 44-75, we no longer hear the melodic contour of the original song, but the sonority comprised of the complex interaction of multiple rhythmic pulsations. The purpose here is to guide the audience to focus on the flow of its inner waves as if someone immerses in the song. It reveals a micro world hidden inside the color of the song (See Figure 29).

All three types of the distances presented in this piece are based on my personal experience. For me, the material of the song is developed and transformed depending on how I perceived them in reality.

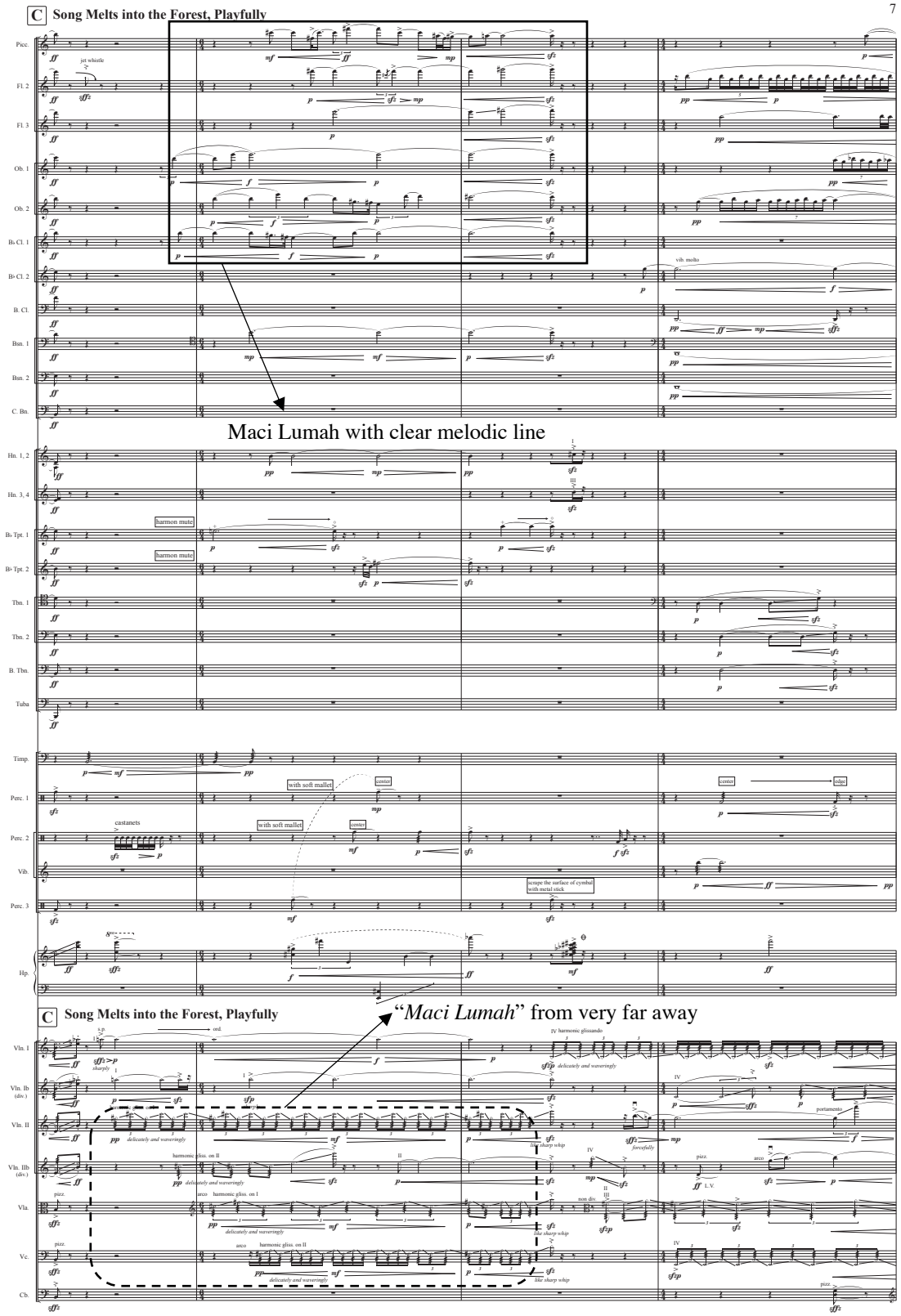


Figure 28 *Maci Lumah*, mm. 28-31

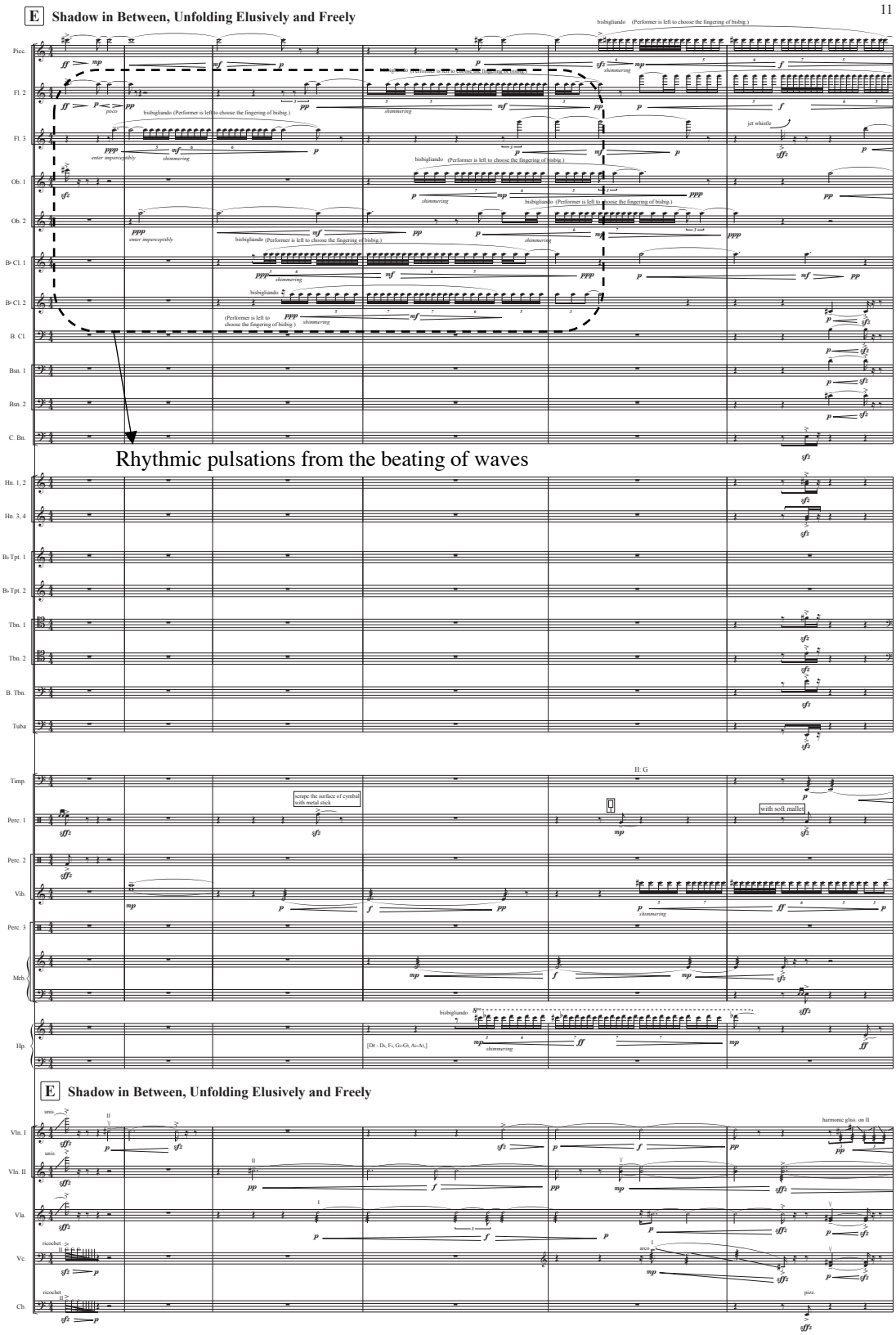


Figure 29 *Maci Lumah*, mm. 44-49

The interaction between soundscape and the song is inspired by the experience when I heard the voice vanished in the environment. In this piece, I do not intend to create a real soundscape by mimicking the environmental sound. The idea of soundscape in this piece serves as the metaphor to evoke audience's imagination about the sonic interaction between the song and the orchestral background texture. For one of the examples, this idea, as I called "song melting into the forest," takes place at mm. 28 – 43 (Figure 28 shows the beginning part of it), showing that the melody of "*Maci Lumah*" is gradually fragmentized and interrupted by harmonic glissando. Ultimately, at m. 35 the original shape of the song disappears, and the dramatic waves, played by the woodwinds and brasses, erupt (at mm. 36-38) from the texture of the string part.[55] I designed this transformation to demonstrate my aural experience of this beautiful phenomenon. Another example could be found at m. 198. In this case, the melody and the rhythm of "*Maci Lumah*" are blurred and obscured by the accumulation of the accelerated trill gestures, forming a dense environmental sound as if the song becomes part of the soundscape. The Figure 31 shows this process at mm. 203-208.

This piece presents my lifelong fascination with the Taiwanese aboriginal vocal music. In the first time when I heard "*Maci Lumah*," it immediately reminded me of the question about line. With the experience of composing this piece, I discovered that a line brought us not only the multi-dimensionality of the physical space but also the cultural and spiritual dimension where such togetherness and belongingness were shared by Bunun family. This togetherness was the essence that made it as a meaningful line.

[55] The shape of growing chromatic wave is derived from the contour of harmonic glissando first appeared at m. 28.

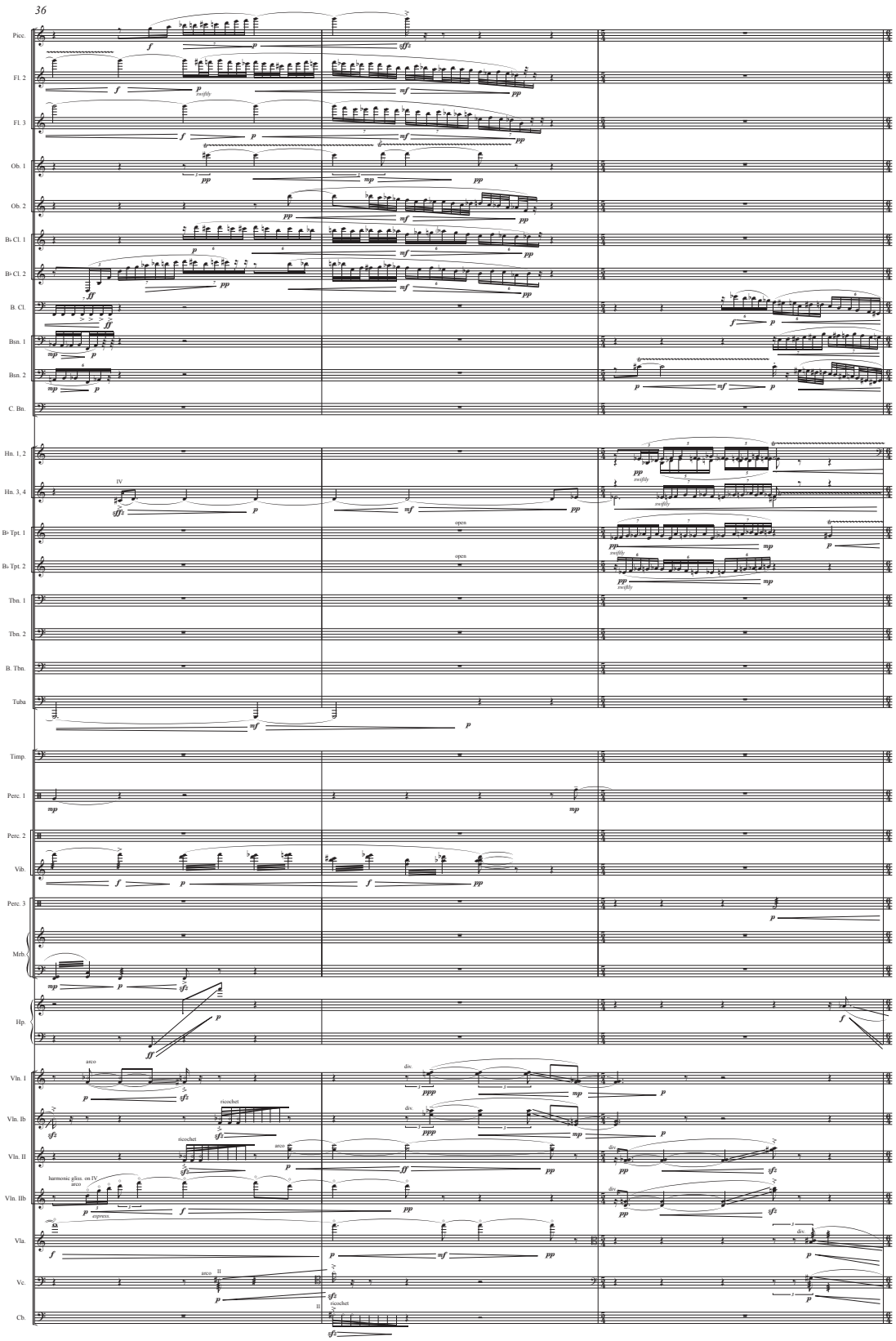


Figure 30 *Maci Lumah*, mm. 36-38

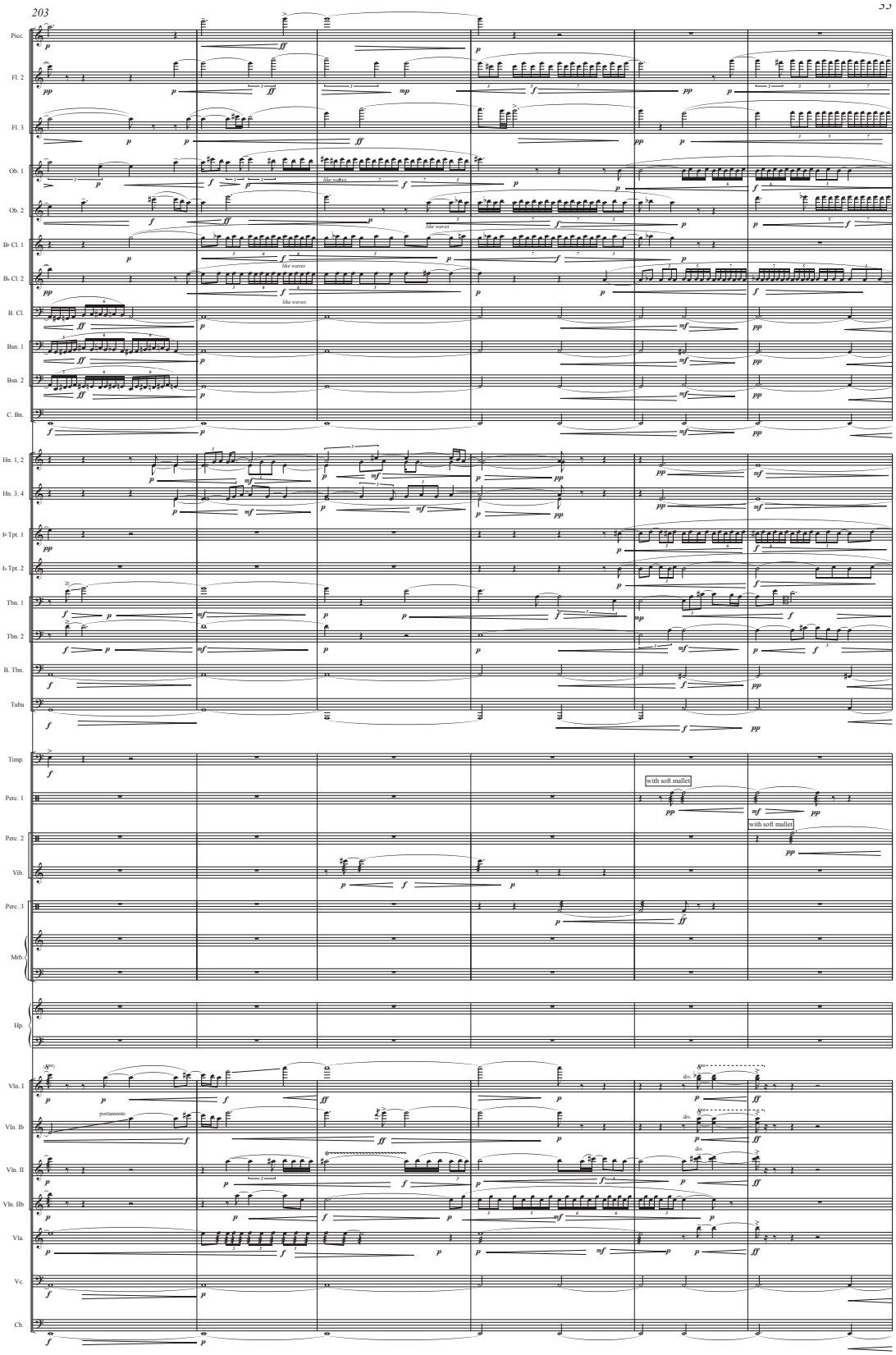


Figure 31 *Maci Lumah*, mm. 203-208

Chapter 4: Conclusion

Exploring the multi-faceted aspects of sound and its relationship with the environment provides us with numerous possibilities for composition. While the study of soundscape, calligraphy, and their creative use to composition might be challenging because of its multidisciplinary nature, it inspires and encourages many composers to unveil the unknown matters of sound and discover the unexplored imaginary landscape. In my compositions, I focused on bringing calligraphic element and soundscapes to combine with my compositional practice, constructing a sonic world where people could experience as if they were in the physical environment. With all these experiences, I developed a new understanding of sound to prepare me to compose the orchestra piece incorporating with an aboriginal song.

Throughout this research, I was always guided by this probing question posted by Chou. I understood that this question cannot be answered. So, I took the other side of the question to propose a new one for myself: "How do we perceive a line?" With this goal in mind, the musical principle of heterophony became the inspiration for me to study various topics based on this question, such as calligraphic sound, soundscape, or even a melody sung in the deep mountain. Heterophony allows us to think about how we view a line as an organized otherness (as the example of brushstroke has shown); and discover that different elements actually move in a similar pattern (as found in the example of acoustic communication of rockfish). In many cases, a line is not just a line, a group of otherness is not just a mass without organization. Thus, I always try to seek this dialogue between many and oneness in various contexts and create compositions to tell the story about the vision of the line in my imaginary landscape.

APPENDIX – MUSIC SCORE

MACI LUMAH FOR ORCHESTRA

Program Note

This piece is inspired by *Maci Lumah* (*Song of Carrying Heavy Things*), a famous tune by Taiwanese aboriginal Bunun. This music is often sung by Bununese in the mountain when their daily work is finished. A leader starts with a bright melodic line to echo with other Bununese, telling everyone that: "It's time to go home!" The beautiful sound of voices in this song, usually comprised of three to five singers, traveling around the environment becomes a unique texture of "spatial heterophony." Since each singer may stay at the different location singing the song, we perceive a different vocal color based on the distances. Sometimes they are close and fast; other times they are far and slow. It is the single melody that speaks with rich layering of timbre and transformation of space. One day, I happened to hear this song far from the mountain. As I tried to find where it came from, I was surprised by the spectacular sight of mountain. It was the moment I discovered that my perception of sound and vision are blending together, evoking an imagination that we see the landscape through sound; and hear the sound through landscape.

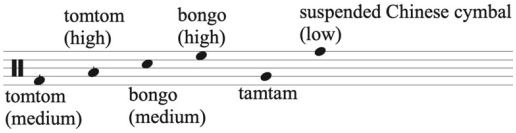
The whole piece is based on the materials of *Maci Lumah*, such as harmony, timbre, rhythm. Each element is structurally interrelated through the evolution of the piece: The timbre is constructed from the harmonic formation; and I seek the rhythmic pulsations from timbre. As all the materials constantly move, gather, and disperse within instrumental groups, we perceive the sound dancing in the space.

Instrumentation

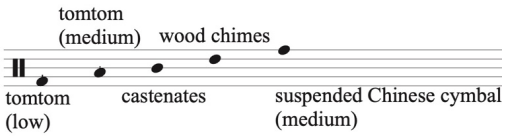
Woodwinds & Brasses:
3 Flutes (with piccolo), 2 oboes, 2 Bb clarinets, 1 Bass clarinet, 2 bassoons, 4 horns, 2 trumpets, 2 trombones, 1 bass trombone, tuba

Percussion section:
Timpani

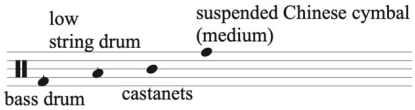
Percussion I – 2 bongos, 2 Tomtoms (high & high-medium), 1 Suspended Chinese Cymbal (low), Tamtam



Percussion II – 2 Tomtoms (medium & low), 1 Suspended Chinese Cymbal (medium), 1 wood chimes, castanets, vibraphone



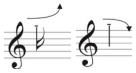
Percussion III – Bass drum, 1 Suspended Chinese Cymbal (high), castanets, 1 low string drum (lion's roar), marimba



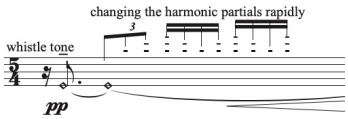
Harp & Strings

Performance Note

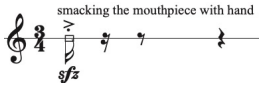
Woodwinds & Brasses:
1. Jet Whistle (Flute)



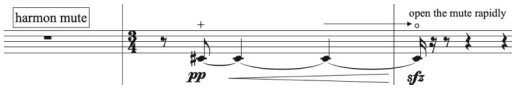
2. Whistle Tone (Flute)



3. Popping Effect of Mouthpiece – smacking the mouthpiece with hand



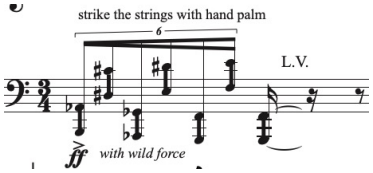
4. Open Mutes Rapidly (trumpet) – cover and uncover the harmon mutes with hand to create "Wah!" effect.



5. Bisbigliando（bisbig.） — performer is left to freely choose the fingering of bisbigliando.

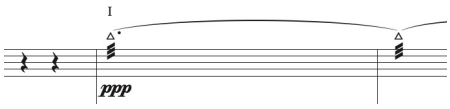
Harp:

1. Tone Cluster

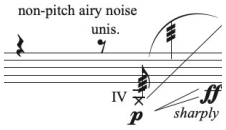


Strings:

1. Extreme High Pitch – It creates an un-pitched percussive noise.

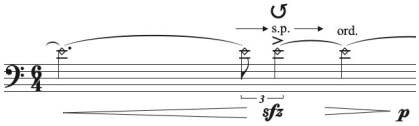


2. Airy Noise —This technique is created by muting the string with left hand while bowing. The numbers, I, II, III, and IV, are used to indicate on which string the performer should mute to create the airy noise. (Please see the following example)

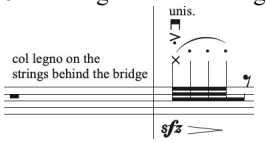


3. S.P. — Sul Ponticello

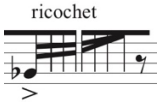
4. Circular Bowing ↺ - move the bow rapidly from the original position to the bridge to create the flash effect of sul ponticello.



5. Col Legno on the Strings Behind Bridge



6. Ricochet

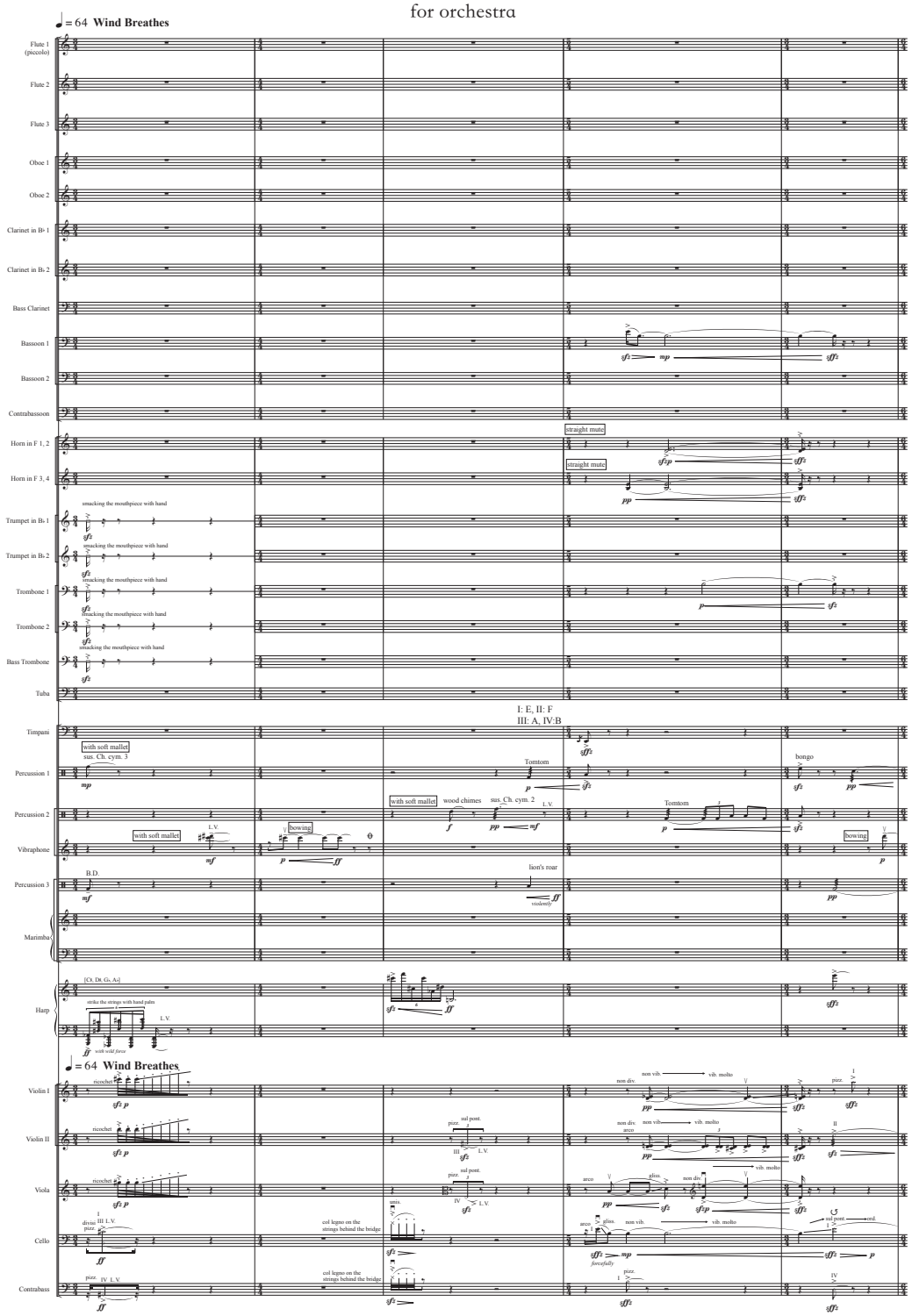


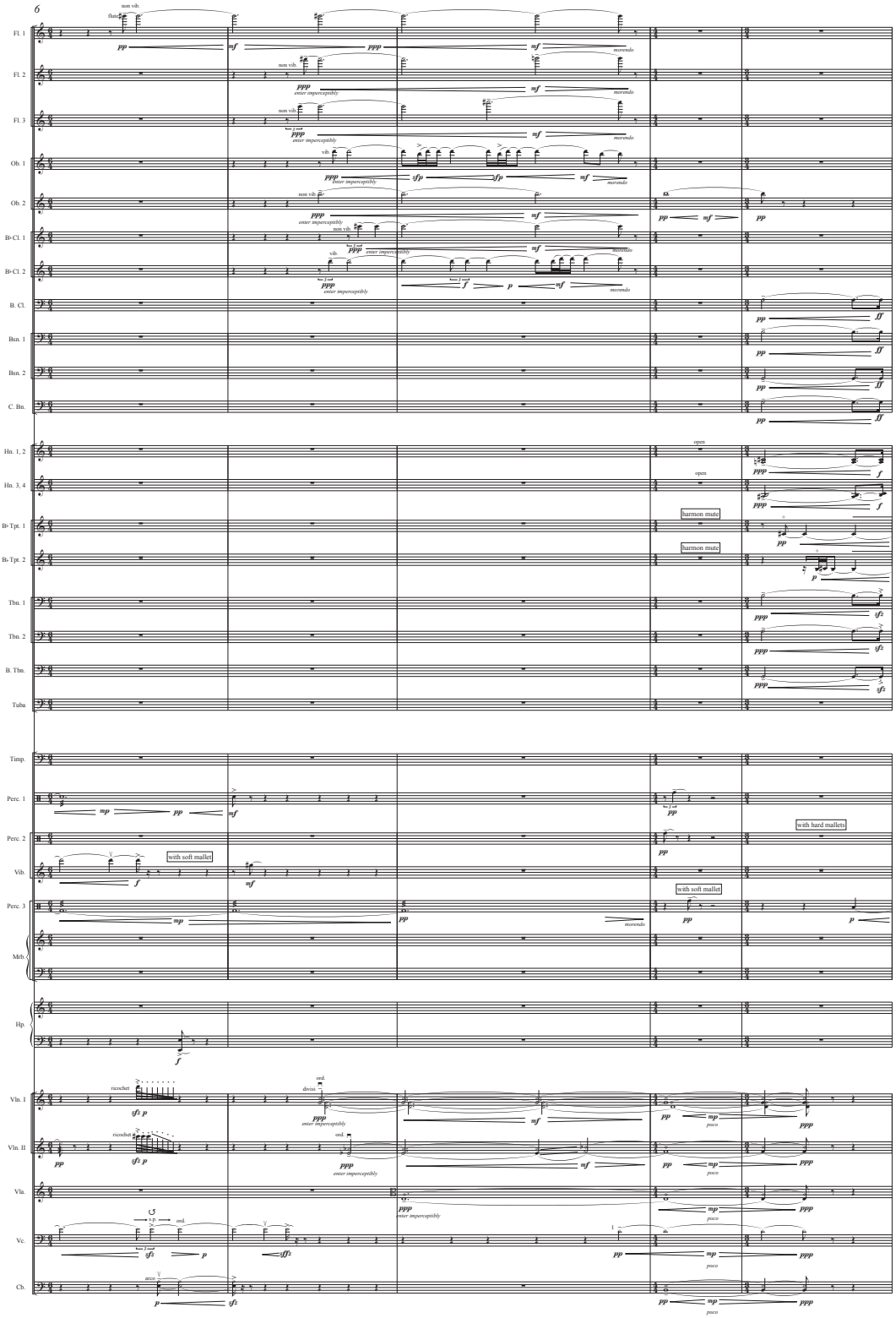
Score

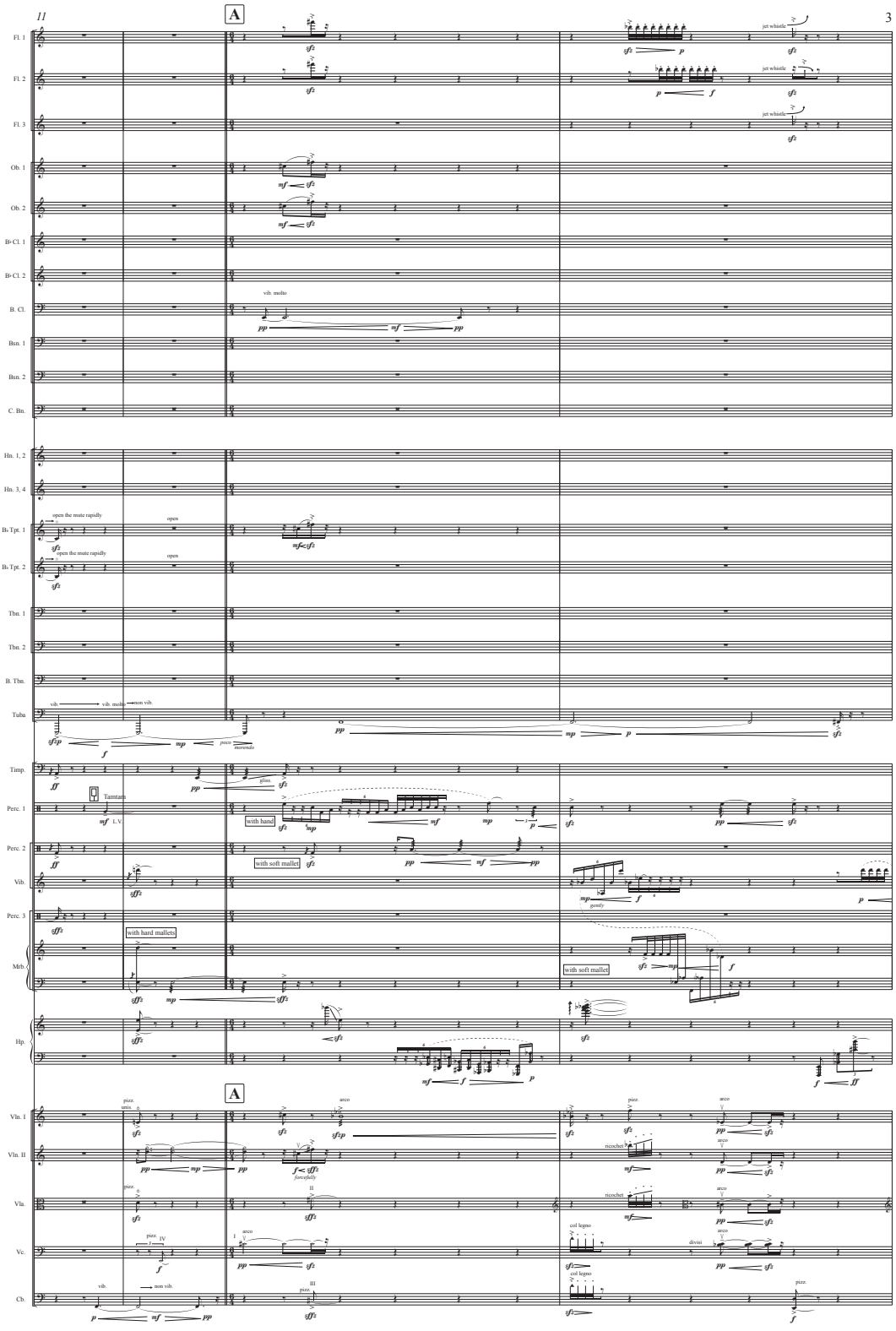
Maci Lumah

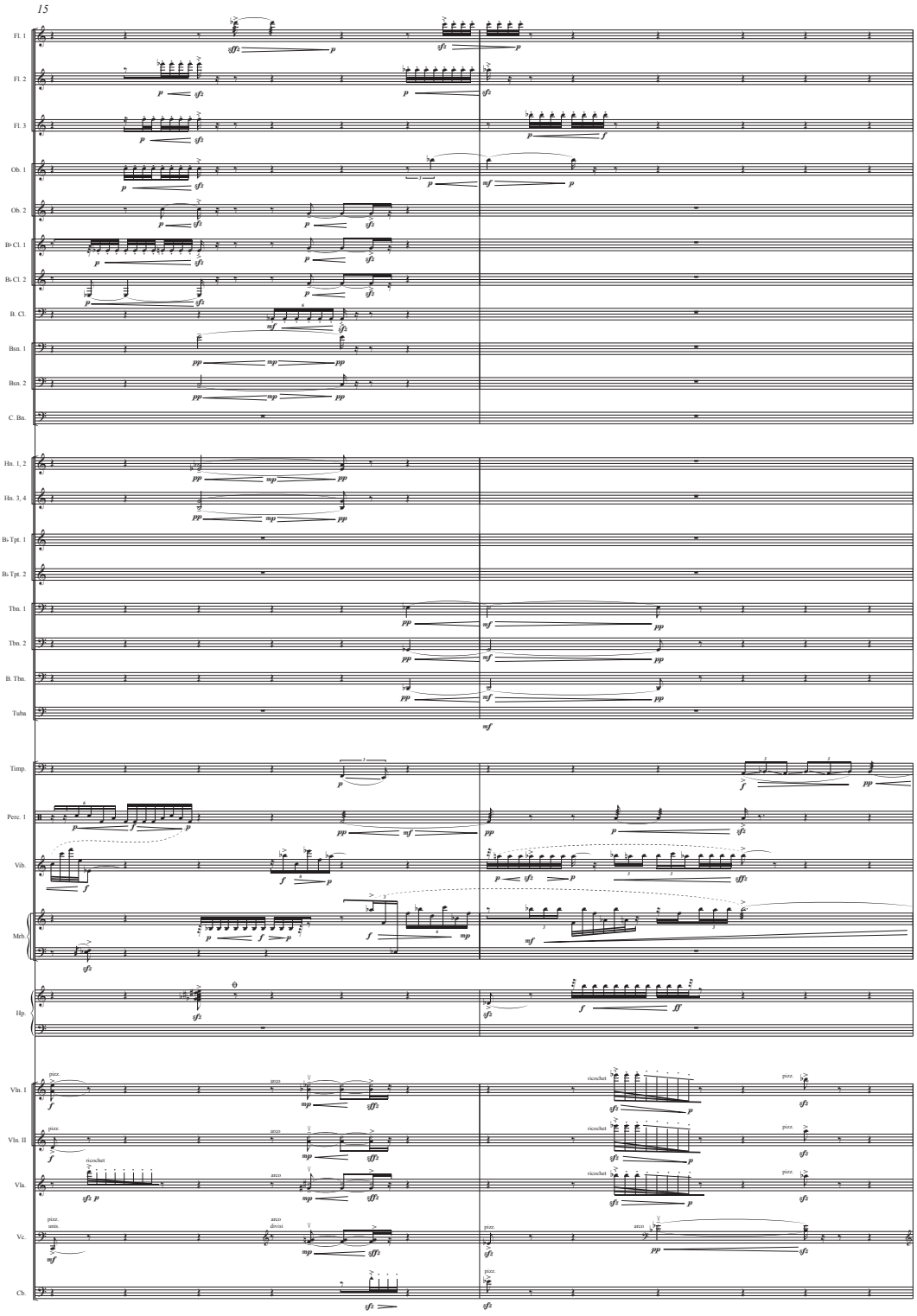
Viewing Distant Song

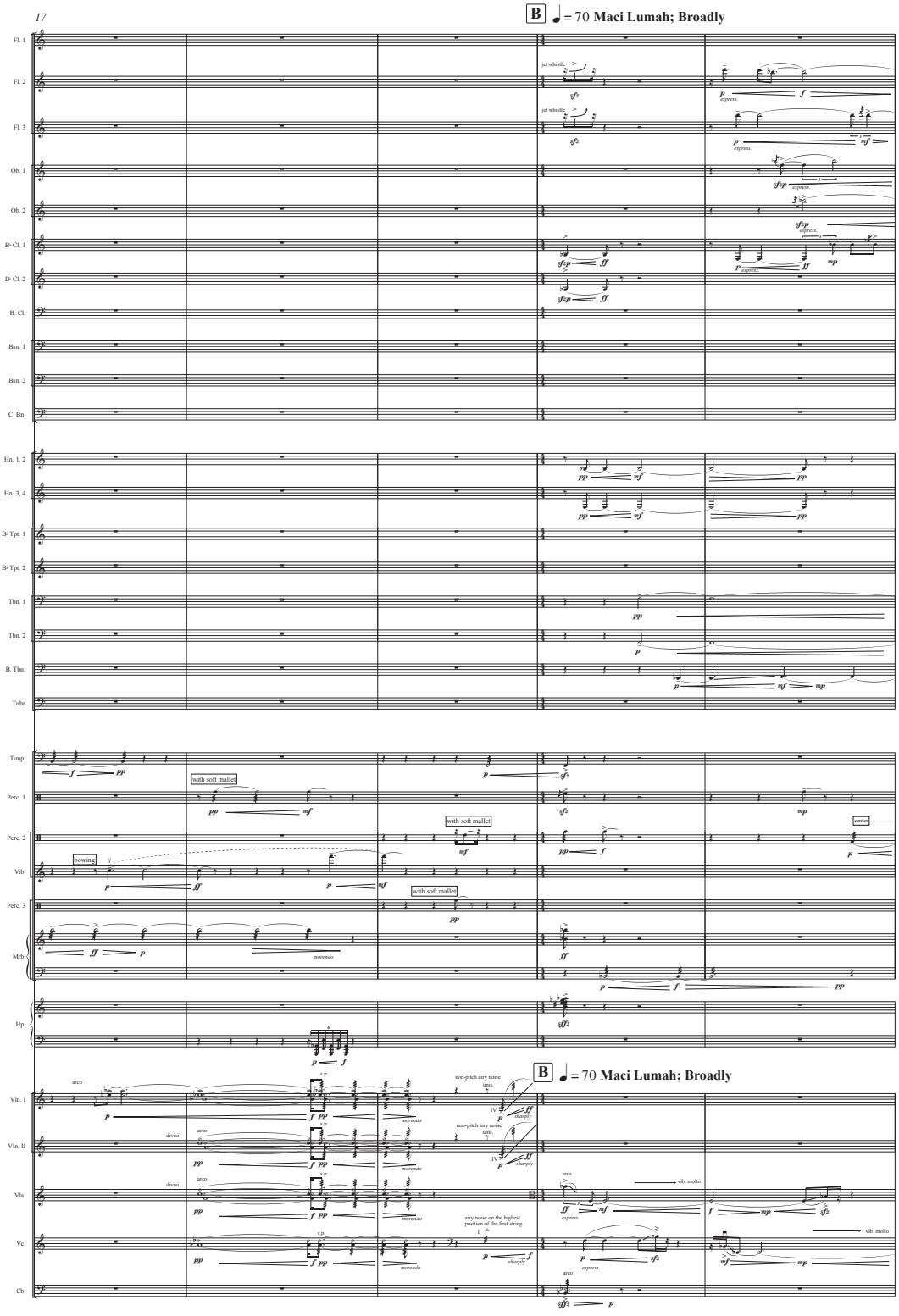
for orchestra

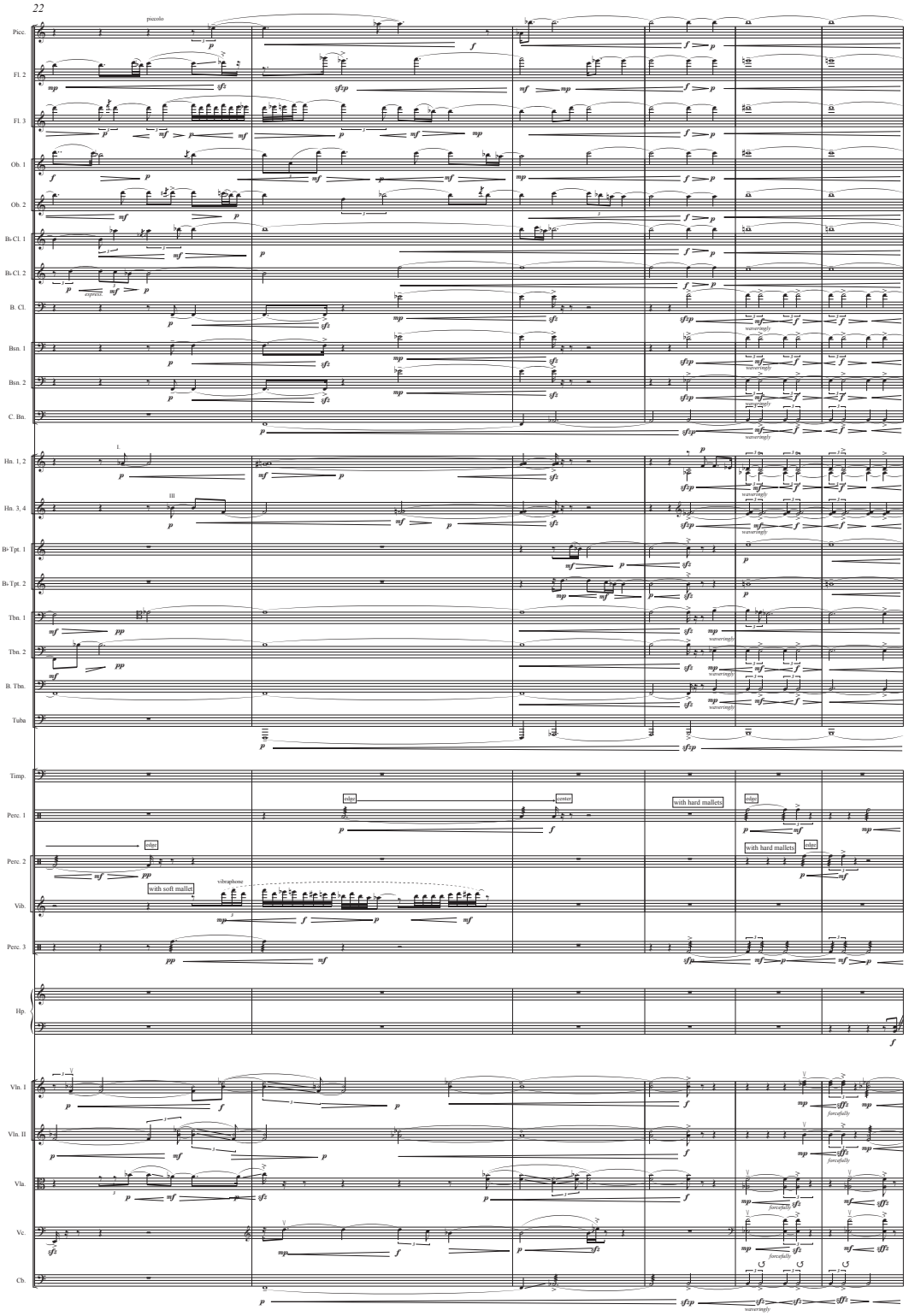


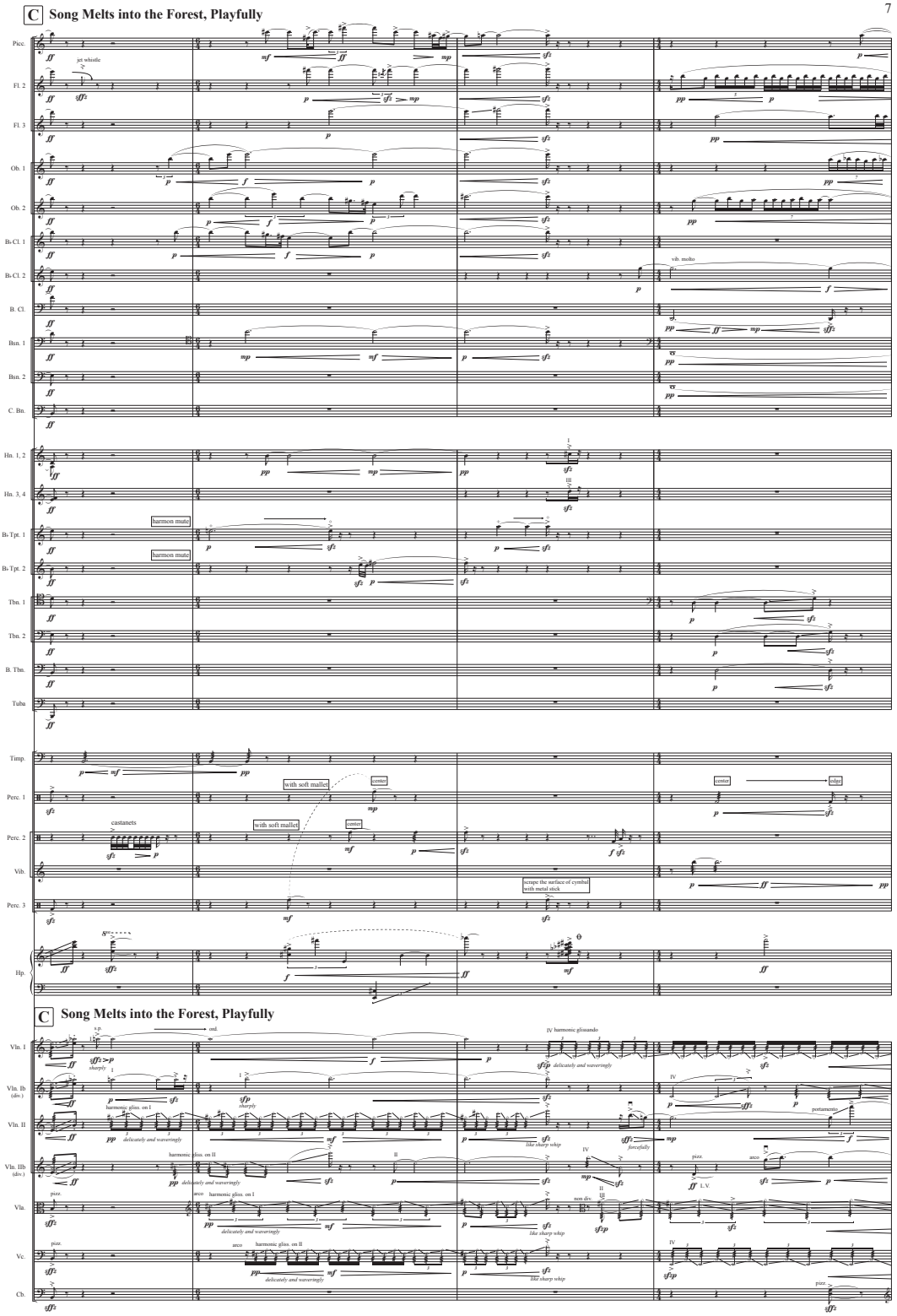

6
Fl. 1
Fl. 2
Fl. 3
Ob. 1
Ob. 2
B♭ Cl. 1
B♭ Cl. 2
B. Cl.
Bsn. 1
Bsn. 2
C. Bn.
Hn. 1, 2
Hn. 3, 4
B♭ Tpt. 1
B♭ Tpt. 2
Tbn. 1
Tbn. 2
B. Tbn.
Tuba
Timp.
Perc. 1
Perc. 2
Vib.
Perc. 3
Mrb.
Hp.
Vln. I
Vln. II
Vla.
Vc.
Cb.
non vib.
enter imperceptibly
morendo
harmon mute
with soft mallet
with hard mallets
ricochet
ord.
divisi
s.p.
arco
poco

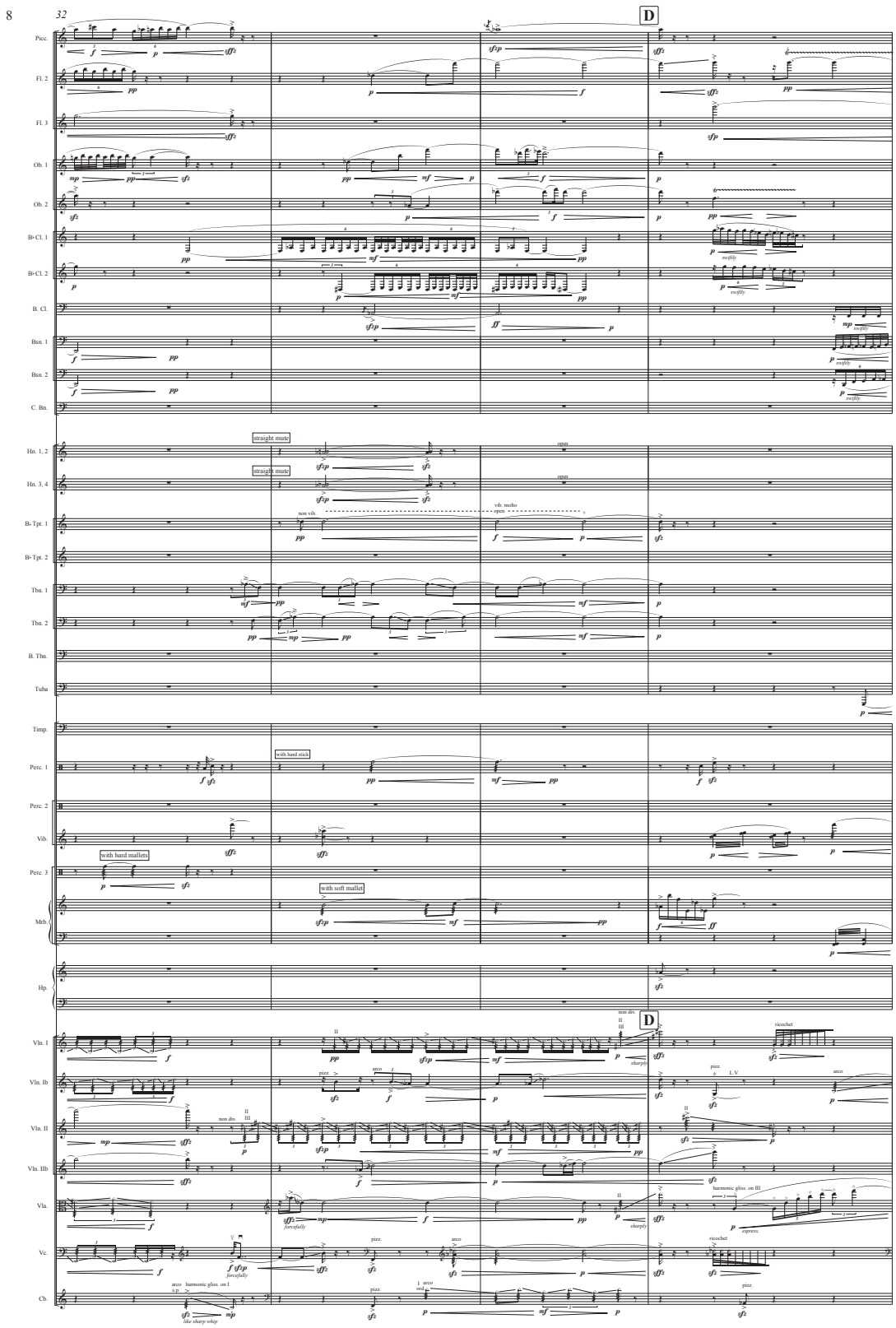

11
A
3
Fl. 1
Fl. 2
Fl. 3
Ob. 1
Ob. 2
B♭ Cl. 1
B♭ Cl. 2
B. Cl.
Bsn. 1
Bsn. 2
C. Bn.
Hn. 1, 2
Hn. 3, 4
B♭ Tpt. 1
B♭ Tpt. 2
Tbn. 1
Tbn. 2
B. Tbn.
Tuba
Timp.
Perc. 1
Perc. 2
Vib.
Perc. 3
Mrb.
Hp.
Vln. I
Vln. II
Vla.
Vc.
Cb.
jet whistle
vib. molto
open the mute rapidly
open
Tamtam
with hand
with soft mallet
with hard mallets
gently
ricochet
col legno
divisi
arco
pizz.
non vib.
vib.

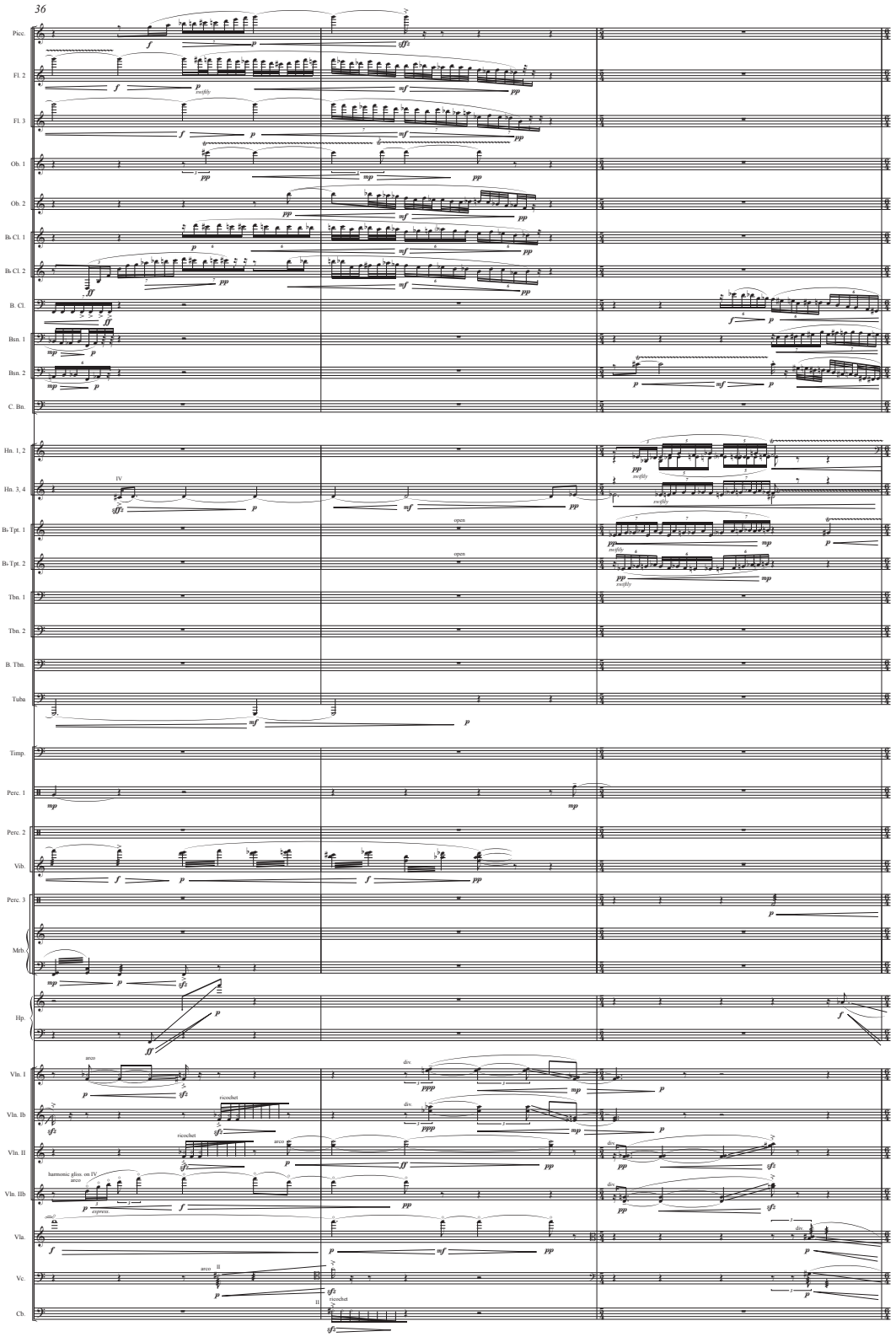

15
Fl. 1
Fl. 2
Fl. 3
Ob. 1
Ob. 2
B♭ Cl. 1
B♭ Cl. 2
B. Cl.
Bsn. 1
Bsn. 2
C. Bn.
Hn. 1, 2
Hn. 3, 4
B♭ Tpt. 1
B♭ Tpt. 2
Tbn. 1
Tbn. 2
B. Tbn.
Tuba
Timp.
Perc. 1
Vib.
Mrb.
Hp.
Vln. I
Vln. II
Vla.
Vc.
Cb.
pizz.
arco
ricochet
pizz. unis.
arco divisi

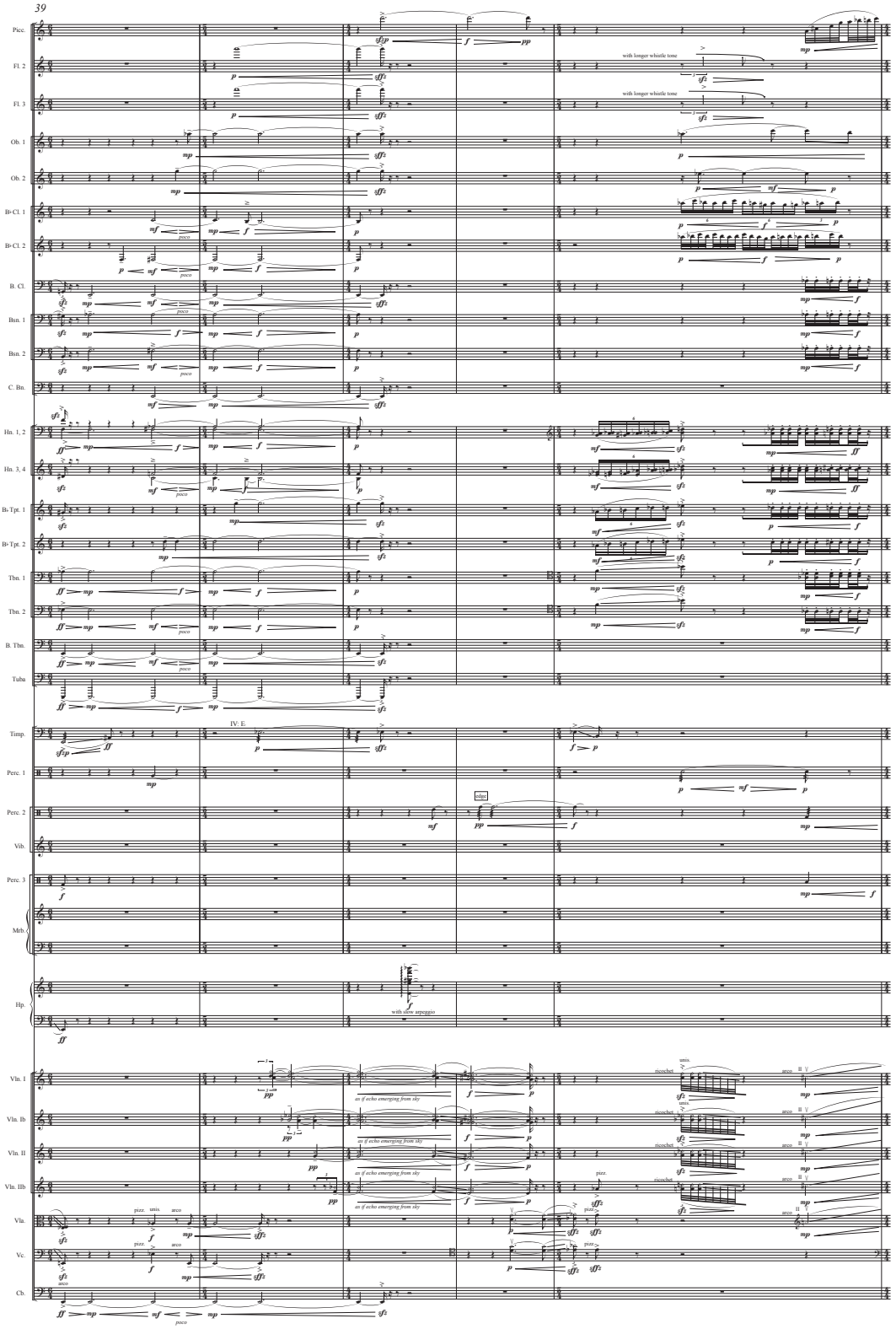

17
B = 70 Maci Lumah; Broadly
Fl. 1
Fl. 2
Fl. 3
Ob. 1
Ob. 2
B♭ Cl. 1
B♭ Cl. 2
B. Cl.
Bsn. 1
Bsn. 2
C. Bn.
Hn. 1, 2
Hn. 3, 4
B♭ Tpt. 1
B♭ Tpt. 2
Tbn. 1
Tbn. 2
B. Tbn.
Tuba
Timp.
Perc. 1
Perc. 2
Vib.
Perc. 3
Mrb.
Hp.
Vln. I
Vln. II
Vla.
Vc.
Cb.
jet whistle
with soft mallet
bowing
arco
divisi
non-pitch airy noise
airy noise on the highest position of the first string
vib. molto
center

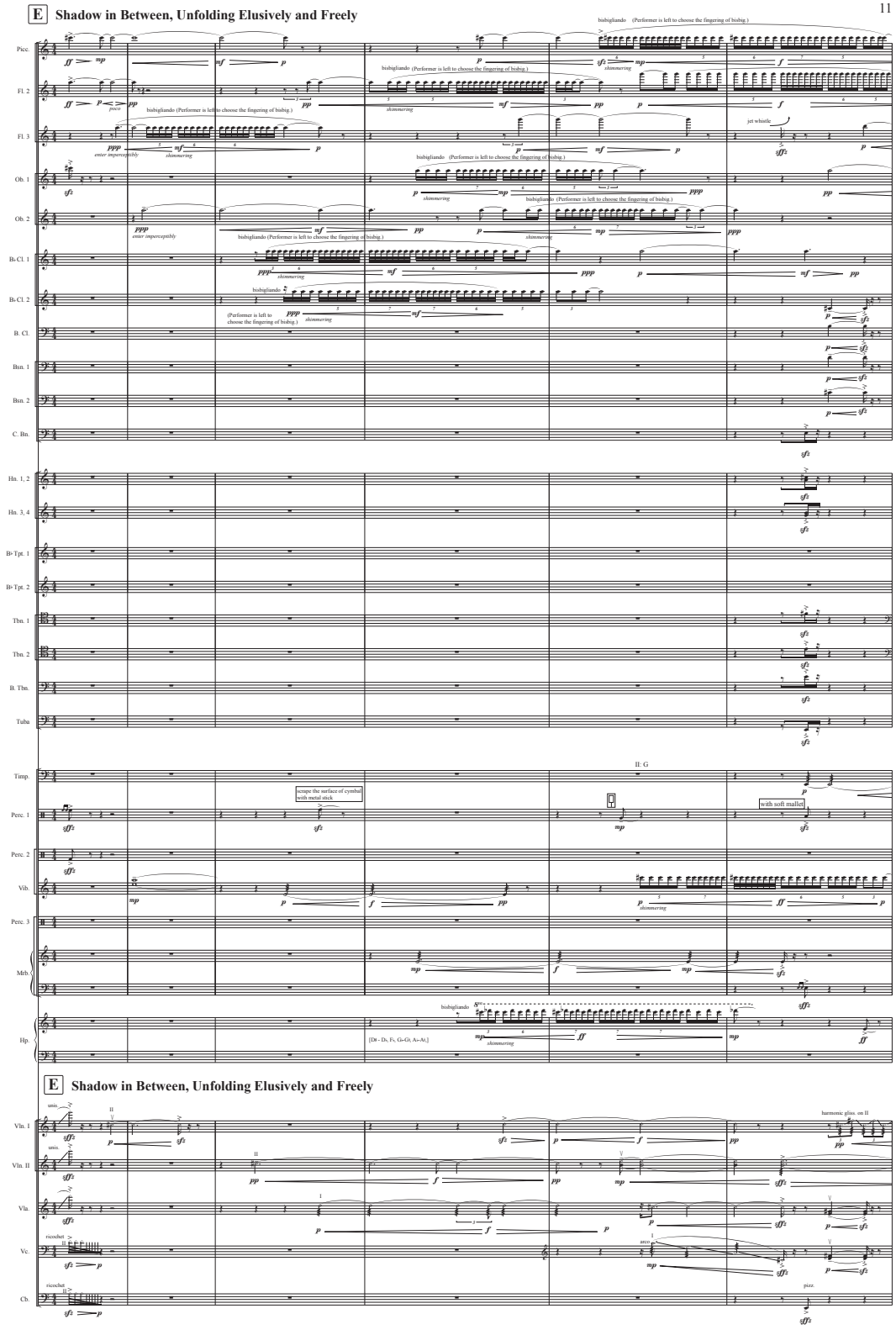

22
Picc.
Fl. 2
Fl. 3
Ob. 1
Ob. 2
B♭ Cl. 1
B♭ Cl. 2
B. Cl.
Bsn. 1
Bsn. 2
C. Bn.
Hn. 1, 2
Hn. 3, 4
B♭ Tpt. 1
B♭ Tpt. 2
Tbn. 1
Tbn. 2
B. Tbn.
Tuba
Timp.
Perc. 1
Perc. 2
Vib.
Perc. 3
Hp.
Vln. I
Vln. II
Vla.
Vc.
Cb.
piccolo
vibraphone
with soft mallet
with hard mallets
wavyringly
forcefully

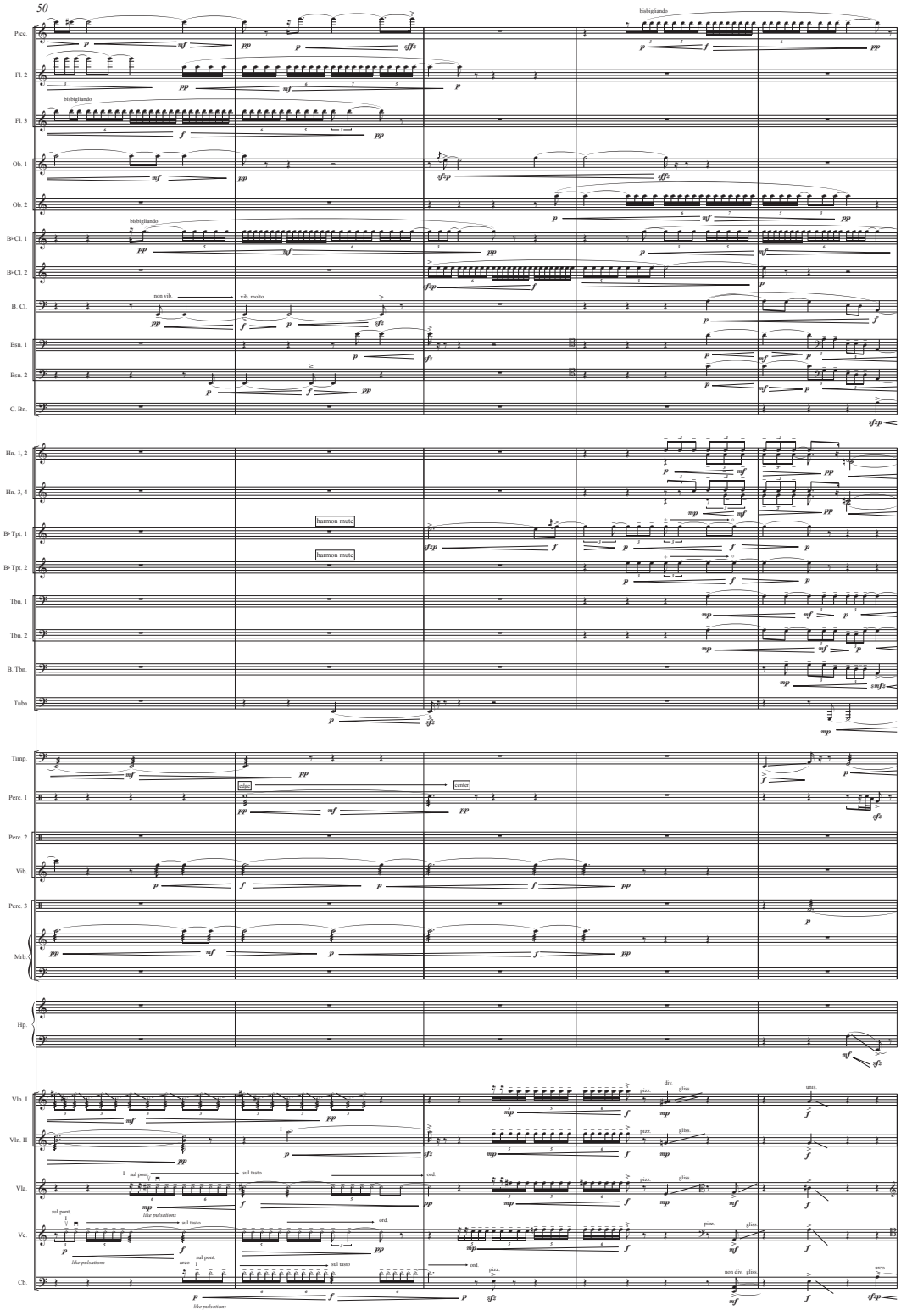

C Song Melts into the Forest, Playfully
Picc.
Fl. 2
Fl. 3
Ob. 1
Ob. 2
B♭ Cl. 1
B♭ Cl. 2
B. Cl.
Bsn. 1
Bsn. 2
C. Bn.
Hn. 1, 2
Hn. 3, 4
B♭ Tpt. 1
B♭ Tpt. 2
Tbn. 1
Tbn. 2
B. Tbn.
Tuba
Timp.
Perc. 1
Perc. 2
Vib.
Perc. 3
Hp.
jet whistle
harmon mute
harmon mute
with soft mallet
with soft mallet
castanets
vib. molto
octape the surface of cymbal with metal stick
C Song Melts into the Forest, Playfully
Vln. I
Vln. Ib (div.)
Vln. II
Vln. IIb (div.)
Vla.
Vc.
Cb.
sharply
delicately and waveringly
harmonic gliss. on I
harmonic gliss. on II
like sharp whip
forcefully
pizz.
arco
portamento
L.V.

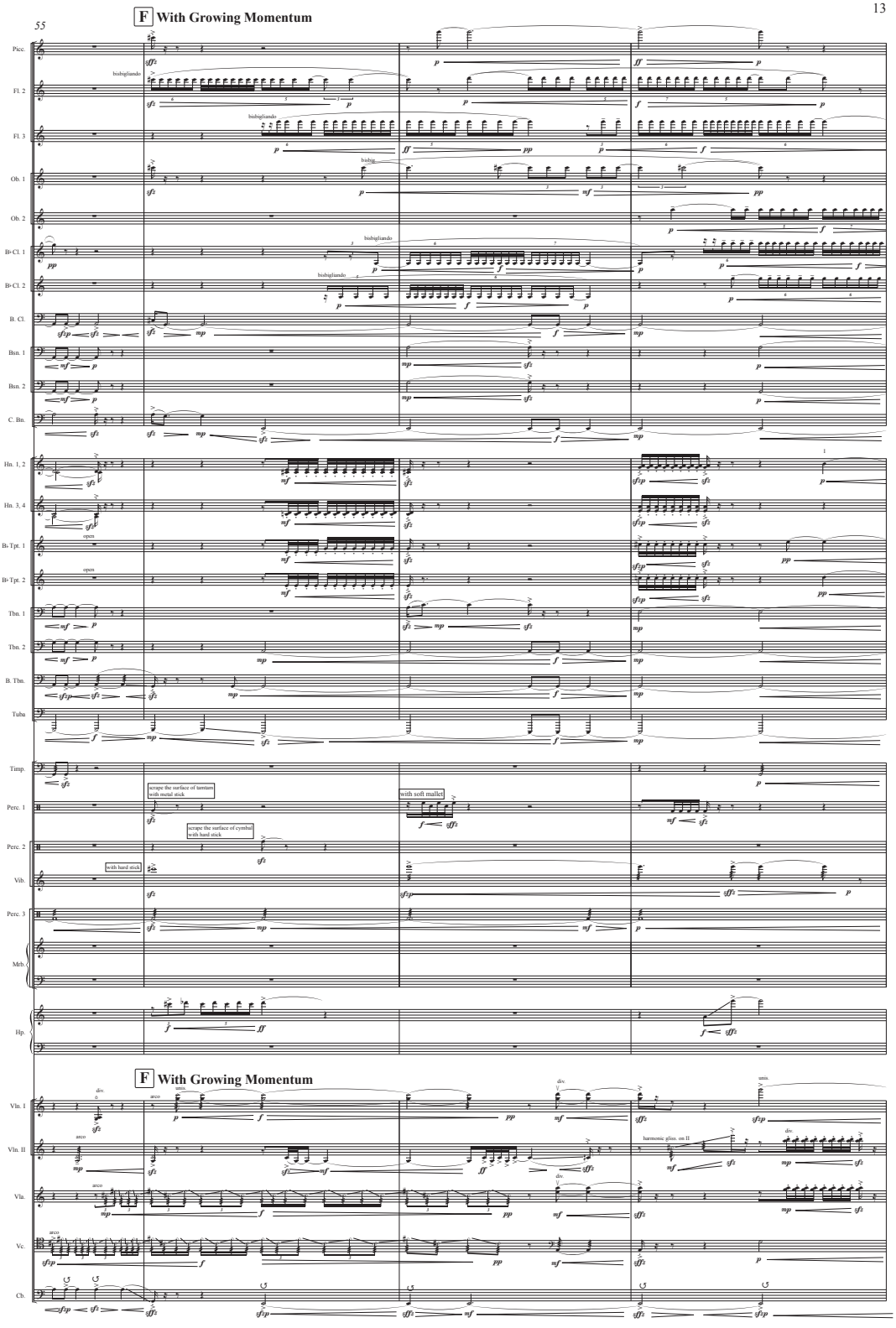

8
32
D
Picc.
Fl. 2
Fl. 3
Ob. 1
Ob. 2
B♭ Cl. 1
B♭ Cl. 2
B. Cl.
Bsn. 1
Bsn. 2
C. Bn.
Hn. 1, 2
Hn. 3, 4
straight mute
open
B♭ Tpt. 1
B♭ Tpt. 2
non vib.
vib. molto
Tbn. 1
Tbn. 2
B. Tbn.
Tuba
Timp.
Perc. 1
with hard stick
Perc. 2
Vib.
with hard mallets
Perc. 3
with soft mallet
Mrb.
Hp.
Vln. I
Vln. Ib
Vln. II
Vln. IIb
Vla.
Vc.
Cb.
non div.
ricochet
pizz.
arco
harmonic gliss. on III
forcefully
like sharp whip

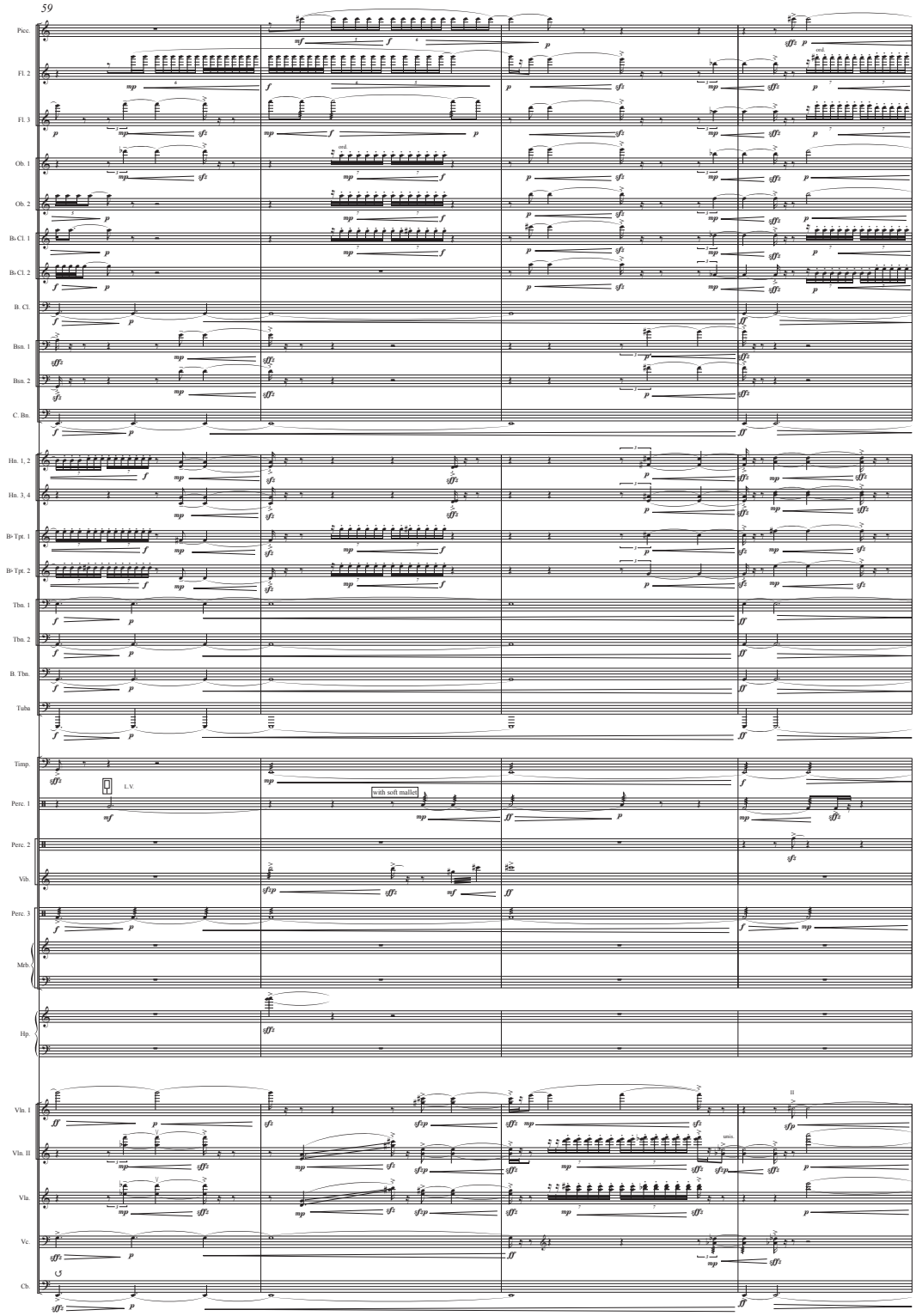

36
Picc.
Fl. 2
Fl. 3
Ob. 1
Ob. 2
B♭ Cl. 1
B♭ Cl. 2
B. Cl.
Bsn. 1
Bsn. 2
C. Bn.
Hn. 1, 2
Hn. 3, 4
B♭ Tpt. 1
B♭ Tpt. 2
Tbn. 1
Tbn. 2
B. Tbn.
Tuba
Timp.
Perc. 1
Perc. 2
Vib.
Perc. 3
Mrb.
Hp.
Vln. I
Vln. Ib
Vln. II
Vln. IIb
Vla.
Vc.
Cb.

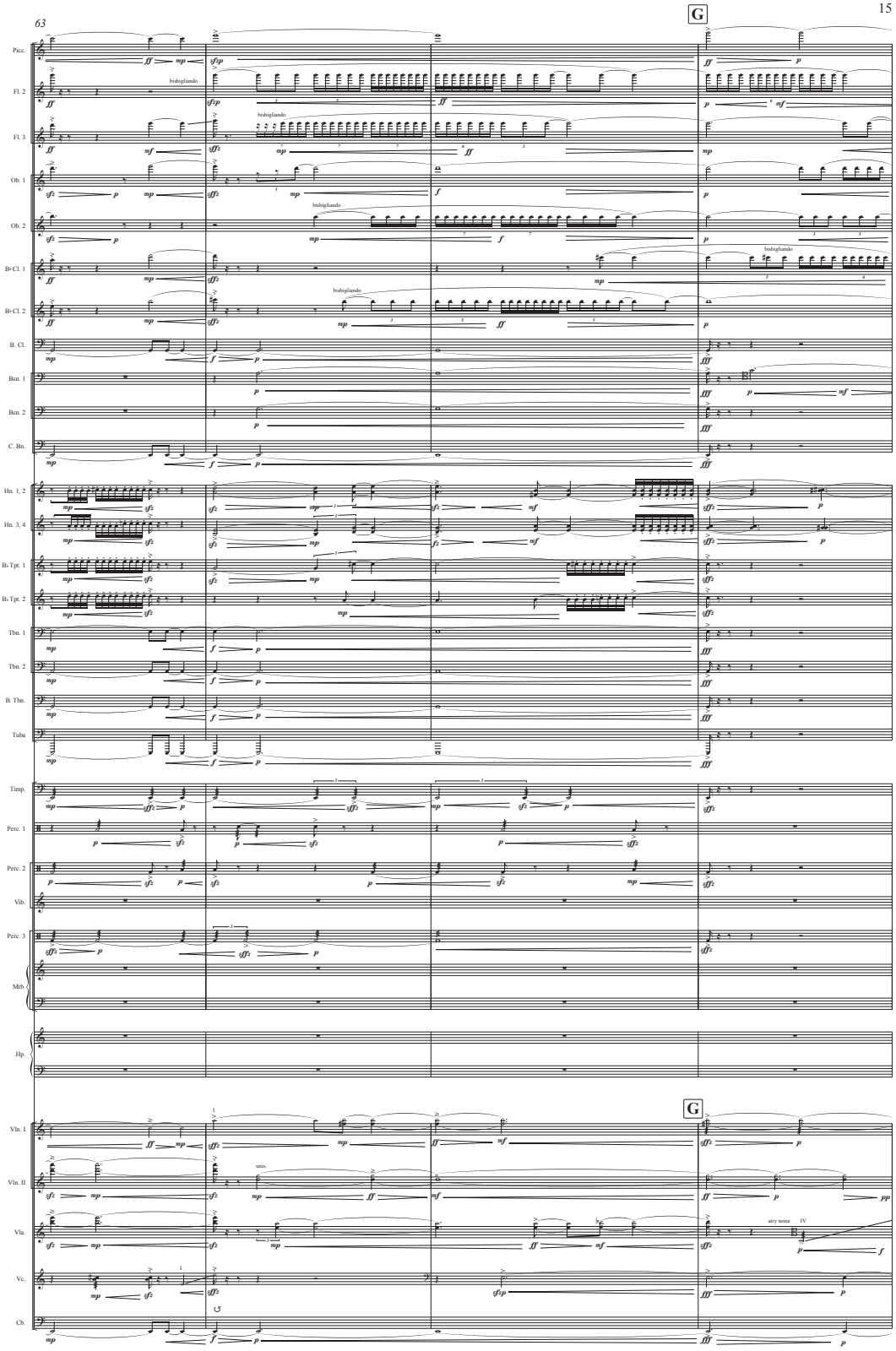

39
Picc.
Fl. 2
Fl. 3
Ob. 1
Ob. 2
B♭ Cl. 1
B♭ Cl. 2
B. Cl.
Bsn. 1
Bsn. 2
C. Bn.
Hn. 1, 2
Hn. 3, 4
B♭ Tpt. 1
B♭ Tpt. 2
Tbn. 1
Tbn. 2
B. Tbn.
Tuba
Timp.
Perc. 1
Perc. 2
Vib.
Perc. 3
Mrb.
Hp.
Vln. I
Vln. Ib
Vln. II
Vln. IIb
Vla.
Vc.
Cb.
with longer whistle tone
with slow arpeggio
as if echo emerging from sky
ricochet
pizz.
arco
poco

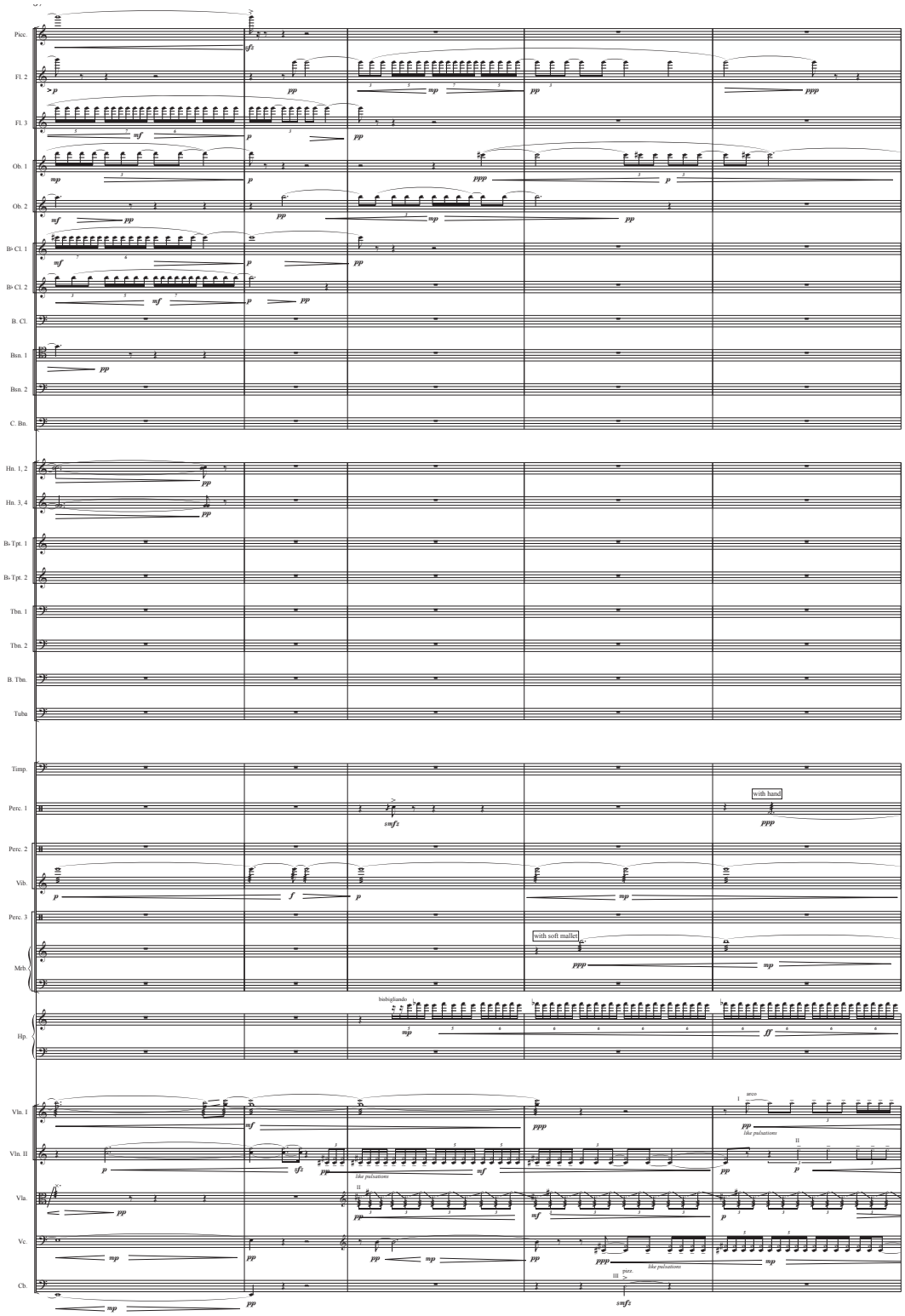

E Shadow in Between, Unfolding Elusively and Freely
Picc.
Fl. 2
Fl. 3
Ob. 1
Ob. 2
B♭ Cl. 1
B♭ Cl. 2
B. Cl.
Bsn. 1
Bsn. 2
C. Bn.
Hn. 1, 2
Hn. 3, 4
B♭ Tpt. 1
B♭ Tpt. 2
Tbn. 1
Tbn. 2
B. Tbn.
Tuba
Timp.
Perc. 1
Perc. 2
Vib.
Perc. 3
Mrb.
Hp.
bisbigliando (Performer is left to choose the fingering of bisbig.)
shimmering
jet whistle
enter imperceptibly
scrape the surface of cymbal with metal stick
with soft mallet
II: G
[Db - Ds, Fs, Gs-G\, As-As,]
E Shadow in Between, Unfolding Elusively and Freely
Vln. I
Vln. II
Vla.
Vc.
Cb.
unis.
ricochet
harmonic gliss. on II
arco
pizz.

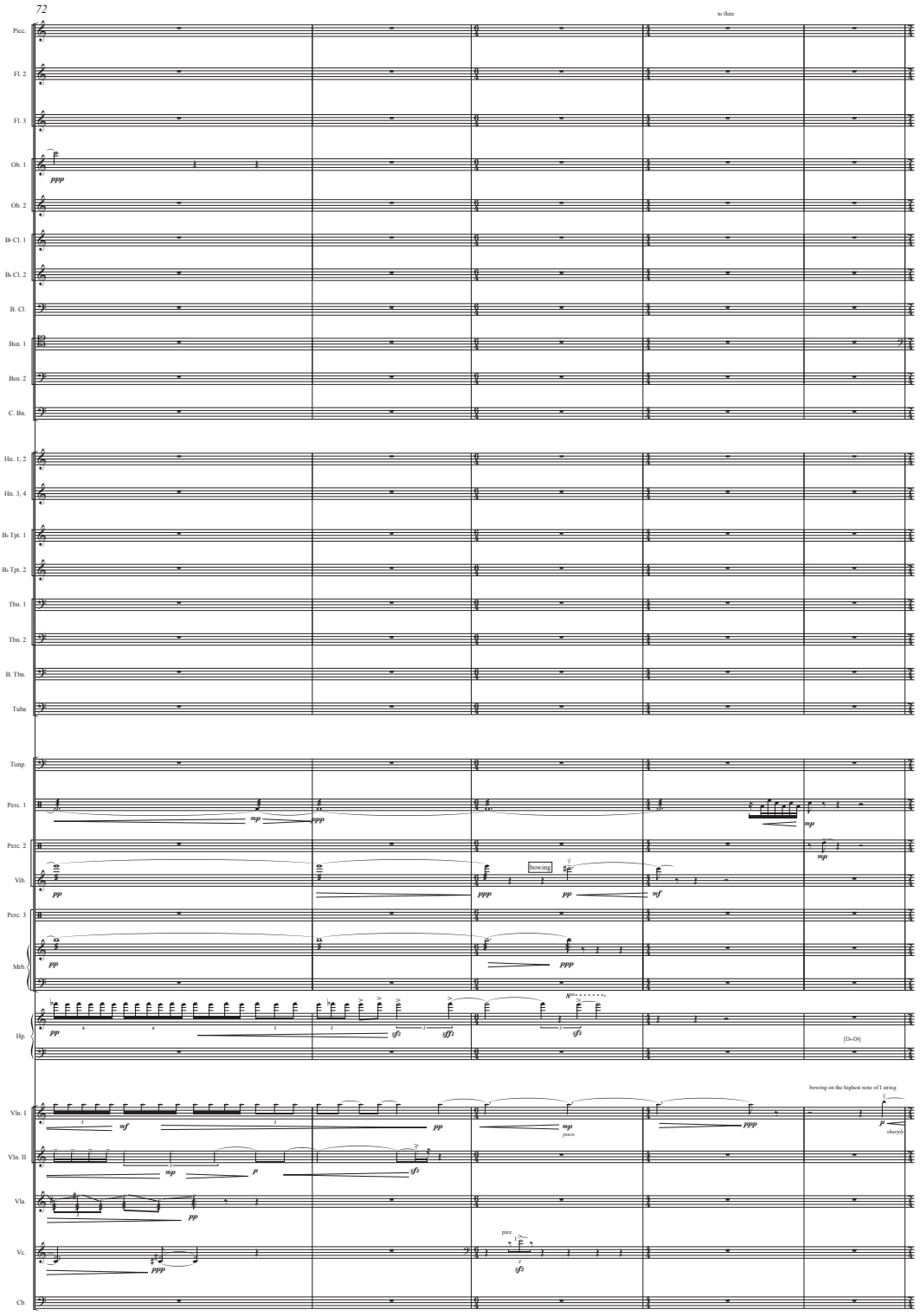

50
Picc.
Fl. 2
Fl. 3
Ob. 1
Ob. 2
B♭ Cl. 1
B♭ Cl. 2
B. Cl.
Bsn. 1
Bsn. 2
C. Bn.
Hn. 1, 2
Hn. 3, 4
B♭ Tpt. 1
B♭ Tpt. 2
Tbn. 1
Tbn. 2
B. Tbn.
Tuba
Timp.
Perc. 1
Perc. 2
Vib.
Perc. 3
Mrb.
Hp.
Vln. I
Vln. II
Vla.
Vc.
Cb.
bisbigliando
non vib.
vib. molto
harmon mute
sul pont.
sul tasto
ord.
like pulsations
pizz.
arco
gliss.
div.
unis.

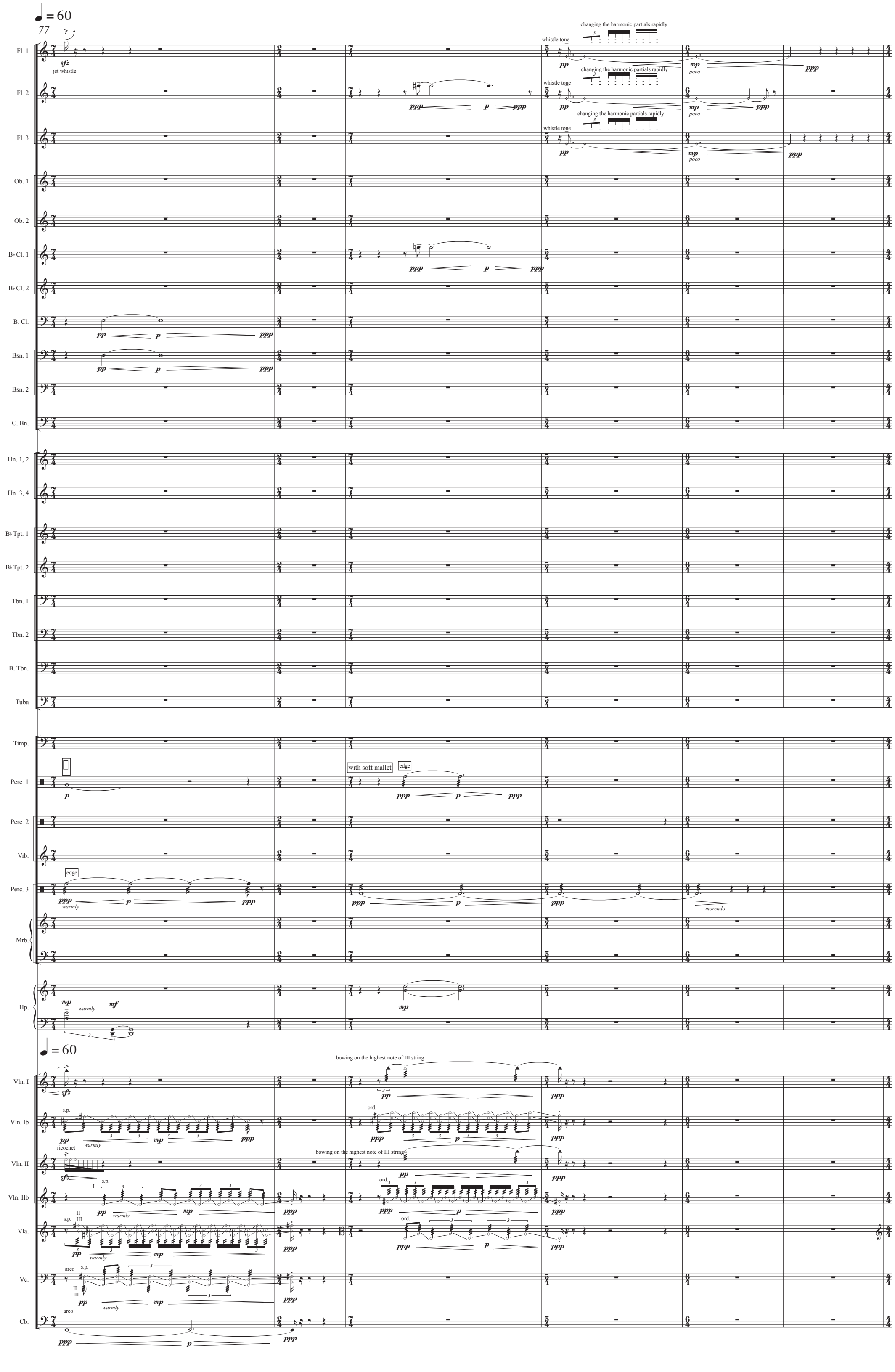

55
F With Growing Momentum
Picc.
Fl. 2
Fl. 3
Ob. 1
Ob. 2
B♭ Cl. 1
B♭ Cl. 2
B. Cl.
Bsn. 1
Bsn. 2
C. Bn.
Hn. 1, 2
Hn. 3, 4
B♭ Tpt. 1
B♭ Tpt. 2
Tbn. 1
Tbn. 2
B. Tbn.
Tuba
Timp.
Perc. 1
Perc. 2
Vib.
Perc. 3
Mrb.
Hp.
F With Growing Momentum
Vln. I
Vln. II
Vla.
Vc.
Cb.
bisbigliando
scrape the surface of tamtam with metal stick
scrape the surface of cymbal with hard stick
with hard stick
with soft mallet
open
arco
div.
unis.
harmonic gliss. on II

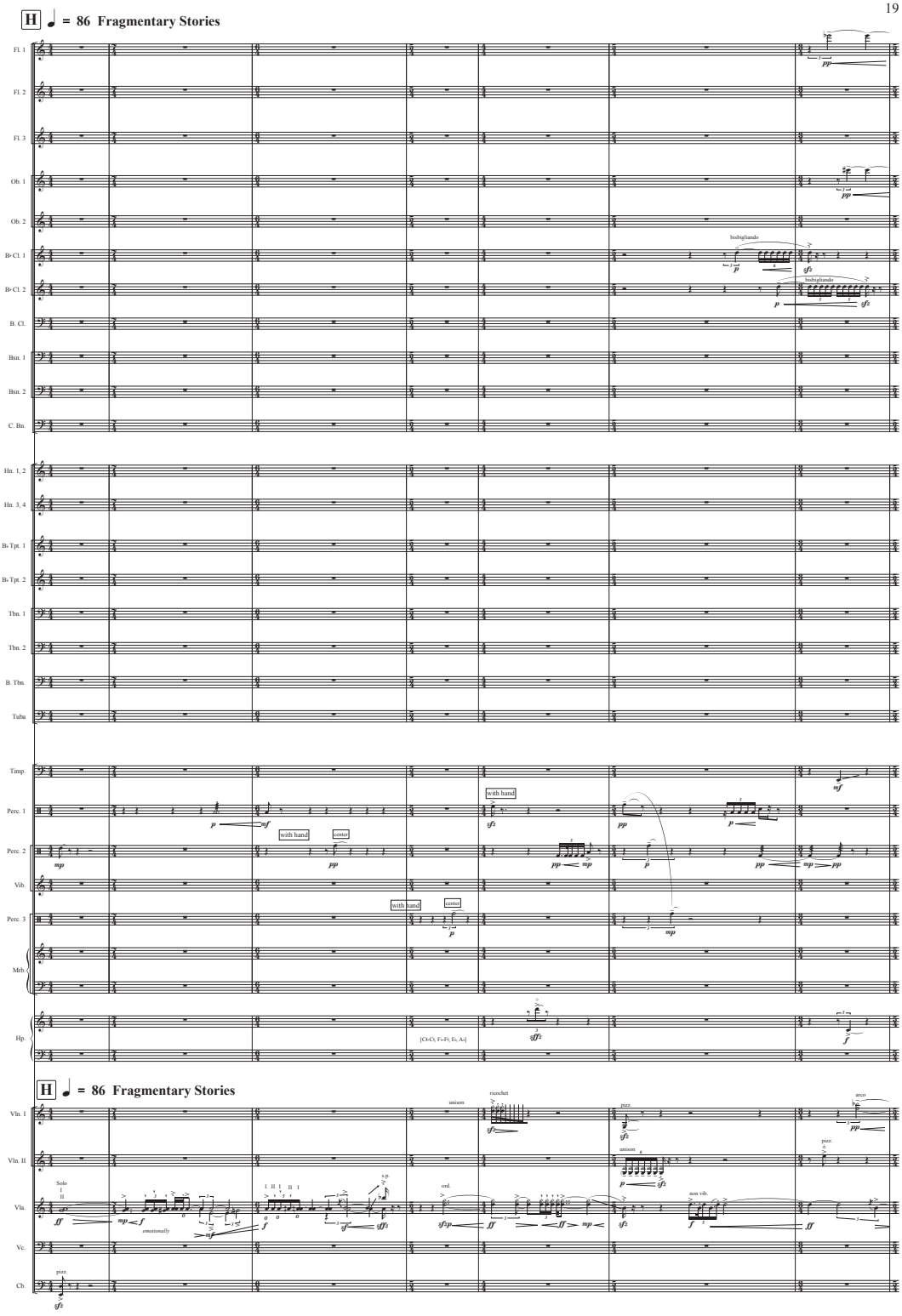

59
Picc.
Fl. 2
Fl. 3
Ob. 1
Ob. 2
B♭ Cl. 1
B♭ Cl. 2
B. Cl.
Bsn. 1
Bsn. 2
C. Bn.
Hn. 1, 2
Hn. 3, 4
B♭ Tpt. 1
B♭ Tpt. 2
Tbn. 1
Tbn. 2
B. Tbn.
Tuba
Timp.
Perc. 1
Perc. 2
Vib.
Perc. 3
Mrb.
Hp.
Vln. I
Vln. II
Vla.
Vc.
Cb.
with soft mallet
L.V.
ord.
unis.

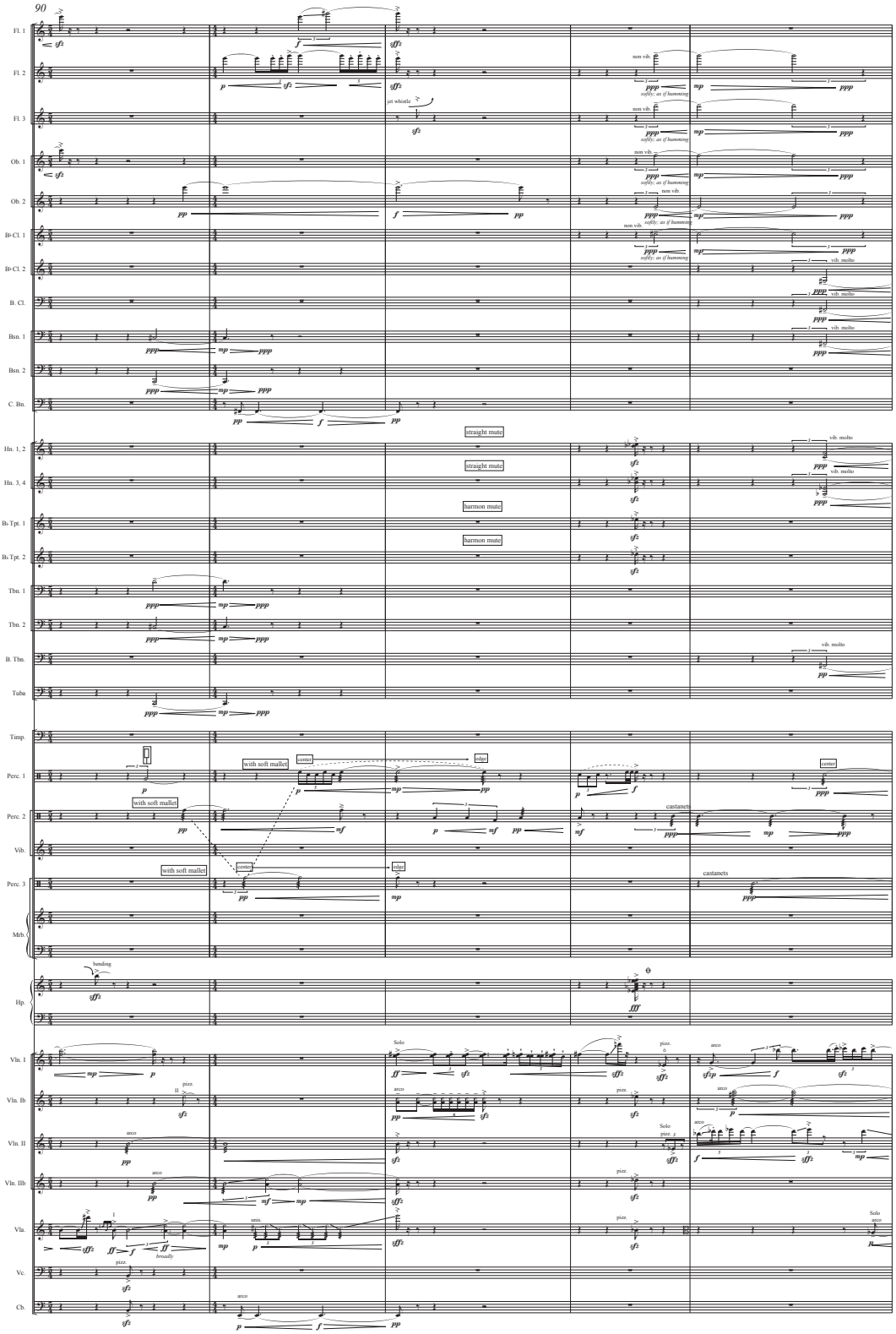

63
G
Picc.
Fl. 2
Fl. 3
Ob. 1
Ob. 2
B♭ Cl. 1
B♭ Cl. 2
B. Cl.
Bsn. 1
Bsn. 2
C. Bn.
Hn. 1, 2
Hn. 3, 4
B♭ Tpt. 1
B♭ Tpt. 2
Tbn. 1
Tbn. 2
B. Tbn.
Tuba
Timp.
Perc. 1
Perc. 2
Vib.
Perc. 3
Mrb.
Hp.
Vln. I
Vln. II
Vla.
Vc.
Cb.
bisbigliando
unis.
airy noise

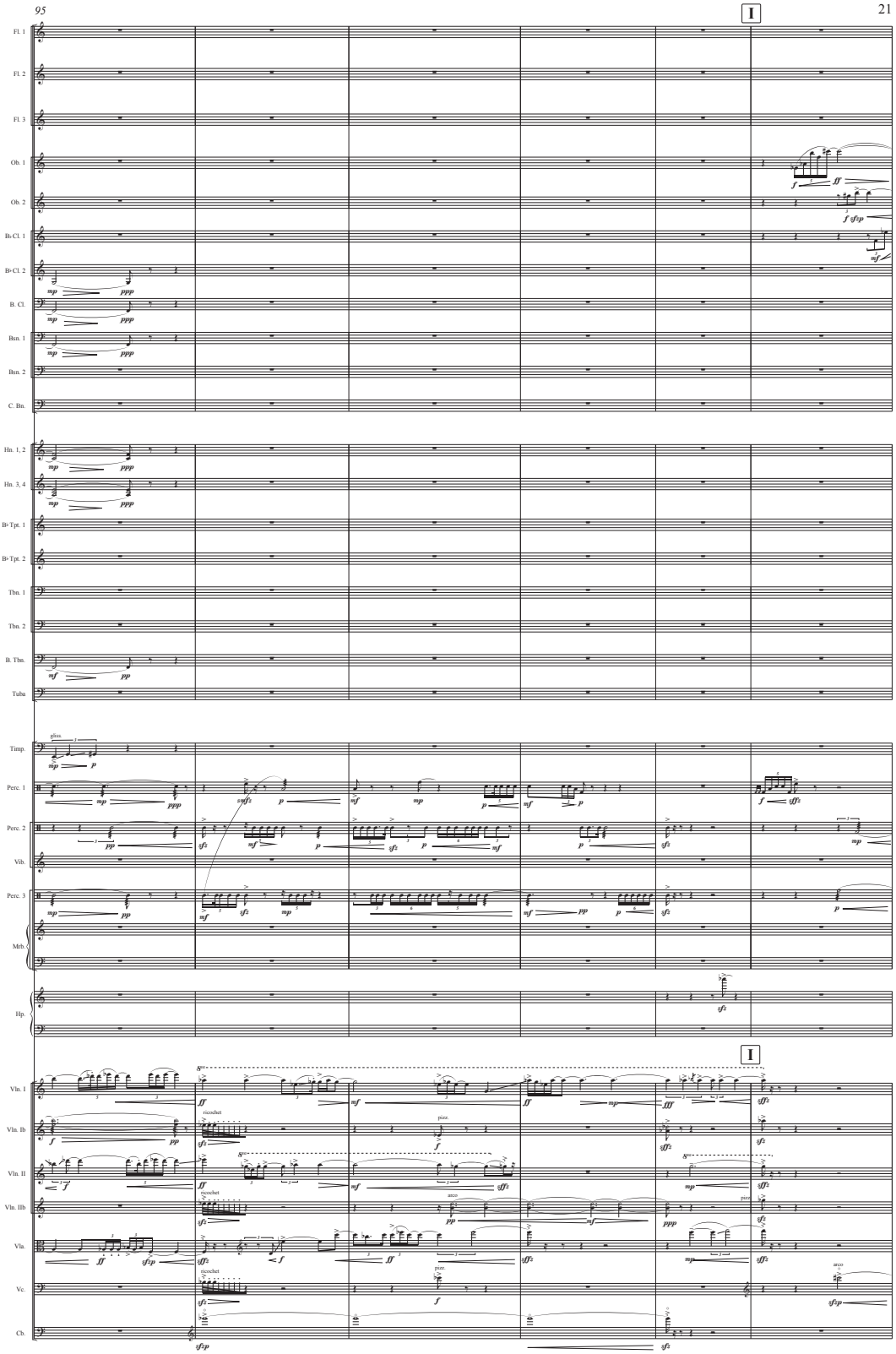

Picc.
Fl. 2
Fl. 3
Ob. 1
Ob. 2
B♭ Cl. 1
B♭ Cl. 2
B. Cl.
Bsn. 1
Bsn. 2
C. Bn.
Hn. 1, 2
Hn. 3, 4
B♭ Tpt. 1
B♭ Tpt. 2
Tbn. 1
Tbn. 2
B. Tbn.
Tuba
Timp.
Perc. 1
Perc. 2
Vib.
Perc. 3
Mrb.
Hp.
Vln. I
Vln. II
Vla.
Vc.
Cb.
with hand
with soft mallet
like pulsations
arco
pizz.

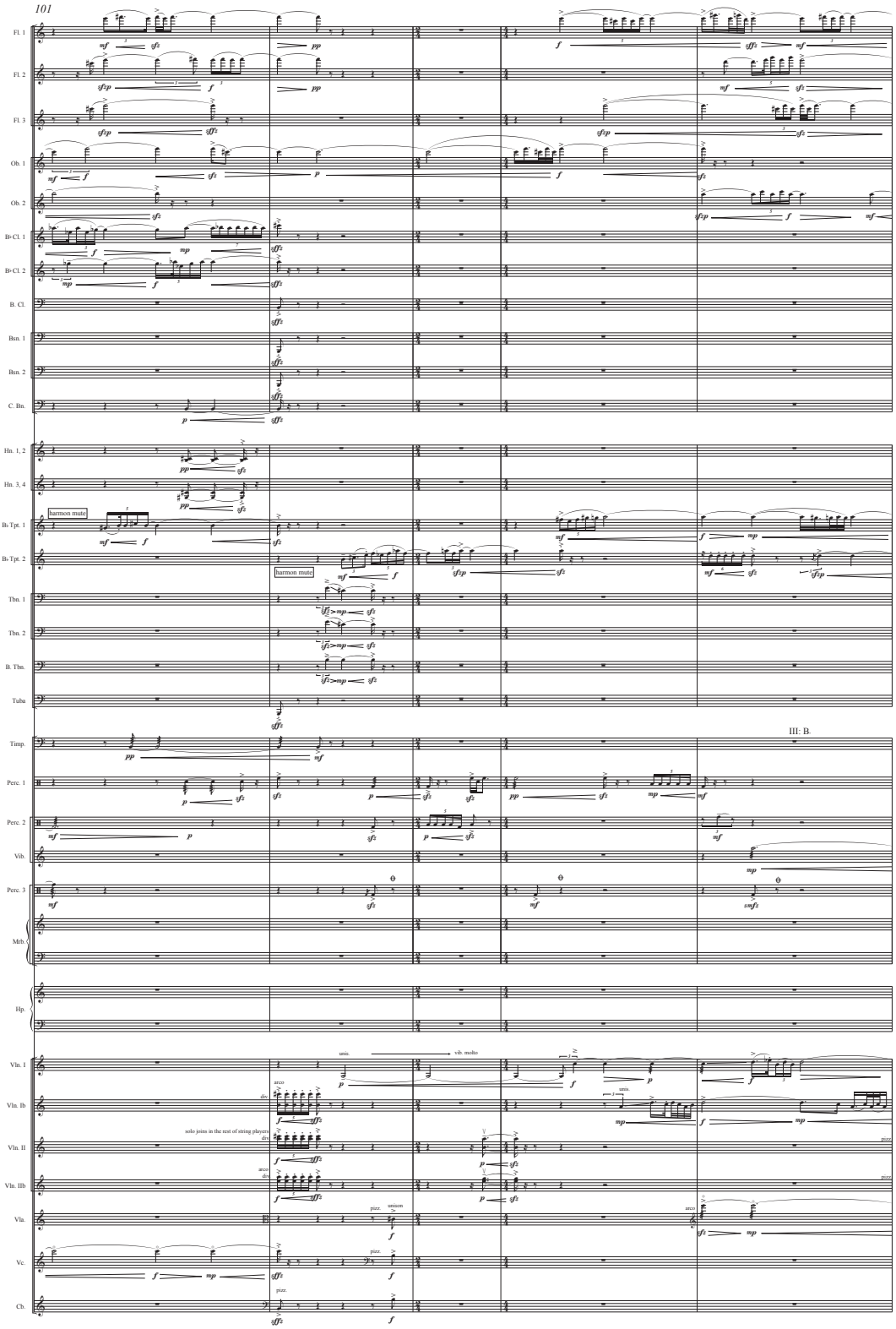

72
to flute
Picc.
Fl. 2
Fl. 3
Ob. 1
Ob. 2
B♭ Cl. 1
B♭ Cl. 2
B. Cl.
Bsn. 1
Bsn. 2
C. Bn.
Hn. 1, 2
Hn. 3, 4
B♭ Tpt. 1
B♭ Tpt. 2
Tbn. 1
Tbn. 2
B. Tbn.
Tuba
Timp.
Perc. 1
Perc. 2
Vib.
Perc. 3
Mrb.
Hp.
bowing
[D♭-D♮]
bowing on the highest note of I string
Vln. I
Vln. II
Vla.
Vc.
Cb.
pizz.

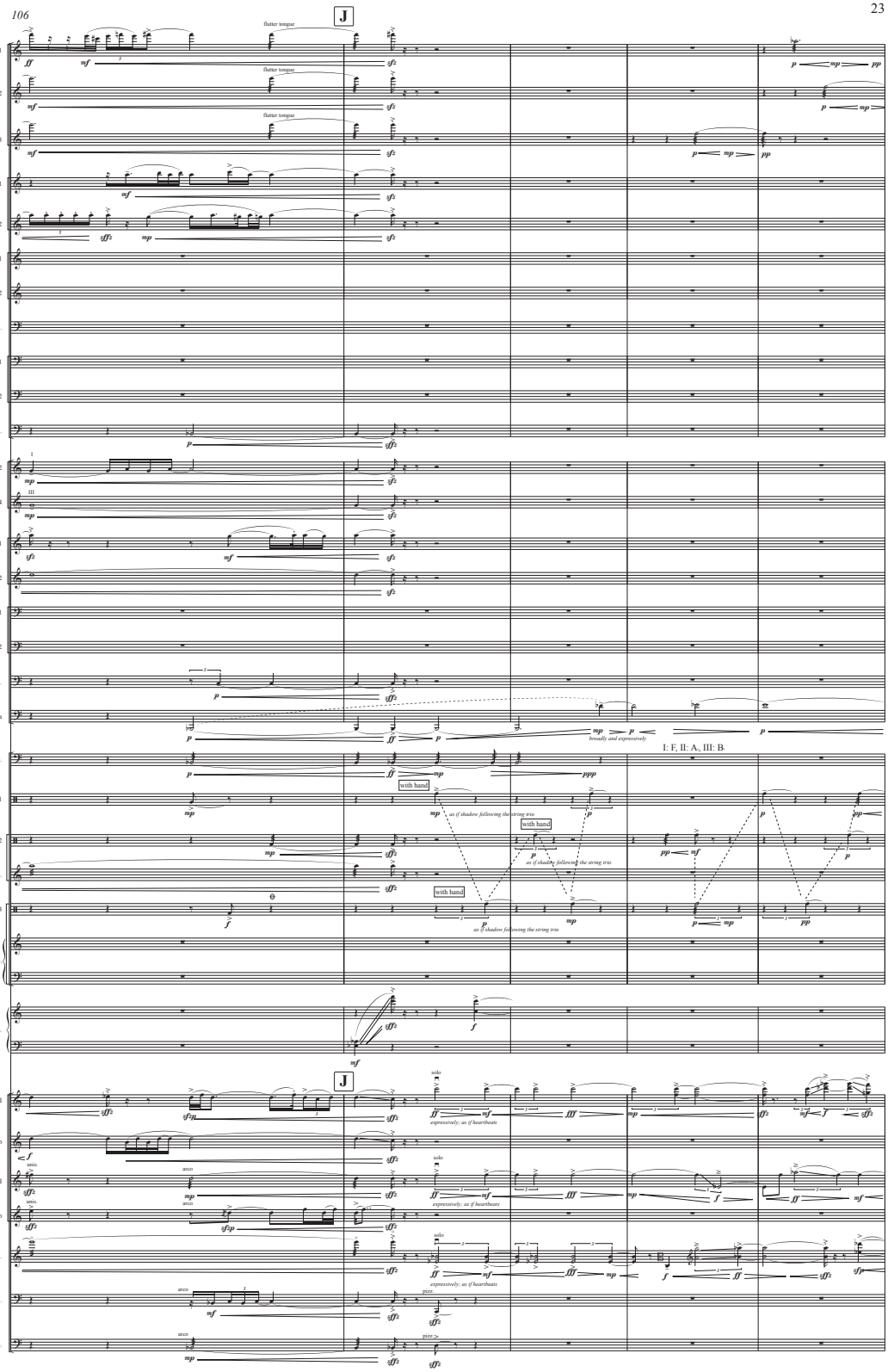

♩= 60
77
Fl. 1
Fl. 2
Fl. 3
Ob. 1
Ob. 2
B♭ Cl. 1
B♭ Cl. 2
B. Cl.
Bsn. 1
Bsn. 2
C. Bn.
Hn. 1, 2
Hn. 3, 4
B♭ Tpt. 1
B♭ Tpt. 2
Tbn. 1
Tbn. 2
B. Tbn.
Tuba
Timp.
Perc. 1
Perc. 2
Vib.
Perc. 3
Mrb.
Hp.
Vln. I
Vln. Ib
Vln. II
Vln. IIb
Vla.
Vc.
Cb.
jet whistle
whistle tone
changing the harmonic partials rapidly
poco
with soft mallet
edge
warmly
morendo
bowing on the highest note of III string
s.p.
ord.
ricochet
arco

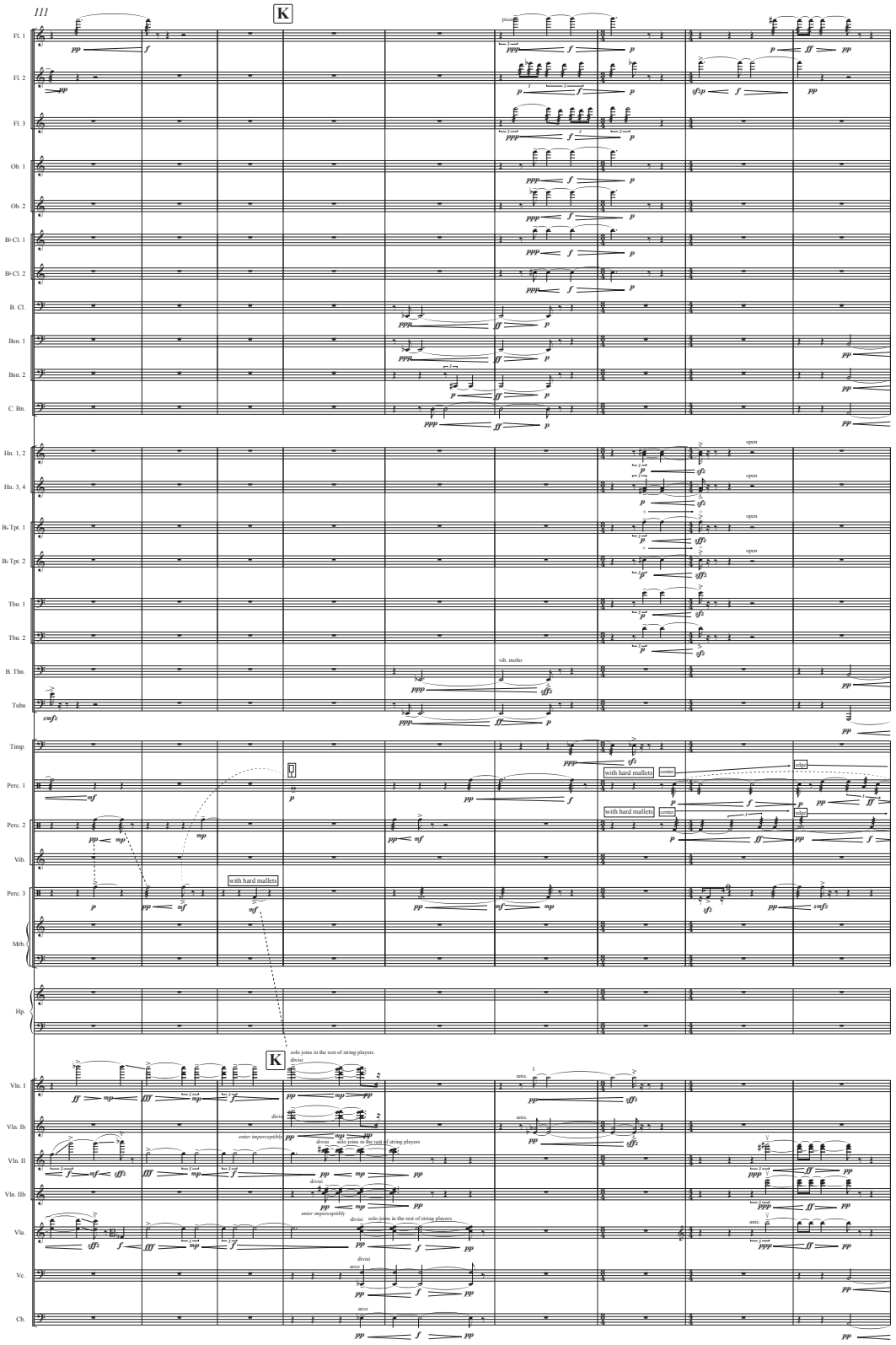

H ♩ = 86 Fragmentary Stories
Fl. 1
Fl. 2
Fl. 3
Ob. 1
Ob. 2
B♭ Cl. 1
B♭ Cl. 2
B. Cl.
Bsn. 1
Bsn. 2
C. Bn.
Hn. 1, 2
Hn. 3, 4
B♭ Tpt. 1
B♭ Tpt. 2
Tbn. 1
Tbn. 2
B. Tbn.
Tuba
Timp.
Perc. 1
Perc. 2
Vib.
Perc. 3
Mrb.
Hp.
with hand
center
bisbigliando
[Cs-O, F-Fs, Es, As]
H ♩ = 86 Fragmentary Stories
Vln. I
Vln. II
Vla.
Vc.
Cb.
Solo
I
II
unison
ricochet
pizz.
arco
ord.
sul pont.
sul tasto
sul vib.
emotionally

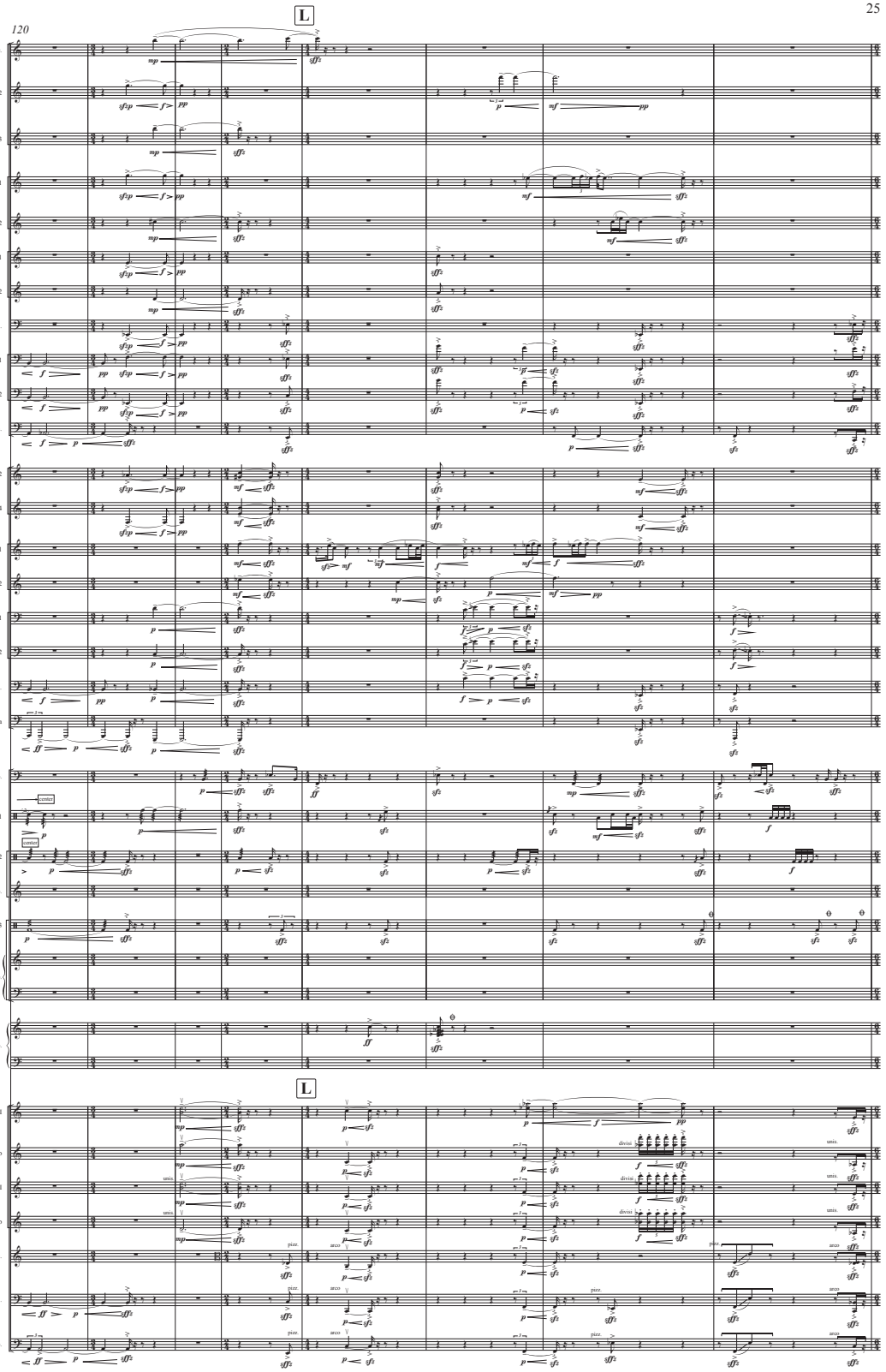

90
Fl. 1
Fl. 2
Fl. 3
Ob. 1
Ob. 2
B♭ Cl. 1
B♭ Cl. 2
B. Cl.
Bsn. 1
Bsn. 2
C. Bn.
Hn. 1, 2
Hn. 3, 4
B♭ Tpt. 1
B♭ Tpt. 2
Tbn. 1
Tbn. 2
B. Tbn.
Tuba
Timp.
Perc. 1
Perc. 2
Vib.
Perc. 3
Mrb.
Hp.
Vln. I
Vln. Ib
Vln. II
Vln. IIb
Vla.
Vc.
Cb.
straight mute
harmon mute
with soft mallet
center
edge
castanets
bending
Solo
pizz.
arco
non vib.
vib. molto
whistle
breadly
unis.

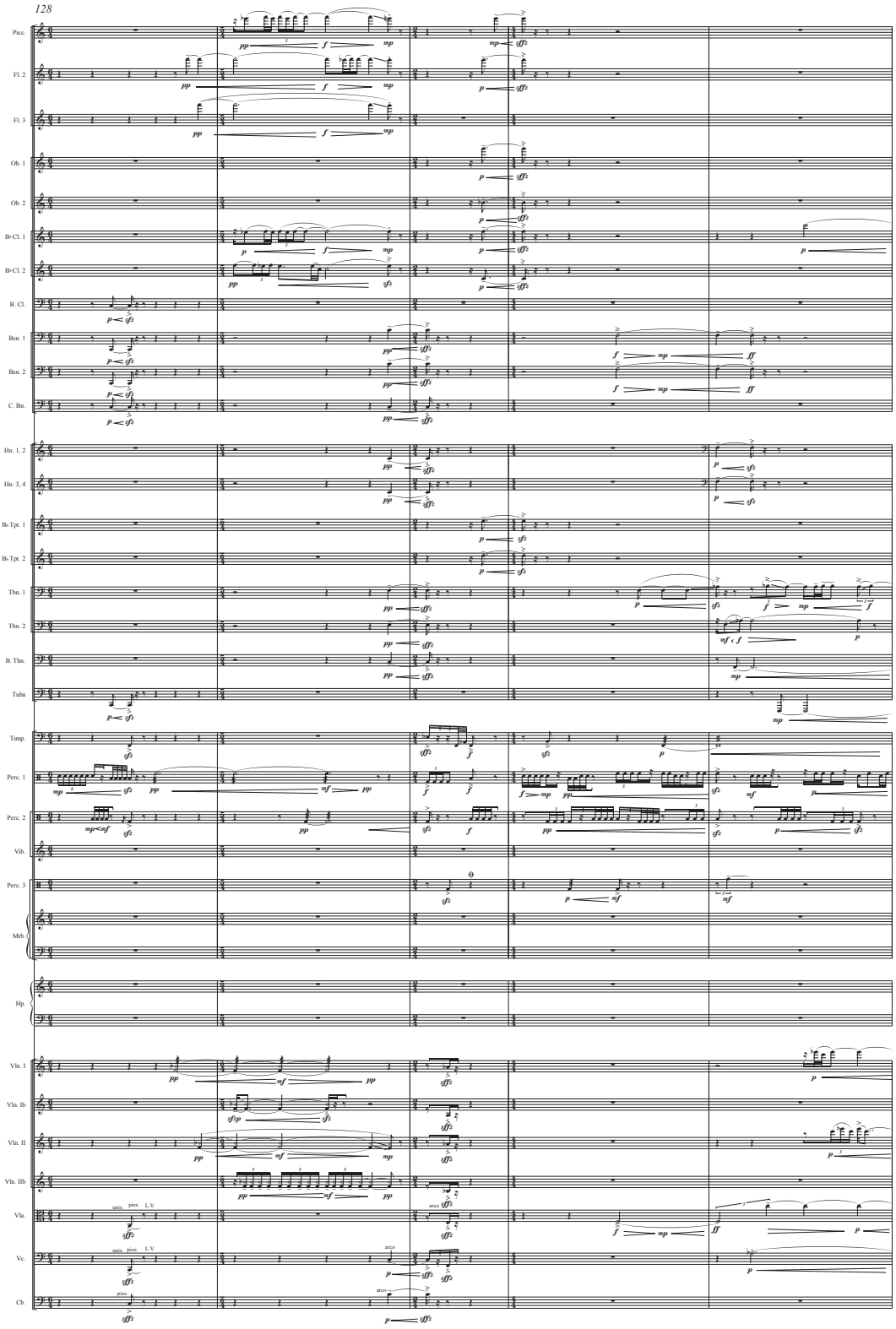

95
I
21
Fl. 1
Fl. 2
Fl. 3
Ob. 1
Ob. 2
B♭ Cl. 1
B♭ Cl. 2
B. Cl.
Bsn. 1
Bsn. 2
C. Bn.
Hn. 1, 2
Hn. 3, 4
B♭ Tpt. 1
B♭ Tpt. 2
Tbn. 1
Tbn. 2
B. Tbn.
Tuba
Timp.
Perc. 1
Perc. 2
Vib.
Perc. 3
Mrb.
Hp.
I
Vln. I
Vln. Ib
Vln. II
Vln. IIb
Vla.
Vc.
Cb.

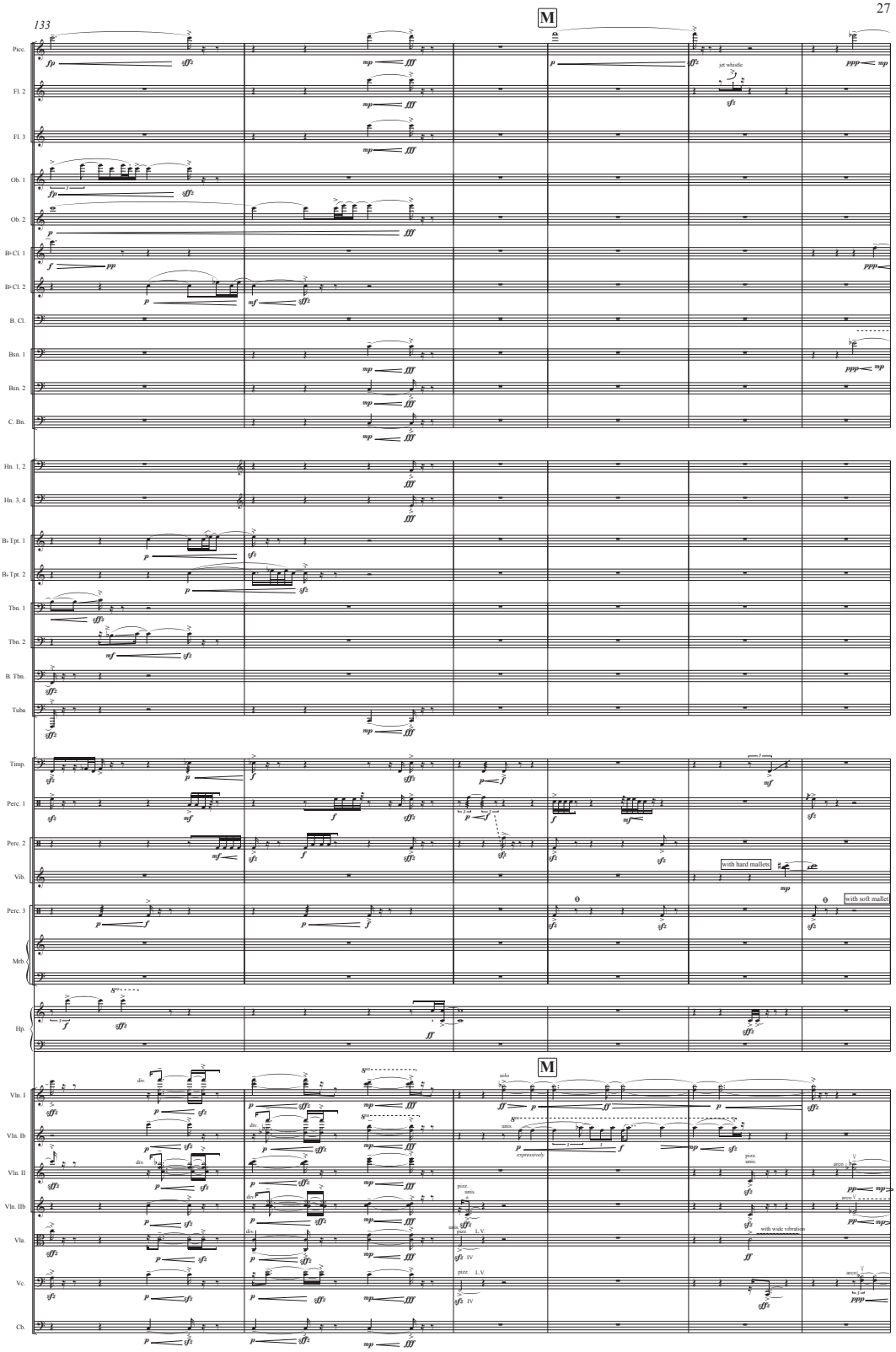

101
Fl. 1
Fl. 2
Fl. 3
Ob. 1
Ob. 2
B♭ Cl. 1
B♭ Cl. 2
B. Cl.
Bsn. 1
Bsn. 2
C. Bn.
Hn. 1, 2
Hn. 3, 4
B♭ Tpt. 1
B♭ Tpt. 2
Tbn. 1
Tbn. 2
B. Tbn.
Tuba
Timp.
Perc. 1
Perc. 2
Vib.
Perc. 3
Mrb.
Hp.
Vln. I
Vln. Ib
Vln. II
Vln. IIb
Vla.
Vc.
Cb.
harmon mute
harmon mute
III: B.
solo joins in the rest of string players
vib. molto
unis.
arco
div.
pizz.
unison

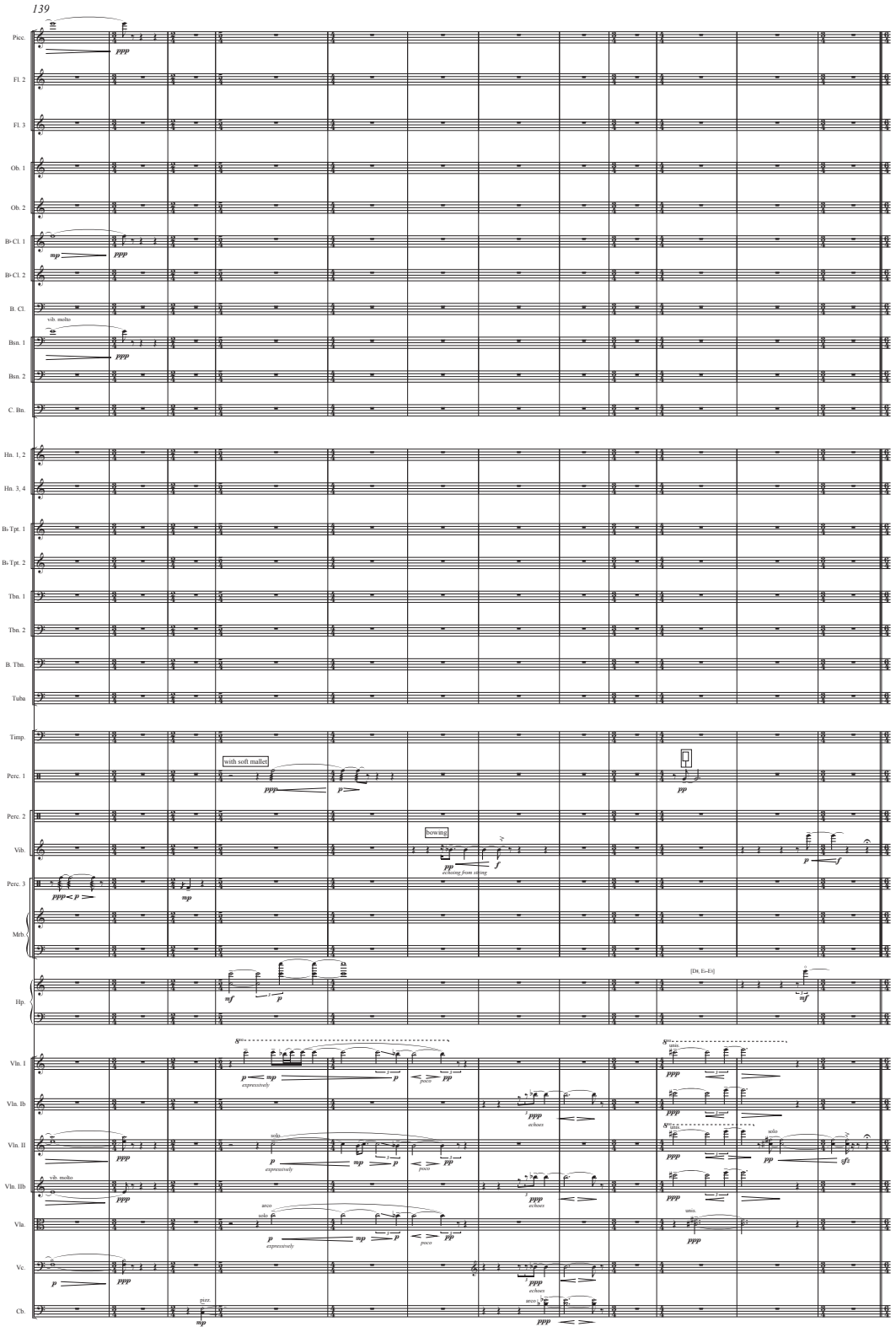

J
Fl. 1
Fl. 2
Fl. 3
Ob. 1
Ob. 2
B♭ Cl. 1
B♭ Cl. 2
B. Cl.
Bsn. 1
Bsn. 2
C. Bsn.
Hn. 1, 2
Hn. 3, 4
B♭ Tpt. 1
B♭ Tpt. 2
Tbn. 1
Tbn. 2
B. Tbn.
Tuba
Timp.
Perc. 1
Perc. 2
Vib.
Perc. 3
Mrb.
Hp.
Vln. I
Vln. Ib
Vln. II
Vln. IIb
Vla.
Vc.
Cb.
flutter tongue
broadly and expressively
I: F, II: A, III: B
with hand
as if shadow following the string trio
solo
expressively; as if heartbeats
arco
pizz.
unis.

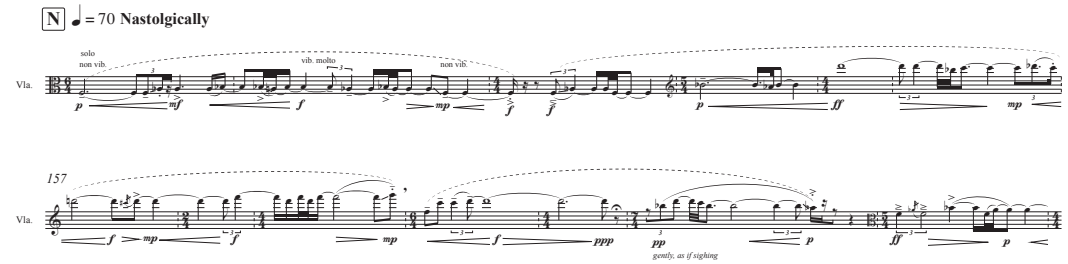

111
K
Fl. 1
Fl. 2
Fl. 3
Ob. 1
Ob. 2
B♭ Cl. 1
B♭ Cl. 2
B. Cl.
Bsn. 1
Bsn. 2
C. Bn.
Hn. 1, 2
Hn. 3, 4
B♭ Tpt. 1
B♭ Tpt. 2
Tbn. 1
Tbn. 2
B. Tbn.
Tuba
Timp.
Perc. 1
Perc. 2
Vib.
Perc. 3
Mrb.
Hp.
Vln. I
Vln. Ib
Vln. II
Vln. IIb
Vla.
Vc.
Cb.
with hard mallets
solo joins in the rest of string players
divisi
unis.
open
vib. molto
arco
enter imperceptibly

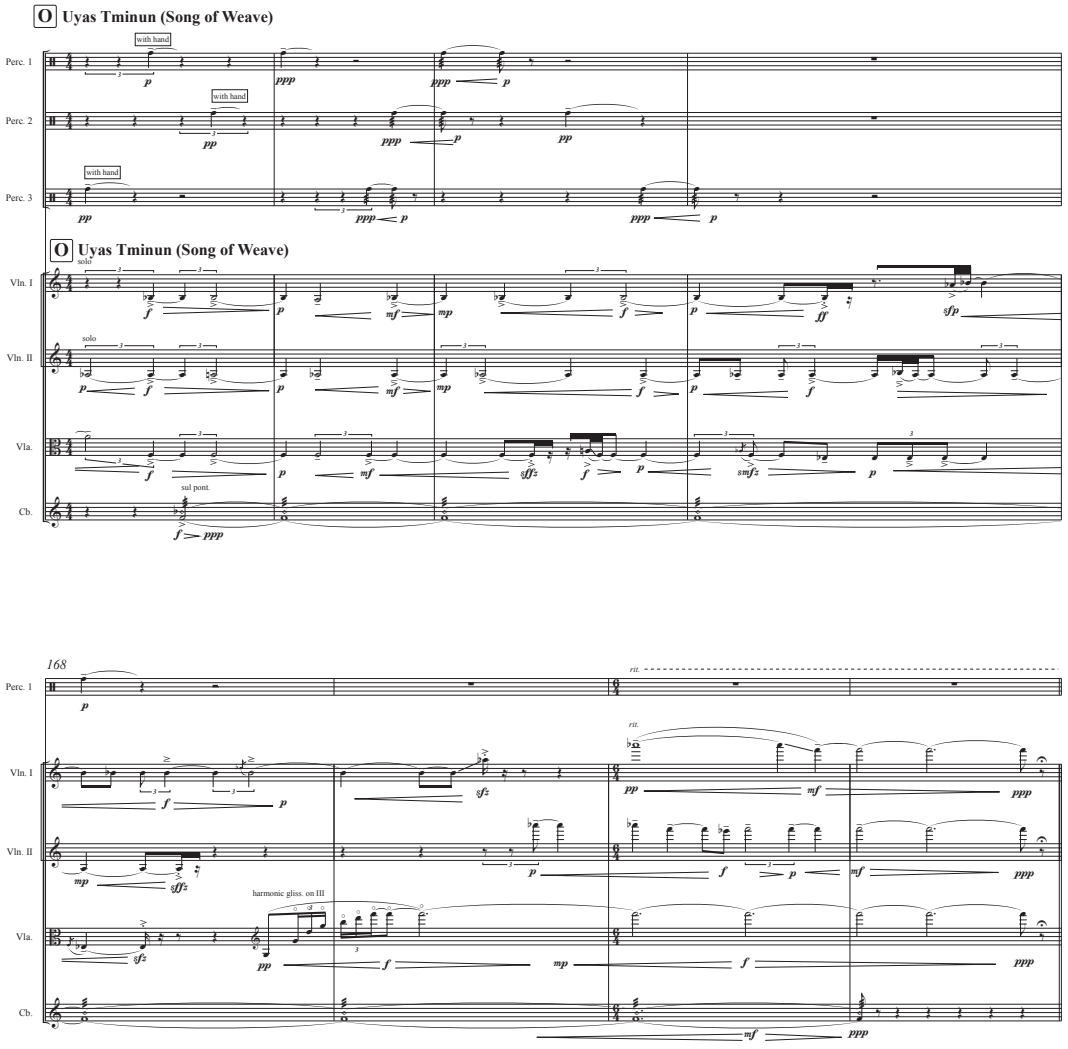

120
L
Picc.
Fl. 2
Fl. 3
Ob. 1
Ob. 2
B♭ Cl. 1
B♭ Cl. 2
B. Cl.
Bsn. 1
Bsn. 2
C. Bn.
Hn. 1, 2
Hn. 3, 4
B♭ Tpt. 1
B♭ Tpt. 2
Tbn. 1
Tbn. 2
B. Tbn.
Tuba
Timp.
Perc. 1
Perc. 2
Vib.
Perc. 3
Mrb.
Hp.
L
Vln. I
Vln. Ib
Vln. II
Vln. IIb
Vla.
Vc.
Cb.


128
Picc.
Fl. 2
Fl. 3
Ob. 1
Ob. 2
B♭ Cl. 1
B♭ Cl. 2
B. Cl.
Bsn. 1
Bsn. 2
C. Bn.
Hn. 1, 2
Hn. 3, 4
B♭ Tpt. 1
B♭ Tpt. 2
Tbn. 1
Tbn. 2
B. Tbn.
Tuba
Timp.
Perc. 1
Perc. 2
Vib.
Perc. 3
Mrb.
Hp.
Vln. I
Vln. Ib
Vln. II
Vln. IIb
Vla.
Vc.
Cb.


133
M
Picc.
Fl. 2
Fl. 3
Ob. 1
Ob. 2
B♭ Cl. 1
B♭ Cl. 2
B. Cl.
Bsn. 1
Bsn. 2
C. Bn.
Hn. 1, 2
Hn. 3, 4
B♭ Tpt. 1
B♭ Tpt. 2
Tbn. 1
Tbn. 2
B. Tbn.
Tuba
Timp.
Perc. 1
Perc. 2
Vib.
Perc. 3
Mrb.
Hp.
jet whistle
with hard mallets
with soft mallet
M
Vln. I
Vln. Ib
Vln. II
Vln. IIb
Vla.
Vc.
Cb.
div.
unis.
solo
pizz.
arco
with wide vibration


139
Picc.
Fl. 2
Fl. 3
Ob. 1
Ob. 2
B♭ Cl. 1
B♭ Cl. 2
B. Cl.
vib. molto
Bsn. 1
Bsn. 2
C. Bsn.
Hn. 1, 2
Hn. 3, 4
B♭ Tpt. 1
B♭ Tpt. 2
Tbn. 1
Tbn. 2
B. Tbn.
Tuba
Timp.
Perc. 1
with soft mallet
Perc. 2
Vib.
bowing
echoing from strong
Perc. 3
Mrb.
Hp.
[D♮, E♭-E♮]
Vln. I
Vln. Ib
Vln. II
Vln. IIb
Vla.
Vc.
Cb.
expressively
poco
echoes
solo
arco
pizz.
unis.


N
= 70 Nastolgically
Vla.
solo
non vib.
vib. molto
non vib.
157
gently, as if sighing


O Uyas Tminun (Song of Weave)
Perc. 1
Perc. 2
Perc. 3
with hand
O Uyas Tminun (Song of Weave)
Vln. I
Vln. II
Vla.
Cb.
solo
sul pont.

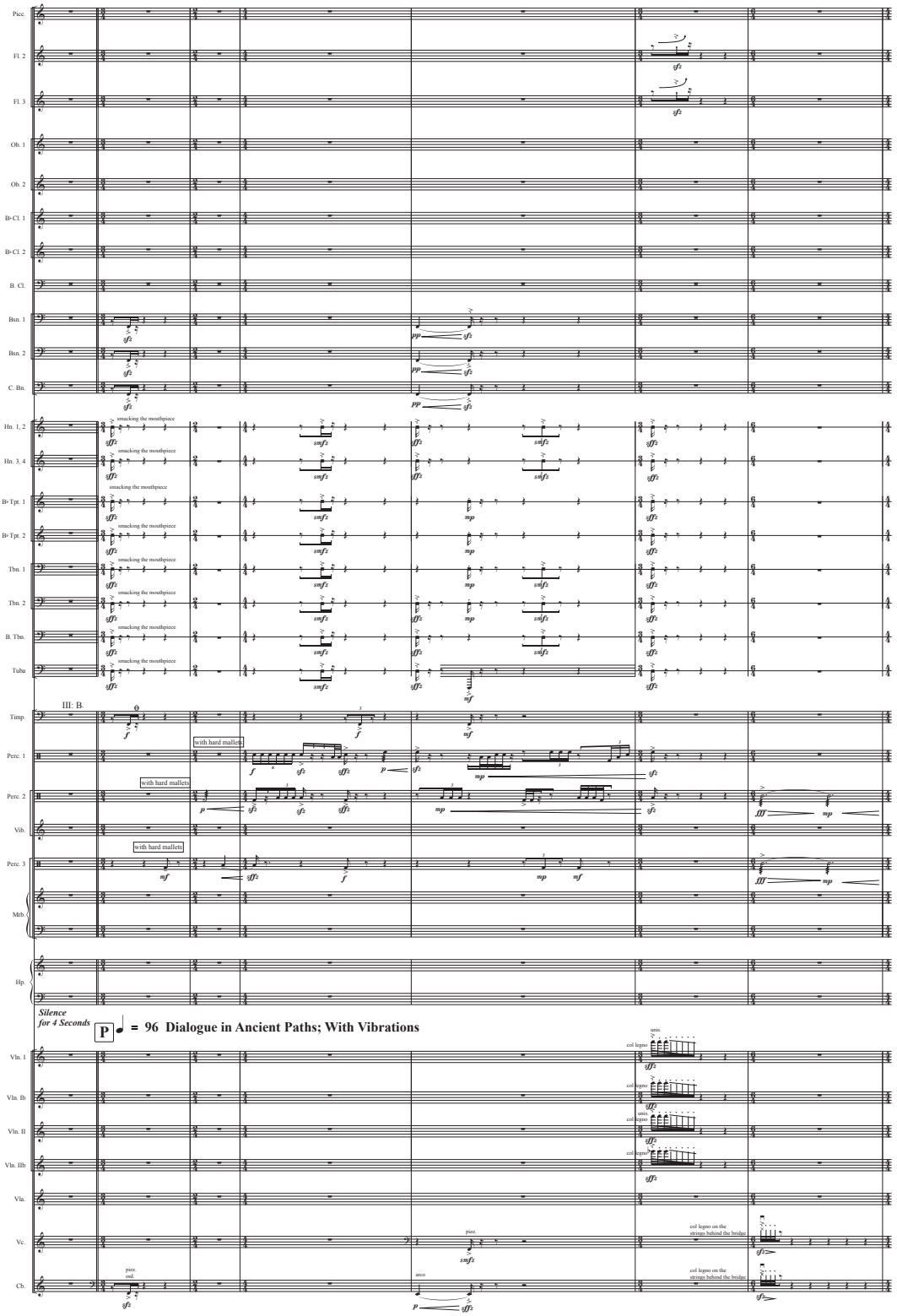
168
Perc. 1
Vln. I
Vln. II
Vla.
Cb.
rit.
harmonic gliss. on III

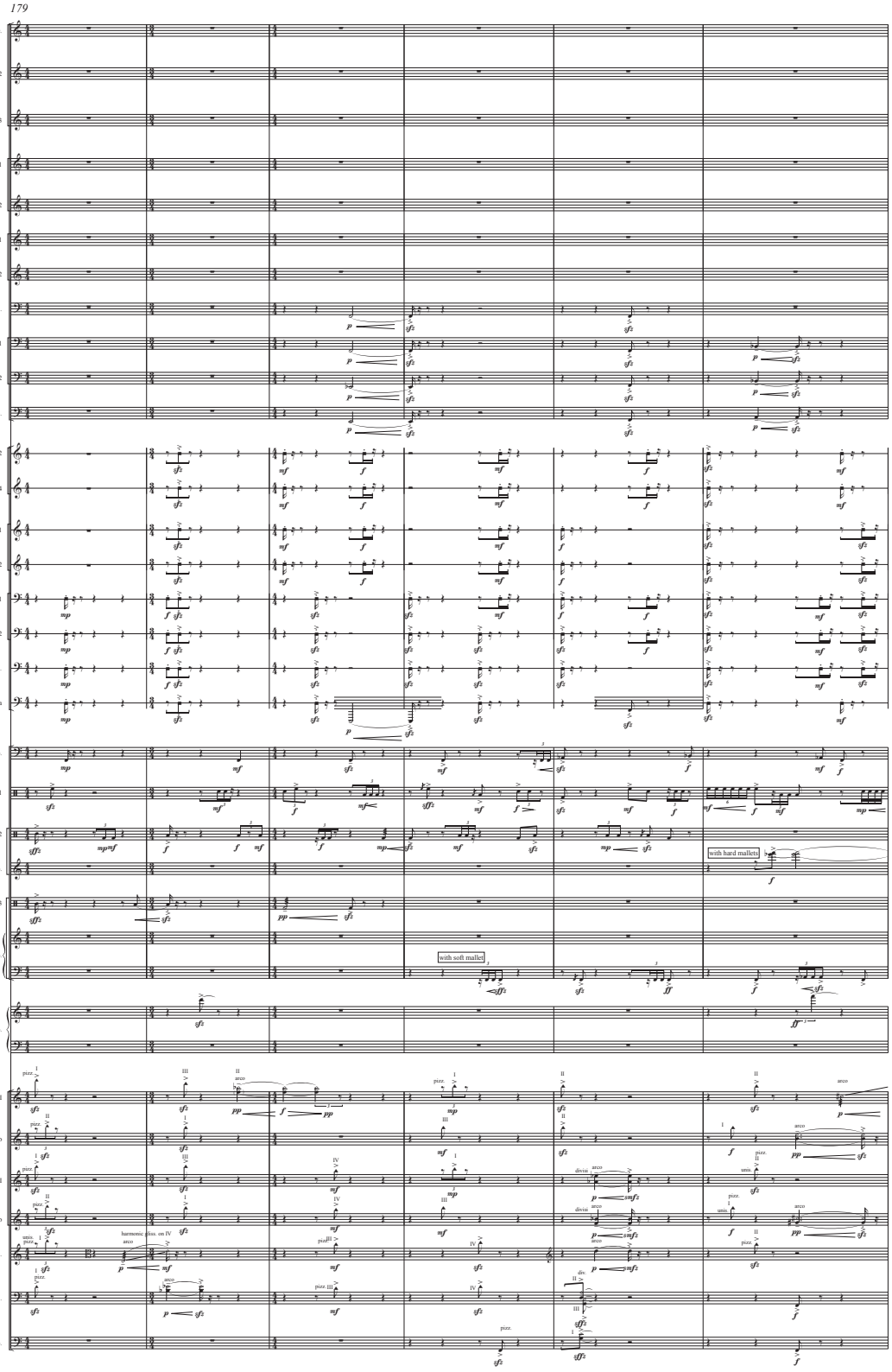
30

Silence for 4 Seconds

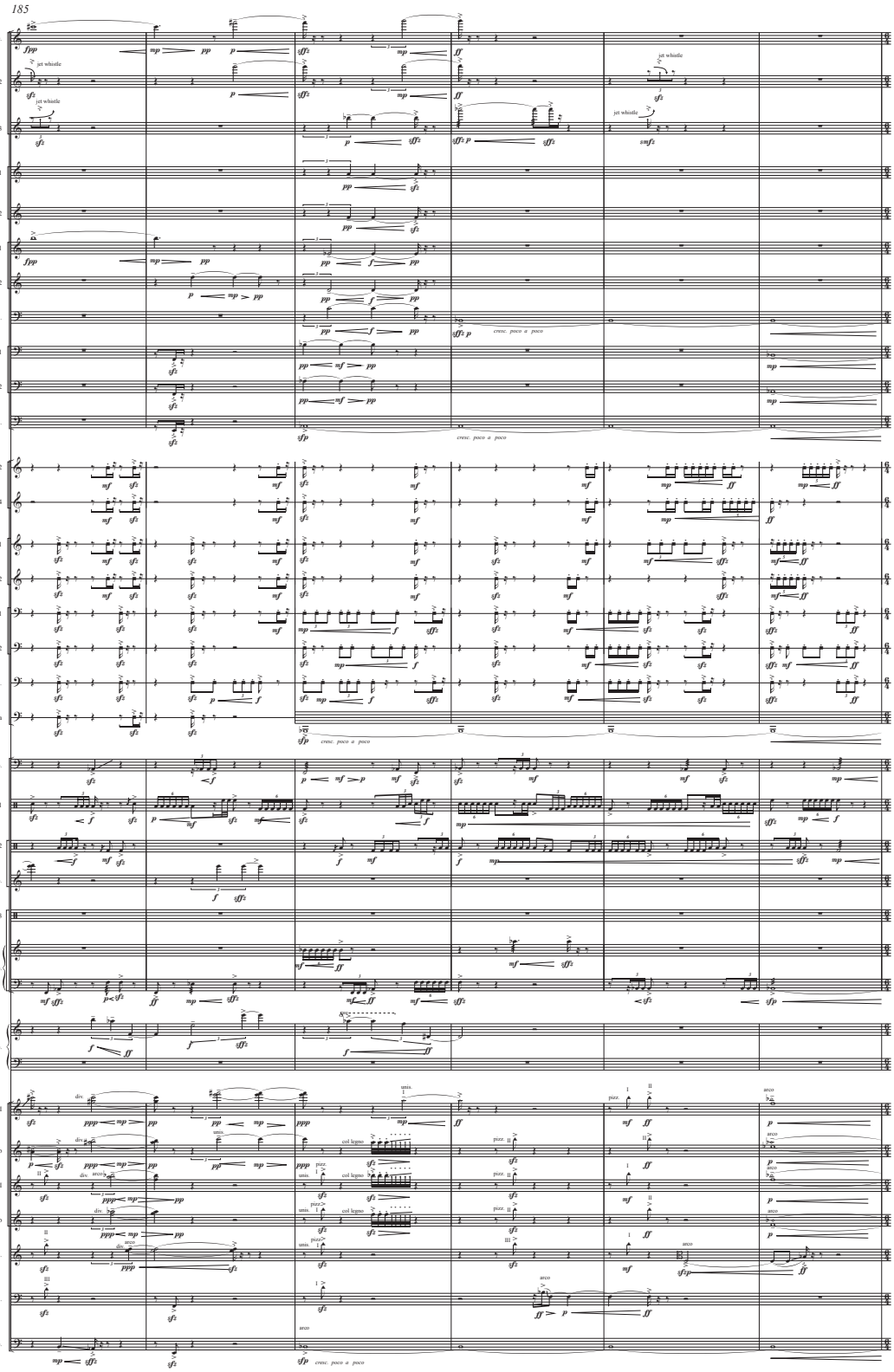
172

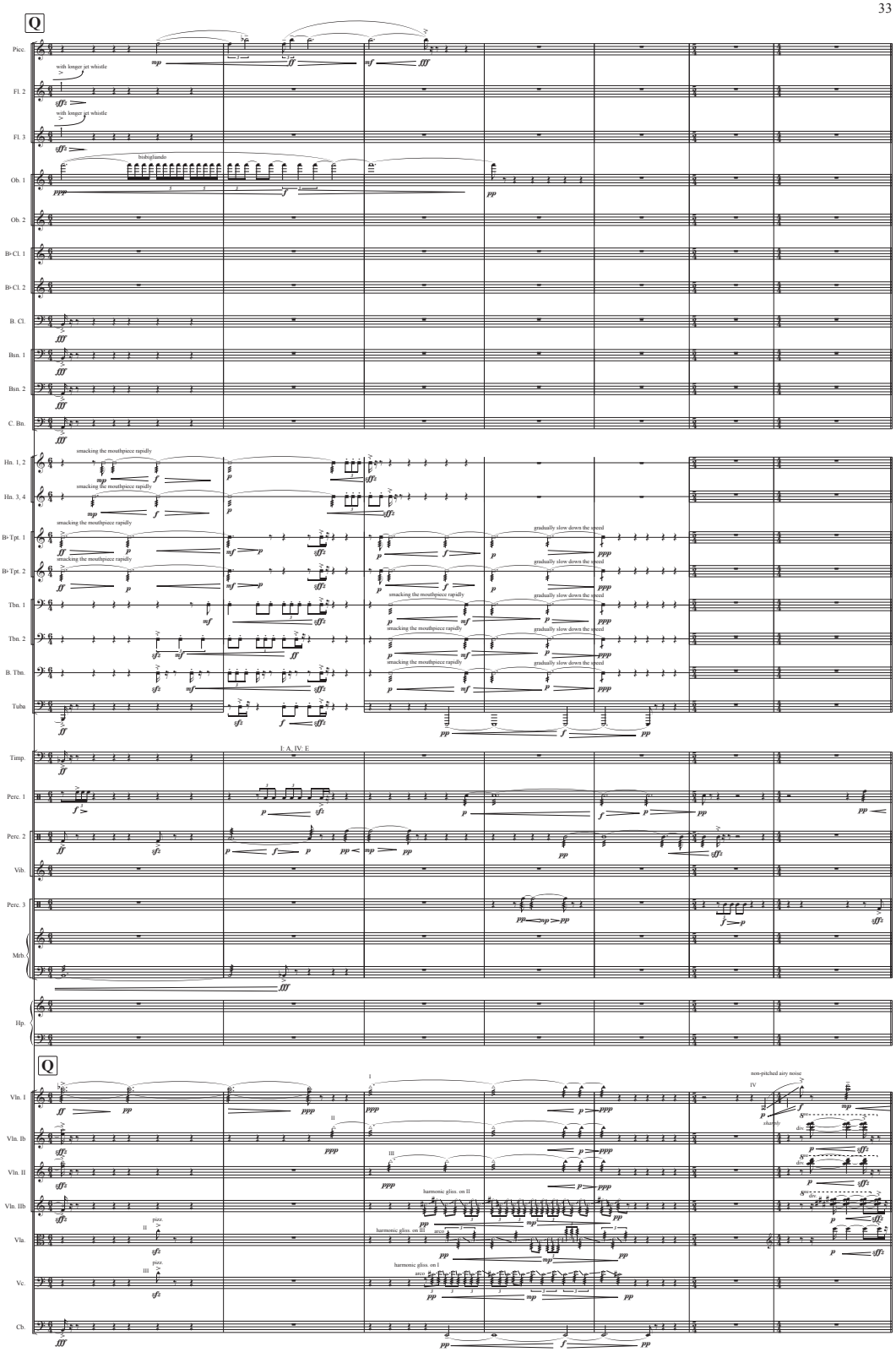
P = 96 **Dialogue in Ancient Paths; With Vibrations**




179
Picc.
Fl. 2
Fl. 3
Ob. 1
Ob. 2
B♭ Cl. 1
B♭ Cl. 2
B. Cl.
Bsn. 1
Bsn. 2
C. Bn.
Hn. 1, 2
Hn. 3, 4
B♭ Tpt. 1
B♭ Tpt. 2
Tbn. 1
Tbn. 2
B. Tbn.
Tuba
Timp.
Perc. 1
Perc. 2
Vib.
Perc. 3
Mrb.
with soft mallet
with hard mallets
Hp.
Vln. I
Vln. Ib
Vln. II
Vln. IIb
Vla.
Vc.
Cb.

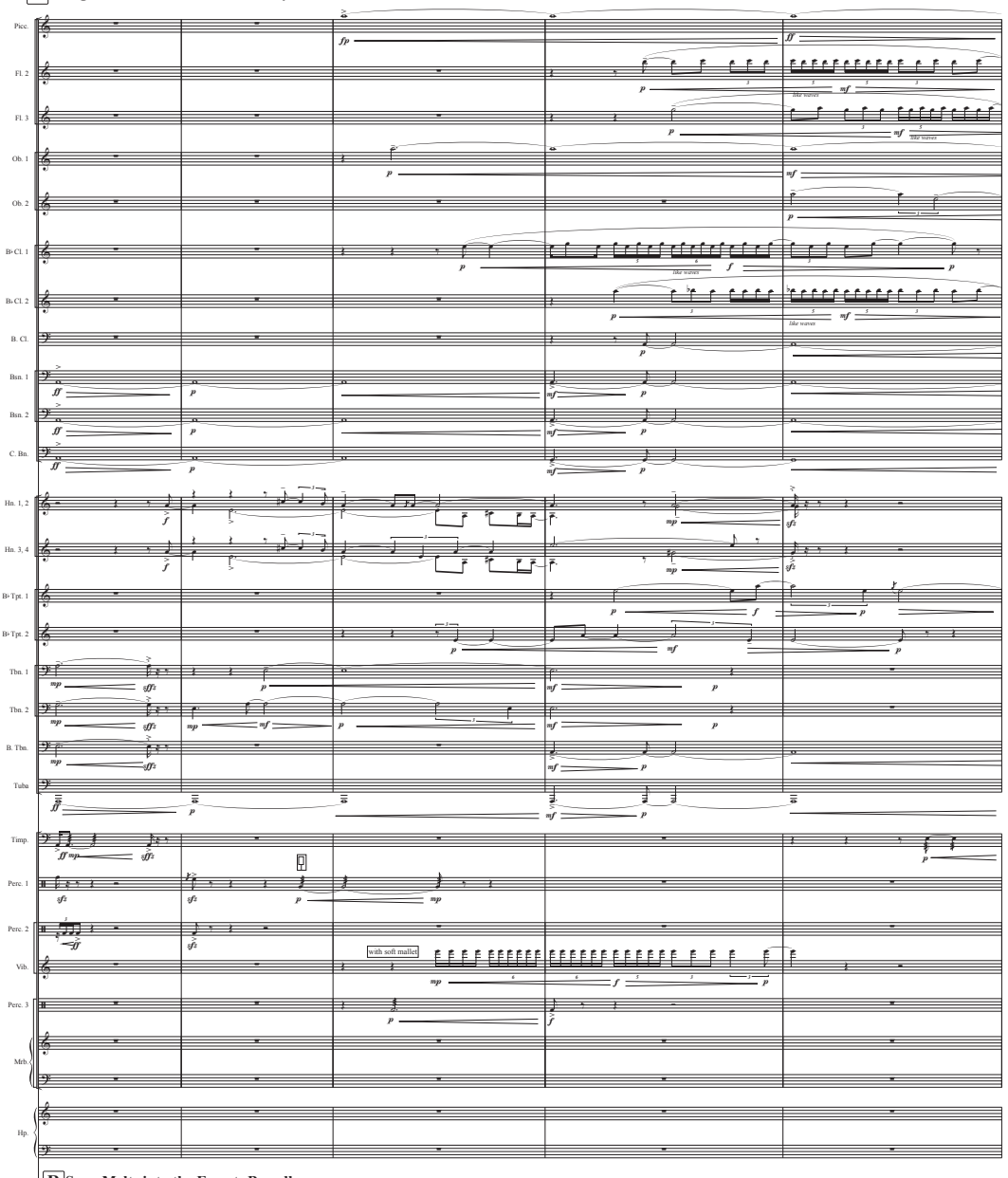
32


185
Picc.
Fl. 2
Fl. 3
Ob. 1
Ob. 2
B♭ Cl. 1
B♭ Cl. 2
B. Cl.
Bsn. 1
Bsn. 2
C. Bn.
Hn. 1, 2
Hn. 3, 4
B♭ Tpt. 1
B♭ Tpt. 2
Tbn. 1
Tbn. 2
B. Tbn.
Tuba
Timp.
Perc. 1
Perc. 2
Vib.
Perc. 3
Mrb.
Hp.
Vln. I
Vln. Ib
Vln. II
Vln. IIb
Vla.
Vc.
Cb.
jet whistle
crenc. poco a poco
div.
unis.
col legno
pizz.
arco

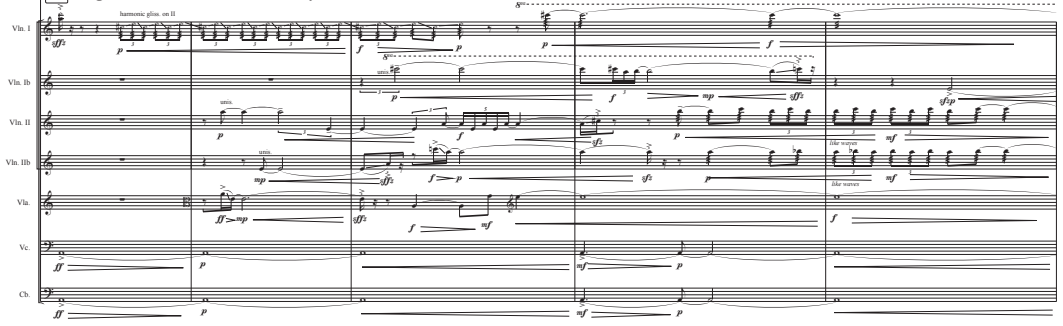

Q
Picc.
with longer jet whistle
Fl. 2
with longer jet whistle
Fl. 3
bisbigliando
Ob. 1
Ob. 2
B♭ Cl. 1
B♭ Cl. 2
B. Cl.
Bsn. 1
Bsn. 2
C. Bn.
Hn. 1, 2
smacking the mouthpiece rapidly
Hn. 3, 4
smacking the mouthpiece rapidly
B♭ Tpt. 1
smacking the mouthpiece rapidly
B♭ Tpt. 2
smacking the mouthpiece rapidly
Tbn. 1
Tbn. 2
B. Tbn.
Tuba
gradually slow down the speed
Timp.
I, A, IV, E
Perc. 1
Perc. 2
Vib.
Perc. 3
Mrb.
Hp.
Q
Vln. I
Vln. Ib
Vln. II
Vln. IIb
Vla.
Vc.
Cb.
non-pitched airy noise
harmonic gliss. on II
harmonic gliss. on III
harmonic gliss. on I
arco
pizz.

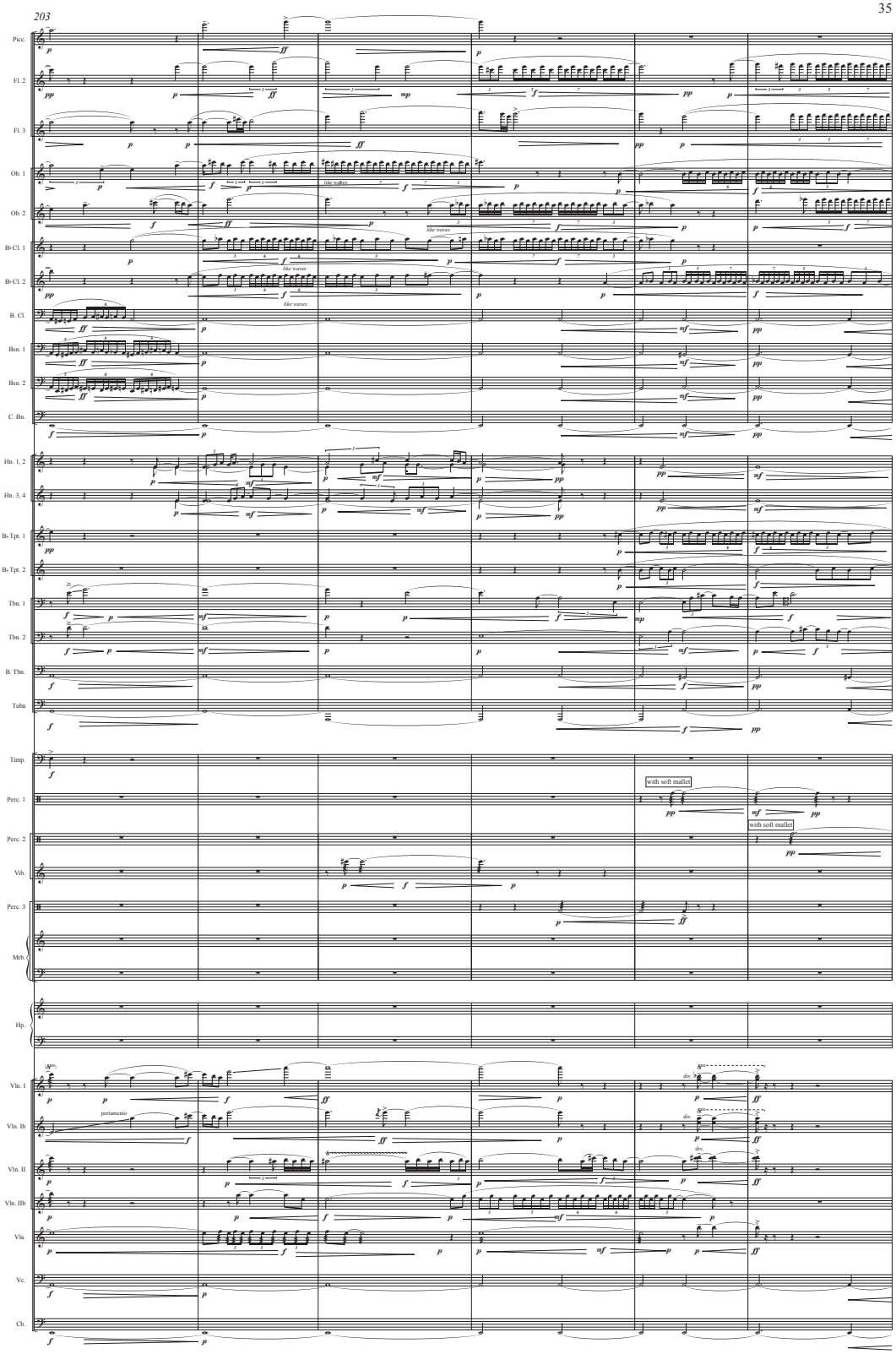
34

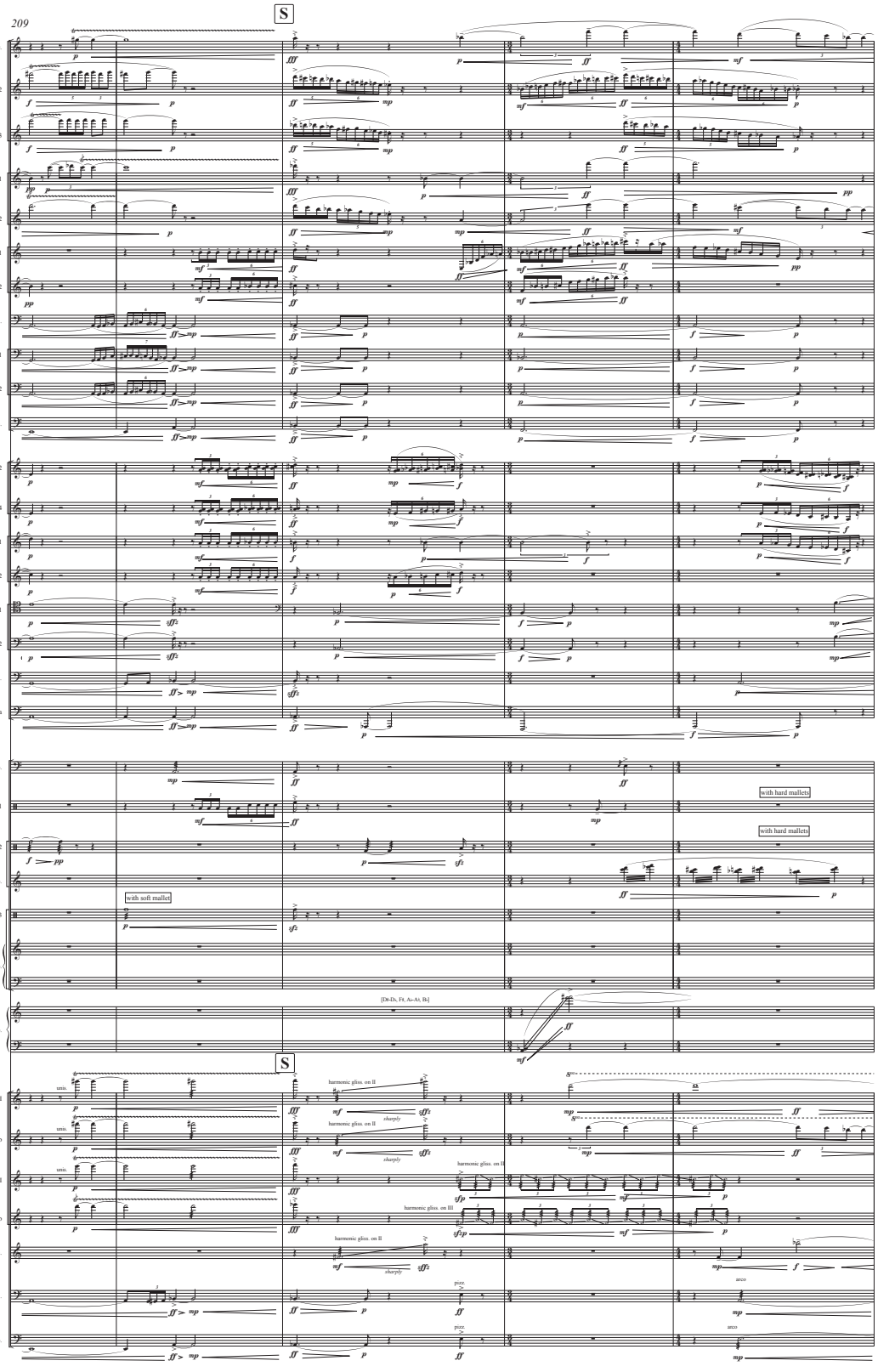
R **Song Melts into the Forest; Broadly**

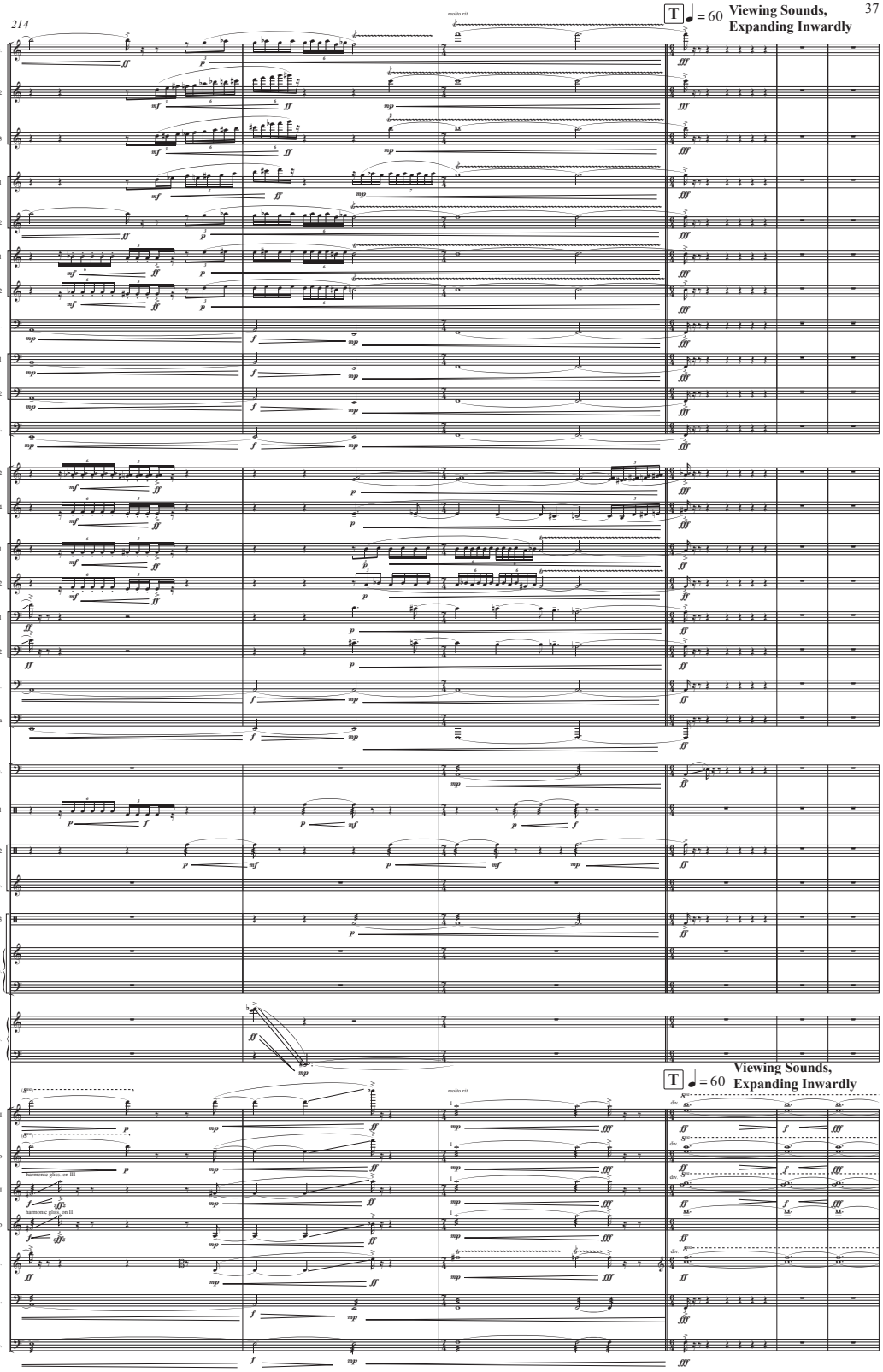


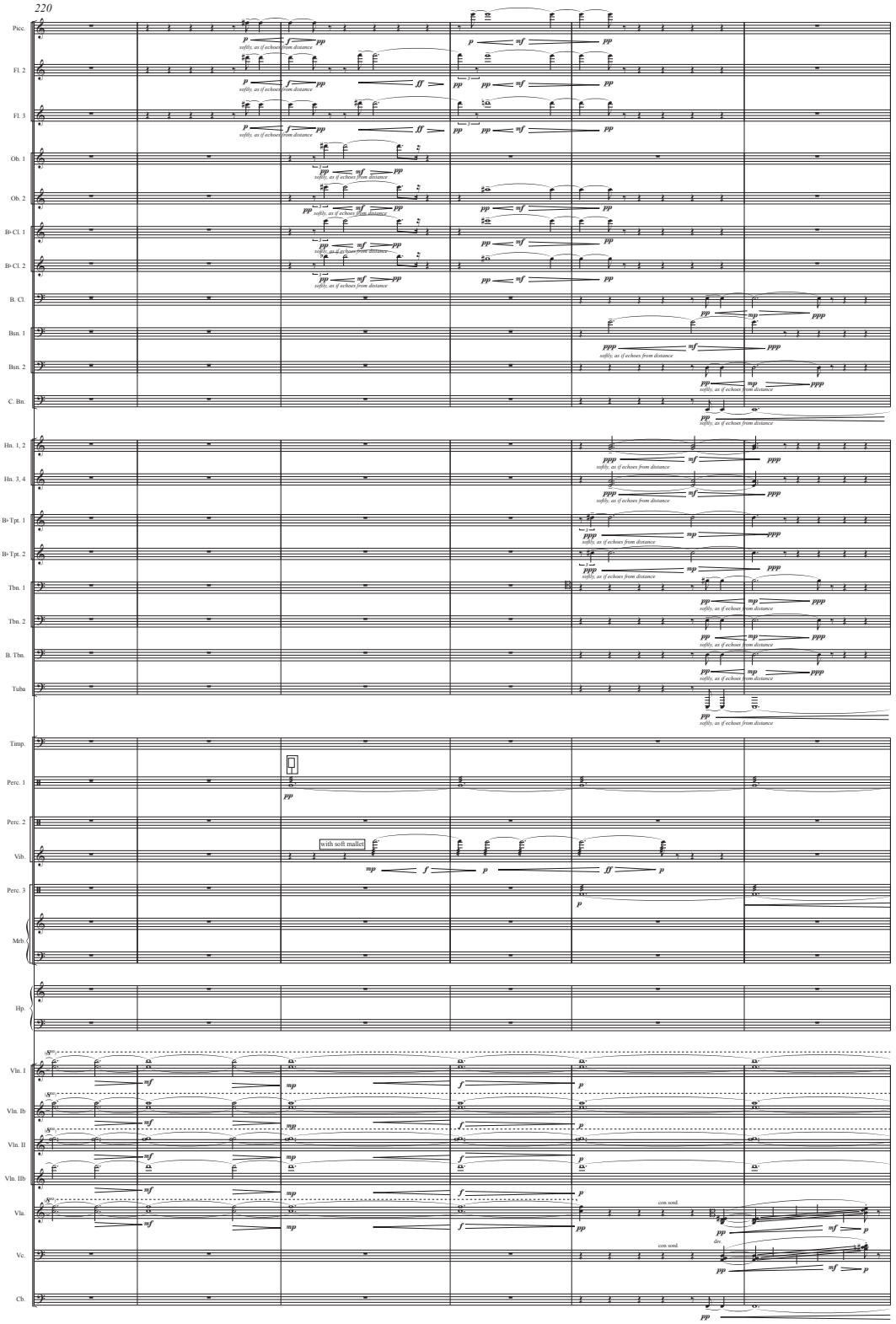
R **Song Melts into the Forest; Broadly**

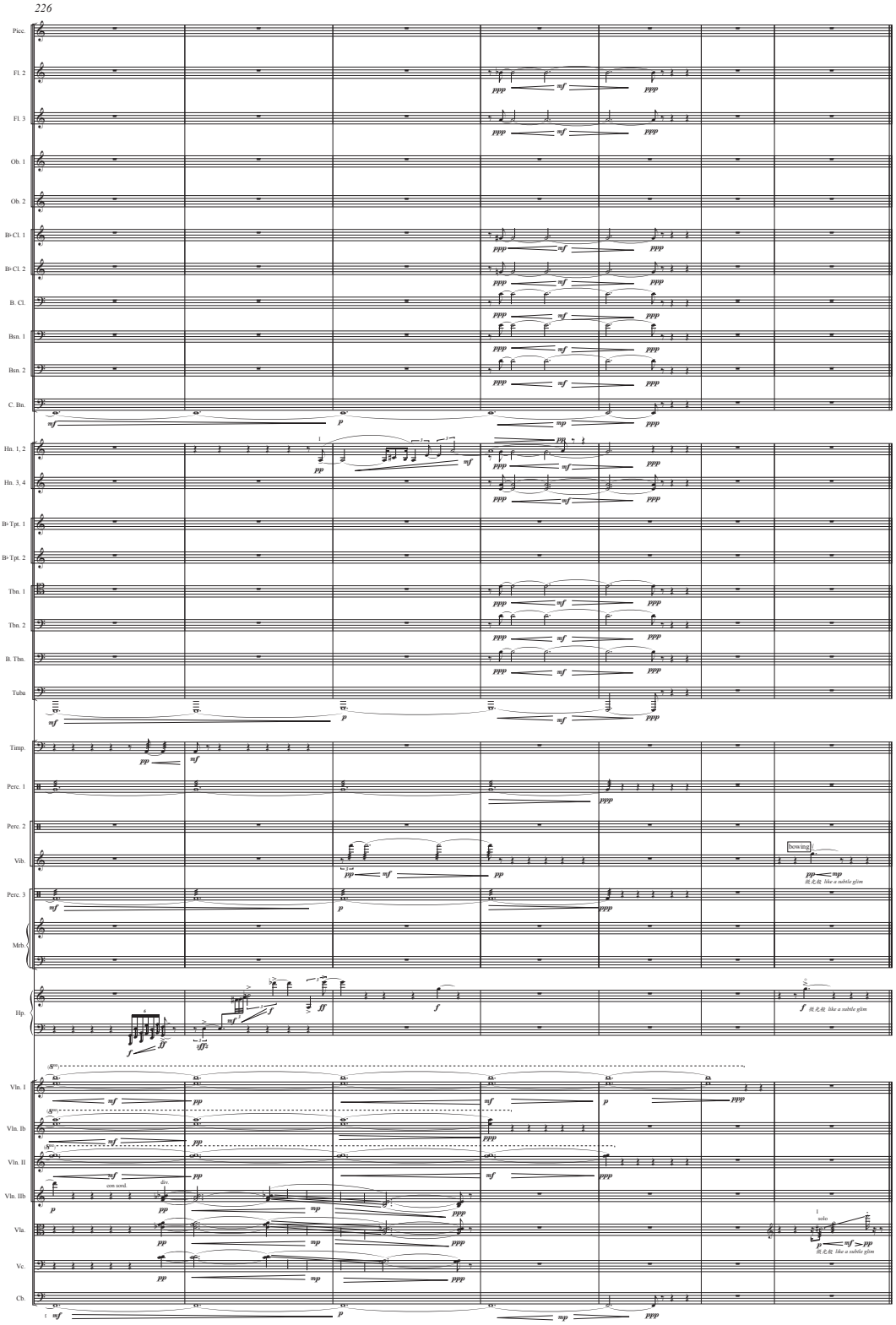



203
Picc.
Fl. 2
Fl. 3
Ob. 1
Ob. 2
B♭ Cl. 1
B♭ Cl. 2
B. Cl.
Bsn. 1
Bsn. 2
C. Bn.
Hn. 1, 2
Hn. 3, 4
B♭ Tpt. 1
B♭ Tpt. 2
Tbn. 1
Tbn. 2
B. Tbn.
Tuba
Timp.
Perc. 1
Perc. 2
Vib.
Perc. 3
Mrb.
Hp.
Vln. I
Vln. Ib
Vln. II
Vln. IIb
Vla.
Vc.
Cb.
with soft mallet
with soft mallet
like warrez
like warrez
like warrez
like mallets
portamento
div.
div.
div.


209
S
Picc.
Fl. 2
Fl. 3
Ob. 1
Ob. 2
B♭ Cl. 1
B♭ Cl. 2
B. Cl.
Bsn. 1
Bsn. 2
C. Bn.
Hn. 1, 2
Hn. 3, 4
B♭ Tpt. 1
B♭ Tpt. 2
Tbn. 1
Tbn. 2
B. Tbn.
Tuba
Timp.
Perc. 1
Perc. 2
Vib.
Perc. 3
Mrb.
Hp.
[Db-Ds, Fs, As-A♮, Bs]
with hard mallets
with hard mallets
with soft mallet
S
Vln. I
Vln. Ib
Vln. II
Vln. IIb
Vla.
Vc.
Cb.
unis.
harmonic gliss. on II
sharply
harmonic gliss. on III
pizz.
arco


214
molto rit.
T ♩ = 60 Viewing Sounds, Expanding Inwardly
Picc.
Fl. 2
Fl. 3
Ob. 1
Ob. 2
B♭ Cl. 1
B♭ Cl. 2
B. Cl.
Bsn. 1
Bsn. 2
C. Bsn.
Hn. 1, 2
Hn. 3, 4
B♭ Tpt. 1
B♭ Tpt. 2
Tbn. 1
Tbn. 2
B. Tbn.
Tuba
Timp.
Perc. 1
Perc. 2
Vib.
Perc. 3
Mrb.
Hp.
molto rit.
T ♩ = 60 Viewing Sounds, Expanding Inwardly
Vln. I
Vln. Ib
Vln. II
harmonic gliss. on III
harmonic gliss. on II
Vln. IIb
Vla.
Vc.
Cb.


220
Picc.
Fl. 2
Fl. 3
Ob. 1
Ob. 2
B♭ Cl. 1
B♭ Cl. 2
B. Cl.
Bsn. 1
Bsn. 2
C. Bn.
Hn. 1, 2
Hn. 3, 4
B♭ Tpt. 1
B♭ Tpt. 2
Tbn. 1
Tbn. 2
B. Tbn.
Tuba
Timp.
Perc. 1
Perc. 2
Vib.
Perc. 3
Mrb.
Hp.
Vln. I
Vln. Ib
Vln. II
Vln. IIb
Vla.
Vc.
Cb.
softly, as if echoes from distance
with soft mallet
con sord.
div.


226
Picc.
Fl. 2
Fl. 3
Ob. 1
Ob. 2
B♭ Cl. 1
B♭ Cl. 2
B. Cl.
Bsn. 1
Bsn. 2
C. Bn.
Hn. 1, 2
Hn. 3, 4
B♭ Tpt. 1
B♭ Tpt. 2
Tbn. 1
Tbn. 2
B. Tbn.
Tuba
Timp.
Perc. 1
Perc. 2
Vib.
Perc. 3
Mrb.
Hp.
Vln. I
Vln. Ib
Vln. II
Vln. IIb
Vla.
Vc.
Cb.
bowing
like a subtle glim
solo
con sord.
div.

SPARKING FOR TWELVE INSTRUMENTS

Program Note

I'm always inspired by Wai-lim Yip, a bilingual poet, when I compose. He proposes that the words in a poem constantly interact and echo with other voices in the past and our aesthetic consciousness to create a "double image." In *Diffusion of Distances*, he says "these other voices bring about changes, like a huge symphony playing inaudibly to our inner ear, converging into a confluent dense music."

This inner dialogue between reader and poet also greatly resonates with me as a composer. As I listen to Nanguan music, a Chinese genre comprised of one singer and nine instrumentalists, its sonic color of voice and instruments altogether flow into my inner vision interweaving and echoing with my aesthetic experience of brushstroke in the painting. Each syllable of lyric in Nanguan plays an important role in providing unique sonic gesture to elaborate the melodic lines. The lyric not only conveys its meaning but also contains rich timbral motives, allowing the singer to interact with other instrumentalists in heterophonic way. Its intricate sonic network reminds me of the motion of brush in the painting, which comprised of rich layering of color and linear elements. The discovery of this connection is like a spark in the darkness, a vivid double image I endeavor to capture.

Duration: c. 11 minutes

Performance Note

a. <u>Notes for all instruments:</u>

1. Airy noise without pitch (for all instruments):

Both  and  indicate airy noise (the circled cross note-head is functioned to distinguish different rhythmic values). The airy noise is used for the string part and wind part. All airy noise produced by the instruments are notated on **five-line staff** in order to be distinguished from the notation for spoken words. The details for other kinds of airy noise (such as half airy noise and exhaling, etc.) are listed in the following different parts.

2. *Non vib*., *vib*., and *molto vib*.*:* These indicate different levels of vibration.

3. Spoken Words

All spoken words are performed in whispering way without using instruments. The notation for this technique is  which are all notated on **one-line staff**. The same notation for airy noise produced by instruments (string part and wind part) is notated on **five-line staff**. The spoken words are written beneath:

All spoken words in this piece are listed as follows:

(1) Ti
(2) Ke
(3) Tu
(4) Dang
(5) Kwah

In this piece, they don't convey any meaning of original words but only present their own sonic quality.

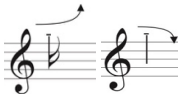
b. <u>Notes for woodwind part</u>

1. Half airy noise (with half pitch)

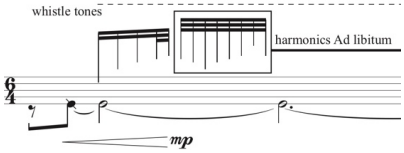
2. Exhaling through the instrument (for flute)

3. Slap tone (for clarinet)

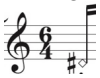
4. Jet whistle (for flute): the following two arrows indicate different directions of jet whistle.



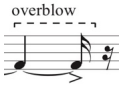
5. Whistle tone (for flute): the fundamental pitch is notated at the bottom, while the upper stems without note-head indicates the rough rhythmic pattern and contour of harmonics.



6. Tongue ram (for flute):

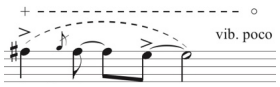


7. Over blow (for flute):

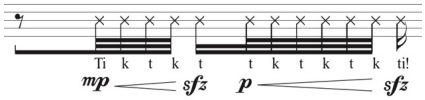


c. <u>Notes for brass part</u>

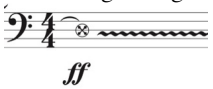
1. wah-wah effect: Uncover and cover the instrument with hand



2. Blow through the instrument with specific consonants to create different percussive sounds:



3. Blowing through the end of mouth piece (without pitch):



d. <u>Notes for celesta and harp</u>

For harp:

1. Slide along the string vertically with paper to create sharp sonic effect.

2. Tone cluster: use the palm to hit the strings.

3. ⊕ indicates muting the string(s).

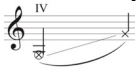
For celesta:

1. Tone cluster created by palms:

e. <u>Notes for string part</u>

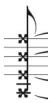
1. Airy noise in the string part:

This technique is created by muting the string with right hand while bowing. The numbers, I, II, III, and IV, are used to indicate on which string the performer should mute to create the airy noise. (Please see the following example)

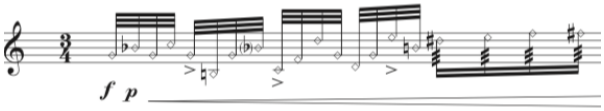


2. *s.p.* – Sul Ponticello
3. *molto s.p.* – Molto Sul Ponticello

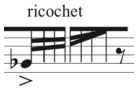
4. Tap on the strings with palm



5.  and  – Vertical Bowing
6.  – Circular Bowing; move the bow quickly from the original position to the bridge to create the effect of sul ponticello.
7. Touch the strings with light pressure: The technique of using left hand to touch the string with light pressure is indicated as follows. It could create indefinite harmonics.



8.  indicates the highest pitch of the string. It creates the un-pitched percussive sound.
9. *Recochet*: the rhythm of ricochet is written for suggestion.

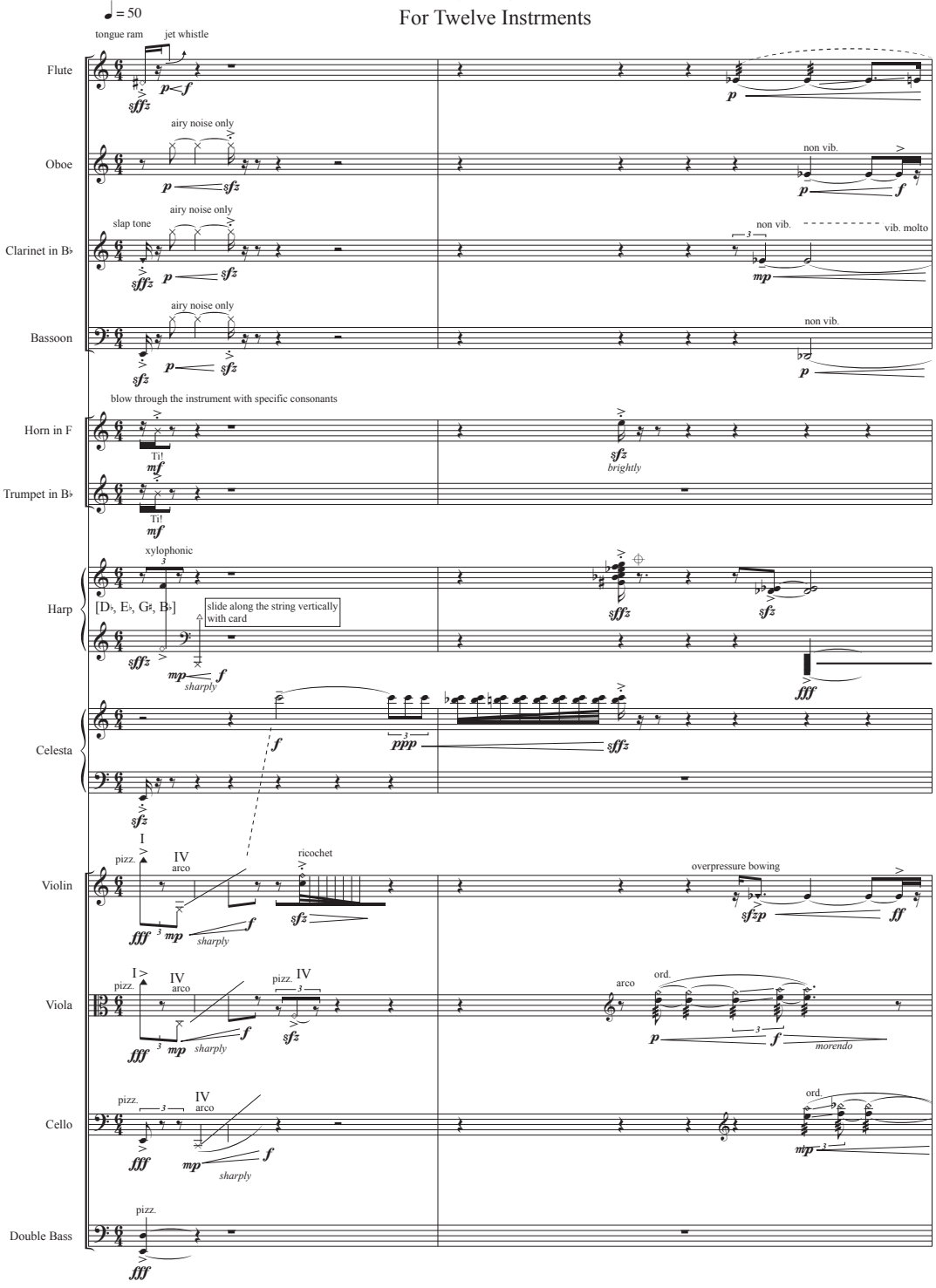


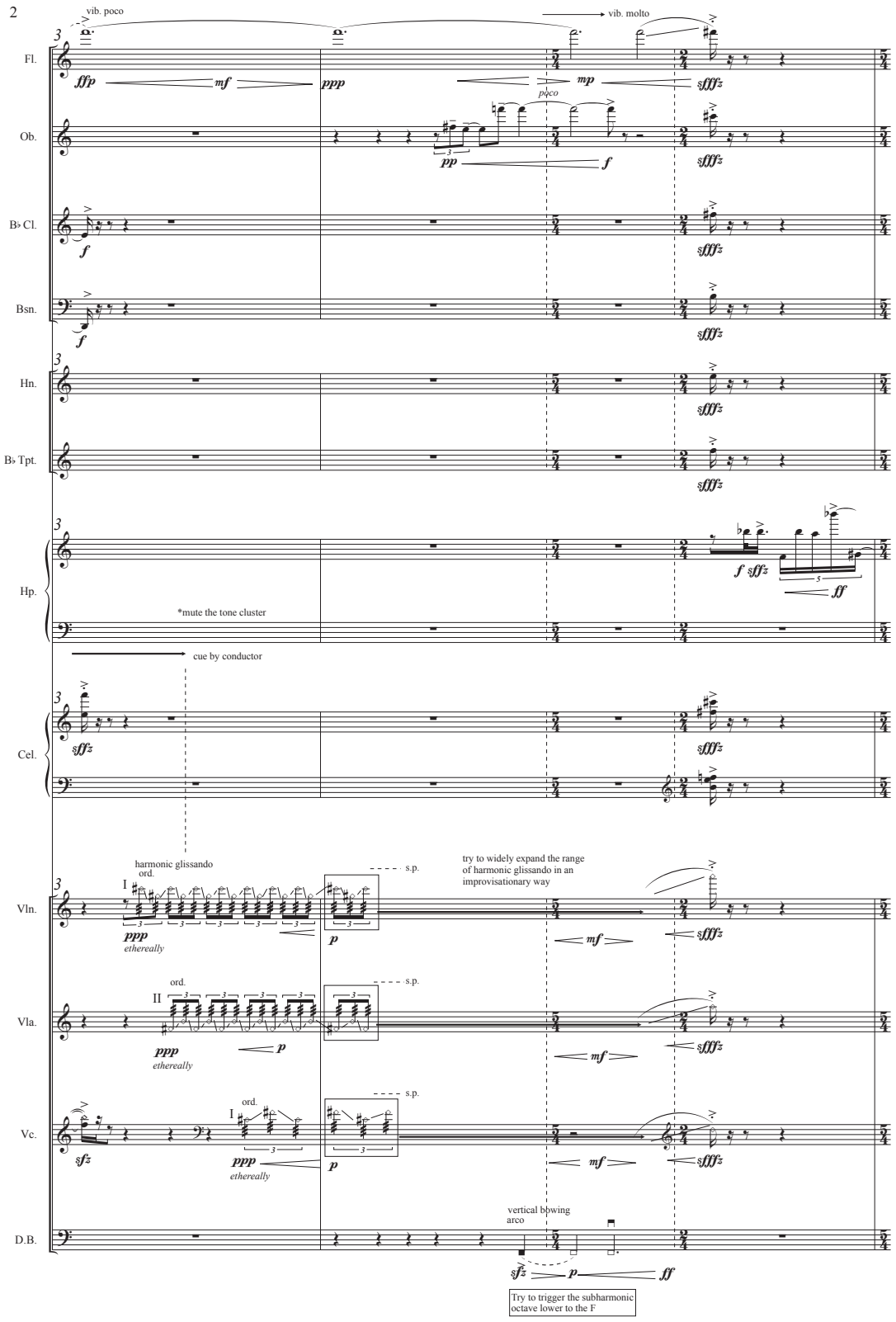
Score in C

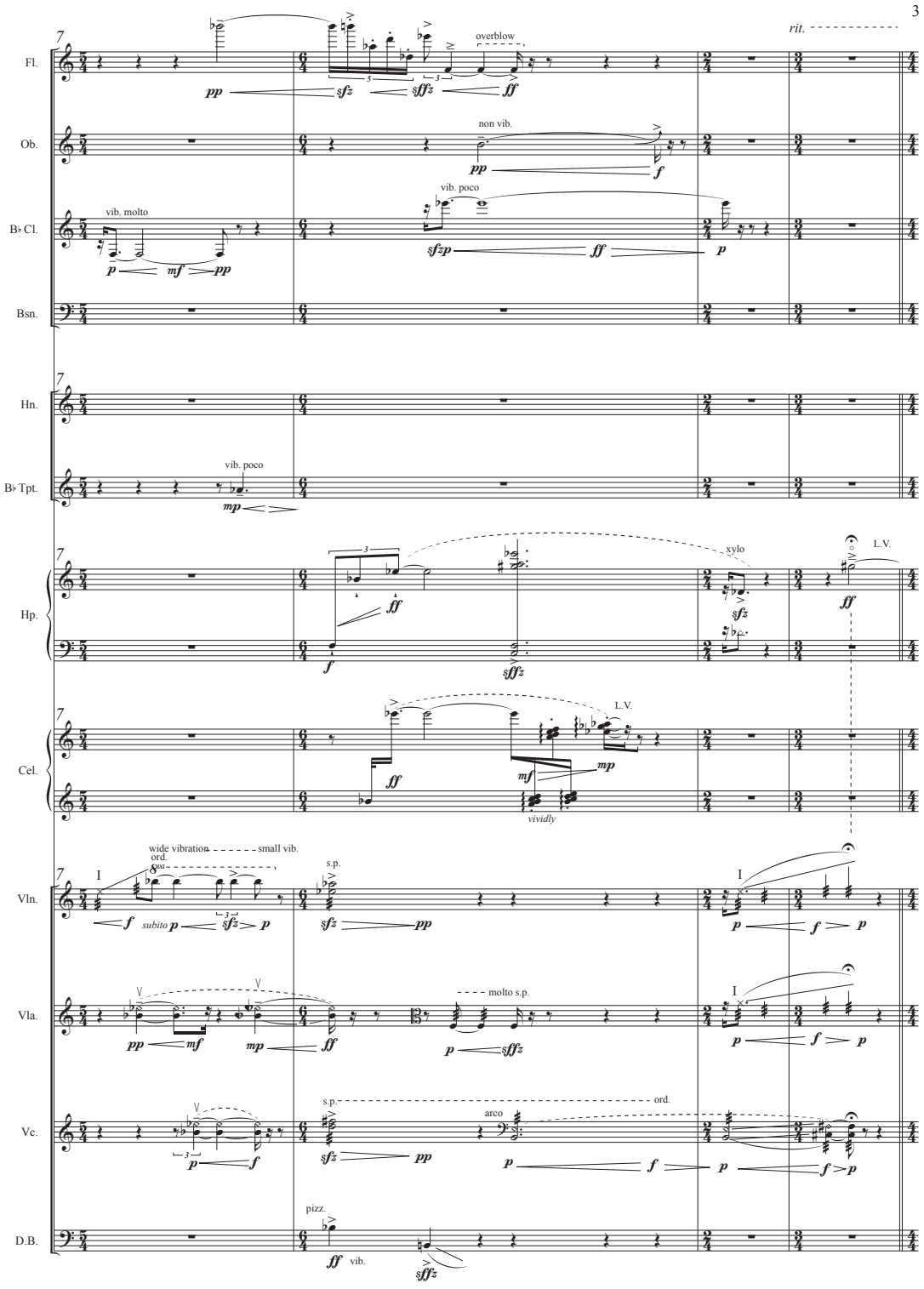
Sparking

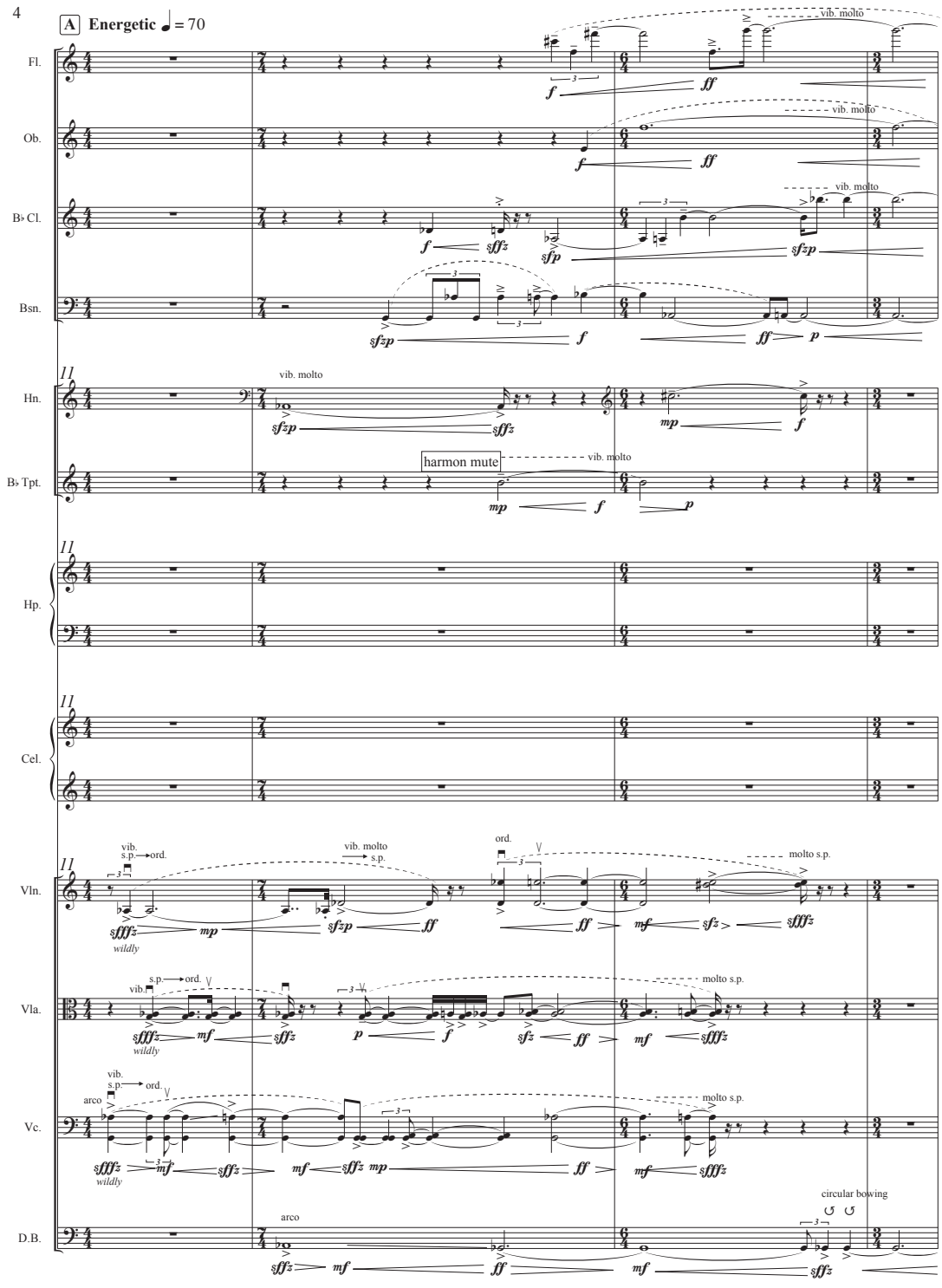
(2020)

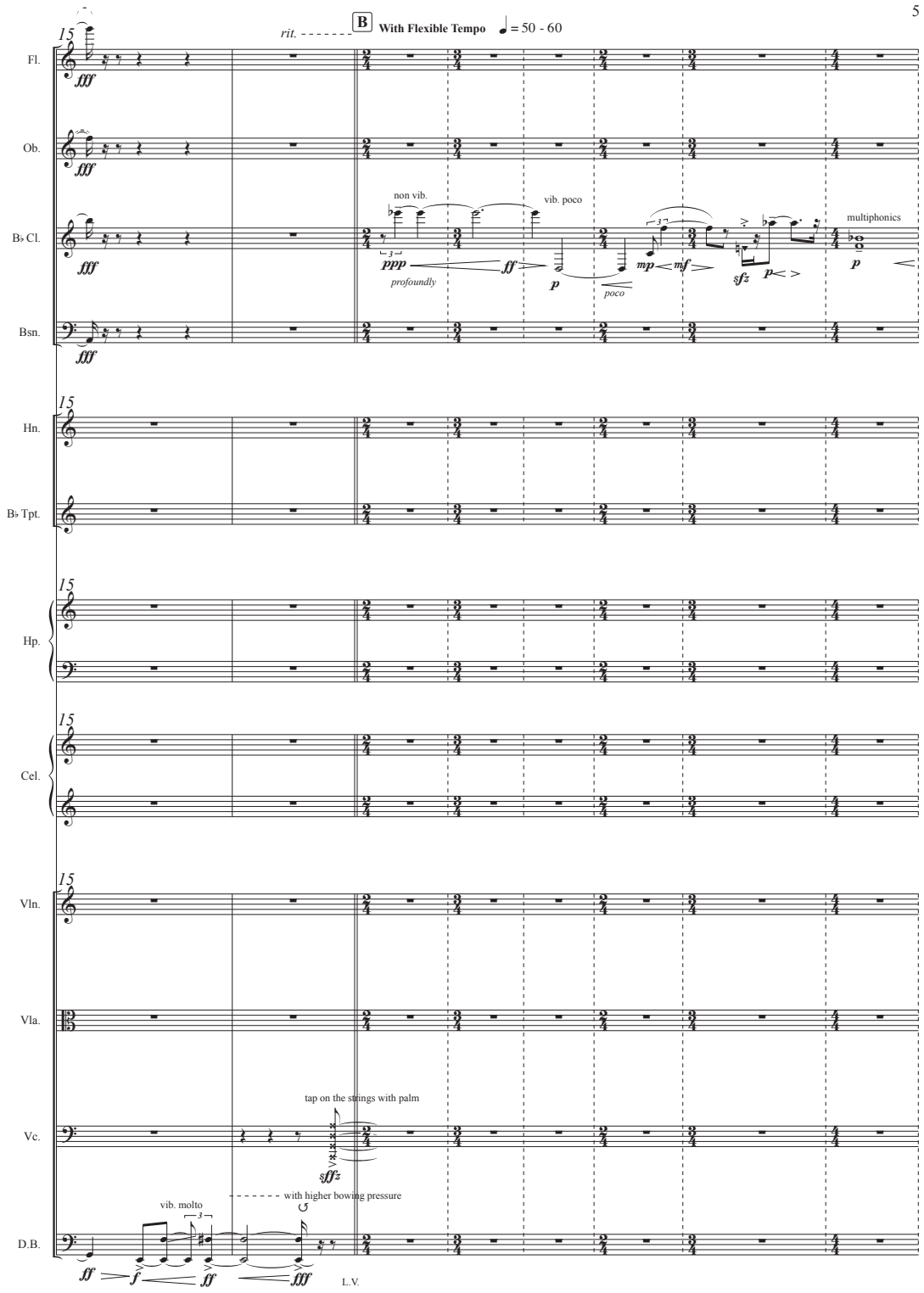
For Twelve Instrments

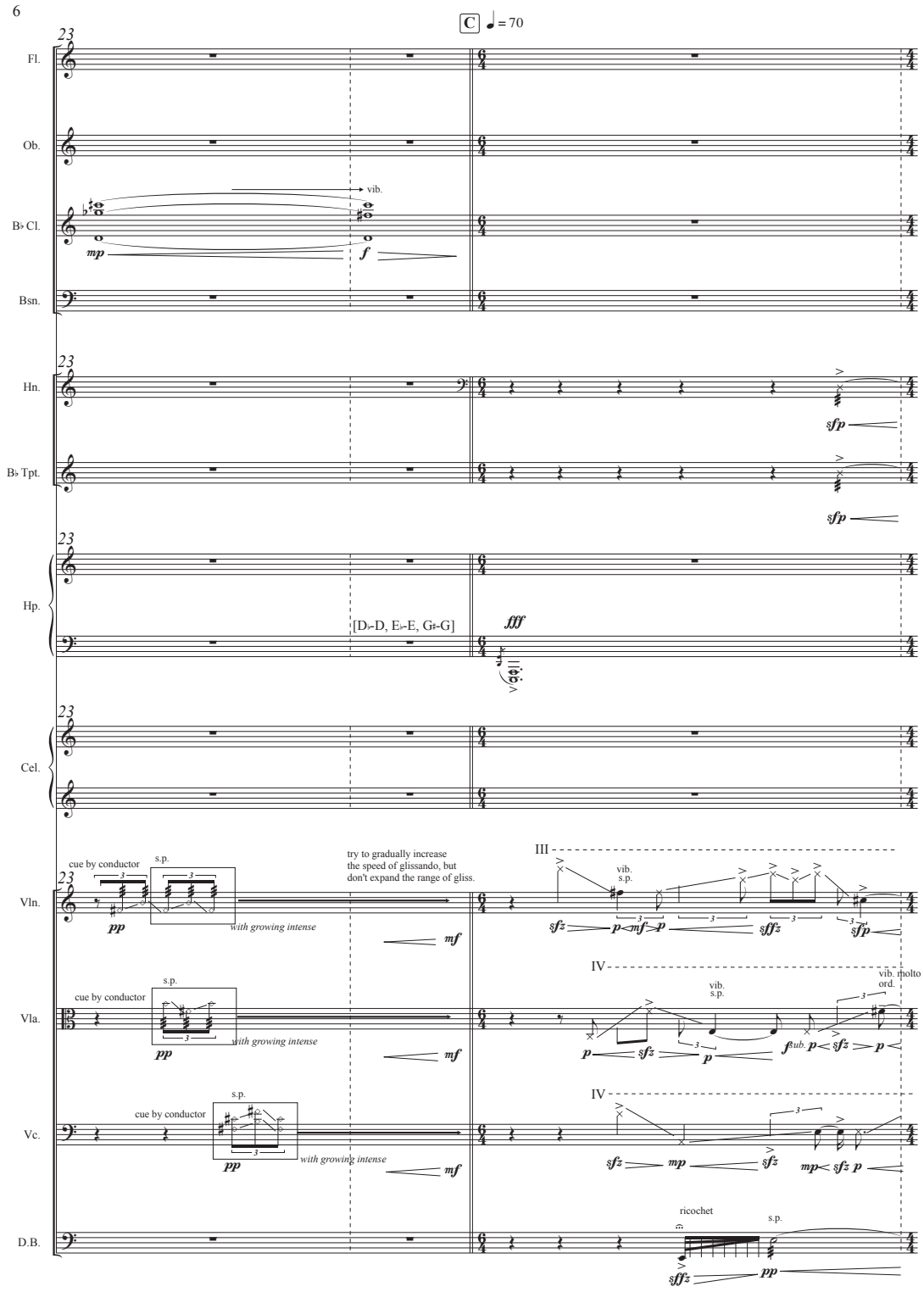


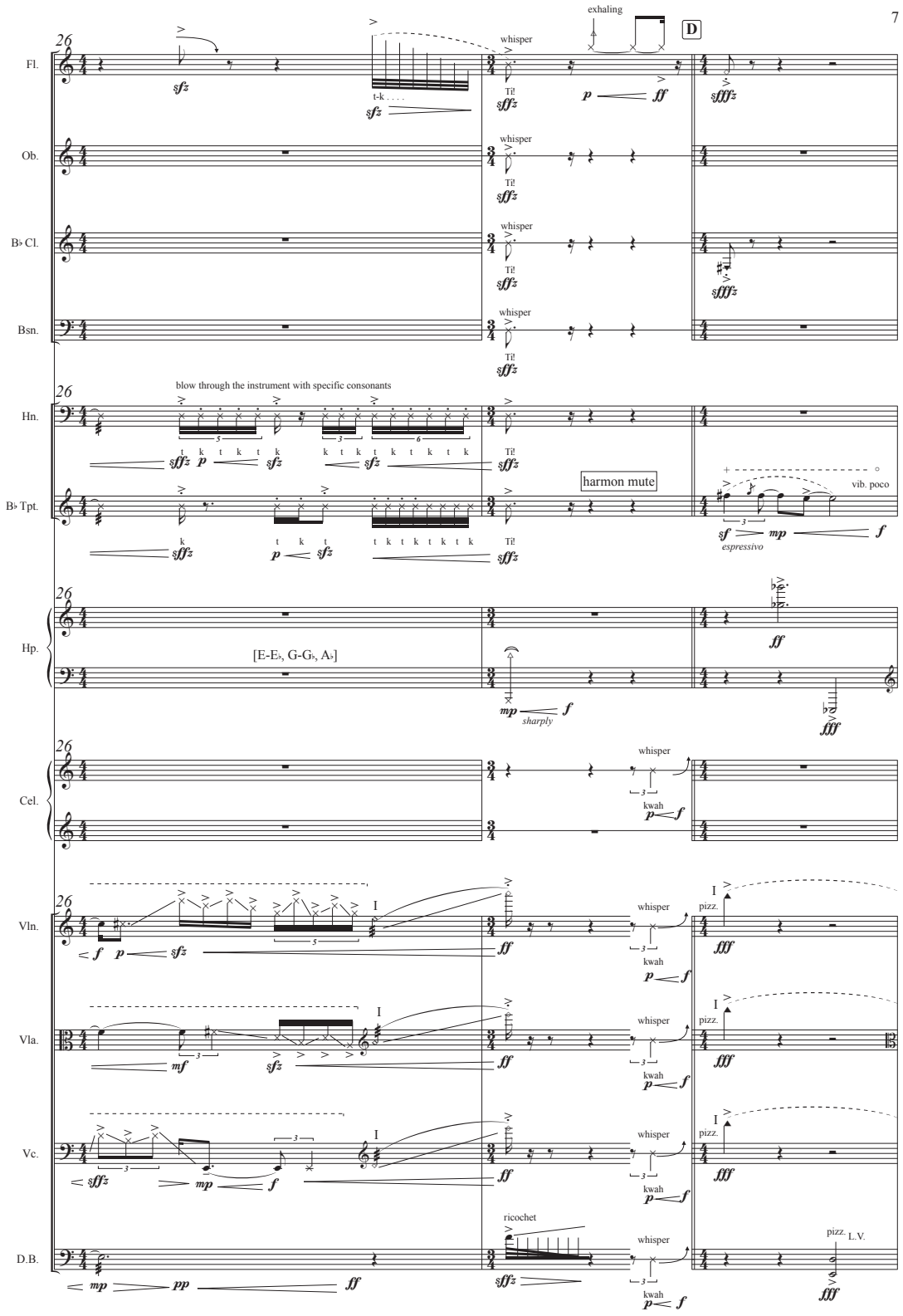

2
vib. poco
vib. molto
Fl.
Ob.
B♭ Cl.
Bsn.
Hn.
B♭ Tpt.
Hp.
*mute the tone cluster
cue by conductor
Cel.
harmonic glissando
ord.
s.p.
try to widely expand the range
of harmonic glissando in an
improvisationary way
Vln.
Vla.
Vc.
ethereally
vertical bowing
arco
D.B.
Try to trigger the subharmonic
octave lower to the F

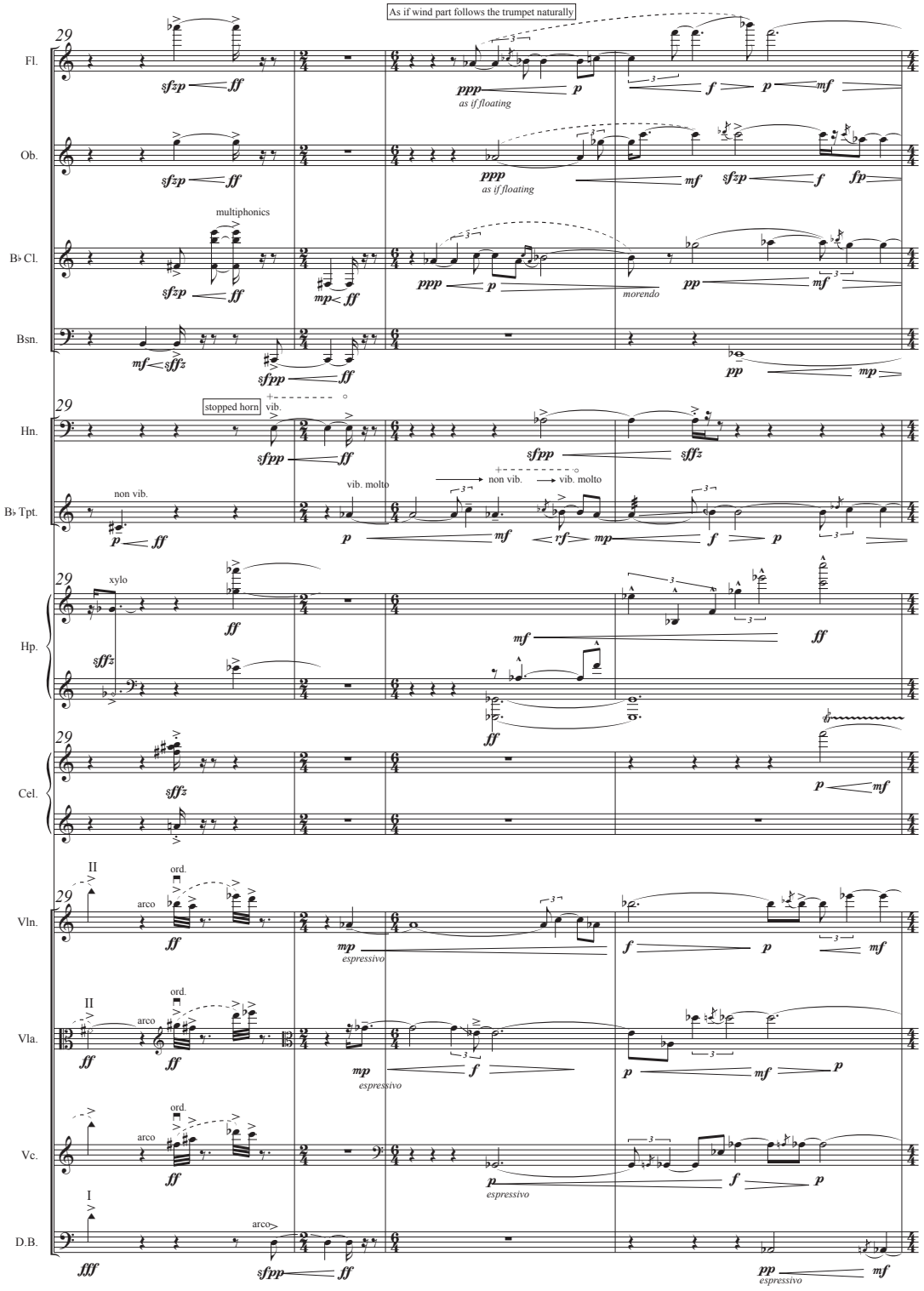

rit.
Fl.
overblow
Ob.
non vib.
B♭ Cl.
vib. molto
vib. poco
Bsn.
Hn.
B♭ Tpt.
vib. poco
Hp.
xylo
L.V.
Cel.
L.V.
vividly
Vln.
wide vibration
small vib.
ord.
s.p.
subito
Vla.
molto s.p.
Vc.
s.p.
ord.
arco
D.B.
pizz.
vib.

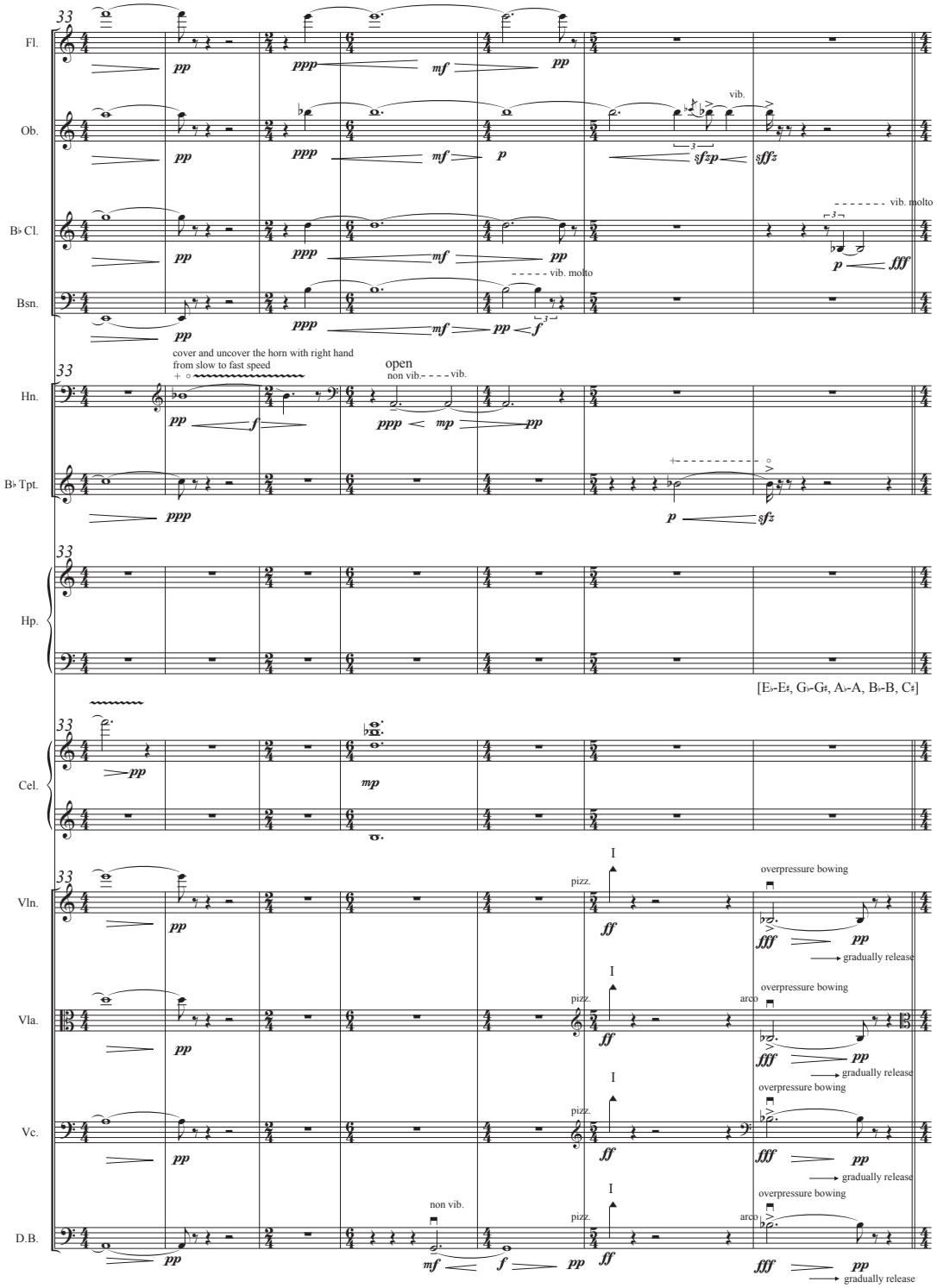

4
A Energetic ♩ = 70
Fl.
Ob.
B♭ Cl.
Bsn.
Hn.
B♭ Tpt.
Hp.
Cel.
Vln.
Vla.
Vc.
D.B.
vib. molto
harmon mute
vib.
s.p. → ord.
vib. molto → s.p.
ord.
molto s.p.
wildly
arco
circular bowing

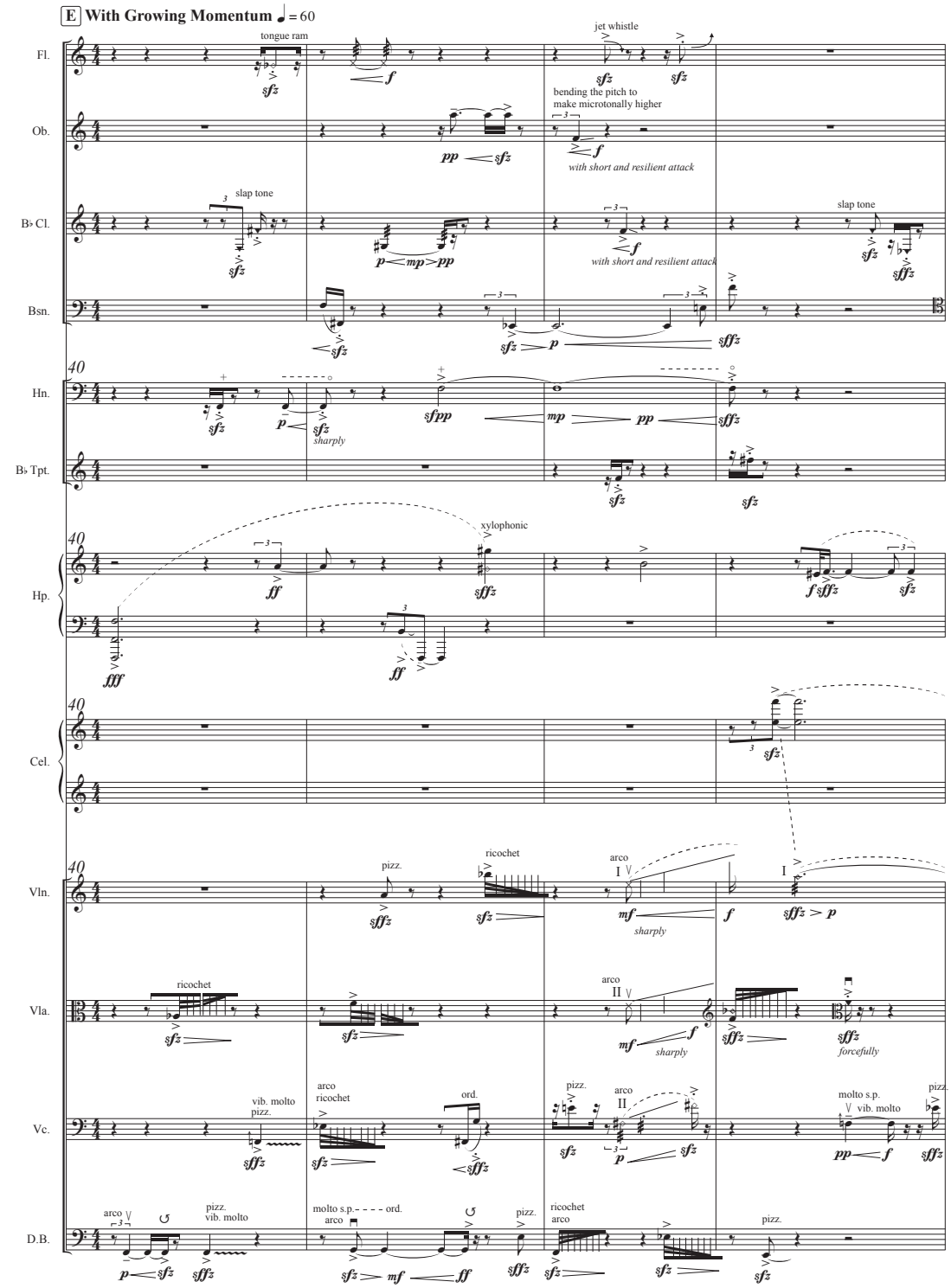

15
rit.
B
With Flexible Tempo
♩ = 50 - 60
Fl.
Ob.
B♭ Cl.
Bsn.
Hn.
B♭ Tpt.
Hp.
Cel.
Vln.
Vla.
Vc.
D.B.
fff
non vib.
ppp
profoundly
ff
vib. poco
p
poco
mp
mf
sfz
p
multiphonics
p
tap on the strings with palm
sffz
with higher bowing pressure
vib. molto
ff
f
ff
fff
L.V.

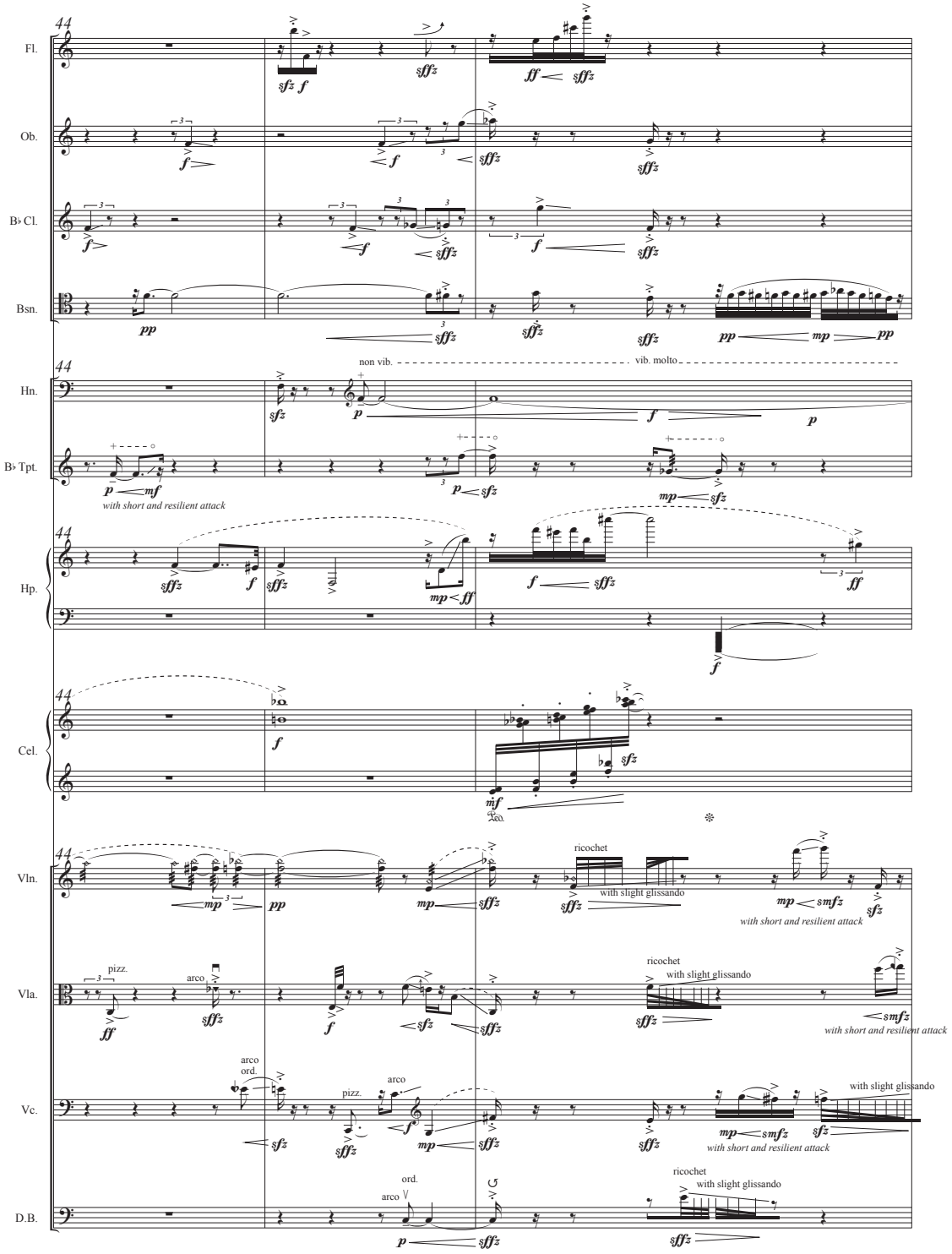

C
♩ = 70
23
Fl.
Ob.
B♭ Cl.
vib.
mp
f
Bsn.
Hn.
sfp
B♭ Tpt.
sfp
Hp.
[D♭-D, E♭-E, G♯-G]
fff
Cel.
Vln.
cue by conductor
s.p.
pp
with growing intense
mf
try to gradually increase
the speed of glissando, but
don't expand the range of gliss.
III
vib.
s.p.
sfz
p
mf
p
sffz
sfp
Vla.
cue by conductor
s.p.
pp
with growing intense
mf
IV
vib.
s.p.
vib. molto
ord.
p
sfz
p
fsub.
p
sfz
p
Vc.
cue by conductor
s.p.
pp
with growing intense
mf
IV
sfz
mp
sfz
mp
sfz
p
D.B.
ricochet
s.p.
sffz
pp

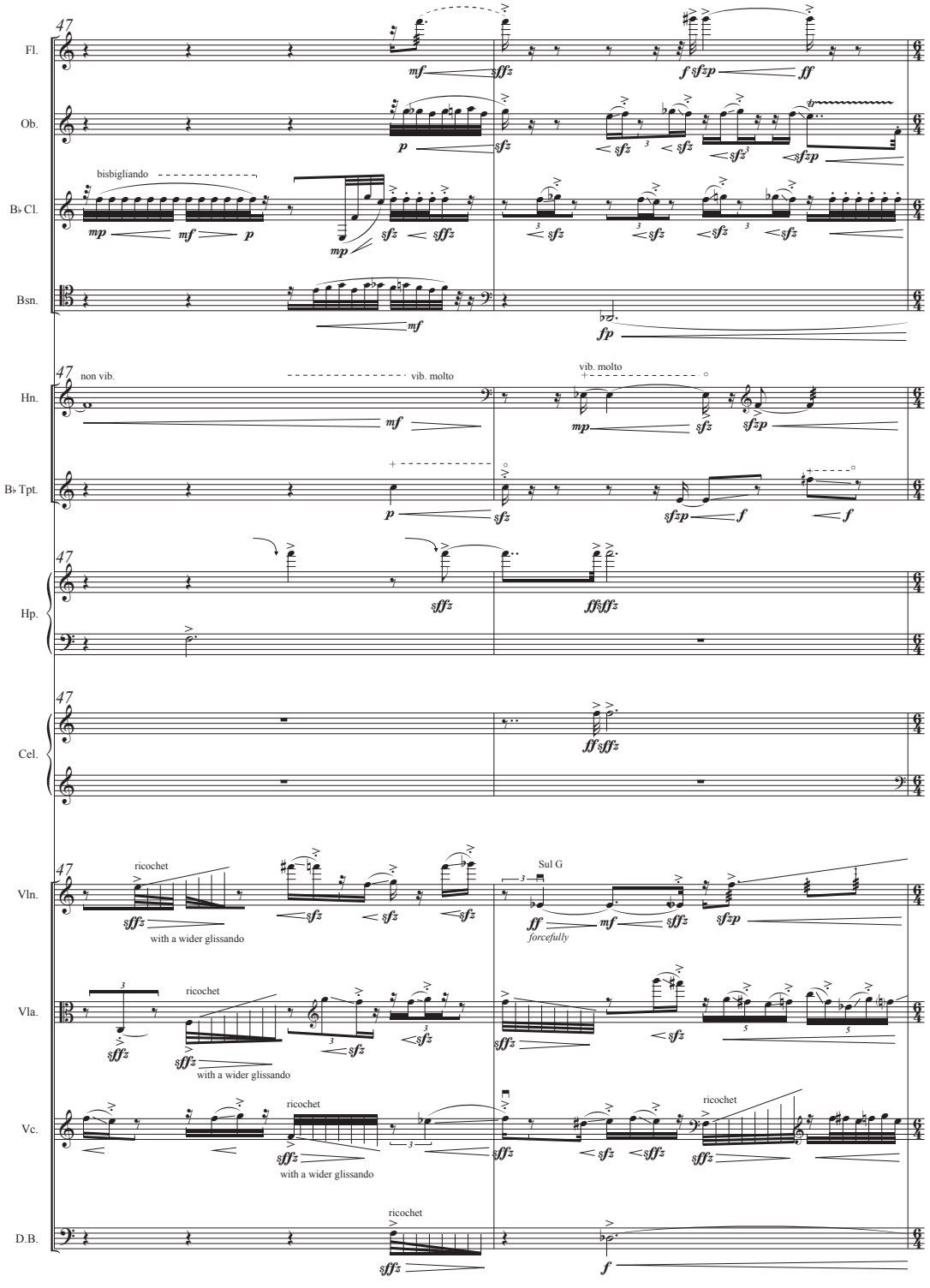

exhaling
D
26
Fl.
Ob.
B♭ Cl.
Bsn.
whisper
Ti!
t-k . . . .
blow through the instrument with specific consonants
Hn.
B♭ Tpt.
harmon mute
vib. poco
espressivo
Hp.
[E-E♭, G-G♭, A♭]
sharply
Cel.
kwah
Vln.
Vla.
Vc.
D.B.
pizz.
ricochet
L.V.

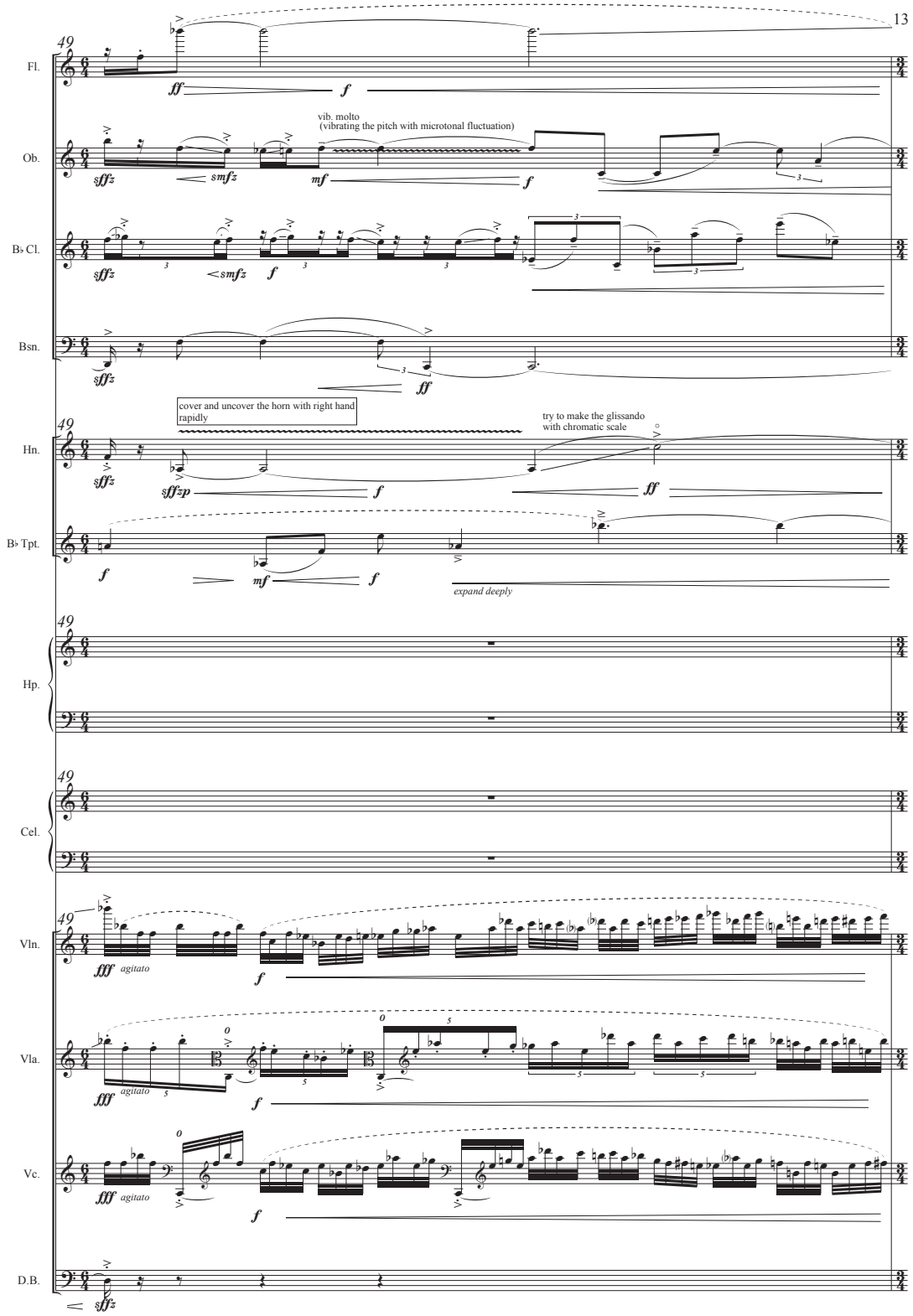

As if wind part follows the trumpet naturally
29
Fl.
Ob.
B♭ Cl.
Bsn.
Hn.
B♭ Tpt.
Hp.
Cel.
Vln.
Vla.
Vc.
D.B.
multiphonics
stopped horn
vib.
non vib.
vib. molto
xylo
arco
ord.
as if floating
morendo
espressivo

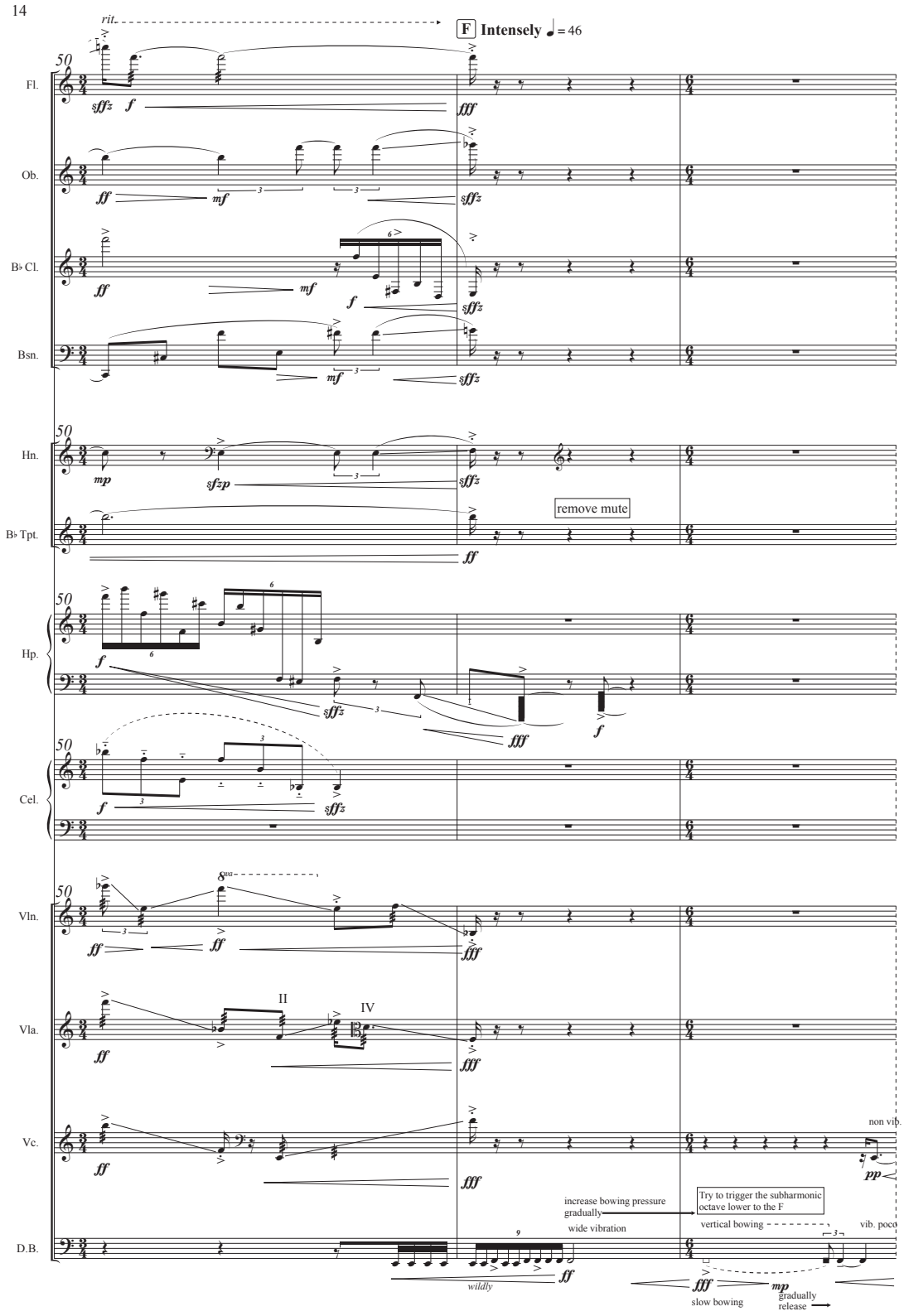

33
Fl.
Ob.
B♭ Cl.
Bsn.
Hn.
B♭ Tpt.
Hp.
Cel.
Vln.
Vla.
Vc.
D.B.
pp
ppp
mf
p
f
mp
ff
fff
sfz
sfzp
vib.
vib. molto
cover and uncover the horn with right hand
from slow to fast speed
open
non vib.
[E♭-E♯, G♭-G♯, A♭-A, B♭-B, C♭]
I
pizz.
arco
overpressure bowing
gradually release

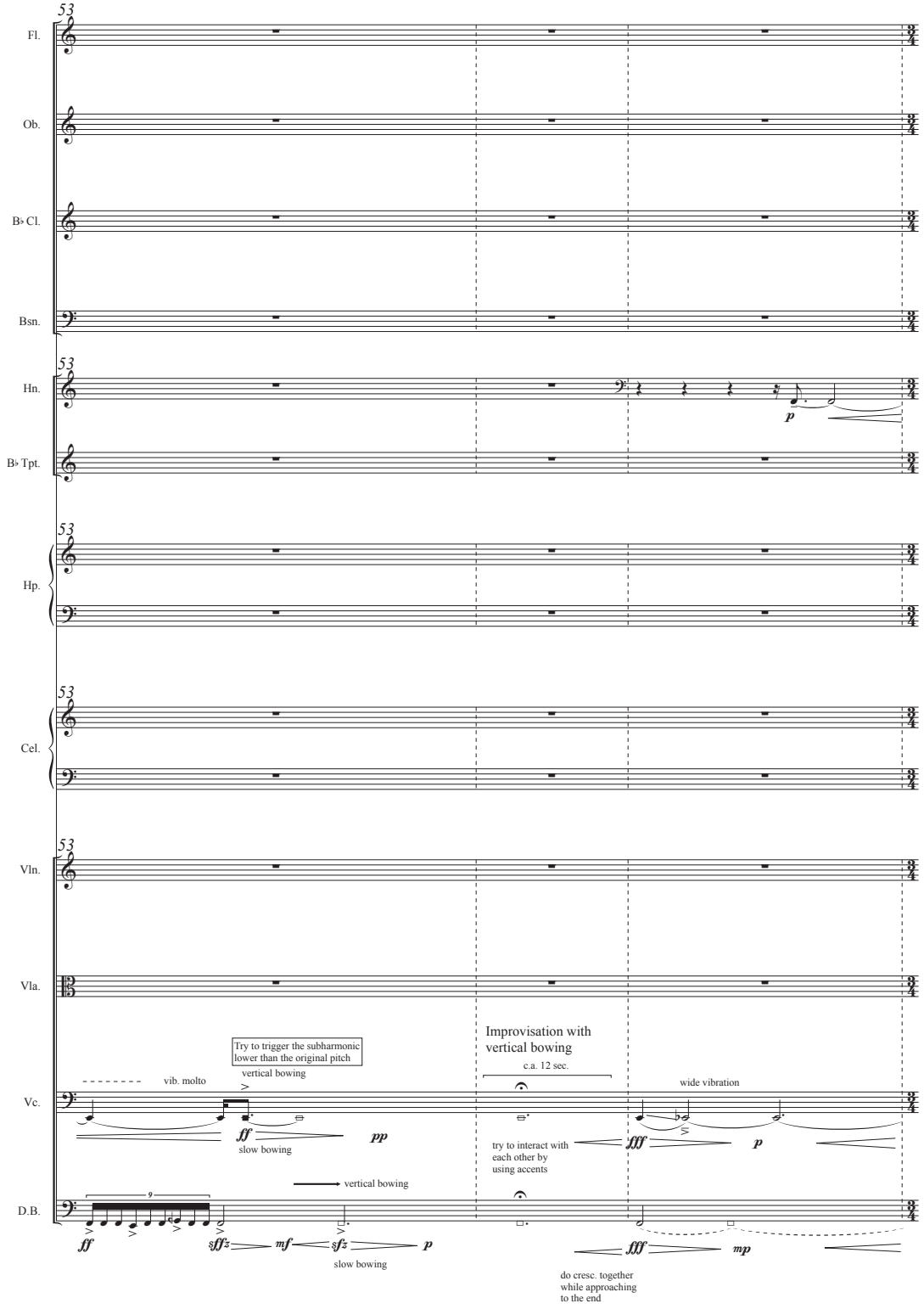

E With Growing Momentum ♩ = 60
Fl.
tongue ram
jet whistle
bending the pitch to make microtonally higher
Ob.
with short and resilient attack
B♭ Cl.
slap tone
Bsn.
40
Hn.
sharply
B♭ Tpt.
Hp.
xylophonic
Cel.
Vln.
pizz.
ricochet
arco
Vla.
Vc.
vib. molto
ord.
molto s.p.
D.B.

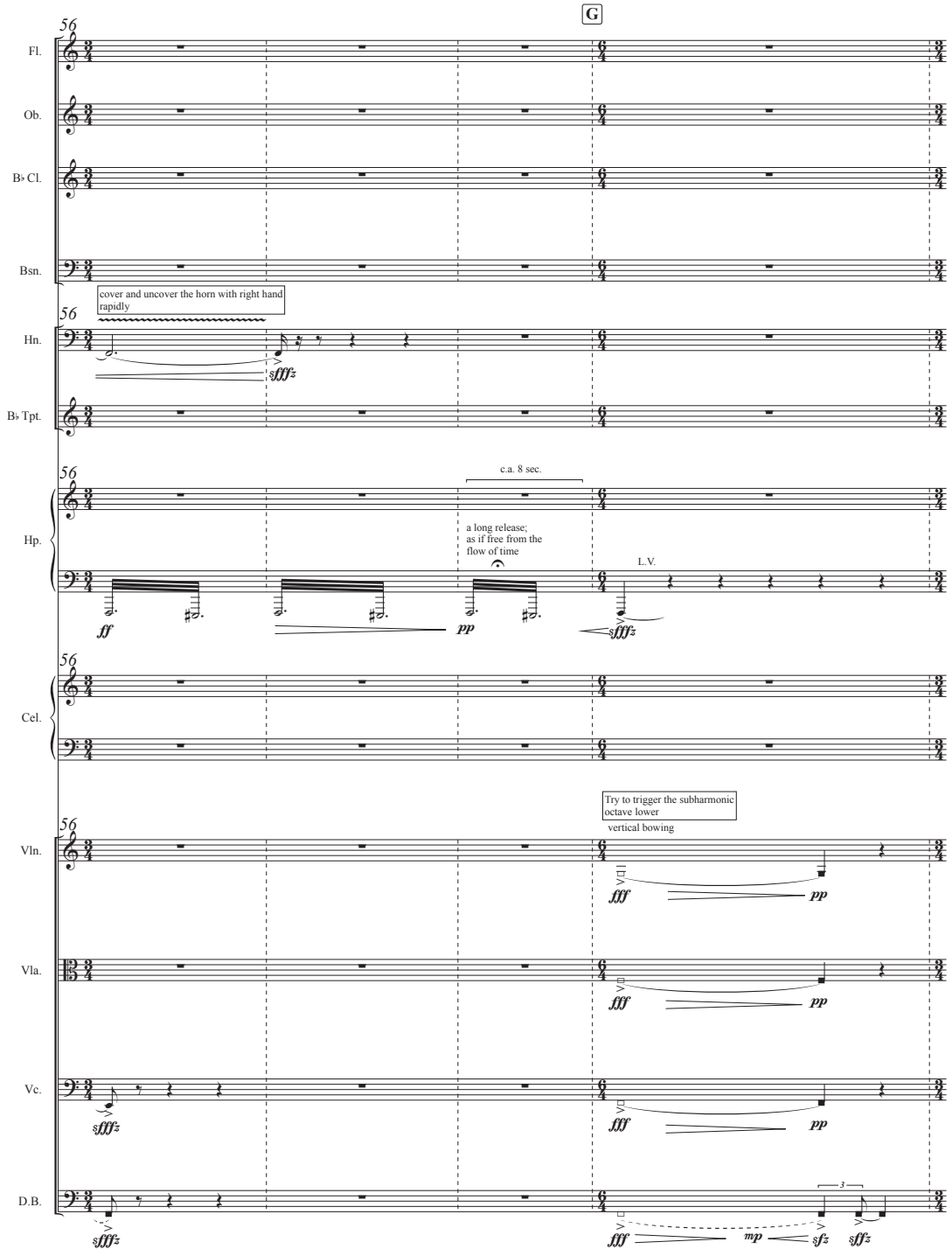

44
Fl.
Ob.
B♭ Cl.
Bsn.
Hn.
B♭ Tpt.
Hp.
Cel.
Vln.
Vla.
Vc.
D.B.
non vib.
vib. molto
with short and resilient attack
ricochet
with slight glissando
pizz.
arco
arco ord.
ord.

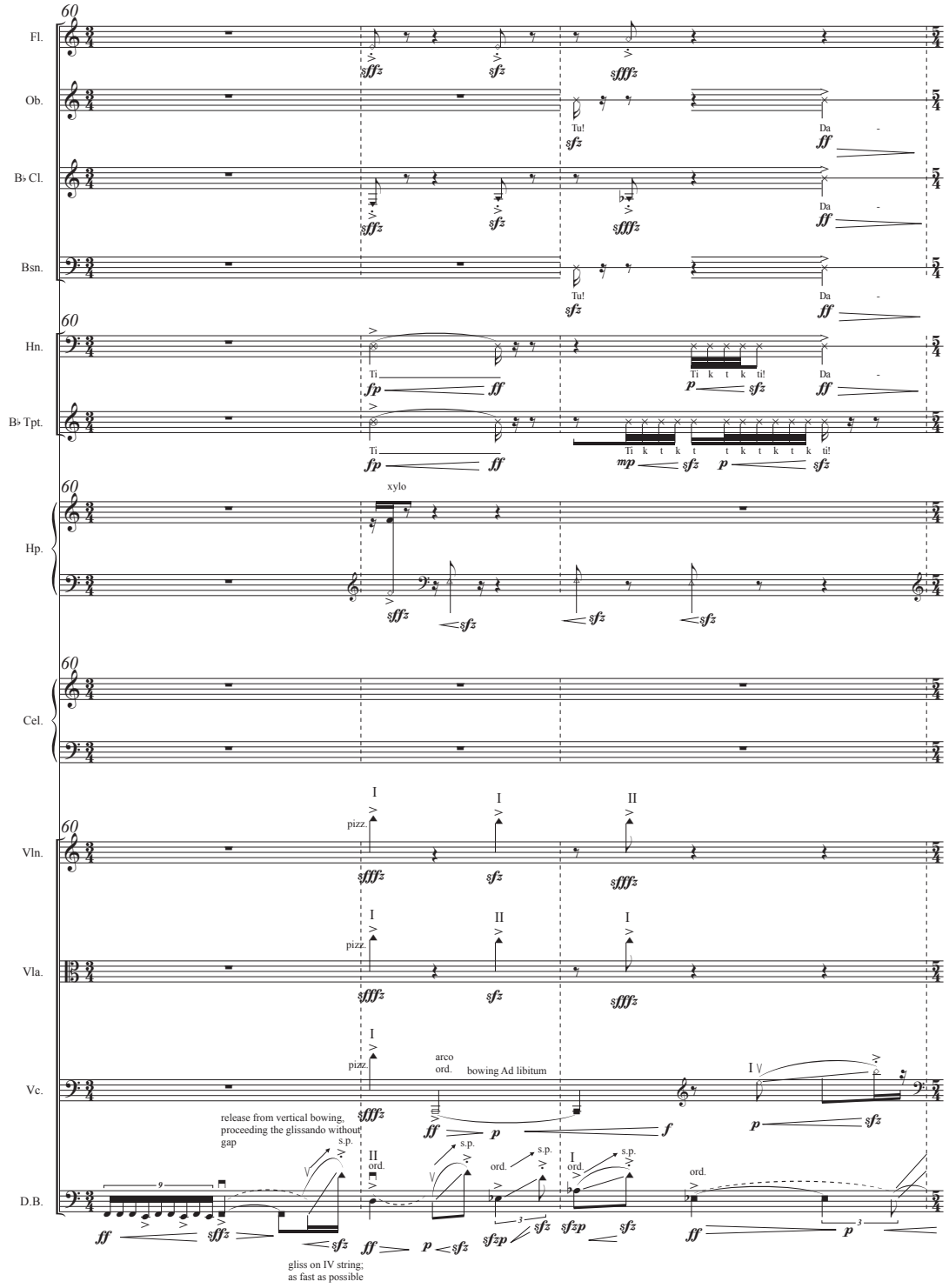

47
Fl.
Ob.
B♭ Cl.
Bsn.
bisbigliando
Hn.
non vib.
vib. molto
B♭ Tpt.
Hp.
Cel.
Vln.
Vla.
Vc.
D.B.
ricochet
with a wider glissando
Sul G
forcefully

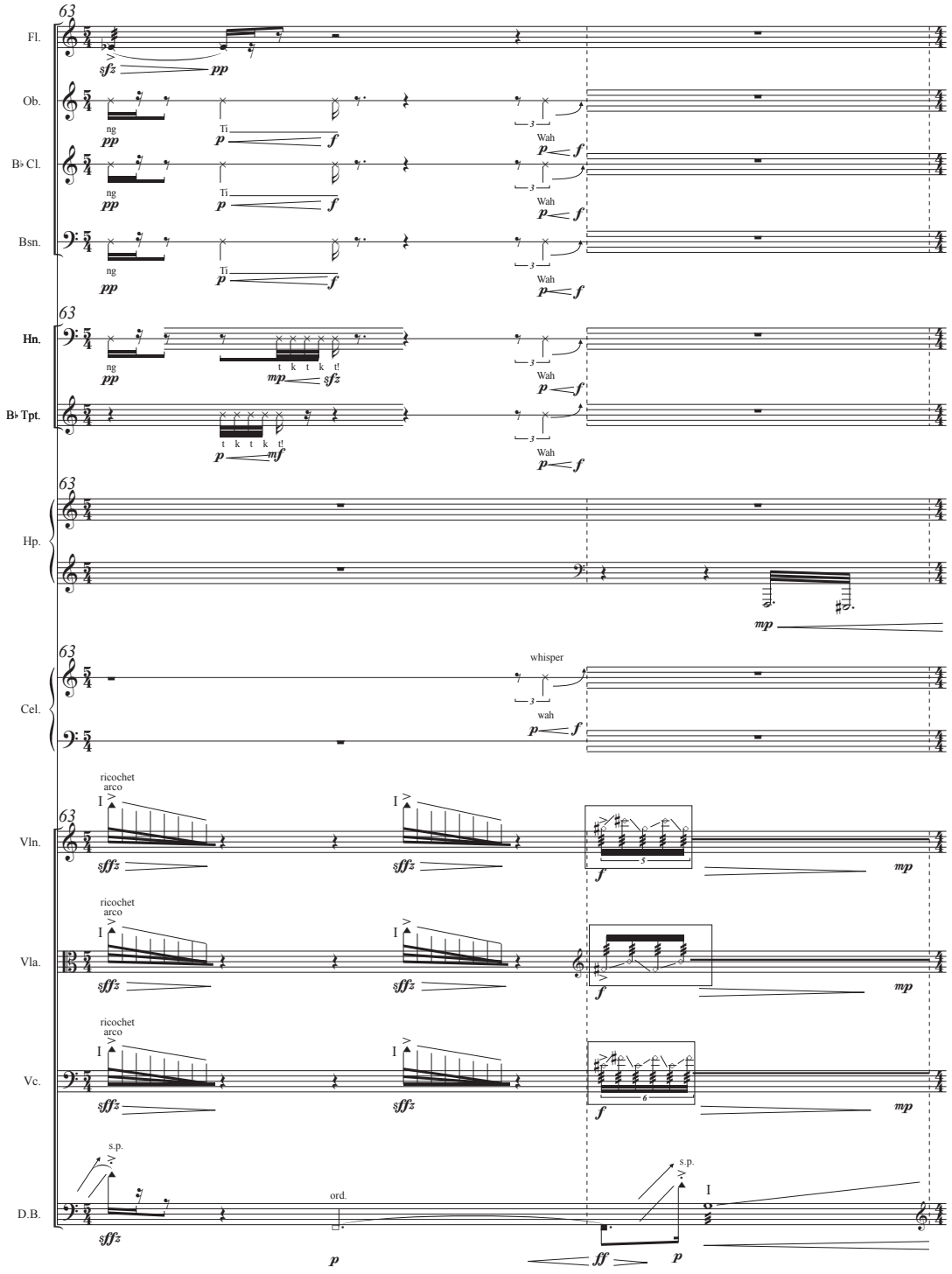

13
49
Fl.
Ob.
B♭ Cl.
Bsn.
Hn.
B♭ Tpt.
Hp.
Cel.
Vln.
Vla.
Vc.
D.B.
vib. molto
(vibrating the pitch with microtonal fluctuation)
cover and uncover the horn with right hand
rapidly
try to make the glissando
with chromatic scale
expand deeply
agitato

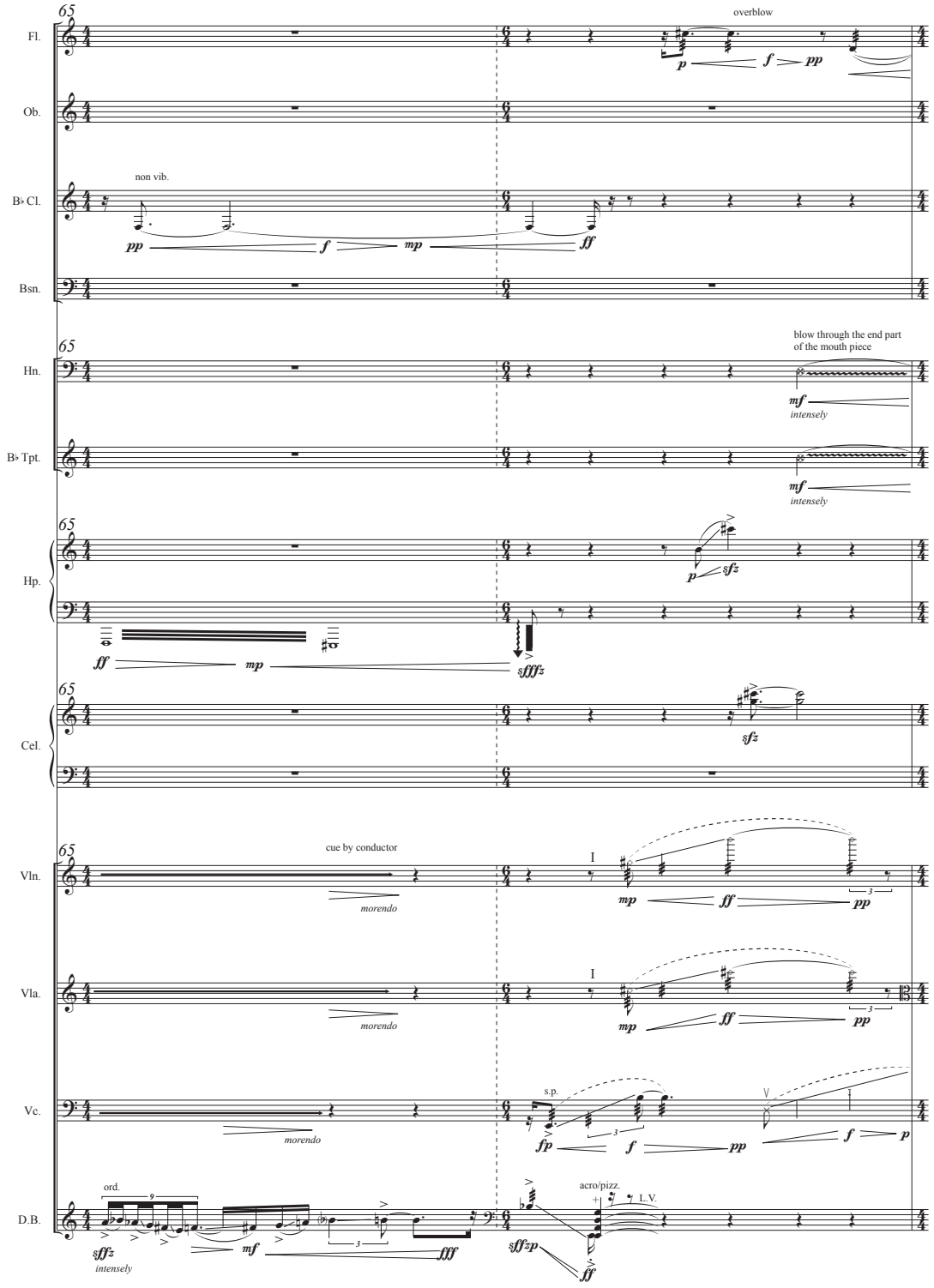

rit.
F Intensely ♩= 46
Fl.
Ob.
B♭ Cl.
Bsn.
Hn.
B♭ Tpt.
remove mute
Hp.
Cel.
Vln.
Vla.
Vc.
D.B.
non vib.
increase bowing pressure gradually
wide vibration
Try to trigger the subharmonic octave lower to the F
vertical bowing
vib. poco
wildly
slow bowing
gradually release

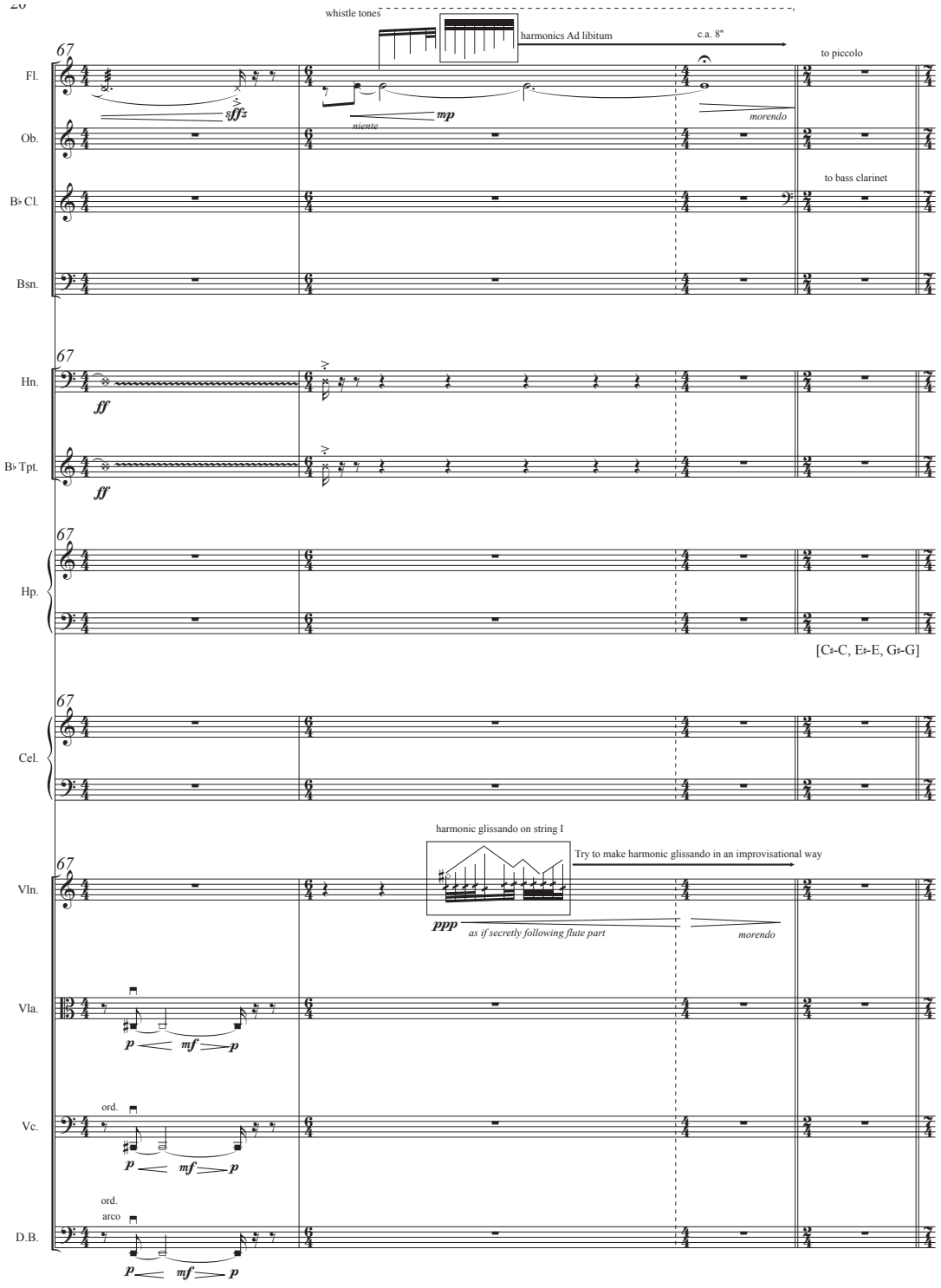

53
Fl.
Ob.
B♭ Cl.
Bsn.
Hn.
B♭ Tpt.
Hp.
Cel.
Vln.
Vla.
Vc.
D.B.
p
Try to trigger the subharmonic lower than the original pitch
vertical bowing
vib. molto
ff
slow bowing
pp
Improvisation with vertical bowing
c.a. 12 sec.
wide vibration
try to interact with each other by using accents
fff
p
vertical bowing
9
ff
sfffz
mf
sfz
p
slow bowing
fff
mp
do cresc. together while approaching to the end

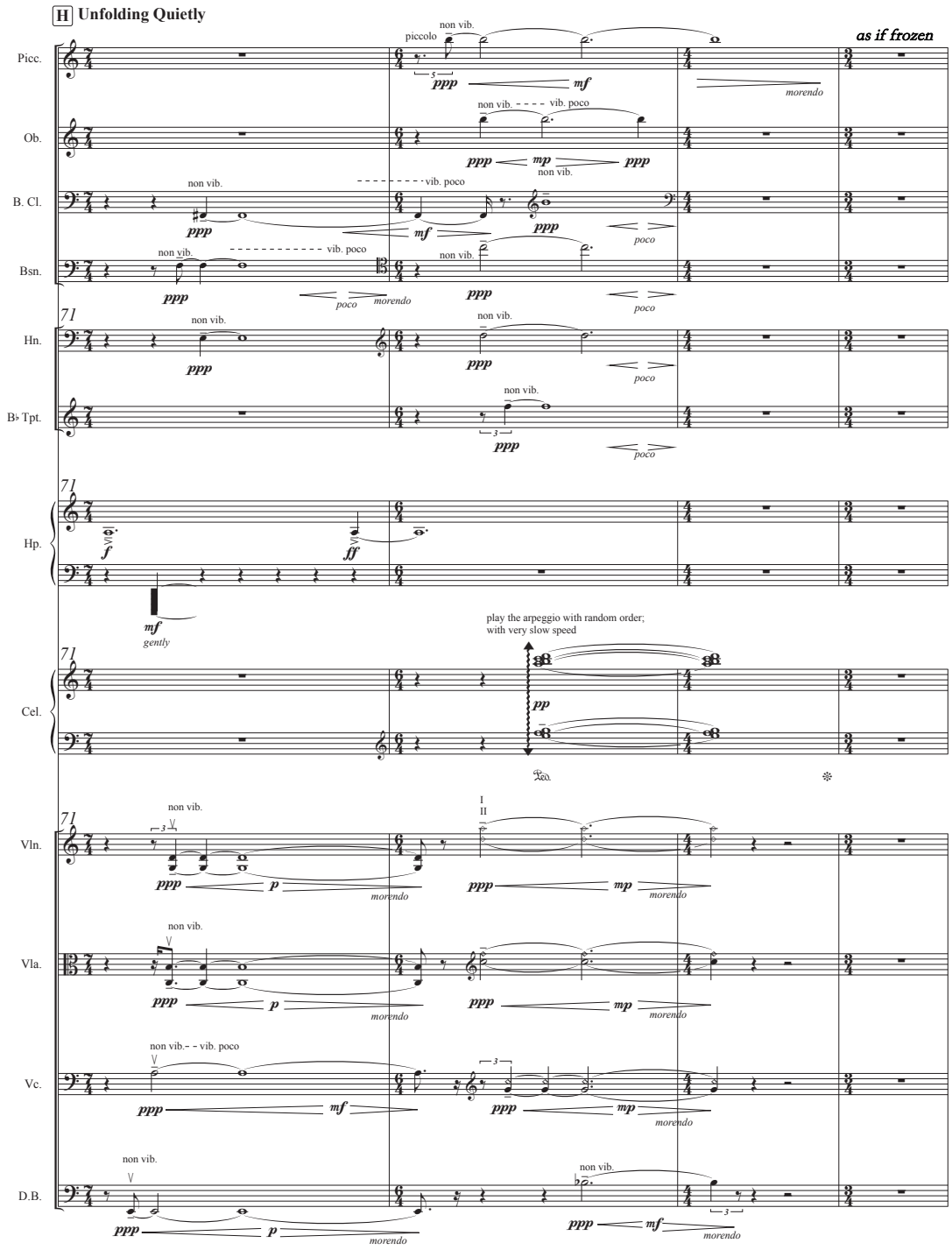

G
56
Fl.
Ob.
B♭ Cl.
Bsn.
cover and uncover the horn with right hand rapidly
Hn.
B♭ Tpt.
c.a. 8 sec.
a long release; as if free from the flow of time
L.V.
Hp.
Cel.
Try to trigger the subharmonic octave lower
vertical bowing
Vln.
Vla.
Vc.
D.B.
sffz
ff
pp
fff
mp
sfz

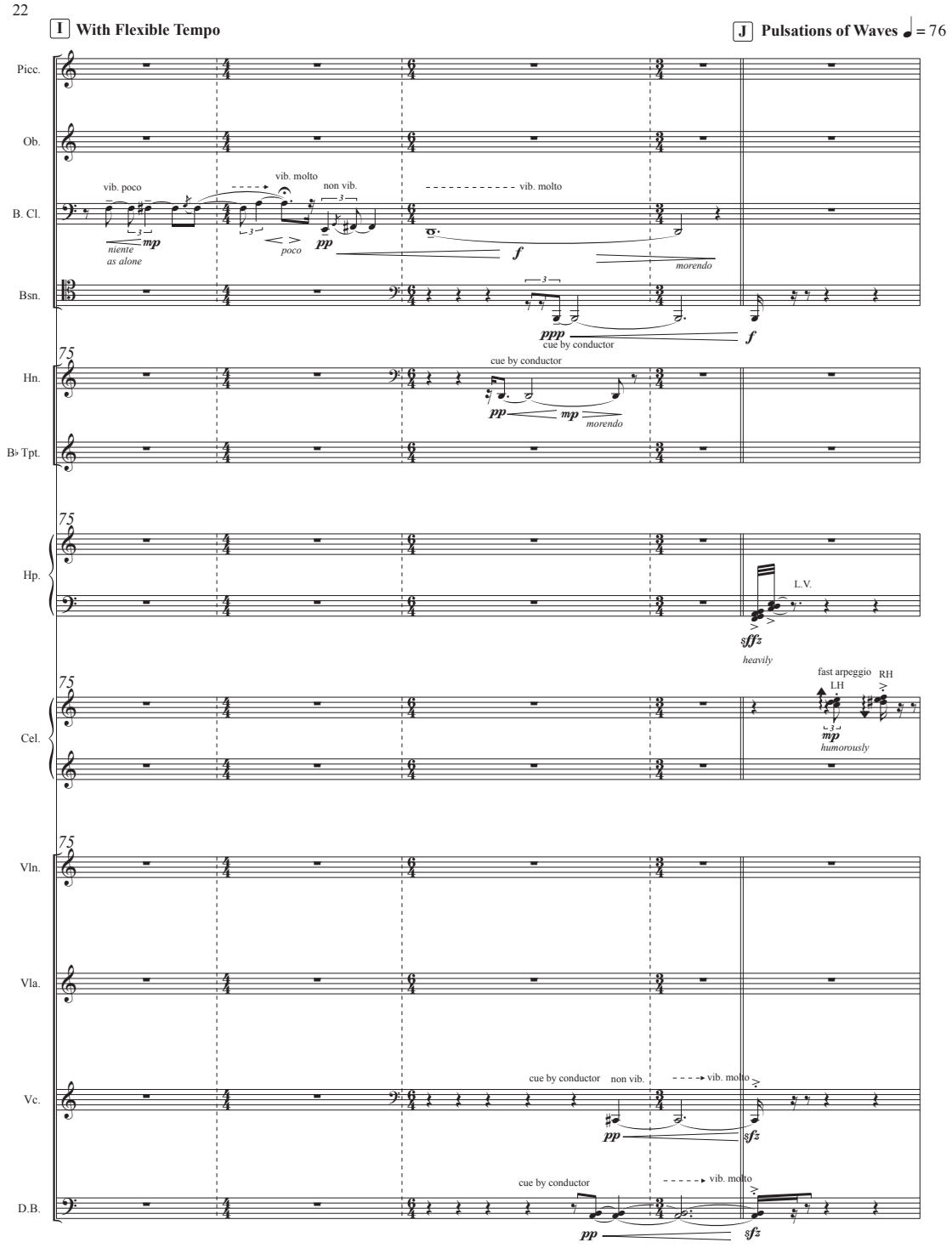

60
Fl.
Ob.
B♭ Cl.
Bsn.
Hn.
B♭ Tpt.
Hp.
Cel.
Vln.
Vla.
Vc.
D.B.
sfffz
sfz
ff
fp
p
mp
Tu!
Da
Ti
Ti k t k ti!
xylo
pizz.
I
II
arco
ord.
bowing Ad libitum
s.p.
release from vertical bowing, proceeding the glissando without gap
gliss on IV string; as fast as possible

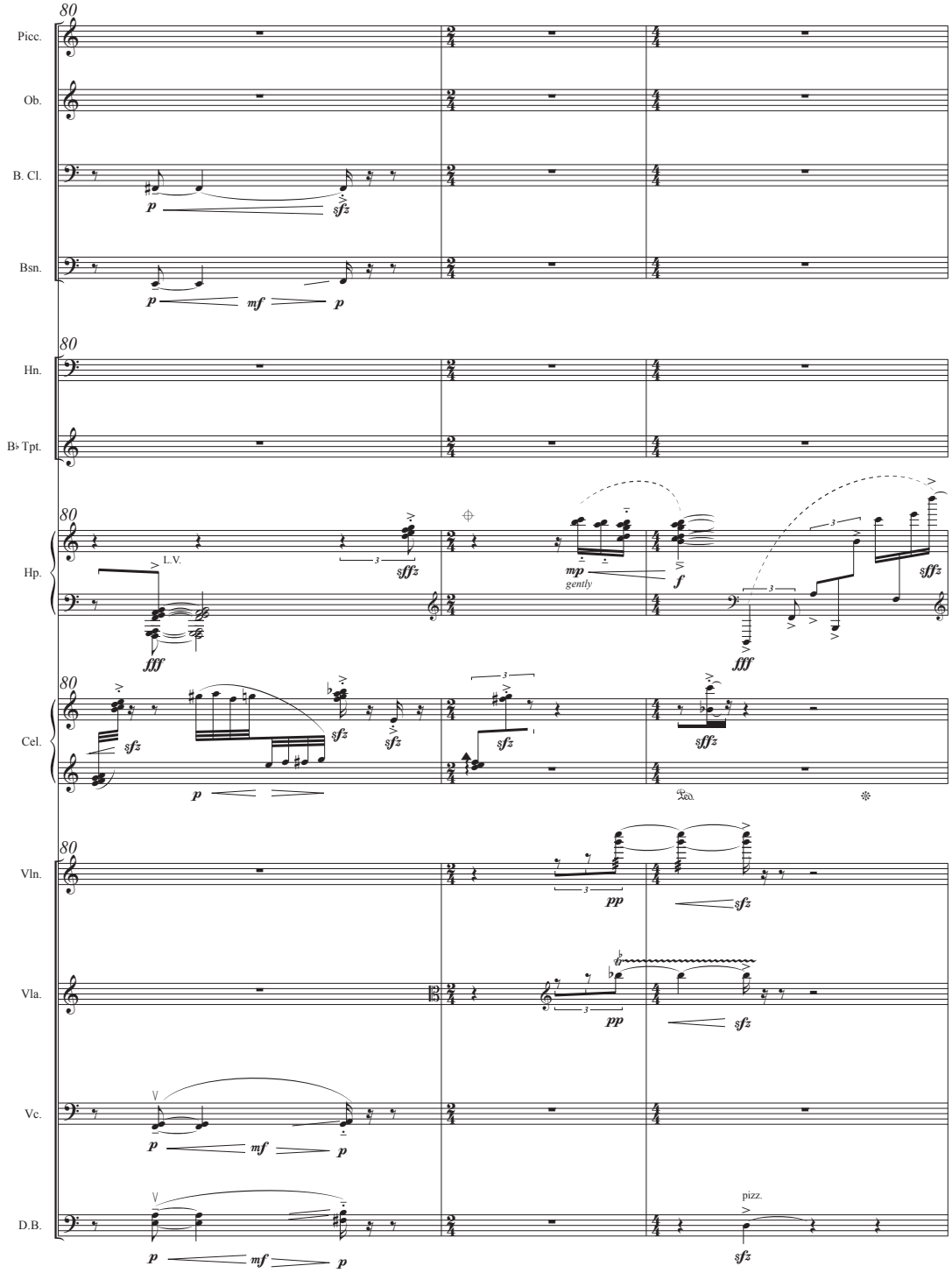

63
Fl.
Ob.
B♭ Cl.
Bsn.
Hn.
B♭ Tpt.
Hp.
Cel.
Vln.
Vla.
Vc.
D.B.
ng
Ti
Wah
t k t k t!
whisper
wah
ricochet
arco
s.p.
ord.
sfz
pp
p
f
mp
mf
sffz
ff

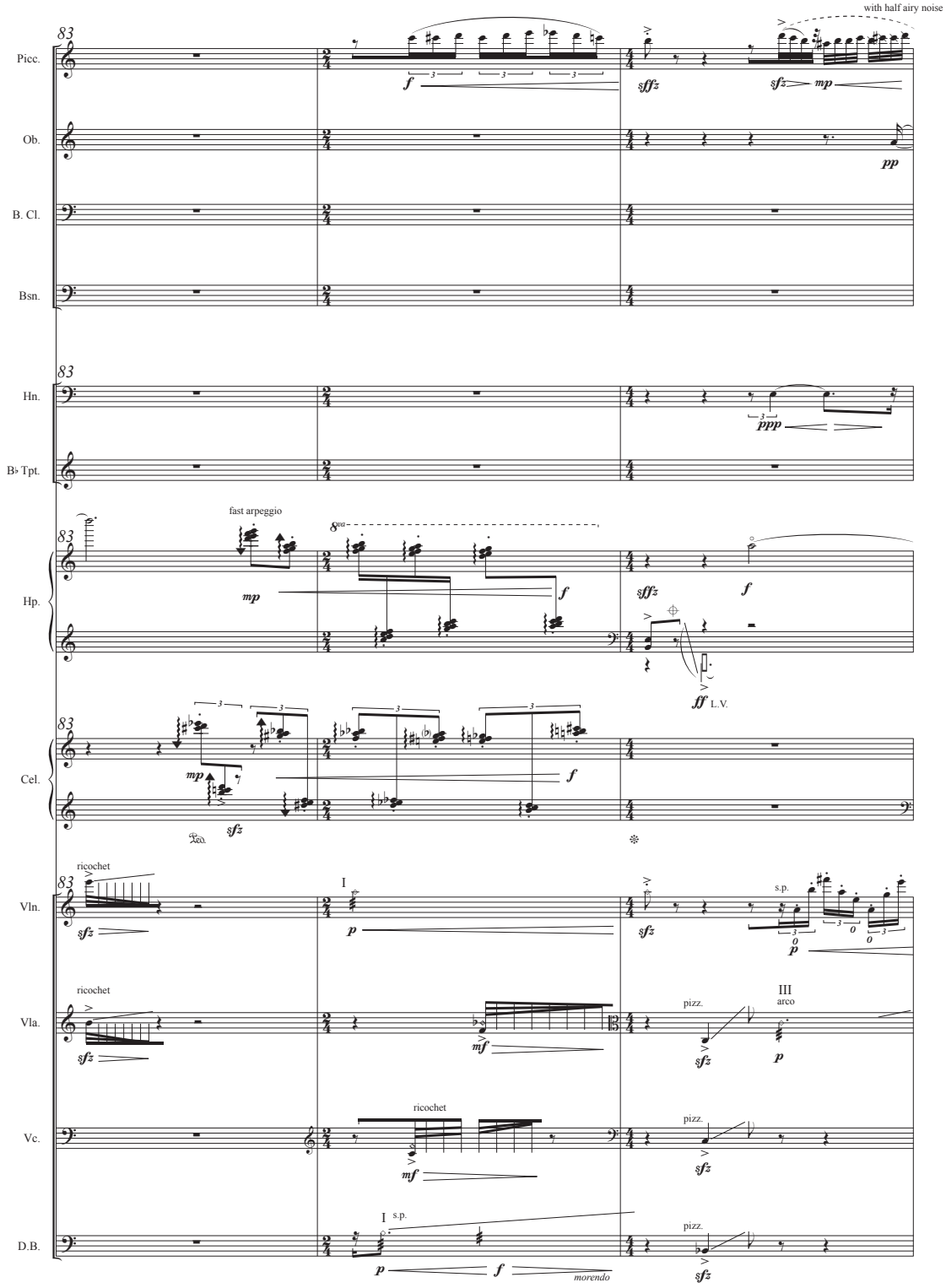

65
Fl.
overblow
p
f
pp
Ob.
B♭ Cl.
non vib.
pp
f
mp
ff
Bsn.
65
Hn.
blow through the end part
of the mouth piece
mf
intensely
B♭ Tpt.
mf
intensely
65
Hp.
p
sfz
ff
mp
sffz
65
Cel.
sfz
65
Vln.
cue by conductor
morendo
I
mp
ff
pp
Vla.
I
morendo
mp
ff
pp
Vc.
s.p.
morendo
fp
f
pp
f
p
D.B.
ord.
sffz
intensely
mf
fff
acro/pizz.
L.V.
sffzp
ff

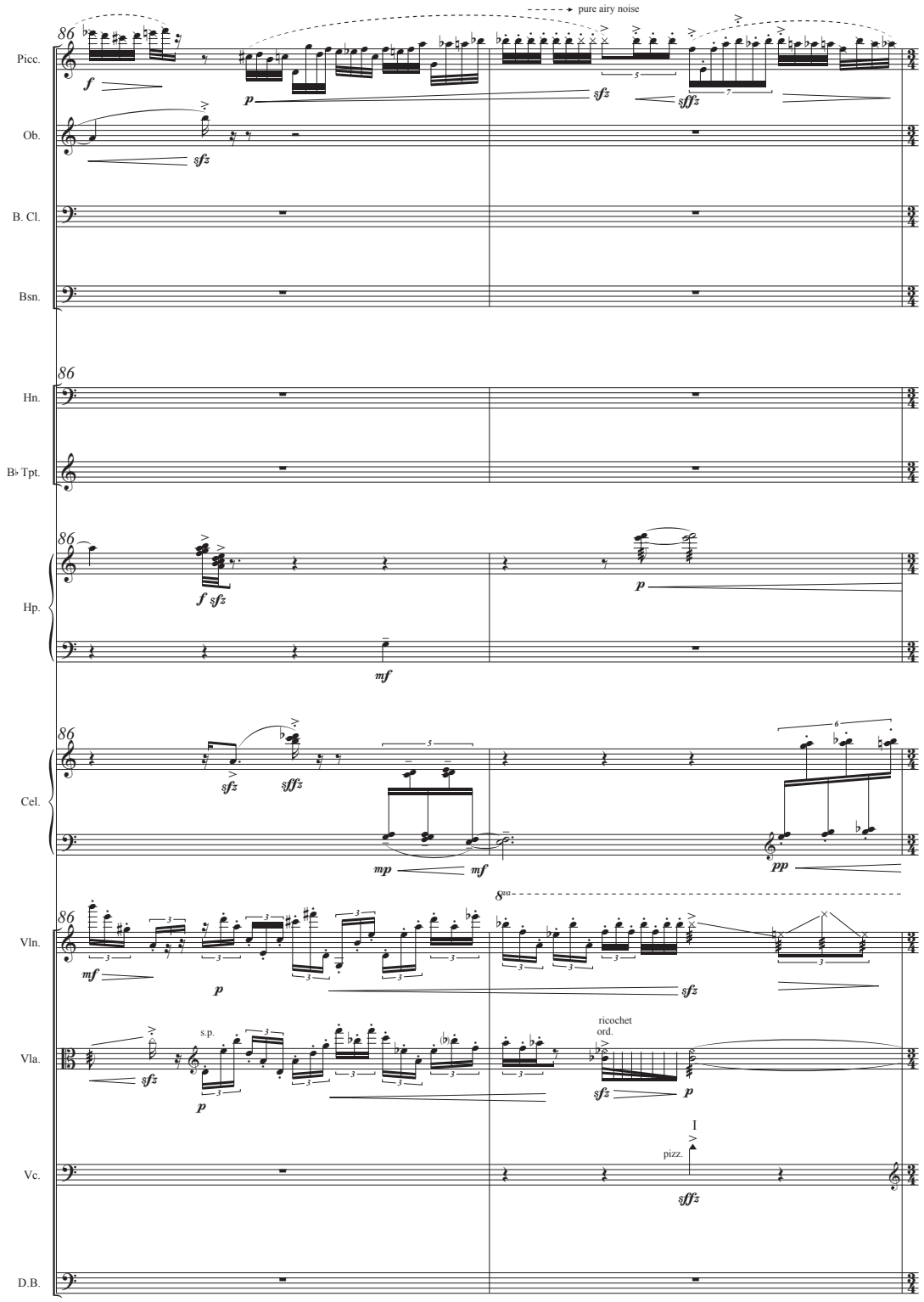

whistle tones
harmonics Ad libitum
c.a. 8"
to piccolo
Fl.
Ob.
B♭ Cl.
to bass clarinet
Bsn.
Hn.
B♭ Tpt.
Hp.
[C♯-C, E♯-E, G♯-G]
Cel.
harmonic glissando on string I
Try to make harmonic glissando in an improvisational way
Vln.
Vla.
Vc.
D.B.
ord.
arco
niente
morendo
as if secretly following flute part

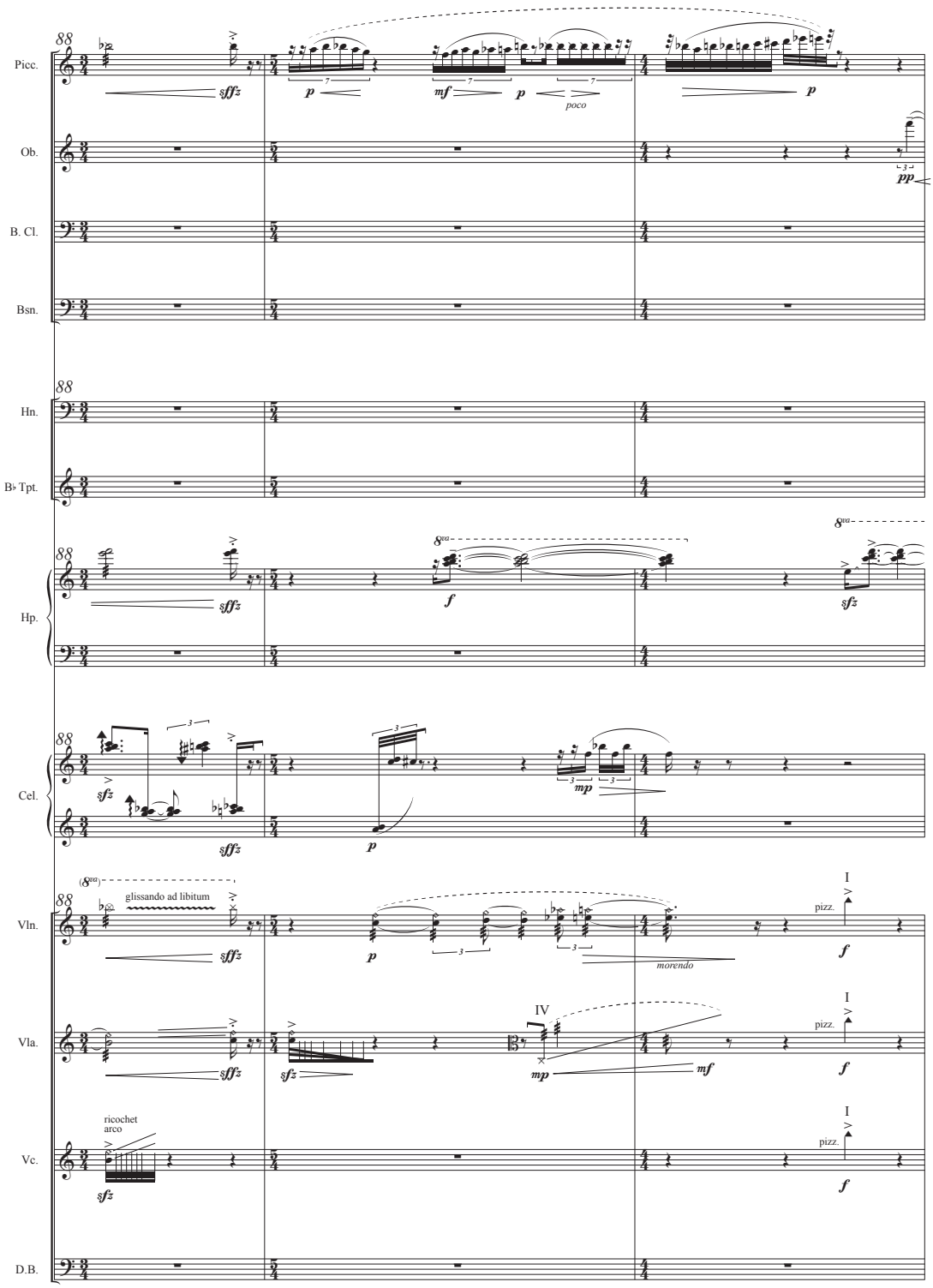

H Unfolding Quietly
as if frozen
Picc.
piccolo
non vib.
ppp
mf
morendo
Ob.
non vib.
vib. poco
ppp
mp
non vib.
ppp
B. Cl.
non vib.
vib. poco
ppp
mf
ppp
poco
Bsn.
non vib.
vib. poco
non vib.
ppp
poco
morendo
ppp
poco
71
Hn.
non vib.
ppp
non vib.
ppp
poco
B♭ Tpt.
non vib.
ppp
poco
71
Hp.
f
ff
mf
gently
71
Cel.
play the arpeggio with random order;
with very slow speed
pp
71
Vln.
non vib.
I
II
ppp
p
morendo
ppp
mp
morendo
Vla.
non vib.
ppp
p
morendo
ppp
mp
morendo
Vc.
non vib. vib. poco
ppp
mf
ppp
mp
morendo
D.B.
non vib.
ppp
p
morendo
non vib.
ppp
mf
morendo

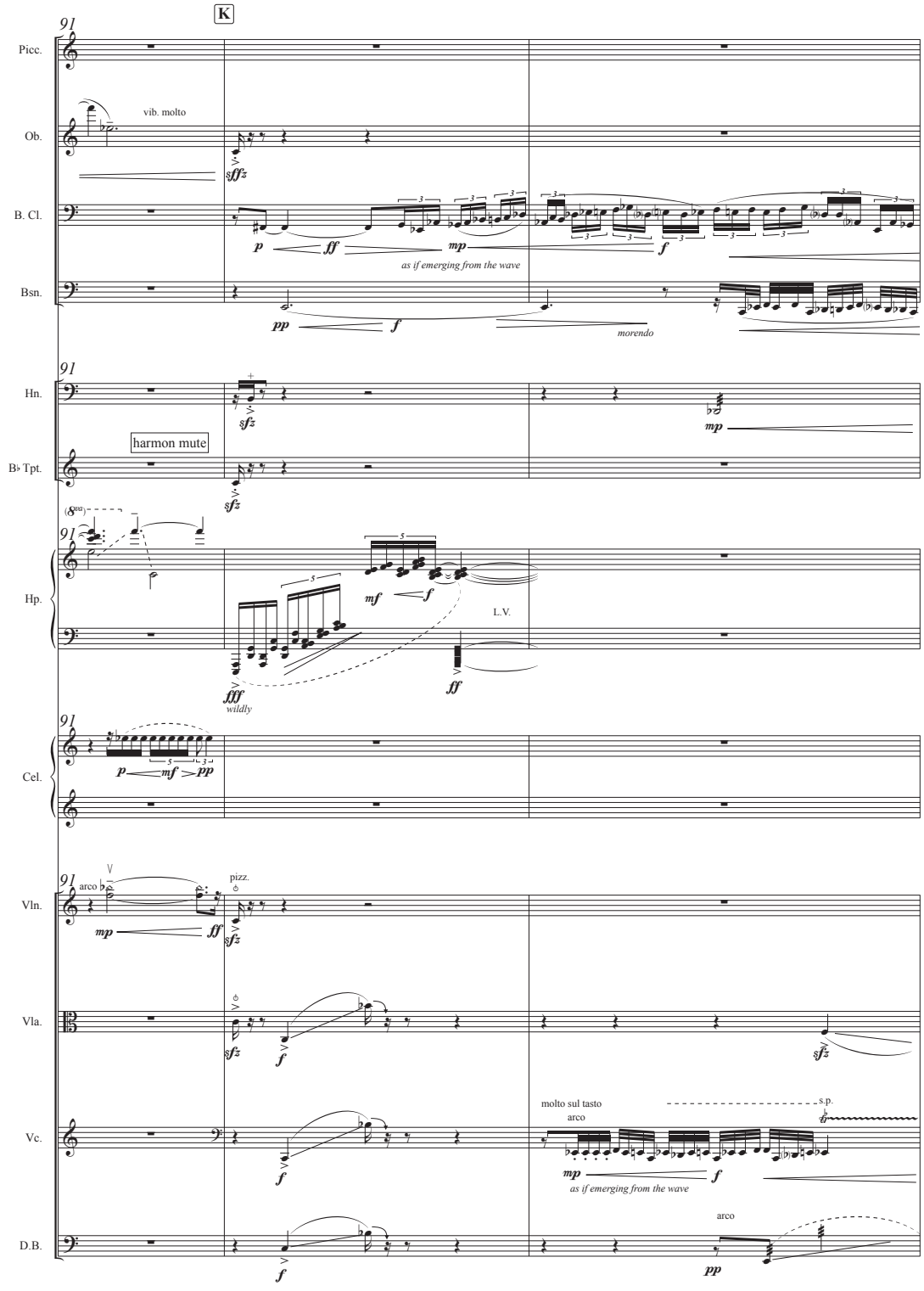

22
I With Flexible Tempo
J Pulsations of Waves ♩ = 76
Picc.
Ob.
B. Cl.
Bsn.
Hn.
B♭ Tpt.
Hp.
Cel.
Vln.
Vla.
Vc.
D.B.
75
vib. poco
vib. molto
non vib.
vib. molto
niente
as alone
mp
poco
pp
f
morendo
ppp
cue by conductor
f
cue by conductor
pp
mp
morendo
L.V.
sfffz
heavily
fast arpeggio
LH
RH
mp
humorously
cue by conductor
non vib.
vib. molto
pp
sfz
cue by conductor
vib. molto
pp
sfz

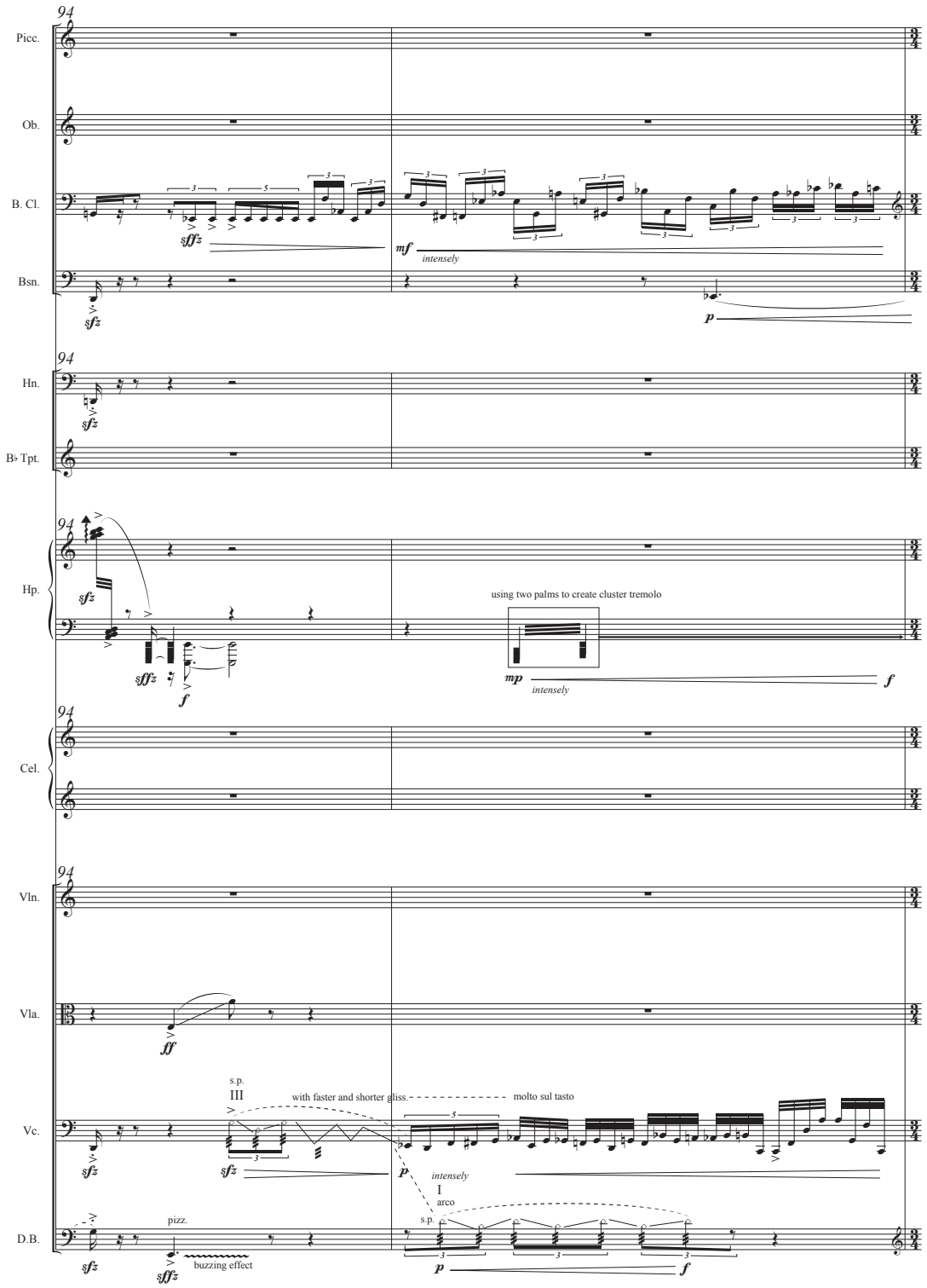

80
Picc.
Ob.
B. Cl.
Bsn.
Hn.
B♭ Tpt.
Hp.
Cel.
Vln.
Vla.
Vc.
D.B.
L.V.
gently
pizz.

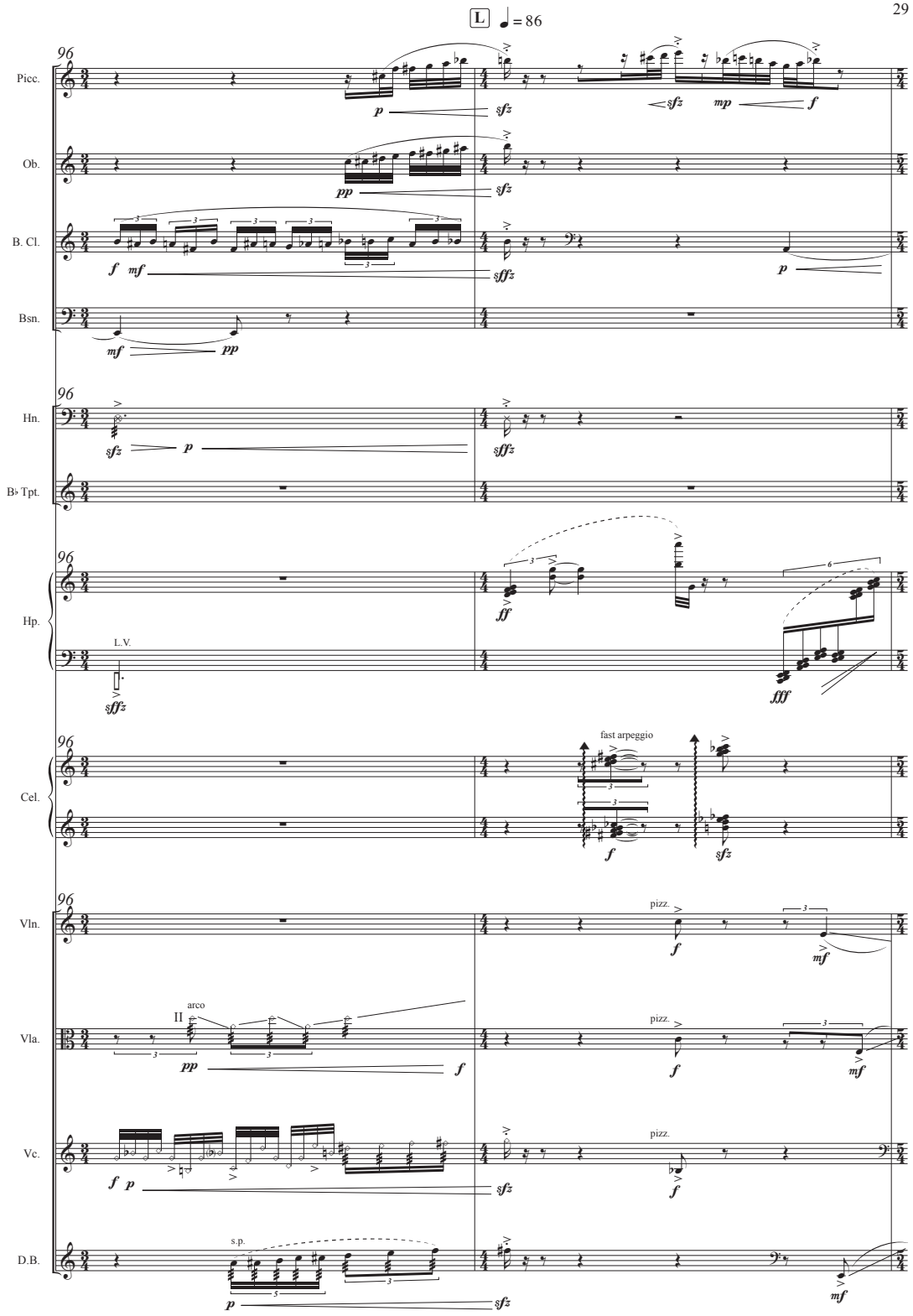

with half airy noise
Picc.
Ob.
B. Cl.
Bsn.
Hn.
B♭ Tpt.
Hp.
Cel.
Vln.
Vla.
Vc.
D.B.
fast arpeggio
ricochet
s.p.
pizz.
arco
morendo
L.V.

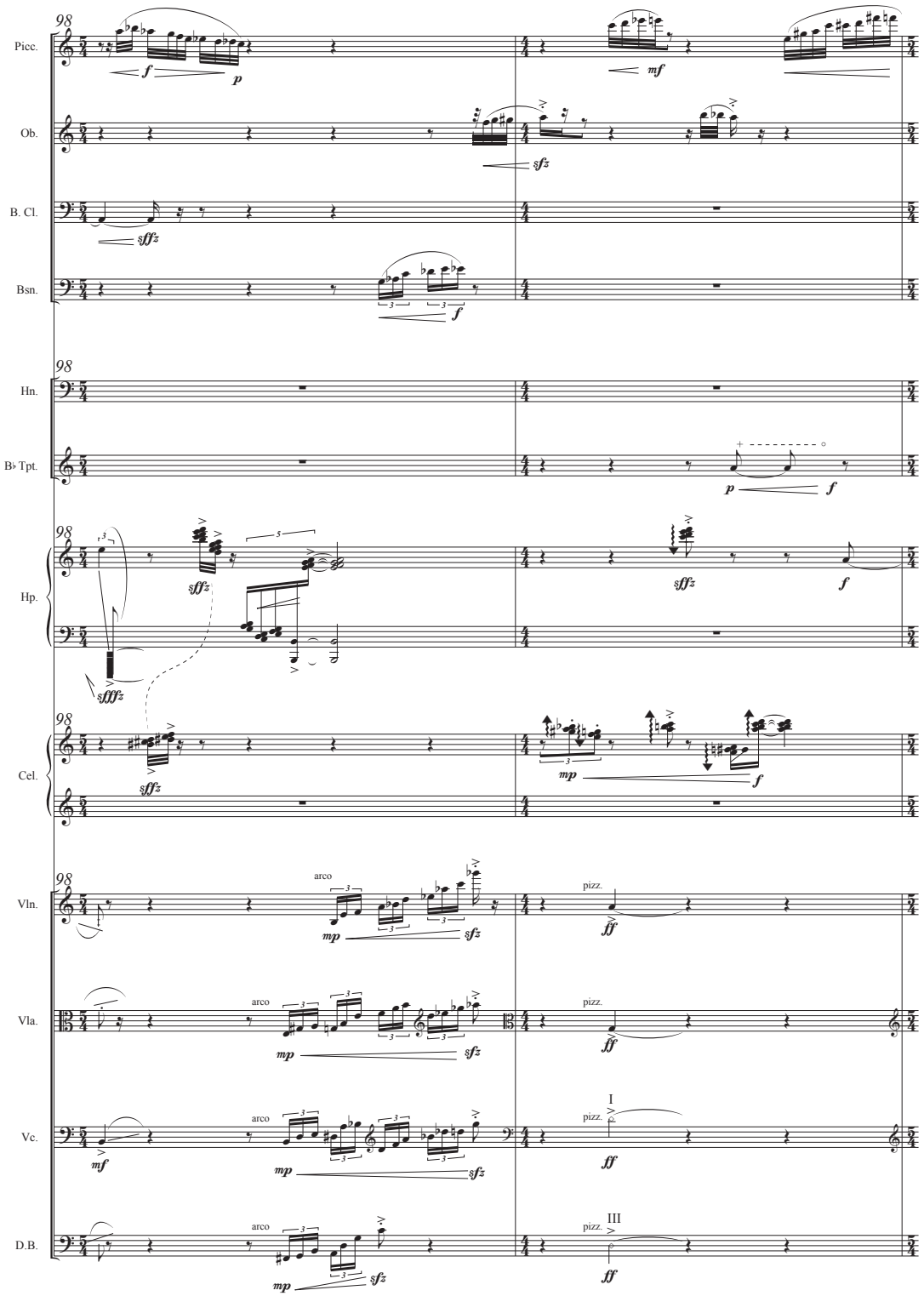

pure airy noise
Picc.
Ob.
B. Cl.
Bsn.
Hn.
B♭ Tpt.
Hp.
Cel.
Vln.
Vla.
Vc.
D.B.
8va
s.p.
ricochet
ord.
pizz.

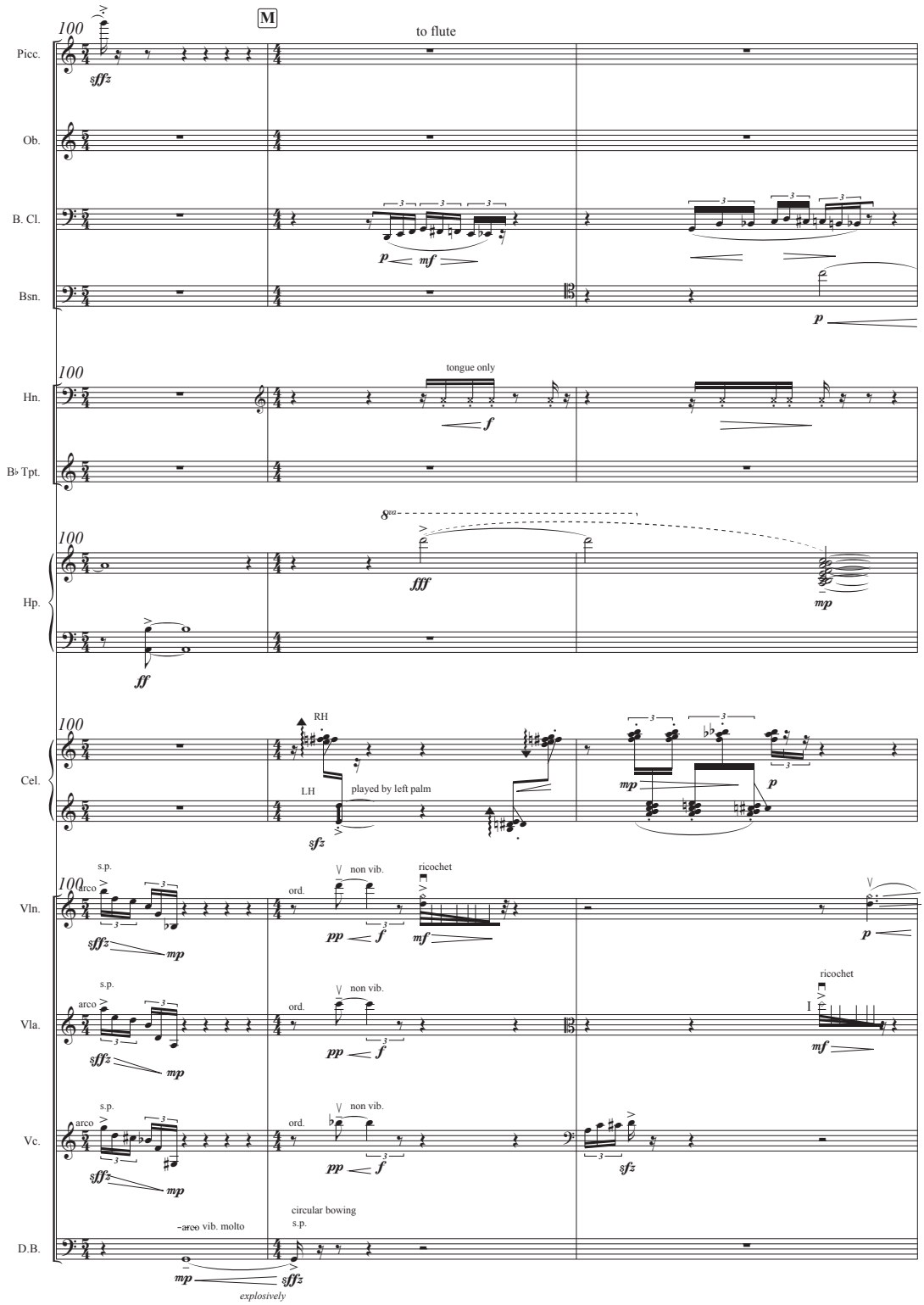

Picc.
Ob.
B. Cl.
Bsn.
Hn.
B♭ Tpt.
Hp.
Cel.
Vln.
Vla.
Vc.
D.B.
glissando ad libitum
ricochet
arco
pizz.
morendo
poco

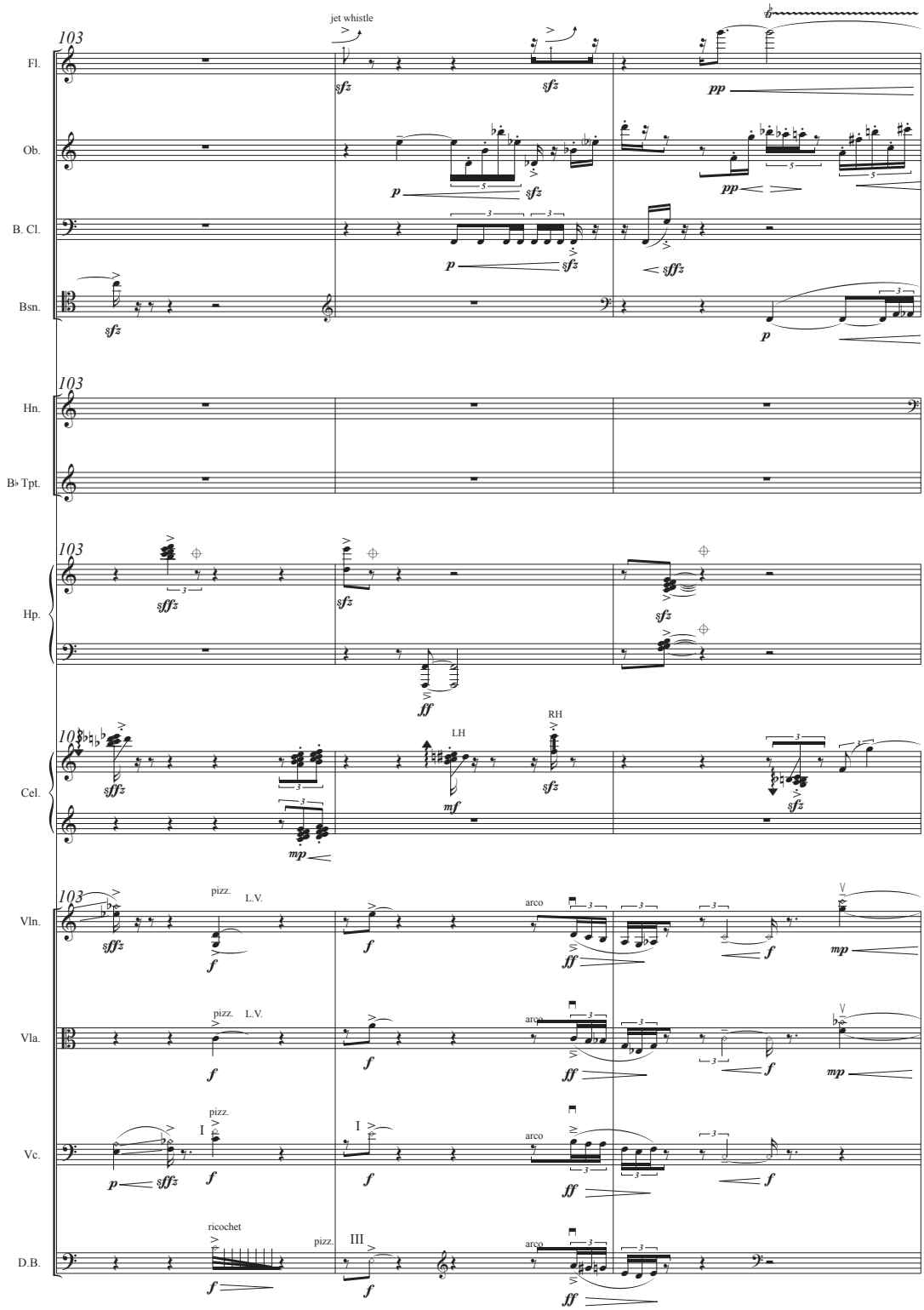

K
91
Picc.
vib. molto
Ob.
sfffz
B. Cl.
p
ff
mp
f
as if emerging from the wave
Bsn.
pp
f
morendo
Hn.
sfz
mp
harmon mute
B♭ Tpt.
sfz
Hp.
mf
f
L.V.
fff
wildly
ff
Cel.
p
mf
pp
Vln.
arco
pizz.
mp
ff
sfz
Vla.
sfz
f
sfz
molto sul tasto
s.p.
arco
Vc.
f
mp
f
as if emerging from the wave
D.B.
f
arco
pp

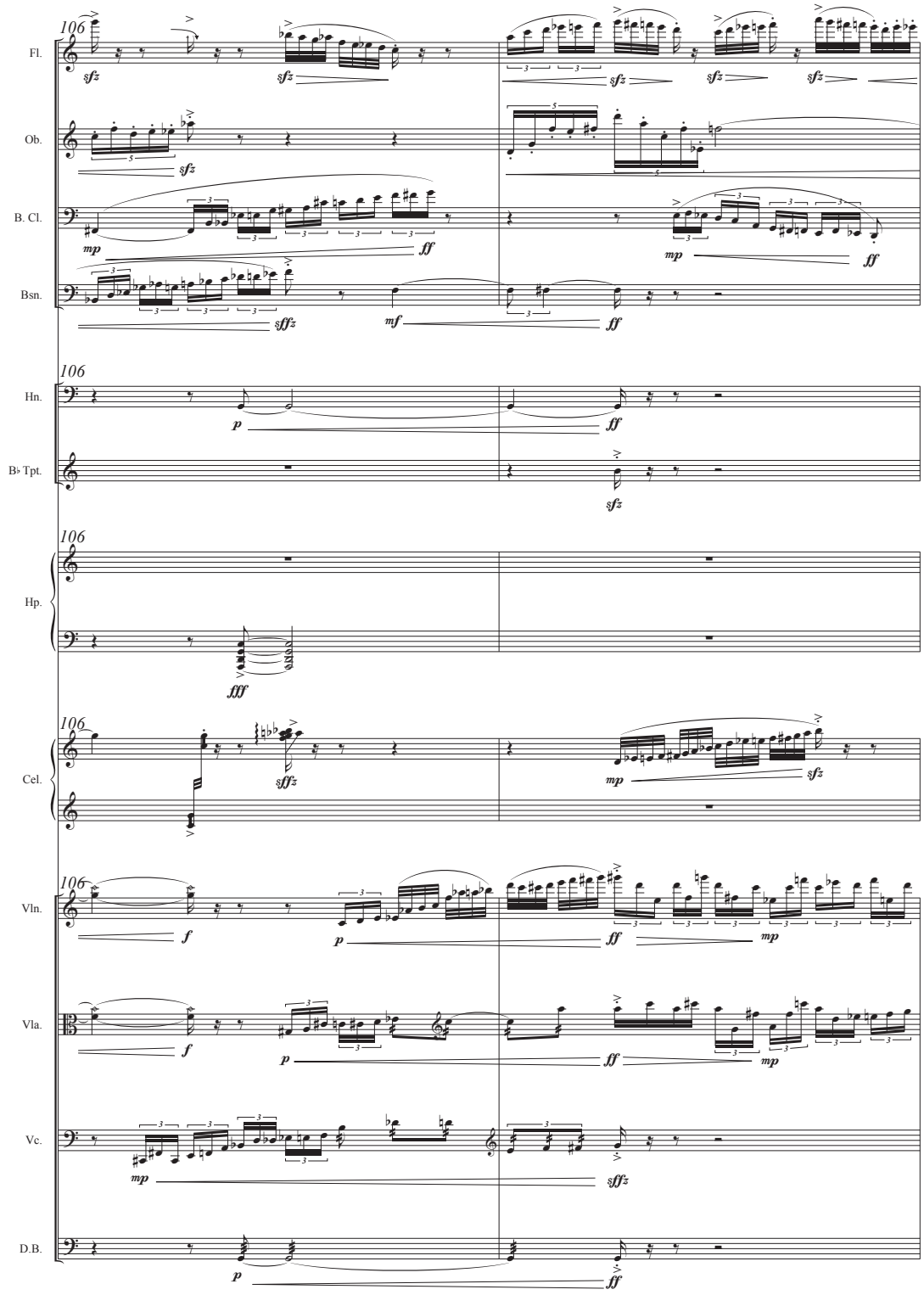

94
Picc.
Ob.
B. Cl.
Bsn.
Hn.
B♭ Tpt.
Hp.
Cel.
Vln.
Vla.
Vc.
D.B.
sffz
mf
intensely
p
sfz
f
using two palms to create cluster tremolo
mp
ff
s.p.
III
with faster and shorter gliss.
molto sul tasto
I
arco
pizz.
buzzing effect


L
♩ = 86
96
Picc.
Ob.
B. Cl.
Bsn.
Hn.
B♭ Tpt.
Hp.
L.V.
Cel.
fast arpeggio
Vln.
pizz.
Vla.
arco
II
Vc.
D.B.
s.p.

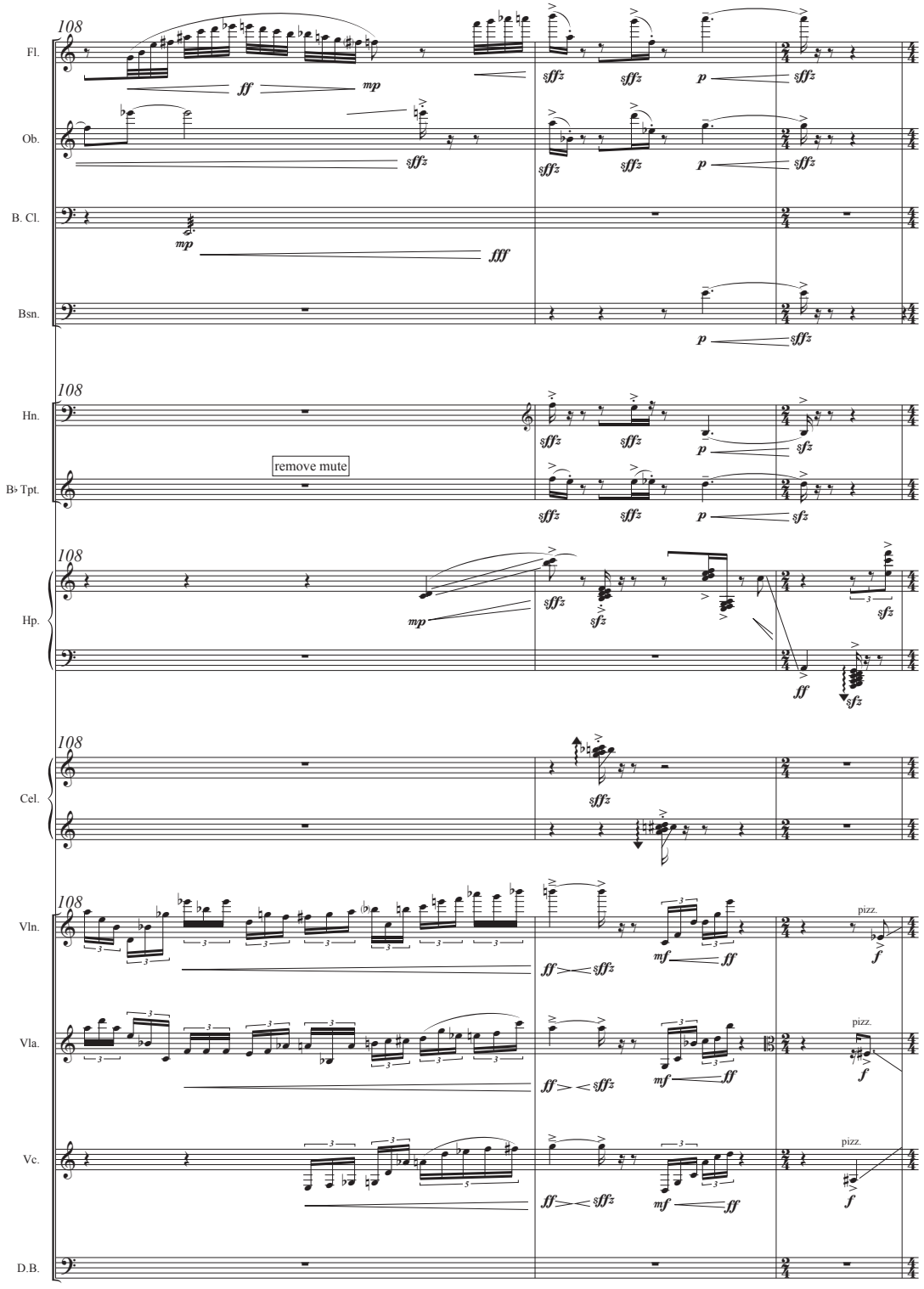

98
Picc.
Ob.
B. Cl.
Bsn.
Hn.
B♭ Tpt.
Hp.
Cel.
Vln.
Vla.
Vc.
D.B.
arco
pizz.
I
III

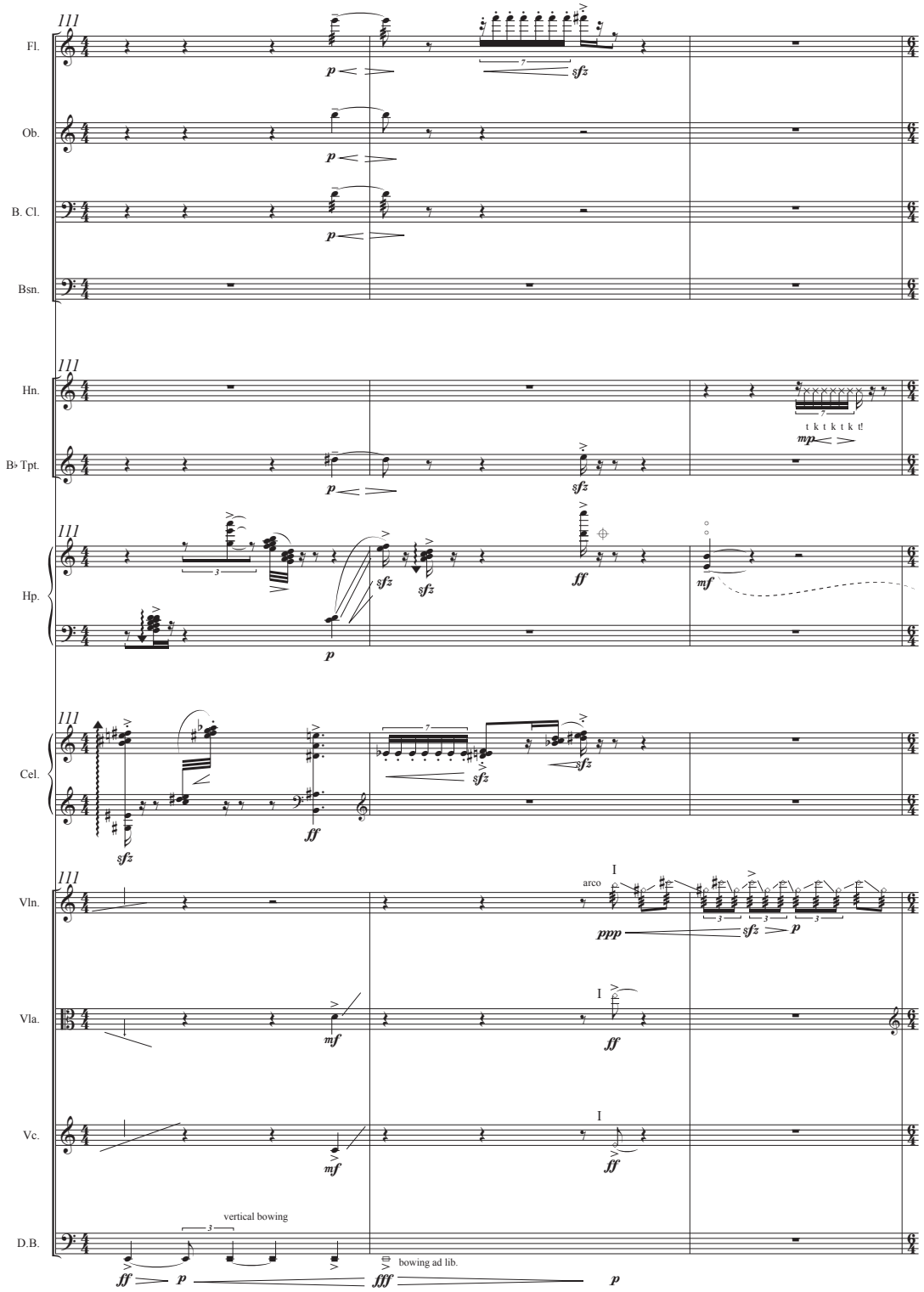

100
M
to flute
Picc.
Ob.
B. Cl.
Bsn.
Hn.
tongue only
B♭ Tpt.
8va
Hp.
RH
LH
played by left palm
Cel.
s.p.
arco
ord.
non vib.
ricochet
Vln.
Vla.
Vc.
circular bowing
s.p.
arco vib. molto
D.B.
explosively

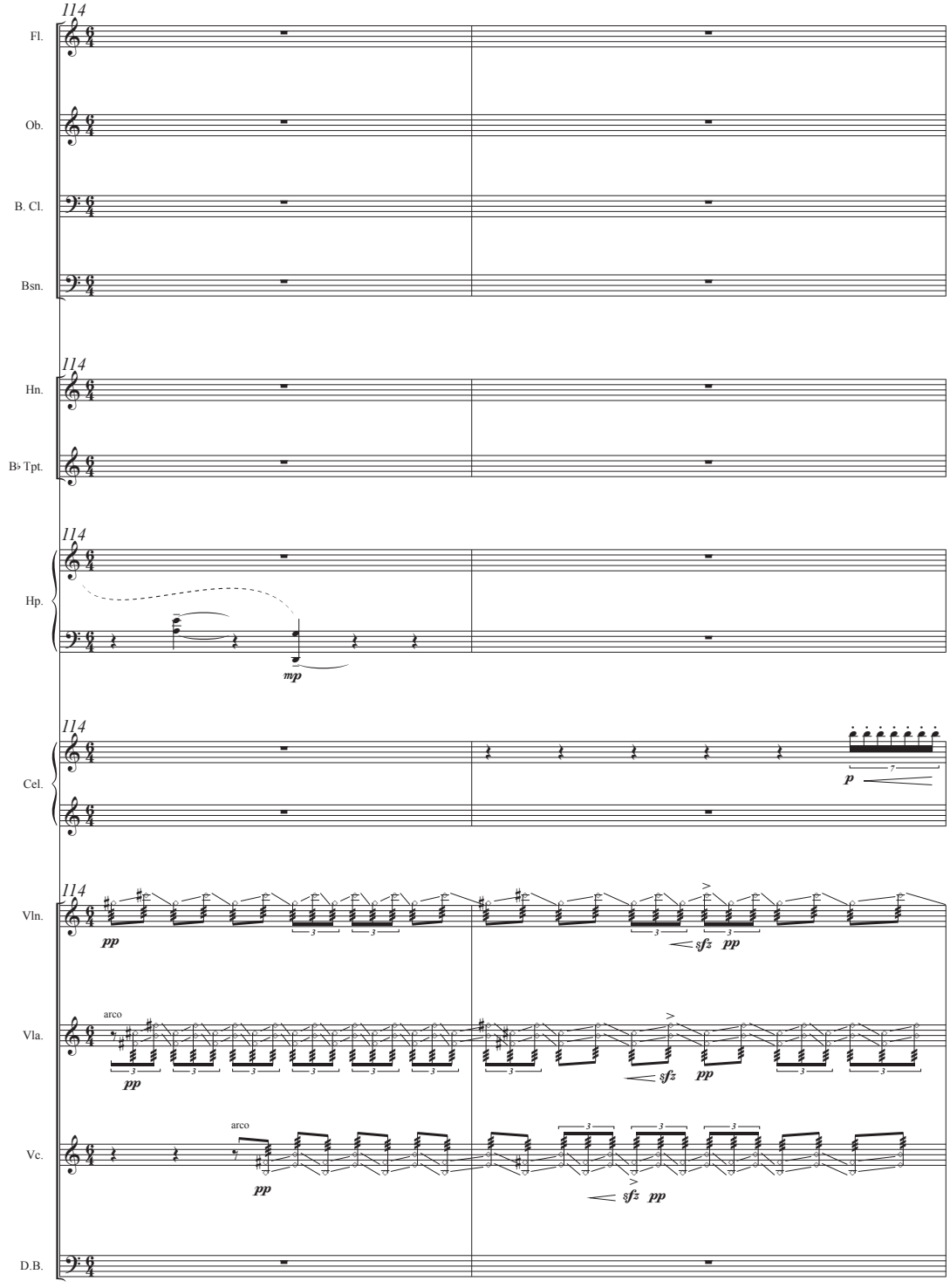

103
jet whistle
Fl.
Ob.
B. Cl.
Bsn.
Hn.
B♭ Tpt.
Hp.
LH
RH
Cel.
Vln.
Vla.
Vc.
D.B.
pizz.
L.V.
arco
ricochet
I
III

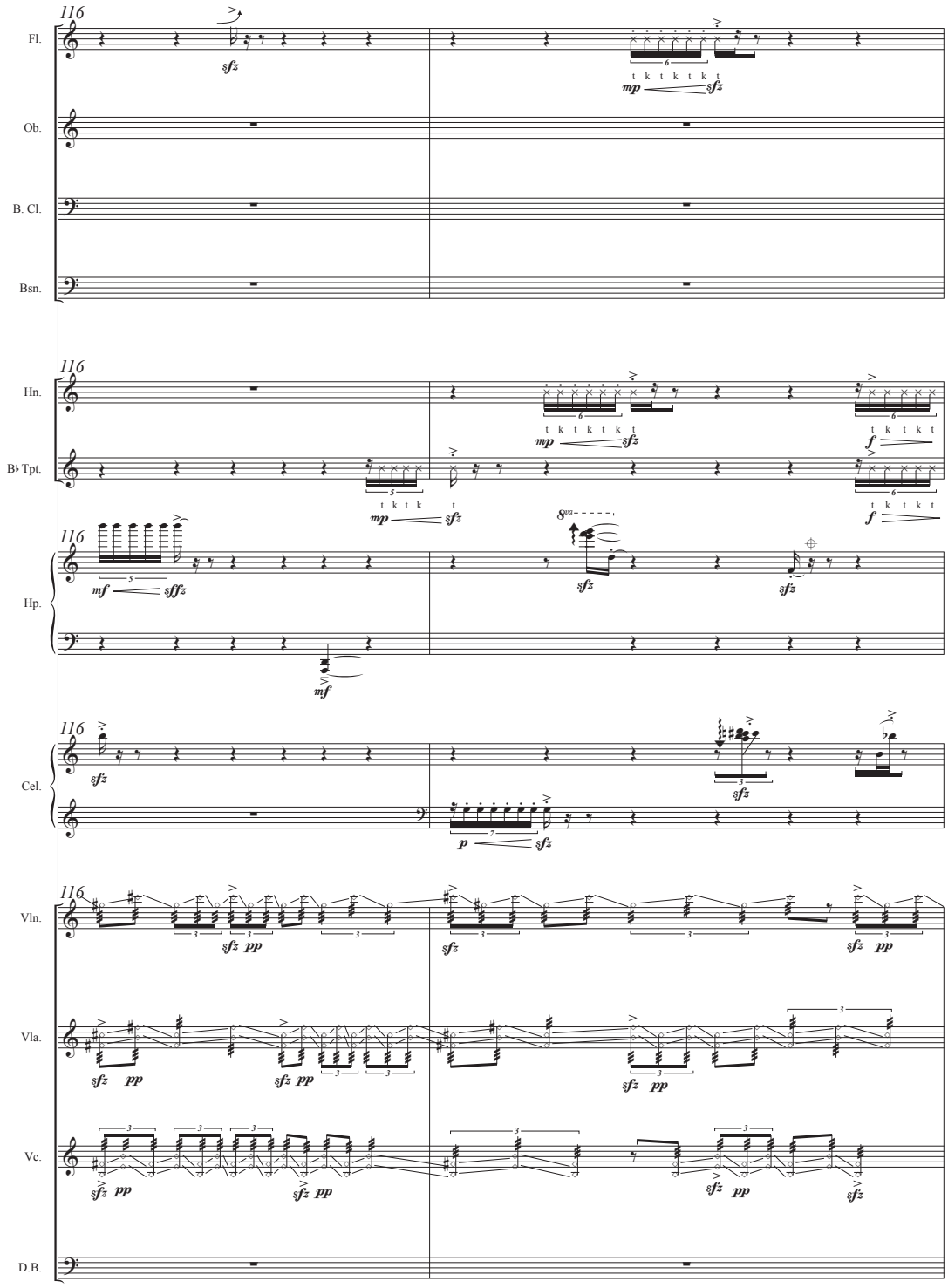

106
Fl.
Ob.
B. Cl.
Bsn.
Hn.
B♭ Tpt.
Hp.
Cel.
Vln.
Vla.
Vc.
D.B.

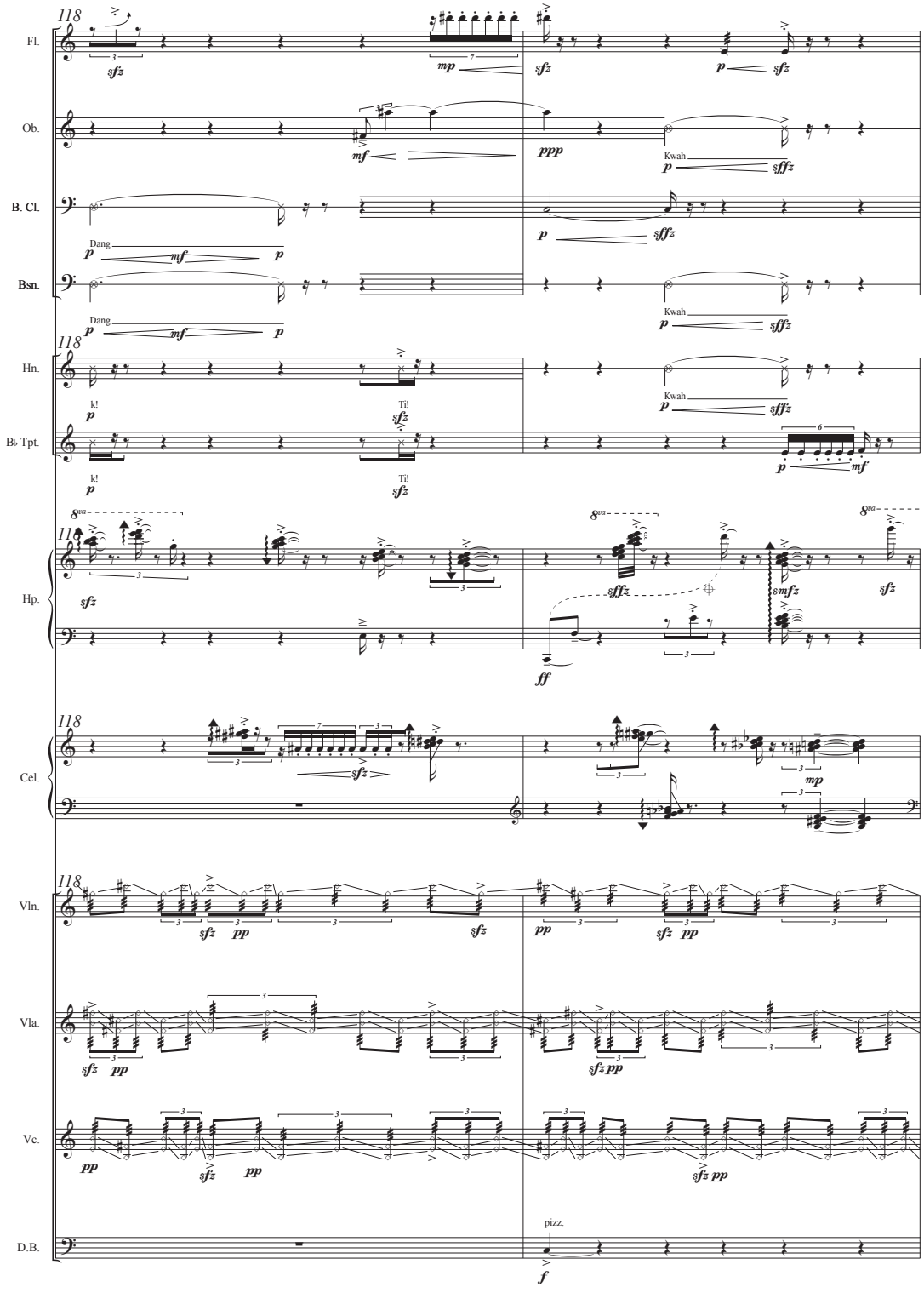
N Intermingling Waves

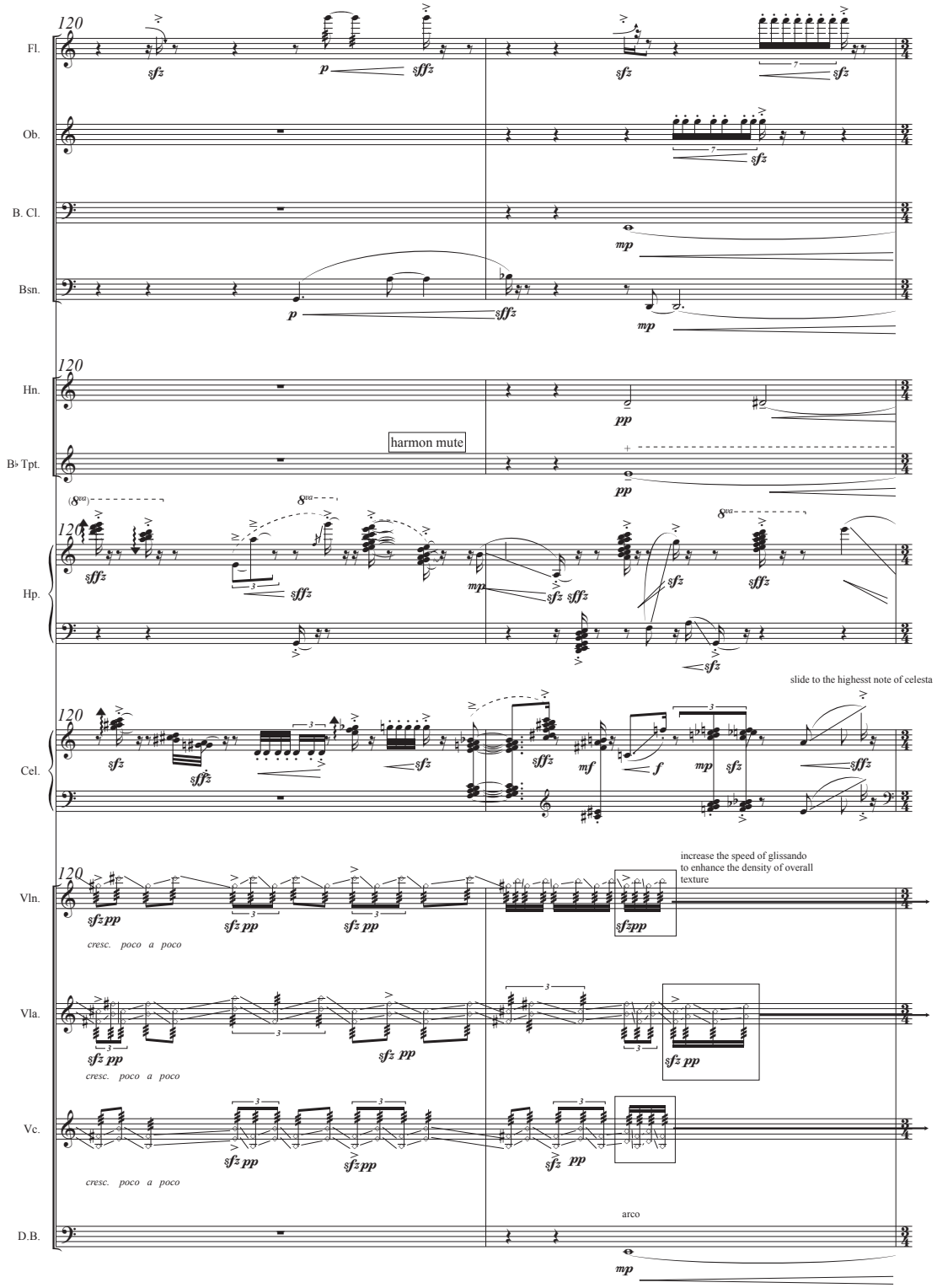


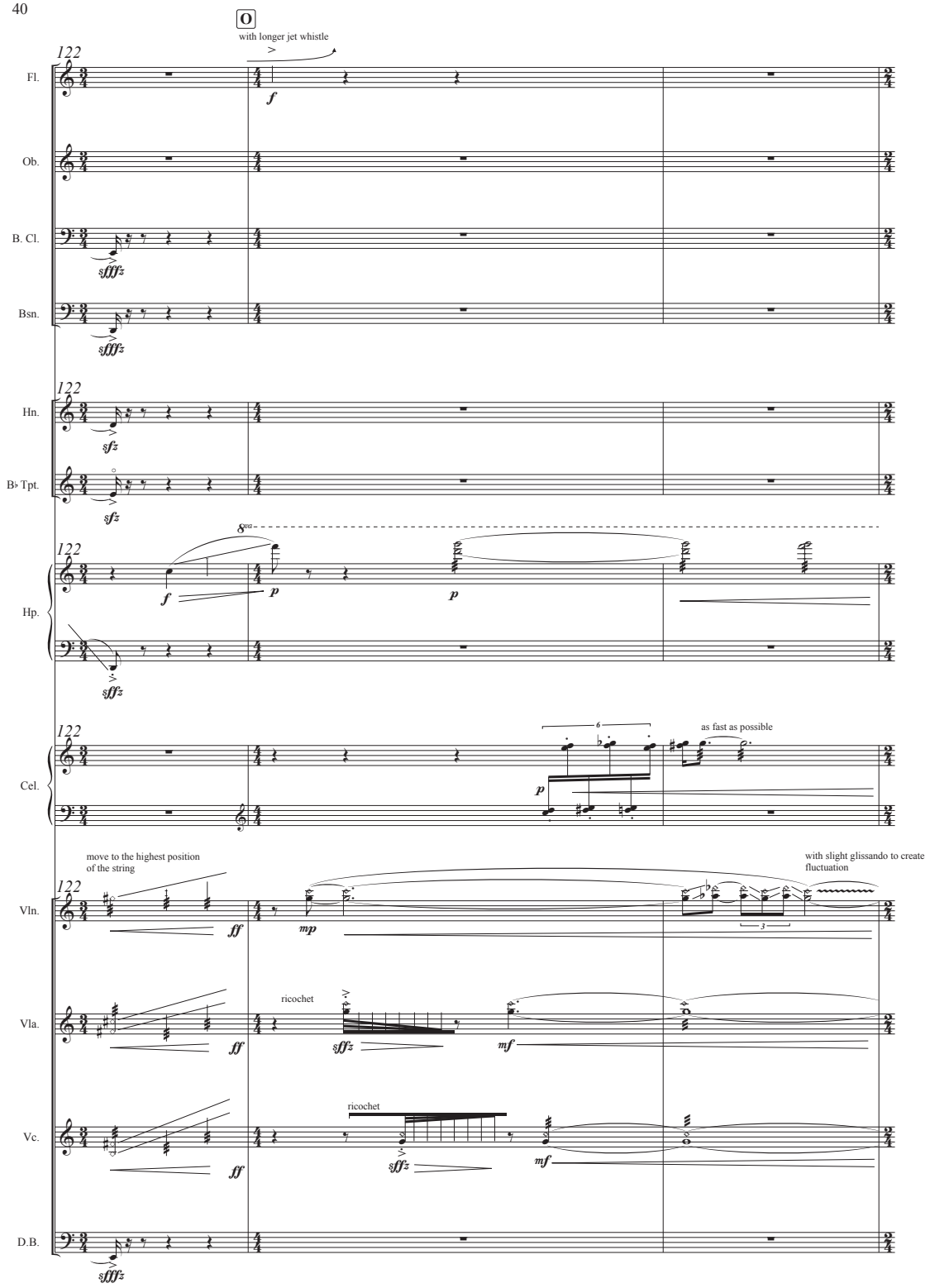

111
Fl.
Ob.
B. Cl.
Bsn.
Hn.
B♭ Tpt.
Hp.
Cel.
Vln.
Vla.
Vc.
D.B.
arco
I
vertical bowing
bowing ad lib.
t k t k t k t!

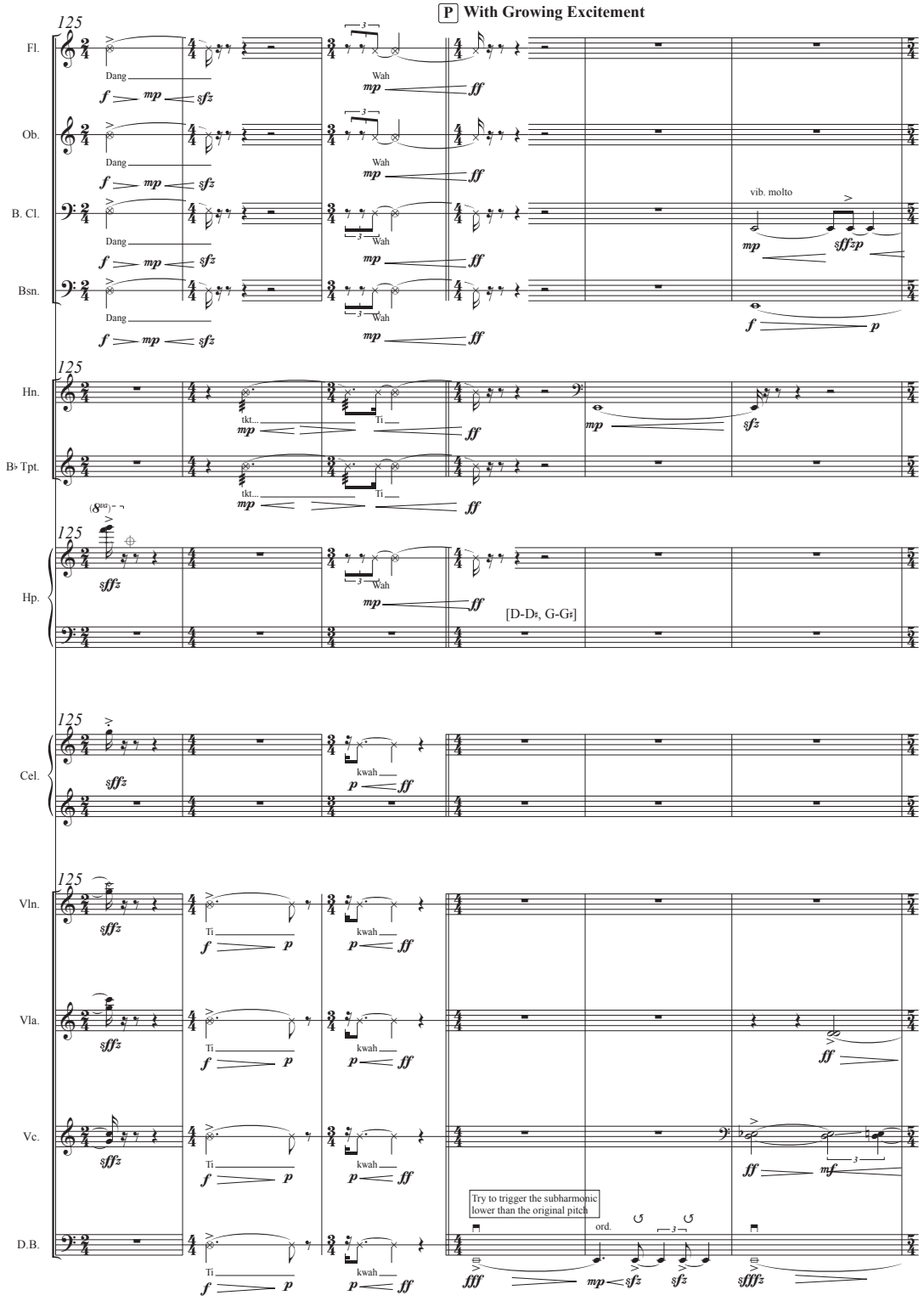

114
Fl.
Ob.
B. Cl.
Bsn.
114
Hn.
B♭ Tpt.
114
Hp.
mp
114
Cel.
p
114
Vln.
pp
sfz pp
Vla.
arco
pp
sfz pp
Vc.
arco
pp
sfz pp
D.B.

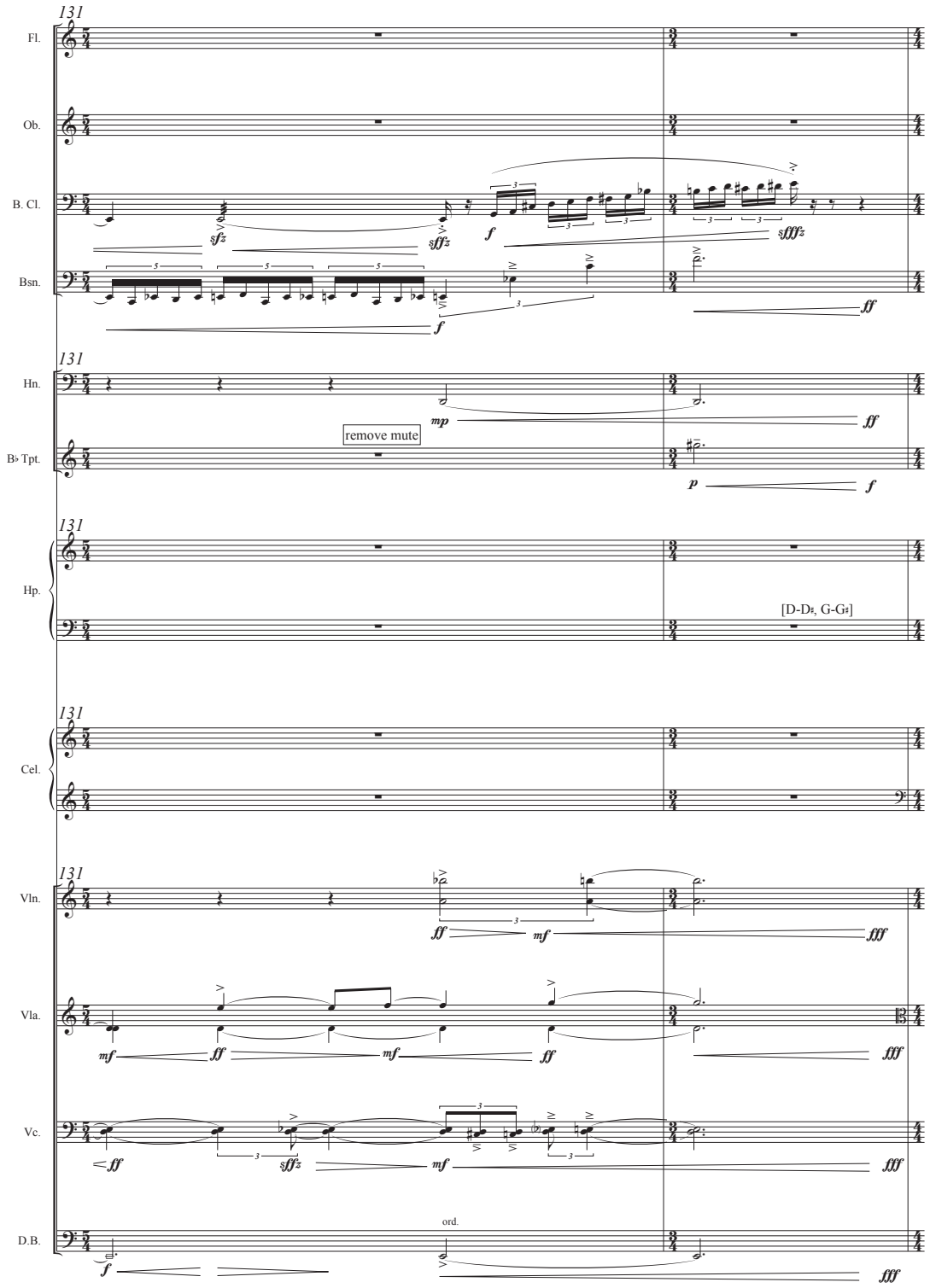

116
Fl.
Ob.
B. Cl.
Bsn.
Hn.
B♭ Tpt.
Hp.
Cel.
Vln.
Vla.
Vc.
D.B.
sfz
mp
mf
sffz
f
p
pp
t k t k t k t

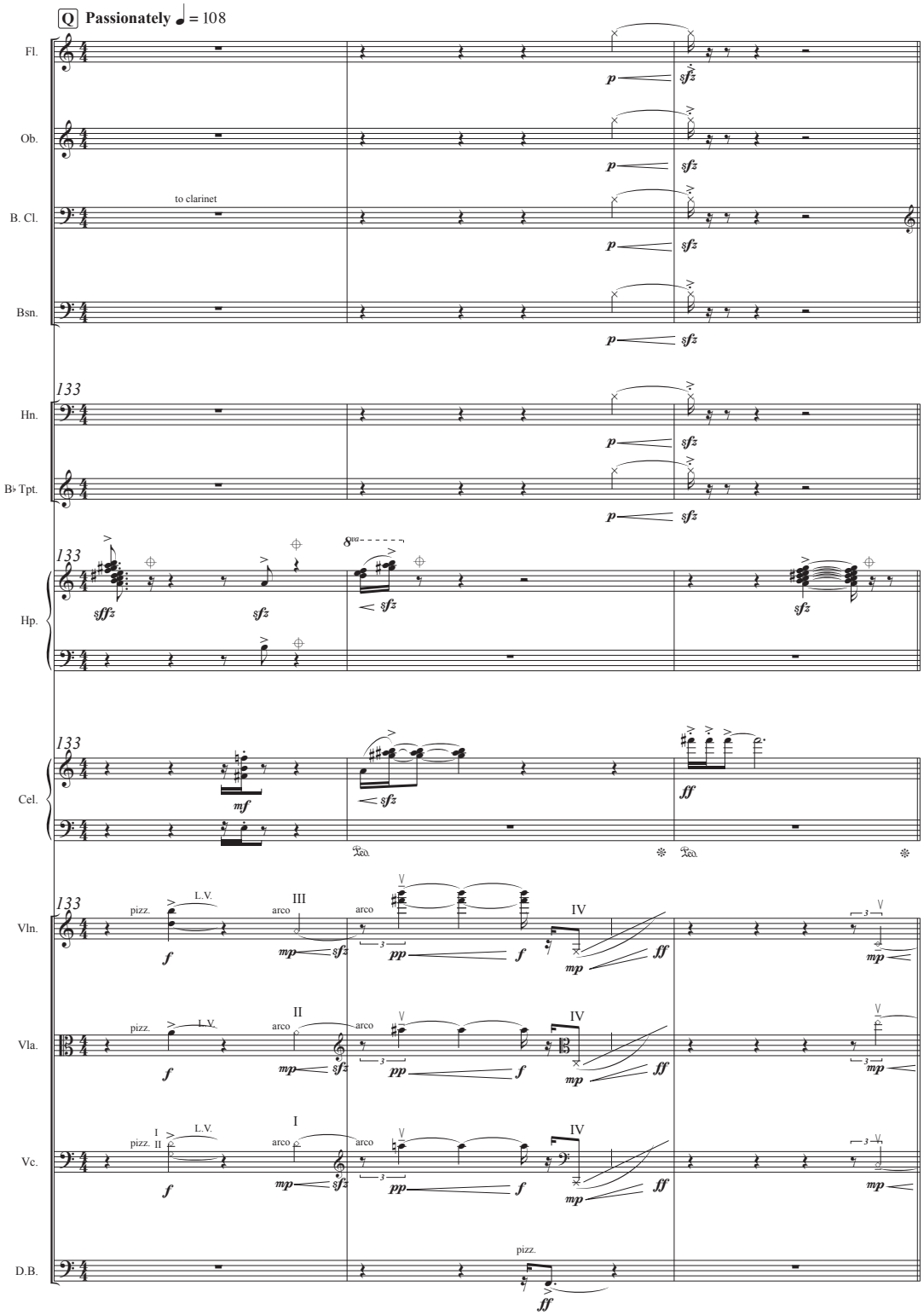

118
Fl.
Ob.
B. Cl.
Bsn.
Hn.
B♭ Tpt.
Hp.
Cel.
Vln.
Vla.
Vc.
D.B.
Dang
Kwah
k!
Ti!
pizz.

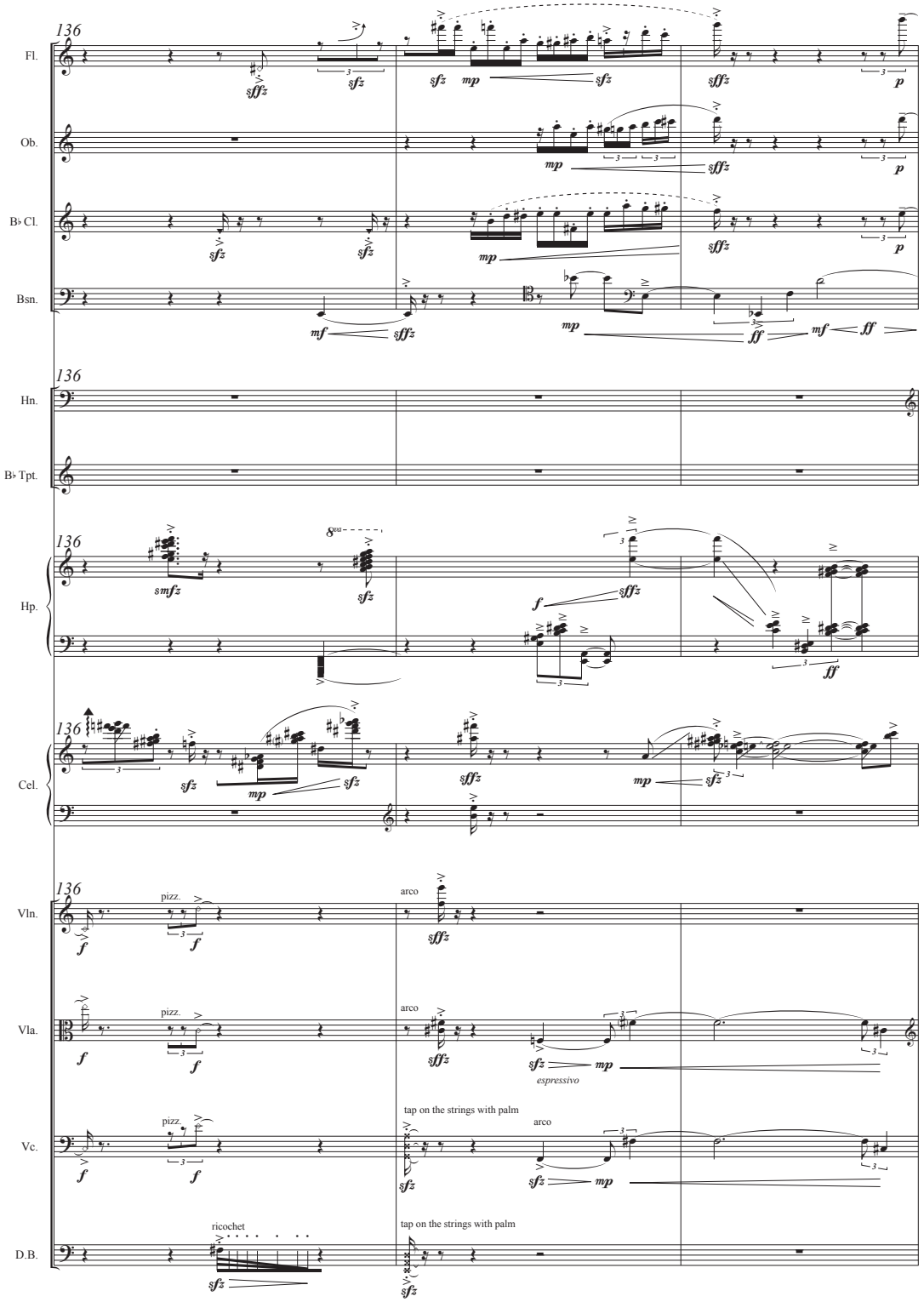

120
Fl.
Ob.
B. Cl.
Bsn.
Hn.
B♭ Tpt.
harmon mute
Hp.
Cel.
slide to the highesst note of celesta
Vln.
increase the speed of glissando
to enhance the density of overall
texture
cresc. poco a poco
Vla.
cresc. poco a poco
Vc.
cresc. poco a poco
arco
D.B.

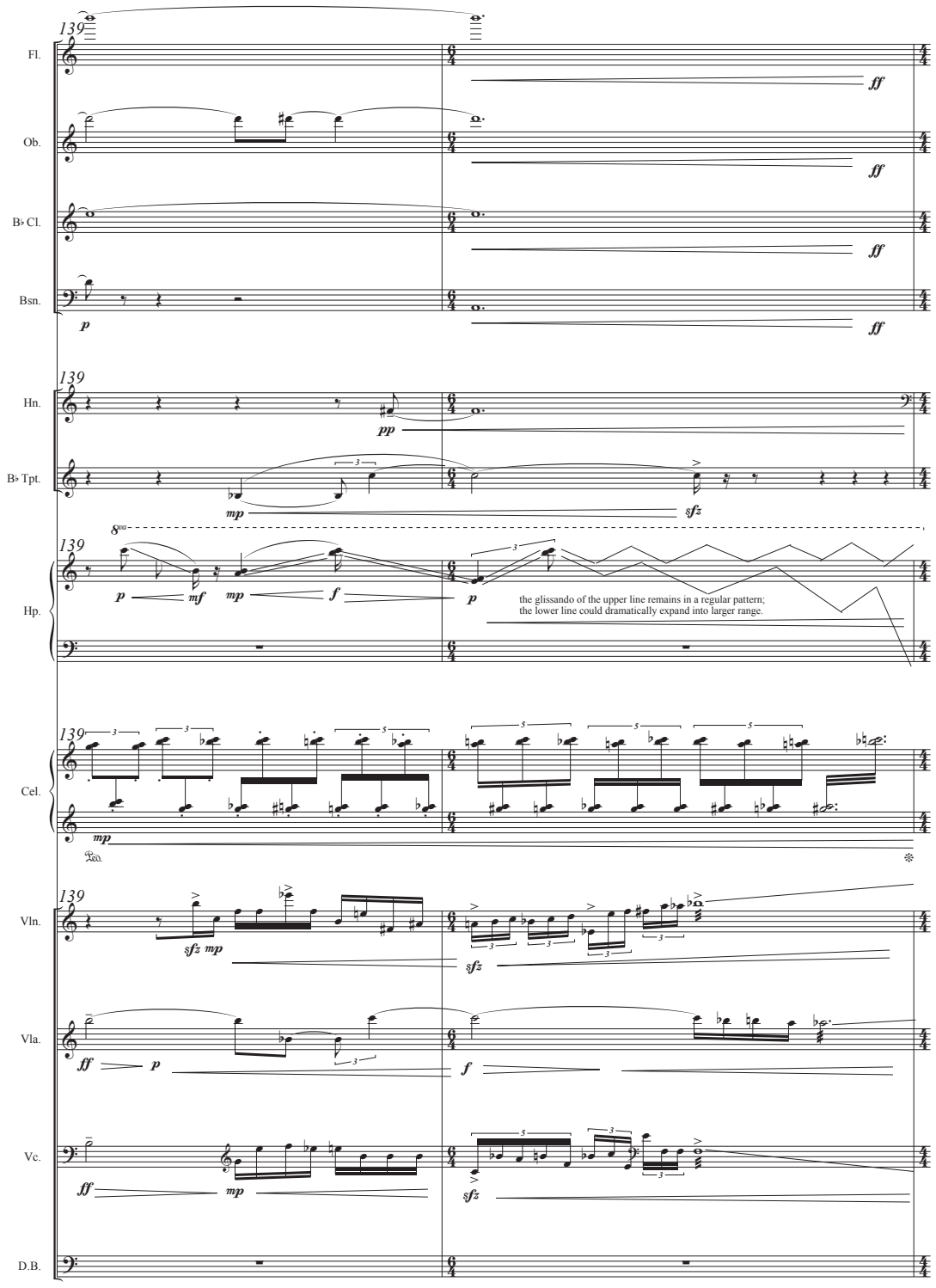

O
with longer jet whistle
122
Fl.
Ob.
B. Cl.
Bsn.
Hn.
B♭ Tpt.
Hp.
Cel.
Vln.
Vla.
Vc.
D.B.
as fast as possible
move to the highest position of the string
with slight glissando to create fluctuation
ricochet
ricochet

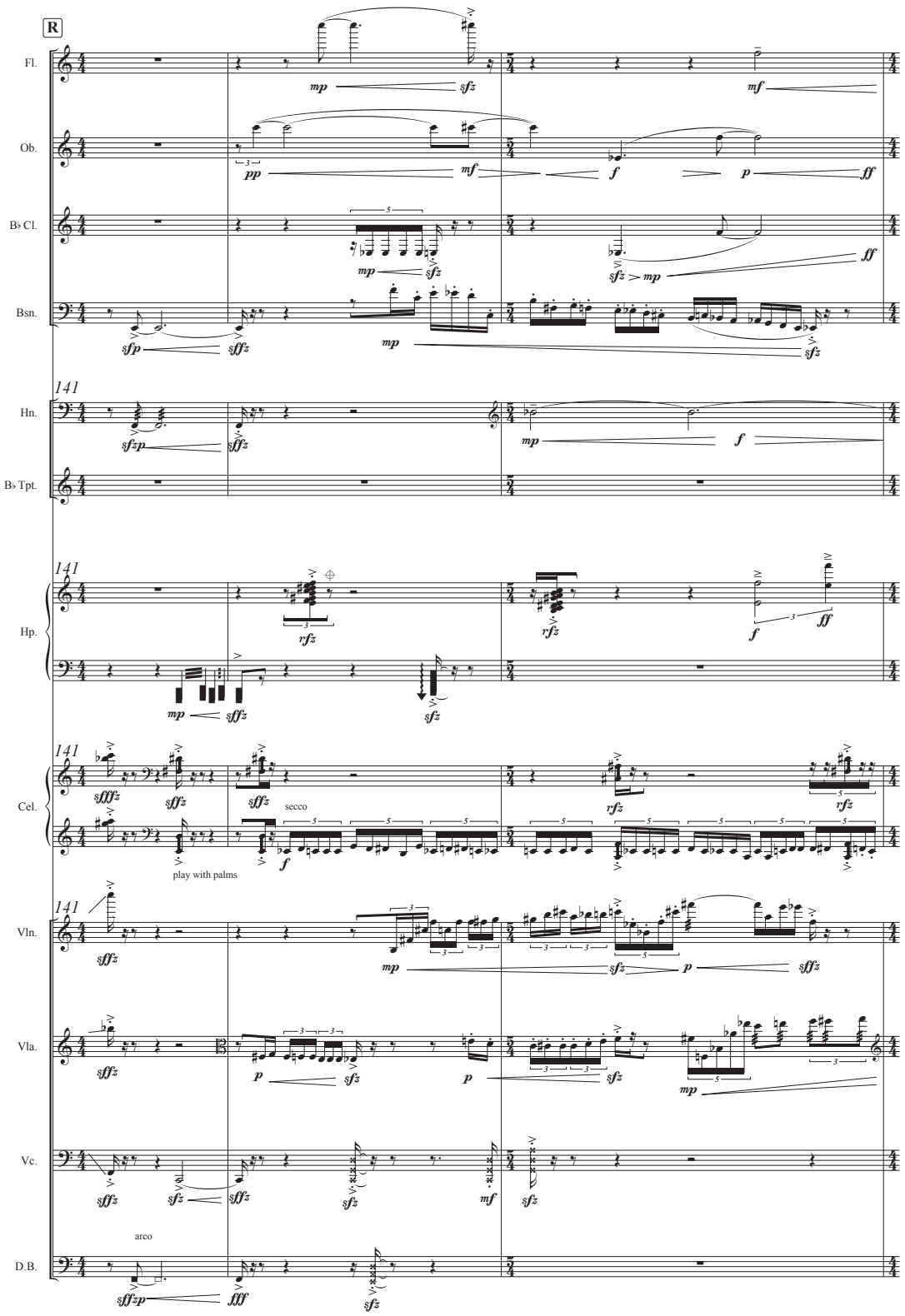

P With Growing Excitement
125
Fl.
Ob.
B. Cl.
Bsn.
Hn.
B♭ Tpt.
Hp.
Cel.
Vln.
Vla.
Vc.
D.B.
Dang
Wah
tkt...
Ti
kwah
vib. molto
[D-D♯, G-G♯]
Try to trigger the subharmonic lower than the original pitch
ord.

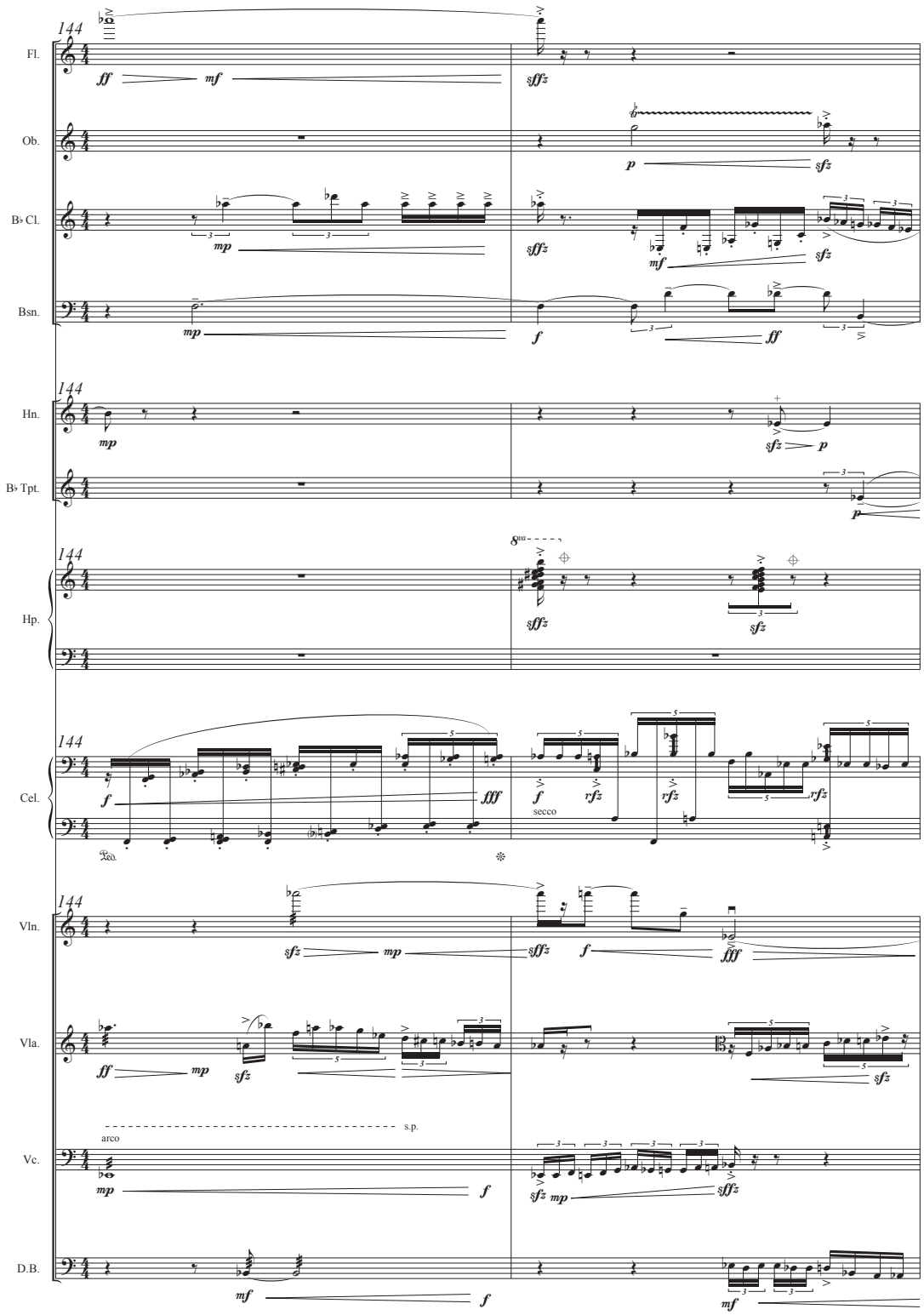

131
Fl.
Ob.
B. Cl.
Bsn.
131
Hn.
remove mute
B♭ Tpt.
131
Hp.
[D-D♯, G-G♯]
131
Cel.
131
Vln.
Vla.
Vc.
ord.
D.B.

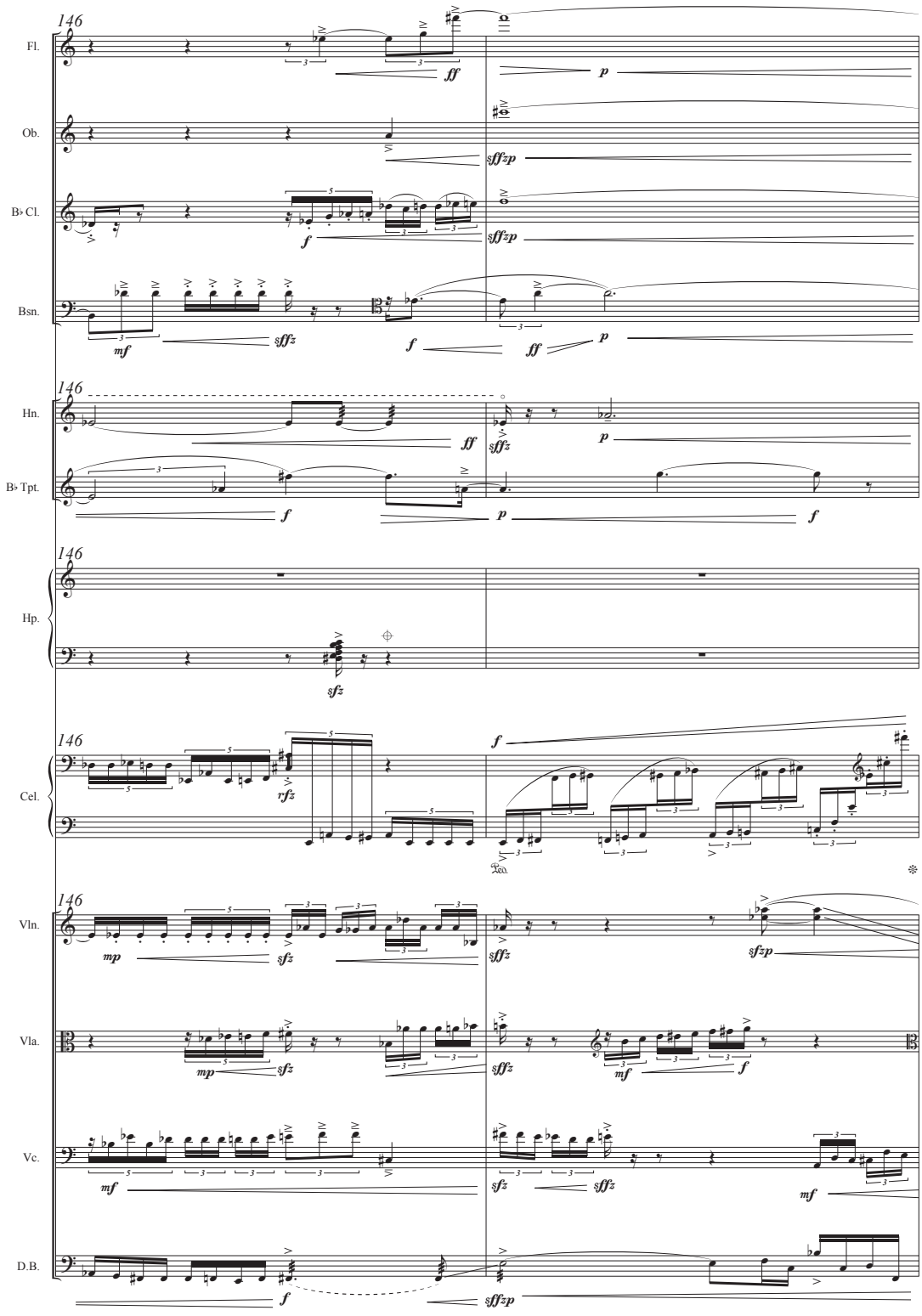

Q Passionately ♩ = 108
Fl.
Ob.
B. Cl.
to clarinet
Bsn.
133
Hn.
B♭ Tpt.
133
Hp.
133
Cel.
133
Vln.
Vla.
Vc.
D.B.
pizz.
L.V.
arco
I
II
III
IV
8va
sffz
sfz
mf
f
mp
pp
ff

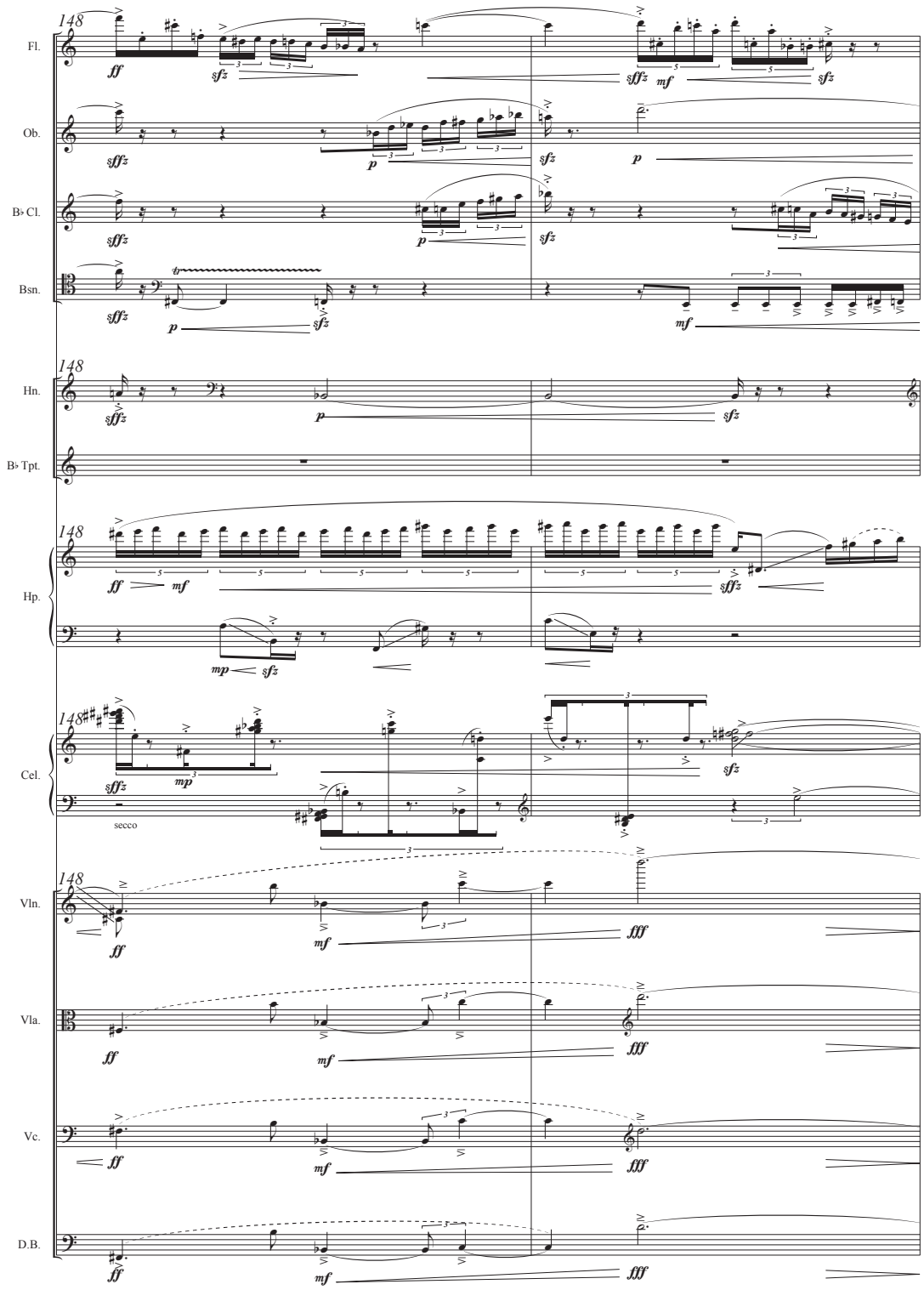

136
Fl.
Ob.
B♭ Cl.
Bsn.
Hn.
B♭ Tpt.
Hp.
Cel.
Vln.
Vla.
Vc.
D.B.
pizz.
arco
espressivo
tap on the strings with palm
ricochet

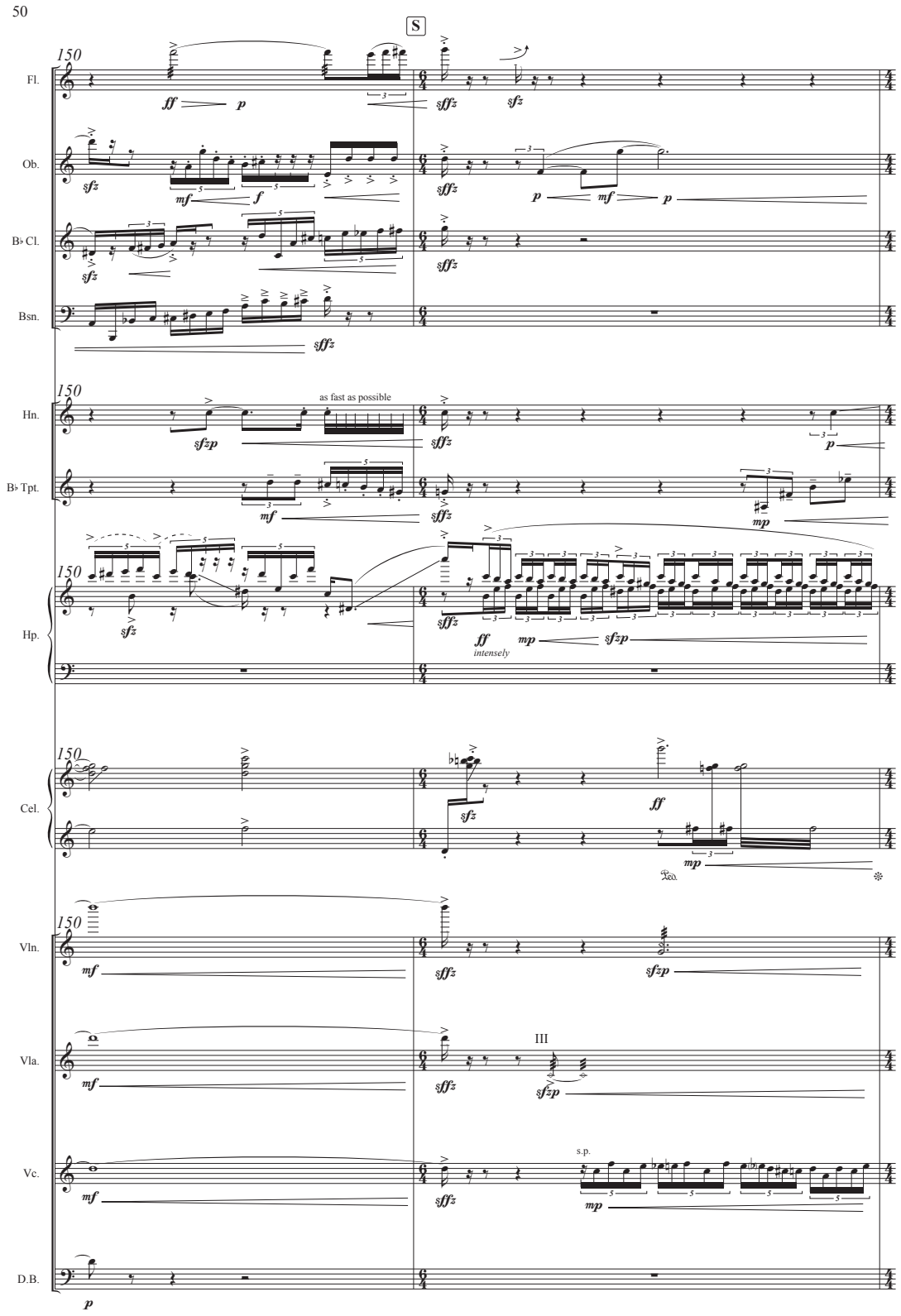

139
Fl.
Ob.
B♭ Cl.
Bsn.
Hn.
B♭ Tpt.
Hp.
Cel.
Vln.
Vla.
Vc.
D.B.
ff
pp
mp
sfz
mf
f
p
8va
the glissando of the upper line remains in a regular pattern;
the lower line could dramatically expand into larger range.

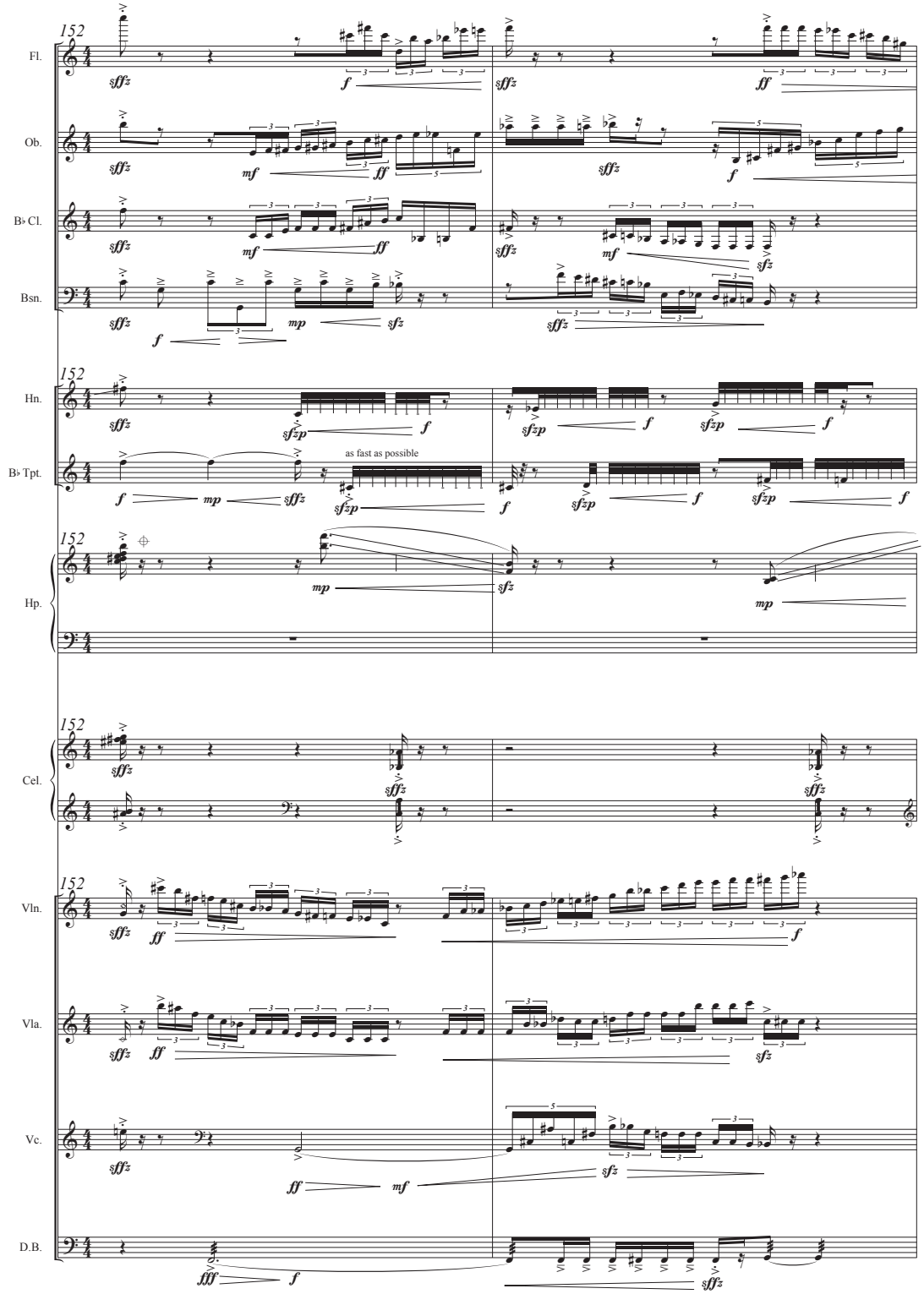

R
Fl.
Ob.
B♭ Cl.
Bsn.
141
Hn.
B♭ Tpt.
141
Hp.
141
Cel.
secco
play with palms
141
Vln.
Vla.
Vc.
arco
D.B.

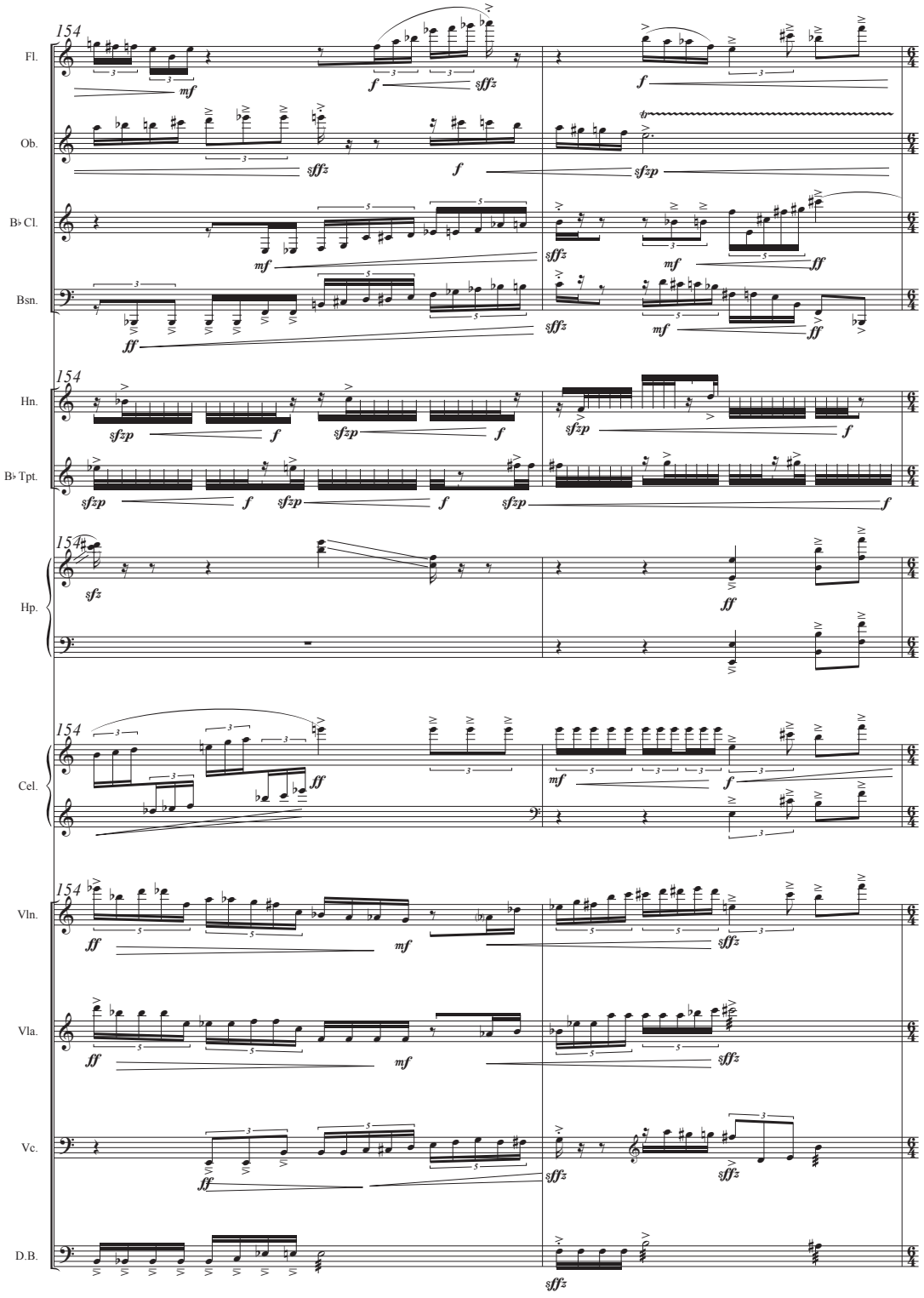

144
Fl.
Ob.
B♭ Cl.
Bsn.
Hn.
B♭ Tpt.
Hp.
Cel.
Vln.
Vla.
Vc.
D.B.
secco
arco
s.p.

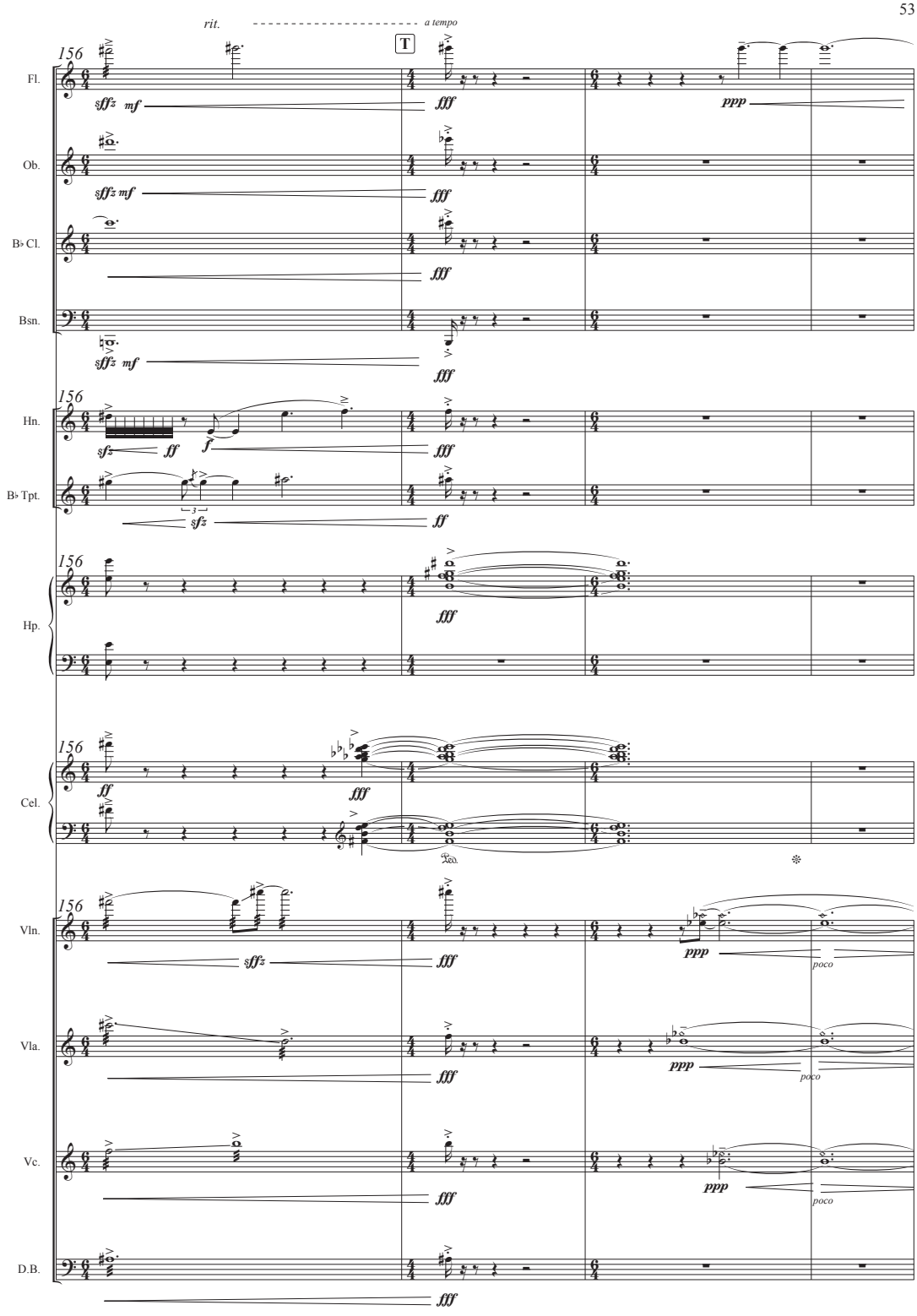

146
Fl.
Ob.
B♭ Cl.
Bsn.
Hn.
B♭ Tpt.
Hp.
Cel.
Vln.
Vla.
Vc.
D.B.

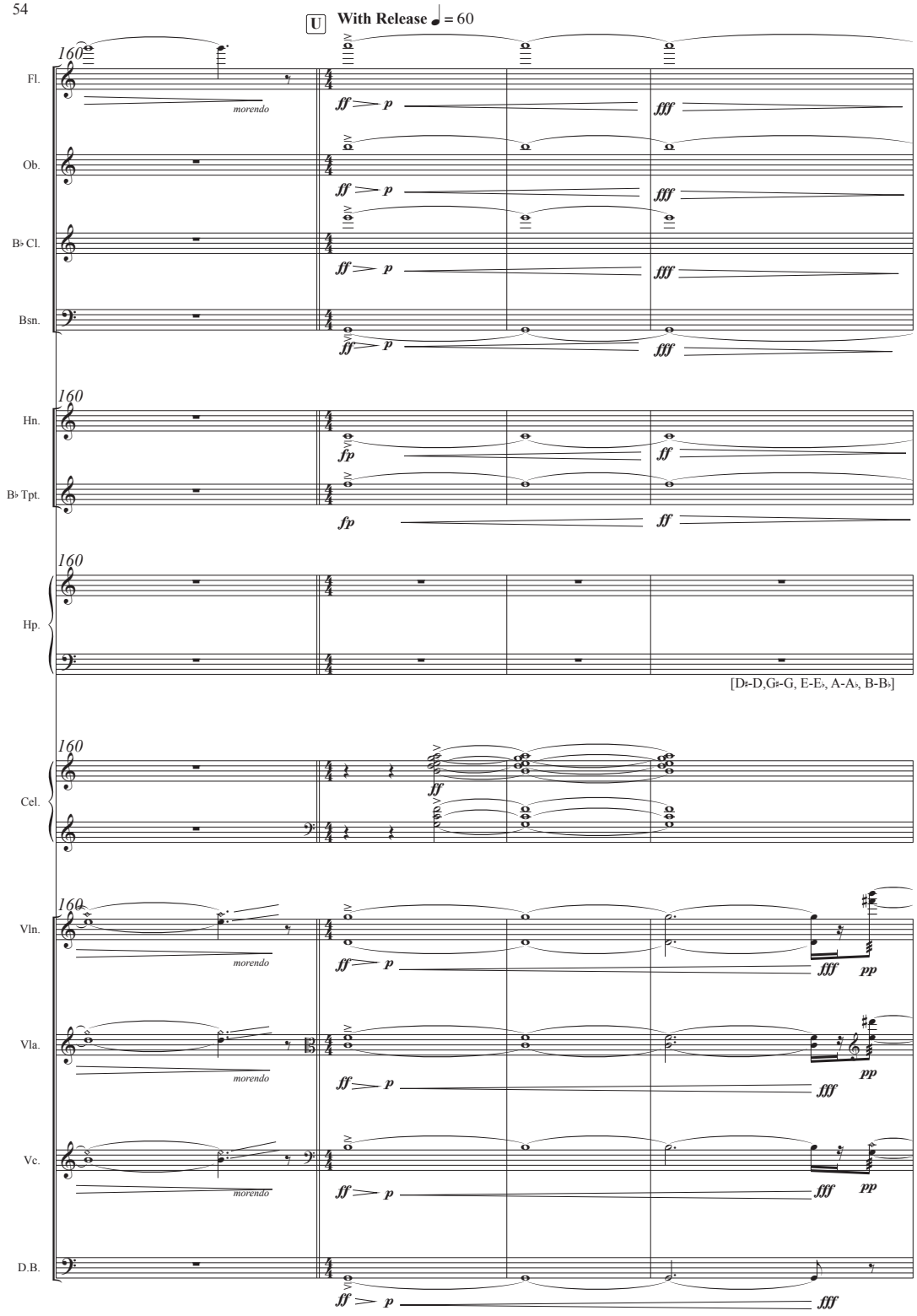

148
Fl.
Ob.
B♭ Cl.
Bsn.
Hn.
B♭ Tpt.
Hp.
Cel.
secco
Vln.
Vla.
Vc.
D.B.

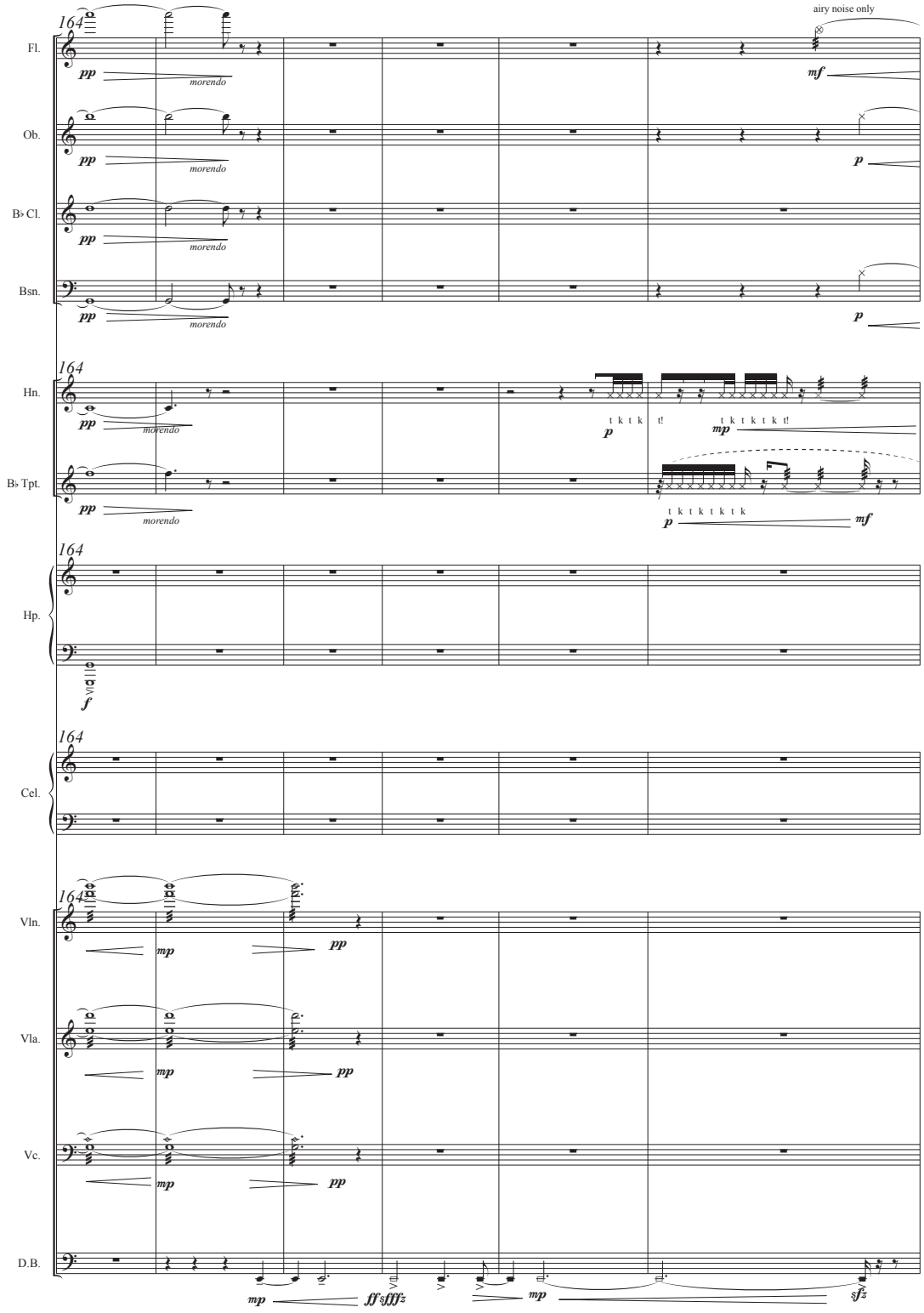

50
S
150
Fl.
Ob.
B♭ Cl.
Bsn.
Hn.
B♭ Tpt.
Hp.
Cel.
Vln.
Vla.
Vc.
D.B.
as fast as possible
intensely
III
s.p.

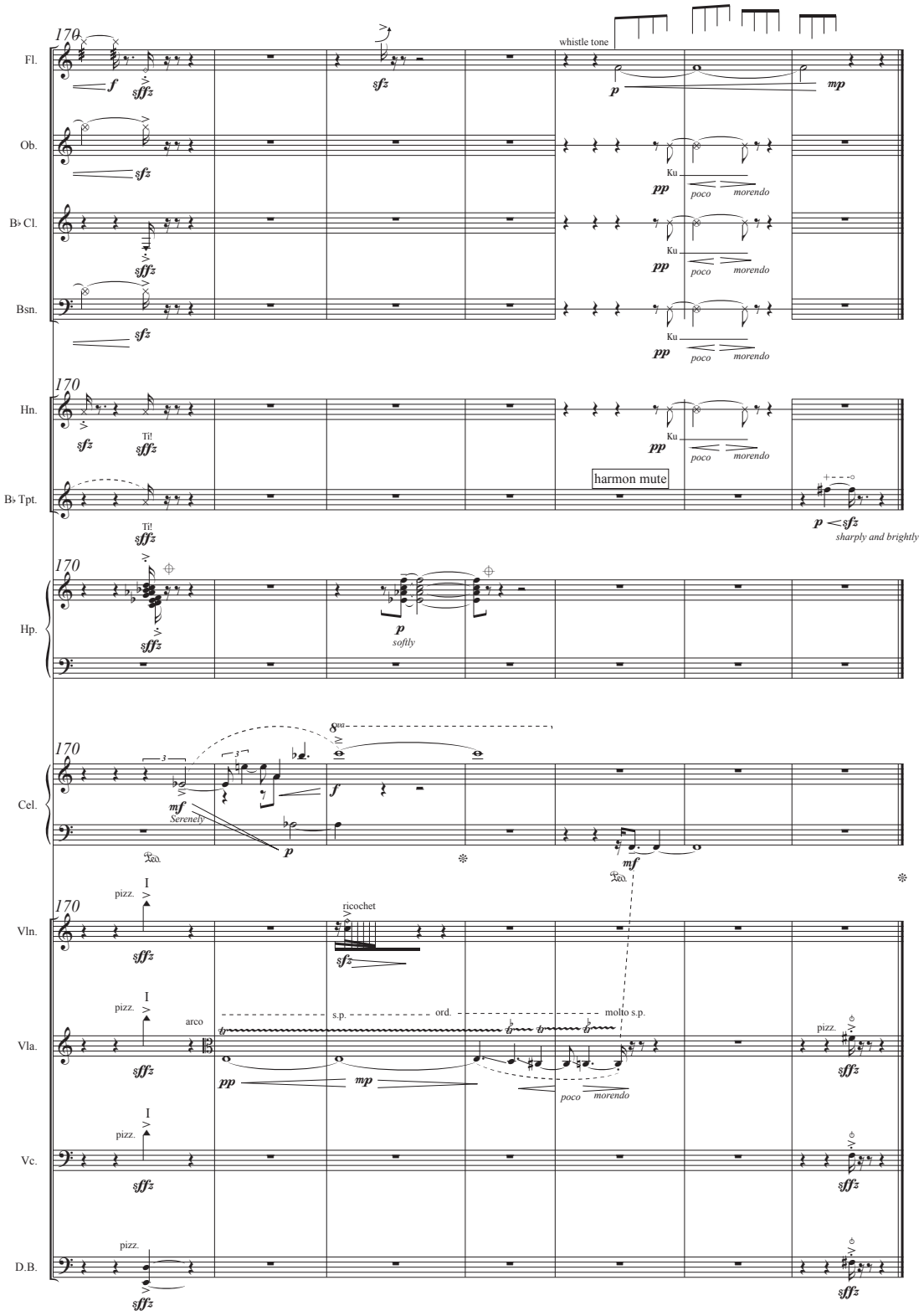

152
Fl.
Ob.
B♭ Cl.
Bsn.
Hn.
B♭ Tpt.
as fast as possible
Hp.
Cel.
Vln.
Vla.
Vc.
D.B.


154
Fl.
Ob.
B♭ Cl.
Bsn.
Hn.
B♭ Tpt.
Hp.
Cel.
Vln.
Vla.
Vc.
D.B.


rit.
a tempo
T
156
Fl.
Ob.
B♭ Cl.
Bsn.
Hn.
B♭ Tpt.
Hp.
Cel.
Vln.
Vla.
Vc.
D.B.
sffz mf
fff
ppp
poco
sfz
ff
f


U
With Release ♩ = 60
160
Fl.
Ob.
B♭ Cl.
Bsn.
Hn.
B♭ Tpt.
Hp.
Cel.
Vln.
Vla.
Vc.
D.B.
morendo
ff
p
fff
fp
pp
[D♯-D,G♯-G, E-E♭, A-A♭, B-B♭]


164
Fl.
Ob.
B♭ Cl.
Bsn.
Hn.
B♭ Tpt.
Hp.
Cel.
Vln.
Vla.
Vc.
D.B.
pp
morendo
airy noise only
mf
p
t k t k t!
mp
t k t k t k t!
t k t k t k t k
f
mp
ff sffffz
sfz


170
Fl.
Ob.
B♭ Cl.
Bsn.
Hn.
B♭ Tpt.
Hp.
Cel.
Vln.
Vla.
Vc.
D.B.
whistle tone
harmon mute
sharply and brightly
softly
Serenely
ricochet
arco
pizz.
s.p.
ord.
molto s.p.
poco
morendo
Ku
Ti!

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