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Working with Metal: The Stylistic Characteristics of the Swedish Band Meshuggah and an Original Composition Inspired by Their Work

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WORKING WITH METAL: THE STYLISTIC CHARACTERISTICS OF THE SWEDISH BAND MESHUGGAH AND AN ORIGINAL COMPOSITION INSPIRED BY THEIR WORK

By

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ABSTRACT

I have long been fascinated by music that is created through the amalgamation of more than one style of music. As a composer, this has led to me exploring paths that combine elements of contemporary, classical, jazz, world, film, and video game music. In this thesis I explore elements of progressive metal band Meshuggah. More specifically I examine their use of polymeter, polyrhythm, and other rhythmic devices used in six of their songs. I then demonstrate how I applied those same components to an original composition, *Armageddon*, scored for flute, Bb clarinet, C trumpet, trombone, percussion, piano, violin, viola, cello, and double bass. I used these techniques both in similar and different ways. I also explain how I employed a few techniques of my own.

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CHAPTER 1 – MESHUGGAH AND THEIR USE OF POLYMETER AND OTHER RHYTHMIC DEVICES

Swedish metal band Meshuggah has garnered an international following since its inception in 1987. This fanbase is comprised of 'metalheads' and 'non-metalheads' alike. The 'non-metalheads,' including jazz and rock musicians,[1] are often more intrigued by the band's intricate use of polymeter and other rhythmic devices than they are by the music genre itself.[2] A closer examination of each of these aspects in some of Meshuggah's songs is helpful in understanding both their music and the original composition (*Armageddon*) contained in this thesis. It is worth mentioning that all of the examples used in this thesis are my own transcriptions.

- **Polymeter**

Arguably, the most quintessential element of Meshuggah's music is polymeter. It can be found in most of their songs unless you go back to their early days as a thrash

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[1] Bryan Beller, "Meshuggah's 'Future Breed Machine': Peter Nordin's Underground Class," *Bass Player*, December 2006.

[2] Olivia R. Lucas, "'So Complete in Beautiful Deformity': Unexpected Beginnings and Rotated Riffs in Meshuggah's *obZen*," *Music Theory Online* 24, No. 3 (September 2018), http://mtosmt.org/issues/mto.18.24.3/mto.18.24.3.lucas.html.

metal band in the late 1980s and early 1990s. Back then their sound was more similar in style to other thrash metal bands such as Metallica, Anthrax, Slayer, and Sepultura.[3] Although present in their music, the band members have stated that they do not think in terms of polymeter, or polyrhythm for that matter, when writing their songs. Other than bassist Dick Lövgren, they may not even be fully aware of what it is they are accomplishing. Although most of them can read music to varying degrees, Lövgren is the only band member with formal music training having studied jazz at the University of Gothenburg.[4] Drummer Tomas Haake can read music, but he prefers to learn everything by ear.[5] Rhythm guitarist Mårten Hagström claims that the music "just comes out the way it does."[6] He also said, "Everything we do is based around a 4/4 core. It's just that we arrange parts differently around that center to make it seem like something else is going on."[7] Haake insists that all of the songs on *obZen* (2008) are in 4/4.[8] When answering

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[3] Jonathan Pieslak, "Re-casting Metal: Rhythm and Meter in the Music of Meshuggah," *Music Theory Spectrum* 29, no. 2 (2007): 219.

[4] Lucas, "So Complete in Beautiful Deformity."

[5] Michael Parillo, "External Combustion: Meshuggah's Tomas Haake," *Modern Drummer*, May 2008: 58.

[6] Petri Eskelinen, "Meshuggah Interview," June 19, 2007, video, 3:11, https://www.youtube.com/watch?v=Yd7T5rOmS3w&t=89s.

[7] Rod Smith, "Meshuggah," *Decibel*, 2005, https://web.archive.org/web/20051129013121/http://decibelmagazine.com/features/jun2005/meshuggah.aspx.

[8] Parillo, "External Combustion," 56 and 64.

questions about *Chaosphere* (1998), vocalist Jens Kidman explained, "we don't think that much. We just do stuff and record it."[9] Regardless of whether they think in terms of polymeter or not while composing, it is still present in much of their music.

One of Meshuggah's primary approaches to polymeter is the use of metric superimposition, which can be found in most of their songs.[10] With this method, they typically create a guitar riff in some meter, or meters, other than 4/4 that is doubled by the kick drum and bass guitar an octave lower. This riff is then superimposed against 4/4 and looped within a four-bar, eight-bar, sixteen-bar, twenty-four-bar, or thirty-two-bar section (see table 1 below for visual representations). No matter how complex the metric patterns get, the primary, underlying 4/4 framework is almost always articulated somewhere in the texture, usually in the hi-hat, cymbals, snare drum, and also sometimes in the lead guitar. The hi-hat, cymbals, and snare drum typically outline a standard backbeat or halftime backbeat in 4/4.[11] These form the basic foundation on which other layers are built and the snare drum is usually heard as the primary layer by audiences.[12] The steady pattern also forms a *tactus*, "the basic beat that forms the most salient periodic

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[9] FaceCulture, "Interview Meshuggah - Jens Kidman," June 21, 2008, video, 3:51, https://www.youtube.com/watch?v=uTeuNxSpR5s.

[10] Pieslak, "Re-casting Metal," 219-221.

[11] Lucas, "So Complete in Beautiful Deformity."

[12] Harris M. Berger, "The Practice of Perception: Multi-Functionality and Time in the Musical Experiences of a Heavy Metal Drummer," *Ethnomusicology* 41, no. 3 (autumn 1997): 474-475.

pulse evident in a musical passage."[13] The multiple meters together create a frenzy of contrasting patterns that fall in and out of phase with each other. The patterns do, however, realign every so often if they are allowed to. When the end of a section is reached the riff usually continues in the remaining space, but is then abruptly cut off before it can complete another cycle. Sometimes, however, an extension is inserted instead to fill in the remaining space. Although this is their usual approach, Meshuggah does also occasionally allow complete cycles without cutting them off, but not usually. That method is more common in the music of TesseracT, another progressive metal band from England.[14] Also, even though the vast majority of Meshuggah's songs contain polymetric structures, it is not something that is used in all of their music. Certain songs are more straightforward. For example, "The Demon's Name Is Surveillance" from the album *Koloss* (2012) is in 6/8, although it is not without its rhythmic complexities.[15]

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[13] David Huron, *Sweet Anticipation: Music and the Psychology of Expectation* (Cambridge: MIT Press, 2006), 176.

[14] Harry Stafylakis, "Altered States: Metrical Dissonance in the Music of TesseracT" (paper presented at the annual conference of the Temple University Theory and Musicology Society [THEMUS], Philadelphia, PA, April 19, 2014): 14.

[15] Meshuggah, "The Demon's Name Is Surveillance," track 2 on *Koloss*, Nuclear Blast NB 2388-2, 2012.

a. 7/8 Against 4/4 in an Eight-Bar Structure

$\frac{4}{4}$	$\frac{4}{4}$	$\frac{4}{4}$	$\frac{4}{4}$	$\frac{4}{4}$	$\frac{4}{4}$	$\frac{4}{4}$	$\frac{4}{4}$
$\frac{7}{8}$	$\frac{7}{8}$	$\frac{7}{8}$	$\frac{7}{8}$	$\frac{7}{8}$	$\frac{7}{8}$	$\frac{7}{8}$	$\frac{7}{8}$	$\frac{7}{8}$

b. 5/4 Against 4/4 in an Eight-Bar Structure

$\frac{4}{4}$	$\frac{4}{4}$	$\frac{4}{4}$	$\frac{4}{4}$	$\frac{4}{4}$	$\frac{4}{4}$	$\frac{4}{4}$	$\frac{4}{4}$
$\frac{5}{4}$	$\frac{5}{4}$	$\frac{5}{4}$	$\frac{5}{4}$	$\frac{5}{4}$	$\frac{5}{4}$		

c. 6/4 Against 4/4 in a Sixteen-Bar Structure

$\frac{4}{4}$	$\frac{4}{4}$	$\frac{4}{4}$	$\frac{4}{4}$	$\frac{4}{4}$	$\frac{4}{4}$	$\frac{4}{4}$	$\frac{4}{4}$	$\frac{4}{4}$	$\frac{4}{4}$	$\frac{4}{4}$	$\frac{4}{4}$	$\frac{4}{4}$	$\frac{4}{4}$	$\frac{4}{4}$	$\frac{4}{4}$
$\frac{6}{4}$	$\frac{6}{4}$	$\frac{6}{4}$	$\frac{6}{4}$	$\frac{6}{4}$	$\frac{6}{4}$	$\frac{6}{4}$	$\frac{6}{4}$	$\frac{6}{4}$	$\frac{6}{4}$						

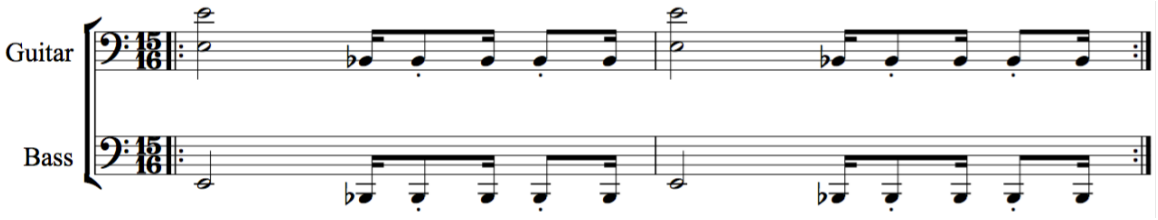
d. Mixed-Meter Against 4/4 in an Eight-Bar Structure

$\frac{4}{4}$	$\frac{4}{4}$	$\frac{4}{4}$	$\frac{4}{4}$	$\frac{4}{4}$	$\frac{4}{4}$	$\frac{4}{4}$	$\frac{4}{4}$
$\frac{9}{8}$	$\frac{4}{4}$	$\frac{9}{8}$	$\frac{4}{4}$	$\frac{9}{8}$	$\frac{4}{4}$	$\frac{9}{8}$	

Table 1: Different Meters Superimposed Against a 4/4 Structure

*These illustrations are of my own design, not taken from actual Meshuggah songs.

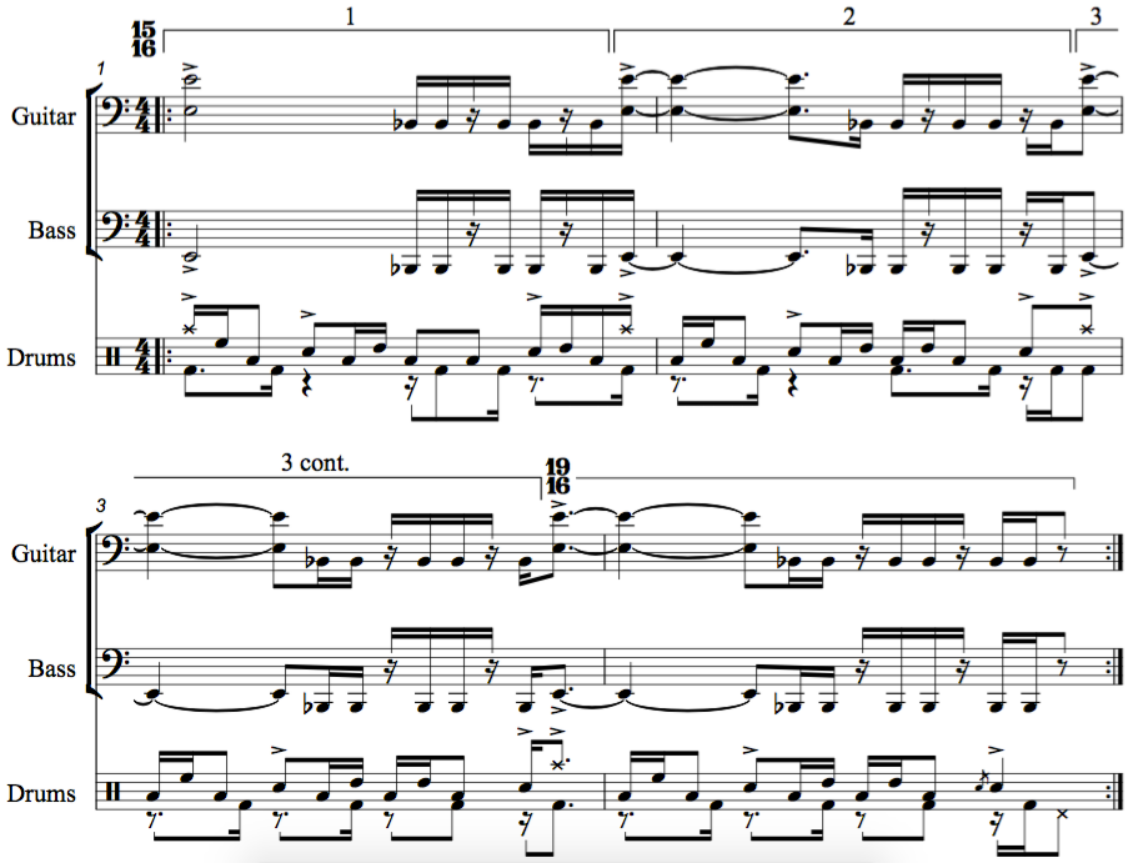
"Neurotica," one of Meshuggah's earlier songs from their 1998 album *Chaosphere,* contains an excellent example of polymeter where an odd time signature is superimposed against 4/4 in a short, four-bar structure rather than their more typical eight, sixteen, twenty-four, or thirty-two-bar forms. This happens right away in the introduction of the song. It opens with a guitar riff, doubled by the bass an octave lower, that is in 15/16 (Musical Example 1). Rhythmically, it is fairly interesting by itself, but it becomes much more engaging when juxtaposed with a drum groove in 4/4 time.



Musical Example 1: "Neurotica" Opening Riff

Musical Example 2 demonstrates how the "Neurotica" riff is transformed when played within a 4/4 framework. The guitar and bass are both playing in 15/16 while the drums are largely playing in 4/4 with a tom-tom groove and snare-drum backbeat. Yet, at the same time, certain parts of the drums such as the crash cymbals and bass drum occasionally break away from the 4/4 framework to accent important moments in the 15/16 riff. The riff is able to achieve three complete repetitions in the four-bar structure. However, instead of continuing the cycle with a fourth repetition, the riff is altered and

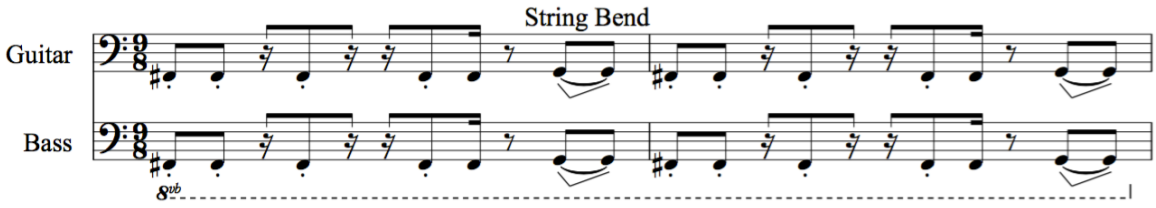
expanded to 19/16 the final time to accommodate the extra space at the end of the four-bar structure. In a short structure like this, the riff is never allowed to realign with that of 4/4 time.



Musical Example 2: "Neurotica" Intro mm. 1-4

Sometimes the riffs used in Meshuggah's songs do not start at the beginning. Sometimes they begin in the middle. Music theorist Olivia R. Lucas of Louisiana State

University discusses this in her September 2018 article for *Music Theory Online*.[16] A prime example of this concept is found in the coda of "Electric Red" from Meshuggah's 2008 release *obZen*. The riff used in this example is in 9/8 time (Musical Example 3). What is also interesting about this coda is that its entrance is unexpected and seemingly cuts off the final chorus of the song. It is also completely unrelated to the rest of the song.



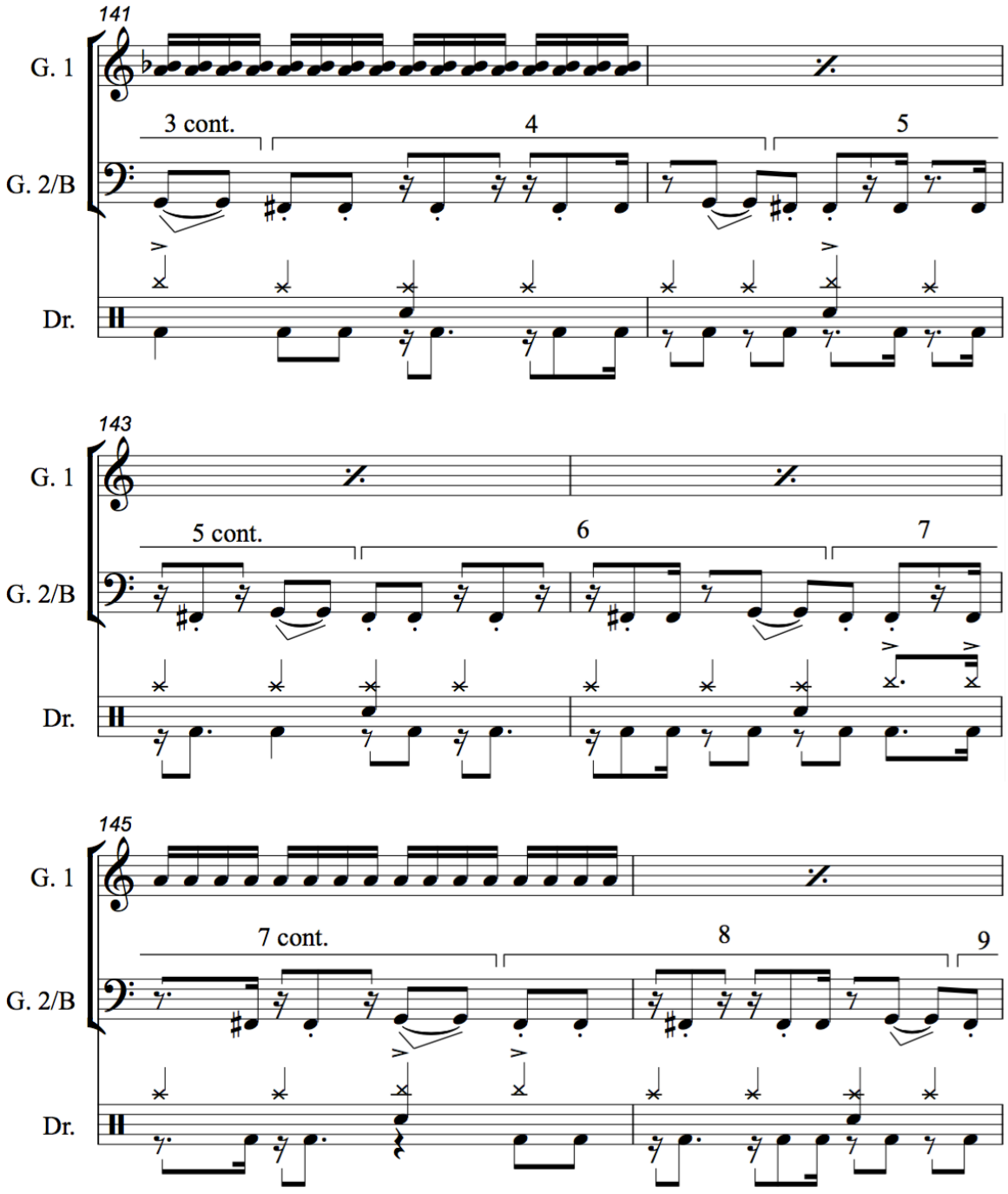
Musical Example 3: "Electric Red" Coda Riff

Musical Example 4 shows how the 9/8 riff looks in a sixteen-bar structure in 4/4 time. The whole section clearly begins and ends with a riff fragment, showcasing the starting-in-the-middle concept. The two contrasting meters realign in mm. 139 and 148. In this example, the crash cymbal, snare drum, and guitar 1 outline 4/4 while the kick drum, guitar 2, and bass play in 9/8. There are also a few well-placed, cymbal crashes that accent 9/8 time. Haake breaks away from playing the groove at the end of the section to insert a drum fill in m. 152. This is very common to his playing style and indicates the

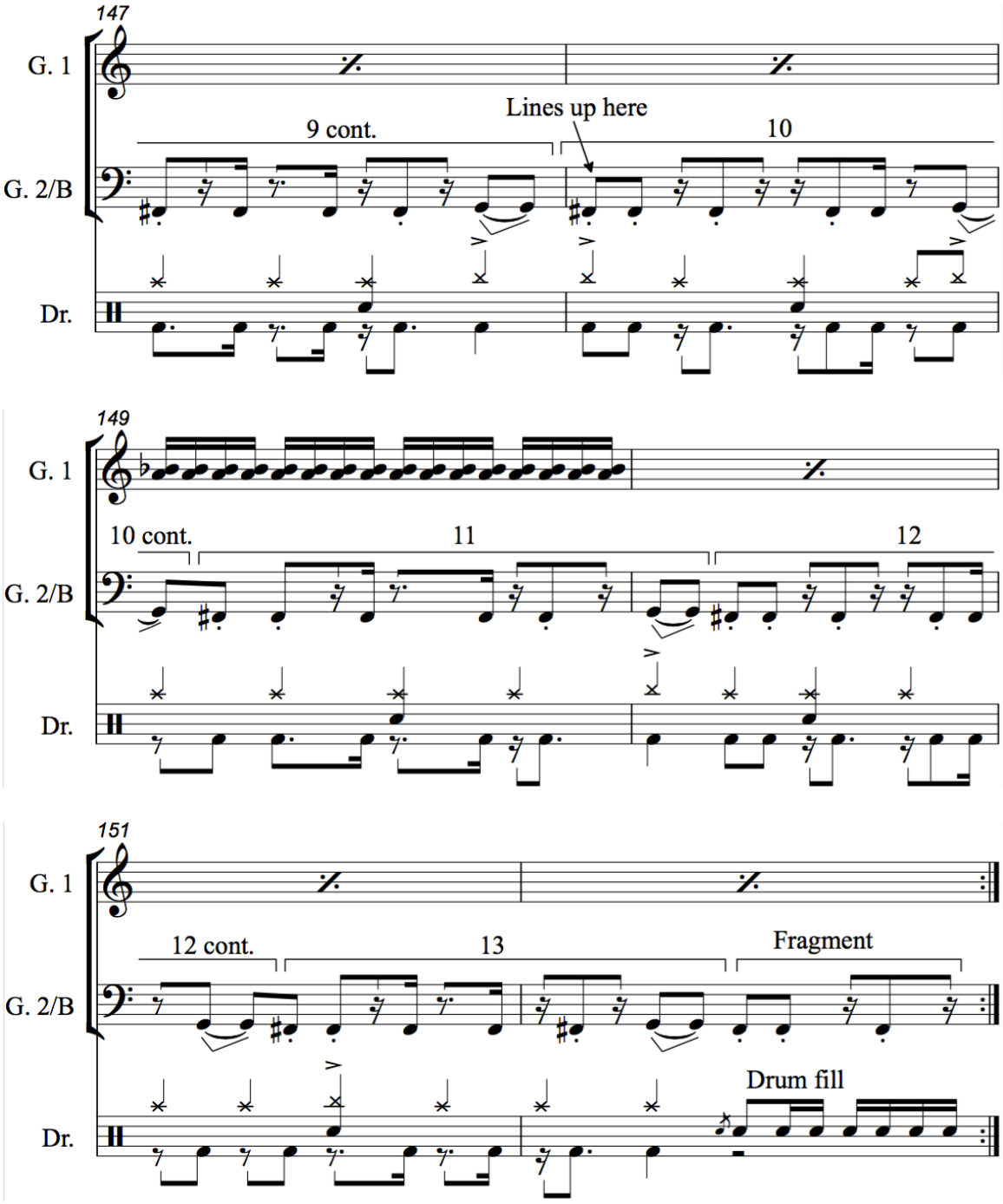
[16] Lucas, "So Complete in Beautiful Deformity."

end of the section. In this case it also serves as a transition into the repeat of the whole section. The song fades out after the repeat, so a second complete section is never heard in its entirety.

Musical Example 4: "Electric Red" Coda mm. 137-140



Musical Example 4 Continued: "Electric Red" Coda mm. 141-146



Musical Example 4 Continued: "Electric Red" Coda mm. 147-152

An example of a riff that is superimposed in an eight-bar section is "Bleed," another song off Meshuggah's 2008 album *obZen* (Musical Example 6). The meter of this riff is not immediately obvious. I have interpreted it as 6/16 against 4/4, but it could just as easily be analyzed as 3/16, 9/16, or 12/16 against 4/4. I have transcribed is as 6/16 against 4/4 for the purposes of this. The snare drum and cymbals again outline a halftime backbeat in 4/4 while the guitars, bass, and bass drum play the riff in 6/16. Another important point of interest about this introduction section is that the riff does not cut off at the end of the introduction section like it does in other examples. Haake does play a fill marking the end of the section as usual, but the riff continues its cycle all the way through to the conclusion of the first verse where it finally cuts off in m. 24. The verse is sixteen measures long. That combined with the eight-bar introduction means the riff is really stretched across twenty-four measures. The riff itself is a herta (musical example 5), a type of hybrid drum rudiment.[17] Whether the band knows this or not is uncertain. Haake stated in a 2008 interview for *Modern Drummer*, "I never studied much...I wanted to bash the hell out of the drums. I didn't want to learn the rudiments."[18] Given this statement, it is unlikely that the band knew this was a drum rudiment prior to writing the riff. Something with which they are familiar, however, is the 'gallop' rhythm (musical example 5). This rhythm is common in metal from the 1970s and 1980s and is relatively

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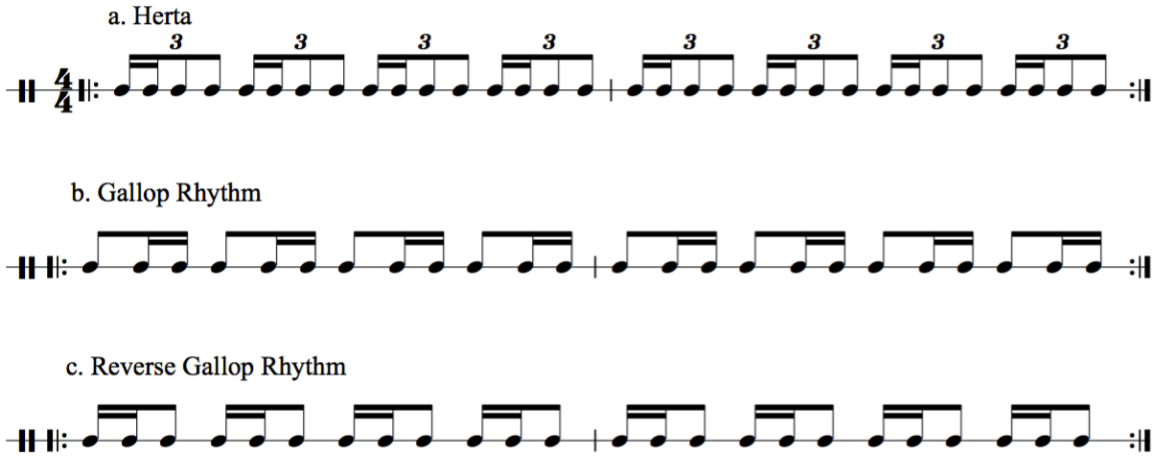
[17] Lewis Partridge, "Herta," Ninja Drumist.com, 2010, http://www.ninjadrummist.com/drum-rudiments/hybrid-rudiments/herta-21/.

[18] Parillo, "External Combustion," 58.

similar to the herta. It has been employed by other metal bands such as Slayer, Metallica, Dio, and Iron Maiden.[19] Meshuggah previously used an altered version of the 'gallop' rhythm on their 2004 EP *I*.[20] They may have done the same for "Bleed."



Musical Example 5: Herta[21] and Gallop Rhythms[22]

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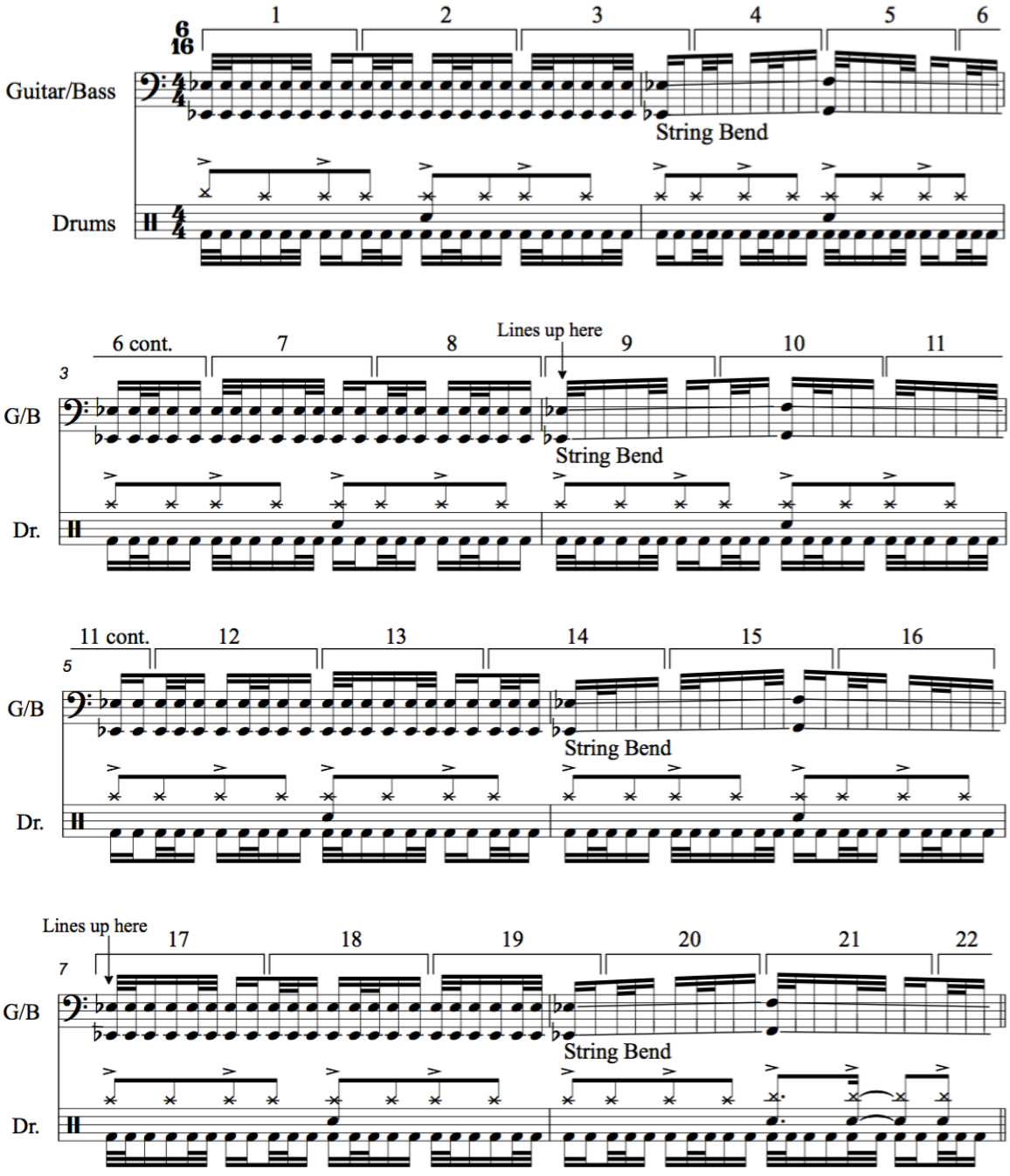
[19] Simon Revill, "Gallop Rhythms for Heavy Metal Guitar, Part 1," *Guitar World*, April 13, 2017, https://www.google.com/amp/s/www.guitarworld.com/amp/lessons/gallop-rhythms-heavy-metal-guitar-part-1, and Simon Revill, "Gallop Rhythms for Heavy Metal Guitar, Part 2," *Guitar World*, August 1, 2018, https://www.google.com/amp/s/www.guitarworld.com/amp/lessons/gallop-rhythms-heavy-metal-guitar-part-2.

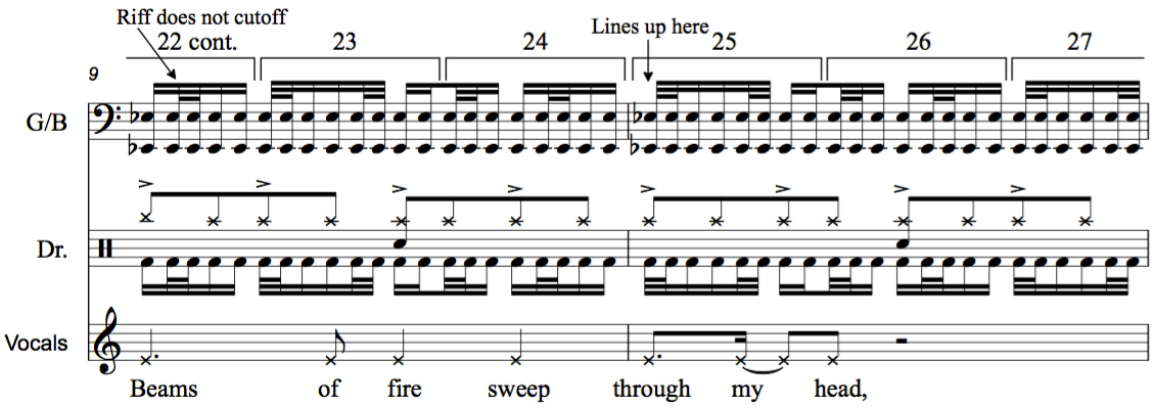
[20] Eric T. Smialek, "Rethinking Metal Aesthetics: Complexity, Authenticity, and Audience in Meshuggah's *I* and *Catch Thirtythr33*" (master's thesis, McGill University, 2008): 53.

[21] Partridge, "Herta."

[22] Revill, "Gallop Rhythms…Part 1."

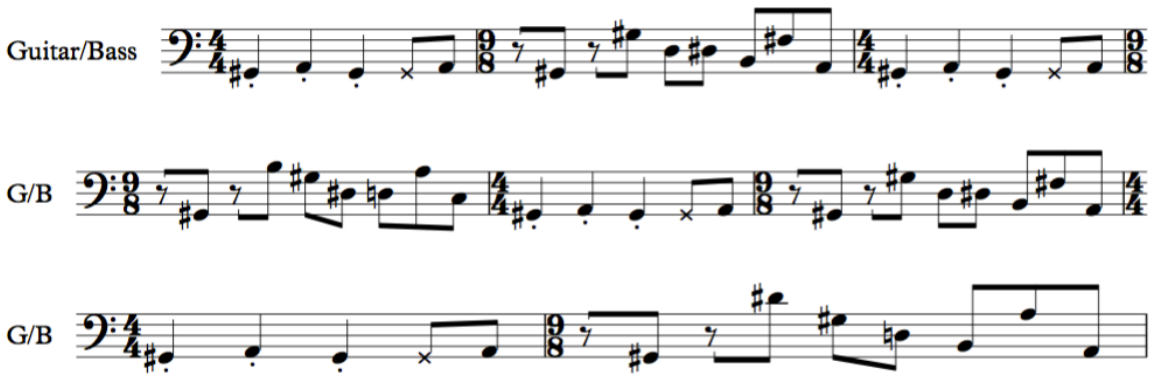


Musical Example 6: "Bleed" mm. 1-8



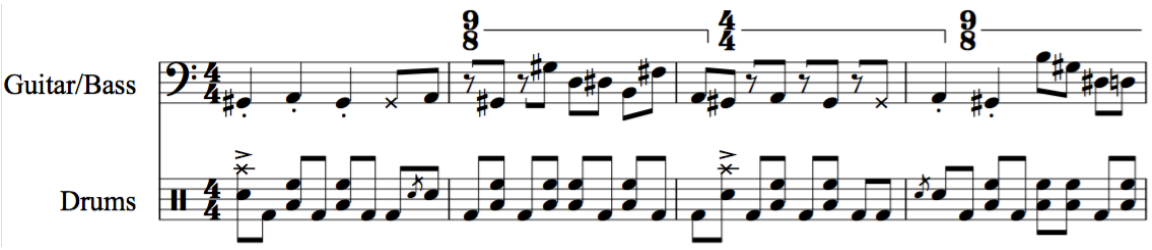
Musical Example 6 Continued: "Bleed" mm. 9-10

An example of a riff that is superimposed in a twenty-four-bar section is "Do Not Look Down" from the 2012 album *Koloss*. Not only is this riff superimposed in a larger section, but it is also much longer than previous examples. It is itself a full eight measures long. The riff is also an example of one that uses mixed meter rather than just one meter. In this case it alternates between 4/4 and 9/8 (Musical Example 7).



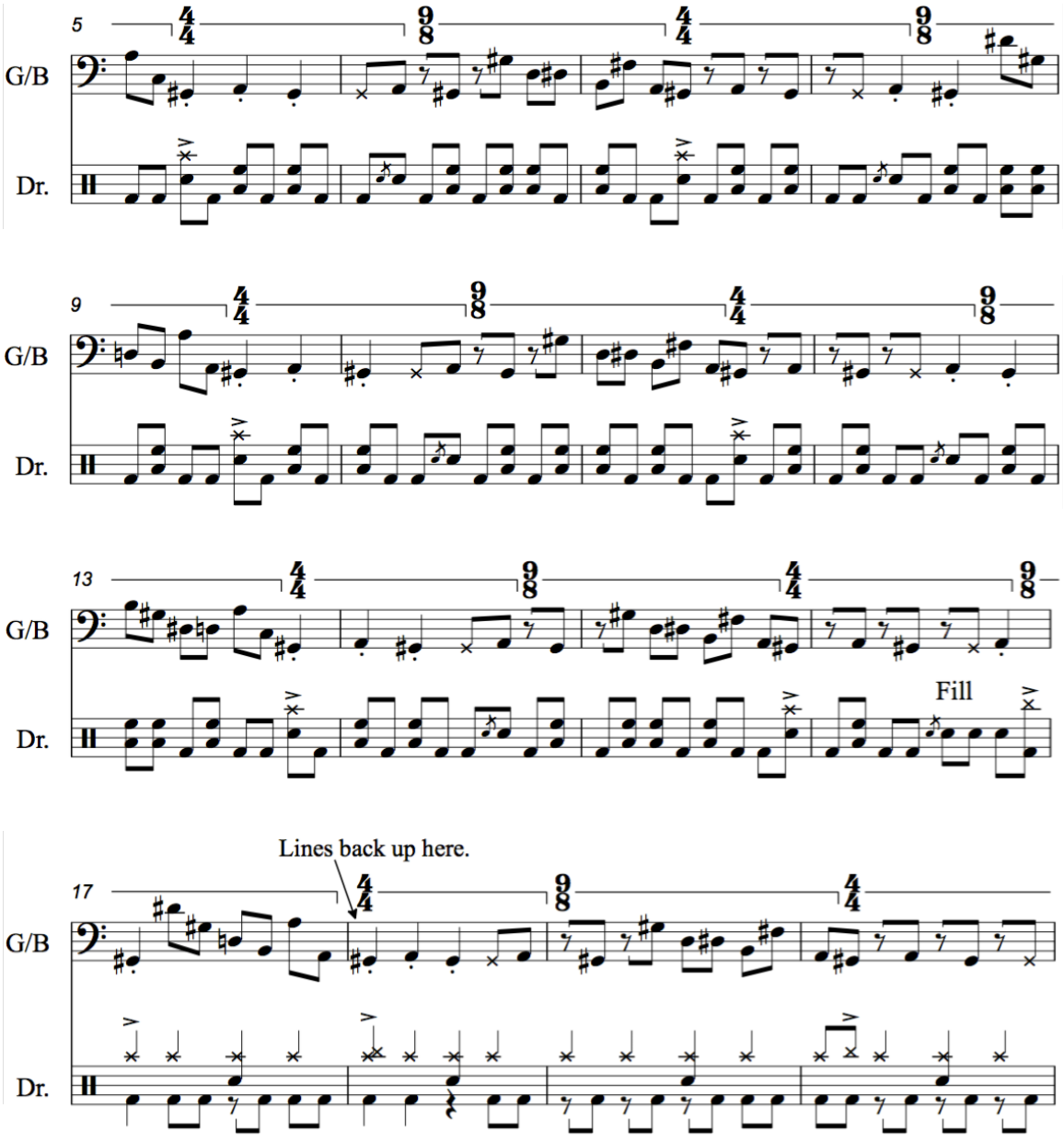
Musical Example 7: "Do Not Look Down" Opening Riff

"Do Not Look Down" begins with everyone playing in mixed meter. It is not until m. 17 that the drums come in with the usual 4/4 halftime backbeat. This is very disorienting when at first it seems like it is going to be a straight forward song that uses mixed meter. The drum fill, however, in m. 16 sets up the 4/4 groove nicely. As usual, when the 4/4 groove comes in, the crash cymbal and snare drum are playing in 4/4 time while the kick drum, guitar, and bass are playing the riff in 4/4 and 9/8 (Musical Example 8). The riff and 4/4 framework line up again in m. 18. Similar to "Bleed," "Do Not Look Down" continues the rhythms and metric cycle into the verses without cutting it off, although the verses are at a different pitch level. The cycle does not come to an end until m. 72 at the start of the guitar solo, but even then, it spills over into m. 73 and a new pattern takes over halfway through the measure. This is analyzed by music theorist Guy Capuzzo in his 2018 article for *Music Theory Spectrum.*[23]

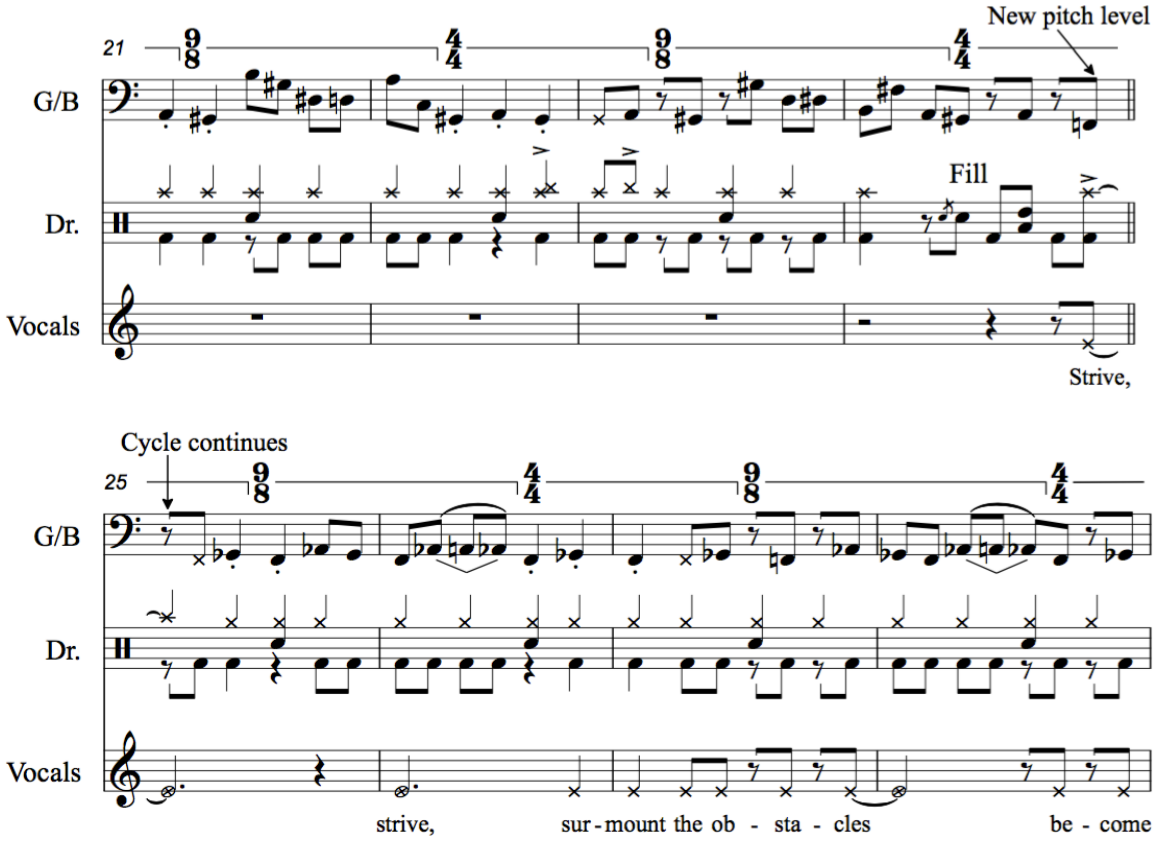


Musical Example 8: "Do Not Look Down" mm. 1-4

[23] Guy Capuzzo, "Rhythmic Deviance in the Music of Meshuggah," *Music Theory Spectrum* 40, no. 1 (2018): 132.



Musical Example 8 Continued: "Do Not Look Down" mm. 5-20



Musical Example 8 Continued: Do Not Look Down" mm. 21-28

- **Other Rhythmic Devices**

Although Meshuggah is perhaps better known for their use of polymeter, other interesting rhythmic aspects also occur in their music, including polyrhythms, rhythms that cross bar lines, rhythms that irregularly divide measures, and alternating rhythmic patterns. Three songs that feature examples of these devices are "Bleed," from the 2008 release *obZen*, "Swarm," from the 2012 release *Koloss*, and "Clockworks," from the 2016 release *Violent Sleep of Reason*.

Examples of all of these rhythmic devices can be found in the song "Clockworks," which also happens to be Meshuggah's first Grammy nomination in the Best Metal Performance category in 2018.[24] The verse of this song contains a polymetric riff that is twenty-three eighth notes long (Musical Example 9). Rather than thinking of this as 23/8, it is easier to comprehend when segmented it into two measures of 9/8 and one measure of 5/8. In addition to polymeter, within the sixteen-bar verse there are five instances of a three-against-four polyrhythm. Notice that the triplets also follow a unique pattern. They alternate between one triplet, two triplets, three triplets, back to two triplets, and finally back to one triplet again as the structure repeats.[25] The sixteenth notes are also grouped in threes rather than fours to accompany the dotted quarter-note rhythm in the guitar part that irregularly divides the measures and sometimes crosses over bar lines. Present throughout is a steady quarter-note pulse in the hi-hat. Unlike with previous examples where the riff continues and is abruptly cut off at the end of the section, "Clockworks" inserts a two-beat extension based on the beginning of the riff to make up for the two-beat lag. This is similar to how Tomas Haake inserts drum fills at the end of

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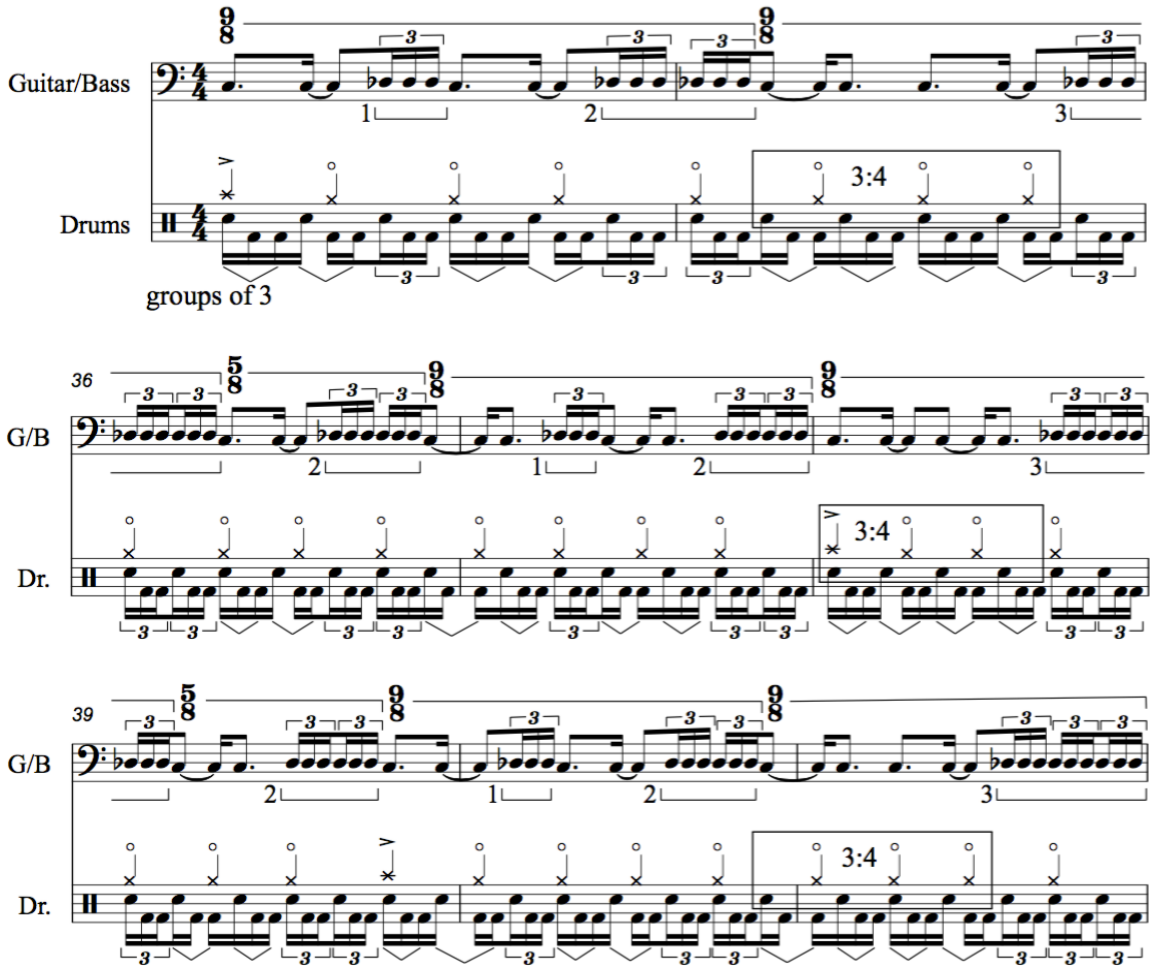
[24] Joe Lynch, "Grammys 2018: See the Complete List of Nominees," Billboard, November 28, 2017, https://www.billboard.com/articles/news/grammys/8047027/grammys-2018-complete-nominees-list.

[25] Alternating rhythmic patterns similar to this also take place in other songs such as "The Demon's Name Is Surveillance", track 2 on *Koloss* (2012).

sections. This is interesting considering the song was also written by Haake and bassist Dick Lövgren.[26]



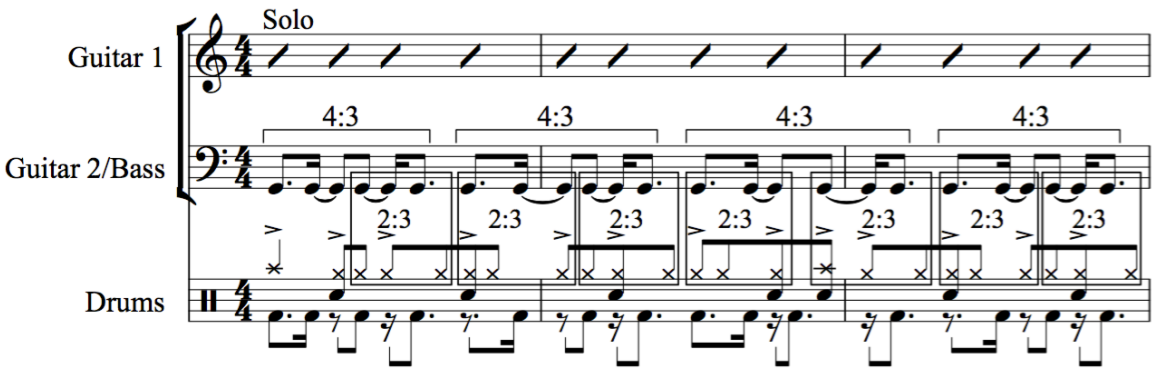
Musical Example 9: "Clockworks" mm. 34-41

[26] Thom Jurek, "Meshuggah: *The Violent Sleep of Reason,"* AllMusic, accessed March 8, 2020, https://www.allmusic.com/album/the-violent-sleep-of-reason-mw0002969441.

Musical Example 9 Continued: "Clockworks" mm. 42-49

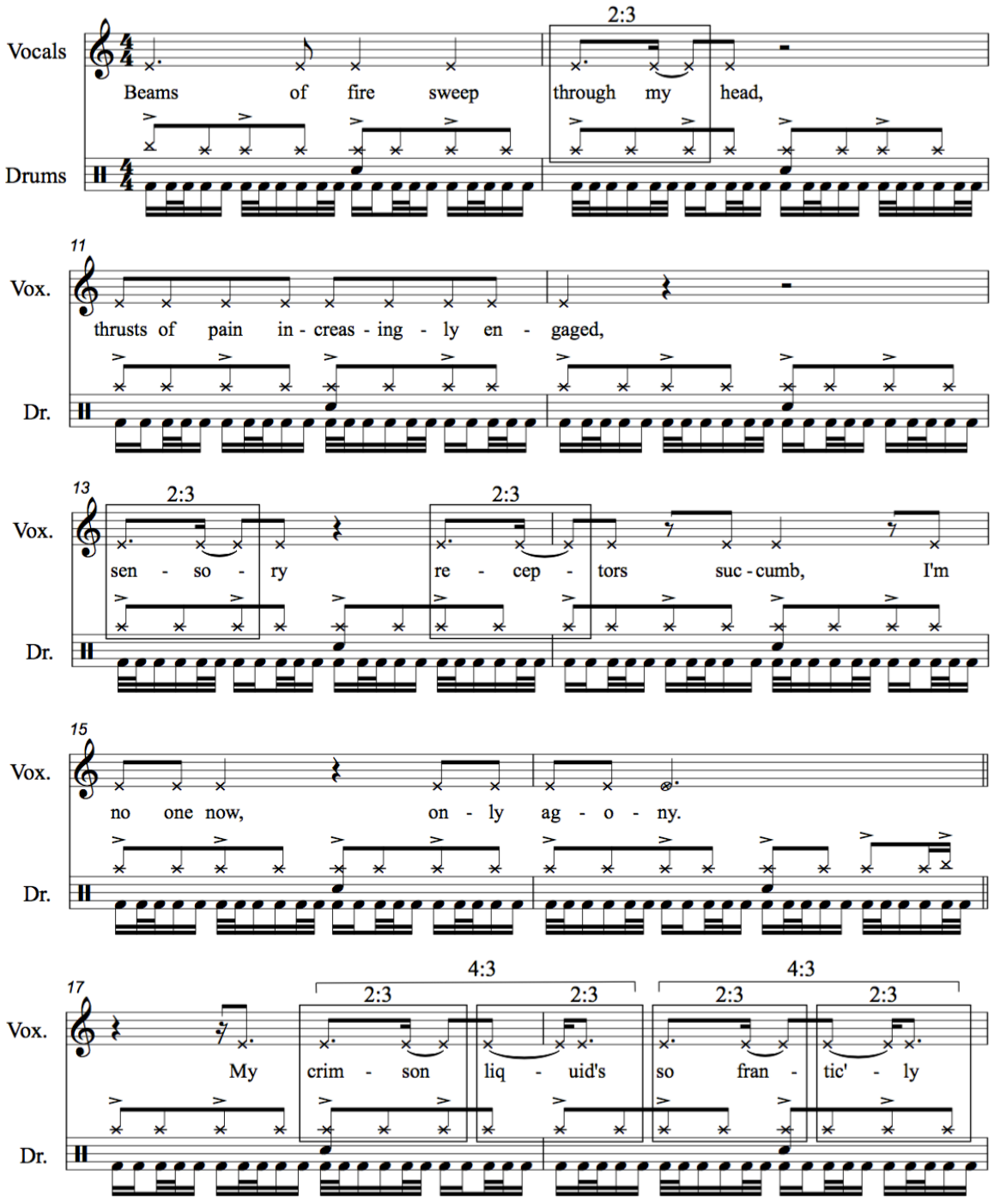
The guitar solo section of "Clockworks" also contains a number of rhythmic complexities. The guitar 2, bass, and kick drum (except where a snare drum occurs) play a constant dotted eighth note figure throughout the entirety of the sixteen-bar section while the guitar 1 is soloing. These dotted eighth notes irregularly divide the measure and also cross over bar lines. This, coupled with the presence of a constant eighth note pattern

in the hi-hat and snare-drum backbeat, creates a number of different polyrhythms. The dotted eighth notes create a four-against-three polyrhythm with the downbeat accents in the hi-hat. Simultaneously, there are also two-against-three polyrhythms that occur between the dotted eighth notes and the steady eighth notes in the hi-hat (Musical Example 10).

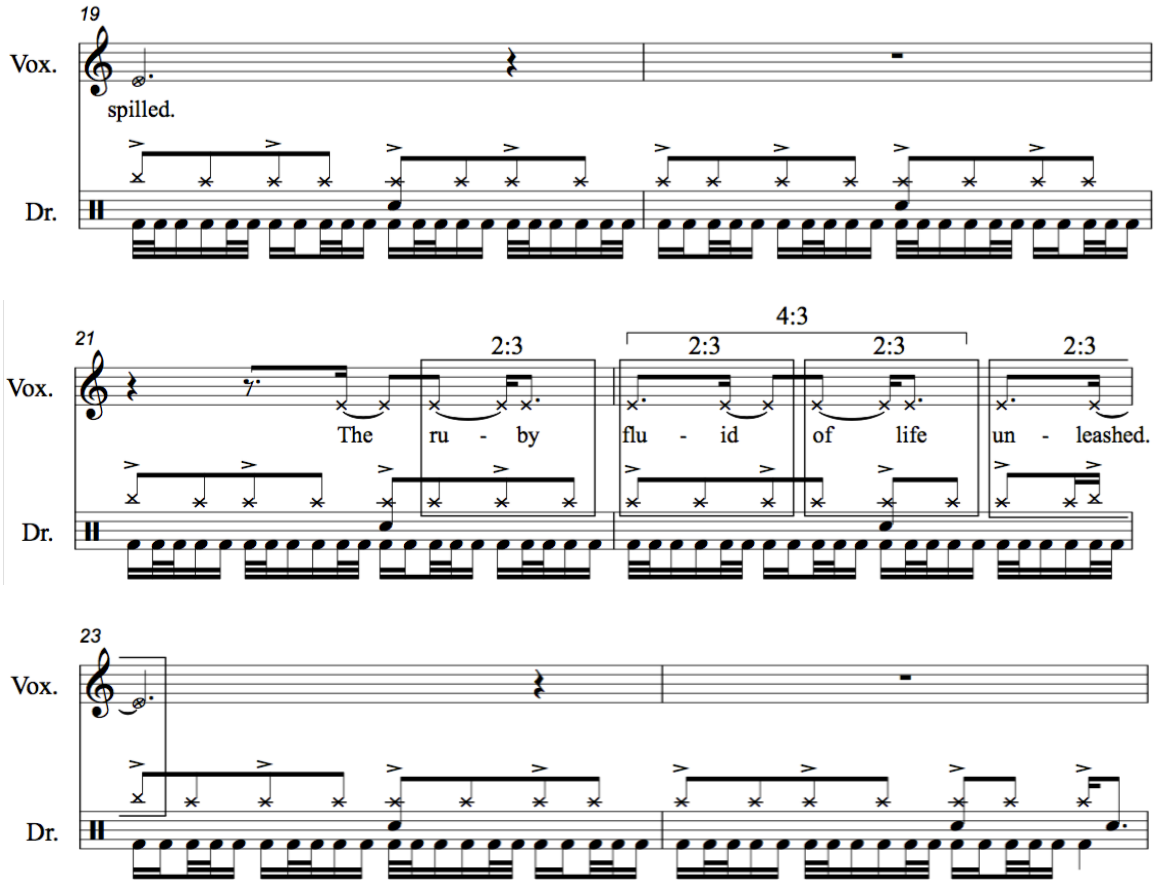


Musical Example 10: "Clockworks" Guitar Solo Section mm. 90-92

In addition to its brisk tempo and polymetric complexities, "Bleed" also contains some examples of polyrhythm. As stated earlier, the rhythmic pattern from the introduction continues all the way through to the end of the verse one in m. 24. Polyrhythms can be heard between the drums and the vocals. This is a result of the vocals existing in 4/4 sometimes, but also breaking away from 4/4 to join forces with the 6/16 structure in the guitar, bass, and kick drum. There are eleven instances of a two-against-three polyrhythm and two examples of four against three (Musical Example 10).



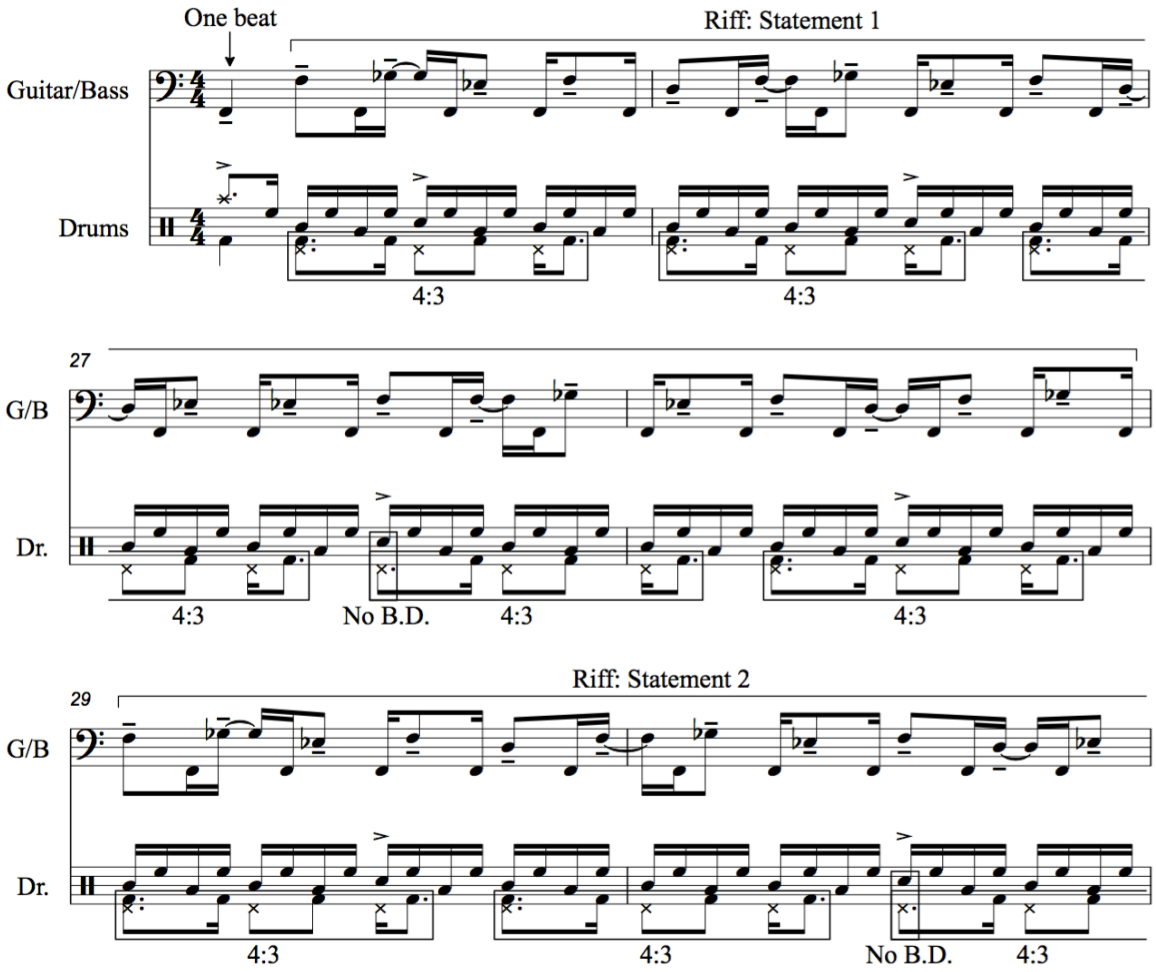
Musical Example 11: "Bleed" mm. 9-18



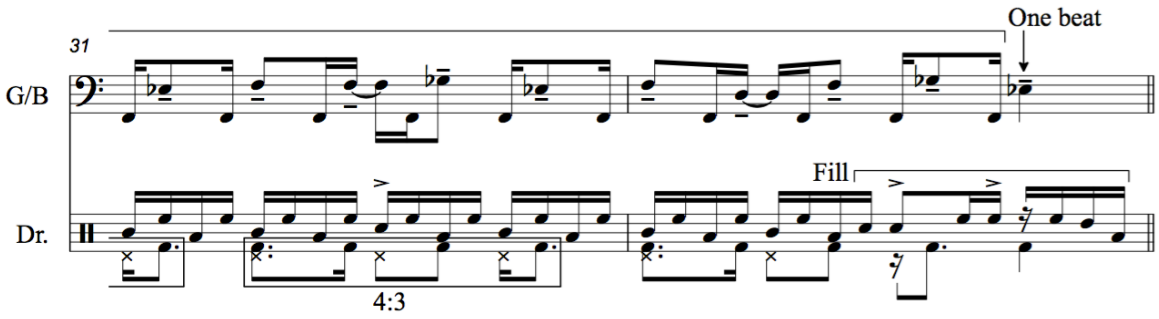
Musical Example 11 Continued: "Bleed" mm. 19-24

"Swarm" is another good example of polyrhythm, irregular divisions of the measure, and a rhythm that occasionally crosses bar lines. The polyrhythm is found in the drum beat itself and is constant throughout most of the song. In this case the hi-hat is stomping steady quarter notes with the left foot while the bass drum is pounding out dotted quarter-note figures with the right, which creates a four-against-three polyrhythm. Over top is a sixteenth-note tom-tom pattern and halftime backbeat in the snare drum. In

this particular passage, the guitar and bass play a riff that consists of a rhythmic pattern that irregularly divides the measures and sometimes crosses over bar lines. It also starts on beat two rather than beat one. In its second iteration, however, it begins on beat one, but concludes on beat three rather than beat four.



Musical Example 12: "Swarm" mm. 25-30



Musical Example 12 Continued: "Swarm" mm. 31-32

- **Conclusion**

Aside from an early stint as a thrash metal band, Meshuggah has developed a style over the years in their thirty-three-year existence that is unique to them using elements such as polymeter, polyrhythm, and other rhythmic complexities. The music can be interpreted in such ways even if the band itself does not think in those terms. According to author Miguel A. Roig-Francolí, analysts should not assume a composer intended to put something in their music unless they have written extensively on the subject. Analysts should only concern themselves with what they discover in the music regardless of what the composer intended.[27] With this in mind, I have taken these concepts that I have transcribed and applied them to my own composition, *Armageddon*.

[27] Miguel A. Roig-Francolí, *Understanding Post-Tonal Music* (New York: Taylor and Francis, 2020), 125.

CHAPTER 2 – *ARMAGEDDON*

Instrumentation:

Flute (Picc.)

Clarinet in Bb (B. Cl.)

Trumpet in C

Trombone

Percussion (Drum Set)

Piano

Violin

Viola

Violoncello

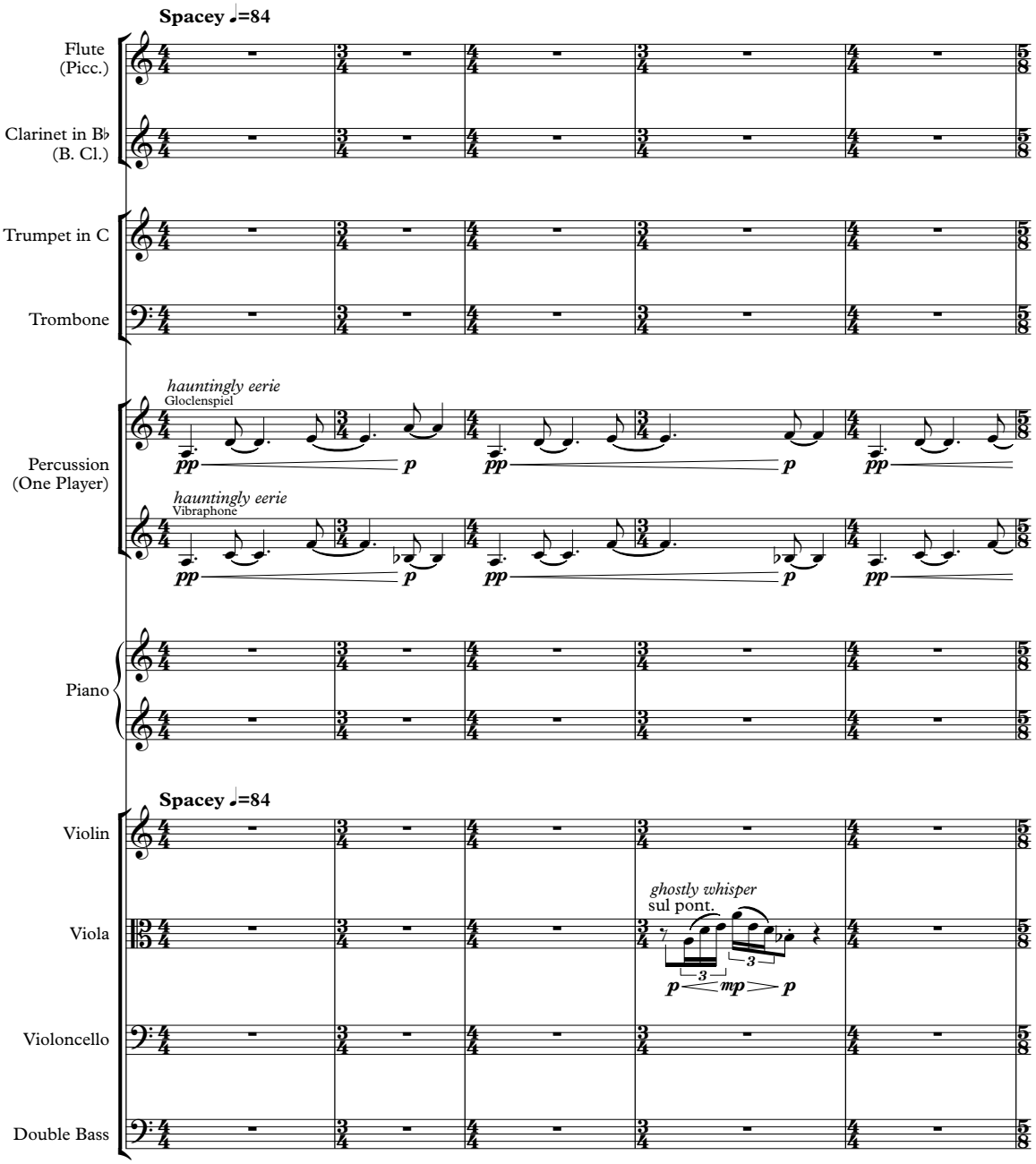
Double Bass

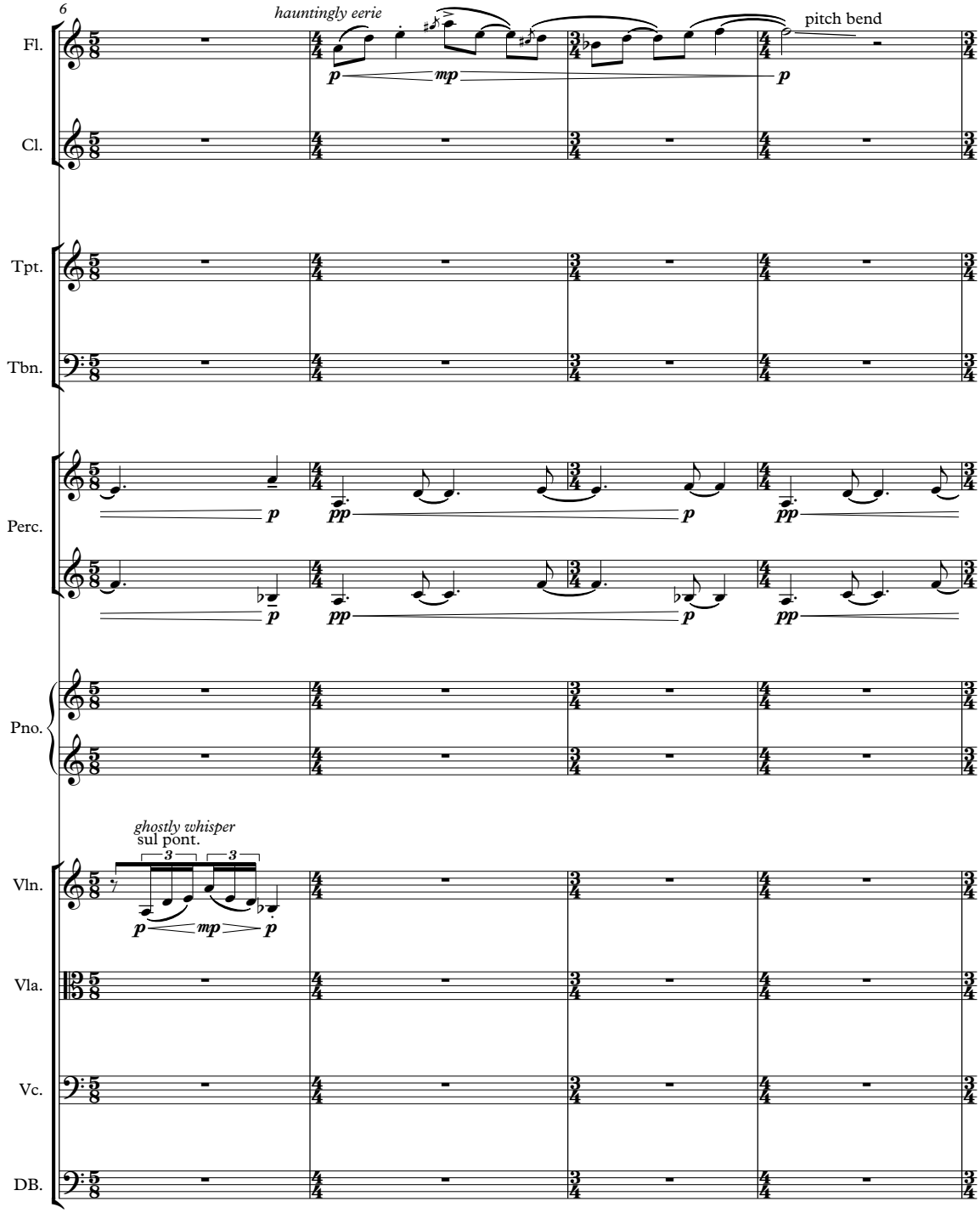
Duration:

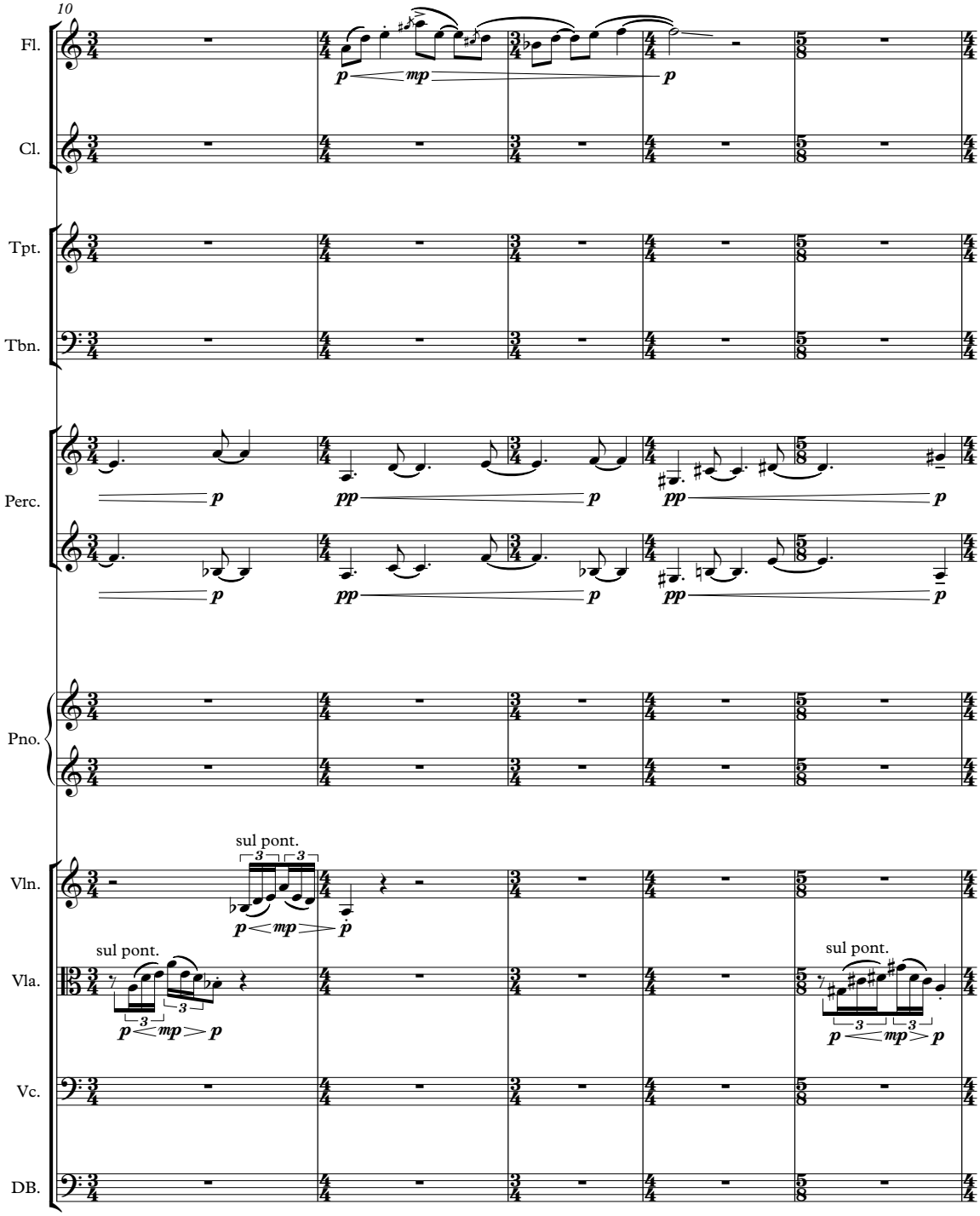
10 minutes and 30 seconds

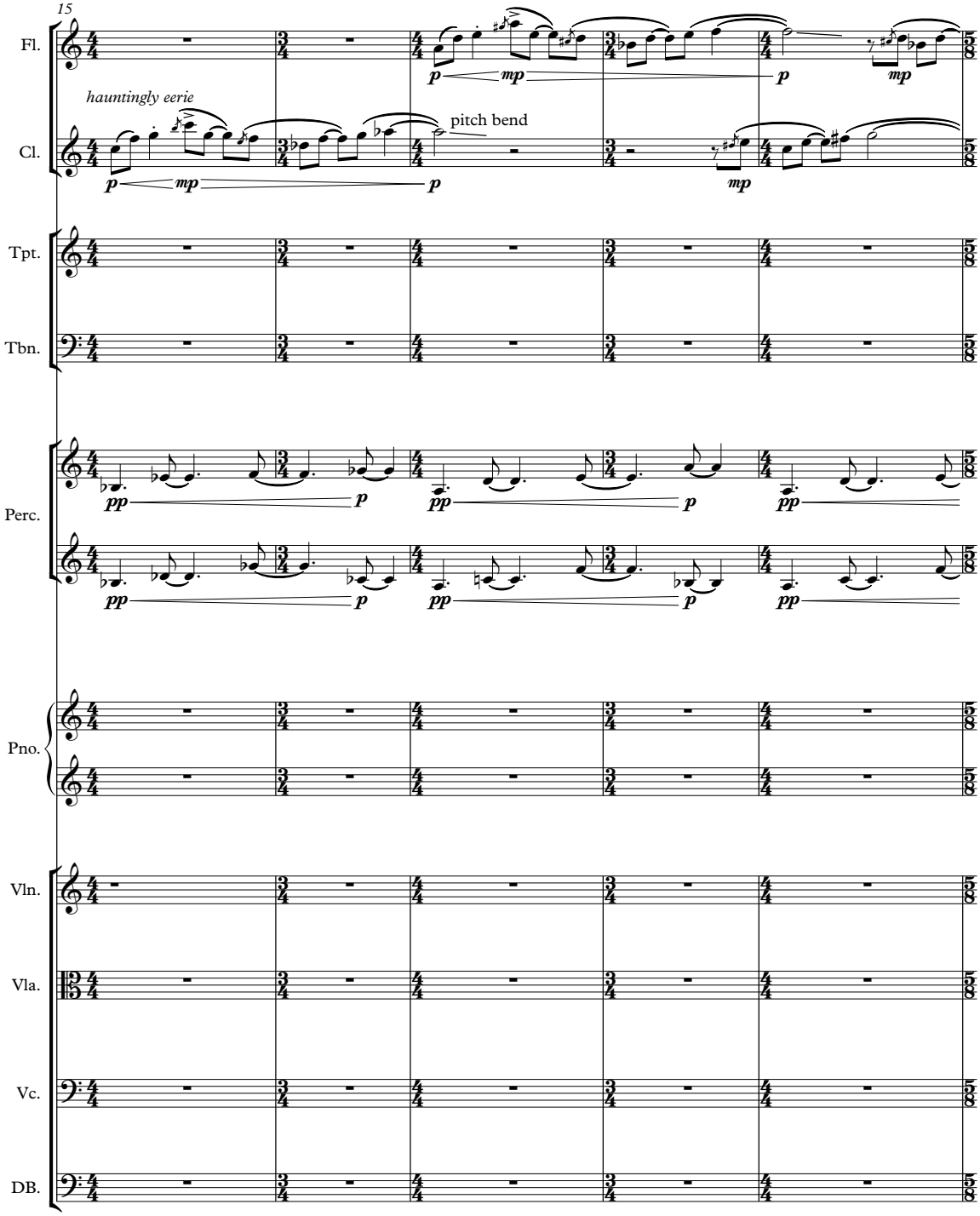
Armageddon

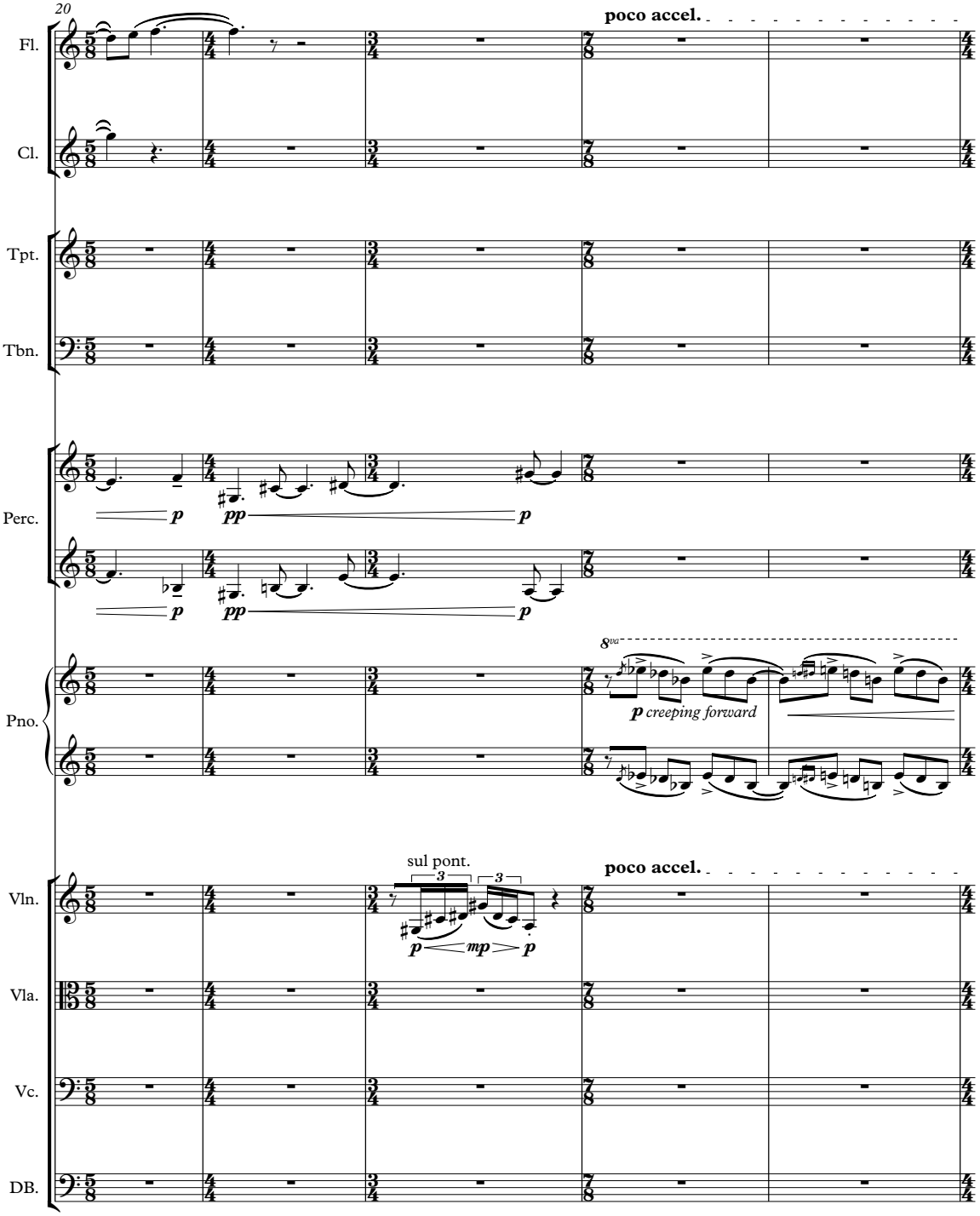
Adam J Benefield (b. 1988)

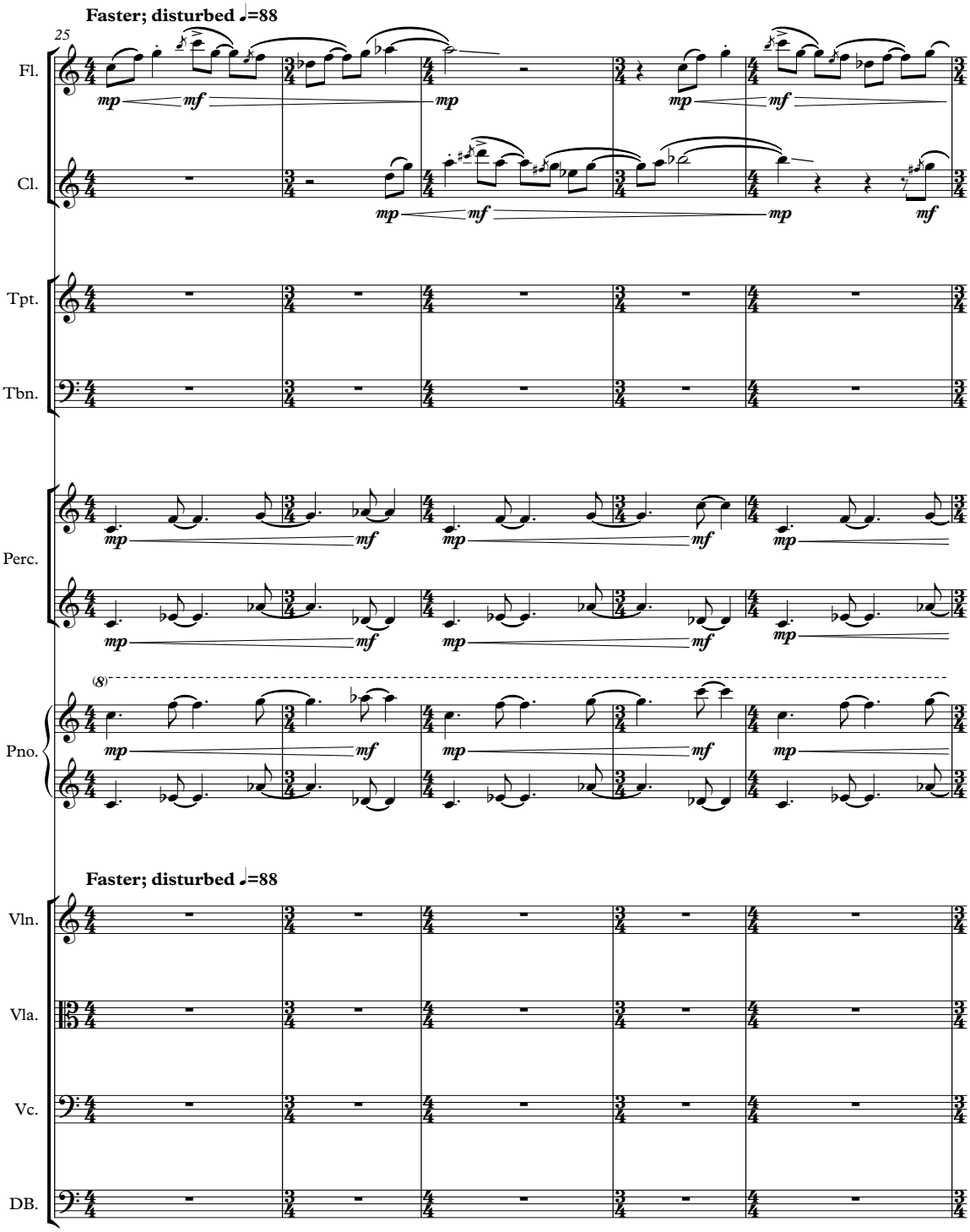


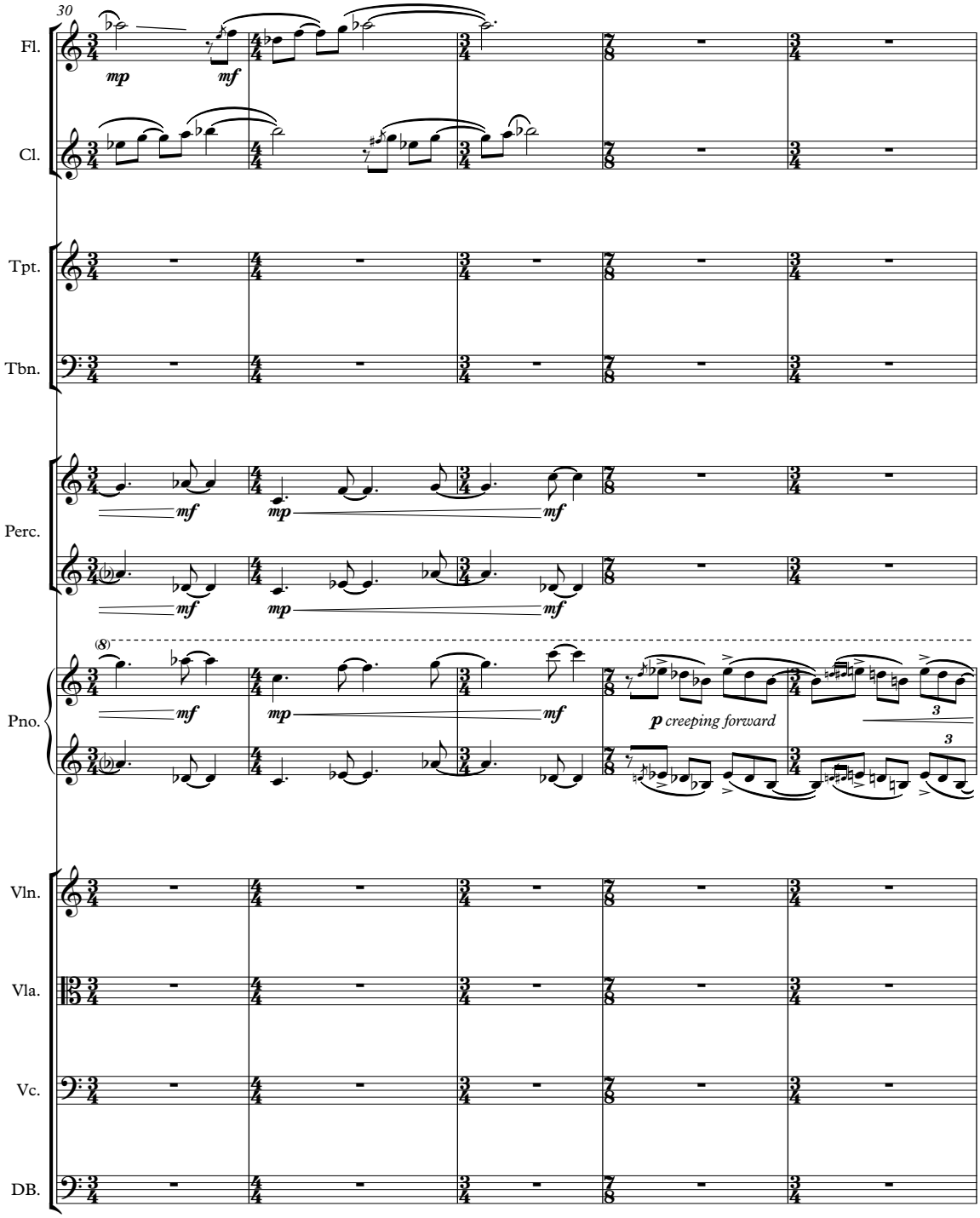

6
hauntingly eerie
pitch bend
Fl.
Cl.
Tpt.
Tbn.
Perc.
Pno.
ghostly whisper
sul pont.
Vln.
Vla.
Vc.
DB.

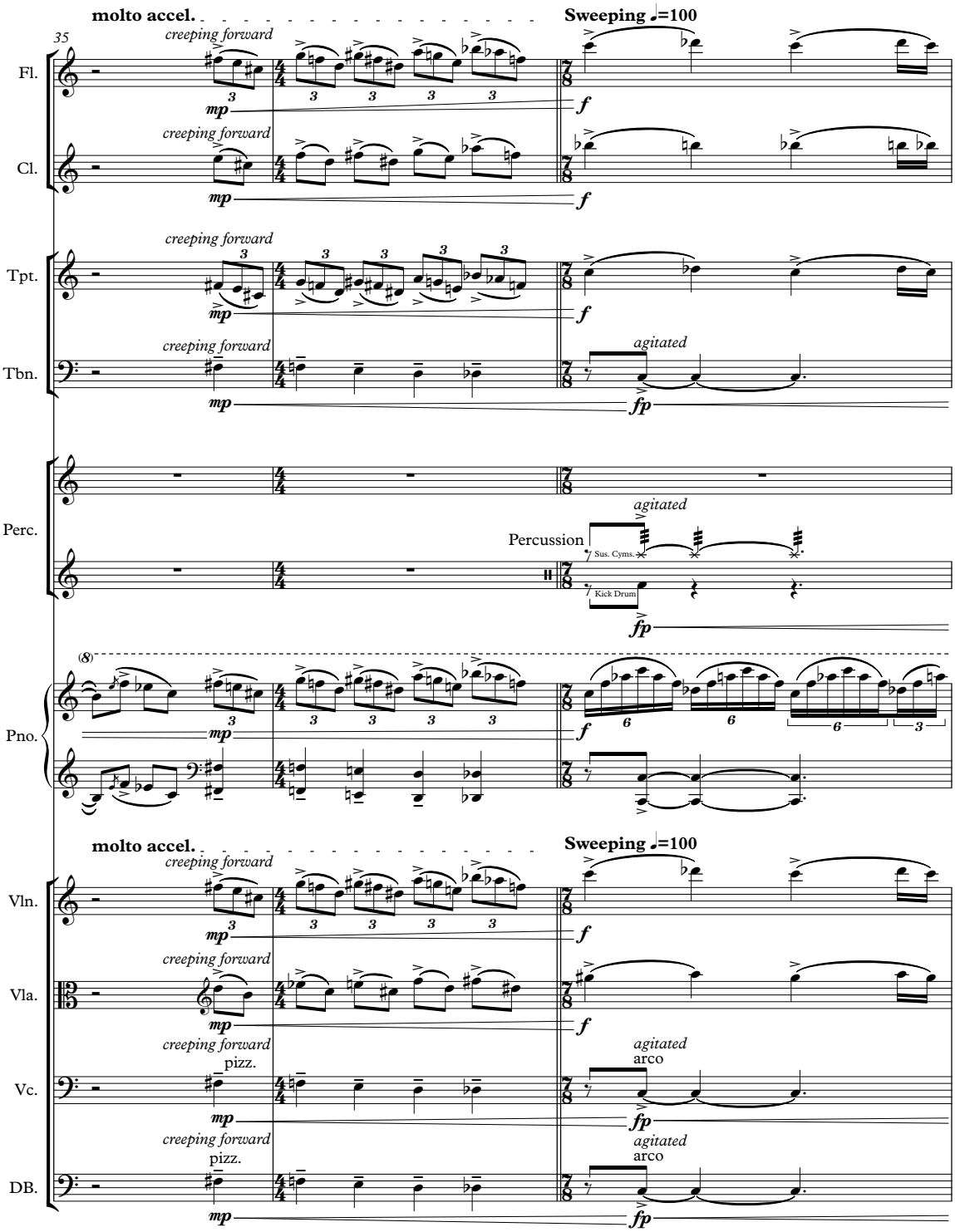

10
Fl.
Cl.
Tpt.
Tbn.
Perc.
Pno.
Vln.
Vla.
Vc.
DB.
sul pont.
sul pont.
sul pont.

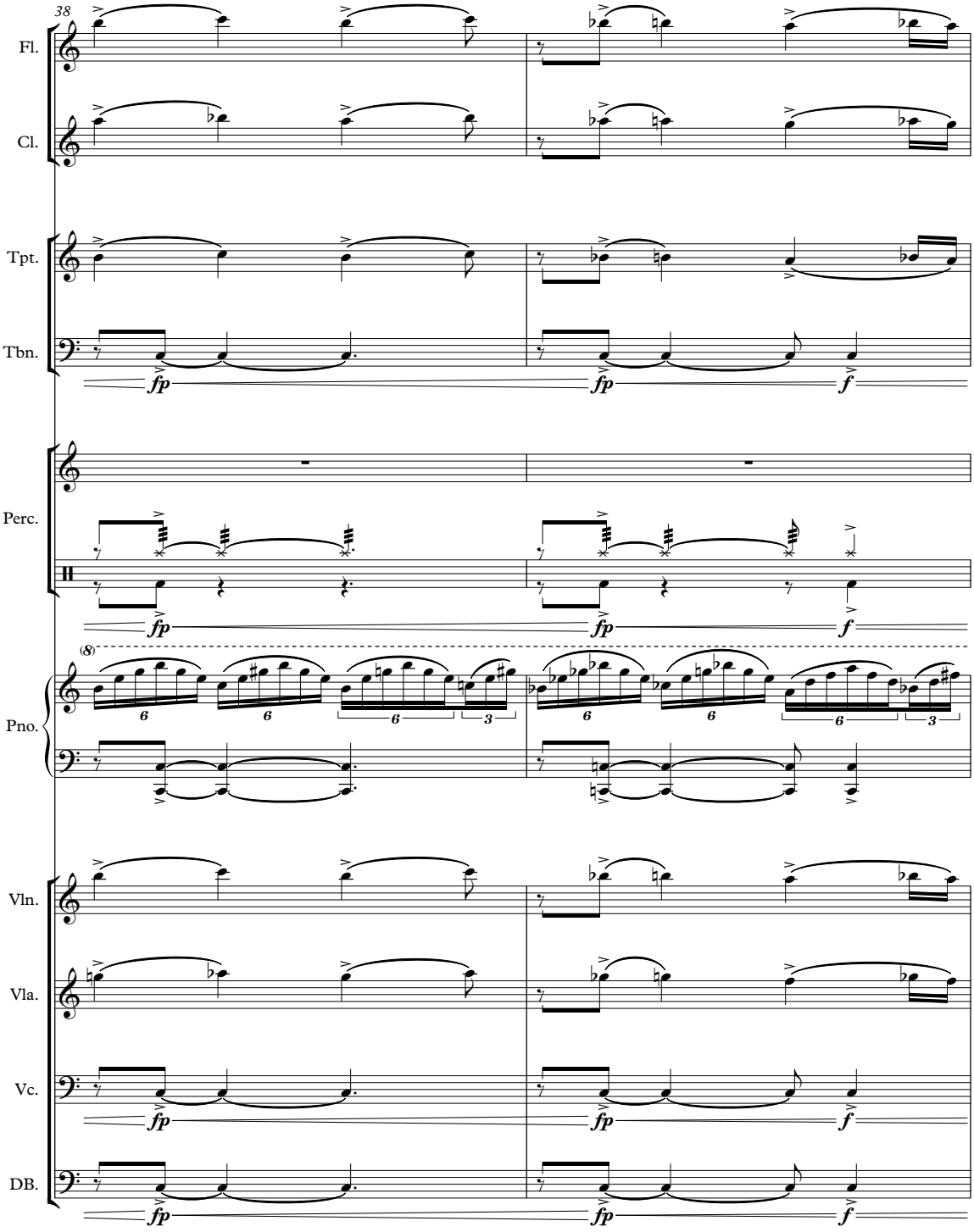

15
Fl.
Cl.
hauntingly eerie
pitch bend
Tpt.
Tbn.
Perc.
Pno.
Vln.
Vla.
Vc.
DB.

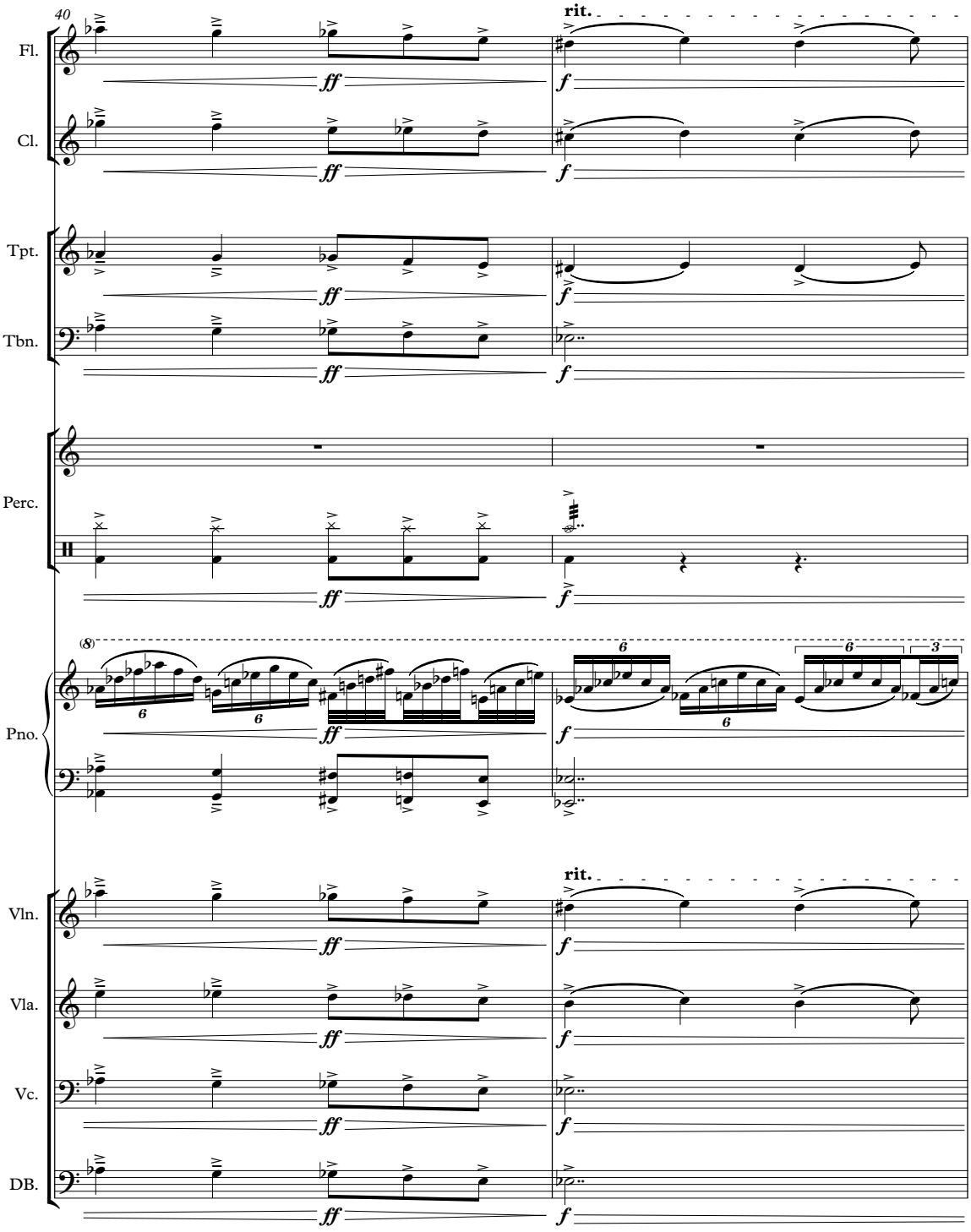

20
poco accel.
Fl.
Cl.
Tpt.
Tbn.
Perc.
Pno.
Vln.
Vla.
Vc.
DB.
p
pp
p
p
pp
p
8va
p creeping forward
sul pont.
3
3
p
mp
p
poco accel.

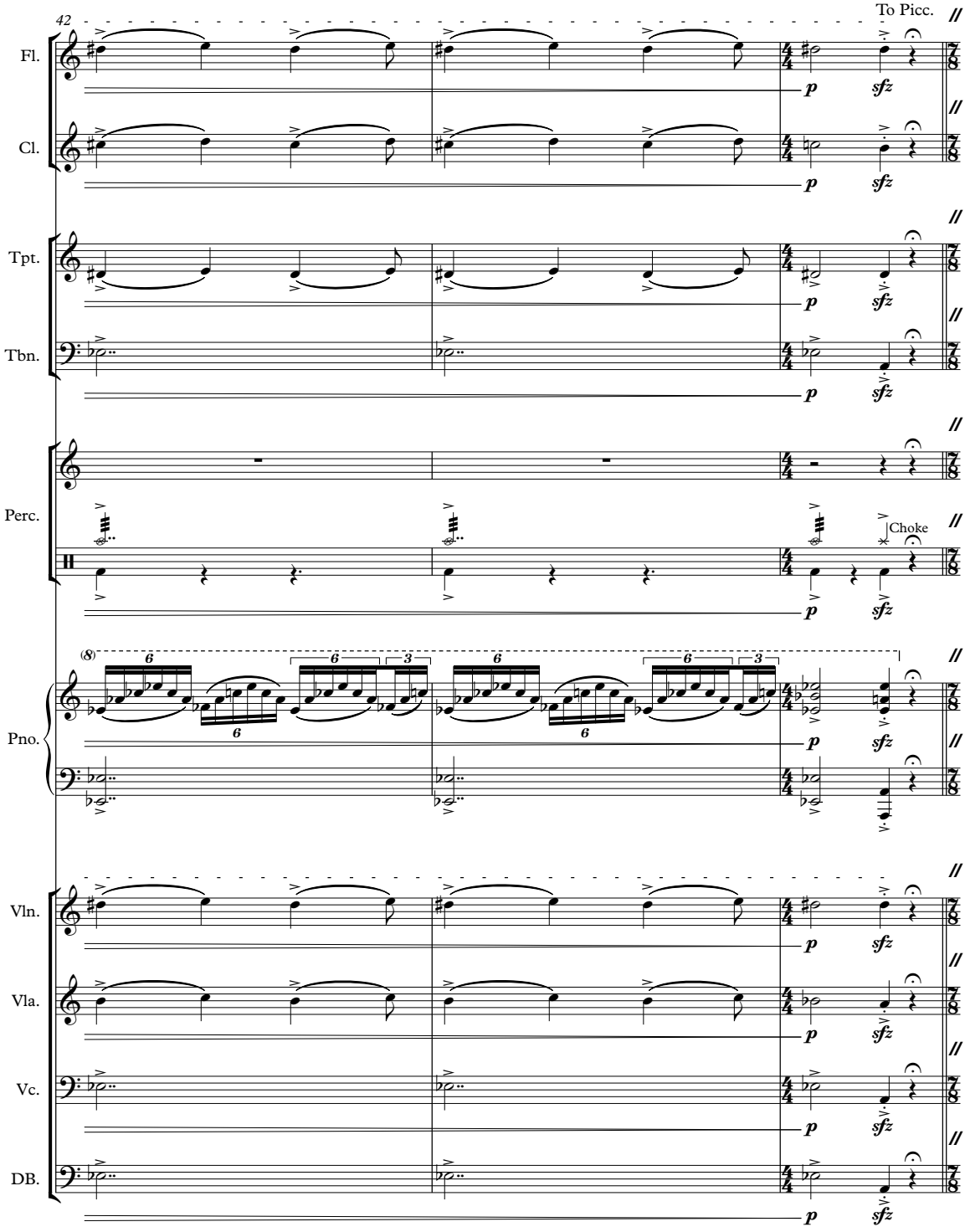

Faster; disturbed ♩=88
25
Fl.
Cl.
Tpt.
Tbn.
Perc.
Pno.
(8)
Faster; disturbed ♩=88
Vln.
Vla.
Vc.
DB.

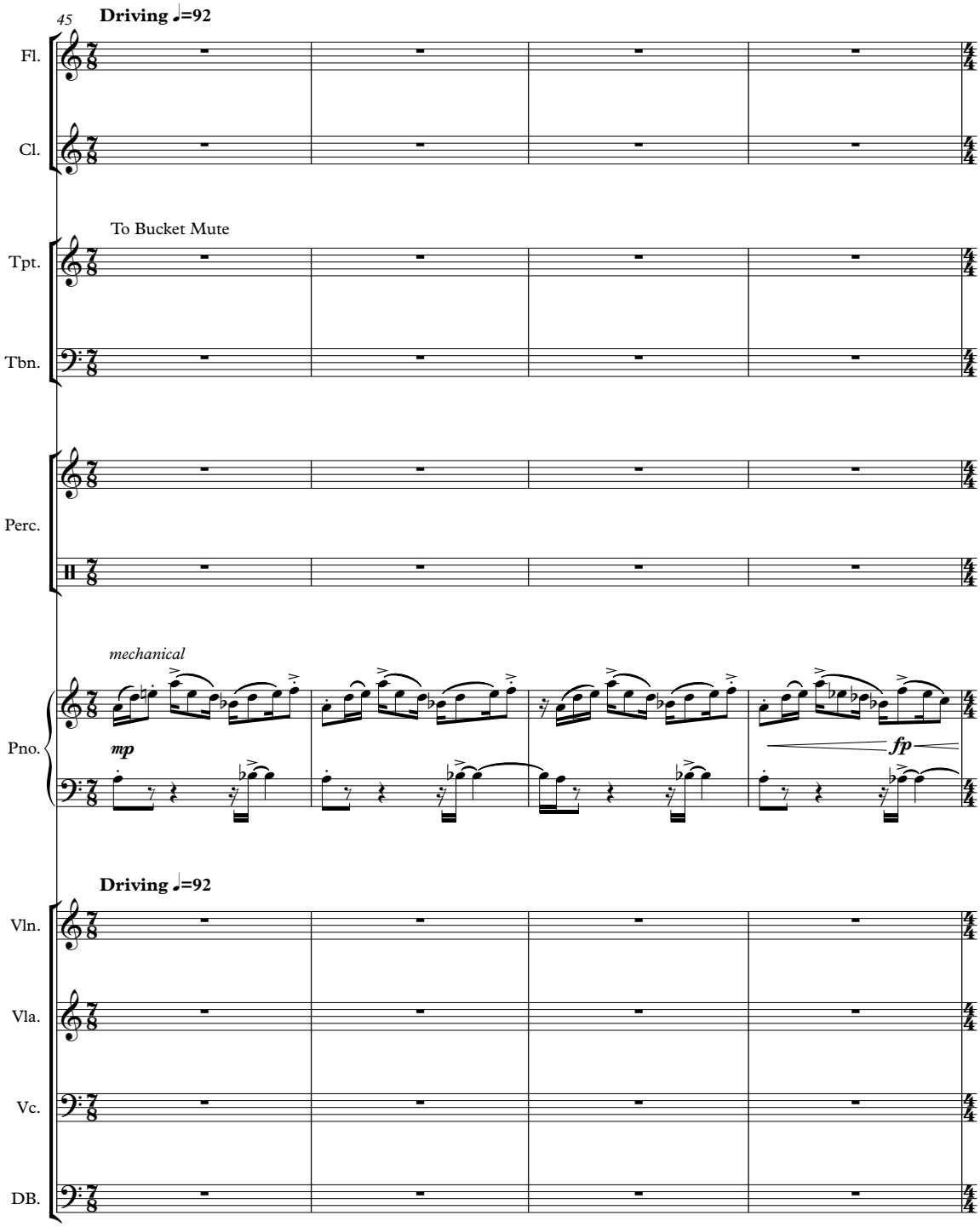

30
Fl.
Cl.
Tpt.
Tbn.
Perc.
Pno.
Vln.
Vla.
Vc.
DB.
mp
mf
p creeping forward

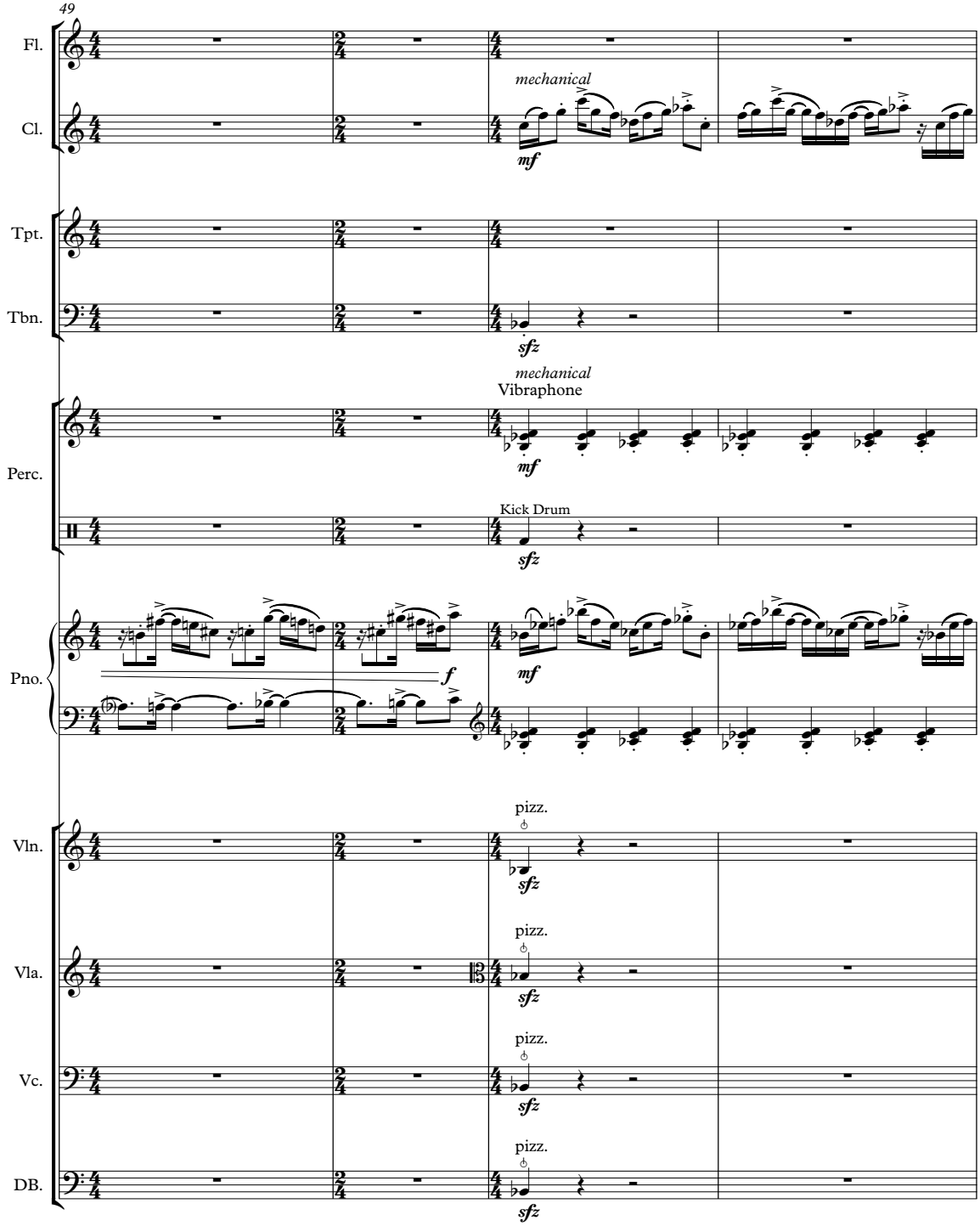

35
molto accel.
Sweeping ♩=100
Fl.
Cl.
Tpt.
Tbn.
Perc.
Pno.
Vln.
Vla.
Vc.
DB.
creeping forward
mp
f
fp
agitated
Percussion
Sus. Cyms.
Kick Drum
pizz.
arco
(8)

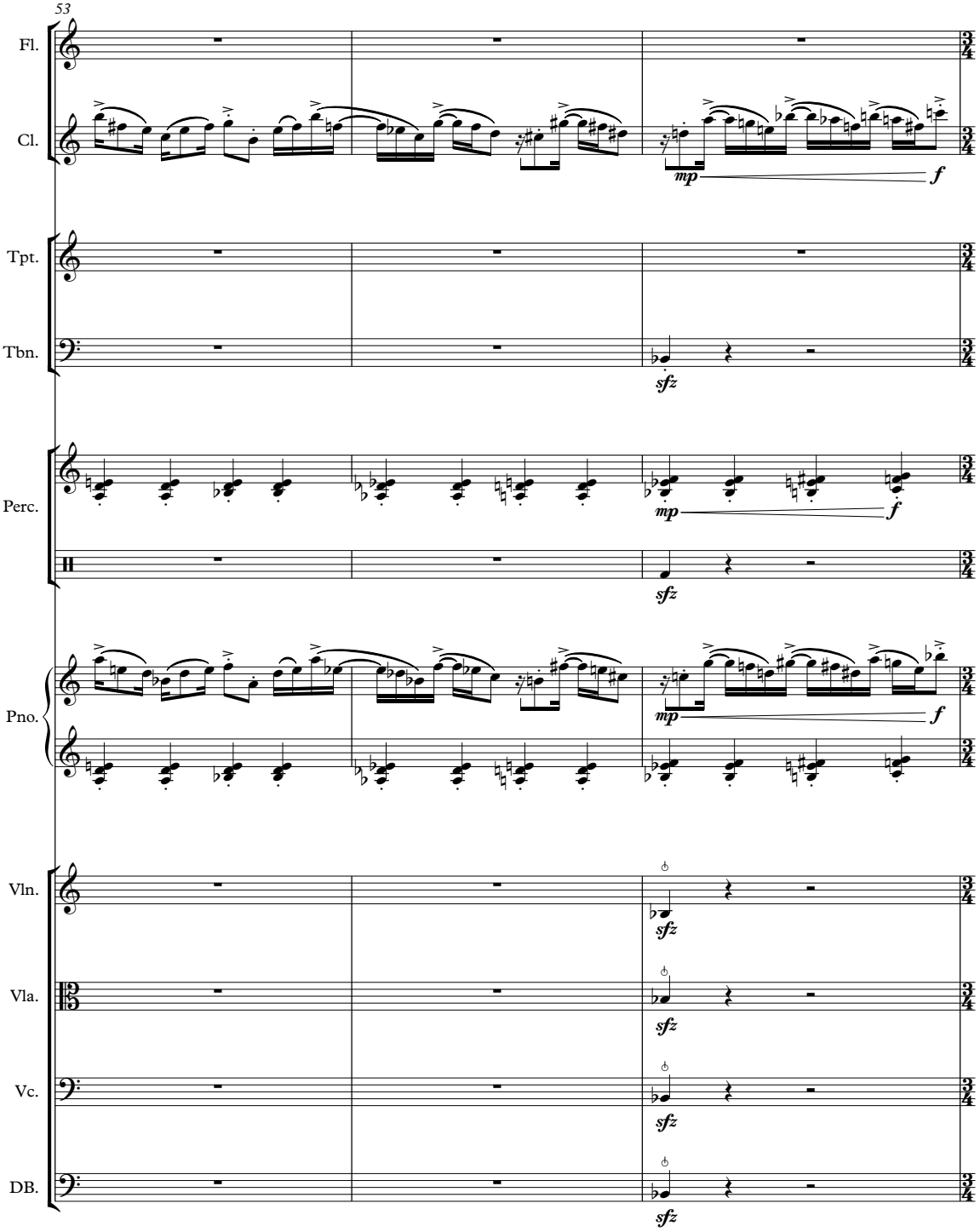

38
Fl.
Cl.
Tpt.
Tbn.
Perc.
Pno.
Vln.
Vla.
Vc.
DB.
fp
f
(8)

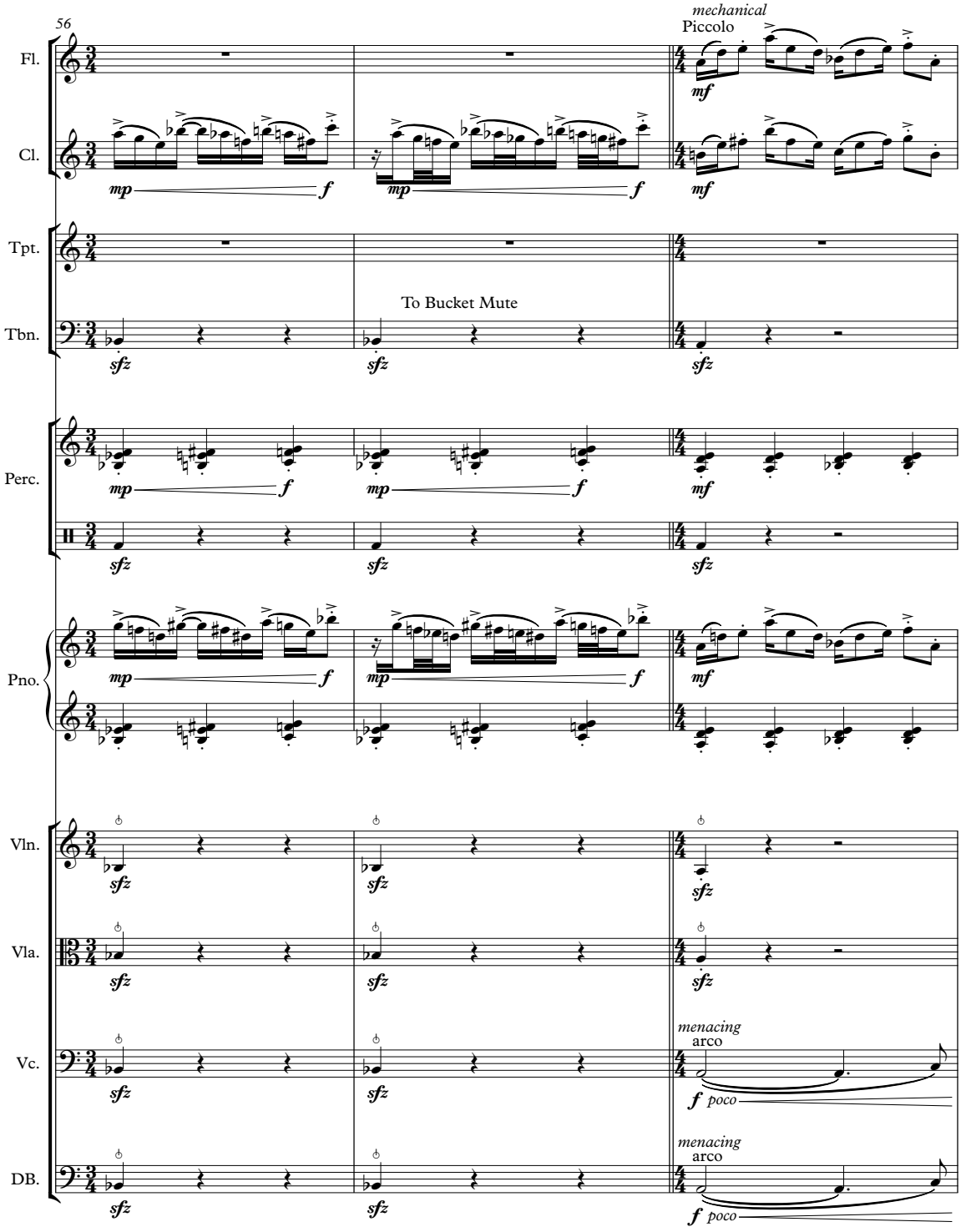

40
rit.
Fl.
Cl.
Tpt.
Tbn.
Perc.
Pno.
Vln.
Vla.
Vc.
DB.
ff
f

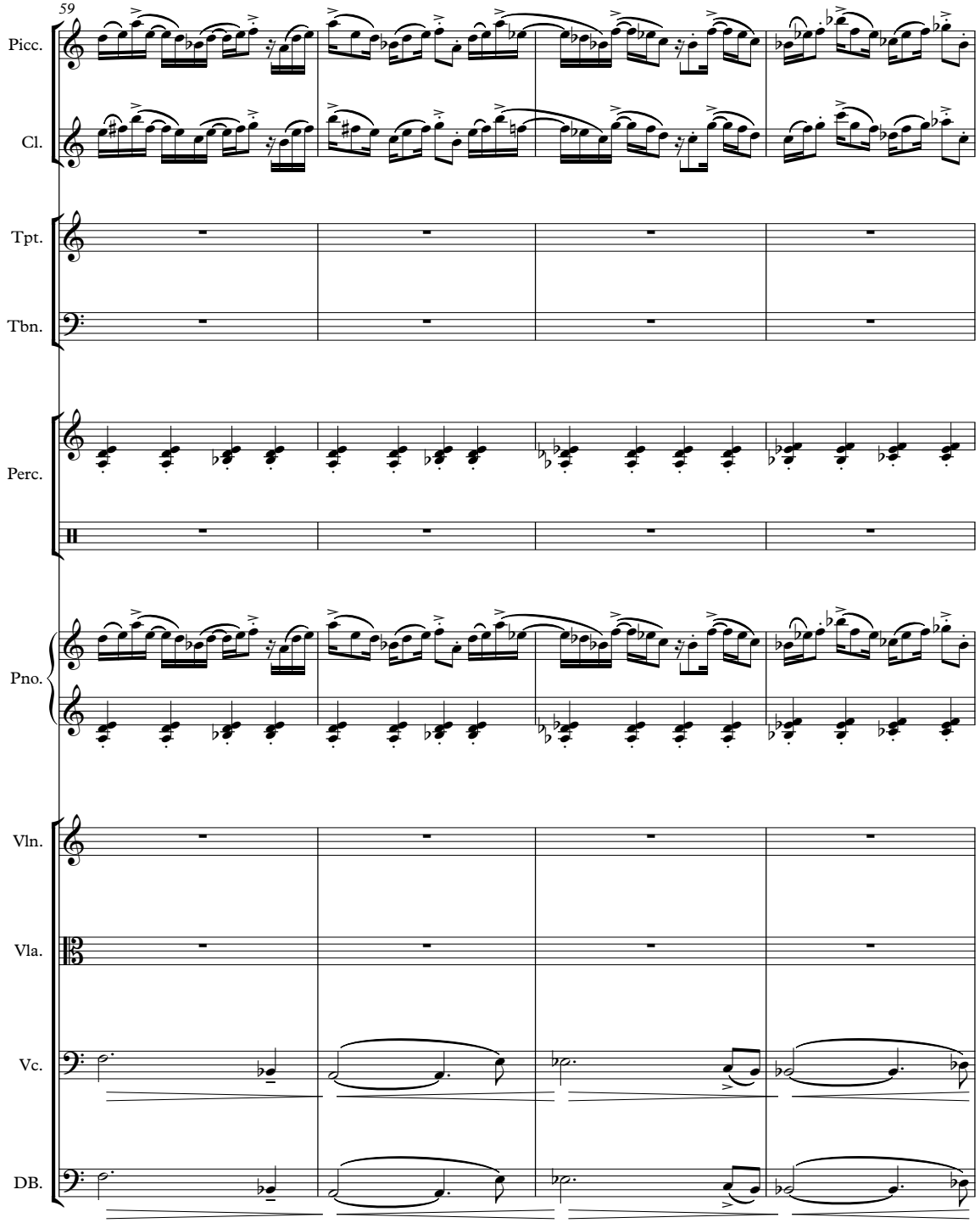

42
To Picc.
Fl.
Cl.
Tpt.
Tbn.
Perc.
Choke
Pno.
Vln.
Vla.
Vc.
DB.
p
sfz

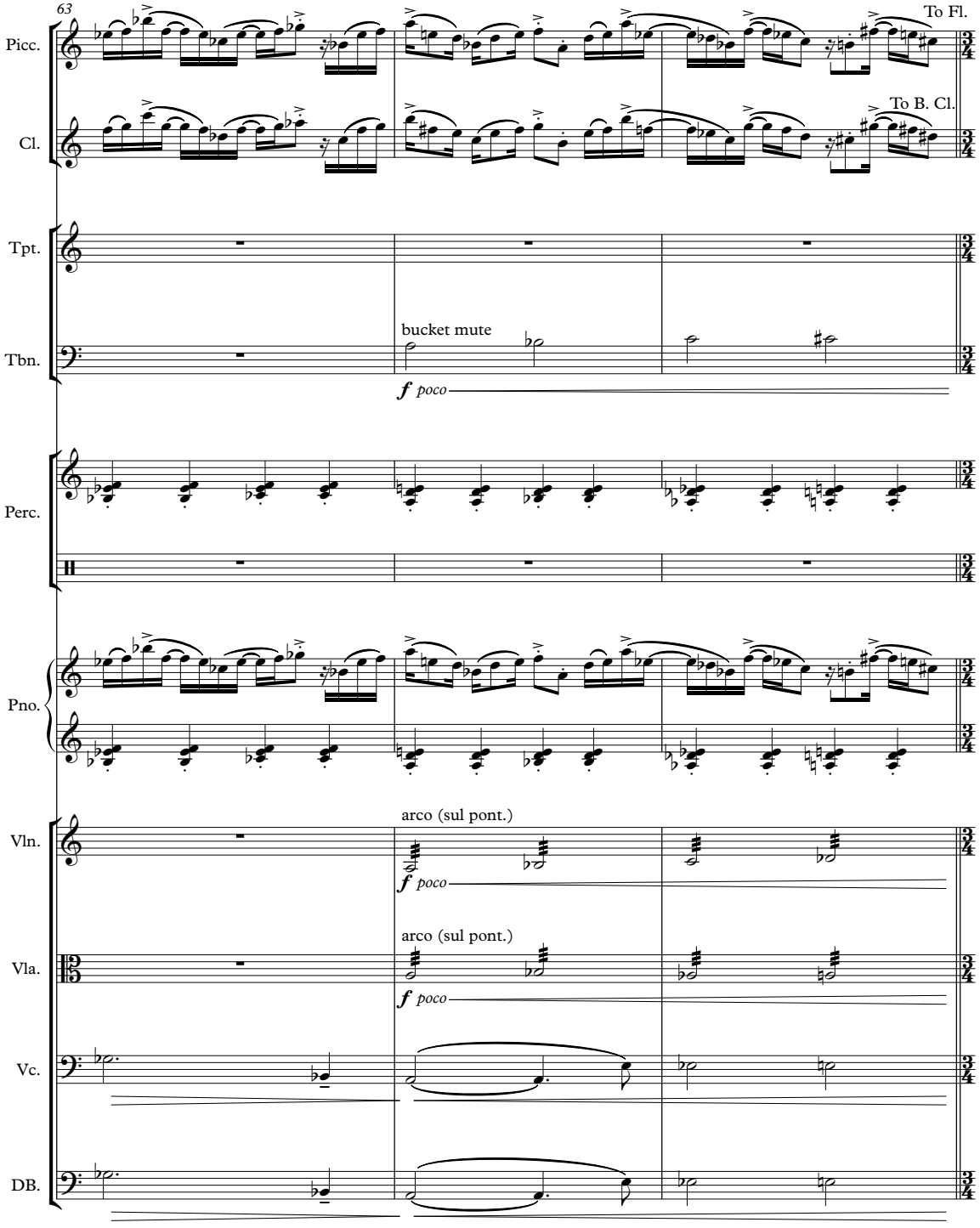

45
Driving ♩=92
Fl.
Cl.
To Bucket Mute
Tpt.
Tbn.
Perc.
mechanical
Pno.
mp
fp
Driving ♩=92
Vln.
Vla.
Vc.
DB.

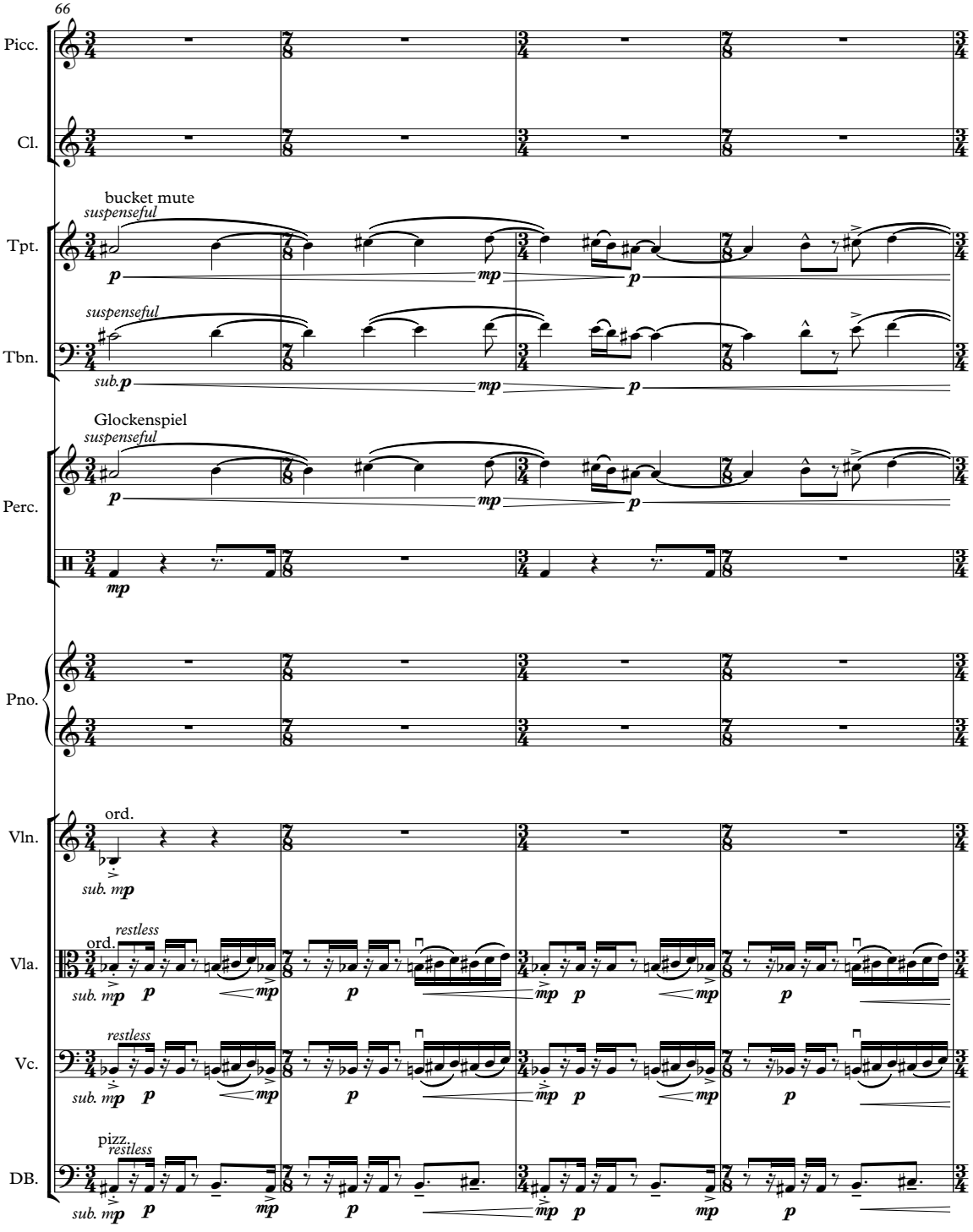

49
Fl.
Cl.
mechanical
mf
Tpt.
Tbn.
sfz
mechanical
Vibraphone
Perc.
mf
Kick Drum
sfz
Pno.
f
mf
Vln.
pizz.
sfz
Vla.
pizz.
sfz
Vc.
pizz.
sfz
DB.
pizz.
sfz

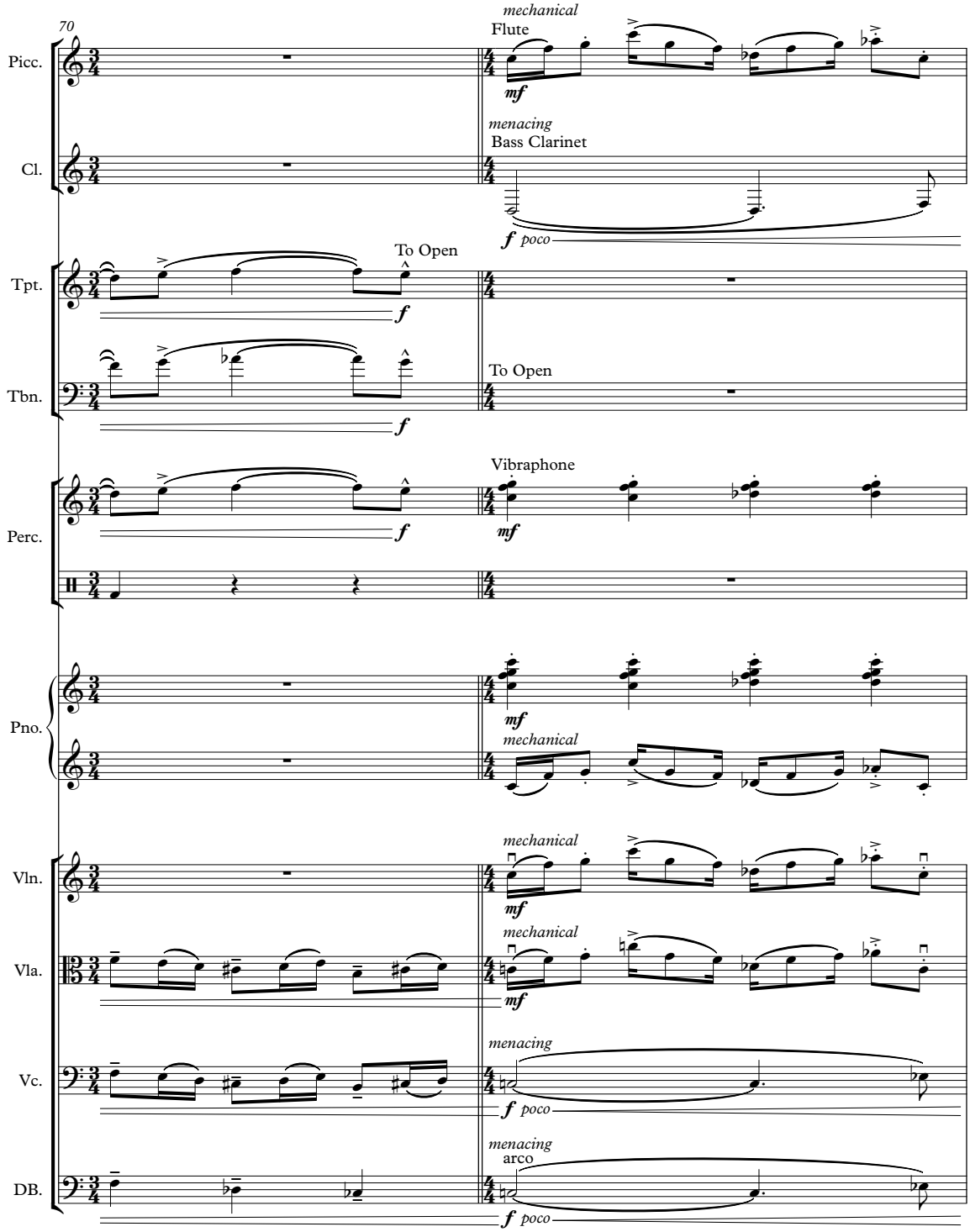

53
Fl.
Cl.
mp
f
Tpt.
Tbn.
sfz
Perc.
mp
f
sfz
Pno.
mp
f
Vln.
sfz
Vla.
sfz
Vc.
sfz
DB.
sfz

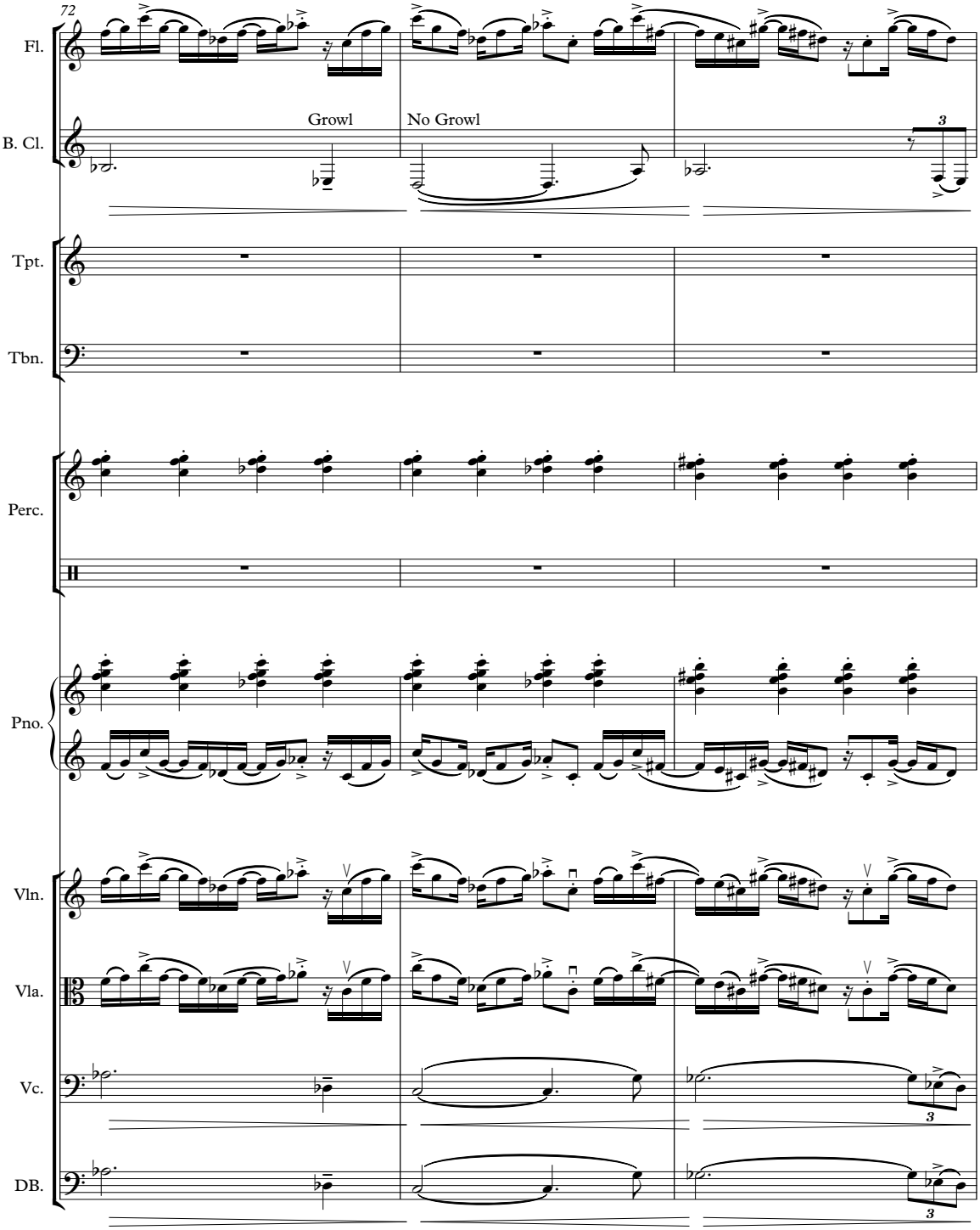

56
mechanical
Piccolo
Fl.
Cl.
Tpt.
To Bucket Mute
Tbn.
Perc.
Pno.
Vln.
Vla.
menacing
arco
Vc.
menacing
arco
DB.

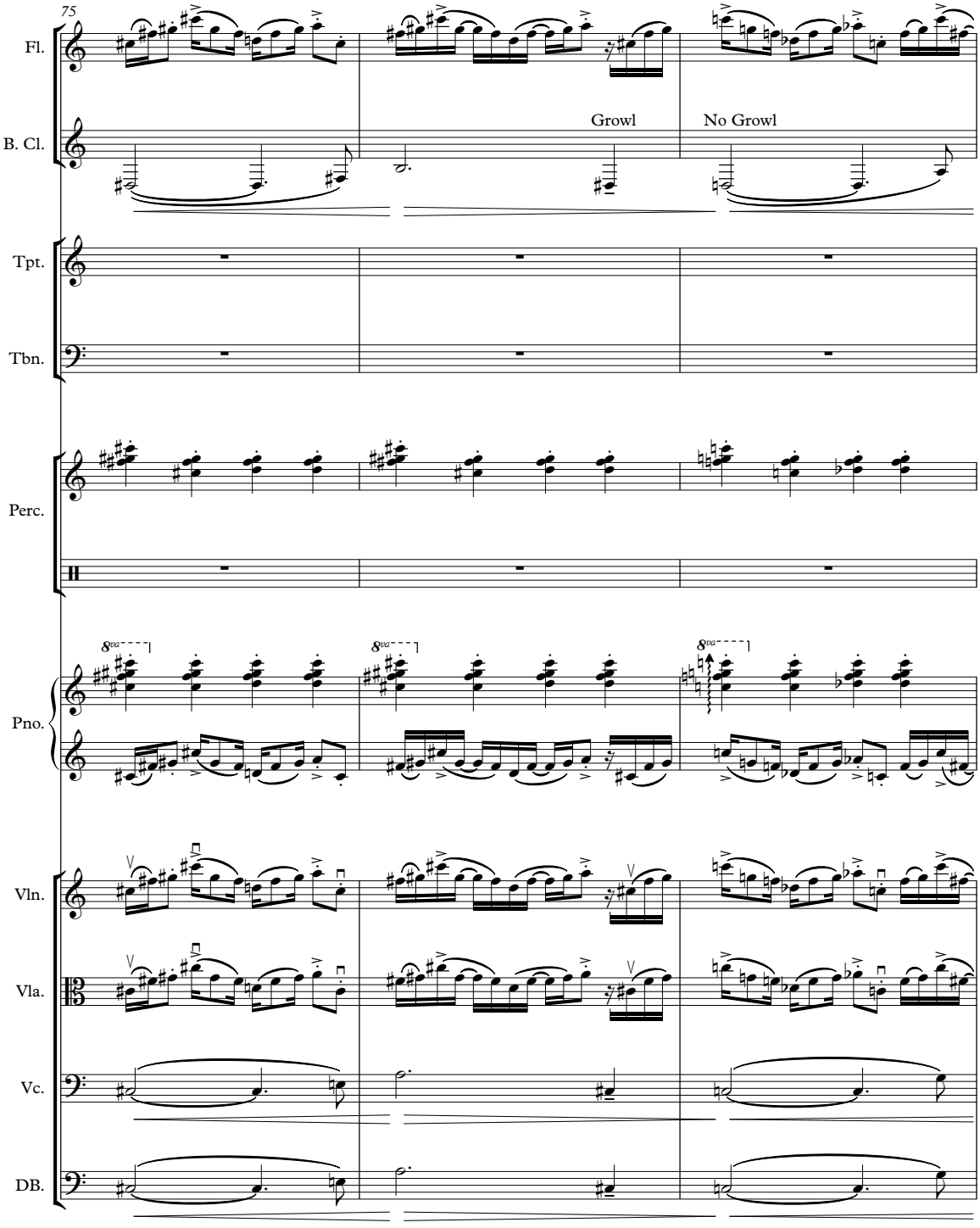

59
Picc.
Cl.
Tpt.
Tbn.
Perc.
Pno.
Vln.
Vla.
Vc.
DB.

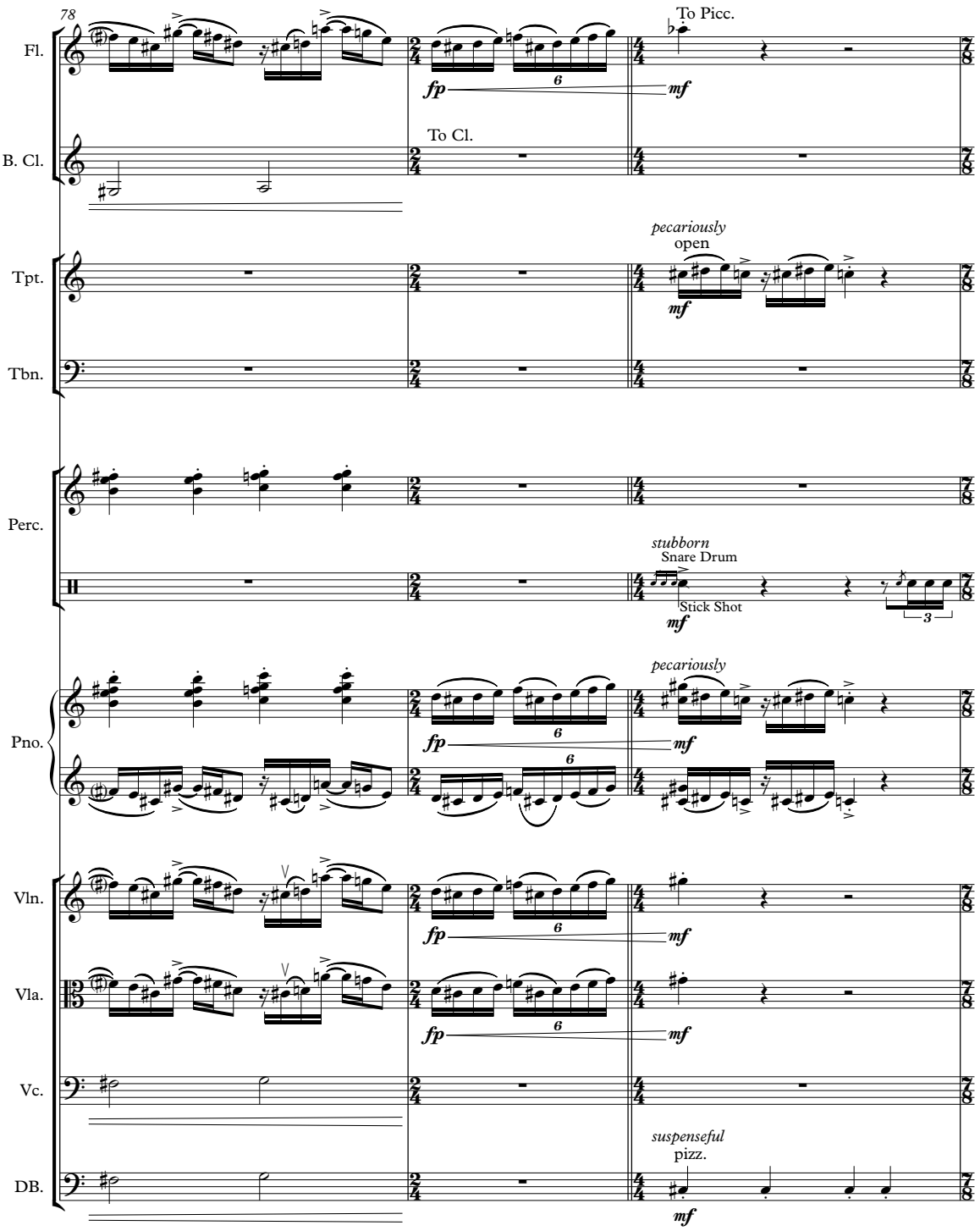

63
Picc.
To Fl.
Cl.
To B. Cl.
Tpt.
Tbn.
bucket mute
f poco
Perc.
Pno.
Vln.
arco (sul pont.)
f poco
Vla.
arco (sul pont.)
f poco
Vc.
DB.

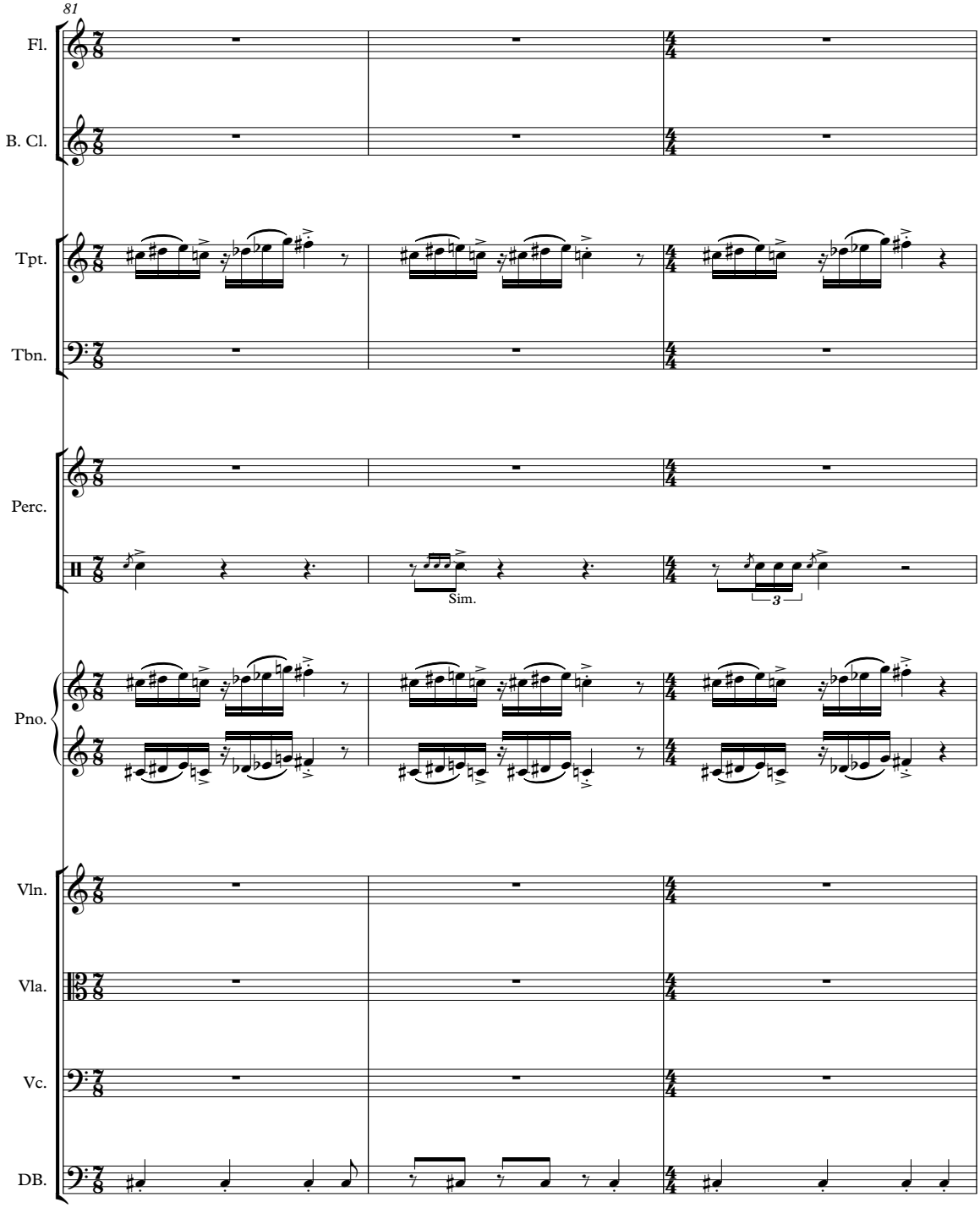

66
Picc.
Cl.
bucket mute
suspenseful
Tpt.
suspenseful
Tbn.
Glockenspiel
suspenseful
Perc.
Pno.
ord.
Vln.
ord.
restless
Vla.
restless
Vc.
pizz.
restless
DB.

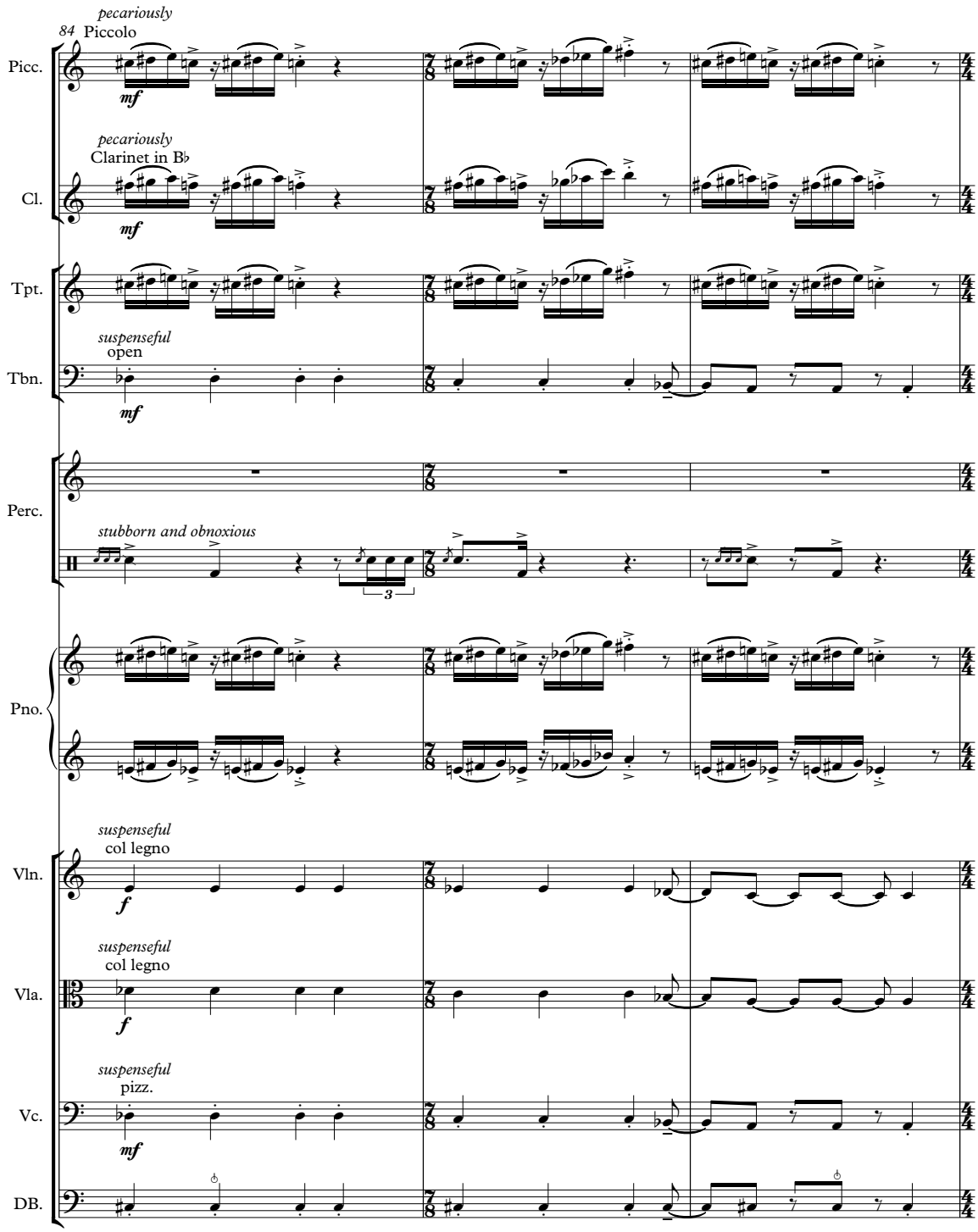

70
Picc.
Cl.
Tpt.
Tbn.
Perc.
Pno.
Vln.
Vla.
Vc.
DB.
mechanical
Flute
mf
menacing
Bass Clarinet
f poco
To Open
f
To Open
f
Vibraphone
mf
f
mf
mechanical
mechanical
mf
mechanical
mf
menacing
f poco
menacing
arco
f poco

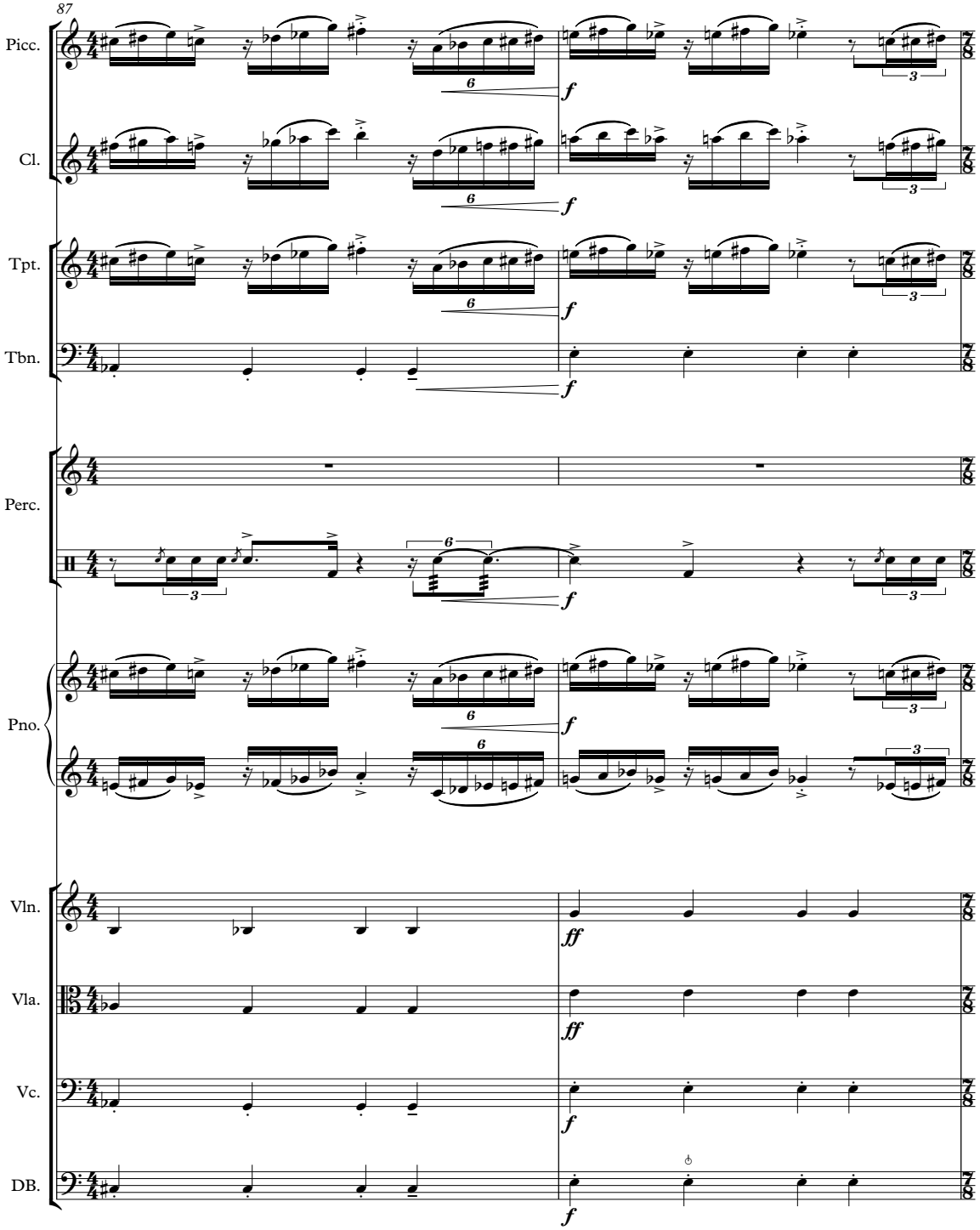

72
Fl.
B. Cl.
Growl
No Growl
Tpt.
Tbn.
Perc.
Pno.
Vln.
Vla.
Vc.
DB.

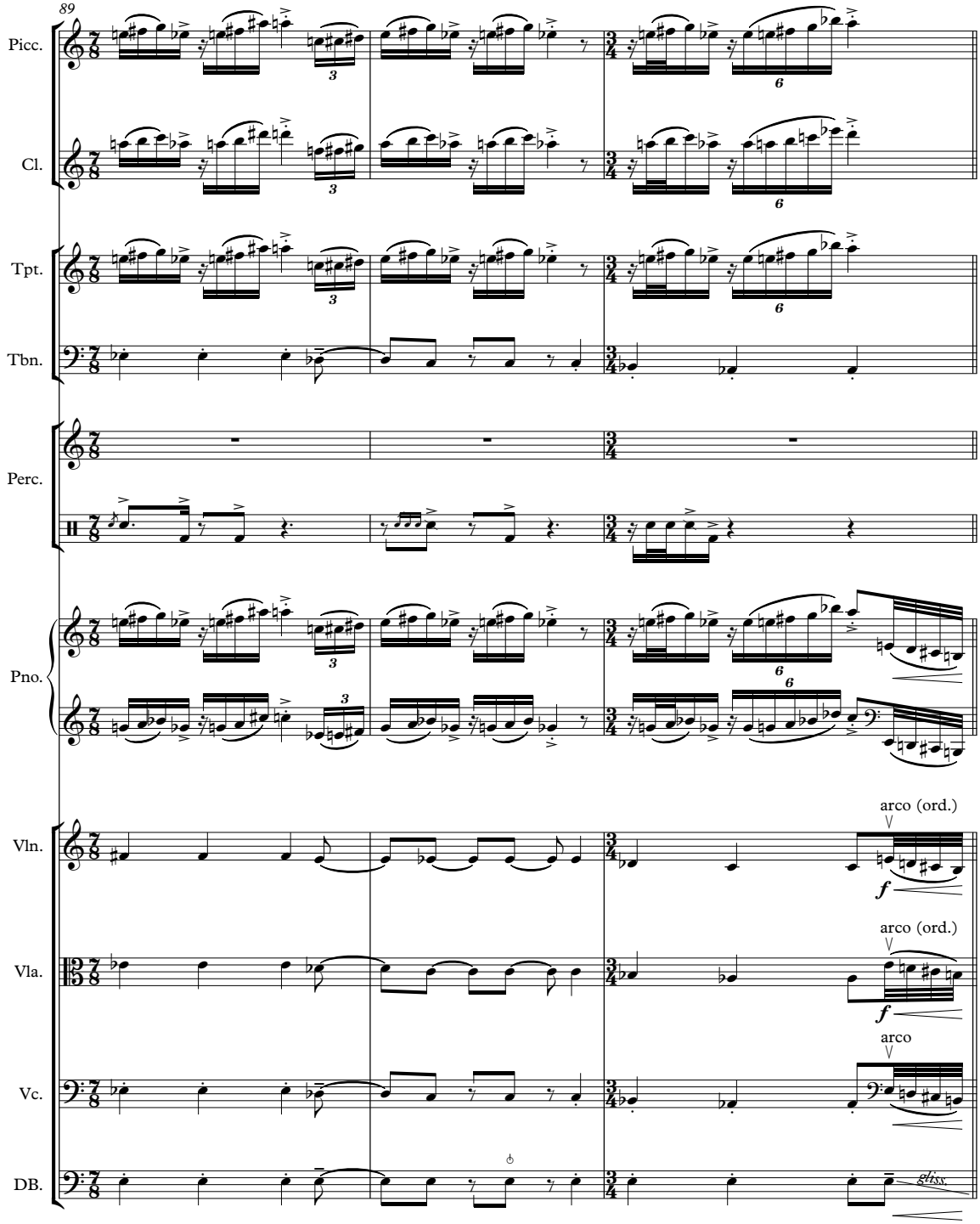

75
Fl.
B. Cl.
Growl
No Growl
Tpt.
Tbn.
Perc.
Pno.
8va
Vln.
Vla.
Vc.
DB.

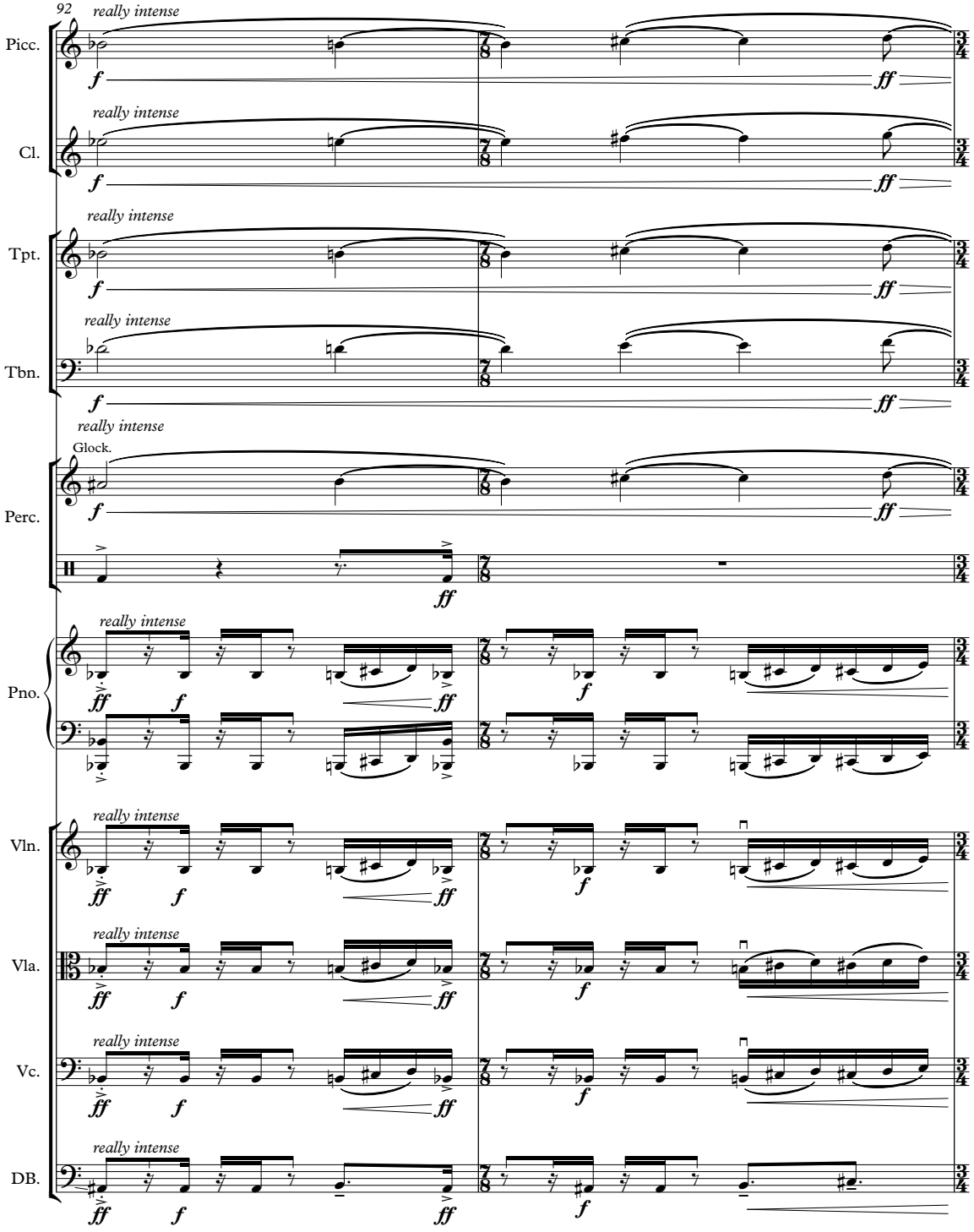

78
Fl.
B. Cl.
Tpt.
Tbn.
Perc.
Pno.
Vln.
Vla.
Vc.
DB.
To Picc.
To Cl.
fp
mf
6
pecariously
open
stubborn
Snare Drum
Stick Shot
3
suspenseful
pizz.

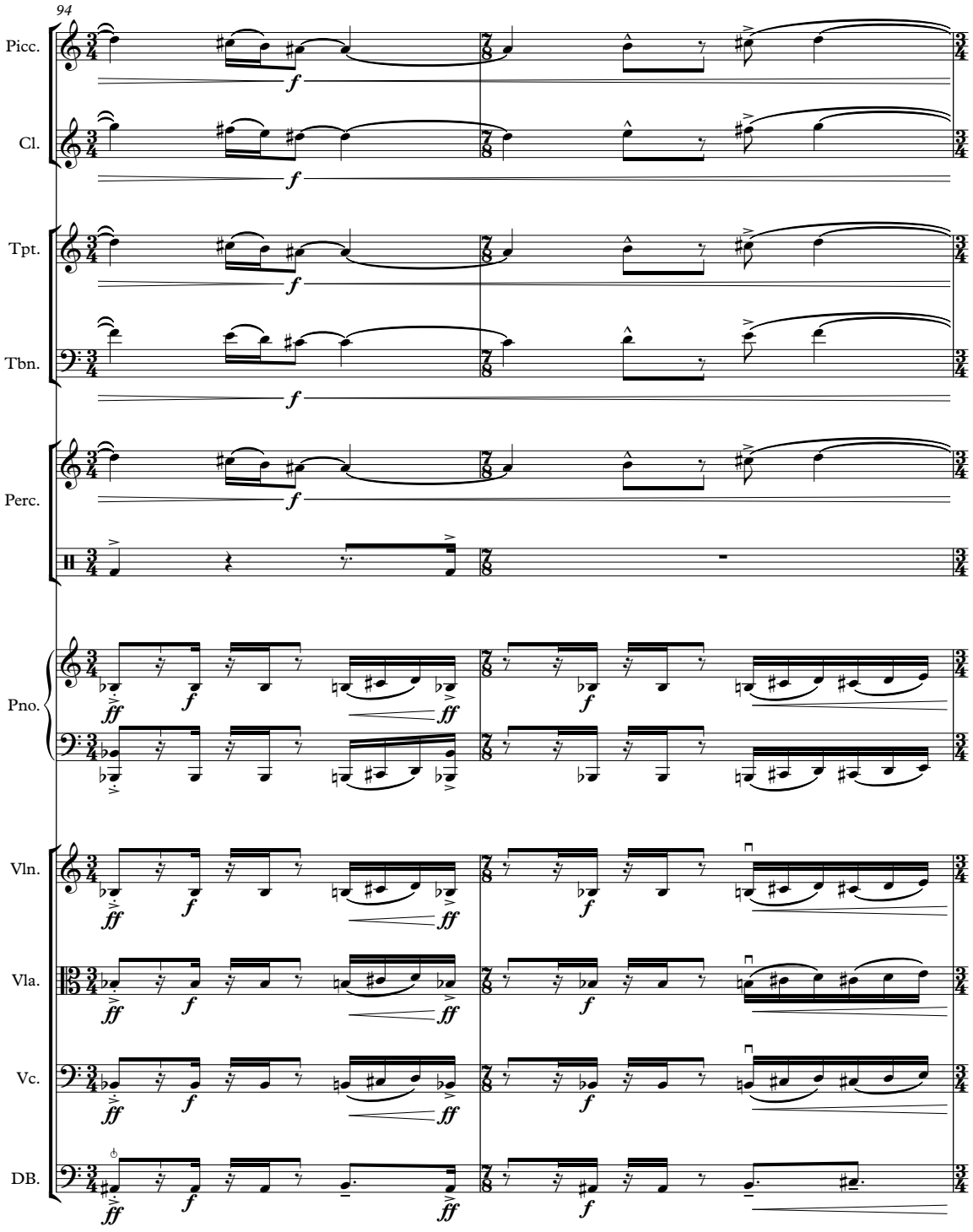

81
Fl.
B. Cl.
Tpt.
Tbn.
Perc.
Sim.
3
Pno.
Vln.
Vla.
Vc.
DB.

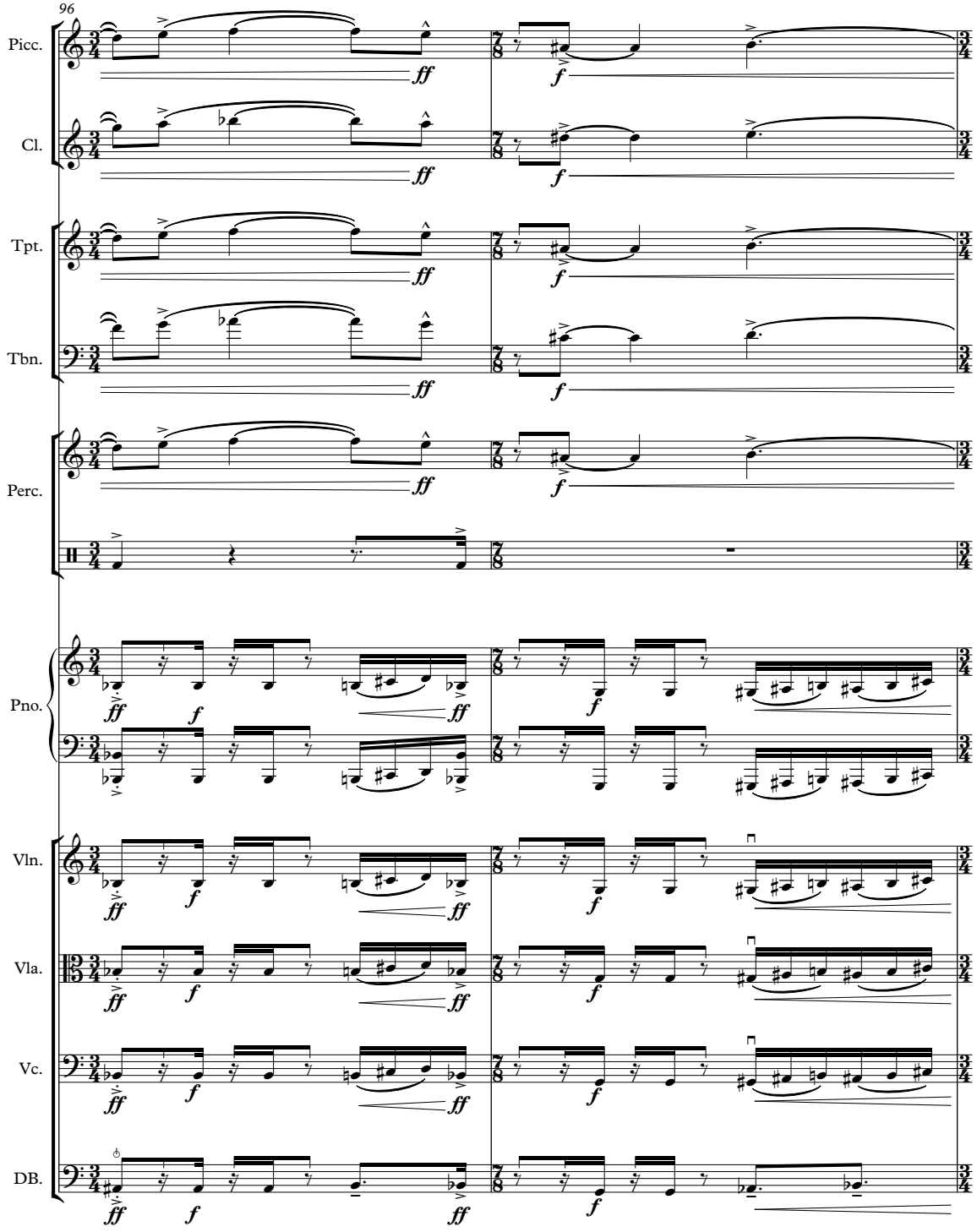

84
pecariously
Piccolo
Picc.
mf
pecariously
Clarinet in B♭
Cl.
mf
Tpt.
suspenseful
open
Tbn.
mf
Perc.
stubborn and obnoxious
3
Pno.
suspenseful
col legno
Vln.
f
suspenseful
col legno
Vla.
f
suspenseful
pizz.
Vc.
mf
DB.

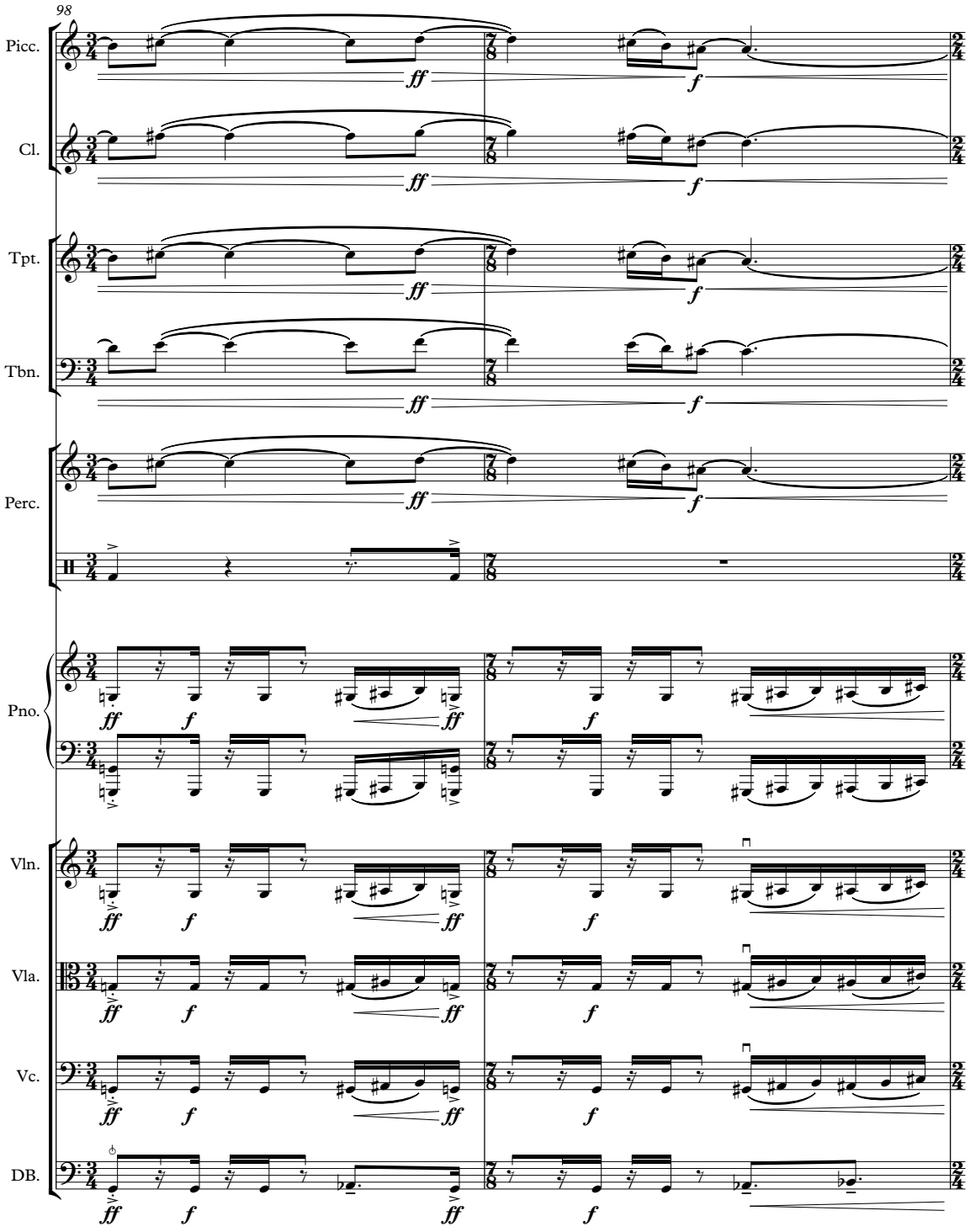

87
Picc.
Cl.
Tpt.
Tbn.
Perc.
Pno.
Vln.
Vla.
Vc.
DB.
f
ff

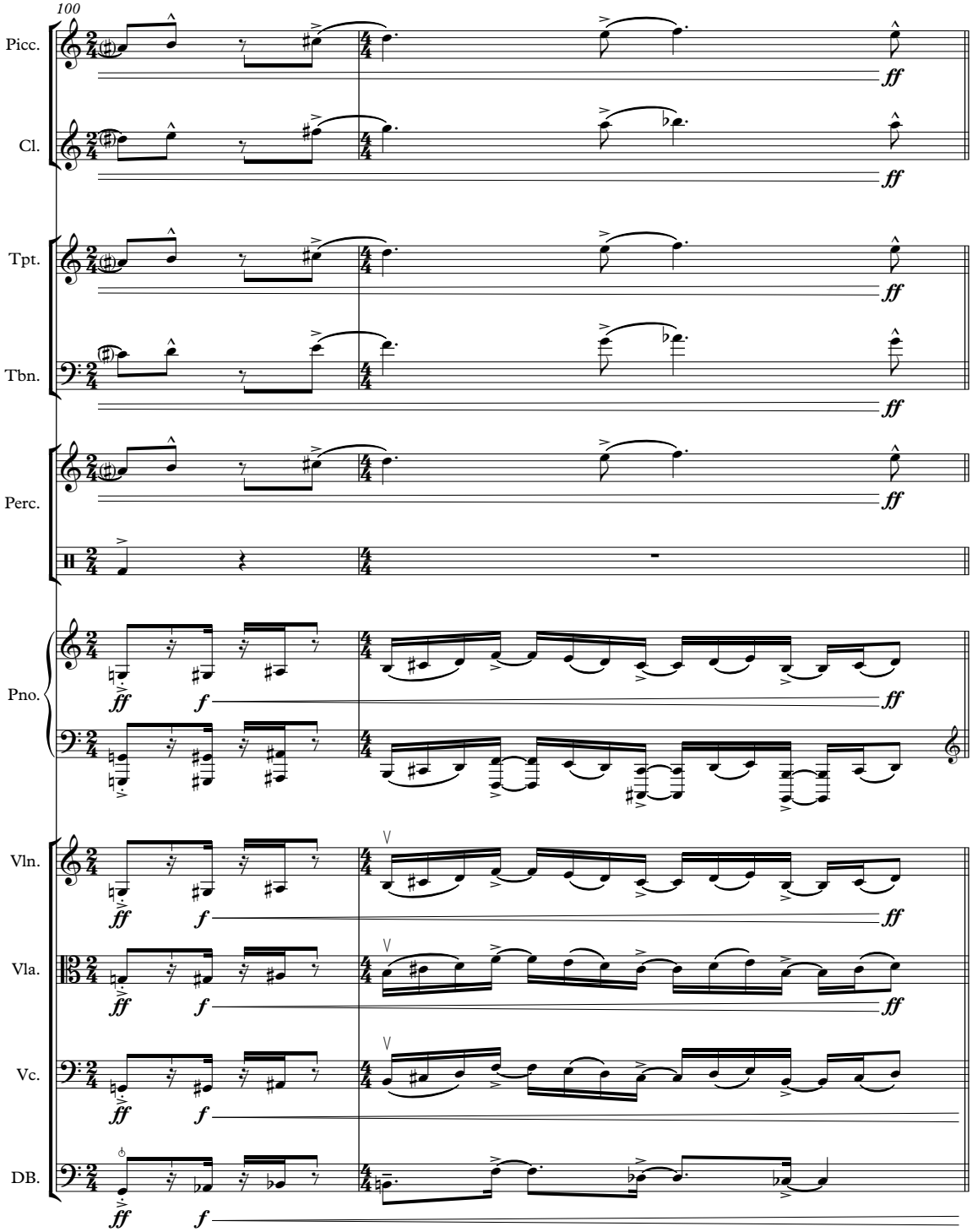

89
Picc.
Cl.
Tpt.
Tbn.
Perc.
Pno.
Vln.
Vla.
Vc.
DB.
arco (ord.)
f
arco (ord.)
f
arco
gliss.

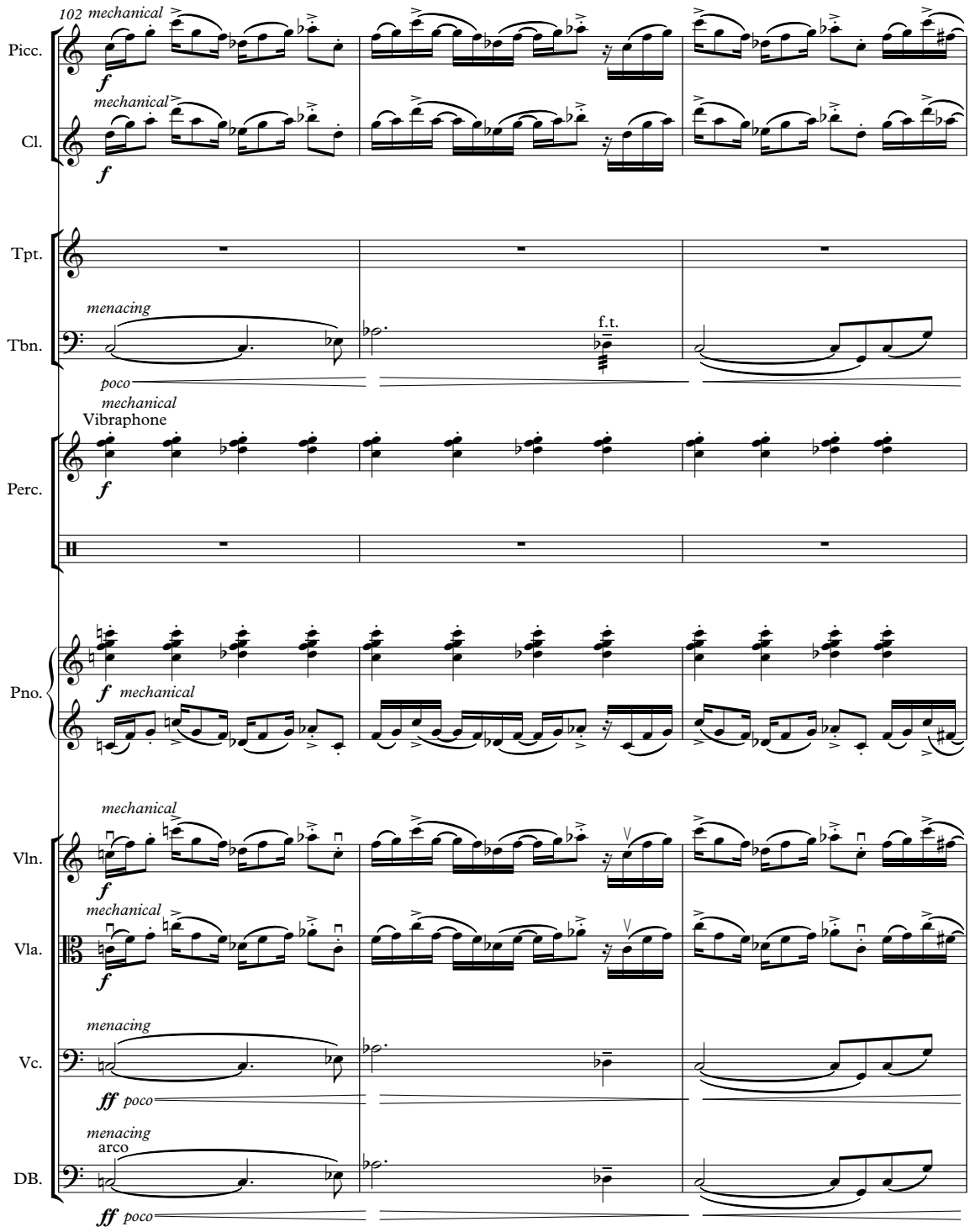

92
really intense
Picc.
Cl.
Tpt.
Tbn.
Glock.
Perc.
Pno.
Vln.
Vla.
Vc.
DB.
f
ff

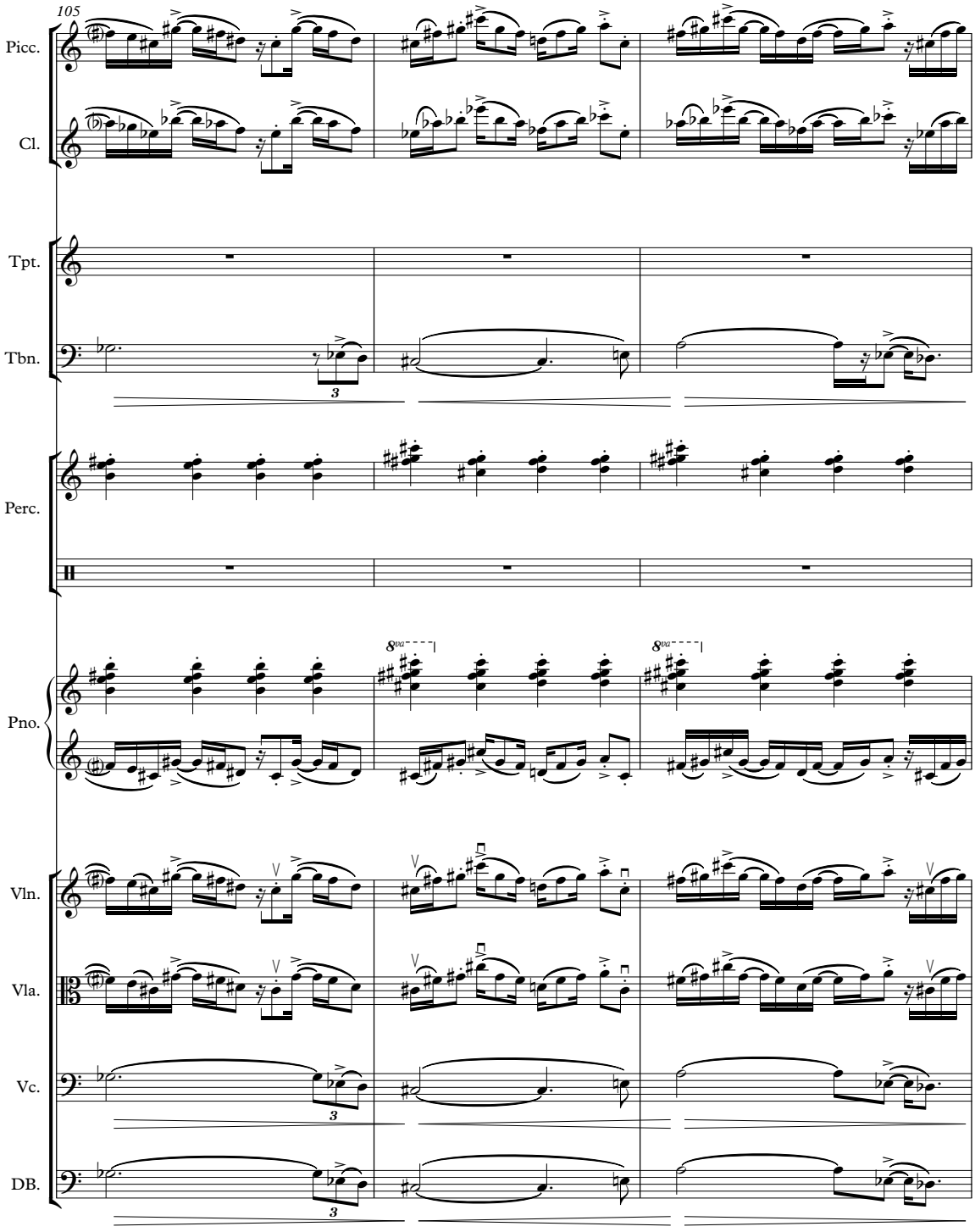

94
Picc.
Cl.
Tpt.
Tbn.
Perc.
Pno.
Vln.
Vla.
Vc.
DB.

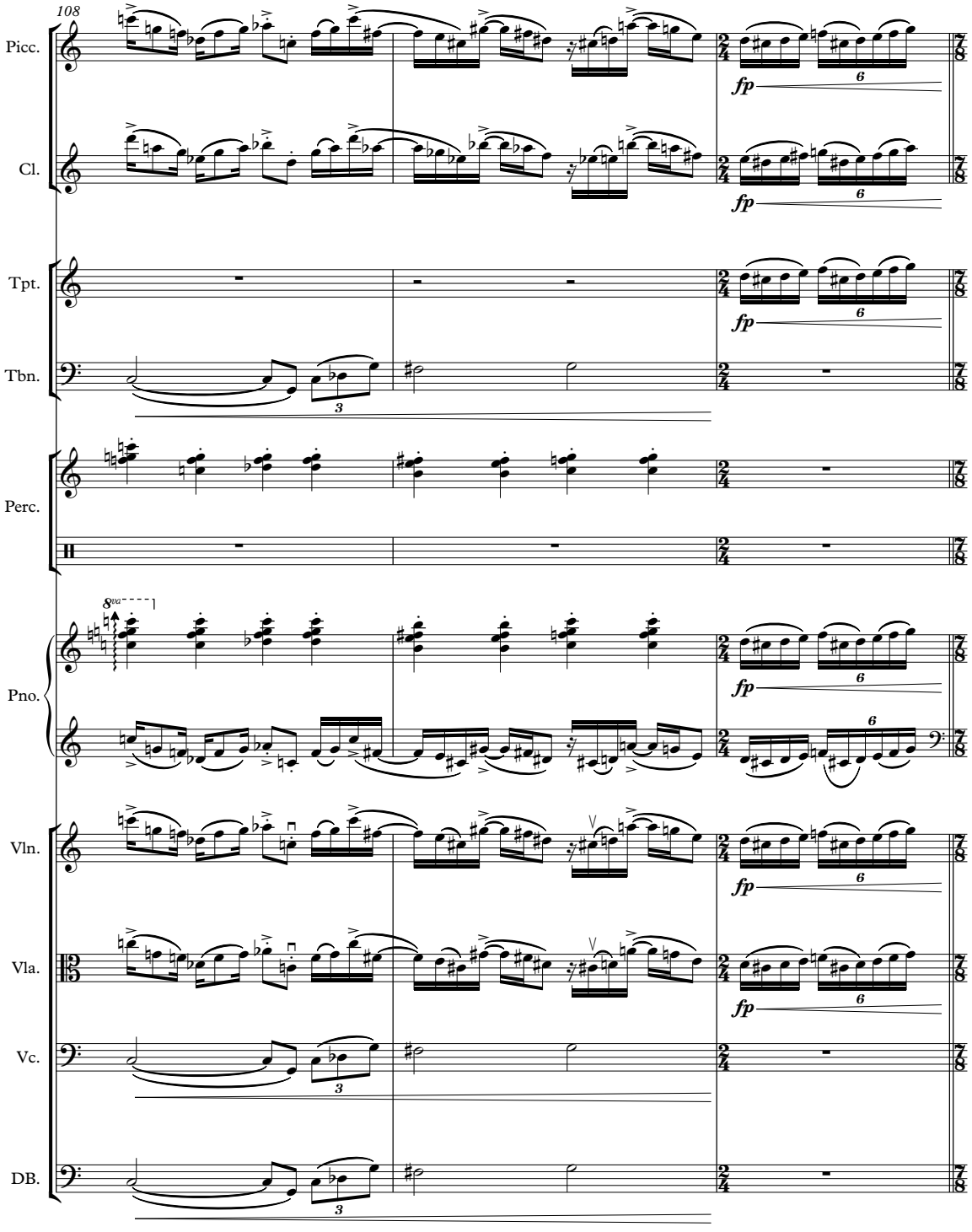

96
Picc.
Cl.
Tpt.
Tbn.
Perc.
Pno.
Vln.
Vla.
Vc.
DB.
ff
f

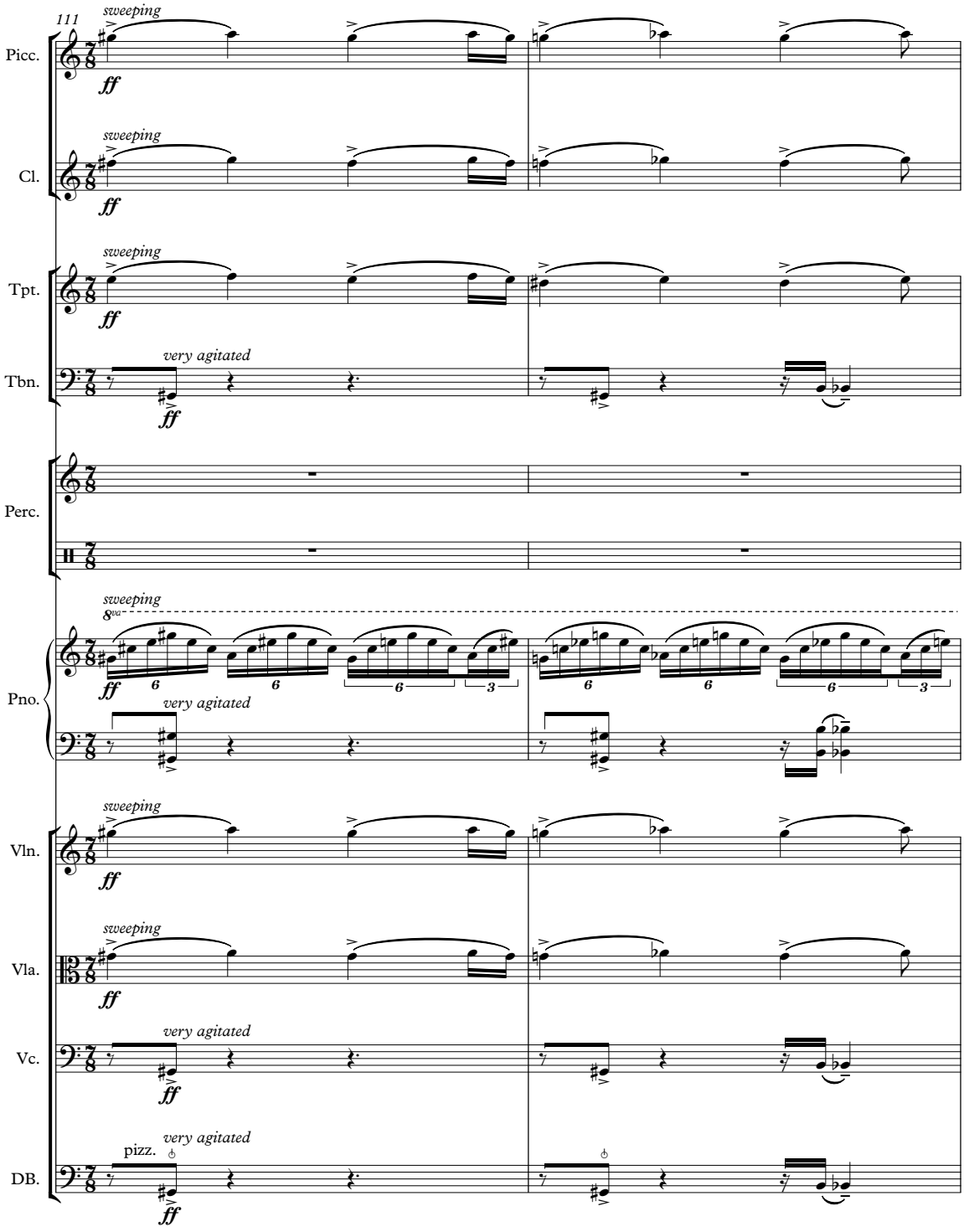

98
Picc.
Cl.
Tpt.
Tbn.
Perc.
Pno.
Vln.
Vla.
Vc.
DB.

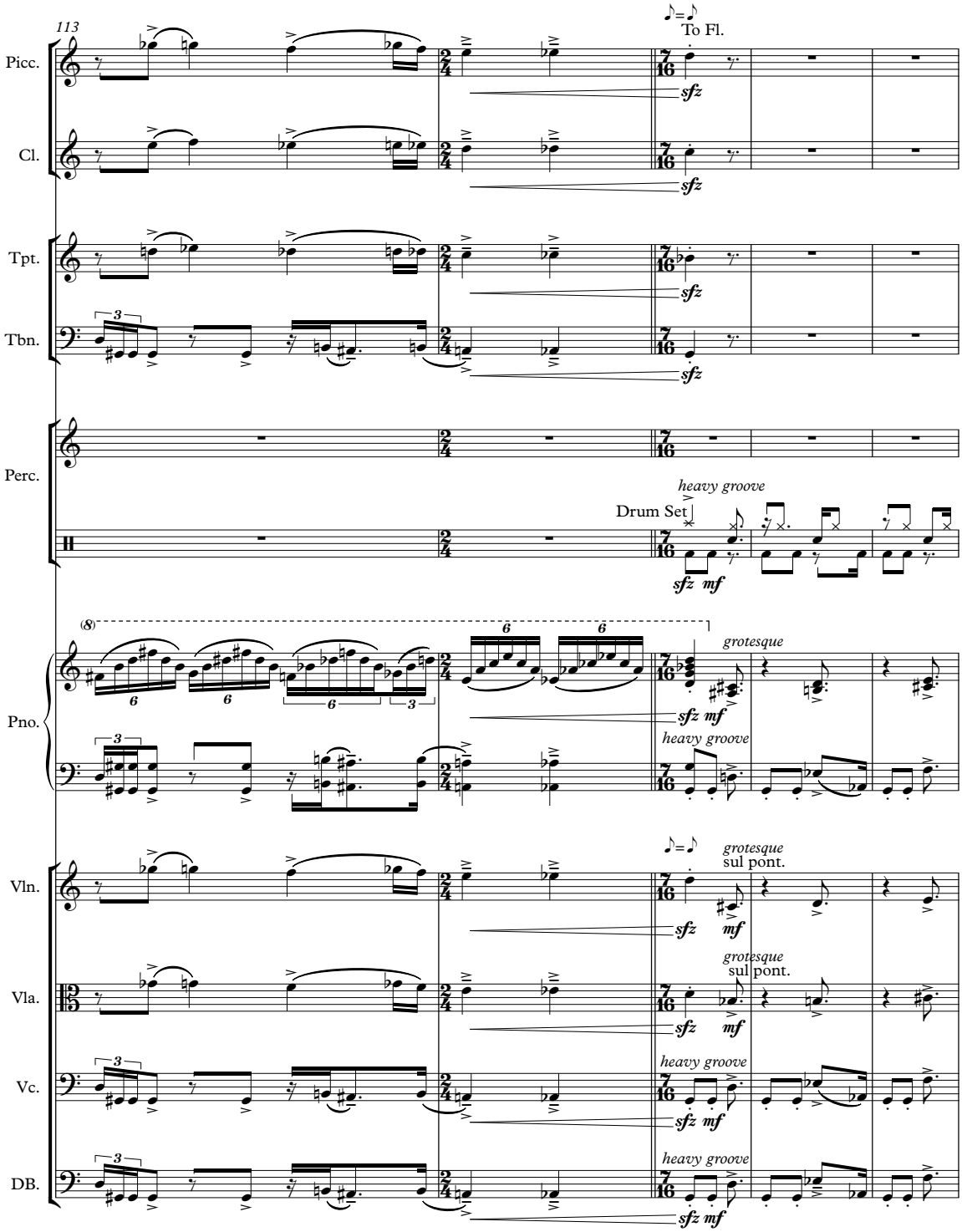

100
Picc.
Cl.
Tpt.
Tbn.
Perc.
Pno.
Vln.
Vla.
Vc.
DB.
ff
f

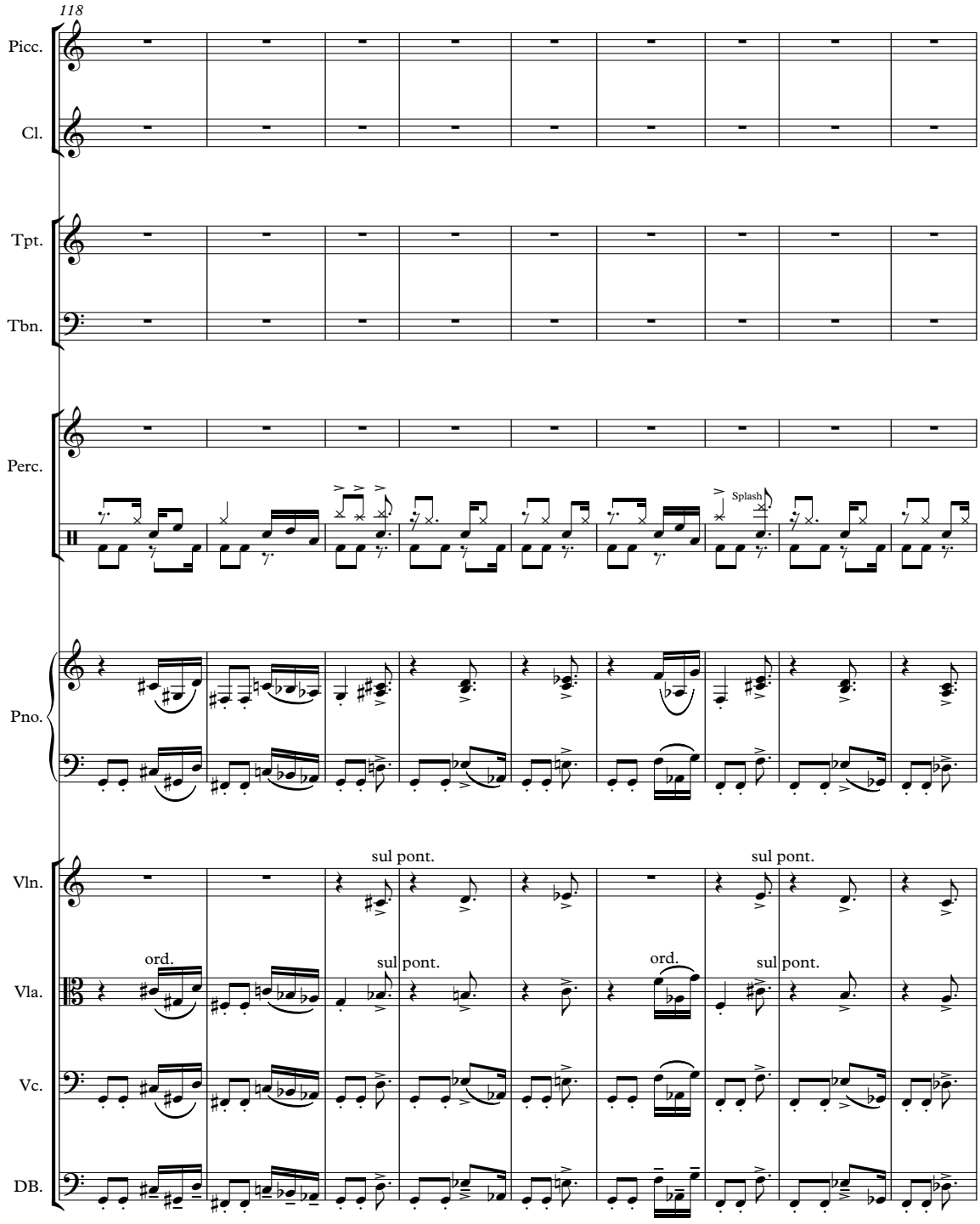

102 mechanical
Picc.
Cl.
mechanical
Tpt.
Tbn.
menacing
f.t.
poco
mechanical
Vibraphone
Perc.
Pno.
mechanical
Vln.
Vla.
Vc.
DB.
arco
ff poco

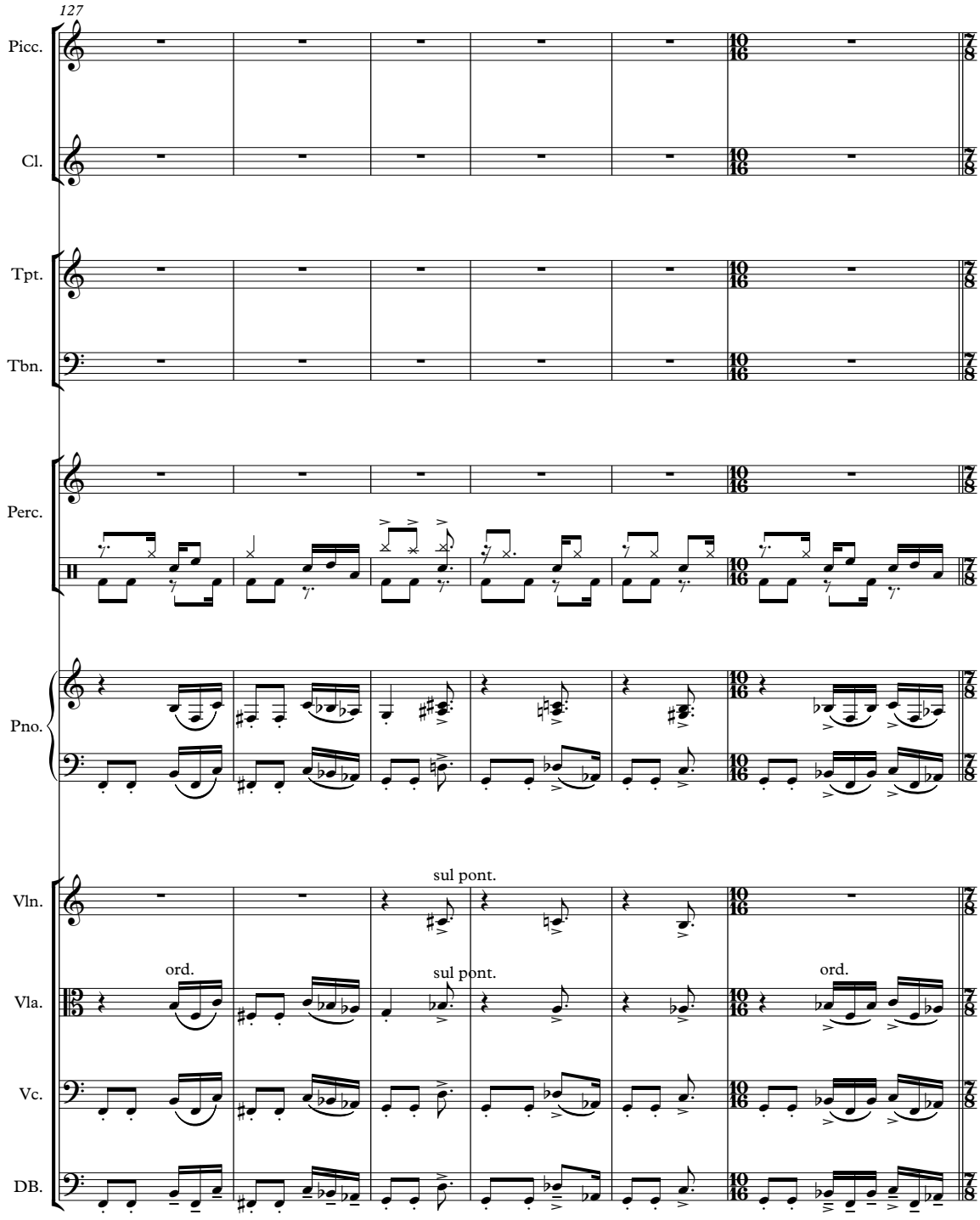

105
Picc.
Cl.
Tpt.
Tbn.
Perc.
Pno.
Vln.
Vla.
Vc.
DB.
8va
8va
3
3
3

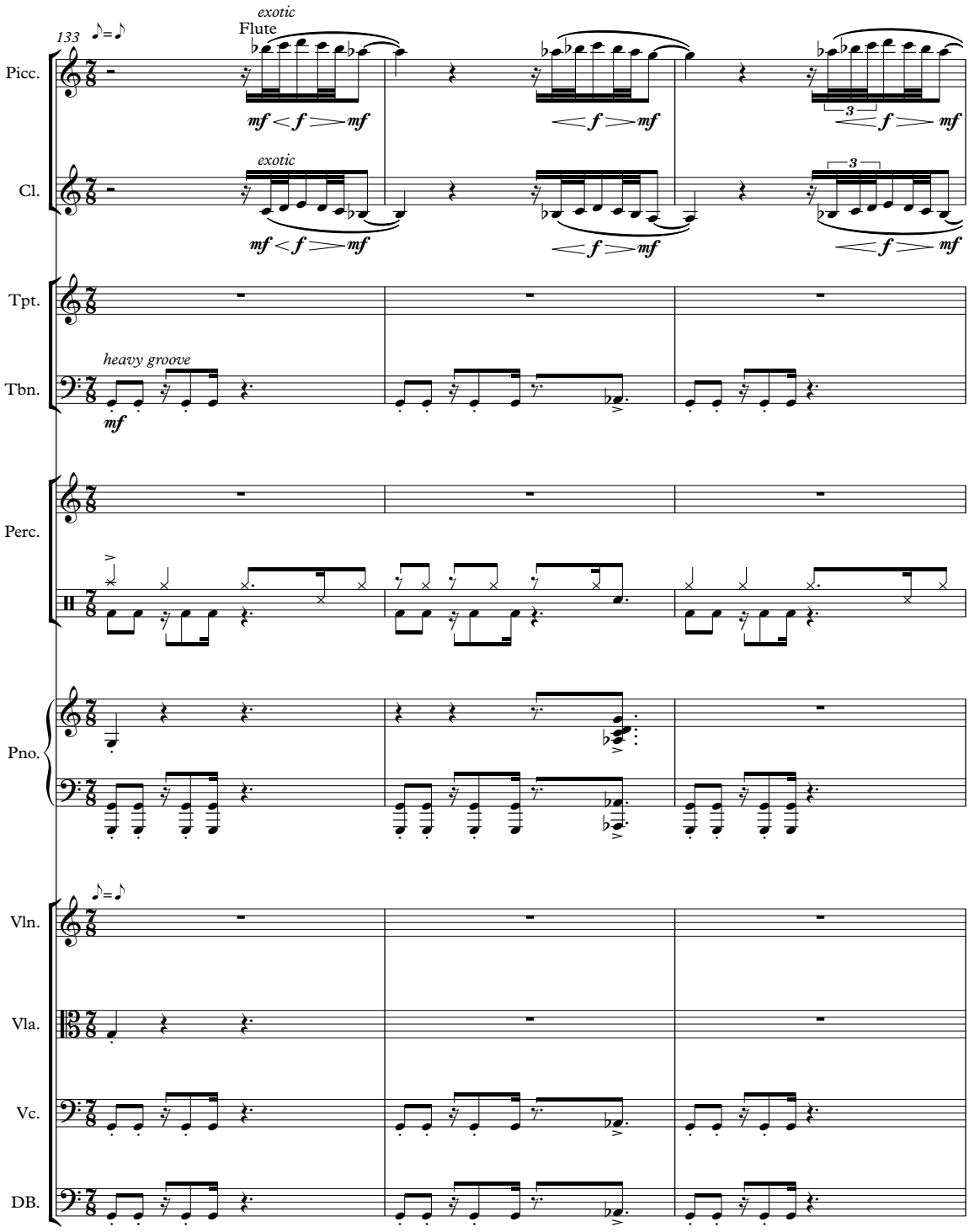

108
Picc.
Cl.
Tpt.
Tbn.
Perc.
Pno.
Vln.
Vla.
Vc.
DB.
fp
6
3
8va

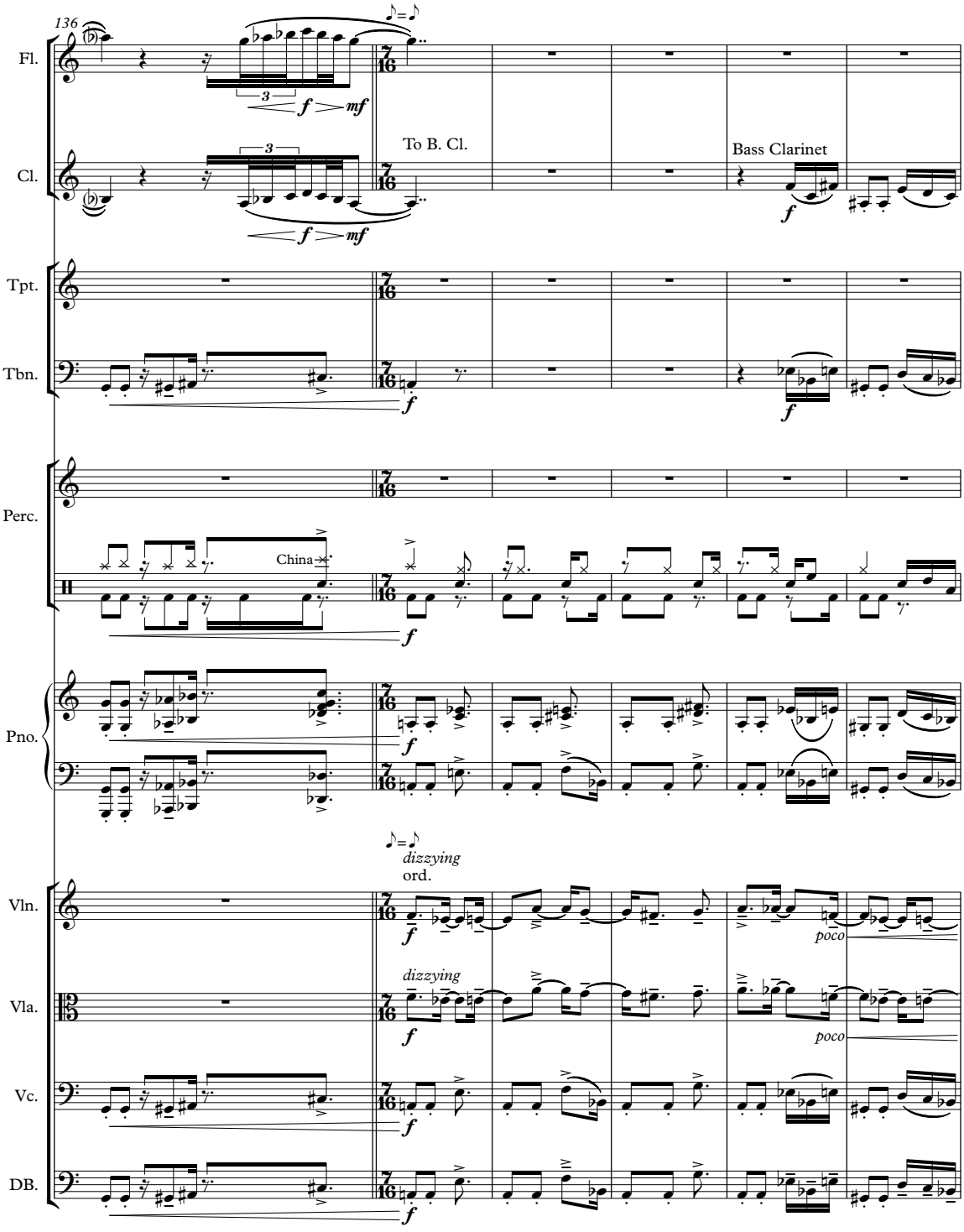

111
Picc.
Cl.
Tpt.
Tbn.
Perc.
Pno.
Vln.
Vla.
Vc.
DB.
sweeping
very agitated
pizz.
ff
8va

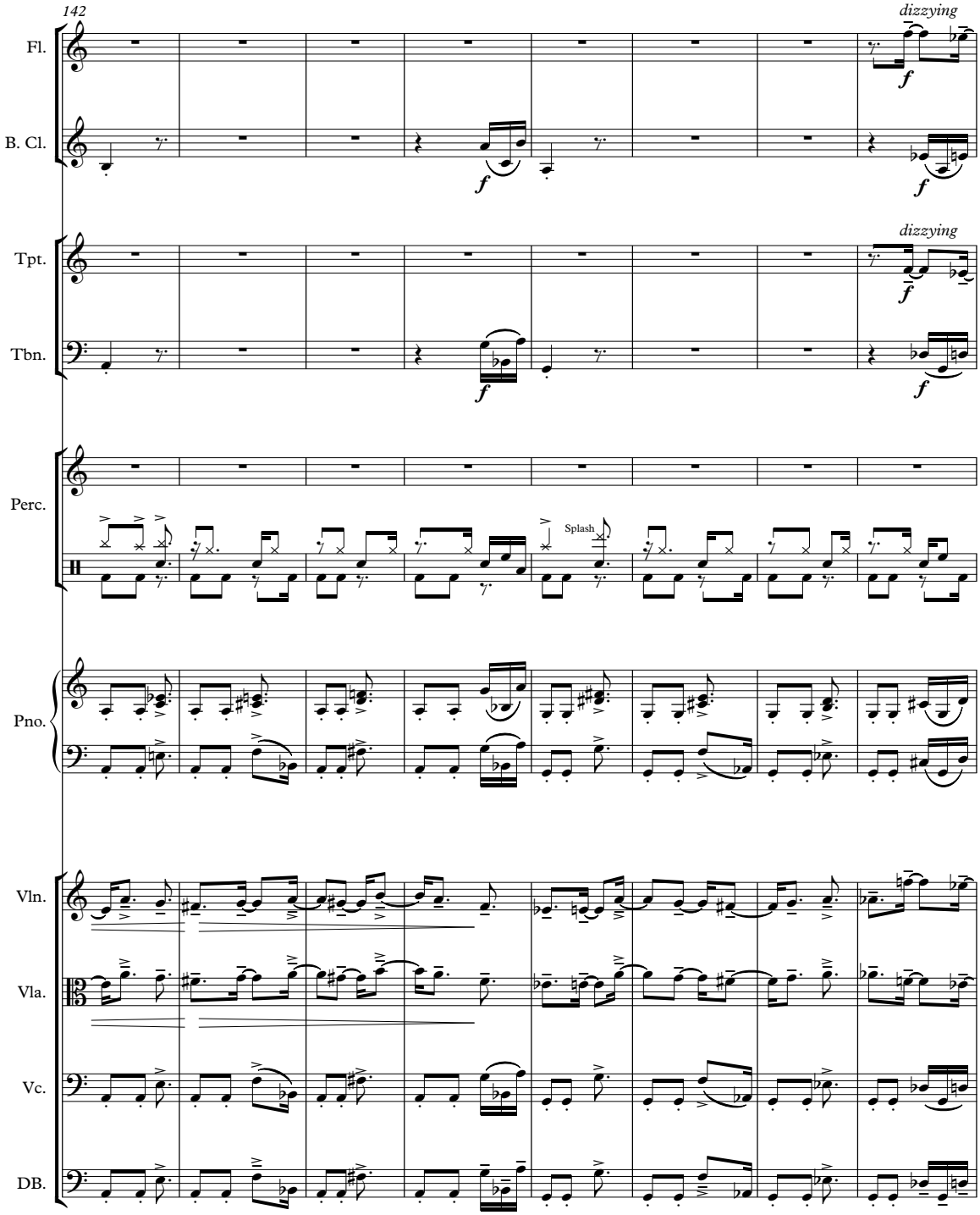

113
♪=♪
To Fl.
Picc.
Cl.
Tpt.
Tbn.
Perc.
Drum Set
heavy groove
Pno.
grotesque
Vln.
sul pont.
Vla.
Vc.
DB.
sfz
mf

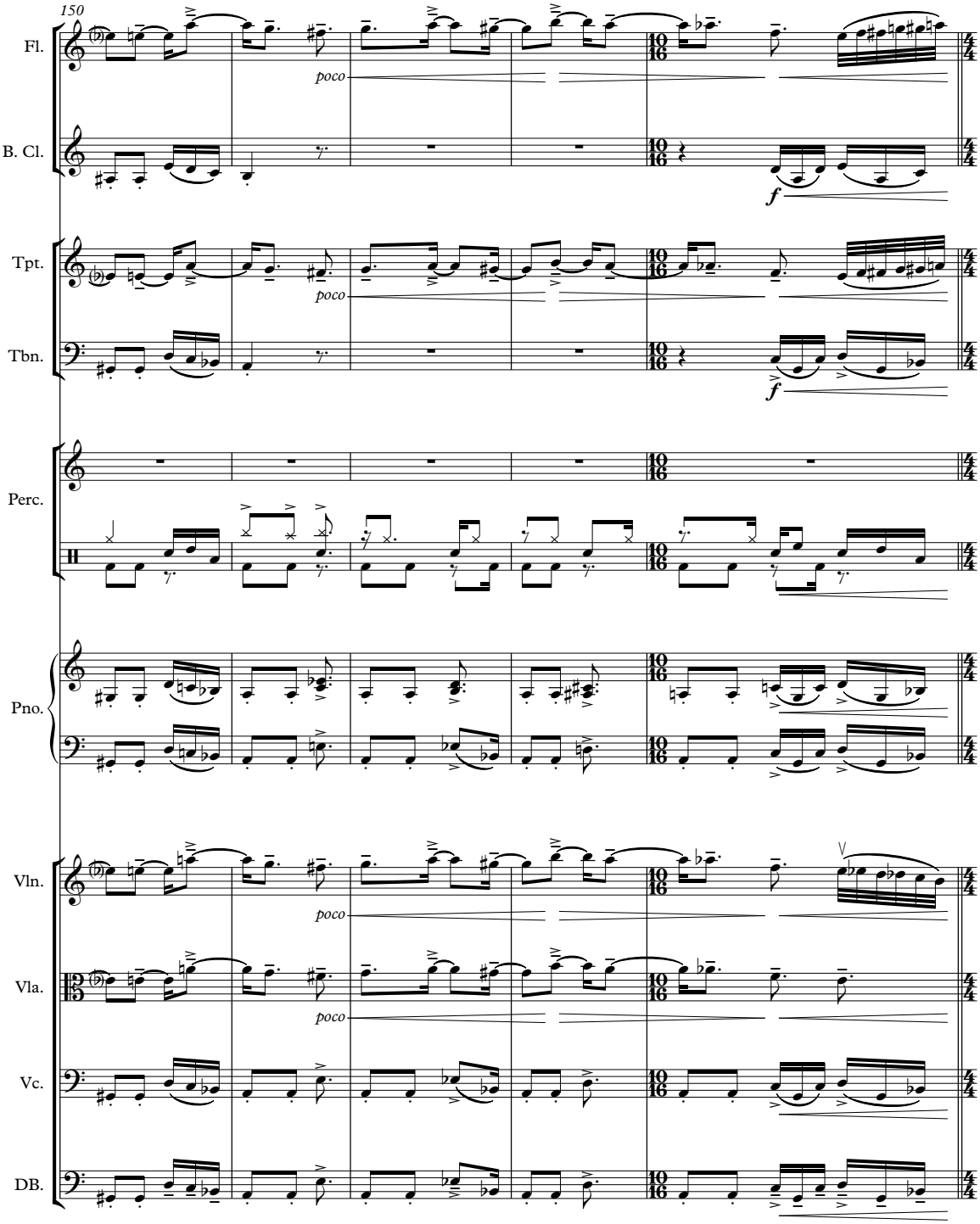

118
Picc.
Cl.
Tpt.
Tbn.
Perc.
Splash
Pno.
Vln.
sul pont.
sul pont.
Vla.
ord.
sul pont.
ord.
sul pont.
Vc.
DB.

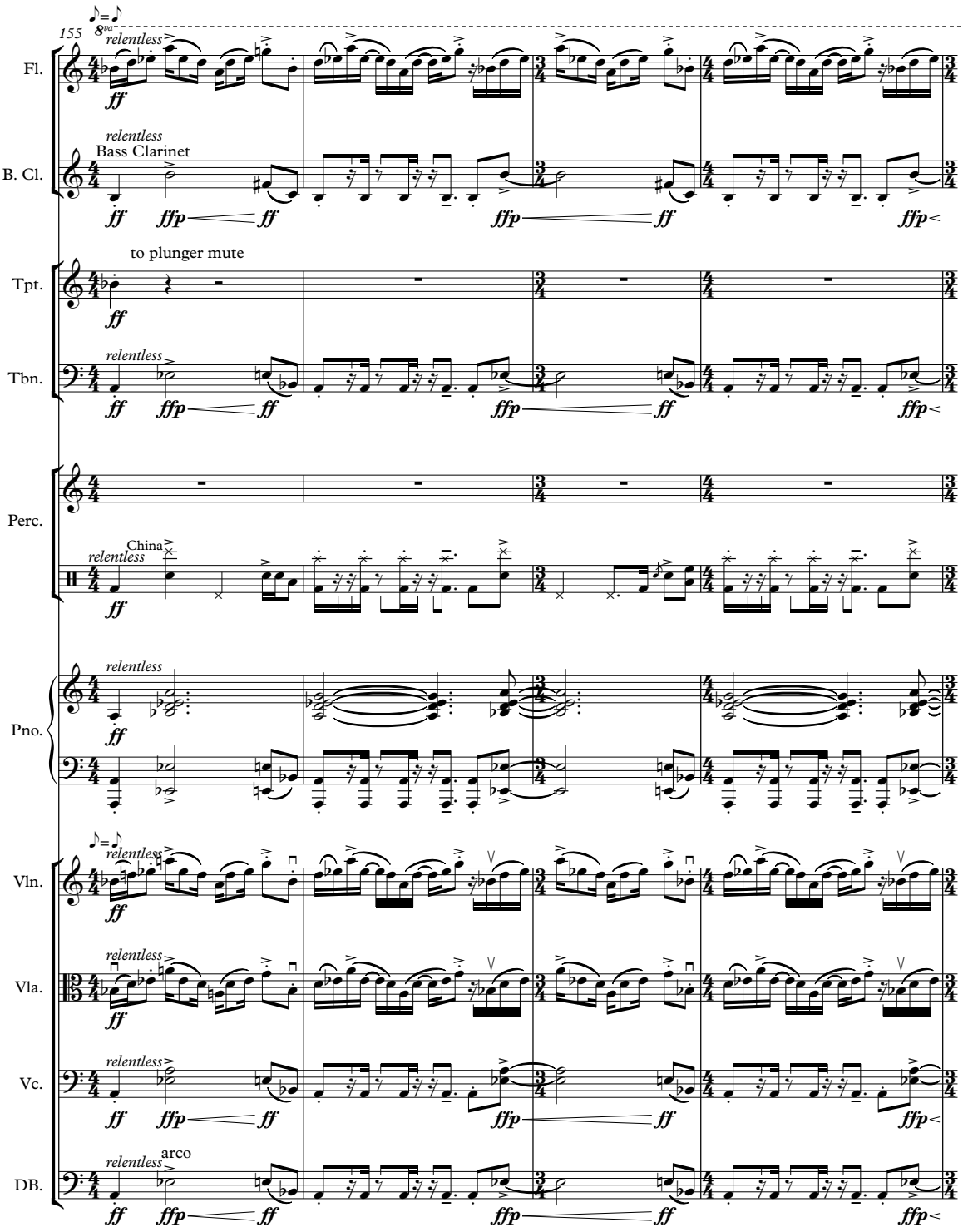

127
Picc.
Cl.
Tpt.
Tbn.
Perc.
Pno.
Vln.
Vla.
Vc.
DB.
sul pont.
ord.
sul pont.
ord.

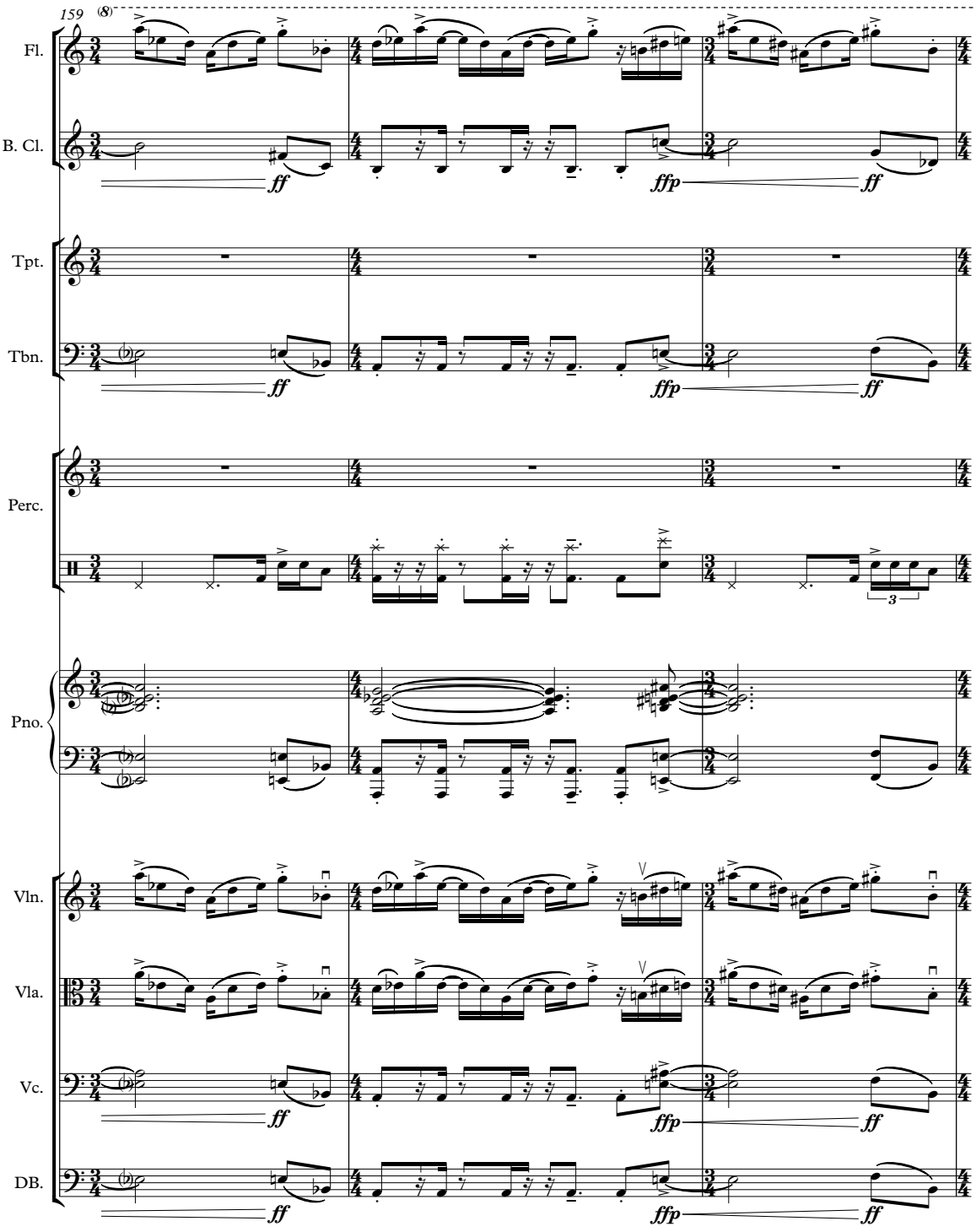

133
exotic
Flute
Picc.
Cl.
Tpt.
Tbn.
heavy groove
Perc.
Pno.
Vln.
Vla.
Vc.
DB.

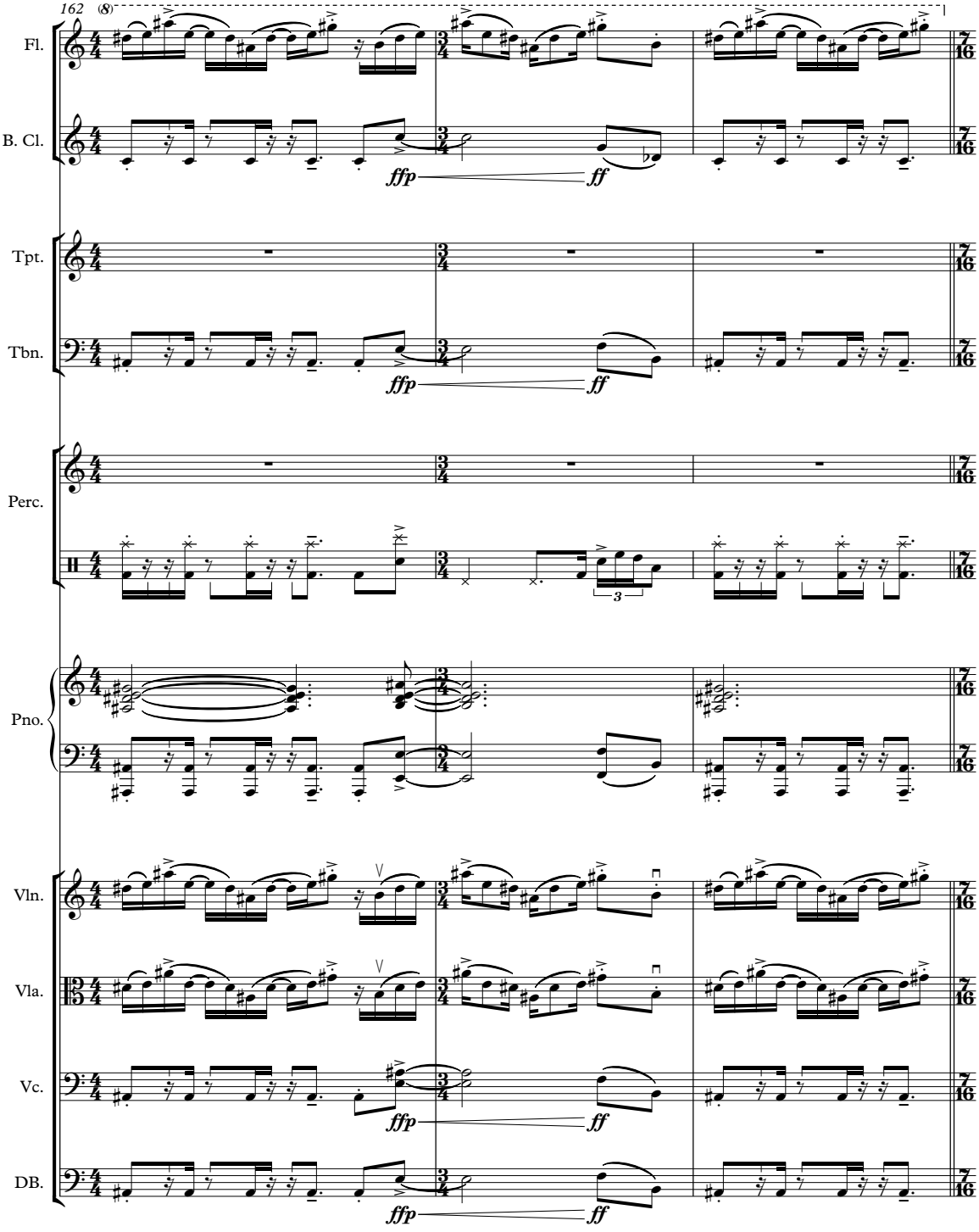

136
Fl.
Cl.
To B. Cl.
Bass Clarinet
Tpt.
Tbn.
Perc.
China
Pno.
dizzying
ord.
Vln.
Vla.
Vc.
DB.
poco

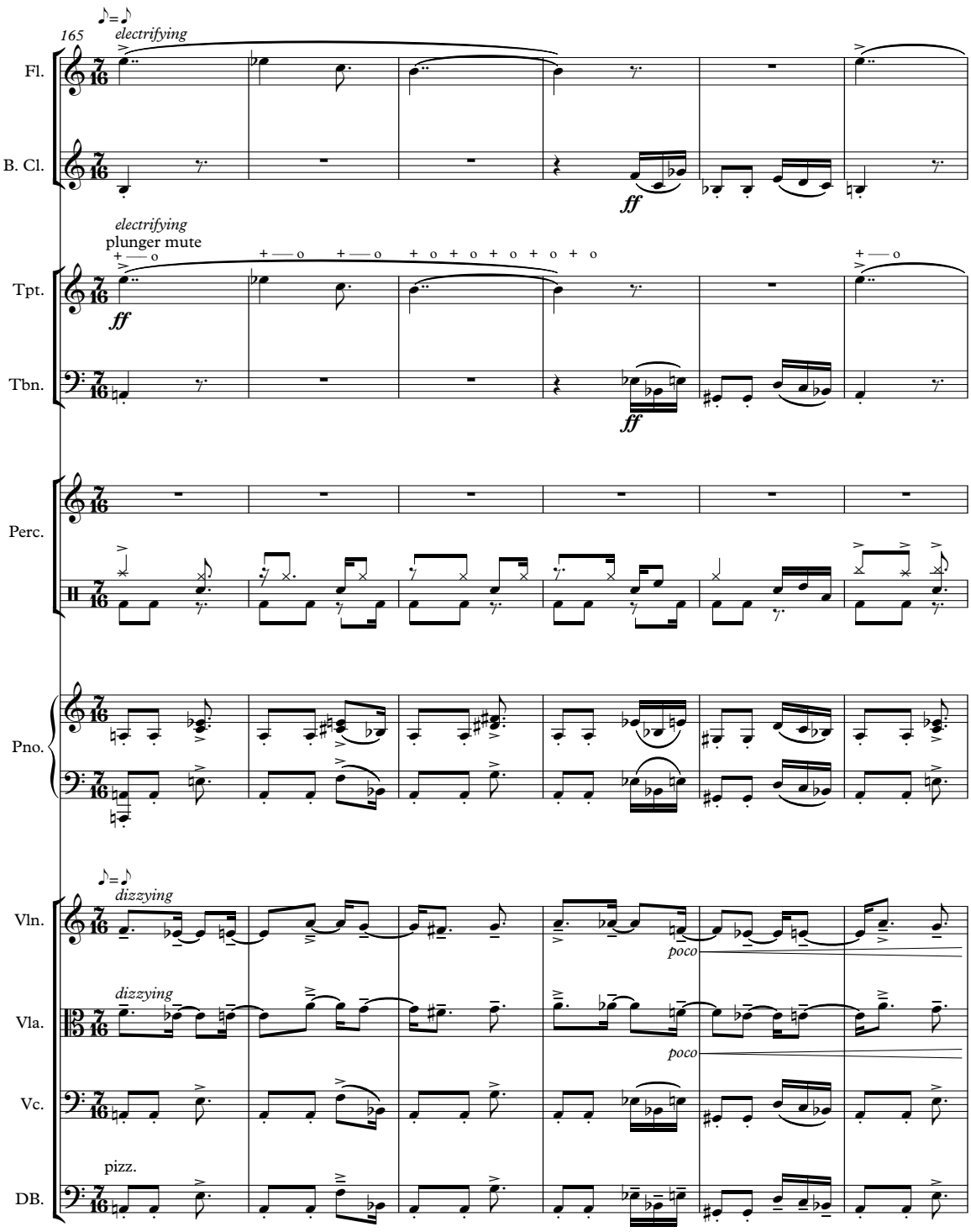

142
dizzying
Fl.
B. Cl.
dizzying
Tpt.
Tbn.
Perc.
Splash
Pno.
Vln.
Vla.
Vc.
DB.

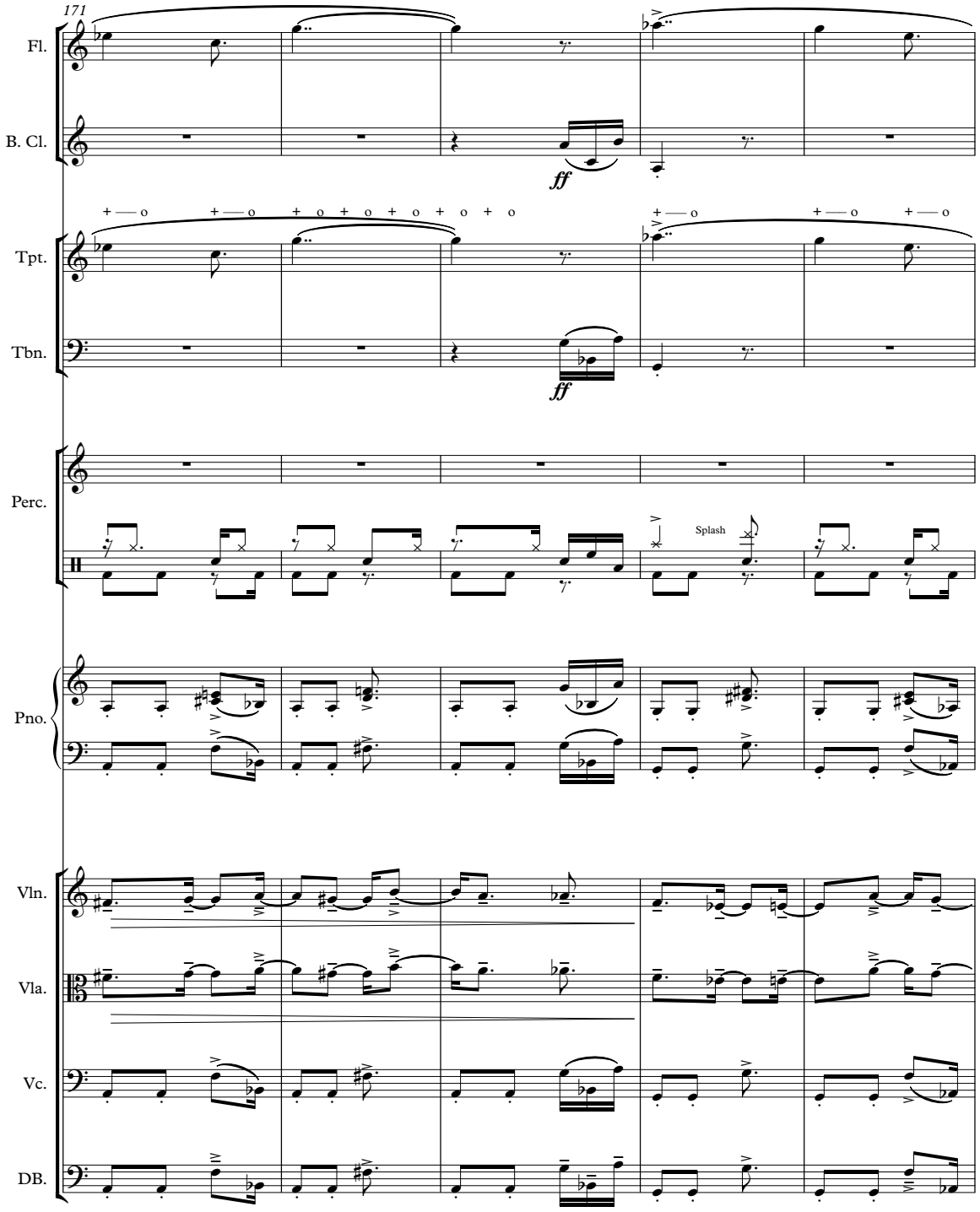

150
Fl.
B. Cl.
Tpt.
Tbn.
Perc.
Pno.
Vln.
Vla.
Vc.
DB.
poco
f

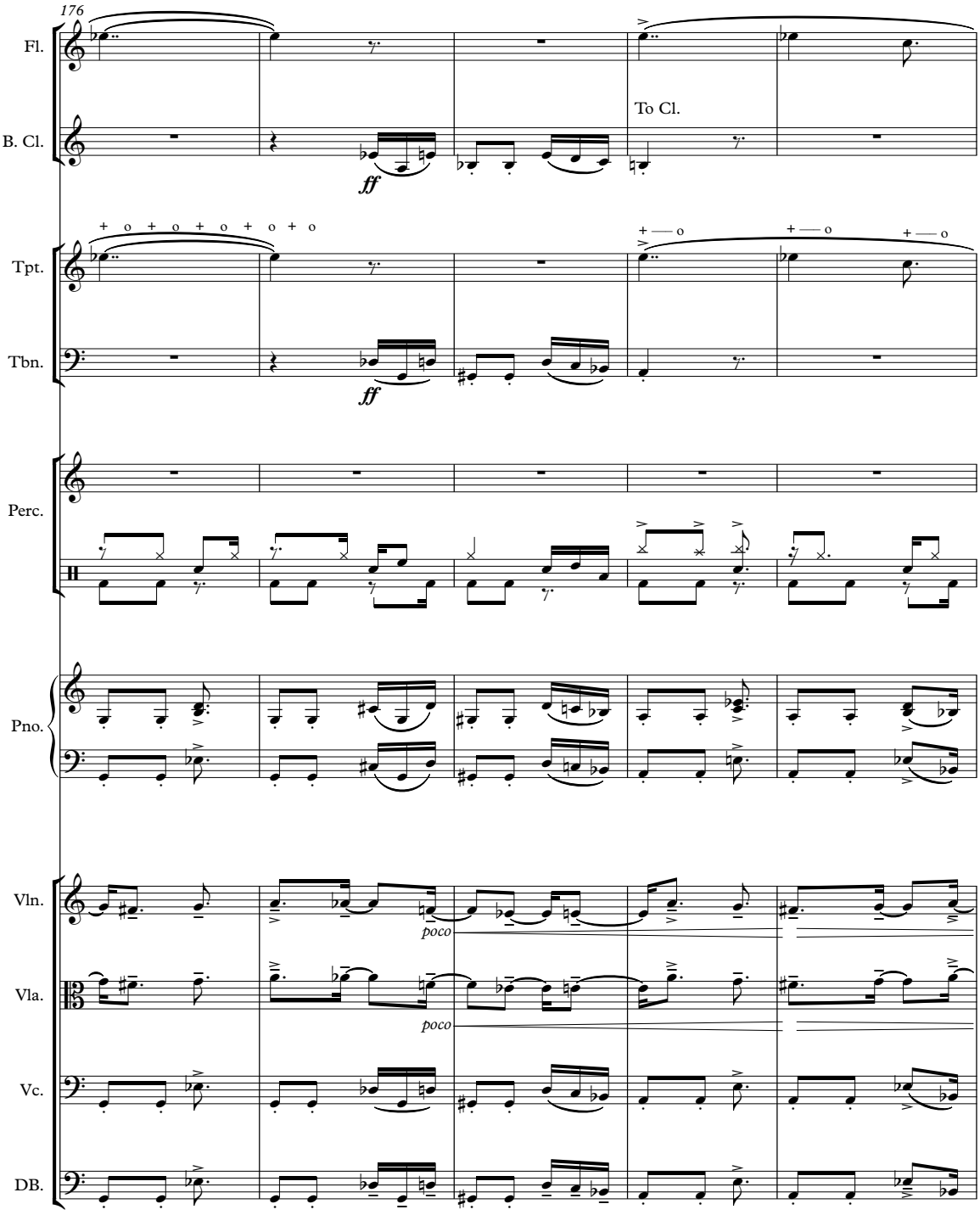

155
relentless
Fl.
relentless
Bass Clarinet
B. Cl.
to plunger mute
Tpt.
relentless
Tbn.
Perc.
China
relentless
Pno.
relentless
Vln.
relentless
Vla.
relentless
Vc.
relentless
arco
DB.

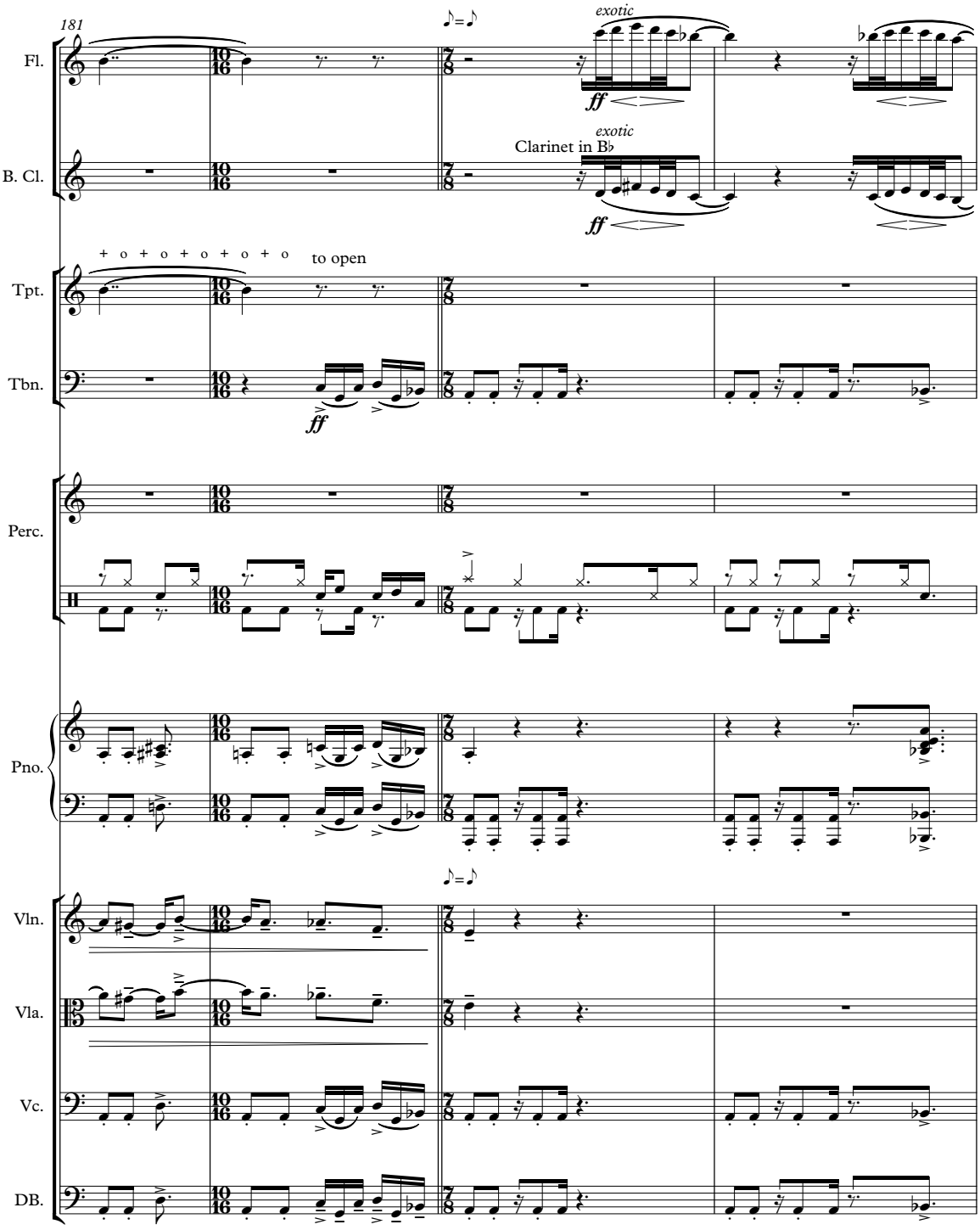

159
(8)
Fl.
B. Cl.
Tpt.
Tbn.
Perc.
Pno.
Vln.
Vla.
Vc.
DB.
ff
ffp
ff
3

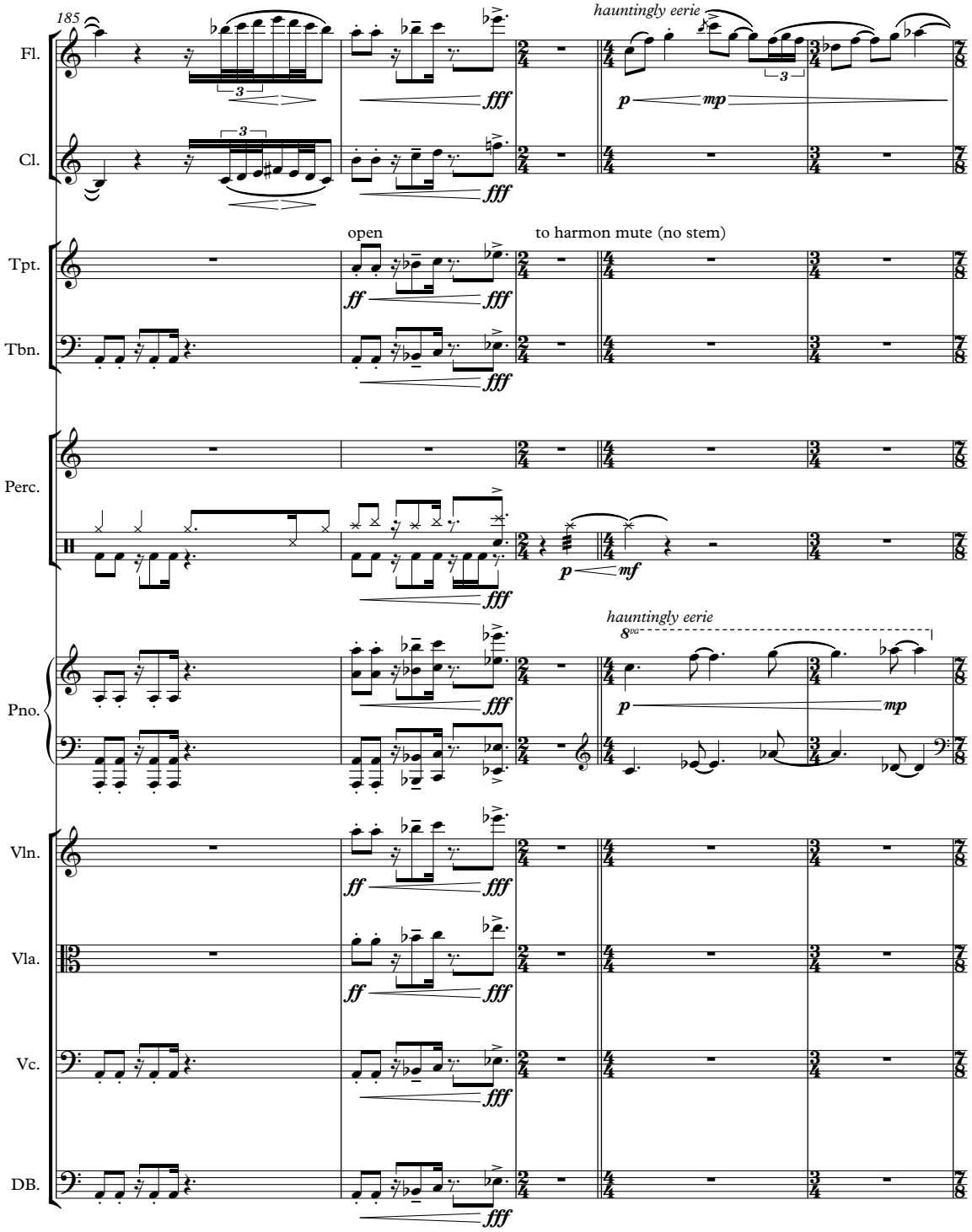

162
(8)
Fl.
B. Cl.
ffp
ff
Tpt.
Tbn.
ffp
ff
Perc.
3
Pno.
Vln.
Vla.
Vc.
ffp
ff
DB.
ffp
ff

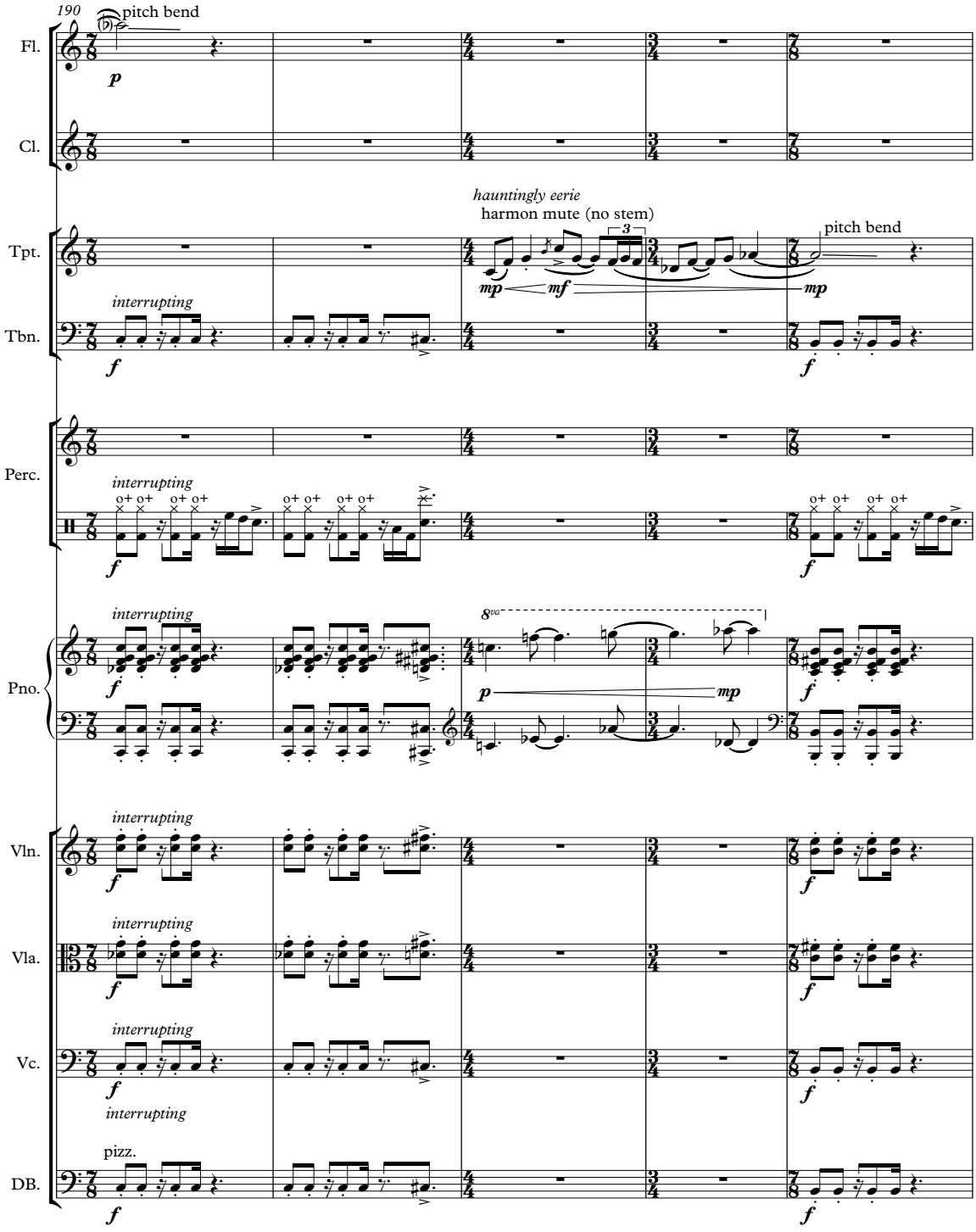

165
electrifying
Fl.
B. Cl.
ff
electrifying
plunger mute
Tpt.
Tbn.
ff
Perc.
Pno.
dizzying
Vln.
poco
dizzying
Vla.
poco
Vc.
pizz.
DB.

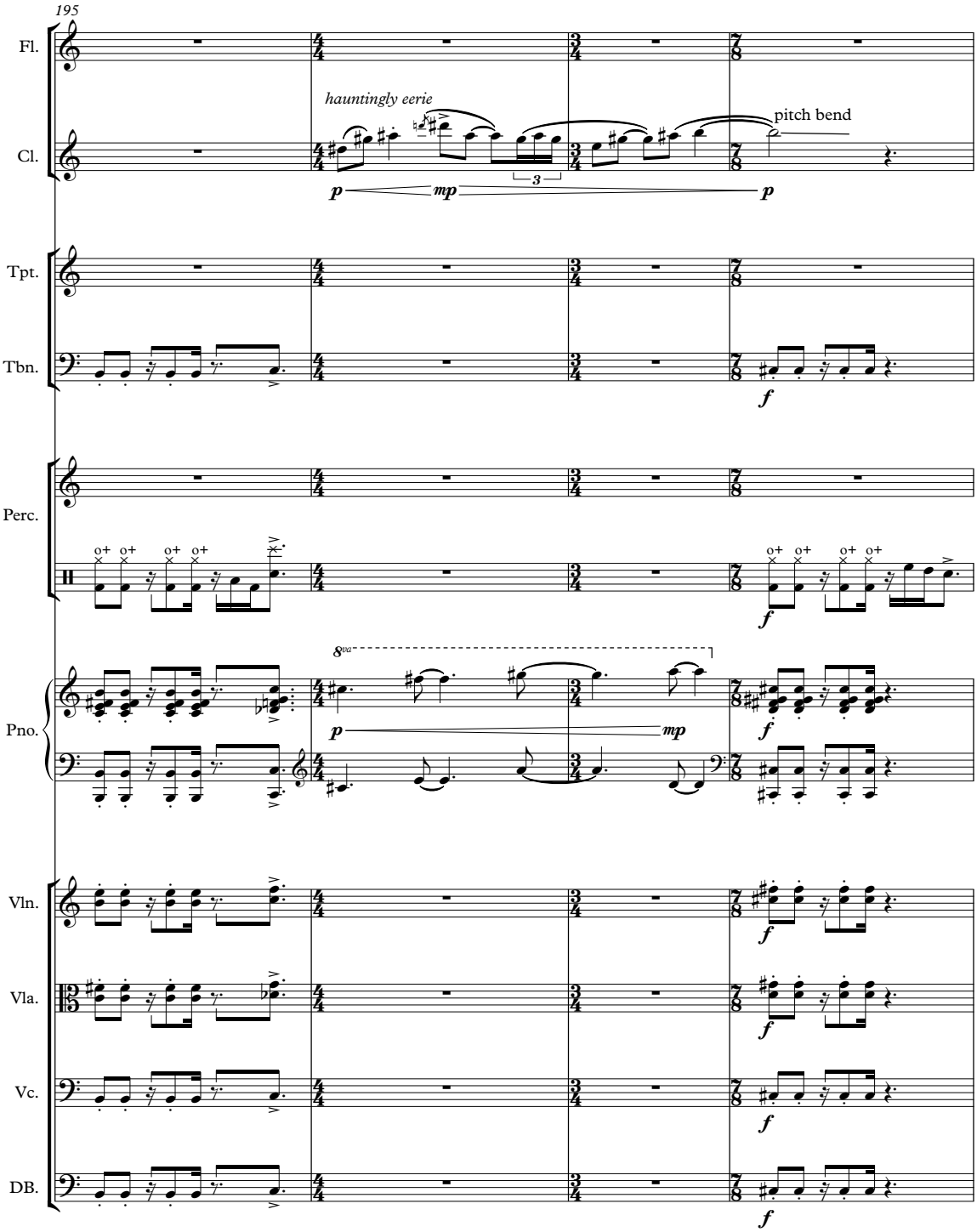

171
Fl.
B. Cl.
ff
Tpt.
Tbn.
ff
Perc.
Splash
Pno.
Vln.
Vla.
Vc.
DB.

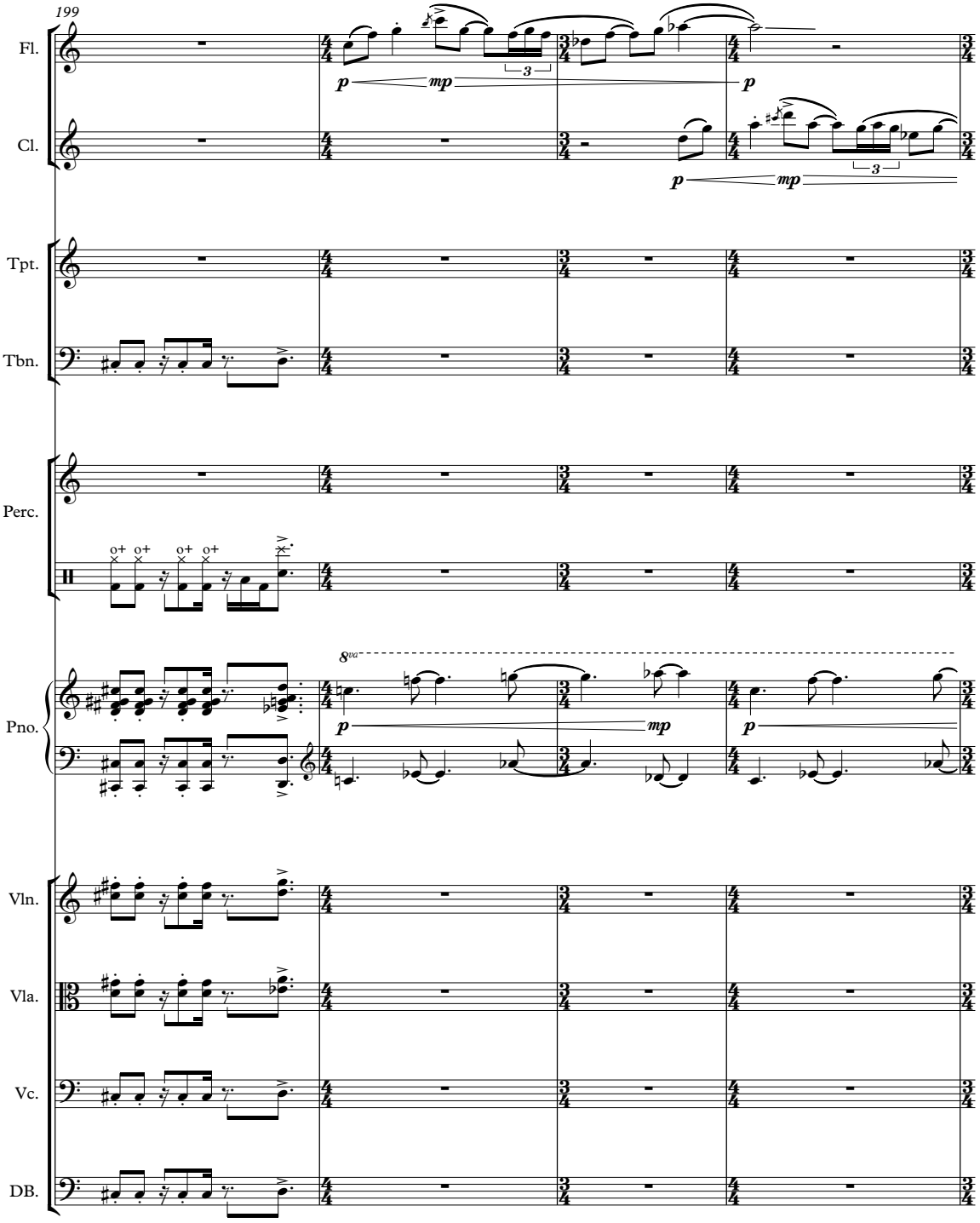

176
Fl.
B. Cl.
To Cl.
ff
Tpt.
Tbn.
ff
Perc.
Pno.
Vln.
poco
Vla.
poco
Vc.
DB.

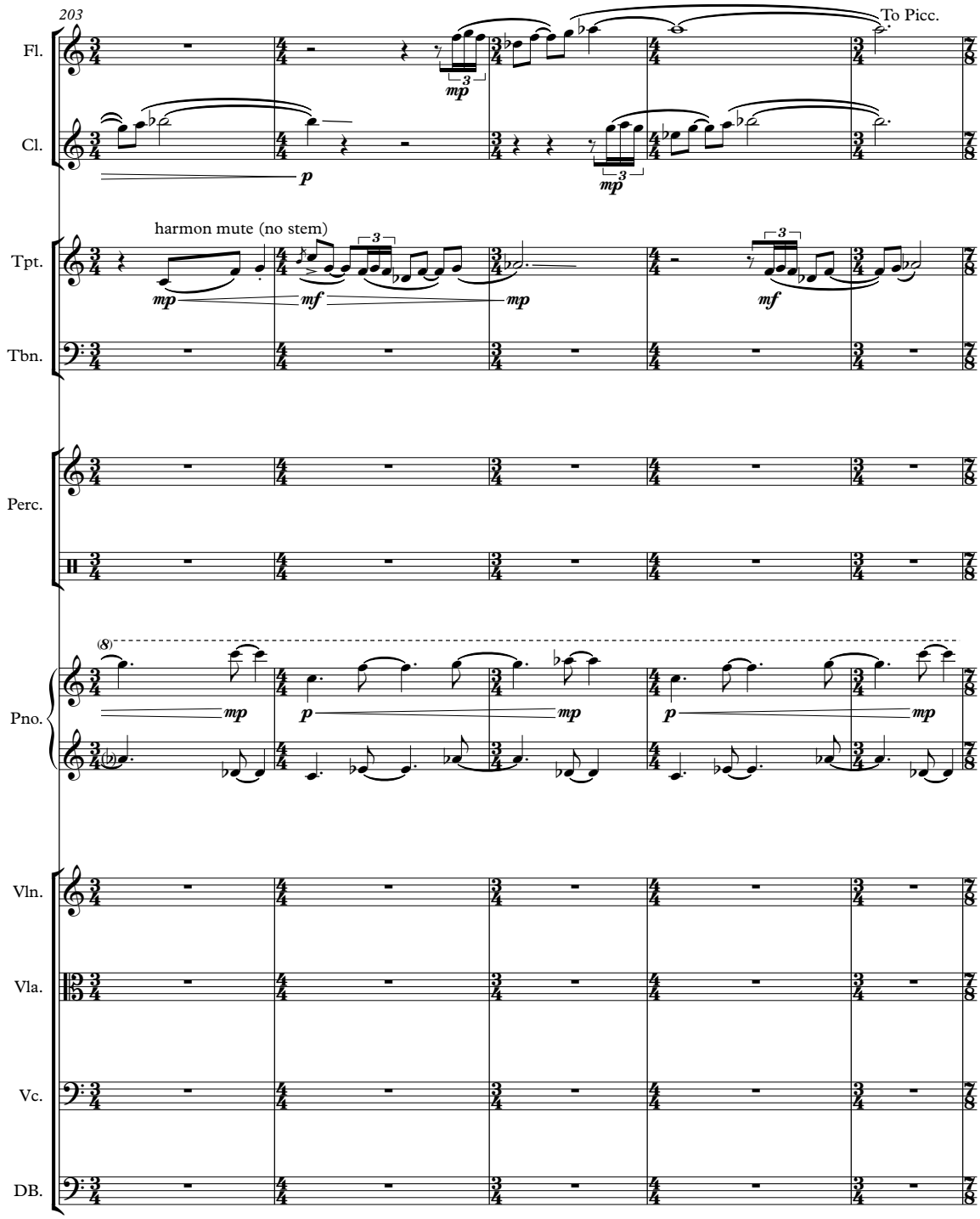

181
Fl.
B. Cl.
exotic
Clarinet in B♭
ff
Tpt.
Tbn.
+ o + o + o + o + o
to open
Perc.
Pno.
Vln.
Vla.
Vc.
DB.

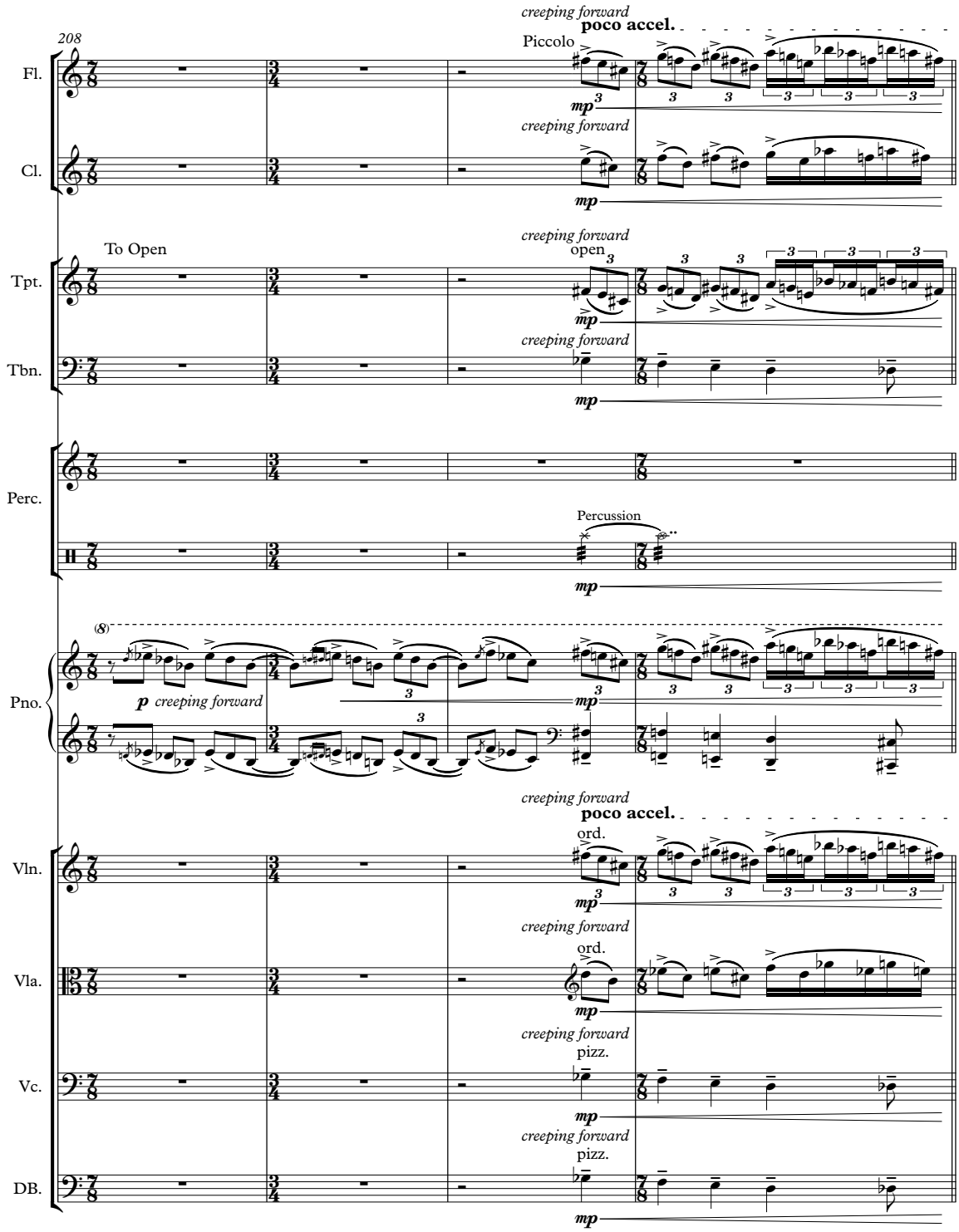

185
Fl.
Cl.
Tpt.
Tbn.
Perc.
Pno.
Vln.
Vla.
Vc.
DB.
hauntingly eerie
open
to harmon mute (no stem)
hauntingly eerie
8va

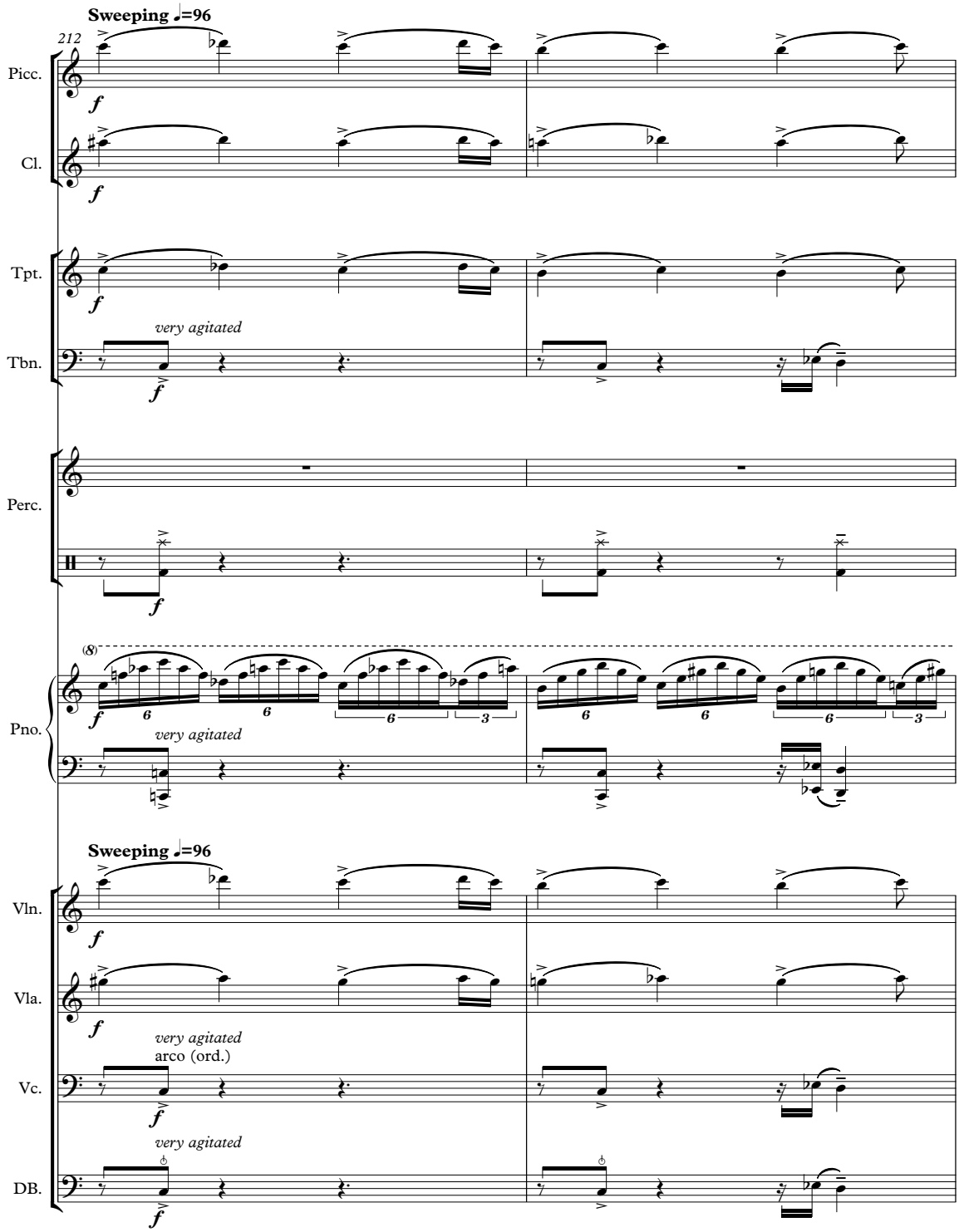

190
pitch bend
Fl.
Cl.
hauntingly eerie
harmon mute (no stem)
pitch bend
Tpt.
interrupting
Tbn.
Perc.
interrupting
Pno.
8va
Vln.
Vla.
Vc.
DB.
pizz.

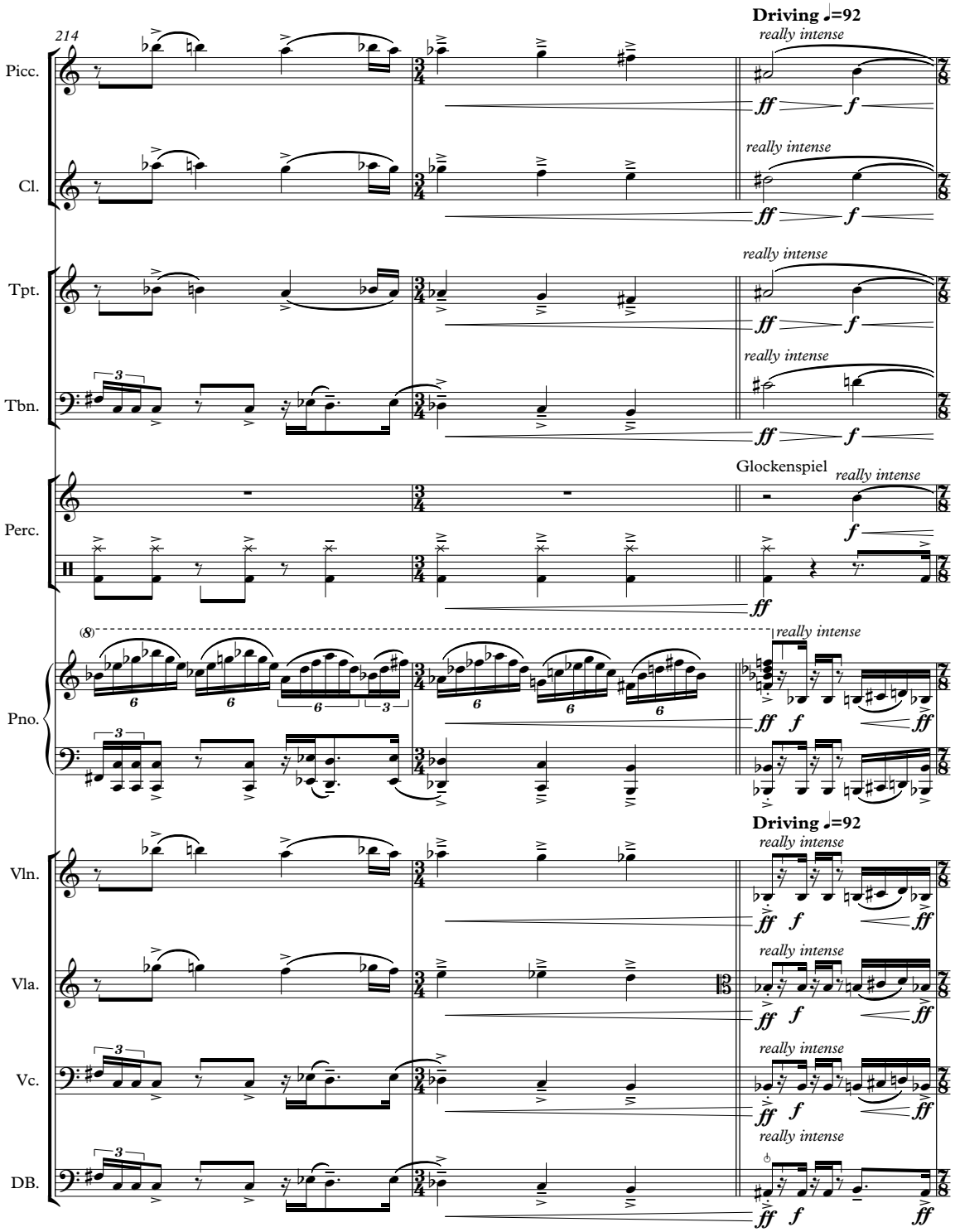

195
Fl.
Cl.
hauntingly eerie
pitch bend
Tpt.
Tbn.
Perc.
Pno.
Vln.
Vla.
Vc.
DB.

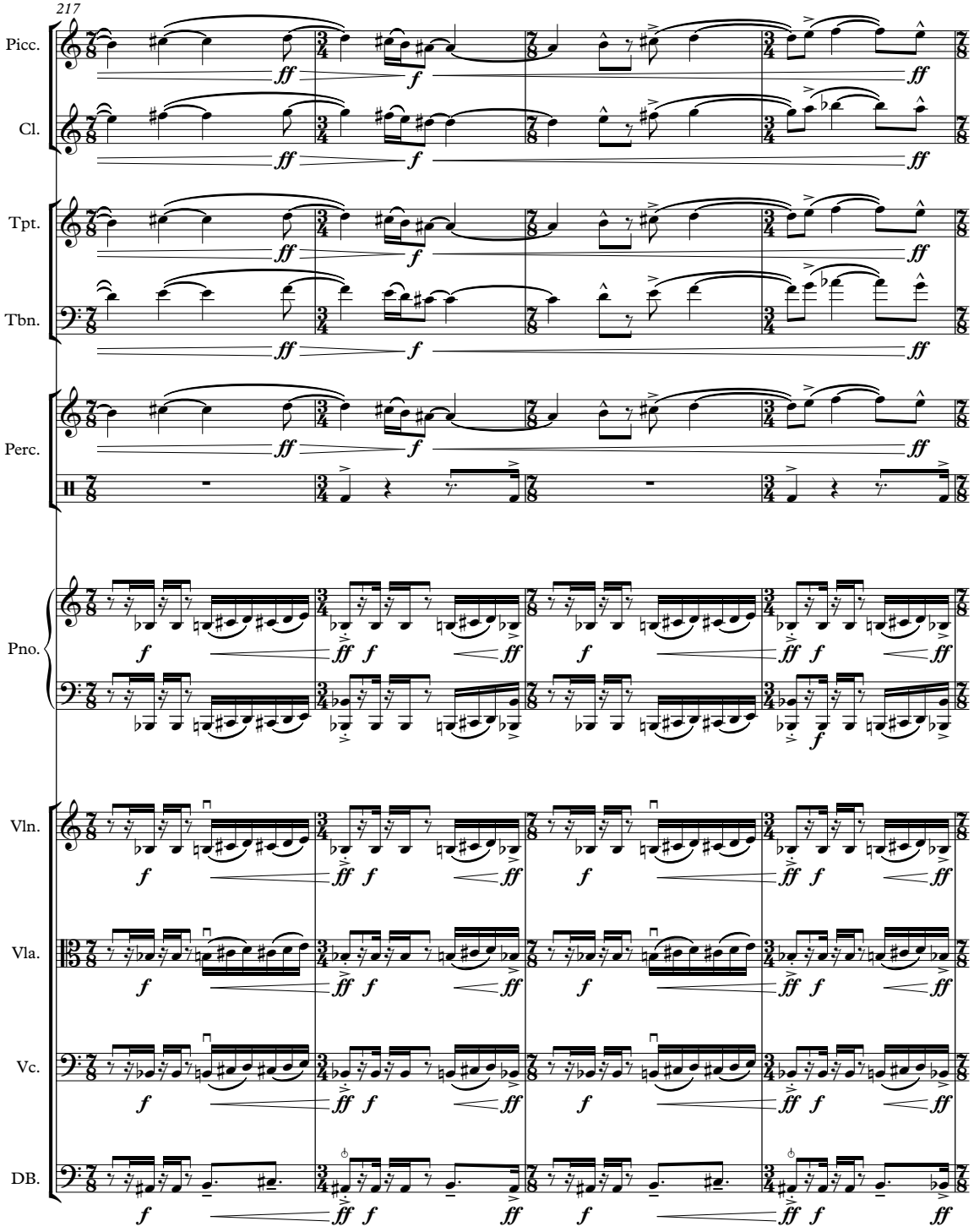

199
Fl.
Cl.
Tpt.
Tbn.
Perc.
Pno.
Vln.
Vla.
Vc.
DB.
8va

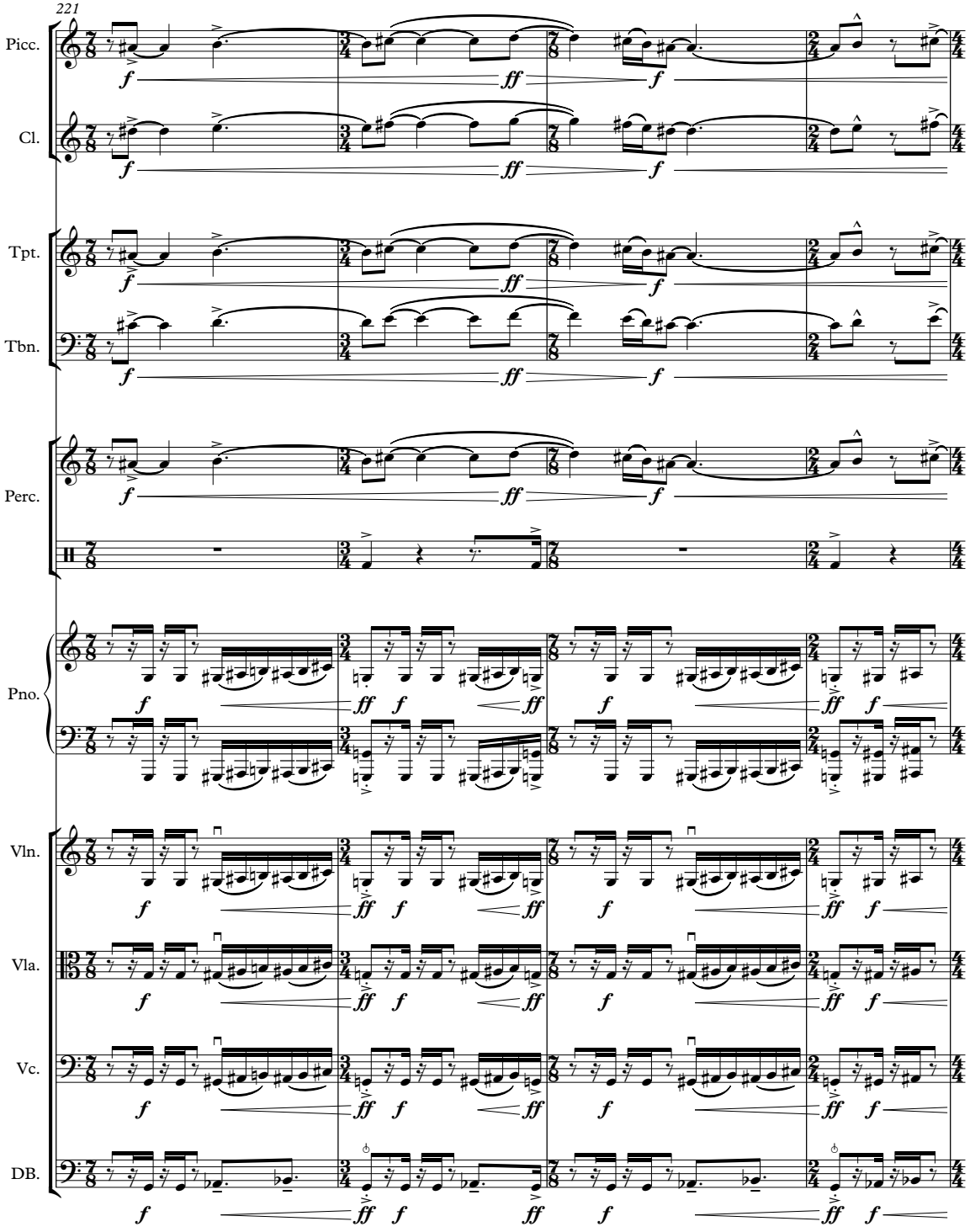

203
To Picc.
Fl.
Cl.
harmon mute (no stem)
Tpt.
Tbn.
Perc.
Pno.
Vln.
Vla.
Vc.
DB.

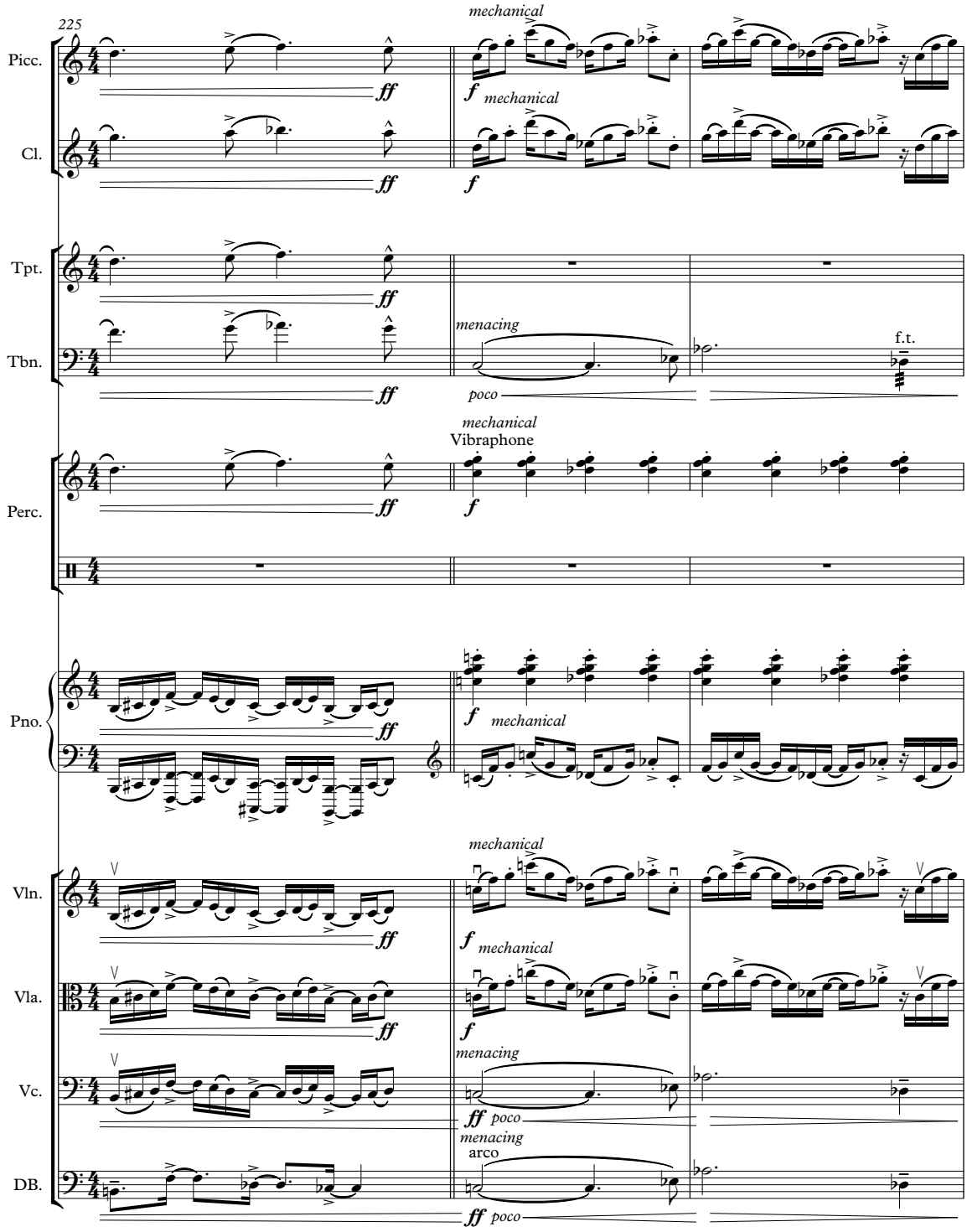

208
Fl.
Cl.
Tpt.
Tbn.
Perc.
Pno.
Vln.
Vla.
Vc.
DB.
Piccolo
To Open
Percussion
creeping forward
poco accel.
open
ord.
pizz.
mp
p
(8)

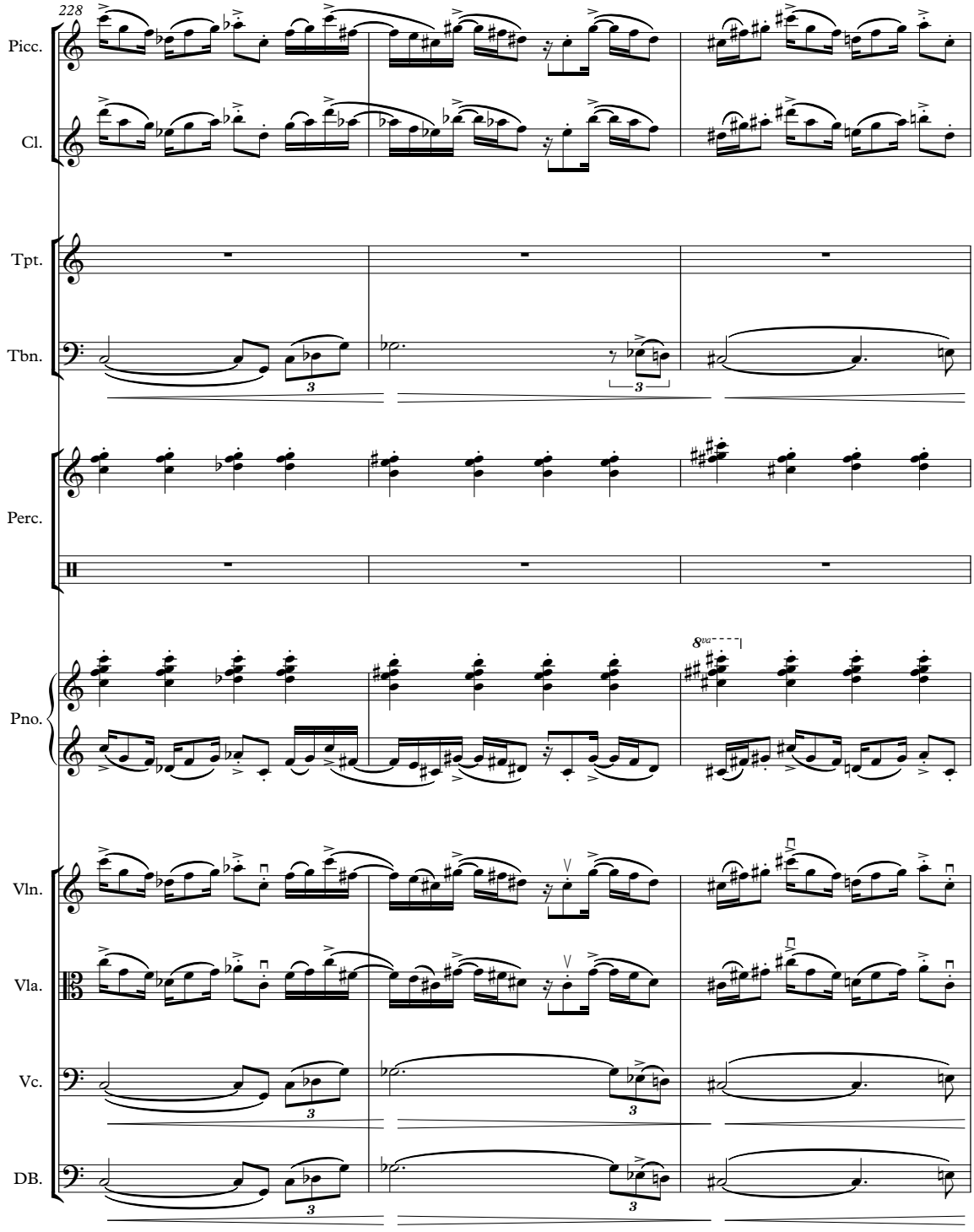

Sweeping ♩=96
212
Picc.
Cl.
Tpt.
Tbn.
very agitated
Perc.
Pno.
very agitated
Sweeping ♩=96
Vln.
Vla.
very agitated
arco (ord.)
Vc.
very agitated
DB.

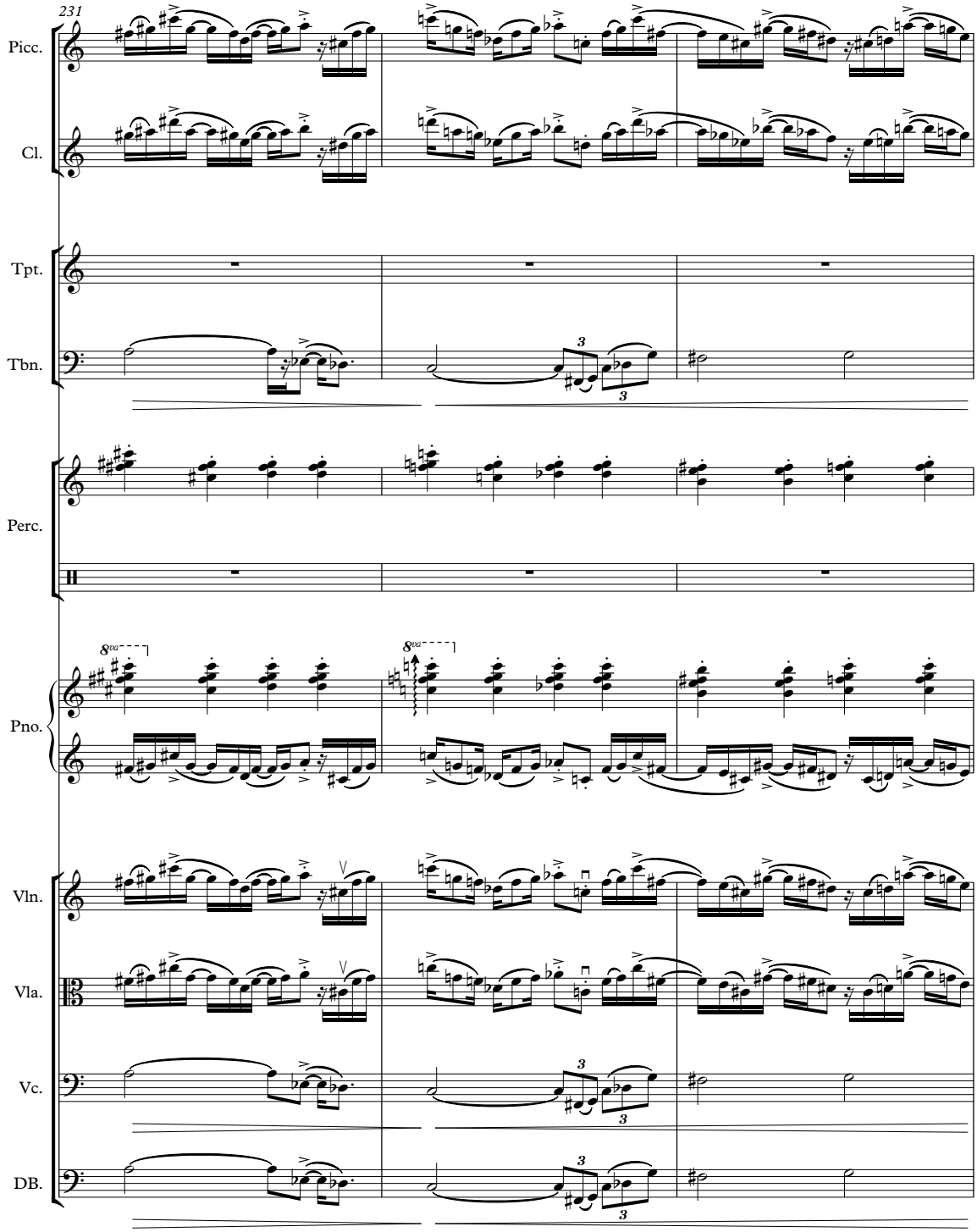

214
Driving ♩=92
really intense
Picc.
Cl.
Tpt.
Tbn.
Glockenspiel
Perc.
Pno.
Vln.
Vla.
Vc.
DB.
ff
f

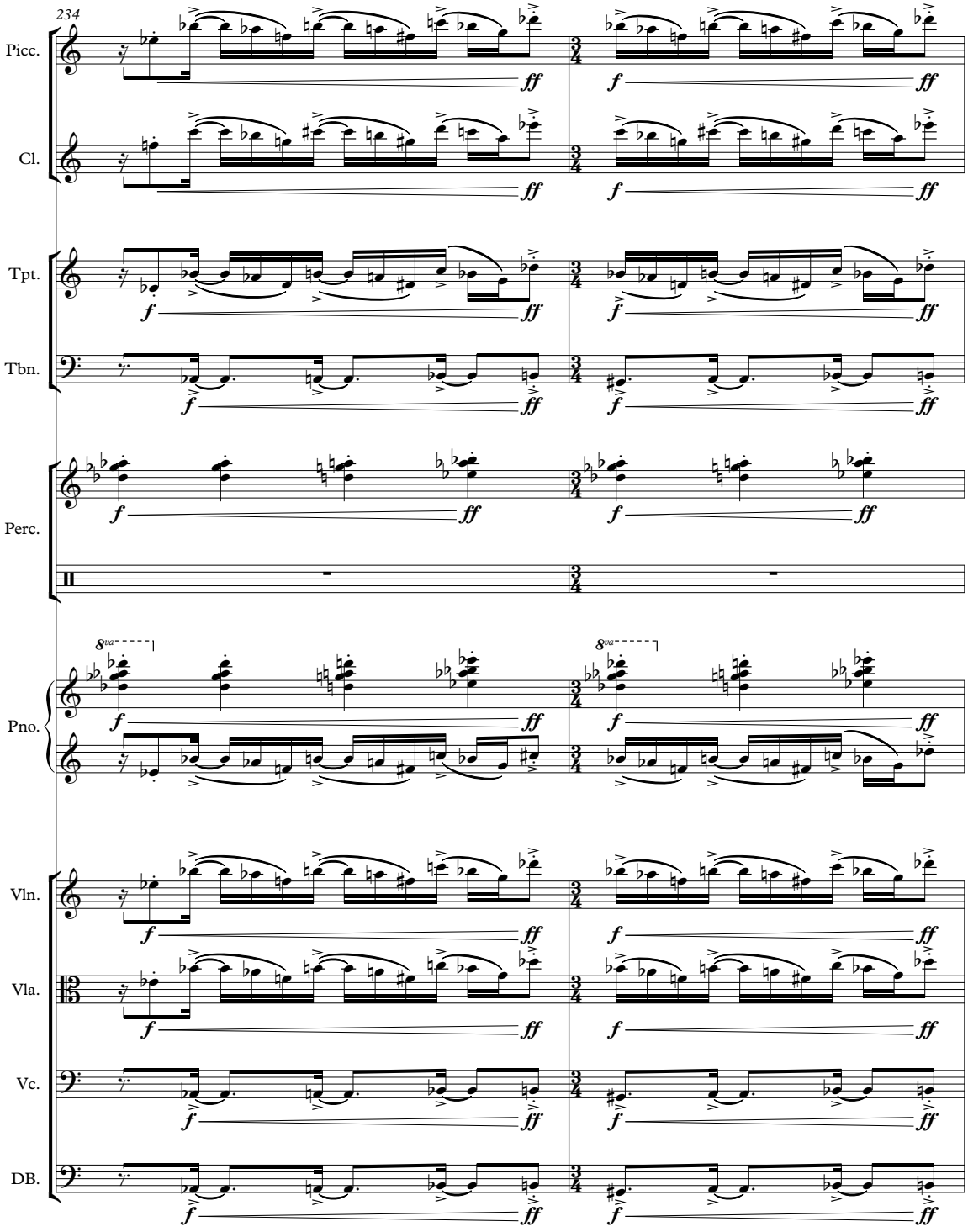

217
Picc.
Cl.
Tpt.
Tbn.
Perc.
Pno.
Vln.
Vla.
Vc.
DB.

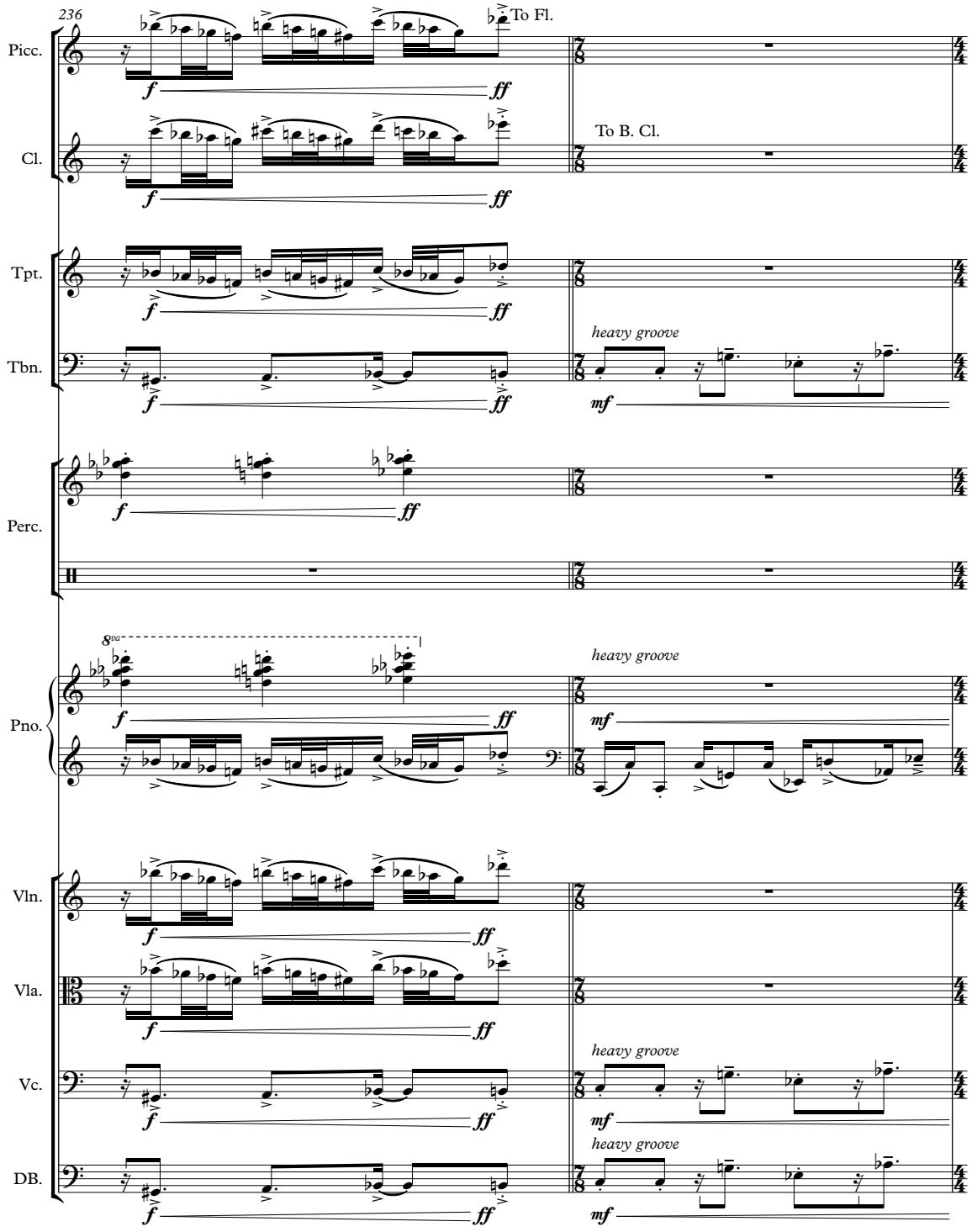

221
Picc.
Cl.
Tpt.
Tbn.
Perc.
Pno.
Vln.
Vla.
Vc.
DB.

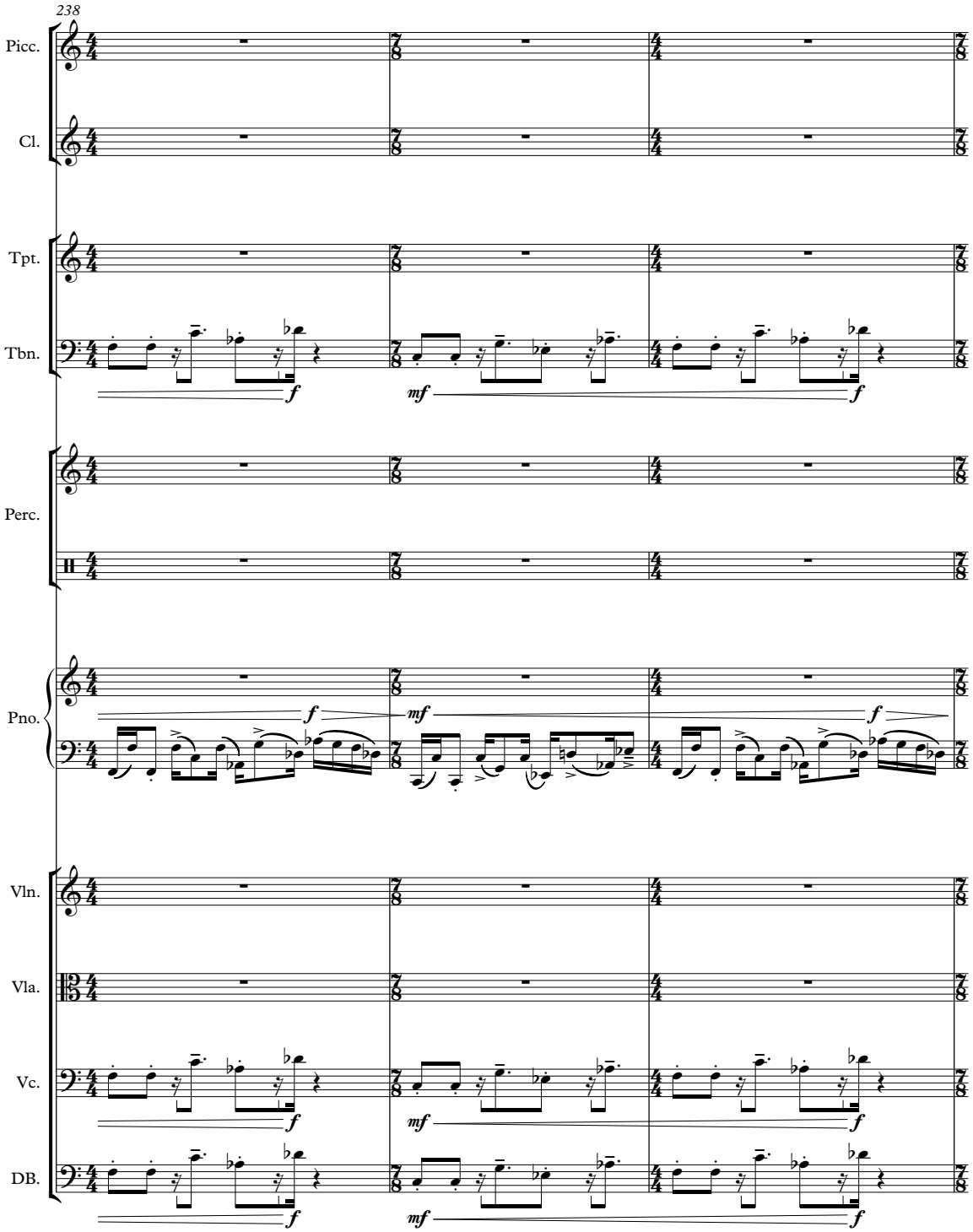

225
Picc.
Cl.
Tpt.
Tbn.
Perc.
Pno.
Vln.
Vla.
Vc.
DB.
mechanical
mechanical
menacing
f.t.
mechanical
Vibraphone
mechanical
mechanical
menacing
menacing
arco
ff
f
poco

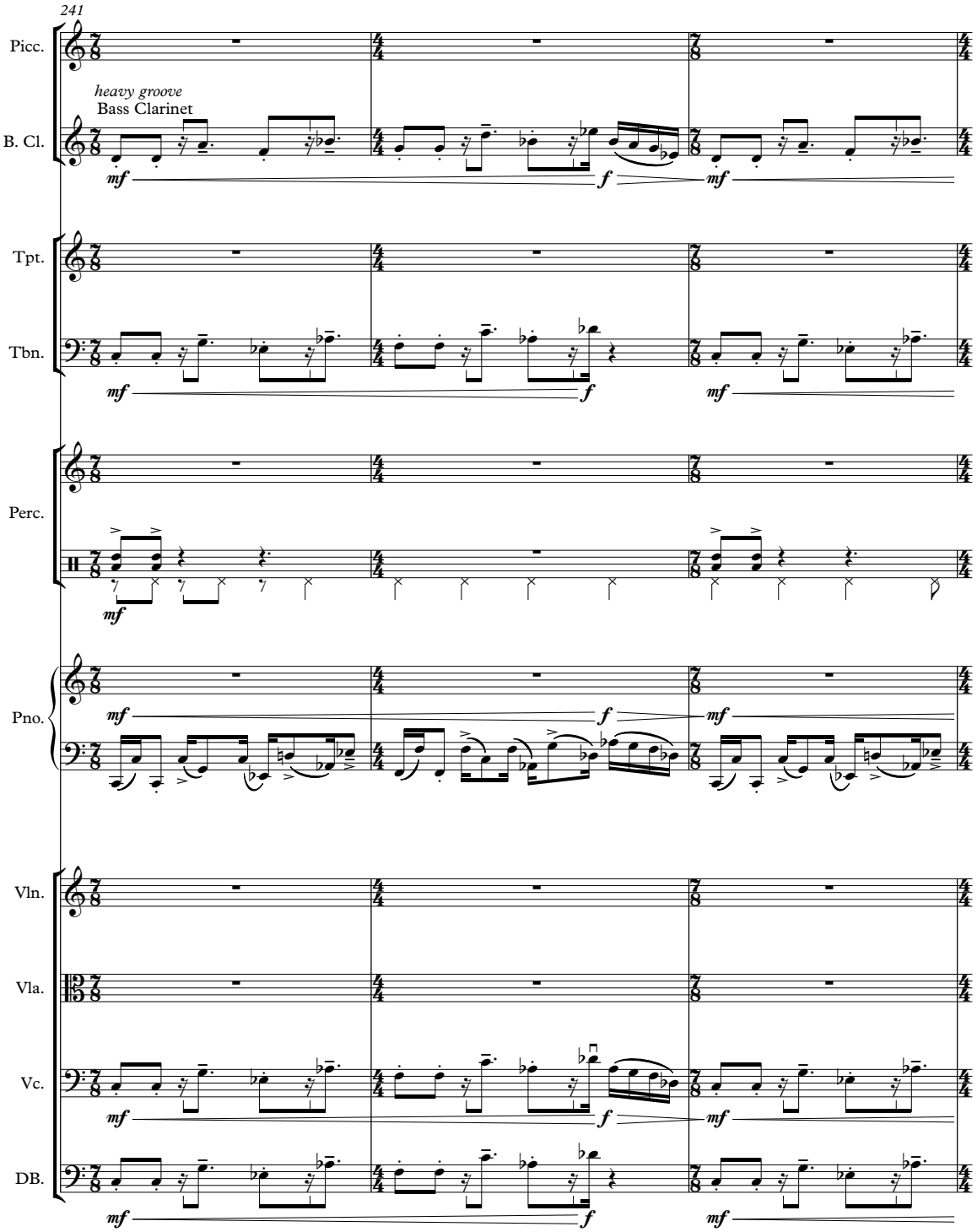

228
Picc.
Cl.
Tpt.
Tbn.
Perc.
Pno.
8va
Vln.
Vla.
Vc.
DB.

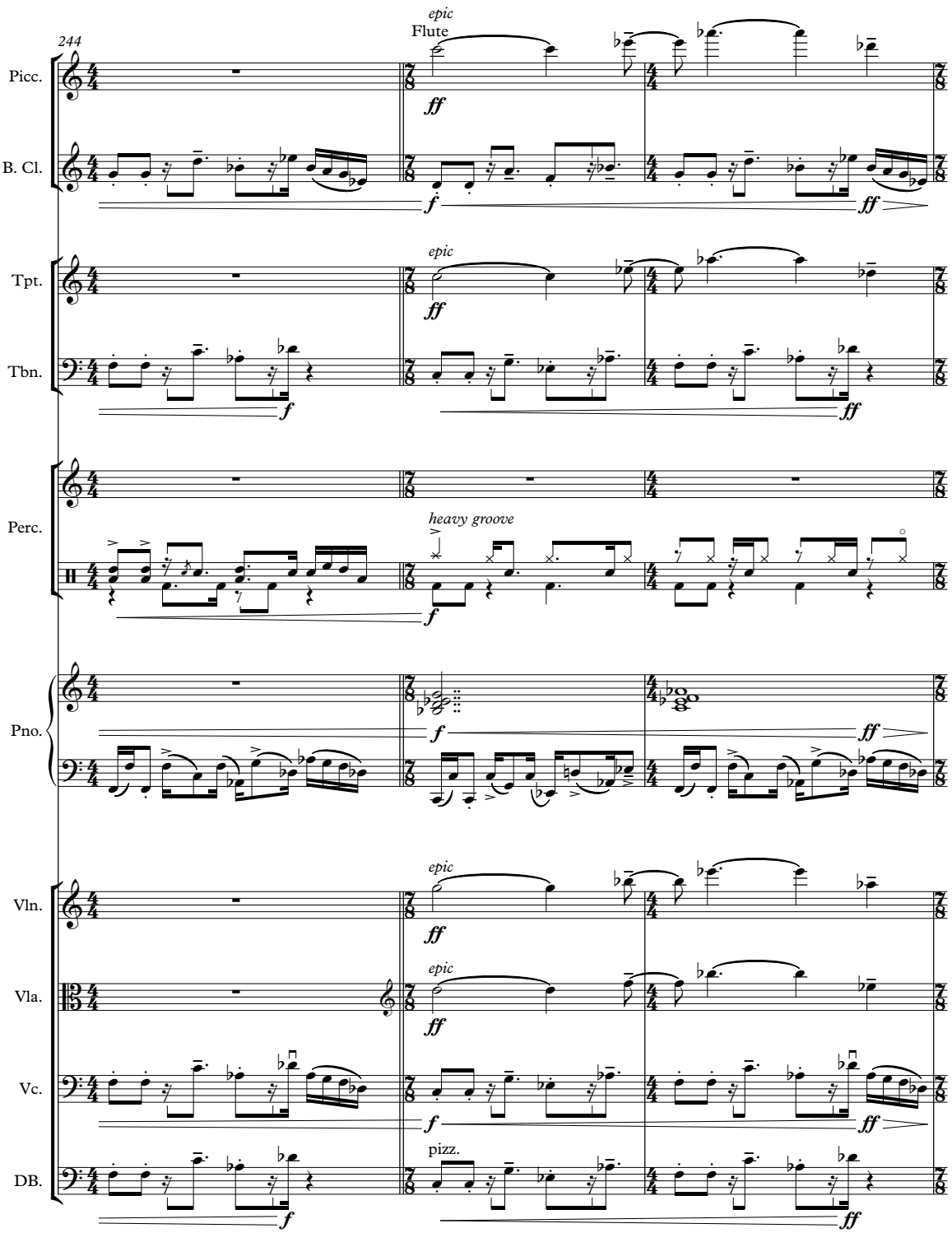

231
Picc.
Cl.
Tpt.
Tbn.
Perc.
Pno.
Vln.
Vla.
Vc.
DB.

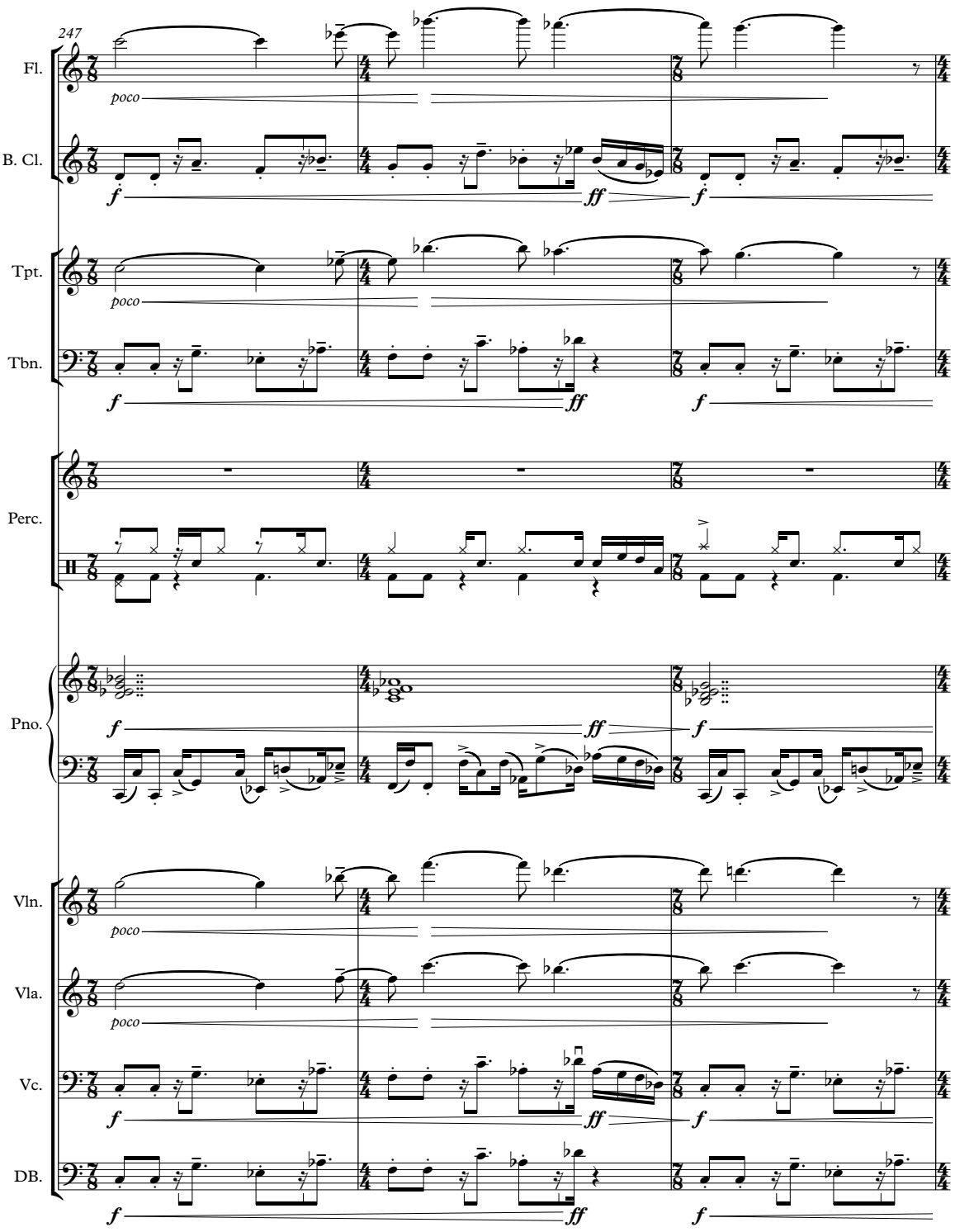

234
Picc.
Cl.
Tpt.
Tbn.
Perc.
Pno.
Vln.
Vla.
Vc.
DB.
8va
8va
ff
f

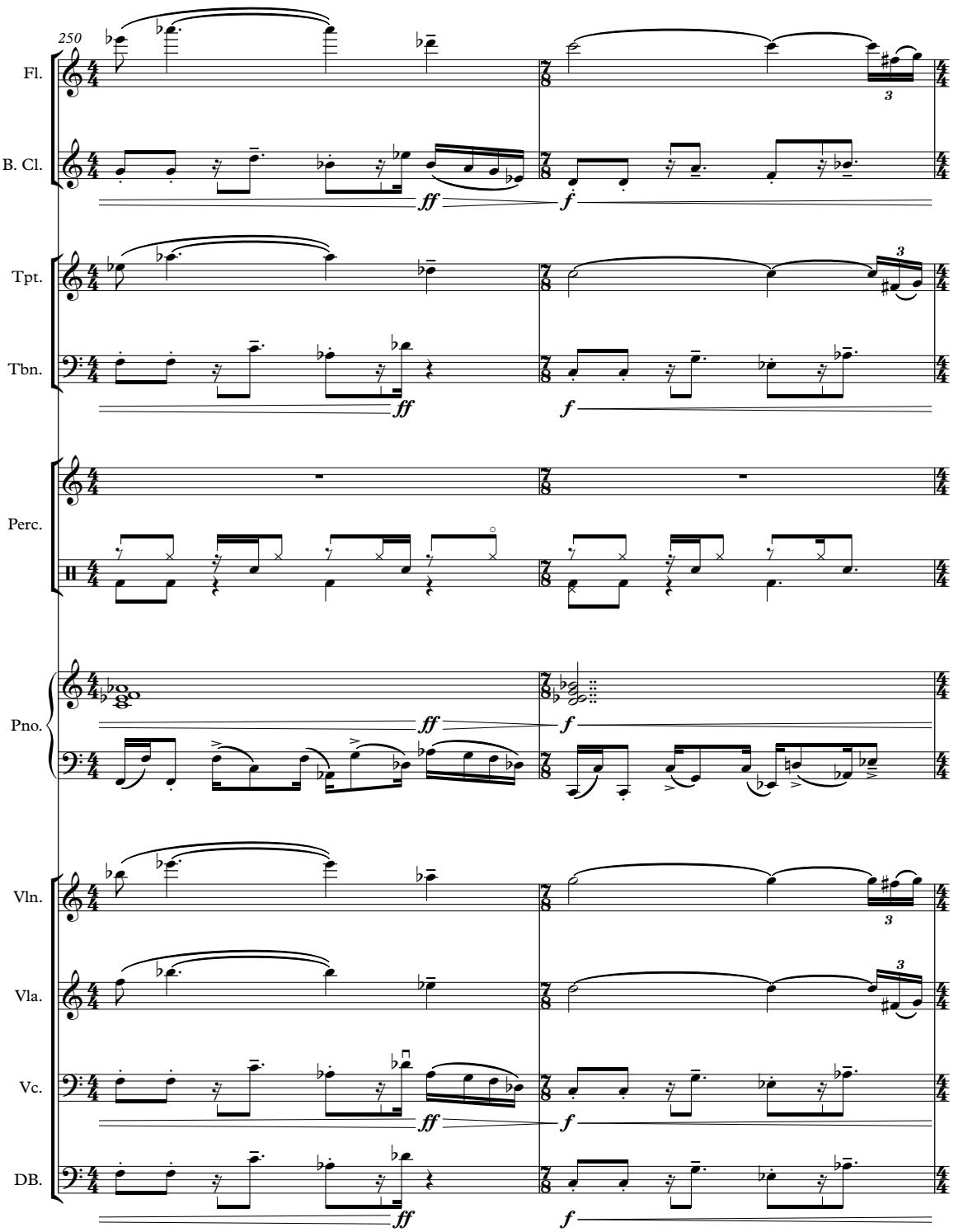

236
Picc.
To Fl.
Cl.
To B. Cl.
Tpt.
Tbn.
heavy groove
Perc.
8va
Pno.
heavy groove
Vln.
Vla.
Vc.
heavy groove
DB.
heavy groove

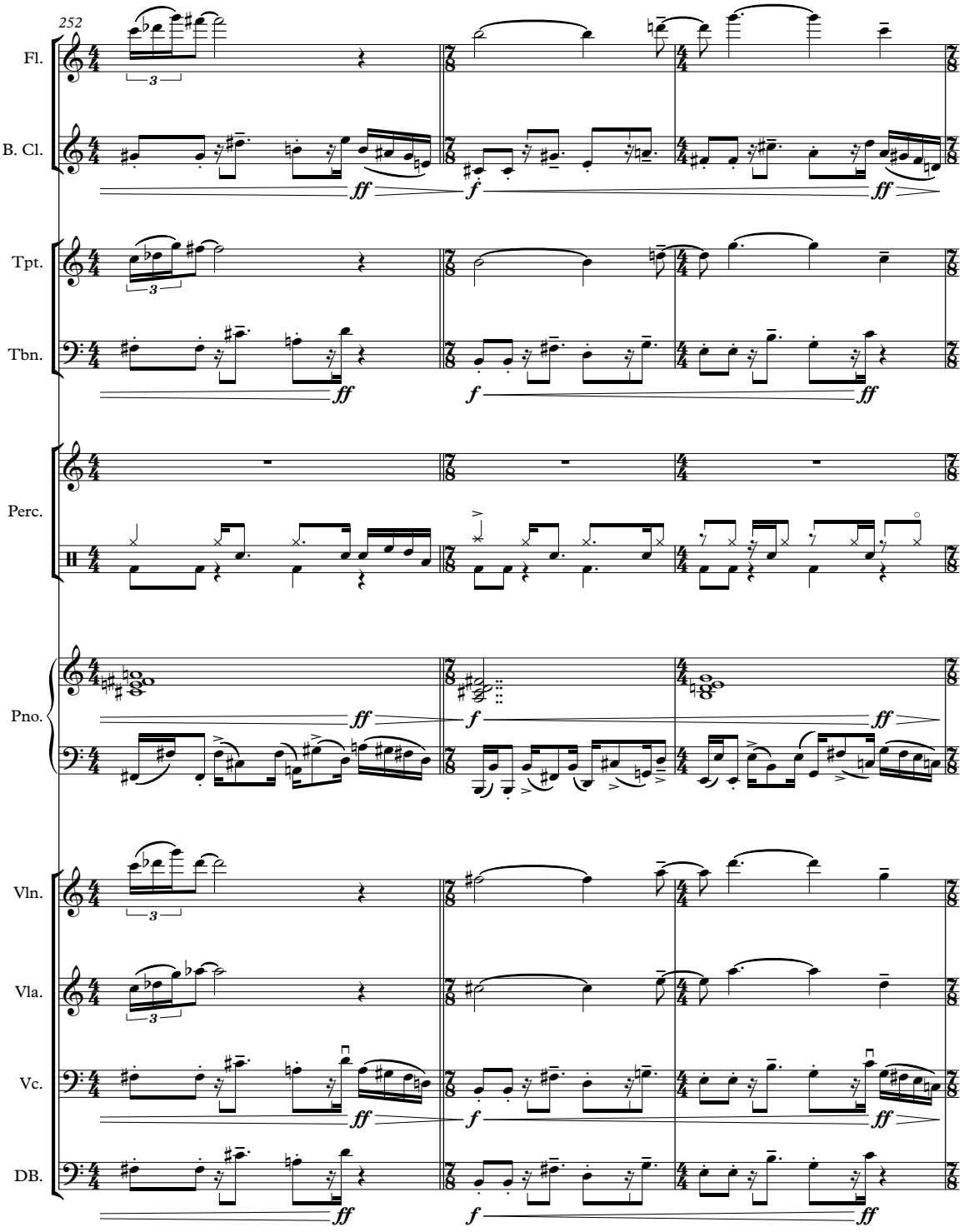

238
Picc.
Cl.
Tpt.
Tbn.
Perc.
Pno.
Vln.
Vla.
Vc.
DB.
f
mf
f

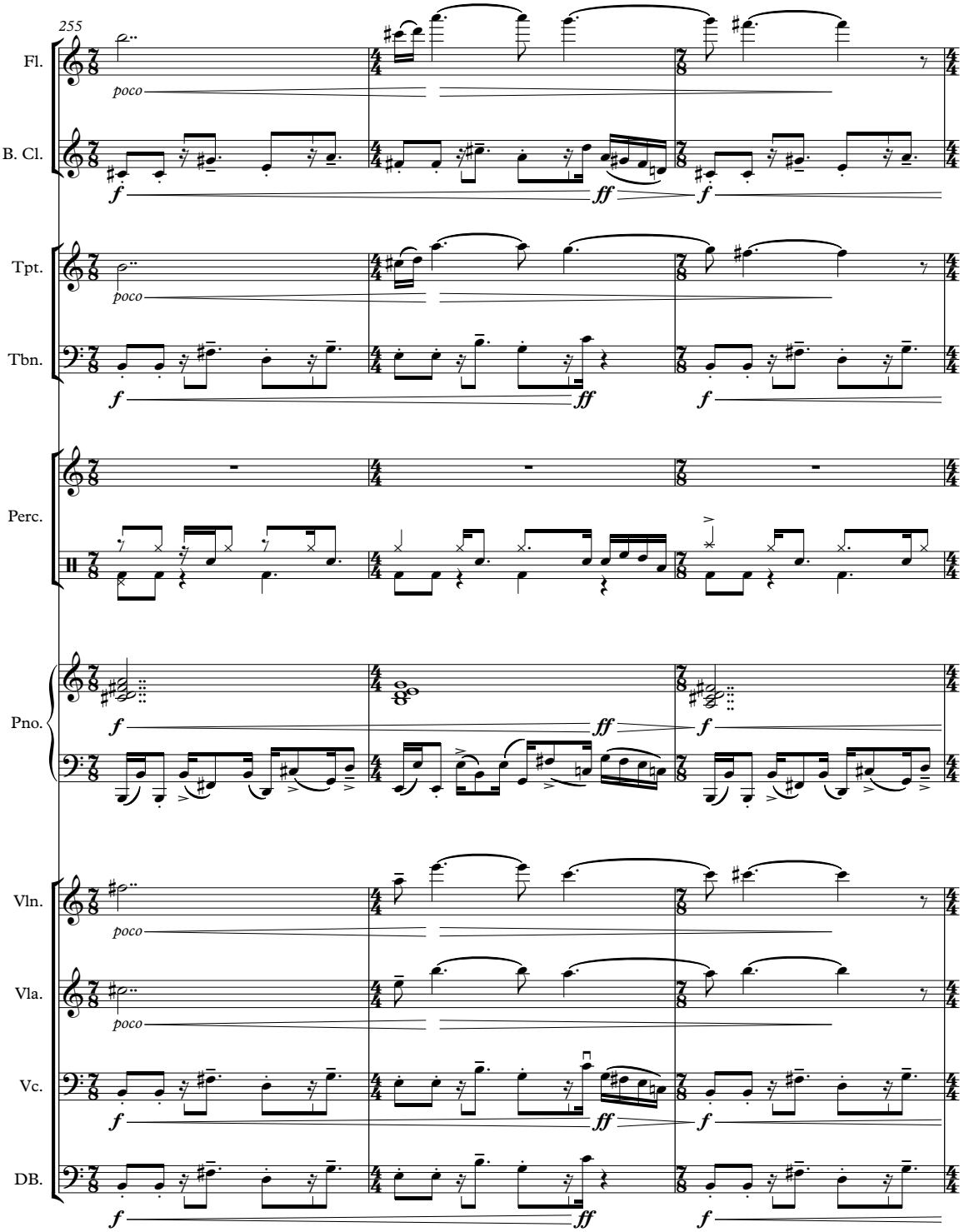

241
Picc.
heavy groove
Bass Clarinet
B. Cl.
Tpt.
Tbn.
Perc.
Pno.
Vln.
Vla.
Vc.
DB.

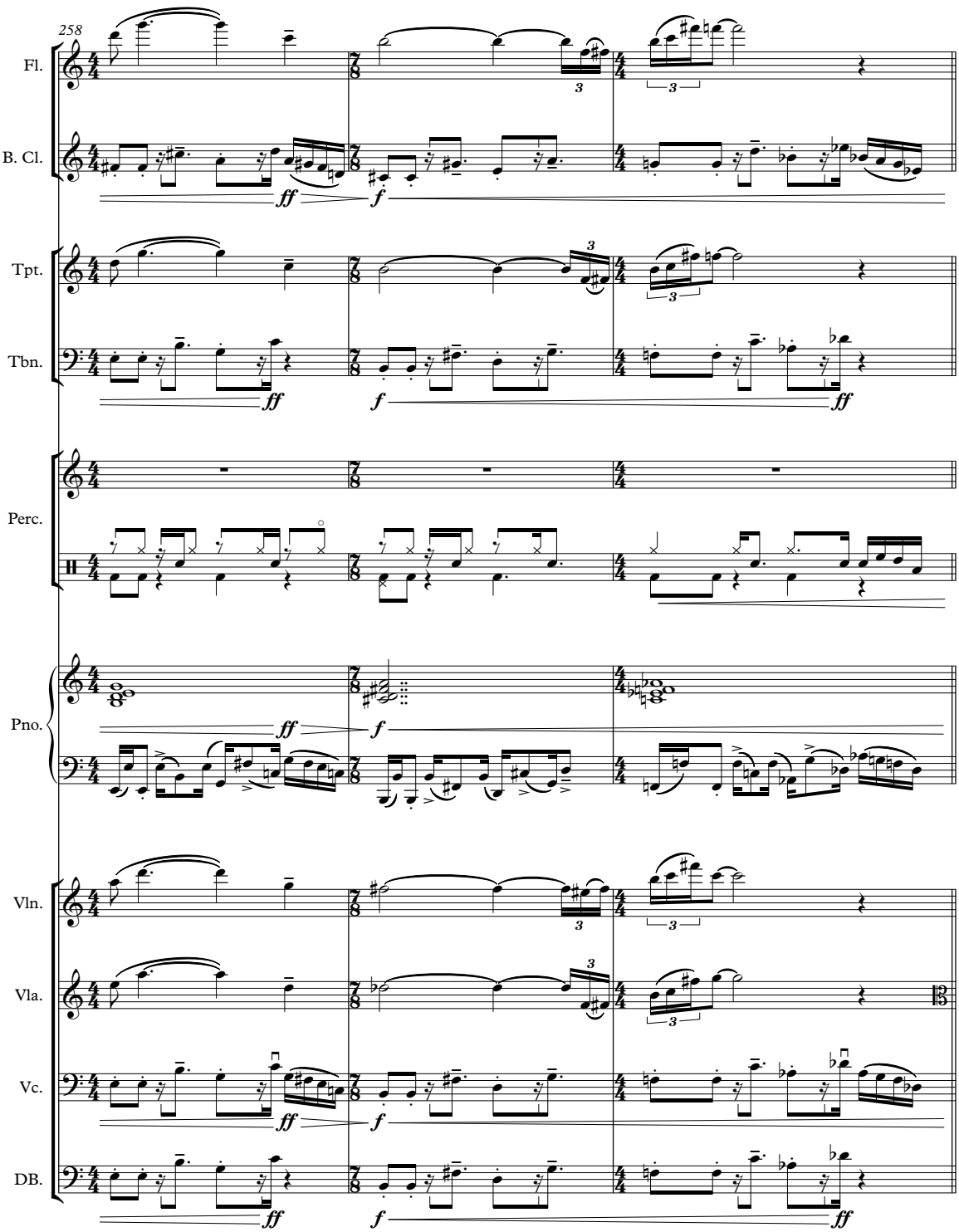

244
Picc.
B. Cl.
Tpt.
Tbn.
Perc.
Pno.
Vln.
Vla.
Vc.
DB.
epic
Flute
ff
f
heavy groove
pizz.

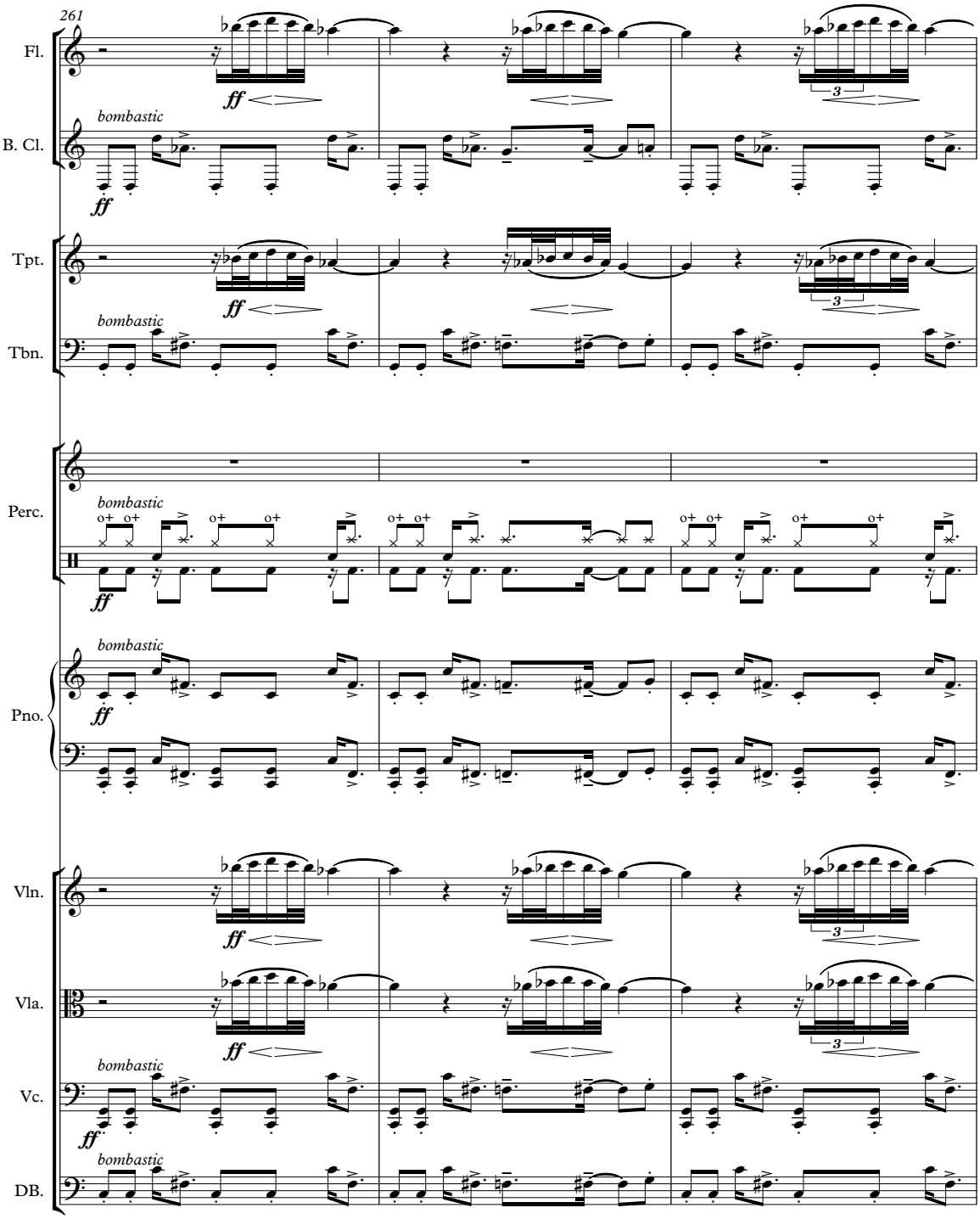

247
Fl.
B. Cl.
Tpt.
Tbn.
Perc.
Pno.
Vln.
Vla.
Vc.
DB.
poco
f
ff

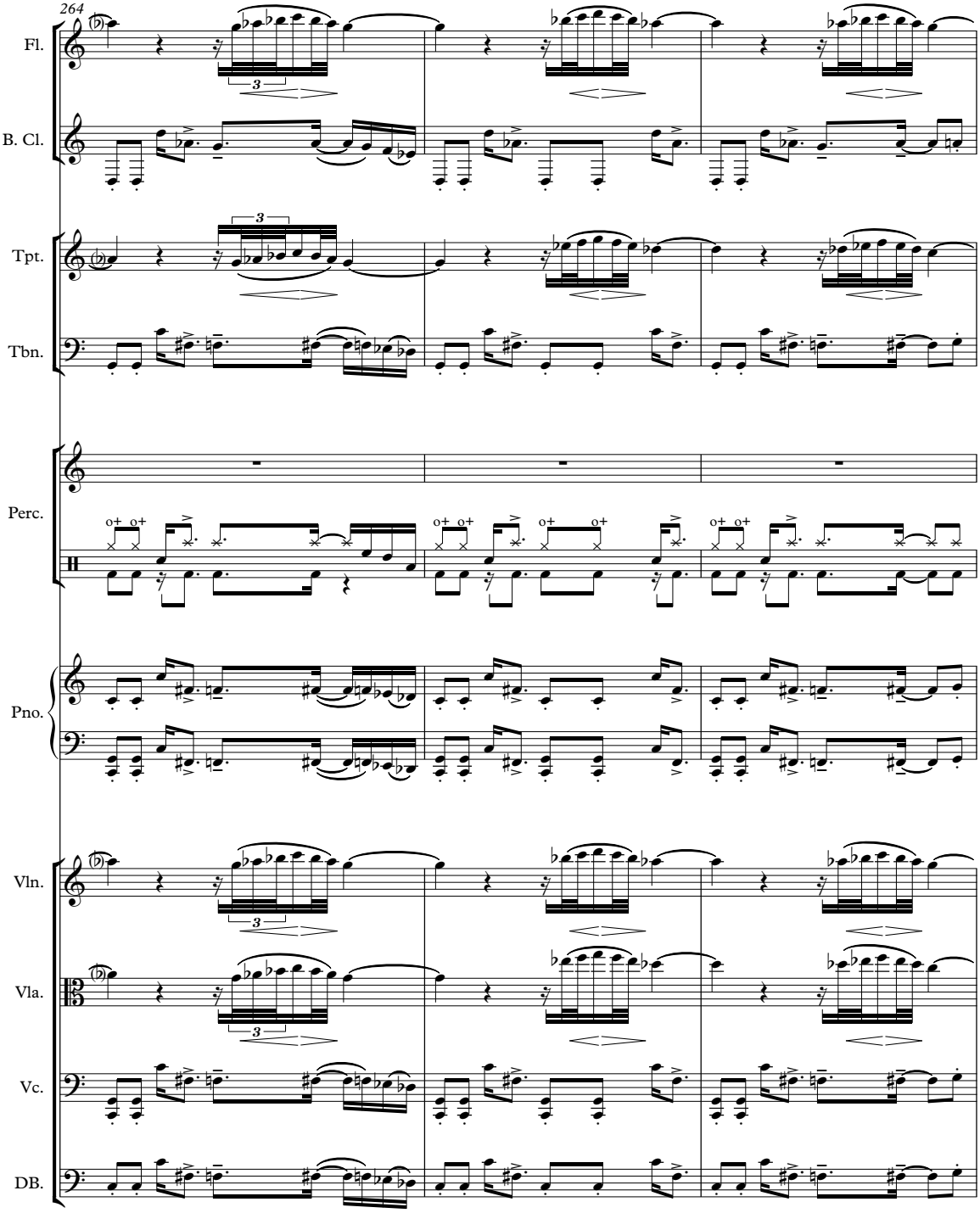

250
Fl.
B. Cl.
Tpt.
Tbn.
Perc.
Pno.
Vln.
Vla.
Vc.
DB.
ff
f
3

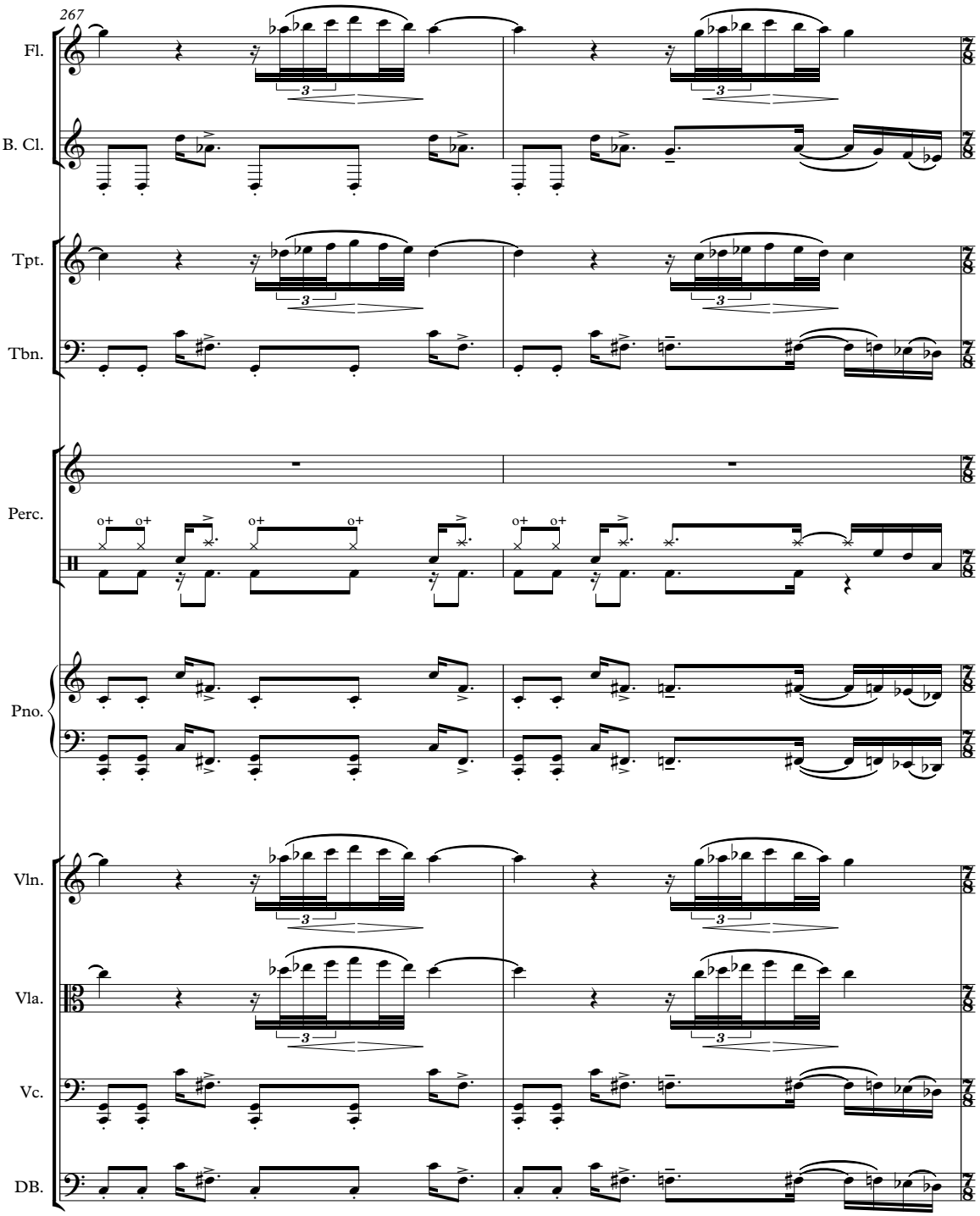

252
Fl.
B. Cl.
Tpt.
Tbn.
Perc.
Pno.
Vln.
Vla.
Vc.
DB.
ff
f
ff

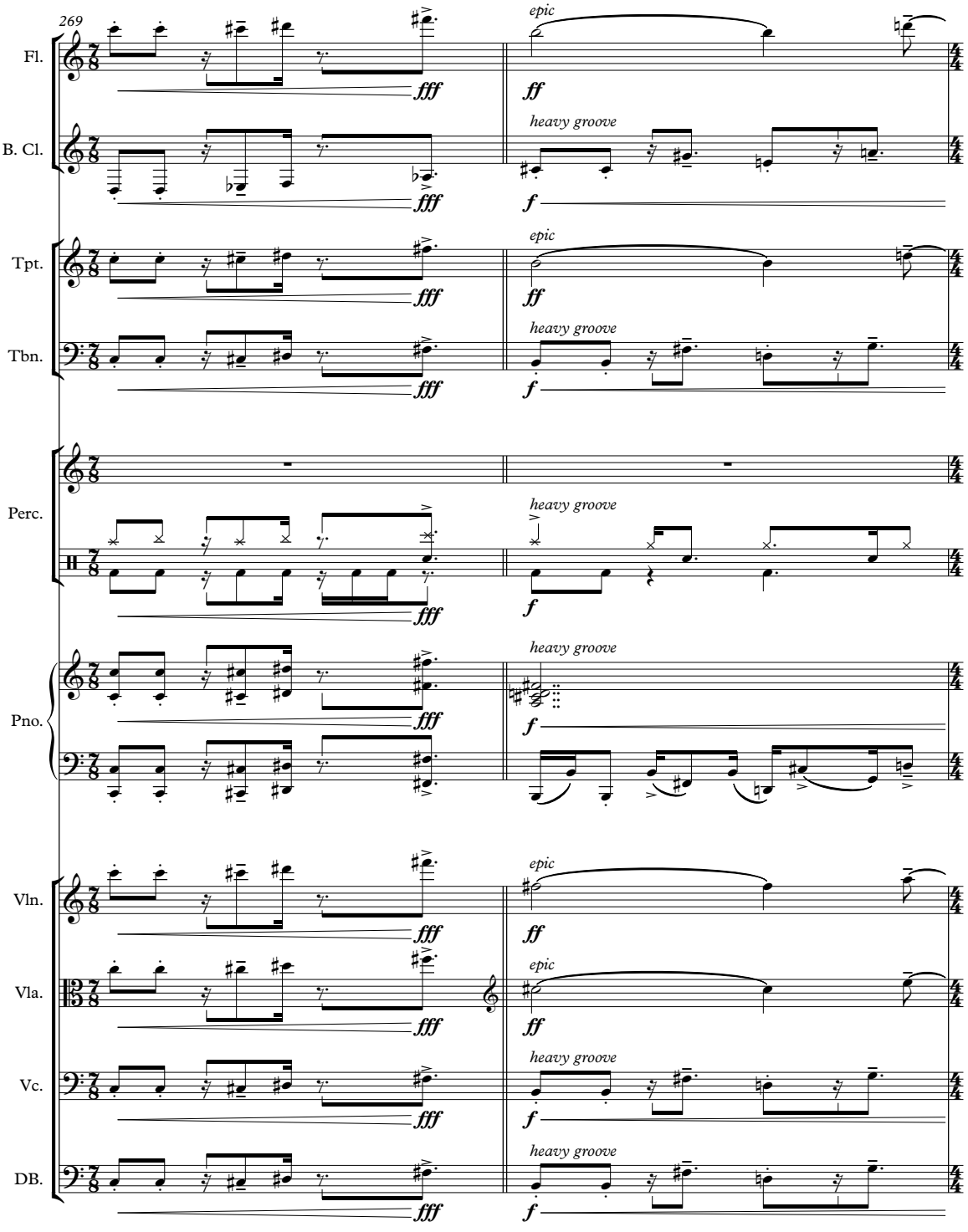

255
Fl.
B. Cl.
Tpt.
Tbn.
Perc.
Pno.
Vln.
Vla.
Vc.
DB.
poco
f
ff

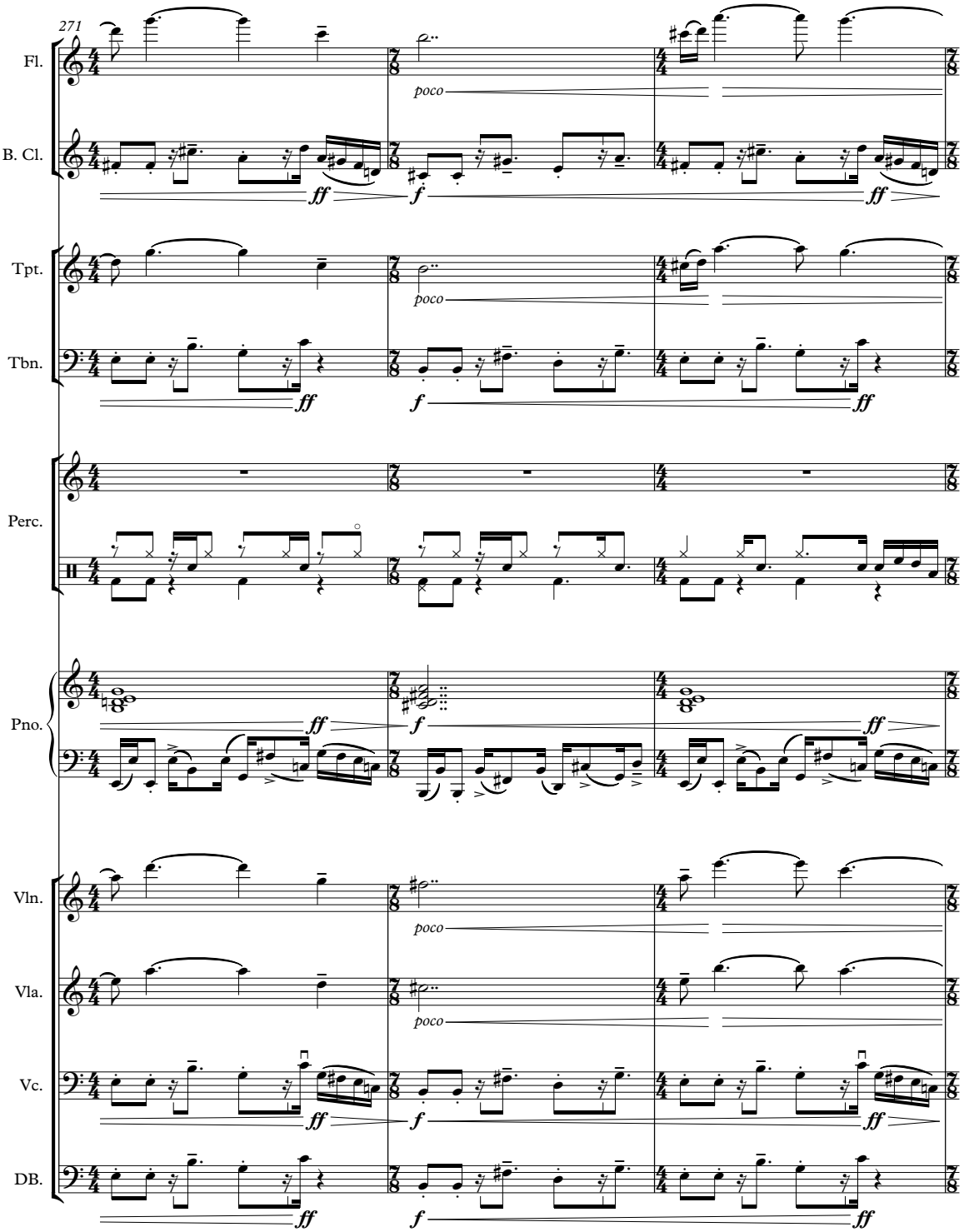

258
Fl.
B. Cl.
Tpt.
Tbn.
Perc.
Pno.
Vln.
Vla.
Vc.
DB.
ff
f
ff

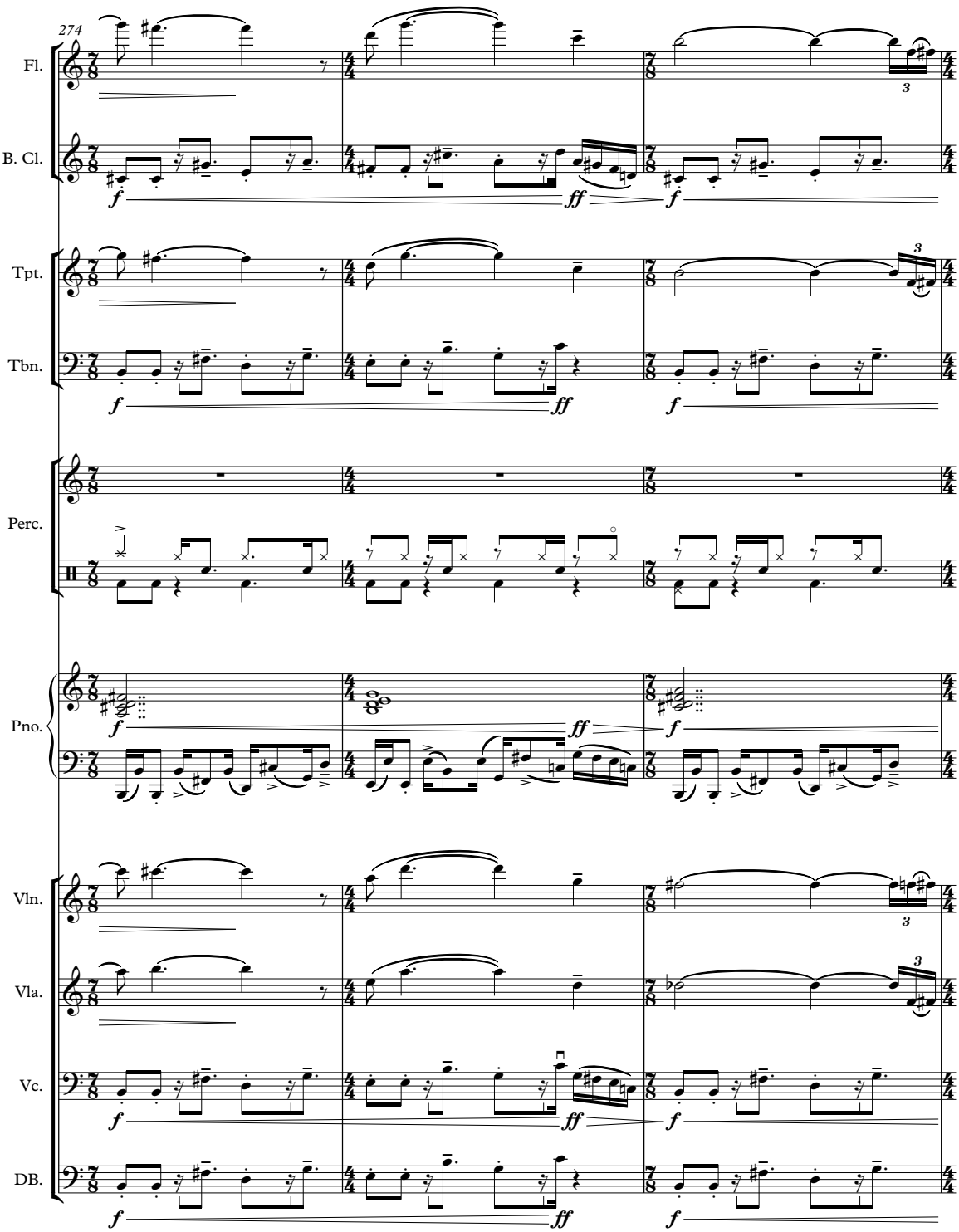

261
Fl.
B. Cl.
Tpt.
Tbn.
Perc.
Pno.
Vln.
Vla.
Vc.
DB.
bombastic
ff
3

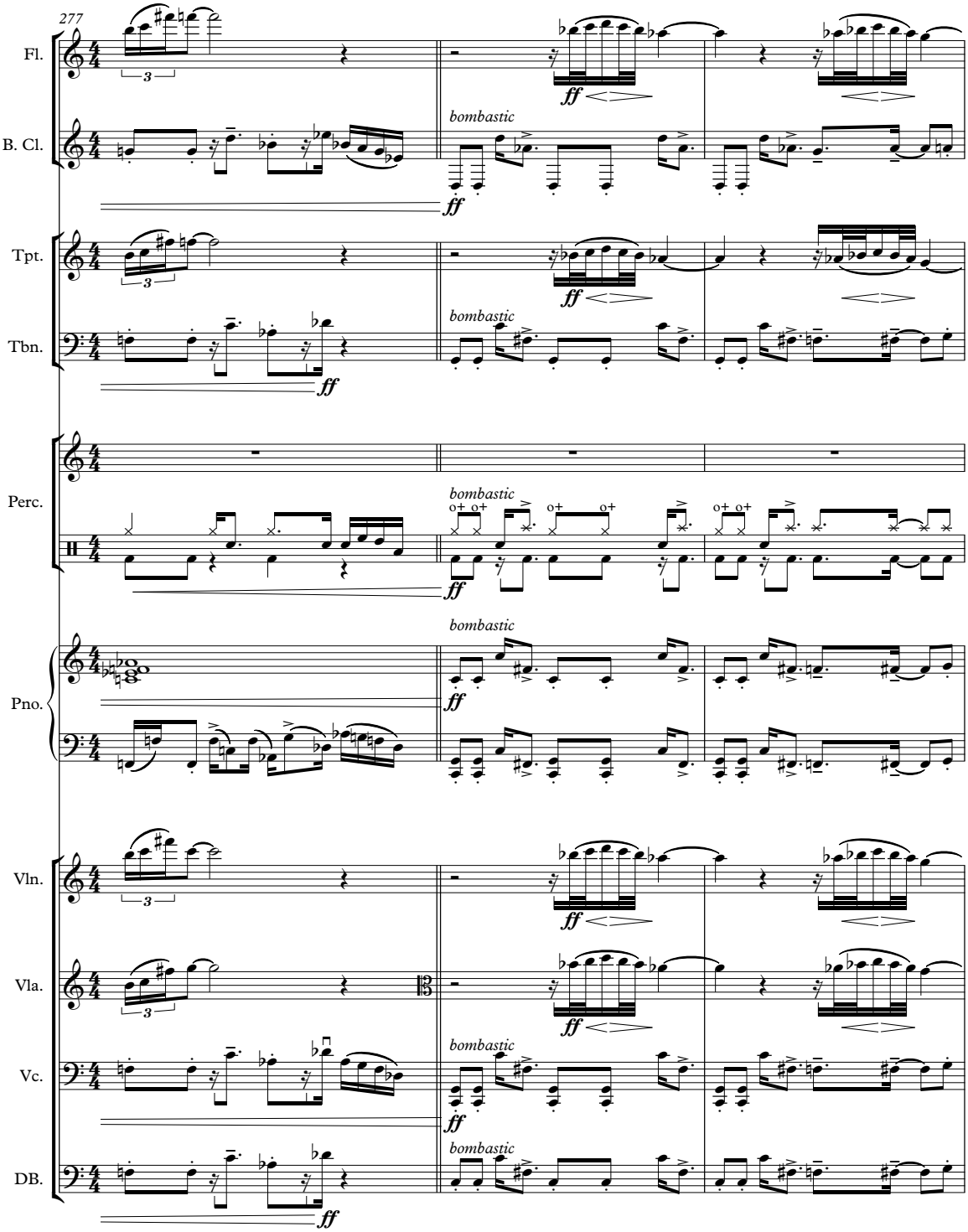

264
Fl.
B. Cl.
Tpt.
Tbn.
Perc.
Pno.
Vln.
Vla.
Vc.
DB.

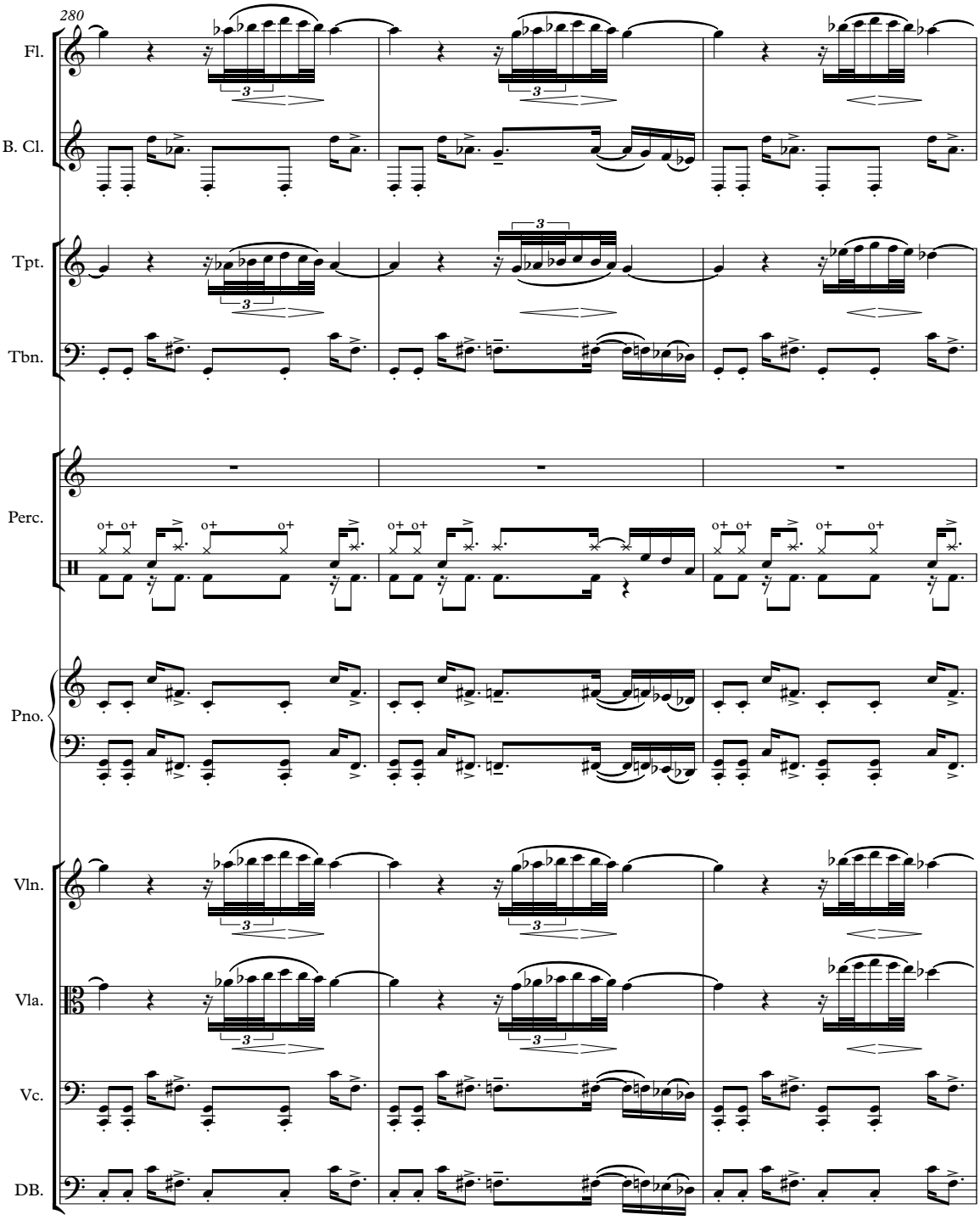

267
Fl.
B. Cl.
Tpt.
Tbn.
Perc.
Pno.
Vln.
Vla.
Vc.
DB.

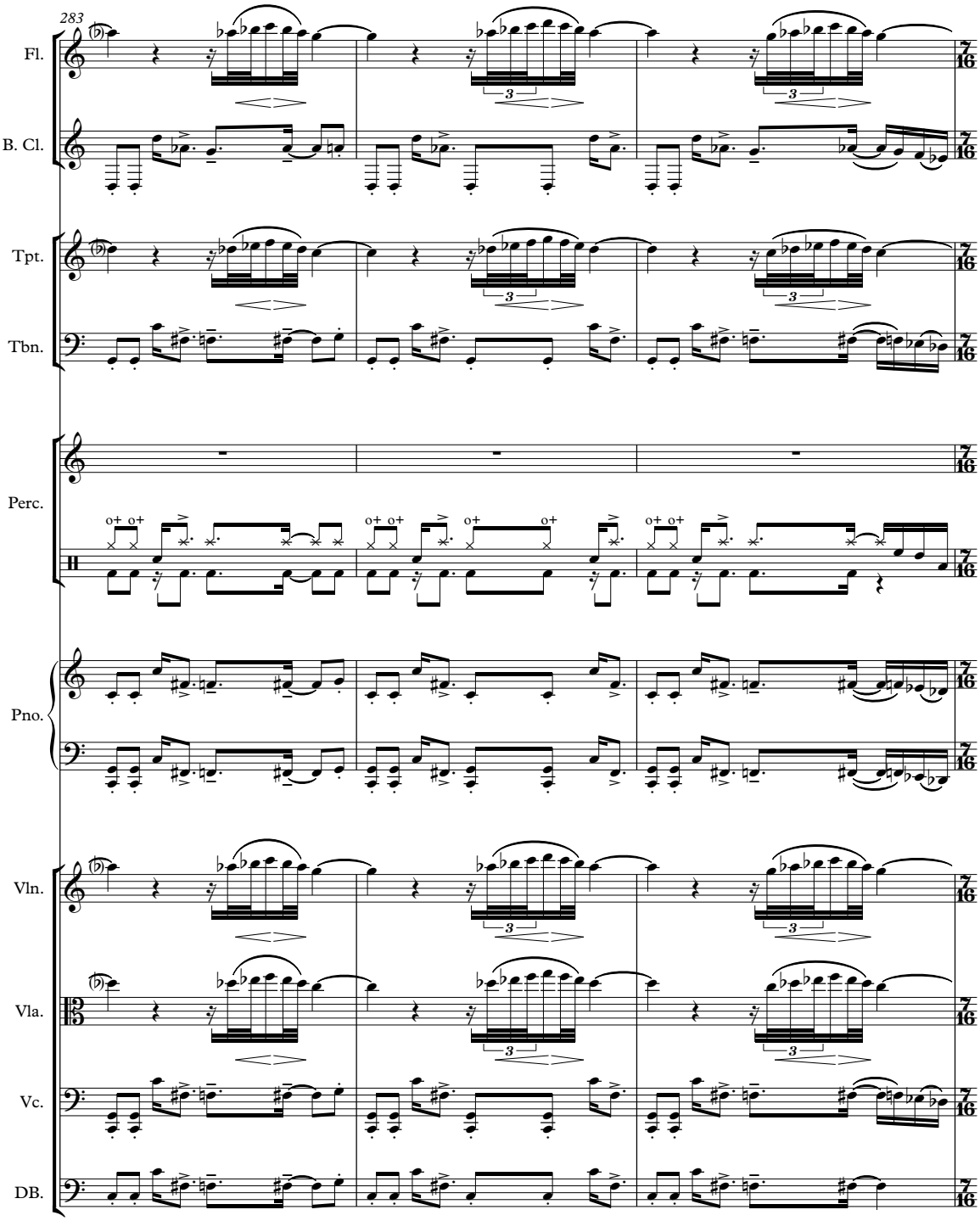

269
Fl.
B. Cl.
Tpt.
Tbn.
Perc.
Pno.
Vln.
Vla.
Vc.
DB.
epic
heavy groove
fff
ff
f

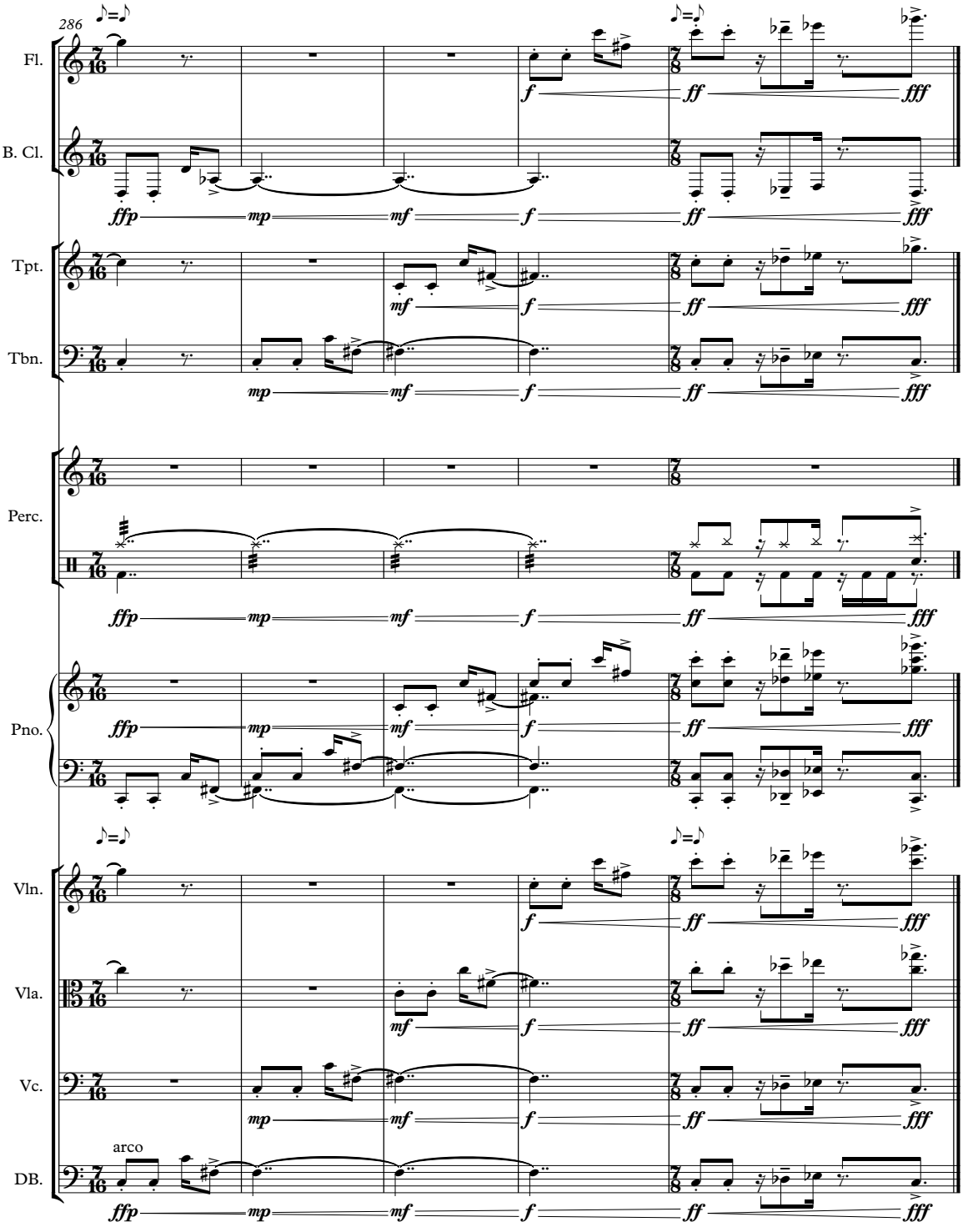

271
Fl.
B. Cl.
Tpt.
Tbn.
Perc.
Pno.
Vln.
Vla.
Vc.
DB.
poco
ff
f


274
Fl.
B. Cl.
Tpt.
Tbn.
Perc.
Pno.
Vln.
Vla.
Vc.
DB.
f
ff
f
3


277
Fl.
B. Cl.
Tpt.
Tbn.
Perc.
Pno.
Vln.
Vla.
Vc.
DB.
bombastic
ff


280
Fl.
B. Cl.
Tpt.
Tbn.
Perc.
Pno.
Vln.
Vla.
Vc.
DB.


283
Fl.
B. Cl.
Tpt.
Tbn.
Perc.
Pno.
Vln.
Vla.
Vc.
DB.


286
Fl.
B. Cl.
Tpt.
Tbn.
Perc.
Pno.
Vln.
Vla.
Vc.
DB.
arco
ffp
mp
mf
f
ff
fff

CHAPTER 3 – CONCEPTS USED IN *ARMAGEDDON*

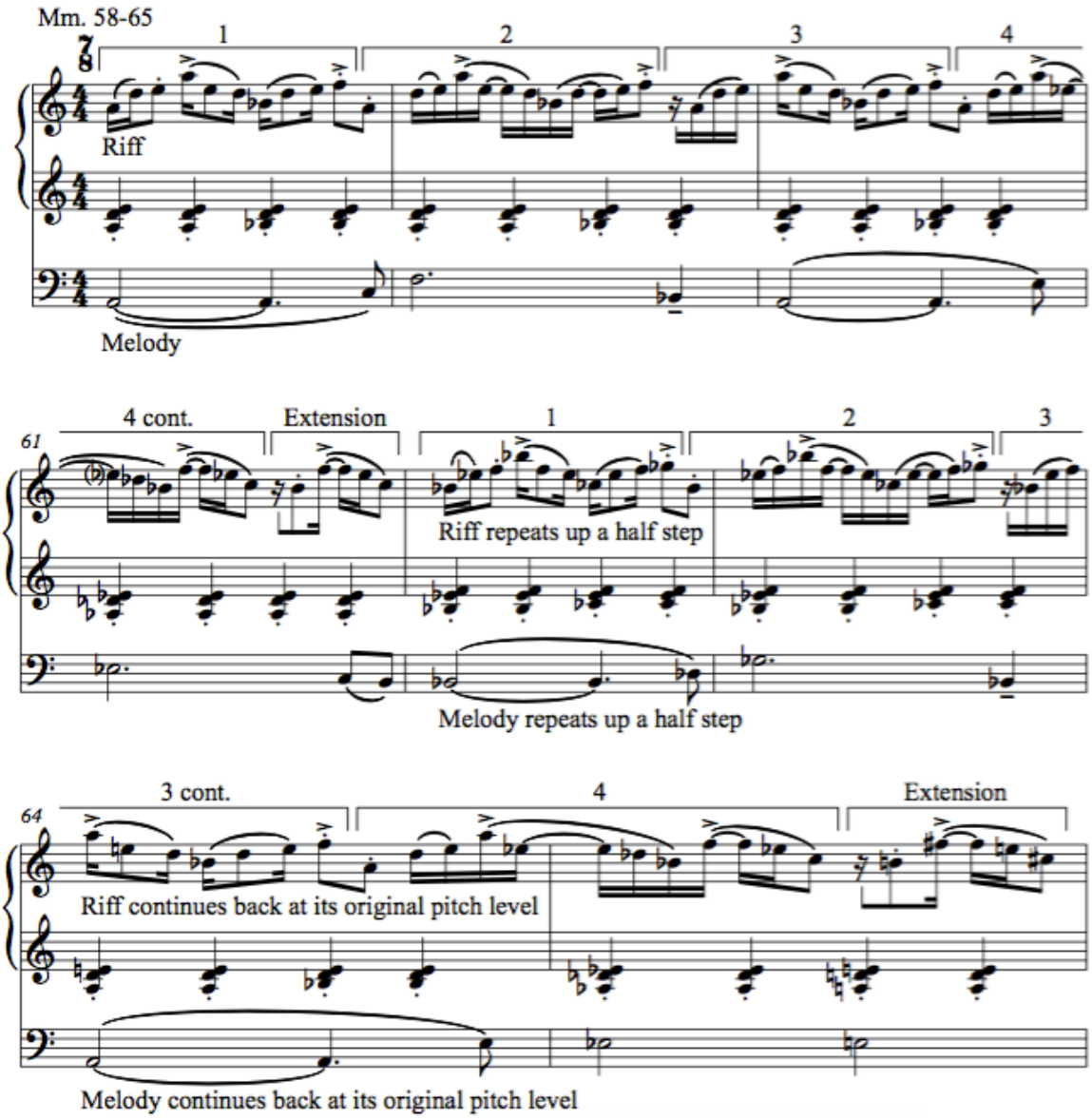
- **Polymeter**

It would be impossible to compose a piece inspired by Meshuggah's music without incorporating the use of polymeter in some way. Therefore, *Armageddon* contains quite a number of instances of polymeter. The very first example can be seen in mm. 51-54 (musical example 13). The 7/8 riff-like material that previously began in mm. 45-48 is now superimposed against a steady 4/4 pulse. This creates a unique interplay between the two juxtaposed parts as they gradually fall further and further out of sync with each other. By m. 54, they are separated by two entire beats. Rather than continue to its mathematical conclusion (seven measures in this case) a brief phrase extension is inserted to fill the void. This extension exemplifies Haake's technique of adding drum fills at the ends of a sections and the extension used in "Clockworks." The idea is expanded upon in mm. 58-65 (musical example 14) as another layer is added. This additional layer further asserts 4/4's dominance over 7/8 with the inclusion of a menacing melody played by the cello and double bass that stretches across an eight-measure section. Halfway through the section, the 7/8 material repeats a half step higher just as the melody continues a half step higher. This same section occurs again in mm 71-78, 102-109, and 226-233, albeit slightly varied and at a different pitch level.

Musical Example 13: *Armageddon* Riff and mm. 51-54

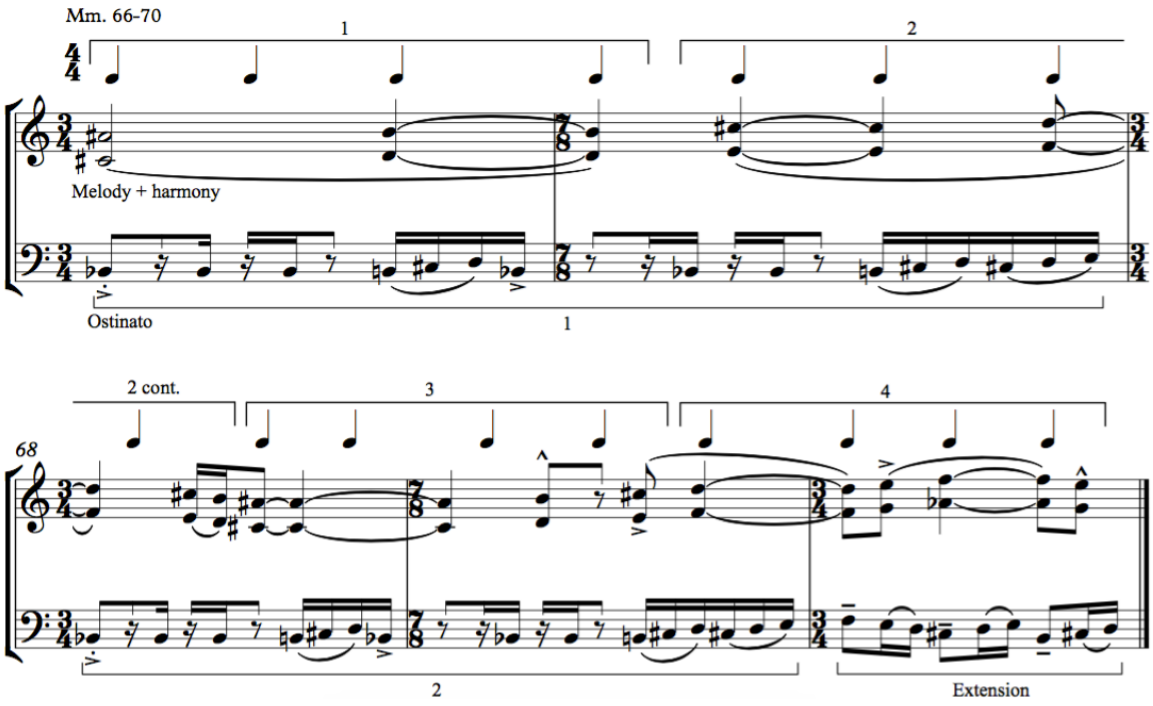
Another example of polymeter occurs in mm. 66-70. This time it might not be at first apparent. Closer examination, however, reveals that it is indeed polymetric, but it is written in mixed meter to allow for easier readability. The melody is in the trumpet and glockenspiel accompanied by a harmony part in the trombone that is a major sixth lower (musical example 15). These parts are in 4/4, although at a glance it might not appear so, and placed on top of an ostinato in the lower strings that oscillates between 3/4 and 7/8. Just like with the previous section, the ostinato and melody gradually fall out of sync with each other. There is a three-beat gap by the end of the section that is again filled with a

phrase extension. This same idea is expanded upon in mm. 92-101 and 216-225 (musical example 16). This time, however, it is stretched across ten measures instead of five.

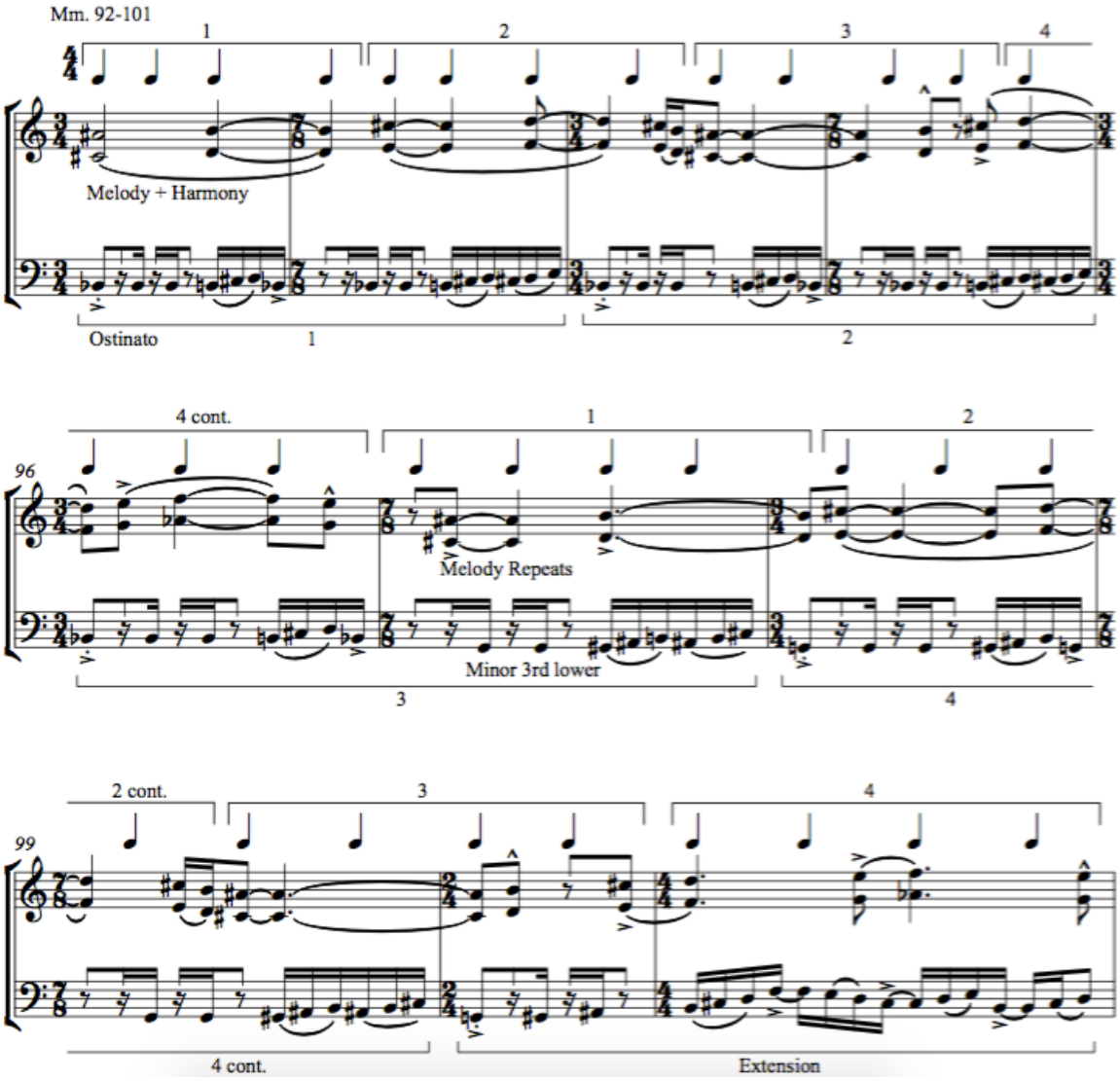


Musical Example 14: *Armageddon* mm. 58-65

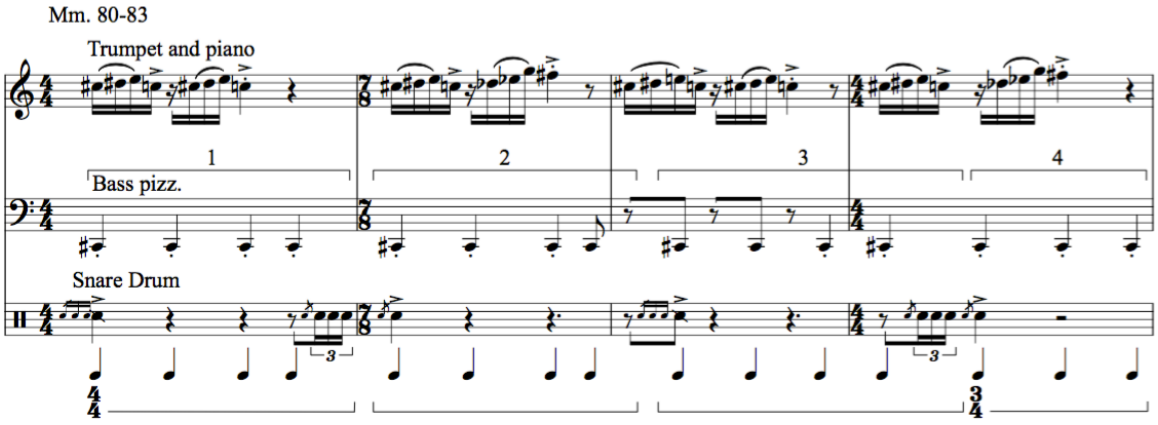
Unlike Meshuggah, *Armageddon* contains an example of polymeter where 4/4 is not heard as the dominant meter in m. 80. At the forefront is a trumpet and piano part that oscillates between 4/4–7/8 and 7/8–4/4 (see example 17). Underneath it, however, the bass and percussion are outlining a steady 4/4 pulse. But, only three full measures of 4/4 are able to fit in the 4/4–7/8 and 7/8–4/4 framework. The fourth measure is shortened to 3/4 because a fourth beat could not be accommodated. This same idea is continued across the next eight measures with full tutti instrumentation.



Musical Example 15: *Armageddon* mm. 66-70



Musical Example 16: *Armageddon* mm. 92-101

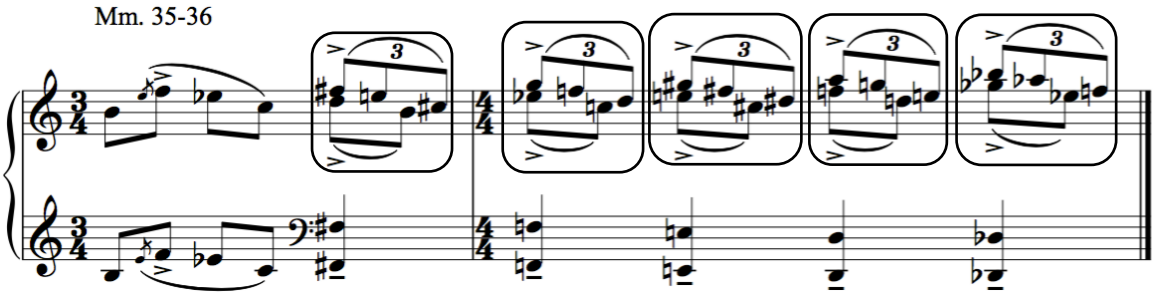


Musical Example 17: *Armageddon* mm. 80-83

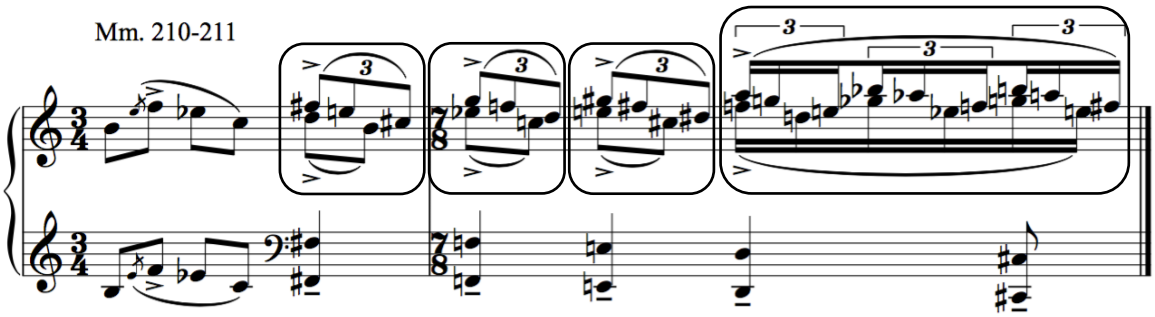
- **Polyrhythm**

In addition to polymeter, a number of examples of polyrhythm also take place throughout the piece. These polyrhythms are used at a much smaller scale than polymeter, but add even more drama when coupled with polymeter. They also demonstrate vocalist Jens Kidman's and drummer Tomas Haake's use of polyrhythms in Meshuggah's vocal lines and drum parts in songs such as "Bleed," "Swarm," and "Clockworks." The difference, however, is that these rhythms are purely polyrhythmic in nature and not byproducts of polymeter. They also only occur on one or two beats rather than across whole sections. Musical example 18 showcases early uses of two-against-three polyrhythms in mm. 35-36, which foreshadow what is later to come. The same thing takes place again in mm. 210-211 (musical example 19), but in an even more dramatic manner. This time the intensity is heightened as the polyrhythms are faster at the end of the measure. The meter is also altered from 4/4 to 7/8 to add more intensity.

Mm. 37-39 demonstrates another use of polyrhythm that later occurs in mm. 111-113 and 212-214 (musical example 20).

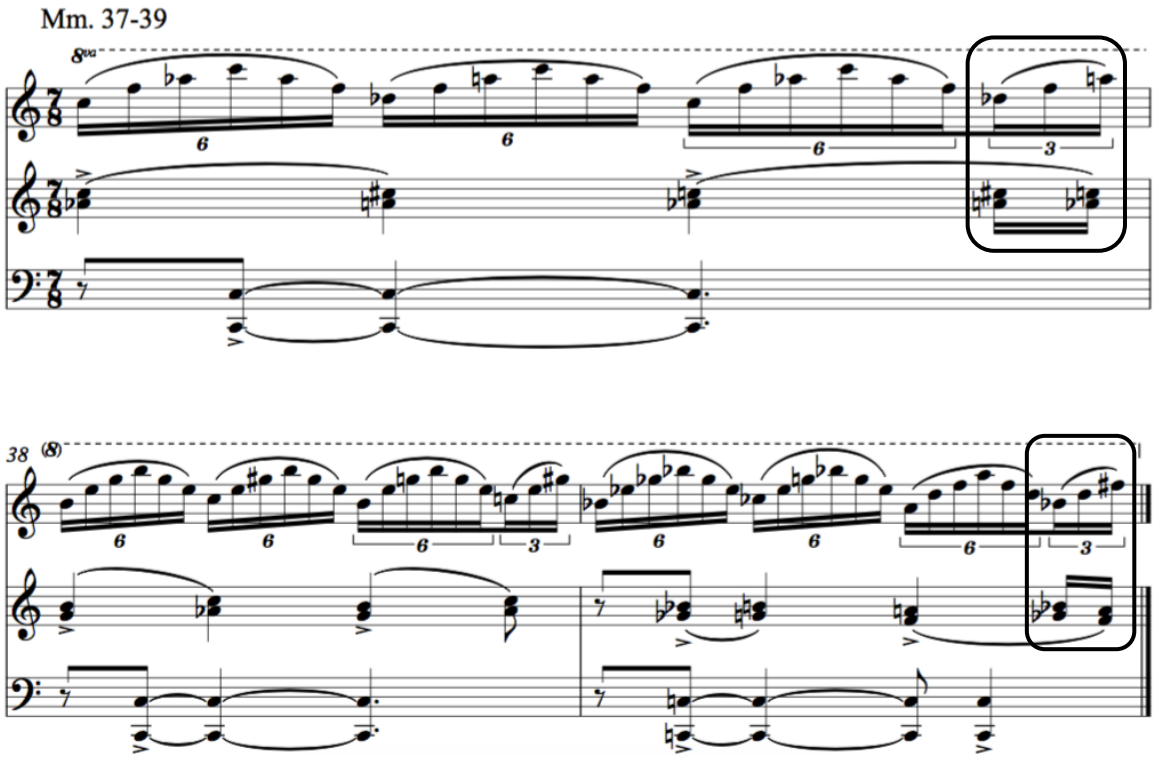


Musical Example 18: Polyrhythms in mm. 35-36

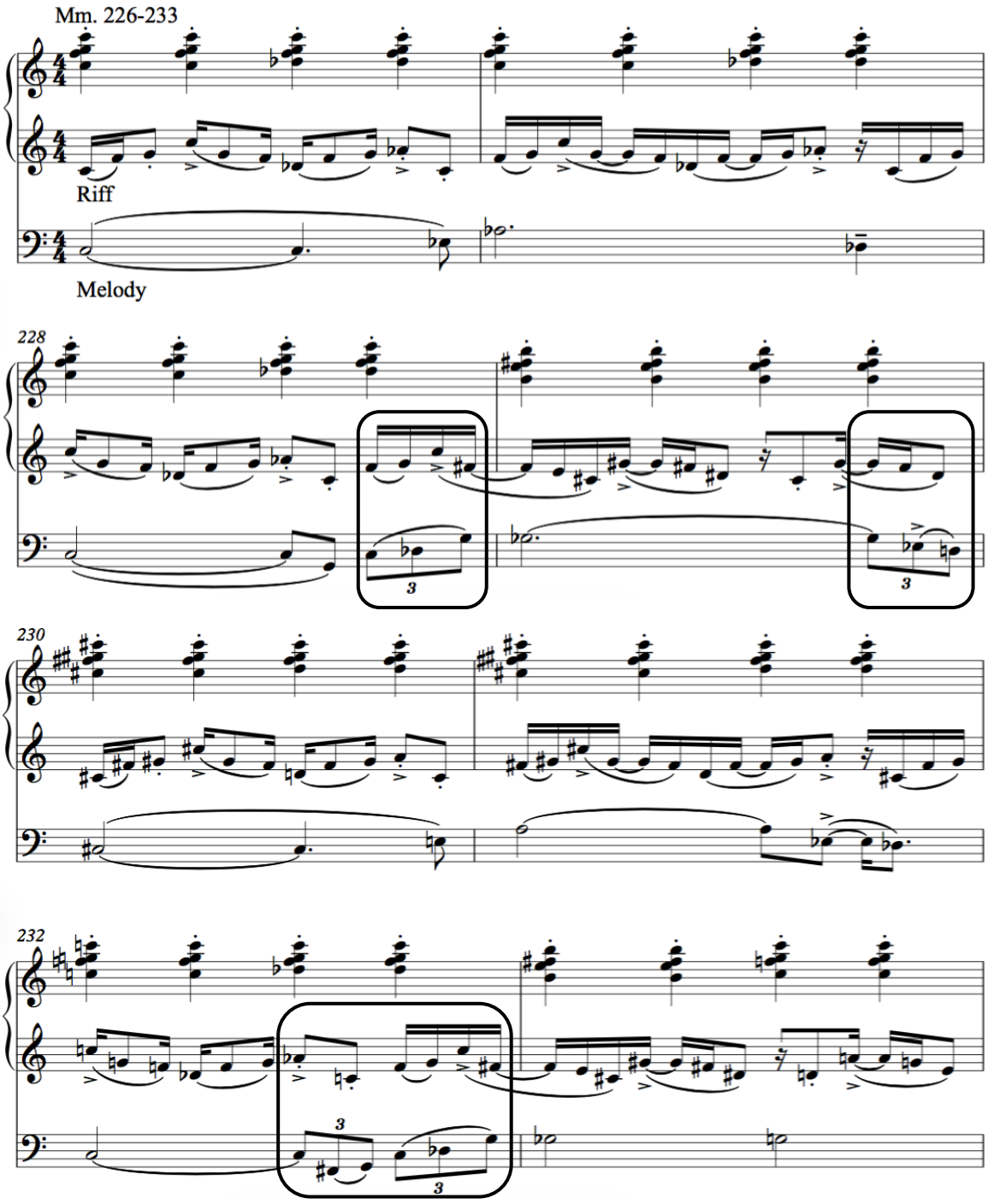


Musical Example 19: Polyrhythms in mm. 210-211

Mm. 226-233 (musical example 21) truly realizes Kidman's technique of adding polyrhythms on top of a polymetric frenzy, similar to "Bleed." The riff and melody have previously been heard on multiple occasions, but each time it is heard, the melody incorporates another polyrhythm. This particular section showcases both two-against-three and three-against-four polyrhythms towards the end of the composition.



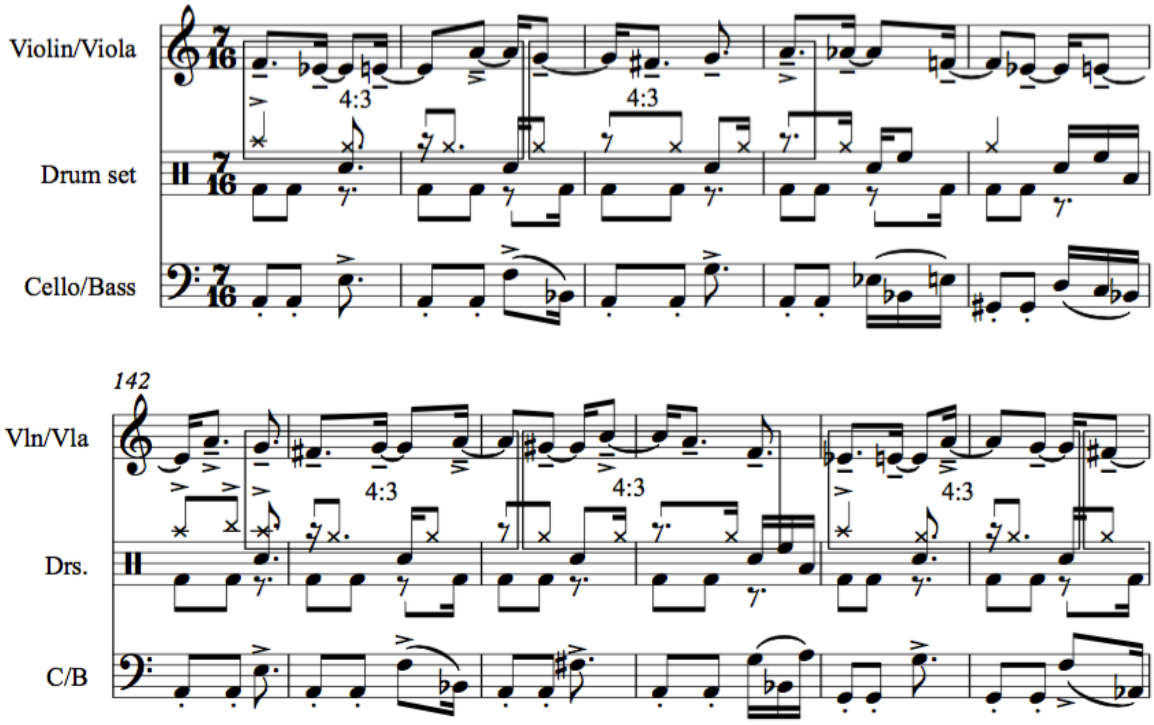
Musical Example 20: Polyrhythms in mm. 37-39



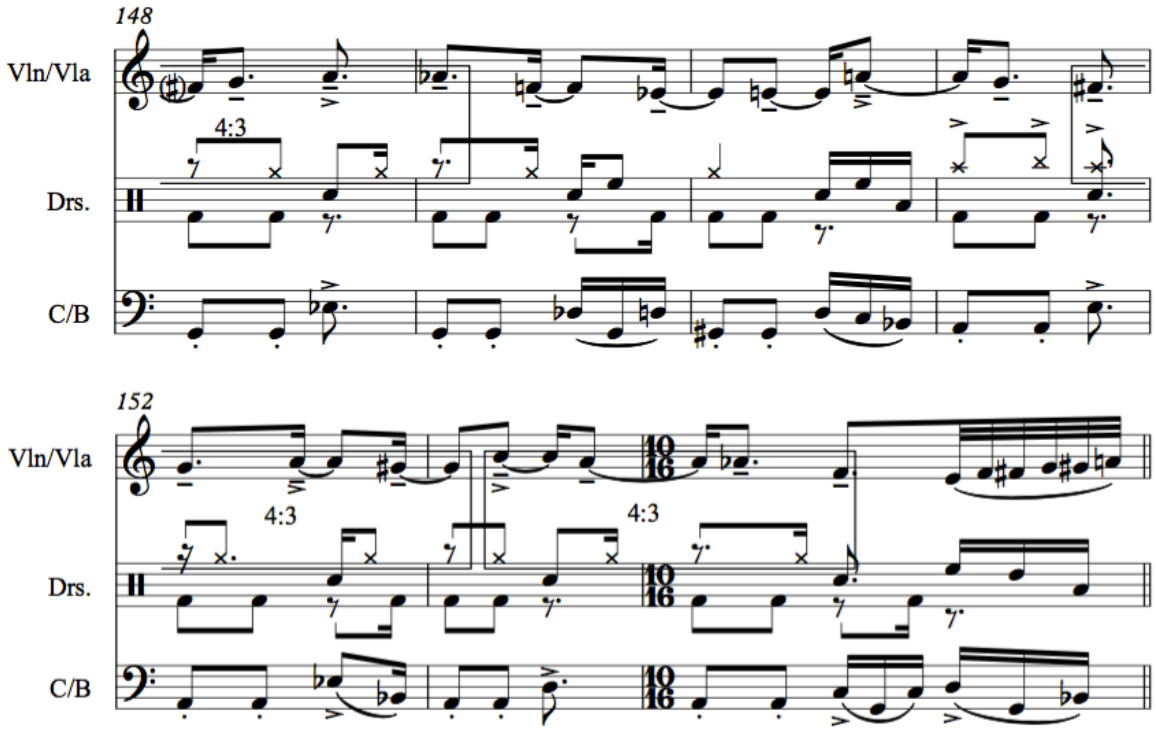
Musical Example 21: Polyrhythms and Polymeter in mm. 226-233

- **Rhythms that Irregularly Divide Measures and Cross Bar Lines**

Armageddon also contains a number of rhythms that irregularly divide measures and crossover bar lines in a similar manner to "Clockworks" and "Swarm." This can be found in mm. 137-154 (musical example 22) and again in mm. 165-182. The cello and double bass are playing in 7/16. The violin and viola, however, come in with a constant dotted quarter-note pattern. The drum set, although largely playing in 7/16, contains a mostly steady quarter-note pattern in the hi-hat. Since the upper strings play constant dotted quarter notes while the hi-hat mostly plays constant quarter notes, eight instances of a four-against-three polyrhythm occur in the passage.



Musical Example 22: *Armageddon* mm. 137-147



Musical Example 22 Continued: *Armageddon* mm. 148-154

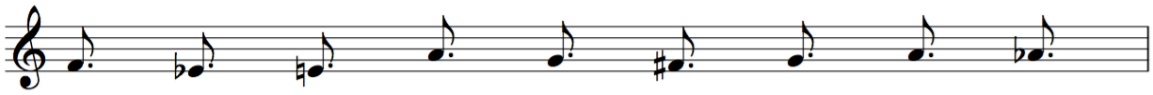
- **Musical Cryptogram**

Although not a Meshuggah technique, a musical cryptogram was used to generate melodic material in *Armageddon's* B section. It is a fun compositional technique to employ that still keeps with the Meshuggah theme. The cryptogram can be heard in the violin and viola parts in mm. 137-154 illustrated in musical example 22 above. This particular musical cryptogram spells out the band's name. To get the results, all letters that are musical pitches are laid out in a row with all non-musical letters placed in columns underneath them. All non-musical letters in a particular word are counted as the musical pitch at the top of the column (**in bold**). The results for M-E-S-H-U-G-G-A-H

are F-E-E-A-G-G-G-A-A. That result, however, does not suit the harmony already in use, but when altered to F-Eb-E-A-G-Gb-G-A-Ab, a well-suited, very interesting line (similar to one of Fredrik Thordendal's hypnotic lead guitar loops) is produced (musical example 23). The line does undergo some alterations here and there throughout the passage, but it can be heard in full many times between mm. 137-154 and again in mm. 165-182.

A	**B**	**C**	**D**	**E**	**F**	**G**
H	I	J	K	L	M	N
O	P	Q	R	S	T	U
V	W	X	Y	Z		

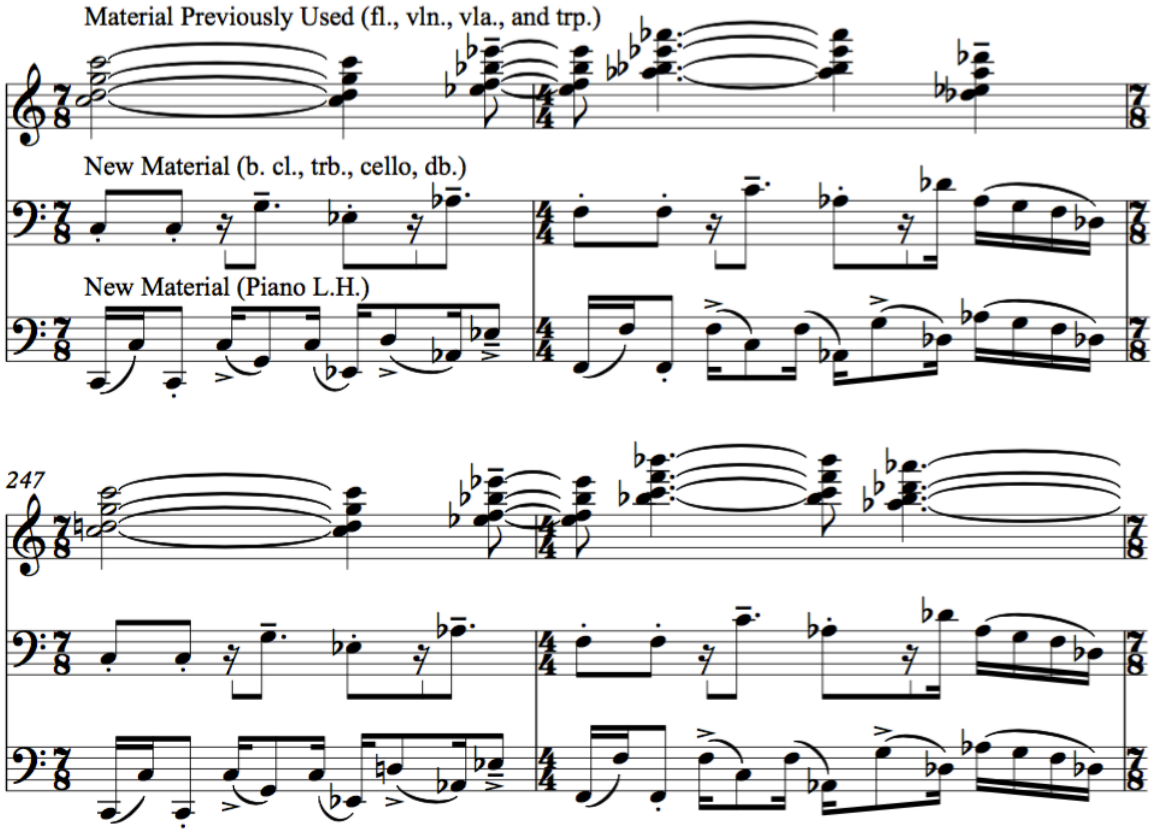
Table 2: Musical Cryptogram Chart



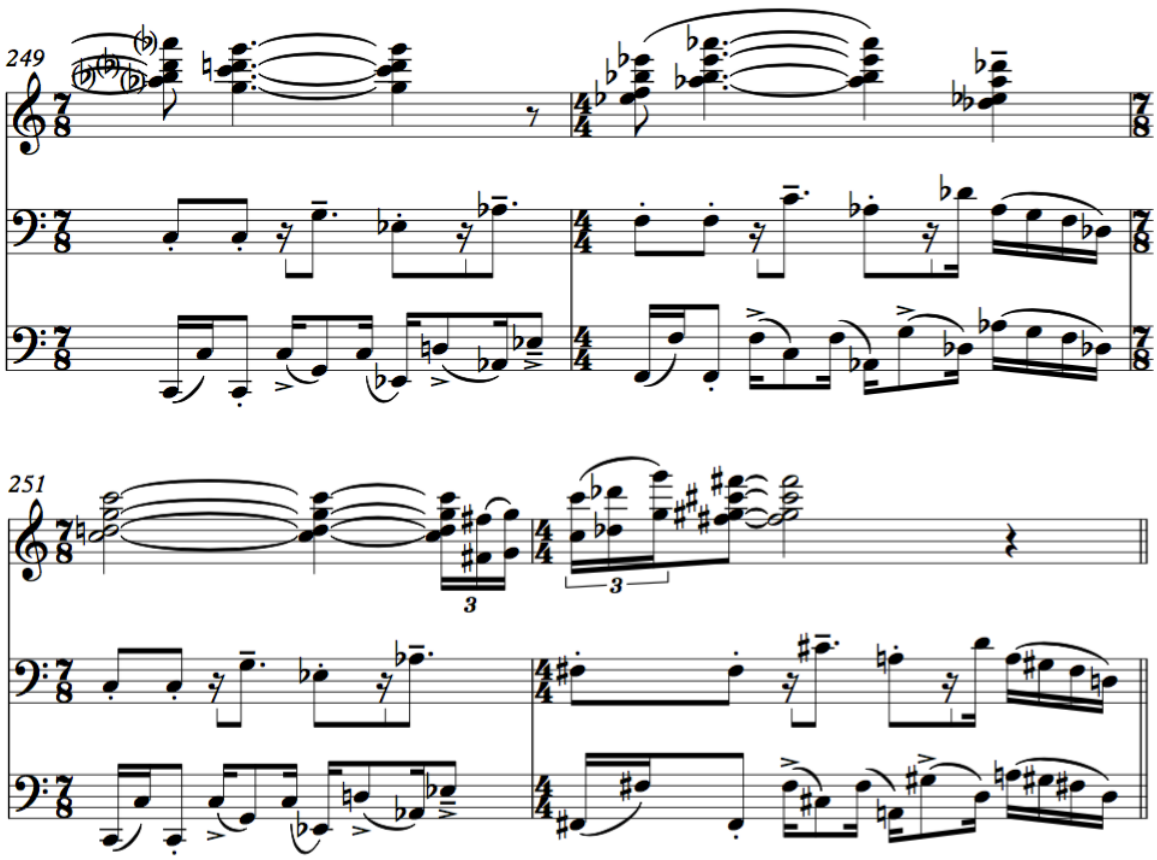
Musical Example 23: Musical Cryptogram Resultant Melody

- **Coda**

Similar to "Electric Red," *Armageddon* contains a coda. Unlike the coda in "Electric Red," *Armageddon's* coda is only partially made up of new material. The piano, bass clarinet, trombone, cello, and double bass introduce new material starting in m. 237. This is then juxtaposed in m. 245 (musical example 24) with a melody and harmony combination heard in the flute, trumpet, violin, and viola that is a reinterpretation of a melody previously used in mm. 58-65, 71-78, 102-109, and 226-233.



Musical Example 24: *Armageddon* Coda mm. 245-248



Musical Example 24 Continued: *Armageddon* Coda mm. 249-252

CHAPTER 4 – REFLECTION

I have been a fan of metal since middle school and Meshuggah since late high school. Writing *Armageddon* and this thesis is a culmination resulting from years of fandom. Although I have been a composer for just as long, this is the first time that I consciously composed something influenced by metal. There are primarily four things that I learned while composing *Armageddon* and writing this thesis.

One important discovery I made about myself is that I think like a drummer, not only when performing, but also when composing. When I was creating polymetric cycles for my piece, I noticed that I tend to think of them like phrases with a fill at the end, much like Tomas Haake does. He often breaks away from playing the groove at the ends of sections and phrases to play a drum fill, which is a relatively standard practice for most styles of music that involve the drum set. I allowed my riffs to repeat as many times as possible within a section, but at the ends of each section I inserted an extension that served as transitional, or fill-like material, into the next section. This is different from the guitars and bass, which usually continue the riff in the remaining space and then abruptly chop it off when the end of the section is reached. This is also similar to Haake's compositional method used in m. 49 of "Clockworks" (musical example 9).

In addition to being a drummer, I am also a pianist. While writing much of *Armageddon*, I used both the drum set and the piano as compositional tools. I usually do use the piano while composing, but using the drum set as a compositional tool was a new

experience for me. I also did something totally new by using the guitar and ukulele to compose most of the B section beginning in m. 115. Although I do play the ukulele, I do not play the guitar, and I have certainly never used either instrument as a compositional tool. This helped me think differently than I normally do and conceive ideas I might not otherwise have come up with. Likewise, other than Haake, most of the members of Meshuggah use the guitar or bass to write their songs. I sought to do something similar.

For the most part in Meshuggah's songs, the guitars and bass play riffs in different meters while the drums are playing in 4/4. Sometimes the lead guitar and vocals are also in 4/4. Although the lead guitar does involve pitch, the drums and vocals do not (Kidman uses death growls rather than pitches in the vocals). Because of this, the pitches used in the riffs do not usually clash with the 4/4 framework when they fall in and out of sync with each other. I, however, had to take great care in making sure the differing meters in *Armageddon* did not clash with each other when the cycles were taking place because most of the instruments utilized involve pitch. To solve this problem, sometimes it was necessary to alter the pitches of the riffs or the pitches of the 4/4 framework, so that they would not clash with each other.

I also learned, at Mr. Stafylakis' suggestion, that it is often necessary to put more instruments on a part than I normally would when writing low-register, metal-style riffs in order for it to translate. This is because the instruments used in metal are heavily amplified, electrified, and often distorted, which gives them a lot of energy and power.

The instruments in an acoustic ensemble, however, are not amplified, so more instruments on a single line are often crucial to capture the right essence of the music.

BIBLIOGRAPHY

Beller, Bryan. "Meshuggah's 'Future Breed Machine': Peter Nordin's Underground Class." *Bass Player*, December 2006.

Berger, Harris M. "The Practice of Perception: Multi-Functionality and Time in the Musical Experiences of a Heavy Metal Drummer." *Ethnomusicology* 41, no. 3 (1997): 464-488.

Capuzzo, Guy. "Rhythmic Deviance in the Music of Meshuggah." *Music Theory Spectrum* 40, no. 1 (2018): 121-137.

Eskelinen, Petri. "Meshuggah Interview." June 19, 2007, video, 9:56, https://www.youtube.com/watch?v=Yd7T5rOmS3w&t=89s.

FaceCulture. "Interview Meshuggah - Jens Kidman." June 21, 2008, video, 3:51, https://www.youtube.com/watch?v=uTeuNxSpR5s.

Huron, David. *Sweet Anticipation: Music and the Psychology of Expectation*. Cambridge: MIT Press, 2006.

Jurek, Thom. "Meshuggah: *The Violent Sleep of Reason*." AllMusic, accessed March 8, 2020, https://www.allmusic.com/album/the-violent-sleep-of-reason-mw0002969441.

Lucas, Olivia R. "'So Complete in Beautiful Deformity': Unexpected Beginnings and Rotated Riffs in Meshuggah's *obZen*." *Music Theory Online* 24, No. 3 (September 2018). http://mtosmt.org/issues/mto.18.24.3/mto.18.24.3.lucas.html.

Lynch, Joe. "Grammys 2018: See the Complete List of Nominees." Billboard, November 28, 2017, https://www.billboard.com/articles/news/grammys/8047027/grammys-2018-complete-nominees-list.

Meshuggah, "The Demon's Name Is Surveillance." track 2 on *Koloss*. Nuclear Blast NB 2388-2, 2012.

Parillo, Michael. "External Combustion: Meshuggah's Tomas Haake." *Modern Drummer*, May 2008.

Partridge, Lewis. “Herta,” Ninja Drumist.com, 2010. http://www.ninjadrummist.com/drum-rudiments/hybrid-rudiments/herta-21/.

Pieslak, Jonathan. “Re-casting Metal: Rhythm and Meter in the Music of Meshuggah.” *Music Theory Spectrum* 29, no. 2 (2007): 219-246.

Revill, Simon. “Gallop Rhythms for Heavy Metal Guitar, Part 1.” *Guitar World*, April 13, 2017. https://www.google.com/amp/s/www.guitarworld.com/amp/lessons/gallop-rhythms-heavy-metal-guitar-part-1.

Revill, Simon. “Gallop Rhythms for Heavy Metal Guitar, Part 2.” *Guitar World*, August 1, 2018. https://www.google.com/amp/s/www.guitarworld.com/amp/lessons/gallop-rhythms-heavy-metal-guitar-part-2.

Roig-Francolí, Miguel A. *Understanding Post-Tonal Music*. New York: Taylor and Francis, 2020.

Smialek, Eric T. “Rethinking Metal Aesthetics: Complexity, Authenticity, and Audience in Meshuggah's *I* and *Catch Thirtythr33*.” Master’s Thesis, McGill University, 2008.

Smith, Rod. “Meshuggah.” *Decibel*, 2005. https://web.archive.org/web/20051129013121/http://decibelmagazine.com/features/jun2005/meshuggah.aspx.

Stafylakis, Harry. “Altered States: Metrical Dissonance in the Music of TesseracT.” Paper presented at the annual conference of the Temple University Theory and Musicology Society [THEMUS], Philadelphia, PA, April 19, 2014.

VITA

After graduating from The Pennsylvania Cyber Charter School, Midland, Pennsylvania, in 2007, Adam J. Benefield attended East Stroudsburg University of Pennsylvania, East Stroudsburg, Pennsylvania, where he majored in classical piano. He later transferred to Moravian College, Bethlehem, Pennsylvania, in 2010 where he pursued composition and jazz drum set performance. While at Moravian College he had the opportunity to participate in a master class with Harry Connick, Jr. and play drum set in the premier of Mr. Connick's musical *The Happy Elf*. Adam received a Bachelor of Music degree in composition from Moravian College in May 2013. After graduating, he worked as a ragtime pianist in Skagway, AK, for six months. He later moved to New York City in 2014 where he worked as a teacher, arranger, and accompanist. Adam entered back into the world of academia in 2018 when he began pursuing a Master of Music degree at Stephen F. Austin State University, Nacogdoches, Texas.

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