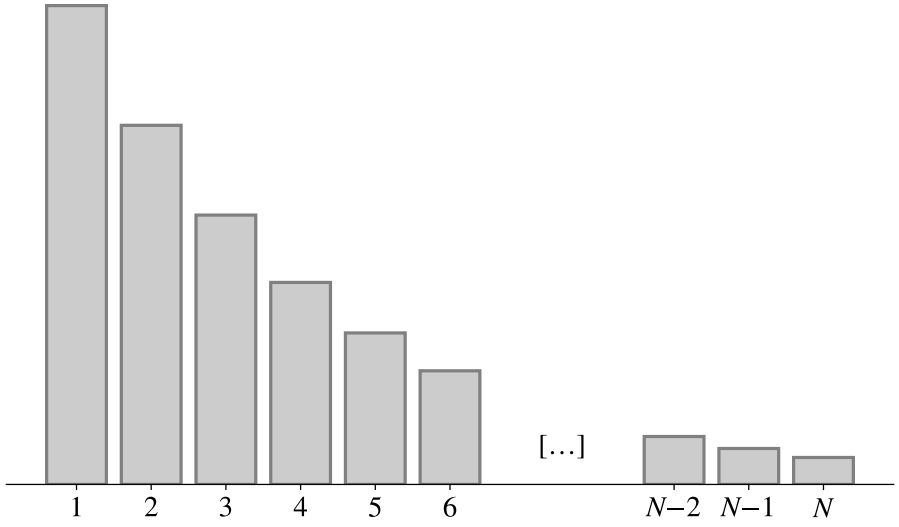
Gilberto Agostinho

Cartographies

2017–2020

Full Scores

All pieces in this series were composed using the following distribution:



$$P(n) = (3/4)^k \times P(n-k)$$

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Contents

Cartography #1, for piano and vibraphone

Mapping and rules

pitches

set size	$N = 6$
transformation period	$8 \times$ ♩
transformation mechanism	$[a, b, c, d, e, f] \rightarrow [b, c, d, e, f, g]$, with uniformly randomly selected g between F3 and E5 such that $g \bmod 12 \neq x \bmod 12$, $\forall x \in [a, b, c, d, e, f]$.
initial set	[G4, D4, E♭4, A4, F4, B4]

articulations

set size	$N = 6$
transformation period	no transformation.
set	[∅, ∅, ∅, >, >, ^], where ∅ represents no articulation.
selection mechanism	accents are tied to pitches, so when a random index has been generated to select a pitch, this same index also selects an accent.

durations (vibraphone)

set size	$N = 8$
transformation period	$32 \times$ ♩
transformation mechanism	$[a, b, c, \ldots, g, h] \rightarrow [a-1, a-2, a-3, \ldots, a-7, a-8]$, where an element equals to 1 if $a-k < 1$.
initial set	$[10, 9, 8, 7, 6, 5, 4, 3]$

durations (piano)

set size	$N = 8$
transformation period	$32 \times$ ♩
transformation mechanism	$[a, b, c, \ldots, g, h] \rightarrow [a+1, a, a-1, \ldots, a-5, a-6]$, where an element equals to 1 if $a - k < 1$.
initial set	$[1, 1, 1, 1, 1, 1, 1, 1]$

constraints

- number of pitch transformations: 40.
- number of duration transformations: 10.
- the piece begins with the vibraphone and the piano playing at the same time.
- the last note of the piano will dictate the last note of the vibraphone.

General performance notes

- all notes are notated as sixteenth-notes, but the effective durations are much longer due to the use of pedalling; that is, the notes represent the attack points only.
- this piece has no dynamic marks. Loudness is solely notated using marcato and martellato signs ($>$ and $\wedge$, respectively). Notes without articulations marks should be played as softly as possible (equivalent to $\boldsymbol{pp}$), notes with a marcato sign should have a medium level of loudness (equivalent to $\boldsymbol{mf}$) and notes with a martellato sign should have a high level of loudness (equivalent to $\boldsymbol{f}$).
- the vibraphone's motor should remain off throughout the piece.
- the vibraphone's pedal should be held down throughout the piece; the performer may flush it ad libitum.
- the piano's sustain pedal should be held halfway down throughout the piece. A good reference point for this is when individual note lengths cannot be precisely perceived (that is, the sound is not cut when releasing a key). Some instruments and acoustic spaces might call for slightly different pedalling (at the discretion of the performer).
- after the last note of the piece, wait for a few seconds before raising the vibraphone's and piano's pedals.

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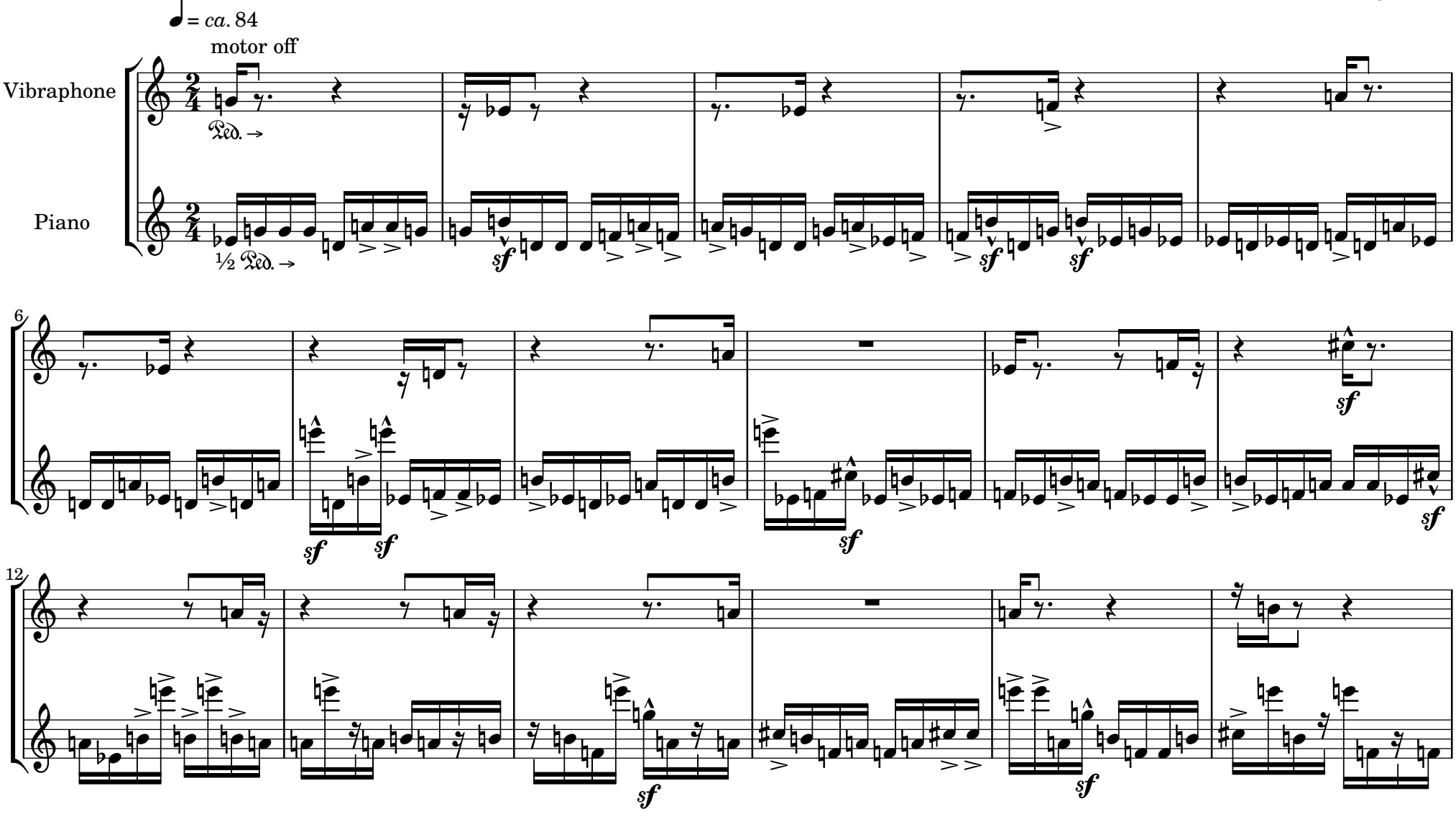
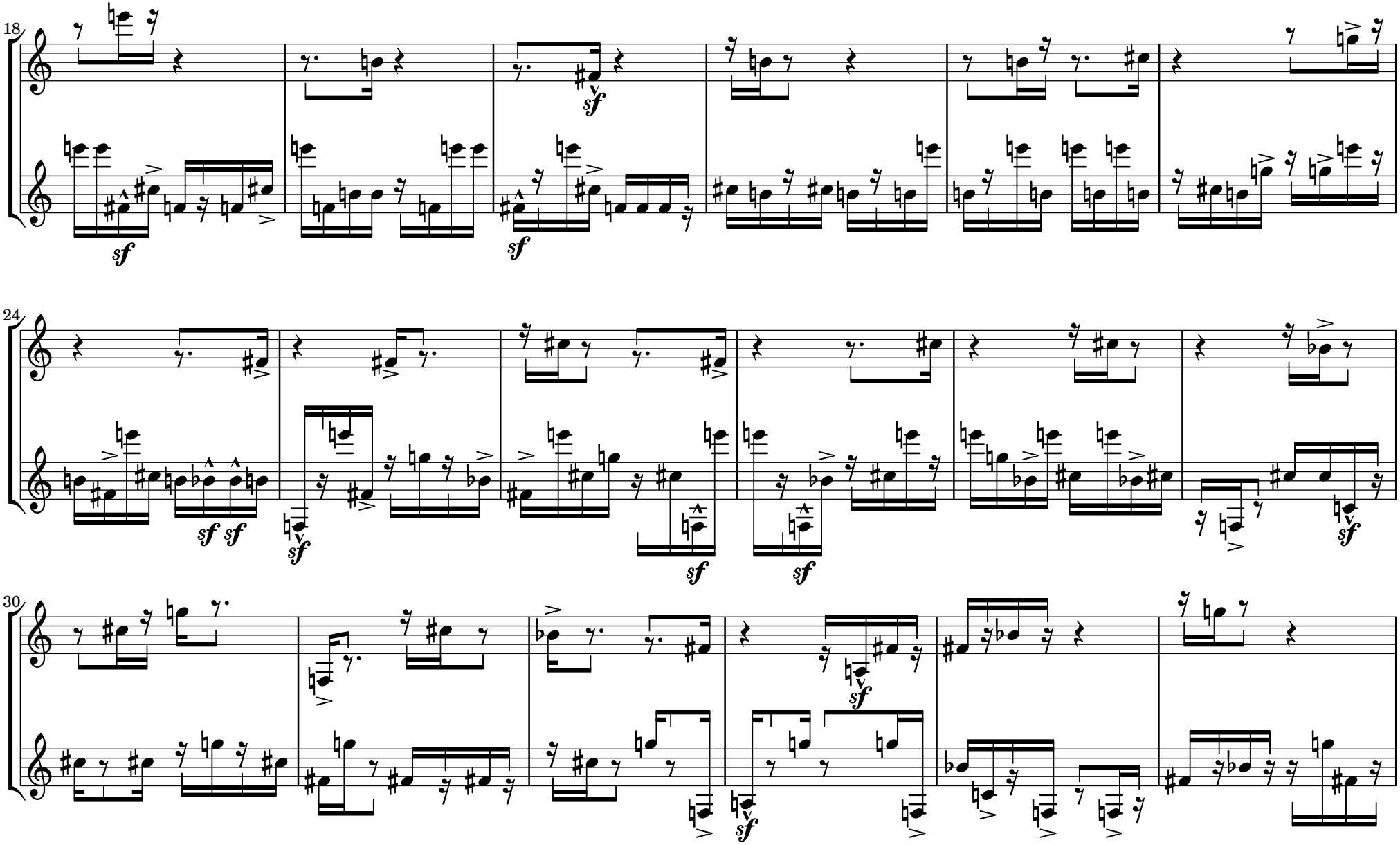
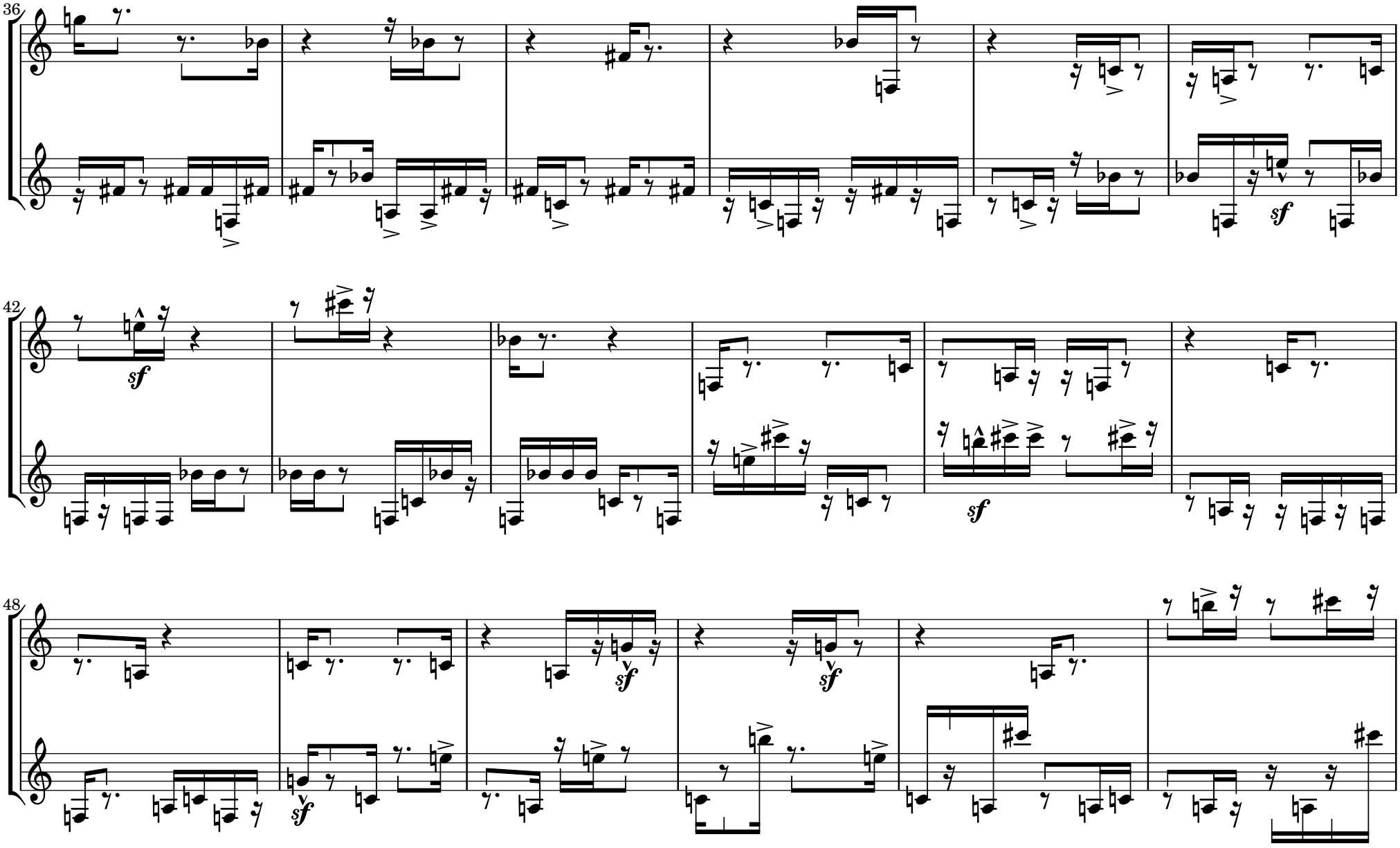
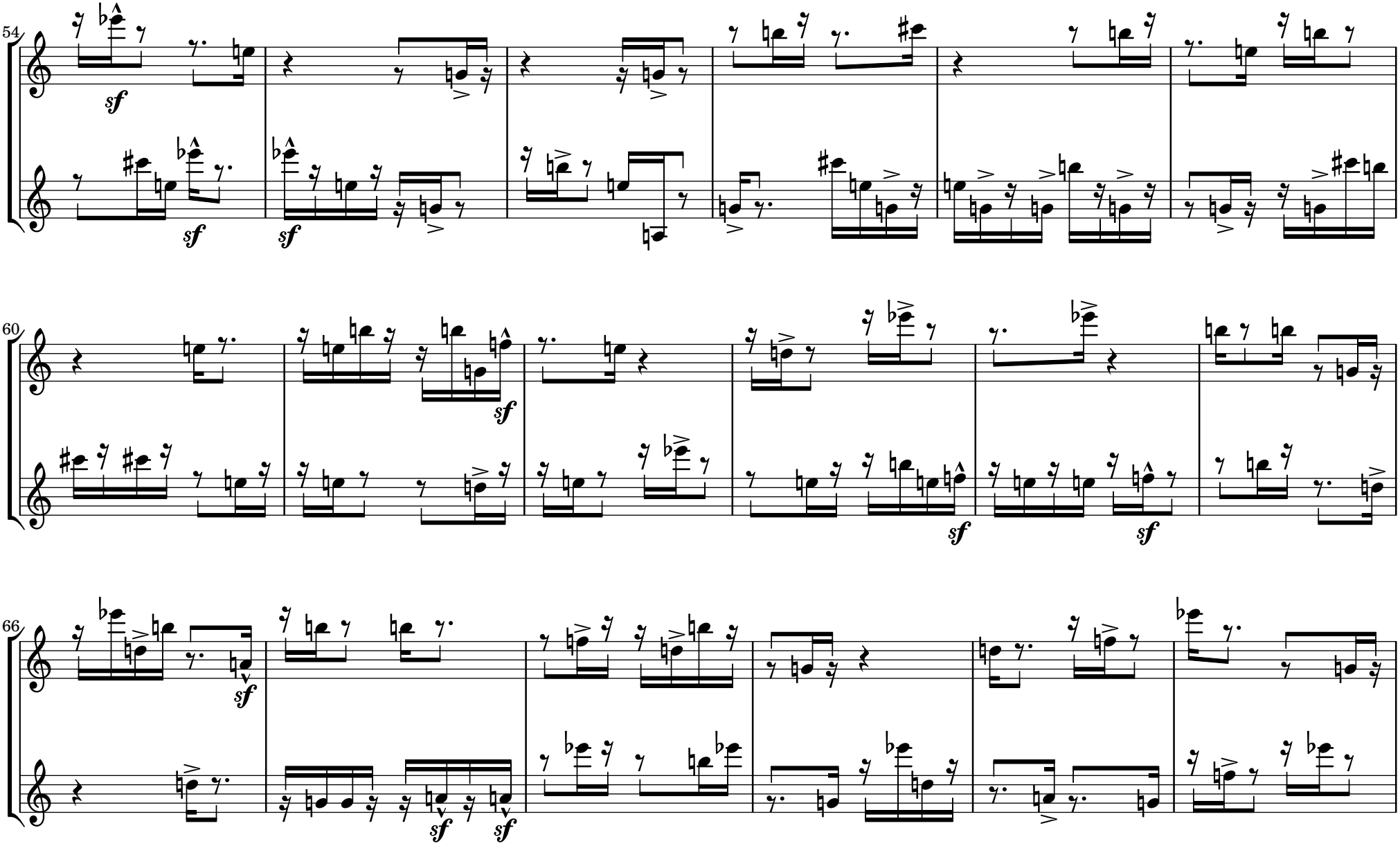
Cartography #1

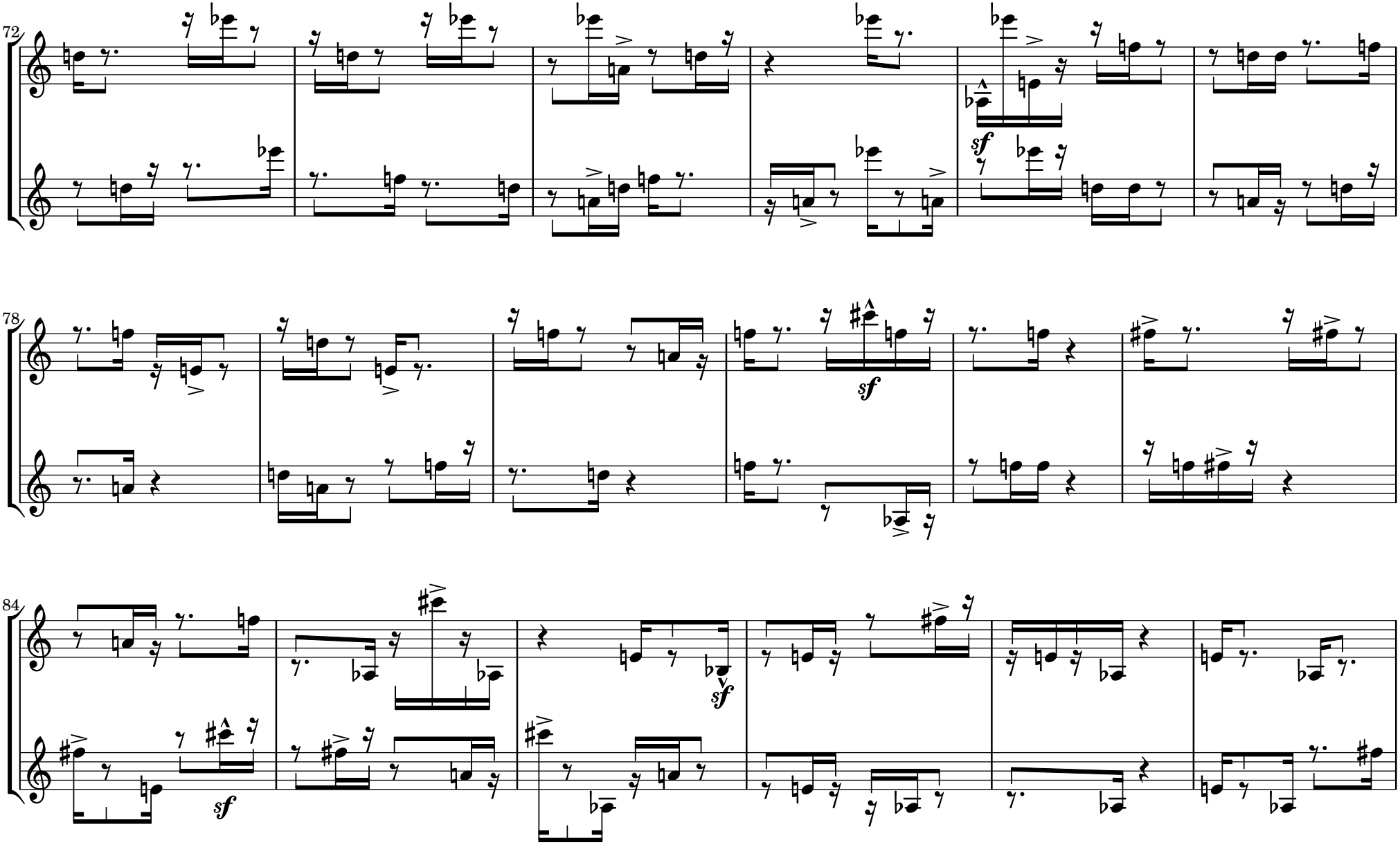
Gilberto Agostinho

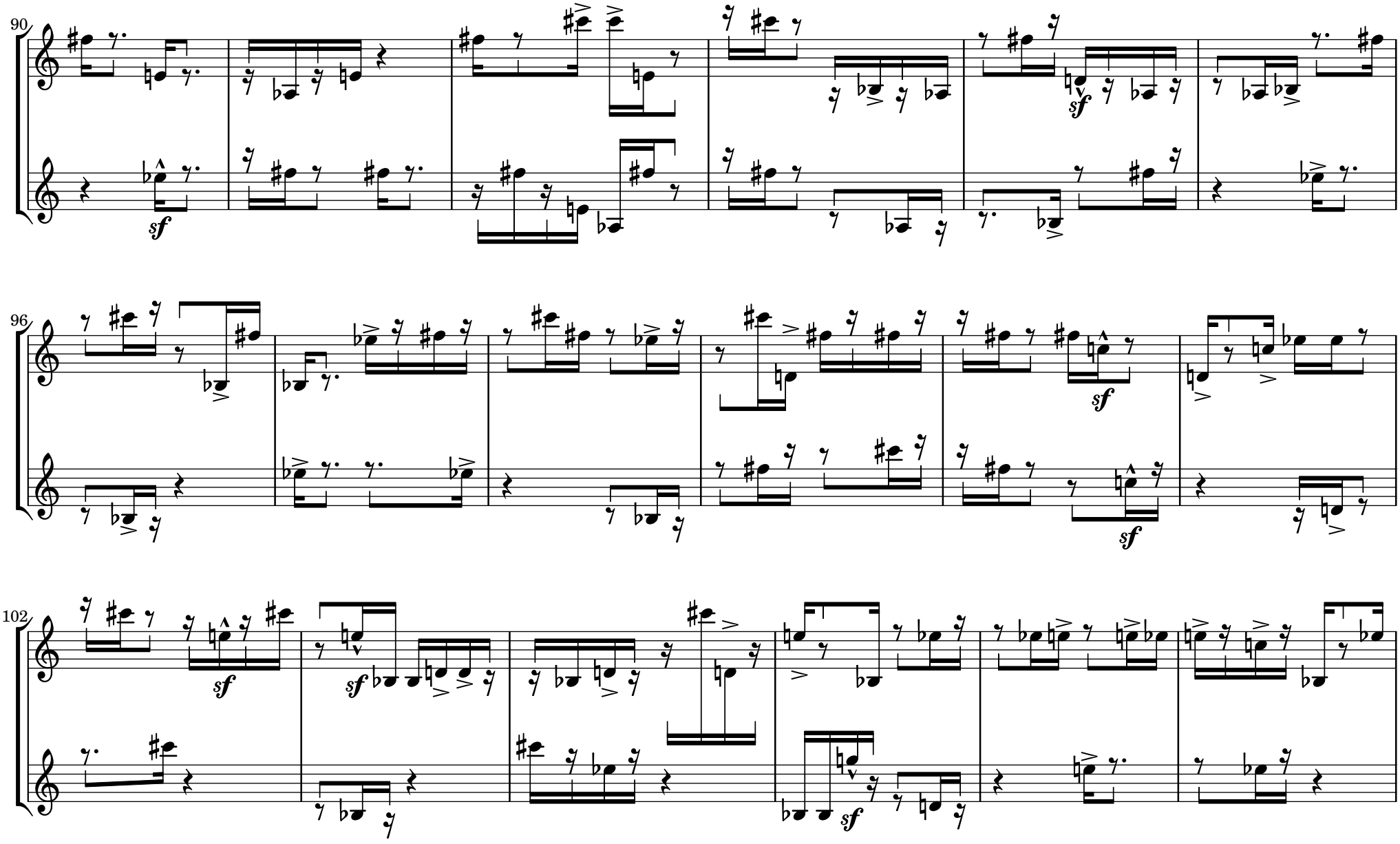


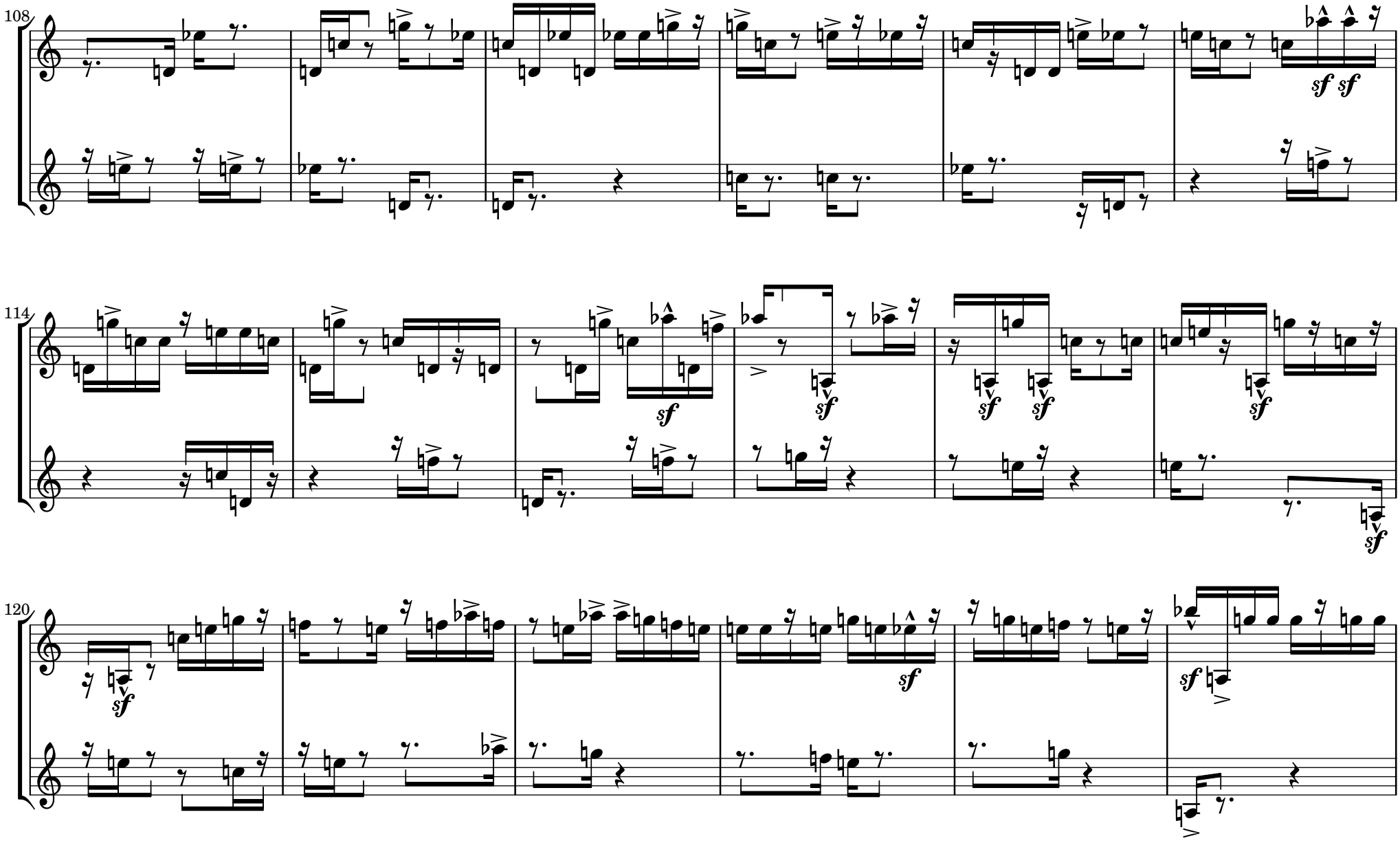

18
24
30


36
sf
42
sf
sf
48
sf
sf


54
60
66
sf


72
78
84
sf
sf
sf
sf


90
96
102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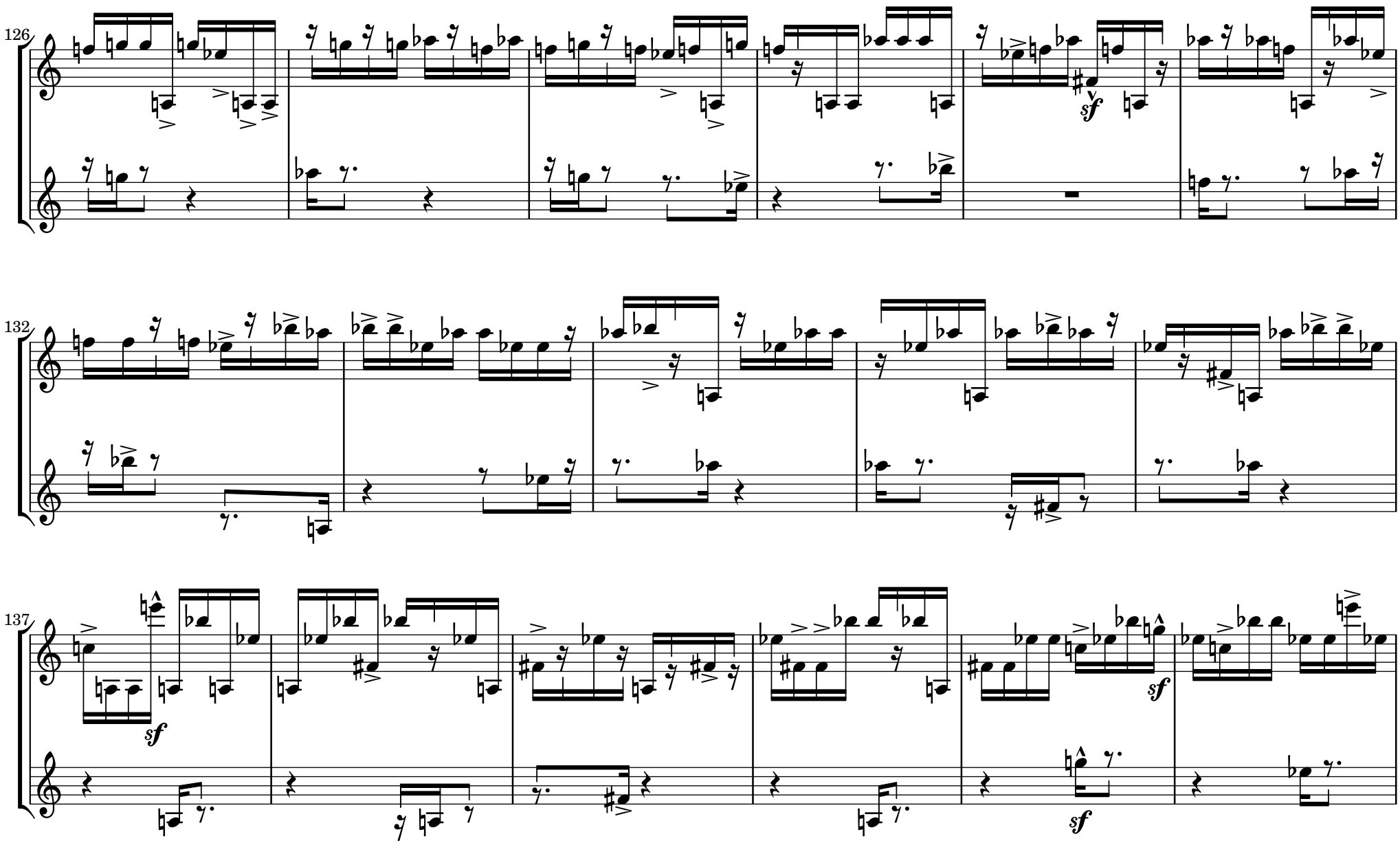
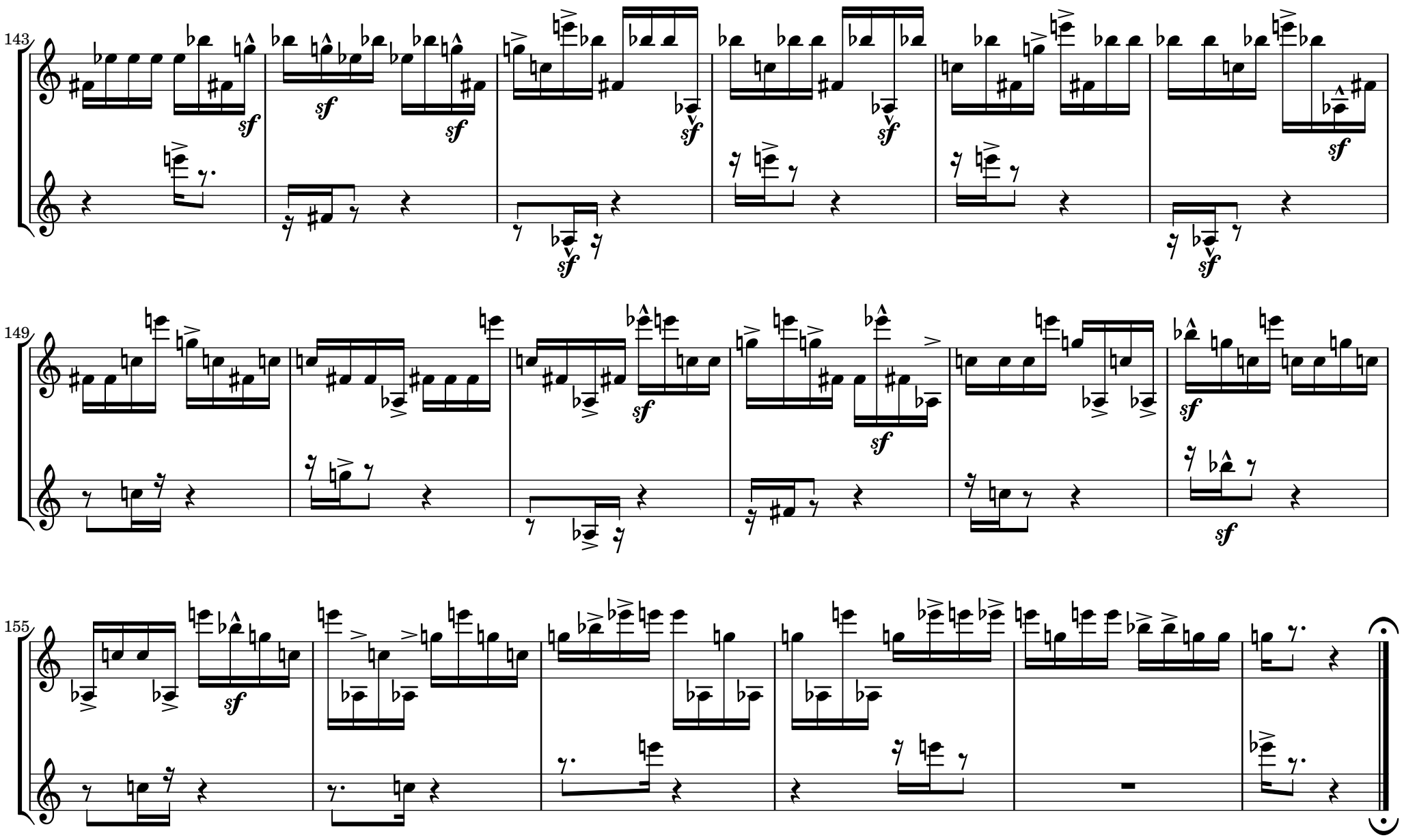
114
120


126
sf
132
137
sf
sf
sf


143
149
155

Cartography #2, for solo piano

Mapping and rules

pitches

set size	$N = 8$
transformation period	$8 \times$ ♪
transformation mechanism	$[a, b, c, d, e, f, g, h] \rightarrow [b, c, d, e, f, g, h, i]$, with $i \bmod 12 = (h \bmod 12) - 1$, and i at a uniformly randomly selected octave transposition.
initial set	[G4, F♯4, F4, E4, E♭4, D4, C♯4, C4]

dynamics

set size	$N = 6$
transformation period	no transformation.
set	[***ppp***, ***ppp***, ***mf***, ***mf***, ***fff***, ***fff***]

durations

set size	$N = 12$
transformation period	$8 \times$ ♪
transformation mechanism	swapping items from middle. For a set $[a, b, c, d, e, f, g, h, i, j, k, l]$, the first iteration swaps f and g, the second e and h, and so on, until the whole set is reversed. At that point, the process starts again, swapping from the middle of the reversed set.
initial set	$[1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12]$

constraints

- number of pitch transformations: 50.
- number of duration transformations: 50.

General performance notes

- the piano's sustain pedal should be held halfway down throughout the piece. A good reference point for this is when individual note lengths cannot be precisely perceived (that is, the sound is not cut when releasing a key). Some instruments and acoustic spaces might call for slightly different pedalling (at the discretion of the performer).
- after the last note of the piece, let the resonance disappear before raising the sustain pedal.

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Cartography #2

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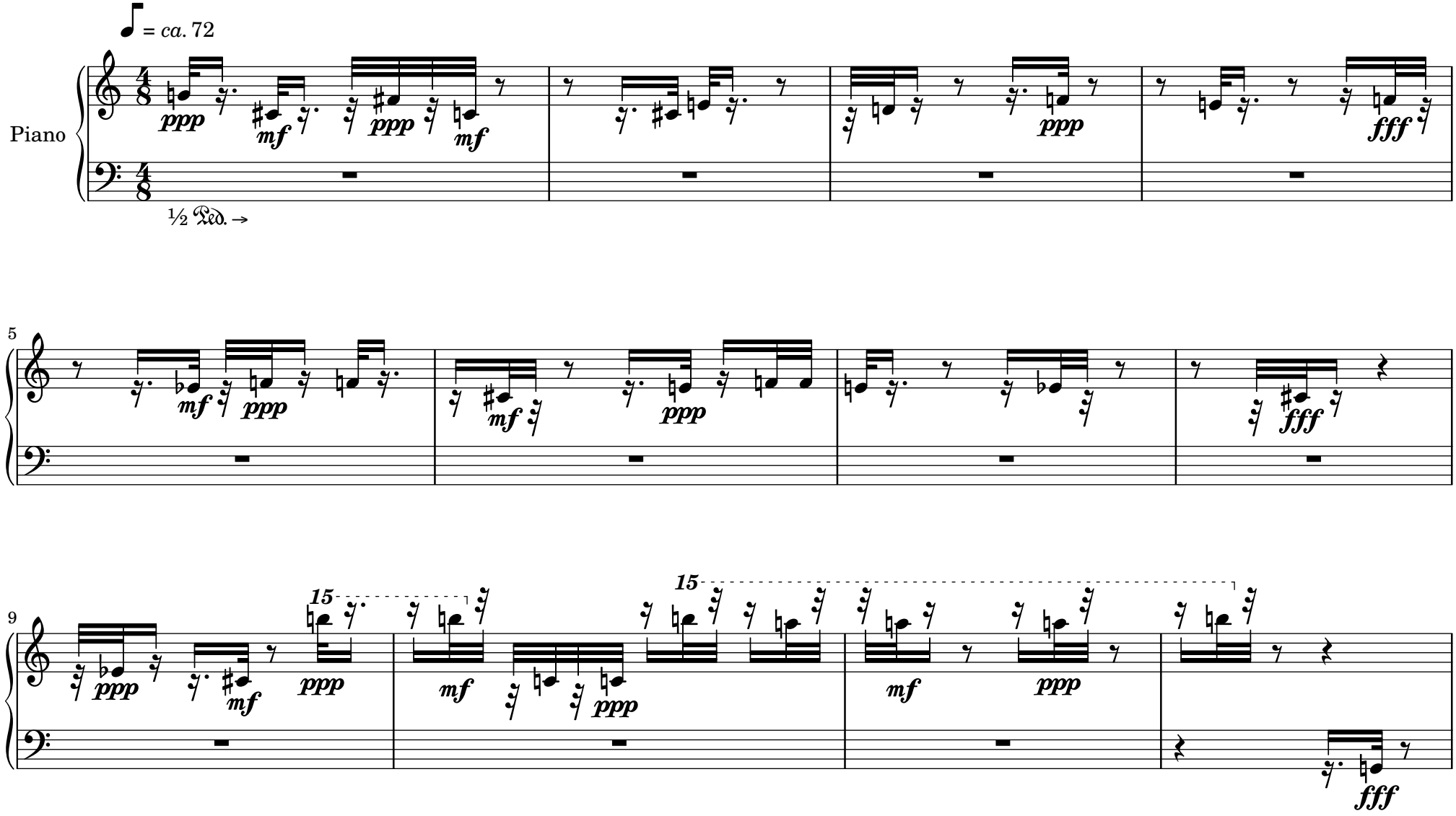

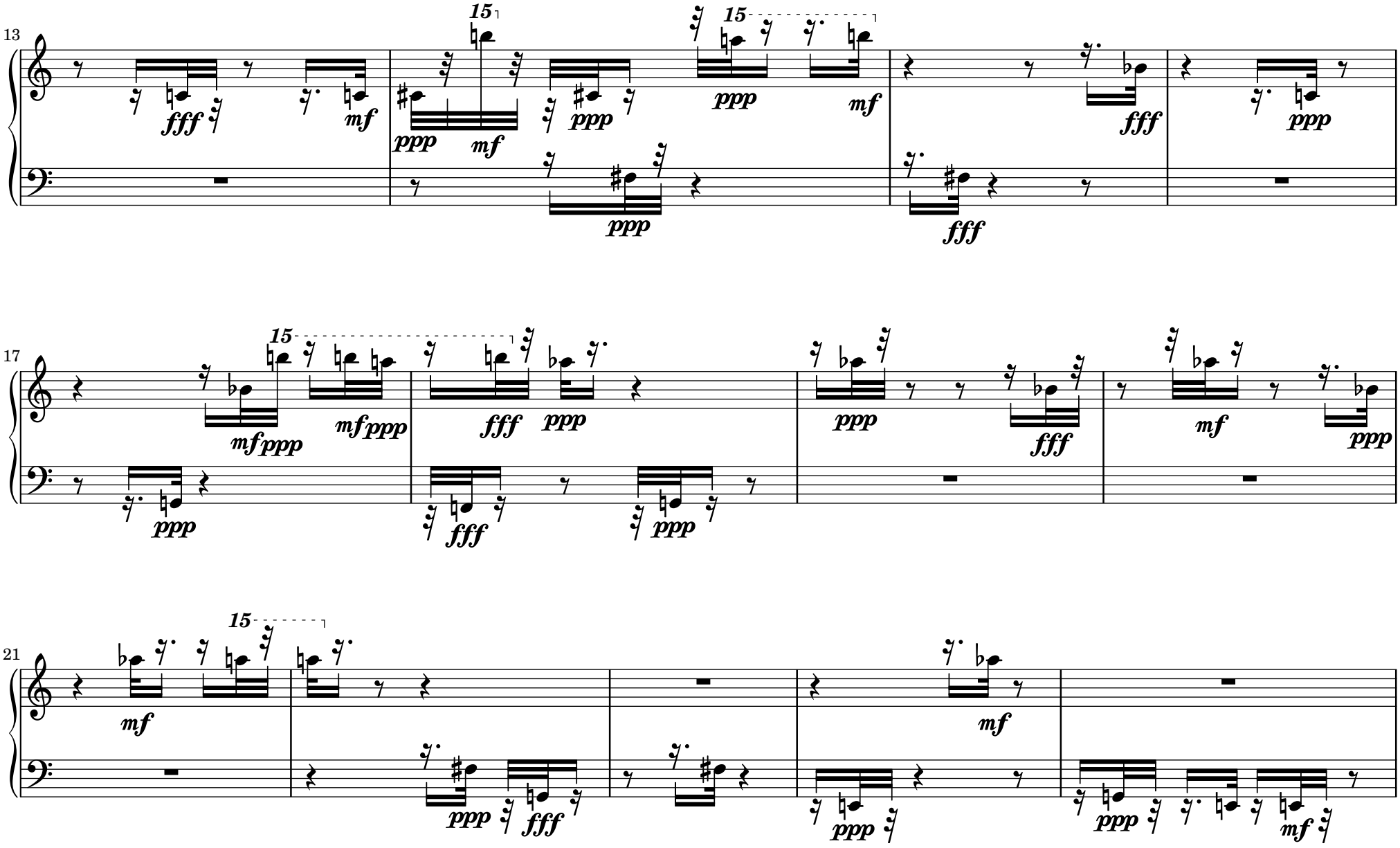
13
15
15
fff
mf
ppp
mf
ppp
ppp
mf
fff
ppp
ppp
fff
17
15
mf
ppp
mf
ppp
fff
ppp
ppp
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ppp
ppp
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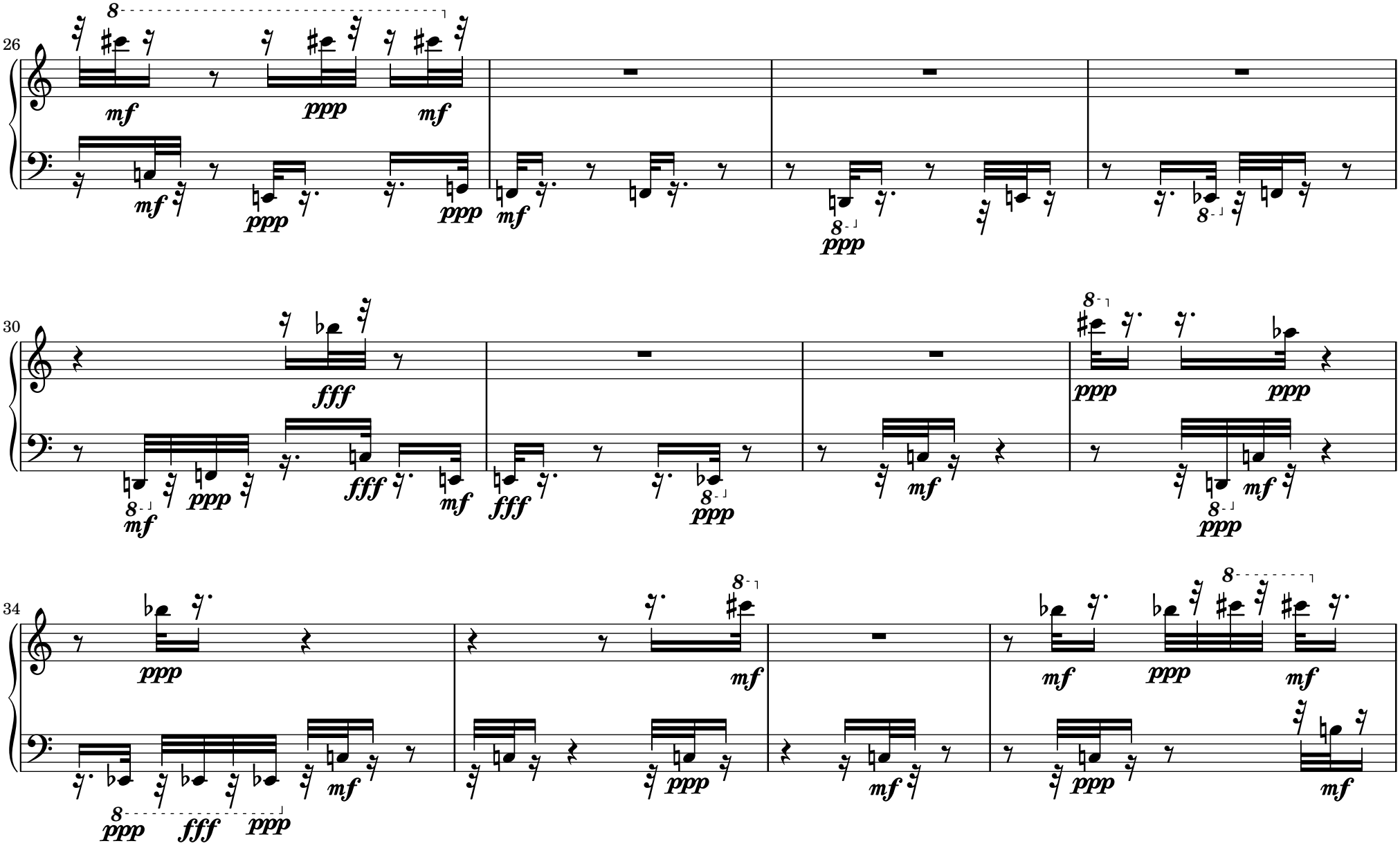
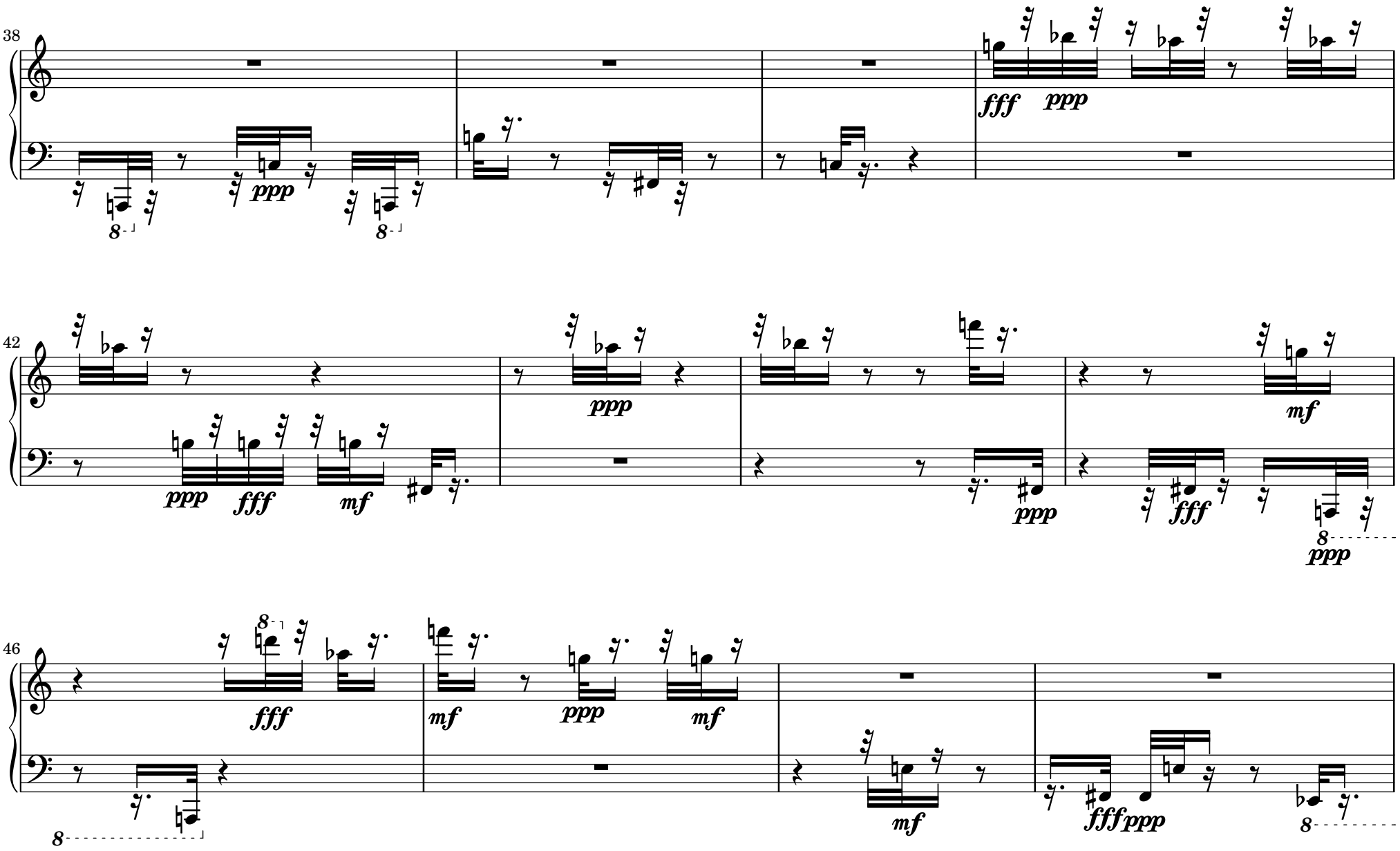
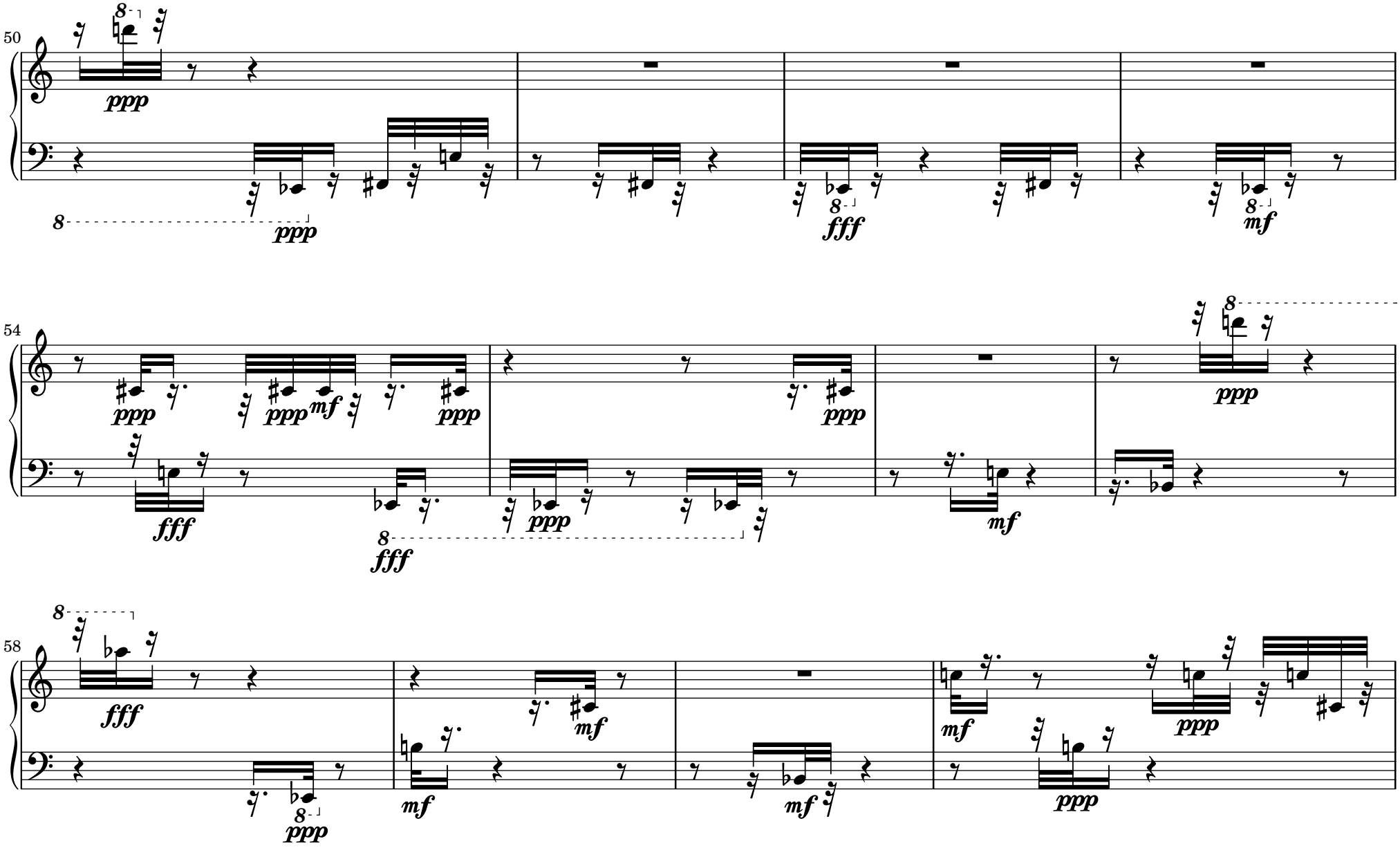
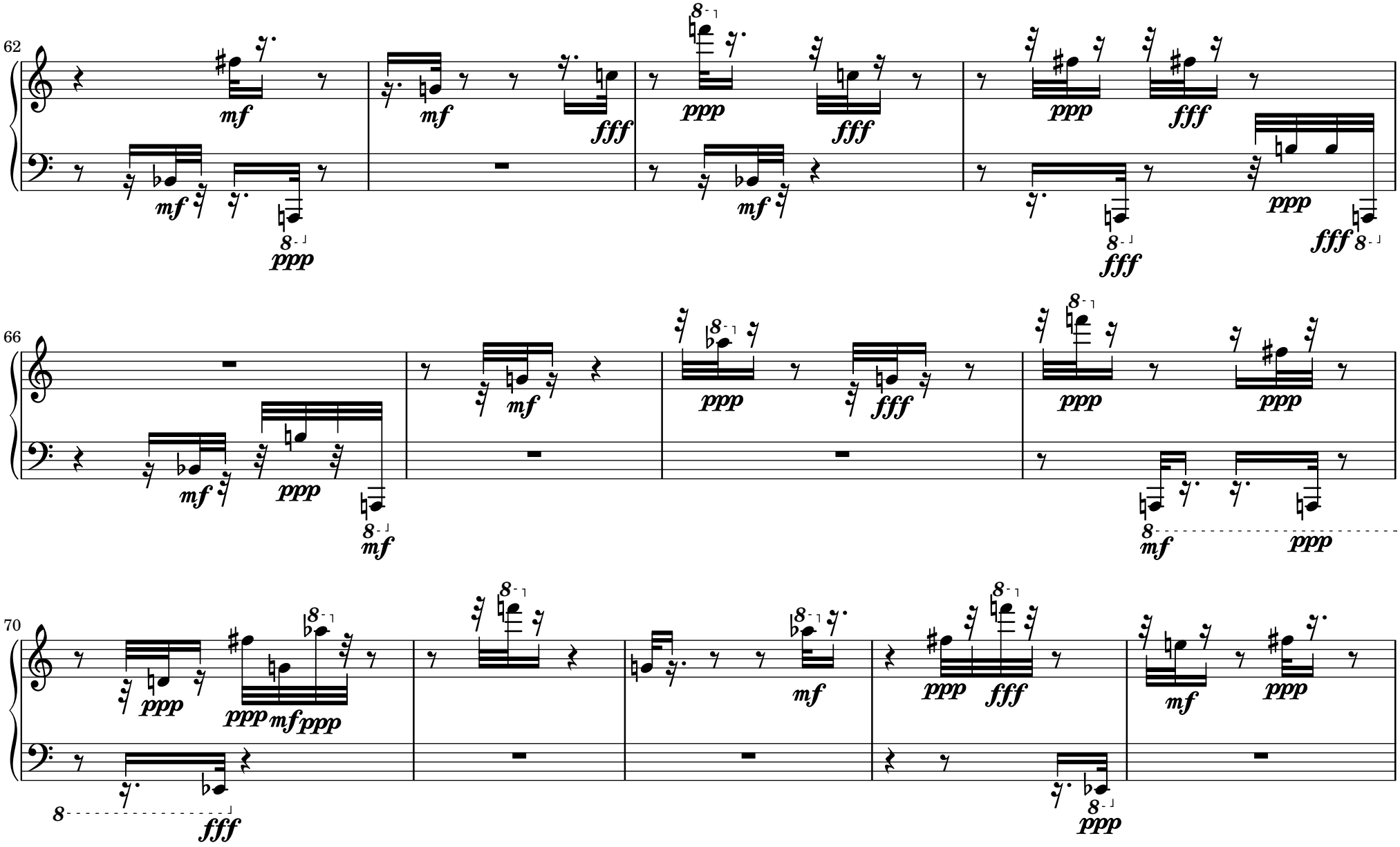
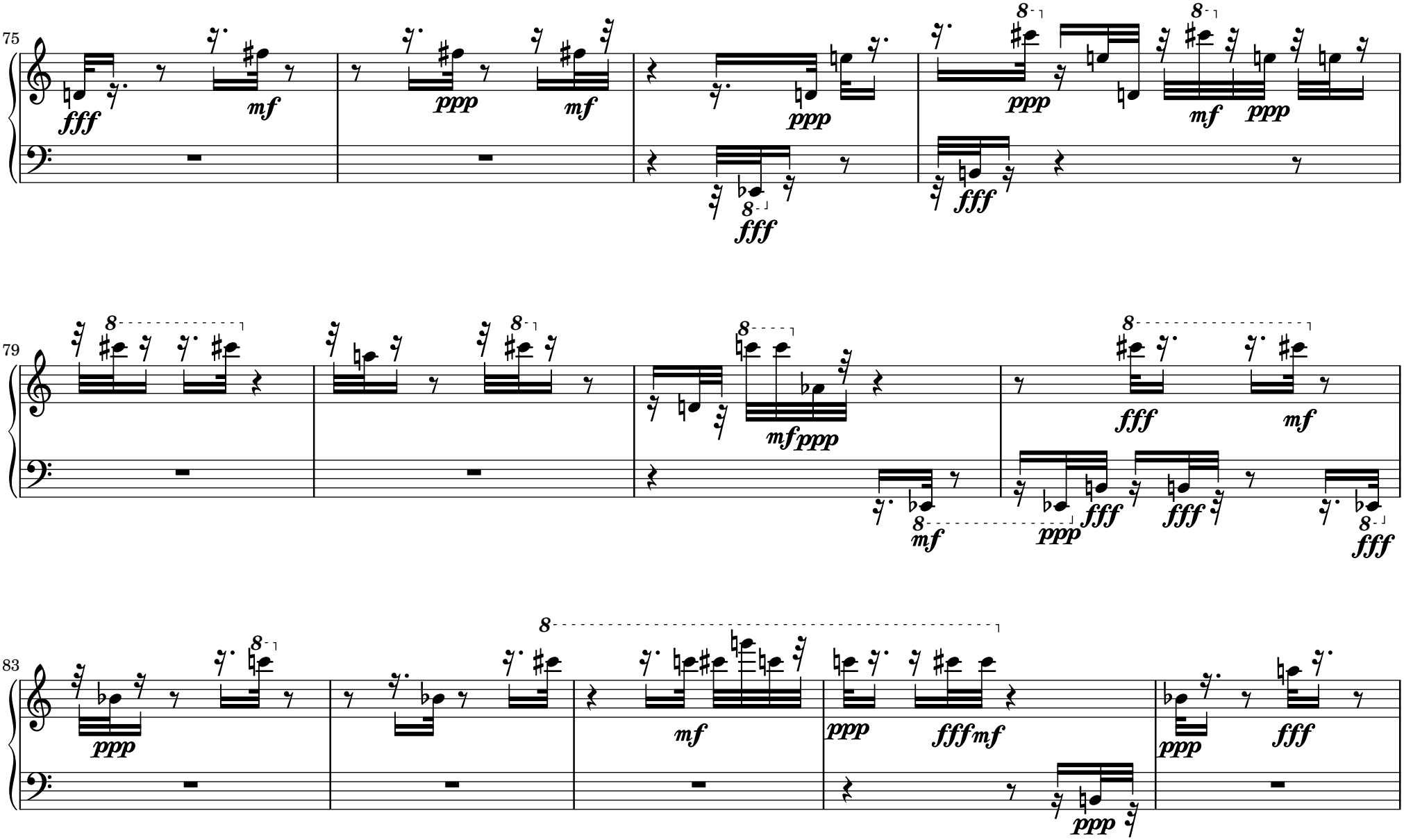
ppp
21
15
mf
ppp
fff
mf
ppp
ppp
mf


26
30
34


38
fff
ppp
ppp
8
8
42
ppp
ppp
fff
mf
ppp
mf
ppp
fff
8
ppp
46
8
fff
mf
ppp
mf
8
mf
fff
ppp
8


50
ppp
8
ppp
fff
mf
54
fff
ppp
mf
58
fff
mf
ppp


62
66
70


75
fff
mf
ppp
mf
ppp
ppp
fff
fff
mf
ppp
79
mf
ppp
fff
mf
mf
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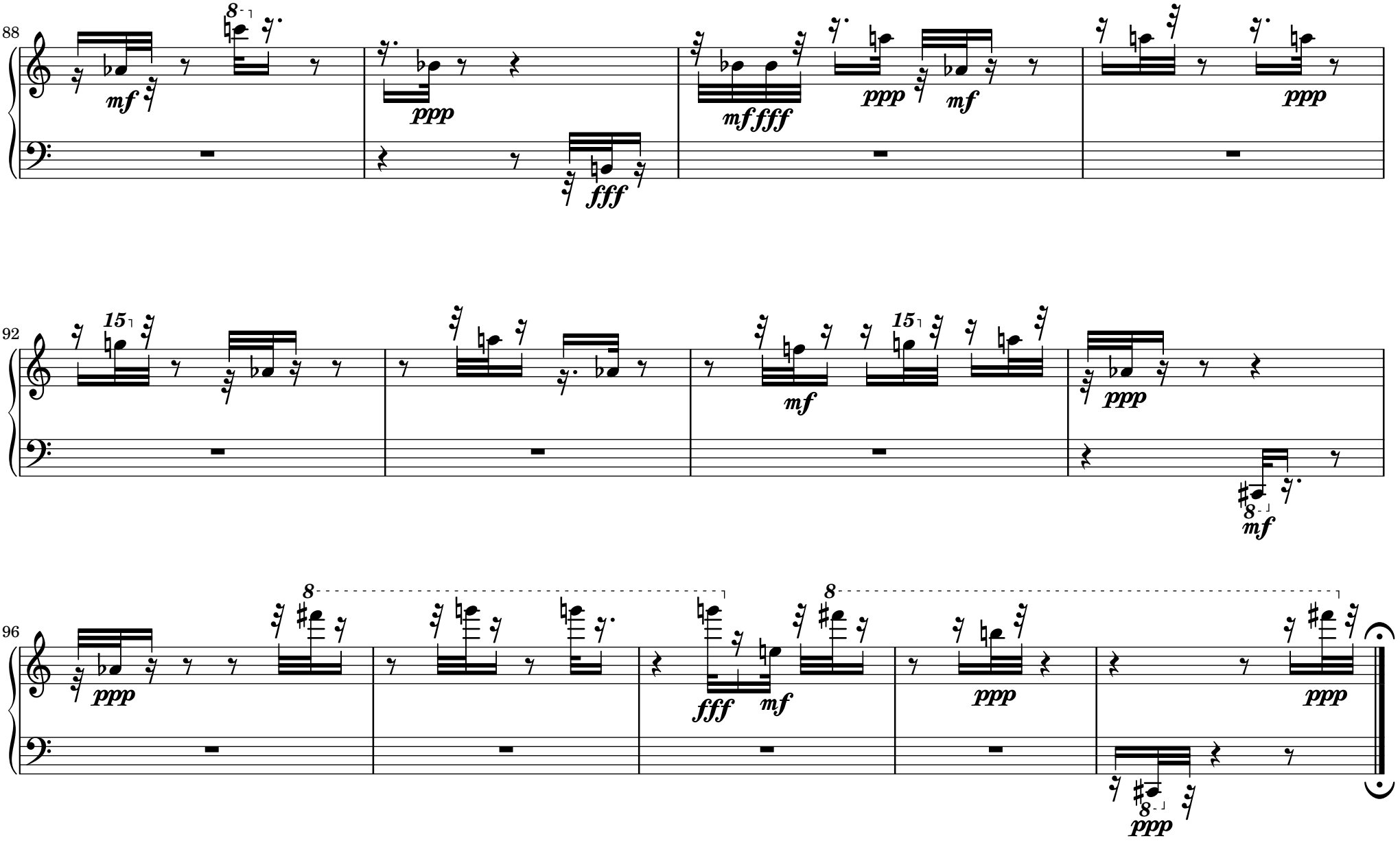
fff
fff
fff
83
ppp
mf
ppp
fff
mf
ppp
ppp
fff


88
mf
ppp
fff
mf fff
ppp
mf
ppp
92
15
mf
15
ppp
mf
96
ppp
fff
mf
ppp
ppp
ppp

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Cartography #3, for solo guitar

Mapping and rules

number of notes per chord

set size	$N = 5$
transformation period	no transformation.
set	$[1, 2, 3, 4, 0]$, where 0 represents a rest.

pitches

set size	$N = 4$
transformation period	every new note/chord event.
transformation mechanism	first, four random strings are selected. Barring is then uniformly randomly selected from the values {0–6}. After, the number of strings with fingered frets is uniformly randomly selected from the values {0–3}, and the fingered frets of a string can be one or two positions from the barred fret. There is a 20% of chance that the bottom note will be an unbarred E2. A set must also follow the constraints that no major or minor thirds are allowed between any two elements and that pitch classes must be unique in the set.

arpeggios for 3-note chords

set size	$N = 2$
transformation period	no transformation.
set	[false, true]

durations

set size	$N = 6$
transformation period	$6 \times$ ♪
transformation mechanism	randomizing the set $[1, 2, 3, 4, 5, 6]$.
initial set	random.

dynamics

set size	$N = 6$
transformation period	no transformation.
set	[***pp***, ***p***, ***mp***, ***mf***, ***f***, ***ff***]

constraints

- number of duration transformations: 40.
- no major thirds, minor thirds or perfect octaves are allowed between any two elements in a chord.
- barre position range from 0 to 6 frets.
- number of fingered strings range from 0 to 3.
- fingered strings range from 1 to 2 frets distance from bar.
- 2-note chords cannot have arpeggios.
- 4-note chords always have arpeggios.

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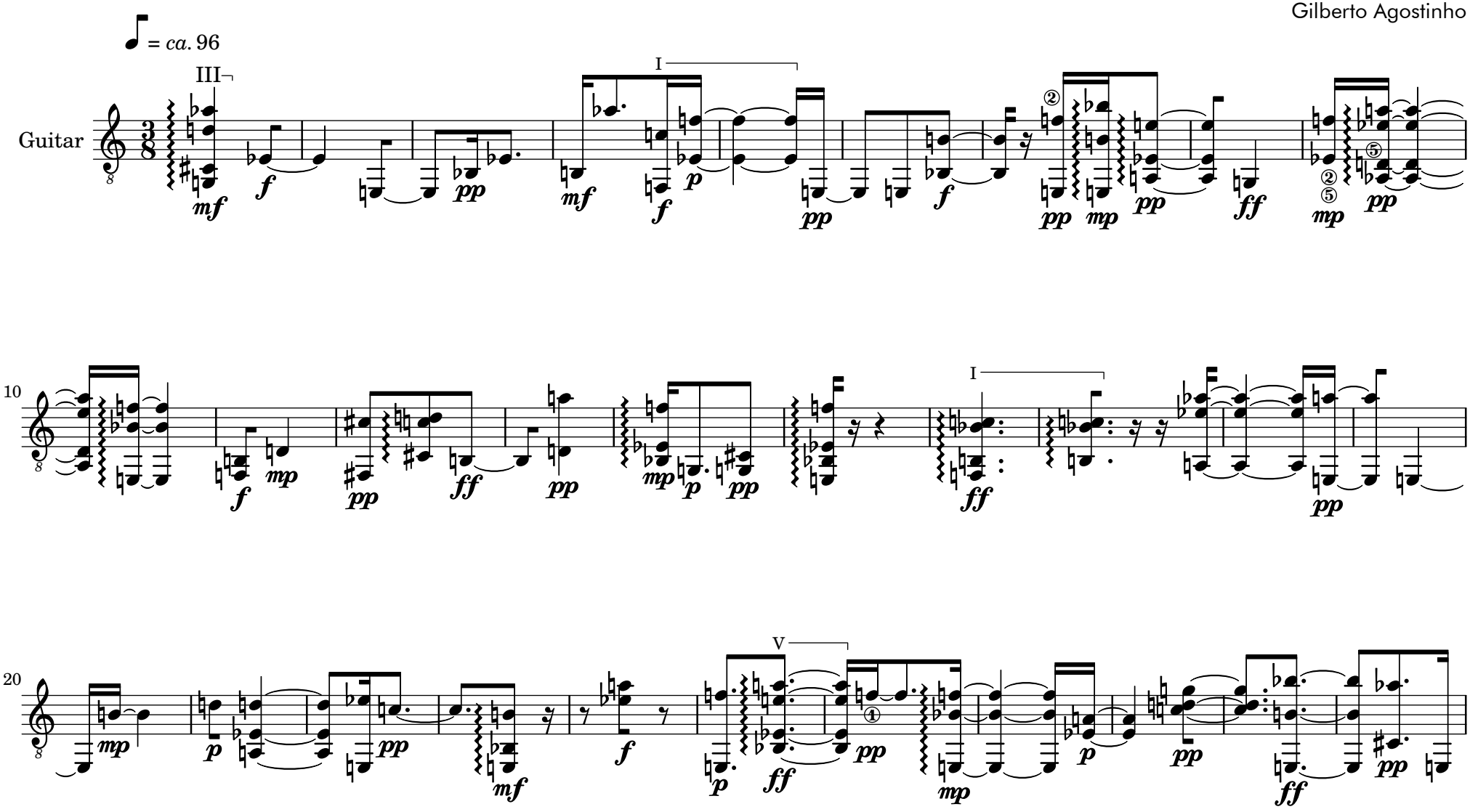
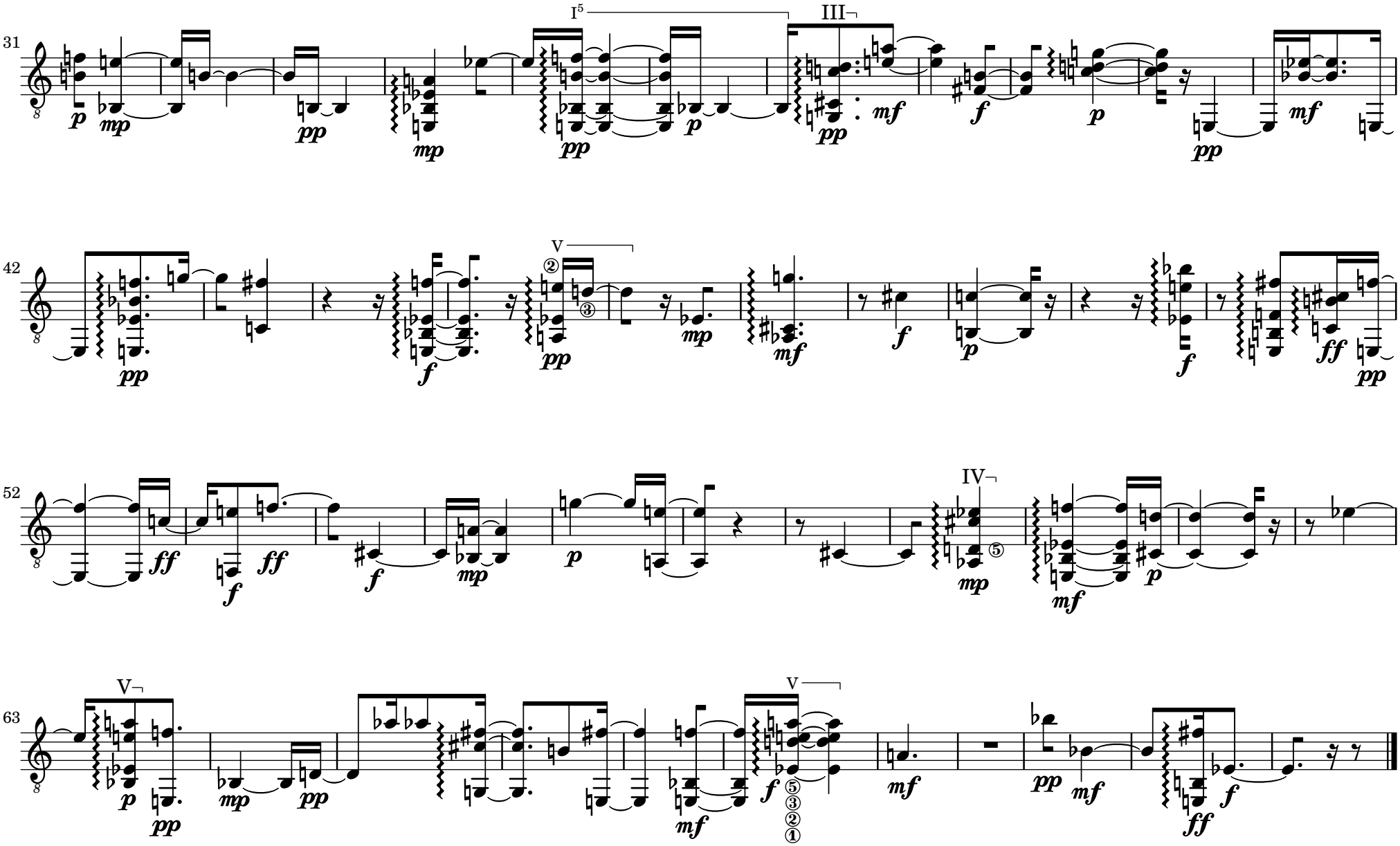
to Luciano Morais

Cartography #3

Gilberto Agostinho




31
I5
III¬
42
V
52
IV¬
63
V¬
V

Cartography #4, for flute, viola, and harp

Mapping and rules – first movement

tempi

set size	$N = 5$
transformation period	no transformation.
set	[♩ = 48, ♩ = 54, ♩ = 60, ♩ = 66, ♩ = 72]

pitches

set size	$N = 8$
transformation period	$16 \times$ ♪
transformation mechanism	$[a, b, c, d, e, f, g, h] \rightarrow [b, c, d, e, f, g, h, i]$, with $i \bmod 12 = (h \bmod 12) - 1$, and i at a uniformly randomly selected octave transposition between a changing range (see range mechanism below). The set must respect the rule that there must be at least two pitches available for the defined range of the flute and viola (C5 to C6).
range mechanism	C5–B6 → C3–B6 → C4–B6 → C3–B6 → → C1–B6 → C5–B6, changing every 8 cycles.
selection mechanism	pitches outside the range of an instrument are ignored during the selection process.
initial set	[C6, B5, B♭5, A5, A♭5, G5, F♯5, F5]

durations (flute and viola)

set size	$N = 5$
transformation period	no transformation.
set	[4, 5, 6, 7, 8]

constraints

- number of duration and pitch transformations: 40.
- tempi are selected every second bar.
- harp durations are fixed throughout the movement, each note lasts for a quaver followed by a quaver rest
- the movement begins with all instruments playing at the same time.
- the range of the flute is defined as C5 to C6.
- the range of the viola is defined as C5 to C6.
- the range of the harp is defined as A♭1 to A6.
- all notes above and including F5 in the harp are played with octave harmonics.
- all instruments play at a very quiet dynamic level of ***pp*** throughout the movement.
- a note is replaced with a rest whenever the flute part had uninterrupted music for over 3 bars.
- every 10 cycles, the instruments rests for a bar and a half.
- the last note of the flute and the viola will have it duration extend as to last for the whole last measure.
- tempo set to ♩ = 60

Mapping and rules – second movement

pitches

set size	$N = 8$
transformation period	$16 \times$ ♪
transformation mechanism	$[a, b, c, d, e, f, g, h] \rightarrow [b, c, d, e, f, g, h, i]$, with $i \bmod 12 = (h \bmod 12) + 1$, and i at a uniformly randomly selected octave transposition between a changing range (see range mechanism below). The set must respect the rule that there must be at least two pitches available for the defined range of the flute and viola (C4 to C5).
range mechanism	C4–B4 → C3–B4 → C2–B4 → C2–B6 → → C1–B6 → C1–B6, changing every 5 cycles.
selection mechanism	pitches outside the range of an instrument are ignored during the selection process.
initial set	[G♭3, A3, B♭3, B3, C4, C♯4, D4, E♭4]

durations (harp)

set size	$N = 4$
transformation period	$16 \times$ ♪
transformation mechanism	first, a value n is selected from the set $[1, 2, 3, 4, 5, 6, 7, 8]$. Then a set durations for the harp is defined as $[n, n + 1, n + 2, n + 3]$.
initial set	randomly selected using the mechanism described above.

durations (flute and viola)

set size	$N = 8$
transformation period	no transformation.
set	$[1, 2, 3, 4, 5, 6, 7, 8]$

constraints

- number of duration and pitch transformations: 30.
- the movement begins with all instruments playing at the same time.
- the range of the flute is defined as C4 to C5.
- the range of the viola is defined as C4 to C5.
- the range of the harp is defined as A♭1 to A6.
- all notes above and including F5 in the harp are played with octave harmonics.
- all instruments play at a very quiet dynamic level of ***pp*** throughout the movement.
- the viola plays *sul pont. trem.* throughout this movement.
- a note is replaced with a rest whenever the flute part had uninterrupted music for over 3 bars.
- every 10 cycles, the instruments rests for a bar and a half.
- the last note of the flute and the viola will have it duration extend as to last for the whole last measure.
- tempo set to ♩ = 76

Mapping and rules – third movement

pitches

set size	$N = 6$
transformation period	$16 \times$ ♪
transformation mechanism	$[a, b, c, d, e, \varnothing] \rightarrow [b, c, d, e, f, \varnothing]$, with f mod $12 = (e \bmod 12) - 1$, and f at a uniformly randomly selected octave transposition. The element in the last index, $\varnothing$, represents rests and does not change. The set must respect the rule that there must be at least two pitches available for the defined range of the flute and viola; they both have a range of B♭6–B♭7 for the first 15 cycles and a range of C4–C5 (flute) and C3–C4 (viola) for the last 15 ones.
selection mechanism	pitches outside the range of an instrument are ignored during the selection process.
initial set	[G6, F♯6, F6, E6, E♭6, ∅], where ∅ represents rests.
16^{th} set	[D4, C♯4, C4, B3, B♭3, ∅], where ∅ represents rests. This set overrides the previous container at the start of the 16^{th} cycle.

durations

set size	$N = 5$
transformation period	no transformation.
set	$[4, 5, 6, 7, 8]$

constraints

- number of duration and pitch transformations: 30.
- the movement begins with all instruments playing at the same time.
- the range of the flute is defined as B♭6 to B♭7 for the first 15 cycles, then as C4 to C5 for the last 15 ones.
- the range of the viola is defined as B♭6 to B♭7 for the first 15 cycles, then as C3 to C4 for the last 15 ones.
- the range of the harp is defined as A♭1 to A6.
- all notes above and including F5 in the harp are played with octave harmonics. All notes above and including C6 in the flute are played as harmonics. All notes the viola above and including F5 are played as artificial harmonics.
- all instruments play at a very quiet dynamic level of ***pp*** throughout the movement.
- the viola plays *sul tasto* during the last 15 cycles.
- a note is replaced with a rest whenever the flute part had uninterrupted music for over 3 bars.
- every 15 cycles, the instruments rests for a bar and a half.
- the last note of the flute and the viola will have it duration extend as to last for the whole last measure.

General performance notes

- all instruments should play at a very quiet dynamic level.
- tremolos are always unmeasured.
- the flute and viola part should sound as legato as possible
- the harpist should never damp any of the strings so that they are left vibrating as long as possible.

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Cartography #4

I

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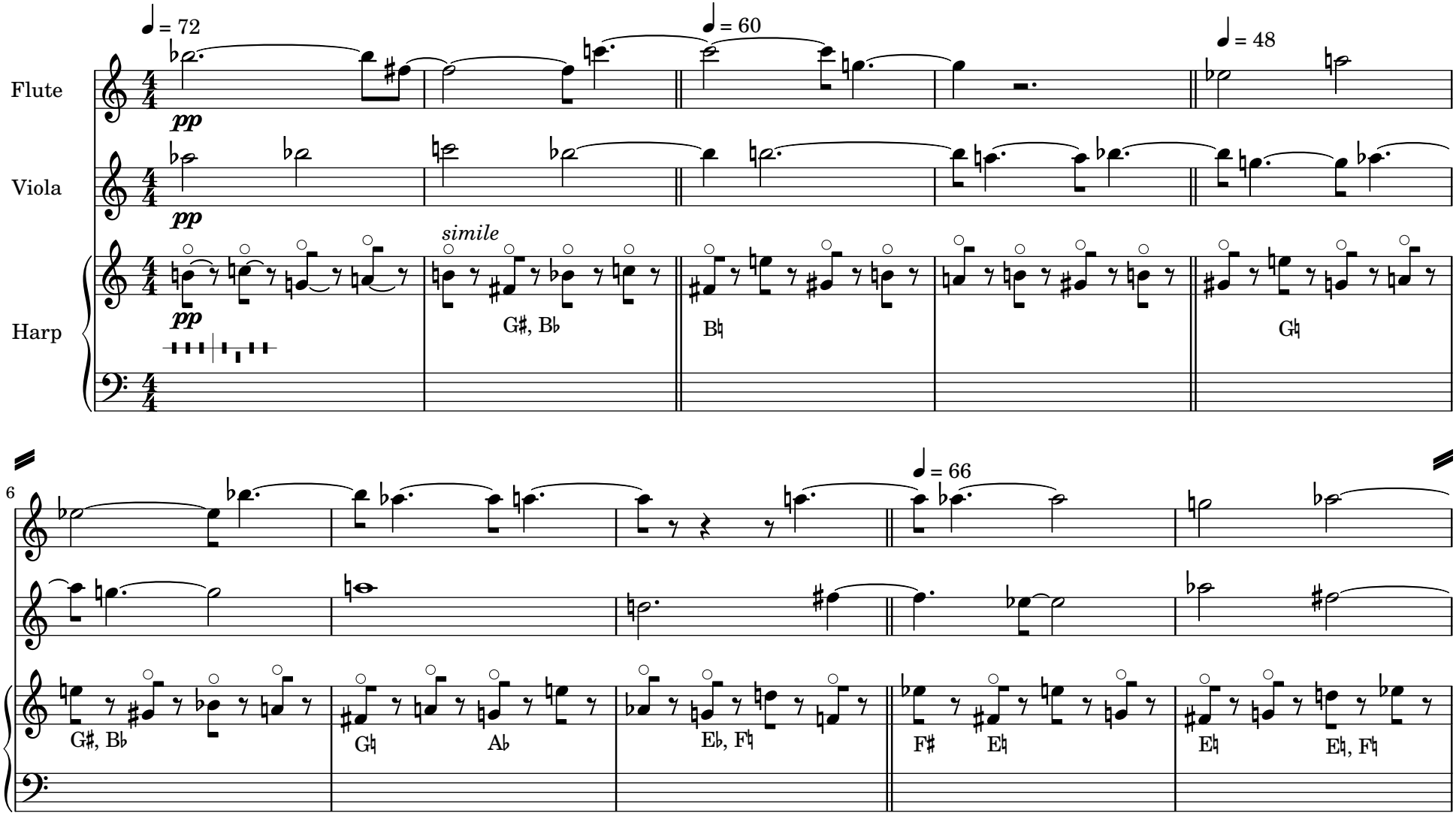
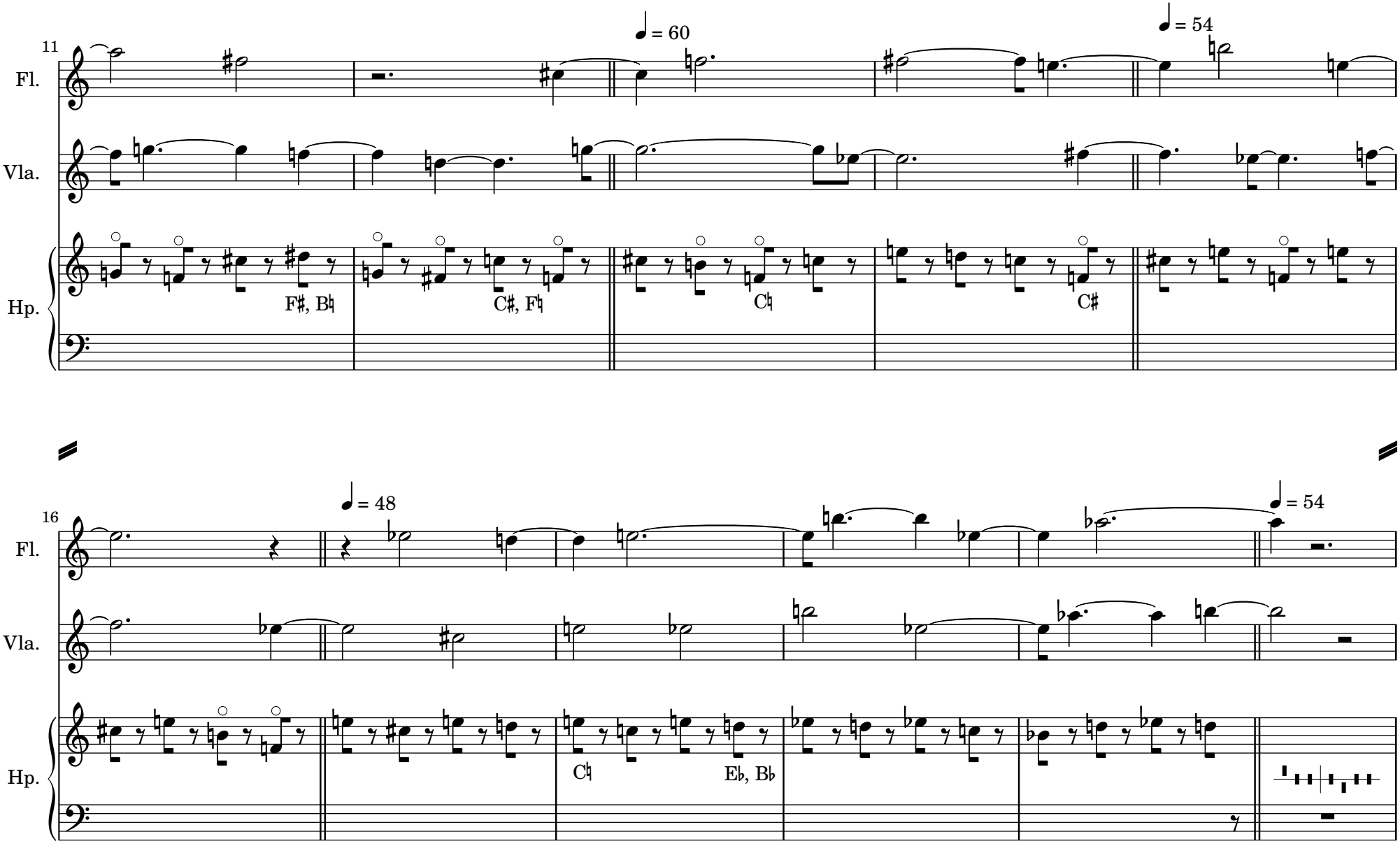
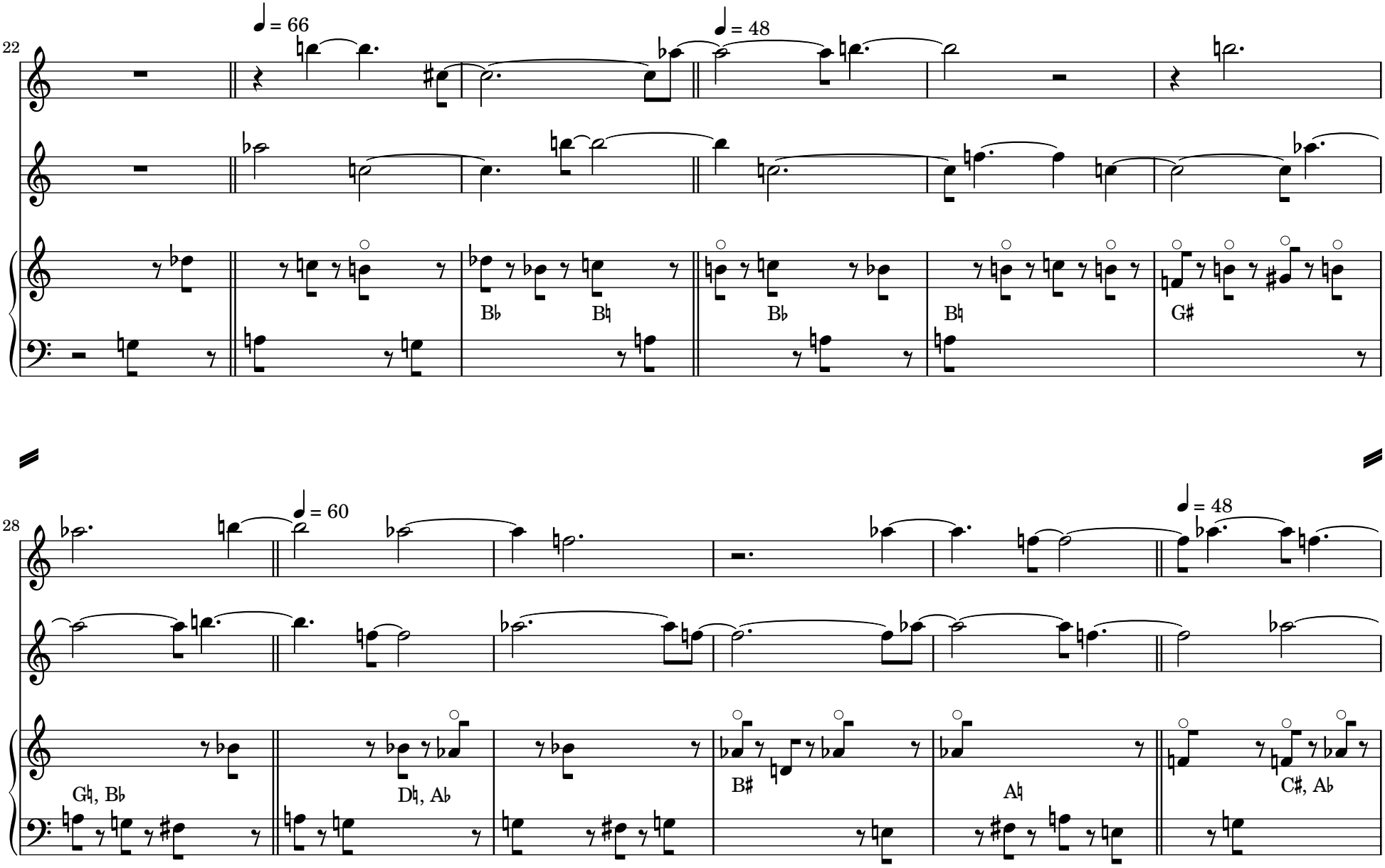
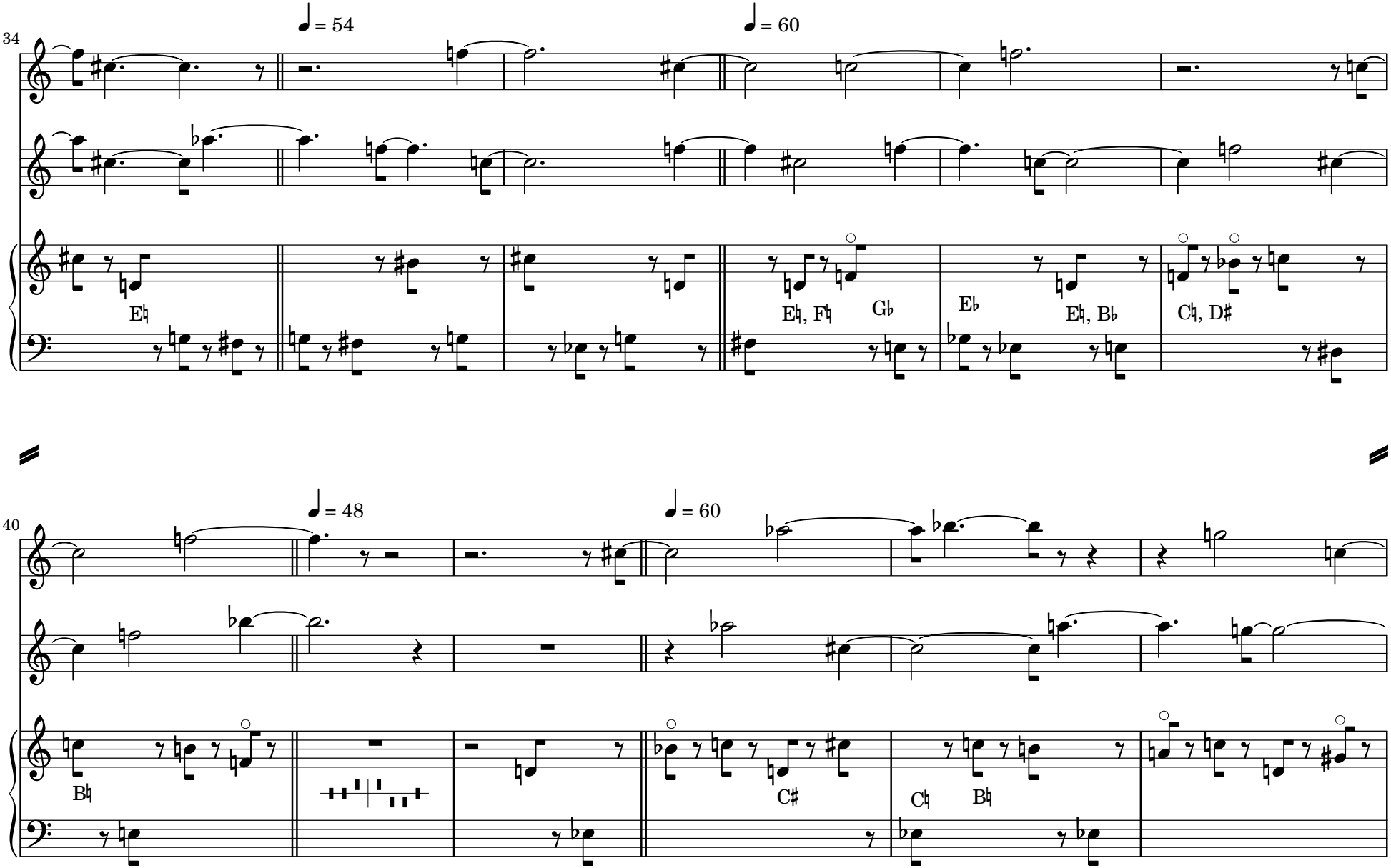
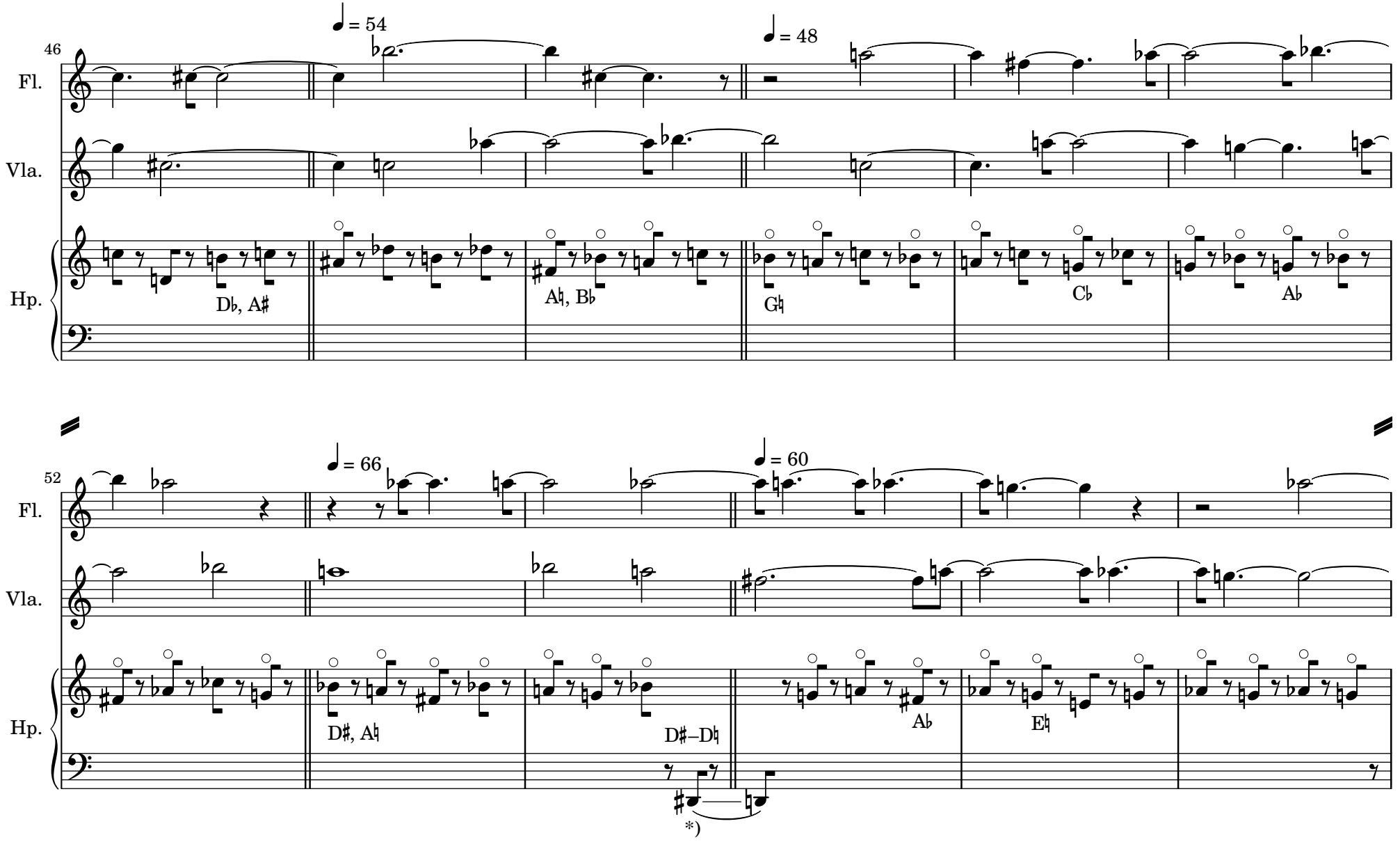


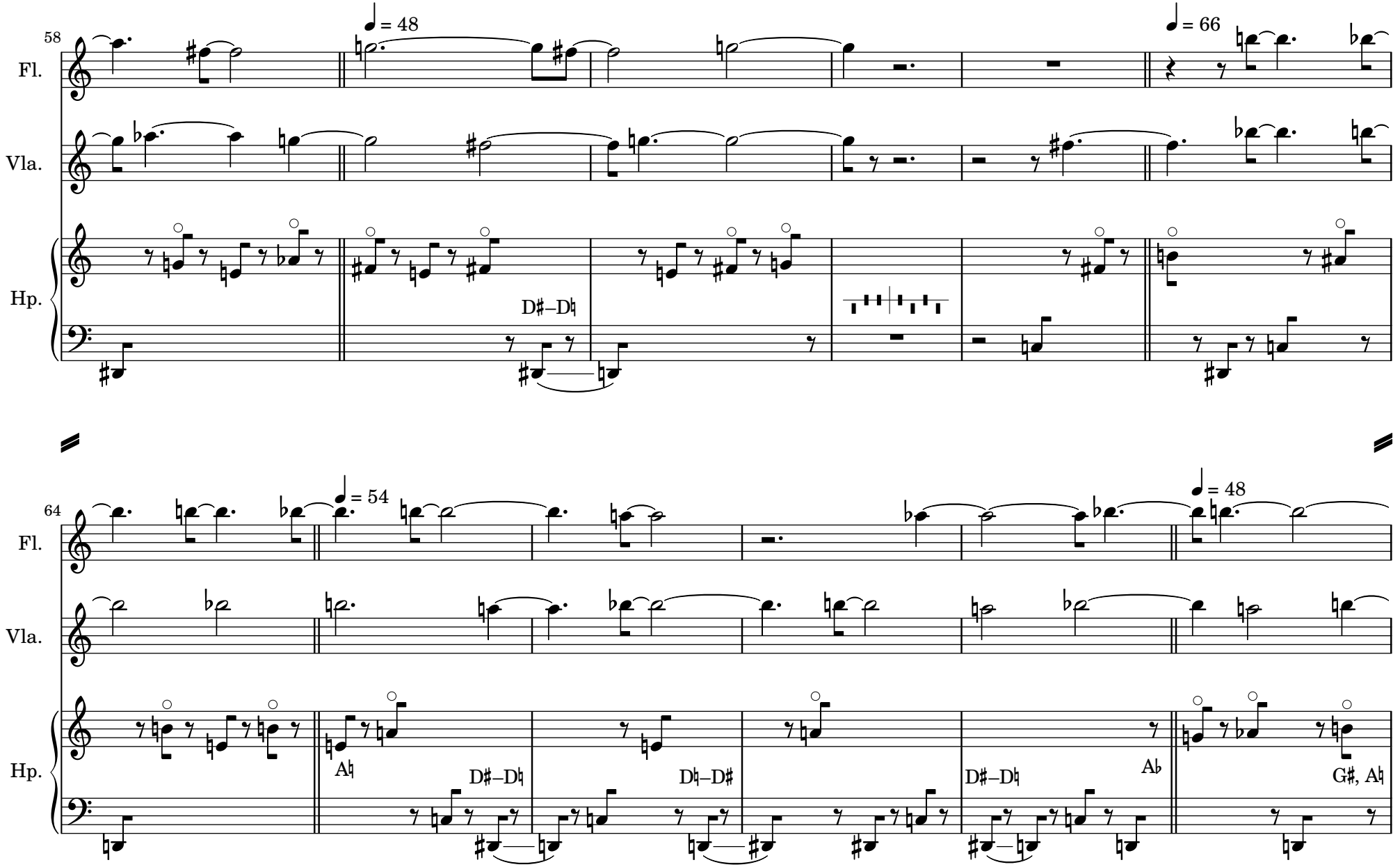

11
Fl.
Vla.
Hp.
♩ = 60
♩ = 54
F♯, B♮
C♯, F♮
C♮
C♯
16
♩ = 48
♩ = 54
C♮
E♭, B♭

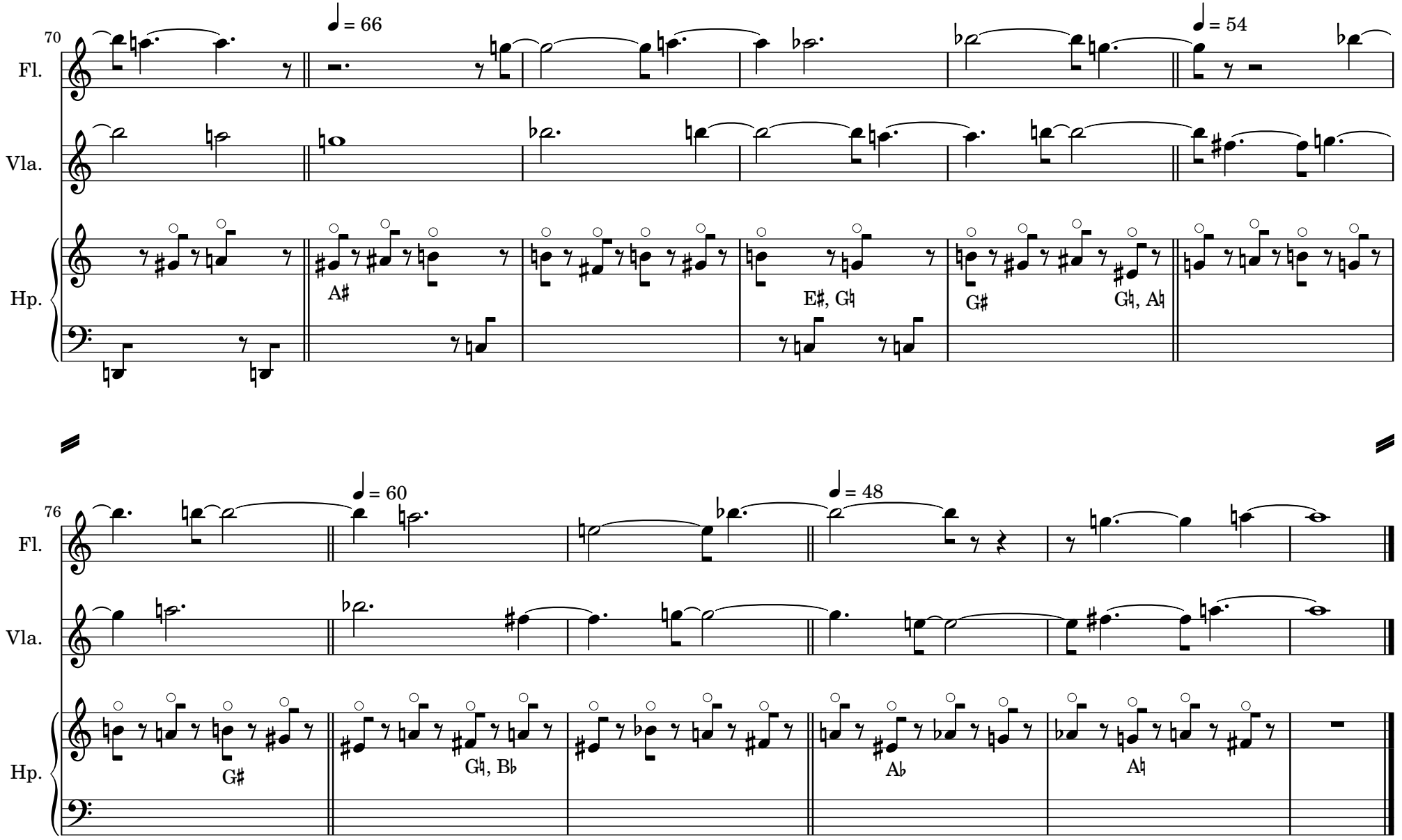

22
Fl.
Vla.
Hp.
♩ = 66
♩ = 48
B♭
B♮
B♭
B♮
G♯
28
Fl.
Vla.
Hp.
♩ = 60
♩ = 48
G♮, B♭
D♮, A♭
B♯
A♮
C♯, A♭


34
♩ = 54
♩ = 60
Fl.
Vla.
Hp.
E♮
E♮, F♮
G♭
E♭
E♮, B♭
C♮, D♯
40
♩ = 48
♩ = 60
B♮
C♯
C♮
B♮



*) Pedal glissando, move the pedal at the exact moment the second note starts.


58
Fl.
Vla.
Hp.
♩ = 48
♩ = 66
D♯–D♮
64
♩ = 54
♩ = 48
A♮
D♯–D♮
D♮–D♯
D♯–D♮
A♭
G♯, A♮


70
Fl.
Vla.
Hp.
♩ = 66
♩ = 54
A♯
E♯, G♮
G♯
G♮, A♮
76
♩ = 60
♩ = 48
G♯
G♮, B♭
A♭
A♮

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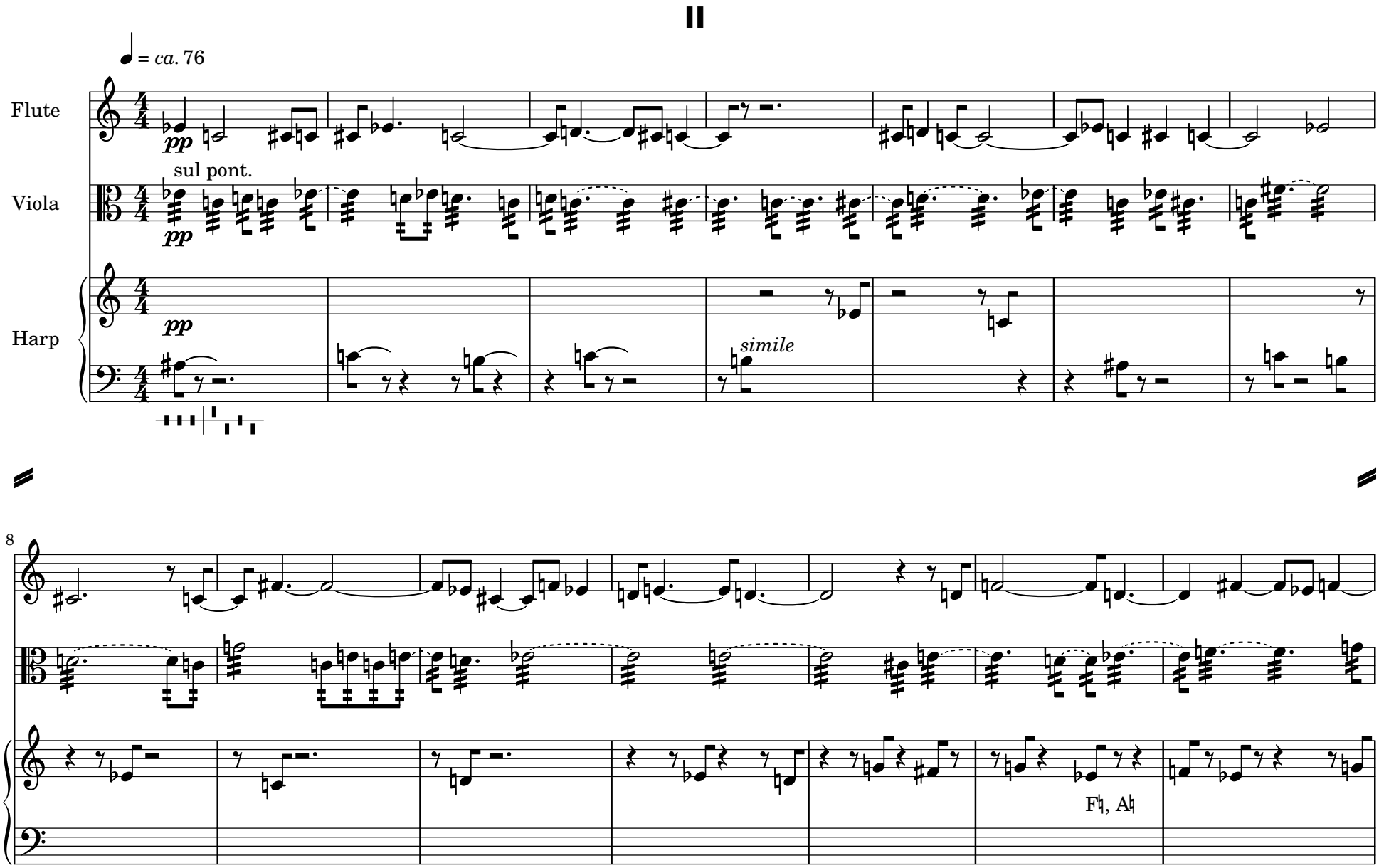
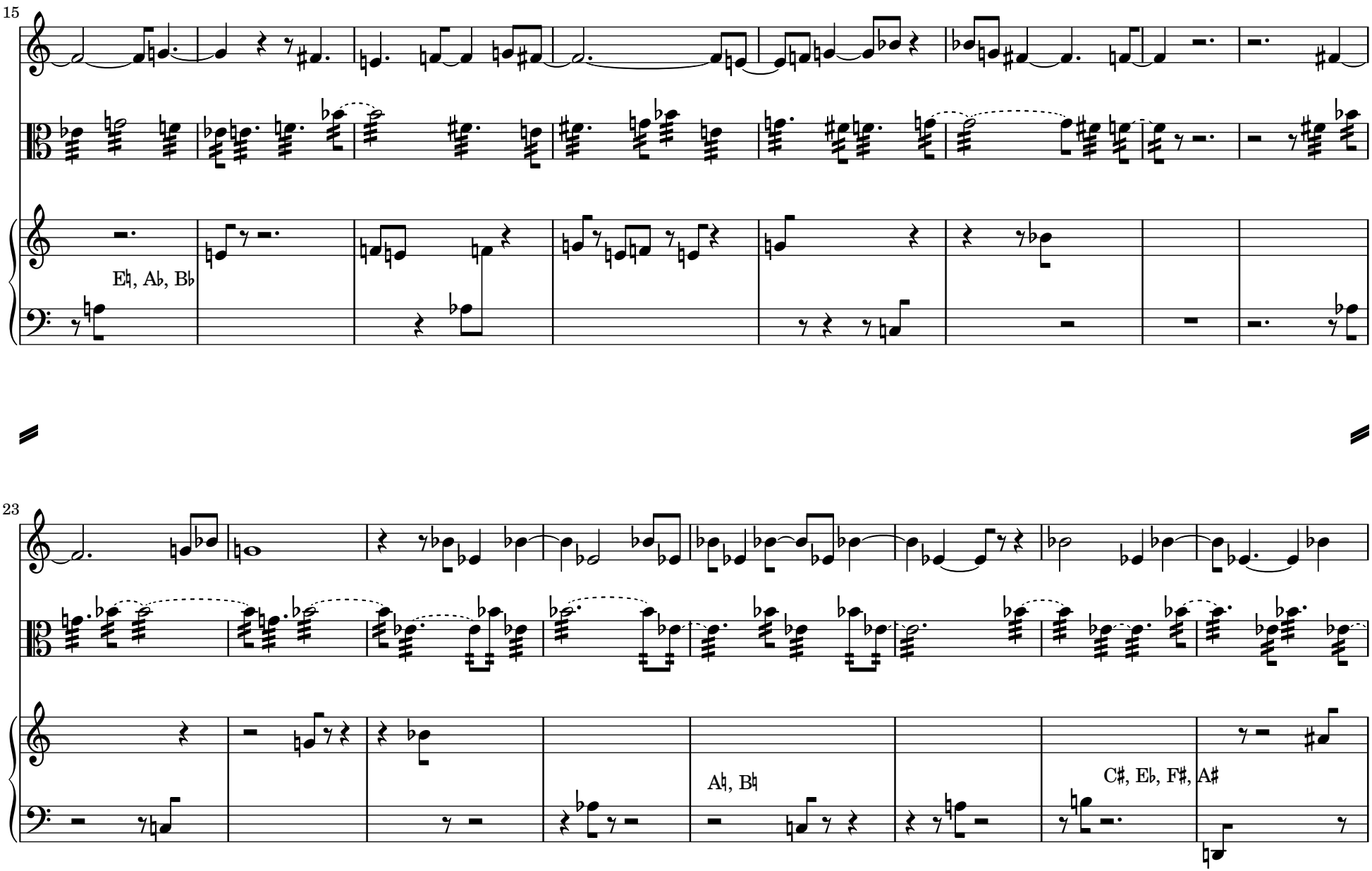
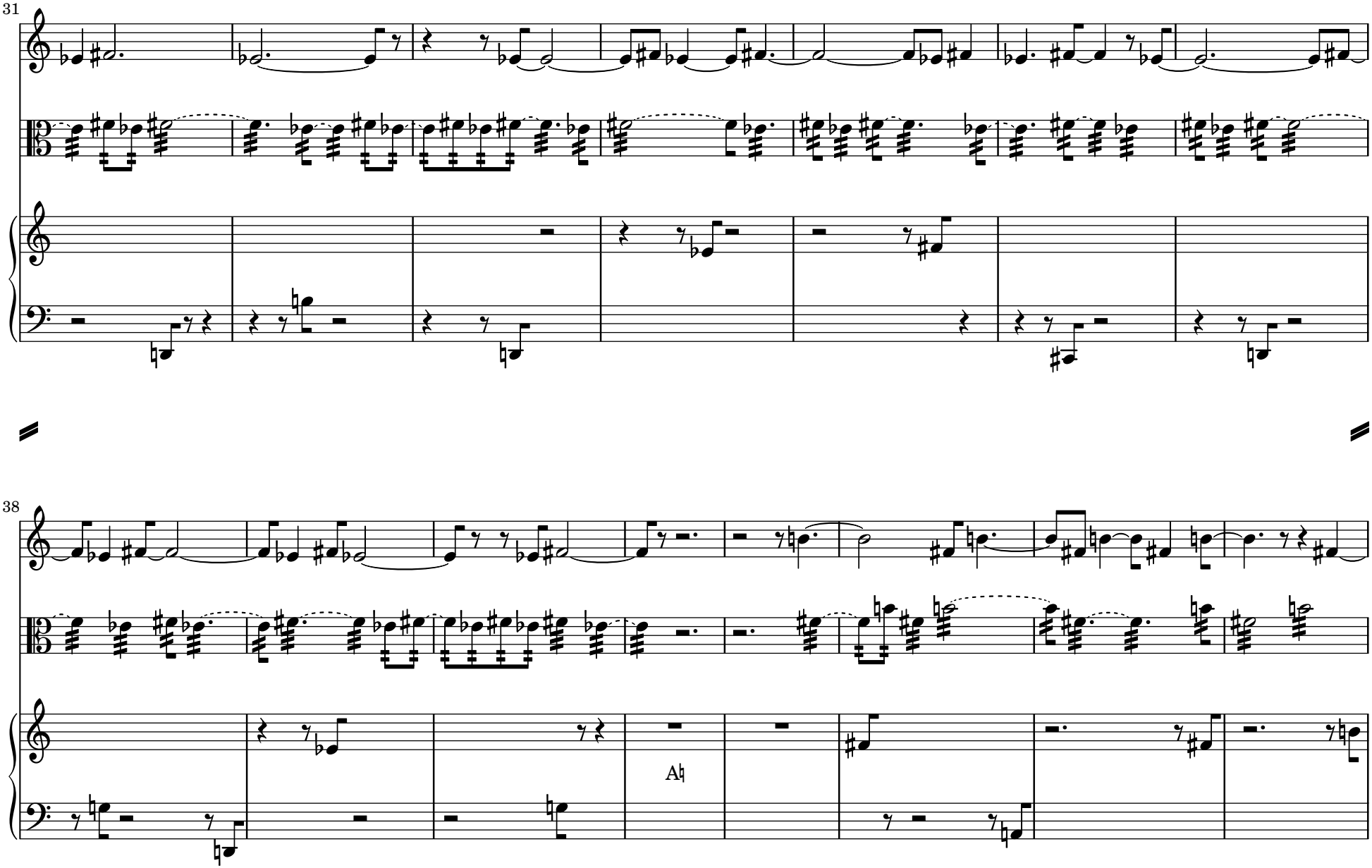
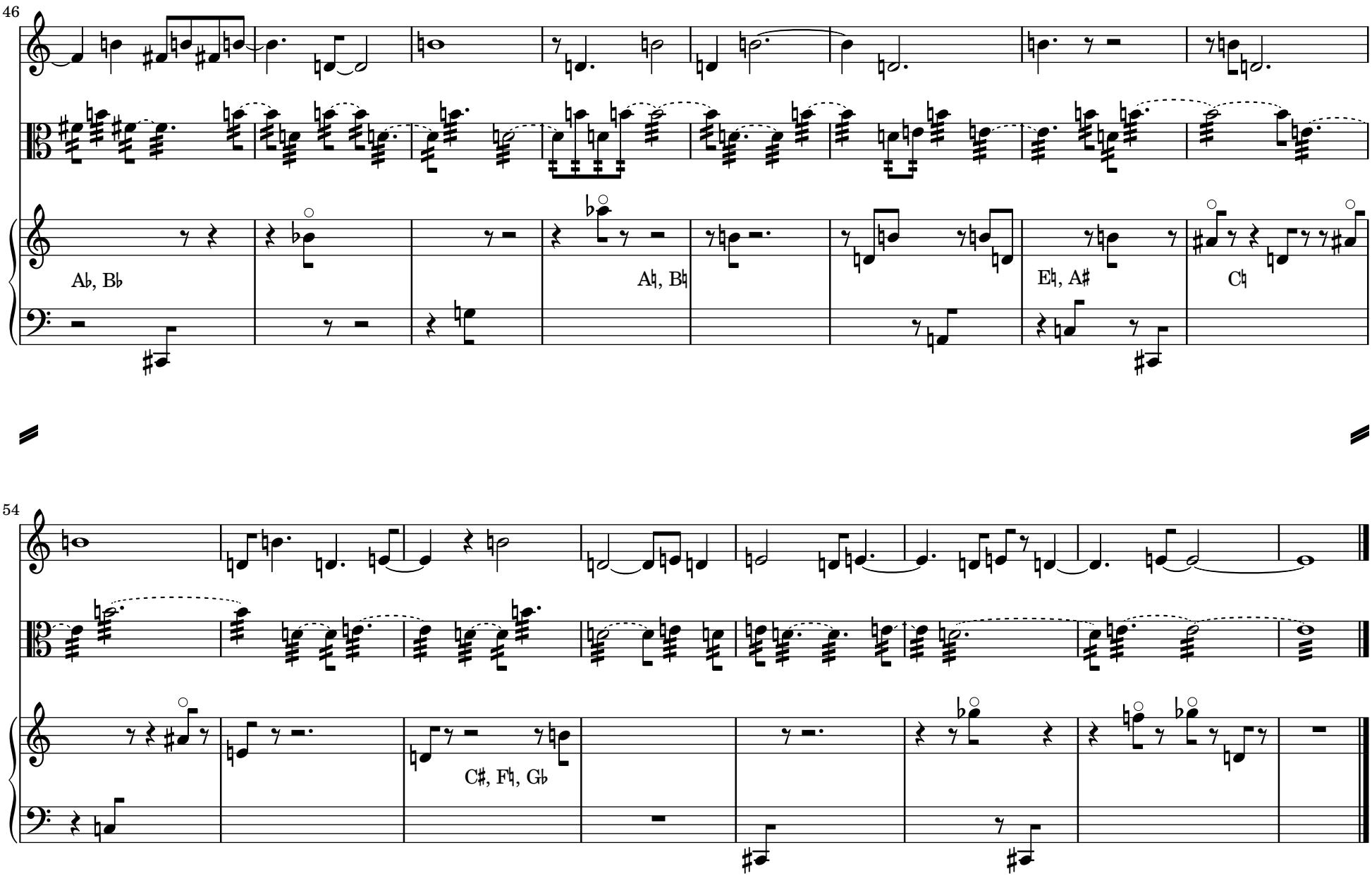
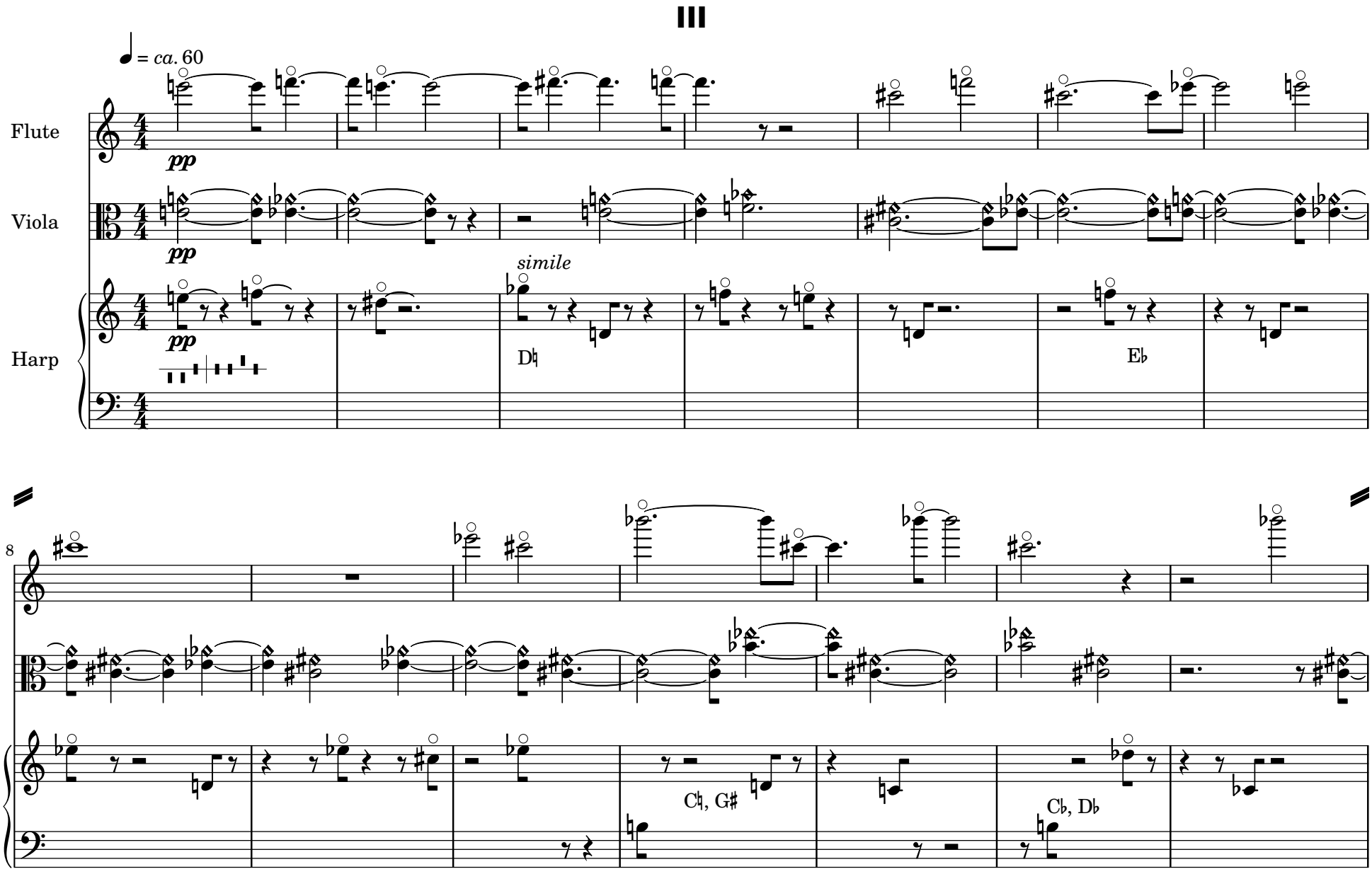
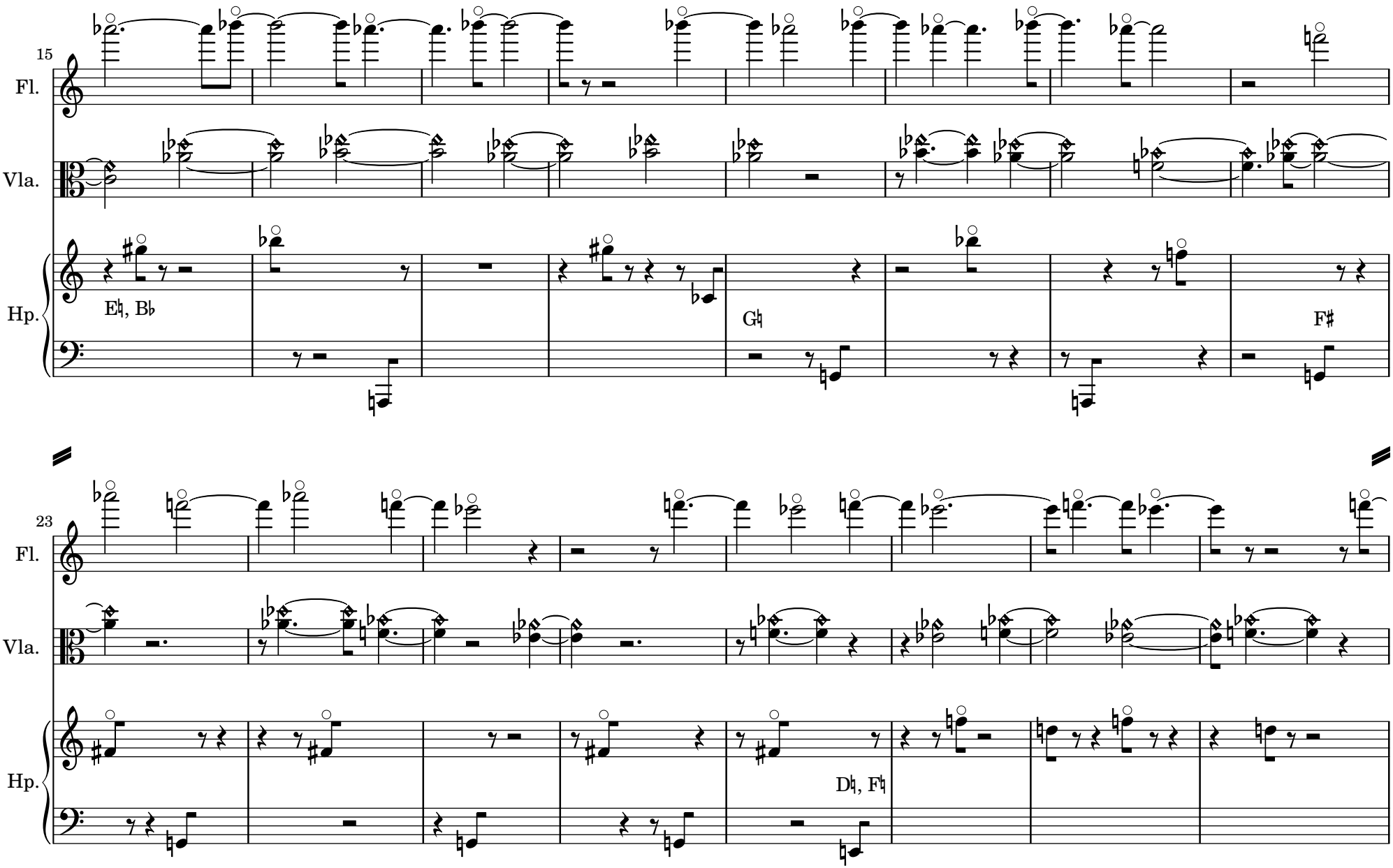

II
♩ = ca. 76
Flute
Viola
Harp
pp
sul pont.
simile
8
Fl.
Vla.
Hp.
F♮, A♮

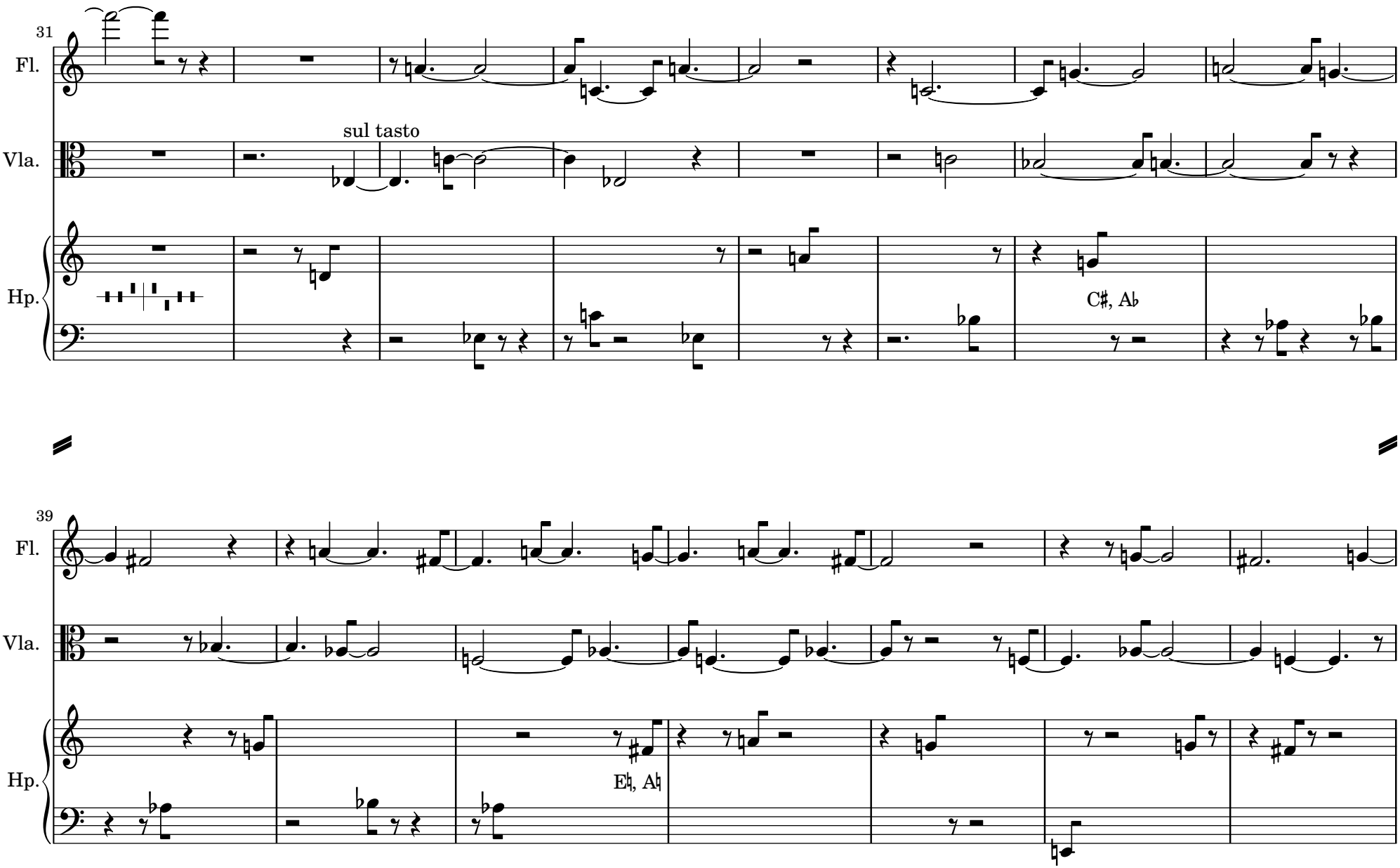

15
Fl.
Vla.
Hp.
E♮, A♭, B♭
23
Fl.
Vla.
Hp.
A♮, B♮
C♯, E♭, F♯, A♯

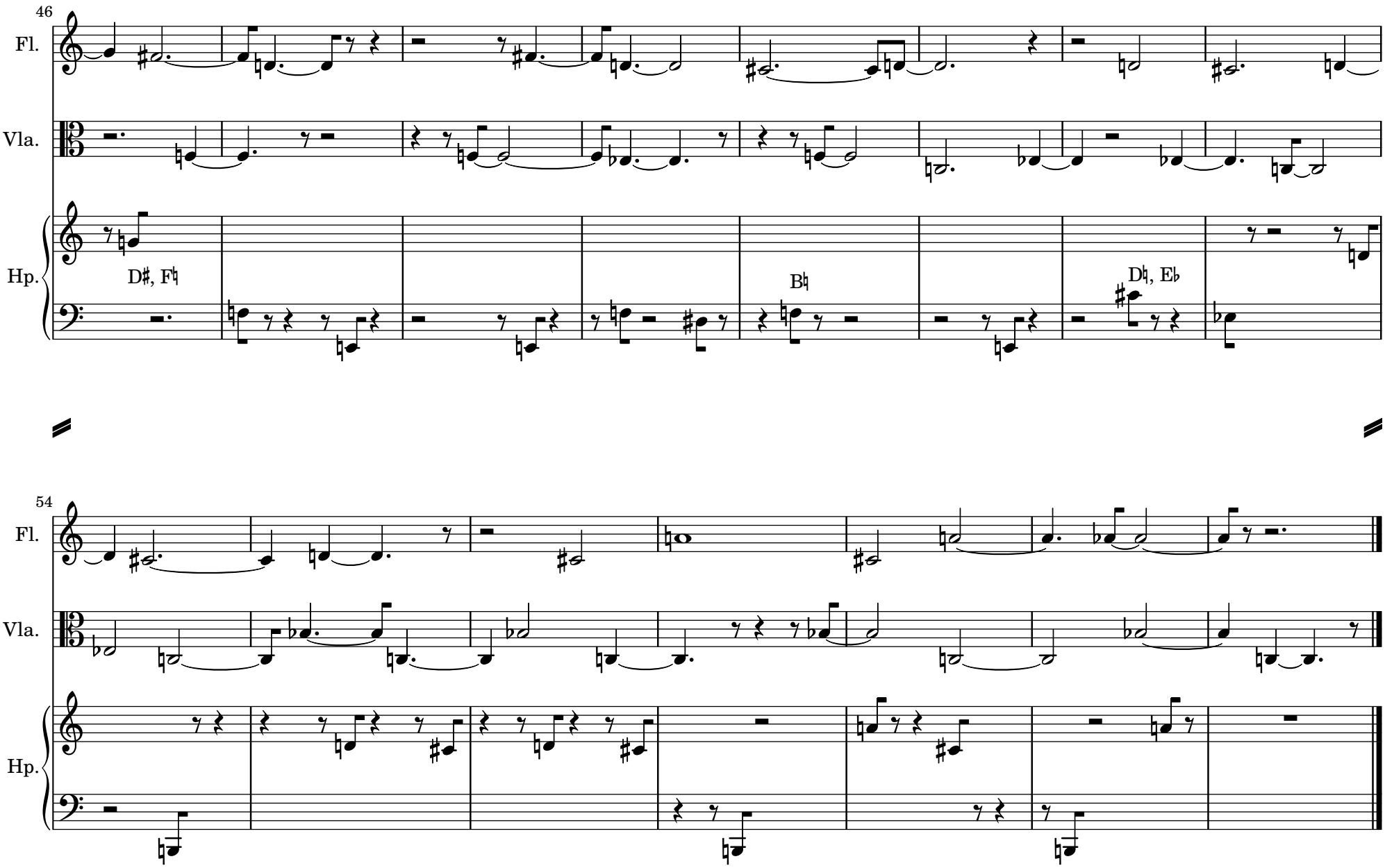

31
Fl.
Vla.
Hp.
38
Fl.
Vla.
Hp.
A♮


46
Fl.
Vla.
Hp.
A♭, B♭
A♮, B♮
E♮, A♯
C♮
54
Fl.
Vla.
Hp.
C♯, F♮, G♭


III
♩ = ca. 60
Flute
Viola
Harp
pp
pp
pp
simile
D♮
E♭
8
Fl.
Vla.
Hp.
C♮, G♯
C♭, D♭


15
Fl.
Vla.
Hp.
E♮, B♭
G♮
F♯
23
Fl.
Vla.
Hp.
D♮, F♮


31
Fl.
Vla.
sul tasto
Hp.
C♯, A♭
39
Fl.
Vla.
Hp.
E♮, A♮


46
Fl.
Vla.
Hp.
D♯, F♮
B♮
D♮, E♭
54
Fl.
Vla.
Hp.

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Cartography #5, for violin and piano

Mapping and rules

pitches

set size	$N = 7$
transformation period	$16 \times$ ♪
transformation mechanism	$[G3, a, b, c, d, e, f] \rightarrow [G3, b, c, d, e, f, g]$, with uniformly randomly selected g from the piano range such that $g \bmod 12 \neq x \bmod 12$, $\forall x \in [G3, a, b, c, d, e, f]$. The first element is fixed throughout the piece as the pitch G3. Also, the algorithm always ensures that there are at least three available notes in the violin range (G3 to A6). Finally, when selecting a pitch from the current set for the violin, the algorithm ensures that there are no skips larger than a major ninth (except for open strings).
initial set	[G3, A♭3, A3, B♭3, B3, C4, C♯4]

durations (violin)

set size	$N = 5$
transformation period	$128 \times$ ♪ (32 bars)
transformation mechanism	$[a, a-1, a-2, \ldots, a-4] \rightarrow [a-1, a-2, a-3, \ldots, a-5]$, where an element equals to 1 if $a - k < 1$.
initial set	$[5, 4, 3, 2, 1]$

durations (piano)

set size	$N = 5$
transformation period	$128 \times$ ♪ (32 bars)
transformation mechanism	$[a, a-1, a-2, \ldots, a-4] \rightarrow [a+1, a, a-1, \ldots, a-3]$, where an element equals to 1 if $a - k < 1$.
initial set	$[1, 1, 1, 1, 1]$

articulations

set size	$N = 7$
transformation period	no transformation.
set	[∅, ∅, ∅, ∅, >, >, ^], where ∅ represents no articulation.
selection mechanism	accents are tied to pitches, so when a random index has been generated to select a pitch, this same index also selects an accent.

constraints

- number of pitch transformations: 40.
- number of duration transformations: 5.
- the piece begins with the violin and the piano playing at the same time.
- there are no intervals larger than a major ninth in the violin part (except when one of the notes is in an open string).

General performance notes

- this piece has no dynamic marks. Loudness is solely notated using marcato and martellato signs ($>$ and $\hat{}$, respectively). Notes without articulations marks should be played as softly as possible (equivalent to ***pp***), notes with a marcato sign should have a medium level of loudness (equivalent to ***mf***) and notes with a martellato sign should have a high level of loudness (equivalent to ***ff***).
- the piano's sustain pedal should be held halfway down throughout the piece. A good reference point for this is when individual note lengths cannot be precisely perceived (that is, the sound is not cut when releasing a key). Some instruments and acoustic spaces might call for slightly different pedalling (at the discretion of the performer).
- after the last note of the piece, let the resonance disappear before raising the sustain pedal.

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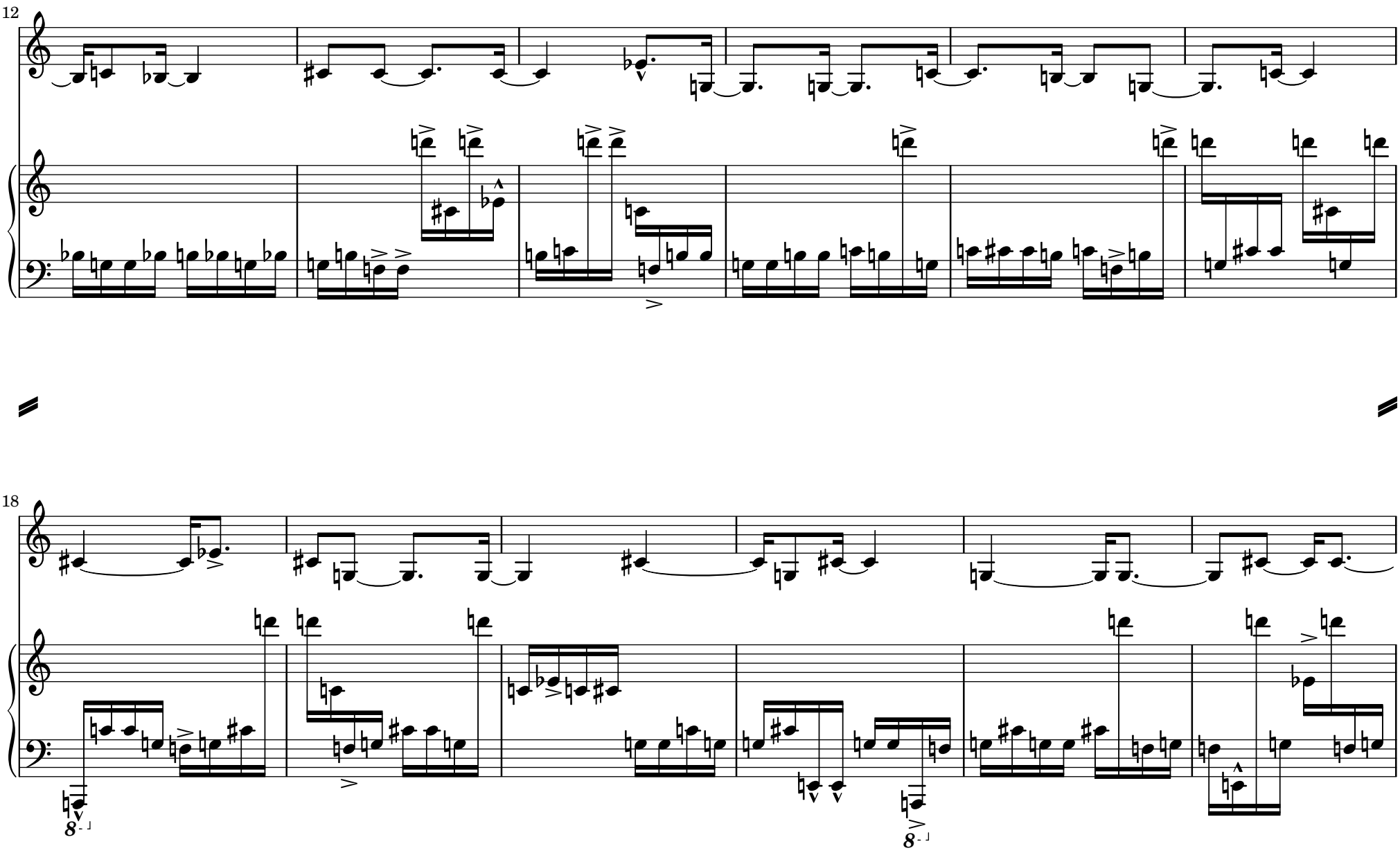
Cartography #5

Gilberto Agostinho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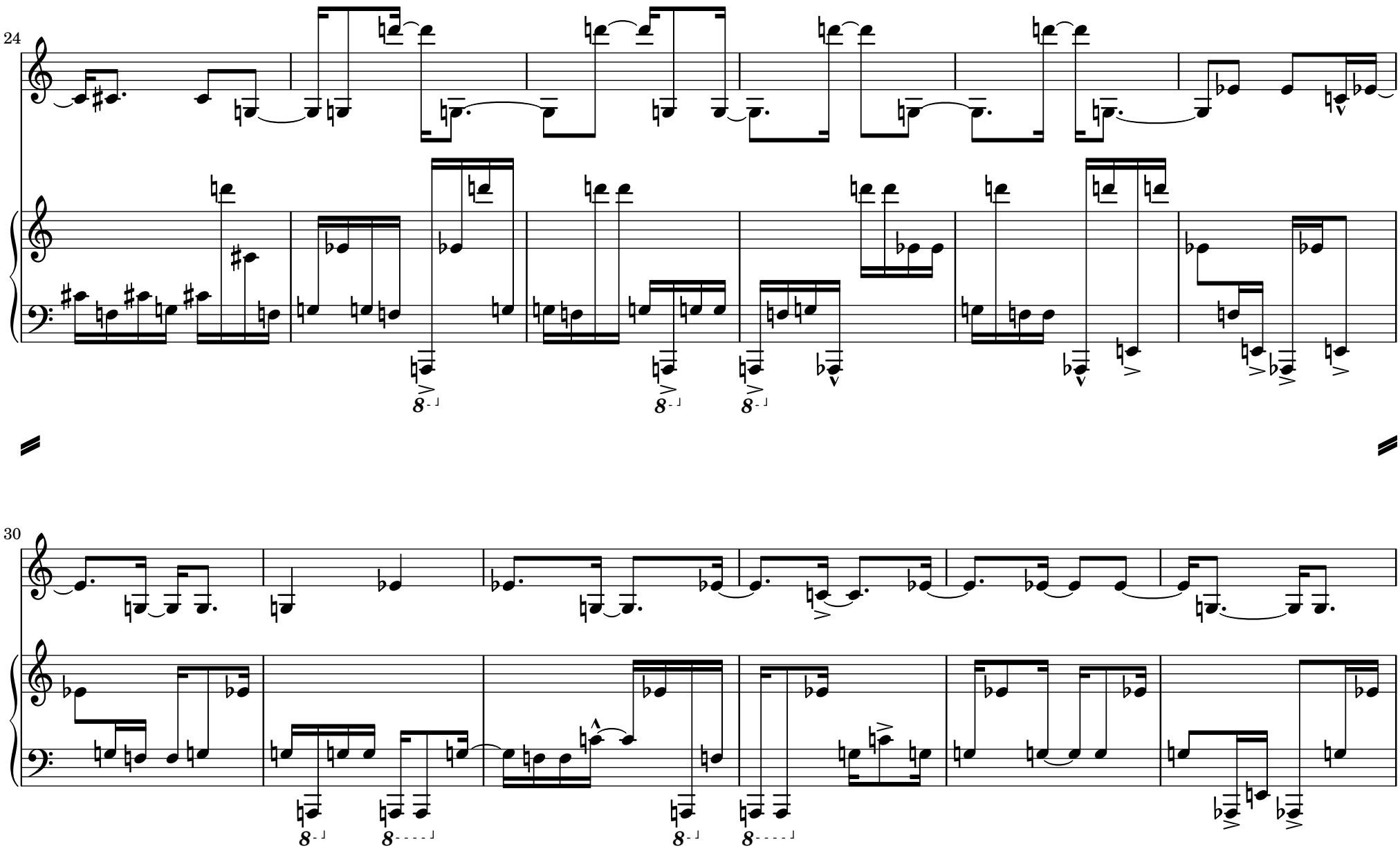
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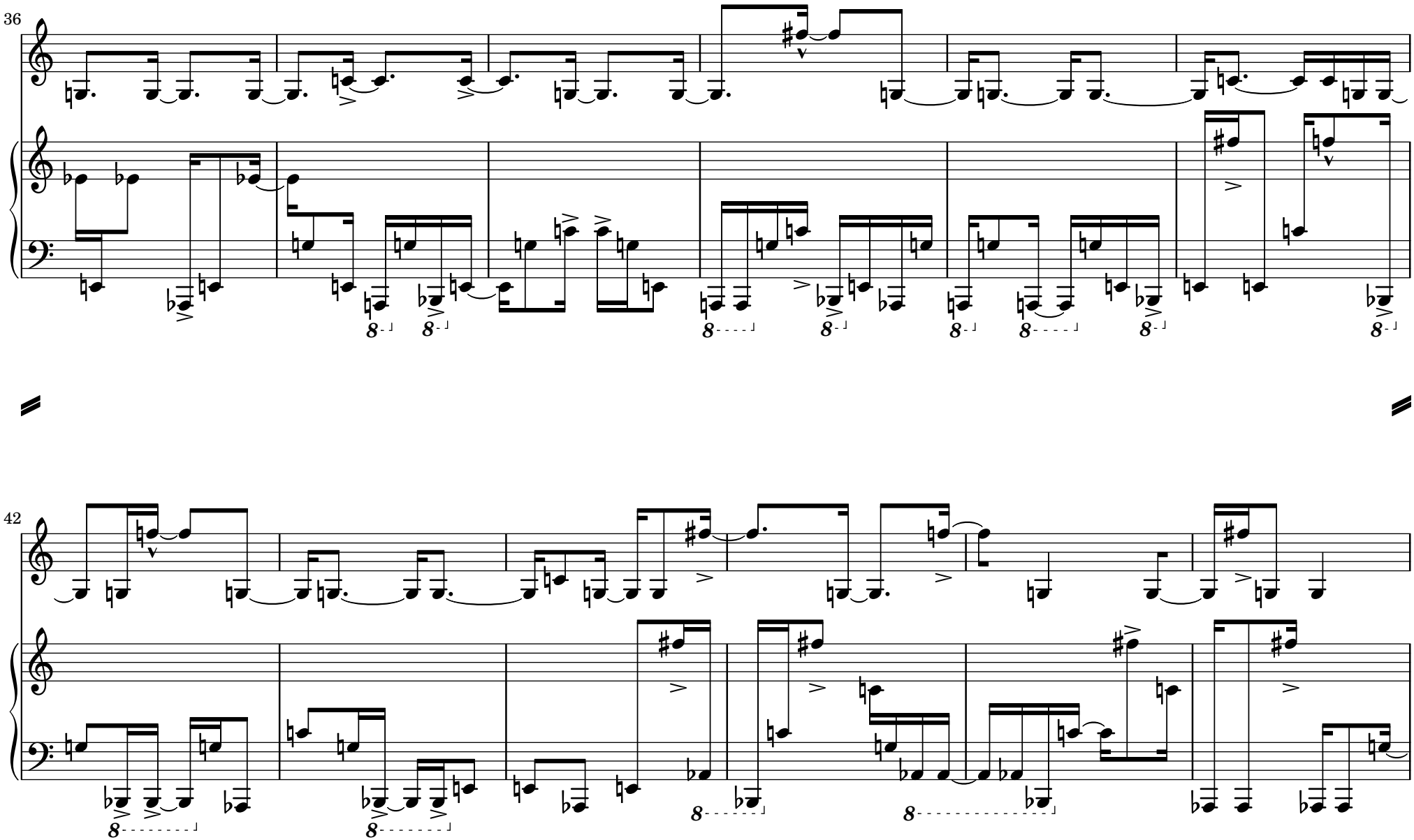
30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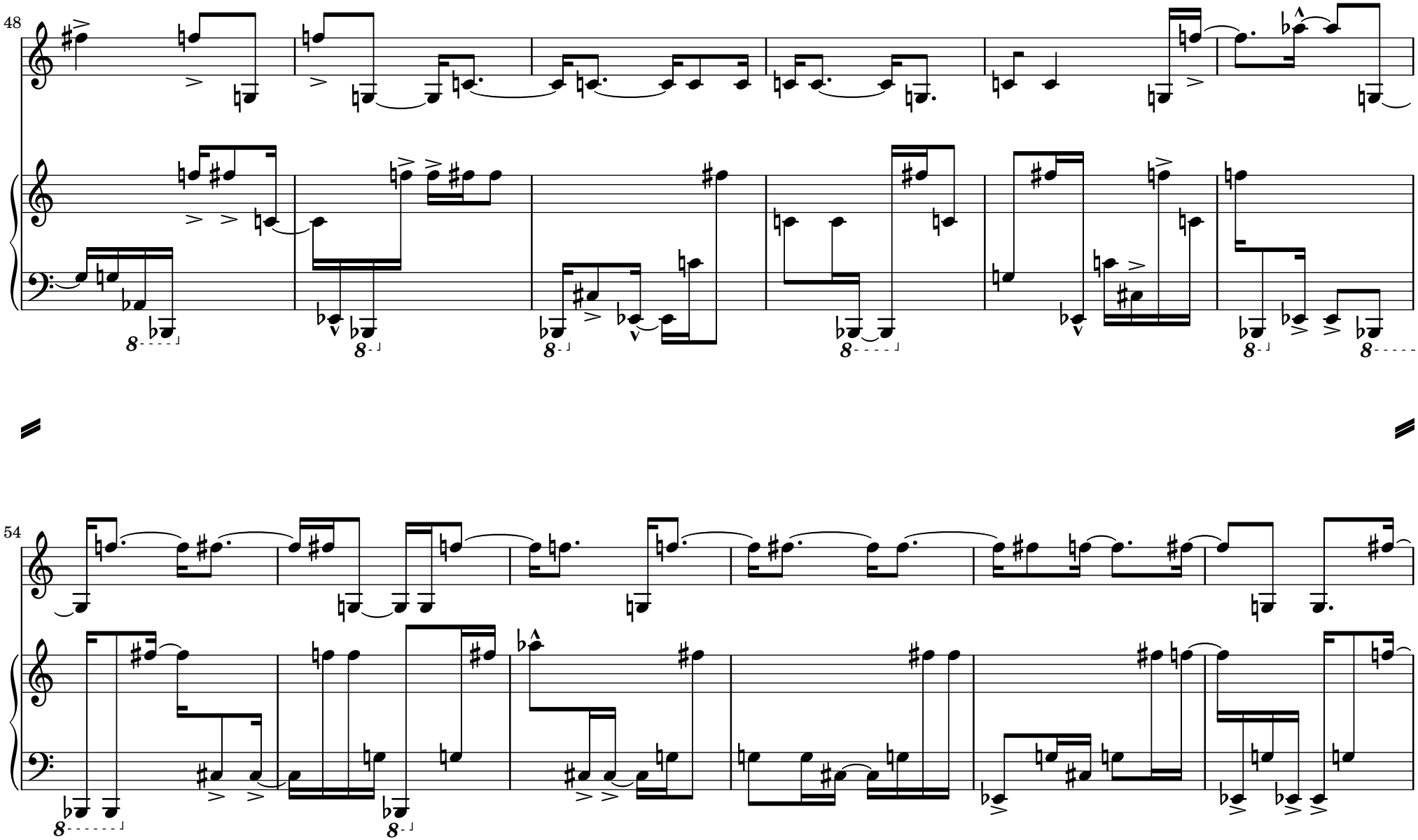
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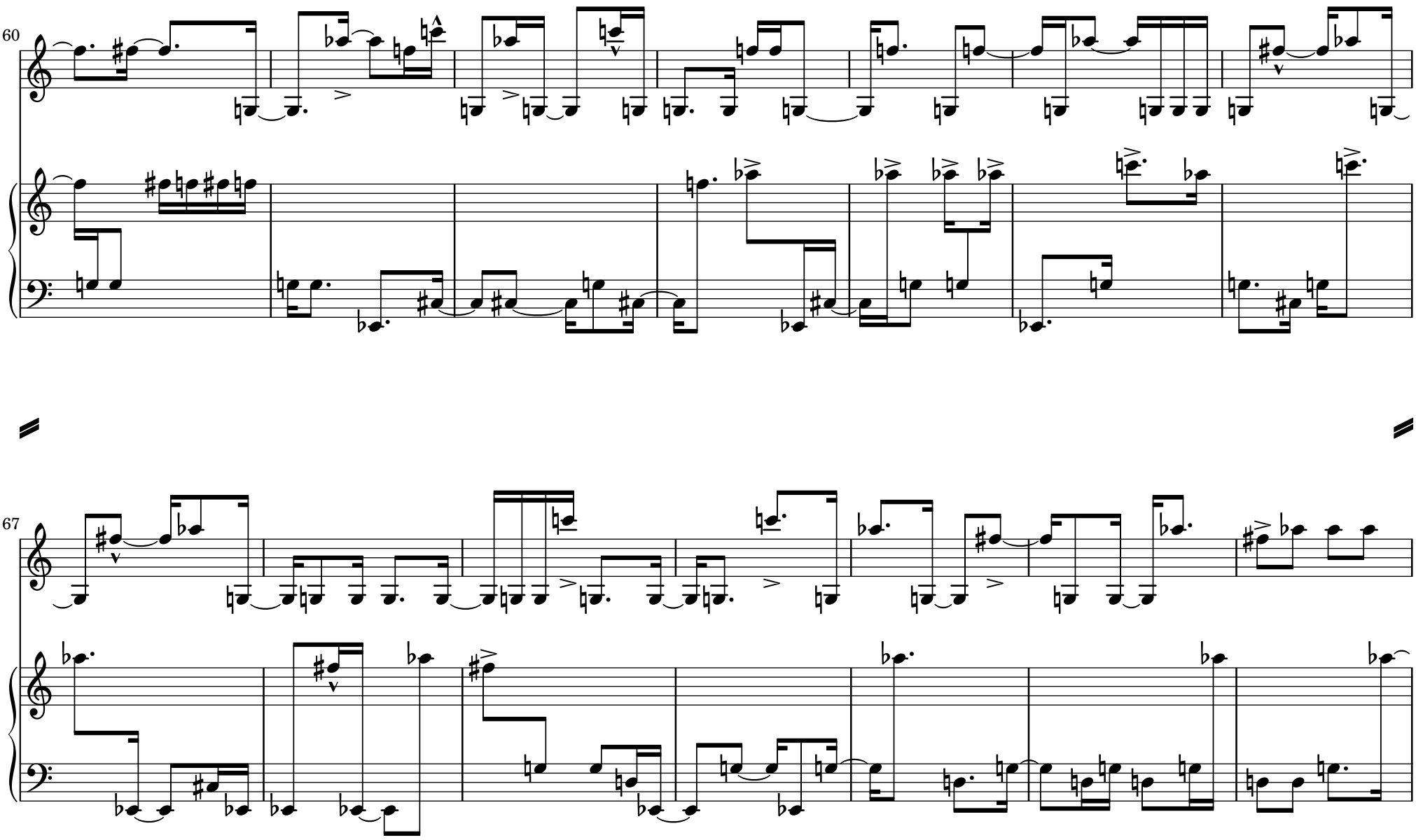
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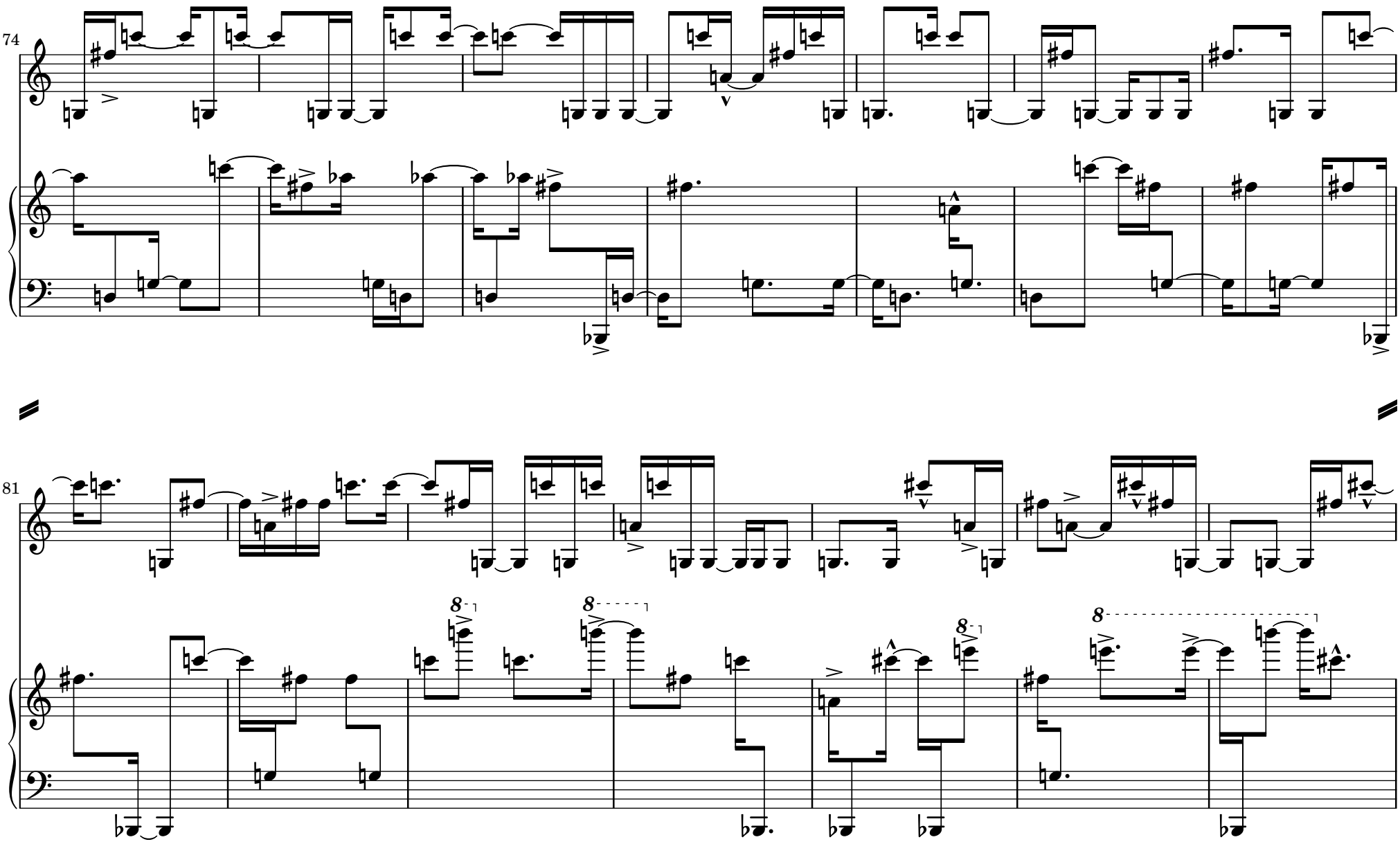
67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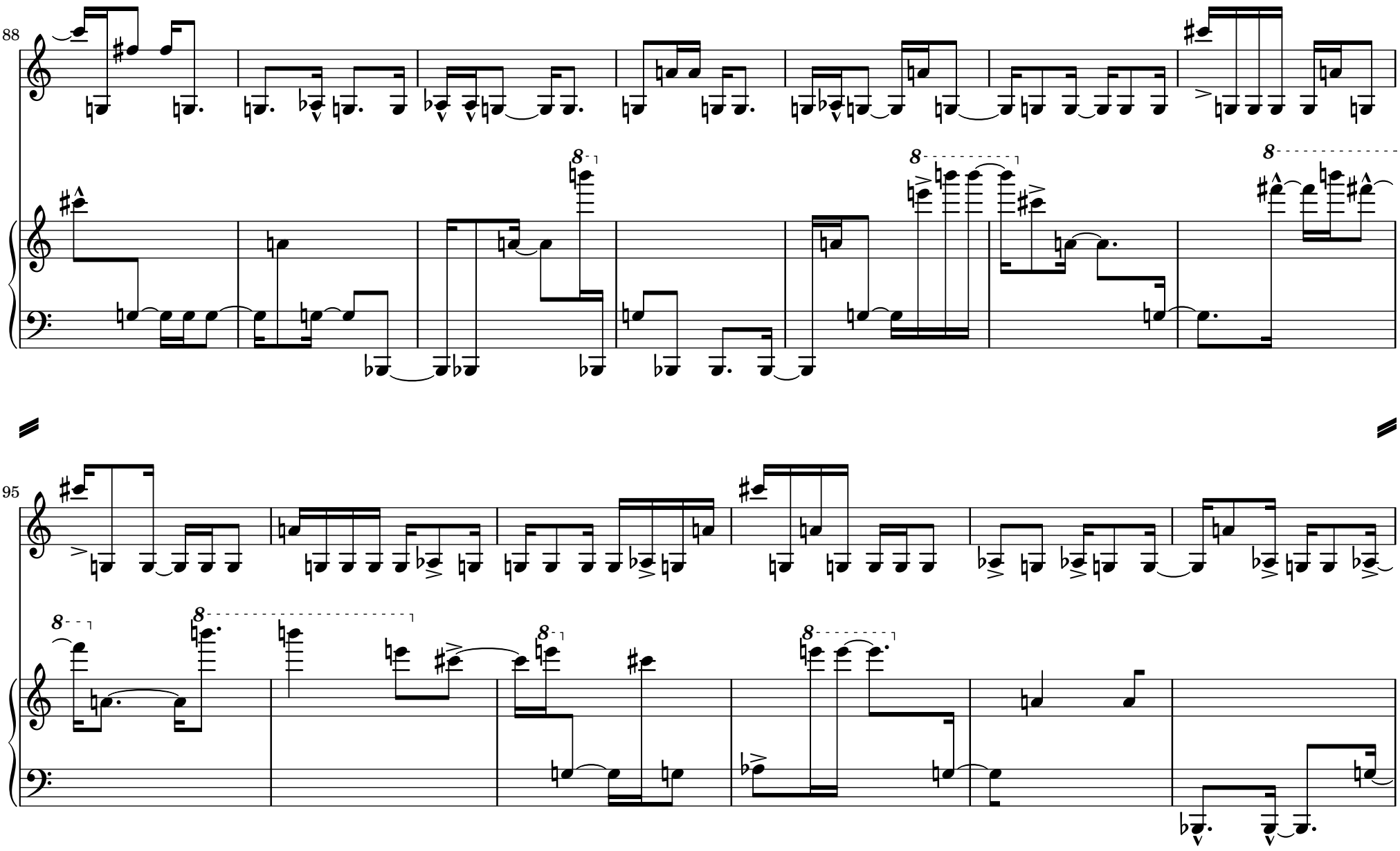
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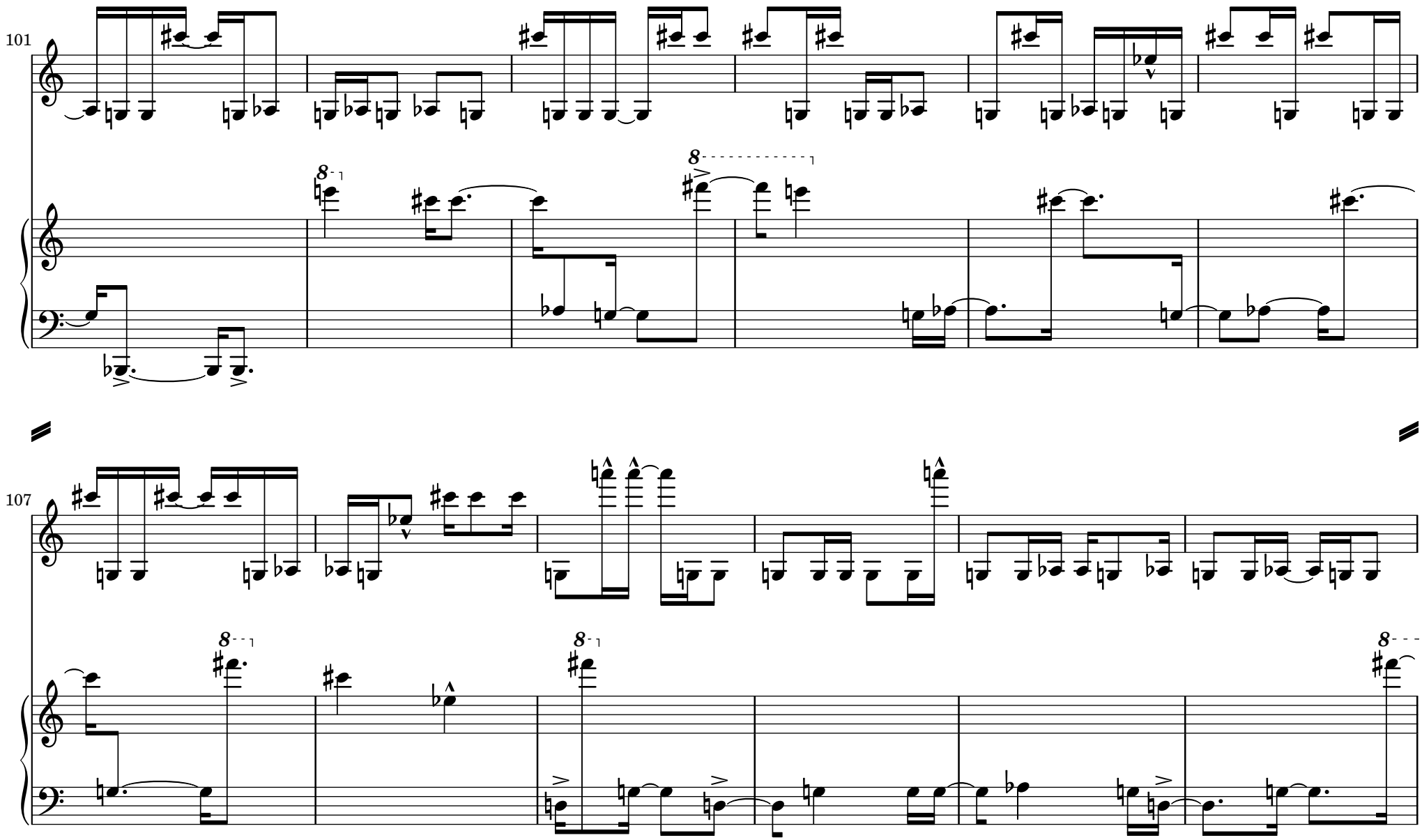
95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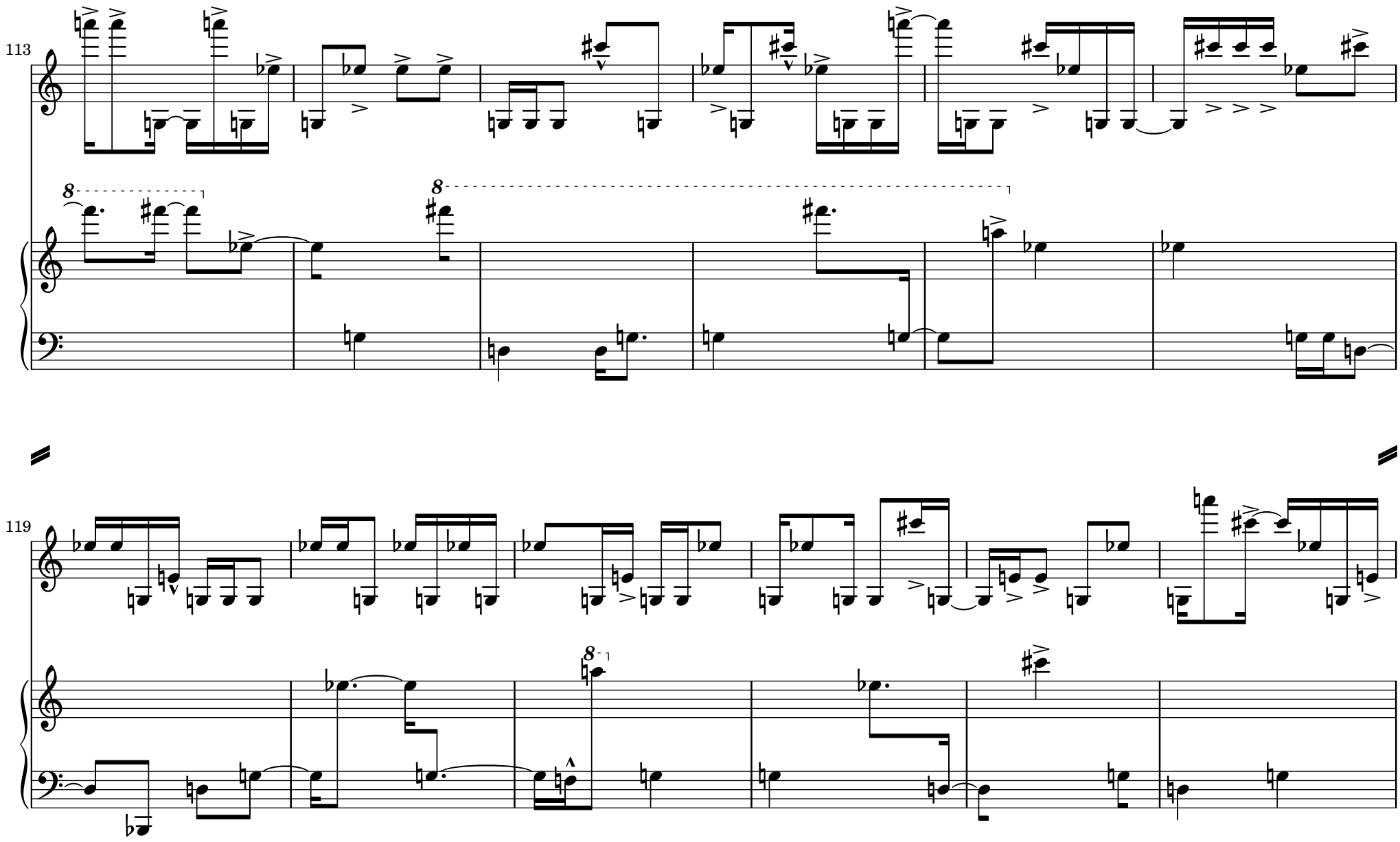
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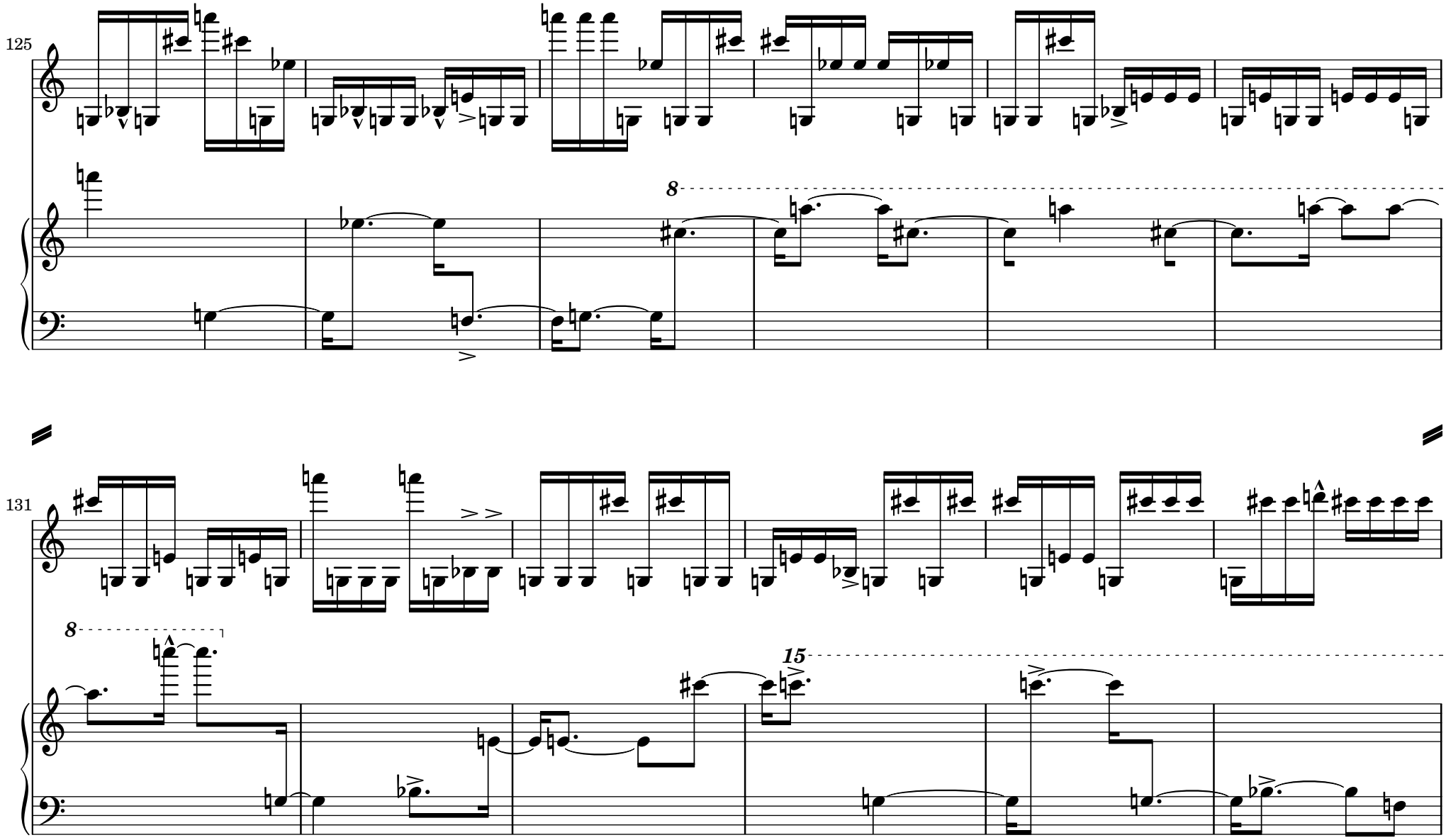
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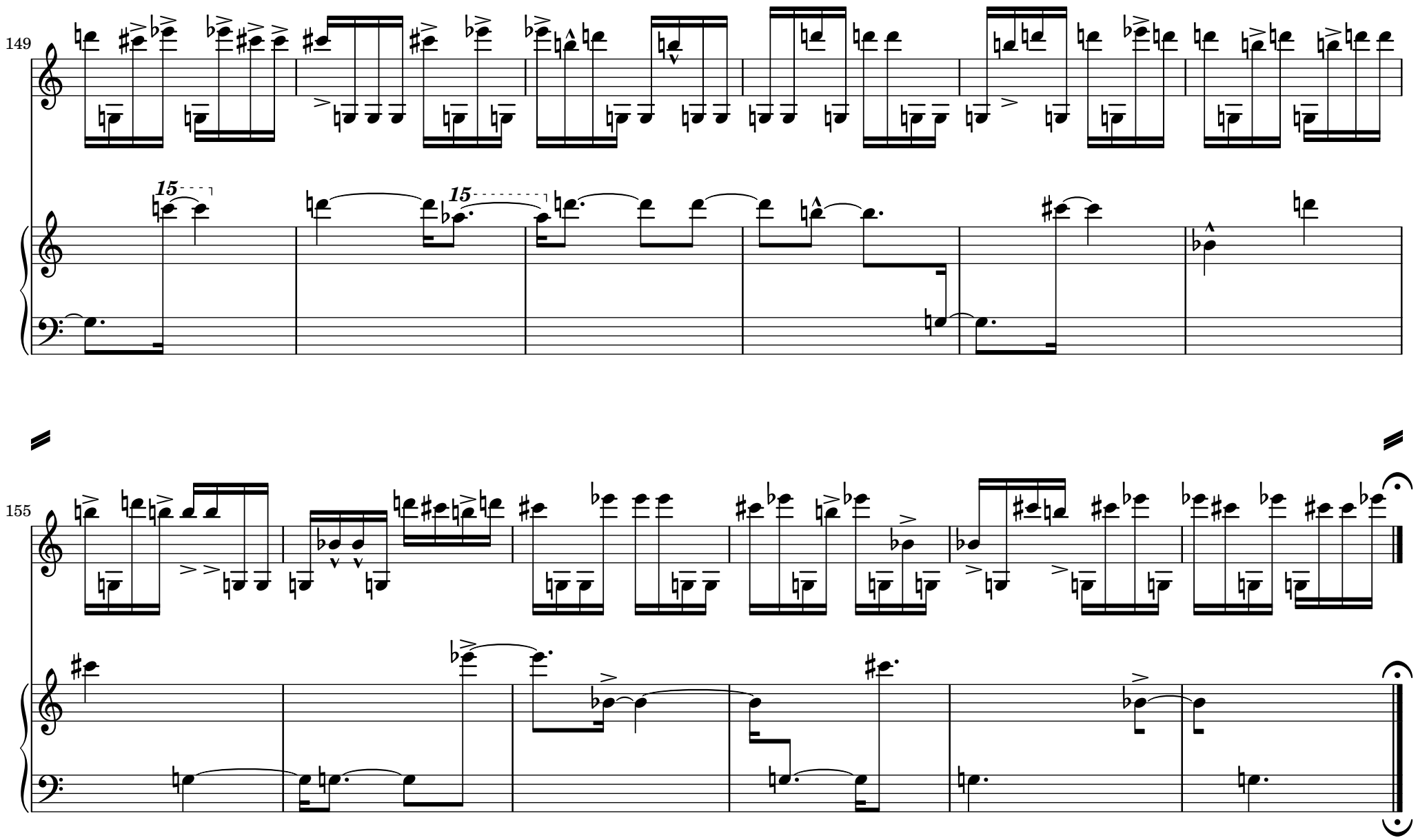
131
8
15


137
15
15
15
143
15
15


149
15
15
155

Cartography #6, for piano four hands

Mapping and rules

pitches (top hands)

set size	$N = 6$
transformation period	$12 \times$ ♪
transformation mechanism	$[a, b, c, d, e, f] \rightarrow [b, c, d, e, f, g]$, with g mod $12 = (f \bmod 12) + 1$, and g at a uniformly randomly selected octave transposition within a given range. For the first half of the composition, this range is F4–B5, and for the second half it is C6–C8.
initial set	[F4, F♯4, G4, A♭4, A4, B♭4]
chance of chords	20%

pitches (bottom hands)

set size	$N = 6$
transformation period	$12 \times$ ♪
transformation mechanism	$[a, b, c, d, e, f] \rightarrow [b, c, d, e, f, g]$, with g mod $12 = (f \bmod 12) - 1$, and g at a uniformly randomly selected octave transposition within a given range. For the first and third quarters of the composition, this range is C3–E4, and for the second and last quarters it is A0–B2.
initial set	[E4, E♭4, D4, C♯4, C4, B3]
chance of chords	20%

articulations

set size	$N = 6$
transformation period	no transformation.
set	[∅, ∅, ∅, >, >, ^], where ∅ represents no articulation.

durations

set size	$N = 4$
transformation period	$30 \times$ ♩
transformation mechanism	there are two mechanisms in use for the durations. The augmentation mechanism works as follows: $[a, b, c, d] \rightarrow [a + 1, b + 1, c + 1, d + 1]$, where an element equals to 1 if $x + 1 < 1$, $\forall x \in [a, b, c, \ldots j]$. The diminishing mechanism works as follows: $[a, b, c, d] \rightarrow [a - 1, b - 1, c - 1, d - 1]$, where an element equals to 1 if $x - 1 < 1$, $\forall x \in [a, b, c, \ldots j]$.
initial set (top hands)	$[7, 8, 9, 10]$
initial set (bottom hands)	$[1, 1, 1, 1]$
mechanism types	the top hands use the dim mechanism throughout the composition. The bottom hands use the aug mechanism in the first half of the composition is and the dim mechanism in the last half.

constraints

- number of pitch transformations: 60.
- number of duration transformations: 12.
- ranges: bottom hands A0–E4, top hands F4–C8.

General performance notes

- this piece has no dynamic marks. Loudness is solely notated using marcato and martellato signs ($>$ and $\hat{}$, respectively). Notes without articulations marks should be played soft (equivalent to ***pp***), notes with a marcato sign should have a medium level of loudness (equivalent to ***mf***) and notes with a martellato sign should have a high level of loudness (equivalent to ***ff***).
- the piano's sustain pedal should be held halfway down throughout the piece. A good reference point for this is when individual note lengths cannot be precisely perceived (that is, the sound is not cut when releasing a key). Some instruments and acoustic spaces might call for slightly different pedalling (at the discretion of the performer).
- after the last note of the piece, hold the sustain pedal down for at least a couple of seconds before raising it.

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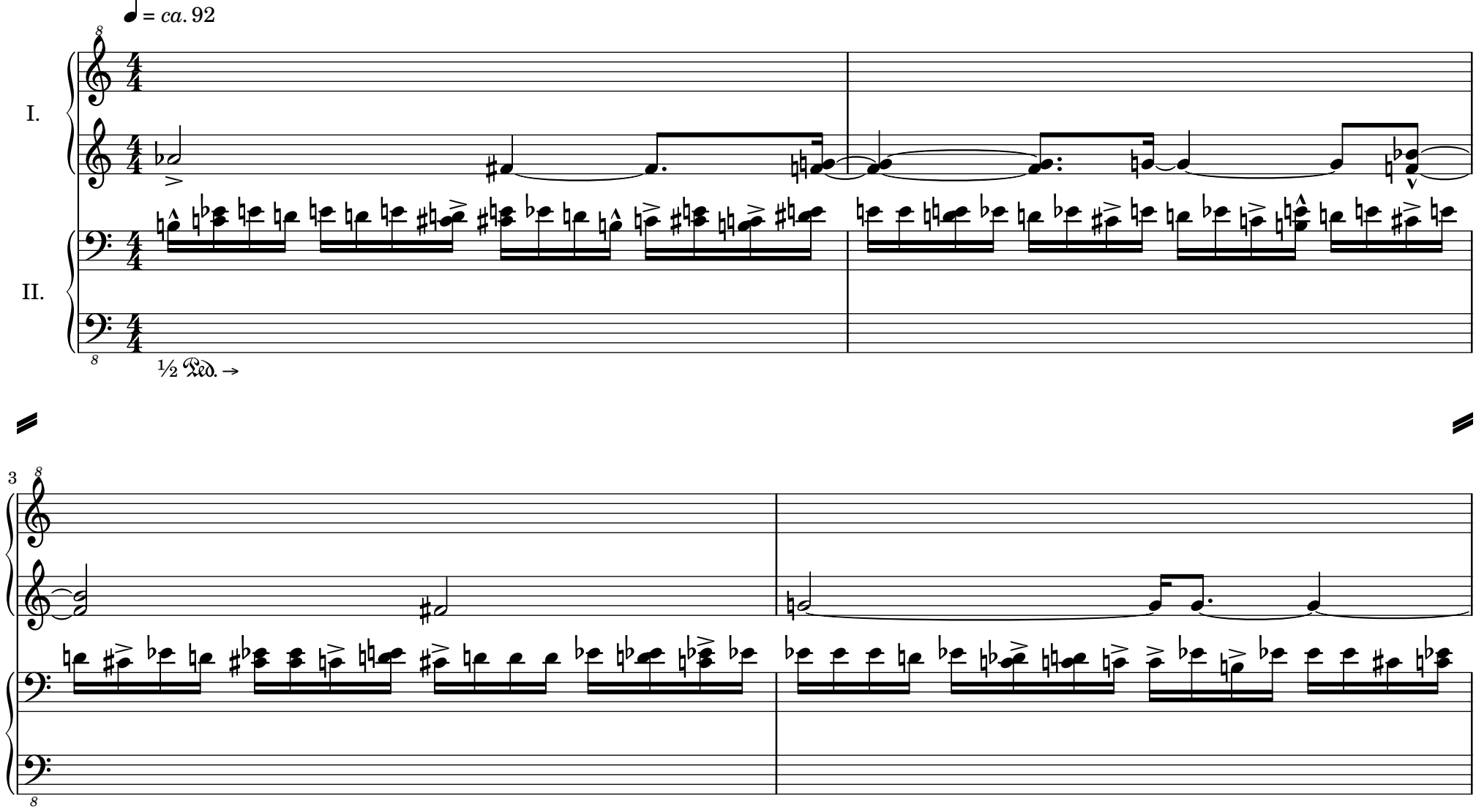
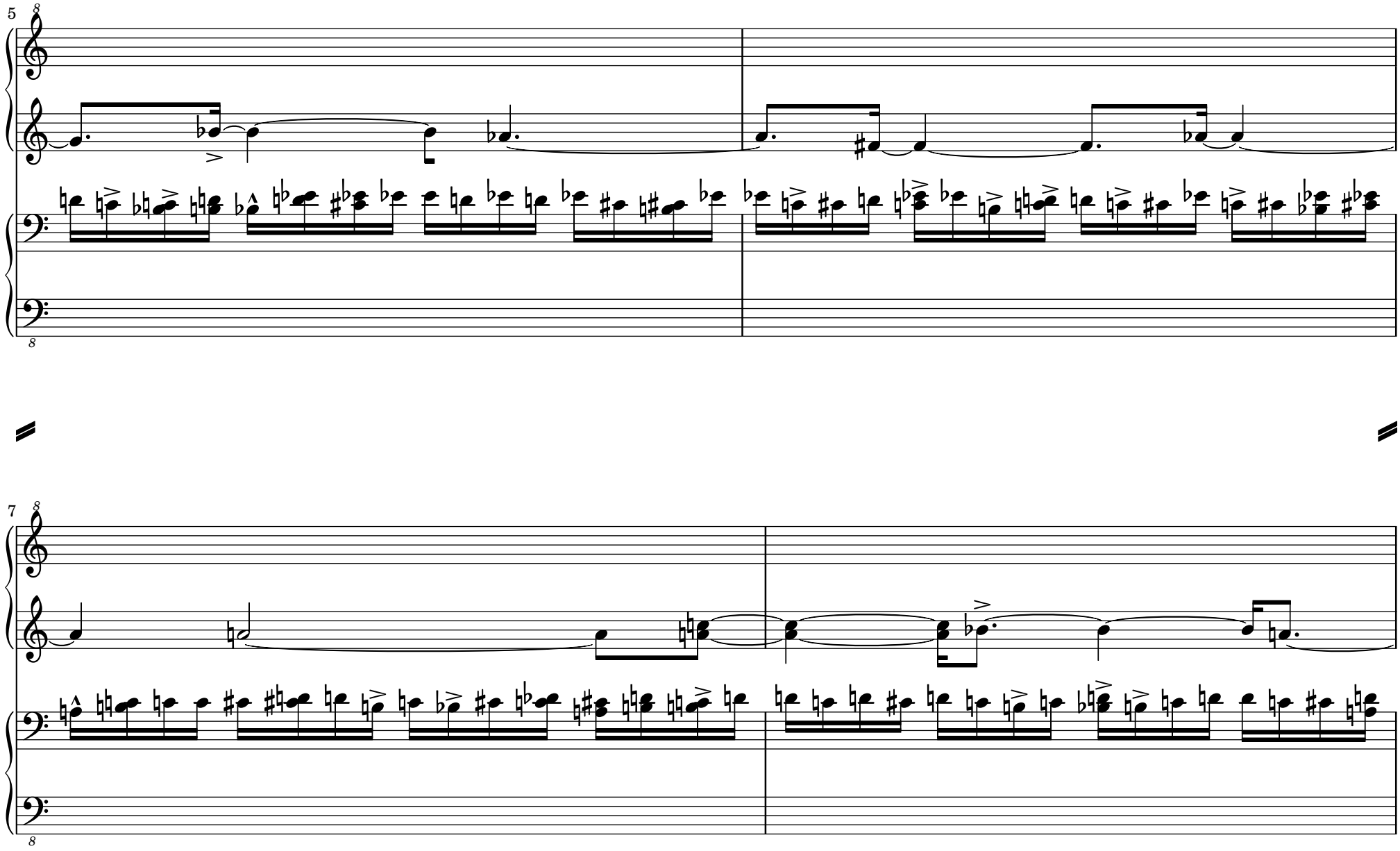
Cartography #6

Gilberto Agostinho

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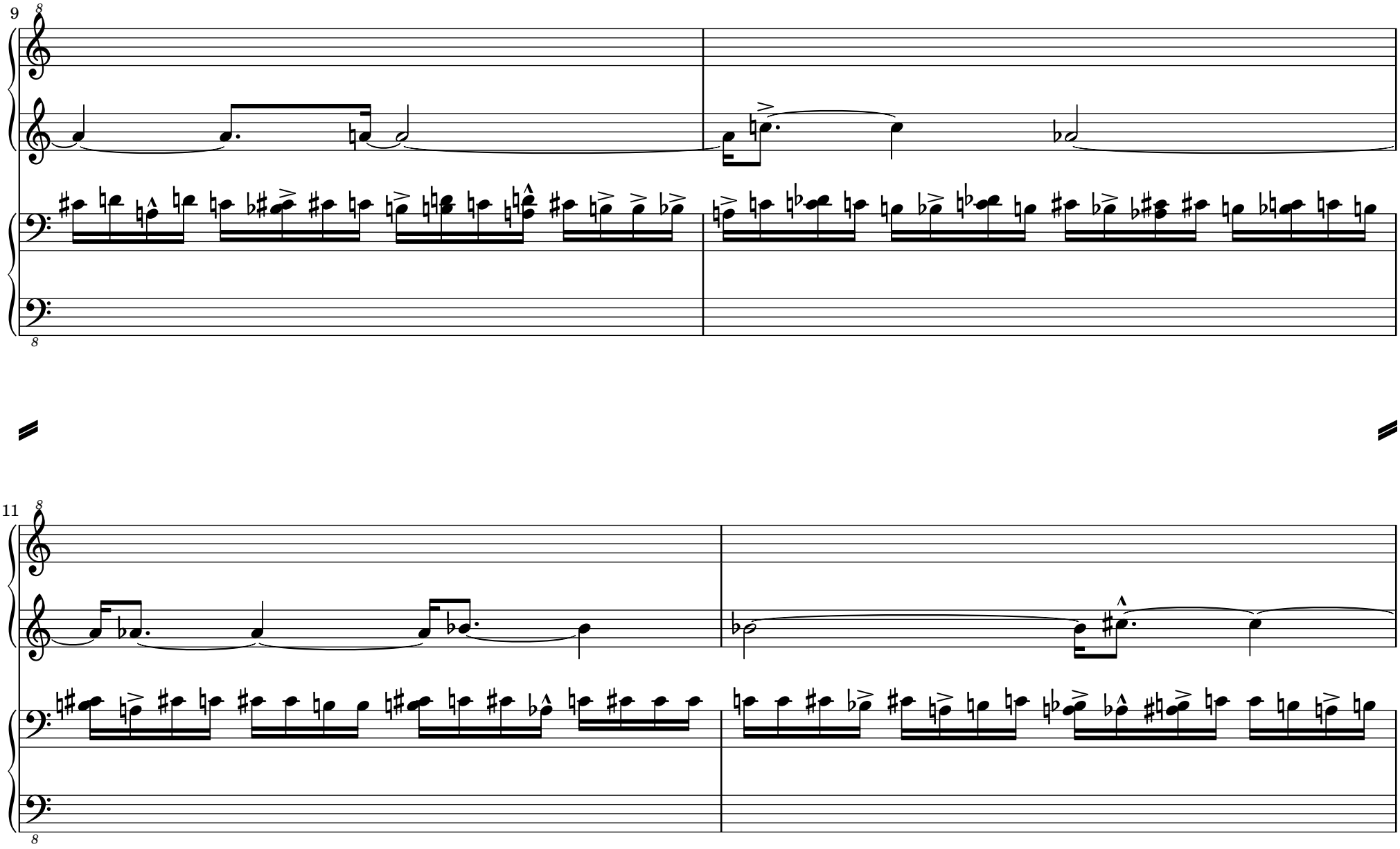
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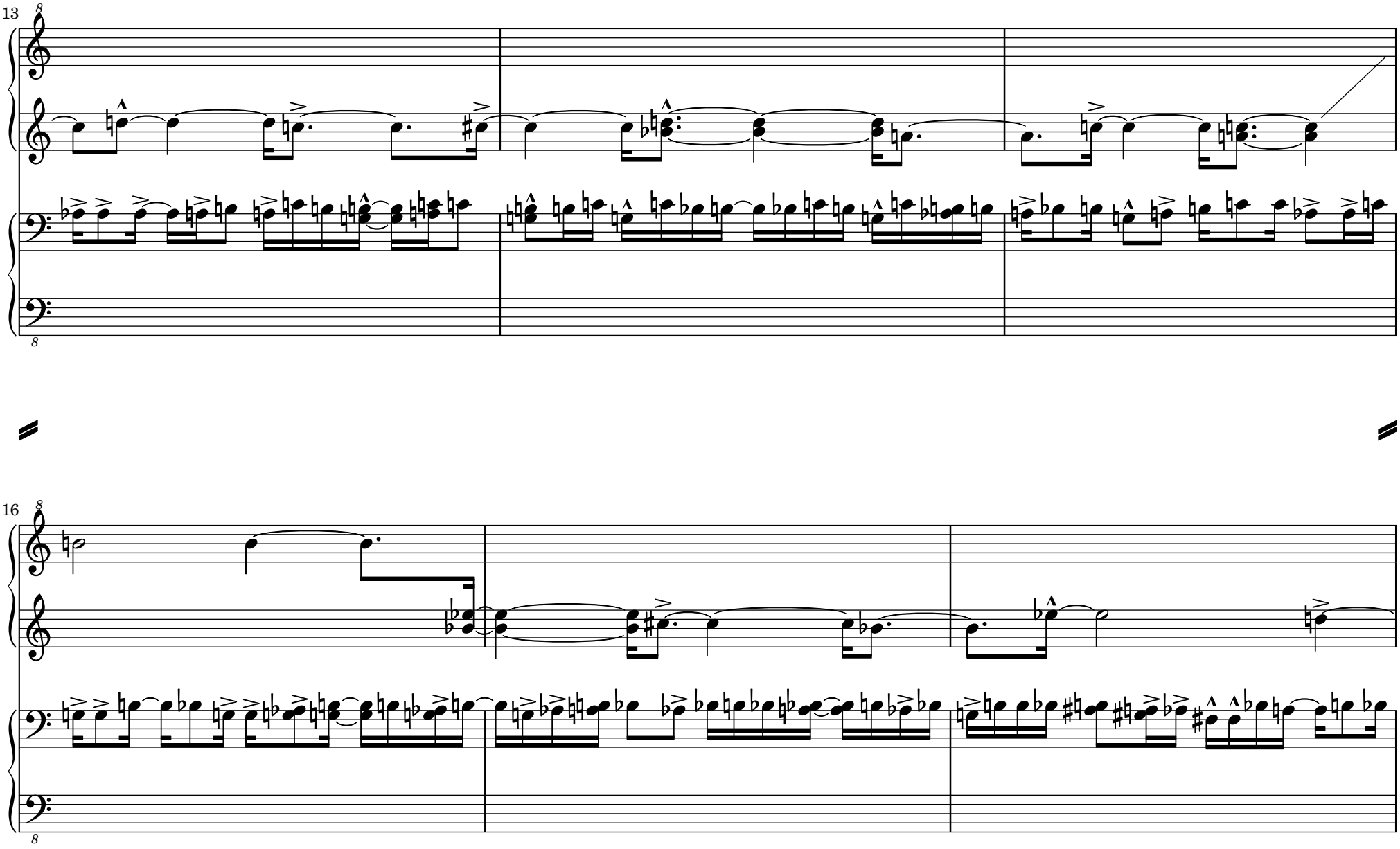
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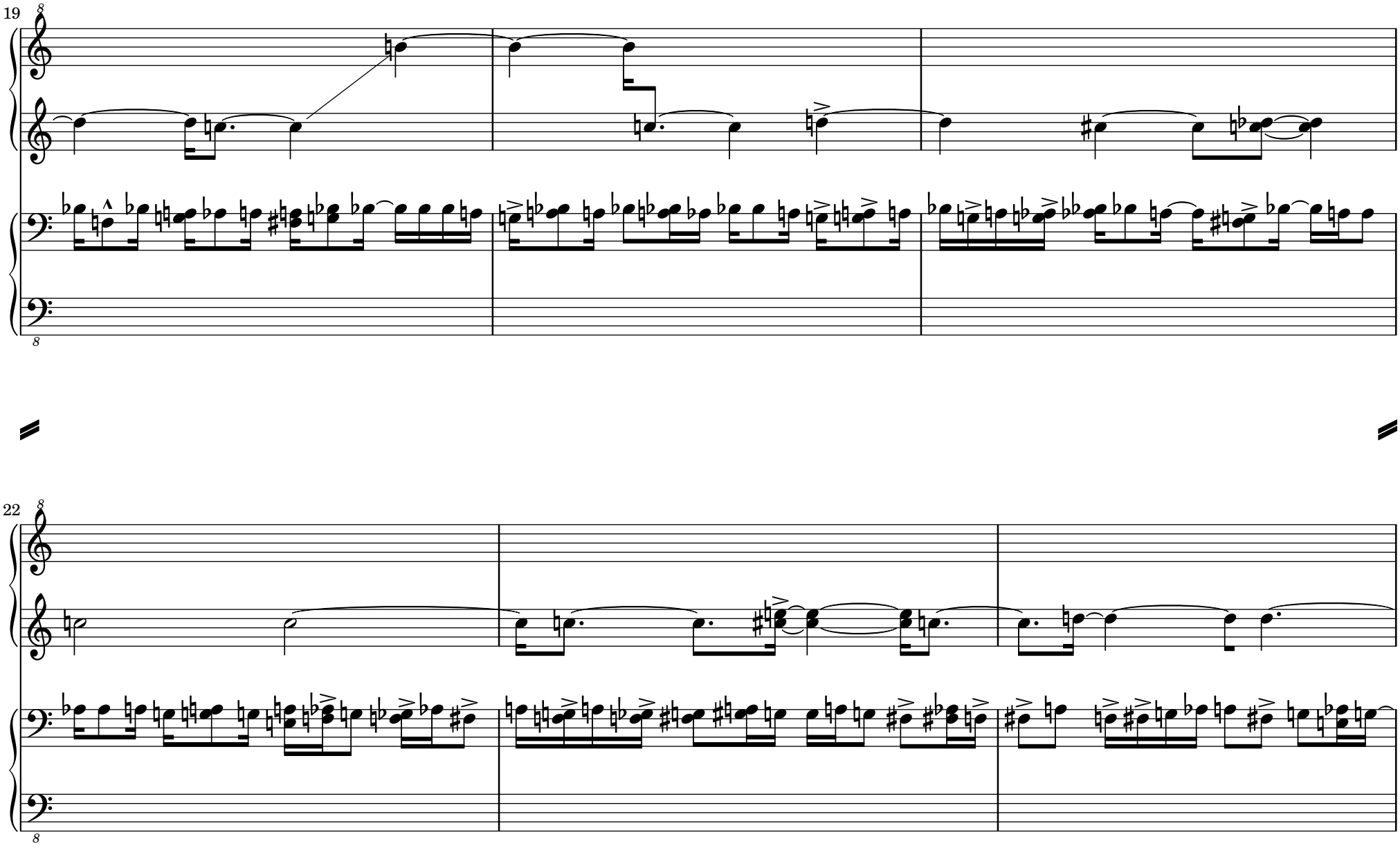
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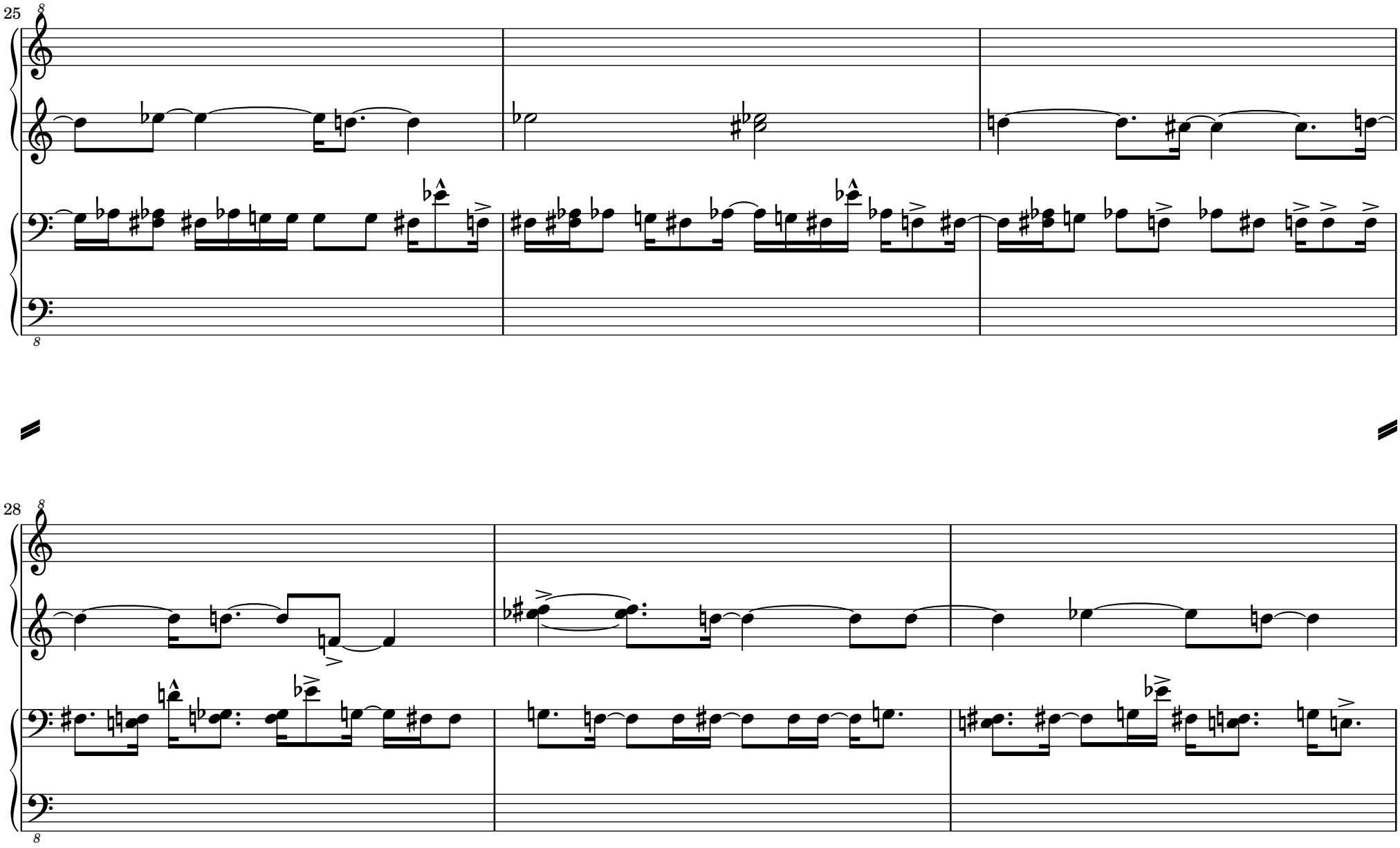
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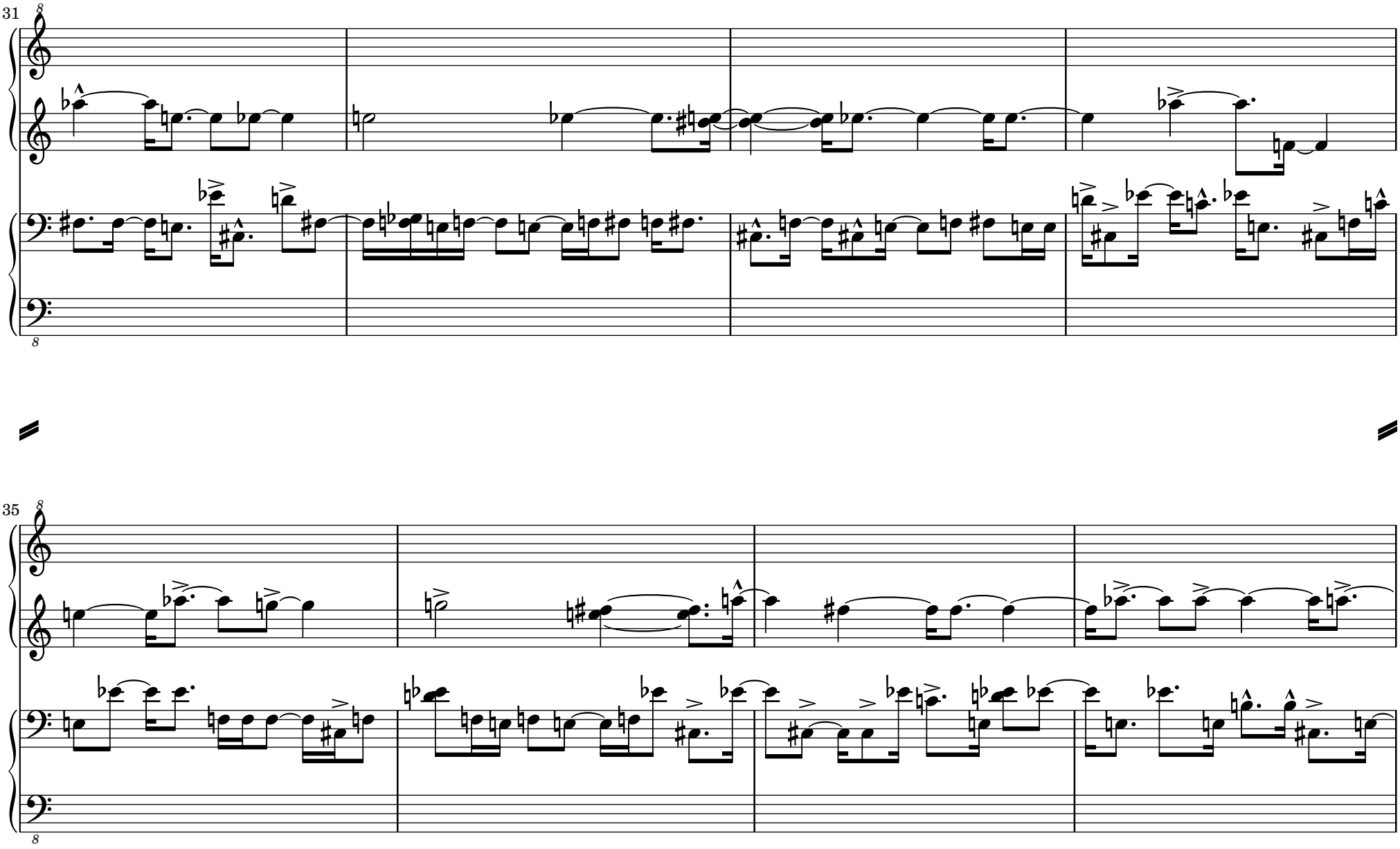
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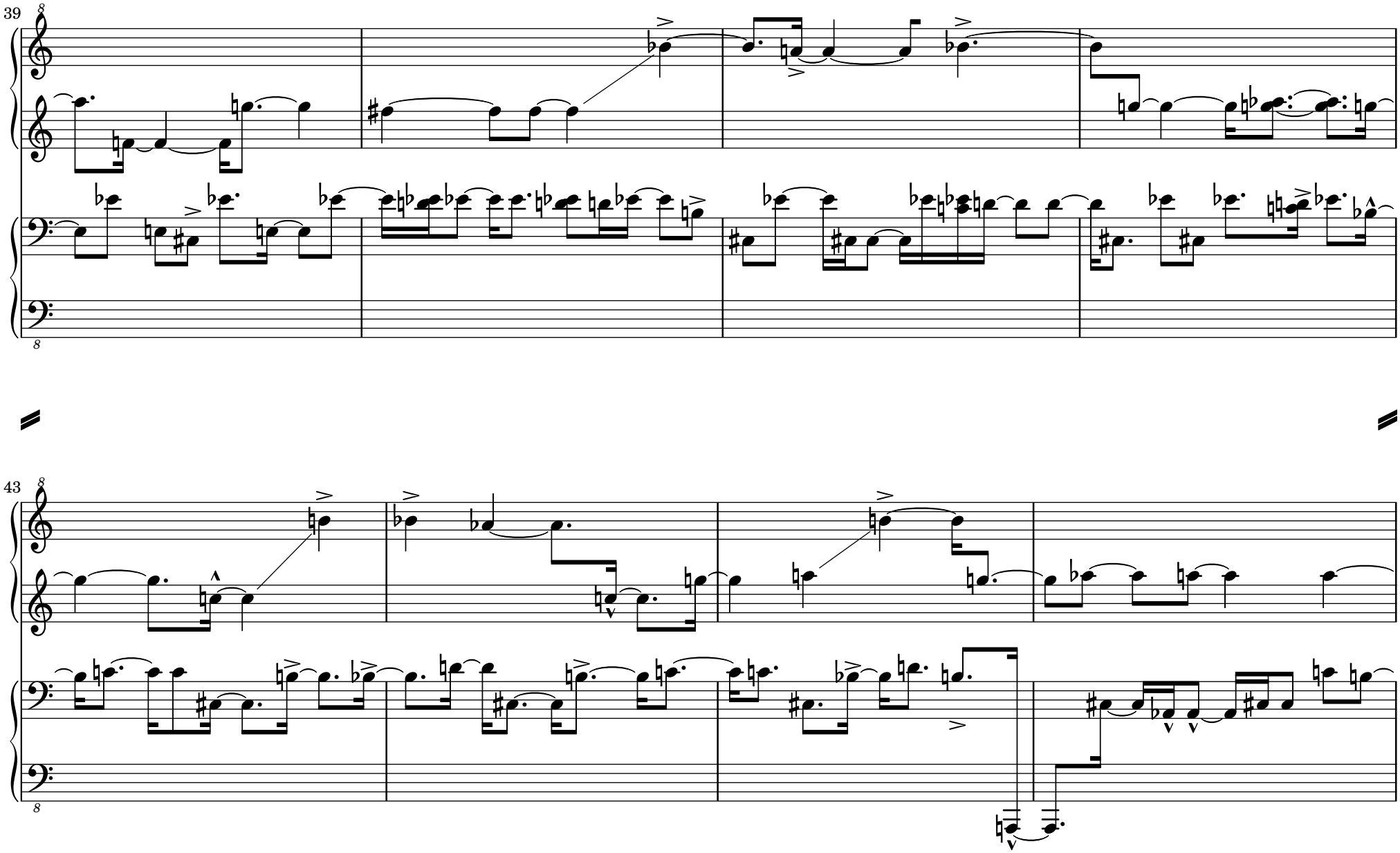
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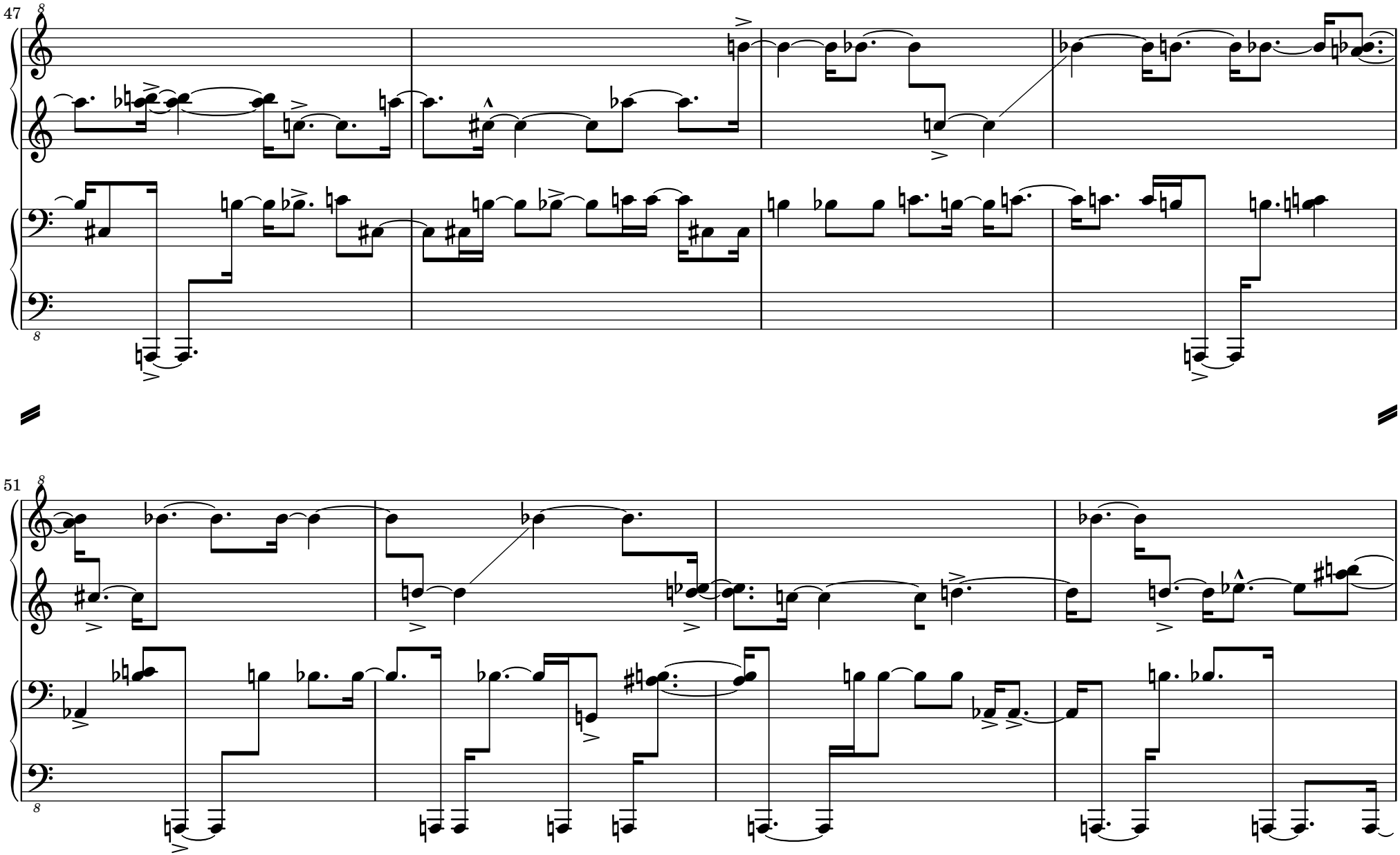
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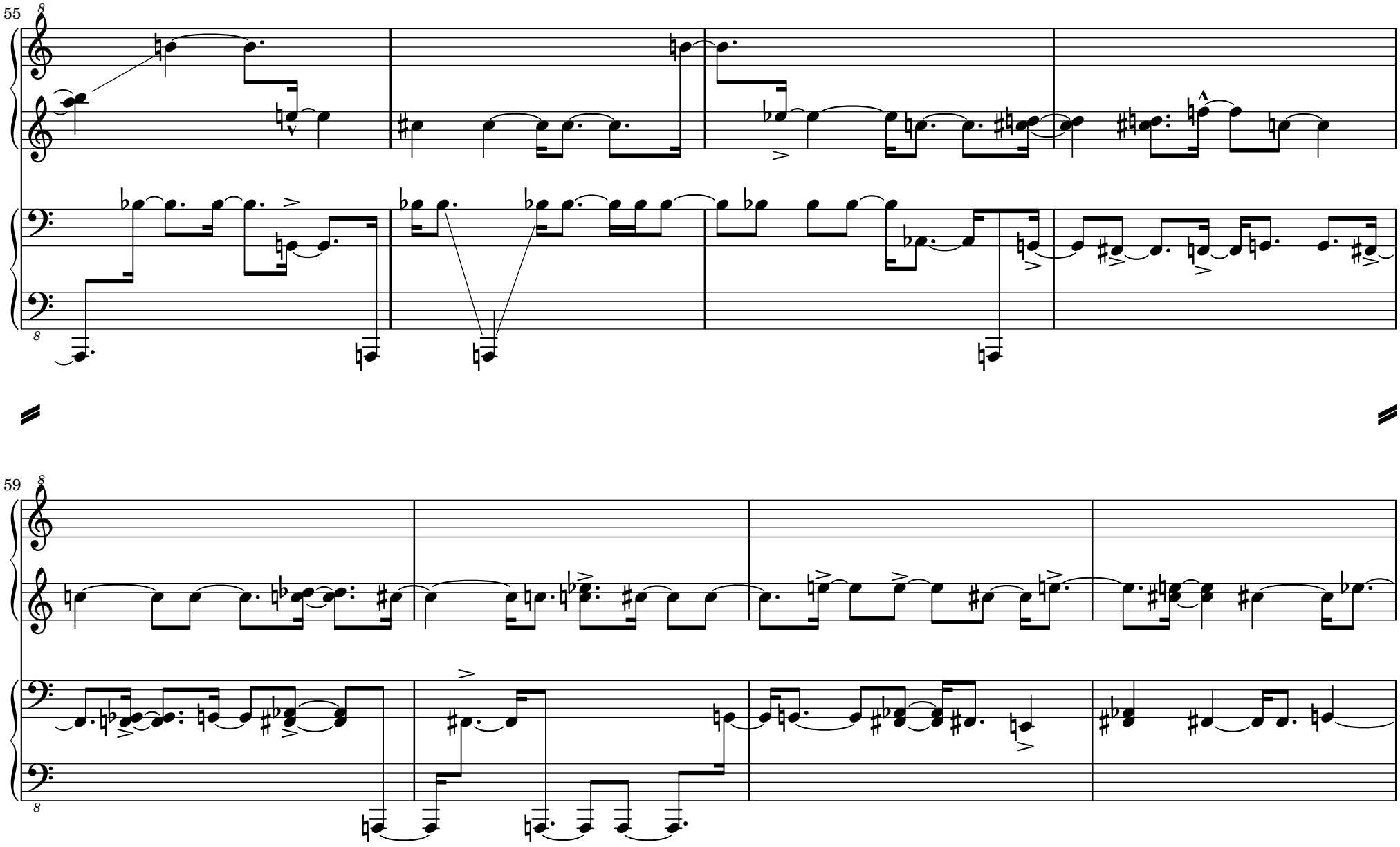
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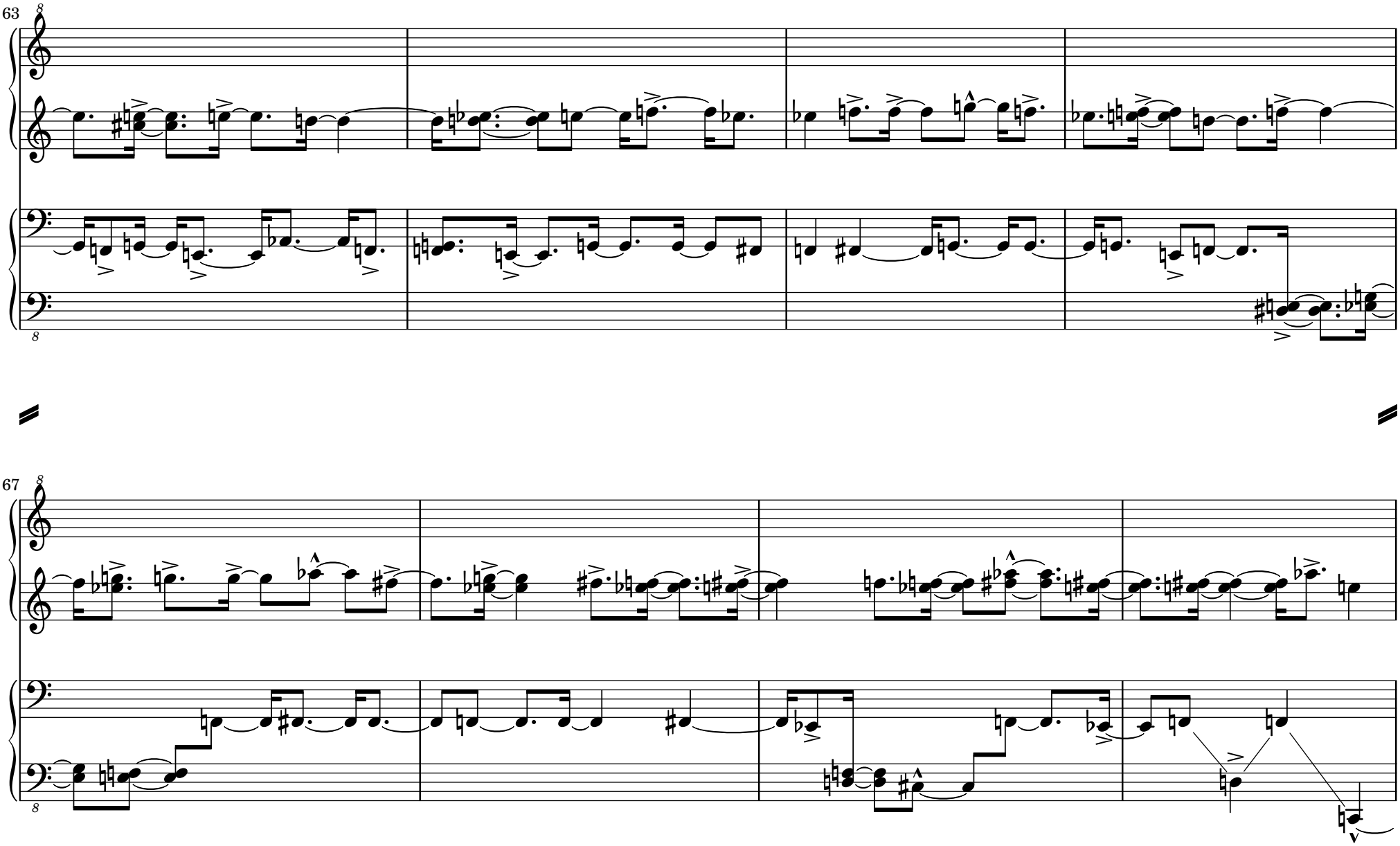
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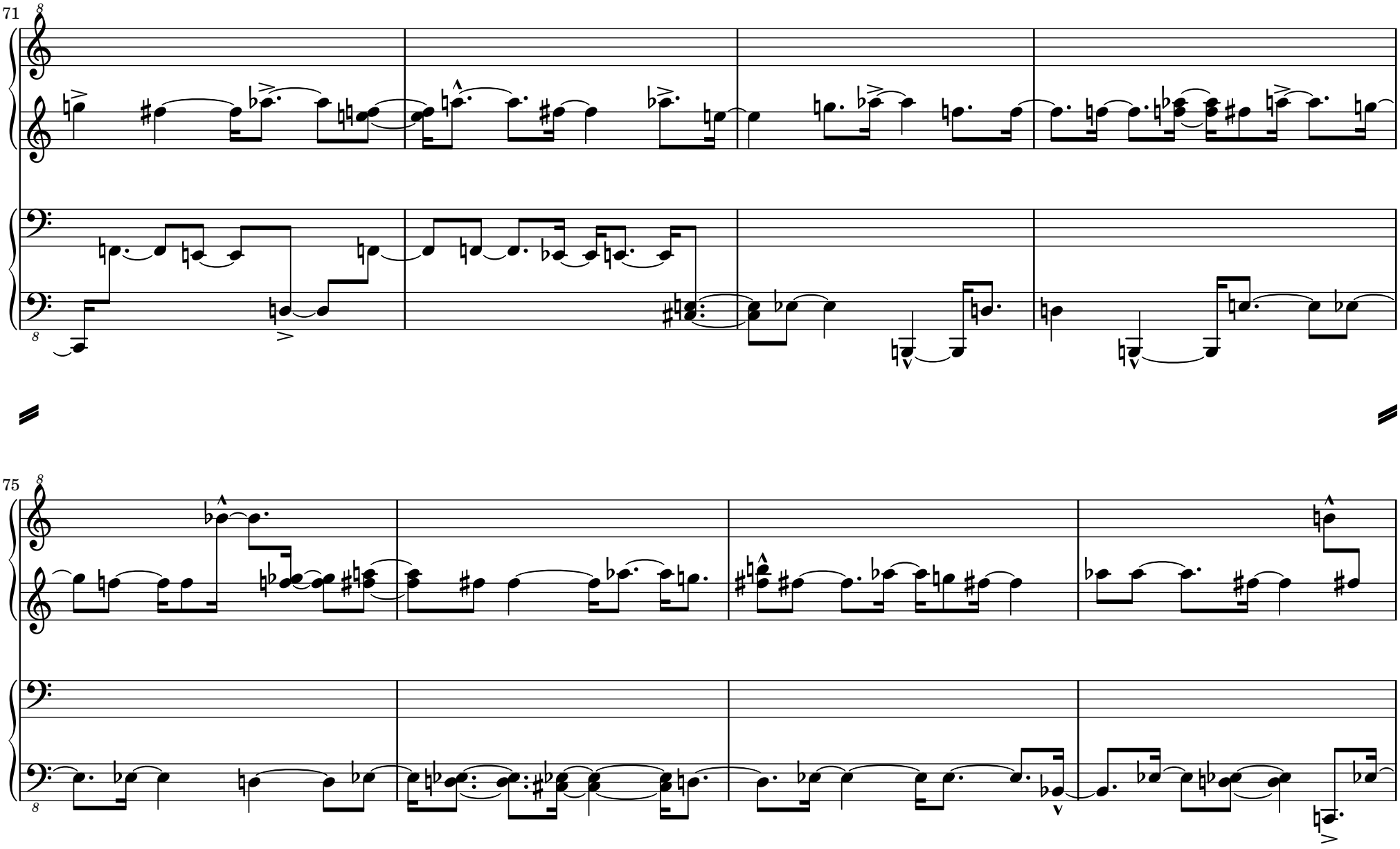
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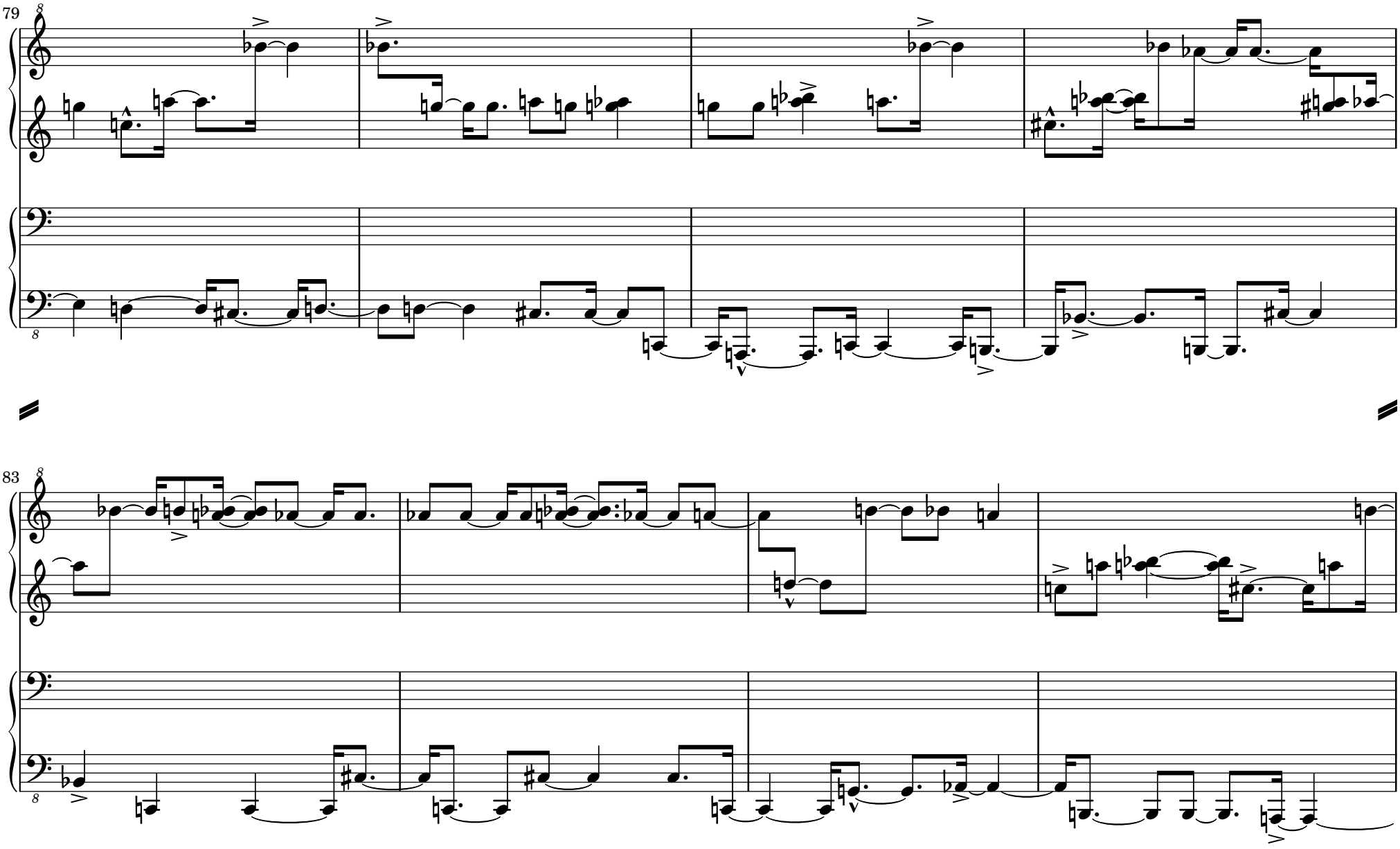
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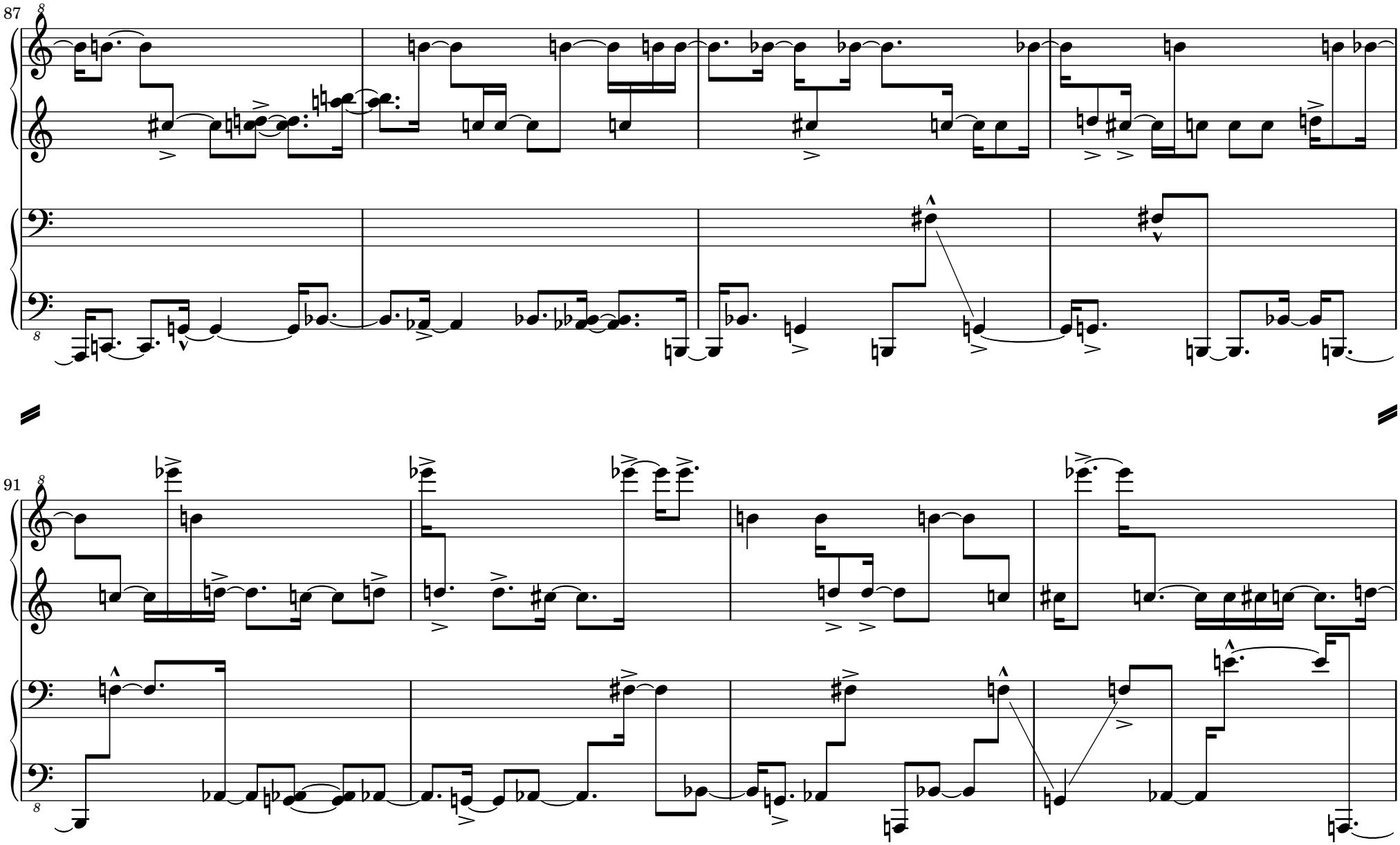
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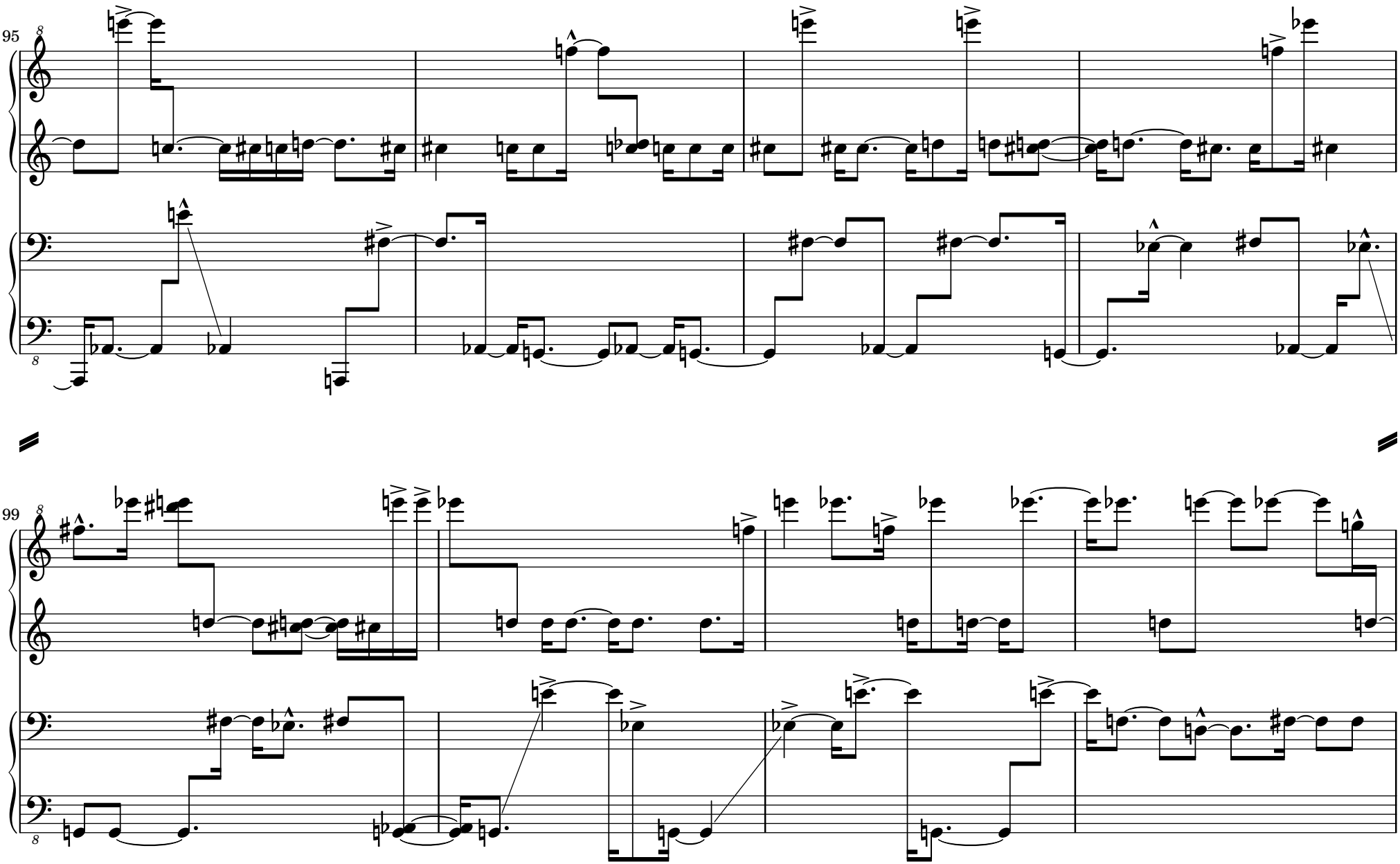
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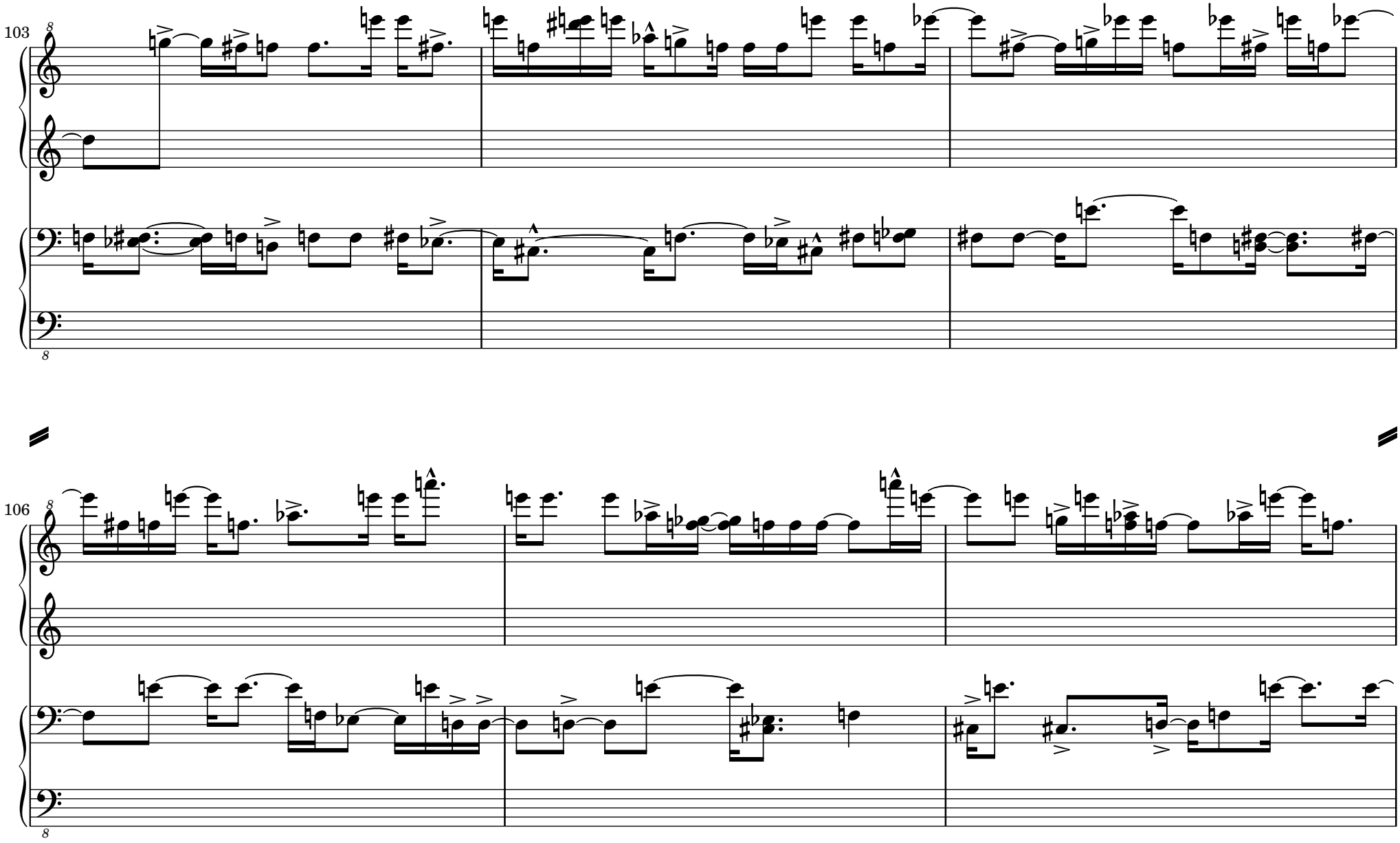
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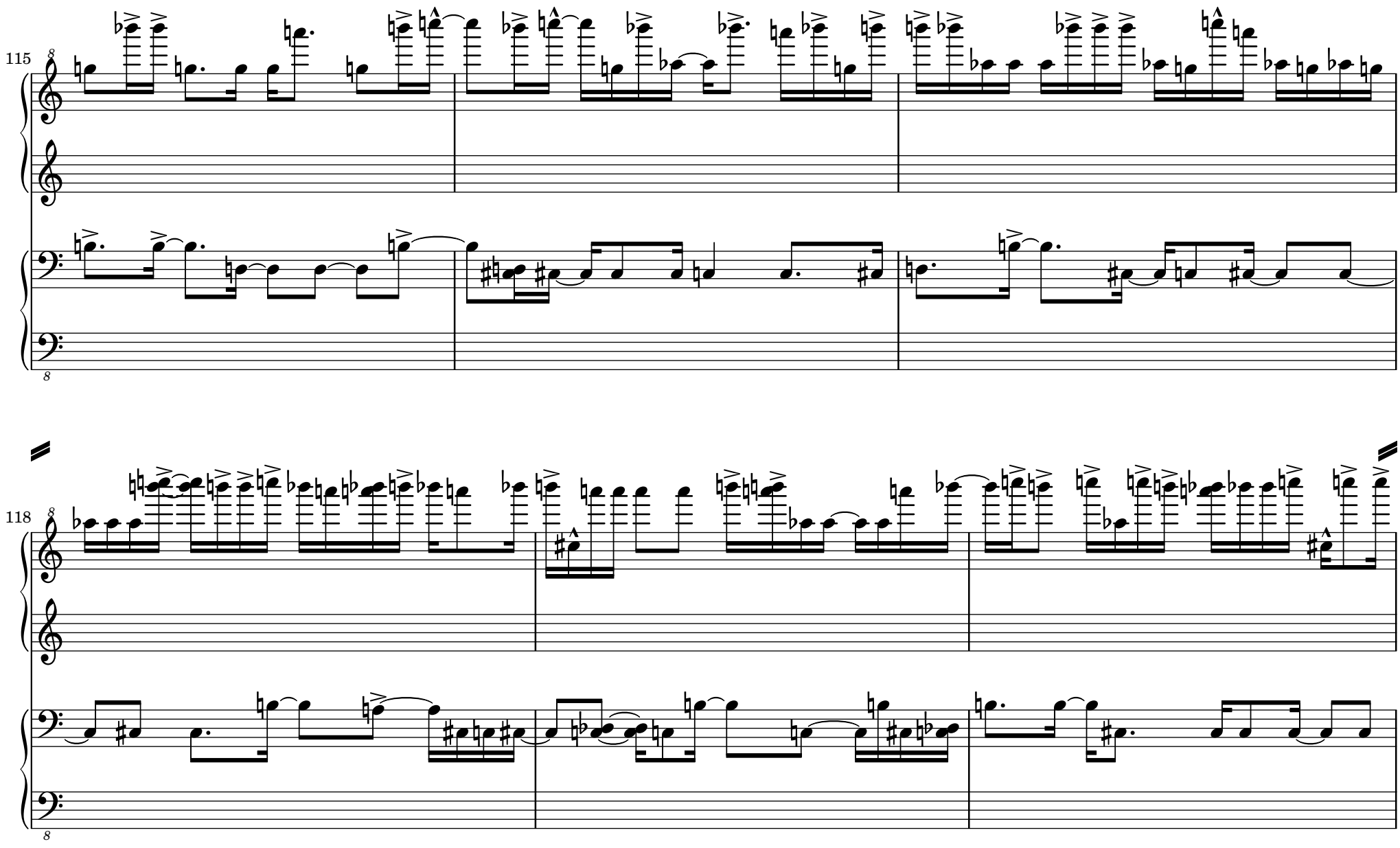
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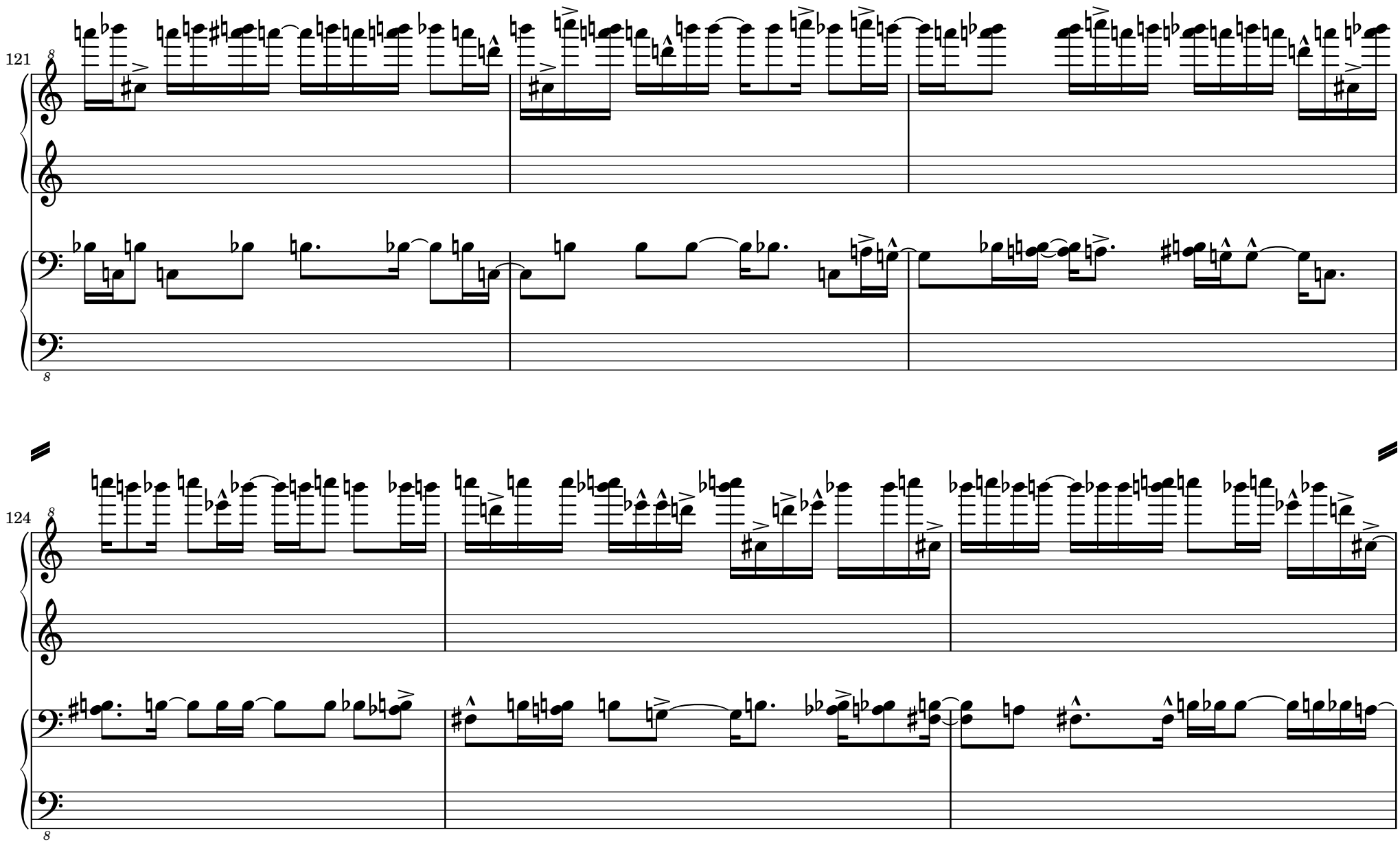
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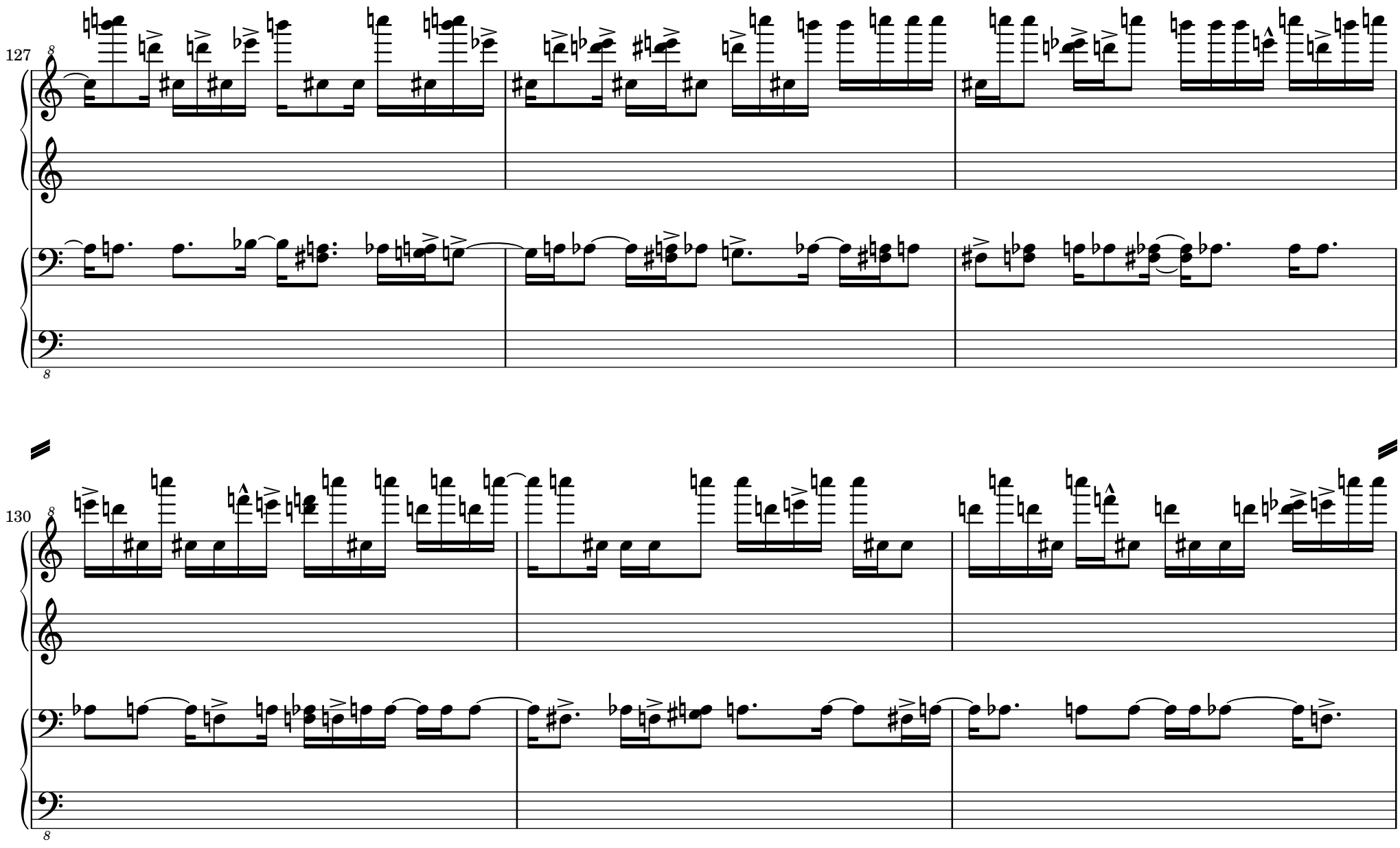
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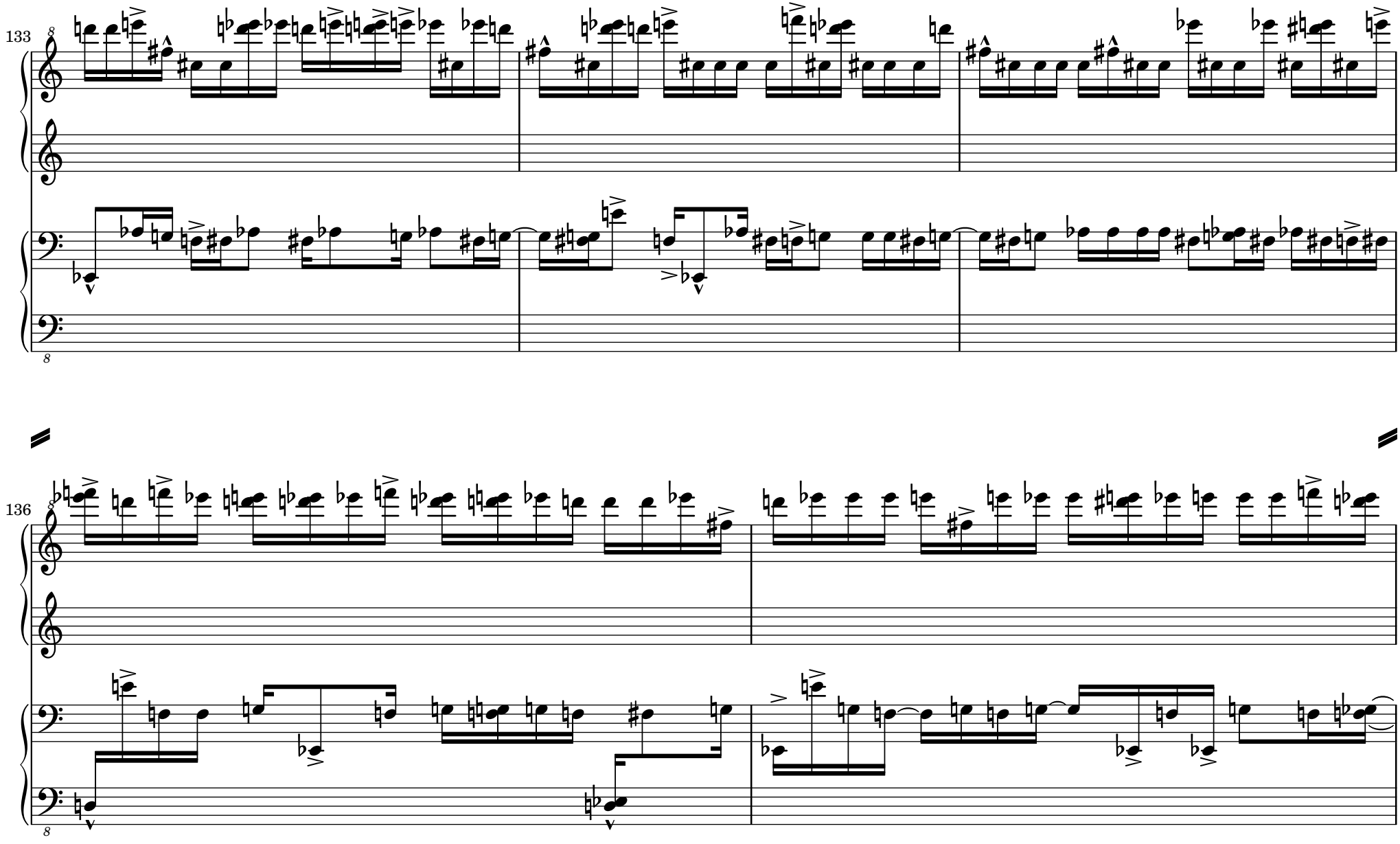
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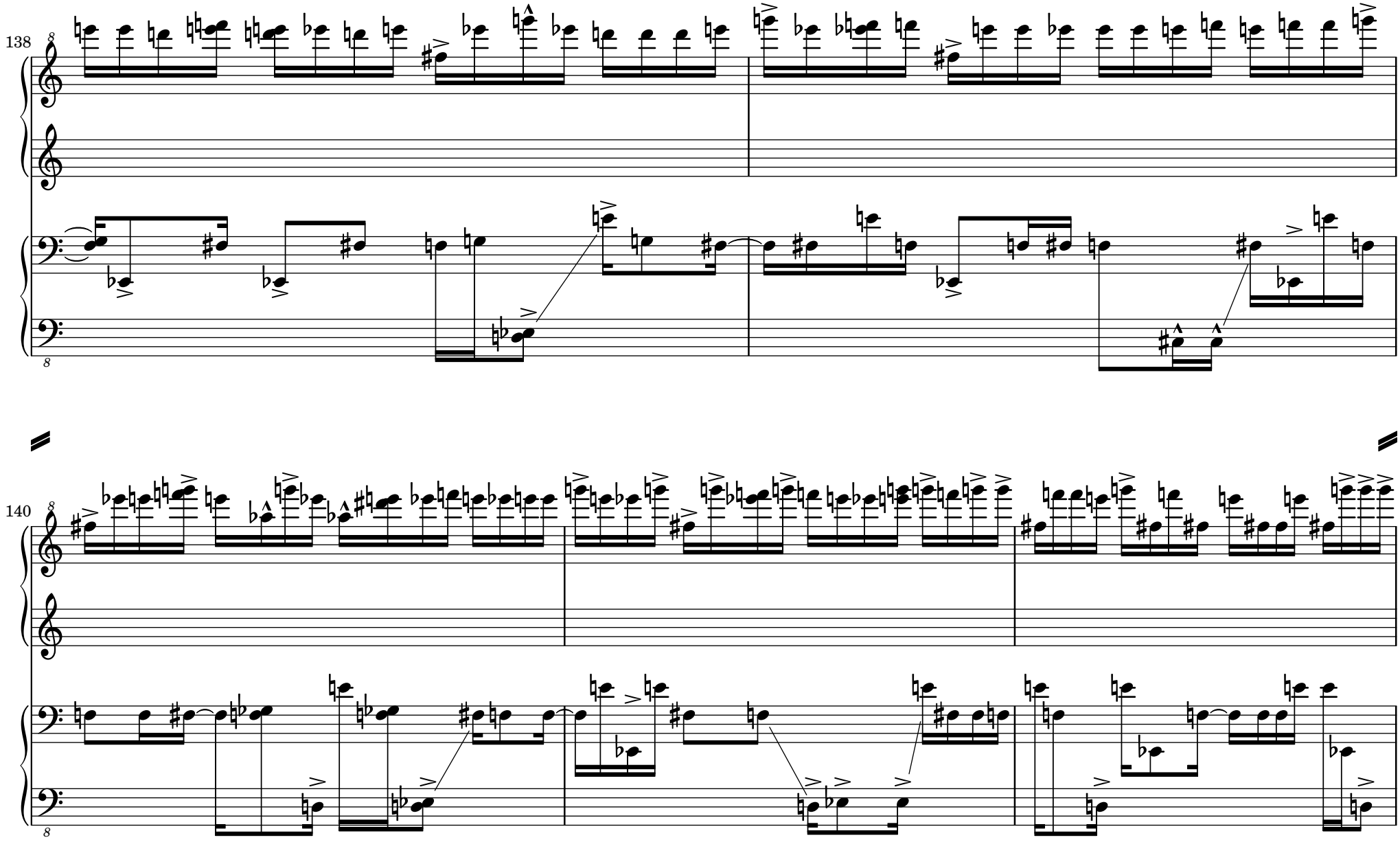
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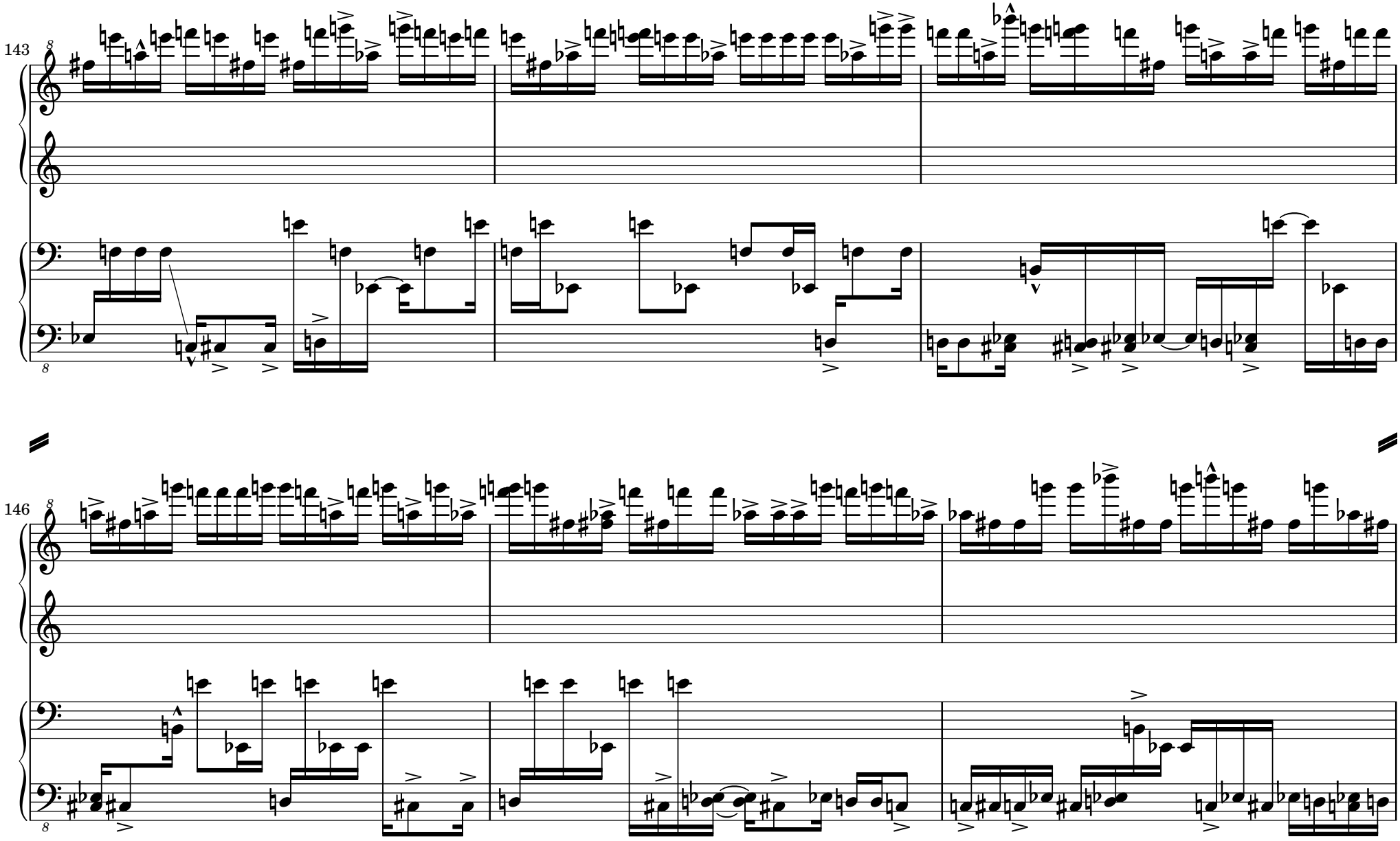
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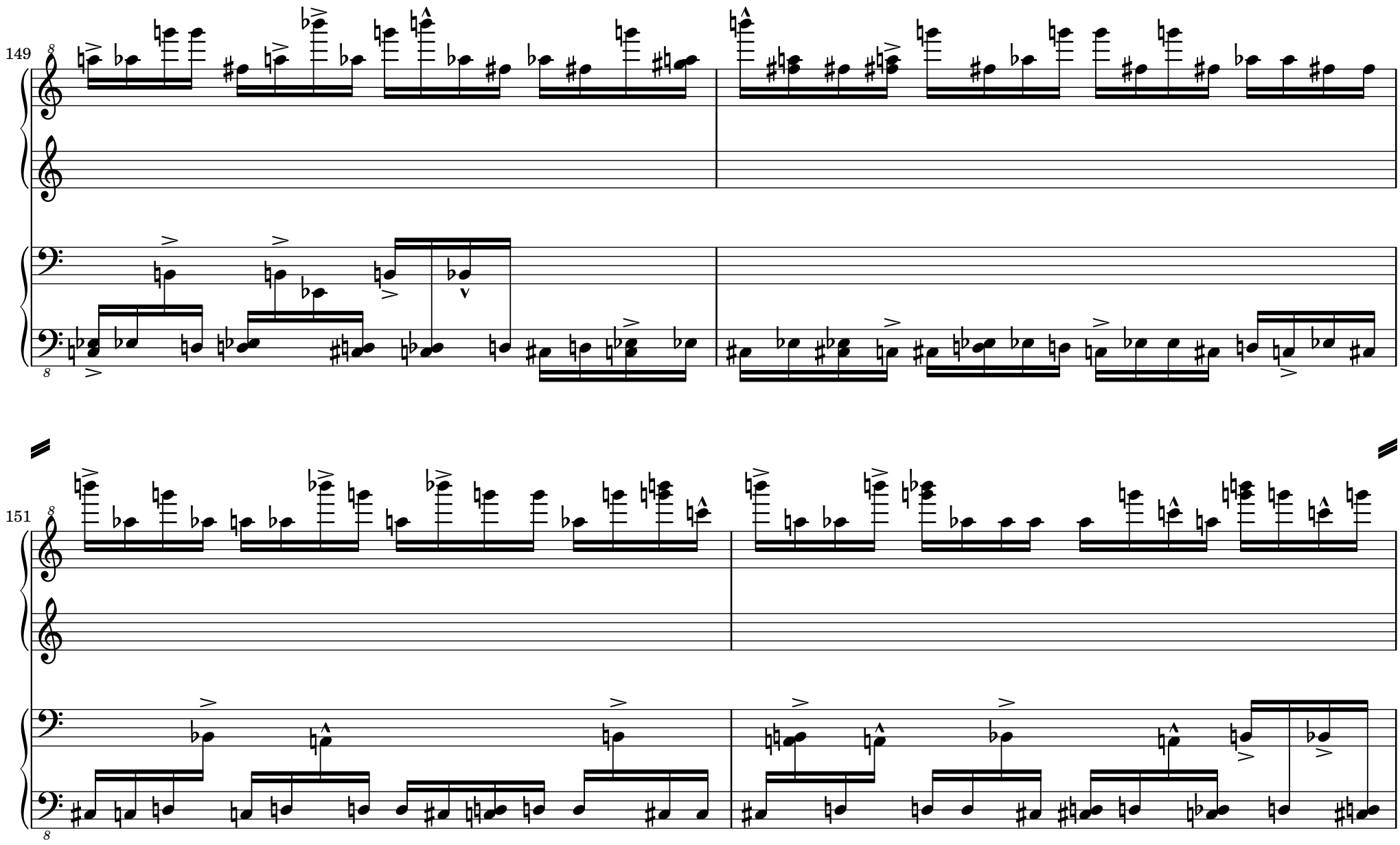
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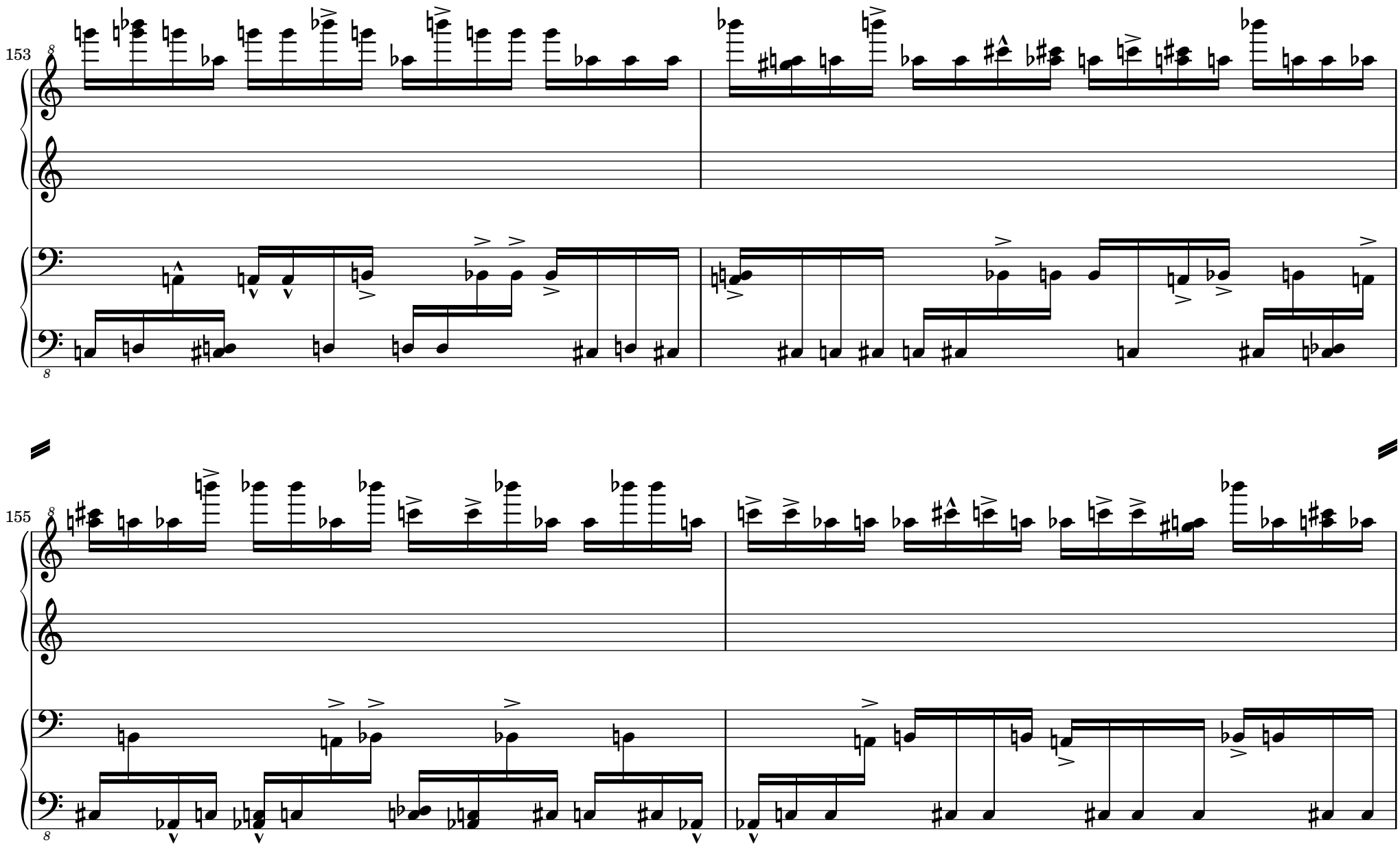
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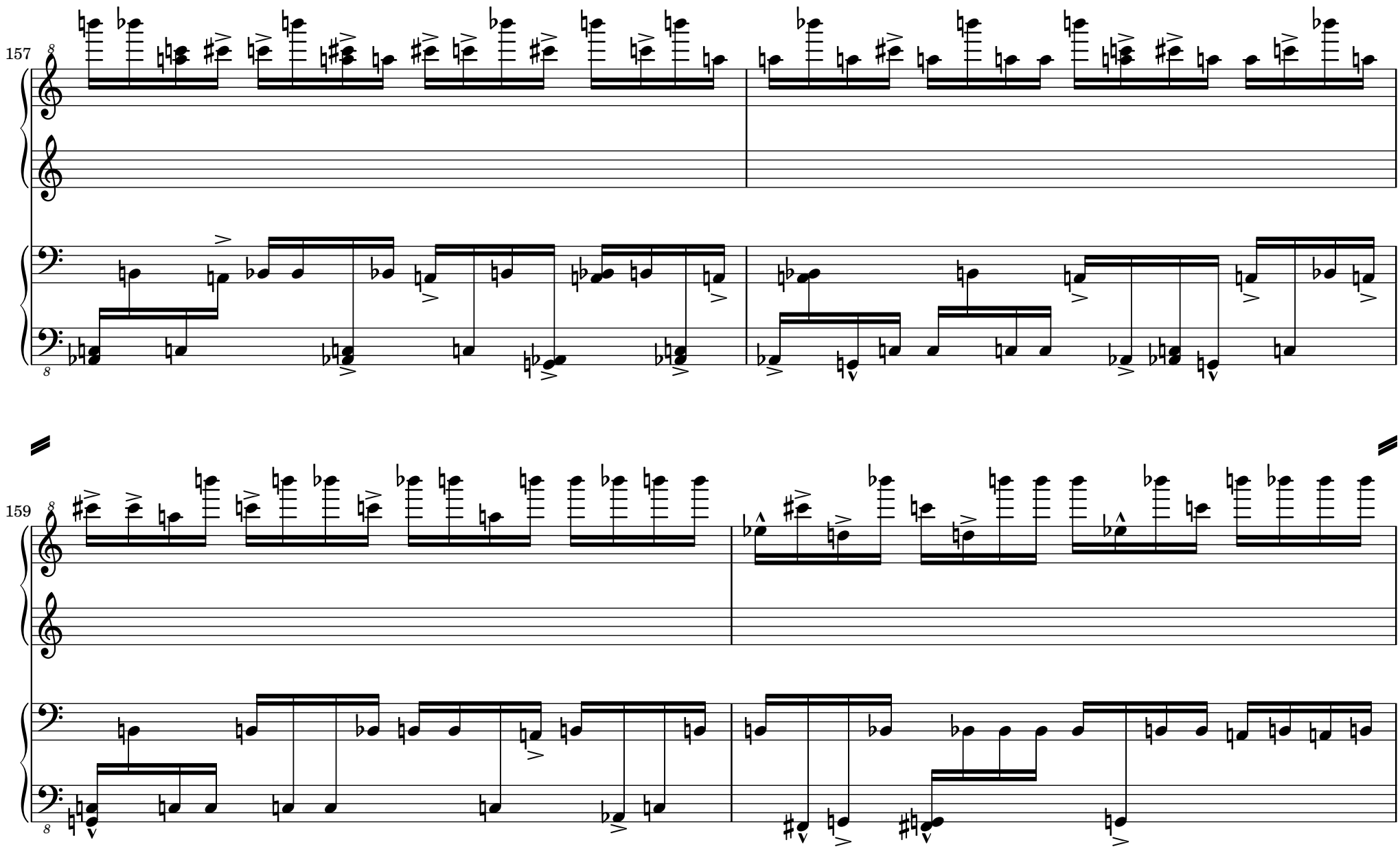
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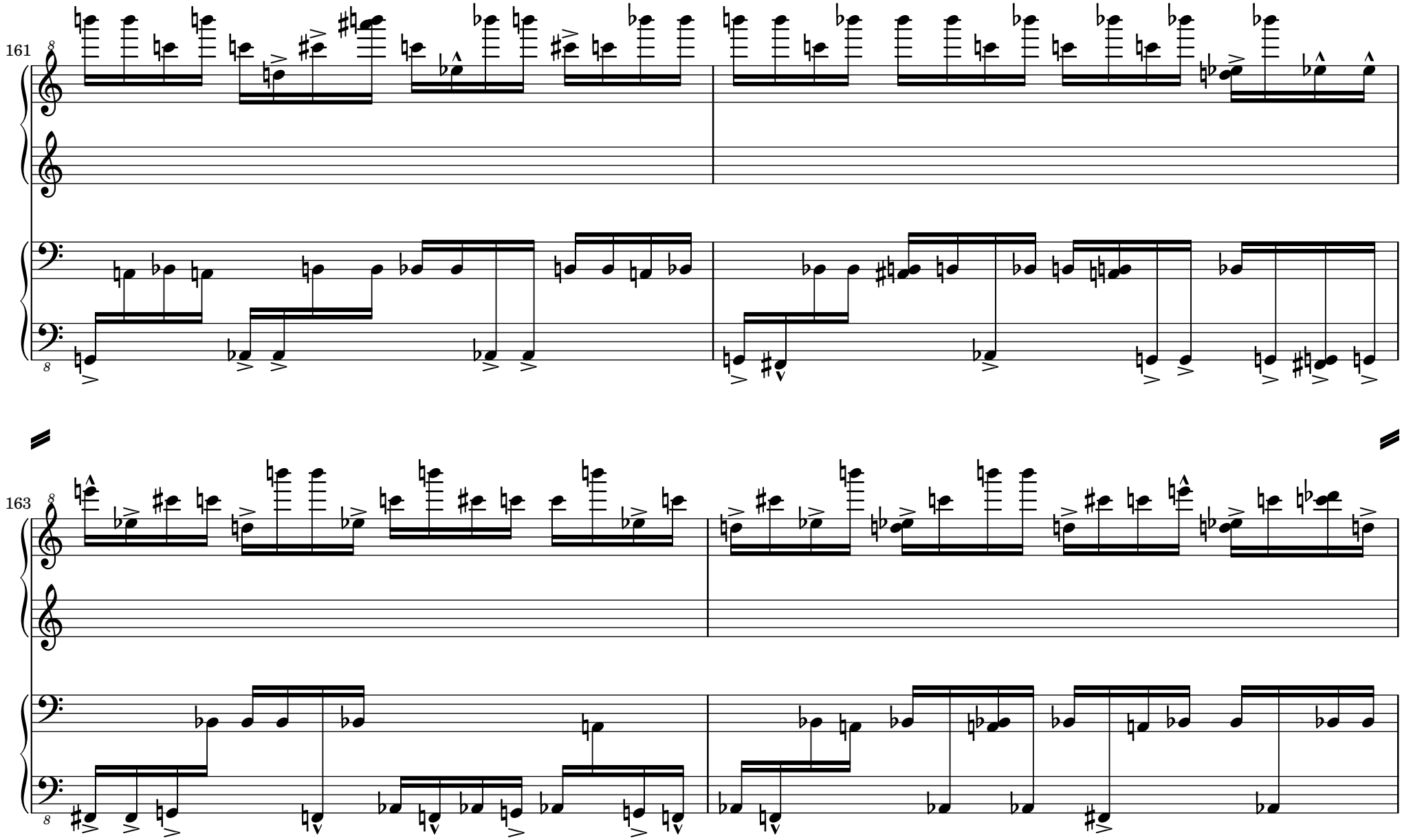
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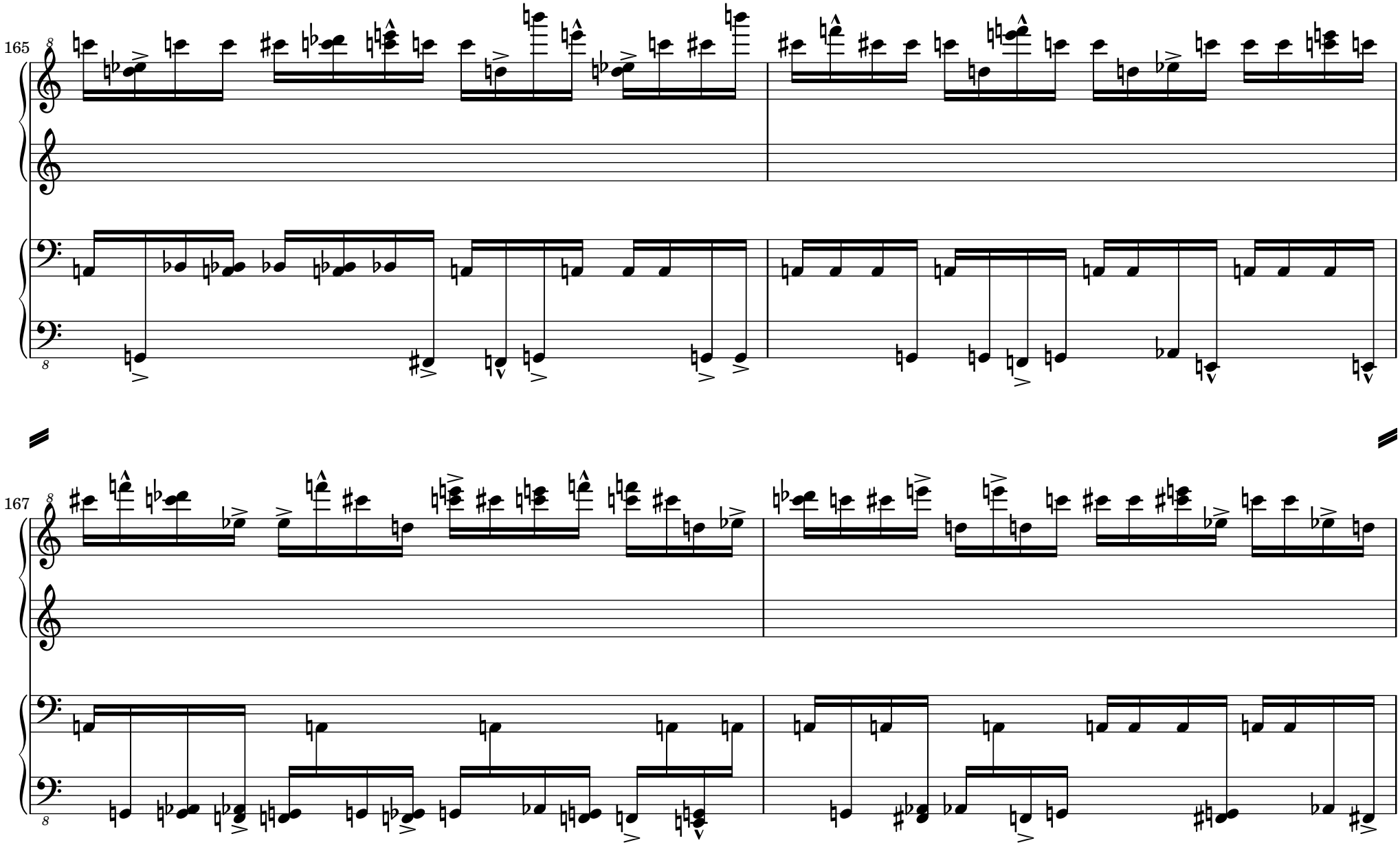
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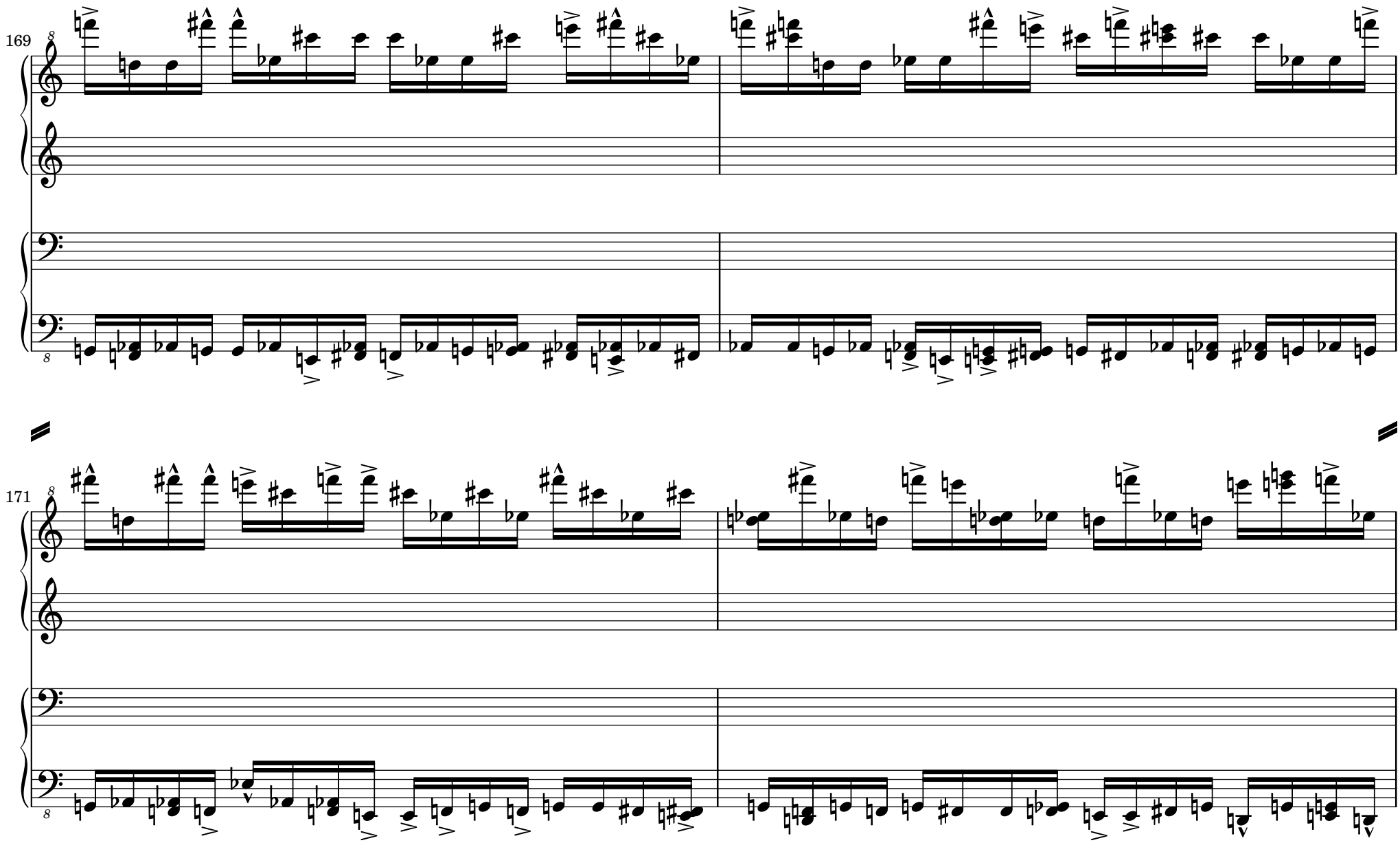
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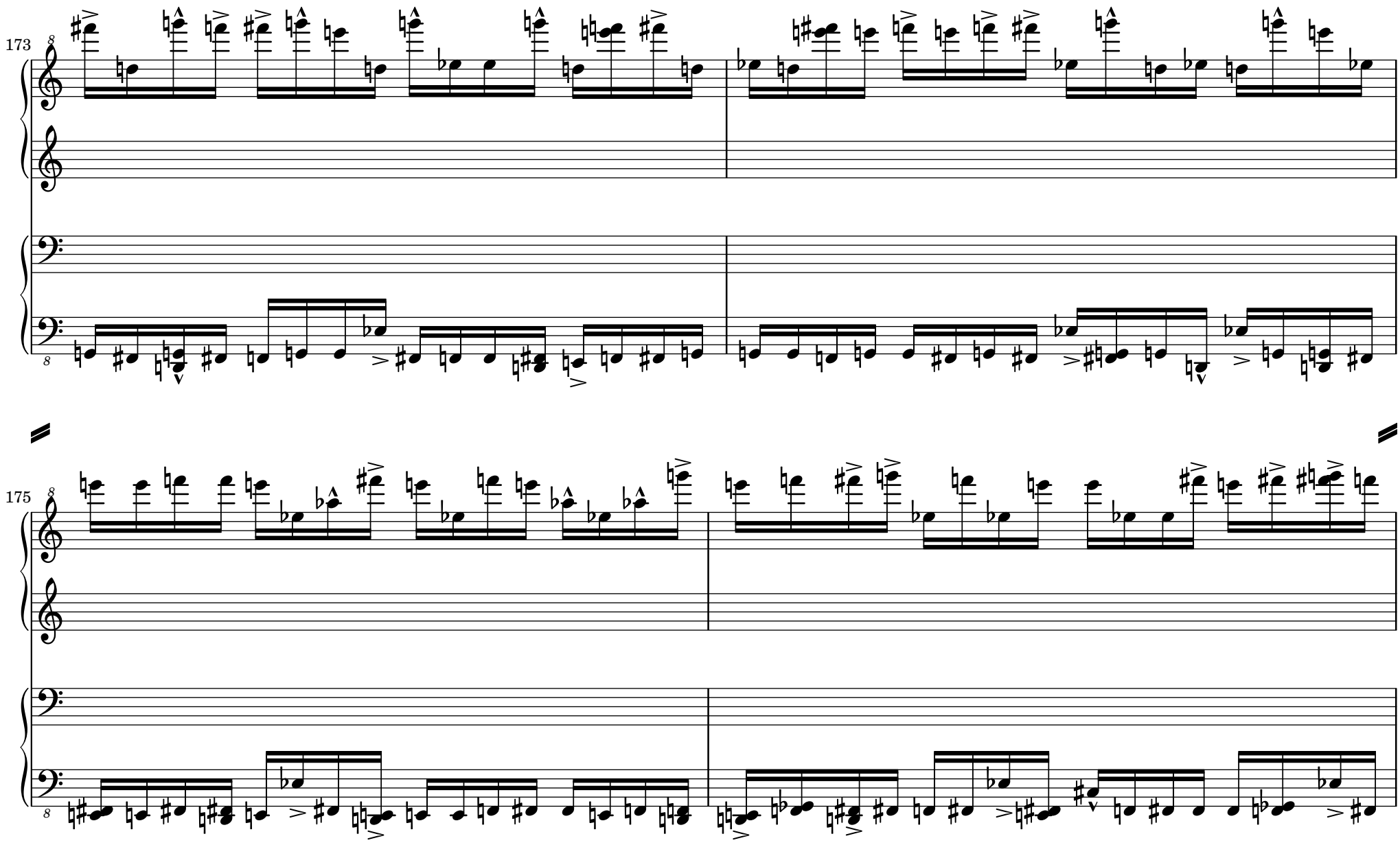
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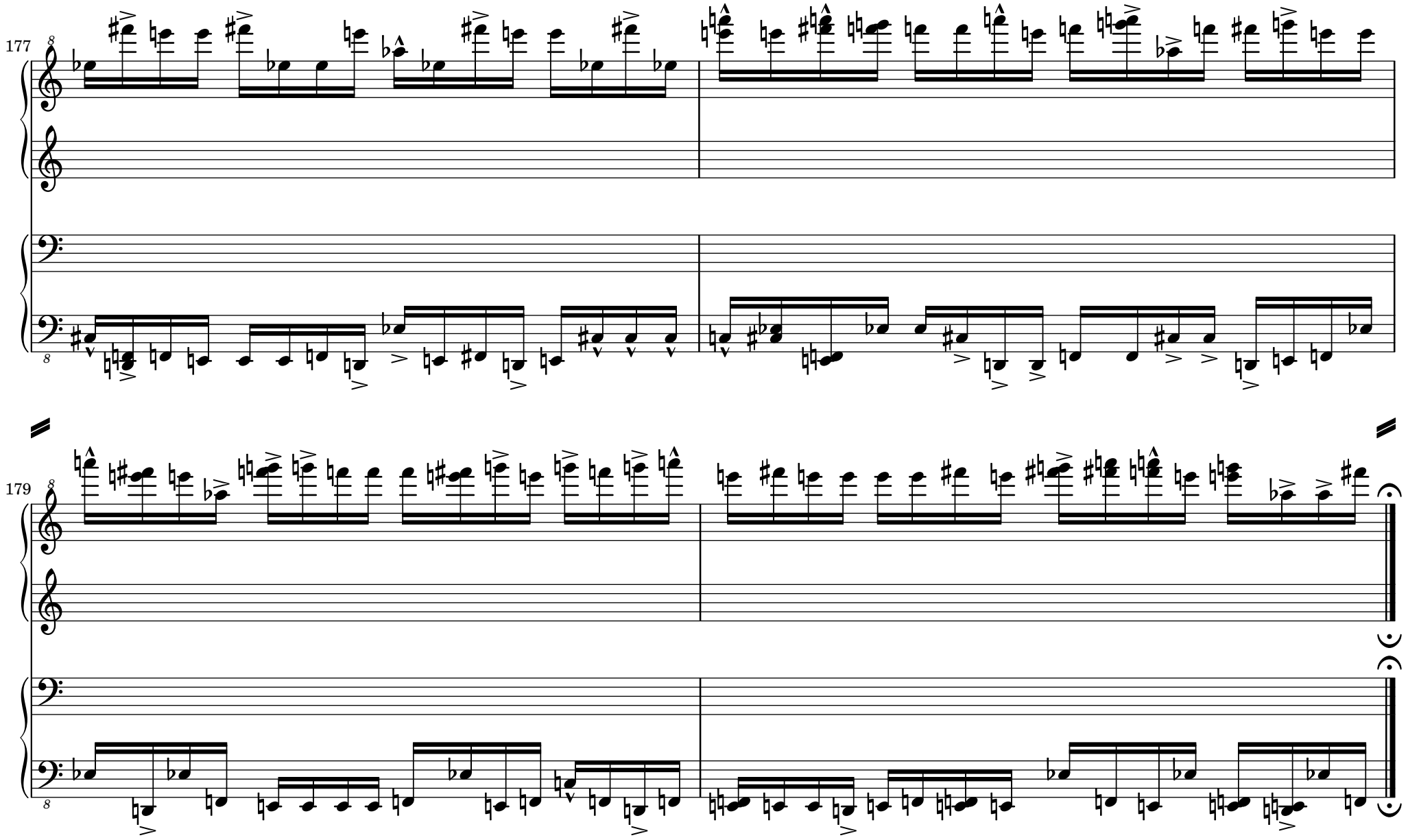
177
179

Cartography #7, for four electric guitars

Mapping and rules

cells

set size	$N = 5$
transformation period	$48 \times$ ♩
possible values	1 : note with cresc. from al niente, 2 : tap harmonic, 3 : group of n consecutive sixteenth-notes (n selected from $[2, 3, 4, 5, 6]$), 4 : note with vibrato, 5 : single regular note, 6 : mixed group of m consecutive sixteenth-notes, the last one with a vibrato (m selected from $[4, 5, 6, 7, 8]$.)
transformation mechanism	There are four stages for the transformation mechanism of the cells. The first four transformations are given by $[a, b, c, d, e] \rightarrow [b, c, d, e, e + 1]$. The next four are given by $[a, b, c, d, e] \rightarrow [b, c, d, e, a]$. The next five are given by $[a, b, c, d, e] \rightarrow [b, c, d, e, 6]$. The final five transformations are given by $[a, b, c, d, e] \rightarrow [b, c, d, e, f]$, where $f = (e \bmod 6) + 1$.
initial set	$[1, 1, 1, 1, 1]$

pitches

set size	$N = 7$
transformation period	$8 \times$ ♪
transformation mechanism	$[a, b, c, d, e, f, g] \rightarrow [b, c, d, e, f, g, h]$, with $h \bmod 12 = (g \bmod 12) - 1$, and h at a uniformly randomly selected octave transposition.
initial set	[C6, B5, B♭5, A5, A♭5, G5, F♯5]

durations

set size	$N = 5$
transformation period	$48 \times$ ♩
transformation mechanism	there are three mechanisms in use. For the first thirteen transformations: $[a, b, c, d, e] \rightarrow [a-1, b-1, c-1, d-1, e-1]$. From the fourteenth transformation until the coda: $[a, b, c, d, e] \rightarrow [a+1, b+1, c+1, d+1, e+1]$. The coda starts one bar after the last active note ends and uses a fixed set $[24, 24, 24, 24, 24]$ for all four electric guitars.
initial set	$[28, 27, 26, 25, 24]$

constraints

- number of pitch transformations: $216 + 1$ for the coda.
- number of duration transformations: $18 + 1$ for the coda.
- range: E3–E6.
- if a pitch below D4 is selected, harmonics mode cannot be selected.
- there is always a sixteenth-note rest between a vibrato mode note and the next note.

General performance notes

- each guitar player should have their own amplifier by the their sit. They should sit at maximal distance from each in order to emphasize the spatial aspect of the composition.
- use a clean guitar sound and soft dynamics throughout the piece.
- notes with *laissez vibrer* ties should last as long as possible but end before the next note.
- all volume changes should be executed with a volume pedal.
- all harmonics should be executed as artificial harmonics and are notated at sounding pitch. They should all be played as tap harmonics in order to achieve a slightly more pronounced attack than a regular pinch harmonic (but still in soft dynamic).
- the vibrato should be executed as fast as possible but within a small frequency range.
- do not add vibrato to any note without a *vib.* indication.
- the performers may want to add a little bit of reverb pedal since that may help with the let it ring effect.
- the performers may also consider using a compressor to help with the tap harmonic sounds, though do that with caution and respecting the overall soft dynamic of this composition.

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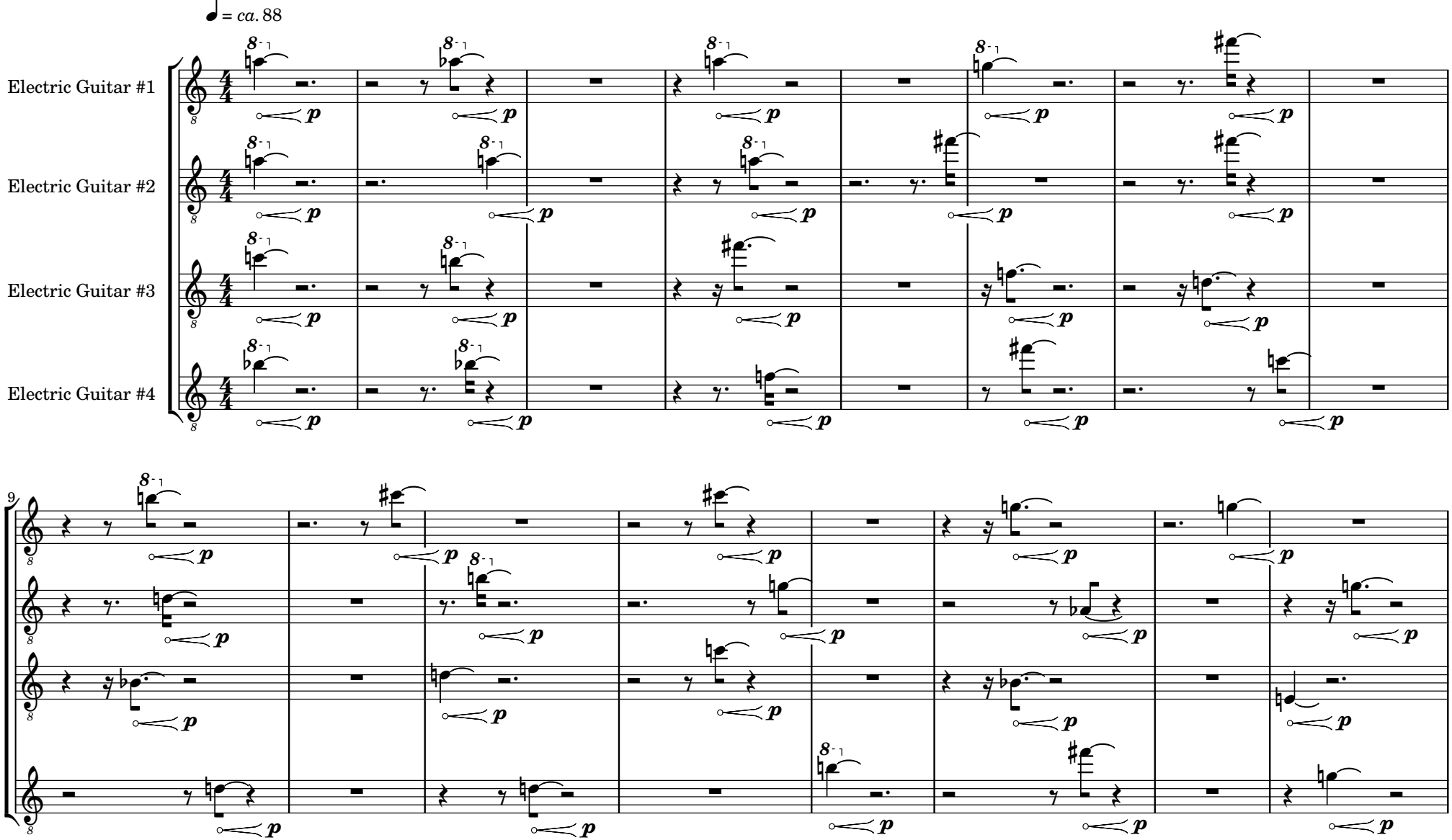
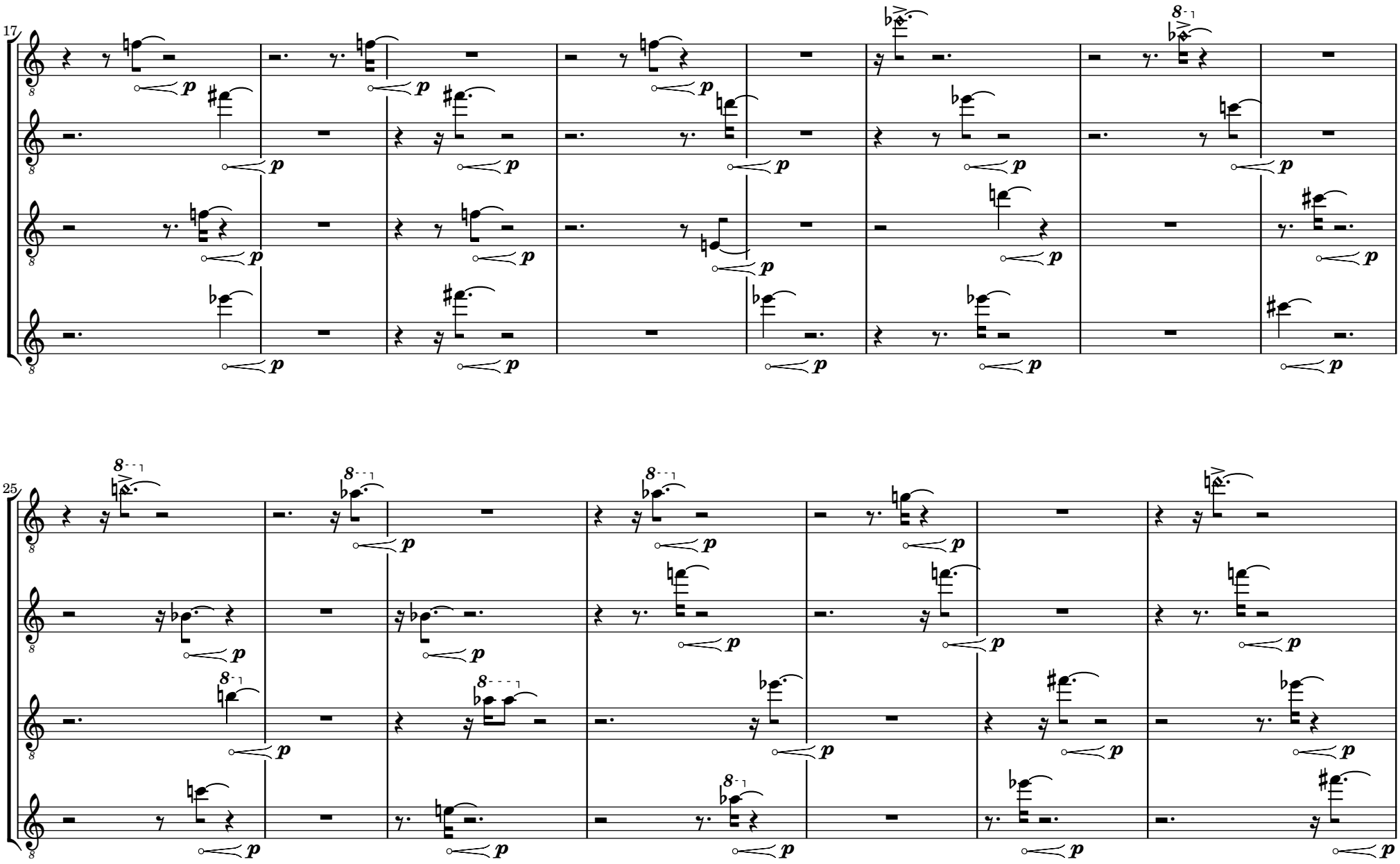
Cartography #7

Gilberto Agostinho

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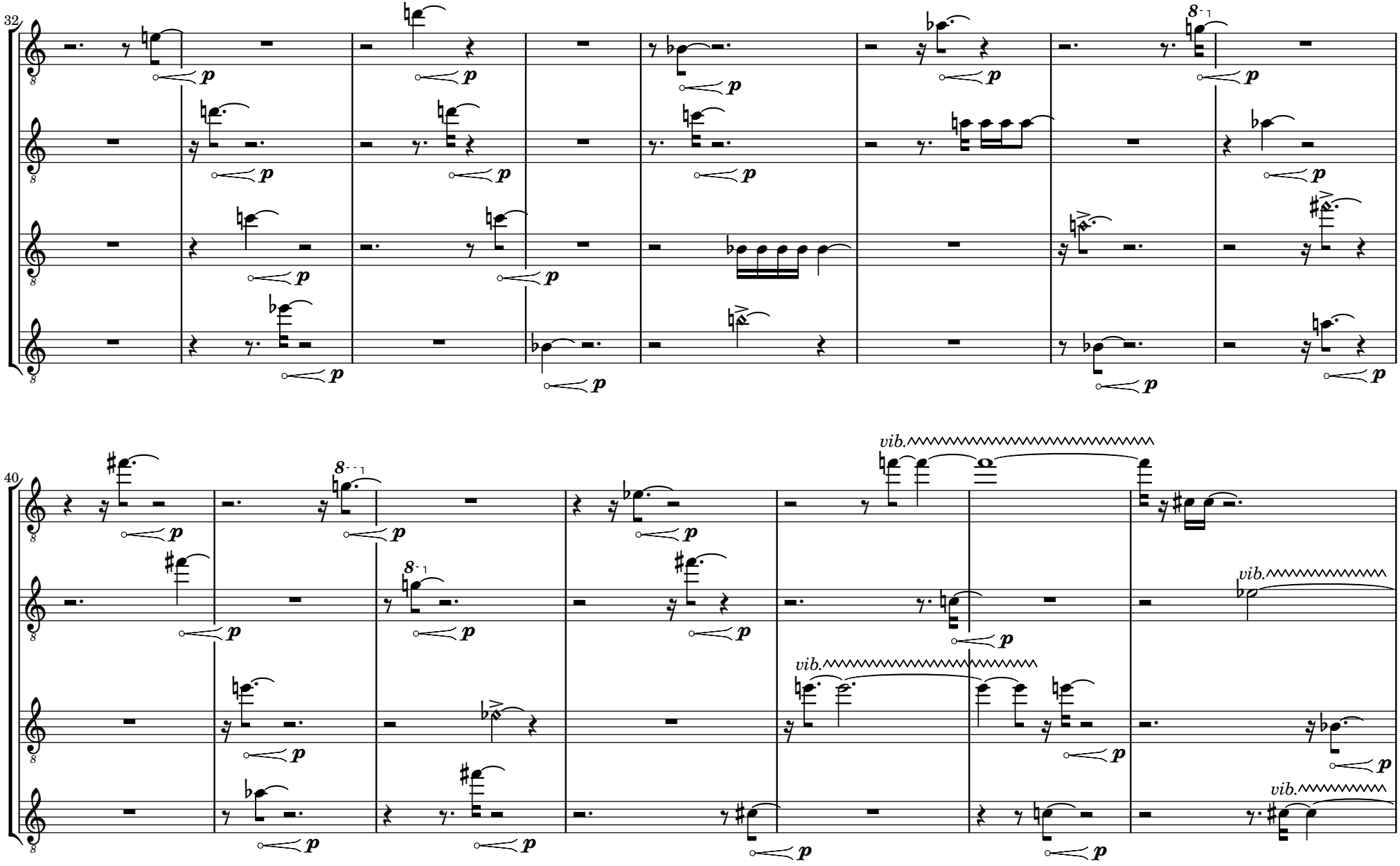
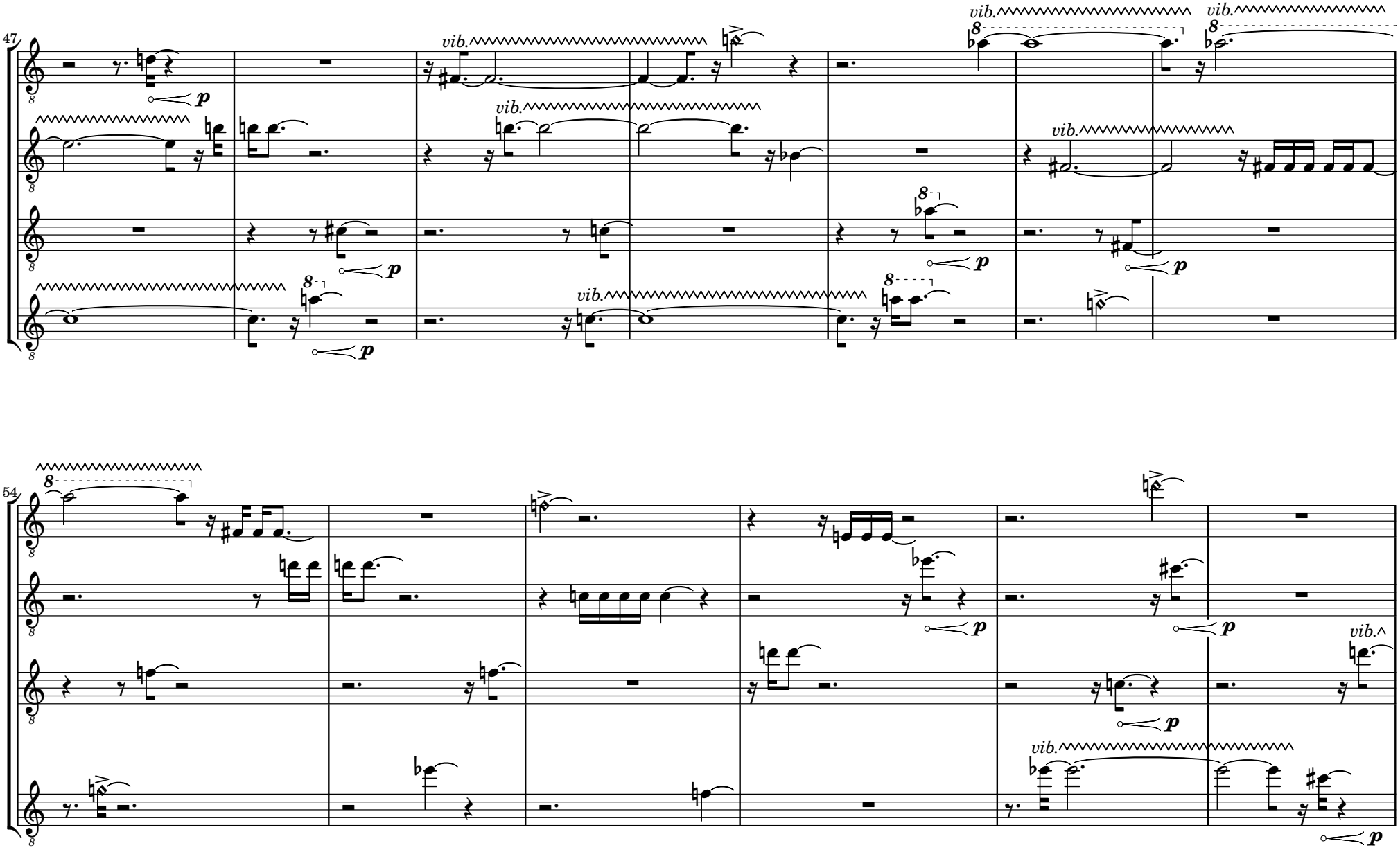
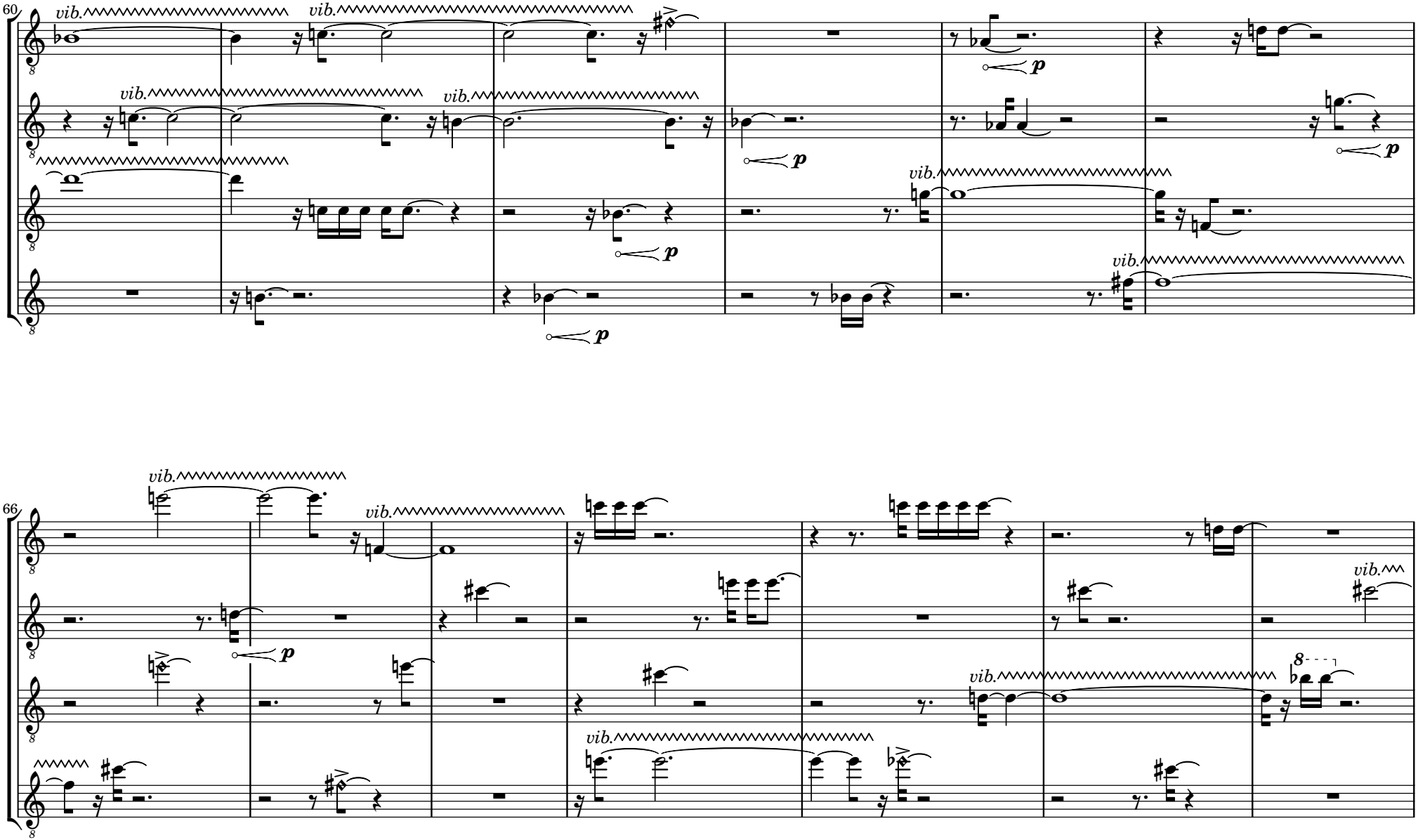
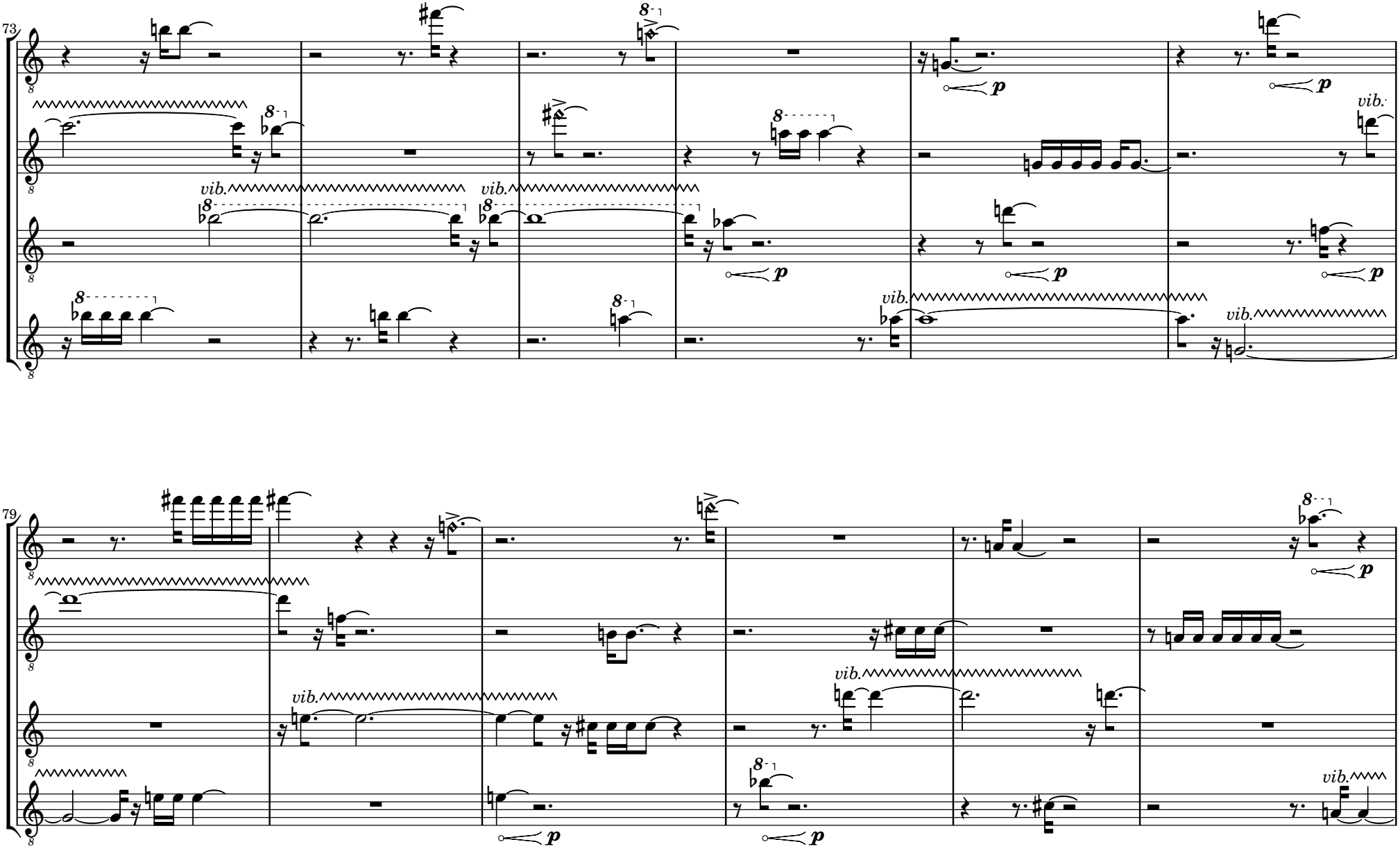
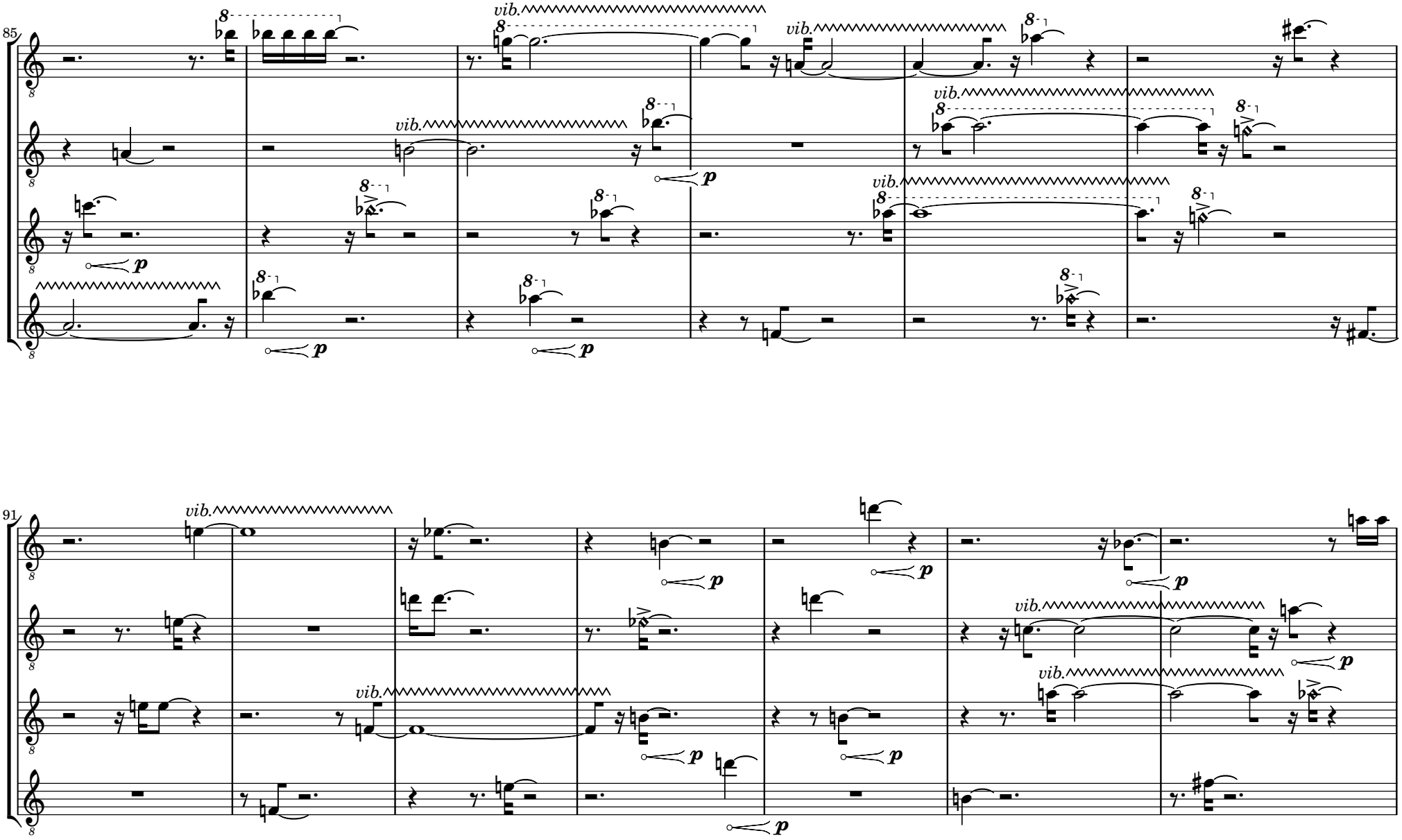
25

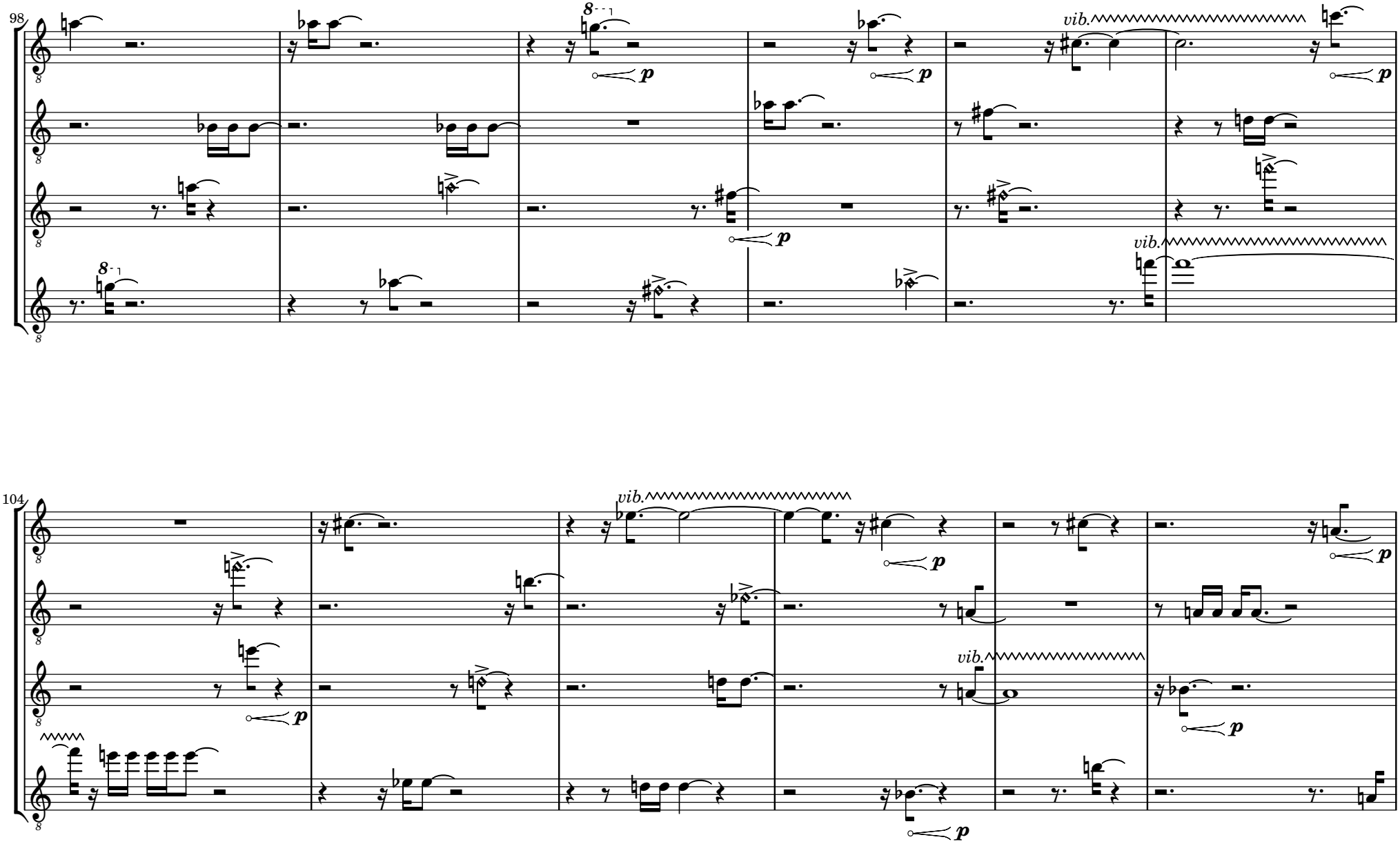

32
8
p
40
vib.

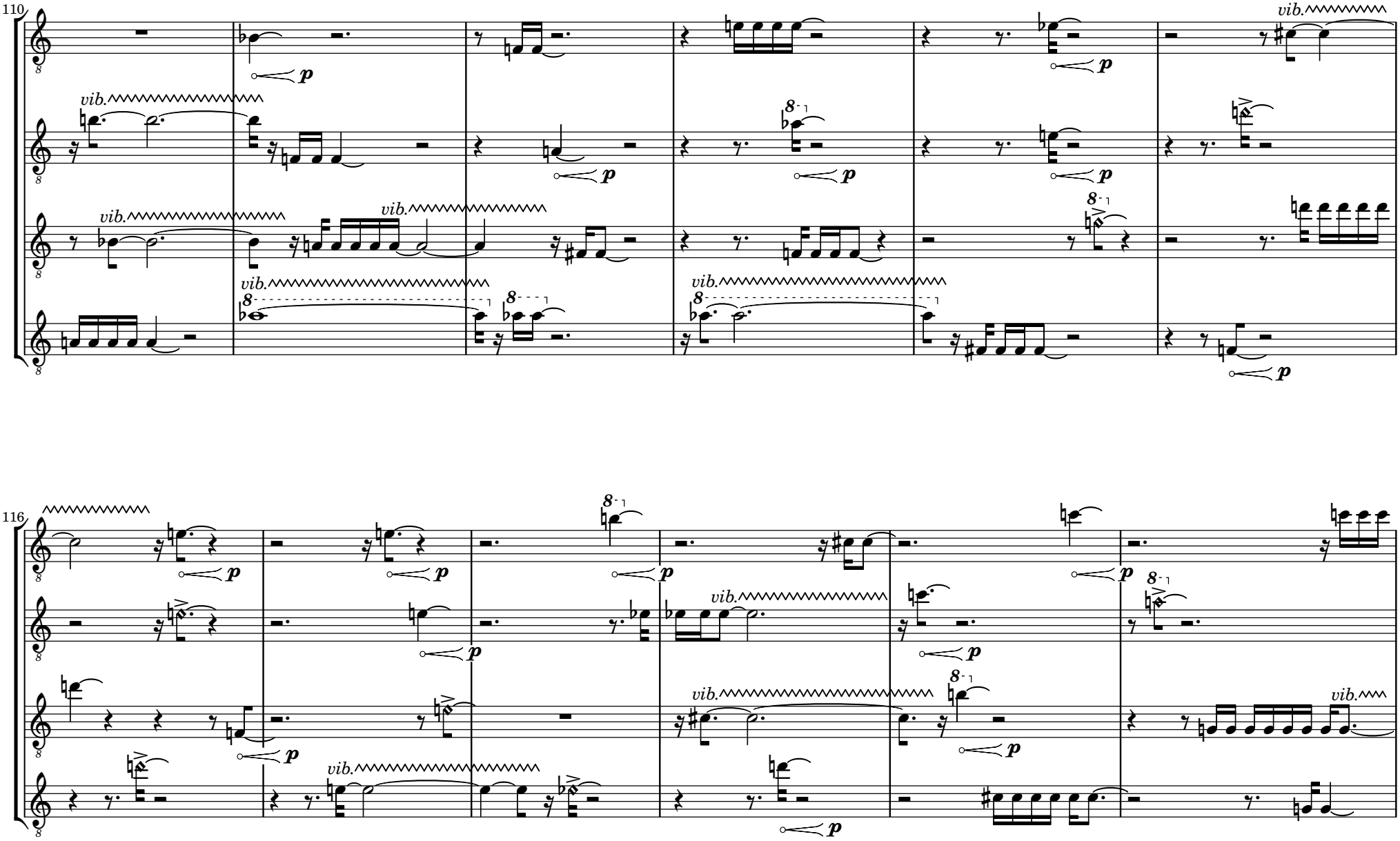

47
vib.
p
54
vib.

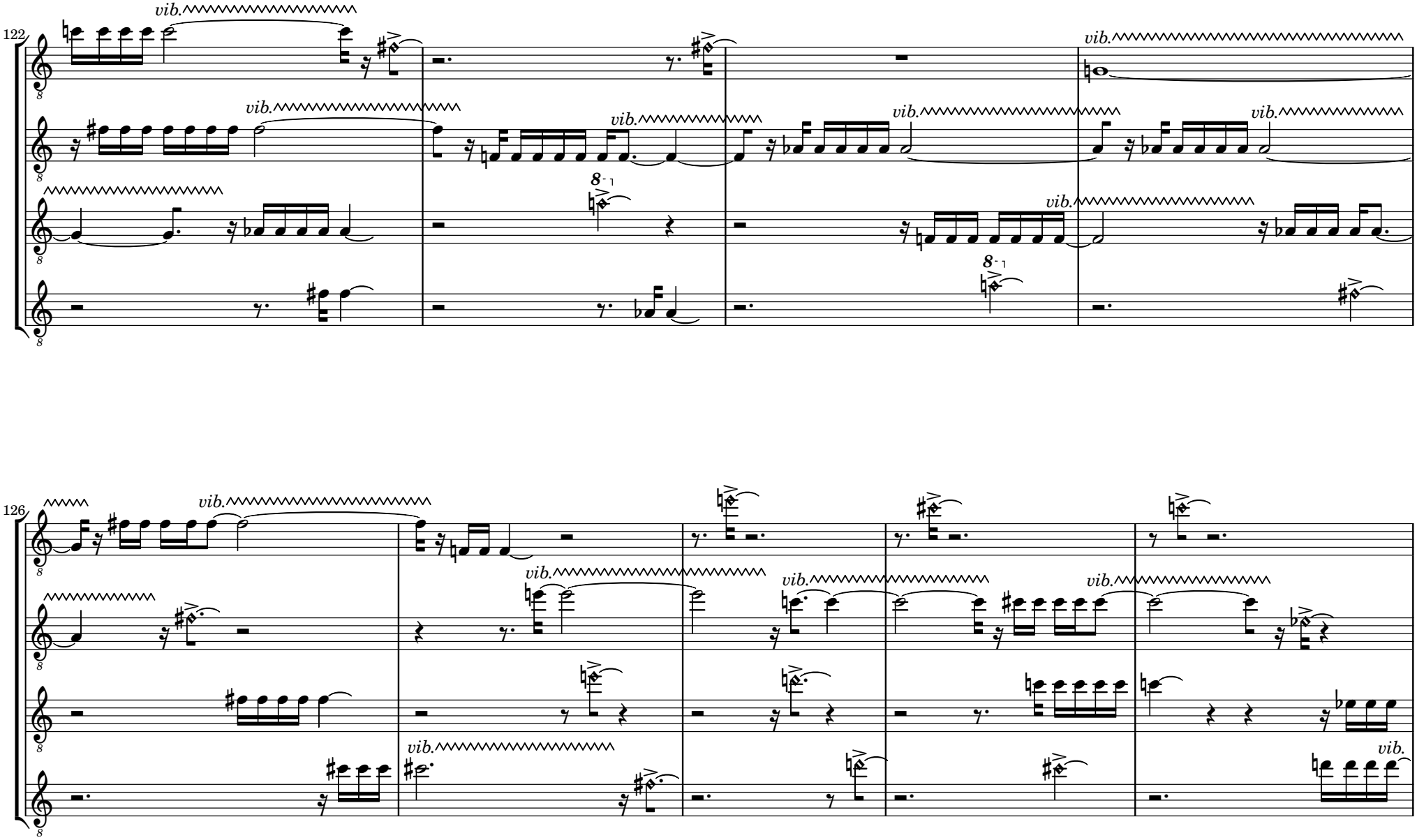

60
vib.
vib.
vib.
vib.
vib.
vib.
vib.
p
p
p
p
66
vib.
vib.
vib.
vib.
vib.
p
8

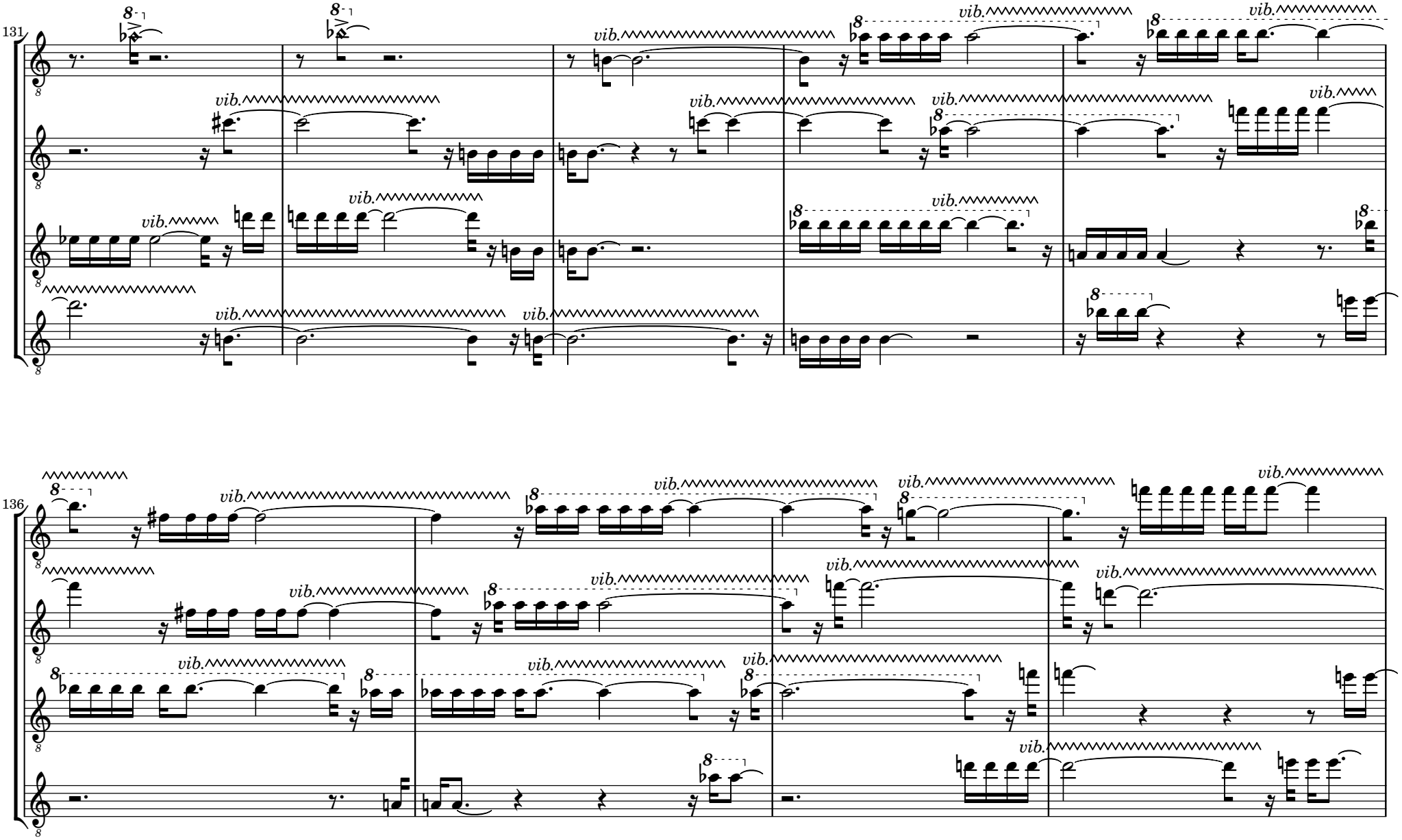

73
vib.
vib.
vib.
vib.
vib.
79
vib.
vib.
vib.

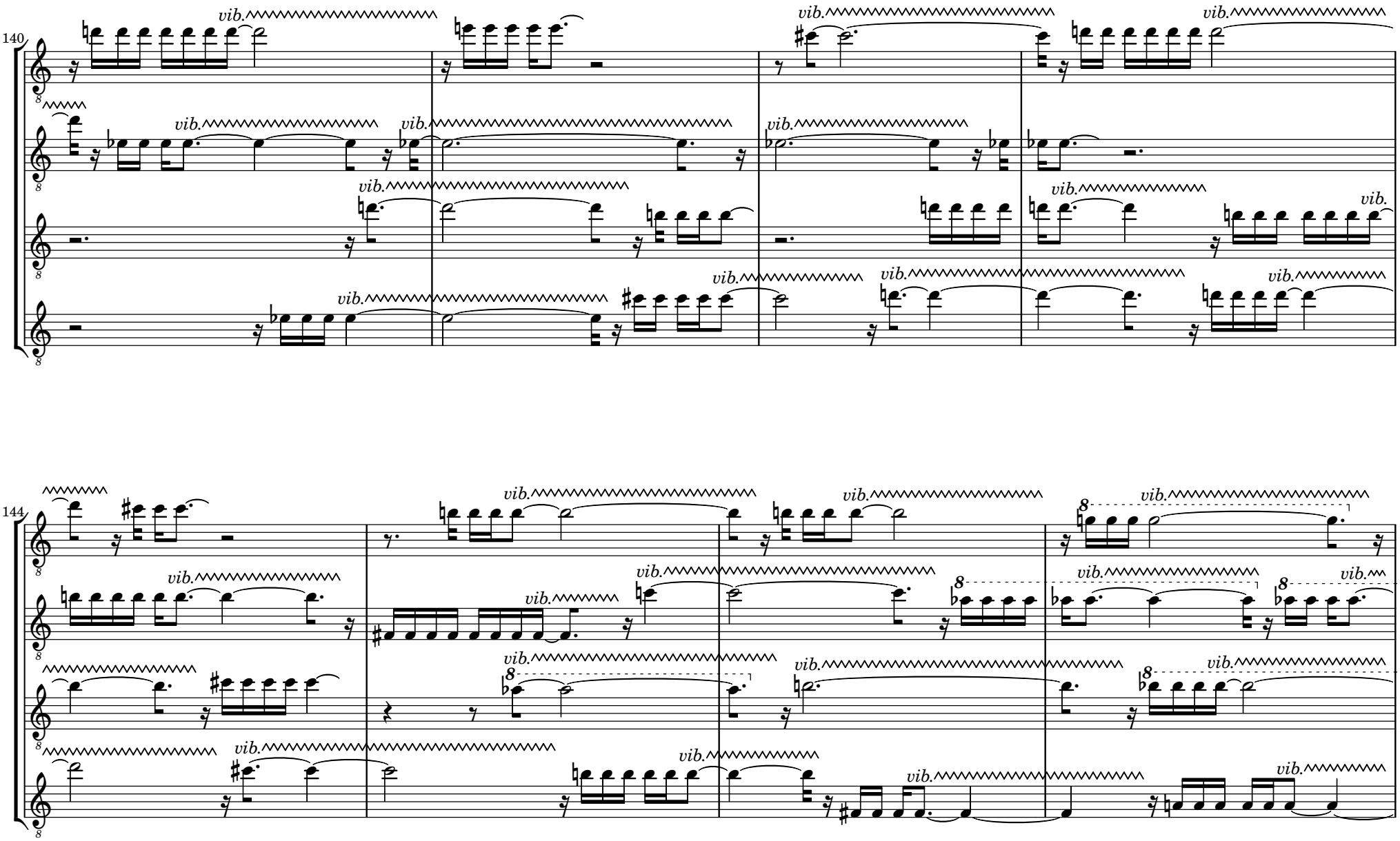

85
vib.
p
91

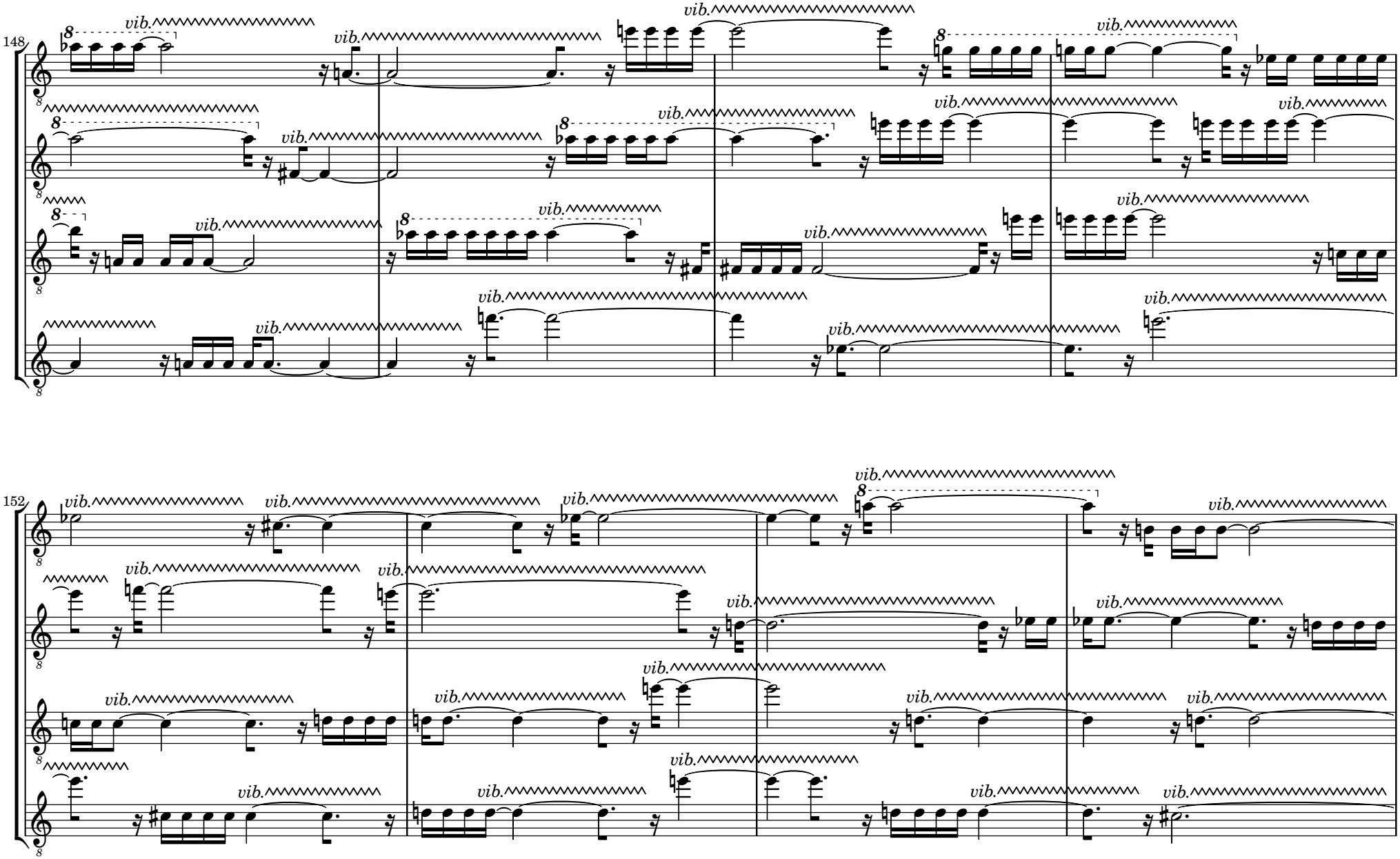

98
8
p
vib.
104

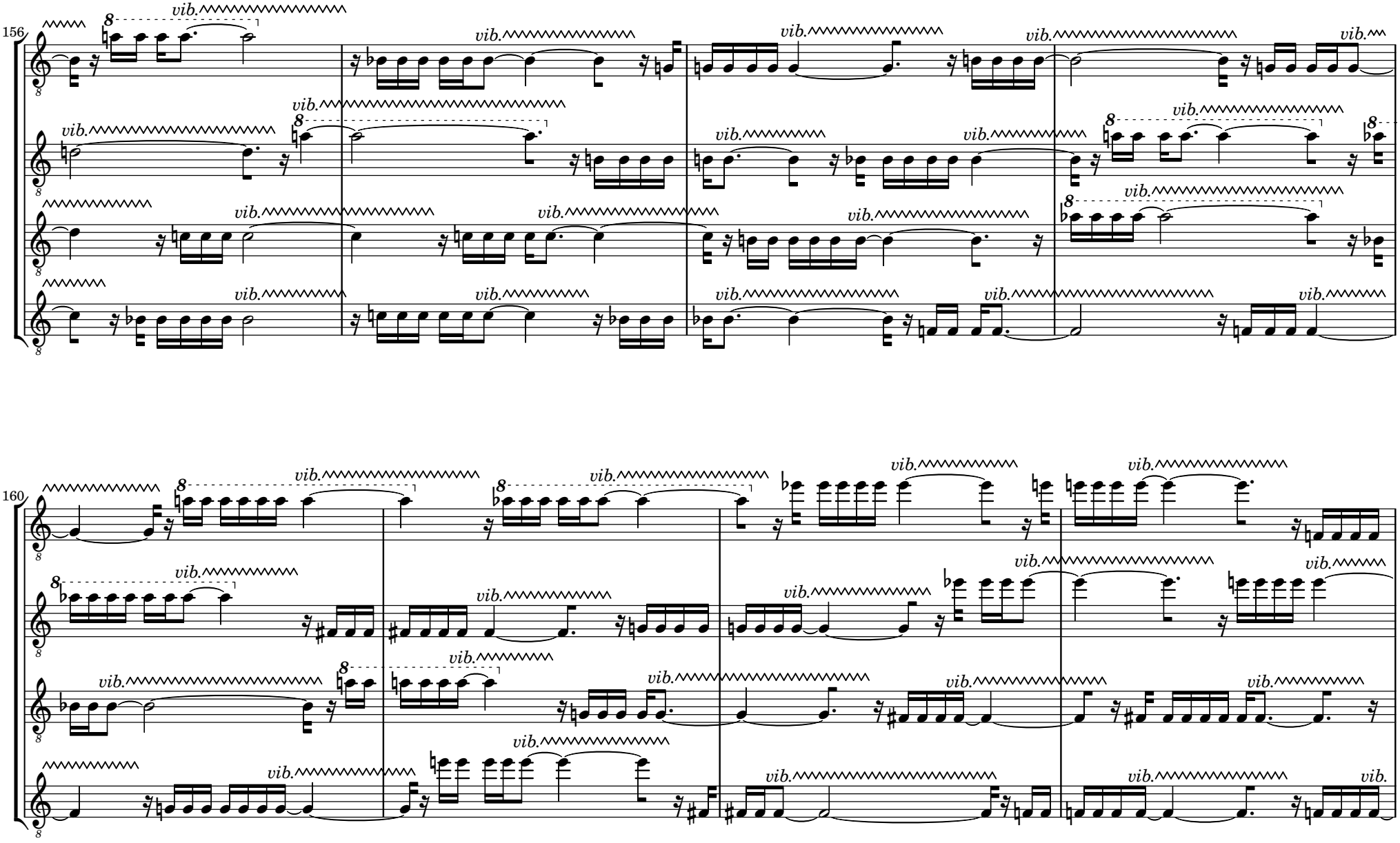

110
116
vib.
p
8

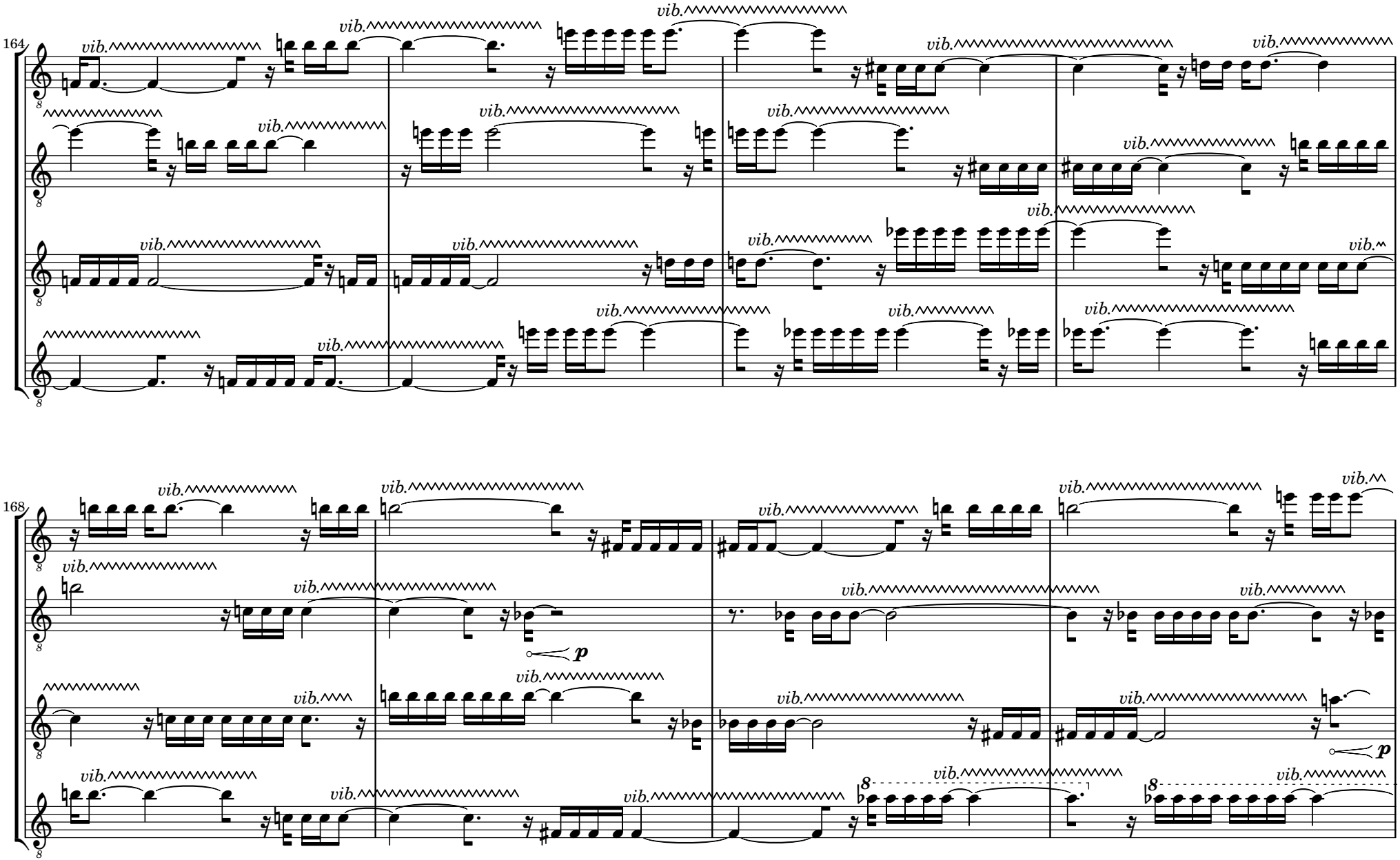

122
vib.
vib.
vib.
vib.
vib.
vib.
8
126
vib.
vib.
vib.
vib.
vib.

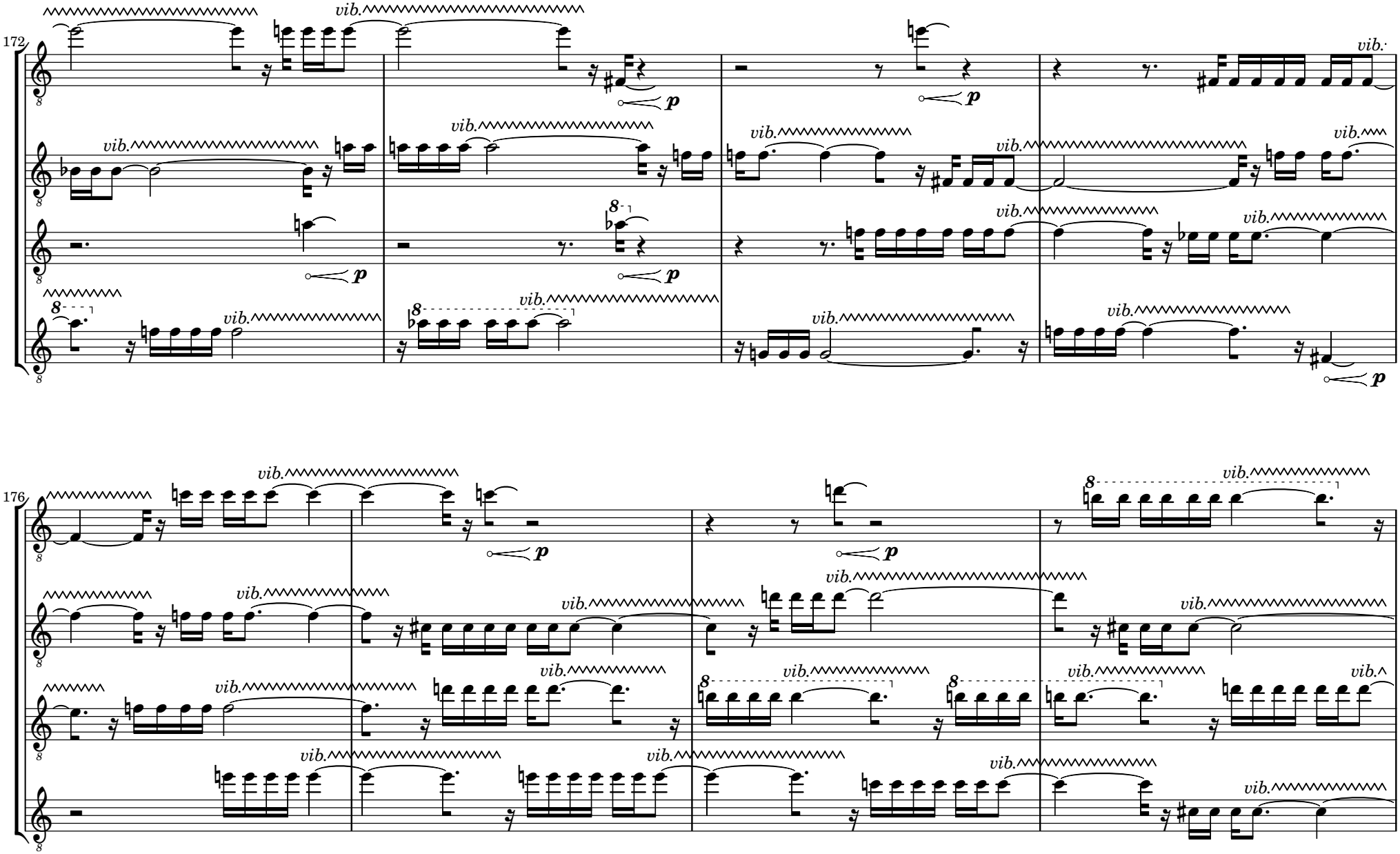

131
136
vib.

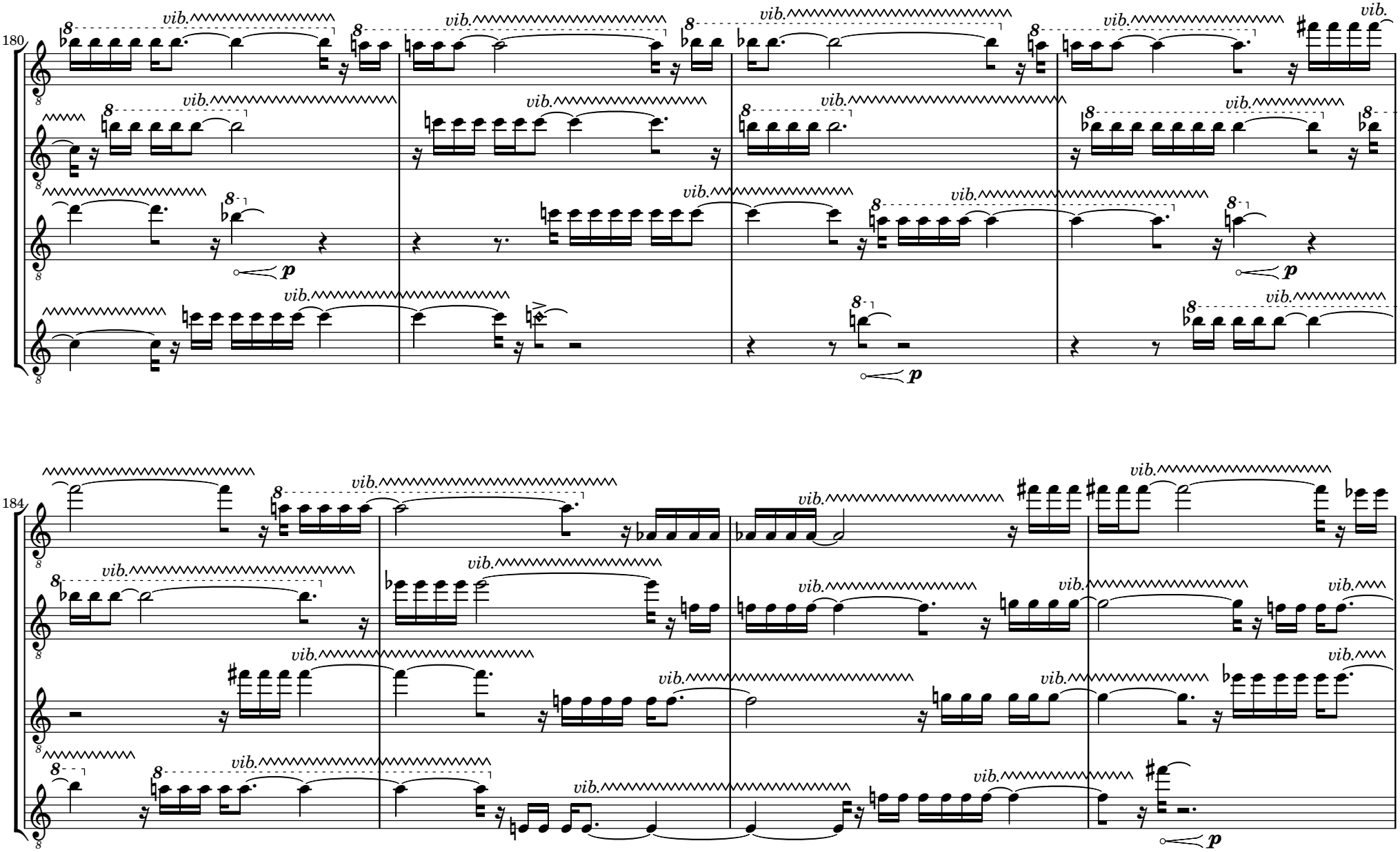

140
vib.
144
8

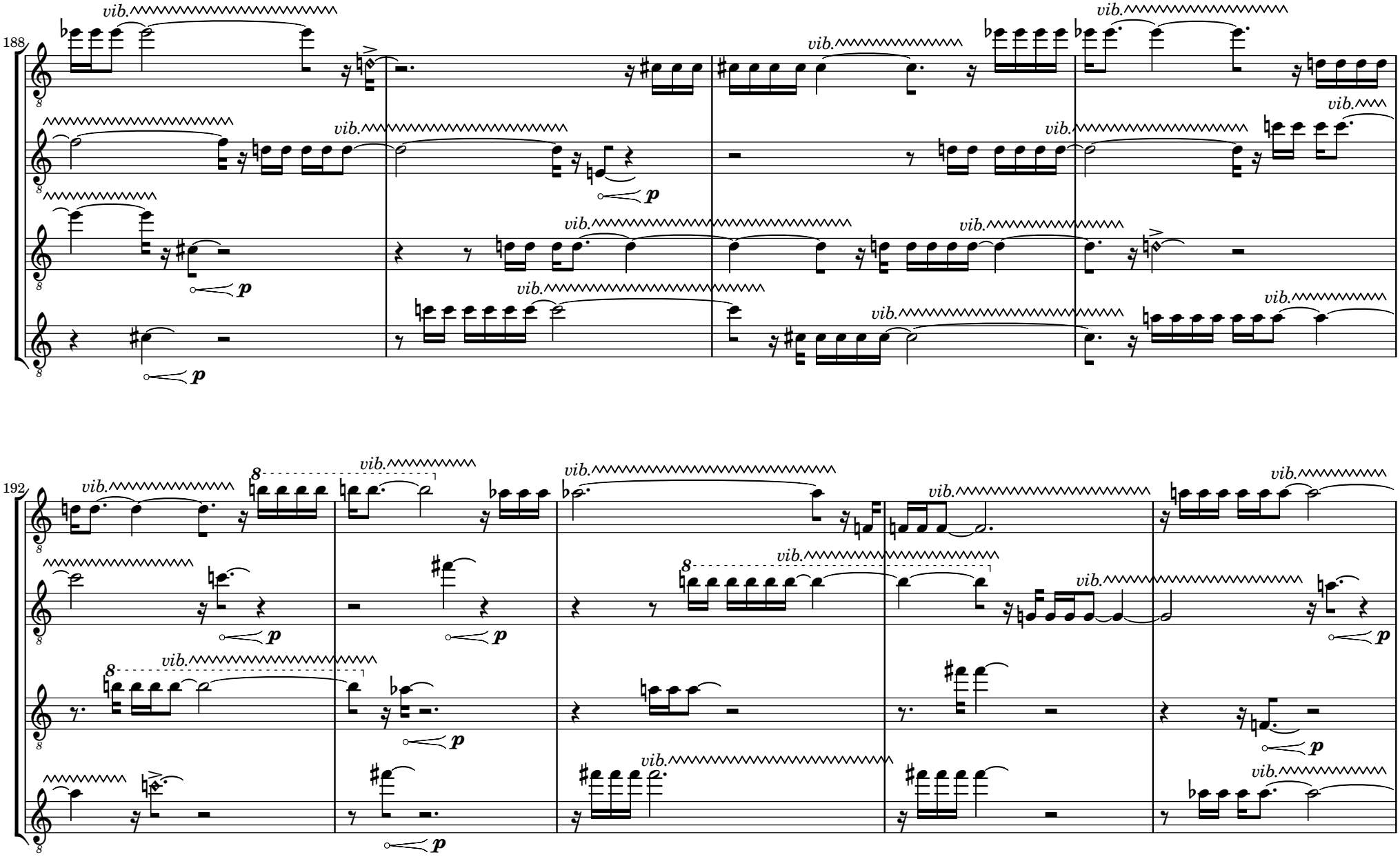

148
vib.
152
vib.

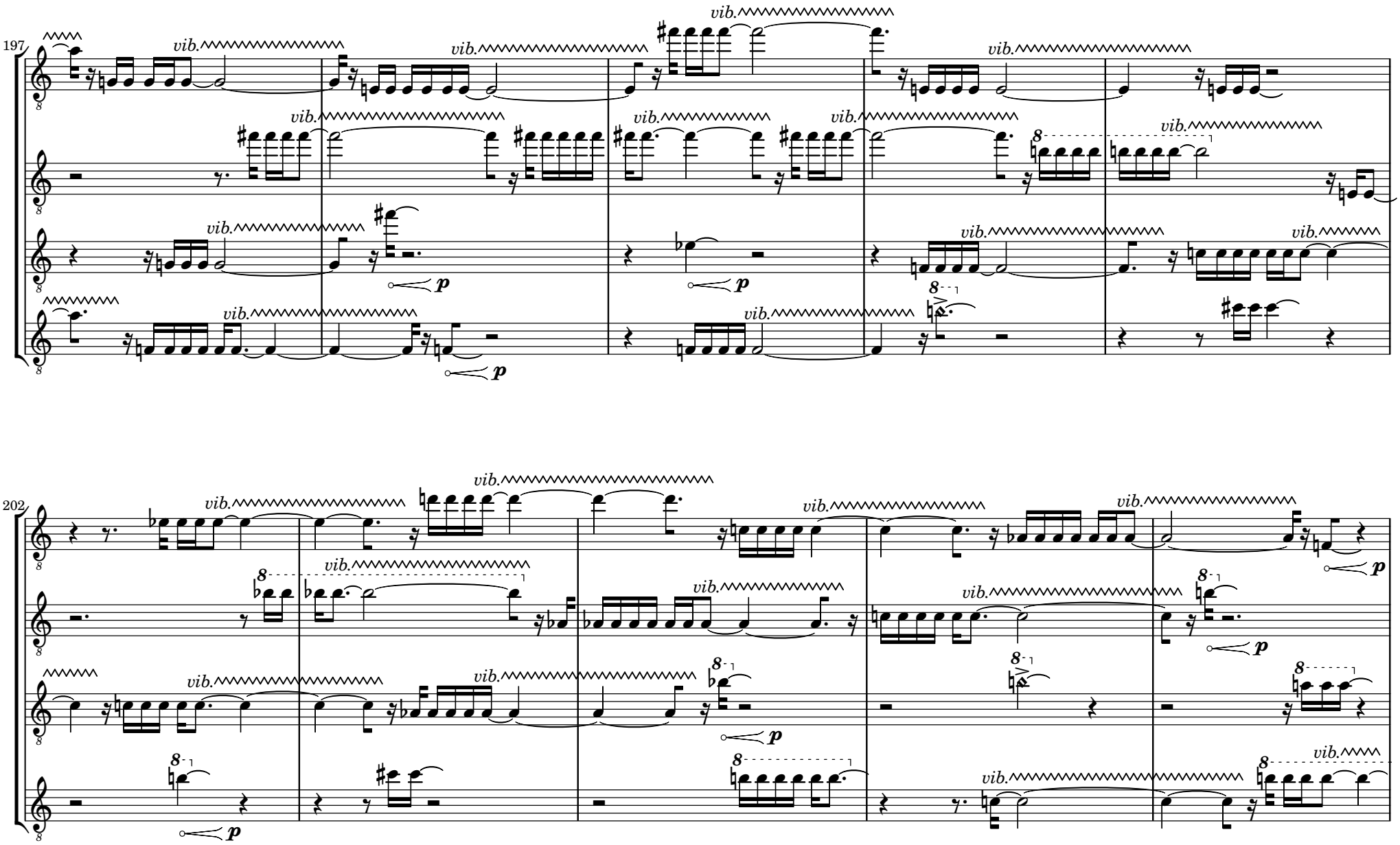

156
160
vib.

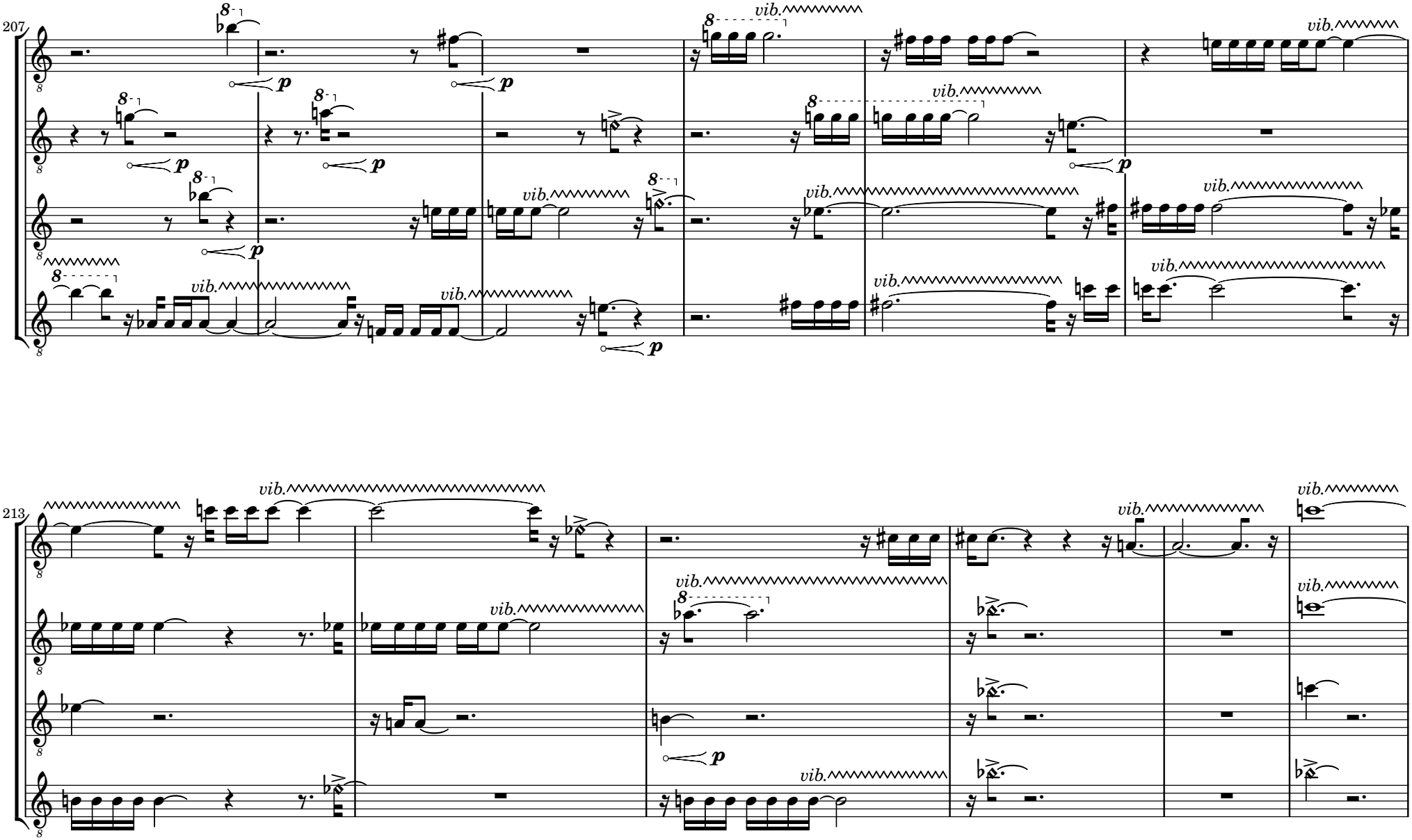

164
vib.
168
p
8

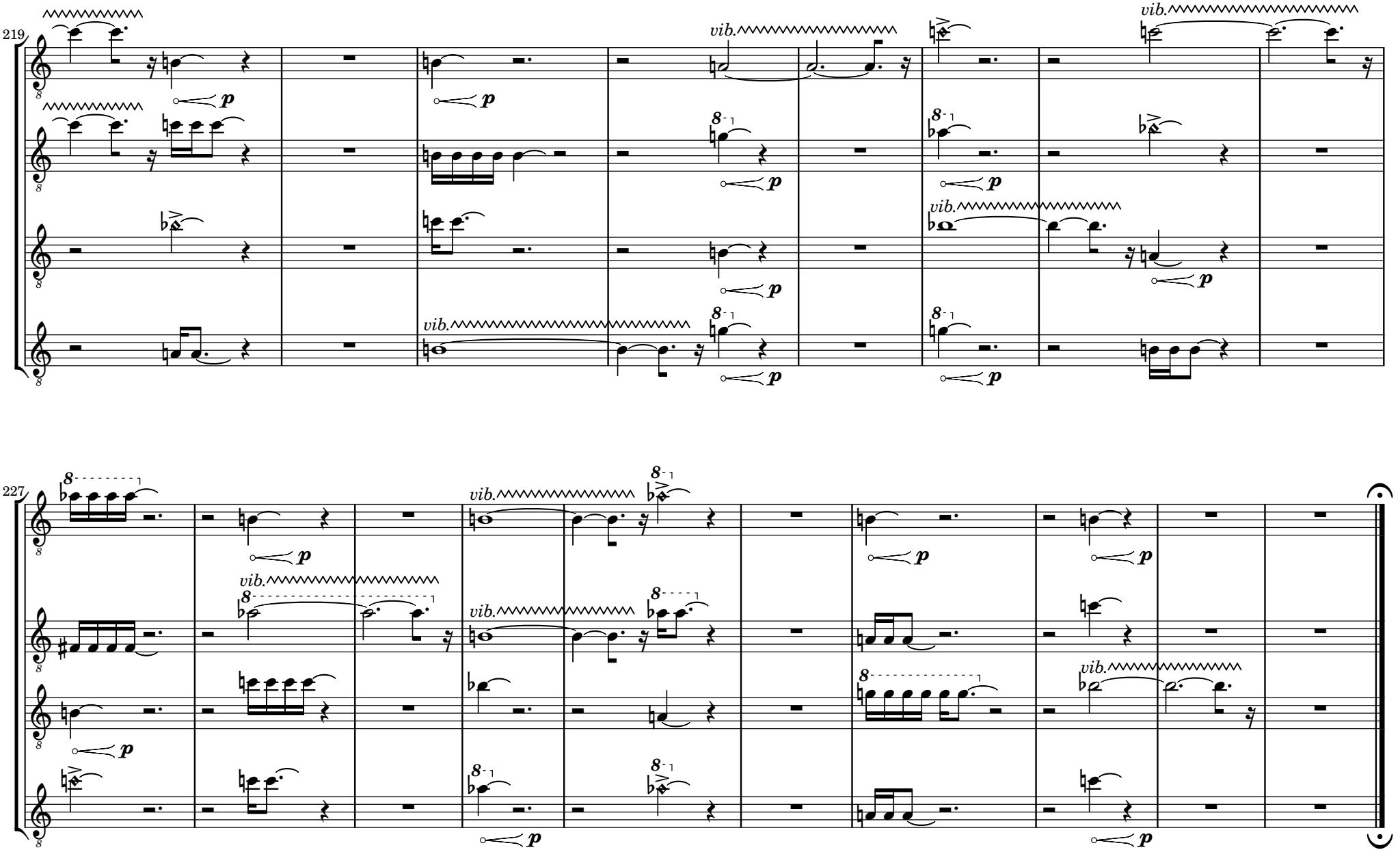

172
vib.
p
176


180
vib.
p
184


188
vib.
p
192
8


197
vib.
p
202
8


207
213
vib.
p


219
vib.
p
8
227

Cartography #8, for flute, soprano sax, violin, violoncello, and accordion

Mapping and rules

pitches

set size	$N = 6$
transformation period	$2 \times$ bars
transformation mechanism	$[a, b, c, d, e, f] \rightarrow [b, c, d, e, f, g]$, with $g \bmod 12 = (f \bmod 12) + 1$, and g at a uniformly randomly selected octave transposition.
initial set	[A5, B♭5, B5, C6, C♯6, D6]

bar lengths

set size	$N = 3$
transformation period	$8 \times$ bars
transformation mechanism	$[a, b, c] \rightarrow [b, c, d]$, with $d = c - 1$.
initial set	$[7, 6, 5]$

number of instruments playing in a given bar

set size	$N = 6$
transformation period	fixed
set	$[5, 4, 3, 2, 1, 0]$
instrumentation	uniformly randomly selected

hairpins

set size	$N = 3$
transformation period	fixed
initial set	[none, *cresc.*, *dim.*]
end dynamic	always one level above or below the initial dynamic.

dynamics

set size	$N = 2$
transformation period	$17 \times$ bars
transformation mechanism	$[a, b] \rightarrow [b, c]$, with $c = b + 1$.
initial set	[***pp***, ***p***]

techniques

set size	$N = 2$
transformation period	fixed
initial set	[option 1, option 2], with the option 1 being ord. for all instruments and 8'+8' registration for the accordion, and option 2 being flageolet for flute, bisbigliando for saxophone, sul ponticello for violin and violoncello and 8'+8'+4' for accordion.

constraints

- number of bars (pre-loop): 40.
- durations: all notes last a whole bar.
- range: A♭4–E7. Highest pitches: flute C7, soprano saxophone E♭6, violin E7 (harmonics from E6 and above), violoncello E7 (harmonics from G5 and above) and
- at least one pitch in a pitch set should be equal to or below C6.
- looping mechanism follows three processes to select which of the 40 bars are output. First process outputs $1 \rightarrow 1, 2 \rightarrow 1, 2, 3 \rightarrow \ldots \rightarrow 1, 2, 3, \ldots, 8, 9, 10$, second process outputs $2, 3, 4, 5, \ldots, 9, 10, 11 \rightarrow 3, 4, \ldots 11, 12 \rightarrow \ldots \rightarrow 31, 32, \ldots 39, 40$, and the third process outputs $32, 33, 34, \ldots, 39, 40 \rightarrow 33, 34, \ldots, 39, 40 \rightarrow 34, \ldots, 39, 40 \rightarrow \ldots \rightarrow 39, 40 \rightarrow 40$.

General performance notes

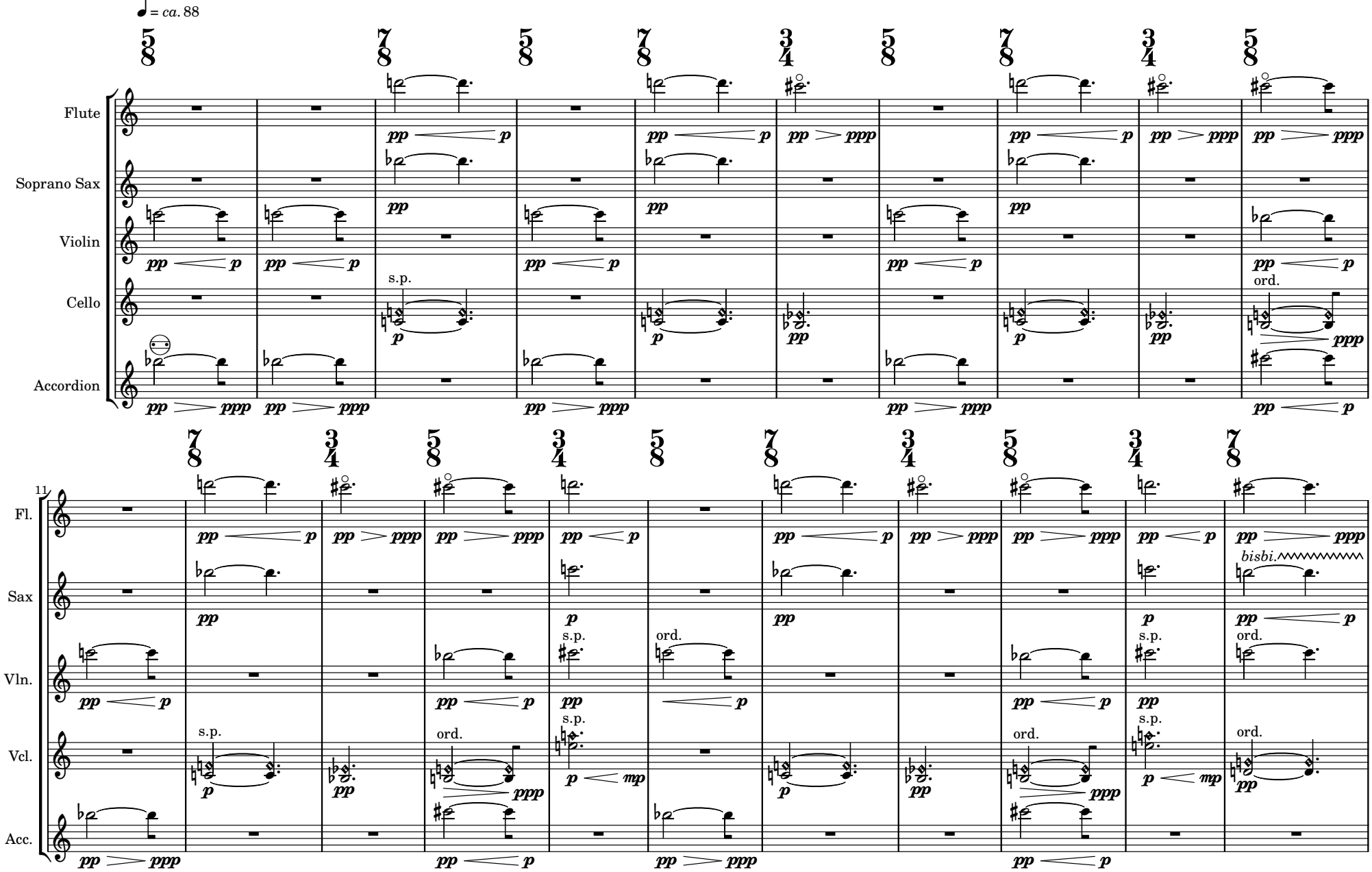
- s.p. stands for sul ponticello.
- flute harmonics should preferably be fingered two octaves below (i.e. third overtone) whenever possible.
- saxophone bisbigliando is notated with the written instruction *bisbi.* followed by a wavy line. Bisbigliando should be performed at medium to fast speed.
- all performers should play without vibrato.

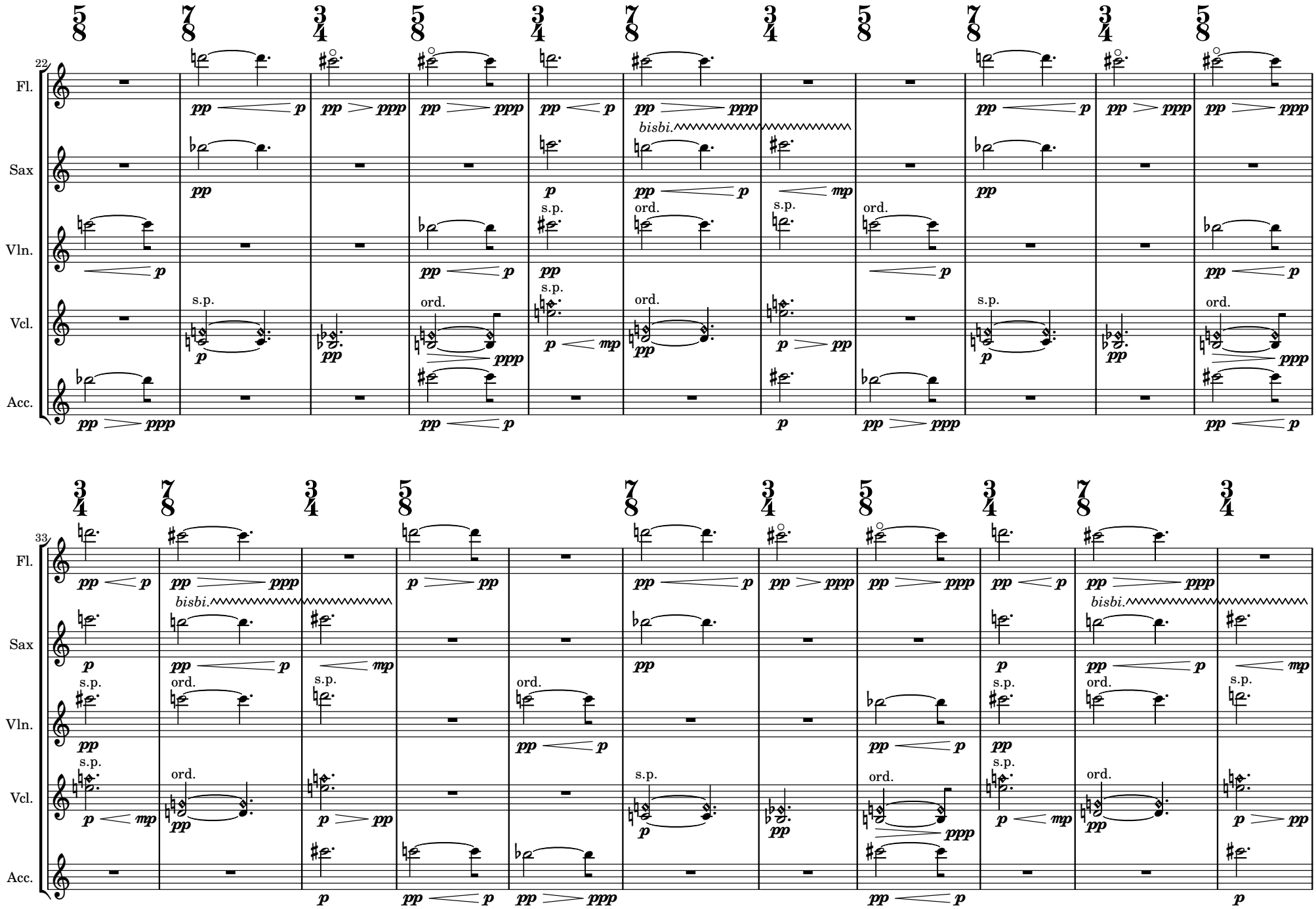
to Ensemble Terrible

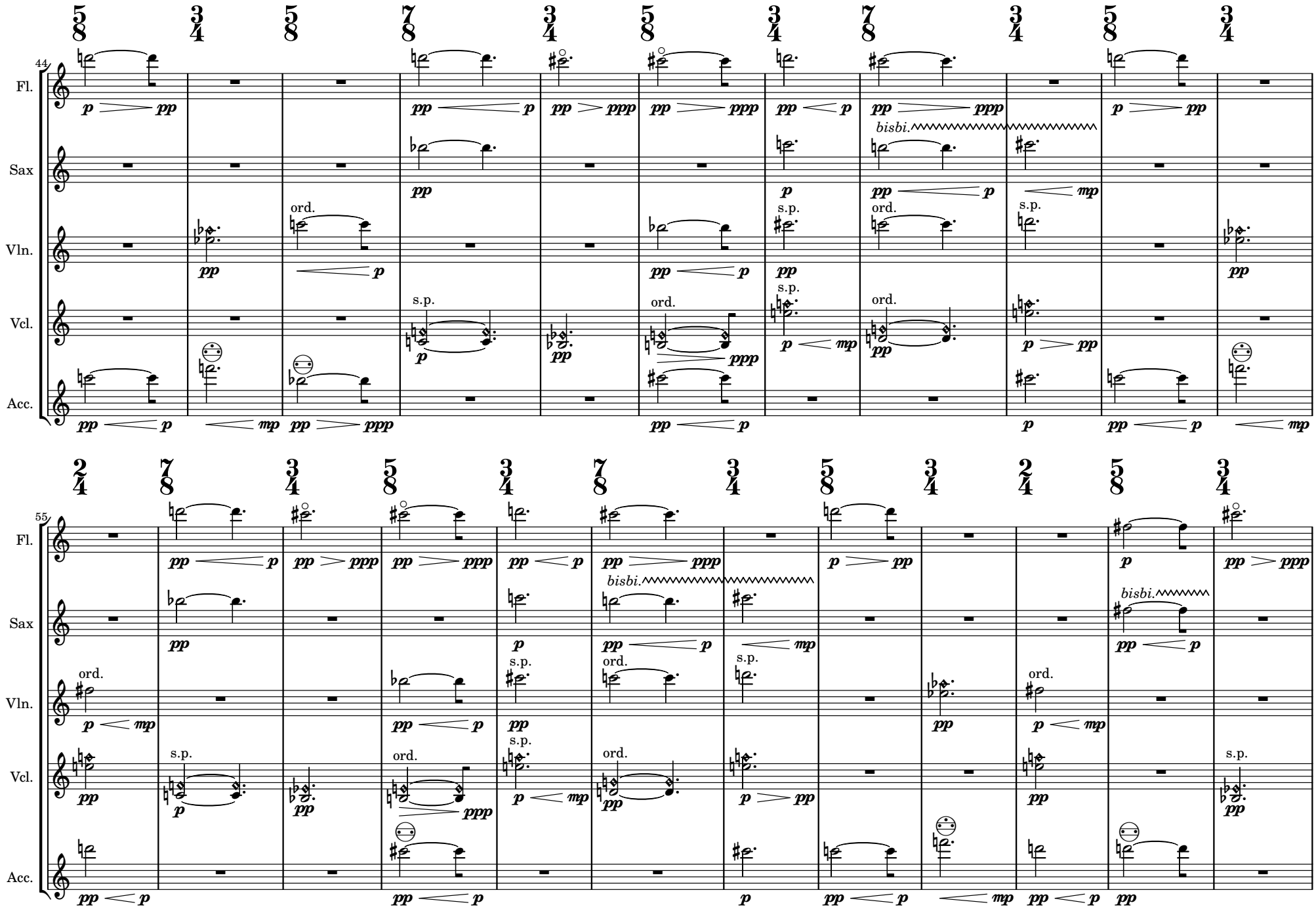
Cartography #8

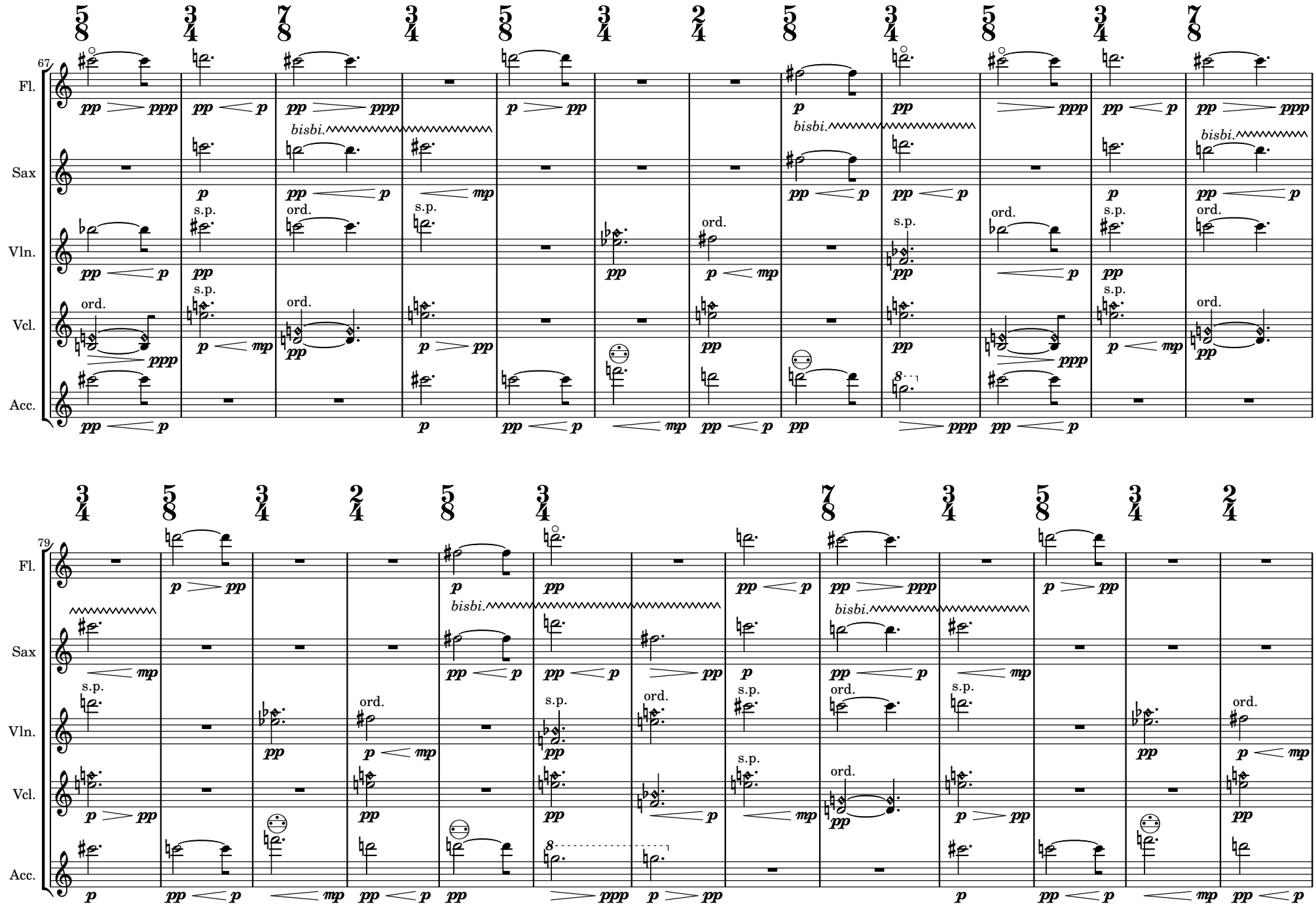
Score in C

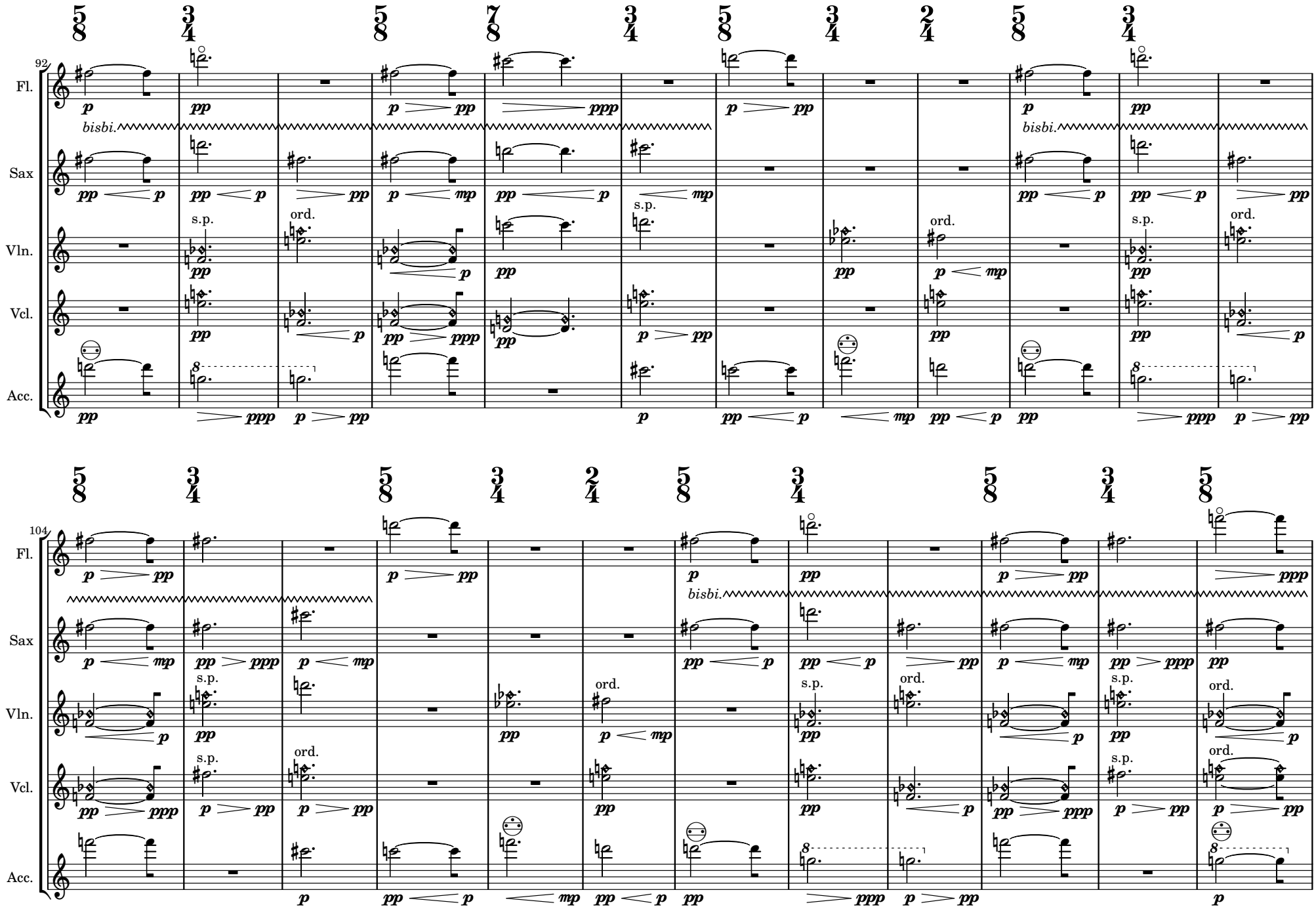
Gilberto Agostinho

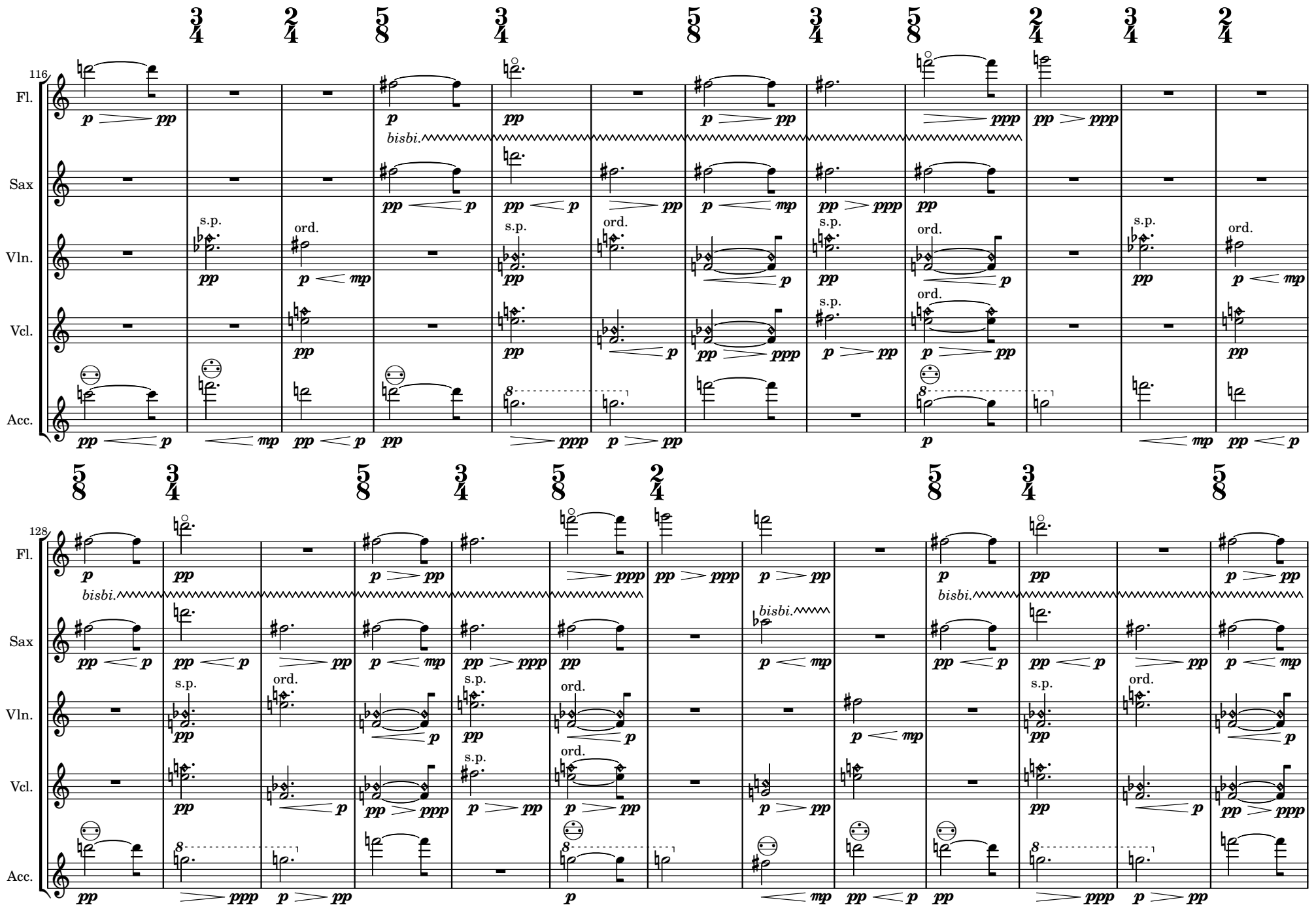



22
Fl.
Sax
Vln.
Vcl.
Acc.
bisbi.
s.p.
ord.
33


44
Fl.
Sax
Vln.
Vcl.
Acc.
bisbi.
ord.
s.p.
55


67
Fl.
Sax
Vln.
Vcl.
Acc.
bisbi.
s.p.
ord.
79


92
Fl.
Sax
Vln.
Vcl.
Acc.
bisbi.
s.p.
ord.
104


116
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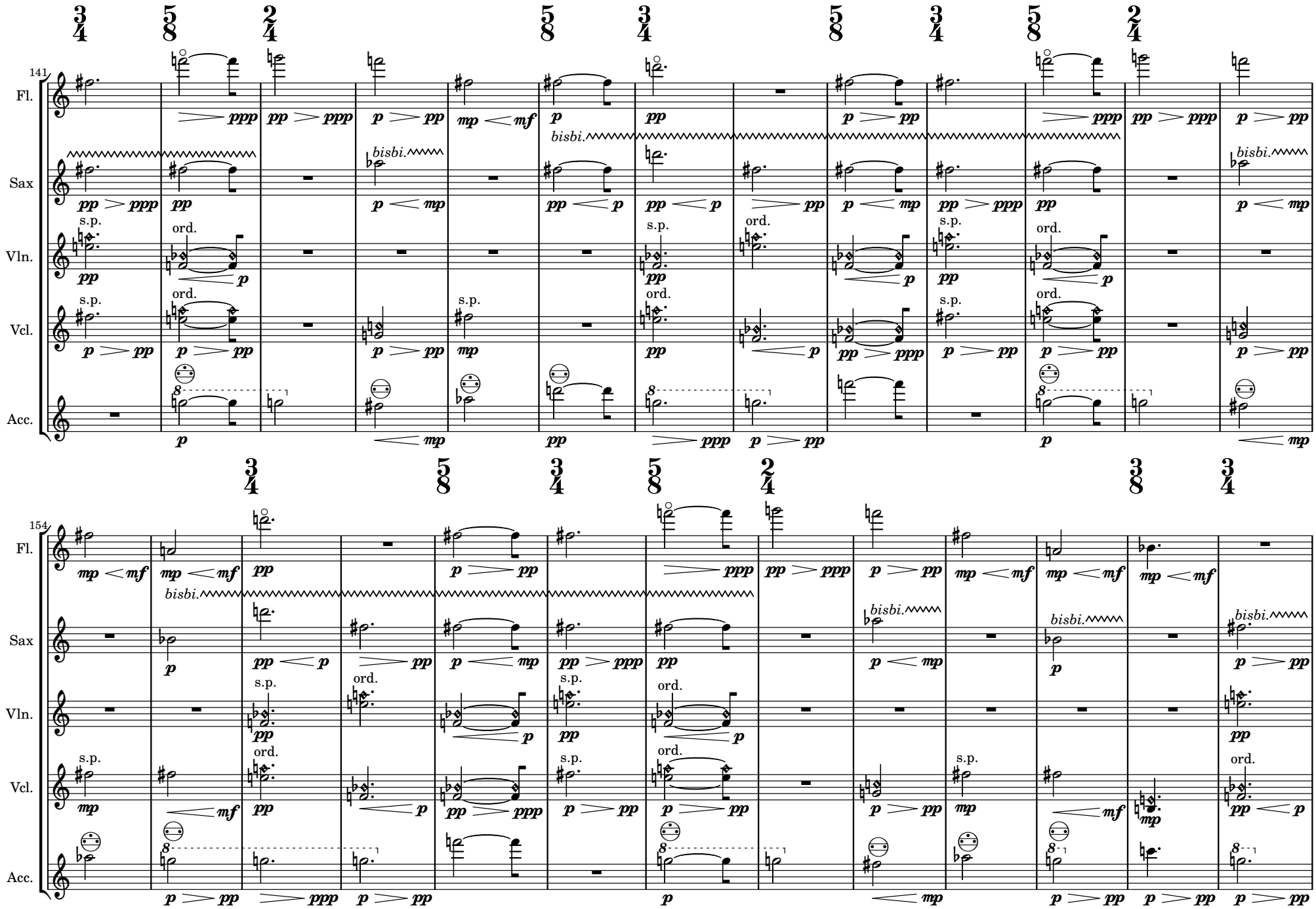
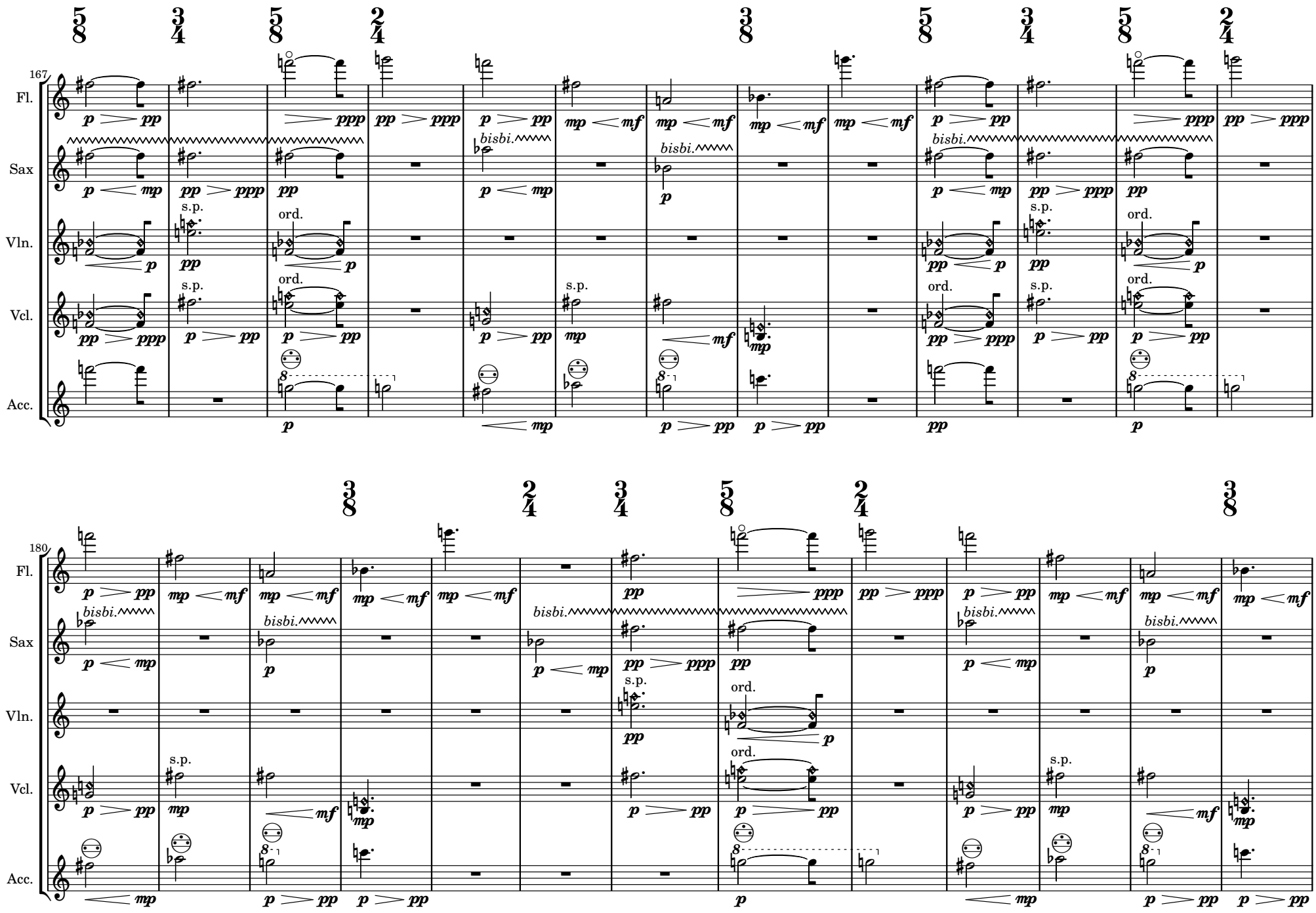
Sax
Vln.
Vcl.
Acc.
bisbi.
s.p.
ord.
128


141
Fl.
Sax
Vln.
Vcl.
Acc.
bisbi.
s.p.
ord.
154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ord.
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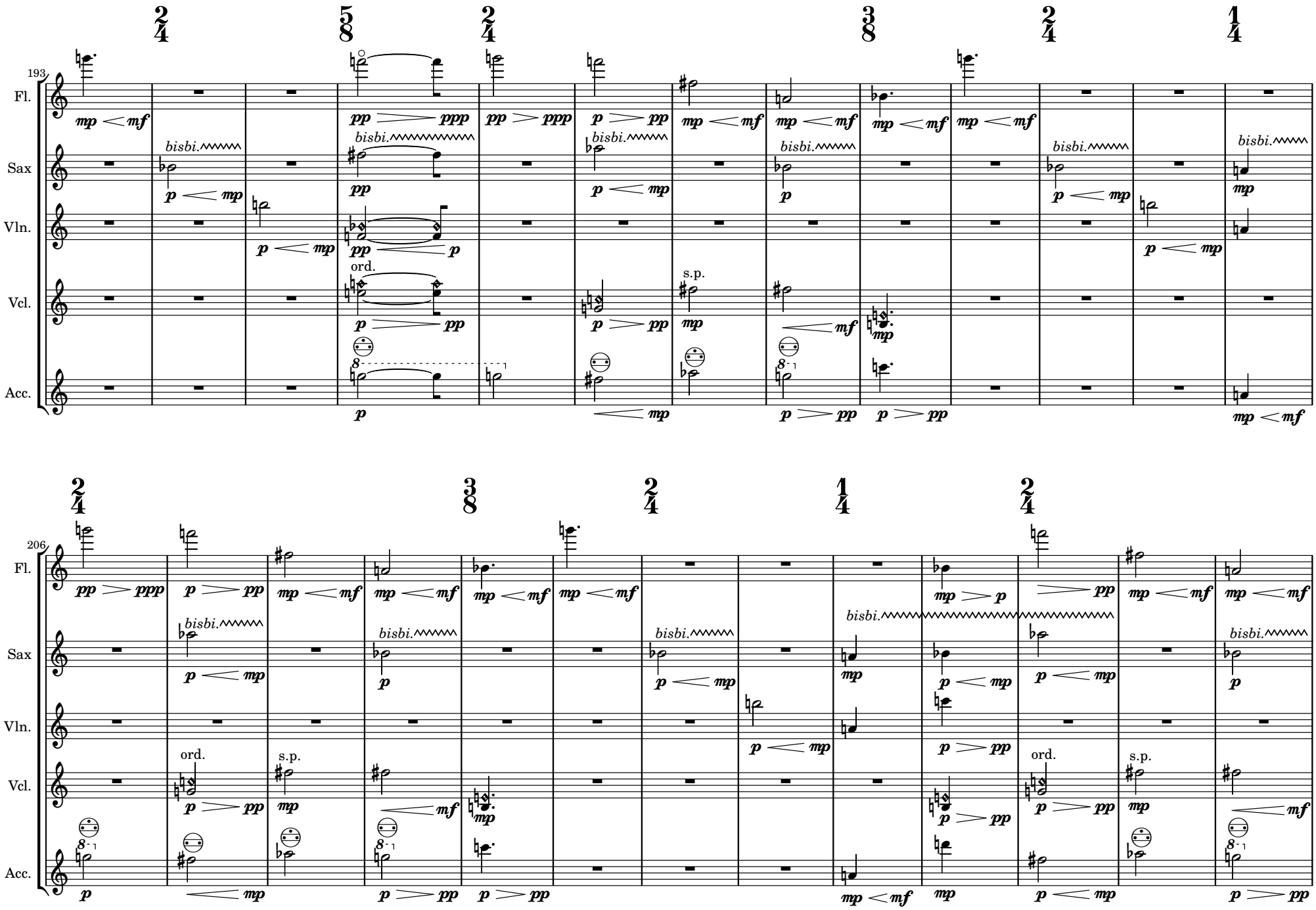
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Vcl.
Acc.
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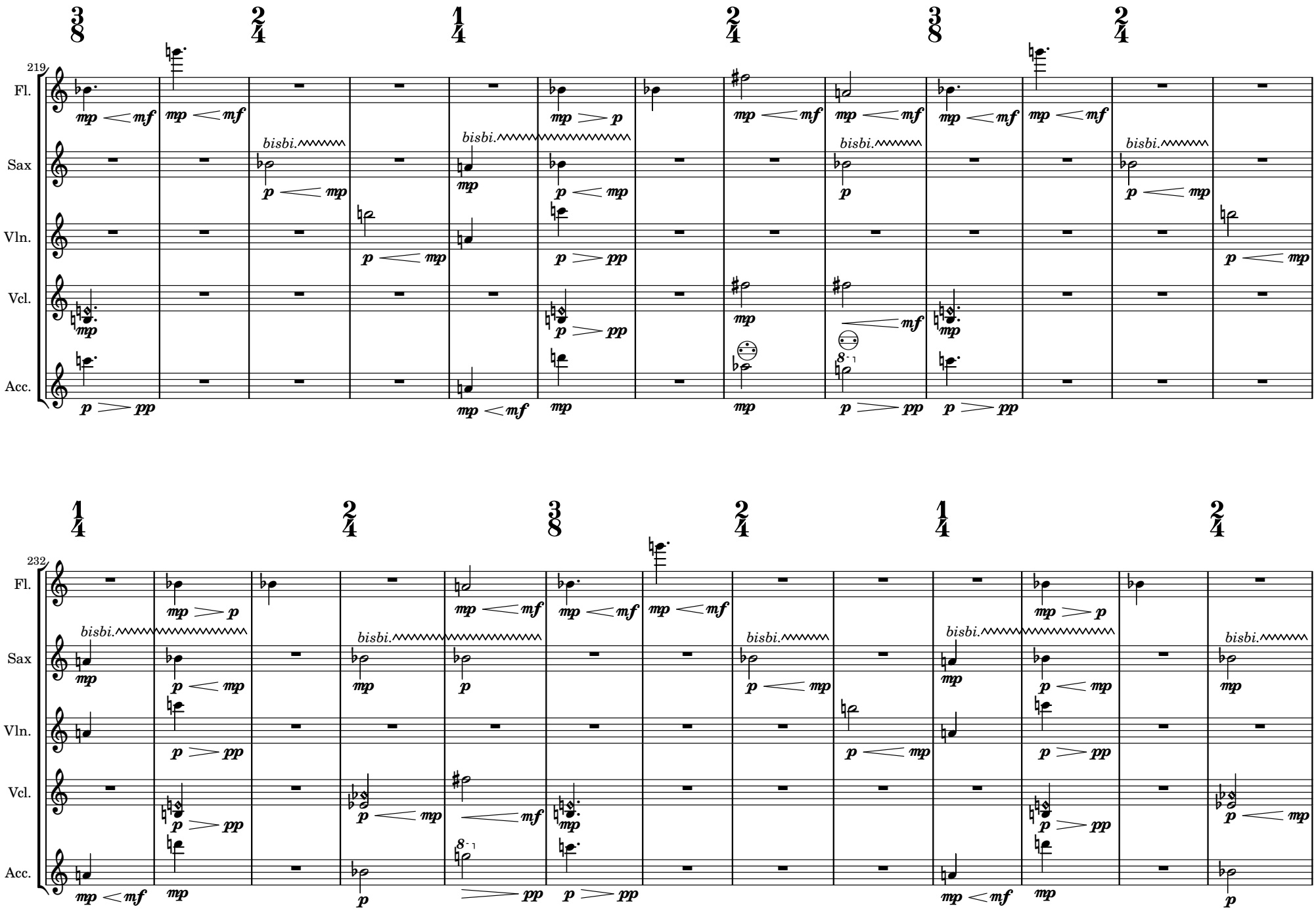
ord.
s.p.
206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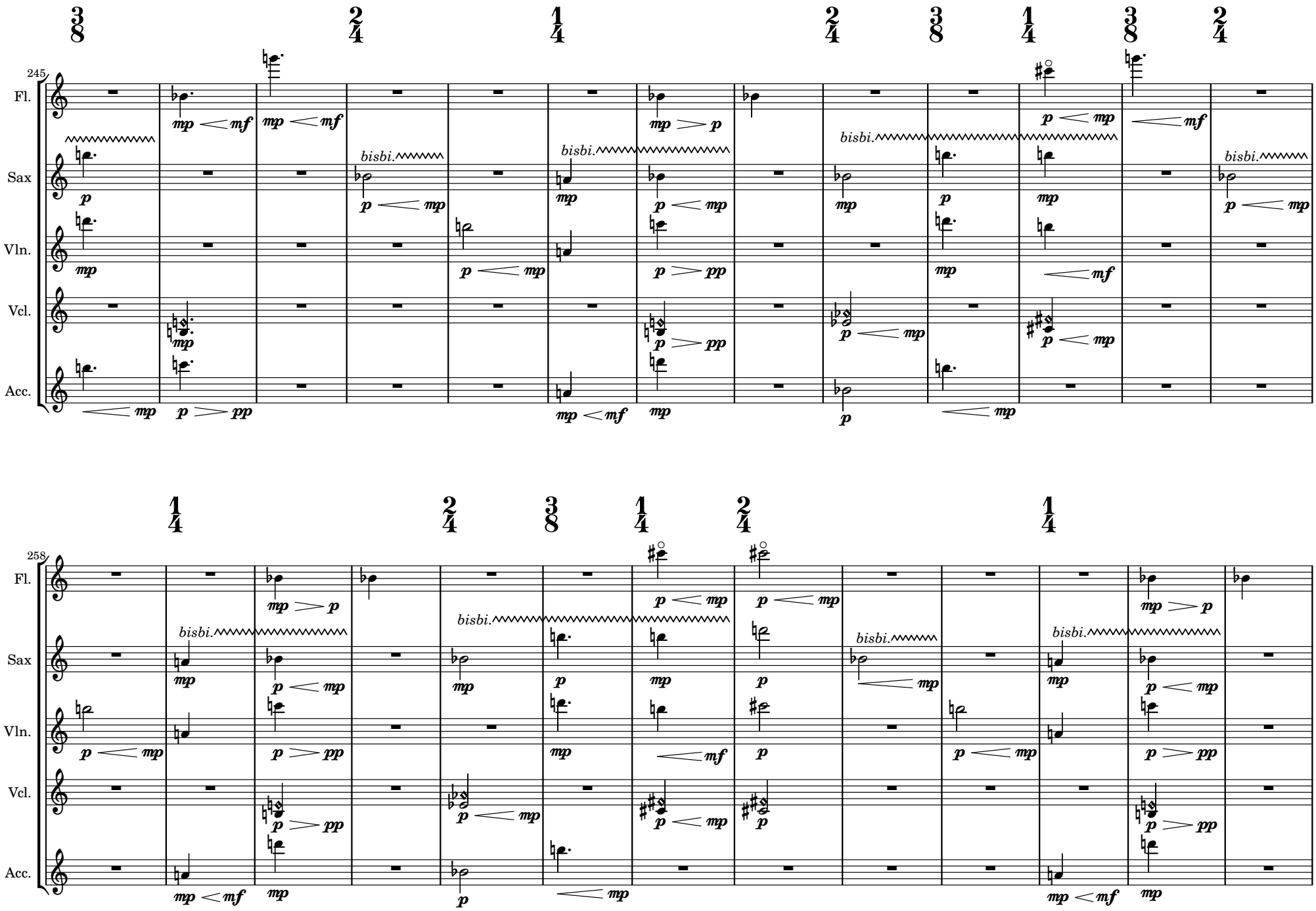
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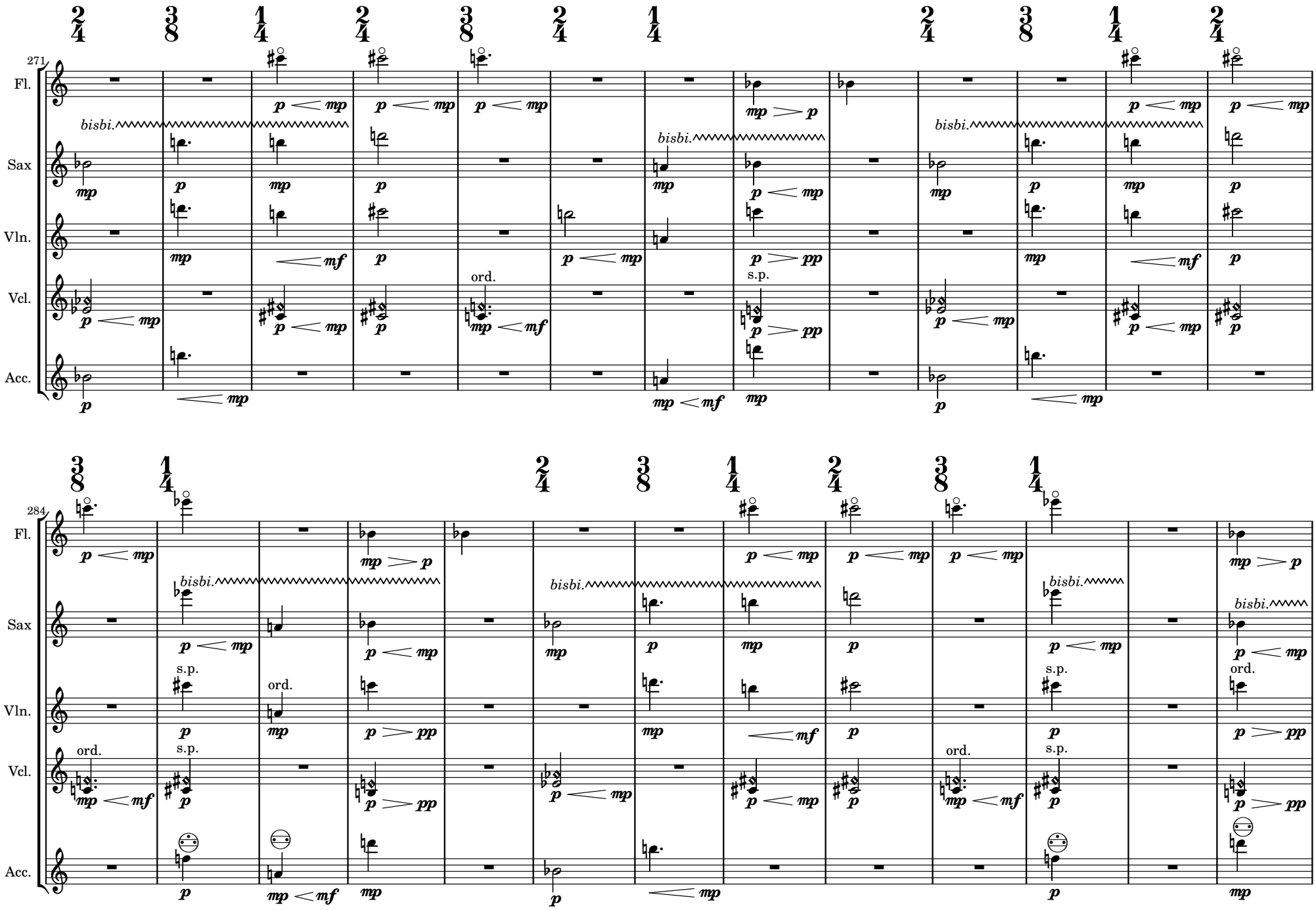
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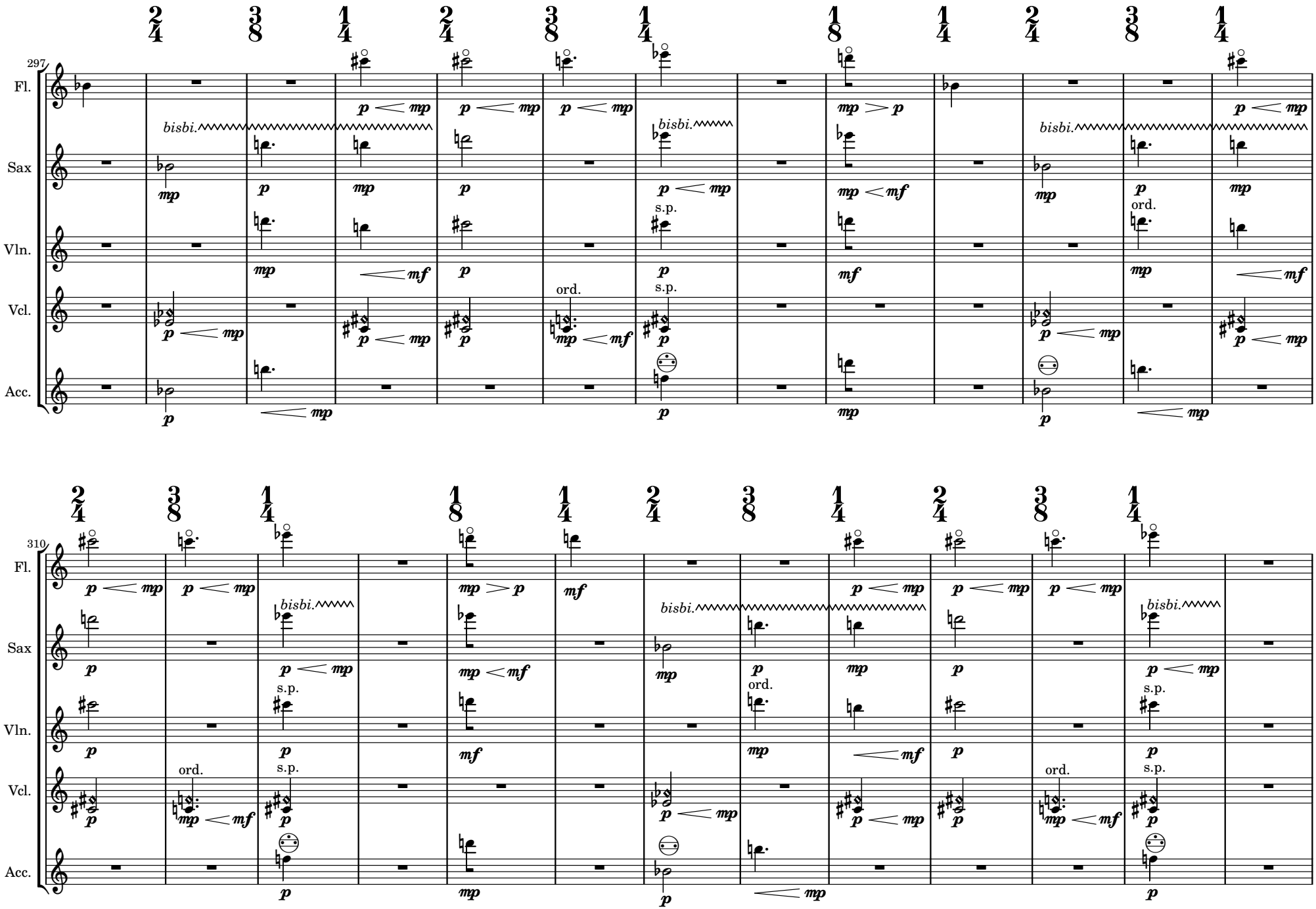
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ord.
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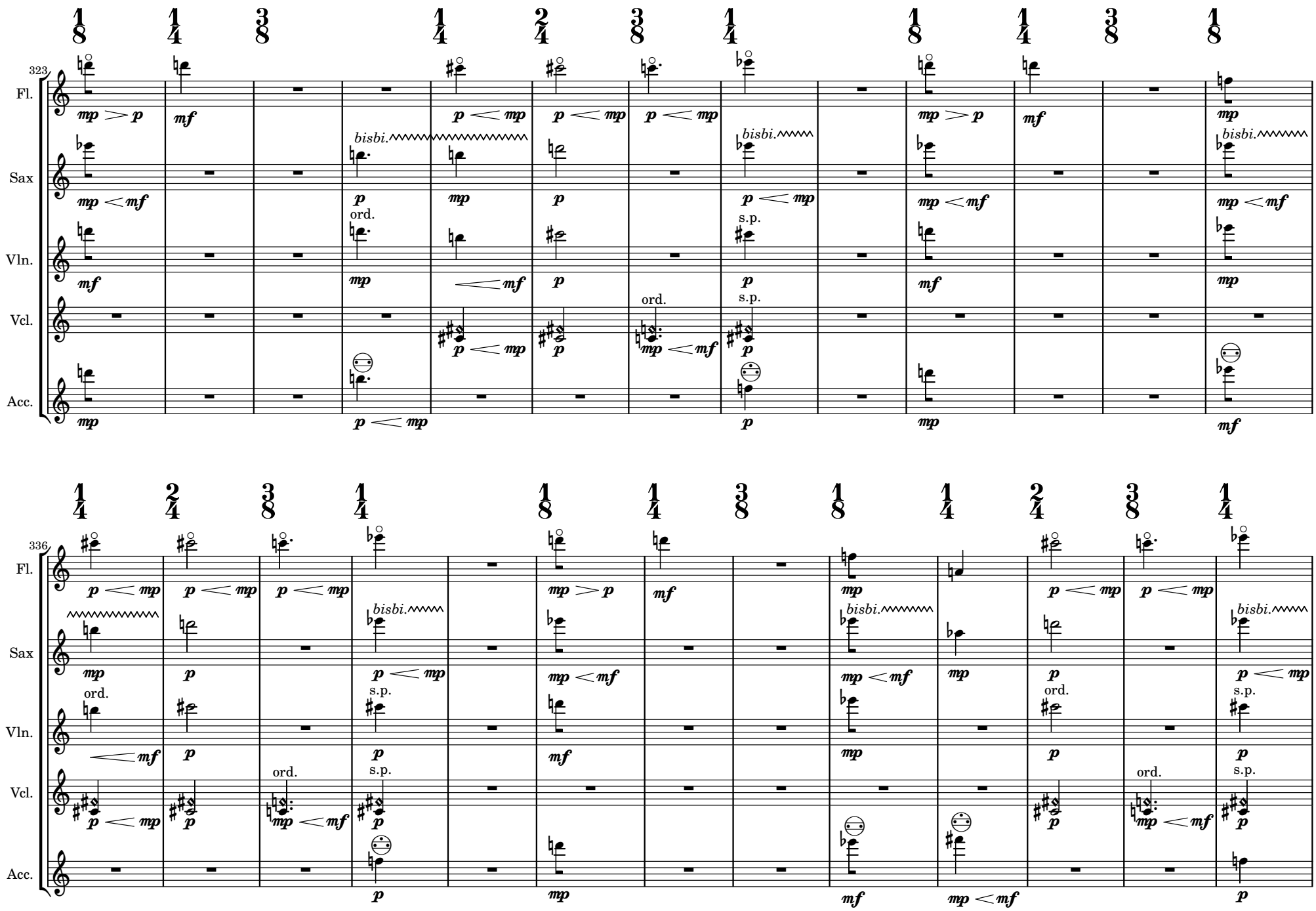
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Vcl.
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s.p.
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Acc.
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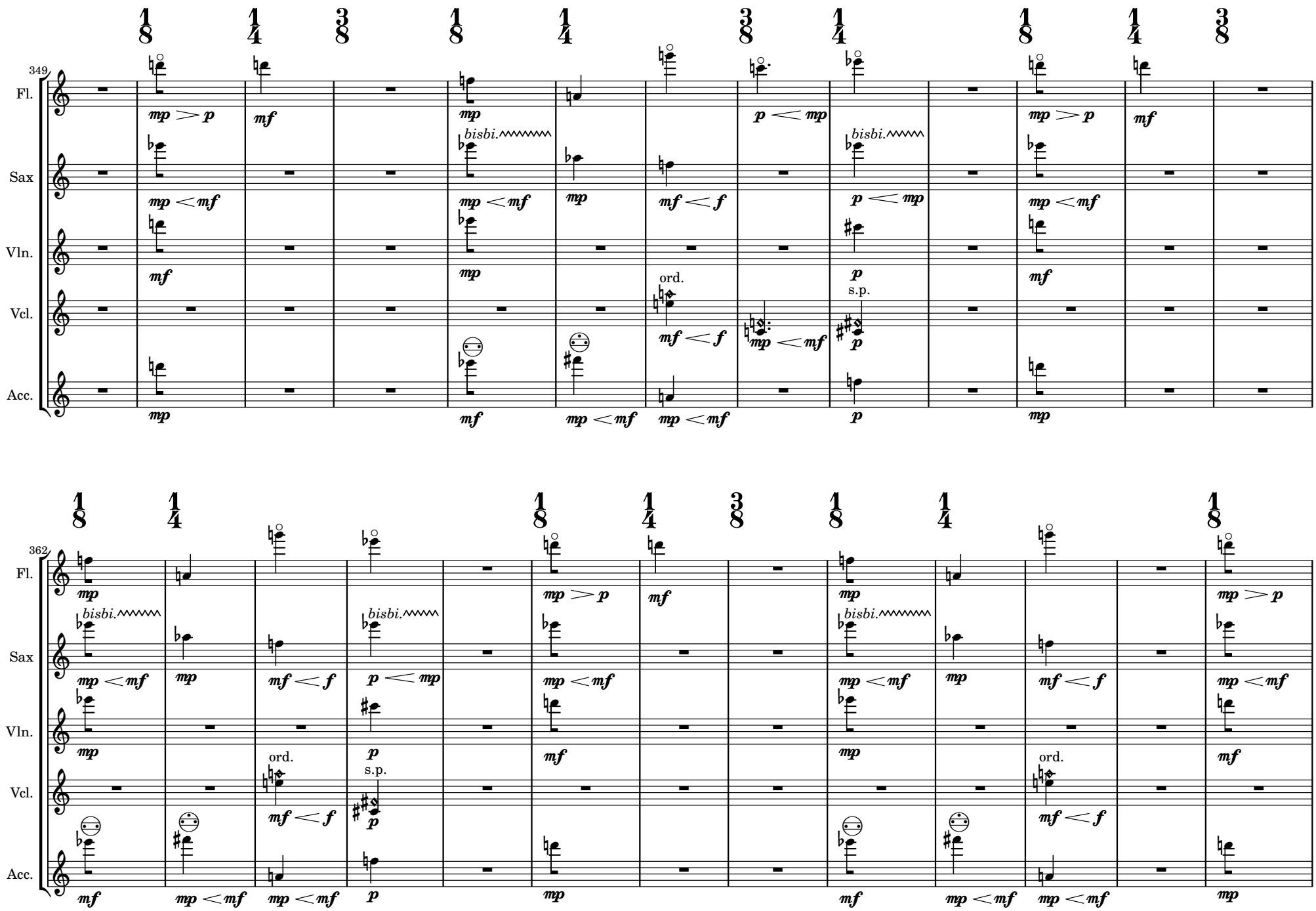
s.p.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Vcl.
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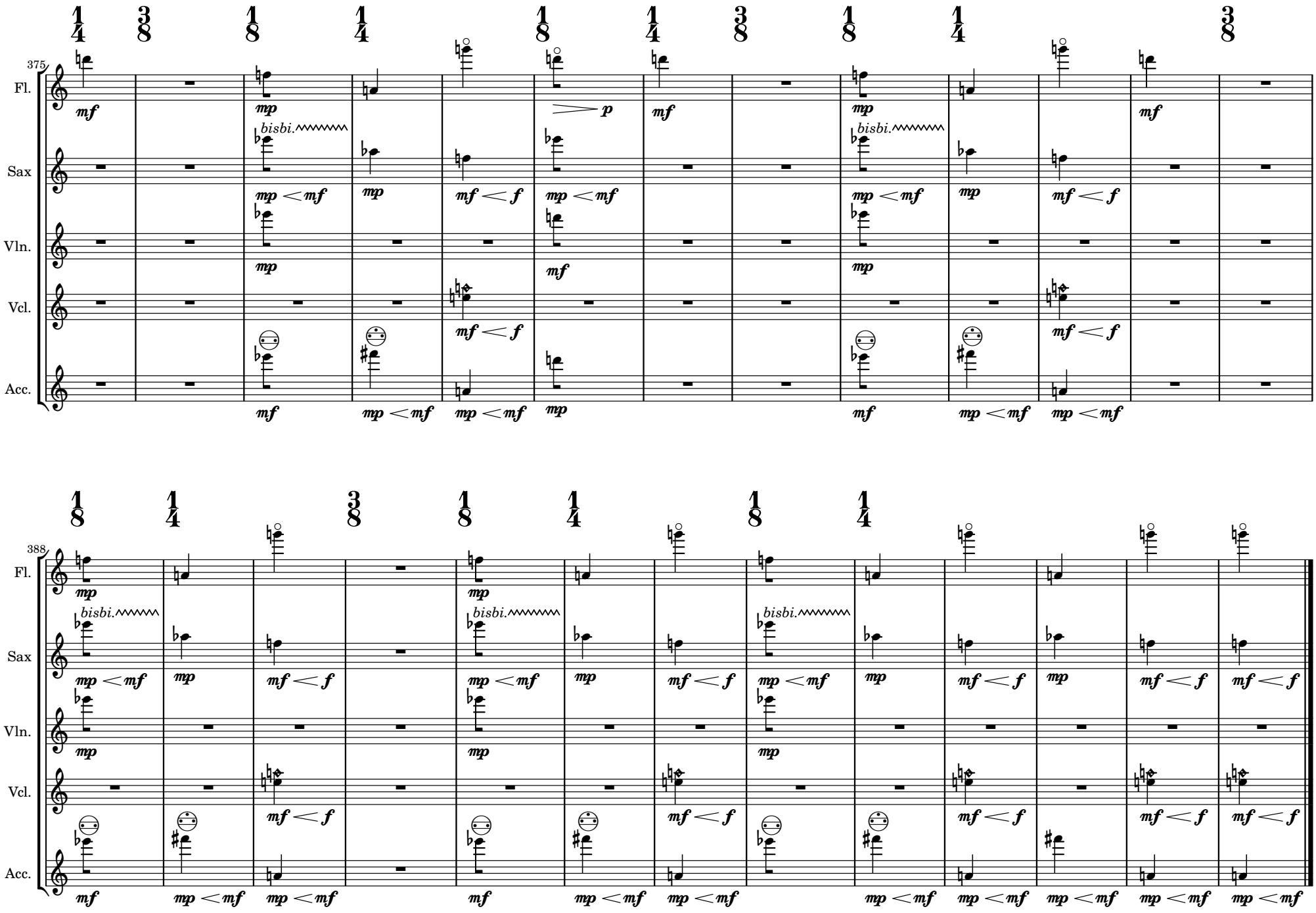
s.p.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Vcl.
Acc.
bisbi.
388
Fl.
Sax
Vln.
Vcl.
Acc.
bisbi.

Cartography #9, for clarinet, viola, vibraphone, and piano

Mapping and rules

pitches

set size	$N = 6$
transformation period	$1 \times$ bar (pre-loop)
transformation mechanism	$[a, b, c, d, e, f] \rightarrow [b, c, d, e, f, g]$, with $g \bmod 12 = (f \bmod 12) + 1$, and g at a uniformly randomly selected octave transposition. At every sixth bar (pre-loop), the whole set of six pitches is replaced by a new one in which each new pitch is uniformly randomly selected within the instrumental range and making sure that each pitch class is unique. The process of selecting a new pitch after that will continue to follow $g \bmod 12 = (f \bmod 12) + 1$, and g.
initial set	[C4, C♯4, D4, E♭4, E4, F4]

dynamics

set size	$N = 5$
transformation period	fixed
set	[***ppp***, ***pp***, ***p***, ***mp***, ***mf***]
selection mechanism	the dynamics map is tied to the duration map, so that a same random index is used to select elements from both. For instance, if the duration at the first index has been selected, the dynamic ***ppp*** is then also selected.

durations

set size	$N = 5$
transformation period	$2 \times$ bars (pre-loop)
transformation mechanism	$[a, b, c, d, e] \rightarrow [b, c, d, e, f]$, with $f = e - 1$.
initial set	$[10, 9, 8, 7, 6]$

looping mechanism

window size	$16 \times$ 𝅘𝅥𝅯 (post-loop)
shift size	semiquaver
mechanism	the algorithm first creates a non-looped version of the music using the maps and transformation mechanisms to select pitches, durations and dynamics as described above. After this music is generated, the next stage is to use a 16 semiquavers-long window which is shifted to the right by a single semiquaver after every cycle. The processes ends when the last note of the pre-looped music leaves the looping window.

constraints

- number of bars (pre-loop): 12.
- range: F3–B♭5.

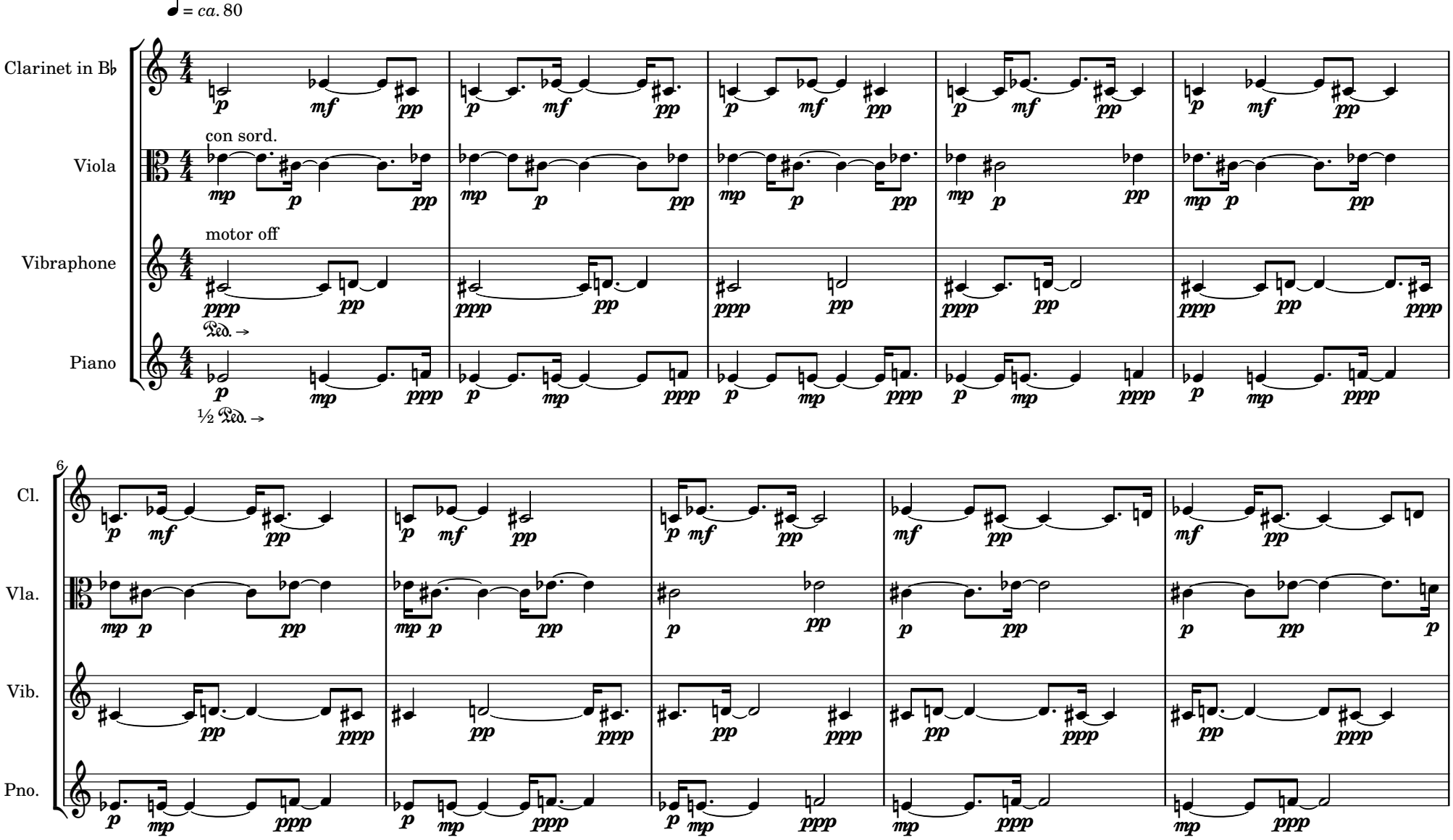
General performance notes

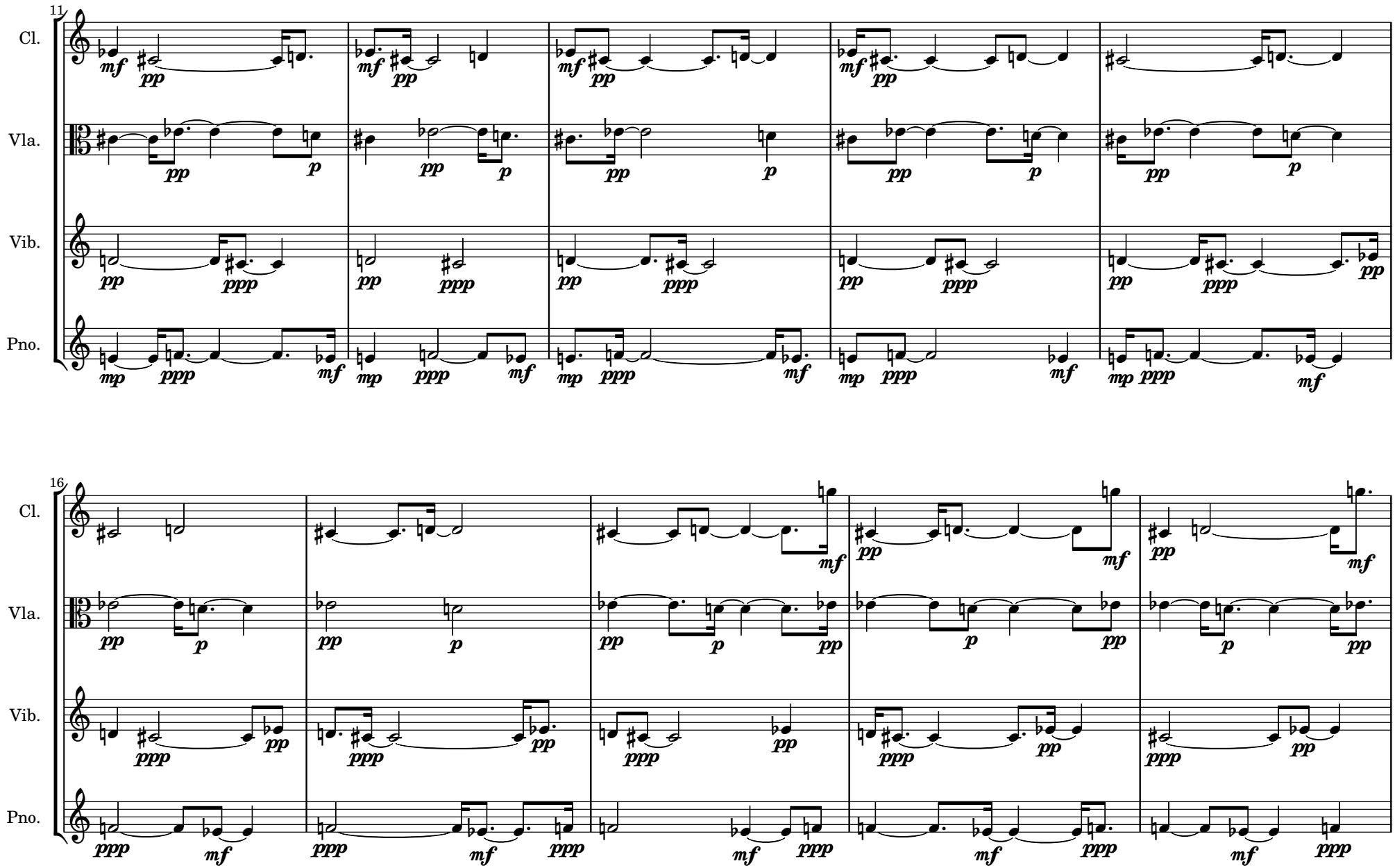
- the piano's sustain pedal should be held halfway down throughout the piece. A good reference point for this is when individual note lengths cannot be precisely perceived (that is, the sound is not cut when releasing a key). Some instruments and acoustic spaces might call for slightly different pedalling (at the discretion of the performer).
- the vibraphone's pedal should be held down throughout the piece.
- after the last note of the piece, both the vibraphone and the piano should let the resonance disappear before raising the sustain pedal.
- the vibraphone's motor should remain off throughout the piece.
- medium mallets are recommended for the vibraphone.
- both the clarinet and viola should play without vibrato.
- the clarinettist should add breathing points after longer notes but preferably not at bar lines.
- if necessary, the clarinettist may take up to two bars of rest at any point in the performance (at the discretion of the performer).
- the viola should use a mute throughout this piece.
- the viola player may decide to play any notes in the piece using harmonics, in particular when that helps with larger leaps.

Cartography #9

Score in C

Gilberto Agostinho

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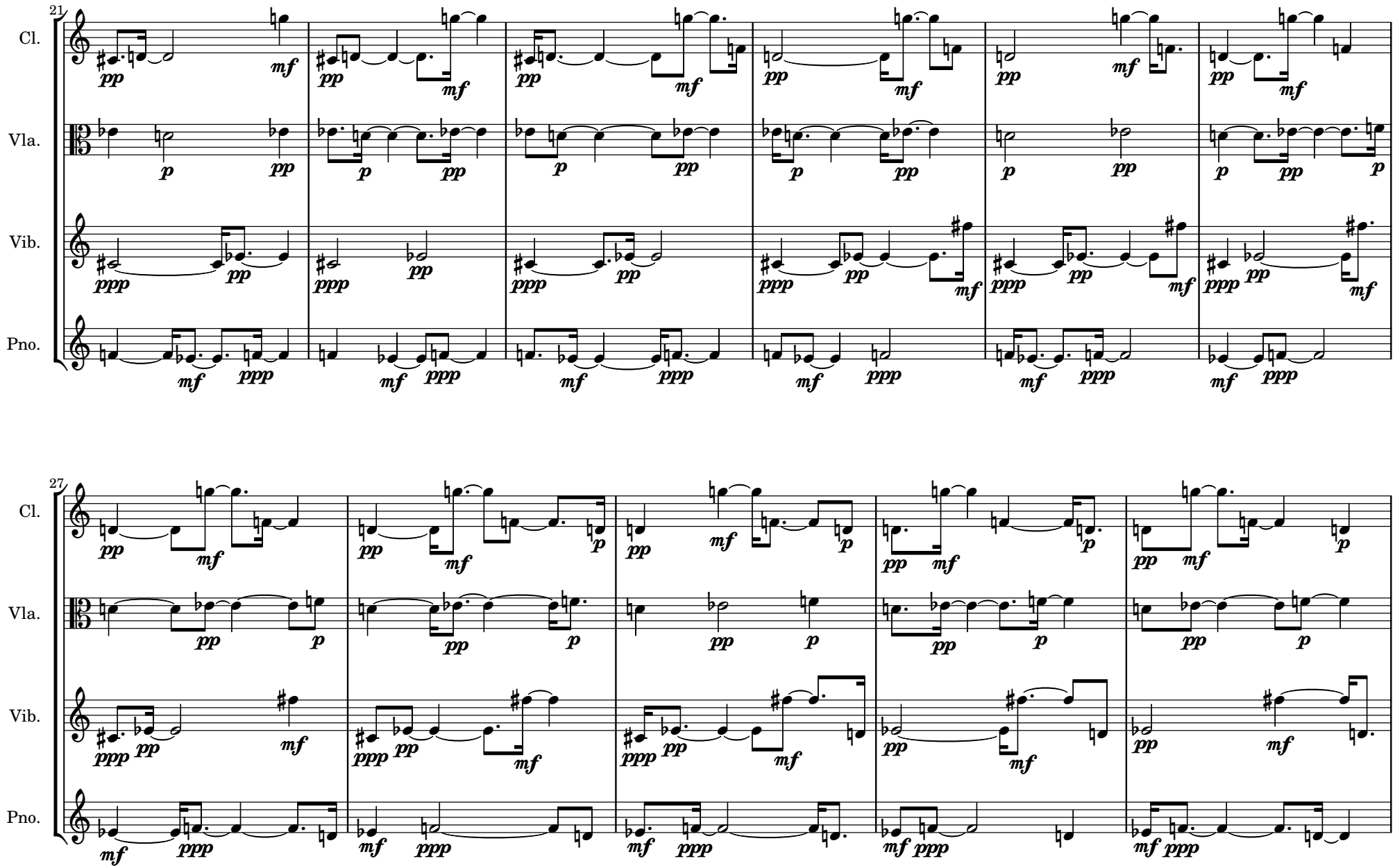
Vla.
Vib.
Pno.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Vib.
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Vib.
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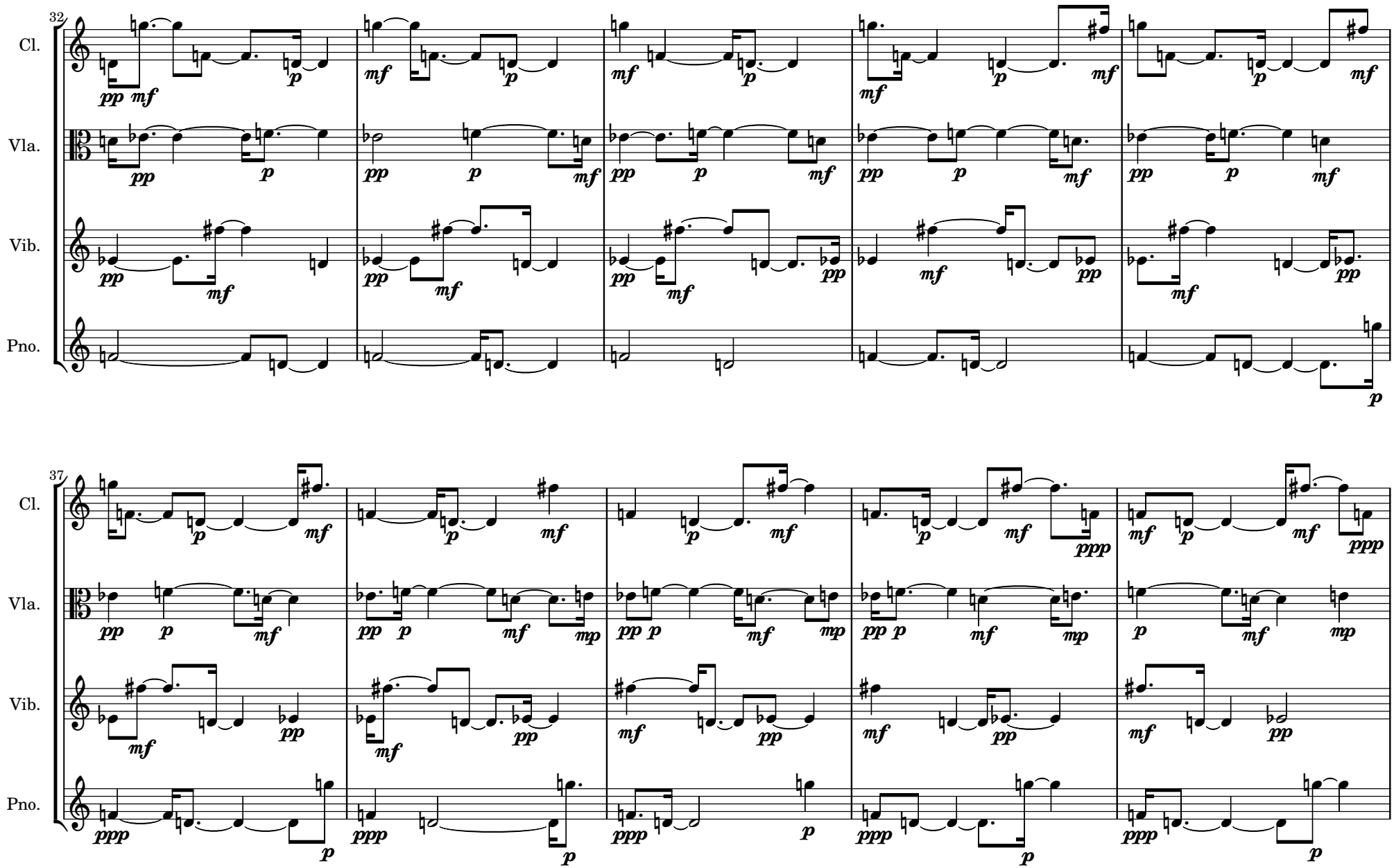
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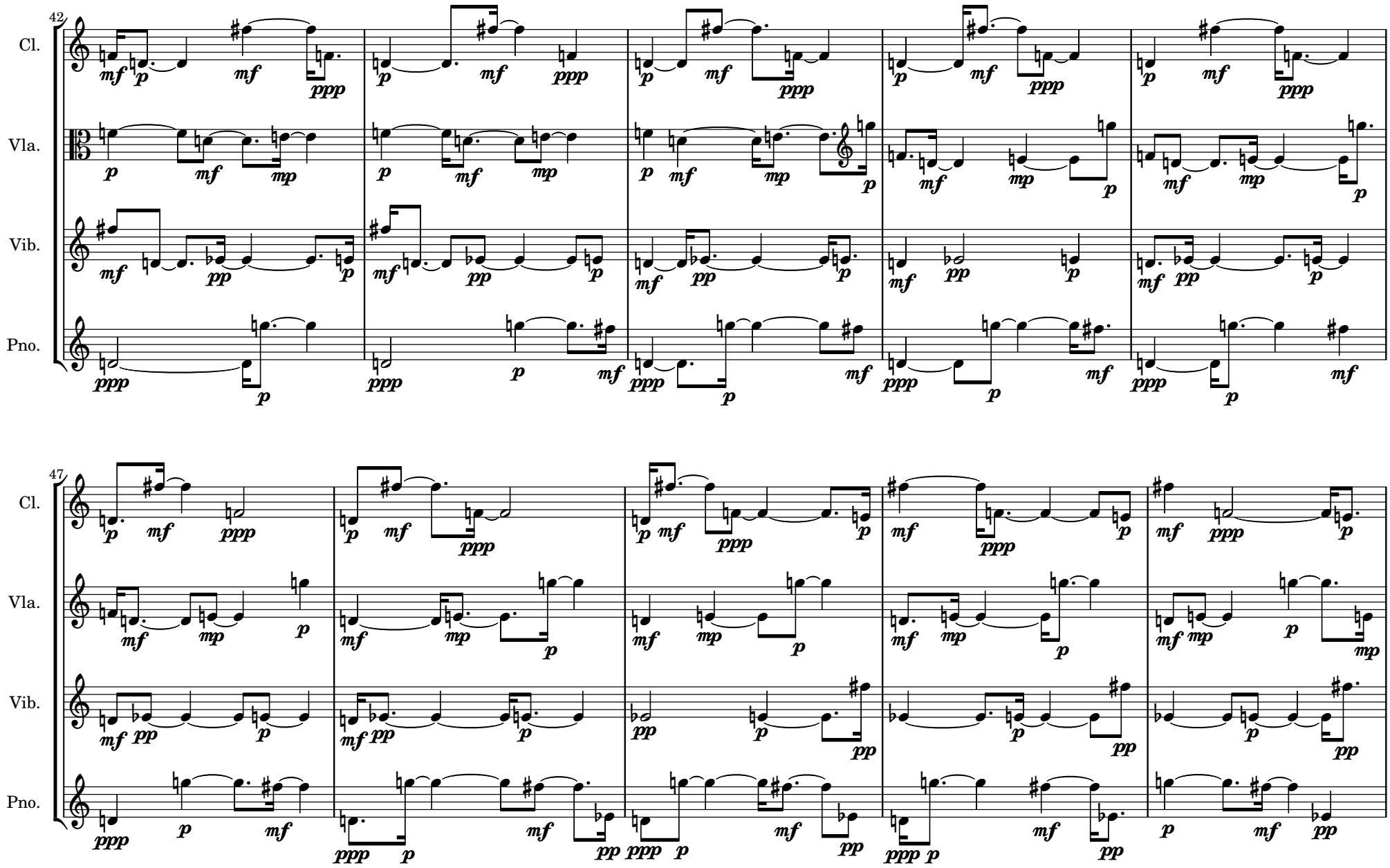
Vib.
Pno.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Vla.
Vib.
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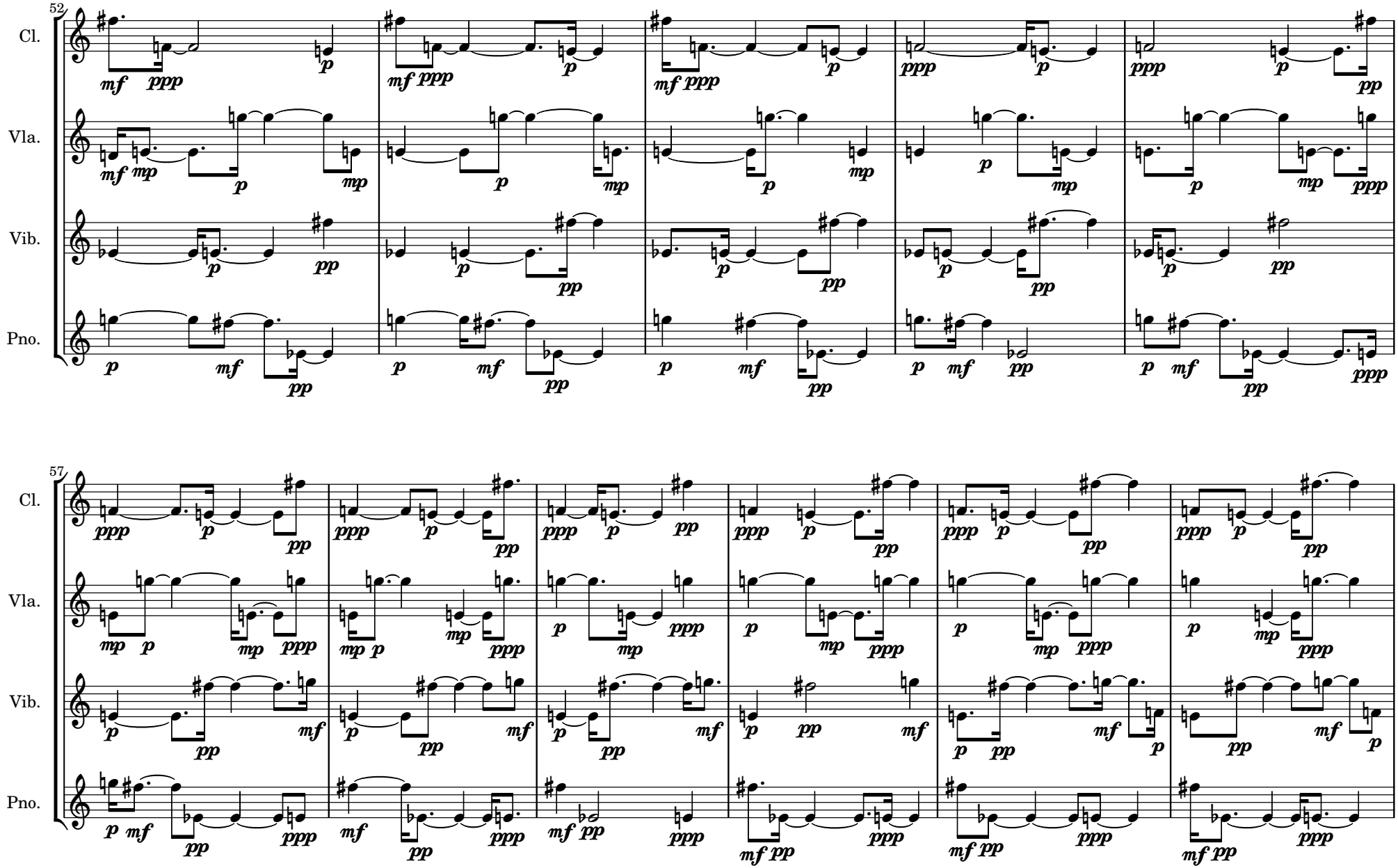
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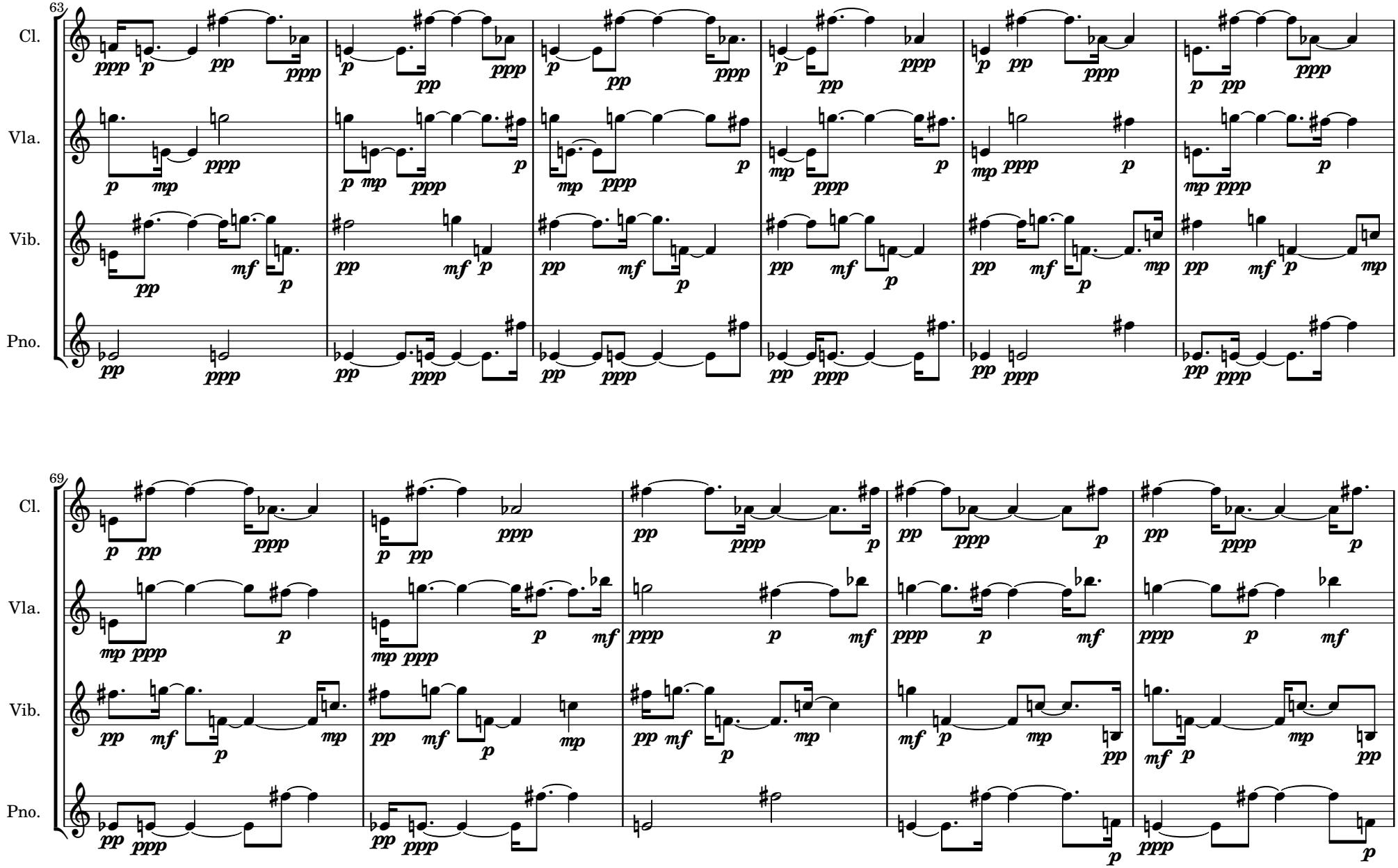
Vib.
Pno.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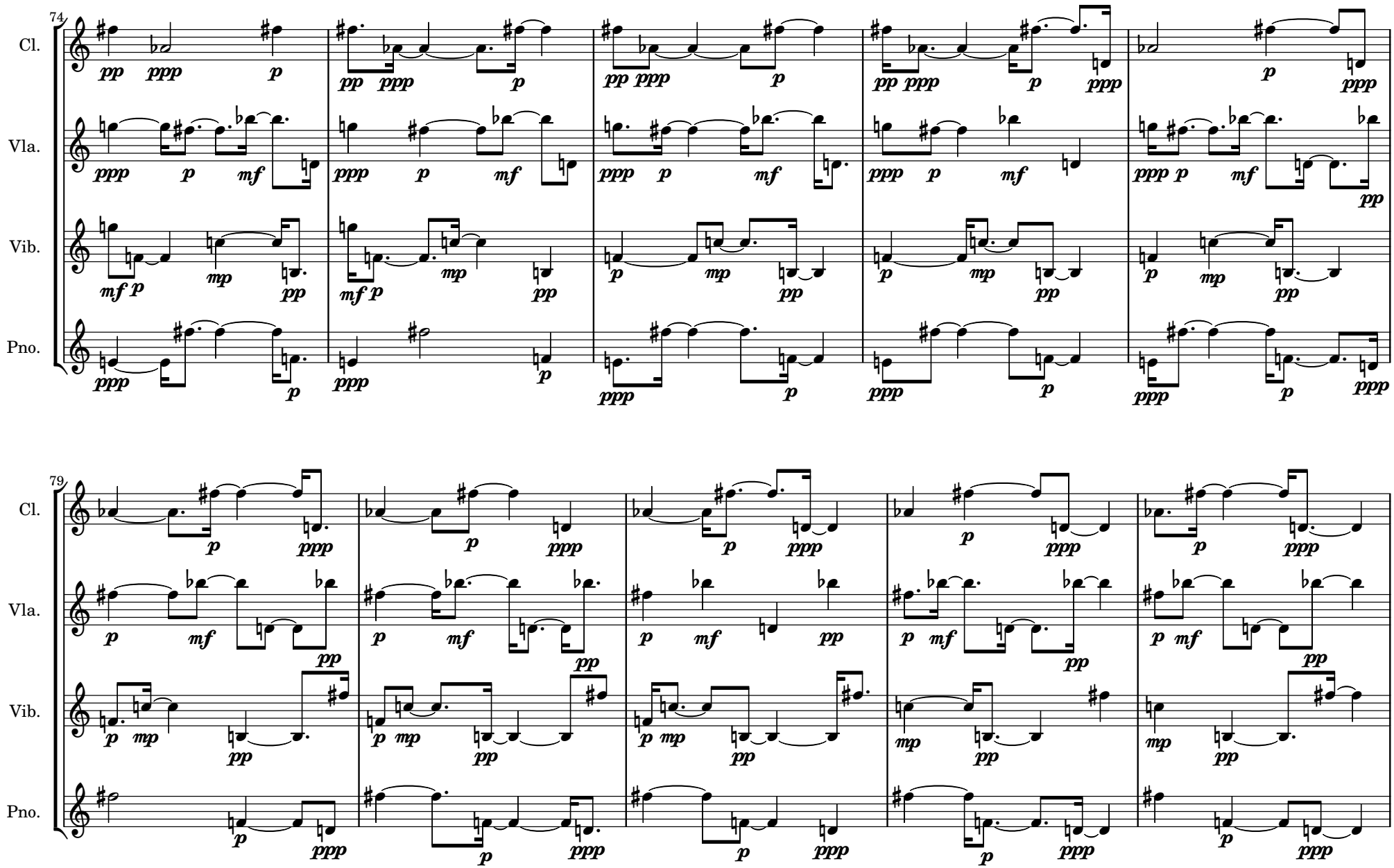
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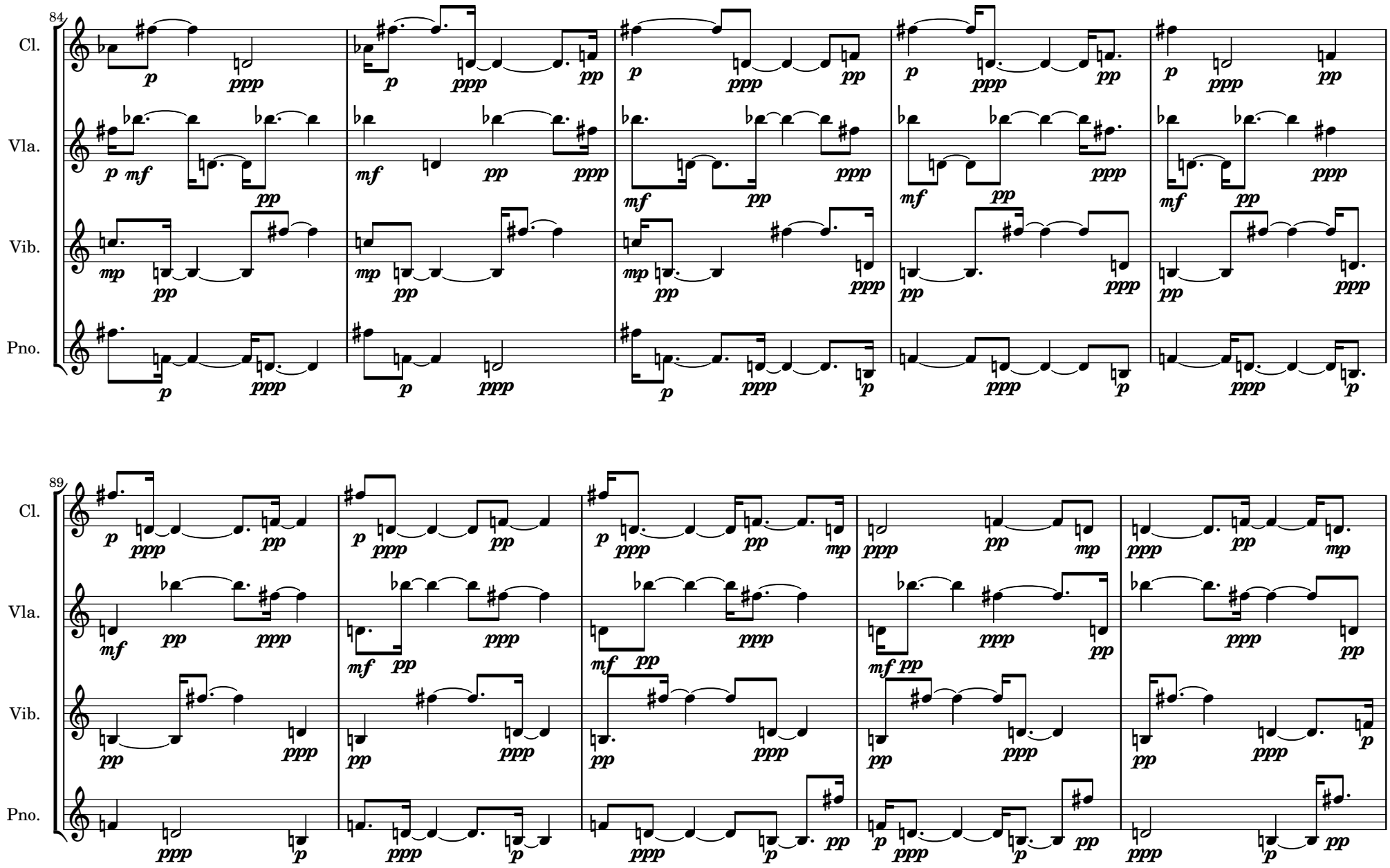
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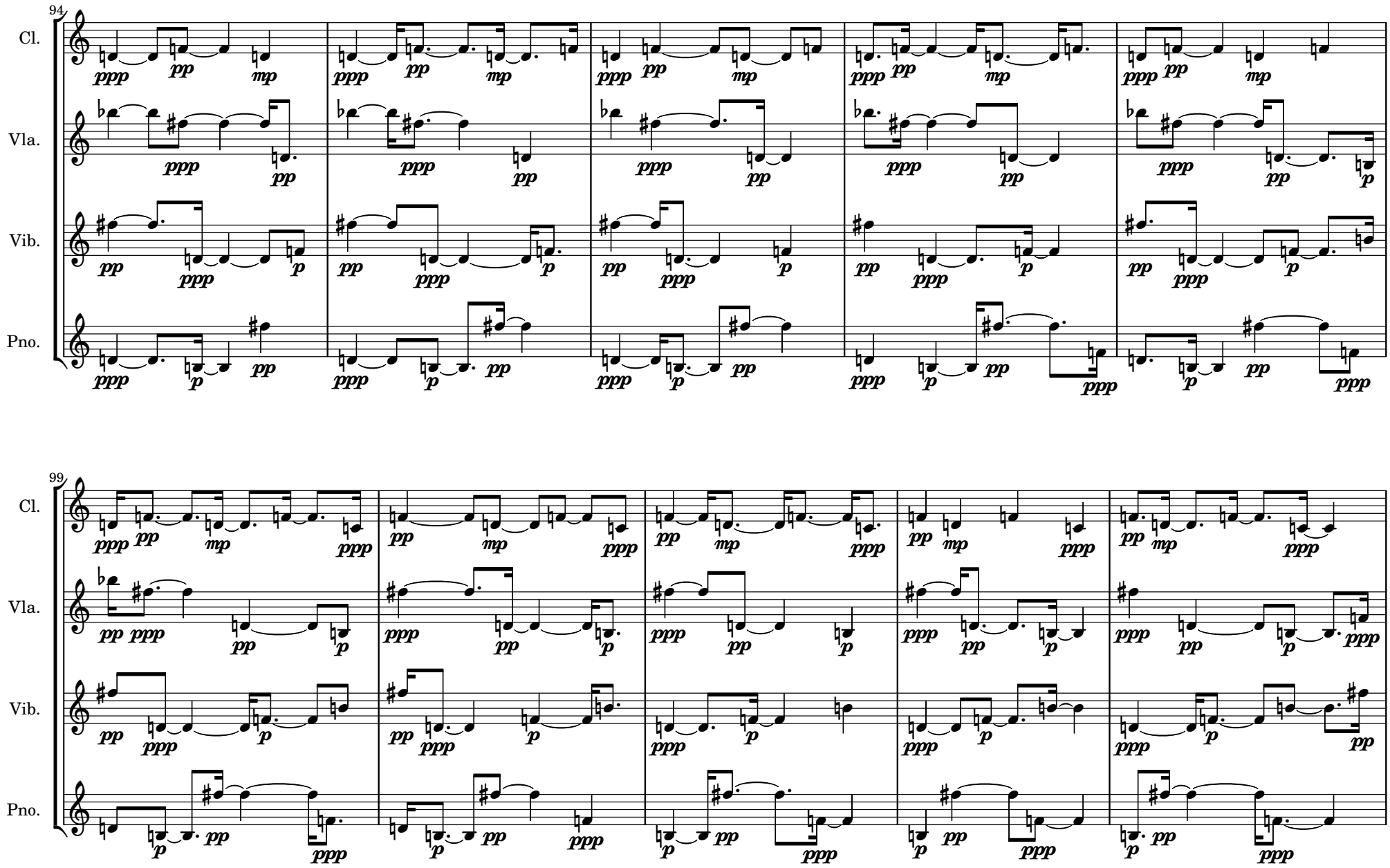
Pno.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Vib.
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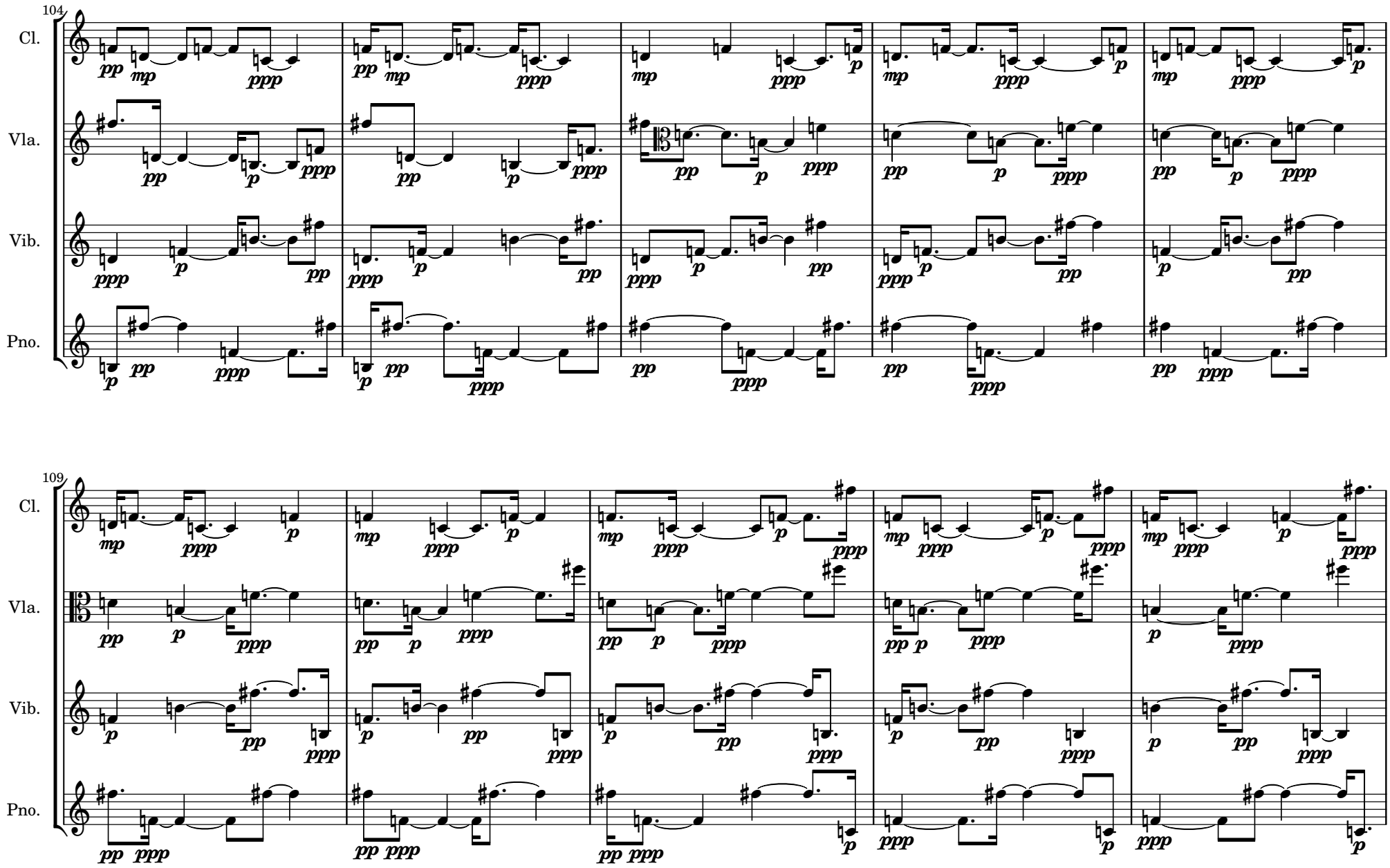
Vib.
Pno.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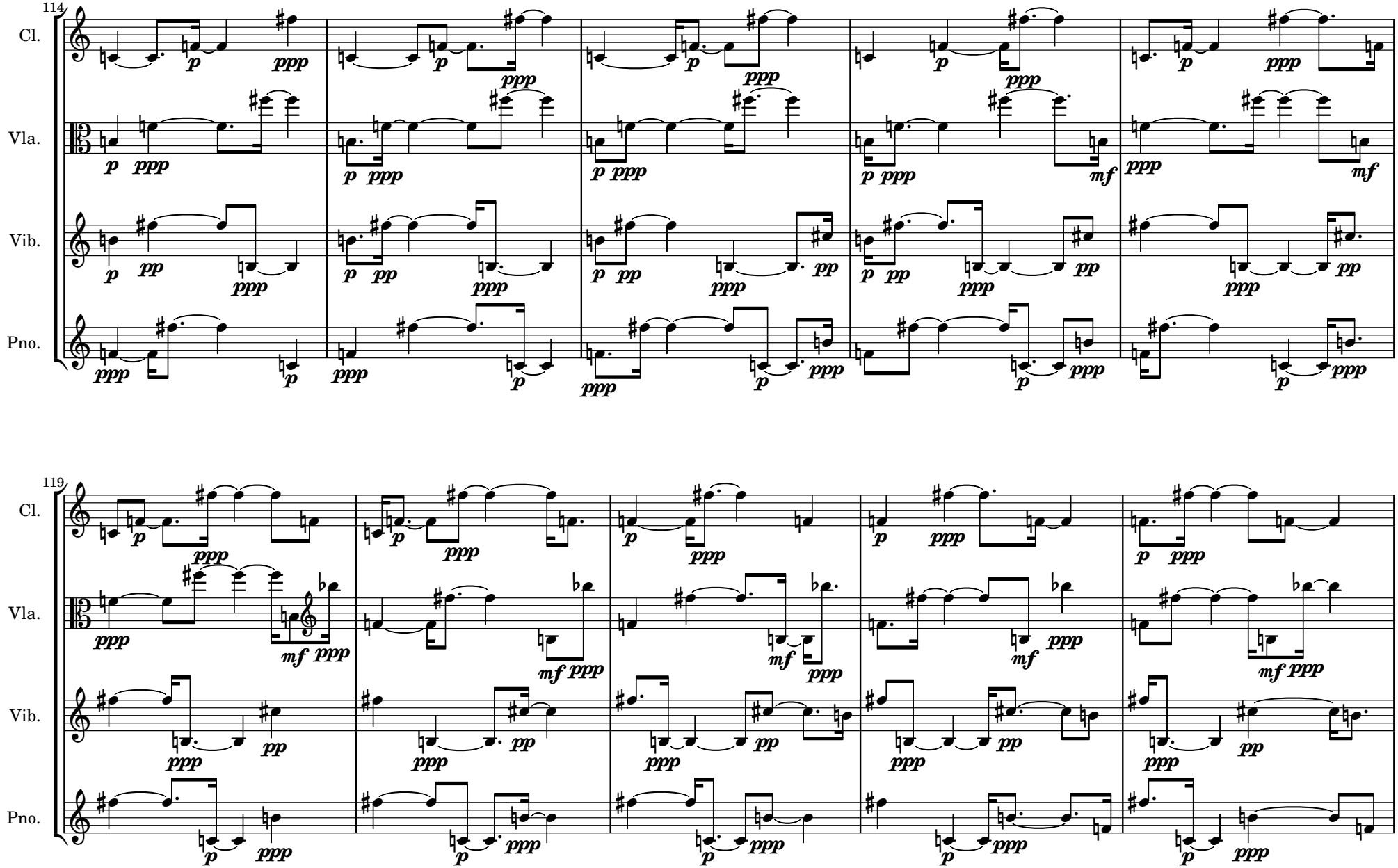
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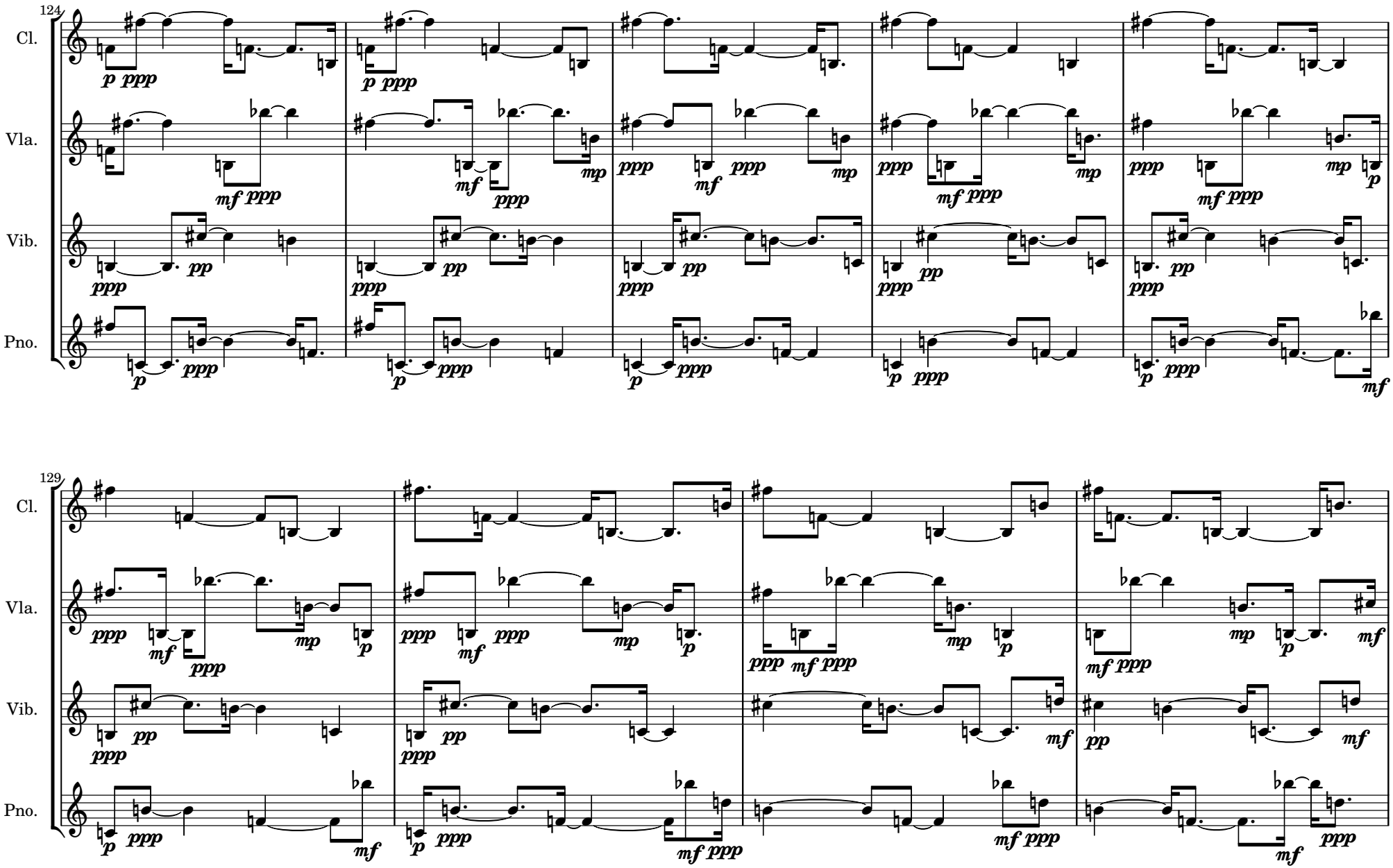
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Vib.
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129
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Vla.
Vib.
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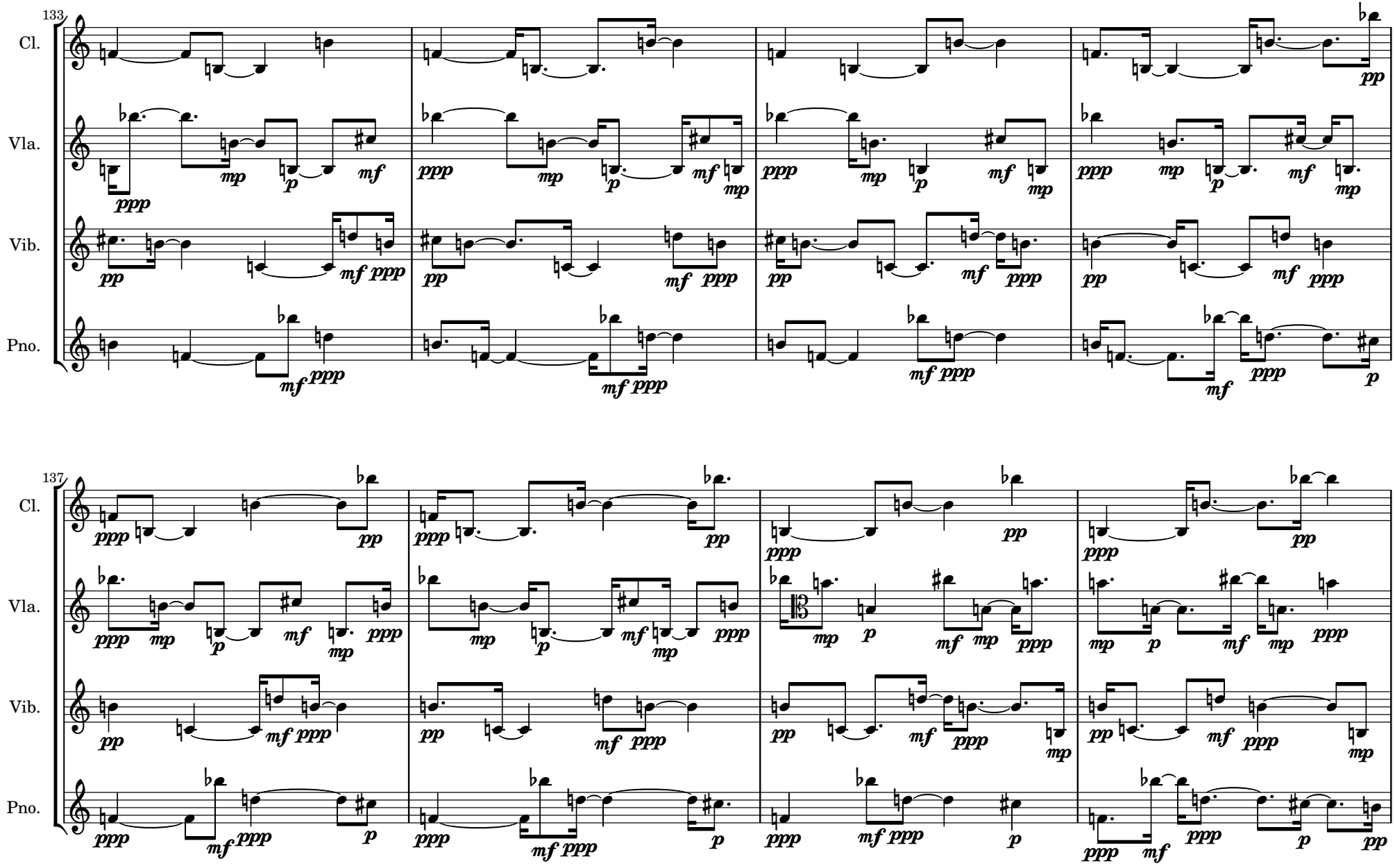
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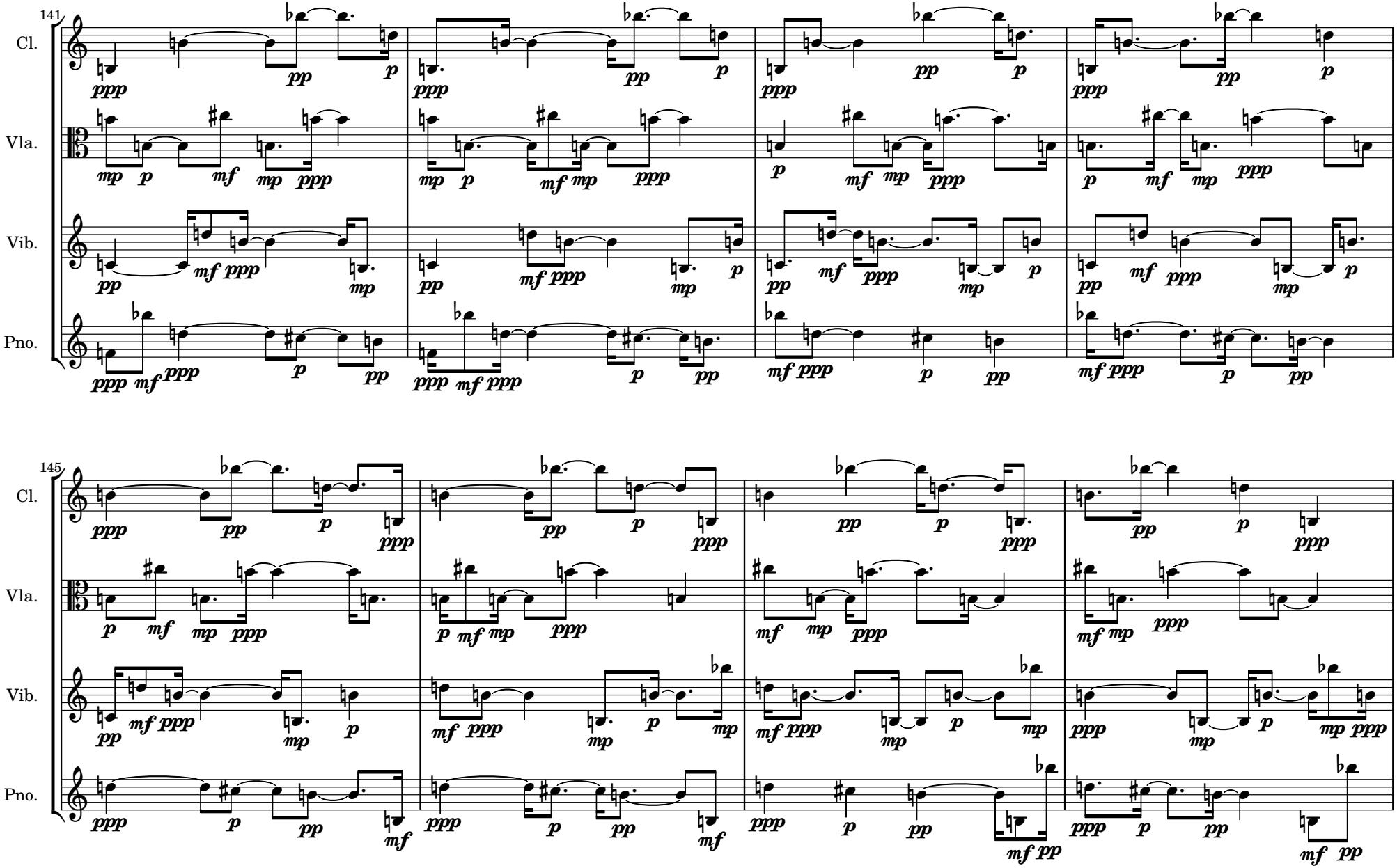
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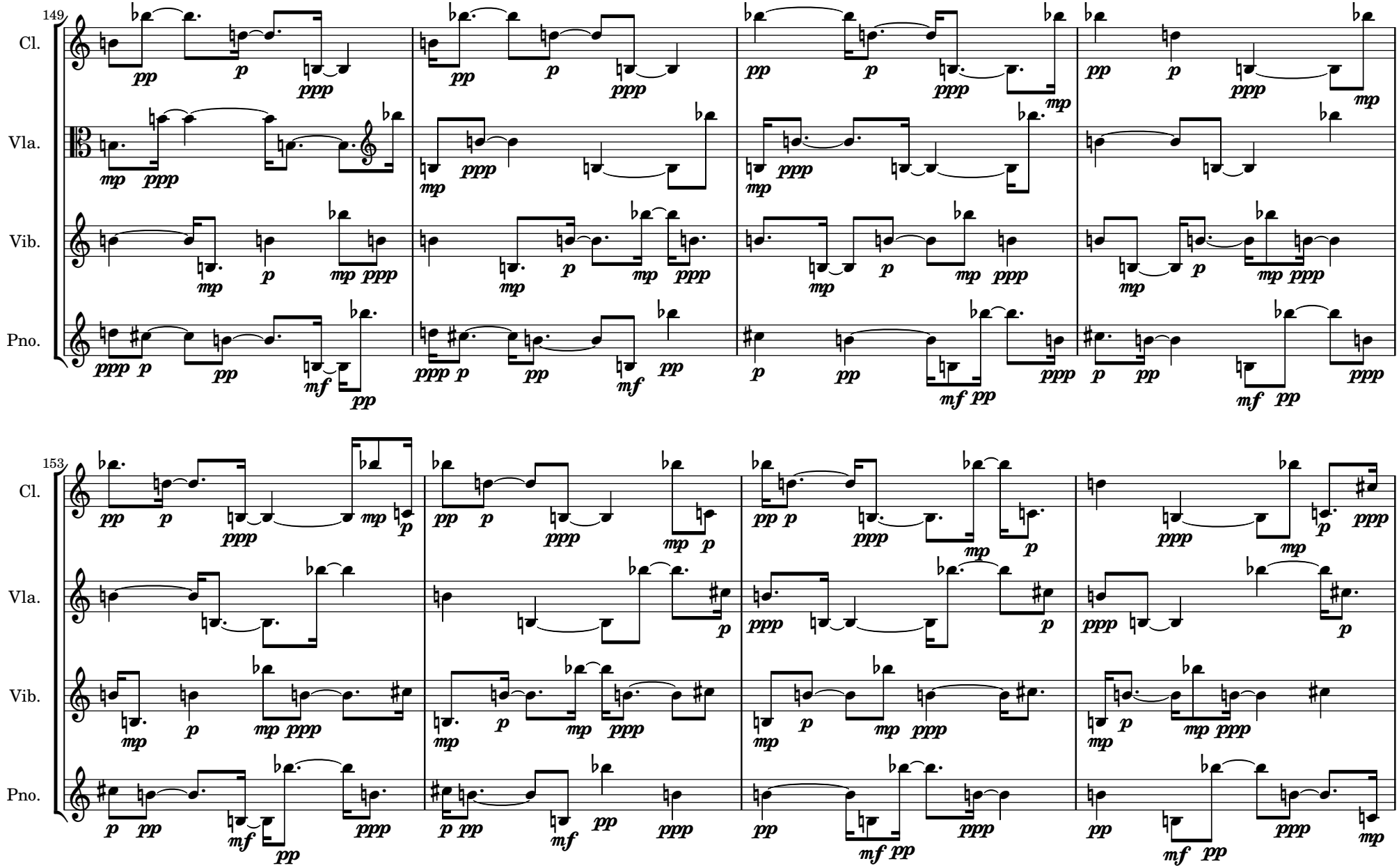
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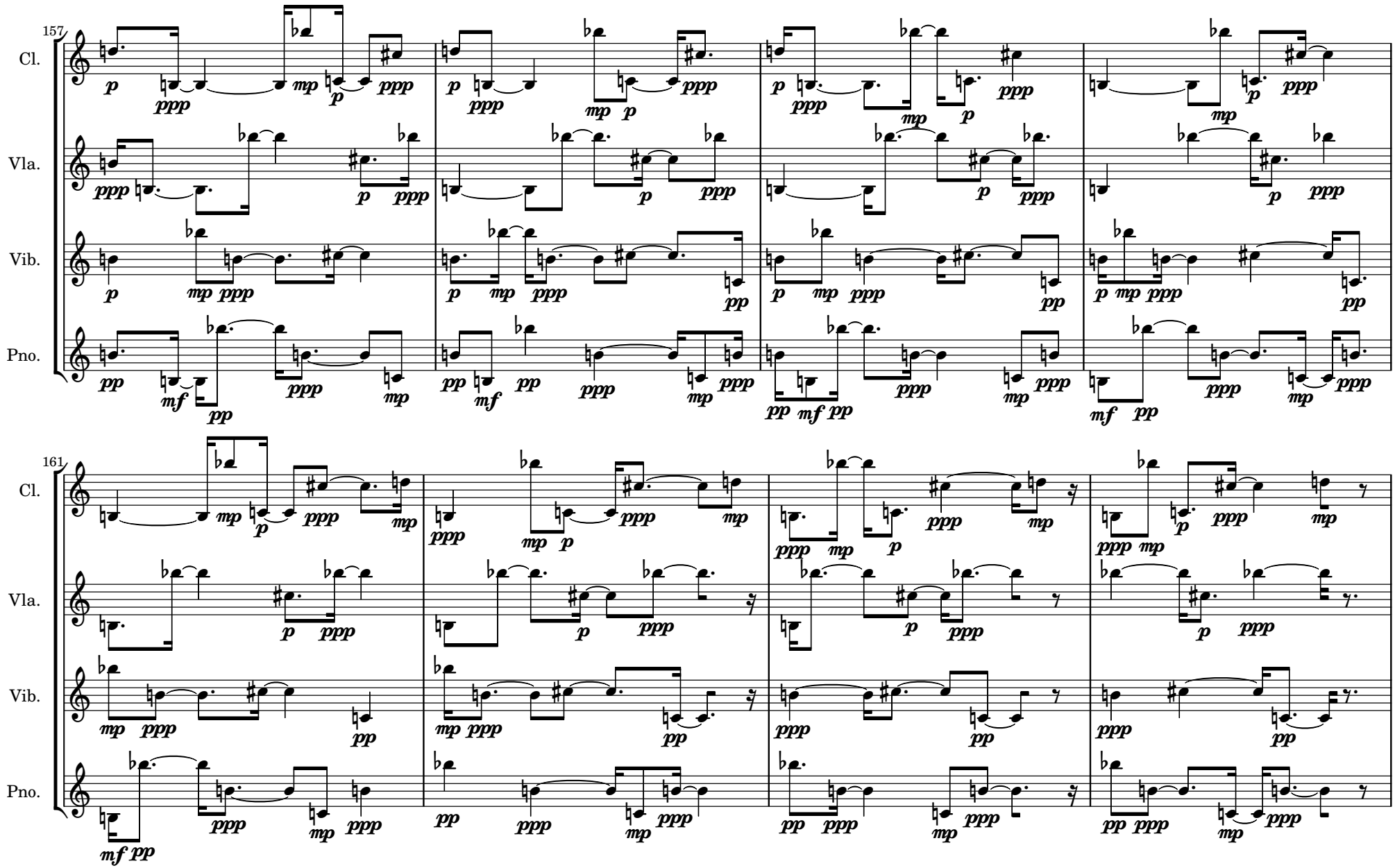
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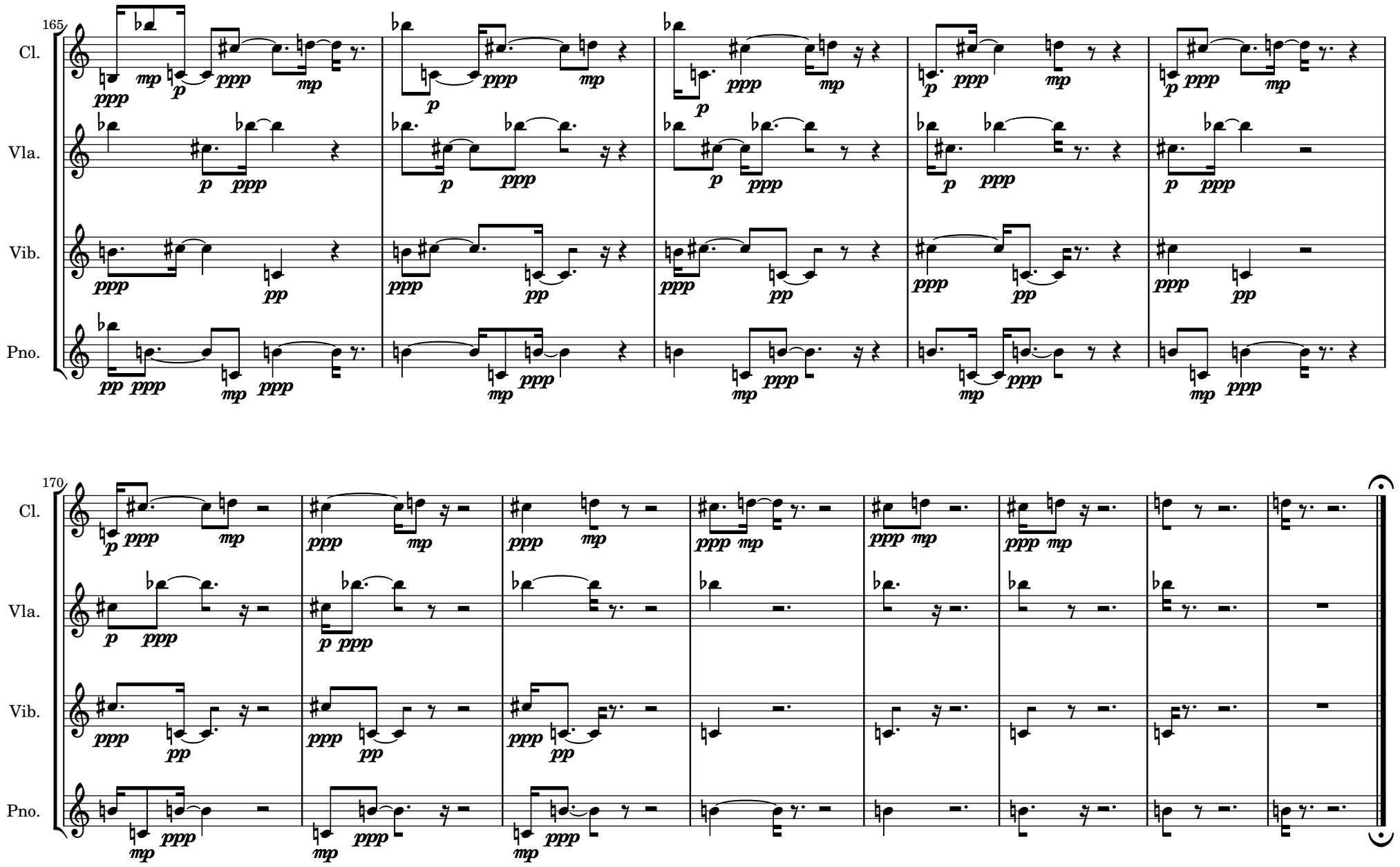
165
Cl.
Vla.
Vib.
Pno.
170
Cl.
Vla.
Vib.
Pno.

Cartography #10, for marimba, vibraphone, and piano

Mapping and rules

pitches

set size	$N = 6$
transformation period	$1/2 \times$ bar (pre-loop)
transformation mechanism	$[a, b, c, d, e, f] \rightarrow [b, c, d, e, f, g]$, with $g \bmod 12 = (f \bmod 12) - 1$, and g at a uniformly randomly selected octave transposition. There is a 50% of chance of a new element being a rest, but two rests can never follow each other.
initial set	[C6, B5, B♭5, A5, A♭5, G5]

dynamics

set size	$N = 3$
transformation period	fixed
set	[***pp***, ***p***, ***mp***]
selection mechanism	the dynamics map is tied to the duration map, so that a same random index is used to select elements from both. For instance, if the duration at the second index has been selected, the dynamic ***p*** is then also selected.

durations

set size	$N = 3$
transformation period	$2 \times$ bars (pre-loop)
transformation mechanism	$[a, a-1, a-2] \rightarrow [a-1, a-2, a-3]$, where an element equals to 1 if $a - k < 1$.
initial set	$[10, 9, 8]$

looping mechanism

window size	$16 \times$ 𝅘𝅥𝅯 (post-loop)
shift size	semiquaver
mechanism	the algorithm first creates a non-looped version of the music using the maps and transformation mechanisms to select pitches, durations and dynamics as described above. After this music is generated, the next stage is to use a 16 semiquavers-long window which is shifted to the right by a single semiquaver after every cycle. The processes ends when the last note of the pre-looped music leaves the looping window.

constraints

- number of bars (pre-loop): 10.
- range: F3–F6.
- accents and diminuendos are added to all initial notes with a dynamic level of ***p*** or ***mp***.

General performance notes

- this piece should be played fairly quietly. New notes with dynamics of ***p*** or ***mp*** always have a slightly louder attack than the ones around it. The diminuendo hairpins should be executed very smoothly, always reaching ***pp*** at the end.
- the piano's sustain pedal should be held halfway down throughout the piece. A good reference point for this is when individual note lengths cannot be precisely perceived (that is, the sound is not cut when releasing a key). Some instruments and acoustic spaces might call for slightly different pedalling (at the discretion of the performer). The performer may flush it ad libitum. Measures with rests at the end may benefit from less pedalling, but abrupt cuts of pedalling are to be avoided.
- use plenty of pedal in the vibraphone throughout the piece, blending consecutive sounds. The performer may flush it ad libitum. Rests are to be respected by flushing all sounds.
- after the last note of the piece, both the vibraphone and the piano should let the resonance disappear before raising the sustain pedal.
- the vibraphone's motor should remain off throughout the piece.
- medium mallets are recommended for the vibraphone.
- medium mallets are recommended for the marimba.

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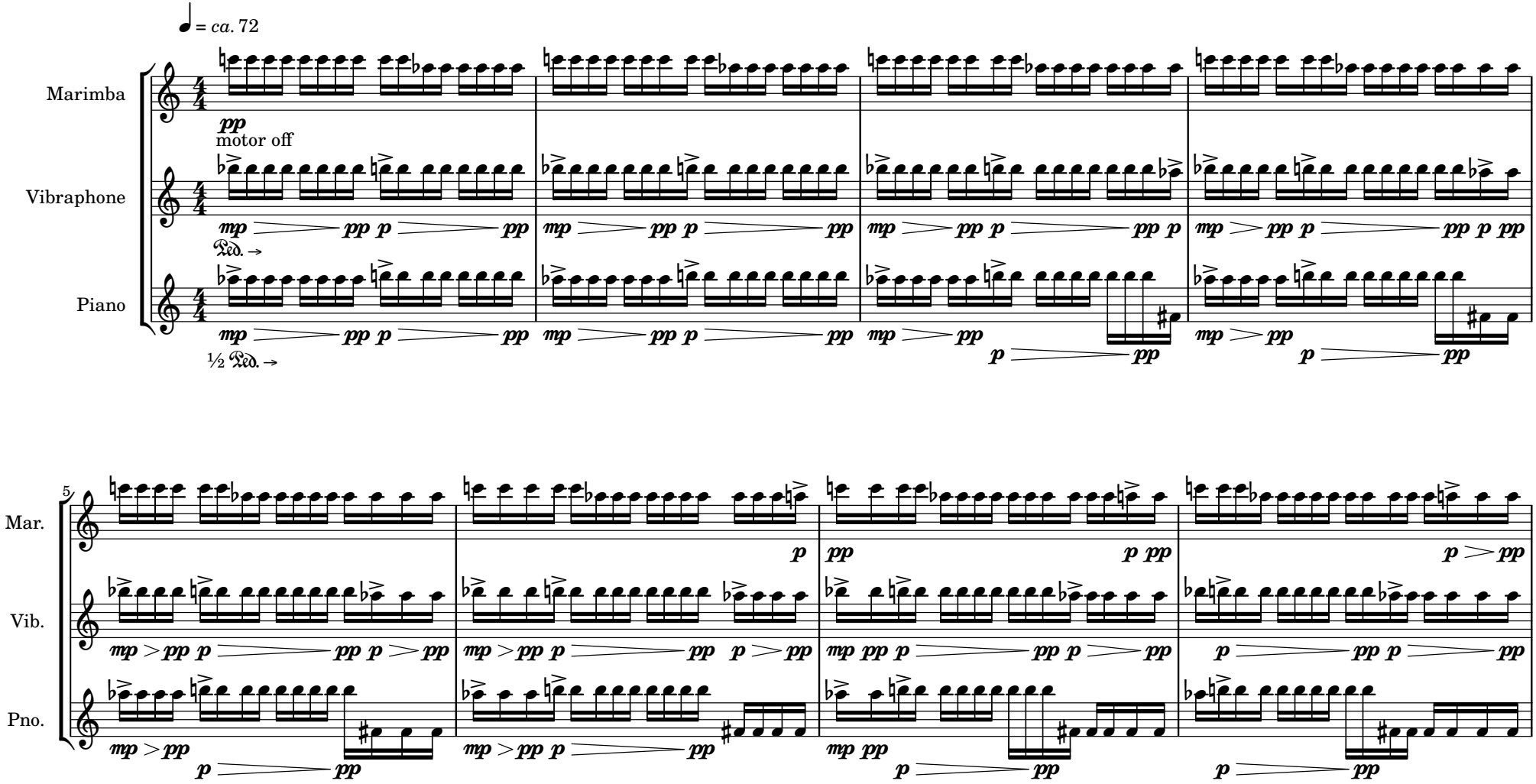
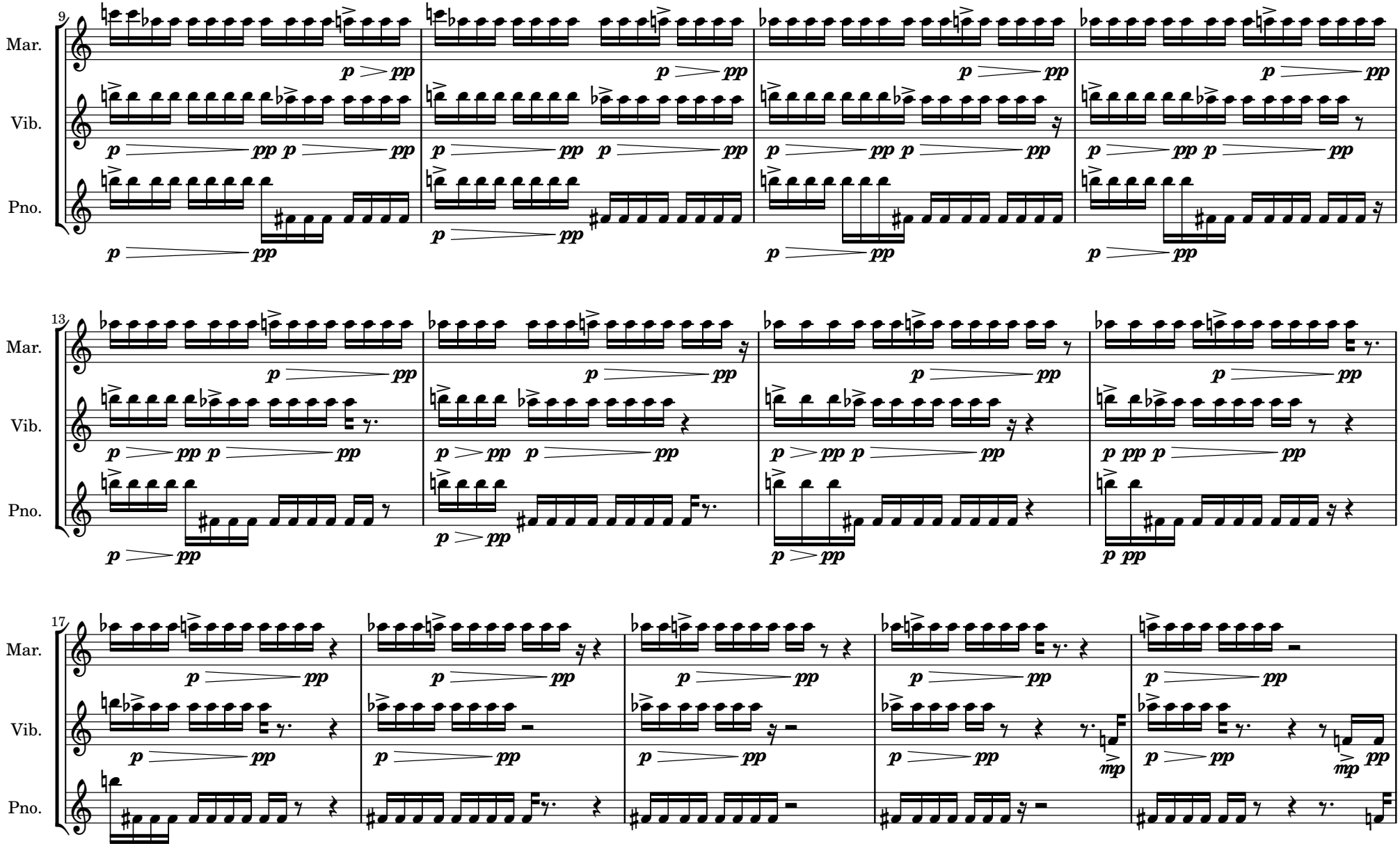
Cartography #10

Gilberto Agostinho

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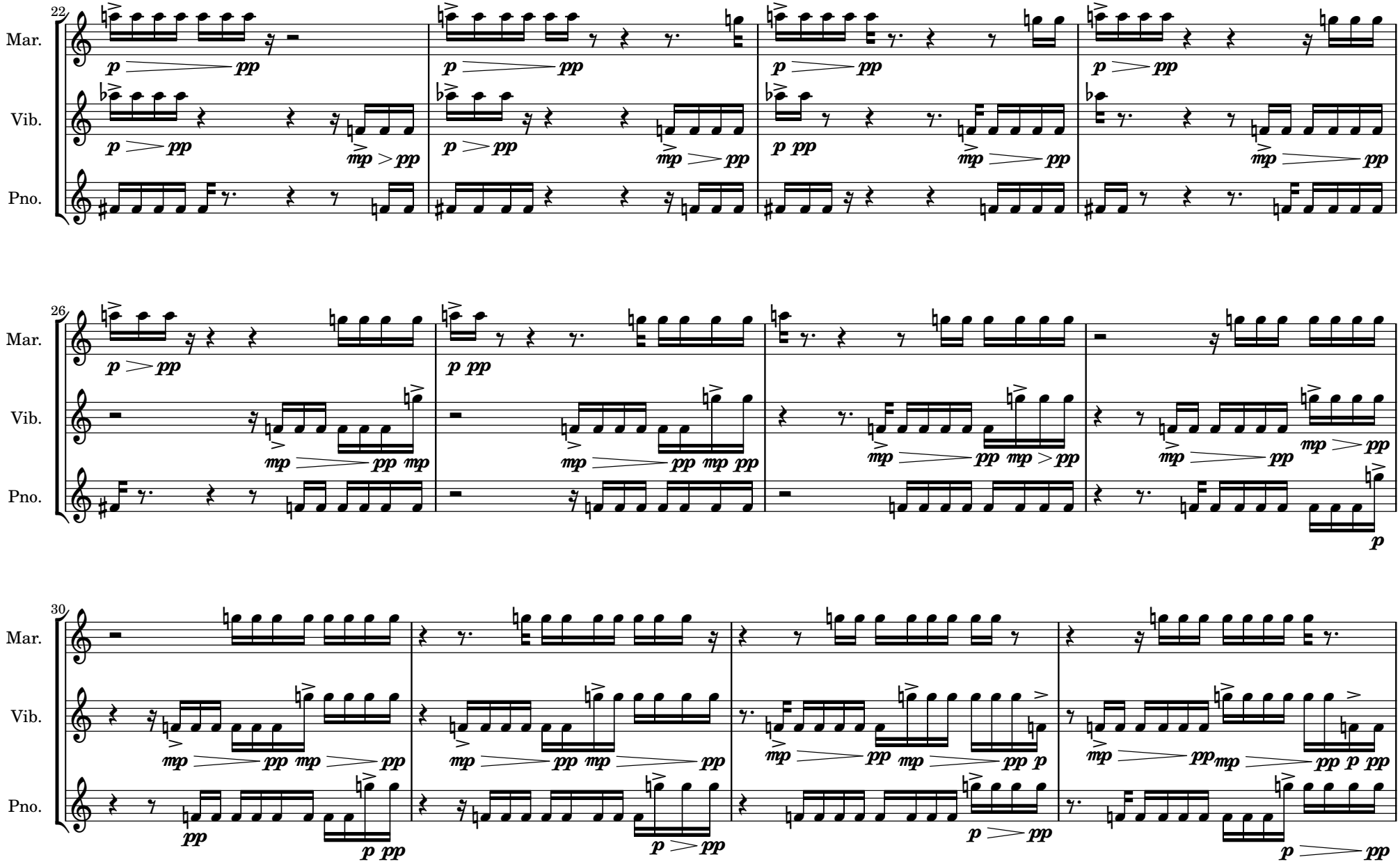
Mar.
Vib.
Pno.
13
Mar.
Vib.
Pno.
17
Mar.
Vib.
Pno.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Vib.
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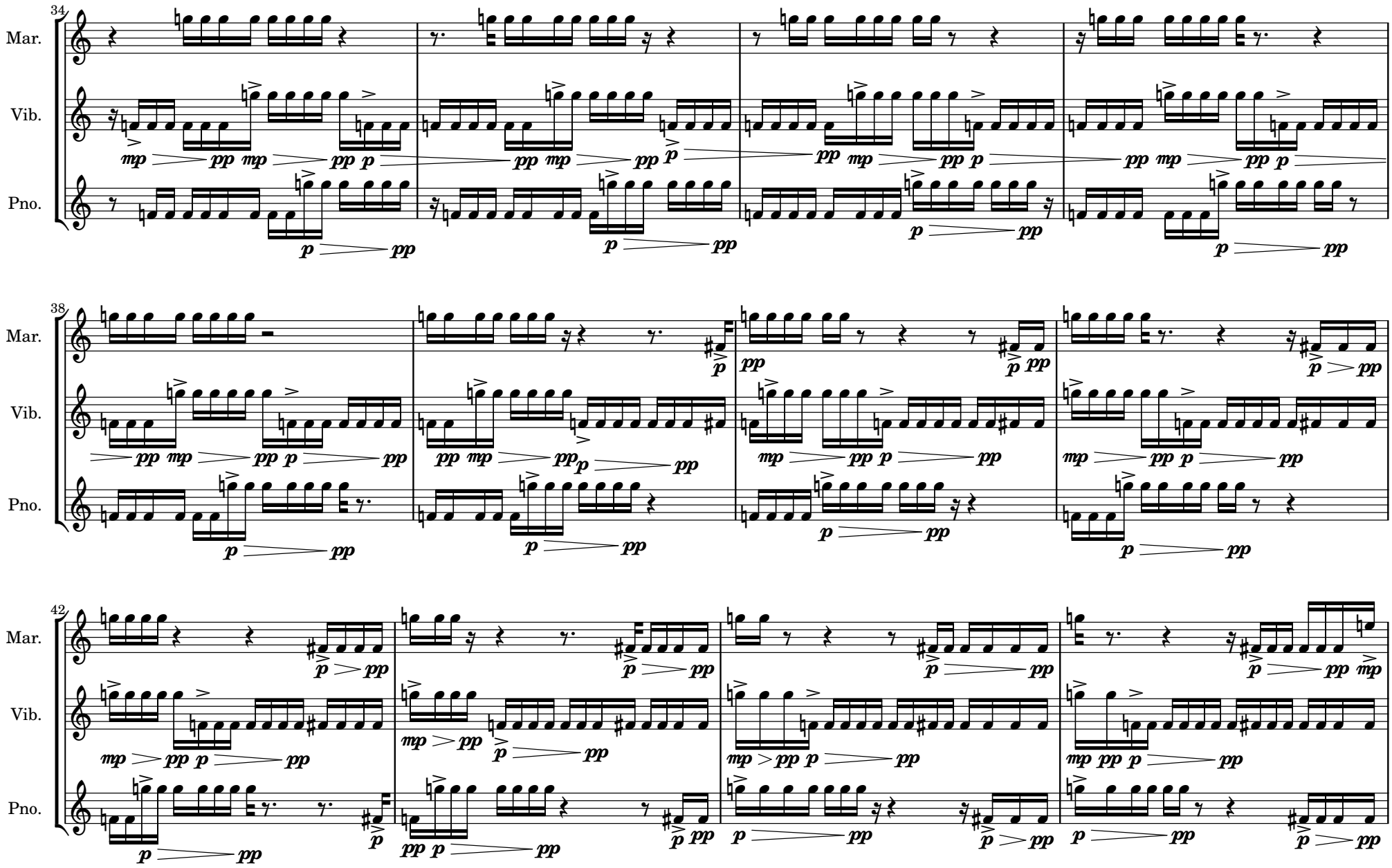
Mar.
Vib.
Pno.
30
Mar.
Vib.
Pno.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Vib.
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42
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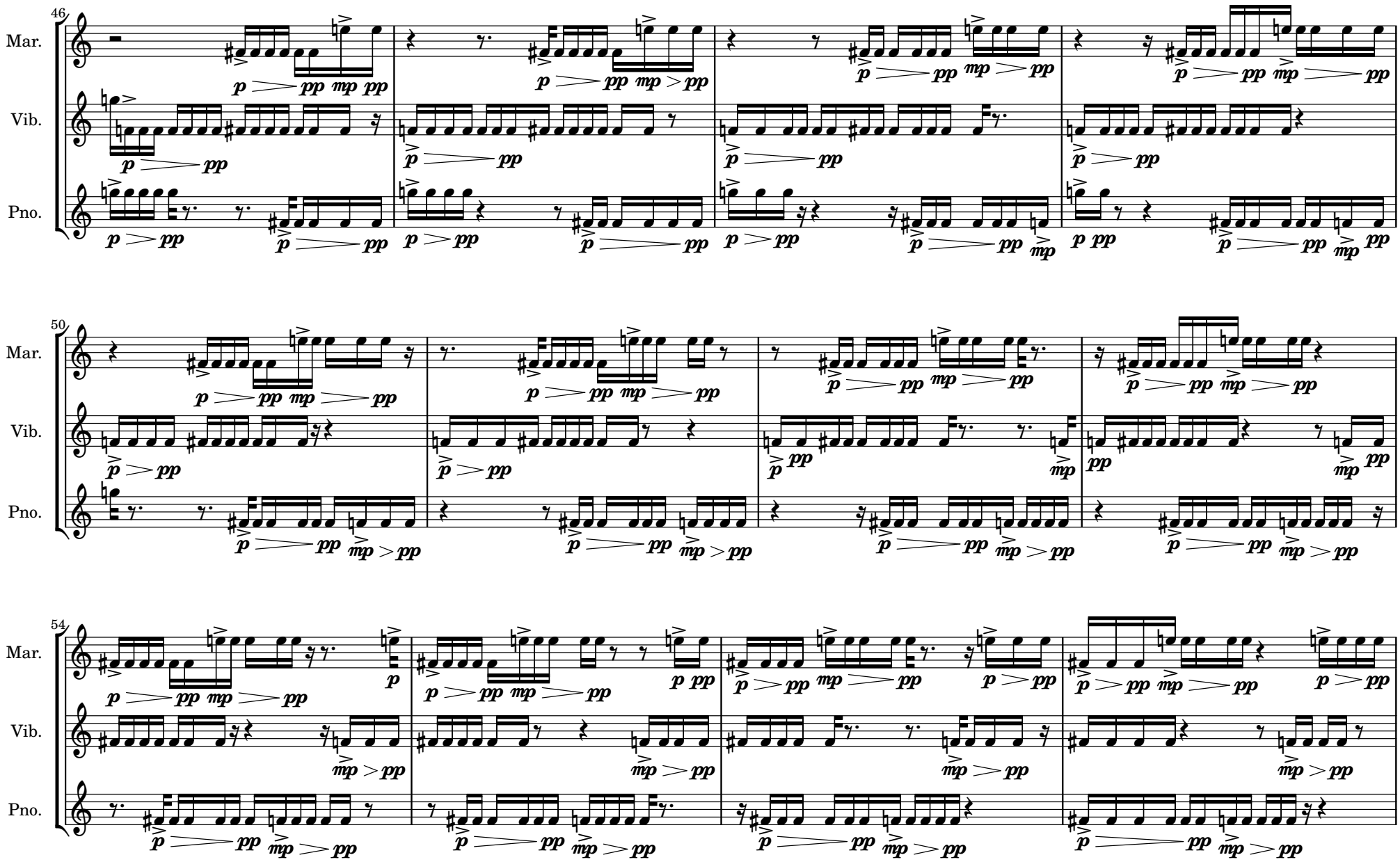
Pno.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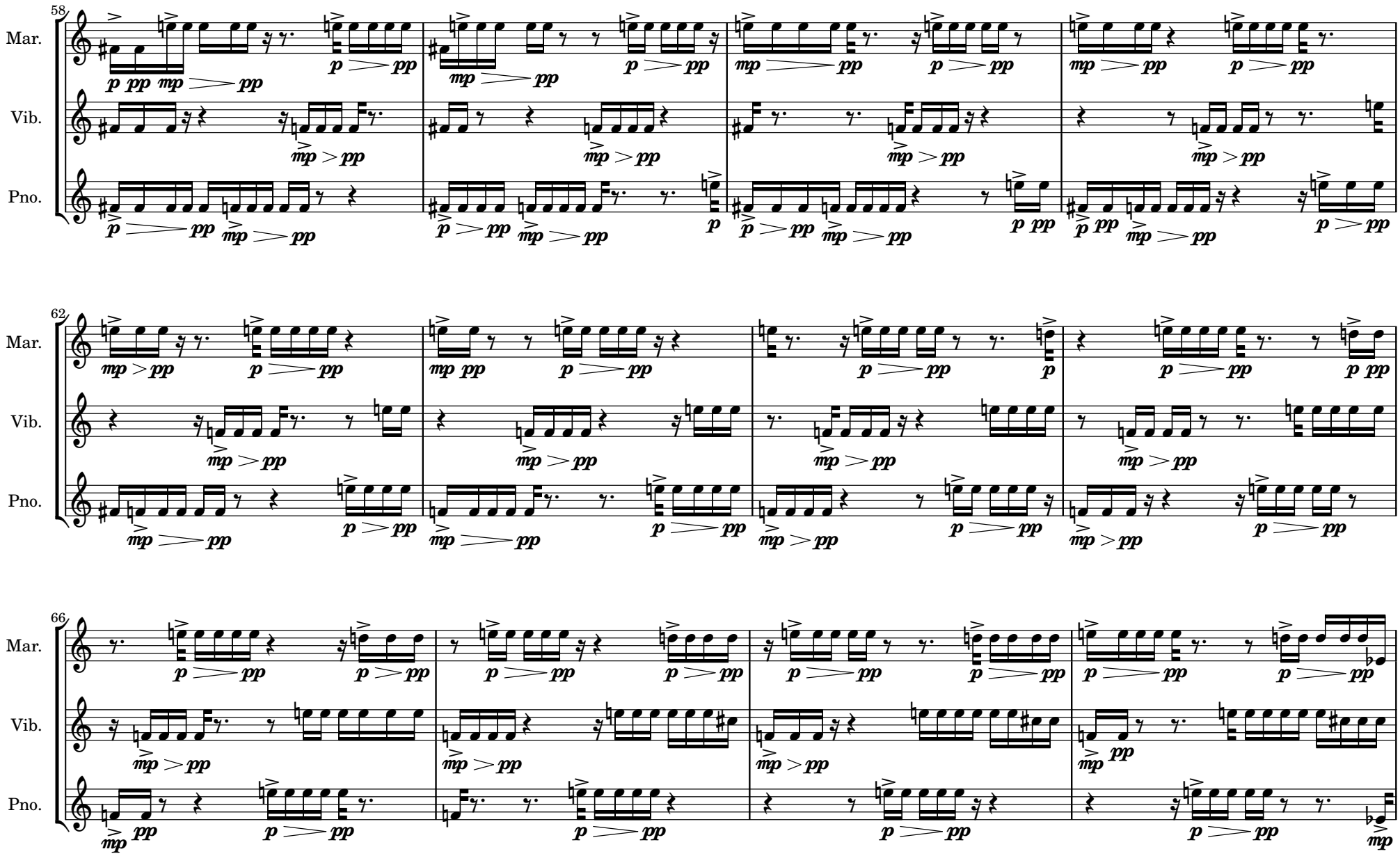
Pno.
54
Mar.
Vib.
Pno.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Pno.
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Pno.
66
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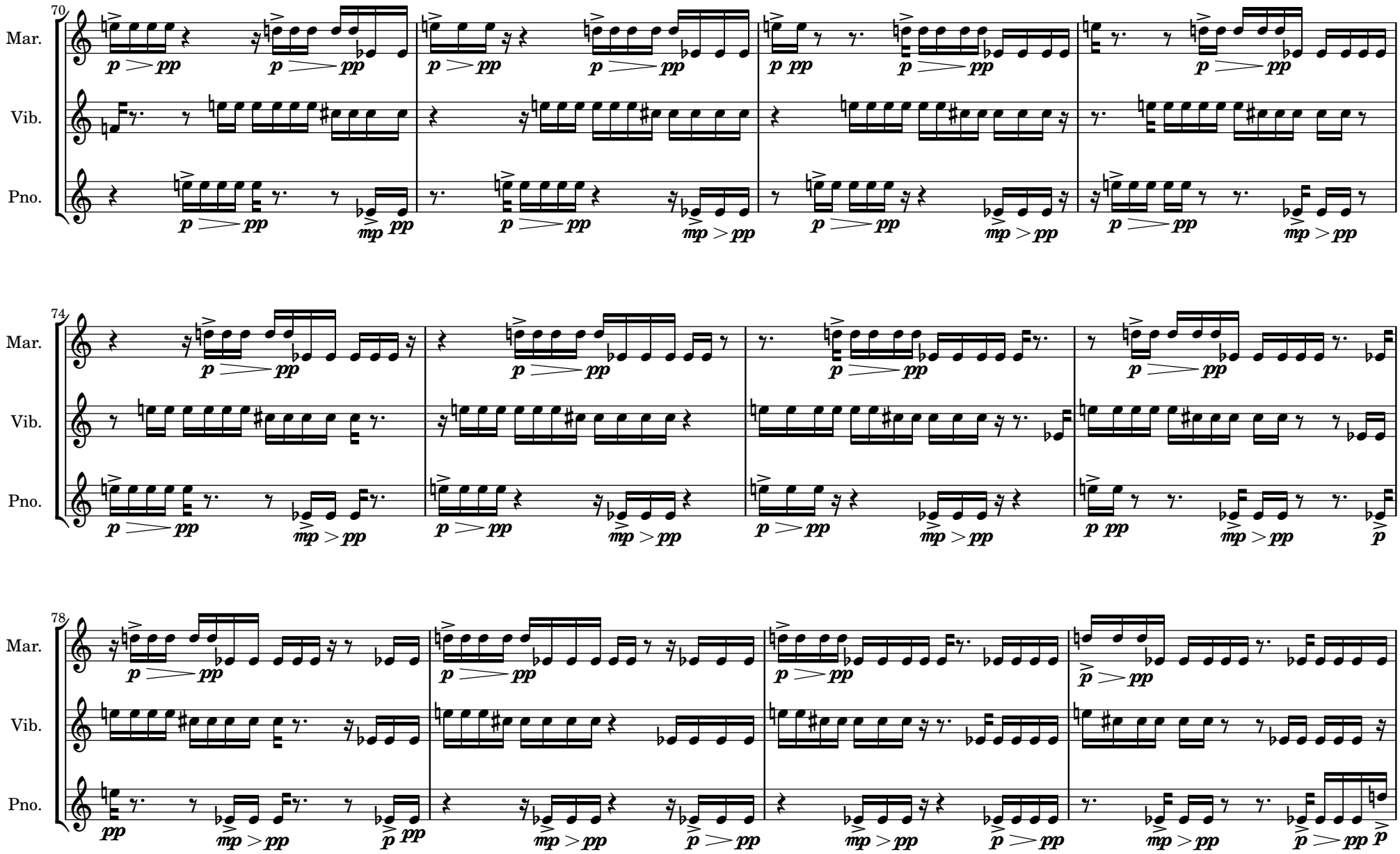
Pno.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78
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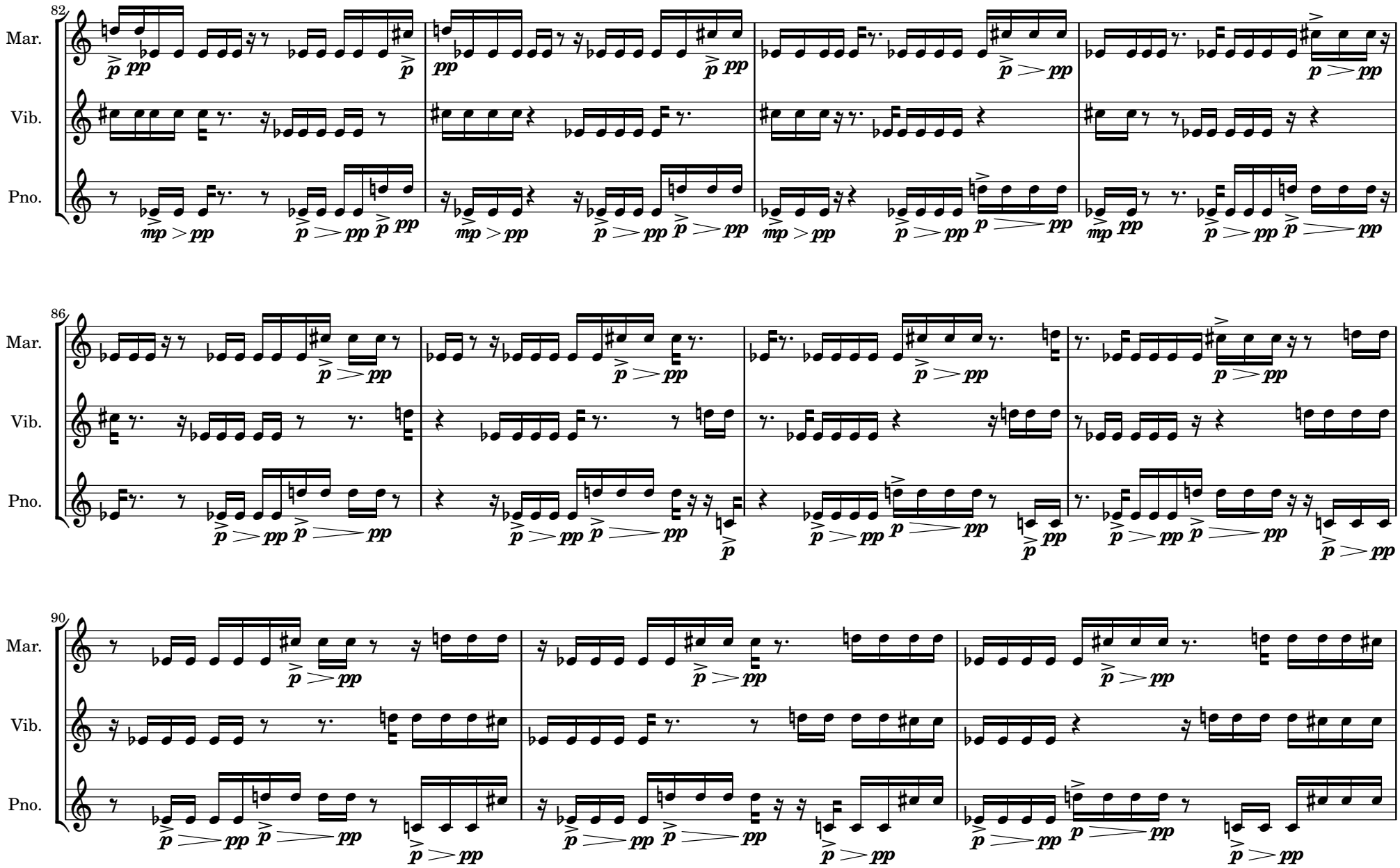
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90
Mar.
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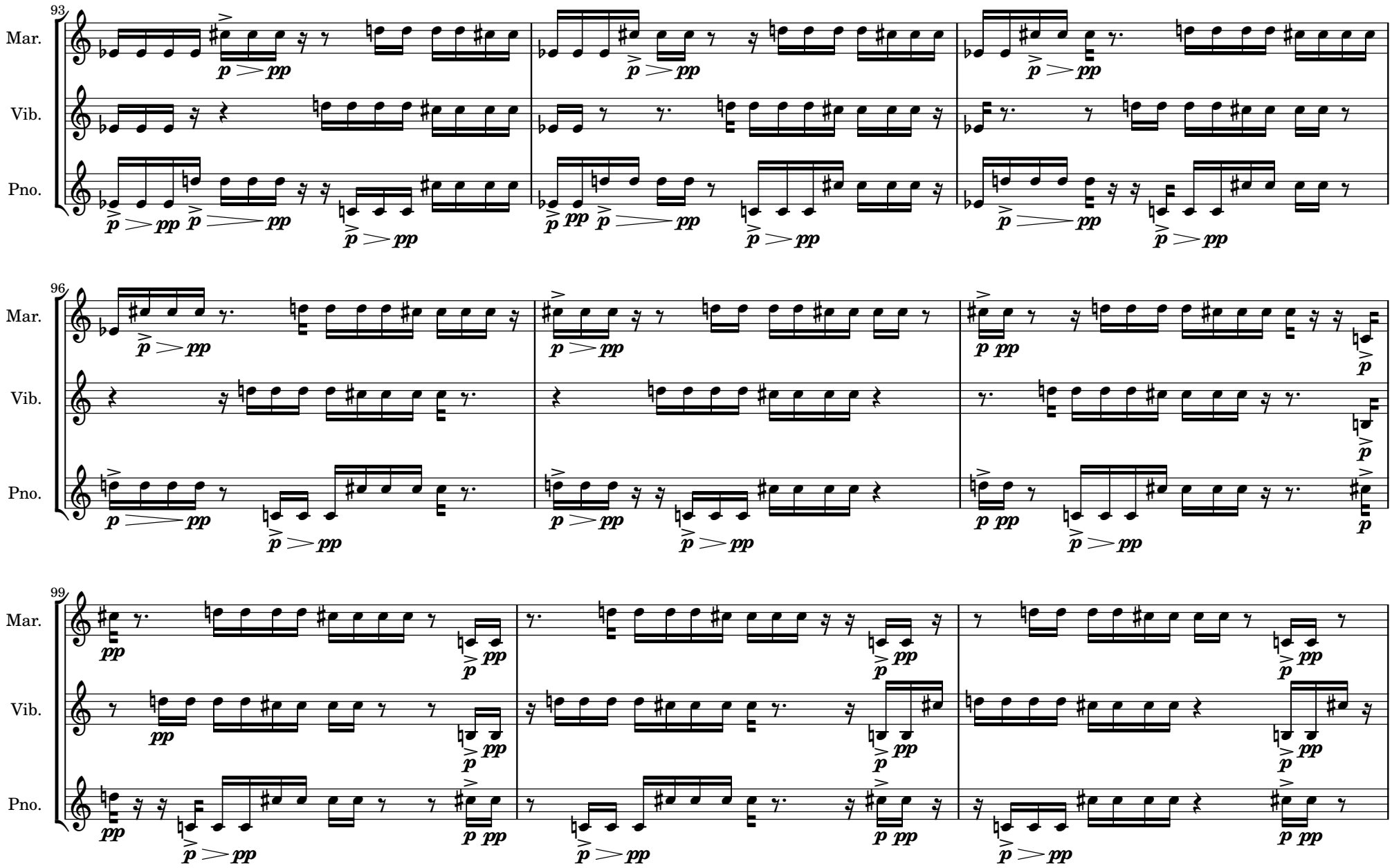
Pno.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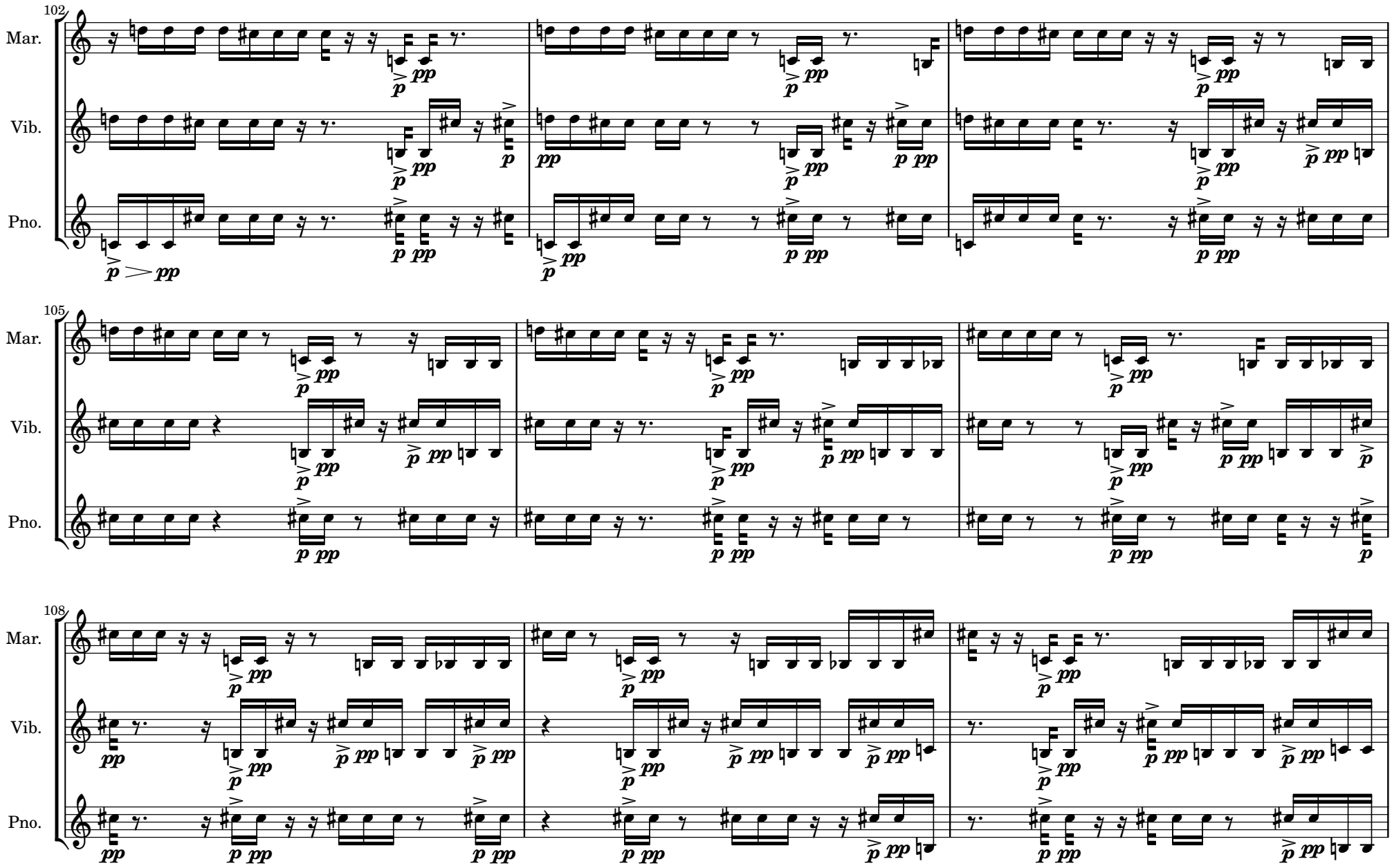
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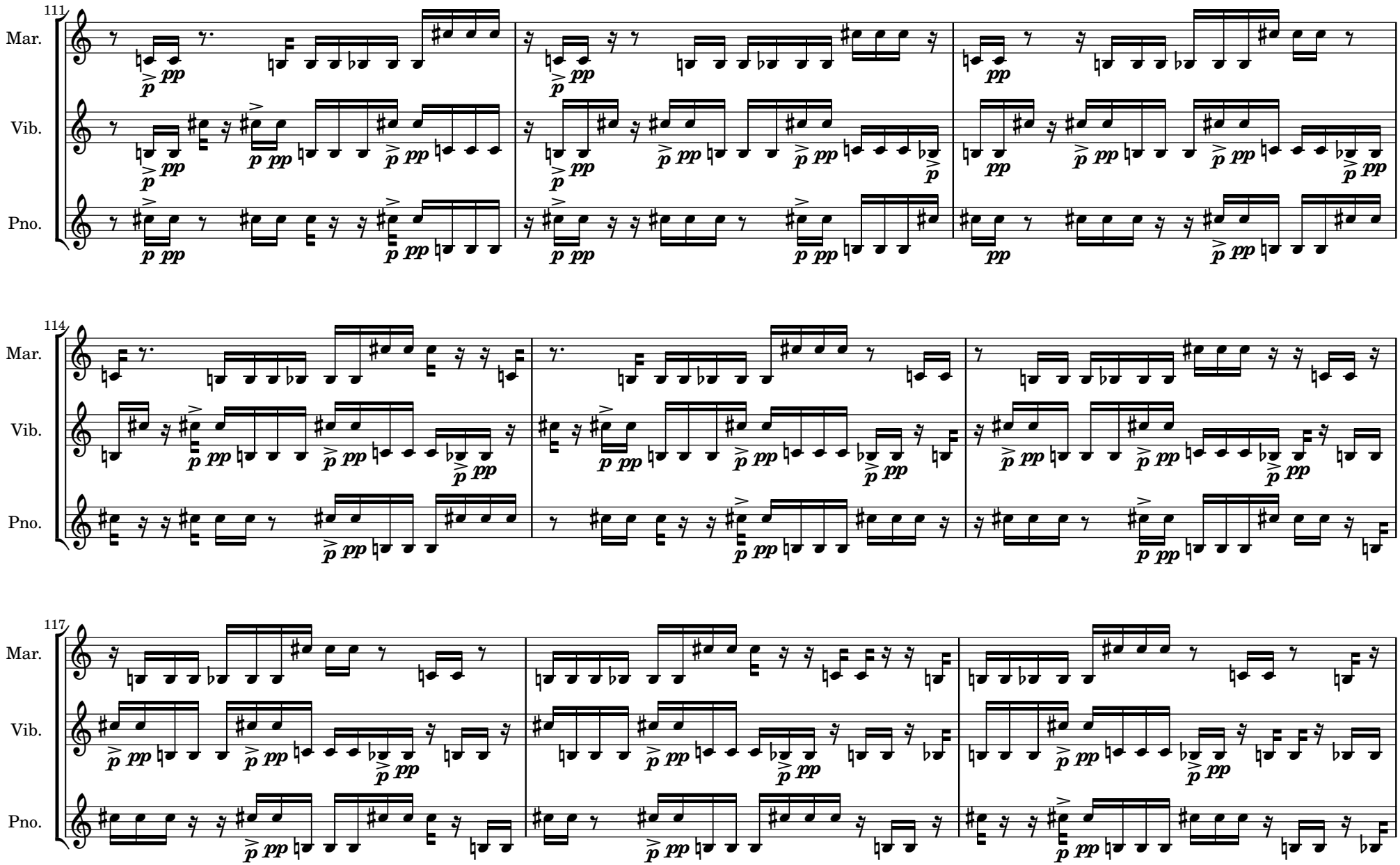
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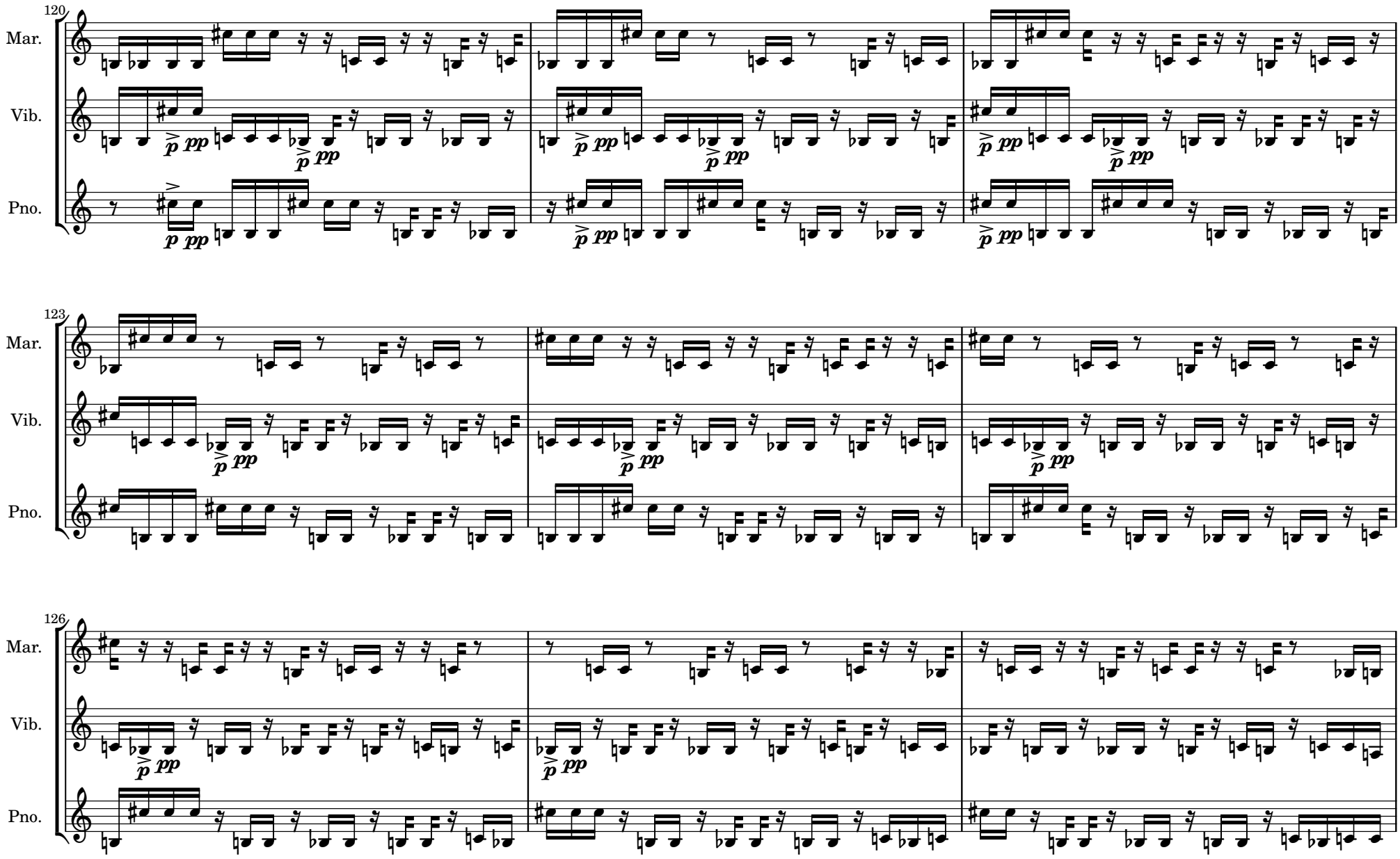
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Vib.
Pno.
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Mar.
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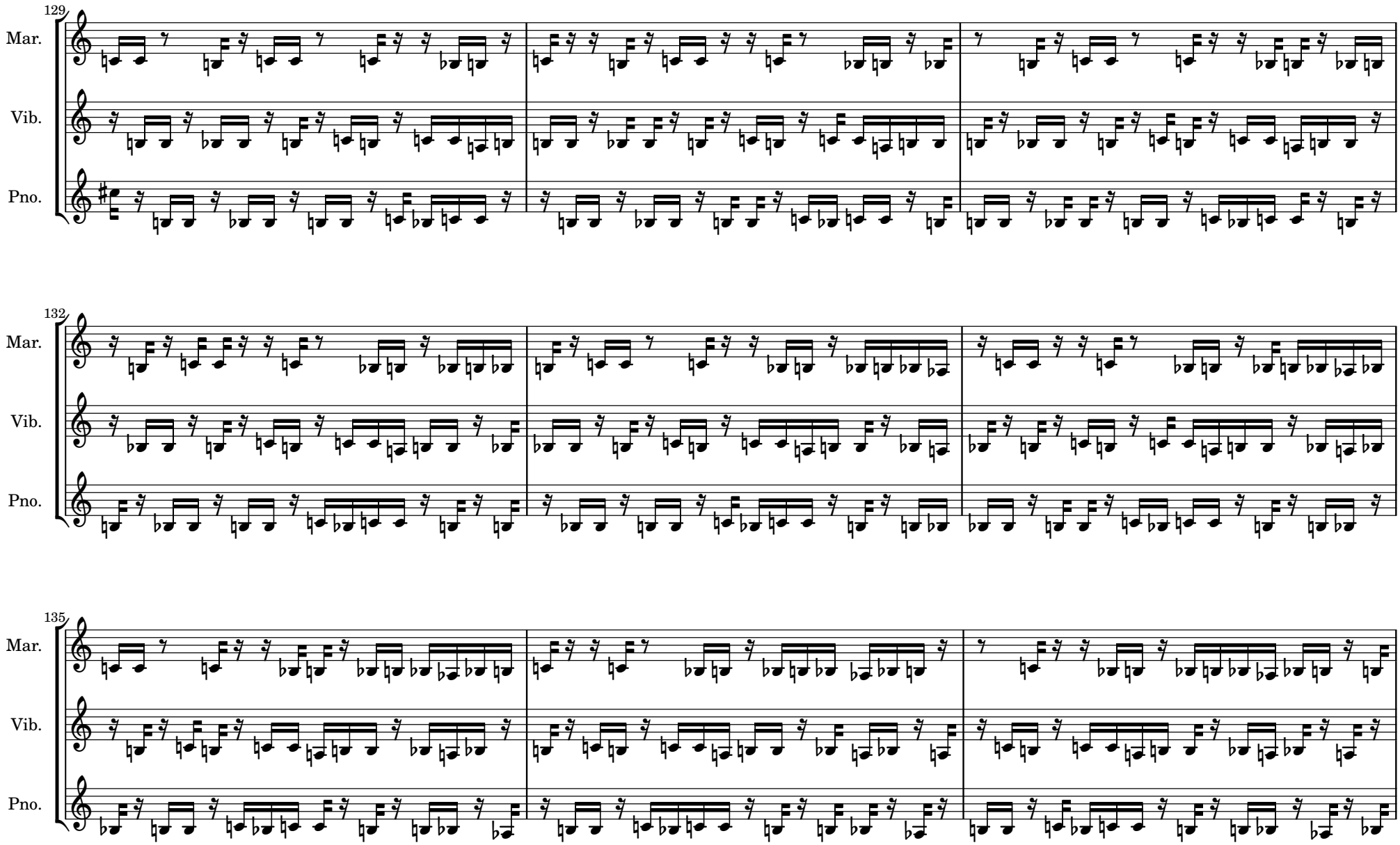
Pno.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Pno.
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Mar.
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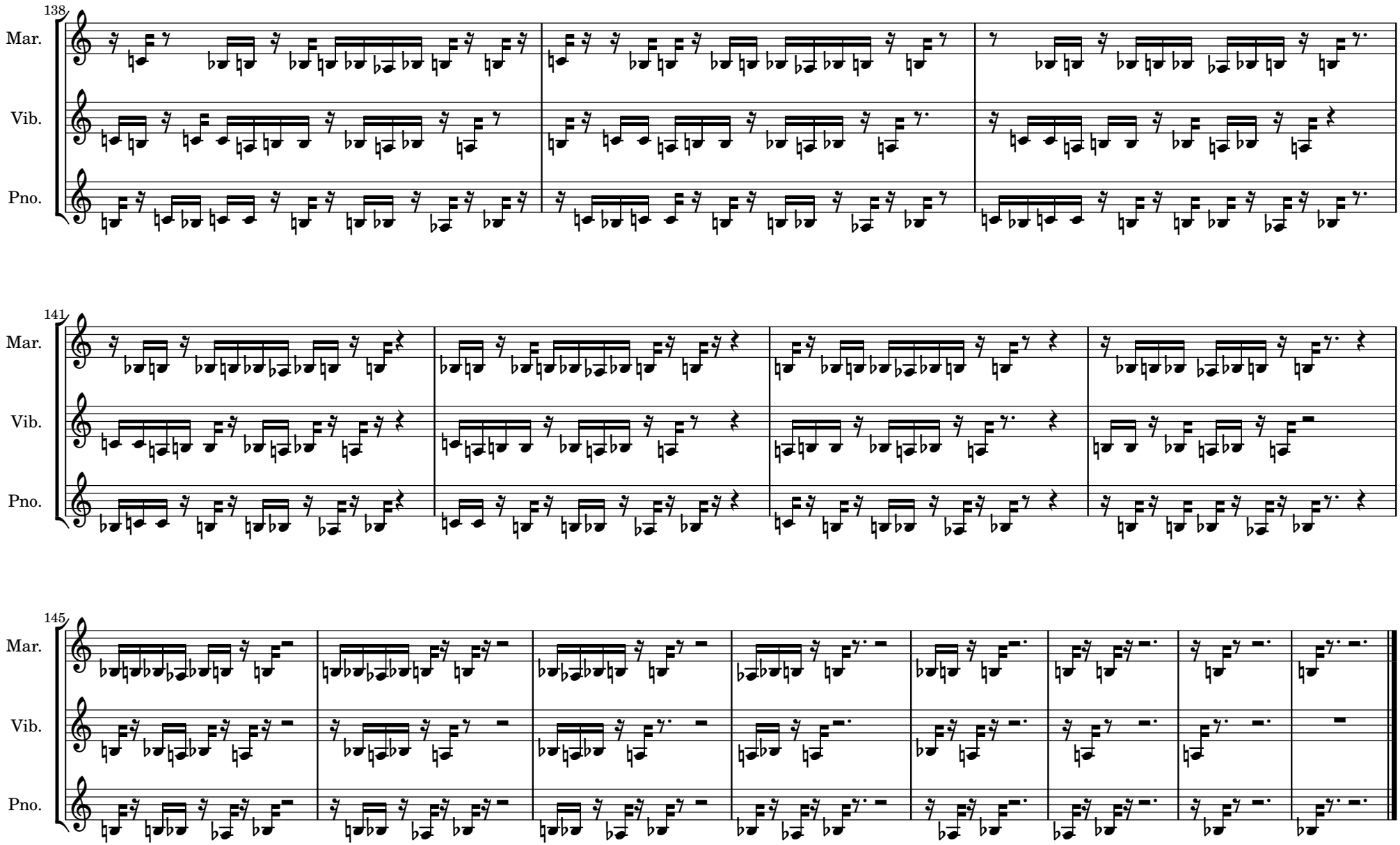
138
Mar.
Vib.
Pno.
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Mar.
Vib.
Pno.
145
Mar.
Vib.
Pno.

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Cartography #11, for solo piano

Mapping and rules

pitches

set size	$N = 6$
transformation period	$1 \times$ bar (pre-loop)
transformation mechanism	$[a, b, c, d, e, f] \rightarrow [b, c, d, e, f, g]$, with $g \bmod 12 = (f \bmod 12) + 1$, and g at a uniformly randomly selected octave transposition within the instrument range defined as a constraint.
initial set	[C4, C♯4, D4, E♭4, E4, F4]

durations

set size	$N = 5$
transformation period	$2 \times$ bars (pre-loop)
transformation mechanism	$[a, b, c, d, e] \rightarrow [b, c, d, e, f]$, with $f = e - 1$.
initial set	$[12, 11, 10, 9, 8]$

articulations

possibilities	{∅, >, ^}, where ∅ represents no articulation.
selection mechanism	the composition is made out of three voices, one for each type of articulation. These are then superimposed to create the final work.

looping mechanism

window size	$16 \times$ 𝅘𝅥𝅯 (post-loop)
shift size	semiquaver
mechanism	the algorithm first creates a non-looped version of the music using the maps and transformation mechanisms to select pitches, durations and dynamics as described above. After this music is generated, the next stage is to use a 16 semiquavers-long window which is shifted to the right by a single semiquaver after every cycle. The processes ends when the last note of the pre-looped music leaves the looping window.

constraints

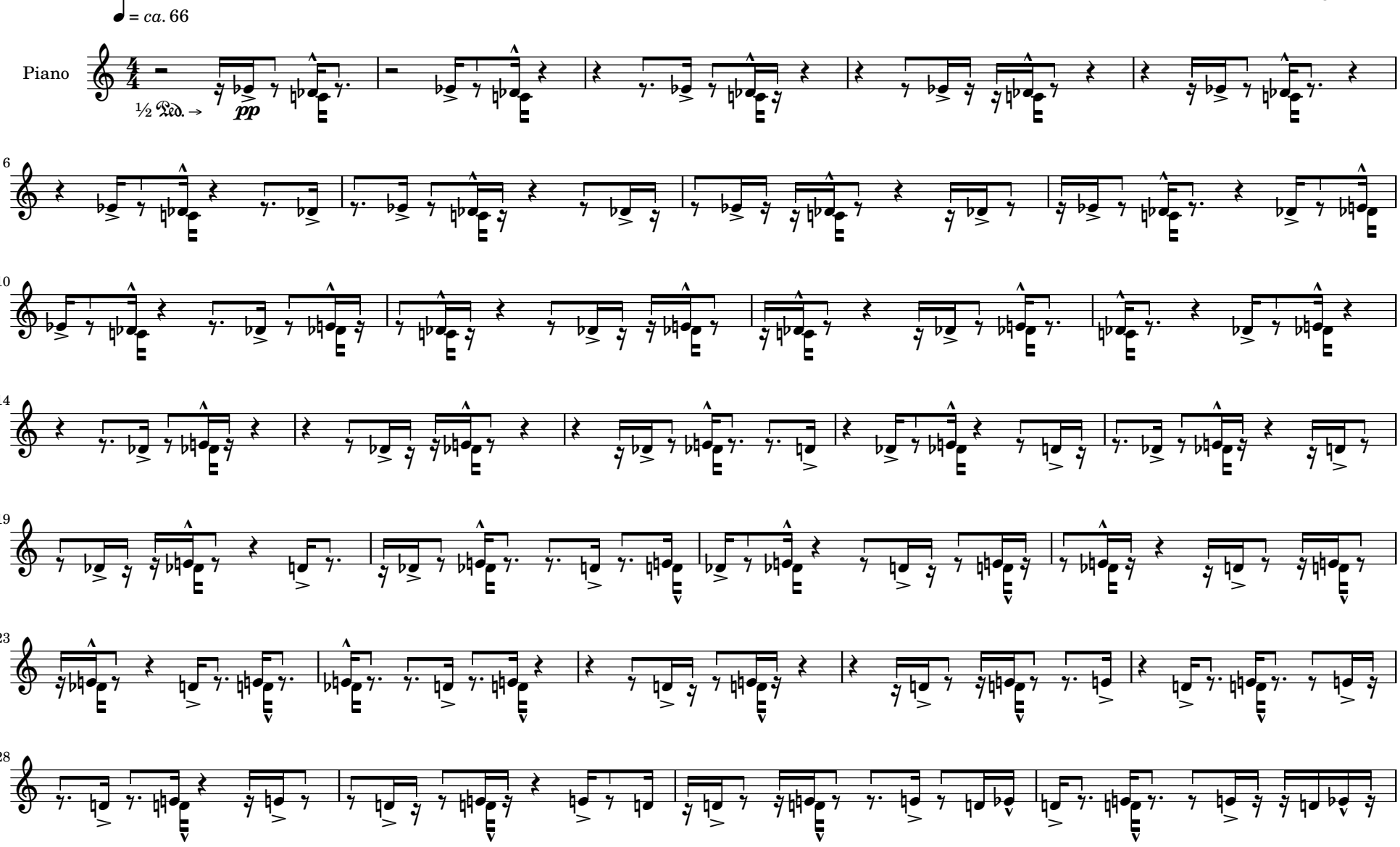
- number of bars (pre-loop): 8.
- range: C3–C7.
- dynamic: ***pp***

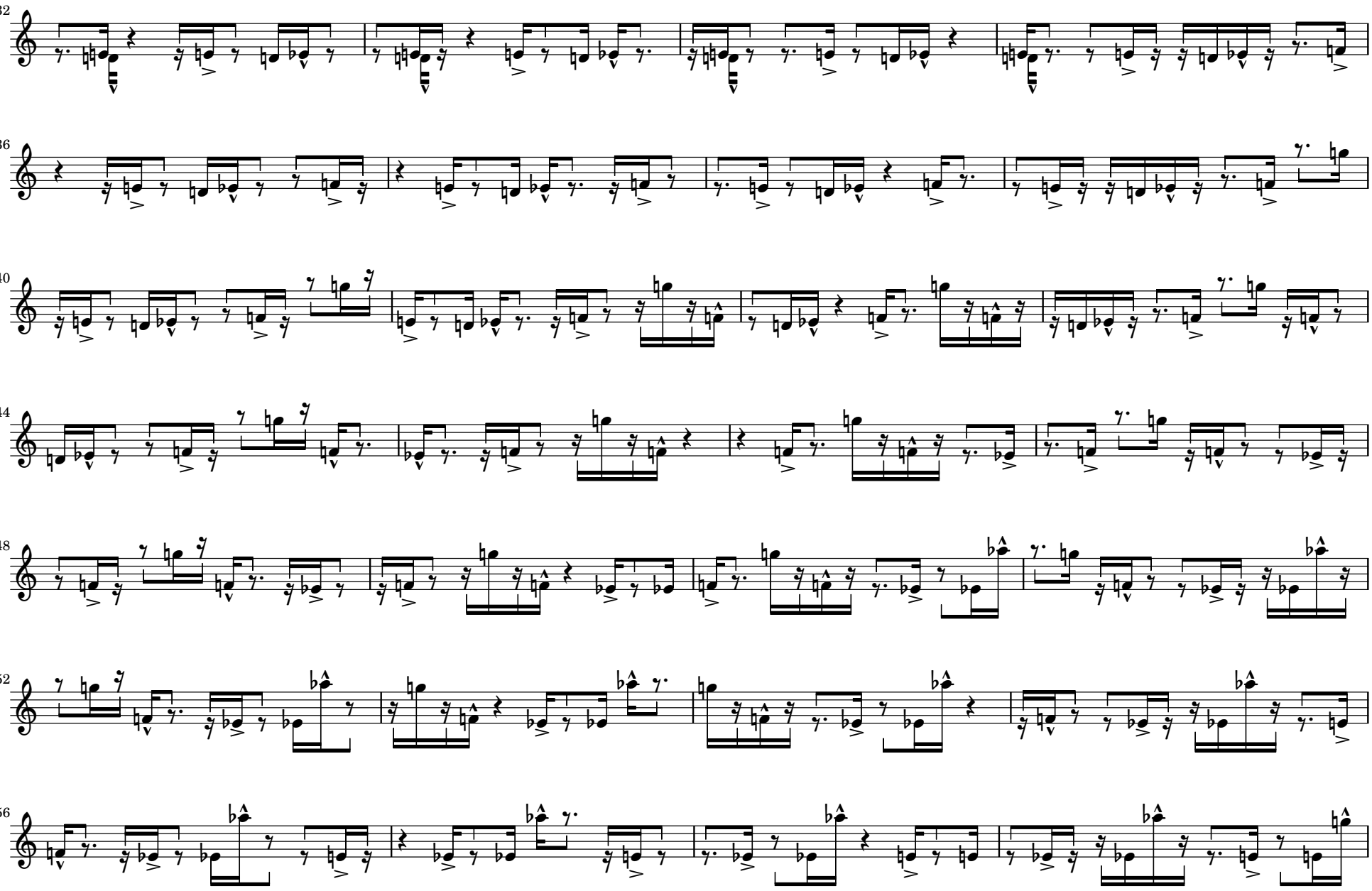
General performance notes

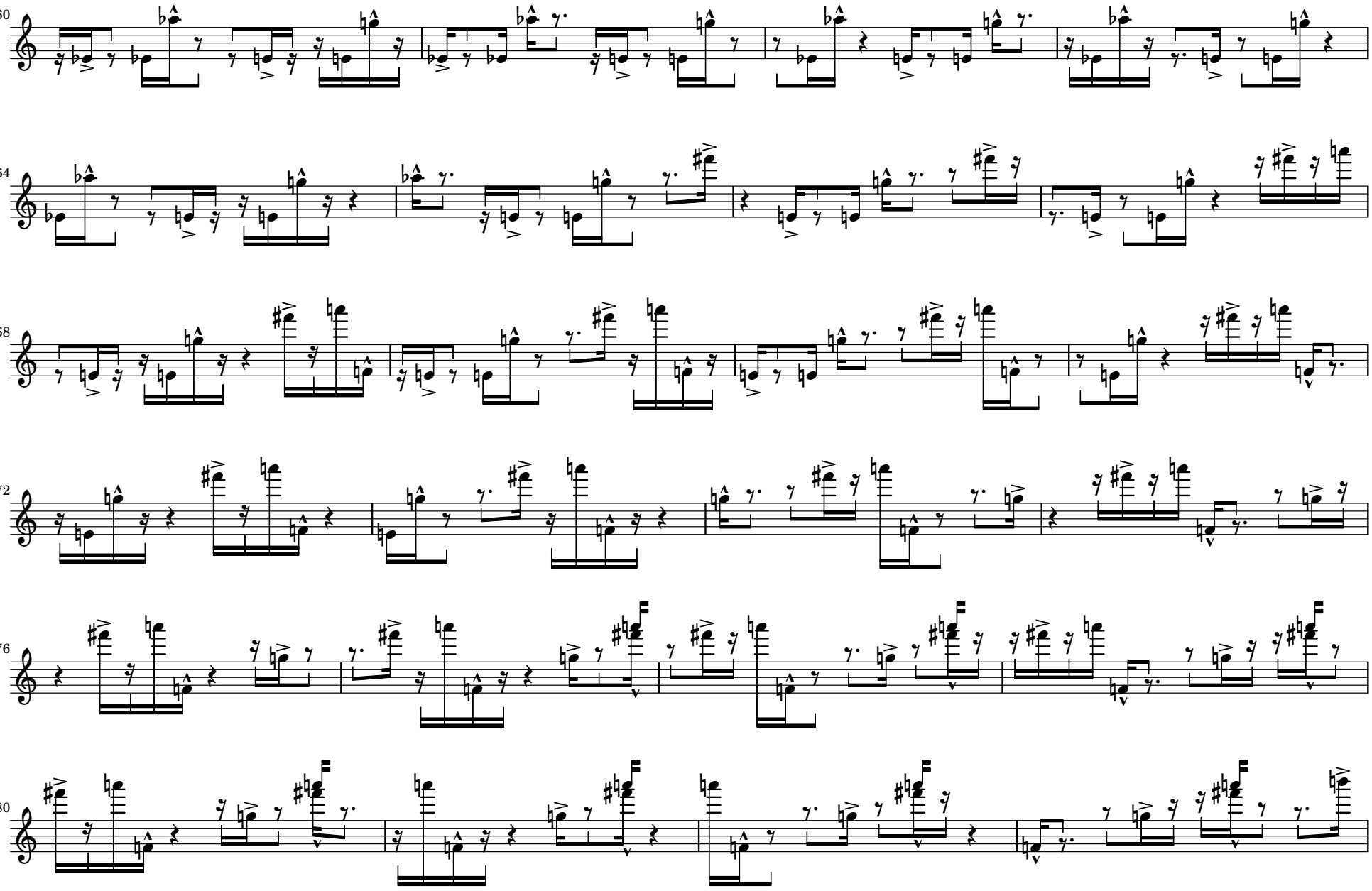
- the piano's sustain pedal should be held halfway down throughout the piece. A good reference point for this is when individual note lengths cannot be precisely perceived (that is, the sound is not cut when releasing a key). Some instruments and acoustic spaces might call for slightly different pedalling (at the discretion of the performer).
- after the last note of the piece, let the resonance disappear before raising the sustain pedal.
- this piece has a single dynamic mark of ***pp***. Variations in loudness are notated using solely marcato and martellato signs ($>$ and $\wedge$, respectively). Notes without articulations marks should be played as softly as possible (equivalent to ***pp***), notes with a marcato sign should have a slightly louder level of loudness (equivalent to ***mp***) and notes with a martellato sign should have a higher level of loudness (equivalent to ***f***).

Cartography #11

Gilberto Agostinho



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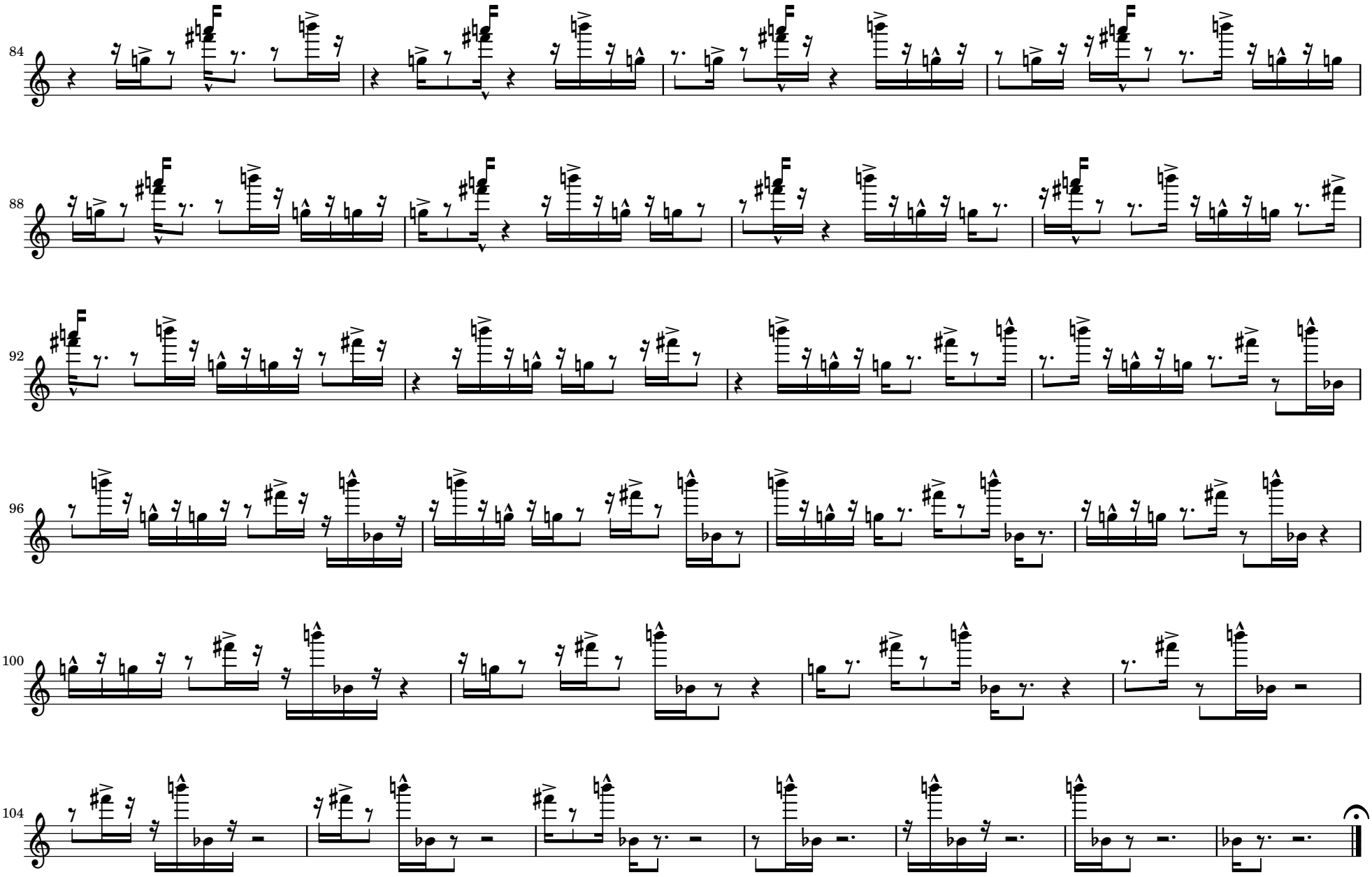
64
68
72
76
80


84
88
92
96
100
104

Cartography #12, for flute, clarinet, violin, viola, and violoncello

Mapping and rules

pitches

set size	$N = 6$
transformation period	$1 \times$ bar (pre-loop)
transformation mechanism	$[a, b, c, d, e, f] \rightarrow [b, c, d, e, f, g]$, with $g \bmod 12 = (f \bmod 12) - 1$, and g at a uniformly randomly selected octave transposition.
initial set	[F4, E♭4, D4, C♯4, C4]

durations

set size	$N = 5$
transformation period	$4 \times$ bars (pre-loop)
transformation mechanism	$[a, b, c, d, e] \rightarrow [b, c, d, e, f]$, with $f = e - 1$.
initial set	$[12, 11, 10, 9, 8]$

appoggiaturas

set size	$N = 6$
transformation period	$4 \times$ bars (pre-loop)
transformation mechanism	$[a, b, c, d, e, f] \rightarrow [b, c, d, e, f, g]$, with $g =$ 'no'.
initial set	[yes, no, yes, no, yes, yes]
notation	appoggiaturas are always a semitone higher than the note they apply to and last for a semiquaver. They are always slurred.

looping mechanism

window size	$16 \times$ 𝅘𝅥𝅯 (post-loop)
shift container	[print position, ignore position]
mechanism	the algorithm first creates a non-looped version of the music using the maps and transformation mechanisms previously described. Next, it applies a 16 semiquavers-long window which is shifted to the right by a semiquaver. The algorithm then decides whether to print or ignore the current window using the container above, and then continues shifting by a semiquaver. Effectively, this creates window shifts of arbitrary sizes. The process ends at the first bar in which all instruments have a rest at the 16th position of a window.

constraints

- number of bars (pre-loop): 20.
- ranges: flute C4–F♯6, clarinet D3–F♯6, violin G3–F♯6, viola C3–C6, violoncello C4–F5.
- dynamics: constantly ***pp***.
- harmonic range: violin B♭5 and above, viola F5 and above, violoncello full range.
- the flute, clarinet, and cello alternate between rests and pitched notes for every selected duration.

General performance notes

- the dynamic level should remain at ***pp*** throughout the entire piece.
- all performers should play without vibrato.

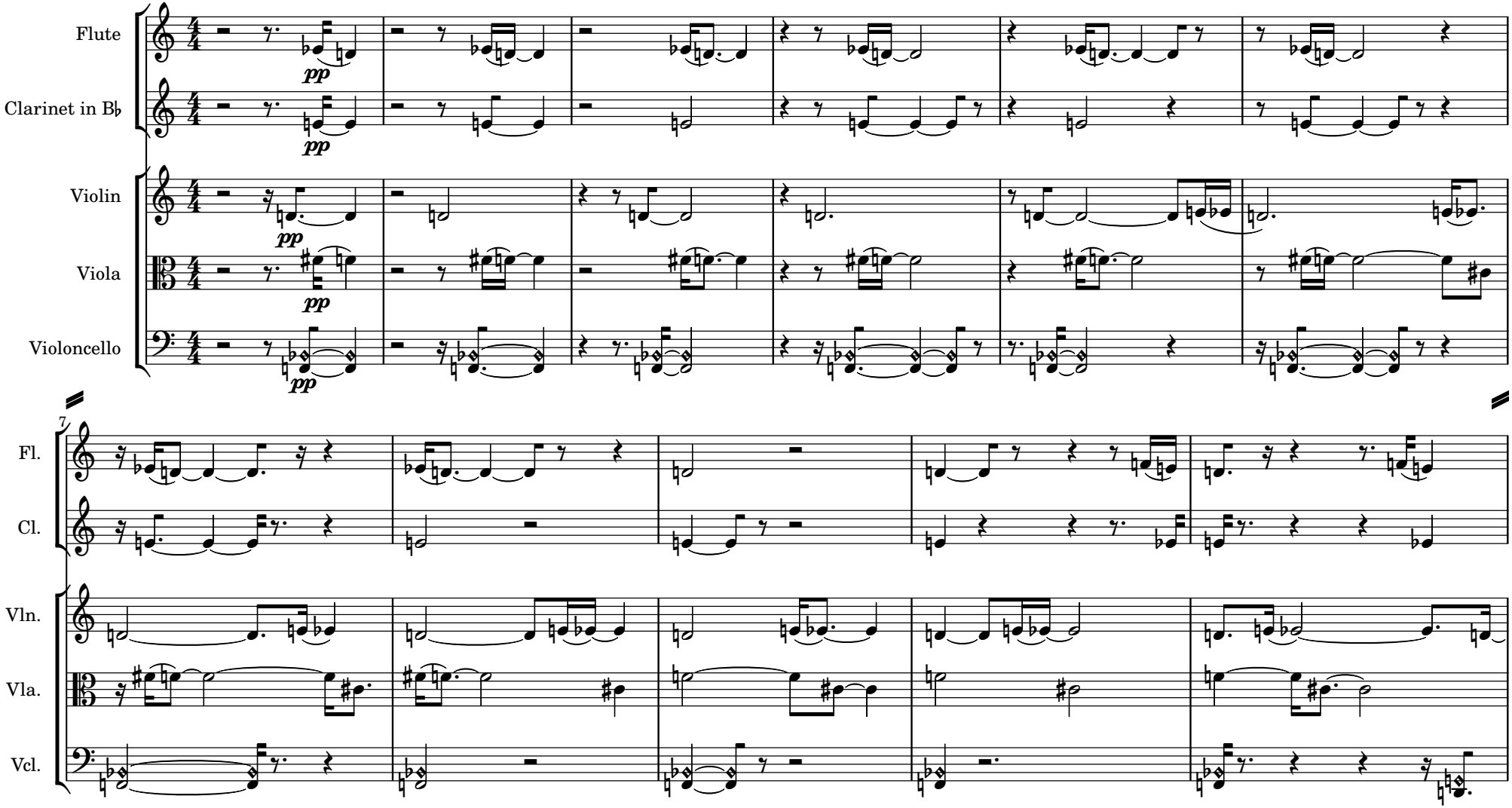
to Ensemble Terrible

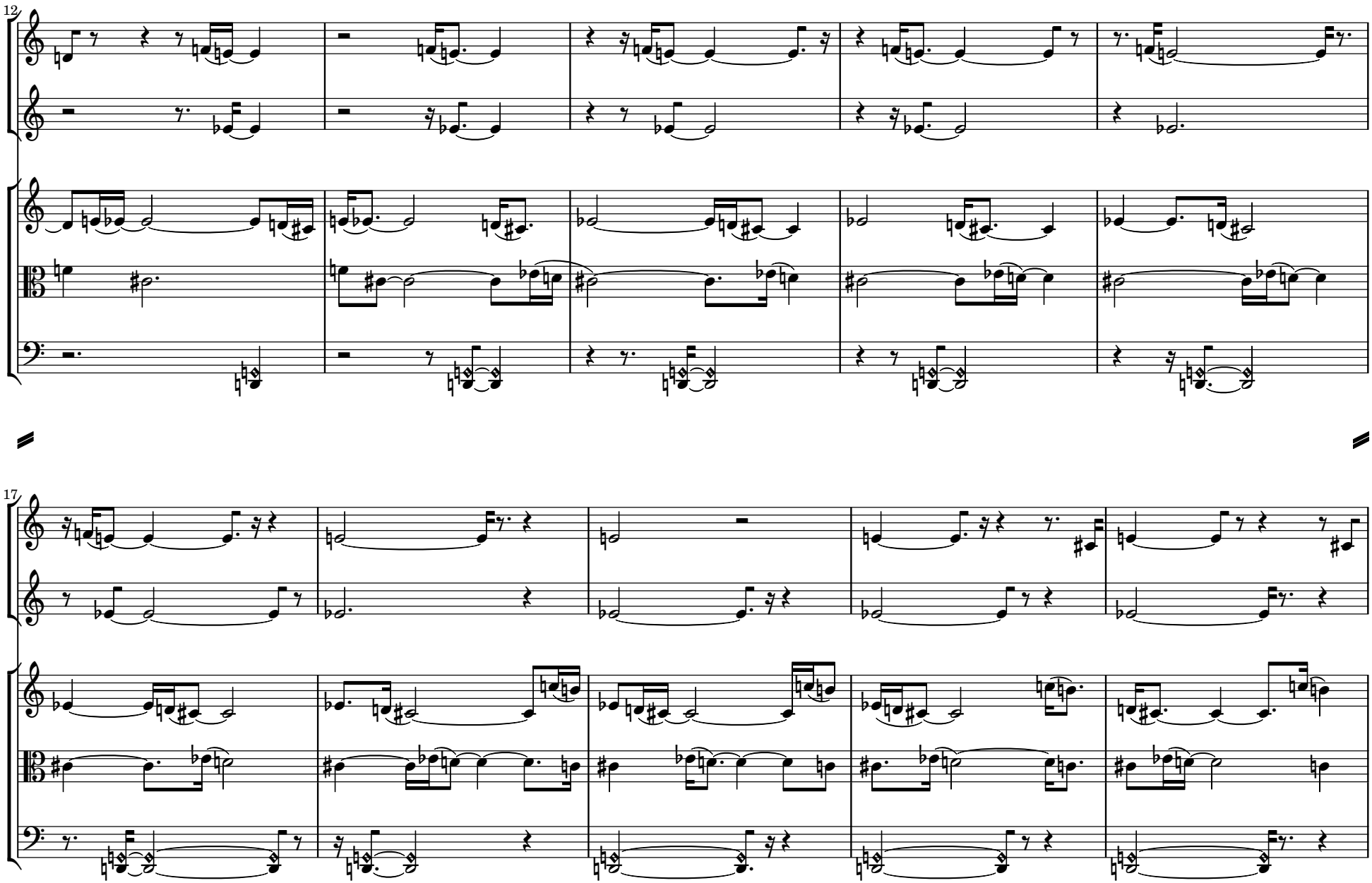
Cartography #12

Score in C

Gilberto Agostinho

♩ = *ca.* 72

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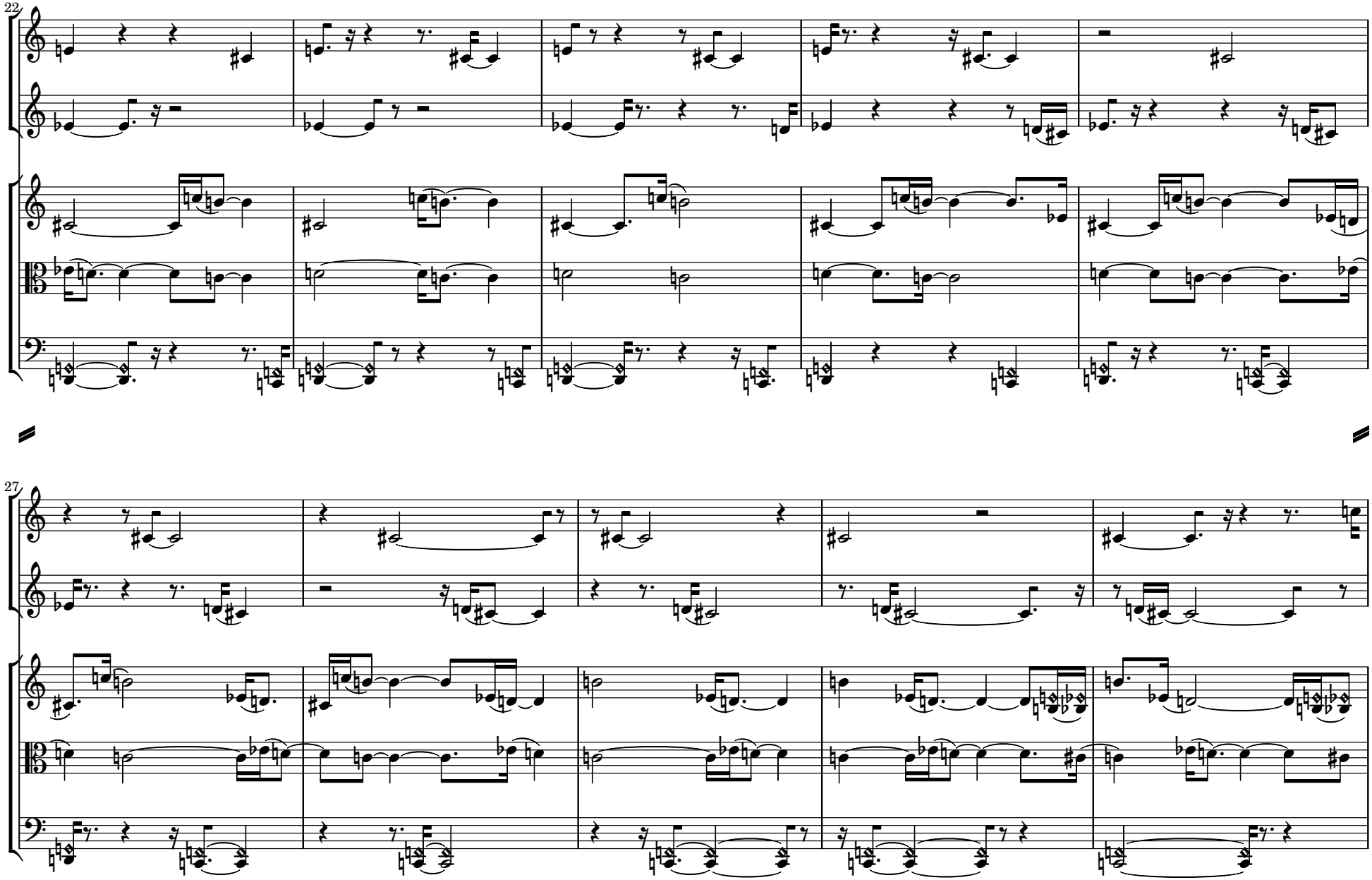
Fl.
Cl.
Vln.
Vla.
Vcl.
17
Fl.
Cl.
Vln.
Vla.
Vcl.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Fl.
Cl.
Vln.
Vla.
Vcl.
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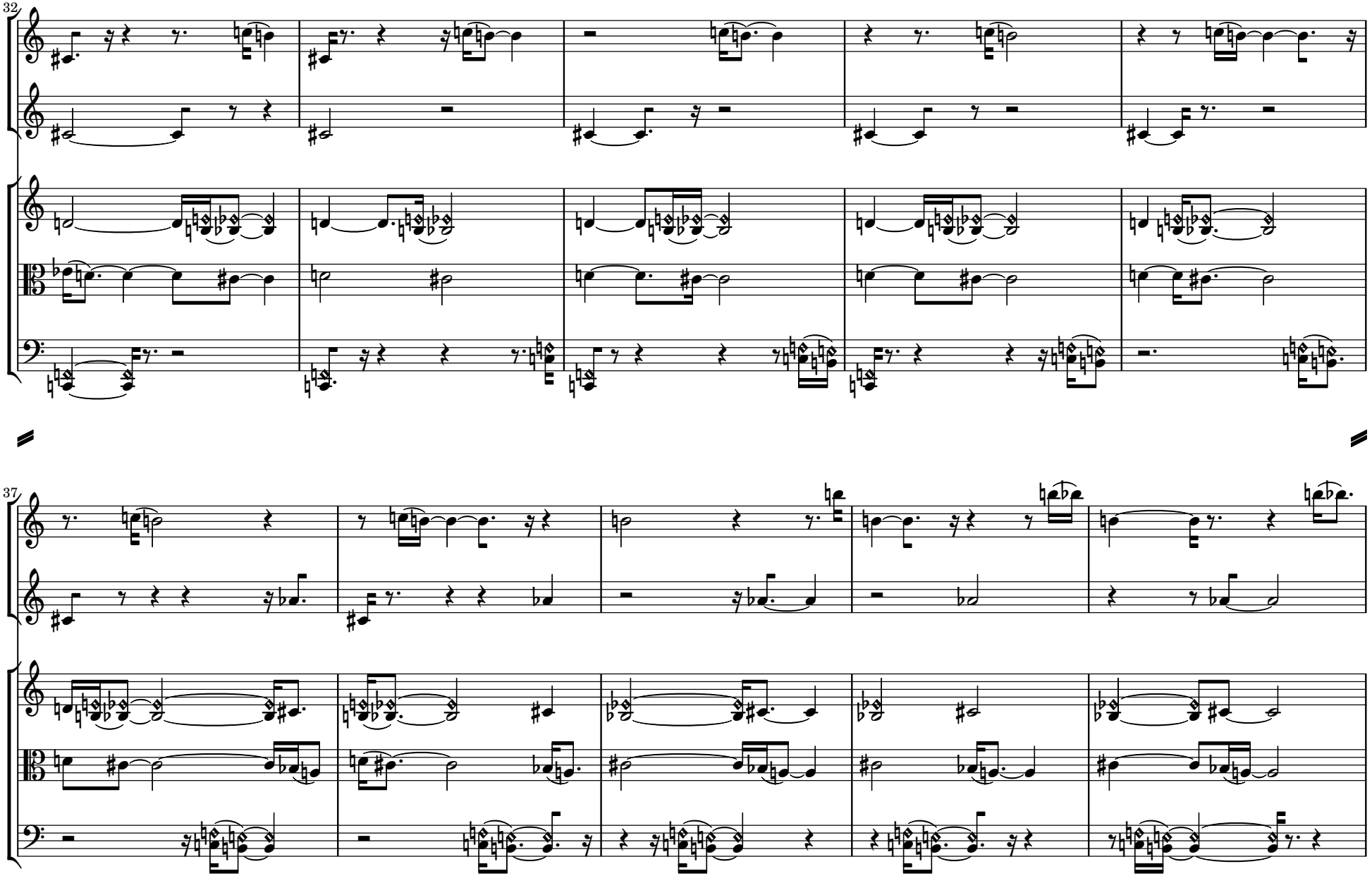
Fl.
Cl.
Vln.
Vla.
Vcl.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Vcl.
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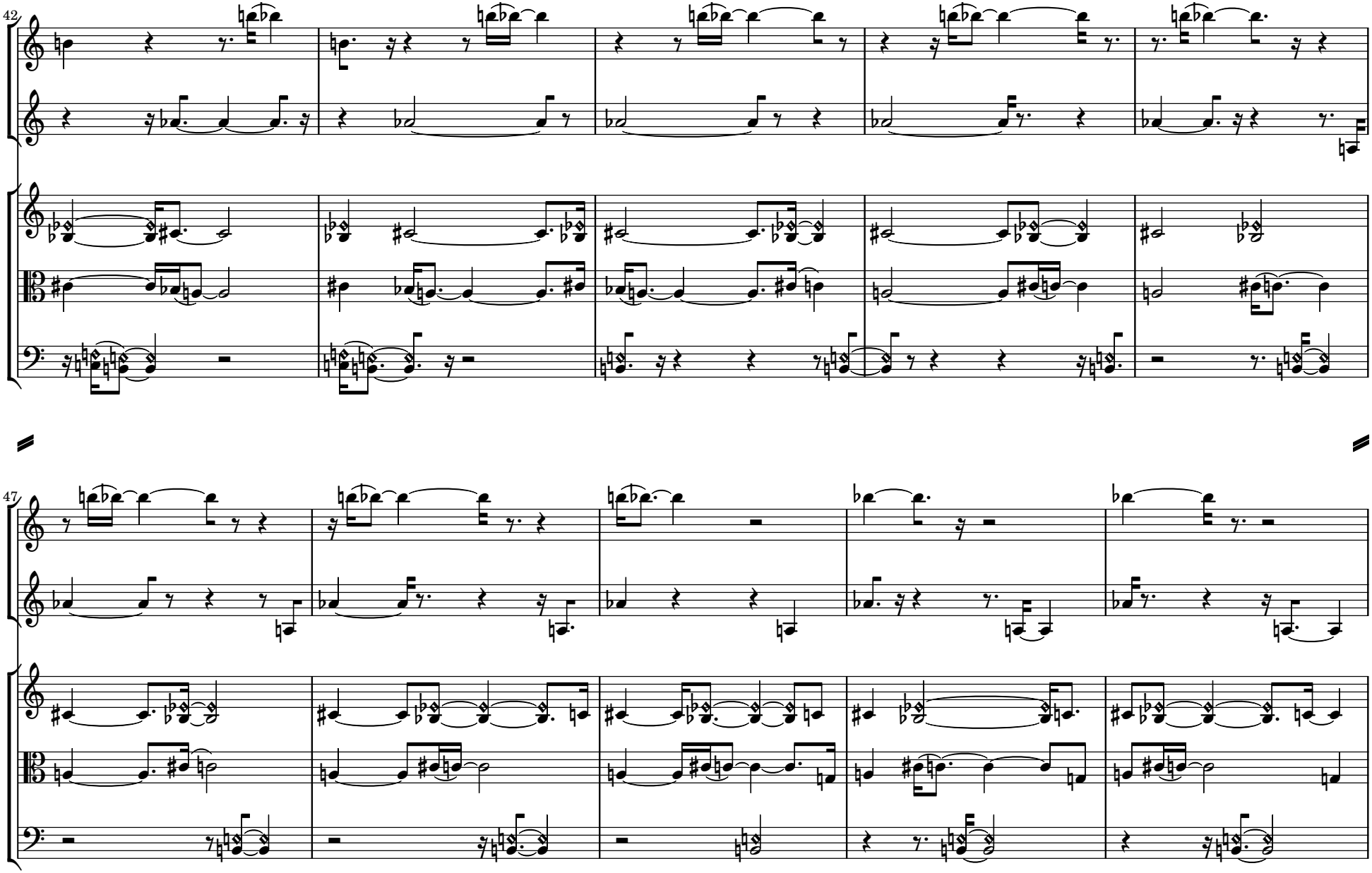
Cl.
Vln.
Vla.
Vcl.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Fl.
Cl.
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Vcl.
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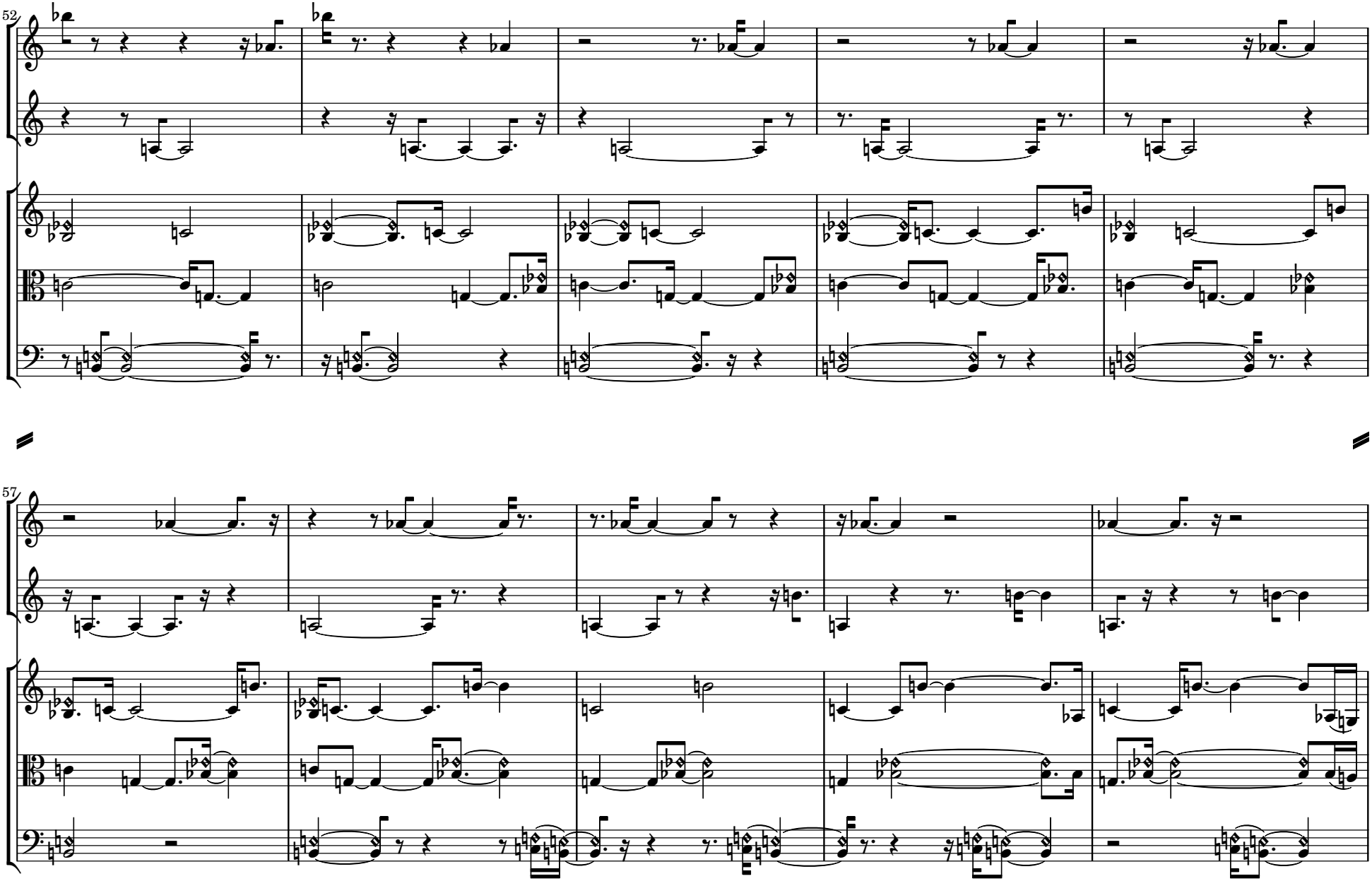
Fl.
Cl.
Vln.
Vla.
Vcl.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Fl.
Cl.
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Vcl.
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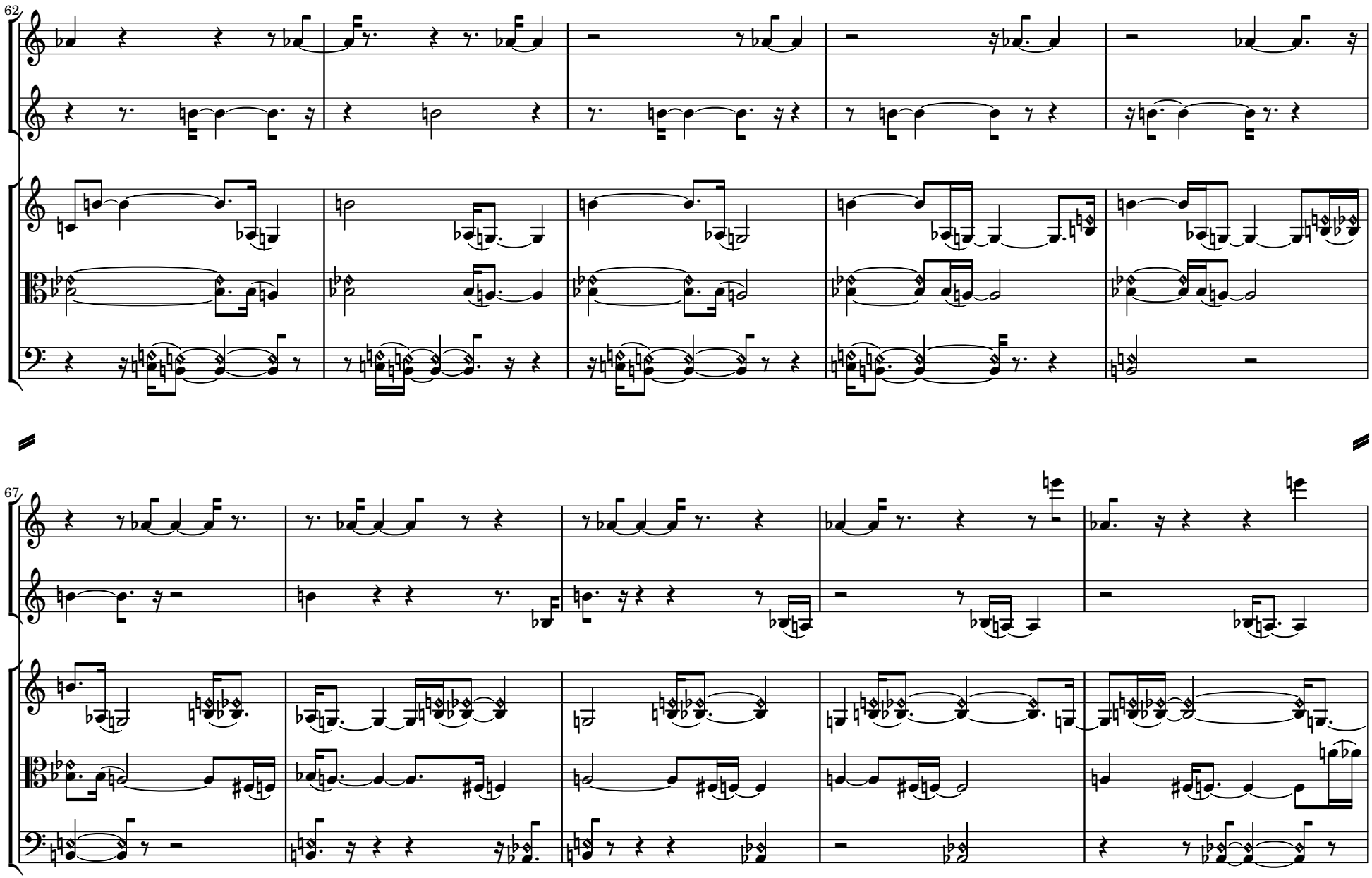
Fl.
Cl.
Vln.
Vla.
Vcl.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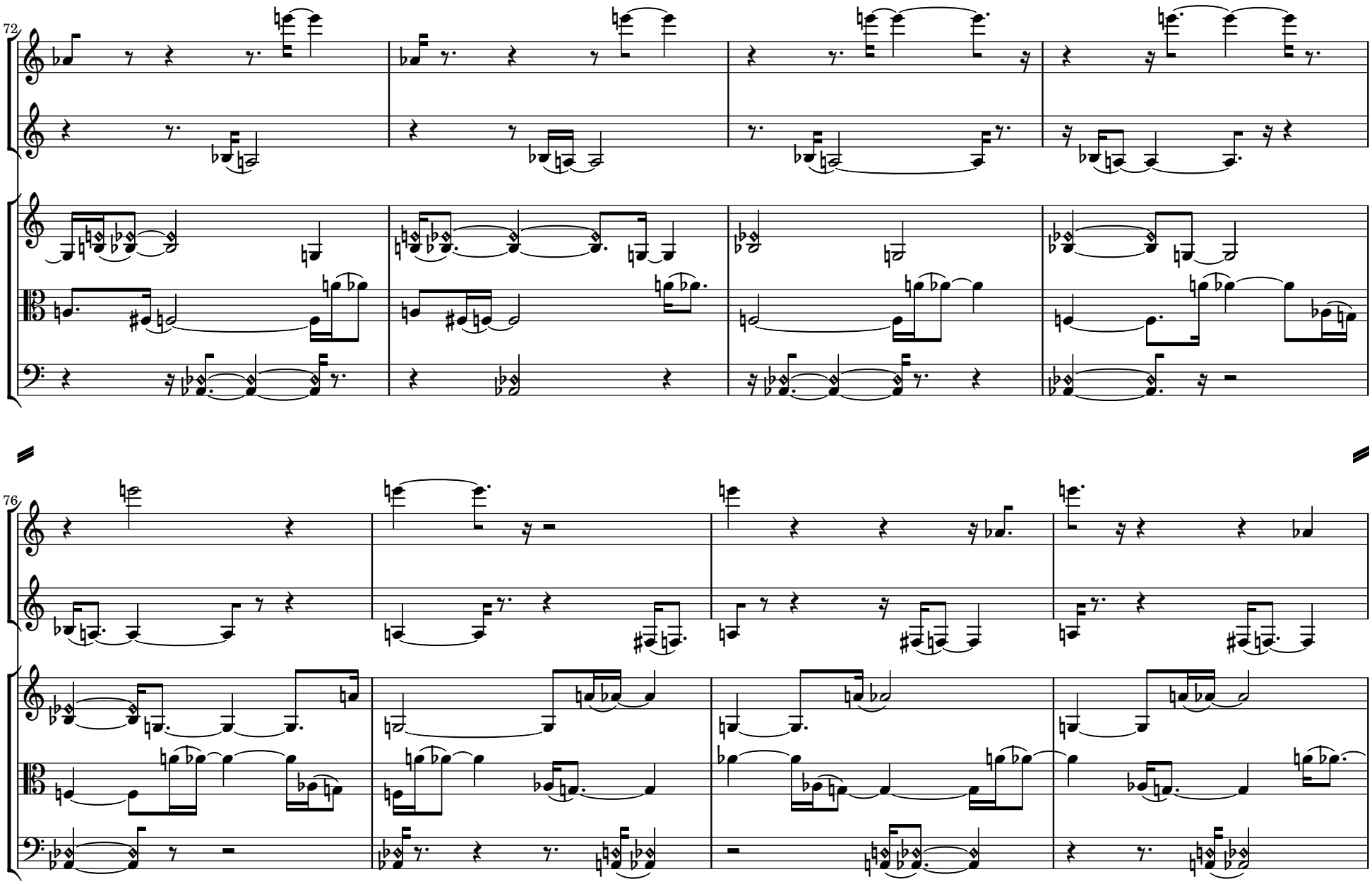
Vla.
Vcl.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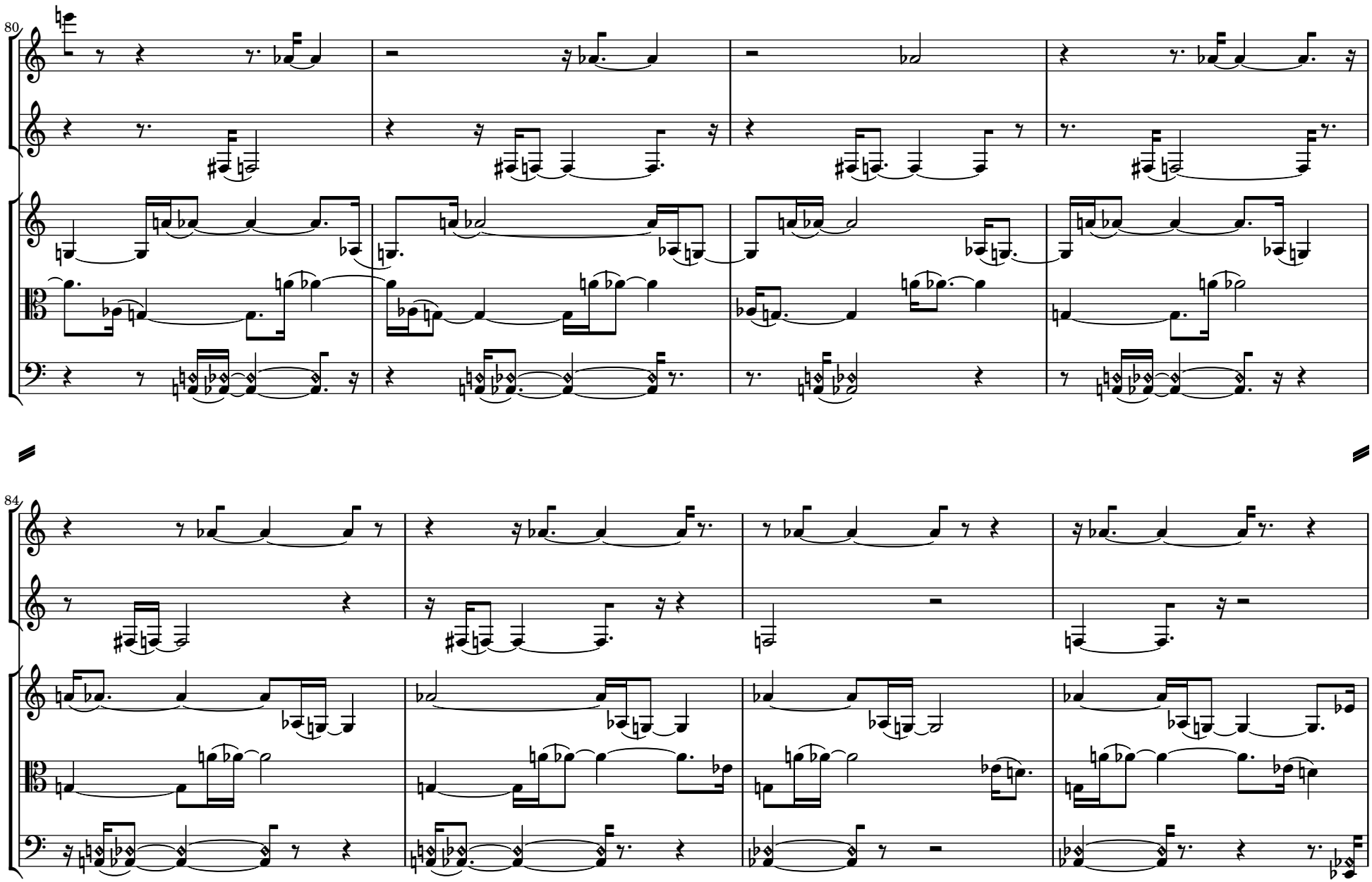
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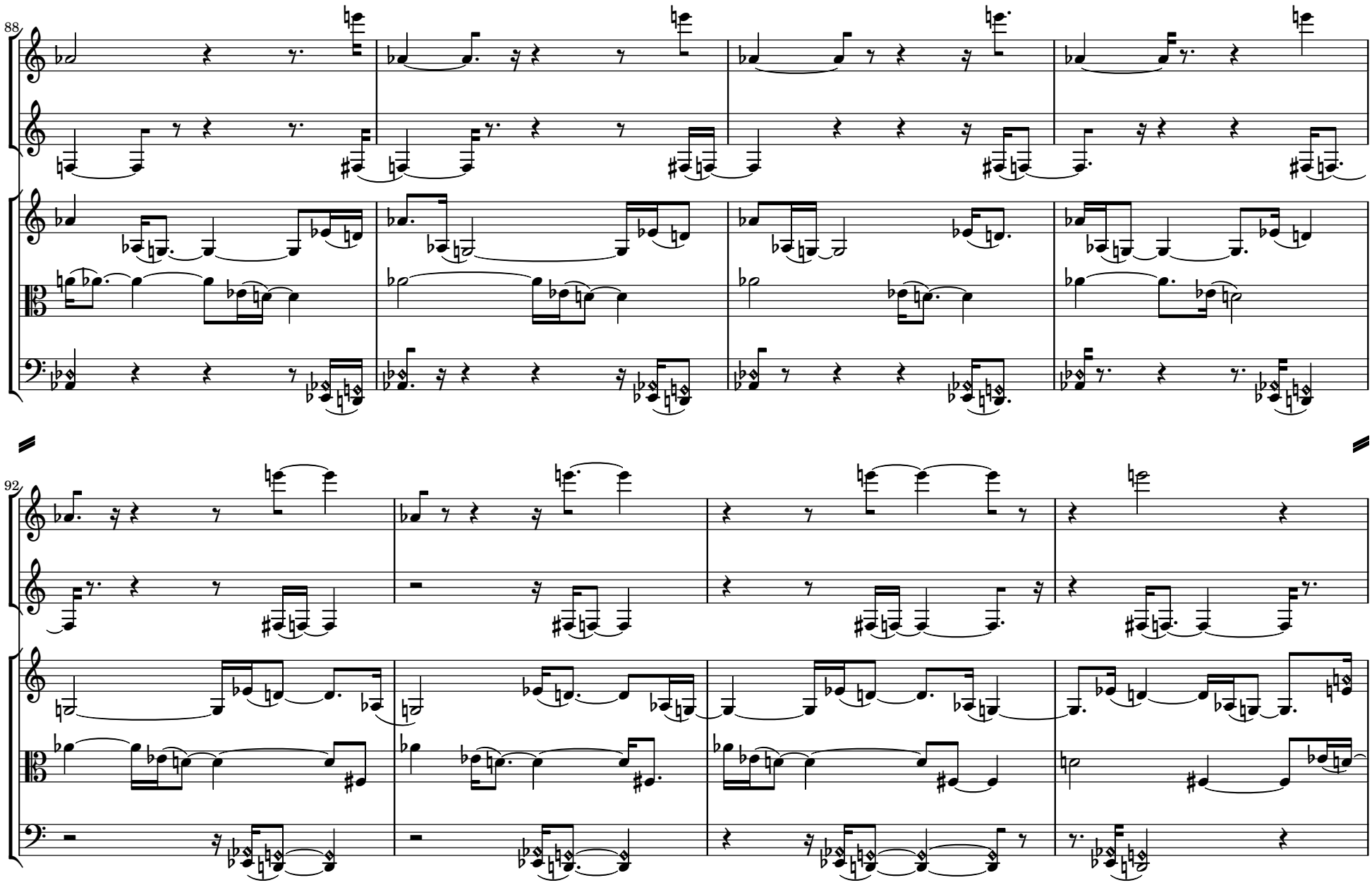
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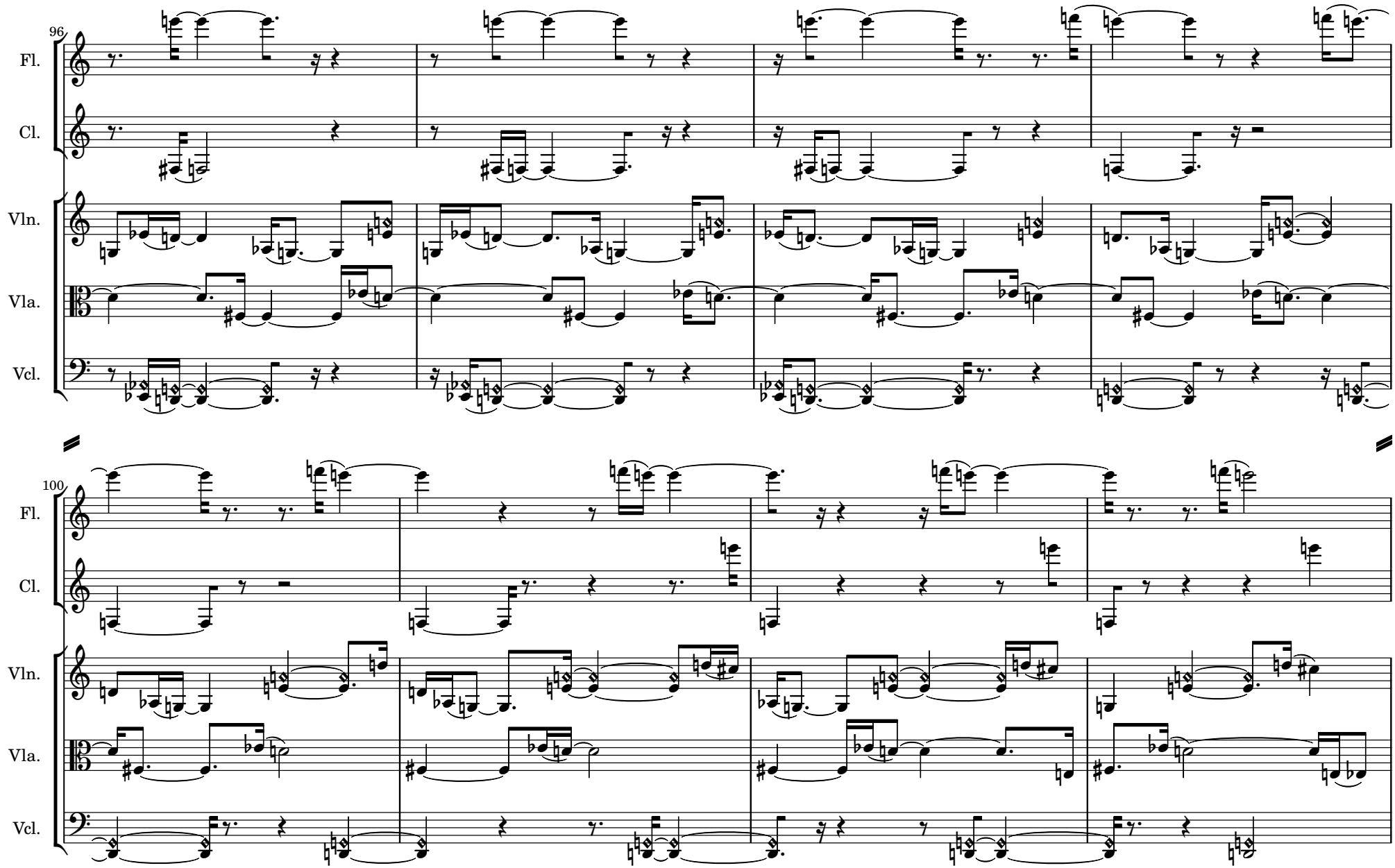
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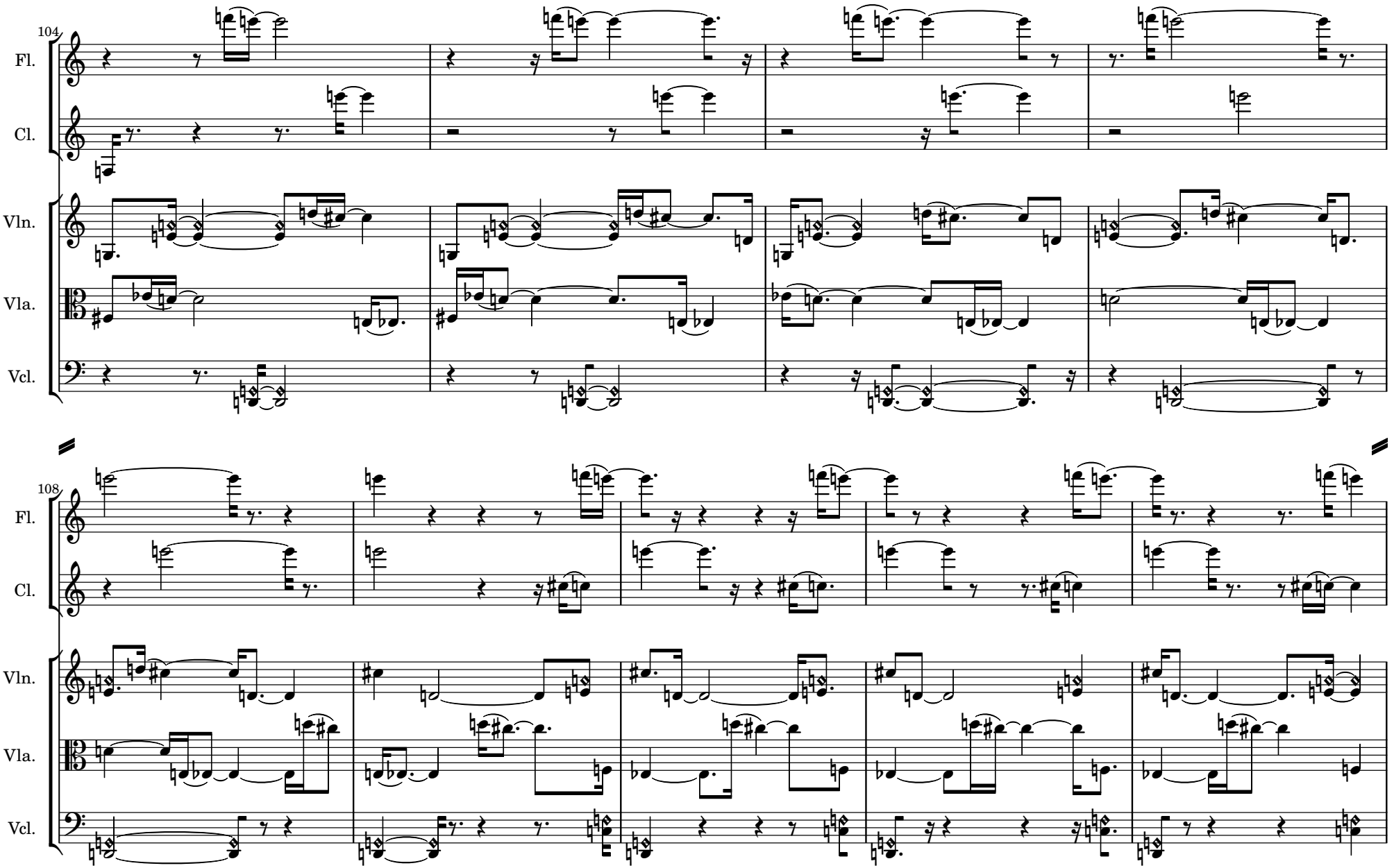
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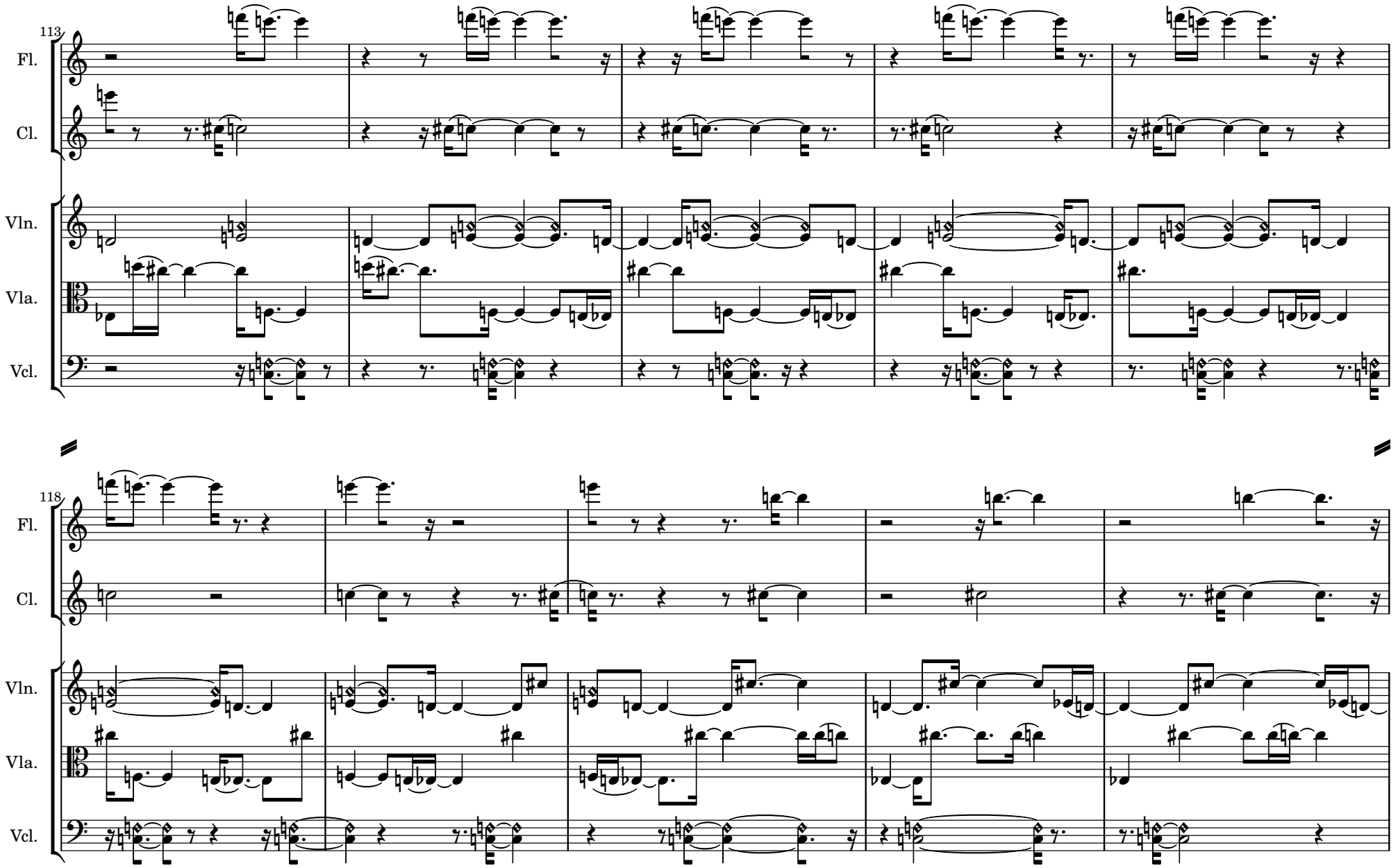
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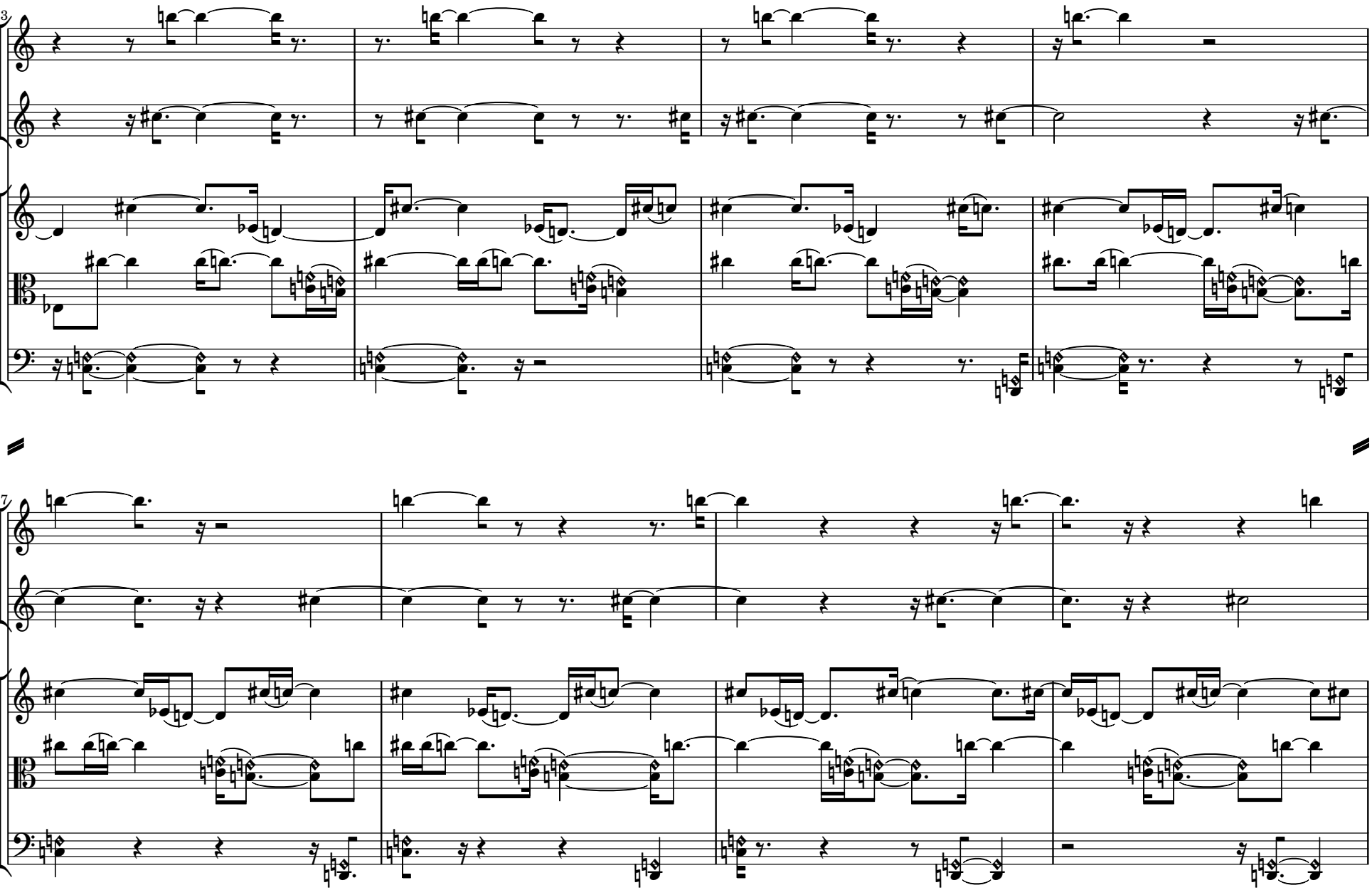
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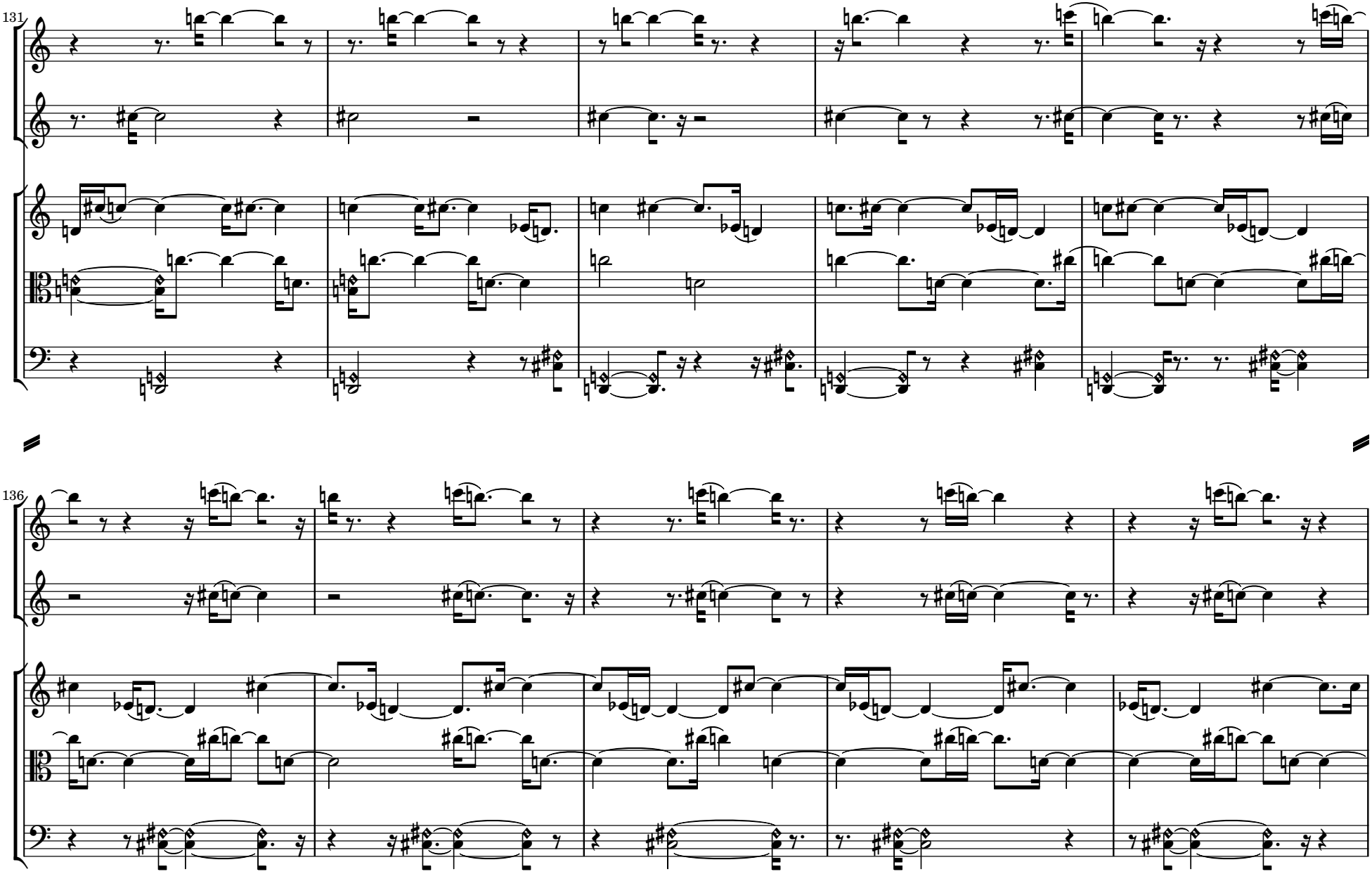
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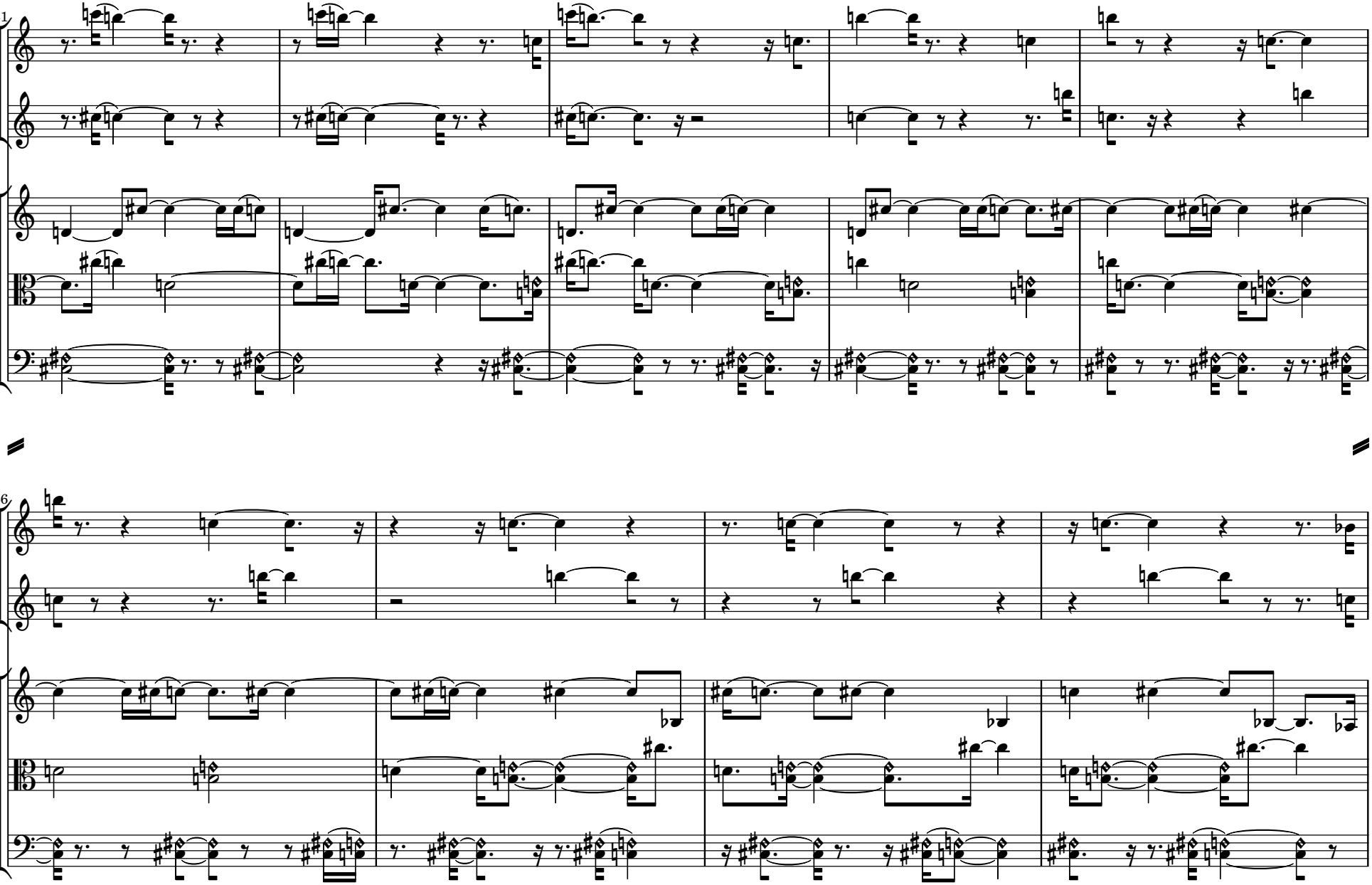
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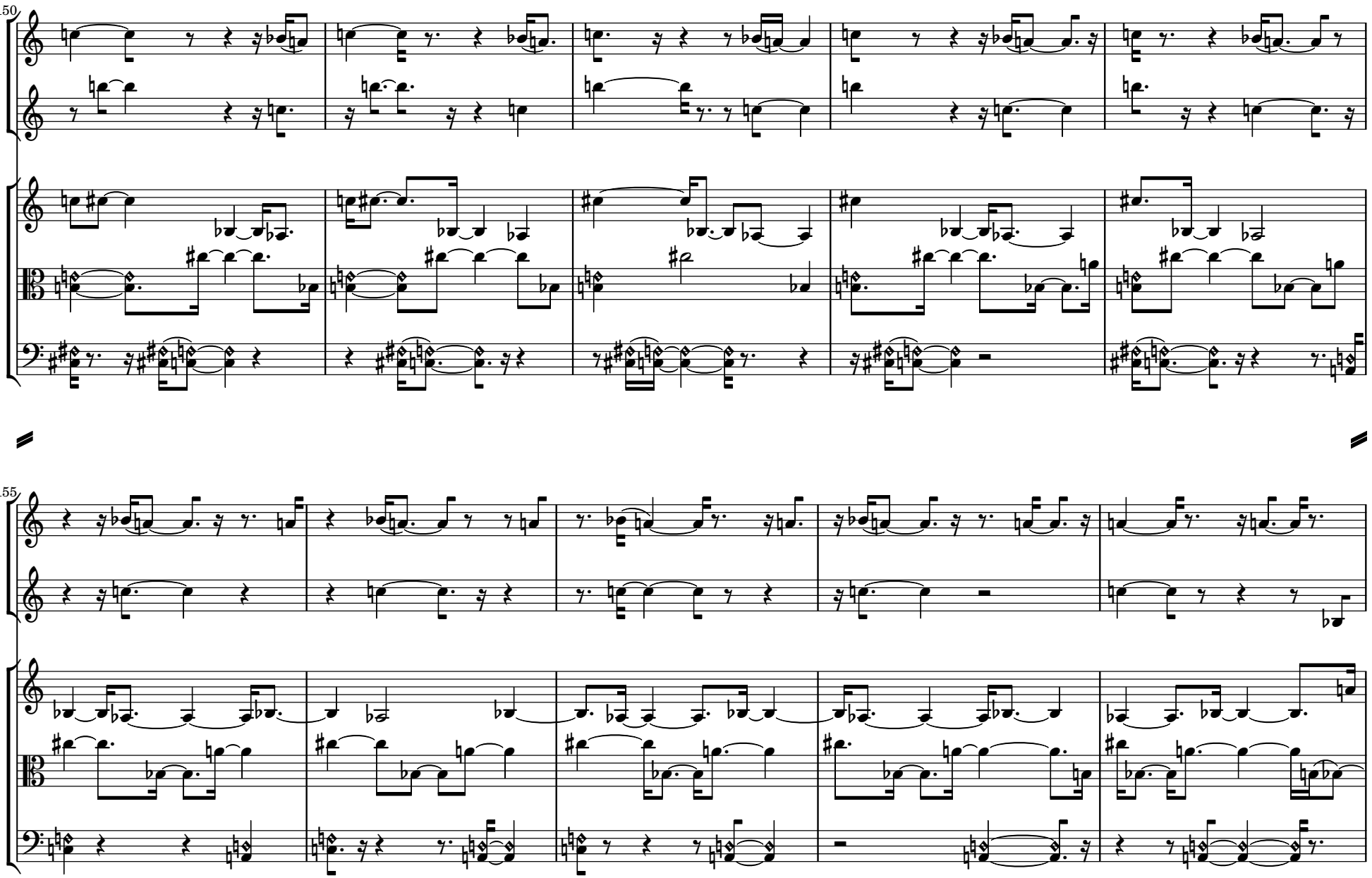
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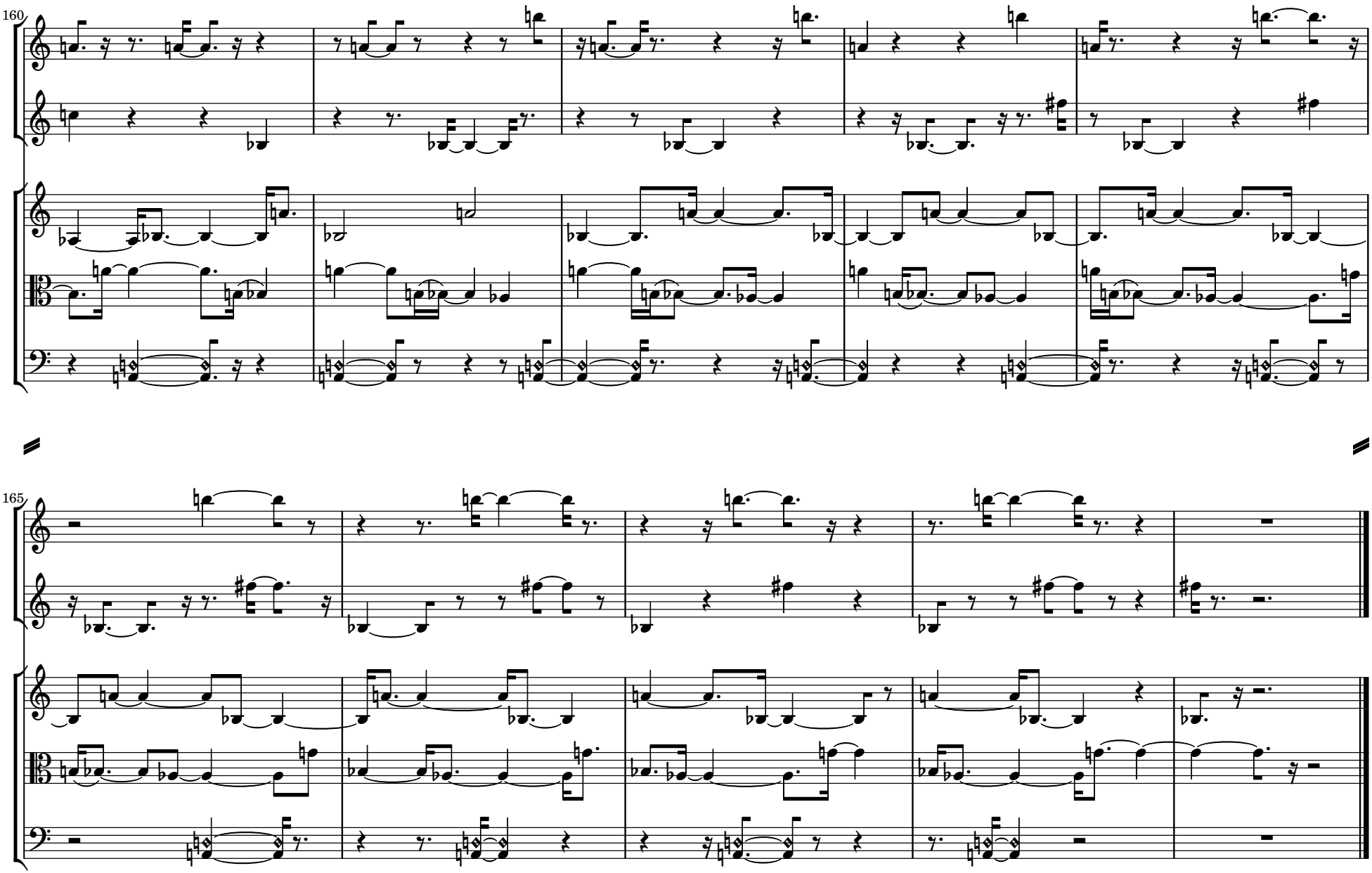
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