Hydrogen(2)Oxygen: String Quartet performance notes

Movement I- Hydrogen (GAS):

This movement relies heavily on the use of four tempo curves, which have been rendered as click tracks with built in cues. Each player follows one of these four click tracks (CT) throughout the duration of the piece in the following groupings:

Click Track 1- Cello, Baritone 1, Alto-, Tenor-
Click Track 2 (modulatory[1])- Viola, Baritone 2, Soprano+, Pencon 1
Click Track 3- Violin 2, Baritone 3, Soprano-, Tenor+
Click Track 4- Violin 1, Baritone 4, Alto+, Pencon 3

During rehearsal mark (RM) 1 of the piece, the four CT's are synchronized to a 60 BMP pulse (defined at that point as the 1/8th note). At RM 2, CT's 1 and 2 follow one tempo curve while CT's 3 and 4 follow another. At the start of RM 3, all four CT's are divergent for the remainder of the piece, although they occasionally elide for brief moments. Similarly, from RM 3 onwards, each part is written in quarter notes and each player is to synchronize their playing to exactly follow the pulse of their CT.

Below are some notes about other performance elements of this movement:

Click Tracks- The CT's have several built in cues based on the tone of the click during different events throughout the piece. The click sounds that are used are as follows:

Mid range wood-block: Signifies that the click is steady, not accelerating or decelerating.

Higher pitched wood-block: Signifies that the click is accelerating.

Lower pitched wood-block: Signifies that the click is decelerating.

Bell: Anticipates the end of a section; eight bell tones are given to signify the end of an RM (only four given at the end of RM 1). For the string players, from RM 3 until the end the bell cue always comes either during the last or the penultimate repetition of the RM cell. However, since the bell tolls eight times, the start of the bell (and the end) will not necessarily coincide with the start or end of the cycle that you are playing, since each cycle has a prime number duration.

Ringing Sound: This only occurs in CT 2, and signifies an instant jump from one tempo to another, rather than a gradual mutation.

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[1] CT 2 is the only track that has tempo jumps after RM 3, rather than gradual mutations. These occur sometimes in the middle of a pattern.

Bowings- Bowings should be as legato as possible throughout the piece, except during RM 2 in which the beginning of each note should be slightly accented with a faster bow pull (like a martelé, but without the bite and with sul tasto, flautando quality).

The first half of RM 1 should be an exploration of the overtone series of each note; bowing should always be sul pont. but the player can move freely around the bridge to extract different overtones for different extended moments, ad lib. During the second half of RM 1, each player should shift back and forth between sul pont. and sul tasto and, if possible, bow in a circular motion. The arrival of each new note aught to come at the exact time with respect to the CT, but should not be accented, and can be in fact occur without a change in bow if convenient. The main idea is that the bowing itself is the focus of the texture, and the change in note adds a new color to a continuous bow tone. This "circular bowing" can continue into RM 2, ad lib, as long as the overall sound quality is of a flautando bowing.

From RM 3 until the end, the player should execute their patterns as legato as possible (perhaps with a detaché, baroque style bowing) and attempt to create an "overtone cloud" between the four players. Each pattern is designed so that the player does not have to move their left hand (if ever this is not possible, please advise me and we can adjust the notes in the pattern to achieve this). Similarly, the quartet is free to decide as to how to color each cell from RM 3 until the end (sul tasto, sul pont., etc…), as long as the net affect is a legato "overtone cloud."

Pitch Material- This movement uses only open strings and natural harmonics. Regardless of that, the string number and harmonic symbol is given at each instance.

Harmonic Notation- For all natural harmonics ranging from the 7^{th} and higher, the number of the harmonic is written next to the notehead like an accidental (this is instead of using JI accidentals like the Helmoltz-Ellis).

Whole Notes- Throughout the piece, if ever there is only one whole note written in a bar and nothing else, the whole note is given the total duration of the bar (no more, no less) regardless of the meter.

Movement 2- Hydrogen (ICE):

This piece moves between material that is metered with specific BPM rates, and material that is given bracketed durations that are to be approximated by the players. These sections should be coordinated through the Violin 1 and the Alto+ players of the two ensembles, so that the full group stays oriented without eliciting an outside conductor. Therefore, all of the string parts have the Alto+ part written in their parts as a cue staff, and all of the percussion players have the Violin 1 in their parts.

Barlines- There are three different types of barlines used in the piece; normal, dashed, and double. Normal barlines represent conventionally metered material; dashed barlines represent time divisions during material that is not strictly metric (for example, even though RM 3 is in common time, ¼ = 50, dashed barlines are given so that the players know that their phrases are to be played loosely, whereas RM 7 is to be played in strict time); double barlines represent division between different sections, usually moving from metered to non-metered material.

Markings-

---------- : The dashed marking is used to connect figures through the score and parts, and represents a direct continuation between two figures without any breach in time. This is used to compensate for the fact that the spacing in the score or part might otherwise make it seem that the two adjacent figures are separated in time, when they are not.

_____ : The straight line is used both in harmonic *glissandi* and *portamenti*. It is meant as a guide, and the noteheads that connect these lines are not to be accented, but rather represent reference points throughout a figure; in other words, figures containing these lines should always be played with continuous gliding motion and should not longer on any given pitch.

Bowing- The whole piece is to be played *senza vibrato*. Particularly bowing styles are given at the beginning of certain RM's and are to be used throughout that particular RM, except in brief moments when another bowing is written in (for example, *jete* on beat 4 of the first measure of RM 10).

Quartet Coordination- There are several moments in the piece where the four parts of the quartet are meant to be played with an interlocked coordination (for example, the harmonic *glissandi* in RM 1). These movements may be difficult to discern from a reading of the part alone, but should be clearly represented in the score. I advise that the players glance breifly at the score for each of these sections (RM 1, RM 4, RM 11, RM 13, RM 14, RM 19).

RM 13-14- I am repeated here what is written into the score for the sake of redundancy. "This section aims at producing tremolos between the various parts to create an effect reminiscent of the accelerating and decelerating phasing of a wheel strobe[2]. The player should execute an even tremolo that fluctuates from fast to slow on a linear time curve, ranging from roughly 720 BMP at the fastest to 240 BMP at the slowest, becoming sautillé bowing at the slowest. Each player should be aware of the accompanying parts, allowing for the various time curves to cross based on the written proportions (7-8-9-10; represented as 14'', 16'', 18'', and 20'' in the four parts).

[2] I am referring here particularly to a strobe tuner; this phenomena can also be witnessed in the rims of tires while riding (on the passenger side) along the highway.

Movement 3- Oxygen (AQUA):

This movement is more straightforward, metrically, than the previous two. However, because of the density of polyrhythms in the various parts, I advise the ensemble play along to a click track at ¼=120 (it is OK if the piece is taken a little slower as well), so that the underlying pulse is never obscured by the various parts. The Lightbulb Ensemble has so far learned the piece along to a click track.

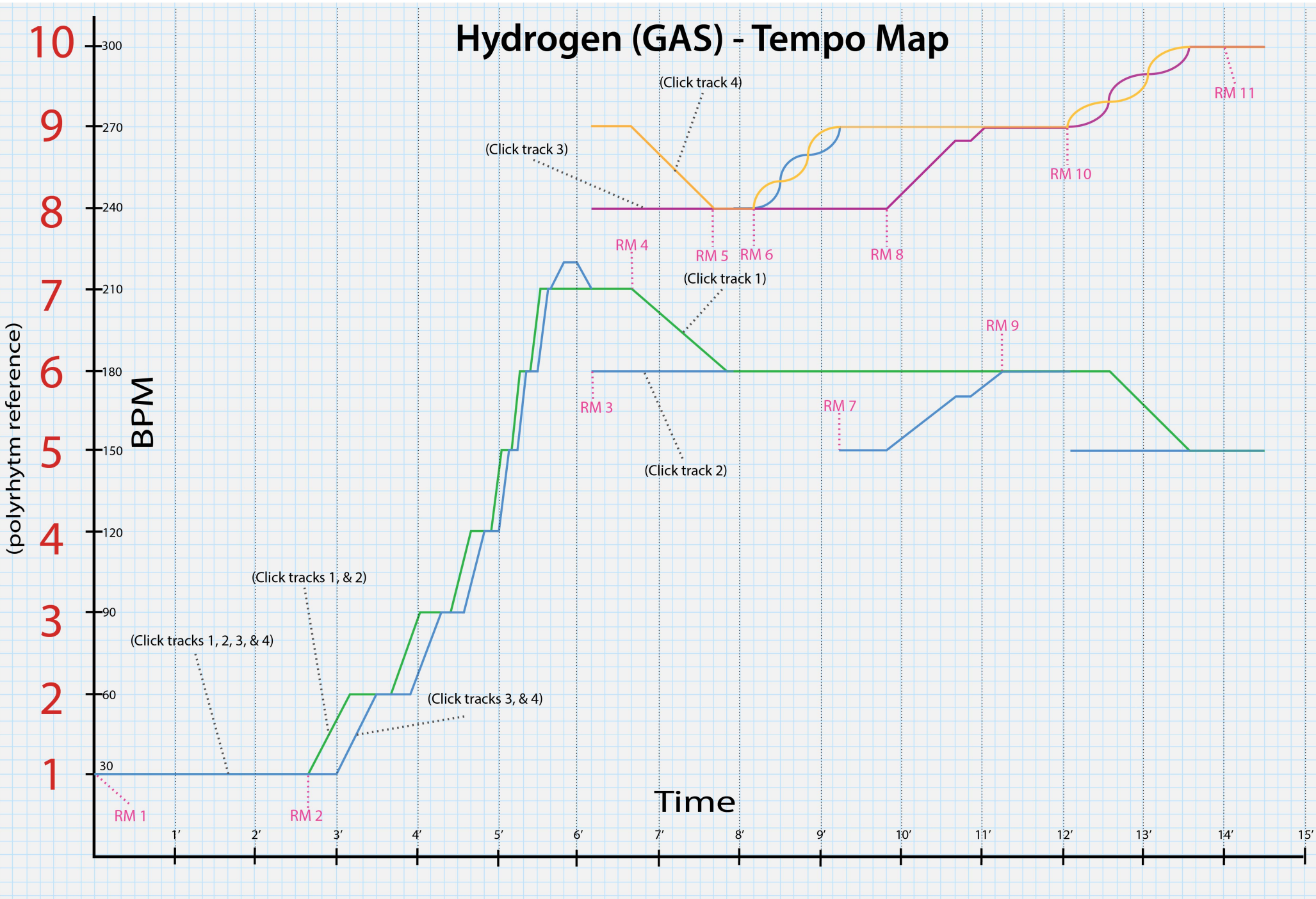
The overarching structure of the piece is one full cycle of a 5-7-8-9 polyrhythm (2520 1/16th notes at ¼=120 becomes 5'15'' total duration). The first 1' of the piece spotlights the cycle of 7, in which the two baritones fill in all of the 1/16th notes in melodic groupings of seven; minute 2 spotlights the cycle of 5 in the soprano, tenor, and viola parts; minute 3 spotlights the cycle of 9 in the altos and violin 1; minute 4 spotlights the cycle of 8 in the sopranos and altos, while the viola outlines cycles of 5; minute 5 sees all of the cycles filling in all 1/16th notes and swirling around each other; the last 15 seconds give just the long-tone polyrhythms. My image of the piece is of fish on a coral reef; all change direction in a unified manner but not at the same instant, and their movement seems both asymmetric and symmetric, unpredictable but inevitable. Some notes:

Hairpin Swells- The dynamics throughout the piece should be steady in a global sense, but the foreground texture is designed to fluctuate. Therefore, all of the hairpin *cresendi* and *decrescendi* and meant to be a coming-in-and-out of texture. Therefore, at the lowest point of the hairpin, your part should still always be confortable audible, and at the highest part of your hairpin, you should be in the foreground of the texture, but still less prominent in volume than whichever part is spotlighted, i.e. filling in all of the 1/16th notes. However, in RM C, the dynamics can be more dramatic rather than textural, and in RM D, since all parts are filling in the 1/16th notes, you can become the most dominant voice at the apex of your hairpin, although the dynamics should be textural again.

Gongs- Notes and rests have been highlighted in pink when they intersect with a gong stroke. This is meant to provide "grappling hooks" for reference throughout the piece, which can be quite dense. The gong stokes occur systematically; every instance that three of the four cycles of polyrhythms coincide.

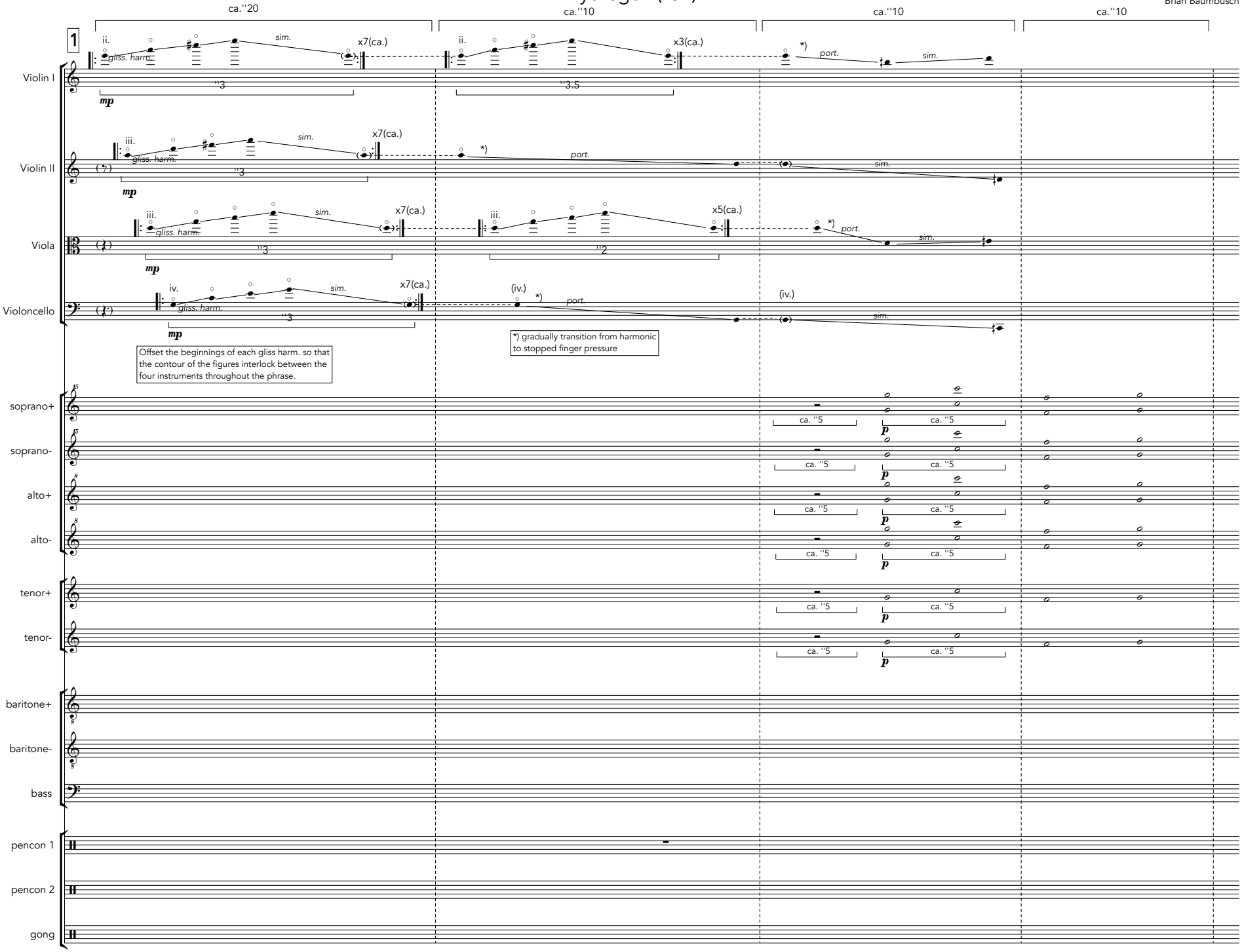
Brian Baumbusch
Santa Cruz, CA.
September, 2015.

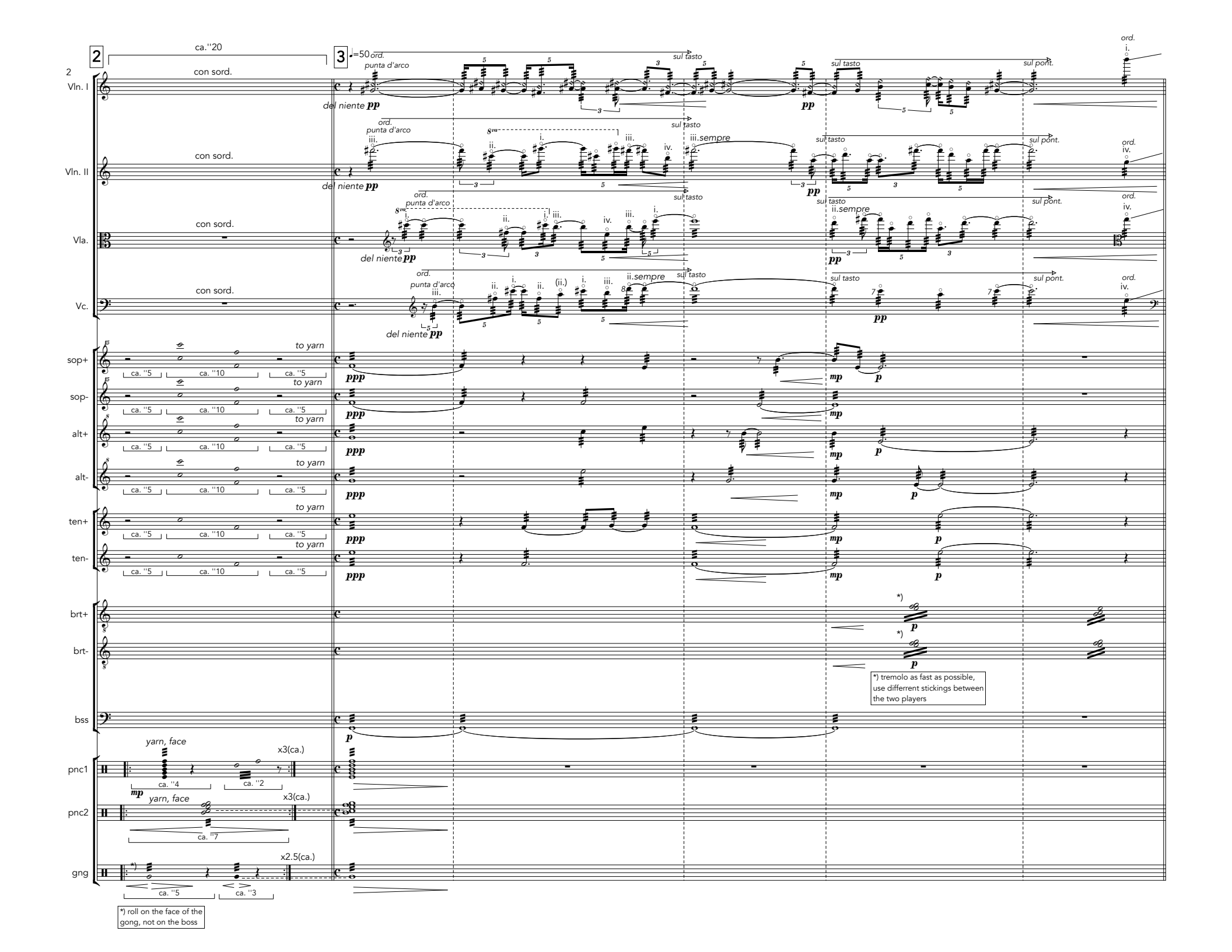
_____
Total Duration: ca. 33'

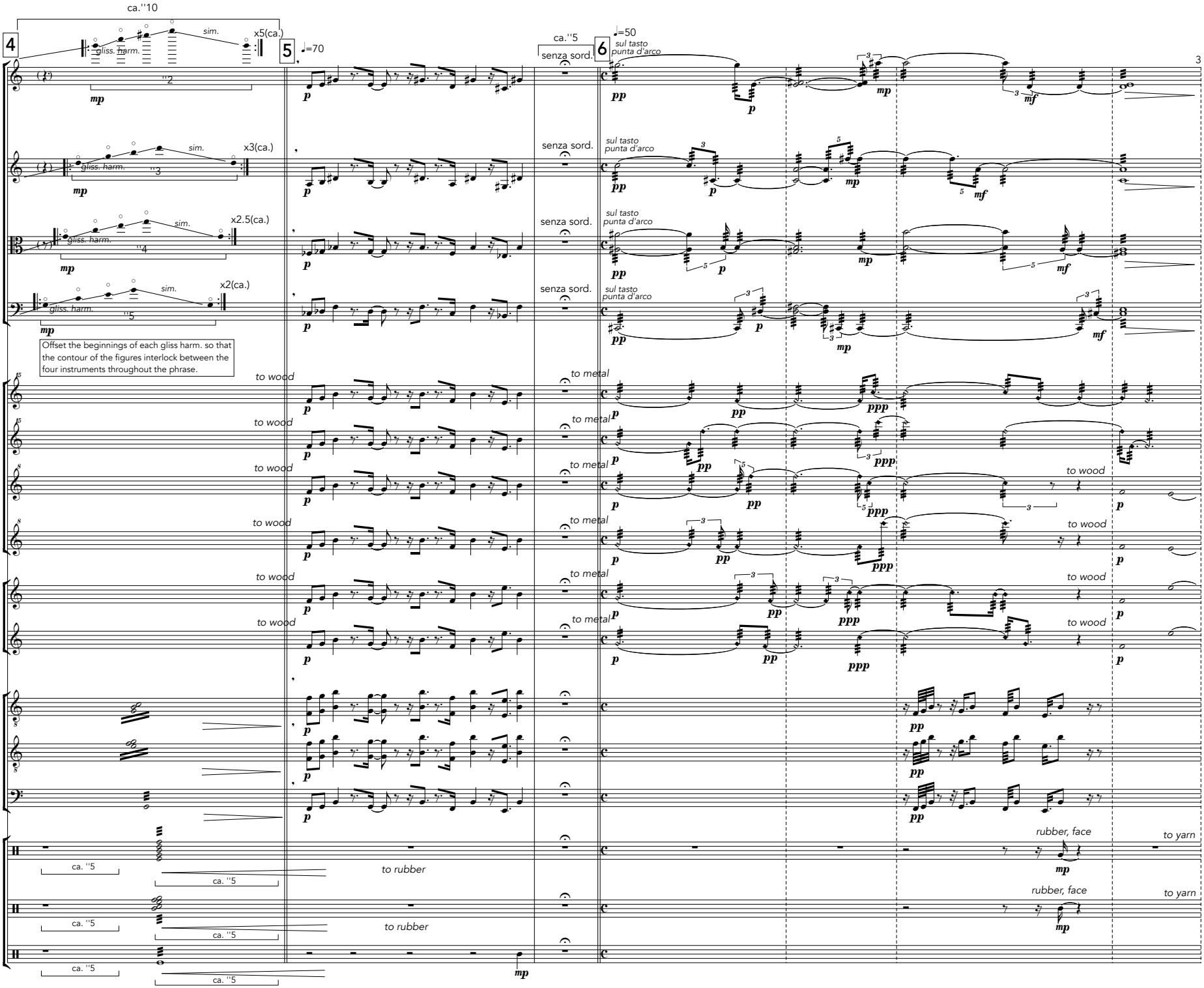


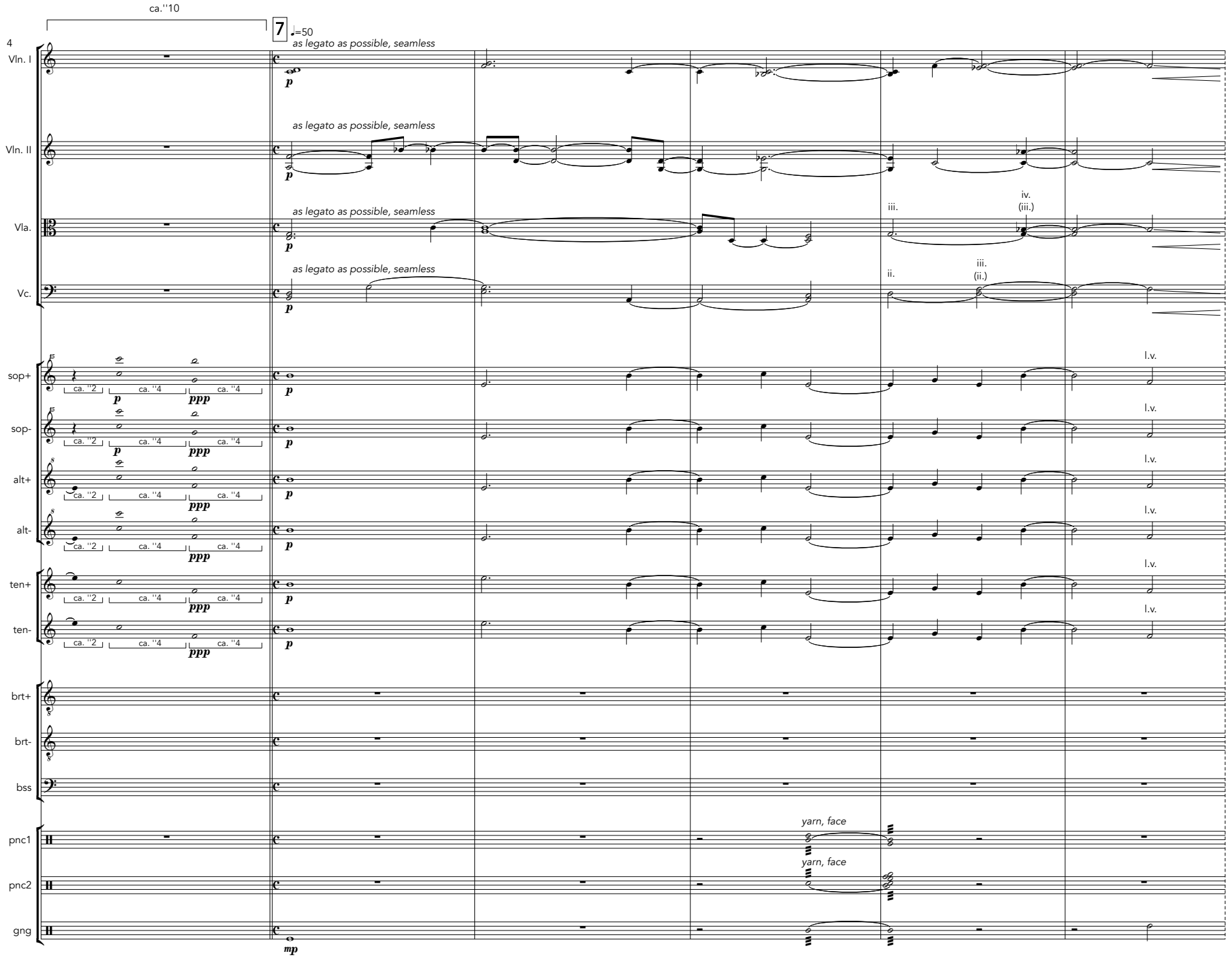
ii. Hydrogen (ICE)

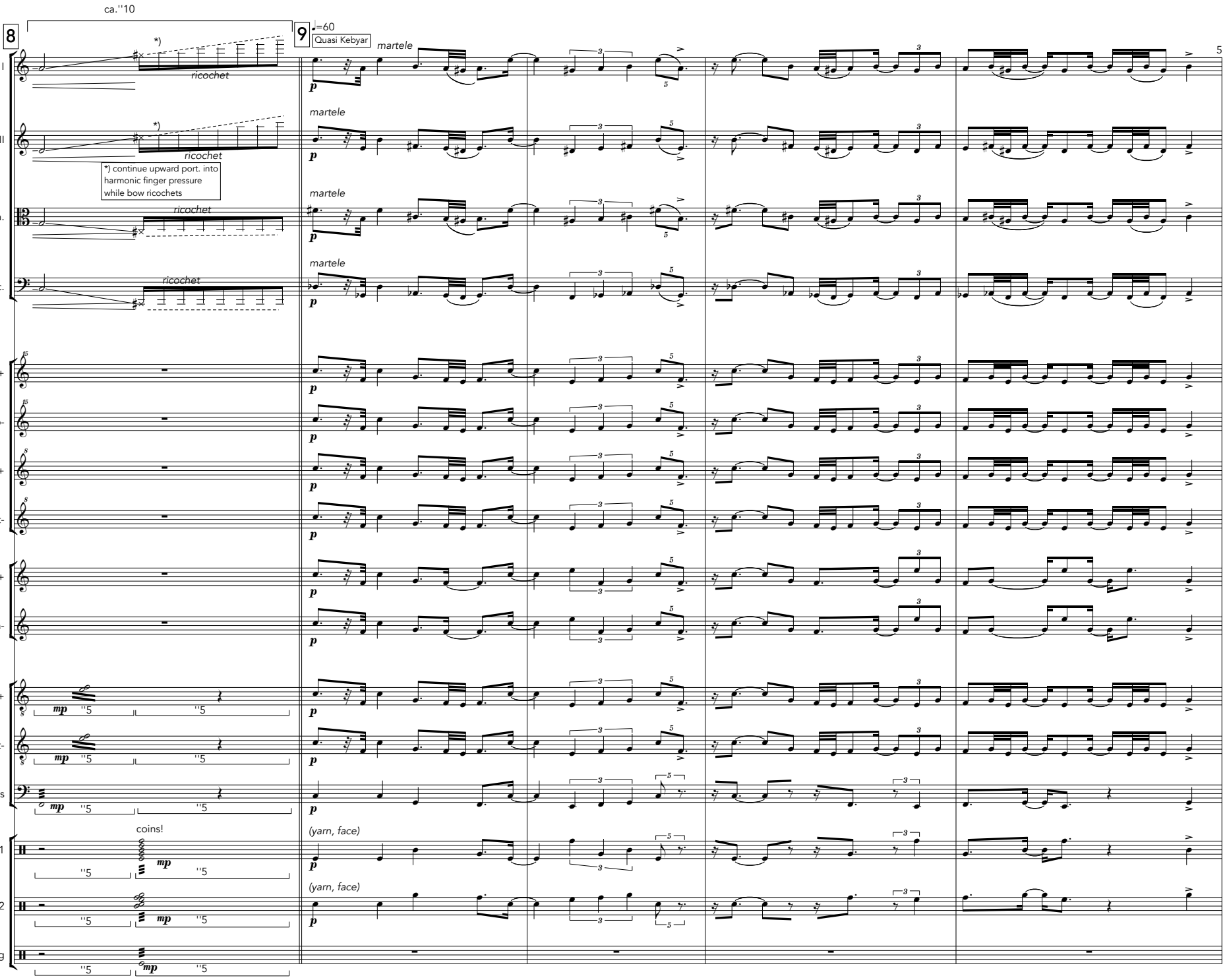
Brian Baumbusch

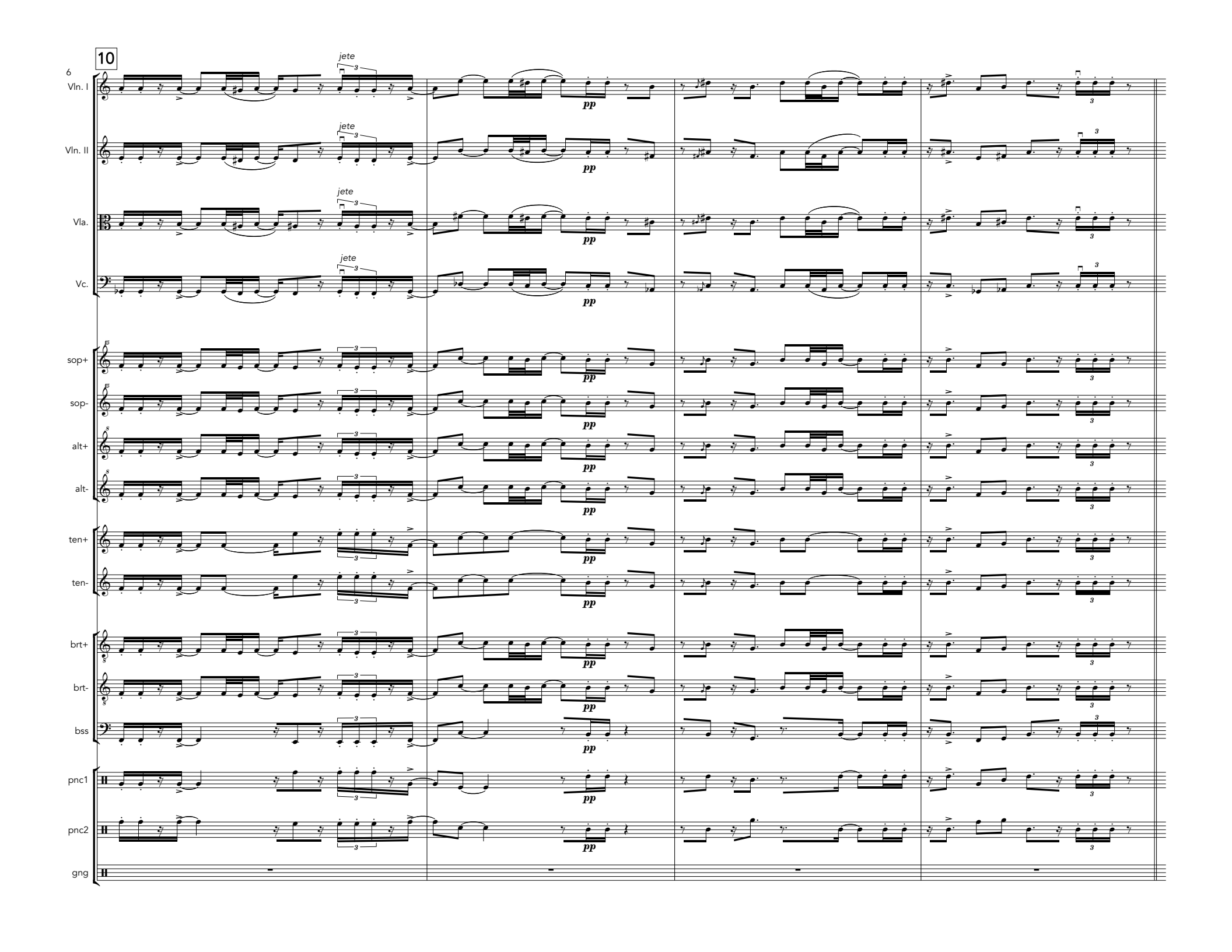


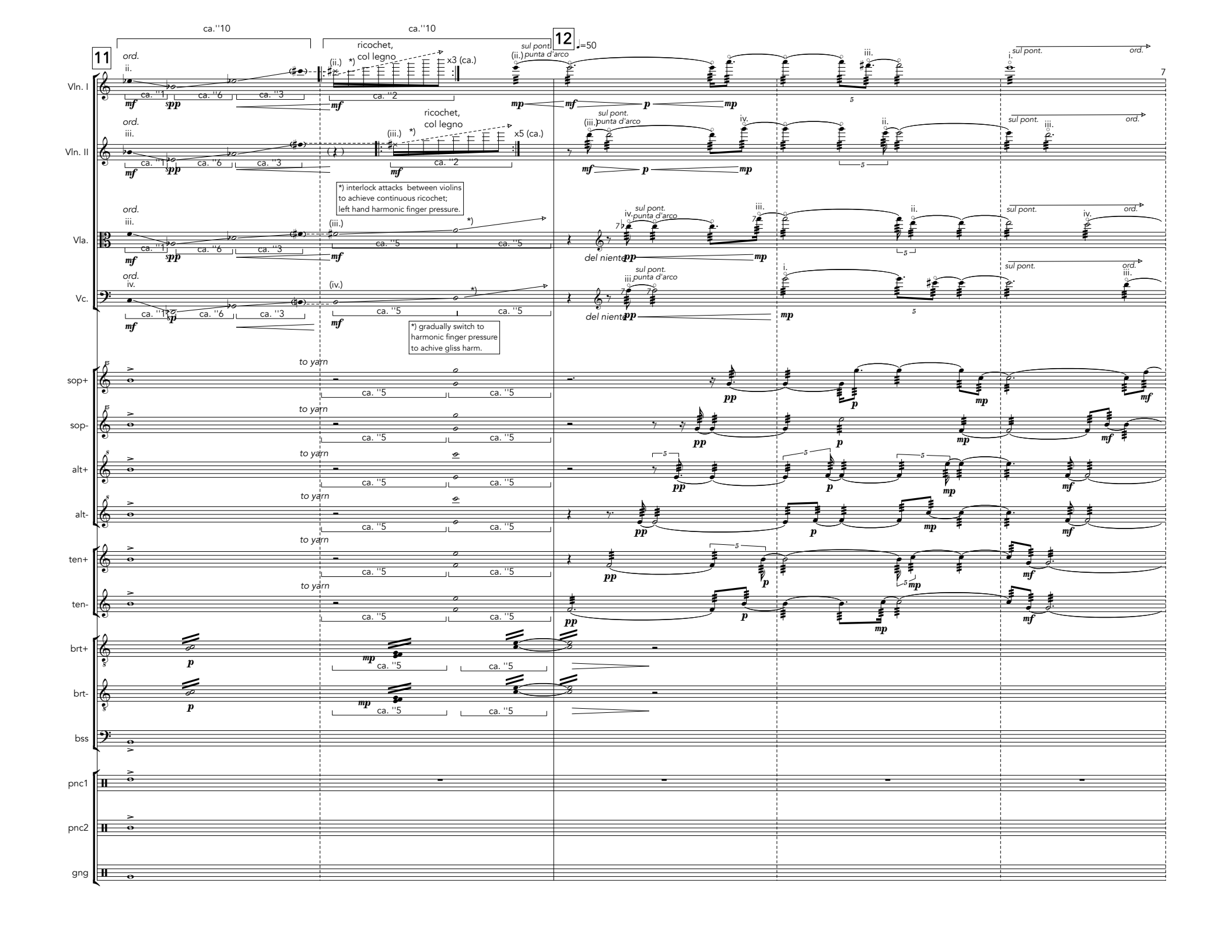

2
ca.''20
3
♩=50
Vln. I
Vln. II
Vla.
Vc.
con sord.
ord.
punta d'arco
sul tasto
sul pont.
del niente pp
iii.sempre
ii.sempre
sop+
sop-
alt+
alt-
ten+
ten-
to yarn
ca. ''5
ca. ''10
brt+
brt-
bss
pnc1
pnc2
gng
yarn, face
x3(ca.)
ca. ''4
ca. ''2
ca. ''7
x2.5(ca.)
ca. ''3
*) tremolo as fast as possible, use differrent stickings between the two players
*) roll on the face of the gong, not on the boss


4
5
6
ca.''10
sim.
x5(ca.)
gliss. harm.
♩=70
ca.''5
senza sord.
♩=50
sul tasto
punta d'arco
Vln. I
Vln. II
Vla.
Vc.
x3(ca.)
x2.5(ca.)
x2(ca.)
Offset the beginnings of each gliss harm. so that the contour of the figures interlock between the four instruments throughout the phrase.
sop+
sop-
alt+
alt-
ten+
ten-
brt+
brt-
bss
pnc1
pnc2
gng
to wood
to metal
to rubber
to yarn
rubber, face
ca. ''5

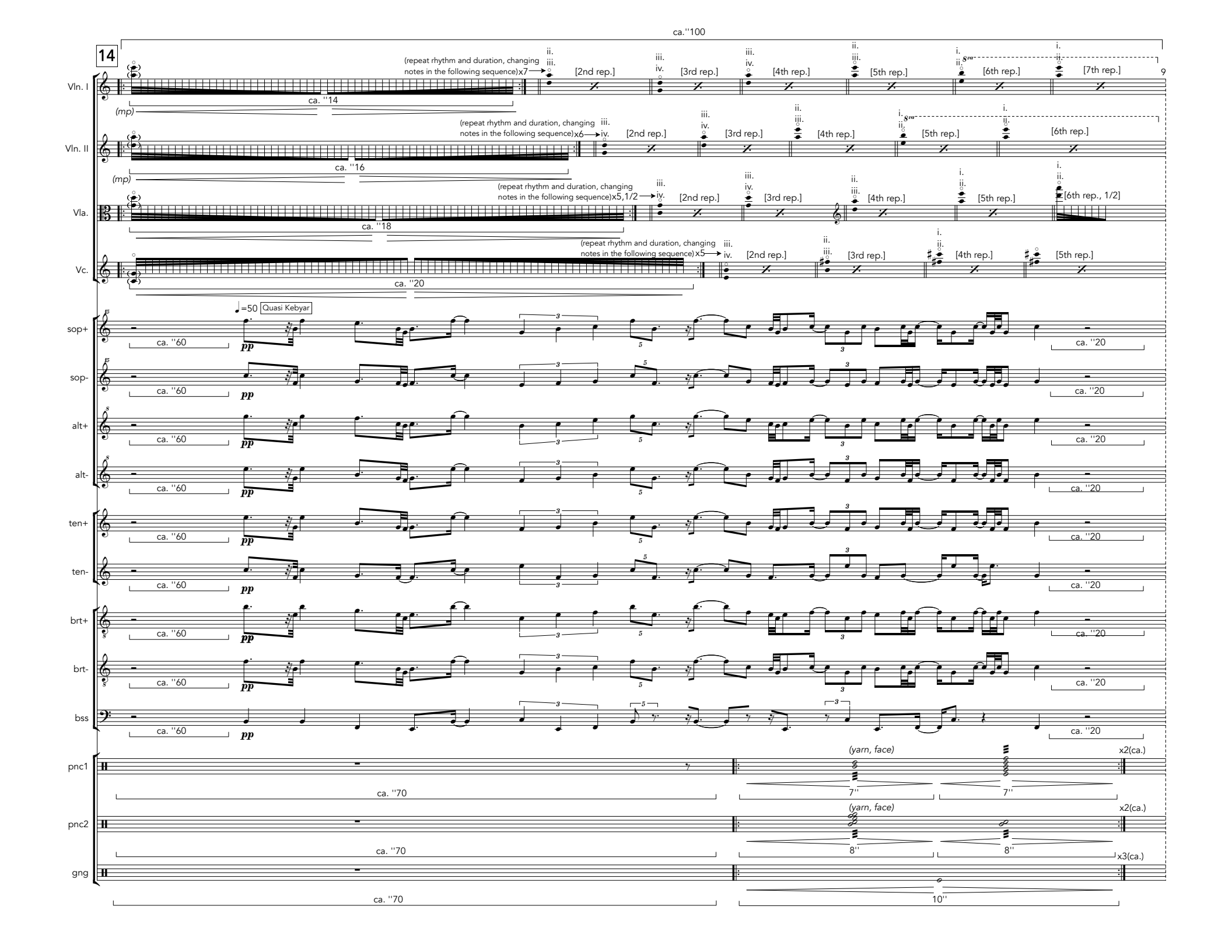

ca.''10
7
♩=50
4
Vln. I
as legato as possible, seamless
p
Vln. II
as legato as possible, seamless
p
Vla.
as legato as possible, seamless
p
iii.
iv.
(iii.)
Vc.
as legato as possible, seamless
p
ii.
iii.
(ii.)
sop+
sop-
alt+
alt-
ten+
ten-
ca. ''2
ca. ''4
ca. ''4
p
ppp
l.v.
brt+
brt-
bss
pnc1
pnc2
gng
yarn, face
yarn, face
mp

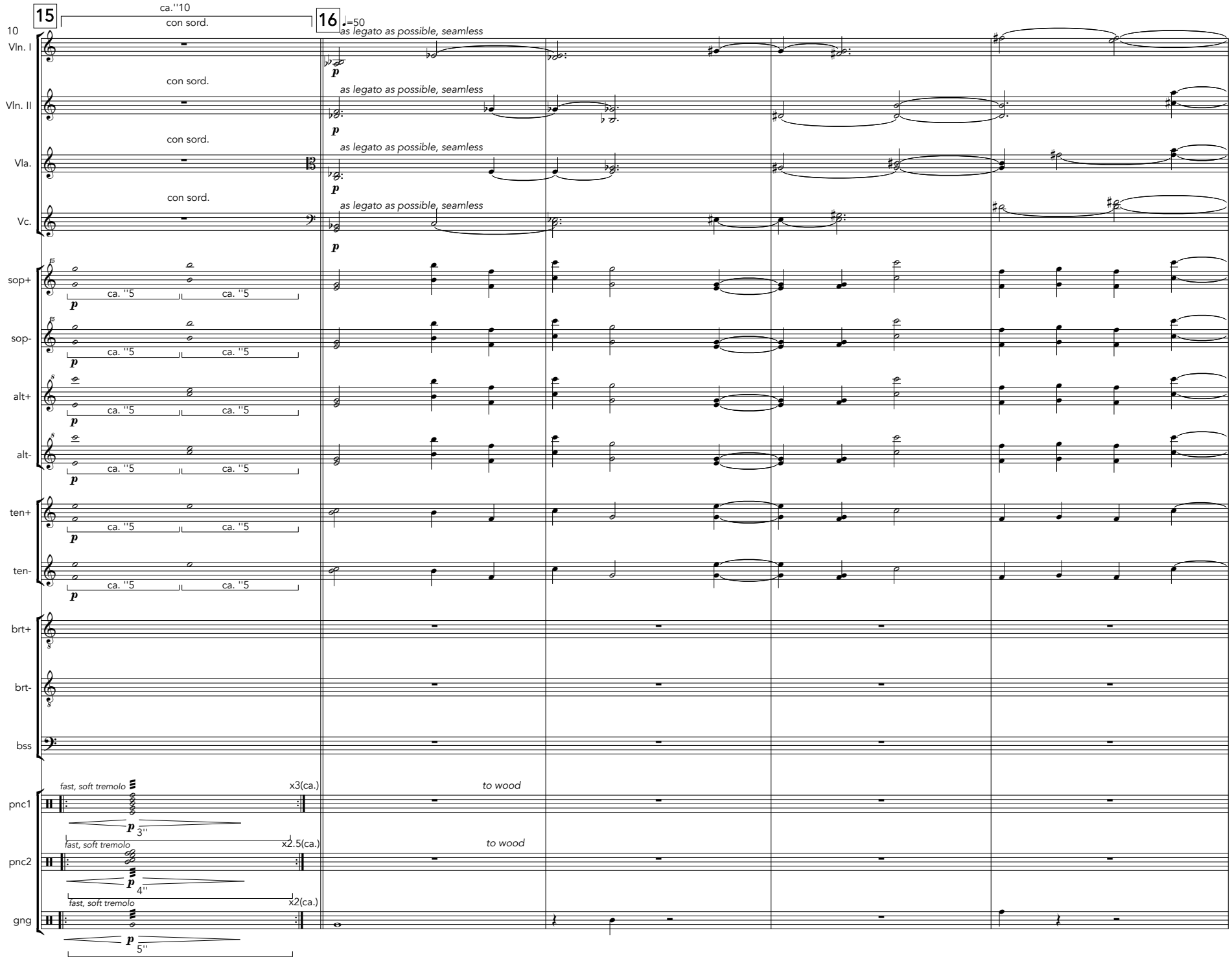

ca.''10
8
9
♩=60
Quasi Kebyar
Vln. I
Vln. II
Vla.
Vc.
sop+
sop-
alt+
alt-
ten+
ten-
brt+
brt-
bss
pnc1
pnc2
gng
*)
ricochet
*) continue upward port. into harmonic finger pressure while bow ricochets
martele
p
mp
''5
coins!
(yarn, face)

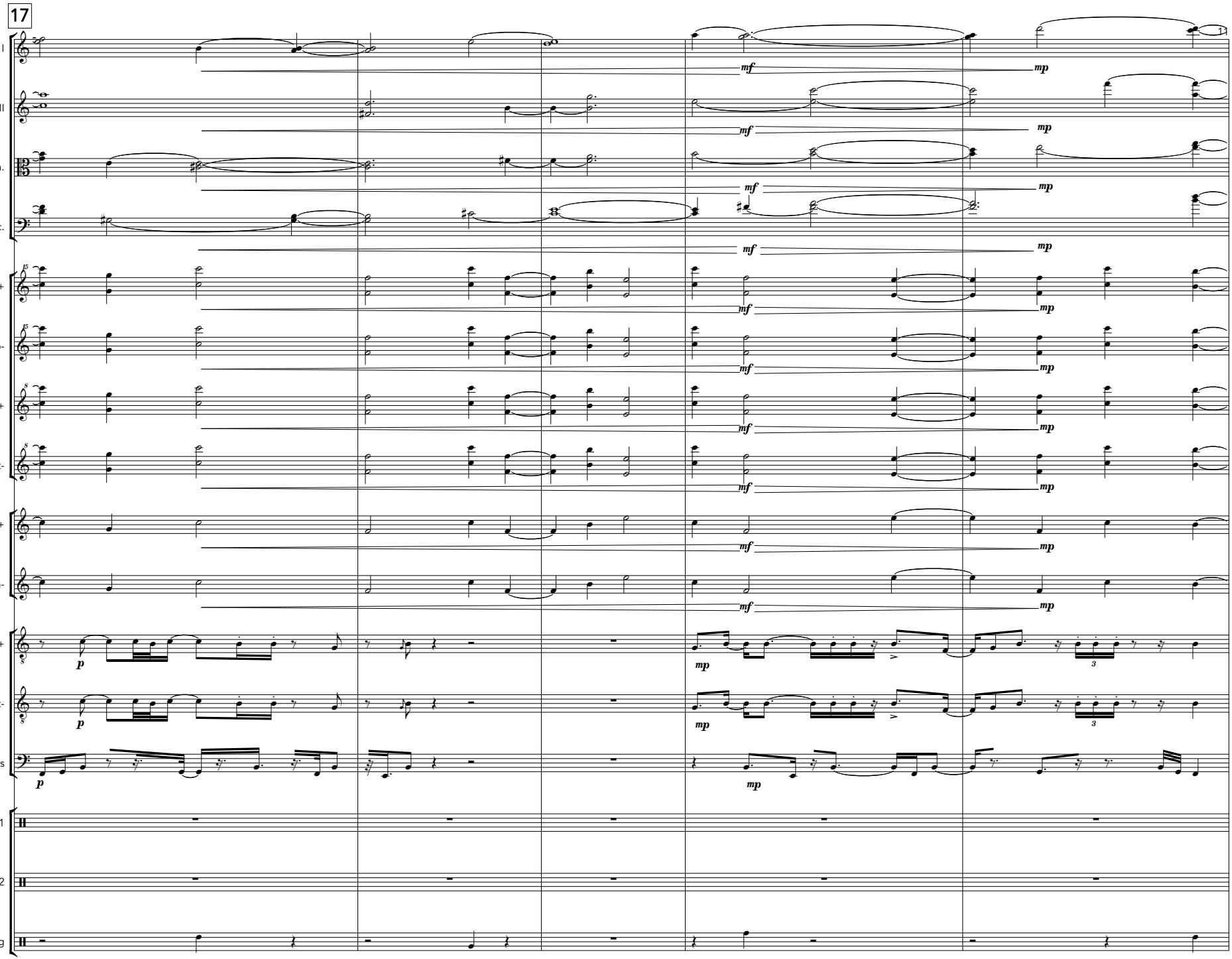

10
6
Vln. I
Vln. II
Vla.
Vc.
sop+
sop-
alt+
alt-
ten+
ten-
brt+
brt-
bss
pnc1
pnc2
gng
jete
pp

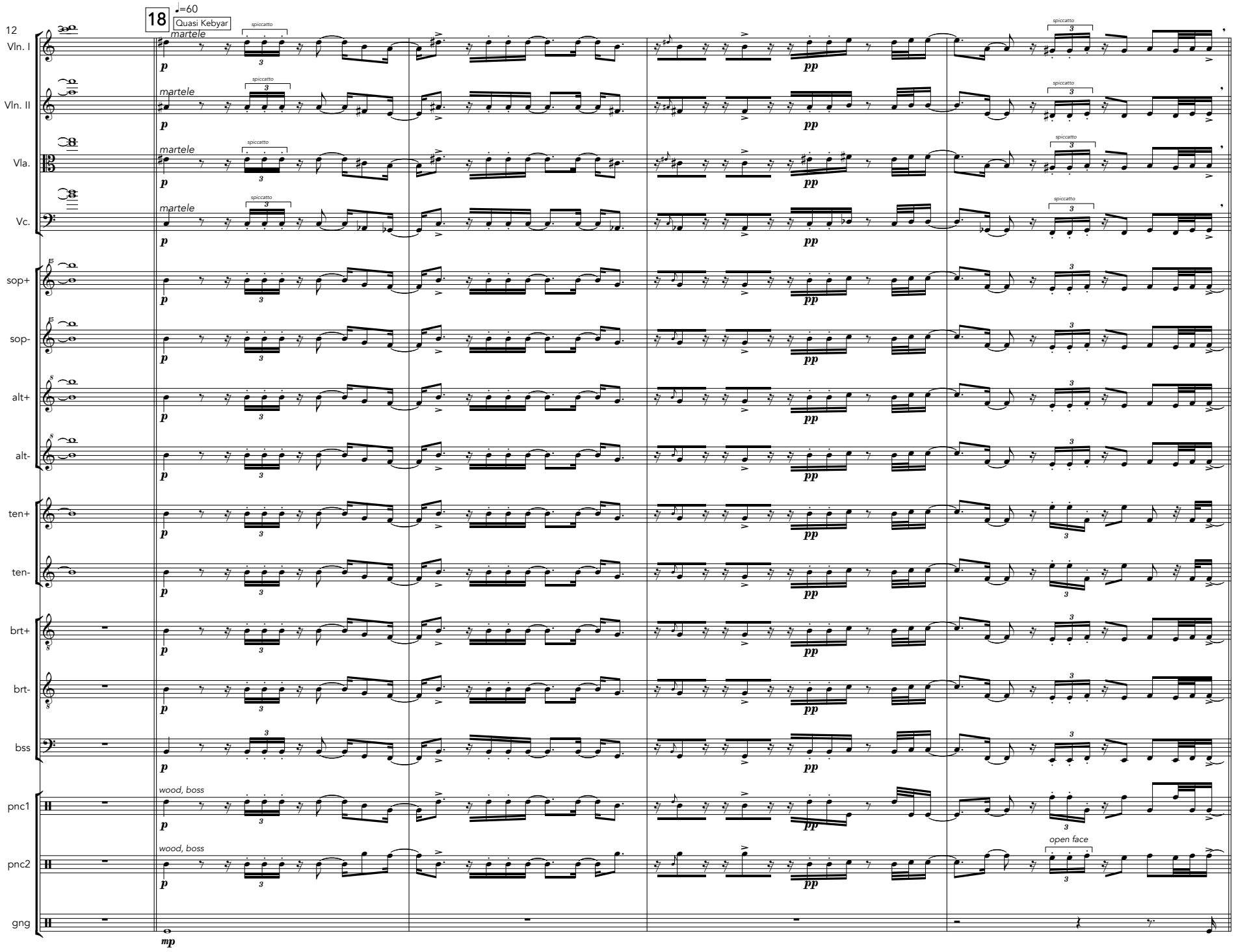

11
12
♩=50
ca.''10
ca.''10
ricochet, col legno
x3 (ca.)
ricochet, col legno
x5 (ca.)
*) interlock attacks between violins to achieve continuous ricochet; left hand harmonic finger pressure.
*) gradually switch to harmonic finger pressure to achive gliss harm.
del niente
to yarn
Vln. I
Vln. II
Vla.
Vc.
sop+
sop-
alt+
alt-
ten+
ten-
brt+
brt-
bss
pnc1
pnc2
gng

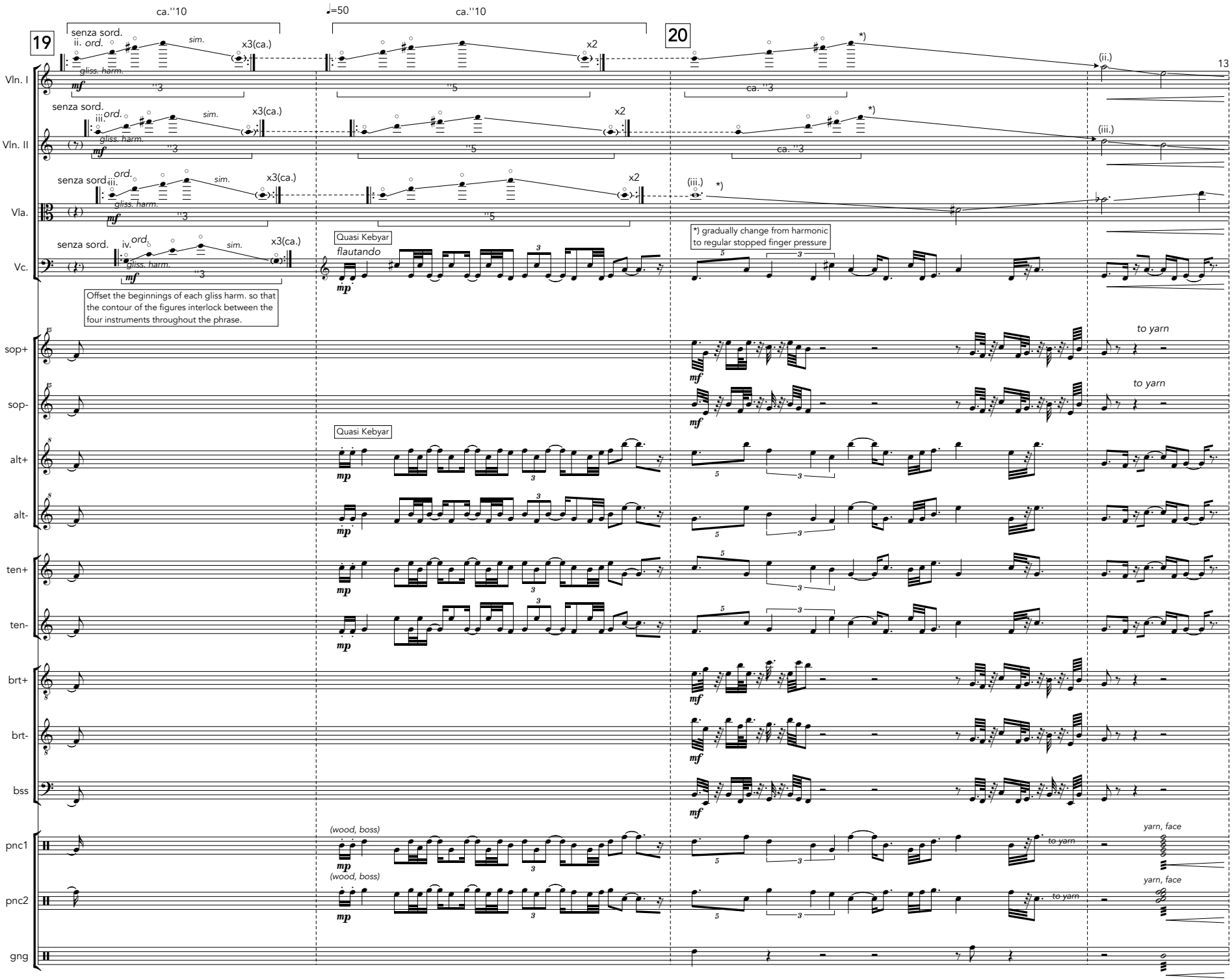

ca.''20
ca.''10
13
8
Vln. I
Vln. II
Vla.
Vc.
sop+
sop-
alt+
alt-
ten+
ten-
brt+
brt-
bss
pnc1
pnc2
gng
*) This section, continued on the next page, aims at producing phasing tremolos between the various parts, to create an effect reminiscent of a strobe accelerating and decelerating. The player should execute an even tremolo that flutuates from fast to slow on a linear time curve, ranging from roughly 720 bpm at the fastest to 240 bmp at the slowest, becoming sautille at the slowest. Each player should be aware of the accompanying parts, allowing for the various time curves to cross based on the written proportions (7-8-9-10).
mp
mp

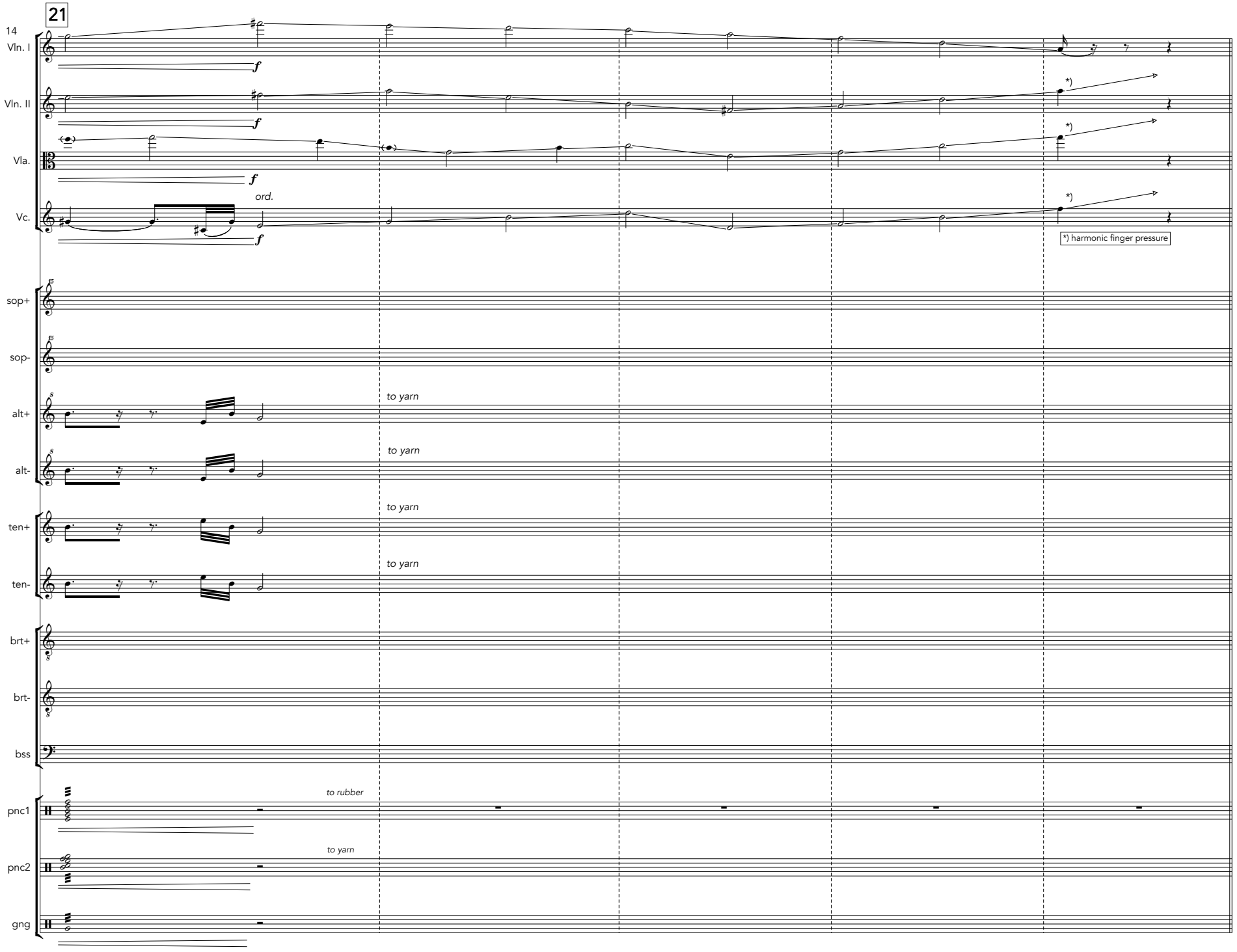

14
ca. ''100
9
Vln. I
Vln. II
Vla.
Vc.
(repeat rhythm and duration, changing notes in the following sequence)x7
(repeat rhythm and duration, changing notes in the following sequence)x6
(repeat rhythm and duration, changing notes in the following sequence)x5,1/2
(repeat rhythm and duration, changing notes in the following sequence)x5
[2nd rep.]
[3rd rep.]
[4th rep.]
[5th rep.]
[6th rep.]
[7th rep.]
[6th rep., 1/2]
ca. ''14
ca. ''16
ca. ''18
ca. ''20
(mp)
=50
Quasi Kebyar
sop+
sop-
alt+
alt-
ten+
ten-
brt+
brt-
bss
ca. ''60
ca. ''20
pp
pnc1
pnc2
gng
(yarn, face)
x2(ca.)
x3(ca.)
ca. ''70
7''
8''
10''

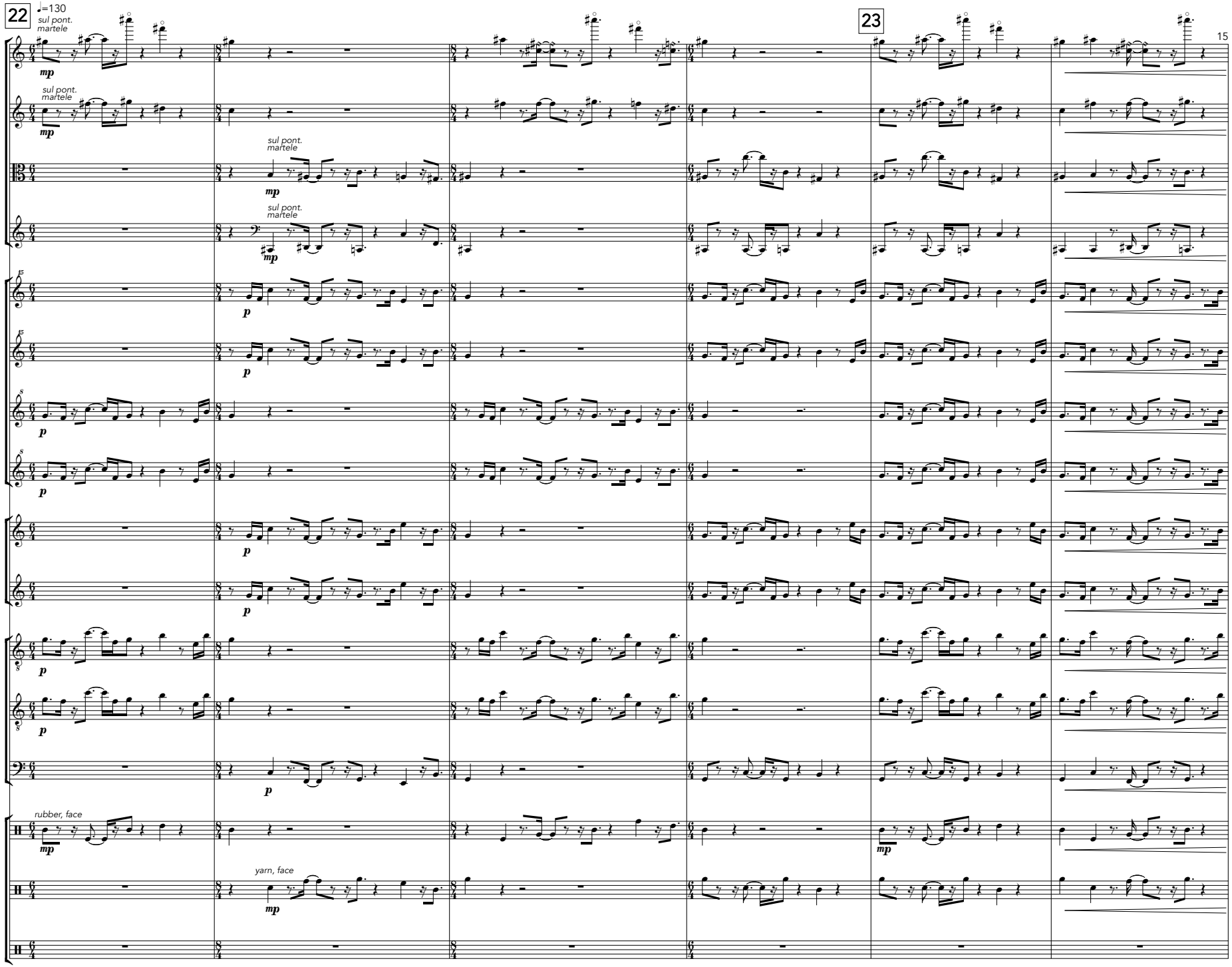

15
ca.''10
con sord.
16
♩=50
10
Vln. I
as legato as possible, seamless
Vln. II
Vla.
Vc.
sop+
sop-
alt+
alt-
ten+
ten-
brt+
brt-
bss
pnc1
pnc2
gng
ca. ''5
fast, soft tremolo
x3(ca.)
x2.5(ca.)
x2(ca.)
to wood
3''
4''
5''

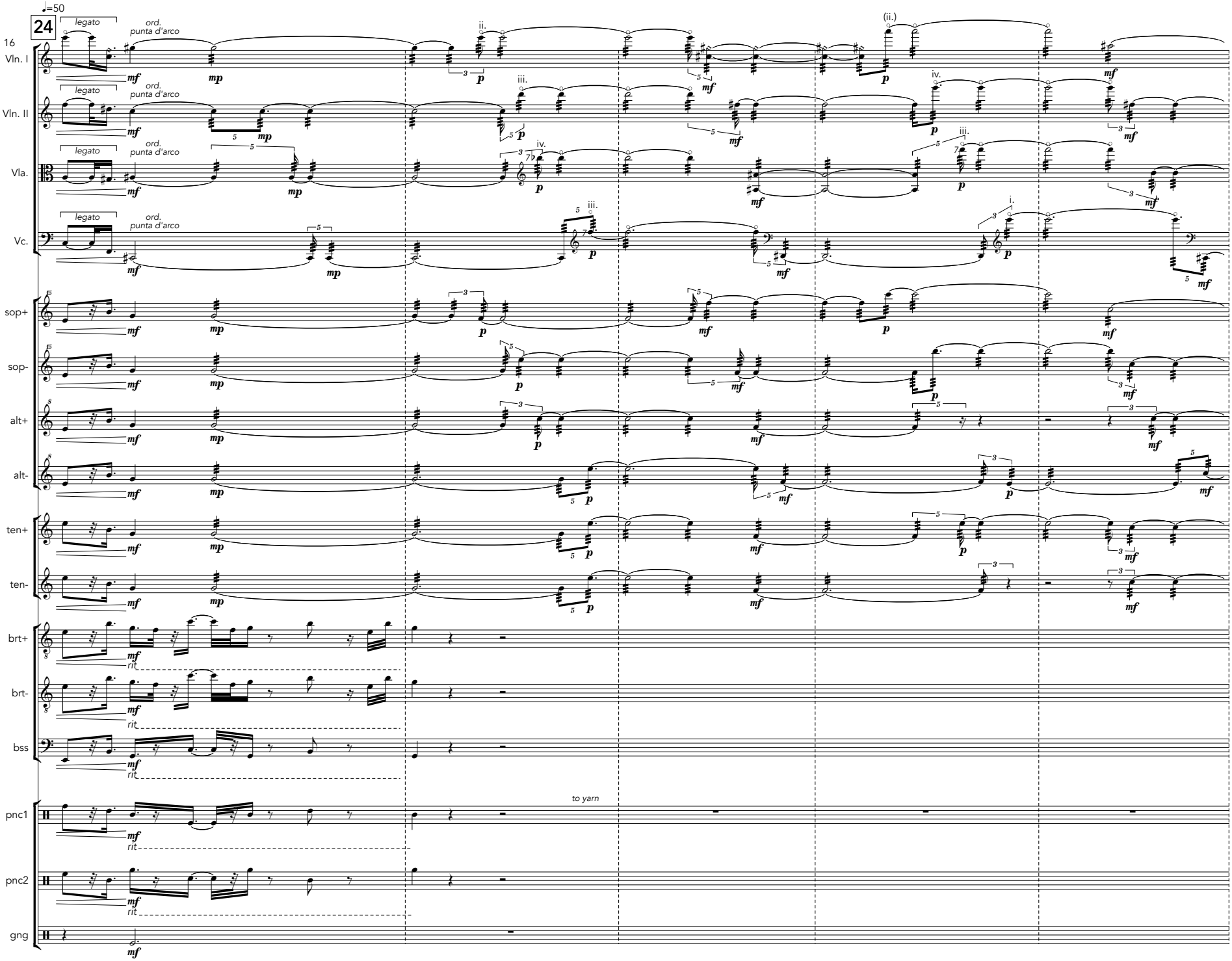

17
Vln. I
Vln. II
Vla.
Vc.
sop+
sop-
alt+
alt-
ten+
ten-
brt+
brt-
bss
pnc1
pnc2
gng
mf
mp
p

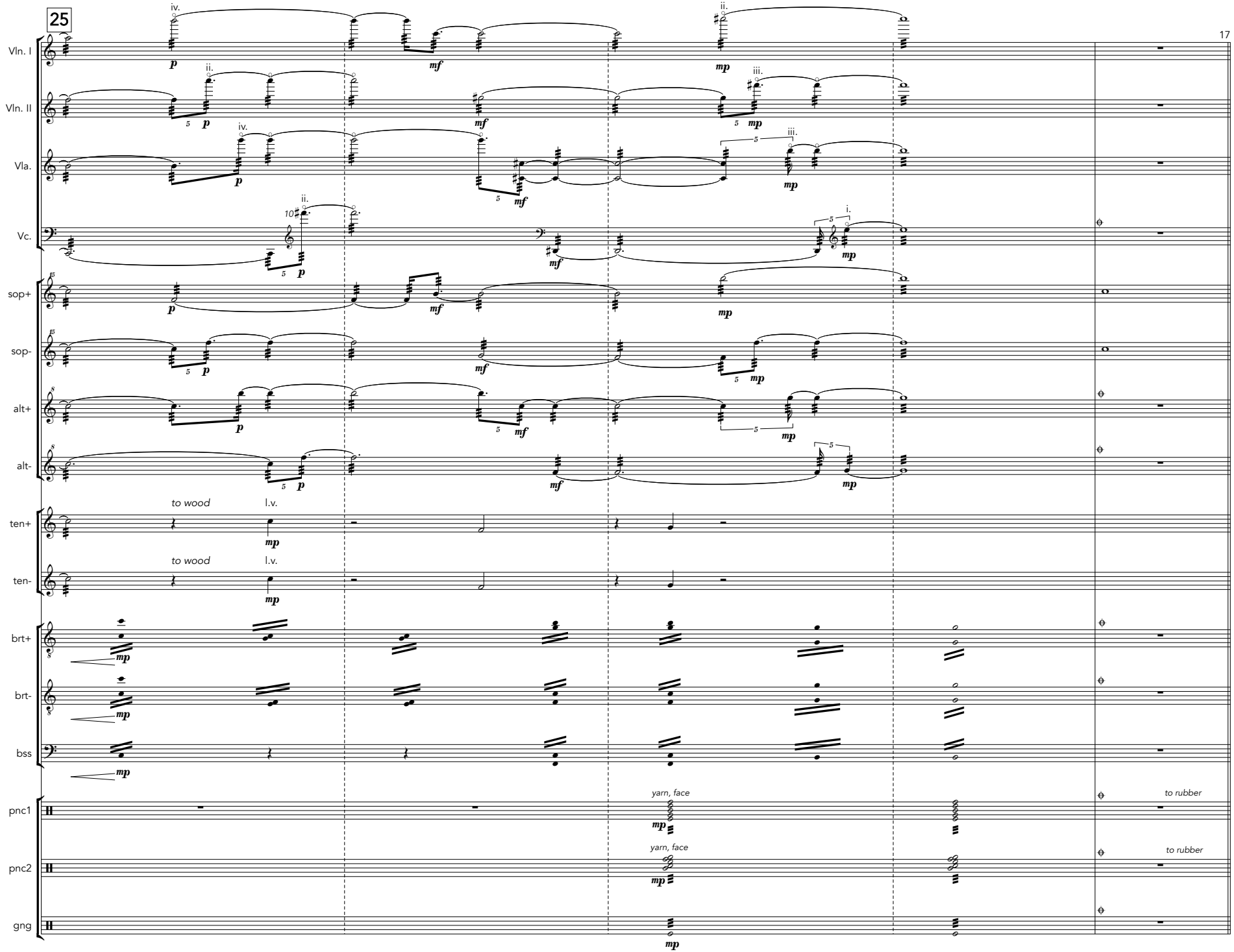

12
18
♩=60
Quasi Kebyar
Vln. I
Vln. II
Vla.
Vc.
sop+
sop-
alt+
alt-
ten+
ten-
brt+
brt-
bss
pnc1
pnc2
gng
martele
spiccatto
wood, boss
open face
p
pp
mp

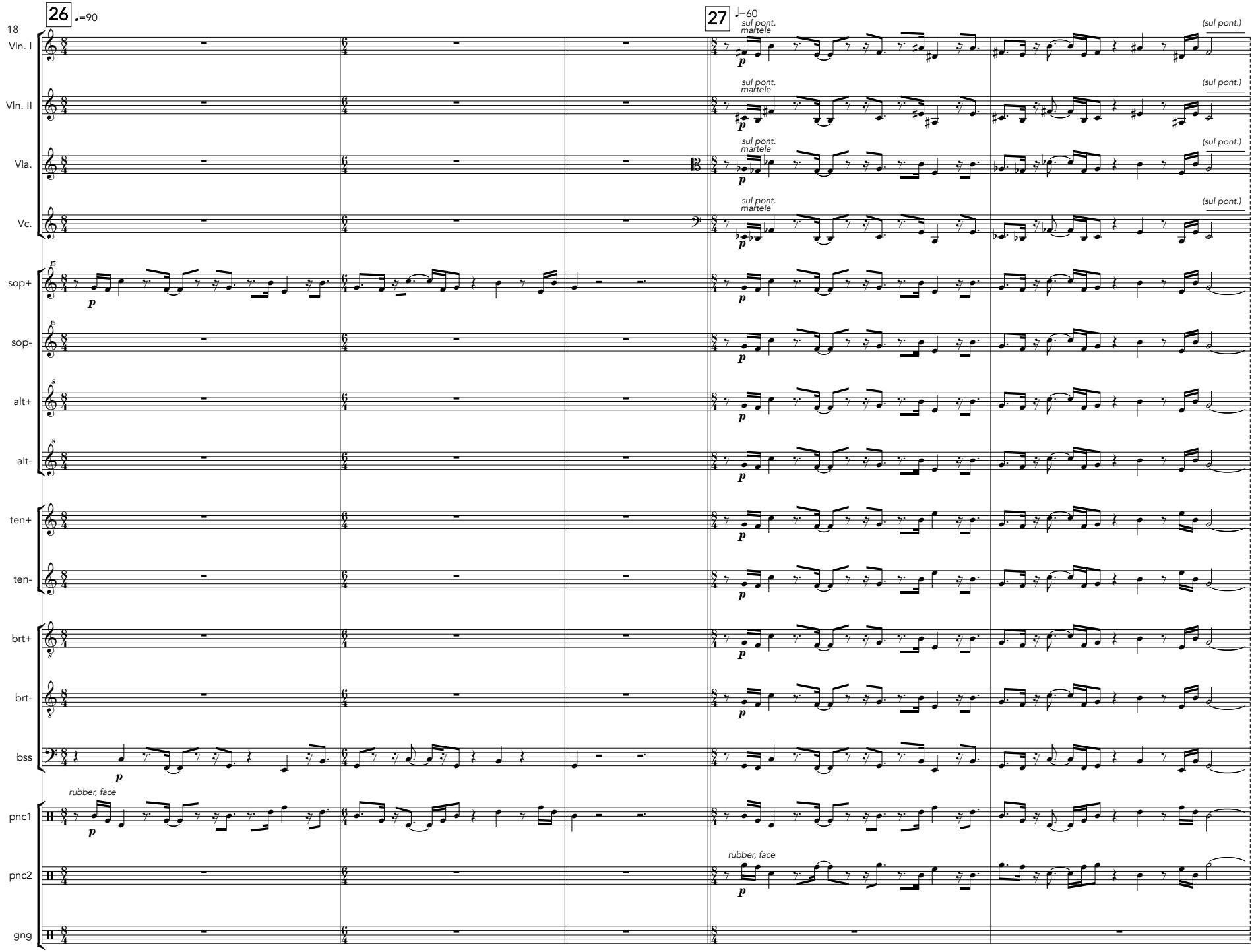

19
20
ca.''10
♩=50
ca.''10
senza sord.
ii. ord.
sim.
x3(ca.)
gliss. harm.
x2
*)
(ii.)
Vln. I
iii. ord.
(iii.)
Vln. II
Vla.
iv. ord.
Vc.
Quasi Kebyar
flautando
*) gradually change from harmonic to regular stopped finger pressure
Offset the beginnings of each gliss harm. so that the contour of the figures interlock between the four instruments throughout the phrase.
to yarn
sop+
sop-
alt+
alt-
ten+
ten-
brt+
brt-
bss
(wood, boss)
pnc1
pnc2
yarn, face
gng

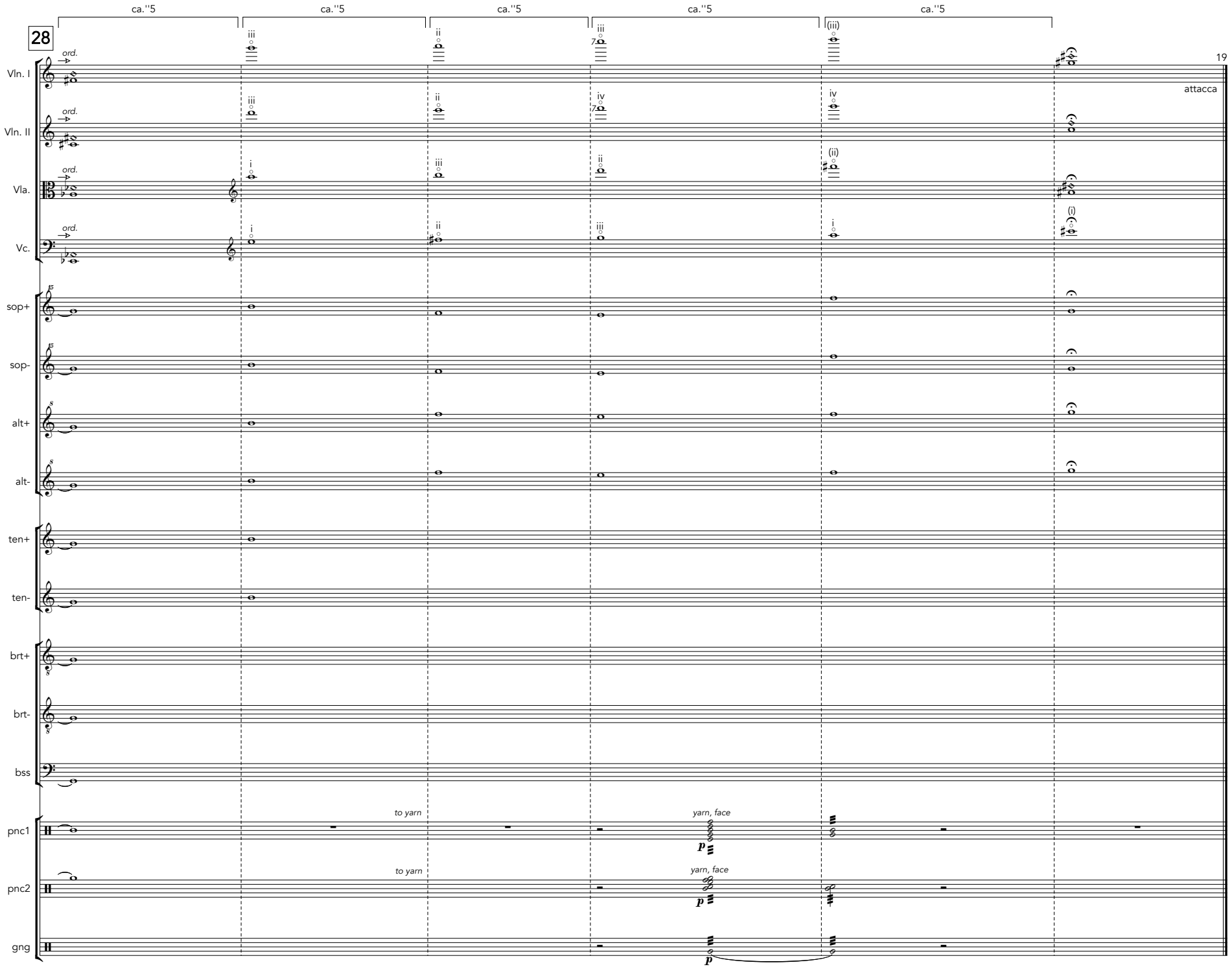

21
Vln. I
Vln. II
Vla.
Vc.
f
ord.
*)
*) harmonic finger pressure
sop+
sop-
alt+
alt-
ten+
ten-
brt+
brt-
bss
pnc1
pnc2
gng
to yarn
to rubber


22
♩=130
23
Vln. I
Vln. II
Vla.
Vc.
sop+
sop-
alt+
alt-
ten+
ten-
brt+
brt-
bss
pnc1
pnc2
gng
sul pont.
martele
mp
p
rubber, face
yarn, face


♩=50
24
16
Vln. I
Vln. II
Vla.
Vc.
sop+
sop-
alt+
alt-
ten+
ten-
brt+
brt-
bss
pnc1
pnc2
gng
legato
ord.
punta d'arco
rit
to yarn


25
Vln. I
Vln. II
Vla.
Vc.
sop+
sop-
alt+
alt-
ten+
ten-
brt+
brt-
bss
pnc1
pnc2
gng
to wood
l.v.
yarn, face
to rubber


26
♩=90
27
♩=60
Vln. I
Vln. II
Vla.
Vc.
sop+
sop-
alt+
alt-
ten+
ten-
brt+
brt-
bss
pnc1
pnc2
gng
sul pont.
martele
(sul pont.)
rubber, face
p



iii. Oxygen [AQUA]

Brian Baumbusch

♩=120

Violin I — *as legato as possible* — *mp*

Violin II — *as legato as possible* — *mp*

Viola — *as legato as possible* — *mp*

Violoncello — *as legato as possible* — *mp*

soprano+ — *p*

soprano- — *p*

alto+ — *p*

alto- — *p*

tenor+ — *mp*

tenor- — *mp*

baritone+ — *mf*

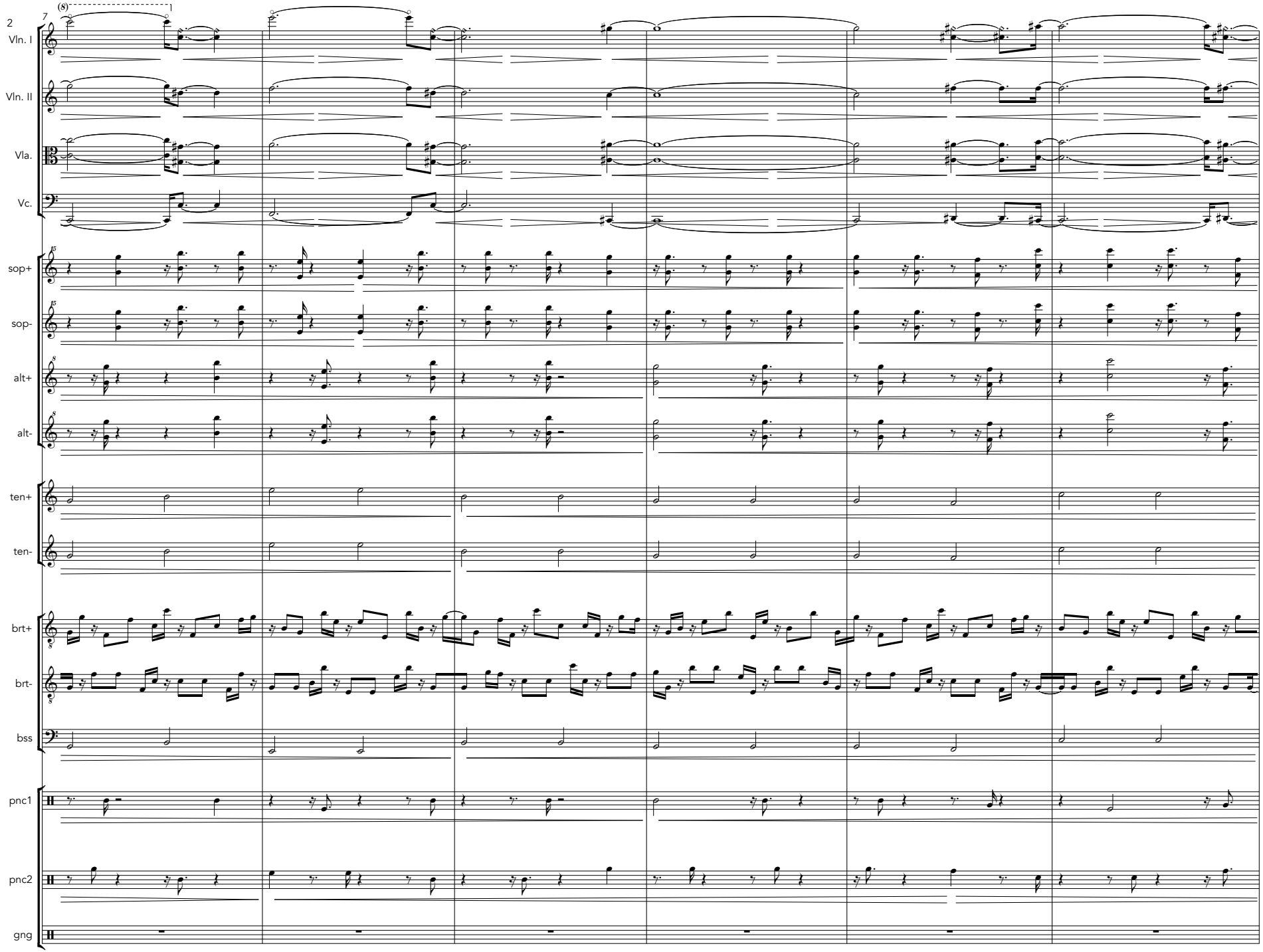
baritone- — *mf*

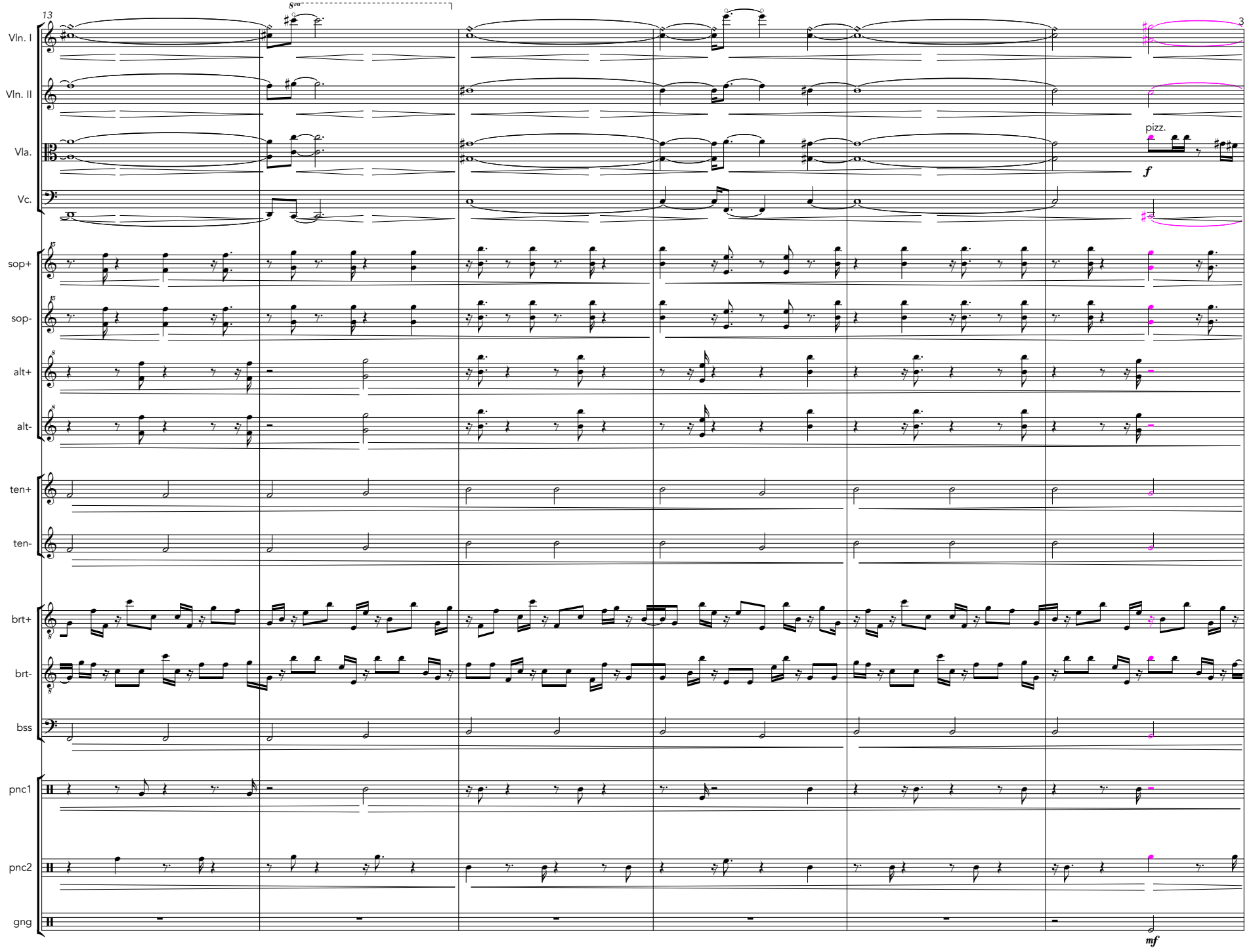
bass — *mp*

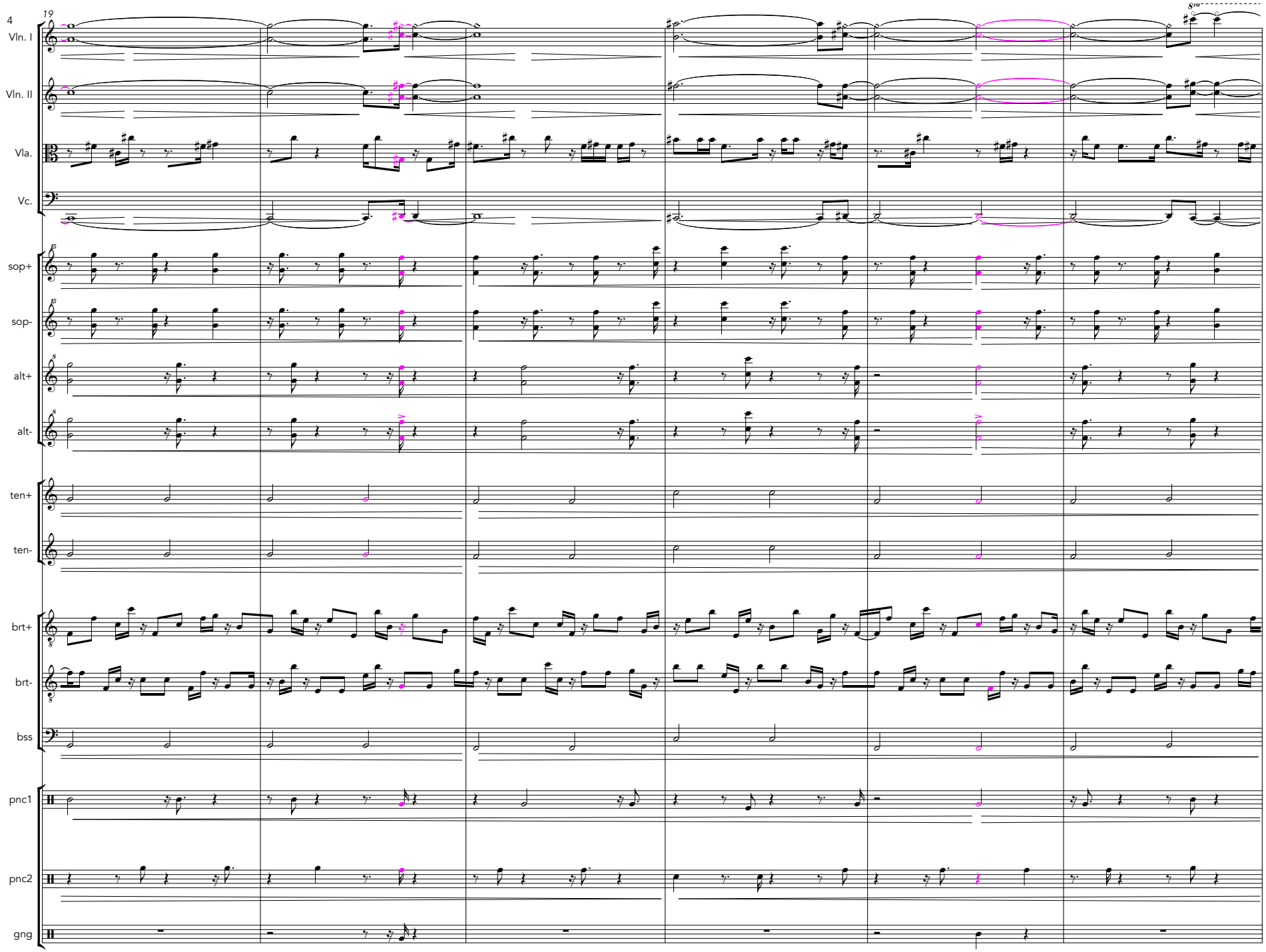
pencon 1 — Trompong, Unmuted open-face strokes until mm. 91 — *p*

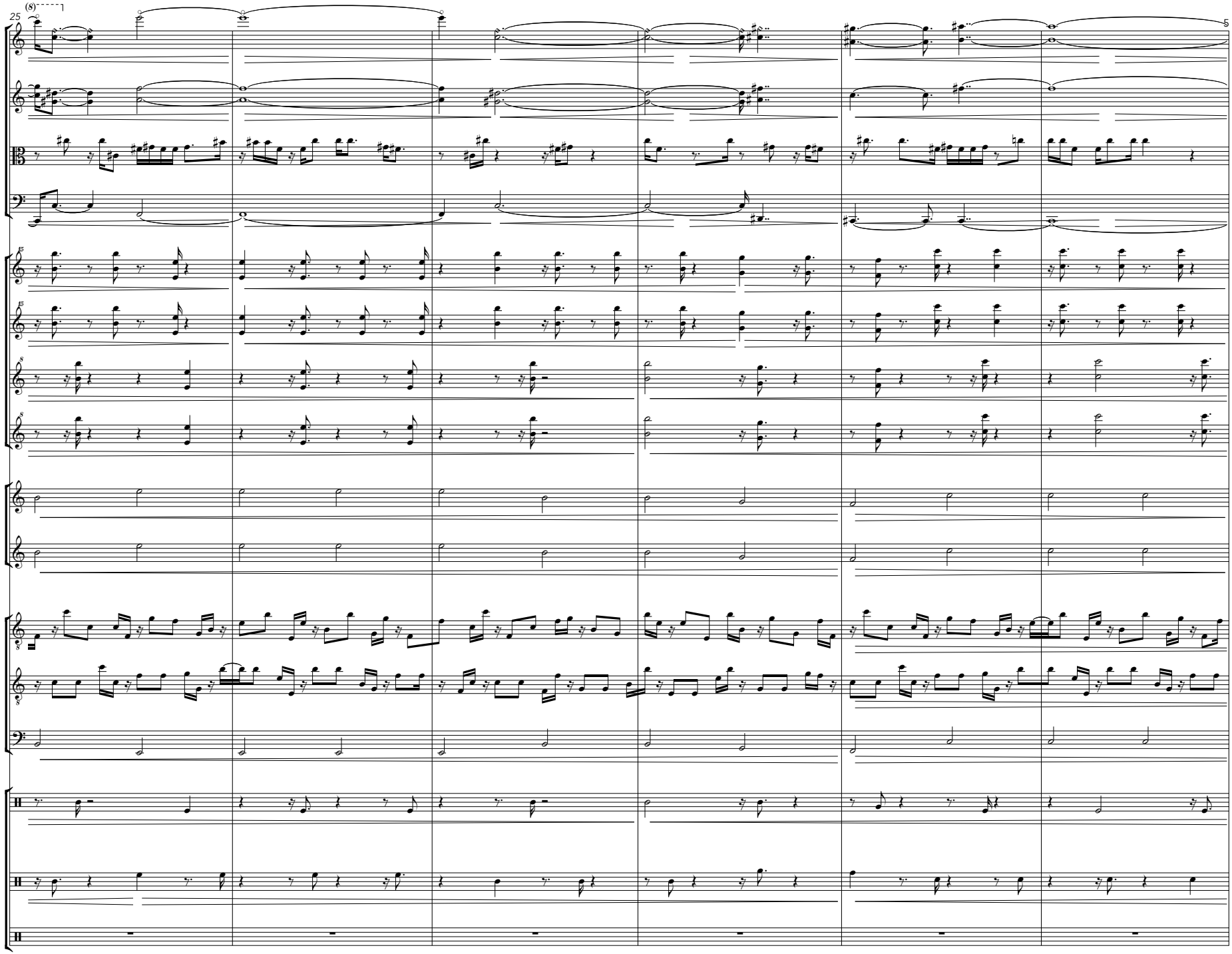
pencon 2 — Muted strokes on LBE Pencon — *p*

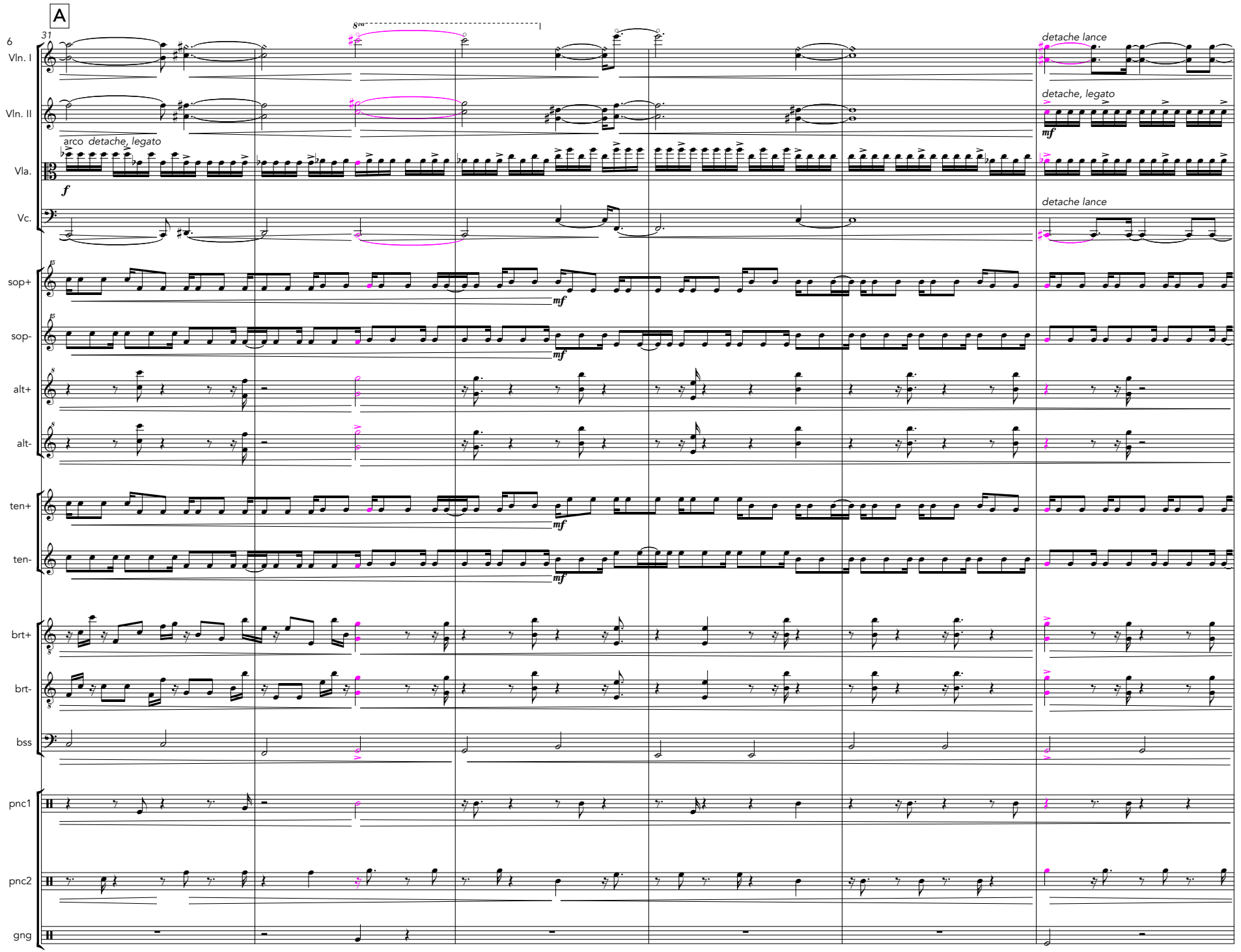
gong

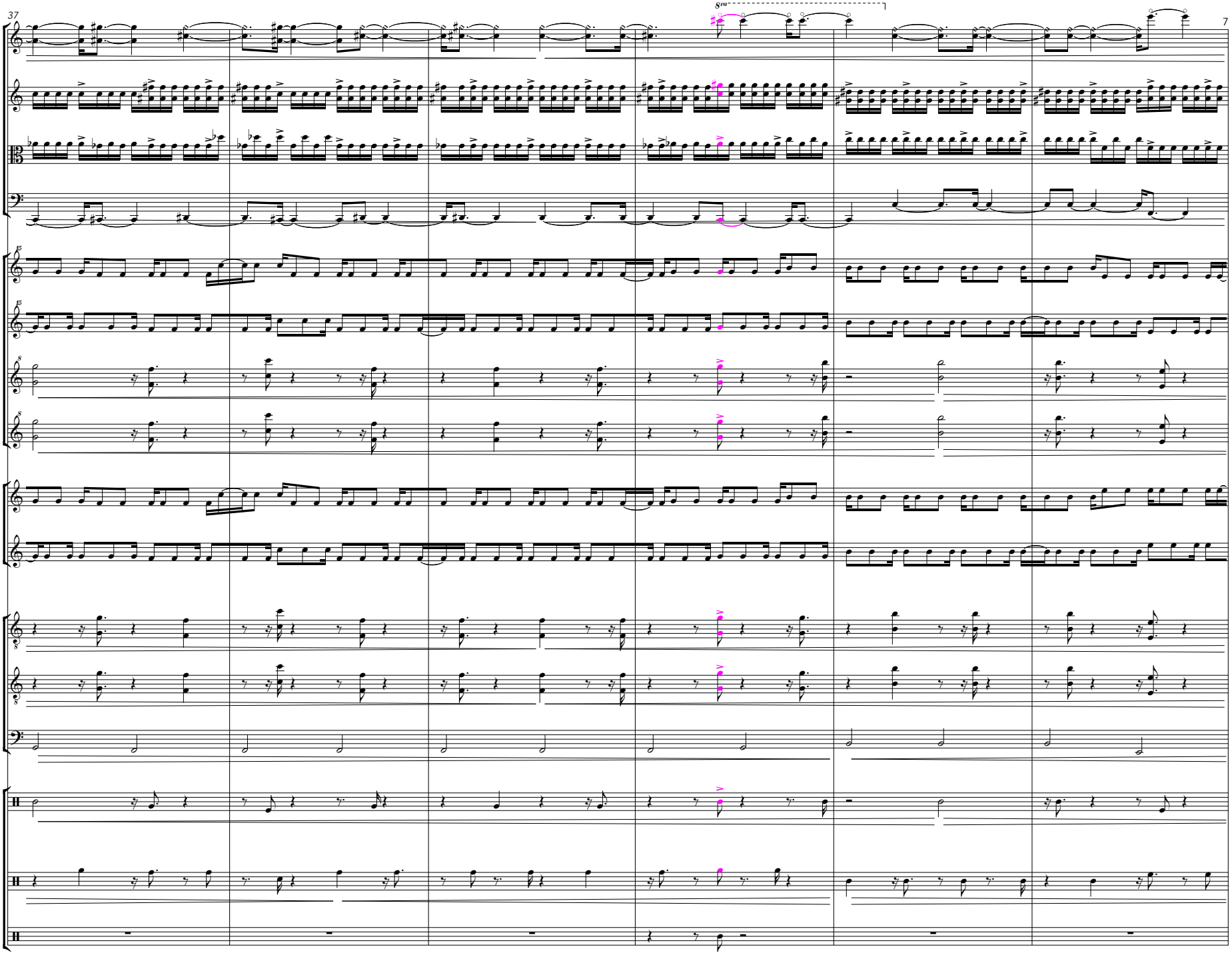

2
7
(8)
Vln. I
Vln. II
Vla.
Vc.
sop+
sop-
alt+
alt-
ten+
ten-
brt+
brt-
bss
pnc1
pnc2
gng

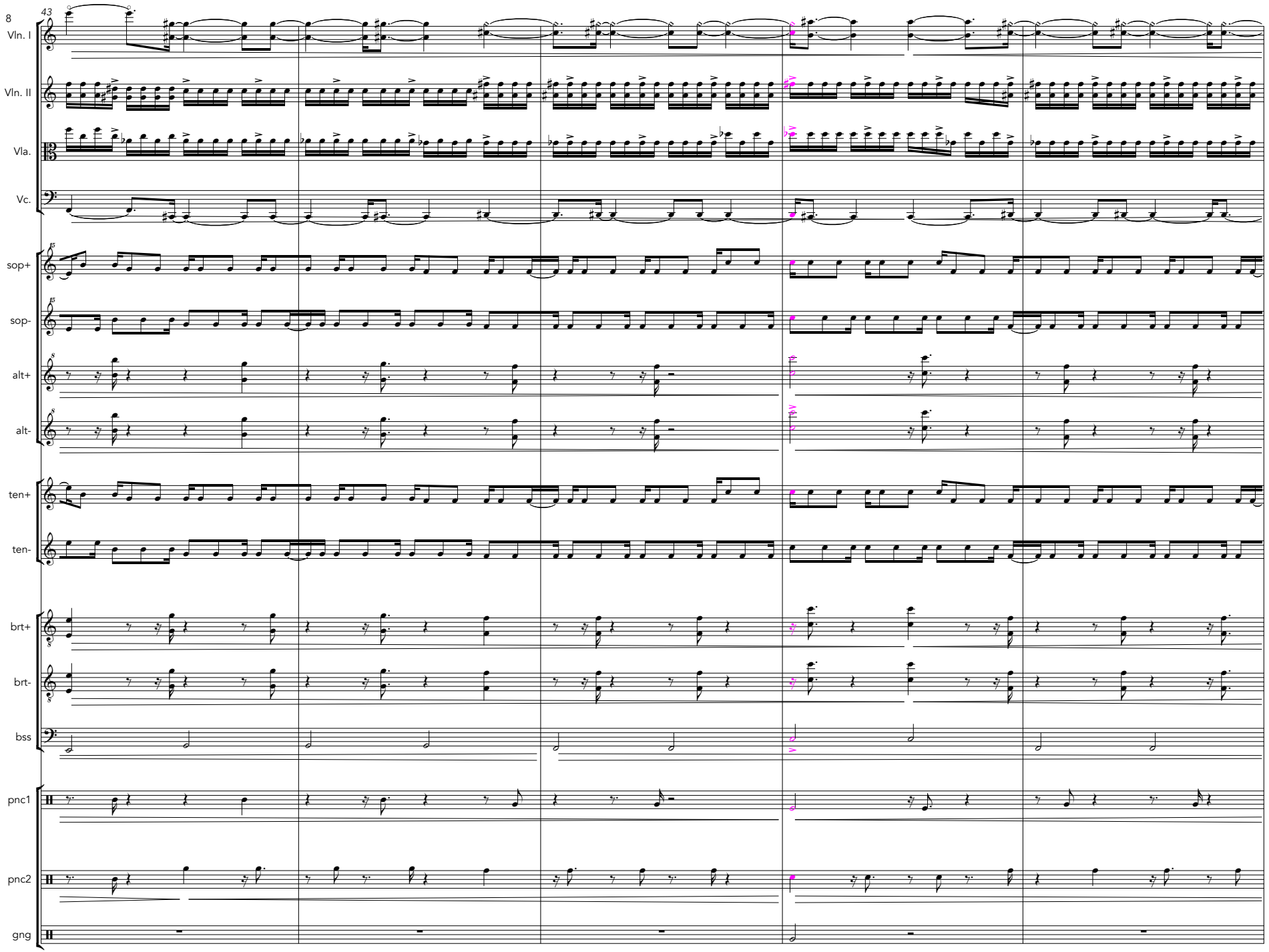

13
3
Vln. I
Vln. II
Vla.
Vc.
pizz.
f
sop+
sop-
alt+
alt-
ten+
ten-
brt+
brt-
bss
pnc1
pnc2
gng
mf

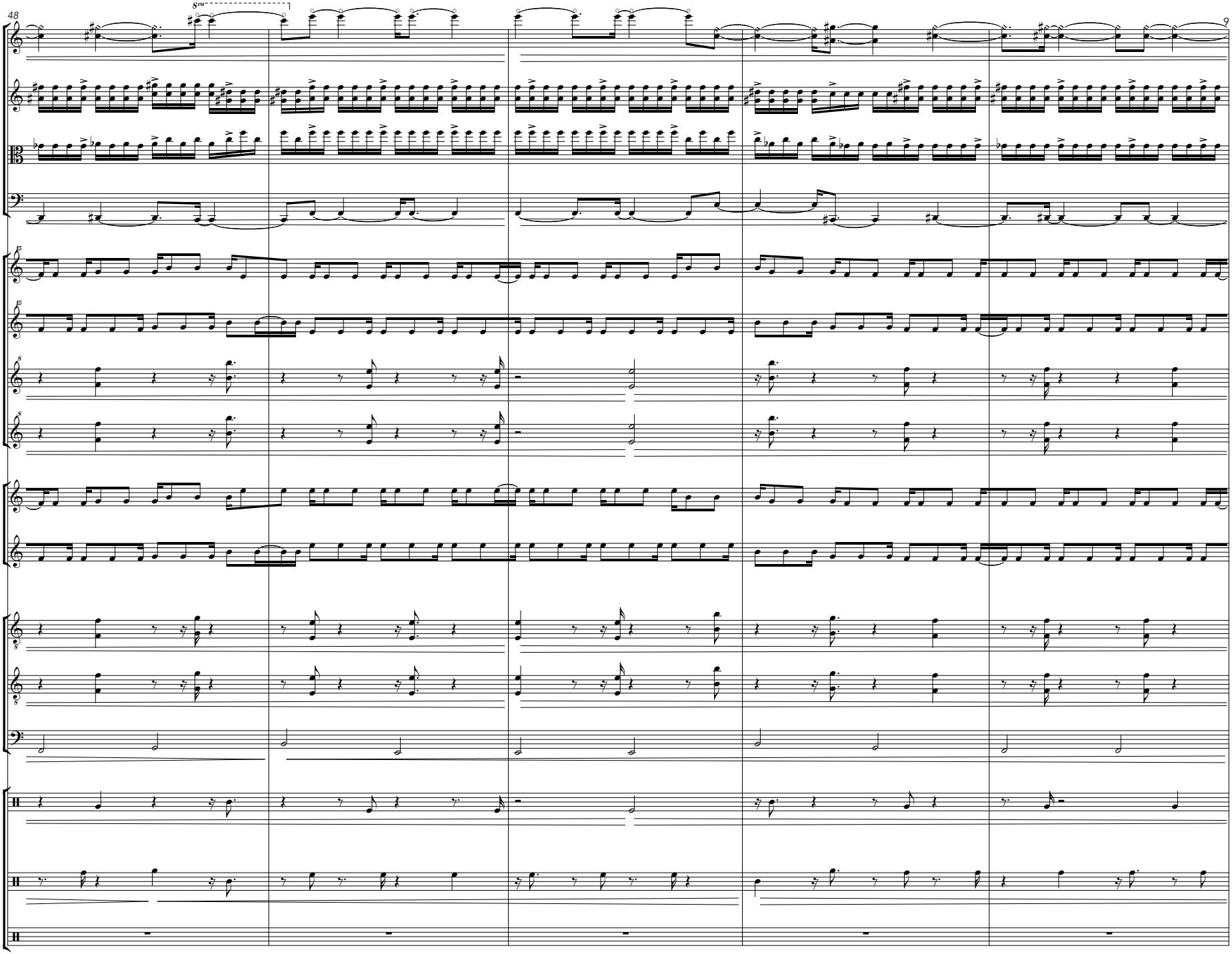

4
19
8va
Vln. I
Vln. II
Vla.
Vc.
sop+
sop-
alt+
alt-
ten+
ten-
brt+
brt-
bss
pnc1
pnc2
gng

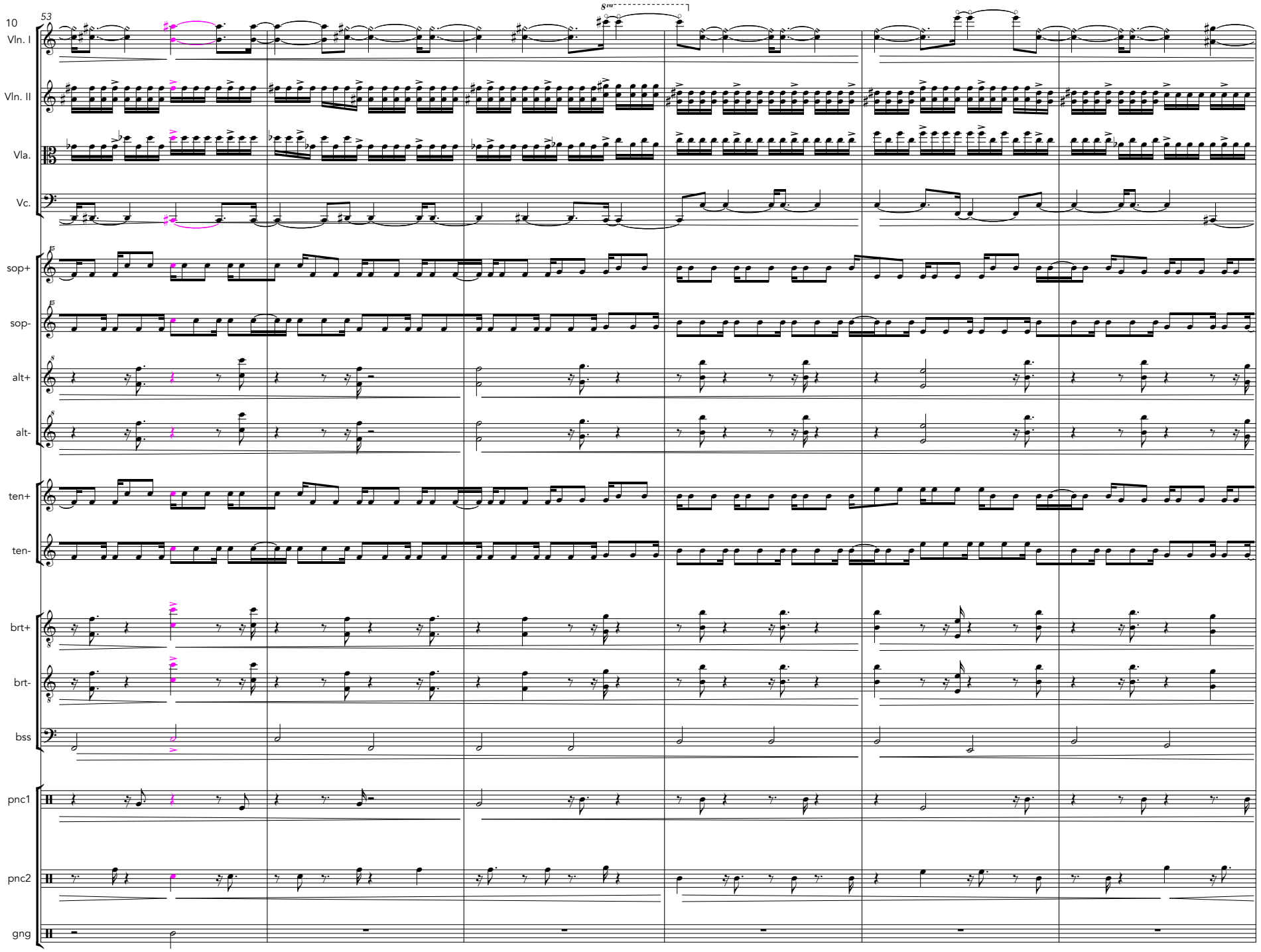

25
(8)
5
Vln. I
Vln. II
Vla.
Vc.
sop+
sop-
alt+
alt-
ten+
ten-
brt+
brt-
bss
pnc1
pnc2
gng

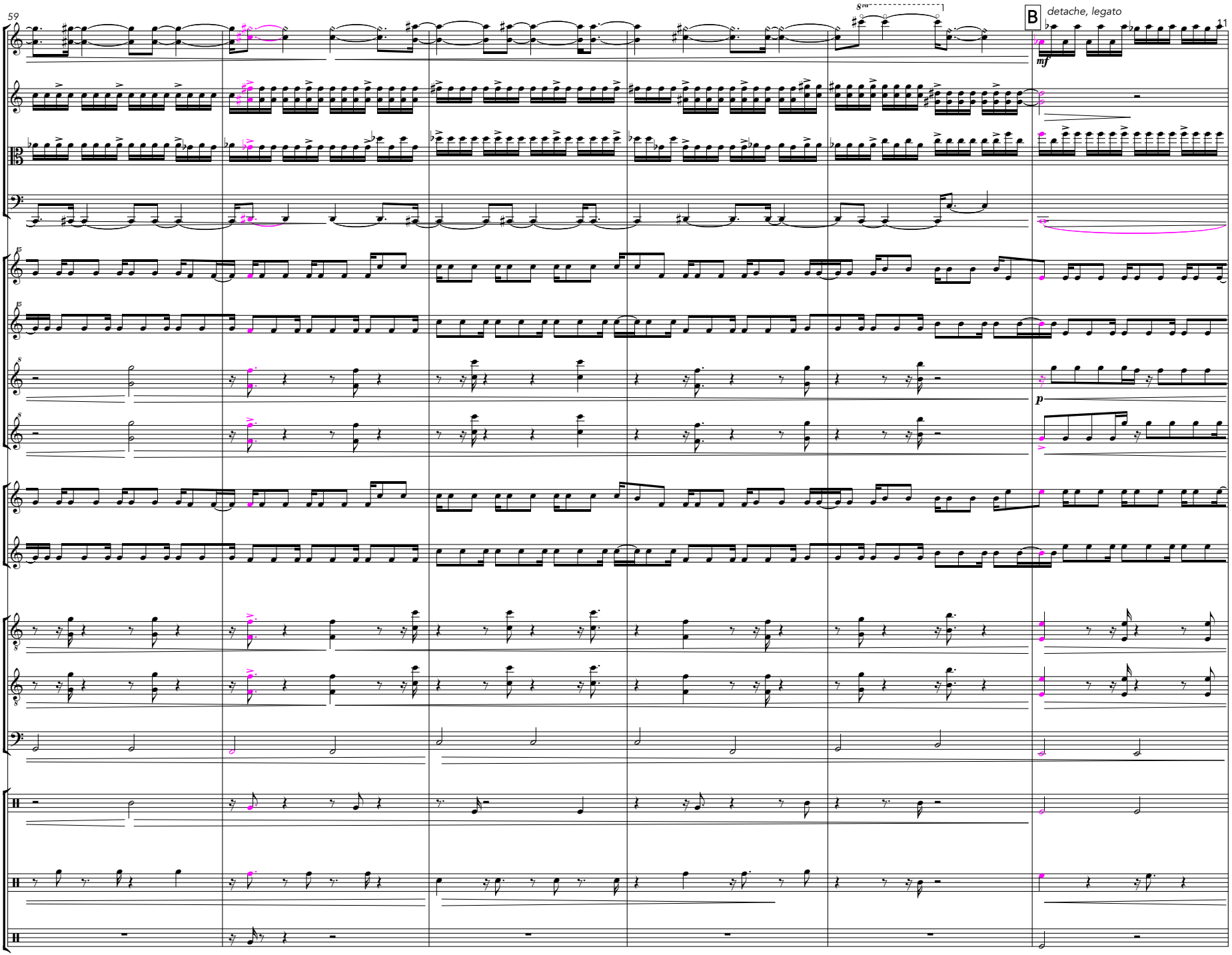

A
6
31
Vln. I
Vln. II
Vla.
Vc.
sop+
sop-
alt+
alt-
ten+
ten-
brt+
brt-
bss
pnc1
pnc2
gng
arco detache, legato
detache lance
detache, legato
detache lance
f
mf
mf
mf
mf
mf

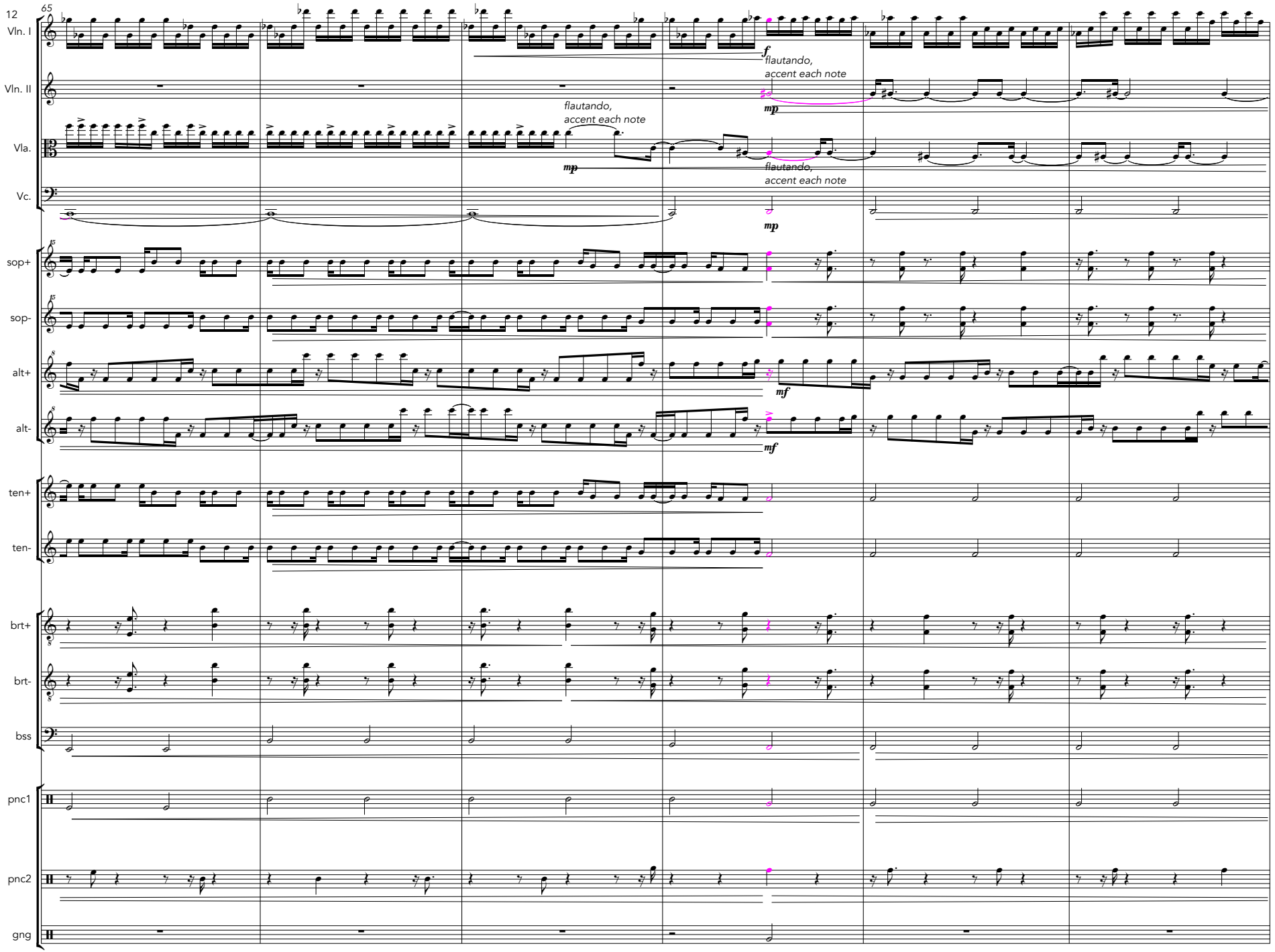

37
7
8va
Vln. I
Vln. II
Vla.
Vc.
sop+
sop-
alt+
alt-
ten+
ten-
brt+
brt-
bss
pnc1
pnc2
gng

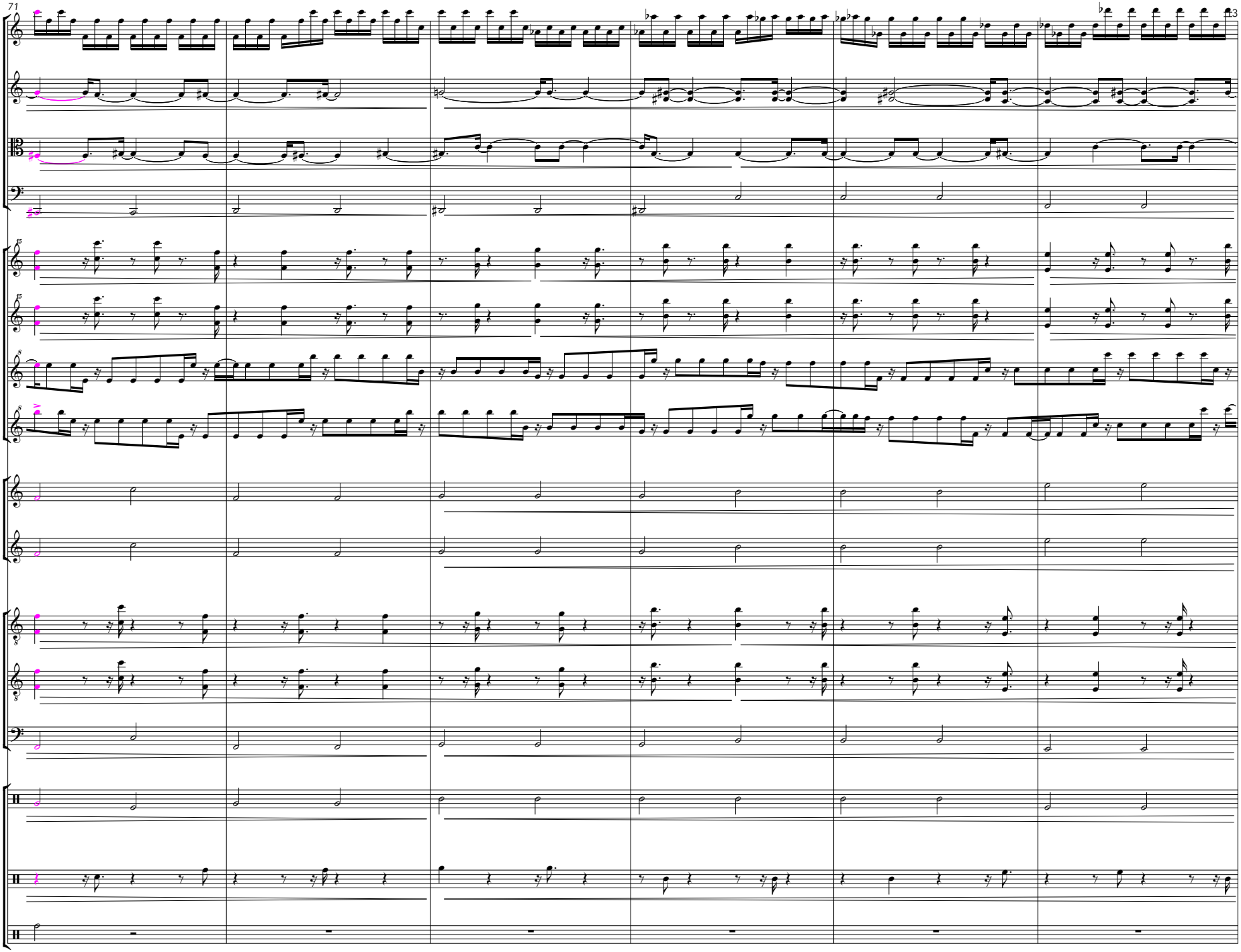

8
43
Vln. I
Vln. II
Vla.
Vc.
sop+
sop-
alt+
alt-
ten+
ten-
brt+
brt-
bss
pnc1
pnc2
gng

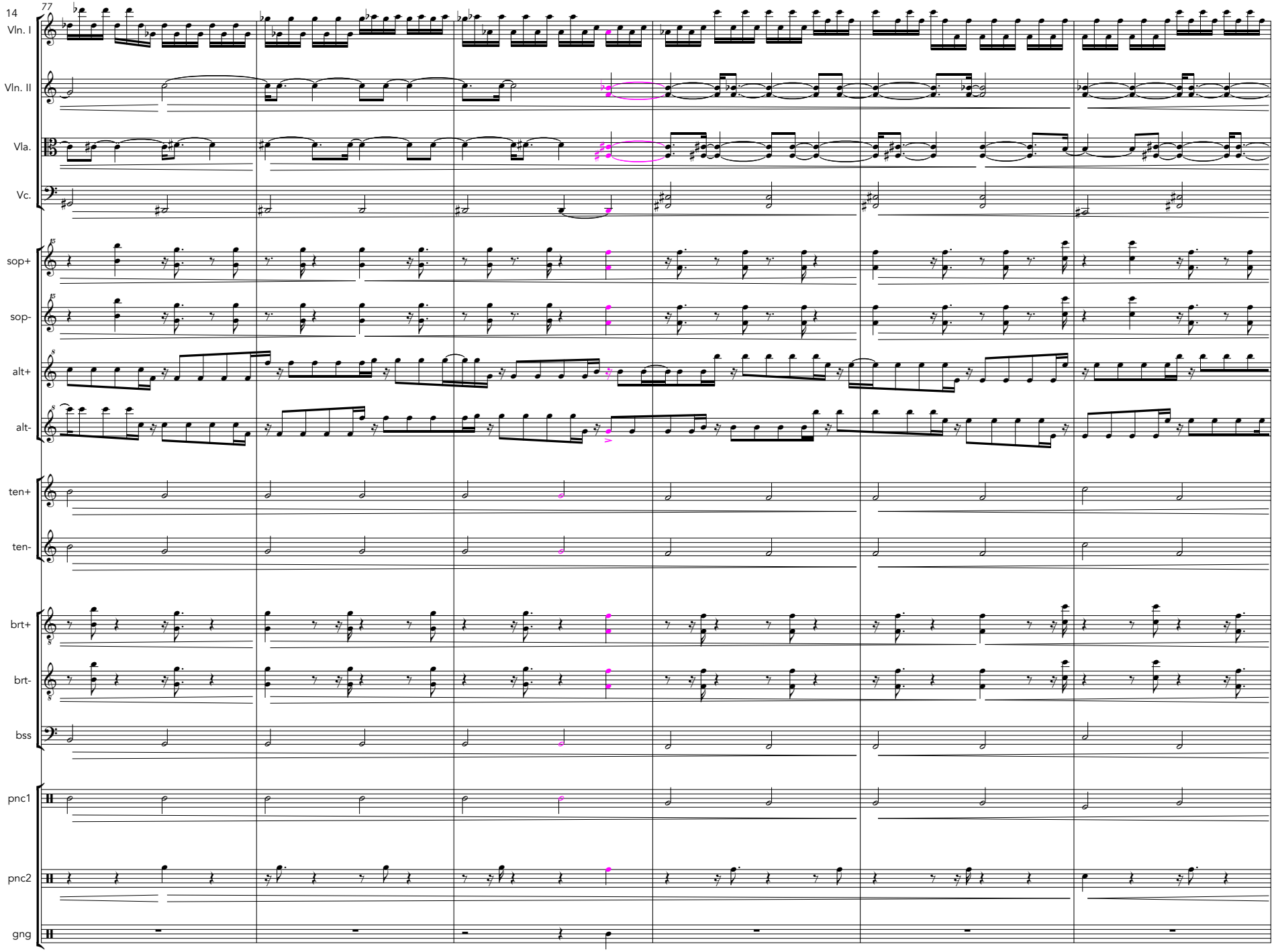

48
8va
9
Vln. I
Vln. II
Vla.
Vc.
sop+
sop-
alt+
alt-
ten+
ten-
brt+
brt-
bss
pnc1
pnc2
gng

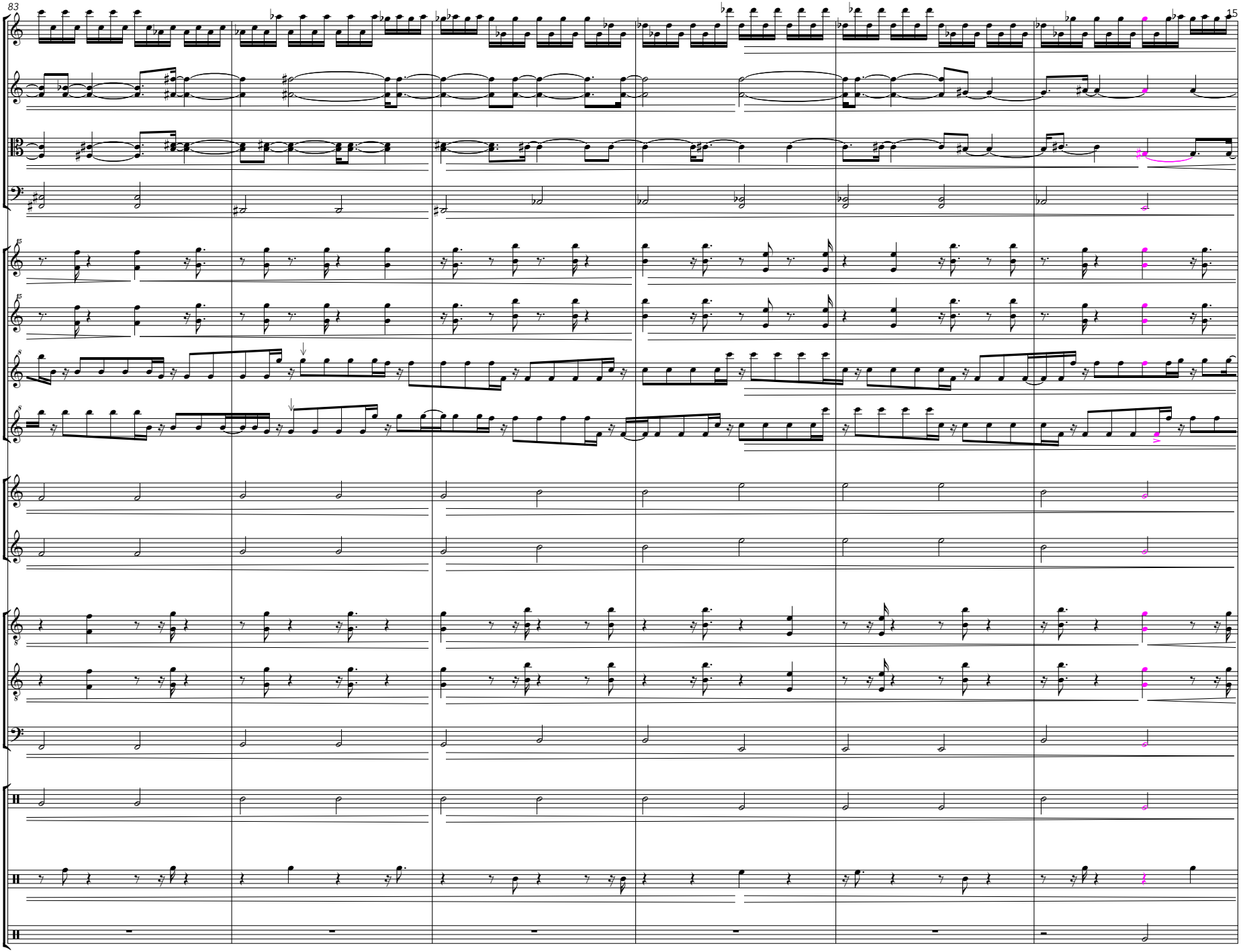

10
53
8va
Vln. I
Vln. II
Vla.
Vc.
sop+
sop-
alt+
alt-
ten+
ten-
brt+
brt-
bss
pnc1
pnc2
gng

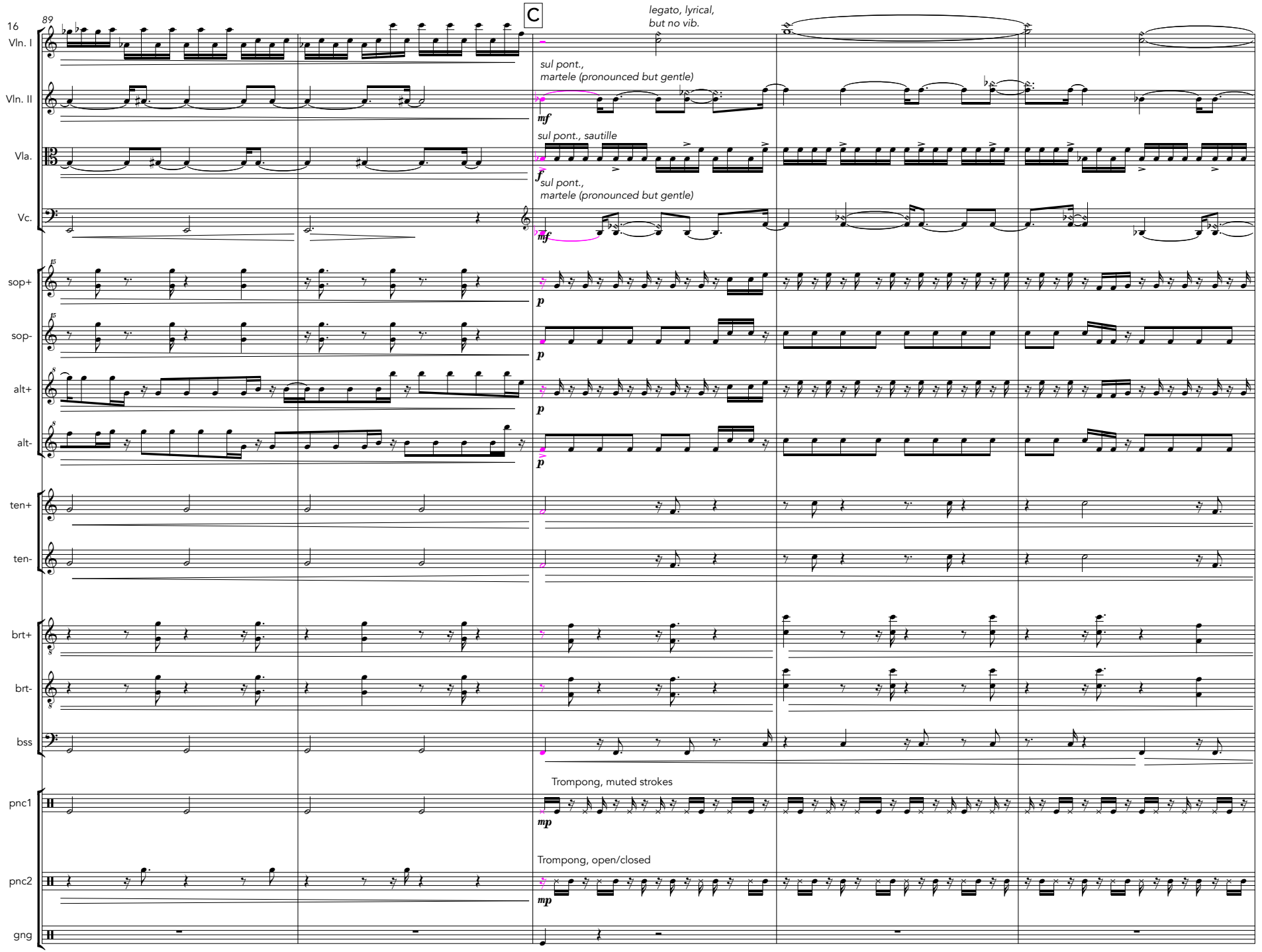

59
8va
B
detache, legato
11
Vln. I
Vln. II
Vla.
Vc.
sop+
sop-
alt+
alt-
ten+
ten-
brt+
brt-
bss
pnc1
pnc2
gng
mf
p

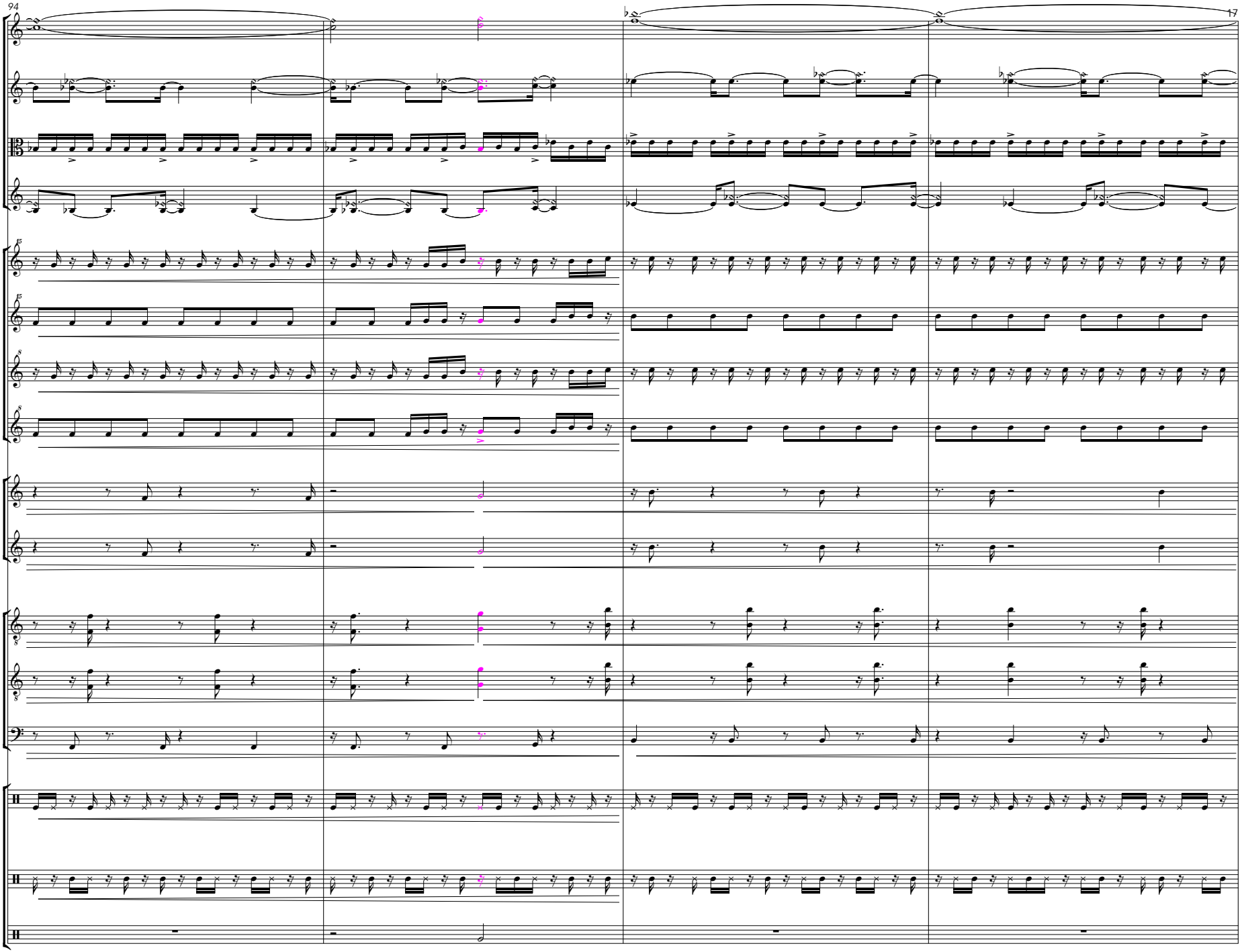

12
65
Vln. I
Vln. II
Vla.
Vc.
sop+
sop-
alt+
alt-
ten+
ten-
brt+
brt-
bss
pnc1
pnc2
gng
f
flautando,
accent each note
mp
flautando,
accent each note
mp
flautando,
accent each note
mp
mf
mf

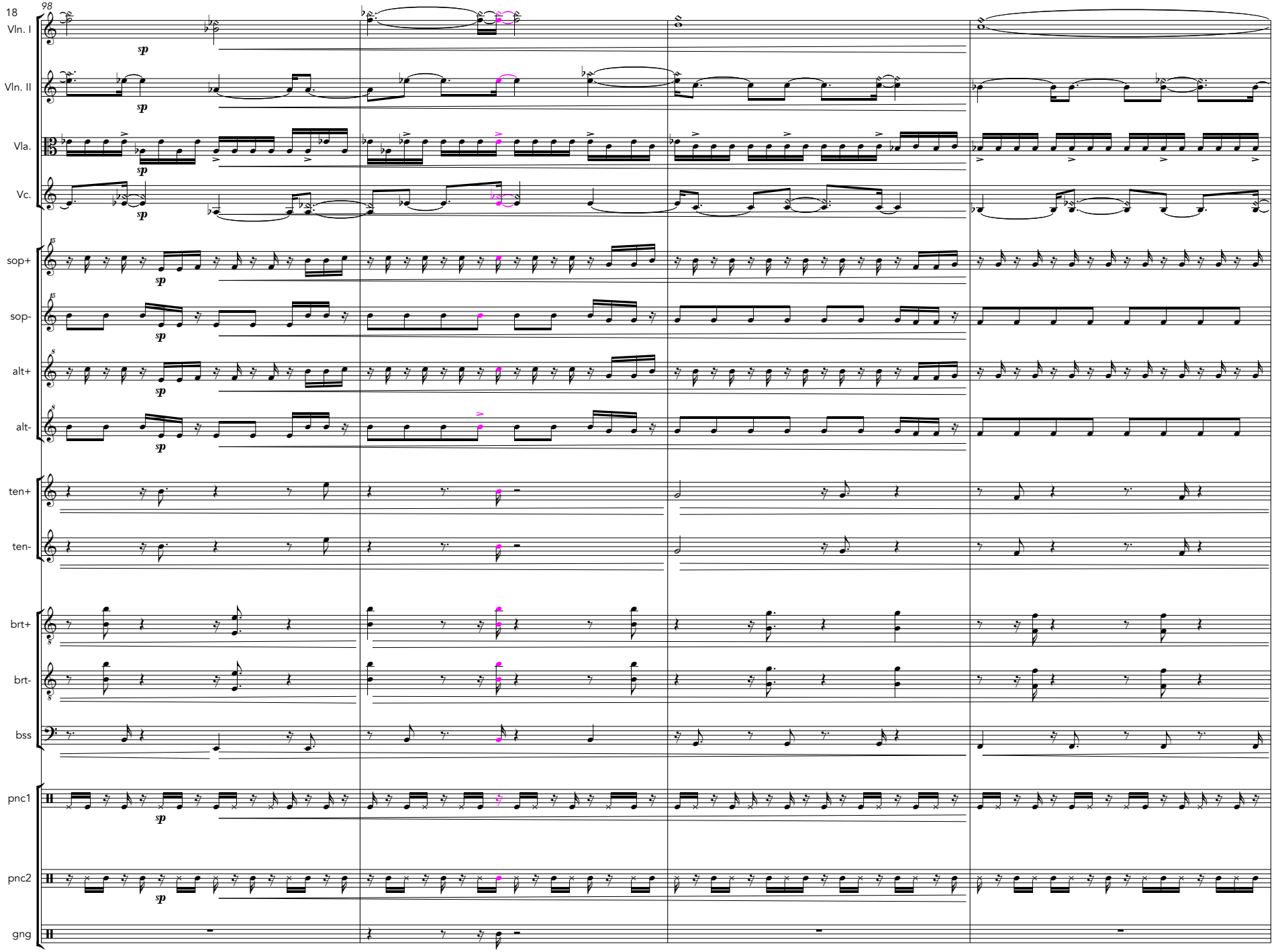

71
Vln. I
Vln. II
Vla.
Vc.
sop+
sop-
alt+
alt-
ten+
ten-
brt+
brt-
bss
pnc1
pnc2
gng

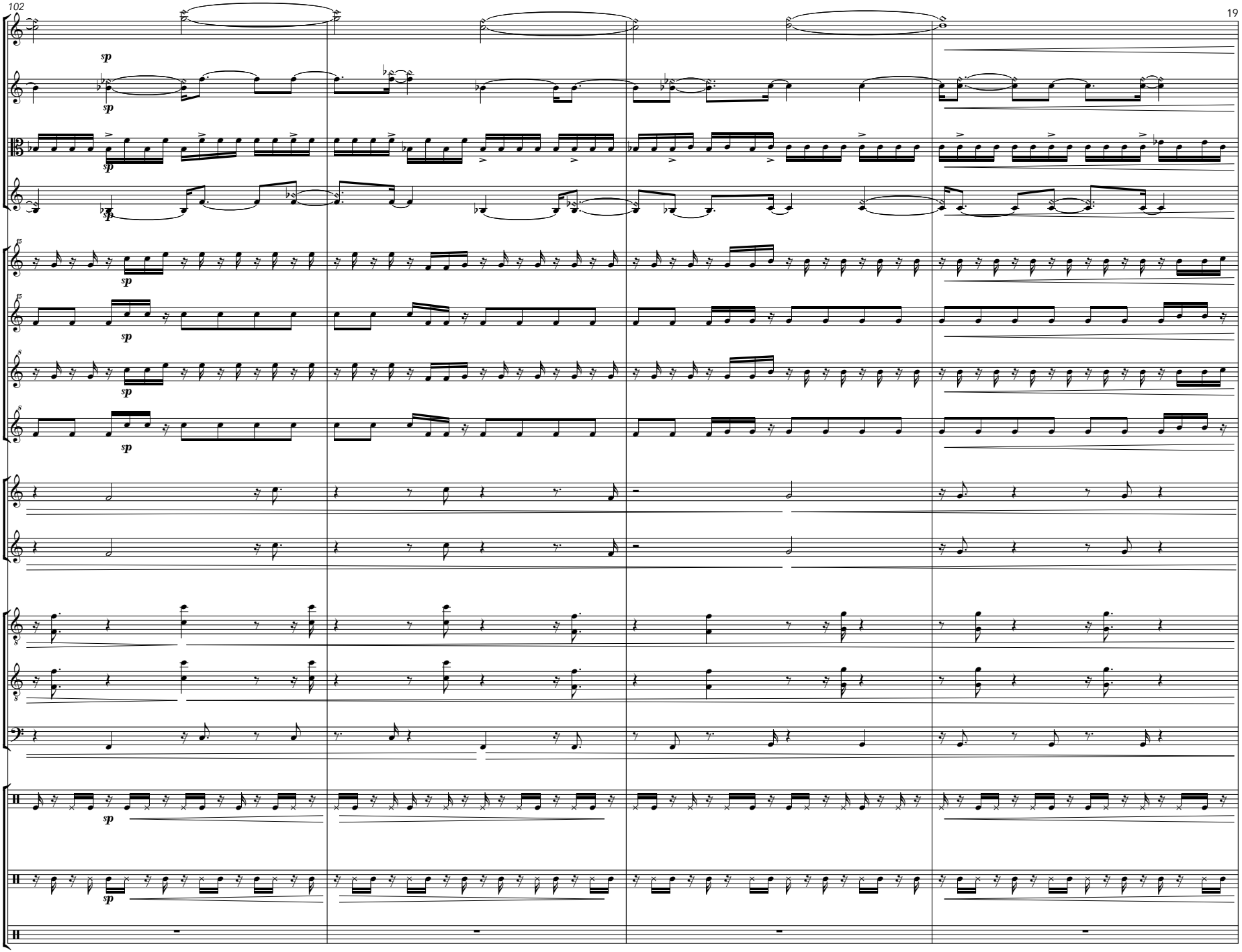

14
77
Vln. I
Vln. II
Vla.
Vc.
sop+
sop-
alt+
alt-
ten+
ten-
brt+
brt-
bss
pnc1
pnc2
gng

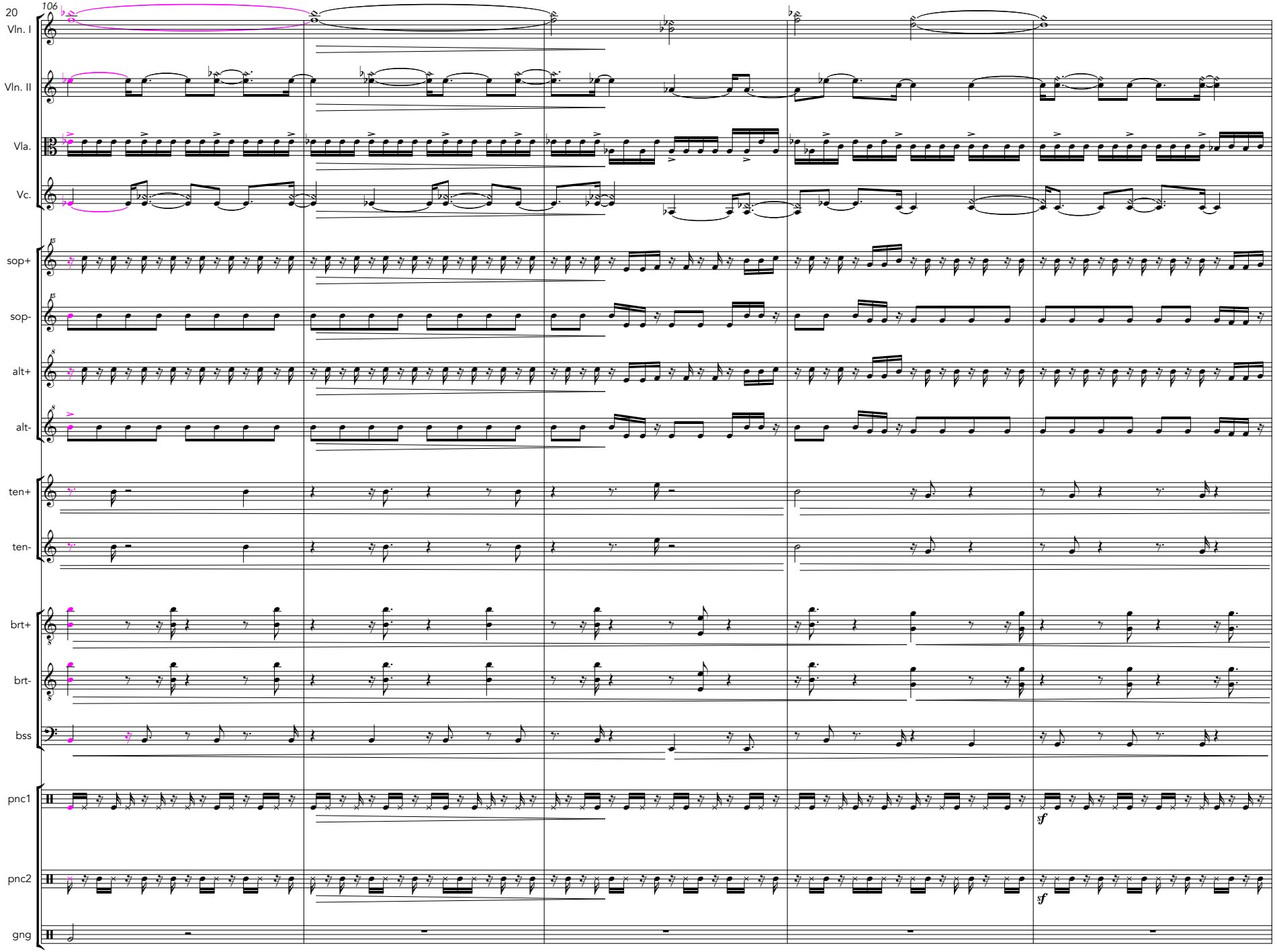

Vln. I
Vln. II
Vla.
Vc.
sop+
sop-
alt+
alt-
ten+
ten-
brt+
brt-
bss
pnc1
pnc2
gng

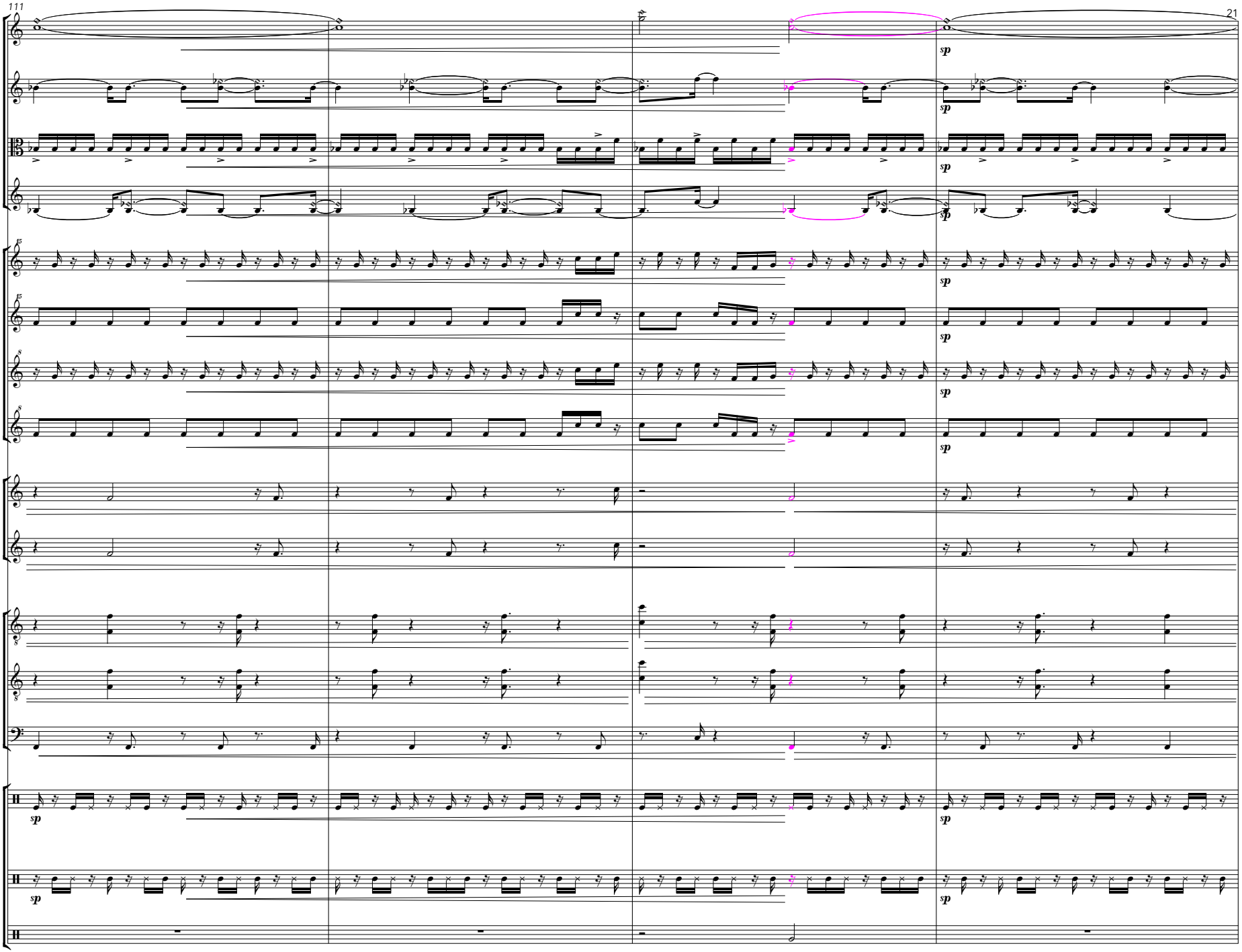

16
89
C
legato, lyrical,
but no vib.
Vln. I
Vln. II
sul pont.,
martele (pronounced but gentle)
mf
Vla.
sul pont., sautille
f
Vc.
sul pont.,
martele (pronounced but gentle)
mf
sop+
p
sop-
p
alt+
p
alt-
p
ten+
ten-
brt+
brt-
bss
Trompong, muted strokes
pnc1
mp
Trompong, open/closed
pnc2
mp
gng

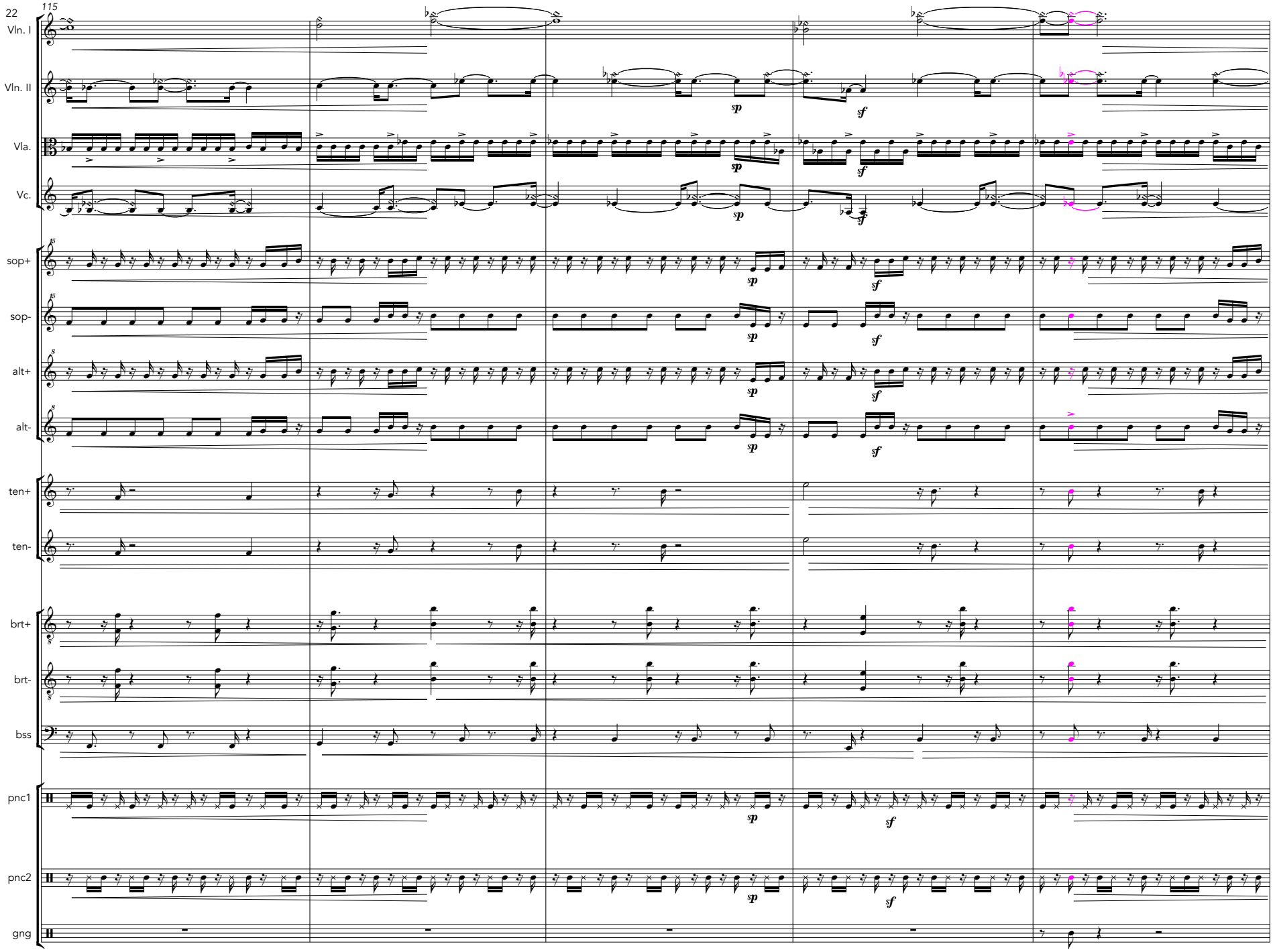

94
17
Vln. I
Vln. II
Vla.
Vc.
sop+
sop-
alt+
alt-
ten+
ten-
brt+
brt-
bss
pnc1
pnc2
gng

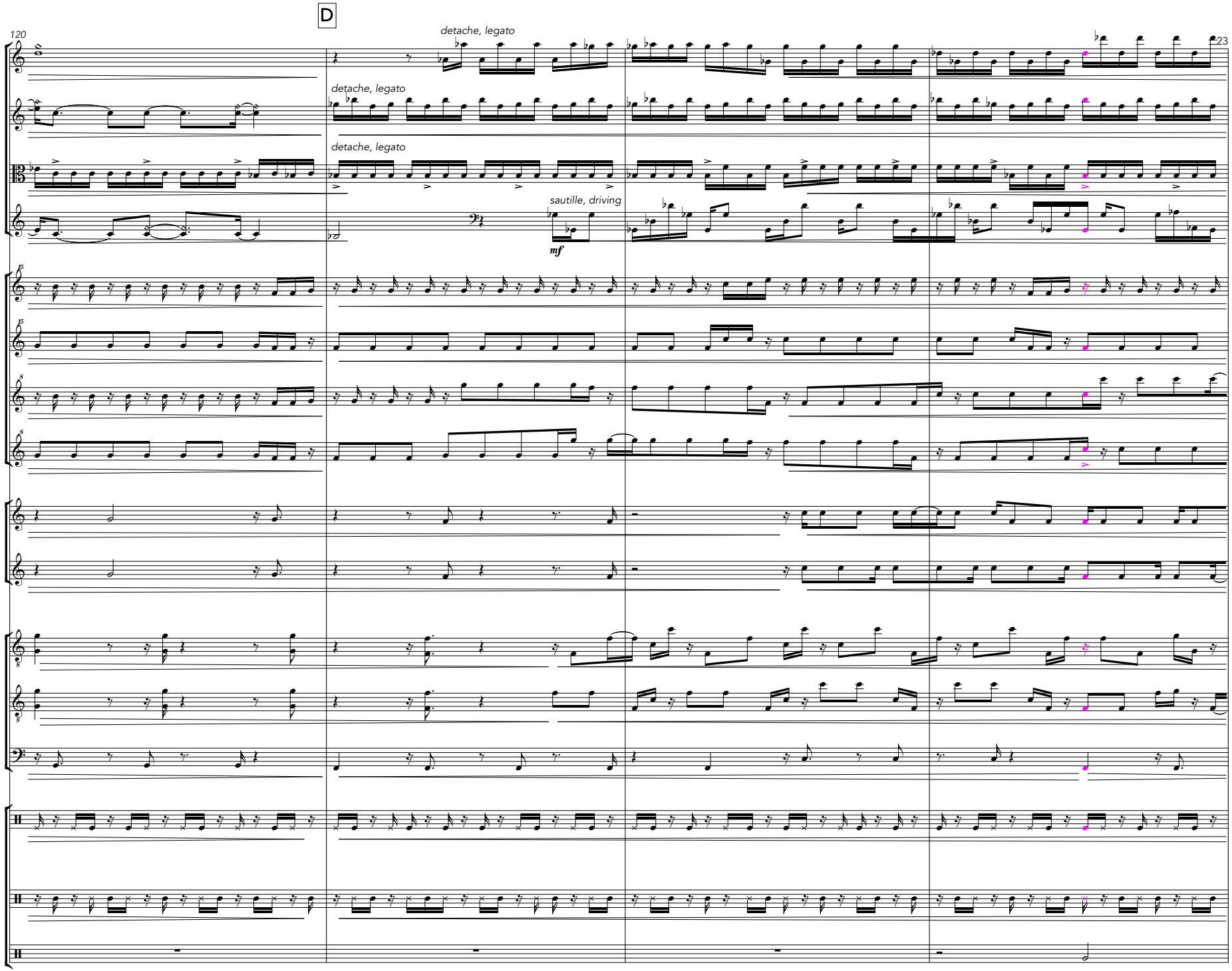

98
Vln. I
Vln. II
Vla.
Vc.
sop+
sop-
alt+
alt-
ten+
ten-
brt+
brt-
bss
pnc1
pnc2
gng
sp

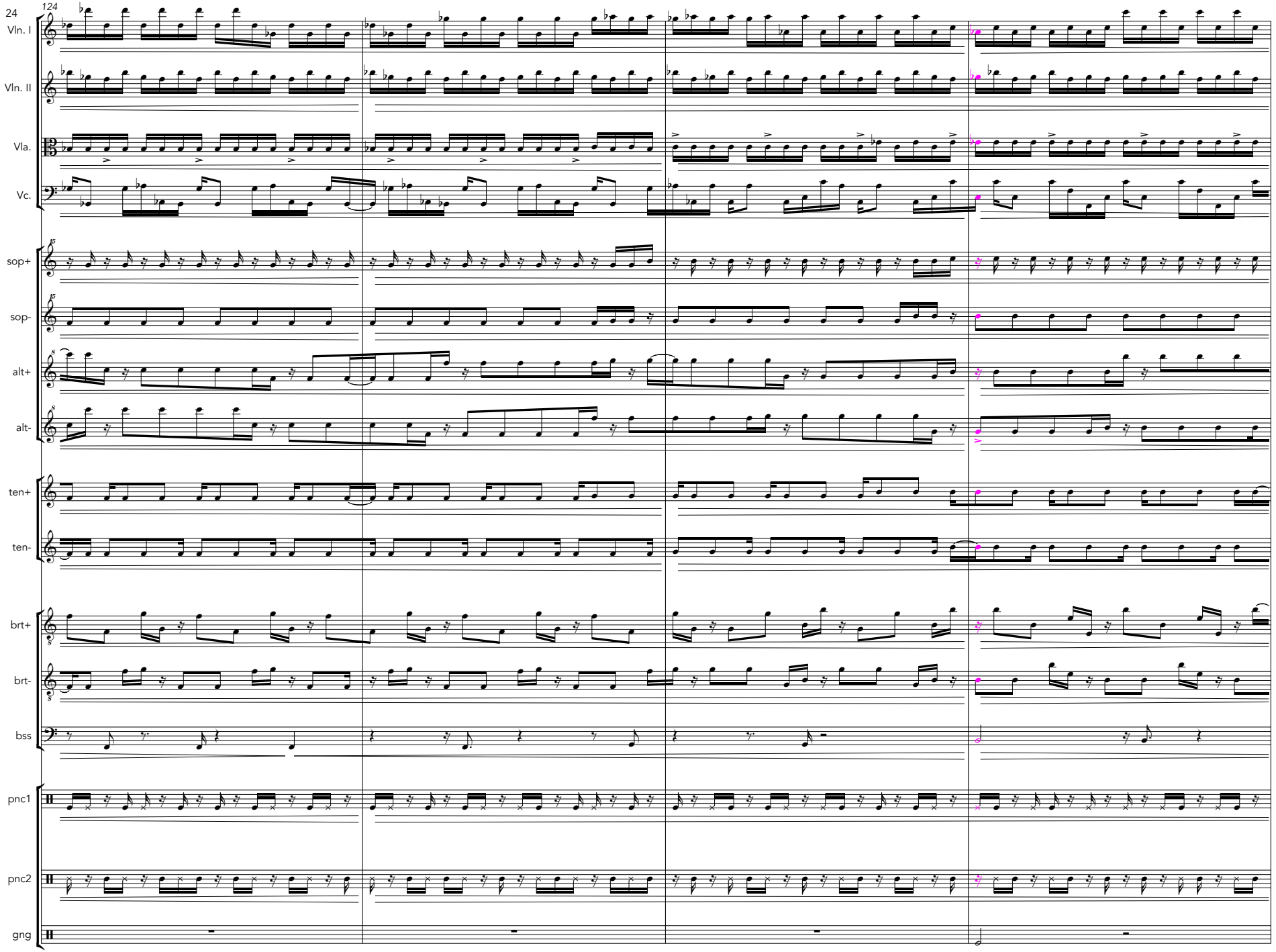

102
Vln. I
Vln. II
Vla.
Vc.
sop+
sop-
alt+
alt-
ten+
ten-
brt+
brt-
bss
pnc1
pnc2
gng
sp

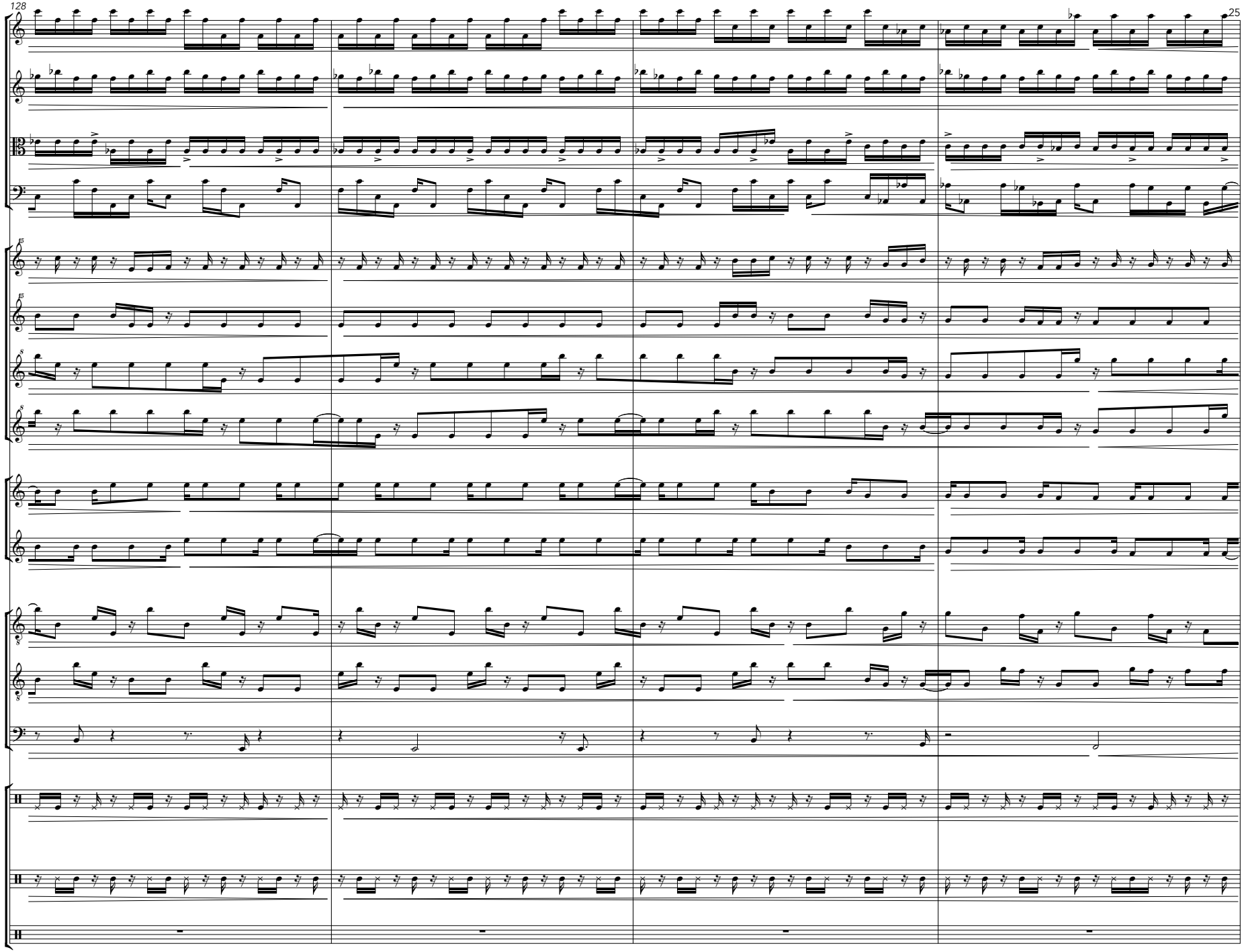

106
Vln. I
Vln. II
Vla.
Vc.
sop+
sop-
alt+
alt-
ten+
ten-
brt+
brt-
bss
pnc1
pnc2
gng
sf
sf

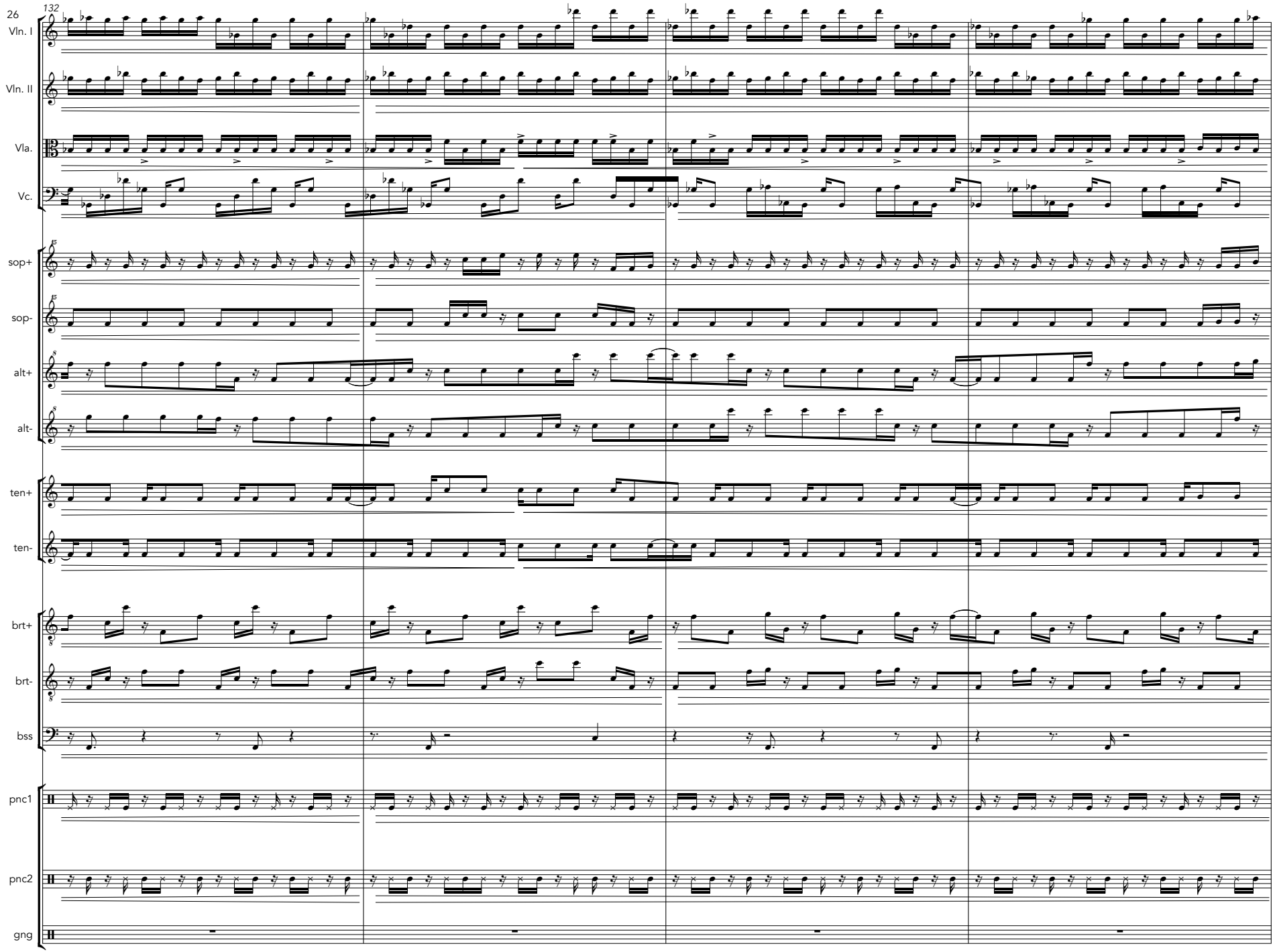

111
21
Vln. I
Vln. II
Vla.
Vc.
sop+
sop-
alt+
alt-
ten+
ten-
brt+
brt-
bss
pnc1
pnc2
gng
sp

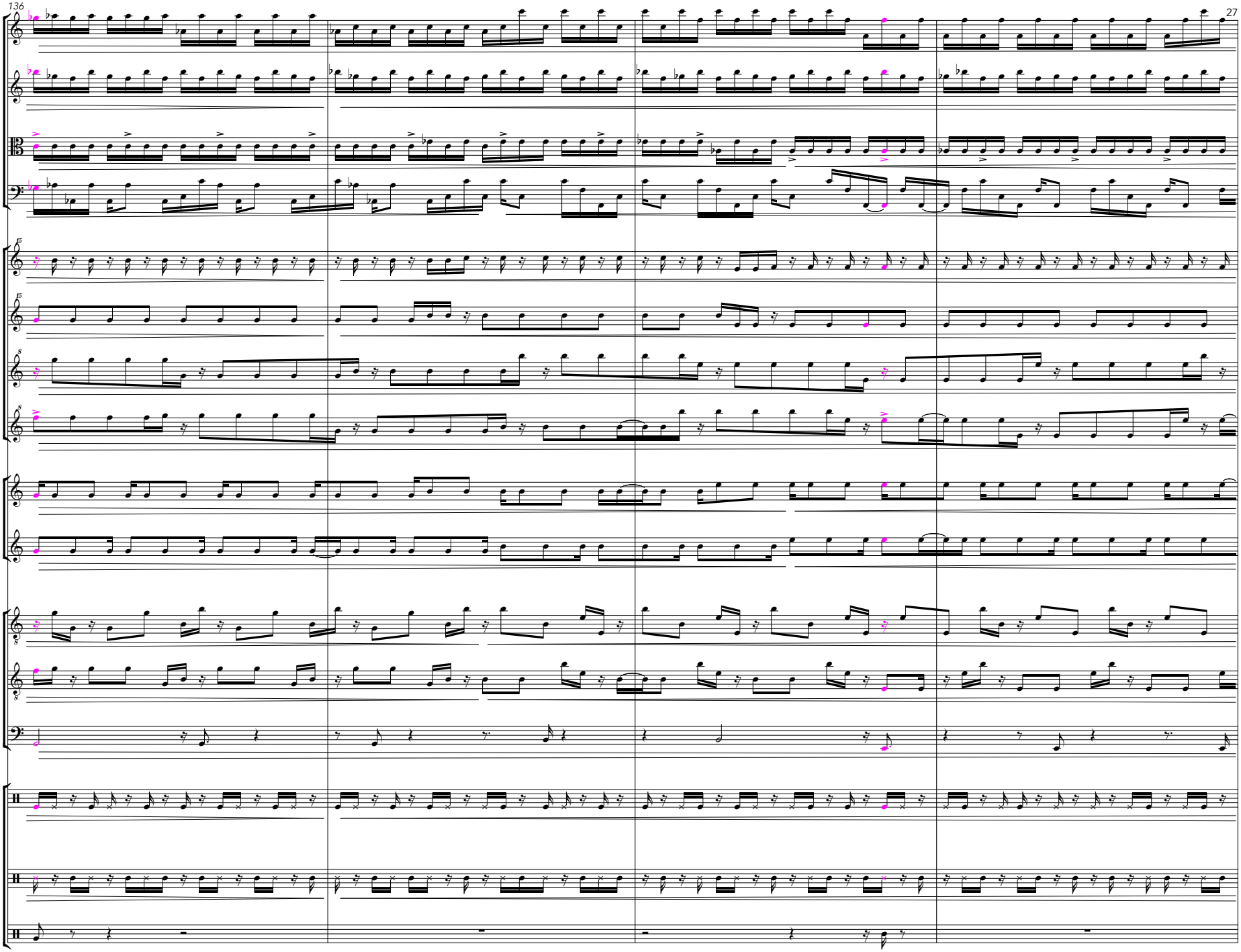

115
Vln. I
Vln. II
Vla.
Vc.
sop+
sop-
alt+
alt-
ten+
ten-
brt+
brt-
bss
pnc1
pnc2
gng
sp
sf

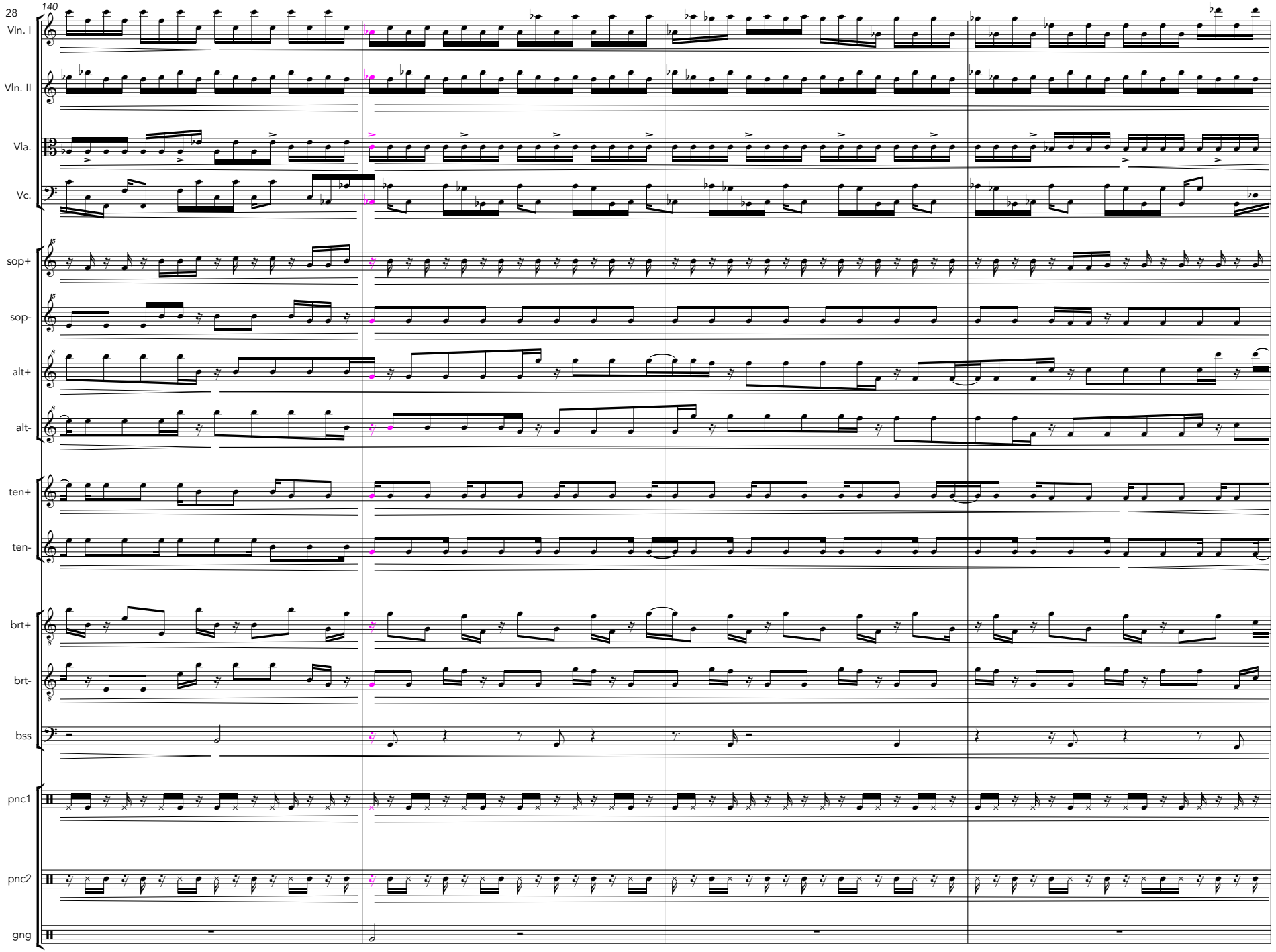

D
120
123
detache, legato
detache, legato
detache, legato
sautille, driving
mf
Vln. I
Vln. II
Vla.
Vc.
sop+
sop-
alt+
alt-
ten+
ten-
brt+
brt-
bss
pnc1
pnc2
gng

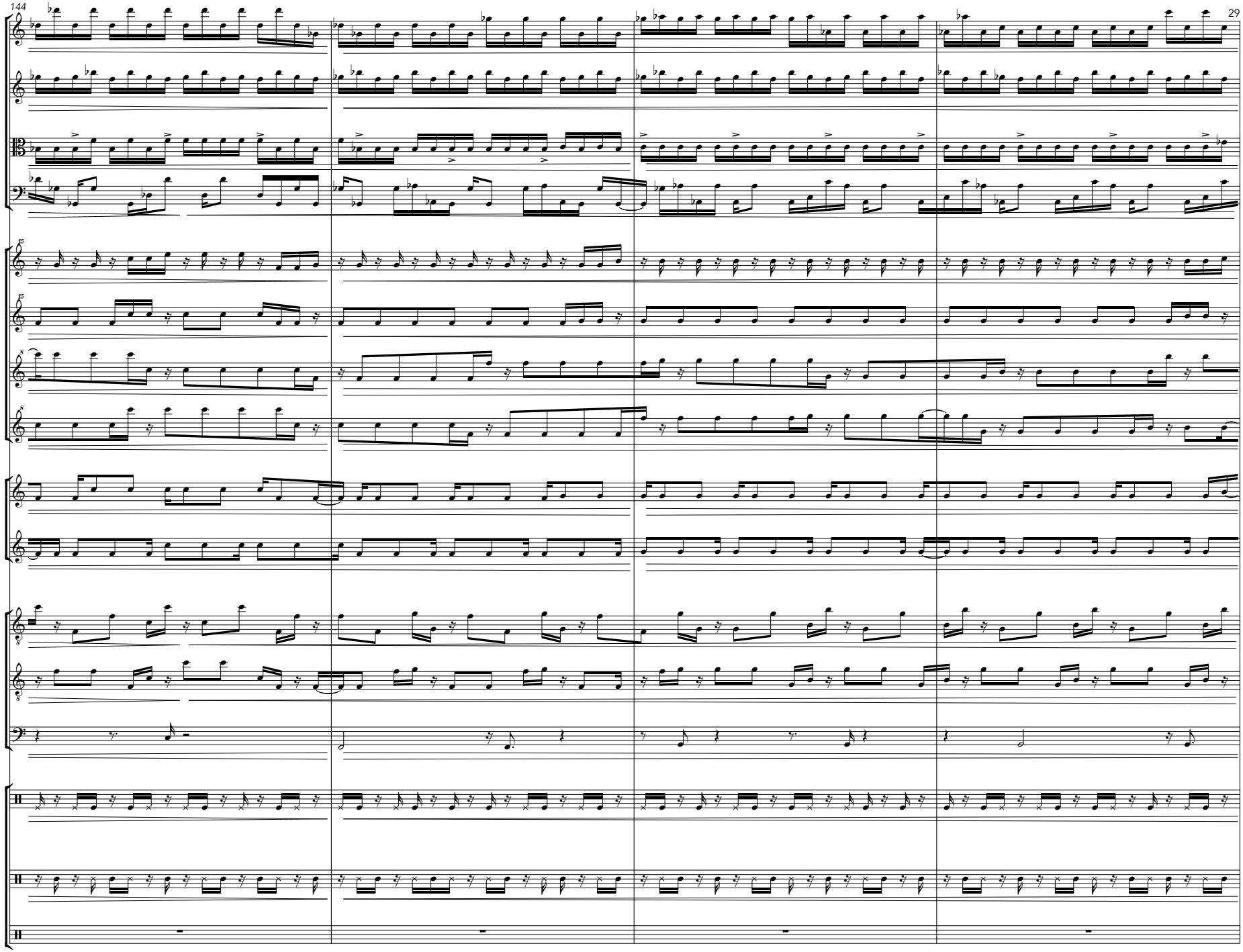

24
124
Vln. I
Vln. II
Vla.
Vc.
sop+
sop-
alt+
alt-
ten+
ten-
brt+
brt-
bss
pnc1
pnc2
gng

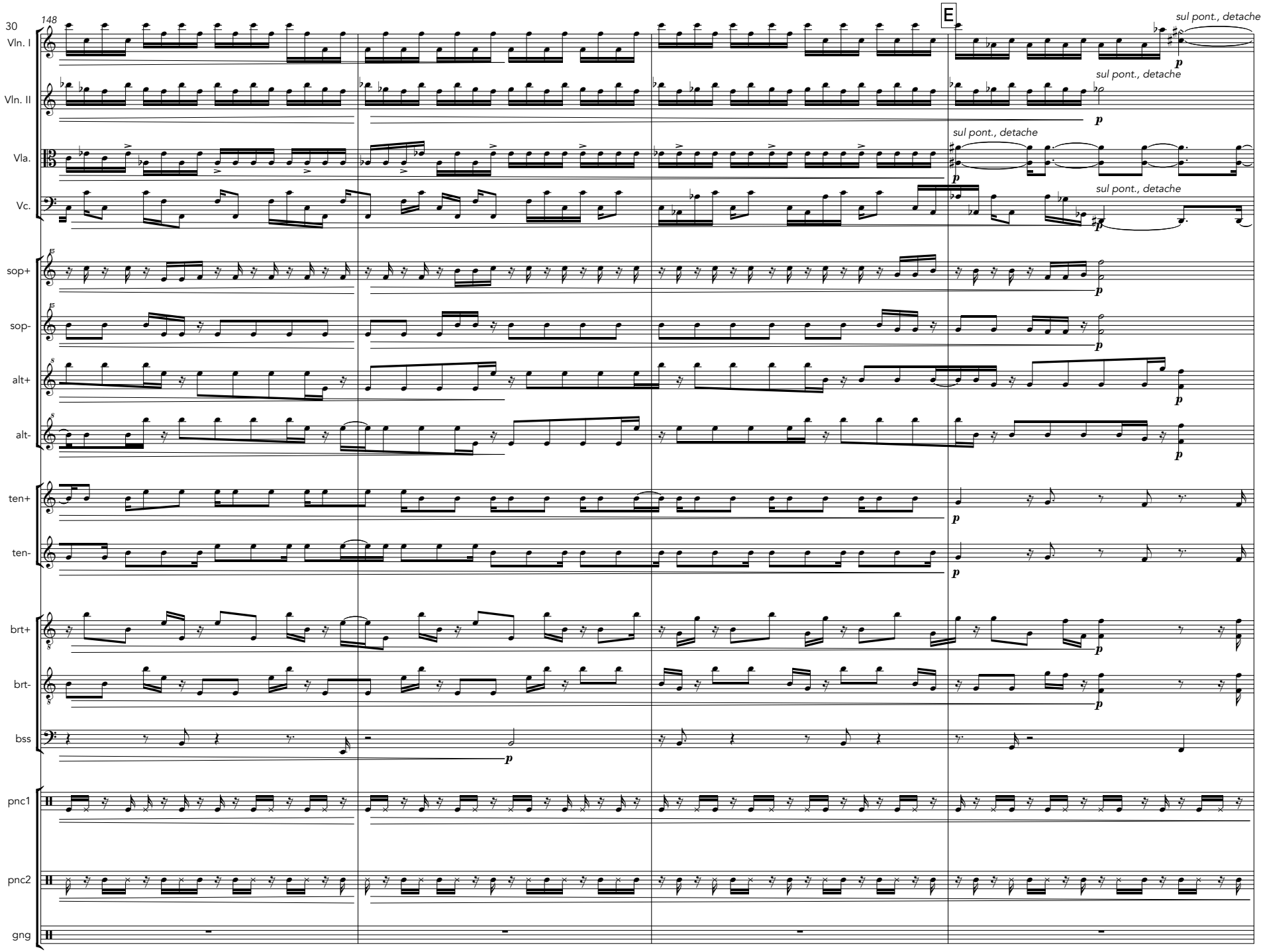

128
25
Vln. I
Vln. II
Vla.
Vc.
sop+
sop-
alt+
alt-
ten+
ten-
brt+
brt-
bss
pnc1
pnc2
gng


132
Vln. I
Vln. II
Vla.
Vc.
sop+
sop-
alt+
alt-
ten+
ten-
brt+
brt-
bss
pnc1
pnc2
gng


136
27
Vln. I
Vln. II
Vla.
Vc.
sop+
sop-
alt+
alt-
ten+
ten-
brt+
brt-
bss
pnc1
pnc2
gng


28
140
Vln. I
Vln. II
Vla.
Vc.
sop+
sop-
alt+
alt-
ten+
ten-
brt+
brt-
bss
pnc1
pnc2
gng


144
29
Vln. I
Vln. II
Vla.
Vc.
sop+
sop-
alt+
alt-
ten+
ten-
brt+
brt-
bss
pnc1
pnc2
gng


30
148
E
Vln. I
Vln. II
Vla.
Vc.
sop+
sop-
alt+
alt-
ten+
ten-
brt+
brt-
bss
pnc1
pnc2
gng
sul pont., detache
sul pont., detache
sul pont., detache
sul pont., detache
p