Timberline

by Lois V Vierk

Commissioned for the Relâche Ensemble of Philadelphia by Kobrand, Inc., importer of Champagne Taittinger

Special thanks to the Foundation for Contemporary Arts for additional support

for chamber ensemble, featuring piano

flute/piccolo
clarinet
bassoon
viola
contrabass
piano/synthesizer
percussion

Timberline

for chamber ensemble, featuring piano

Timberline requires close miking of all instruments, including without fail close-miking of piano with at least 2 microphones. Also active participation of sound engineer to mix.

Bring out piano - entire piece. Bring out all piano glissandi.

Grace notes are to be played before the beat.

All instruments -- dynamics are very important to the structure and expression of this piece. Play dynamcis strongly and clearly, and exactly where written.

Timberline
©1991LoisVVierk

Lois V Vierk
LVVVV@aol.com
www.loisvvierk.com

Timberline

for chamber ensemble, featuring piano

All instruments NON VIBRATO, entire piece.

Use entire note value for each glissando.

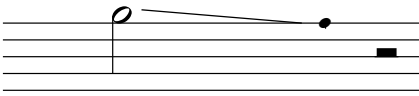
All tremolos and trills are measured 32nd notes.

All instruments:

means reiterated 32nd notes (no woodwind flutter tongue)

Grace notes are to be played before the beat, fast as possible.

Strings and bassoon:



Use 2 full beats to gliss down to small note. Do not articulate small note in any way.

Strings:

The note in parenthesis is a "place marker" of the pitch. Do not change bow or articulate note in parenthesis in any way.

All instruments -- dynamics are very important to the structure and expression of this piece. Play dynamcis strongly and clearly, and exactly where written.

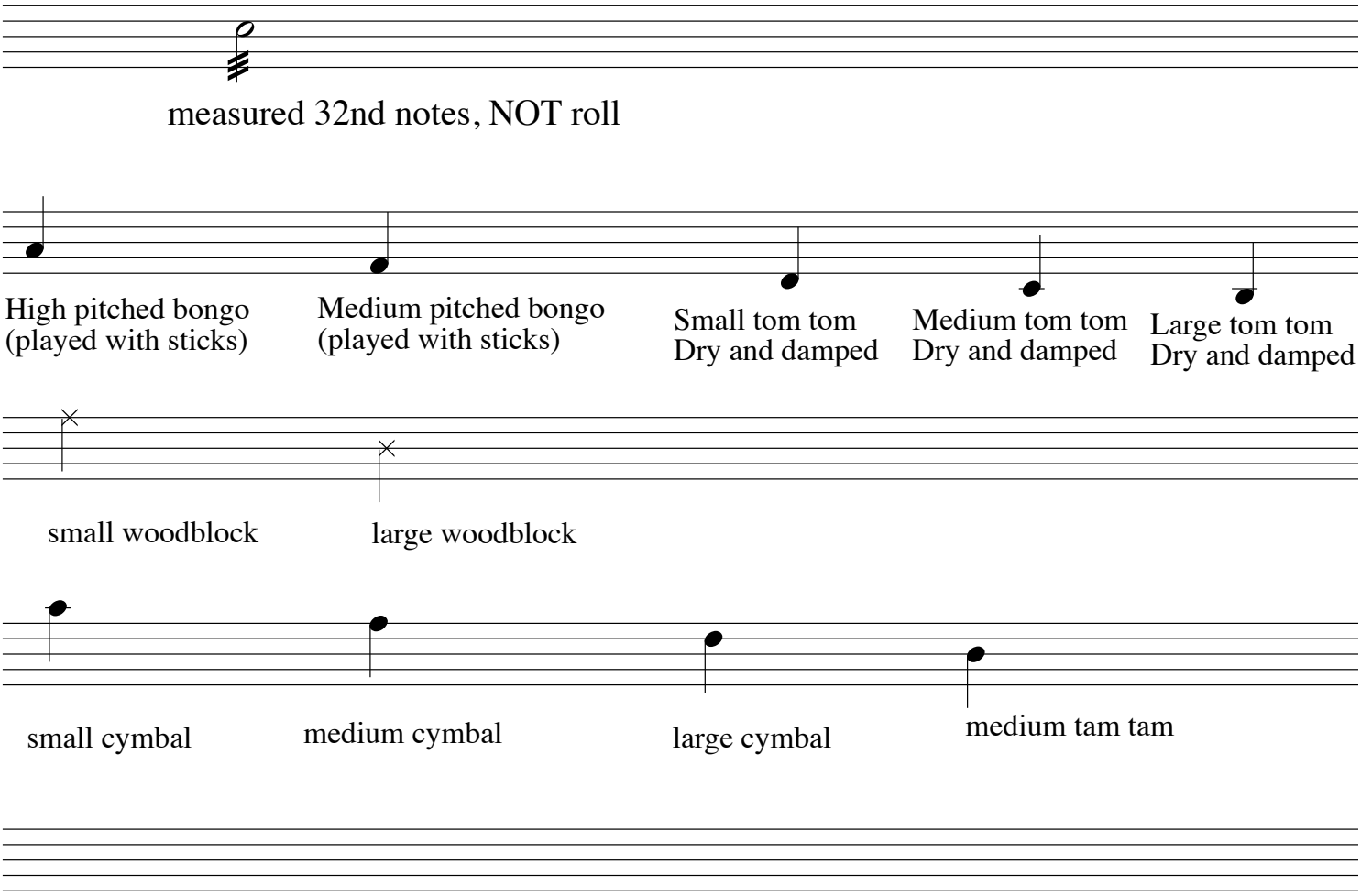
Timberline

for chamber ensemble, featuring piano

Percussion

Let all notes ring unless marked to damp.

All skin drums should sound dry and be damped:



All instruments -- dynamics are very important to the structure and expression of this piece. Play dynamics strongly and clearly, and exactly where written.

Timberline -- performance notes
for conductor and sound engineer

Timberline requires sound reinforcement, with each instrument close-miked. The piano requires 2 microphones.

This music is very dense, yet each instrument must be clearly heard in order for the music to make sense. **The piano must be prominent and sound strong and clear throughout the piece**.

The piece must be mixed carefully by the sound engineer.

As for the performers, dynamics are very important. Play all crescendos and decrescendos strongly, exactly as written.

Timberline

Piano/synth

The piano part should be prominent, and should be strong and clear throughout the piece. Dynamics are extremely important. Play dynamics strongly, exactly as written.

The synth part (m. 114-205) is not prominent.

Use a synth voice with **NO VIBRATO**. It should be sustained and not have a sharp attack. It should be similar to a string sound.

Timberline requires sound reinforcement, with each instrument close-miked. The piano requires 2 microphones.

Timberline
(1991)

by Lois V Vierk

Hiking a trail to high altitudes takes you through an ever changing landscape. The dark closeness of the forest gradually gives way to increasing spaciousness. Light shimmers in as hints of the grandeur ahead draw you up the mountain. Arriving at the timberline and then at the mountain top gives you a spectacular view of the land below and the sky all around you.

This work is in two continuous sections. The first section begins with winds and strings in the mid range, playing held notes and slow glissandi. Simple grace notes are added. Little by little a dense texture is built as grace notes are transformed into ascending pentatonic scale passages in winds and strings. This is overlaid contrapuntally with a piano texture of ornate grace notes, tremolos and trills, gradually moving up over the full range of the keyboard. Cymbals roll at the climax.

The second section begins under the ringing cymbals with slow, open fifths in the lowest register of the winds and strings. The sounds are dark and languid, with many sliding tones. Very gradually more percussive sounds are added. Phrases are becoming shorter, notes are getting faster, shifting from whole notes to half notes to quarters. The piano begins a bright and rhythmic punctuation of the phrase, introducing 16th notes. The development of this rhythmic and harmonic figure gradually moves the piece to its climactic conclusion. Finally all the instruments combine to form one texture--dynamic, rhythmic, covering the entire instrumental range.

Timberline was commissioned for the Relâche Ensemble of Philadelphia by Kobrand, Inc., importer of Champagne Taittinger. A CD recording was released on New World Records -- Lois V Vierk: Words Fail Me, New World 80766.

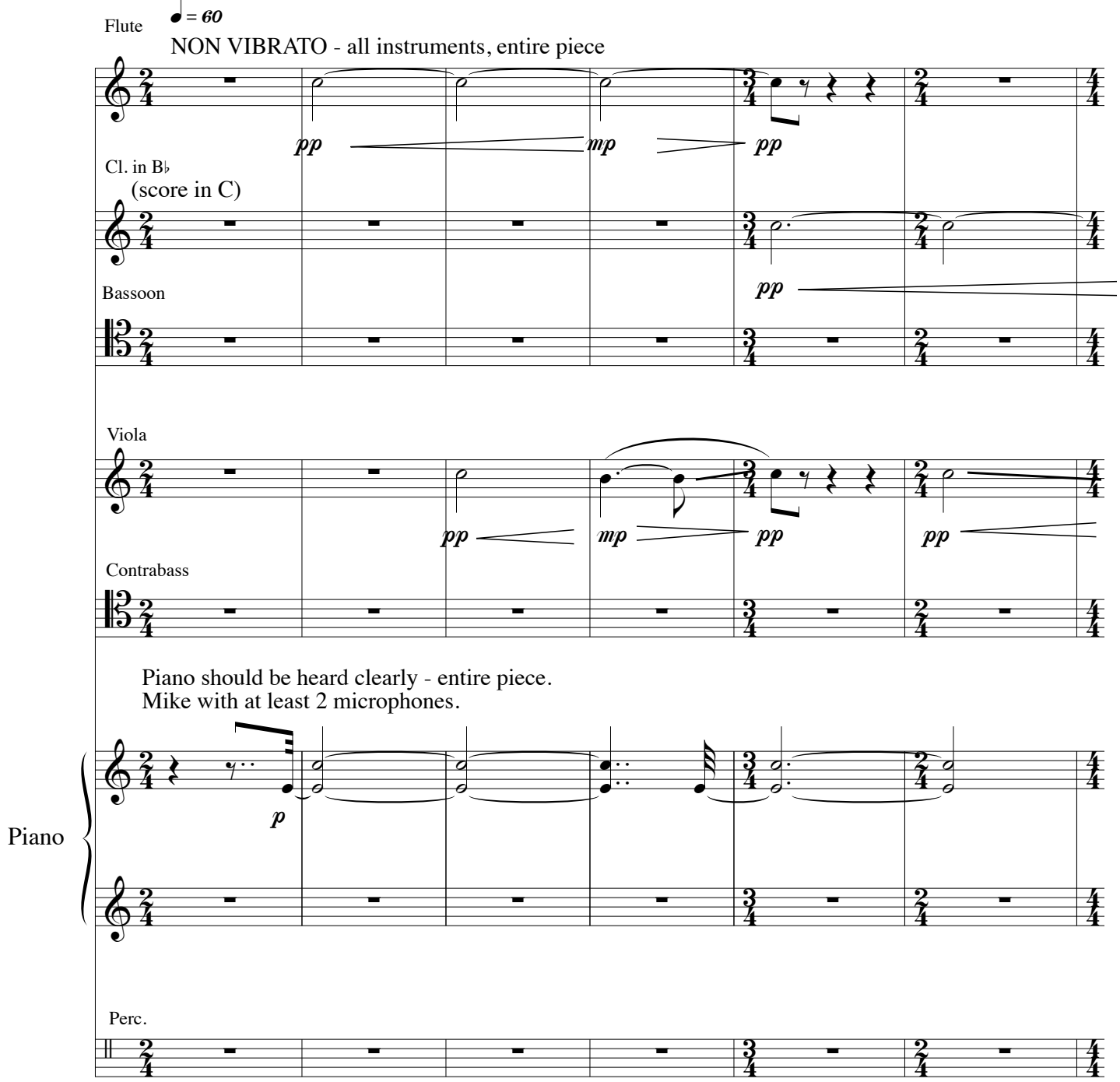
Analytical material on *Timberline* can be found at the very end of this document, following the score.

Timberline

Lois V Vierk

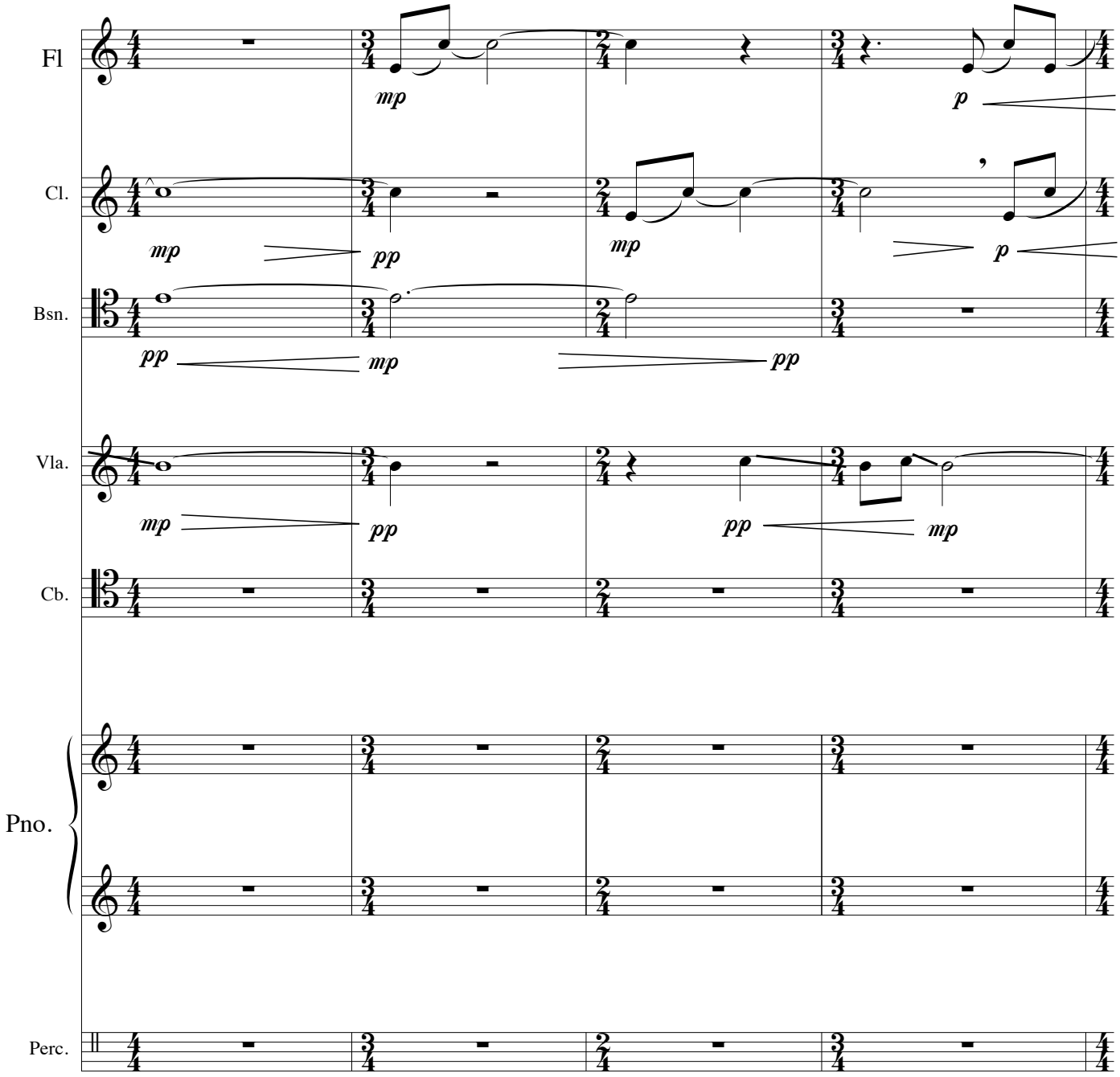
Timberline requires close miking of all instruments, including without fail close-miking of piano with at least 2 microphones. Also active participation of sound engineer to mix.

1

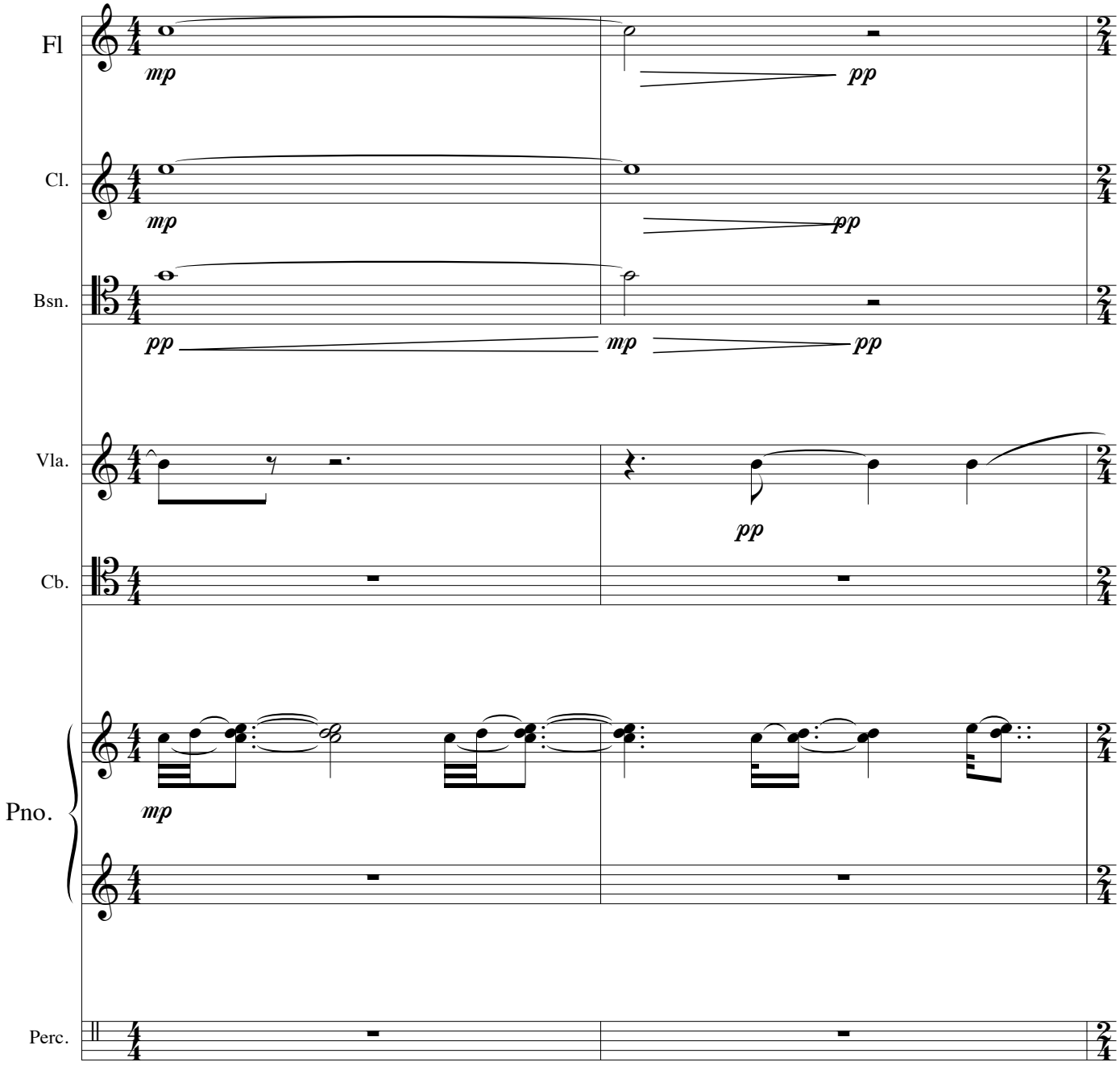


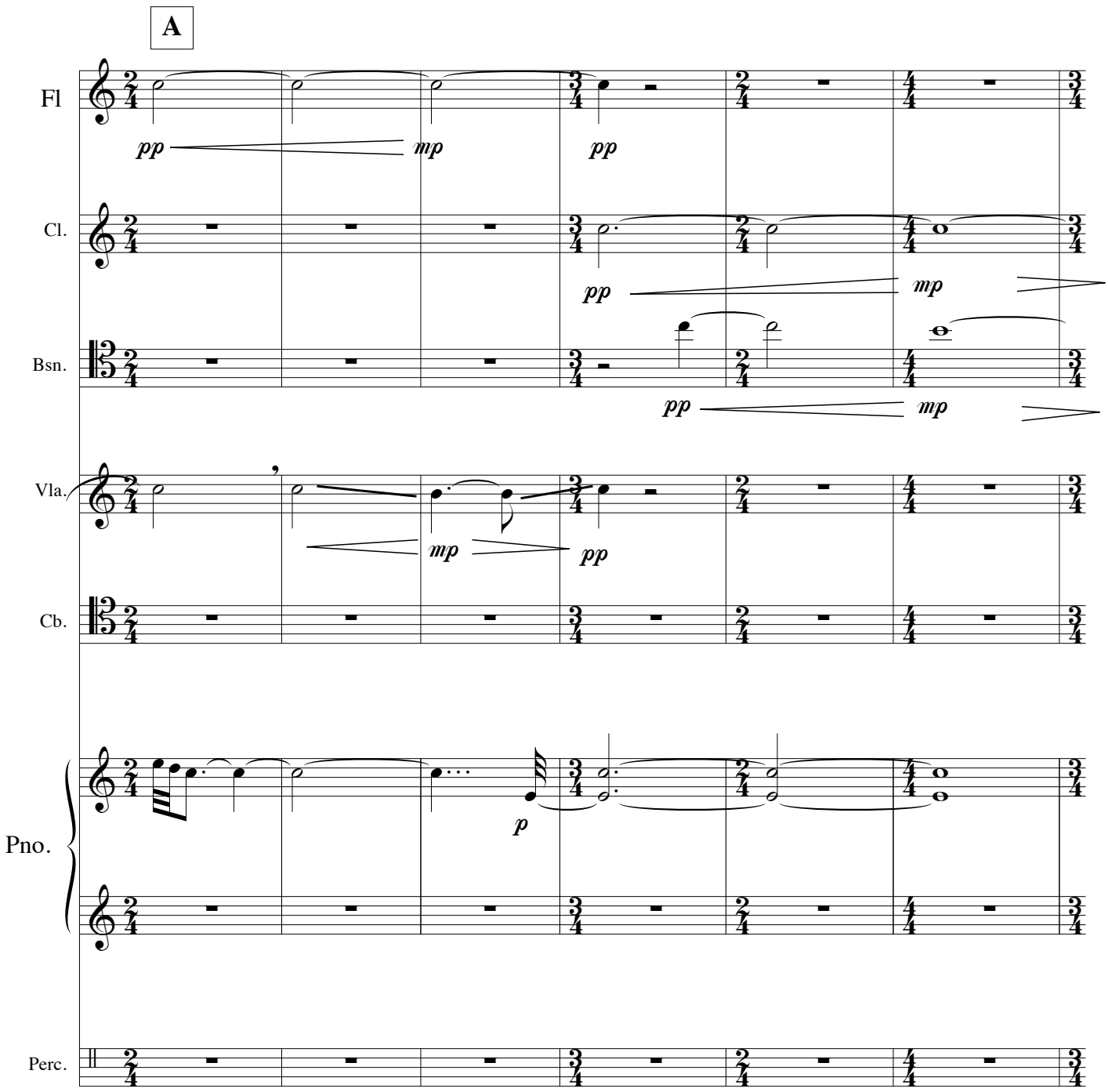
© 1991 Lois V Vierk (ASCAP)

2021Sep23

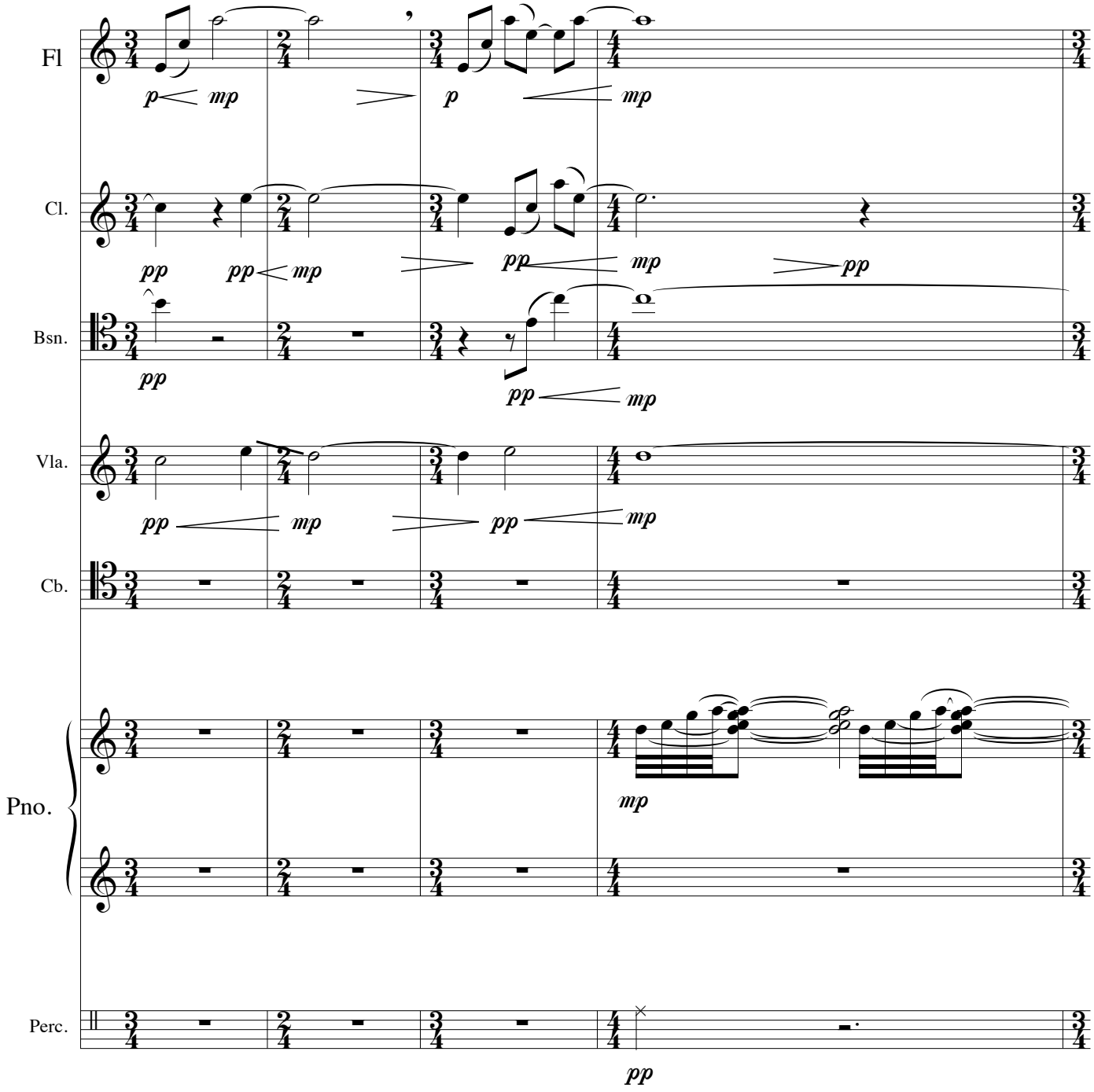

Fl
Cl.
Bsn.
Vla.
Cb.
Pno.
Perc.
mp
p
mp
pp
mp
p
pp
mp
pp
mp
pp
mp

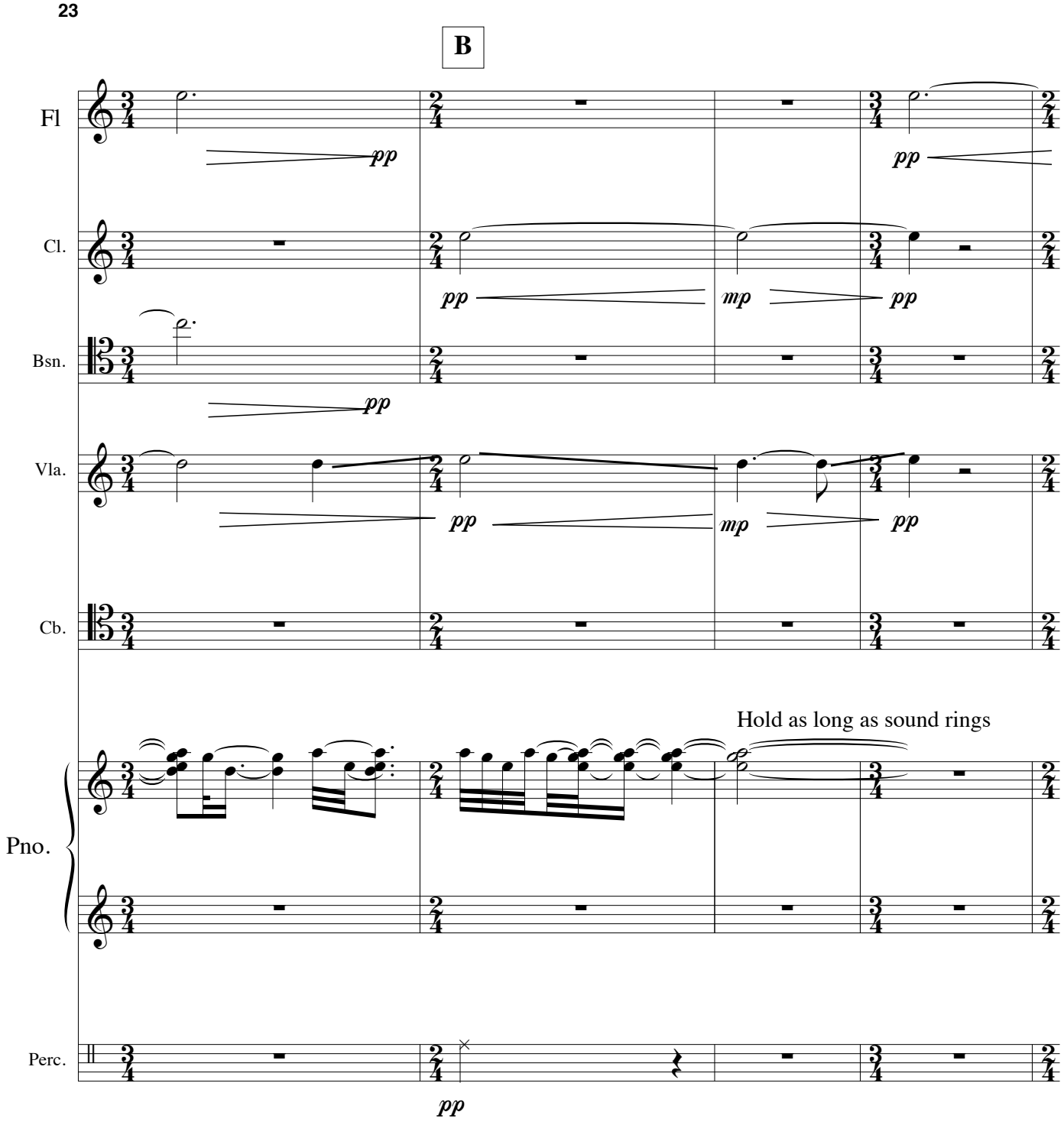
11



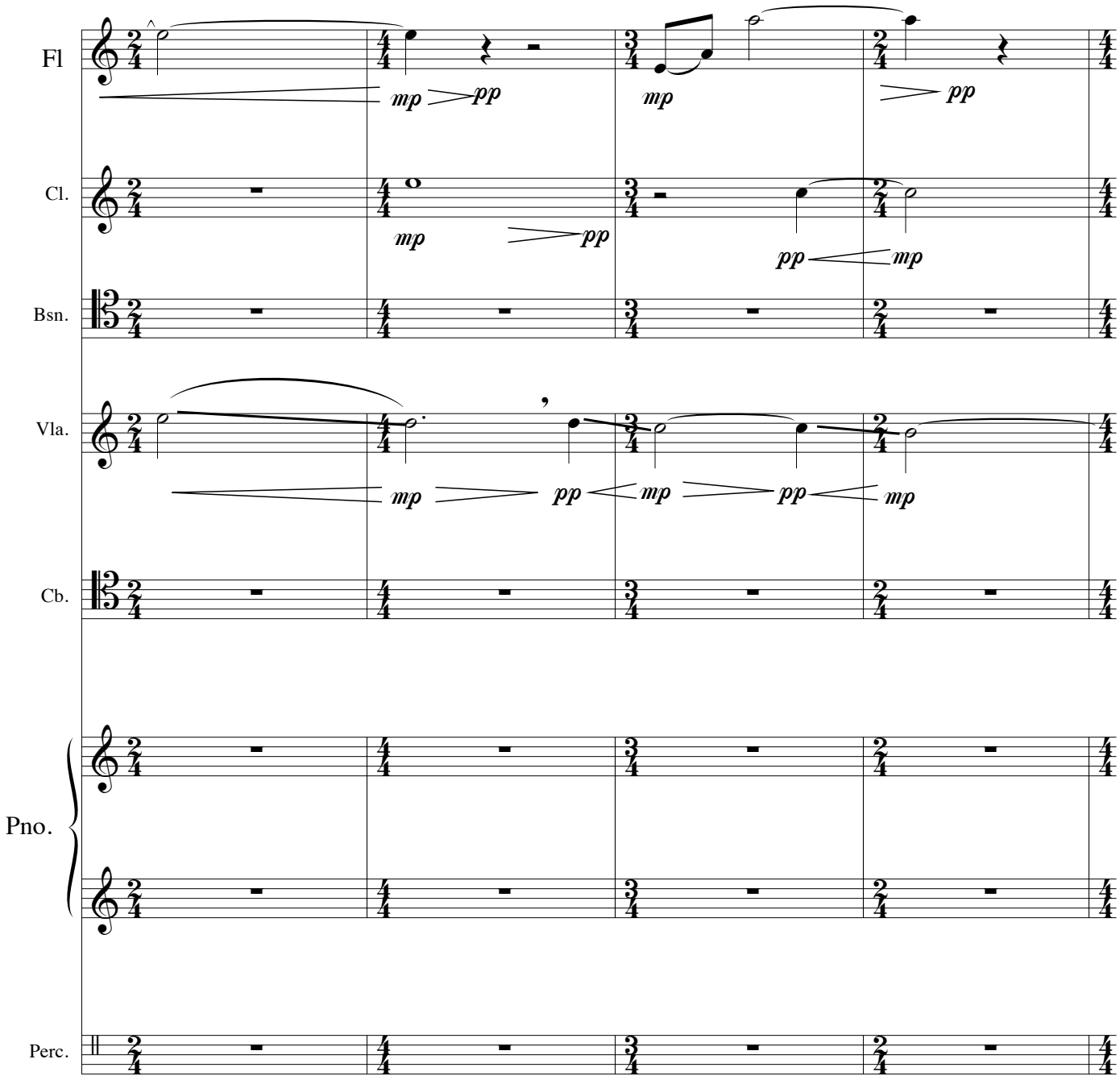

13
A
Fl
pp
mp
pp
Cl.
pp
mp
Bsn.
pp
mp
Vla.
mp
pp
Cb.
Pno.
p
Perc.

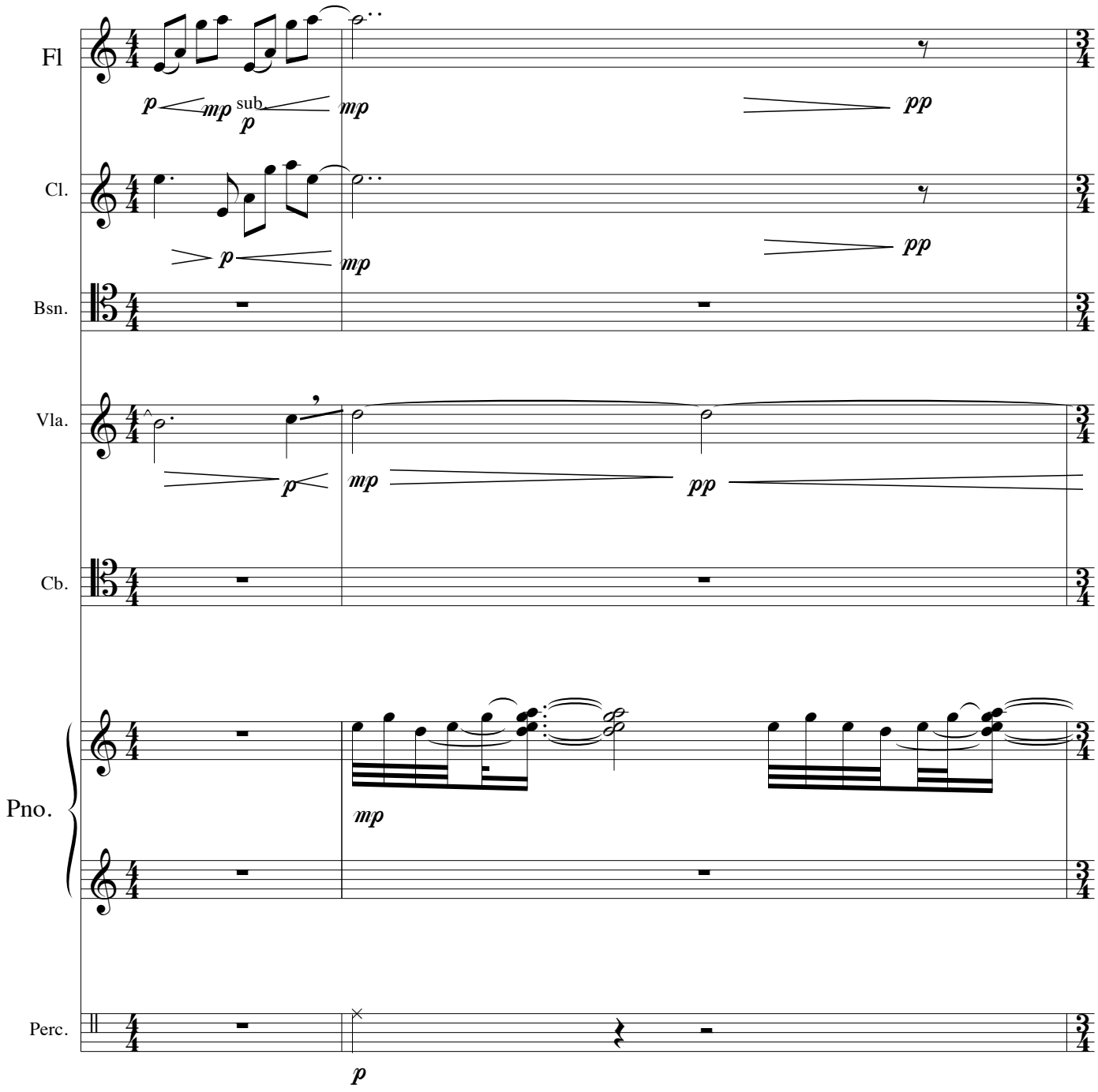
19

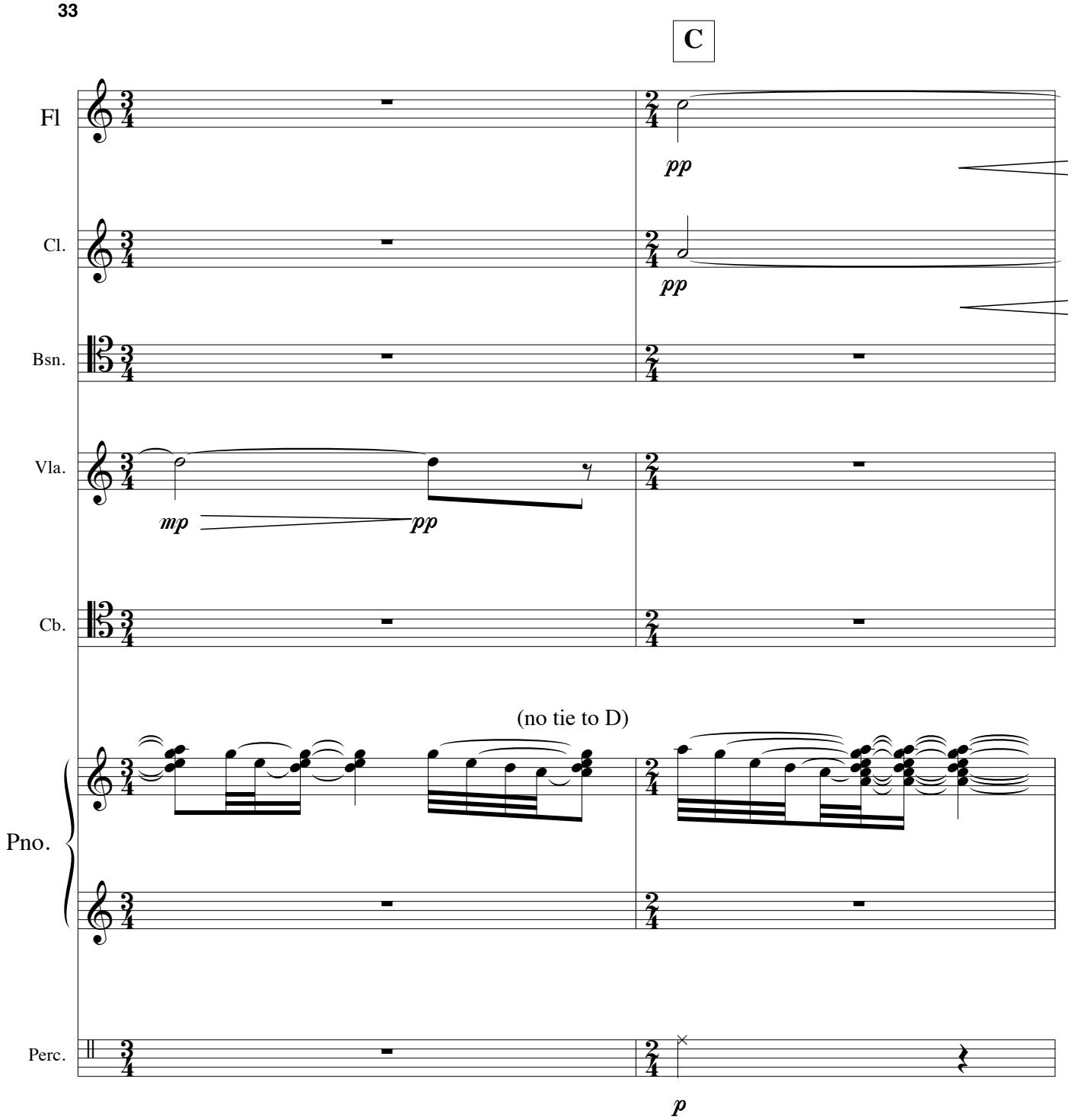



23
B
Fl
pp
pp
Cl.
pp
mp
pp
Bsn.
pp
Vla.
pp
mp
pp
Cb.
Hold as long as sound rings
Pno.
Perc.
pp

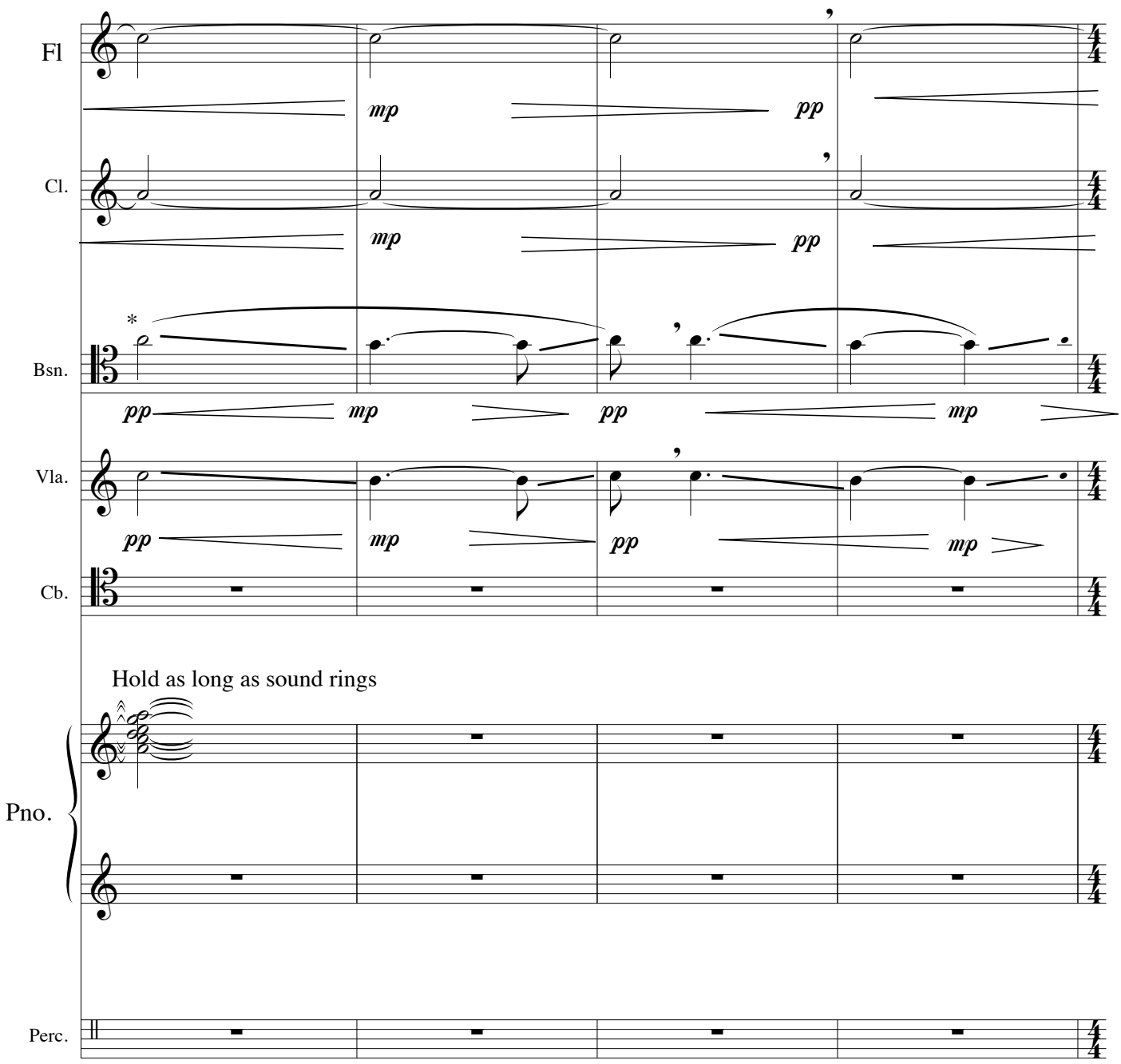
27




31
Fl
Cl.
Bsn.
Vla.
Cb.
Pno.
Perc.
p
mp
sub
p
mp
pp
p
mp
pp
p
mp
pp
mp
p

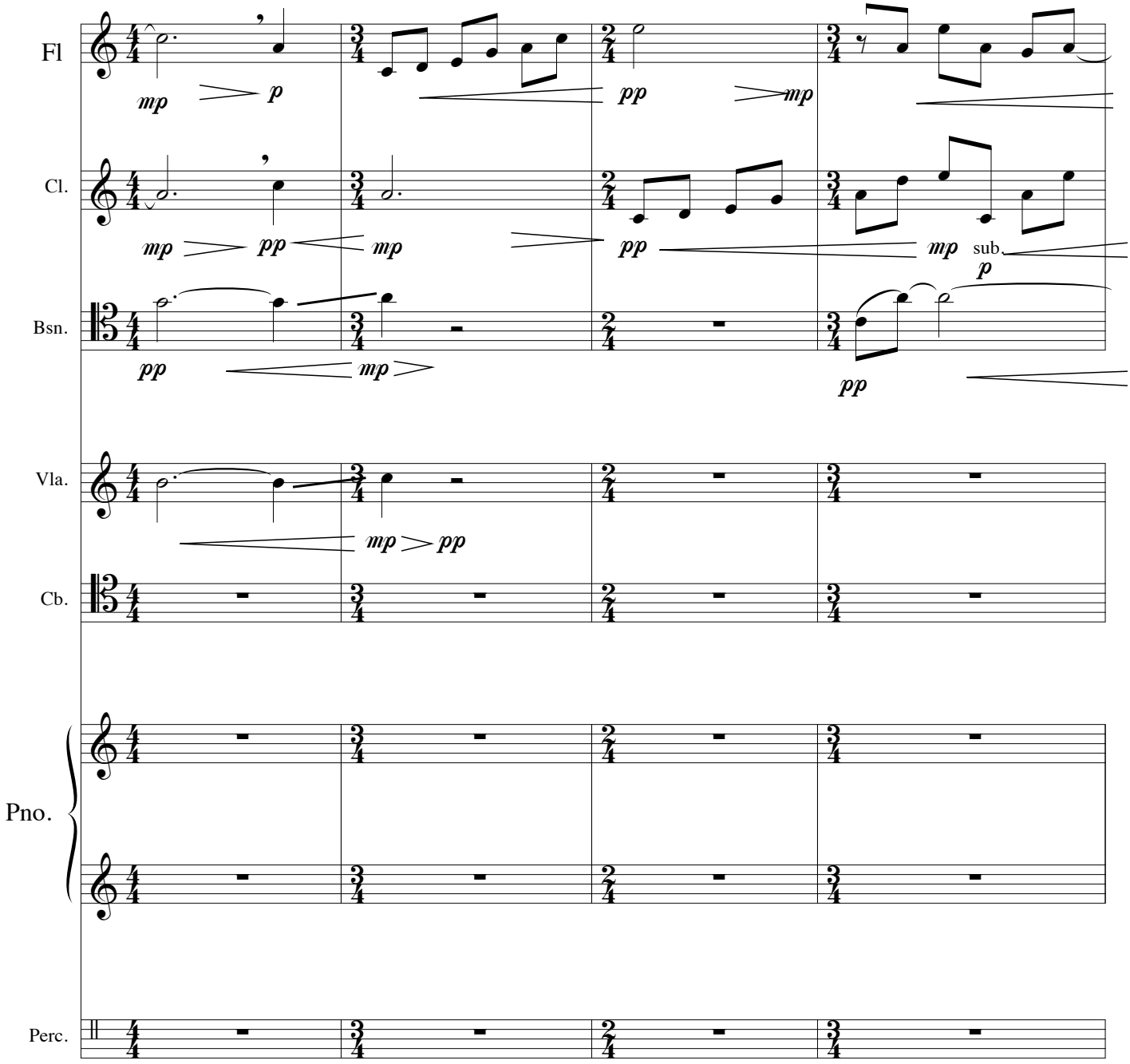

33
C
Fl
pp
Cl.
pp
Bsn.
Vla.
mp
pp
Cb.
(no tie to D)
Pno.
Perc.
p

35

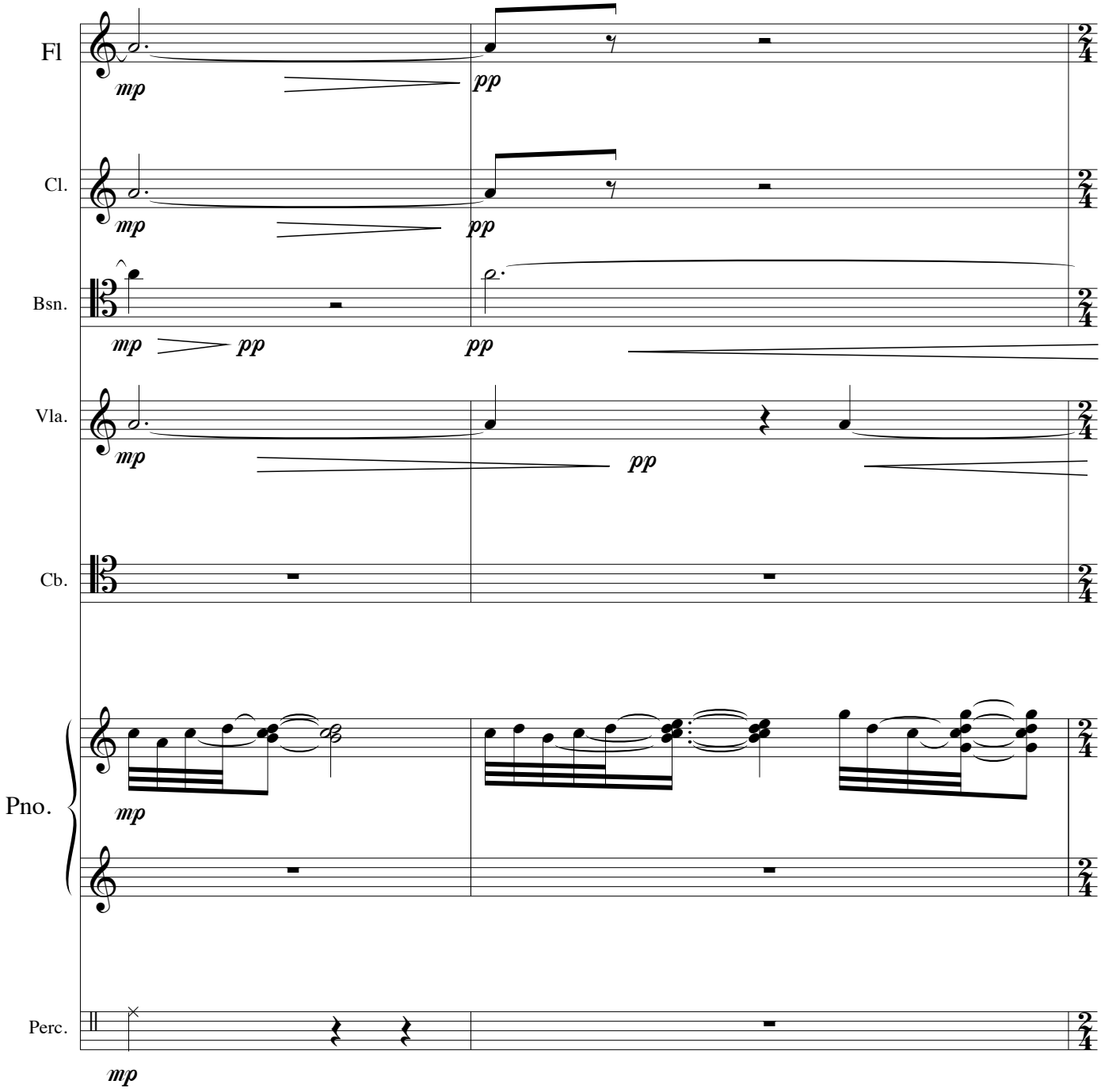


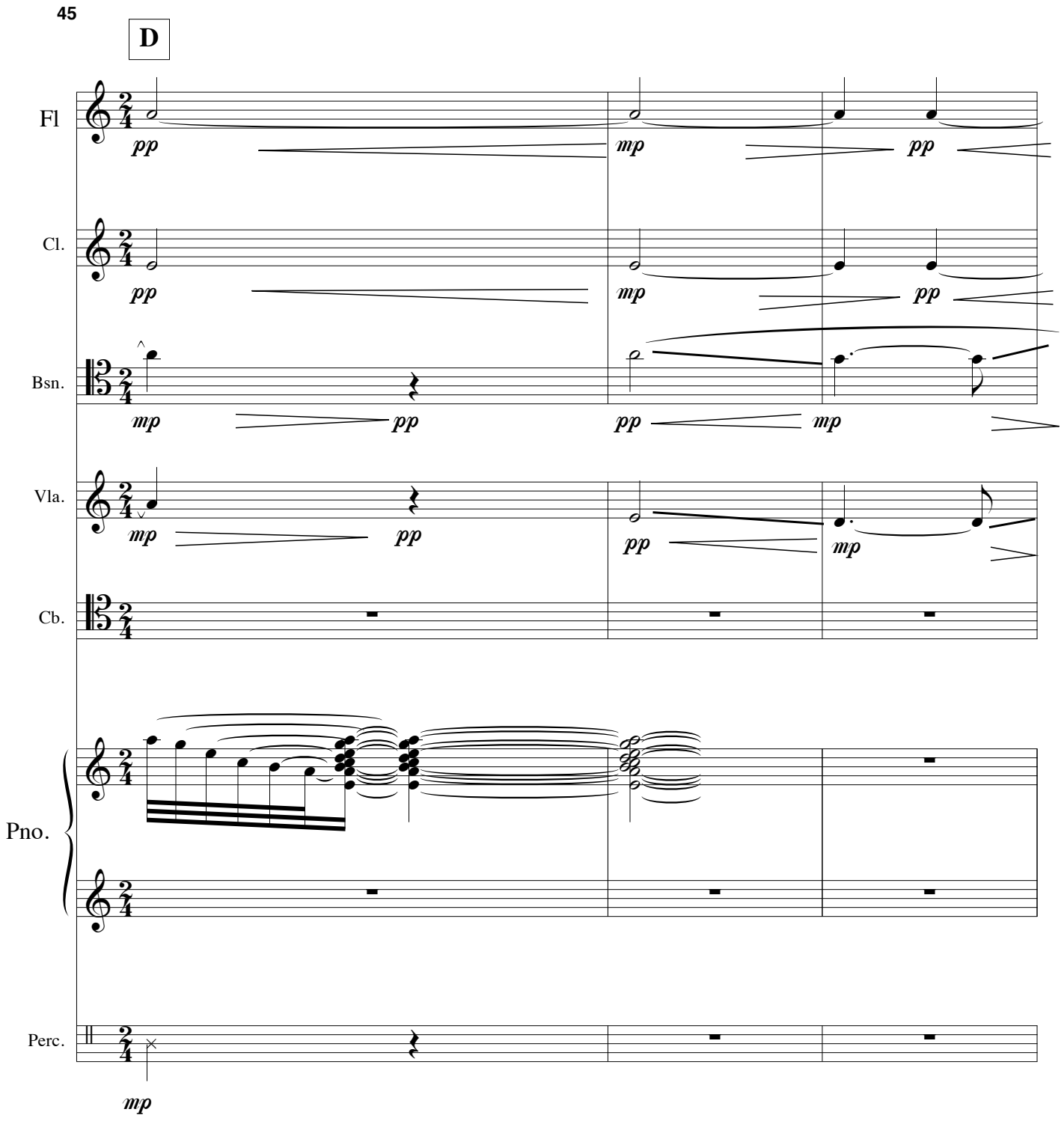
*Gliss as far as possible toward G with embouchure only (not fingers),
then change to G fingering on m. 36, beat 1.

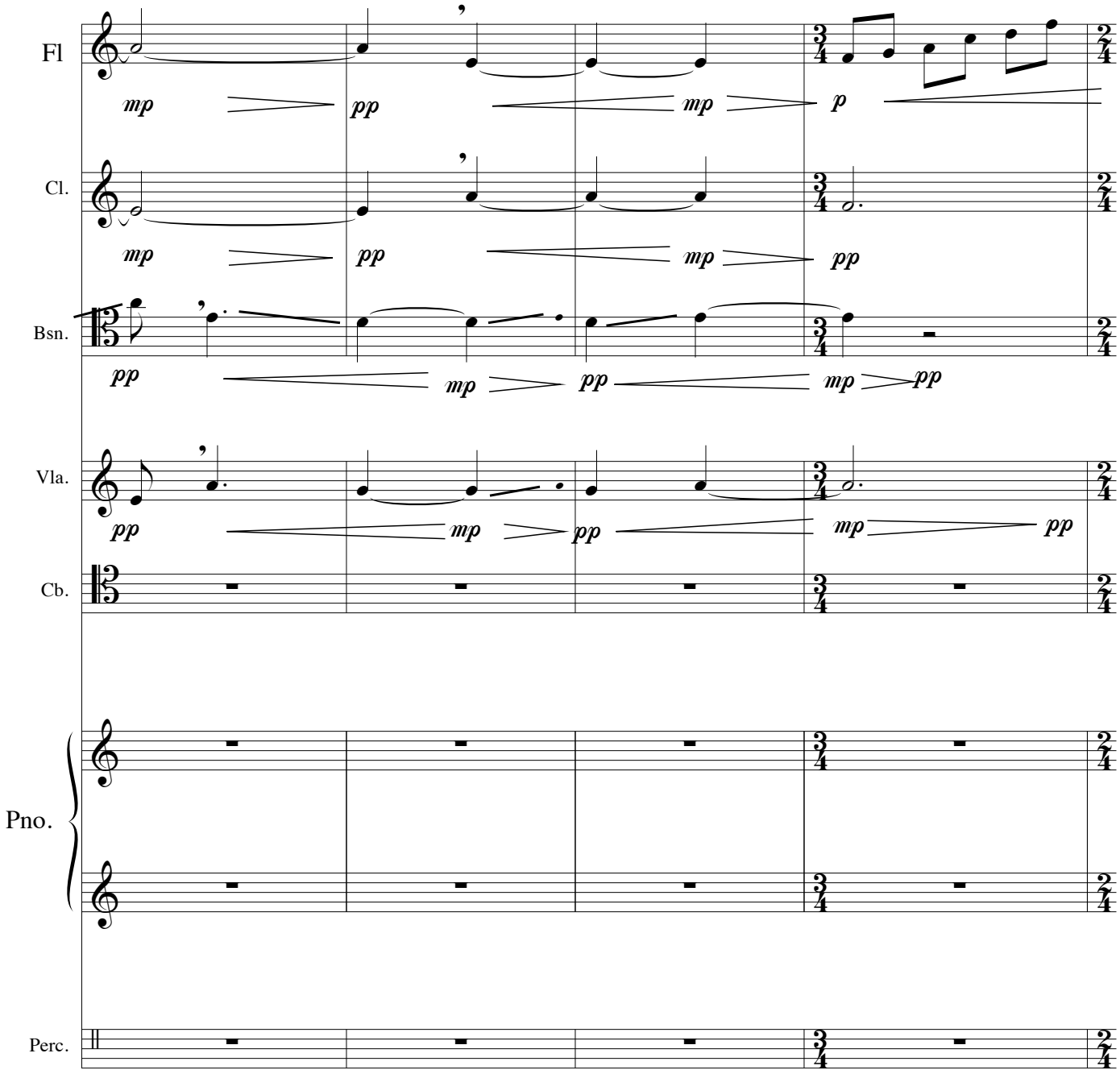
39



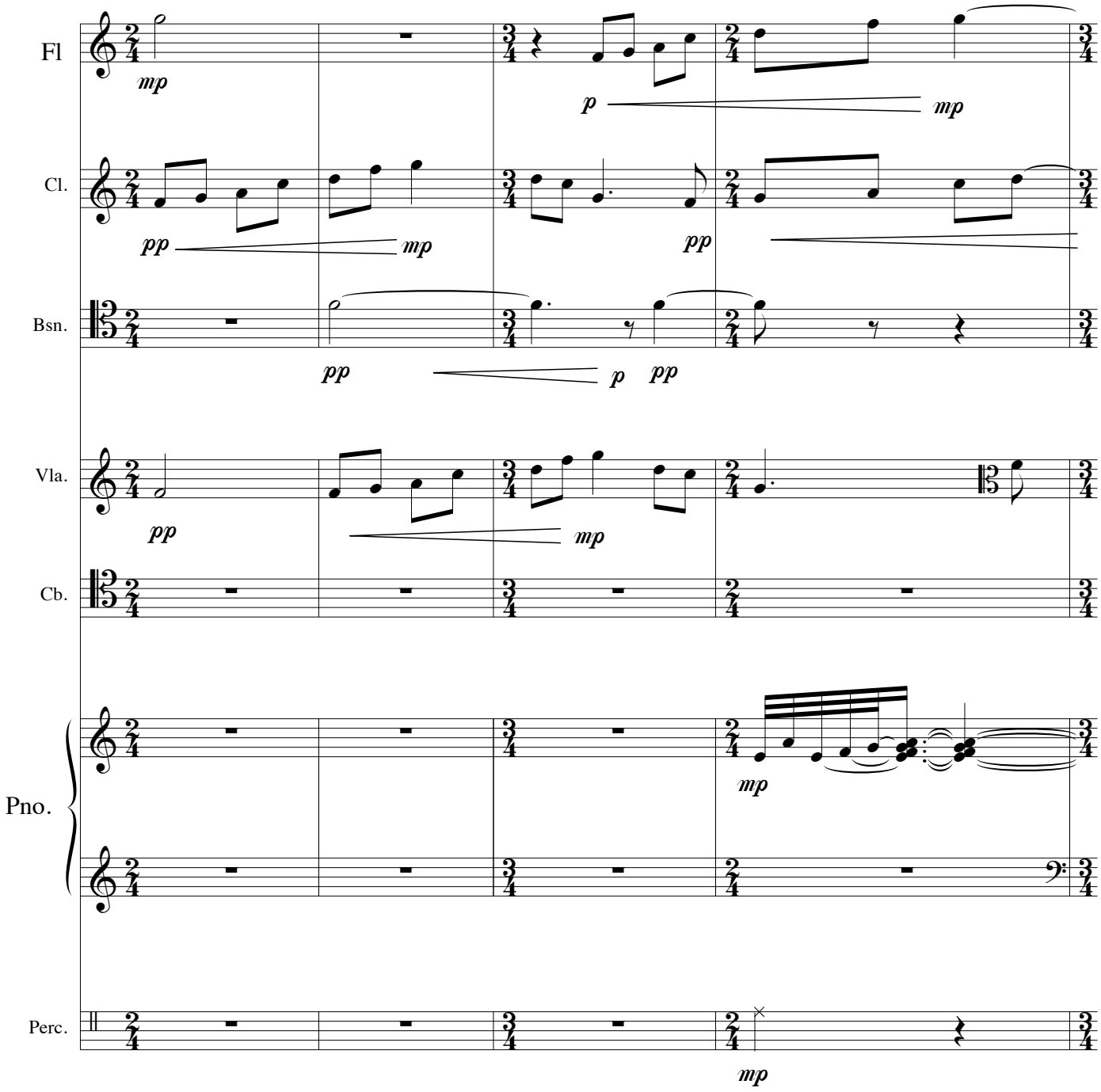
43

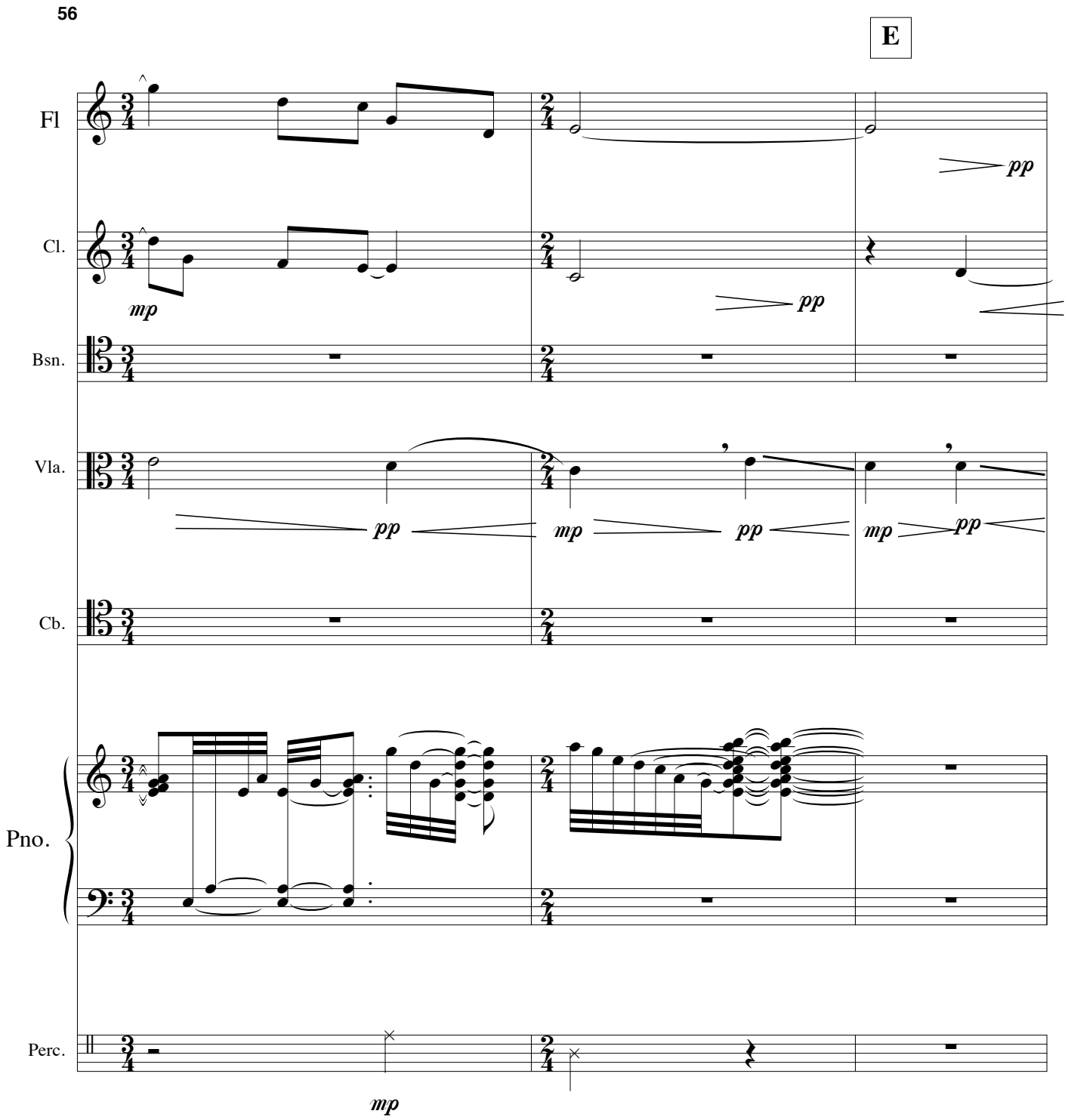



45
D
Fl
Cl.
Bsn.
Vla.
Cb.
Pno.
Perc.
pp
mp
pp
mp
pp
mp
pp
mp
pp
mp
pp
mp
pp
mp
mp

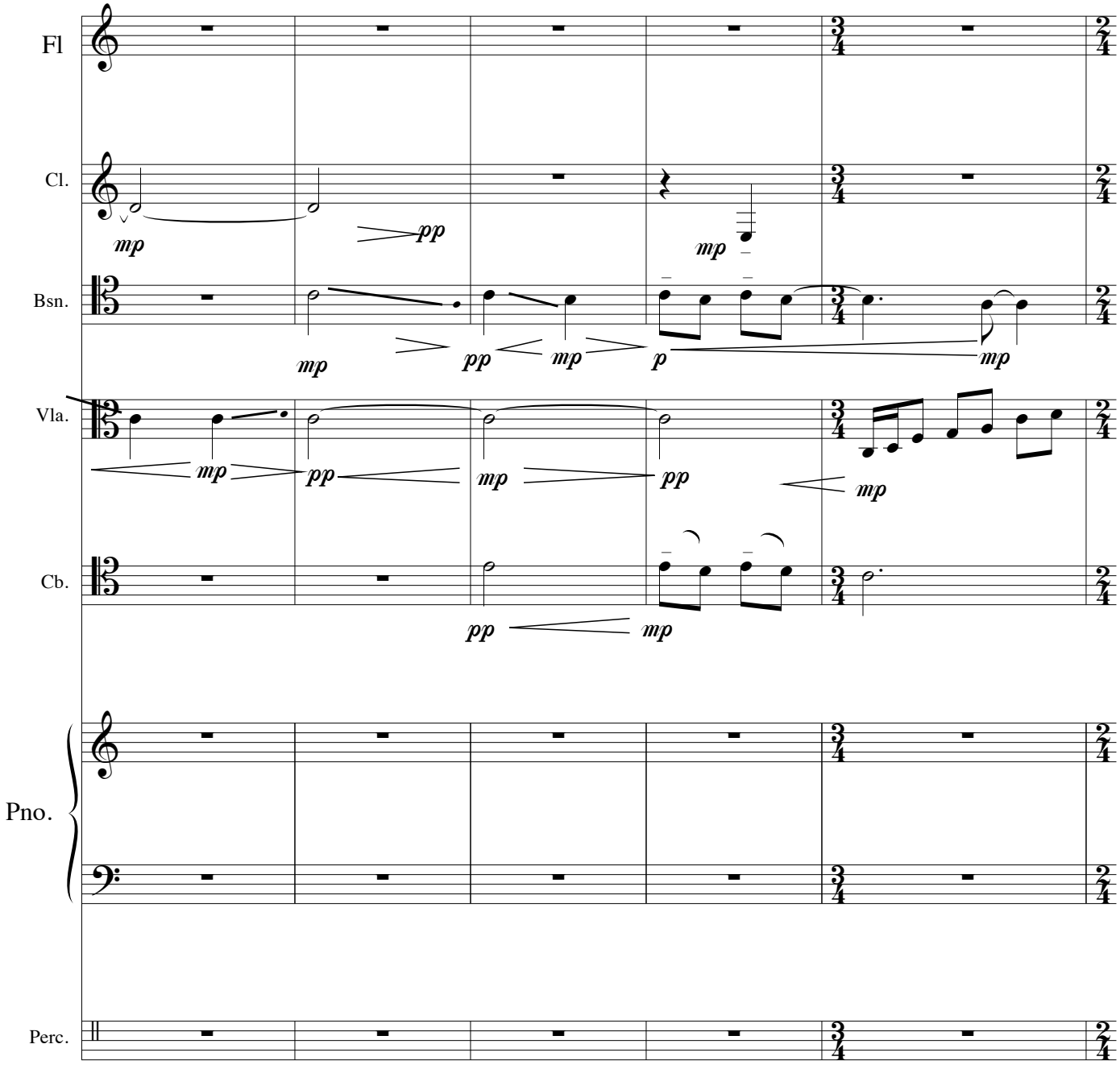

Fl
Cl.
Bsn.
Vla.
Cb.
Pno.
Perc.
mp
pp
mp
p
mp
pp
mp
pp
pp
mp
pp
mp
pp
pp
mp
pp

52

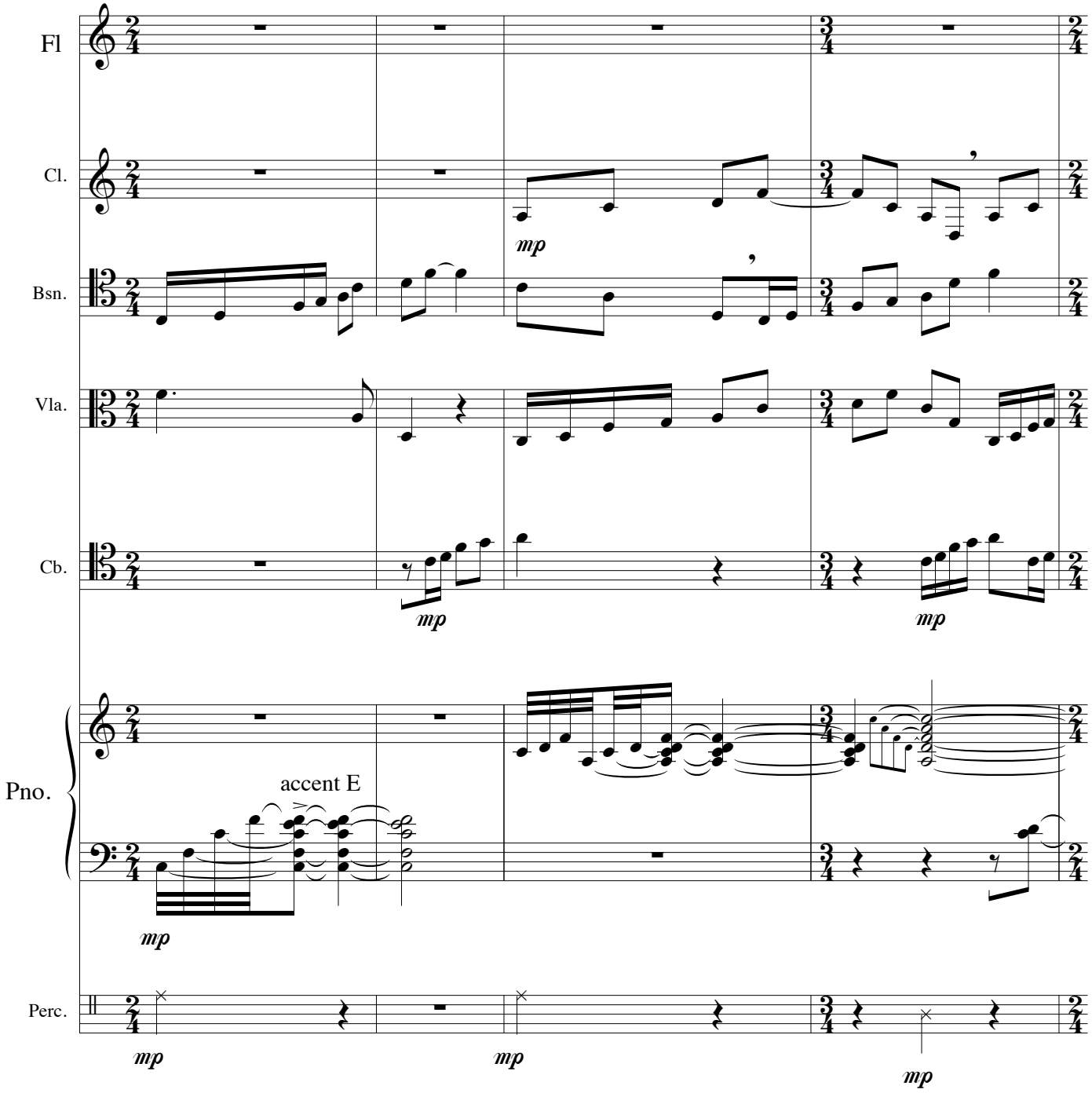


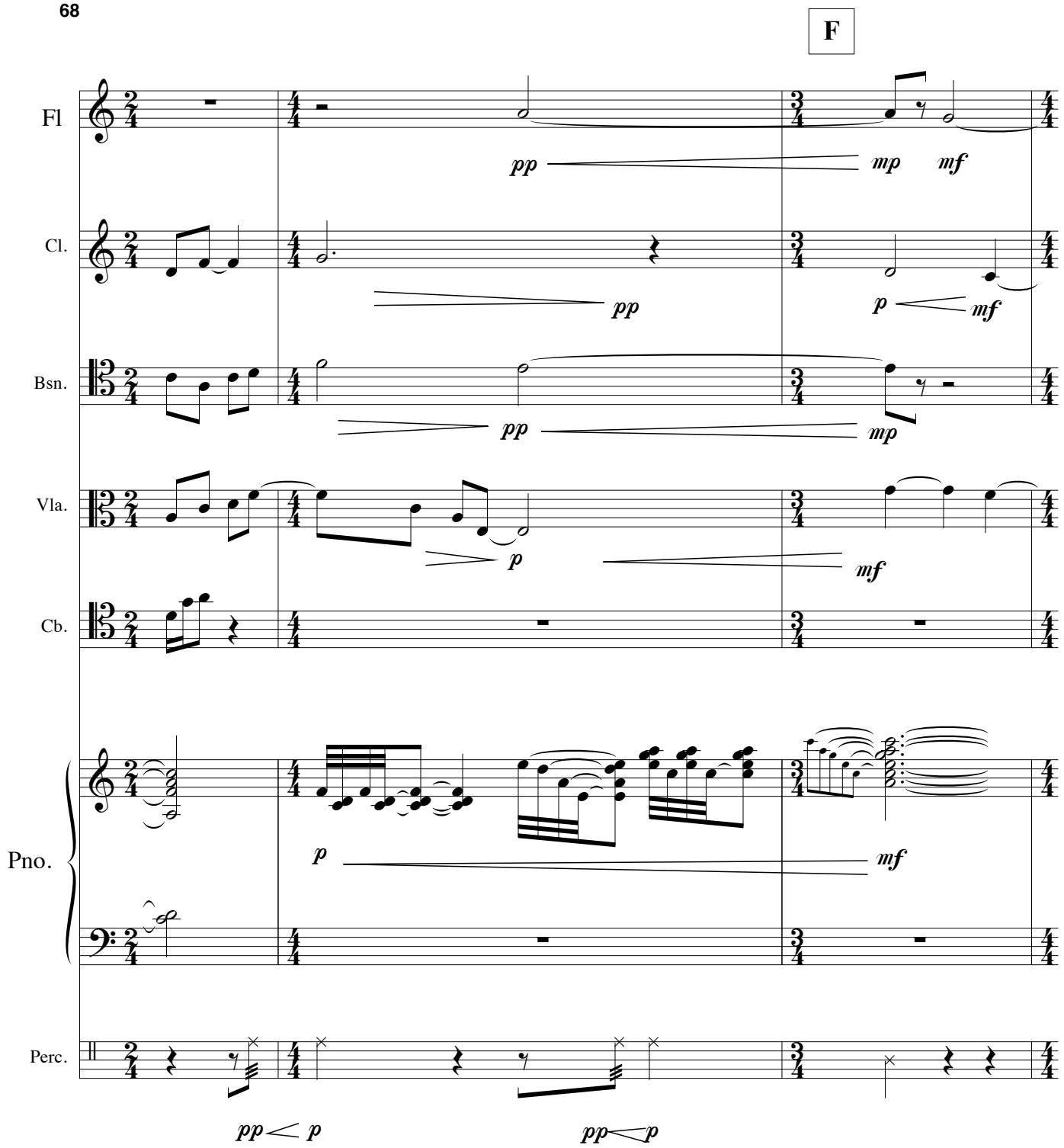

56
E
Fl
Cl.
Bsn.
Vla.
Cb.
Pno.
Perc.
mp
pp
pp
pp
mp
pp
mp
pp
mp

59

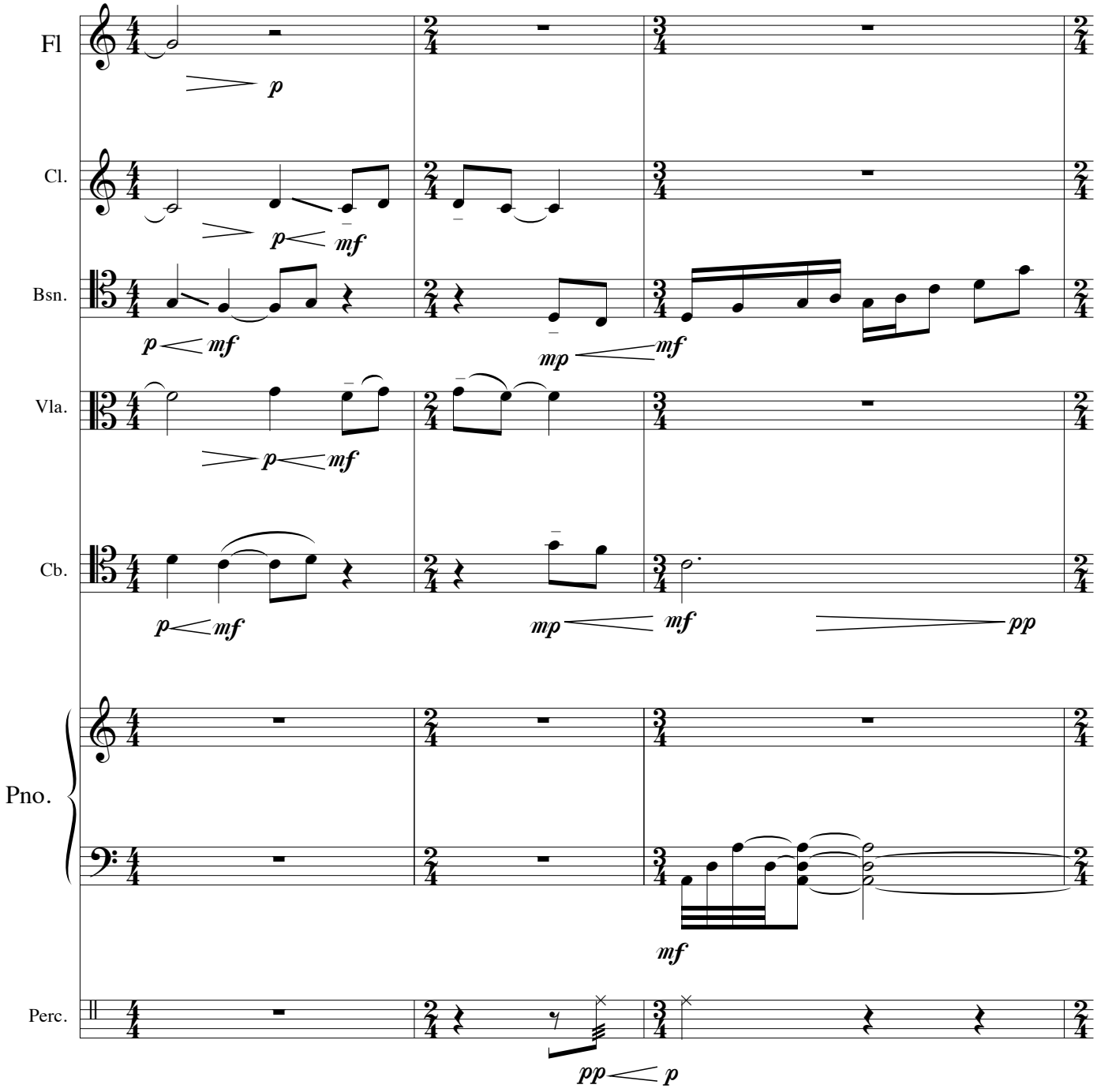


64

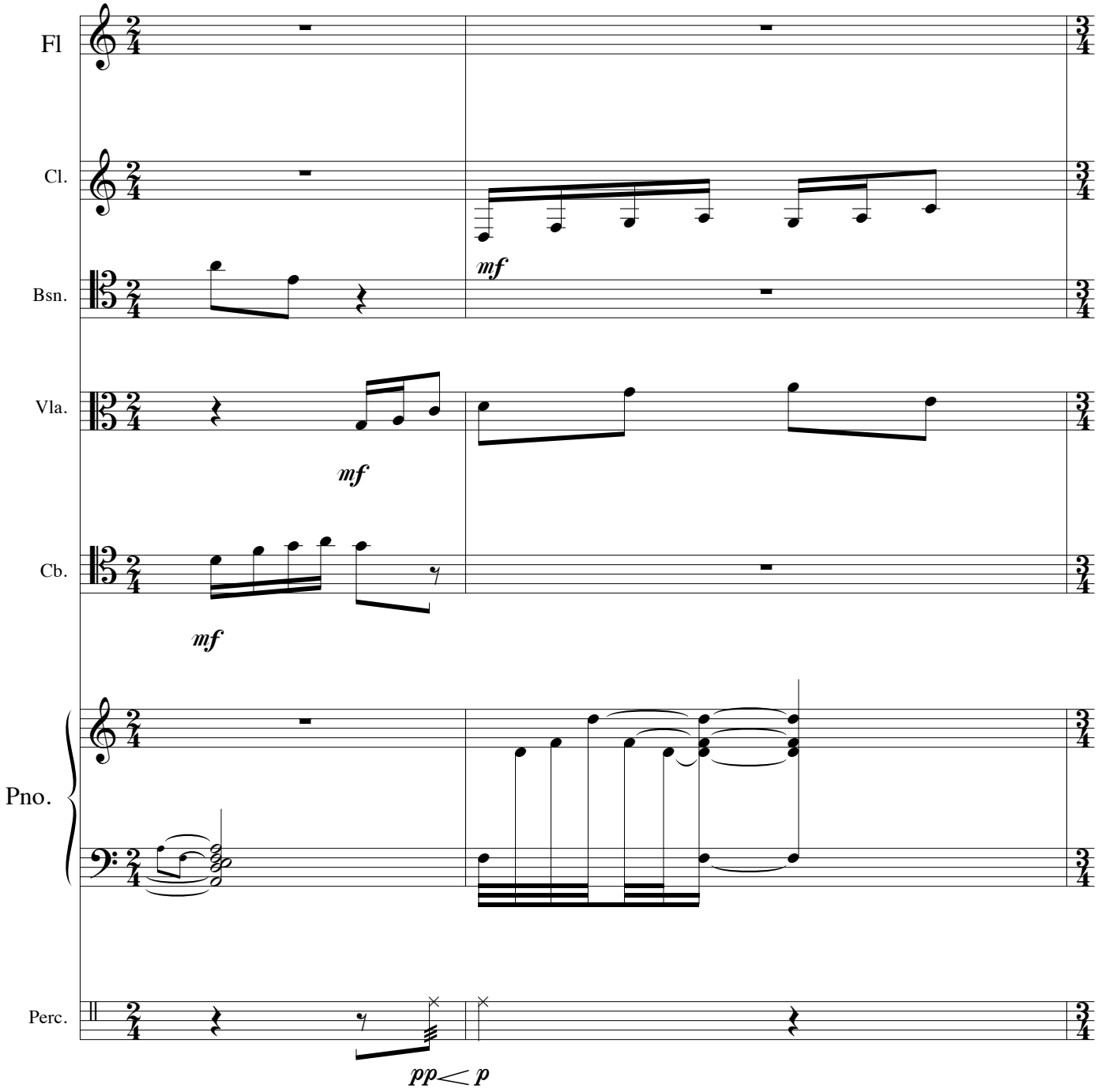



68
F
Fl
pp
mp
mf
Cl.
pp
p
mf
Bsn.
pp
mp
Vla.
p
mf
Cb.
Pno.
p
mf
Perc.
pp
p
pp
p

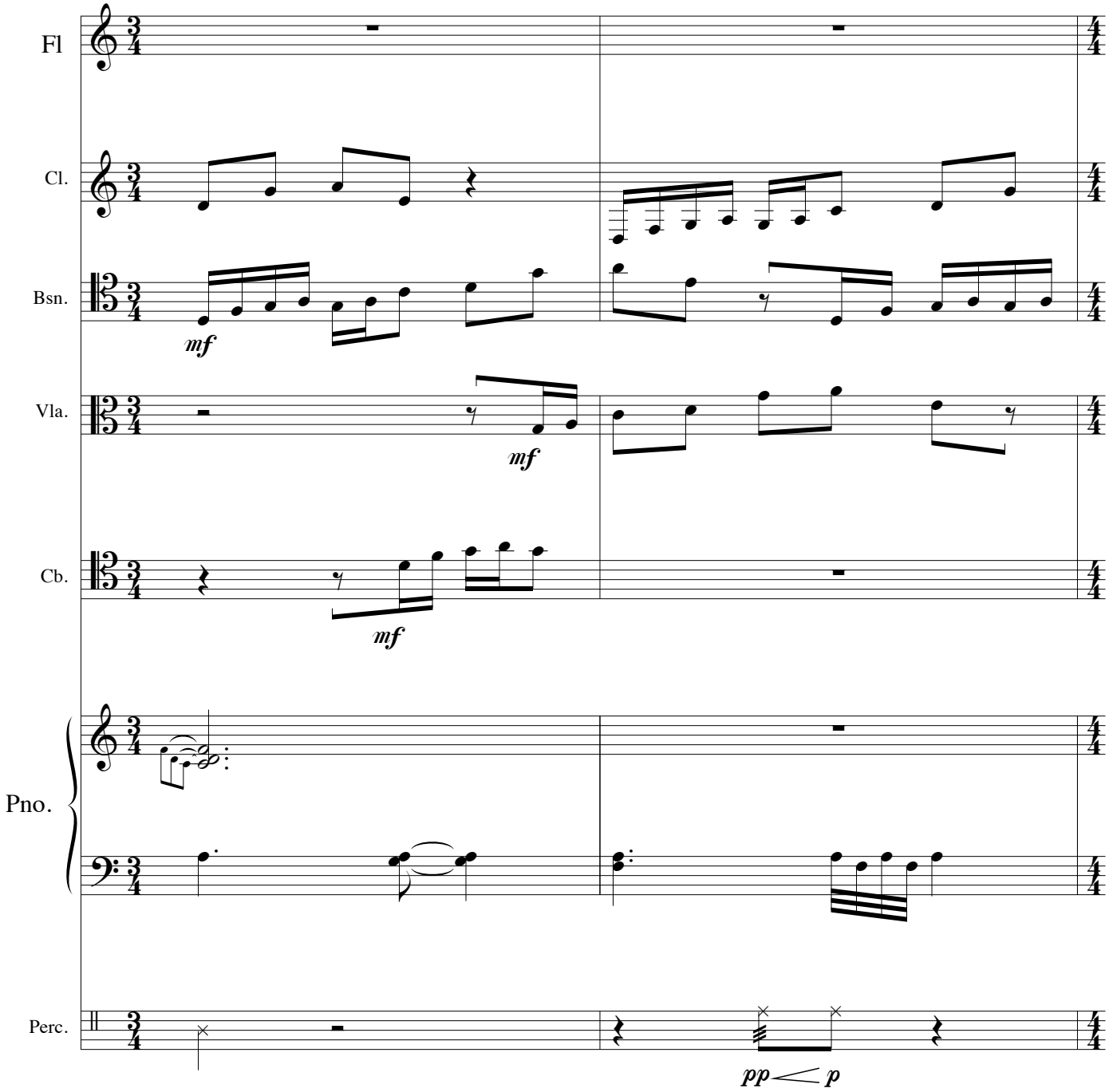
71



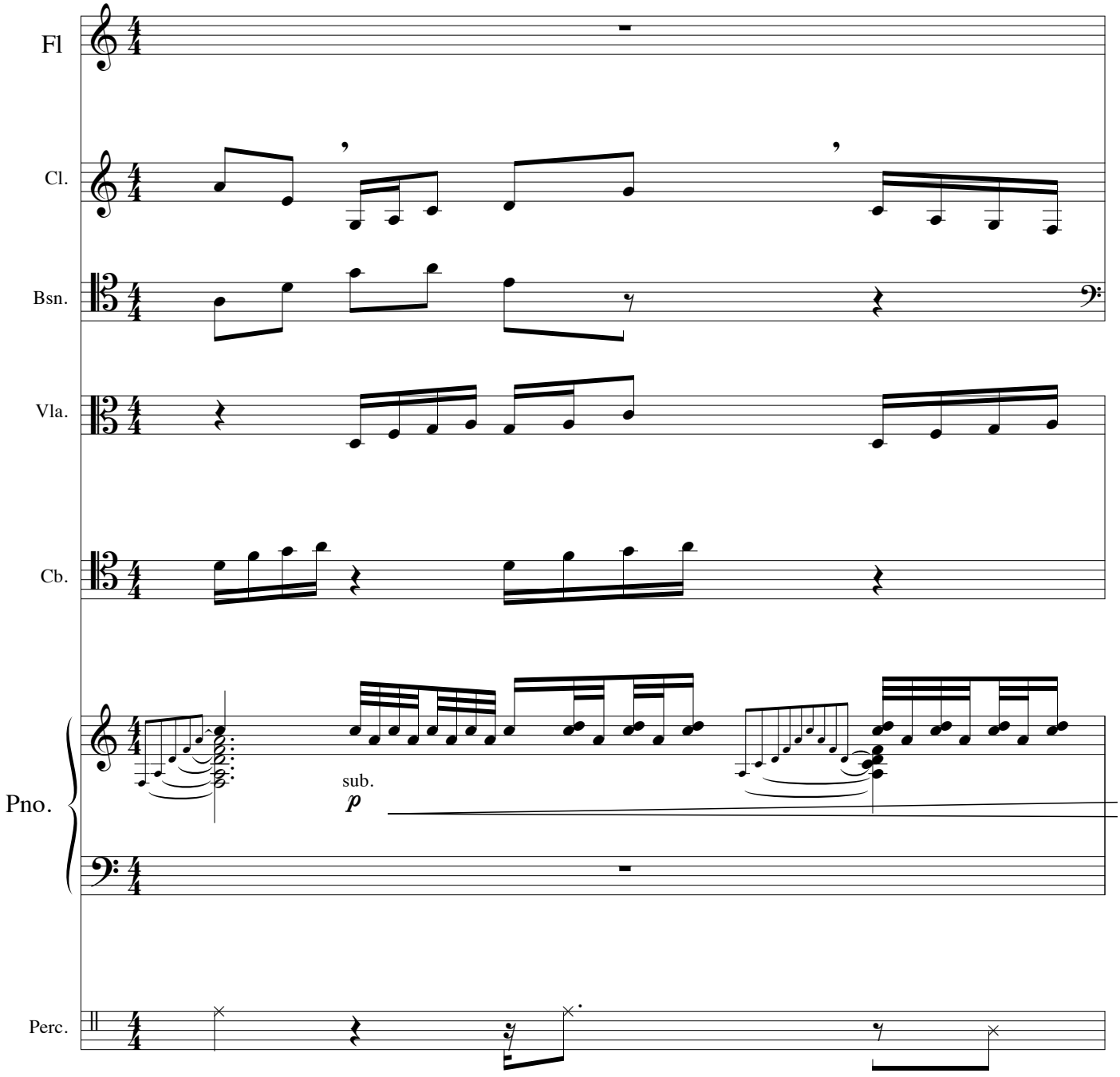
74

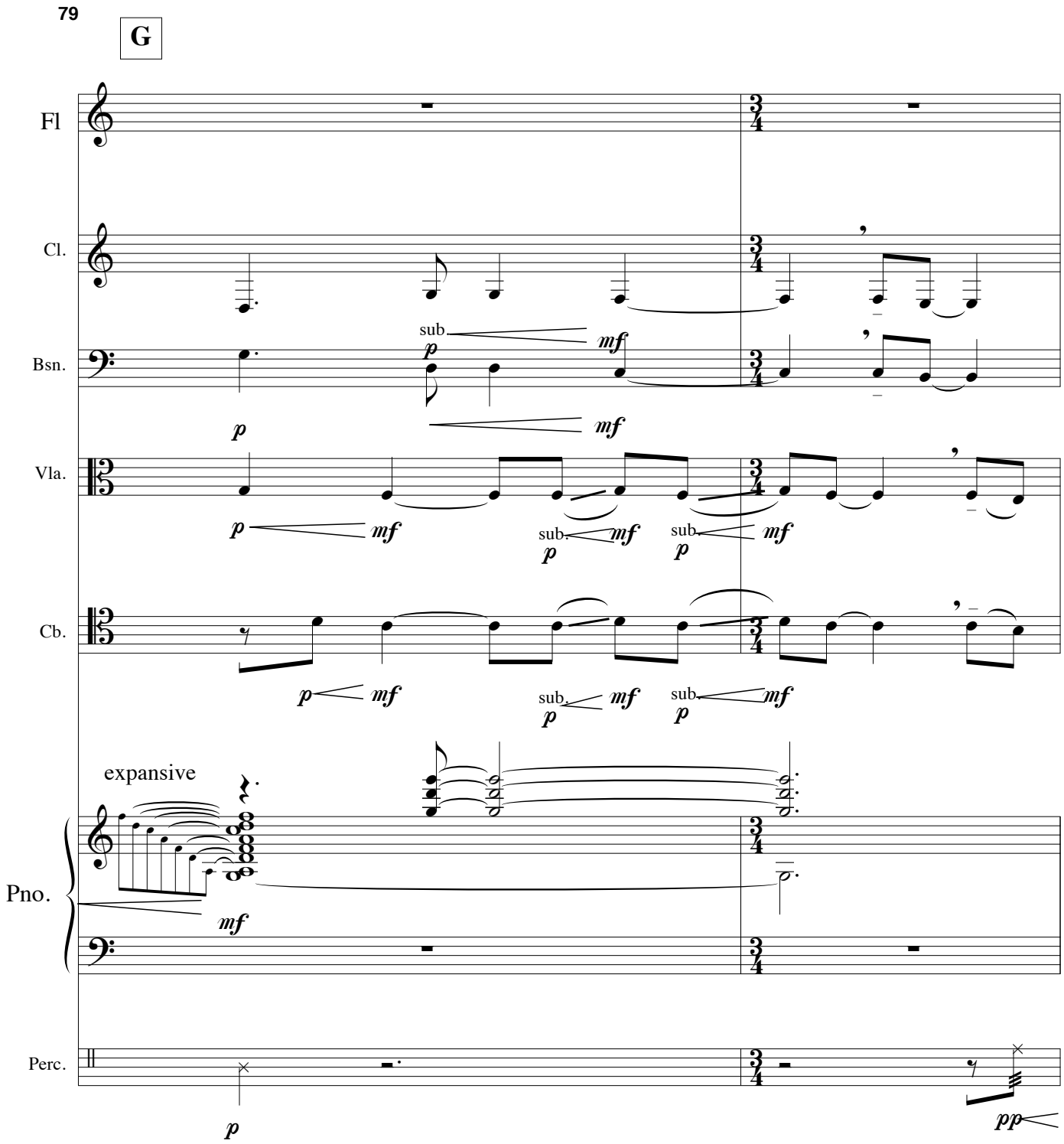


76

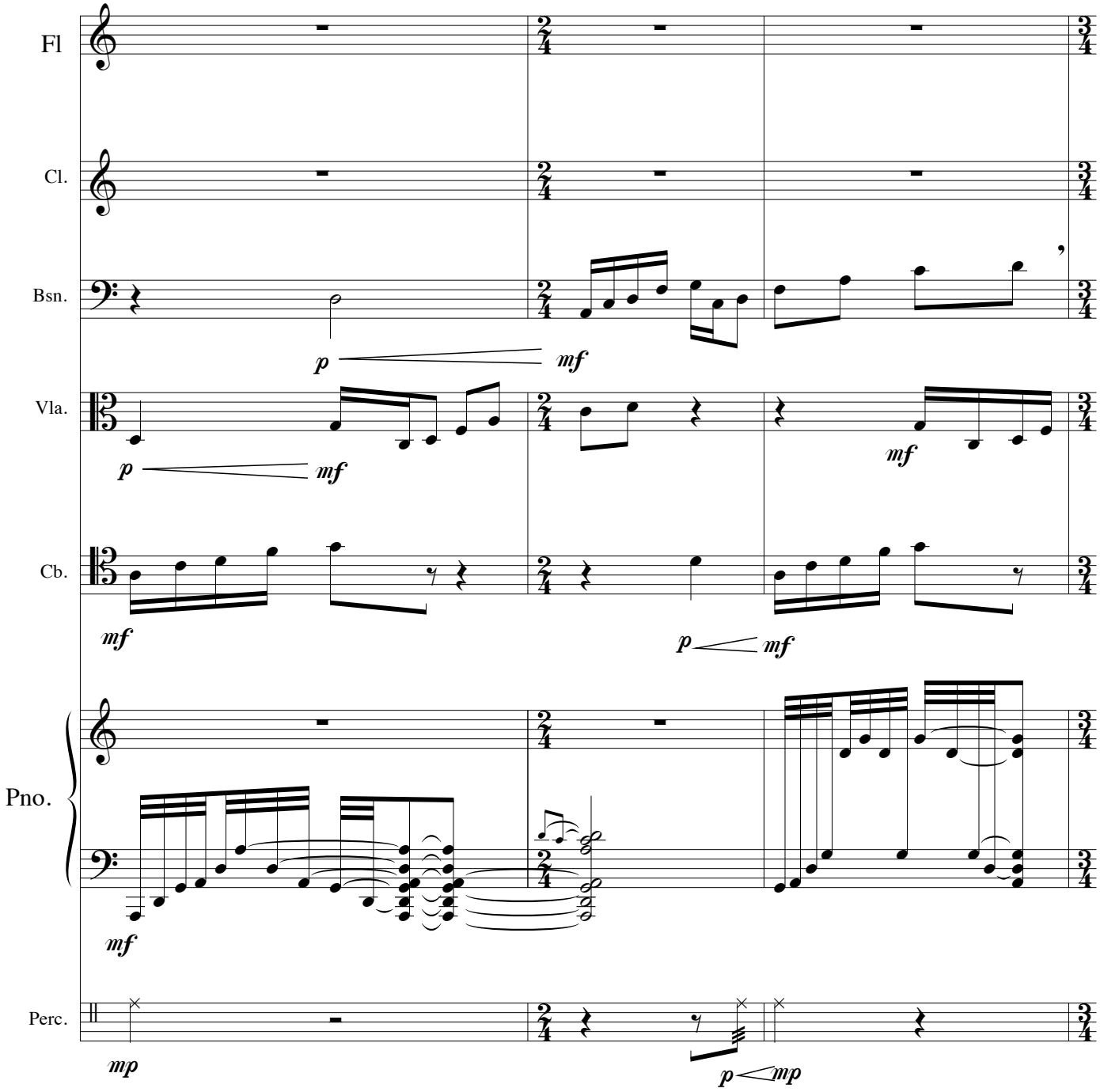


78

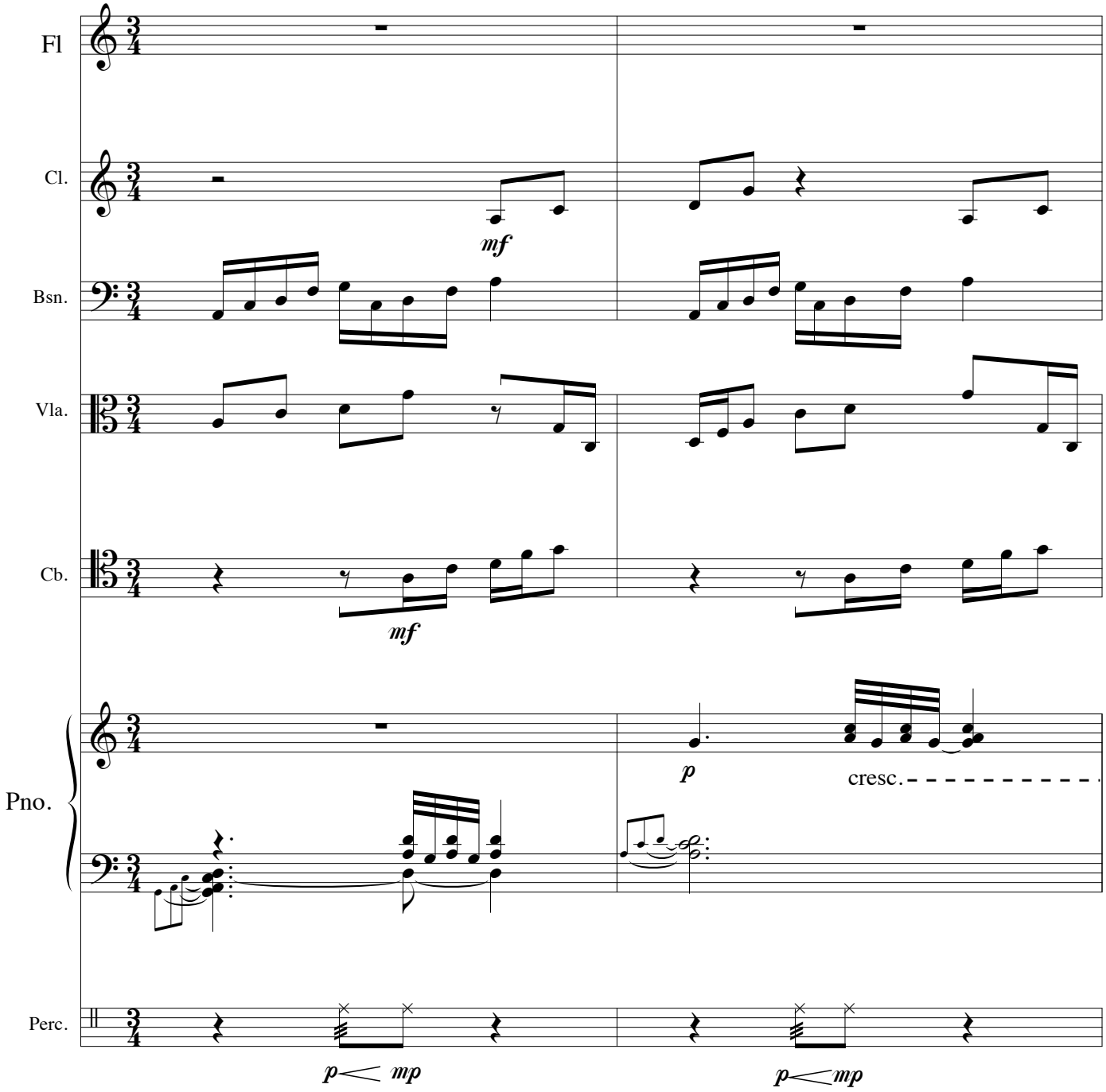


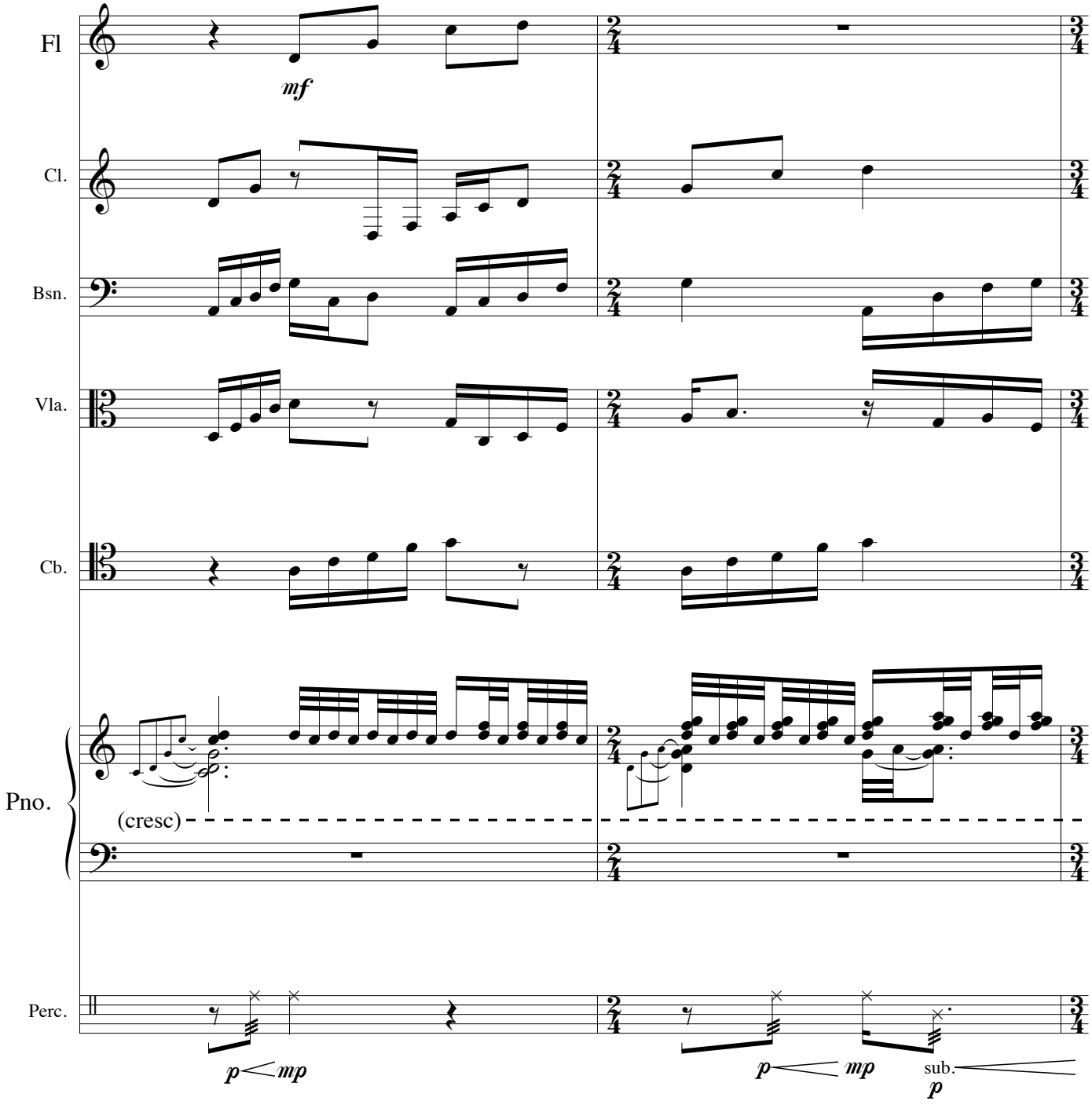

79
G
Fl
Cl.
Bsn.
Vla.
Cb.
Pno.
Perc.
sub.
p
mf
expansive
pp

81



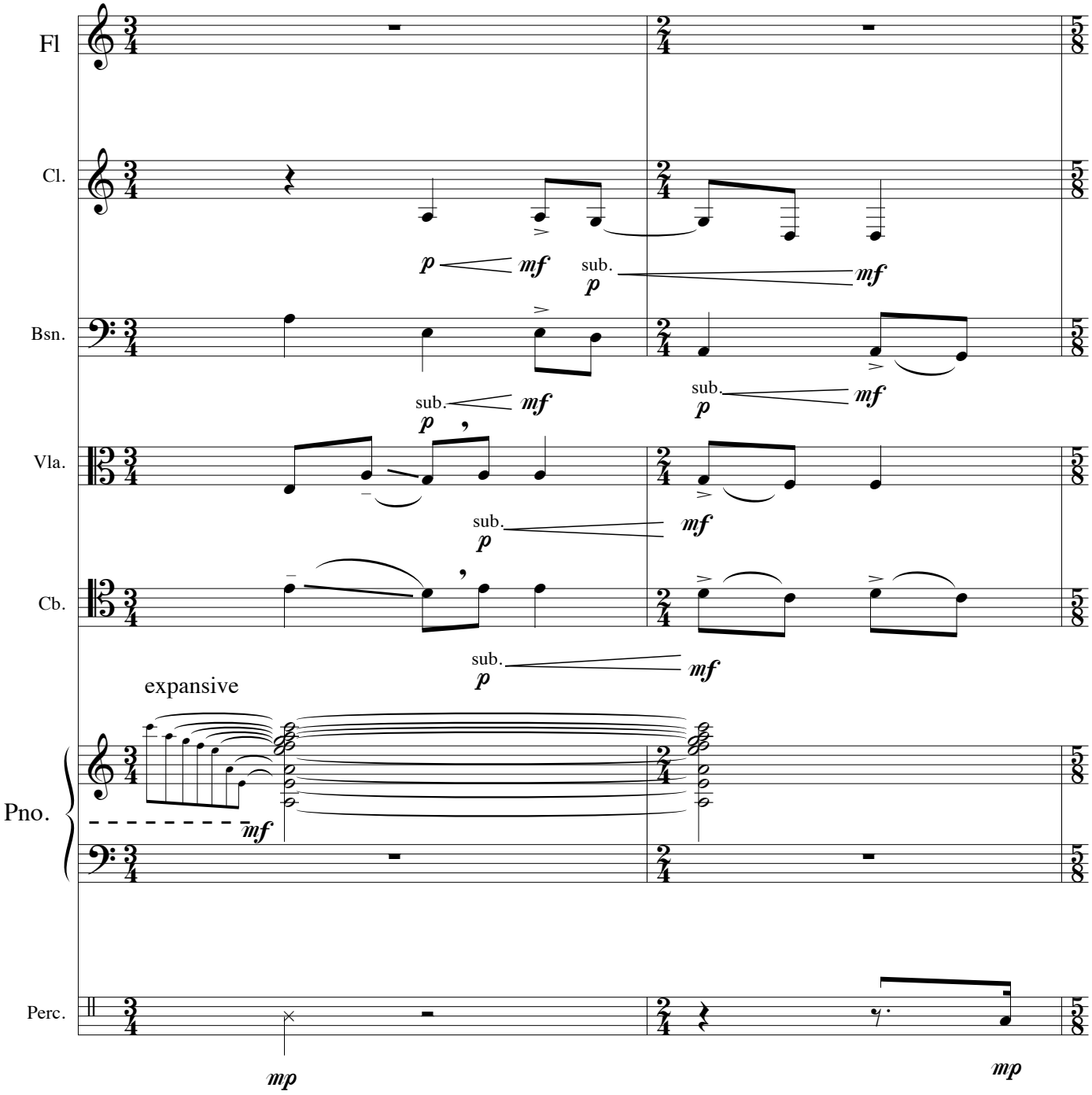
84

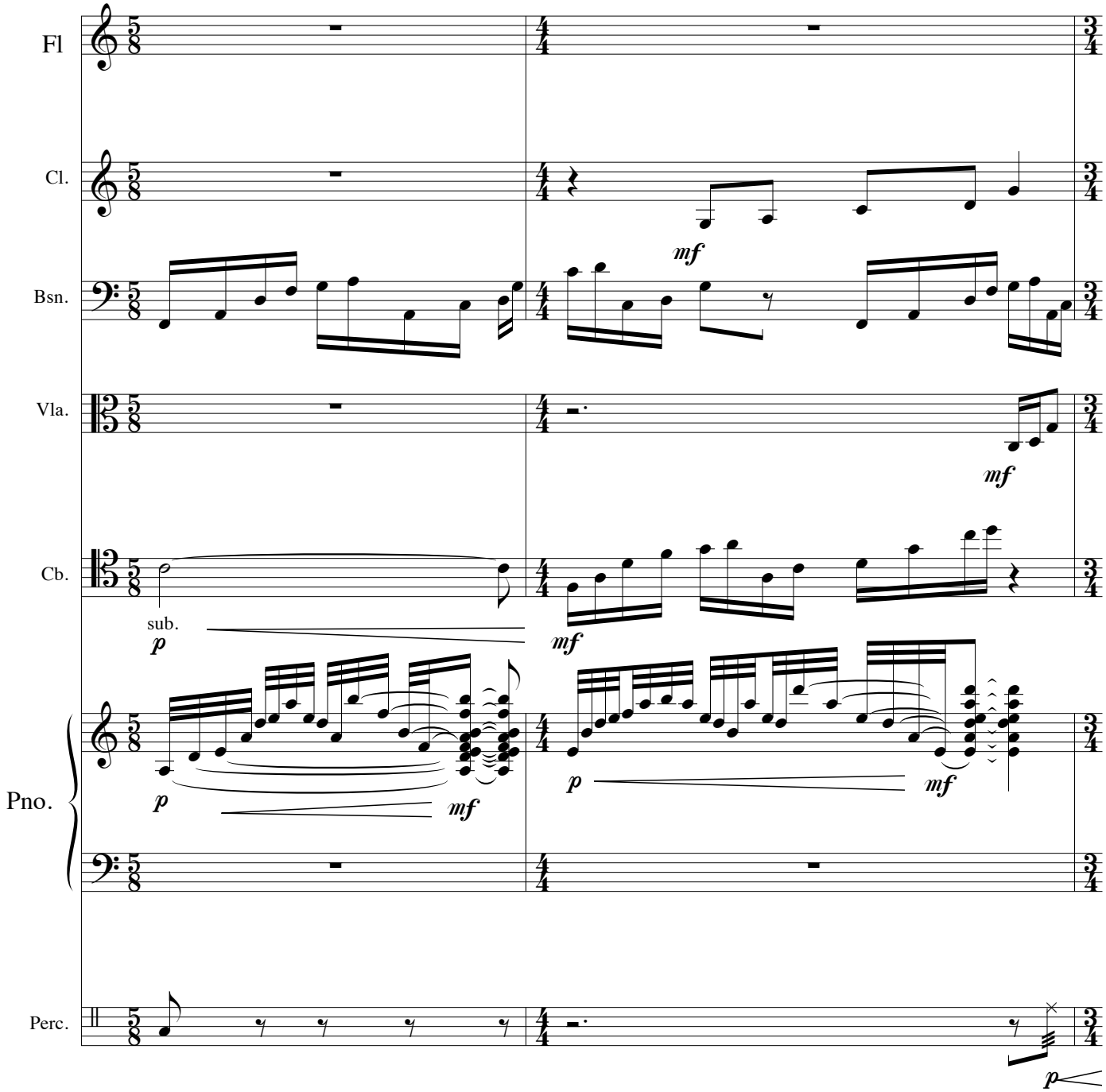



Fl
mf
Cl.
Bsn.
Vla.
Cb.
Pno.
(cresc)
Perc.
p mp
p mp
sub.
p

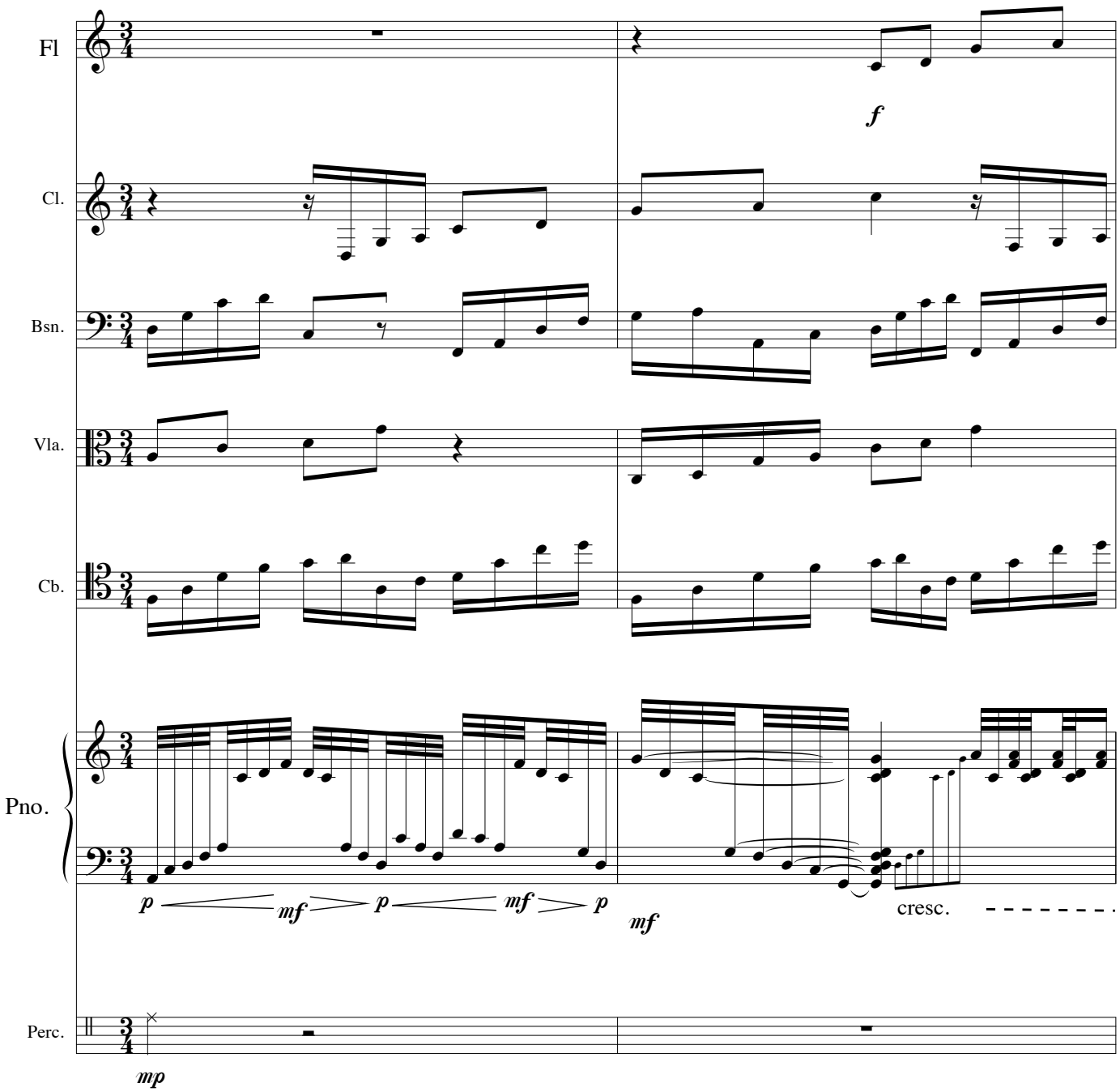
88

H

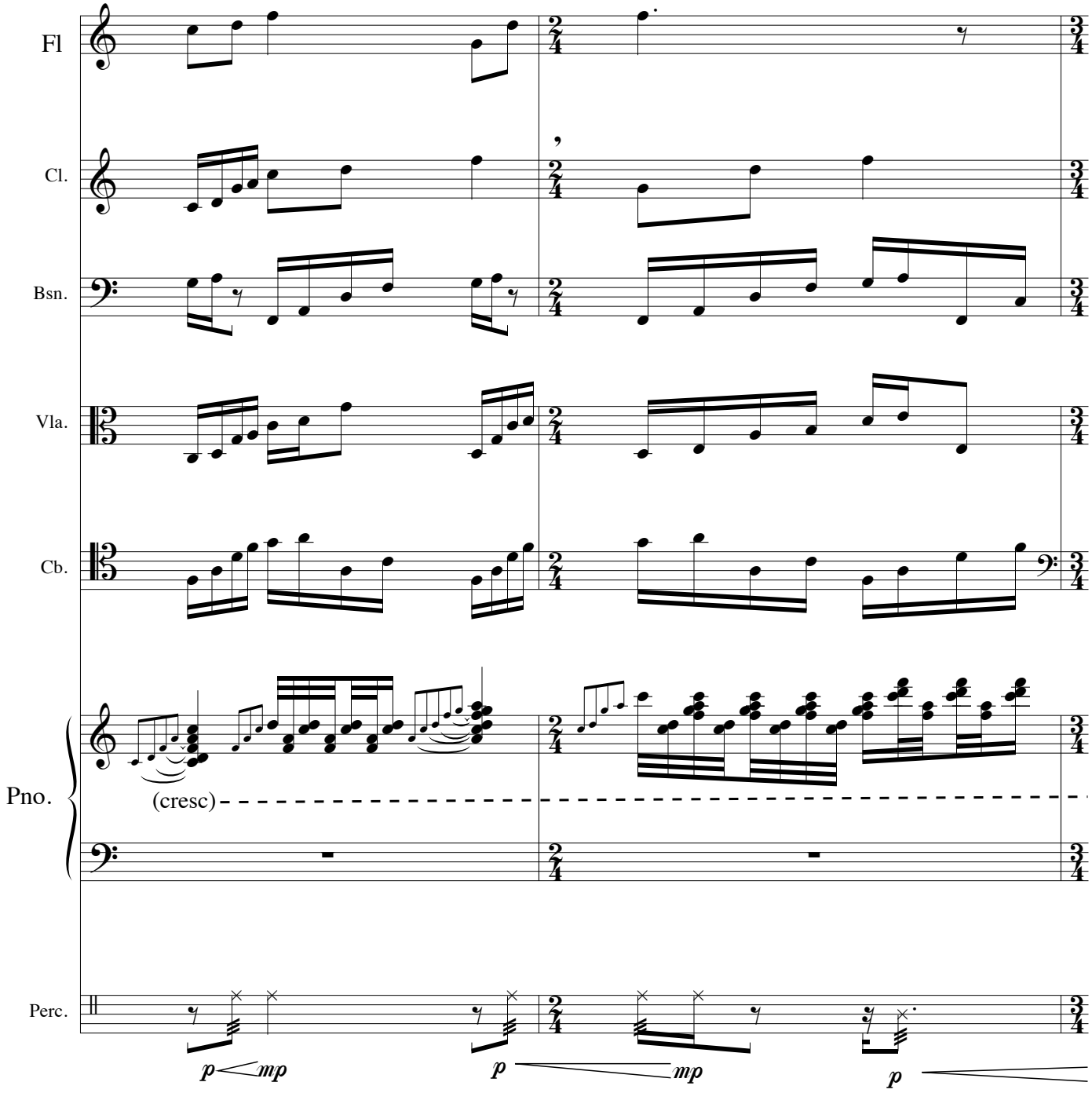


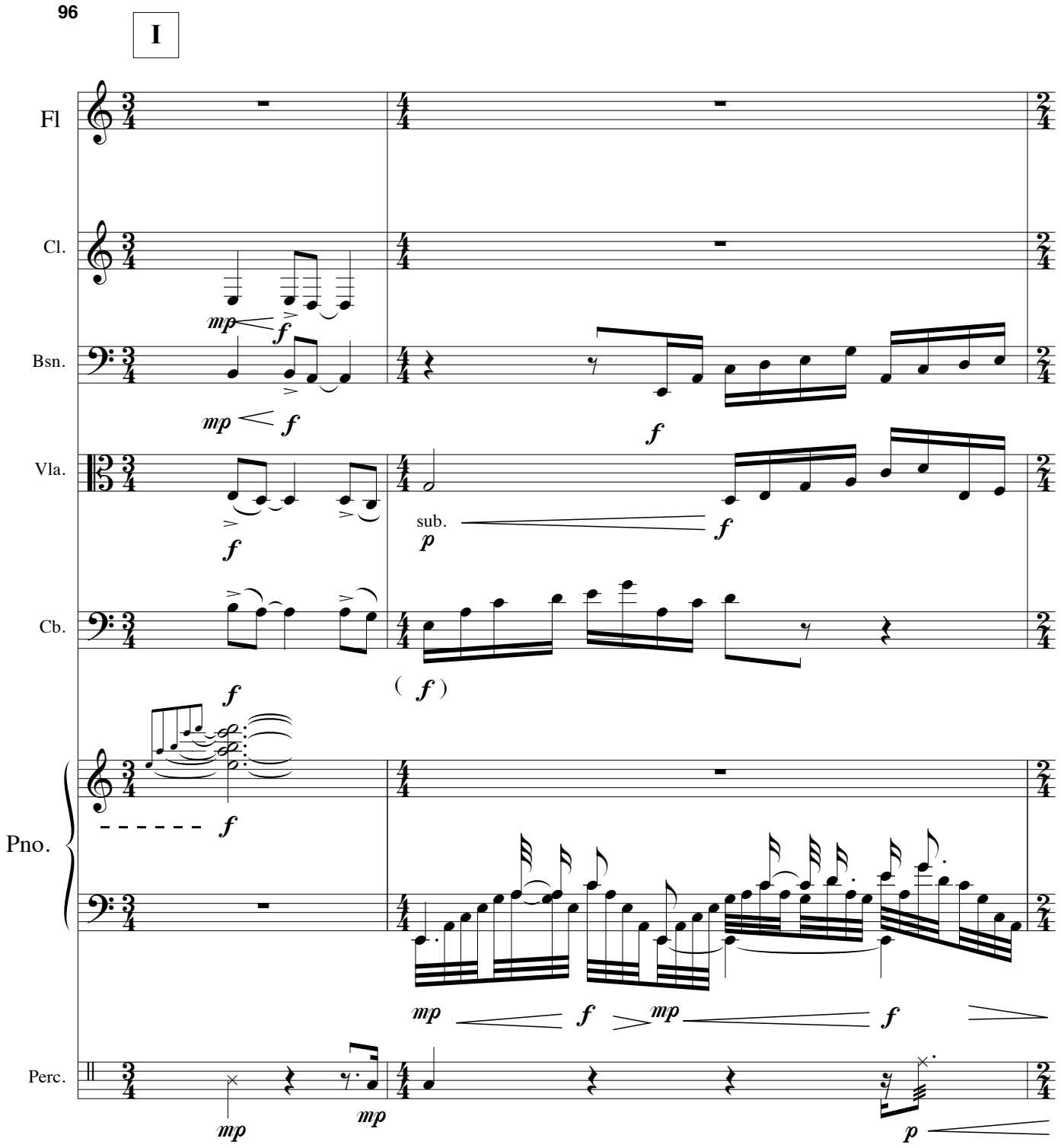

Fl
Cl.
Bsn.
Vla.
Cb.
Pno.
Perc.
mf
mf
sub.
p
mf
p
mf
p
mf
p

92

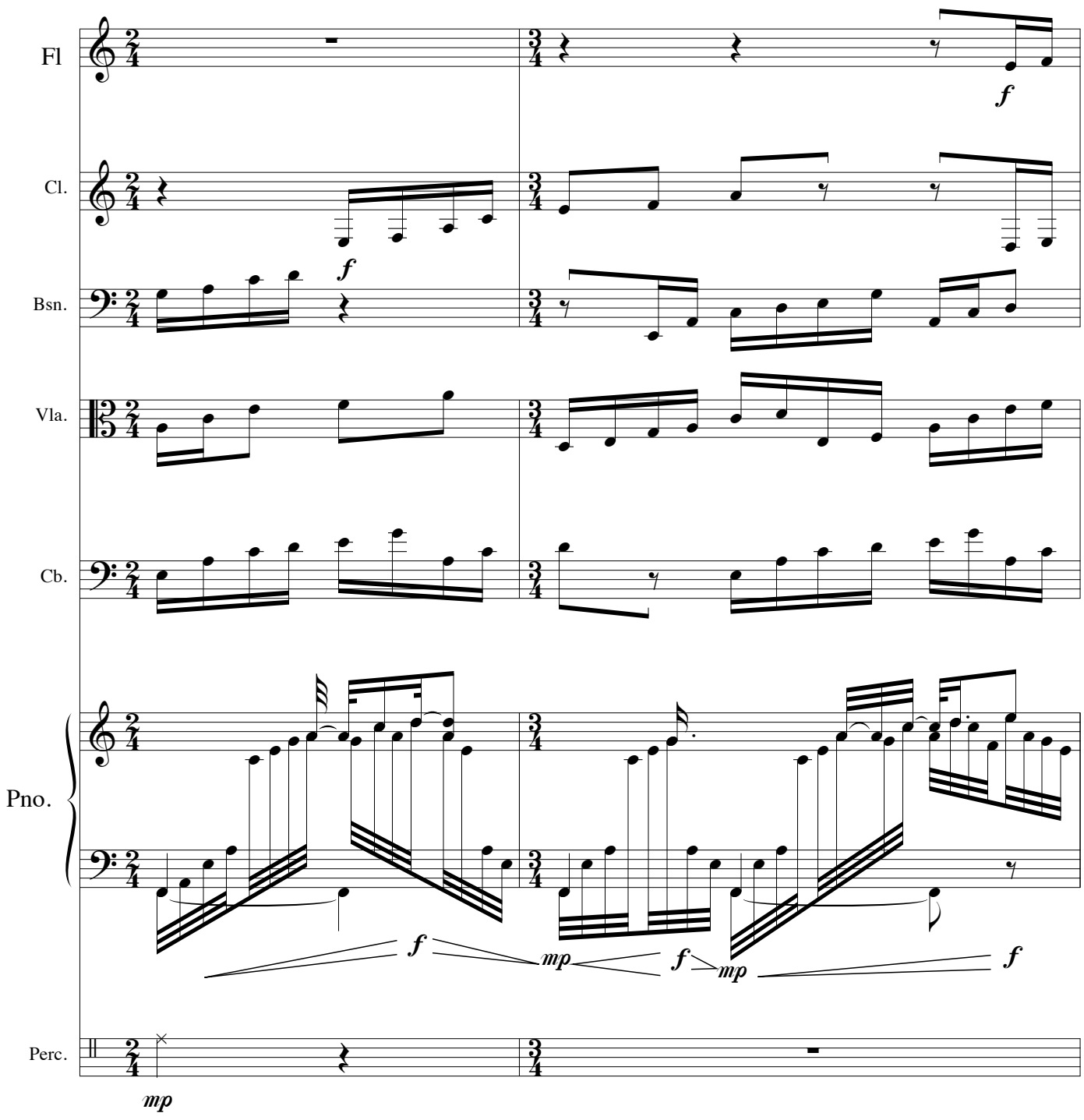


94

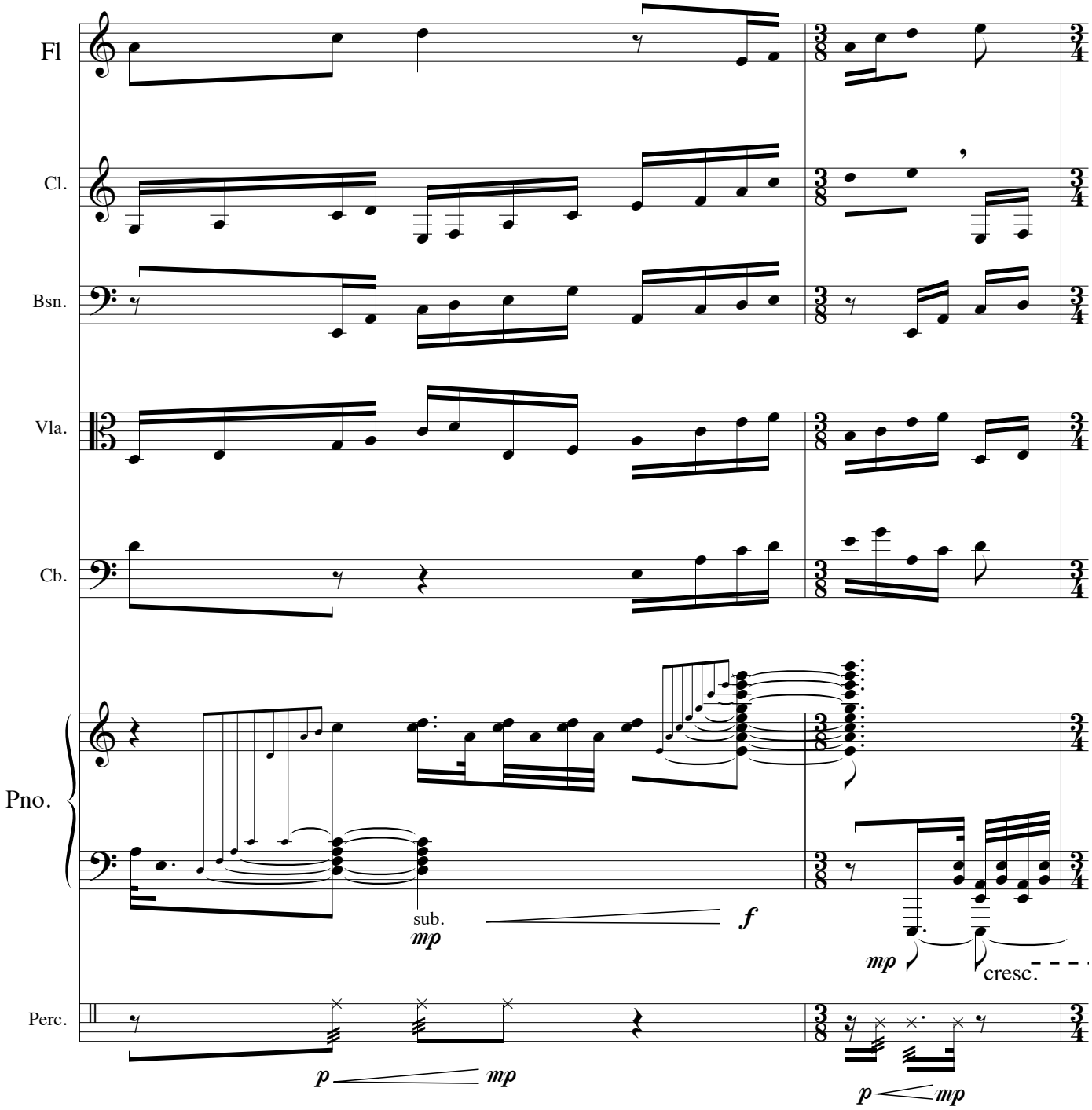


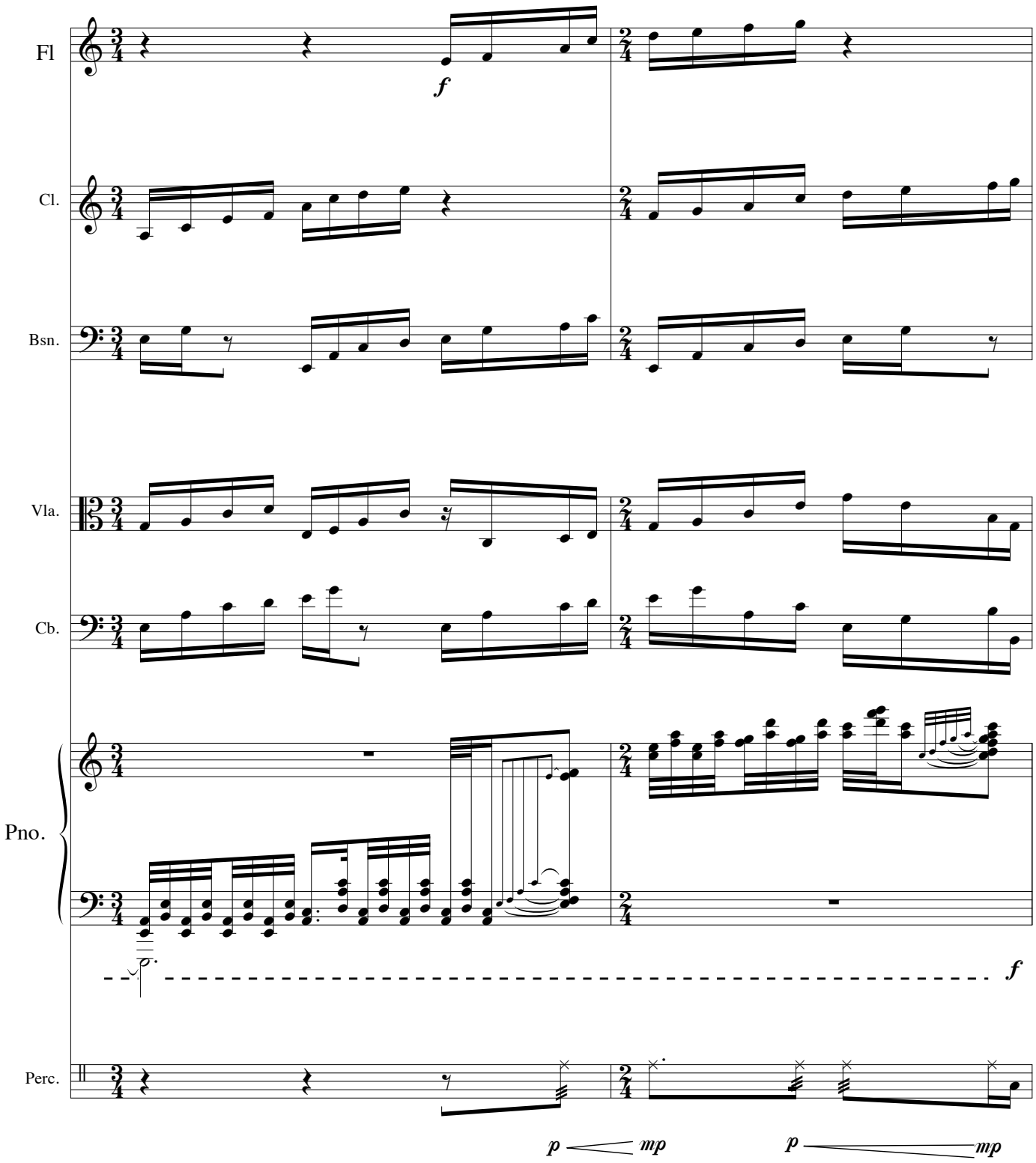

96
I
Fl
Cl.
Bsn.
Vla.
Cb.
Pno.
Perc.
mp
f
sub.
p
(f)

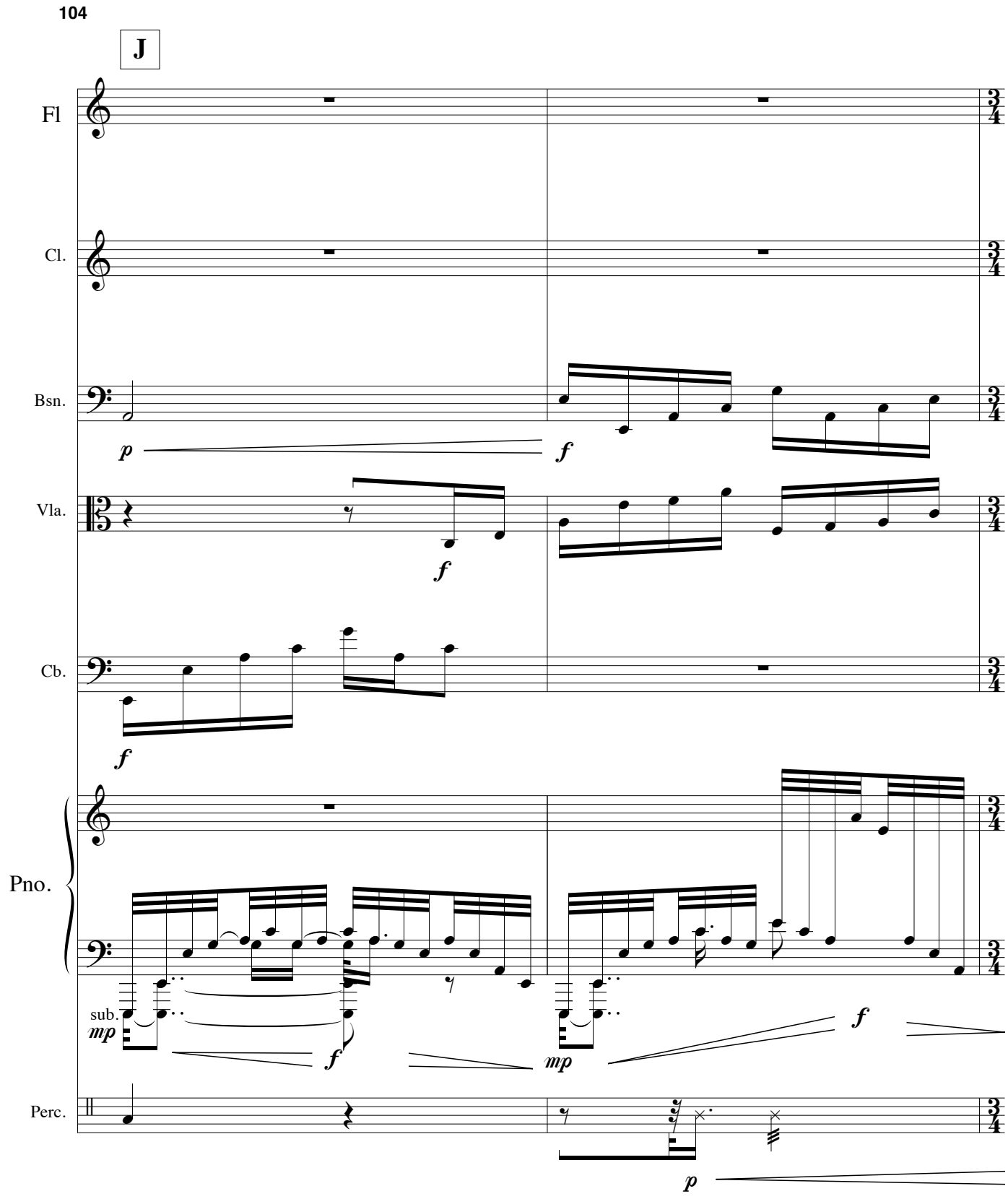
98



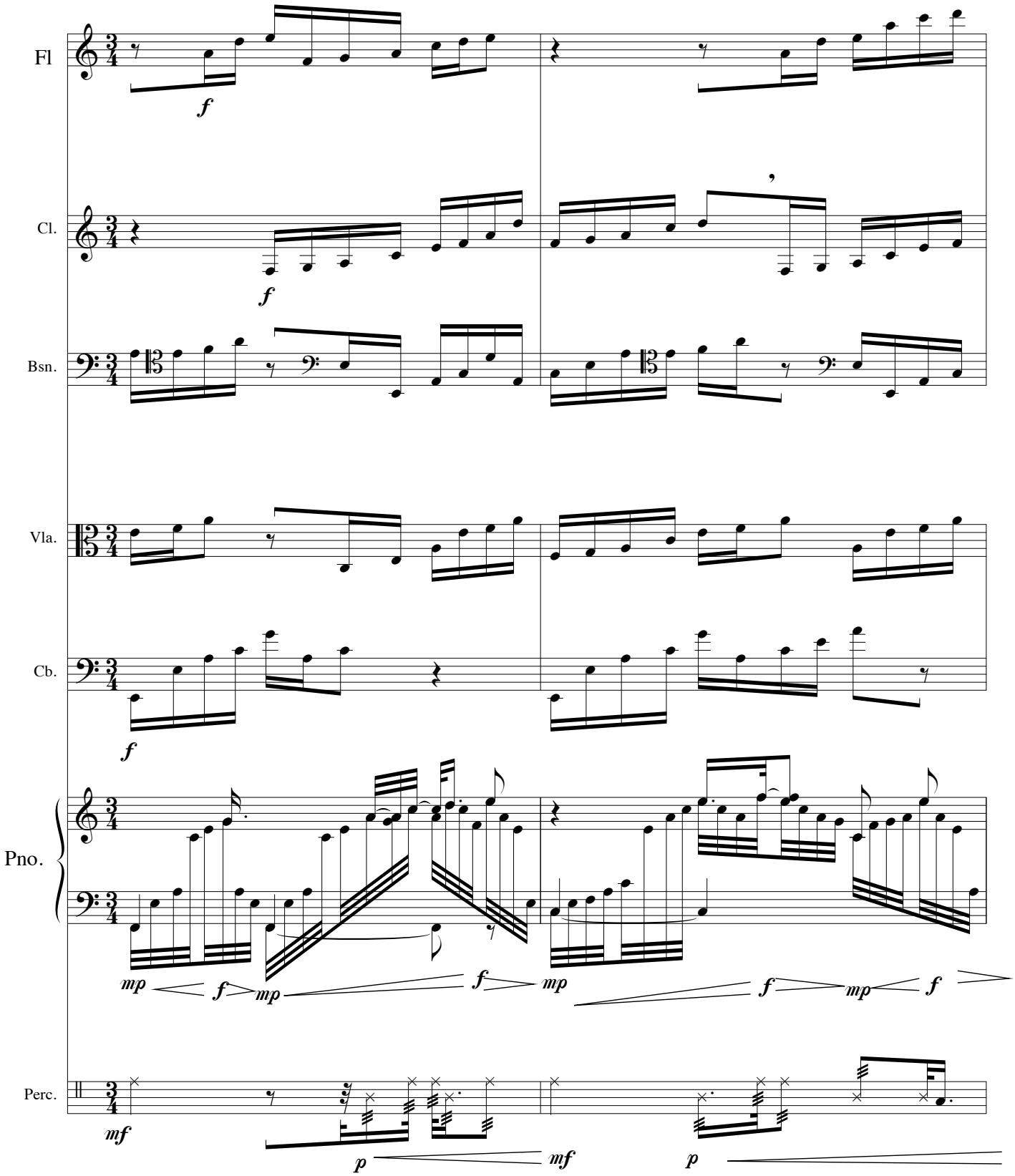
100

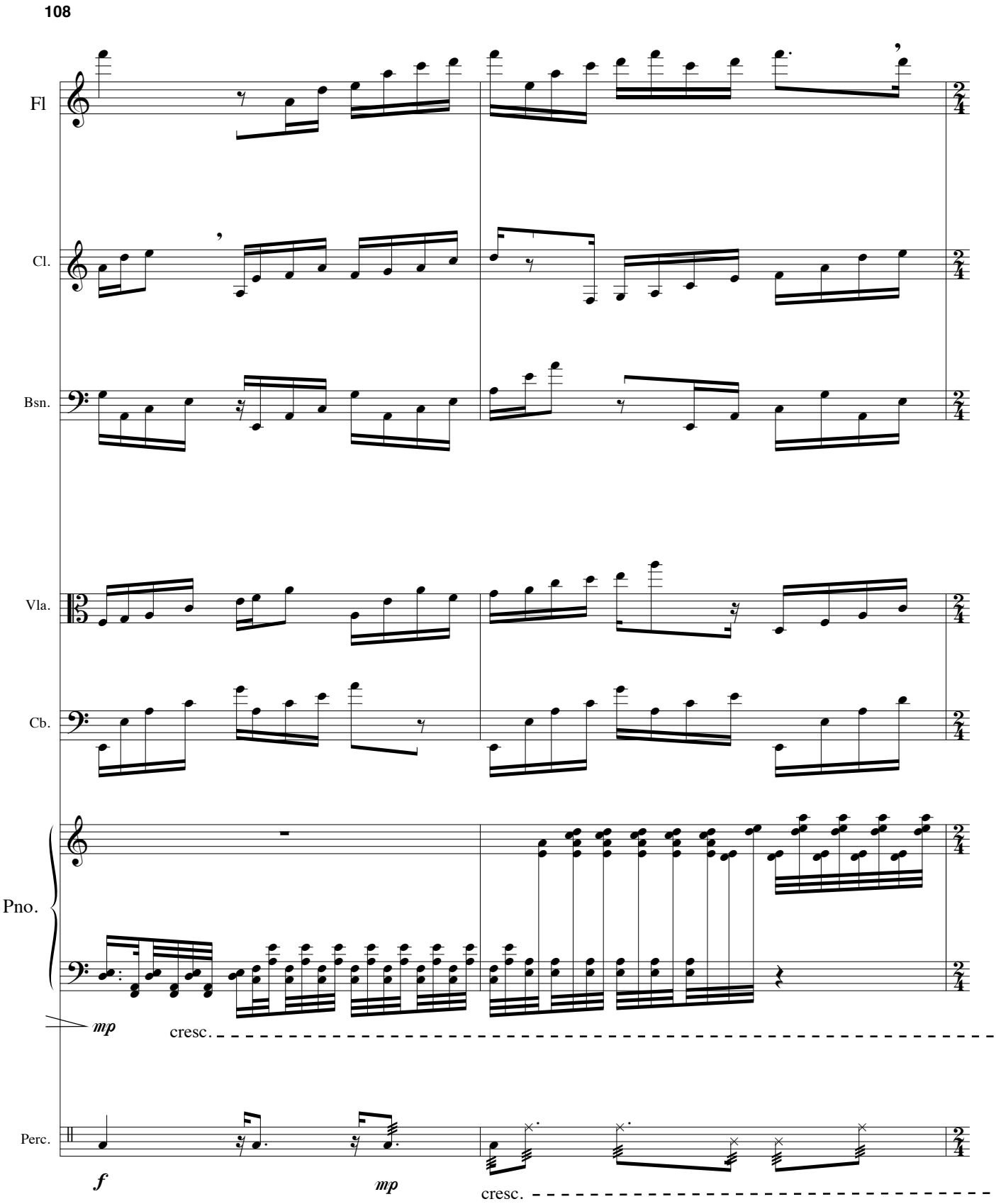


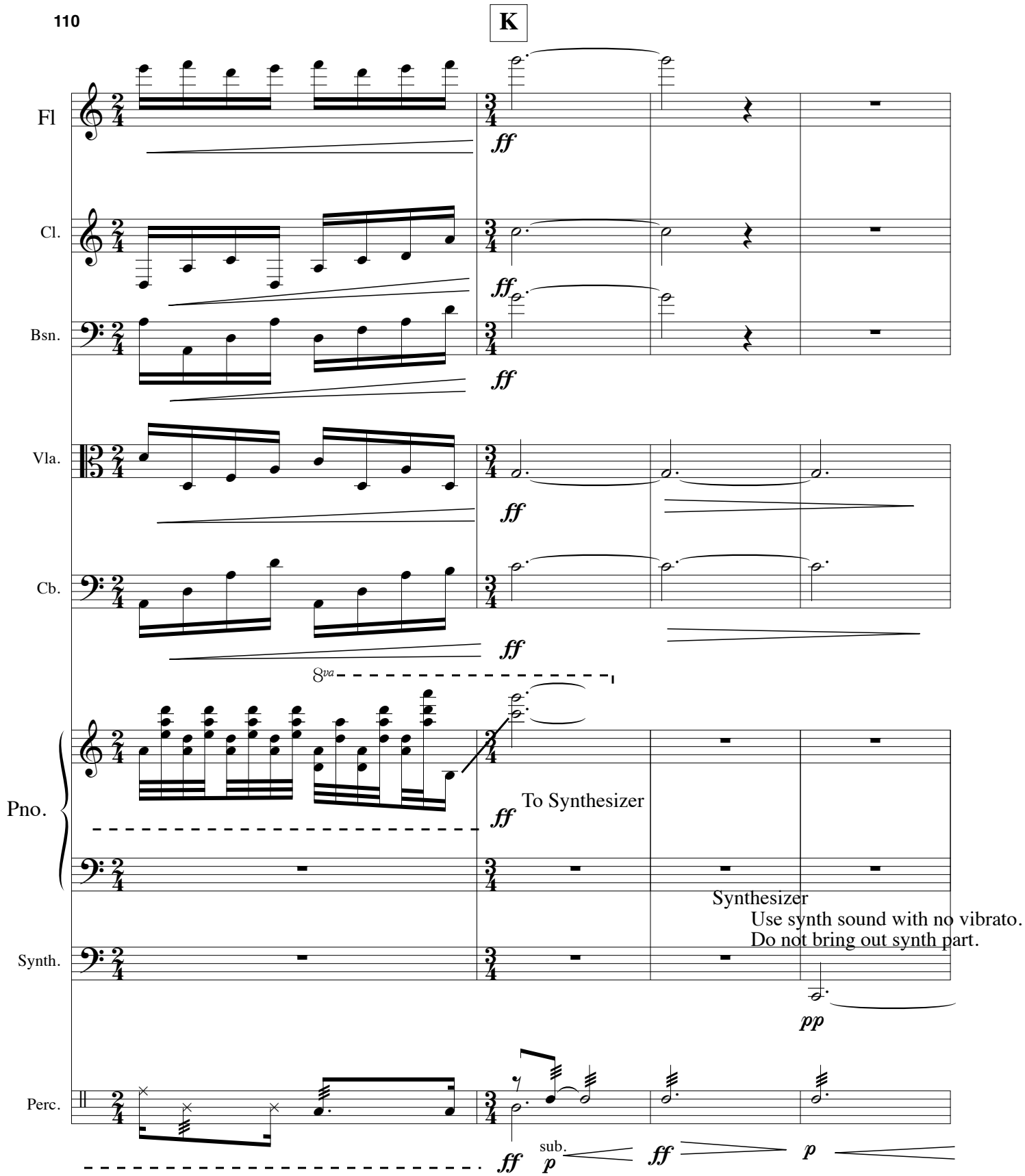

Fl
Cl.
Bsn.
Vla.
Cb.
Pno.
Perc.
f
f
p
mp
p
mp

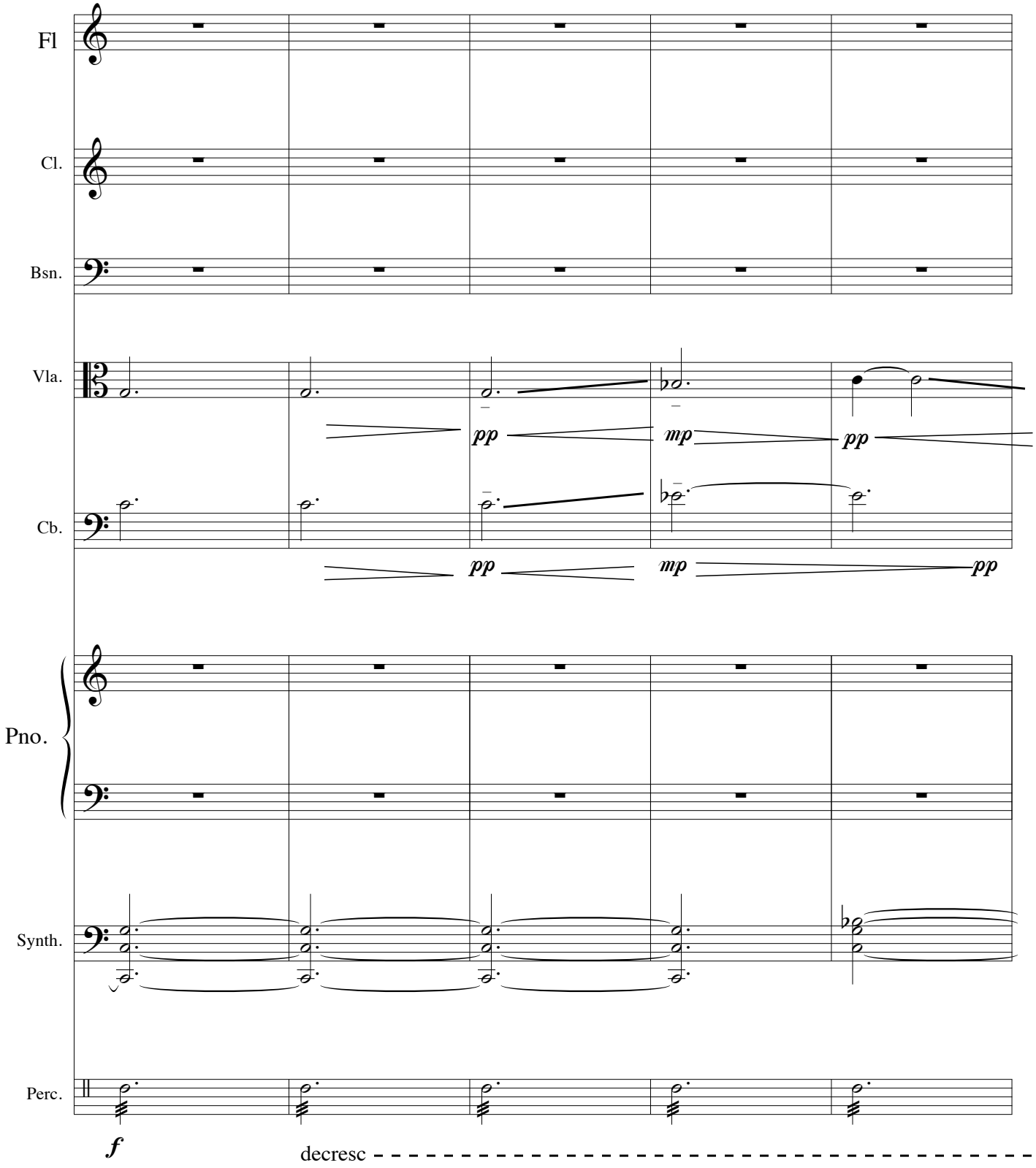

104
J
Fl
Cl.
Bsn.
Vla.
Cb.
Pno.
Perc.
sub.
p
f
mp
3
4

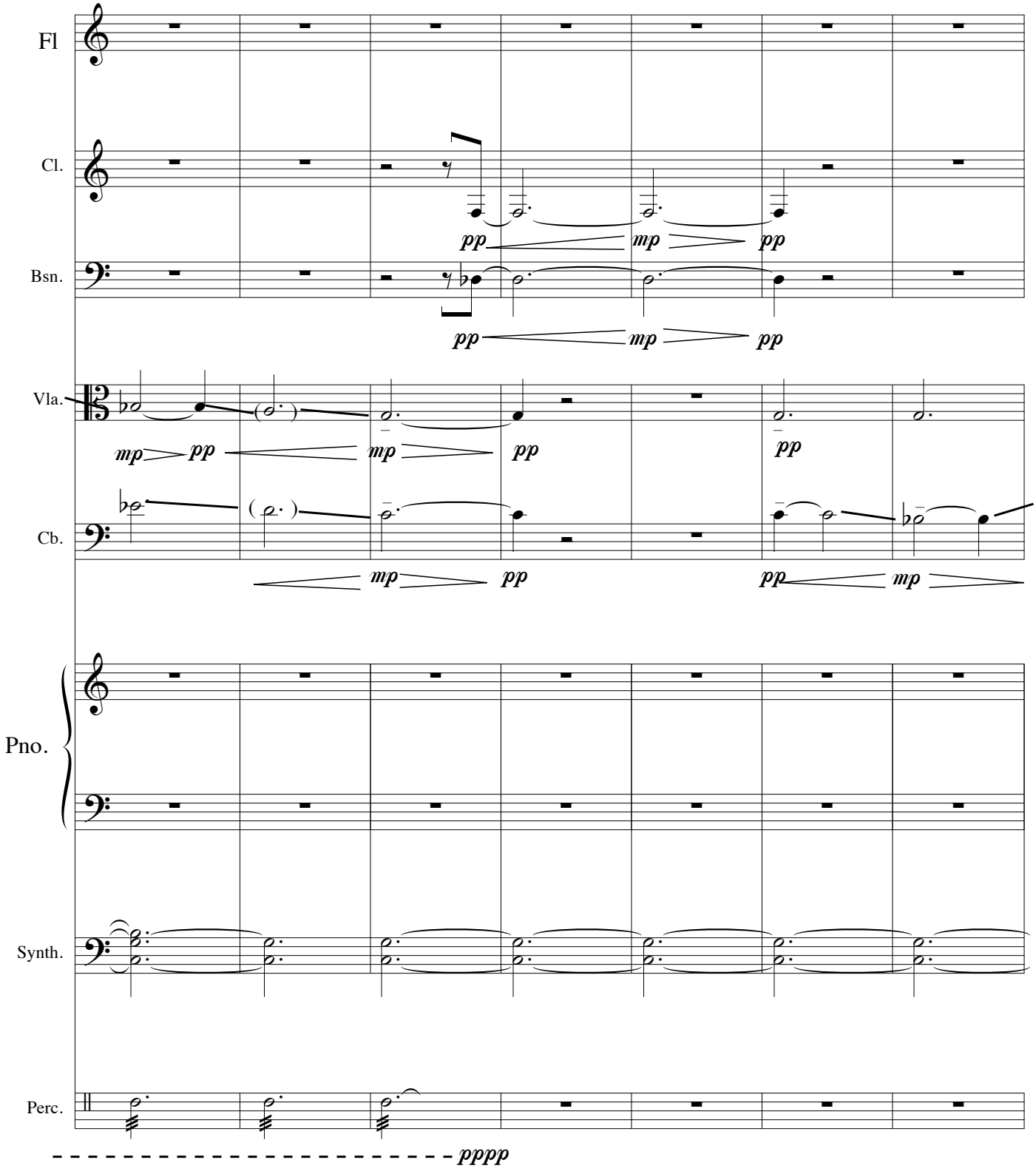
106



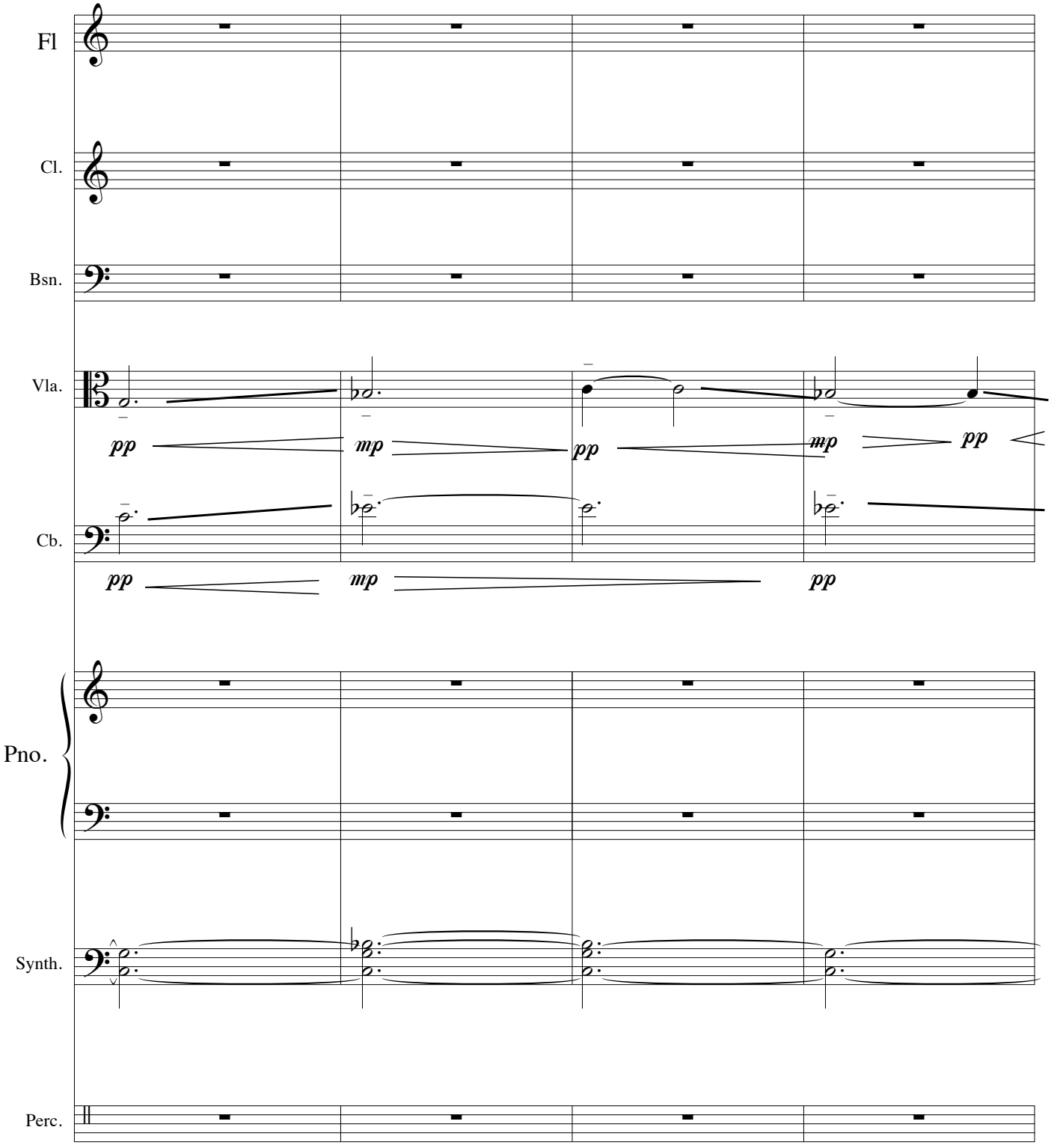

108
Fl
Cl.
Bsn.
Vla.
Cb.
Pno.
Perc.
mp
cresc.
f
mp
cresc.

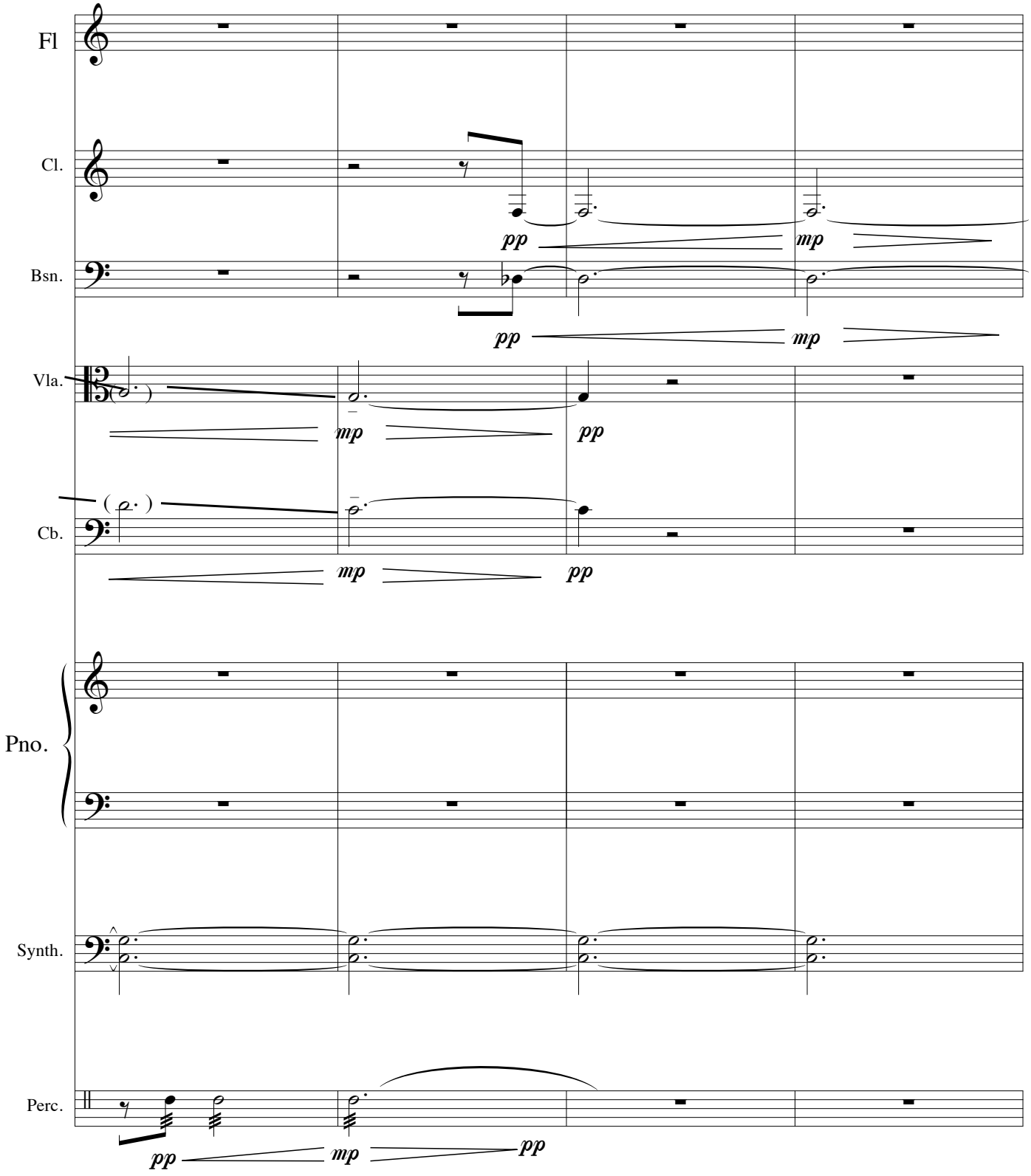

110
K
Fl
Cl.
Bsn.
Vla.
Cb.
Pno.
Synth.
Perc.
ff
8va
To Synthesizer
Synthesizer
Use synth sound with no vibrato.
Do not bring out synth part.
pp
sub.
p

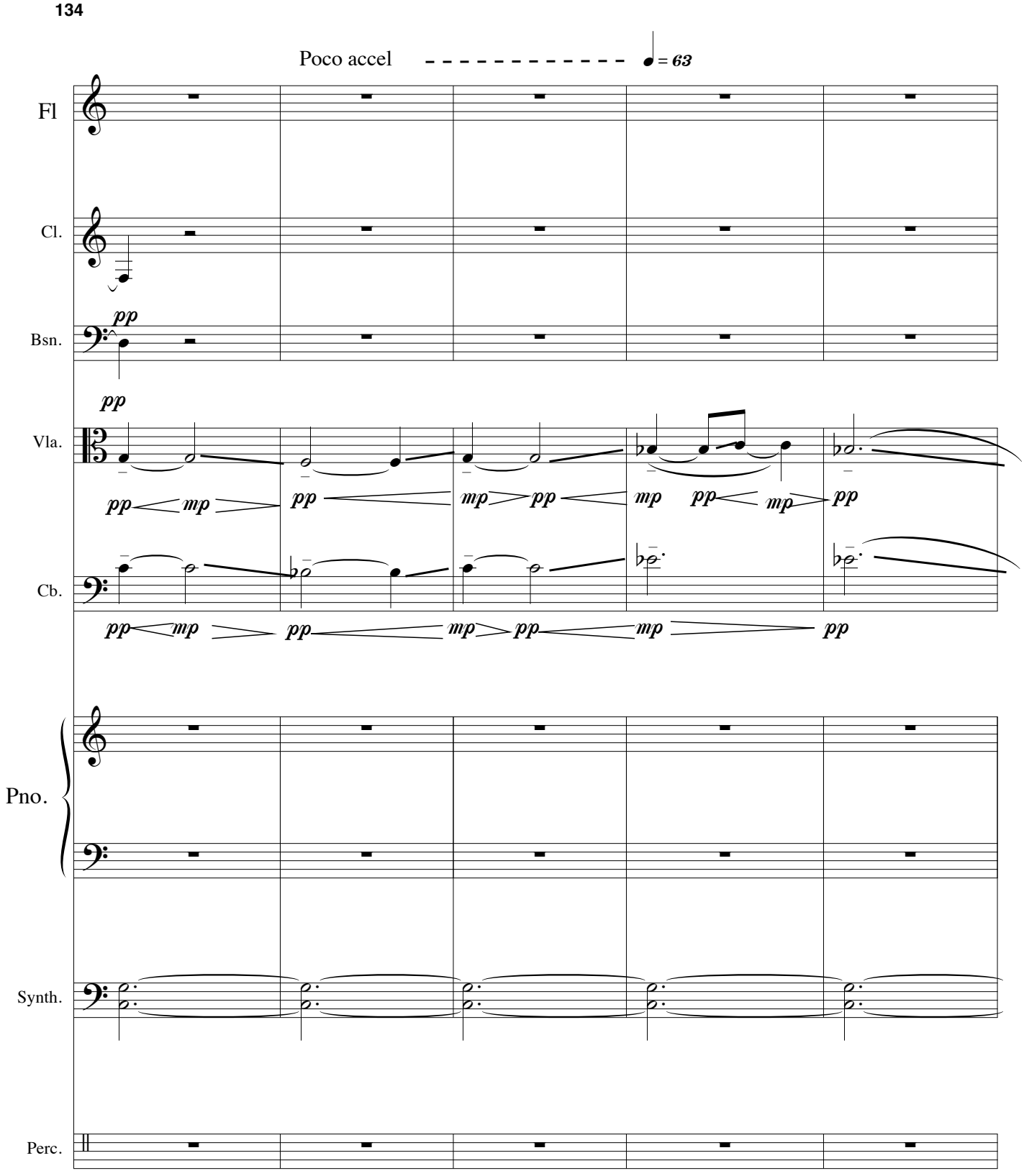

Fl
Cl.
Bsn.
Vla.
pp
mp
pp
Cb.
pp
mp
pp
Pno.
Synth.
Perc.
f
decresc

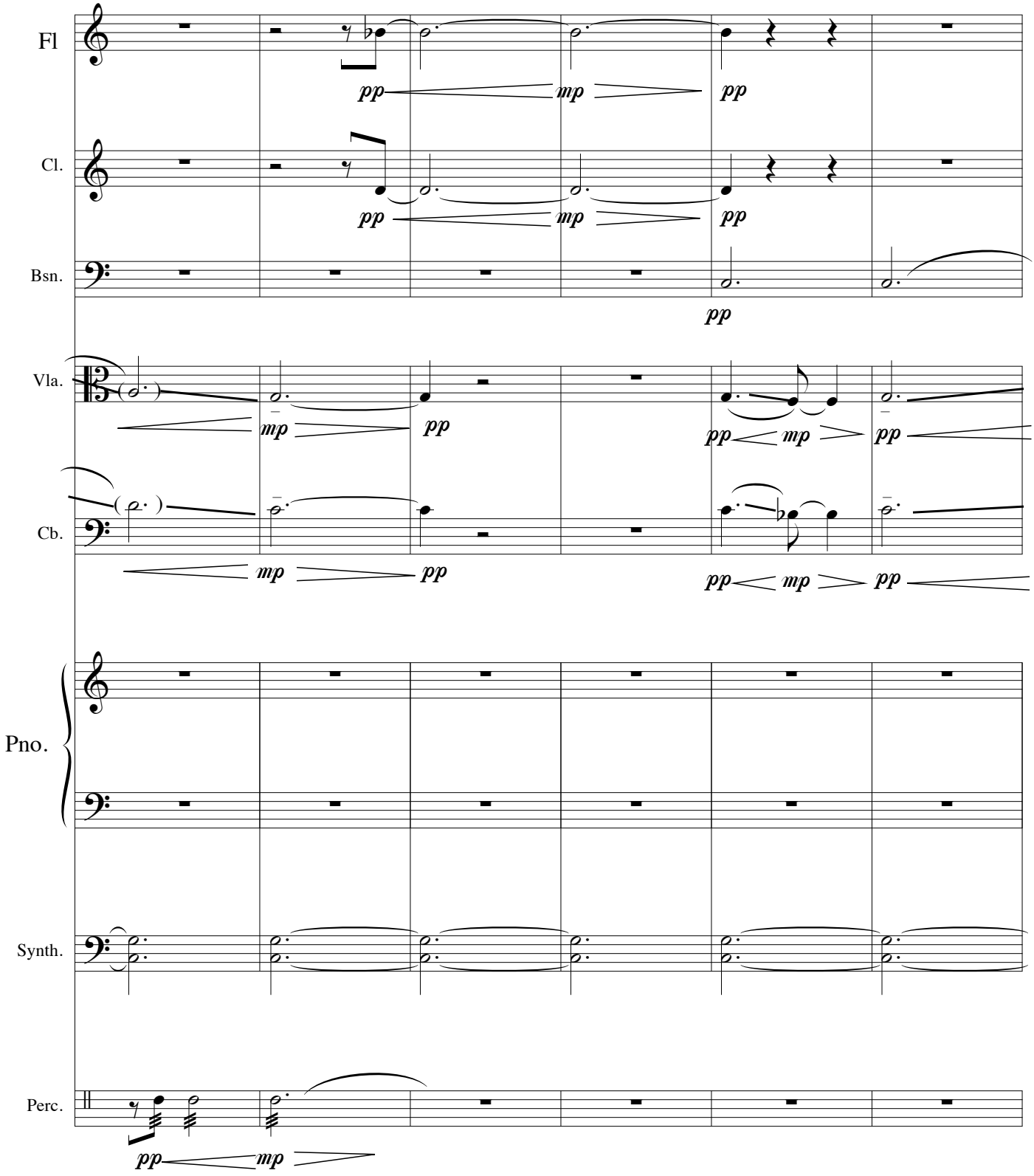

119
Fl
Cl.
Bsn.
Vla.
Cb.
Pno.
Synth.
Perc.
pp
mp
pp
pp
mp
pp
mp
pp
mp
pp
pp
mp
pp
pp
mp
pppp

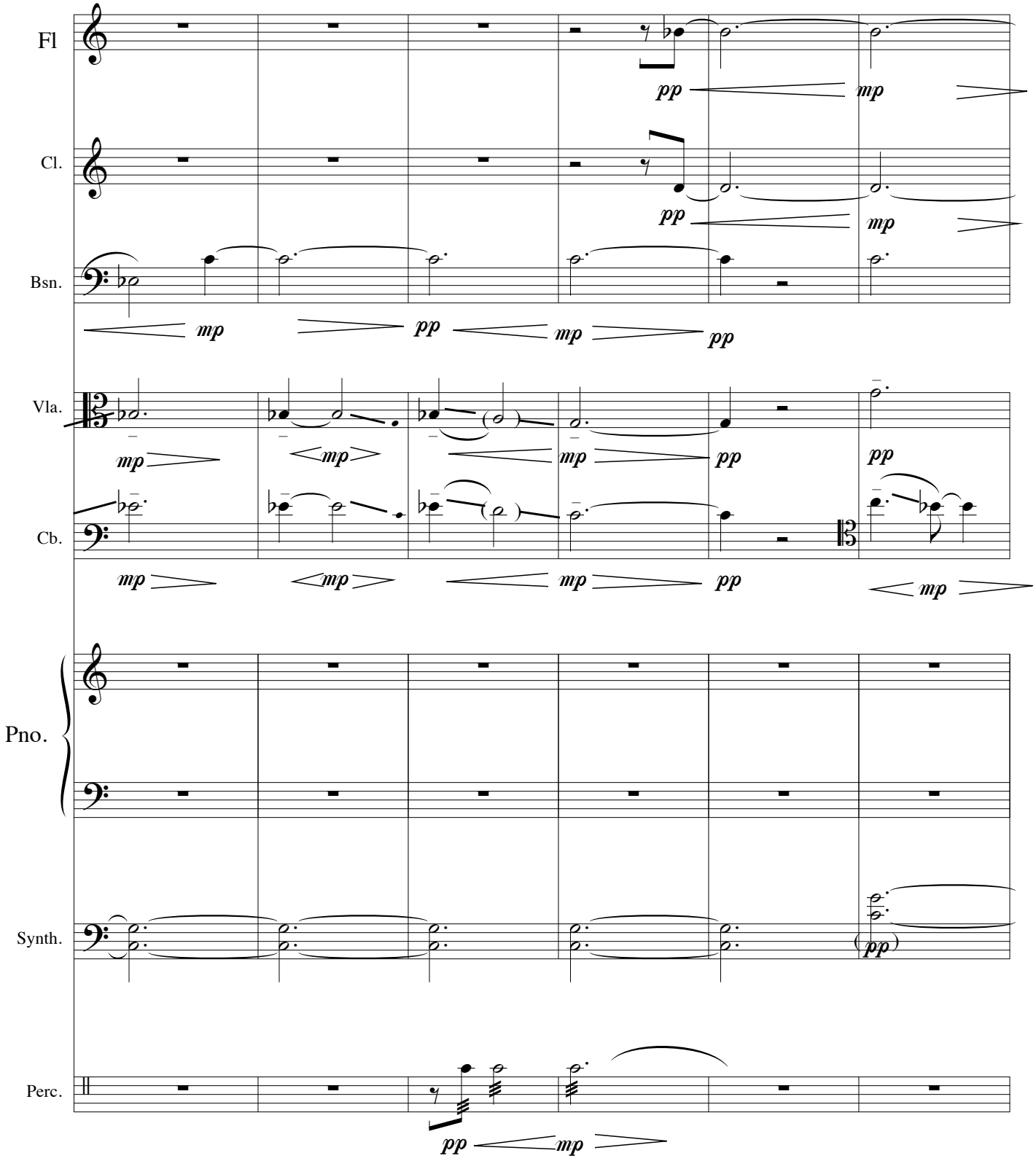
126

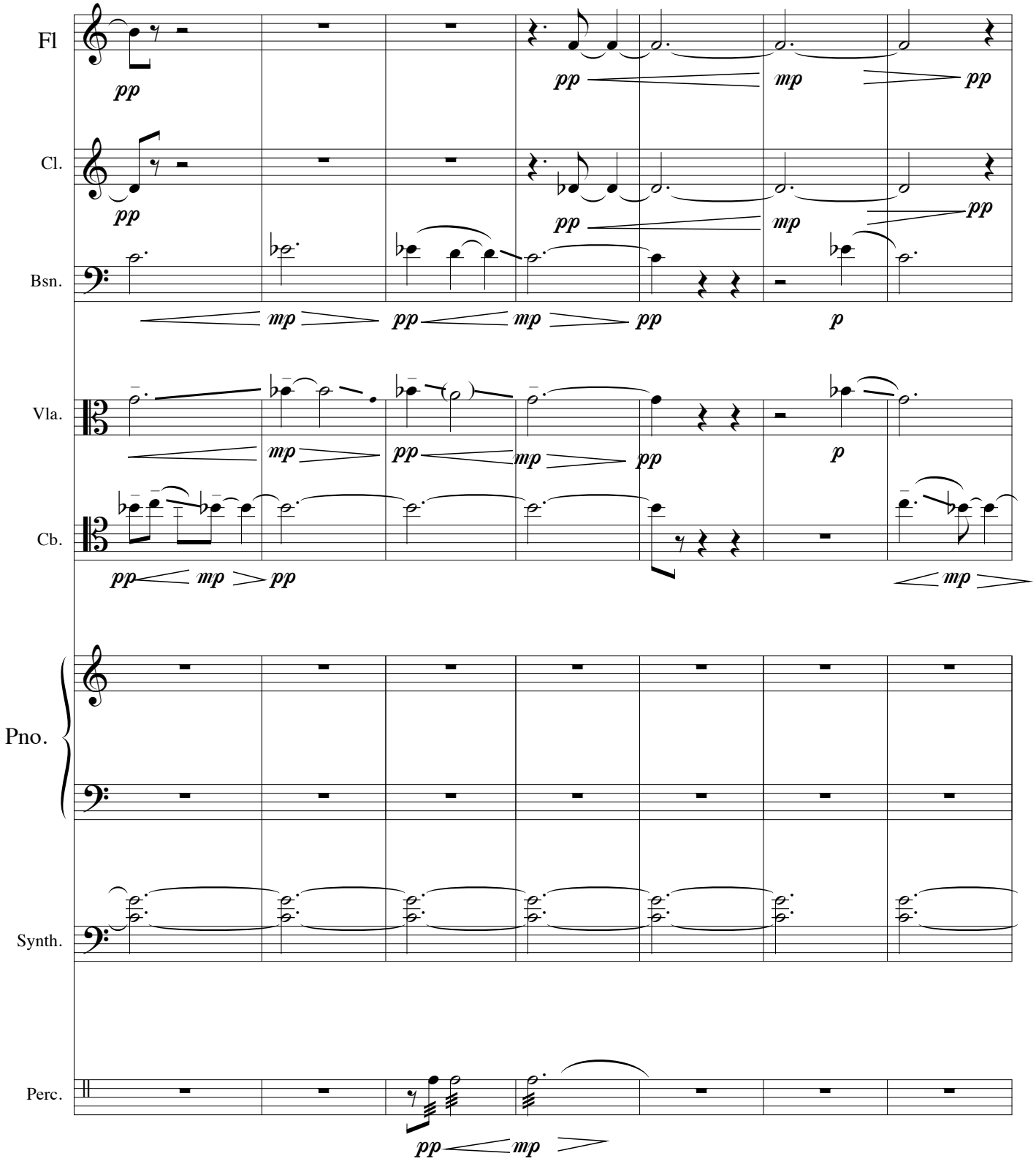


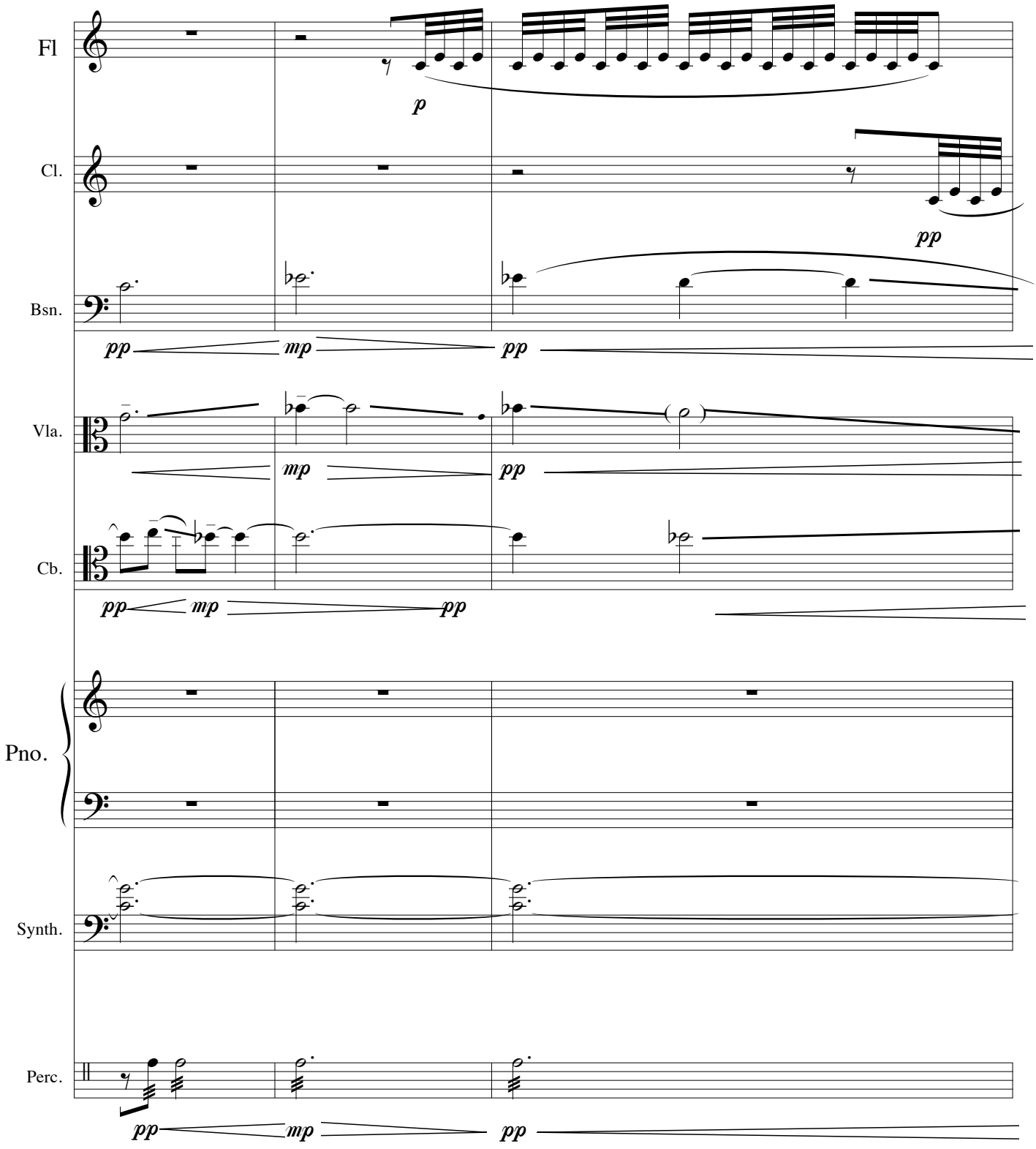

Fl
Cl.
Bsn.
Vla.
Cb.
Pno.
Synth.
Perc.
pp
mp
pp
mp
mp
pp
mp
pp
pp
mp
pp

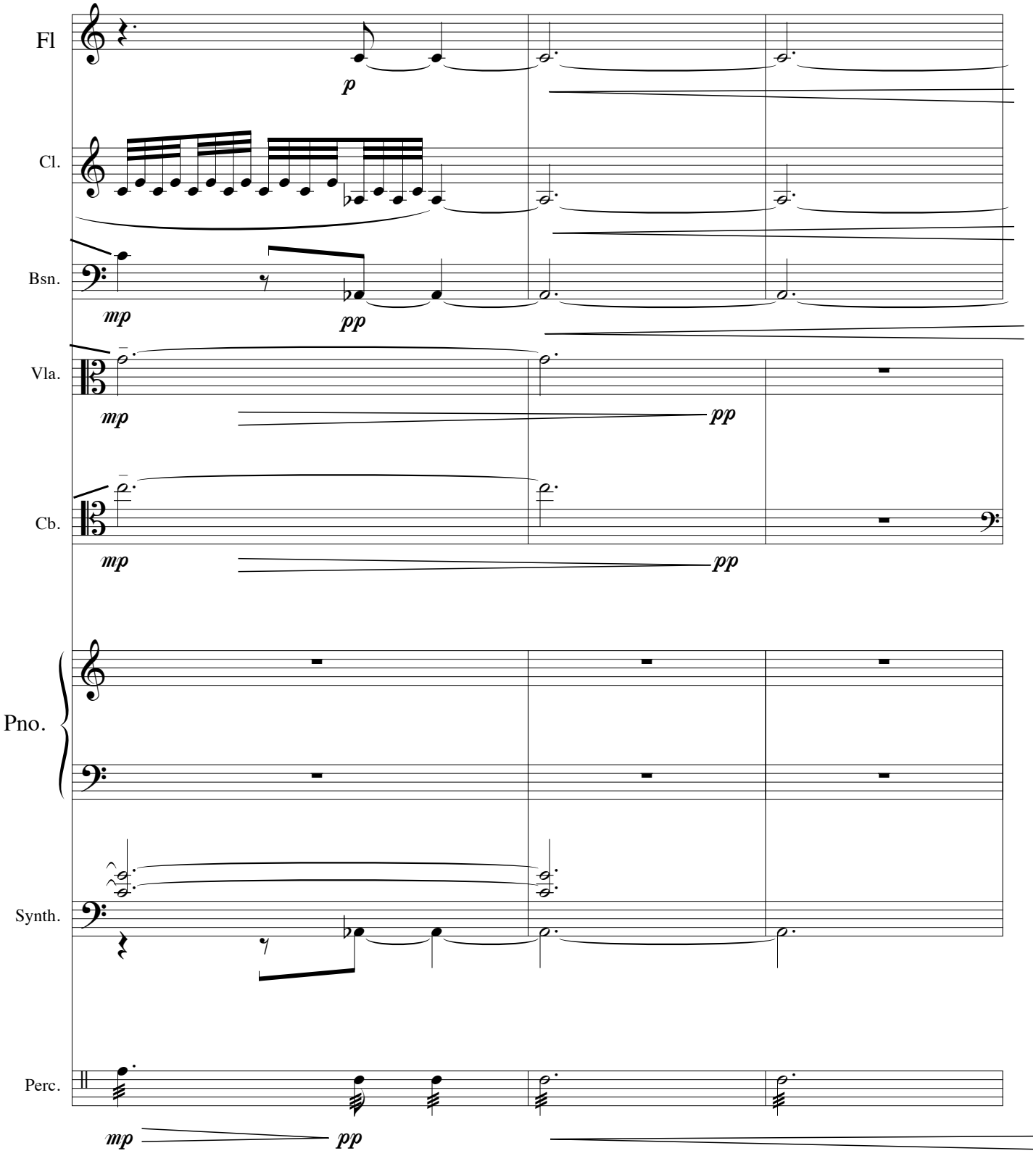

134
Poco accel
= 63
Fl
Cl.
Bsn.
pp
Vla.
pp
mp
Cb.
Pno.
Synth.
Perc.

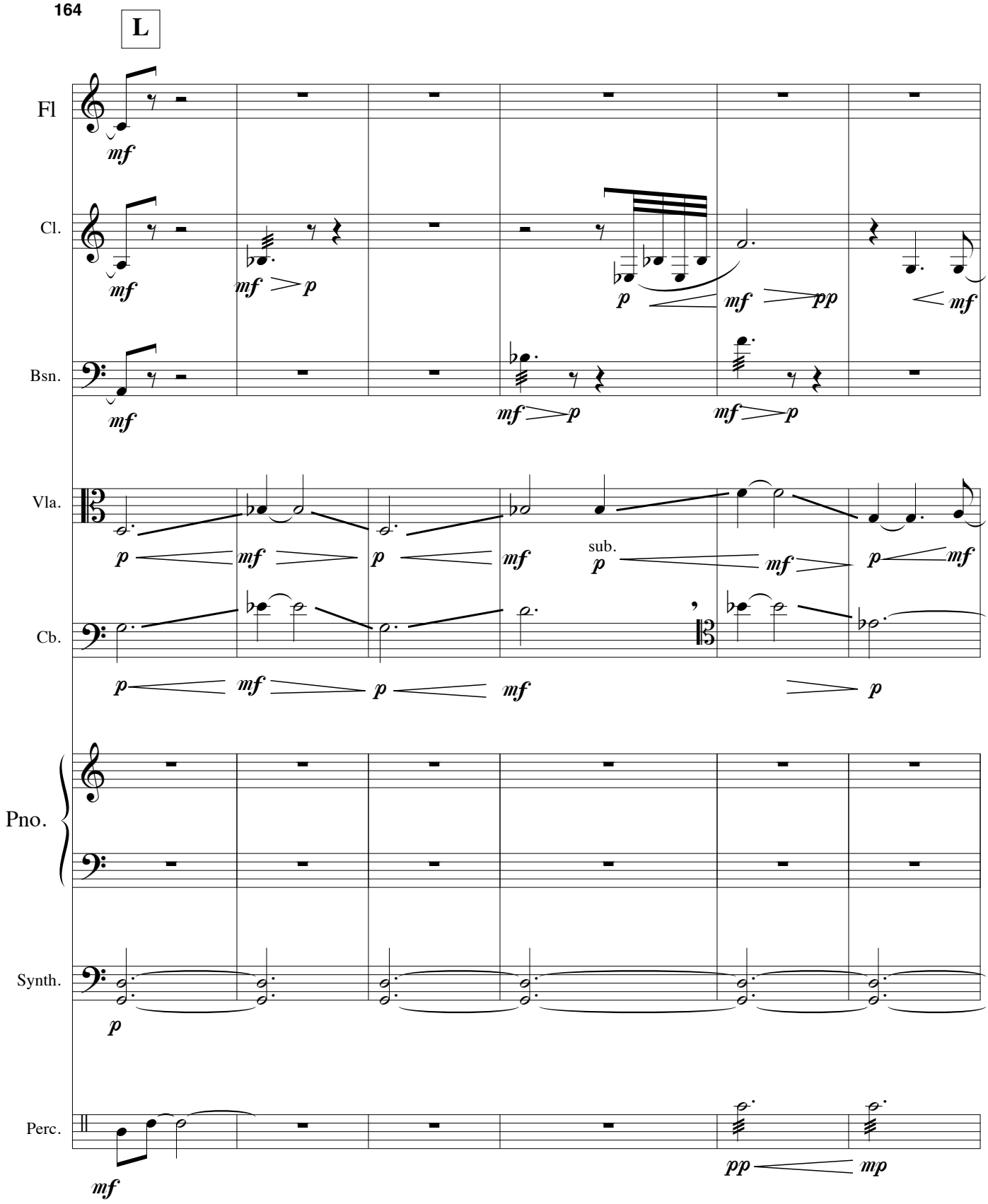

Fl
Cl.
Bsn.
Vla.
Cb.
Pno.
Synth.
Perc.
pp
mp
pp

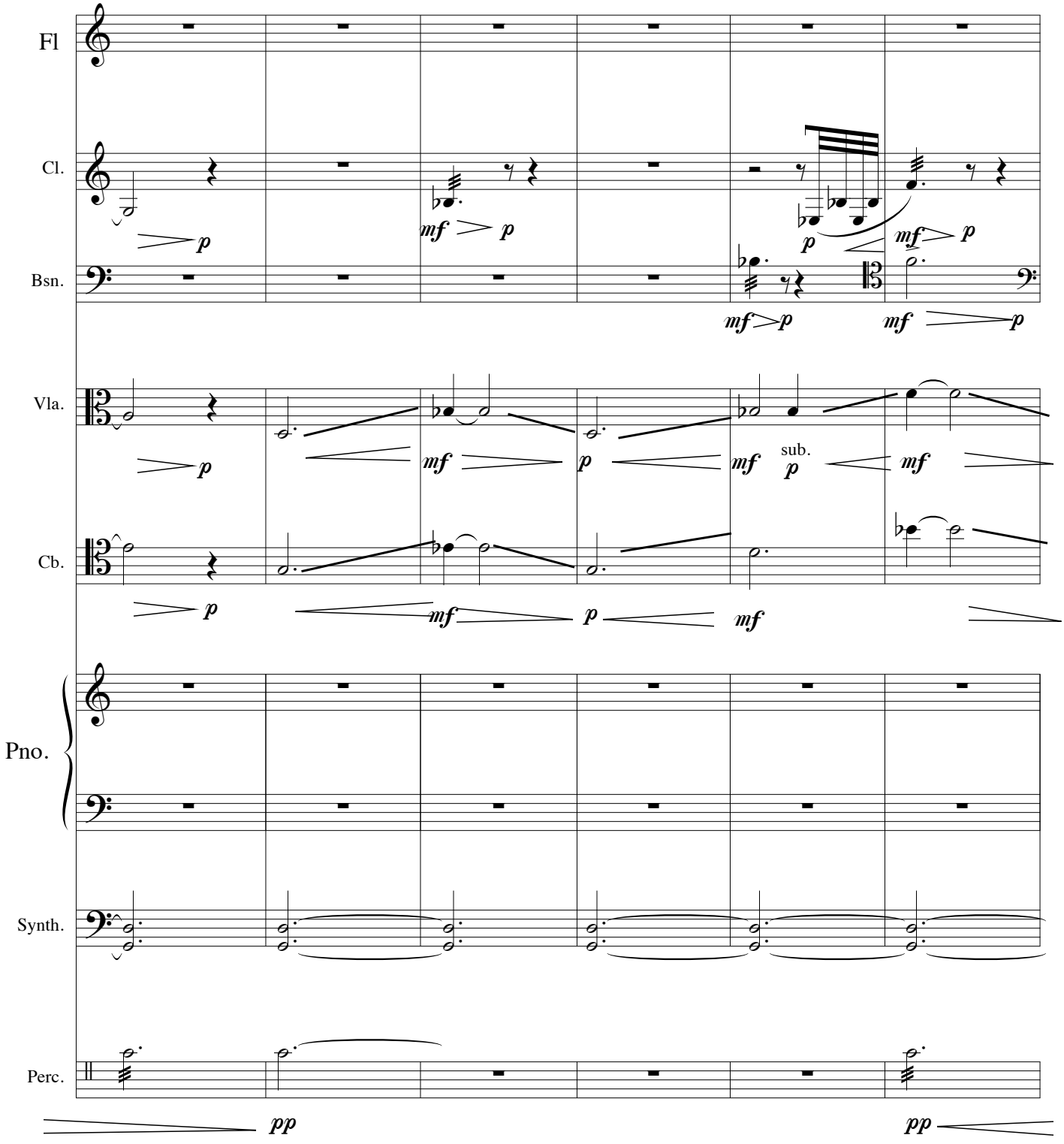

Fl
Cl.
Bsn.
Vla.
Cb.
Pno.
Synth.
Perc.
pp
mp


Fl
Cl.
Bsn.
Vla.
Cb.
Pno.
Synth.
Perc.

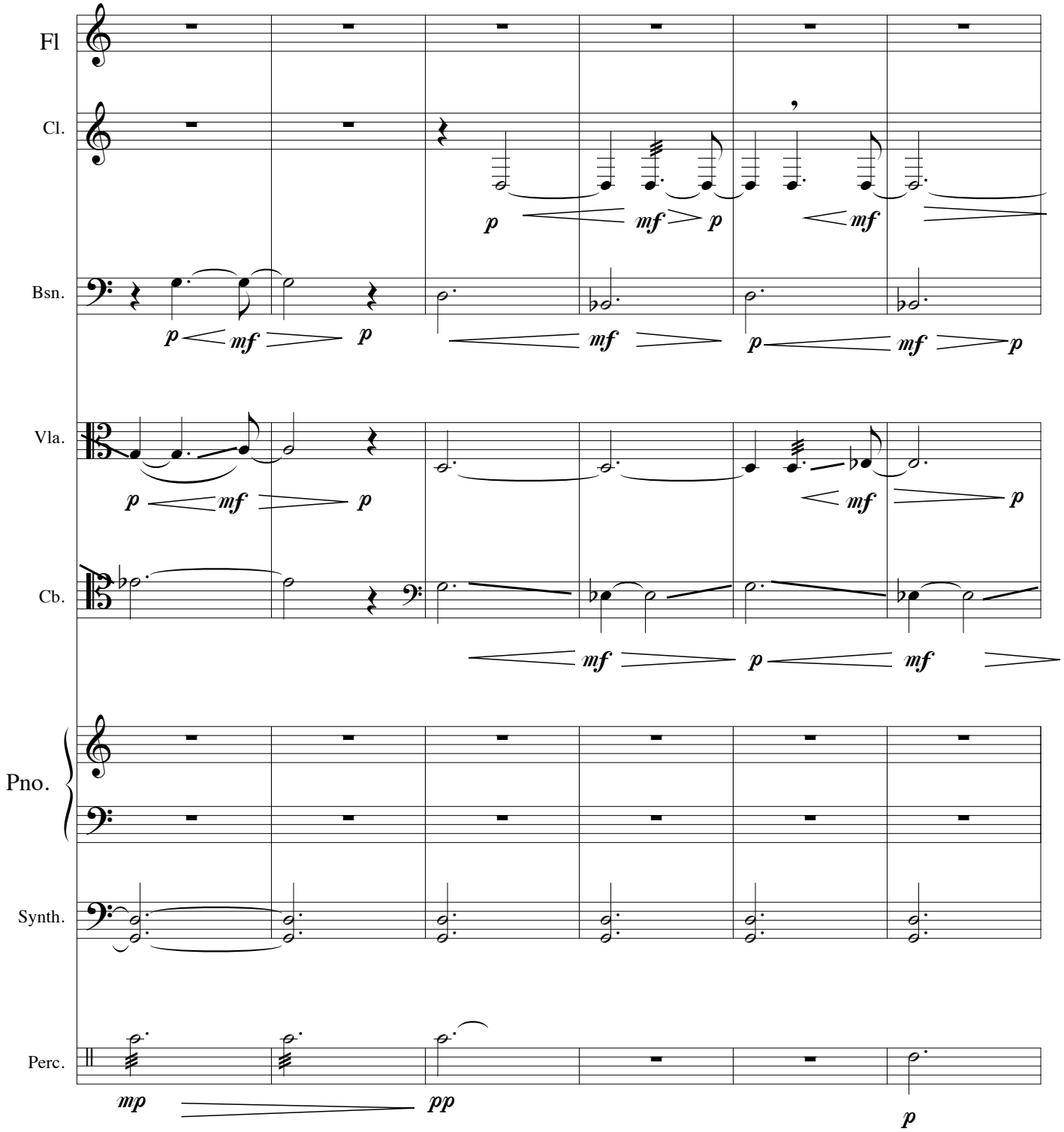

Fl
Cl.
Bsn.
Vla.
Cb.
Pno.
Synth.
Perc.
p
pp
mp
pp
pp
mp
pp
pp
mp
pp
pp
mp
pp


Fl
Cl.
Bsn.
Vla.
Cb.
Pno.
Synth.
Perc.
p
mp
pp
mp
pp
mp
pp
mp
pp

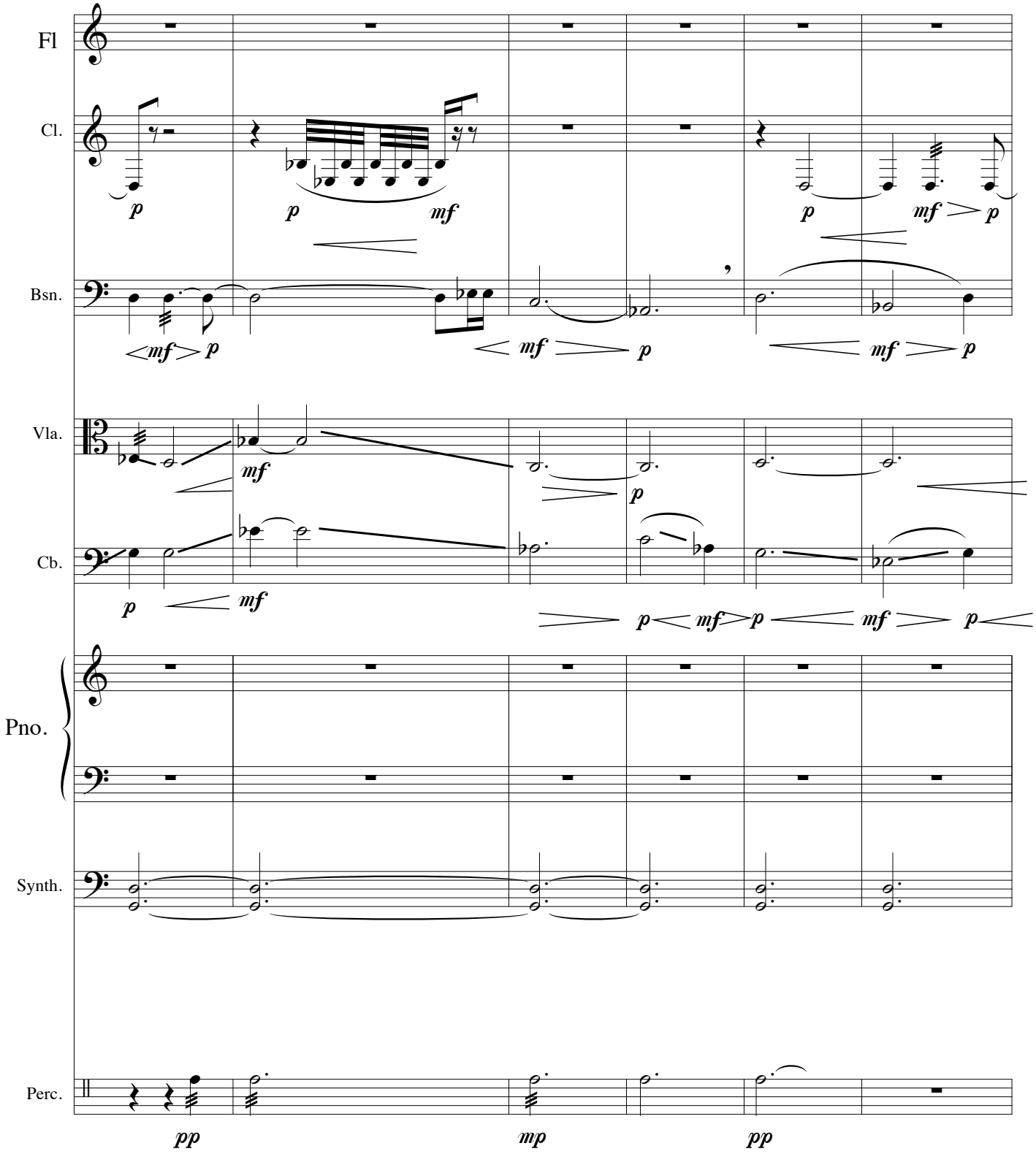

164
L
Fl
Cl.
Bsn.
Vla.
Cb.
Pno.
Synth.
Perc.
sub.


Fl
Cl.
Bsn.
Vla.
Cb.
Pno.
Synth.
Perc.
sub.

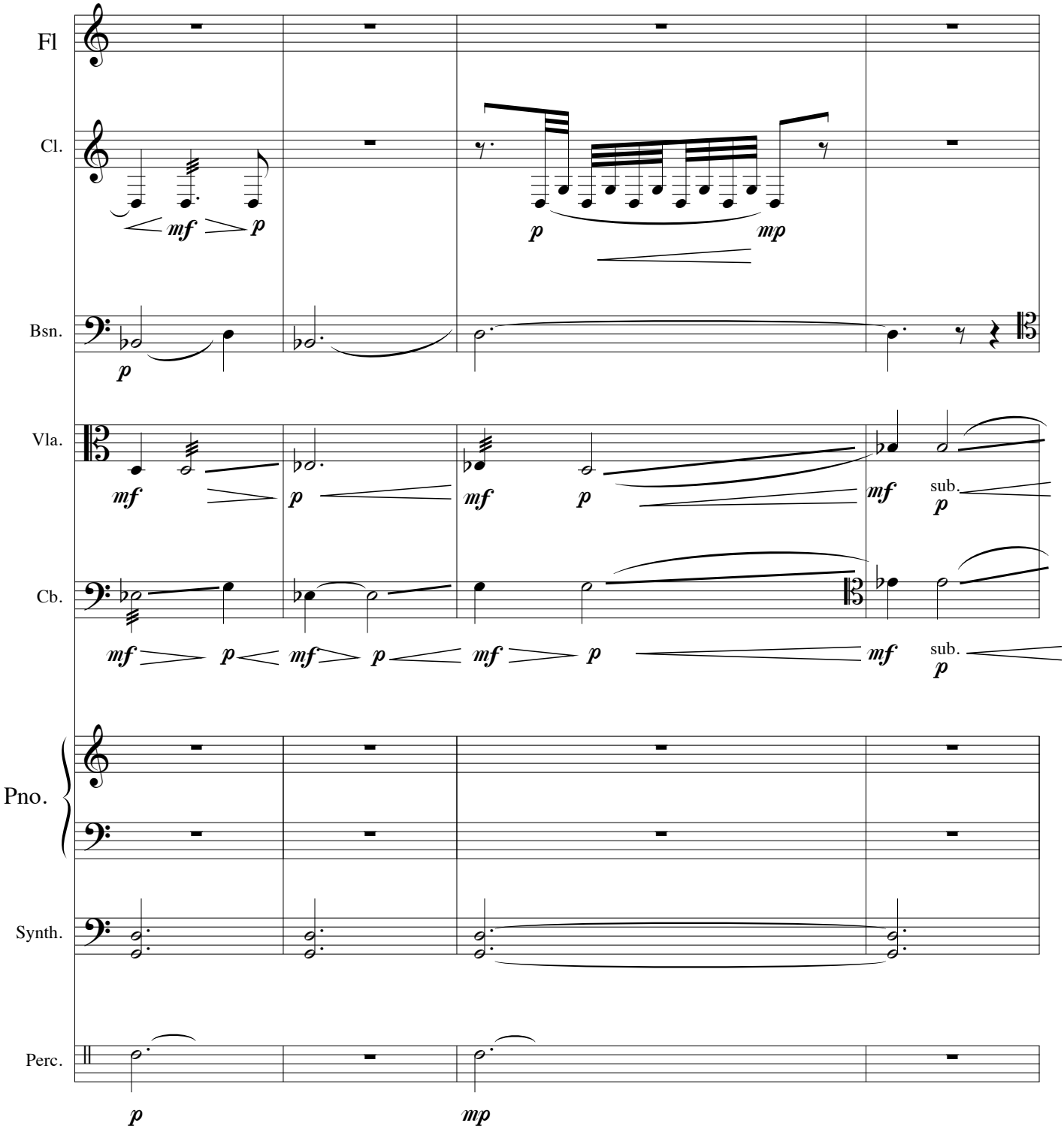
176


Fl
Cl.
Bsn.
Vla.
Cb.
Pno.
Synth.
Perc.
p
mf
p
mf
p
mf
p
p
mf
p
mf
p
mf
p
mf
p
mp
pp
p

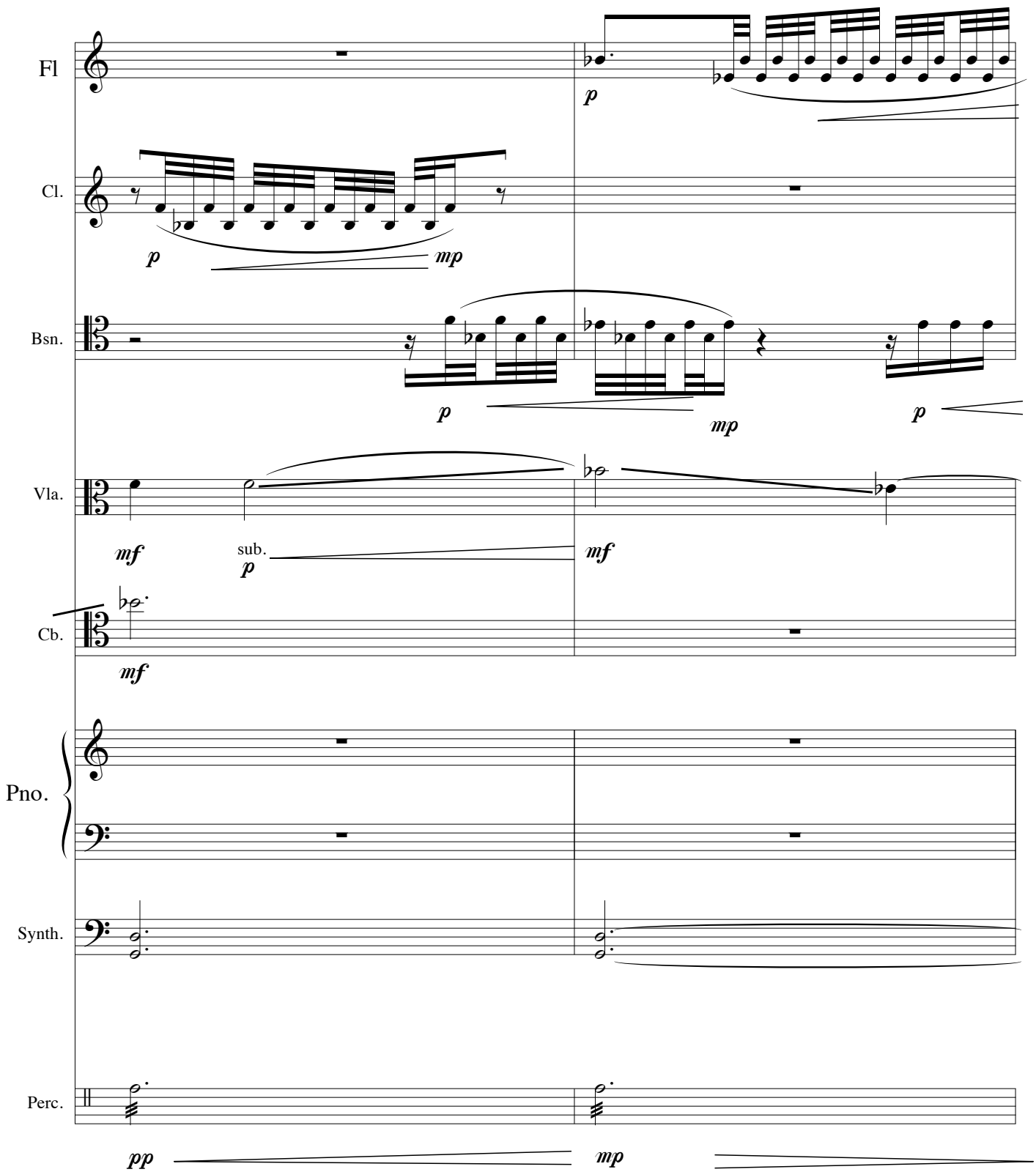
182

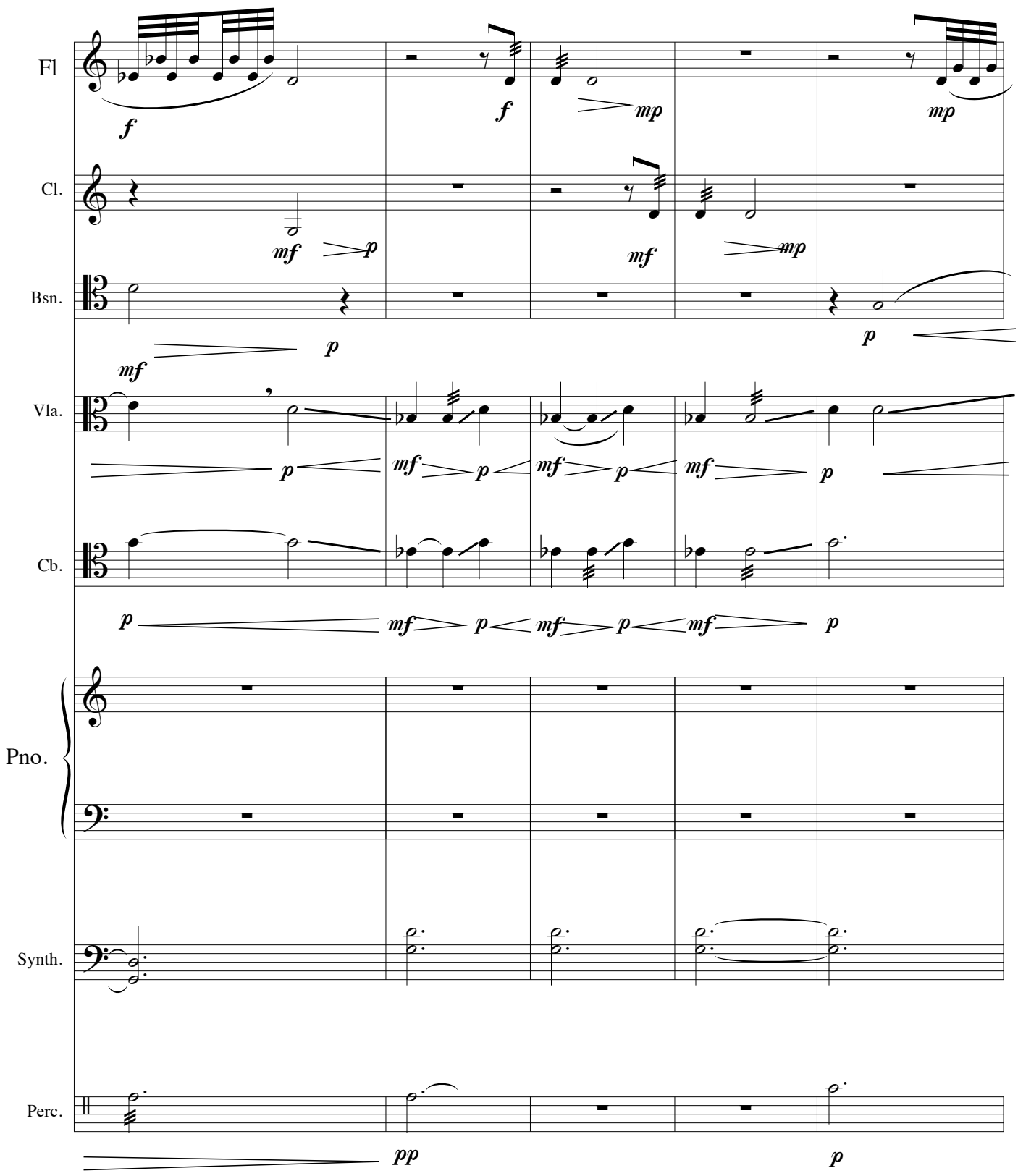


188

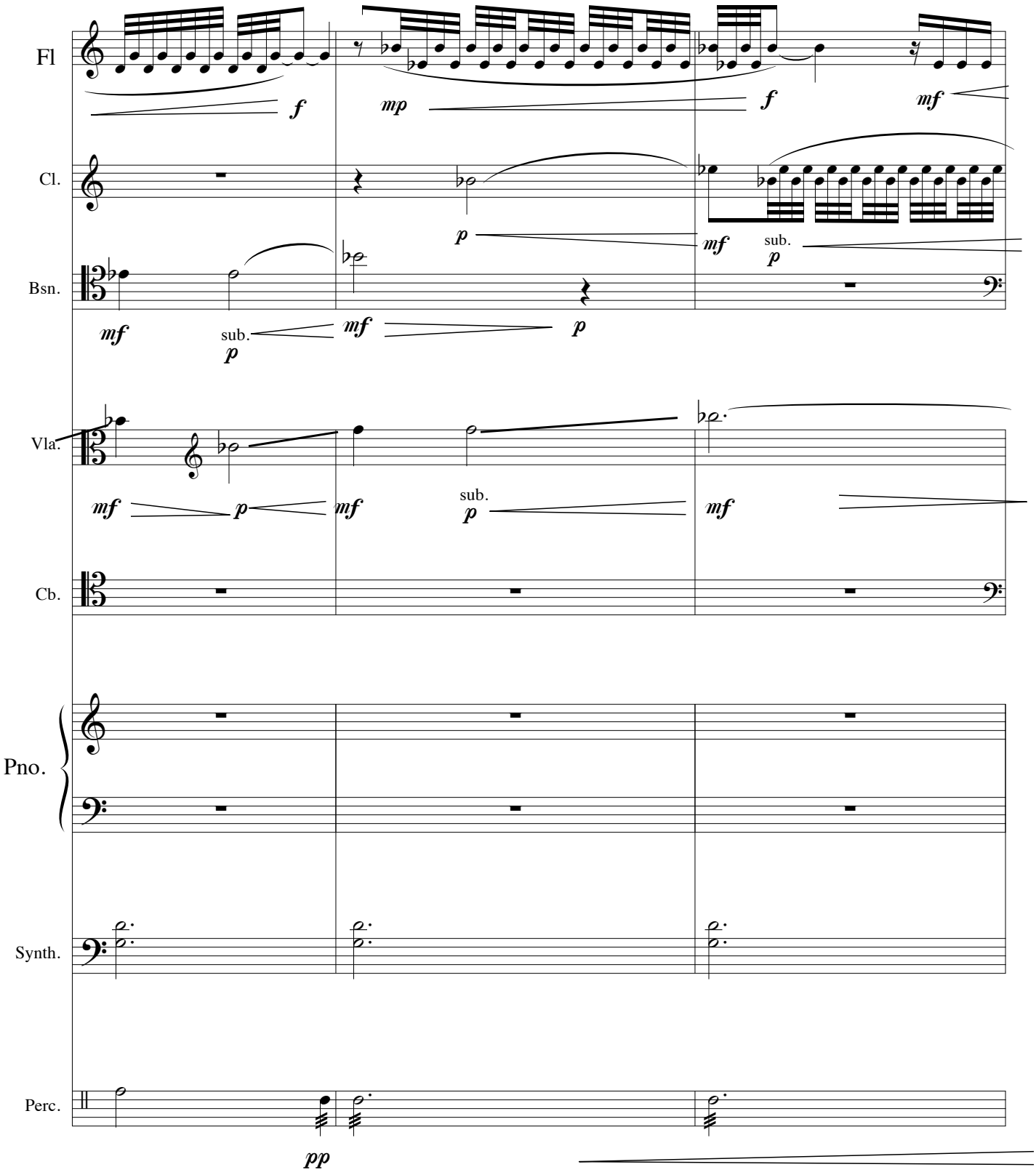


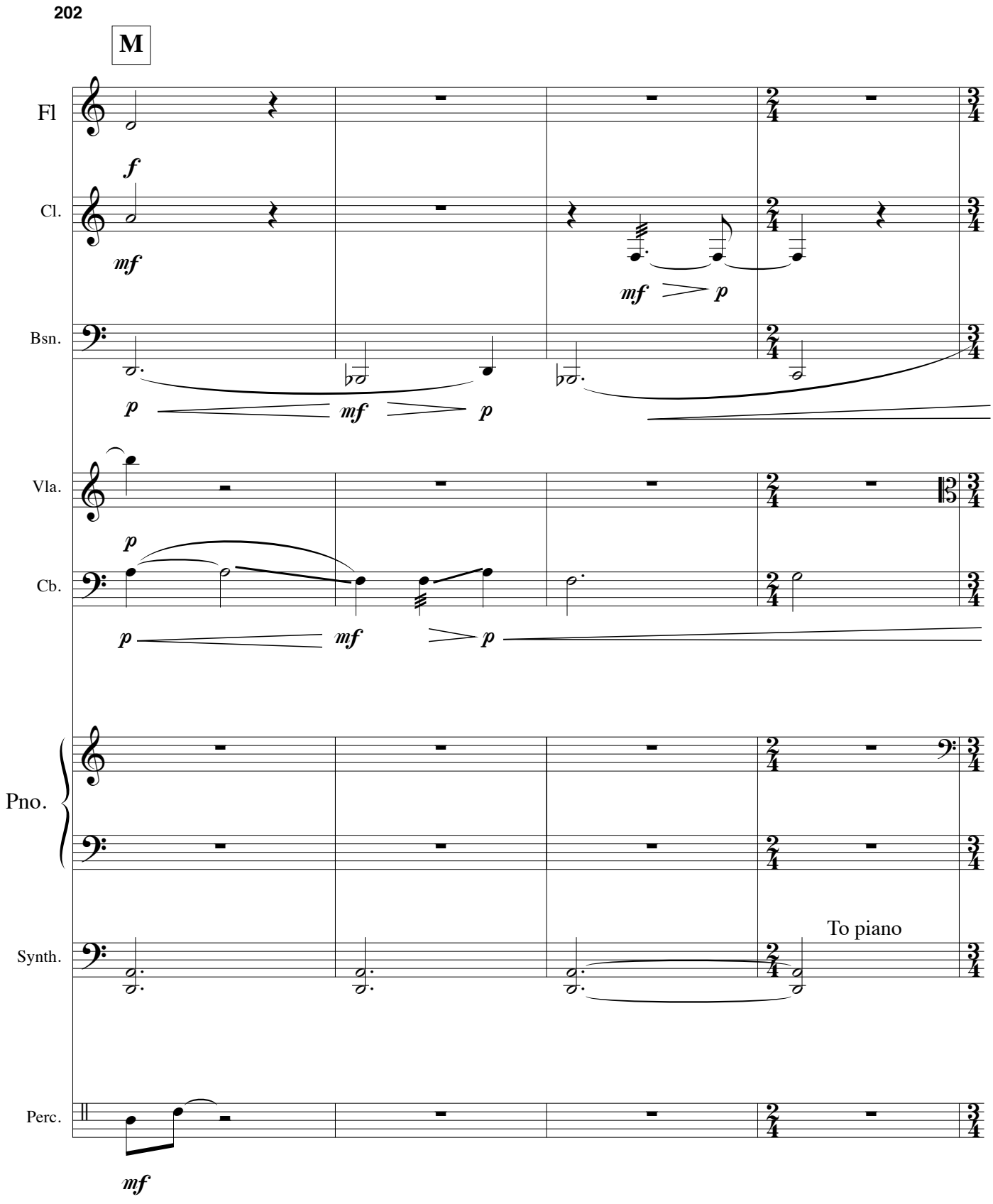
192



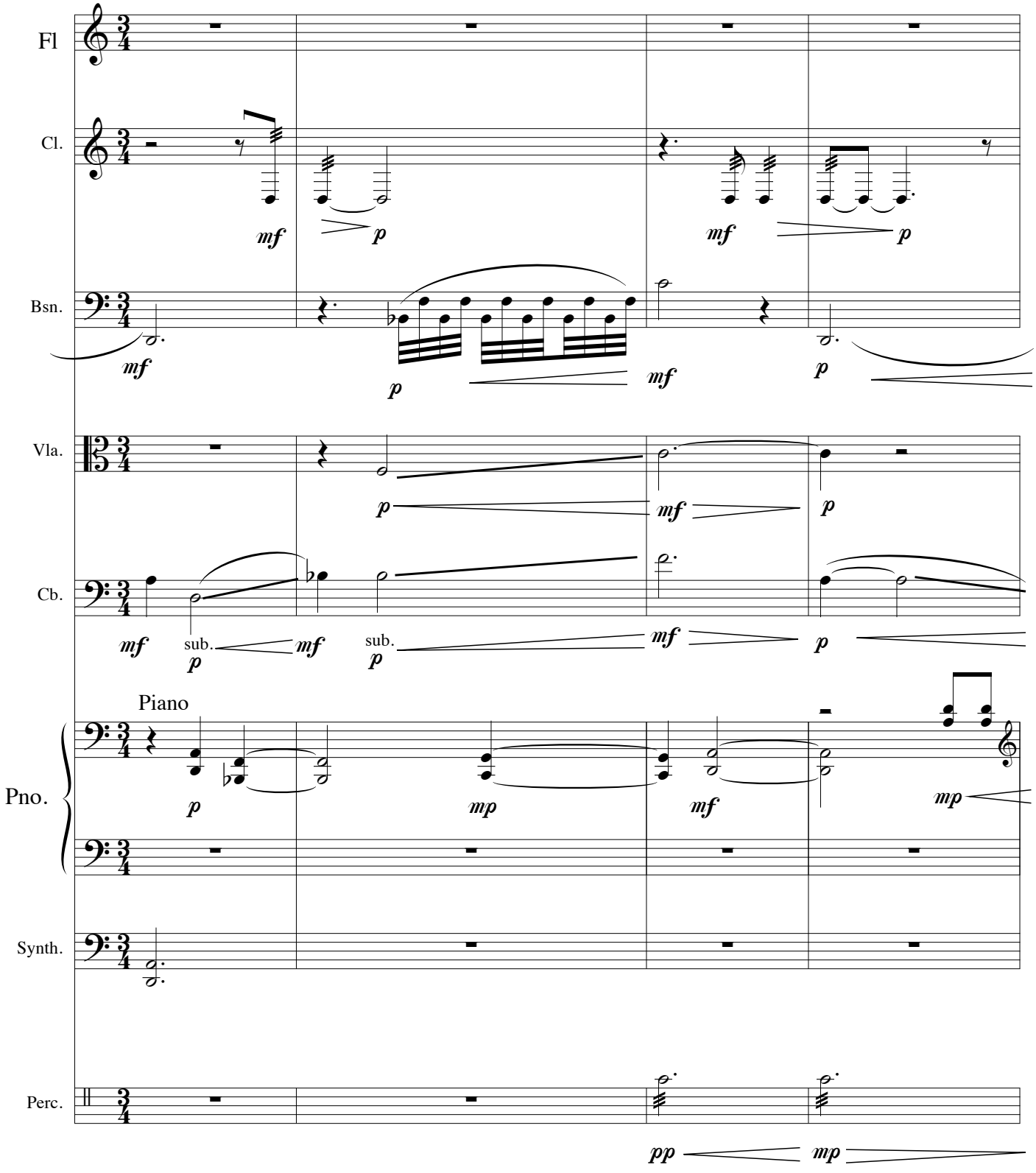

194
Fl
Cl.
Bsn.
Vla.
Cb.
Pno.
Synth.
Perc.

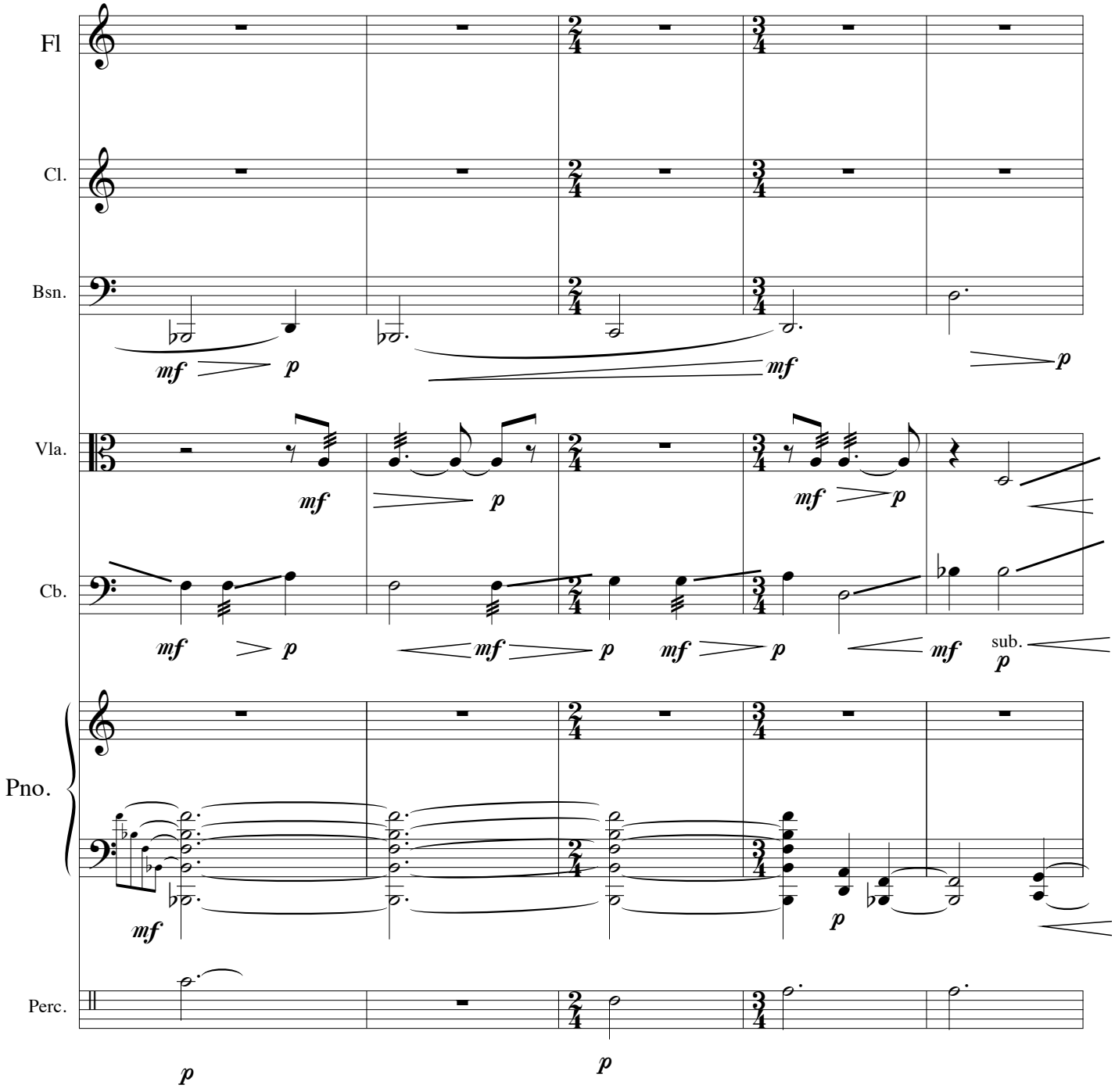
199

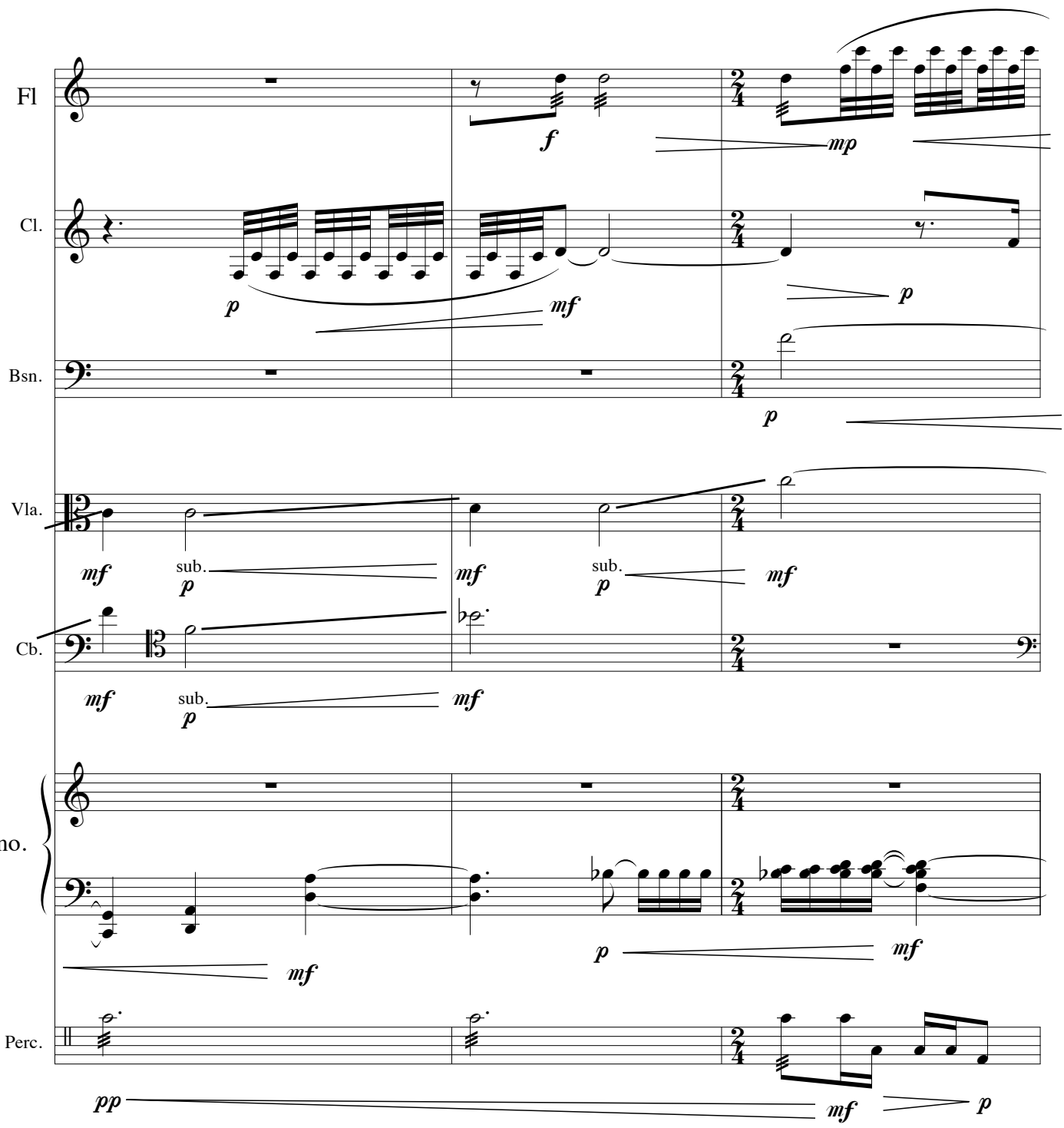

Fl
Cl.
Bsn.
Vla.
Cb.
Pno.
Synth.
Perc.
f
mp
f
mf
p
mf
sub.
p
mf
sub.
p
mf
p
mf
p
mf
sub.
p
mf
pp

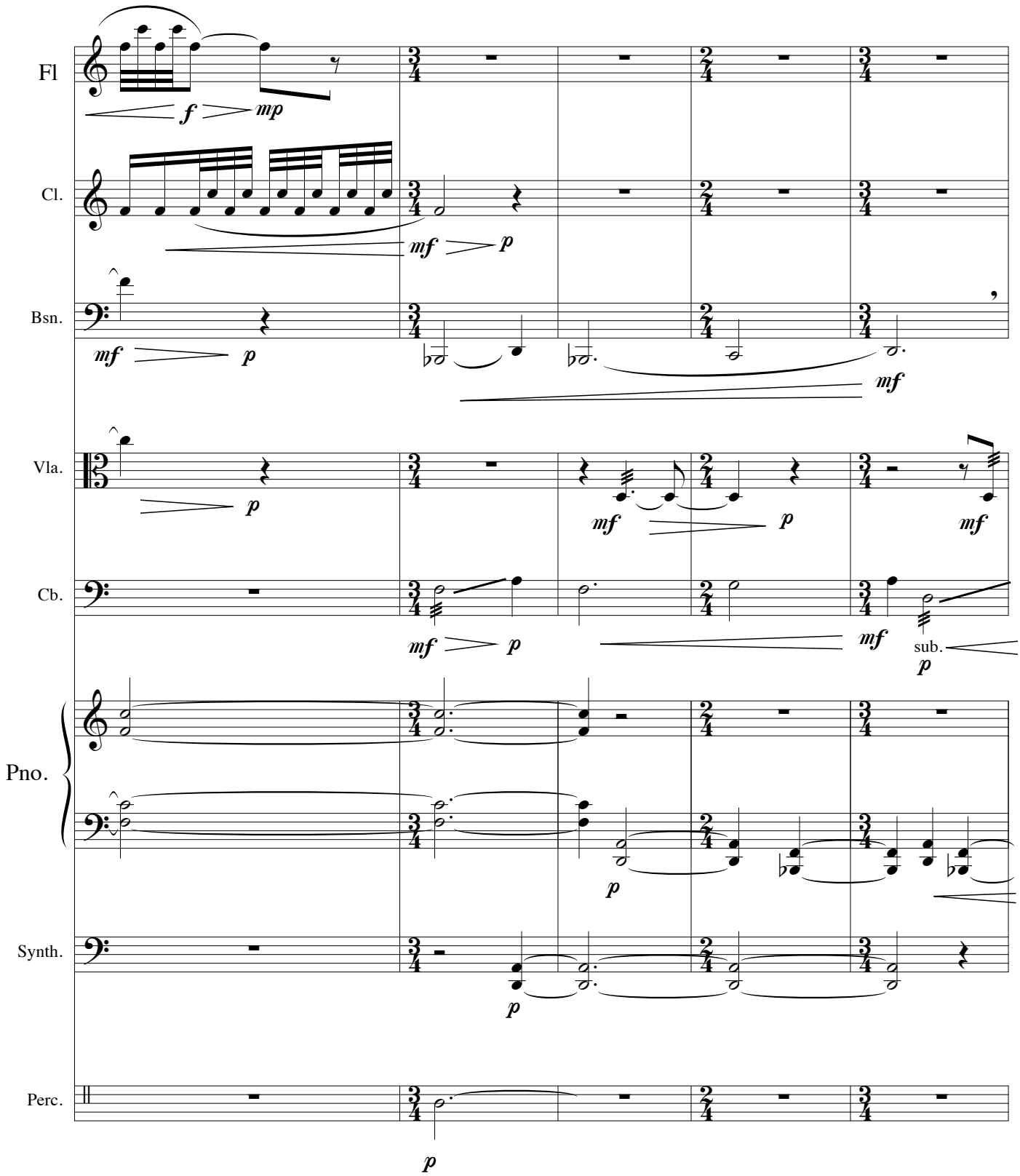

202
M
Fl
Cl.
Bsn.
Vla.
Cb.
Pno.
Synth.
Perc.
To piano

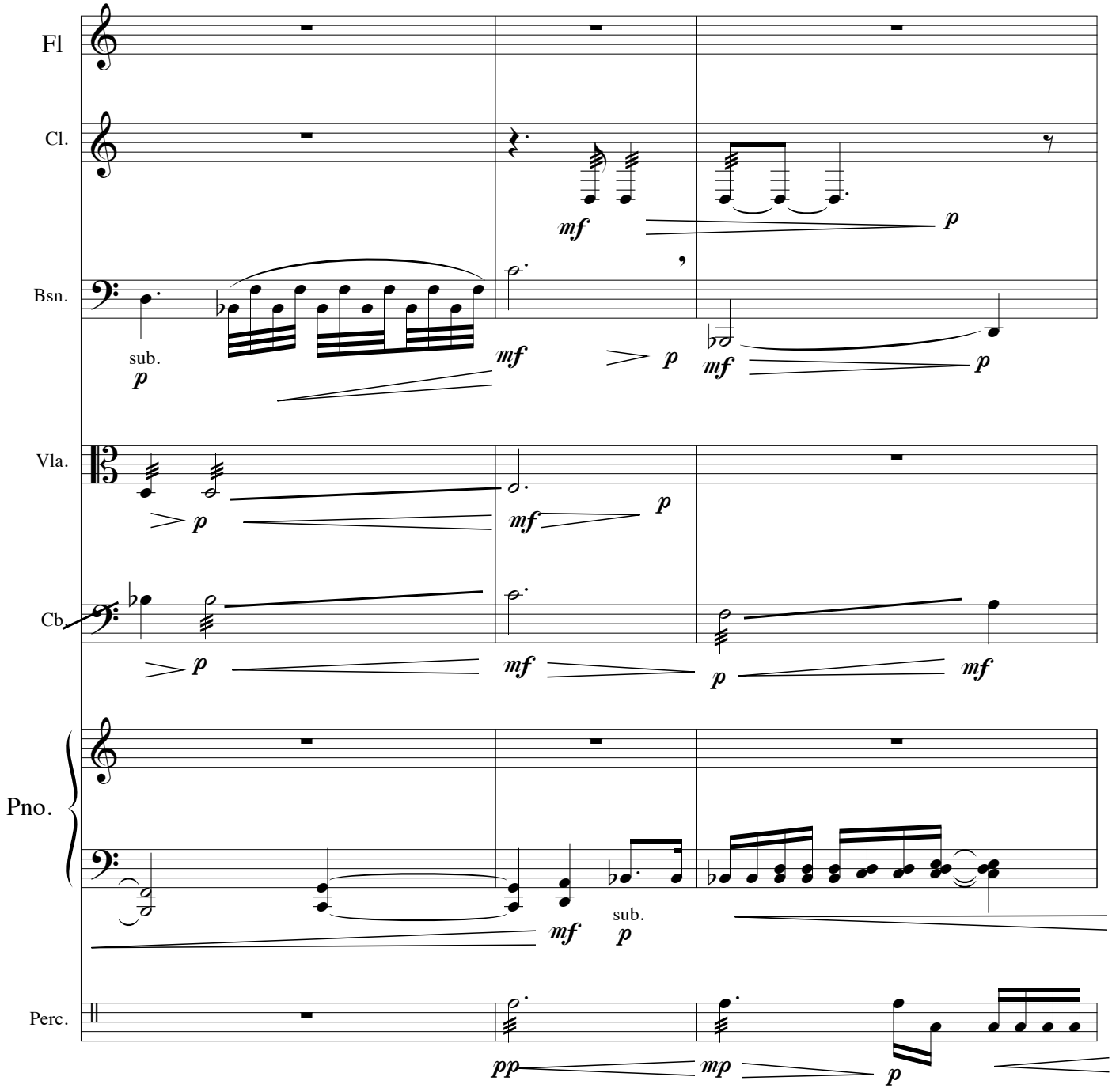
206

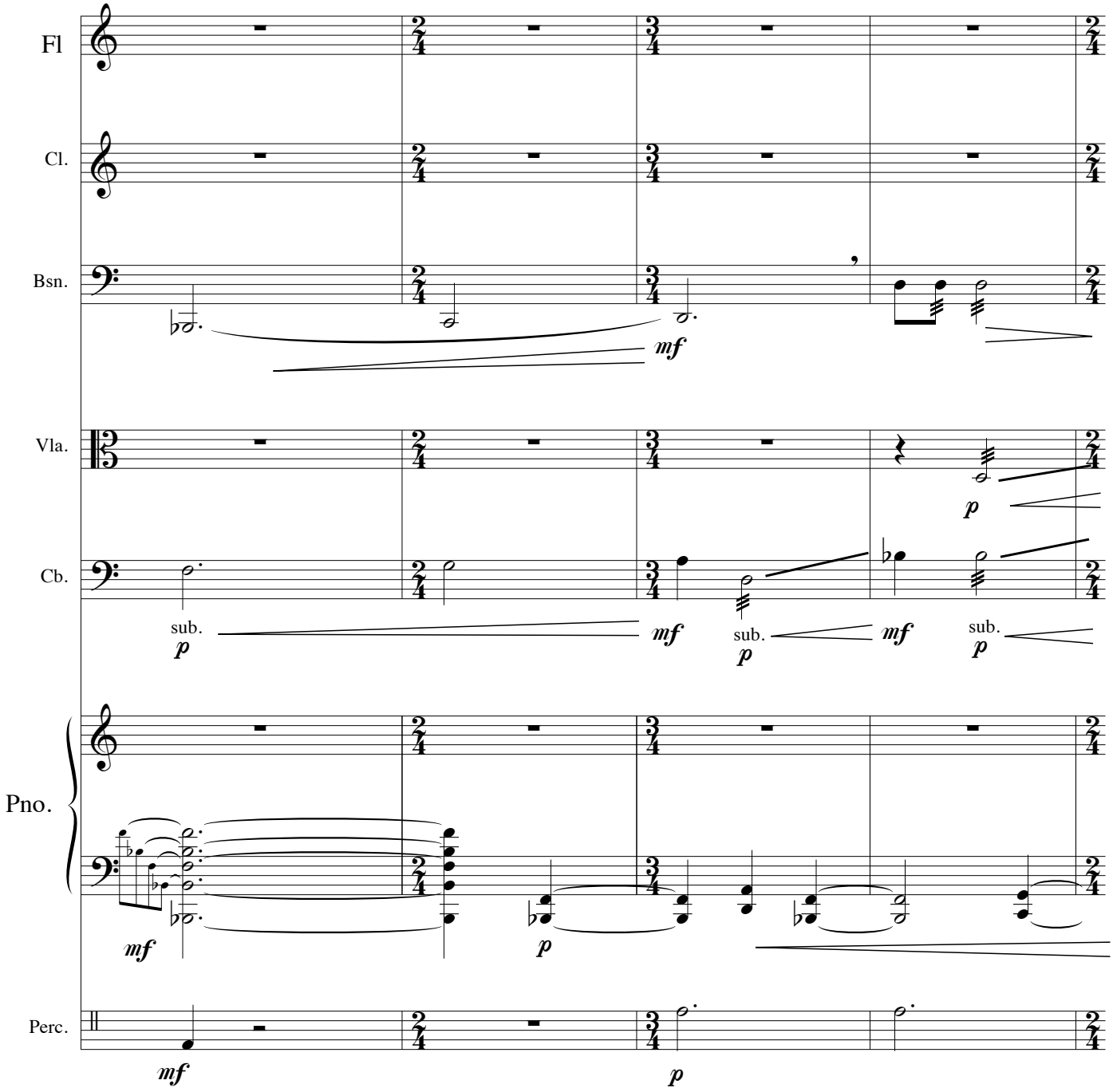


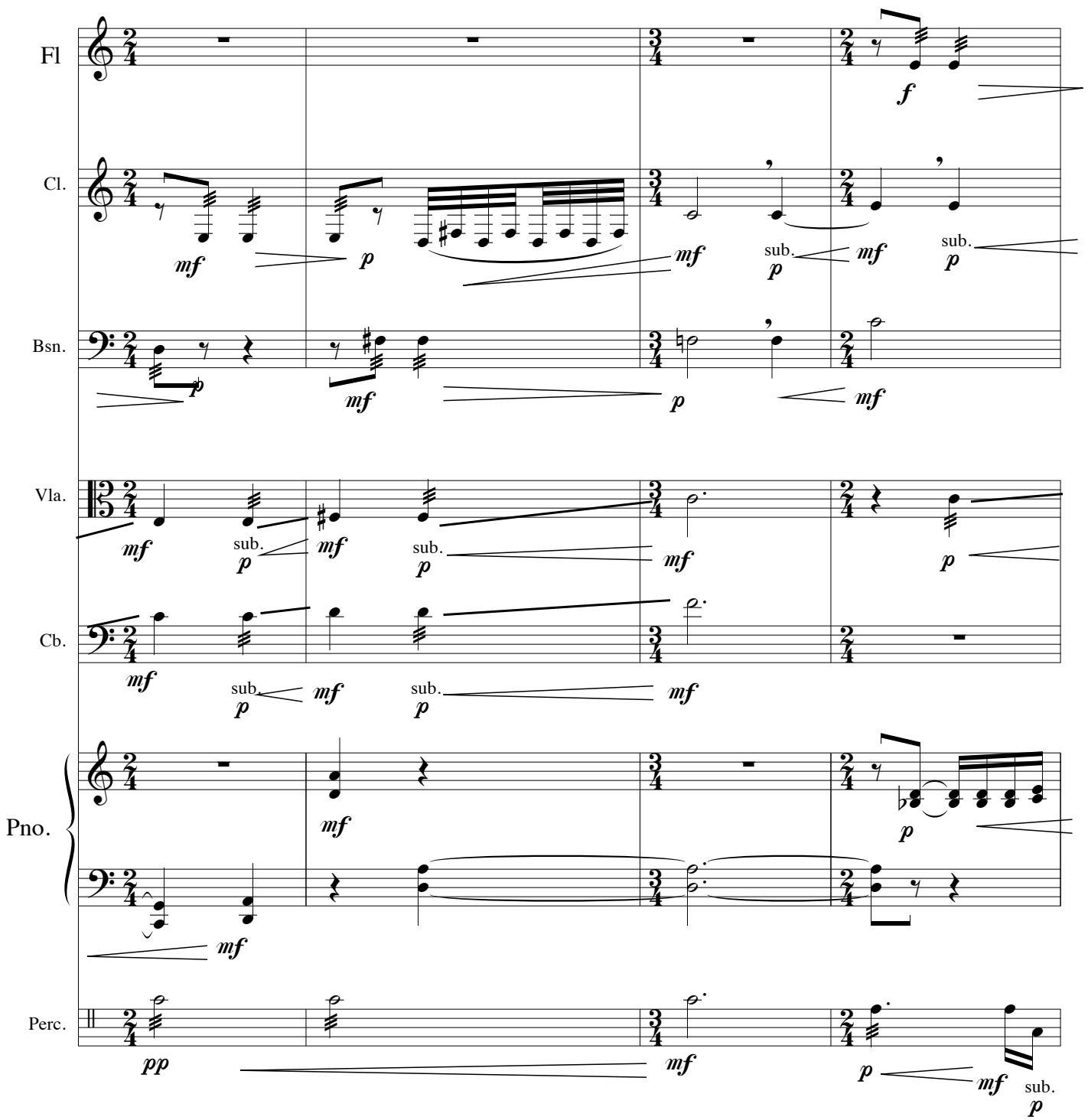

Fl
Cl.
Bsn.
Vla.
Cb.
Pno.
Perc.
mf
p
sub.


215
Fl
Cl.
Bsn.
Vla.
Cb.
Pno.
Perc.
f
mp
p
mf
p
p
mf
sub.
p
mf
sub.
p
mf
mf
sub.
p
mf
p
mf
mf
p
pp
mf
p

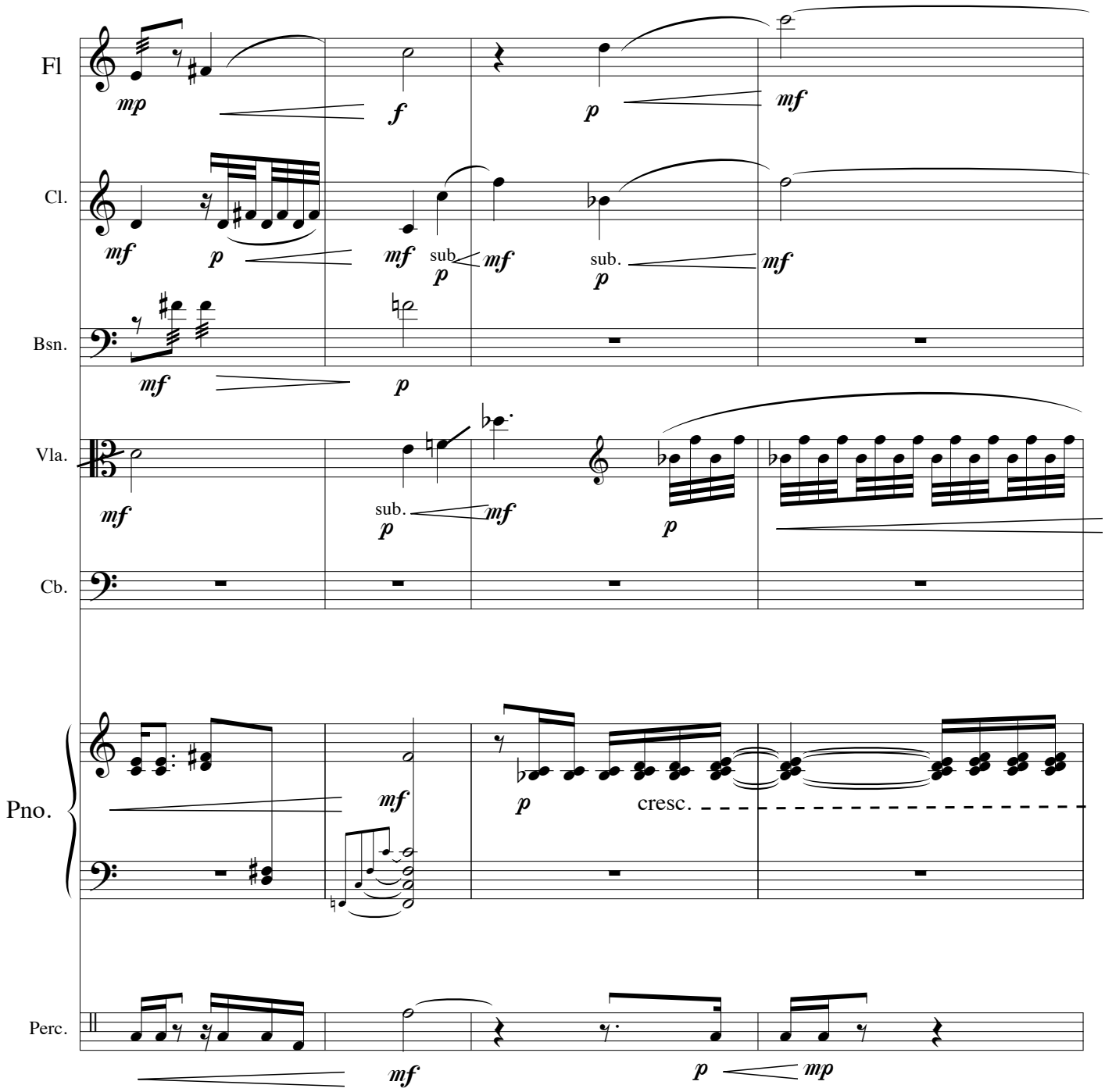

218
Fl
Cl.
Bsn.
Vla.
Cb.
Pno.
Synth.
Perc.
sub.

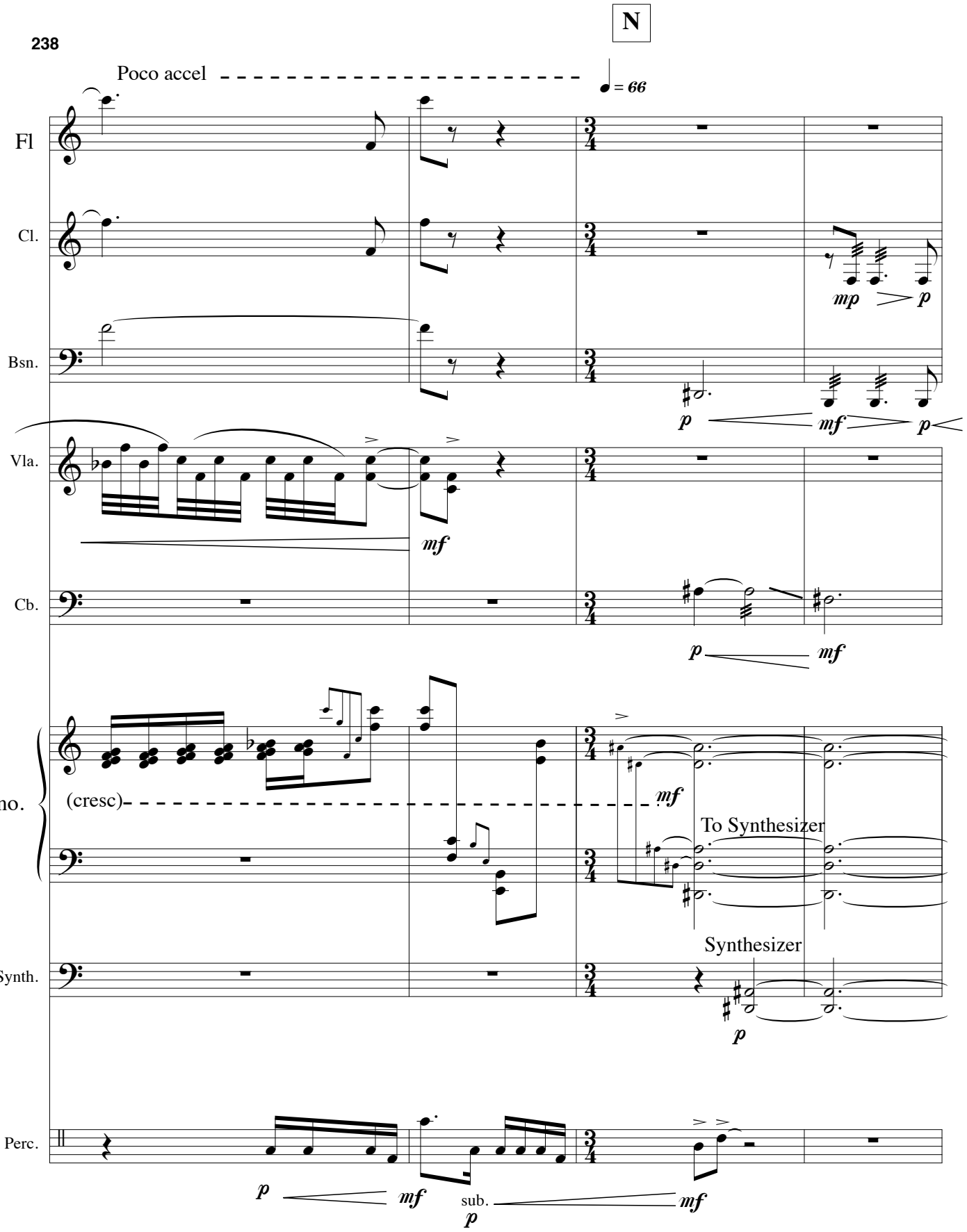

Fl
Cl.
Bsn.
Vla.
Cb.
Pno.
Perc.
mf
p
sub.
p
mf
p
mf
p
p
mf
p
p
mf
p
mf
mf
sub.
p
pp
mp
p

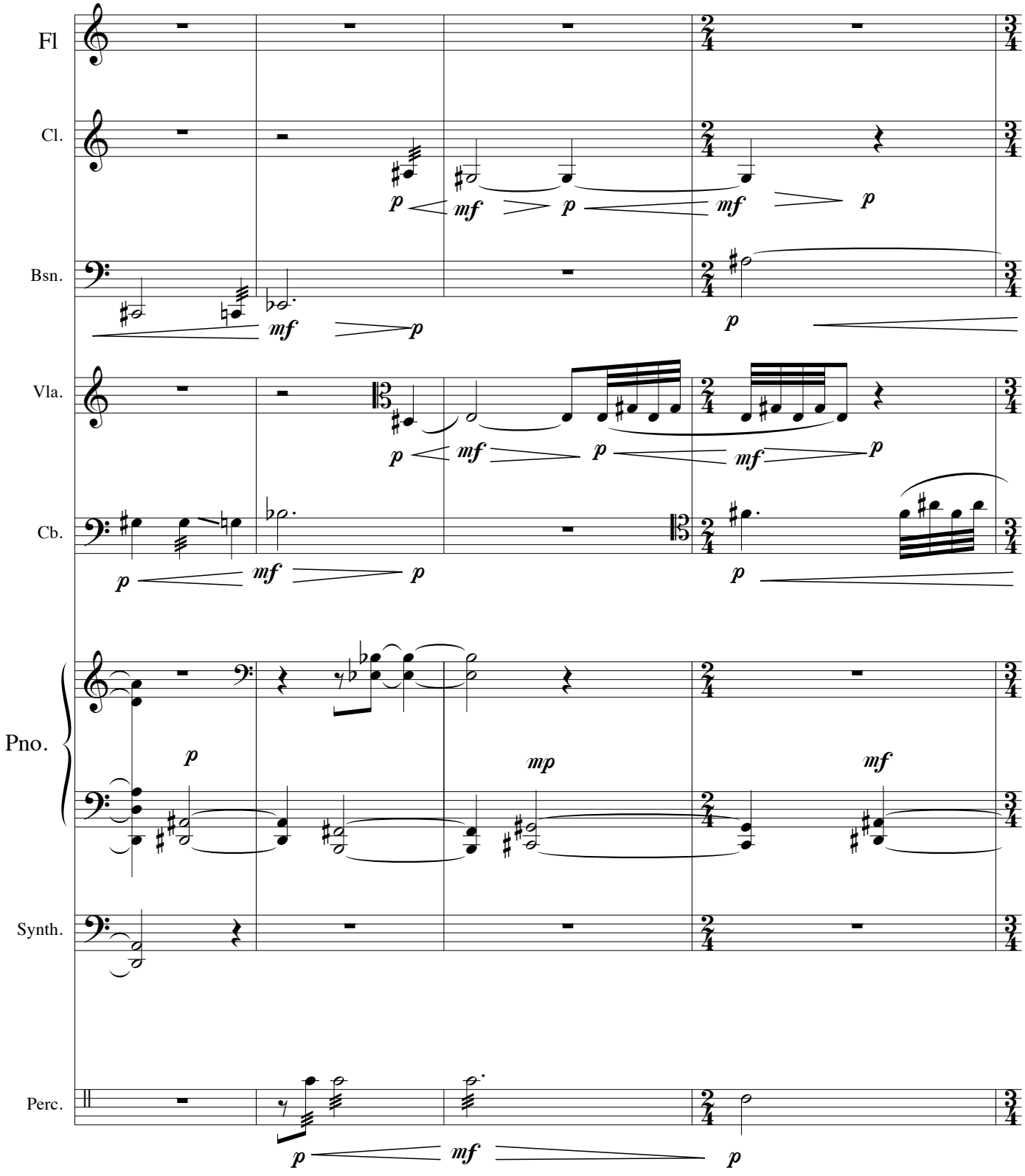

Fl
Cl.
Bsn.
mf
Vla.
p
Cb.
sub.
p
mf
sub.
p
mf
sub.
p
Pno.
mf
p
Perc.
mf
p


Fl
Cl.
Bsn.
Vla.
Cb.
Pno.
Perc.
mf
p
f
sub.
pp

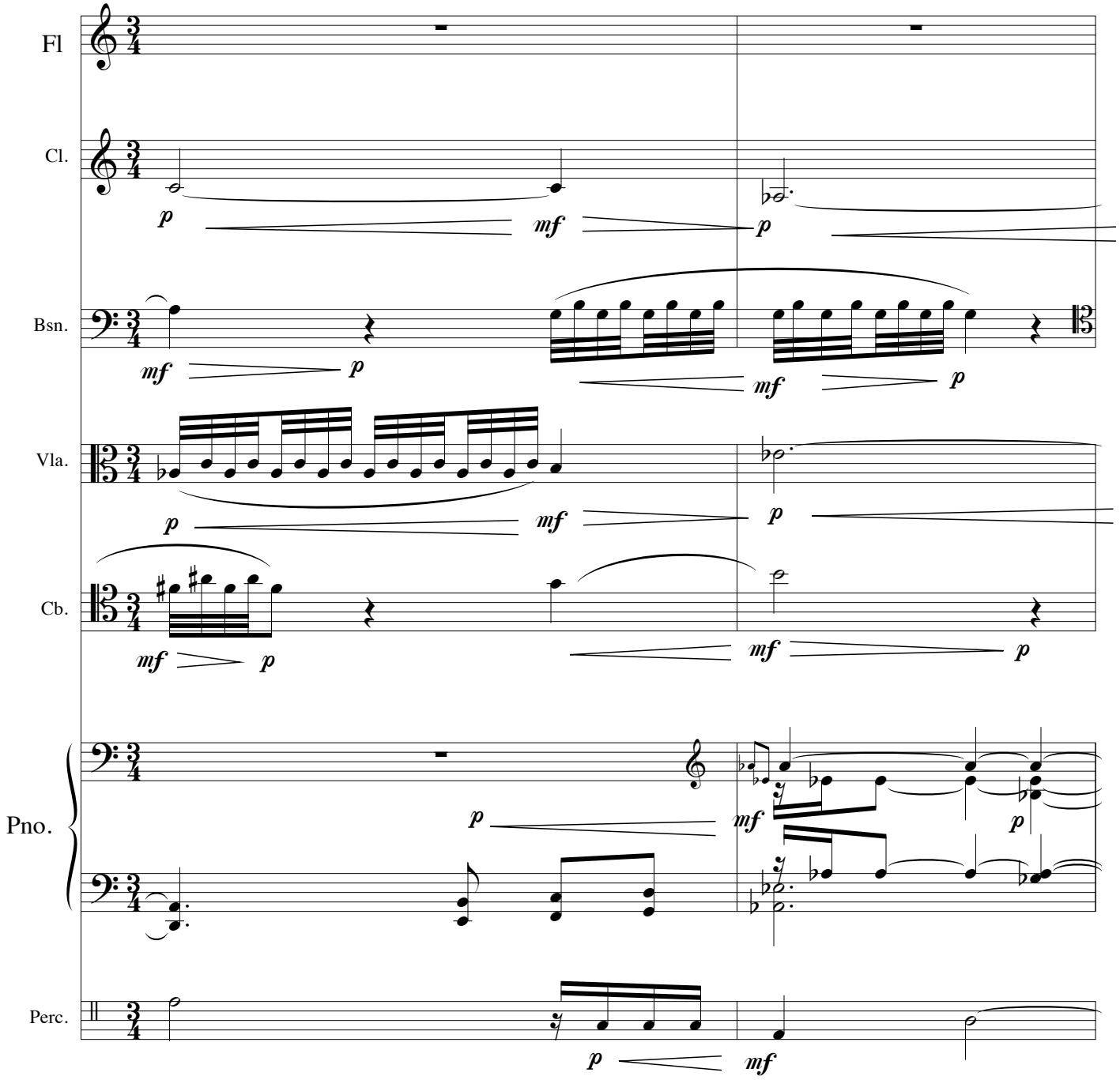
234



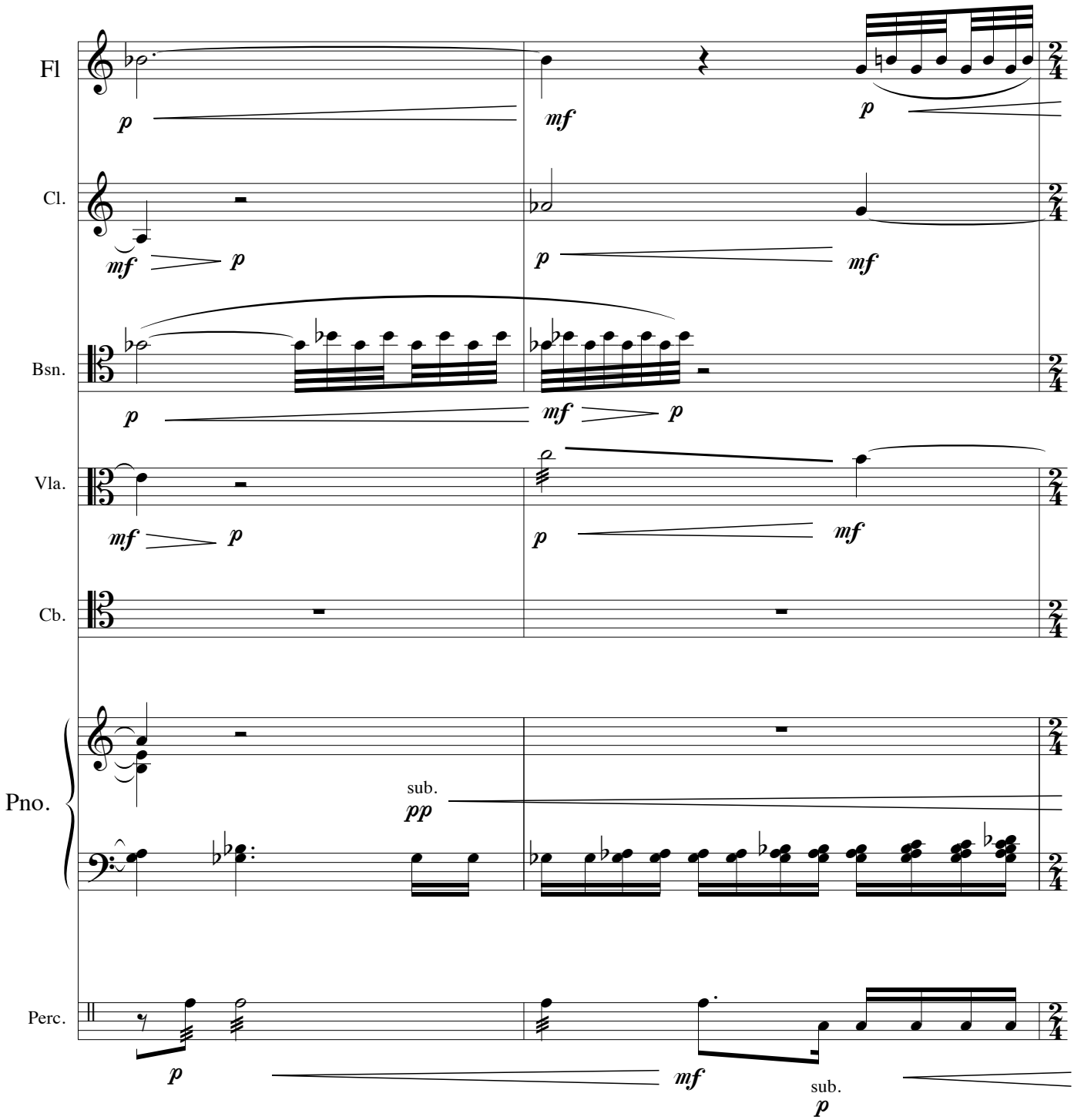

238
N
Poco accel
= 66
Fl
Cl.
Bsn.
Vla.
Cb.
Pno.
(cresc)
To Synthesizer
Synth.
Synthesizer
Perc.
sub.

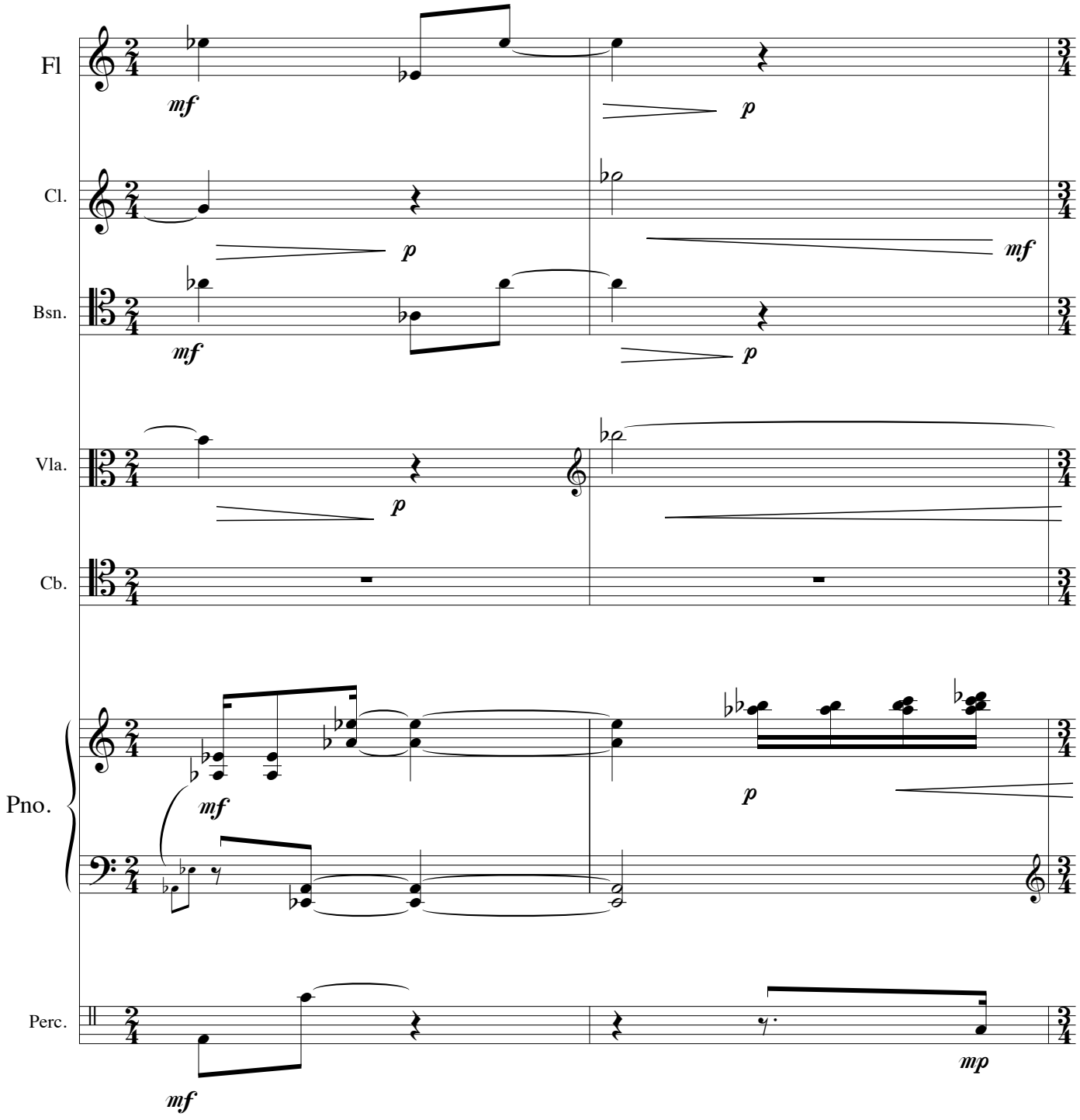

Fl
Cl.
Bsn.
Vla.
Cb.
Pno.
Synth.
Perc.
p
mf
p
mf
p
p
mf
p
p
mf
p
p
mf
p
p
mp
mf
p
mf
p

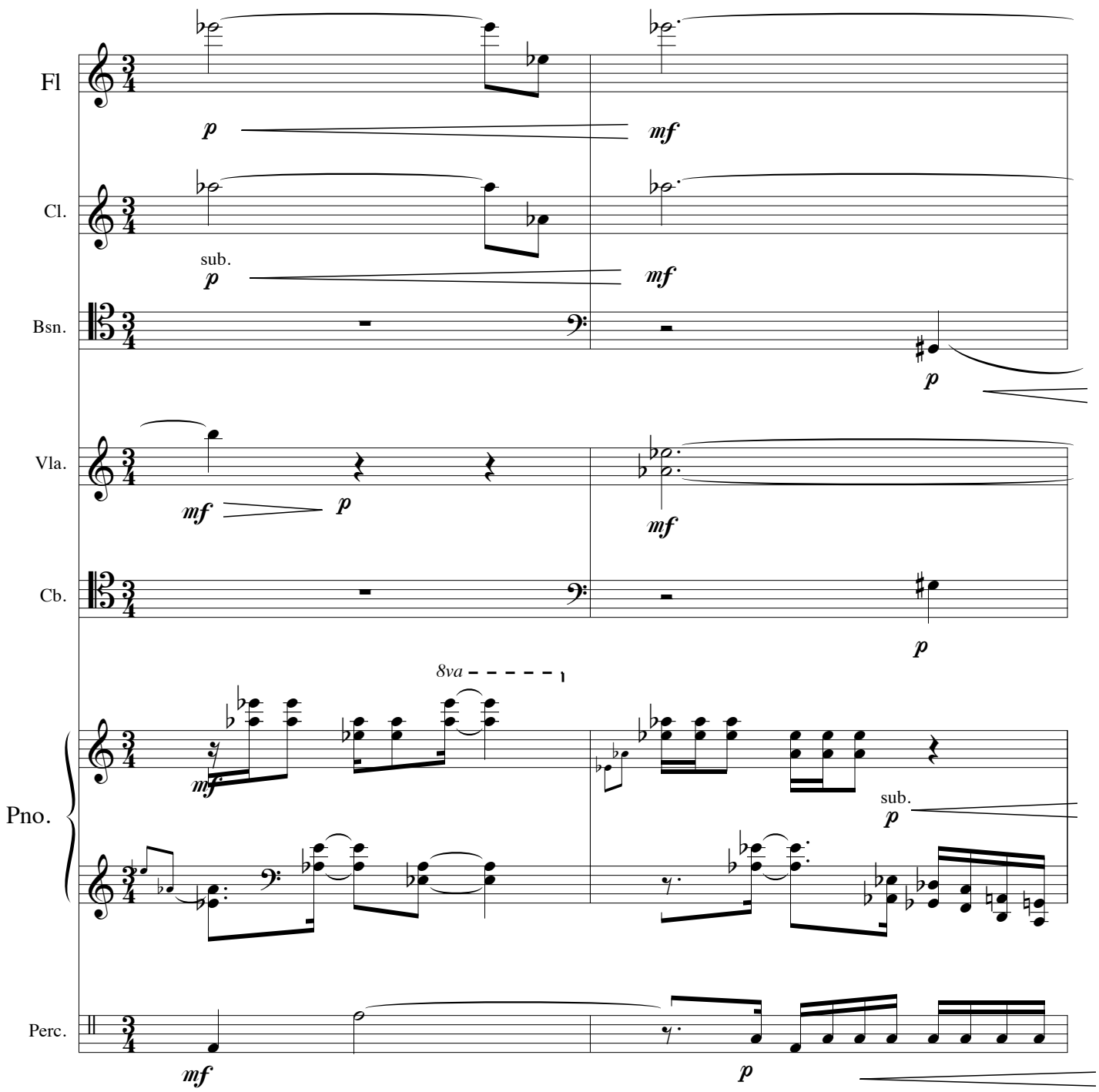
246

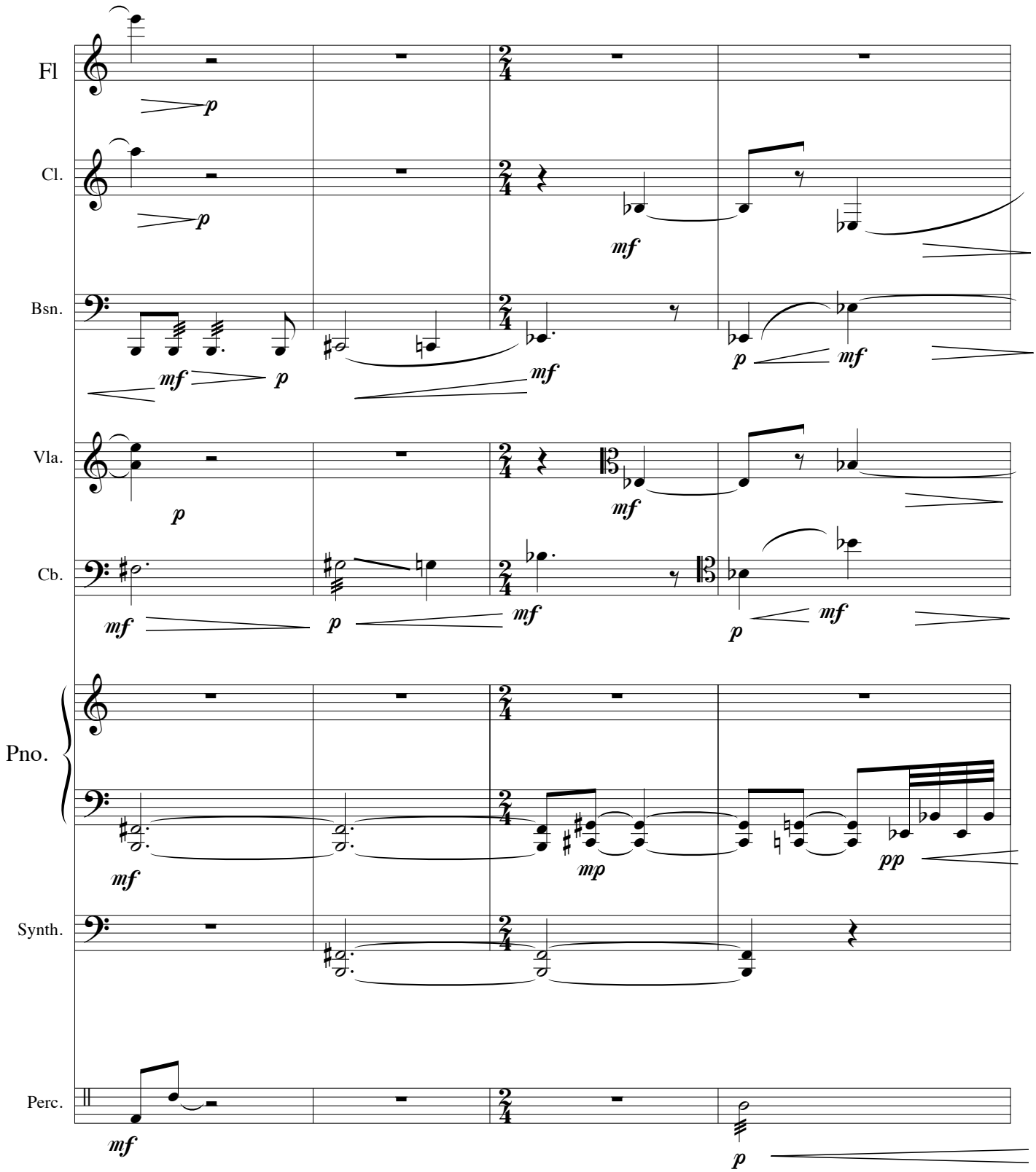


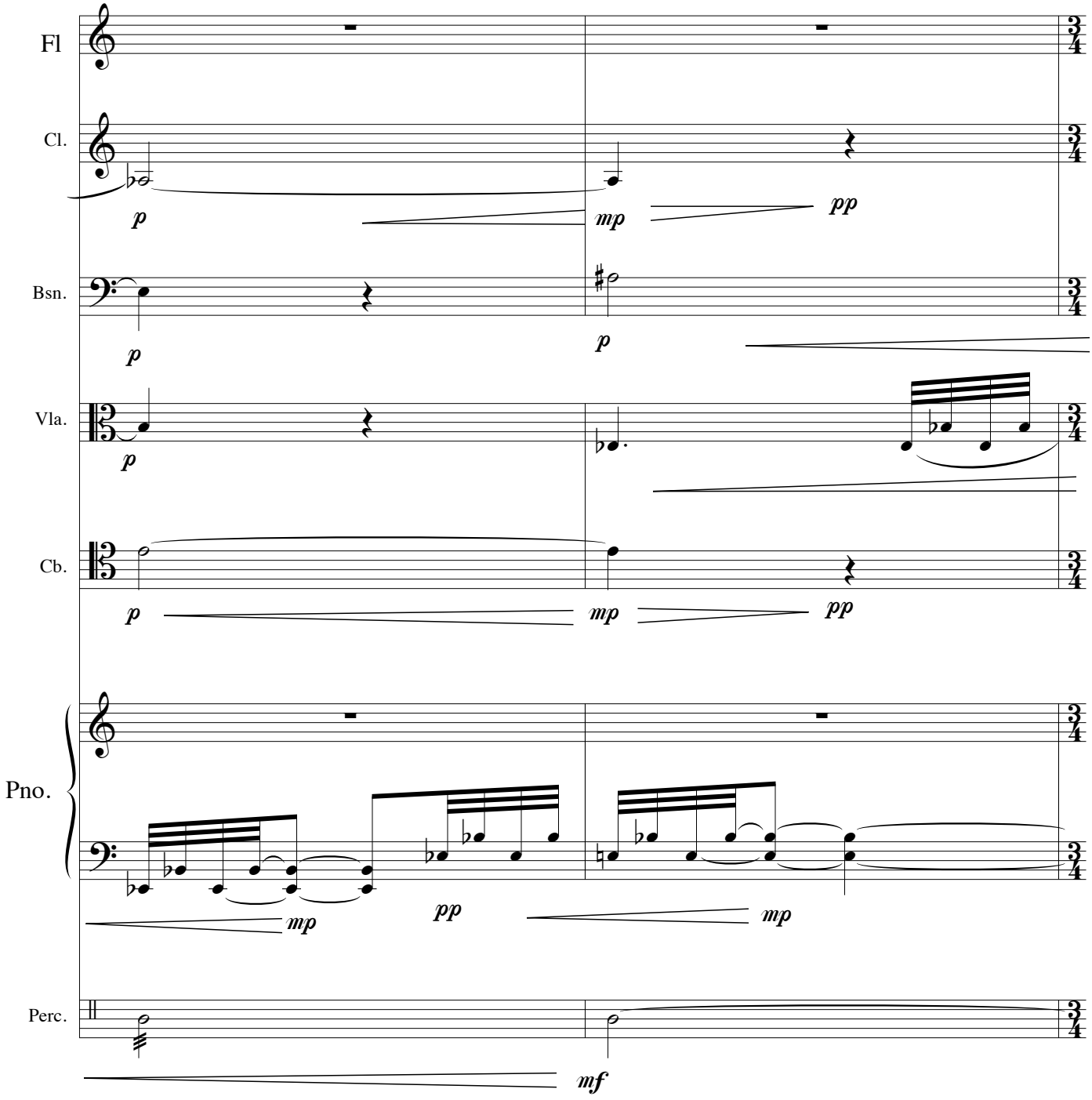
248

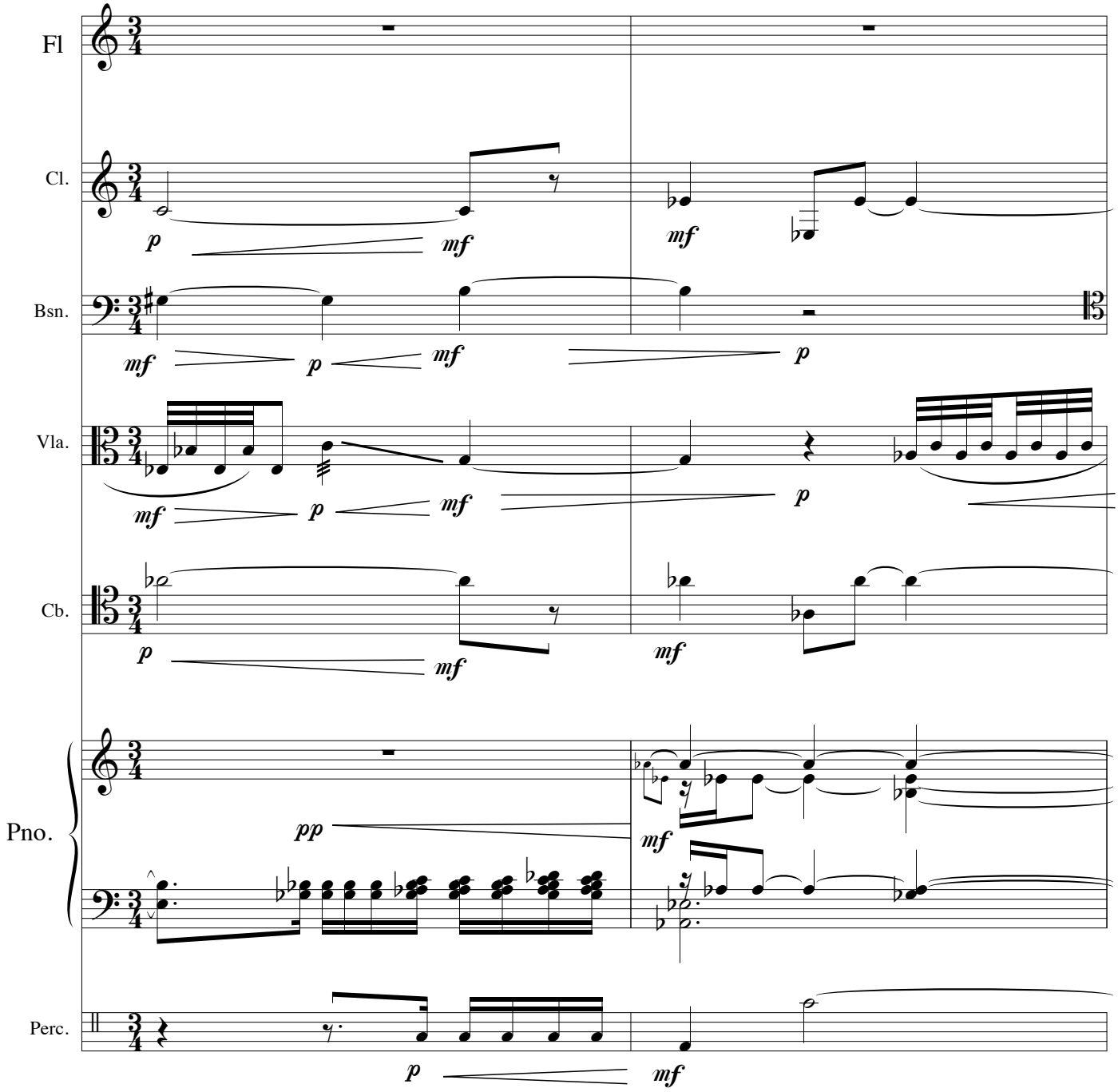


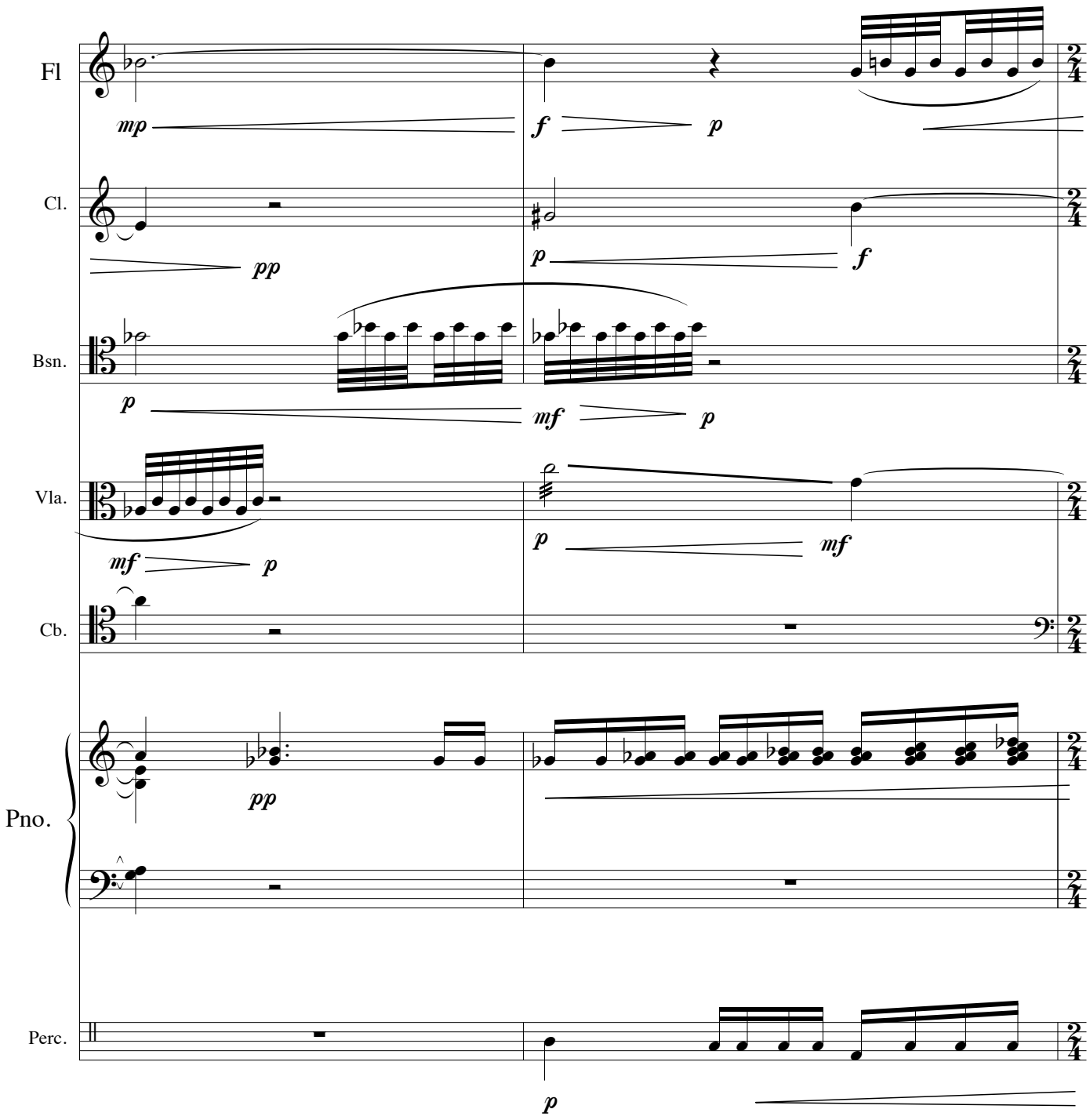

250
Fl
Cl.
Bsn.
Vla.
Cb.
Pno.
Perc.
mf
p
mf
p
mf
p
p
mf
p
mf
mp


252
Fl
Cl.
Bsn.
Vla.
Cb.
Pno.
Perc.
sub.
8va
mf
p

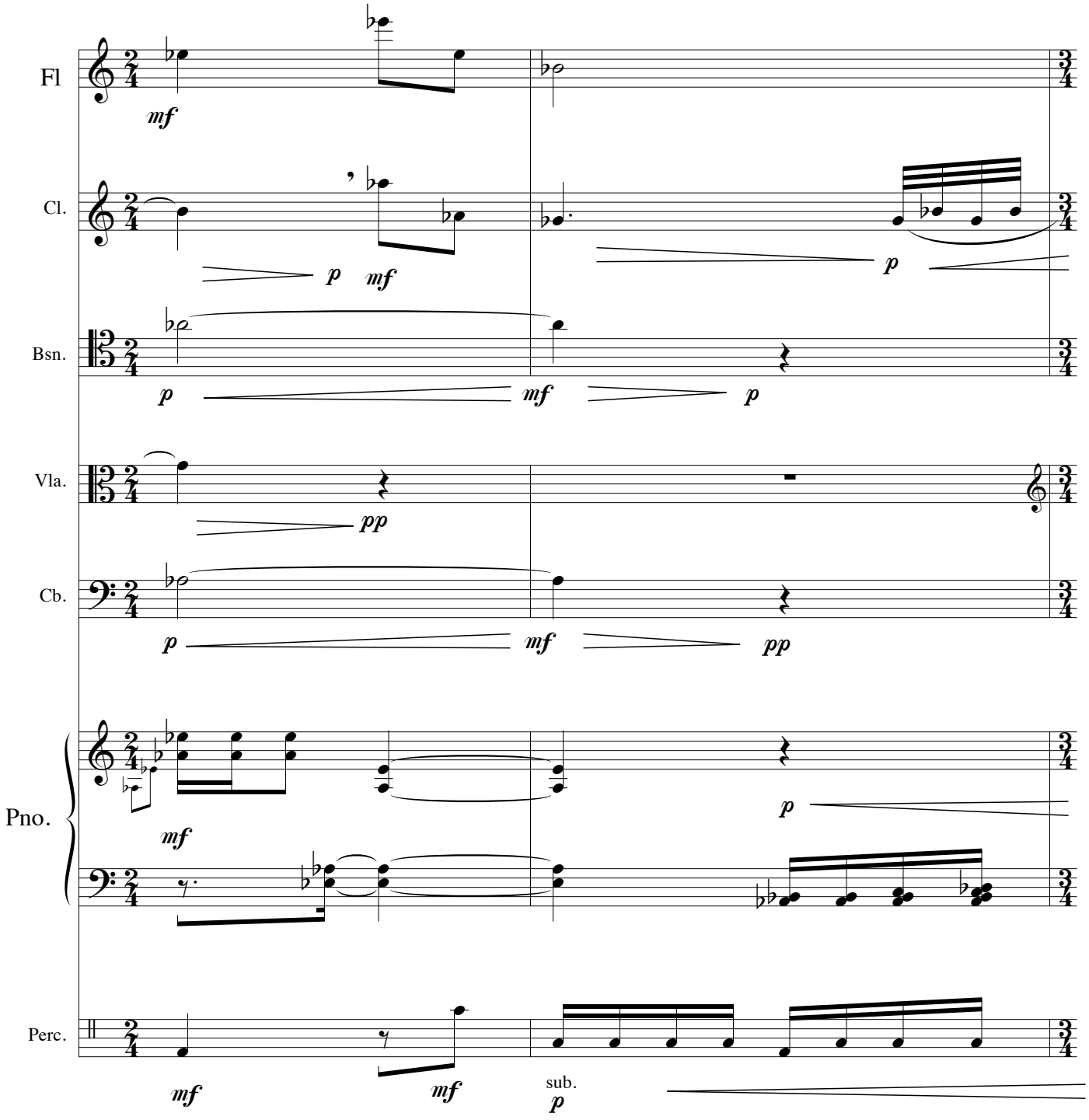

Fl
Cl.
Bsn.
Vla.
Cb.
Pno.
Synth.
Perc.
p
mf
mp
pp

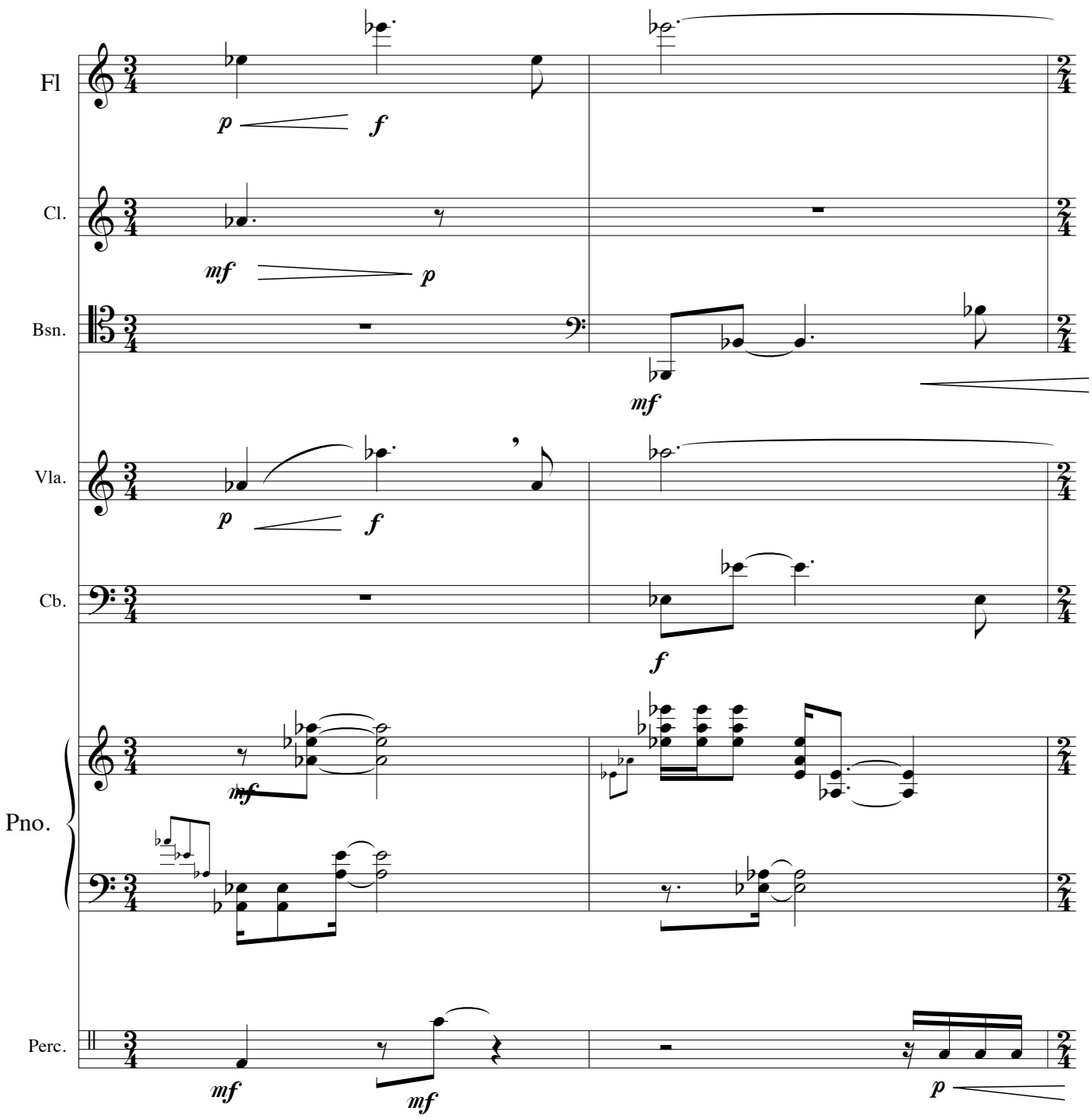

Fl
Cl.
Bsn.
Vla.
Cb.
Pno.
Perc.
p
mp
pp
mf

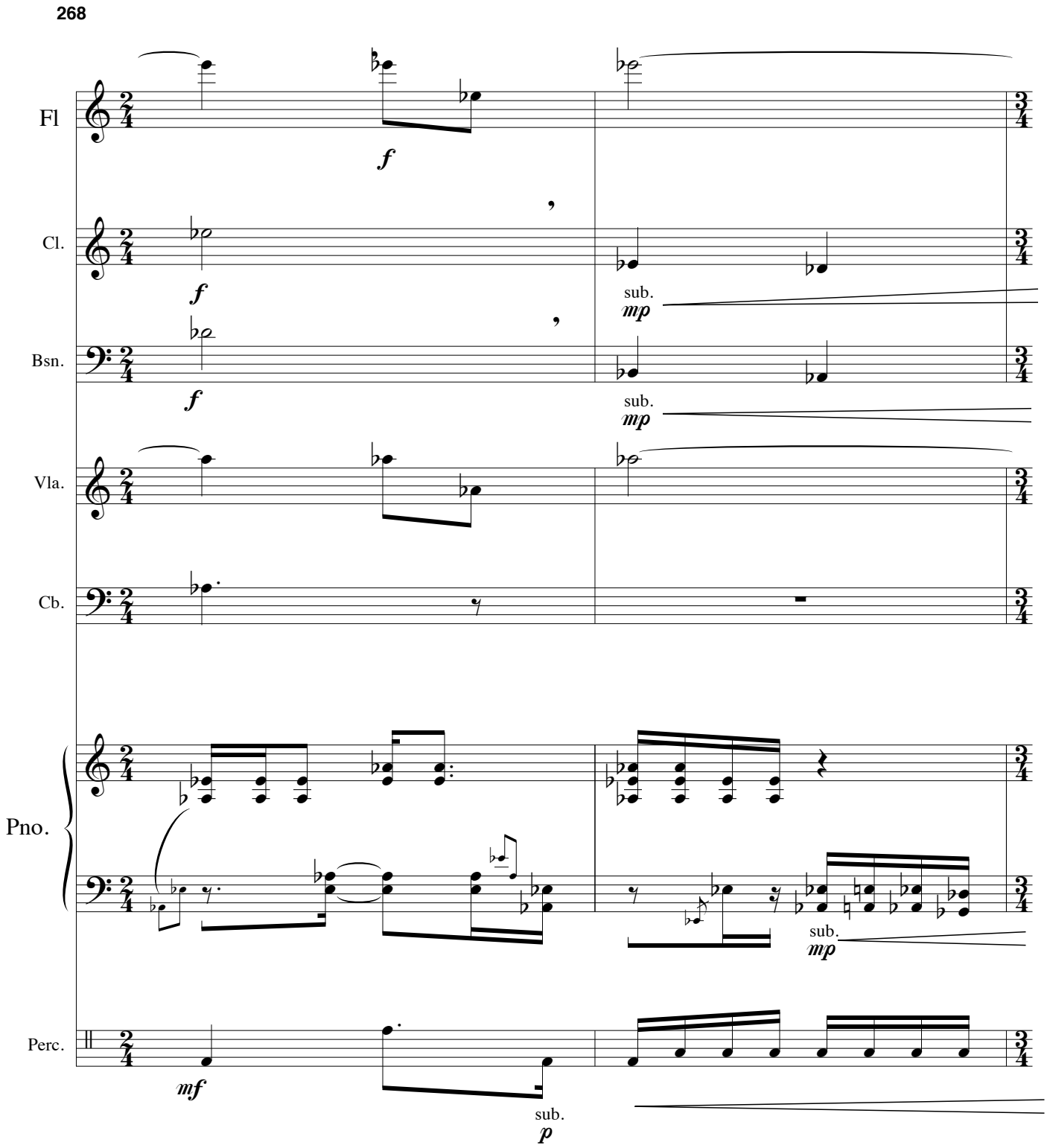

Fl
Cl.
Bsn.
Vla.
Cb.
Pno.
Perc.
p
mf
pp

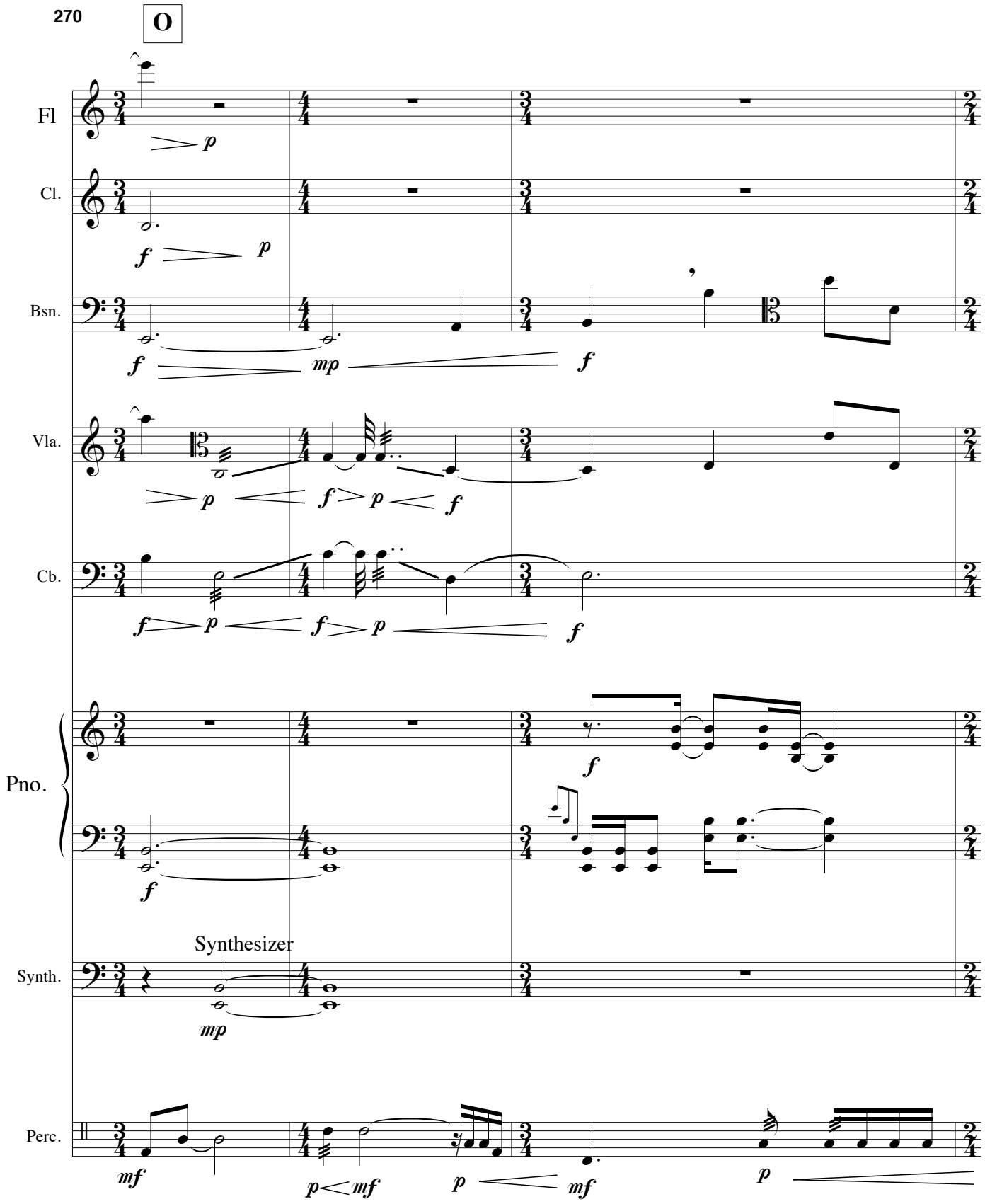

Fl
mp
f
p
Cl.
pp
p
f
Bsn.
p
mf
p
Vla.
mf
p
p
mf
Cb.
Pno.
pp
Perc.
p

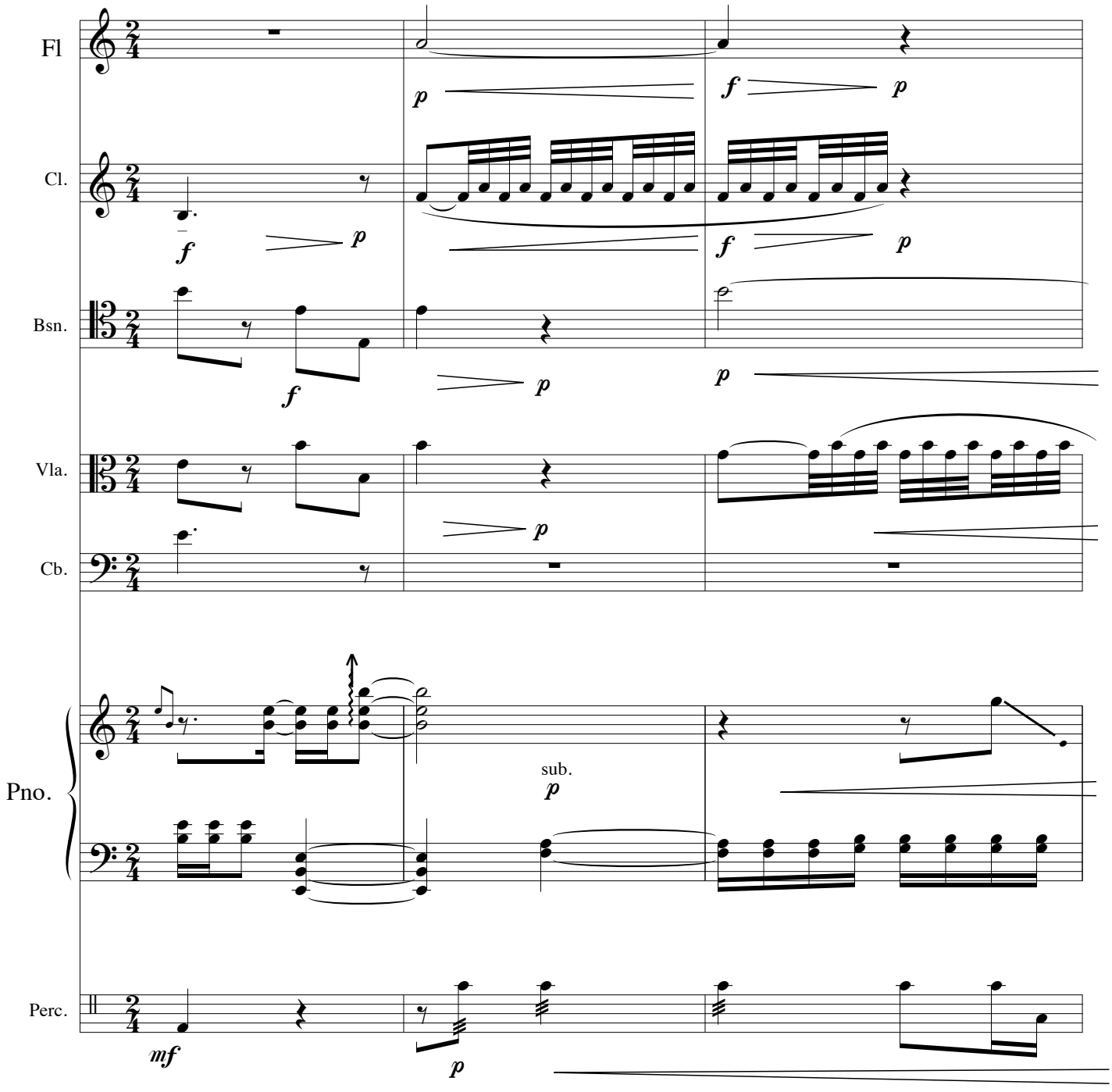
264

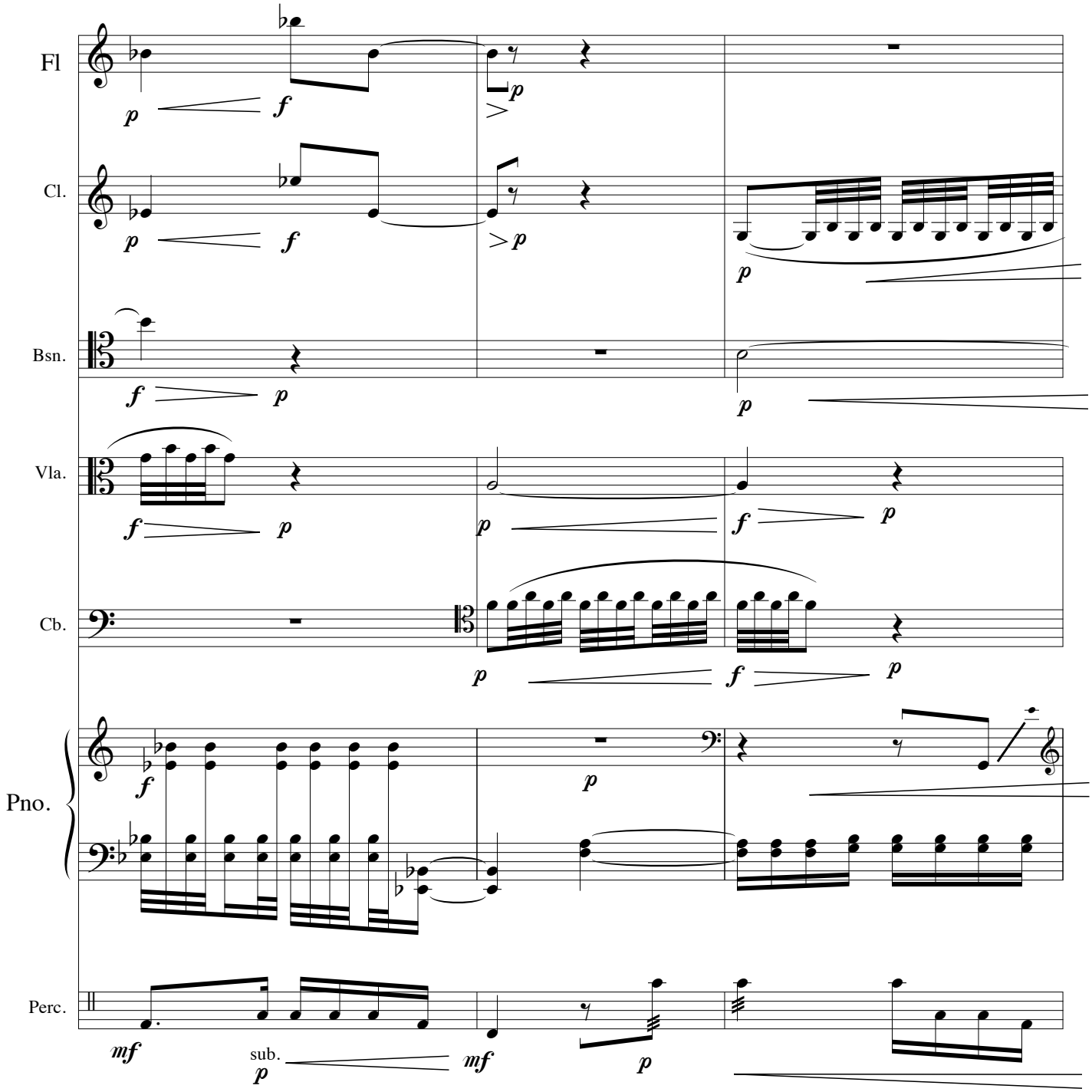



Fl
Cl.
Bsn.
Vla.
Cb.
Pno.
Perc.

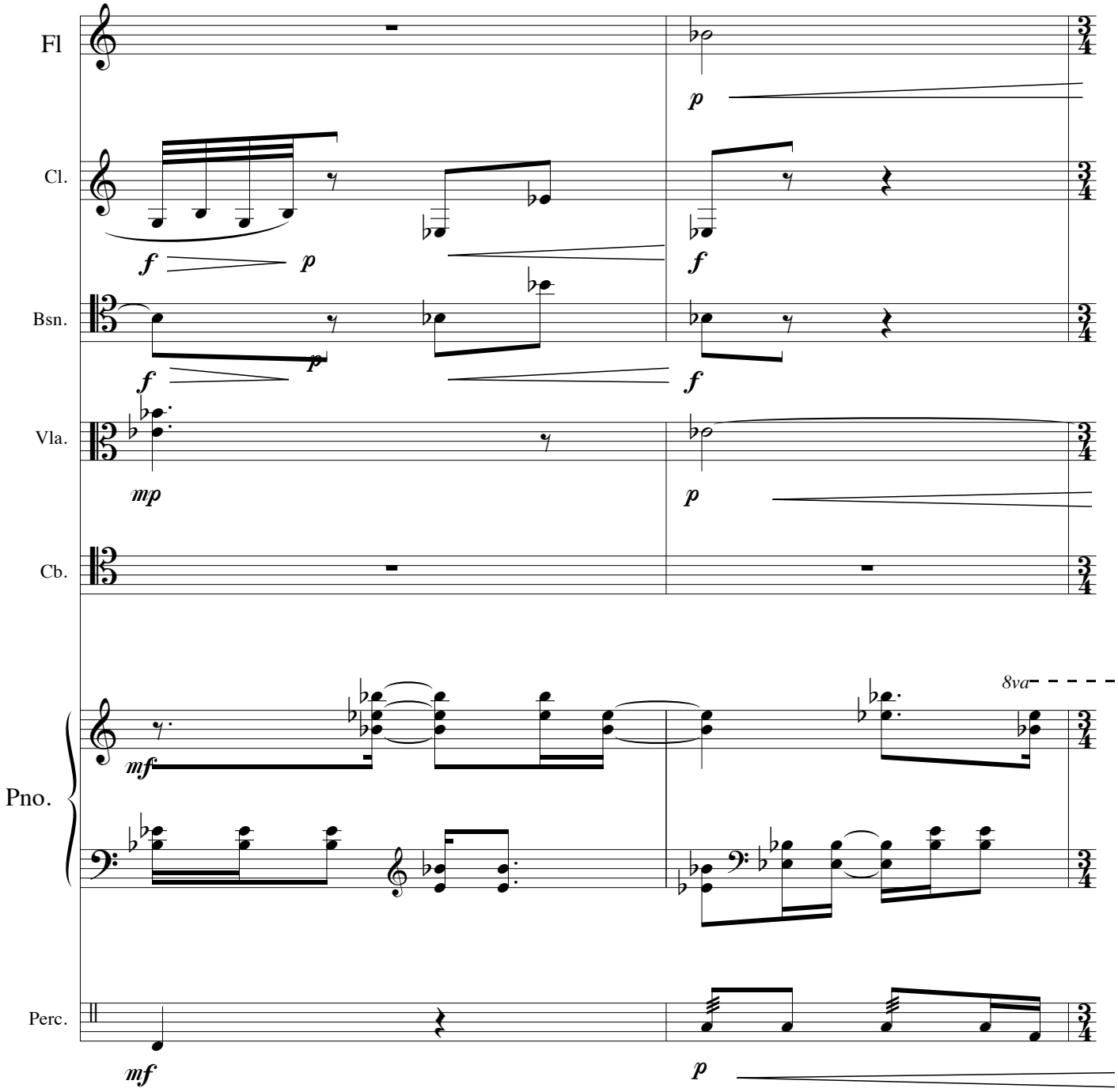

268
Fl
Cl.
Bsn.
Vla.
Cb.
Pno.
Perc.
f
mf
mp
p
sub.


270
O
Fl
Cl.
Bsn.
Vla.
Cb.
Pno.
Synthesizer
Synth.
Perc.

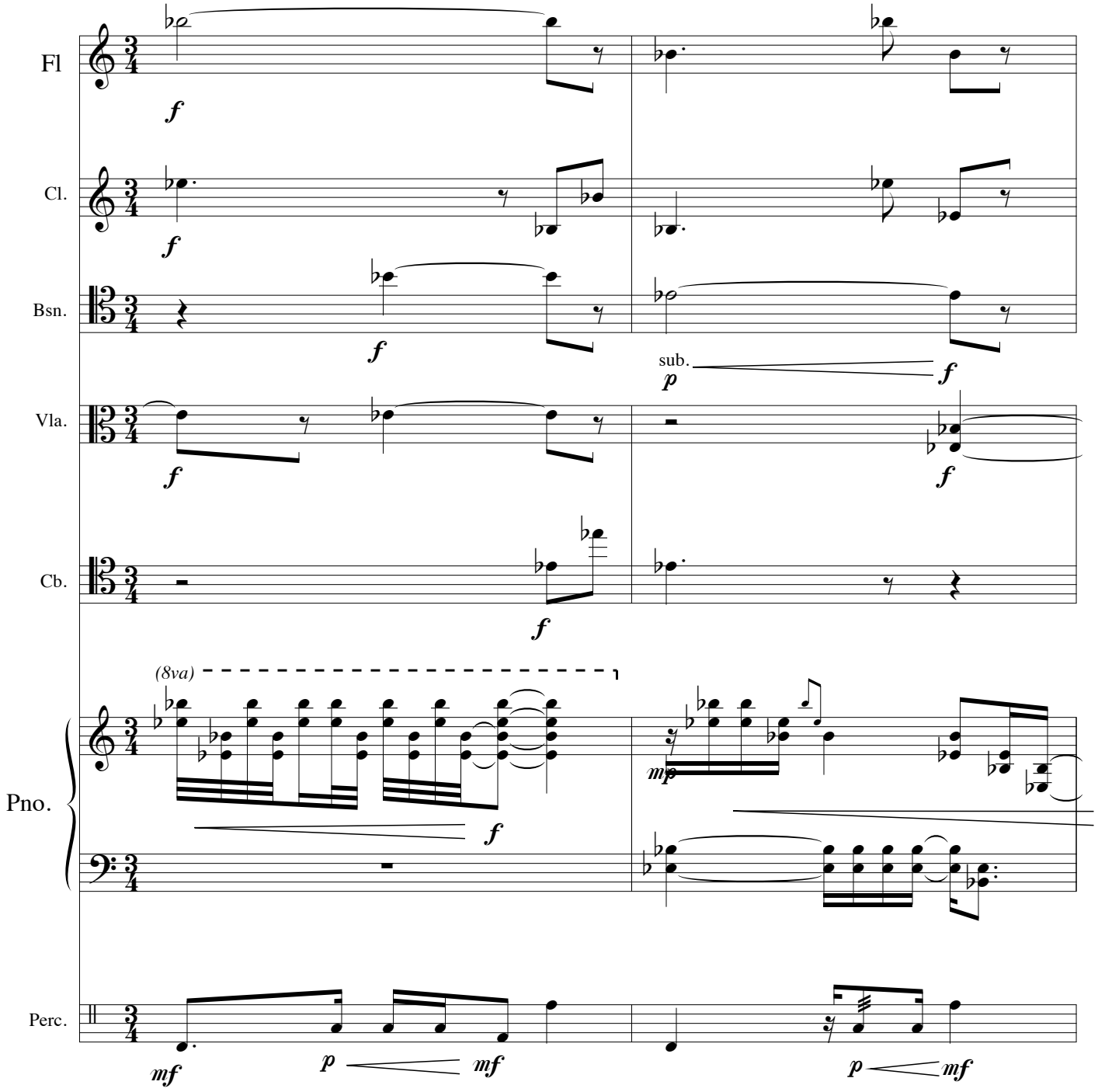

Fl
Cl.
Bsn.
Vla.
Cb.
Pno.
Perc.
sub.


Fl
Cl.
Bsn.
Vla.
Cb.
Pno.
Perc.
sub.

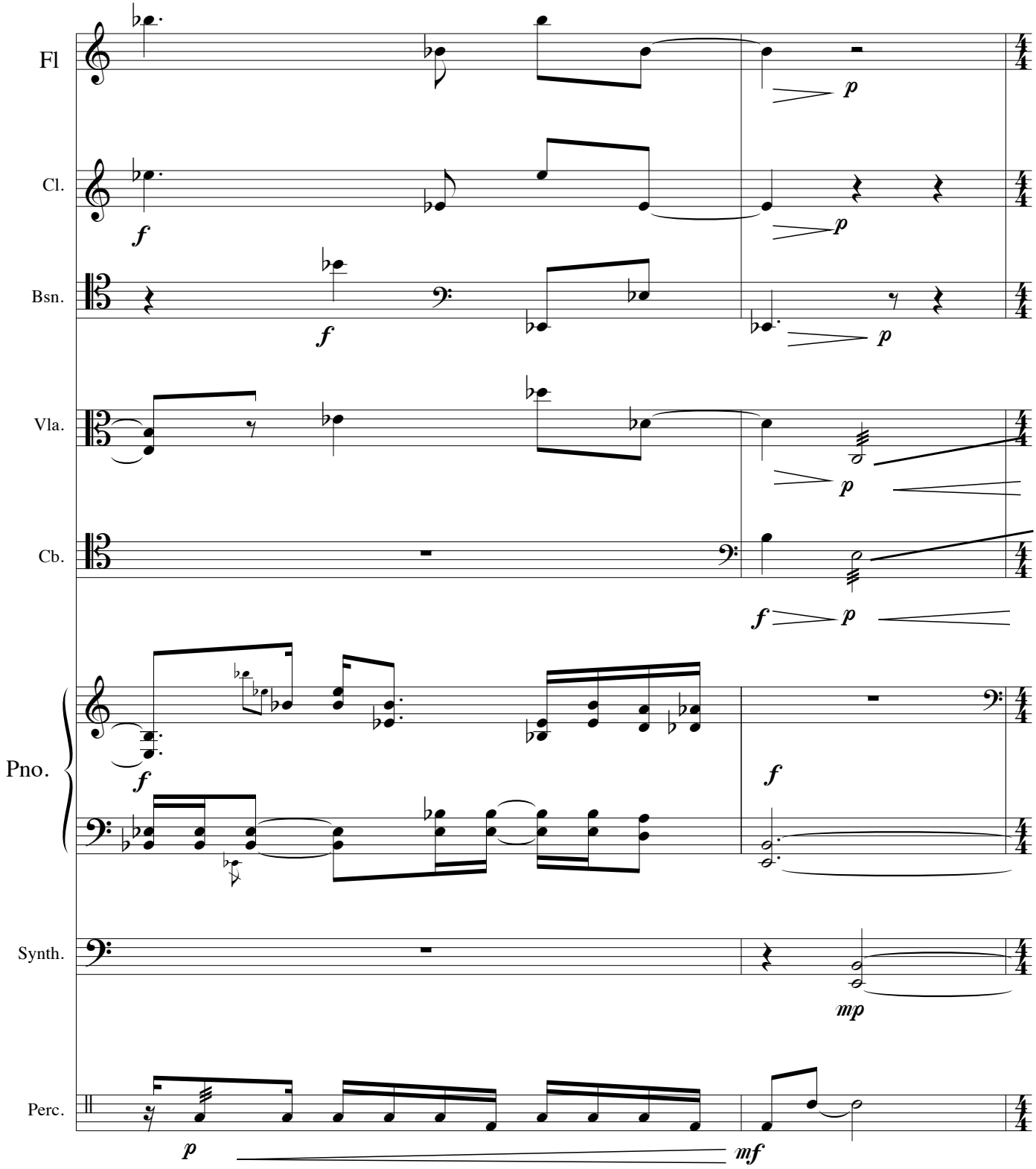
279

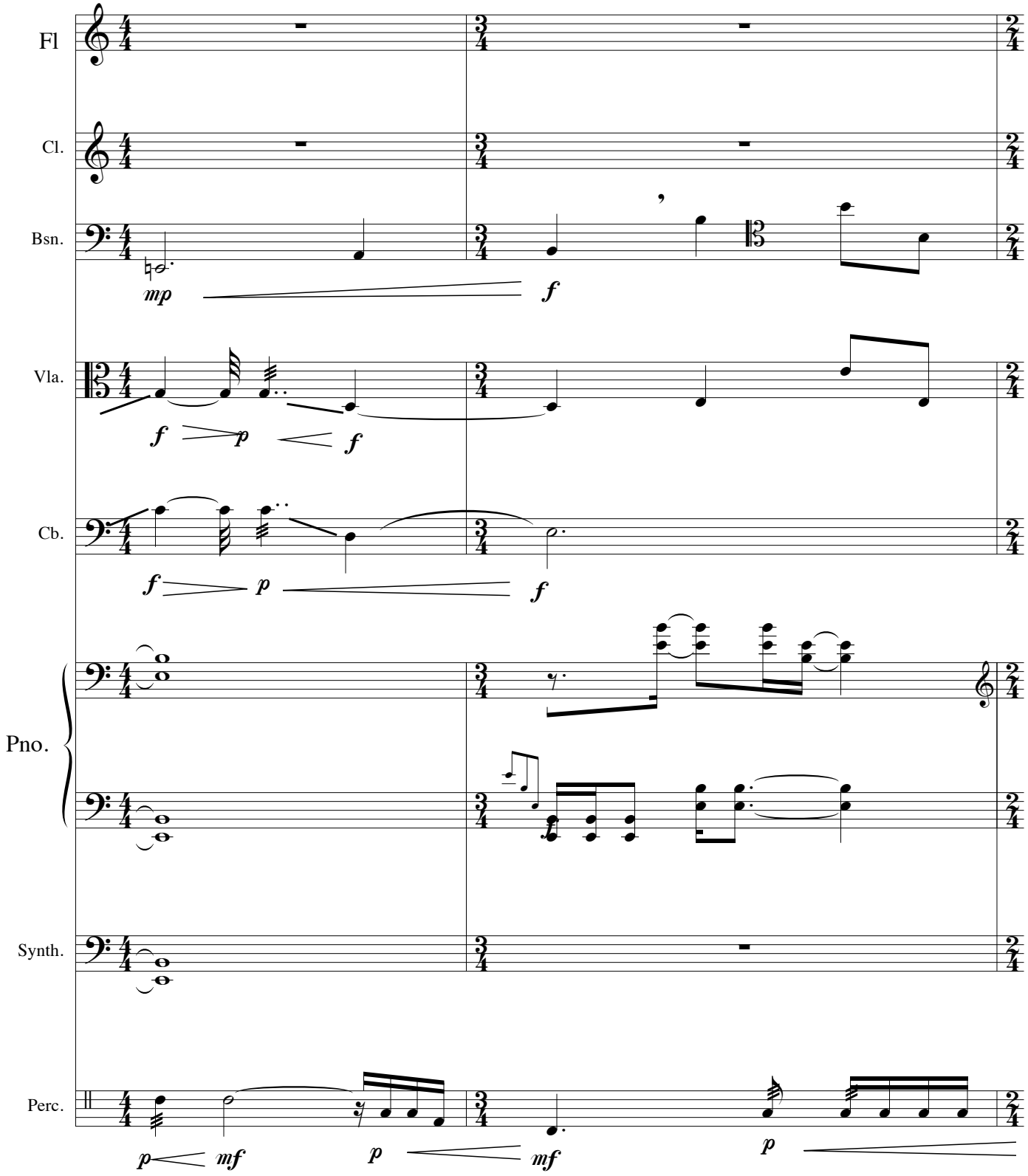


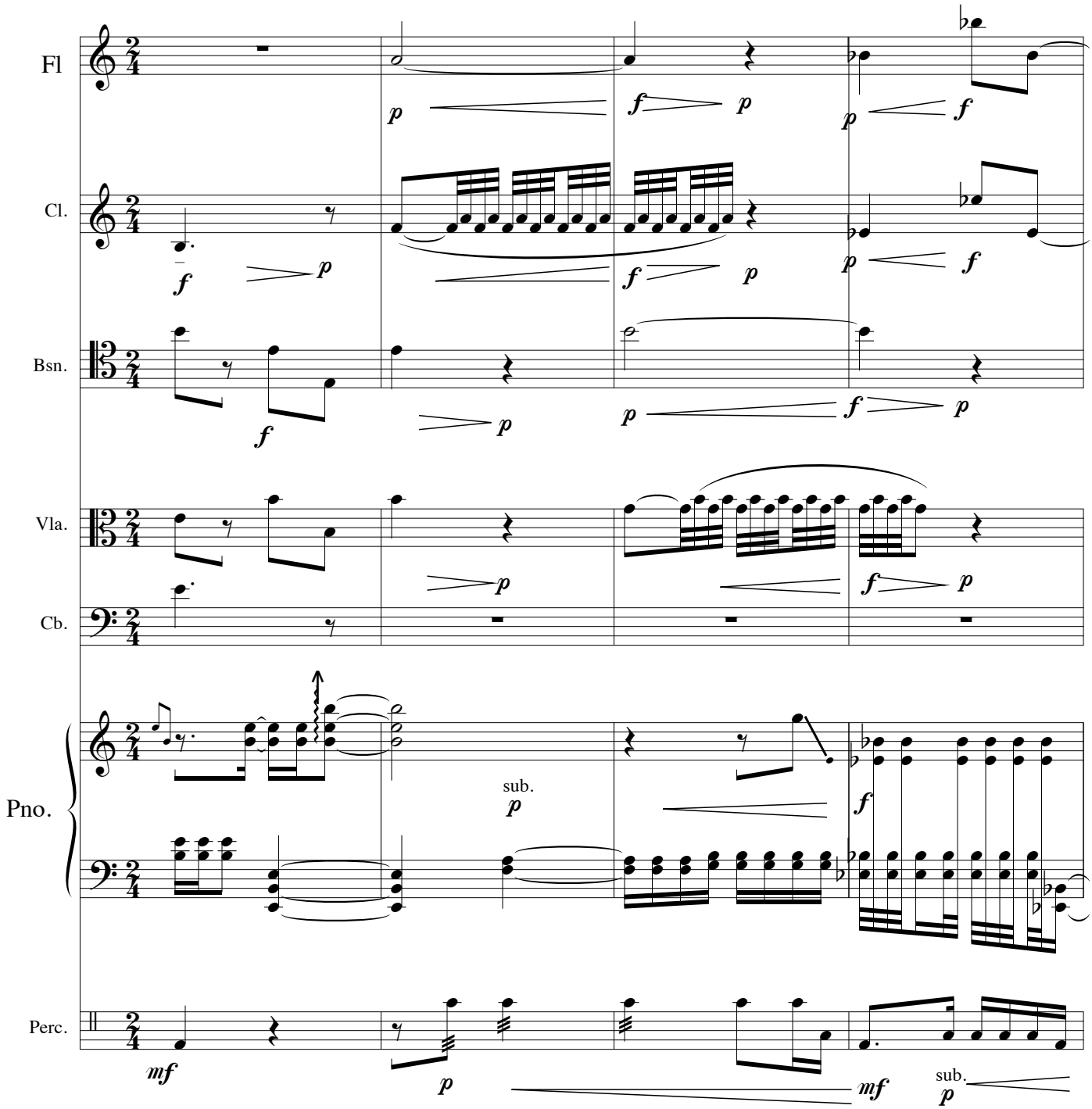
281

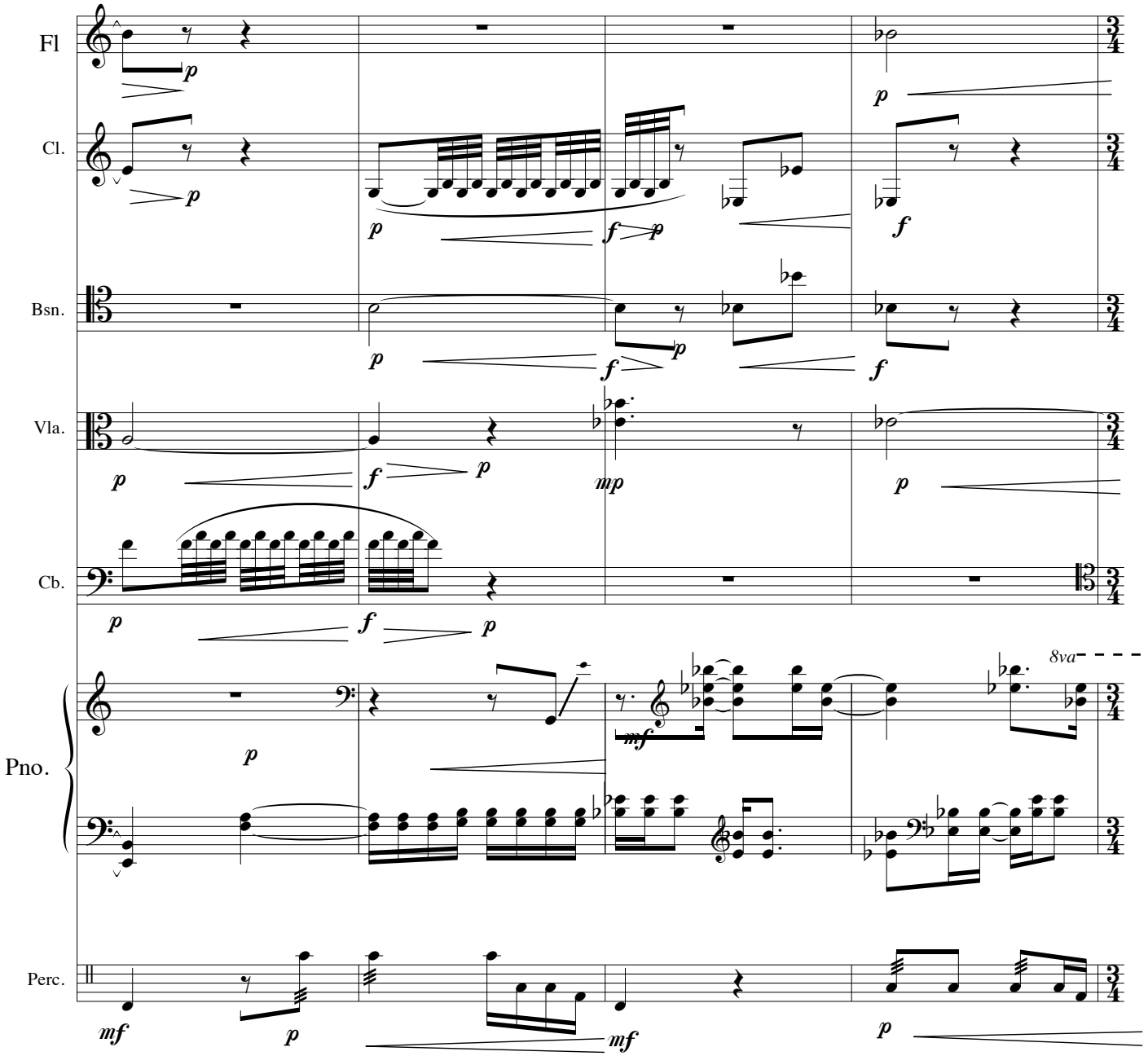


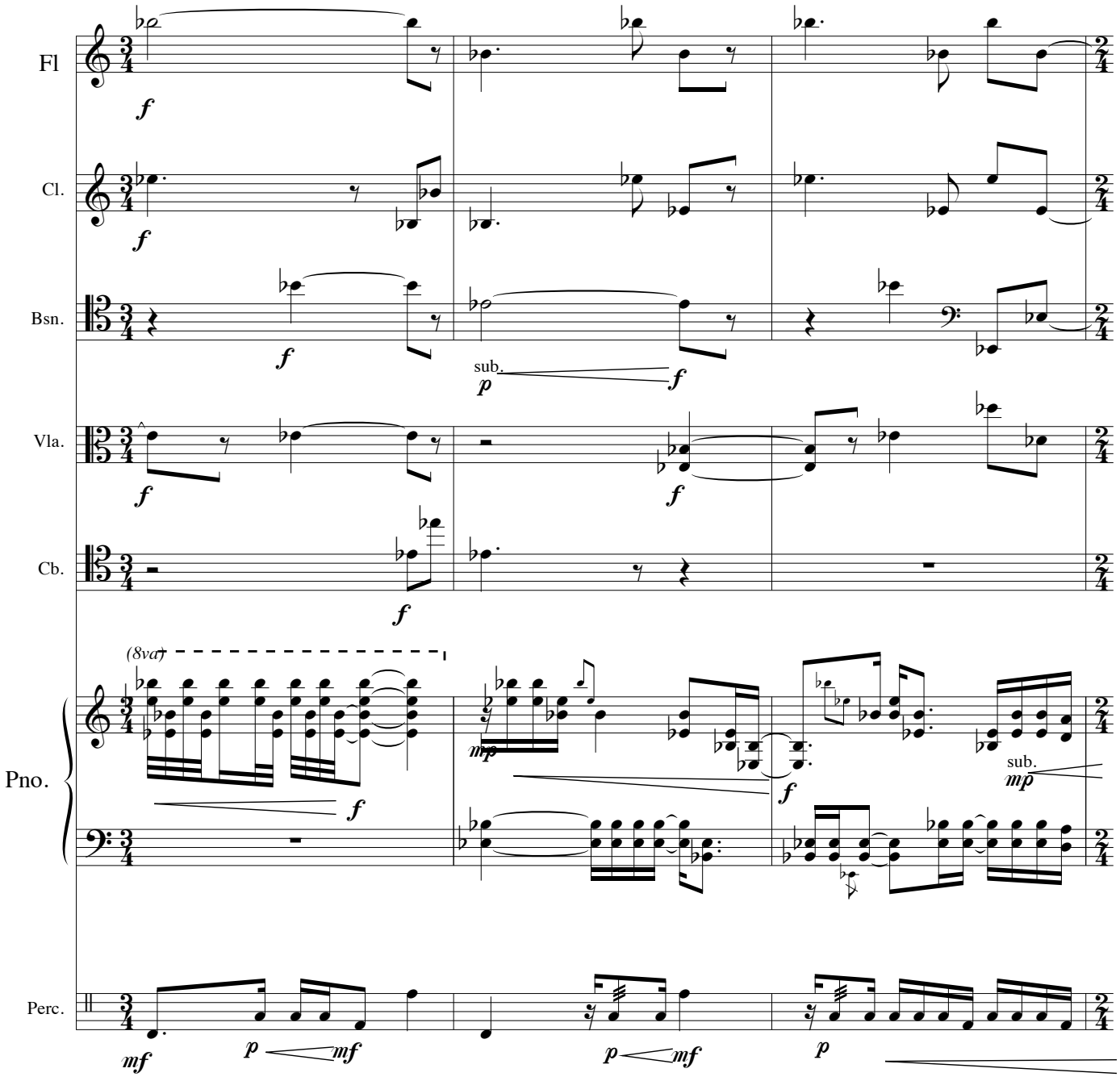
283

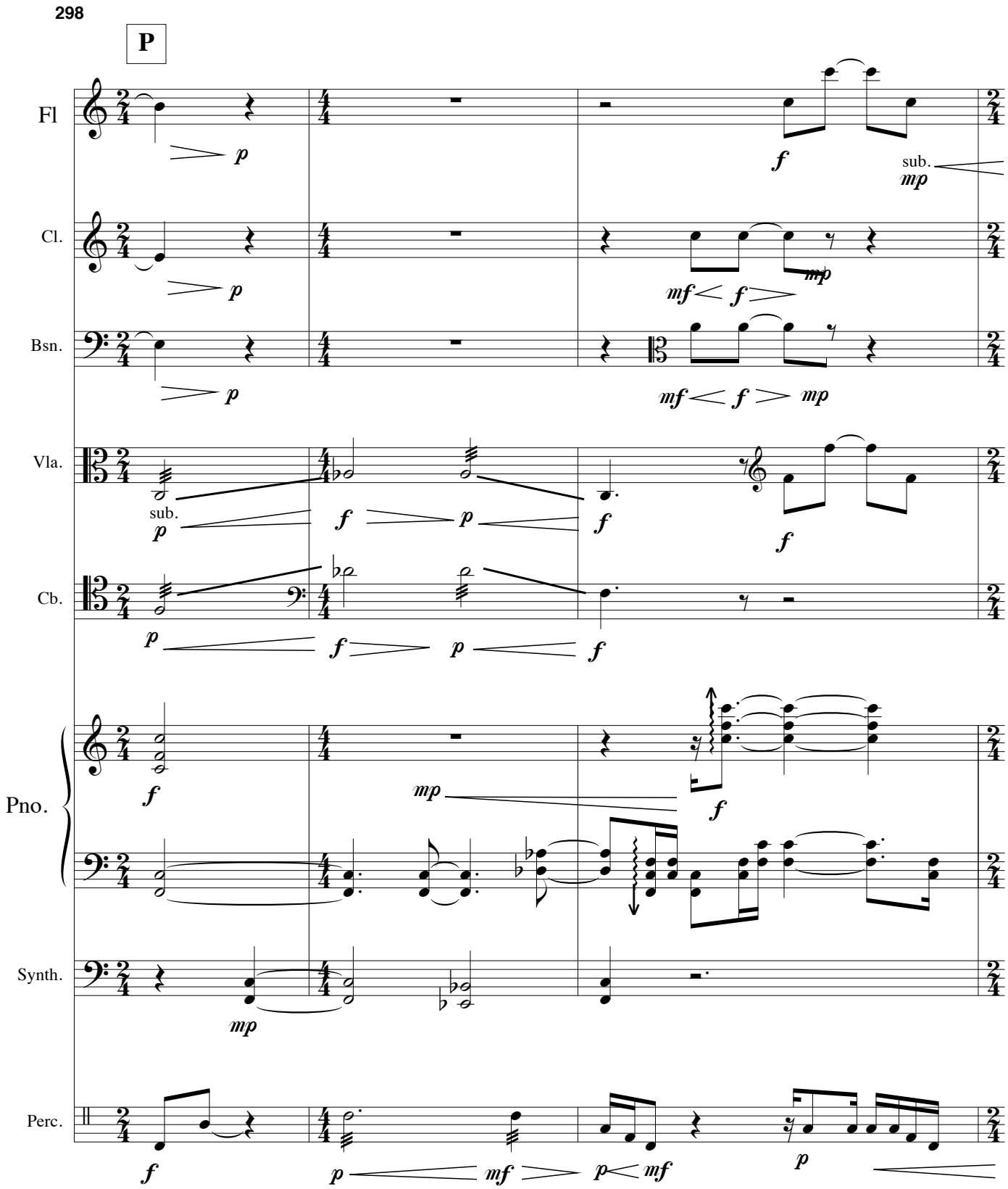


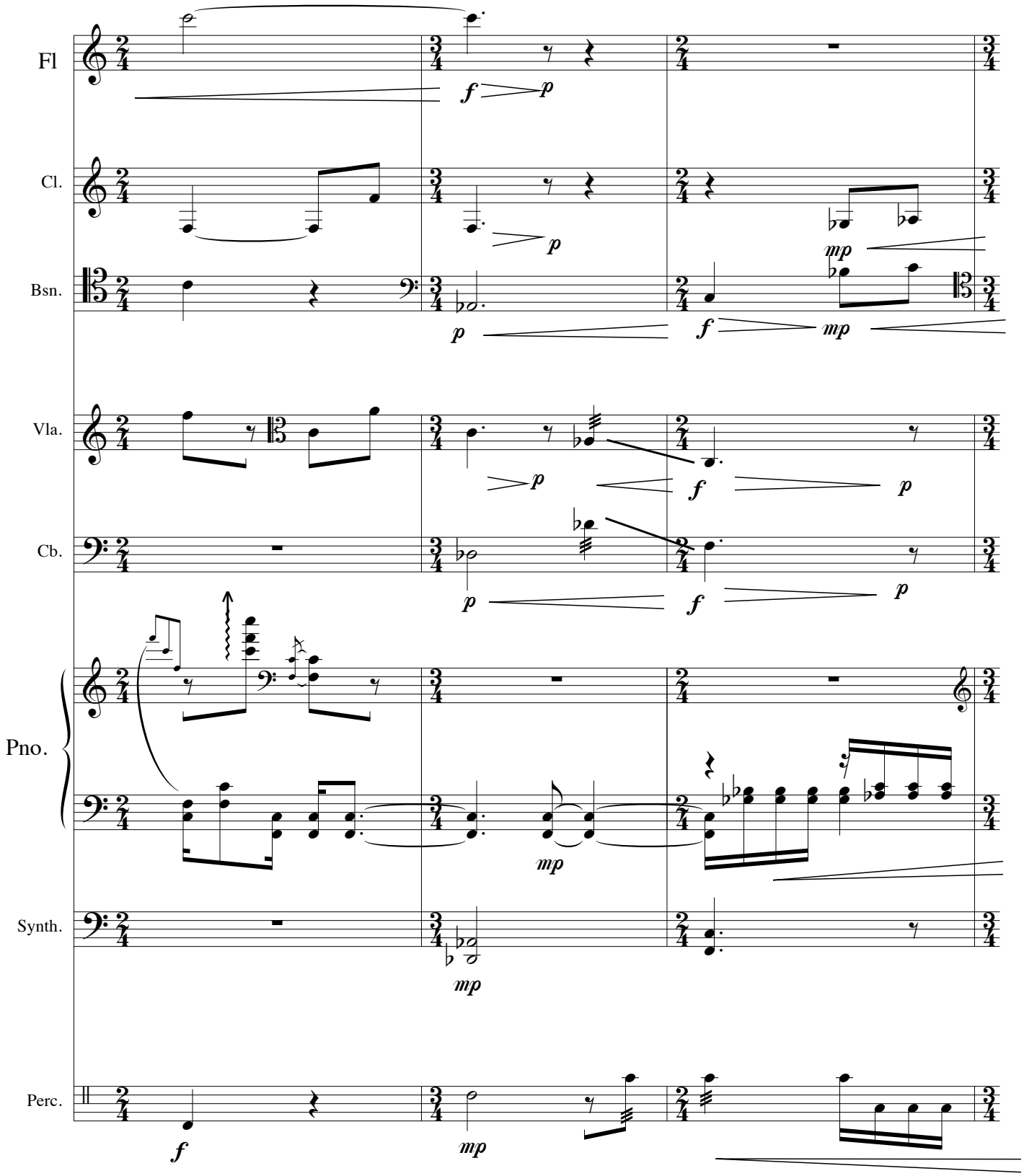

Fl
Cl.
Bsn.
mp
f
Vla.
f
p
f
Cb.
f
p
f
Pno.
Synth.
Perc.
p
mf
p
mf
p

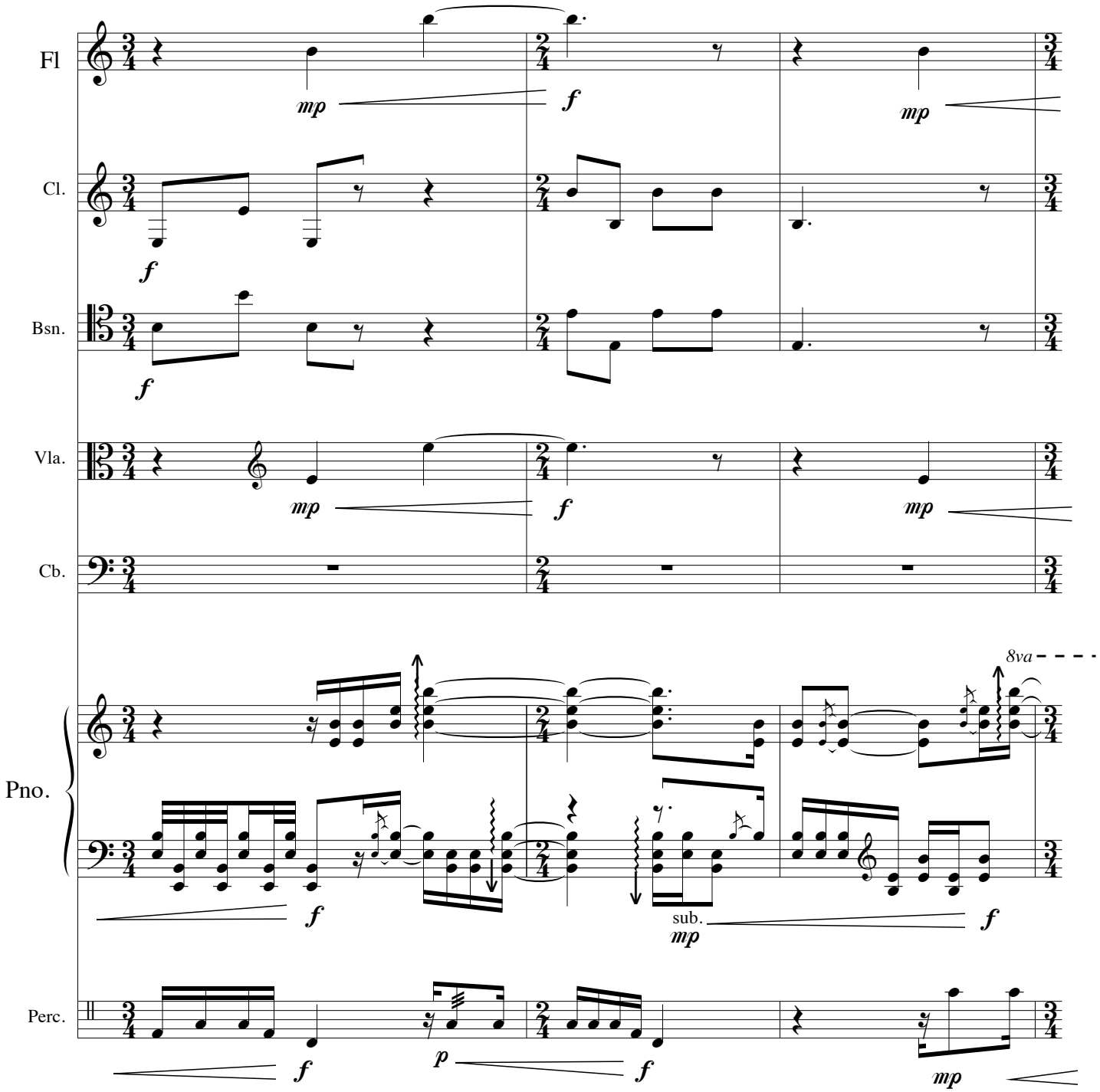

Fl
Cl.
Bsn.
Vla.
Cb.
Pno.
Perc.
sub.
sub.

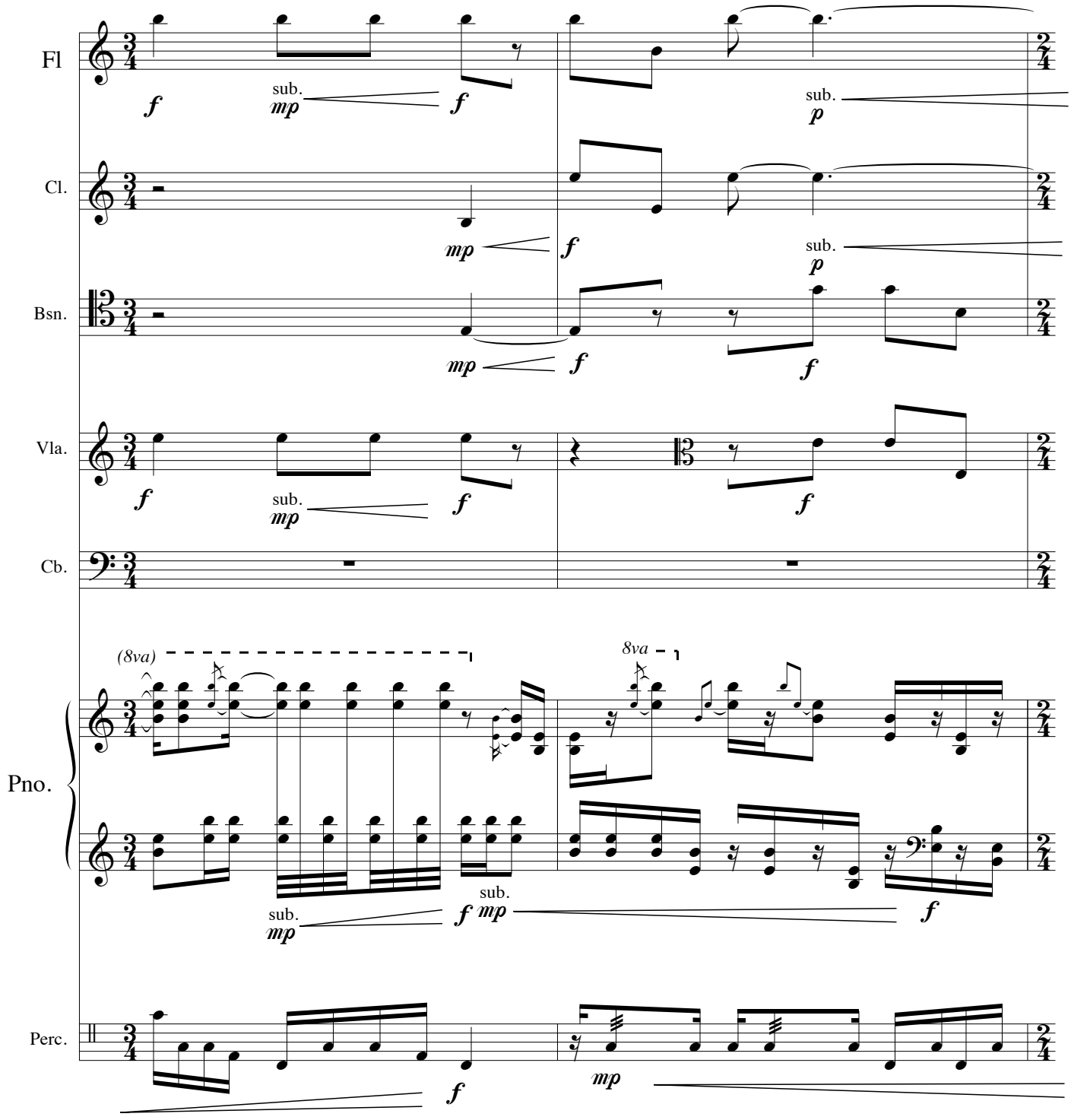

Fl
Cl.
Bsn.
Vla.
Cb.
Pno.
Perc.
8va

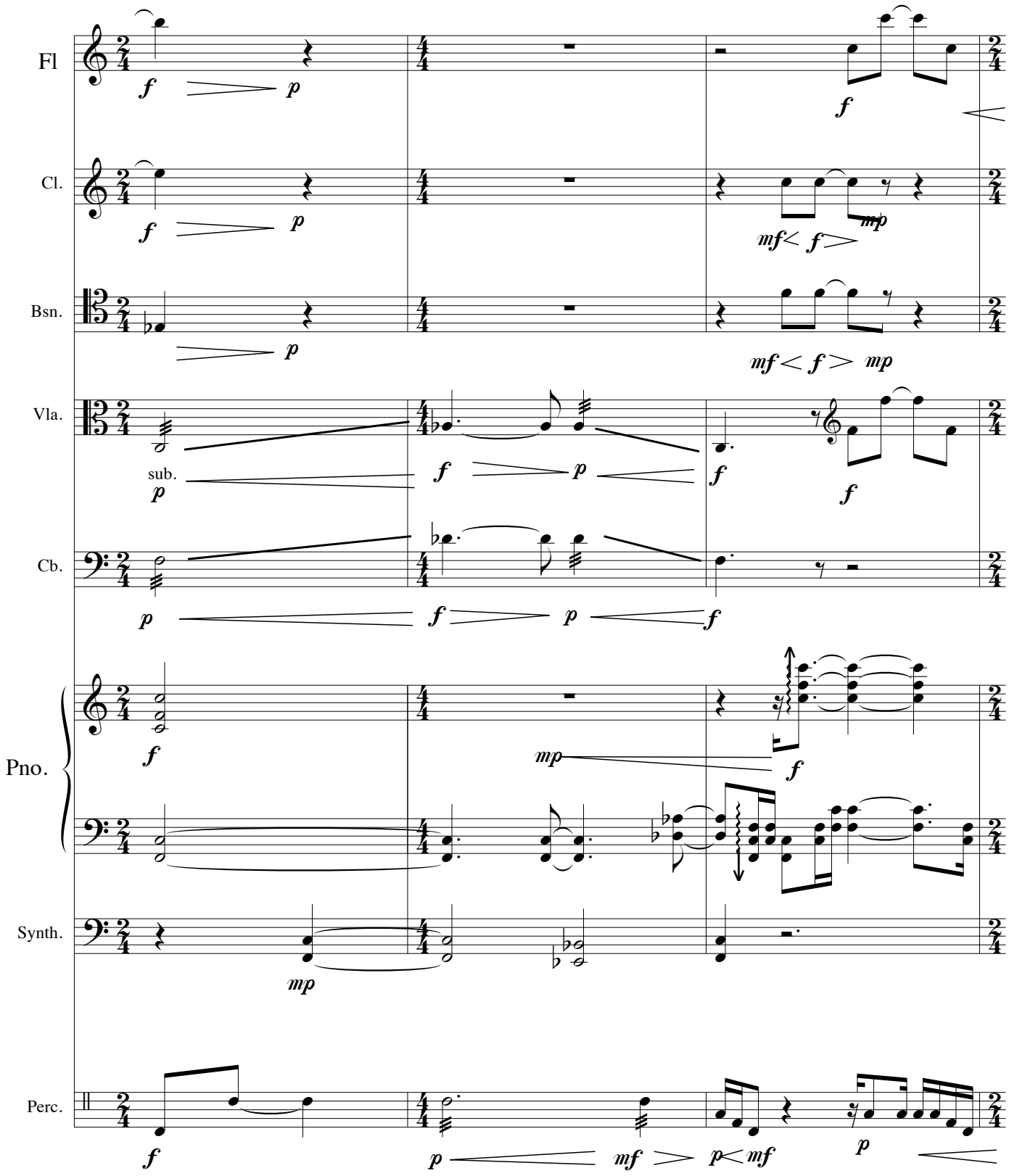

Fl
Cl.
Bsn.
Vla.
Cb.
Pno.
Perc.
(8va)
sub.
sub.

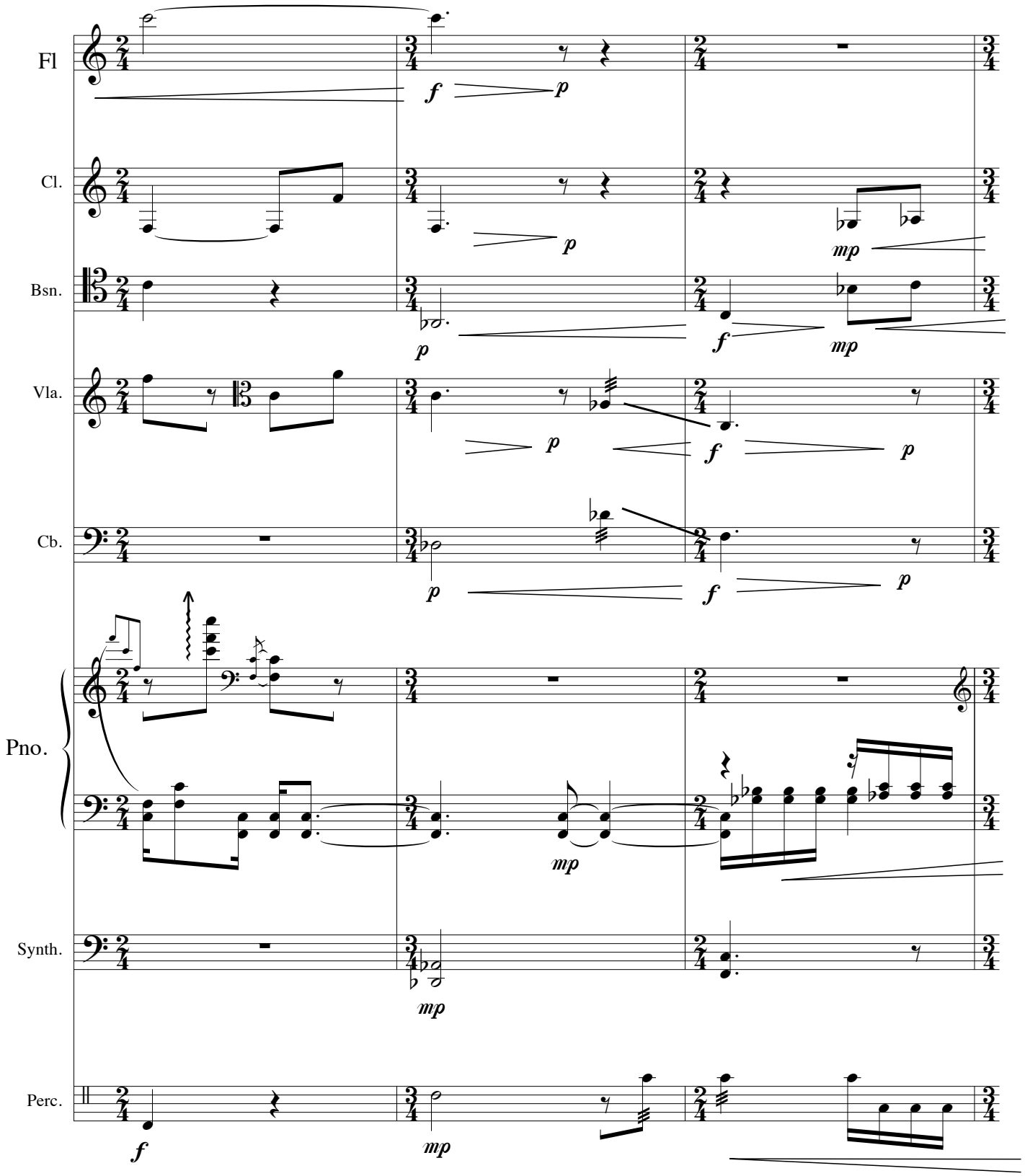

298
P
Fl
Cl.
Bsn.
Vla.
Cb.
Pno.
Synth.
Perc.
sub.
mp

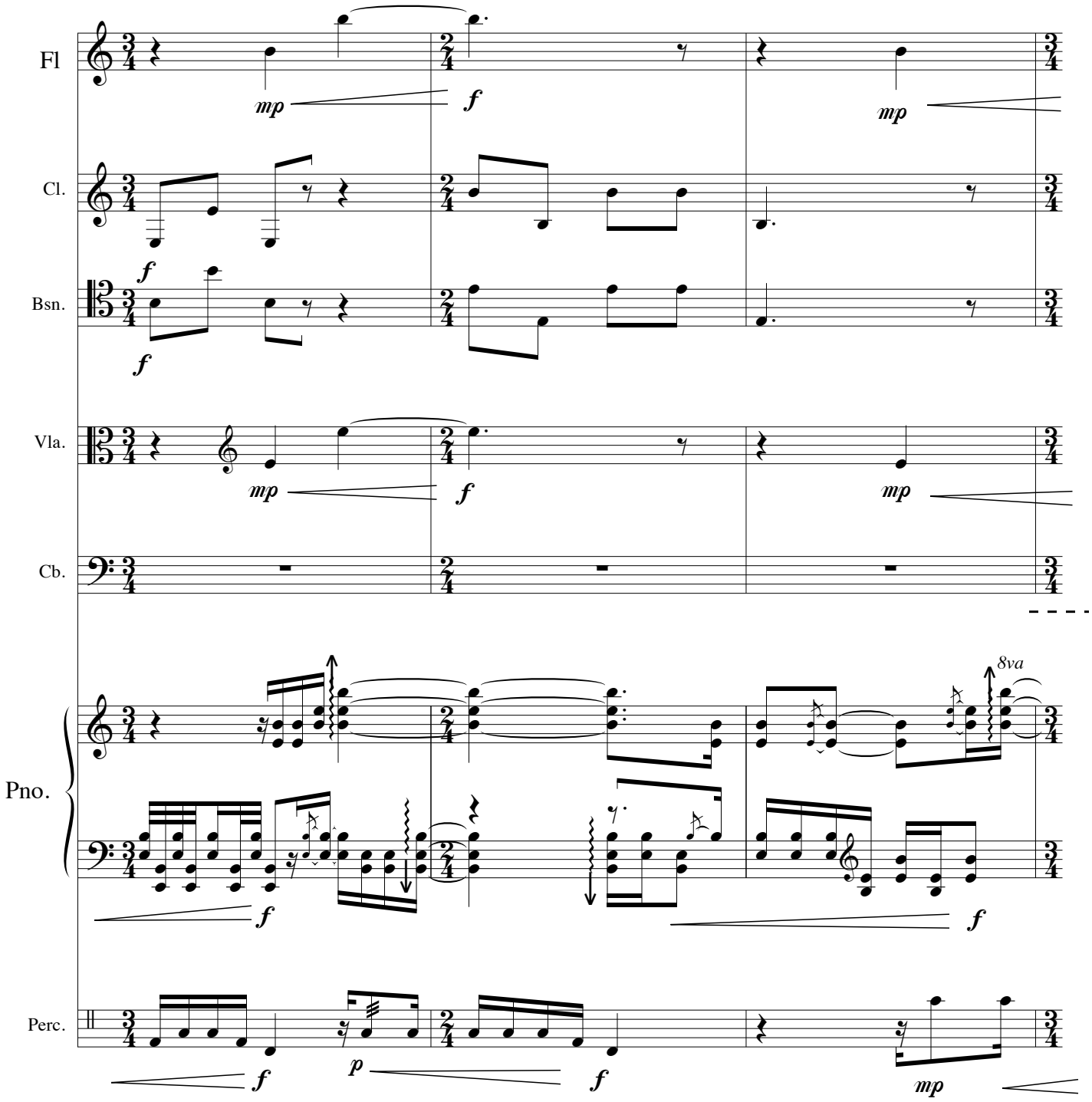

301
Fl
Cl.
Bsn.
Vla.
Cb.
Pno.
Synth.
Perc.

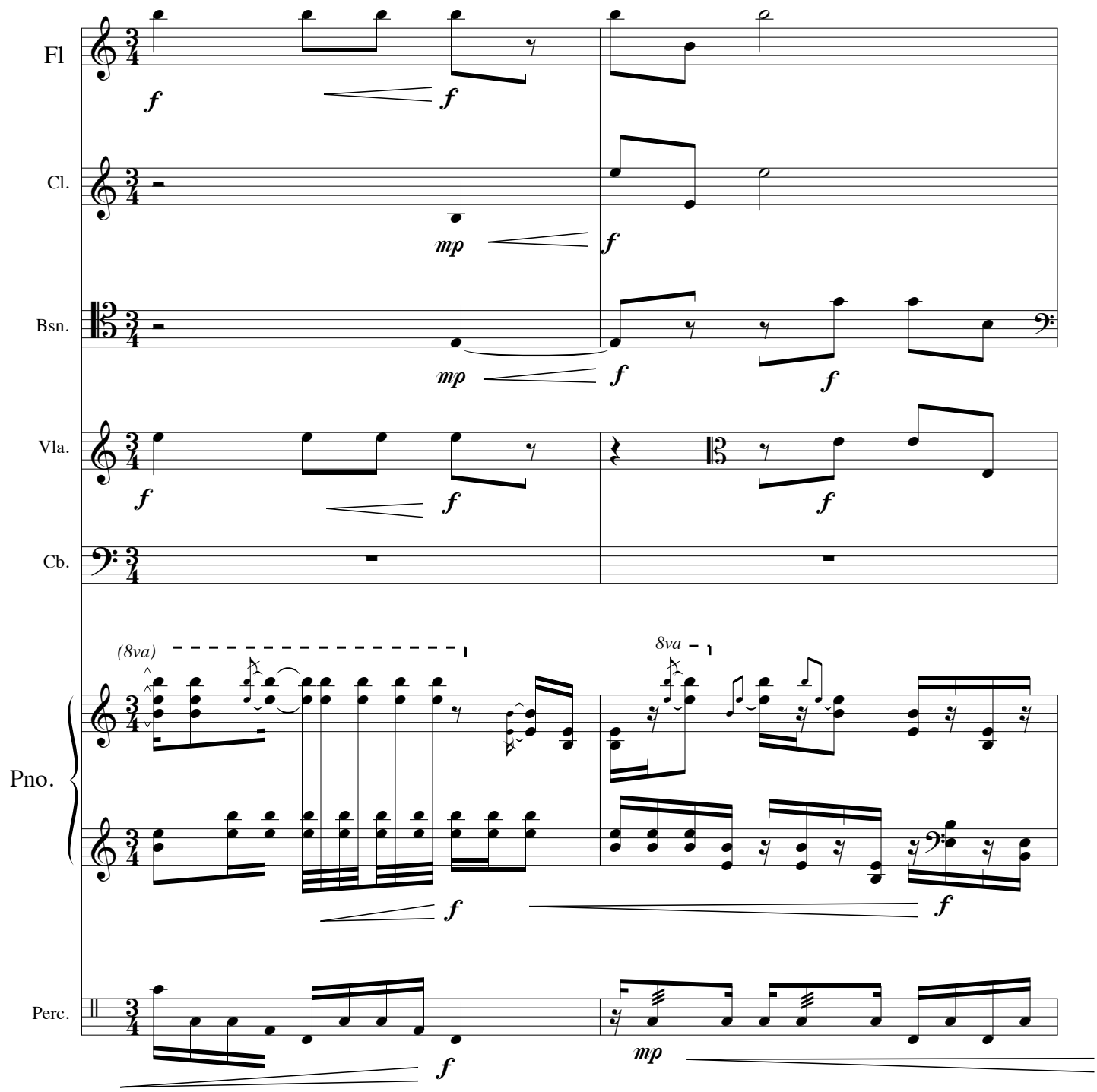

Fl
Cl.
Bsn.
Vla.
Cb.
Pno.
Perc.
mp
f
mp
f
f
mp
f
mp
8va
f
sub.
mp
f
f
p
f
mp

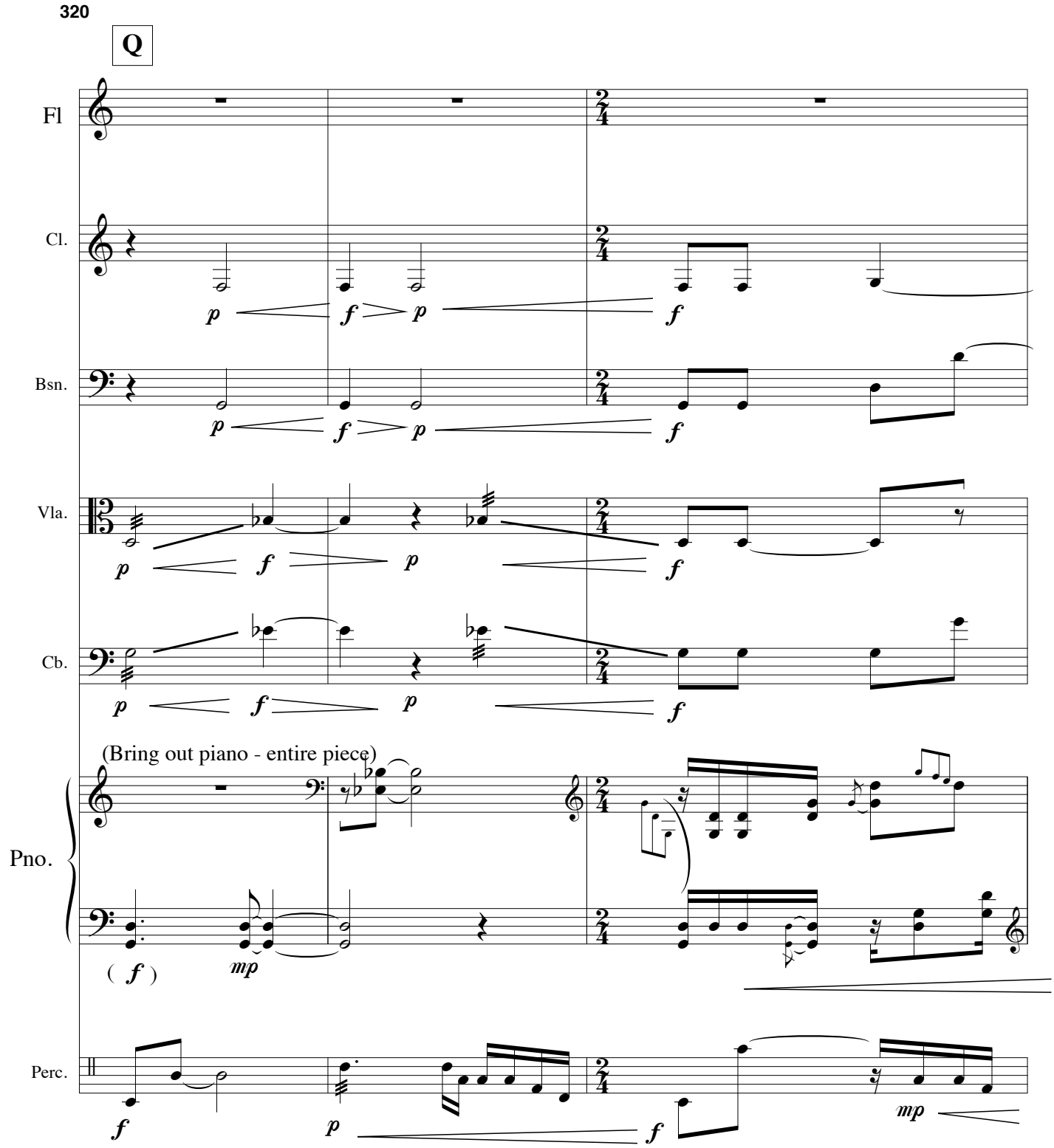

Fl
Cl.
Bsn.
Vla.
Cb.
Pno.
Perc.
sub.
(8va)
8va

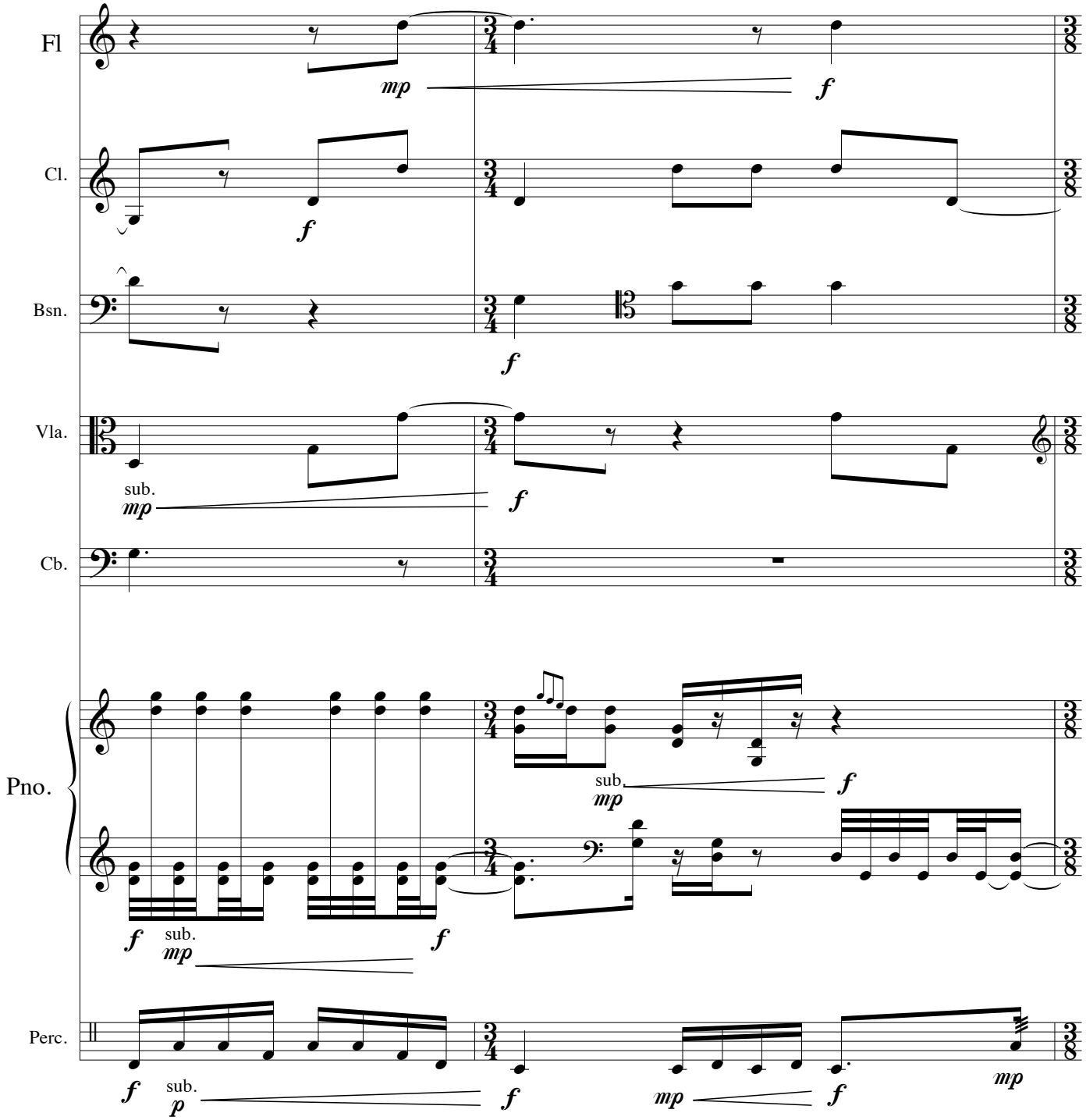

Fl
Cl.
Bsn.
Vla.
sub.
Cb.
Pno.
Synth.
Perc.

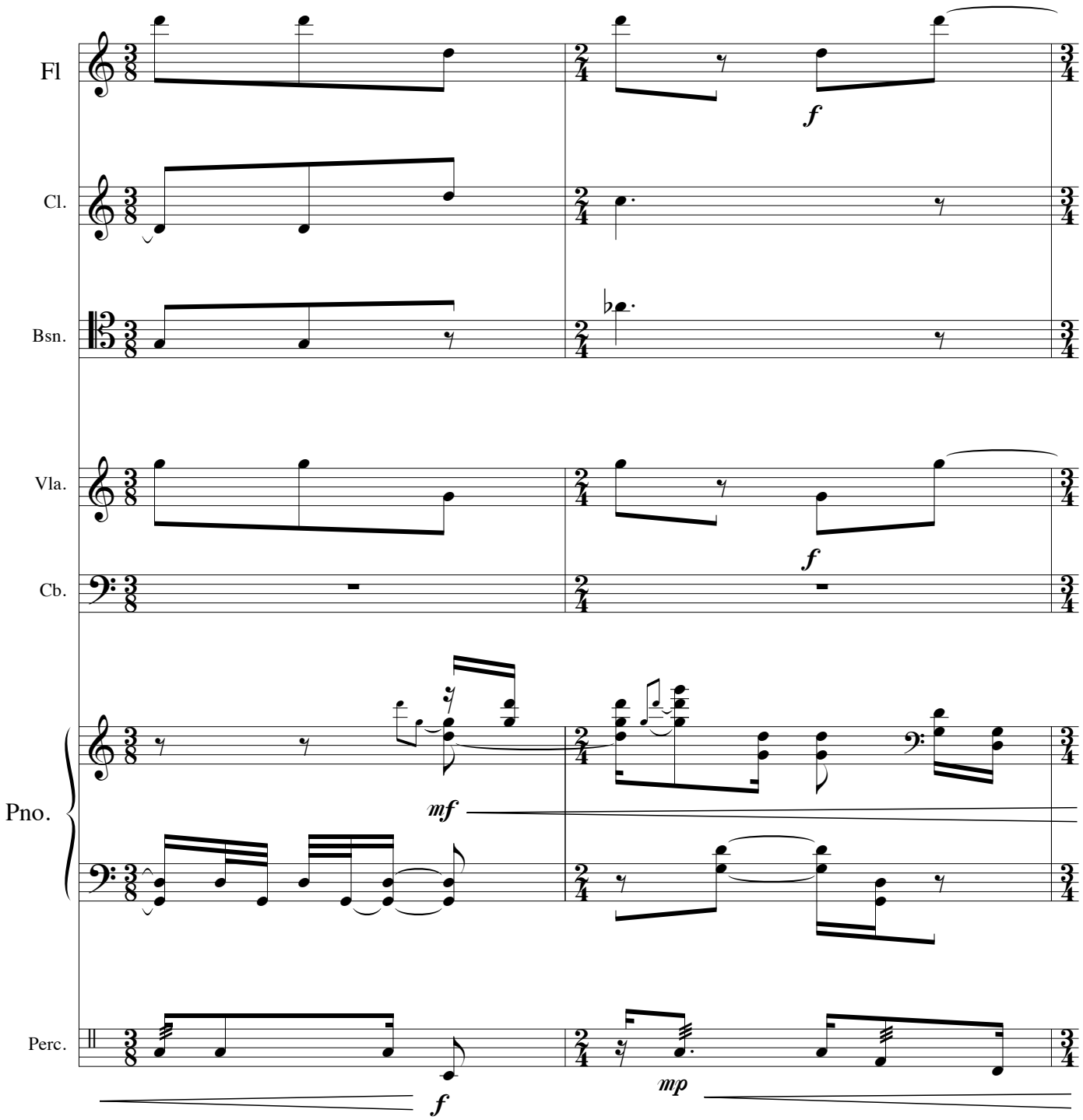

Fl
Cl.
Bsn.
Vla.
Cb.
Pno.
Synth.
Perc.

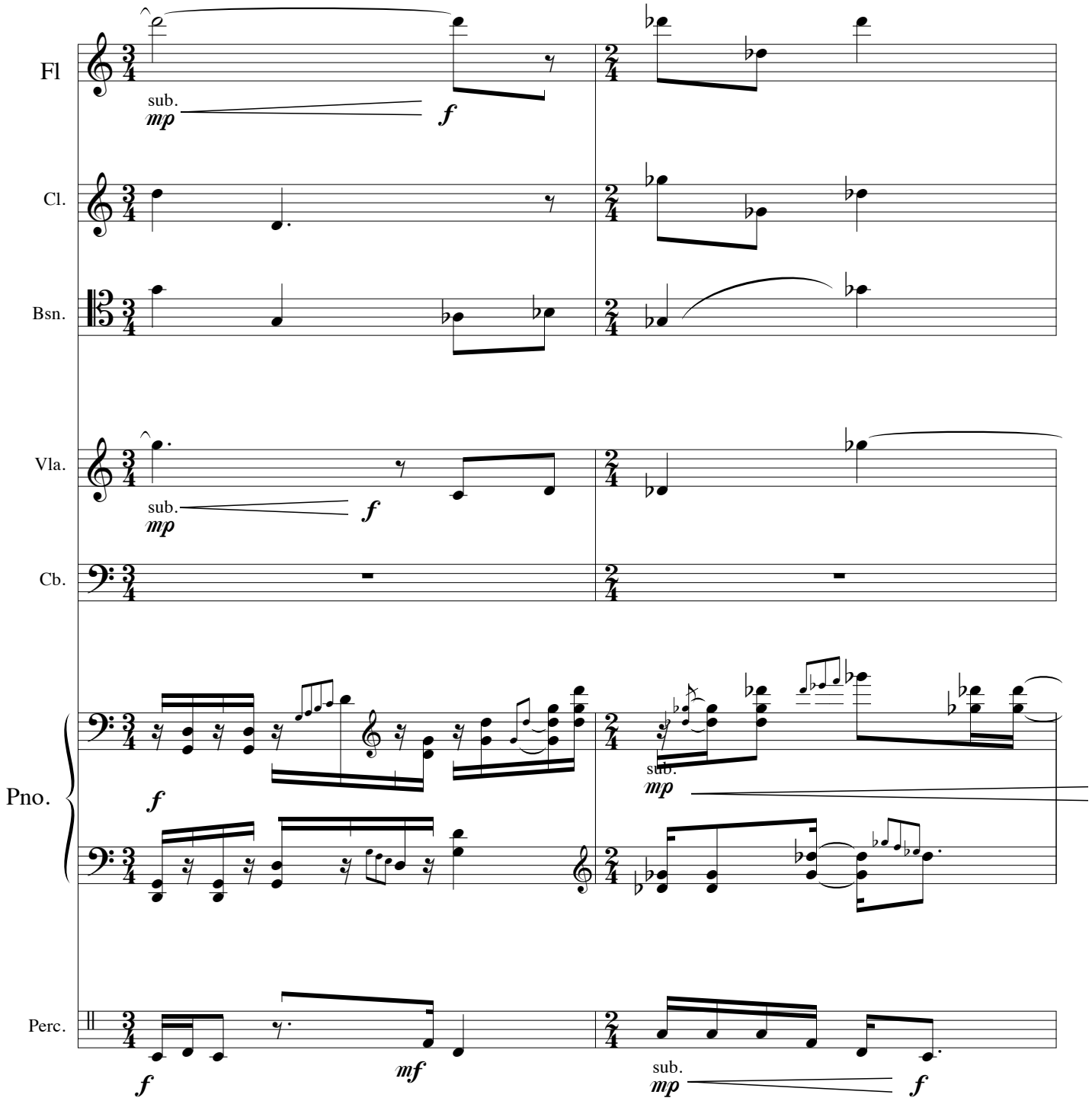

Fl
Cl.
Bsn.
Vla.
Cb.
Pno.
Perc.
8va

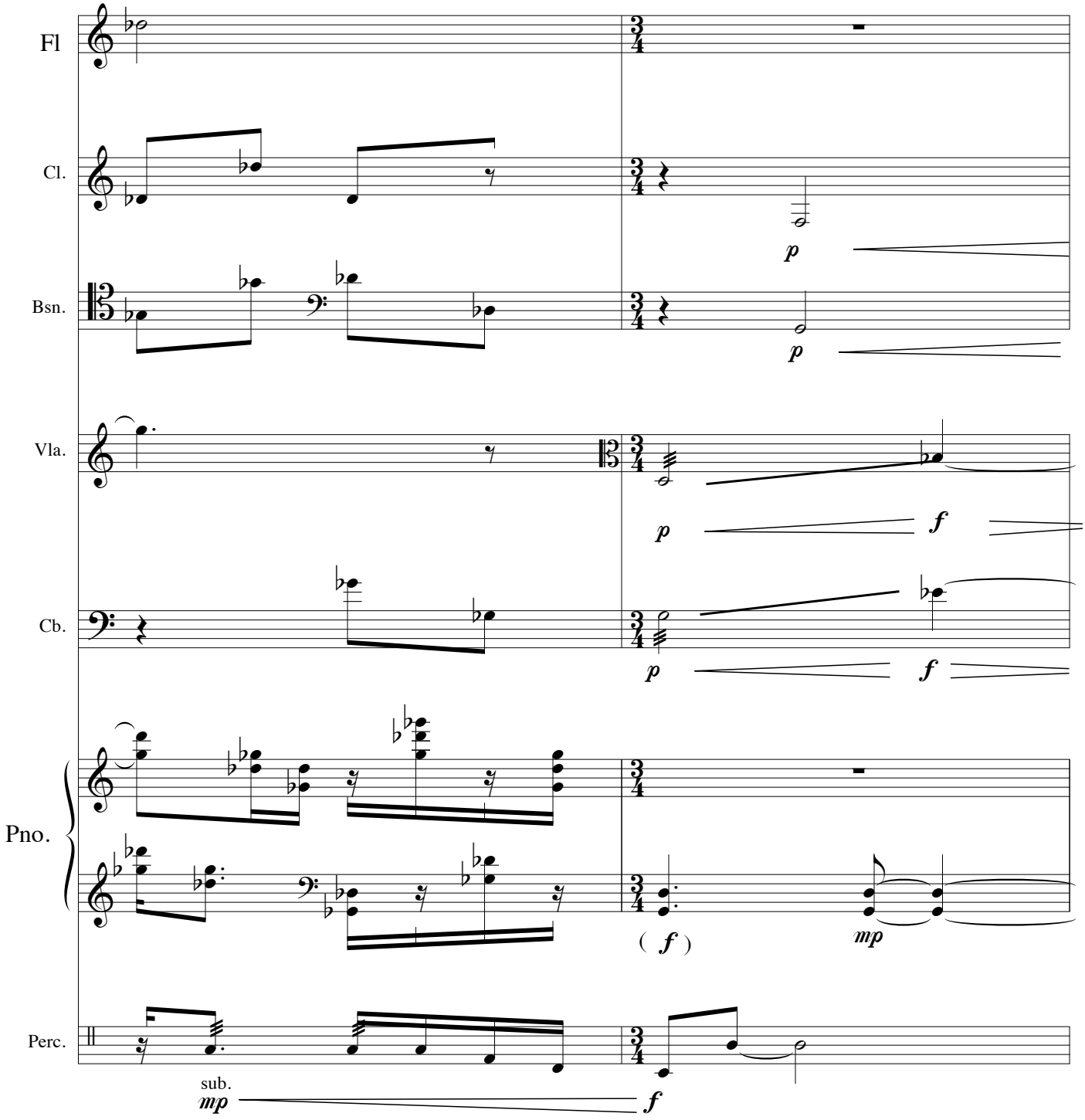

Fl
Cl.
Bsn.
Vla.
Cb.
Pno.
Perc.
(8va)
8va
f
mp

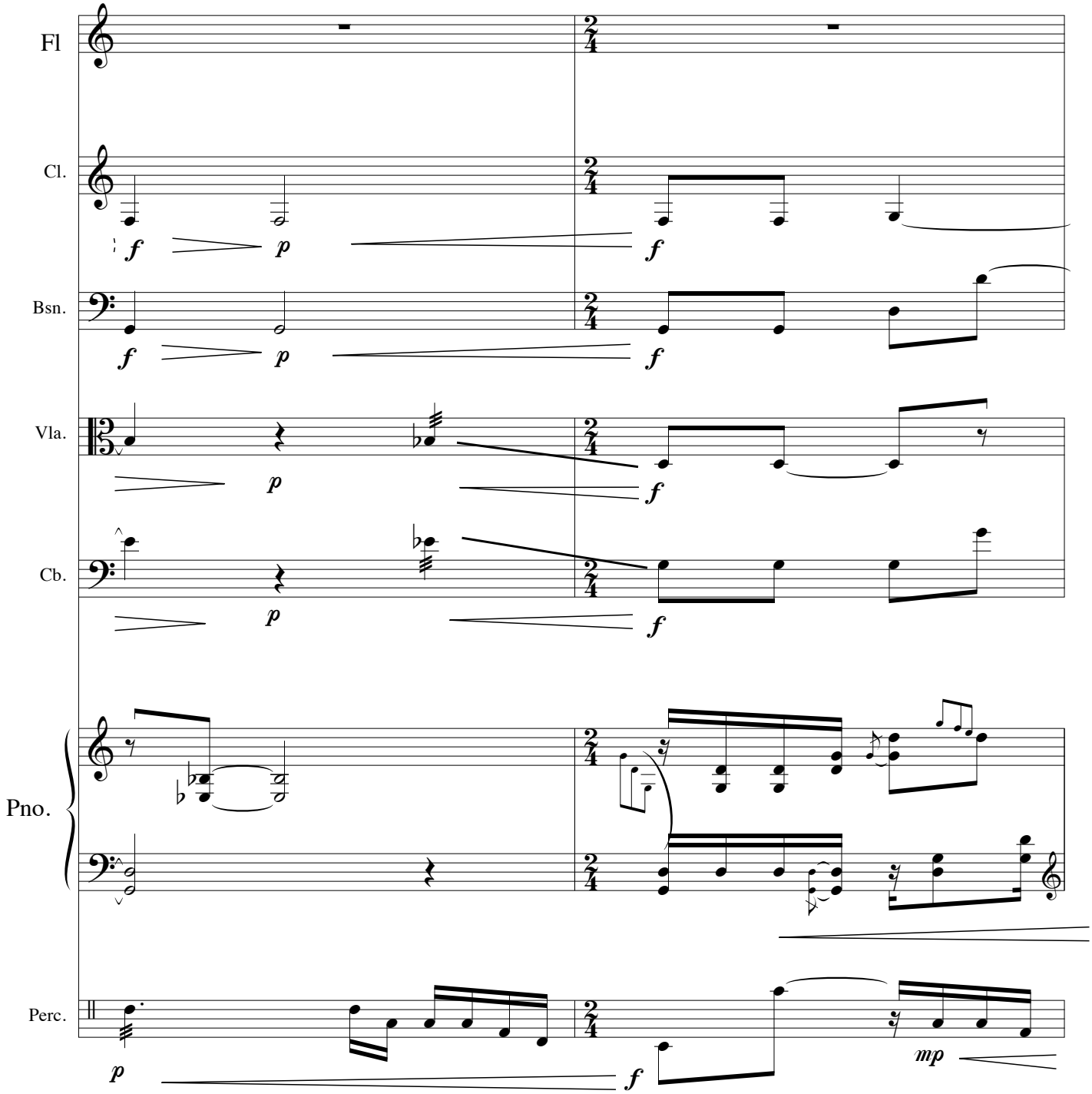

320
Q
Fl
Cl.
Bsn.
Vla.
Cb.
(Bring out piano - entire piece)
Pno.
Perc.

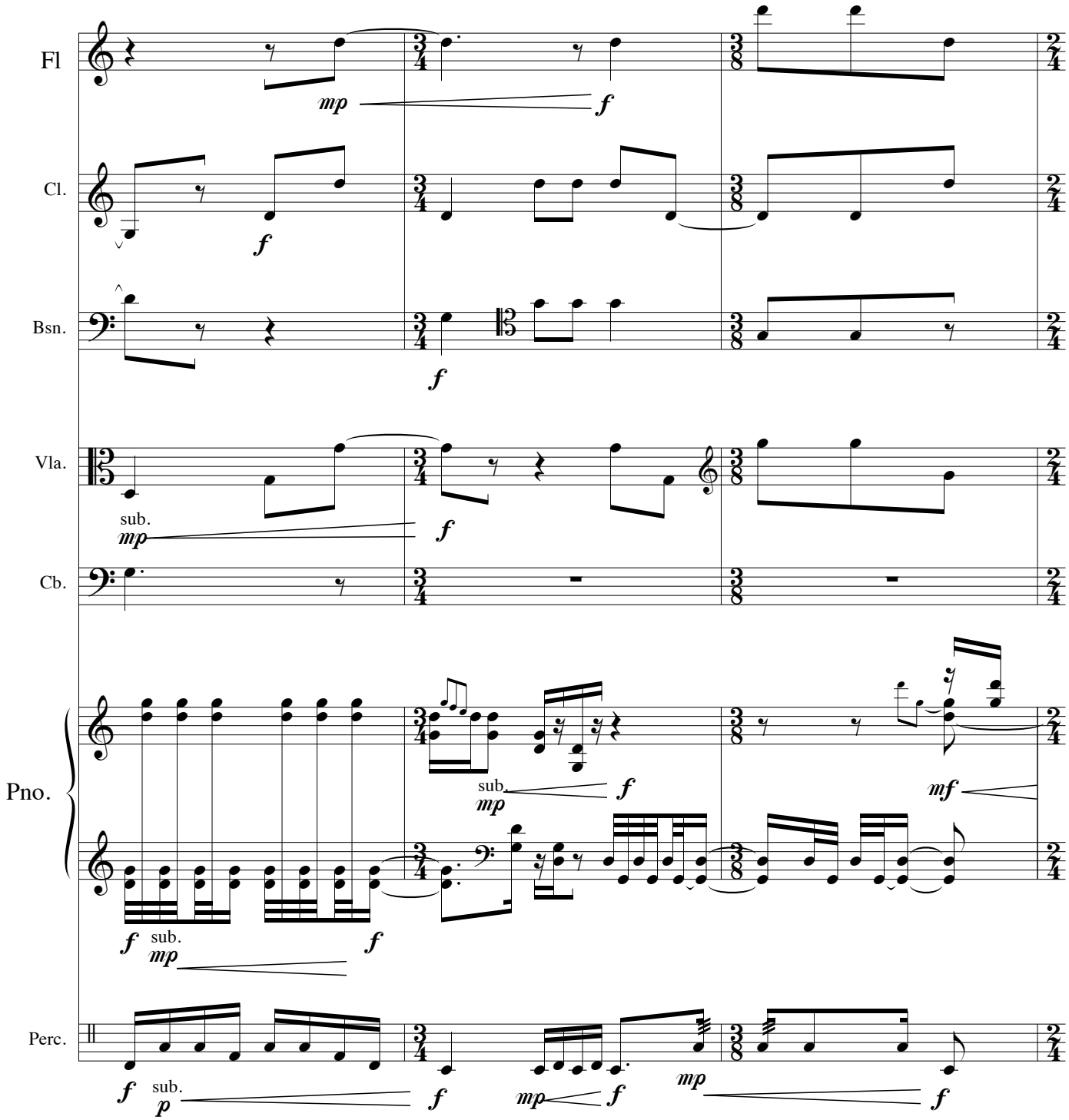

Fl
Cl.
Bsn.
Vla.
Cb.
Pno.
Perc.
mp
f
sub.
mp
f
sub.
mp
f
f
sub.
mp
f
sub.
p
f
mp
f
mp

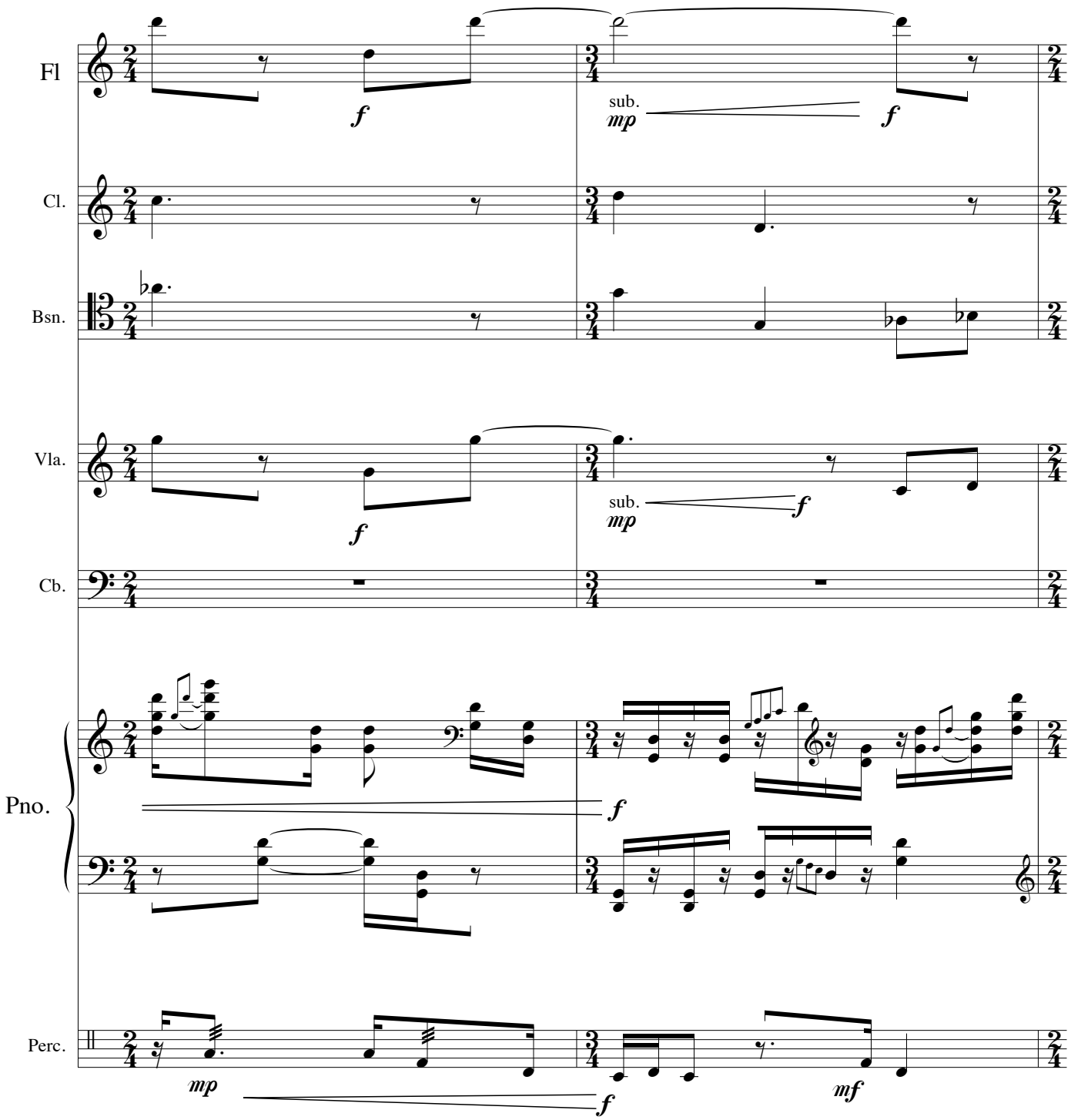

Fl
Cl.
Bsn.
Vla.
Cb.
Pno.
Perc.
f
mf
mp


Fl
Cl.
Bsn.
Vla.
Cb.
Pno.
Perc.
sub.
mp
f
mf

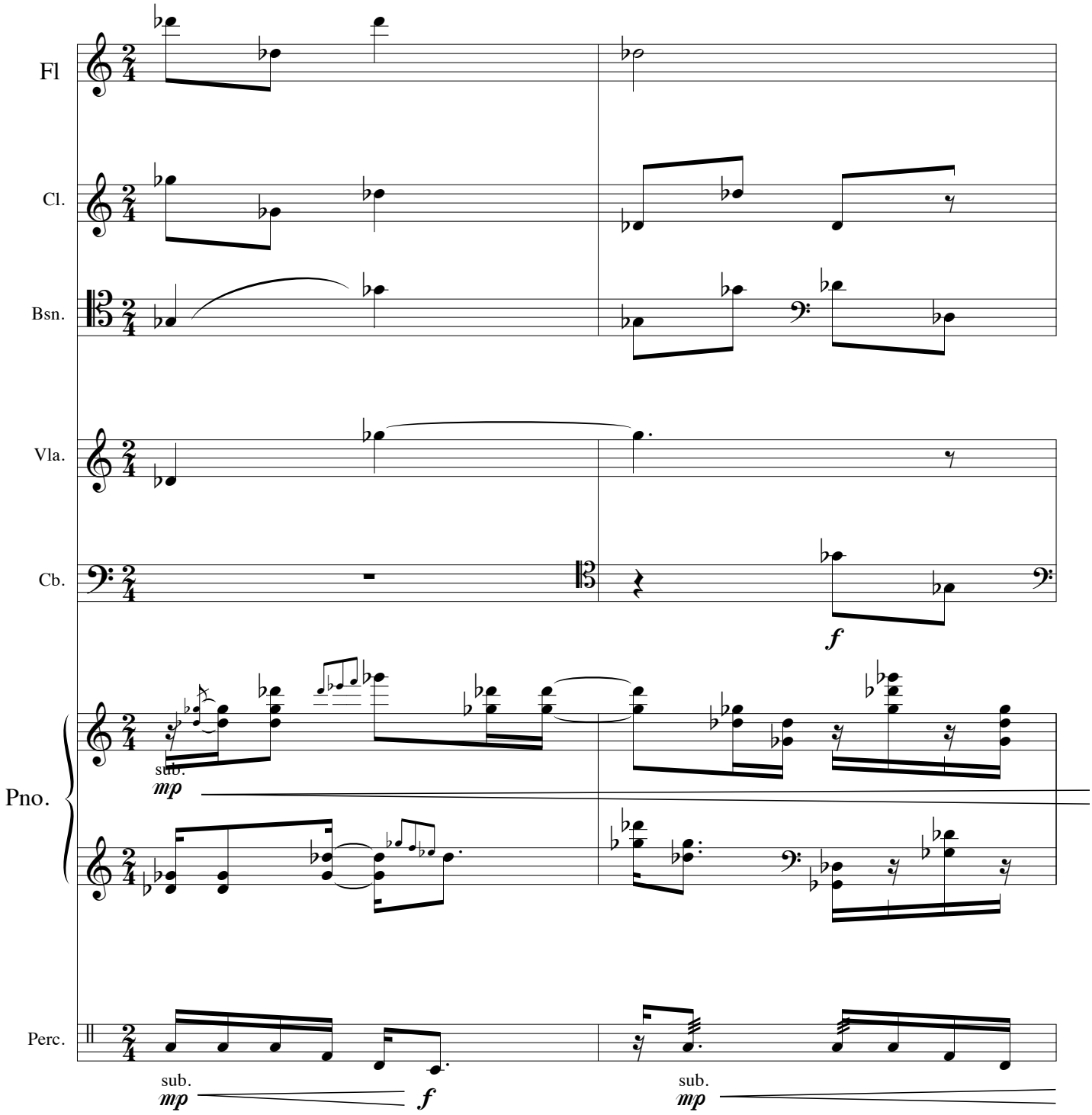

Fl
Cl.
Bsn.
Vla.
Cb.
Pno.
Perc.
p
p
p
f
p
f
(f)
mp
sub.
mp
f

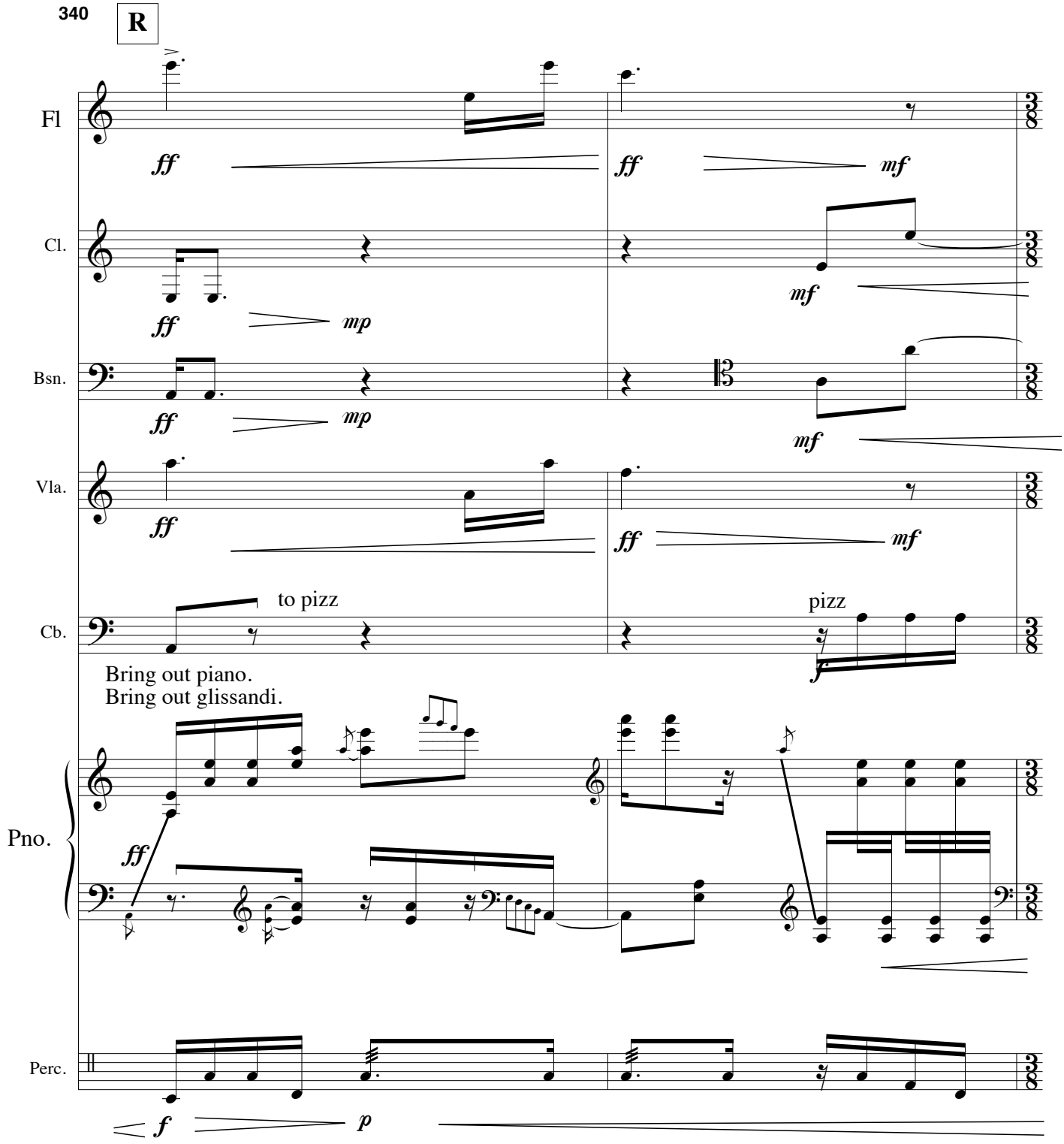

Fl
Cl.
Bsn.
Vla.
Cb.
Pno.
Perc.
f
p
f
f
p
f
p
f
p
f
mp


Fl
Cl.
Bsn.
Vla.
Cb.
Pno.
Perc.
mp
f
sub.
mf
p

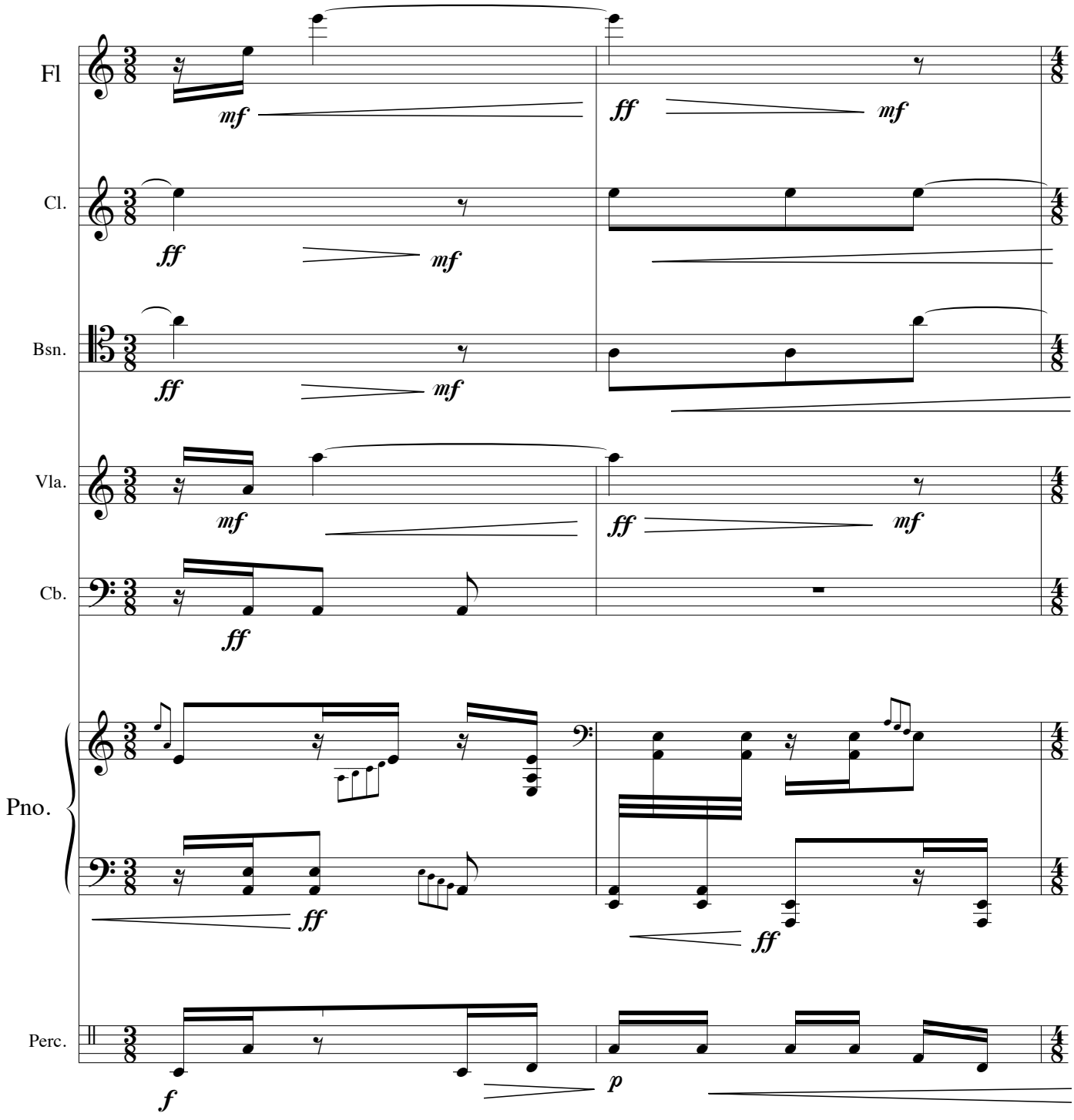

Fl
Cl.
Bsn.
Vla.
Cb.
Pno.
Perc.
sub.
mp
f
sub.
mp
f
f
mp
f
mf

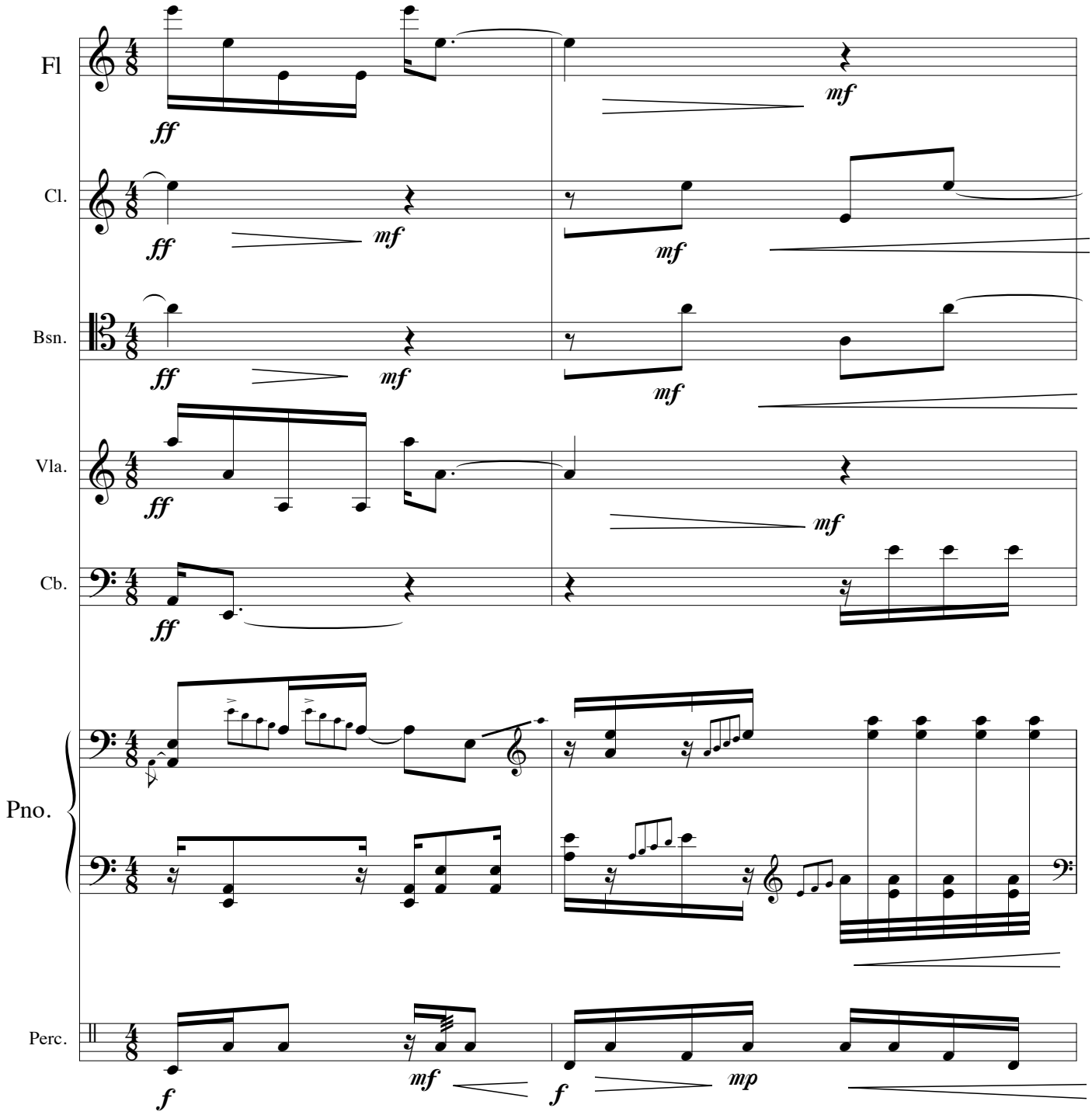
338



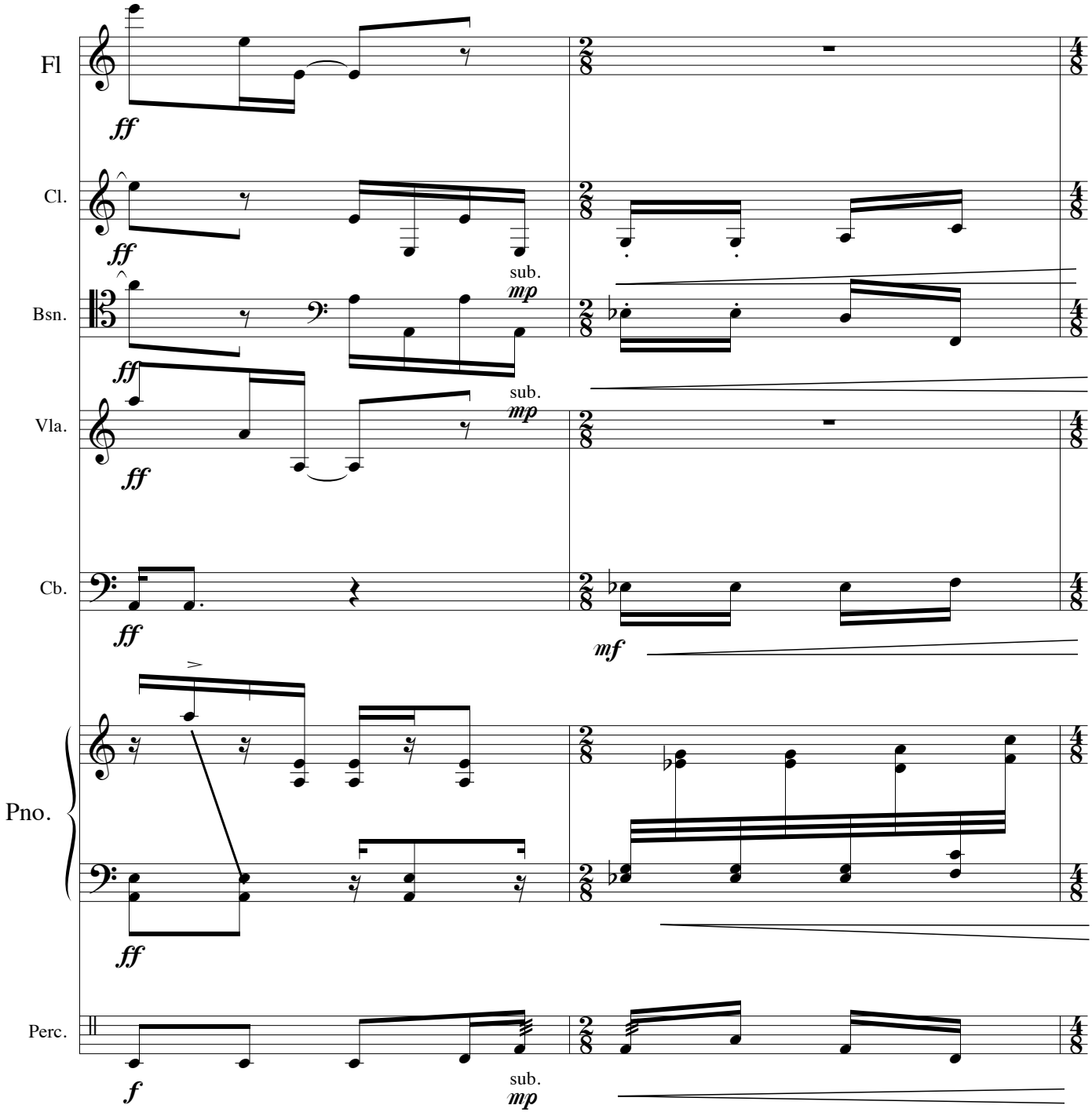

340
R
Fl
Cl.
Bsn.
Vla.
Cb.
Pno.
Perc.
ff
mf
mp
f
p
to pizz
pizz
Bring out piano.
Bring out glissandi.

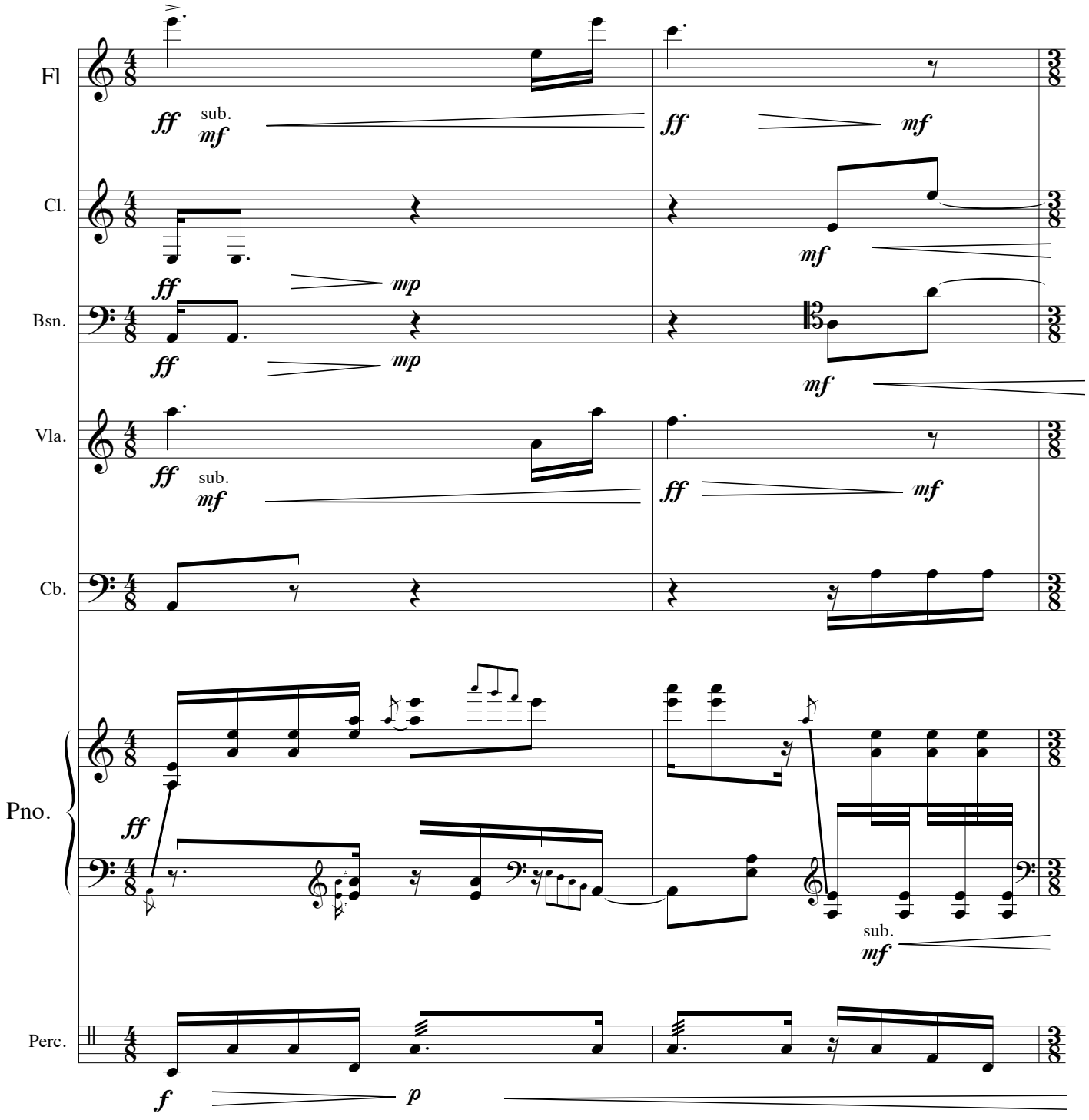
342

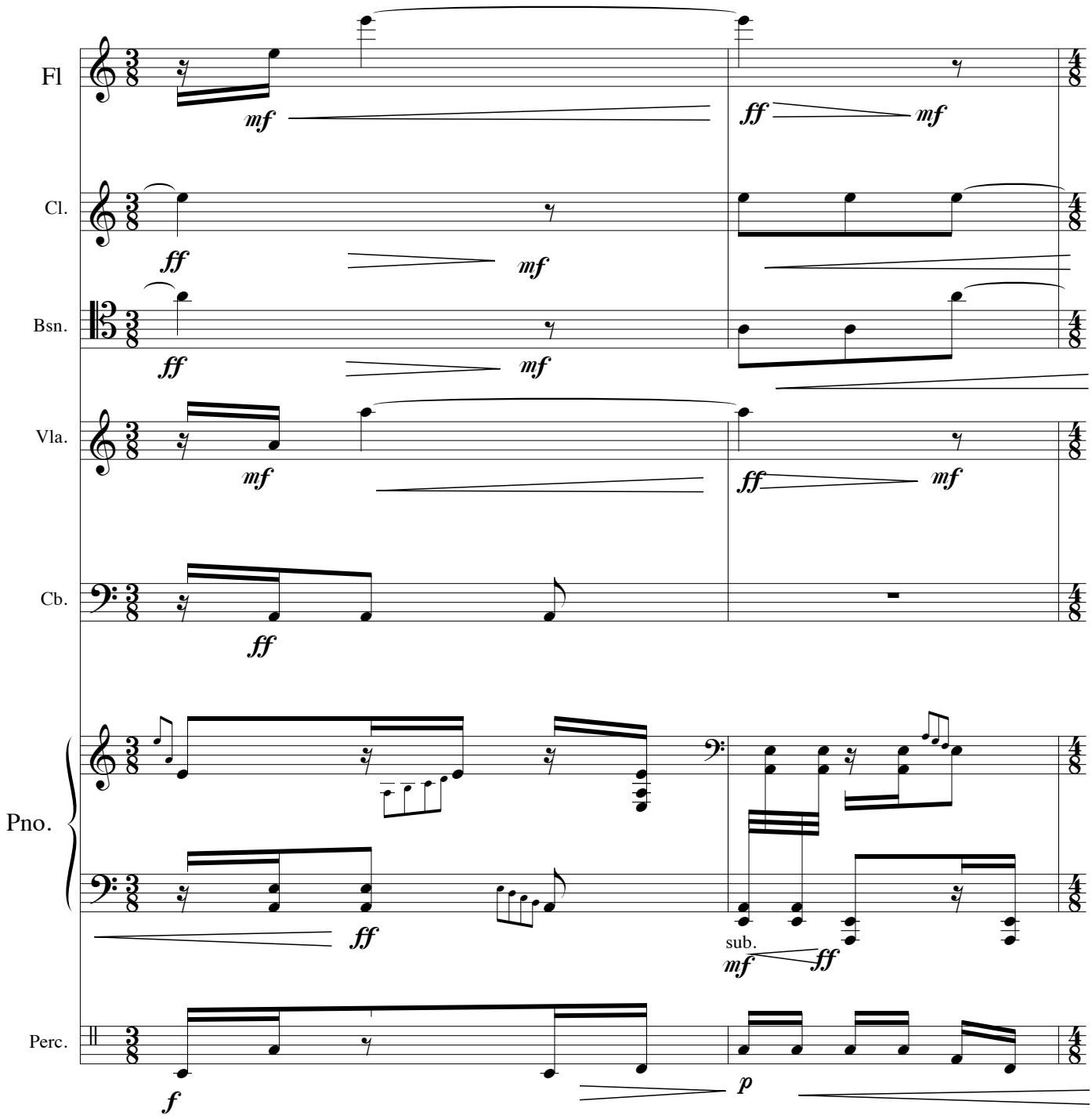


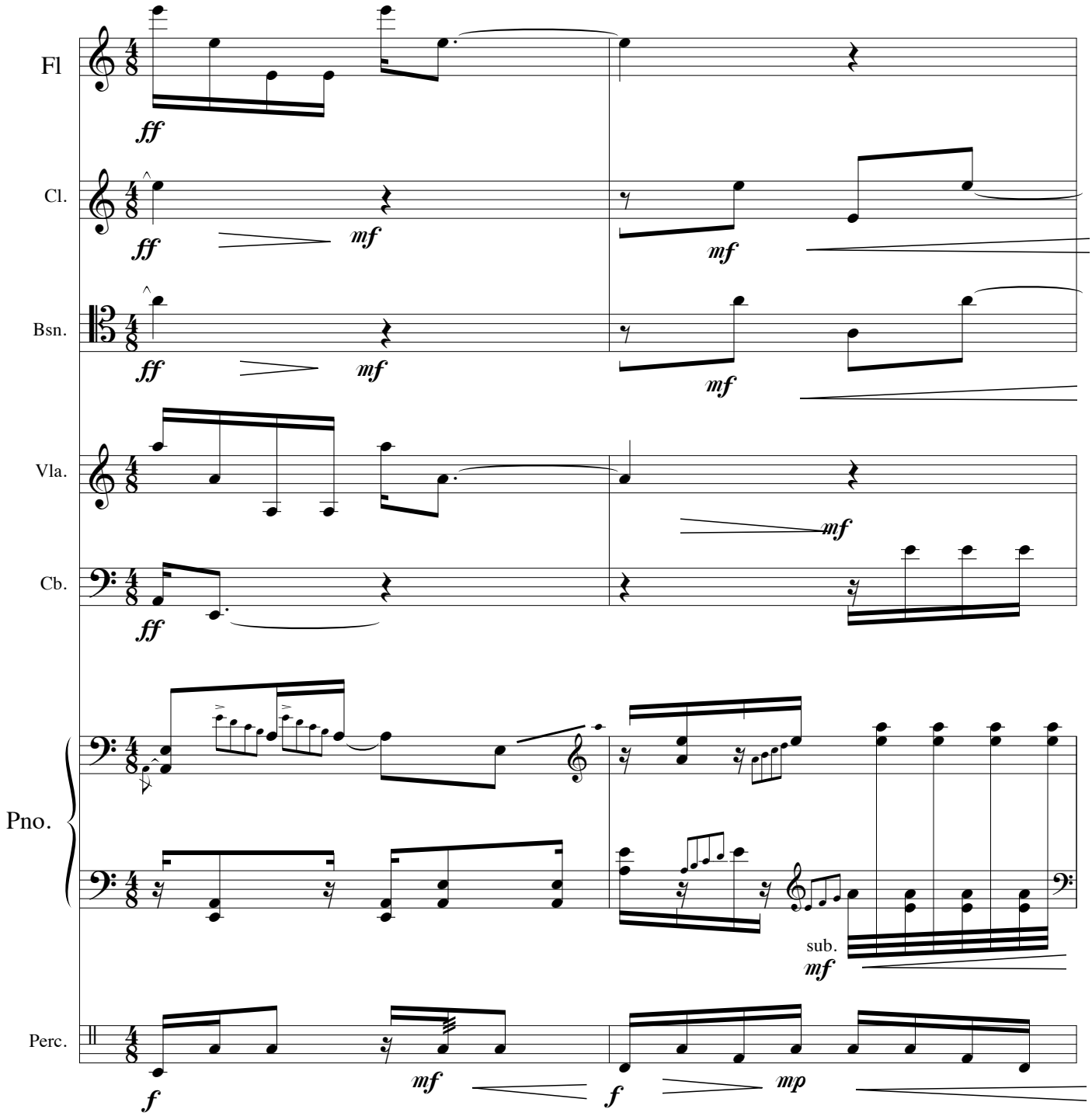

Fl
Cl.
Bsn.
Vla.
Cb.
Pno.
Perc.
ff
mf
f
mp

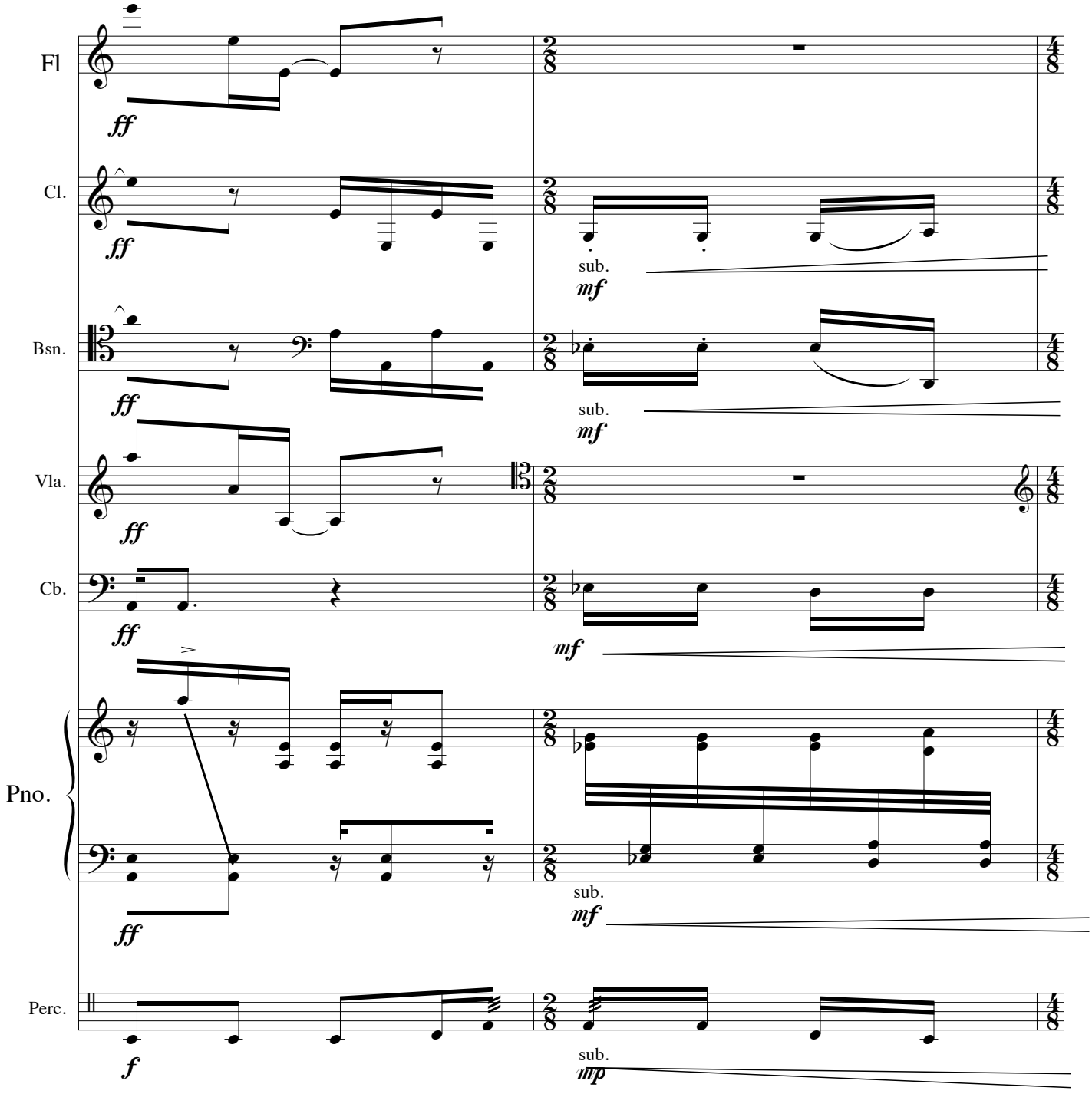
346

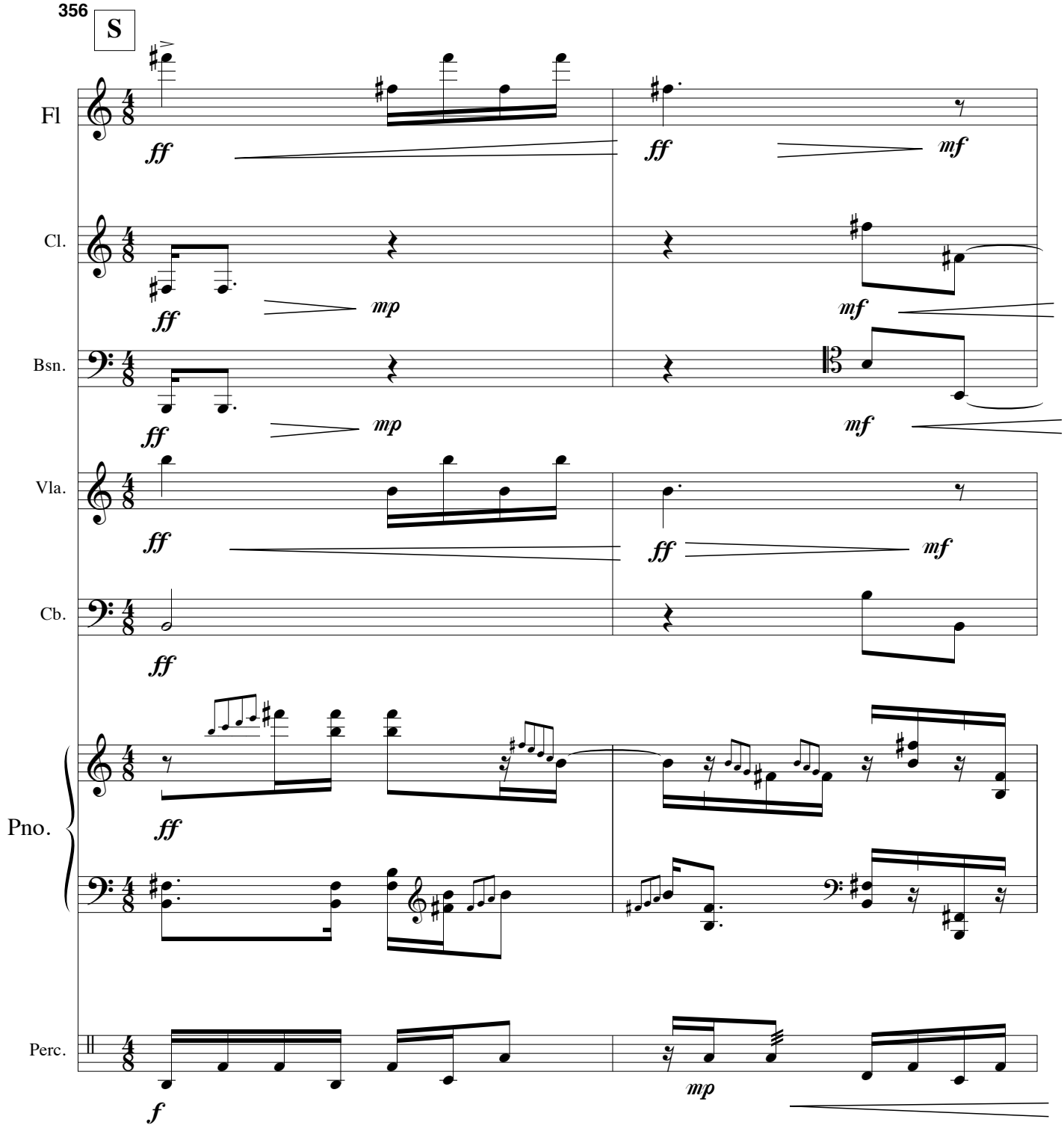


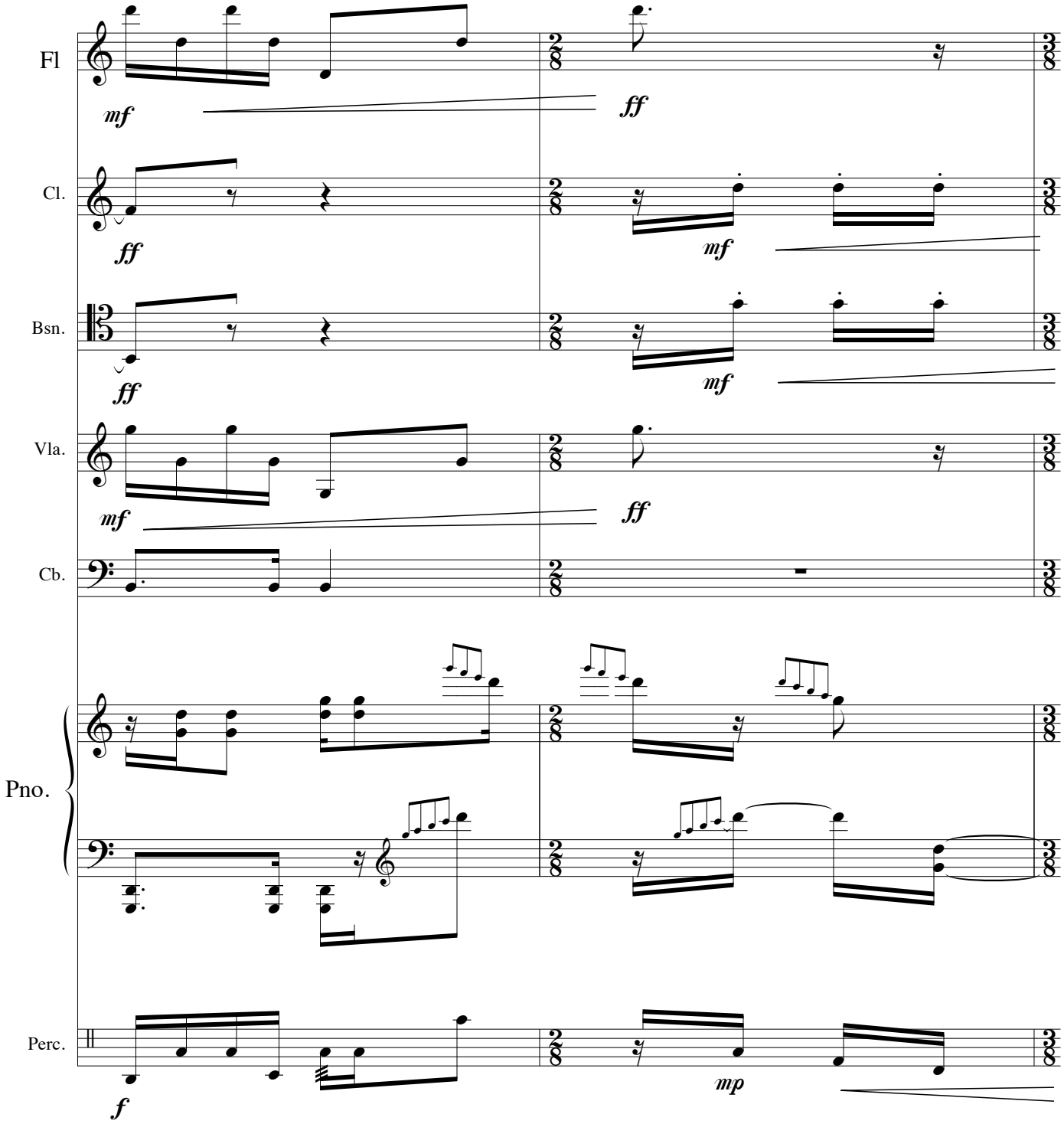

Fl
Cl.
Bsn.
Vla.
Cb.
Pno.
Perc.
ff
sub.
mf
mp
f
p

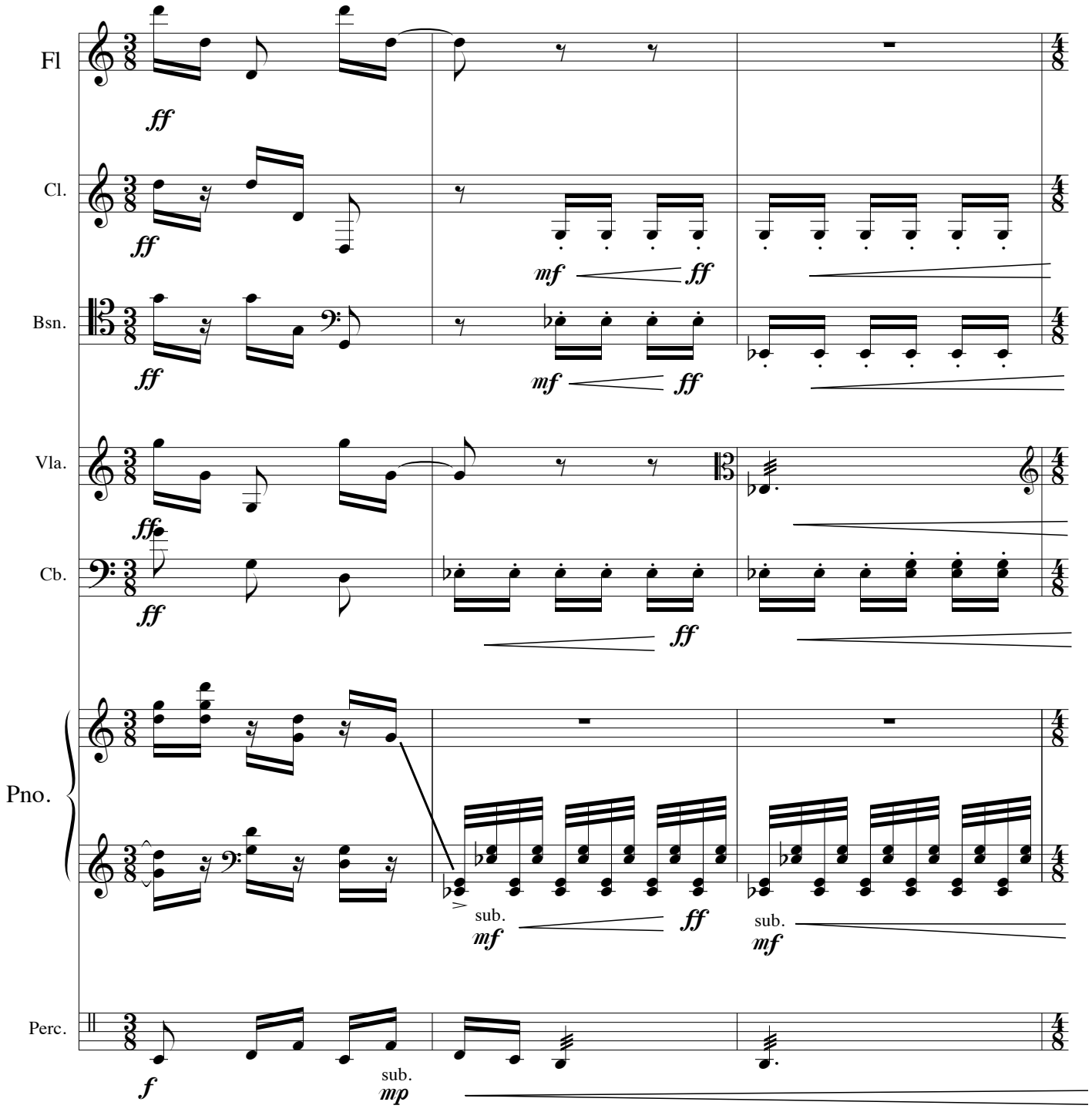

350
Fl
Cl.
Bsn.
Vla.
Cb.
Pno.
Perc.
mf
ff
mf
ff
mf
ff
mf
ff
mf
ff
mf
ff
sub.
mf
ff
f
p

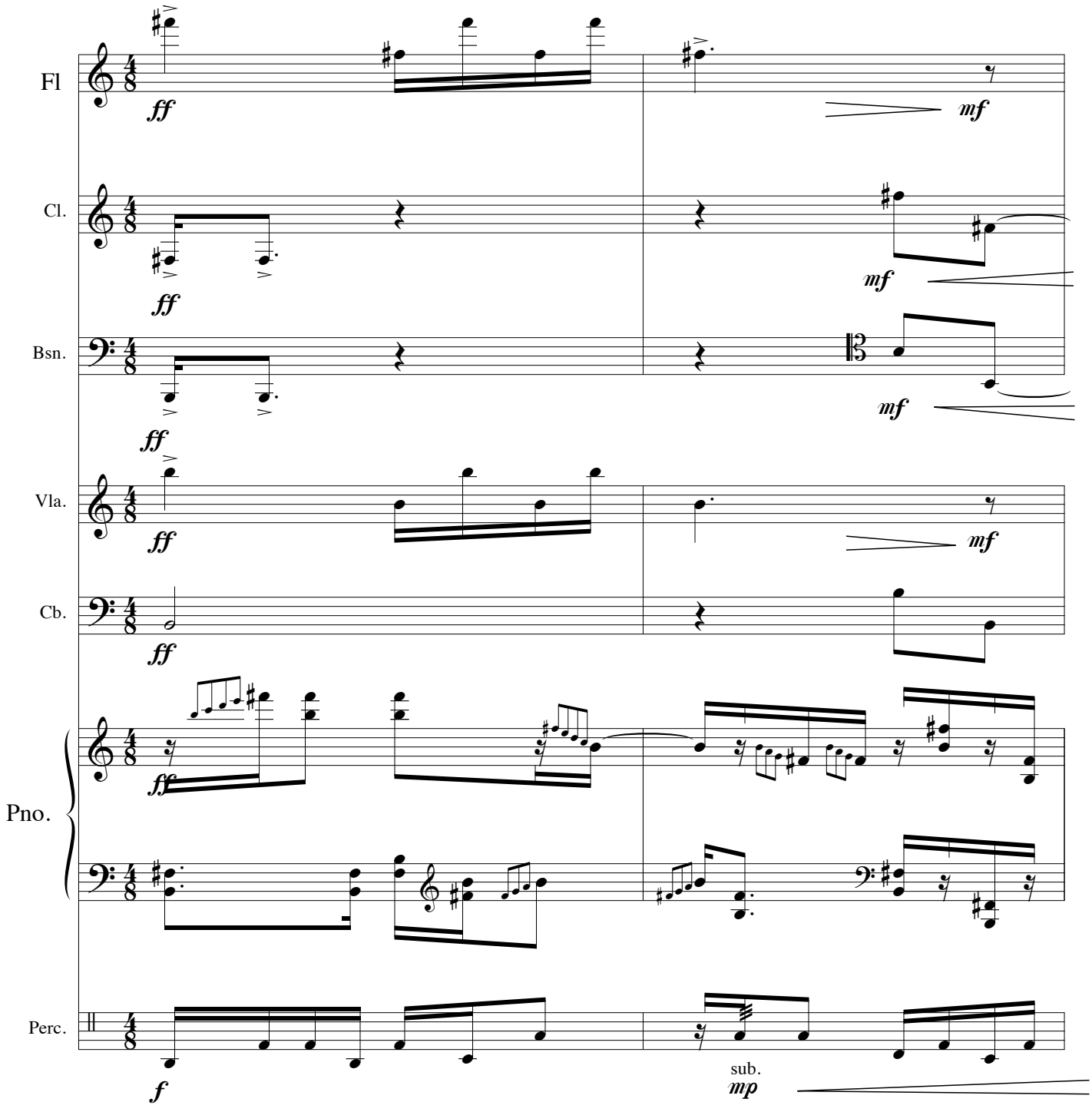

Fl
Cl.
Bsn.
Vla.
Cb.
Pno.
Perc.
ff
mf
sub.
f
mp


Fl
Cl.
Bsn.
Vla.
Cb.
Pno.
Perc.
ff
sub.
mf
mp

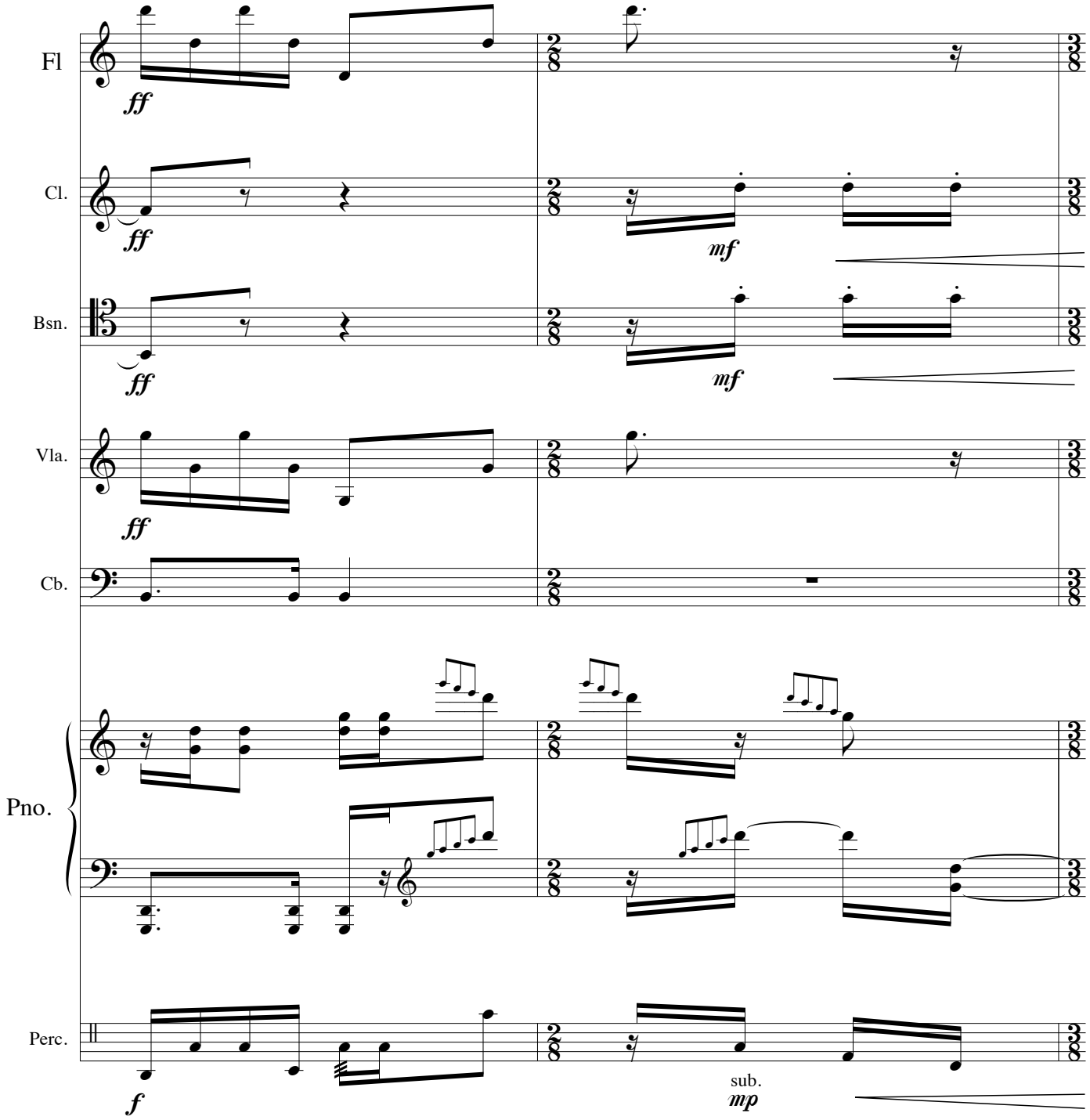

356
S
Fl
Cl.
Bsn.
Vla.
Cb.
Pno.
Perc.
ff
mp
mf
f

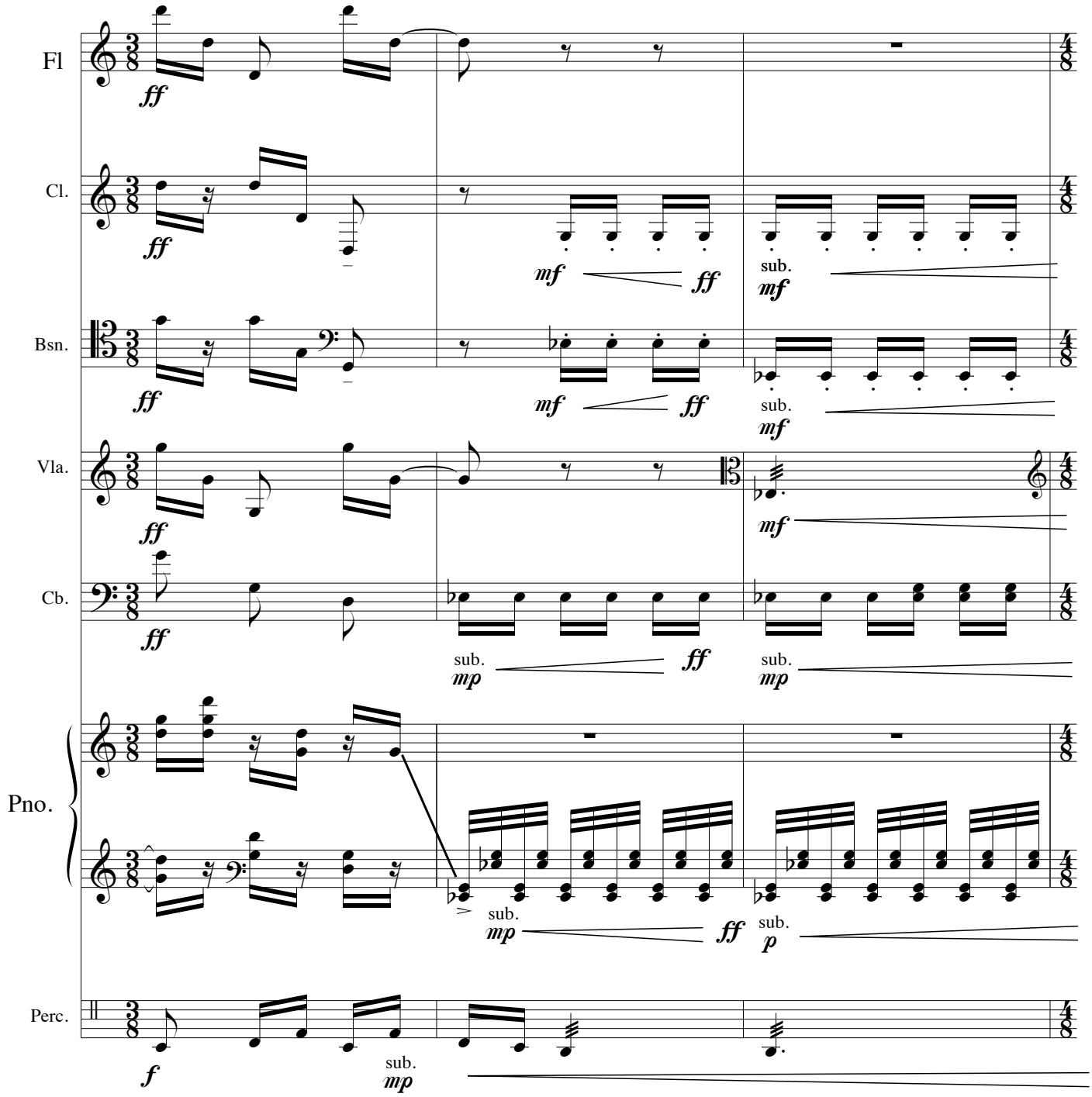

Fl
mf
ff
Cl.
ff
mf
Bsn.
ff
mf
Vla.
mf
ff
Cb.
Pno.
Perc.
f
mp

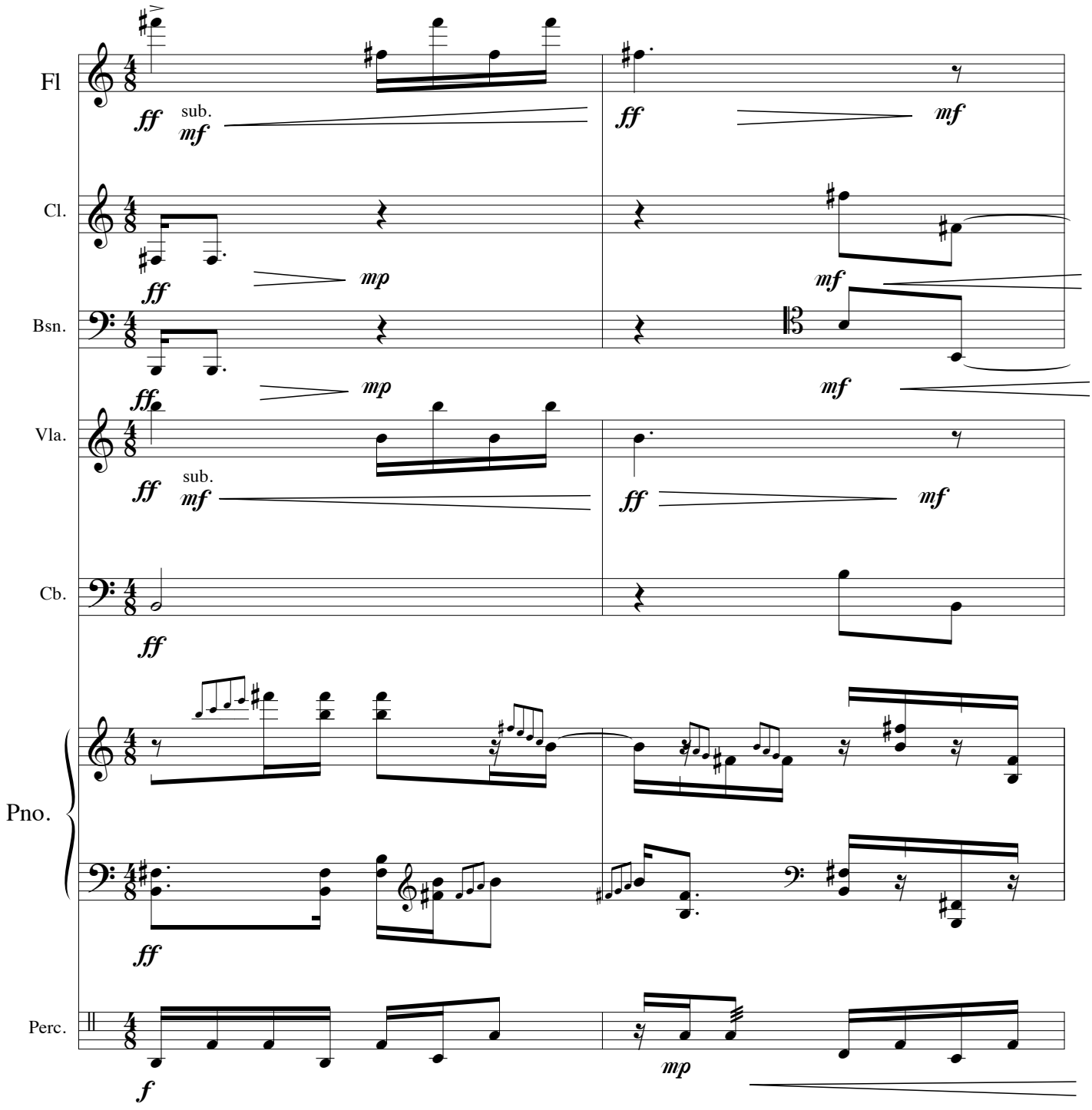

Fl
Cl.
Bsn.
Vla.
Cb.
Pno.
Perc.
ff
mf
sub.
mp

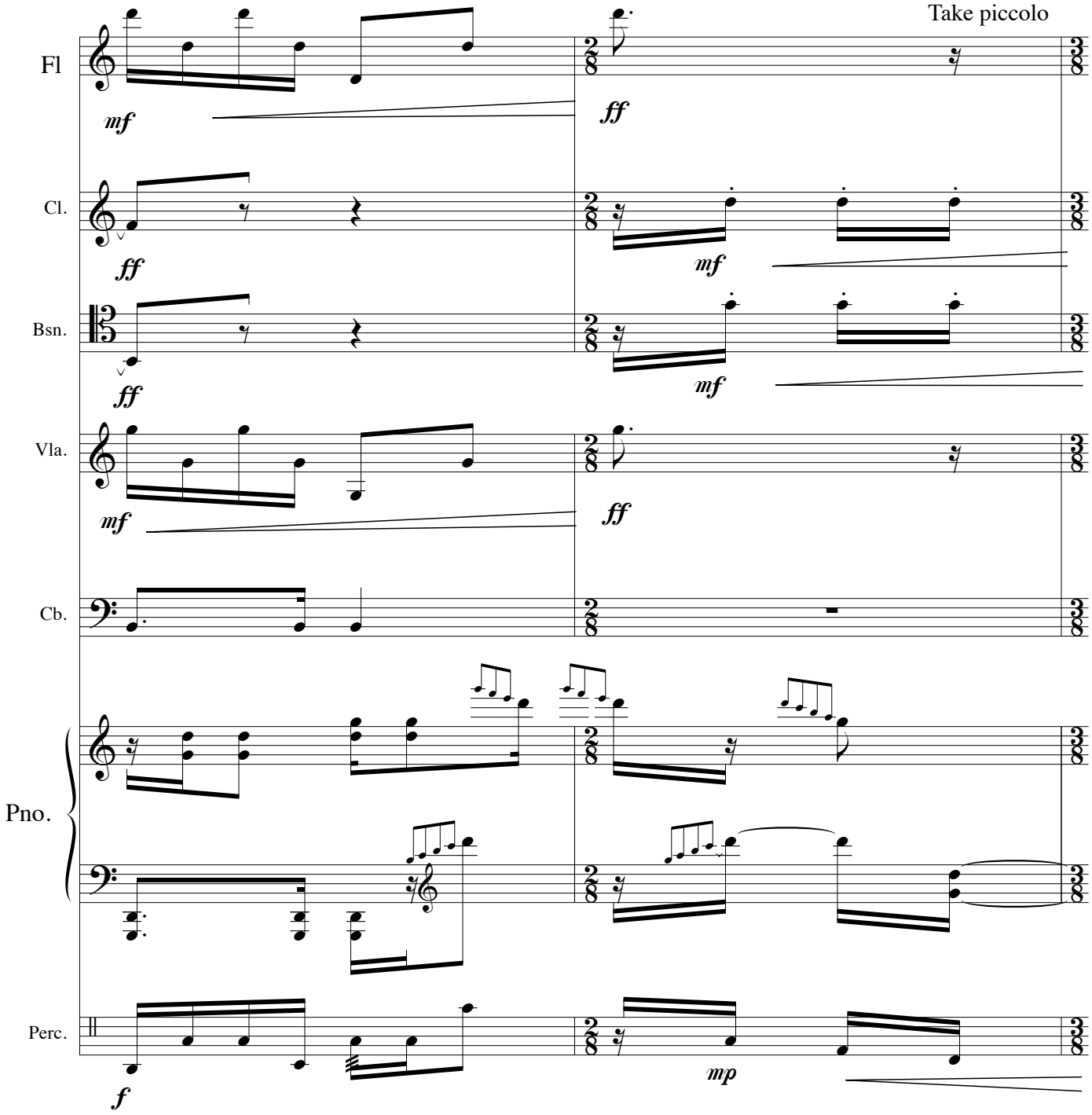

Fl
Cl.
Bsn.
Vla.
Cb.
Pno.
Perc.
ff
mf
sub.
mp
f

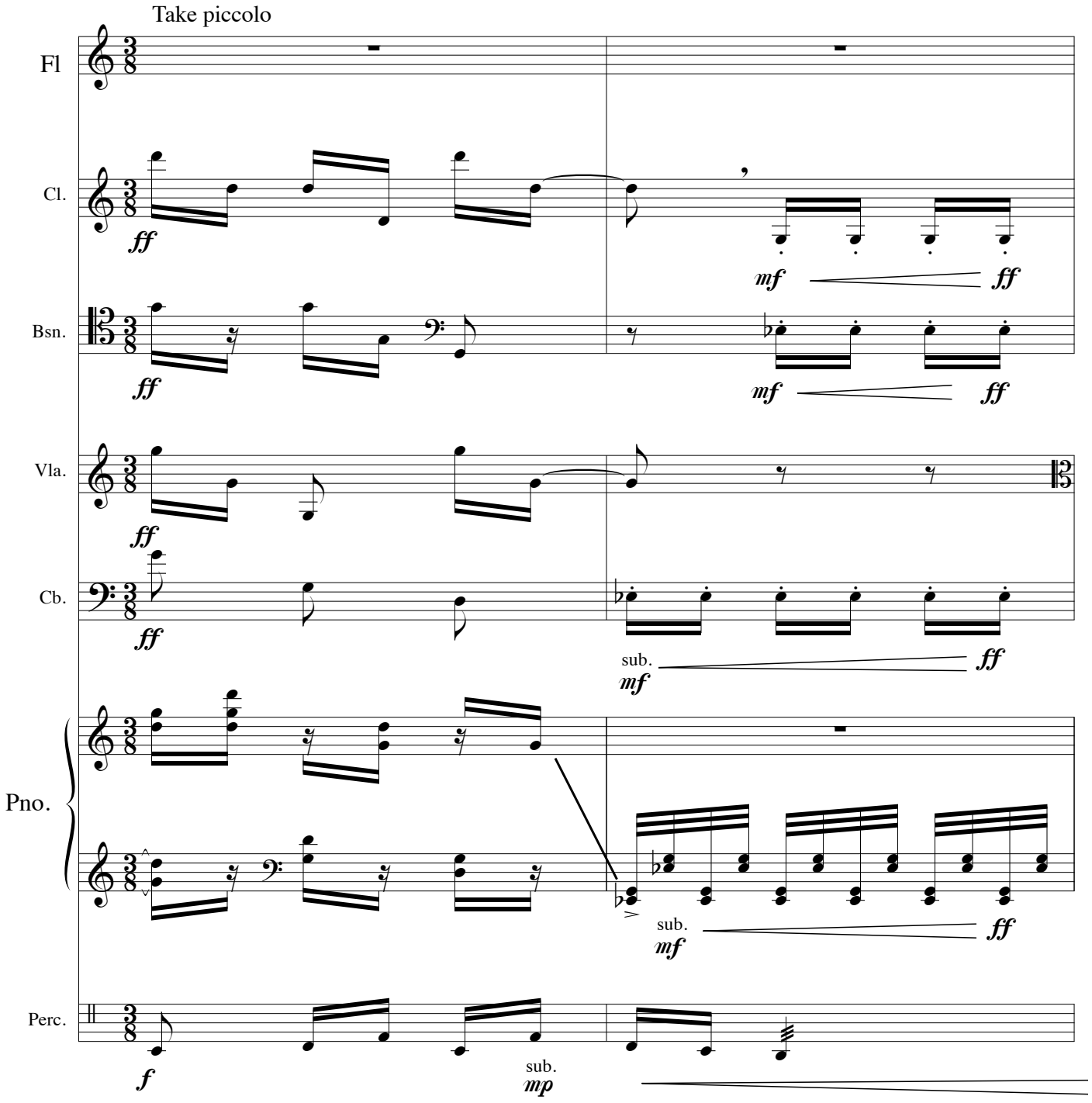
365




Fl
Cl.
Bsn.
Vla.
Cb.
Pno.
Perc.
ff
mf
sub.
mp
p
f


Fl
ff
sub.
mf
ff
mf
Cl.
ff
mp
mf
Bsn.
ff
mp
mf
Vla.
ff
sub.
mf
ff
mf
Cb.
ff
Pno.
ff
Perc.
f
mp


Take piccolo
Fl
Cl.
Bsn.
Vla.
Cb.
Pno.
Perc.
mf
ff
mf
ff
mf
ff
mf
ff
f
mp


Take piccolo
Fl
Cl.
Bsn.
Vla.
Cb.
Pno.
Perc.
ff
mf
sub.
mp

T

Piccolo

Pic

sempre marcato

ff

Cl.

sempre marcato

sub. *mf*

ff

Bsn.

sempre marcato

sub. *mf*

ff

Vla.

sempre marcato

mf

ff

Cb.

sempre marcato

sub. *mf*

ff

Pno.

sempre marcato

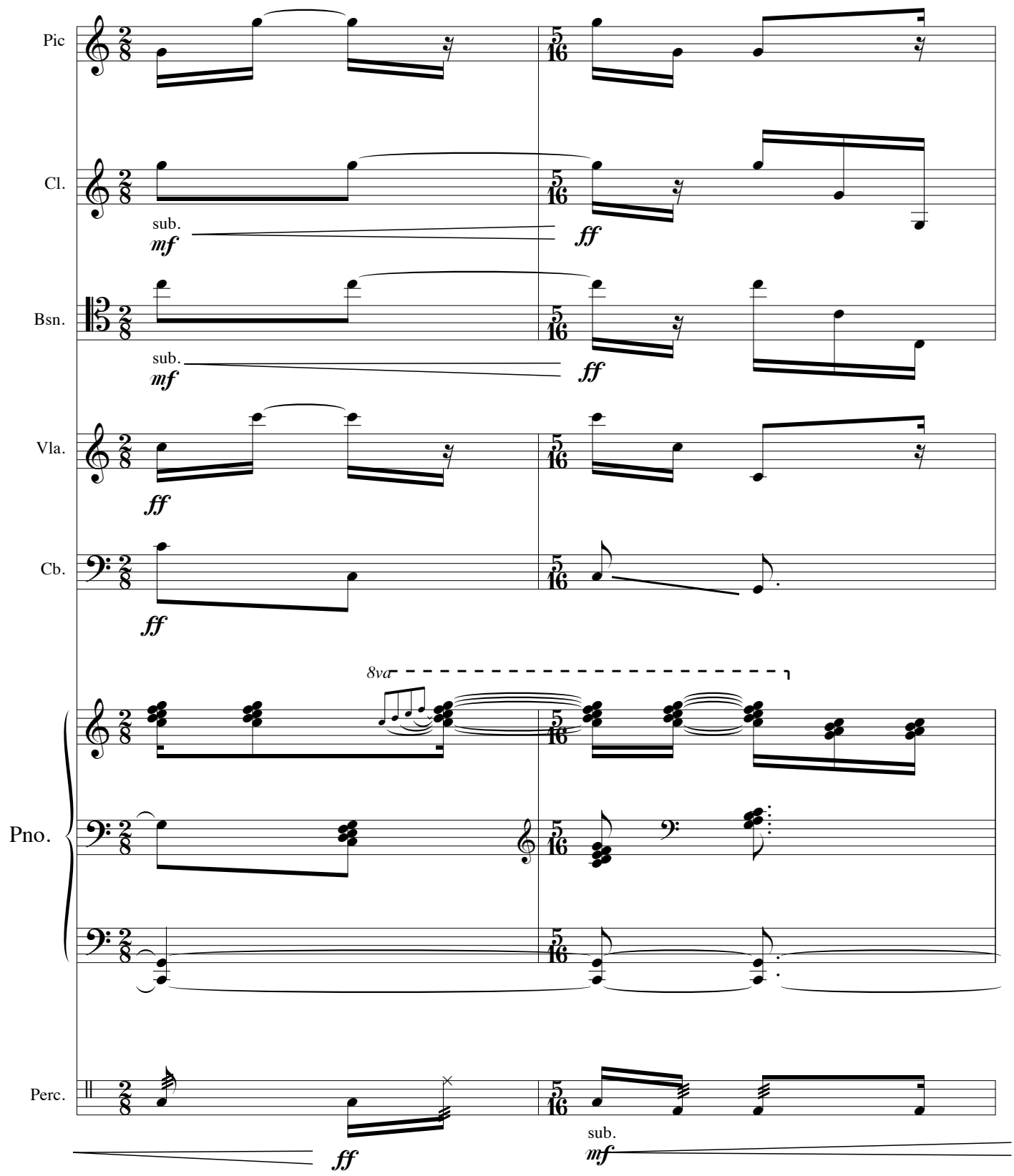
sub. *mf*

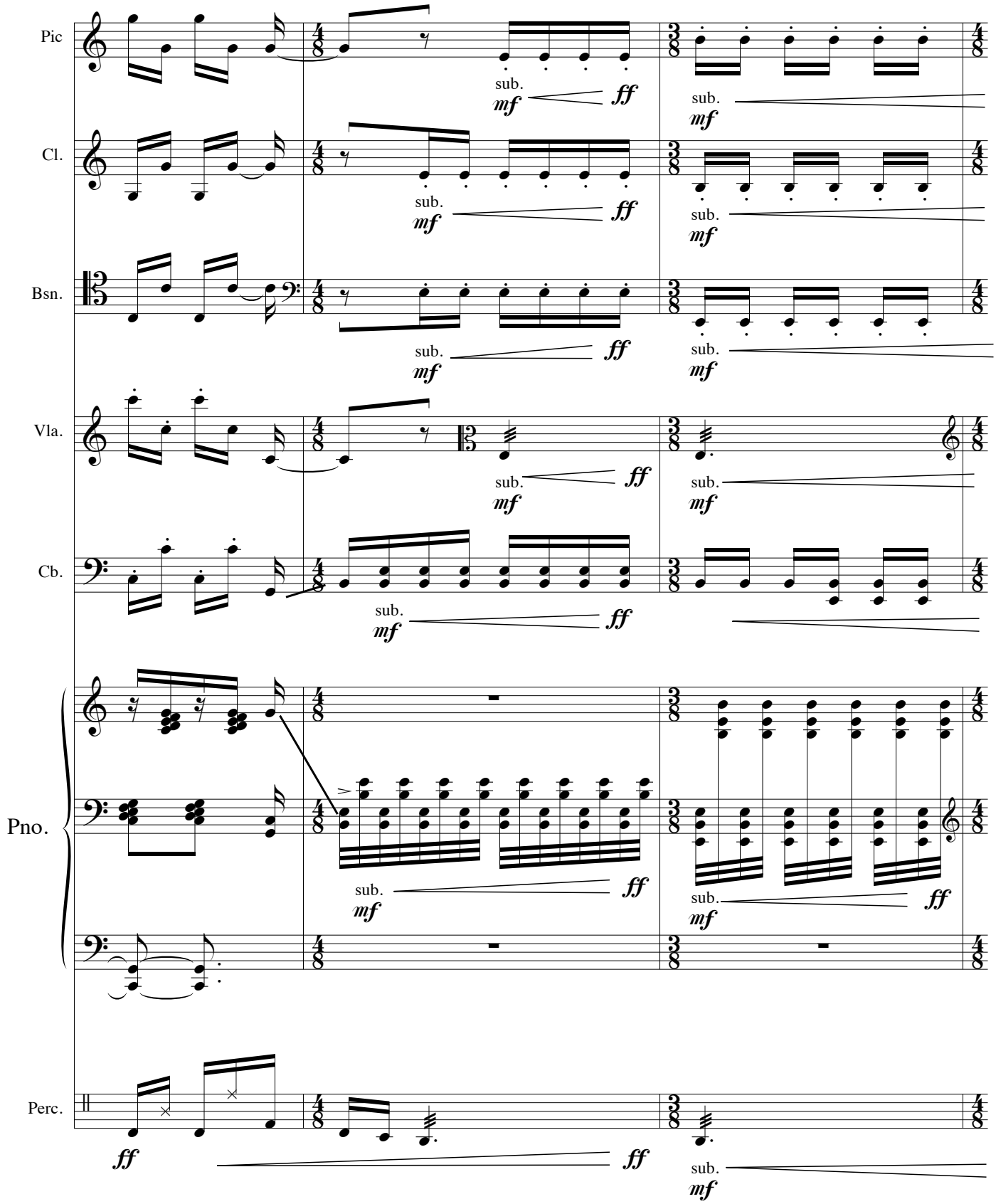
ff

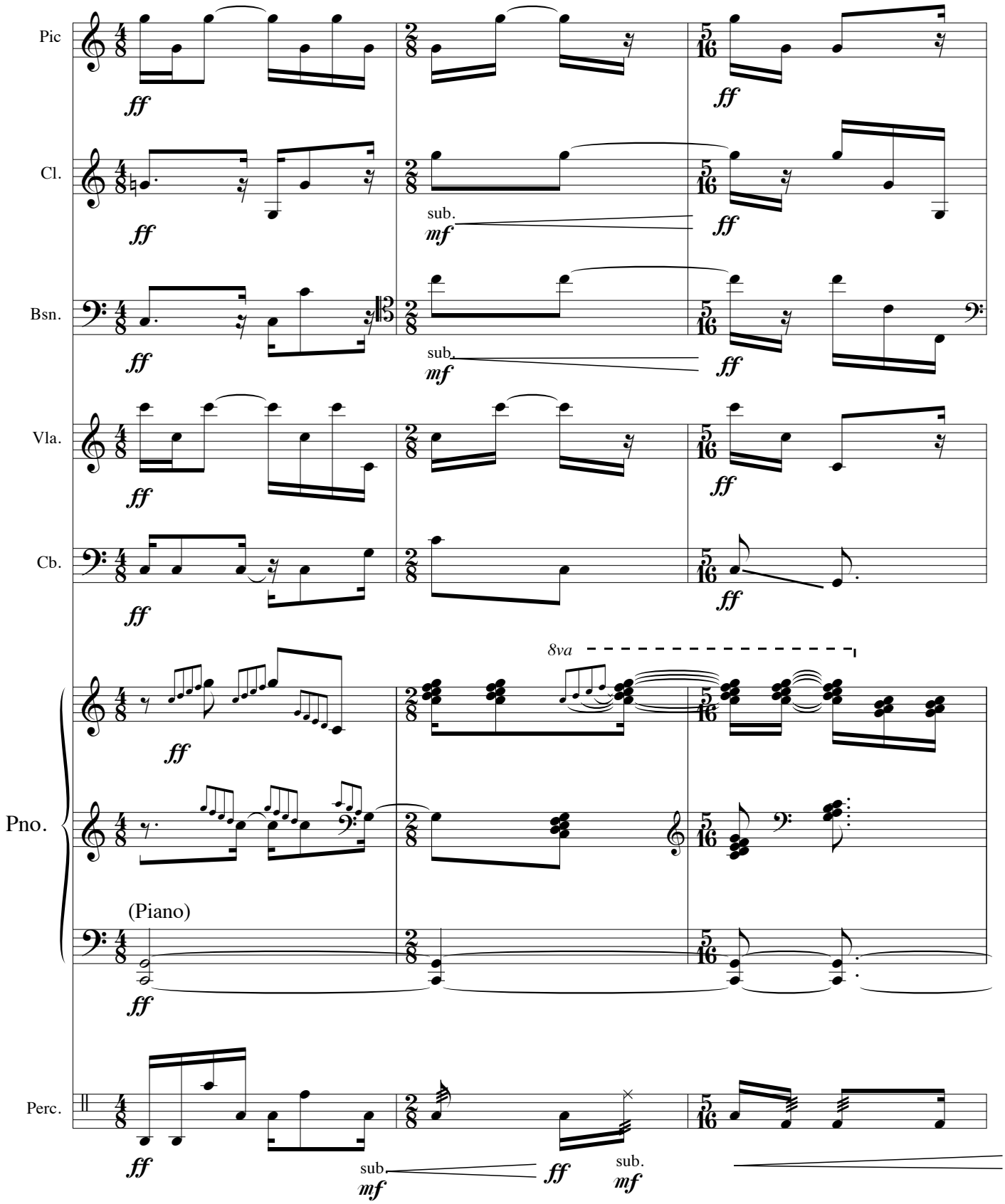
(Piano)

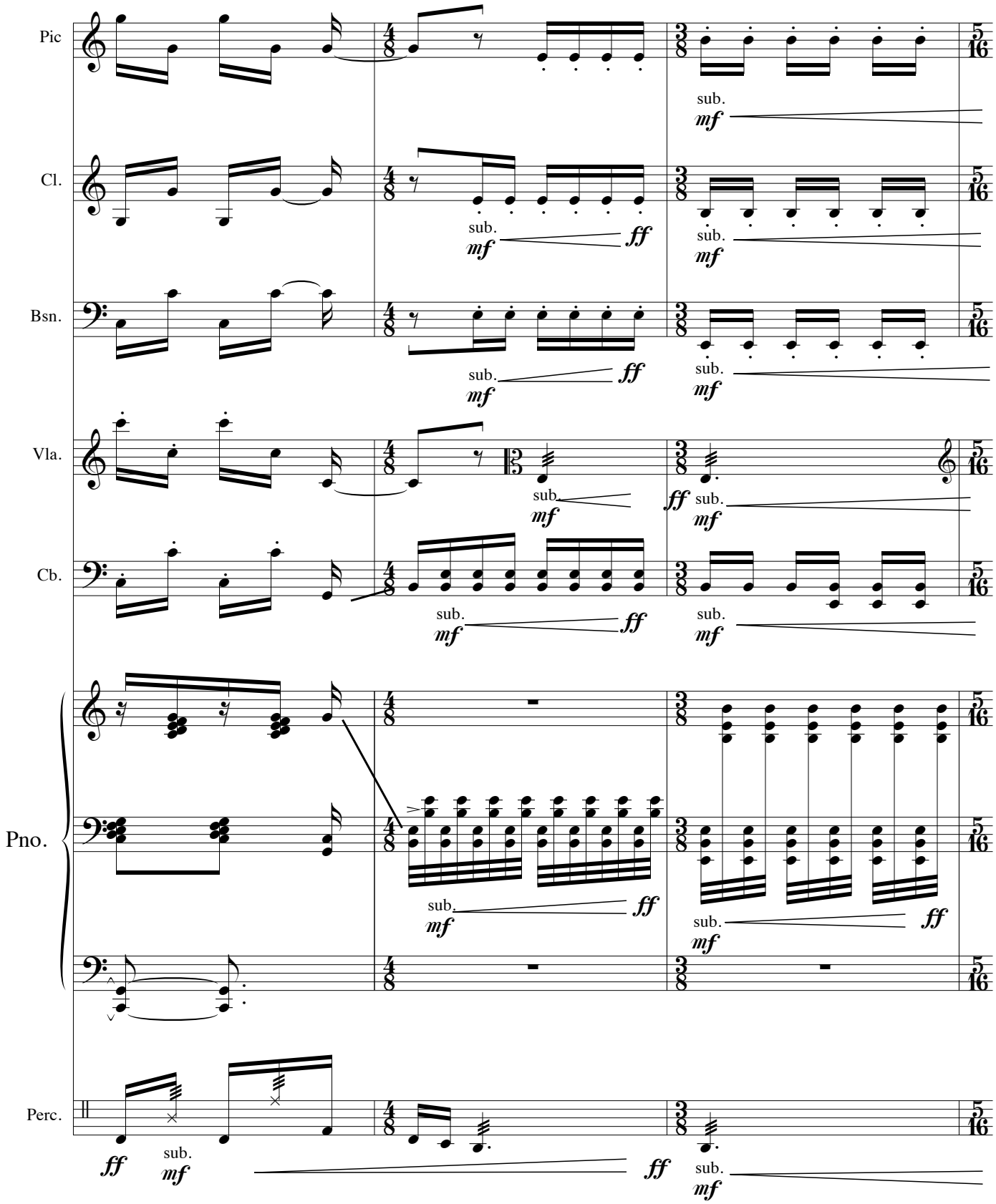
Perc.

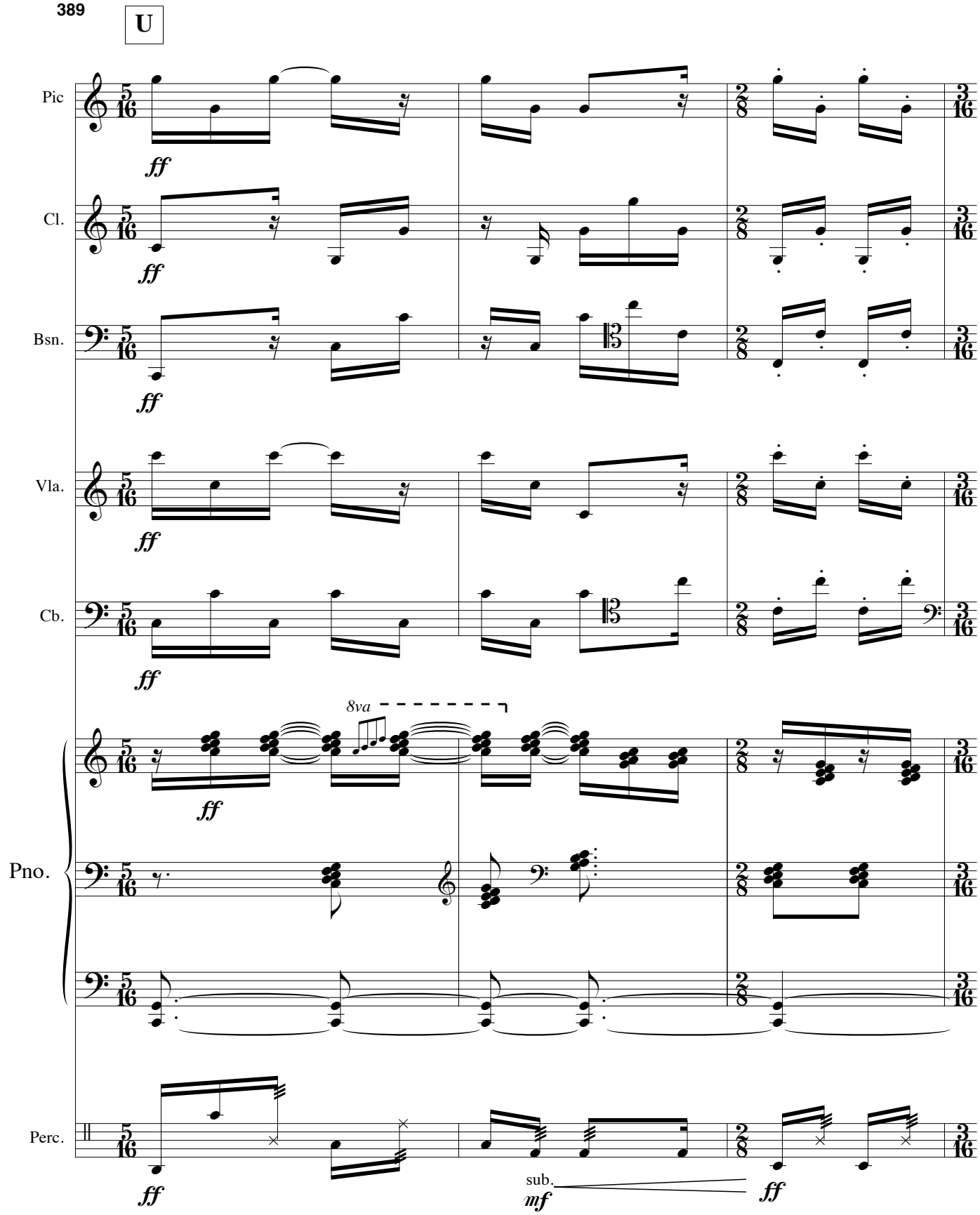
ff

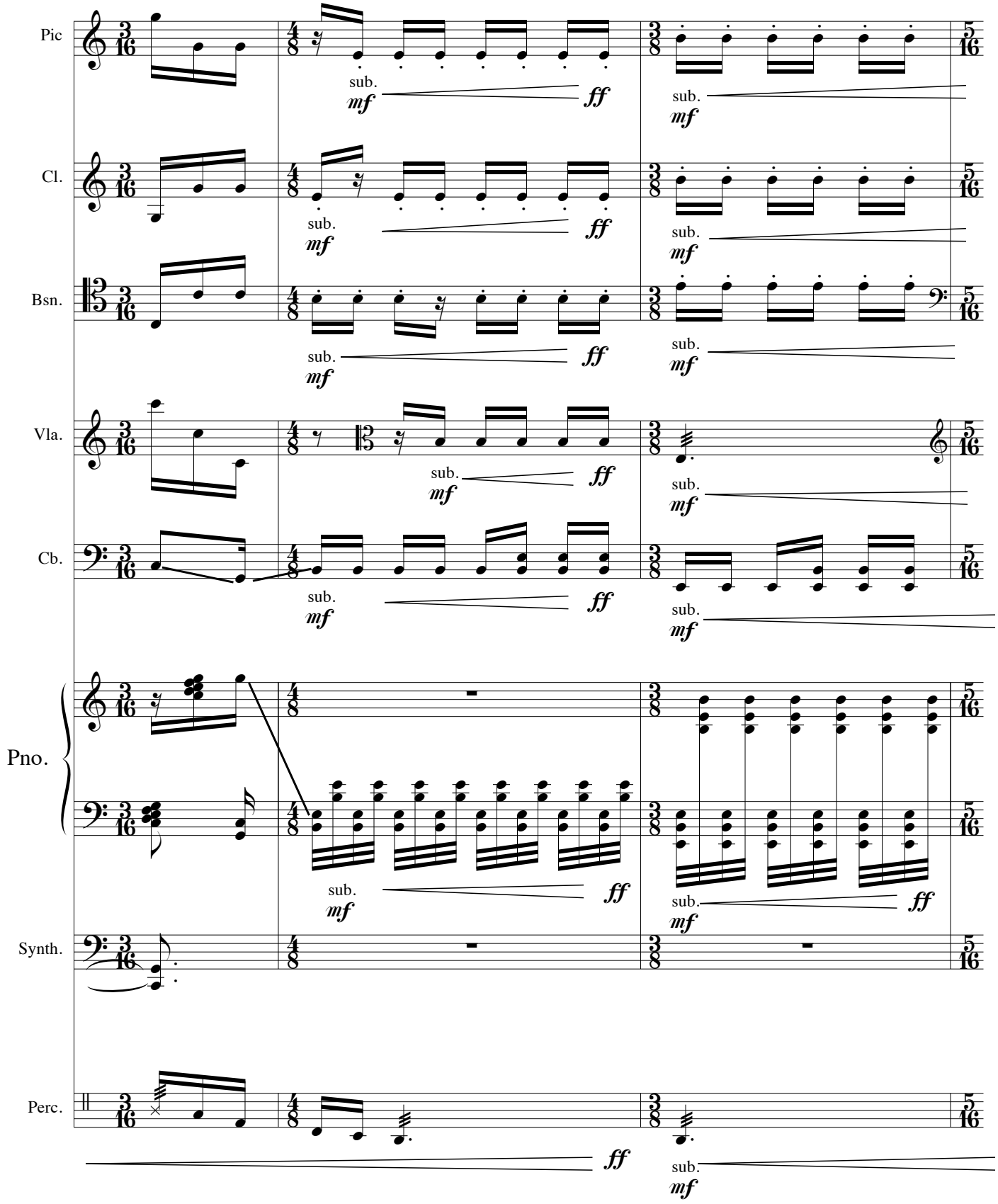

Pic
Cl.
sub.
mf
ff
Bsn.
sub.
mf
ff
Vla.
ff
Cb.
ff
8va
Pno.
Perc.
ff
sub.
mf

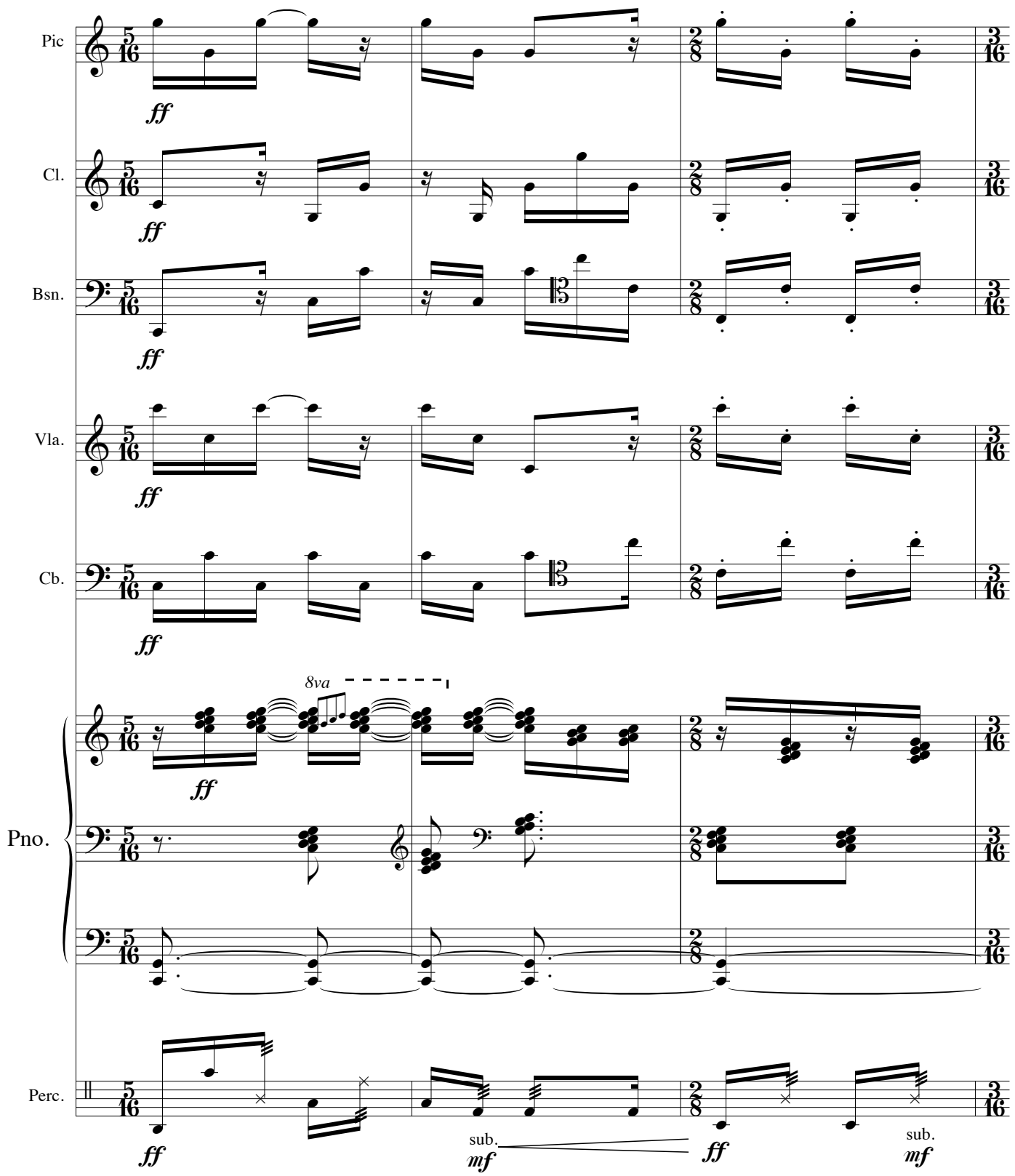

Pic
Cl.
Bsn.
Vla.
Cb.
Pno.
Perc.
sub.
mf
ff

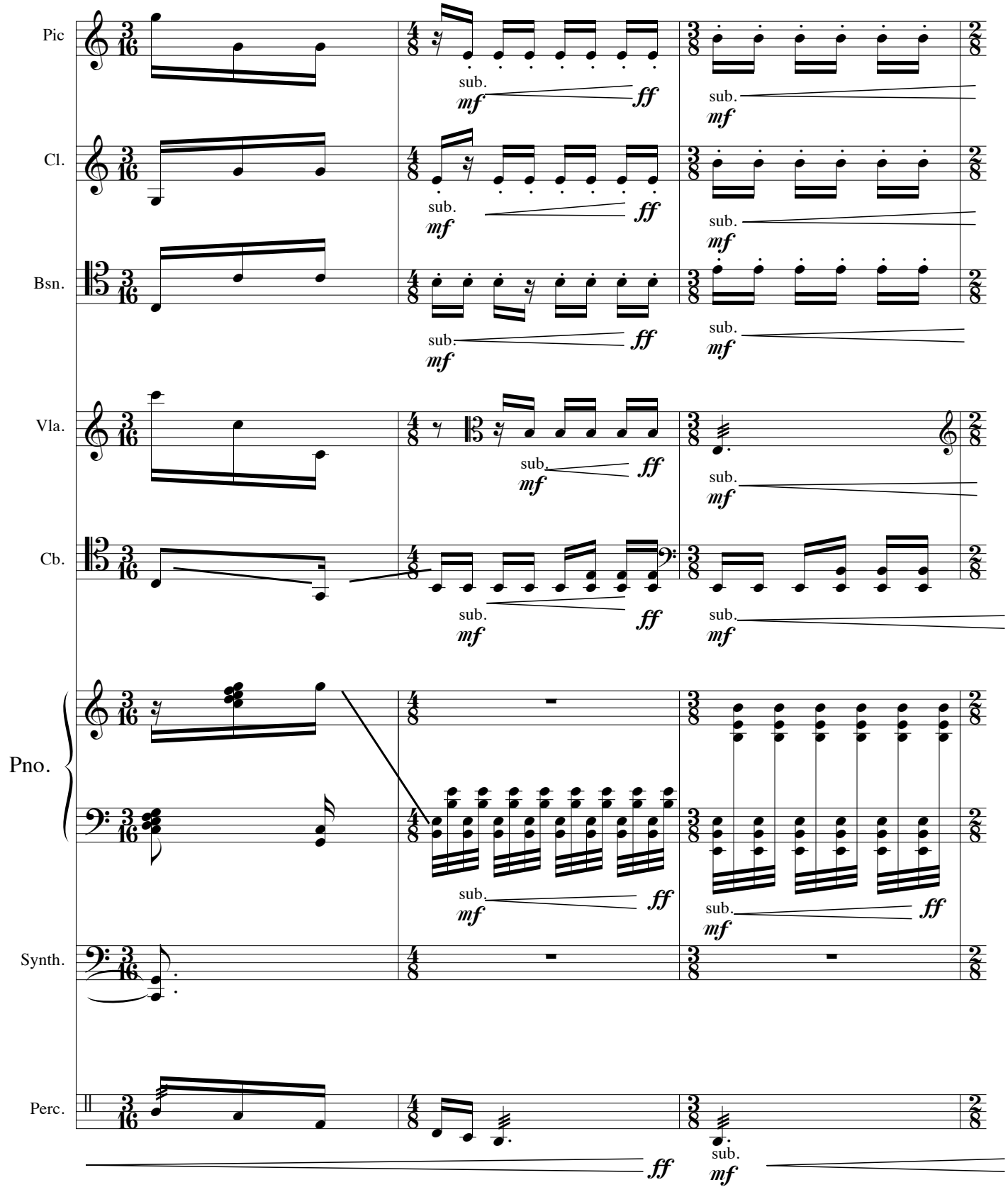

Pic
Cl.
Bsn.
Vla.
Cb.
Pno.
Perc.
ff
sub.
mf
8va
(Piano)


Pic
Cl.
Bsn.
Vla.
Cb.
Pno.
Perc.
sub.
mf
ff
5
16

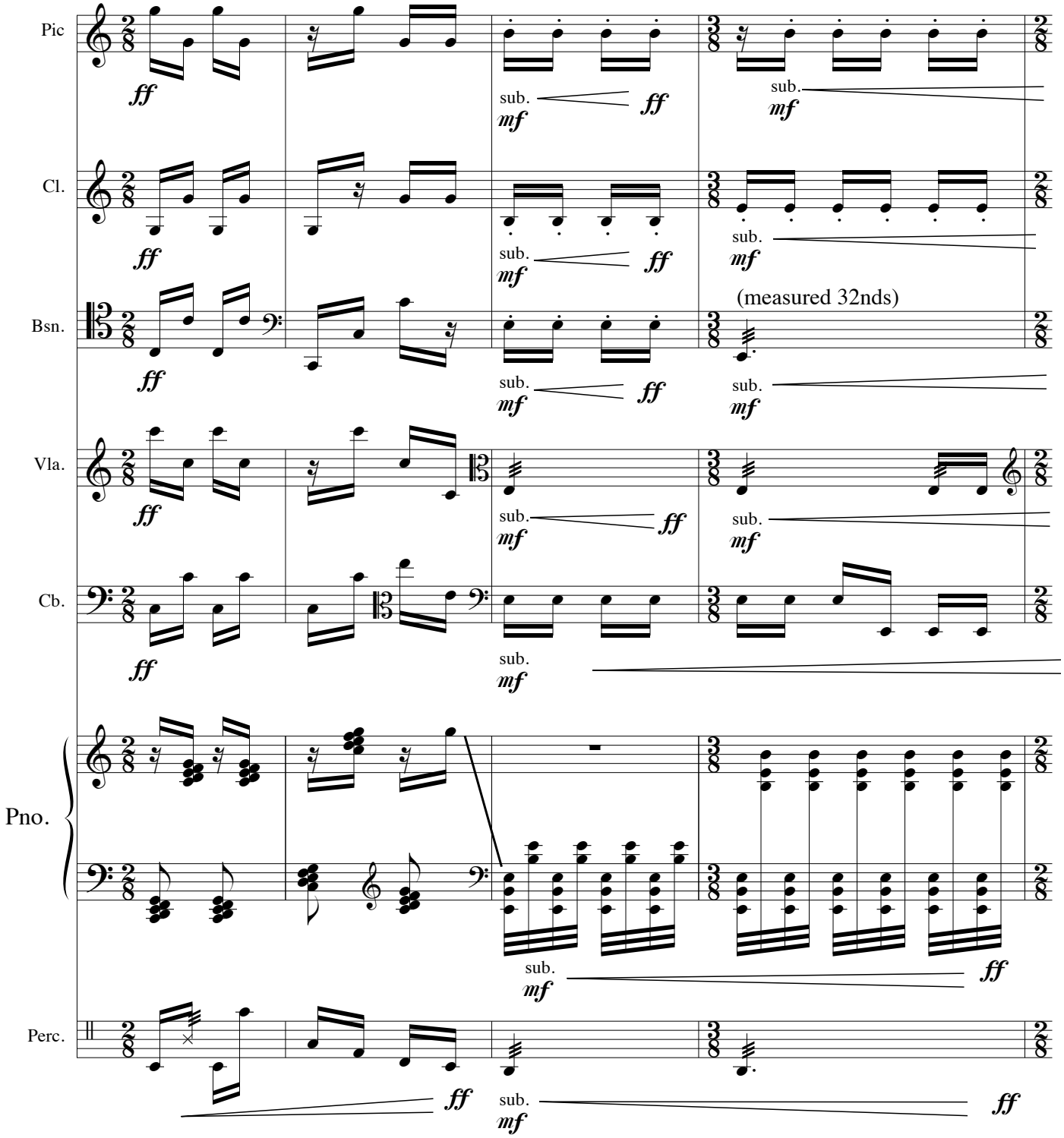

389
U
Pic
Cl.
Bsn.
Vla.
Cb.
Pno.
Perc.
ff
8va
sub.
mf

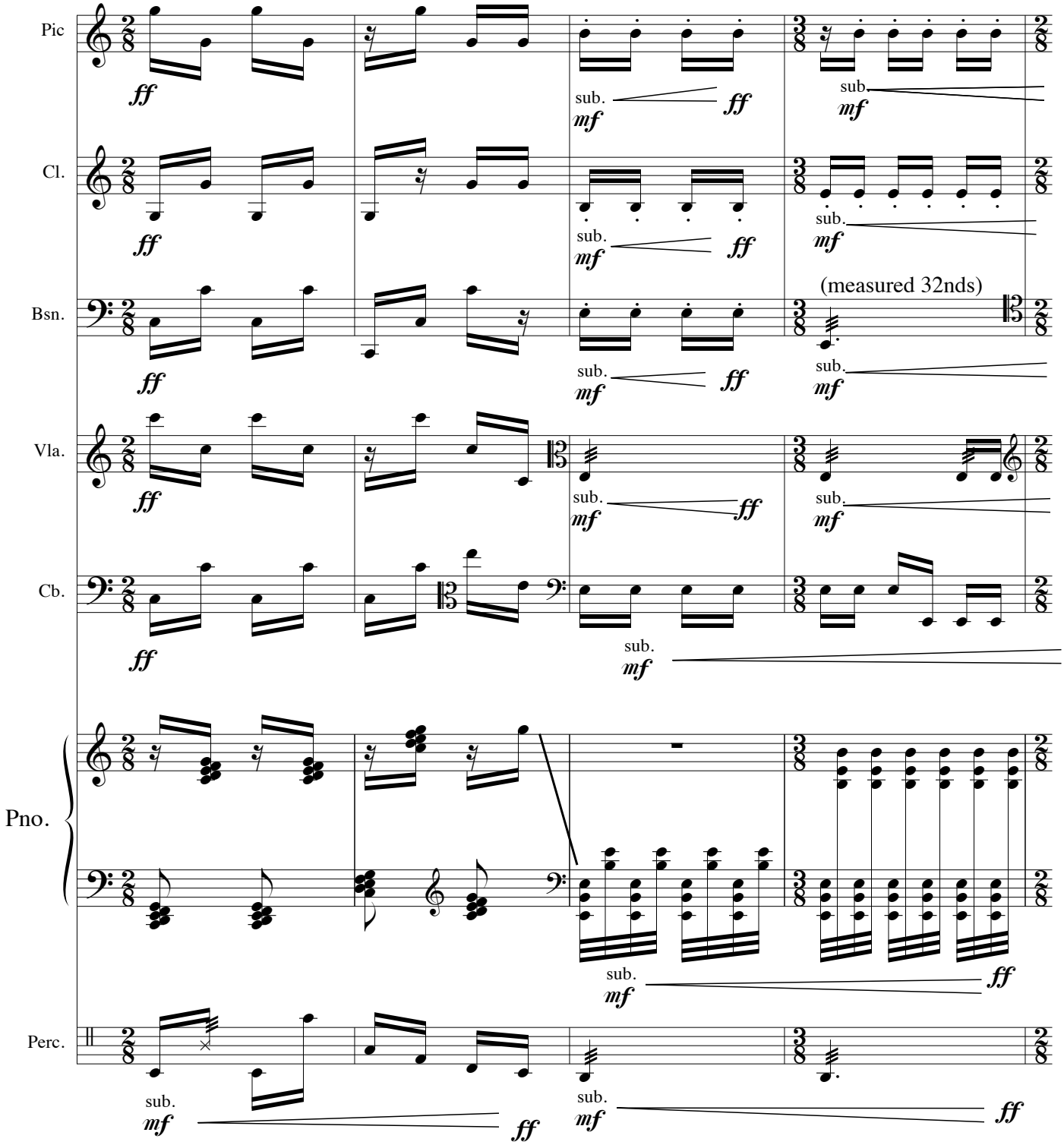

Pic
Cl.
Bsn.
Vla.
Cb.
Pno.
Synth.
Perc.
sub.
mf
ff

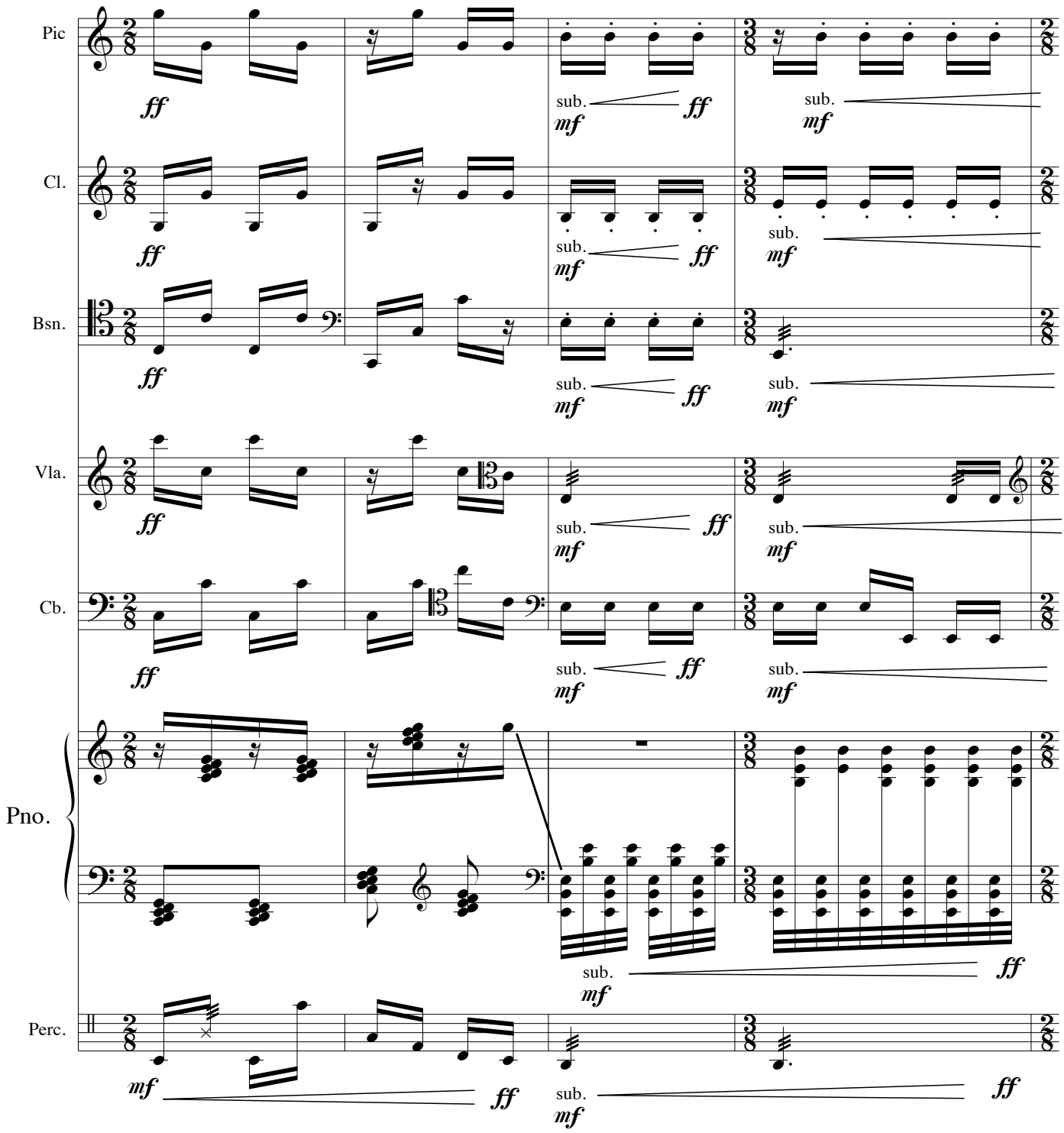

Pic
Cl.
Bsn.
Vla.
Cb.
Pno.
Perc.
ff
8va
sub.
mf

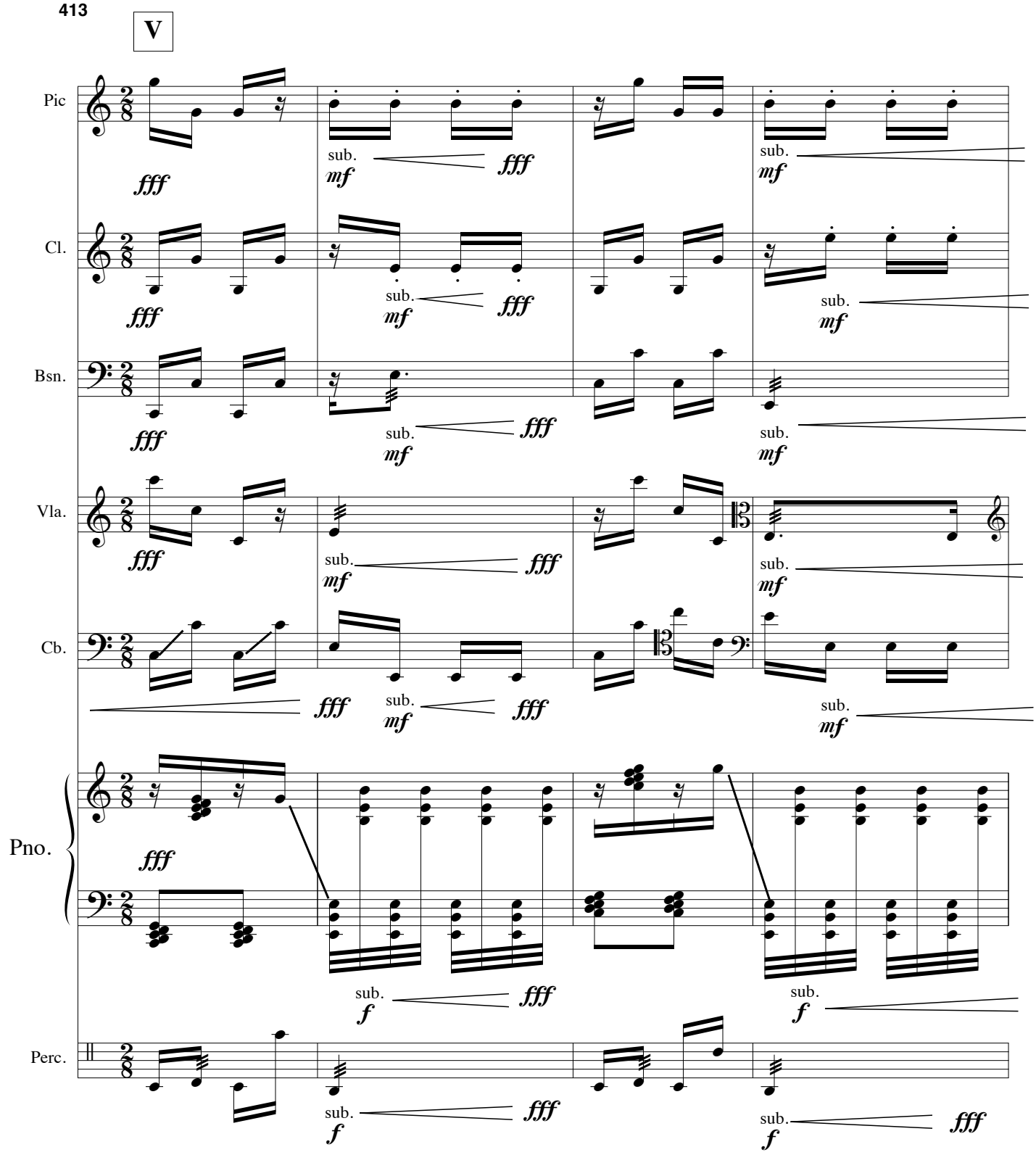

Pic
Cl.
Bsn.
Vla.
Cb.
Pno.
Synth.
Perc.
sub.
mf
ff

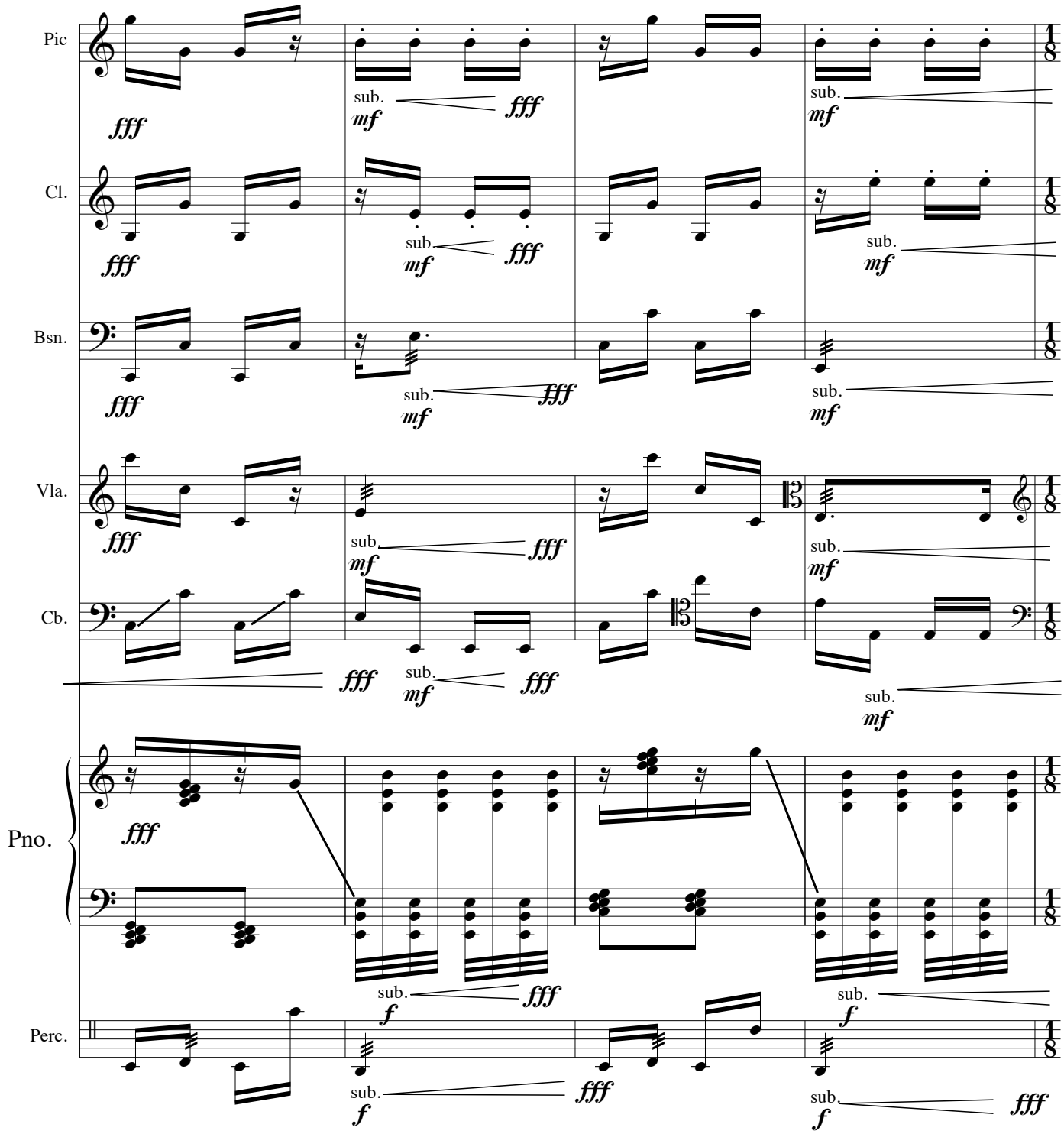
401



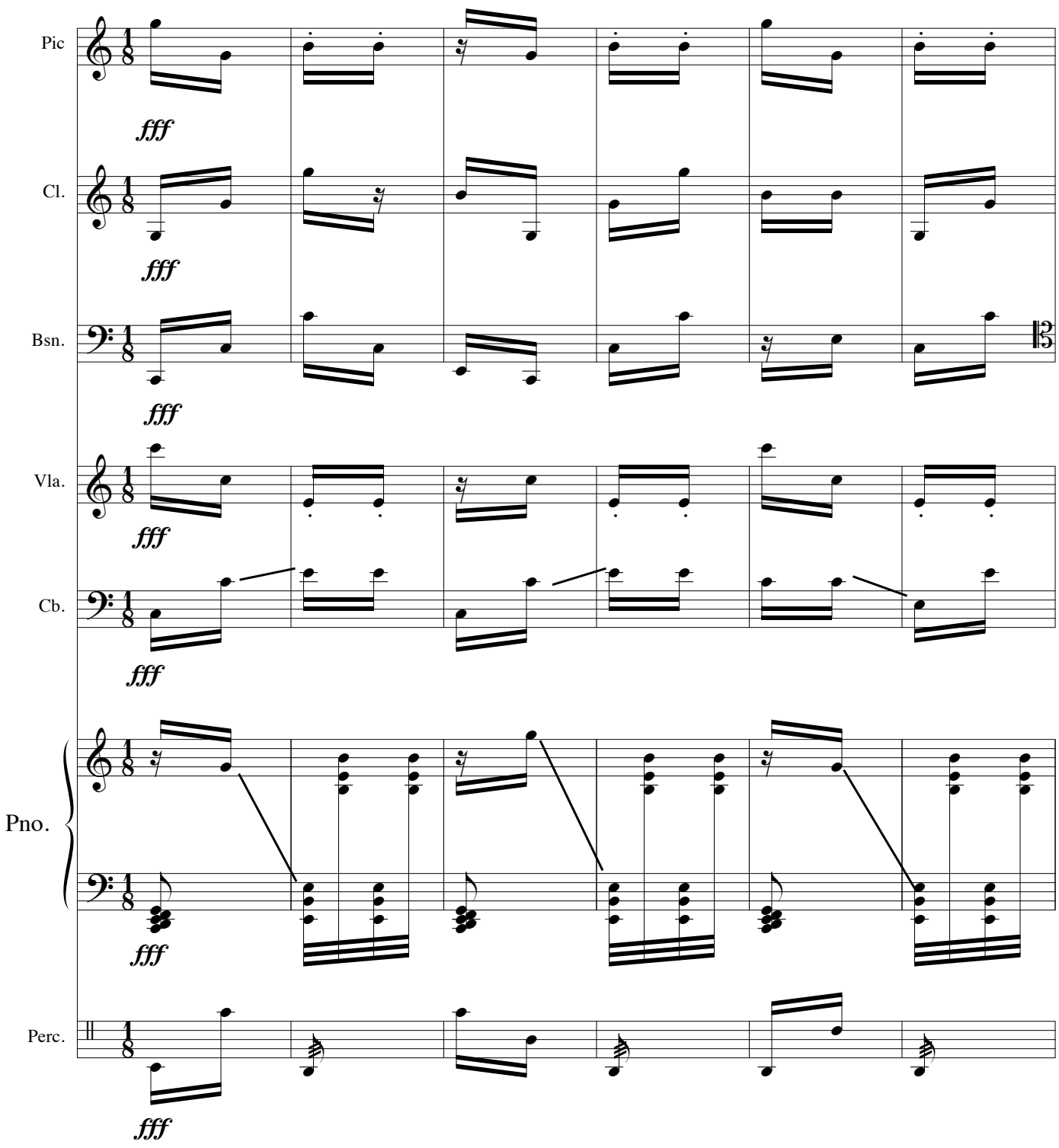

Pic
Cl.
Bsn.
Vla.
Cb.
Pno.
Perc.
ff
sub.
mf
(measured 32nds)

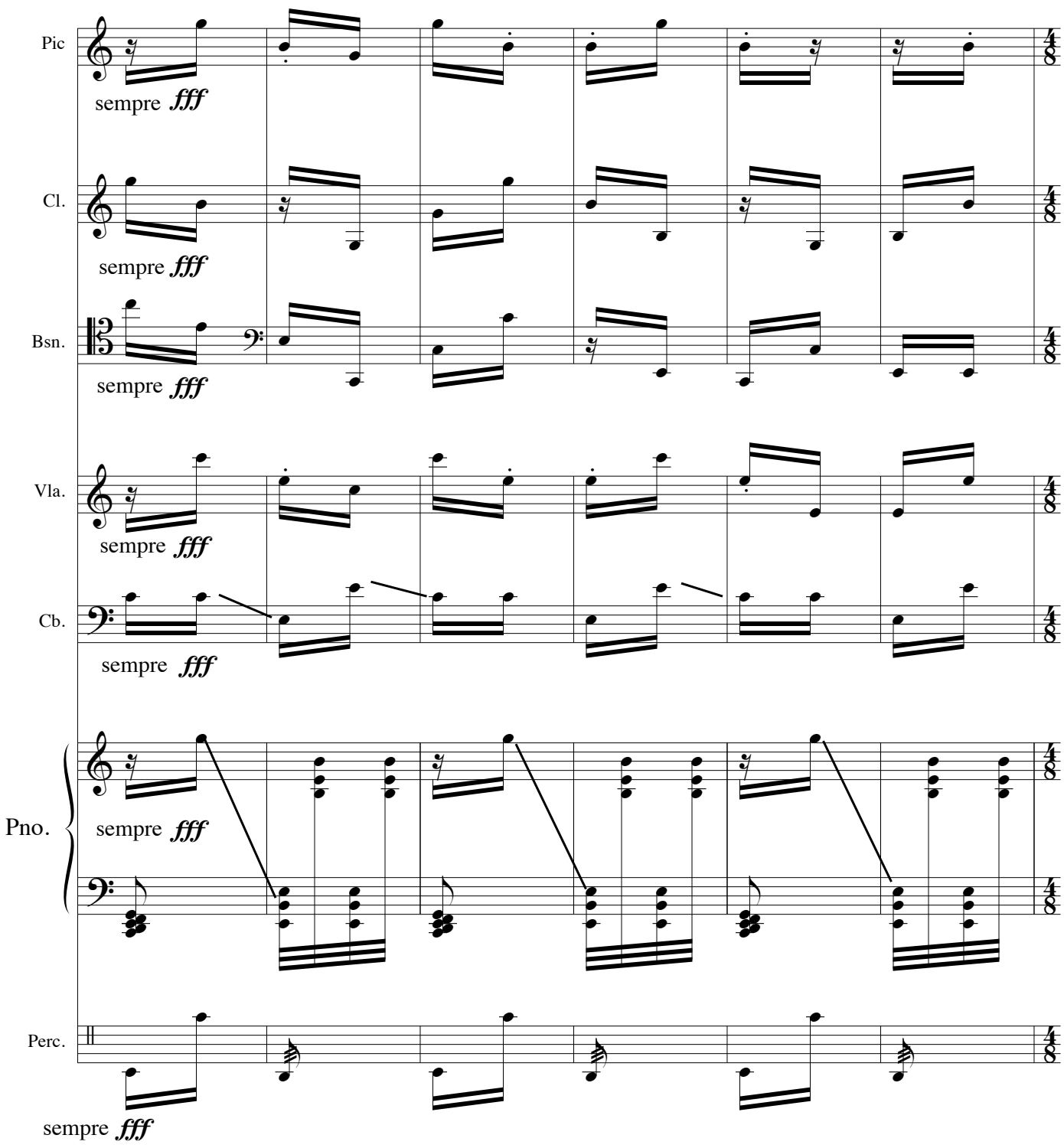

Pic
Cl.
Bsn.
Vla.
Cb.
Pno.
Perc.
ff
mf
sub.

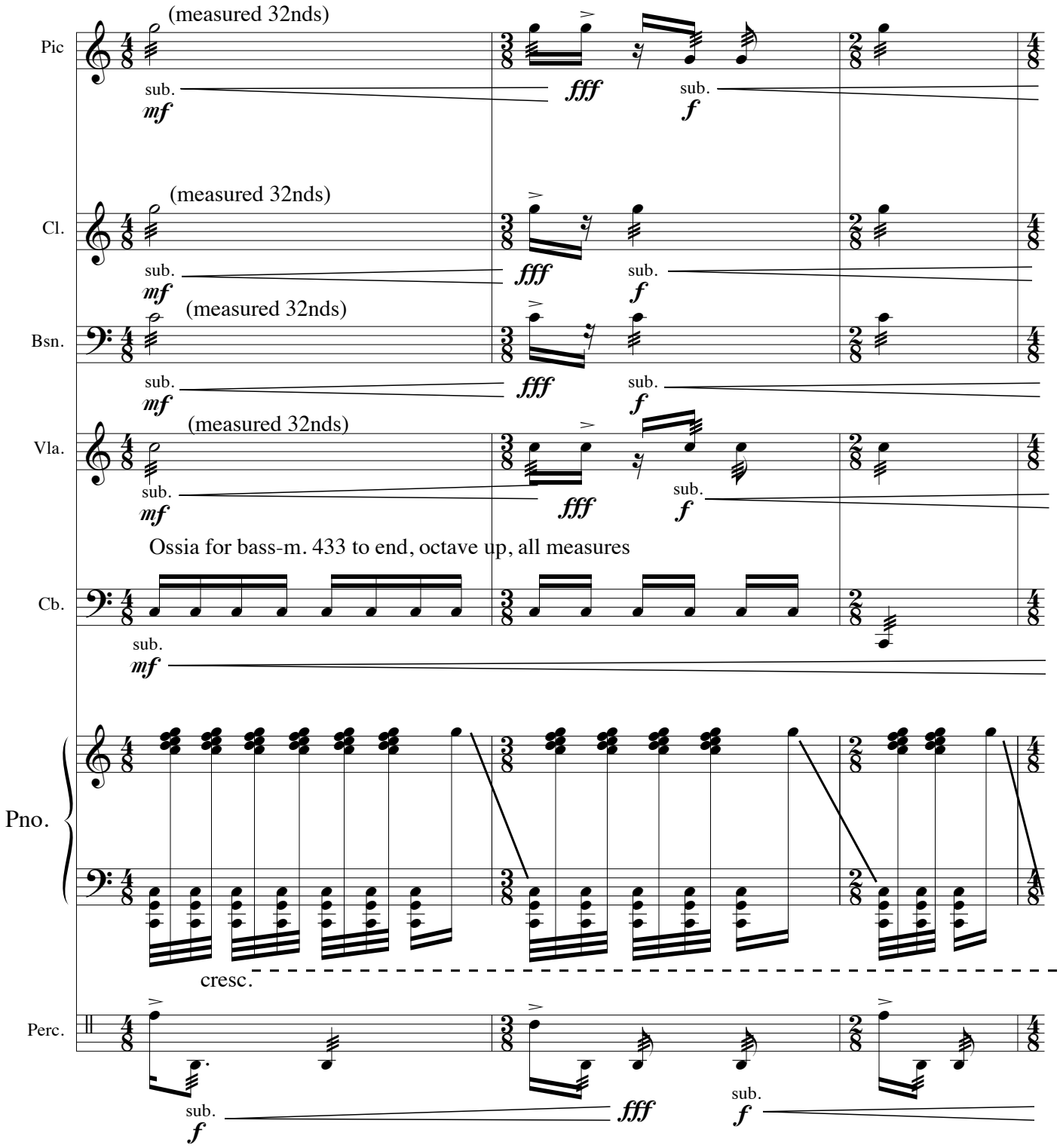

413
V
Pic
Cl.
Bsn.
Vla.
Cb.
Pno.
Perc.
fff
sub.
mf
f

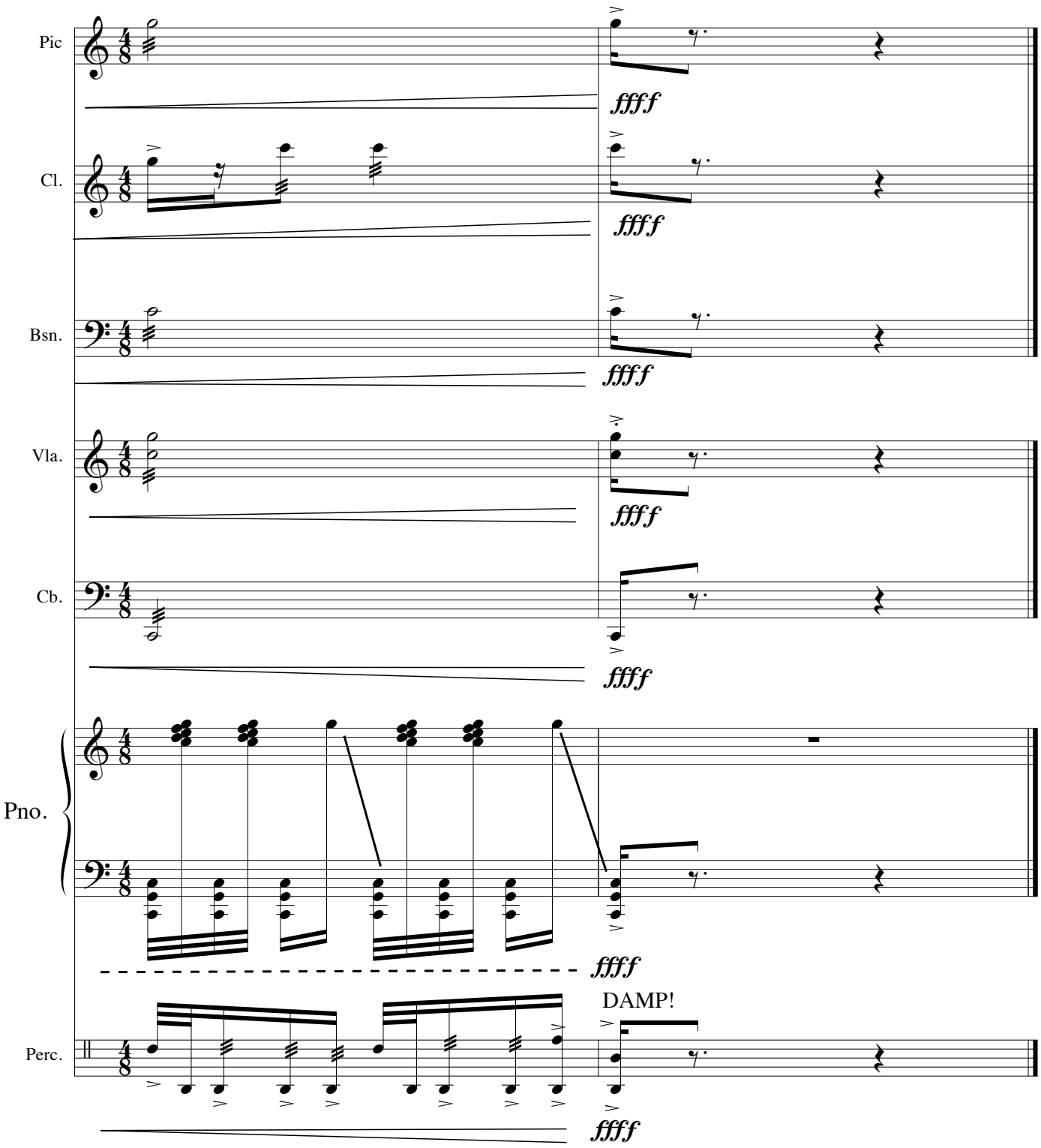

Pic
Cl.
Bsn.
Vla.
Cb.
Pno.
Perc.
fff
sub.
mf
fff
f

421



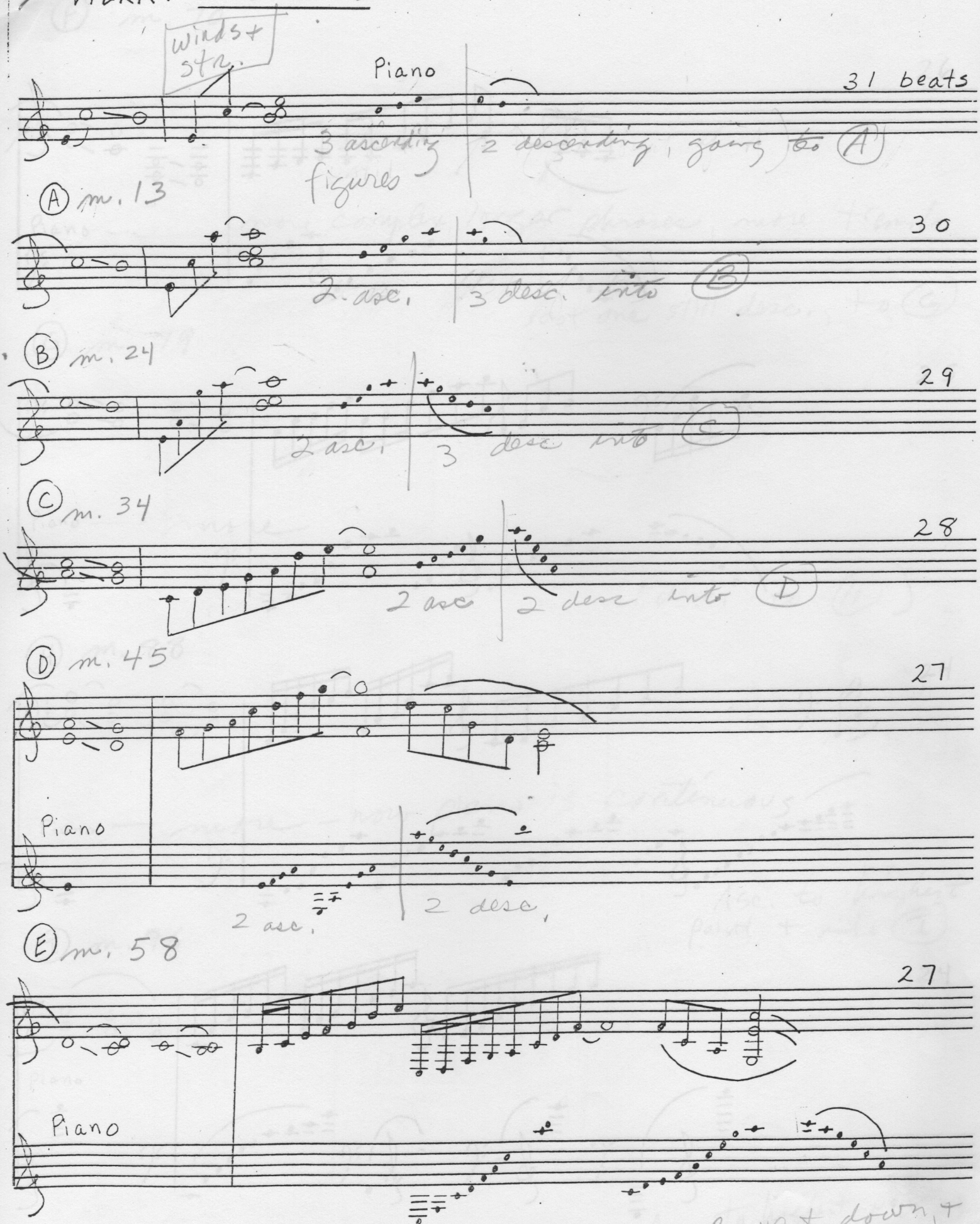

Pic
sempre fff
Cl.
sempre fff
Bsn.
sempre fff
Vla.
sempre fff
Cb.
sempre fff
Pno.
sempre fff
Perc.
sempre fff


(measured 32nds)
Pic
sub.
mf
fff
sub.
f
(measured 32nds)
Cl.
sub.
mf
fff
sub.
f
(measured 32nds)
Bsn.
sub.
mf
fff
sub.
f
(measured 32nds)
Vla.
sub.
mf
fff
sub.
f
Ossia for bass-m. 433 to end, octave up, all measures
Cb.
sub.
mf
Pno.
cresc.
Perc.
sub.
f
fff
sub.
f

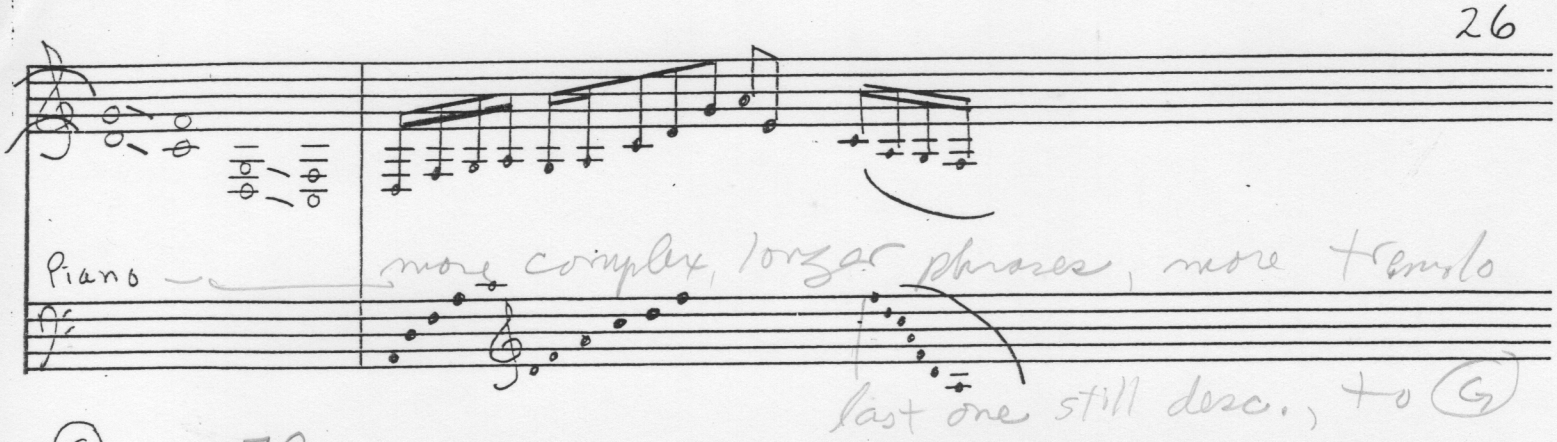

Pic
Cl.
Bsn.
Vla.
Cb.
Pno.
Perc.
ffff
DAMP!

Analytical material on *Timberline* follows. First there are five pages of handwritten sketches of pitches, timing, and various gestures important to the structure of the piece. Then there is an explanation of Exponential Structure as used in this work.

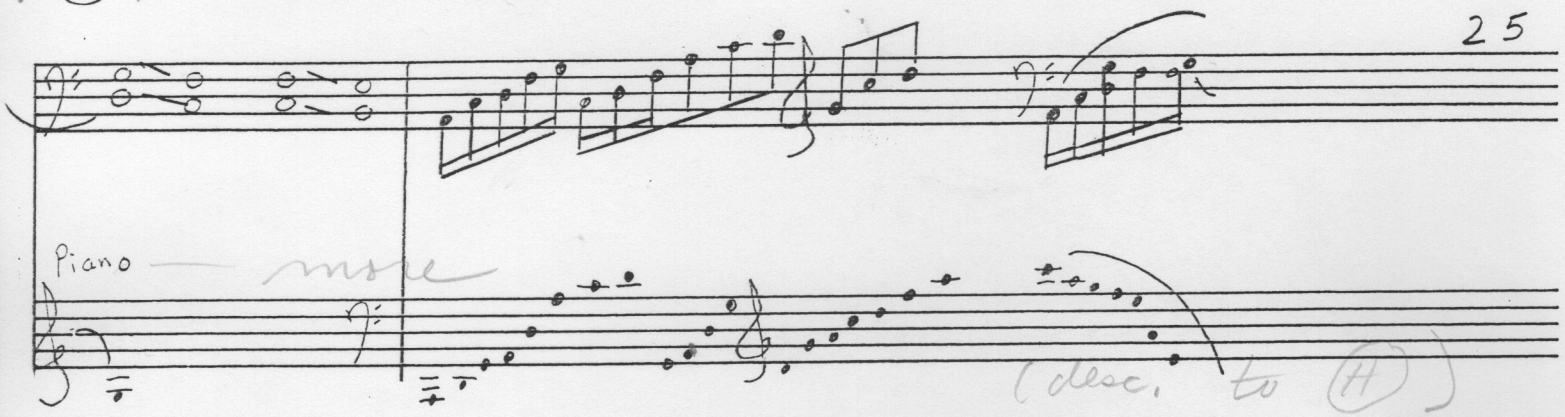
VIERK: TIMBERLINE



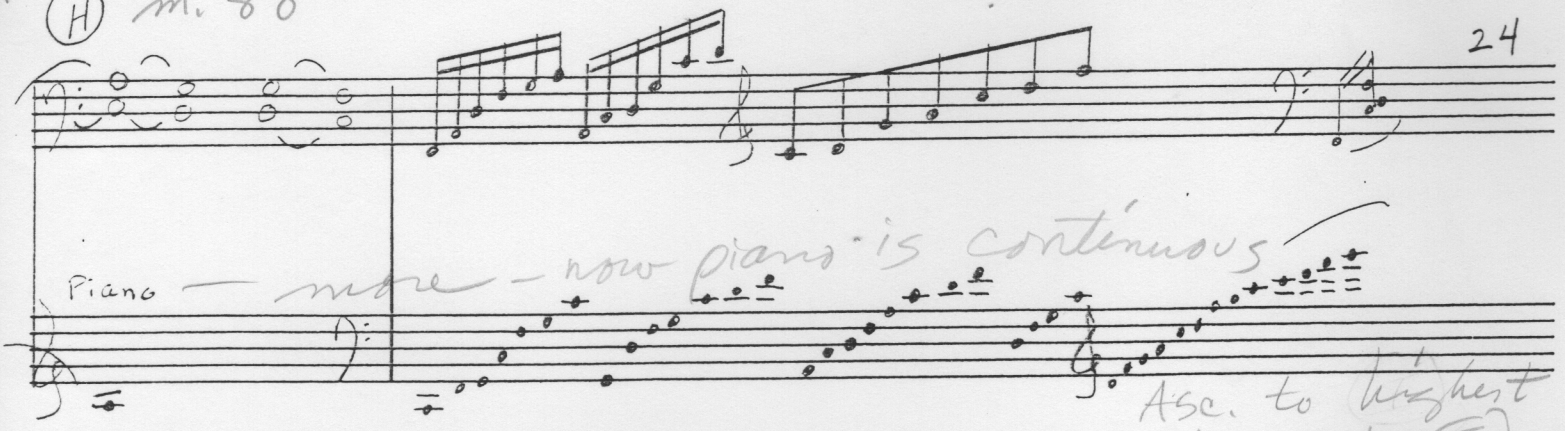
(F) m. 70



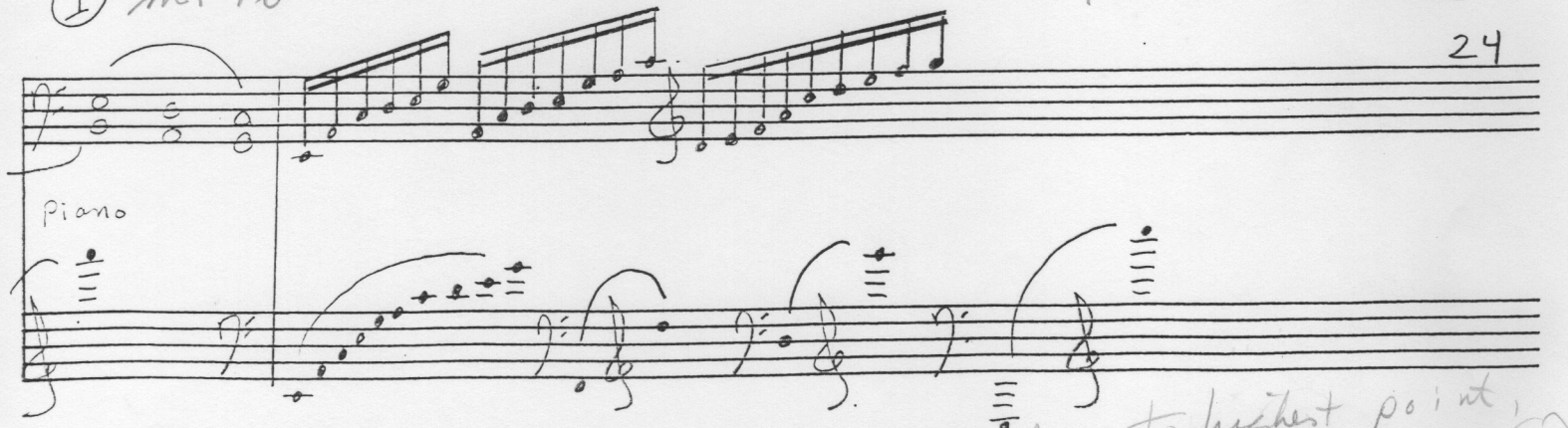
(G) m. 79



(H) m. 88

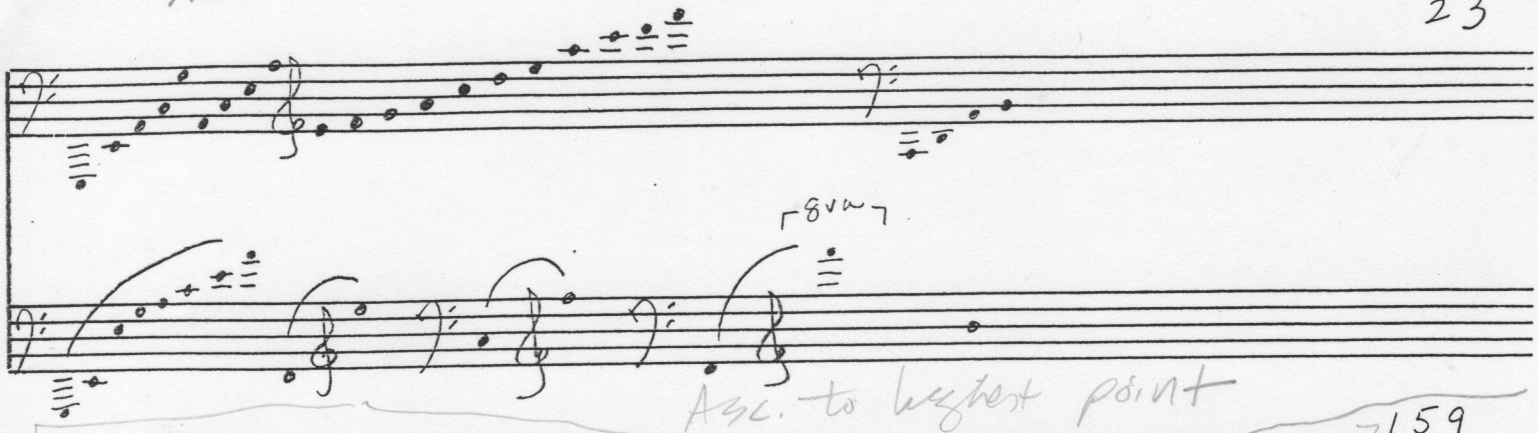


(I) m. 96



(J) (J) m. 104

23



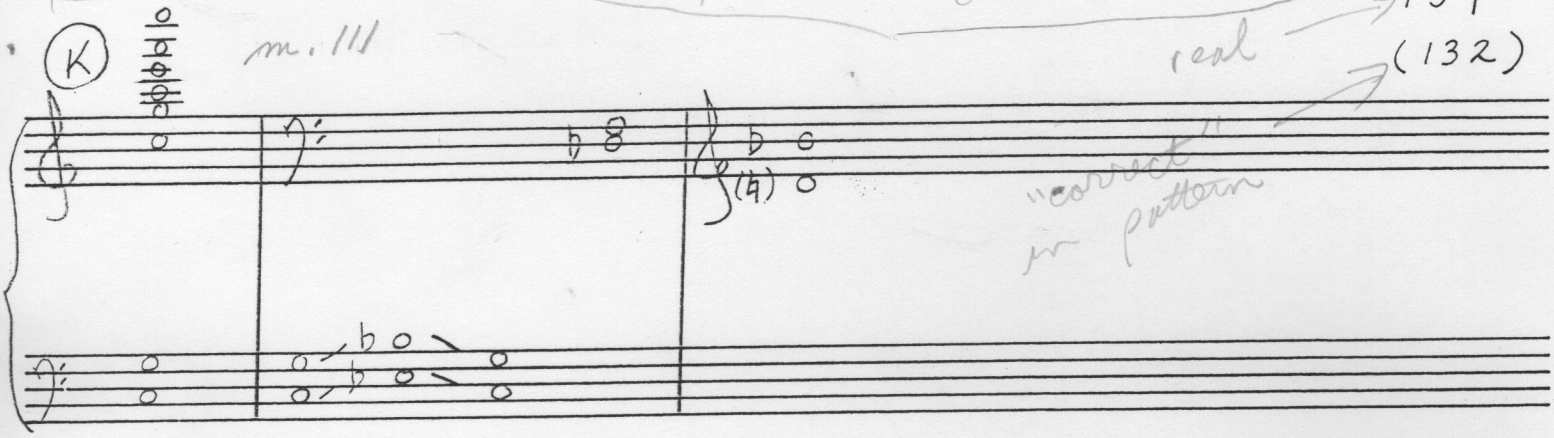
Asc. to highest point

(K) m. 111

159

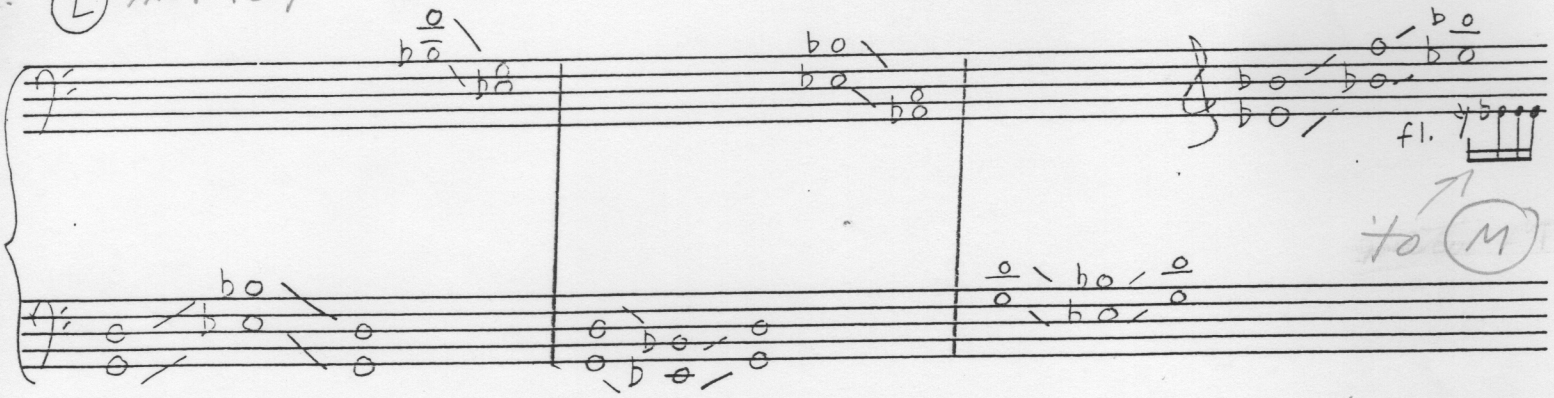
real (132)

"correct" pr pattern



112

(L) m. 164

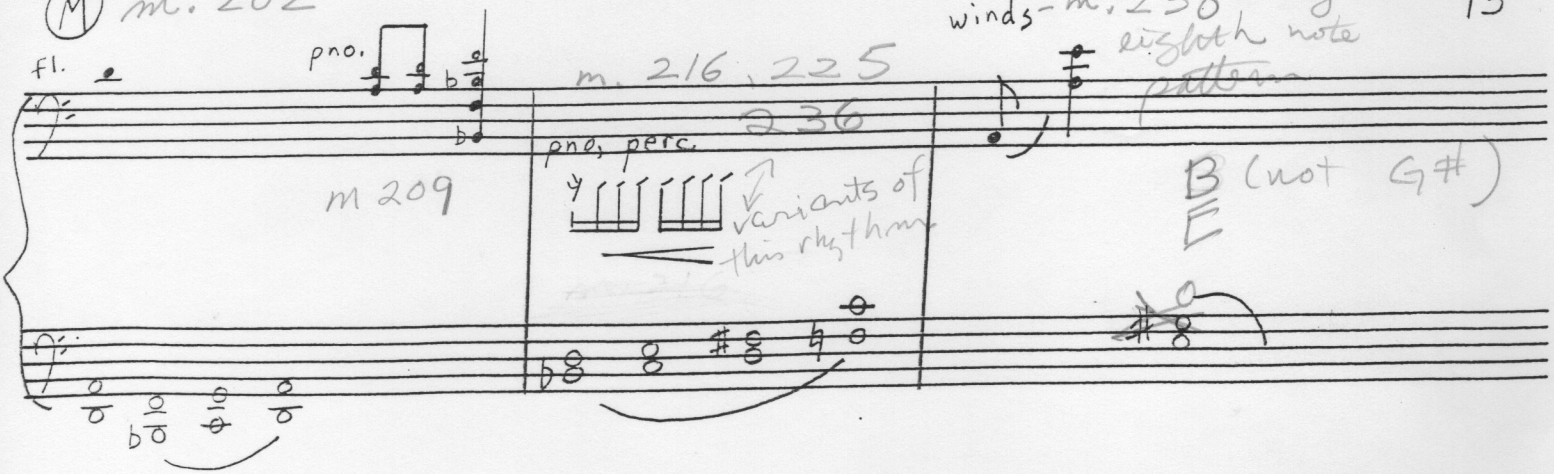


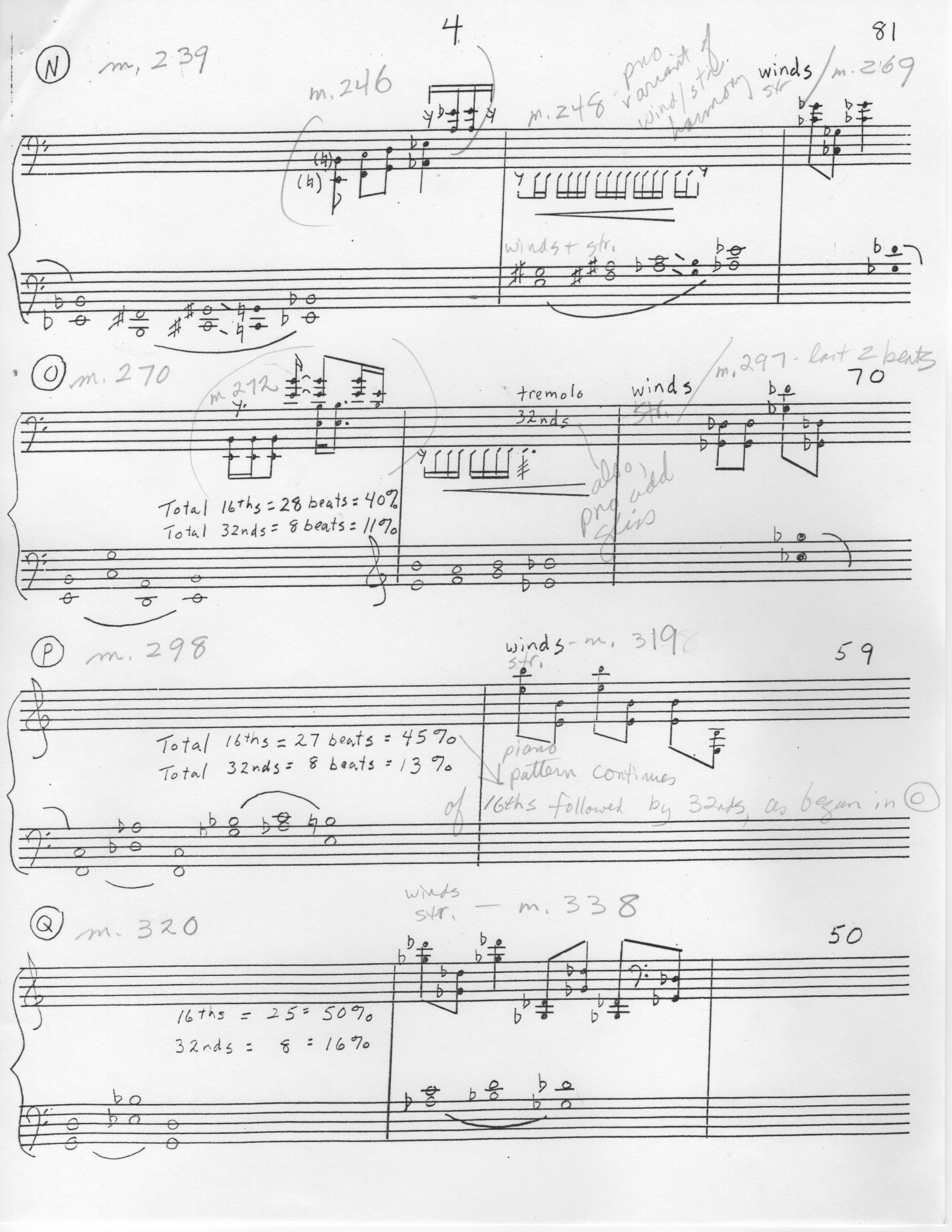
to (M)

(M) m. 202

95

winds - m. 238 - begin eighth note pattern




(N) m. 239
m. 246
m. 248 - pno variant of wind/str harmony
winds / m. 269
str
winds + str.
(O) m. 270
m. 212
tremolo 32nds
winds / m. 297 - last 2 beats
str.
70
Total 16ths = 28 beats = 40%
Total 32nds = 8 beats = 11%
also pno add glis
(P) m. 298
winds - m. 319
str.
59
Total 16ths = 27 beats = 45%
Total 32nds = 8 beats = 13%
piano pattern continues of 16ths followed by 32nds, as begun in (O)
winds str. — m. 338
(Q) m. 320
50
16ths = 25 = 50%
32nds = 8 = 16%

m. 340

(R)

winds, etc.

(m 353 last 2 16ths / m. 354)

winds, str. piano, perc.

16ths = 24 beats = 56%
32nds = 8 = 20%

36

(S) m. 356 (m310) 312 m361 376

16ths = 22 beats = 62%
32nds = 9 = 24%

m. 377 a m381 b

(T) 30

16ths = 22 beats = 70%
32nds = 8 = 30%

ending:

No of 16ths		No of 16ths		plus
a	b	a	b	
22	14	4	4	
22	14	4	4	
17	14	2	2	
8	6	2	2	
8	6	2	2	
8	6	2	2	
4	4	2	2	
4	4	2	2	

This is an explanation of my Exponential Structure, principles of organization of sound and time which I have used in many of my works. Exponential Structure is clearest in some of my pieces which reach high energy climactic conclusions, such as *Timberline*, *Simoom*, *Manhattan Cascade, Red Shift, Words Fail Me (2nd movement)*, and *Cirrus* (this last one reaches a high energy conclusion towards the end, then backs down into a lyrical ending). These pieces use Exponential Structure for the entire work or movement. Other compositions, such as *River Beneath the River*, use Exponential Structure for sections of the piece but not for its entirety. Following is a document for people who want to delve just a little into mathematics. I thank David Sulzer PhD, aka Dave Soldier, for helpful comments as I was writing what's below.

2022Aug4

Exponential Structure:
Organizational Principles in some of my Compositions, using *Timberline* as an Example

by Lois V Vierk

In the 1980s I began crafting principles of sound organization using what I call Exponential Structure. The impetus for this came from my interest in sensory perception. I'd been reading about how the body processes sensory stimuli and I had learned that the amount of stimulation that we take in via our senses is measured and described mathematically in exponential terms rather than in arithmetic terms. The one exception is the length of a line: if someone looks at two lines it can easily be judged that one line is, say, about twice as long as the other. The line is perceived as twice as long and it actually is twice as long. However in other situations it is not so simple, as confirmed by many scientific experiments. For example, sensory stimuli (such as loudness of sound, brightness of light, amount of pain, etc.) that are perceived by a human as "twice as much" or "three times as much" or "four times as much" as the reference stimulus, do not have two, three, or four times the amount of energy as the reference. It might rather be some number squared, cubed, to the 4th power, for example, compared with the reference. Explorations of different sensory stimuli have produced a different exponential equation, a different mathematical curve, for each one.

I thought it would be interesting to apply such exponential ideas to time and to rates of development and change of musical material. I did this is various ways in various pieces. The simplest manifestation of Exponential Structure in my music concerns the amount of time in sections of the work as ever-decreasing by a mathematical factor instead of by subtraction. One of my pieces that demonstrates this Exponential Structure is *Timberline*, as discussed below. The result of using such a structural tool in this case is sustained energy over a period of time, with the energy building up gradually to a climactic conclusion as time segments decrease and musical complexity increases. My music, though, does not seek to present an abstract mathematical concept as art. Exponential Structure is one tool of many that I use in the service of composing music.

Timberline was composed in 1991 for the Relâche Ensemble of Philadelphia (flute, clarinet, bassoon, viola, contrabass, piano/synth, percussion). I began work in my usual way, working with players in order to understand as much as I could of the possible instrumental sounds and playing techniques. I made many pages of sketches of musical materials. Based on sketched materials, I determined that the piece would consist of two parts. In the first part, the materials and methods of developing materials would be gentle and lyrical. It would be close to 6 minutes. The second part would be longer, close to 11 minutes, and would be persistent and unrelenting in the way it would unfold. It would gradually develop from simple phrases to a more complex high energy climax. These decisions informed the equations that I then developed.

Timberline uses two different exponential equations to define the two parts of the piece - beginning through Letter J, and then Letter K to the end. The anticipated tempo for the first part

was quarter note = 50 (though later this was changed to quarter note = 60, because the faster tempo worked better with the sounds and phrases). The first part of the piece was imagined to be a little under 6 minutes, actually 353 seconds, or 294 beats at the anticipated tempo. The number of sections in the first part of the piece was defined to be 11, based on my musical materials.

The equation for first section - beginning through Letter J - is below. The mathematical constant for producing the values by which to multiply the number of beats in the previous segment was set at .97, a number which for these purposes can be considered somewhat close to "1". (Setting the constant to "1" itself would produce no change in time of the segments. A number close to "1" would yield a small change.) Solving for "x" in the equation below gives the value 31, the number of beats in the opening section. The time in the rest of the sections, which sections are denoted by Letters and defined by changes of pitch center, are gently decreasing until the end of the first part of the piece.

$$x + .97x + .97^2x + .97^3x + .974^x + .97^5x + .97^6x + .97^7x + .97^8x + .97^9x + .97^{10}x = 294$$
$$x + .97x + .94x + .91x + .89x + .86x + .83x + .80x + .78x + .76x + .73x = 294$$
$$x \approx 31$$

So the sequence of numbers for beats in each section is approximately:

31, 30, 29, 28, 27, 27, 26, 25, 24, 24, 23

As noted before, the actual tempo was set later to quarter note = 60, but the above equation was basically followed. The length of the first part of the piece at this tempo is about 5 minutes.

The second part of the piece was desired to be close to 11 minutes long. Based on the musical materials, the tempo was set at quarter note = 66. The second part was defined to be 708 beats. The number of sections was defined to be 10. A much smaller multiplier was chosen for this second equation (.85 as opposed to .97) with the result being that the ongoing decrease of the time in the sections (again denoted by Letters and defined by pitch center) is more drastic. The musical changes are propelled at a faster rate as the piece rushes to its conclusion. Again, the numbers serve the music, not vice versa. For example, the equation's numbers are followed fairly closely until letter R, when the piece is nearing its arrival point, at Letter T. From letter R to the end the timing of sections is intuitive.

The equation for the second section, Letter K to Letter T, is below.

$$x + .85x + .85^2x + .85^3x + .85^4x + .85^5x + .85^6x + .85^7x + .85^8x + .85^9x = 708$$
$$x + .85x + .72x + .61x + .52x + .44x + .38x + .32x + .27x + .23x = 708$$
$$5.34x = 708$$
$$x \approx 132$$

So the sequence of numbers for beats in each section is approximately:

132, 112, 95, 81, 70, 59, 50, 42, 36, 31

The above equation was basically followed for much of the second part of the piece, with notable exceptions as explained on the next and last page.

equation number of beats	actual number	comments
beginning - 31 beats	33	From the beginning through Letter J, differences in timing are mainly due to carrying out lengths of phrases.
Letter A - 30 beats	30	
Letter B - 29	29	
Letter C - 28	28	
Letter D - 27	27	
Letter E - 27	28	
Letter F - 26	24	
Letter G - 25	25	
Letter H - 24	22.5	
Letter I - 24	21	
Letter J - 23	18	

(So far this is a very gentle decrease in beats from section to section, perhaps not even picked up as ever-decreasing time segments by the human ear/brain. This is in contrast to the second and final part, with time segments decreasing at a faster pace.)

Letter K - 132	159	Musically, Letter K, beginning of 2nd part of the piece, needed to be longer than in equation.
Letter L - 112	114	
Letter M - 95	99	
Letter N - 81	79	
Letter O - 70	70	
Letter P - 59	60	
Letter Q - 50	47	
Letter R - 42	28	The musical arrival, climax of the piece, is reached at Letter T. In preparation, the timings of sections Letter R and Letter S are intuitive and not controlled by the equation. Note that the equation itself ends with Letter T. More time was added at the end in order to carry out the development of musical materials and the piece as a whole.
Letter S -36	40.5	
Letter T - 31	18	
Letter U - not in equation	29	
Letter V - not in equation	22.5	

Score is available from Frog Peak Music

http://frogpeak.org/

For performance questions please contact the composer

LVVVV@aol.com

www.loisvvierk.com