PETER JAMES LEARN

CAN ONE HEAR THE SHAPE OF A DRUM?

For Mixed Octet

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INSTRUMENTATION

Flute/Piccolo	Piano
Bass Clarinet	Violin I
Horn in F	Violin II
Percussion	Cello

PERCUSSION INSTRUMENTS

Vibraphone, Snare Drum, Suspended Cymbal
Small Shaker (preferably plastic egg-type), Triangle
Bass Drum, Chimes (or single E-flat/D-sharp chime)

IMPLEMENTS

4 hard yarn mallets, 2 med. mallets, 1 hard plastic or metal mallet, bass or cello bow, drumsticks,
wire brushes, triangle beater, 2 bass drum beaters, chime mallet

- Score is transposed.
- 1/4-tones are indicated by accidentals with arrows affixed ( ).
- Multiphonics are required of the bass clarinetist. Fingerings provided in the score are from P. Rehfeldt's book *"New Directions For Clarinet."* If another fingering better suits a particular instrument or player, it should of course be substituted.
- Bass clarinetist will also require a scrap of cloth with which to mute their instrument.
- Inside-piano passages tested on a Steinway D with the shelf removed. All efforts should be made to adhere to score, but if a particular passage is impossible on a given piano, omission is generally preferable to transposition. In some cases it may be desirable to play these notes on the keys, but dynamic alteration will be necessary to accommodate the difference in timbre.

Ca. 12'

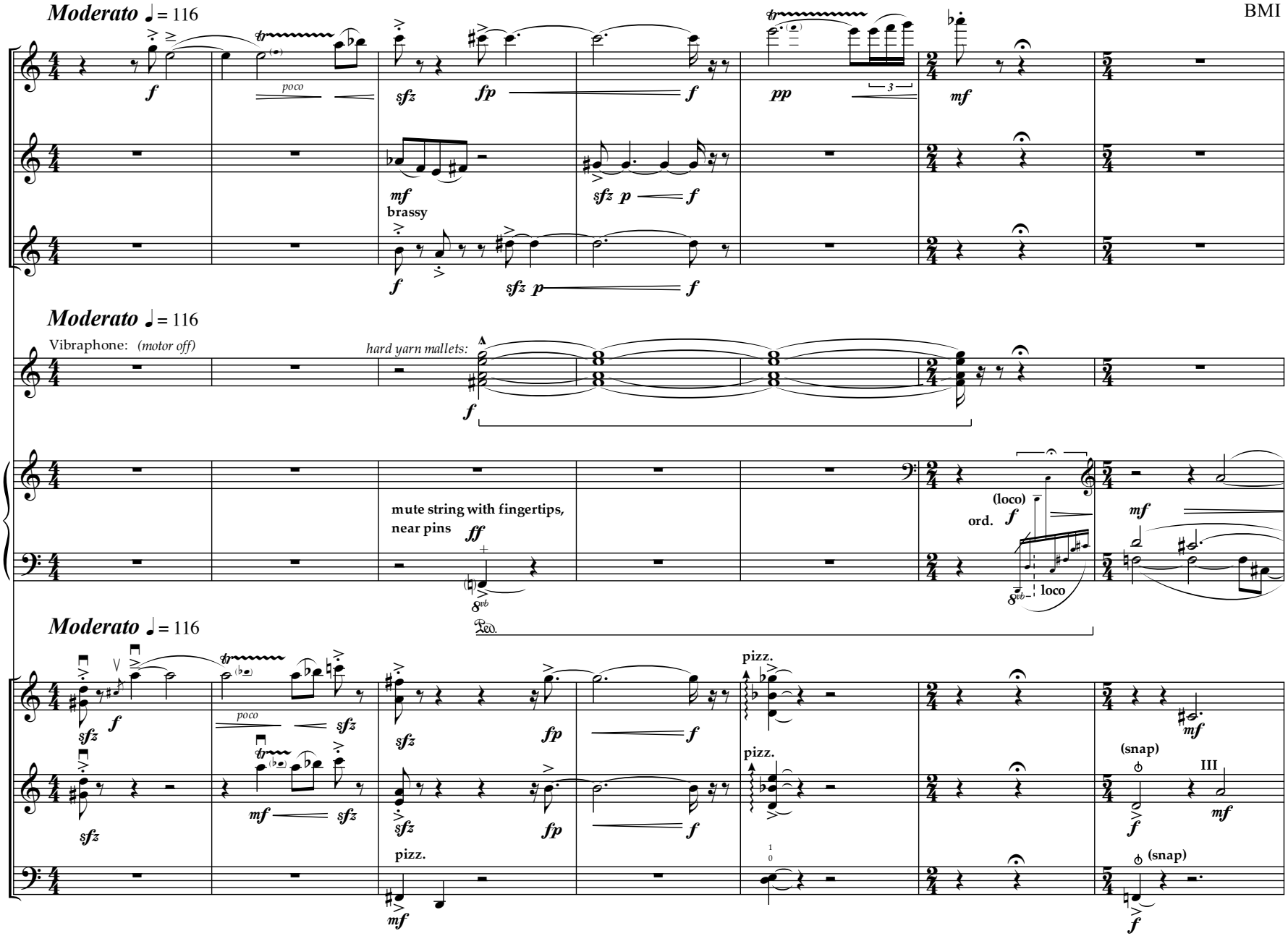
PROGRAM NOTE

"Before I explain the title and introduce the theme ... I should like to state that my presentation will be more in the nature of a leisurely excursion than of an organized tour. It will not be my purpose to reach a specified destination at a scheduled time. Rather I should like to allow myself on many occasions the luxury of stopping and looking around."

- *Mark Kac,* "Can One hear the Shape of a Drum?," The American Mathematical Monthly, Vol. 73, No. 4, Apr., 1966.

CAN ONE HEAR THE SHAPE OF A DRUM?

PETER JAMES LEARN (b. 1982)
BMI



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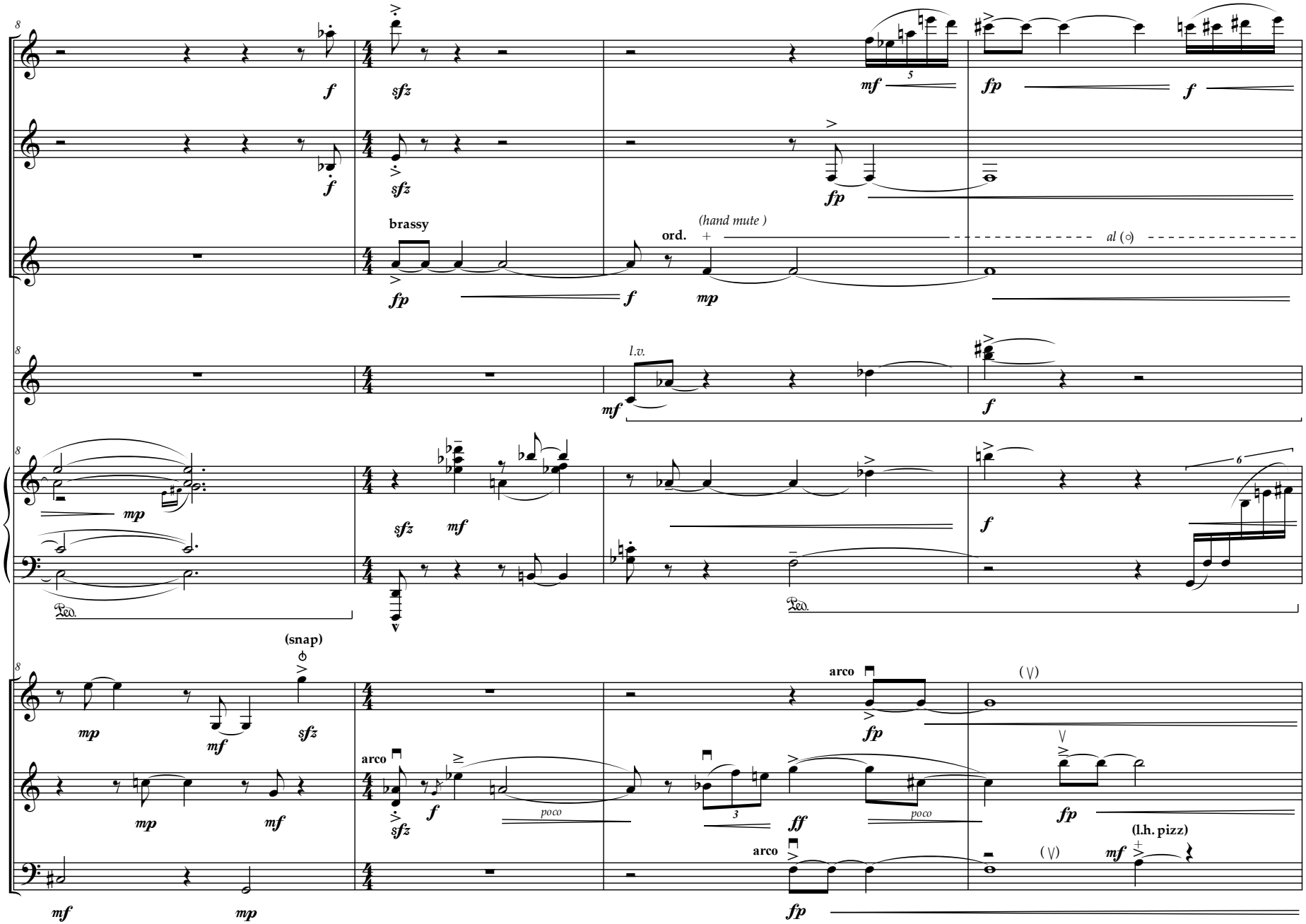
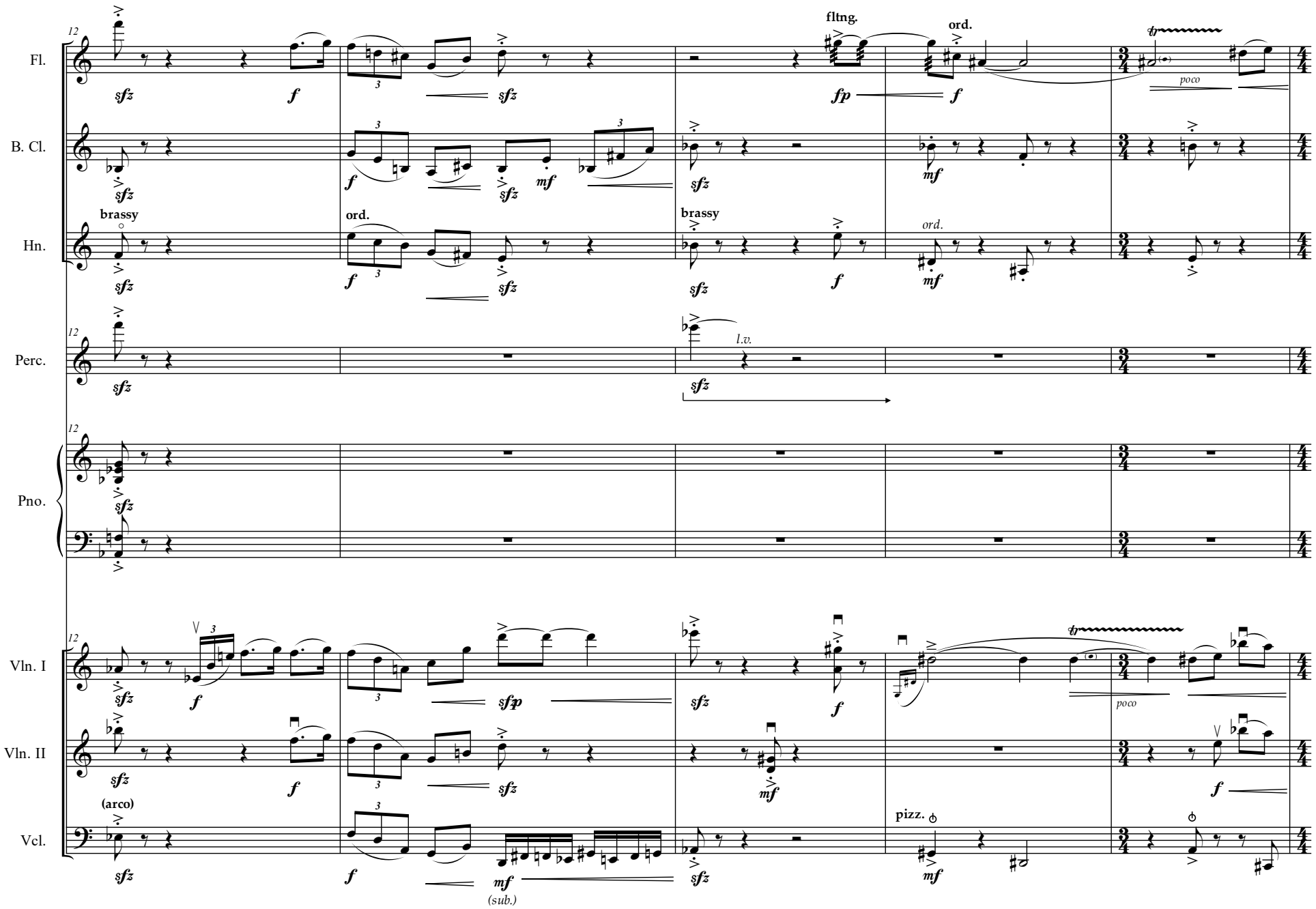
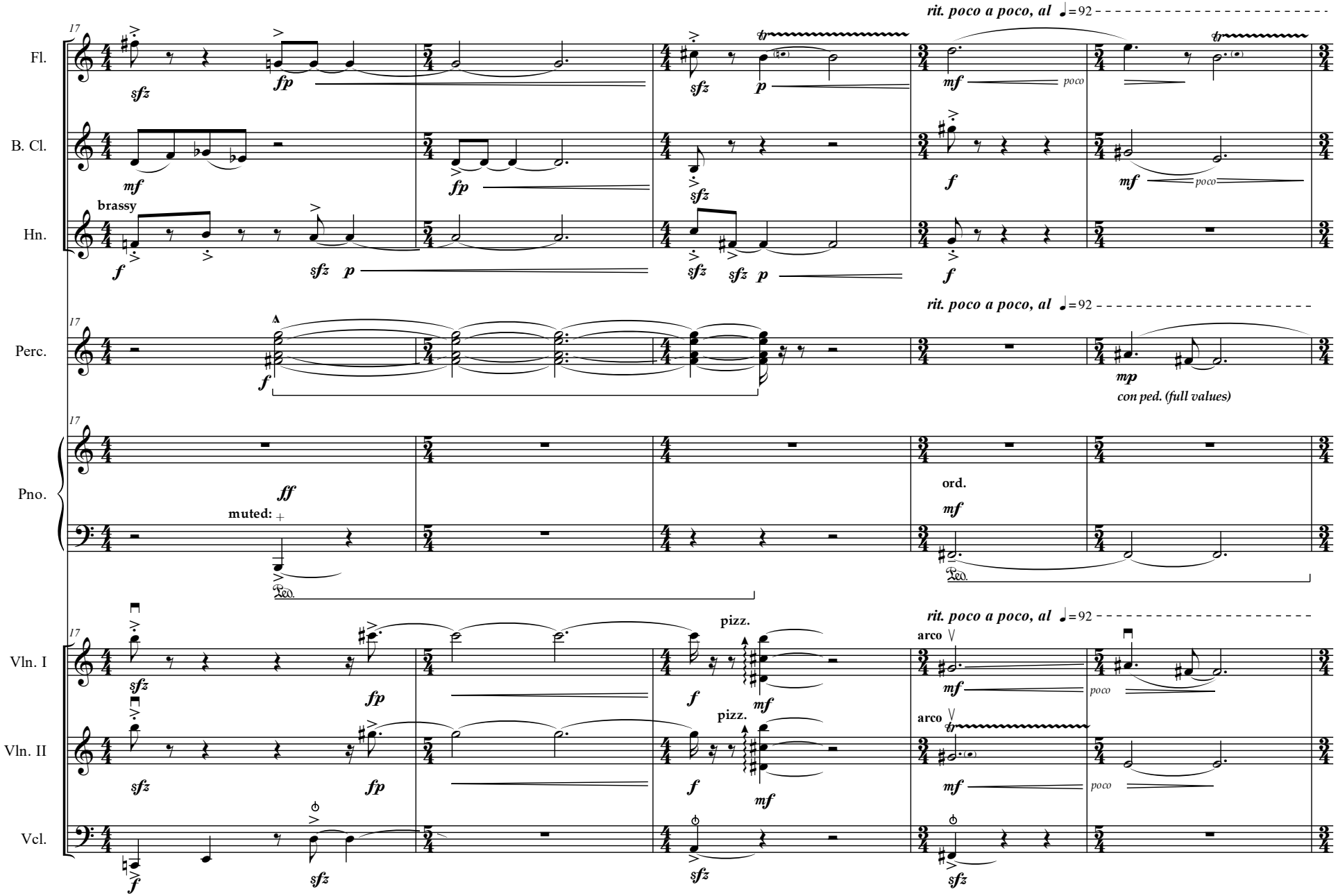
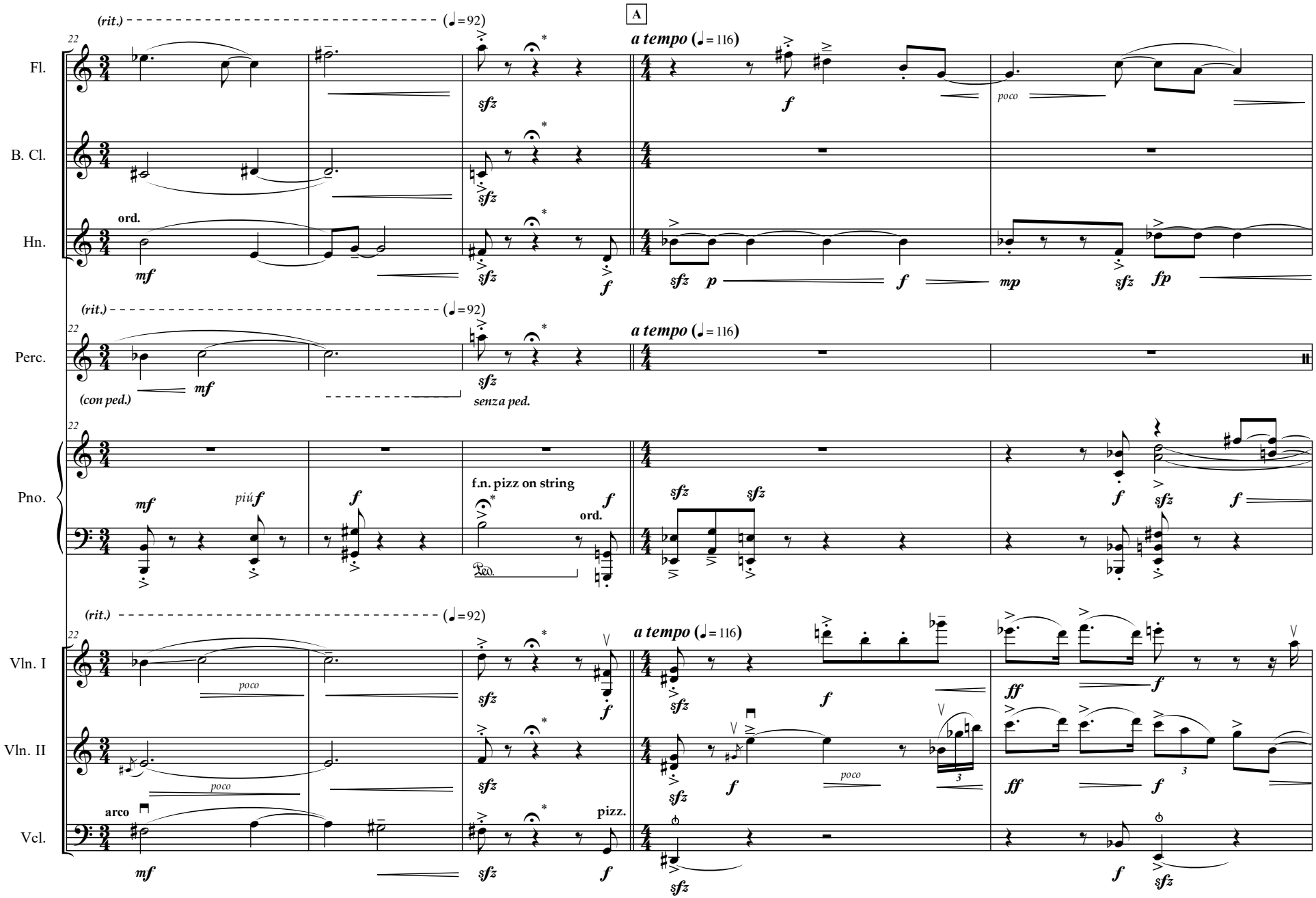
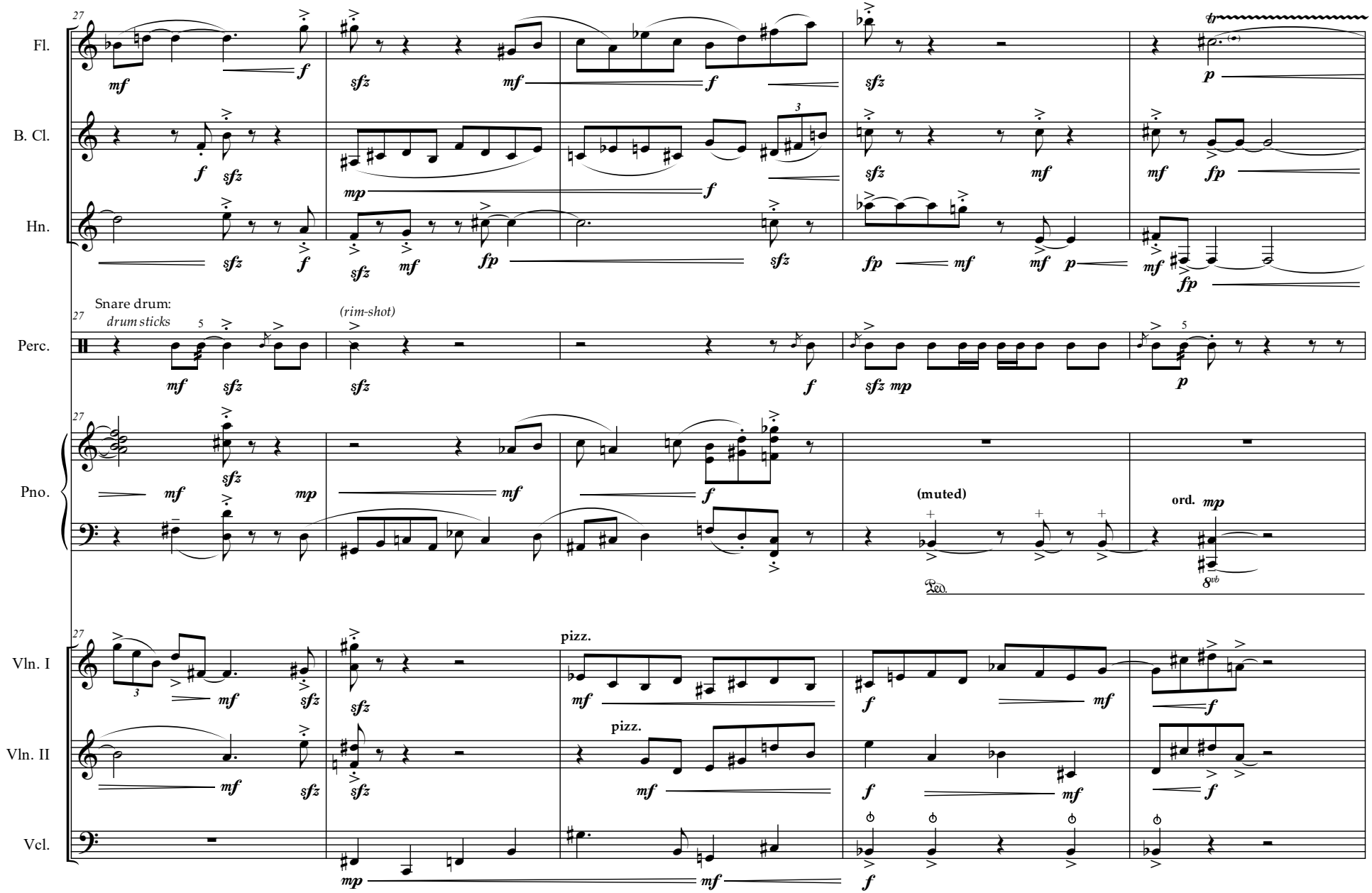

Fl.
B. Cl.
Hn.
Perc.
Pno.
Vln. I
Vln. II
Vcl.
brassy
ord.
(hand mute)
al (○)
l.v.
(snap)
arco
poco
(l.h. pizz)

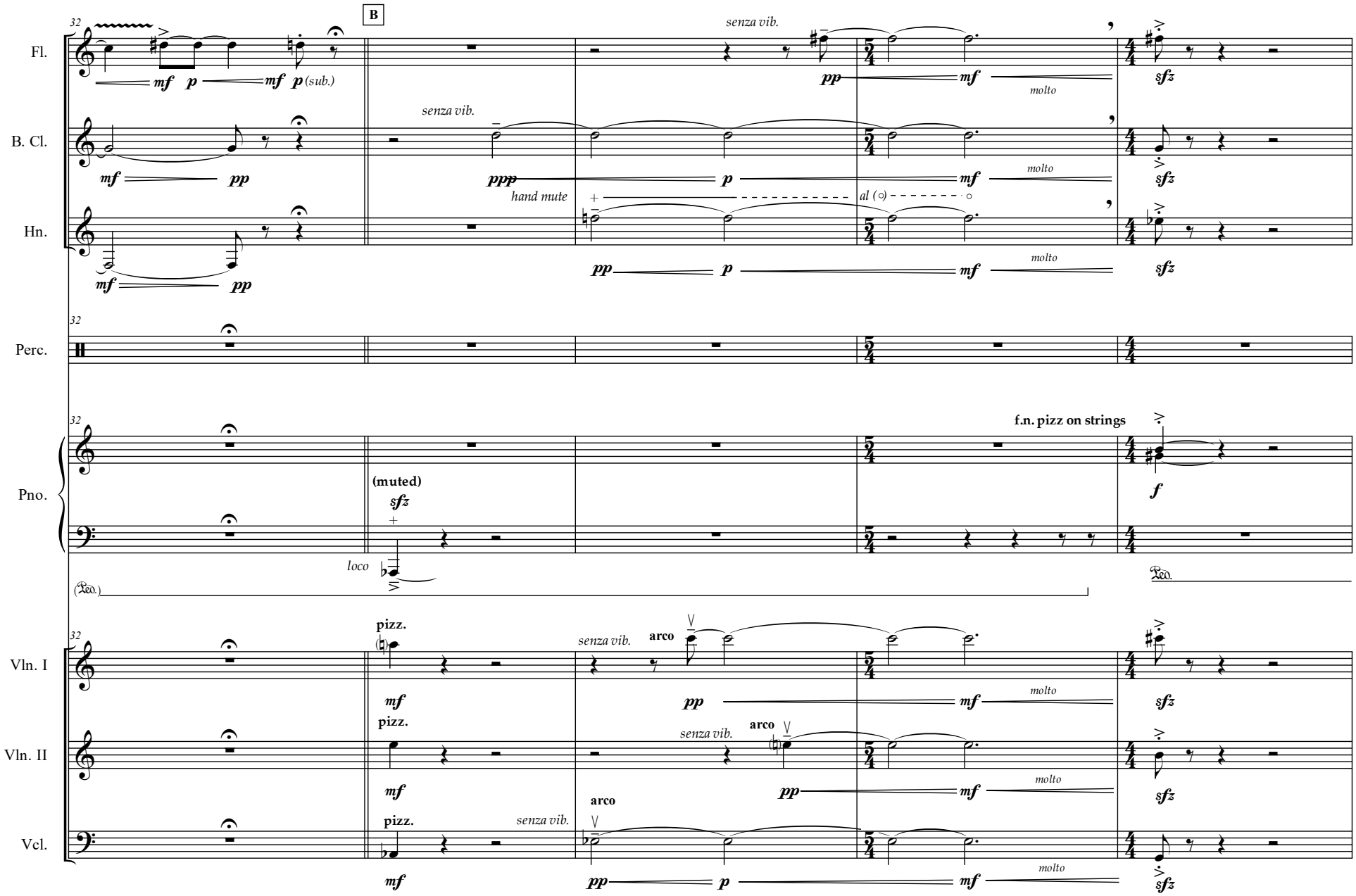

Fl.
B. Cl.
Hn.
Perc.
Pno.
Vln. I
Vln. II
Vcl.
fltng.
ord.
brassy
l.v.
poco
pizz.
(arco)
(sub.)

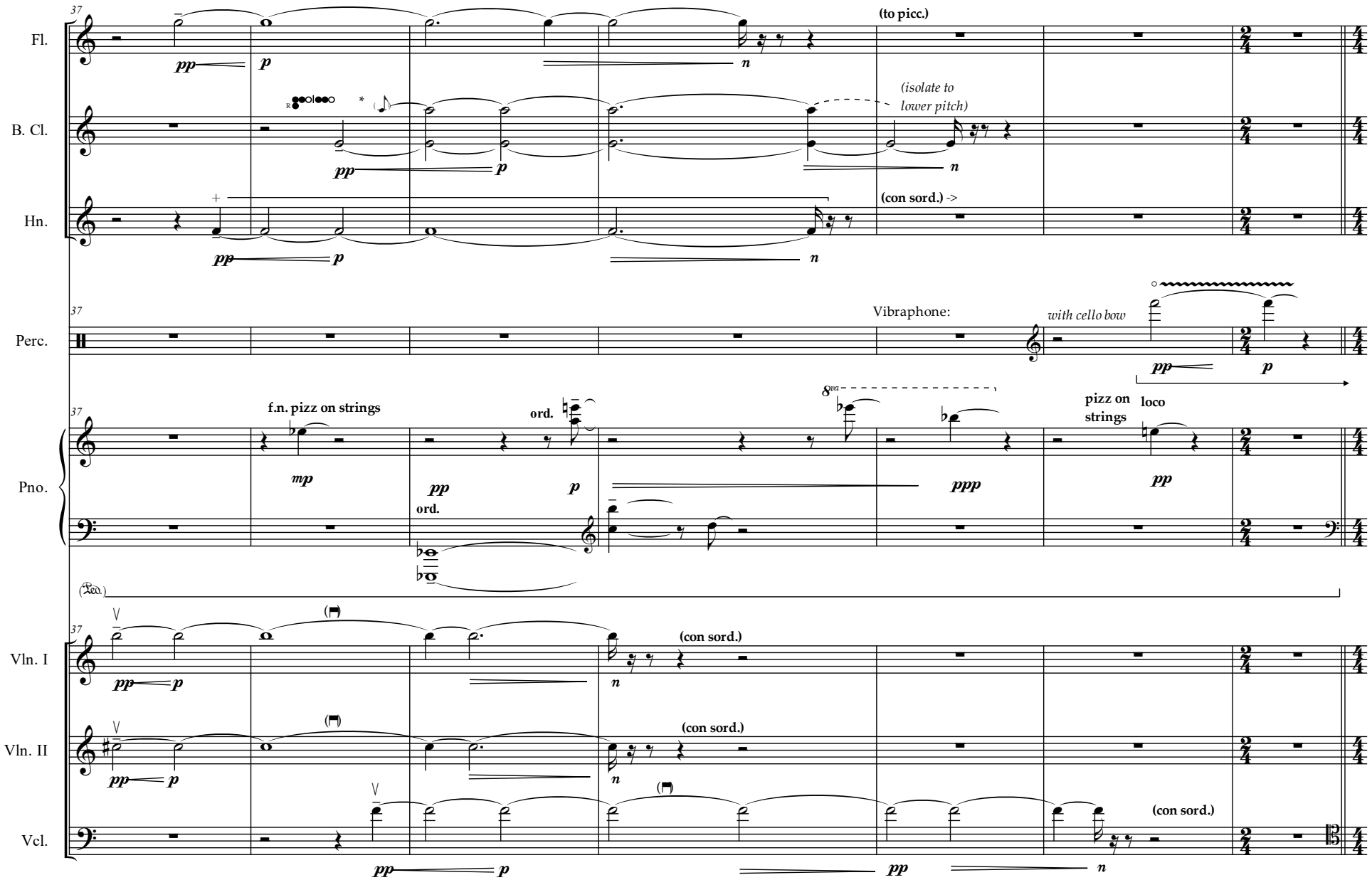

rit. poco a poco, al ♩=92
17
Fl.
B. Cl.
Hn.
brassy
Perc.
con ped. (full values)
Pno.
muted:
ord.
Vln. I
Vln. II
Vcl.
pizz.
arco
poco



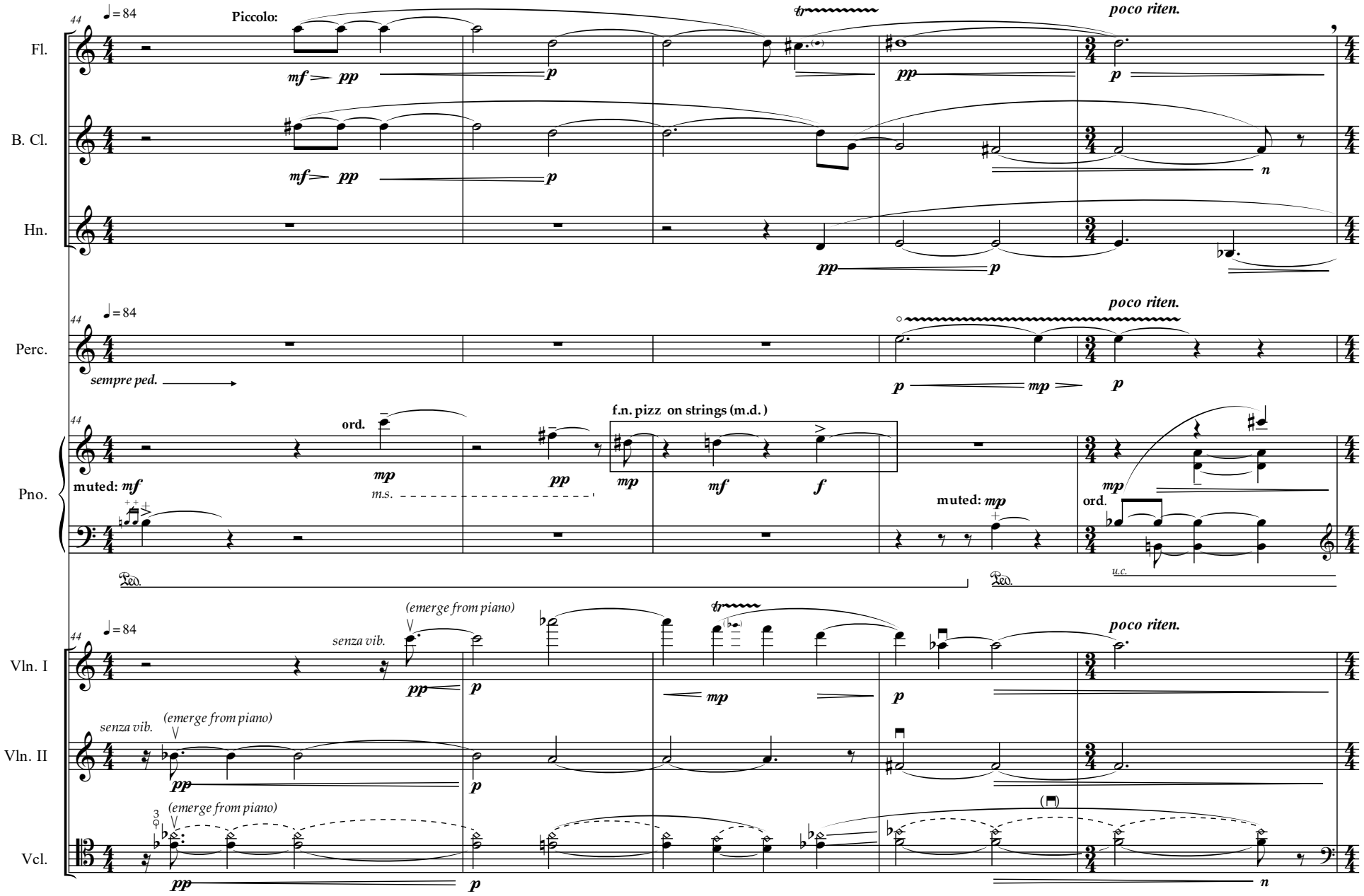
* Allow piano pizz. note to die away considerably before continuing.

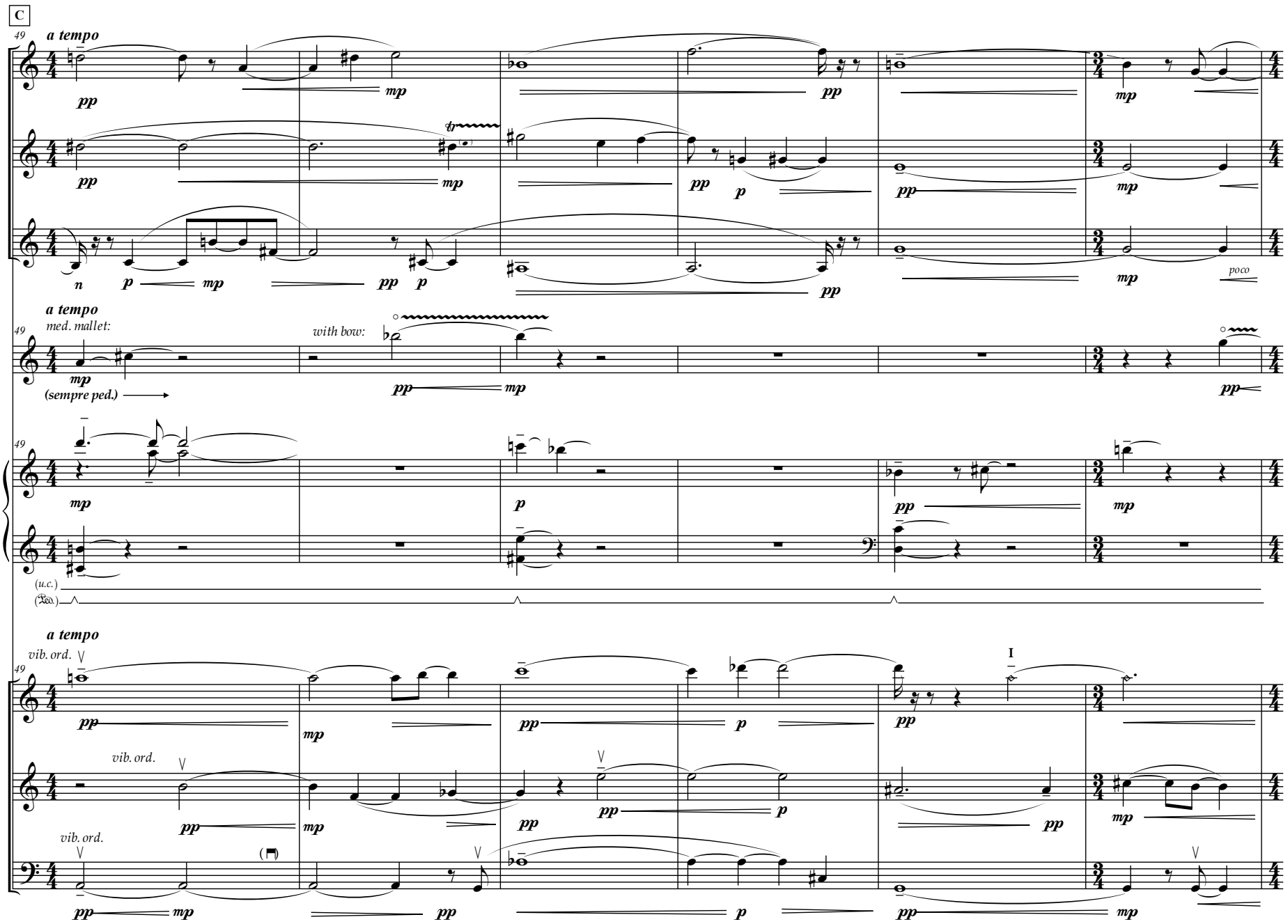

27
Fl.
B. Cl.
Hn.
Snare drum:
drum sticks
(rim-shot)
Perc.
Pno.
(muted)
ord.
Vln. I
pizz.
Vln. II
pizz.
Vcl.

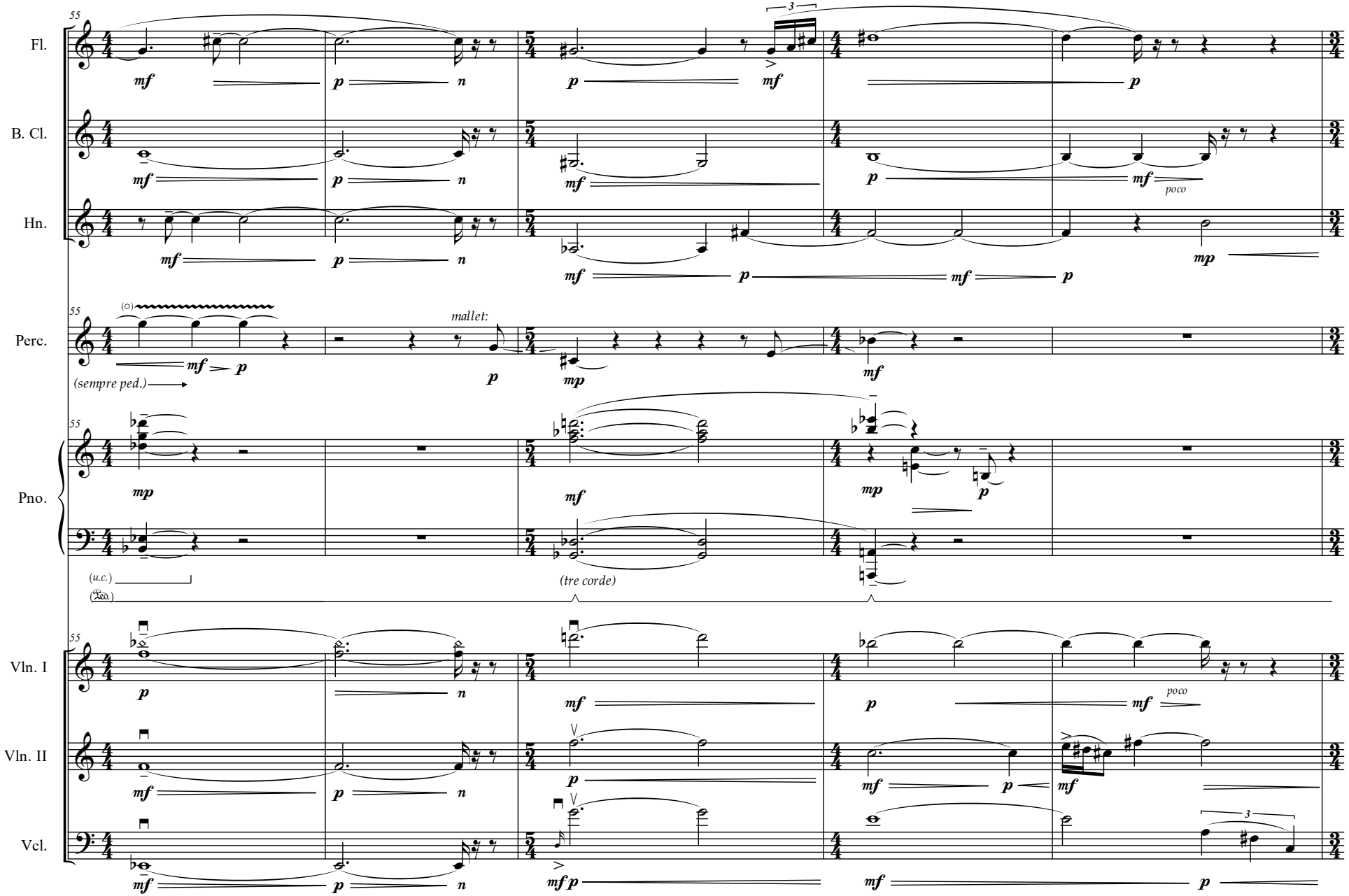

B
Fl.
B. Cl.
Hn.
Perc.
Pno.
Vln. I
Vln. II
Vcl.
senza vib.
molto
hand mute
al (○)
(muted)
loco
f.n. pizz on strings
pizz.
arco
(sub.)

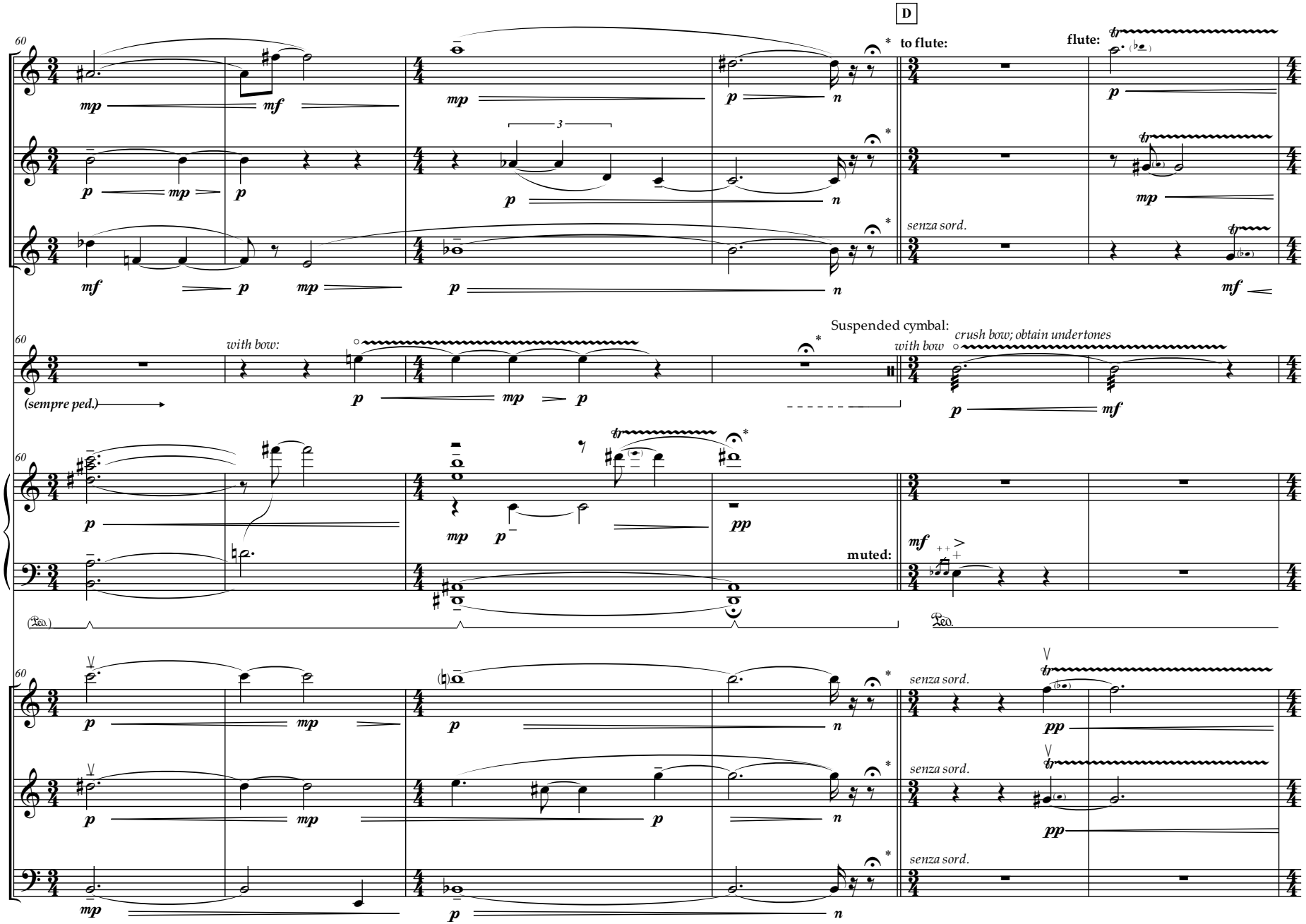


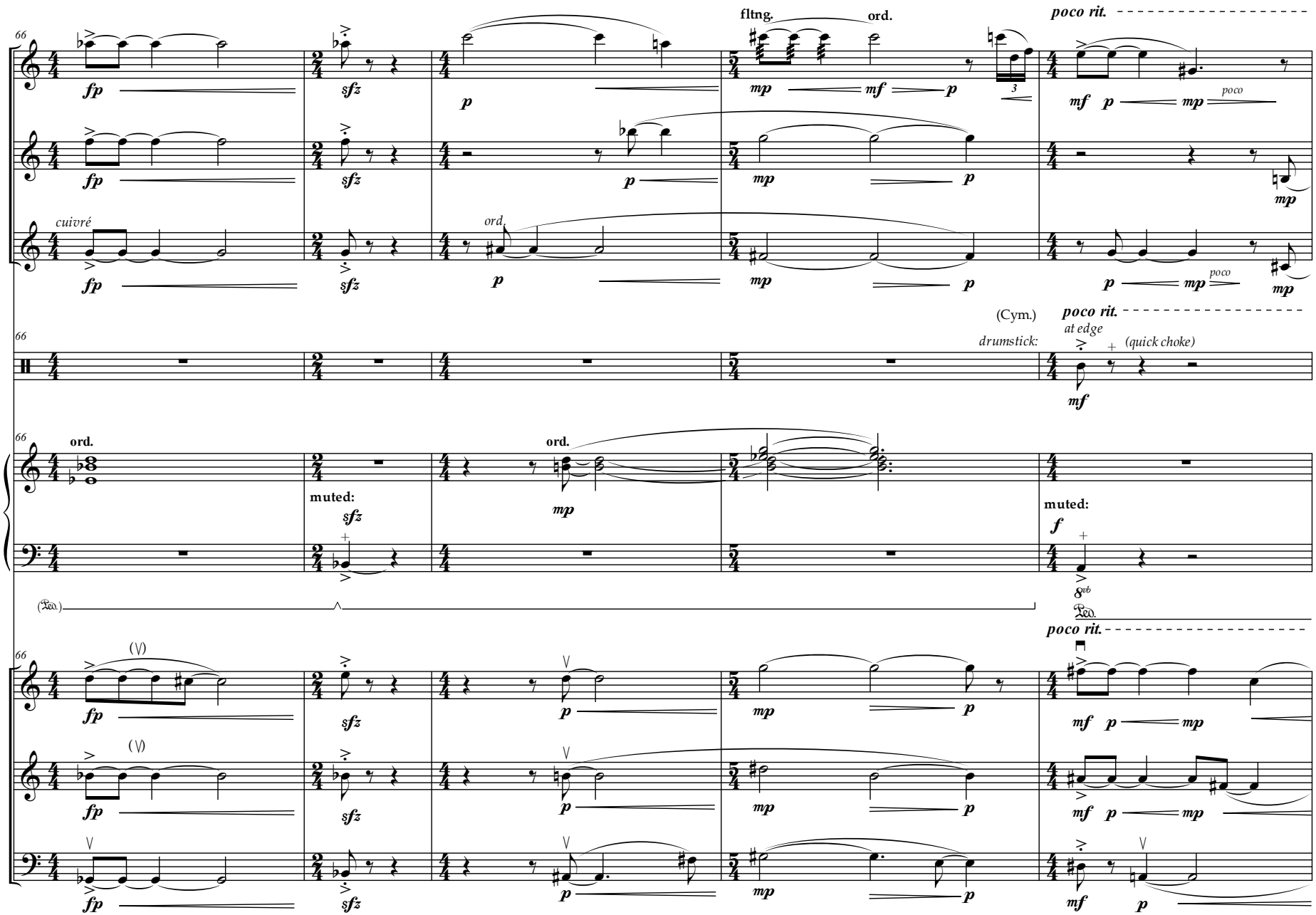
*Produce higher pitch gradually, allowing it to emerge naturally during cresc. This is a cat. 5 multiphonic in P. Rehfeldt's classification system; *"New Directions for Clarinet"* may be referred to for performance tips.

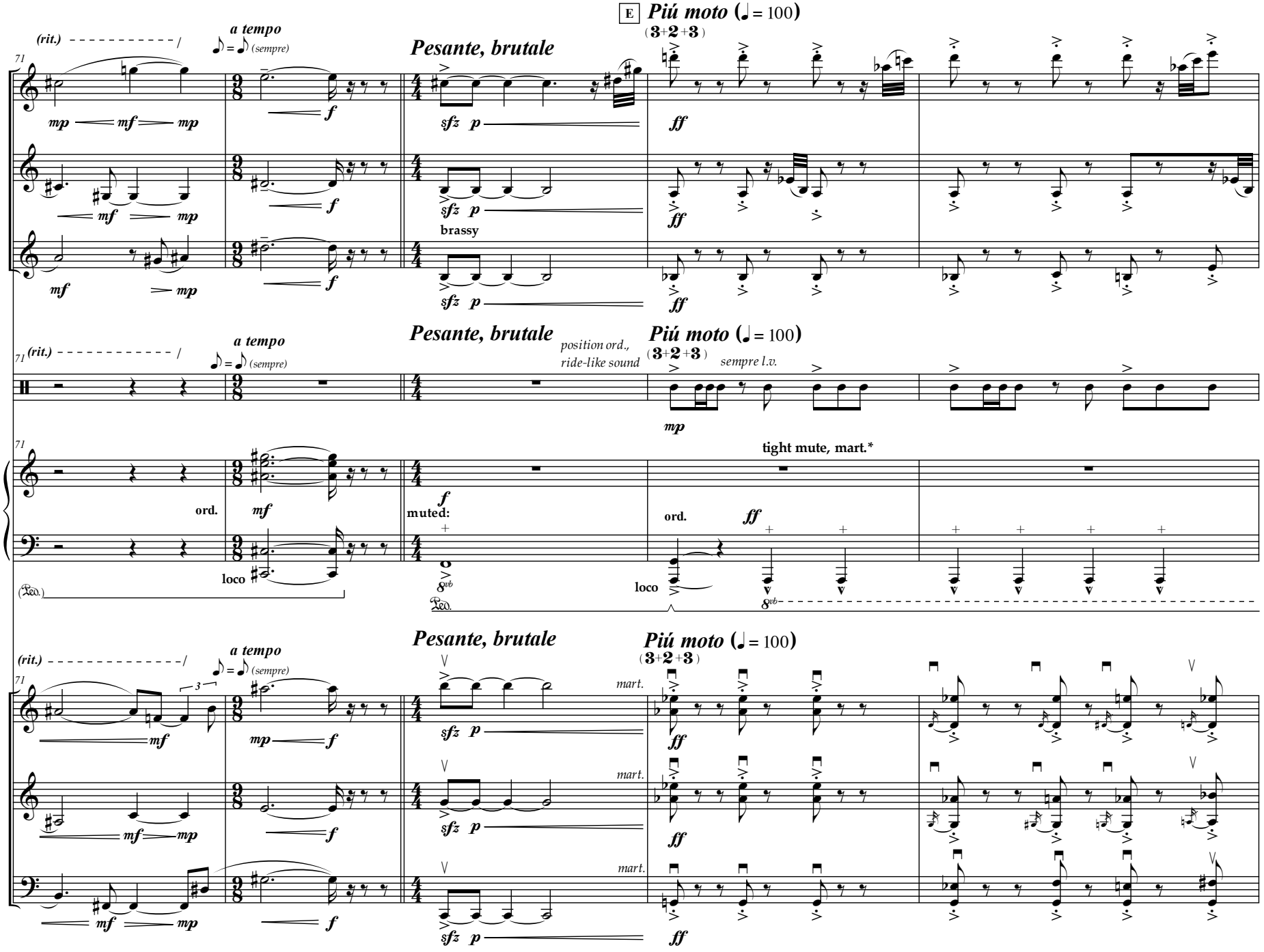

Fl.
B. Cl.
Hn.
Perc.
Pno.
Vln. I
Vln. II
Vcl.
Piccolo:
poco riten.
sempre ped.
ord.
muted:
m.s.
f.n. pizz on strings (m.d.)
(emerge from piano)
senza vib.
u.c.


C
49
a tempo
Fl.
B. Cl.
Hn.
poco
a tempo
med. mallet:
with bow:
Perc.
(sempre ped.)
Pno.
(u.c.)
a tempo
vib. ord.
Vln. I
I
vib. ord.
Vln. II
vib. ord.
Vcl.

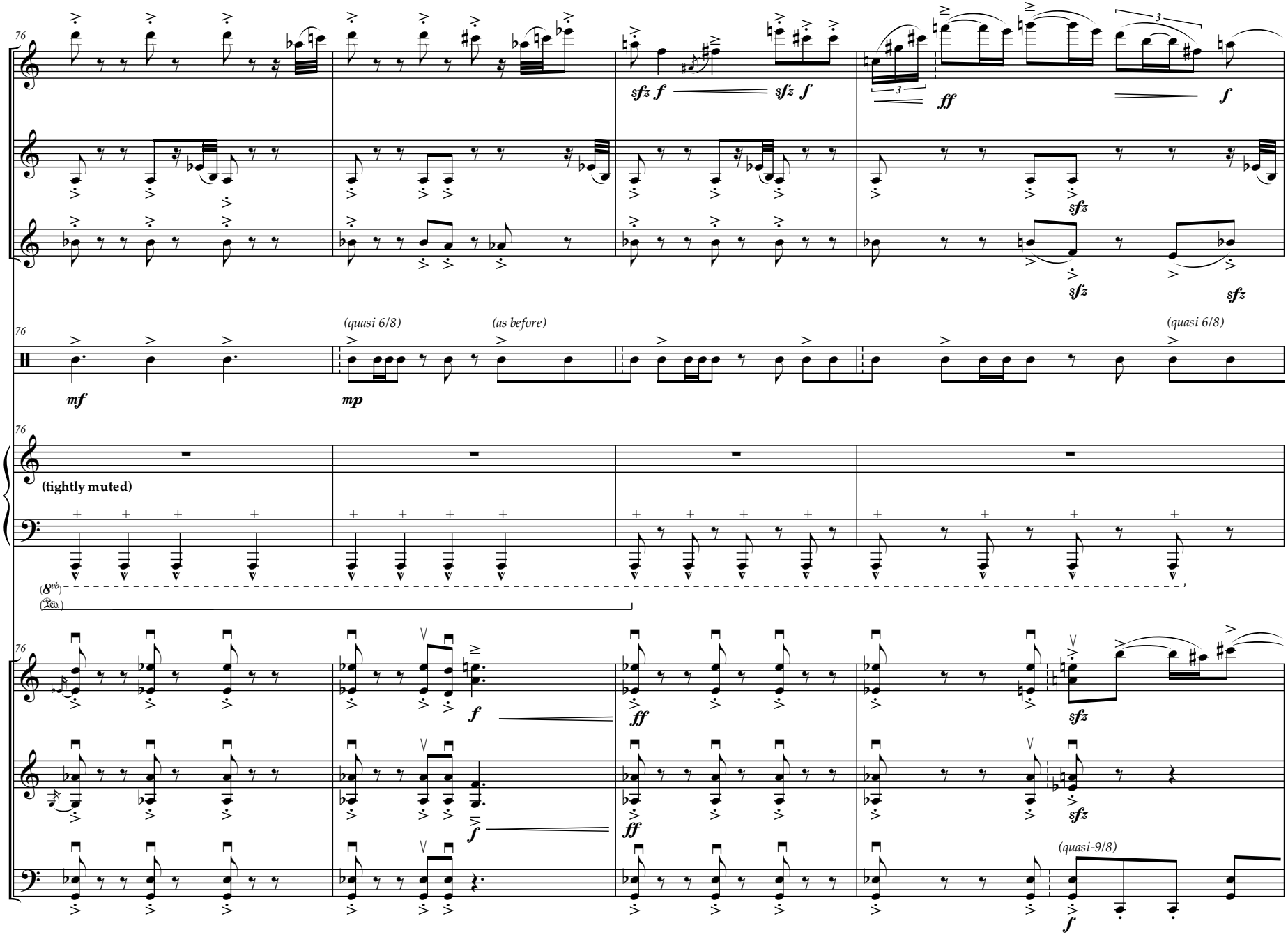

55
Fl.
B. Cl.
Hn.
Perc.
Pno.
Vln. I
Vln. II
Vcl.
mallet:
(sempre ped.)
(u.c.)
(tre corde)
poco
3

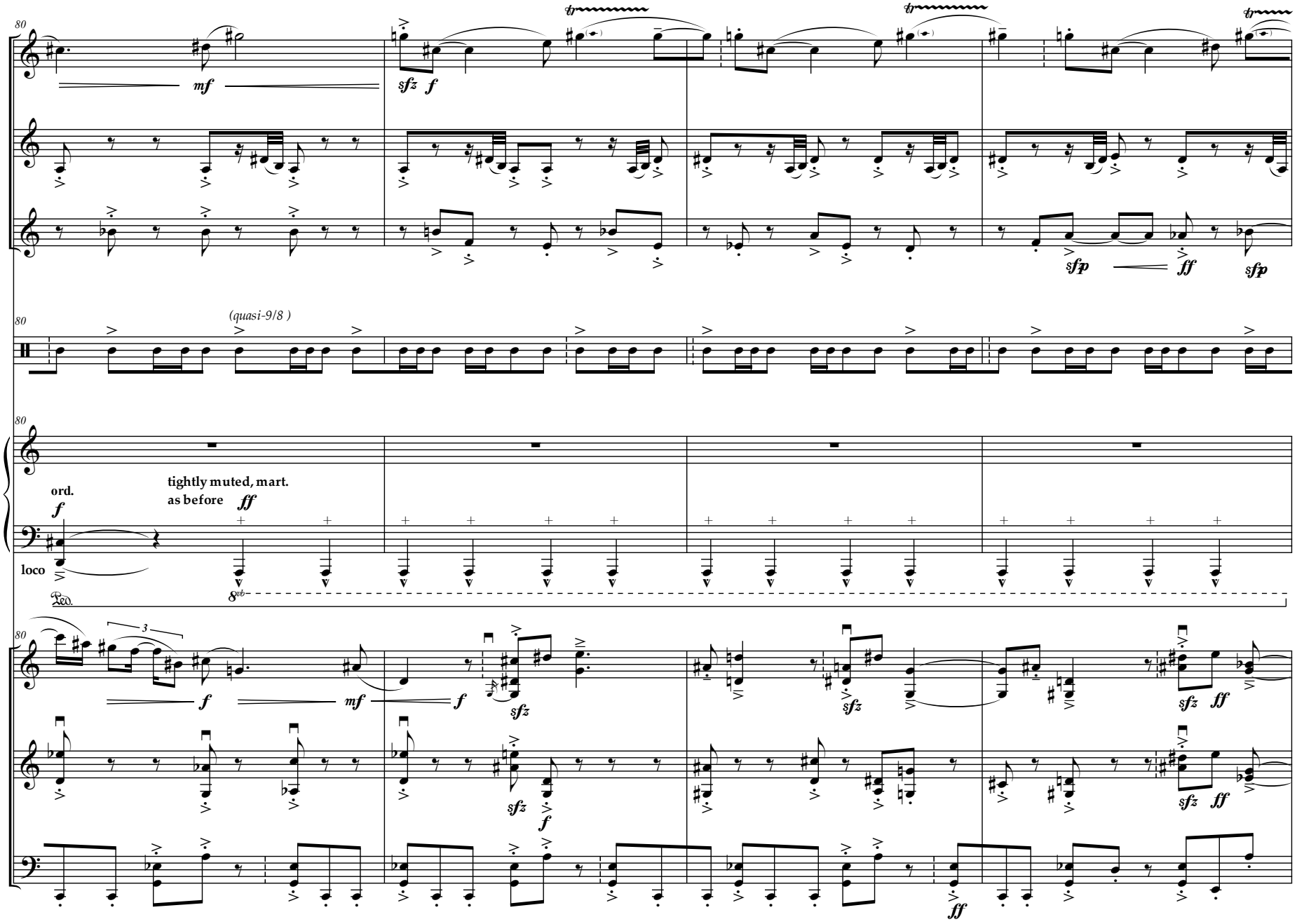

D
Fl.
B. Cl.
Hn.
Perc.
Pno.
Vln. I
Vln. II
Vcl.
to flute:
flute:
senza sord.
with bow:
(sempre ped.)
Suspended cymbal:
with bow
crush bow; obtain undertones
muted:
Ped.
* Allow piano to die away fully.

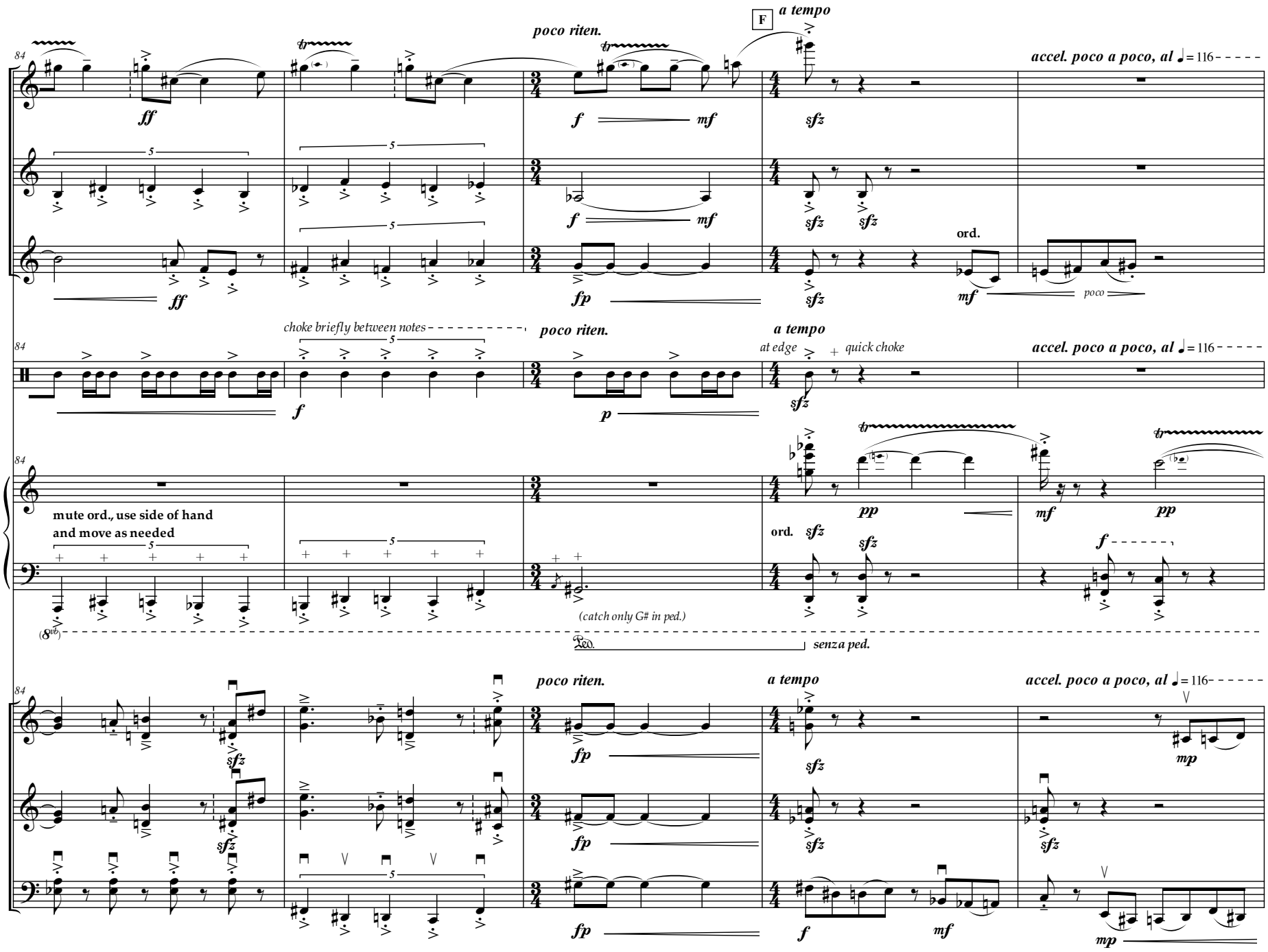

66
Fl.
B. Cl.
Hn.
Perc.
Pno.
Vln. I
Vln. II
Vcl.
fltng.
ord.
poco rit.
cuivré
ord.
(Cym.)
drumstick:
at edge
(quick choke)
muted:
8vb
fp
sfz
p
mp
mf
f
poco

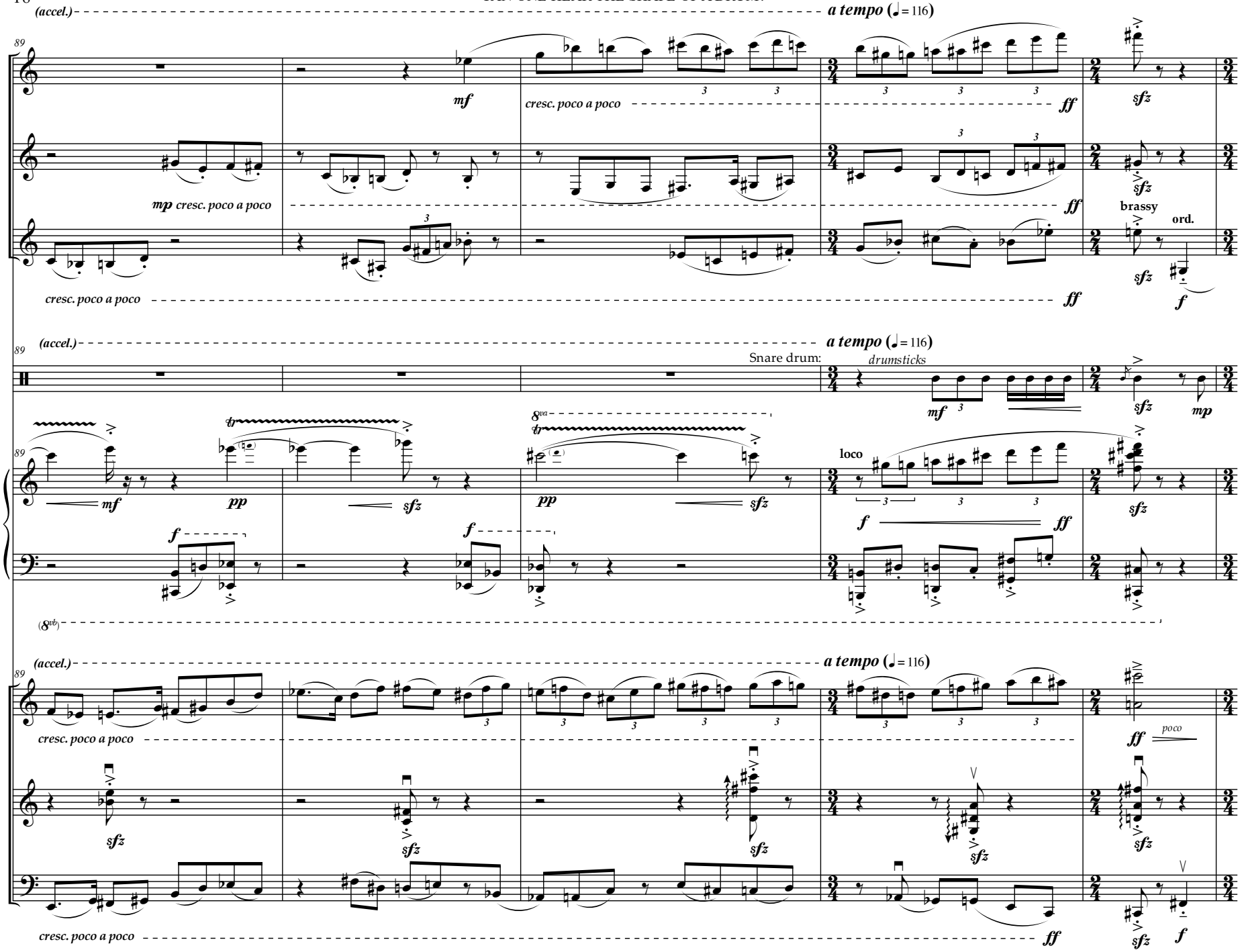


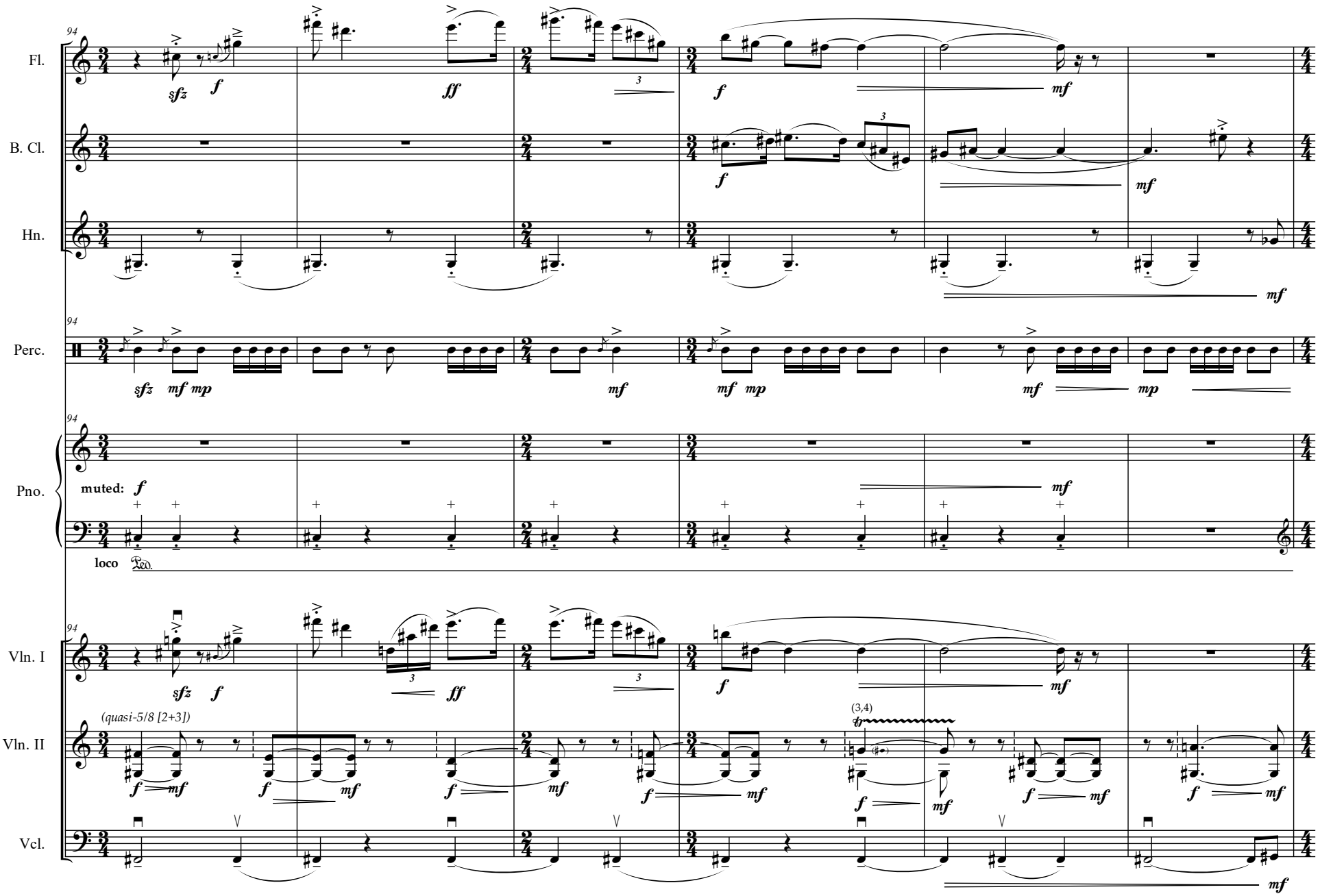
* Mute very tightly and near pins, obtaining a percussive hammering sound with little discernable pitch.

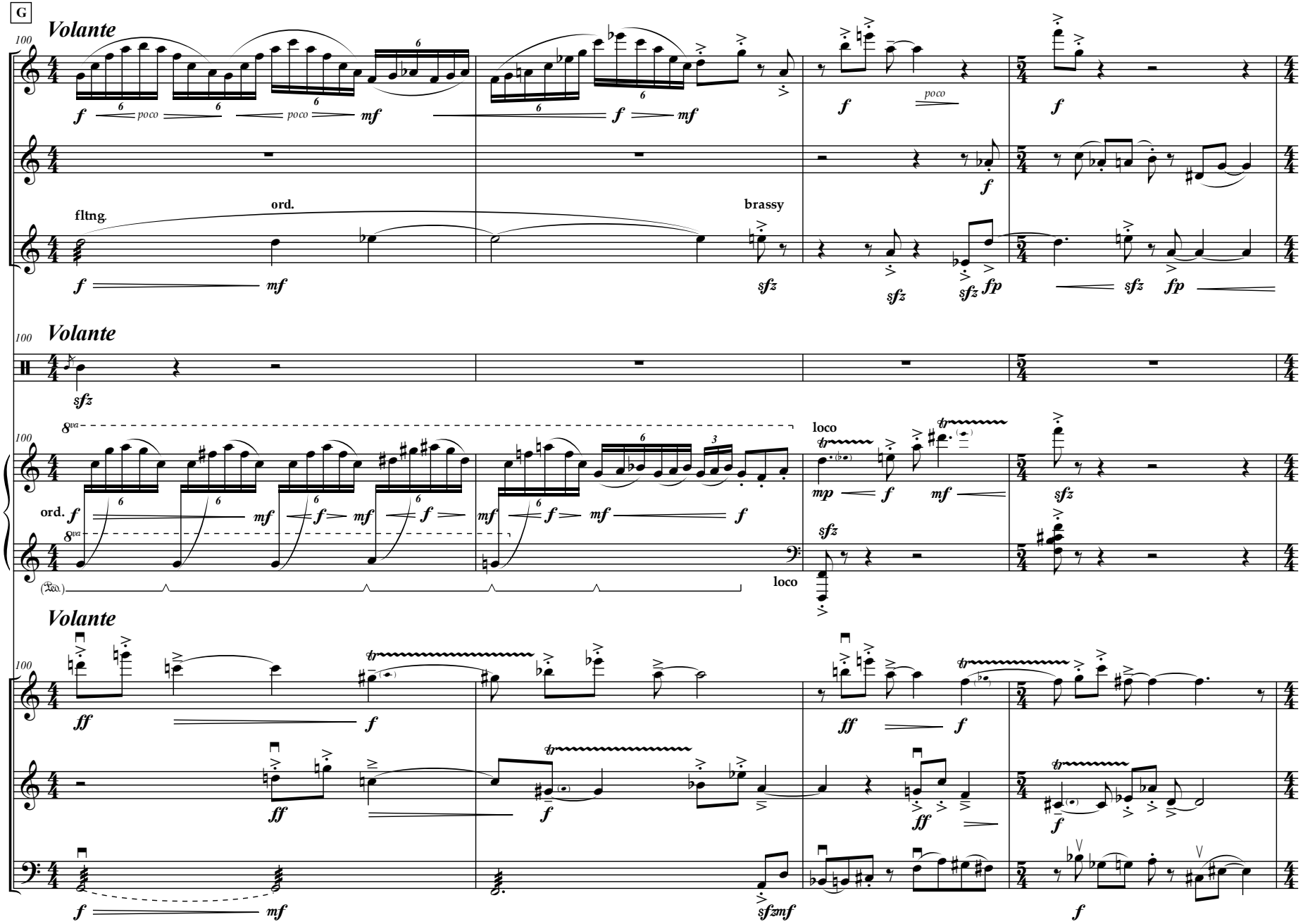

76
Fl.
B. Cl.
Hn.
Perc.
Pno.
Vln. I
Vln. II
Vcl.
sfz f
sfz f
ff
f
sfz
sfz
sfz
(quasi 6/8)
(as before)
(quasi 6/8)
mf
mp
(tightly muted)
(8vb)
f
ff
sfz
f
ff
sfz
(quasi-9/8)
f

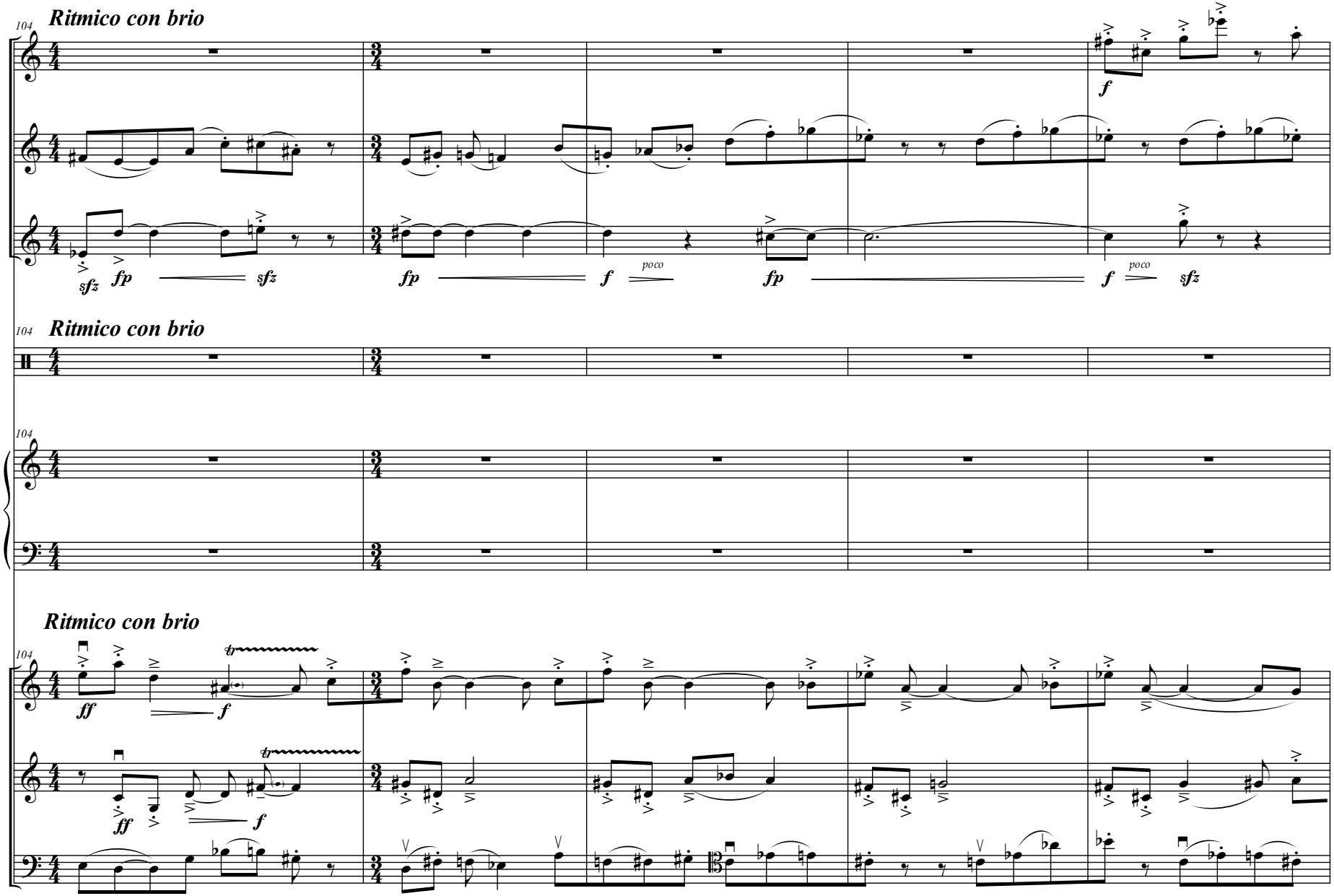

Fl.
B. Cl.
Hn.
Perc.
Pno.
Vln. I
Vln. II
Vcl.
80
mf
sfz f
sfp ff sfp
(quasi-9/8)
ord.
f
tightly muted, mart.
as before ff
loco
8vb
Ped.
3
f mf f
sfz
sfz ff
ff

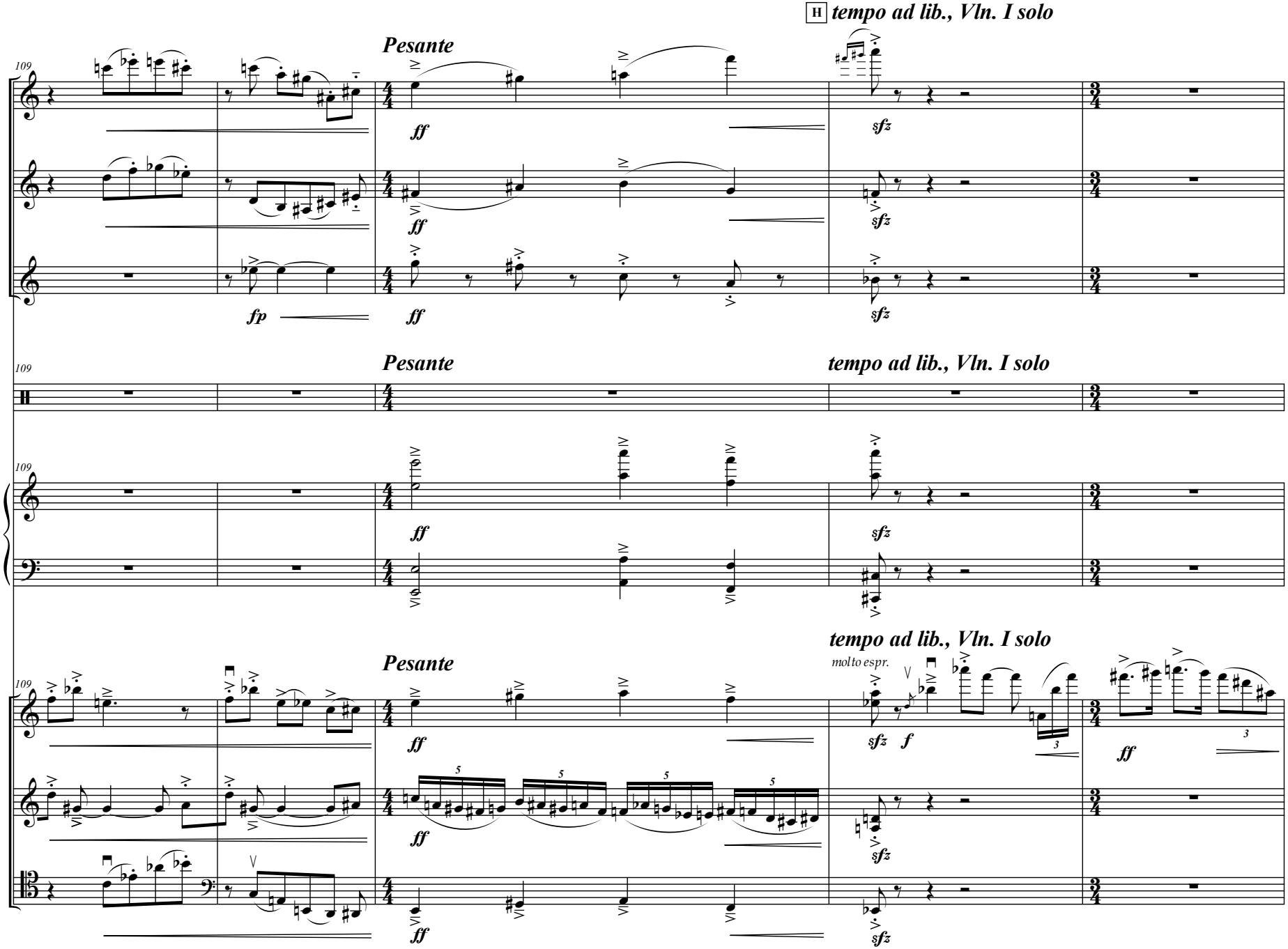

F
a tempo
poco riten.
accel. poco a poco, al ♩= 116
Fl.
B. Cl.
Hn.
ord.
poco
choke briefly between notes
Perc.
at edge
quick choke
mute ord., use side of hand
and move as needed
Pno.
(catch only G# in ped.)
senza ped.
Vln. I
Vln. II
Vcl.

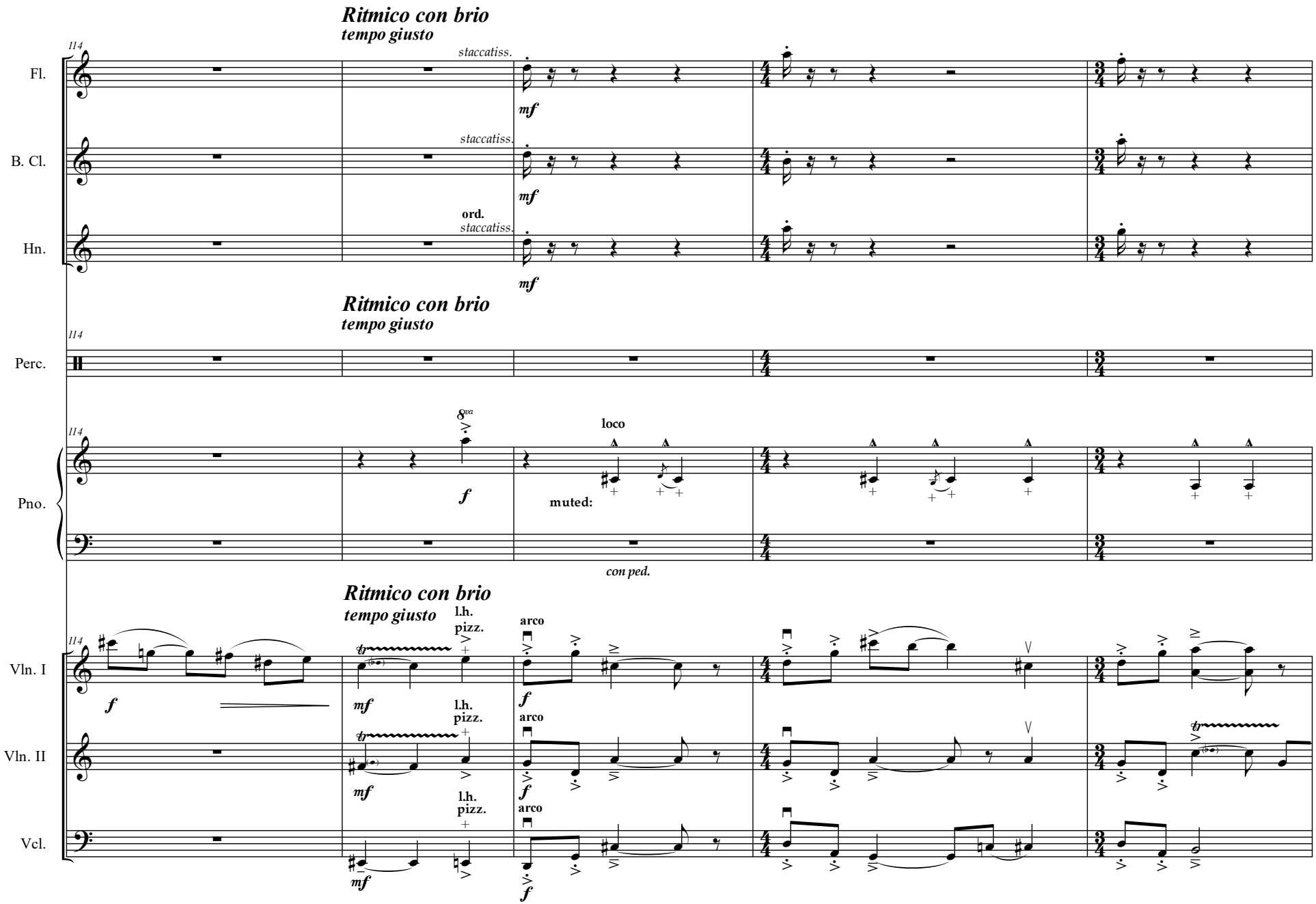

(accel.)
a tempo (♩= 116)
Fl.
B. Cl.
Hn.
Perc.
Pno.
Vln. I
Vln. II
Vcl.
mf
cresc. poco a poco
ff
sfz
mp cresc. poco a poco
brassy
ord.
f
Snare drum:
drumsticks
pp
loco
poco

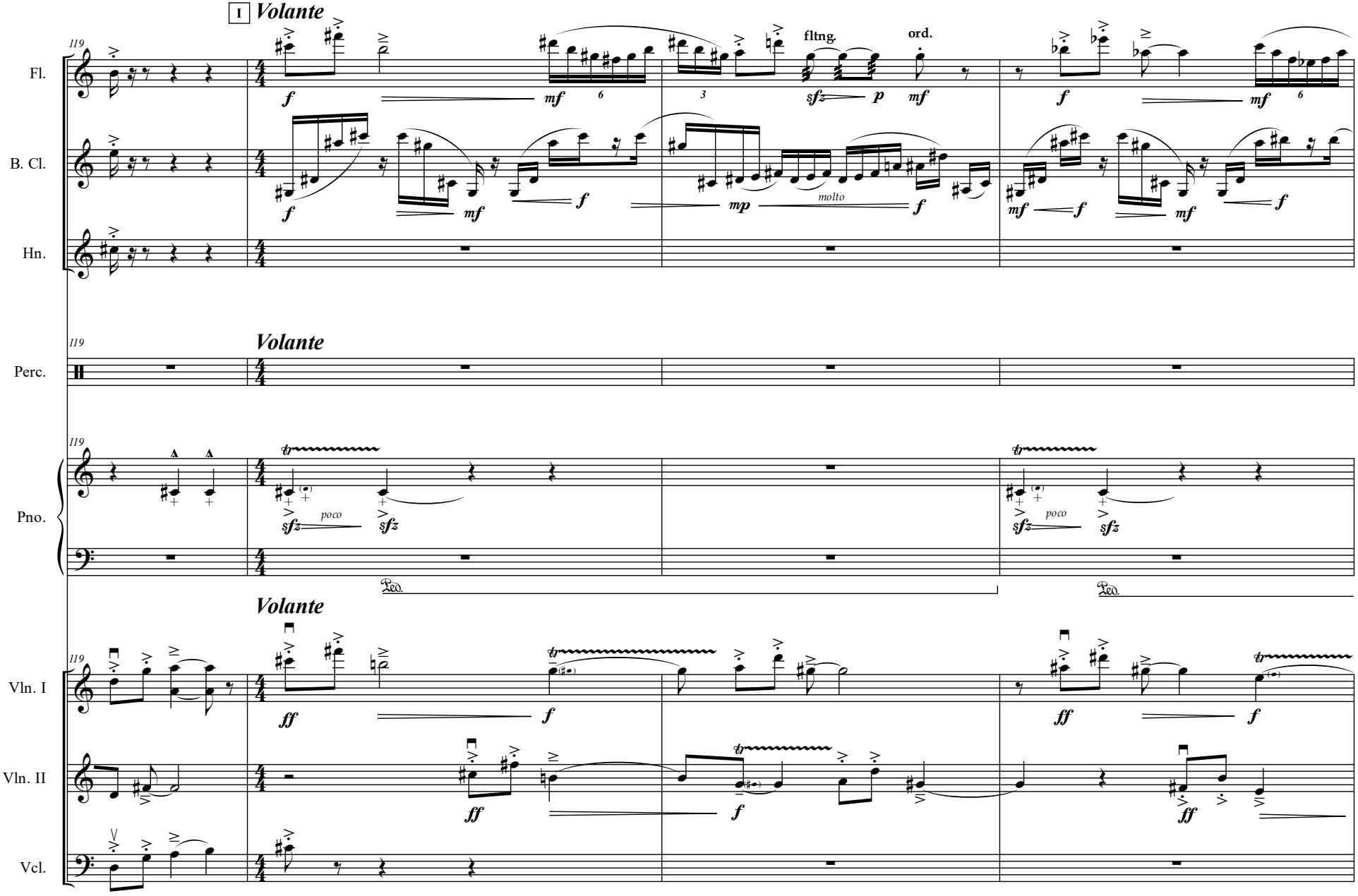

Fl.
B. Cl.
Hn.
Perc.
Pno.
Vln. I
Vln. II
Vcl.
94
sfz f
ff
mf
muted: f
loco
(quasi-5/8 [2+3])
(3,4)
tr

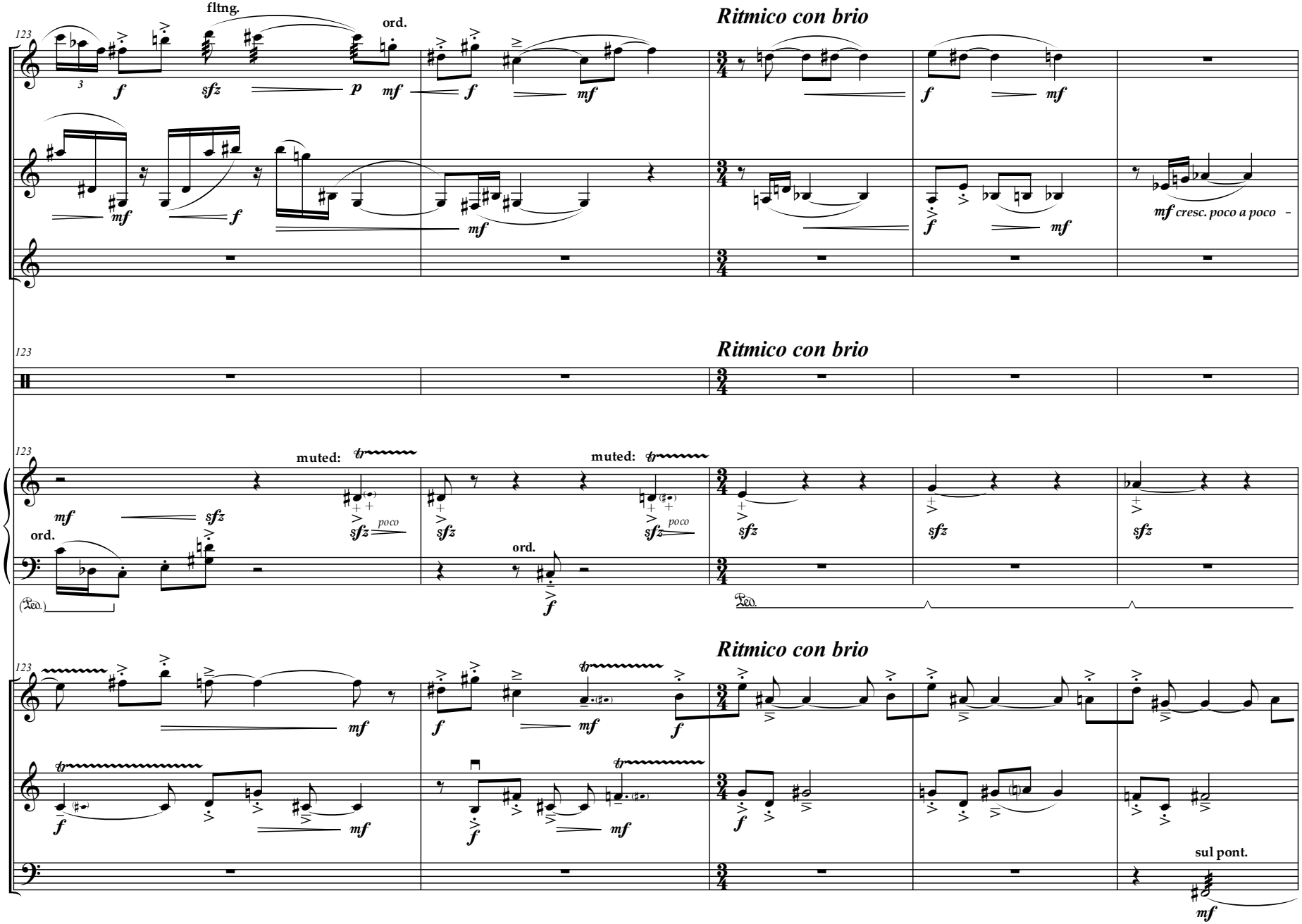

G
Volante
100
Fl.
B. Cl.
Hn.
fltng.
ord.
brassy
Perc.
Pno.
8va
loco
Vln. I
Vln. II
Vcl.
poco
sfz
fp
sfzmf

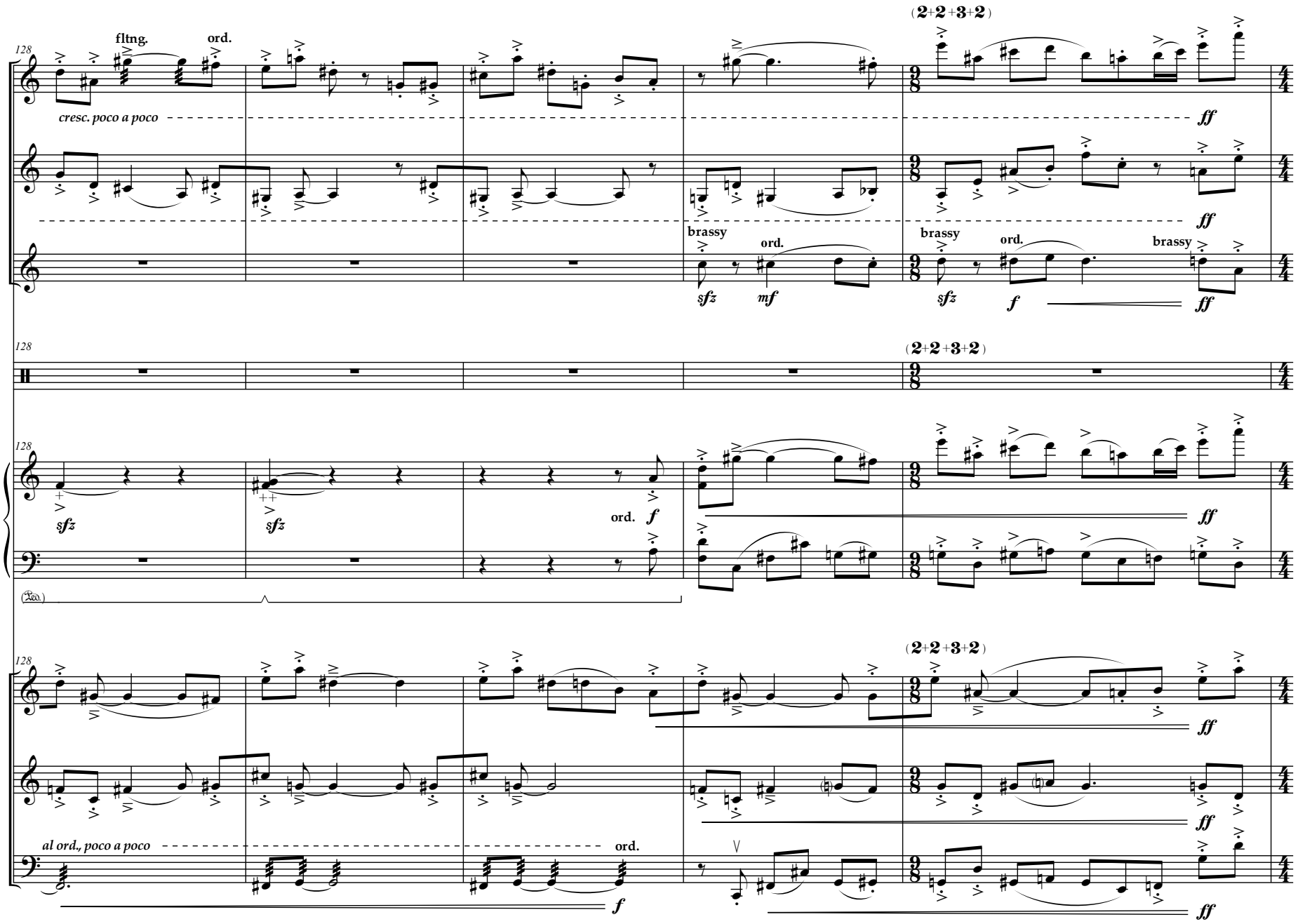

104
Ritmico con brio
Fl.
B. Cl.
Hn.
sfz fp sfz
fp
f poco
fp
f poco sfz
104
Ritmico con brio
Perc.
104
Pno.
Ritmico con brio
104
Vln. I
ff f
Vln. II
ff f
Vcl.

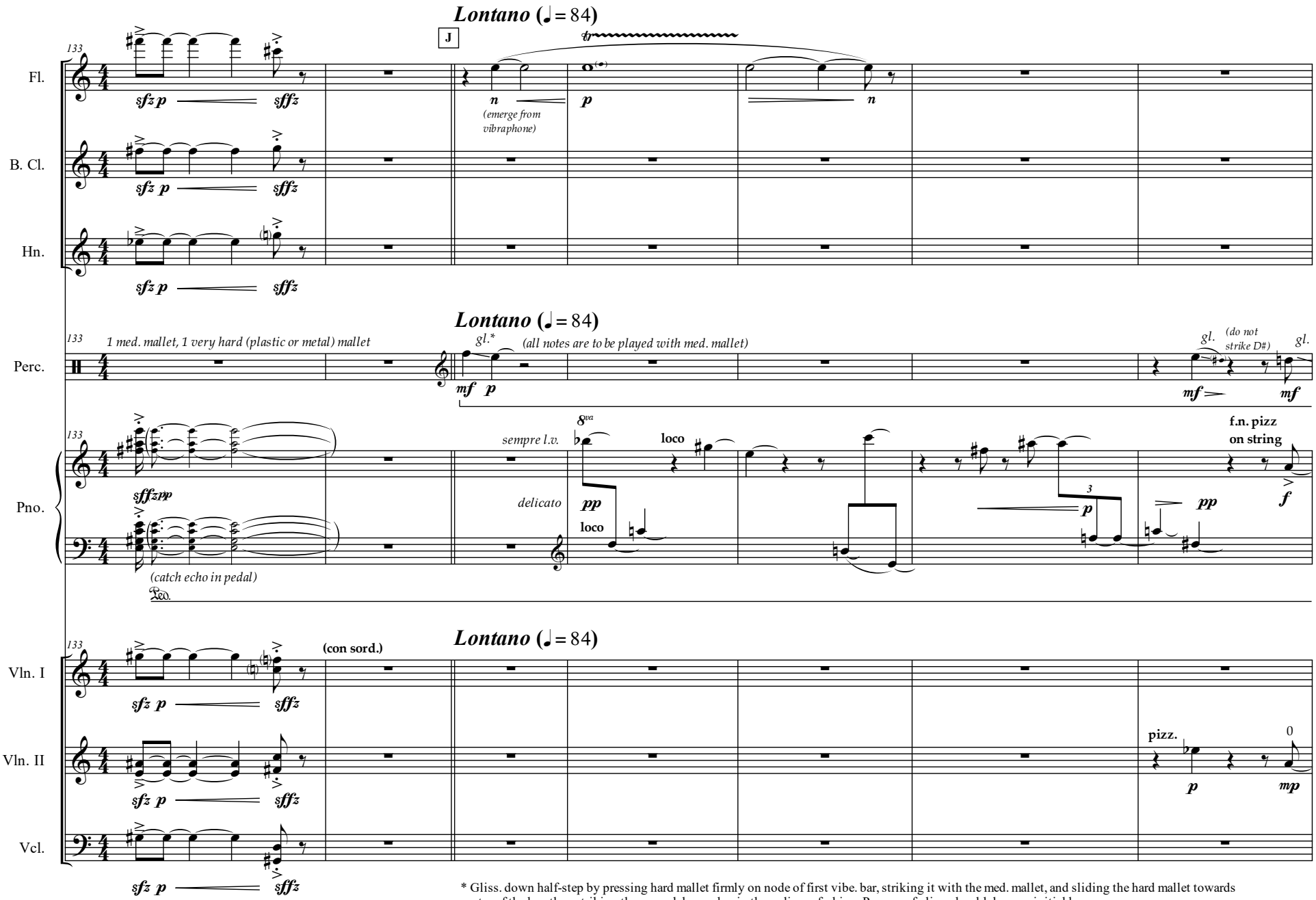

H tempo ad lib., Vln. I solo
Pesante
109
Fl.
B. Cl.
Hn.
Perc.
Pno.
Vln. I
Vln. II
Vcl.
ff
fp
sfz
f
molto espr.
5
3


Ritmico con brio
tempo giusto
114
Fl.
staccatiss.
mf
B. Cl.
staccatiss.
mf
ord.
Hn.
staccatiss.
mf
Ritmico con brio
tempo giusto
114
Perc.
114
Pno.
8va
f
loco
muted:
con ped.
Ritmico con brio
tempo giusto
114
Vln. I
f
l.h. pizz.
mf
arco
f
Vln. II
l.h. pizz.
mf
arco
f
Vcl.
l.h. pizz.
mf
arco
f

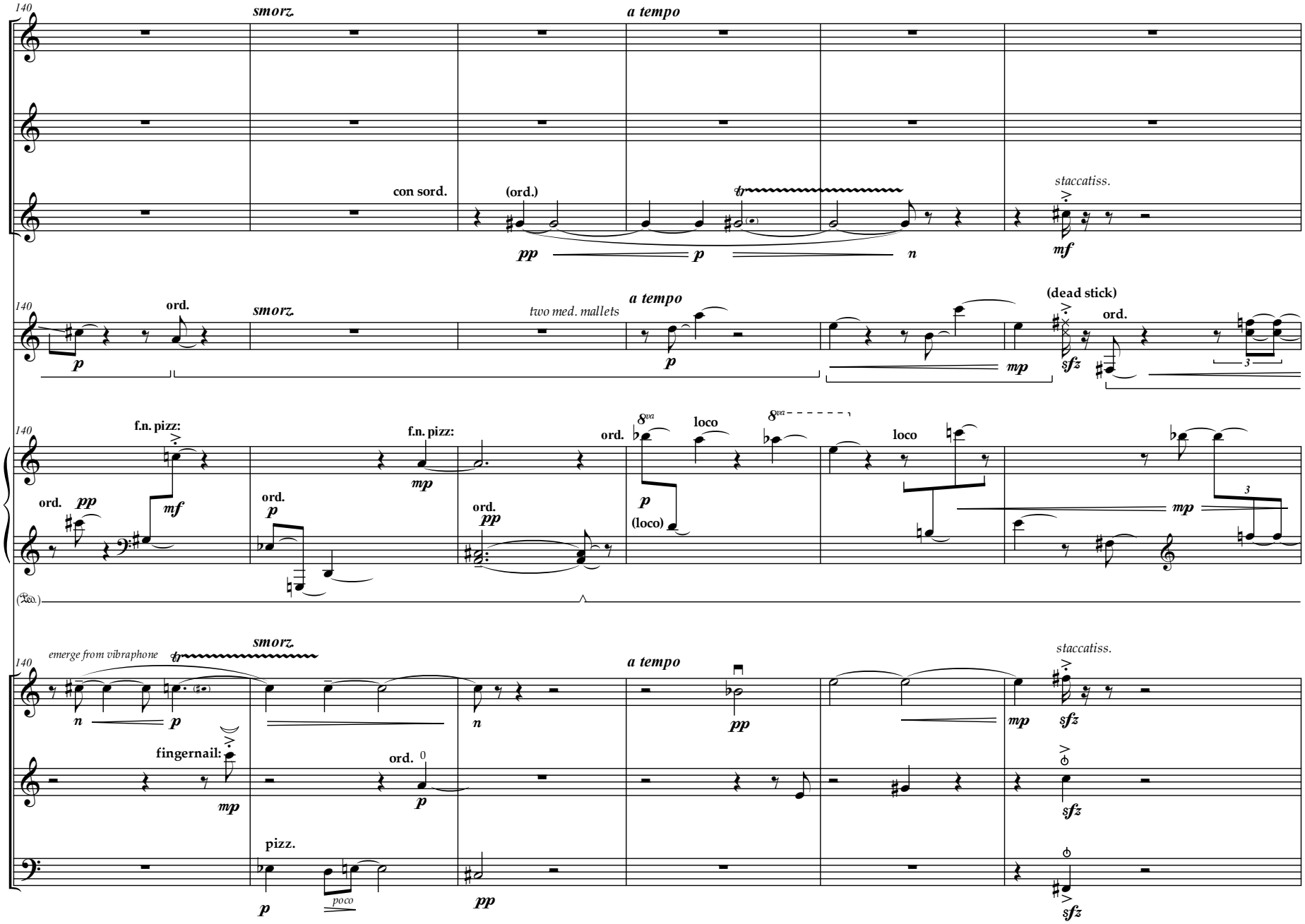

I Volante
119
Fl.
B. Cl.
Hn.
fltng.
ord.
molto
Volante
Perc.
Pno.
poco
Ped.
Volante
Vln. I
Vln. II
Vcl.

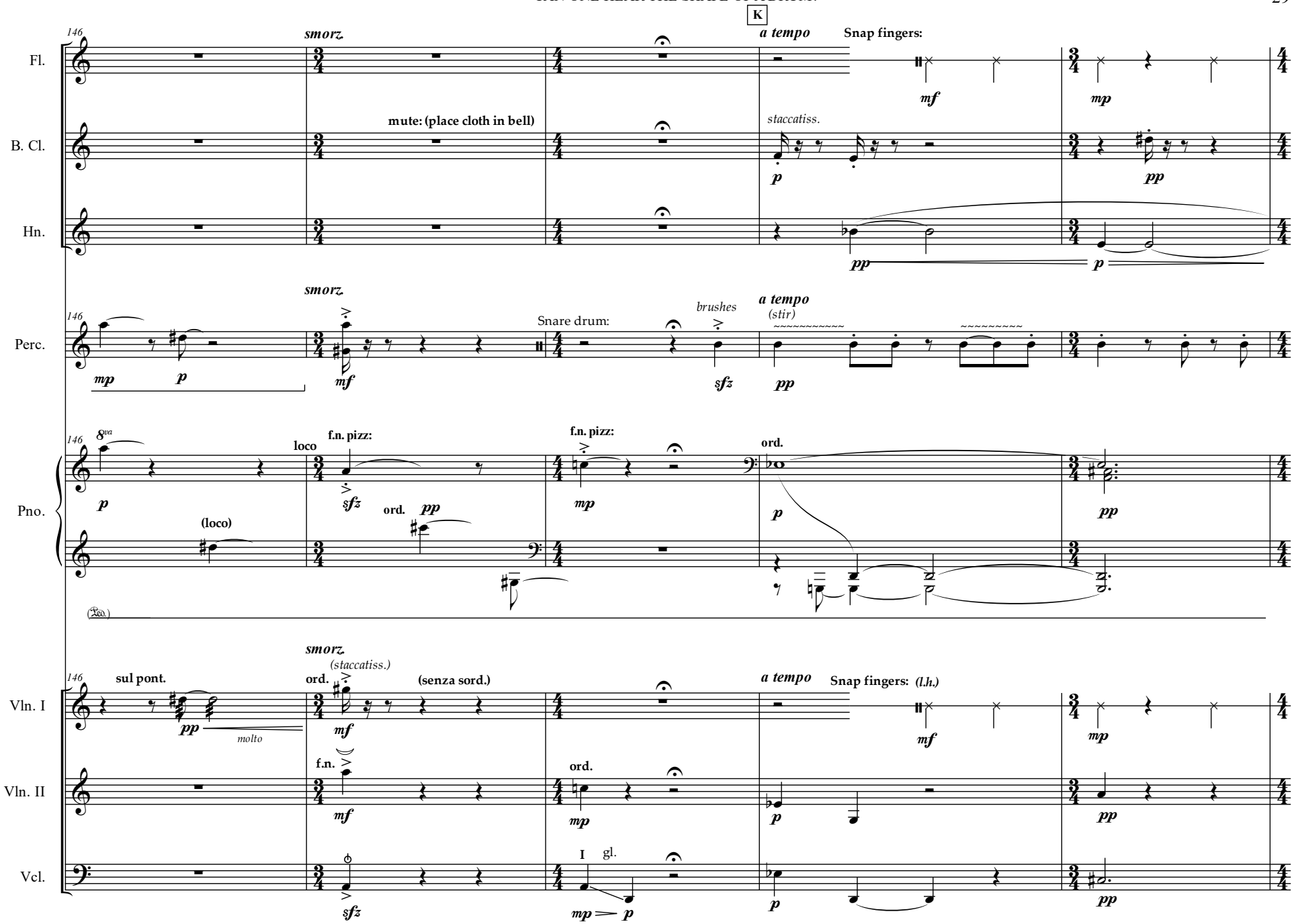

Ritmico con brio
Fl.
B. Cl.
Hn.
fltng.
ord.
mf cresc. poco a poco
Ritmico con brio
Perc.
Ritmico con brio
Pno.
muted:
ord.
poco
Ritmico con brio
Vln. I
Vln. II
Vcl.
sul pont.

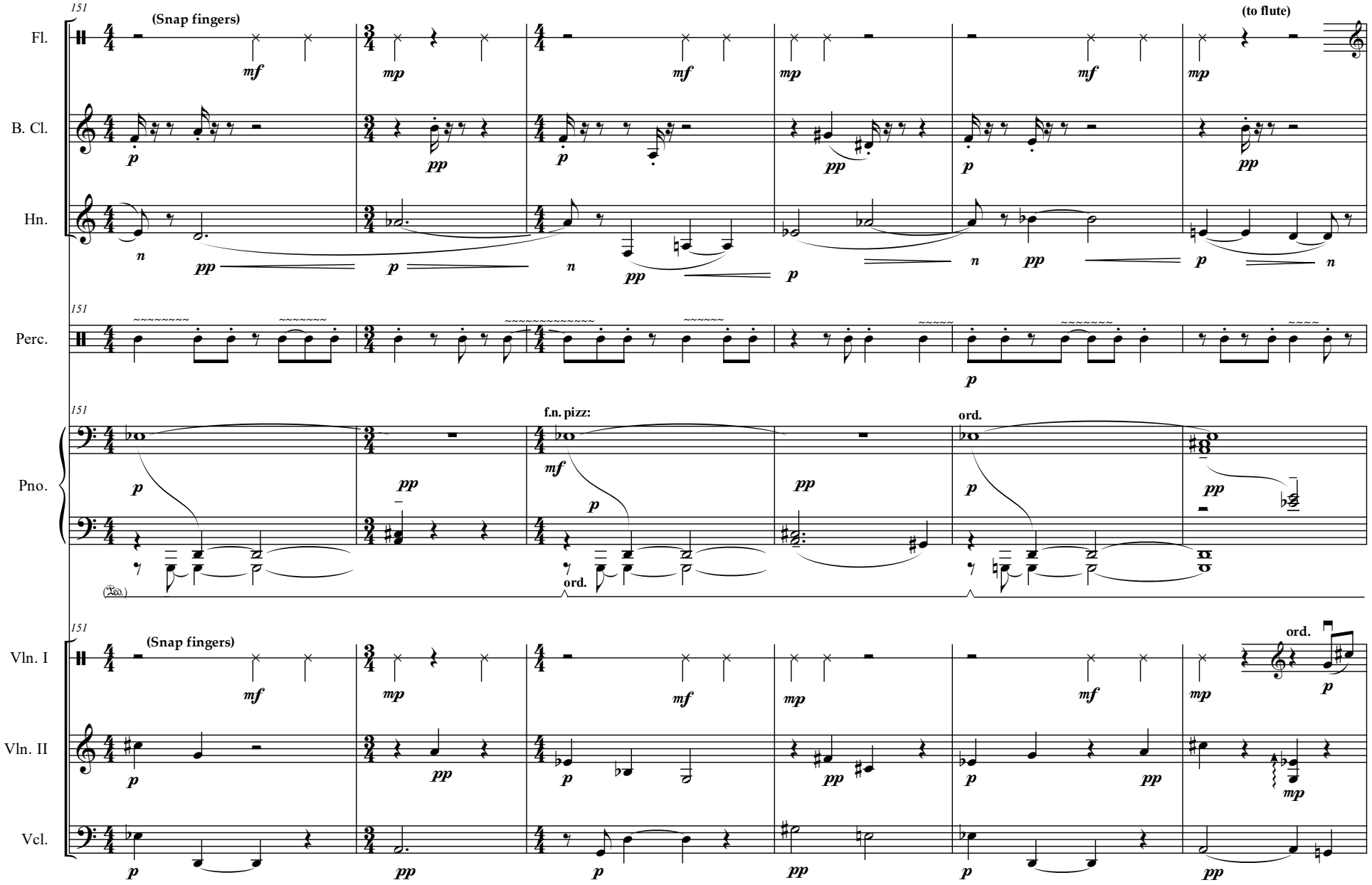

128
fltng.
ord.
(2+2+3+2)
Fl.
cresc. poco a poco
ff
B. Cl.
ff
brassy
ord.
brassy
ord.
brassy
Hn.
sfz
mf
sfz
f
ff
128
(2+2+3+2)
Perc.
128
(2+2+3+2)
Pno.
sfz
sfz
ord.
f
ff
(Ped.)
128
(2+2+3+2)
Vln. I
ff
Vln. II
ff
al ord., poco a poco
ord.
Vcl.
f
ff

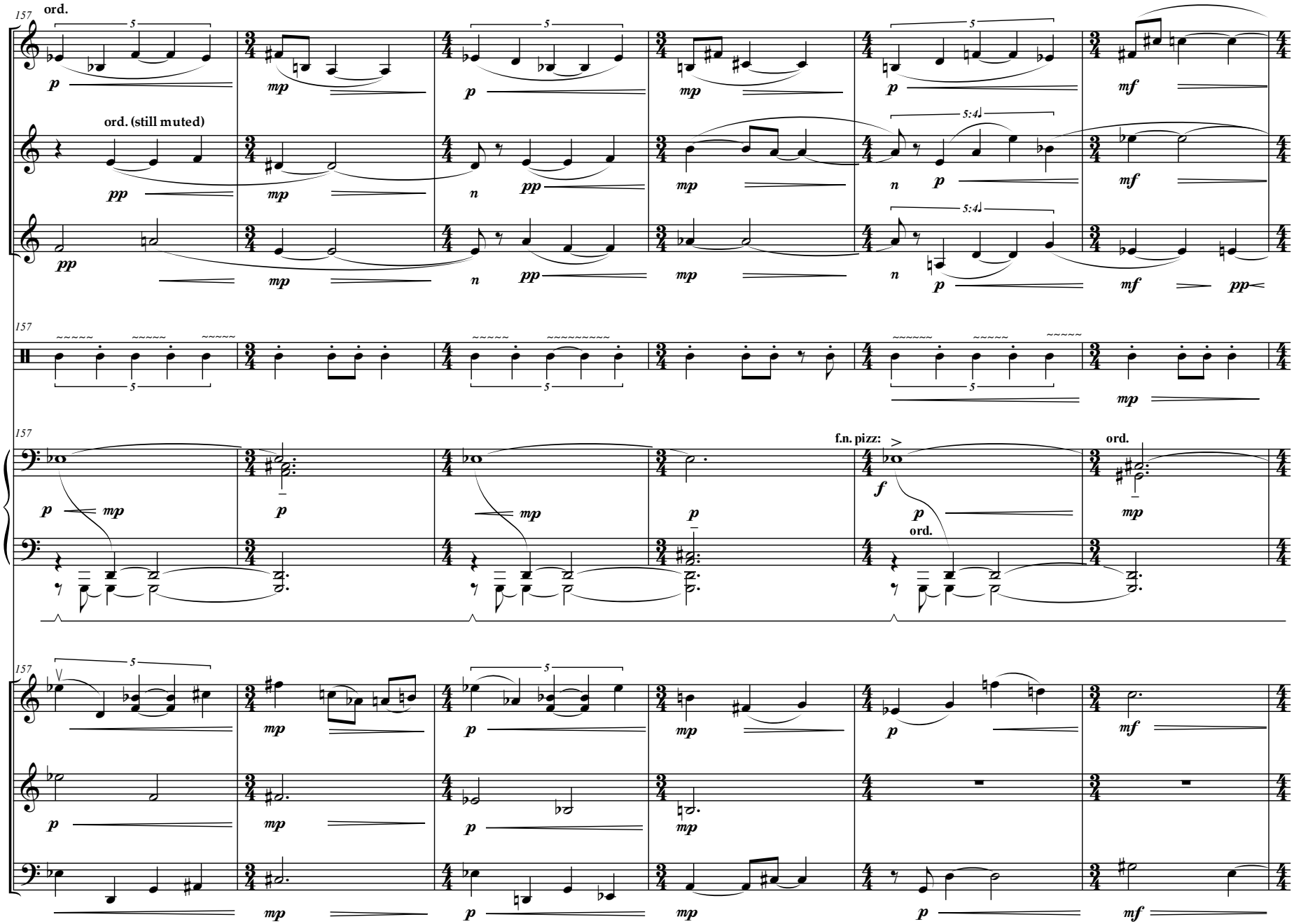


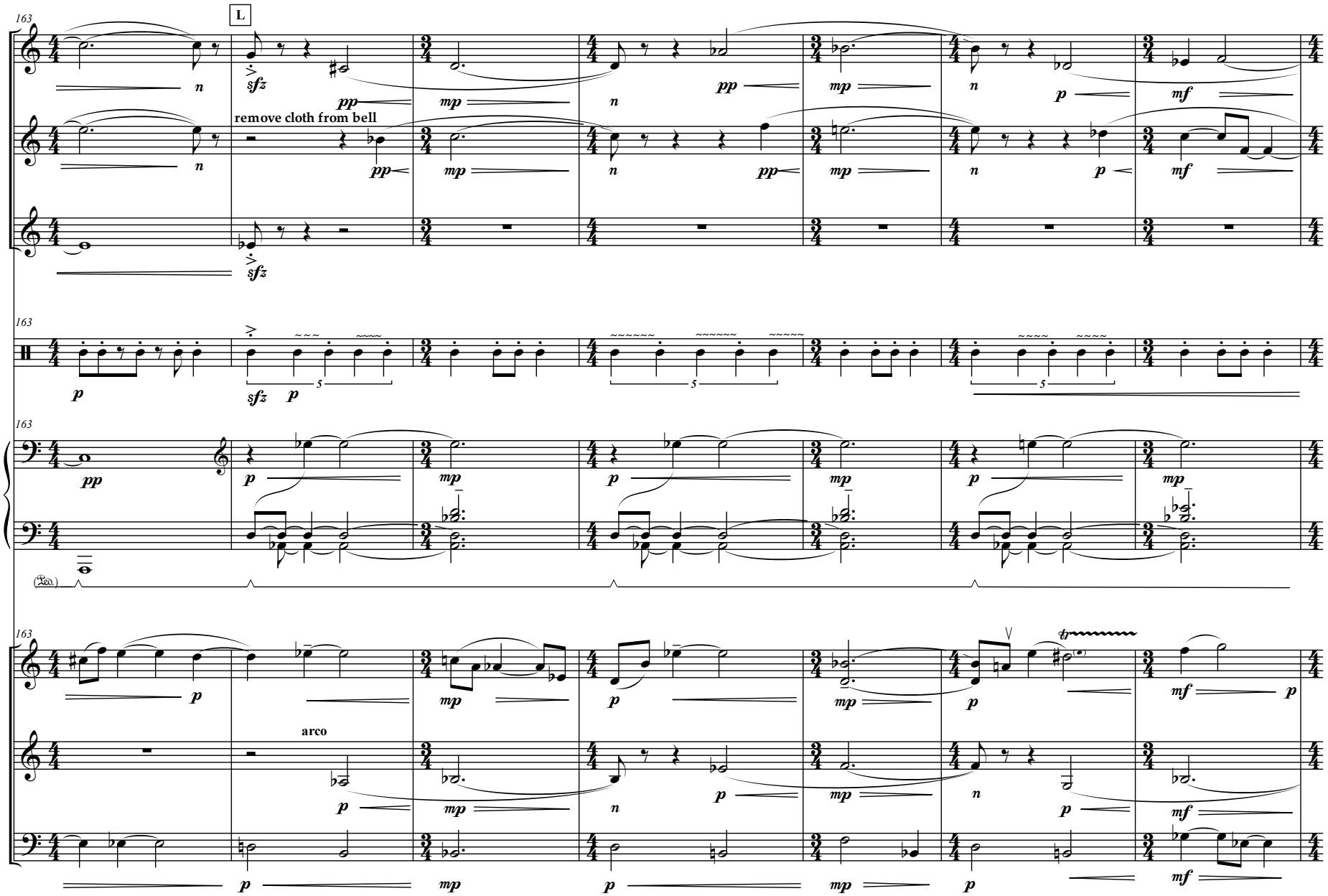
* Gliss. down half-step by pressing hard mallet firmly on node of first vibe. bar, striking it with the med. mallet, and sliding the hard mallet towards center of the bar, then striking the second, lower, bar in the ordinary fashion. Process of gliss. should dampen initial bar.

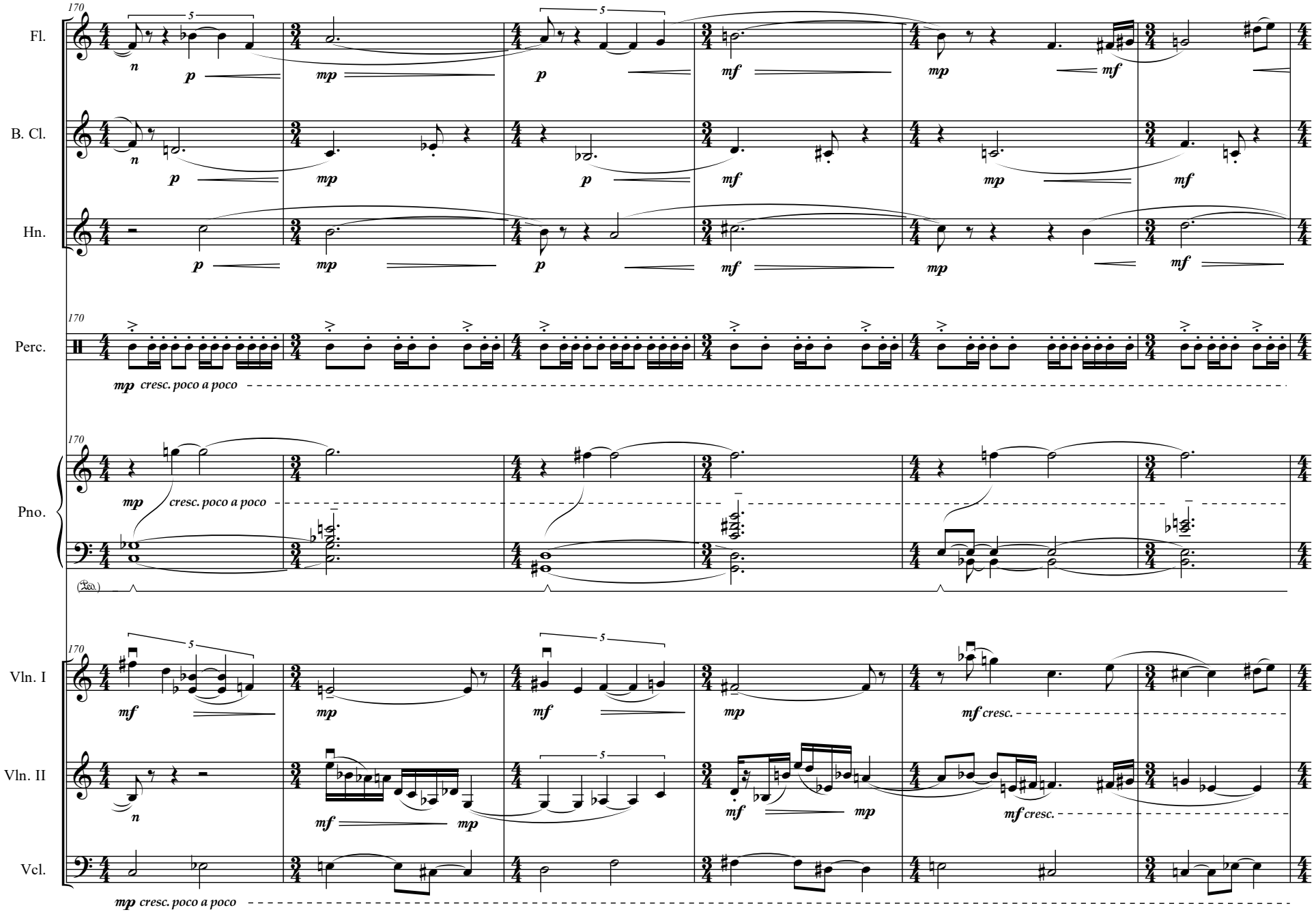

140
Fl.
B. Cl.
Hn.
Perc.
Pno.
Vln. I
Vln. II
Vcl.
smorz.
a tempo
con sord.
(ord.)
staccatiss.
two med. mallets
(dead stick)
ord.
f.n. pizz:
loco
emerge from vibraphone
fingernail:
pizz.
poco

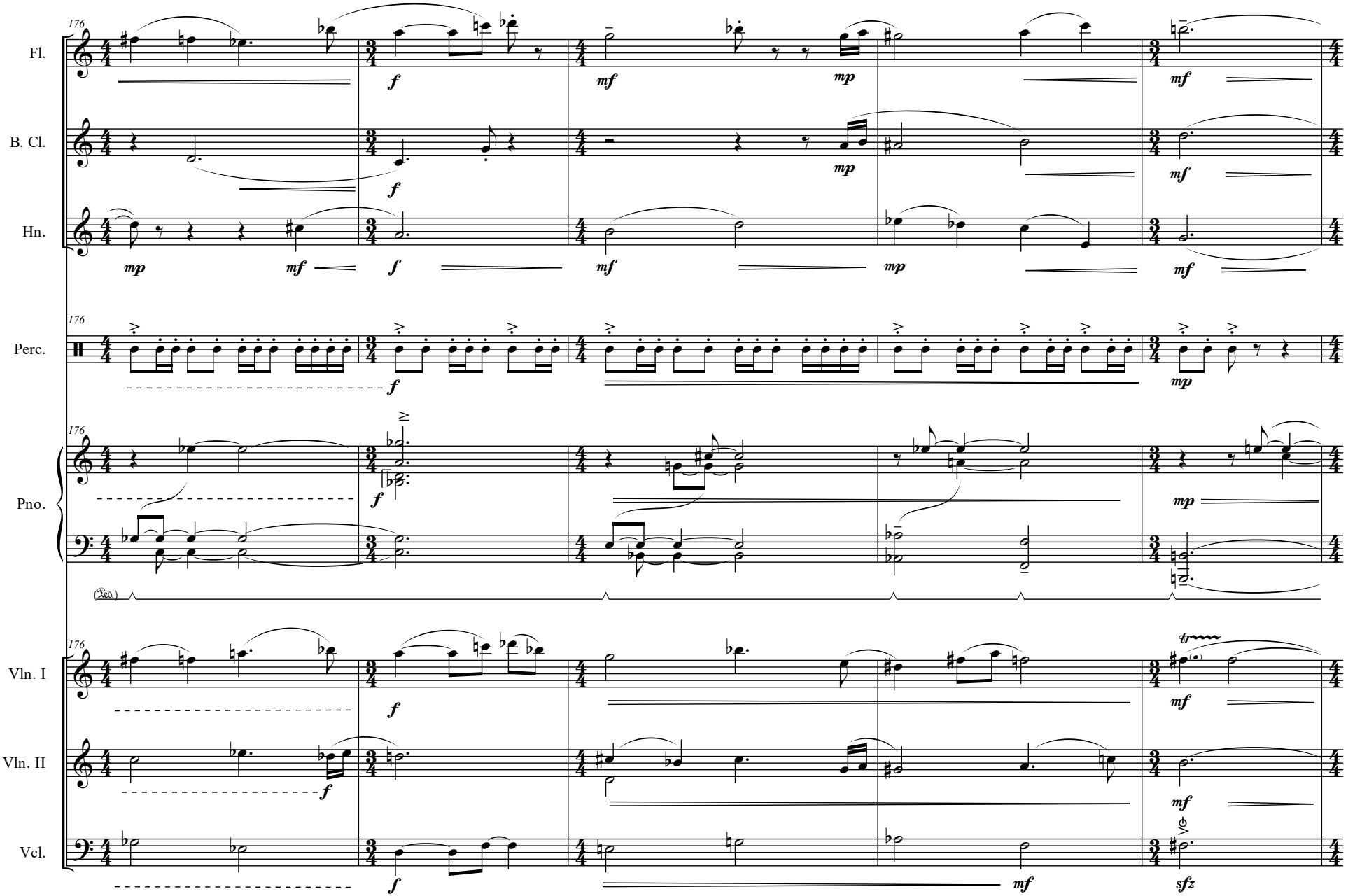

K
146
Fl.
B. Cl.
Hn.
Perc.
Pno.
Vln. I
Vln. II
Vcl.
smorz.
a tempo
Snap fingers:
mute: (place cloth in bell)
staccatiss.
Snare drum:
brushes
(stir)
8va
loco
f.n. pizz:
ord.
(loco)
sul pont.
molto
(staccatiss.)
(senza sord.)
f.n.
(l.h.)
I
gl.

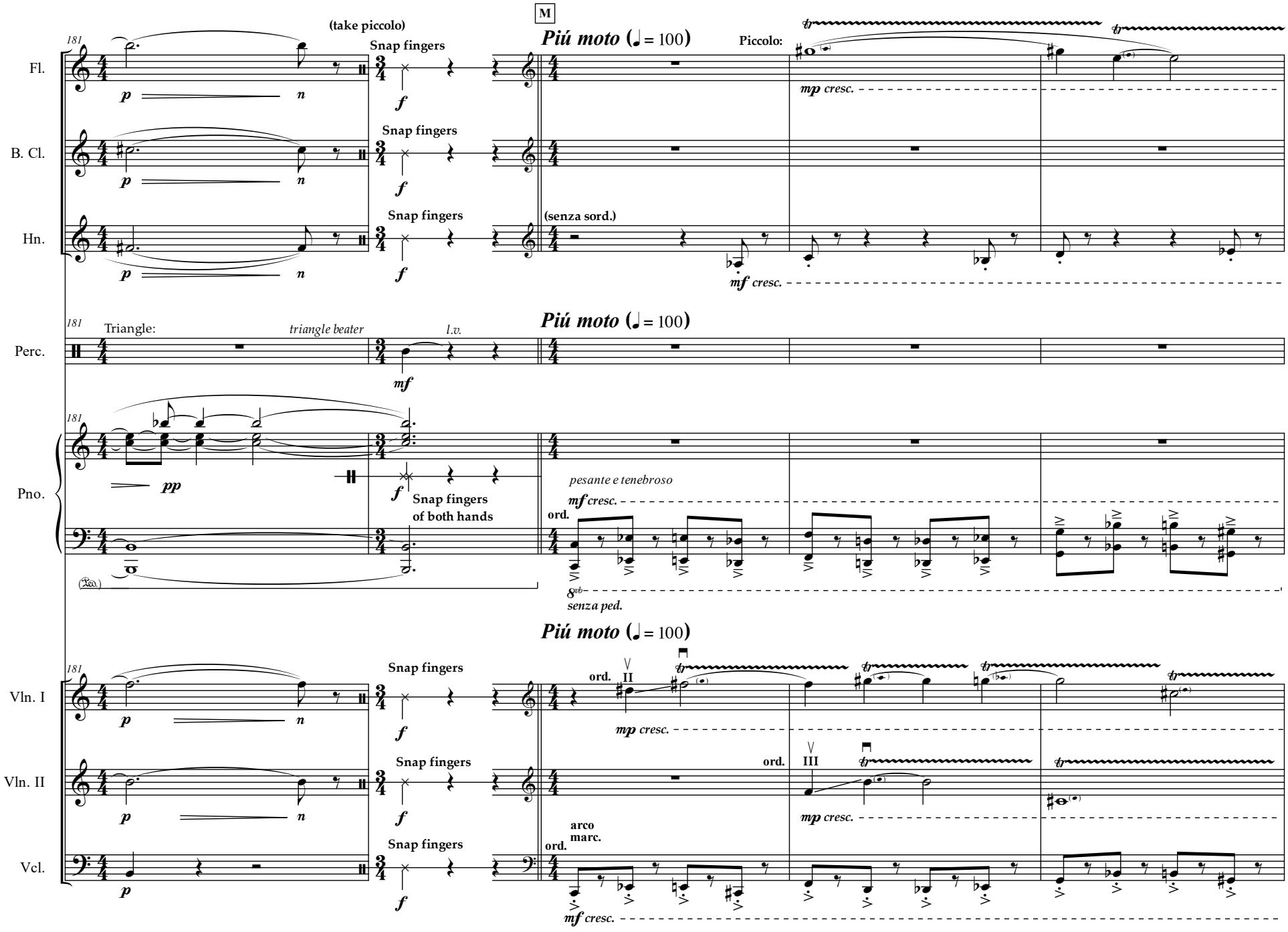

151
Fl.
(Snap fingers)
(to flute)
B. Cl.
Hn.
Perc.
Pno.
f.n. pizz:
ord.
Vln. I
Vln. II
Vcl.

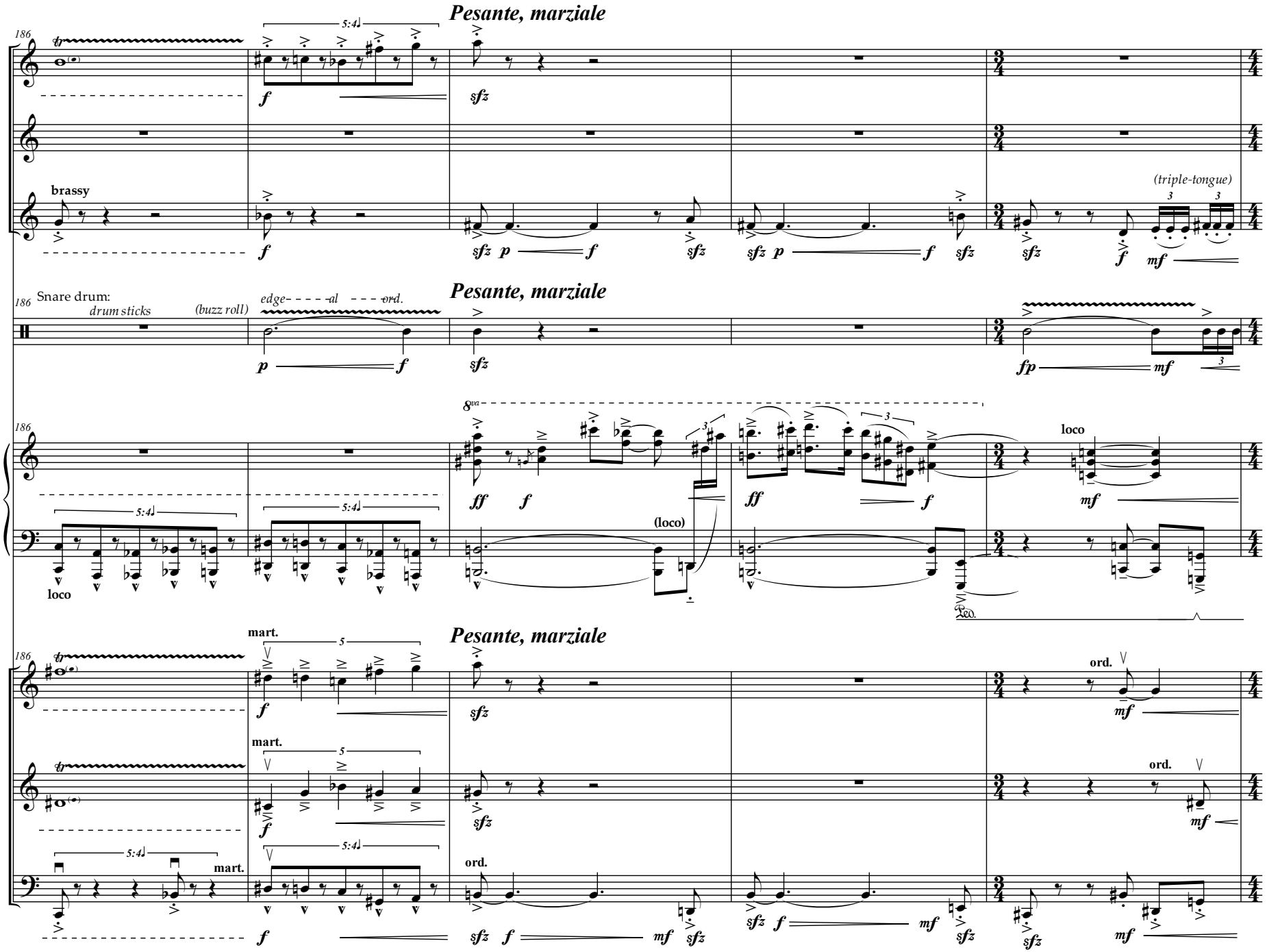

157
Fl.
ord.
B. Cl.
ord. (still muted)
Hn.
Perc.
Pno.
f.n. pizz:
ord.
Vln. I
Vln. II
Vcl.

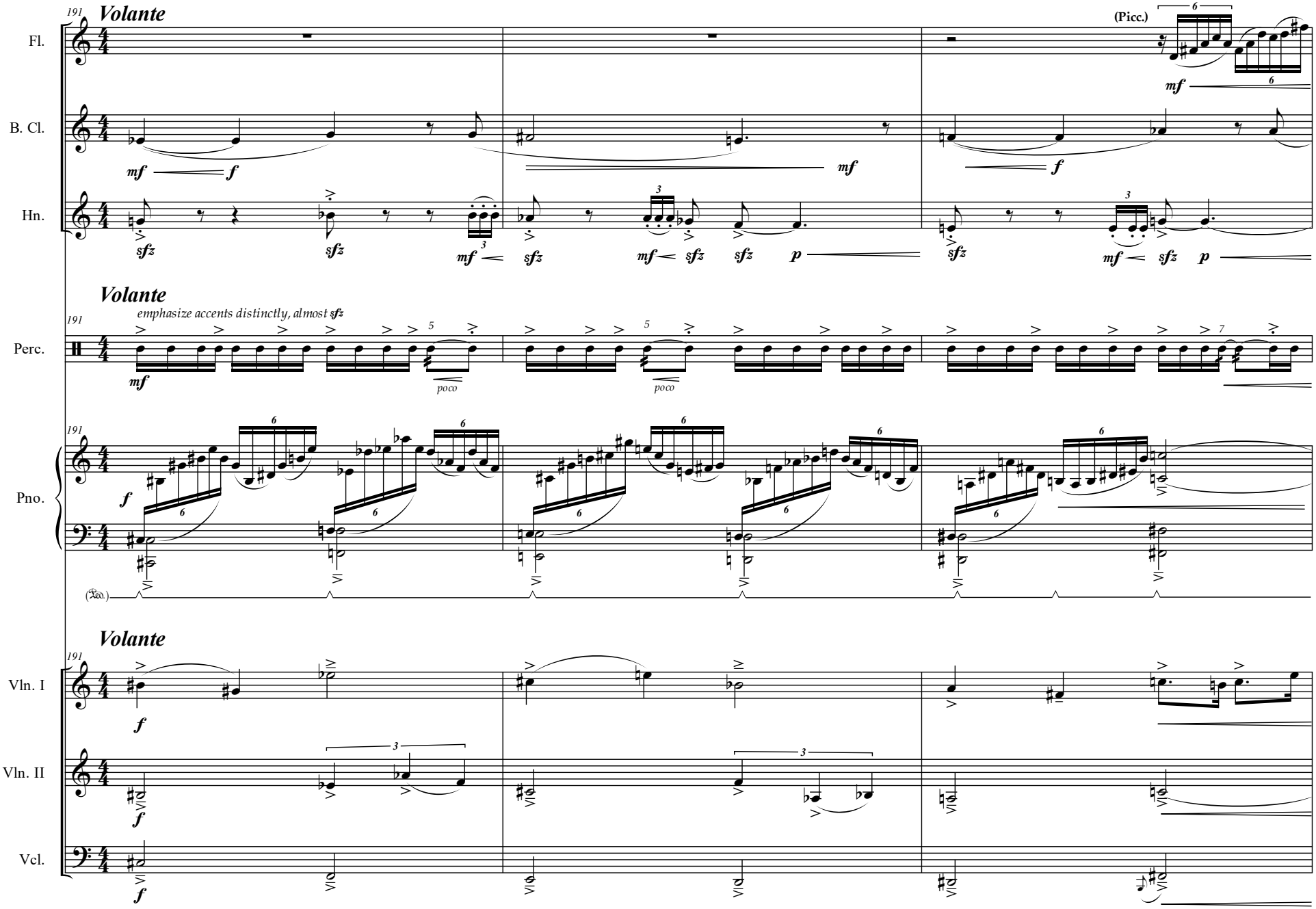

163
L
Fl.
B. Cl.
remove cloth from bell
Hn.
Perc.
Pno.
Vln. I
Vln. II
arco
Vcl.

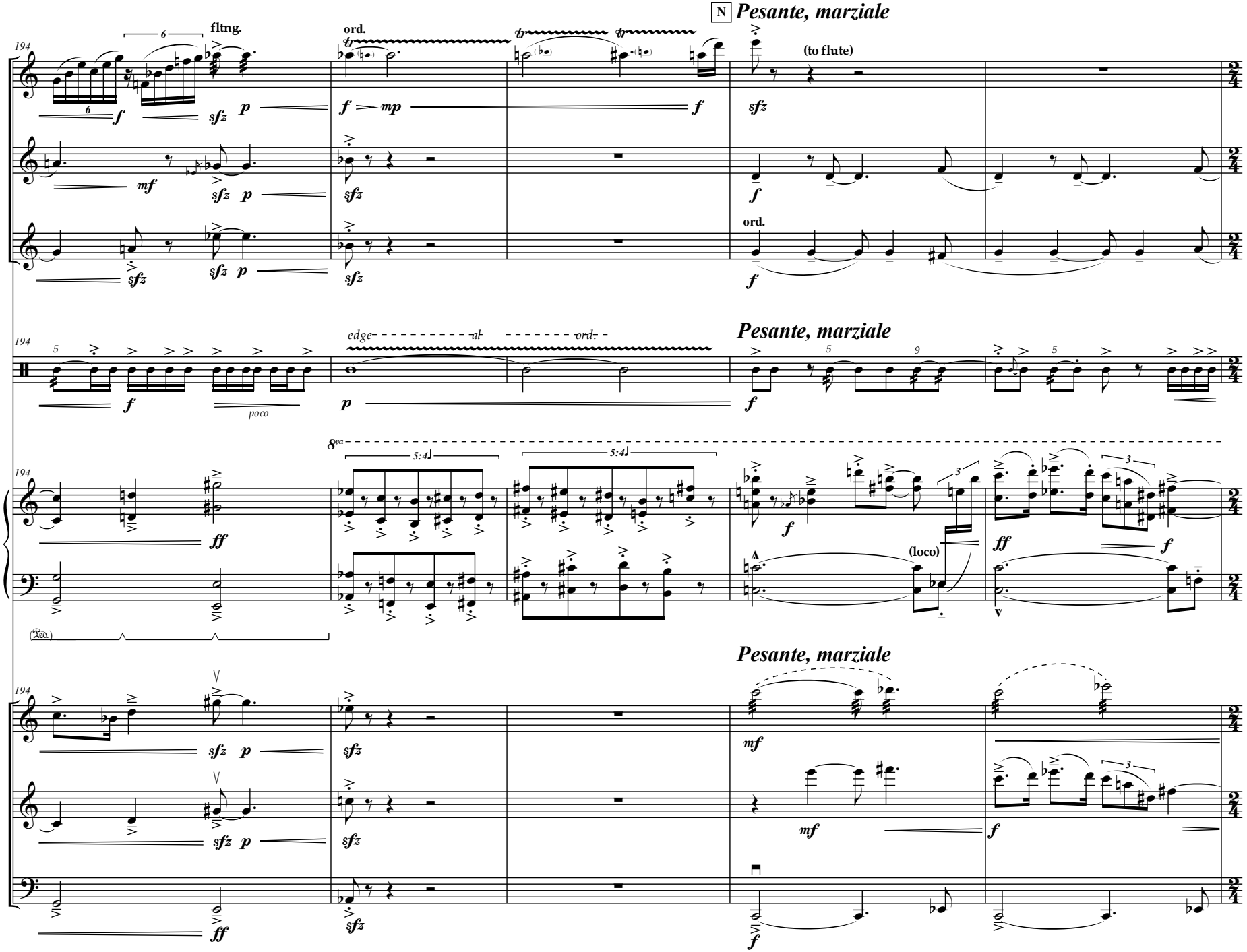

170
Fl.
B. Cl.
Hn.
Perc.
Pno.
Vln. I
Vln. II
Vcl.
n
p
mp
mf
cresc. poco a poco
cresc.
5

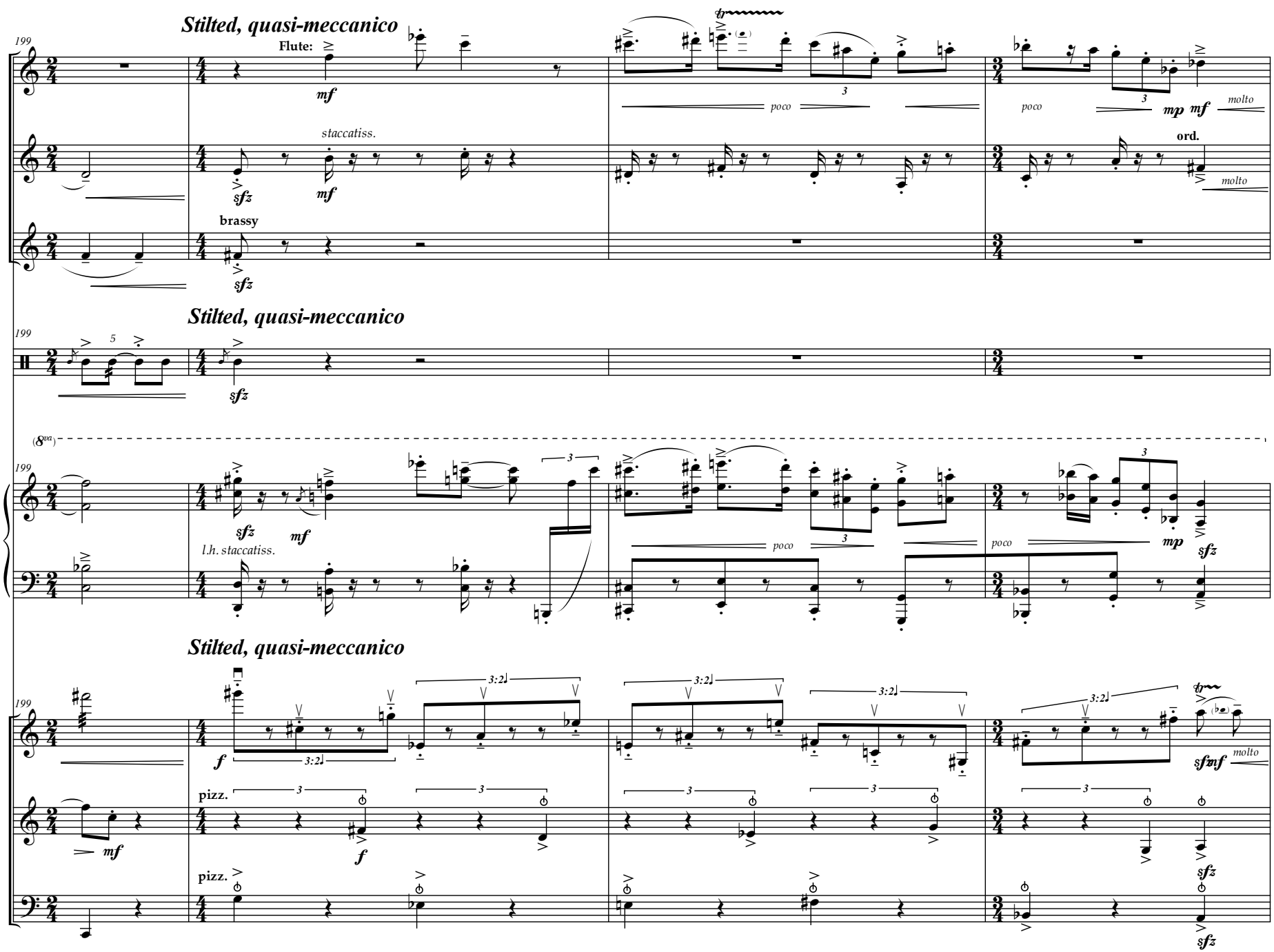

176
Fl.
B. Cl.
Hn.
Perc.
Pno.
Vln. I
Vln. II
Vcl.
f
mf
mp
sfz
tr

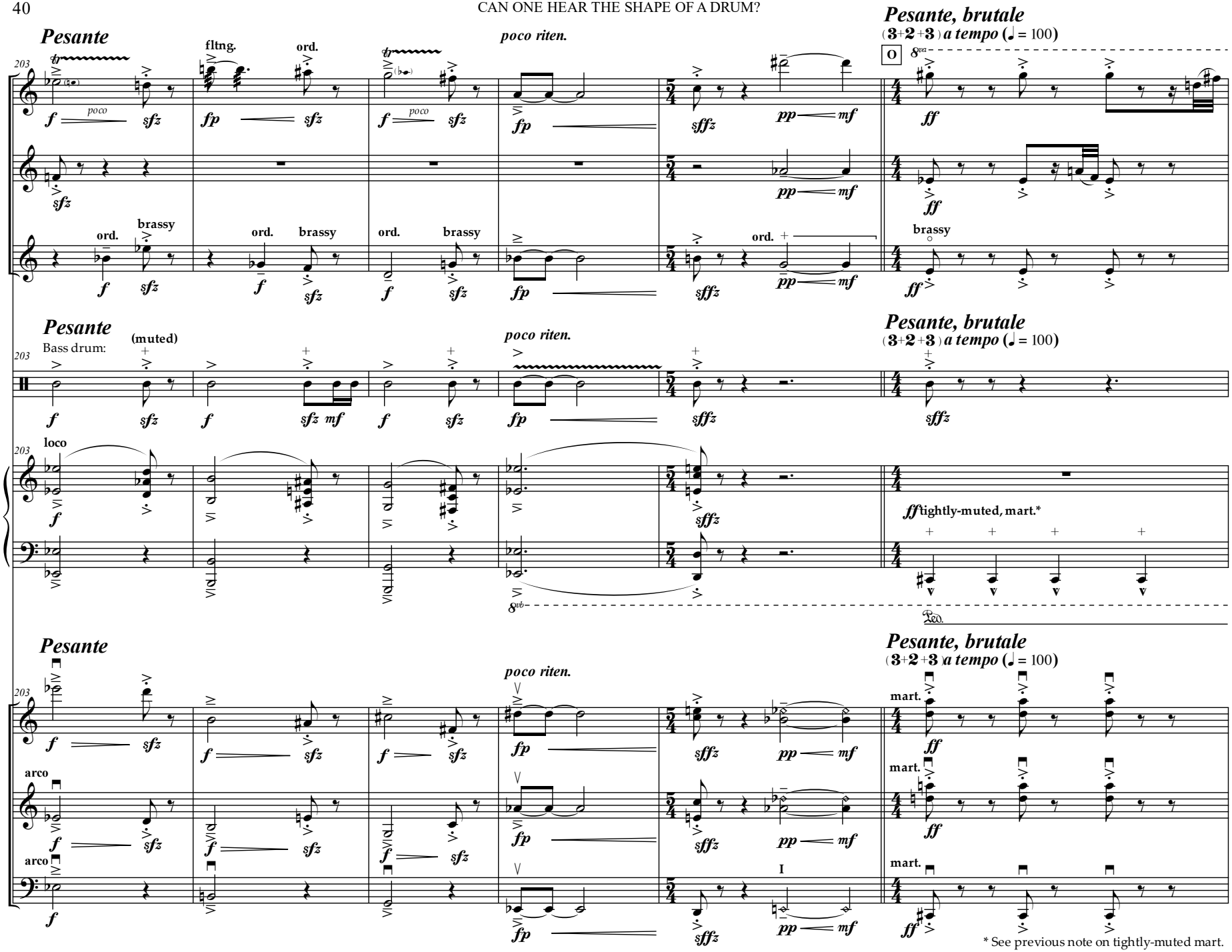

M
(take piccolo)
Snap fingers
Piú moto (♩= 100)
Piccolo:
mp cresc.
Fl.
B. Cl.
Hn.
(senza sord.)
mf cresc.
Triangle:
triangle beater
l.v.
Perc.
Pno.
pesante e tenebroso
mf cresc.
ord.
8vb
senza ped.
Snap fingers of both hands
Vln. I
Vln. II
Vcl.
arco
marc.


Pesante, marziale
Fl.
B. Cl.
Hn.
brassy
(triple-tongue)
Pesante, marziale
Perc.
Snare drum:
drum sticks
(buzz roll)
edge- - - - -al - - - ord.
Pesante, marziale
Pno.
loco
(loco)
Pesante, marziale
Vln. I
Vln. II
Vcl.
mart.
ord.

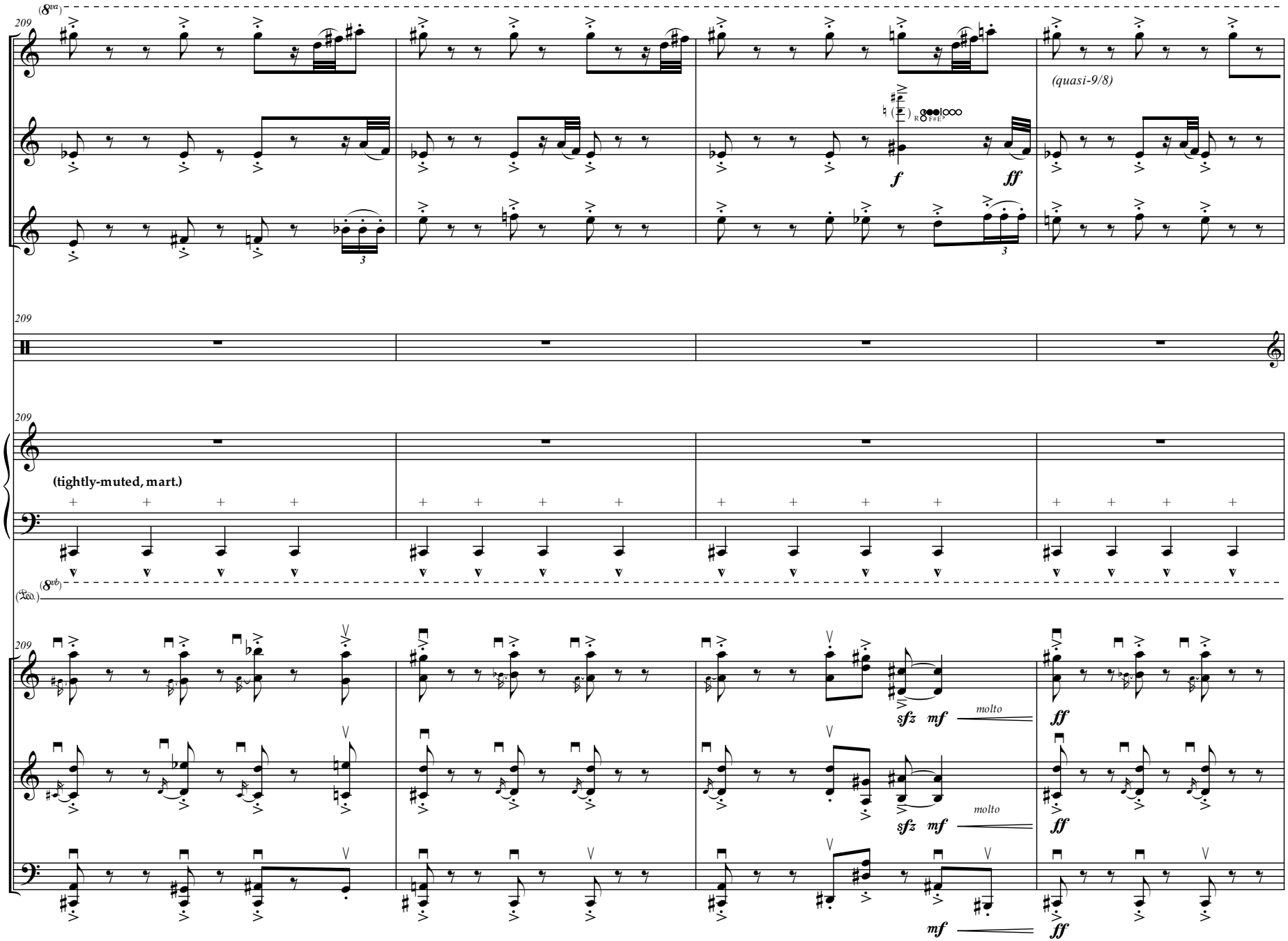

191
Volante
Fl.
B. Cl.
Hn.
(Picc.)
mf
f
sfz
p
Volante
emphasize accents distinctly, almost sfz
Perc.
poco
Pno.
Volante
Vln. I
Vln. II
Vcl.

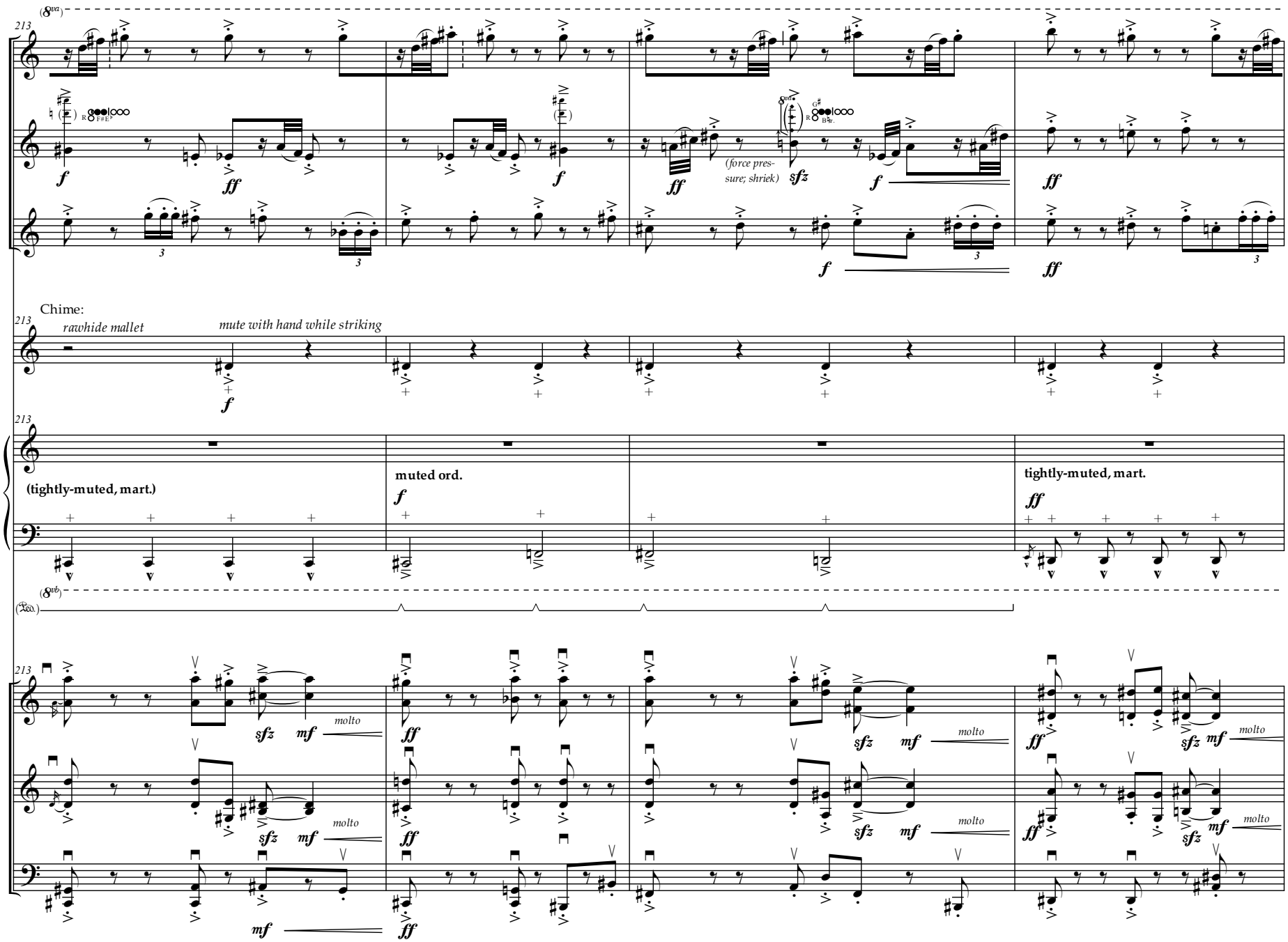

N Pesante, marziale
Fl.
B. Cl.
Hn.
Perc.
Pno.
Vln. I
Vln. II
Vcl.
194
fltng.
ord.
(to flute)
edge
ord.
poco
8va
5:4
(loco)
Pesante, marziale

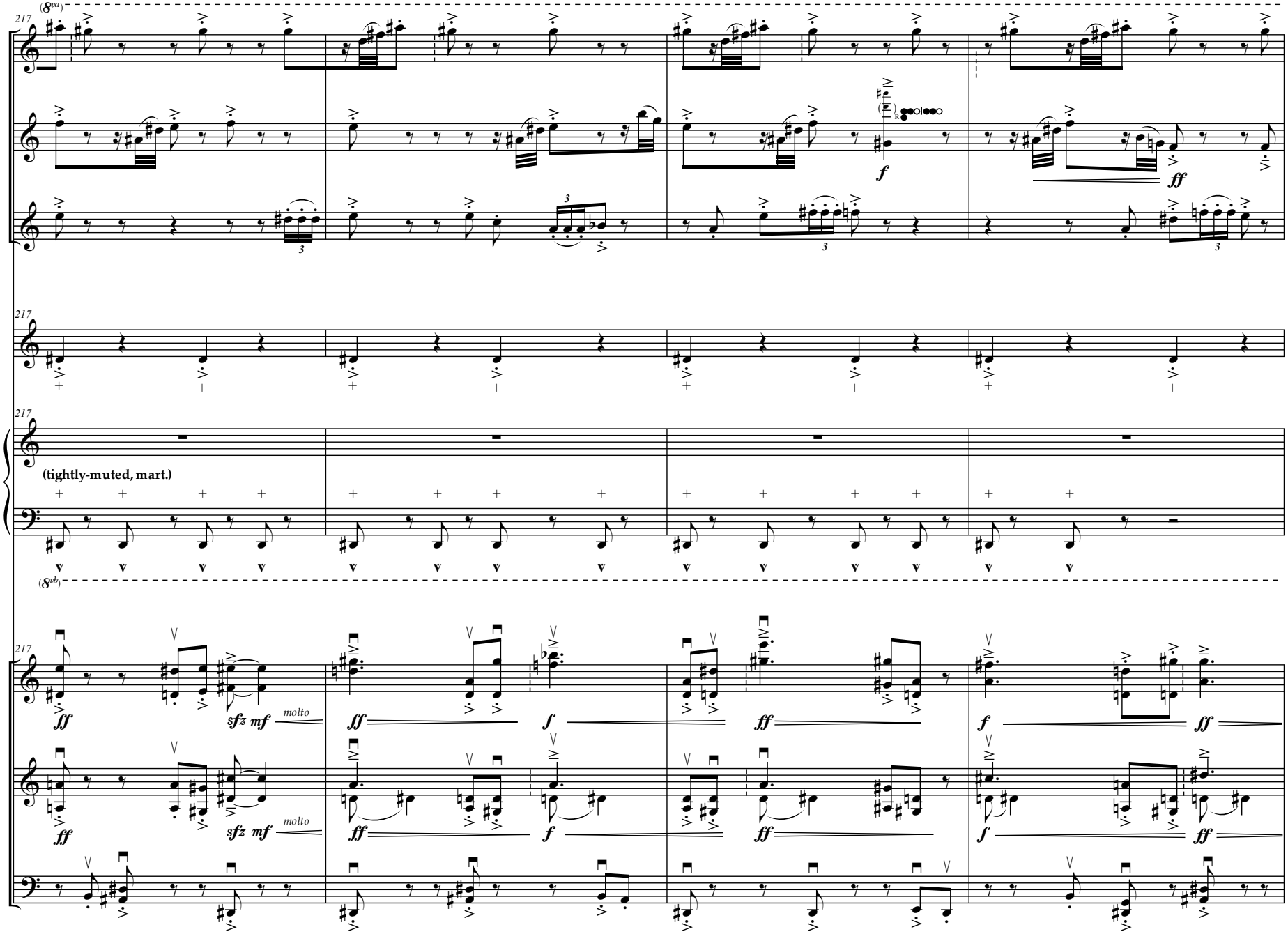

Stilted, quasi-meccanico
Fl.
B. Cl.
Hn.
Perc.
Pno.
Vln. I
Vln. II
Vcl.
199
Flute:
mf
staccatiss.
sfz
brassy
poco
mp
molto
ord.
l.h. staccatiss.
f
pizz.
3:2
sfzmf

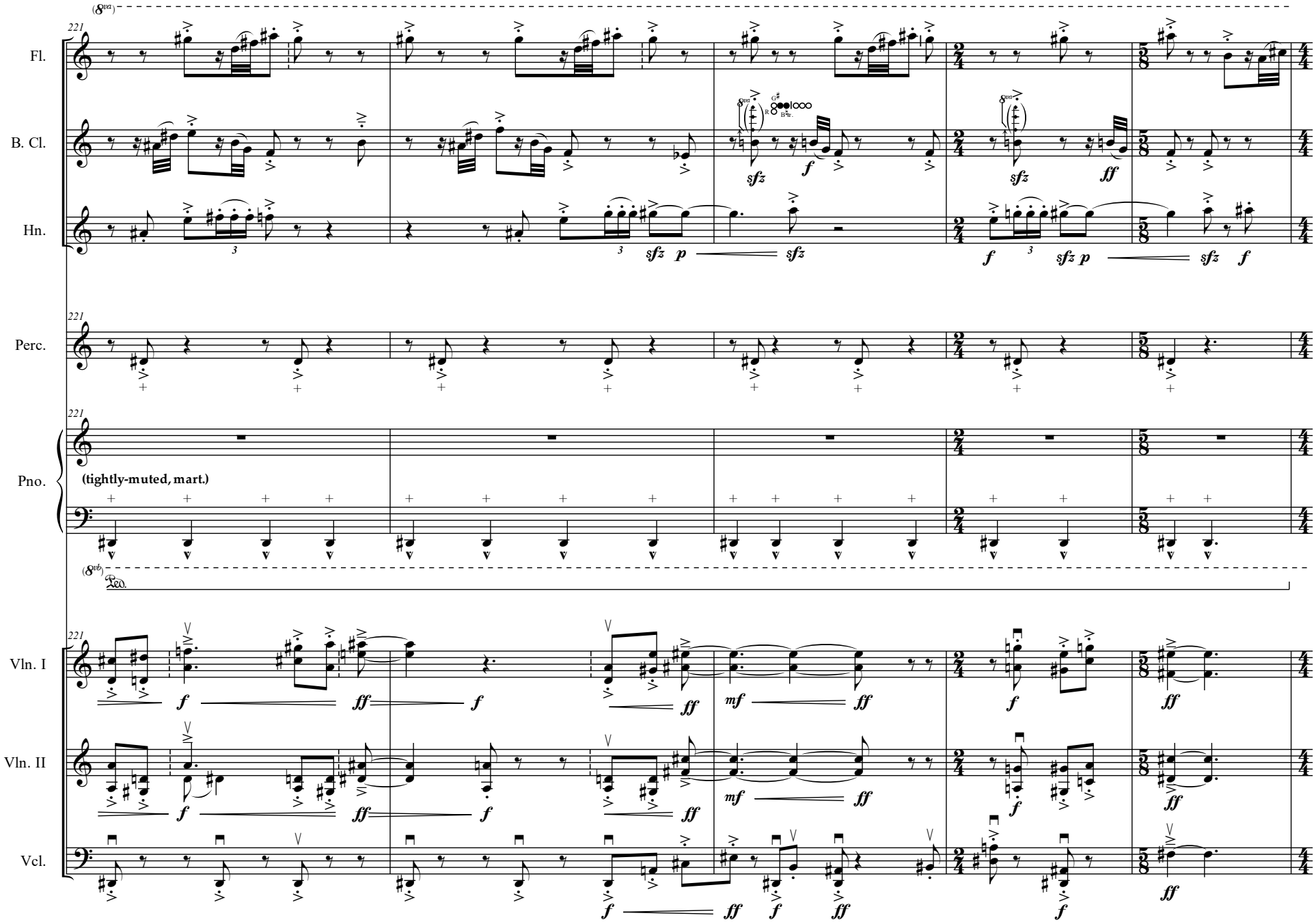


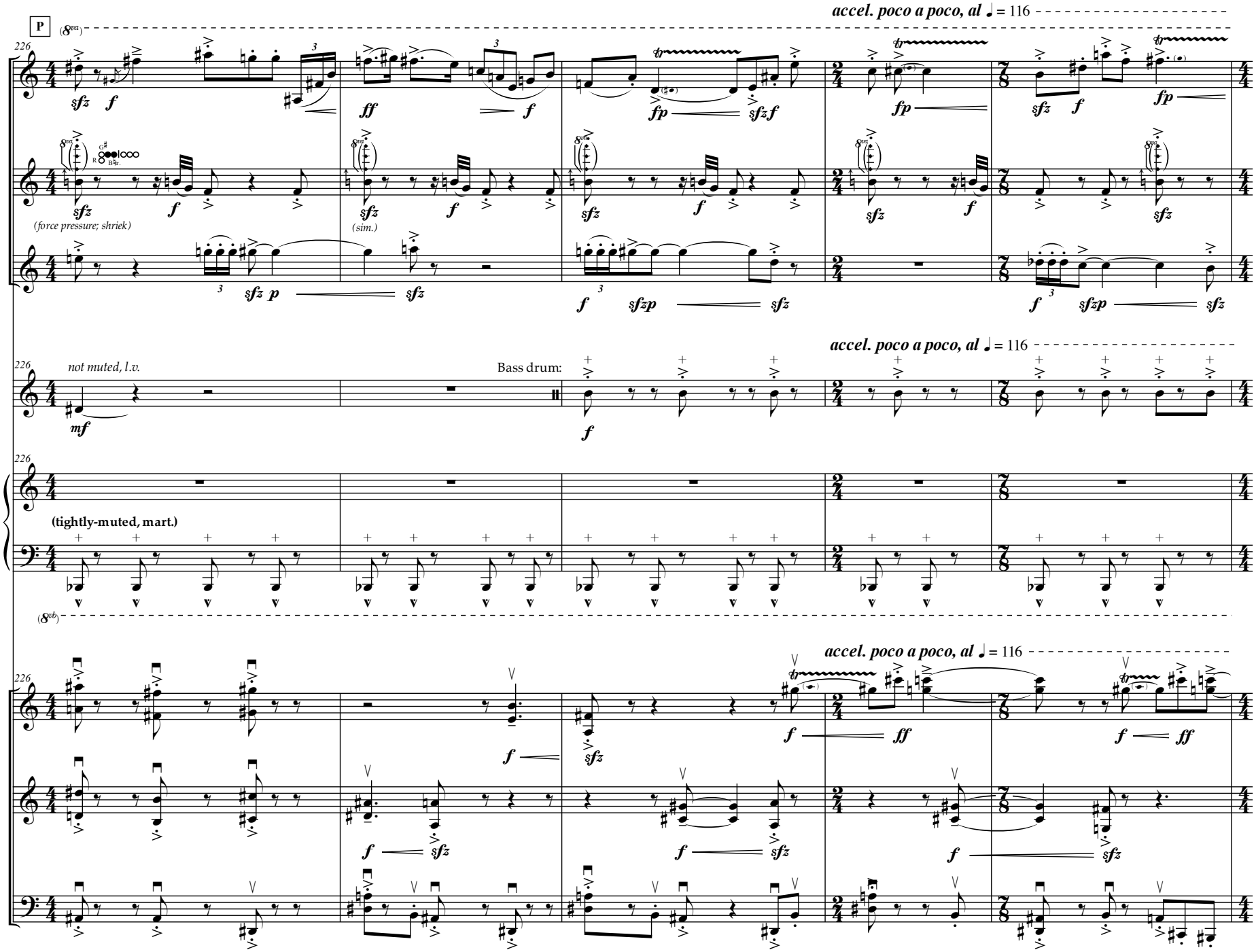
* See previous note on tightly-muted mart.

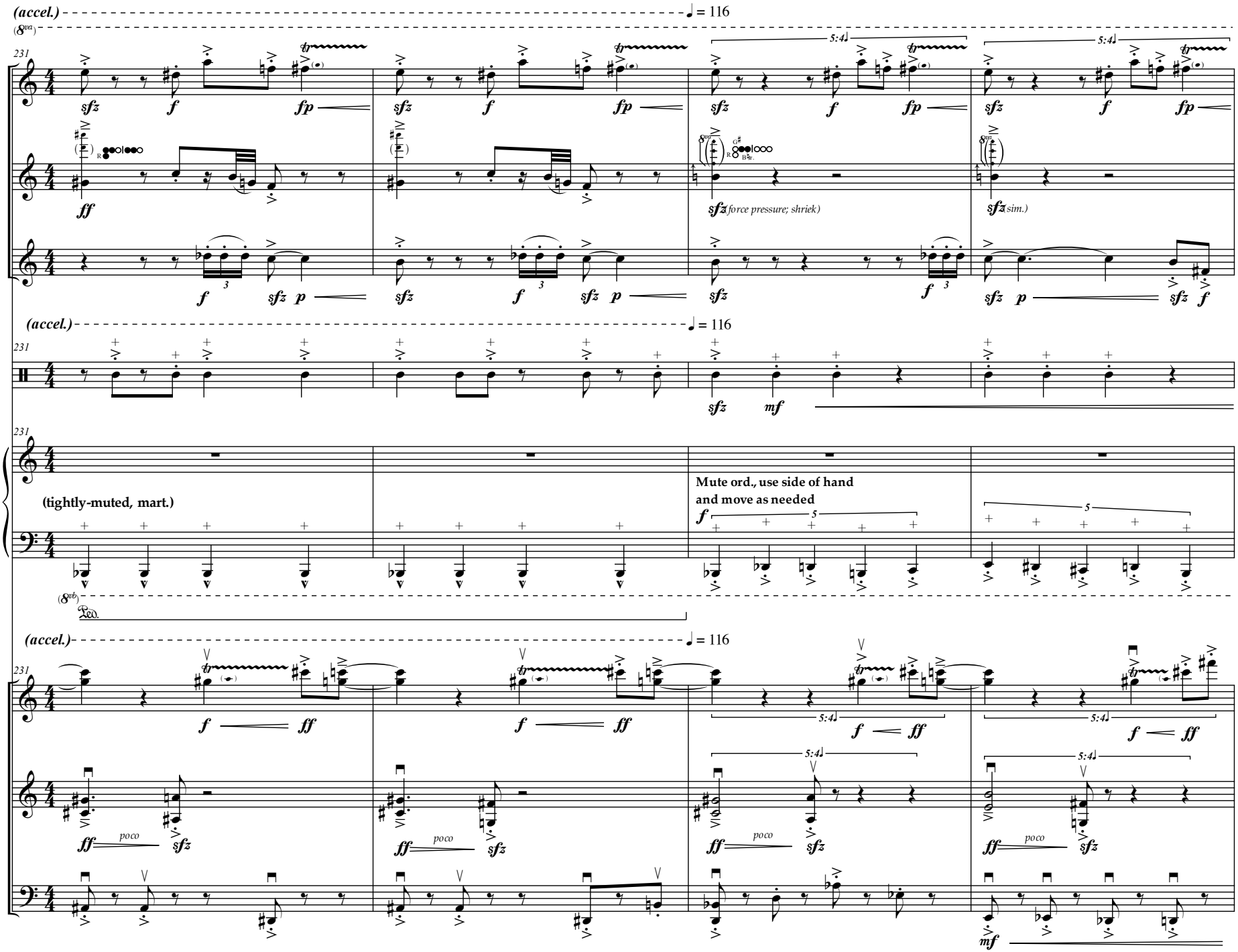

Fl.
B. Cl.
Hn.
Perc.
Pno.
Vln. I
Vln. II
Vcl.
209
(quasi-9/8)
f
ff
(tightly-muted, mart.)
sfz mf molto
ff
mf

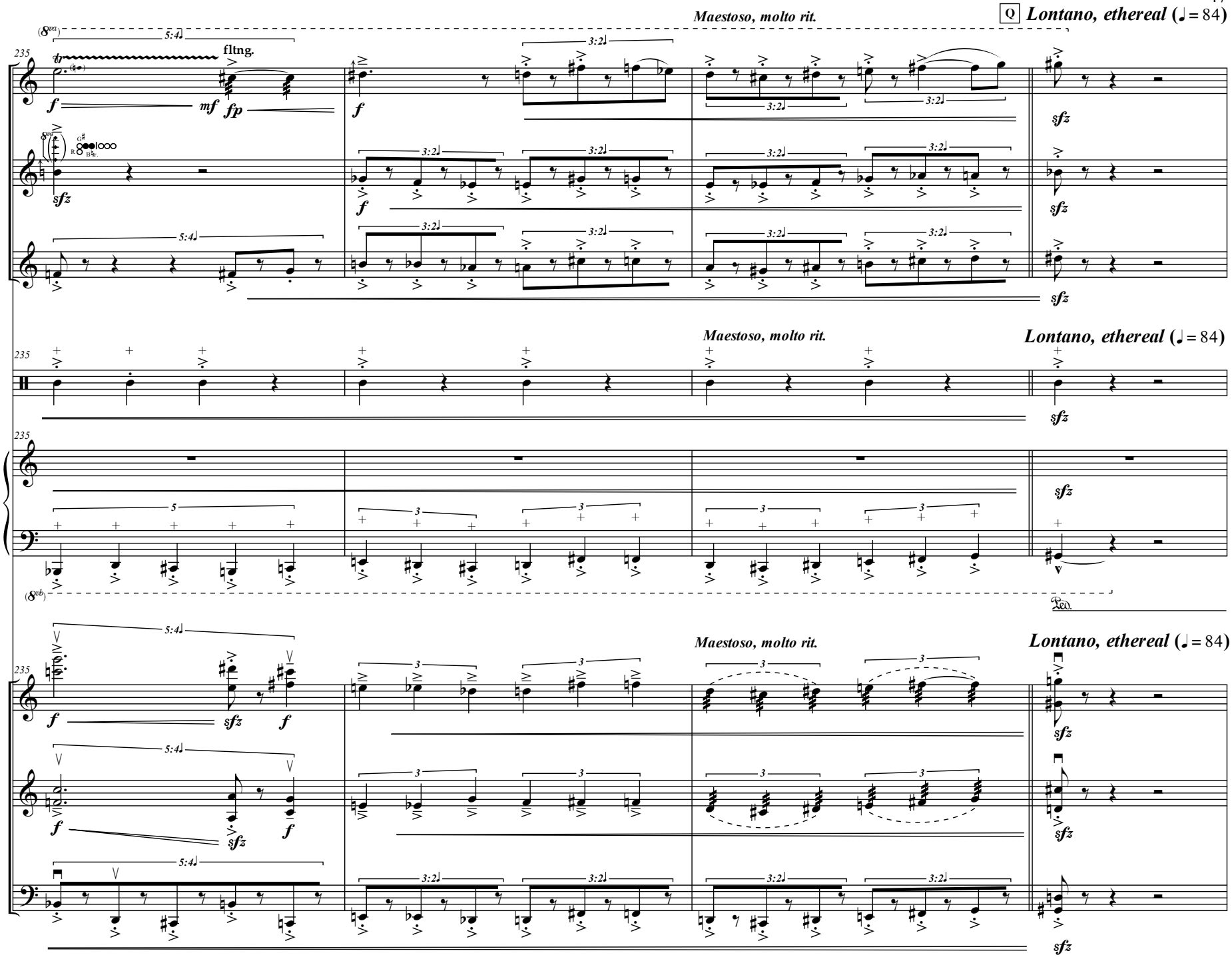

Fl.
B. Cl.
Hn.
Perc.
Pno.
Vln. I
Vln. II
Vcl.
213
(force pressure; shriek)
Chime:
rawhide mallet
mute with hand while striking
(tightly-muted, mart.)
muted ord.
tightly-muted, mart.
molto

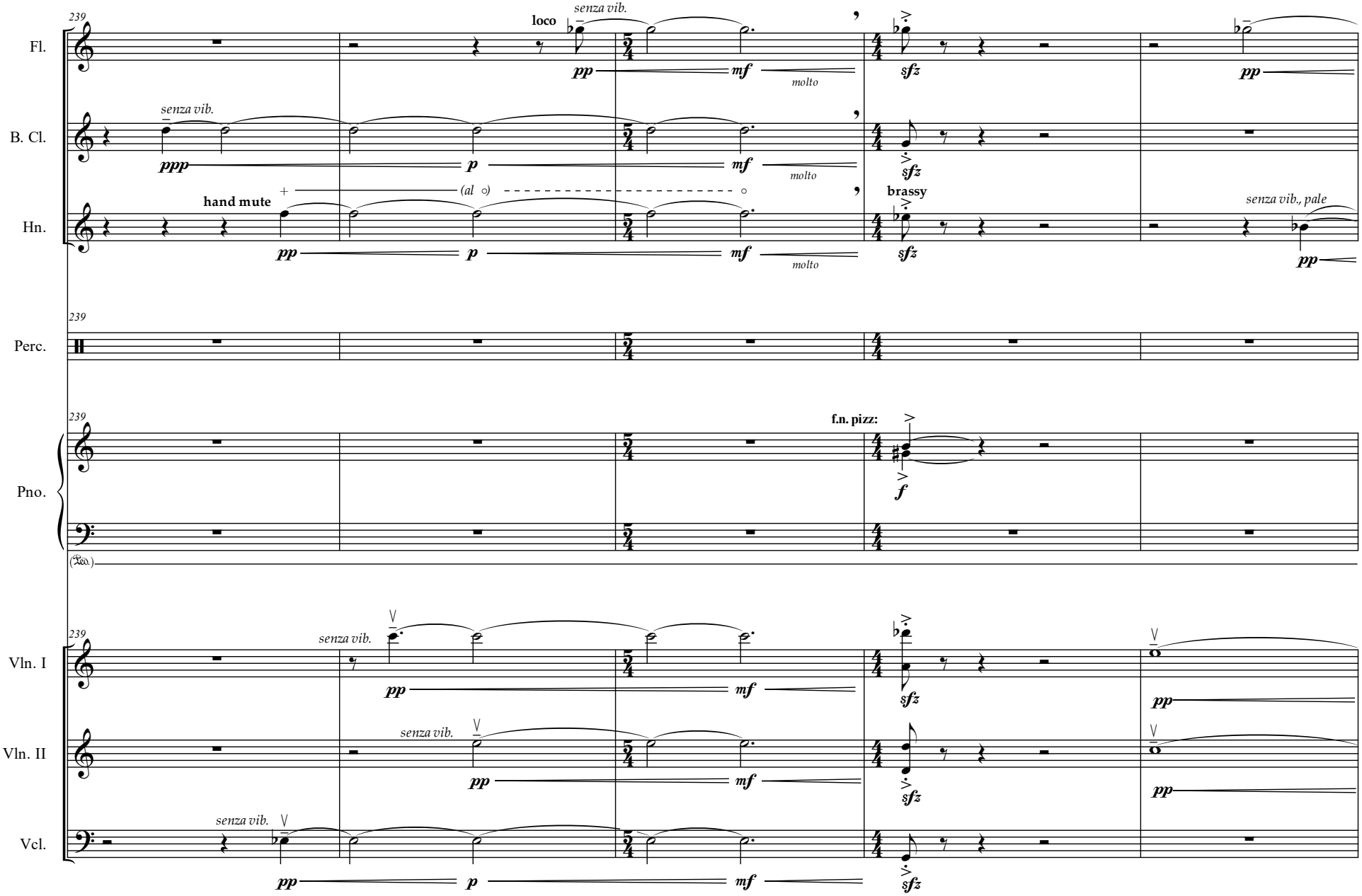

Fl.
B. Cl.
Hn.
Perc.
Pno.
(tightly-muted, mart.)
Vln. I
Vln. II
Vcl.
molto
molto

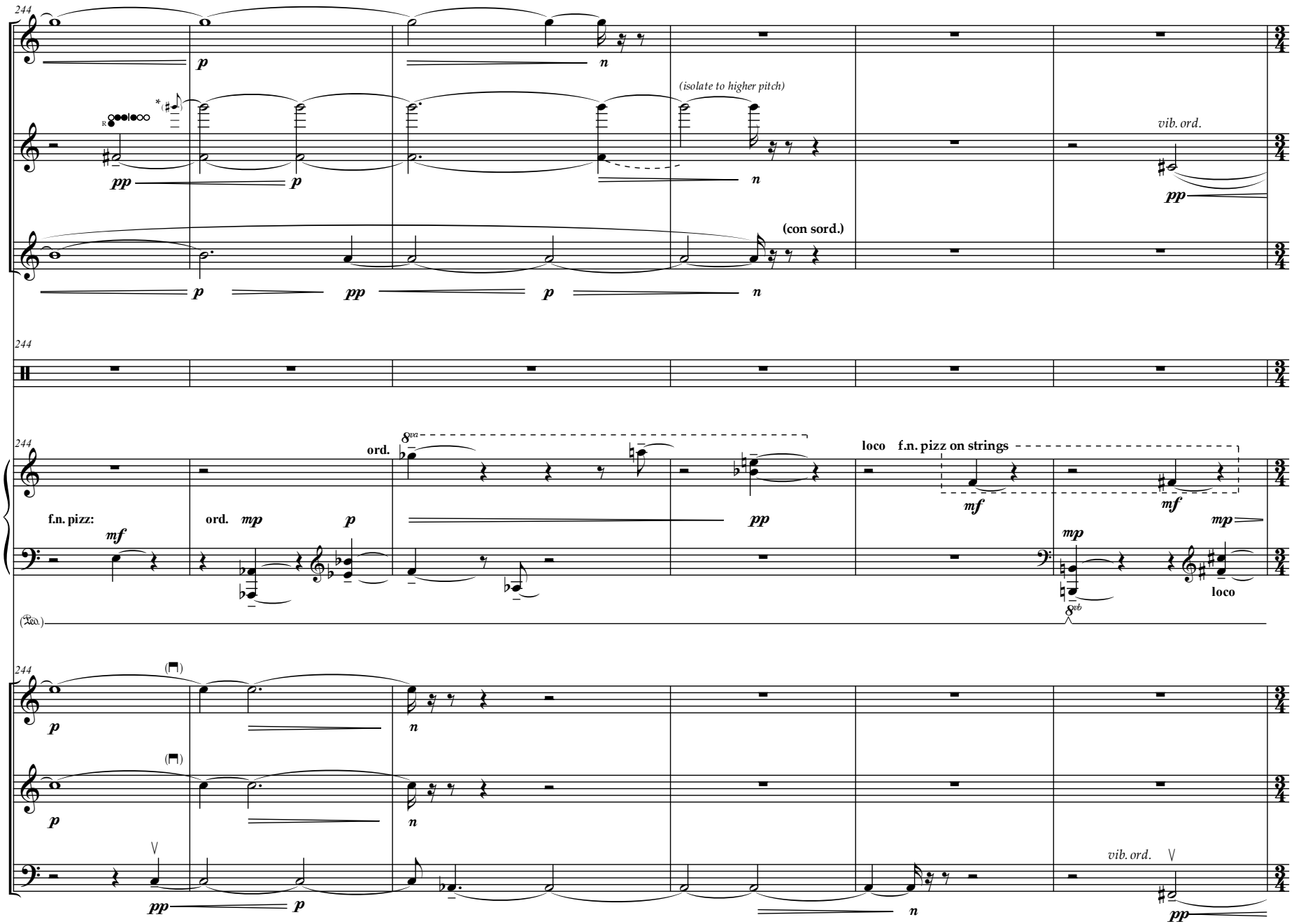

Fl.
B. Cl.
Hn.
Perc.
Pno.
(tightly-muted, mart.)
Vln. I
Vln. II
Vcl.


P
accel. poco a poco, al ♩ = 116
226
Fl.
B. Cl.
(force pressure; shriek)
(sim.)
Hn.
Perc.
not muted, l.v.
Bass drum:
Pno.
(tightly-muted, mart.)
Vln. I
Vln. II
Vcl.

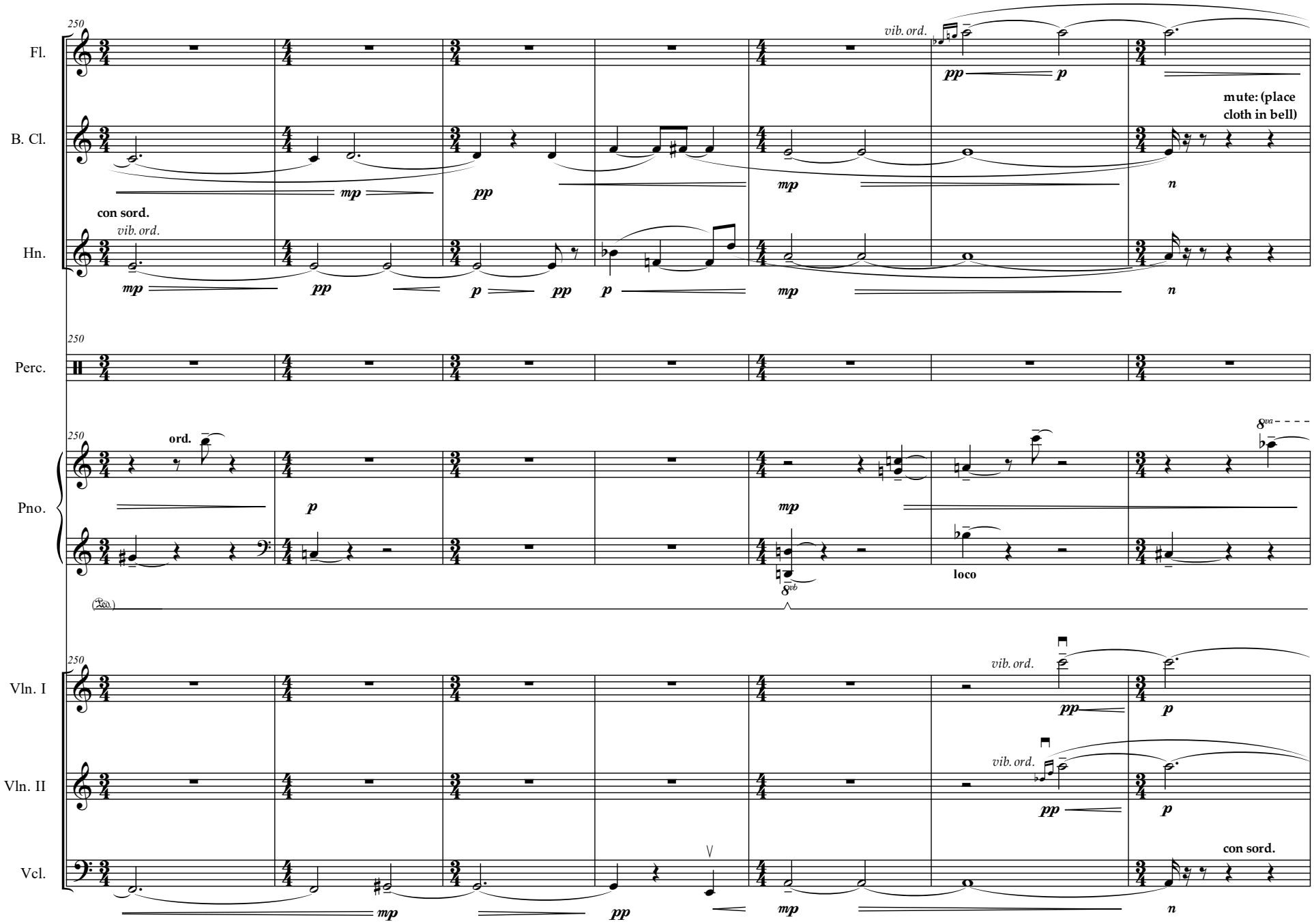

(accel.)
♩ = 116
(8va)
231
Fl.
B. Cl.
Hn.
Perc.
Pno.
Vln. I
Vln. II
Vcl.
sfz f fp
ff
sfz (force pressure; shriek)
sfz (sim.)
f sfz p
mf
(tightly-muted, mart.)
Mute ord., use side of hand
and move as needed
5:4
5
(8vb)
Ped.
poco
ff poco sfz
mf

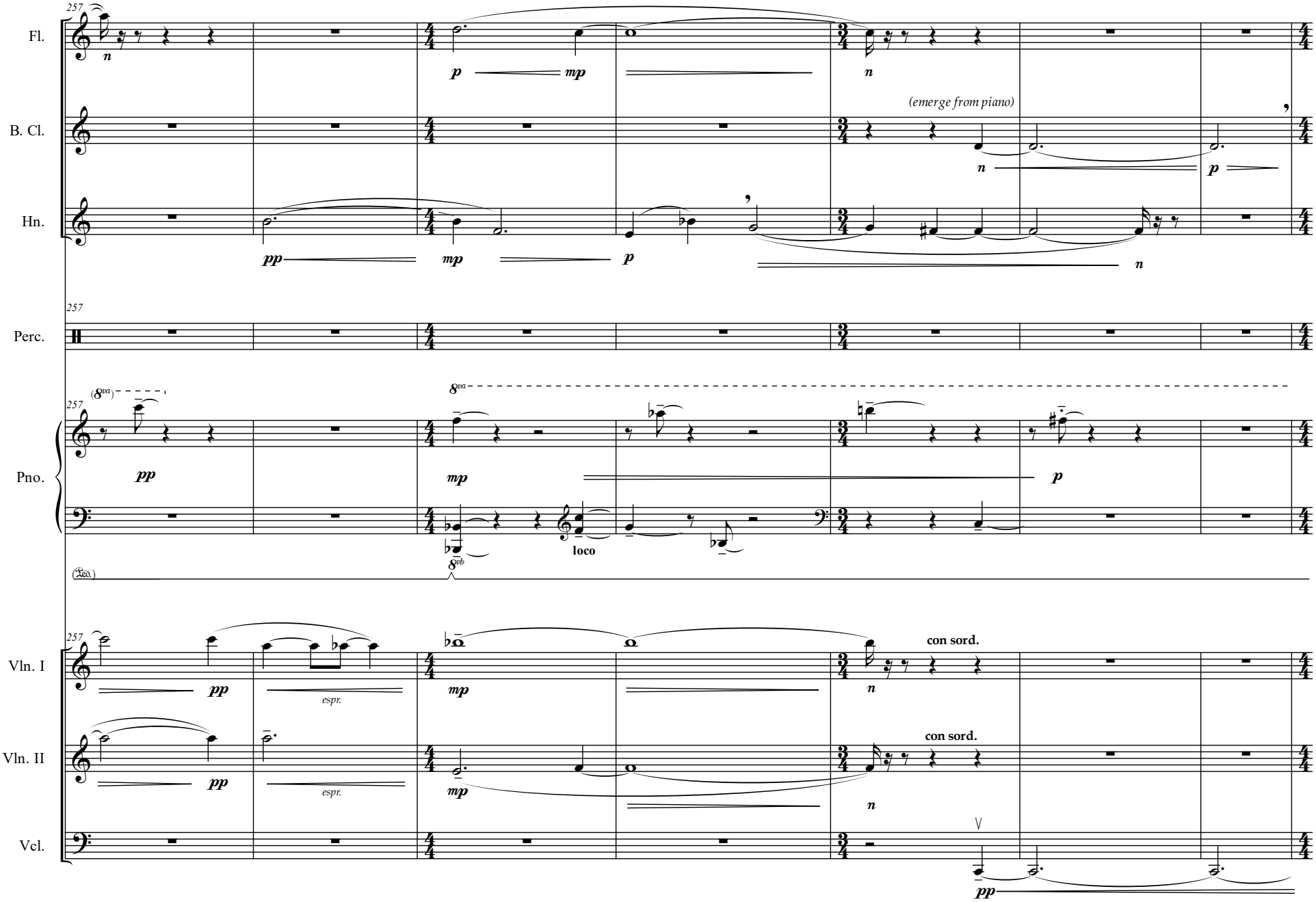

Maestoso, molto rit.
Q Lontano, ethereal (♩ = 84)
Fl.
fltng.
B. Cl.
Hn.
Perc.
Pno.
Vln. I
Vln. II
Vcl.
Ped.

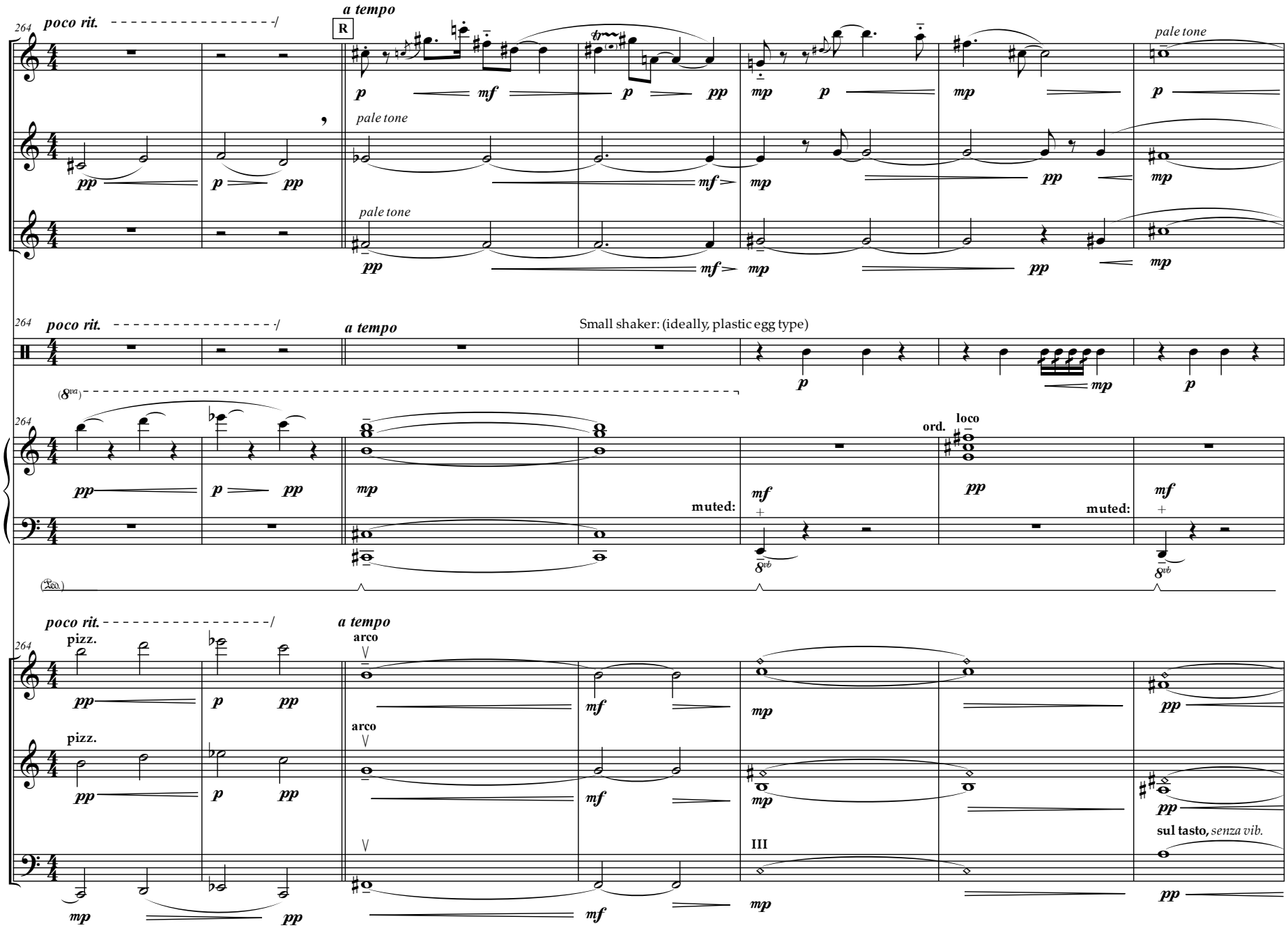

239
Fl.
loco
senza vib.
pp
mf
molto
sfz
pp
B. Cl.
senza vib.
ppp
p
mf
molto
sfz
Hn.
hand mute
(al ○)
brassy
senza vib., pale
pp
p
mf
molto
sfz
pp
Perc.
Pno.
f.n. pizz:
f
Vln. I
senza vib.
pp
mf
sfz
pp
Vln. II
senza vib.
pp
mf
sfz
pp
Vcl.
senza vib.
pp
p
mf
sfz

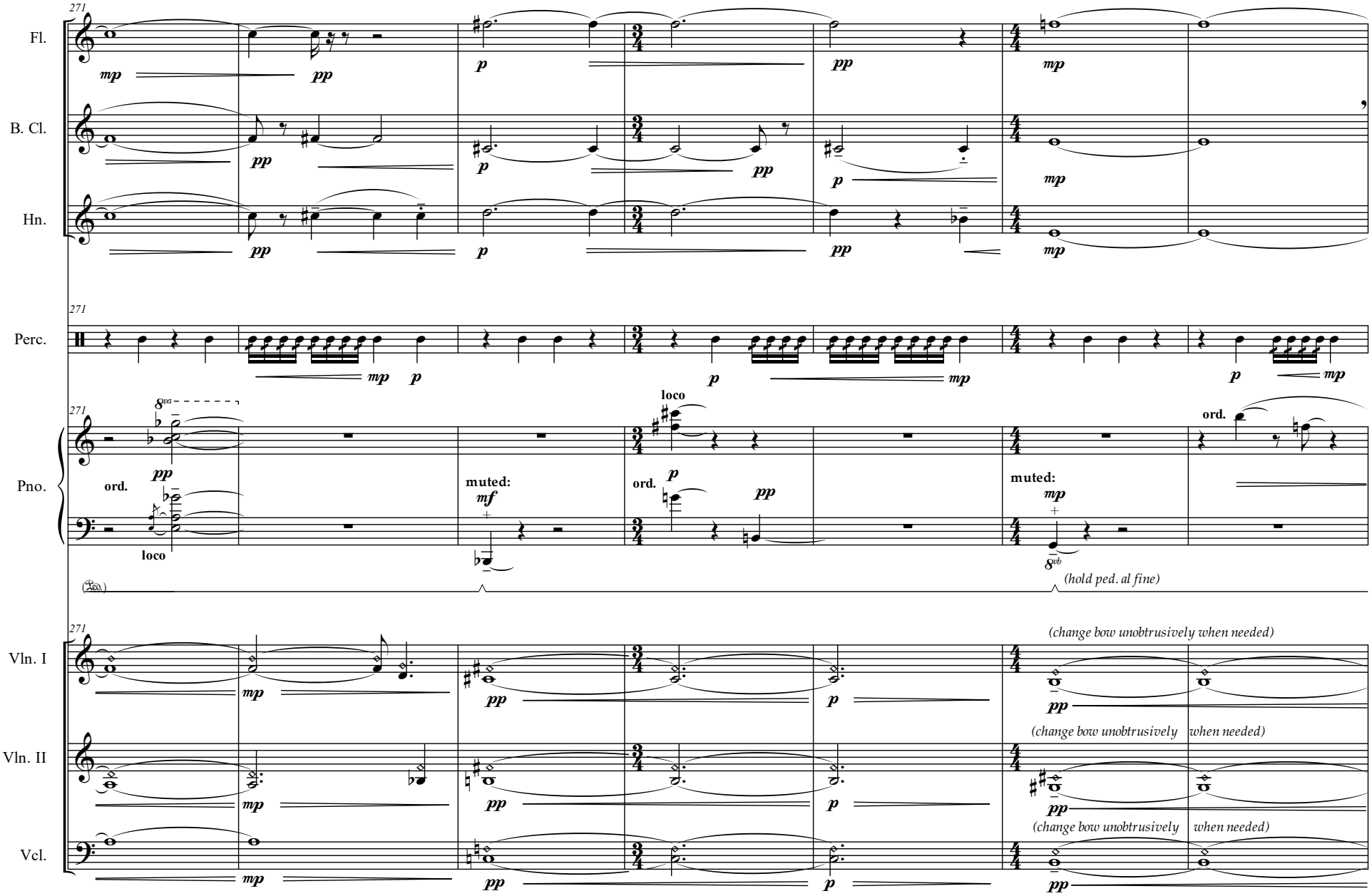


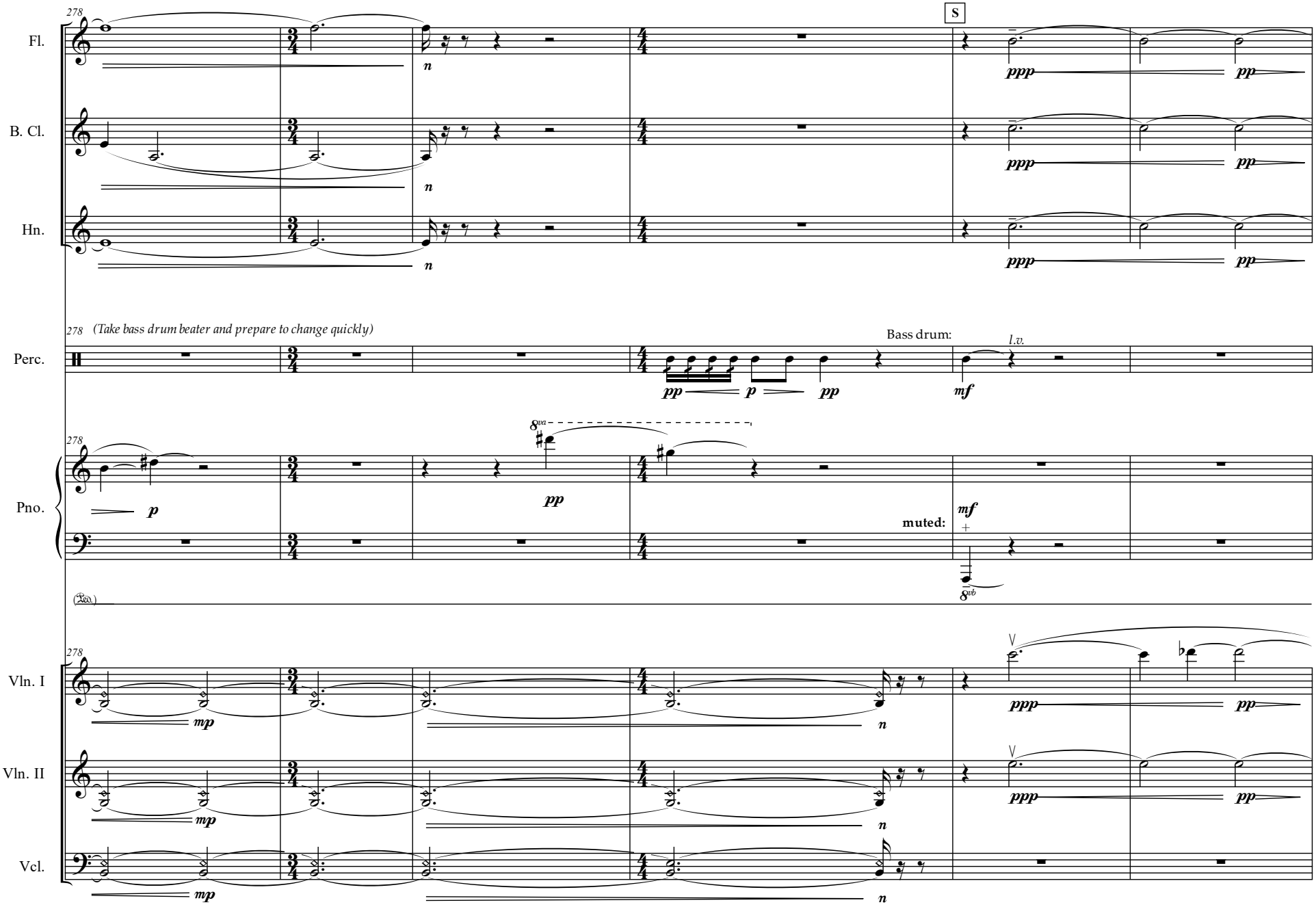
*Produce higher pitch gradually, allowing it to emerge naturally during cresc.

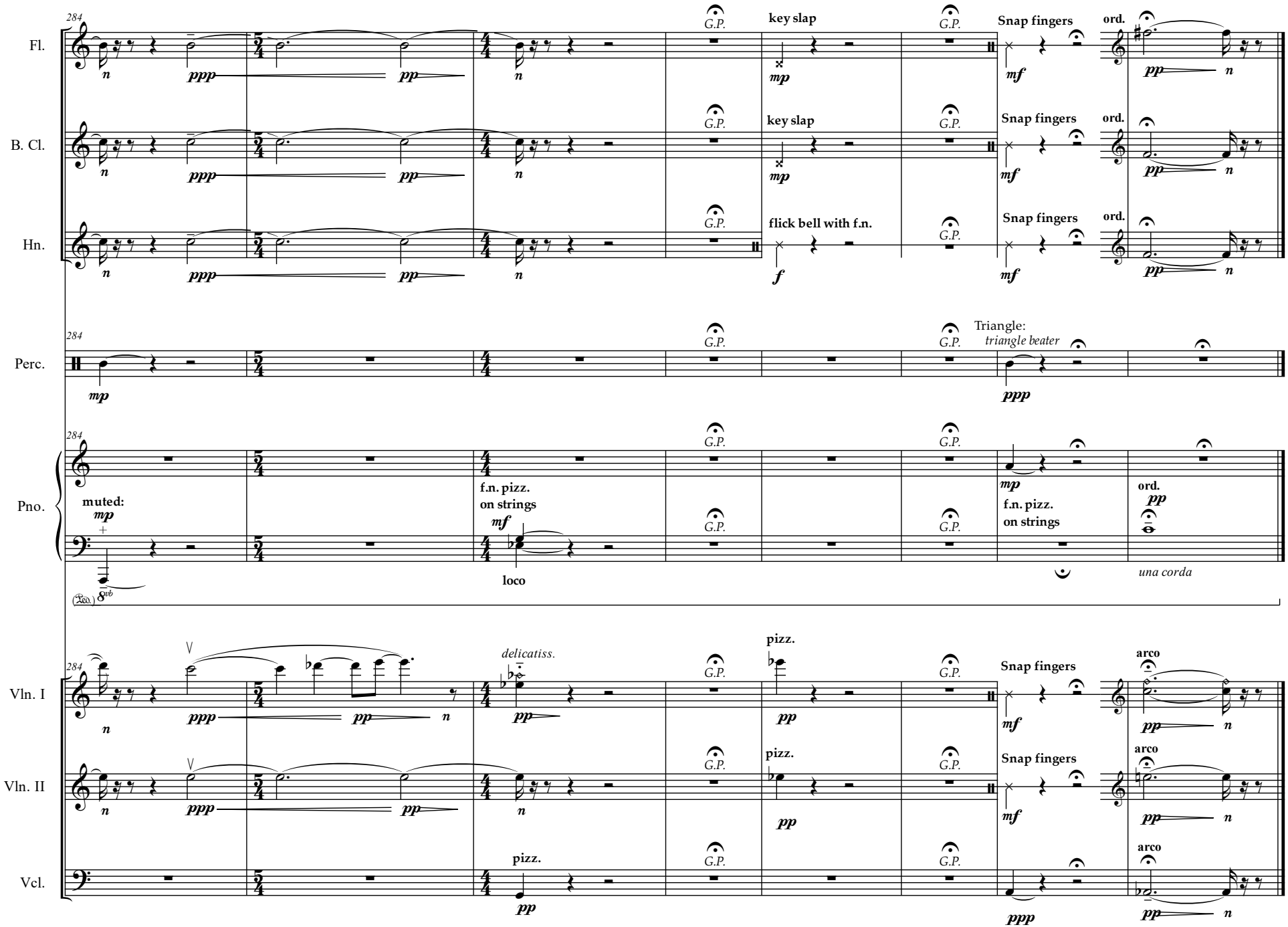

250
Fl.
B. Cl.
Hn.
Perc.
Pno.
Vln. I
Vln. II
Vcl.
vib. ord.
pp
p
mute: (place cloth in bell)
mp
n
con sord.
ord.
loco
8va
8vb
con sord.


257
Fl.
B. Cl.
Hn.
Perc.
Pno.
Vln. I
Vln. II
Vcl.
(emerge from piano)
loco
con sord.
con sord.
espr.
espr.


264
poco rit.
a tempo
R
Fl.
B. Cl.
Hn.
pale tone
Perc.
Small shaker: (ideally, plastic egg type)
Pno.
ord.
loco
muted:
Vln. I
Vln. II
Vcl.
pizz.
arco
III
sul tasto, senza vib.


271
Fl.
B. Cl.
Hn.
Perc.
Pno.
Vln. I
Vln. II
Vcl.
mp
pp
p
mf
ord.
loco
muted:
8va
8vb
(hold ped. al fine)
(change bow unobtrusively when needed)


278
S
Fl.
B. Cl.
Hn.
ppp
pp
n
278 (Take bass drum beater and prepare to change quickly)
Perc.
Bass drum:
l.v.
pp
p
mf
278
Pno.
8va
8vb
muted:
(Ped.)
278
Vln. I
Vln. II
Vcl.
mp


284
Fl.
B. Cl.
Hn.
Perc.
Pno.
Vln. I
Vln. II
Vcl.
G.P.
key slap
flick bell with f.n.
Snap fingers
ord.
Triangle:
triangle beater
muted:
f.n. pizz.
on strings
loco
una corda
delicatiss.
pizz.
arco