Data for the Study of Timbral Modulation

for bass clarinet, trombone, percussion, and violin

Alex Stephenson
(for the ACTOR Project)
2019

Score
First version
2020.02.18

Composed for the ACTOR Project (Analysis, Creation, and Teaching of Orchestration)
https://www.actorproject.org
Duration: approximately 5 minutes

Performance Notes

Violin

The circled numerals 0 through 4 are used to indicate gradations of bow position. 0 corresponds to ordinario, while 4 corresponds to sul ponticello (N.B. not molto sul ponticello), with 1, 2, and 3 corresponding to gradations in between. A numeral remains in effect until replaced by another.

Trombone

The circled numerals 0 through 4 are used to indicate gradations in the placement of the hand over the harmon mute. 0 corresponds to the mute being fully covered, while 4 corresponds to the mute being fully uncovered, with 1, 2, and 3 corresponding to gradations in between. A numeral remains in effect until replaced by another.

Percussion

Required instruments: vibraphone, 2 tom-toms, 2 triangles (small, medium). The tom-toms should be muted (e.g., with cloth) throughout.

Commentary

"Timbral modulation," which is roughly equivalent to "Schoenbergian Klangfarbenmelodie," was defined by Stephen McAdams in his 2017 lectures at UC San Diego. This etude takes the term as an impetus for creating emergent timbral complexes and gradually transforming those timbral complexes—in other words, gradually transporting them through timbre space (similarly defined by McAdams). Certain musical situations in the etude specifically invited consideration of parallels of classical pitch modulation techniques in the timbral domain. The entire etude is also concerned with the effect of tempo on the perceived emergence of timbral complexes as well as our ability to judge the metaphorical distances between them.

The etude proceeds through the following four scenarios:

(1) A looping series of instrumental pairs articulating sustained tones smoothly traverses timbre space: violin/trombone, trombone/clarinet, clarinet/bowed vibraphone, trombone/clarinet, violin/trombone, etc. The pairs, which share timbral "common tones" to help ensure smooth traversal of timbre space, are chosen particularly with the dimension of spectral centroid in mind. Pitch material is initially tightly focused around D4. In this opening state, the pairs articulate pitches in rhythmic unison and are separated by silences. Instruments are then instead presented in a series of imbricated cross-fades (e.g. the start of a trombone tone overlaps with the end of a violin tone, while the end of that same trombone tone overlaps with the start of a clarinet tone). The pitch repertoire expands, and the rate of cross-fading between pairs increases in a series of accelerating waves. Furthermore, as this rate increases, distance traversed in timbre space also increases (specifically, via changes of violin bow position and trombone harmon mute), thus translating the expansion of pitch space, just discussed, into the timbral domain.

(2) An alternate version of (1). As the cross-fade rate increases, pitch and timbre space contract rather than expand.

(3) By this point, pitch and timbre spaces have started from a place of relative contraction, expanded, and finally contracted again. A series of suddenly emphatic unisons on a single pitch, G3, emphasize this moment of arrival. Other frequencies in a harmonic relationship to the frequency associated with this first pitch are gradually added: thus, the extent of the ever- richer timbral complex's occupation of timbre space gradually grows without (hopefully) its identity being lost. The music simultaneously accelerates.

(4) The ensemble suddenly splits into two streams, differentiated through register as well as attack characteristics: relatively low frequencies with dry staccato attacks, higher frequencies in a more continuous stream. Instruments hop across the metaphorical chasm separating the two timbral complexes in an increasingly rapid manner, thereby gradually morphing the precise timbral makeup of the complexes at any given moment.

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Score in C

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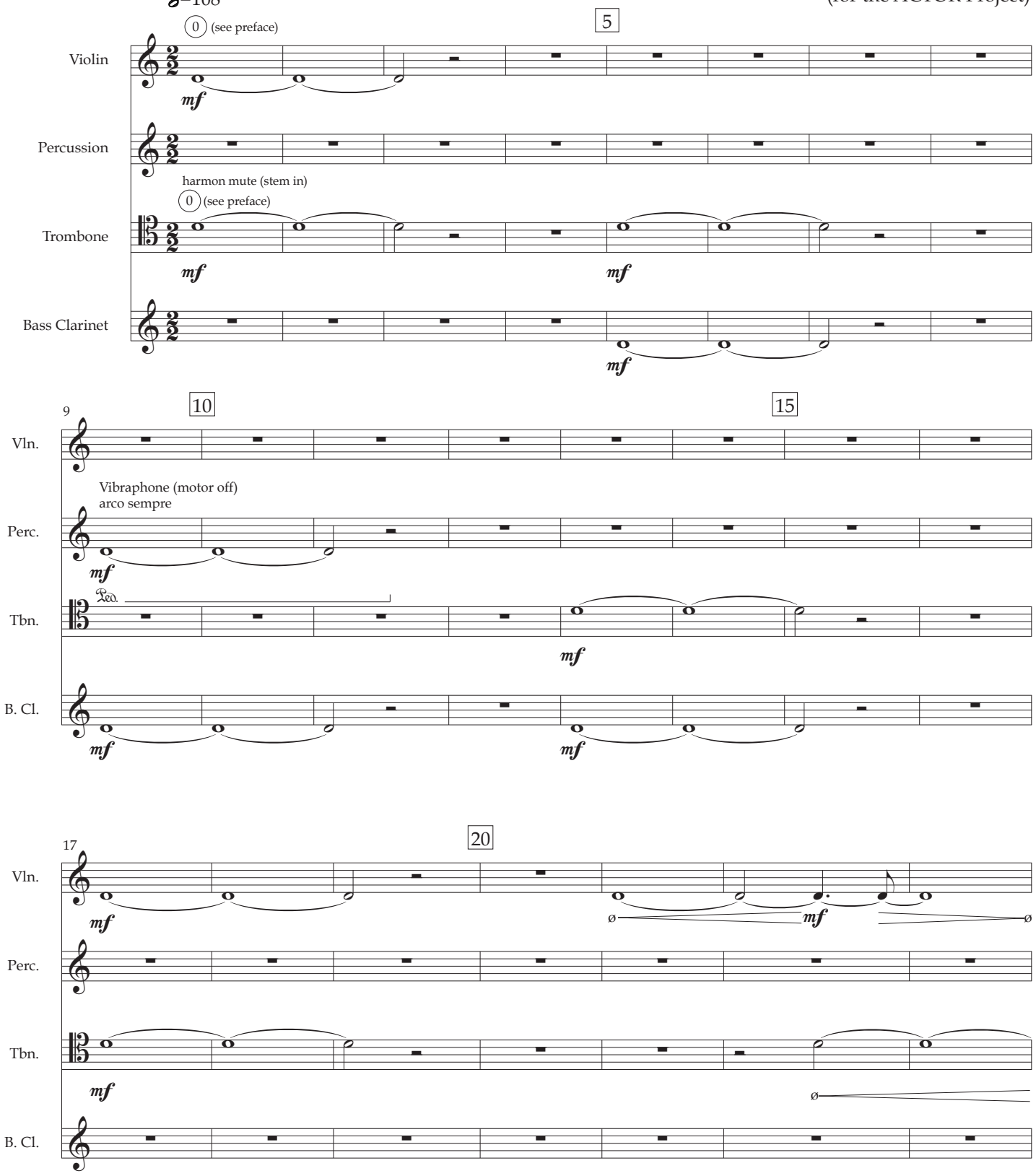
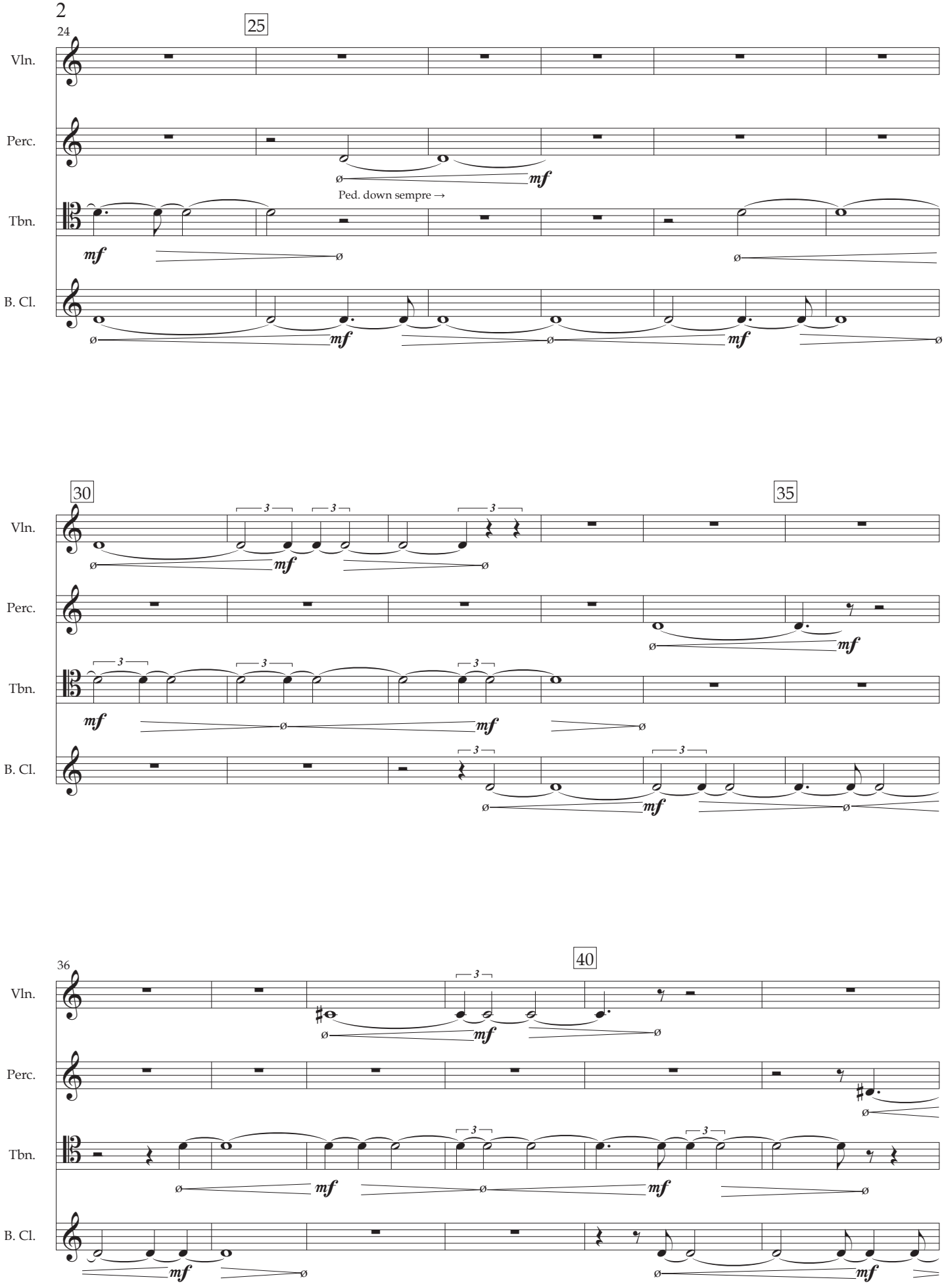
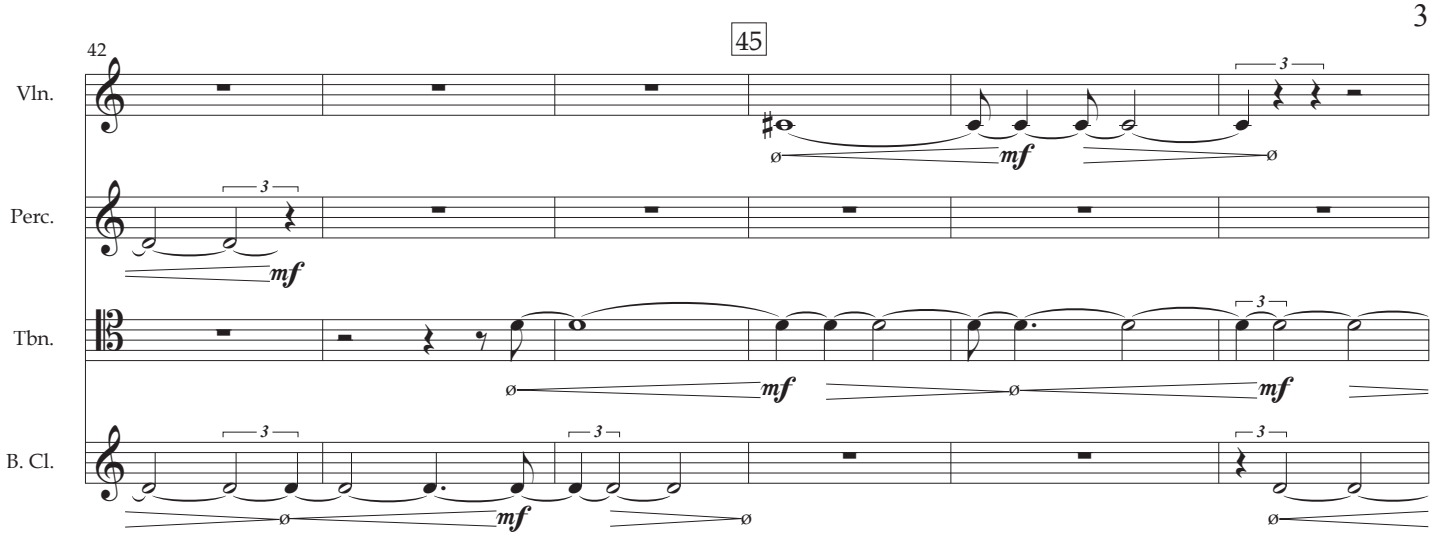
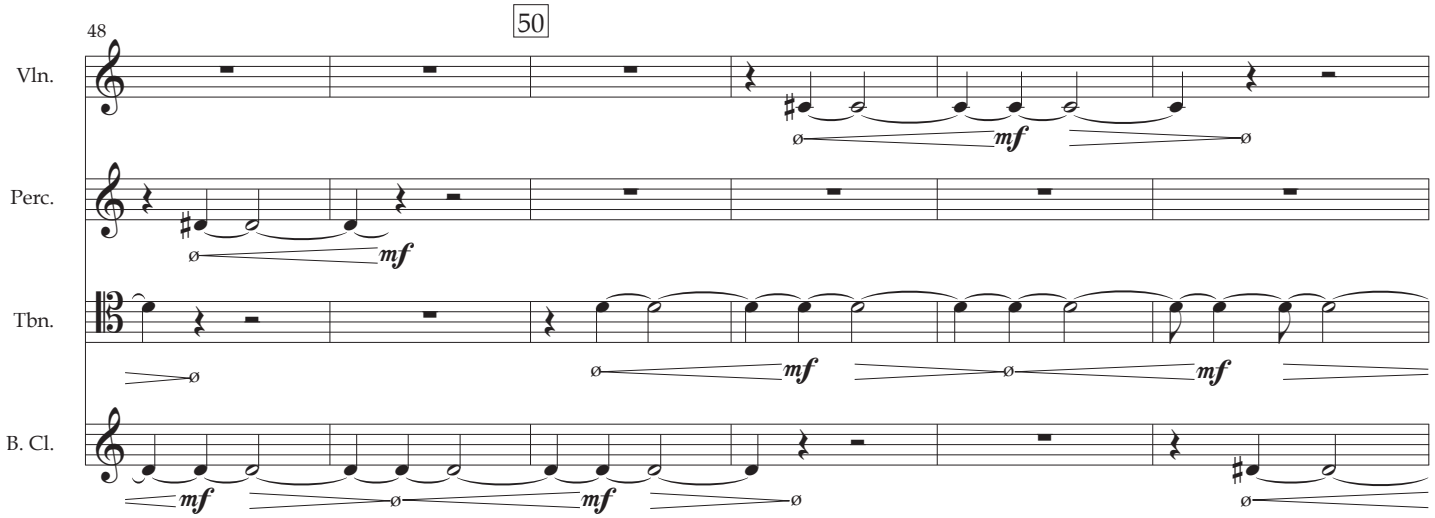
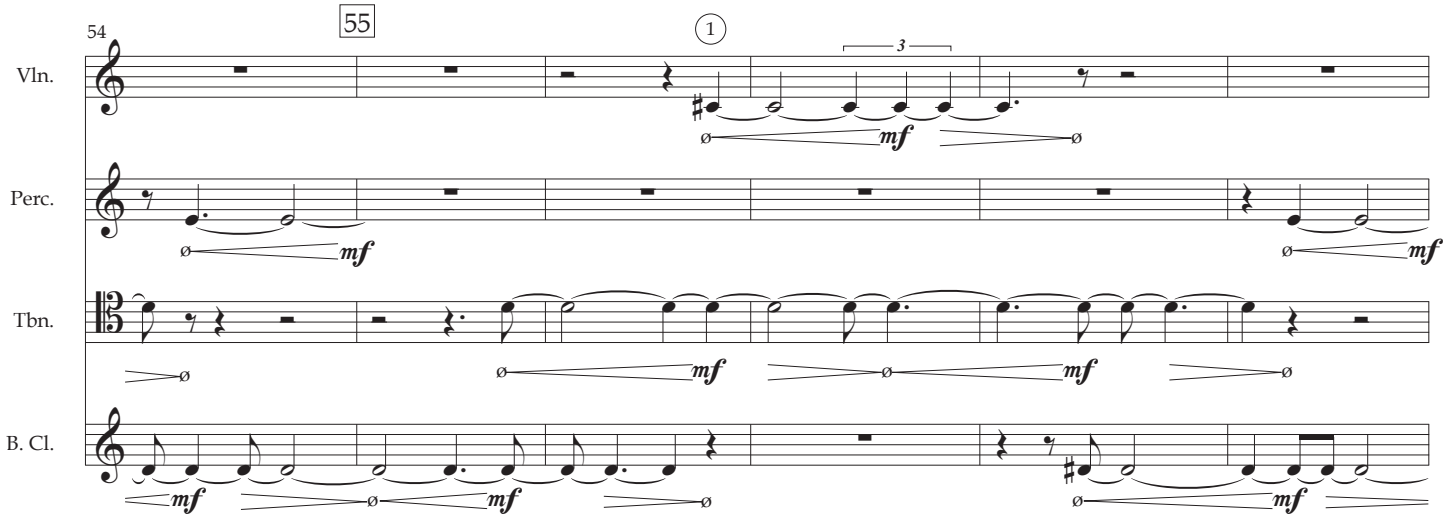
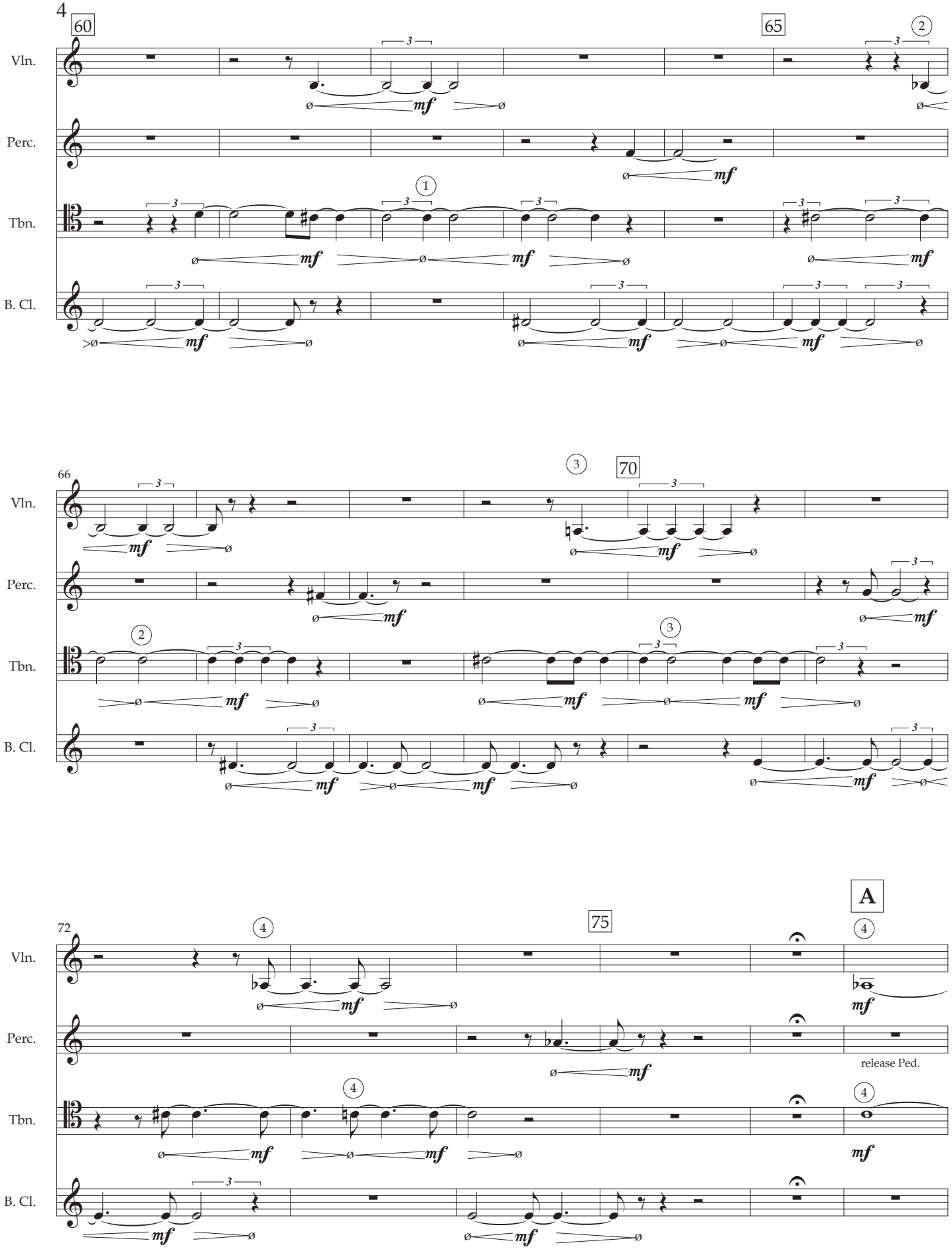


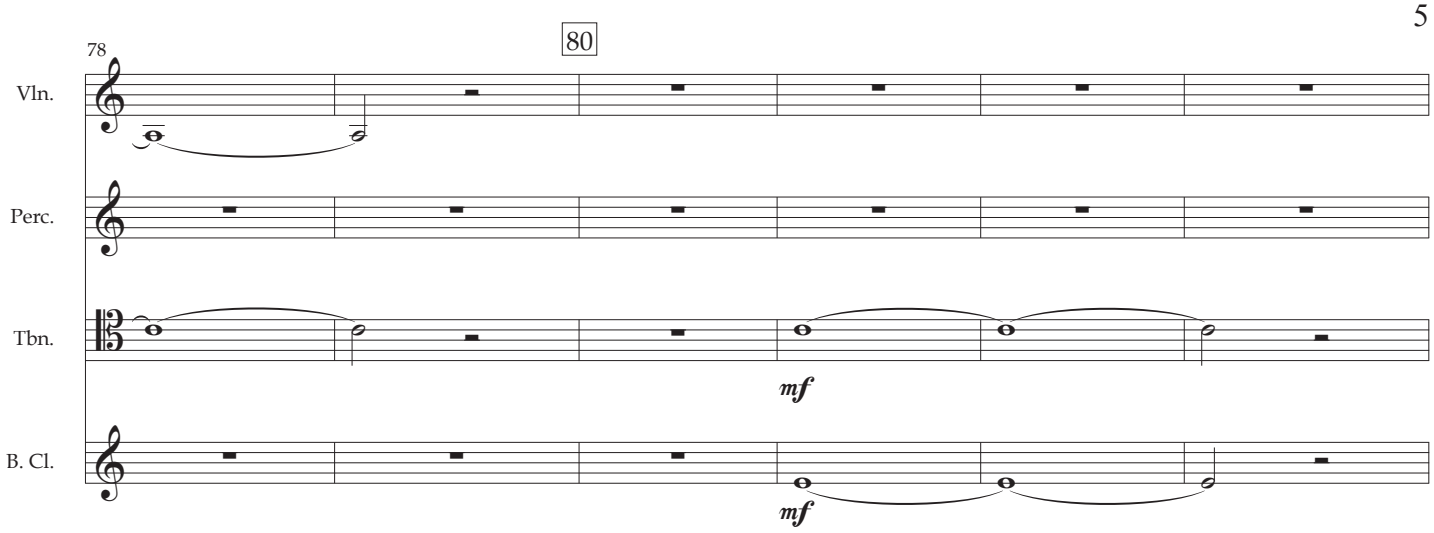

24
25
Vln.
Perc.
mf
Ped. down sempre →
Tbn.
mf
B. Cl.
mf
30
35
Vln.
mf
Perc.
mf
Tbn.
mf
mf
B. Cl.
mf
36
40
Vln.
mf
Perc.
Tbn.
mf
mf
B. Cl.
mf
mf

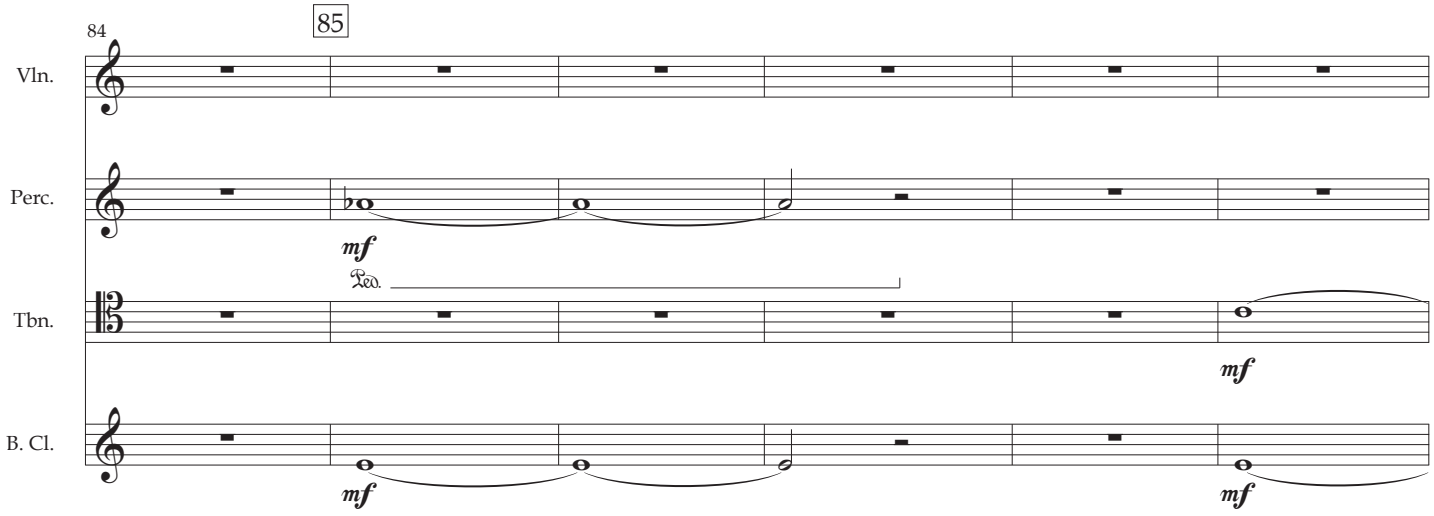

42
45
Vln.
Perc.
Tbn.
B. Cl.
mf

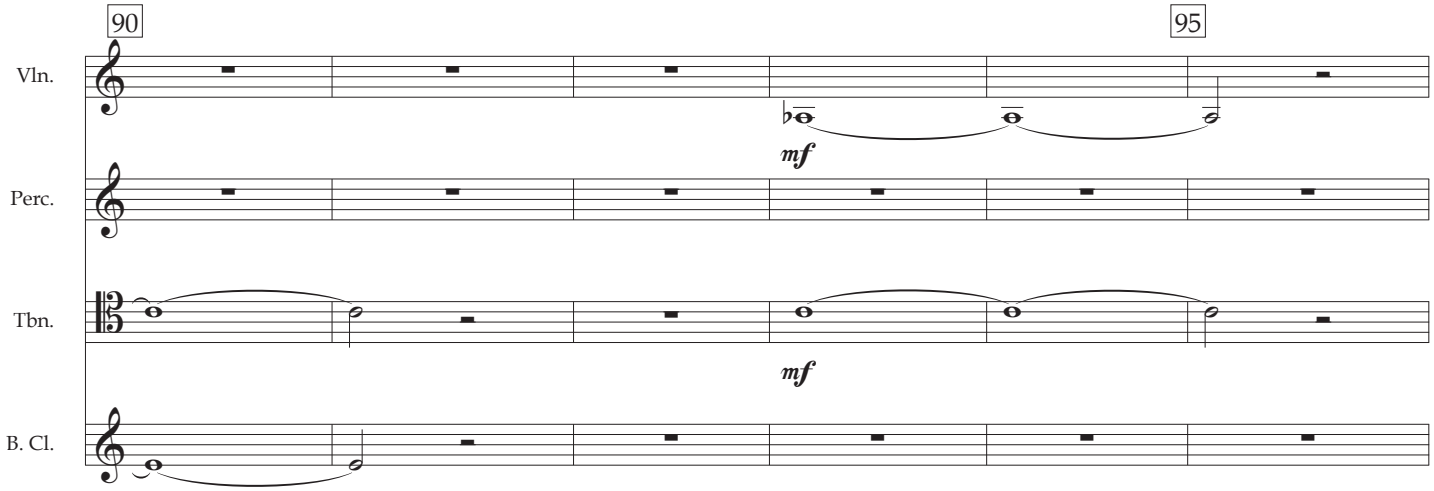

48
50
Vln.
Perc.
Tbn.
B. Cl.
mf


54
55
1
Vln.
Perc.
Tbn.
B. Cl.
mf


60
65
66
70
72
75
A
Vln.
Perc.
Tbn.
B. Cl.
mf
release Ped.


78
80
Vln.
Perc.
Tbn.
B. Cl.
mf
mf


84
85
Vln.
Perc.
Tbn.
B. Cl.
mf
Ped.
mf
mf
mf


90
95
Vln.
Perc.
Tbn.
B. Cl.
mf
mf

96

100

Vln.

Perc.

Tbn.

B. Cl.

mf

Ped. down sempre →

102

105

Vln.

Perc.

Tbn.

B. Cl.

3

mf

108

110

Vln.

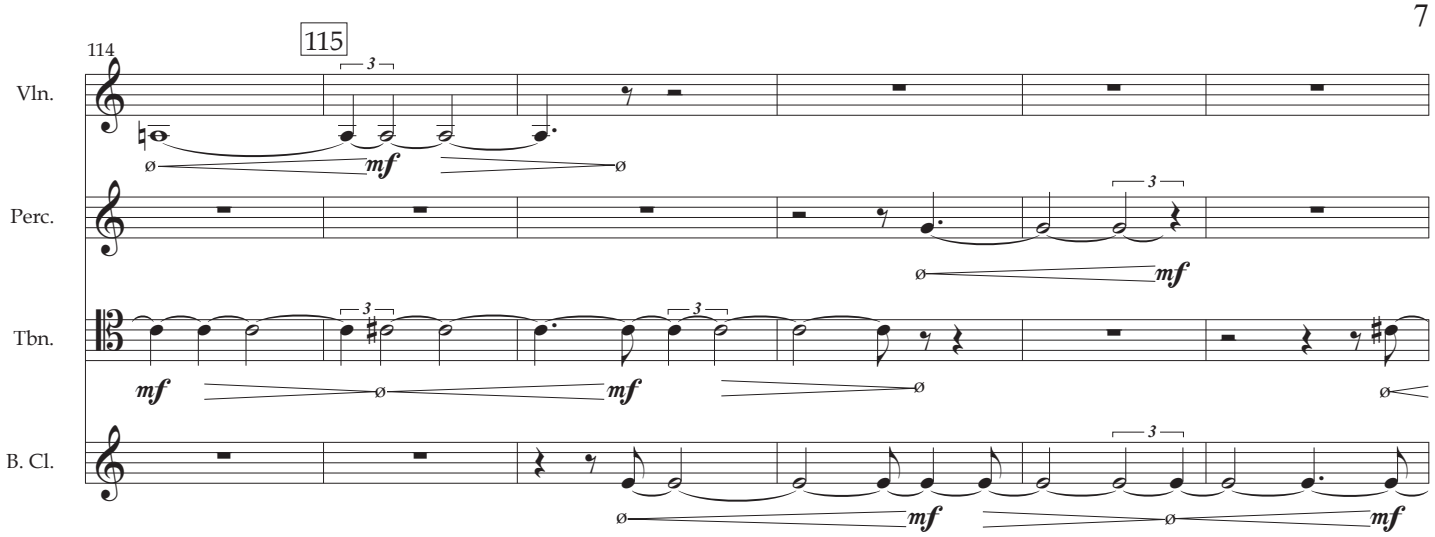
Perc.

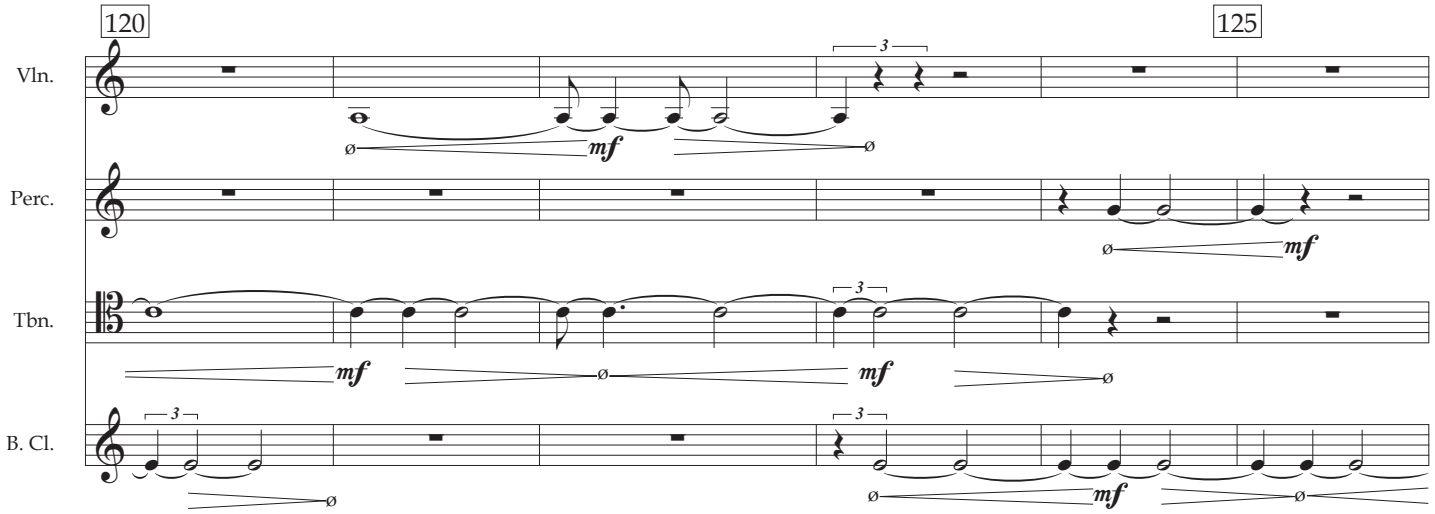
Tbn.

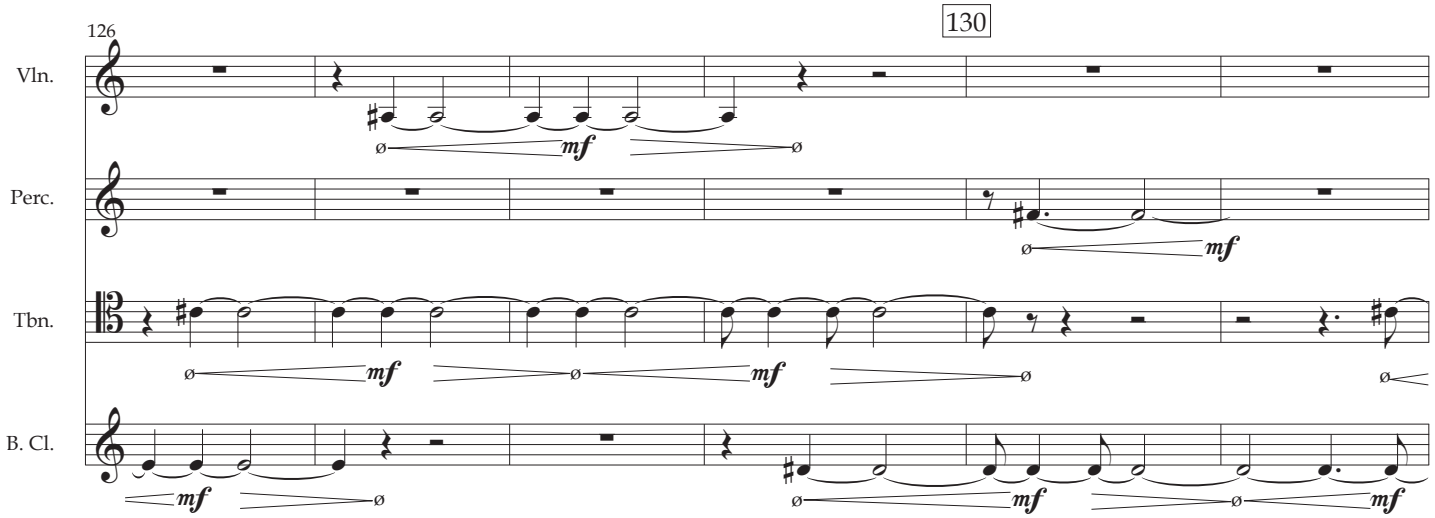
B. Cl.

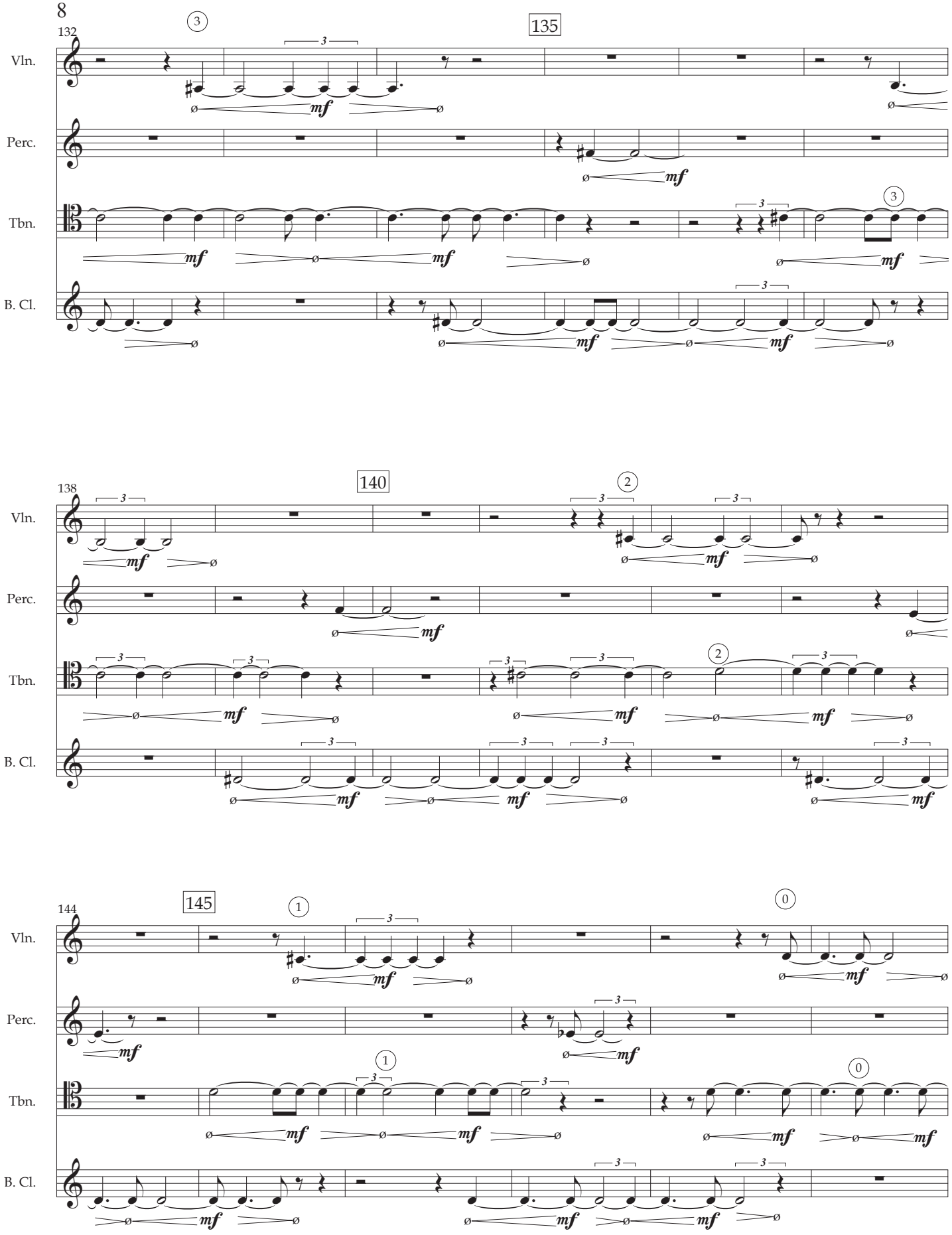
3

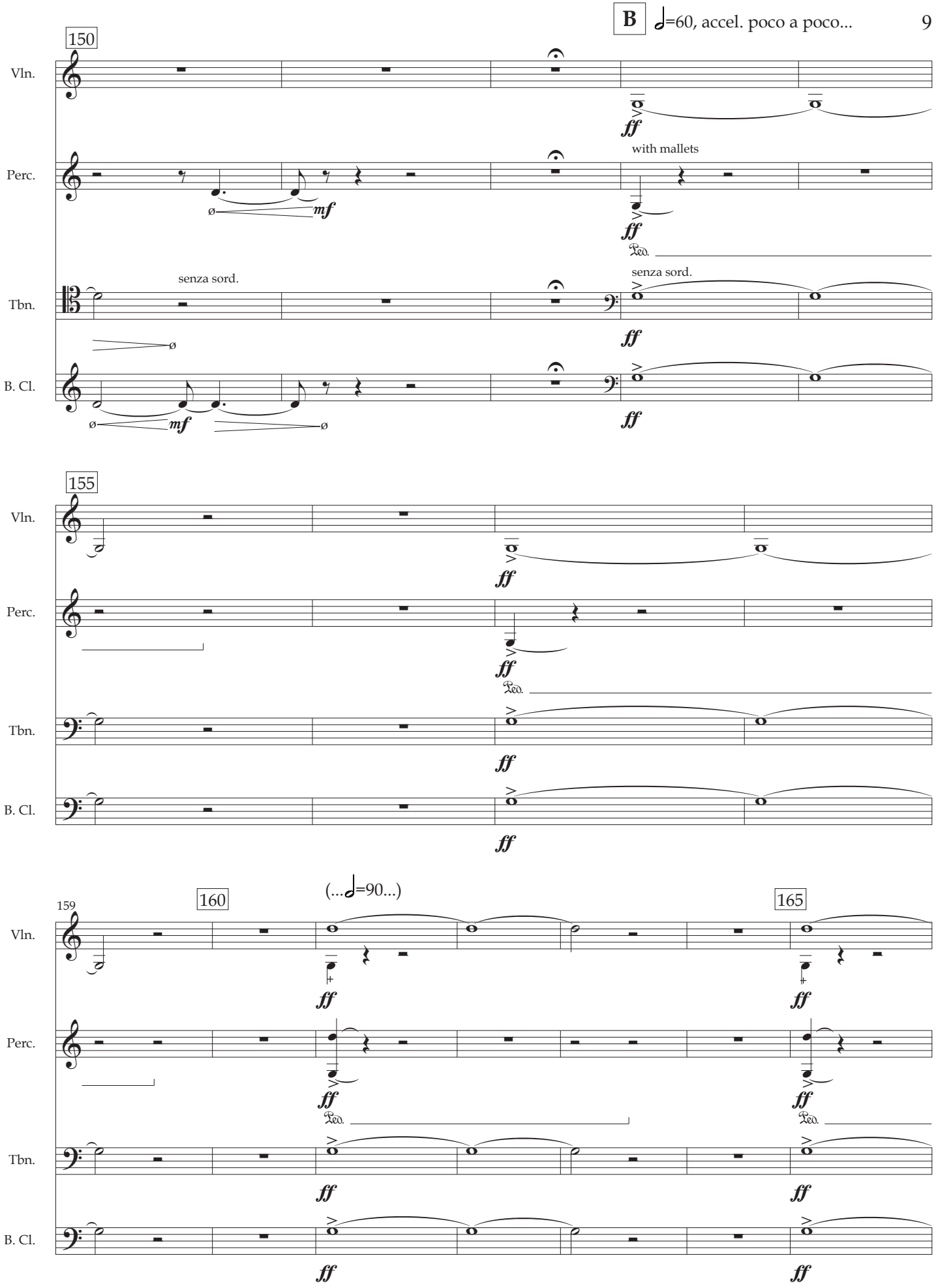
mf


114
115
Vln.
Perc.
Tbn.
B. Cl.
mf


120
125
Vln.
Perc.
Tbn.
B. Cl.
mf


126
130
Vln.
Perc.
Tbn.
B. Cl.
mf


132
135
Vln.
Perc.
Tbn.
B. Cl.
mf
138
140
145
144


B
♩=60, accel. poco a poco...
150
Vln.
Perc.
with mallets
Tbn.
senza sord.
senza sord.
B. Cl.
155
Vln.
Perc.
Tbn.
B. Cl.
159
160
(...♩=90...)
165
Vln.
Perc.
Tbn.
B. Cl.