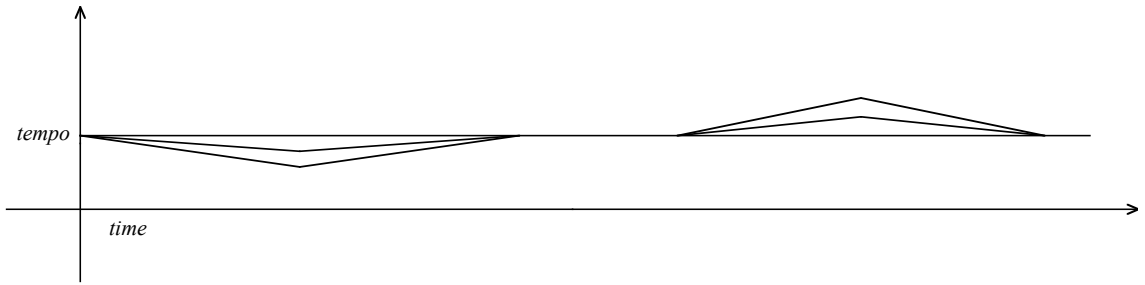
Metamorphoses

Canon a 3 for solo cello and real-time computer delay
or cello trio

2007

Clifton Callender

Metamorphoses is a three-part canon for solo cello and real-time computer-assisted delay that explores the simultaneous presentation of multiple independent accelerandos and ritardandos. (This is accomplished with variable tap delays in Max/MSP.) The solo cello and two "virtual" cellos begin at the same time and in the same tempo, M.M. = 120. The virtual cellos gradually slow to tempos of M.M. = $114\frac{2}{3}$ and M.M. = $109\frac{1}{3}$ over the course of the first 90 seconds. Reversing this process, the virtual cellos return to their original tempos three minutes into the piece, but lagging behind the solo cello by four and eight beats. The second half of the piece inverts this process with the virtual cellos accelerating to tempos of M.M. = $126\frac{2}{5}$ and M.M. = $132\frac{4}{5}$ before returning to M.M. = 120. The piece concludes with all three voices converging on melodic and rhythmic unisons. The following figure graphs the tempo design of the work:



While the sound is entirely acoustic, the computer is absolutely essential to the composition, generation, and realization of the work.

Metamorphoses may also be performed by solo cello with prerecorded virtual cellos or as a canon for three live cellist, each listening to a separate click track. (A non-canonic version for solo cello is also available by contacting the composer at clifton.callender@fsu.edu.) However, the work is ideally performed with solo cello and real-time computer so that the performance of the canon line is "echoed" in every detail.

Metamorphoses was premiered by Evan Jones. My thanks to both Evan Jones and Craig Hultgren for their expert cello advice.

Tempo indications

While the starting tempo is indicated as 120 beats per minute, a range of initial tempos is possible from 96 to 120. All other tempo indications are relative to a starting tempo of 120; a slower initial tempo would necessitate proportionally slower subsequent tempos.

Tempos in the "second" and "third" cellos are often accompanied by variables that modify the tempo of the solo cello part. These variables are defined as below (with t measured in minutes):

$$
\begin{aligned}
a_1(t) &= \frac{-3\frac{5}{9}t + 120}{120}, \\
a_2(t) &= \frac{-7\frac{1}{9}t + 120}{120}, \\
b_1(t) &= \frac{3\frac{5}{9}(t - \frac{3}{2}) + 114\frac{2}{3}}{120}, \\
b_2(t) &= \frac{7\frac{1}{9}(t - \frac{3}{2}) + 109\frac{1}{3}}{120}, \\
c_1(t) &= \frac{\frac{v_1}{l}|t - t_0| + v_1 + 120}{120}, \text{and} \\
c_2(t) &= \frac{\frac{v_2}{l}|t - t_0| + v_2 + 120}{120},
\end{aligned}
$$

where $t_0 = \frac{321211}{60000}$, $l = \frac{321211-245000}{60000}$, $v_1 = 8/l$, and $v_2 = 16/l$.

All indicated accelerandos and ritardandos, such as those on pages 14 and following, are *linear*.

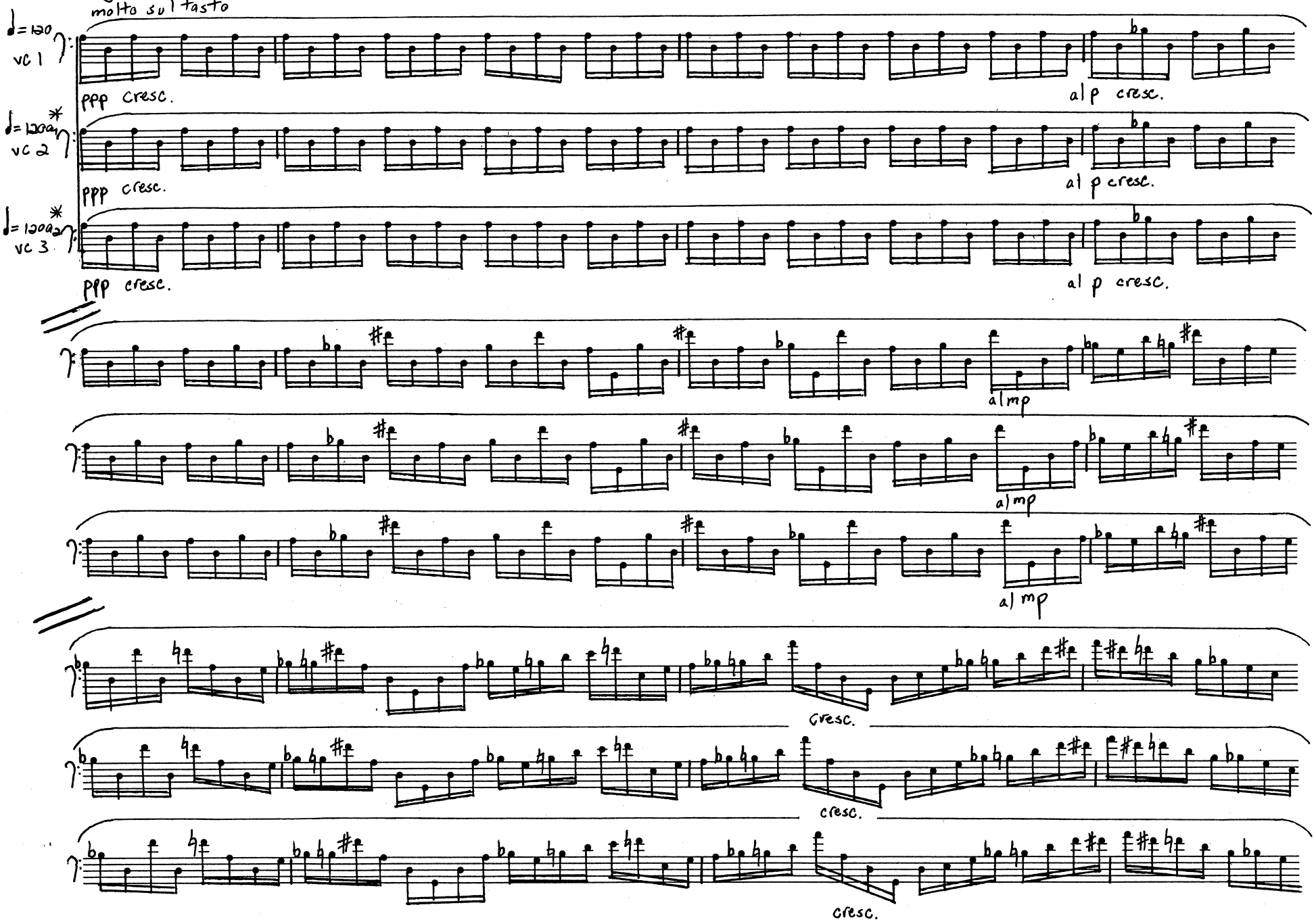
Click tracks are available upon request.

Metamorphoses

Canon a 3 for cello(s)

Clifton Callender

legatissimo (change bow as necessary)
molto sul tasto



* See notes regarding tempos with variables.
Click tracks are available from the composer.

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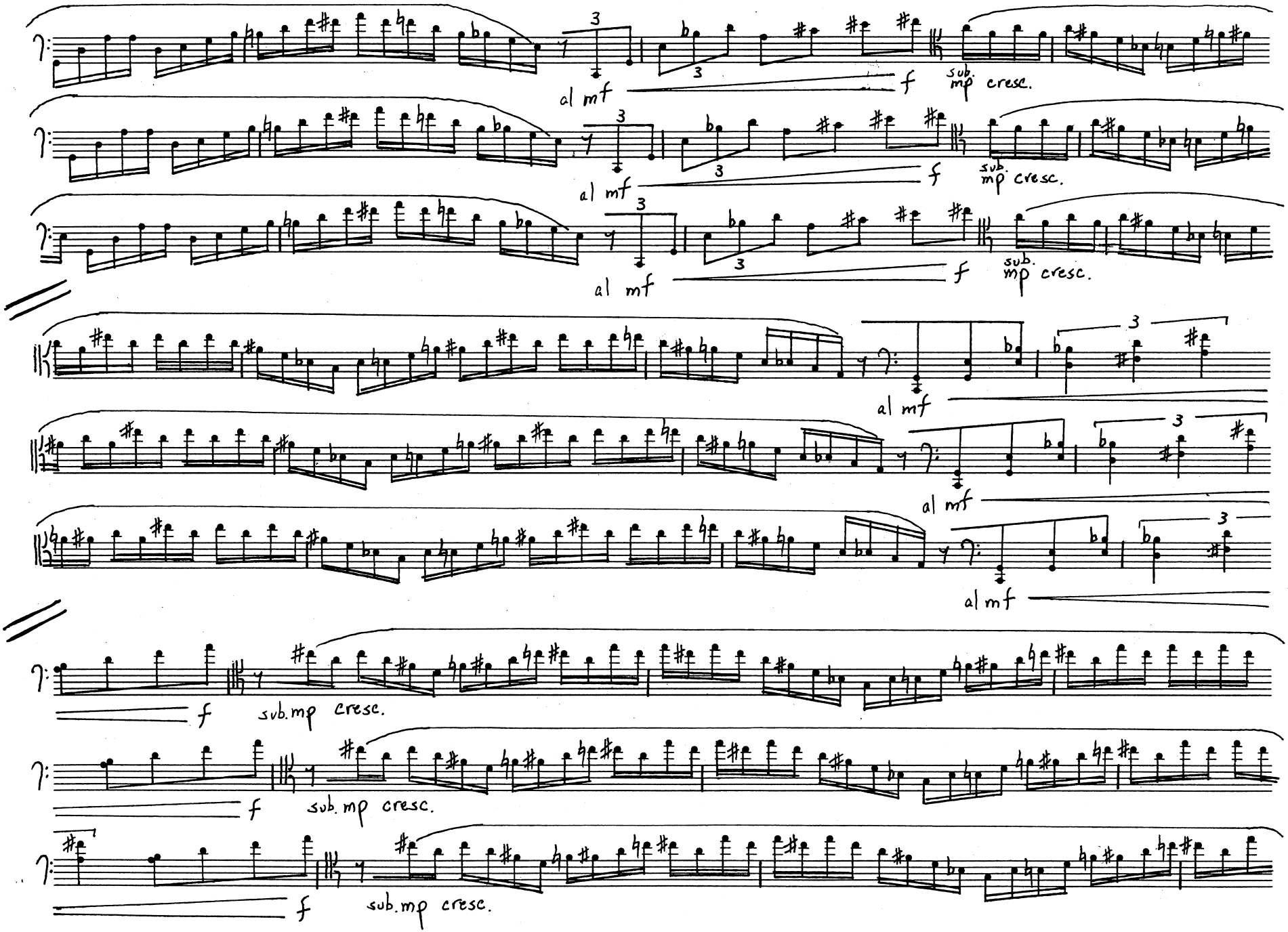
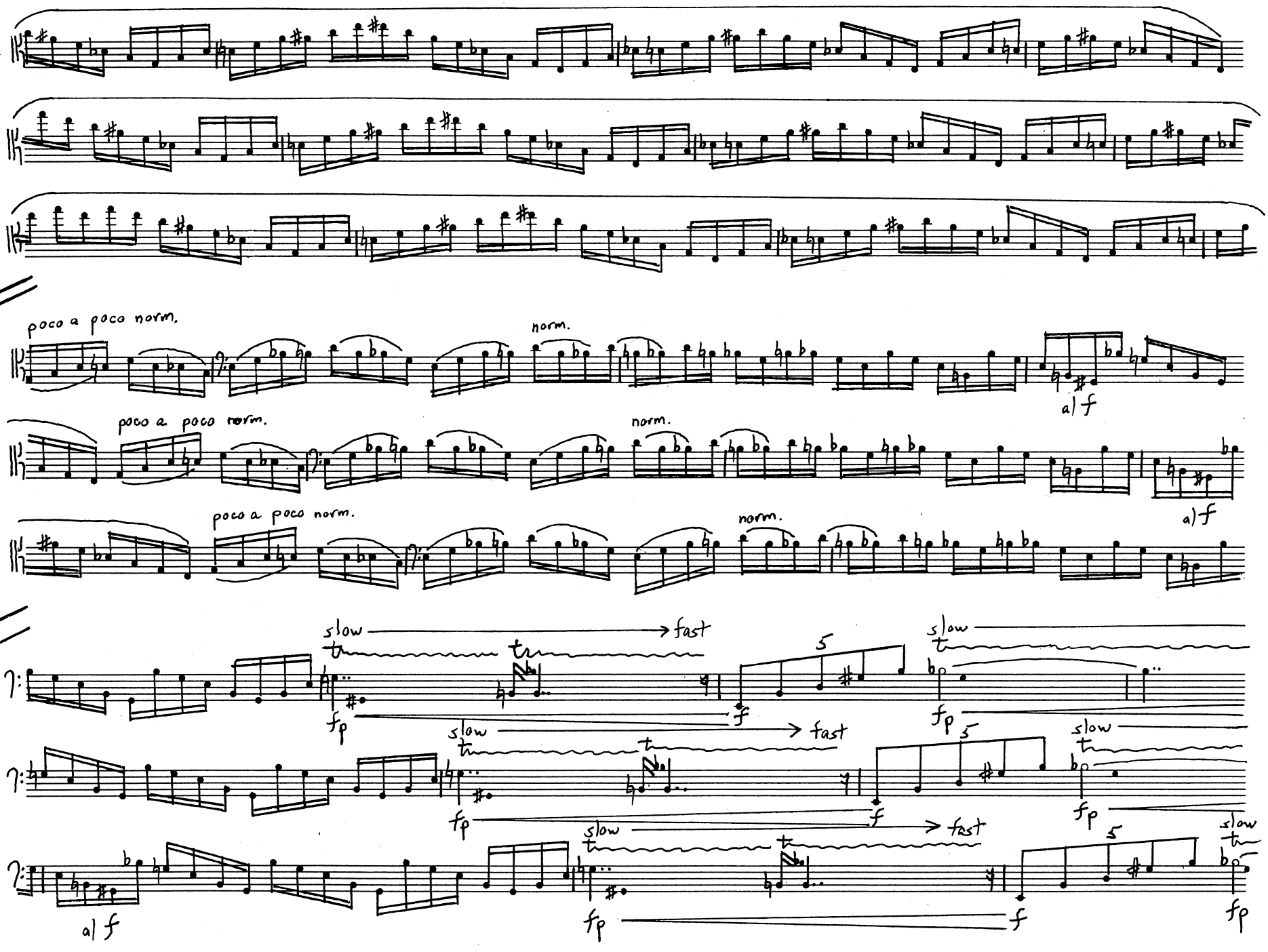
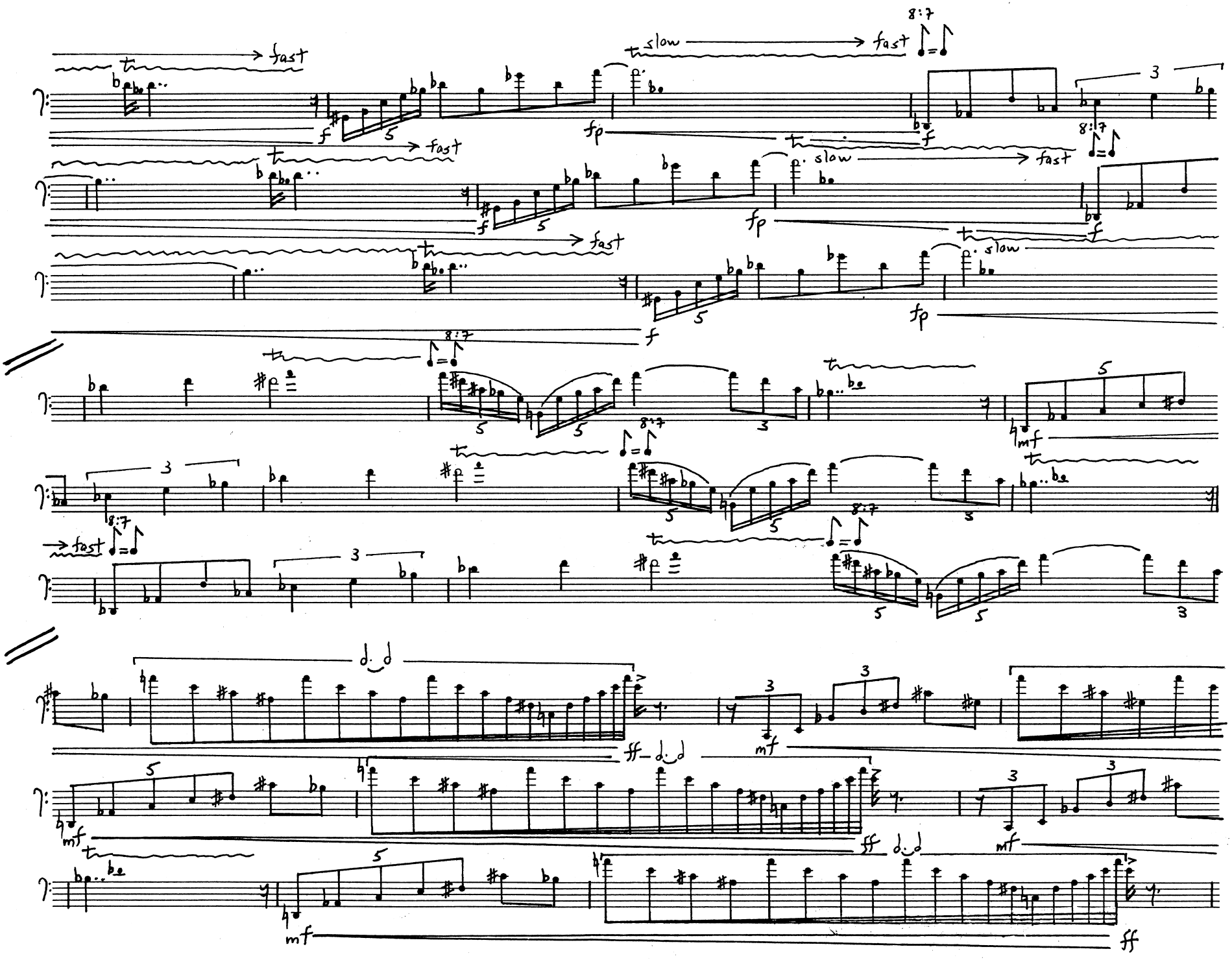
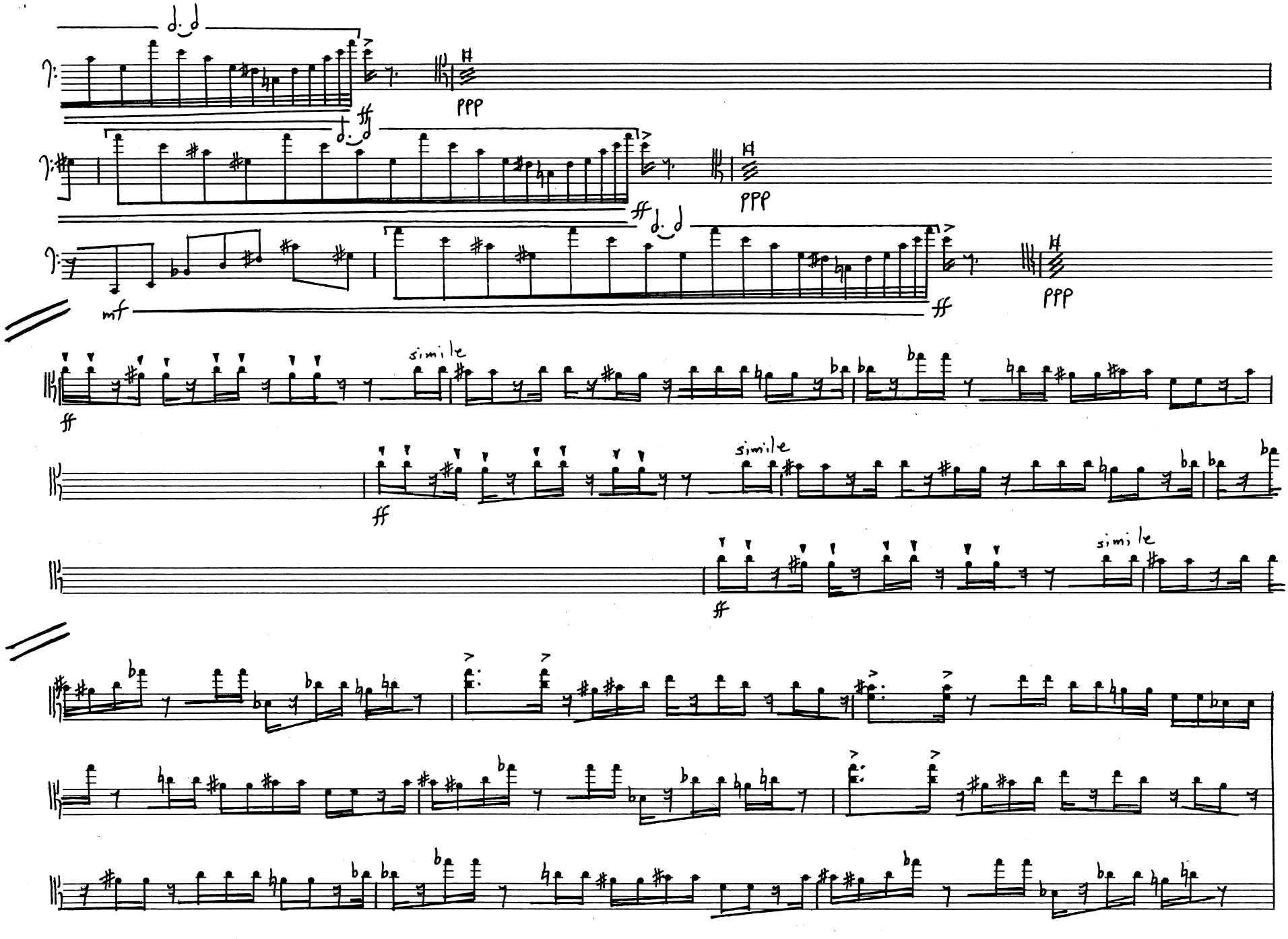
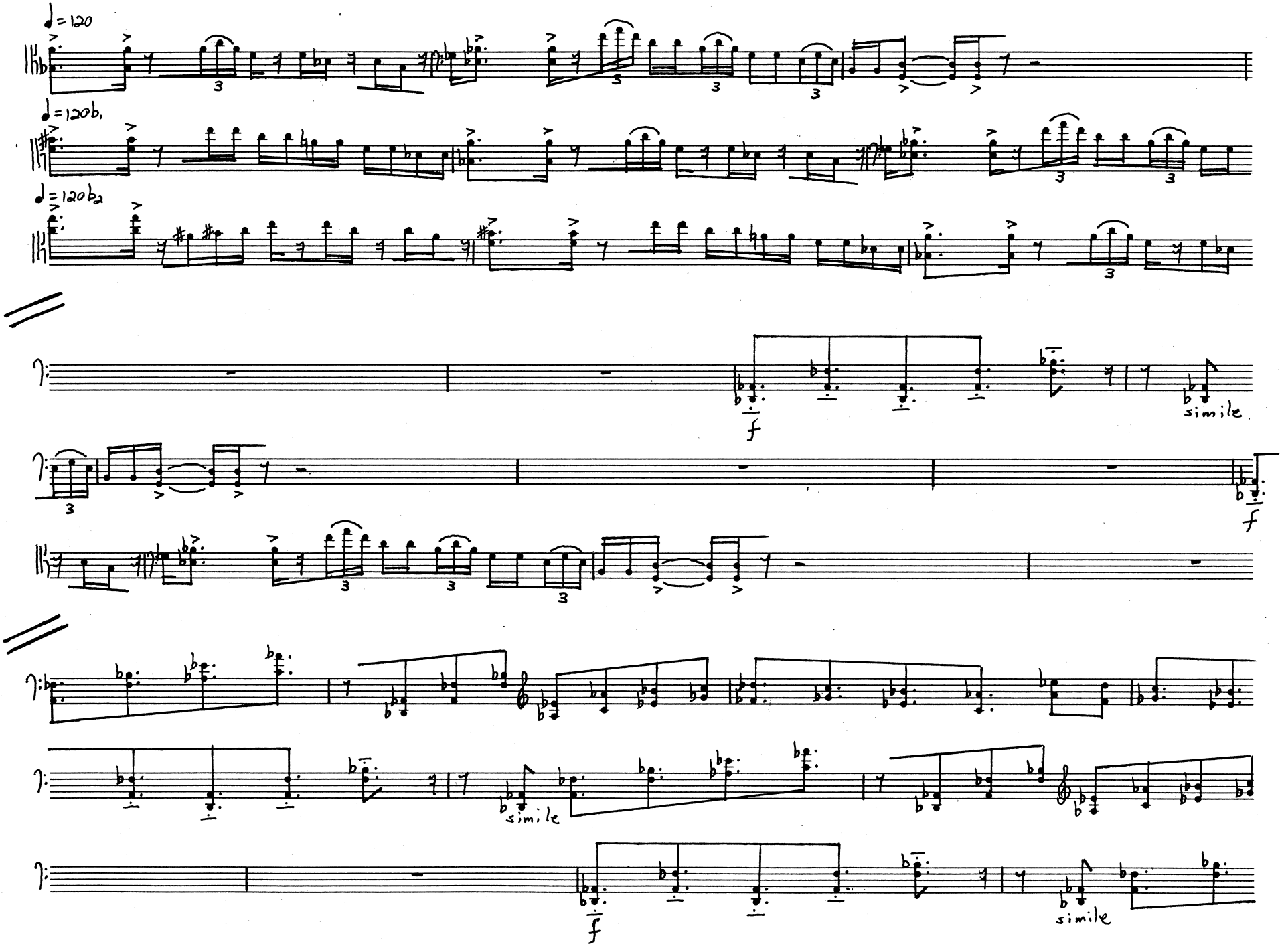
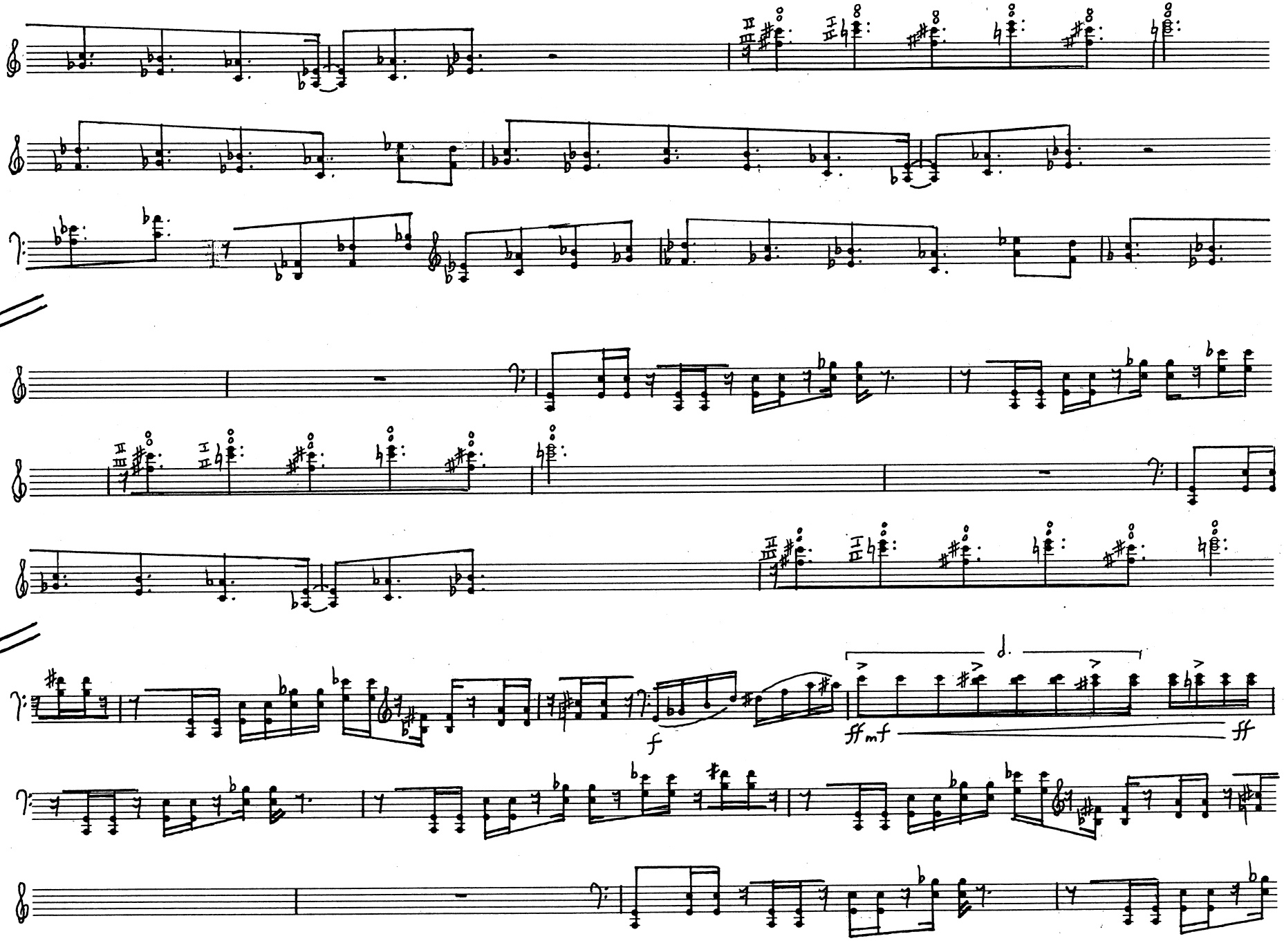

al mf
f
sub. mp cresc.
sub.mp cresc.

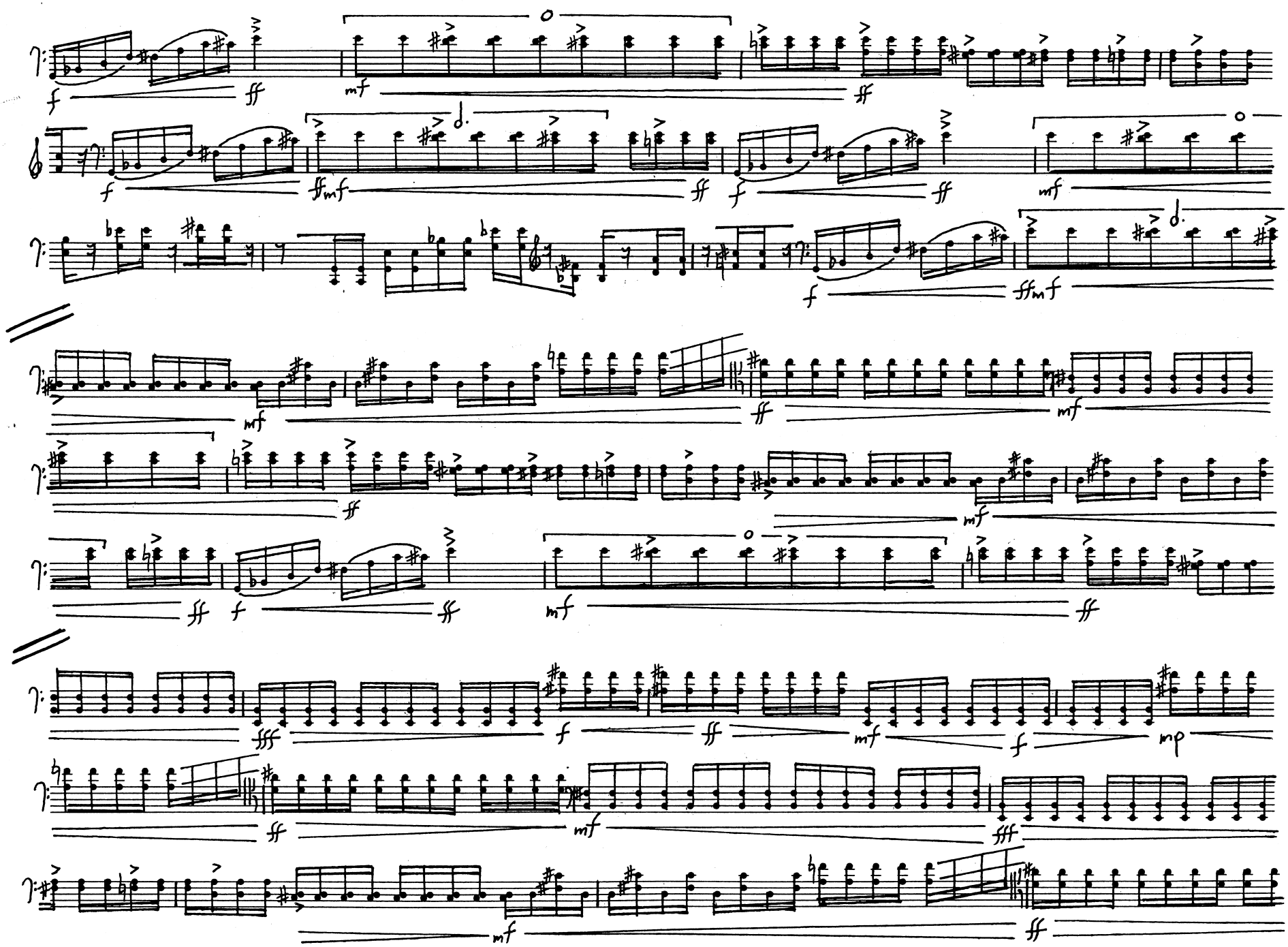

poco a poco norm.
norm.
a| f
poco a poco norm.
norm.
a| f
poco a poco norm.
norm.
slow
fast
fp
f
5
a| f

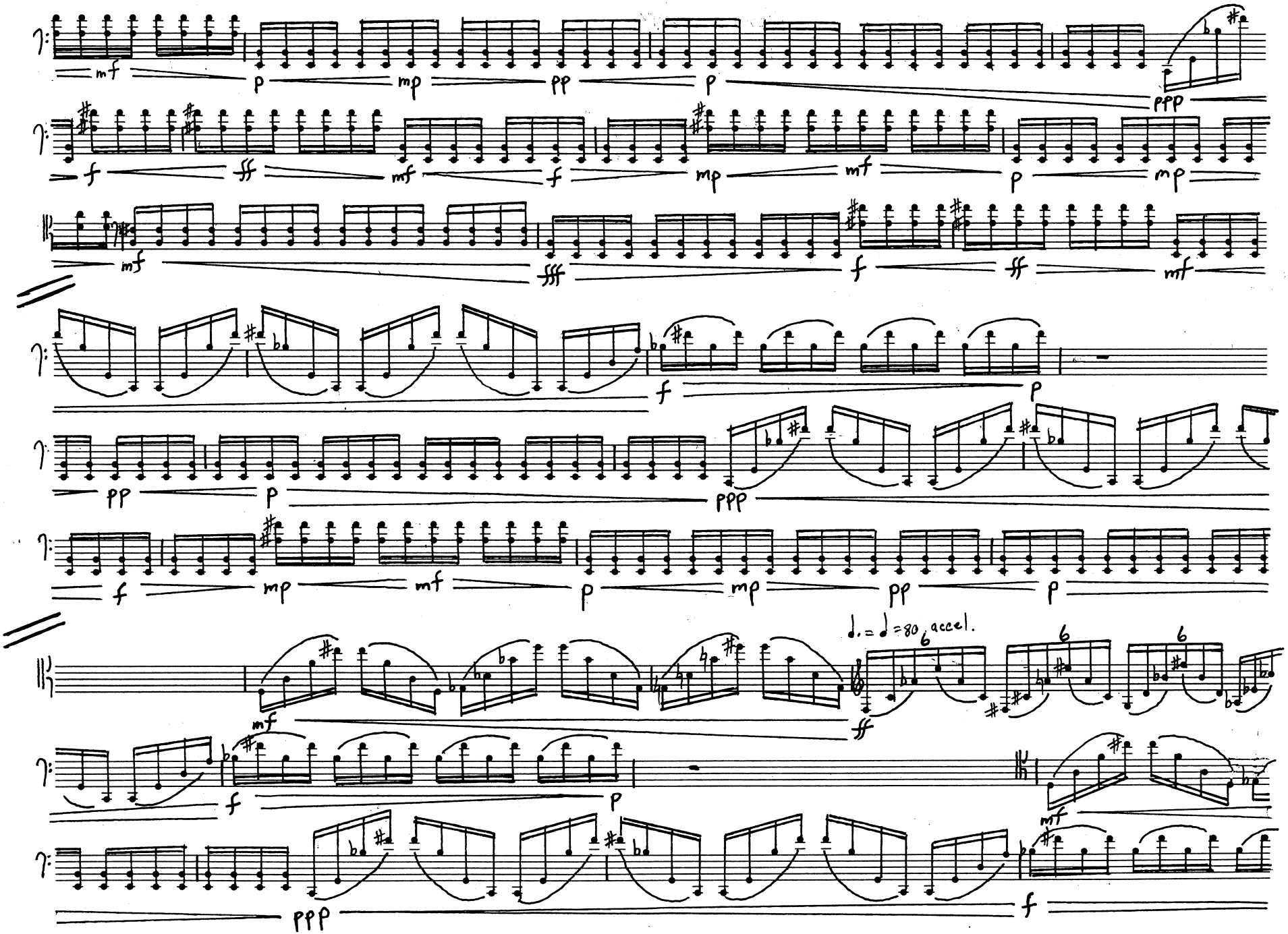

fast
slow
fast
8:7
fp
mf
ff

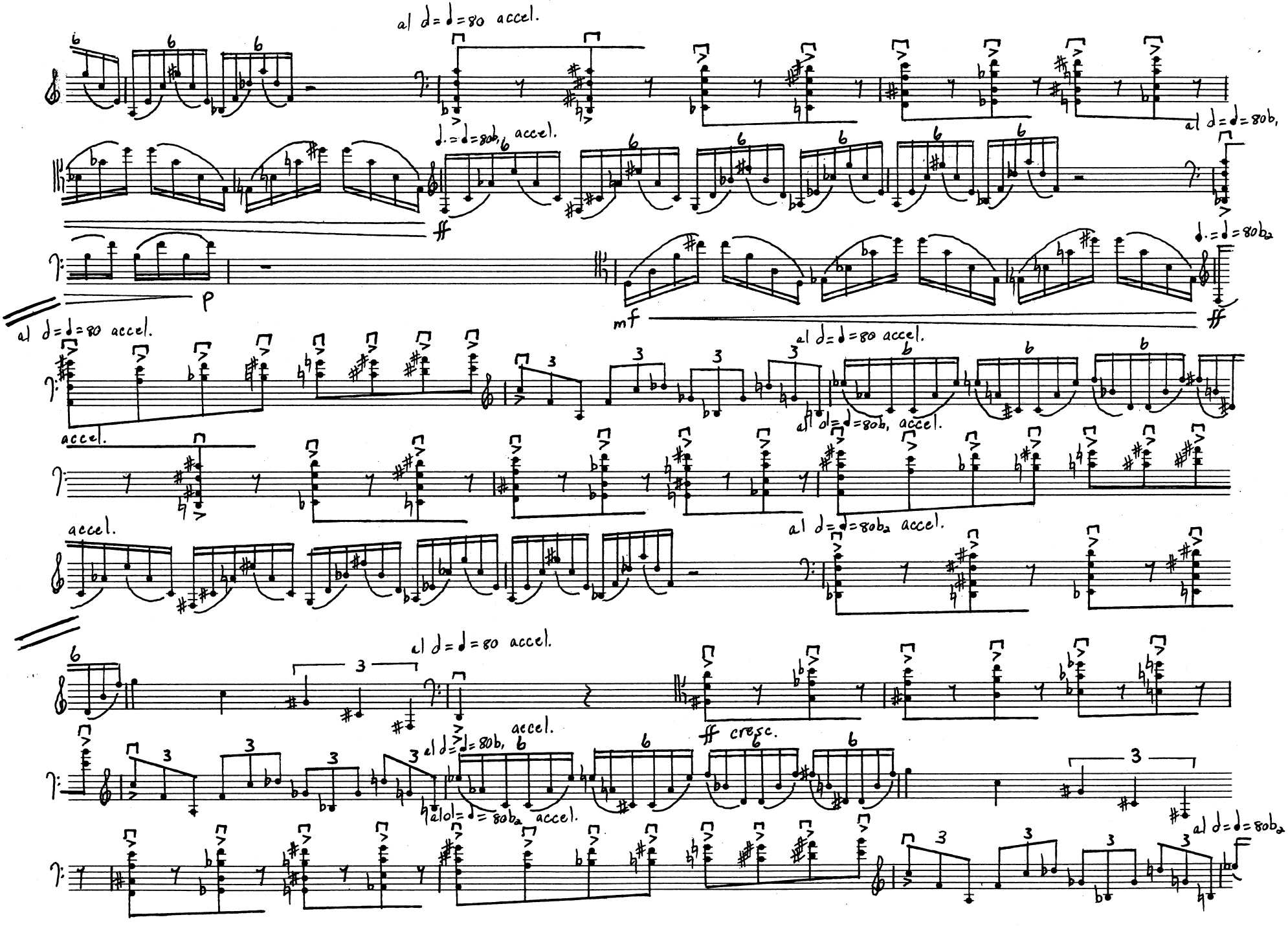

ppp
ff
ppp
ff
ppp
mf
ff
simile
ff
simile
ff
simile

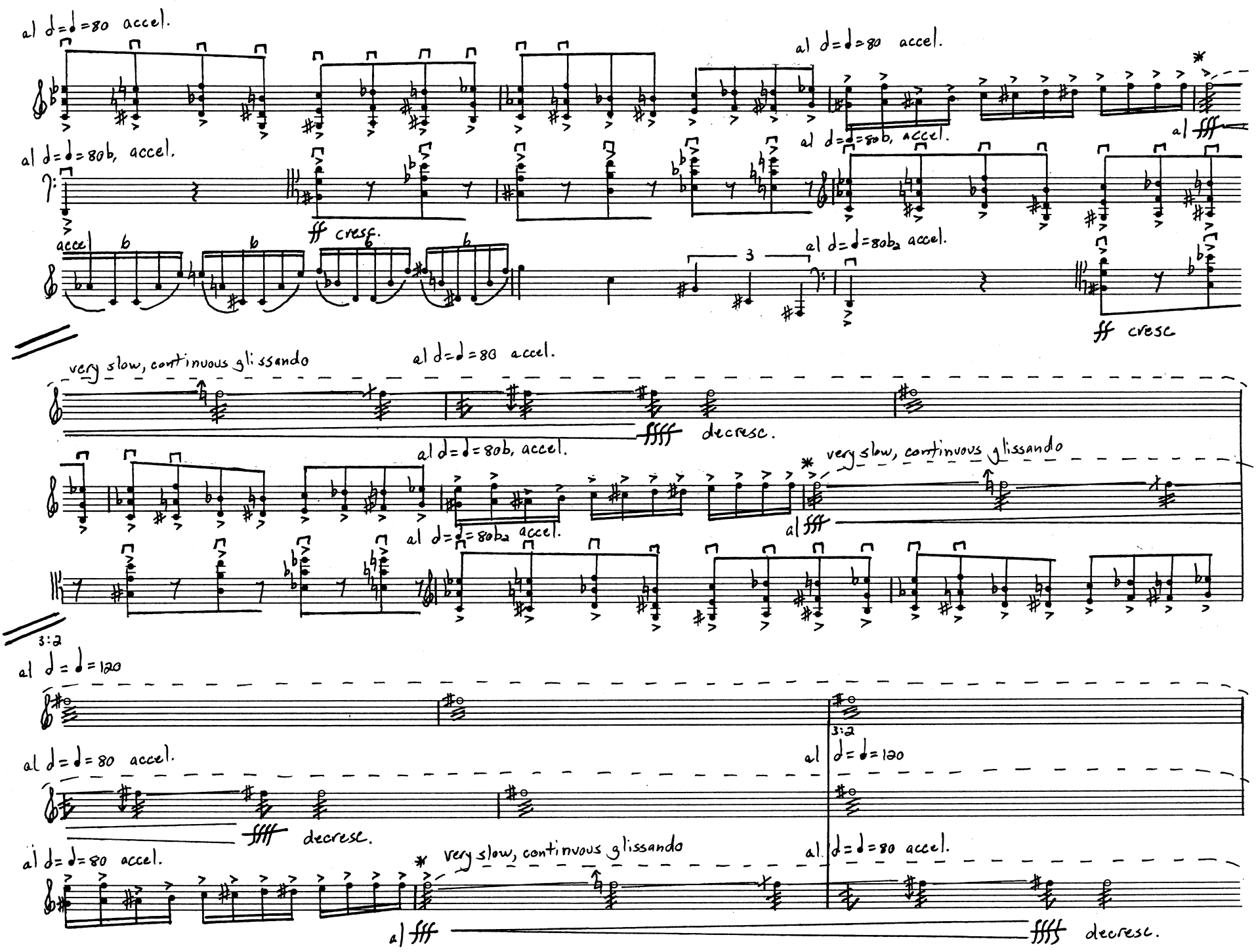

♩=120
♩=120b.
♩=120b2
f
simile
f
f
simile
simile


f
ff mf
ff

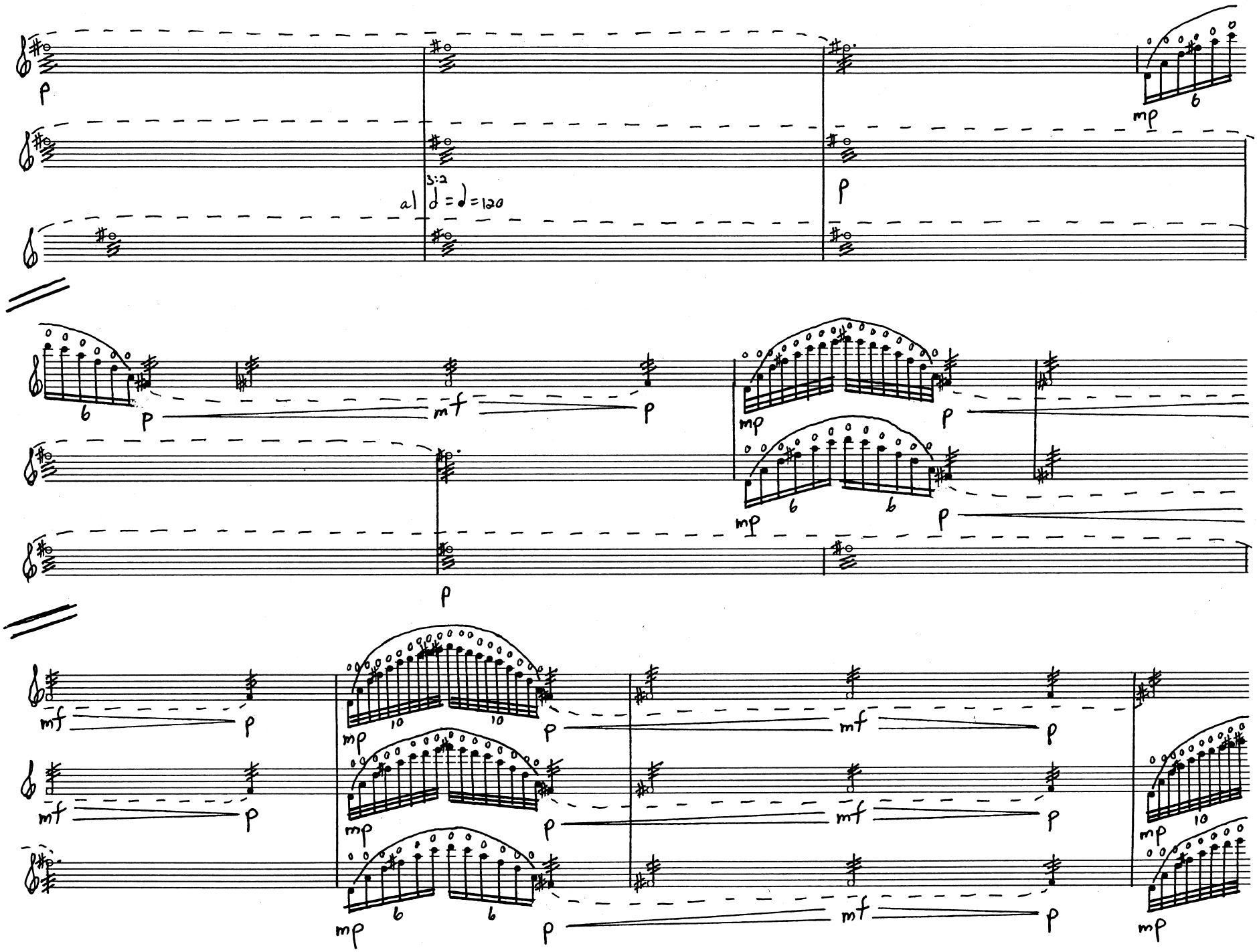


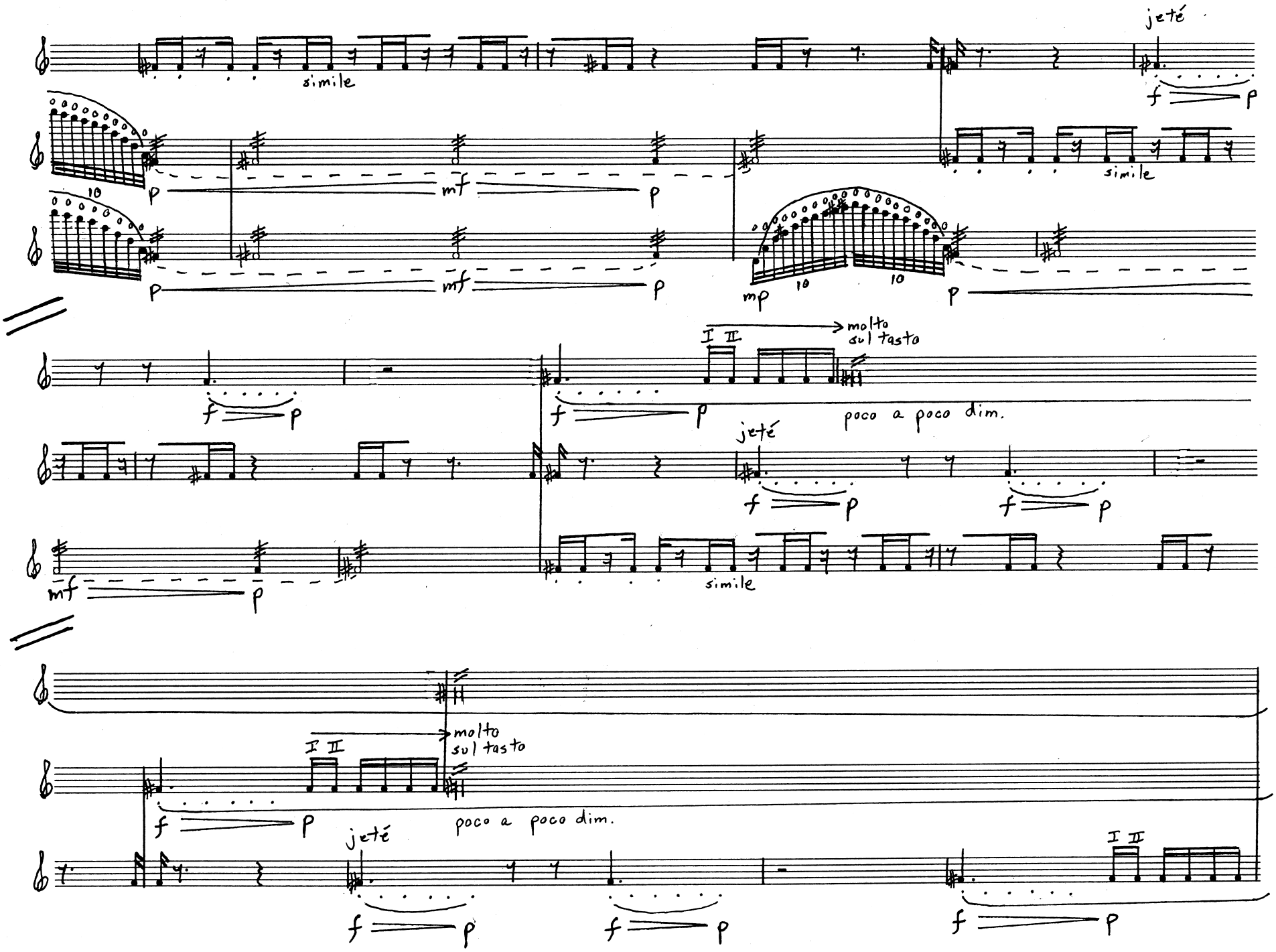

mf
p
mp
pp
p
ppp
f
ff
mf
f
mp
mf
p
mp
mf
fff
f
ff
mf
f
p
pp
p
ppp
f
mp
mf
p
mp
pp
p
mf
ff
♩. = ♩ = 80 accel.
6
6
6
f
p
mf
ppp
f

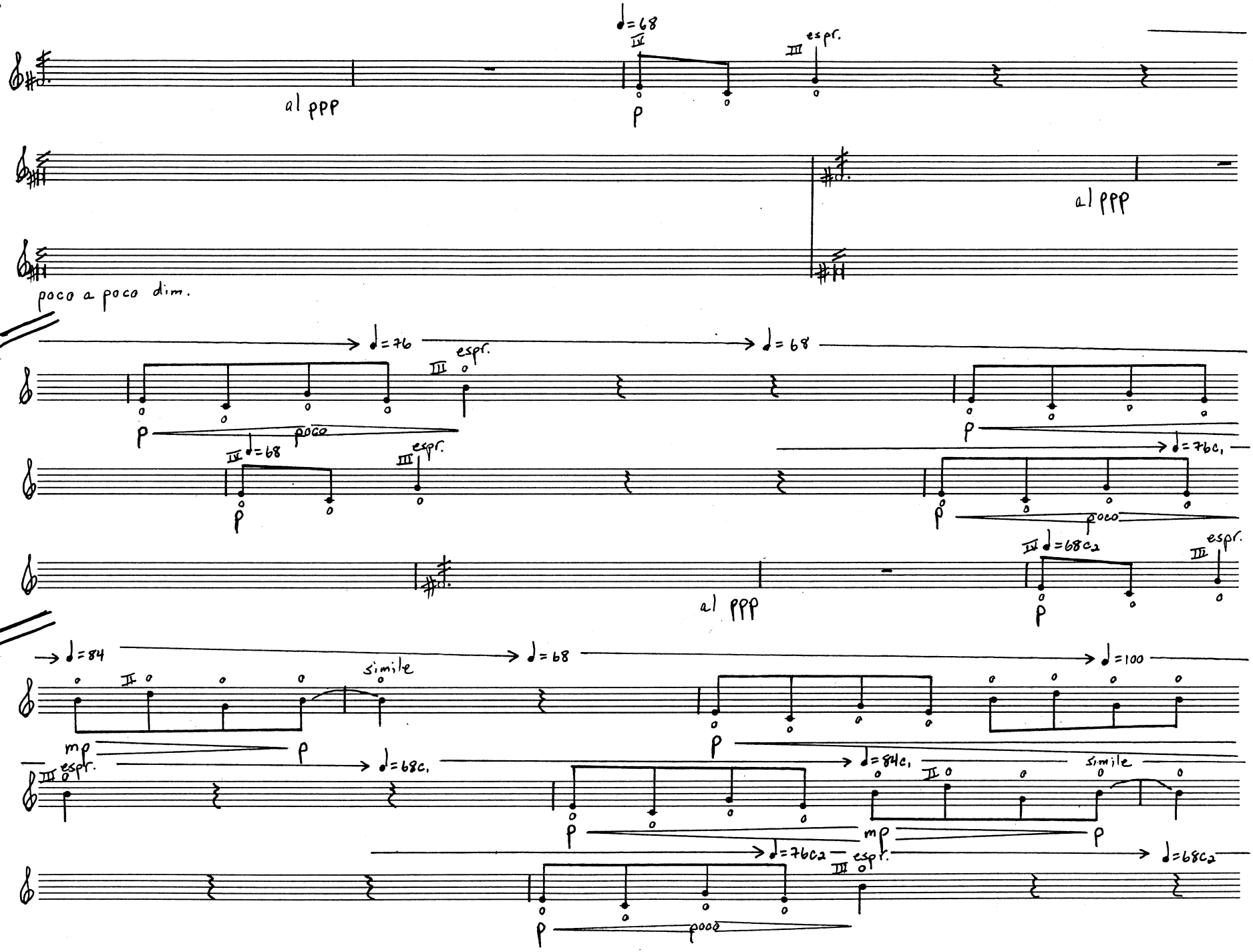

al ♩=♩=80 accel.
♩.=♩=80b, accel.
al ♩=♩=80b,
♩.=♩=80b2
ff
p
mf
ff
al ♩=♩=80 accel.
accel.
al ♩=♩=80 accel.
al ♩=♩=80b, accel.
accel.
al ♩=♩=80b2 accel.
al ♩=♩=80 accel.
ff cresc.
al ♩=♩=80b, accel.
al ♩=♩=80b2 accel.
al ♩=♩=80b2

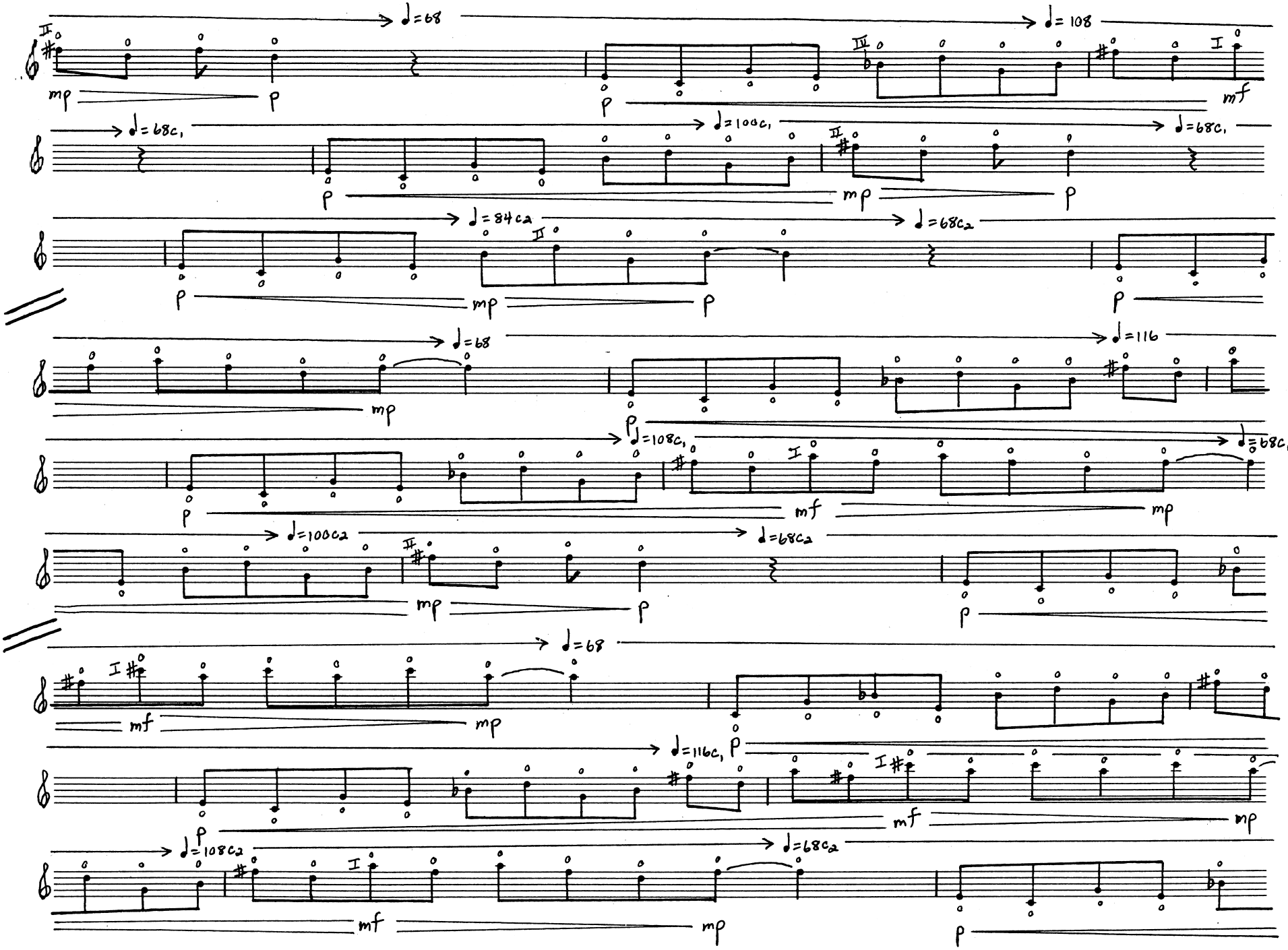


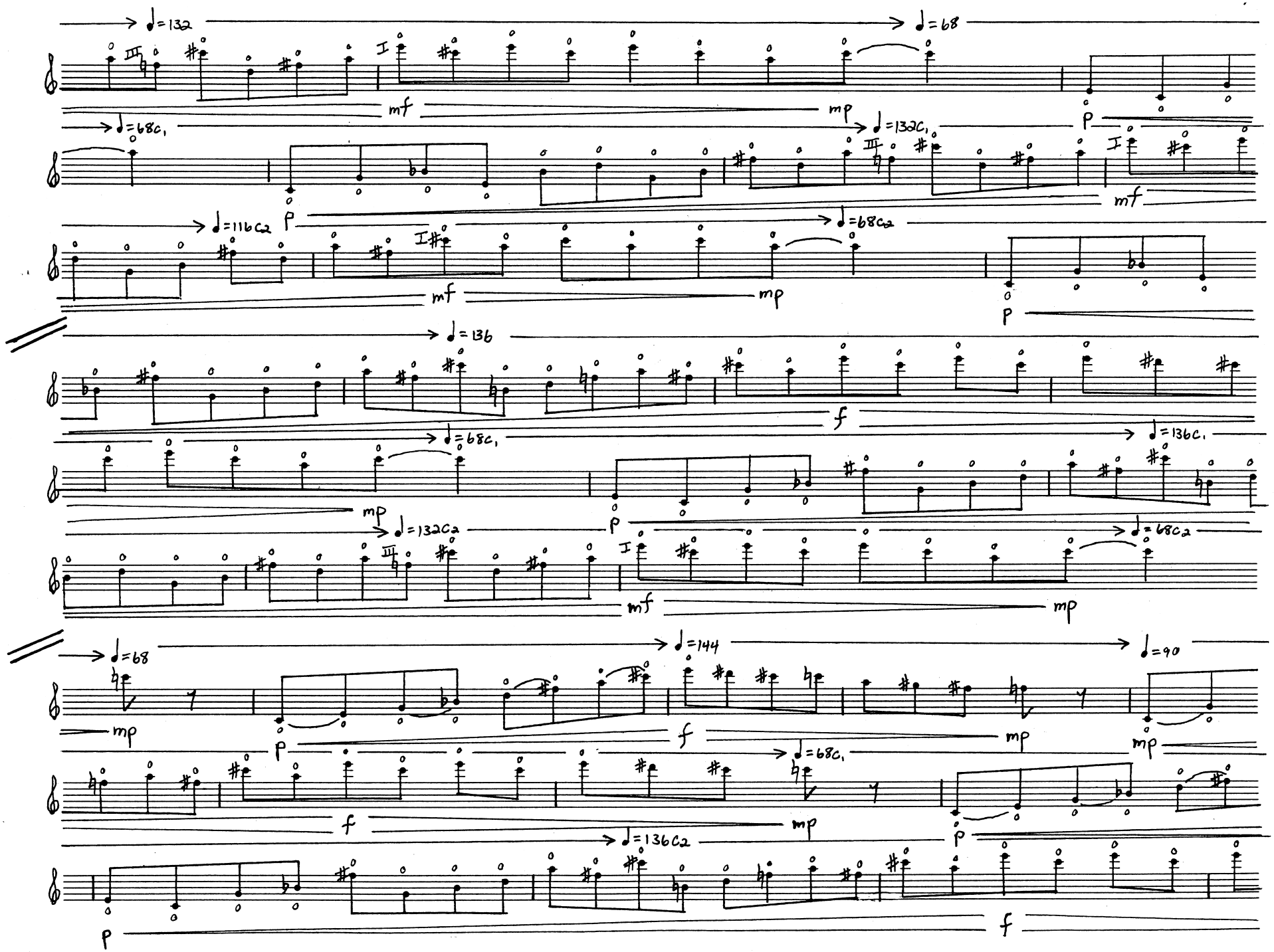
* Continue the same rate of acceleration until tremolo becomes as fast as possible; very dense tremolo with much bowing noise.

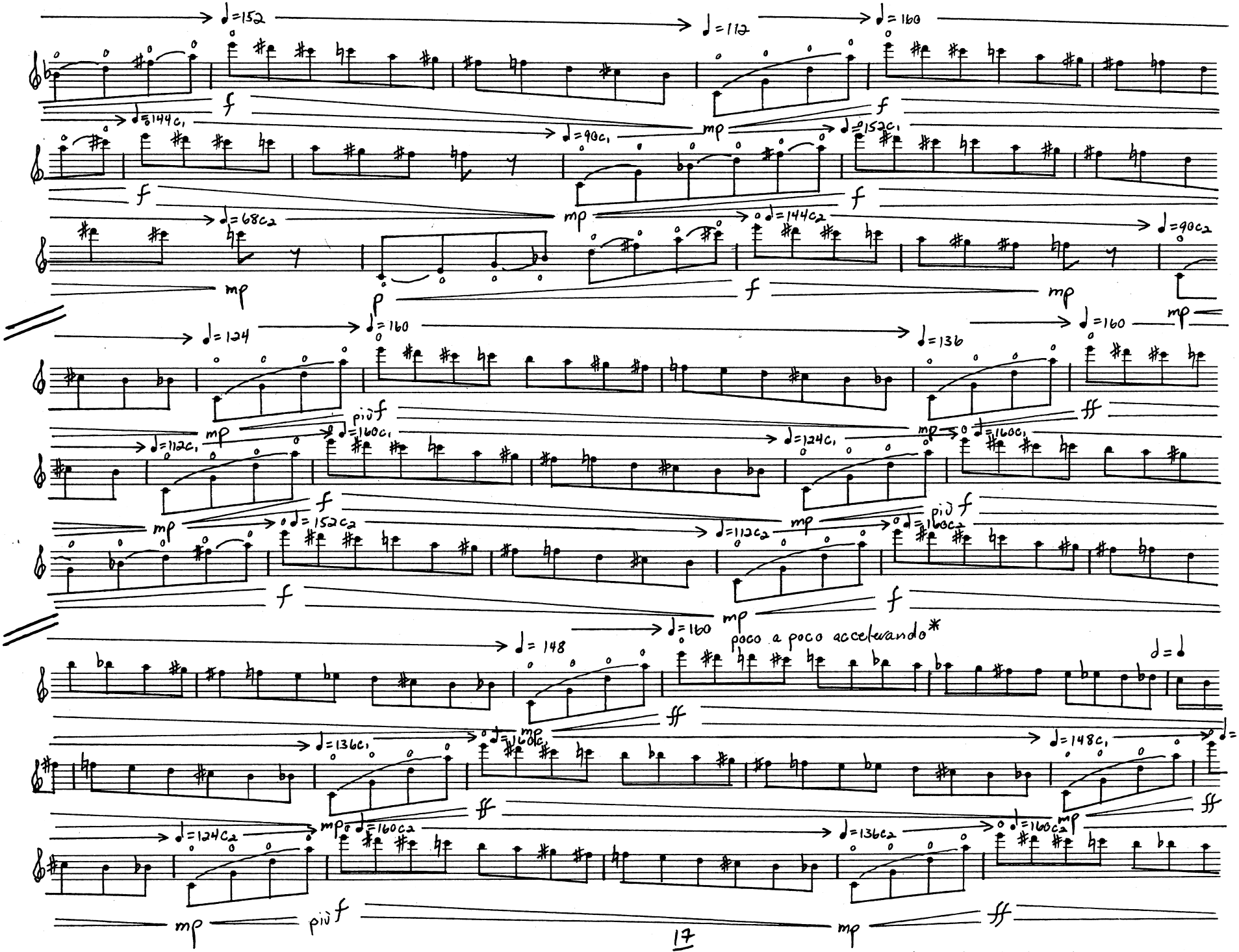

p
mp
6
3:2
al 𝅗𝅥 = ♩ = 120
p
6
p
mf
p
mp
p
mp
6
6
p
p
mf
p
mp
10
10
p
mf
p
mf
p
mp
p
mf
p
mp
10
mp
6
6
p
mf
p
mp


jeté
simile
f p
p mf p
10
p mf p
mp 10 10 p
simile
I II
molto sul tasto
f p
f p
poco a poco dim.
jeté
f p
f p
mf p
simile
I II
molto sul tasto
f p
poco a poco dim.
jeté
f p
f p
I II
f p

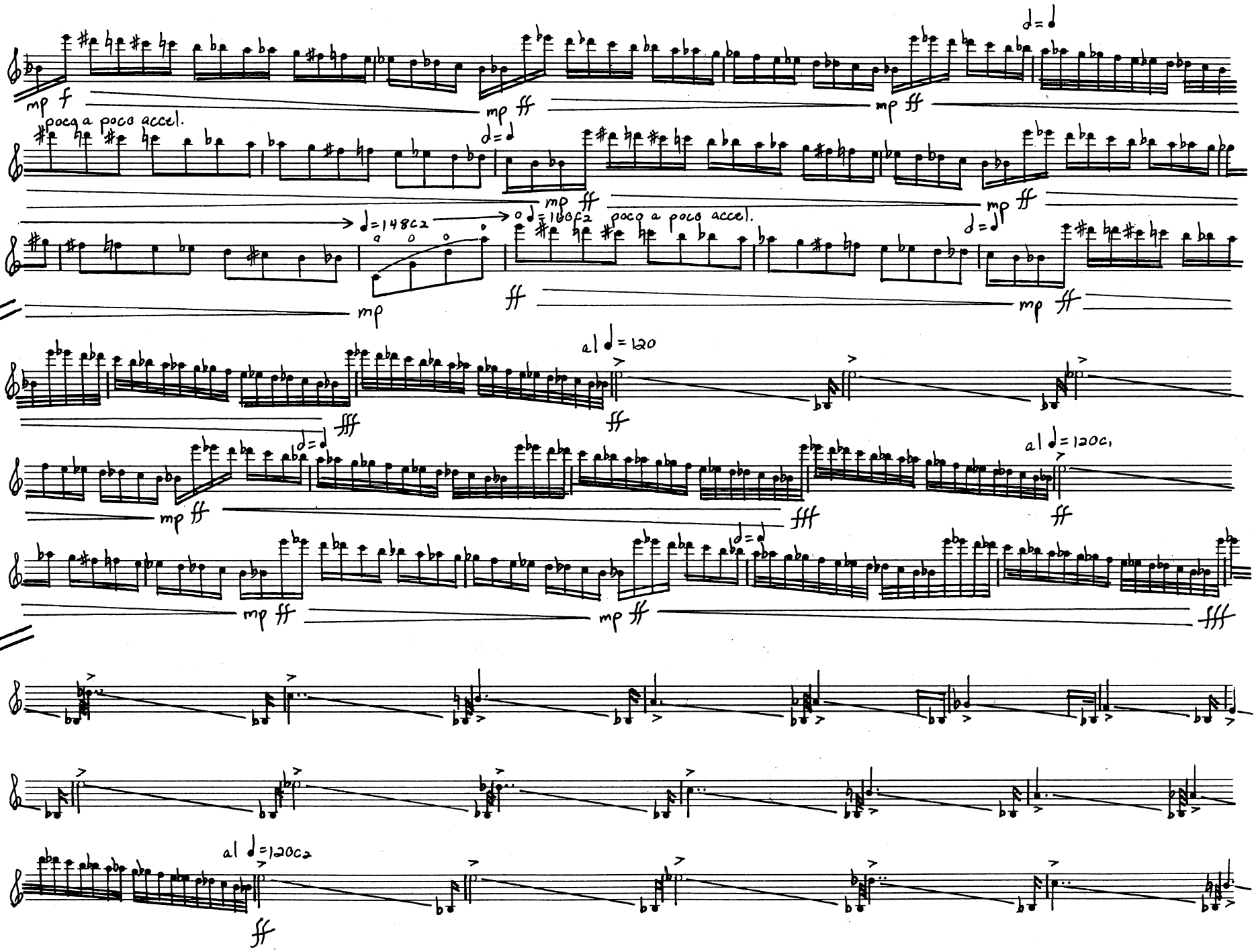

♩=68
III
esprr.
III
al ppp
p
al ppp
poco a poco dim.
♩=76
III
esprr.
♩=68
p
poco
III
♩=68
III
esprr.
p
p
♩=76c1
poco
al ppp
III
♩=68c2
III
esprr.
p
♩=84
simile
♩=68
♩=100
mp
p
p
III
esprr.
♩=68c1
♩=84c1
simile
II
p
mp
p
♩=76c2
III
esprr.
♩=68c2
p
poco

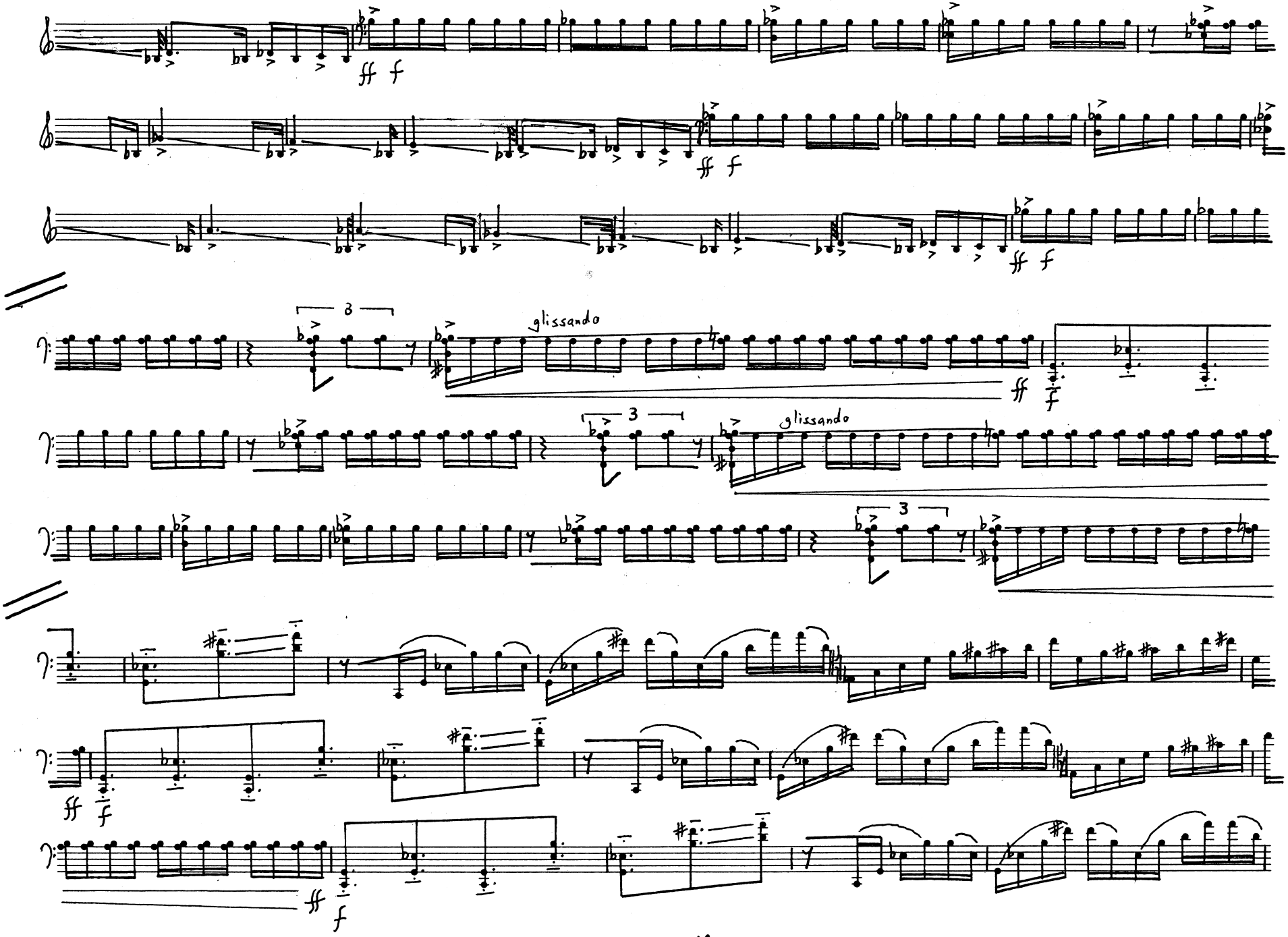

♩=68
♩=108
♩=68c1
♩=100c1
♩=68c1
♩=84c2
♩=68c2
♩=68
♩=116
♩=108c1
♩=68c1
♩=100c2
♩=68c2
♩=68
♩=116c1
♩=108c2
♩=68c2

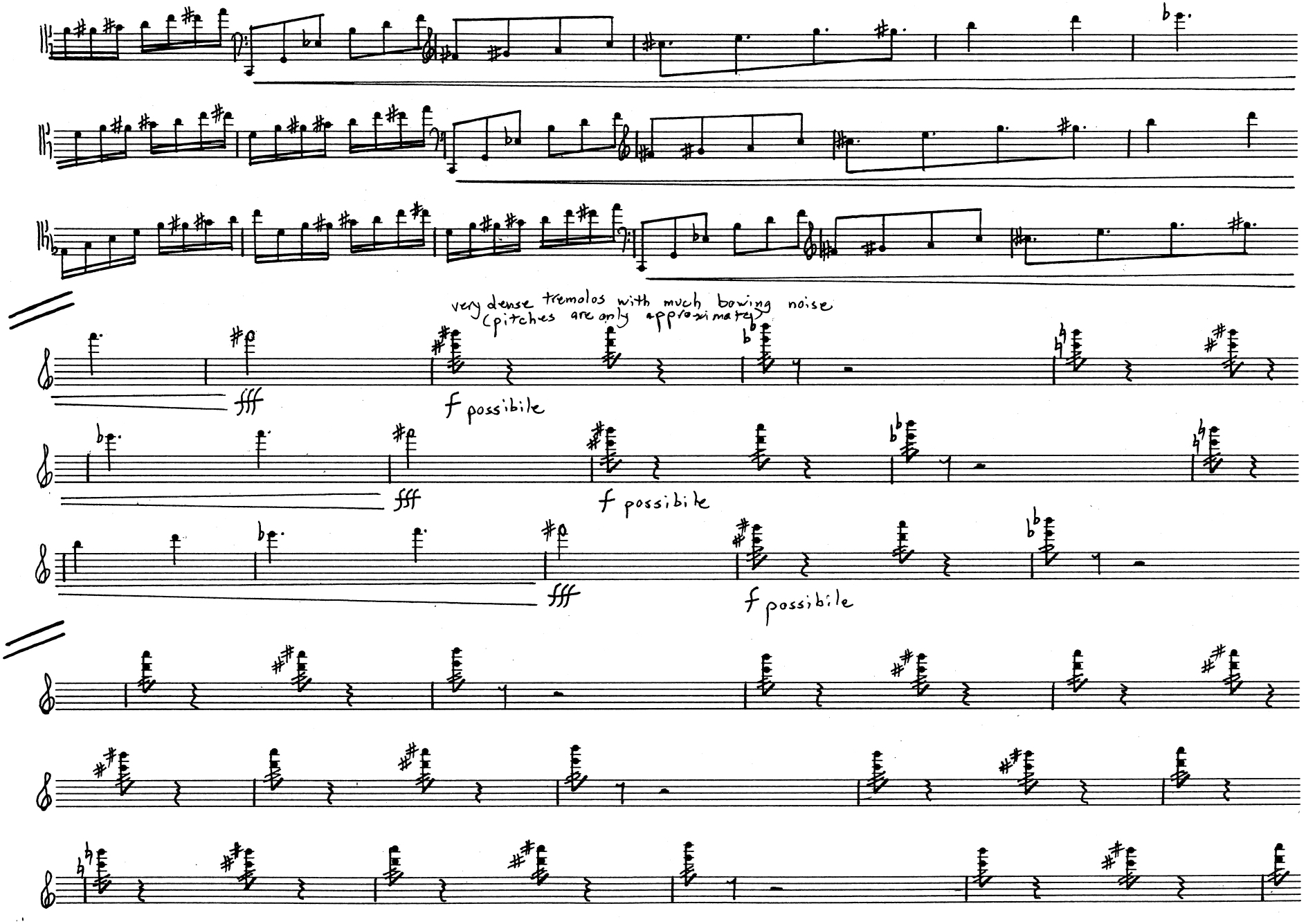

♩=132
♩=68
III
I
mf
mp
p
♩=68c1
♩=132c1
III
I
mf
p
♩=116c2
♩=68c2
I
mf
mp
p
♩=136
f
♩=68c1
♩=136c1
mp
p
♩=132c2
III
♩=68c2
I
mf
mp
♩=68
♩=144
♩=90
mp
p
f
mp
mp
♩=68c1
f
mp
p
♩=136c2
p
f

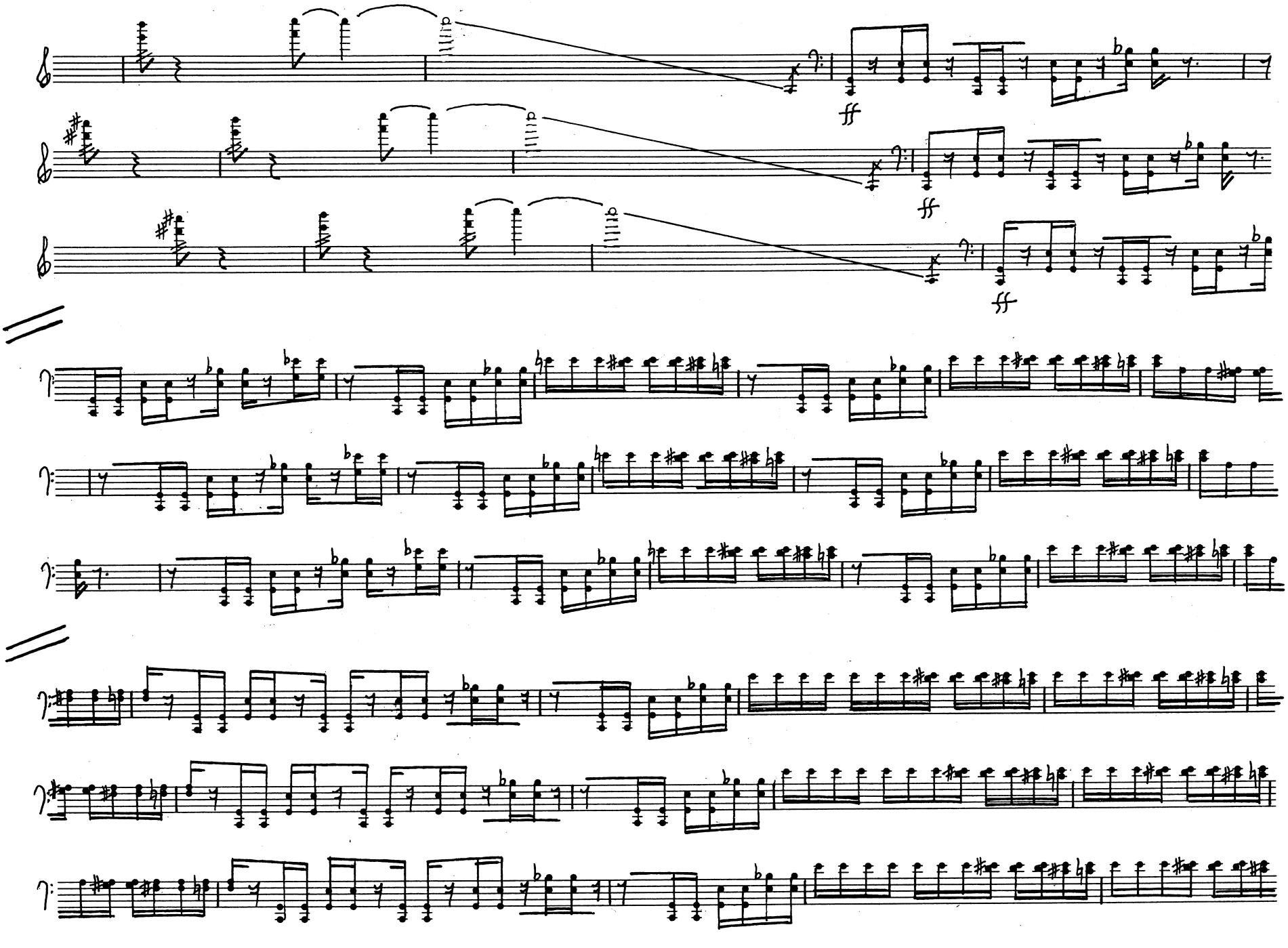


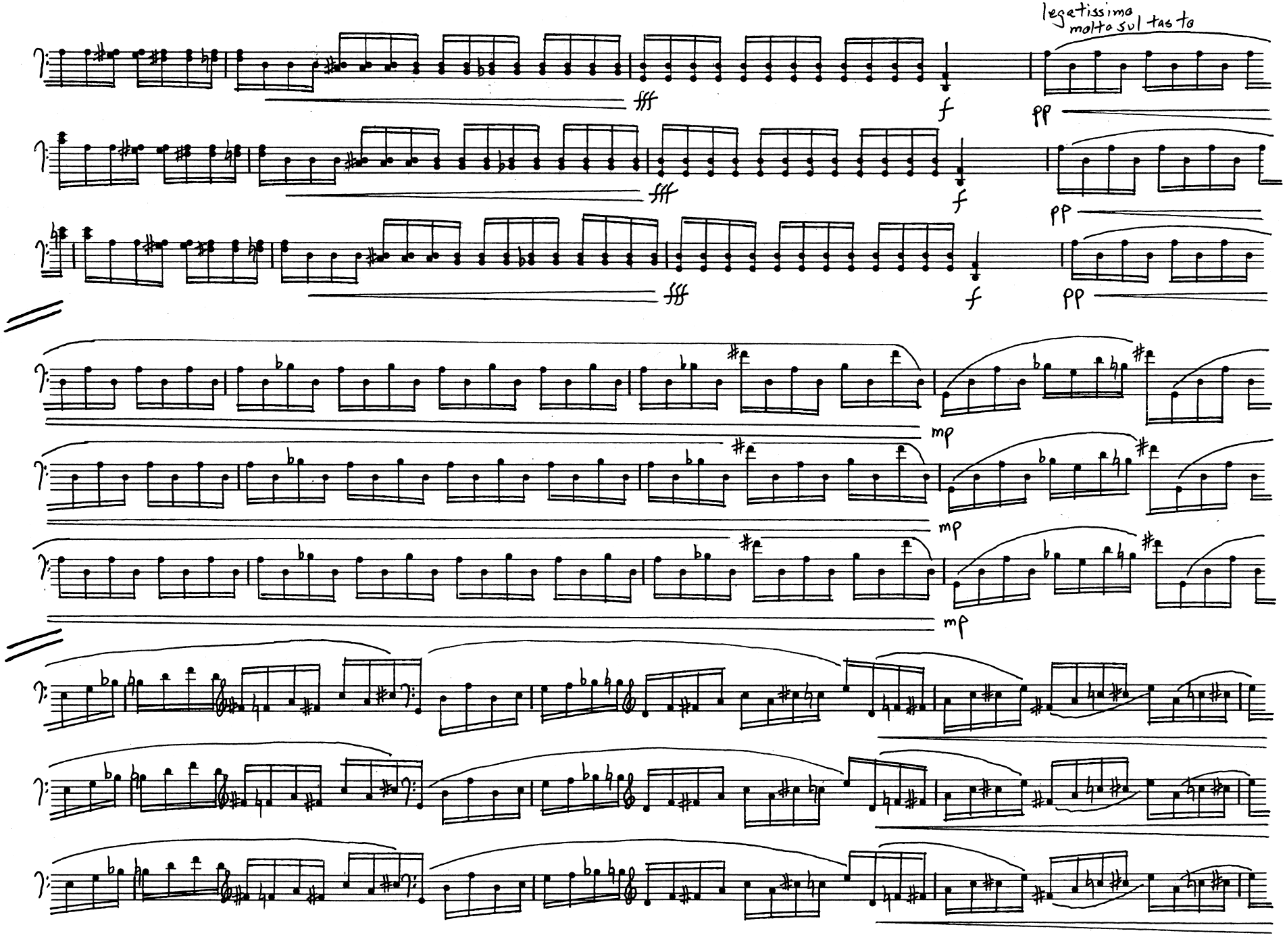
* As tempo increases descending scales morph into glissandos and détaché bowing morphs into (very dense) tremolos with much bowing noise!

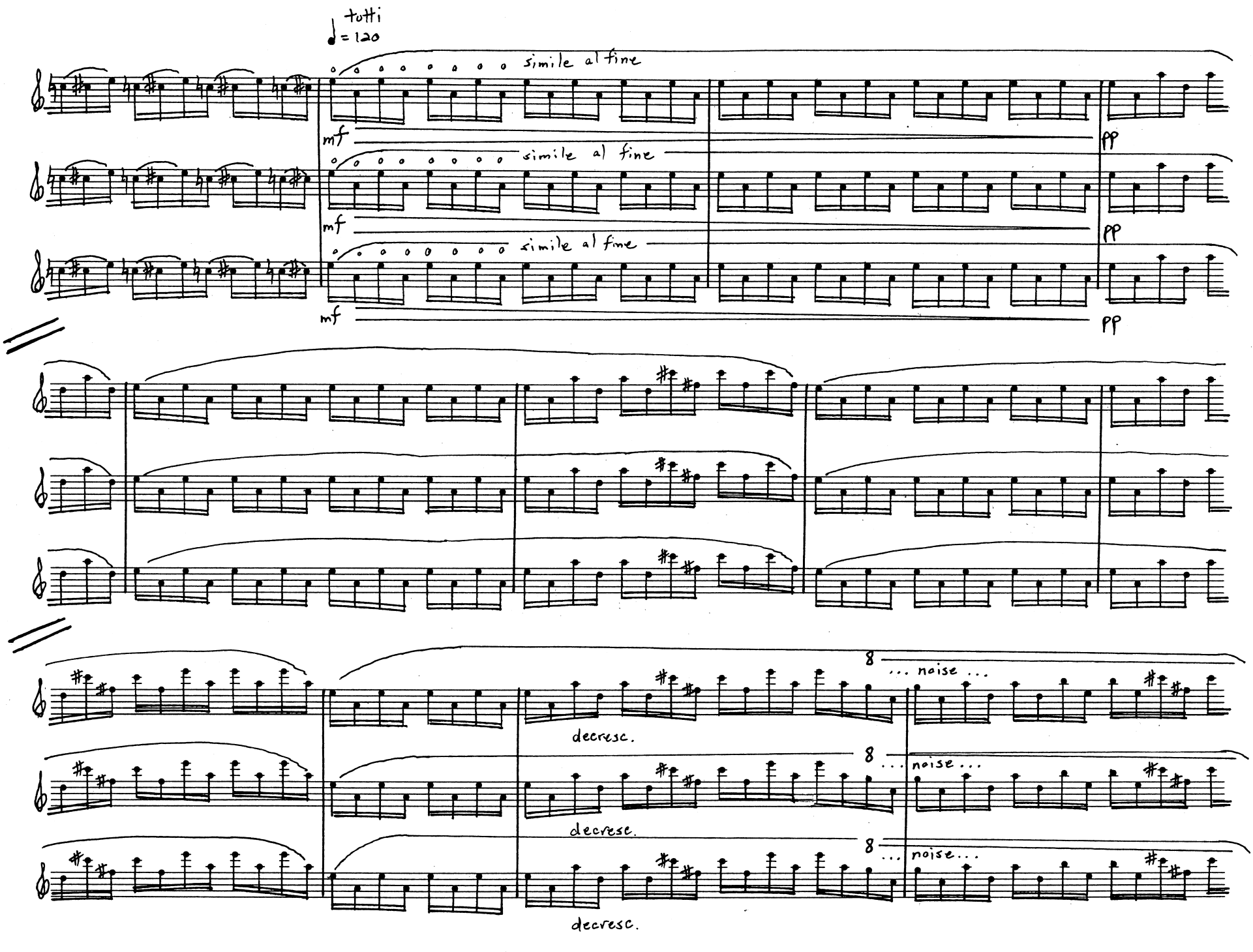

mp f
mp ff
mp ff
poco a poco accel.
mp ff
mp ff
♩=148c2
♩=160c2
poco a poco accel.
mp
ff
mp ff
al ♩=120
fff
ff
mp ff
fff
al ♩=120c1
ff
mp ff
mp ff
fff
al ♩=120c2
ff

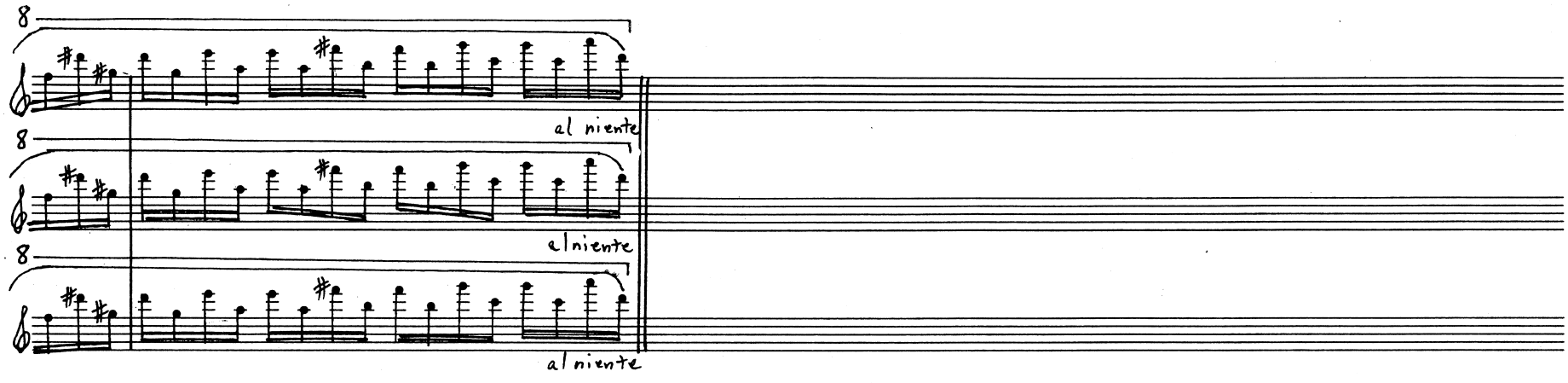

ff f
ff f
ff f
3
glissando
ff f
3
glissando
3
ff f
ff f


very dense tremolos with much bowing noise
(pitches are only approximate)
fff
f possibile
fff
f possibile
fff
f possibile




legatissimo
molto sul tasto
fff
f
pp
mp


tutti
♩= 120
simile al fine
mf
pp
simile al fine
mf
pp
simile al fine
mf
pp
8
... noise ...
decresc.
8
... noise ...
decrese.
8
... noise ...
decresc.


8
al niente
8
al niente
8
al niente