Liam Carey

Rabbit Hole

for solo cello and electronics

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Duration: 11'30

Technical requirements:

Directional instrument microphone, computer running Max/MSP 6 or later, audio interface, mixing desk (9 channels required), loud speakers (either 2 or 8).

The electronics in this piece are generated by processing the sound from the cello, therefore the cello must be mic'ed and the signal sent through the Max patch. The output from the Max patch is the electronics only, however it may be necessary on the mixing desk to add some of the mic signal from the cello for balance purposes. The Max patch generates 8 channels of electronics which can either be sent to a full 8 channel array, or sent to a standard stereo pair. If sent to the stereo pair the 8 channels of output from the Max patch should be panned from left to right across the stereo field (i.e. channel 1 – full left, channel 2 – 80% left, channel 3 – 60% left, . . . channel 8 – full right).

The Max patch uses a pitch tracker which follows the cello signal, therefore it is essential that the cello microphone does not pick up the electronics coming out of the speakers. For this reason a close directional microphone such as a DPA 4011 is preferred.

Changes to the Max patch are triggered using MIDI notes, these are the notes given on the small stave in the score. Middle C on the score corresponds to MIDI note 60.

Programme Note:

The initial idea for this piece was to write something for soloist and electronics in which the electronics, rather than simply acting as an extension or enhancement of the soloists line, acted more like an antagonist. The electronics use pitch tracking software to follow the notes played by the soloist and then assign these pitches to a group of synth oscillators. The effect is of the electronics tracking and imitating the cello, sometimes overlapping the different pitches to create harmonies, and sometimes following the cello at a rapid pace to create a harsh distorted imitation of it's line. Over the course of the piece the soloist attempts to elude the electronics by playing sounds which the electronics cannot accurately follow, from rapid torrents of notes, to sounds so soft they are at the limit of audibility, and finally to pitch-less noise.

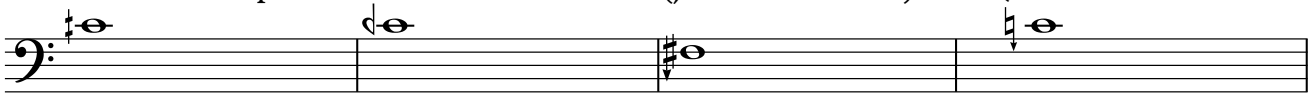
Accidentals:

1/4-tone sharp

1/4-tone flat

Pitch lowered by 14c
(just 3rd above D)

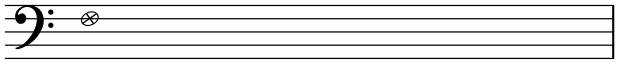
Pitch lowered by 31c
(harmonic 7th above D)



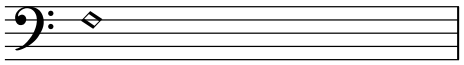
Left hand techniques:

Finger pressure:

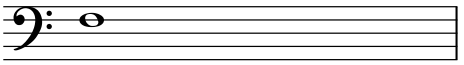
Dampened - all four fingers placed very lightly on the string to stop normal string vibration, given pitch gives approx. position of the hand on the string



Harmonic pressure

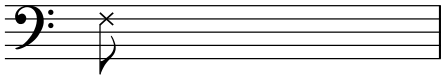


Standard note head = normal finger pressure



Other left hand techniques:

Left hand tapping - sound the note by tapping the fingerboard, do not bow or pluck with the right hand



Bow position:

Ord. = standard position
s.p. = sul pont
s.t. = sul tasto
m.s.p./m.s.t. = molto sul pont./tasto
p.s.p./p.s.t. = poco sul pont./tasto
On the bridge = bow directly on top of the bridge

Bow pressure:

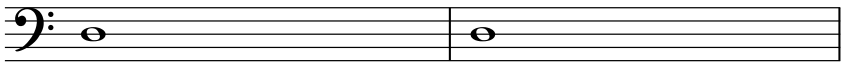
Ord. pr. = standard bow pressure for a clear pitched tone

 = overpressure - very heavy bow pressure to create a harsh distorted tone

alto flautando = extremely light bow pressure, just enough to produce gentle white noise with no clear pitch

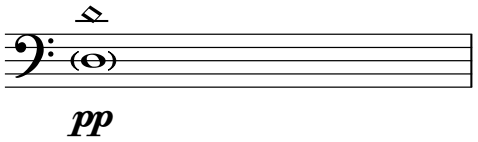
Transitions: move from one playing technique to another, e.g. transition from ord. bow position to sul pont. Also applies to left and right hand pressure techniques.

ord. ⟶ s.p.

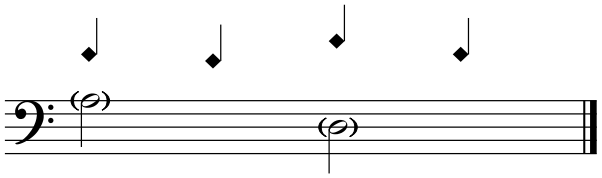


Harmonics:

Harmonics are always given with two pitches. The lower pitch in brackets gives the open string on which the harmonic should be played, and the upper pitch with the diamond notehead shows were the left hand finger should be placed on that string.

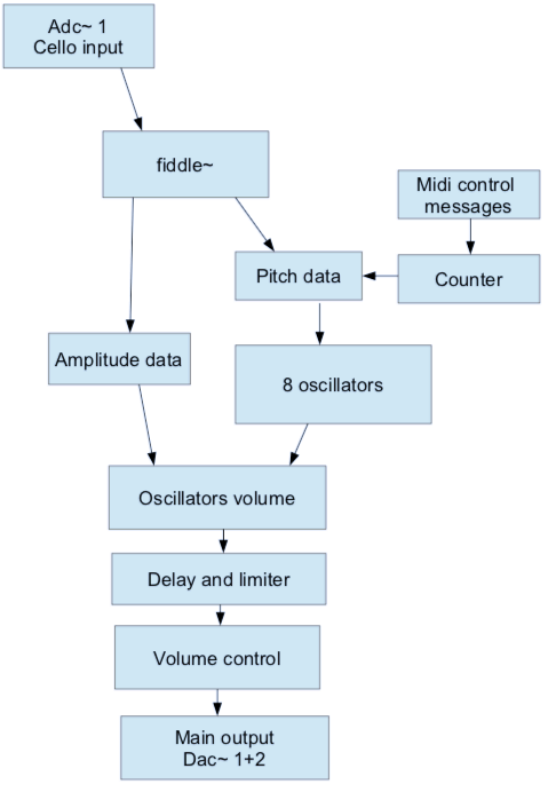


This does not apply for the ad lib harmonics in bars 82-108. In this case only the lower notes in brackets, which give the string the harmonics should be played on, are given. The upper notes indicate instead that the player should improvise extremely high harmonics fingered close to the bridge. These upper notes are do not give exact pitch, but give correct rhythm and a very approx sense of contour, e.g.:

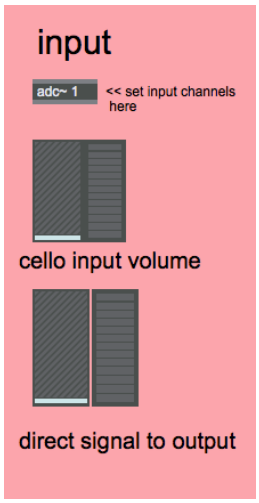


Liam Carey – *Rabbit Hole*

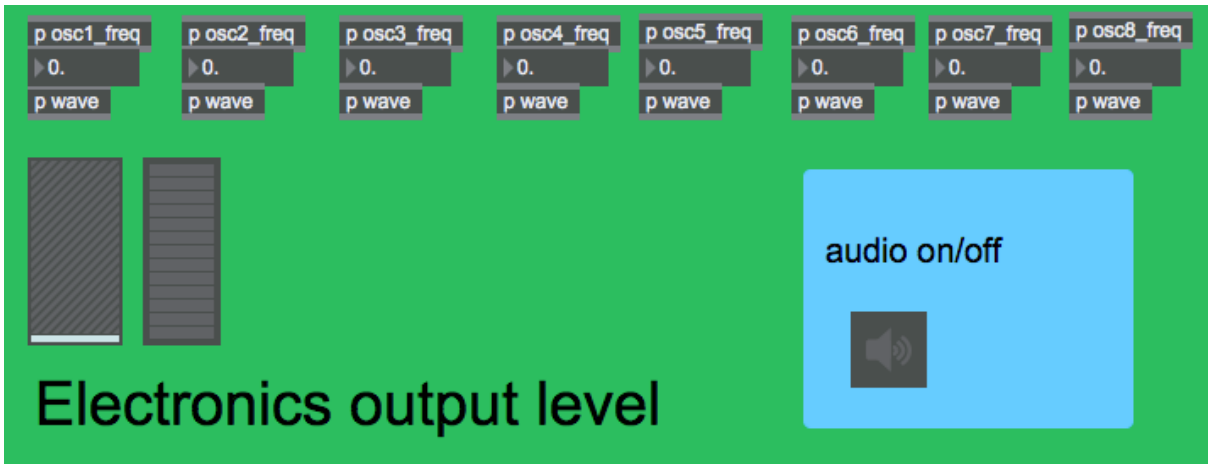
Max patch information



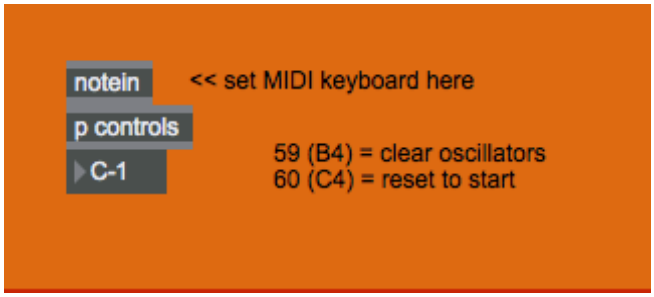
The electronics for this piece are taken from readings from the live cello signal. The incoming signal from the cello [adc~ 1] is sent into a [fiddle~] object. The readings from this fiddle object are then sent to 8 oscillators which then follow the pitch of the cello signal. On the presentation screen of the patch, volume controls are provided to control the incoming volume level from the cello. For balance reasons the signal from the cello is also sent direct to the speakers, for which there is also a volume control provided.



The frequency settings of the 8 oscillators which are taken from the [fiddle~] object, and also an overall volume control for the output of the oscillators can be found on the green section of the presentation screen:



The readings from the [fiddle~] object are not sent continuously but are sent through to the oscillators when by a counter object. The regularity at which these signals are sent to the oscillators are controlled by a series of message boxes. The changes between these messages are triggered by midi notes from a keyboard. The cues for these midi notes are on the 'electronics' stave in the score. The controls for both of these can be found in the orange section of the presentation screen:



The yellow section shows the current status of the reading controls, including read speed. The [readon_off] function is controlled by the [fiddle~] object and is used to automatically stop the frequency readings being sent to the oscillators when the cello is not playing.

Overall the balance between the cello and the electronics should be about even throughout the performance.

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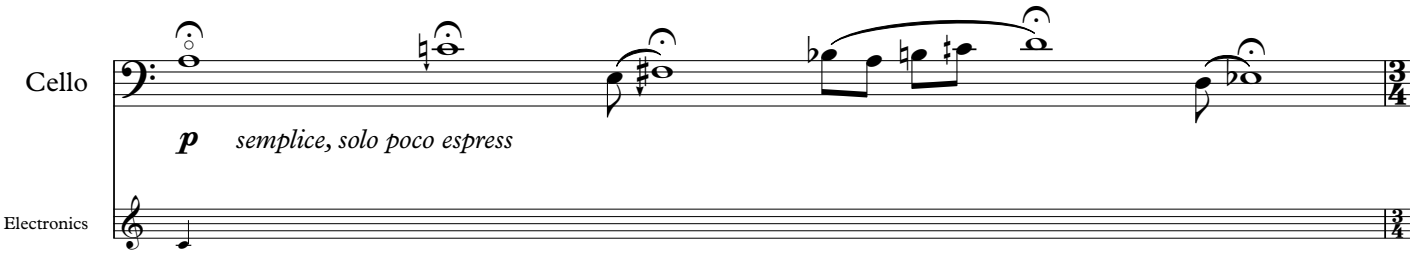
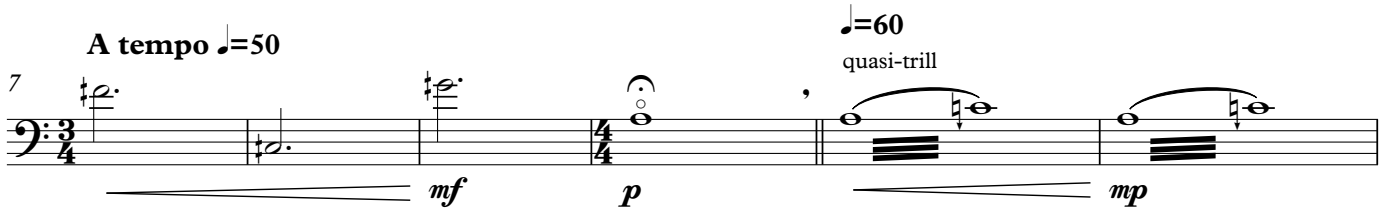
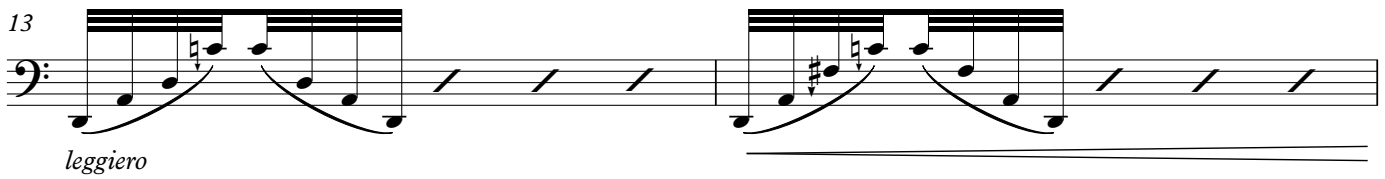
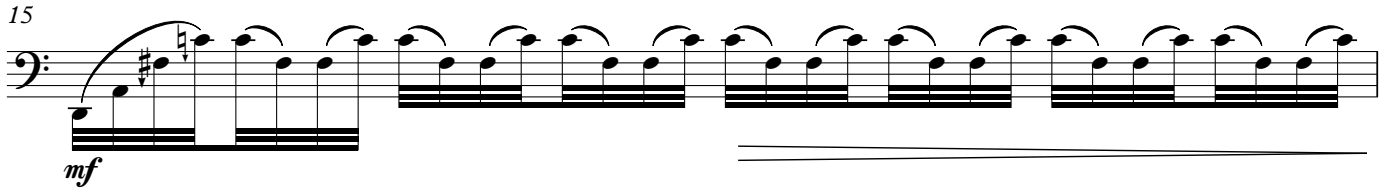
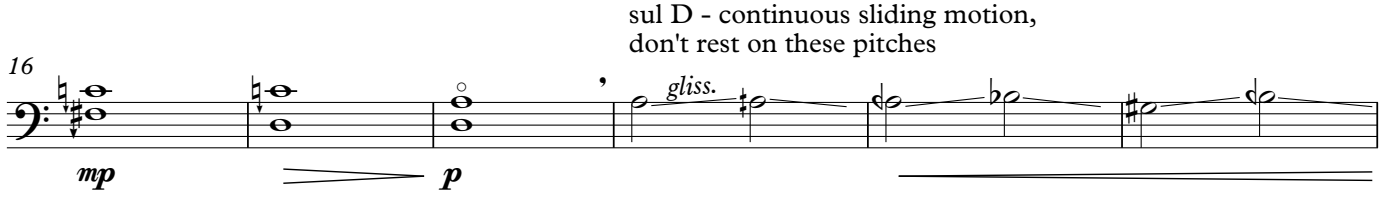
Freely (𝅗𝅥=c.40) - Very calm and measured, all notes with fermatas should be held long enough to be matched by the electronics

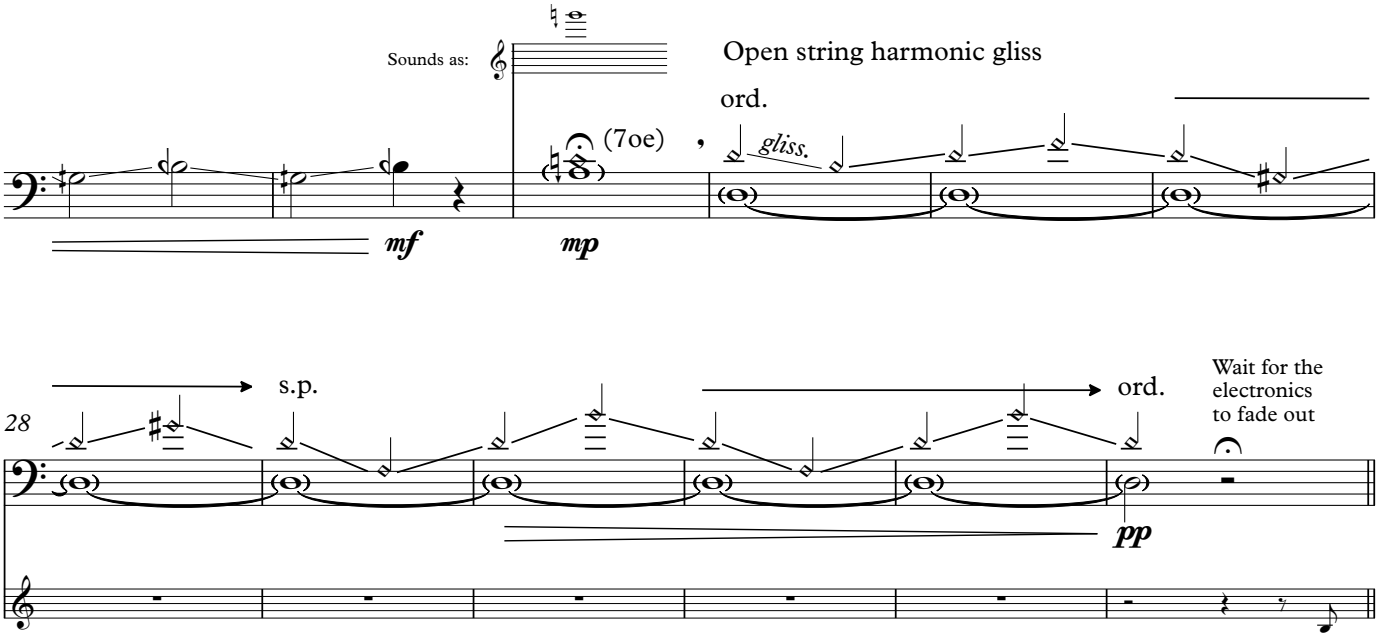




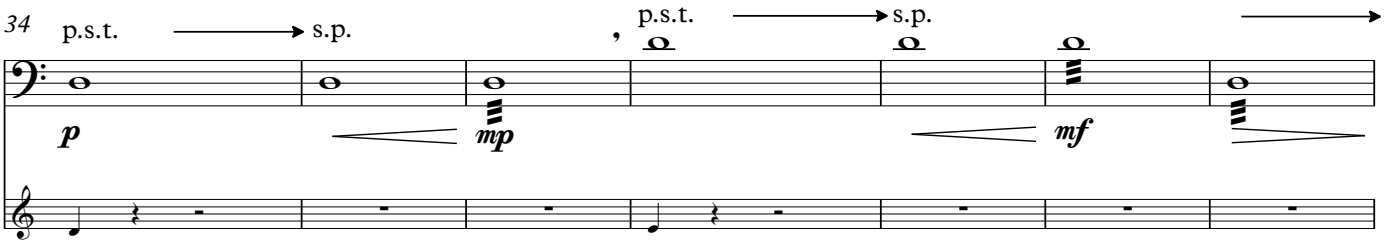


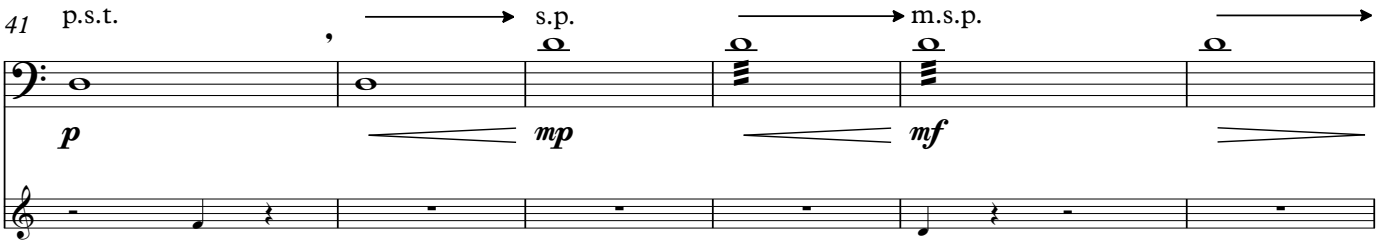


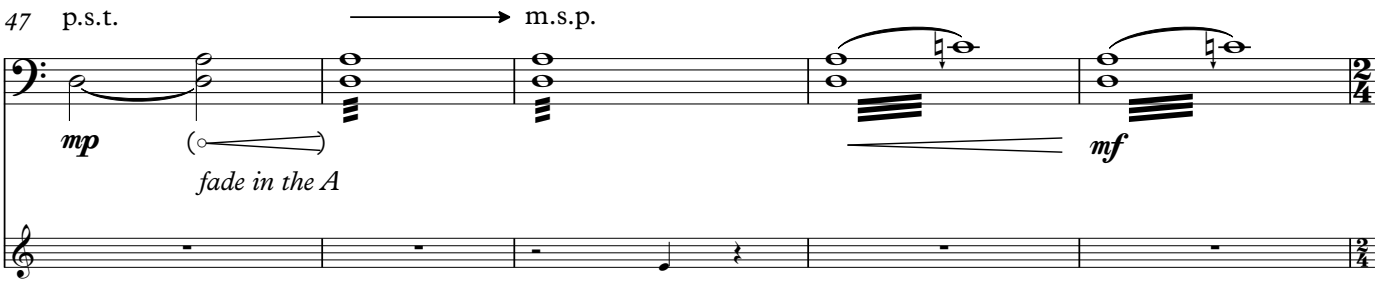


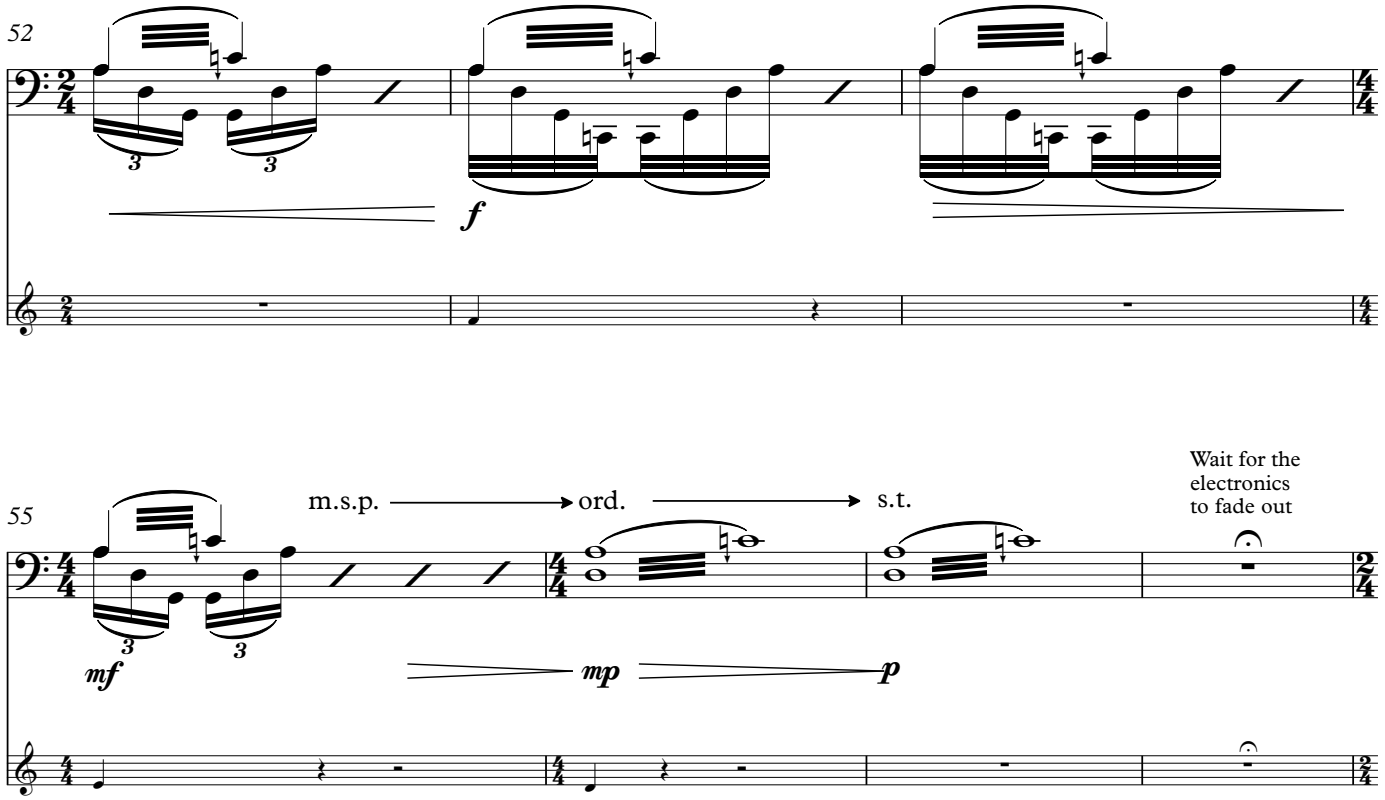


A ♩=60 - long drawn out sounds with distinct changes of colour

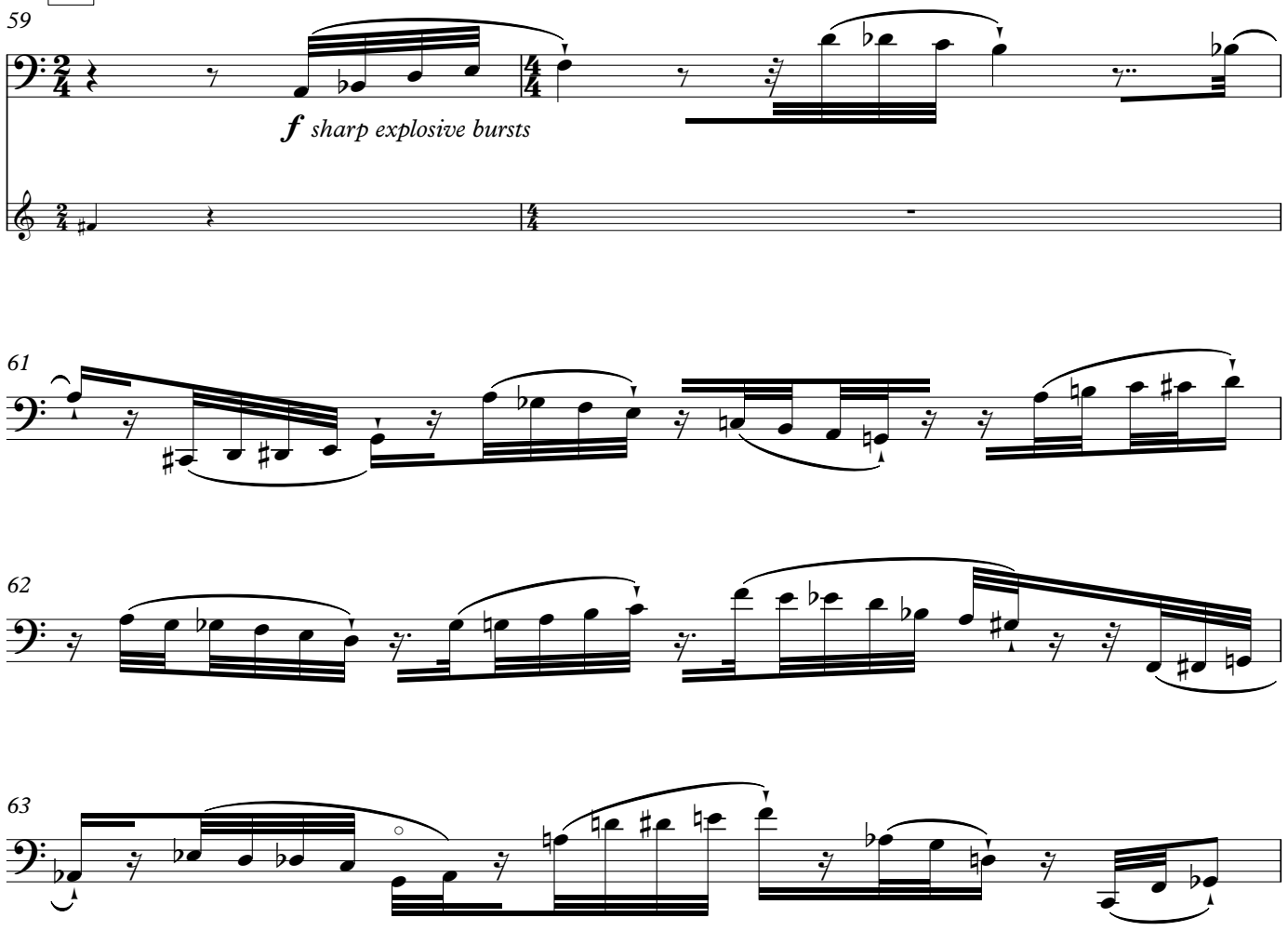


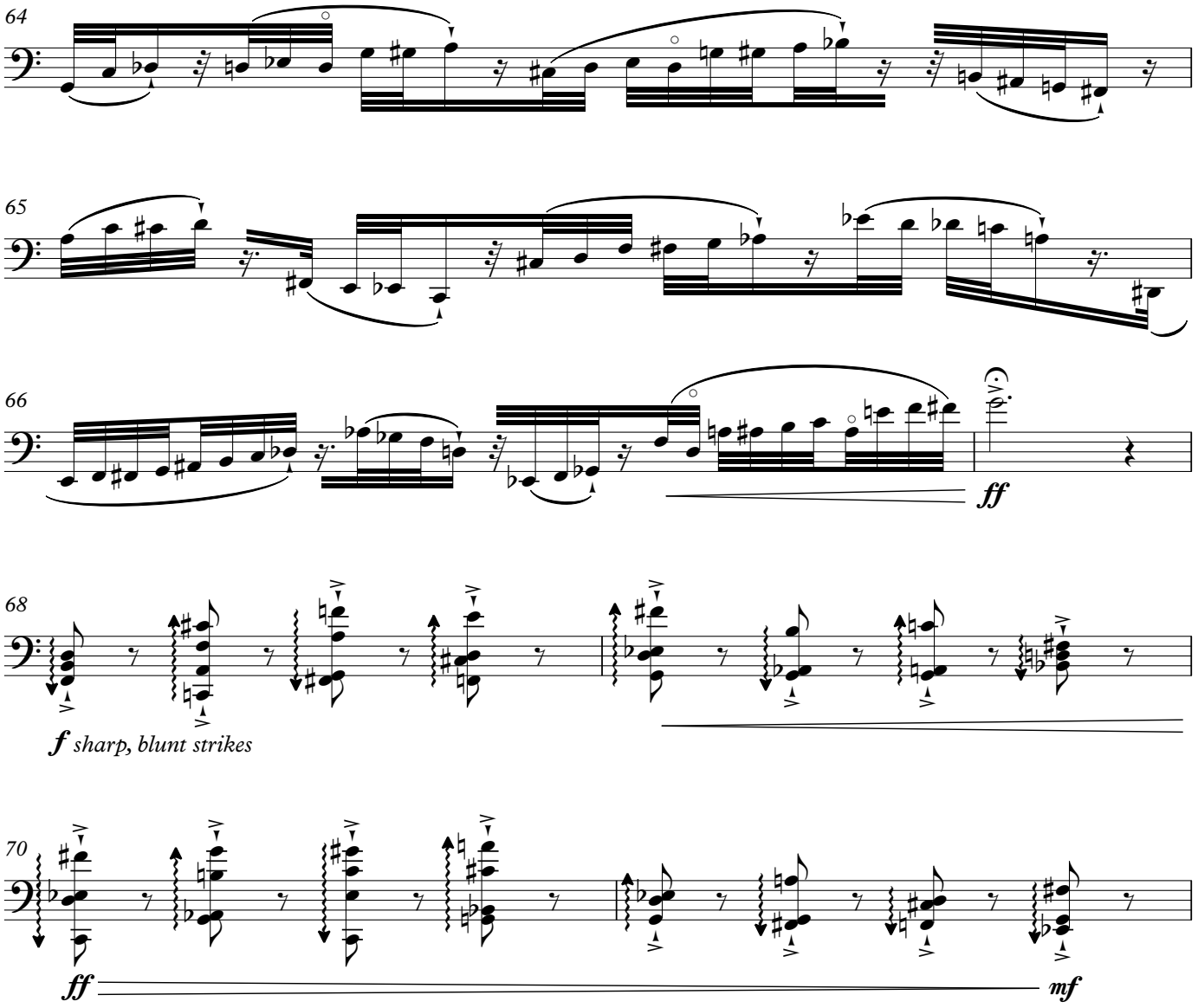






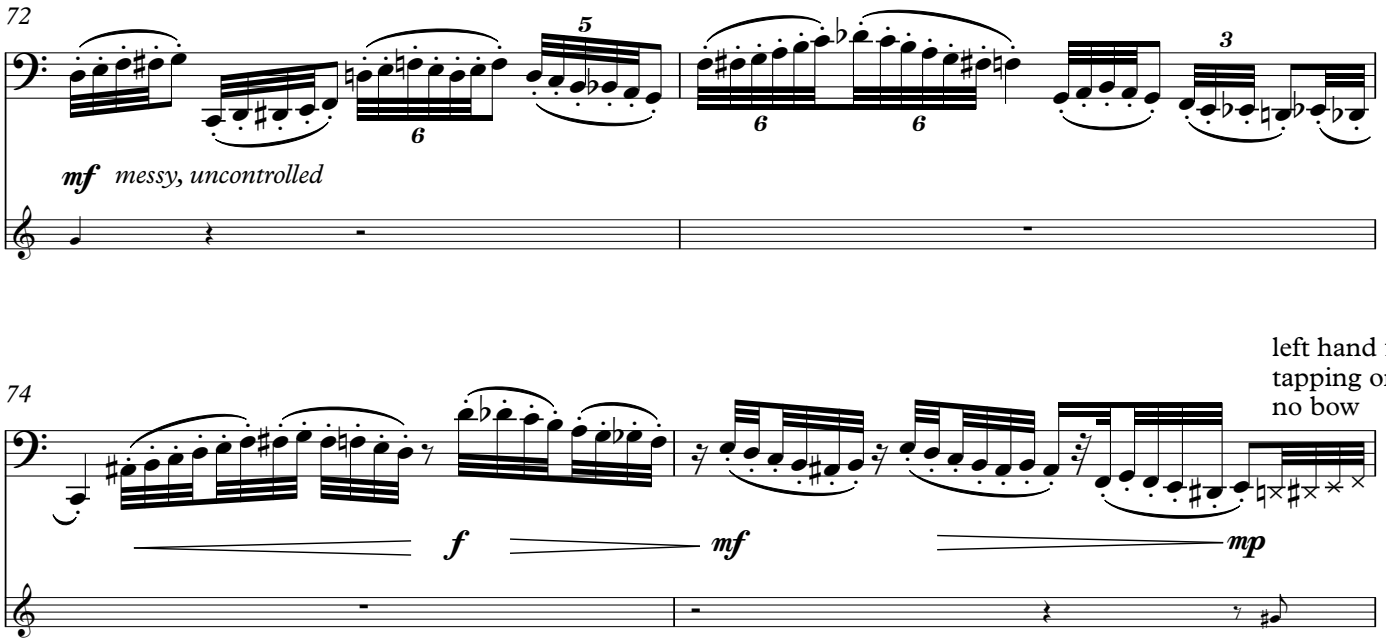
B ♩=100 (or faster) - **Frantic, writhing, as if trying to escape**

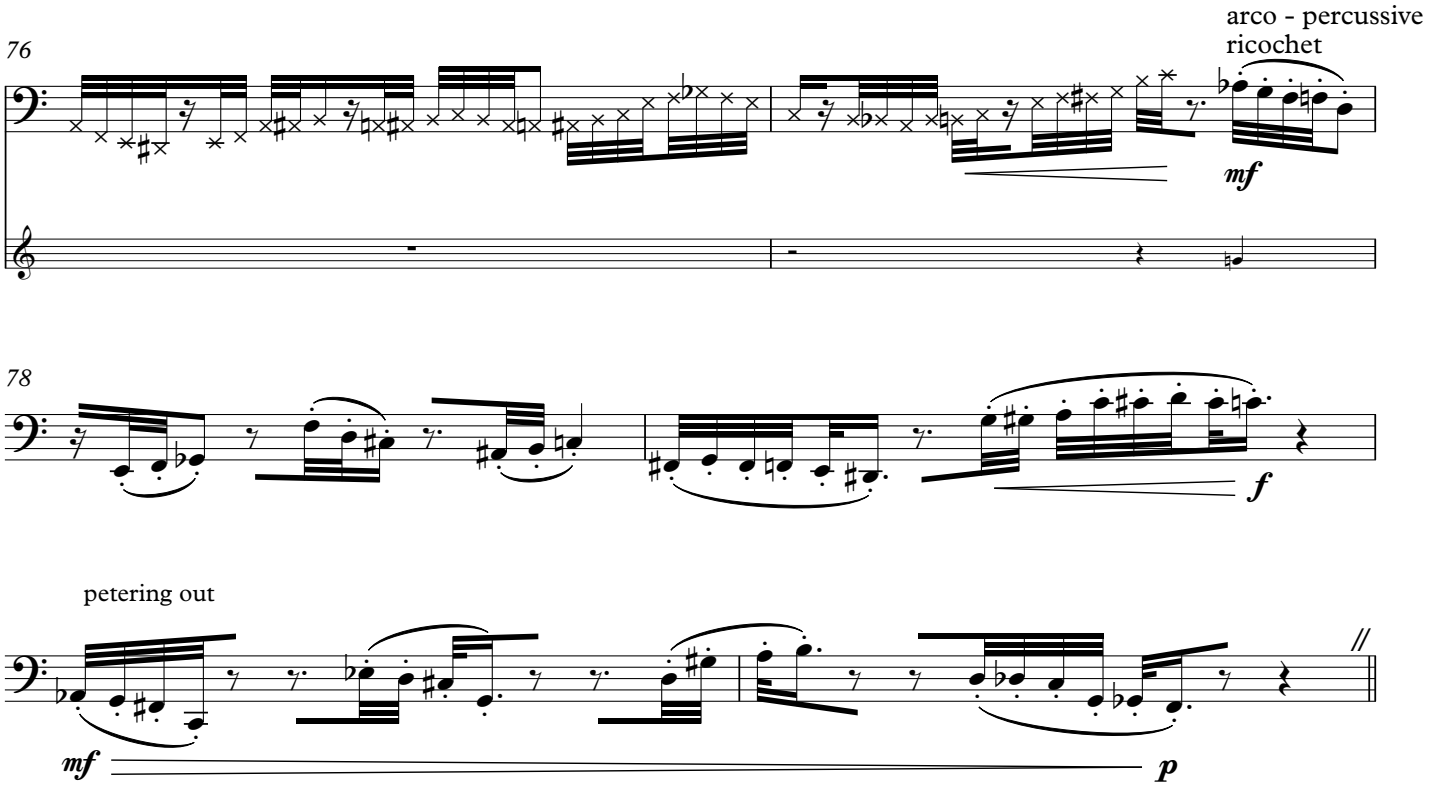




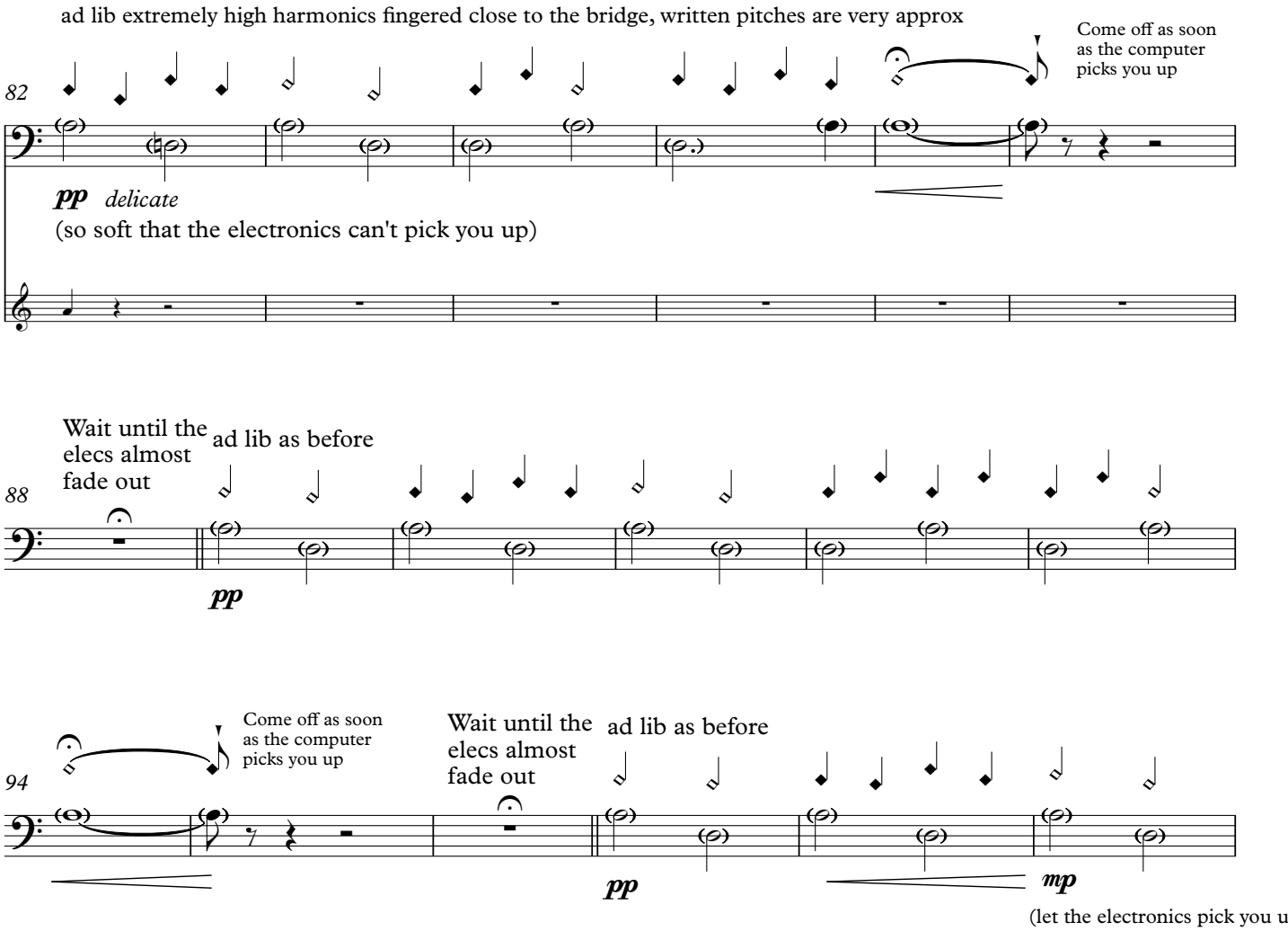
Less frantic, but still writhing

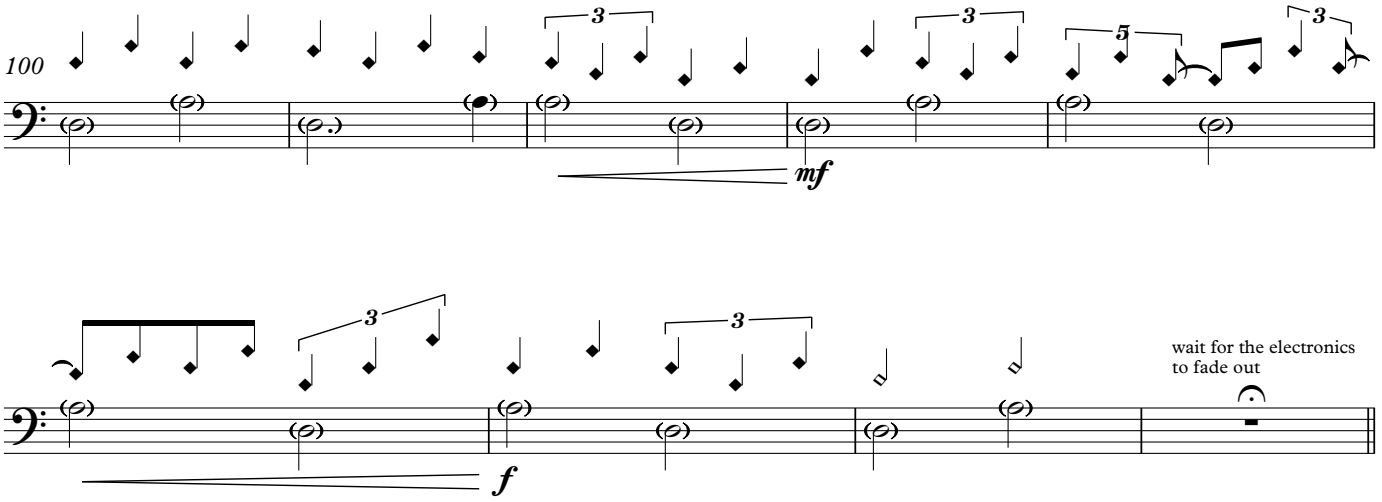
percussive ricochet - let the wood hit the strings along with the hair



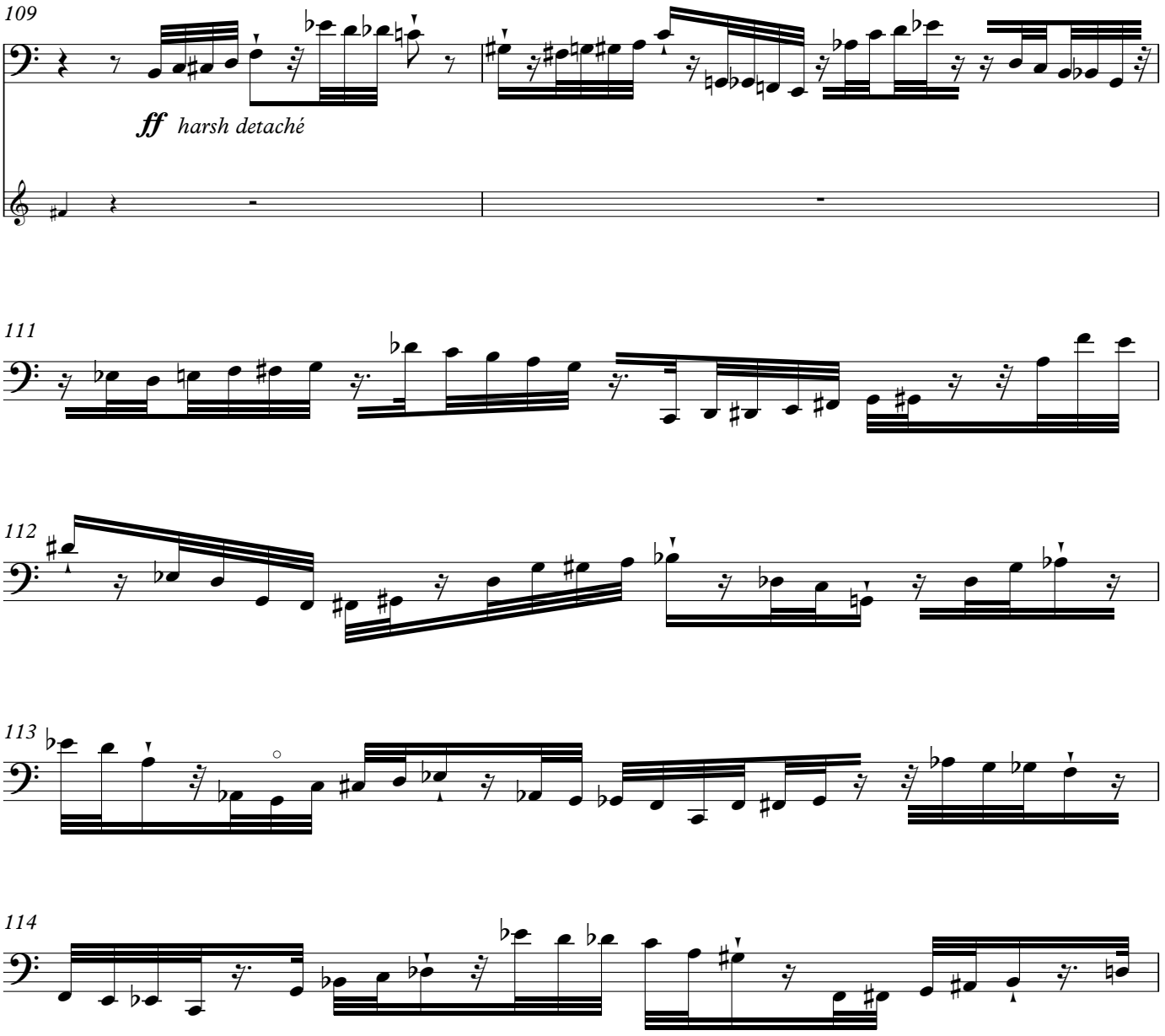


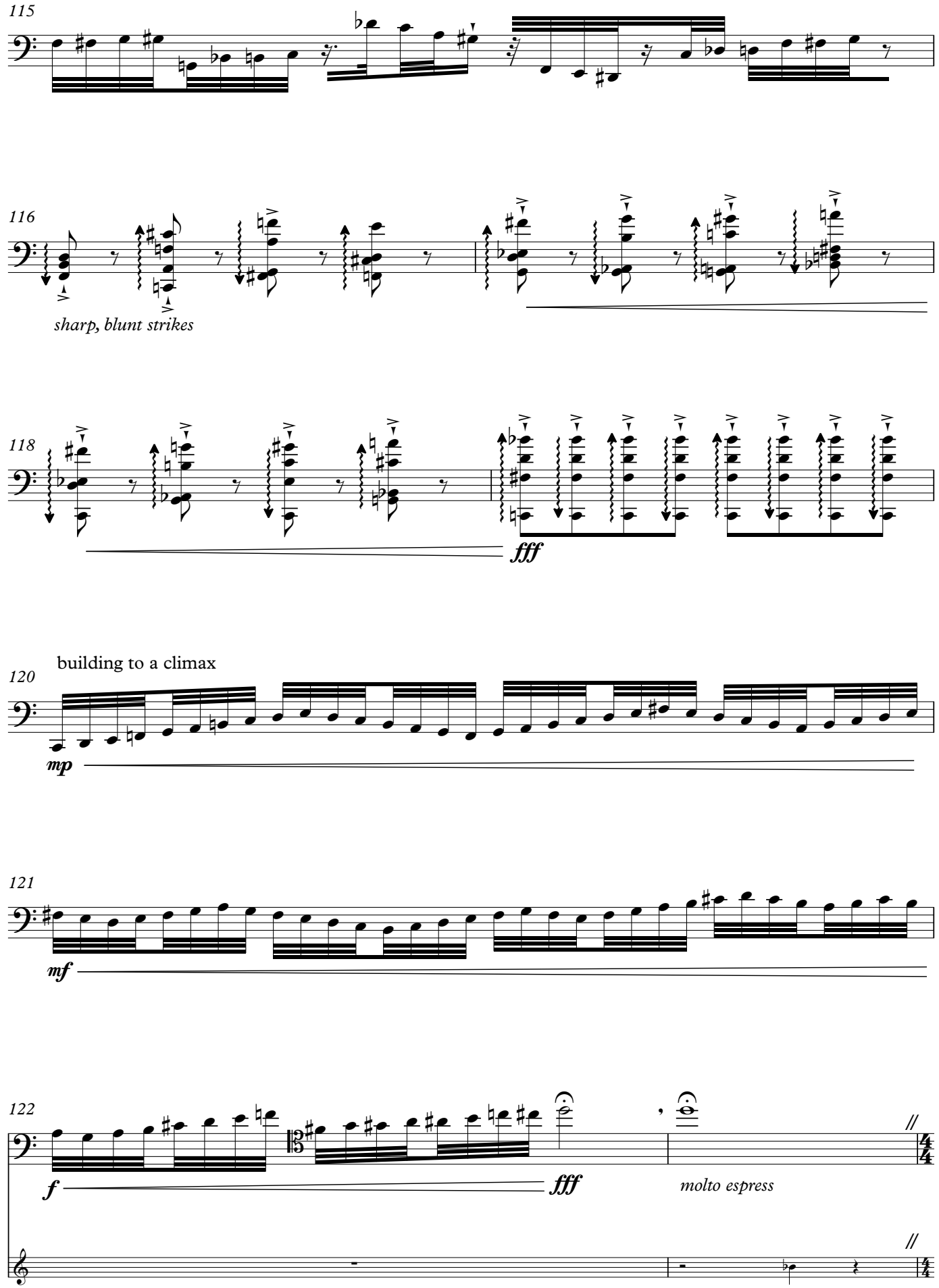
C ♩=60 **Suddenly very still but with a sense of apprehension, as if hiding within earshot**





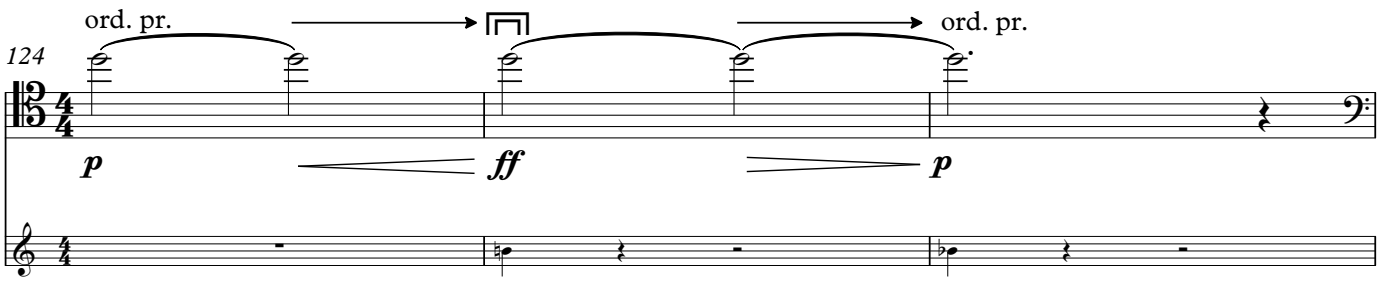
D ♩=100 - **With aggressive determination, still trying to escape but no longer frantic**

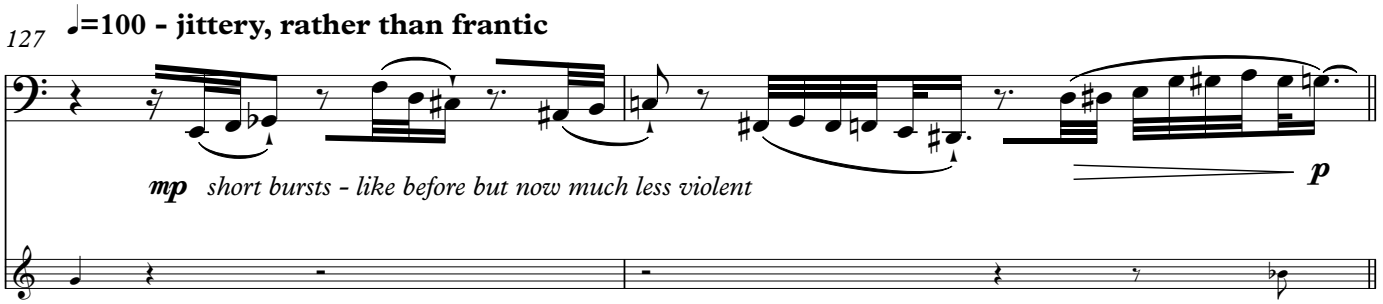


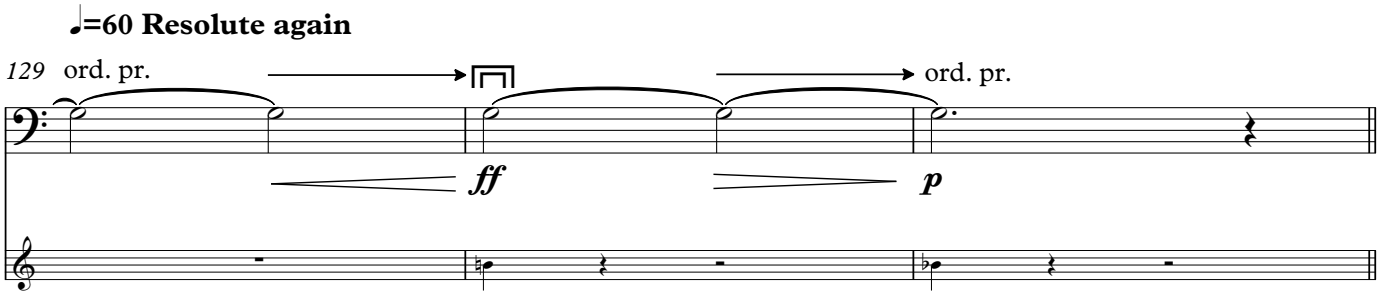

115
116
sharp, blunt strikes
118
fff
120
building to a climax
mp
121
mf
122
f
fff
molto espress

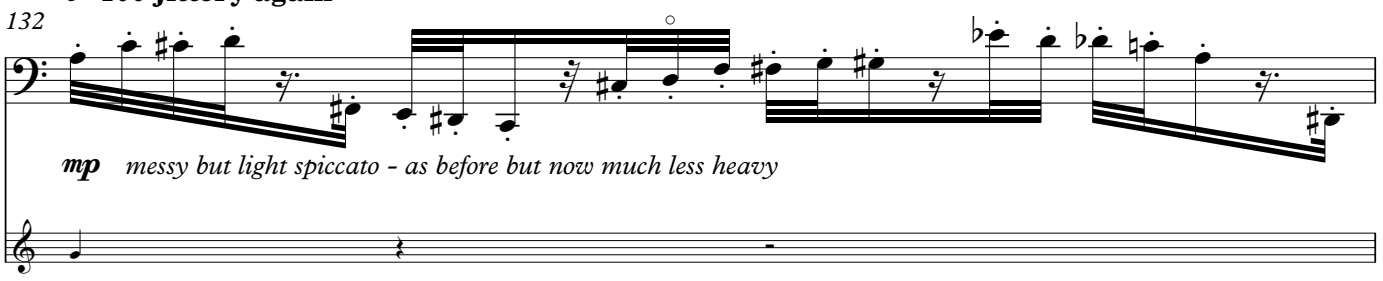
E ♩=60 - **Resolute, steady**

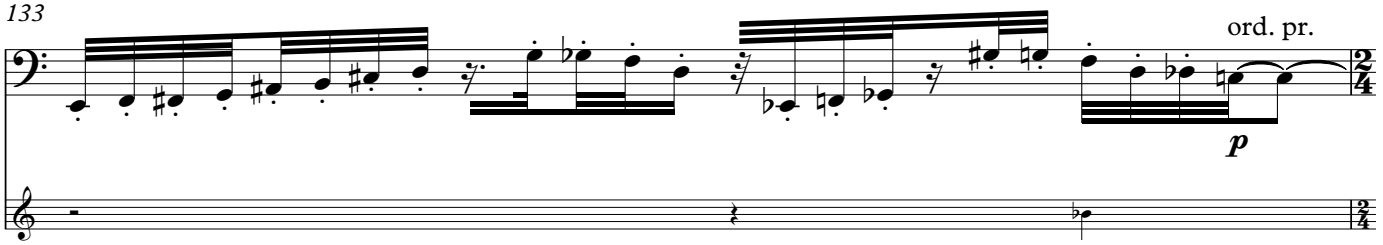
Ord. tone with clear pitch, moving into heavy overpressure/noise and then back to a clear note again



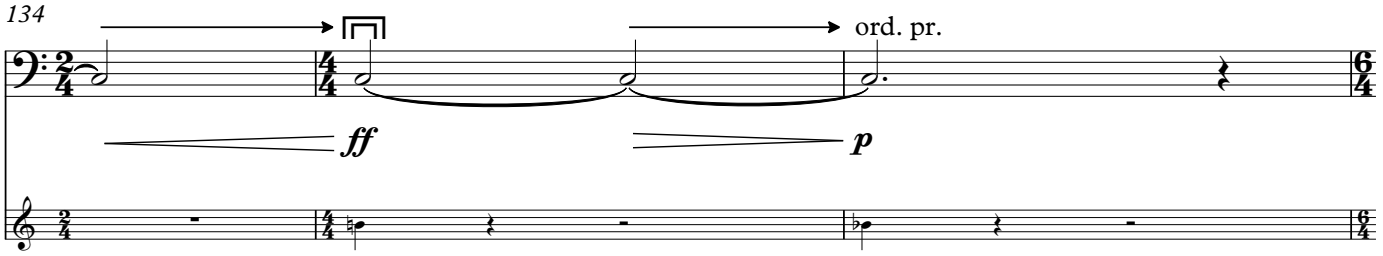




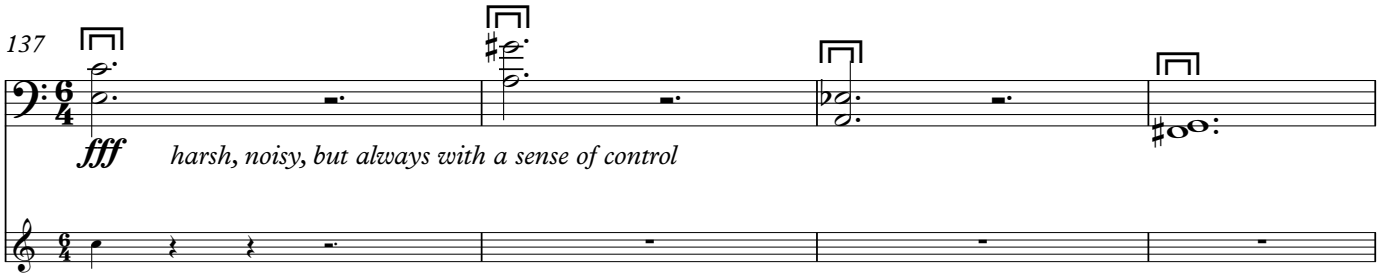


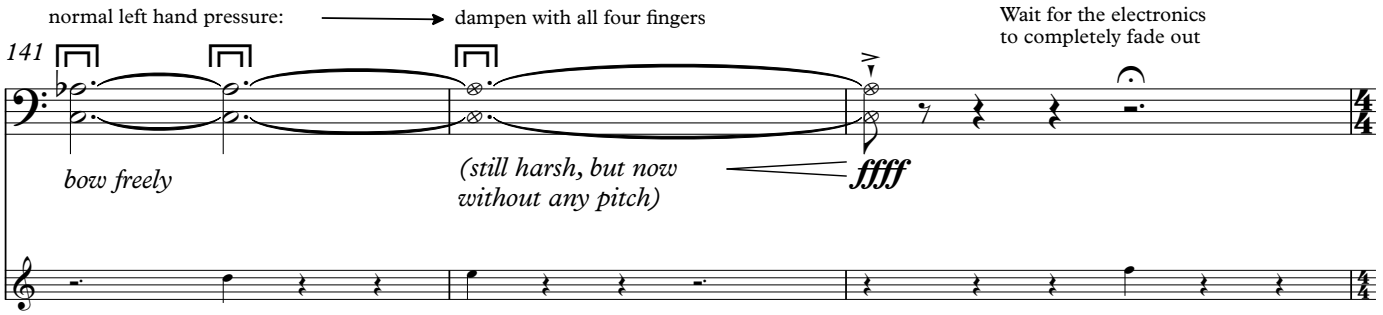


♩=60 **Resolute**



Suddenly burst into grinding noise (bow freely, all written pitches approx.)

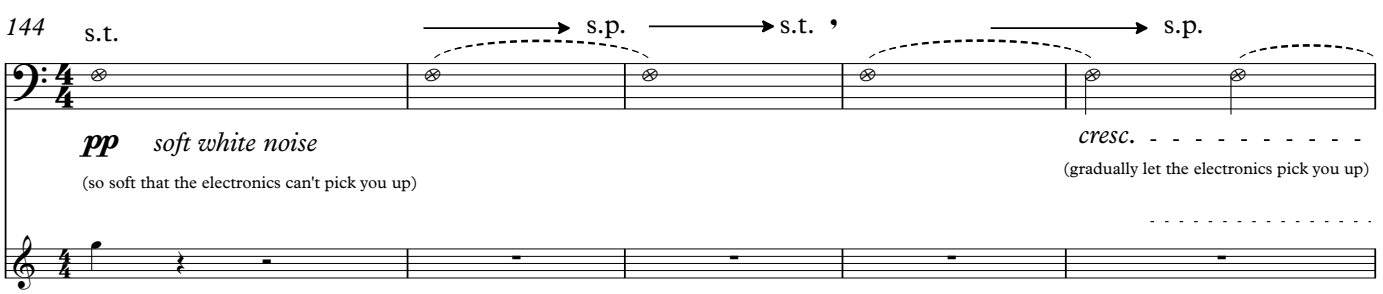


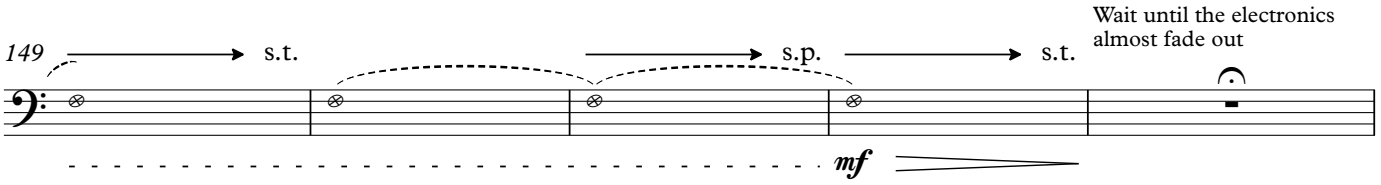


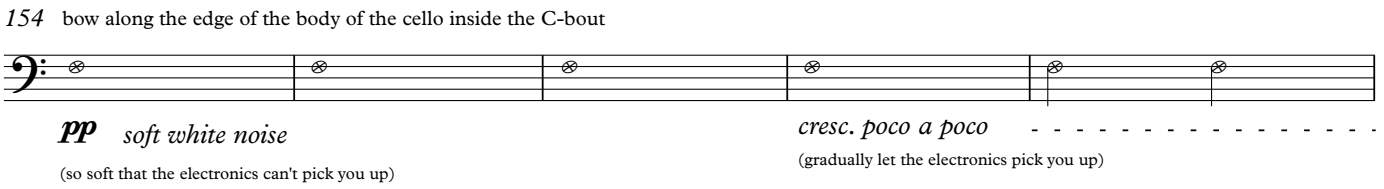
F ♩=50 - **Very calm and measured, the placid cello should contrast the chaotic electronics**

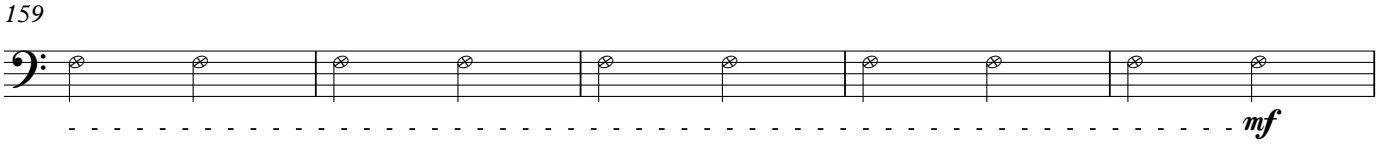
1. alto flautando - extremely light bow pressure, just enough to produce gentle white noise with no clear pitch.
2. dampened strings - all four fingers placed very lightly on the string to stop normal string vibration.

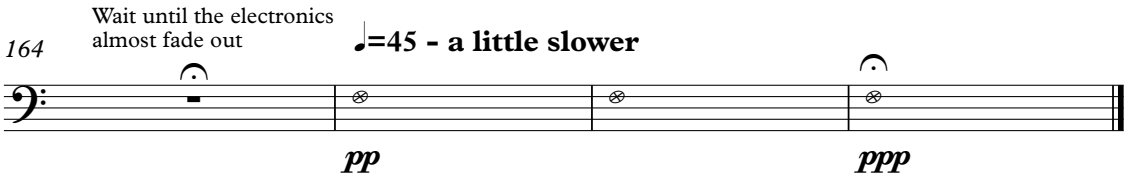
sul G and D




149
s.t.
s.p.
s.t.
Wait until the electronics almost fade out
mf


154
bow along the edge of the body of the cello inside the C-bout
pp
soft white noise
(so soft that the electronics can't pick you up)
cresc. poco a poco
(gradually let the electronics pick you up)


159
mf


164
Wait until the electronics almost fade out
♩=45 - a little slower
pp
ppp