wood, metal and tension (2023)

for violin + electronics

Cárthach Ó Nuanáin

General Remarks

This piece continues a cycle of compositions known as *Materials* that explores the interaction between acoustic instruments and real-time analysis and intelligent organisation of timbres using concatenative synthesis. In a process that is antithesis and antagonistic of Big Data, I am fascinated by the seemingly endless sound shapes and sonic events that can be squeezed out of smaller, intimate collections of carefully-curated sounds through selection and myriad post transformations that render the original unintelligible.

The piece is built around the *Deacon*[1] instrument where collections of sound samples are loaded into a Max/MSP device that segment the samples by onset times then analyse their spectral, timbral and perceptual characteristics. The device can then listen to live input and select and play the closest matched samples using those timbral fingerprints.

The instrument was conceived for my acousmatic piece *Sem Cordas*, selected as a highlight work of the International Computer Music Conference in 2021[2]. I first experimented by recording long improvisations with a detuned Irish tenor banjo, exploiting the sharp attacks to create curious collisions of sounds with the computer. Hours of material was then edited down to form the cohesive piece I was satisfied with.

Since then I have elaborated instrument and technique to enable live performance with other instrumentalists. This brought with it significant challenges. The instrument needed to be refined to be less chaotic, more controlled and efficient in its role as automaton accompanist. A notation system was devised using MuseScore and Inkcape to engrave graphic scores to help human performers navigate a piece. This culminated in *metal and air* for flute and electronics - first performed in 2022[3].

wood, metal and tension for solo violin and electronics renews a focus on mechanical and digital materiality. The corpus of sound curated is thematically related to the physical qualities of the violin, and includes recordings of wooden string-based instruments like the bouzouki and fiddle along with metallic impacts, scrapes and other electronic noises from sampled sources and synthesisers.

The piece is divided into 4 sections according to the electronic material that responds to the violin player's performance.

Section A is mostly percussive, noisy electronics with corresponding extended techniques for the violin. Section B contains more coherent pitched material for both electronics and violin. Section C combines material and approaches from A and. Section D concludes with dissipating harmonics coupled with bouzouki samples.

Sound spatialisation of the electronic sources is achieved using the E4L open-source tools for Ambisonics 3D panning[4]. This allows flexible deferral of final speaker configuration to the point of performance.

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[1] https://github.com/carthach/deacon

[2] https://artes.uc.cl/noticias/concierto-presenta-las-mejores-obras-musicales-en-formato-acusmatico-y-audiovisual-de-la-icmc-2021/

[3] https://soundcloud.com/carthach/metal-and-air-flute-and-electronics

[4] McArthur, Angela, et al. "A survey of 3D audio through the browser: practitioner perspectives." *2021 Immersive and 3D Audio: from Architecture to Automotive (I3DA)*. IEEE, 2021.

Piece Length
No more than 7 minutes

Performers Required
- Violin Soloist
- FOH Sound Engineer
- Composer will operate electronics

Technical Requirements (Venue)

Sound to Composer:
Microphone/line feed of violin to soundcard. Violin should have a rich reverberant sound but with clarity and definition.

Sound to FOH:
The electronics are mixed in Ambisonics so the final speaker arrangement is flexible depending on the venue. The piece works well in stereo but higher order arrangements like quad or octophonic will increase the sense of immersion.

Stage Layout:
Not so strict, as long as the performer and operator can see each other.

Setup Time:
30 minutes or so to test the microphone feed, adjust thresholds and ensure triggering of electronics is responsive in the space.

Technical Requirements (Composer Provided)

Computer Hardware:
Mac computer
Sound card 1 in / Multi out

Software:
Ableton Live Suite (open only/trial is fine)
Max for Live with *MuBu* and Cage packages installed

Electronics and Performance

Open the Ableton Session and load the corpus audio files to the respective Max for Live device. Test with some audio to tweak the gain on the envelope follower so that the device triggers cleanly with the violin.

Notation Instructions

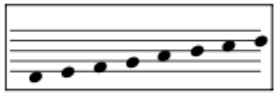
Use your favourite stopwatch to keep track of time. Timings are not precise but try to indicate somehow to the electronics operator that you are proceeding to the next rehearsal mark.

Anything with a single staff line is very open to interpretation. The electronics are interactive, so if you discover something that works well go with it! Anything with five staff lines should be performed as is in terms of pitch.

Notation Key

Anything scratchy or scrapey, including sul pont, rosin noises, bowing on the bridge, bowing behind the bridge, bowing the tailpiece etc.

Anything percussive and transient like body strikes, dead notes, pizzicato, Bartok pizzicato, snaps, knocks plucks etc.

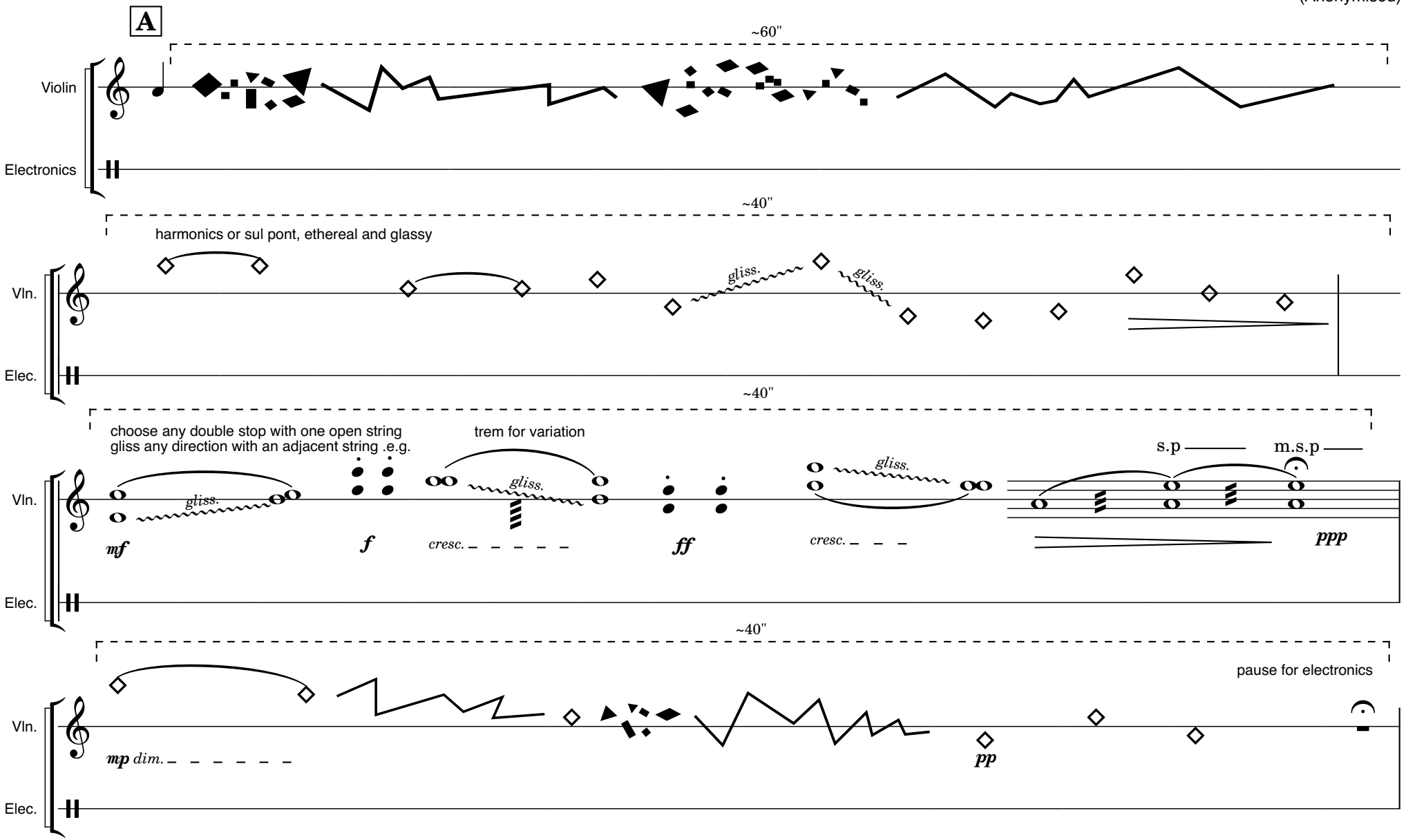


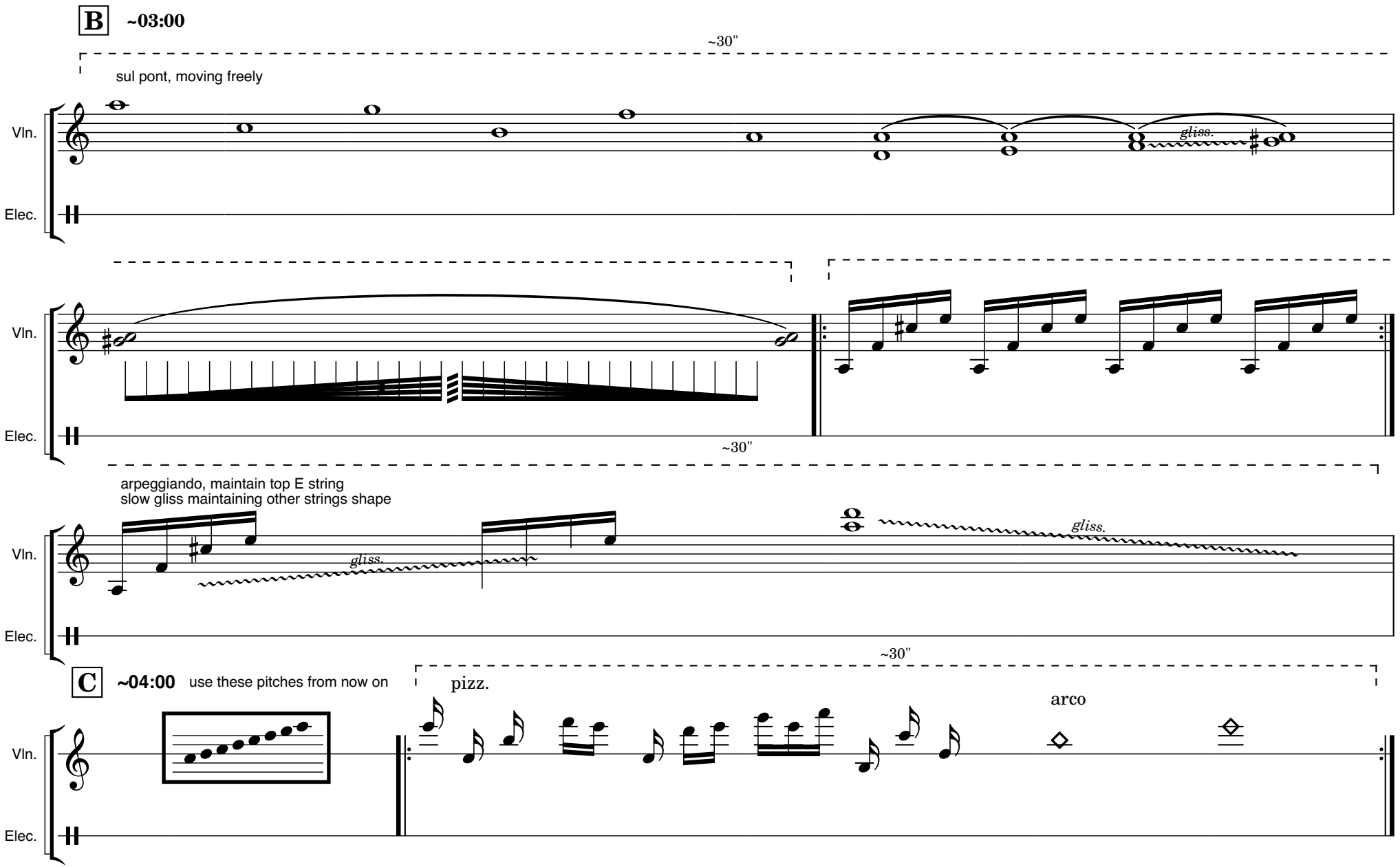
Use notes from this pitch set

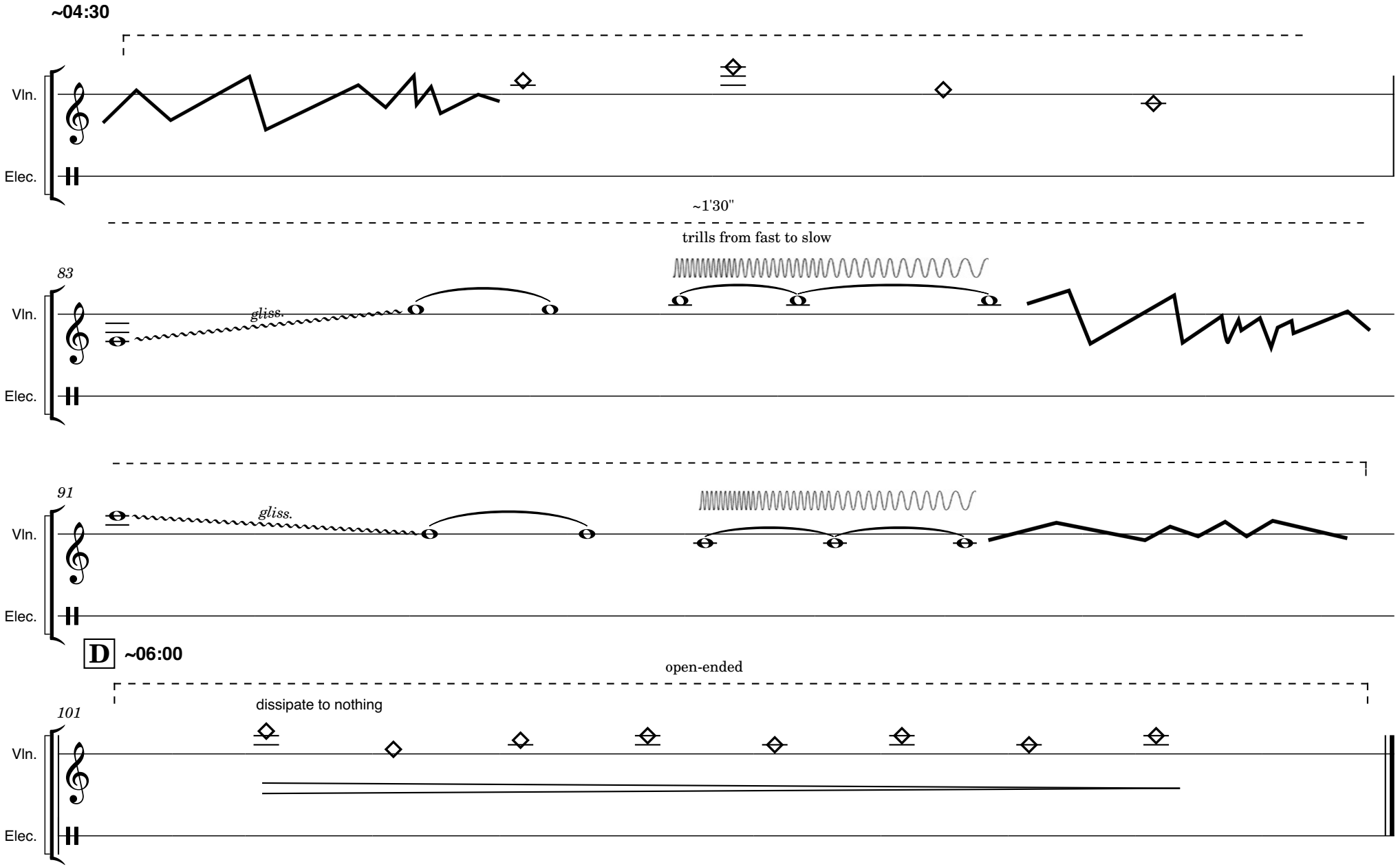
wood, metal and tension

for violin and electronics

(Anonymised)




B
~03:00
~30"
sul pont, moving freely
Vln.
Elec.
gliss.
~30"
arpeggiando, maintain top E string
slow gliss maintaining other strings shape
gliss.
gliss.
C
~04:00
use these pitches from now on
~30"
pizz.
arco


~04:30
Vln.
Elec.
~1'30"
trills from fast to slow
83
gliss.
91
gliss.
D
~06:00
open-ended
dissipate to nothing
101