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## **Earth White Fracture**

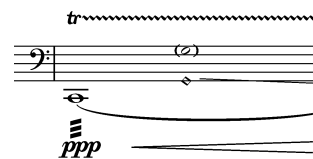
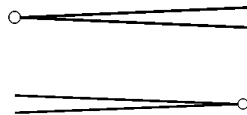
For Contrabass Flute, 'Cello and Live Electronics

Approximate Duration: 7'20"



## Guide to Notation

### General marks



ord. Ordinary articulation (cancels previous articulation)

Tremolo, always play as fast as possible

Crescendo dal niente

Diminuendo al niente

Trill, always to indicated note

**Contrabass flute**



flz. Fluttertongue

**'Cello**

s.t

Sul tasto

s.p

Sul ponticello

molto s.t

Sul tasto, as much as possible

molto s.p

Sul ponticello, as much as possible

norm.

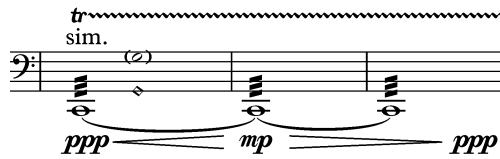
Normal bow position



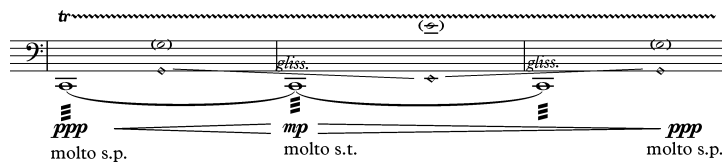
Increase bow pressure to produce noise, then decrease



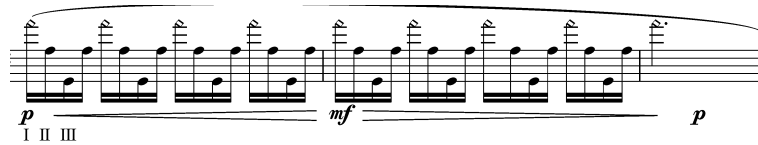
Stopped harmonic



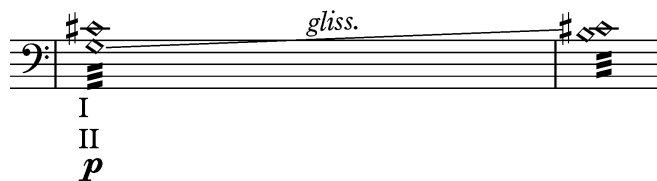
Trill between open string and harmonic node



Trill between open string and harmonic nodes. Start glissando immediately.



Arpeggio with harmonic on indicated strings



Harmonics with tremolo and glissando on indicated strings. Start glissando immediately

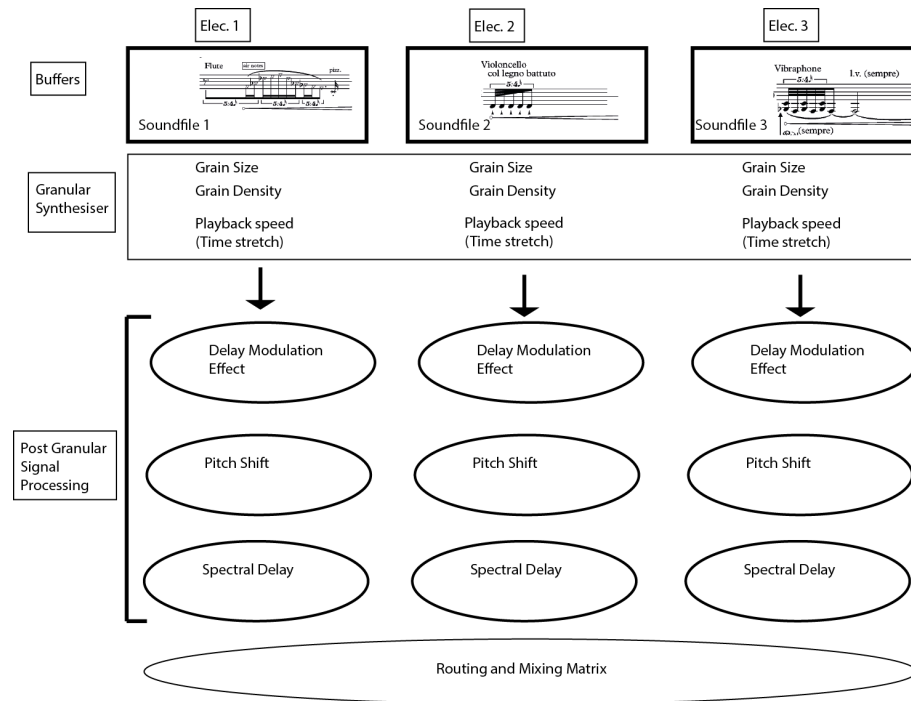


Jeté con legno battuto. As close to the bridge as possible



## Guide to the Electronics

The electronic part consists of a three-channel granular synthesiser. A broad overview of the software performance environment is shown below.



The level of the electronic part should be balanced to match the level of the acoustic part as indicated by the dynamics in the score.

A small mixing desk is necessary in order to make minor adjustments to the levels during the performance.

The acoustic instruments should only be amplified only if necessitated by the size of the performance space.

The electronic part requires a computer running Max v. 6 or above ([www.cycling74.com](http://www.cycling74.com)), a suitable digital to analogue convertor, a mixing desk and amplification appropriate for the room. The Max patch is available from the composer on request.

Each of the three channels is followed by identical signal processing chains consisting of a delay modulation effect, a pitch shifter and a spectral delay. Each channel carries out real-time granulation of a soundfile. The soundfile is a pre-recorded gesture taken from the 'cello part. These gestures should be recorded before the performance and edited to eliminate silence and discontinuities at the beginning and end of the recording. The recordings should match, as far as possible, the ambience of the room in which the performance will take place.

An example of a 'cello gesture used in the electronic part is shown below:

The image shows a musical score for a cello gesture. It begins with a 'Cue 2' box at 37". The score is divided into sections with time markers: 37", 41", 45", 49", 53", 57", 1'02", 1'06", and 1'10". The first section (37" to 49") is marked 'molto s.p.' and 'molto s.t.'. The second section (53" to 1'10") is marked 'f' and 'Fade'. Processing parameters are listed: 'gs 8, 12, 14', 'pbs 0.2, 0.25, 0.3', 'freq 9, 5, 7', 'win 200, 500, 70', 'phase 9, 5, 7', and 'fb 0.2, 0.4, 0.4'. The score includes a bass clef and a staff with notes and a dynamic marking 'f'.

Pre-composed events are triggered manually from the software environment using numbered cues. These are indicated on the score as shown in the example above.



Although the events are pre-composed, all processing takes place in real time and there will be subtle but significant differences between performances.

All timings shown are approximate and will vary between performances



## Guide to Notation (Electronic Part)

A system of graphic notation has been used to indicate both performance parameters and the resulting textures. Examples from system are described below, together with an explanation of abbreviations used.



gs

Grain size in  
milliseconds  
(small)



gs

Grain size in  
milliseconds  
(large)



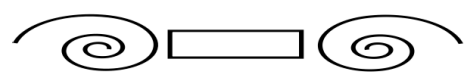
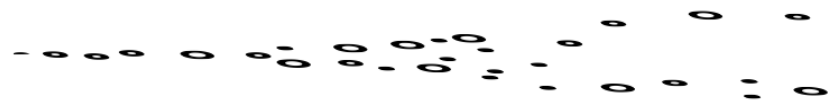
gd

Grain density.  
Dense - becoming  
less dense in  
example

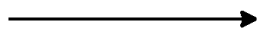


PBS

Play back speed -  
time stretching  
effect.  
Normal playback  
speed = 1



space 0.2



Delay Modulation  
(comb filtering)  
effect

Fq Frequency  
P Phase  
components  
Win Window size  
Fb Feedback  
Bl Balance

Pitch (Hz)

Space Spectral delay  
effect  
(wet dry balance  
0.2 in example)

Interpolate  
between  
parameters

## **Instruments**

Contrbass Flute

'Cello

Computer running Max 6 or higher, audio interface, mixing desk, suitable microphones and amplification



# Earth White Fracture

**lento** Cue 1 4" 8" 12" 16" 20" 24" 28" 33"

♩ = 58 s.t.

'Cello granulation

gs 2,4,6  
pbs 0.1

freq 8 4 2  
win 800 400 800  
phase 8 4 2  
fb 0.2 0.4 0.4

*f* Fade

Contrabass Flute

ord. flz. ord. ord. flz. ord.

*p* < *ff* > *p*      *p* < *ff* > *p*

Violoncello

s.t.

*ppp* < *ff* > *p*

The score is divided into three staves. The top staff, 'Cello granulation', is in bass clef and features a granulation effect with a triangular envelope and a 'Fade' box. The middle staff, 'Contrabass Flute', is in treble clef and contains two dynamic swells marked with 'ord.' and 'flz.' (flautando). The bottom staff, 'Violoncello', is in bass clef and features a dynamic swell from ppp to ff to p, with a triangular envelope above it. Time markers in inches are placed above the first staff. A tempo marking of 'lento' and a metronome marking of 58 are also present.

Cue 2

37" 41" 45" 49" 53" 57" 1'02" 1'06" 1'10"

10 *molto s.p.* *molto s.t.* *molto s.p.* gs 8, 12, 14  
*tr* pbs 0.2, 0.25, 0.3

freq 9, 5, 7  
 win 200, 500, 70  
 phase 9, 5, 7  
*f* fb 0.2, 0.4, 0.4

*f*

Fade

ord. ord. flz. ord. ord. flz. ord.

*mf* < *f* *p* < *ff* > *p* *mf* *f* *p* *p* < *ff* > *p* *mf* < *f* *fp*

*molto s.p.* *molto s.t.* *molto s.p.* *tr* sim.

*ppp* *mp* *ppp* *ppp* *mp* *ppp* *ff* *ppp*



1'14"

Cue 3

1'18"

1'22"

1'26"

pbs 0.4, 0.45, 0.45

gs 30, 40, 50

freq 6, 5, 4  
win 600, 500, 400  
phase 6, 5, 4  
fb 0.2, 0.4, 0.5

space 0.3

19

tr

molto s.p. molto s.t. molto s.p. **f**

ord. flz. ord. ord. flz. ord. ord. flz. ord. ord. flz. ord.

**fp** **mf** **p** **mf** > **p** **fp** **mf** **p** **fp** **mf** **p** **mf** > **p**

molto s.p. molto s.t. molto s.p.

tr

**ppp** **mp** **ppp**

1'31" 1'35" 1'39" 1'43" 1'47"

23

A piano roll visualization for the first system. The top part shows a series of overlapping, elongated shapes representing pitch contours. Below this, a staff with a bass clef contains several groups of notes, some with stems pointing downwards. A horizontal line with a double bar and a 'f' dynamic marking is positioned below the staff.

Fade

Musical notation for the first system. It features a treble clef staff with notes and rests. Above the staff, performance instructions include 'ord.', 'flz.', and 'ord.'. Below the staff, dynamic markings are written: *mf*, *p*, *fp*, *mf*, *p*, *mf*, *p*, *fp*, *mf*, *p*, *fp*, *mf*, *p*. Slurs connect groups of notes.

Musical notation for the second system. It features a bass clef staff with notes and rests. Above the staff, a trill is marked with 'tr' and a wavy line. Below the staff, dynamic markings include *ppp* molto s.p., *mp* molto s.t., and *ppp* molto s.p. Slurs connect notes across the system.

1'51" Cue 4  
 28 molto s.p.  
 1'55" tr  
 1'59" gliss.  
 2'04" gliss.  
 2'08" pbs 0.1, 0.01, 0.2  
 gs 30, 40, 50  
 pitch 0, 2000, -2000  
 freq 6, 5, 4  
 win 600, 500, 400  
 phase 6, 5, 4  
 fb 0.2, 0.4, 0.4  
 space 0.3 **f**

ord. flz. ord. flz. ord. 5:4 ord. flz. ord.  
**f** **pp** **mf** **sfz** **p** **mf** **p** **fp** **pp** **mf** **p** **mf** **f** **p** **fp** **mf** **p**

norm. s.p. tr gliss. molto s.p. gliss. s.p. norm.  
**ffppp** **mp** **mf** **ppp**

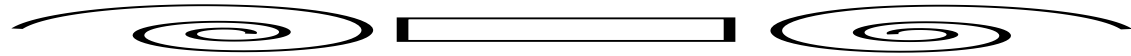
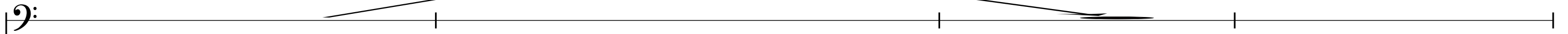
2'12"

2'16"

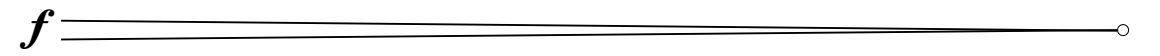
2'20"

2'24"

33



Fade



ord. flz. ord.

ord. flz. ord.

*p* *mf* *p* *mf* *p* *mf* *fp* *mf* *p*

ord. 5:4

molto s.p.

tr

gliss.

norm.

*mf* *ppp*

2'28"  
Cue 5

2'33"

2'37"

pbs 0.01, 0.1, 0.4  
gs 200, 400, 800  
gd 3500, 4000, 8000  
2'41"

37

norm. #

(⊕)

s.p.

#

norm.

pitch800, -4000, 4000

freq 6, 5, 4  
win 600, 500, 400  
phase 6, 5, 4  
fb 0.2, 0.4, 0.4  
(balance 0.2)

space 0.3

Bass clef staff with notes and dynamics. A slur covers the first two notes. A dynamic line below the staff starts at *f* and tapers to the right. A tremolo line is above the staff, with a downward-pointing triangle below it.

Treble clef staff with notes and dynamics. A slur covers the first four notes. Dynamics include *sfz*, *mf*, *sfz*, *sfz*, *sfz*, *fp*, *mf*, and *p*. Performance markings include *flz.*, *ord.*, *flz.*, *ord.*, *flz.*, *ord.*, *flz.*, and *ord.*

Bass clef staff with notes and dynamics. A slur covers the first two notes. Dynamics include *mf*, *ff*, and *p*. A tremolo line is above the staff, with a downward-pointing triangle below it.

2'45"

2'49"

2'53"

2'57"

3'02"

41

*f* Fade

flz. ord.

ord. flz. ord. flz. ord. flz.

*sfz mf fp mf p sfz sfz sfz mf > pp*

*tr*

norm. # *mf*

()

s.p. *ff*

# *p*

norm.

3'06" Cue 6  
 3'10" pbs 0.01, 0.1, 0.4  
 3'14" gs 400, 800, 1000 3'18" gd 4000, 8000, 6000  
 pitch 220, 6000, -5000  
 space 0.7

46

I II III

*f*

flz. ord. ord. flz. ord.

*sfz fp mf f mf fp mf p mf pp mf*

5:4

*p mf p mf p*

I II III

3'22" 3'26" 3'31"

50

ord. flz. ord. flz. ord. 5:4

*sfz* *p* *mf* *p* *fp* *pp* *mf* *p* *mf* *mf* *p*

*p* *mf* *p*



3'35"

3'39"

53

The image shows a musical score for a piece, likely a vocal and piano work. It consists of three staves. The top staff is a piano part, starting with a bass clef and a series of dots, followed by a 'Fade' box. The middle staff is a vocal line in treble clef, featuring a melodic line with various dynamics and performance instructions. The bottom staff is a piano accompaniment in bass clef, consisting of a series of chords. The score includes time markers '3'35"' and '3'39"', a measure number '53', and various musical notations such as dynamics (*mf*, *f*, *p*, *sfz*), articulation (*flz.*, *ord.*), and phrasing slurs.

*f*  
Fade

*mf* *f* *p* *sfz* *p* *sfz* *sfz* *sfz*

*flz.* *ord.* *flz.* *ord.* *flz.*

3'43" Cue 7  
 55  
 I  
 II  
 gliss.  
 3'47"  
 3'51" pitch 500, 600, -800  
 gs 400, 800, 1000  
 gd 3500, 2500, 4500  
 pbs 0.2, 0.4, 0.6  
 f  
 pitch 500, 600, -800  
 space 0.4

flz. ord.  
 flz. ord. flz. ord. flz. ord.  
 p mf sfz mf sfz sfz sfz fp mf p

gliss.  
 I  
 II  
 p

Detailed description: The score consists of three staves. The top staff is a bass clef with a glissando line from 3'43" to 3'47". The middle staff is a treble clef with a melodic line starting at 3'43" and ending at 3'55". The bottom staff is a bass clef with a glissando line from 3'47" to 3'51". The treble staff includes dynamics like p, mf, sfz, and fp, and articulations like flz. (flautando) and ord. (ordinando). The bass staff includes fingering I and II and a dynamic p.

3'59" 4'04" 4'08" 4'12" 4'16"

59

The score consists of three staves. The top staff is a graphic notation staff with a series of dots and lines, including a large 'f' and a 'Fade' box. The middle staff is a standard musical staff with notes, rests, and dynamic markings: *mf*, *f*, *p*, *sfz*, *fp*, *mf*, *p*, *sfz*, *sfz*, *sfz*, *mf*, *pp*. The bottom staff is a standard musical staff with a *gliss.* marking and a *p* dynamic marking.

I  
II *p*

4'20" Cue 8  
 64  
 4'24" molto s.t. (e)  
 4'28" molto s.p. gliss. (#) (e)  
 4'33" f

pbs 0.1, 1, 0.8  
 gs 120, 800, 100  
 gd 120, 800, 100  
 4'37"  
 pitch 500, 600, -800  
 space 0.2

ord. flz. ord. flz. ord. 5:4 ord. flz. ord.  
 f pp mf sfz p mf p fp pp mf p mf fp mf p

molto s.p. (e) molto s.t. (#) (e) molto s.p. (e)  
 gliss. gliss.

II ppp mp ppp

69 4'41" 4'45" 4'49" 4'53"

ord. flz. ord. flz. ord. flz. ord.

*p* *mf* *p* *mf* *mf* *p* *mf* *fp* *mf* *p*

*tr*

molto s.p. (*e*) *gliss.* molto s.t. (*e*) *gliss.* molto s.p. (*e*)

*ppp* *mp* *ppp*

II

4'57"  
Cue 9

5'02"

5'06"

5'10"  
pitch 20, -20, 40  
gs 90, 80, 100

norm

molto s.p.

73

III II I II

I

pbs 0.8, 0.9, 0.7

freq 8, 4, 2  
win 800, 400, 200  
phase 8, 4, 2  
fb 0.2, 0.4, 0.2  
(balance 0.2) space 0.2

*f*

ord. flz. ord. flz. ord. flz. ord.

*fp* *mf* *p* *mf* *p* *fp* *mf* *p* *fp* *mf* *p* *mf* *p*

III III I II

norm

molto s.p.

I

*mp*

*p*

*ppp*

5'14" 5'18" 5'22" 5'26" 5'31"

77

The score consists of two staves. The upper staff is in treble clef and contains a melodic line with various dynamics and articulations. The lower staff is in bass clef and contains a rhythmic accompaniment with specific fingering and dynamics.

**Upper Staff (Treble Clef):**

- Measures 1-3: *mf*  $\triangleright$  *p* *fp* *mf* *p*. Articulations: *ord.*, *flz.*, *ord.*
- Measures 4-6: *mf*  $\triangleright$  *p* *fp* *mf* *p*. Articulations: *flz.*, *ord.*
- Measures 7-9: *fp* *mf* *p*. Articulations: *ord.*, *flz.*, *ord.*

**Lower Staff (Bass Clef):**

- Measures 1-3: *mp*. Fingering: III III II
- Measures 4-6: *p*. Fingering: I
- Measures 7-9: *ppp*

**Effects and Performance Indications:**

- 5'14" - 5'18": Visual effects including a wavy line, a series of circles, and a dotted line.
- 5'22": *f* (forte) dynamic marking.
- 5'22" - 5'31": "Fade" box indicating a gradual decrease in volume.
- 5'26" - 5'31": "norm" (normal) and "molto s.p." (molto sostenuto) performance markings.

82

Cue 10

5'35" 5'39" 5'43" 5'47" 5'51"

pitch 10, -10, 20  
 gs 70, 60, 50  
 pbs 0.6, 0.7, 0.5

freq 8, 4, 2  
 win 800, 400, 200  
 phase 8, 4, 2  
 fb 0.2, 0.4, 0.2  
 (balance 0.3)

space 0.1

ord. ord. flz. ord.

*mf* *f* *p* *ff* *p* *mf* *f* *p*

norm

*mp* *gliss.* *gliss.* *mf* *ff* *mp*

*f* *f*

Fade

Detailed description of the musical score: The score is for page 18 and consists of three staves. The top staff is a bass clef staff starting at measure 82. It contains a sequence of notes with glissando markings and dynamic markings of *f*. A large black downward-pointing triangle is positioned above the staff between 5'39" and 5'43". The middle staff is a treble clef staff with notes and rests, marked with dynamics *mf*, *f*, *p*, *ff*, *p*, *mf*, *f*, and *p*. Above this staff are performance instructions: 'ord.', 'ord.', 'flz.', and 'ord.'. A large black downward-pointing triangle is positioned below the staff between 5'39" and 5'43". The bottom staff is a bass clef staff with notes and rests, marked with dynamics *mp*, *gliss.*, *gliss.*, *mf*, *ff*, and *mp*. The word 'norm' is written above the first measure. A large black downward-pointing triangle is positioned above the staff between 5'39" and 5'43". On the right side of the page, there are several technical diagrams: a wavy line with an arrow, a series of overlapping circles, a box labeled 'Fade', a series of horizontal lines with dots, and a diagram with two circles and a rectangle. Time markers are placed at 5'35", 5'39", 5'43", 5'47", and 5'51".



5'55" Cue 11

87 jete con legno battuto

5'59"

6'04" gs 15, 27, 10

6'08"

pbs0.01, 0.05, 0.02

freq 2, 4, 2  
win 800, 400, 200  
phase 2, 4, 2  
fb 0.2, 0.2, 0.2  
(balance 0.6)

ord. flz. ord.

*p* *ff* *p* *mf* *f* *fp*

jete con legno battuto

5:4

*sfz* *pp*

sim sempre

5:4

*sfz* *sfz*

6'12"

6'16"

6'20"

6'24"

6'28"

6'33"

91

A bass clef staff with a long horizontal line extending across the page. A dynamic marking *f* is placed above the line. A box labeled "Fade" is positioned below the line.

*f*

Fade

A series of scattered circles and dots of varying sizes, arranged in a roughly horizontal line across the page.

flz. ord.

flz. ord.

A musical staff with notes and rests. The notes are mostly half notes and quarter notes, with some rests. The staff is divided into measures by vertical bar lines.

*ff* *p*

*mf* *f* *fp*

*ff* *p*

5:4

5:4

A bass clef staff with notes and rests. The notes are mostly quarter notes and eighth notes, with some rests. The staff is divided into measures by vertical bar lines.

*sfz*

*sfz*

6'37" Cue 12 6'41" 6'45" pbs 0.2, 0.1, 0.05  
 6'49" gs 2, 4, 6 6'53" 6'57" 7'02" 7'06" 7'10" 7'14"

97

freq 8, 9, 10  
 win 800, 900, 1000  
 phase 8, 9, 10  
 fb 0.1, 0.1, 0.1  
 (balance 1)

*f* Fade

ord. flz. ord. ord. flz. ord. ord. flz. ord. ord. flz. ord.

*p* < *ff* > *p* *p* < *ff* > *p* *p* < *ff* > *p* *p* < *ff* > *p*

*p* *ff* *p* *p* *ff* *p* 7'18"