

# MULTIPLICATIONS N.1 by YUVAL AVITAL

for saxophone alto & its multiplications\*;  
viola & its multiplications\*;  
percussions & its multiplications\*;  
analogue synthesiser & its multiplications\*.

\*-Multiplications through live mixing or video or additional performers at will.



World premiere:

Tempo Reale Ensemble,

Tempo Reale Festival, 10 October 2015, Florence, Italy

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"Chaos theory, in mechanics and mathematics, the study of apparently random or unpredictable behaviour in systems governed by deterministic laws. A more accurate term, "deterministic chaos," suggests a paradox because it connects two notions that are familiar and commonly regarded as incompatible. The first is that of randomness or unpredictability, as in the trajectory of a molecule in a gas or in the voting choice of a particular individual from out of a population. In conventional analyses, randomness was considered more apparent than real, arising from ignorance of the many causes at work. In other words, it was commonly believed that the world is unpredictable because it is complicated. The second notion is that of deterministic motion, as that of a pendulum or a planet, which has been accepted since the time of Isaac Newton as exemplifying the success of science in rendering predictable that which is initially complex.

In recent decades, however, a diversity of systems have been studied that behave unpredictably despite their seeming simplicity and the fact that the forces involved are governed by well-understood physical laws. The common element in these systems is a very high degree of sensitivity to initial conditions and to the way in which they are set in motion. For example, the meteorologist Edward Lorenz discovered that a simple model of heat convection possesses intrinsic unpredictability, a circumstance he called the "butterfly effect," suggesting that the mere flapping of a butterfly's wing can change the weather. A more homely example is the pinball machine: the ball's movements are precisely governed by laws of gravitational rolling and elastic collisions—both fully understood—yet the final outcome is unpredictable." (**Encyclopaedia Britannica**)

"Feynman's idea of a sum over histories is that a system evolves by every path of history. This can be demonstrated by directing a stream of particles at a sheet with two slits in it. The number of particles arriving at a subsequent screen will form fringes, as if they were light rays. The interpretation is that each particle has two alternative histories, one going through one slit, and the other through the other slit, and they interfere like light rays." (**Stephen Hawking, The Wired mMagazine, Interview**)

"a film, I always say, can stay the same, but depending on the audience, the viewers, all the screenings are a little bit different, and people are coming up with their own interpretations which are completely valid. (**David Lynch, Foundation Television**).

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DURATION 21 minutes or more.

Commissioned by TEMPO REALE

Premiere TEMPO REALE FESTIVAL, October 10 2015, Florence, Italy.



# PERCUSSIONS

Percussion

1

2

3

4

5

6

7

8

9

10

11

12

13

14

15

16

17

18

19

20

21

(1) - tam tam (2) tam tam scratch short(3) tam tam scratch long (4) police whistle (5) bass drum (6) bass drum scratch (7) bass drum on edge (8) snare drum (9) snare drum ghost notes (10) snare drum rim shot (11) low tom tom (12) low mid tom (13) low bongas (14) high bongas (15) ride cymbal (16) an instrument of your choice - YES - choose and additional percussion - could be another cymbal or a piece of junk. (17) china cymbal large (18) shaker (19) low woodblock (20) high woodblock (21) typing machine (amplified with contact mic).

\*additional - metal sheet (indicated verbally).

## MALLETS:

♩

♩

♩

♩

♩

♩

♩

♩

♩

♩

1

2

3

4

5

6

7

8

9

10

(1) - soft (2) mid-soft (3) hard (4) superball (5) tam tam (6) brushes (7) triangle mallet (8) coins (9) with hand (10) drum sticks

♩ irreg.

irregular tremolo

♩ scrtch

scratch sounds (with superball or other mallets)

# ANALOGUE SYNTH(S)

monophonic, with oscillator/s of various wave types, noise generator/s & filters.  
 More than one synth can be used - a sequencer could be great as a second synth.  
 Please don't use digital simulators of analogue synths.



Analogue synthesizer 1

1

2

3

4

5

6

7

(1) - extra low register [50 Hz-25 Hz.]  
 (2-5) wave types: (2) - sinusoidal (3) square (4) triangular (5) noise  
 (6) relative height  
 (7) very high register (relative and depending on the general context, but could be also 9 KHz.-15 Khz).

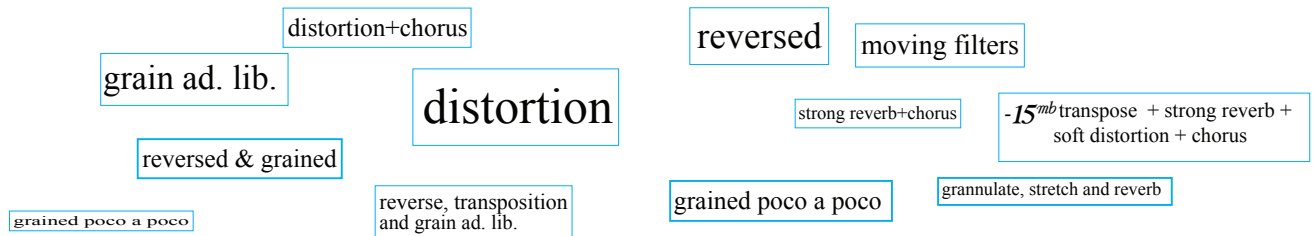
\* notation usually has also a frequency range indicator.

# LIVE ELECTRONICS (EFFECTS)

The piece should be amplified and have a general small reverb to all instruments (20%-30%, 1.5 sec. - 2.5 sec.).

During the piece some additional simple effects are asked (marked with light blue boxes).

The interpretation of these effects are at the hands of the performers - from pedals to patches, all is good for me.



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## LIVE MIXING

The Live mixer is a super conductor in this piece. He or she controls constantly the dynamics of the multiplicationed parts - either with gesture (in case of an entirely live performance), through a mixer or computer.

Whenever a saxophone, viola, percussions or synth multi tutti clef is used (meaning all the 6 multiplications need to perform the section), the live mixer chooses a great deal about what will be heard - he or she can take voices out and in, and by this create the meta-interpretation of each performance.

In H section in a certain point all parts play patterns and loops, and there the live mixer becomes almost a DJ.





Before you read the music, read the score.

What is the story behind the score ? (each musician and each multiplication can have different opinion about it) who are the characters, and which one is you? (each musician and each multiplication can have different opinion about it). Study your part/s well. Study the visual episodes even better. Try to find their sounds (each musician and each multiplication can have different opinion about it). When recording/filming/rehearsing - try to separate each multiplication from the others, in term of character, temper, behaviour, gesture. Try to understand the visual components, and how do they fit into the equation represented in the score.



When live mixing (audio/VJ/conductor) - search for a collective balance which becomes a sonic interpretation of the meaning of the score, in which you are a meta-observer, a marionette operator, a narrator, a mystery man.



Y.A.  September 2015



# Multiplications N.1

for saxophone alto & it's multiplications\*; viola & it's multiplications\*;  
percussions & it's multiplications\*;  
analogue synthesiser & it's multiplications\*.

\*-Multiplications through live mixing or video or additional performers at will.

Timeline

10" 5" 10" ♩ = 48 (♩ = 5") 10" a tempo ♩ = 48 (♩ = 5") 01:00"

Alto Sax 1

Alto Sax multiplication 2

Alto Sax multiplication 3

Viola I

Viola all multiplications

Viola multiplication II

Viola multiplication III

Percussion I

Analogue synthesizer I

Analogue synthesizer all multiplication

strong reverb+chorus

H.1 H.67 H.69 H.16 H.13 H.104

ppp mp > 0 mp mp mf > p-ppp sfz 0 mf

vento ad. lib.

ppp-p

ppp-p

breath slowly

distortion

pluck

6

mp

0

reversed

reversed

grained poco a poco

pp

pp

ppp-p

irreg.

L.V.

mf mp

p

moving filters

p mf

f pp

a little out of time,  
+ octaves transpositions  
(instrumental or electronic)

grain ad. lib.

respiro + Flz. + grawl ad. lib.

pp-f

reverse, transposition  
and grain ad. lib.

breath slowly

mp

respiro + Flz. + grawl

mp

Via. I

Via. Mlt. Tutti

scrtch.

Perc. I

pp-f

high morse

Synth I

ppp-p

"winds"

Synth. mlt. Tutti

B

Time

10

10

A. Sx. I

A. Sx. Mlt. Tutti

A. Sx. mlt. 3

Via. I

Via. Mlt. Tutti

Perc. I

Synth I

Synth. mlt. Tutti

grain ad. lib.

respiro + Flz. + grawl ad. lib.

pp-f

reverse, transposition  
and grain ad. lib.

breath slowly

mp

respiro + Flz. + grawl

mp

Via. I

Via. Mlt. Tutti

scrtch.

Perc. I

pp-f

high morse

Synth I

ppp-p

"winds"

Synth. mlt. Tutti

01:00"

02:00"



**C** 15" a tempo ♩ = 48 (♩ = 5") 02:20" 02:30" 02:40"

**Time**

**A. Sx. I**  
 strong reverb  
 pp → mp > 0  
 mf ff  
 S. mp  
 fp  
 f  
 Var. ▲ / norm. ...  
 mp ↔ sfz

**A. Sx. Mlt. Tutti**  
 vento ad. lib.  
 ppp-p

**Vla. I**  
 8va  
 sfz f  
 sfz  
 distortion pluck  
 mp  
 mf ff  
 f marcato  
 sim.

**Vla. Mlt. Tutti**  
 CHORAL: when individual parts are signed, play them and then return to the choral notes  
 -15<sup>th</sup> transpose + strong reverb + soft distortion + chorus  
 pp-mp

**Vla. mlt. II**  
 distortion  
 col legno batt.  
 jete irregolare, ad. lib.  
 ppp ↔ mp  
 sfz

**Vla. mlt. III**  
 freezed  
 mp

**Vla. mlt. IV**  
 distortion  
 col legno batt.  
 jete irregolare, ad. lib.  
 ppp ↔ mp

**Vla. mlt. V**  
 a little out of time, octaves transpositions (instrumental or electronic)  
 sfz

**Vla. mlt. VI**  
 distortion  
 col legno batt.  
 jete irregolare, ad. lib.  
 ppp ↔ mp

**Vla. mlt. VII**  
 distortion  
 jete irregolare, ad. lib.  
 ppp ↔ mp

**Perc. I**  
 irreg.  
 ff  
 mp  
 ff  
 mf  
 ff  
 mf  
 f  
 mf

**Synth I**  
 super low 30Hz - 50Hz; insert sometimes "barks" noise

**Synth. mlt. Tutti**  
 f → pp

**Synth. mlt. 3**  
 accel. gliss 75 Hz. till 3500 Hz. +

**Synth. mlt. 7**  
 high morse  
 ppp-p

continue previous formula using open III string and given notes (also 1 oct. higher)

strong reverb+chorus enter & disappear freely

mf-ff-0

super low 30Hz - 50Hz; insert sometimes "barks" noise





Time

21 03:10" 20" 3" 17"

A. Sx. 1

A. Sx. Mlt. Tutti

respiro + Flz. (&) grawl ad. lib.

A. Sx.mlt. 2

A. Sx.mlt. 3

A. Sx.mlt. 4

A. Sx.mlt. 5

A. Sx.mlt. 7

continue previous formula using open III string and given notes (also 1 oct. higher)

Vla. I

Vla. Mlt. Tutti

a little out of time, octaves transpositions (instrumental or electronic)

Vla.mlt. II

distortion

Vla.mlt. III

REFLECT VxI.

Vla.mlt. IV

Vla.mlt. V

Vla.mlt. VI

Vla.mlt. VII

Perc. I

velocissimo ad. lib.

Perc. Mlt. Tutti

Synth I

104Hz - 207 Hz.

bursts, unexpected, quick

Synth.mlt. Tutti

Synth.mlt. 3

STOP

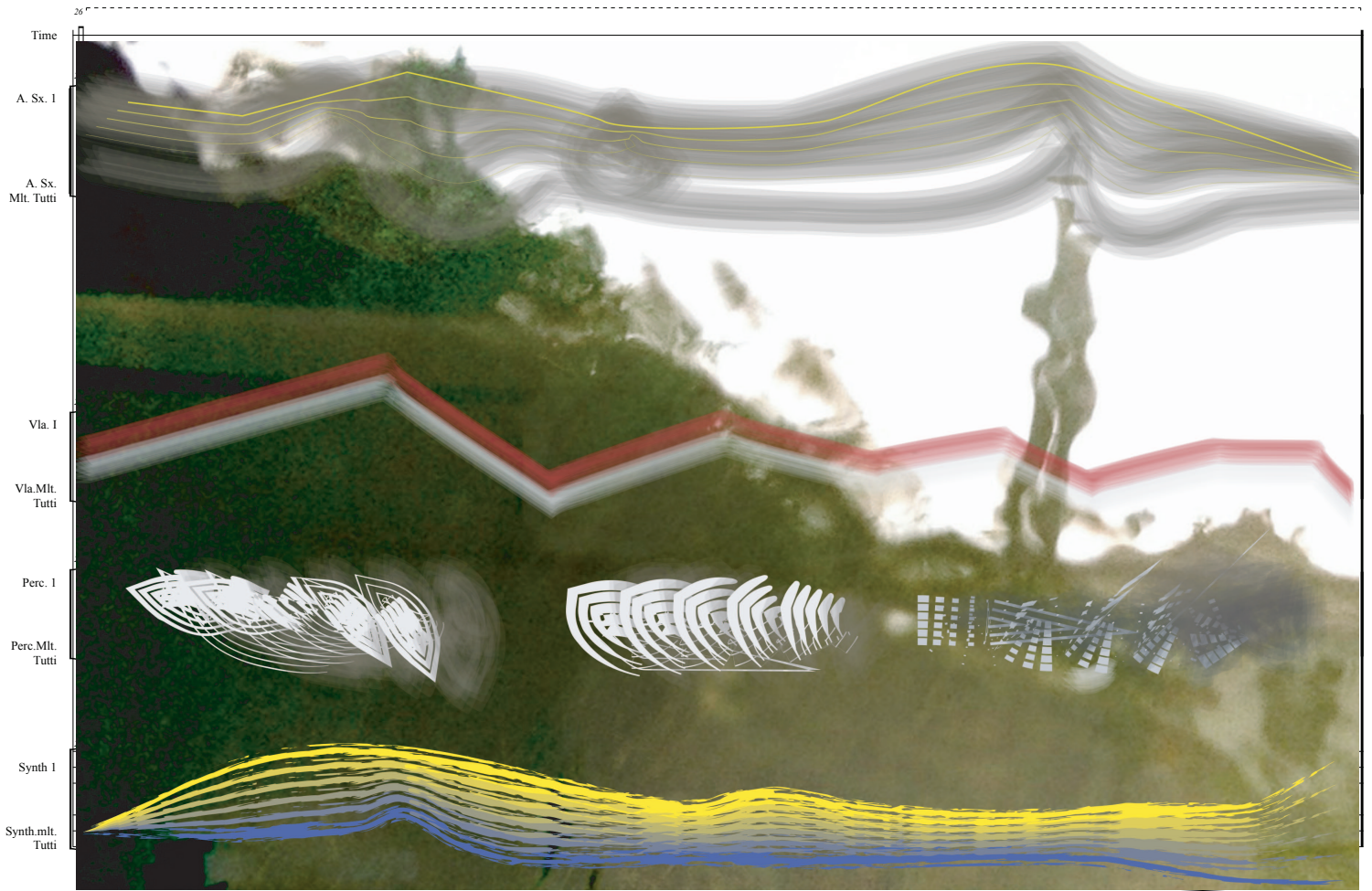
super low 30Hz - 50Hz.; insert sometimes harmonics gliss.

D

drones & overtones, low continuum & high bips, thin & full, impersonal

03:50"

03:10"



E

07:00"

a tempo  $\text{♩} = 48$  ( $\text{♩} = 5''$ )

are the basic mallets. use additional mallets as you wish.

Perc. 1

$p < ff$

$p < ff$

$f$

$fp < ff$

$mp$

$mp$

$f$

$fp < ff$

08:40" .ca