

# **DIESIS**

for double-bass and electronics





Commissioned by the London Sinfonietta as part of Writing the Future,  
which is generously supported by The Boltini Trust, The John S Cohen Foundation,  
Anthony Mackintosh and Michael & Patricia McLaren-Turner.

Premiered by Enno Senft, Kings Place, London 21<sup>st</sup> October, 2011



### **Programme note**

This work is an exploration of microtonal commas (a minute interval) of which a diesis, a diminished second, gives this piece its title. Historically when tuning a scale, rather than divide an octave into equal parts (as used today with equal temperament) early tuning systems would tune notes using a sequence of pure intervals, which are slightly different in size to the equal tempered intervals we use today. These discreet differences in pitch would result with an undesirable and perceptually dissonant imperfect octave, the interval of this imperfection being a comma. *Diesis* is therefore a response to the dissonant qualities that made a comma undesirable: namely its complex timbre and pulsing beating tones.

## Notes to the performer

### Percussive sections and dynamics

The opening percussive section is unbarred, with a tempo marking as a guide, and should be realized with a degree of approximation. The tempo throughout should have a discreet feel of fluctuation, as marked. The opening section (A) should start somewhat cautiously and gradually gain momentum and confidence, however at no point should it appear steady. The second percussive section (C) is principally a constant pulse that fluctuates in tempo (through *accelerando* and *rallentando*) this sections should have a distinct sense of forward momentum. Every care should be made to realize the dynamic shape, timbre and tempo direction.

The percussive sections (parts A & C) should use the following playing techniques as a guide

### Note heads and feathered beams



Fig. 1, strike using the finger tip or pad, and finger joint when accented, care should be made not to use the fingernail.

Fig. 2, strike using the knuckle

Fig. 3, strike/slap with the palm of the hand

Fig. 4, strike the strings (un-pitched), where no articulation mark is present every effort should be made to avoid slapping the string against the fingerboard. Though un-pitch, it is advised for best effect that the strikes are focused on the lower two strings (E & A).

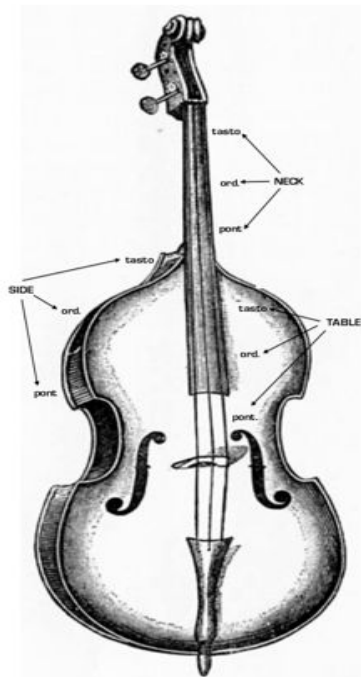
Fig. 5, *rallentando* quaver into semiquaver pulse (start as a quavers gradually speeding up into semi-quavers and onto a tremolo)

Fig. 6, *accelerando* semi-quavers (starts as a tremolo, gradually slows to semi-quavers and then quavers)

Fig. 7, crossed note head (during arco sections) signals playing the given pitch but position the bow on the wood of the bridge, the example here should shift between this and an ordinary bow position.

**N.B.** where a tenuto marking appears strike and hold, + symbolizes mute/stop resonance, Z on a stem denotes tremolo

### Example 2



### Staff notation and areas to strike

All percussive material is to be played on the neck, upper-bout and c-bout areas. In the opening section (A) upward stems are to be played with the left hand and downward using the right hand. The second percussive section (C) is to be realized as directed and *ad libitum* by the performer. The three-line staff symbolizes areas of the instrument to strike, the top line for the neck, the middle line for the shoulder sides (from the neck to the top of the violin corners), lower line for the table/belly (from the edge to the area immediately above the bridge) and the strings when all lines are marked with a slashed note head. Each area is then divided into three discreet areas; *sul tasto* (*tasto*) – the third furthest from the bridge; *ordinary* (*ord.*) the third in the midway from the bridge and *sul ponticello* (*pont.*) the third nearest the bridge. Please see the diagram (example 2, left) for further information.

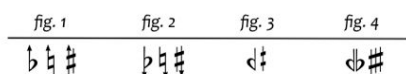
### Dynamics

*ppp* – *pp* = use one digit.

*mp* – *mf* = use two digits.

*f* – *fff* = use multiple digits.

## Accidentals



- Fig. 1, discreetly higher in pitch (by an eighth tone) – circa 25 cents sharp  
 Fig. 2, discreetly flattened lower in pitch (by an eighth tone) – circa 25 cents lower  
 Fig. 3, quartertone higher in pitch – 50 cents higher  
 Fig. 4, quartertone lower in pitch – 50 cents lower

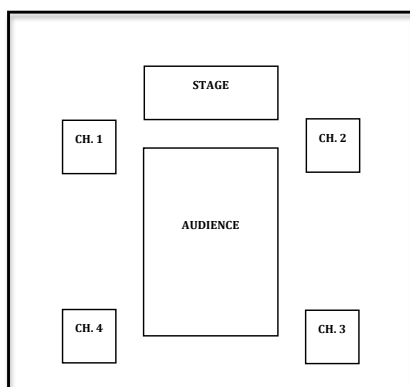
## Arco Sections

All arco sections are at pitch (*suono reale*). In section B each measure equates to 5 seconds. The player must hold each note for the duration given and gradually glissando between the given pitches.

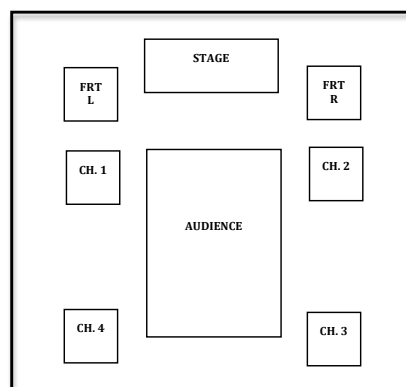
## Electronics and Amplification

This work requires amplification and either a quadraphonic speaker setup or quadraphonic with additional stereo speaker setup (see suggested setup below). Furthermore the work should be performed with a subwoofer, placed wherever best suits the venue. The work requires a MAX/MSP patch – available from the composer direct (duncanm@cleod.org).

Quadraphonic setup



Quadraphonic with stereo setup



## Notation

The 2 line staff provides directions for real-time processing of the live double bass (found on the upper line) and cues for the pre-recorded tape part, with additional real-time processing (on the lower line).

### Live part – general overview

Amplification of the live instrument is used throughout utilizing either a contact/air microphone or pickup, the output of which will have varying degrees of amplitude and reverb applied, with additional Q filters applied and ring modulator in certain sections. A ‘tape’ delay is used in sections A & D. Material captured from section A & D is played back and looped through the same sections, gradually panned around the quadraphonic channels in a cyclic motion. Section C utilizes a granulation delay and D utilizes live pitch shifting (15vb and 23vb) with spectral filter (the delay material from A and B gradually decay during the first half of this section). The precise points to apply these effects are given in the score with the settings provided below;

Live part Q Filter Settings 1, 2 & 3

Q point	1	2	3	4	5	6	7	8
Frequency	62Hz	104Hz	225Hz	365Hz	580Hz	4650Hz	3150 Hz	12.8Khz
Amplitude	+12db	+12db	+12db	+12db	+11db	+11db	+9db	+9db

Q point	1	2	3	4	5	6	7	8
Frequency	33Hz	72Hz	105Hz	312Hz	572Hz	1250Hz	2.28KHz	4.19KHz
Amplitude	+15db	+15db	+15db	+15db	+15db	+15db	+15db	+15db

Q point	1	2	3	4	5	6	7	8
Frequency	58Hz	116Hz	232Hz	464Hz	948Hz	1.9KHz	3.79KHz	7.58KHz
Amplitude	+15db	+15db	+15db	+15db	+15db	+15db	+15db	+15db

Delay times



Delay	1	2	3	4	5	6
Time	20"	40"	10"	20"	20"	40"

Live part Reverb setting to be applied throughout

Decay Time	Dry to wet ratio	Output
Circa 5"	40%	0 db

Delay 1 & 2 reverb setting (section A)

Decay Time	Dry to wet ratio	Output
Circa 5"	60%	0 db

Delay 5 & 6 reverb setting (section D)

Decay Time	Dry to wet ratio	Output
Circa 2"	80%	-15 db

Live part Ring modulator setting

Mod. Freq.	Dry to wet ratio	Output
1.36KHz	70%	0 db

**Tape part – general overview**

In addition to the live electronic processing of the double bass there are several quadraphonic tracks that need to be cued throughout the work, the precise points are provided in the score. There are some additional real-time fading and filtering that needs to be applied, the precise point is provided in the score. The filter settings are as follows;

Tape part Q Filter Settings 4, 5 & 6

Q point	1	2	3	4	5	6	7	8
Frequency	33Hz	72Hz	144Hz	295Hz	620Hz	1280Hz	2.3KHz	4.6KHz
Amplitude	+24db	+24db	+24db	+24db	+24db	+18db	+12db	+12db

Q point	1	2	3	4	5	6	7	8
Frequency	37Hz	92Hz	146Hz	330Hz	740Hz	1320Hz	2350Hz	5.9KHz
Amplitude	+24db	+24db	+24db	+24db	+24db	+24db	+24db	+24db

Q point	1	2	3	4	5	6	7	8
Frequency	62Hz	104Hz	225Hz	365Hz	580Hz	4650Hz	3150 Hz	12.8KHz
Amplitude	+12db	+12db	+12db	+12db	+12db	+12db	+12db	+12db



# DIESIS

**SECTION A**

**PRELUDE**  $\text{♩} = c. 72$  *portato & unsteady*

*c. 30" pont.* *\* Reverb*

*pp* *p* *pp*

*pont. -----> ord.* *pont. -----> pont.*

**rall.**  $\text{♩} = c. 54$

*5"*

Cue Throb 1

$\text{♩} = c. 72$  *laboured* **poco accel.**

*pont.* *ord.* *3* *tasto.* *(tasto.) -----> pont.*  $\text{♩} = c. 72$  **rall.** *2"*

*p* *mp* *p* *mp* *p*

*pont. -----> ord.* *tasto ord.* *(ord.) -----> tasto*

start delay 1 & 2 capture

**accel.**  $\text{♩} = c. 84$  **rall.**  $\text{♩} = c. 72$  **accel.**

*poco legato* *tasto* *pont.* *(pont.) -----> tasto* *m. tasto* *m. tasto* *(m. tasto) -----> pont.*

*mp* *mf* *mp* *mf* *mp*

*tasto* *tasto -----> ord.* *tasto* *(tasto) -----> ord.*

Cue Throb 2

*with unsteady forward motion*  $\text{♩} = c. 84$  **poco rall.** *(ord.) -----> pont.*

*mf* *mp* *mf* *mp* *f* *mp*

*tasto* *(tasto) -----> ord.* *tasto -----> ord.* *(ord.) -----> tasto* *(tasto)* *(tasto) -----> ord.*

Delay 1 playback + Reverb, fade in gradually to c. -10db

**accel.**  $\text{♩} = c. 90$  **rall.**  $\text{♩} = c. 72$  **accel.** 2

ord. pont. tasto ord. tasto ord. m. tasto ord.

L.H. R.H.

*mf* *mp* *p*

ord. tasto (tasto) pont. m. tasto (tasto)

Delay 2 playback + Reverb, gradually fade in to c. -10db

$\text{♩} = c. 90$  **poco rall.** **accel.**  $\text{♩} = c. 96$

pont. tasto ord.

L.H. R.H.

*mp* *mf* *f* *mf*

ord. pont. ord. tasto

Gradually apply Q filter to delay 1 c. +12db

**poco rit.** **accel.**  $\text{♩} = c. 96$  **rit.**  $\text{♩} = c. 84$  **accel.**

pont. (pont.) ord. tasto pont. ord.

L.H. R.H.

*sfz mp* *f* *mf* *ff*

pont. tasto ord.

**SECTION B**

$\text{♩} = c. 96$  **rit.**  $\text{♩} = c. 72$  **Arco** **Suono Reale**

ord. tasto ord. molto pont. ord.

L.H. R.H.

*mp* *fffz* *sf* *mp* *mf* *mp*

ord. pont. Pick up bow Start delay 3 & 4 capture Cue delay 3 playback fade in to c. 0db Cue delay 4 playback fade in to c. -8db

Delays 1, 2 & QF 1 fade to silence Cue Throb 3 Cue Bb drones fade in to c. -15db

20" 25" 30" 35" 40" 45" 50" 55" 1'00" c. 5"

Db. *f* *mf* *mp* *f* *mf* *mp* put down bow

Cue taps, fade in to c. -18db Apply Q filter 4 to taps, fade in to -5db over 40" Cue Throb 4

SECTION C

♩ = c.144 awkwardly, but with forward momentum

tasto (tasto) -----> ord. (ord.) ----->

(o + d) (o)

*mf* *rall.* *f* *accel.* *mf*



---> *tasto* *tasto* -----> *ord.*

(sc)

*mp* *rall.* *mf* *f*

Q filter 2 fade in to c. odb



ord. -----> *tasto*

(sc) *accel.*

(tasto table)

*mf* *f* *mf*

Apply Q filter 5 to taps, fade in to c. -5db over 25"



*tasto* *tasto* -----> *ord.* *ad. lib. ord/tasto*

(o + d) *rall.* *3* *3*

*mp* *mf* *f* *mf*

Fade in granulation delay to c. odb

Q filter 3 fade in to c. odb, QF 2 continues



(ord.) -----> *tasto*

(o) *accel.* *3*

*f* *mf* *mp*

molto tasto -----> ord. ad. lib. ord/tasto

*mf* *f* *mf sfz*

*rall.*

*f* *mf* *f* *mf* *accel.* *rit.*

3 (♩) (♩ + ♩)

Ring mod. fade in to c. odb, QF 2 & 3 continues

tasto -----> ord. -----> tasto -----> ord.

*f* *mf* *f* *mf* *accel.* *f*

3 (♩ + ♩)

table ad. lib.

(ord.) -----> tasto ad. lib. tasto/pont.

*f* *ff* *f*

*rit.* 3 3 (♩)

rit. -----> (ord.) -----> pont. (♩ = c.54) ♩ = c.72

SECTION D

Arco Suono reale

*ff* *mf*

QF 2, 3 & Ring mod. OFF

Apply Q filter 6 to taps, fade in to c. odb over 20"

Bb drone gradually fade out to c. -22db over 55"

Cue Throb 5

Taps fade to c. -35db over 1' 30" QF 4 & 5 fade out completely over 30"

5

Db.

*mf* *mf* *mf*

Gradually fade out granulation delay over 20"

15vb pitch shifter, fade in to c. odb

Db.

$\text{♩} = \text{c. } 54$

*f* *f* *mf* *mp* *mf* *mp*

23vb pitch shifter fade in to c. odb, 15vb continues

Spectral hold filter fade in to c. odb, 15vb & 23vb continue

Bb drone gradually fade to silence over 2'

Db.

*mf* *f* *mf* *f* *mf* *mp* *mf* *mp*

Delay 5 & 6 start capture

Delay 5 playback + Reverb, fade in to c. -15db

Db.

*mp* *f* *mf* *f* *mf*

Delay 6 playback + Reverb, fade in to c. -15db

Taps gradually fade to silence over 1'

Db.

*mp* *p*

Bb Drone & Taps, fade out to silence 1st time through  
Delay playback 5 & 6 fade out to silence 2nd time through

Mute Throb 5  
No fade out