

# *Two Systems*

for Tenor Trombone and electronics

Liam Carey

Instrumentation: Tenor Trombone and Electronics

Duration: 5 minutes

Note on the electronics:

This piece requires one microphone, a computer running Max 6 (or later) and stereo speakers. The trombone should be miked and the signal run through the Max patch. Only the electronic output from the Max patch is to be played out, no 'dry' mix is required.

The Max patch is an FM synth with four carrier oscillators fixed at the frequencies 110Hz, 220Hz, 330Hz and 440Hz. The frequency of the modulator oscillators and the modulation index is taken from a live reading of the trombone signal using pitch and volume tracking software. The volume reading is taken continuously and is also used to control the output level of the electronics, so as the Trombone plays louder so the electronics will also increase in volume. The overall balance of the two should be pretty much equal. The pitch reading, however, is not taken continuously but is instead taken at specific points through out the piece. These points have been notated in the score on a single line below the Trombone part and need to be triggered by a separate person.

Also, as the purpose of the microphone is to provide a reading from the Trombone, bleed from the electronics should be avoided as much as possible, i.e. by using a highly directional microphone.

Note for the Trombone player on intonation:

This piece deliberately uses contrasts between the 12 note equally tempered scale commonly used in Western music and the natural harmonic series. The sections marked "E.T." on the score should be played, as much as possible, in very even equal temperament. The sections marked "Harmonics in II" should be played as natural overtones all in this position and should sound, as much as possible, in their natural intonation, for example the 7th harmonic G in bar 24 should be noticeably flat of an equally tempered G. In these sections all the pitches are labeled with their position in the harmonic series, i.e. 5oe, 6oe, 7oe, etc. (the one exception here are the D quarter sharps in bars 23, 66 and 69, which are derived from the 11th harmonic but have been brought down an octave. This can be pitched as an equally tempered quarter tone and will still be 'harmonically' accurate.)

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♩=75 Calm, lyrical, with some rubato

Tbn. E.T.

*p poco espress* *mp* *p*

Tbn. 4

*poco accel.* *mp* *p*

Tbn. 7

*Piu mosso* *rall.* *A tempo*  
*mf* *f* *p*

Tbn. 10

♩=60 Long steady, but growing in intensity  
*ppp* *fff* *ppp*

Elec. 6/4

Tbn. 14

*ppp* *fff = ppp* *ppp*

Elec.

Tbn. 19


*fff = ppp* *ppp* *fff = ppp*

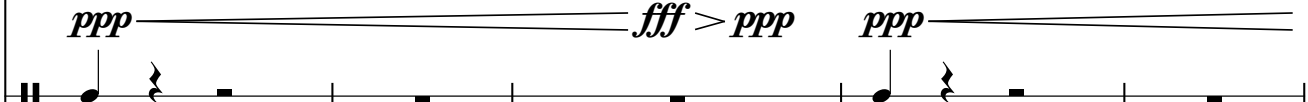
Elec.

Harmonics in II:

7oe


23


Tbn. 

Elec. 

*ppp* *fff* *ppp* *ppp*

28 5oe 6oe


Tbn. 


Elec. 

*fff* *mf* *ppp* *fff*

$\text{♩} = 80$  With more urgency, becoming more dramatic


33 E.T.


Tbn. 

Elec. 

*f*


36

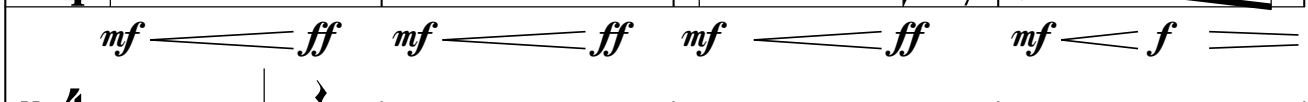
Tbn. 

Elec. 

*f*

39

Tbn. 

Elec. 

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

43

Tbn. 

Elec. 

*mf* *fff* *mf* *f* *mf* *fff* *ff*

47

Tbn. *f* *ff* *mp* *ff* *mf* *ff* *mf* *ff*

Elec.

51 **Poco allargando** **Meno mosso - suddenly more withdrawn**

Tbn. *mp* *mf* *mp* *f*

Elec.

55

Tbn. *mp* *mf* *mp* *f* *mf*

Elec.

59 **rall.** **♩=60 Broad, maestoso**

Tbn. *ff*

Elec.

63 **Harmonics in II:** **♩=50 Morendo**

8oe 7oe 8oe 7oe 5oe (except this one)

Tbn. *mf*

Elec.

67 **rall.**

6oe 8oe 7oe 5oe 7oe 5oe 9oe

Tbn. *mp* *p* *pp*

$\text{♩} = 68$  Calm and lyrical again

71 E.T.

Tbn.



*p*

74

Tbn.



77

Tbn.

