

# **Music for Tuba & Computer**

**by Cort Lippe**

**2008**

**Written for Melvyn Poore**

**Commissioned by the ZKM | Zentrum für Kunst und Medientechnologie, Karlsruhe, Germany,  
and realized in the studios of the ZKM Institut für Musik und Akustik.**

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## Performance notes

- ◇ Sung notes. Sing into the tuba, while playing. If the specified pitch is too high or too low for the voice, use the octave transposition most comfortable, and which produces the most "beating" between the tuba pitch and voice.

Intonation on extremely low pedal tones may be somewhat approximate and pitch may drift slightly during notes



Electronic event cues. There are two sections in the piece.  
Section 1 has 26 events, and Section 2 has 22 events

(Since during Event 2 and Event 6 of Section 1, a live recording is made of the tuba, it is necessary during rehearsal of Section 1 to execute Events 2 and 6. After the recordings are made, events can be skipped to rehearse later events in the section. The recordings are no longer needed from Event 26 of Section 1.)

Sections can be rehearsed separately, and in any order.

Events are triggered by the computer operator.

The tuba should be amplified with cardioid or hyper-cardioid microphones.

A reverb unit can be used in conjunction with amplification.

A mono mix of the unreverberated amplified tuba signal should be sent via a pre-fader aux send to the computer input

The computer, running the software in Max/MSP should be output as a stereo mix.

See the Max/MSP computer patch for further instructions.

## Cort Lippe

### Program Notes

**Music for Tuba and Computer** (2008) was commissioned by the ZKM (Zentrum für Kunst und Medientechnologie), Karlsruhe, Germany, realized in the studios of the ZKM Institut für Musik und Akustik, and premiered in the Cubus performance space at ZKM in 2009. The piece was written for and dedicated to the tuba virtuoso Melvyn Poore, whose encouragement, patience, and musicality were “instrumental” in making this piece happen.

The electronic part was created using the software *Max*, originally developed by Miller Puckette, whose scientific support made this piece possible. The computer tracks parameters of the tuba during performance, such as pitch, amplitude, spectrum, density, rests, and articulation, and uses this information to continuously influence and manipulate the computer sound output by directly affecting digital synthesis and compositional algorithms in real-time. Thus, while interacting with the computer system, the performer shapes all of the computer output. The intent is to create a level of interactivity between the performer and the computer in which the performer influences the computer output based on aspects of the musical expressivity of his/her interpretation of the score. Much like chamber music playing, in which individual expressivity has a fundamental influence on the entire ensemble; the feedback loop between performer and computer hopefully has a positive influence on the final musical result.

Standard signal processing such as sampling, harmonizing, frequency shifting, phasing, spatialization, and reverb are employed. Less standard, frequency domain spectral processing of individual FFT channels is also explored, including spectral filtering, delay/feedback, spectral spatialization, timbral snapshots, cross-synthesis, noise reduction/enhancement, and component reordering. In addition, phase aligned format synthesis, significant use of analysis/resynthesis via oscillator banks, and FFT-based control of oscillator amplitudes is exploited.

Formally, the piece is in two sections, and the instrument/computer relationship moves on a continuum between the poles of an extended solo and a duo. Musically, the computer part is sometimes inseparable from the tuba part, but serves rather to amplify the tuba in multiple dimensions and directions; while at the other extreme of the continuum, the computer part also has its own independent musical voice.

**Music for Tuba and Computer** is recorded by Melvyn Poore on the Wergo Label CD entitled *Death Be Not Proud*. Duration: 16 minutes.

# Music for Tuba and Computer

Cort Lippe 2008

## Section 1

*emphasize breathy attacks*

**1** *c. 3"* *c. 4" - 6"* *poco* *poco*  
25" *simile...* *simile...*

**2** *stop breathy attacks*

10" *c. 4" - 6"* *simile...*

**3** *(poco a poco longer durations c. 6" - 8")*

10" *mp* *pp* *mp*

**4** *ad libitum begin slight timbre changes via mouth shape, harmonics, and consonant multiphonics*  
*(poco a poco longer durations moving to c. 7" - 10")*

30" *p* *pp* *p* *pp* *p* *pp* *(ad libitum sempre small local dynamic variations within pp to mf range)*

**5** *ad libitum change timbre slowly via mouth shape, harmonics, and consonant multiphonics*  
*(poco a poco longer durations moving to c. 8" - 12")*

20" *subito sfz* *mf* *sfz* *mf*

**6** *ad libitum sempre change timbre slowly*  
*(long durations greater than c. 12")*

30" *mf* *p* *pp* *p* *pp* *p* *pp* *(small local dynamic variations)*  
*(global decrescendo)*

**7** *ad libitum sempre change timbre slowly*  
, (*sempre long durations greater than c. 12"*) *poco*

20" *pp* *mp*

(*sempre small local dynamic variations.....*)

**8** *simile timbre changes...*  
*simile durations...*

17" *p* *mf*

*simile small local dynamic variations...*

**9** *simile...*

13" *p* *f*

*simile...*

**10** *simile...*

11" *p* *ff*

*simile...*

**11** *simile...*

9" *p* *sfz*

*simile...* (sharp release)

**12** *simile...*

7" *p* *sfz*

*simile...* (sharp release)

**13** *sempre timbre changes...*

*mp* *f*  
*<sfz>* *<sfz>* *<sfz>*  
*ad libitum short accents...*

**14** *sempre timbre changes: begin singing into tuba while playing*  
*sempre long durations: begin circular breathing (if possible)*

*mf* *f* *sempre sfz short accents...*

*(sing long notes chosen from in the rectangle, with similar dynamics to tuba playing)*

**15** *simile...*

*mf* *f*  
*simile short accents...*

*(continue singing long notes, with similar dynamics to tuba playing, in consonant intervals of octaves and perfect fifths)*

**16** *simile long durations (circular breathing), timbre changes, and singing*

*f* *ff*  
*simile short accents...*

**17** *simile...*

*sfz* *fff*  
*simile short accents...*

**18**

*fff* *ffff*  
*simile short accents...*

*rapid glissando slightly above and below note* *rapid octave gliss*

**19**

*simile long durations and timbre changes, but without singing*  
 (slowly varying dynamics controls computer timbre "bandwidth")

*stop sfz short accents* **f** **mf**  
*begin slowly varying dynamics while following global dynamic indication*

**20**

*simile long durations and timbre changes*

**mf** **mp**  
*sempre slowly varying dynamics while following global dynamic indication*

**21**

*voice appearing and disappearing ad libitum to produce beating with tuba*

*small glissandi, gradually getting larger*  
**mp** ↔ **mf** (begin more rapid small local dynamic variations between pp and mf)

**22**

*simile voice*

*slow gliss above and below note*  
**mp** ↔ **mf** **mp**  
 (sempre more rapid small local dynamic variations between pp and mf)

**23**

*simile voice*

**f** **mp**  
 (sempre more rapid small local dynamic variations between mp and f)

**24**

*(voice)*

**mf** **p** **mf** **mp** **f** **mp** **f** **mf** **f** **ff**  
 (sempre more rapid small local dynamic variations on long notes)

(intonation of extremely low pedal tones may be somewhat approximate and may drift slightly)

25

15"

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

26

40"

*rallentando poco a poco...* *rallentando molto*

*p* *pp* *ppp* *pppp* *mf* *mf* *mf* *mf* *mf*

## Section 2

1

emphasize breath with attacks and decays of notes (breathy attacks and decay into breath)  
begin timbre changes

*ad libitum*  
*short tremolando* *simile trem...*

25"

*mf* *mf* *mf* *mf* *mf* *mf*

2

simile timbre changes and breath  
*simile trem...*

10"

(allow pitches of lowest notes to drift)

*mf* *mf* *mf* *mf* *mf* *mf*

3

simile timbre changes and breath  
*simile trem...*

10"

*mf* *mf* *mf* *mf* *mf* *mf*

4

10"

*mf* *mf* *mf* *mf* *mf* *mf*

5

20" *mf* *poco a poco cresc...*

*f* *poco a poco cresc...*

6

*Martellato*

22" *sempre poco a poco cresc...*

*ff* *sempre poco a poco cresc...* *fff*

7

27" *poco a poco meno martellato* *poco* *poco a poco ritardando* *poco*

*poco* *sempre rit...* *poco a poco descrecendo*

*sempre descre...* *poco*

## EXAMPLE FOR EVENTS 8 and 9

*Lento e molto legato*

Range of pitches to use.

*mp* ↔ *mf*

Begin phrase: chromatic ascending or descending line, "searching" for consonant interval

Use a predominance of pitches in mid-range.

Consonant interval found. Play long durations moving from one consonant note to another, including P5th above, M3rd above, P4th below, and octaves.

Continue consonant intervals. Finish with a long duration and decrescendo.

Dissonant note. Move off note quickly.

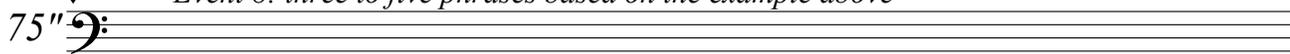
Start a new phrase. Begin on last note of previous phrase.

Silence at end of phrase should be at least 1" long. During silence computer chooses a new pitch for next phrase.

*poco simile...*

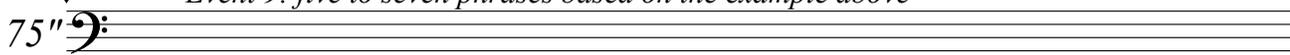
**8** *Lento e molto legato*

Event 8: three to five phrases based on the example above



**9**

Event 9: five to seven phrases based on the example above



Event 9: *poco a poco piu mosso e meno legato*

**10** *poco legato*

10"

*mf* < *f* *mf*

**11**

10"

*mf* < *f* *mf* < *f* *mf* > *mp* *mf* <

*non legato 3*

**12**

10"

*f* < *ff* > *f* > *mf* < *f*

**13**

10"

> *mp* *mf* < *f* *mf* < *f* *mf* *f* *mf* *f* *mf*

14

10"

*mf*  $\triangleright$  *p* *mf* *mf* *mf* *mf* *mf* *mf* *mf* *mf*

*8vb* *sfz* *sfz* *mf* *mf* *mf* *mf* *mf* *8vb* *sfz* *sfz*

15

10"

*mf* *mf* *sfz* *sfz* *mf* *mf* *mf* *sfz* *sfz* *sfz*

*mf* *mf* *sfz* *sfz* *sfz* *sfz* *mp* *mp* *mf* *mf*

16

10"

17

10"

The musical score for events 16 and 17 consists of two staves of music in bass clef. Event 16 starts with a dynamic of *mp* and includes a *mf* section and a *sfz* section. It features a triplet of eighth notes and a quintuplet of eighth notes. Event 17 starts with a dynamic of *mp* and includes a *mf* section and a *sfz* section. It features a quintuplet of eighth notes and a sextuplet of eighth notes. Dynamics are indicated by slanted lines and text labels (*mp*, *mf*, *sfz*) throughout the score. Fermatas are placed over several notes, and various articulations like staccato and accents are used.

The musical material for events 18 and 19 should be made up of material from events 14, 15, 16, 17. Use the boxed phrases that begin with notes of very short duration, followed by a longer note with fermata, and then another set of notes with very short durations. Phrases should be chosen ad libitum, so that the order in the score is not followed, and with as few repeated choices as possible. Gradually over the course of events 18 and 19, the notes with fermati should get longer and longer in duration while their dynamics of sustain should become more and more varied. At the same time, the rhythms of the short notes should gradually become more staccato and faster, with shorter durations. See the example at the top of page 10.

EXAMPLE FOR EVENTS 18 and 19

*mp sfz mp* *poco a poco over 50 seconds* *p sfz ad libitum variable dynamics p*

*breathe when necessary  
use circular breathing on  
long durations if possible*

18

50"

*Event 18: ad libitum phrases based on the example above, gradually transforming...*

19

45"

*Event 19: ad libitum phrases based on the example above becoming more exaggerated...*

20

30"

*p ad libitum variable dynamics (p to ff) p (simile p to f) (simile p to mf) p*

21

30"

*p mp (simile p to mp.....)*

22

20"

*wait for electronics to fade completely*