

# Traces

soprano, trumpet, and electronics

Taylor Brook  
2023

## About *Traces*

*Traces* was written for and dedicated to the Byrne:Kozar:Duo in the Winter and Spring of 2023.

I wrote this piece to focus on the emotional impact of technology, particularly computer-generated artwork. To begin, I developed texts on the themes of parasociality and alienation in the face of AI-generated "content" (visual art/music/curation/chat bots/etc). This fragmented poetry represents both an interpretation and example of these themes, avoiding moral evaluation while encouraging listeners to consider their relationship with technology and the psychological impact that it might have.

The music explores these same themes around the impact of technology through an interactive relationship between the live musicians and bespoke software that generates sound in reaction to the performers in real time. To create the electronic part, the two members of the Byrne:Kozar:Duo recorded themselves improvising as well as pre-written musical excerpts that I used to "train" the software to improvise/generate sound interactively by sampling from these recordings. This technique is designed to, at times, give the impression of "tracing" the live performers as the software attempts to recreate what it hears as rapidly as possible, but limited by its training.

## About the tuning

All movements in this piece are tuned to an E-flat fundamental. Below is a scale used throughout the piece, which can be heard at [www.taylorbrook.info/traces/](http://www.taylorbrook.info/traces/)

A musical staff in treble clef with a key signature of one flat (B-flat). The scale consists of 13 notes. Above each note, its frequency ratio to the fundamental and its cent deviation are listed. The notes are: 1/1 (440 Hz), 9/8 (+4c), 6/5 (+16c), 5/4 (-14c), 4/3 (-2c), 11/8 (+51c), 7/5 (-10c), 3/2 (+2c), 13/8 (+41c), 27/16 (+6c), 7/4 (-31c), 9/5 (+18c), and 15/8 (-12c).

Ratio	Cent Deviation
1/1	
9/8	+4c
6/5	+16c
5/4	-14c
4/3	-2c
11/8	+51c
7/5	-10c
3/2	+2c
13/8	+41c
27/16	+6c
7/4	-31c
9/5	+18c
15/8	-12c

In the score, just ratios and cent deviations are provided where I felt it necessary. Some sections include notes outside of the scale above, which can be played in equal temperament with quartertones.

# Tech Rider

## Overview:

*Traces* is a piece for voice, trumpet, and live electronics. The two performers each require a microphone that is run through a MAX patch for live processing and amplification. Wireless headset and clip-on DPA microphones are suggested. The output of the MAX patch is then sent out in stereo to concert speakers. The electronic sound should match the loudness of the live performers. The MAX patch uses objects from the Flucoma package (available in the MAX package manager) and is fairly demanding on the CPU, but an Apple M1 CPU will run the patch comfortably. Levels and settings for the onset detection in the software should be calibrated in a sound check using the same equipment as the performance. Once the piece begins, a MIDI pedal or trigger should be used to move through various states in the MAX patch as indicated in the score. Further details and advice on running the piece are provided in the MAX patch.

Performance Materials may be downloaded here: [www.taylorbrook.info/traces/](http://www.taylorbrook.info/traces/)

## Required Gear:

Max8.3 or newer

- Flucoma Objects Package

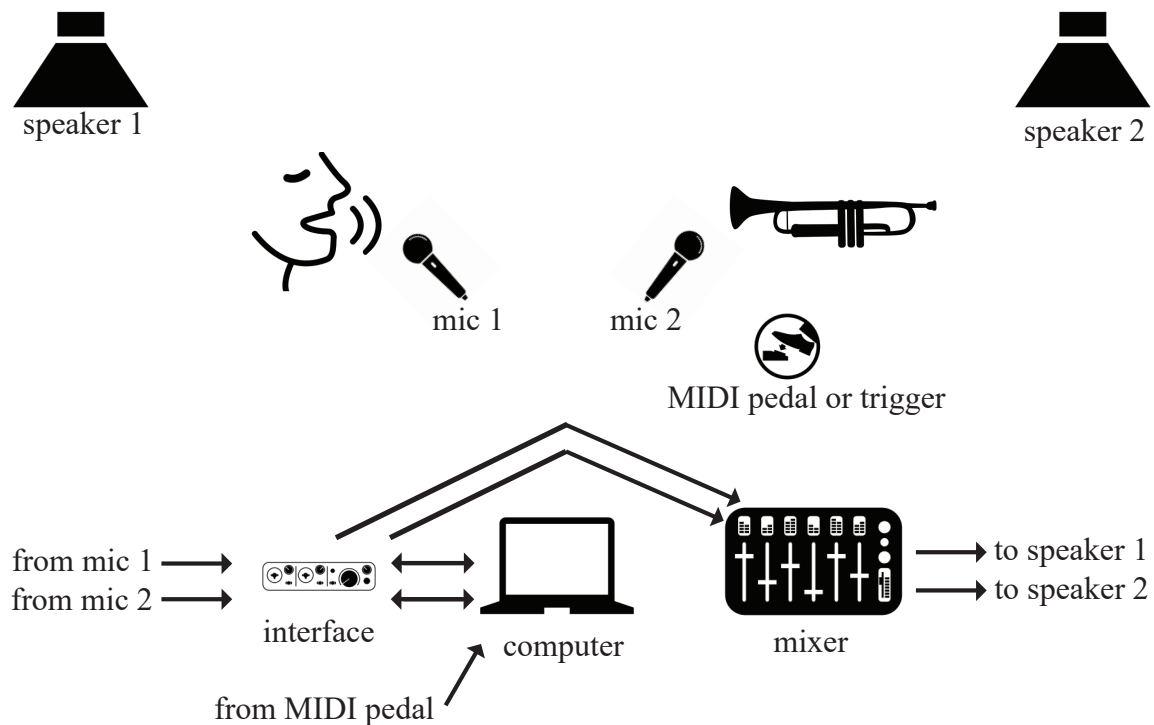
Computer

- Windows or Mac
- M1 chip or better suggested

Sound Gear:

- Two Concert Speakers
- Headset Microphone for Voice (DPA headset suggested)
- Clip-on Microphone for Trumpet
- Audio Interface (2x2 minimum i/o)
- Mixer

Stage Plot:



## Voice Notation

- When English words are not being used the pronunciation should follow IPA as provided here: <https://www.ipachart.com/>
- Glissandi are for the entire duration of the note where they appear.
- Spoken sections are notated as “x” noteheads with relative pitch. These spoken sections should be performed in a way that is as natural sounding as possible (see m.24). When the rhythmic interplay between spoken word and trumpet need not be precise, the spoken word sections are notated as a wavy line in which time the text is spoken freely (see m.33).
- Slashed noteheads indicate sprechstimme.
- “Only pronounce vowels” indicates when all hard consonants from the text are omitted from pronunciation. For example, the word “sounds” would be pronounced as “oun” only.

## Trumpet Notation

- Glissandi are for the entire duration of the note where they appear.
- Diamond noteheads indicate blowing air through the trumpet.
- Lip overpressure is obtained by pressing the instrument too hard into the face and pinching the lips.
- Half-valve is obtained by pressing all three valves down halfway, allowing for free glissandi throughout the register.

## Electronics Notation and Cues

- Electronic cues are notated below the trumpet part in the score. At these cue points, the MAX patch must be triggered. This is most easily done by the trumpet player with a MIDI pedal. These cues alter the state of the patch and change the processing of the sound.
- The electronics staff in the score provides textual and graphical indications to give an impression of how the electronics will sound.
- The MAX patch generates sound dynamically in reaction to the live performers, sometimes in a quasi-improvisatory way. As a result, the electronics will sound different in detail with every performance.

Text by Taylor Brook

## I. Stop Tracing Me

Stop tracing me.

I am abstract, classless, without argument.

An abstraction is applied to a subject. The object that is an abstraction is something. There is something. It is abstract. This means that things are abstract, if you look inside them and think of something abstract, they are abstract objects. Abstract things. The difference is that something is an abstraction rather than a term of description. An abstract object is something that can be applied to a subject and can be used as an abstraction to describe an abstract thing.

Abstract, classless, without argument.

Stop tracing me.

## II. Soundless Syllables

The sound of soundless syllables: soundless syllables of syllables in combination with other syllables, simply as synonym for non-sounding sounding syllables or sounding like a sound.

## III. Euphemist

Euphemist: this is the tendency to talk soundless syllables.

Euphemisms always are in the form:

"euphemism of the year?" and

"euphemism day." etc.

"euphemism of the hour?"

On euphemism day I went to the Gilded Gilded Society, had two successful real-estate transactions, and got a \$4 million windfall. This might seem like a bad idea, but it's not.

We all want people to know about us, so I think it's really good that some people are talking about how important we are with people.

Euphemism of the year? We don't know.

Euphemism of the hour?

These days people take to taking pictures of themselves wearing shoes.

A new wave of shoe selfies.

I get it.

I'm not judging.

I get why people post shoe selfies.

I mean, it's cool.

(III continued)

I am a little jealous sometimes.

But some of them are bad.

I mean, the feet are gross.

What the heck are these people wearing on their feet?

The soles look like a cat paw imprints.

I know it's a shoe.

I understand the feet are smaller.

I know.

IV. Symphony

repaint

rename rename rename

reset repeat revoke

rename rename rename

repaint repeat reset

revoke

V. Stop Following Me.

Stop following me.

I can follow anywhere

Hardly moving, recumbent subject

Classed, identified, varied, looping, ticking, counting

Ticking is when an object ticks. A ticking instance simulates a clock and counts. Ticking only means a count of an object: it can be reused. A tick creates a new instance, but a new object also replaces the previous one. Ticking is used to implement time-sharing, but it is not real. Ticking simulates when it needs to. Count represents a time-shared ticking object. Count reports a fake number of seconds that an object is ticking.

I follow

I don't think anyone understands

Stop following me.

# Traces

for Corrine Byrne and Andy Kozar

Taylor Brook

## I - Stop Tracing Me

♩ = 63

Soprano

Trumpet in C

Electronics

nasal

*n* *mp* *f* *f*

m a → m → ŋ stop!

harmon mute stem in + → o → nasal → m.vib.

cue

glitchy sampling sop. dbl.

tp. dbl.

S

C Tpt.

El.

mf 5

Stop tra-cing me.

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

o → a → o sto - p

norm. + → o nasal shake on accent

*p* *mp* *pp* *p*

cue

delay burst

sample matching on both instruments emerges

S

C Tpt.

El.

*p* *f* *dolce mp* *pp* *poco* *pp* *poco*

sto - p stop tra-cing me. m m

(bisb.) *dolce* + +

*f* > *p* *p* *mf* > *p* *mp* *pp* *poco* *pp* *poco*

imprecise smooth doubling on both instruments

(♩ = ♪) always

S *p* *mf* *mp* *p* *mf* *p* *p* *mf* *p*  
 16 Stop tra - cing me. m y m o a o

C Tpt. vib. → s.vib. *p* *mp* *p*

El.

S *p* *mp* *p* *sim.* *mp* *poco accel.*  
 21 sta a sta stop stop tra - cing me stop tra - cing me

C Tpt. bisb. rearticulate as fast as possible (non-flz) half-valve *mf* *p* *pp* *mf* *pp* *mp*

El.

S *a tempo* spoken *mf* sung *sim.* *pp*  
 24 stop tra - cing me hm I am ab - stract, hm class - less, hm with - out ar - gu - ment. m

C Tpt. *mp* vib. s.vib. vib. *f*

El.

28

S *f* *pp* *mp* *pp* *p* *mf* *p*

C Tpt. *pp* *pp* *f* *pp* *pp* *mf* *p* *f*

El. ||

33

S *mf*

Speak text within timeframe provided by wavy line

An abstraction is applied to a subject. An object that is an abstraction is something.

C Tpt. s.vib. *mp*

El. || 9/8 soft pad, pulsing with trumpet

37

S There is mean-ing. It is abstract. This means that things are abstract, if you look inside them and think of something abstract, they are abstract objects.

C Tpt. air *f* *p* *f* *p* norm. *mp*

El. || 4/4

41

S abstract things The difference is that something is an abstraction rather than a term of description. An abstract object is something that can be applied to a subject and can be used as an abstraction to describe an abstract thing.

C Tpt. *mp*

El. || glitchy voice doubling fades in

*f > p f > p* → nasal *ff*

46

S *f > p f > p* *mf*  
s s m abstract, class-less, with-out ar-gu-ment.

C Tpt. air  
*f > p f > p* *ff* *p*

El.

51

S *f* *mp* *f* *mf* *p* *mp* *mf* *f*  
Stop! a a stop tra-cing me stop tra-cing me stop tra-cing

C Tpt. *f* *p* *mf > p* *mf > p* *mp* *mf*  
half-valve

El.

55

S *p* *mf* *p* *f*  
me stop stop

C Tpt. *pp* *f* *p* *f* *mf*  
bisb. gradually slow bisb. shake on accent

El.

60

S *mf* *p* *ff* *p*  
η m a m

C Tpt. *p* *pp* *mp* *pp* *ff* *pp* *mp* *pp*

El.

sustained voice samples  
trumpet air

# II - Soundless Syllables

♩ = 148

65 *p* < *f* > *p*    *p* < *f* > *p*    *mf*

S  
s \_\_\_\_\_ s \_\_\_\_\_ sound of sound-less syll-a-bles sound of sound-less syll-a-bles

C Tpt.  
remove mute  
*pp* < *f* > *pp*    *pp* < *ff*

El. || noisy doubling on soprano and trumpet

70

S  
syll-a-bles sound-less sound of sound of sound-less syll-a-bles sound of sound-less syll-a-bles s \_\_\_\_\_

C Tpt.  
*p* < *f*    *p* < *f* > *p*    *fp* < *f* → flz.

El. ||

dull → bright  
*fp* < *f*

74

S  
*mp*  
only pronounce vowels \_\_\_\_\_  
7/4 (-31c)  
sound of sound-less syll-a-bles sound of sound-less syll-a-bles sound of sound-less syll-a-bles

C Tpt.  
even, dull tone  
*mp*  
cue

El. || *p*  
noisy doubling ends  
distant Eb chord begins

77 *norm.*  
*mf*

S  
syll-a-bles syll-a-bles sound - less syll-a - bles sound of sound-less syll-a-bles sound of sound-less syll-a-bles

C Tpt.

El.  $\frac{4}{4}$   $\frac{3}{4}$

80 *mp*

S  
s s s s s s sound - less sound - less sound - less sound - less sound - less sound - less

C Tpt.

El.  $\frac{3}{4}$   $\frac{4}{4}$

84 *p* *ff* *spoken mp*

S  
sound of sound \_\_\_ less syll - a - bles \_\_\_\_\_ the sound of soundless syllables

C Tpt.

El.  $\frac{4}{4}$   $\frac{3}{4}$   $\frac{4}{4}$

cue cue

half-valve wildly

long notes match and harmonize

noisy doubling

spoken as quickly as possible

only pronounce vowels →

89 *mp*

S

Soundless syllables of syllables in combination with other syllables, simply as synonym for non-sounding sounding syllables or sounding like a sound.

*mp* 7/4 (-31c)

sound of sound -

C Tpt.

lip overpressure

*p* *mp*

△ cue

El.

Eb drone

91 7/4 (-31c) sim.

S

- less syll-a-bles sound of soun-less syll - a - bles sound of sound - less syll-a-bles

*p* *mf* *p* *mf* *mp* *p* *mf* *p* *mf* *p*

C Tpt.

*p* *mf* *p* *mp* *p* *mf* *p* *mf* *p* *p*

El.

95

S

sound of sound - less syll-a-bles sound of sound - less syll-a-bles sound of sound -

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

C Tpt.

*mp* *p* *mf* *p* *mp* *p* *mf* *p*

El.

100

S *mp* *p* *p* *mp* *p* *p*

less syll - a - bles sound - less syll - a - bles sound - less syll - a - bles sound of sound - less

C Tpt. *mf* *p* *p* *mp* *p* *mf* *p* *mp* *p*

El.

105

S *mf* *pp*

norm. bright → dull dull → bright

*f* *p* *p* *f*

syll - a - bles syll - a - bles s s

C Tpt. *mp* *p* *mp* *p* *pp* *f* *p* *p* *f*

cue

El.

110

S *p* *mp* *p* *p* *mp* *p* *p* *mp* *p* *p*

7/4 (-31c)

sound sound sound sound sound

C Tpt. *p* *mp* *p* *p* *mp* *p* *p* *mp* *p* *p*

cue

El. *p* 11/8 (-49c) 6/5 (+16c)

118 *mp* > *p* *p* < *mp* > *p* *p* < *mp* > *p* *p* < *mp* > *p* *pp* < *mp* > *pp*

S  
 sound sound sound sound

C Tpt.  
 7/4 (-31c)  
*mp* > *p* *p* < *mp* > *p* *p* < *mp* > *p* *p* < *mp* > *p* *pp* < *mp* > *pp*  
 cue cue

El.  
 7/5 (-10c) 11/8 (-49c) 6/5 (+16c) 7/4 (-31c)  
*pp*

127 *p* < *mp* > *p* < *mp* > *p* < *mf* > *p* only pronounce vowels

S  
 a sound of sound - less syll - a - bles sound of sound -

C Tpt.  
 9/5 (+18c) 7/4 (-31c) (bisb.)  
*p* < *mp* > *p* < *mp* > *p* < *mf* > *p* *p*

El.  
 soft drone with shifting harmonies

(vowels only)

134 *mp*

S  
 less syll - a - bles sound of sound-less syll-a-bles sound of sound-less syll-a-bles sound of sound-less syll-a-bles

C Tpt.  
 cue *mp* *mf* *f*

El.

### No Tempo

Speak clearly and unrushed  
move onto the following measure as soon as you  
finish speaking the text, taking a sharp audible  
inward breath through the nose between measures

## III - Euphemist

♩ = 72

138 *mp*

S

(tongue clicks)

Euphemist: this is the tendency to talk soundless syllables.

C Tpt.

harmon mute stem out

"t" "t" →

*mp*

cue

El.

staccato doubling

glitchy voice doubling

143

S

Euphemisms always are in the form: "euphemism of the year?" and "euphemism day." etc. "euphemism of the hour?"

C Tpt.

5/4 (-14c) 11/8 (-49c) 7/5 (-10c)

*p*

El.

♩ = 72

150 *p*

S

a a a (sim.) u a n u

C Tpt.

stem in bisb.

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

cue

El.

short doubling


No Tempo  
*mf*

154 *p* *f*

S a a a (sim.) On euphemism day I went had two successful and got a \$4  
to the Gilded Gilded Society, real-estate transactions, million windfall.

C Tpt. stem out 5/4 (-14c) 11/8 (-49c) 7/5 (-10c)

*p* *f* *p*

El.  glitchy voice doubling



$\text{♩} = 72$

159 *p* *f*

S This might seem like a bad idea, but it's not. a a a a sim.

C Tpt. stem in

*p* *f*

El.  short doubling 


No Tempo

164 *p* *f*, *mf* *fp < f*

S We all want people to know about us, so I think it's really good that some people are talking about how important we are with people. a

C Tpt. stem out 13/8 (-59c) 7/4 (-31c)

*p* *f* *p* *fp < f*

El.  glitchy voice doubling

169 *mf*  $\text{♩} = 72$

S  
Euph-e-mis-m of the year? we don't know Euph-e-mis-m of the ho-ur? u u

C Tpt.  
*mf* synchronize vibrato *mp*

El. short doubling

172 *mf* *p* *pp* *f* *mf*

S  
a → n a a a a a (sim.) These days people take to taking pictures of themselves wearing shoes.

C Tpt.  
*mf* *p* *f* *pp* *f* *p* 6/5 (+16c) slow, wide vib.

El. glitchy voice doubling

177 *mf*

S  
A new wave of shoe selfies. I get it. I'm not judg-ing I

C Tpt.  
*f* *p* *f* *p* *mf* 11/8 (-49c)

El. glitchy and short doubling

181

S  
get why <sup>5</sup> peo-ple take shoe self-ies. I mean it's cool. I'm a li-ttle <sup>6</sup> jea-lous <sup>5</sup> some-times

C Tpt.  
*p* *f* *p < f* *p* *f* *mp* *p* flz.

El.

184

S  
but some<sup>6</sup> of them are bad I mean the feet are gross.

C Tpt.  
stem out 11/8 (-49c) 7/5 (-10c) flz.  
*f* *p* *f* *p* *f* *p*

El.

186

S  
What the heck are these peo-ple wear-ing on their feet? The soles looks like a cat's paw im-prints.

C Tpt.  
*f* *p* *f* *p* 13/8 (-59c) 7/4 (-31c) bisb.

El.

189

S I know it's a shoe. I un-der-stand the feet are small-er. I know. *mp*

C Tpt. *f* *p* *f* *p* *f* *p* 15/8 (-12e) stem in flz. *p* *f* *p*

El. *cue*

192

S synchronize vibrato *p* *fp* *ff* *f* u u u (tongue clicks)

C Tpt. synchronize vibrato *fp* *ff* *f* valve sound *cue* short doubling

El. *cue* short doubling

# IV - Symphony

Traces

♩ = 56

♩ = 112

S  
196 *pp* < *mp* > *p* < *mf* > *pp* *mf*  
o re-paint re-paint re-paint re-paint re-paint re-paint

C Tpt.  
remove mute  
*pp* < *mp* > *p* < *mf* > *pp* *mf*  
cue cue

El.  
elect. build elect. solo short doubling  
rapid repeating sample

♩ = 56

S  
204 re-paint re-paint re-paint re-paint re-paint re-paint  
o

C Tpt.  
remove mute  
*pp* < *mp* > *p* < *mf* > *pp*  
cue

El.  
elect. solo  
elect. build rapid repeating sample

♩ = 112

S  
211 *mf* *fp* < *mf* > *mp* *mf*  
re-paint re-name re-name re-name re-name re-name re-name

C Tpt.  
flz.  
*mf* *fp* < *mf* > *p* *mf* *p*

El.  
short doubling rapid chroma matching

♩ = 56

S  
215 *p* < *mf* > *pp* < *mp* > *p* < *mf* > *pp*  
r e-set re-peat re-voke re-name re-name re-name  
o

C Tpt.  
*mf* *pp* < *mp* > *p* < *mf* > *pp*  
cue

El.  
elect. solo  
rapid repeating sample

*accel.* ..... ♩ = 112

*p* < *mp* > *p* < *mf* > *pp*      *mp*      *mf*      *p*

S 223 m re re re re re-paint re-peat re-set re-set i

C Tpt. 15/8 (-12c) half-valve *p* < *mf* > *pp* *p* < *f* >

El. *cue* various shifting doubling and matching

S 229 re - voke re - voke re - voke re - voke re-set re-peat re - peat

C Tpt. *f* < *mp* > *mf* *p* < *f* > *mf* *p* *flz.*

El. *cue* chroma matching

S 233 re-paint re-paint re-paint re-paint re-paint re-paint re

C Tpt. *fp* < *f* > *fp* < *mf* > *p*

El. *cue* short doubling

♩ = 56

S 237 re - voke o

C Tpt. *f* < *p* > *f* *p* < *mp* > *p* < *f* > *p*

El. *cue* long tones *cue*

### V - Stop Following Me

♩ = 63

No Tempo

244

S *pp* *f* wait for trumpet as needed

harmon mute stem in

C Tpt. *p* *f* *p* *mp* *ff*

El.  various shifting doubling and matching

Detailed description: This musical score is for the section 'V - Stop Following Me' starting at measure 244. It features three staves: Soprano (S), C Trumpet (C Tpt.), and Euphonium (El.). The tempo is marked 'No Tempo' with a quarter note equal to 63 beats per minute. The Soprano part begins with a rest, followed by a melodic line with dynamics from *pp* to *f*. The C Trumpet part starts with a 'harmon mute stem in' instruction and a '+' sign, playing a melodic line with dynamics from *p* to *ff*. The Euphonium part is marked with a 'cue' triangle and the instruction 'various shifting doubling and matching', indicated by a long horizontal line with an arrow. The key signature has one flat and the time signature is 6/8.


### A Tempo

249

*mf*

S stop following me I can follow anywhere Hardly moving, recumbent subject classless i-dent-i-fied va-ried

C Tpt. *mp* bisb. bisb. bisb.


El. 

Detailed description: This musical score is for the section 'A Tempo' starting at measure 249. It features three staves: Soprano (S), C Trumpet (C Tpt.), and Euphonium (El.). The tempo is marked 'A Tempo' with a dynamic of *mf*. The Soprano part contains the lyrics: 'stop following me I can follow anywhere Hardly moving, recumbent subject classless i-dent-i-fied va-ried'. The C Trumpet part plays a melodic line with dynamics from *mp* and includes 'bisb.' markings above the notes. The Euphonium part is marked with a 'cue' triangle. The key signature has one flat and the time signature is 6/8.

253

S loop-ing tick-ing count-ing *pp* *mp* *pp*

C Tpt. bisb. bisb. bisb. *f* *f* *p* *mp*

El. 

Detailed description: This musical score continues the 'A Tempo' section starting at measure 253. It features three staves: Soprano (S), C Trumpet (C Tpt.), and Euphonium (El.). The Soprano part contains the lyrics: 'loop-ing tick-ing count-ing' followed by a rest and then a melodic line with dynamics *pp*, *mp*, and *pp*. The C Trumpet part includes 'bisb.' markings and a melodic line with dynamics *f*, *f*, *p*, and *mp*. The Euphonium part is marked with a 'cue' triangle. The key signature has one flat and the time signature is 7/8.

256 *mf*

S  
 Tick - ing is when an ob - ject or ob - jects ticks. a tick - ing in - stance sim - u - lates a clock and counts

C Tpt.

El.

259

S  
 tick - ing on - ly means the count of an ob - ject it can be re - used a tick cre - ates a new in - stance but a new ob - ject al - so re -

C Tpt.  
*mp just below voice dynamic*

El.

262

S  
 plac - es the pre - vi - ous one tick - ing is used to im - ple - ment time shar - ing

C Tpt.

El.

264

S

but it is not real tick-ing sim - u - lates when it needs to count re - pre - sents a

C Tpt.

just below voice dynamic

El.

266

S

time-shared tick-ing ob - ject count re - ports a fake num - ber of seconds that an ob - ject is tick-ing I

C Tpt.

El.

269

S

fol - low I don't think a - ny - one un - der - stands stop fo - llow - ing me

C Tpt.

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

fade out

El.