

**Quintuple Escapement (2003)**  
for Interactive controller and computer

William Kleinsasser

**PROGRAM NOTE**

About *Quintuple Escapement*, the composer writes: Our musical knowledge is heavily invested in the concept of discrete musical events, which form measurable inter-event relationships (i.e. pitch intervals). Digital musical instrument paradigms now offer a fundamental decoupling of the generation of physical sound from instrument's physical design responding to performance gestures. This raises the question of what musical potential lies in the domain of a single performer engaging instrumental interactions that go beyond control of individual event streams and entering into the realm of inter-event intervals -- the direct playing of many kinds of musical relationships. Beginning in 2003, Daniel Koppelman asked me to work with him on a project exploring these ideas. The first result of this project is an interactive laptop instrument running in Max/MSP. The instrument, named *Erard's Springs & Levers* after the developer of double-escapement piano action, owes philosophical and sonic debts to John Cage's developments of the prepared piano half a century ago. Unlike the prepared piano, this virtual instrument allows for the triggering and continuous control of complex musical events as well as single tones. Composed for this instrument, *Quintuple Escapement* presents five short pieces that explore what might be considered to be idiomatic music for this new instrumental paradigm engaging the intersection between traditional performance and the domains of freedom recently made available. The pieces grow out of two principal ideas: a series of movements that are compressed, nearly rarified character pieces, and each movement built up from juxtaposed and inter-related musical statements that are constrained by the notion of 8-second 'sound bites.' For this performance an expanded diffusion version has been developed which takes advantage of the SARC performance space. Thanks to Daniel Koppelman, Les Stuck, Richard Dudas, Timothy Place, Joshua Kit Clayton, Cort Lippe, Erik Oña, Zack Settel, [www.zolaweb.com](http://www.zolaweb.com), and Soeren Bovbjerg for help and shared elements for the Max/MSP instrument.

**Acknowledgements**

*Erard's Springs and Levers* is based on a combination of patches designed by the composer and modifications of patches included in the distribution of Max/MSP as help files and tutorials all using standard-issue Max/MSP objects. The sampler and buffer playback approaches are modifications based on Les Stuck's anticlick and anticlick-voice sampling examples in the Max/MSP distribution. The granular synthesis module is a modification of the Max/MSP granular synthesis example by Les Stuck and xoaz. Preset incrementing is done with a subpatch designed by Daniel Koppelman. Control of interface settings without using the preset object was suggested by Les Stuck and is done using modifications of Richard Dudas' sw and swpre objects and methods. In addition to the standard Max/MSP objects, this instrument uses the tap.shift pitch shifting object which is part of the TapTools library by Timothy Place, and the reverb module is based on Richard Dudas' newverb~ external object. The sound sources for the instrument are recordings made by the composer of plucked, struck, and scraped piano strings, short excerpts from solo piano recordings of Kleinsasser's *Available Instruments* for piano and computer, and sampled recordings of piano tones used with permission from [www.zolaweb.com](http://www.zolaweb.com) and Steinway Model C piano tones by Soeren Bovbjerg. <http://www.hum.aau.dk/~bovbjerg>.

### Computer music system requirements

866 G4 (or better) Macintosh computer running Max/MSP software (version 4.3 or later)

MIDI Keyboard, foot pedal, MIDI interface

MIDI Continuous Controller set (minimum 10 separate controllers)

Audio mixer for computer output

#### STEREO VERSION:

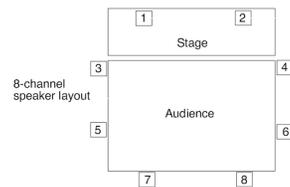
Amplifier for two-channel audio or powered speakers

2 loudspeakers in stereo configuration (suggested placement diagrammed to right)

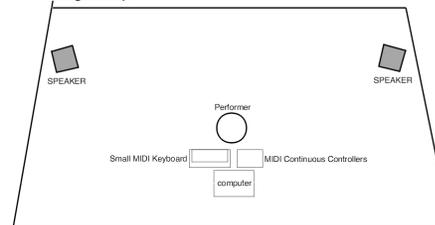
#### SURROUND VERSION:

Amplifiers for eight-channel audio or powered speakers

8 loudspeakers in surround configuration



### Stage setup



The performer plays a small MIDI keyboard with right hand and a set of MIDI continuous controllers with Left hand. These controllers are connected to theMIDI input of a Macintosh G4 886 or faster computer running the composer's Max/MSP instrument: Erard's Springs and Levers.

Loudspeakers should be placed on stands approx. 6 feet high and placed so that the performer can clearly hear the performance. Additional speakers can be placed throughout the space if desired.

# Quintuple Escapement

for MIDI keyboard, continuous controllers and computer  
written for Daniel Koppelman

William Kleinsasser  
(2003)

Change presets just before playing

**Movement 1**  
Click MAIN ON and MOVEMENT 1 Button

1 Advance Computerpresets with sustain pedal (ctrl 64) or spacebar

2

4" 6" 2" 3" 5"

Controllers (Left Hand)

KEYBD Pitchbend

Graphic indicates the position of the MIDI controller

KEYBD: KNOB 7

Keyboard (Right Hand)

*ff* *ff* *ff*

The pitches played do not always correspond to the resulting sound

Computer music graphic representation is extremely approximate!

Brittle, bright motivic arpeggiations

Causes disturbance in arpeggiation pattern

1 2 3 4 5

3 10" 2" 4 8" 5 4" 6 6" 7

Controllers

KEYBD: MOD

KEYBD: DATA

KEYBD Pitchbend

Keyboard

*Heavily*

*ca. 2 sec.*

*(slow arp)*

*ff ff ff ff*

*ff mf p*

SILENT

Comp.

6 7 8 9 10 11

Movement 2

8

9

10

11

12

5"

8"

0.5"

2"

2"

8"

Wait until figures end

2"

Controllers  
(Left Hand)

KEYBD: MOD

KEYBOARD KNOB 6

KEYBD Pitchbend

As arp. ends

Keyboard  
(Right Hand)

Hold until events end

Ad Libitum

legato

Release in this order

SILENT

*ff*

*ff*

*ff*

*f*

1

2

3

4

5

6

7

8

13

14

15

16

10"

3"

6"

1"

8"

6"

Controllers

KEYBD: DATA

KEYBD MOD

Keyboard

Chromatic flourish

Let Ring

$\bullet = 56$   
Extremely Heavily

sim.

SILENT

Heavy legato

*fff*

SILENT

*mp*

*fff*

9

10

11

12

13

14

15

Movement 3

17

18

19

20

21

Controllers  
(Left Hand)

KEYBD: MOD

100

127

Keyboard  
(Right Hand)

7  
4

Match tempo of sixteenths from computer

Deliberately

8  
4

Keep tempo

End clear tempo

Ad Libitum

9  
4

Clear faster tempo  
Match tempo of sixteenths from computer

Ad Libitum

Sudden distant, quiet

ppp



Rhythms begin to vary and uncouple



1

2

3

4

5

22 23 24

1" 8" 3"

Controllers

KEYBD: MOD

PITCH BEND

10/4 Match tempo in figures of audio file

In tempo with ticking from computer

4/4 Ticking continues

10/4 Match tempo in figures of audio file

Keyboard

SILENT

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

6 7 8 9 10 11

Detailed description of the musical score: The score is presented on a grand staff with three systems. The top system, labeled 'Controllers', contains two tracks: 'KEYBD: MOD' and 'PITCH BEND'. The 'KEYBD: MOD' track shows a continuous, slightly fluctuating signal. The 'PITCH BEND' track shows a series of square pulses, with a '10/4' tempo marking above the first and third sections. The middle system, labeled 'Keyboard', contains two staves (treble and bass clef). The treble staff is marked 'SILENT'. The bass staff contains a melodic line with dynamic markings *mf*, *ff*, *f*, *mf*, *mf*, and *ff*. It includes a 4/4 time signature and tempo instructions: 'Match tempo in figures of audio file' and 'In tempo with ticking from computer'. The bottom system consists of two empty staves. Measure numbers 6, 7, 8, 9, 10, and 11 are indicated at the bottom of the page.

25

26

6" 5" 4" 3" 3" 6"

Controllers

KEYBD: DATA

10

KEYBD: MOD

100

Slowly, Ad Libitum

Deliberately

Ticking continues

Keyboard

*mp*

Release stops the ticking

SILENT

*mf* (loud enough to start ticking from computer)

mmmm

12

13

14

15

16

17

18

Movement 4

27

28

29

30

31

32

4" 8" 0.5" 4" 6"

Controllers  
(Left Hand)

Keyboard  
(Right Hand)

Ticking at slower tempo

$\bullet = 62$

$\bullet = 62$

Faster and yet more complex  
cross-rhythmic patterns

$\bullet = 46$

Extremely Heavily

*sim.*

*ff*

*f*

*ff*

*f*

*fff*



Generates more complex  
cross-rhythmic  
patterns in computer

Generates more complex  
cross-rhythmic  
patterns in computer

1

2

3

4

5

6

7

8

33

34

35

36

37

4" 8" 4" 8" 9" 7" 9"

Controllers

KEYBD Knob 3

KEYBD: DATA

KEYBD: MOD

Slowly

KEYBD: MOD

Keyboard

Sudden distant, quiet

Play free, rolling arpeggios using these pitches

Ticking at slower tempo

*pp*

*pp*

*mp* (loud enough to start ticking from computer)



9

10

11

12

13

14

15

16

Movement 5

38

39

25" 10" 20"

Controllers  
(Left Hand)

KEYBD: MOD

Move to chiming bell tones  
ca. 100  
Fade gradually away

Keyboard  
(Right Hand)

This preset uses the keyboard to transpose the figures upward and downward:  
Mid. C = no transposition, above Mid. C = transposes upward by relative interval  
and below Mid. C = transposes downward.  
Play slow, free, rolling arpeggios using these pitches

Use these pitches above Mid. C to raise the tones of the texture into extreme upper register.

Long

SILENT

Freely improvised quiet texture of pinao bell tones through granular process

1

2

3

4