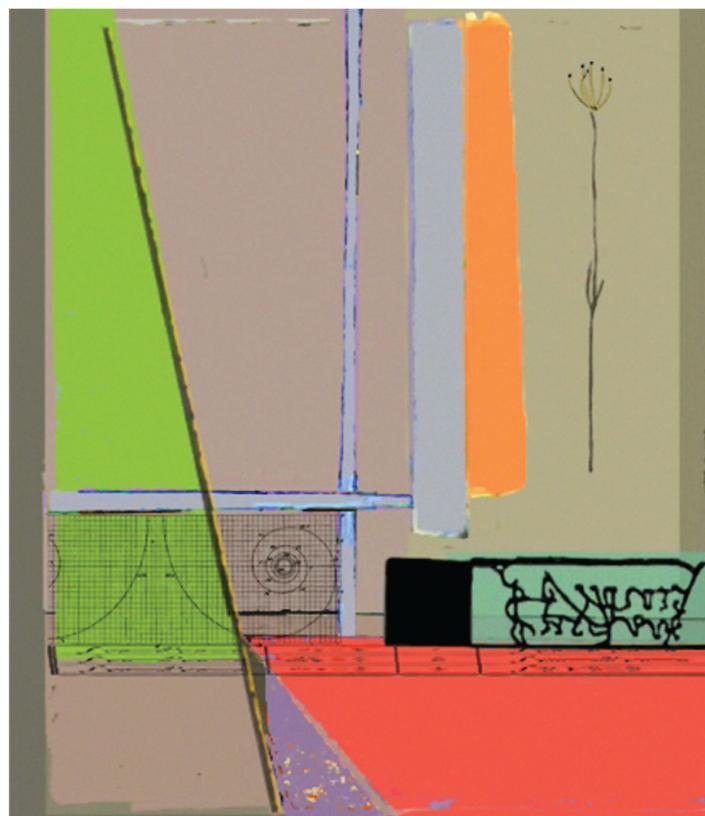


~ *bitKlavier* ~

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# Mikroetudes

*for Prepared Digital Piano*



*edited by*

Dan Trueman

---

~ Many Arrows Music ~

[www.manyarrowsmusic.com](http://www.manyarrowsmusic.com)



~ *bitKlavier* ~

---

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# The *bitKlavier* Series:

## Nostalgic Synchronic Mikroetudes

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cover art, by Judy Trueman, from the film *Matisse's Garden Lesson*

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# Preface to *bitKlavier* and the *Prepared Digital Piano*

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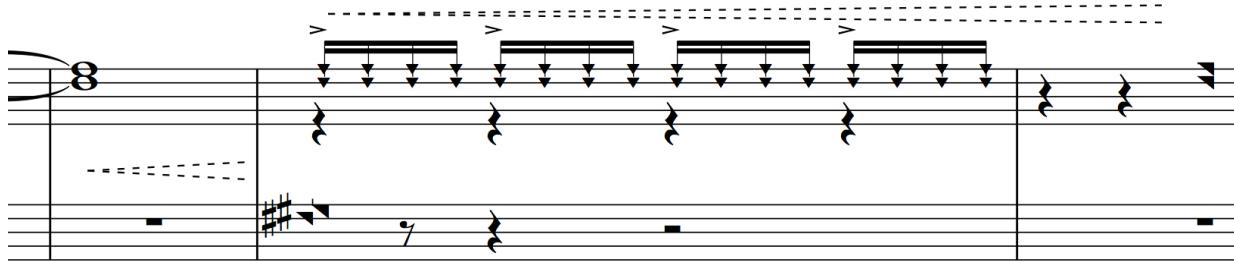
Like the prepared piano, the prepared *digital piano* feels just like a piano under the hands and often sounds like one, but it is full of surprises; instead of bolts and screws stuck between the piano strings, virtual machines of various sorts adorn the virtual strings of the digital piano, transforming it into an instrument that pushes back, sometimes like a metronome, other times like a recording played backwards. The virtual strings also tighten and loosen on the fly, dynamically tuning in response to what is played.

I have long been interested in the differences between mechanical time and how we actually feel and articulate time as biological creatures. This goes back to my experiences—shared by many!—practicing with a metronome, and has continued through my recent piece *neither Anvil nor Pulley*, commissioned by So Percussion. Directly inspired by an instrument created for *neither Anvil nor Pulley*, the prepared digital piano is driven by *bitKlavier*, the most recent software instrument I have built to explore these ideas. One thing I am particularly excited about here is how *accessible* the technology is; all the player needs is a standard 88-key MIDI keyboard and a laptop (or even an iPad).

Comprehensive technical notes about the instrument are included at the end of this volume and with the software itself, but for purposes of understanding the pieces and notation, I will summarize here. There are four main sorts of preparations: *synchronic*, *nostalgic*, *tuning*, and *direct*. The **synchronic** preparations create pulses based on the notes played; these pulses may be metronomic or more complex, depending on how the preparation is configured. At its core, the synchronic preparation is a kind of *resettable metronome* (which, rather than clicking like a metronome, plays piano sounds) where the player can reset the start time for the metronome by simply playing the instrument; it is in part my revenge against the metronome. The **nostalgic** preparations create reversed piano sounds, again based on the notes played; these reverse piano strikes may synchronize with the synchronic pulses or be based on the length of the notes played, and they may feature *undertow*, where, after reaching a peak, the piano sound then

reverses direction, moving forward and fading out. The **tuning** preparations do what you might imagine, changing the tuning in various ways. The **direct** preparations are the simplest and, as of this writing, in part a placeholder for things to come, but at the moment they simply silence particular strings so playing them creates no direct sound (this is inspired in part by Ligeti's Etude #3, *Touches Bloquées*), though other preparations for those notes still activate. All of these preparations are **dynamic** in the sense that they can change as the instrument is played, in a ways impossible with conventional acoustic instruments.

Both the synchronic and nostalgic preparations are usually partially notated in the score, and tuning changes are also sometimes notated. The notation is only partial to avoid clutter; I have attempted to include just enough to be useful to the performer. Synchronic metronome pulses are indicated with downward facing triangles and small note-heads, stemmed opposite to normal notes. Nostalgic swells are indicated with dashed hairpins, cresting/peaking at small angled triangle note-heads:



#### Synchronic/Nostalgic Preparation Notation.

Sometimes the changeable tuning requires that one note be played ever so slightly before others, triggering the instantaneous tuning change; these notes are indicated with a slash through the note-head:

#### Tuning Preparation Notation.

Some of the pieces use a single configuration (or preset) of preparations, in which case the player simply selects that preset in *bitKlavier* and plays away. During others, however, the preparations change as the piece is played, so the presets are indicated by name, in boxes (the boxed “Etude5-2” in the figure above is an example. This is essential for practice, as the player will need to select the appropriate preset for rehearsing particular moments within a piece.

More detailed information about the instrument can be found at the end of this volume, and also on the website for the project:

<http://manyarrowsmusic.com/nostalgicsynchronous/>

This website includes a video about the instrument: seeing it in action is second only to actually playing it to understand how it works!



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# Forward

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I grew up in a house full of harpsichords, clavichords, and lutes that my parents built, and with a family that played them with varying levels of proficiency (my sister, Jennifer, is an expert pianist). I quit piano lessons too early, claiming my violin studies were enough, but somehow ended up the one who tuned the harpsichord and its multiple sets of strings. I loved it. I also loved when it was out of tune, especially when its multiple sets which should have been in unison were instead “out” at some unseemly interval, sounding, as the acousticians say, “rough.” I distinctly remember one party when my friends egged me on to play the Bach D-minor two-part Invention with the harpsichord in such a “rough” state; somehow this odd party trick would inspire fits of gleeful twisted dancing—I had unusual friends!

The point being: I grew up with my hands inside instruments of various sorts, and I was used to messing with these instruments, sometimes playing them myself, and other times getting them ready for others to play. Somehow, decades later, I’m still doing that, whether writing new music, hacking up new instruments, or cross-tuning my fiddle; it’s incredibly inspiring! And this is the story of the “prepared digital piano,” the *Nostalgic Synchronic Etudes*, and this volume.

I built the prepared digital piano to explore a number of musical ideas, but also just because I like to build things and to program. After sharing some of the early *Nostalgic Synchronic Etudes* with a few friends and in a couple different venues, I began getting requests for the instrument, and that’s where the idea for this volume came from: wouldn’t it be great to have a volume of short pieces that various people write for instrument, as a way for them to try writing for the instrument, but also to create something that other pianists and musicians could play to explore the instrument and the different musical challenges and ideas it presents?

Bartók’s *Mikrokosmos* was an initial point of reference, and gave us the title for this volume (and the suggestion that there may be more to come), but this

has inevitably turned out somewhat differently than the *Mikrokosmos*; rather than being a graded set of pedagogical pieces by one composer, this is a grab bag of short pieces by a group of different composers, pieces of varying degrees of difficulty and coming from different stylistic perspectives. This is why I decided to simply order them alphabetically by title, rather by some other much harder to articulate criterion. My hope is that musicians interested in exploring the instrument will be able to open to any random page and find a piece that is a useful starting point.

Fortunately, I still have unusual friends: some old friends and some new friends that I've made just through this project. I am absolutely *thrilled* with what these friends have come up with; the range of approaches, of sounds, of musical sensibilities, of delightful misuses of the instrument, all add up to a collection that is for me full of beauty and surprises. I am grateful to them all for diving into this project with enthusiasm and thoughtfulness, and hope that musicians find these mikroetudes as useful and inspiring as I do.

—Dan Trueman  
August 2015

---

# And so...

---

Louise Fristensky

**Allegretto**  $\text{♩} = 96$

B♯ will trigger the Synchronic repetition for 5 pulses roughly but not exactly in rhythm

$8^{\text{va}}$  -----

$p$

$mp$

4 (8) 1

$p$

7

$p$

11

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14

rall.

3 3

18  $\text{♩} = 102$

3 3

21

3 3

23

3 3

25

3 3

28

30

34

39

[1 min. 46 sec.]

---

# Around 60

---

N. Cameron Britt

$\text{♩} = 120$

The music consists of two staves. The top staff is in common time (indicated by a '7') and the bottom staff is in common time (indicated by a '8'). Both staves have treble clefs. The top staff has eighth-note patterns: (B, A), (G, F), (E, D), (C, B), (A, G), (F, E), (D, C). The bottom staff has eighth-note patterns: (E, D), (C, B), (A, G), (F, E), (D, C), (B, A). A box contains the note: NB: The metronome clicks at a consistent 60 bpm. Except when it doesn't.

Metronome markings:  $\text{♩} = 120$

Time signatures: 7, 8, 5, 3, 4, 4, 4, 5, 5

Tempo: 60 BPM

7 slowing down and unravelling

The music consists of two staves. The top staff starts in common time (indicated by a '7') and changes to common time (indicated by a '8'), then common time (indicated by a '3'), then common time (indicated by a '4'), then common time (indicated by a '4'). The bottom staff starts in common time (indicated by a '8') and changes to common time (indicated by a '3'), then common time (indicated by a '4'), then common time (indicated by a '4'). A bracket indicates (metronome resets in bars 9 and 10).

Time signatures: 7, 8, 5, 3, 4, 4, 4, 5, 5

Tempo: Slowing down and unravelling

(metronome resets in bars 9 and 10)

13

The music consists of two staves. The top staff starts in common time (indicated by a '7') and changes to common time (indicated by a '3'), then common time (indicated by a '4'), then common time (indicated by a '2'), then common time (indicated by a '4'). The bottom staff starts in common time (indicated by a '8') and changes to common time (indicated by a '3'), then common time (indicated by a '4'), then common time (indicated by a '2'), then common time (indicated by a '4').

Time signatures: 7, 8, 3, 4, 2, 4

18

r.h.

23

3

3

28

3

3

4

2

2

3

33

rit.

3

3

4

2

2

3

5

39 **A tempo**

5  
4  
5  
4  
5  
4  
3  
4  
5  
4  
5  
4

43

5  
4  
5  
4  
5  
4  
3  
4  
5  
4  
5  
4

[1 min. 26 sec.]

# Circleville

Nate May

[Circleville] (synchronic pulses of changing tempos throughout; presets will change as you play)

With aplomb.  $\text{♩} = 126 / \text{♩} = 84.$

The sheet music consists of six staves of musical notation, each with a treble clef and a bass clef. The key signature is consistently three flats. The time signature varies across the staves, indicated by the fraction  $3+3+2+2$  above the staff. The first staff begins with a dynamic *f*. The second staff starts with a dynamic *p*, followed by *ped.* and *sim.* markings. The third staff begins with a dynamic *p*. The fourth staff begins with a dynamic *p*. The fifth staff begins with a dynamic *p*. The sixth staff begins with a dynamic *p*. The music features various rhythmic patterns, primarily eighth-note and sixteenth-note chords, with some sixteenth-note grace notes and fermatas. Measure numbers 12, 17, and 22 are explicitly marked above the staves.

[1 min. 4 sec.]

# Crests

Seth Cluett

**Adagio** ...  
♩=42

5

9

**p** ————— **mp**

**pp** ————— **p**

**pp** ————— **mp**

[1 min. 6 sec.]

# Cygnet

Nate May

In General Settings, increase Nostalgic Gain to 1.5.

**Quiet and sweet.**  $\text{♩} = 63$ .

RH sempre  $8^{\text{va}}$

Musical score for measures 1-3. The score consists of two staves. The top staff is in treble clef, B-flat major (two sharps), and 2/4 time. The bottom staff is in bass clef, B-flat major (two sharps), and 2/4 time. The instruction "RH sempre  $8^{\text{va}}$ " is written above the top staff. Measure 1 starts with a dynamic  $p$ . Measures 2 and 3 show a repeating pattern of eighth-note pairs. Muted notes are indicated by 'x' on the noteheads. Measure 3 ends with a fermata over the last note.

**Reo.**

(x notehead denotes muted note; play as usual, but they will not sound)

**Rit.**

Musical score for measures 4-6. The score continues with the same two staves and key signature. The instruction "Rit." is written above the top staff. Measures 4 and 5 show the same eighth-note pattern as before. Measure 6 ends with a fermata over the last note.

**A tempo.**

Musical score for measures 7-9. The score continues with the same two staves and key signature. Measures 7 and 8 show the eighth-note pattern. Measure 9 ends with a fermata over the last note. A long horizontal line with a wavy line underneath it spans across the page below the staff.

**10**

Musical score for measure 10. The score continues with the same two staves and key signature. The instruction "A tempo." is implied from the previous section. The score ends with a fermata over the last note. A long horizontal line with a wavy line underneath it spans across the page below the staff.

13

16

19

22

25

28

31

34

37

39

*Ped.*

42

45

48

51

54

57

— — — — — — — —

60

63

[2 min. 6 sec.]

# Daily Decrease

Andrea Mazzariello

**J=120**

**pp** (*cresc poco a poco through m. 21*)

7

(p)

(mp)

12

(mf)

17

(f)

21

26

31

36 (swells short and frequent throughout....)

*pp* subito, then crescendo poco a poco through m. 55

(p)

42

(mp)

47

(mf)

51

(mf)

55

f

mf

59

mp

63

p

[2 min. 13 sec.]

# Didymus

Dan Trueman

**Quick!**

Musical score for 'Didymus' in 6/8 time. The treble and bass staves show eighth-note patterns. The treble staff has six measures of eighth-note pairs followed by six measures of eighth-note triplets. The bass staff has six measures of eighth-note pairs followed by six measures of eighth-note pairs.

**To Coda**

Musical score for 'Didymus'. Measure 7 shows eighth-note pairs in 6/8 time. Measure 8 begins a transition to 9/8 time, indicated by a measure repeat sign and a 9/8 signature. Measures 9 and 10 continue in 9/8 time with eighth-note pairs. Measure 11 concludes the section with a half note followed by a fermata over a dotted half note.

**I2**

Musical score for 'Didymus'. Measures 12-13 show eighth-note pairs in 9/8 time. Measures 14-15 continue in 9/8 time with eighth-note pairs. Measures 16-17 conclude the section with eighth-note pairs.

**D.C. al Coda**

Musical score for 'Didymus'. Measures 18-19 show eighth-note pairs in 6/8 time. Measures 20-21 continue in 6/8 time with eighth-note pairs. Measures 22-23 conclude the section with eighth-note pairs.

**CODA**



21

Musical score for piano, page 17, measures 21-24, followed by a repeat sign and measures 25-28. The score continues with the same two-staff format and key signature. Measure 21 begins with a half note in the bass staff. Measures 22-24 show a continuation of the eighth-note patterns. A repeat sign with a first ending bracket is placed above measure 24. Measures 25-28 continue the pattern, with measure 28 concluding with a final cadence.

[57 sec.]

---

for Bill D.

---

Quinn Collins

**Sweetly, but also with a very deliberate and meditative purpose**

for-Bill-D\_1

Musical score for piano, page 1, measures 1-4. The score consists of two staves. The top staff is in treble clef, 4/4 time, dynamic *p*, and tempo 120 BPM. It features a continuous eighth-note pattern with grace notes. The bottom staff is in bass clef, 4/4 time, with sustained notes. Measures 1-4 are identical, followed by a repeat sign and a new section starting at measure 5.

Musical score for piano, page 1, measures 5-8. The top staff continues the eighth-note pattern with grace notes. The bottom staff has sustained notes. Measures 5-8 are identical, followed by a repeat sign and a new section starting at measure 9.

Musical score for piano, page 1, measures 9-12. The top staff shows a change in rhythm and dynamics, with quarter notes and a forte dynamic. The bottom staff has sustained notes. Measures 9-12 are identical, followed by a repeat sign and a new section starting at measure 13.

for-Bill-D\_2

Musical score for piano, page 2, measures 13-16. The top staff is in 7/8 time, with a sustained note in the bass staff. The bottom staff is in 7/8 time, with a sustained note. Measures 13-16 are identical, followed by a repeat sign and a new section starting at measure 17.

17 for-Bill-D\_3

21 for-Bill-D\_1

25

for-Bill-D\_2

29 for-Bill-D\_1

preset2

32

36 for-Bill-D\_4 for-Bill-D\_5

*let nostalgic resonance decay...*

[1 min. 32 sec.]

---

# Gigue Interrupted

---

Jennifer Trueman

JennifersGigue1

$\text{♩} = 120$

Musical score for JennifersGigue1. The score consists of two staves. The top staff is in treble clef and 6/8 time, starting with a quarter note. The bottom staff is in bass clef and 6/8 time, starting with a half note. Measure 1: Treble staff has eighth-note pairs (B-C, D-E, G-A), bass staff has eighth notes (D, G, B). Measure 2: Treble staff has eighth-note pairs (C-D, E-F, G-A), bass staff has eighth notes (E, G, B). Measures 3-6: Both staves have rests. Measure 7: Treble staff has eighth-note pairs (A-B, C-D, E-F, G-A), bass staff has eighth notes (F, A, C, E). Measure 8: Treble staff has eighth-note pairs (B-C, D-E, G-A), bass staff has eighth notes (D, G, B).

Musical score for JennifersGigue1. The score continues from measure 7. Measure 7: Treble staff has eighth-note pairs (A-B, C-D, E-F, G-A), bass staff has eighth notes (F, A, C, E). Measures 8-12: Both staves have rests.

JennifersGigue2

Musical score for JennifersGigue2. The score consists of two staves. The top staff is in treble clef and 6/8 time, starting with a quarter note. The bottom staff is in bass clef and 6/8 time, starting with a half note. Measure 13: Treble staff has eighth-note pairs (B-C, D-E, G-A), bass staff has eighth notes (D, G, B). Measures 14-17: Both staves have rests.

JennifersGigue3

Musical score for JennifersGigue3. The score consists of two staves. The top staff is in treble clef and 6/8 time, starting with a quarter note. The bottom staff is in bass clef and 6/8 time, starting with a half note. Measure 17: Treble staff has eighth-note pairs (B-C, D-E, G-A), bass staff has eighth notes (D, G, B). Measures 18-22: Both staves have rests.

21

*8<sup>vb</sup>*

25

(8) [29 sec.]



# Houseboat

see the General Settings at the end of this etude and adjust accordingly  
(and be sure to revert to the defaults when you are done with this one!)

Van Stiefel

**houseboat\_1**

*simile*

1 = 120

7

10/4 *mp*

12/4 *mp*

11

6/4 *mf*

12/4 *mf*

14

10/4 *p*

18/4 *f*

accelerando - - - - -

8/4

houseboat\_2

17 **a tempo**

ff                      f                      mf                      mp

21

houseboat\_3

p                      mp                      f

25

p                      p

28

f                      mf                      f

31

accelerando - - - - -

f

houseboat\_4

33 a tempo

42

houseboat\_5

51

56

(accelerando - - - - -)

?

tune: ▶ 256. number keys recall presets:

global tempo multiplier: ▶ 1. invert sustain pedal:

synchronic gain: ▶ 1. release hammer gain: ▶ 0.05

nostalgic gain: ▶ 2.1 release resonance gain: ▶ 1.

**general settings:** direct gain: ▶ 0.8 GLOBAL GAIN: ▶ 1.

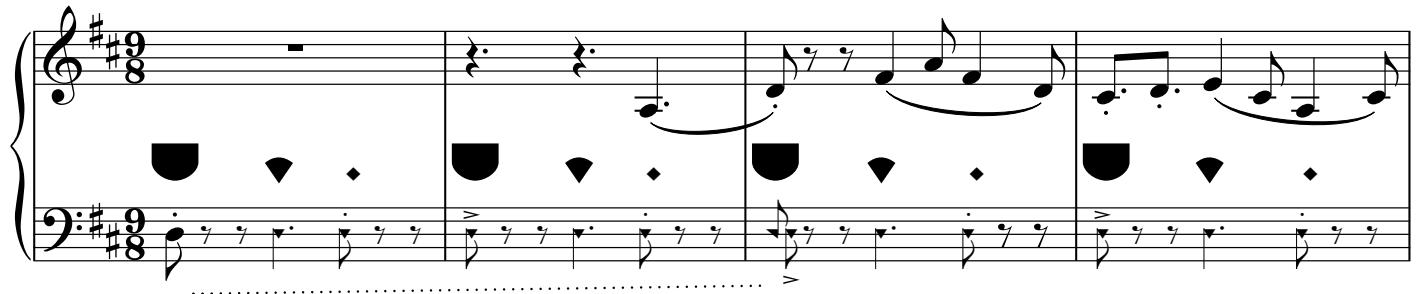
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# Hurra for Josh Q

---

Traditional Norwegian/Dan Trueman

"Telespringar"



symbols indicate different beat length/qualities

5

The continuation of the musical score, starting at measure 5. The pattern of symbols and note heads continues from the previous section, maintaining the 9/8 time signature. The bass staff shows a sustained note followed by a series of eighth and sixteenth notes.

9

The continuation of the musical score, starting at measure 9. The pattern of symbols and note heads continues, showing a transition to a more continuous eighth-note pattern in the bass staff.

14

The continuation of the musical score, starting at measure 14. The pattern of eighth and sixteenth notes continues across the staves, with the bass staff providing harmonic support.

19

A

Musical score for piano, page 19, section A. The score consists of two staves: treble and bass. The treble staff has a key signature of one sharp (F#). The bass staff has a key signature of one sharp (F#). The music starts with eighth-note pairs followed by quarter notes. The bass staff features eighth-note pairs with a fermata over the second note.

23

Musical score for piano, page 23. The score consists of two staves: treble and bass. The treble staff has a key signature of one sharp (F#). The bass staff has a key signature of one sharp (F#). The music continues the pattern of eighth-note pairs and quarter notes, with the bass staff maintaining its eighth-note pairs and fermatas.

27

Musical score for piano, page 27. The score consists of two staves: treble and bass. The treble staff has a key signature of one sharp (F#). The bass staff has a key signature of one sharp (F#). The music introduces a new section with eighth-note pairs and sixteenth-note chords in the treble staff, while the bass staff continues its eighth-note pairs and fermatas.

32

Musical score for piano, page 32. The score consists of two staves: treble and bass. The treble staff has a key signature of one sharp (F#). The bass staff has a key signature of one sharp (F#). The music continues the eighth-note pairs and sixteenth-note chords in the treble staff, with the bass staff maintaining its eighth-note pairs and fermatas.

36

B

Musical score for piano, page 36, section B. The score consists of two staves: treble and bass. The treble staff has a key signature of one sharp (F#). The bass staff has a key signature of one sharp (F#). The music features eighth-note pairs and quarter notes, with the bass staff showing eighth-note pairs and fermatas.

40

Treble staff: eighth note followed by a sixteenth-note grace note, then a eighth-note followed by a sixteenth-note grace note. Bass staff: eighth note followed by a sixteenth-note grace note, then a eighth-note followed by a sixteenth-note grace note.

44

Treble staff: eighth note followed by a sixteenth-note grace note, then a eighth-note followed by a sixteenth-note grace note. Bass staff: eighth note followed by a sixteenth-note grace note, then a eighth-note followed by a sixteenth-note grace note.

48

Treble staff: eighth note followed by a sixteenth-note grace note, then a eighth-note followed by a sixteenth-note grace note. Bass staff: eighth note followed by a sixteenth-note grace note, then a eighth-note followed by a sixteenth-note grace note.

52

Treble staff: eighth note followed by a sixteenth-note grace note, then a eighth-note followed by a sixteenth-note grace note. Bass staff: eighth note followed by a sixteenth-note grace note, then a eighth-note followed by a sixteenth-note grace note.

56

C

Treble staff: eighth note followed by a sixteenth-note grace note, then a eighth-note followed by a sixteenth-note grace note. Bass staff: eighth note followed by a sixteenth-note grace note, then a eighth-note followed by a sixteenth-note grace note.

61

65

69

73

78

**D**

A musical score for piano, featuring two staves. The top staff uses a treble clef and has a key signature of two sharps. The bottom staff uses a bass clef and has a key signature of one sharp. The score consists of four measures. Measure 1: Treble staff has eighth-note pairs (D, E) and (G, A). Bass staff has eighth-note pairs (B, C) and (E, F). Measure 2: Treble staff has eighth-note pairs (D, E) and (G, A). Bass staff has eighth-note pairs (B, C) and (E, F). Measure 3: Treble staff has eighth-note pairs (D, E) and (G, A). Bass staff has eighth-note pairs (B, C) and (E, F). Measure 4: Treble staff has eighth-note pairs (D, E) and (G, A). Bass staff has eighth-note pairs (B, C) and (E, F).

A musical score for piano, featuring two staves. The top staff uses a treble clef and has a key signature of two sharps. The bottom staff uses a bass clef and has a key signature of one sharp. The music consists of measures 86 through 90. Measure 86 starts with a eighth note followed by a sixteenth note. Measures 87-89 feature eighth-note patterns. Measure 90 concludes with a half note followed by a repeat sign and a double bar line.

90

91

92

93

A musical score for piano, showing two staves. The top staff uses a treble clef and has a key signature of two sharps. The bottom staff uses a bass clef and has a key signature of one sharp. The music consists of four measures. Measure 1: Treble staff has eighth-note pairs (B-C, D-E, G-A), bass staff has eighth-note pairs (D-G, B-F). Measure 2: Treble staff has eighth-note pairs (B-C, D-E, G-A), bass staff has eighth-note pairs (D-G, B-F). Measure 3: Treble staff has eighth-note pairs (B-C, D-E, G-A), bass staff has eighth-note pairs (D-G, B-F). Measure 4: Treble staff has eighth-note pairs (B-C, D-E, G-A), bass staff has eighth-note pairs (D-G, B-F).

A musical score for piano, page 10, system 2. The score consists of two staves. The top staff is in treble clef and the bottom staff is in bass clef. Both staves are in common time and A major (two sharps). The music continues from the previous system, showing a series of eighth-note chords and sustained notes.

103 **E**

107

III

synchronic pulse stops, but  
continue with same warped meter

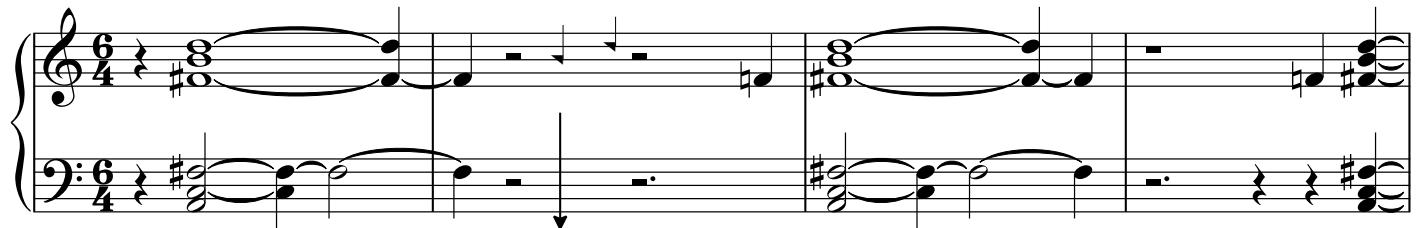
[2 min. 45 sec.]

# Juxtaposed Weather

Louise Fristensky

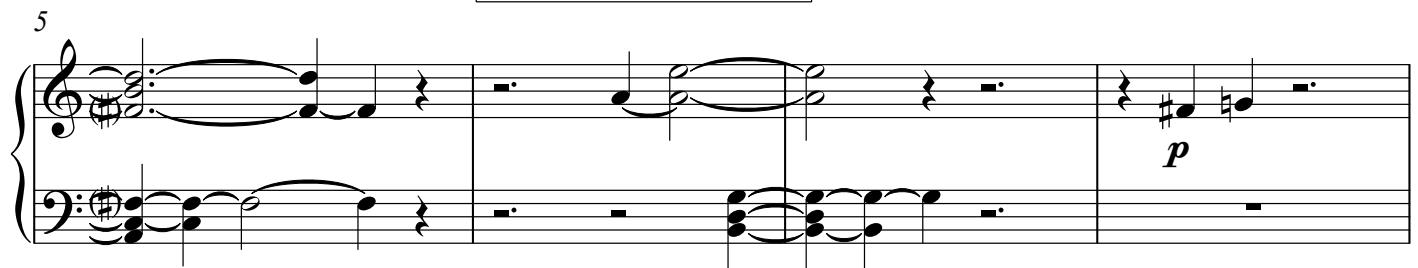
**Allegretto**

$\text{♩} = 96$

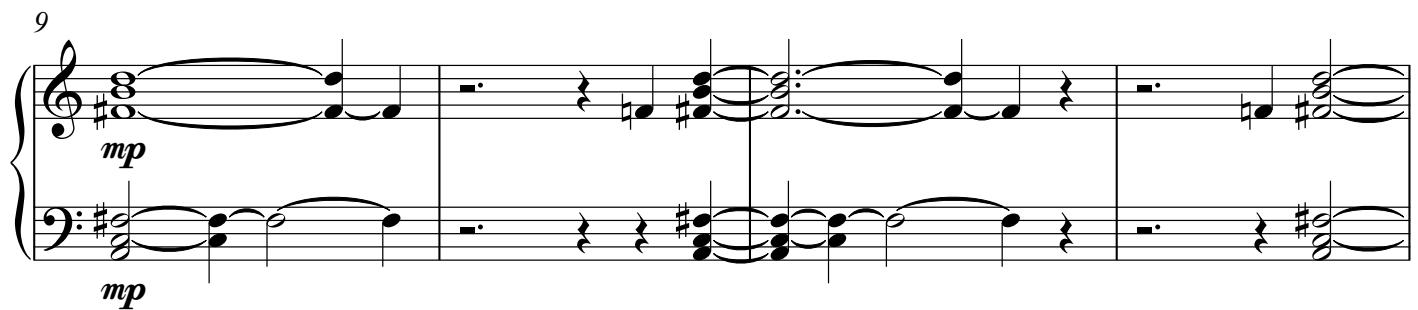


***p***

asynchronous reverse waves;  
don't worry about their metric  
placement



***p***



***mp***



17

*p*

*mp*

*p*

*mp*

21

*mf*

*mp*

25

*mf*

*f*

*mf*

*f*

29

*subito p*

*subito p*

*pp*

*pp*

**Allegretto**  
**accel.**

33

*pp*

**Allegro**

$\text{♩}=126$

*mf*

All notes above F $\sharp$ 5 have  
synchronic repetition

37 
  
 40 
  
 43 
  
 46 
  
 49

52

*pp*

*ppp*

Largo

$\text{♩} = 47$

55 Only the preparations will sound, not the note struck

*8vb pp*

*pp*

*8vb*

*pp*

63

(8)

70

(8)

(8)

[4 min. 28 sec.]

# Keep It Steady

Dan Trueman

14

**D.C. al Coda**

Musical score for measures 14 and the beginning of the Coda. The score consists of three staves: Treble, Bass, and Pedal. The Treble staff has a key signature of one flat. The Bass staff has a key signature of one flat. The Pedal staff has a key signature of one flat. Measure 14 starts with a half note in the Treble staff followed by a half note in the Bass staff. The Pedal staff has a continuous eighth-note pattern. Measures 15 and 16 continue this pattern with some variations in the bass line. Measure 17 begins the Coda section.

19 CODA

Musical score for the Coda section starting at measure 19. The score consists of three staves: Treble, Bass, and Pedal. The Treble staff has a key signature of one flat. The Bass staff has a key signature of one flat. The Pedal staff has a key signature of one flat. The score features a series of eighth-note patterns in the bass and pedal staves, with the treble staff providing harmonic support. Measure 19 starts with a sixteenth-note pattern in the bass staff. Measures 20 and 21 continue this pattern. Measure 22 begins with a sixteenth-note pattern in the bass staff, followed by a change in key signature to one sharp. Measures 23 and 24 continue this pattern.

23

Musical score for measures 23 and 24 of the Coda. The score consists of three staves: Treble, Bass, and Pedal. The Treble staff has a key signature of one flat. The Bass staff has a key signature of one flat. The Pedal staff has a key signature of one flat. The score features a series of eighth-note patterns in the bass and pedal staves, with the treble staff providing harmonic support. Measure 23 starts with a sixteenth-note pattern in the bass staff. Measures 24 and 25 continue this pattern.

[1 min. 35 sec.]

# Keep It Steady (or not)

Dan Trueman

$\text{♩} = 120$

6  
4

*pp*      *f*      *pp*

5

*pp*      *f*      *pp*

9

*pp*

13

8:  
*f*

8:  
*pp*

17

8:  
*f*

8:  
*pp*

21

[1 min. 42 sec.]

---

# Listen!

---

Louise Fristensky

## Ballad

Listen!

♩=42

Musical score for the first section of the Ballad. The score consists of two staves. The top staff is in common time (4/4) and has a key signature of one flat. It features a bassoon line with various note heads and rests, and a piano line below it. Dynamics include *f*, *mp*, and *p*. The bottom staff is also in common time (4/4) and has a key signature of one flat. It shows a bassoon line with rests and a piano line. A section of eighth-note patterns is followed by a repeat sign and the instruction "etc...".

Musical score for the second section of the Ballad, starting at measure 6. The score consists of two staves. The top staff shows a bassoon line with eighth-note patterns and a piano line. The dynamic *mf* is indicated. The bottom staff shows a bassoon line with eighth-note patterns and a piano line. The dynamic *mf* is indicated.

Musical score for the third section of the Ballad, starting at measure 9. The score consists of two staves. The top staff shows a bassoon line with eighth-note patterns and a piano line. The dynamic *mp* is indicated. The bottom staff shows a bassoon line with eighth-note patterns and a piano line. The dynamic *mp* is indicated. A box contains the text "E♯ will trigger a rapid shiver of notes...".

Listen! 2

Musical score for the final section of the Ballad, starting at measure 13. The score consists of two staves. The top staff shows a bassoon line with eighth-note patterns and a piano line. The dynamic *f* is indicated. The bottom staff shows a bassoon line with eighth-note patterns and a piano line. The dynamic *p* is indicated. The tempo is marked as *accel.* and *♩=56*.

17

*p*

*pp*

20

25

28

*p*

[2 min. 30 sec.]

# Mama's Musette

Jennifer Trueman

L.H.

$\text{♩} = 110$

5

9

12

16 Deliberate

[42 sec.]

# Petite Gymnopedie

Jennifer Trueman



8

14

Wait for fade

20

Wait for fade

[47 sec.]

# Pyramids

Caitlin Cawley and Nick Joliat

$\text{♩} = 100$

sustain notes to bracket end

Musical score for Pyramids, page 1, measures 1-5. The score consists of two staves: treble and bass. Measure 1 starts in common time (C). Measure 2 begins with a 3/4 measure followed by a 2/4 measure. Measure 3 starts with a 3/4 measure followed by a 2/4 measure. Measure 4 starts with a 3/4 measure followed by a 2/4 measure. Measure 5 starts with a 3/4 measure followed by a 2/4 measure. Brackets group notes together, and arrows indicate sustained notes.

so in this first case, all the notes, beginning with the middle-C, should be sustained through the first beat of measure 2, and all five notes will be released together.

Reversed notes should lock in metrically with forward notes; however, within that constraint, tempo and meter can be flexible.

Musical score for Pyramids, page 1, measures 6-10. The score consists of two staves: treble and bass. Measure 6 starts with a 3/4 measure followed by a 2/4 measure. Measure 7 starts with a 3/4 measure followed by a 2/4 measure. Measure 8 starts with a 3/4 measure followed by a 2/4 measure. Measure 9 starts with a 3/4 measure followed by a 2/4 measure. Measure 10 starts with a 3/4 measure followed by a 2/4 measure. Brackets group notes together, and arrows indicate sustained notes.

Musical score for Pyramids, page 1, measures 11-15. The score consists of two staves: treble and bass. Measure 11 starts with a 3/4 measure followed by a 2/4 measure. Measure 12 starts with a 3/4 measure followed by a 2/4 measure. Measure 13 starts with a 3/4 measure followed by a 2/4 measure. Measure 14 starts with a 3/4 measure followed by a 2/4 measure. Measure 15 starts with a 3/4 measure followed by a 2/4 measure. Brackets group notes together, and arrows indicate sustained notes. The instruction "slower, rubato" is written above the staff.

Musical score for Pyramids, page 1, measures 16-20. The score consists of two staves: treble and bass. Measure 16 starts with a 3/4 measure followed by a 2/4 measure. Measure 17 starts with a 3/4 measure followed by a 2/4 measure. Measure 18 starts with a 3/4 measure followed by a 2/4 measure. Measure 19 starts with a 3/4 measure followed by a 2/4 measure. Measure 20 starts with a 3/4 measure followed by a 2/4 measure. Brackets group notes together, and arrows indicate sustained notes. The instruction "8va" is written above the staff.

[51 sec.]

# Quickie

Louise Fristensky

**Andante**

$\text{♩} = 76$  *freely*

Synchrone repetition for 3 pulses, arhythmic

5

6

7

8

(8)

9

3

5

11

10

(8)

3

6 6 6

*8va*

6 6 6 6

11 (8)

6 6 6

6 6 6

14

rall.

5

16

*mp*

*p*

[1 min. 30 sec.]

# Scales within Sliding Scales

Dan Trueman

**=80** (or half that, for slow practice)

Musical score for measures 1-3. The score consists of two staves: treble and bass. The treble staff has a key signature of one sharp (F#) and a time signature of common time (4/4). The bass staff has a key signature of one sharp (F#) and a time signature of common time (4/4). Measure 1 starts with a single note followed by a sixteenth-note scale pattern. Measures 2 and 3 continue this pattern.

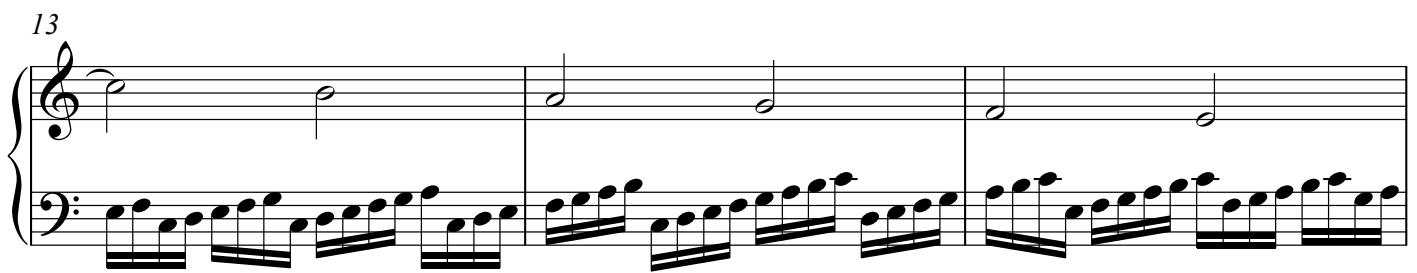
NOTE: playing one of the F#s on either side of middle-C will reset the tuning.  
Also, playing a single note by itself will silence the synchronic pulse

Musical score for measures 4-6. The score consists of two staves: treble and bass. The treble staff has a key signature of one sharp (F#) and a time signature of common time (4/4). The bass staff has a key signature of one sharp (F#) and a time signature of common time (4/4). Measure 4 starts with a single note followed by a sixteenth-note scale pattern. Measures 5 and 6 continue this pattern.

Musical score for measures 7-9. The score consists of two staves: treble and bass. The treble staff has a key signature of one sharp (F#) and a time signature of common time (4/4). The bass staff has a key signature of one sharp (F#) and a time signature of common time (4/4). Measure 7 starts with a single note followed by a sixteenth-note scale pattern. Measures 8 and 9 continue this pattern.

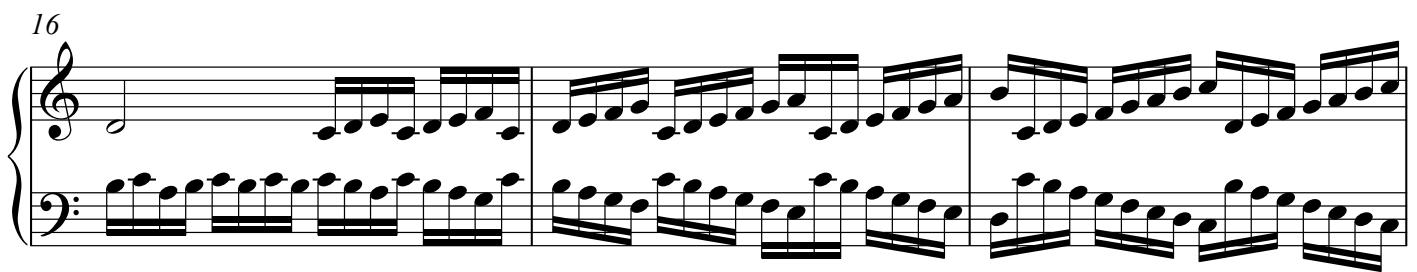
Musical score for measures 10-12. The score consists of two staves: treble and bass. The treble staff has a key signature of one sharp (F#) and a time signature of common time (4/4). The bass staff has a key signature of one sharp (F#) and a time signature of common time (4/4). Measure 10 starts with a single note followed by a sixteenth-note scale pattern. Measures 11 and 12 continue this pattern.

13



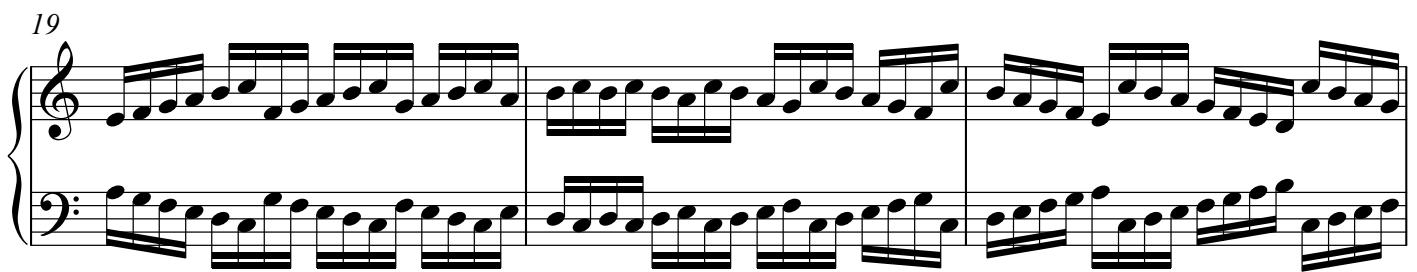
Musical score page 13. The top staff shows a treble clef, a key signature of one sharp, and a common time signature. The bottom staff shows a bass clef, a key signature of one sharp, and a common time signature. The music consists of a single measure followed by a repeat sign, then a measure of two eighth notes.

16



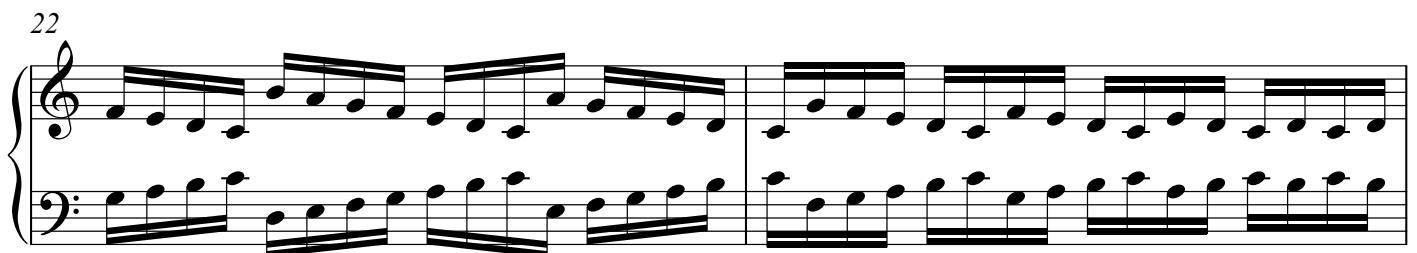
Musical score page 16. The top staff shows a treble clef, a key signature of one sharp, and a common time signature. The bottom staff shows a bass clef, a key signature of one sharp, and a common time signature. The music consists of a single measure followed by a repeat sign, then a measure of sixteenth-note patterns.

19



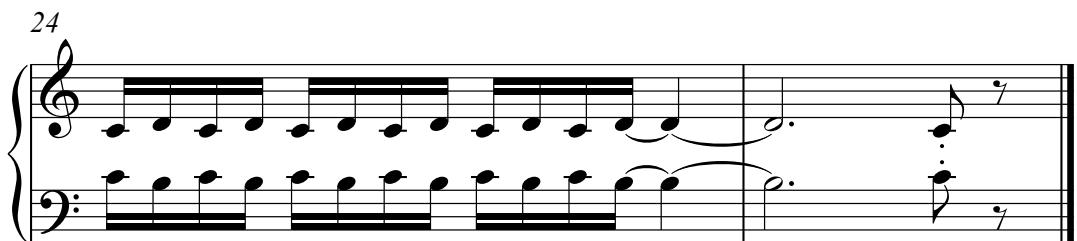
Musical score page 19. The top staff shows a treble clef, a key signature of one sharp, and a common time signature. The bottom staff shows a bass clef, a key signature of one sharp, and a common time signature. The music consists of a single measure followed by a repeat sign, then a measure of sixteenth-note patterns.

22



Musical score page 22. The top staff shows a treble clef, a key signature of one sharp, and a common time signature. The bottom staff shows a bass clef, a key signature of one sharp, and a common time signature. The music consists of a single measure followed by a repeat sign, then a measure of sixteenth-note patterns.

24



Musical score page 24. The top staff shows a treble clef, a key signature of one sharp, and a common time signature. The bottom staff shows a bass clef, a key signature of one sharp, and a common time signature. The music consists of a single measure followed by a repeat sign, then a measure of sixteenth-note patterns.

[1 min. 15 sec.]



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# Slow To Come Back

---

SlowToComeBack1

Brooks Frederickson

$\text{♩} = 100$

*pp*

1

4

7

9

11

13

15

17

*trigger note*

A

SlowToComeBack1.1

19

22

25

27

29

31

33

35

*trigger note*

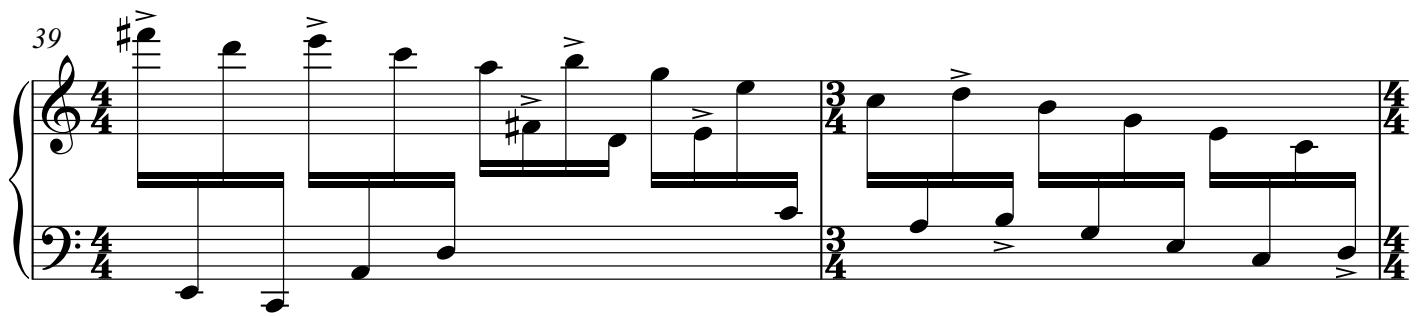
**B**

SlowToComeBack2

37

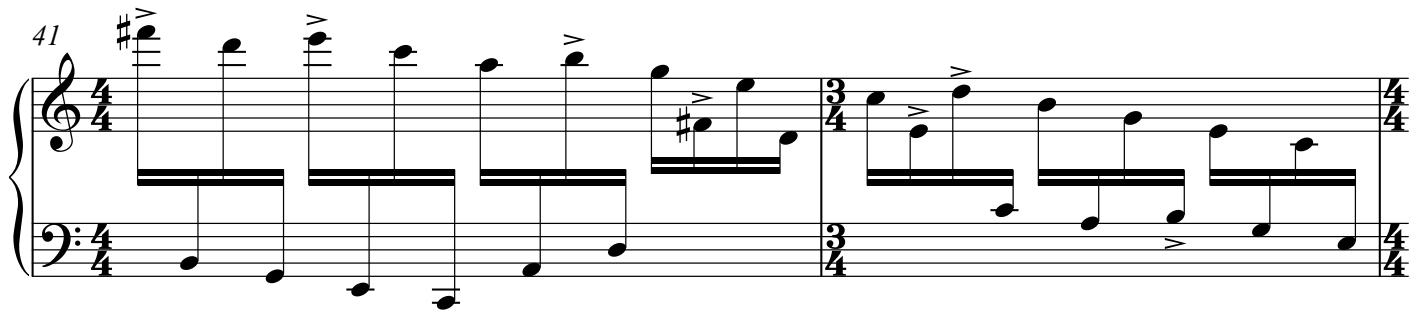
**p**

39



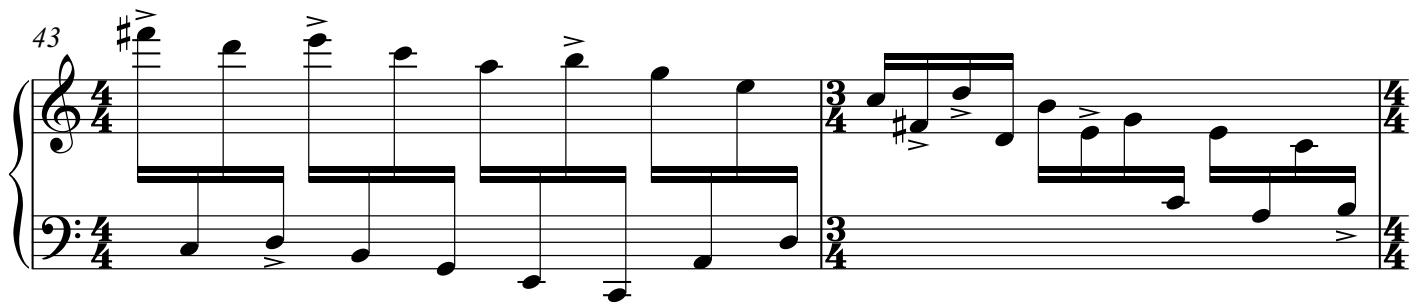
Musical score page 39. The key signature is one sharp. The time signature starts at 4/4, changes to 3/4, then back to 4/4. The melody consists of eighth and sixteenth notes, with dynamic markings like > and >>. The bass line provides harmonic support.

41



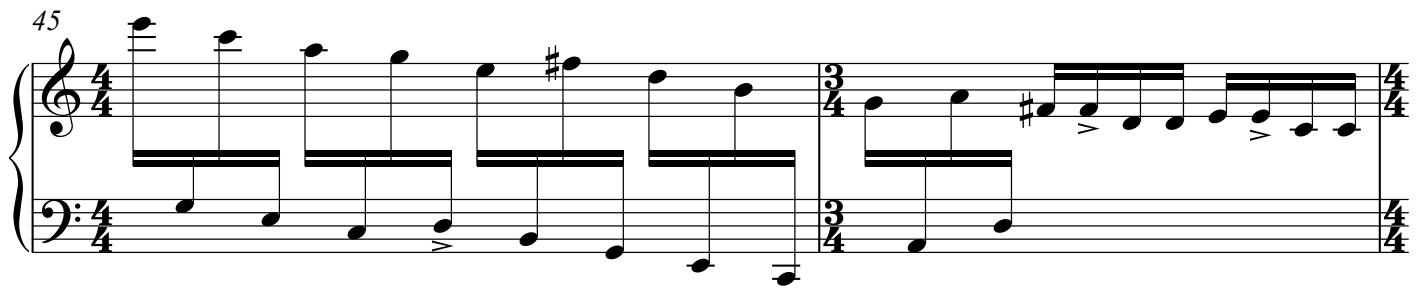
Musical score page 41. The key signature remains one sharp. The time signature changes between 4/4 and 3/4. The melody continues with eighth and sixteenth notes, maintaining the dynamic markings from the previous page.

43



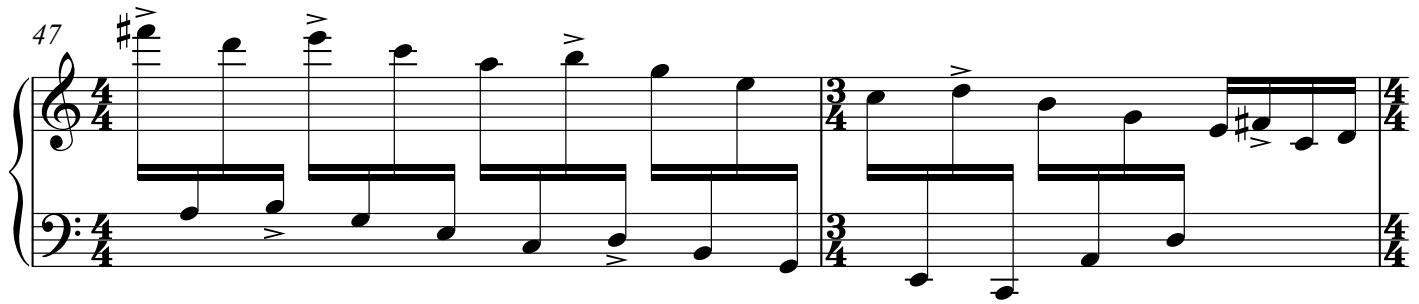
Musical score page 43. The key signature remains one sharp. The time signature changes between 4/4 and 3/4. The melody and bass line continue with the established pattern of eighth and sixteenth notes.

45



Musical score page 45. The key signature changes to two sharps. The time signature changes between 4/4 and 3/4. The melody becomes more complex, featuring sixteenth-note patterns and grace notes, while the bass line provides harmonic support.

47



Musical score page 47. The key signature remains two sharps. The time signature changes between 4/4 and 3/4. The melody continues with sixteenth-note patterns and grace notes, with the bass line providing harmonic support.

49

*trigger note*

C

51 SlowToComeBack3

53

[1 min. 52 sec.]

# Southwing

Lainie Fefferman

**Tempo can be fluid  
Hover around  $\frac{1}{8}$  note = 60**

The sheet music consists of five staves of piano music. Staff 1 starts with a single eighth note followed by a sixteenth-note pattern. Staff 2 begins with a sixteenth-note pattern. Staff 3 begins with a sixteenth-note pattern. Staff 4 begins with a sixteenth-note pattern. Staff 5 begins with a sixteenth-note pattern. Each staff concludes with a fermata over the last note. Measure numbers 1, 2, 3, 4, and 5 are placed above their respective staves. Measure numbers 1, 2, 3, 4, and 5 are placed above their respective staves. Measure numbers 1, 2, 3, 4, and 5 are placed above their respective staves. Measure numbers 1, 2, 3, 4, and 5 are placed above their respective staves.

Pause until  
low A is  
inaudible

7

Treble staff:  $\begin{array}{cccccc} \text{---} & \text{---} & \text{---} & \text{---} & \text{---} & \text{---} \\ | & | & | & | & | & | \\ \text{---} & \text{---} & \text{---} & \text{---} & \text{---} & \text{---} \end{array}$

Bass staff:  $\text{---}$

8

Treble staff:  $\begin{array}{cccccc} \text{---} & \text{---} & \text{---} & \text{---} & \text{---} & \text{---} \\ | & | & | & | & | & | \\ \text{---} & \text{---} & \text{---} & \text{---} & \text{---} & \text{---} \end{array}$

Bass staff:  $\text{---}$

9

Treble staff:  $\begin{array}{cccccc} \text{---} & \text{---} & \text{---} & \text{---} & \text{---} & \text{---} \\ | & | & | & | & | & | \\ \text{---} & \text{---} & \text{---} & \text{---} & \text{---} & \text{---} \end{array}$

Bass staff:  $\text{---}$

10

Treble staff:  $\begin{array}{cccccc} \text{---} & \text{---} & \text{---} & \text{---} & \text{---} & \text{---} \\ | & | & | & | & | & | \\ \text{---} & \text{---} & \text{---} & \text{---} & \text{---} & \text{---} \end{array}$

Bass staff:  $\text{---}$

11

Treble staff:  $\begin{array}{cccccc} \text{---} & \text{---} & \text{---} & \text{---} & \text{---} & \text{---} \\ | & | & | & | & | & | \\ \text{---} & \text{---} & \text{---} & \text{---} & \text{---} & \text{---} \end{array}$

Bass staff:  $\text{---}$

12

3 3 3

3 3 3

3 3 3

3 3 3

3 3 3

13

3 3 3

3 3 3

3 3 3

3 3 3

3 3 3

14

3 3 3

3 3 3

3 3 3

3 3 3

3 3 3

15

3 3 3

3 3 3

3 3 3

3 3 3

3 3 3

16

3 3 3

3 3 3

3 3 3

3 3 3

3 3 3

A page of sheet music for piano, featuring two staves. The top staff uses a treble clef and the bottom staff uses a bass clef. Measure numbers 17 through 22 are indicated above each measure. The music consists of eighth-note patterns primarily on the black keys of the piano. Measure 17 starts with a dotted half note in the bass. Measures 18 and 19 begin with quarter notes in the bass. Measures 20 and 21 start with half notes in the bass. Measure 22 concludes with a half note in the bass followed by a fermata over the next measure.

[1 min. 12 sec.]

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# "Who do you think you are, Mars?"

for Dan Trueman and Adam Sliwinski

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Brooks Frederickson

$\text{♩}=160$  never rushed, with much legato

Musical score for measures 1-4. The music is in 4/4 time. The treble clef is on the top line, and the bass clef is on the bottom line. The key signature is A major (no sharps or flats). The tempo is indicated as  $\text{♩}=160$ . The dynamic is *mf*. The melody consists of eighth-note patterns. Measure 1: Treble: three eighth notes grouped by a brace. Bass: two eighth notes. Measure 2: Treble: three eighth notes grouped by a brace. Bass: two eighth notes. Measure 3: Treble: three eighth notes grouped by a brace. Bass: two eighth notes. Measure 4: Treble: three eighth notes grouped by a brace. Bass: two eighth notes.

Musical score for measures 5-9. The music continues in 4/4 time. The treble clef is on the top line, and the bass clef is on the bottom line. The key signature changes to E major (one sharp). The melody remains consistent with eighth-note patterns. Measure 5: Treble: three eighth notes grouped by a brace. Bass: two eighth notes. Measure 6: Treble: three eighth notes grouped by a brace. Bass: two eighth notes. Measure 7: Treble: three eighth notes grouped by a brace. Bass: two eighth notes. Measure 8: Treble: three eighth notes grouped by a brace. Bass: two eighth notes. Measure 9: Treble: three eighth notes grouped by a brace. Bass: two eighth notes.

Musical score for measures 10-14. The music continues in 4/4 time. The treble clef is on the top line, and the bass clef is on the bottom line. The key signature changes to C major (no sharps or flats). The melody includes eighth-note patterns and some sixteenth-note patterns. Measure 10: Treble: three eighth notes grouped by a brace. Bass: two eighth notes. Measure 11: Treble: three eighth notes grouped by a brace. Bass: two eighth notes. Measure 12: Treble: three eighth notes grouped by a brace. Bass: two eighth notes. Measure 13: Treble: three eighth notes grouped by a brace. Bass: two eighth notes. Measure 14: Treble: three eighth notes grouped by a brace. Bass: two eighth notes.

Musical score for measures 15-19. The music continues in 4/4 time. The treble clef is on the top line, and the bass clef is on the bottom line. The key signature changes to G major (one sharp). The melody includes eighth-note patterns and some sixteenth-note patterns. Measure 15: Treble: three eighth notes grouped by a brace. Bass: two eighth notes. Measure 16: Treble: three eighth notes grouped by a brace. Bass: two eighth notes. Measure 17: Treble: three eighth notes grouped by a brace. Bass: two eighth notes. Measure 18: Treble: three eighth notes grouped by a brace. Bass: two eighth notes. Measure 19: Treble: three eighth notes grouped by a brace. Bass: two eighth notes.

20

Measures 20-24: Treble staff has eighth-note pairs (3) over five measures. Bass staff has eighth-note chords (3) over five measures.

25

Measures 25-29: Treble staff has eighth-note pairs (3) over five measures. Bass staff has eighth-note chords (3) over five measures.

30

Measures 30-34: Treble staff has eighth-note pairs (3) over five measures. Bass staff has eighth-note chords (3) over five measures. Dynamic: ***pp***

**B**

35

Measures 35-39: Treble staff has sixteenth-note pairs (3) over five measures. Bass staff has eighth-note chords (3) over five measures. Dynamic: ***mf***

Nostalgic return

Measures 40-44: Treble staff has sixteenth-note pairs (3) over five measures. Bass staff has eighth-note chords (3) over five measures. Dynamics: Nostalgic return, ***sim.***

40

45

**C**

49

53

57

62

66

***pp***

[1 min. 43 sec.]

# Worm

"Worm" means that notated rhythms only indicate when to attack each note and that you should hold each note as long as possible, until you need the finger in use to play another note.  
"Ord." turns this direction off.

Gideon Broshy

The musical score consists of four staves of piano music. Staff 1 (measures 1-7) starts at  $\text{♩} = 92$  with dynamic *mf*. It includes a "Worm" instruction with an arrow pointing right, indicating sustained notes. Staff 2 (measures 8-12) starts at  $\text{♩} = 112$  with dynamic *f*, followed by an "Ord." instruction. Staff 3 (measures 13-17) starts at  $\text{♩} = 92$  with dynamic *rit.*, followed by an "Ord." instruction. Staff 4 (measures 18-22) starts at  $\text{♩} = 92$  with dynamic *mp*, followed by an "Ord." instruction. The score uses various rhythmic patterns, including eighth and sixteenth notes, and includes measure numbers 1, 8, 13, and 18.

23 *accel.*

This section consists of five measures. The treble staff has eighth-note patterns with slurs and grace notes. The bass staff has eighth-note patterns with slurs and grace notes. Measure 23 starts with a forte dynamic.

28

This section consists of five measures. The treble staff has eighth-note patterns with slurs and grace notes. The bass staff has eighth-note patterns with slurs and grace notes. Measure 28 starts with a forte dynamic.

33

$\text{♩} = 144$

*ff*

This section consists of five measures. The treble staff has eighth-note patterns with slurs and grace notes. The bass staff has eighth-note patterns with slurs and grace notes. Measures 33-37 include dynamics *ff* and  $\text{♩} = 144$ .

36

This section consists of five measures. The treble staff has sixteenth-note patterns with slurs and grace notes. The bass staff has sixteenth-note patterns with slurs and grace notes.

38

6

40

6 6 6

42

rit..

44

6 6 6 6 6 6 6 6

46

48

Ord.

50  $\text{♩} = 92$  rit.

55

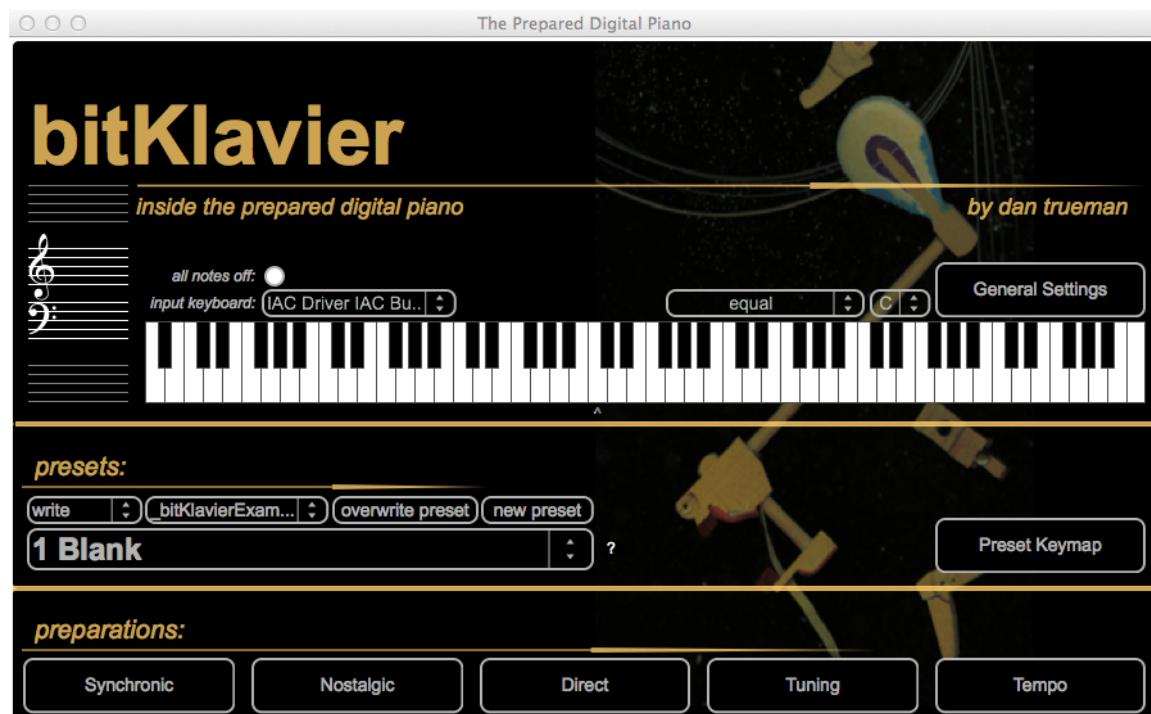
[2 min. 18 sec.]

# Technical Notes

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## The Thing Itself:

...consists of a MIDI piano-style keyboard controller—a nice one ideally, that feels good under the hands—attached to a Mac computer (circa 2010 or later) running custom software (*bitKlavier*) with the digital “preparations.” (as of this writing, and iPad version of the software is near completion, and a Windows version is under development.) Speaker setup and so on is left to the performer, but it should sound great! In performance, it should also look great, and care should be taken to conceal wires and minimize the “techie” appearance of things. I also imagine these being played solitary, through headphones.



## The Main Screen:

...pictured above shows the main keyboard, and gives the player options to set the controller input and the tuning (described later) for the primary notes played. Below that is the Presets menu, where presets can be loaded, stored, and saved to disc. *Note that if you “re-store” or create a “new preset” those then need to be “saved” to disc if you want to be able to use them after quitting the application.*

For people only playing the instrument (as opposed to creating new preparations and presets), this window (and specifically the controller input menu and the preset menu) will be all you ever have to deal with!

For those interested in creating or simply looking at the various presets and preparations, the remaining buttons on this screen open additional screens for “preparing” the digital piano.

Note that the little ? buttons open help screens with this information.

### Synchronic Preparations:

This preparation began in the piece *120bpm*, from *neither Anvil nor Pulley*, that I composed for So Percussion. In that piece, the phase of a digital metronomic click is reset by striking a wood-block that the computer is listening to. Put another way: the metronome goes non-stop, clicking every 500ms, but every time the wood-block is struck, the count-down to the next click is reset to 500ms. I have found this almost inanely simple (though perhaps no more inane than putting a screw between a pair of piano strings) “machine” to be remarkably inspiring.

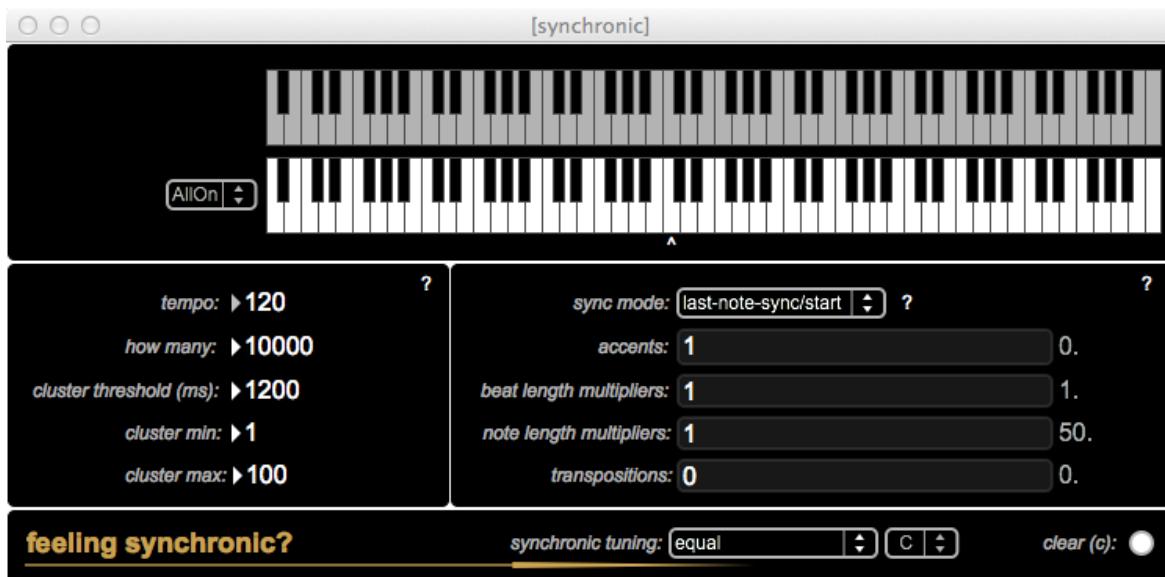


Figure 1: Synchronic Settings

The synchronic piano is similar except that instead of a click, the metronome sounds the most recent piano notes played. Playing the piano resets the phase, and any notes struck within a given “cluster threshold” are gathered and struck on every tick of the “metronome.” The whole keyboard can function this way, or particular keys can be selected to be “synchronic.”

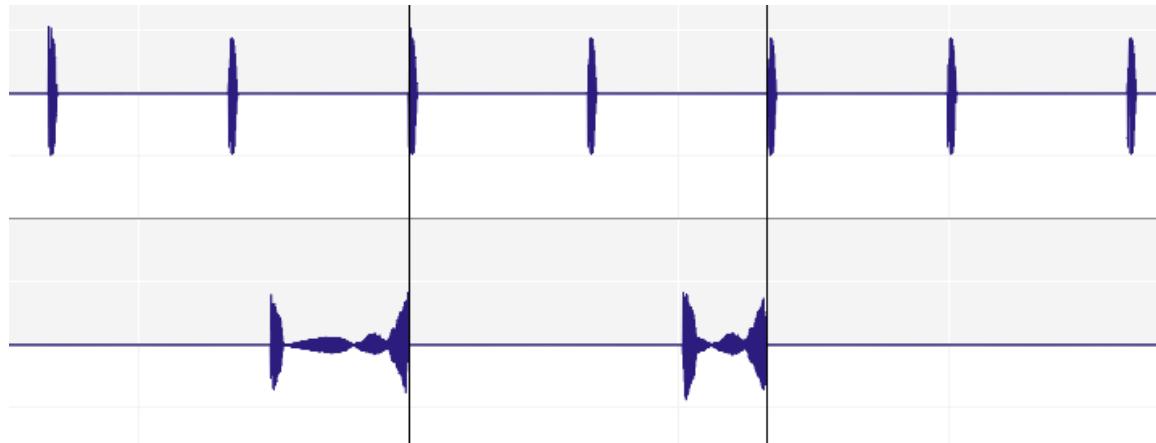
The keyboard second from the top of Figure 1 is where the synchronic “keymap” can be setup, turning on/off the synchronic behavior for those keys (the top keyboard shows what notes are currently being held on the controller, for reference). Preparations can apply to the entire keyboard, or (as in this example) only to specific keys (highlighted in yellow here). Other things in Figure 1:

- **how many**: how many metronome cycles to play before stopping
- **cluster threshold (ms)**: how close notes need to be played together to be included in the metronome “cluster”
- **cluster minimum/maximum**: minimum (or maximum) number of notes to be played within that threshold to create a metronome (so, in this example, playing a single note will effectively silence the metronome — very handy)
- **synchronic tuning/fundamental**: more on tunings later, but this sets the tuning system for the metronome notes
- **sync mode**: determines how the syncing is triggered:
  - *last-note-sync/start*: the *last* note in the cluster within the threshold sync the metronome
  - *first-note-sync*: the *first* note in the cluster within the threshold sync the metronome
  - *note-off-sync*: each note off syncs the metronome
  - *note-off-start*: like *note-off-sync*, except the metronome starts just as the note is released, as opposed to one cycle later
  - *first-note-start*: like *first-note-sync*, except the metronome starts when the note is struck, rather than one cycle later
- **tempo**: sets the tempo, in bpm, for the metronome
- **accents**: defines a sequence of accents for the metronome to cycle through
- **beat length multipliers**: multiplies the basic time difference between metronome clicks (the *inter-onset-interval*, or IOI). In this example, the single value essentially speeds up the tempo of the metronome, while other examples (like preset “Etude7-2”) go through a sequence of values, essentially warping the meter.

- **note length multipliers:** multiplies the base length of each metronome note, so some can be longer than others.

### Nostalgic Preparations:

This preparation also began in *120bpm* from *neither Anvil nor Pulley*. In *120bpm*, metal pipes are struck and sampled live by the computer.



**Figure 2: Example Nostalgic Preparation**

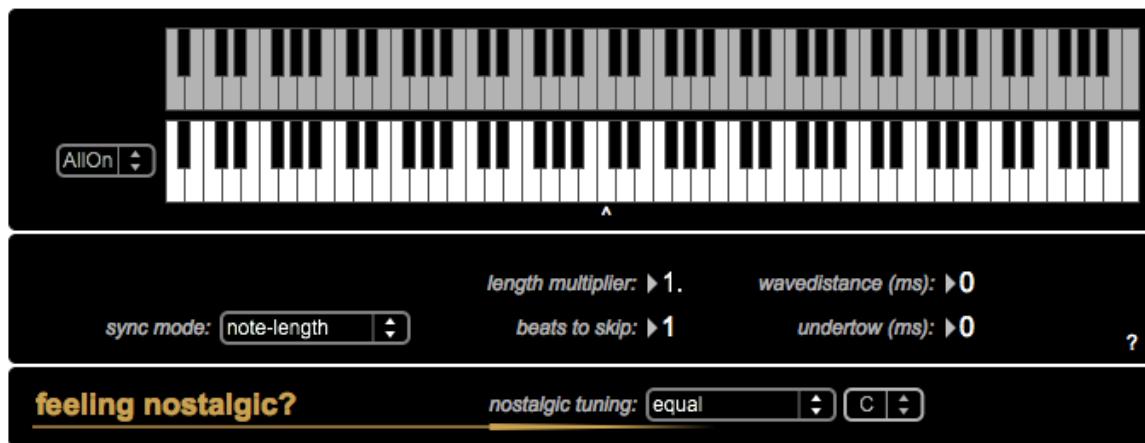
When the computer hears that a pipe has been struck, it notes how much time needs to pass until the next metronome click, then it waits (while sampling the pipe) until *half* that time has passed, and then begins playing the newly sampled pipe backwards so that it reaches its attack in sync with the next click. The effect of this is a reverse delay that is shaped and constrained by the prevailing metronome pulse.

In Figure 2, the top channel shows the metronome pulses, while the bottom channel shows two different pipe strikes, placed at different time locations between pulses, and then the reverse of that strike, peaking at the subsequent metro pulse.

As with the synchronic settings, the nostalgia can be limited to particular pitches, as set with the keyboard second from the top of Figure 3 (in this example, all the keys are prepared). Other nostalgic parameters include:

- **length multiplier:** stretches (or compresses) the nostalgia relative to the expected time (set by played note length, so this only works when *the sync mode* is set to “note length;” see below)

- **beats to skip:** rather than reversing to the next click, skip some before peaking (only works when sync mode is set to “synchronous”)
- **nostalgic tuning:** tuning for the nostalgic notes; again, more on this later
- **sync mode:** determines how to time the nostalgic notes
  - *synchronic:* as described above, time the nostalgic notes so they peak with the metronome pulses
  - *note-length:* the length of the nostalgic notes are set by how long the original notes are actually played; so this is completely decoupled from the synchronic metronome pulse
- **wave distance (ms):** when this is non-zero, the nostalgic note peaks a given time short of its attack, and then reverses direction, now moving forward for a certain amount of time (set by undertow). This has the effect of smoothing out the peaks, giving a swell rather than an attack
- **undertow (ms):** as just described, this determines how long to continue forward in the live sample after peaking



**Figure 3: Nostalgic Settings**

### Direct Preparations:

This preparation is (for the moment) dead simple; highlighted notes will not sound when they are played, though their preparations *will* activate; this is surprisingly useful. This preparation is in part inspired by Ligeti’s *Touches Bloquées* étude.

## Tuning:

In addition to equal temperament, this piano uses two tunings that I began working with in *Justice Partial*, a piece I composed for the Kalamazoo Laptop Orchestra and two Disklaviers. The *just* tuning is a conventional just-intonation temperament, while the *partial* tuning is based in part on intervals drawn from the overtone series:

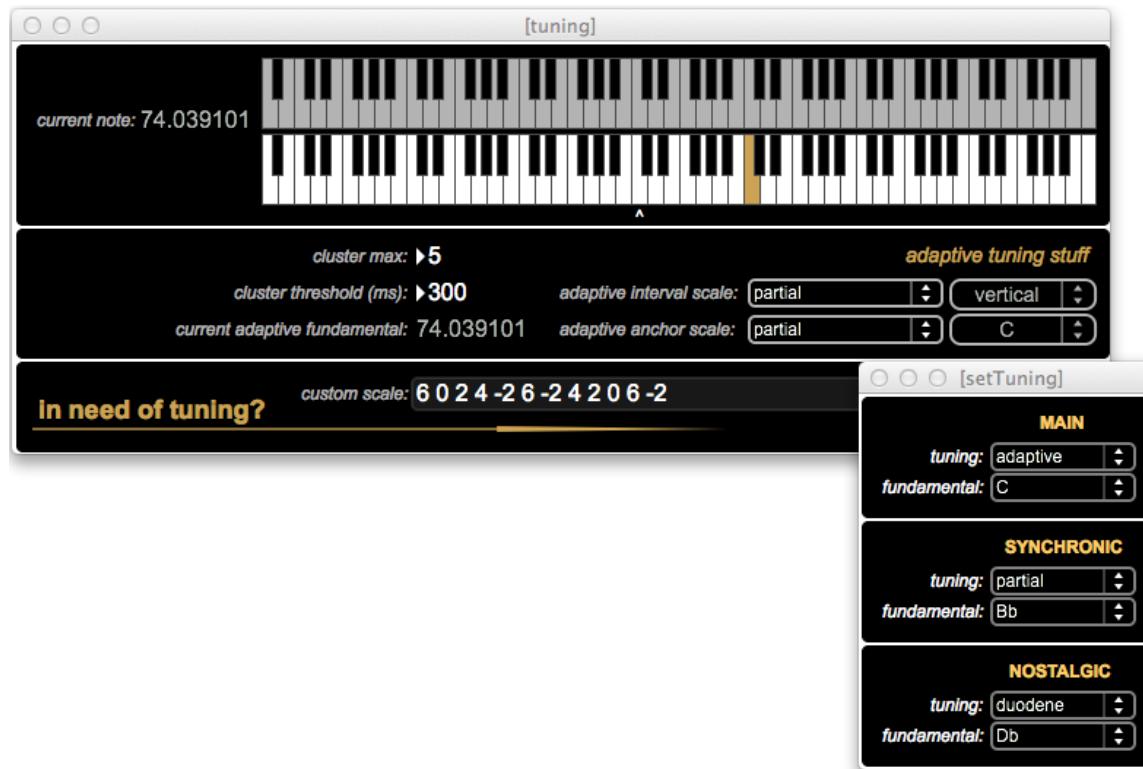
Partial Tuning				Just Tuning		
Pitch	Frequency	Ratio	Cents from ET	Frequency	Ratio	Cents from ET
G#	<b>806.67</b>	<b>11/6</b>	<b>-51</b>	<b>825</b>	<b>15/8</b>	<b>-12</b>
G	770	7/4	-31	770	7/4	-31
F#	733.33	5/3	-16	733.33	5/3	-16
F	<b>715</b>	<b>13/8</b>	<b>+41</b>	<b>704</b>	<b>8/5</b>	<b>+14</b>
E	660	3/2	+02	660	3/2	+02
D#	<b>605</b>	<b>11/8</b>	<b>-49</b>	<b>616</b>	<b>7/5</b>	<b>-17</b>
D	586.33	4/3	-03	586.33	4/3	-03
C#	550	5/4	-14	550	5/4	-14
C	<b>513.33</b>	<b>7/6</b>	<b>-33</b>	<b>528</b>	<b>6/5</b>	<b>+16</b>
B	495	9/8	+04	495	9/8	+04
Bb	469.33	16/15	+12	469.33	16/15	+12
A	440	1/1	0	440	1/1	0

**Figure 4: The Partial and Just Tunings, A Fundamental**

These tunings are variously inspired. The most direct inspiration is from a recording of the Norwegian bridal march *Bruremarsj fra Engerdal* by Sven Nyus, the first Norwegian fiddle tune I ever learned. In particular, the 6<sup>th</sup> (F/A) is usually somewhere between and major and minor-6<sup>th</sup>, sounding similarly to the 13<sup>th</sup> partial; an awesome sound. He sometimes at the ends of phrases lets this rise up slightly to a just-tuned major-6<sup>th</sup>—glorious difference tones!—and occasionally lets it sink to a just-tuned minor-6<sup>th</sup>. This was the starting point for building these two scales, and why they are so named. In Hardanger fiddle music, I often hear the major-7<sup>th</sup> tuned quite flat (11/6 sounds like the closest ratio to what I often hear, and I've chosen to use ratios of some sort for all these intervals), and similarly, the raised 4<sup>th</sup>—giving the

Hardanger music its characteristic “Lydian” sound—is not *so* raised (it also sounds a bit flat, to equal-tempered ears). While I am not typically drawn to number games in music, there is a certain symmetry to the way this D# is mirrored by the “partial” F around the perfect 5<sup>th</sup> E (11/8 : 12/8 : 13/8), and for that reason, I chose to tune the minor-3<sup>rd</sup> C similarly symmetrical to the previously described “flat” major-7<sup>th</sup> (7/6 : 9/6 : 11/6). I love the way these two scales sound relative to one another; the qualities of the 6ths and minor-3rds in particular are vivid, and it’s not hard to start hearing voice leading patterns between them.

Partial tuning is probably not the best name for this tuning, as it is not consistently based on overtones (“bruremarsj tuning” or “fiddle tuning” might be better, I suppose), but it is the name I’ve used for some time now and I feel stuck with it.



**Figure 5: Tuning Settings**

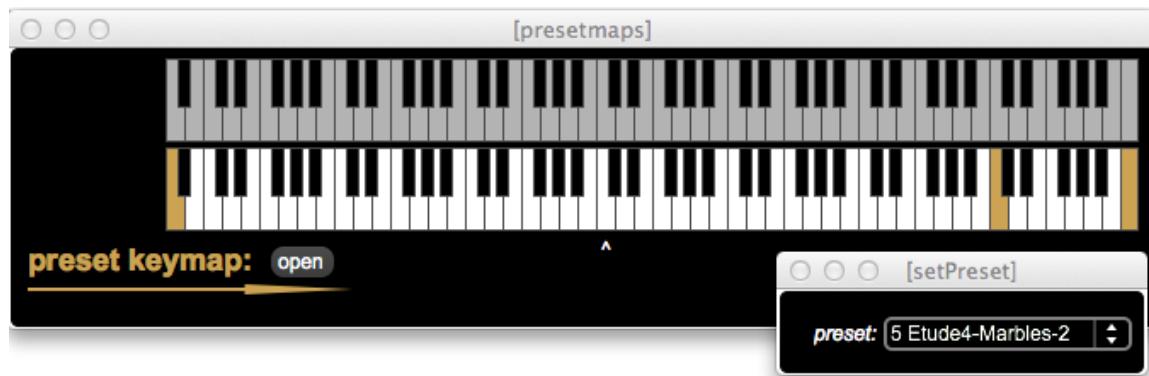
These tunings can be set independently for the played piano notes, the synchronic notes, and the nostalgic notes. They can also change on the fly, depending on the notes played, with the “tuning keymap” (see Figure 5).

When notes in the keymap keyboard are selected, a dialog box opens to set what tuning and fundamental to switch to when that note is actually played.

In addition to the partial, just, and equal-tempered tuning, we have two *adaptive* tunings, tuning which change as you play, endeavoring to make every interval just-tuned with its predecessor. This will naturally cause some drift (something I find musically quite enticing), so the *adaptive\_anchored* tuning will fix the note given by the fundamental to an equal-tempered frequency. You can, of course, invent your own anchorings and modifications of this through using the tuning keymap. There are also a handful of additional tunings, and a simple way to enter a *custom scale*.

### Presets:

All of these settings can be saved as presets and then recalled using the main pulldown menu (see Figure 6). For each of the Etudes, an initial preset is specified in the score that the player should select before beginning.

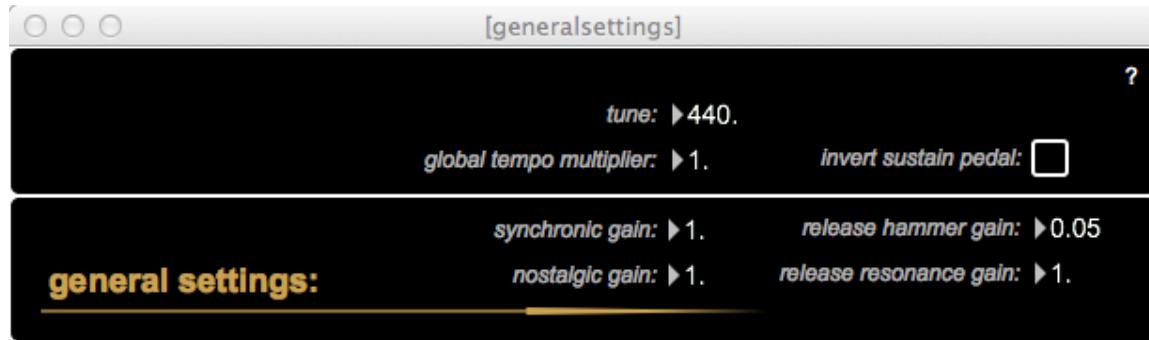


**Figure 6: Presets**

However, as with tuning, there is also a preset keymap, so specific keys can call up new presets. This is leveraged in many of the Etudes (#4 and #7, for instance). The player doesn't have to worry about these changes as they are composed into the piece; however, when practicing in the middle of one of the Etudes, it will be important to choose the correct preset for that moment (preset changes are indicated in the score, so it should be possible to find the needed preset).

## General Settings:

Here the piano's main frequency (for A) can be set, and a global tempo multiplier can be set you want all the presets to scale in tempo (this can be useful for practice, or if you prefer to perform some of the etudes faster or slower than the presets are composed for, without having to revise all the presets).



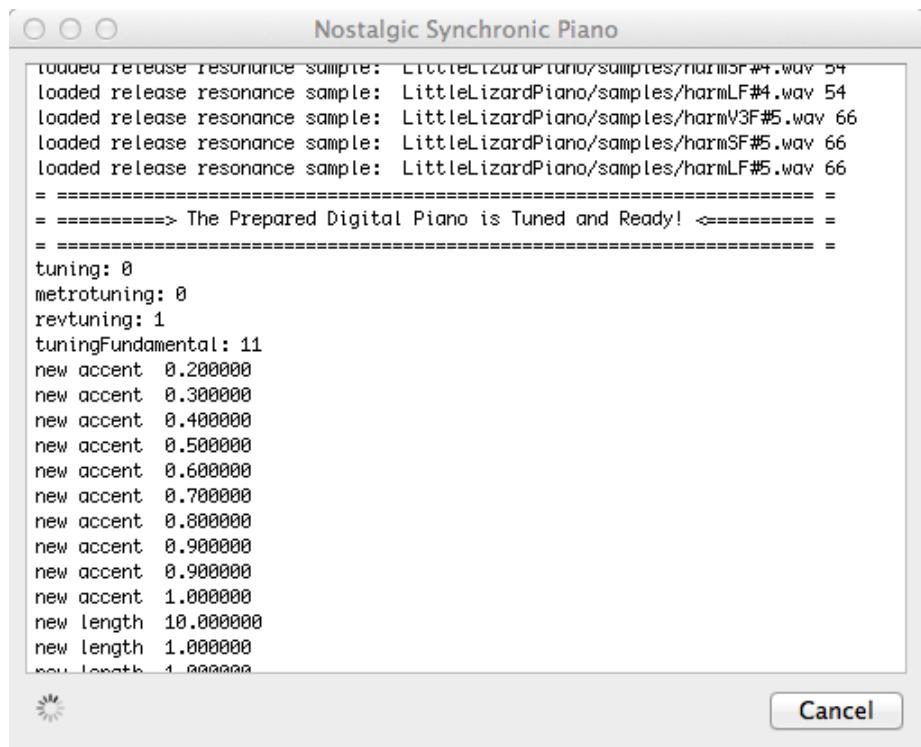
**Figure 7: General Settings**

The relative gains of the synchronic and nostalgic preparations can be adjusted here as well, if they seem too loud or soft for a particular situation (again, setting them here means you don't have to revise all the presets), as can the samples for the hammer releases and release resonances (if you don't know what these are, turn them up high and explore the low keys on the keyboard).

Finally, some MIDI controllers seem to invert the sustain pedal signal, resulting in all notes being sustained when the pedal is up; this can be fixed by toggling on the “invert sustain pedal” button.

## The Console:

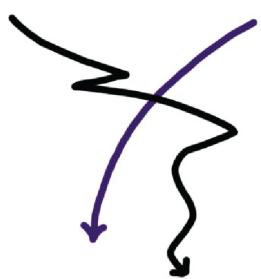
... is a window (pictured below) that opens on launch that displays status information about the instrument. You probably only care about this at the beginning, so you can watch to see when all of the samples are loaded and ready.



The screenshot shows a window titled "Nostalgic Synchronous Piano". The main area contains a text log of system messages and configuration parameters. The text includes:

```
loaded release resonance sample: LittleLizardPiano/samples/harmLF#4.wav 54
loaded release resonance sample: LittleLizardPiano/samples/harmLF#4.wav 54
loaded release resonance sample: LittleLizardPiano/samples/harmV3F#5.wav 66
loaded release resonance sample: LittleLizardPiano/samples/harmSF#5.wav 66
loaded release resonance sample: LittleLizardPiano/samples/harmLF#5.wav 66
=====
=> The Prepared Digital Piano is Tuned and Ready! <=====
=====
tuning: 0
metrotuning: 0
revtuning: 1
tuningFundamental: 11
new accent 0.200000
new accent 0.300000
new accent 0.400000
new accent 0.500000
new accent 0.600000
new accent 0.700000
new accent 0.800000
new accent 0.900000
new accent 0.900000
new accent 1.000000
new length 10.000000
new length 1.000000
new length 1.000000
```

At the bottom left is a small circular icon with a sunburst pattern. At the bottom right is a "Cancel" button.



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