

~ bitKlavier ~

Nostalgic Synchronic

Etudes for Prepared Digital Piano



by
Dan Trueman

~ Many Arrows Music ~
www.manyarrowsmusic.com

~ *bitKlavier* ~

Nostalgic Synchronic

Etudes for Prepared Digital Piano



by
Dan Trueman

~ Many Arrows Music ~
www.manyarrowsmusic.com

The *bitKlavier* Series:

Nostalgic Synchronic
Mikroetudes

cover art, by DM Stith, from the *Nostalgic Synchronic* record

©2015 Many Arrows Music

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

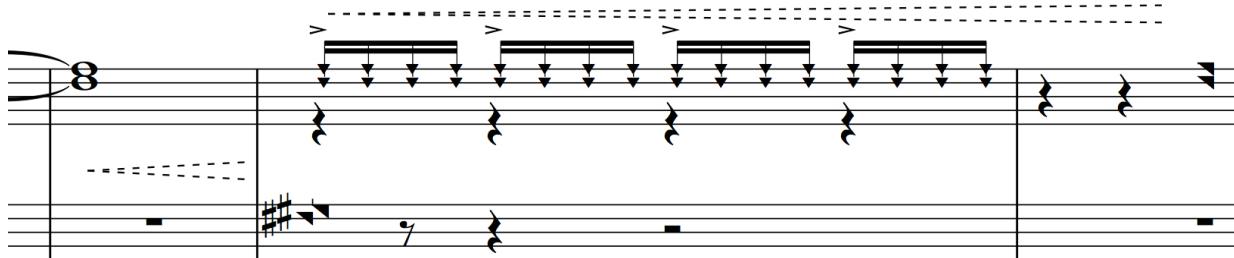
Like the prepared piano, the prepared *digital piano* feels just like a piano under the hands and often sounds like one, but it is full of surprises; instead of bolts and screws stuck between the piano strings, virtual machines of various sorts adorn the virtual strings of the digital piano, transforming 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 silenced 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!

Nostalgic Synchronic: Contents

Preface ... 3

Forward, by Adam Sliwinski ... 8

About the Etudes ... 10

The Etudes:

- *Prelude* ... 14
- *Undertow* ... 20
- *Song* ... 22
- *Marbles* ... 26
- *Wallumrød* ... 36
- *Points among Lines (with Occasional Tantrum)* ... 39
- *Systerslått* ... 48
- *It is Enough!* ... 61

Technical Notes ... 64

Forward

When Dan showed me the first of what would become the *Nostalgic Synchronic* etudes, I experienced a seismic realignment. It reminded me of a handful of other times in my life that I had heard something so profoundly new that would make it impossible to hear music in exactly the same way again. It's not that the music was from outer space - in fact, its familiarity was shocking. Somehow I thought this was a perfectly natural next step, a synthesis of many things that were going on at precisely that moment in culture. And yet I was intellectually aware that it would have been impossible to make, at least technologically, at any moment before.

It is interesting that a work which thrusts us forward in this way would be called "nostalgic," for we think of progress as sequential and directional. However true that may be with technology, the condition of art is more winding and elusive. Do we ever have the sense that we've "improved" upon Bach, Bach 2.0? The concept is flimsy enough that it falls apart in the mind, and yet we sometimes talk of progress in music as if we know exactly what that means. I prefer to think of the arts as jumping back and forth across time and space, connecting minds and spirits in chaotic ways. Bach never could have imagined the kinds of tools that Dan uses, but that does not mean that his art was any less advanced.

In the music of brilliant futuristic thinkers like Edgard Varese or Karlheinz Stockhausen, new resources are usually deployed with a kind of detached aesthetic strangeness – it must be some kind of future music, because it *feels* like it is. Dan challenges us to realize that linear progress in tool making does not have to translate into any certain sound or style of music. The pieces in this set reference Bach, Norwegian folk music, Ligeti's piano etudes, even the rich open sonorities of a Romantic like Brahms. But they do

not make us believe in the future so much as circle us back around to confronting what our best tools say about us as humans.

The greatest etudes stay with you: they nest inside your brain and your hands even while you make other gestures in other music. The *Nostalgic Synchronic* pieces have changed the way I play music, and I hope they will do the same for you.

—Adam Sliwinski
Princeton, New Jersey
August 2015

About the Etudes

I started writing the Etudes for myself to explore some of the possibilities of the prepared digital piano in a more focused manner. I had used versions of these sorts of “instruments” or “machines” in various ad hoc ways in a number of pieces with larger ensembles, but felt that I might find some things by limiting the field a bit. I didn’t imagine that these would become anything more than fodder for other compositions, but they proved much more interesting (to me, anyhow!) than I had anticipated. I think it is likely obvious that the Ligeti Etudes were on my mind, but I also found an unexpected resonance with much older music (Bach in particular, but also fiddle music), mostly in how I engage with that music—at home, alone with the piano or fiddle, not performing, just exploring, practicing (in the broadest sense of the word). It seems odd to me that this way of engaging with music—which is how I spend probably 95% of my musical energy—receives so little attention; performance, presentation, personality dominate. But I digress!!!

Etude #1 — *Prelude*:

The preparations for this etude are silent when any of the piano keys are depressed. When two or more keys are *released*, 16th-note synchronic pulses, accented into groups of 4 and running for 4 beats begin (single notes do not trigger synchronic pulses). Also, when any key is released, a nostalgic note begins, sustaining for the duration the individual keys were held. This etude is a bit didactic in this regard; for instance, mm. 72–84 are all about gradually adding pitches to a long sustained sonority, and then hearing those pitches swell and peak one by one. This didactic quality, along with its focus on a single set of preparations, is one of the reasons I think it functions well to start, as a sort of prelude.

Etude #2 — *Undertow*:

I grew up near the Long Island Sound and would regularly spend time there, letting the variable tides push and pull at my ankles, mixing and shaping and sounding constantly and patiently.

Etude #3 — *Song*:

This feels like a simple fiddle tune, and who knows, maybe it is and I've forgotten where I learned it. It's also impossible on a conventional piano; the tuning, of the 7th in particular, and how the tuning changes, is *part* of the tune; these aren't notes that deviate from some equal-tempered norm—they are their own good notes just as they are thank you very much.

Etude #4 — *Marbles*:

The little bits of rubber that racecar tires shed while turning are sometimes called "marbles." Sonically this seems about right for this etude, but I also like the racecar driving metaphor; the driver is not expending energy *directly* to drive the car, but is rather virtuosically handling a powerful beast, sometime slowing it down, pushing it one way, using the smallest muscles as well as the largest. We should have more musical instruments that are like racecars.

Etude #5 — *Wallumrød*:

This began as an exploration and retuning of a particular pair of sonorities from a record by the wonderful Norwegian "jazz" composer and pianist Christian Wallumrød. It also has a sense of majestic and slow oozing urgency, something I hear in Wallumrød's music.

Etude #6 — *Points among Lines (with Occasional Tantrum)*:

The simplest preparation: a single, very quick metronome strike (well, and some tuning action in addition), perhaps a bit like a paddleball. Perhaps it is the implied neglect of such a lightweight preparation that makes this etude occasionally cranky.

Etude #7 — *Systerslått*

Systerslått is one of a set of Norwegian Hardanger fiddle tunes that are particularly ancient and mysterious, both in terms of tuning (it is usually played in an unusual scordatura with a major-6th between the middle strings) and groove (it is a *telespringar*, a type of Norwegian dance that feels particularly wobbly and disorienting to the uninitiated but feels *great* to those who dance it). The funny little symbols over most of the beats give an

indication of how they are weighted and shaped, and it should become apparent through playing with the preparations how the meters should feel.

Etude #8 — *It is Enough!*

I originally composed a version of this etude for *Symphony of W's*, for the Crash Ensemble. More theft here, in this case from a Bach chorale that has been fodder for a number of composers over the years, most notably Berg, in his violin concerto; unlike in the Berg, however, I think the Bach is transformed beyond recognition here, for better or worse.

I don't think I can overstate how important and inspiring Adam Sliwinski has been to the making of these pieces. As a member of So Percussion, Adam has been one of my favorite musicians to work with—extraordinarily musical, dedicated, inspired, always asking questions and thinking about the bigger picture while attending to the finest details. Though I knew Adam played piano when I showed him the beginnings of the first couple etudes, I hadn't expected him to embrace these pieces directly, and in turn demonstrate that he doesn't just "play piano," but that he is truly a *pianist*. Ok, fine, this is one strange piano, but the piano has always been in flux, and at its most exciting when it is viewed as something *with potential*, not something that is *done*, and perhaps it makes sense that a pianist who spends most of his time as a percussionist would be the first to embrace this wacky piano and the pieces I've made with it. But, more than that, I really had Adam in mind as I continued to compose these etudes, and I confess that I never would have written #7, with its bizarre polyrhythms (four-against-a-decidedly-lopsided-3, anyone?), if I hadn't known Adam would not only be up to the task, but would relish it. Really, this music is for *people to play* (the machines are only here to get us places we couldn't get to otherwise), and knowing that Adam was eager to get his hands on them made all the difference, and continues to make all the difference.

Nostalgic Synchronic #1

Prelude

8^{va} > > (8va both hands)

f

(8)

6

10

A

13 15^{ma} > >

p 8^{va} >

Detailed description: The image shows four staves of piano sheet music. The first staff starts with a dynamic 'f' and a tempo of 100 BPM. It features eighth-note patterns with grace notes and changes in time signature between common time and 3/4. The second staff begins with measure 6, continuing the eighth-note patterns. The third staff begins with measure 10. The fourth staff, labeled 'A', begins with measure 13 and includes a dynamic 'p'. All staves include vertical stems and arrows indicating direction for the eighth-note patterns.

18 (15) *8va*

(8)

22 (8) **B** *8va*

cresc....

25 (8)

f *16* *16*

28 (8) **C**

mp

31

34

8va right hand only, and from here on out

37

8va

40

8va

43

46

8va

49 Gradually lengthen to 8th-notes

→

52

D 8va

(8)

58

61

(8)

63

65

(8)

67

70

72

E

82

87

91

95

101

107

110 F

112 Gradually lengthen... →

114

Nostalgic Synchronic #2

Undertow

$\text{♩} = 35-40$ (at the fastest)

etc.... reverse wave (swell) continues for as long as prior note was held, and then "undertow" (fade) continues forward

sustain through

(slash note-head indicates the F should be sounded earlier than the D, for tuning purposes; F resets the tuning)

17

20

23

lowest octave barely sounding...

26

Nostalgic Synchronic #3

Song

$\text{♩} = 100$

14

8

14

20

A

25

31

37

43

48

B

54

60

C

66

D

71

77

83

89

95

Musical score for piano, featuring three staves of music. The top staff begins at measure 101 in 5/8 time, with a key signature of one sharp. It includes dynamic markings such as mp and Ped. . Measure 109 starts in 6/4 time. Measure 114 begins in 6/4 time and transitions to 4/4 time.

E

101

109

114

Nostalgic Synchronic #4

Marbles

Etude4-Marbles-1

$\text{♩.} = 91$

15^{ma}

pp

8^{va}

p1C

p2C

15^{ma}

8^{va}

8^{vib}

presets automatically switch with keymap, mostly indicated in shorthand, like p1C, for Etude4-Marbles-1C

4 (15)

8^{va}

p1C

8^{va}

p2

8^{va}

p1

8^{vib}

8^{vib}

8^{vib}

8^{vib}

7 15^{ma}

8^{va}

p2C

8^{va}

p1C

15^{ma}

p2C

p1C

p2C

p1C

8^{vib}

8^{vib}

8^{vib}

8^{vib}

10 (15)

15^{ma}

8^{va}

p1C

15^{ma}

8^{va}

p2C

8^{va}

p1C

8^{vib}

8^{vib}

8^{vib}

8^{vib}

13 *15ma*

8va

15ma

17 (15) p1 p1C p1 *15ma*

8va

15ma

A Etude4-Marbles-1C
22 (15)

8va

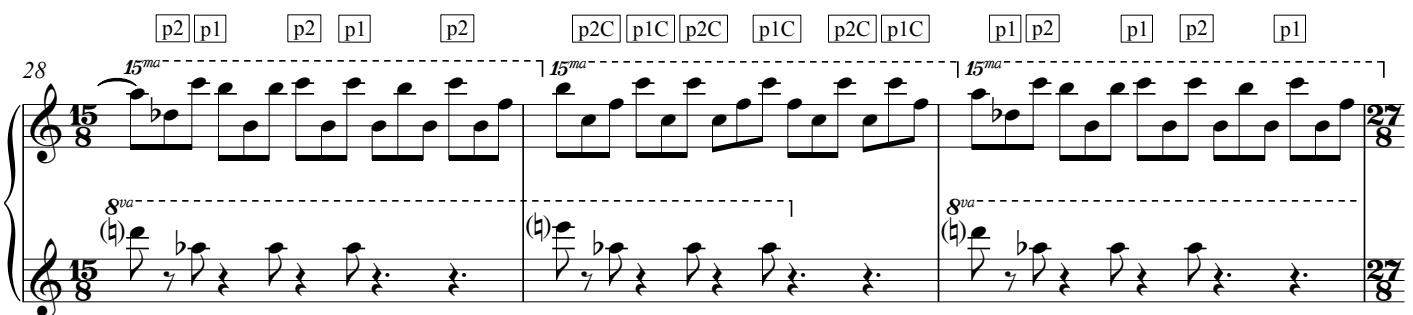
p1C p2C p2

25 (15) *15ma* p1 p1C p2C *15ma*

(8)

p1 p1C p2C

28 *15ma* p2 p1 p2 p2 p1 p1C p2C p1C p2C p1C p1 p2 p1 *15ma* p2 p1 p2 p1 *15ma* p2 p1 *15ma* p2 p1 p2 p1 *27*



8va

8va

8va

27

p1C p2C p1C p2C p1C p2C p1C

31 *15^{ma}* 1 *15^{ma}*

8

8va

p2 p2C

33 *(15)* 1 *15^{ma}*

8

8va

p2 p2C

p1C p2C

8vb

36 *15^{ma}* 1 *15^{ma}*

8va

8va

39 *(15)* 1 *15^{ma}*

8va

8va

p2 p2C

p2 p2C

8va

Etude4-Marbles-2

43 *(15)* 1 *15^{ma}*

8va

8va

6/8 12/8

6/8 12/8

B Etude4-Marbles-1

46

mf

p1

8^{vb}

49

8^{va}

8^{vb}

p2C

51

8^{va}

8^{vb} [p1]

53

speed phase to in sync....

slow phase out of phase....

these measures with phasing in and out
can take more or less the specified number
of notes; don't be constrained by the notation

8^{vb} [p2]

56

then fast in again...

then slow out again...

then fast in again...

8^{vb} [p1]

Etude4-Marbles-1

59

C

pp

63

p2

8vb

66

p1

8vb

p1C

69

p2C

8vb

72

75

p1C
8va

78

p1C
8va

82

p1C
8va

D ("Etude4-Marbles-1")

86

p1C
8va

88 (8)~

mf

91

94

97

100

103

rall.

E Etude4-Marbles-1C

106 $\text{♩} = 76$

synchronic accent on 3rd 8th-note of each beat through here

108

p1

112

♩ = 91

pp

p2d.

115 (45)

F Etude4-Marbles-1

p1C

p1

118

122

15ma

8va

[p1C]

[p2C]

15ma

8va

[p1C]

[p2C]

15

15

8

8vb

125 (15)

15ma

8va

[p2]

[p1]

15

12

8

8vb

127 (15)

15ma

8va

[p1]

15

8

8vb

129 (15)

15ma

8va

[p1C]

12

8

21

8

131 (15)

15ma

8va

[p1C still]

8vb

[p2C]

12

8

21

8

133 (15)

1 15ma

8va

8vb

p1

p2

[p1C]

[p2]

135 (15)

8va

8vb

p1

p2

[p1C]

[p2C]

137 (15)

8va

8vb

p1

p2

[p1C]

[p2]

139 (15)

8va

8vb

p1

Nostalgic Synchronic #5

Wallumrød

Etude5-1

J=55

mp

etc...

etc...

A

6

Etude5-2
(pulses cease)

pp

p

13 lots of movement, stretching, taut;
the tenutos and ornaments will require it!

13

15

pp

18 ***pp***

20

B

24 Etude5-3

C Etude5-1
(8th-note pulse returns)

28

37

Etude 5-4

Etude 5-2

41

D

Etude 5-5

45

meno mosso

pp

no pedal, fragile

51

Nostalgic Synchronic #6

Points among Lines (with Occasional Tantrum)

The musical score consists of four staves of music, each with a treble clef and a 4/4 time signature. The tempo is indicated as $\text{♩} = 96$. The score includes dynamic markings such as *mf* (mezzo-forte) and *p* (pianissimo). There are also performance instructions like "5" above certain groups of notes and "8^{vib}" below specific notes, indicating vibraphone entries. The music is divided into measures by vertical bar lines. In measure 10, a box labeled "A" is placed above the top staff. Measure 14 begins with a key change to A major, indicated by a sharp sign in the key signature.

18

8vb

8vb

6

6

22

8vb

ff

mf

8vb

8vb

B

26

8vb

8vb

8vb

8vb

30

8vb

8vb

8vb

8vb

34

8vb

38

43

48

C

53

57

D

62

67

71

75

E

(8)

80

(both hands 8va)

85 (8)

90 (8)

94

F

97

100

103

106

109

114

117

120

ff

mf

15

Musical score for section H, page 125. The score consists of two staves. The top staff is for the treble clef (G-clef) and the bottom staff is for the bass clef (F-clef). Both staves are in common time (indicated by 'C'). The key signature is A major (no sharps or flats). The music features eighth-note patterns with various dynamics and rests. The first measure starts with a dynamic of 125. Measures 2-4 show a repeating pattern of eighth notes and rests. Measures 5-8 continue this pattern. Measures 9-12 show a variation with more eighth-note pairs. Measures 13-16 return to the original pattern. Measures 17-20 conclude the section with a final variation.

A musical score page for piano, numbered 129. The top staff uses a treble clef and shows a continuous melodic line consisting of eighth-note pairs. The bottom staff uses a bass clef and provides harmonic information, with vertical lines and dots indicating specific notes for each measure. Measure numbers 1 through 12 are present above the top staff, and measure numbers 6, 9, and 12 are present above the bottom staff. Measure 12 ends with a double bar line.

A musical score for piano, page 137. The top staff uses a treble clef and shows a pattern of eighth notes. The bottom staff uses a bass clef and shows a pattern of quarter notes and eighth notes. The music consists of two measures of eighth-note patterns followed by two measures of quarter-note patterns.

141

Two staves of music. The top staff has a treble clef and the bottom staff has a bass clef. Both staves have six measures of music. The top staff consists of eighth-note pairs (one note up, one note down). The bottom staff consists of eighth-note pairs with a sharp sign.

146

Two staves of music. The top staff has a treble clef and the bottom staff has a bass clef. Both staves have four measures of music. The top staff consists of eighth-note pairs. The bottom staff consists of eighth-note pairs with a sharp sign. Measures 3 and 4 have a '5' written below them.

149

Two staves of music. The top staff has a treble clef and the bottom staff has a bass clef. Both staves have four measures of music. The top staff consists of eighth-note pairs. The bottom staff consists of eighth-note pairs with a sharp sign. Measures 2 and 3 have a '5' written below them. Measure 4 starts with a sharp sign.

152

Two staves of music. The top staff has a treble clef and the bottom staff has a bass clef. Both staves have four measures of music. The top staff consists of eighth-note pairs. The bottom staff consists of eighth-note pairs with a sharp sign. Measures 2 and 3 have a '5' written below them. Measure 4 starts with a sharp sign.

155

Two staves of music. The top staff has a treble clef and the bottom staff has a bass clef. Both staves have four measures of music. The top staff consists of eighth-note pairs. The bottom staff consists of eighth-note pairs with a sharp sign. Measures 2 and 3 have a '5' written below them. Measure 4 starts with a sharp sign and ends with a double bar line.

158

J

161

167

172

174

Nostalgic Synchronic #7

Systerslått

Etude7-1

Musical score for Etude7-1. The score consists of two staves. The top staff is a rhythmic pattern of sixteenth-note pairs with vertical stems, starting with a fermata. The bottom staff has three voices: soprano (G clef), alto (C clef), and bass (F clef). The bass voice starts with a dynamic *mp*. The bass and alto voices continue with quarter notes and eighth-note pairs, while the soprano voice remains silent. The bass line ends with a fermata. The entire section is labeled *Ped.*

Continuation of the musical score for Etude7-1. The score begins at measure 3. The top staff shows a rhythmic pattern of sixteenth-note pairs with vertical stems. The bottom staff continues with the bass and alto voices, maintaining the quarter note and eighth-note pair pattern established in the previous section. The bass line ends with a fermata. The section concludes with a key signature change to $\frac{9}{8}$.

A

Etude7-2

Musical score for Etude7-2. The score consists of two staves. The top staff is a rhythmic pattern of eighth-note pairs with vertical stems, starting with a fermata. The bottom staff has three voices: soprano (G clef), alto (C clef), and bass (F clef). The bass voice starts with a dynamic *p*. The bass and alto voices continue with eighth-note pairs, while the soprano voice remains silent. The bass line ends with a fermata. The section concludes with a key signature change to $\frac{9}{8}$.

the melodic ornamenting is not meant to be prescriptive;
rather, it is suggestive of a vocabulary of possibilities—play with it.

10

14

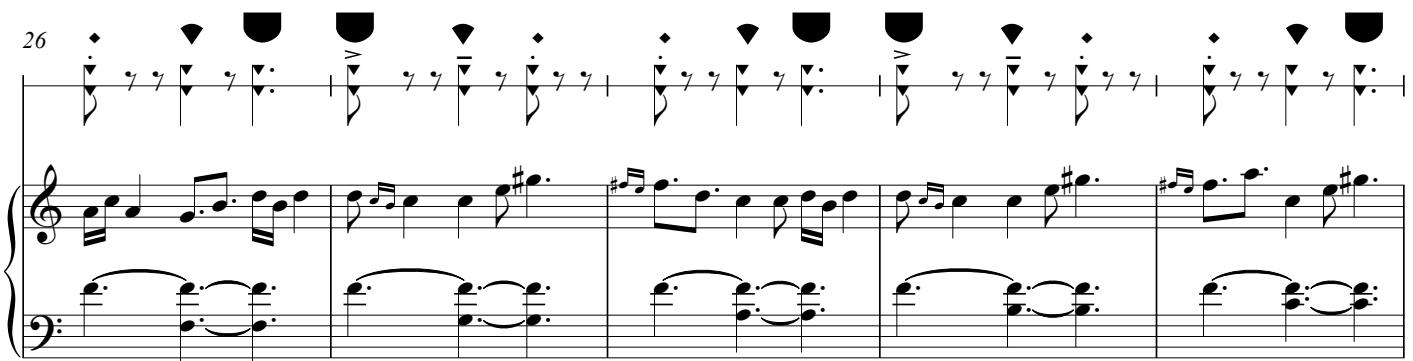
18

G-just A-just B-just F-just

22

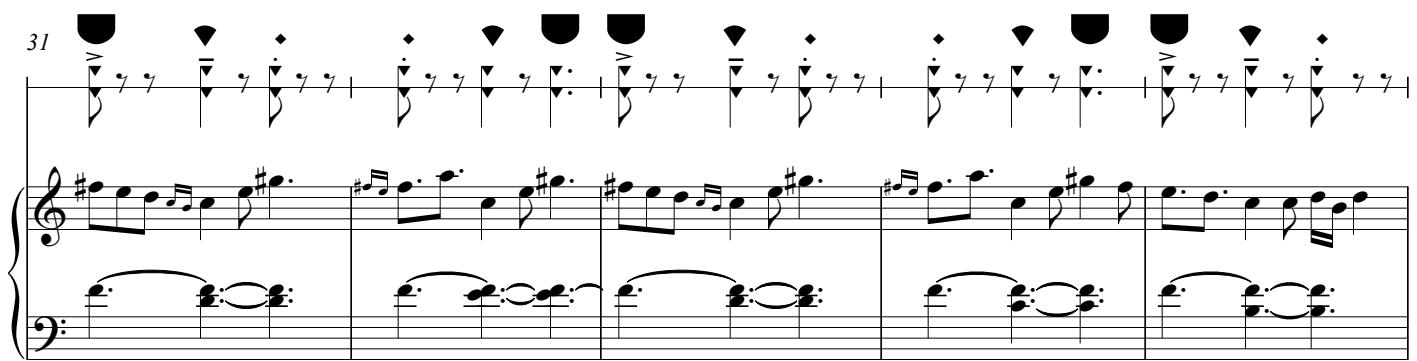
D-just F-just

26



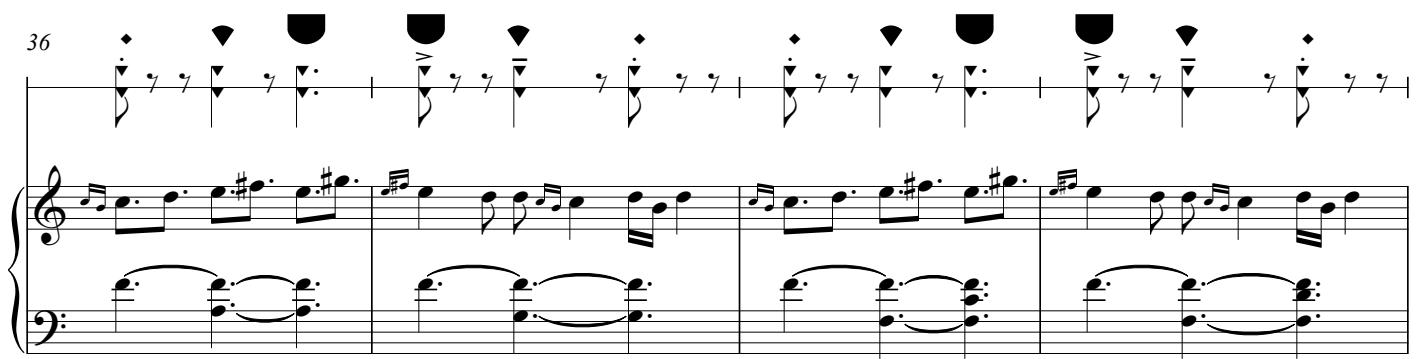
Musical score page 26. The score consists of three staves. The top staff has a treble clef and a key signature of one sharp. It contains six measures of music, each starting with a dotted half note followed by a whole note. The middle staff has a treble clef and a key signature of one sharp. It contains six measures of music, each starting with a eighth note followed by a sixteenth note, a quarter note, another eighth note, and a sixteenth note. The bottom staff has a bass clef and a key signature of one sharp. It contains six measures of music, each starting with a half note followed by a quarter note.

31



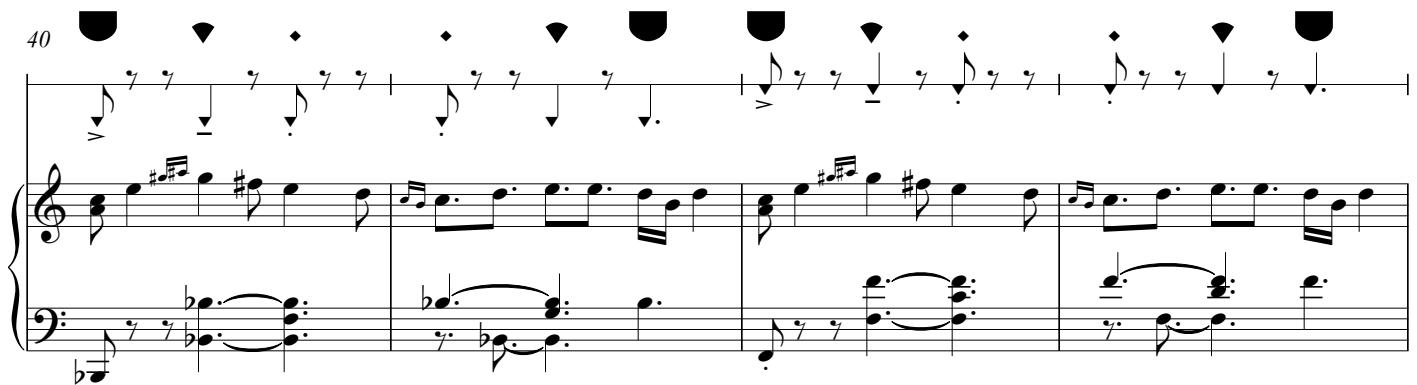
Musical score page 31. The score consists of three staves. The top staff has a treble clef and a key signature of one sharp. It contains six measures of music, each starting with a dotted half note followed by a whole note. The middle staff has a treble clef and a key signature of one sharp. It contains six measures of music, each starting with a eighth note followed by a sixteenth note, a quarter note, another eighth note, and a sixteenth note. The bottom staff has a bass clef and a key signature of one sharp. It contains six measures of music, each starting with a half note followed by a quarter note.

36



Musical score page 36. The score consists of three staves. The top staff has a treble clef and a key signature of one sharp. It contains six measures of music, each starting with a dotted half note followed by a whole note. The middle staff has a treble clef and a key signature of one sharp. It contains six measures of music, each starting with a eighth note followed by a sixteenth note, a quarter note, another eighth note, and a sixteenth note. The bottom staff has a bass clef and a key signature of one sharp. It contains six measures of music, each starting with a half note followed by a quarter note.

40



Musical score page 40. The score consists of three staves. The top staff has a treble clef and a key signature of one sharp. It contains six measures of music, each starting with a dotted half note followed by a whole note. The middle staff has a treble clef and a key signature of one sharp. It contains six measures of music, each starting with a eighth note followed by a sixteenth note, a quarter note, another eighth note, and a sixteenth note. The bottom staff has a bass clef and a key signature of one sharp. It contains six measures of music, each starting with a half note followed by a quarter note.

44

Red.

15^{ma}

pp

B

49

54

58

62

67

C Etude 7-3
♩=81.4

72

76

88

8va

15mb

79

8va

ff

p

15mb

15mb

20

82

arpeggiate lightly, bottom up

p

15mb

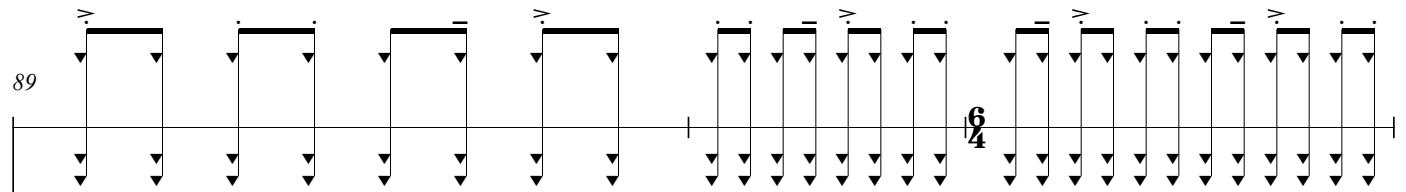
15mb

85

15ma

pp

8vb



again, arpeggiate lightly, bottom up

p

6/4

4/4

92

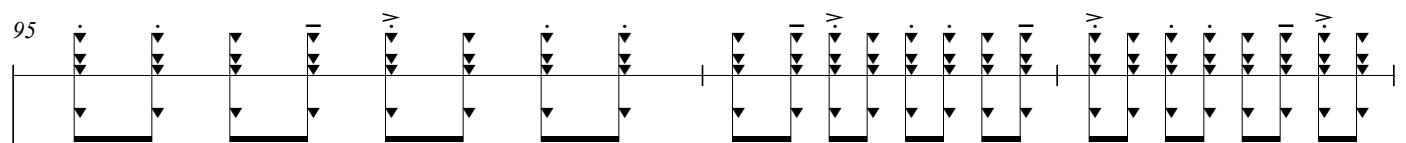
D [Etude 7-4]

B-flat major

4/4

4/4

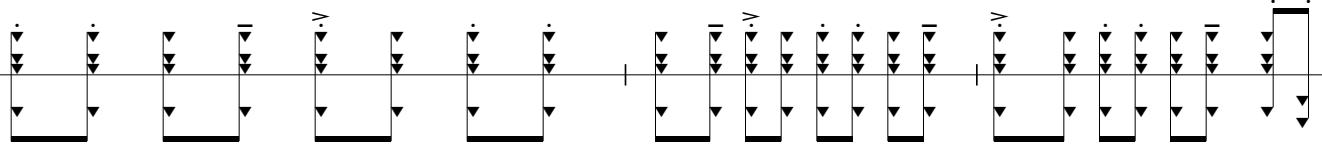
4/4

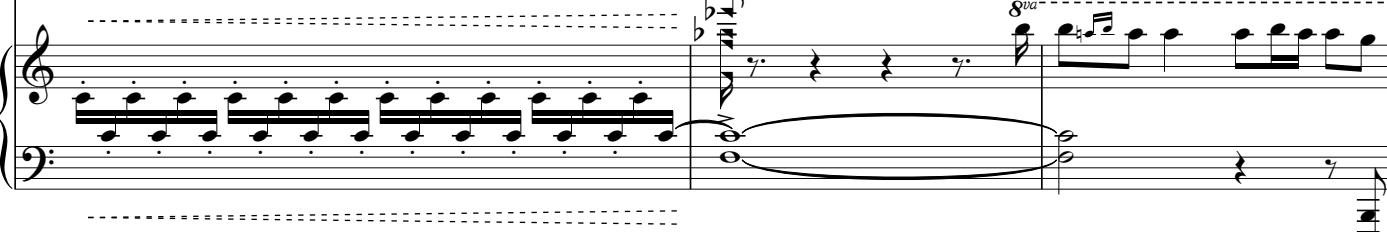


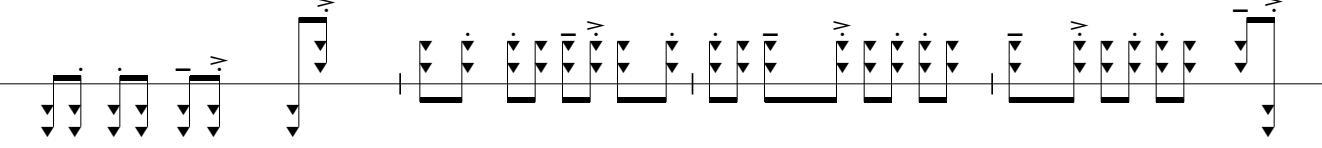
B-flat major

4/4

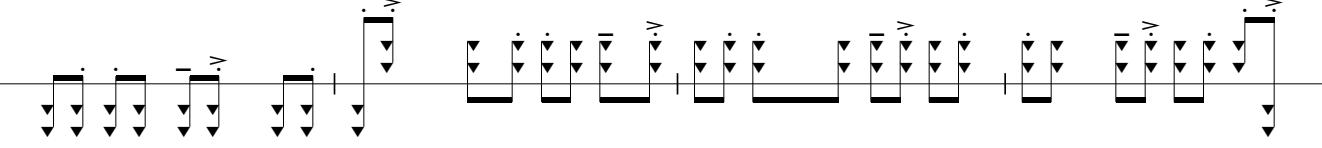
4/4

98 

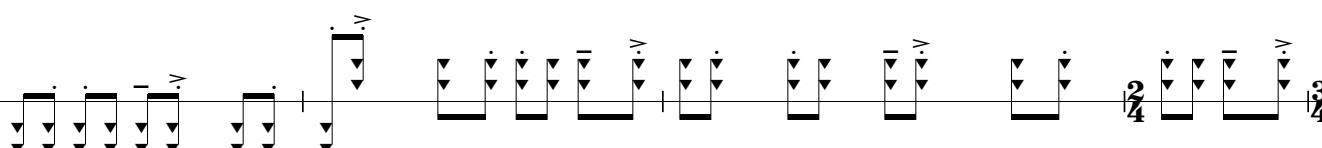


101 



105 



109 



113

8va

117

p

E Etude 7-5 $\text{♩} = 79$

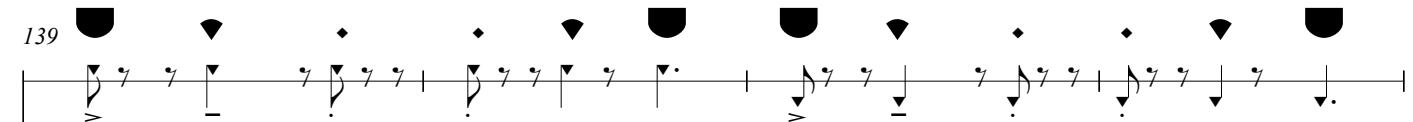
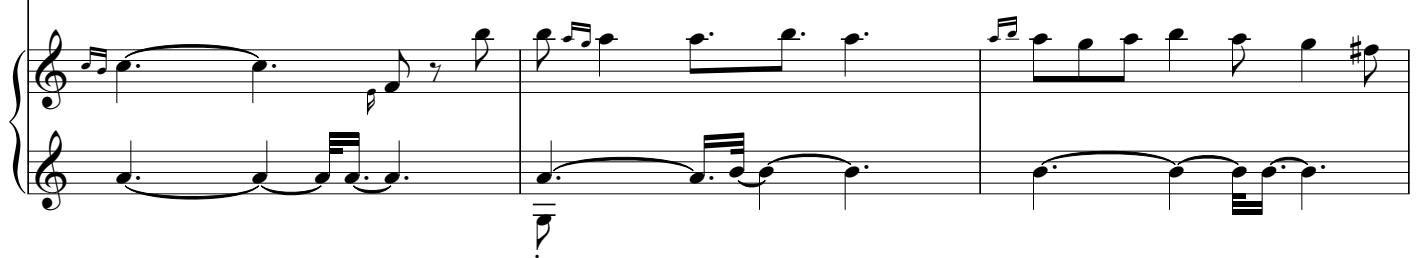
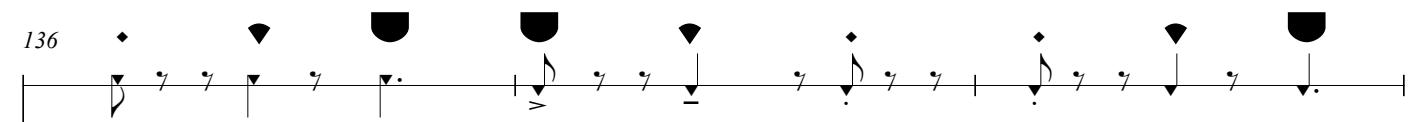
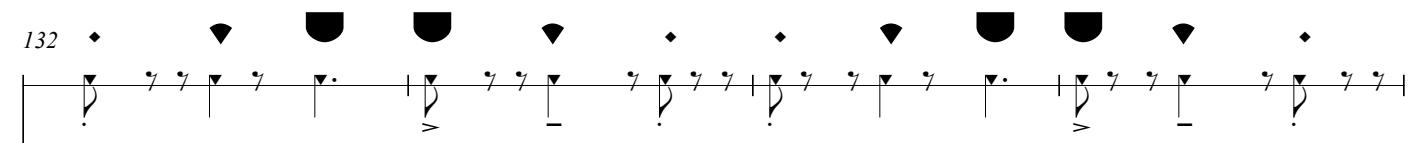
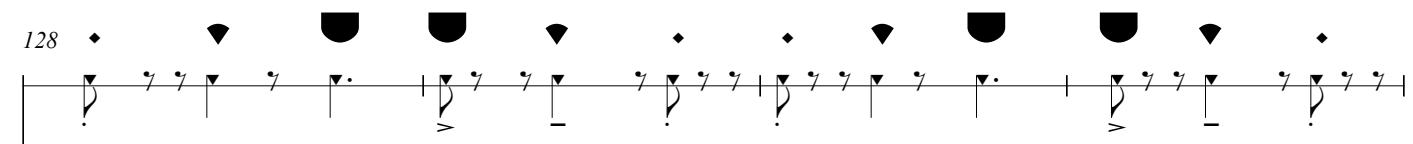
120

pp

124

mf

A's continue evenly; one 4/4 bar => two 9/8 bars



143

8vb

147

F

(8)-----|

151

155

155

159

159

163

163

8va

167

167

171

175

179

182

Etude 7-6

$\text{♩} = 79$

Nostalgic Synchronic #8

It Is Enough!

[Etude8-1]

$\text{♩} = 30$

p

1 2

most reverse crescendi and accents are not notated, to avoid clutter

5 6

9 10

13 14

p

* use pedal as needed to sustain all three lines;
this may result in some notes sustaining longer
than notated, which is fine, given the slow tempo.

17 A Etude8-2

This section consists of four measures (measures 17, 18, 19, and 20). The key signature changes from G major (one sharp) to F# major (two sharps) at measure 17. The music is in common time. The first measure contains a single note on the top staff. The second measure features a continuous eighth-note pattern on the middle staff. The third measure has a similar eighth-note pattern on the bottom staff. The fourth measure returns to the top staff with another eighth-note pattern. Measure 18 begins with a single note on the top staff. Measures 19 and 20 continue the eighth-note patterns established in the previous measures, with slight variations in the harmonic progression.

21

This section consists of four measures (measures 21, 22, 23, and 24). The key signature changes from F# major (two sharps) to E major (one sharp) at measure 21. The music is in common time. The first measure contains a single note on the top staff. The second measure features a continuous eighth-note pattern on the middle staff. The third measure has a similar eighth-note pattern on the bottom staff. The fourth measure returns to the top staff with another eighth-note pattern. Measure 22 begins with a single note on the top staff. Measures 23 and 24 continue the eighth-note patterns established in the previous measures, with slight variations in the harmonic progression.

25 B

This section consists of four measures (measures 25, 26, 27, and 28). The key signature changes from E major (one sharp) to D major (no sharps or flats) at measure 25. The music is in common time. The first measure contains a single note on the top staff. The second measure features a continuous eighth-note pattern on the middle staff. The third measure has a similar eighth-note pattern on the bottom staff. The fourth measure returns to the top staff with another eighth-note pattern. Measure 26 begins with a single note on the top staff. Measures 27 and 28 continue the eighth-note patterns established in the previous measures, with slight variations in the harmonic progression.

29

This section consists of four measures (measures 29, 30, 31, and 32). The key signature changes from D major (no sharps or flats) to C major (no sharps or flats) at measure 29. The music is in common time. The first measure contains a single note on the top staff. The second measure features a continuous eighth-note pattern on the middle staff. The third measure has a similar eighth-note pattern on the bottom staff. The fourth measure returns to the top staff with another eighth-note pattern. Measure 30 begins with a single note on the top staff. Measures 31 and 32 continue the eighth-note patterns established in the previous measures, with slight variations in the harmonic progression.

34 C *8va*

p

38 *6* *2* *4*

mp

42 D *8va*

p

46 *Etude8-3*

mp

50 *Etude8-4*

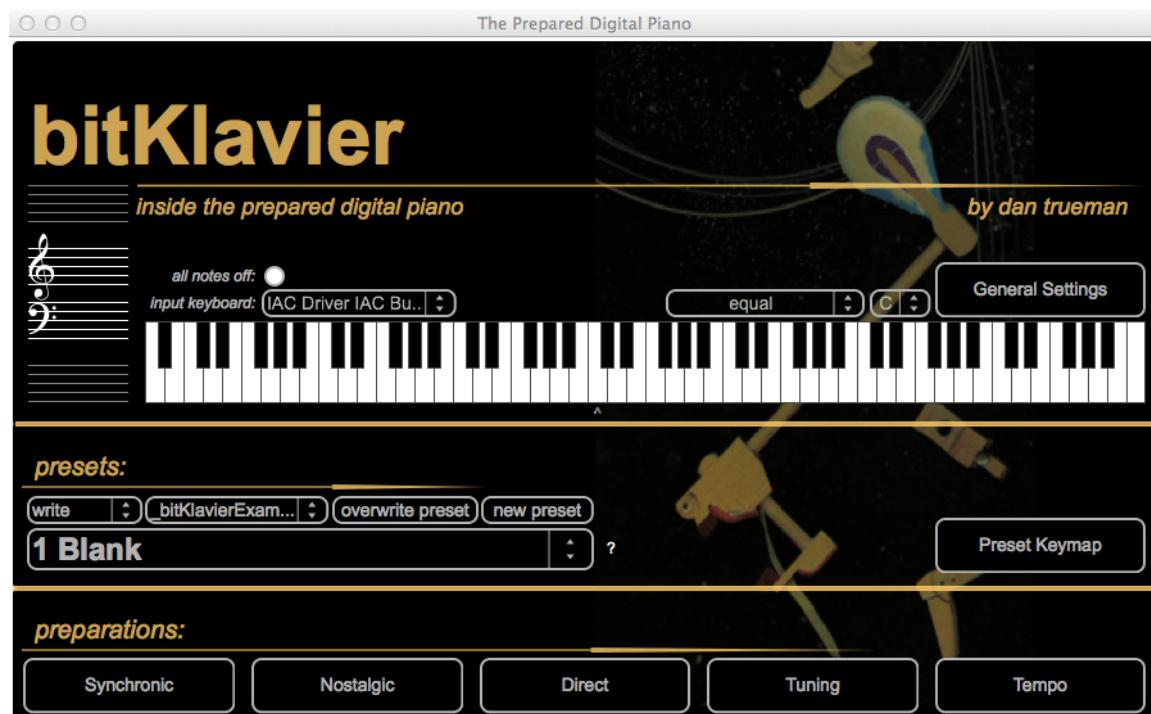
8vb

pppp

Technical Notes

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.

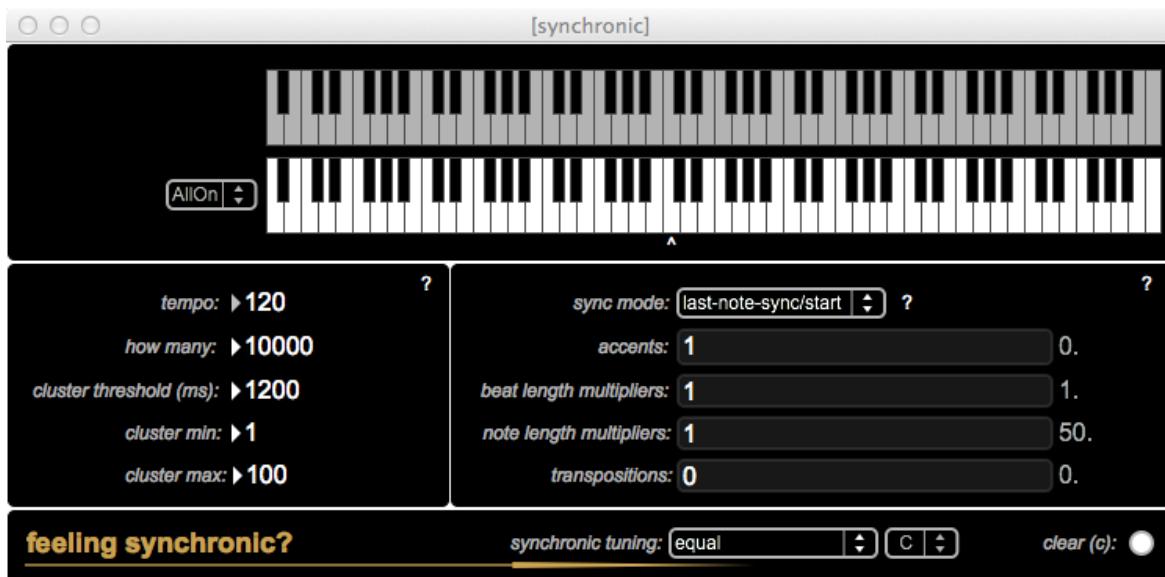


Figure 1: Synchronic Settings

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.

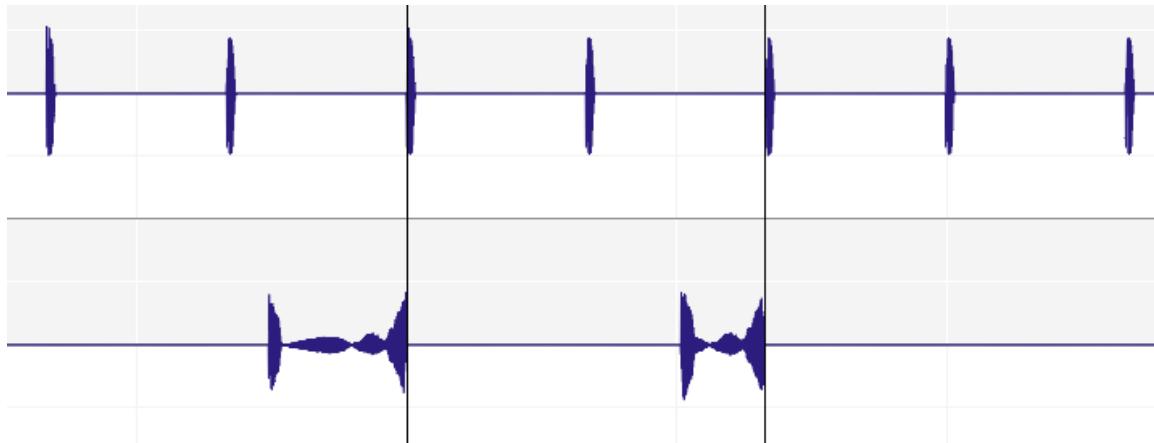


Figure 2: Example Nostalgic Preparation

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

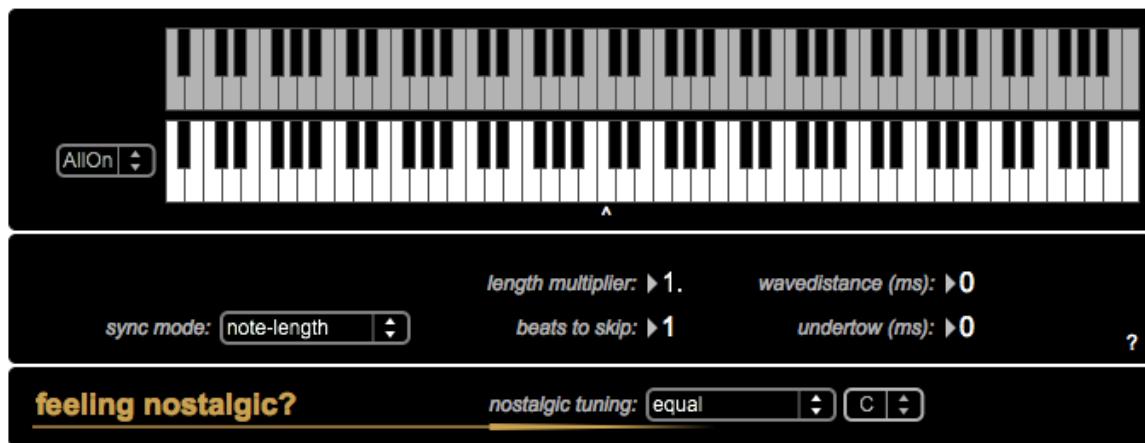


Figure 3: Nostalgic Settings

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#	806.67	11/6	-51	825	15/8	-12
G	770	7/4	-31	770	7/4	-31
F#	733.33	5/3	-16	733.33	5/3	-16
F	715	13/8	+41	704	8/5	+14
E	660	3/2	+02	660	3/2	+02
D#	605	11/8	-49	616	7/5	-17
D	586.33	4/3	-03	586.33	4/3	-03
C#	550	5/4	-14	550	5/4	-14
C	513.33	7/6	-33	528	6/5	+16
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 6th (F/A) is usually somewhere between and major and minor-6th, sounding similarly to the 13th partial; an awesome sound. He sometimes at the ends of phrases lets this rise up slightly to a just-tuned major-6th—glorious difference tones!—and occasionally lets it sink to a just-tuned minor-6th. 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-7th 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 4th—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 5th E (11/8 : 12/8 : 13/8), and for that reason, I chose to tune the minor-3rd C similarly symmetrical to the previously described “flat” major-7th (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.

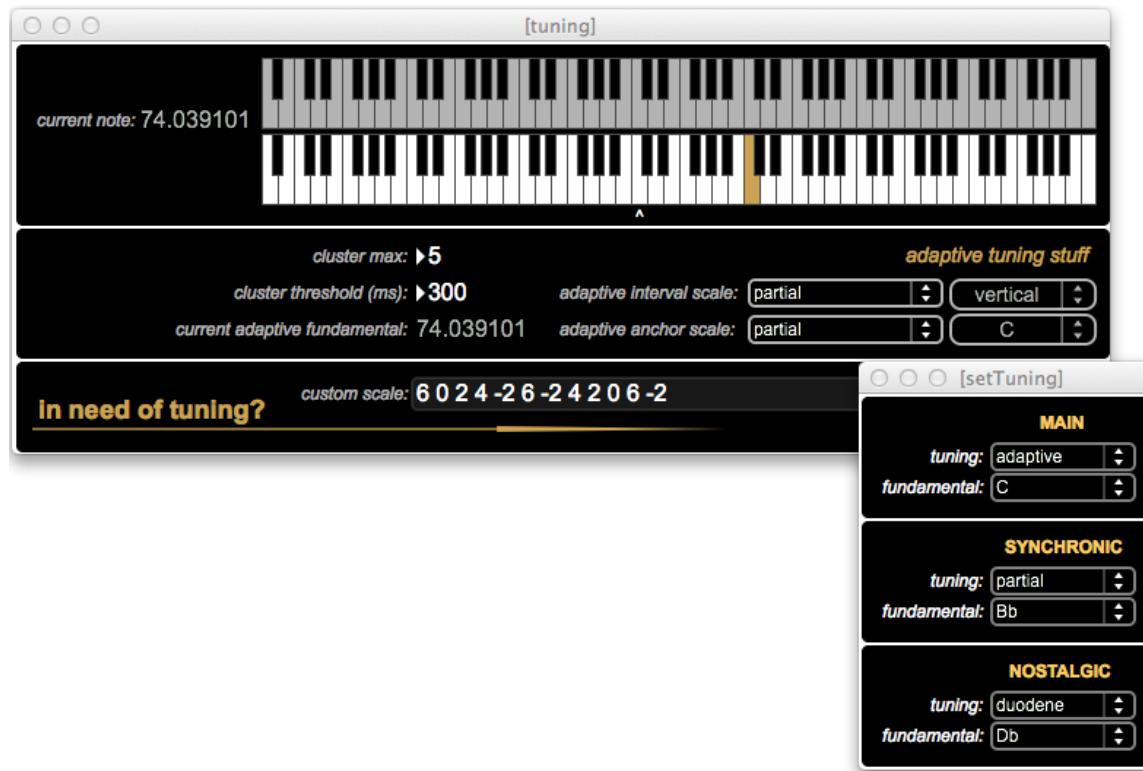


Figure 5: Tuning Settings

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.

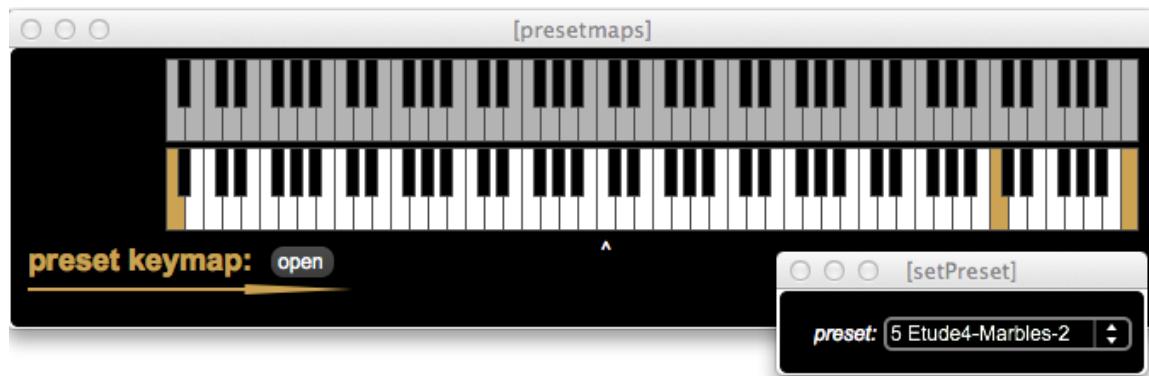


Figure 6: Presets

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).

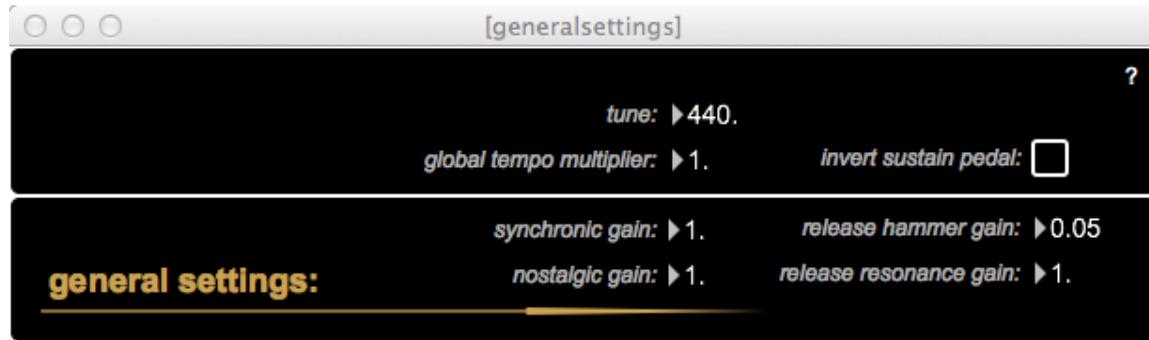


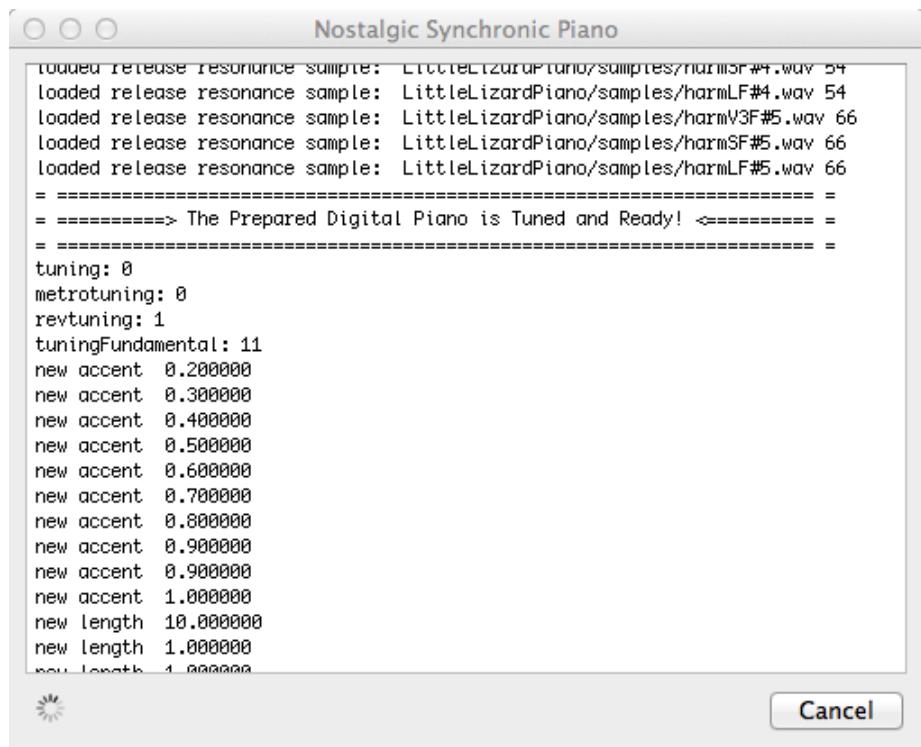
Figure 7: General Settings

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.

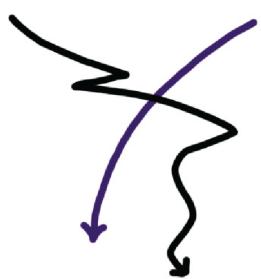
The Console:

... 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 Mac OS X-style window titled "Nostalgic Synchronous Piano". The window contains a text log of system messages. At the top, it lists several "loaded release resonance sample" entries for various harmonic partials (e.g., 54, 55, 66). It then displays a message indicating the piano is tuned and ready. Below this, it shows tuning parameters like "tuning: 0", "metrotuning: 0", and "revtuning: 1", followed by a series of "new accent" values ranging from 0.200000 to 1.000000. Finally, it lists "new length" values of 10.000000, 1.000000, and 1.000000. A "Cancel" button is visible in the bottom right corner of the window.

```
loaded release resonance sample: LittleLizardPiano/samples/harmIR#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
```



© 2015 Many Arrows Music
Princeton, NJ
www.manyarrowsmusic.com
All Rights Reserved