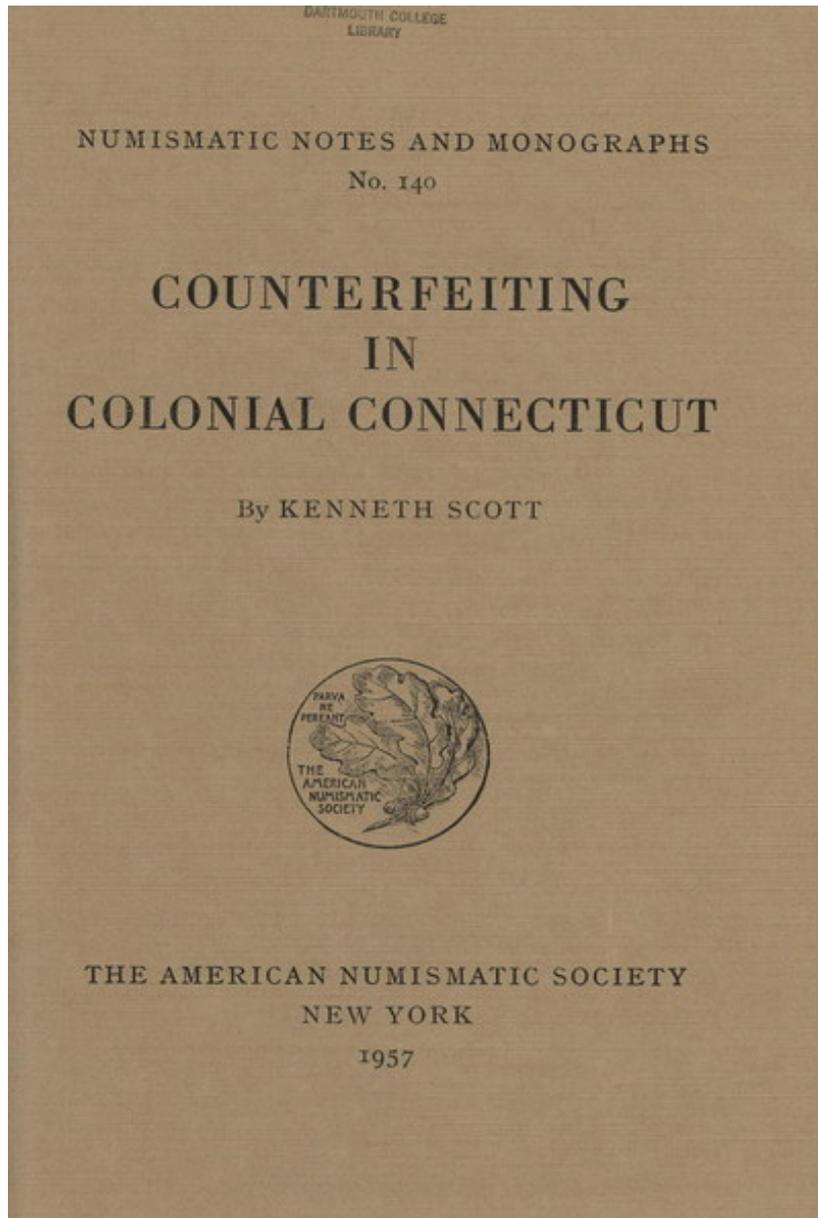


***Counterfeiting in Colonial Connecticut***  
for guitar with low and high accompaniment and reader

dedicated to Elliot Simpson and Alex Bruck  
in honor and memory of George Floyd

*Preferably played in a dark or dim setting (e.g. with the least light needed by the performers) outside in the open air or any space that allows for audience members to be at least six feet apart. Proceeds generated by the piece should be donated to causes of social justice.*

Michael Winter  
(cdmx and gatlinburg, tn; 2020)



general remarks . . . . .	1
instructions . . . . .	2
musical score . . . . .	6
appendix 1 - excerpts from “Counterfeiting in Colonial Connecticut” by Kenneth Scott . . . . .	97
appendix 2 - SuperCollider code and Lilypond templates . . . . .	103

**general remarks** (to optionally be used as a program note and / or read during performance)

I started writing this piece with the intention to set readings of excerpts from the book *Counterfeiting in Colonial Connecticut* written by Kenneth Scott and published by the American Numismatic Society in 1957. I was intrigued by the stories and the dry, austere nature of Scott's accounts.

My original intentions were transformed by two major crises that occurred during the development of this piece: the Covid-19 pandemic and protests sparked by the death of George Floyd, a black man brutally murdered by police. I decided to add the possibility of complementing readings from the Scott compendium with readings of texts reflecting my experience during the time in which the piece was written.

I was reluctant to connect George Floyd with counterfeiting and colonialism. Floyd was being arrested for *allegedly* using a counterfeit \$20 bill and his murder, as well as the pandemic, clearly demonstrated that inequalities accepted in colonial times have persisted. As such, the use of texts about counterfeiting in colonial America acquired a whole new meaning and gravity. However, these coincidences and connections are actually quite apt. The systems enforced and perpetuated by governments today in 2020—capitalism, democracy, communism—are counterfeit. They are fraudulent implementations of ideas manipulated to satisfy greed but traded as currency for the “good” of the people; far more dangerous than the relatively benign act of passing (perhaps unknowingly) a counterfeit \$20 bill. In a more humane system, George Floyd would still be alive and a pandemic would demonstrate the resilience of our society rather than expose systemic inequalities within it.

The music of this piece was written using a coin press as a central metaphor. The underlying variables in the computer program that generates the piece vary slightly within and between each section, like variations and errors in the minting of coins.

## instructions

The piece consists of a guitar part, a high accompaniment, a low accompaniment, optional electronic interludes, and readings of texts. All accompanying parts can be played by real instruments or electronically synthesized using custom software written in the SuperCollider programming language. The tempo should be determined by the guitarist (i.e. fast but comfortable; not strained). The score is divided into sections and subsections. Any number of sections can be played in any order such that the piece lasts at least 10 minutes. A section may also occur multiple times. While structurally similar, each section is actually quite distinct and reordering the sections based on personal preference is encouraged.

### guitar

Any hollow-body guitar may be used (if electric, the acoustic sound should be as present or louder than the output from the pickups). The open strings are tuned as follows given by string number, a note with a deviation in cents (100th of a tempered semitone), and a frequency ratio from the lowest note within a set of parentheses:

VI) E down to D (1/1)

V) A +2¢ (3/2)

IV) D (2/1)

III) G down to F<sup>#</sup> -14¢ (5/2)

II) B down to A -47¢ (35/12)

I) E down to C -31¢ (7/2) - Note that string II is a just 6/5 down from string I.

The notes in the guitar part of the score are written as the closest pitch in 12-tone equal-temperament *as sounds* (without cent deviations). Except in the ultimate subsection of each section, written below each note is the exact string number given as a Roman numeral and a fret number given as an Arabic superscript needed to sound the correct pitch. In the ultimate subsection of each section, the written notes all correspond to open strings. However, throughout each ultimate subsection, the guitarist can play arbitrary natural harmonics of the indicated string such that approximately half the tones are played as open strings and half are played as natural harmonics (the option of which is indicated by a diamond next to the Roman numeral below each note).

Throughout, the guitarist should try to allow all tones to decay naturally for as long as possible beyond the written durations creating an overall resonant sound (e.g. fretting notes for as long as possible). The non-picking hand always remains in a relatively compact position on the fretboard. However, the notes will often switch between the open string and a fretted note within and around the current position. Transitions between notes on the same string can occasionally be played as hammer-ons or pull-offs even if they are not written in direct succession.

The guitar part should be present and in the foreground throughout except for each ultimate subsection, which should be played with a decrescendo corresponding to the written-in ritardando.

### high accompaniment

This part can be played by any high-register, sustaining instrument. Optionally, the part may be transposed down or up an octave. Each tone should enter and exit from a soft volume or silence with a swell over the course of the tone duration such that the crescendo portion of the swell is slightly shorter than the decrescendo portion.

The part oscillates between two pitches every subsection. The higher tone (an F) is preferably played 16 cents sharp (a frequency ratio of 6/5 to the next lowest D). The performer can also explore slightly altering the tuning every few tones (i.e. once a tone is altered, it should sound a few times at that exact pitch before it is altered again).

This part should be present, floating above yet not overwhelming the guitar part.

### low accompaniment

This part consists of two voices that always sound together. While the noteheads of the voices are written in unison with opposing stems, the number given above indicates the difference in frequency between the two tones. This creates a beating effect caused by the slight difference with the exception of when the two voices are actually in unison (i.e. when the number given above is 0). In the second subsection of every section, the beating progressively gets slower (a smaller and smaller frequency difference between the two tones). While the indication of the frequency difference is precise, exact execution is less important than the movement towards unison. Also, the F that occurs in the penultimate subsection of every section is preferably played 16 cents sharp (a just 6/5 above the next lowest D).

The tones should have a sharp attack and a long decay such as with an electric bass that is plucked. The notation indicates this with *laissez vibrer* ties extending from the notes which are all written simply with quarter-note durations. Sustaining instruments can also be used such that each tone follows the dynamic profile described above. The part may be transposed up an octave if necessary (note the *ottava* marking on the clef).

This part should be loud and clear. The attacks should briefly overwhelm the other parts.

## readings

Occasionally, texts may be read in a rather inexpressive yet clear and intelligible voice. The readings may be from accounts in the book *Counterfeiting in Colonial Connecticut* written by Kenneth Scott and published by the American Numismatic Society in 1957. A few of the accounts from the book are provided in an appendix to this document. Longer accounts may be read in part. Scott published several books about counterfeiting in colonial America. Accounts from any of these compendiums may also be read. Other texts may be considered so long as they are related to numismatics and specifically counterfeiting (e.g., excerpts from the *Lex Cornelia testamentaria nummaria* that define early counterfeiting laws in ancient Rome).

Occasionally the following texts may also be read alone or over readings from the Kenneth Scott book (via a second speaker or recording). In any order. Shorter phrases may be repeated. Portions of the “general remarks” above can also be read.

### Black Lives Matter

Getting put on a ventilator was not a good sign. They were hypoxic without even realizing it. Multiple organ failure often followed. The World Health Organization finally declared a pandemic. The disease is now officially called Covid-19.

The police officer continued to kneel on his neck even though he was pleading that he could not breathe. 8 minutes and 46 seconds in total. It was so clearly murder.

We watched as country by country, they balanced or chose between health and economy. In a more humane society, this would not even be an issue. In a more humane society, the state of art and technology would be more of an indicator of well-being than gross domestic product and strictly financial measures.

The murder of George Floyd and the pandemic were inextricably linked. Due to systemic inequities, not only are black people disproportionately more likely than white people to be incarcerated and killed by police, they are also disproportionately succumbing to Covid-19.

The bears knew that the people were away and were more cavalier in their search for food outside the park. For a while, I saw bears more frequently than people.

from mark

email subject: death drop into kharachi

have you been following this?? so crazy. at first it was so strange-seeming that the crew would land with no gear, and be so baffled as to bounce three times on the engines before attempting a go around, but look at this insane approach! suddenly everything makes sense. they hadn't even grabbed the i.l.s. signal, much less got their speed, sink rate, altitude, configuration, etc under control – by the time the landing gear warning sounded (as heard in a.t.c. audio), it could have been an overlimit warning for any number of factors.

### The prison-industrial complex

Thanks Paulo,

I am fine.

Very removed from everything.

With hard feelings that I am not contributing to the cause.

In solidarity with the protests.

With hopes that it signals change.

And fears that the suffering will worsen and authoritarianism will reign with an even heavier fist.

Perhaps we can connect tomorrow.

“Report fever, stiff muscles or confusion, which might mean a life threatening reaction. Or uncontrollable muscle movements may be permanent. Side effects may not appear for several weeks. Metabolic changes may occur. Movement dysfunction, restlessness, sleepiness, stomach issues are common side effects.” It is a constant cycle of political pundits acting as journalists intertwined with pharmaceutical advertisements.

Both in Brazil and in the United States, the far-right are weaponizing democratic ideals to implement authoritarianism. They want all-power. And if not, they want war. Civil unrest seems inevitable.

Not surprisingly, this was the world many corporations already wanted and envisioned. The marketing machines were essentially ready to cater to a touchless society. Corporations should be replaced by cooperations. Markets should be fair in that products are valued by the cost it takes to create them and not by manufactured desire or controlled supply.

### The military-industrial complex

It is out of the scope of most peoples' vision that capitalism itself is the cause for all the suffering. As evidenced by my taxation studies, it seems clear that a proper solution to combat greed and inequality would be a wealth tax. Simply put, if everyone starts out near equal and can only accumulate wealth within their lifetime, then large wealth gaps would not persist over generations. The excess wealth could then be used for the basic needs and good of the people. There would be less incentive to ruthlessly profiteer. Poverty and inequality should not exist.

Some of the earliest laws against counterfeiting were enforced in ancient Rome as decreed in a document called the *Lex Cornelia testamentaria nummaria*. Despite legislation against counterfeiting, the Romans sometimes benefited from the practice as it inflated their currency in times of economic peril.

So many were quicker to condemn the looting than they were to condemn the murder. As Trevor Noah pointed out: it was the police that initially broke the social contract.

Complex financial instruments

Wipe down the seat with disinfectant. Mask on properly. Don't touch your face. Get through security as fast as possible once you arrive in Atlanta.

The United States constitution is not so holy. The human rights that it outlined did not apply to black people. Slavery was not even abolished until the 13th amendment was passed in 1865. And even then, there were plenty of means of oppression left intact. Protections and rights that have been painstakingly garnered over time—for and by people of color, for and by women, for and by the LGBTQ+ community—are fragile at best. Health care is a human right. Access to information is a human right. Intellectual property is the property of *all* people. Human rights are fundamental and should not be amendable.

## optional interludes

Optional interludes can be inserted between sections such that they fade in starting at the ultimate subsection of each section ( $x.4$ ), sound indefinitely, and then fade out at the beginning of the subsequent section ( $(x + 1).1$ ). This can be used to facilitate a solo performance, allowing the guitarist to stop playing and read a text during the interlude or simply to give the guitarist a rest.

The interlude is essentially a tremolo that is fed through a feedback system with a delay time that is a whole number divisor of the tremolo rate. Note that the feedback system is intentionally quite sensitive to the frequencies of the notes in the tremolo and the delay time. The tremolo should generally oscillate between two pitches with an interval between a major second and a perfect fourth apart that are centered around a pitch located between the D below middle C and an octave below. Occasionally the tremolo can focus on one of the pitches instead of oscillating between the two pitches.

This effect is modeled and implemented in the SuperCollider programming language as shown below (and also embedded in the computer program) using an oscillator as the source. However, a real instrument could be used as a source into a similar feedback system.

The interlude tremolo may also be played before the piece starts and after the piece ends.

```
1  (//note that this is sensitive to frequency and tremolo rate inputs
2  SynthDef(\interludeTremelo, {arg gate = 0, amp = 1, freq1, freq2, tremRate;
3    var tremeloTrig, trem, freq, sig, feedback, fade;
4    //fast tremelo - note that this can be slower so long as the delaytime of the feedback remains short
5    tremeloTrig = Impulse.kr(tremRate);
6    //tremelo between two notes
7    trem = Select.kr(Stepper.kr(tremeloTrig, 0, 0, 1), [freq1, freq2]);
8    //occasionally tremelo on same note
9    freq = Select.kr(TWChoose.kr(Dust.kr(10), [0, 1, 2], [5, 1, 1], 1), [trem, freq1, freq2]);
10   //generate signal
11   sig = VarSaw.ar(freq, 0, 0.3, 0.1) * EnvGen.kr(Env.perc(0.01, 0.1), tremeloTrig);
12   //feedback
13   feedback = CombC.ar(sig, 0.2, tremRate.reciprocal, 5);
14   fade = feedback * EnvGen.ar(Env.asr(15, 1, 15, \sine), gate) * amp * 0.75;
15   Out.ar([0, 1], fade);
16 })
17 )
18 (//example usage
19 var center, interval, freq1, freq2, tremRate;
20 center = 50 - 12.0.rand;
21 interval = 3.0.rand + 2;
22 freq1 = center + (interval / 2);
23 freq2 = center - (interval / 2);
24 tremRate = 50 + 4.0.rand2;
25 t = Synth(\interludeTremelo, [\gate, 1, \amp, 1, \freq1, freq1, \freq2, freq2, \tremRate, tremRate])
26 )
```

interlude synth code in SuperCollider

## SuperCollider program

While the piece has been written such that it can be played without the aid of a computer, a custom program written in the SuperCollider language can be used to synthesize any of the accompanying parts. The program also synthesizes the guitar part using a Karplus-Strong plucked string model, but this should only be used for auditioning and practice. The high accompaniment part is synthesized using sine tones with skewed, bell-shaped envelopes and the low accompaniment is synthesized using sine tones and envelopes that approximate a plucked electric bass.

The application source code is appended at the end of this score and downloadable from a git repository at:

[https://gitea.unboundedpress.org/mwinter/counterfeiting\\_in\\_colonial\\_connecticut](https://gitea.unboundedpress.org/mwinter/counterfeiting_in_colonial_connecticut)

The application provides a transport window to control playback and set variables as well as a basic mixing console to control the levels of the various sonic elements of the piece. The program also allows new versions of the piece to be generated and transcribed. Note that most of the code facilitates usability, playback, and transcription. However, the music of the piece is completely generated by the algorithm in `cicc_musical_data_generator.scd`. A help / readme file is included with the application documenting its functionality and use. To launch the application, execute `cicc_main.scd` in SuperCollider (on Linux, this is achieved by pressing `cmd+enter` with the cursor anywhere within the code block).

The generation of this document (using LaTeX) contains a version date at the bottom of this page in order to help track changes and the git repository will also detail commit changes. The piece was written using SuperCollider version 3.11.0 and Lilypond version 2.18.83.



application user interface

version generated: 2021.03.08

---

*I would like to extend a special thanks to Alex Bruck, Freeman Edwards, Paulo Dantas, Lauren Pratt, and Elliot Simpson. I first encountered the Kenneth Scott compendium at Alex's apartment months prior to leaving Mexico because of the pandemic. It was also around that time that I first communicated with Freeman after we discovered each others' work. However, our friendship really started to grow throughout the pandemic and his comments and suggestions regarding the score were extremely helpful. Similarly, Paulo and Lauren, with whom I communicated frequently while in quarantine, made several suggestions that greatly improved the general remarks. Finally, Elliot's advice was integral. He generously answered questions about notation that led to the final format of the musical score for the piece, which is written for him as a performer in mind.*

# Counterfeiting in Colonial Connecticut

seed: 20200525

michael winter  
(cdmx and gatlinburg, tennessee; 2020)

**1.1**  
♩ = approx. 80 (preferably faster towards 90 and no less than 70)

The score is divided into five systems, each with three staves: high (treble clef), guitar (treble clef with tablature), and low (bass clef). The guitar part includes chord diagrams and fret numbers. The first system starts with a circled '1.1' and a tempo instruction. The second system begins with a circled '5'. The third system begins with a circled '9'. The fourth system begins with a circled '13'. The fifth system begins with a circled '17'. The guitar part features a complex sequence of chords and melodic lines, while the high and low parts provide harmonic support with sustained notes and occasional melodic fragments.

high

guitar

low

21

high

guitar

low

25

high

guitar

low

29

1.2

high

guitar

low

33

high

guitar

low

37

high

guitar

low

41

high

guitar

low

45

high

guitar

low

49

high

guitar

low

53

high

guitar

low

57

high

guitar

low

61

high

guitar

low

65

high

guitar

low

69

high

guitar

low

73

high

guitar

low

77

high

guitar

low

81

high

guitar

low

85

high

guitar

low

89

high

guitar

low

1.3

93

high

guitar

low

97

high

guitar

low

101

high

guitar

low

105

high

guitar

low

109

1.4

high

guitar

low

112

high

guitar

low

116

high

guitar

low

120

high

guitar

low

124

high

guitar

low

128

high

guitar

low

2.1

high

guitar

low

0.0

Chord diagrams for guitar: II<sup>12</sup>, I<sup>10</sup>, I<sup>9</sup>, V<sup>0</sup>, III<sup>0</sup>, VI<sup>0</sup>, II<sup>10</sup>, I<sup>0</sup>, V<sup>0</sup>, III<sup>9</sup>, VI<sup>0</sup>, I<sup>0</sup>, III<sup>9</sup>, II<sup>0</sup>, IV<sup>9</sup>, VI<sup>0</sup>, IV<sup>0</sup>, II<sup>9</sup>.

high

guitar

low

Chord diagrams for guitar: VI<sup>0</sup>, IV<sup>9</sup>, II<sup>9</sup>, VI<sup>0</sup>, IV<sup>0</sup>, II<sup>9</sup>, VI<sup>12</sup>, VI<sup>10</sup>, I<sup>0</sup>, II<sup>8</sup>, I<sup>8</sup>, II<sup>7</sup>, III<sup>0</sup>, V<sup>8</sup>, I<sup>0</sup>, III<sup>9</sup>, III<sup>6</sup>, V<sup>0</sup>, IV<sup>0</sup>.

high

guitar

low

Chord diagrams for guitar: II<sup>0</sup>, I<sup>7</sup>, IV<sup>7</sup>, V<sup>7</sup>, II<sup>0</sup>, VI<sup>0</sup>, I<sup>7</sup>, III<sup>0</sup>, I<sup>7</sup>, IV<sup>0</sup>, VI<sup>10</sup>, VI<sup>9</sup>, III<sup>0</sup>, I<sup>7</sup>, I<sup>6</sup>.

2.2

high

guitar

low

7.0

Chord diagrams for guitar: II<sup>0</sup>, I<sup>7</sup>, IV<sup>7</sup>, V<sup>7</sup>, II<sup>0</sup>, I<sup>7</sup>, I<sup>7</sup>, IV<sup>0</sup>, VI<sup>9</sup>, III<sup>0</sup>.

high

guitar

low

5.6

Chord diagrams for guitar: I<sup>7</sup>, I<sup>6</sup>, II<sup>0</sup>, I<sup>7</sup>, V<sup>7</sup>, II<sup>0</sup>, I<sup>7</sup>.

20

high

guitar

low

4.2

24

high

guitar

low

2.8

28

high

guitar

low

32

high

guitar

low

1.4

36

high

guitar

low

2.3

0.0

40

high

guitar

low

(8)

IV<sup>7</sup> V<sup>0</sup> VI<sup>7</sup> VI<sup>5</sup> I<sup>0</sup> IV<sup>0</sup> V<sup>4</sup> VI<sup>5</sup> VI<sup>4</sup> I<sup>0</sup> IV<sup>0</sup> V<sup>4</sup> VI<sup>0</sup> I<sup>6</sup> I<sup>4</sup> IV<sup>0</sup> V<sup>0</sup> VI<sup>4</sup> I<sup>4</sup> IV<sup>0</sup> V<sup>0</sup> VI<sup>0</sup> I<sup>4</sup>

44

high

guitar

low

(8)

IV<sup>6</sup> V<sup>0</sup> VI<sup>0</sup> I<sup>4</sup> IV<sup>5</sup> V<sup>0</sup> VI<sup>0</sup> V<sup>0</sup> VI<sup>0</sup> I<sup>4</sup> IV<sup>5</sup> IV<sup>4</sup> III<sup>6</sup> IV<sup>0</sup> II<sup>0</sup> III<sup>0</sup> VI<sup>4</sup>

48

high

guitar

low

(8)

IV<sup>4</sup> II<sup>0</sup> III<sup>0</sup> IV<sup>0</sup> VI<sup>0</sup> IV<sup>4</sup> I<sup>0</sup> VI<sup>4</sup> III<sup>0</sup> II<sup>0</sup> III<sup>0</sup> I<sup>4</sup> III<sup>0</sup> V<sup>0</sup> I<sup>0</sup> VI<sup>4</sup> II<sup>0</sup> IV<sup>4</sup> I<sup>0</sup>

52

high

guitar

low

(8)

III<sup>4</sup> IV<sup>0</sup> III<sup>0</sup> IV<sup>4</sup> VI<sup>0</sup> III<sup>0</sup> II<sup>5</sup> III<sup>0</sup> I<sup>0</sup> V<sup>0</sup> IV<sup>4</sup> II<sup>0</sup> III<sup>4</sup> III<sup>3</sup> I<sup>0</sup> V<sup>0</sup> IV<sup>4</sup> IV<sup>2</sup>

56

high

guitar

low

(8)

II<sup>0</sup> III<sup>0</sup> I<sup>4</sup> I<sup>2</sup> V<sup>0</sup> IV<sup>2</sup> V<sup>0</sup> IV<sup>2</sup> III<sup>0</sup> II<sup>0</sup> VI<sup>4</sup> VI<sup>2</sup> V<sup>0</sup> IV<sup>0</sup> III<sup>3</sup> II<sup>0</sup> I<sup>2</sup> V<sup>2</sup> IV<sup>0</sup> III<sup>0</sup>

60

high

guitar

low

64

high

guitar

low

68

high

guitar

low

72

2.4

high

guitar

low

76

high

guitar

low

3.1

2/2

high

guitar

low

0.0

(8)

5

high

guitar

low

(8)

9

high

guitar

low

(8)

13

high

guitar

low

(8)

17

high

guitar

low

(8)

21

high

guitar

low

25

high

guitar

low

3.2

6.0

29

high

guitar

low

5.5

33

high

guitar

low

5.0

4.5

37

high

guitar

low

4.0

3.5

3.0

41

high

guitar

low

IV<sup>0</sup> VI<sup>0</sup> V<sup>4</sup> I<sup>6</sup> VI<sup>0</sup> III<sup>7</sup> III<sup>5</sup> I<sup>6</sup> IV<sup>0</sup>

2.5 2.0

45

high

guitar

low

VI<sup>0</sup> III<sup>7</sup> III<sup>5</sup> I<sup>6</sup> VI<sup>0</sup> V<sup>4</sup> I<sup>6</sup> IV<sup>0</sup>

1.5 1.0

49

high

guitar

low

III<sup>7</sup> V<sup>4</sup> IV<sup>0</sup> VI<sup>0</sup> III<sup>7</sup> III<sup>5</sup> I<sup>6</sup> IV<sup>0</sup> III<sup>0</sup> VI<sup>0</sup>

0.5 0.0

3.3

53

high

guitar

low

V<sup>0</sup> I<sup>0</sup> IV<sup>0</sup> VI<sup>0</sup> IV<sup>5</sup> II<sup>0</sup> V<sup>0</sup> VI<sup>4</sup> IV<sup>0</sup> II<sup>0</sup> V<sup>0</sup> VI<sup>0</sup> IV<sup>0</sup> II<sup>0</sup> V<sup>4</sup> II<sup>7</sup>

57

high

guitar

low

II<sup>6</sup> V<sup>0</sup> IV<sup>0</sup> VI<sup>3</sup> I<sup>5</sup> V<sup>4</sup> V<sup>3</sup> II<sup>0</sup> V<sup>0</sup> II<sup>0</sup> II<sup>0</sup> IV<sup>5</sup> IV<sup>3</sup> III<sup>4</sup> V<sup>0</sup> VI<sup>0</sup> II<sup>4</sup> IV<sup>0</sup> III<sup>0</sup> V<sup>0</sup>

61

high

guitar

low

65

high

guitar

low

69

high

guitar

low

73

high

guitar

low

3.4

76

high

guitar

low

80

high

guitar

low

VI° I° V° II°

Detailed description: This system contains measures 80 through 83. The high part (treble clef) has a whole rest in measure 80, followed by a half note G4 in measure 81, a half note A4 in measure 82, and a whole rest in measure 83. The guitar part (treble clef) starts with a whole rest in measure 80. In measure 81, it plays a half note G4 (VI°), a half note A4 (I°), and a half note B4 (V°). In measure 82, it plays a half note C5 (II°), a half note B4 (V°), and a half note A4 (I°). In measure 83, it plays a half note G4 (VI°), a half note F4 (I°), and a half note E4 (V°). The low part (bass clef) has whole rests in all four measures.

84

high

guitar

low

VI° I° V°

Detailed description: This system contains measures 84 through 87. The high part (treble clef) has a whole rest in measure 84, followed by a half note G4 in measure 85, a half note A4 in measure 86, and a whole rest in measure 87. The guitar part (treble clef) starts with a whole rest in measure 84. In measure 85, it plays a half note G4 (VI°), a half note A4 (I°), and a half note B4 (V°). In measure 86, it plays a half note C5 (II°), a half note B4 (V°), and a half note A4 (I°). In measure 87, it plays a half note G4 (VI°), a half note F4 (I°), and a half note E4 (V°). The low part (bass clef) has whole rests in all four measures.

88

high

guitar

low

II°

Detailed description: This system contains measures 88 through 91. The high part (treble clef) has a whole rest in measure 88, followed by a half note G4 in measure 89, a half note A4 in measure 90, and a whole rest in measure 91. The guitar part (treble clef) starts with a whole rest in measure 88. In measure 89, it plays a half note G4 (II°), a half note A4 (I°), and a half note B4 (V°). In measure 90, it plays a half note C5 (II°), a half note B4 (V°), and a half note A4 (I°). In measure 91, it plays a half note G4 (VI°), a half note F4 (I°), and a half note E4 (V°). The low part (bass clef) has whole rests in all four measures.

4.1

high

guitar

low

5

high

guitar

low

9

high

guitar

low

13

high

guitar

low

17

4.2

high

guitar

low



41

high

guitar

low

45

high

guitar

low

49

high

guitar

low

53

high

guitar

low

57

high

guitar

low

61

high

guitar

low

3.0

65

high

guitar

low

69

high

guitar

low

2.6

73

high

guitar

low

2.1

77

high

guitar

low

81

high

guitar

low

1.7

85

high

guitar

low

89

high

guitar

low

93

high

guitar

low

1.3

97

high

guitar

low

0.9

101

high

guitar

low

105

high

guitar

low

109

high

guitar

low

113

high

guitar

low

117

4.3

high

guitar

low

121

high

guitar

low

(8)

III<sup>5</sup> VI<sup>0</sup> VI<sup>0</sup> VI<sup>0</sup> II<sup>0</sup> V<sup>4</sup> IV<sup>0</sup> I<sup>0</sup> VI<sup>4</sup> V<sup>0</sup> IV<sup>0</sup> VI<sup>4</sup> I<sup>0</sup> III<sup>0</sup> II<sup>0</sup> VI<sup>4</sup> I<sup>6</sup> III<sup>0</sup> II<sup>0</sup> VI<sup>0</sup>

125

high

guitar

low

(8)

I<sup>0</sup> III<sup>0</sup> II<sup>4</sup> II<sup>3</sup> VI<sup>0</sup> I<sup>0</sup> III<sup>4</sup> II<sup>0</sup> I<sup>5</sup> III<sup>0</sup> II<sup>0</sup> VI<sup>4</sup> VI<sup>3</sup> I<sup>0</sup> III<sup>4</sup> II<sup>0</sup> I<sup>0</sup> V<sup>3</sup> II<sup>3</sup> IV<sup>0</sup> VI<sup>3</sup> I<sup>0</sup> V<sup>0</sup>

129

high

guitar

low

(8)

II<sup>0</sup> IV<sup>4</sup> VI<sup>0</sup> I<sup>5</sup> I<sup>4</sup> V<sup>0</sup> II<sup>2</sup> IV<sup>2</sup> V<sup>0</sup> VI<sup>0</sup> II<sup>1</sup> IV<sup>0</sup> V<sup>0</sup> VI<sup>2</sup> II<sup>1</sup> IV<sup>2</sup> IV<sup>1</sup> III<sup>0</sup> I<sup>0</sup> IV<sup>0</sup>

133

high

guitar

low

(8)

V<sup>0</sup> II<sup>0</sup> III<sup>3</sup> I<sup>2</sup> IV<sup>0</sup> V<sup>3</sup> V<sup>2</sup> II<sup>0</sup> III<sup>1</sup> I<sup>0</sup> IV<sup>0</sup> V<sup>0</sup> II<sup>0</sup> III<sup>0</sup> I<sup>0</sup> IV<sup>0</sup> V<sup>0</sup> II<sup>0</sup> I<sup>0</sup> VI<sup>0</sup>

4.5

137

high

guitar

low

(8)

II<sup>0</sup> IV<sup>0</sup> I<sup>0</sup> VI<sup>0</sup> II<sup>0</sup> IV<sup>0</sup> V<sup>0</sup> VI<sup>0</sup> VI<sup>0</sup> II<sup>0</sup> I<sup>0</sup> IV<sup>0</sup> V<sup>0</sup> VI<sup>0</sup> III<sup>0</sup> II<sup>0</sup> I<sup>0</sup> III<sup>0</sup> II<sup>0</sup> I<sup>0</sup>

2.0

4.4

high

guitar

low

high

guitar

low

high

guitar

low

5.1

high

guitar

low

5

high

guitar

low

9

high

guitar

low

13

high

guitar

low

17

high

guitar

low

5.2

2/2

20

high

guitar

low

(8)

7.0

23

high

guitar

low

(8)

6.0

27

high

guitar

low

(8)

31

high

guitar

low

(8)

5.0

35

high

guitar

low

(8)

4.0

39

high

guitar

low

43

high

guitar

low

47

high

guitar

low

51

high

guitar

low

55

high

guitar

low

59

high

guitar

low

5.3

0.0

63

high

guitar

low

67

high

guitar

low

71

high

guitar

low

3.1

75

high

guitar

low

2.6

79

high

guitar

low

3

5.4

2

0.0

82

high

guitar

low

86

high

guitar

low

6.1

high

guitar

low

Chord diagrams:  $(6s)$   $IV^8$   $I^0$   $III^{11}$   $II^0$   $IV^8$   $I^0$   $III^{11}$   $II^0$   $VI^{10}$   $I^0$   $VI^0$   $I^0$   $VI^9$   $I^0$   $VI^0$   $I^{11}$   $VI^0$   $I^0$   $\#VI^8$   $I^0$   $II^0$   $VI^0$

5

high

guitar

low

Chord diagrams:  $(6s)$   $IV^8$   $VI^0$   $III^{10}$   $II^0$   $V^0$   $IV^0$   $\#VI^8$   $III^8$   $II^0$   $V^0$   $II^0$   $\#VI^8$   $IV^0$   $II^0$   $\#VI^8$   $IV^0$   $II^0$   $VI^8$

9

high

guitar

low

Chord diagrams:  $(6s)$   $IV^0$   $II^0$   $VI^0$   $IV^0$   $II^0$   $VI^0$   $IV^0$   $II^9$   $VI^0$   $IV^0$   $V^0$   $IV^8$   $I^{11}$   $V^0$   $IV^8$   $I^{10}$   $V^0$

13

high

guitar

low

Chord diagrams:  $(6s)$   $IV^8$   $VI^0$   $I^9$   $\#VI^8$   $V^0$   $I^0$   $II^0$   $\#VI^8$   $V^0$   $II^0$   $VI^0$   $V^0$   $I^9$   $II^0$   $\#VI^8$   $V^0$   $I^0$

17

high

guitar

low

Chord diagrams:  $(6s)$   $II^9$   $II^8$   $VI^0$   $V^0$   $I^9$   $I^8$   $II^8$   $III^8$   $V^0$   $I^8$   $IV^0$   $V^0$   $I^8$   $II^0$   $VI^0$   $III^0$   $\#VI^8$   $I^0$   $II^0$

21

high

guitar

low

25

high

guitar

low

29

high

guitar

low

33

high

guitar

low

37

high

guitar

low

41

high

guitar

low

45

high

guitar

low

49

high

guitar

low

52

high

guitar

low

56

high

guitar

low

60

high

guitar

low

(8)

VI<sup>5</sup> II<sup>0</sup> V<sup>0</sup> IV<sup>4</sup> V<sup>0</sup> I<sup>3</sup> II<sup>4</sup> IV<sup>0</sup> IV<sup>5</sup> IV<sup>4</sup>

4.0

64

high

guitar

low

(8)

V<sup>0</sup> II<sup>0</sup> I<sup>0</sup> VI<sup>6</sup> II<sup>0</sup> VI<sup>5</sup> II<sup>0</sup> I<sup>0</sup> IV<sup>4</sup> V<sup>0</sup>

68

high

guitar

low

(8)

I<sup>3</sup> II<sup>5</sup> II<sup>4</sup> IV<sup>0</sup> II<sup>0</sup> IV<sup>5</sup> V<sup>0</sup> II<sup>0</sup> I<sup>0</sup> VI<sup>6</sup> II<sup>0</sup>

3.0

72

high

guitar

low

(8)

VI<sup>5</sup> II<sup>0</sup> I<sup>0</sup> V<sup>0</sup> IV<sup>4</sup> V<sup>0</sup> I<sup>3</sup> II<sup>5</sup> II<sup>4</sup>

2.0

76

high

guitar

low

(8)

IV<sup>0</sup> II<sup>0</sup> IV<sup>5</sup> V<sup>0</sup> II<sup>0</sup> I<sup>0</sup> VI<sup>6</sup> VI<sup>5</sup> II<sup>0</sup> I<sup>0</sup> V<sup>0</sup>

80

high

guitar

low

84

high

guitar

low

87

high

guitar

low

91

high

guitar

low

95

high

guitar

low

99 6.4

high

guitar

low

103

high

guitar

low

107

high

guitar

low

111

high

guitar

low

7.1

high

guitar

low

0.0

5

high

guitar

low

9

high

guitar

low

13

high

guitar

low

17

high

guitar

low

21

high

guitar

low

Chords: III<sup>6</sup>, I<sup>6</sup>, V<sup>6</sup>, VI<sup>6</sup>, V<sup>6</sup>, IV<sup>0</sup>, II<sup>0</sup>, I<sup>0</sup>, VI<sup>0</sup>, V<sup>6</sup>, III<sup>6</sup>, II<sup>0</sup>, I<sup>0</sup>, II<sup>7</sup>, IV<sup>0</sup>, I<sup>6</sup>, VI<sup>6</sup>, V<sup>0</sup>, I<sup>6</sup>, V<sup>6</sup>

25

high

guitar

low

Chords: I<sup>0</sup>, V<sup>0</sup>, I<sup>6</sup>, V<sup>0</sup>, VI<sup>0</sup>, II<sup>0</sup>, IV<sup>0</sup>, V<sup>0</sup>, IV<sup>9</sup>, III<sup>0</sup>, IV<sup>0</sup>, III<sup>6</sup>

28

7.2

high

guitar

low

Chords: VI<sup>0</sup>, IV<sup>0</sup>, III<sup>0</sup>, VI<sup>6</sup>, IV<sup>7</sup>, III<sup>4</sup>, IV<sup>0</sup>, III<sup>0</sup>, VI<sup>6</sup>, IV<sup>7</sup>, IV<sup>0</sup>, III<sup>0</sup>, VI<sup>6</sup>

Fret numbers: 5.0, 4.2

31

high

guitar

low

Chords: IV<sup>7</sup>, III<sup>4</sup>, IV<sup>0</sup>, III<sup>0</sup>, VI<sup>6</sup>, IV<sup>7</sup>, III<sup>4</sup>

Fret number: 3.3

35

high

guitar

low

Chords: IV<sup>0</sup>, III<sup>0</sup>, VI<sup>6</sup>, IV<sup>7</sup>, III<sup>4</sup>, IV<sup>0</sup>, III<sup>0</sup>, VI<sup>6</sup>, IV<sup>7</sup>, III<sup>4</sup>

Fret numbers: 2.5, 1.7



58

high

guitar

low

62

high

guitar

low

66

high

guitar

low

8.1

high

guitar

low

5

high

guitar

low

9

high

guitar

low

13

high

guitar

low

17

high

guitar

low

Detailed description of the musical score: The score is for a piece in 2/2 time, starting at measure 8.1. It consists of five systems, each with three staves: high voice, guitar, and low voice. The high voice part is mostly rests with some melodic fragments. The guitar part is the primary melodic and harmonic component, featuring a variety of chords and fretting techniques. The low voice part is mostly rests. The guitar chords and fretting are as follows:  
System 1 (Measures 8-10):  
Measure 8: V<sup>10</sup>, V<sup>9</sup>, III<sup>0</sup>, VI<sup>0</sup>, I<sup>10</sup>, V<sup>9</sup>, III<sup>0</sup>, I<sup>0</sup>, V<sup>0</sup>, III<sup>0</sup>, VI<sup>11</sup>, VI<sup>9</sup>, I<sup>0</sup>, V<sup>9</sup>, III<sup>0</sup>, VI<sup>9</sup>, I<sup>0</sup>.  
System 2 (Measures 11-13):  
Measure 11: V<sup>0</sup>, III<sup>12</sup>, III<sup>11</sup>, VI<sup>9</sup>, VI<sup>8</sup>, V<sup>0</sup>, III<sup>9</sup>, VI<sup>0</sup>, I<sup>8</sup>, V<sup>0</sup>, III<sup>0</sup>, VI<sup>8</sup>, V<sup>9</sup>, V<sup>8</sup>, III<sup>0</sup>, I<sup>0</sup>, II<sup>0</sup>, VI<sup>0</sup>.  
System 3 (Measures 14-16):  
Measure 14: I<sup>0</sup>, VI<sup>8</sup>, V<sup>0</sup>, IV<sup>8</sup>, I<sup>0</sup>, IV<sup>0</sup>, III<sup>9</sup>, VI<sup>0</sup>, I<sup>0</sup>, V<sup>0</sup>, II<sup>0</sup>, III<sup>0</sup>, VI<sup>8</sup>, I<sup>0</sup>, V<sup>8</sup>, II<sup>0</sup>, III<sup>0</sup>, VI<sup>0</sup>, I<sup>8</sup>, V<sup>8</sup>, II<sup>0</sup>.  
System 4 (Measures 17-19):  
Measure 17: III<sup>0</sup>, VI<sup>0</sup>, I<sup>0</sup>, V<sup>8</sup>, II<sup>11</sup>, II<sup>10</sup>, III<sup>0</sup>, VI<sup>0</sup>, V<sup>7</sup>, II<sup>10</sup>, II<sup>8</sup>, III<sup>0</sup>, VI<sup>0</sup>, II<sup>0</sup>, IV<sup>7</sup>, III<sup>0</sup>, II<sup>0</sup>, IV<sup>6</sup>, III<sup>0</sup>, VI<sup>7</sup>.  
System 5 (Measures 20-22):  
Measure 20: II<sup>0</sup>, IV<sup>6</sup>, III<sup>0</sup>, VI<sup>6</sup>, II<sup>0</sup>, IV<sup>0</sup>, III<sup>7</sup>, II<sup>0</sup>, IV<sup>5</sup>, III<sup>0</sup>, VI<sup>5</sup>, II<sup>0</sup>, IV<sup>5</sup>, V<sup>7</sup>, V<sup>5</sup>, I<sup>0</sup>, II<sup>0</sup>, VI<sup>5</sup>, V<sup>0</sup>, I<sup>7</sup>.

8.2

3

2

high

guitar

low

40

high

guitar

low

44

high

guitar

low

8.3

47

high

guitar

low

51

high

guitar

low

55

high

guitar

low

59

high

guitar

low

63

high

guitar

low

67

high

guitar

low

71

high

guitar

low

75

high

guitar

low

79 **8.4**

high

guitar

low

83

high

guitar

low

86

high

guitar

low

9.1

high

guitar

low

5

high

guitar

low

9

high

guitar

low

13

high

guitar

low

17

high

guitar

low

21

9.2

high

guitar

low

(8)

III<sup>0</sup> V<sup>5</sup> I<sup>5</sup> IV<sup>0</sup> II<sup>0</sup> III<sup>5</sup> V<sup>5</sup> I<sup>0</sup> IV<sup>6</sup> V<sup>0</sup> II<sup>4</sup> IV<sup>0</sup> II<sup>0</sup> III<sup>5</sup> I<sup>0</sup> IV<sup>6</sup> V<sup>0</sup>

7.0

25

high

guitar

low

(8)

II<sup>0</sup> III<sup>5</sup> V<sup>5</sup> I<sup>0</sup> IV<sup>6</sup> V<sup>0</sup> II<sup>4</sup> IV<sup>0</sup> II<sup>0</sup>

6.4 5.8

29

high

guitar

low

(8)

V<sup>5</sup> I<sup>0</sup> V<sup>0</sup> II<sup>4</sup> IV<sup>0</sup> II<sup>0</sup> V<sup>5</sup> V<sup>0</sup> II<sup>4</sup>

5.3

33

high

guitar

low

(8)

IV<sup>0</sup> II<sup>0</sup> III<sup>5</sup> I<sup>0</sup> IV<sup>6</sup> II<sup>4</sup> IV<sup>0</sup> II<sup>0</sup>

4.7 4.1

37

high

guitar

low

(8)

III<sup>5</sup> V<sup>5</sup> I<sup>0</sup> IV<sup>6</sup> V<sup>0</sup> IV<sup>0</sup> II<sup>0</sup> III<sup>5</sup>

3.5

41

high

guitar

low

2.9

2.9

45

high

guitar

low

2.3

2.3

49

high

guitar

low

1.8

53

high

guitar

low

1.2

0.6

57

high

guitar

low

0.6

61 9.3

high

guitar

low

65

high

guitar

low

69

high

guitar

low

73

4.2

high

guitar

low

77

1.3

high

guitar

low



10.1

high

guitar

low

Chord diagrams for guitar line:

- Measures 1-2:  $\text{II}^9$ ,  $\text{I}^0$ ,  $\text{II}^0$ ,  $\text{I}^0$ ,  $\text{II}^0$ ,  $\text{I}^0$ ,  $\text{V}^{11}$ ,  $\text{IV}^{10}$ ,  $\text{V}^{11}$ ,  $\text{IV}^0$ ,  $\text{V}^{11}$ ,  $\text{V}^9$ ,  $\text{IV}^0$ ,  $\text{VI}^9$ ,  $\text{IV}^9$ ,  $\text{VI}^8$ ,  $\text{IV}^0$ ,  $\text{VI}^8$ ,  $\text{IV}^8$
- Measures 3-4:  $\text{VI}^0$ ,  $\text{IV}^0$ ,  $\text{V}^9$ ,  $\text{V}^8$ ,  $\text{IV}^8$ ,  $\text{II}^0$ ,  $\text{III}^0$ ,  $\text{V}^0$ ,  $\text{IV}^8$ ,  $\text{II}^8$ ,  $\text{III}^0$ ,  $\text{II}^8$ ,  $\text{IV}^0$ ,  $\text{I}^0$ ,  $\text{VI}^8$ ,  $\text{III}^0$ ,  $\text{II}^0$ ,  $\text{IV}^0$ ,  $\text{VI}^0$ ,  $\text{III}^0$
- Measures 5-6:  $\text{II}^8$ ,  $\text{VI}^8$ ,  $\text{III}^0$ ,  $\text{II}^8$ ,  $\text{III}^0$ ,  $\text{II}^0$ ,  $\text{VI}^0$ ,  $\text{III}^0$ ,  $\text{II}^8$ ,  $\text{I}^0$ ,  $\text{III}^0$ ,  $\text{IV}^8$ ,  $\text{II}^8$ ,  $\text{I}^0$ ,  $\text{III}^0$ ,  $\text{IV}^8$ ,  $\text{I}^0$ ,  $\text{II}^0$ ,  $\text{V}^0$ ,  $\text{VI}^8$ ,  $\text{IV}^0$ ,  $\text{II}^8$ ,  $\text{VI}^8$
- Measures 7-8:  $\text{II}^8$ ,  $\text{VI}^0$ ,  $\text{VI}^8$ ,  $\text{II}^0$ ,  $\text{VI}^0$ ,  $\text{VI}^0$ ,  $\text{VI}^0$ ,  $\text{VI}^0$ ,  $\text{VI}^0$ ,  $\text{IV}^0$ ,  $\text{II}^8$ ,  $\text{V}^0$ ,  $\text{III}^0$ ,  $\text{IV}^8$ ,  $\text{II}^0$ ,  $\text{V}^8$ ,  $\text{III}^0$ ,  $\text{V}^8$
- Measures 9-10:  $\text{VI}^0$ ,  $\text{III}^0$ ,  $\text{IV}^8$ ,  $\text{I}^{10}$ ,  $\text{V}^7$ ,  $\text{VI}^0$ ,  $\text{III}^0$ ,  $\text{IV}^8$ ,  $\text{I}^9$ ,  $\text{V}^0$ ,  $\text{VI}^8$ ,  $\text{VI}^7$ ,  $\text{III}^0$ ,  $\text{IV}^0$ ,  $\text{I}^7$ ,  $\text{VI}^7$ ,  $\text{I}^7$ ,  $\text{IV}^0$ ,  $\text{III}^0$ ,  $\text{V}^7$ ,  $\text{I}^0$ ,  $\text{VI}^0$ ,  $\text{IV}^7$

21 10.2

high  
guitar  
low

25

high  
guitar  
low

29

high  
guitar  
low

33

high  
guitar  
low

37

high  
guitar  
low

41

high

guitar

low

45

high

guitar

low

49

high

guitar

low

53

high

guitar

low

57

high

guitar

low

61

high

guitar

low

10.3

65

high

guitar

low

69

high

guitar

low

73

high

guitar

low

77

high

guitar

low

81

high

guitar

low

4.6

85

high

guitar

low

1.6

89

high

guitar

low

93

10.4

high

guitar

low

0.0

97

high

guitar

low

Musical score for guitar, consisting of three staves: high, guitar, and low. The score is marked with a circled number 101 at the beginning of the high staff. The high staff contains a melodic line with a slur over the final two notes, which are marked with a '7' and a '2' respectively. The guitar staff contains a series of chords: a first chord with a circled '8' below it, a second chord with a circled '1' below it, and a third chord with a circled 'VI' below it. The low staff contains a series of chords, with a circled '8' below the first one. The score ends with a double bar line.

11.1

high

guitar

low

5

high

guitar

low

9

high

guitar

low

13

high

guitar

low

17

high

guitar

low

21

high

guitar

low

(8)

VI<sup>7</sup> VI<sup>5</sup> III<sup>0</sup> V<sup>0</sup> II<sup>5</sup> IV<sup>5</sup> VI<sup>5</sup> III<sup>0</sup> V<sup>7</sup> II<sup>0</sup> IV<sup>0</sup> VI<sup>5</sup>

24

high

guitar

low

(8)

11.2

3/2

5.0

III<sup>0</sup> IV<sup>0</sup> VI<sup>5</sup> IV<sup>0</sup> I<sup>7</sup> II<sup>5</sup> II<sup>4</sup> VI<sup>5</sup> III<sup>0</sup> VI<sup>5</sup> IV<sup>0</sup> I<sup>7</sup> II<sup>5</sup>

27

high

guitar

low

(8)

4.6

4.2

II<sup>4</sup> IV<sup>0</sup> VI<sup>5</sup> IV<sup>0</sup> II<sup>5</sup> II<sup>4</sup> VI<sup>5</sup> III<sup>0</sup> IV<sup>0</sup> VI<sup>5</sup> IV<sup>0</sup> I<sup>7</sup>

31

high

guitar

low

(8)

3.8

II<sup>5</sup> II<sup>4</sup> VI<sup>5</sup> III<sup>0</sup> IV<sup>0</sup> VI<sup>5</sup> IV<sup>0</sup> I<sup>7</sup> II<sup>5</sup> II<sup>4</sup>

35

high

guitar

low

(8)

3.3

2.9

2.5

VI<sup>5</sup> III<sup>0</sup> IV<sup>0</sup> VI<sup>5</sup> II<sup>5</sup> VI<sup>5</sup> III<sup>0</sup> IV<sup>0</sup> VI<sup>5</sup> I<sup>7</sup> II<sup>4</sup> VI<sup>5</sup> III<sup>0</sup> IV<sup>0</sup>

39

high

guitar

low

(8)

VI<sup>5</sup> IV<sup>0</sup> I<sup>7</sup> II<sup>5</sup> II<sup>4</sup> VI<sup>5</sup> III<sup>0</sup> IV<sup>0</sup> VI<sup>5</sup> IV<sup>0</sup>

2.1

43

high

guitar

low

(8)

II<sup>5</sup> II<sup>4</sup> VI<sup>5</sup> III<sup>0</sup> IV<sup>0</sup> VI<sup>5</sup> IV<sup>0</sup> I<sup>7</sup> II<sup>5</sup> VI<sup>5</sup>

1.7 1.3

47

high

guitar

low

(8)

III<sup>0</sup> IV<sup>0</sup> VI<sup>5</sup> I<sup>7</sup> II<sup>5</sup> II<sup>4</sup> VI<sup>5</sup> III<sup>0</sup> IV<sup>0</sup> VI<sup>5</sup>

0.8

61

high

guitar

low

(8)

IV<sup>0</sup> I<sup>7</sup> II<sup>5</sup> II<sup>4</sup> VI<sup>5</sup> III<sup>0</sup> IV<sup>0</sup>

0.4

11.3

3/2

54

high

guitar

low

(8)

VI<sup>5</sup> IV<sup>0</sup> I<sup>7</sup> II<sup>5</sup> III<sup>0</sup> IV<sup>5</sup> IV<sup>4</sup> III<sup>0</sup> IV<sup>0</sup> III<sup>0</sup> IV<sup>4</sup> III<sup>0</sup> IV<sup>0</sup> VI<sup>0</sup> V<sup>7</sup>

0.0

57

high

guitar

low

61

high

guitar

low

65

high

guitar

low

69

high

guitar

low

73

high

guitar

low

77

high

guitar

low

(8)

III<sup>6</sup> III<sup>5</sup> VI<sup>0</sup> IV<sup>0</sup> V<sup>0</sup> I<sup>0</sup> III<sup>4</sup> VI<sup>0</sup> VI<sup>1</sup> IV<sup>2</sup> VI<sup>1</sup> V<sup>0</sup> IV<sup>0</sup> VI<sup>1</sup> V<sup>1</sup> IV<sup>0</sup> VI<sup>0</sup> V<sup>0</sup> IV<sup>0</sup> II<sup>1</sup>

81

high

guitar

low

(8)

I<sup>2</sup> VI<sup>0</sup> IV<sup>0</sup> V<sup>0</sup> I<sup>0</sup> II<sup>1</sup> IV<sup>0</sup> VI<sup>0</sup> V<sup>0</sup> I<sup>2</sup> II<sup>0</sup> IV<sup>0</sup> VI<sup>0</sup> IV<sup>0</sup> I<sup>0</sup> II<sup>0</sup> V<sup>0</sup> IV<sup>0</sup> I<sup>0</sup> II<sup>0</sup> V<sup>0</sup>

4.8

85

high

guitar

low

(8)

IV<sup>0</sup> I<sup>1</sup> II<sup>0</sup> V<sup>0</sup> VI<sup>0</sup> V<sup>0</sup> III<sup>3</sup> II<sup>0</sup> IV<sup>0</sup> VI<sup>0</sup> V<sup>0</sup> III<sup>0</sup> II<sup>0</sup> IV<sup>0</sup> V<sup>0</sup> IV<sup>0</sup> III<sup>0</sup> I<sup>0</sup> II<sup>0</sup> VI<sup>0</sup> I<sup>0</sup>

1.5

89

high

guitar

low

(8)

III<sup>2</sup> VI<sup>0</sup> IV<sup>0</sup> II<sup>0</sup> V<sup>0</sup> III<sup>2</sup> V<sup>0</sup> II<sup>0</sup> VI<sup>0</sup> III<sup>0</sup> IV<sup>0</sup> V<sup>0</sup> II<sup>0</sup> VI<sup>0</sup> IV<sup>0</sup> II<sup>0</sup> V<sup>0</sup> VI<sup>0</sup> IV<sup>0</sup> I<sup>0</sup> II<sup>0</sup>

11.4

93

high

guitar

low

(8)

0.0

III<sup>0</sup> IV<sup>0</sup> I<sup>0</sup> II<sup>0</sup> III<sup>0</sup> IV<sup>0</sup> I<sup>0</sup> II<sup>0</sup> III<sup>0</sup> IV<sup>0</sup> I<sup>0</sup> II<sup>0</sup> III<sup>0</sup>

Musical score for guitar, consisting of three staves: high, guitar, and low. The high staff is in treble clef and contains a whole note chord in the final measure, marked with a circled 97. The guitar staff is in treble clef and contains a melodic line with a circled 88 at the beginning. The low staff is in bass clef and contains a whole note chord in the final measure, marked with a circled 88. The guitar staff includes chord markings: IV°, I°, II°, and III°.

12.1

high

guitar

low

Chord diagrams:  $IV^0$ ,  $I^{10}$ ,  $II^0$ ,  $III^0$ ,  $IV^9$ ,  $I^0$ ,  $II^{10}$ ,  $III^0$ ,  $IV^0$ ,  $I^9$ ,  $II^9$ ,  $III^9$ ,  $I^0$ ,  $V^0$ ,  $II^9$ ,  $V^9$ ,  $IV^0$ ,  $VI^0$ ,  $V^0$

5

high

guitar

low

Chord diagrams:  $I^9$ ,  $III^0$ ,  $VI^{12}$ ,  $VI^{11}$ ,  $V^0$ ,  $I^0$ ,  $III^0$ ,  $I^8$ ,  $VI^0$ ,  $III^0$ ,  $VI^0$ ,  $V^8$ ,  $III^0$ ,  $II^0$ ,  $IV^8$ ,  $VI^0$ ,  $IV^0$ ,  $VI^9$ ,  $III^0$ ,  $II^0$

9

high

guitar

low

Chord diagrams:  $V^6$ ,  $IV^0$ ,  $V^6$ ,  $III^0$ ,  $IV^0$ ,  $I^6$ ,  $V^6$ ,  $III^0$ ,  $IV^0$ ,  $I^6$ ,  $III^8$ ,  $IV^0$ ,  $I^0$ ,  $III^7$ ,  $V^0$ ,  $I^0$ ,  $III^0$ ,  $V^0$ ,  $I^6$ ,  $III^0$ ,  $IV^7$

13

high

guitar

low

Chord diagrams:  $V^0$ ,  $III^0$ ,  $IV^0$ ,  $V^0$ ,  $III^0$ ,  $IV^6$ ,  $V^0$ ,  $III^0$ ,  $IV^0$ ,  $V^0$ ,  $III^7$ ,  $III^6$ ,  $IV^0$ ,  $V^0$ ,  $III^6$ ,  $IV^0$ ,  $V^0$ ,  $III^6$ ,  $IV^0$ ,  $V^0$ ,  $III^6$

17

high

guitar

low

Chord diagrams:  $IV^0$ ,  $V^0$ ,  $III^5$ ,  $IV^0$ ,  $V^0$ ,  $III^0$ ,  $IV^6$ ,  $V^0$ ,  $III^0$ ,  $IV^0$ ,  $V^6$ ,  $III^0$ ,  $IV^0$ ,  $V^0$ ,  $III^0$ ,  $IV^0$ ,  $V^6$ ,  $III^0$ ,  $IV^0$ ,  $V^6$ ,  $III^0$



39

high

guitar

low

43

high

guitar

low

47

high

guitar

low

51

high

guitar

low

12.3

55

high

guitar

low

59

high

guitar

low

(61) I<sup>0</sup> III<sup>0</sup> IV<sup>0</sup> V<sup>0</sup> I<sup>4</sup> I<sup>3</sup> III<sup>3</sup> VI<sup>0</sup> IV<sup>0</sup> V<sup>0</sup> I<sup>0</sup> III<sup>3</sup> #VI<sup>6</sup> IV<sup>0</sup> V<sup>0</sup> I<sup>0</sup> III<sup>0</sup> VI<sup>0</sup> IV<sup>0</sup>

63

high

guitar

low

(64) #V<sup>4</sup> I<sup>0</sup> III<sup>3</sup> VI<sup>0</sup> V<sup>0</sup> I<sup>3</sup> VI<sup>0</sup> V<sup>0</sup> II<sup>0</sup> VI<sup>5</sup> V<sup>0</sup> II<sup>0</sup> I<sup>0</sup> #VI<sup>3</sup> V<sup>4</sup> I<sup>0</sup> II<sup>2</sup> VI<sup>0</sup> V<sup>0</sup> II<sup>2</sup>

67

high

guitar

low

(67) VI<sup>0</sup> I<sup>0</sup> V<sup>3</sup> I<sup>0</sup> #V<sup>1</sup> I<sup>0</sup> VI<sup>0</sup> I<sup>0</sup> V<sup>0</sup> I<sup>0</sup> V<sup>0</sup> I<sup>0</sup> VI<sup>3</sup> V<sup>0</sup> II<sup>0</sup> IV<sup>0</sup> I<sup>0</sup> VI<sup>2</sup> V<sup>0</sup> II<sup>0</sup> IV<sup>2</sup> I<sup>0</sup>

3.2

71

high

guitar

low

(70) VI<sup>0</sup> V<sup>0</sup> IV<sup>2</sup> IV<sup>0</sup> I<sup>0</sup> VI<sup>0</sup> V<sup>0</sup> IV<sup>0</sup> I<sup>0</sup> III<sup>1</sup> IV<sup>0</sup> VI<sup>0</sup> V<sup>0</sup> VI<sup>0</sup> V<sup>0</sup> IV<sup>0</sup> II<sup>0</sup> I<sup>0</sup>

2.1

75

12.4

high

guitar

low

(73) III<sup>1</sup> V<sup>0</sup> VI<sup>0</sup> V<sup>0</sup> VI<sup>0</sup> II<sup>0</sup> IV<sup>0</sup> III<sup>0</sup> V<sup>0</sup> III<sup>0</sup> V<sup>0</sup> III<sup>0</sup> V<sup>0</sup> III<sup>0</sup>

0.0

78

high

guitar

low

82

high

guitar

low

**13.1**

high

guitar

low

0.0

Chord diagrams and fret numbers for system 13.1:  
 Measure 1: III<sup>0</sup>, II<sup>0</sup>, I<sup>11</sup>, I<sup>10</sup>, IV<sup>0</sup>  
 Measure 2: I<sup>0</sup>, II<sup>10</sup>, II<sup>9</sup>, I<sup>0</sup>, IV<sup>0</sup>, V<sup>10</sup>, IV<sup>0</sup>, V<sup>0</sup>  
 Measure 3: I<sup>10</sup>, III<sup>11</sup>, IV<sup>0</sup>, V<sup>0</sup>, I<sup>10</sup>, I<sup>9</sup>

high

guitar

low

Chord diagrams and fret numbers for system 13.1, measures 5-8:  
 Measure 5: III<sup>0</sup>, IV<sup>11</sup>, IV<sup>10</sup>, V<sup>0</sup>, III<sup>0</sup>, IV<sup>0</sup>, V<sup>10</sup>, V<sup>8</sup>, I<sup>9</sup>, I<sup>8</sup>, III<sup>0</sup>, IV<sup>10</sup>, V<sup>8</sup>, I<sup>8</sup>, III<sup>0</sup>, IV<sup>0</sup>, II<sup>0</sup>, IV<sup>9</sup>, IV<sup>8</sup>, II<sup>0</sup>, IV<sup>0</sup>, II<sup>8</sup>

high

guitar

low

Chord diagrams and fret numbers for system 13.1, measures 9-12:  
 Measure 9: I<sup>0</sup>, IV<sup>0</sup>, VI<sup>10</sup>, II<sup>0</sup>, I<sup>0</sup>, IV<sup>0</sup>, II<sup>8</sup>, VI<sup>0</sup>  
 Measure 10: I<sup>0</sup>, II<sup>0</sup>, III<sup>0</sup>, IV<sup>8</sup>, I<sup>8</sup>, II<sup>8</sup>, III<sup>9</sup>, IV<sup>0</sup>, II<sup>0</sup>, VI<sup>0</sup>, V<sup>0</sup>

**13.2**

high

guitar

low

7.0

Chord diagrams and fret numbers for system 13.2, measures 13-16:  
 Measure 13: II<sup>8</sup>, II<sup>7</sup>, VI<sup>0</sup>, V<sup>7</sup>, II<sup>0</sup>, VI<sup>8</sup>, V<sup>7</sup>, V<sup>6</sup>  
 Measure 14: III<sup>0</sup>, IV<sup>8</sup>, I<sup>8</sup>, III<sup>9</sup>, IV<sup>0</sup>, II<sup>0</sup>

high

guitar

low

Chord diagrams and fret numbers for system 13.2, measures 17-20:  
 Measure 17: VI<sup>0</sup>, V<sup>0</sup>, II<sup>7</sup>, VI<sup>0</sup>, V<sup>7</sup>  
 Measure 18: II<sup>0</sup>, VI<sup>8</sup>, V<sup>7</sup>

21

high

guitar

low

25

high

guitar

low

29

high

guitar

low

33

high

guitar

low

37

high

guitar

low

41

high

guitar

low

3.5

45

high

guitar

low

2.8

49

high

guitar

low

53

high

guitar

low

2.1

57

high

guitar

low

1.4

61

high

guitar

low

0.7

65

high

guitar

low

69

13.3

high

guitar

low

0.0

73

high

guitar

low

77

high

guitar

low

81

high

guitar

low

85

high

guitar

low

89

high

guitar

low

93

high

guitar

low

97

high

guitar

low

101

high

guitar

low

105

13.4

high

guitar

low

109

high

guitar

low

14.1

high

guitar

low

5

high

guitar

low

9

high

guitar

low

13

high

guitar

low

17

high

guitar

low

21

high

guitar

low

25

14.2

high

guitar

low

29

high

guitar

low

33

high

guitar

low

37

high

guitar

low

41

high

guitar

low

1.4

45

high

guitar

low

14.3

0.0

49

high

guitar

low

53

high

guitar

low

57

high

guitar

low

61

65

69

73

77

Musical score for three parts: high, guitar, and low. The score is written on three staves. The high part is in treble clef and features a long note with a slur and a 7th fret marker. The guitar part is in treble clef and includes a circled 81, a circled 78, and chord markings IV°, VI°, and III°. The low part is in bass clef and includes a circled 78. The score concludes with a double bar line.

15.1

2/2

high

guitar

low

0.0

Chord symbols: V<sup>0</sup>, IV<sup>9</sup>, VI<sup>11</sup>, VI<sup>10</sup>, III<sup>0</sup>, V<sup>0</sup>, IV<sup>0</sup>, VI<sup>0</sup>, III<sup>0</sup>, V<sup>10</sup>, IV<sup>9</sup>, VI<sup>9</sup>, III<sup>0</sup>, V<sup>0</sup>, IV<sup>0</sup>, VI<sup>0</sup>, V<sup>0</sup>, IV<sup>0</sup>, III<sup>9</sup>, V<sup>9</sup>, IV<sup>9</sup>.

5

high

guitar

low

Chord symbols: VI<sup>9</sup>, III<sup>0</sup>, V<sup>0</sup>, IV<sup>9</sup>, VI<sup>0</sup>, III<sup>0</sup>, V<sup>9</sup>, IV<sup>9</sup>, VI<sup>0</sup>, III<sup>9</sup>, IV<sup>9</sup>, VI<sup>9</sup>, III<sup>9</sup>, V<sup>0</sup>, IV<sup>9</sup>, VI<sup>0</sup>, III<sup>0</sup>.

9

high

guitar

low

Chord symbols: V<sup>9</sup>, IV<sup>0</sup>, VI<sup>9</sup>, III<sup>0</sup>, V<sup>0</sup>, IV<sup>9</sup>, VI<sup>0</sup>, III<sup>9</sup>, V<sup>0</sup>, II<sup>0</sup>, VI<sup>9</sup>, V<sup>9</sup>, II<sup>0</sup>, VI<sup>0</sup>, V<sup>0</sup>, II<sup>0</sup>, VI<sup>9</sup>, III<sup>9</sup>, I<sup>0</sup>, V<sup>9</sup>, II<sup>10</sup>, VI<sup>9</sup>.

13

high

guitar

low

Chord symbols: III<sup>0</sup>, I<sup>12</sup>, V<sup>0</sup>, VI<sup>0</sup>, III<sup>9</sup>, I<sup>12</sup>, I<sup>11</sup>, V<sup>0</sup>, II<sup>10</sup>, II<sup>9</sup>, VI<sup>8</sup>, III<sup>0</sup>, I<sup>0</sup>, V<sup>8</sup>, II<sup>0</sup>, VI<sup>0</sup>, III<sup>9</sup>, III<sup>8</sup>, I<sup>0</sup>, III<sup>0</sup>, I<sup>10</sup>, VI<sup>8</sup>.

17

high

guitar

low

Chord symbols: VI<sup>7</sup>, V<sup>8</sup>, V<sup>7</sup>, III<sup>7</sup>, I<sup>0</sup>, VI<sup>0</sup>, V<sup>0</sup>, III<sup>7</sup>, V<sup>0</sup>, IV<sup>0</sup>, VI<sup>7</sup>, II<sup>0</sup>, III<sup>7</sup>, V<sup>0</sup>, IV<sup>0</sup>, VI<sup>7</sup>, II<sup>8</sup>, III<sup>7</sup>, V<sup>0</sup>, IV<sup>8</sup>, VI<sup>7</sup>.

21

high

guitar

low

(8)

25

high

guitar

low

(8)

29

high

guitar

low

(8)

33

15.2

high

guitar

low

(8)

36

high

guitar

low

(8)

40

high

guitar

low

6.0

44

high

guitar

low

5.0

48

high

guitar

low

4.0

52

high

guitar

low

56

high

guitar

low

3.0

60

high

guitar

low

(8)

V<sup>0</sup> IV<sup>4</sup> II<sup>6</sup> III<sup>6</sup> VI<sup>3</sup> VI<sup>4</sup> IV<sup>4</sup> V<sup>0</sup> I<sup>0</sup>

2.0

64

high

guitar

low

(8)

III<sup>0</sup> V<sup>0</sup> IV<sup>0</sup> III<sup>6</sup> I<sup>0</sup> IV<sup>4</sup> V<sup>0</sup>

68

high

guitar

low

(8)

IV<sup>4</sup> II<sup>6</sup> III<sup>6</sup> VI<sup>3</sup> IV<sup>4</sup> I<sup>0</sup> III<sup>0</sup> IV<sup>0</sup> I<sup>0</sup>

1.0

72

high

guitar

low

(8)

V<sup>0</sup> IV<sup>4</sup> V<sup>0</sup> IV<sup>4</sup> III<sup>6</sup> VI<sup>3</sup>

15.3

76

high

guitar

low

(8)

V<sup>4</sup> IV<sup>0</sup> II<sup>0</sup> III<sup>0</sup> III<sup>6</sup> III<sup>5</sup> I<sup>4</sup> V<sup>0</sup> I<sup>0</sup> V<sup>3</sup> I<sup>0</sup> IV<sup>0</sup> I<sup>0</sup> IV<sup>4</sup> IV<sup>3</sup> I<sup>0</sup> IV<sup>3</sup> I<sup>4</sup> IV<sup>3</sup> I<sup>0</sup> IV<sup>3</sup> I<sup>0</sup> IV<sup>3</sup> I<sup>0</sup>

0.0

80

high

guitar

low

84

high

guitar

low

88

high

guitar

low

92

high

guitar

low

15.4

96

high

guitar

low

100

high

guitar

low

(8)

V° IV° I° III°

Detailed description: This system contains measures 100, 101, and 102. The high part (treble clef) features a melodic line with a 7th fret barre and a fermata over the final measure. The guitar part (treble clef) shows a sequence of chords: V°, IV°, I°, and III°. The low part (bass clef) has a single bass note in each measure. A circled measure number '100' is at the start, and '(8)' is at the bottom left.

103

high

guitar

low

(8)

VI°

Detailed description: This system contains measures 103 and 104. The high part (treble clef) has a melodic line with a 7th fret barre and a fermata. The guitar part (treble clef) shows a VI° chord. The low part (bass clef) has a single bass note. A circled measure number '103' is at the start, and '(8)' is at the bottom left.

16.1

high

guitar

low

21

high

guitar

low

(8)

II<sup>0</sup> VI<sup>0</sup> IV<sup>5</sup> III<sup>5</sup> I<sup>0</sup> V<sup>0</sup> III<sup>5</sup> I<sup>5</sup> V<sup>0</sup> III<sup>0</sup> V<sup>0</sup> VI<sup>0</sup> III<sup>0</sup> IV<sup>0</sup> V<sup>8</sup> V<sup>7</sup> VI<sup>0</sup> III<sup>0</sup> IV<sup>4</sup>

16.2

25

high

guitar

low

(8)

II<sup>0</sup> VI<sup>0</sup> IV<sup>5</sup> III<sup>5</sup> I<sup>0</sup> III<sup>5</sup> I<sup>5</sup> V<sup>0</sup> III<sup>0</sup> V<sup>0</sup> VI<sup>0</sup> IV<sup>0</sup>

5.0

29

high

guitar

low

(8)

V<sup>8</sup> V<sup>7</sup> VI<sup>0</sup> III<sup>0</sup> IV<sup>4</sup> II<sup>0</sup> VI<sup>0</sup> IV<sup>5</sup> I<sup>0</sup>

4.6

33

high

guitar

low

(8)

V<sup>0</sup> I<sup>5</sup> V<sup>0</sup> III<sup>0</sup> V<sup>0</sup> VI<sup>0</sup> IV<sup>0</sup> V<sup>8</sup> V<sup>7</sup> VI<sup>0</sup> III<sup>0</sup>

37

high

guitar

low

(8)

IV<sup>4</sup> II<sup>0</sup> VI<sup>0</sup> IV<sup>5</sup> III<sup>5</sup> V<sup>0</sup> III<sup>5</sup> I<sup>5</sup> V<sup>0</sup>

4.2

41

high

guitar

low

45

high

guitar

low

49

high

guitar

low

53

high

guitar

low

57

high

guitar

low



81

high

guitar

low

85

high

guitar

low

89

high

guitar

low

93

high

guitar

low

97

high

guitar

low

101

high

guitar

low

VI<sup>0</sup> IV<sup>5</sup> V<sup>0</sup> III<sup>5</sup> I<sup>5</sup> V<sup>0</sup> III<sup>0</sup>

0.4

105

high

guitar

low

V<sup>0</sup> VI<sup>0</sup> III<sup>0</sup> IV<sup>0</sup> V<sup>8</sup> V<sup>7</sup> VI<sup>0</sup> III<sup>0</sup> IV<sup>4</sup>

16.3

3/2

109

high

guitar

low

I<sup>0</sup> V<sup>7</sup> III<sup>0</sup> II<sup>5</sup> II<sup>4</sup> IV<sup>0</sup> V<sup>7</sup> III<sup>4</sup> VI<sup>0</sup>

0.0

112

high

guitar

low

II<sup>4</sup> IV<sup>0</sup> V<sup>0</sup> III<sup>4</sup> VI<sup>4</sup> IV<sup>4</sup> V<sup>0</sup> IV<sup>4</sup> I<sup>0</sup> IV<sup>0</sup> I<sup>0</sup> V<sup>0</sup> IV<sup>4</sup> III<sup>0</sup> V<sup>0</sup> IV<sup>0</sup> III<sup>4</sup> I<sup>0</sup> II<sup>4</sup> VI<sup>4</sup> V<sup>0</sup>

116

high

guitar

low

III<sup>4</sup> I<sup>0</sup> II<sup>4</sup> V<sup>0</sup> III<sup>0</sup> I<sup>0</sup> II<sup>0</sup> IV<sup>0</sup> VI<sup>4</sup> V<sup>7</sup> V<sup>6</sup> IV<sup>0</sup> III<sup>0</sup> IV<sup>0</sup> III<sup>0</sup> IV<sup>4</sup> III<sup>0</sup> IV<sup>0</sup> III<sup>4</sup>

120

high

guitar

low

Chord symbols: VI<sup>4</sup>, V<sup>0</sup>, I<sup>5</sup>, IV<sup>0</sup>, V<sup>0</sup>, III<sup>3</sup>, IV<sup>0</sup>, VI<sup>3</sup>, VI<sup>0</sup>, V<sup>0</sup>, IV<sup>0</sup>, VI<sup>0</sup>, V<sup>0</sup>, IV<sup>4</sup>, IV<sup>3</sup>, VI<sup>3</sup>, V<sup>0</sup>, IV<sup>3</sup>, I<sup>5</sup>, I<sup>3</sup>

124

high

guitar

low

Chord symbols: IV<sup>3</sup>, I<sup>0</sup>, IV<sup>0</sup>, I<sup>3</sup>, IV<sup>3</sup>, I<sup>3</sup>, IV<sup>0</sup>, III<sup>0</sup>, IV<sup>0</sup>, V<sup>0</sup>, II<sup>0</sup>, IV<sup>0</sup>, III<sup>0</sup>, VI<sup>0</sup>, VI<sup>0</sup>, V<sup>0</sup>, IV<sup>3</sup>, III<sup>3</sup>, I<sup>0</sup>, II<sup>4</sup>

128

high

guitar

low

Chord symbols: VI<sup>0</sup>, II<sup>0</sup>, V<sup>0</sup>, IV<sup>0</sup>, II<sup>3</sup>, V<sup>0</sup>, IV<sup>0</sup>, II<sup>3</sup>, V<sup>0</sup>, IV<sup>0</sup>, II<sup>3</sup>, V<sup>0</sup>, IV<sup>0</sup>, III<sup>3</sup>, I<sup>3</sup>, III<sup>3</sup>, I<sup>3</sup>, III<sup>0</sup>, I<sup>3</sup>, III<sup>0</sup>, I<sup>0</sup>

132

high

guitar

low

Chord symbols: V<sup>0</sup>, II<sup>3</sup>, IV<sup>0</sup>, III<sup>3</sup>, I<sup>3</sup>, V<sup>0</sup>, II<sup>0</sup>, IV<sup>0</sup>, III<sup>0</sup>, I<sup>3</sup>, V<sup>0</sup>, II<sup>3</sup>, IV<sup>3</sup>, III<sup>0</sup>, I<sup>3</sup>, V<sup>0</sup>, II<sup>0</sup>, IV<sup>0</sup>, III<sup>0</sup>, I<sup>0</sup>

136

high

guitar

low

Chord symbols: V<sup>5</sup>, II<sup>2</sup>, IV<sup>3</sup>, III<sup>0</sup>, I<sup>0</sup>, V<sup>0</sup>, II<sup>2</sup>, IV<sup>0</sup>, III<sup>0</sup>, I<sup>2</sup>, V<sup>4</sup>, II<sup>0</sup>, IV<sup>2</sup>, III<sup>0</sup>, I<sup>1</sup>, V<sup>3</sup>, II<sup>0</sup>, IV<sup>1</sup>, III<sup>0</sup>, I<sup>0</sup>

3.9

140

high

guitar

low

144

high

guitar

low

16.4

147

high

guitar

low

151

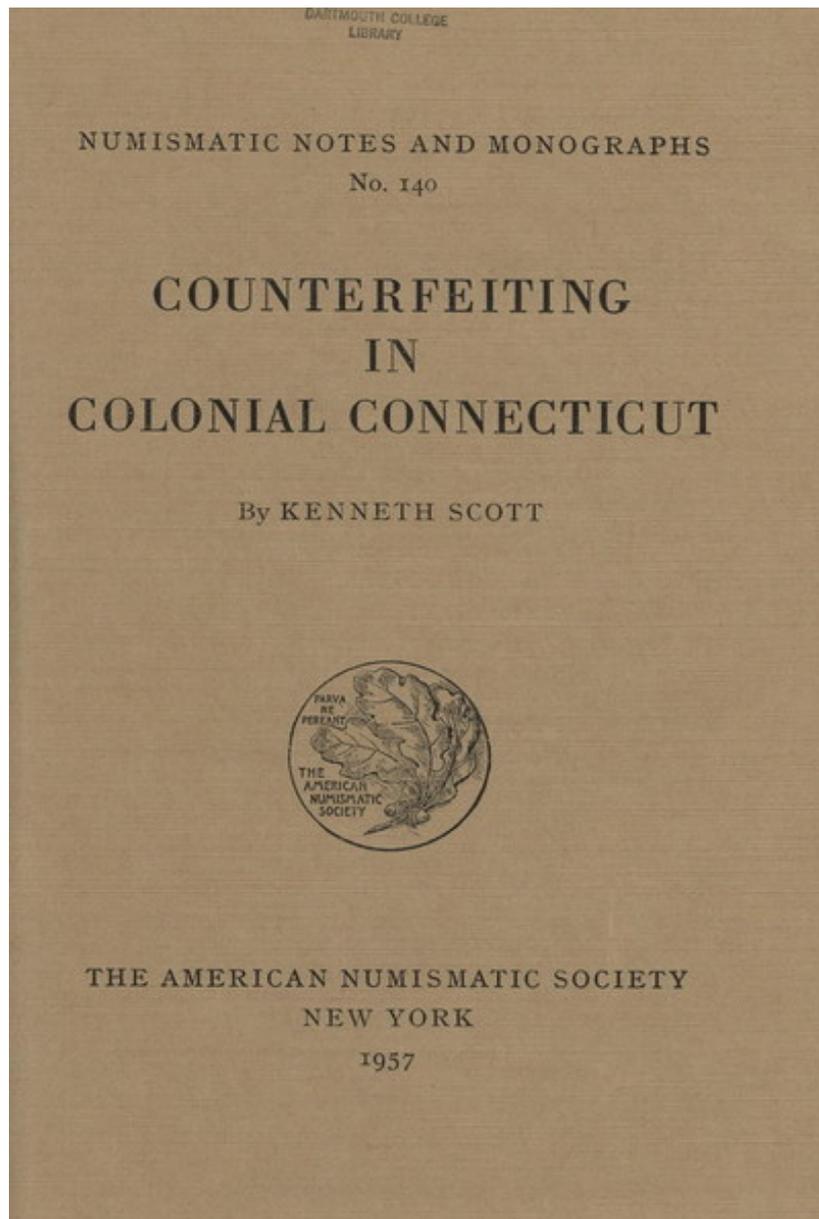
high

guitar

low

**appendix 1 - excerpts from “Counterfeiting in Colonial Connecticut” by Kenneth Scott**  
reprinted from <http://numismatics.org/digitallibrary/ark:/53695/nnan72127>

Note that there are generally 3 denominations: pounds, shillings, and pence. In the book, pounds are denoted with the prefix “£”. Numbers followed by the suffix “s.” denote shillings. Generally, pence do not occur alone but rather as part of a cumulative sum in the form of pounds/shillings/pence; e.g. “£5/11/9” would be read “five pounds, eleven shillings, and nine pence”. Sometimes 2 numbers instead of 3 are separated by a forward slash. If they are preceded by a “£”, the numbers denote pounds/shillings (e.g. “£3/10s.”). Otherwise the pair denotes shillings/pence as with the common 2/6 which would be pronounced “two shillings and sixpence”.



## William Barker and Samuel Munn

Early in January, 1712, William Barker and Samuel Munn, who were thought to have come together from Okinoke to Milford, were at Mr. Richard Bryant's house, where Munn paid the reckoning. Both men passed altered bills of credit, and on January 8 a complaint against Barker was made to John Ailing, assistant, at Guilford, who at nine o'clock that evening ordered a hue and cry after Barker, who was said to be a trader from Rhode Island and was thus described: "of red hair, a well made portly man, black wigg, light colourd loose Coat, dark Colourd straight Coat, speckled vest dark Colourd stock Stockings washt leather Breeches who is Charged with ye Crime of Counterfeiting or altering a five Shillings bill of this Colony to five pounds..."

The object of the hue and cry was apprehended at Lyme the next day and was taken before Captain Ely, J.P., of that town, who, after examining the prisoner, ordered the constable of Saybrook to take him to New Haven. On the road Barker broke away but was soon retaken and brought again before Justice Ely. The magistrate now ordered the captive's portmanteau searched, and in Barker's pocket-book were found three counterfeit bills, one of 3s. made into £5, one of 3s. altered to 20s., and one of 2s. raised to 10s.

This paper money was sealed up by the justice, and the criminal was sent off again under guard to New Haven, where he was examined by Warham Mather, J.P. It was discovered that Barker had stopped at a tavern in Killingworth, at Eastchester and at the house of Abraham Chanker, to whom he had passed a counterfeit 10s. bill to pay a reckoning of about 1/8. He likewise had uttered to Tavernkeeper Stiles in Milford a counterfeit 10s. Connecticut bill, no. 3931, which is preserved in the Connecticut State Library.

Justice Mather and John Ailing committed their prisoner to the jail in New Haven on January 11 but three days later, as was reported by Sheriff Joshua Hotchkiss, Barker broke prison and made his escape despite a vigorous pursuit, in the course of which three men set out from Branford in the hope of overtaking the fugitive, Seth Morse and John Hoadly to Guilford and Jacob Carter to Killingworth, all under the supervision of Constable Isaac Foot.

Barker's acquaintance, Samuel Munn of Woodbury, was not as fortunate as his companion. At Milford on January 7, 1712, Samuel Eells, assistant, acting on a complaint lodged by Samuel Stone of that town, issued a warrant to Deputy Sheriff Gideon Buckingham to arrest Munn. Stone charged that on the morning of January 7 at the house of Edward Wilkinson in Milford Munn offered a Connecticut 5s. bill altered to £5 to Wilkinson, who refused it, and then to Samuel Clark, Jr. About nine or ten o'clock John and Samuel Stone arrived and together with Wilkinson pointed out to Munn that the bill was altered. Munn told them that he had received it from Samuel Hawley, Sr., of Stratford and that he would go at once to Stratford to induce Hawley to take back the bill.

Munn was apprehended the same day that the warrant was issued and he was examined before Justice Eells and Jonathan Law, J.P. At first he told the magistrates that he got the counterfeit bill from "old Mr. Samll Hauley," who, he explained, owed him £5 and sent the money by Jonathan Stiles to Francis Stiles, who delivered it to him (Munn). He intended, in case he could not pass the bill in Milford, to destroy or burn it. Finally, however, he confessed that he had bought the bill for 40s. from a stranger from Long Island at Mr. Richard Bryant's house.

Munn was bound over to the next Superior Court to be held at New Haven on the second Tuesday in March but was released on bail provided by Daniel Munn and Ephraim Warner. His sureties brought him into court, where he was indicted for having on January 5 altered a 2s. Connecticut bill to 10s. and passed it to John Camp of Milford; also for having on January 7 altered a 5s. Connecticut bill to £5 (Plate VII) and passed it to Samuel Clark. The witnesses against him were Sergeant John Camp, Edward Elberton, mariner, Edward Wilkinson, Samuel Clark, John Stone and Gamaliel Prime. He pleaded not guilty, was tried, convicted and sentenced to be imprisoned for six months and to pay a fine of £45. The informer against him was granted the reward of £20 established by law.

Barker, doubtless encouraged by his escape, continued his career of crime but on November 15, 1717, made the mistake of passing a counterfeit 20s. bill of Rhode Island to Captain John Raymond, Jr., in Norwalk. Raymond quickly detected the cheat and sent his son after Barker, while he himself hastened to make a complaint to Major Peter Burr, J.P., of Fairfield.

The suspected counterfeiter was soon seized and, when he was searched, two more false 20s. Rhode Island bills were found on him, as well as three 5s. Connecticut bills, a half crown Connecticut bill, three 10s. Boston bills, one 10s. Rhode Island bill and one 5s. and one is. Boston bill. At his examination before Major Burr on November 16 he said that he was from Rhode Island, where he had a father and brothers. He had, he admitted, been in jail in New York and his father had sent £70 there to redeem him. About five years before, he confessed, he had escaped from the jail in New Haven in order to save his life, as he was like to freeze to death. He added that he had not been to Rhode Island for thirteen months and that he came last from the Widow Mead's at Horseneck on Long Island. As for the counterfeit bills, he claimed that he had received two of the 20s. bills from Charles Congrove at the Oyster Pond on Long Island and that he had changed silver with a Hartford man for two 20s. bills. He planned, he said, to obtain money from his father to buy land for a settlement in the "New Country."

Justice Burr was not favorably impressed, especially when a bill, not quite finished, was found in Barker's pocket, so he ordered the prisoner committed to the jail in Fairfield. On the night of November 20, however, Barker broke out but this time was recaptured and returned to prison on November 23 by John Bagly and Lieutenant John Taylor. Now he was confined in irons.

At the Superior Court held in Fairfield on December 11, 1717, Barker, described as late of Newport, Rhode Island, was indicted for having, about November 15 at Norwalk, counterfeited four 20s. Rhode Island bills and for having uttered one of them. He pleaded not guilty, was tried, convicted and at the next sessions of the court on February 5, 1718, was sentenced forthwith to be given thirty lashes on the naked body and again, during the first week in March, to receive another thirty stripes. In addition he was to be imprisoned for six months and to pay costs of £14/0/4. The informer had some difficulty in obtaining his reward, as well as his 20s. and the treble damages due him by law. He therefore memorialized the Assembly in May, 1718, and was granted the reward of £20.

### **Shubael Rowly, Jr.**

At the Superior Court held in New London on March 25, 1712, Shubael Rowly, Jr., of Colchester was supposed to appear. In the latter part of November, 1711, he had altered three Connecticut bills, one of 2s. to 20s., one of 3s. to 30s. and one of 5s. to 50s. The first he passed to Thomas Atwell in New Haven, the second to Sergeant Strickland and the third to Richard Christophers. Christophers at once detected the cheat and bound Rowly over to appear at the next Superior Court. Shubael Rowly, Sr., and Joshua Hempstead provided bail in the amount of £40. The following day, according to Christophers, young Rowly confessed that he had altered the bills and had passed two of them, of which he had taken up one and was desirous of taking up the other.

At the March session of the Superior Court Rowly was called three times but neither he nor his sureties appeared. He was, however, indicted, his bail was declared forfeited, and a warrant was issued for his arrest. Sometime later, probably in September, John Reed, the Queen's Attorney, recovered from Shubael Rowly, Sr., £36 of the forfeited bond and, apparently because of a deal between Reed and the father of young Rowly, the Assembly in October, 1712, was persuaded to pass a resolution that Shubael Rowly, Jr., should not be further prosecuted on his indictment. As Christophers pointed out, the Assembly seems to have considered the answering of the bond as equivalent to the miscreant's conviction. Christophers was, as the informer, entitled to the reward of £20, which the Court advised him to seek of the Assembly and which that body finally granted him in May, 1713.

### **Joseph Elderkin**

Jonas Hambleton and Paul Wentworth both of New London, and Joseph Elderkin of Norwich were brought before the Superior Court held in New London in September, 1712, on suspicion of having passed an altered Connecticut bill but it was discovered that the first two were not involved and they were cleared by proclamation, each being ordered to pay costs of £5/11/9. Elderkin, however, was indicted for uttering a 2/6 Connecticut bill altered to 20s., to which charge he pleaded not guilty. He was tried, convicted and sentenced to spend six months in prison and to pay a fine of £15 and costs of £10/18/6. Paul Wentworth, who had informed against Elderkin, in open court requested that his costs and those of Hambleton be deducted from the reward of £20 due him as informer, and the court ordered Elderkin to pay £20 to be turned over to Wentworth.

Elderkin, who was in poor health and feared the consequences of spending the winter in what was doubtless an unheated jail, petitioned the Assembly for "the abatement of his imprisonment," and in October it was voted that "if the petitioner shall give bail to any of the judges of the superiour court to render himself to him or any of the said judges upon command at any time within a twelve month after the session of this Court, the time yet to come of his imprisonment, according to the sentence given against him, shall commence when the prison and weather will allow him to be imprisoned without danger of hazarding his health."

### **Ann Lockwood**

When the Superior Court met at Fairfield on September 3, 1717, it had the task of determining who had altered a 2/6 Rhode Island bill to 10/6. Three persons were involved, Lieutenant Richard Higgenbotham, Sergeant Richard Lockwood and Ann Lockwood, the wife of Gersham Lockwood, Jr., of Greenwich. Higgenbotham was cleared by proclamation and it was ordered that the charges of prosecution be paid out of the public treasury. 23 Richard Lockwood gave bail for his appearance in the amount of £100 but did not come into court, sending a note to the effect that he was too ill to attend because of pains in his neck. His bond was declared forfeited, and a scire facias was issued for his appearance before the next sessions in March. At that time he was brought into court, when his case was continued until September. He appeared then but his case was apparently dropped, and there is no further notice of it.

Ann Lockwood was the real culprit. It was revealed that about the beginning of July Mrs. Richard Higgenbotham went from Cos Cob with four pairs of stockings for Mrs. Lockwood to sell in Greenwich. While in Greenwich Mrs. Higgenbotham sold two pairs of the stockings, one to Joseph Knap for Indian corn and another to Mr. Jessup for four shillings. She left the money and the remaining two pairs of stockings with Mrs. Lockwood. A few days later Lieutenant Richard Higgenbotham and his wife went to Ann Lockwood and gave her a 2s. bill and a 2/6 Rhode Island bill. She was to add this to the 4s. she already had from them and was to purchase for them some wool. When Mrs. Lockwood looked at the Rhode Island half crown bill, she remarked that it was a fair opportunity to change the 2 to a 10 because of a vacancy in the paper. At this Mr. Higgenbotham told her not to do so and she said that she would not.

The temptation, however, proved too strong. She altered the bill and paid it out, together with three 2s. bills, to Benjamin Hobby for nine and a quarter pounds of wool. But soon Hobby found that the altered bill would not pass and returned it to her. Ann, thoroughly frightened, on Saturday, July 13, took the altered bill to the Higgenbothams. She told them it was the way the apple tempted Mother Eve and that she would never do such a thing again. She talked with them for about an hour under a green tree, asking them to take back the bill and to stretch the truth by saying that they had the bill of a stranger. If they would do this, she promised them £20 and said they could live at one end of her house and have the use of her cows. Her husband knew of her crime and so did his brother Joseph, who had informed her that he had a good mind to knock her on the head because her husband was like to be ruined by her confounded tricks. Subsequently Gersham Lockwood begged Higgenbotham to burn the bill and to say nothing about Ann's confession.

Eventually Ann was taken into custody by Constable Joshua Reynolds. In September she was indicted for having altered the bill, pleaded not guilty, was tried, convicted and sentenced to stand in the pillory on three several lecture days or days of public meeting for a half hour each day. She was further to be disabled to give any evidence before any court, magistrate, or justice of the peace and was to pay costs of prosecution amounting to £6/13/6. On Saturday, September 7, she was discharged on bail provided by her husband on condition that she would appear at Fairfield on the public days appointed by the Deputy Governor to receive such parts of her punishment as had not yet been executed.

### **The Oblong Gang and Associates**

In 1744 the attention of the authorities in Connecticut, as well as in other provinces, was directed to a band of counterfeiters residing in the Oblong or Equivalent Tract, which had been ceded by Connecticut to New York on May 14, 1731. In a letter dated August 18, 1744, Governor Morris wrote to Governor Clinton of New York about the matter and sent along several examinations and papers concerned with the business. Clinton communicated his information to Governor Jonathan Law of Connecticut, who sent instructions to several justices of the peace to inquire into the matter.

Governor Law on January 2, 1745, wrote from Milford to Governor Clinton:

I have lately received an account from one of our Justices near ye Western Borders of this Gov<sup>t</sup> that he has committed one Andrew Nelson to Goal for putting off a Counterfeit 20s. Bill of Rhoad Island equal to 4" w<sup>th</sup> w<sup>m</sup> he found 72" of ye same sort, and the place where this Wickedness is supposed to be carryd on is the Oblong and it is probable that great Quantities of it are handed about by a confederated Gang of w<sup>ch</sup> I thot fit to advise you...

Nelson, who was, as has been seen, in custody early in January, swore a number of false bills, which were either found on his person or had been traced to him, upon Israel Keith and Samuel Browne of Dover, New York, and Benjamin Stone of Litchfield. Nelson was released on bail provided by himself and his father, William Nelson, for his appearance at the Superior Court in New Haven in August. On August 19, 1745, Justice Samuel Hutchinson issued instructions to the constables to summon as witnesses against Nelson Captain John Sprague, John Gay, James Betts, John Neland and Daniel Parke, all of Sharon. In his indictment Nelson was charged with having on the evening of December 3, 1744, in Sharon, passed a false 20s. Rhode Island bill to James Betts. When the court convened and Nelson was called, he did not appear.

An explanation was forthcoming, for a letter, signed by Andrew Nelson and his father, had been sent to Samuel Darling of New Haven. It stated that Andrew had been pressed into the King's service, had got a substitute and that the substitute had fallen ill. The captain then insisted that Andrew serve. Accompanying documents showed that Captain Leonard Hoar, acting on orders from Colonel John Stoddard, had impressed Andrew to serve in guarding the western frontier and ordered him to impress his father's firelock gun for his use. In this way Nelson escaped almost certain conviction.

Before long more of these 20s. Rhode Island bills were passed by men from the Oblong: Jeremiah Thornton on February 5, 1745, at Colchester passed to James Glass of that town such a forged bill of the emission of 1741. Glass detected the cheat and reported the matter to Nathaniel Foot, J.P., of Colchester, who had Thornton arrested. On the same day Thomas Cooper, also from the Oblong, uttered to Joseph Chamberlain in Colchester another counterfeit Rhode Island bill. Both men were tried and convicted at the March session of the Superior Court in Hartford and were sentenced in accordance with law. On May 9, 1745, these two criminals, encouraged, no doubt, by previous action of the Assembly in similar cases, petitioned for release from life imprisonment in case they could find someone to pay their expenses and charges. Their prayer was granted on condition that they pay all costs and charges and £20 each (the rewards given to the informer or informers against them, one of whom was James Glass) and with the understanding that if they were ever found in the colony after the ten days following their release had elapsed they were to be returned to the workhouse for life.

In addition to these two members of the Oblong gang still another two, Joseph Boyce, Sr., and John Scias (also spelled Scious and Syas) had been taken up, through the efforts of Robert Clark of Uxbridge, Massachusetts, and lodged in the jail in Hartford. In May Clark requested of and received from the Assembly aid in having the two offenders transported to Hampshire County in Massachusetts.

Other members of the gang appear to have been Joseph Boyce, Jr., Samuel Thompson, Joseph Plummer, Henry Bosworth, Israel Keith of New Sherburn, Seth Sherwood and a certain Hurlburt. It also seems likely that Justice Daniel Hunt and Captain Augustine Hunt were somehow involved. Some of these persons were apprehended, as is shown by the following letter of June 19, 1745, sent by Governor Law to Governor Shirley. Law wrote:

Saturday night was Sennit a Justice of peace on our western Borders informed me of one who Contrived to Expose young Boyce and others to be taken in ye Very act of using ye Counterfeit plates in a Certain Swamp in ye Oblong on tuesday following but it being out of this Gover<sup>mt</sup> I sent ye Justice directly to Gov<sup>r</sup> Clinton to Inform of ye Stratagem thinking nothing was wanting but an authority & assistance Sufficient would readily be had of our people within ten miles of ye Spot, he Shewed me two rhoad island xx<sup>s</sup> bills one with Divers mistakes in it ye other with these errors rectified taken of ye day before, and ye Justice returned with a Letter ye Gov<sup>r</sup> Signifying y<sup>t</sup> ye Council were of opinion yt yr was no foundation for a warrant, ye Justice being able to Sware only to here Says but ye undertaker had found ye plates a 20 s Rh and a half a Crown Plate & a N.Y. plate of 20<sup>s</sup> not perfectly Compleated, Press cloths and other implements &c: Sends them over ye line, Decoys Boyce & one Hurlburt a partner into ye Edge of this Gov<sup>mt</sup> Seizeth them & they are in N. Haven Goal Hurlburt Confesseth himself Guilty and accuseth 22 persons as Confederate with them Boyces father and Scious were transported through this Gov<sup>mt</sup> to you some time Since.

The persons concerned in giving information against or seizing these malefactors (Sherwood, Boyce, Nelson and Hurlburt) were William Drinkwater, who informed against Sherwood, James Betts, who informed against Andrew Nelson, and William Spencer and Ephraim Seeley. The Connecticut Assembly voted Drinkwater and Betts £20 each, while Seeley was given £50 for having helped to detect the criminals and because it was feared he might suffer from the vengeful practices of the delinquents and their associates. Spencer, aided by others, had probably taken an active part in the capture of some of the counterfeiters, all of whom escaped conviction, since some were released on bail, which they forfeited, and others escaped from jail. The two who broke jail were Hurlburt and Joseph Boyce, who escaped from prison in New Haven between July 18 and August 21, leaving only their plates in the hands of the authorities. Sherwood, like Nelson, must have been released on bail and forfeited his bond by failing to appear.

### **Joseph Holmes**

Joseph Holmes of Hatfield in Hampshire County, Massachusetts, was indicted at the Superior Court in Hartford on September 1, 1761, for having on August 29 at Middletown passed off five counterfeit Spanish milled dollars, one to Samuel Starr, one to Thomas Danforth, one to Matthew Talcott and two to Abigail Shayler. He pleaded guilty and was sentenced to have his right ear cut off, to be given twenty-five lashes on the naked body and to pay costs of £14/9/9.

### **Jonathan Olds**

On January 27, 1763, Samuel Pettibone, King's Attorney of Litchfield County, complained to Justice John Patterson against Jonathan Olds of Egrimont Parish in Sheffield, Berkshire County, Massachusetts. He charged that at Cornwall on January 25 Olds made thirty Spanish dollars and the following day passed one of them to Hopestill Pierce, wife of Lieutenant Joshua Pierce of Cornwall, another to the wife of Jeremiah Griswold of Litchfield and a third to some person in Sharon. John Pierce, Constable of Cornwall, arrested Olds on January 27 and the prisoner was examined and bound over in bail of £100 to the August term of the Superior Court in Litchfield. Olds pleaded guilty and was sentenced to be whipped thirty lashes and to pay costs of £20/8-. Sheriff Oliver Wolcott had him whipped at the sign post in Litchfield and then sent back to jail, doubtless because the costs were not paid.

### **James Sturdevant**

A complaint was made on February 23, 1770, to Justice Michael Humphry that Jesse and George Tobey and James Sturdevant of Norfolk had coining instruments and were making coin. A warrant was issued and Constable Josiah Starr of New Milford apprehended Sturdevant, upon whom he found a recipe containing in fixed proportions arsenic, sublimate, sal ammoniac, salt of tartar, borax and potash, evidently to be used in coining. Sturdevant was bound over to the Superior Court to be held in Litchfield and was then released on bail of £100, furnished by Caleb Knap, Nathan Sturdevant and Jonathan Pinney, all of Norfolk. On March 19 Justice Humphry issued a search warrant but Constable Giles Pettibone could find neither coining instruments nor metal. At the Superior Court Sturdevant was indicted for having on July 20, 1769, counterfeited several Spanish dollars and pistareens and for having on October 20 in Norfolk passed one of the false dollars to Samuel Knap, Jr., of that town. He was tried, convicted and sentenced to pay a fine of £50 and costs. Apparently Jesse and George Tobey were not arrested, or, if they were, they were not bound over to the Superior Court.

## **Timothy Keys**

The grand jurors of Norfolk on September 15, 1770, informed Justice Michael Humphry that Timothy Keys of New Marlborough in Berkshire County, Massachusetts, had in Norfolk an instrument for coining dollars and that he had made dollars and other coins. A warrant was issued for the arrest of the suspected coiner but it was found that he had fled to Massachusetts. Justice John Ashley in Berkshire County also issued a writ for Keys's arrest and the Sheriff of Berkshire County pursued Keys across the line to Norfolk, where on September 17 the fugitive was captured by John Phelps. It was charged that on March 31, 1769, at Norfolk Keys had made ten false dollars and passed one of them to Reuben Stevens of Canaan. When the case came up in court, Keys pleaded that the facts alleged against him were done more than a year before the commencement of the suit and hence were barred by the statute of limitations. It was decided by the court that the plea in abatement was sufficient

## **Coiners in Colchester**

Daniel Isham on March 21, 1771, complained to Justice Daniel Groot that John Newton, Jr., of Colchester had made Spanish dollars and gold coin. Newton was at once arrested and at his examination on the following day admitted that he had made molds, had cast pewter dollars in sand and had then hidden the coins in his shop. He had, he confessed, showed two of the dollar molds at his shop to Asahel Newton and Joseph Chapman. At New London, he said, he had passed a false pistareen or an English shilling to Captain Douglas, who had refused to accept it. He was bound over to the Superior Court to be held in Hartford in September and then released on bail of £200 furnished by himself and by Israel Newton of Colchester. At the Superior Court he was indicted for having about March 5 at Colchester constructed a mold for making dollars and for having cast about forty coins with it. Despite his admissions to Justice Groot he pleaded not guilty, was tried, acquitted and dismissed on payment of costs.

Isham likewise complained that Joseph Chapman, who had previously lived at Great Barrington but was then residing at Colchester, had at some time after September 1, 1770, stamped dollars and passed some of them. Justice Groot issued a writ for Chapman's arrest and he was taken up on March 21 by Constable Elihu Clark of Colchester. At his examination before the magistrate he, too, talked freely and incriminated Asahel Newton. He and Asahel, he stated, had secured two molds made by John Newton in his shop and they paid John twelve shillings for one of them and borrowed the other. One evening at Asahel's house in Colchester he (Chapman) and Asahel ran seven dollars out of pewter, of which he (Chapman) passed one to James Morgan, who later returned it. According to Chapman, Asahel had in a chest a mold and twenty or twenty-five counterfeit dollars. Chapman was bound over to the Superior Court and released on bail of £100, provided by himself and Joseph Tubbs of Colchester, for his appearance in court in September. He failed, however, to appear and his bond was declared forfeited.

## appendix 2 - SuperCollider code and Lilypond template

### cicc\_readme.scd

```
1 /*
2 ----execute
3 Execute cicc_main.scd to run.
4
5
6 ----transport tab
7 The play button will always start from the beginning of the current section.
8
9 The transport buttons allow you to advance by subsection (<,>) and section (<<>>).
10
11 Tempo change will only go into effect once "set tempo" button is pressed
12
13 Turning the "auto advance" button on will automatically move from one subsection to the other.
14
15 Setting the address:port will create a pipe to receive a message to advance the subsection externally with an OSC message '/nextSubsection. This could be used to set up a
16 foot pedal / controller for the guitarist to advance the subsections manually.
17
18 Turning the "interludes" button on will automatically fade in the interlude synth at the start of the ultimate subsection of each section. This will turn of automatic
19 advance between the ultimate subsection of a section and the first subsection of the following section. That is, the performer will have manually advance after
20 the last subsection of each section. The interlude synth will automatically fade out once a new section has been triggered.
21
22 Set order takes comma and dash delimited values; e.g.: "1, 2, 3, 4 - 10" will play from section 1 to section 10 and "5 - 10, 1, 2, 3" will play from section 5 to section
23 10 and then from section 1 to section 3. This will only go into effect once the "set order" button is pressed.
24
25 The default seed given in the application will generate the default music and score (as provided). Changing the seed will generate a new version with that seed once the "
26 generate" button is pressed. After the new version is generated, new Lilypond files can be generated by pressing the "transcribe" button. This will create a
27 cicc.score.ly file in a folder labeled "seed.[number]" which can be rendered by Lilypond. Note that the file must be rendered from that location as it depends in
28 files in that folder and the "includes" subfolder.
29
30 ----mixer tab
31 This allow individual control of each of the sonic elements. The synthesized guitar part is automatically muted is at should only be used for audition and practice. The low
32 accompaniment has two separate tracks in case a performer cannot play both the notes. The sonification will go to outputs 1 and 2 while the click will go to
33 outputs 3 and 4.
34
35 */
```

### cicc\_main.scd

```
1 (
2 // MAIN LAUNCH (loads necessary files and definitions)
3
4 var appEnvironment;
5
6 //push new environment
7 appEnvironment = Environment.make;
8 appEnvironment.push;
9
10 s.waitForBoot({
11
12     `hash = Date.getDate.hash.asString;
13
14     // load all files
15     "cicc.musical_data_generator.scd".loadRelative;
16     "cicc.sonifier.scd".loadRelative;
17     "cicc.gui.scd".loadRelative;
18     "cicc.transcriber.scd".loadRelative;
19
20     // generate all the data
21     `genAll = {arg seed;
22         `allMusicData = `genMusicData.value(seed);
23         `patterns = `allMusicData[0];
24         `scoreData = `allMusicData[1];
25         `sectionOffsets = `allMusicData[2];
26         `currentSection = 0;
27         `currentSubsection = 0;
28         `isPlaying = false;
29     };
30
31     // set the global variables
32     `tempoClock = TempoClock.new(90 / 60);
33     `dir = thisProcess.nowExecutingPath.dirname;
34     "loading app".postln;
35     `genAll.value(20200525);
36     `play = Synth.new(\masterPlayerControl ++ `hash);
37     {
38         var center, interval, freq1, freq2, tremRate;
39         center = 50 - 12.0.rand;
40         interval = 3.0.rand + 2;
41         freq1 = (center + (interval / 2)).midicps;
42         freq2 = (center - (interval / 2)).midicps;
43         tremRate = 50 + 4.0.rand2;
44         `interludeTremelo = Synth.new(\interludeTremelo ++ `hash, [\freq1, freq1, \freq2, freq2, \tremRate, tremRate]);
45     }.value;
46     `autoAdvance = true;
47     `interludes = false;
48     `sectionOrder = `patterns.size.collect({arg sec; sec});
49     `generateGUI.value;
50     "ready".postln;
51 });
52 appEnvironment.pop;
53 )
```

### cicc\_musical\_data\_generator.scd

```
1 (
2 var genInitSeq, finalizeSeqs, finalizeAccompHigh, finalizeAccompLow;
3
4 //----init vars for initial sequence generation
5 genInitSeq = {arg seed = 20200525;
6     var setDur, strings, stringIndex, state, lastStrings, position, dur, openStringCount, landingCount, sectionCount,
7     modelInitSeq, res;
8
9     thisThread.randSeed = seed;
10
11     //----helper dur function
12     setDur = {arg probs; [2, 3, 4, 5.rand + 3].wchoose(probs.normalizeSum)};
13
14     modelInitSeq = 16.collect({
15         [
16             //probably adjustment for altering picking pattern
17             2 + 1.0.rand2,
18             //probabilities adjustment for position
19             7 + 2.0.rand2,
20             //probabilities for inserting walk down
21             2.5 + 1.5.rand2,
```

```

22 //penultimate position
23 6.collect({2.rand + 1}),
24 //probabilities for adjustment to duration
25 3 + 1.0.rand2,
26 //probabilities for note durations
27 [5 + 2.0.rand2, 5 + 2.0.rand2, 5 + 2.0.rand2, 1],
28 //probabilities adjustment for altering state
29 2 + 1.0.rand2,
30 //number of notes in ultimate section
31 12 + 4.rand
32 ]
33 };
34
35 strings = (0..5);
36 state = 6.collect({[0, 1].wchoose([2, 1].normalizeSum)}); //fretted or not
37 lastStrings = [nil, nil];
38 position = 6.collect({10 + 3.rand}); //which frets
39 dur = setDur.value(modelInitSeq[0][5]);
40 openStringCount = 0;
41 landingCount = 0; //for extending section landing on open strings
42 sectionCount = 0;
43
44 res = []; //notes before the more static repetitions are put in
45
46 //----run routine and create template sequence
47 //----number of sections must be even - generate 16 by default
48 ({sectionCount < 16}).while({
49   var alterPattern, penultimatePos, lastFrettedString, forceUltimateDescent;
50
51   //alter string pattern or not
52   penultimatePos = (position.sign.sum == 1);
53   if(penultimatePos, {lastFrettedString = position.sign.indexOf(1)});
54   forceUltimateDescent = penultimatePos && strings.includes(lastFrettedString).not;
55   alterPattern = [true, forceUltimateDescent].wchoose([1, modelInitSeq[sectionCount][0]].normalizeSum);
56   if(alterPattern, {
57     //var lastFrettedString;
58     strings = (0..5).scramble[. (4.rand + 1)];
59     //keep selecting until you have the final string
60     while({forceUltimateDescent && strings.includes(lastFrettedString).not}, {
61       strings = (0..5).scramble[. (4.rand + 1)];
62     });
63     //rotate if a note gets repeated
64     if(lastStrings.last == strings.first, {strings = strings.rotate});
65     lastStrings = strings;
66   });
67
68   //iterate through the strings
69   strings.do({arg string, stringIndex;
70     var alterPos;
71
72     //alter fret if fretted and keeping hand in similar position
73     alterPos = (position[string] * state[string]) > 0;
74     alterPos = alterPos && (state[string] == 1); //isFretted
75     alterPos = alterPos && (position[string] > (position.maxItem - 3));
76     alterPos = [alterPos, false].wchoose([modelInitSeq[sectionCount][1], 1].normalizeSum);
77     if(alterPos, {
78       var walkDown, stepLimit;
79
80       //walk down or not
81       walkDown = [true, false].wchoose([1, modelInitSeq[sectionCount][2]].normalizeSum);
82       if(walkDown, {
83         res = res.add([string, state[string] * position[string], dur, position.deepCopy]);
84       });
85
86       //make sure a hand position is not too wide
87       stepLimit = (position.maxItem - (position[string] - 2)) != 4;
88       if(stepLimit.not, {
89         position[string] = (position[string] - 1).clip(0, 12);
90       });
91       if(stepLimit, {
92         position[string] = (position[string] - [1, 2].choose).clip(0, 12);
93       });
94     }, {
95     if((position[string] <= modelInitSeq[sectionCount][3][string]) && (state[string] == 0), {position[string] = 0});
96   });
97
98   //alter duration or not
99   if([true, false].wchoose([modelInitSeq[sectionCount][4], 1].normalizeSum), {dur = setDur.value(modelInitSeq[sectionCount][5])});
100
101   //add
102   res = res.add([string, state[string] * position[string], dur, position.deepCopy]);
103
104   //alter state or not favoring off if on (determines if string is open or fretted)
105   if(sectionCount.even, {
106     var isFretted, probs, alterState;
107     isFretted = (state[string] == 1);
108     probs = [if(isFretted, {modelInitSeq[sectionCount][6]}, {1}), 1].normalizeSum;
109     alterState = [true, false].wchoose(probs);
110     if(alterState, {state[string] = (state[string] + 1) % 2});
111   });
112
113   //alternate option
114   if(sectionCount.odd, {
115     var isFretted, alterable;
116     isFretted = (state[string] == 1);
117     alterable = isFretted || ((state[string] == 0) && (state.sum < 3));
118     if(alterable, {
119       var probs, alterState;
120       probs = [if(isFretted, {1}, {modelInitSeq[sectionCount][6]}), 1].normalizeSum;
121       alterState = [true, false].wchoose(probs);
122       if(alterState, {state[string] = (state[string] + 1) % 2});
123     });
124   });
125
126   //reset if everything arrives at the bottom string
127   if(position == [0, 0, 0, 0, 0, 0], {
128     var noNotes, hasLanded;
129     noNotes = modelInitSeq[sectionCount][7];
130     hasLanded = (landingCount > noNotes) && (stringIndex == (strings.size - 1));
131     if(hasLanded, {
132       (landingCount - 1).do({arg index;
133         res[res.size - index - 1][2] = (dur * (1 + ((1 - (index / landingCount).clip(0, 1).pow(0.5)) * 8))).asInteger
134       });
135       position = 6.collect({10 + 3.rand});
136       landingCount = 0;
137       sectionCount = sectionCount + 1;
138     });
139     if(hasLanded.not, {landingCount = landingCount + 1})
140   });
141 });
142 };
143 res
144 };
145
146

```

```

147 //----insert more static sections by repeating a figure
148 finalizeSeqs = {arg initSeq;
149   var modelReps, extendToBeat, insertTS,
150   timeStampSection, timeStampTotal, timeStampSectionStart, lastDur, lastPos,
151   sectionSeq, timeSigInsSeq, state, sectionCount, guitarSeq;
152
153   modelReps = 16.collect({
154     [
155       //where in the descent will the repetitions occur
156       4 + 4.rand,
157       //length of repetition
158       15.rand + 5,
159       //number of repetitions
160       10.rand + 5,
161       //probabilities for keeping a note in the repetition
162       5 + 1.0.rand2,
163       //max interval of bass part in repetitions
164       5 + 3.rand
165     ]
166   });
167
168   extendToBeat = {arg seq, round = 4;
169     var timeStampTotal, altEndDur;
170     //this makes sure it is some multiple of a beat
171     timeStampTotal = seq.slice(nil, 2).sum;
172     altEndDur = timeStampTotal.round(round) - timeStampTotal;
173     //must remain larger than a 16th notes
174     if((seq.last[2] + altEndDur) <= 1, {altEndDur = altEndDur + round});
175     seq.last[2] = seq.last[2] + altEndDur;
176     [seq, altEndDur];
177   };
178
179   insertTS = {arg seq, timeStampSectionStart, type, accompSwitch;
180     var timeStampTotal, noMeasures;
181     timeStampTotal = seq.slice(nil, 2).sum;
182     sectionSeq = sectionSeq.add([timeStampTotal, type, accompSwitch]);
183     noMeasures = ((timeStampTotal - timeStampSectionStart) / 16);
184     if(noMeasures.frac > 0, {
185       timeSigInsSeq = timeSigInsSeq.add(
186         // make 3/2 instead of 1/2
187         if((noMeasures.frac / 0.25).asInteger != 2, {
188           [timeStampTotal - (4 * noMeasures.frac / 0.25).asInteger], (noMeasures.frac / 0.25).asInteger
189         }, {
190           [timeStampTotal - (4 * 6), 6]
191         }
192       );
193       timeSigInsSeq = timeSigInsSeq.add([timeStampTotal, 4]);
194     });
195   };
196
197   timeStampSection = 0; //track time in each section
198   timeStampTotal = 0; //track overall time
199   timeStampSectionStart = 0; //track the time of the start of a section
200   lastDur = initSeq[0][2]; //helper for time signature data
201   lastPos = initSeq[0].last; //helper for keeping track of landing.
202
203   guitarSeq = []; //this is the final sequence with repetitions inserted
204   sectionSeq = [[0, 0, true]]; //sequence of times for each section (used for double bars in score)
205   timeSigInsSeq = [[0, 4]]; //sequence for insertion of time signatures and double bars;
206
207   state = 0;
208   sectionCount = 0;
209
210   initSeq.do({arg item, index, altEndDur;
211     var dur, pos;
212     dur = item[2];
213     pos = item.last;
214
215     if(state != 1, {
216       // basically this just copies the original template over
217       var landingBorder, sectionBorder;
218       landingBorder = (pos == [0, 0, 0, 0, 0, 0]) && (lastPos != [0, 0, 0, 0, 0, 0]);
219       sectionBorder = (pos != [0, 0, 0, 0, 0, 0]) && (lastPos == [0, 0, 0, 0, 0, 0]);
220       if(landingBorder || sectionBorder, {
221         var seqExtPair;
222         seqExtPair = extendToBeat.value(guitarSeq, 8);
223         guitarSeq = seqExtPair[0];
224         timeStampSection = timeStampSection + seqExtPair[1];
225         insertTS.value(guitarSeq, timeStampSectionStart, if(pos == [0, 0, 0, 0, 0, 0], {1}, {-1}), false);
226         timeStampSectionStart = guitarSeq.slice(nil, 2).sum;
227       });
228
229       if(sectionBorder, {
230         state = 0;
231         sectionCount = sectionCount + 1;
232       });
233
234       guitarSeq = guitarSeq.add(item.add(-1));
235       timeStampSection = timeStampSection + dur;
236
237       lastDur = dur;
238       lastPos = pos;
239
240       if((state == 0) && (pos.minItem < modelReps[sectionCount][0]), {state = 1});
241     });
242
243     if(state == 1, {
244       // grabs a figure and repeats it altering it subtly
245       var rec, reps, noMeasures;
246
247       guitarSeq = extendToBeat.value(guitarSeq, 8)[0];
248       timeStampTotal = guitarSeq.slice(nil, 2).sum;
249       insertTS.value(guitarSeq, timeStampSectionStart, 0, true);
250       timeStampSectionStart = timeStampTotal;
251       rec = guitarSeq[(guitarSeq.size - modelReps[sectionCount][1])..guitarSeq.size].deepCopy;
252       reps = modelReps[sectionCount][2];
253       reps.do({arg index;
254         rec.do({arg item, rIndex;
255           var add, dur;
256           add = if(index == 0, {3}, {0});
257           dur = (item[2] + 2.rand2 + add);
258           if(dur < 2, {dur = [0, 2].wchoose([1, 4].normalizeSum)});
259           rec[rIndex] = [item[0], item[1], dur];
260           if([true, false].wchoose([modelReps[sectionCount][3], 1].normalizeSum), {
261             guitarSeq = guitarSeq.add(rec[rIndex].add(modelReps[sectionCount][4] * (1 - ((1 / reps) * index))));
262           });
263
264           // if chord randomly choose one of the notes
265           if(guitarSeq.last[2] == 0, {
266             arg toAdd = [];
267             toAdd = toAdd.add(guitarSeq.pop);
268             toAdd = toAdd.add(guitarSeq.pop);
269             toAdd[0][2] = toAdd[1][2];
270             toAdd[1][3] = toAdd[0][3];
271             toAdd = toAdd.choose;

```

```

272         guitarSeq = guitarSeq.add(toAdd);
273     });
274 });
275
276     if(index < (reps - 1), {
277         guitarSeq = extendToBeat.value(guitarSeq, 4)[0];
278     }, {
279         guitarSeq = extendToBeat.value(guitarSeq, 8)[0];
280     });
281
282 });
283
284     insertTS.value(guitarSeq, timeStampSectionStart, 0, true);
285
286     timeStampSection = 0;
287     timeStampSectionStart = guitarSeq.slice(nil, 2).sum;
288     lastDur = initSeq[index + 1][2];
289     state = 2;
290 });
291 });
292 [guitarSeq, sectionSeq, timeSigInsSeq]
293 };
294
295 // add the high note part
296 finalizeAccompHigh = {arg sectionSeq;
297     var accompHighSeq, timeStamp, subSecType, modelAccomp;
298     accompHighSeq = [];
299     timeStamp = 0;
300     subSecType = 0;
301
302     modelAccomp = sectionSeq.size.collect({
303         [
304             //short probability
305             1.5 + 0.5.rand2,
306             //rest probability
307             3 + 1.0.rand2,
308             //short note average
309             20 + 5.rand2,
310             //short note range
311             5 + 3.rand2,
312             //long note average
313             50 + 10.rand2,
314             //long note range
315             10 + 5.rand2,
316             //rest average
317             40 + 10.rand2,
318             //rest range
319             5 + 5.rand2,
320             //internote space (short rest)
321             6.rand
322         ]
323     });
324
325     sectionSeq.do({arg subSecData, subSecIndex;
326         var subSecEnd, freq, noRestCount, shortCount;
327         subSecEnd = subSecData[0];
328         freq = if(subSecIndex.even, {50.midicps * 8}, {50.midicps * 8 * 6/5});
329         if(subSecData.last, {subSecType = ((subSecType + 1) % 2)});
330         noRestCount = 0;
331         shortCount = 0;
332         while({timeStamp < subSecEnd}, {
333             var dur, sus, isShort, insertRest;
334
335             isShort = case
336             {shortCount == 0} {true}
337             {shortCount < 3} {[true, false].wchoose([modelAccomp[subSecIndex][0], 1].normalizeSum)}
338             {true} {false};
339
340             insertRest = [true, noRestCount > 3].wchoose([modelAccomp[subSecIndex][1], 1].normalizeSum);
341
342             if(isShort, {
343                 sus = (modelAccomp[subSecIndex][2] + modelAccomp[subSecIndex][3].rand2).round(2);
344                 shortCount = shortCount + 1;
345             }, {
346                 sus = (modelAccomp[subSecIndex][4] + modelAccomp[subSecIndex][5].rand2).round(2);
347                 shortCount = 0;
348             });
349
350             if(insertRest, {
351                 dur = sus + (modelAccomp[subSecIndex][6] + modelAccomp[subSecIndex][7].rand2).round(2);
352                 noRestCount = 0;
353             }, {
354                 dur = sus + 2 + modelAccomp[subSecIndex][8].rand.round(2);
355                 noRestCount = noRestCount + 1;
356             });
357
358             if((timeStamp + dur) < subSecEnd, {
359                 accompHighSeq = accompHighSeq.add([freq, dur, sus.clip(0, dur)]);
360             }, {
361                 var remainder;
362                 remainder = (subSecEnd - timeStamp);
363                 sus = if(remainder > 10, {(remainder - 10).rand + 8}.round(2), {0});
364                 dur = (remainder + 10.rand).clip(2, 1000).round(2);
365                 accompHighSeq = accompHighSeq.add([freq, dur, sus]);
366             });
367             timeStamp = timeStamp + dur;
368         });
369     });
370     accompHighSeq
371 };
372
373
374 // add the low note part
375 finalizeAccompLow = {arg guitarSeq, sectionSeq;
376     var accompLowSeq, durAccum, lastTrigVal;
377     accompLowSeq = [];
378     durAccum = 0;
379     lastTrigVal = 0;
380     guitarSeq.do({arg item, i;
381         var dur, trig, freq1, freq2, finalDur;
382         dur = item[2];
383         trig = item.last;
384         if(lastTrigVal != trig, {
385             freq1 = if(trig > -1, {62.midicps / 4 * 3/4}, {62.midicps / 4});
386             freq2 = freq1 + if(trig > -1, {trig}, {0});
387             finalDur = durAccum;
388             accompLowSeq = accompLowSeq.add([freq1, freq2, finalDur]);
389             durAccum = 0;
390         });
391         durAccum = durAccum + dur;
392         lastTrigVal = trig;
393     });
394
395     accompLowSeq = [accompLowSeq.slice(nil, 0), accompLowSeq.slice(nil, 1), accompLowSeq.slice(nil, 2).integrate].flop;
396     sectionSeq.collect({arg section, secIndex;

```

```

397     if(section[1] == 1, {
398         var curTime, secLength;
399         curTime = section[0];
400         secLength = section[0] - sectionSeq[secIndex - 1][0];
401         accompLowSeq = accompLowSeq.add([62.midicps / 8, (62.midicps / 8) + 0, curTime]);
402         curTime = curTime - (50.rand + 50).clip(0, (secLength / 3) - 5).round(4).asInteger;
403         accompLowSeq = accompLowSeq.add([64.midicps / 8, (64.midicps / 8) + 2 + 1.0.rand2, curTime]);
404         curTime = curTime - (50.rand + 50).clip(0, (secLength / 3) - 5).round(4).asInteger;
405         accompLowSeq = accompLowSeq.add([65.midicps / 8, (65.midicps / 8) + 4 + 1.0.rand2, curTime]);
406     });
407     if(section[1] == -1, {
408         var curTime = section[0];
409         accompLowSeq = accompLowSeq.add([62.midicps / 4, (62.midicps / 4) + 0, curTime]);
410     });
411 });
412
413 accompLowSeq = accompLowSeq.sort({ arg a, b; a[2] < b[2] });
414 accompLowSeq = [accompLowSeq.slice(nil, 0), accompLowSeq.slice(nil, 1),
415               accompLowSeq.slice(nil, 2).differentiate.drop(1).add(1)].flop;
416
417 accompLowSeq
418 };
419
420 ~genMusicData = {arg seed;
421   var initSeq, finalSeqs, guitarSeq, accompHighSeq, accompLowSeq, sectionSeq, timeSigSeq,
422     patterns, scoreData, sectionOffsets;
423
424   initSeq = genInitSeq.value(seed);
425   finalSeqs = finalizeSeqs.value(initSeq);
426   guitarSeq = finalSeqs[0];
427   accompHighSeq = finalizeAccompHigh.value(finalSeqs[1].deepCopy.add([finalSeqs[0].slice(nil, 2).sum, -1, false]));
428   accompLowSeq = finalizeAccompLow.value(finalSeqs[0], finalSeqs[1]);
429   sectionSeq = finalSeqs[1];
430   timeSigSeq = finalSeqs[2];
431
432   patterns = ~genPatterns.value(guitarSeq, accompLowSeq, accompHighSeq, sectionSeq);
433   scoreData = ~genScoreData.value(guitarSeq, accompLowSeq, accompHighSeq, timeSigSeq, sectionSeq);
434   sectionOffsets = sectionSeq.slice(nil, 0);
435
436   [patterns, scoreData, sectionOffsets]
437 };
438 )

```

### cicc\_sonifier.scd

```

1  (
2  //busses
3  ~masterBus = Bus.audio(s, 1);
4  ~guitarBus = Bus.audio(s, 1);
5  ~accompHighBus = Bus.audio(s, 1);
6  ~accompLowLowerBusA = Bus.audio(s, 1);
7  ~accompLowUpperBusA = Bus.audio(s, 1);
8  ~accompLowLowerBusB = Bus.audio(s, 1);
9  ~accompLowUpperBusB = Bus.audio(s, 1);
10 ~interludeTremoloBus = Bus.audio(s, 1);
11 ~clickBus = Bus.audio(s, 1);
12
13 SynthDef(\masterPlayerControl ++ ~hash, {
14   arg sel = 0,
15   masterVol = 1, masterMute = 1,
16   guitarVol = 1, guitarPan = 0, guitarMute = 0,
17   accompHighVol = 1, accompHighPan = 0, accompHighMute = 1,
18   accompLowLowerVol = 1, accompLowLowerPan = 0, accompLowLowerMute = 1,
19   accompLowUpperVol = 1, accompLowUpperPan = 0, accompLowUpperMute = 1,
20   interludeVol = 1, interludePan = 0, interludeMute = 1,
21   clickVol = 1, clickPan = 0, clickMute = 1;
22   var guitarSig, accompHighSig, accompLowLowerSig, accompLowUpperSig, interludeSig, clickSig,
23     guitarSigPanned, accompHighSigPanned, accompLowLowerSigPanned, accompLowUpperSigPanned, interludeSigPanned, clickSigPanned,
24     masterSig, imp;
25
26   guitarSig = In.ar(~guitarBus) * guitarVol;
27   accompHighSig = In.ar(~accompHighBus) * accompHighVol;
28   accompLowLowerSig = Mix.ar(
29     [
30       In.ar(~accompLowLowerBusA) * EnvGen.kr(Env.asr(0.001, 1, 0.1), (sel + 1) % 2),
31       In.ar(~accompLowLowerBusB) * EnvGen.kr(Env.asr(0.001, 1, 0.1), sel)
32     ]
33   ) * accompLowLowerVol;
34   accompLowUpperSig = Mix.ar(
35     [
36       In.ar(~accompLowUpperBusA) * EnvGen.kr(Env.asr(0.001, 1, 0.1), (sel + 1) % 2),
37       In.ar(~accompLowUpperBusB) * EnvGen.kr(Env.asr(0.001, 1, 0.1), sel)
38     ]
39   ) * accompLowUpperVol;
40   interludeSig = In.ar(~interludeTremoloBus) * interludeVol;
41   clickSig = In.ar(~clickBus) * clickVol;
42
43   guitarSigPanned = Pan2.ar(guitarSig * guitarMute, guitarPan);
44   accompHighSigPanned = Pan2.ar(accompHighSig * accompHighMute, accompHighPan);
45   accompLowLowerSigPanned = Pan2.ar(accompLowLowerSig * accompLowLowerMute, accompLowLowerPan);
46   accompLowUpperSigPanned = Pan2.ar(accompLowUpperSig * accompLowUpperMute, accompLowUpperPan);
47   interludeSigPanned = Pan2.ar(interludeSig * interludeMute, interludePan);
48   clickSigPanned = Pan2.ar(clickSig * clickMute, clickPan);
49
50   masterSig = Mix.ar(
51     [
52       guitarSigPanned,
53       accompHighSigPanned,
54       accompLowLowerSigPanned,
55       accompLowUpperSigPanned,
56       interludeSigPanned
57     ] * masterVol * masterMute;
58
59   Out.ar(0, masterSig);
60   Out.ar(2, clickSigPanned); //change this if you want the click to go somewhere else
61
62   imp = Impulse.kr(10);
63   SendReply.kr(imp,
64     '/masterLevels' ++ ~hash,
65     values: [Amplitude.kr(masterSig)]);
66   SendReply.kr(imp,
67     '/trackLevels' ++ ~hash,
68     values:
69     [
70       Amplitude.kr(guitarSig), Amplitude.kr(accompHighSig),
71       Amplitude.kr(accompLowLowerSig), Amplitude.kr(accompLowUpperSig),
72       Amplitude.kr(interludeSig), Amplitude.kr(clickSig)
73     ]
74   );
75   }).add;
76
77 SynthDef(\transport ++ ~hash, {arg measure = 0, beat = 0, gate = 1, dur = 1;

```

```

79   SendReply.kr(Impulse.kr(0) * (measure > 0) * (beat > 0), '/measureClock' ++ `hash, values: [measure, beat]);
80   SendReply.kr(Impulse.kr(0) * (measure < 1) * (beat < 1), '/nextSubsection' ++ `hash);
81   EnvGen.kr(Env.sine(dur), gate, doneAction: 2);
82   }).add;
83
84
85   SynthDef(\click ++ `hash, {arg beat = 0, gate = 1, dur = 1;
86     Out.ar("clickBus", 10 * BPF.ar(WhiteNoise.ar * EnvGen.kr(Env.perc(0.01, 0.1), gate), 440 * ((beat <= 1) + 1), 0.02));
87     EnvGen.kr(Env.sine(dur), gate, doneAction: 2);
88   }).add;
89
90
91   //-----karplus
92   SynthDef(\karplus ++ `hash, {arg freq, gate = 1, amp = 0.5, bus;
93     Out.ar(bus,
94       Pluck.ar(WhiteNoise.ar(0.1), Impulse.kr(0), 220.reciprocal, freq.reciprocal, 10, coef:0) *
95       Linen.kr(gate, doneAction: 2) * amp)
96   }).add;
97
98
99   //-----accompaniment
100  SynthDef(\accompBass ++ `hash, {arg freq1 = 100, freq2 = 100, gate = 1, amp = 0.5, busLower, busUpper, cutoff = 0;
101    var env, lower, upper;
102    env = EnvGen.kr(Env.perc(0.1, 10, level: amp), Impulse.kr(0) + Changed.kr(freq2));
103    lower = SinOsc.ar(freq1, 0, 0.5) * env;
104    upper = SinOsc.ar(freq2, 0, 0.5) * env;
105    Out.ar(busLower, lower);
106    Out.ar(busUpper, upper)
107  }).add;
108
109
110  //this is not releasing properly
111  SynthDef(\accompTreble ++ `hash, {arg freq, gate = 1, sustain, amp, bus;
112    var treble;
113    treble = SinOsc.ar(freq, 0, EnvGen.kr(Env.linen(0.3, 0, 0.7, amp * 0.075, \sine), gate, timeScale: sustain, doneAction: 2));
114    Out.ar(bus, treble)
115  }).add;
116
117  //-----interlude
118  //note that this is sensitive to frequency and tremolo rate inputs
119  SynthDef(\interludeTremolo ++ `hash, {arg gate = 0, amp = 1, freq1, freq2, tremRate;
120    var tremoloTrig, trem, freq, sig, feedback, fade;
121    //fast tremolo - note that this can be slower so long as the delaytime of the feedback remains short
122    tremoloTrig = Impulse.kr(tremRate);
123    //tremolo between two notes
124    trem = Select.kr(Stepper.kr(tremoloTrig, 0, 0, 1), [freq1, freq2]);
125    //occasionally tremolo on same note
126    freq = Select.kr(TWChoose.kr(Dust.kr(10), [0, 1, 2], [5, 1, 1], 1), [trem, freq1, freq2]);
127    //generate signal
128    sig = VarSaw.ar(freq, 0, 0.3, 0.1) * EnvGen.kr(Env.perc(0.01, 0.1), tremoloTrig);
129    //feedback
130    feedback = CombC.ar(sig, 0.2, tremRate.reciprocal, 5);
131    fade = feedback * EnvGen.kr(Env.asr(15, 1, 15, \sine), gate) * amp * 0.75;
132    Out.ar("interludeTremoloBus", fade);
133  }).add;
134
135  //-----gen music
136  genPatterns = {arg guitarSeqIn, accompLowSeqIn, accompHighSeqIn, sectionSeqIn, beatFrac = 1/8;
137    var calcSustains, genSectionSec, sectionLimits, measureCount;
138
139    //-----helper sus function
140    calcSustains = {arg stringSeq, durSeq;
141      var res = [];
142      stringSeq.size.do({arg index;
143        var curString, dur, count;
144        if(stringSeq[index].isRest.not, {
145          curString = stringSeq[index];
146          dur = durSeq[index];
147          count = 1;
148          while({(stringSeq[(index + count).clip(0, stringSeq.size - 1)] != curString) &&
149            (dur < 16) && (count < 100)}, {
150            dur = dur + durSeq[(index + count).clip(0, durSeq.size - 1)];
151            count = count + 1;
152          });
153          res = res.add(dur.clip(0, 16));
154        }, {
155          res.add(Res( ));
156        });
157      };
158      res
159    };
160
161    genSectionSec = {arg seq, startTime, endTime, type;
162      var durSum, resSeqs, inSecs, mult;
163      durSum = 0;
164      resSeqs = [];
165      seq.do({arg item;
166        if((durSum >= startTime) && (durSum < endTime), {
167          var dur = durSum - startTime;
168          if((resSeqs.size == 0) && (dur > 0), {
169            switch(type,
170              0, {resSeqs = resSeqs.add([Res(-1), Res(-1), dur])},
171              1, {resSeqs = resSeqs.add([Res(-1), Res(-1), dur])},
172              2, {resSeqs = resSeqs.add([Res(-1), dur, dur])});
173          });
174          resSeqs = resSeqs.add(item);
175        });
176        durSum = durSum + if(type == 2, {item[1]}, {item[2]});
177      });
178      resSeqs
179    };
180
181    measureCount = 0;
182    sectionLimits = [];
183    sectionSeqIn.slice(nil, 0).add(100000).doAdjacentPairs({arg a, b; sectionLimits = sectionLimits.add([a, b])});
184    `sectionStartMeasure = [];
185    sectionLimits.collect({arg timePair, secIndex;
186      var startTime, endTime, beatLength, beatSeq, measureSeq,
187      guitarSecSeq, accompLowSecSeq, accompHighSecSeq,
188      stringSeq, fretSeq, harmLimit, freqSeq, durSeq, susSeq, trigSeq, openStrings, pattern;
189
190      startTime = timePair[0];
191      endTime = timePair[1];
192
193      if((secIndex % 4) == 0, {measureCount = 0});
194      beatLength = (endTime - startTime) / 8;
195      beatSeq = ((beatLength / 2) - 1).asInteger.collect({[1, 2]});
196      beatSeq = if((beatLength % 2) == 0, {beatSeq.add([1, 2])}, {beatSeq.add([1, 2, 3])});
197      measureSeq = measureCount + beatSeq.collect({arg measure, mIndex; measure.collect({mIndex + 1})}).flat;
198      `sectionStartMeasure = `sectionStartMeasure.add(measureCount + 1);
199      measureCount = measureSeq.last;
200      beatSeq = beatSeq.flat;
201      measureSeq = measureSeq.add(0);
202      beatSeq = beatSeq.add(0);
203

```

```

204 guitarSecSeq = genSectionSec.value(guitarSeqIn, startTime, endTime, 0);
205 accompLowSecSeq = genSectionSec.value(accompLowSeqIn, startTime, endTime, 1);
206 accompHighSecSeq = genSectionSec.value(accompHighSeqIn, startTime, endTime, 2);
207
208 if(accompHighSecSeq == [], {accompHighSecSeq = [[Rest(-1), 1, 0], [Rest(-1), 1, 0]]});
209
210 openStrings = [1/1, 3/2, 2/1, 5/2, 35/12, 7/2];
211 harmLimit = [9, 8, 7, 6, 5, 4];
212 stringSeq = guitarSecSeq.slice(nil, 0);
213 fretSeq = guitarSecSeq.slice(nil, 1);
214 durSeq = guitarSecSeq.slice(nil, 2);
215 susSeq = calcSustains.value(stringSeq, durSeq);
216 freqSeq = stringSeq.collect({arg string, index};
217   if(string.isRest, {Rest(0)}, {
218     var midi, freq;
219     //this is transposed up because karplus-strong does not really sound correctly in the guitar range
220     midi = (62.midicps * openStrings[string]).cpsmidi + fretSeq[index];
221     freq = midi.midicps * if((secIndex % 4) != 3, {1}, {[1, harmLimit[string].rand + 1].choose});
222   });
223
224 pattern = EventPatternProxy.new;
225 pattern.source = Ppar([
226   Pbind(
227     \instrument, \karplus ++ ^hash,
228     \amp, 0.3,
229     \dur, Pseq(durSeq * beatFrac),
230     \sustain, Pseq(susSeq * beatFrac),
231     \freq, Pseq(freqSeq),
232     \bus, ^guitarBus.index),
233   if(accompLowSecSeq.size > 1, {
234     Pmono(
235       \accompBass ++ ^hash,
236       \amp, 0.5,
237       \freq1, Pseq(accompLowSecSeq.slice(nil, 0)),
238       \freq2, Pseq(accompLowSecSeq.slice(nil, 1)),
239       \dur, Pseq(accompLowSecSeq.slice(nil, 2) * beatFrac),
240       \busLower, if(secIndex % 2 == 0, {accompLowLowerBusA.index}, {^accompLowLowerBusB.index}),
241       \busUpper, if(secIndex % 2 == 0, {accompLowUpperBusA.index}, {^accompLowUpperBusB.index})
242     ), {
243       Pmono(
244         \accompBass ++ ^hash,
245         \amp, 0.5,
246         \freq1, Pseq([accompLowSecSeq[0][0]]),
247         \freq2, Pseq([accompLowSecSeq[0][1]]),
248         \dur, Pseq([accompLowSecSeq[0][2]] * beatFrac),
249         \busLower, if(secIndex % 2 == 0, {accompLowLowerBusA.index}, {^accompLowLowerBusB.index}),
250         \busUpper, if(secIndex % 2 == 0, {accompLowUpperBusA.index}, {^accompLowUpperBusB.index})
251       )
252     },
253     Pbind(
254       \instrument, \accompTreble ++ ^hash,
255       //\freq, Pseq(accompHighSecSeq.slice(nil, 0)),
256       \freq, Pseq(accompHighSecSeq.slice(nil, 0).curdle(0.3).collect({arg item; item.cpsmidi - 0.16 + 0.32.rand}).midicps.flat),
257       \dur, Pseq(accompHighSecSeq.slice(nil, 1) * beatFrac),
258       \sustain, Pseq(accompHighSecSeq.slice(nil, 2) * beatFrac),
259       \amp, 0.5,
260       \bus, ^accompHighBus.index),
261     Pbind(
262       \instrument, \transport ++ ^hash,
263       \measure, Pseq(measureSeq),
264       \beat, Pseq(beatSeq),
265       \dur, beatFrac * 8
266     ),
267     Pbind(
268       \instrument, \click ++ ^hash,
269       \beat, Pseq(beatSeq.drop(-1)),
270       \dur, beatFrac * 8
271     )
272   )
273   pattern
274 ];
275
276 )

```

## cicc.transcriber.scd

```

1 (
2 ^transcribe = {arg scoreData, seed;
3   var rawMusicData, timeSigData, sectionData, dir, basePath, scoreFile, maxSize, lineBreakString, openStrings, musicData;
4
5   rawMusicData = scoreData[0];
6   timeSigData = scoreData[1];
7   sectionData = scoreData[2];
8
9   basePath = ^dir ++ "/" ++ "lilypond" ++ "/" ++ "seed." ++ seed;
10  basePath.mkdir;
11  (basePath ++ "/" ++ "includes").mkdir;
12
13  scoreFile = File(basePath ++ "cicc.score.ly".standardizePath, "w");
14  scoreFile.write(File.readAllString(basePath ++ "/" ++ "templates" ++ "cicc.score.template.ly").replace("seed: xxx", "seed: " ++ seed));
15  scoreFile.close;
16  scoreFile = File(basePath ++ "cicc.pseudoincidents.def.ly".standardizePath, "w");
17  scoreFile.write(File.readAllString(basePath ++ "/" ++ "templates" ++ "cicc.pseudoincidents.def.ly"));
18  scoreFile.close;
19
20  openStrings = [1/1, 3/2, 2/1, 5/2, 35/12, 7/2];
21
22  maxSize = 0;
23  musicData = rawMusicData.collect({arg partData, p;
24    var res;
25    res = partData.collect({arg item, i;
26      var note, rest;
27      switch(p,
28        0, {
29          var string, fret, dur, sus;
30          string = item[0];
31          fret = item[1];
32          dur = item[2];
33          sus = item[3];
34          note = sus.collect({[string, fret, i]});
35        },
36        1, {
37          var freq, dur, sus;
38          freq = item[0];
39          dur = item[1];
40          sus = item[2];
41          note = sus.collect({[freq, i]});
42          rest = if(p < rawMusicData.size, {(dur - sus).collect({[-1, i]}), {[]}};
43        },
44        2, {
45          var freq1, freq2, dur, sus;
46          freq1 = item[0];
47          freq2 = item[1];

```



```

173     " \\mark \\markup { \\bold \\box " ++ sectionIndex ++ "." ++ subsectionIndex ++ " }" ++ pageBreak;
174     if(sectionCount < (sectionData.size - 1), {sectionCount = sectionCount + 1});
175     switch(sectionData[sectionCount][1],
176     0, {subsectionIndex = subsectionIndex + 1},
177     1, {subsectionIndex = subsectionIndex + 1},
178     -1, {sectionIndex = sectionIndex + 1; subsectionIndex = 1});
179 });
180
181 if((i == (timeSigData[timeSigIndex][0] / 4)) && (g == 0),{
182     timeSigData[timeSigIndex][0];
183     curTimeSig = timeSigData[timeSigIndex][1];
184     if(curTimeSig % 2 == 0, {
185         lilyString = lilyString + "\n\\time " ++ (curTimeSig / 2).asInteger.asString ++ "/2\n";
186     }, {
187         lilyString = lilyString + "\n\\time " ++ curTimeSig.asString ++ "/4\n";
188     });
189     if(timeSigIndex < (timeSigData.size - 1), {timeSigIndex = timeSigIndex + 1});
190     curTime = 0;
191 });
192
193 switch(p,
194 0, {
195     lilyNote = lilyNotes[((38.midicps * openStrings[group[0][0]].cpsmidi + group[0][1]).round(1) % 12)];
196     lilyNote = lilyNote + lilyOcts[((38.midicps * openStrings[group[0][0]].cpsmidi + group[0][1]).round(1) / 12).asInteger - 2];
197 },
198 1, {
199     if(group[0][0] != -1, {
200         lilyNote = lilyNotes[((group[0][0].cpsmidi).round(1) % 12)];
201         lilyNote = lilyNote + lilyOcts[((group[0][0].cpsmidi).round(1) / 12).asInteger - 2];
202     }, {lilyNote = "x"});
203 },
204 2, {
205     if(group[0][0] != -1, {
206         lilyNote = lilyNotes[((group[0][0][0].cpsmidi).round(1) % 12)]; // * 2;
207         lilyNote = lilyNote + lilyOcts[((group[0][0][0].cpsmidi).round(1) / 12).asInteger - 2];
208         lilyBeatingMark = "" \\markup{ " ++ group[0][0][1].round(0.1) ++ " } ";
209     }, {lilyNote = "x"});
210     }
211 );
212
213 //duration
214 lilyDur = switch(noteLength, 1, {"16 "}, 2, {"8 "}, 3, {"8. "}, 4, {"4 "});
215 //append rest directive
216 //lilyRest = "";
217 lilyGString = if((group[0] != lastVal) && (p == 0), {
218     var stringString, fretString;
219     stringString = ["VI ", "V ", "IV ", "III ", "II ", "I "][group[0][0]];
220     fretString = group[0][1].asString;
221     if(isHarmonic, {fretString = "\\musicglyph \"noteheads.s0harmonic\"});
222     "\\markup{\\concat{ " ++ stringString ++ " \\super " ++ fretString ++ " } } "
223 }, {" "});
224
225 if((p != 2) || (lilyNote == "x"), {
226     lilyString = lilyString + lilyNote + lilyDur + lilyGString;
227 }, {
228     lilyString = lilyString + " <<< { " ++ lilyNote + lilyDur +
229     " \\laissezVibrer " ++ lilyBeatingMark ++ " } \\new Voice { \\voiceTwo " ++
230     lilyNote + lilyDur + " \\laissezVibrer } >>> \\oneVoice " ++ lilyGString;
231 });
232
233 //beam group
234 if((p != 2) && (g == 0) && (noteLength != 4), {lilyString = lilyString + " [ "});
235 if((p != 2) && (gSum == 4) && (noteLength != 4), {lilyString = lilyString + " ] "});
236
237 lastVal = group[0];
238 curTime = curTime + (noteLength / 4);
239 });
240 });
241
242 //end voice
243 lilyString = lilyString + " ] \\bar \".\" } \\n";
244
245
246 noteTuples = [lilyNotes, lilyOcts].allTuples.collect({arg val; val.join}).join("|");
247
248 markupSuffixes = ["VI ", "V ", "IV ", "III ", "II ", "I "].collect({arg stringString;
249     ("\\musicglyph \\noteheads.s0harmonic\\\"") ++ (0..14).collect({arg fret;
250     "\\markup{\\concat{ " ++ stringString ++ " \\super " ++ fret.asString ++ " }"}").flatten.join("|");
251 });
252
253 lilyString.findRegexp(
254     "(" ++ noteTuples ++ ")4 (" ++ markupSuffixes ++ ") " ++
255     "(" ++ noteTuples ++ ")4 ^ (" ++ noteTuples ++ ")4 ^ (" ++
256     noteTuples ++ ")4 ^ (" ++ noteTuples ++ ")4 ^ (" ++ noteTuples ++ ")4"
257 ).clump(8).do({arg match;
258     lilyString = lilyString.replace(match[0][1], match[1][1] ++ "1. " ++ match[2][1]);});
259
260 lilyString.findRegexp(
261     "(" ++ noteTuples ++ ")4 (" ++ markupSuffixes ++ ") ^ (" ++ noteTuples ++ ")4 ^ (" ++ noteTuples ++ ")4 ^ (" ++ noteTuples ++ ")4"
262 ).clump(6).do({arg match;
263     lilyString = lilyString.replace(match[0][1], match[1][1] ++ "1 " ++ match[2][1]);});
264
265 lilyString.findRegexp(
266     "(" ++ noteTuples ++ ")4 (" ++ markupSuffixes ++ ") ^ (" ++ noteTuples ++ ")4 ^ (" ++ noteTuples ++ ")4"
267 ).clump(5).do({arg match;
268     lilyString = lilyString.replace(match[0][1], match[1][1] ++ "2. " ++ match[2][1]);});
269
270 lilyString.findRegexp("(" ++ noteTuples ++ ")4 (" ++ markupSuffixes ++ ") ^ (" ++ noteTuples ++ ")4").clump(4).do({arg match;
271     lilyString = lilyString.replace(match[0][1], match[1][1] ++ "2 " ++ match[2][1]);});
272
273 //consolidate notes
274 lilyString.findRegexp(
275     "(" ++ noteTuples ++ ")4 ^ (" ++ noteTuples ++ ")4 ^ (" ++
276     noteTuples ++ ")4 ^ (" ++ noteTuples ++ ")4 ^ (" ++ noteTuples ++ ")4 ^ (" ++ noteTuples ++ ")4"
277 ).clump(7).do({arg match;
278     lilyString = lilyString.replace(match[0][1], match[1][1] ++ "1.");});
279
280 lilyString.findRegexp(
281     "(" ++ noteTuples ++ ")4 ^ (" ++ noteTuples ++ ")4 ^ (" ++ noteTuples ++ ")4 ^ (" ++ noteTuples ++ ")4"
282 ).clump(5).do({arg match;
283     lilyString = lilyString.replace(match[0][1], match[1][1] ++ "1");});
284
285 lilyString.findRegexp("(" ++ noteTuples ++ ")4 ^ (" ++ noteTuples ++ ")4 ^ (" ++ noteTuples ++ ")4").clump(4).do({arg match;
286     lilyString = lilyString.replace(match[0][1], match[1][1] ++ "2.");});
287
288 lilyString.findRegexp("(" ++ noteTuples ++ ")4 ^ (" ++ noteTuples ++ ")4").clump(3).do({arg match;
289     lilyString = lilyString.replace(match[0][1], match[1][1] ++ "2");});
290
291 //consolidate rests
292 lilyString.findRegexp("r4 r4 r4 r4 r4").clump(2).do({arg match;
293     lilyString = lilyString.replace(match[0][1], "R1+3/2");});
294
295 lilyString.findRegexp("r4 r4 r4 r4 r4").clump(2).do({arg match;
296     lilyString = lilyString.replace(match[0][1], "r4 r1");});
297

```

```

298
299 lilyString.findRegexp("r4 r4 r4 r4").clump(2).do({arg match;
300   lilyString = lilyString.replace(match[0][1], "r1");});
301
302 lilyString.findRegexp("r4 r4 r4").clump(2).do({arg match;
303   lilyString = lilyString.replace(match[0][1], "r2.");});
304
305 lilyString.findRegexp("r4 r4").clump(2).do({arg match;
306   lilyString = lilyString.replace(match[0][1], "r2.");});
307
308
309 lilyString.findRegexp("\\| r1").clump(2).do({arg match;
310   lilyString = lilyString.replace(match[0][1], "| R1");});
311
312 lilyString.findRegexp("d\\nr1").clump(2).do({arg match;
313   lilyString = lilyString.replace(match[0][1], "2\\n R1");});
314
315 //write file
316 lilyFile.write("\n" ++ lineBreakString ++ "\n" ++ lilyString);
317 lilyFile.close;
318 });
319 };
320
321 ^genScoreData = {arg guitarSeq, accompLowSeq, accompHighSeq, timeSigInsSeq, sectionSeq;
322   var stringSeq, fretSeq, durSeq,
323   partData, timeSigData, sectionData;
324   stringSeq = guitarSeq.slice(nil, 0);
325   fretSeq = guitarSeq.slice(nil, 1);
326   durSeq = guitarSeq.slice(nil, 2);
327   partData = [
328     [stringSeq, fretSeq, durSeq, durSeq].flop,
329     accompHighSeq,
330     accompLowSeq
331   ];
332   timeSigData = timeSigInsSeq;
333   sectionData = sectionSeq;
334   [partData, timeSigData, sectionData]
335 };
336 )

```

## cicc\_gui.scd

```

1 (
2 //FUNCTION THAT GENERATES THE GUI
3 ^generateGUI = {
4   var win, clockStringFunc, metronomeStringFunc, metronomeColorFunc, masterView, faderView, helpView, tabs;
5   var tabButtonReset, transportButton, mixerButton, helpButton, startPos = 0;
6   var partAbbr = ["guitar", "accompHigh", "accompLowLower", "accompLowUpper", "interlude", "click"];
7   var trackNames = ["guitar", "high", "low 1", "low 2", "interlude", "click"];
8   var partVols, partMutes, partPans;
9   var masterMute, masterVol;
10
11 // set initial mixer values
12 partVols = [1, 1, 1, 1, 1, 1];
13 partMutes = [0, 1, 1, 1, 1, 0];
14 partPans = [0, 0, 0, 0, 0, 0];
15 masterMute = 1;
16 masterVol = 1;
17
18 // these funcs update the elements of the transport panel
19 clockStringFunc = {
20   arg measure, beat;
21   var measureString, beatString, leadSpace;
22   measureString = measure.asInteger.asString;
23   beatString = beat.asInteger.asString;
24   leadSpace = (3 - measureString.size).collect({" "}).join;
25   leadSpace ++ measureString ++ "." ++ beatString
26 };
27 // [-30, -105, -104] and [-30, -105, -113] are unicode inverse bullet and normal bullet, respectively
28 metronomeStringFunc = { arg beat; if (beat == 1,
29   {[-30, -105, -104].collect({arg int; int.asAscii}).as(String)},
30   {[-30, -105, -113].collect({arg int; int.asAscii}).as(String)});
31 metronomeColorFunc = { arg beat; if (beat == 1, {Color.red}, {Color.black});
32
33 win = Window("Counterfeiting in Colonial Connecticut", Rect(500, 500, 1100, 575), false).front;
34 masterView = {
35   var updateTransport, updateSection,
36   view, generator, transport, countOff, ranSeed, order, tempo, sectionDisplay, clock, metronome, address;
37
38 // this func updates the whole transport panel
39 updateTransport = {arg measure, beat;
40   clock.string = clockStringFunc.value(measure, beat);
41   metronome.stringColor = metronomeColorFunc.value(beat);
42   metronome.string = metronomeStringFunc.value(beat);
43   {0.75 wait; {metronome.string = ""}.defer}.fork(tempoClock, quant: 0);
44 }.inEnvir;
45
46 // this func handles the movement between sections
47 updateSection = {arg shift, stop = true, manualCall = true;
48   var runThis;
49   runThis = (manualCall || (manualCall.not && ^autoAdvance));
50   runThis = runThis && ((^currentSection + shift) < ^sectionOrder.size);
51   runThis = runThis && (((^currentSection % 4) == 3) && ^interludes && manualCall.not).not;
52   if (runThis, {
53     var truncOnly, section, subSection;
54     if (^isPlaying, {
55       if (stop, {
56         ^patterns[^sectionOrder[^currentSection]].stop
57       })
58     });
59
60     truncOnly = case
61     {(^currentSection + shift) < 0} {true}
62     {(shift < 0) && ^isPlaying} {true}
63     {(shift < -1) && ((^currentSection % 4) > 0)} {true}
64     {true} {false};
65
66     if (truncOnly.not, {
67       ^currentSection = (^currentSection + shift).trunc(shift.abs);
68     }, {
69       ^currentSection = ^currentSection.trunc(shift.abs);
70     });
71
72     section = ((^sectionOrder[^currentSection] / 4) + 1).asInteger;
73     subSection = ((^sectionOrder[^currentSection] % 4) + 1).asInteger;
74     sectionDisplay.string = "section: " ++ section.asString ++ "." ++ subSection.asString;
75     if (^isPlaying, {
76       countOff = {
77         if (^interludes && ((^currentSection % 4) == 0), {
78           Pbind(
79             \instrument, \click ++ ^hash,
80             \beat, Pseq([1, 2, 1, 2]),
81             \dur, 1

```

```

82         ).play(~tempoClock, quant: 0);
83     [1, 2, 1, 2].do({arg beat;
84     {
85         metronome.stringColor = metronomeColorFunc.value(beat);
86         metronome.string = metronomeStringFunc.value(beat);
87     }.defer;
88     0.75.wait;
89     {metronome.string = ""}.defer;
90     0.25.wait;
91     });
92 });
93
94 play.set(\sel, ~currentSection % 2);
95
96 patterns["sectionOrder["currentSection]].play(~tempoClock, quant: 0);
97
98 if("interludes && ((~currentSection % 4) == 3) && (~currentSection != (~sectionOrder.size - 1)), {
99     var center, interval, freq1, freq2, tremRate;
100     center = 50 - 12.0.rand;
101     interval = 3.0.rand + 2;
102     freq1 = (center + (interval / 2)).midicps;
103     freq2 = (center - (interval / 2)).midicps;
104     tremRate = 50 + 4.0.rand2;
105     ~interludeTremelo.set(\gate, 1, \amp, 1, \freq1, freq1, \freq2, freq2, \tremRate, tremRate);
106 });
107
108 if(~currentSection % 4) == 0, {
109     ~interludeTremelo.set(\gate, 0);
110 };
111
112 if(~currentSection % 4) != 0 && (~currentSection % 4) != 3, {
113     ~interludeTremelo.set(\gate, 0, \amp, 0);
114 };
115
116 }.fork(~tempoClock, quant: 0);
117
118 }, {
119     var measure, beat;
120     measure = ~sectionStartMeasure["sectionOrder["currentSection]];
121     beat = 1;
122     updateTransport.value(measure, beat);
123 });
124
125 }.inEnvir;
126
127 // these funcs receive messages from the synth
128 OSCFunc({ arg msg, time;
129     {
130         var measure, beat;
131         measure = msg[3];
132         beat = msg[4];
133         updateTransport.value(measure, beat)
134     }.inEnvir.defer;
135 }, '/measureClock' ++ ~hash, s.addr);
136
137 OSCFunc({ arg msg, time; {updateSection.value(1, false, false)}.inEnvir.defer}, '/nextSubsection' ++ ~hash, s.addr);
138
139 OSCdef(\externalAdvance ++ ~hash, {arg msg, time; {updateSection.value(1)}.inEnvir.defer}, '/nextSubsection', s.addr);
140
141 view = View(win);
142 generator = HLayout (
143     ranSeed = TextField(view, Rect(10, 10, 10, 20)).string("20200525"),
144     Button(view).states([[["reset seed"]]).action({ ranSeed.string = "20200525".inEnvir},
145     Button(view).states([[["random seed"]]).action({ ranSeed.string = 50000000.rand.asString}.inEnvir),
146     Button(view).states([[["generate"]]).action({
147         {genAll.value(ranSeed.string.asInteger); ~appStatus.string = "status: ready"}.fork(AppClock);
148         ~appStatus.string = "status: generating".inEnvir,
149     Button(view).states([[["transcribe"]]).action({
150         {transcribe.value("scoreData", ranSeed.string); ~appStatus.string = "status: ready"}.fork(AppClock);
151         ~appStatus.string = "status: transcribing".inEnvir,
152     ["appStatus = StaticText(view).string("status: ready"), stretch: 1], nil);
153     transport = HLayout (
154     Button(view).states([[["<<"], Color.black]].action({arg pState; updateSection.value(-4)}.inEnvir),
155     Button(view).states([[["<"], Color.black]].action({arg pState; updateSection.value(-1)}.inEnvir),
156     Button(view).states([[["play"], Color.black], ["stop", Color.black, Color.grey]].action({
157     {arg pState;
158     if(pState.value == 0, {
159         var measure, beat;
160         countOff.stop;
161         ~isPlaying = false;
162         ~patterns["sectionOrder["currentSection]].stop;
163         ~interludeTremelo.set(\gate, 0);
164         measure = ~sectionStartMeasure["currentSection"];
165         beat = 1;
166         updateTransport.value(measure, beat);
167         ~interludeTremelo.set(\gate, 0, \amp, 0);
168     }}, {
169     countOff = {
170         Pbind(
171             \instrument, \click ++ ~hash,
172             \beat, Pseq([1, 2, 1, 2]),
173             \dur, 1
174         ).play(~tempoClock, quant: 0);
175     [1, 2, 1, 2].do({arg beat;
176     {
177         metronome.stringColor = metronomeColorFunc.value(beat);
178         metronome.string = metronomeStringFunc.value(beat);
179     }.defer;
180     0.75.wait;
181     {metronome.string = ""}.defer;
182     0.25.wait;
183     });
184     ~isPlaying = true;
185     play.set(\sel, ~currentSection % 2);
186     ~patterns["sectionOrder["currentSection]].play(~tempoClock, quant: 0);
187     if("interludes && ((~currentSection % 4) == 3) && (~currentSection != (~sectionOrder.size - 1)), {
188         var center, interval, freq1, freq2, tremRate;
189         center = 50 - 12.0.rand;
190         interval = 3.0.rand + 2;
191         freq1 = (center + (interval / 2)).midicps;
192         freq2 = (center - (interval / 2)).midicps;
193         tremRate = 50 + 4.0.rand2;
194         ~interludeTremelo.set(\gate, 1, \amp, 1, \freq1, freq1, \freq2, freq2, \tremRate, tremRate);
195     });
196     }.fork(~tempoClock, quant: 0);
197     })
198     }.inEnvir
199 ),
200 Button(view).states([[[">"], Color.black]].action({arg pState; updateSection.value(1)}.inEnvir),
201 Button(view).states([[[">>"], Color.black]].action({arg pState; updateSection.value(4)}.inEnvir), nil,
202 sectionDisplay = StaticText(win).string("section: 1.1").font(Font("Liberation Mono", 70)), nil);
203 view.layout(HLayout(
204     [VLayout(
205         HLayout(clock = StaticText(win).string(" 1.1").font(Font("Liberation Mono", 200)),
206         StaticText(win).string("|").font(Font("Liberation Mono", 200)),
207         metronome = StaticText(win).string([-30, -105, -104].collect({arg int; int.asAscii}).as(String)).font(Font("Liberation Mono", 300)).stringColor(
208         Color.red)),
209         nil, transport, nil,
210         HLayout (
211         tempo = TextField(view).string("90"),
212         Button(view).states([[["set tempo"]]).action({~tempoClock.tempo = tempo.string.asInteger / 60}.inEnvir),
213         StaticText(view).string(" | "),

```

```

206 Button(view).states({"auto advance", Color.black}, {"auto advance", Color.black, Color.grey}).action({
207   arg v; ~autoAdvance = if(v.value == 0, {false}, {true}); ~autoAdvance;
208   }.inEnvir).value(1),
209 Button(view).states({"interludes", Color.black}, {"interludes", Color.black, Color.grey}).action({
210   arg v; ~interludes = if(v.value == 0, {false}, {true})
211   }.inEnvir),
212 StaticText(view).string(" | "),
213 address = TextField(view, Rect(10, 10, 10, 20)).string("127.0.0.1:57120"),
214 Button(view).states({"set address:port"}).action({
215   var addr, ip, port;
216   addr = address.string.split($:);
217   ip = addr[0];
218   port = addr[1].asInteger;
219   thisProcess.openUDPPort(port);
220   addr = NetAddr(ip, port);
221   OSCdef(\externalAdvance ++ ~hash, {arg msg, time; {updateSection.value(1)}.inEnvir.defer}, '/nextSubsection', addr);
222   }.inEnvir),
223 [StaticText(view).string(" "), stretch: 1]),
224 [StaticText(view).string(" "), stretch: 1],
225 HLayout (
226   order = TextField(view).string("1-16"),
227   Button(view).states({"set order"}).action({
228     ~patterns["sectionOrder["currentSection]].stop;
229     ~sectionOrder = order.string.split($,).collect({arg secEntry;
230       var bounds;
231       bounds = secEntry.split($-).collect({arg item; item.asInteger - 1});
232       (bounds.minItem)..(bounds.maxItem).collect({arg sec;
233         (sec.asInteger * 4) + [0, 1, 2, 3]
234       });
235     }).flat;
236     ~currentSection = 0;
237     updateSection.value(0);
238     }.inEnvir),
239 [StaticText(view).string(" "), stretch: 1]),
240 [StaticText(view).string(" "), stretch: 1], generator
241 ), alignment: \top));
242 faderView = {
243   var view, masterIndicators, trackIndicators, master, tracks;
244   view = View(win);
245   masterIndicators = {LevelIndicator()} ! 2;
246   trackIndicators = {LevelIndicator()} ! 6;
247
248   OSCFunc.new({arg msg; {
249     {arg i; masterIndicators[i].value = msg[3 + i].ampdb.linlin(-40, 0, 0, 1)} ! 2}.defer},
250   '/masterLevels' ++ ~hash, s.addr);
251   OSCFunc.new({arg msg; {
252     {arg i; trackIndicators[i].value = msg[3 + i].ampdb.linlin(-40, 0, 0, 1)} ! 6}.defer},
253   '/trackLevels' ++ ~hash, s.addr);
254
255   master = HLayout (
256     VLayout (
257       HLayout (
258         Slider(view).value(0.8).action({
259           {arg v; masterVol = v.value * 1.25; ~play.set(\masterVol, masterVol)}.inEnvir),
260           masterIndicators[0],
261           masterIndicators[1], stretch: 2),
262         Button(view).states({"mute", Color.black}, {"mute", Color.black, Color.grey}).action({
263           {arg v; masterMute = (1 - v.value).abs; ~play.set(\masterMute, masterMute)}.inEnvir),
264         StaticText(view).string("          master          ").align(\center)
265       ), nil),
266     tracks = {arg part;
267       HLayout (
268         VLayout (
269           HLayout (
270             Slider(view).value(0.8).action({
271               {arg v; partVols[part] = v.value * 1.25; ~play.set(partAbbr[part] ++ "Vol", partVols[part])}.inEnvir),
272             trackIndicators[part]),
273             Button(view).states({"mute", Color.black}, {"mute", Color.black, Color.grey}).action({
274               {arg v; partMutes[part] = (1 - v.value).abs; ~play.set(partAbbr[part] ++ "Mute", partMutes[part])}.inEnvir).value({
275               if(part == 0 || part == 5, {1}, {0}).value),
276             StaticText(view).string("pan").align(\center),
277             Knob(view).value(0.5).action({
278               {arg v; partPans[part] = v.value * 2 - 1; ~play.set(partAbbr[part] ++ "Pan", partPans[part])}.inEnvir),
279             StaticText(view).string(trackNames[part]).align(\center)
280           ),
281           nil)
282         } ! 6;
283       view.layout.(HLayout(master, nil, *tracks));
284     helpView = {
285       TextView(win).string(File.readAllString("dir +/" + "cicc_readme.scd")).editable(false);
286     };
287     tabButtonReset = {transportButton.value = 1; mixerButton.value = 1; helpButton.value = 1};
288     win.layout = VLayout (
289       HLayout (
290         HLayout (
291           [
292             transportButton = Button().states({"transport", Color.white, Color.grey}, {"transport", Color.black}).action({
293               {tabButtonReset.value; transportButton.value = 0; tabs.index = 0}.inEnvir).value(0), stretch: 1
294           ], [
295             mixerButton = Button().states({"mixer", Color.white, Color.grey}, {"mixer", Color.black}).action({
296               {tabButtonReset.value; mixerButton.value = 0; tabs.index = 1}.inEnvir).value(1), stretch: 1
297           ]
298         ),
299         helpButton = Button().states({"help", Color.white, Color.grey}, {"help", Color.black}).action({
300           {tabButtonReset.value; helpButton.value = 0; tabs.index = 2}.inEnvir).value(1)
301       ),
302       tabs = StackLayout(masterView.value, faderView.value, helpView.value);
303     };
304   )

```

## cicc\_score\_template.ly

```

1 \version "2.19.83"
2
3 \include "cicc_pseudoindent.def.ly"
4
5 #define factor 2)
6
7 #define (enlarged-extent-laissez-vibrer::print grob)
8 (let* ((stil (laissez-vibrer::print grob))
9 (stil-ext (ly:stencil-extent stil X))
10 (stil-length (interval-length stil-ext))
11 (new-stil-length (* stil-length factor))
12 (scale-factor (/ new-stil-length stil-length))
13 (new-stil (ly:stencil-scale stil scale-factor 1))
14 (new-stil-ext (ly:stencil-extent new-stil X))
15 (x-corr (- (car stil-ext) (car new-stil-ext))))
16 (ly:stencil-translate-axis
17 new-stil
18 x-corr
19 X))
20
21 #assoc-set! (assoc-ref all-grob-descriptions 'LaissezVibrerTie)

```

```

22 'stencil enlarged-extent-laissez-vibrer::print)
23
24 \paper {
25   #(set-paper-size "a4" 'portrait)
26   top-margin = 1 \cm
27   bottom-margin = 1 \cm
28   left-margin = 2.25 \cm
29   ragged-bottom = ##t
30
31   top-system-spacing =
32   #'((basic-distance . 20 )
33     (minimum-distance . 20 )
34     (padding . 0 )
35     (stretchability . 0))
36
37   system-system-spacing =
38   #'((basic-distance . 25 )
39     (minimum-distance . 25 )
40     (padding . 0 )
41     (stretchability . 0))
42
43   last-bottom-spacing =
44   #'((basic-distance . 15 )
45     (minimum-distance . 15 )
46     (padding . 0 )
47     (stretchability . 0))
48
49   systems-per-page = 5
50   first-page-number = 6
51   print-first-page-number = ##t
52
53   print-page-number = ##t
54   oddHeaderMarkup = \markup { \fill-line { \line { \on-the-fly #not-first-page {\italic {Counterfeiting in Colonial Connecticut} (seed: xxx)}}} }
55   evenHeaderMarkup = \markup { \fill-line { \line { \on-the-fly #not-first-page {\italic {Counterfeiting in Colonial Connecticut} (seed: xxx)}}} }
56   oddFooterMarkup = \markup { \fill-line {
57     \concat {
58       " "
59       \fontsize #1.5
60       \on-the-fly #print-page-number-check-first
61       \fromproperty #'page:page-number-string
62       " "
63     } }
64   evenFooterMarkup = \markup { \fill-line {
65     \concat {
66       " "
67       \fontsize #1.5
68       \on-the-fly #print-page-number-check-first
69       \fromproperty #'page:page-number-string
70       " "
71     } }
72 }
73 \header {
74   title = \markup { \italic {Counterfeiting in Colonial Connecticut} }
75   composer = \markup { \right-column {"Michael Winter" "(CDMX and Gatlinburg, Tennessee; 2020)"} }
76   poet = "seed: xxx"
77   tagline = ""
78 }
79 #(set-global-staff-size 11)
80
81 \layout {
82   indent = 0.0 \cm
83   line-width = 17 \cm
84   ragged-last = ##f
85   ragged-right = ##f
86
87   \context {
88     \Score
89     \override BarNumber.stencil = #(make-stencil-circler 0.1 0.25 ly:text-interface::print)
90     \override Stem.stemlet-length = #0.75
91     \proportionalNotationDuration = #(ly:make-moment 1/16)
92     \remove "SeparatingLineGroupEngraver"
93   }
94   \context {
95     \Staff
96
97     \override VerticalAxisGroup.staff-staff-spacing =
98     #'((basic-distance . 15 )
99       (minimum-distance . 15 )
100      (padding . 0 )
101      (stretchability . 0))
102
103     \override RehearsalMark.X-offset = #1
104     \override RehearsalMark.Y-offset = #4
105     \override VerticalAxisGroup.default-staff-staff-spacing =
106     #'((basic-distance . 16 )
107       (minimum-distance . 16 )
108       (padding . 0 )
109       (stretchability . 0))
110
111     \override TimeSignature.font-size = #2
112     \override TimeSignature.break-align-symbol = #'clef
113     \override TimeSignature.X-offset =
114     #ly:self-alignment-interface:x-aligned-on-self
115     \override TimeSignature.self-alignment-X = #LEFT
116     \override TimeSignature.Y-offset = #9
117     \override TimeSignature.extra-offset = #'(2 . 0)
118     \override TimeSignature.break-visibility = #end-of-line-invisible
119   }
120   \context {
121     \StaffGroup
122     \name "SemiStaffGroup"
123     \consists "SpanBarEngraver"
124     \override SpanBar.stencil =
125     #(lambda (grob)
126       (if (string=? (ly:grob-property grob 'glyph-name) "|")
127         (set! (ly:grob-property grob 'glyph-name) ""))
128       (ly:span-bar::print grob))
129   }
130   \context {
131     \Score
132     \accepts SemiStaffGroup
133   }
134 }
135
136 \score{
137 \new Score
138 <<
139 \new SemiStaffGroup {
140 <<
141 \new Staff \with {
142   instrumentName = "high"
143   shortInstrumentName = "high"
144 }
145 <<
146 \include "includes/cicc.high.ly"

```

```

147 >>
148
149 \new Staff \with {
150   instrumentName = "guitar"
151   shortInstrumentName = "guitar"
152 }
153 <<
154 \include "includes/cicc.guitar.ly"
155 >>
156
157 \new Staff \with {
158   instrumentName = "low"
159   shortInstrumentName = "low"
160 }
161 <<
162 \include "includes/cicc.low.ly"
163 >>
164
165 >>
166 }
167 >>
168
169 \layout{}
170 }

```

## cicc\_pseudoindents\_def.ly

```

1 %%%%%%%%%% HEADER %%%%%%%%%%
2 %
3 % this code was prompted by
4 % https://lists.gnu.org/archive/html/lilypond-user/2019-07/msg00139.html
5 % and offers a pseudoIndent hack suitable for general use
6
7 % keywords:
8 % indent short-indent indentation system line
9 % mid-score temporarily arbitrary individual single just only once
10 % coda margin
11 % mouse's tale acrostic mesostic spine
12
13 %%%%%%%%%% PSEUDOINDENT FUNCTIONS %%%%%%%%%%
14
15 % these two functions are for indenting individual systems
16 % - to left-indent a system, apply \pseudoIndent before the music continues
17 % - \pseudoIndents is similar, but lets you also indent on the right
18 % - both provide an option for changing that system's instrument names
19
20 % N.B. these functions
21 % - assume application to non-ragged lines (generally the default)
22 % - include a manual \break to ensure application at line start
23 % - misbehave if called more than once at the same line start
24
25 % the parameters of the (full) pseudoIndents function are:
26 % 1: name-tweaks
27 %   usually omitted; accepts replacement \markup for instrument names
28 %   as an ordered list; starred elements leave their i-names unchanged.
29 % 2: left-indent
30 %   additional left-indentation, in staff-space units; can be negative,
31 %   but avoid a total indentation which implies (unsupported) stretching.
32 % 3: right-indent
33 %   amount of right-indentation, in staff-space units; can be negative.
34 %   - not offered by the (reduced) pseudoIndent function
35
36
37 pseudoIndents = % inline alternative to a new \score, also with right-indent
38 # (define-music-function (parser location name-tweaks left-indent right-indent)
39   ((markup-list? '()) number? number?)
40   (define (warn-stretched p1 p2) (ly:input-warning location (.
41     " pseudoIndents `s `s is stretching staff; expect distorted layout") p1 p2))
42   (let* (
43     (narrowing (+ left-indent right-indent)) ; of staff implied by args
44
45     (set-staffsymbol! (lambda (staffsymbol-grob) ; change staff to new width
46       (let* (
47         (left-bound (ly:spanner-bound staffsymbol-grob LEFT))
48         (left-moment (ly:grob-property left-bound 'when))
49         (capo? (moment<=? left-moment ZERO-MOMENT)) ; in first system of score
50         (layout (ly:grob-layout staffsymbol-grob))
51         (lw (ly:output-def-lookup layout 'line-width)) ; debugging info
52         (indent (ly:output-def-lookup layout (if capo? 'indent 'short-indent)))
53         (old-stil (ly:staff-symbol:print staffsymbol-grob))
54         (staffsymbol-x-ext (ly:stencil-extent old-stil X))
55         ;; >=2.19.16's first system has old-stil already narrowed [2]
56         ;; compensate for this (ie being not pristine) when calculating
57         ;; - old leftmost-x (its value is needed when setting so-called 'width)
58         ;; - the new width and position (via local variable narrowing-)
59         (ss-t (ly:staff-symbol-line-thickness staffsymbol-grob))
60         (pristine? (<= 0 (car staffsymbol-x-ext) ss-t)) ; would expect half
61         (leftmost-x (+ indent (if pristine? 0 narrowing)))
62         (narrowing- (if pristine? narrowing 0)) ; uses 0 if already narrowed
63         (old-width (+ (interval-length staffsymbol-x-ext) ss-t))
64         (new-width (- old-width narrowing-))
65         (new-rightmost-x (+ leftmost-x new-width)) ; and set! this immediately
66         (junk (ly:grob-set-property! staffsymbol-grob 'width new-rightmost-x))
67         (in-situ-stil (ly:staff-symbol:print staffsymbol-grob))
68         (new-stil (ly:stencil-translate-axis in-situ-stil narrowing- X))
69         ; (new-stil (stencil-with-color new-stil red)) ; for when debugging
70         (new-x-ext (ly:stencil-extent new-stil X)))
71         (ly:grob-set-property! staffsymbol-grob 'stencil new-stil)
72         (ly:grob-set-property! staffsymbol-grob 'X-extent new-x-ext)
73       )))
74
75     (set-X-offset! (lambda (margin-grob) ; move grob across to line start
76       (let* (
77         (old (ly:grob-property-data margin-grob 'X-offset))
78         (new (lambda (grob) (+ (if (procedure? old) (old grob) old) narrowing))))
79         (ly:grob-set-property! margin-grob 'X-offset new))))
80
81     (tweak-text! (lambda (i-name-grob mkup) ; tweak both instrumentname texts
82       (if (and (markup? mkup) (not (string=? (markup->string mkup) ""))))
83       (begin
84         (ly:grob-set-property! i-name-grob 'long-text mkup)
85         (ly:grob-set-property! i-name-grob 'text mkup)
86       ))) ; else retain existing text
87
88     (install-narrowing (lambda (leftedge-grob) ; on staves, + adapt left margin
89       (define (grob-name x) (assq-ref (ly:grob-property x 'meta) 'name))
90       (let* (
91         (sys (ly:grob-system leftedge-grob))
92         (all-grobs (ly:grob-array->list (ly:grob-object sys 'all-elements)))
93         (grobs-named (lambda (name)
94           (filter (lambda (x) (eq? name (grob-name x))) all-grobs)))
95         (first-leftedge-grob (list-ref (grobs-named 'LeftEdge) 0))
96         (relsys-x-of (lambda (g) (ly:grob-relative-coordinate g sys X)))

```

```

97 (leftedge-x (relsys-x-of first-leftedge-grob))
98 (leftedged? (lambda (g) (= (relsys-x-of g) leftedge-x)))
99 (leftedged-ss (filter leftedged? (grobs-named 'StaffSymbol))))
100 (if (eq? leftedge-grob first-leftedge-grob) ; ignore other leftedges [1]
101 (begin
102 (for-each set-staffsymbol! leftedged-ss)
103 (for-each set-X-offset! (grobs-named 'SystemStartBar))
104 (for-each set-X-offset! (grobs-named 'InstrumentName))
105 (for-each tweak-text! (grobs-named 'InstrumentName) name-tweaks)
106 ))))
107
108 (if (negative? narrowing) (warn-stretched left-indent right-indent))
109 #f % and continue anyway
110 % ensure that these overrides are applied only at begin-of-line
111 \break % (but this does not exclude unsupported multiple application)
112 % give the spacing engine notice regarding the loss of width for music
113 \once \override Score.LeftEdge.X-extent = #(cons narrowing narrowing)
114 % discard line start region of staff and reassemble left-margin elements
115 \once \override Score.LeftEdge.after-line-breaking = #install-narrowing
116 % shift the system to partition the narrowing between left and right
117 \overrideProperty Score.NonMusicalPaperColumn.line-break-system-details
118 .X-offset #(- right-indent)
119 % prevent a leftmost barnumber entering a stretched staff
120 \once \override Score.BarNumber.horizon-padding = #(max 1 (- 1 narrowing))
121 #f))
122
123 pseudoIndent = % for changing just left-indent
124 #(define-music-function (parser location name-tweaks left-indent)
125 ((markup-list? '()) number?)
126 #f
127 \pseudoIndents $name-tweaks $left-indent 0
128 #f)
129
130 % [1] versions <2.19.1 can have end-of-line leftedges too
131 % - these were eliminated in issue 3761
132 % [2] versions >=2.19.16: the first system behaves differently from the rest
133 % - a side effect of issue 660 ?

```