

seeds and ledgers 1–3
for string quartet

dedicated to lucie, cat, and ira, respectively

michael winter
(berlin and cdmx; 2023–2024)

notes	1
<i>seeds and ledgers 1</i>	3
<i>seeds and ledgers 2</i>	14
<i>seeds and ledgers 3</i>	20

Description (which can optionally be used/adapted as a program note)

The musical processes realized in *seeds and ledgers* explore a reexamination of the traditional concept of ‘voice leading’: how individual melodic lines create and maintain harmonies in aggregate while sometimes modulating. However, this musical question is recontextualized in a phenomenological framework called *just-intonation* in *harmonic space*. In just-intonation, whole number ratios express the frequency relationship between pitches. The resulting musical scales are untempered. They do not favor the accuracy of one interval over another such as with different well- and equal-temperaments, which prioritize and sacrifice the accuracy of different intervals for key cyclicness.

Traditionally, distance between pitches is typically measured in terms of subjective height expressed in units of semitones or cents (100th of a tempered semitone). This particular concept of a musical space can be referred to as pitch (or melodic) space. However, in harmonic space, distance is measured as a complexity function on the frequency ratio between two tones: the smaller the quantity and size of the prime factors needed to express the numbers in the frequency ratio, the closer they are in harmonic space and relatively easier to tune. For example, the perfect 5th (a frequency ratio of 3/2) is one of the closest intervals in harmonic space but relatively far (7 semitones) in pitch space. On the contrary, smaller melodic and chromatic differences/movements in pitch space are often distant in harmonic space. This gives rise to several vexing musical questions. How is it possible to reconcile these two very different, well-defined measures of distance? How can one tune stepwise movement in pitch space when the relationship between two tones may actually be distant in harmonic space? How can one modulate in harmonic space as the space is by definition acyclic?

In *seeds and ledgers*, these problems are explored using a custom software program that maintains ‘compact sets’ (consonant groups of tones) in harmonic space among any simultaneously sounding tones, but favors smaller steps in pitch space when one voice moves melodically. A compact set is defined as a group of notes such that each note in the group is close in harmonic space to some other note in the group, but not necessarily all of them. When one voice moves melodically, the program will favor notes that move by a smaller step in pitch space within a voice while modulating/transitioning to another compact set among all the voices.

Any individual part would be near impossible to play by itself. However, because compact sets are always maintained, each successive tone within a part can always be tuned via a relatively simple interval in harmonic space to a tone that is already sounding in one of the other instruments. As a result of this process, some of the passages have an almost baroque, contrapuntal feel; a chromatic drift in harmonic space constantly modulating.

Tuning

Each written note indicates the closest pitch in twelve-tone equal temperament with a cents-deviation (100th of a tempered semitone) provided above.

As explained in the description above, the note-to-note melodic movement may be very complex. However, each note can always be tuned via a relatively simple interval from a note that is currently sounding or has recently terminated in one of the other parts. For the purposes of the following explanation, the current note will be referred to as the *referencing note* and the pitch against which it can be tuned will be called the *reference pitch*.

No indication below a note means that it is the same pitch as the prior note within the respective part.

A Roman numeral below a note indicates the part in which the reference pitch is. The Arabic superscript and the corresponding arrow indicate the exact interval, up or down, of the referencing note from the reference pitch as detailed below. It can be assumed that the reference pitch was initiated before the referencing note and continues to sound. Occasionally, the reference pitch terminates in the beat prior to the initiation of the referencing note. As a courtesy, this is indicated by a '<' preceding the Roman numeral below the referencing note.

A Roman numeral with a superscript of 1 below a referencing note means that its pitch is an octave equivalent of the reference pitch.

A Roman Numeral with a superscript of 3, 5, 7, 11, or 13 followed by an up arrow indicates that the pitch of the referencing note is a frequency ratio of a $3/2$, $5/4$, $7/4$, $11/8$ or $13/8$, respectively, from the reference pitch if the reference pitch were transposed to the nearest octave *below* the pitch of the referencing note.

A Roman Numeral with a superscript of 3, 5, 7, 11, or 13 followed by a down arrow indicates that the pitch of the referencing note is a frequency ratio of a $2/3$, $4/5$, $4/7$, $8/11$ or $8/13$, respectively, from the reference pitch if the reference pitch were transposed to the nearest octave *above* the pitch of the referencing note. That is, the down arrow is the inversion of an up arrow and it could alternatively be understood that the referencing note is a frequency ratio of $4/3$, $8/5$, $8/7$, $16/11$, or $16/13$, respectively, from the reference pitch if the reference pitch were transposed to the nearest octave *below* the pitch of the referencing note.

Tempo and Duration

Each of the pieces may be played individually, but it is preferred that they are all played together in sequence.

Pieces 1 and 2 are written with a $2/2$ time signature and should be played at a tempo such that a half note is approximately 60 beats per minute (2 seconds per measure). A number with a fermata above it indicates the exact number of seconds the computer program that generated the piece assigned to the measure. As the fermata implies, these durations can be interpreted more freely by the ensemble.

Piece 3 is more open. Note durations are not provided until measure 105. Within a part, each tone should generally be held until the next tone, but one can occasionally choose to fade out the current tone and rest a moment before initiating the next tone. Among the parts, durations between the initiation of one tone to the next should generally be 1 to 2 seconds. However, that is more of a lower limit. The performer initiating the next note has discretion as to when that tone begins based on how the current chord contrasts with other chords in the piece. The generating program favors simple chords in some sections and relatively complex chords in others. The performer could, for example, highlight a chord that seem particularly simple or complex by allowing it to sustain for an extended period of time (potentially much longer than 1 to 2 seconds) before initiating the next tone.

Time signatures and note durations are only provided for the end of piece 3 (measures 105 to 114) and an optional coda (starting at measure 115). Like pieces 1 and 2, the ending and the coda of piece 3 should be interpreted with a tempo such that a half note is approximately 60 beats per minute.

Optional Coda

Given that the coda of piece 3 starting at measure 115 is exceedingly difficult, it is optional. Good luck to any group that attempts it and congratulations in advance to any group who successfully executes it!

Generating programs

These pieces were generated using custom software written in SuperCollider with a front-end user interface developed with Open Stage Control (Javascript). These programs can also be used to audition the pieces and each individual part. The most recent version of the code along with any utilities that are developed are downloadable from a git repository at: https://unboundedpress.org/code/mwinter/seeds_and_ledgers

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 last generated using SuperCollider version 3.13 and Lilypond version 2.24.1.

Acknowledgement

A special thanks to Lucie Nezri whose comments, suggestions, and encouragement were integral to the completion of these pieces.

seeds and ledgers 1

for lucie nezri

michael winter
(berlin; 2023-24)

First system of musical notation (measures 1-6). The system consists of four staves (I, II, III, IV) in 2/2 time. Staff I contains a melodic line with various intervals and ledger lines, with fingerings indicated by numbers above the notes. Staff II contains a sustained note with a +0 interval. Staff III is empty. Staff IV contains a sustained note with a +0 interval.

Second system of musical notation (measures 7-12). The system consists of four staves (I, II, III, IV) in 2/2 time. Staff I contains a melodic line with various intervals and ledger lines, with fingerings indicated by numbers above the notes. Staff II contains a melodic line with various intervals and ledger lines, with fingerings indicated by numbers above the notes. Staff III contains a melodic line with various intervals and ledger lines, with fingerings indicated by numbers above the notes. Staff IV contains a sustained note with a +47 interval.

Third system of musical notation (measures 13-18). The system consists of four staves (I, II, III, IV) in 2/2 time. Staff I contains a melodic line with various intervals and ledger lines, with fingerings indicated by numbers above the notes. Staff II contains a melodic line with various intervals and ledger lines, with fingerings indicated by numbers above the notes. Staff III contains a melodic line with various intervals and ledger lines, with fingerings indicated by numbers above the notes. Staff IV contains a melodic line with various intervals and ledger lines, with fingerings indicated by numbers above the notes.

20

Staff I: Treble clef, whole notes, ledger lines above. Fingerings: 6, 6.

Staff II: Treble clef, eighth notes, ledger lines above. Fingerings: I 7[↑], I 3[↑], I 11[↑], I 3[↓]. Accidentals: +16, +49, -2, +45.

Staff III: Bass clef, whole notes, ledger lines below. No notes.

Staff IV: Bass clef, eighth notes, ledger lines below. Fingerings: II 13[↑], I 5[↓], II 1, I 11[↓], I 13[↑]. Accidentals: -13, -40, -2, -5, -13.

27

Staff I: Treble clef, whole notes, ledger lines above. Fingerings: IV 1, 6. Accidental: -22.

Staff II: Treble clef, eighth notes, ledger lines above. Fingering: III 1. Accidental: +47.

Staff III: Bass clef, eighth notes, ledger lines below. Fingerings: I 1, II 7[↑]. Accidentals: +47, +16.

Staff IV: Bass clef, eighth notes, ledger lines below. Fingerings: III 13[↑], III 3[↑], III 3[↓], III 5[↑], III 7[↓], II 1, II 13[↓]. Accidentals: -13, +49, +45, +33, -22, +47, +6.

34

Staff I: Treble clef, whole notes, ledger lines above. Fingerings: IV 1, II 11[↑], II 5[↓]. Accidentals: +6, -2, 2, 4, -40.

Staff II: Treble clef, whole notes, ledger lines above. No notes.

Staff III: Bass clef, eighth notes, ledger lines below. Fingerings: II 5[↓], II 13[↑], II 3[↑]. Accidentals: -40, -13, +49.

Staff IV: Bass clef, eighth notes, ledger lines below. Fingerings: II 5[↑], I 5[↓], III 5[↓], II 7[↓], I 13[↑], II 1, III 11[↑]. Accidentals: +33, +12, -38, -22, +39, +47, +0.

43

-20 +14 +49 -49 6 4

III 7↓ IV 5↓ III 1 IV 11↑

-2 -40 -5 +45 -41

IV 3↓ II 5↓ II 11↓ II 3↓ IV 13↓

52

2

-8 -47 -35 +20 +20

I 13↑ I 3↑ I 5↓ I 7↑

III 13↑ III 3↑ III 11↑ III 11↓

60

-49

IV 1

+49

IV 3↓

+36 +47 -47 -35 +9 -19 +36

II 5↑ II 3↓ IV 3↑ IV 5↓ II 13↓ II 7↓ II 5↑

+18 +6 -49

III 3↓ III 5↑ III 7↓

68

Measure 68: I (II 5[↑]), II (+49), III (+47, II 3[↓]), IV (+18, II 7[↑]).
 Measure 69: I (+36, II 5[↑]), II (+49), III (-10, II 13[↑]), IV (+18, II 5[↓]).
 Measure 70: I (+47, II 3[↓]), II (+49), III (+18, II 7[↑]), IV (-37, II 5[↓]).
 Measure 71: I (+9, II 13[↓]), II (+49), III (-19, II 7[↓]), IV (-49, II 3[↑]).
 Measure 72: I (-19, II 7[↓]), II (+38, IV 5[↑]), III (+47, II 3[↓]), IV (-49, IV 1[↑]).
 Measure 73: I (-19, II 7[↓]), II (+11, IV 13[↓]), III (-49, IV 1[↑]), IV (-49, IV 1[↑]).
 Measure 74: I (-19, II 7[↓]), II (+38, IV 5[↑]), III (+47, II 3[↓]), IV (-49, IV 1[↑]).
 Measure 75: I (-19, II 7[↓]), II (+11, IV 13[↓]), III (-49, IV 1[↑]), IV (-49, IV 1[↑]).

76

Measure 76: I (-19, II 7[↓]), II (+3, IV 11[↑]), III (-19, II 7[↓]), IV (-21, I 3[↓]).
 Measure 77: I (-19, II 7[↓]), II (-6, I 5[↓]), III (-19, II 7[↓]), IV (-18, III 7[↓]).
 Measure 78: I (-19, II 7[↓]), II (+21, I 13[↑]), III (-19, II 7[↓]), IV (-18, III 7[↓]).
 Measure 79: I (-19, II 7[↓]), II (+49, IV 3[↓]), III (-19, II 7[↓]), IV (-20, II 7[↑]).
 Measure 80: I (-19, II 7[↓]), II (+11, IV 13[↓]), III (-19, II 7[↓]), IV (+29, I 11[↓]).
 Measure 81: I (-19, II 7[↓]), II (+49, III 3[↓]), III (-19, II 7[↓]), IV (+29, I 11[↓]).
 Measure 82: I (-19, II 7[↓]), II (+49, III 3[↓]), III (-19, II 7[↓]), IV (+29, I 11[↓]).

83

Measure 83: I (2), II (2), III (2), IV (+32, I 11[↑]).
 Measure 84: I (2), II (2), III (2), IV (-10, II 13[↑]).
 Measure 85: I (2), II (2), III (2), IV (-37, II 5[↓]).
 Measure 86: I (2), II (2), III (2), IV (-49, III 1[↑]).
 Measure 87: I (2), II (2), III (2), IV (-21, I 3[↓]).
 Measure 88: I (2), II (2), III (2), IV (+29, I 11[↓]).
 Measure 89: I (2), II (2), III (2), IV (+29, I 11[↓]).
 Measure 90: I (-19, II 7[↓]), II (-33, I 5[↑]), III (+49, I 7[↑]), IV (-33, I 5[↑]).

93

Measure 93: I 11[↑] +32, II 11[↑] +32, III 11[↑] +32, IV 11[↑] +32

Measure 94: I 13[↑] +21, II 13[↑] +21, III 13[↑] +21, IV 13[↑] +21

Measure 95: I 5[↓] -6, II 5[↓] -6, III 5[↓] -6, IV 5[↓] -6

Measure 96: I 11[↑] +32, II 11[↑] +32, III 11[↑] +32, IV 11[↑] +32

Measure 97: I 11[↓] +29, II 11[↓] +29, III 11[↓] +29, IV 11[↓] +29

Measure 98: I 13[↑] +21, II 13[↑] +21, III 13[↑] +21, IV 13[↑] +21

Measure 99: I 1[↑] -6, II 1[↑] -6, III 1[↑] -6, IV 1[↑] -6

Measure 100: I 3[↑] -18, II 3[↑] -18, III 3[↑] -18, IV 3[↑] -18

101

Measure 101: I 7[↓] +12, II 7[↓] +12, III 7[↓] +12, IV 7[↓] +12

Measure 102: I 3[↑] -18, II 3[↑] -18, III 3[↑] -18, IV 3[↑] -18

Measure 103: I 7[↑] +49, II 7[↑] +49, III 7[↑] +49, IV 7[↑] +49

Measure 104: I 1[↑] -19, II 1[↑] -19, III 1[↑] -19, IV 1[↑] -19

Measure 105: I 13[↑] +19, II 13[↑] +19, III 13[↑] +19, IV 13[↑] +19

Measure 106: I 1[↑] +12, II 1[↑] +12, III 1[↑] +12, IV 1[↑] +12

Measure 107: I 13[↓] +40, II 13[↓] +40, III 13[↓] +40, IV 13[↓] +40

Measure 108: I 7[↓] +25, II 7[↓] +25, III 7[↓] +25, IV 7[↓] +25

109

Measure 109: I 11[↓] +29, II 11[↓] +29, III 11[↓] +29, IV 11[↓] +29

Measure 110: I 11[↑] +32, II 11[↑] +32, III 11[↑] +32, IV 11[↑] +32

Measure 111: I 5[↑] -33, II 5[↑] -33, III 5[↑] -33, IV 5[↑] -33

Measure 112: I 7[↓] +12, II 7[↓] +12, III 7[↓] +12, IV 7[↓] +12

Measure 113: I 7[↑] +49, II 7[↑] +49, III 7[↑] +49, IV 7[↑] +49

Measure 114: I 3[↑] -18, II 3[↑] -18, III 3[↑] -18, IV 3[↑] -18

Measure 115: I 11[↑] +32, II 11[↑] +32, III 11[↑] +32, IV 11[↑] +32

Measure 116: I 5[↓] -4, II 5[↓] -4, III 5[↓] -4, IV 5[↓] -4

116

I 4 4 2 -6 +38
IV 5↓ III 13↓

II +42 I 13↓ -18 IV 3↑

III -21

IV -19

126

I 6 4 -23 +30
III 3↓ III 11↑

II +10 III 7↓

III -21 IV 11↑

IV -19

137

I 6 6 2 +27 -19 2
III 11↓ IV 1↓

II +38 III 13↓

III -21 IV 1↓

IV -19

148

III 5↓ IV 7↓

IV 5↓

III 13↑ III 3↑

III 7↓ III 5↑

II 3↓

158

III 13↑ III 3↑

III 7↓ III 5↑

II 3↓

167

IV 1 IV 7↑

IV 5↓

II 13↑ II 3↑ IV 13↓

II 5↑ II 7↓

179

IV 3[↑]

IV 5[↑] IV 3[↓]

IV 11[↓] IV 5[↓]

184

I 13[↑] II 7[↑] IV 13[↓] II 3[↑] I 11[↑]

194

IV 7[↑] IV 13[↑]

IV 11[↑] III 7[↓]

I 11[↑] II 5[↓]

II 3[↑]

203

II +42
I 3↑

III +49
II 3↑

IV +39 I 3↓ +42 II 1 -8 I 11↑ -19 III 7↓

211

I +41

II -46 I 5↓ -49 III 3↑ +1 IV 11↑

III +49

IV +49 III 1

219

I +41 +41

II -11 I 11↓ +36 III 5↑ +47 IV 3↓ +39 I 3↓

III +49 +49

IV +49 III 1 +18 III 7↑

228

III 13 \downarrow IV 3 \uparrow I 13 \downarrow III 5 \uparrow IV 3 \downarrow III 1 III 13 \uparrow III 1 III 7 \uparrow III 5 \downarrow

236

I 7 \uparrow III 11 \downarrow IV 3 \downarrow III 13 \downarrow III 1 III 7 \uparrow III 5 \downarrow

245

I 5 \downarrow III 11 \uparrow I 5 \downarrow III 3 \downarrow III 3 \uparrow III 13 \uparrow III 7 \uparrow III 1 III 7 \uparrow III 13 \uparrow III 11 \downarrow

(254)

Staff I: $\text{III } 1$, $\text{IV } 1$, $\text{III } 1$

Staff II: $\text{IV } 3 \downarrow$, $\text{IV } 7 \uparrow$, $\text{IV } 11 \uparrow$, $\text{IV } 13 \uparrow$

Staff III: $\text{IV } 7 \downarrow$, $\text{IV } 1$, $\text{IV } 5 \uparrow$, $\text{IV } 1$

Staff IV: -2 , $+39$, $+0$, $+39$, -33

Staff IV fingerings: $\text{III } 13 \uparrow$, $\text{III } 3 \uparrow$, $\text{III } 13 \uparrow$, $\text{III } 7 \uparrow$

(261)

Staff I: $\text{IV } 3 \uparrow$, $\text{IV } 13 \downarrow$, $\text{II } 7 \uparrow$, $\text{II } 11 \uparrow$, $\text{II } 1$

Staff II: $+36$, $\text{IV } 7 \uparrow$, $\text{II } 1$

Staff III: -47 , $+26$, $+36$, $+18$, -35 , -24 , $+5$, $+22$, $\text{II } 5 \uparrow$

Staff IV: $+38$, $+36$, $\text{II } 1$

Staff IV fingerings: $\text{II } 3 \uparrow$, $\text{II } 1$

seeds and ledgers 2

for cat lamb

michael winter
(berlin; 2023)

First system of the musical score, measures 1-6. The score is for four staves (I, II, III, IV) in 2/2 time. Staff I (treble clef) has notes with intervals +0, -14, -41, and +6. Staff II (treble clef) has notes with intervals -14, -41, and -2. Staff III (bass clef) has notes with intervals +49, +2, and +14. Staff IV (bass clef) has a whole note with interval +0. Roman numerals IV 1, IV 5↑, and IV 13↓ are indicated below the staves.

Second system of the musical score, measures 7-12. The score continues with four staves. Staff I has notes with intervals +0, -14, -41, and +16. Staff II has notes with intervals -14, -41, and -2. Staff III has notes with intervals +46, +29, +49, +2, and +14. Staff IV has notes with intervals -27, +47, and +0. Roman numerals I 5↑, II 7↓, IV 11↓, IV 3↑, IV 5↓, I 5↓, II 11↓, and < II 3↑ are indicated below the staves.

Third system of the musical score, measures 13-18. The score continues with four staves. Staff I has notes with intervals +16, +47, -25, +14, +2, +16, and -16. Staff II has notes with intervals +47, -25, +14, +2, +16, and -16. Staff III has notes with intervals -16, -36, and +18. Staff IV has notes with intervals -44 and +0. Roman numerals I 7↓, I 13↓, I 3↓, I 5↑, I 1, I 7↑, II 5↑, I 11↓, I 3↑, and I 13↑ are indicated below the staves.

35

+44 2 -29 2 -17 +36 2 +33 -14 -2 2

II 13↓ II 5↑ II 3↓ II 11↑ II 11↓ II 3↑ II 5↓

45

+25 -47 2 +44 2 -17 4 +20 2 +31

II 13↑ II 7↑ II 13↓ II 3↓ III 3↑ IV 5↓

IV 13↓

7 +18 II 1

-47 +18 II 7↑ III 1

55

-42 -14 2 2 4 2

IV 13↑ IV 7↑

+16 IV 3↓

+46 -27 -16 +38

I 13↓ I 5↑ I 3↓ I 11↑

66

IV 5[↑]

IV 1

IV 11[↓]

I 11[↓] I 3[↑] I 13[↑] I 5[↓] I 3[↑]

77

IV 13[↓] IV 7[↑] IV 7[↑] IV 13[↑] IV 3[↑] IV 5[↓] IV 1

IV 3[↓] IV 3[↓]

IV 3[↑]

87

II 5[↓] III 1 III 13[↑]

III 1

II 7[↓] IV 1 II 11[↑]

II 5[↓] II 13[↑] III 3[↑] III 11[↓]

(96)

Measure 96: I (III 13↓, III 7↓, III 5↑), II, III (II 3↓, I 13↑, I 5↓, IV 1), IV (II 11↑, III 1, II 5↑, III 7↑, I 13↑, I 3↑, I 11↓, I 11↑, III 7↑).

Measure 97: I (-25, +47, +35), II, III (-13, -39, +49), IV (-31, +16, +4).

Measure 98: I, II, III, IV (-16, -13, +49, -5, -2, +18).

Measure 99: I, II, III, IV.

Measure 100: I, II, III, IV.

Measure 101: I, II, III, IV.

(102)

Measure 102: I (IV 1, III 13↑, II 1, IV 1, IV 1, II 11↑), II, III, IV.

Measure 103: I, II (III 5↓, III 3↑), III, IV.

Measure 104: I, II (II 5↑, II 13↓, II 5↑), III, IV.

Measure 105: I, II, III, IV (III 11↓, II 3↑, II 11↓, I 1, II 3↓, III 1).

Measure 106: I, II, III, IV.

Measure 107: I, II, III, IV.

(108)

Measure 108: I (III 13↓, III 5↑, III 3↓, III 11↑, IV 11↓), II, III, IV.

Measure 109: I, II (III 3↑, III 5↓, III 13↑, III 7↑, III 3↑, III 5↓), III, IV.

Measure 110: I, II, III, IV.

Measure 111: I, II, III, IV.

Measure 112: I, II, III, IV.

Measure 113: I, II, III, IV (< II 1).

119

IV 3[↑] IV 5[↓] IV 1 IV 13[↑] IV 7[↑] IV 1

IV 13[↓] IV 3[↓] IV 5[↑] IV 3[↓] IV 11[↑] IV 11[↓]

IV 5[↑] IV 13[↓] IV 3[↑] IV 5[↓] IV 13[↓] IV 5[↑]

+16

127

IV 1 IV 13[↑] IV 7[↑] IV 1 IV 5[↑]

IV 5[↑] IV 3[↓] IV 11[↑] IV 11[↓] IV 3[↑]

IV 3[↑] IV 5[↓] IV 13[↓] IV 5[↑] IV 3[↓]

+16

140

IV 3[↓] IV 11[↑] IV 11[↓]

IV 13[↑] IV 3[↓] I 1

IV 5[↓] IV 7[↑] IV 5[↑]

+16

151

IV 3[↑] IV 13[↑] IV 7[↑]

I¹ IV 7[↓] IV 13[↓]

IV 13[↓] IV 11[↑]

159

IV 1¹ IV 3[↑] IV 11[↓] II 1¹

IV 3[↓] IV 11[↑] III 1¹ IV 3[↓]

IV 11[↓] IV 5[↑] IV 13[↓] IV 5[↓]

+16

172

IV 3[↑] IV 11[↓] IV 3[↓] IV 5[↑] IV 13[↓]

IV 11[↑] IV 5[↑] IV 3[↓] IV 7[↓] IV 1¹

IV 5[↑] IV 13[↓] IV 5[↓] IV 13[↑] IV 7[↑]

+16

seeds and ledgers 3

for irasema fernandez

michael winter
(berlin; 2023-24)

The musical score is written for five voices (I, II, III, IV, and V) across three systems. Each voice part is represented by a staff with a specific clef and key signature. The notation includes notes, rests, and various musical symbols such as fingerings, accidentals, and ledger lines. The score is divided into measures, with some measures containing multiple notes or rests. The fifth voice (V) begins at measure 15, indicated by a circled '15' at the start of its staff.

System 1 (Measures 1-8):

- Voice I:** Treble clef, key signature of one sharp (F#). Notes: G4, A4, B4, C5, D5, E5, F5, G5. Fingerings: +0, +2, +6, -31, +0, -2, +2, -31. Chord symbols: II¹, IV^{3↑}, III^{7↑}, II¹, IV^{3↓}, IV¹, IV^{7↑}.
- Voice II:** Treble clef, key signature of one sharp (F#). Notes: G4, A4, B4, C5, D5, E5, F5, G5. Fingerings: +2, +6, +0, +2, +0, -2, +0, +2. Chord symbols: IV^{3↑}, I¹, III¹, III¹, IV^{3↑}, IV¹, III¹, IV^{3↑}.
- Voice III:** Bass clef, key signature of one sharp (F#). Notes: G3, A3, B3, C4, D4, E4, F4, G4. Fingerings: +0, +2, +14, +0, +0. Chord symbols: IV^{3↓}, IV^{5↓}, II¹, IV^{3↑}.
- Voice IV:** Bass clef, key signature of one sharp (F#). Notes: G3, A3, B3, C4, D4, E4, F4, G4. Fingerings: +0, +4, +0, -2, +2, -2, +0. Chord symbols: II^{3↑}, II¹, I¹, III^{3↑}, III^{3↓}, III¹.

System 2 (Measures 9-14):

- Voice I:** Treble clef, key signature of one sharp (F#). Notes: G4, A4, B4, C5, D5, E5, F5, G5. Fingerings: +0, -12, -10, +17, -27, -12, -10, -23. Chord symbols: IV¹, IV^{5↑}, IV¹, III^{7↓}, III^{5↑}, II¹, III¹, III^{5↑}.
- Voice II:** Treble clef, key signature of one sharp (F#). Notes: G4, A4, B4, C5, D5, E5, F5, G5. Fingerings: -12, -12, -8, +4. Chord symbols: I¹, IV^{3↓}, III^{3↑}, IV¹.
- Voice III:** Bass clef, key signature of one sharp (F#). Notes: G3, A3, B3, C4, D4, E4, F4, G4. Fingerings: +2, +4, -10, +2, -14, -10. Chord symbols: II¹, II^{3↑}, I^{3↑}, II¹, IV^{3↓}, IV^{3↑}.
- Voice IV:** Bass clef, key signature of one sharp (F#). Notes: G3, A3, B3, C4, D4, E4, F4, G4. Fingerings: +0, -2, +2, -10, -45, -12, -14, -10, -12, +4. Chord symbols: III¹, I^{3↓}, II¹, III^{5↑}, III^{11↑}, I¹, III¹, II^{3↑}, II¹, III^{5↓}.

System 3 (Measures 15-21):

- Voice I:** Treble clef, key signature of one sharp (F#). Notes: G4, A4, B4, C5, D5, E5, F5, G5. Fingerings: -8, -20, -10, -8, +42, +10, -36, -21. Chord symbols: IV^{3↑}, IV^{5↑}, III¹, III^{11↓}, III^{3↓}, III¹, II^{5↑}, II¹.
- Voice II:** Treble clef, key signature of one sharp (F#). Notes: G4, A4, B4, C5, D5, E5, F5, G5. Fingerings: -22, +42, -10, -45, +10, -23, -34. Chord symbols: I^{5↑}, III^{11↑}, I¹, IV^{5↓}, I¹, IV^{7↑}, III^{5↑}.
- Voice III:** Bass clef, key signature of one sharp (F#). Notes: G3, A3, B3, C4, D4, E4, F4, G4. Fingerings: +43, +10, +42, -21. Chord symbols: IV^{11↑}, IV^{7↑}, IV¹, II^{3↑}.
- Voice IV:** Bass clef, key signature of one sharp (F#). Notes: G3, A3, B3, C4, D4, E4, F4, G4. Fingerings: -10, -6, -23, -8, +30, +42, +8, -38, -36. Chord symbols: III¹, I^{3↑}, III^{5↑}, III^{3↑}, III^{5↑}, I¹, II^{3↓}, I^{3↓}, I¹.

22

System 1 (Measures 22-28):

- Staff I:** -38 (III¹), -36 (III^{3↑}), +50 (IV^{5↑}), -38 (IV^{3↓}), -36 (IV^{3↓}), -21 (III¹), +26 (IV^{11↓}), -23 (II¹).
- Staff II:** -23 (IV^{5↓}), -38 (IV¹), -34 (III¹), -36 (IV¹), -34 (IV^{3↑}), -23 (III^{5↓}).
- Staff III:** -38 (IV^{3↓}), -34 (IV^{3↑}), +32 (IV^{7↑}), -36 (IV¹), -36 (IV^{3↓}), -21 (II^{3↑}), -36 (IV^{3↓}), +46 (II^{7↑}), -34 (IV^{5↑}).
- Staff IV:** -38 (III¹), -36 (I¹), -34 (II¹), -23 (II¹), -21 (II^{3↑}).

29

System 2 (Measures 29-35):

- Staff I:** -36 (III^{3↓}), -33 (IV^{3↑}), -21 (IV^{5↓}), -34 (II¹), -21 (IV^{3↑}), -19 (IV^{3↑}), -36 (II^{3↓}), -33 (III^{7↓}), +10 (IV^{5↑}), -23 (III^{3↓}).
- Staff II:** -34 (I^{3↑}), -33 (IV^{5↑}), -9 (I^{5↓}).
- Staff III:** +50 (I^{5↑}), -19 (I^{5↓}), -33 (I¹), -23 (I^{3↓}), -21 (IV¹), +46 (I^{7↑}).
- Staff IV:** -38 (I^{3↓}), -34 (II¹), -21 (I¹), -19 (III^{5↓}), +34 (II^{7↑}), -23 (III¹), -21 (I¹), -19 (I¹), -25 (I^{3↓}).

36

System 3 (Measures 36-42):

- Staff I:** -25 (IV¹), -50 (II^{13↓}), -21 (IV¹), -34 (IV¹), -46 (III^{3↑}), -11 (IV^{7↑}), -11 (III^{3↓}), -31 (IV^{11↓}), +3 (III^{7↓}).
- Staff II:** -34 (IV^{5↑}), -8 (III^{13↑}), -15 (I^{7↓}), -20 (IV^{13↓}), -9 (I^{3↑}), +19 (IV^{3↓}), -28 (III¹).
- Staff III:** -23 (IV^{3↑}), -23 (IV^{3↓}), -48 (II^{5↑}), +34 (IV^{5↓}), +7 (IV^{5↑}), -28 (IV^{11↑}).
- Staff IV:** -23 (III¹), -21 (III^{3↑}), -34 (II¹), -33 (II^{3↑}), +21 (III^{7↑}), +41 (III^{7↑}).

(43)

Measure 43: I (IV 5[↑]), II (+1, I 3[↓]), III (+3, I 1), IV (+17, I 5[↓]).
 Measure 44: I (-31), II (+34, III 7[↓]), III (+0, I 7[↓]), IV (+44, III 13[↑]).
 Measure 45: I (-37, III 11[↑]), II (-37, III 13[↓]), III (+11, II 13[↓]), IV (-17, II 11[↓]).
 Measure 46: I (-23, III 1), II (+38, I 7[↑]), III (-23, II 3[↓]), IV (+38, II 1).
 Measure 47: I (+5, II 7[↑]), II (-48, IV 5[↓]), III (+5, II 13[↓]), IV (-35, II 5[↑]).
 Measure 48: I (+36, III 13[↓]), II (-21, IV 13[↑]), III (-37, III 7[↑]), IV (-26, I 7[↑]).
 Measure 49: I (+36, III 13[↓]), II (-37, IV 3[↓]), III (+5, II 13[↓]), IV (-21, III 3[↑]).

(50)

Measure 50: I (+12, III 11[↓]), II (-23, I 13[↑]), III (-6, II 11[↓]), IV (+44, II 3[↓]).
 Measure 51: I (+1, II 11[↓]), II (-48, I 13[↑]), III (-33, I 7[↓]), IV (+36, I 1).
 Measure 52: I (-46, III 3[↑]), II (-7, II 13[↑]), III (-37, II 5[↑]), IV (+17, II 13[↑]).
 Measure 53: I (-15, IV 1), II (-19, IV 3[↓]), III (+25, II 11[↓]), IV (-34, II 5[↓]).
 Measure 54: I (-17, IV 1), II (-19, IV 3[↓]), III (+1, II 11[↓]), IV (+10, I 3[↓]).
 Measure 55: I (-17, IV 1), II (-19, IV 3[↓]), III (-29, I 13[↓]), IV (+14, I 3[↑]).
 Measure 56: I (-48, II 1), II (-46, I 1), III (-7, II 13[↑]), IV (-17, II 7[↓]).

(57)

Measure 57: I (-15, IV 3[↑]), II (-15, IV 5[↑]), III (-15, II 1), IV (+37, II 11[↑]).
 Measure 58: I (+35, IV 3[↓]), II (-30, IV 5[↑]), III (-3, II 5[↓]), IV (-15, III 5[↑]).
 Measure 59: I (+28, II 7[↓]), II (-15, I 1), III (-1, II 5[↓]), IV (-50, III 11[↑]).
 Measure 60: I (+30, III 7[↓]), II (-3, III 3[↓]), III (-48, IV 3[↑]), IV (-15, III 5[↑]).
 Measure 61: I (+19, IV 7[↑]), II (+1, III 3[↑]), III (-9, IV 13[↑]), IV (-50, III 3[↑]).
 Measure 62: I (+19, IV 7[↑]), II (+19, III 1), III (-48, III 1), IV (-46, III 3[↑]).
 Measure 63: I (+21, III 7[↑]), II (-48, III 1), III (-50, III 3[↓]), IV (-17, III 7[↓]).

64

System 1 (Measures 64-69):

- Staff I:** Notes at measures 64, 65, 66, 67, 68, 69. Interval markings: IV³↑, III³↑, IV⁵↑, III⁵↑, III¹.
- Staff II:** Notes at measures 64, 65, 66, 67, 68, 69. Interval markings: III³↓, I³↑, III³↓, III⁵↓, I¹, I¹, IV³↓, III³↑.
- Staff III:** Notes at measures 64, 65, 66, 67, 68, 69. Interval markings: I³↑, I¹, IV³↓, IV⁷↓, II⁵↓, II³↑, I¹³↑, II³↑.
- Staff IV:** Notes at measures 64, 65, 66, 67, 68, 69. Interval markings: III¹, II¹, I³↑, II¹, III⁵↑, III⁷↓, II¹.

71

System 2 (Measures 70-75):

- Staff I:** Notes at measures 70, 71, 72, 73, 74, 75. Interval markings: IV⁷↓, IV⁷↑, II⁵↑, II⁷↑, IV³↑, IV¹¹↓, III³↓.
- Staff II:** Notes at measures 70, 71, 72, 73, 74, 75. Interval markings: III⁷↑, III⁷↓, III⁷↑, IV⁵↓, IV³↑, I¹³↓, III¹¹↓, I⁷↑.
- Staff III:** Notes at measures 70, 71, 72, 73, 74, 75. Interval markings: II¹, IV¹¹↓, I⁵↑, II³↓, II⁵↓, II⁷↓, IV⁷↑.
- Staff IV:** Notes at measures 70, 71, 72, 73, 74, 75. Interval markings: III³↑, I¹, III¹, II⁷↓, III¹, II⁷↑.

78

System 3 (Measures 76-81):

- Staff I:** Notes at measures 76, 77, 78, 79, 80, 81. Interval markings: IV³↓, IV¹, IV³↑, III¹, III³↑, III¹.
- Staff II:** Notes at measures 76, 77, 78, 79, 80, 81. Interval markings: IV⁵↓, IV⁵↓, I⁵↑, IV¹, IV⁷↓, I³↑.
- Staff III:** Notes at measures 76, 77, 78, 79, 80, 81. Interval markings: I¹¹↓, IV¹¹↓, II³↓, IV⁷↑, I⁷↑.
- Staff IV:** Notes at measures 76, 77, 78, 79, 80, 81. Interval markings: III¹, III³↑, III¹¹↑, III⁷↑, III¹¹↓, I¹, III⁷↓, III⁵↓, II¹¹↓, III³↓, III⁷↑.

85

+50 +1 +3 +36 -15

IV¹¹↓ IV¹ IV¹ III¹ IV¹¹↓

-48 +3 +5 -48 +5 +34

IV¹¹↑ IV¹ IV³↑ III¹¹↑ IV³↑ I⁷↓

+50 +1 -28 +5 +1 +36 +34 -17

I¹ IV¹ IV⁷↑ II¹ IV¹ IV³↑ II¹ II¹¹↓

+3 +1 +17 +34 +32 +36 -35 +36 -15

III³↑ I³↓ I⁵↓ II¹ II³↓ III¹ III⁷↓ I¹ I¹

92

-27 +2 -29 +4

III³↑ III⁷↓ IV⁵↑ IV³↑

-17 -31 -29 -29 -31 +16 -42 -29

IV³↓ IV⁵↑ III¹ IV⁵↑ III⁷↑ IV⁷↓ I⁵↑ I¹

-13 -29 -29 +0 -15 +2

IV³↑ IV⁵↑ IV⁵↑ I³↓ IV¹ II⁵↑

-17 -15 -15 -15 +2 +0

II¹ III⁵↓ III⁵↓ III¹ III¹ III³↓

98

+0 -13 +28 -5 +24 +28

IV¹ IV⁵↑ II⁵↓ II⁷↑ II³↓ IV¹

+2 -49 +14 +41 +30 +14 +26

III¹ III¹¹↓ IV⁵↓ IV¹³↑ IV³↑ I⁵↑ IV⁵↓

+0 -41 -13 +12 +14 -23 -43

IV¹ IV⁷↓ I¹³↓ IV¹ IV³↑ II¹¹↑ II⁷↓

+4 +0 +0 +28 -41 +12 +28

III³↑ I¹ III¹ I¹ III¹ II³↓ II³↑

105

-45 +40 -16 -27

II 7↑ IV 1 II 3↑

+26 -29

III 5↓

-43 -31 -27

II 3↓ II 3↑

+28 -45 -41 -2 -29 +6 +15 +24 -16 -27

I 1 III 3↑ III 13↑ III 5↓ III 11↓ I 13↓ I 7↑ II 5↓ II 3↑

115

-27 -27 -27 -16 -27 -16 +19

III 1 III 1 IV 5↓ IV 3↑ IV 5↓ IV 11↓

-29 -27 +4 -41 -29 -25 -14 -25 -41 -29 -25 -27 -41 -29 -43 -31 -14

III 1 III 5↑ III 3↑ I 3↑ IV 1 I 3↓ I 1 I 5↑ IV 1 IV 5↑ I 5↓ IV 3↓

III 7↓ III 5↑ I 5↓

-16 -27 +11 -27 -29 +21 -25 +24 -41 -29 -25 -43 +41 -39 -27 -16 +40 -29 -45 -29

IV 3↓ II 13↑ IV 1 I 3↓ I 3↑ I 5↑ I 3↑ I 3↑ IV 3↓ II 3↑ IV 5↓ IV 7↑ IV 1 II 7↑ IV 1

-27 -29 -27 +4 -41 +24 -25 -29

III 3↓ I 1 I 7↓ III 1 I 11↑ I 3↓ I 3↑

119

-16 -27 -29 -25 -14 +41 -25 +13 -25 +6 -39 -23 +15 -23 -12 -29

III 5↓ III 3↑ < III 1 II 3↑ IV 7↑ IV 13↑ III 7↓ IV 1 IV 1 III 5↓ IV 3↓

IV 5↓ IV 3↑ III 1

+2 -43 -31 -43 -25 -14 +41 -27 -23 -12 +43 +15 -27 -39 +17 -21 +34 +26 -23 +32

III 7↓ III 3↓ IV 5↑ < I 3↑ IV 7↑ III 3↑ III 7↑ III 3↓ III 5↑ IV 13↑ III 13↓ III 3↑

III 5↑ III 3↑ III 13↑ IV 3↑ III 11↑ IV 13↓

-27 -25 +13

< I 1 II 1 I 1 IV 13↑

-16 -27 +19 -31 -29 -41 -29 +21 -27 -27 -23 -12 -23 -12 +26 -27

III 5↓ III 11↓ III 1 I 5↑ III 1 I 11↓ < I 1 II 1 III 3↑ III 5↓ III 3↑ III 5↓ III 3↓ III 11↑

123

Staff I: -25 -14 +21 | +19 -31 -27 | -16 | -29 | -18 | +38
 IV 3[↑] IV 5[↓] IV 11[↓] | II 11[↓] II 3[↑] IV 1 | < II 1 | III 5[↓] IV 7[↑]

Staff II: -29 -41 -25 -29 | | | -16 | -33 -29 -18 +38 -31 +40 | +38 -31
 IV 3[↓] IV 5[↑] IV 3[↑] | IV 3[↓] | < I 1 | III 3[↓] I 1 IV 7[↑] IV 1 | I 3[↑] I 1 I 7[↓]

Staff III: -41 | +35 +23 | -27 -29 | | | -18 +38 -14 -31 | +24 +36 +40 +36 +40
 IV 5[↑] I 5[↓] I 3[↑] | II 3[↑] II 1 | < I 3[↓] II 3[↑] IV 3[↓] I 3[↓] | I 5[↑] II 1 IV 3[↓] I 3[↓] II 1

Staff IV: +19 -31 -29 +2 -43 -27 -16 +40 | | | -31 | +24 +38 | +40
 II 11[↓] III 1 III 5[↑] III 5[↓] III 7[↑] | II 3[↓] III 7[↓] I 1 | III 1 | I 5[↑] I 1 III 1

127

Staff I: +38 +6 -38 | | | | |
 III 7[↓] III 5[↑]

Staff II: +38 +36 +24 +40 | +40 | -25 -11 +24 -23 -45 -37 | -25 +30 -40 -37 -25 +30
 I 1 III 1 I 5[↑] I 3[↑] | III 1 IV 1 III 3[↑] I 3[↑] | I 5[↓] IV 1 I 5[↓] I 7[↑] | I 3[↑]

Staff III: +36 +24 +38 +26 +6 | -22 +40 -49 -25 | -37 +2 -37 -40 +48 | -40 -37 -25 +30 +2 -37
 I 3[↓] I 5[↑] I 1 II 5[↑] | I 13[↑] I 5[↓] II 1 IV 5[↑] | I 3[↑] I 13[↑] IV 3[↓] I 5[↑] | IV 1 I 3[↑] I 7[↑] I 13[↑] I 3[↑]

Staff IV: +36 +24 -11 | -11 | +24 | +48 -38 -40 | +10 +30 -25
 III 3[↓] I 11[↑] | III 11[↓] | I 5[↑] I 1 I 3[↓] | I 11[↓] I 5[↓]

131

Staff I: -25 -37 +13 -37 +2 +30 | -38 | -25 +10 +13 -37 +13 -37
 IV 1 II 3[↑] IV 1 II 13[↑] II 7[↑] | < II 1 | < I 5[↓] IV 1 III 3[↑] III 3[↑]

Staff II: -38 | | | -25 +10 -40 +48 -40 -37 | -40 +48 +13 -37 -25 -37 -38
 < I 1 | < II 5[↓] IV 1 III 5[↑] I 3[↑] | < I 3[↓] III 5[↑] IV 1 III 3[↑] III 3[↑] III 5[↓] III 1

Staff III: -25 -37 +2 +30 -38 -10 +28 | +30 -38 +8 -42 -38 -35 +21 | -38
 IV 1 IV 1 II 13[↑] II 1 I 13[↓] I 3[↓] | < I 1 I 1 IV 11[↓] I 1 II 3[↑] | < I 1

Staff IV: -25 -37 | -25 +30 +44 | -40 | -37 -25 -5 | +13 | -37 -40 -38
 II 3[↑] II 5[↓] I 5[↓] | < II 3[↓] | I 3[↑] III 5[↓] II 7[↓] | < I 11[↑] I 1 III 3[↓] III 1

134

Measure 134: Staff I has a whole note with interval -38 and chord <III¹. Staff II has a half note with interval -37 and chord <I¹, followed by a half note with interval +13 and chord IV¹¹↑, and a half note with interval -7 and chord III¹. Staff III has a half note with interval -7 and chord IV⁷↓, followed by a half note with interval +48 and chord I⁵↑, and a half note with interval -40 and chord II¹. Staff IV has a half note with interval -38 and chord III¹, followed by a half note with interval -7 and chord I¹, and a half note with interval -38 and chord II³↓. Measure 135: Staff I has a whole note with interval -40 and chord <I³↓, followed by a half note with interval +48 and chord IV⁵↑, and a half note with interval +13 and chord IV¹¹↑. Staff II has a half note with interval +30 and chord <I⁷↑, followed by a half note with interval -38 and chord IV¹, and a half note with interval -7 and chord IV⁷↓. Staff III has a half note with interval -25 and chord <II¹, followed by a half note with interval +30 and chord IV⁷↑, and a half note with interval +46 and chord I⁵↑. Staff IV has a whole note with interval -38 and chord <I¹.

136

Measure 136: Staff I has a whole note with interval -38 and chord <IV¹. Staff II has a half note with interval -38 and chord <II¹, followed by a half note with interval -37 and chord IV¹, and a half note with interval -25 and chord I⁵↓. Staff III has a half note with interval -40 and chord <IV³↓, followed by a half note with interval -37 and chord IV¹, and a half note with interval -25 and chord IV¹. Staff IV has a half note with interval -37 and chord <III¹, followed by a half note with interval -25 and chord I⁵↓, and a half note with interval -37 and chord I³↑. Measure 137: Staff I has a whole note with interval -38 and chord <IV¹. Staff II has a half note with interval -40 and chord I³↓, followed by a half note with interval +48 and chord I⁵↑, and a half note with interval +13 and chord I¹¹↑. Staff III has a half note with interval -37 and chord I³↑, followed by a half note with interval -25 and chord I⁵↓, and a half note with interval -38 and chord I¹. Staff IV has a half note with interval -37 and chord I³↑, followed by a half note with interval -25 and chord I⁵↓, and a half note with interval -38 and chord I¹.

138

Measure 138: Staff I has a half note with interval -38 and chord III⁷↑, followed by a half note with interval +28 and chord IV¹. Staff II has a half note with interval +30 and chord III³↑, followed by a half note with interval -38 and chord IV³↓, and a half note with interval +46 and chord IV⁵↑. Staff III has a half note with interval +13 and chord I¹¹↑, followed by a half note with interval -37 and chord IV¹¹↓, and a half note with interval +10 and chord IV³↓. Staff IV has a half note with interval -38 and chord III¹, followed by a half note with interval -40 and chord I⁷↑, and a half note with interval +28 and chord III¹. Measure 139: Staff I has a half note with interval -40 and chord IV¹. Staff II has a half note with interval -9 and chord IV⁷↓, followed by a half note with interval -27 and chord I⁵↓, and a half note with interval -38 and chord IV³↑. Staff III has a half note with interval -9 and chord I⁷↓, followed by a half note with interval +46 and chord I³↓, and a half note with interval -42 and chord III¹. Staff IV has a half note with interval -42 and chord I³↓, followed by a half note with interval -38 and chord I⁷↑, and a half note with interval -40 and chord III¹. Measure 140: Staff I has a half note with interval +46 and chord 5↑, followed by a half note with interval +11 and chord 11↑, and a half note with interval -38 and chord 3↑. Staff II has a half note with interval +28 and chord 7↑, followed by a half note with interval +0 and chord 13↑, and a half note with interval -38 and chord 3↑. Staff III has a half note with interval +11 and chord 11↑, followed by a half note with interval +46 and chord 5↑, and a half note with interval -37 and chord III³↑. Staff IV has a half note with interval -38 and chord 3↑, followed by a half note with interval -42 and chord 3↑, and a half note with interval -38 and chord 3↑.

*note that for all parts in this measure, the reference pitch is the *a* sharp -40 cents unless otherwise indicated.