

Marc Sabat

Les Duressees

a book of music in Just Intonation

PLAINSOUND MUSIC EDITION

Les Duresses (2004–)

for violins

This work-in-progress is a collection of pieces for violin or violin+instrument, conceived as experimental 'intonation studies' in a sense parallel to Conlon Nancarrow's 'Studies for Player Piano'. Like Couperin's books of music for harpsichord, I think of my collection as contemporary house music existing for private playing pleasure which might occasionally double as more formal concert music. 'Les Duresses' is dedicated to Natalie Pfeiffer.

The first two pieces in the series, titled 'Intonation after Morton Feldman #1 and #2', each take as a point of departure a pair of tuned dyads drawn from Morton Feldman's unfinished 'Composition' (1984) for solo violin. The harmonically complex transitions become the respective topics of the new pieces, seeking to make these comprehensible to both player and listener. These pieces may be transposed and played on viola, Partch adapted viola, or cello if desired.

The Extended Helmholtz-Ellis JI Pitch Notation

microtonal accidentals designed by Marc Sabat and Wolfgang von Schweinitz, 2004

3-LIMIT (PYTHAGOREAN) INTERVALS

FUNCTION OF THE ACCIDENTALS

notate 35 pitches from the series of untempered perfect fifths
 $(3/2) \approx \pm 702.0$ cents;
perfect fifth (3/2); perfect fourth (4/3); major wholetone (9/8)

5-LIMIT (PTOLEMAIC) INTERVALS

notate an alteration by one syntonic comma $(81/80) \approx \pm 21.5$ cents;
*major third (5/4); minor third (6/5); major sixth (5/3); minor sixth (8/5);
 minor wholetone (10/9)*

notate an alteration by two syntonic commas
 $(81/80) \cdot (81/80) \approx \pm 43.0$ cents;
augmented fifth (25/16); diminished fourth (32/25)

notate an alteration by three syntonic commas
 $(81/80) \cdot (81/80) \cdot (81/80) \approx \pm 64.5$ cents;
minor diesis (128/125)

7-LIMIT (SEPTIMAL) INTERVALS

notate an alteration by one septimal comma $(64/63) \approx \pm 27.3$ cents;
*natural seventh (7/4); septimal wholetone (8/7);
 septimal diminished fifth (7/5); septimal tritone (10/7);
 septimal minor third (7/6); septimal quartertone (36/35)*

notate an alteration by two septimal commas
 $(64/63) \cdot (64/63) \approx \pm 54.5$ cents;
septimal sixtitone (49/48)

11-LIMIT (UNDECIMAL) INTERVALS

notate an alteration by one undecimal quartertone
 $(33/32) \approx \pm 53.3$ cents;
undecimal augmented fourth (11/8); undecimal diminished fifth (16/11)

13-LIMIT (TRIDECIMAL) INTERVALS

notate an alteration by one tridecimal thirdditone $(27/26) \approx \pm 65.3$ cents;
tridecimal neutral sixth (13/8); tridecimal neutral third (16/13)

PRIMES IN THE HARMONIC SERIES OCTAVE 16 - 32 (5-limit signs are given here relative to "A")

notate an alteration of the 5-limit accidental by one 17-limit schisma
 $(16/17) \cdot (16/15) = (256/255) \approx \pm 6.8$ cents;
*Galileo's "equal-tempered" semitone (18/17);
 17-limit diminished seventh chord 10:12:14:17*

notate an alteration by one 19-limit schisma
 $(19/16) \cdot (27/32) = (513/512) \approx \pm 3.4$ cents;
19-limit minor third (19/16); 19-limit minor triad 16:19:24

notate an alteration by one 23-limit comma
 $(23/16) \cdot (8/9) \cdot (8/9) \cdot (8/9) \approx \pm 16.5$ cents;
raised leading tone (23/12)

↑
♯

↓
♯

notate an alteration of the 5-limit accidental by one 29-limit comma
 $(29/16) \cdot (5/9) = (145/144) \approx \pm 12.0$ cents

-
♯

+
♯

notate an alteration of the 11-limit accidental by one 31-limit schisma
 $(32/31) \cdot (32/33) = (1024/1023) \approx \pm 1.7$ cents

PRIMES IN THE HARMONIC SERIES OCTAVE 32 - 64 (5-limit signs are given here relative to "A")

{
} ↑
♯

{
} ↓
♯

notate an alteration of the 11-limit accidental by one 37-limit schisma
 $(36/37) \cdot (33/32) = (297/296) \approx \pm 5.8$ cents

{
} ↑
♯

{
} ↓
♯

notate an alteration of the 5-limit accidental by one 41-limit schisma
 $(32/41) \cdot (81/64) \cdot (81/80) = (6561/6560) \approx \pm 0.3$ cents

{
} ↑

{
} ↓

notate an alteration by one 43-limit comma
 $(43/32) \cdot (3/4) = (129/128) \approx \pm 13.5$ cents

{
} ↑
♯ or {
} ↑
♯

{
} ↓
♯ or {
} ↓
♯

notate an alteration of the 7-limit accidental by one 47-limit schisma
 $(32/47) \cdot (48/49) \cdot (3/2) = (2304/2303) \approx \pm 0.8$ cents

{
} ↑
♯

{
} ↓
♯

notate an alteration of the 5-limit accidental by one 53-limit comma
 $(32/53) \cdot (5/3) = (160/159) \approx \pm 10.9$ cents

{
} ↑
♯

{
} ↓
♯

notate an alteration of the 13-limit accidental by one 59-limit schisma
 $(32/59) \cdot (24/13) = (768/767) \approx \pm 2.3$ cents

{
} ↑
♯

{
} ↓
♯

notate an alteration of the 7-limit accidental by one 61-limit schisma
 $(61/32) \cdot (21/40) = (1281/1280) \approx \pm 1.4$ cents

IRRATIONAL AND TEMPERED INTERVALS

♭

♭

♯

♯

×

notate the respective Equal Tempered Semitone;
may be combined with a cents indication to notate any pitch

NOTE ABOUT CENTS INDICATIONS

optional cents indications may be placed above or below the respective accidentals and are always understood in reference to Equal Tempered semitones, as implied by the Pythagorean accidentals

'Les Duresses' : a book of music in Just Intonation

for Natalie Pfeiffer

No. 1 : Intonation after Morton Feldman #1 (violin solo)

Marc Sabat, 2004

814 ¢ $\boxed{8/5}$ 969 ¢ $\boxed{7/4}$ 498 ¢ $\boxed{4/3}$ 386 ¢ $\boxed{5/4}$ 2. repeat sign : entire bracket

con sordino +155 cents 32 : 35 -112 ¢ 16 : 15

1.

as many bow changes and repetitions as accurate intonation requires,
proceed continuously through the numbered phrases

653 ¢ $\boxed{35/24}$

2.

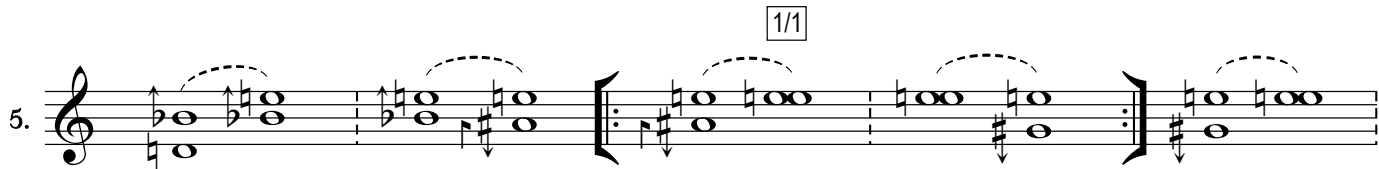
3.

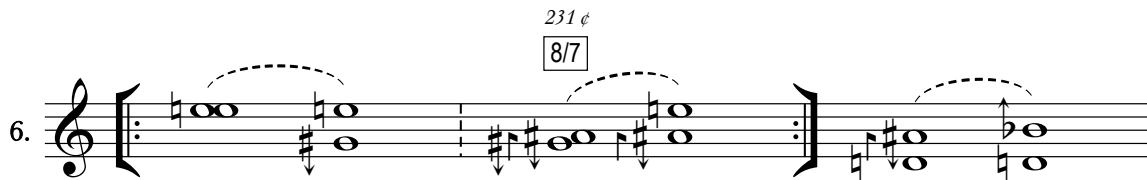
590 ¢ $\boxed{45/32}$ 582.5 ¢ $\boxed{7/5}$ 1. time only

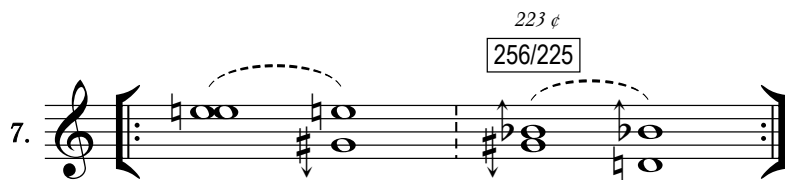
224 : 225 +8 ¢

4.

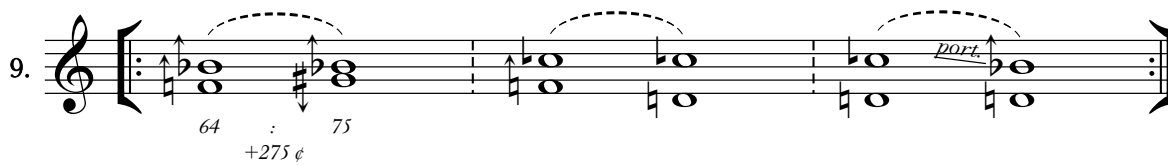
821 ¢ $\boxed{45/28}$ 1. time only

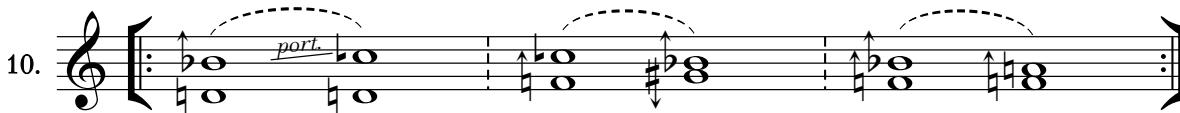
5. 

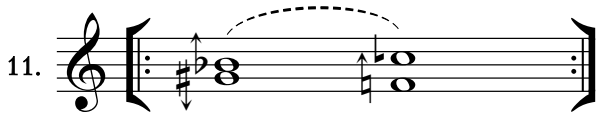
6. 

7. 

8. 

9. 

10. 

11. 

No. 2 : Intonation after Morton Feldman #2 (*violin solo*)

386 ϵ 5/4 814 ϵ 8/5 275 ϵ 75/64

con sordino

sempre simile

as many bow changes and repetitions (at least 3) of each interval as accurate intonation requires;
 "loure" stroke with several articulations in one bow; repeat segments under square brackets as desired

498 ϵ 4/3 267 ϵ 7/6 379 ϵ 56:45

224 : 225 $+8 \epsilon$ 225 : 224 -8ϵ

582.5 ϵ 7/5

617.5 ϵ 10/7 506 ϵ 75/56 610 ϵ 64/45

224 : 225 $+8 \epsilon$

884 ϵ 5/3 969 ϵ 7/4 1018 ϵ 9/5

20 $+84.5 \epsilon$: 21 $4 \text{-----} \rightarrow$

1173 ϵ 63/32

1 $\text{-----} \rightarrow$ 2 $\text{-----} \rightarrow$

224 : 225 $+8 \epsilon$

541.5 ¢ 175:128 316 ¢ 6/5 1200 ¢ 2/1

1178 ¢ 160/81

1067 ¢ 50/27 1049 ¢ 11/6 547.2 ¢ 1000:729 612 ¢ 729:512

100 : 99 55 : 54

-17 ¢ -32 ¢

12/7

41 ¢ 128/125 231 ¢ 8/7 546.8 ¢ 48/35

49 ¢ 36/35 551.3 ¢ 11/8

540 : 539

225 : 224

-3 ¢ -8 ¢

1045 ¢ 64/35

No. 3 : Two Commas (*violin solo*)

con sordino

5/3 8/5 81/64 5/4 27/16 81 : 80 -21.5¢ 81/50

80 : 81 +21.5¢

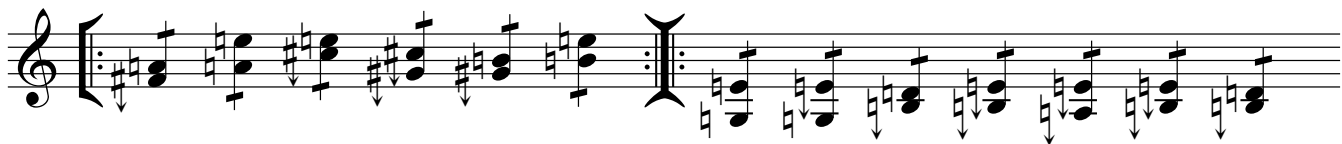
repeat each double-stop 2 or 3 times as indicated, and each pattern 2 or 3 times as desired; tune as accurately as possible whilst maintaining a lively brisk tempo

27/20 4/3 7/4 9/7 9/5

35 : 36 +49¢

3/2

81/40 6/5



Skhisma
-2¢
----->
32805 : 32768



Octave (2:1) + Ptolemaic (Syntonic) Comma (81:80)

Octave (2:1) + Pythagorean Comma (531441:524288)

+2¢
----->
32768 : 32805



-2¢
----->
32805 : 32768



32805 : 32768
----->
-2¢



No. 4 : Duas Quintas (2 violins)

con sordino, legato sempre

35

24

con sordino, legato sempre

events which are connected by dotted lines are to be co-ordinated as indicated, otherwise played freely; boxed numbers refer to the harmonic series numbers over a low G0 (3 octaves below the G string)

36

The image shows a musical score for two staves, likely a piano and a violin or flute. The score is divided into several systems. The first system consists of two staves with various notes and rests. The second system also has two staves, with a measure number '25' in a box above the second staff. Below the first staff of the second system is the instruction *un poco più forte*. The third system has two staves with a measure number '37' in a box above the second staff. Below the second staff of the third system is the instruction *number of repetitions always ad libitum*. The fourth system has two staves with measure numbers '(25)' and '(12)' above the first and second staves respectively. The score includes various musical notations such as notes, rests, slurs, and dynamic markings.

This musical score is written for guitar and consists of six systems of two staves each. The notation includes various musical symbols such as notes, rests, accidentals, and dynamic markings. Fingerings are indicated by Roman numerals (III, IV, I, II, III) and numbers (110, 111, 116, 121, 125, 137, 147, 148). The score includes several repeat signs and first/second endings. A wavy line in the fifth system indicates a continuation of a repeated phrase. The key signature changes from one sharp (F#) to two flats (Bb) in the fifth system. The piece concludes with a final double bar line and repeat sign.

(repeated phrase continues)

Annotations include: (22), (3), (15), III, IV, +16 ϵ , 110, 111, I, I, II, III, (21), (16), +12 ϵ , 147, 148, (37), (25), (12).

First system of musical notation, consisting of two staves. The upper staff contains a melodic line with a flat sign (b) and a fermata. The lower staff contains a bass line with a wavy line indicating a tremolo or sustained vibration.

Second system of musical notation, consisting of two staves. The upper staff has a fermata and a measure with a sharp sign (#) and a Roman numeral II. The lower staff has a measure with a Roman numeral III and a measure with a Roman numeral II. Measure numbers (15) and (4) are present.

Third system of musical notation, consisting of two staves. The upper staff has a measure with a sharp sign (#) and a Roman numeral II. The lower staff has a measure with a Roman numeral III and a measure with a Roman numeral II. A wavy line is present in the lower staff.

Fourth system of musical notation, consisting of two staves. The upper staff has a measure with a sharp sign (#) and a Roman numeral III. The lower staff has a measure with a sharp sign (#) and a Roman numeral IV. Measure numbers (13) and (6) are present. A dashed line connects a note in the upper staff to a note in the lower staff.

Fifth system of musical notation, consisting of two staves. The upper staff has a measure with a sharp sign (#) and a Roman numeral III. The lower staff has a measure with a sharp sign (#) and a Roman numeral IV. A wavy line is present in the lower staff.

Sixth system of musical notation, consisting of two staves. The upper staff has a measure with a sharp sign (#) and a Roman numeral III. The lower staff has a measure with a sharp sign (#) and a Roman numeral IV. A wavy line is present in the lower staff.

First system of musical notation. It consists of two staves. The upper staff contains a melodic line with notes and rests, including a measure with a circled '12' and another with a circled '19' and a flat sign. The lower staff contains a bass line with chords and single notes.

Second system of musical notation. It consists of two staves. The upper staff continues the melodic line with a flat sign and a circled '19'. The lower staff contains a bass line with chords and single notes, including a circled '7' and the instruction *più calmo*.

Third system of musical notation. It consists of two staves. The upper staff has a circled '39' and a circled '27'. The lower staff contains a bass line with chords and single notes. Dashed lines connect notes between the two staves.

Fourth system of musical notation. It consists of two staves. The upper staff continues the melodic line. The lower staff contains a bass line with chords and single notes. Dashed lines connect notes between the two staves.

Fifth system of musical notation. It consists of two staves. The upper staff continues the melodic line. The lower staff contains a bass line with chords and single notes, including a circled 'II' and a circled 'III'.

Sixth system of musical notation. It consists of two staves. The upper staff continues the melodic line. The lower staff contains a bass line with chords and single notes, including a circled 'II' and a circled 'III'.

First system of musical notation. It consists of two staves. The upper staff contains a melodic line with a half note, a quarter note, and a dotted quarter note, followed by a comma. The lower staff contains a bass line with a half note, a quarter note, and a dotted quarter note, followed by a comma. The lower staff also features a triplet of eighth notes marked with 'II' and 'III'.

Second system of musical notation. The upper staff has a dotted half note, a quarter note, and a dotted quarter note, followed by a comma. The lower staff has a dotted half note, a quarter note, and a dotted quarter note, followed by a comma. The lower staff also features a triplet of eighth notes marked with 'I'.

Third system of musical notation. The upper staff has a dotted half note, a quarter note, and a dotted quarter note, followed by a comma. The lower staff has a dotted half note, a quarter note, and a dotted quarter note, followed by a comma. The lower staff also features a triplet of eighth notes marked with 'I'.

Fourth system of musical notation. The upper staff has a dotted half note, a quarter note, and a dotted quarter note, followed by a comma. The lower staff has a dotted half note, a quarter note, and a dotted quarter note, followed by a comma. The lower staff also features a triplet of eighth notes marked with 'II' and 'III'.

Fifth system of musical notation. The upper staff has a dotted half note, a quarter note, and a dotted quarter note, followed by a comma. The lower staff has a dotted half note, a quarter note, and a dotted quarter note, followed by a comma. The lower staff also features a triplet of eighth notes marked with 'I'.

Sixth system of musical notation. The upper staff has a dotted half note, a quarter note, and a dotted quarter note, followed by a comma. The lower staff has a dotted half note, a quarter note, and a dotted quarter note, followed by a comma. The lower staff also features a triplet of eighth notes marked with 'II' and 'III'.

System 1: Treble clef, two staves. The upper staff contains a melodic line with eighth and sixteenth notes, some beamed together, and a fermata. The lower staff contains a bass line with chords and fingerings I, II, II, II, I. A comma is placed at the end of the system.

System 2: Treble clef, two staves. The upper staff has a few notes with a fermata. The lower staff has a melodic line with chords and fingerings I, I, III, III. A comma is placed at the end of the system.

System 3: Treble clef, two staves. The upper staff has a melodic line with a repeat sign and a fermata. The lower staff has a bass line with chords and fingerings III, I, I, I. A comma is placed at the end of the system.

System 4: Treble clef, two staves. The upper staff is mostly empty with a wavy line. The lower staff has a melodic line with chords and fingerings II, III, III, III. A comma is placed at the end of the system.

System 5: Treble clef, two staves. The upper staff has a melodic line with a fermata and a dashed line pointing to the end of the system. The lower staff has a bass line with chords and fingerings I, I, I, II, II. A comma is placed at the end of the system.