Wolfgang von Schweinitz

Just Major Thirds

INTONATION STUDY
for two clarinets in B-flat

op. 54

2010

composed for
James Sullivan and Brian Walsh
and the
Machine Project
Hammer Museum, Los Angeles

PLAINSOUND MUSIC EDITON

Performance Notes

REHEARSAL PROCEDURE

This piece is a tuning study exploring some new playing techniques for microtonal just intonation, namely the employment of non-conventional microtonal fingerings in order to produce the specific sonority of precisely tuned non-tempered intervals.

Each fingering must be carefully examined and fine-tuned by embouchure at an extremely slow tempo in the first duo rehearsal(s). This initial phase of experimentation could perhaps start out with checking the fingerings for the major sixths (with a frequency ratio of 5/3) in measure 5, 8, 9, 10 and 18, as the beatings between the third and fifth partials will be particularly noticeable if the major sixths are tempered. Then the tuning of the pure major thirds and perfect fourths (and their octave expansions) should carefully be studied, memorizing the specific timbre of these intervals in the various registers. This procedure will also establish a feeling for the melodic interval of the just diatonic semitone with a size of 112 cents (and a frequency ratio of 16 : 15, which is the difference between a perfect fourth and a pure major third). The small chromatic semitone with a size of only 71 cents (25 : 24) is established as the difference between a pure major and a pure minor third (in measures 12-13, 13-14 and 22-23).

When the tuning of all the fingerings used in Part I ("Diatonic Theme") has been optimized, the additional microtonal fingerings needed in Part II ("Enharmonic Variation") must be checked, again at an extremely slow tempo. The exact absolute pitch-height of these enharmonic passing notes (dotted quarter notes) as specified by the numbers for their cent deviations from the twelve pitches of Equal Temperament must not be taken too literally, for it is only important that these dyads ascending or descending in microtonal steps (various third-tones, quarter-tones, sixth-tones and commas) all sound like pure major thirds or major sixths. Here the two clarinetists are asked to decide in the rehearsal process who is leading and who is following with regard to the tuning of these passing notes.

In Part I, on the other hand, each new note is tuned to the pitch played by the other clarinetist at that moment, so that the tuning can stay on track throughout the entire performance duration. In Part II this will also be possible, if the main scaffolding diatonic notes are played with lip memory at the same pitch-height as in Part I.

Once all fingerings have been examined at slow tempo in the duo rehearsals, they can then be practiced in solo rehearsals, gradually increasing the speed to create a musical flow. During the final duo rehearsals the players can choose to make use of some occasionally quite drastic rubato to give themselves a bit of extra time here and there for the most difficult fingering sequences; but the general tempo should not be slower than indicated in the score.

PERFORMANCE DURATION

Version I (Part 1 + Part 2): circa 3 minutes and 20 seconds
Version II (Part 2 only): circa 2 minutes

Part I ("Diatonic Theme") may be omitted if so desired, and in this case measure 35 can be replaced by measure 1. But Part I must be rehearsed in any case, even if it is omitted in the performance!

This piece has been commissioned by the Machine Project 2010, Hammer Museum, Los Angeles.
It is dedicated to James Sullivan and Brian Walsh.

NOTATION

The notation of the fingerings is fairly straight forward. The keys near the bell are named according to their pitch in the clarion register. The four keys played by the first finger of the right hand are notated in their order on the upper left side (with a small "x" or "o" for "employed" or "not employed"). The small arrow at the top signifies that the pitch may need to be corrected by embouchure downwards or upwards by perhaps 5 or 10 cents.

The pitches are notated in the "Extended Helmholtz-Ellis JI Pitch Notation" (see legend below), with an additional cent number for every note specifying its pitch deviation from the respective pitch in Equal Temperament.

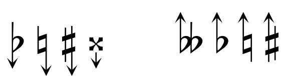
The attached arrows denoting the pitch alteration by a syntonic comma are transcriptions of the notation that Hermann von Helmholtz used in his book "Die Lehre von den Tonempfindungen als physiologische Grundlage für die Theorie der Musik" (1863). The annotated English translation "On the Sensations of Tone as a Physiological Basis for the Theory of Music" (1875/1885) is by Alexander J. Ellis, who refined the definition of pitch within the 12-tone system of Equal Temperament by introducing a division of the octave into 1200 cents. – The accidental for the pitch alteration by a septimal comma was devised by Guiseppe Tartini (1692-1770), the composer-violinist and researcher who first studied the production of difference tones by means of tuned double-stops.

ACCIDENTALS *for Just Intonation*

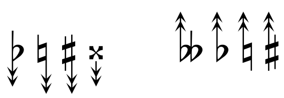
EXTENDED HELMHOLTZ-ELLIS JI PITCH NOTATION

The exact intonation of each pitch is written out by means of the following harmonically defined accidentals:

Pythagorean series of non-tempered perfect fifths
(based on the open strings : ... c g d a e ...)



Lowers / raises the pitch by a syntonic comma
(81/80) = ***circa 21.5 cents***



Lowers / raises the pitch by two syntonic commas
(81/80)(81/80) =* ***circa 43.0 cents***

Lowers / raises the pitch by a septimal comma
(64/63) = ***circa 27.3 cent***

Raises / lowers the pitch by two septimal commas
(64/63)(64/63) =* ***circa 54.5 cents***

Raises / lowers the pitch by an 11-limit undecimal quarter-tone
(33/32) = ***circa 53.3 cents***

Lowers / raises the pitch by a 13-limit tridecimal third-tone
(27/26) = ***circa 65.3 cents***
(not used in this score)

Lowers / raises the pitch of the subsequent accidental by a 17-limit schisma
(16/17)(16/15) = (256/255) =* ***circa 6.8 cents***
(not used in this score)

Raises / lowers the pitch of the subsequent accidental by a 19-limit schisma
(19/16)(27/32) = (513/512) =* ***circa 3.4 cents***
(not used in this score)

Raises / lowers the pitch of the subsequent accidental by the 23-limit comma
(23/16)(8/9)*(8/9)*(8/9) = (736/729) =* ***circa 16.5 cents***
(not used in this score)

Lowers / raises the pitch of the subsequent accidental by a 29-limit comma
(29/16)(5/9) = (145/144) =* ***circa 12.0 cent***

Indicates the respective Equal Tempered Semitone, accompanied by a cents deviation to notate any irrational or tempered pitch.

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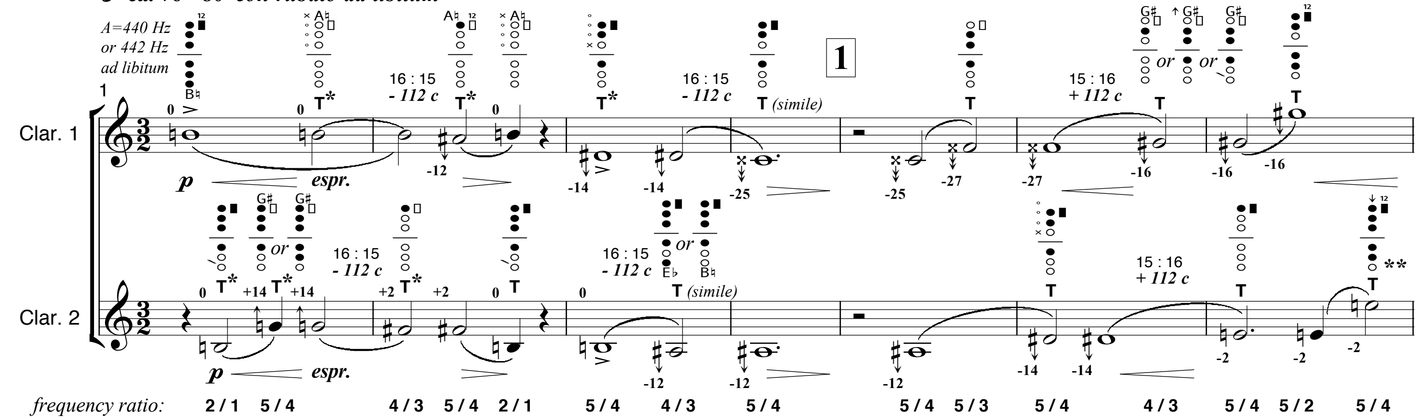
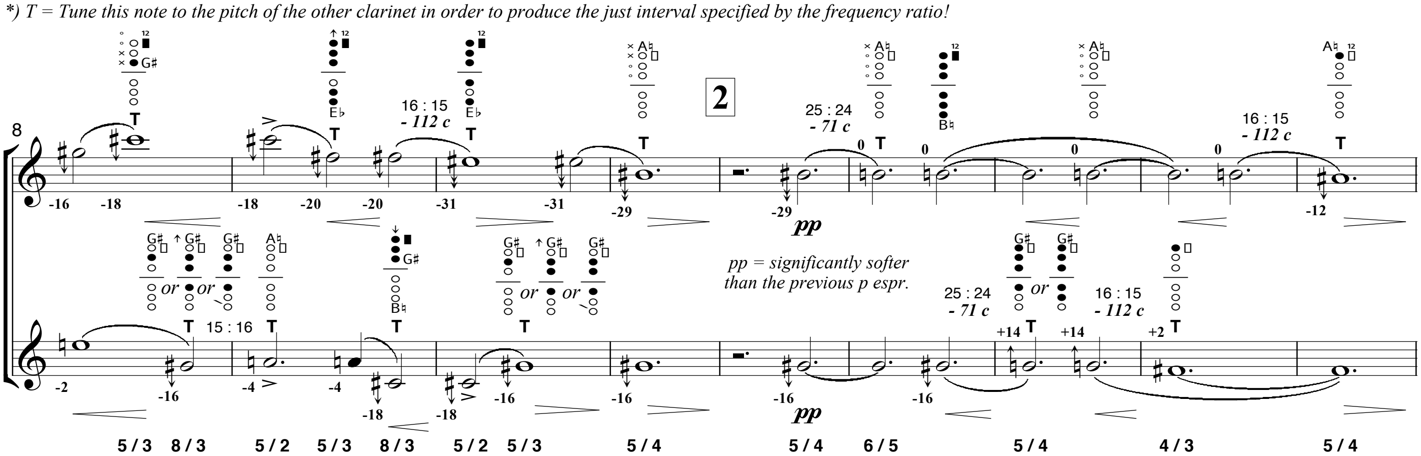
PART 1 : Diatonic THEME

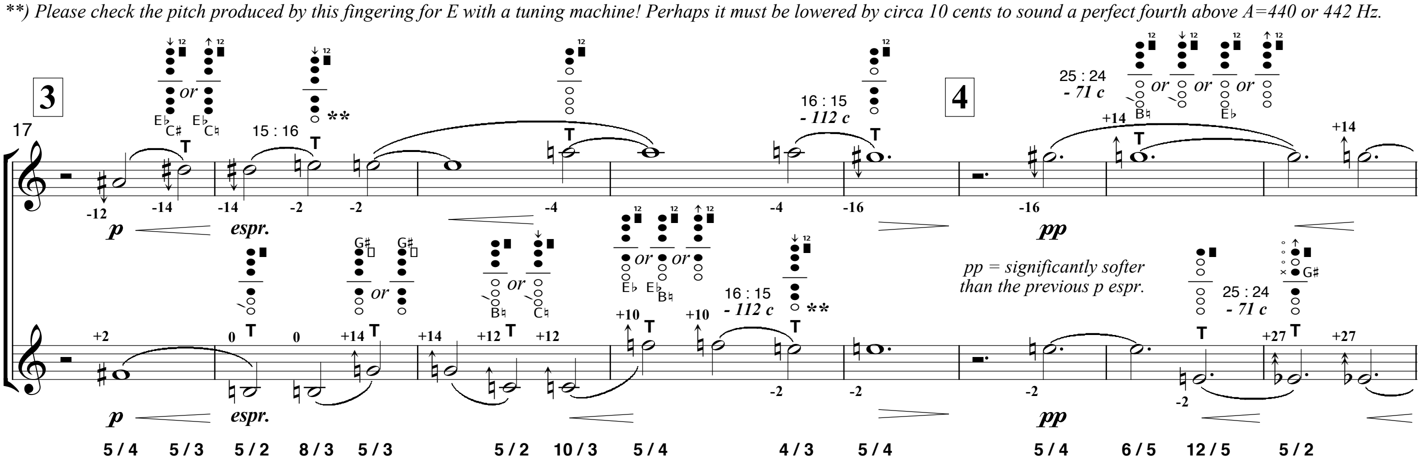
𝅗𝅥 **ca. 76 - 80** ***con rubato ad libitum***



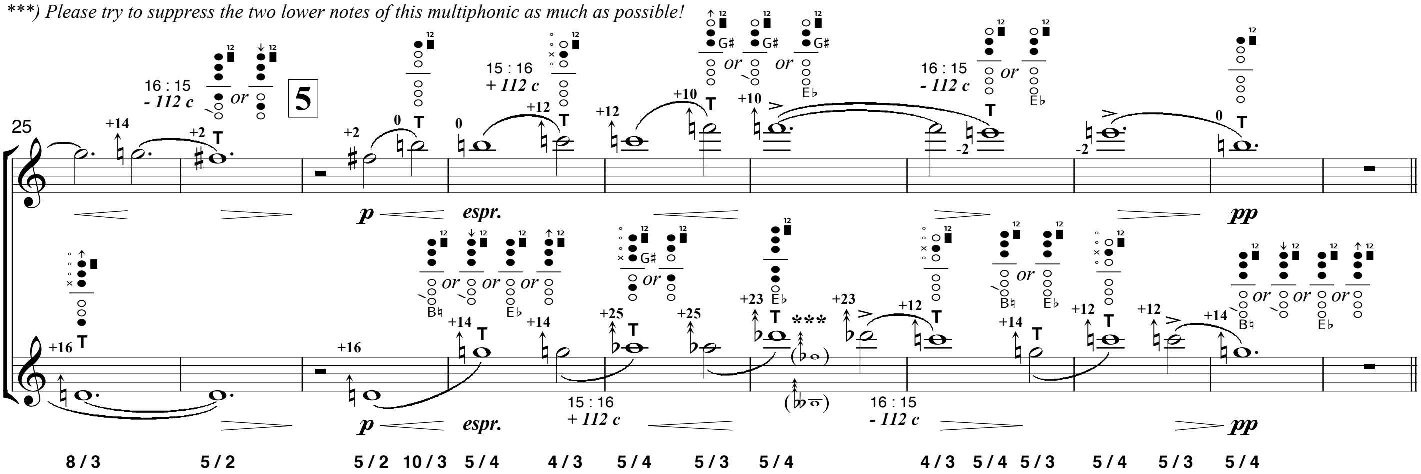
*) T = Tune this note to the pitch of the other clarinet in order to produce the just interval specified by the frequency ratio!



**) Please check the pitch produced by this fingering for E with a tuning machine! Perhaps it must be lowered by circa 10 cents to sound a perfect fourth above A=440 or 442 Hz.



***) Please try to suppress the two lower notes of this multiphonic as much as possible!




6
7
8
9
espr.
pp = significantly softer
than the previous p espr.


20 : 21
+ 84 c
espr.
16 : 15
- 112 c
10
50 : 49
- 35 c
49 : 48
- 36 c
pp
pp = significantly softer than the previous p espr.
7 : 10
28 : 27
- 63 c
11
15 : 16
+ 112 c
p
mf
poco ritenuto
poco f
dim.