

Marc Sabat
Cucumber Serenades

for bass flute, alto saxophone, violin(s) and electronic tones

PLAINSOUND MUSIC EDITION

Cucumber Serenades (2009/16)

for bass flute, alto saxophone, violin(s) and electronic tones

‘Cucumber Serenades (Gurkenlieder)’ acquired its rather unusual title because of how the piece initially came about. In a number of recent projects I have collaborated with the visual artist Lorenzo Pompa, and he has a series of sculptures in which a straight cucumber is sliced off at the bottom and then placed vertically, like a cactus, in a bed of pickling salt inside a glass vitrine. Over the course of several weeks, a gradual transformation takes place, as the cucumber slowly becomes dessicated, in the process releasing a small drip of fluid and a sweet delicate perfume. Lorenzo invited me to compose a piece of music which eventually might be a kind of intermittent counterpoint to one of his cucumber vitrine sculptures, a kind of ‘moaning serenade’.

When Gerhard Uebele asked me to compose a new work for solo violin and violin choir for his Violinale Festival, I saw a possibility of creating a kind of music sculpture, a slow process of harmonic transformation mirroring that of the cucumber, a piece with a fixed beginning and end which could, if needed, begin and/or end at any point within its course.

In making my pieces, I am often interested in finding a confrontation between rigorous, objective excavations of material, filtered by various physical/perceptual parameters, and allusions to an elusive poetic sense of the ‘musical’ which is highly personal and specific.

‘Cucumber Serenades’ is the first in a new series of Just Intonation works based on what I call the ‘Koan cantus firmus’, in homage to James Tenney: basically a rising glissando is rastered in some way into a sequence of precisely tuned pitches. In this case, the initial material arose by calculating the set of possible tuneable 23-limit JI intervals from the first six natural harmonics of all four violin strings. The idea was that the texture would be a juxtaposition of a solo changing element (the gradually rising line) and a relatively static element (a chorus playing natural harmonics), creating a gradually shifting perception from a fixed set of harmonic intervals. The material is presented as relatively steady and quick sequence of tones, grouped in shifting patterns of (up to) 3 pulses, delicately reminiscent of a dance, sometimes graceful, but with occasional missteps. The initial indication to the players: *Sweetly flowing along, well tuned but somewhat roughly articulated, folk*. The 2016 version adapts the solo part for an alto saxophone and adds a freely composed bass flute counterpoint.

Berlin, 22 September 2009 / 16 May 2017

An informal introduction to the Helmholtz-Ellis Accidentals

by Marc Sabat

Berlin, April 2009

In learning to read HE accidentals, without having to rely on an electronic tuning device, it is important to be familiar with three things:

First, to keep in mind the natural tuning of intervals in a harmonic series, which deviate from the tempered system.

Second, to get to know how the accidentals refer to these overtone relationships.

Third, to observe that each written pitch may be related to many other pitches by natural intervals, and to tune it accordingly.

In most cases, this approach will allow the player to quickly and intuitively play just intonation (JI) pitches quite accurately. Any remaining adjustments can be made by ear, based on the specific sound of JI intervals.

Just intervals are readily learned because they are built up from simple, tuneable harmonic relationships. These are generally based on eliminating beating between common partials, finding common fundamentals and audible combination tones, and establishing a resonant, stable sonority which maximizes clarity: both of consonance and of dissonance.

A well-focussed JI sound is completely distinct from the irregular, fuzzy beating of tempered sounds. Just consonances, when marginally out of tune, beat slowly and sweetly and may be corrected with the most subtle adjustments of bowing or breath. Just dissonances produce a sharply pulsing regular rhythm and have very clear, distinct colors.

To become familiar with the notation and sounds of JI, the fundamental building blocks are prime number overtones 3, 5, 7, 11 and 13, each of which is associated with a specific pair of accidentals and a basic musical interval.

3 is associated with the signs flat, natural, sharp and refers to the series of untempered perfect fifths (Pythagorean intonation). Generally, A is taken as the tuning reference, and the central pitches C-G-D-A-E can be imagined as the normal tuning of the orchestral string instruments. The just C is rather lower than tempered tuning because of the pure fifths. The further this series is extended, the greater the deviation from tempered tuning: the flats are lower, the sharps higher.

5 is associated with arrows attached to the flat, natural, sharp signs and refers to the pure major third. These arrows correct the Pythagorean intervals by a Syntonic Comma, which is approximately $\frac{1}{9}$ of a whole tone or 22 cents. So, for example, the note E-flat arrow-up is a just major third below G, and the note F-sharp arrow-down is a major third above D. In most music, flats are often raised by a comma and sharps are lowered. Because of the open string tuning, it is common to sometimes raise F and C (to match A and E) and to sometimes lower A and E (to match F and C). Corrections by one Syntonic Comma have been used throughout Western music history and are relatively familiar to the ear. However, traditionally these corrections have been hidden by players, for example in Meantone Temperament where fifths are mistuned narrow by $\frac{1}{4}$ comma so that the third C-E ends up sounding pure. More recently, the currently prevailing Equal Temperament has made us accustomed to beating thirds, so at first the pure intervals may seem unfamiliar. To play the arrows accurately, one must carefully learn the sound of the consonant major and minor thirds and sixths, and learn to articulate comma differences clearly.

7 is associated with a Tartini sign resembling the numeral. It corrects the Pythagorean intervals by a Septimal Comma, which is approximately $\frac{1}{7}$ of a whole tone or 27 cents. When the Pythagorean minor third is lowered by this amount, it becomes a noticeably low third often heard in Blues music.

11 is associated with the quartertone signs (cross and backwards flat). The accidental is used to raise the perfect fourth by 53 cents, producing the exact tuning of the 11th partial in a harmonic series. The sound is most easily learned by playing one octave plus one fourth and raising it by a quartertone.

13 is associated with the thirddtone signs (cross and backwards flat, each with 2 verticals). The accidental is used to lower the Pythagorean major sixth by 65 cents, producing the exact tuning of the 13th partial in a harmonic series. The sound is most easily learned as a neutral-sounding sixth, one-third of the way between the just minor and just major sixths (closer to minor than to major).

The following table presents the accidentals together with their associated ratios and cents deviations. To calculate the cents deviation from Equal Temperament of a specific written pitch (if desired) the following shortcut may be used:

- 1.) Find the cents deviation of the Pythagorean pitch, by calculating how many fifths it is away from A, multiplying by 2, and using a plus sign if it is on the sharp side and a minus if it is on the flat side.
- 2.) For each microtonal accidental, add or subtract its approximate cents value (as given above), keeping in mind whether the accidental is raising or lowering the pitch.

The resulting value should be a cents deviation within 1 or 2 cents accuracy, which is an acceptable starting point for fine-tuning by ear.

ACCIDENTALS

EXTENDED HELMHOLTZ-ELLIS JI PITCH NOTATION

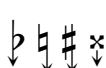
for Just Intonation

designed by Marc Sabat and Wolfgang von Schweinitz

The exact intonation of each pitch may be written out by means of the following harmonically-defined signs:



*Pythagorean series of fifths – the open strings
(... c g d a e ...)*

*lowers / raises by a syntonic comma
 $81 : 80 = \text{circa } 21.5 \text{ cents}$*

*lowers / raises by two syntonic commas
circa 43 cents*



*lowers / raises by a septimal comma
 $64 : 63 = \text{circa } 27.3 \text{ cents}$*



*lowers / raises by two septimal commas
circa 54.5 cents*



*raises / lowers by an 11-limit undecimal quarter-tone
 $33 : 32 = \text{circa } 53.3 \text{ cents}$*



*lowers / raises by a 13-limit tridecimal third-tone
 $27 : 26 = \text{circa } 65.3 \text{ cents}$*



*lowers / raises by a 17-limit schisma
 $256 : 255 = \text{circa } 6.8 \text{ cents}$*



*raises / lowers by a 19-limit schisma
 $513 : 512 = \text{circa } 3.4 \text{ cents}$*



*raises / lowers by a 23-limit comma
 $736 : 729 = \text{circa } 16.5 \text{ cents}$*

In addition to the harmonic definition of a pitch by means of its accidentals, it is also possible to indicate its absolute pitch-height as a cents-deviation from the respectively indicated chromatic pitch in the 12-tone system of Equal Temperament.

The attached arrows for 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 sign for a septimal comma was devised by Giuseppe Tartini (1692-1770) – the composer, violinist and researcher who first studied the production of difference tones by means of double stops.

VORZEICHEN

EXTENDED HELMHOLTZ-ELLIS JI PITCH NOTATION

für die natürliche Stimmung

konzipiert von Marc Sabat und Wolfgang von Schweinitz

Die Stimmung jedes Tons ist mit folgenden harmonisch definierten Vorzeichen ausnotiert:

$\flat \quad \flat \quad \natural \quad \sharp \quad \times$

*Pythagoreische Quintenreihe der leeren Streicher-Saiten
(... c g d a e ...)*

$\flat \downarrow \natural \downarrow \sharp \downarrow \times \downarrow \quad \uparrow \flat \uparrow \natural \uparrow \sharp \uparrow$

*Erniedrigung / Erhöhung um ein Syntonisches Terzkomma
 $81:80 = \text{circa } 21.5 \text{ cents}$*

$\flat \downarrow \natural \downarrow \sharp \downarrow \times \downarrow \quad \uparrow \flat \uparrow \natural \uparrow \sharp \uparrow$

*Erniedrigung / Erhöhung um zwei Syntonische Terzkommas
circa 43 cents*

$\flat \quad \natural$

*Erniedrigung / Erhöhung um ein Septimenkomma
 $64:63 = \text{circa } 27.3 \text{ cents}$*

$\flat \quad \natural$

*Erniedrigung / Erhöhung um zwei Septimenkommas
circa 54.5 cents*

$\flat \quad \natural$

*Erhöhung / Erniedrigung um den undezimalen Viertelton der 11er-Relation
 $33:32 = \text{circa } 53.3 \text{ cents}$*

$\flat \quad \natural$

*Erniedrigung / Erhöhung um den tridezimalen Drittelton der 13er-Relation
 $27:26 = \text{circa } 65.3 \text{ cents}$*

$\flat \quad \natural$

*Erniedrigung / Erhöhung um ein Siebzehner-Schisma
 $256:255 = \text{circa } 6.8 \text{ cents}$*

$\flat \quad \natural$

*Erhöhung / Erniedrigung um ein Neunzehner-Schisma
 $513:512 = \text{circa } 3.4 \text{ cents}$*

$\flat \quad \natural$

*Erhöhung / Erniedrigung um ein Dreiundzwanziger-Komma
 $736:729 = \text{circa } 16.5 \text{ cents}$*

Zusätzlich zu der harmonischen Definition der Tonhöhe durch das Vorzeichen für jeden Ton ist auch der Cents-Wert der Abweichung der gewünschten Stimmung von der Tonhöhe des jeweils bezeichneten chromatischen Tons der gleichstufig temperierten Zwölfton-Skala angegeben.

Die attachierten Pfeile für die Alteration um ein Syntonisches Terzkomma sind eine bloße Transkription der Notation, die Hermann von Helmholtz in seinem Buch "Die Lehre von den Tonempfindungen als physiologische Grundlage für die Theorie der Musik" (1863) verwendet hat. Die kommentierte englische Übersetzung "On the Sensations of Tone as a Physiological Basis for the Theory of Music" (1875/1885) stammt von Alexander J. Ellis, der auch eine enorme Verfeinerung der Tonhöhendefinition innerhalb des Zwölftonsystems der gleichstufig temperierten Stimmung durch die Unterteilung der Oktave in 1200 Cents eingeführt hat. – Das Vorzeichen für die Alteration um ein Septimenkomma wurde von Giuseppe Tartini (1692-1770) erfunden, der als Komponist, Geiger und Wissenschaftler die durch Doppelgriffe erzeugten Differenztöne untersucht hat.

Cucumber Serenades

Sounding pitch score

(Gurkenlieder)

Marc Sabat

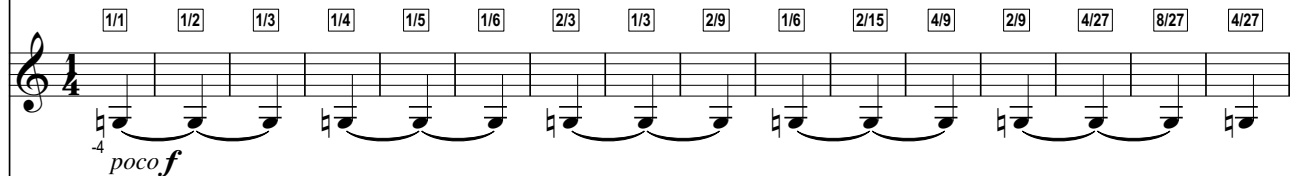
Sweetly flowing along, well tuned but somewhat roughly articulated, folk

ca. 84 : poco rubato

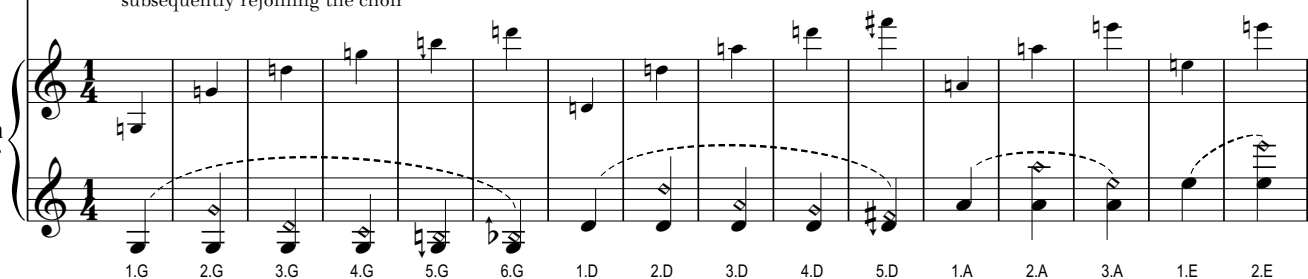
bass
flute



alto
sax



violin
choir

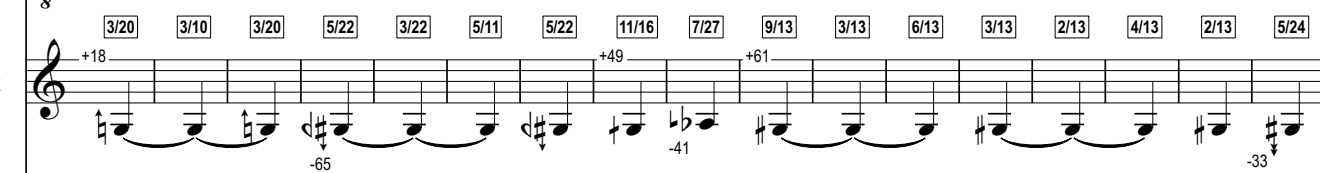


A

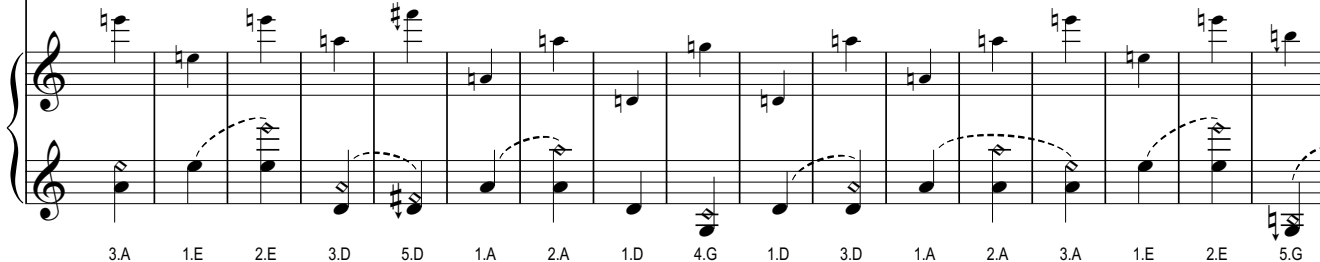
b fl



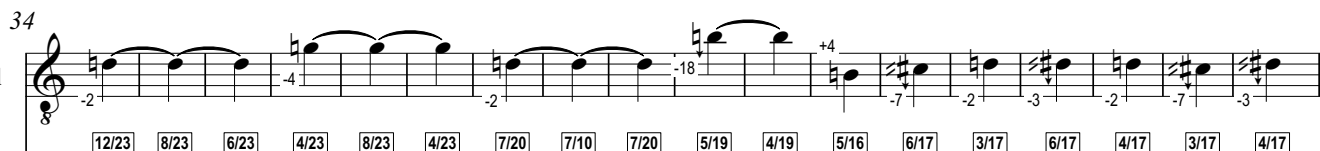
sax



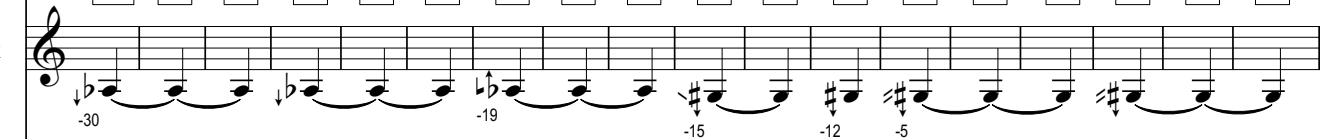
vln



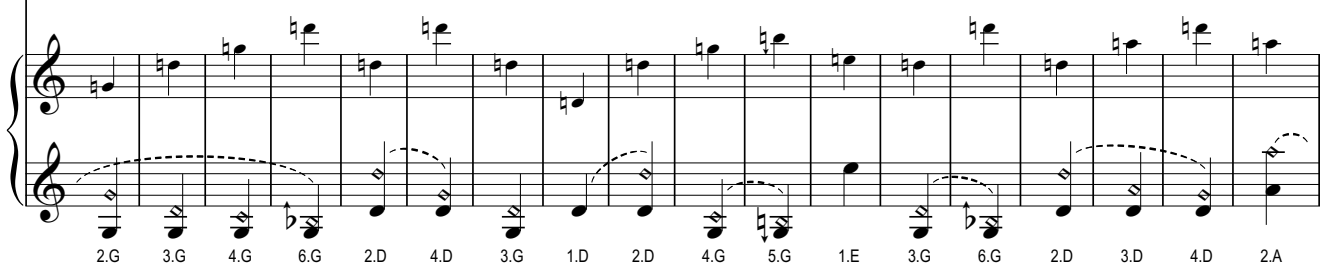
b fl



sax



vln



B

52

b fl

sax

vln

3.A 1.E 2.E 2.G 4.G 3.G 5.G 6.G 1.D 2.D 3.D 4.D 5.D 2.A 1.E 2.G

3/19 6/19 3/19 8/15 4/15 5/14 3/14 5/28 5/7 5/14 5/21 5/28 1/7 5/21 7/22 7/13

+2 +10 -2 -49 B-44

+6 +8 +16 +24 -81

68

b fl

sax

vln

3.D 2.A 3.A 1.E 2.E 1.E 5.G 2.G 3.G 4.G 6.G 1.D 2.D 4.D 2.G 4.G 5.G 5.D

6/25 6/25 4/25 8/25 4/25 9/28 5/23 6/11 4/11 3/11 2/11 8/11 4/11 2/11 5/9 5/18 2/9 4/27

+16 +4 -44 -2 -4

+29 +37 -60 -53 -22

C

86

b fl

sax

vln

3.G 6.G 1.D 2.D 3.D 4.D 5.D 6.D 1.A 2.A 3.A 4.A 1.E 2.E 5.G

3/8 3/16 3/4 3/8 1/4 3/16 3/20 1/8 1/2 1/4 1/6 1/8 1/3 1/6 5/22

-16 -2 -83

101

b fl

sax

vln

1.G 2.G 4.G 6.G 4.D 3.G 5.G 6.G 1.D 2.D 4.D 5.D 1.G 2.G 3.G 4.G 1.D 2.D

8/7 4/7 2/7 4/21 4/21 5/13 3/13 5/26 10/13 5/13 5/26 2/13 7/6 7/12 7/18 7/24 7/9 7/18

+27 -4 -16 -18 -4 -37

+44 +44

119

b fl

sax

vln

3.D 2.A 3.D 6.D 1.A 2.A 3.A 4.A 1.E 2.E 4.G 5.G 1.E 3.D 5.D 2.A 4.G 5.G

7/27 7/27 6/23 3/23 12/23 6/23 4/23 3/23 8/23 4/23 5/17 4/17 7/20 5/19 3/19 5/19 8/27 5/21

-26 -24 -9 B#-19 -16 -13 -11 -10 -2

+2 +16 +2 +14

137

D

b fl

sax

vln

3.A 1.E 2.E 1.G 2.G 3.G 4.G 5.G 6.G 1.D 2.D 3.D 4.D 5.D 6.D

3/17 6/17 3/17 6/5 3/5 2/5 3/10 6/25 1/5 4/5 2/5 4/15 1/5 4/25 2/15

-3 -4 -2 -1 +12

Cucumber Serenades

152

b fl

sax

vln

8/15 4/15 2/15 5/28 5/14 5/28 7/13 11/9 9/11 3/11 3/22 6/11 3/11 2/11 3/22 4/11 2/11

+2

0

+19

+28

+43

-49

1.A 2.A 4.A 3.A 1.E 2.E 1.A 1.G 1.D 3.D 6.D 1.A 2.A 3.A 4.A 1.E 2.E

169

b fl

sax

vln

8/13 4/13 7/17 7/17 5/4 5/8 5/12 5/16 1/4 5/24 5/6 5/12 5/18 5/24 1/6 5/9

+56

-38

-18

-4

-16

2.G 4.G 3.G 2.D 1.G 2.G 3.G 4.G 5.G 6.G 1.D 2.D 3.D 4.D 5.D 1.A

E

185

b fl

sax

vln

5/18 8/19 6/19 4/19 8/19 4/19 3/16 3/8 3/16 1/8 7/11 7/22 8/25 9/7 9/14 3/7

+1

+4

+6

+2

+10

+29

-2

-4

-35

-86

2.A 3.G 4.G 6.G 2.D 4.D 3.A 1.E 2.E 3.E 2.G 4.G 4.G 1.G 2.G 3.G

201

b fl

sax

vln

9/28 3/14 6/7 3/7 2/7 3/14 1/7 4/7 2/7 4/21 1/7 4/21 7/27

4.G 6.G 1.D 2.D 3.D 4.D 6.D 1.A 2.A 3.A 4.A 2.E 5.G

+33 -4 -55

214

b fl

sax

vln

5/26 5/13 5/26 13/10 6/23 5/23 5/23 4/23 7/8 7/24 7/12 7/24 7/18 5/19 3/23

3.A 1.E 2.E 1.G 5.G 6.G 4.D 5.D 1.D 3.D 1.A 2.A 1.E 5.G 3.E

G#-39 -30 -19 -31 -15 +48 -50 -44 -33 -29 -22

229

b fl

sax

vln

5/17 3/17 5/17 4/3 2/3 4/9 1/3 4/15 2/9 4/9 8/27 2/9 4/27 8/27 4/27

3.D 5.D 2.A 1.G 2.G 3.G 4.G 5.G 6.G 2.D 3.D 4.D 6.D 2.A 4.A

-5 -4 -6 -19 -6

244 **F**

b fl

sax

vln

5.D 3.D 6.D 1.A 2.A 3.A 4.A 1.E 2.E 3.E 3.G 5.G 6.G 2.D 4.D 5.D

5/28 3/10 3/20 3/5 3/10 1/5 3/20 2/5 1/5 2/15 5/11 3/11 5/22 5/11 5/22 2/11

+2 +16 -16 -53 -67

260

b fl

sax

vln

1.G 2.G 3.E 2.G 3.G 6.G 2.D 3.D 4.D 6.D 1.A 2.A 4.A 5.G 1.E

11/8 11/16 3/22 9/13 6/13 3/13 6/13 4/13 3/13 2/13 8/13 4/13 2/13 5/18 7/17

+47 -45 +59 -35 -34 -2 -16 -22 -3

275

b fl

sax

vln

4.G 1.G 2.G 4.G 3.D 5.D 1.A 2.A 3.A 5.A 1.E 2.E 4.G 6.G 4.D

8/23 7/5 7/10 7/20 5/16 3/16 5/8 5/16 5/24 1/8 5/12 5/24 6/17 4/17 4/17

+10 +14 -4 +19 -5 -32 -21 -14 -7

290 **G**

b fl

sax

vln

3.D 6.D 2.A 3.A 4.A 1.E 2.E 1.G 2.G 4.G 5.G 6.G 4.D 5.D

304

b fl

sax

vln

3.D 1.A 2.A 6.G 3.D 4.D 6.D 2.A 4.A 5.D 1.G 3.D 1.A 2.A

318

b fl

sax

vln

3.A 1.E 2.E 3.E 1.G 2.G 4.G 5.G 3.A 5.A 2.E 5.G 5.G

331

b fl

sax

vln

1.G 2.G 3.G 4.G 5.G 6.G 1.D 2.D 3.D 4.D 5.D 6.D 1.A 2.A 3.A 4.A 5.A 1.E

349

b fl

sax

vln

2.E 3.E 3.E 3.A 5.A 1.E 2.E 2.G 4.G 5.G 1.A 1.G 2.G 4.G 6.G 4.D

365

b fl

sax

vln

1.A 3.A 1.E 2.E 3.E 5.G 5.D 3.G 6.G 2.D 3.D 4.D 6.D 2.A 4.A 1.G 3.D 1.A 2.A

331

3/2 3/4 1/2 3/8 3/10 1/4 1/1 1/2 1/3 1/4 1/5 1/6 2/3 1/3 2/9 1/6 2/15 4/9

349

2/9 4/27 3/20 5/22 3/22 5/11 5/22 10/13 5/13 4/13 11/16 14/9 7/9 7/18 7/27 7/27

365

9/13 3/13 6/13 3/13 2/13 5/16 5/24 12/23 6/23 12/23 8/23 6/23 4/23 8/23 4/23 11/7 7/20 7/10 7/20

H

384

b fl

sax

vln

5.G 6.G 4.D 5.D 3.D 6.D 2.A 3.A 4.A 2.E 5.G 3.E 1.G 2.G 3.G 4.G 5.G 6.G

402

b fl

sax

vln

2.D 4.D 5.G 3.D 5.D 6.D 1.A 2.A 3.A 4.A 5.A 2.E 3.G 2.D 3.A 2.E 3.E 1.G

420

b fl

sax

vln

5.D 2.G 3.G 6.G 2.D 3.D 4.D 6.D 1.A 2.A 4.A 4.G 1.G 2.G 3.G 4.G 5.G 6.G

I

6/19 5/19 5/19 4/19 6/17 3/17 6/17 4/17 3/17 4/17 7/22 3/19 8/5 4/5 8/15 2/5 8/25 4/15

8/15 4/15 9/28 5/14 3/14 5/28 5/7 5/14 5/21 5/28 1/7 5/21 7/13 7/13 6/25 6/25 4/25 13/8

5/23 9/11 6/11 3/11 6/11 4/11 3/11 2/11 8/11 4/11 2/11 7/17 5/3 5/6 5/9 5/12 1/3 5/18

+1 +2 -3 -6 -4

-13 -3 -100 +8 +10

+16

+17 +26 +31 -63

+14 -2 -51 -4 -18 Ab+35 -4

-58 -51 -40 -20

J

438 +45 -20 -2 +2

b fl

sax

vln

2.D 4.D 5.D 5.A 4.G 3.D 6.D 1.A 2.A 3.A 4.A 5.A 6.A 1.E 2.E 3.E 4.E 5.D

5/9 5/18 2/9 4/27 8/19 3/8 3/16 3/4 3/8 1/4 3/16 3/20 1/8 1/2 1/4 1/6 1/8 5/22

456 -2 -4 -2 -14 -16

b fl

sax

vln

1.G 2.G 3.G 4.G 6.G 1.D 2.D 4.D 6.D 4.A 3.D 5.D 6.D 1.A 2.A 4.A 5.A 5.G

12/7 6/7 4/7 3/7 2/7 8/7 4/7 2/7 4/21 4/21 5/13 3/13 5/26 10/13 5/13 5/26 2/13 8/23

474 -2 -4 -2 +2 +4

b fl

sax

vln

1.G 2.G 3.G 5.G 6.G 1.D 2.D 3.D 4.D 1.A 2.A 3.A 2.E 3.A 6.A 1.E 2.E 3.E 4.E

7/4 7/8 7/12 7/20 7/24 7/6 7/12 7/18 7/24 7/9 7/18 7/27 7/27 6/23 3/23 12/23 6/23 4/23 3/23

K

493

b fl

sax

vln

512

b fl

sax

vln

528

b fl

sax

vln

6/17 5/17 5/17 4/17 5/19 3/19 5/19 4/9 8/27 8/27 5/14 5/21 3/17 9/5 3/5 3/10 6/5 3/5 2/5

3/10 6/25 1/5 4/5 2/5 4/15 1/5 4/25 2/15 8/15 4/15 2/15 5/28 7/13 5/11 4/11

11/6 11/9 9/11 3/11 3/22 6/11 3/11 2/11 3/22 8/13 6/13 4/13 8/13 4/13 7/17 7/17 13/7

5.G 6.G 4.D 5.D 3.A 5.A 2.E 4.G 6.G 4.D 5.G 5.D 3.E 1.G 3.G 6.G 1.D 2.D 3.D

4.D 5.D 6.D 1.A 2.A 3.A 4.A 5.A 6.A 1.E 2.E 4.E 3.E 1.E 4.G 5.G

1.G 1.D 1.A 3.A 6.A 1.E 2.E 3.E 4.E 3.G 4.G 6.G 2.D 4.D 3.D 2.A 1.G

545

b fl

sax

vln

1.G 3.G 5.G 6.G 1.D 2.D 3.D 4.D 5.D 6.D 1.A 2.A 3.A 4.A 5.A 1.E 2.E

15/8 5/8 3/8 5/16 5/4 5/8 5/12 5/16 1/4 5/24 5/6 5/12 5/18 5/24 1/6 5/9 5/18

-2 -20 -16 -4 +16 +19 -18 -14

562 **L**

b fl

sax

vln

6.G 3.D 4.D 6.D 2.A 4.A 3.E 3.G 6.G 2.D 4.D 1.G 6.G 4.D 5.G 3.G 6.G 1.D 2.D

6/19 8/19 6/19 4/19 8/19 4/19 3/16 7/11 7/22 7/11 7/22 23/12 8/25 8/25 5/13 9/14 9/28 9/7 9/14

+2 +29 +2 +6 +10 +29 -13 Ab+47 Eb+49 -4 -84 +22 +25 +28 +33

581

b fl

sax

vln

3.D 4.D 6.D 1.A 2.A 3.A 4.A 6.A 1.E 2.E 3.E 4.E 5.G 5.D 3.E 1.D 5.D 6.D 4.A

3/7 9/28 3/14 6/7 3/7 2/7 3/14 1/7 4/7 2/7 4/21 1/7 7/18 7/27 5/26 13/10 6/23 5/23 5/23

+33 +31 +35 +2 +33 -4 -2 -20 -53 -48 -42 +50

600

b fl

sax

vln

5.A 1.A 3.A 1.E 2.E 5.D 3.A 5.A 2.E 1.G 2.G 3.G 4.G 5.G 6.G 1.D 2.D 3.D

618

b fl

sax

vln

4.D 5.D 6.D 2.A 3.A 4.A 6.A 2.E 4.E 5.A 3.A 6.A 1.E 2.E 3.E 4.E

634

b fl

sax

vln

3.D 5.D 6.D 2.A 4.A 5.A 5.G 3.G 1.D 2.D 3.G 2.D 3.D 6.D 2.A 3.A 4.A 6.A 1.E

4/23 7/8 7/24 7/12 7/24 5/19 5/17 3/17 5/17 2/1 1/1 2/3 1/2 2/5 1/3 4/3 2/3 4/9

31 27 17 4

0 0 M +2 +2

1/3 4/15 2/9 4/9 8/27 2/9 4/27 8/27 4/27 5/28 3/10 3/20 3/5 3/10 1/5 3/20

4 +4 +18

G#-39

14 16 16 14

5/11 3/11 5/22 5/11 5/22 2/11 7/17 11/16 11/8 11/16 9/13 9/13 6/13 3/13 6/13 4/13 3/13 2/13 8/13

65 54 49 61

653

b fl

sax

vln

2.E 4.E 5.G 5.D 4.G 6.G 4.D 3.G 6.G 1.D 2.D 4.D 5.G 3.A 5.A 1.E 2.E 3.E

4/13 2/13 5/12 5/18 12/23 8/23 8/23 7/10 7/20 7/5 7/10 7/20 8/19 5/16 3/16 5/8 5/16 5/24

-18 -2 -18 +4 -33 -30 -19 -15

671

N

b fl

sax

vln

5.E 6.G 4.D 6.D 4.A 3.A 6.A 2.E 3.E 4.E 4.G 3.G 5.G 6.G 1.D 2.D 4.D 5.D

1/8 6/17 6/17 4/17 4/17 6/19 3/19 6/19 4/19 3/19 8/15 5/7 3/7 5/14 10/7 5/7 5/14 2/7

-12 -5 +4 +10 +29 +31 +6 +8 +16

689

b fl

sax

vln

6.D 4.A 5.A 3.A 1.E 2.E 4.G 6.D 3.A 4.A 6.A 2.E 4.E 5.A 1.G 1.D 3.A

5/21 5/21 4/21 7/22 7/11 7/22 7/13 6/25 8/25 6/25 4/25 8/25 4/25 5/26 13/6 13/9 9/28

-49 B-44 -6 -81 +24 +29 +32 +37 -65

706

b fl

sax

vln

1.E 2.E 3.E 3.G 4.G 6.G 1.D 2.D 4.D 5.D 1.G 3.E 5.E 5.D 4.G 5.G 5.D

9/14 9/28 3/14 8/11 6/11 4/11 16/11 8/11 4/11 7/24 11/5 5/23 3/23 5/17 5/9 4/9 8/27

C+33 -53 -4 -16 -20

-53 -49 -38 -34 -22

+61

723

b fl

sax

vln

1.G 3.G 6.G 1.D 2.D 3.D 4.D 5.D 6.D 1.A 2.A 3.A 4.A 5.A 6.A

9/4 3/4 3/8 3/2 3/4 1/2 3/8 3/10 1/4 1/1 1/2 1/3 1/4 1/5 1/6

-2 -4 -16

0

738

b fl

sax

vln

1.E 2.E 3.E 4.E 5.E 5.G 2.G 4.G 3.E 5.E 3.G 5.G 6.G 2.D 4.D 5.D 1.E

2/3 1/3 2/9 1/6 2/15 5/11 8/7 4/7 5/22 3/22 10/13 6/13 5/13 10/13 5/13 4/13 11/16

-4 -83 -61 +27 +44 +53

755

b fl

sax

vln

1.G 2.G 3.G 4.G 6.G 1.D 2.D 4.D 6.D 4.A 1.E 3.E 5.D 5.A 3.D 6.D 2.A

7/3 7/6 7/9 7/12 7/18 14/9 7/9 7/18 7/27 7/27 9/13 3/13 5/16 5/24 12/23 6/23 12/23

-6 -4 -2 -14 +65 -29 -26

772

b fl

sax

vln

3.A 4.A 6.A 2.E 4.E 1.D 3.A 1.E 2.E 5.D 6.D 4.A 5.A 1.G 3.A 6.A 2.E

8/23 6/23 4/23 8/23 4/23 11/7 7/20 7/10 7/20 6/19 5/19 5/19 4/19 19/8 6/17 3/17 6/17

+16 -3 +2 +1 +81 -16 -11 -6 -1

789

b fl

sax

vln

3.E 4.E 5.D 1.G 2.G 3.G 4.G 6.G 1.D 2.D 3.D 4.D 5.D 6.D 2.A 4.A

4/17 3/17 7/22 12/5 6/5 4/5 3/5 2/5 8/5 4/5 8/15 2/5 8/25 4/15 8/15 4/15

+2 -2 -4 +12 -98 0

P

805

b fl

sax

vln

5.D 3.A 5.A 6.A 1.E 2.E 3.E 4.E 5.E 3.D 2.A 1.G 3.E 1.D 2.G 5.A

Intervallic notation for saxophone: $\frac{9}{28}$, $\frac{5}{14}$, $\frac{3}{14}$, $\frac{5}{28}$, $\frac{5}{7}$, $\frac{5}{14}$, $\frac{5}{21}$, $\frac{5}{28}$, $\frac{1}{7}$, $\frac{7}{13}$, $\frac{7}{13}$, $\frac{17}{7}$, $\frac{6}{25}$, $\frac{13}{8}$, $\frac{11}{9}$, $\frac{5}{23}$

Intervallic notation for flute: +2, -14, -12, +6, -2, -8

Intervallic notation for violin: +19, +28, +32, +33, +43, -61, -56

821

b fl

sax

vln

3.G 2.D 3.D 6.D 2.A 3.A 4.A 6.A 1.E 2.E 4.E 4.G 6.G 4.D 1.G 2.G 3.G

Intervallic notation for saxophone: $\frac{9}{11}$, $\frac{9}{11}$, $\frac{6}{11}$, $\frac{3}{11}$, $\frac{6}{11}$, $\frac{4}{11}$, $\frac{3}{11}$, $\frac{2}{11}$, $\frac{8}{11}$, $\frac{4}{11}$, $\frac{2}{11}$, $\frac{8}{13}$, $\frac{7}{17}$, $\frac{7}{17}$, $\frac{5}{2}$, $\frac{5}{4}$, $\frac{5}{6}$

Intervallic notation for flute: -7, -2

Intervallic notation for violin: +56, -38, -18

838

b fl

sax

vln

4.G 5.G 6.G 1.D 2.D 3.D 4.D 5.D 6.D 2.A 4.A 5.A 5.E 6.G 4.D 3.A 6.A 1.E

Intervallic notation for saxophone: $\frac{5}{8}$, $\frac{1}{2}$, $\frac{5}{12}$, $\frac{5}{3}$, $\frac{5}{6}$, $\frac{5}{9}$, $\frac{5}{12}$, $\frac{1}{3}$, $\frac{5}{18}$, $\frac{5}{9}$, $\frac{5}{18}$, $\frac{2}{9}$, $\frac{4}{27}$, $\frac{8}{19}$, $\frac{8}{19}$, $\frac{3}{8}$, $\frac{3}{16}$, $\frac{3}{4}$

Intervallic notation for flute: -16, -4, -18, -2, -4, -1

Intervallic notation for violin: +1, +4

Section marker: Q

Cucumber Serenades

856

b fl

sax

vln

2.E 3.E 4.E 5.E 4.G 5.A 1.G 2.G 3.G 4.G 6.G 1.D 2.D 3.D 4.D 6.D 1.A 2.A

Ab+47

+2 +29 +33

3/8 1/4 3/16 3/20 7/11 5/22 18/7 9/7 6/7 9/14 3/7 12/7 6/7 4/7 3/7 2/7 8/7 4/7

-86 -79

+31

-4

874

b fl

sax

vln

4.A 6.A 4.E 3.A 5.A 6.A 1.E 2.E 4.E 5.E 1.G 2.G 5.G 5.D 3.G 1.D 2.D

G#-39

+48

-4 -2

2/7 4/21 4/21 5/13 3/13 5/26 10/13 5/13 5/26 2/13 13/5 13/10 12/23 8/23 7/8 7/4 7/8

-50 -44 -33

891

b fl

sax

vln

3.D 5.D 6.D 1.A 2.A 3.A 4.A 1.E 2.E 3.E 3.E 5.D 6.D 4.A 5.A 3.E 5.E

+2

-2

7/12 7/20 7/24 7/6 7/12 7/18 7/24 7/9 7/18 7/27 6/23 6/17 5/17 5/17 4/17 5/19 3/19

-22 -19 -7

908 R

b fl

sax

vln

1.G 2.G 4.G 5.G 6.G 4.D 6.D 4.A 5.D 5.A 5.G 1.D 3.D 6.D 1.A 2.A 3.A

8/3 4/3 2/3 8/15 4/9 4/9 8/27 8/27 5/14 5/21 7/13 9/5 3/5 3/10 6/5 3/5 2/5

+8 -6 -4 -6 +2 +11 +16 +18 +14

925

b fl

sax

vln

4.A 5.A 6.A 1.E 2.E 3.E 4.E 5.E 5.G 6.G 4.D 5.D 1.G 2.G 4.G 1.D 1.A

3/10 6/25 1/5 4/5 2/5 4/15 1/5 4/25 6/11 5/11 5/11 4/11 11/4 11/8 11/16 11/6 11/9

+2 -2 +16 +4 -53 -51 -2 -4 +47

942

b fl

sax

vln

1.E 3.E 4.G 6.G 3.D 4.D 6.D 2.A 4.A 5.G 3.A 2.E 1.D 1.G 2.G 4.G

9/11 3/11 9/13 6/13 8/13 6/13 4/13 8/13 4/13 5/9 7/17 7/17 13/7 14/5 7/5 7/10

+2 +14 -22 -31 -2 +10 +14 -45 -59 -35 -34 -30 -21

958

b fl

sax

vln

1.D 3.D 5.D 6.D 1.A 2.A 3.A 4.A 5.A 6.A 1.E 2.E 3.E 4.E 5.E 1.G

974 **S**

b fl

sax

vln

6.D 3.A 4.A 6.A 2.E 4.E 1.G 2.G 4.G 5.G 3.D 6.D 2.A 4.A 1.G 1.D 6.D 4.A

992

b fl

sax

vln

5.D 2.G 3.D 6.D 1.A 2.A 3.A 4.A 6.A 1.E 2.E 3.E 4.E 2.G 4.G 5.G 5.D 5.A

1010

b fl

sax

vln

1.A 5.A 6.A 4.E 5.E 1.E 3.E 5.A 3.E 5.E 1.G 2.G 3.G 4.G 5.G 6.G

1026

b fl

sax

vln

1.D 2.D 3.D 4.D 5.D 6.D 1.A 2.A 3.A 4.A 5.A 6.A 2.E 3.E 4.E 5.E 3.E

T

1043

b fl

sax

vln

3.A 5.A 6.A 2.E 4.E 5.E 4.G 5.G 5.D 3.D 1.A 2.A 1.G 2.G 4.G 3.D 2.A 3.A

1061

b fl

sax

vln

6.A 2.E 3.E 4.E 1.G 5.G 5.D 5.A 6.G 4.D 6.D 4.A 1.G 2.G 3.D 6.D 1.A

3/13 6/13 4/13 3/13 25/8 5/8 5/12 5/18 12/23 12/23 8/23 8/23 22/7 11/7 7/10 7/20 7/5

-16 -31 -28 +79 -17

1078

b fl

sax

vln

2.A 4.A 5.D 3.E 5.E 1.G 6.D 4.A 6.A 4.E 5.G 3.E 1.G 2.G 4.G 6.G 4.D

7/10 7/20 8/19 5/16 3/16 19/6 6/17 6/17 4/17 4/17 7/11 6/19 16/5 8/5 4/5 8/15 8/15

-13 -10 -8 -3 -3 -100 +8 +10

U

1095

b fl

sax

vln

5.G 3.D 5.D 6.D 1.A 2.A 4.A 5.A 6.A 4.E 5.E 3.E 6.G 4.D 6.A 3.E 4.E 5.E

9/14 5/7 3/7 5/14 10/7 5/7 5/14 2/7 5/21 5/21 4/21 7/22 7/13 7/13 6/25 8/25 6/25 5/26

-16 -14 +17 +26 +31 +34 -79 +16

1113

b fl

sax

vln

1.G 2.G 1.D 1.A 3.E 4.G 6.G 3.D 4.D 6.D 1.A 2.A 4.A 5.A 1.D 5.A

13/4 13/8 13/6 13/9 9/28 9/11 6/11 8/11 6/11 4/11 16/11 8/11 4/11 7/24 11/5 5/17

-4 -2 -51 -2 -4

+39 -63 -51 -47 +63 -32

V

1129

b fl

sax

vln

1.G 2.G 4.G 5.G 6.G 4.D 5.D 5.A 1.G 1.D 3.D 6.D 1.A 2.A 3.A 4.A 5.A

10/3 5/3 5/6 2/3 5/9 5/9 4/9 8/27 27/8 9/4 3/4 3/8 3/2 3/4 1/2 3/8 3/10

-18 -22 -4 -16 +14 +2 +16

+2 -20

1146

b fl

sax

vln

6.A 1.E 2.E 3.E 4.E 5.E 1.G 5.D 1.G 2.G 3.G 4.G 6.G 2.D 4.D 5.G 5.G 3.D 5.D

1/4 1/1 1/2 1/3 1/4 1/5 17/5 5/11 24/7 12/7 8/7 6/7 4/7 8/7 4/7 11/16 9/13 10/13 6/13

+2 -4 -2

+15 +29 +34 +46

-81

1165

b fl

sax

vln

6.D 2.A 4.A 5.A 1.G 2.G 3.G 4.G 5.G 6.G 1.D 2.D 3.D 4.D 6.D 1.A 2.A 4.A 6.A

5/13 10/13 5/13 4/13 7/2 7/4 7/6 7/8 7/10 7/12 7/3 7/6 7/9 7/12 7/18 14/9 7/9 7/18 7/27

-2 -4 -2 -35

1184

b fl

sax

vln

4.E 5.A 3.A 6.A 2.E 3.E 4.E 1.A 3.E 5.A 6.A 4.E 1.D 5.G 3.E 5.A

7/27 5/16 12/23 6/23 12/23 8/23 6/23 11/7 7/20 6/19 5/19 5/19 19/8 5/7 6/17 7/22

-27 -24 +82 -14 -9 -4 -0 +1 -96

W

1200

b fl

sax

vln

1.G 2.G 3.G 6.G 1.D 2.D 3.D 4.D 6.D 1.A 2.A 3.A 4.A 5.A 6.A 2.E 4.E

18/5 9/5 6/5 3/5 12/5 6/5 4/5 3/5 2/5 8/5 4/5 8/15 2/5 8/25 4/15 8/15 4/15

+14 +2 +14 +12 -2 -2

1217

b fl

sax

vln

5.A 3.E 3.A 2.E 5.G 1.D 1.A 1.G 2.G 3.G 2.D 3.D 2.A 3.A 6.A 2.E 3.E

9/28 5/14 7/13 7/13 8/11 17/7 13/8 11/3 11/6 11/9 11/9 9/11 9/11 6/11 3/11 6/11 4/11

+21 +30 +34 +45 -6 -4 -32 -49 -45 -69 -59 -47

1234

b fl

sax

vln

4.E 6.G 4.D 6.D 4.A 2.G 1.G 2.G 3.G 5.G 6.G 1.D 2.D 3.D 4.D 5.D 6.D 1.A

3/11 8/13 8/13 7/17 7/17 13/7 15/4 15/8 5/4 3/4 5/8 5/2 5/4 5/6 5/8 1/2 5/12 5/3

+58 -36 -32 -16 -20 -16 -4 +16

1252

b fl

sax

vln

2.A 3.A 4.A 5.A 6.A 2.E 4.E 6.D 4.A 3.E 1.G 6.G 4.D 1.G 2.G 5.G

5/6 5/9 5/12 1/3 5/18 5/9 5/18 8/19 8/19 3/8 19/5 7/11 7/11 23/6 23/12 10/13

+19 -18 -14 -13 +2 -4 Eb+49 +6 +7 +22 +28 -84

X

Cucumber Serenades

1268

b fl

+29 +33 +31 +35 +2 +33

sax

27/7 9/7 9/14 18/7 9/7 6/7 9/14 3/7 12/7 6/7 4/7 3/7 2/7 8/7 4/7

vln

1.G 3.G 6.G 1.D 2.D 3.D 4.D 6.D 1.A 2.A 3.A 4.A 6.A 1.E 2.E

1283

b fl

+50

sax

-53 -48 -42 -31

2/7 7/9 5/13 13/10 13/5 13/10 12/23 8/23 7/8 7/4 7/8 7/12 7/20 7/24 7/6 7/12 7/18 7/24

vln

4.E 5.G 3.E 3.G 1.D 2.D 5.D 5.A 3.D 1.A 2.A 3.A 5.A 6.A 1.E 2.E 3.E 4.E

1301

b fl

-4 -18 -6 -2

sax

-17 -4

6/17 5/17 5/17 4/1 2/1 4/3 1/1 4/5 2/3 8/3 4/3 2/3 8/15 4/9 4/9 8/27 8/27

vln

5.A 6.A 4.E 1.G 2.G 3.G 4.G 5.G 6.G 1.D 2.D 4.D 5.D 6.D 4.A 6.A 4.E