

APERTURE

for string quartet

Amy Brandon 2018

Instrumentation.

Violin I
Violin II
Viola
Violoncello

Duration.

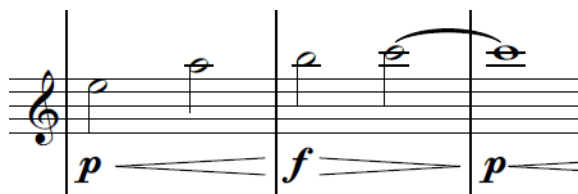
~5min

Program notes.

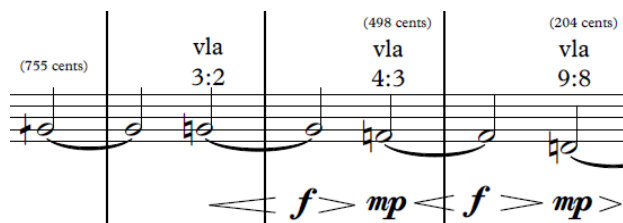
Aperture uses a combination of tuning systems and dynamic shifts to create the impression of a fluid, shifting but static portal or rift.

Technical notes.

1. The primary goal of this piece is resonance. All notes should be tuned to be as resonant as possible within the ensemble.
2. Pitch material is a combination of equal temperament, quartertones and just intonation from a C fundamental. Pitches are intended to be tuned to be as resonant as possible throughout the piece, with the exception of equal tempered quartertones, which should be as dissonant as possible.
3. Pitches are almost exclusively restrained to the same octave (G3-G4) across all instruments to ensure close voicings. Staying sul G on the violins, viola and sul A on the cello is preferred, but not required, except where a neighbouring open string is needed.
4. Equal temperament pitches either have **no accidental** or a **regular accidental**.



5. Just intonation intervals are indicated through natural symbols, Helmholtz-Ellis notation and/or ratios.

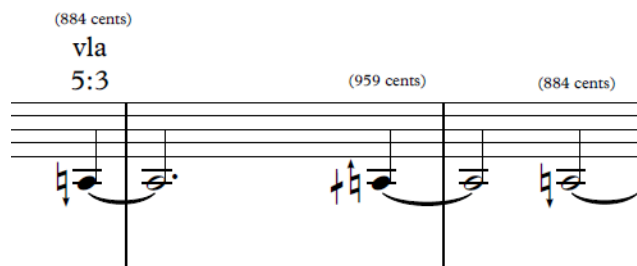


6. Quartertones are tuned normally, about 50 cents sharper than equal tempered intervals and are indicated with the usual quartertone accidentals.



To correctly tune the Just Intonation pitches:

- It may be helpful to practice the Just Intonation pitches (sul G or sul A) with a tuner to familiarize the location and sound. A chart with the pitches in cents is below for reference. However, **in performance, the most resonant interval possible is desired – actual tuning to the exact cent is not expected.**
- In performance, there is notation to guide you to the approximate pitch.
- Firstly, aim for the indicated note: in this example, a natural A below middle C. Sliding into notes to tune is acceptable.
- This note should be tuned slightly flat (indicated by the downwards arrow on the natural sign) so that it is **resonant with the ensemble** and/or **makes the correct interval indicated.**



- In the above example, the first violin tunes the A3 slightly flat to a natural minor third below C in the viola, then to a natural minor third, sharpened by one syntonic comma (21.5 cents) plus one undecimal quartertone (53 cents) and returning to the original slightly flat A natural.

<i>Notation indicates the instrument to tune to, and the interval</i>	
Octave: ie. tune to a unison or octave with the first violin	vln1 1:1

<p>Perfect Fifth: ie. tune a perfect fifth above the viola</p>	<p>vla 3:2</p>
<p>Augmented Fourth: ie. tune an augmented fourth above the viola</p>	<p>vla 24:17</p>
<p>Perfect Fourth: ie. tune a perfect fourth above the first violin</p>	<p>vln1 4:3</p>
<p>Natural Major Third: ie. tune to a natural major third above the viola</p>	<p>vla 5:4</p>
<p>Natural Minor Third: ie. tune to a natural minor third below the viola</p>	<p>vln1 5:3</p>

So in this piece, while the actual pitch may be +59 cents or -27 cents compared to equal temperament, you will almost always be tuning these pitches using a common interval with another member of the group. This is to take advantage of the usual tuning process of string quartets to achieve the most resonant intervals. **Sliding into pitches in order to tune correctly is acceptable.**

- In addition, for clarity in cases of melodic lines between JI pitches, square and triangle brackets indicate the actual interval from the previous note. This is to help in cases where the starting and ending pitches are unclear, but the distance between them is a perfect interval.

Square brackets alone indicate **just intonation 9:8 wholetones** (204 cents).



Triangle brackets indicate **just intonation 16:15 semitone** (113 cents).

(642 cents)
 vln1
 6:5
 (200 cents) (200 cents) (200 cents) (45 cents)
p *pp* *mf*

Square brackets with a (ie. 2:1, 3:2, 4:3, 24:17) indicate a just intonation octave, perfect fifth (702 cents), perfect fourth (498 cents), and augmented fourth (668 cents).

(642 cents) (438 cents) (438 cents)
 vln1
 2:1 2:1
p *f*

Below is a chart of the Just Intonation pitches used in this piece with actual cents, cent difference from equal temperament and notation. MIDI bend information has been used to approximate the sounds in Sibelius for the MIDI MP3 accompanying this score.

Note and MIDI Bend	Partial / Ratio	Cent Difference	Actual Cents
B [^] : 0,77	495/256	B+41.5	1141.5
B _v : 0,61	15/8	B-11.7	1088.3
B _b : 0,69	9/5	B _b +17.6	1017.6
A [^] : 0, 83	891/512	A+59.1	959.1
A: 0,59	5/3	A-15.6	884.4
A _b : 0,68	8/5	A _b +13.7	813.7
G [^] : 0,82	99/65	G+55.2	755.2
G: 0,65	3/2	G+2	702
F [#] : 0,78	1485/1024	F [#] +43.5	643.5
F: 0,63	4/3	F-2	498.0
E: 0,60	5/4	E-13.7	386.3
E _b : 0,69	6/5	E _b +15.6	315.6
D [^] : 0,82	297/256	D+57.2	257.2
D: 0,65	9/8	D+4	203.9
C [^] : 0,78	4455/4096?	C+45.5	45.5
C: 0,64	1/1	C 0	0

8. The piece can be played as slowly as needed, however, the given tempo is ideal.
9. Dynamics should always be smoothly shifting, fluid and dramatic in order to give the impression of a physical 'aperture' appearing and disappearing. **Exact dynamics are not required as long as the general curvature is followed.**

APERTURE

Amy Brandon 2018

Expressively

♩ = about 100

(257 cents)
vla
3:2

Violin I

Violin II

Viola

Violoncello

pp < *mp* < *mf* < *ppp* < *f* > *p*

mf

pp < *f* > *mp* > *ppp* > *p* > *pp* < *mf* >

mp

molto sul pont

molto sul pont

(959 cents)

(755 cents)

8

(959 cents)

4:3

(642 cents)

pp < *f* > *mp* > *pppp* > *p*

p

mp

(642 cents)

vln1
6:5

(200 cents)

(200 cents)

(200 cents)

(45 cents)

p < *pp* < *mf* > *mp* > *p* < *f* >

mp

(642 cents)

vln1
2:1

(438 cents)

(438 cents)

2:1

(45.5 cents)

vla
ET M3

24:17

24:17

p

Aperture - Full Score

14

(1088 cents) vln 4:3

(884 cents) vln 5:3

(959 cents) (884 cents)

20

(702 cents)

(755 cents) vln bar 20

4:3 (257 cents)

(386 cents) VC

(755 cents)

(643 cents) vln1 5:4

(257 cents) vln1 1:1

Aperture - Full Score

A

27 (643 cents) vla 5:4 (386 cents) vla 5:4 (1088 cents) 3:2 vla 3:2 (959 cents) vln2 1:1

ord. (884 cents) VC 4:3 (959 cents)

(1141.5 cents) vln1 4:3 (643.2 cents) vln1 bar 27 (386 cents) VC 1:1

(386 cents) vln1 1:1 ord. (1088 cents) vln1 bar 32

p < *f* > *pppp* <

34 (884 cents)

(755 cents)

(959 cents) vln1 1:1 vln1 4:3 (959 cents) vln1 1:1 (884 cents) vln1 bar 39

f > *mp* < *f* > *ppppp* *mp* > *p* < *f* > *ppppp* < *mp* < *mf* *mp* < *f* >

Aperture - Full Score

41

(1088 cents) vln2 6:5 (814 cents) vla 8:5

(814 cents) vln1 8:5

(498 cents)

(0 cents)

pppp *f* *mp* *f* *mp* *f* *pppp* *mp* *f* *pppp*

p *pp* *mp* *pppp* *mf* *f* *mp*

mp *pppp* *f* *mf* *p* *f* *mp* *pppp* *mp*

mp *mf* *mp* *pp* *f* *mp*

48

(755 cents) vln2 2:1 (257 cents) vln2 6:5

(959 cents)

(643 cents) VC 1:1

(643 cents) vln2 1:1

(643 cents) vln2 1:1

(643 cents) vln2 1:1

(498 cents)

(386 cents) 5/4

(1088 cents) VC 4:3 4:3

mf *p* *mp* *pppp*

p *f* *pppp* *mf* *p* *mp* *pp* *mp*

f *mp* *f* *mp* *mf* *mp* *mf* *mp* *mf* *mp*

f *pppp* *mf* *mp* *mf* *mp* *f* *pp* *p*

55

(1088 cents) vln2 6:5

(204 cents)

(386 cents) vla 1:1

(884 cents) vla 5:3

(643 cents) vln1 5:4

(386 cents) vla 5:4

(1088 cents) vla 1:1

(814 cents) vla 8:5

f *pppp* *p* *f* *pppp* *mp* *mf* *pppp* *mf* *mp*

pppp *mp* *f* *p* *mp* *pppp*

p *f* *mp* *p* *f* *mp* *pppp* *mf* *mp* *pppp* *f*

f *mp* *mf* *p* *pppp*

B

64

molto sul pont

p *mp* *mf* *p* *mp*

mp *mf* *p*

mf *p* *mf* *pppp* *f*

mf *p* *mp* *mf*

70

Musical score for measures 70-75. The score is written for five staves: two treble clefs, a grand staff (treble and bass clefs), and a bass clef. The first two staves contain melodic lines with various dynamics including *mf*, *p*, *mp*, and *f*. The grand staff features a sustained note with dynamic markings *mf*, *pppp*, *mp*, and *f*, along with cent measurements of (755 cents) and (643 cents). The bass staff provides harmonic support with dynamics *p*, *mp*, *mf*, *p*, and *mp*.

76

Musical score for measures 76-81. The score is written for five staves: two treble clefs, a grand staff (treble and bass clefs), and a bass clef. The first two staves contain melodic lines with dynamics *mp* and *mf*. The grand staff features a sustained note with dynamic markings *pp*, *mp*, *f*, *mp*, *f*, *mp*, and *p*, along with cent measurements of (257 cents), (1141 cents), (439 cents), (1141 cents), and (386 cents). The bass staff provides harmonic support with dynamics *mf* and *p*.

83 **C**

mf

ord. vla 1:1

vla 9:8

vla 9:8

5:4

(959 cents)

f *pppp* *mp* *f* *pppp* *mp*

ord. (884 cents) 5:3

mp *f*

89

(498 cents) vla 2:1

(814 cents) vla 8:5

(1017 cents) vc 9:5

vla 1:1

f *mp* *f* *mp* *f* *mp* *f* *mp*

(755 cents)

(755 cents)

pppp *f* *p* *mp* *f* *mf* *p* *pppp* *mp*

(959 cents)

mp *f* *mp* *f* *pppp* *mp* *f*

mp *f* *mp* *f* *pppp* *mf* *pp*

gliss.

96

f *mp* *mf* *mp* *p* *mf* *mp* *mf* *pppp*

(755 cents) *vla* 3:2 (498 cents) *vla* 4:3 (204 cents) *vla* 9:8 0 (1141 cents) (1100 cents)

p *f* *mp* *f* *mp* *p* *mp* *f* *mp* *f* *p*

mp *pppp* *mf* *p* *mp* *f* *pppp*

gliss. *gliss.* *gliss.* *gliss.*

pp

104

mf *mp* *f* *pppp* *mf* *mp* *f* *pppp*

(1141 cents) (1100 cents) (Tune normally to end)

mp *f* *pppp* *mp* *f* *mf* *mp*

mp *f* *p* *f* *p* *mp* *f* *pppp*

gliss. *gliss.* *gliss.* *gliss.*

pppp

112

Musical score for measures 112-115. The score consists of four staves. The first staff has dynamics *mp*, *mf*, and *p*. The second staff has dynamics *f* and *pppp*. The third staff has dynamics *p*, *mp*, *mf*, and *p*. The fourth staff has dynamics *mf*, *p*, *mp*, and *mf*.

116

Musical score for measures 116-119. The score consists of four staves. The first staff has dynamics *mp*, *mf*, and *p*. The second staff has dynamics *p* and *pppp*. The third staff has dynamics *mp*, *mf*, and *p*. The fourth staff has dynamics *p*, *mp*, and *mf*.