

# APERTURE

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for string quartet

Amy Brandon 2018

## Instrumentation.

Violin I  
Violin II  
Viola  
Violoncello

## Duration.

~5min

## Program notes.

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

## Technical notes.

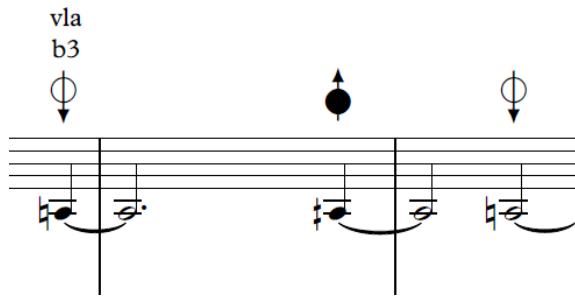
1. The primary goal of this piece is resonance. All notes should be tuned to be as resonant as possible within the ensemble.
2. Pitch material is a combination of equal temperament, quartertones and just intonation from a C fundamental. Pitches are intended to be tuned to be as resonant as possible throughout 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 intervals are played as usual, although tuned to be as resonant as possible within the ensemble.



5. Quartertones are tuned normally, about 50 cents sharper than equal tempered intervals.

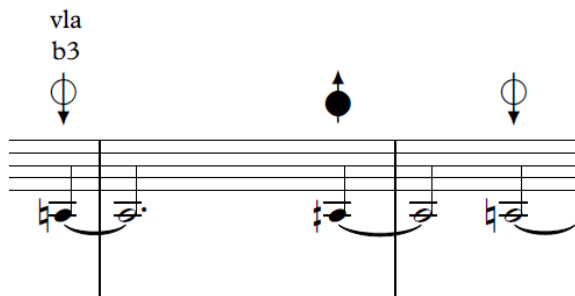


6. Just intonation pitches are indicated with a white or black circle with an arrow:



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.

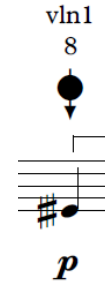


- Firstly, aim for the indicated note: in this example, a natural A below middle C. Sliding into notes to tune is acceptable.
- This note should be tuned slightly flat (indicated by the downwards white circle arrow) so that it is **resonant with the ensemble** and/or **makes the correct interval indicated.**
- 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 slightly sharp A quartersharp, and returning to the original slightly flat A natural.

*Notation indicates the instrument to tune to, and the interval*

**Octave:**

ie. tune to a unison or octave with the first violin



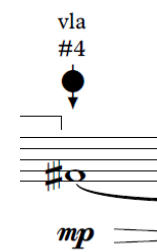
**Perfect Fifth:**

ie. tune a perfect fifth above the viola



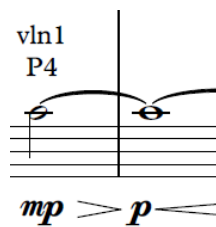
**Augmented Fourth:**

ie. tune an augmented fourth above the viola



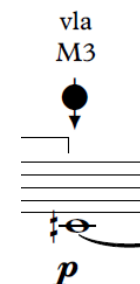
**Perfect Fourth:**

ie. tune a perfect fourth above the violin



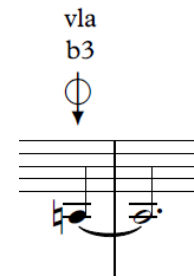
**Natural Major Third:**

ie. tune to a natural major third above the viola



**Natural Minor Third:**

ie. tune to a natural minor third below the viola



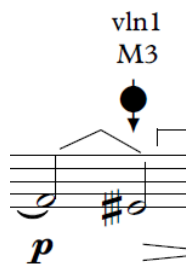
So in this piece, while the actual pitch may be +59 cents or -27 cents compared to equal temperament, you will almost always be tuning these pitches using a common interval with another member of the group. This is to take advantage of the usual tuning process of string quartets to achieve the most resonant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

7. 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.

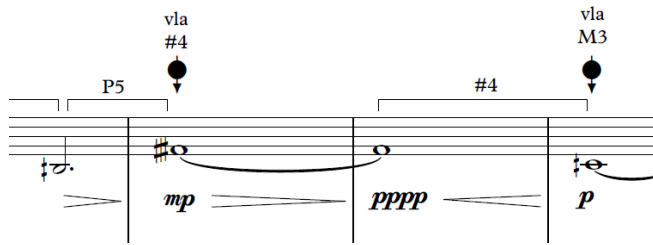
Square brackets alone indicate equal tempered wholetones (200 cents).



Triangle brackets indicate an equal tempered semitone (100 cents).








Square brackets with an interval (ie. P5, P4, #4) indicate equal tempered perfect fifth (700 cents), perfect fourth (500 cents), and augmented fourth (600 cents).



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	Notation	Resonant Tuning Notation
B <sup>^</sup> : 0,77	<b>495/256</b>	B+41.5	1141.5	♯	●
B <sub>v</sub> : 0,61	<b>15/8</b>	B-11.7	1088.3	-	○
B <sub>b</sub> : 0,69	<b>9/5</b>	B <sub>b</sub> +17.6	1017.6	b	○
A <sup>^</sup> : 0, 83	<b>891/512</b>	A+59.1	959.1	♯	●
A: 0,59	<b>5/3</b>	A-15.6	884.4	-	○
A <sub>b</sub> : 0,68	<b>8/5</b>	A <sub>b</sub> +13.7	813.7	b	○
G <sup>^</sup> : 0,82	<b>99/65</b>	G+55.2	755.2	♯	●
G: 0,65	<b>3/2</b>	G+2	702	-	-
F <sup>^</sup> : 0,78	<b>1485/1024</b>	F <sup>^</sup> +43.5	643.5	♯	●
F: 0,63	<b>4/3</b>	F-2	498.0	-	-
E: 0,60	<b>5/4</b>	E-13.7	386.3	-	○

Eb: 0,69	<b>6/5</b>	Eb+15.6	315.6	b	
D^: 0,82	<b>297/256</b>	D+57.2	257.2		
D: 0,65	<b>9/8</b>	D+4	203.9	-	-
C^: 0,78	<b>4455/4096?</b>	C+45.5	145.5		
C: 0,64	<b>1/1</b>	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

vla  
P5  
▲

Violin I

Violin II

Viola

Violoncello

*pp* < *mp* < *mf*

*ppp* < *f* > *p*

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

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

*ppp* < *f* > *p*

*pp* < *mf* >

*mf*

*mp*

*mp*

molto sul pont

molto sul pont

(+9 cents)

Note 6. Arrow circles indicate Just Intonation notes. Aim for the indicated note and sharpen or flatten in the direction given until as resonant as possible and/or until the given interval is achieved.

Note 7. Square brackets indicate whole tone movement, triangle brackets semitones, and square brackets with P4, P5 etc. indicate other intervals

8

P4

P5

#4

vln1 M3

vln1 8

*pp*

*f*

*mp*

*pppp*

*p*

*p*

*pp*

*mf* > *mp*

*p*

*f*

*mp*

*mp*

*p*

*p*

*mp*

*p*



14

vla P5  
⊕  
↓

vla b3  
⊕  
↓

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

*mp* *p* *mp* *p* *mp*

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

*p* *mp* *p* *mp*

20

P4

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

*mf* *p* *vln1 M3* *pp*

*vln1 8* *vln1 8* *vln1 8*

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

*mp* *p* *pp*

Aperture - Full Score

27

vla M3

vla M3 **A**

vla P5

vln2 8

ord.

vln1 5

(vln1 bar 35)

vc 8

ord.

vln1 8

(vln1 bar 39)

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

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

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

*p* *f* *pp*

34

vln1 8

vln1 P4

vc b3

(vln1 bar 46)

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

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

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

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

Aperture - Full Score

41

vln1 b3  
vln2 M3

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 0 mf mp pp *f* > mp

48

vln2 M3  
vln1 M3  
vc P5  
vln2 M3  
vln1 M3  
vc P5  
vln2 M3  
vln1 M3  
vc P5

mf > *p* mp > pppp

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

*f* > mp *f* > mp < mf > mp mp < mf > mp

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

55

vla M3

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

vln2 b3

vln1 5

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

vln1 M3

vln1 M3

vc P5

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

vln1 8

vln1 M3

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

**B** molto sul pont

64

*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 consists of four staves: two treble clefs, a bass clef, and a double bass clef. The first two staves are for the upper strings, the third for the lower strings, and the fourth for the double bass. Dynamics include *mf*, *p*, *mp*, *pppp*, and *f*. There are also performance markings such as hairpins and accents.

76

Musical score for measures 76-81. The score consists of four staves: two treble clefs, a bass clef, and a double bass clef. Dynamics include *pp*, *mp*, *f*, and *p*. There are also performance markings such as hairpins, accents, and a circled note in the lower strings.

**C**

82

Musical score for measures 82-88. The score is written for four staves: two treble clefs and two bass clefs. Measure 82 is marked with a box containing the letter 'C'. The first treble staff has a whole note with a dynamic marking of *mf*. The second treble staff has a whole rest, with the instruction 'ord.' appearing in measure 84. The first bass staff has a whole note with a dynamic marking of *p*, followed by a crescendo to *f*, then a decrescendo to *pppp*, followed by a crescendo to *mp*, then a decrescendo to *f*, then a decrescendo to *pppp*, and finally a crescendo to *mp*. A circled 'M3' with a downward arrow is positioned above the first bass staff in measure 83. The second bass staff has a whole rest, with the instruction 'ord.' appearing in measure 86. The bottom-most staff has a whole rest, with a dynamic marking of *mp* and a crescendo to *f* starting in measure 87.

89

Musical score for measures 89-95. The score is written for four staves: two treble clefs and two bass clefs. Above the first treble staff, there are circled 'M3' markings with upward arrows in measures 90 and 91, and a circled '8' with an upward arrow in measure 95. Above the second treble staff, there is a circled 'M3' with an upward arrow in measure 91 and a circled '8' with an upward arrow in measure 95. The first treble staff has dynamics: *f* > *mp* < *f* =, *mp* =, *f* > *mp* < *f* =, and *mp* =. The second treble staff has dynamics: *pppp* < *f* > *p* =, *mp* < *f* =, *mf* > *p* >, and *pppp mp* >. The first bass staff has dynamics: *mf* > *mp* < *f* =, *mp* =, *pppp* < *mp* < *f*. The second bass staff has dynamics: *mp* < *f* > *mp* =, *f* =, *pppp* < *mf* >, and *pp*. The word 'gliss.' is written above the second bass staff in measure 95.

96

Musical score for measures 96-103. The score is written for four staves: Violin I, Violin II, Viola, and Cello/Double Bass. The key signature is one sharp (F#). The dynamics range from *pp* to *pppp*. The Violin I staff starts with *f* and ends with *pppp*. The Violin II staff starts with *p* and ends with *p*. The Viola staff starts with *mp* and ends with *pppp*. The Cello/Double Bass staff starts with *pp* and includes glissando markings. There are also some performance markings like a dot with an arrow pointing up and a dot with an arrow pointing down.

104

Musical score for measures 104-108. The score is written for four staves: Violin I, Violin II, Viola, and Cello/Double Bass. The key signature is one sharp (F#). The dynamics range from *pppp* to *f*. The Violin I staff starts with *mf* and ends with *pppp*. The Violin II staff starts with *mp* and ends with *mp*. The Viola staff starts with *mp* and ends with *pppp*. The Cello/Double Bass staff starts with *pppp* and includes glissando markings. There are also some performance markings like a dot with an arrow pointing down.

112

Musical score for measures 112-115. The score consists of four staves. The top 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 bottom staff has dynamics *mf*, *p*, *mp*, and *mf*.

116

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