

Matt Sargent

oxbow

for solo percussion

about 6'30"

2011

Instrumentation

vibraphone
crotales (one or two octaves)
two singing bowls
small tam-tam or wind gong
two cello bows

Instrumentation Details

Vibraphone should be played with the pedal down and motor off throughout.

Two octaves of crotales are preferable, to maximize the possibility of performing the notated intervals in the score without octave transposition. Crotale pitches and intervals requested in the score may be octave transposed upward or downward, where necessary, to fit within the octave range of the available crotales.

All notes on the “overtone” staff should be played as harmonics and held down throughout using felt or rubber pads pressed against the given bar using small metal weights. This preparation is necessary, as harmonic notes are often played at the same time as non-harmonics, without space provided to press nodes by hand or mallet. In the original performance, percussionist Bill Solomon used 50 gram metal laboratory scale weights with rubber pads affixed to the bottom.

The two singing bowls should be an interval of a major second or minor third apart from one another. Either intervallic relationship is acceptable, creating two possible modalities for the piece.

The singing bowls must not have a primary pitch¹ above Ab₄ (minor sixth above middle C) to permit that all notes in the “ascending fifths” staff fit on to the vibraphone without use of harmonics or transposition.

Some combinations of singing bowls may produce unperformable collisions, based on the pitches produced by the *Pitch Material* process. Preferably, multiple bowl combinations should be tested to determine the most appropriate set of bowls.

Pitch Material

In *oxbow*, the vibraphone is treated as a resonating body for the two singing bowls. As a result, there are no pre-determined pitches given within the composer's score: instead, fixed intervallic relationships are provided, with which the percussionist is to generate pitches prior to the performance based on the unique properties of their selected singing bowls.

Pitches are determined in the following ways:

- 1) “ascending fifths” staff: For both staves marked “ascending fifths”, the pitches are a stack of three ascending fifths from the primary pitch of given singing bowl.
For example: a singing bowl pitched C would produce the notes G, D, A.
- 2) “overtones” staff: For both staves marked “overtones”, the pitches are determined using a spectral analysis of the singing bowl. The performer may contact the composer (mattsargentmusic@gmail.com) with a recorded sample of the bowed singing bowls. Alternately, the performer may generate the analysis using a MAX/MSP-based analyzing tool available from the composer: <http://www.mattsargentmusic.com/oxbow.html>. The pitches on this staff are arranged in order of their amplitude within the spectrum of the singing bowl, rather than by ascending pitch. For more information about the spectral analysis, see below.
- 3) “crotales” staff: The crotales act as a second-order harmonizer of the vibraphone. For this staff, indications of pitch are given in relation to pitches from the vibraphone staff.
For example: [F# = P5 above second overtone staff note, bowl II]

On pages 2-4, there is also an indication of [difference tone = bowl 1 – bowl 2] on the vibraphone staff. This pitch will be determined in the analyzing patch (transposed by octave to fit on the vibraphone).

¹ *Primary pitch*: the loudest perceived note from the singing bowl. I identify this as the “primary pitch” as singing bowls often have a much lower, weaker fundamental pitch.

Notes about the Spectral Analysis

The spectral analysis is realized primarily with Miller Puckette's *sigmund~* object for MAX/MSP. The analysis could however be performed with any spectral analyzing tool, if the performer is unable to reach the composer. The composer's analysis tool utilizes the following specifications:

- 1) Use a spectral analysis program, set to a window of 1024 with at least 2x overlap.
- 2) Analyze entire recorded bowl sample (length of a single long bow of singing bowl) and create an average of the spectral information.
- 3) Remove all octaves (repeated notes) from analysis data.
- 4) Choose the three pitches with the loudest amplitude, excluding the primary pitch.
- 5) Transpose (by octave) any of the three pitches to a lower register if they are above 1760 hz or A6 (notes above are generally outside the range of possible harmonics on a vibraphone).
- 6) Transpose (by octave) any pitches that produce unperformable collisions with the "ascending fifths" staves.
- 7) Determine the difference tone through subtraction of the primary pitch of bowl II (lower) from the primary pitch of bowl I (higher). Transpose (by octave) to place the note in the lowest possible range of the vibraphone.

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Still; even (♩ = 54-60)

4	2	4	3	4	3	4
4	4	4	2	4	4	4

with bow throughout
 [= P5 above 2nd overtone
 staff note, bowl I]

Pedal down throughout. Motor off throughout. Let all instruments vibrate freely.

* Pitches of the three prominent harmonics of the singing bowl. Determined before the performance, using the MAX/MSP analysis patch that accompanies the score. See the instructions page for operating instructions and a download link. Note: these harmonics are ordered from loudest to softest in spectral amplitude, rather than pitch: the highest pitch tone may not be the third note on the staff, etc. **These notes should be played as harmonics, using felt or rubber pressed against nodes by metal weights.**

** Ascending perfect fifths from the strongest perceived pitch of the singing bowl. (1 = 5th above, 2 = 9th above, 3 = 13th above)

*** Notated crescendi should be realized as a subtle blooming. The end of the crescendo indicates a settling to a steady state, rather than a dramatic release.

3 4 4 3 4 4 3

crot.

vibes & bowl I

vibes & bowl II

pp

pppp sub.

vispy; extremely soft; almost without pitch

no decresc.

stop pitch at end of bow motion, do not let vibrate

4 3 6 4 6

4 4 4 4

crot.

vibes & bowl I

vibes & bowl II

small gong

wispy; with lightest possible bow pressure; like a false wolf tone

[difference tone = bowl I - bowl II]

pppp

[difference tone = bowl I - bowl II]

pppp

p

pp

p

ppp

p

very gently, with fingertip like a false attack of the bowed difference tone note.

(l.v.)

pppp

with fingertip

pppp

N.B.: The intervals on the crotale staff relate only to the corresponding notes on the lower staves. The notation of B & F# does not indicate a defined intervallic relationship.

4 4 [B = P5 above 1st overtone staff note, bowl II]

[F# = P5 above 2nd overtone staff note, bowl I]

3 4

ppp [G# = M6 above previous crotale pitch (B)]

pp

ppp *p*

ppp *pp* *ppp*

4 6 4 4 4 4 4

[Bb = P5 below third overtone staff note, bowl II]

[F# = P5 above second overtone staff note, bowl I]

[G = M6 above previous bowl II crotale (Bb)]

ppp *pp* *ppp* *ppppp* sub.

as faint as possible while still producing harmonic

nearly silent; airy bow noise without pitch

stop pitch at end of bow motion do not let vibrate

[difference tone = bowl I - bowl II]
wispy; with lightest possible bow pressure; like a false wolf tone

pppp

small gong: very gently with fingertip

pppp

