The deep-rooted microtonality of the bass clarinet

Proefschrift

ter verkrijging van

de graad van Doctor aan de Universiteit Leiden,

op gezag van Rector Magnificus prof.mr. C.J.J.M. Stolker,

volgens besluit van het College voor Promoties

te verdedigen op woensdag 17 oktober 2018

klokke 11.15 uur

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geboren te Rotterdam

in 1950

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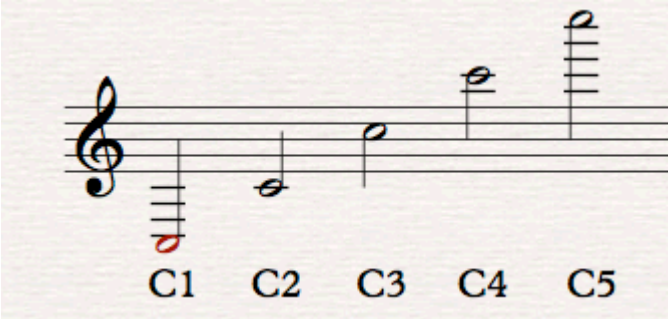
Nomenclature of the octaves

In order to clearly denominate the different octaves of the bass clarinet, the following nomenclature will be used in this study. Using French notation, transposed in B♭, and sounding a 9th lower than notated, the lowest note of the instrument is labelled C1. Each subsequent octave is then given a higher number.

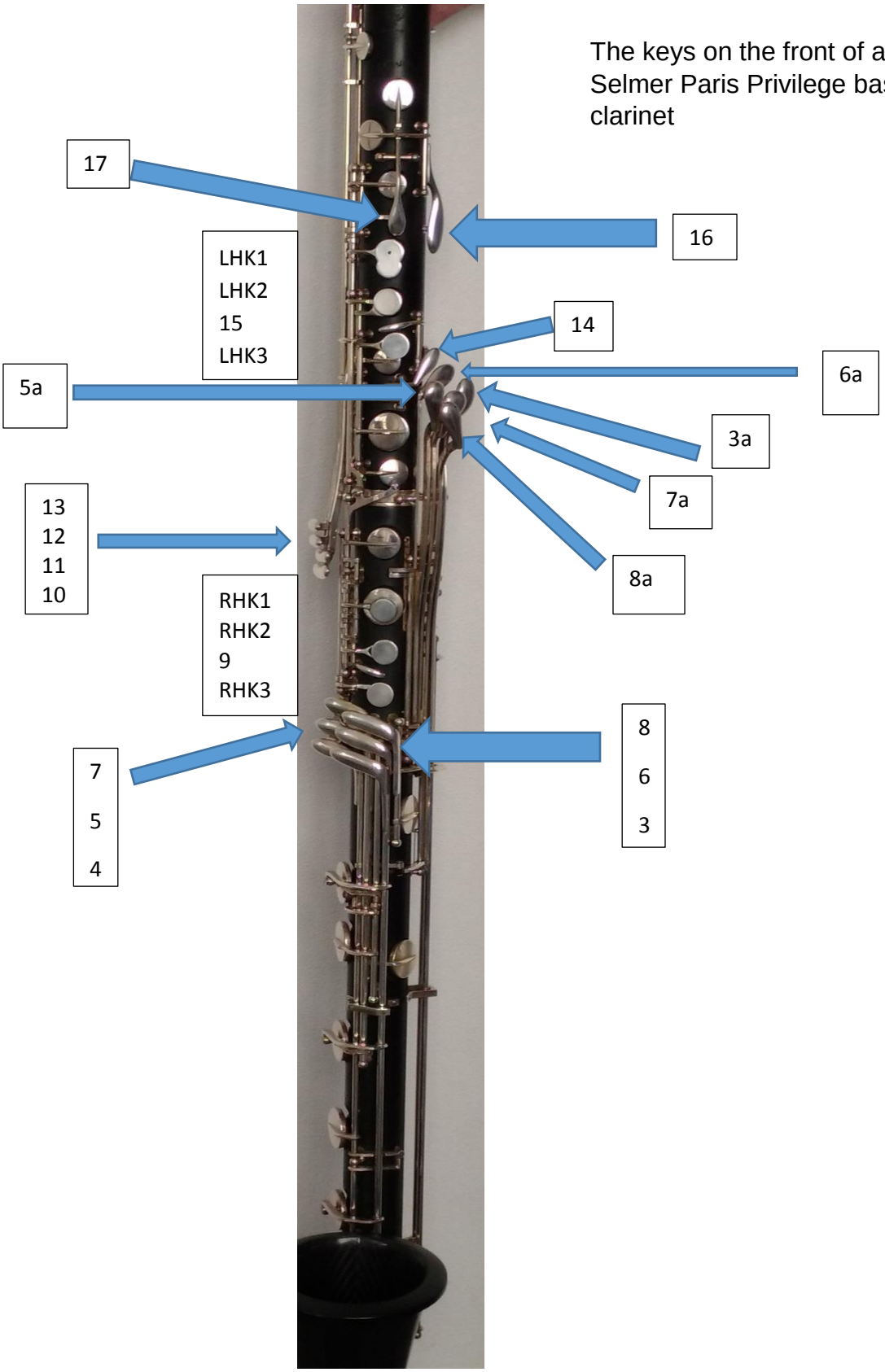


Henri Bok notation	C1	C2	C3	C4	C5

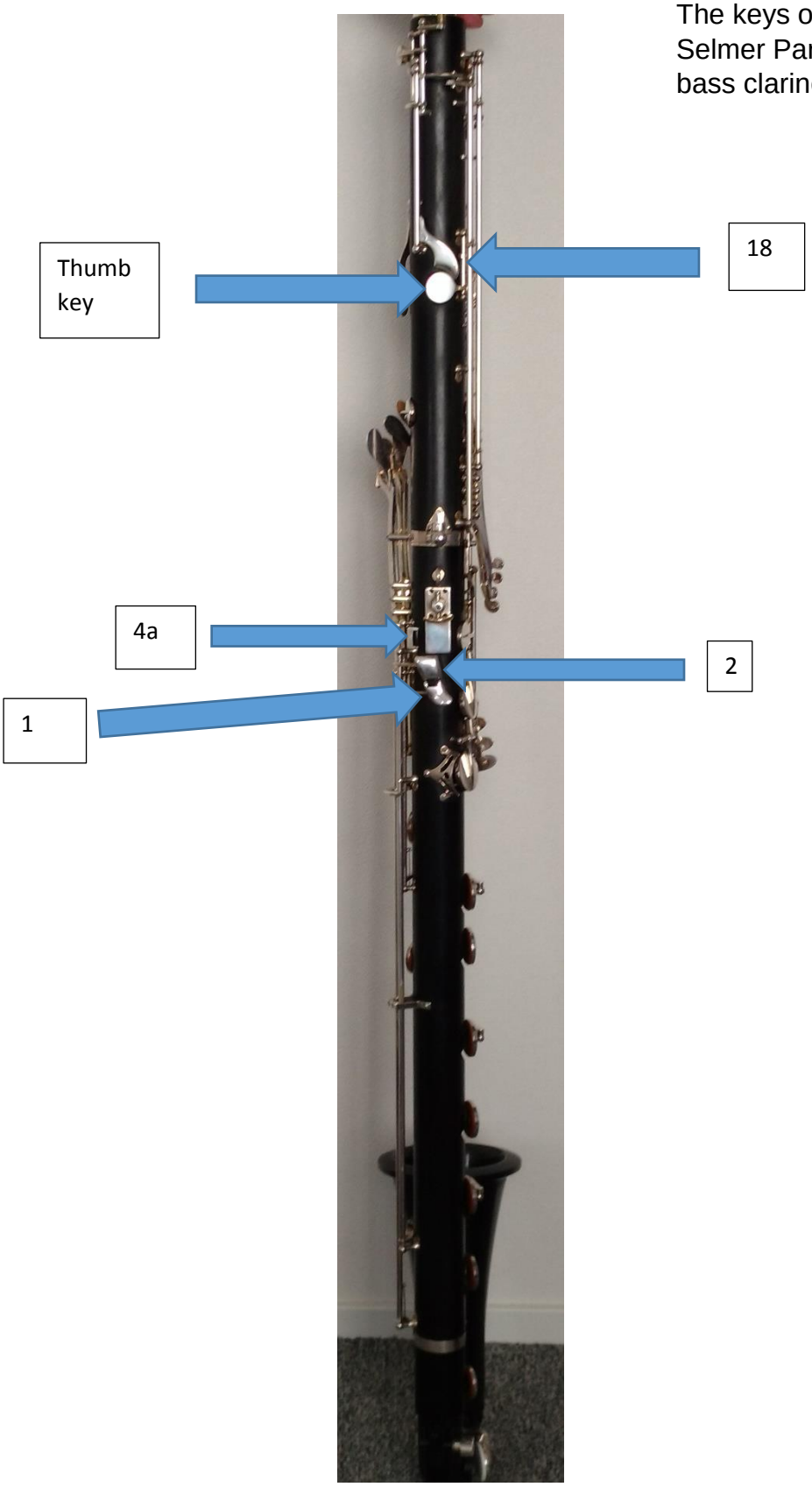
The octave designation and the corresponding pitch in C (concert pitch) is as follows:

Scientific Pitch Notation	B♭1	B♭2	B♭3	B♭4	B♭5
Helmholtz Notation	B♭,	B♭	b♭	b♭′	b♭′′

Key nomenclature system



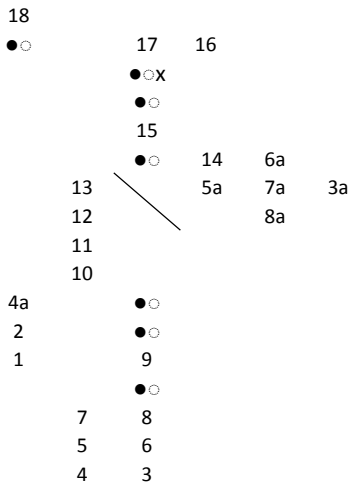
The keys on the back of a Selmer Paris Privilege bass clarinet



Key numbers and corresponding pitches for the lowest fifth to aid with the translation of fingering patterns to other bass clarinet models.

Key	Pitch
8	G♯1/A♭1
7	F♯1/G♭1
6	F1
5	E1
4	D♯1/E♭1
3	D1
2	C♯1/D♭1
1	C1

For the purpose of this research the key nomenclature system will be translated to a simple diagram in the fingering pattern charts:



The circles for LHK2, LHK3, RHK1, RHK2, RHK3, and the thumb key represent open (○) and closed (●) keys. In addition to these symbols, LHK1 also has a symbol to represent half open (x).

Glossary

31 tET see **microtonal divisions**.

altissimo the uppermost register on woodwind instruments.

ambitus the range or the distance between the lowest and highest note of an instrument.

barrel or socket is located between the mouthpiece and upper joint of the soprano clarinet and has a straight form. It is used to fine-tune the instrument. On the bass clarinet it has a curved shape and is called the neck.

bell located at the bottom of the (bass) clarinet, under the lower joint. It reinforces the sound of the lowest notes and facilitates the production of overtones. That is why the material used for the bell (metal, wood, or carbon-fibre) matters.

bisbigliando is a tremolo, often referred to as a timbral colour trill. On the bass clarinet **bisbigliando** is a tremolo between two or more harmonics of approximately the same pitch, using different root fingering patterns.

(the) break the passage from B♭2 to B2 on the (bass) clarinet which marks the exact transition from the root area of the instrument to the overtone area. To make this a smooth transition lower lip adjustment is needed, otherwise there will be a dip in the sound, the sound will 'break'.

eighth-tone see **microtonal divisions**.

embouchure the shaping and position of the lips in the playing of wind instruments.

false fingerings term used to refer to alternative fingering patterns in jazz music, frequently involving pitch change.

fundamental the lowest in a whole series of pitches, called the *harmonic series*. The fundamental is counted as the first harmonic, upon which several overtones can be produced. On the bass clarinet the area of fundamentals (roots) comprises the lowest octave plus the next minor seventh (C1-B♭2).

glissando a glide from one pitch to another.

harmonic an integer (whole number) multiple of the fundamental frequency of a vibrating object. In acoustics the basic vibration is the 'first harmonic'.

harmonic series the whole series of pitches comprising a fundamental and its natural overtones.

keywork the complete set of keys, mounted on the instrument.

microtonal divisions

> **quartertone** a microtone which is half a semitone. There are therefore two quartertones to each semitone, and four quarter tones to each whole tone. A quartertone equals 50 cents.
>
> **31 tET** 31-tone equal temperament is the tempered scale derived by dividing the octave into 31 equal-sized steps (equal frequency ratios). A 31-tone equals 38.7 cents.
>
> **eighth-tone** microtonal interval 1/8th the size of a whole-tone, measuring 25 cents.

microtone any interval smaller than a semitone.

monophonic producing one note at a time.

multiphonic extended technique on a monophonic musical instrument whereby several notes are produced at once.

> **type 1 multiphonic** produced by embouchure manipulation of a given fundamental whereby upper partials are sounded on top of the root. The simultaneous production of elements belonging to the harmonic series of the chosen fundamental, by using standard fingerings and embouchure manipulation.
>
> **type 2 multiphonic** produced by using special (unorthodox, alternative, bastardized) fingering patterns.

multiple sound/multisound see multiphonic.

nano tones the term I have used in this study to refer to microtonal intervals of less than an eighth-tone.

neck is located between the mouthpiece and upper joint of the bass clarinet. It is curved in shape and has the same function as the barrel on the soprano clarinet (to fine-tune the instrument).

overblow using a root fingering pattern (fundamental) with an overtone lower lip position (position 2, 3, or 4) so that an upper partial from the natural harmonic series is generated.

overtone term used to refer to any resonant frequency above the fundamental frequency. It is important to note that the term ‘overtone’ does not include the fundamental frequency. The first overtone is therefore already the second harmonic or second partial.

partial (tone) see **harmonic**.

quartertone see **microtonal divisions**.

root is the fundamental frequency of a vibrating object. It is the first harmonic of a harmonic series. See also **fundamental**.

smorzando is obtained by small movements of the lower lip on the reed, similar to the jaw movements (not diaphragm) used in normal vibrato.

standard fingering patterns fingering patterns in general use for semitonal pitches.

split sound also called ‘son fendu’, a multiphonic sound comprised of only two pitches.

underblow playing an overtone with such a relaxed embouchure that it generates an isolated or simultaneous undertone.