Contrabassoon Fingering Chart

(revision 1.1 - February 2018)

Richard Bobo

Contrabassoonist, Tulsa Symphony & Symphony of Northwest Arkansas

me.subcontrabassoon.com

Contents

2
3
3
4
6
11
19
23
24
25
26
27

Introduction

Much more so than bassoons, contrabassoons vary greatly from one instrument to another. As a result, fingerings that work well on one instrument may be poor or completely ineffective on another. However, rather than try to accommodate endless possible permutations of instrument makes, models, and keywork configurations, I am presenting my personal fingerings *as is*. In other words, this chart should not be interpreted <u>The One True Fingering Chart</u>[™] but as one additional data set with which contrabassoonists can inform their own personal fingerings.

All fingering graphics were created with my Legni woodwind fingering fonts. These fonts are available for most common—and a few uncommon—woodwinds and can be downloaded for free at http://www.subcontrabassoon.com/legnifont/.

This work is licensed under a Creative Commons Attribution-ShareAlike 4.0 International License. More information can be found at http://creativecommons.org/licenses/by-sa/4.0/.

My Setup

In order to judge how effective my fingerings are likely to be on your setup, it may be helpful to know more about mine:

The main contrabassoon I use is a Mollenhauer made in the early 2000's (serial number 9xx). My primary bocal is a Heckel C3 which has a stronger and better in-tune upper register than the Mollenhauer bocals that came with the instrument.

My keywork is relatively spartan; just the standard contrabassoon keywork with the addition of an alternate E key (for the right thumb) and an alternate touch for the upper octave key (for the left thumb, between and to the right of the C and lower octave keys). Personally, I find the alternate upper octave key touch more convenient in all circumstances and have abandoned using the primary touch entirely.

My reeds measure approximately 67–68 mm overall, with a 34–35 mm blade length and 20 mm tip width. They are shaped using a Skinner-Braunstein #1 flat shaper made by Fox.



Keywork

Range



The <u>remedial range</u> extends from B_b0 to C3. As the fingerings in this range are mostly very similar or identical to bassoon fingerings, this range is accessible to most experienced bassoonists with little contrabassoon practice.

The <u>basic range</u> extends the remedial range up to G3 and covers a very large majority of the contrabassoon repertoire. Many of the most important pieces in this repertoire take for granted a fluent command of this entire range, so it is vital that any bassoonist wishing to be taken seriously on contrabassoon be proficient here.

The <u>orchestral range</u> extends the basic range up to C#4 and covers virtually the entire orchestral, ballet, and opera repertoire. In my opinion, if the contrabassoon were held to the same standards as the other orchestral woodwinds (sadly, this is definitely not the case) this would be its "textbook range." With time and practice, this range is achievable on almost all contrabassoons.



Like bassoon, <u>low A</u> occasionally occurs in parts for contrabassoon. Unlike bassoon, contrabassoons built with a range to low A are not terribly uncommon. For contrabassoons lacking this additional semitone, an inexpensive and effective low A extension can be made. *(see Appendix D)* With the extension in place, A0 is played by fingering Bb0, Bb0 becomes impossible, and B0 becomes noticeably stuffy. Extensions below A0 are possible (I have a set down to E0) but extremely awkward to use and completely uncalled-for in the repertoire. *(see Appendix E)*



The <u>lower altissimo register</u> covers from D4 to Ab4. On many contrabassoons this register can—with much practice and preparation—be played with good intonation and characteristic tone quality. Articulation, however, can be inconsistent; some notes speak more readily than others and certain slurs are likely to be unplayable. This register is not wholly unknown to orchestral repertoire but is primarily limited to solo repertoire.

The <u>upper altissimo register</u> covers from A4 up to Eb5. In my opinion, on a traditional contrabassoon—as opposed to a contraforte or Fast-system contrabassoon—this register is far too deficient in reliability, tone, articulation, and intonation to be musically useful.



The <u>resultant tones</u> are a special type of multiphonic in which the components form an acceptably harmonic relationship that suggests a missing fundamental below the range of the contrabassoon. Each multiphonic component responds to voicing changes independently, so the effect is highly dependent on finding the proper voicing that brings both components into harmonicity. However, as a result the overall intonation of the resultant tone cannot be altered without spoiling its harmonicity entirely. On my setup, Ab0 and (especially) G0 can be surprisingly effective.

The <u>squeal register</u> covers E5 and higher. I have only ever been able to play in this register by placing my teeth directly on the reed, with accordingly atrocious tone. At present, I cannot consider this register any more than a novelty, and even that is being generous.





Bobo - Contrabassoon Fingering Chart (rev1.1) - 8/27

Bobo - Contrabassoon Fingering Chart (rev1.1) - 9/27

Bobo - Contrabassoon Fingering Chart (rev1.1) - 10/27

Bobo - Contrabassoon Fingering Chart (rev1.1) - 11/27

slightly narrow

Appendix A – Keywork Variants

The keywork of most professional-level woodwind instruments has more or less completed the experimentation process. Today, these instruments are both able to meet the technical demands of the vast majority of the repertoire, and are highly standardized between manufacturers. On contrabassoon, in contrast, this refinement and standardization process is still very much ongoing. Manufacturers and performers address the various deficiencies in contrabassoon keywork in different, and occasionally incompatible, ways.

(This list is not exhaustive.)

E♭ keys

As the standard $E\flat$ key is unfamiliar to bassoonists and awkward to use in many situations, an alternate $E\flat$ key is the most common non-standard keywork addition on contrabassoons. The most common types of alternate $E\flat$ key are the <u>right thumb $E\flat$ key</u> (**A**) and the <u>right index finger $E\flat$ key (**B**). Less common types include the <u>left thumb $E\flat$ key (**C**), <u>left pinky $E\flat$ key (**D**), or the saxophone-style <u>side $E\flat$ key (**E**</u>). Each type has its advantages and disadvantages. More "tricked-out" instruments may have multiple alternate $E\flat$ keys.</u></u></u>

C# keys

Due to the demands placed on the left thumb, an alternate C# key is also advantageous, though significantly less common than an alternate E key. The most simple type is the <u>alternate C# key touch</u> (**F**) which allows a C# key to be used in combination with the upper octave key on instruments lacking the alternate upper octave key touch. The <u>right middle finger C# key</u> (**G**) and <u>left pinky C# key</u> (**H**) generally require a second C# tonehole on the front of the body joint. As with alternate E keys, it is possible for an instrument to have multiple alternate C# keys.

A♭ keys

Though standard on bassoon, the <u>right thumb Ab key</u> (I) is much less common on contrabassoon. When present, it may open the same tonehole as the standard Ab key, or have its own tonehole.

F# keys

Though older contrabassoons may lack the front F# key, most contrabassoons have the same two F# keys found on bassoon. However, contrabassoons have three broad types of setups regardings the F# toneholes:

1) Two F# keys open a single tonehole. On these instruments, there will be no difference in tone or intonation between the two fingerings in either octave.

2) Two F# keys open two different toneholes that are very similar in dimensions and position. On these instruments, there may be slight differences in tone or intonation between the two fingerings, but either fingering is likely to be effective in either octave.

3) Two F# keys open two different toneholes that are rather different in dimensions and position. On these instruments, there are likely to be significant differences in tone and intonation between the two fingerings, and certain octave/fingering combinations may be noticeably more effective than others.

B♭ keys

While the large majority of contrabassoons have the same two B_b keys as bassoon, some instruments discard the unpopular front B_b key, either to make room for more keys or to bring the other right hand keys closer together. However, this key can still be rather useful if the instrument possesses a right thumb E_b key.

e/f# trill key

The <u>e/f# trill key</u> (**J**) is another key that is standard on bassoon but often absent on contrabassoon. Without it, the E2/F#2 trill is precarious at best and impossible at worst. This key requires an additional tonehole.

low A key

Contrabassoons with a low A bell have an additional <u>low A key</u> (**K**). This key is generally positioned for the left pinky, below the low C# key.

Divorced E mechanism

Standard contrabassoons have a linkage that automatically closes the pad closed by the low E key whenever the lower octave key is used. This improves the tone, stability, and intonation of most of the middle-register notes that use the lower octave key. However, this linkage can negatively impact G#2 when played using the lower octave key. The <u>divorced E mechanism</u> replaces this linkage with one that closes the pad closed by the low E key whenever RH3 is not used. This retains the benefits of the traditional linkage without adversely affecting G#2, and can extend some benefits to the lower octave as well.

Alternate upper octave key touch

With standard contrabassoon keywork, it is difficult to move quickly from the C# key to the upper octave key due to the intervening lower octave key. Additionally, there are notes (E3 and F3 especially) which greatly benefit from both the C# and upper octave keys in combination. The <u>alternate upper octave key touch</u> (L) lessens or solves—respectively—these issues.

Standard octave vents

A standard contrabassoon has four octave vents: The first is opened automatically by the half-hole mechanism. The second and third are opened simultaneously by the lower octave key. The fourth is opened by the upper octave key. Like all reed instruments, the placement, size, and number of these vents are an acoustic compromise. However, the contrabassoon octave system is noticeably deficient compared to other instruments. In particular, G#2 (which falls in the gap between the ideal ranges for the half-hole vent and lower octave vents) and C#3 through Eb3 (which fall between the ideal ranges for the lower octave vents and upper octave vent) are generally less than satisfactory. These deficiencies have been addressed in a few different ways, all of which remain uncommon.

Middle octave vent & key

The <u>middle octave key</u> is an additional key and vent specifically for the notes C#3, D3, and E \flat 3. When present, its touch can be found as a palm/side key for the right hand (**M**), in a variety of positions for the left thumb (**N**), or both.

G vent & key

The <u>G vent key</u> is a very uncommon additional key and vent specifically for the notes G2 and G#2. When present, its touch can be found for the left thumb (**O**) or the left index finger—in a position analogous to rolling down to the bassoon's half-hole (**P**).

Fast-system

The <u>Fast-system</u> reworks the contrabassoon's octave vents entirely. The system features six octave vents in contrast to the standard four. While the half-hole mechanism and vent remain unchanged, the other five octave vents are controlled by just three octave keys (the standard lower and upper octave keys, plus the non-standard middle octave key) through an elaborate series of linkages and mechanisms. Though Fast-system instruments generally have a large complement of additional keywork (available on non-Fast instruments and discussed above), the Fast-system is properly defined by this octave system.

Contraforte

Whether the contraforte is simply a subtype of contrabassoon or a completely separate instrument is a matter open to debate. Regardless, it is designed to fill the role of a contrabassoon and to be played by contrabassoonists. Beyond the superficial visual differences (most noticeably the thumb keys), the most important differences between its keywork and that of a traditional contrabassoon are:

- 1. <u>low A key</u>
- 2. <u>side Eb key</u>
- 3. single automatic <u>octave key</u>
- 4. <u>twelfth key</u> for third-harmonic notes
- 5. <u>fifteenth key</u> for fourth-harmonic notes
- 6. <u>alternate C# key</u> for use in combination with 4. & 5.
- 7. optional twentieth-plus key for fifth- and sixth-harmonic notes

Appendix B – Half-Hole Mechanism Adjustment

Since all contrabassoon toneholes are covered by pads (rather than directly by the fingers) a bassoon-style half-hole is not possible. Instead, the contrabassoon has an automatic half-hole mechanism, diagrammed below:

E is the tonehole for E2 and E3. **F** is the primary tonehole for F2 and F3. **H** is the half-hole vent and secondary tonehole for F2 and F3. **E** is closed directly by LH2, **H** is closed directly by LH1, and **F** is closed indirectly by either LH1 or LH2. As a result, the contrabassoon's equivalent of a half-hole is produced automatically whenever LH2 is depressed but LH1 is not.

The significant, but unavoidable, drawback of this system is that the amount of half-hole is fixed and cannot be shaded for different notes. It is therefore critical that the mechanism be well adjusted.

The most obvious setting is to adjust the mechanism so that **F** is fully closed whenever the half-hole is active. This setting works well on some contrabassoons. However, it is often beneficial for **F** to leak slightly when the half-hole is active. This is particularly important for D4 and $E\flat4$, which may be impossible otherwise.

The degree to which **F** leaks while the half-hole is active is regulated by the cork at linkage **Z**. The cork can be sanded thinner for more leakage, or replaced with thicker cork for less leakage. However, if the cork is too thick, **E** will leak and virtually the entire playing range will be unstable or unplayable.

The most sensitive notes to this adjustment are Ab2 (if played using the half-hole instead of the lower octave key alone) and D4, but all half-hole notes should be checked for intonation and reponse while adjusting this cork.

Appendix C – Water Key Extension

The contrabassoon's water key vent (located on the tuning slide) is not positioned or sized for musical purposes. However, on at least some instruments it is—by pure coincidence—well-suited to serve as a harmonic vent that can improve the reliability of some otherwise troublesome notes:

However, the water key touch is not designed to be easily accessible while playing, making it difficult to use in many situations. For this reason, I have soldered a key extension onto my water key, allowing it to be used easily by either RH2 or RH3.

Appendix D – Low A Extension

A lightweight, inexpensive, and effective conical low A extension can be made using a 3-inch cardboard mailing tube. Before beginning construction, it is helpful to have enough material for at least two extensions so that the first can serve as a trial to establish dimensions.

Construction is straightforward:

Cut to length, **X**. If this is first extension for this particular instrument, cut long so it can be shortened for tuning.

Cut a long triangular wedge out of the tube lengthwise. The width of the removed wedge should be chosen so that the resulting diameter of the smaller end, \mathbf{Y}_0 , fits in the bell comfortably and securely.

Close the seam using duct tape.

Wrap in matte black electrical tape for appearance, if desired.

The dimensions of my low A extension are below:

	Х	Y٥	Y1
A0	425 mm	73 mm	79 mm
	(16 ¾ in)	(2 ⅔ in)	(3 ¼ in)

Appendix E – Lower Extensions

Extensions below low A can be made in the same manner, but require a bend at the bottom. These bends can be made from readily-available 3-inch PVC DWV pipe fittings. I made my low extensions in two halves, the first half (W) of which is common to all. The length of this common half (X_w) should be chosen so that the PVC bends rest on the ground while the instrument is in a comfortable playing position. The F#0, F0, and E0 extensions require the use of 4-inch mailing tubes.

	X	Y٥	Y1	PVC		
w	Xw	73 mm (2 ⅔ in)	79 mm (3 ⅓ in)	90°		
A♭0	600 mm – X _w (23 ½ in – X _w)	79 mm (3 ½ in)		45° Street		
G0	960 mm – X _w (37 ½ in – X _w)	79 mm (3 ¼ in)		90° Street		
F#0	1250 mm – X _w (49 ½ in – X _w)	79 mm (3 ¼ in)	88 mm (3 ½ in)	90° Street		
F0	1620 mm – X _w (63 ½ in – X _w)	79 mm (3 ¼ in)	98 mm (3 ⅔ in)	90° Street		
E0	2160 mm – X _w (85 in – X _w)	79 mm (3 ¼ in)	104 mm (4 ⅓ in)	90° Street		

Revision History

- **1.0** Jan. 2018 Original
- **1.1** Feb. 2018 Corrected divorced E mechanism description