

# Master Research

## **Fingering of the Viennese Double Bass**

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Date: March, 2016

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Format: Research paper

Presentation: 5<sup>th</sup> April, 2016 / 10:15 A.M. / Studio 3

Koninklijk Conservatorium Den Haag

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# Chapter 1: Introduction

## The instrument

The Viennese double bass was a historical type of double bass used during the Classical Period. There were other types of double basses coexisted in the period, but this one was dominantly and exclusively used in Vienna. A Viennese double bass usually has 5 strings, tuned in  $(F_1)^1$ -A<sub>1</sub>-D-F#-A, with frets. This tuning differs to any other double basses that co-existed in the history.



Figure 1: A modern Viennese double bass after a model of J.J.Stadlmann in 18th century

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<sup>1</sup> The tuning of the bottom string is flexible. Both  $F_1$  and  $G_1$  are documented in history while some modern Viennese double bass players often tune it to  $D_1$  in order to produce better resonance of the instrument and cover the low range of double bass part in orchestral music.

## The history

The Viennese double bass was a 'newly' invented instrument in the end of 17<sup>th</sup> century. The origin of this instrument remains uncertain. The frets identify itself as a member of the viola da gamba family. The tuning could be an evolution from the G-violone, one of the Baroque double bass gambas, which is tuned in G<sub>1</sub>-C-F-A-d-g. The top g string somehow split into two strings (f# and a). However, it is only a theory.

This type of tuning was first documented in 1692 by James Talbot (1664-1708)<sup>2</sup>. However it began to be popular around 1750s.

Joseph Haydn wrote the first concerto for the Viennese double bass during 1760s (which is unfortunately lost), as well as numerous solo passages in his symphonies (e.g. No.6,7,8,31,45). In the following four decades, almost 50 concertante works were written for it including the works of Dittersdorf, Vanhal, Kohaut, Kozeluch, Pichl, A.Zimmermann, Hoffmeister, Sperger, as well as many chamber music. Wolfgang Mozart wrote a superb Concert Aria *Per questa bella mano*, K612 for bass singer and Viennese double bass obligato.

Leopold Mozart spoke highly of this instrument which 'can bring out the difficult passages more easily: and I have heard uncommonly beautiful interpretations of concertos, trios, and solos, etc.'<sup>3</sup>

However, the Viennese double bass 'mysteriously' faded out during the beginning of the 19<sup>th</sup> century. After a break of over 100 years, this instrument is experiencing a revival since the second half of the 20<sup>th</sup> century with the influence of the early music movement. It is not only a rediscovery of the instrument itself, but also a lead for modern musicians to explore the style, flavor and atmosphere of music in the Viennese classical period.

## The fingering

Compared to the standard type of modern double bass (usually 4 strings tuned in E<sub>1</sub>-A<sub>1</sub>-D-G, fretless), the Viennese double bass differs, especially in the fingering. Unfortunately, as Panyavsky said, 'The Viennese double bass school was forgotten in the nineteenth century since it left no fixed, written method'<sup>4</sup>, we have no historical material left on the fingering of this instrument. The modern players usually apply the method of playing on the fourth-tuning double bass to the Viennese double bass, with necessary adjustment based on their own experience.

However, the modern approach does not fully appreciate the distinctive possibilities of

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<sup>2</sup> Focht, Josef. *Der Wiener Kontrabass*. (Schneider, 1999), p.24

<sup>3</sup> Panyavsky, Alfred. *The Baroque Double Bass Violone*, trans. James Barket (Lanham, Md., and London: The Scarecrow Press, Inc., 1998), p.129-130.

<sup>4</sup> Ibid. p.131

the Viennese double bass. Firstly, the frets change the position of finger contact point. The finger is placed slightly behind the frets while the fretless double bass is right on the point of the pitch. With frets, it's also possible to use 'chordal fingering' which is quite rare on fretless double bass. Secondly, the pattern on the fourth-tuning of string-cross and double stop is broken because of the different interval between neighbor strings. Generally, it's easier to play scales on the Viennese double bass because of less shift. But it becomes complicated when playing large intervals (e.g. octave). All these reasons lead me to the aim of the research.

## The aim of research

Since the Viennese double bass is an important historical instrument and is becoming popular again nowadays, it is urgent to make a summary of the practice experience and a systemized method for the fingering.

In my research, I hope to discuss the fingering system of the Viennese double bass under various categories. At first, I will explain the basic concept of fingerings, e.g. scales, octaves, arpeggios. Followed by excerpts from solo works, orchestral parts, etc. with suggested fingerings. For some difficult passages, I will supply all the possible fingerings for discussion.

## Current Research Status

**Igor Pecevski:** articles in Periodical. *Viennese Bass Method*, published online<sup>5</sup>.

The American double bass player and scholar Igor Pecevski has done a decent work on the Viennese tuning. He published a method online with the summary of his works. But, the instrument in his mind is a four-string fretless double bass tuned in Viennese tuning, which has a major difference to the historical Viennese bass with the frets. Furthermore, he wants to apply the Viennese tuning to play the double bass music from later periods which were not written for this tuning or instrument anymore.

The basic part of his method (e.g. the fingering of scale, arpeggio, etc.) is still useful for my research. However, as mentioned in the introduction, all the fingerings related to the frets have a different approach.

**Korneel Le Compte:** articles posted online containing fingerings for specific pieces.

The Belgium double bass virtuoso Korneel Le Compte is committed in performing practice on the Viennese double bass. He did detailed work on some pieces, e.g. an analyse of Vanhal concerto. The specific fingering is inspiring for my research.

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<sup>5</sup> Link accessed July 5, 2015. <http://www.viennesetuning.com/>

Attach a link to the video of Le Compte playing Mozart Concert aria K.612:  
<https://www.youtube.com/watch?v=JcwocxRetYg>

Figure 2. Korneel Le Compte playing Mozart *Per questa bella mano*





## Chapter 2: History of various double bass fingerings

### History of double bass fingerings

Since there is no particular fingering method written for the Viennese double bass, it's necessary to search for the possible pattern through the fingerings of other double basses. (Finger numbers for string players: 1-index finger, 2-middle finger, 3-ring finger, 4-little finger,) In the early period, for a long time, most of the double bassists only use 2-finger, finger 1 and 4. The strongest index finger can press on the string independently. But when the weak little finger is used, because of the difficulty of pressing down the thick and heavy strings, all the other fingers are pressing in the same time to help. This is so-called the 'fisticuff' fingering. It could be a semitone or a whole between finger 1 and 4.

Figure 3. 'Fisticuff' fingering



Later, when the string making technique was developed, bassists began to have more possibilities. **Domenico Dragonetti** (1763-1846) was the first one to use all the four fingers. His double basses were tuned in 4<sup>th</sup> (A-D-G) and 5<sup>th</sup> (G-D-A). In France, **Michel Corrette** published *Méthodes de contre-basse à 3, à 4, à 5 cordes* (1781) with basses tuned in 4<sup>th</sup> and 5<sup>th</sup> (E-A-D-G, G-D-A, F#-B-E-A-D), also using 1-2-3-4 fingering system. In Germany, **Wenzel Hause** *Kontrabaß Schule* (1796) – bass tuned in 4<sup>th</sup> (E-A-D-G), 1-2-4 fingering system which later becomes the modern standard. Above three were the most important double bass schools before or in the same time as the Viennese classical period which could have influence and relationship to the Viennese double bass.

Figure 4. '1-2-3-4' fingering



Figure 5. '1-2-4' fingering



Following figure is an overview of various fingering systems of double basses, mostly documented in historical methods.

Figure 6. Historical double bass fingerings

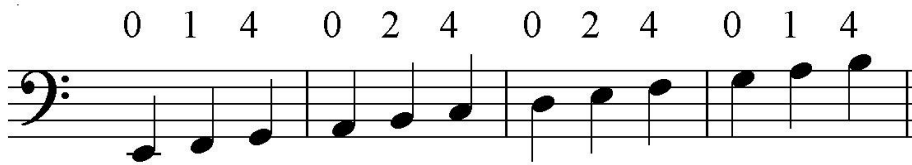
Source (Method)	School	Tuning	Interval	Fingers
(Early period)	(various)	(various)	(various)	1-4
Dragonetti (1763-1846)	Italian	A-D-G, G-D-A	4 <sup>th</sup> & 5 <sup>th</sup>	1-2-3-4
Corrette (1781)	French	E-A-D-G, G-D-A, F <sup>#</sup> -B-E-A-D	4 <sup>th</sup> & 5 <sup>th</sup>	1-2-3-4
Hause (1796)	Czech / German	E-A-D-G	4 <sup>th</sup>	1-2-4
(Viennese classical period)		F-A-D-F <sup>#</sup> -A	3 <sup>rd</sup> & 4 <sup>th</sup>	?
Fröhlich (1813)	German	E-A-D-G	4 <sup>th</sup>	1-4
Franke (ca.1820)	German	E-A-D-G	4 <sup>th</sup>	1-2-3-4
Asioli (1820)	Italian	E-A-D-G	4 <sup>th</sup>	1-3-4
Miné (ca. 1830)	French	G-D-A	5 <sup>th</sup>	1-2-3-4
Durier (1836):	French	G-D-A	5 <sup>th</sup>	1-2-3-4
Brulon (1841)	French	G-D-A	5 <sup>th</sup>	1-2-3-4
Hartman (1854)	French	G-D-A	5 <sup>th</sup>	1-2-3-4
Bernier (1864)	French	E-A-D-G	4 <sup>th</sup>	1-2-4
Verrimst (1866)	French	E-A-D-G	4 <sup>th</sup>	1-2-4
Bottesini (1869)	Italian	E-A-D-G	4 <sup>th</sup>	1-3-4
Simandl (1874)	Czech / Austrian	E-A-D-G	4 <sup>th</sup>	1-2-4

From the chart, we can find a pattern between the fingerings and the tunings: larger interval (5<sup>th</sup>) with more fingers (1-2-3-4), smaller interval (4<sup>th</sup>) with less fingers (1-2-4 or 1-3-4). The reason is related to shiftings. In all the fingering systems, there is always a semitone between neighbour fingers, which means one can always play a scale from the bottom string to the top string without shifting.

Figure 7. 5<sup>th</sup> tuning double bass scale fingering with 1-2-3-4 system



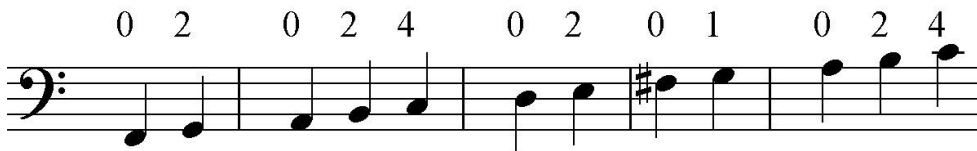
Figure 8. 4<sup>th</sup> tuning double bass scale fingering with 1-2-4 system



### Possible fingering used on the Viennese double bass

The relationship between fingering and shifting is a basic idea for any double bass. The Viennese double bass has even smaller intervals (3<sup>rd</sup> and 4<sup>th</sup>). The tuning itself implies the usage of a less-finger system. It probably only used three fingers (1-2-4 or 1-3-4). Since the 1-2-4 system already appeared at that time (Hause, 1796) and 1-3-4 system was first documented in a later period (Asioli, 1820), the 1-2-4 fingering system was more possible used on the Viennese double bass. Also physically the 2<sup>nd</sup> finger usually is stronger than the 3<sup>rd</sup> finger, it would be more reasonable to use a 1-2-4 fingering system.

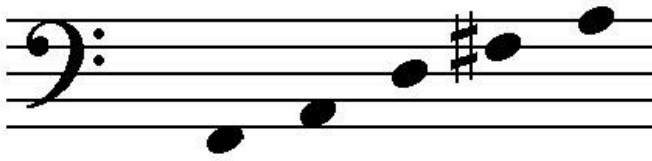
Figure 9. Scale fingering on the Viennese double bass with 1-2-4 system



It's important to mention that this 1-2-4 system is used in the basic position. There are exceptions which will be discussed later.

## Chapter 3: Fingering of the Viennese Double Bass

Figure 10. Tuning of the Viennese double bass



Legend: Symbols and marks used to indicate fingering

1,2,3,4	finger numbers
0	open string
o	harmonic
F,A <sub>1</sub> ,D,F#,A	string
$\frac{1}{2}$ , I, II, II $\frac{1}{2}$ , III...	position numbers
∧/∧	stay in one position
b.	bar fingering
c.	chordal fingering
e.	extension fingering

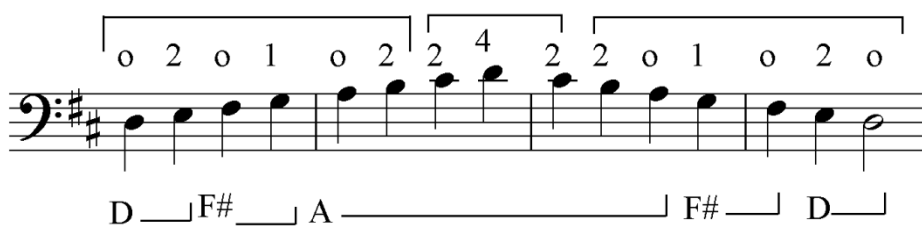
### Basic

#### Scale:

On the Viennese double bass, it's convenient to play scales with less shiftings.

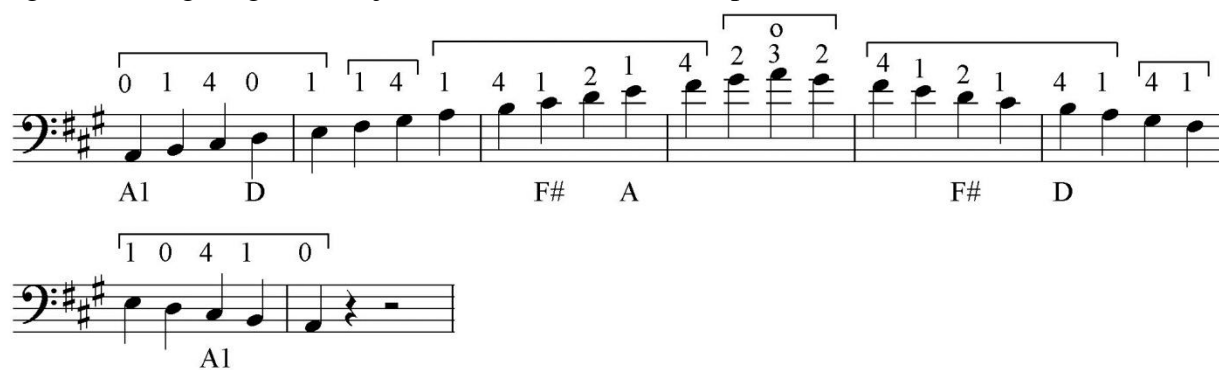
#### Fingering of D Major Scale

Figure 11. Fingering of D Major scale - Preferable on  $\frac{1}{2}$  position



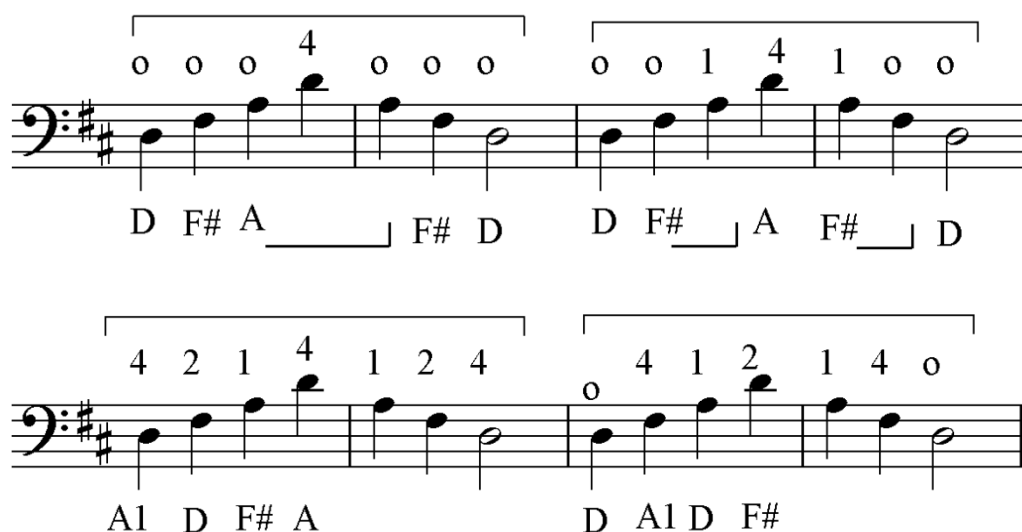
D \_\_\_\_\_ F# \_\_\_\_\_ A \_\_\_\_\_ F# \_\_\_\_\_ D \_\_\_\_\_

Figure 16. Fingering of A Major scale - Preferable on IV position



## Arpeggio

Figure 17. Fingering of D Major arpeggio



In D major arpeggio, all the fingers could stay in one position in all four solutions.

## Fingering of A Major Arpeggio

Figure 18. Fingering of A Major arpeggio - Preferable on I & IV positions

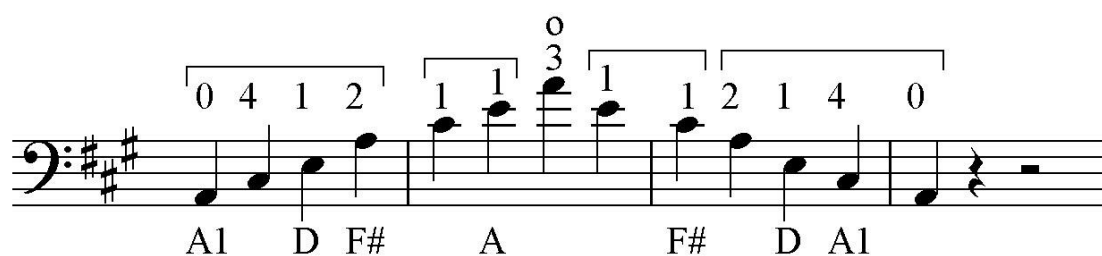


Figure 19. Fingering of A Major arpeggio - Preferable on III position

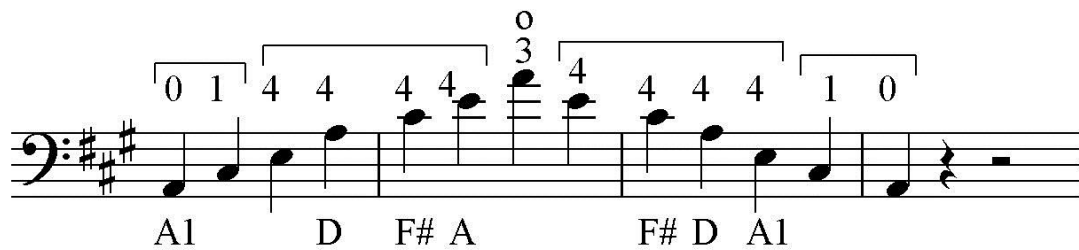
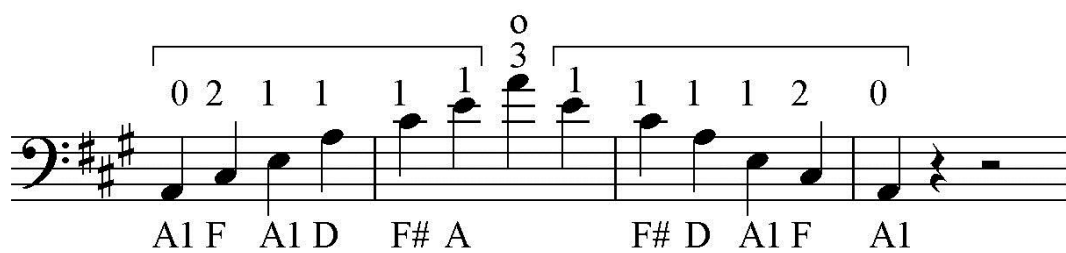


Figure 20. Fingering of A Major arpeggio - Preferable on IV position

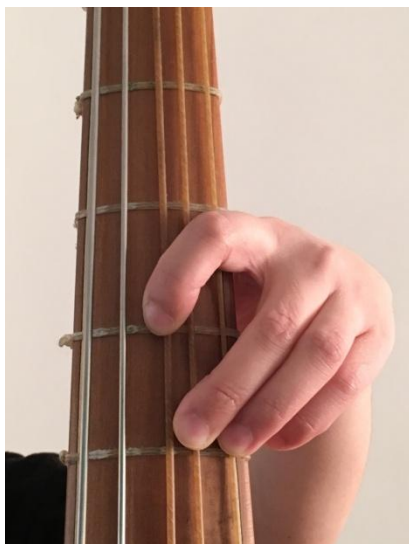


## Exception

### Chordal fingering:

Chordal fingering (put two or more fingers on a same fret) is often used in fretted instruments (e.g. lute, viola da gamba), but very rare in fretless instruments. Though the purpose of using frets is for clarity, the frets would still help with the intonation.

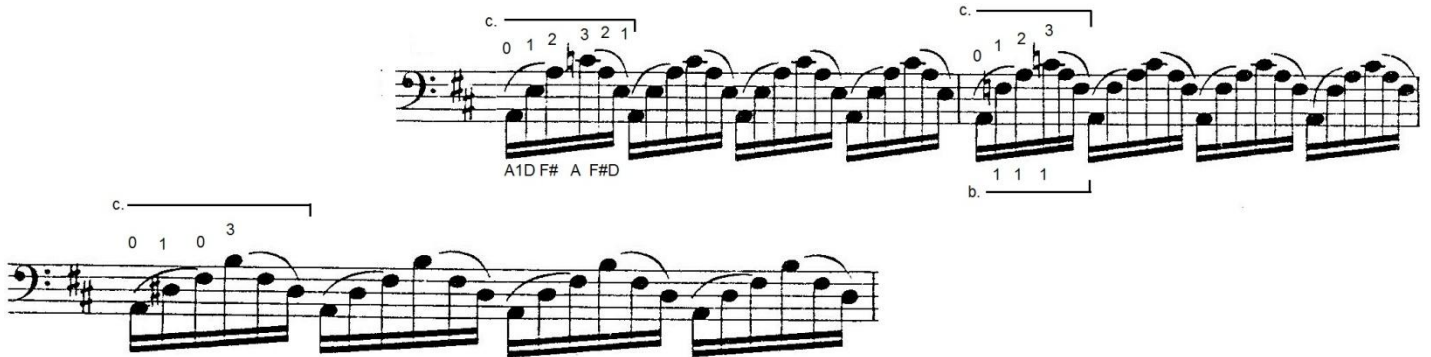
Figure 21. Chordal fingering





In some specific passages of solo works for the Viennese bass, we can see that chordal fingering is probably used in Viennese double bass. In the chordal fingering, all the fingers (including 3) are used.

Figure 22. Chordal fingering passage - Dittersdorf *Double Bass Concerto No.2*



In bar 2 of the above figure, one could also use a ‘bar fingering’<sup>6</sup>. However, there is a strict regulation of bar fingering in all the instruments of viola da gamba family that only the index finger (finger 1) could be used as the bar finger. So in bar 1 of the above figure, we couldn’t use a bar fingering on finger 2 or 3, which is conflict to the regulation. The chordal fingering would be the most possible solution.

Figure 23. Chordal fingering passage - Pichl *Double Bass Concerto No.1*

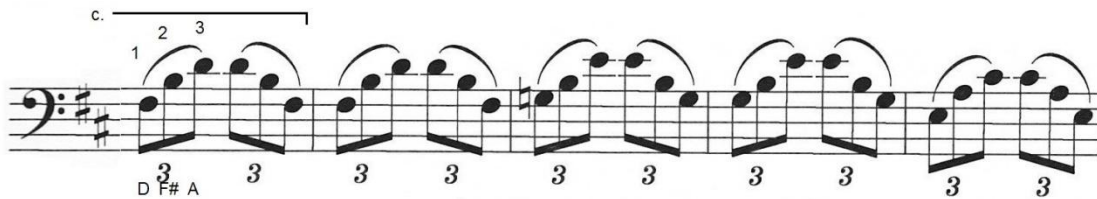
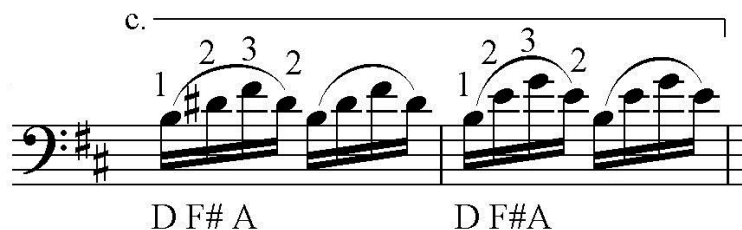


Figure 24. Chordal fingering passage - Sperger *Sonata for Double Bass and Viola No.2*



For the modern double bassists, it’s allowed to use bar fingering on every finger. We can use bar fingering to deal with difficult excerpts. But the fretted Viennese double bass might

<sup>6</sup> Using one finger to press down two or more strings in the same time

be still following the rule of bar fingering on viola da gamba family. In this situation, we could use the chordal fingering instead.

The above figures are some evidence of the using of chordal fingering in solo works. I believe that it could be used widely also in double bass part of orchestral music.

## Octave Fingering

### Basic octave fingering

Generally, it's easier to play scales on the Viennese double bass without shift. But it becomes complicated when playing large intervals. Because of the small interval between neighbour strings, we usually cross two middle strings in order to play an octave on the Viennese double bass.

Figure 25. Basic octave fingering, crossing two open strings



### Chordal Fingering in octaves

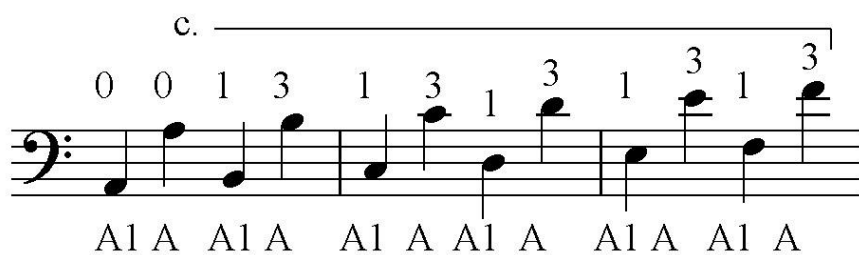
This basic octave fingering is suitable in a slow tempo. However there are disadvantages in fast tempo. Firstly, besides the bow, it would also take a long time for the fingers to switch between the bottom string and the top string in octave, which would slow down the tempo. Secondly, if we use bar fingering on finger 1 to play octave, we would have to keep pressing down four strings with one finger for a long time, which is extremely tiring for the finger.

One of the possible solutions of playing octave is using the chordal fingering.

Figure 26. Choral fingering for octaves



Figure 27. Octave by using the chordal fingering

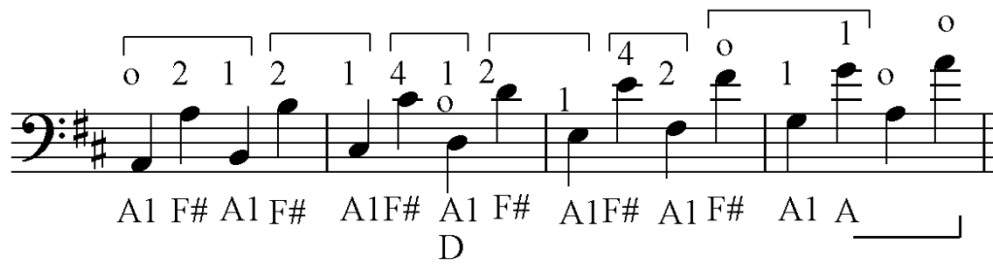


With the chordal fingering, one can ease the pressure for single finger and save the time for switch between strings.

### Shifting strategy

When playing octave passages in a fast tempo, one has to make a large effort to control the bow jumping over two middle strings without scratching on them. In order to reduce the possibility of unrequired scratch, there is another solution to play octave-scales with jumping over only one middle string by using a different shifting strategy.

Figure 28. Shifting strategy in playing octaves



With this shifting solution, it is easier to control the bow with acceptable increasing of shiftings.

Here is an comparison to demonstrate different shifting strategies in playing octave passages. Excerpt from bass part of Haydn Overture to *L'isola disabitata*.

Figure 29. Haydn Overture to *L'isola disabitata* - Basic octave fingering

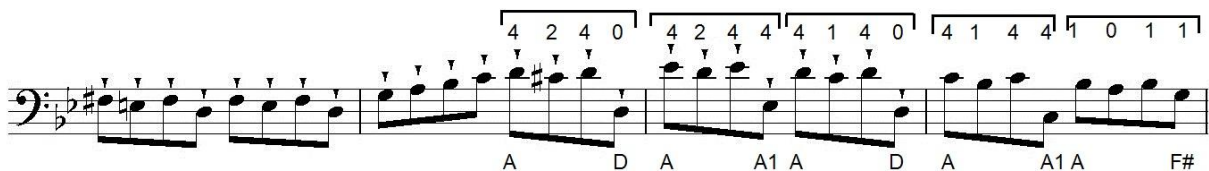
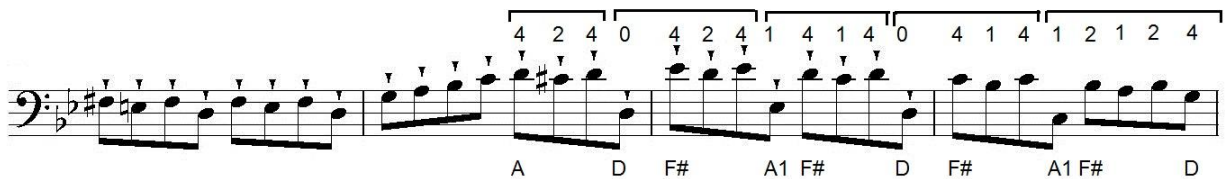


Figure 30. Haydn Overture to *L'isola disabitata* - Shifting strategy in playing octave



With the first fingering, one has to often cross two open strings with the same finger which is difficult to maintain a tempo. It also gives more pressure to the weak little finger. With the second fingering, we only need to cross one open string and other fingers share the pressure with little finger. Furthermore, the number of shiftings is the same as first one.

### Extension fingering

However, when playing the faster ‘tremolo-octave’<sup>7</sup>, we have to figure out a particular solution. By using the extension fingering, one can still play the octave by only jumping over one middle string by stretch the palm and fingers to reach wider interval. With the help of frets, one can still play in tune even if the finger was placed slightly lower than the accurate spot, which makes this fingering more adaptable.

<sup>7</sup> Rapid alternation of an octave

e.

1 4 1 4 1 4

A1 F# A1 F# A1 F#

## Solo work

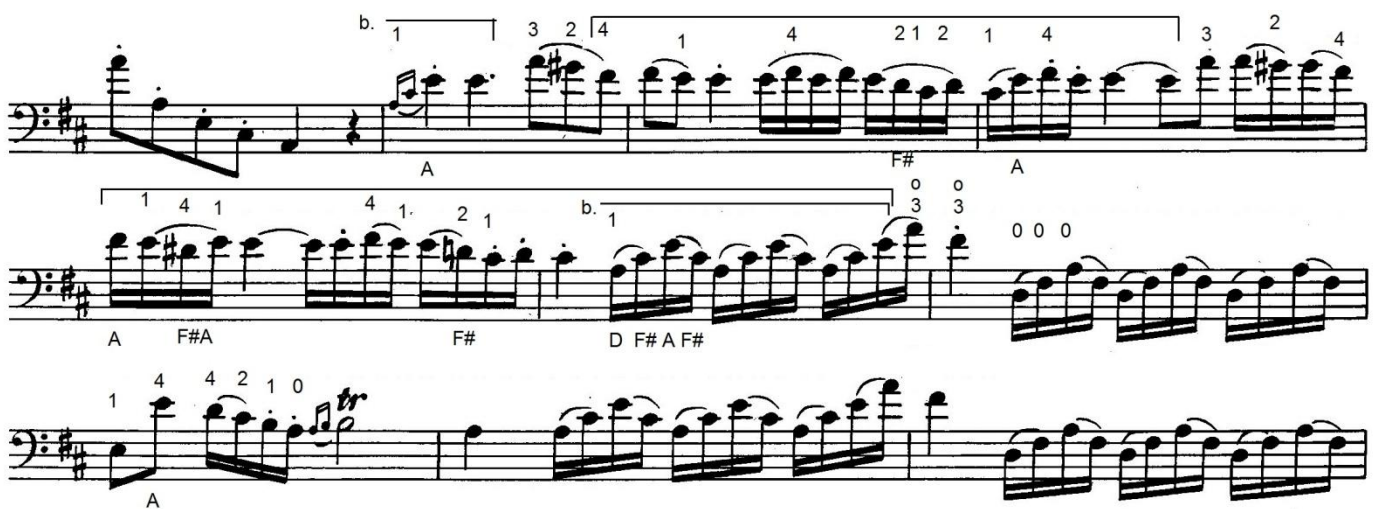
Figure 32. Mozart Concert Aria *Per questa bella mano*, bar 9-13 - Fingering 1

Figure 33. Mozart Concert Aria *Per questa bella mano*, bar 9-13 - Fingering 2

\*  = Thumb on harmonic

In this passage, it implies to use a ‘bariolage’ technique, which is a term ‘to describe the alternation of notes on adjacent strings, one of which is usually open, was commonly employed in the eighteenth century’<sup>8</sup>. In this piece, Mozart used double-stops as the stop notes, which increased the virtuosity. In the fingering of figure 32, the upper double-stops are played on higher strings, which can produce brighter timbre. However, one has to jump over an open string in the middle for every group with the low A1 is involved, which is rare in ‘Bariolage’ excerpt. In the fingering of figure 33, the upper double-stops are played on lower strings. The timbre would be darker. But the alternation of notes is always on the neighbour strings. This fingering seems more corresponding to the concept of ‘Bariolage’. I believe that the fingering of figure 33 was more possibly used in history.

Figure 34. Vanhal *Double Bass Concerto*, mov.I



This is a characteristic solo passage for the Viennese double bass: less shifting on conjunct, bar fingering on major third chord.

<sup>8</sup> Stowell, Robin. *Violin Technique and Performance Practice in the Late Eighteenth and Early Nineteenth Centuries*, p.172. Cambridge, 1990



Dittersdorf has written two concertos for the Viennese double bass. Concerto No.2 is one of the most famous double bass concertos. The following figure is the excerpt of the 'Alberti bass' part.

Figure 35. Dittersdorf *Double Bass Concerto* No.2, bar 66-73 - Fingering 1

Figure 35 shows the musical score for bars 63-73 of Dittersdorf's *Double Bass Concerto* No. 2, using Fingering 1. The score is in bass clef with a key signature of two sharps (F# and C#). It features a dynamic range from forte (*f*) to mezzo-forte (*mf*). Fingerings are indicated by numbers 1-4 above notes, and bar lines are marked with 'b.' and 'e.'. Chord symbols like AF#, DF#, A1F#, and D F# are provided below the staff.

This is the standard fingering for this passage. It has less string cross. But the disadvantages are obvious: 1) Continuously bar fingering on little finger which is a heavy burden; 2) Extension fingering used in every bar. However, there is another fingering solution for the passage.

Figure 36. Dittersdorf *Double Bass Concerto* No.2, bar 66-73 - Fingering 2

Figure 36 shows the musical score for bars 63-73 of Dittersdorf's *Double Bass Concerto* No. 2, using Fingering 2. The score is in bass clef with a key signature of two sharps (F# and C#). It features a dynamic range from forte (*f*) to mezzo-forte (*mf*). Fingerings are indicated by numbers 1-4 above notes, and bar lines are marked with 'b.' and 'e.'. Chord symbols like AF#, DF#, F F#, and A1F# are provided below the staff.

Advantages of this fingering: 1) Most bar fingerings are played on index finger; 2) In the middle two bars where the little finger is doing bar fingering, the index finger can have a rest; 3) Less shiftings; 4) Less extension fingerings.

Disadvantage of this fingering: More string crosses, which is more difficult to the right hand.

## Orchestral part

The Viennese double bass was the dominant type of double bass in Vienna in the classical period. Haydn was very fond of it. Besides the concerto, he also wrote some solo passages for the Viennese double bass in his symphonies. These solos are fine examples to demonstrate this instrument including the fingerings. There are also different options of fingerings.

Figure 37. Haydn Symphony No.31, mov.IV var.7 - Fingering 1

Variation 7  
Moderato

4

9

14

A

F# A

F# A<sup>6</sup>

F# A<sup>6</sup>

F# A<sup>6</sup>

A

F# A<sup>1</sup> F# D

F# A

This fingering is preferable played on higher string (especially the top A string) with a lot of shiftings which is more solo characteristic. There is another fingering solution for this excerpt.



Figure 38. Haydn Symphony No.31, mov.IV var.7 - Fingering 2

Variation 7  
Moderato

A1 D F#D A1 D<sup>6</sup> F# A A1/A A F# A1F# D F#

4 D A1 D F#D F#D F#D<sup>6</sup> F#D A1D<sup>6</sup> A1

9 A1 A F# A F# D F#<sup>3</sup> A F# D A1 D F#

14 DF# A F# D A1 D<sup>6</sup> F# D A1F# D F# A

This fingering is based on thumb position with a lot of string crosses. Notes are often played on higher position of lower strings, which would produce a darker timbre than the previous fingering. But the use of harmonics would have a warm and resonant sound. There is also a major advantage that almost the whole passage could be played without shifting until the last second bar. It makes perfect sense on the instrument. I believe the second fingering is more likely the historical way of playing the Viennese double bass. This excerpt is also a textbook. Besides the fingering, it also implies it could be a different aesthetic concept of timbre in that period.

Figure 39. Haydn Symphony No.45, mov.IV bar 55-67

The musical score for Figure 39 shows the Cello and Bass parts for Haydn's Symphony No. 45, movement IV, bars 55-67. The key signature is D major (two sharps). The score is divided into three systems, each with a Cello staff and a Bass staff. The Bass staff includes extensive fingerings (numbers 1-4) and chordal markings: F#D, A D, A D, F#D, F#D, and A F#. The first system (bars 55-56) includes the instruction 'si parte' with fingerings 0 0 1 0 2 1 4. The second system (bars 57-61) includes the instruction 'A1A' and fingerings 1 2 1 4 1 2 2 4 2 3 4 2 1 3 2 1. The third system (bars 62-67) includes the instruction 'si parte' with fingerings 2 4 2 1 4 1 2 4 2 1 4 2 1 4 2 1 0. Chordal markings in the third system include AF#, A1F#, A1F#, AF#, F#A, DF#, and A1.

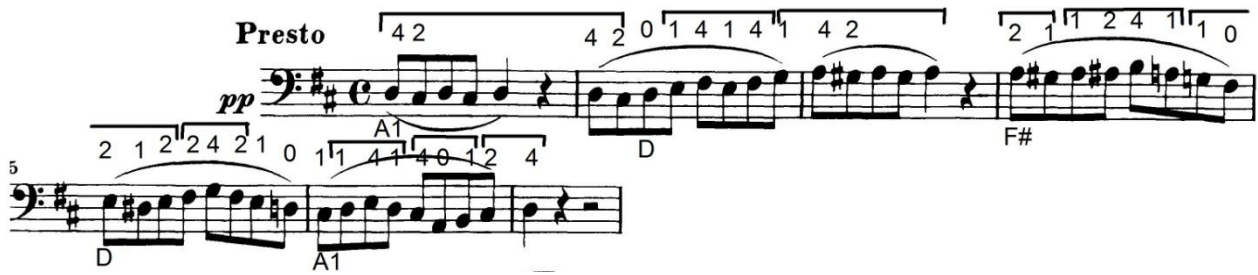
The double bass solo part in the last movement of Haydn's symphony no.45 (Farewell) is an example of the combination of various fingerings. It could include the 'Bariolage', chordal fingering and extension fingering.

Mozart's orchestral parts are also excellent fingering examples for the Viennese double bass.

Figure 40. Mozart Overture to *Le nozze di Figaro* - Fingering 1

The musical score for Figure 40 shows the Presto section of Mozart's Overture to *Le nozze di Figaro*. The key signature is D major (two sharps). The score is divided into two systems, each with a Bass staff. The first system (bars 1-4) includes the instruction 'Presto' and 'pp' (pianissimo). The second system (bars 5-8) includes the instruction 'A1' and fingerings 2 12 0 1 0 2 0 4 0 1 0 4 0 1 4 0. Chordal markings in the second system include D, F#, D, A1D, A1, and D. The first system includes fingerings 4 2 4 2 0 1 4 1 0 1 4 2 4 2 0 1 2 0 1 0.

Figure 41. Mozart Overture to *Le nozze di Figaro* - Fingering 2



The above are two fingerings for Mozart's Overture to *Le nozze di Figaro*. The first one is played preferable with open strings. It has easier work for the left hand and less shiftings. But it requires string cross within a single slur for several times, which demands more smooth bowing to make the string cross inconspicuous. However, the second fingering keeps a single slur played on one string, which is easier for the right hand. Of course, it has more shiftings for the left hand. No matter which fingering is chosen by the players, it should be not only a technique choice, but also a musical choice. This example reminds us that the fingering is never an isolated issue. The left hand must cooperate with the right hand in order to find the perfect fingerings.

Figure 42. Mozart Symphony No.35, mov.IV bar 1-31



The following excerpt from Mozart's Symphony No.40 is another proof of the advantage of the Viennese double bass which has much more reasonable fingerings.

## Chapter 4: Fingering on Modern Tuning of the Viennese Double

### Bass and Its Effect

Modern Viennese double bass players often tune the bottom F string to D1. There are advantages of this tuning. It can produce better resonance of the instrument and cover the lower range of double bass part in orchestral music. Of course, we should be aware that when the tuning is changed, the vibration of strings and the resonance of the instrument is already different.

Furthermore, the modern tuning changes the positions of notes on the bottom string and so does the fingering. Sometimes, it not only changes the fingering of bottom string, but also changes the related fingering on the high strings.

Figure 45. Historical tuning of the Viennese double bass

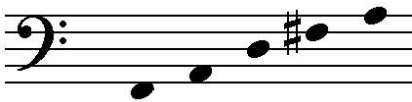
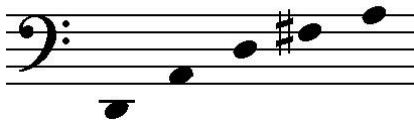


Figure 46. Modern tuning of the Viennese double bass



Here is an example from bass part of Haydn *Die Schöpfung*.

Figure 47. Haydn *Die Schöpfung* - Fingering on the historical Viennese double bass tuning

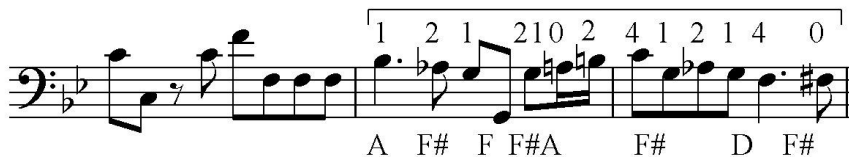




Figure 48. Haydn *Die Schöpfung* - Fingering 1 on the modern Viennese double bass tuning

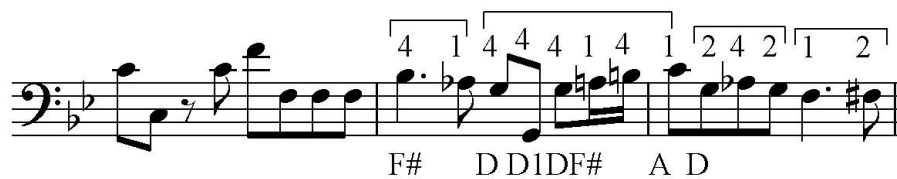
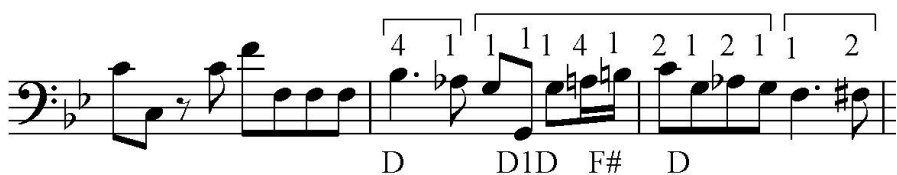


Figure 49. Haydn *Die Schöpfung* - Fingering 2 on the modern Viennese double bass tuning



In the fingering of historical tuning, left hand stays in half position. Excerpt is played on lower notes of higher strings or open strings. In the fingerings of modern tuning, left hand is in higher positions. Excerpt is played on higher notes of lower strings without open string. It produces different sounds in different positions. Generally, a note played on higher position of lower string sounds darker and warmer than the same one played on lower position of higher string. The open string is even brighter. Thus, the modern tuning of Viennese double bass changes some related fingerings and in the meantime the sound is also changed.

## Conclusion and further questions

The Viennese Double Bass was a dominant type of double bass used in the Classical Period in Vienna. It usually has 5 string, tuned in  $F_1$ (or  $G_1$ )- $A_1$ -D-F#-A, with frets. Unfortunately, we can barely find any historical material that was written down on the fingering of this instrument.

In my research, I try to find a historical fingering system of the Viennese double bass, as well as modern solutions.

In chapter 2, through the analysis of the history of fingerings on various double basses documented in historical methods, we can find the pattern of fingering that is often related to the tuning intervals. In short, double basses with larger intervals (tuned in 5th/4th) are usually played with more fingers ('1-2-3-4' system); double basses with smaller intervals (tuned in 4th) are usually played with less fingers ('1-2-4' system). Thus, the Viennese double bass was possibly using a '1-2-4' fingering system, since it has even smaller intervals (3rd/4th). In fact, the tuning itself implies the usage of fingers.

In chapter 3, I give my suggestion of specific fingerings, including basic fingerings (scales, arpeggios), exception fingerings (chordal fingering, octave fingering). Playing octaves is a particular difficulty for the Viennese double bass. I try to use multiple solutions, including basic fingering, chordal fingering, shifting strategy and extension fingering.

With excerpts of solo works and orchestral parts, I give further explanation of the fingerings. These excerpts demand high playing technique and exploit the full potential of the instrument. The music and the instrument themselves are actually teaching us how to use our fingers. We can have some conclusions through the detailed discussion: The Viennese double bass is preferable to be played with more string crosses and less shiftings. Even in the thumb position, it could still prefer to play on high position of lower string, which would produce a warm and resonant timbre of the instrument. The chordal fingering could be widely used not only in solo works, but also in orchestral music. The 'bariolage' technique was probably used on adjacent strings. In some orchestral parts, the fingering of the Viennese double bass makes much more sense than the fourth-tuning double bass.

In chapter 4, I try to point out that the modern tuning of the Viennese double bass could cause alteration of the historical fingerings. Furthermore, it would also change the timbre.

In the end, I would like to leave some questions for the future. I hope to have a further research on the fingerings that are affected by the temperament reason. In the orchestra of 18<sup>th</sup> century in Vienna, the double bass was the only fretted string instrument, which would cause some issues of the intonation. Especially on the F# string, it would have a significant influence. Some of the stop notes on the F# string would have different intonation to other strings because of the various temperaments. One would have to make a choice to play the

same note on which string. However, in most of the quick passages, we don't have any choice of string. Actually the F# string implies the increasing use of the equal temperament. Of course, these questions are beyond my current research topic. But they are actually very important and really matter to the musical environment of the 18<sup>th</sup> century Vienna.



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