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**Extended techniques on the saxophone;**

**how to deal with them and the science behind**

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**Table of Contents**

[Chapter One: Introduction 4](#_Toc166076274)

[Research Question and motivation 4](#_Toc166076275)

[State of the Art 4](#_Toc166076276)

[Methodology 5](#_Toc166076277)

[Step 1: Gathering sources 6](#_Toc166076278)

[Step 2: Interview, survey 6](#_Toc166076279)

[Step 3: Personal artistic experiments 6](#_Toc166076280)

[Chapter two: Explanation of Extended Techniques 6](#_Toc166076281)

[Extended techniques in “L’air d’ailleurs - Bicinium” 6](#_Toc166076282)

[Colour / timbre trills or bisbigliando 7](#_Toc166076283)

[Various effects 7](#_Toc166076284)

[Extended techniques in “*Saxophonequartett”* 9](#_Toc166076285)

[Quarter tones, Sixth tones and Twelfth tones 9](#_Toc166076286)

[Harmonic Multiphones / Multiphones 11](#_Toc166076287)

[Extended techniques in “*Babioles”* 12](#_Toc166076288)

[Slap 12](#_Toc166076289)

[Subtone / Niente 13](#_Toc166076290)

[Flutter tonguing 14](#_Toc166076291)

[Extended techniques in “*L’eveil de la toupie”* 14](#_Toc166076292)

[Altissimo register 15](#_Toc166076293)

[Double tonguing 15](#_Toc166076294)

[Glissando 15](#_Toc166076295)

[Chapter three: approaches in working on extended techniques 16](#_Toc166076296)

[Approaches on extended techniques in *“L’air d’ailleurs - Bicinium”* 16](#_Toc166076297)

[Colour trills / bisbigliando 16](#_Toc166076298)

[Various effects 18](#_Toc166076299)

[Approaches on extended techniques in “Saxophonequartett” 19](#_Toc166076300)

[Bibliography 20](#_Toc166076301)

# Chapter One: Introduction

## Research Question and motivation

In my master's thesis I will talk about the extended techniques of the saxophone and my experience with them in the pieces I play for my master recital. I chose this topic because, in the past few years, I have started to play pieces that require the performer to play an instrument in a special way. It often requires a lot of effort before a performer can comfortably perform a section of extended techniques. This leads me to the following main research question:

* How can I as a saxophonist practice extended techniques?

This question can be further subdivided in two subquestions:

* Which extended techniques do I have to use in the pieces I play, what are they in the first place and how do you play them?
* What are some of the approaches in working on extended techniques and how do they compare to mine?

The answer to these questions would not only help other inspiring musicians but would also be a great way to see how I deal with those problems myself. Where am I losing time and what could I have done to master a certain technique faster and better. To understand myself better and to try to explain things I take for granted.

For my master recital I have made a selection of compositions which can help me find an answer to my artistic research questions. This selection will be the following:

The piece that I would play first on my recital would be by **Fabien Levy** and it is called *L'air d'ailleurs – Bicinium*. It is a solo piece with electronics where you have to not only play your saxophone but also be in charge of a reverb pedal and have to move closer and further away from the microphone. I think it would serve as a great example of extended techniques as it is required to play double tunging, slaps, glissandos, quartertones, and many more on the saxophone.

The second piece that I would play is a piece by **Georg Friedrich Haas** called *Saxophonquartett*. It is a piece for a saxophone quartet, and it shows extended techniques like quartertones, sixthtones, twelvetones and harmonic multiphones. It is not so often that we see the use of these kind of extended techniques. Moreover, it would be great to show my chamber music skills in a piece like this and prove that I can play also tenor saxophone.

The third piece in my master recital would be a solo piece by **Marc Monnet** called *Babioles*. It is a twelve-minute piece divided into six smaller movements each one showing one of the characteristics of a circus man. It is quite a taxing piece to perform due to its very clear writings that demand the performer to be precise in his playing, especially in the dynamics. Besides that, it also includes extended techniques like slap, glissando, and quartertones.

The last piece would serve as a kind of mix of all the extended techniques. It is written for alto saxophone and piano and it is called *L'eveil de la Toupie* by **Vincent David**. It includes almost all of the extended techniques mentioned in the pieces before with an emphasis on the altissimo register and would therefore be great to conclude my master exam.

## State of the Art

To formulate an answer to my research question I have gather various kind of sources such as books, articles and recordings. Firstly, I found a doctoral essay from Matthew Jeffery Taylor [2012] on teaching extended techniques on the saxophone. It offers a great understanding of not only learning extended techniques but also trying to teach them to other people and the best ways to do that. Another doctoral essay as an example could be from Iain Harrison [2012]. This source is full of useful information about extended techniques and their use in actual concrete pieces of the saxophone repertoire. However, my research will focus on different pieces, so it would be interesting to see the same extended techniques used in another way. Besides that, I will try to show you my side of the extended techniques and my way of working on them.

Various books on extended techniques could help me answer the question. One of them is from a legendary saxophonist Jean-Marie Londex [1989] and it is called *Hello Mr. Sax ou parametres du saxophone*. In it, he talks about the parameters of saxophone and its possible uses in the saxophone repertoire. Another book that is very well-known in the saxophone community is by Daniel Kienzy [2003] called *Les Sons Multiples aux Saxophones*. It offers almost all of the saxophone multiphones on all four saxophones and is a great resource for studying them. Another book worth checking out would is by Larry Teal [1963] called *The Art of Saxophone Playing*. It was revolutionary for its time placing a big emphasis on the embouchure (since it was still heavily influenced by the clarinet) and developing the subtone technique. The book is in many ways regarded as the start of the American school of saxophone playing. Similar to the book of Lary Teal is a book by John Harle [2017] called *The Saxophone*. It offers an in-depth reference on playing the saxophone in this modern era. It explores various techniques with illuminating illustrations and new perspectives on embouchure, tone production, and other extended techniques. I have to also mention a book written by a great saxophone teacher in Lyon, Jean-Denis Michat [2010], called *Contemporary Saxophone*. A great book about not only extended techniques but also posture, tone quality, timbre, performance, and all sorts of various things.

Let us not forget about several videos that would help us in our quest for extended techniques on the saxophone. One great series of videos about the extended techniques was made by Joshua Hyde [2020]. The series is called "Composer Resources" and consists of twenty-one videos where he explains all of the possible effects on the saxophone. It is not only a great resource for composers who want to get to know the saxophone better but also for saxophone players who would like to understand the effects better. Another great video series is by Grace Kelly and Leo P, also known as "2SAXY" [2024] called "Saxophone & Performance Masterclass" where they talk about improvisation, altissimo register, bending the tone, vibrato, and many more extended techniques. This video series reminds us that one can use extended techniques also in jazz improvisation. One of the many video series that I found interesting is by Sean Hurlburt [2020] and it is called "Saxophone Altissimo". It takes a deeper look into alto saxophone altissimo and the origin of the fingerings. Sean also has some other playlists on his channel that explore some of the other saxophone techniques.

One of the people who could help me immensely in my research is my teacher, Simon Diricq [2020]. His knowledge of extended techniques and general saxophone knowledge is very large. He is aware of unusual fingerings and methods that are not very well known. He could help me deepen my knowledge about the saxophone. Another person who would be able to offer a different perspective on extended techniques is Vincent David [2020]. As a professor of saxophone with more than twenty-five years of experience and as one of the innovators in contemporary saxophone am sure have a huge insight into the world of extended techniques.

My research contributes to the existing materials in a way, that would put them through a test. That way I can share my experience with them and write if I found them helpful or not. Try to find out a better way of practicing extended techniques or show a new, unconventional way of practicing them.

## Methodology

The methodology of this research will consist of the following steps:

### 

### Step 1: Gathering sources

Firstly, I have to gather all the crucial sources mentioned in State of the art. Sort out the ones that do not apply in my research and focus more on the ones that do. Try and read as many articles as possible, books, doctoral essays and video and audio recordings. Anything that might help me in my research.

### Step 2: Interview, survey

Sources like an interview, survey or an experiment are a great way to gather unique material. They are great, because you can make the parameters as you see fit and does not require to adjust yourself for the data. In an interview I would be able to ask some very specific questions that would help me the most instead trying to get something for everybody. The same goes for the survey and the experiment. Just the possibility to have something tailored for your research is very attractive.

### Step 3: Personal artistic experiments

In this step I would concentrate on keeping track of my personal development on the extended techniques. How it changed over time and how I did I discover new methods of practicing. Perhaps the best way for this could be to keep a logbook of my practice routine and write down what I wanted to learn and what I achieved in a practice session. What has changed from last time and how I evolved with the piece itself.

# Chapter two: Explanation of Extended Techniques

In this chapter I would like to explain the main ideas of the extended techniques in each of the four pieces that I will play for my master examination. Since there are so many in each of the pieces, I will focus only on the ones that I think are special to the piece and are not seen very often elsewhere.

## Extended techniques in “L’air d’ailleurs - Bicinium”

The following is a list of all of the extended techniques we can find in this piece:

* Quartertones
* Key-striking with sound
* Slap
* Colour / timbre trills (Bisbigliando)
* More covered, more muted
* More open, brighter
* Close to normal tone colour
* Crescendo with *“reverse sound”*
* Aeolian sound
* Subtone / Niente
* Moving closer and further away from the microphone
* Breathy sound
* Glissandos
* Flutter-tonguing
* Multiphones
* Double tonguing
* Altissimo register

There are various extended techniques that are quite special in this piece, and I think would be nice to explain them in more detail.

### Colour / timbre trills or bisbigliando

Bisbigliando or timbre / colour trill originates from the harp where the player needs to quickly alternate between two strings tuned to the same pitch. On the saxophone you would need to use slightly different fingerings then traditional for the same pitch in order to achieve a new tone colour as close to the original pitch. Something that would sound as the note being played normally, but with a change in timbre. The specialty of this piece is that the composer writes what kind of bisbigliando he wants - a more open one, closed one or one that is as close to the original note as possible.

Here we have a legend that explains to the performer when to play which bisbigliando.

A close up of words

Description automatically generated

Here is an example of a bisbigliando trill in this piece. Notice how it is required that we play one Sib more open and the other one more closed that the normal Sib.

A black and white image of a music note

Description automatically generated

And here in this example we can clearly see all of the bisbigliando possibilities.

A close-up of a music note

Description automatically generated

### Various effects

#### Crescendo with reverse sound

This piece also uses several special effects. The first one I would like to highlight is the crescendo with *“reverse sound”.* In principle this sound effect could be explained by making a normal crescendo, but really pushing the sound at the end. To complete the crescendo as late as possible.

You can recognize it by two lines pointing upwards and downwards at the end of the crescendo.



And here, we can see *”reverse sound”* crescendo in action starting from mezzo-piano going to forte.

A musical note with a letter and a symbol

Description automatically generated with medium confidence

#### Reverb pedal and moving closer and further away from the microphone

Another special sound effect is made with the help of a microphone. By pressing the pedal and playing into the microphone, you can achieve the effect of reverb on the saxophone. That is certainly not something you see in every piece with electronics, especially with pieces that do not use electronics. Besides using the pedal, you must also move closer or further away from the microphone. This helps to amplify the reverb sound.

Here we can see both of the terms explained in the legend.



A close-up of black text

Description automatically generated

And in this example, we can see both of the techniques being used.

A close-up of a math problem

Description automatically generated with medium confidence

#### Aeolian sound / blowing into the instrument

One minor extended technique that is often overlooked by its simplicity is simply blowing into the instrument without making any pitch sounds. In the legend it is written as an aeolian sound, which comes from flute techniques. It is referring to the way you blow into the flute by changing the embouchure and airflow strength. In our score it simply says blow or “*Souffle”* on top of the note.



A close-up of a music note

Description automatically generated

#### Key striking with sound

Finally, one technique that is also quite special in this piece is key striking with sound, double tonguing, flutter tonguing and blowing all together at the same time. Combining a lot of different extended techniques together leaves us with a cluster of sound that is perhaps unique to this piece.

A diagram of a sewing machine

Description automatically generated with medium confidence

## Extended techniques in “*Saxophonequartett”*

First let us start by listing all of the extended techniques we can find in this piece:

* Quartertones
* Sixth tones
* Twelfth tones
* Harmonic multiphones
* Subtone
* Altissimo register

There are not as many extended techniques in this piece as in previous, but they are very special nevertheless and some of them are used very rarely. Let us take a closer look.

### Quarter tones, Sixth tones and Twelfth tones

The idea of a quarter tone is simple. A pitch in between a semitone. Now the sixth tones are between the quarter tone and normal tone and the twelfth tone is between a sixth tone and a normal tone.  That would lead us to the conclusion that there are two extra steps in between normal pitch and a quarter tone. That means that there are twelve steps just between one whole tone!

Here are all of the quarter tone possibilities:

This one explains the quarter tones.

A white background with black text

Description automatically generated

This one explains the sixth tones.

A close-up of a white background

Description automatically generated

And this explains the twelve-tones.

A close-up of a text

Description automatically generated

Finally, this graph explains us all of the possible combinations between the quarter tones, sixth tones and twelfth tones.

A white sheet with black text

Description automatically generated

With all this material, the composer cleverly uses is to compose a piece full of dissonance and tension. One example of the use of all the micro tones are in the beginning of the piece where he effectively writes out a glissando using previously mentioned techniques.

In this example we can see that we start on Si and are then taken through the twelve steps to Do#

A diagram of a musical instrument

Description automatically generated

There are also other instances where the composer uses these techniques. One good example could be found here in this image (the score is written in C):

Notice how there is a cluster of notes in between MIb and Mi♮? The Baritone plays a MIb, the tenor plays Mib with a twelve tone higher, the alto plays Mi ♮ with a twelve tone lower and the soprano plays Mi ♮. This kind of chord creates a special kind of cluster that is quite uncommon.

A sheet music with musical notes

Description automatically generated

There comes a point in the piece, where we can see two groups, divided on soprano and alto (group one) and tenor and baritone (group two) that start to play quartertones while being a quartertone apart and being an octave and fourth apart. This creates a very special line of melody and tension that I think is very unique.

A sheet of music with notes

Description automatically generated

### Harmonic Multiphones / Multiphones

When we are talking about multiphones we often think about an ugly sound that often includes quartertones and is difficult to produce on the saxophone. Usually with a not so comfortable fingering. However, this is not the case here. The composer cleverly takes advantage of the saxophones ability to play harmonics. In this case not just one but multiple at the same time, in order to create this colour template of the saxophone. It is also very cleverly used as a kind of bass where the other three voices support it.

Here is an example of how the harmonic multiphone looks like in the first place.

A close-up of a music note

Description automatically generated

And in this example, we can see how the composer makes use of this harmonic multiphone by putting notes from the multiphone in other voices so that they become more apparent.

A sheet of music with notes

Description automatically generated

Of course, this kind of harmonic multiphones are not very common. Usually, multiphones come with their own set of fingerings. Some are easier to play than others. In most cases the multiphone is based on a fundamental pitch in the multiphone on which all of the other harmonics are based on. Let us not forget that it is often required to change our embouchure position, our air direction and air strength to achieve the required multiphone.

As you can see in this example from Fabien Levy’s L’air d’ailleurs, there are fingerings written on top of the multiphones. In some cases, multiple fingerings are possible, we can also notice which will most likely be our fundamental note. On the third beat in the bar, we should hear a smallp portato glissando from FA-to-FA

A close-up of a music note

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Quite often we must start with a normal note which then morphs into a multiphone. This is exactly what is happening in this example. The REb becomes the fundamental of the multiphone. In these cases, it is useful to make some of the fingering already on the note before the multiphone so that the transition is as smooth as possible and we can avoid the noise the change of the keys makes, especially here where we have written a pianissimo.

A close-up of a music note

Description automatically generated

## Extended techniques in “*Babioles”*

Like before, let us start by listing all the extended techniques found in this piece:

* Slap
* Quarter tones
* Subtone / Niente
* Glissandos
* Flutter tonguing
* Air sound
* Circular breathing

In the next chapters I would like to take a closer look at the extended techniques that are present in this piece.

### Slap

This extended technique is quite common in contemporary pieces. Perhaps because of its sound colour and many possible uses. In principle it should make a slap kind of sound, similar like on the bass guitar or other wind instruments like oboe or clarinet. For the musician to perform slap he or she should create suction on the reed so that it is pulled away from the mouthpiece and then when the tension breaks, the reed “*slaps”* back against the mouthpiece. That will create a kind of sound that is like a very violent attack but drier and with a different sound colour.

In principle we know many ways to perform slap but the main two in my opinion are open and pitched. The difference between the two is that in an open slap, we focus solely on the suction and release of the tension of the reed on to the mouthpiece. We are interested more in the percussive kind of sound. In a pitched slap, we put more emphasis on the pitch. For us to achieve that, we need to keep our embouchure in place, keep our mouth shut and add a bit of air while we release the tension of the suction on to the reed. Both have their advantages and can be used in all sorts of ways.

Not to forget that there is also dry slap, which is almost the same as the pitched slap, but the pitch is less obvious. Another technique of slap is a reverse slap, where we put the air before we create the suction and release of the tension. This creates the opposite effect as in pitched slap. Quite often we also see quasi slap in our repertoire. It is basically a mix between a normal attack and a pitched slap. A performer may also start the note with a slap and then continue playing the note. Instead of articulation the beginning of the piece normally, he or she starts with a slap and hold the note through. In this piece however, we only use the pitched slap.

The composer uses two kinds of writings for slap. Here we can see that the head of the notes are normal but since we have slap written on top, we assume that we play slap on those notes written below for the duration of the arrow.

A close-up of a music note

Description automatically generated

The other kind of writing for slap that the composer uses is the one where the heads of the notes are like the letter X with slap writing on top of it. Again, we assume to play slaps for the duration of the arrow and the X shaped note heads.

A diagram of a music note

Description automatically generated

### Subtone / Niente

Subtone is predominately used in the low register of the saxophone due to being less effective once we start using the octave key. Its origins go back to the early jazz era of Ben Webster and his use of a very fluffy kind of subtone. While it is still used to this day, the subtone has also changed over the years, where it is now used in a somewhat different way. The idea is to get rid of all the high partials in the sound. Like a filter that would allow just the low-end parts of the sound instead of the rich and full sound that we normally play with. It allows the performer to play soft dynamics in the low register with a clean sound.

With a good enough control, a performer may also be able to play niente. A technique where the sound gradually disappears into nothing or where it starts from nothing and becomes louder step by step.

There are several places where we could use the subtone in this piece:

First example could be found in the opening two bars of the fifth movement, where we start from pp on Do# and do a crescendo to ff. I think the optimal would be to start with a subtone and then gradually abandon it with the crescendo to achieve the ff. I would also play the Do# in the second bar in subtone.

A close-up of a music note

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And here in this example we notice that we must go to nothing at the end of the bar. I would start the bar playing in mezzo-forte and then gradually add the subtone where I completely disappear at the end.

A close-up of a music note

Description automatically generated

### Flutter tonguing

Before moving on to the next piece I would just quickly like to mention one other extended technique and that is flutter tonguing. It is a technique where the performer flutters their tongue to create this Frrrrr kind of sound. It can also be produced by using your throat. It is quite present throughout the piece.

Here is an example of the flutter tonguing in the piece.

A drawing of a bow tie

Description automatically generated

## Extended techniques in “*L’eveil de la toupie”*

This piece includes the following extended techniques:

* Colour trills (bisbigliando)
* Quartertone trill
* Flatter tonguing
* Glissando
* Slap
* Subtone / Niente
* Double tonguing
* Altissimo register
* Air noise / breathy sound
* Multiphones
* Low La on the alto saxophone
* Use of side keys in trills or a passage

Like before, I would like to explain some of the extended techniques in more detail.

### Altissimo register

Altissimo register is a register on the saxophone for which there are no specific keys, but rather a combination of them. That means that there are multiple fingerings for one note in the altissimo register. Some work better than others but there are of course endless possibilities. This piece uses quite a lot of altissimo register and in fact reaches quite high on the saxophone (Mib in the fourth octave). It is sometimes hard to find a good fingering for the altissimo register that does not disturb the equality of sound. Sometimes it is required to change the fingerings in the normal register so that the jump to the altissimo register is less evident.

One such example is found here where we must seamlessly switch between the normal register and altissimo register.

A black and white drawing of a scale

Description automatically generated with medium confidence

### Double tonguing

### 

This extended technique is helping the performer to play articulated fast passages that are too fast to play with normal tonguing. One can achieve double tonguing by articulating every other note with your tongue and doing all the rest with the throat.  The idea is for the tongue to make a movement similar to saying the words TA–KA–TA–KA, with TA being articulated by the tongue and the KA by the throat. The vowels change depending on the context of the music. For example, in quiet dynamics the vowel may be DU-GU-DU-GU. The vowels also vary from instrument to instrument, since the angle of the mouthpiece is different on the clarinet or oboe for example. There is also a technique of triple tonguing or even quadruple tonguing. In these two techniques one plays two (or three for quadruple) times with normal a normal articulation and once with your throat. So, the tongue should be saying the vowels TA-TA-(TA)-KA. In this piece however, only double tonguing is needed.

Here is an example of a place where I would use double tonguing.

A black and white image of a musical note

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Another example of double tonguing

A close-up of a music note

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### Glissando

This extended technique is probably the most fun to play out of all of them. It is quite simple to do on the saxophone and it does not take long to learn it. There are two or rather three ways one can perform a glissando. The first one is by slowly opening or closing your keys. This method works well if one has to perform a glissando to or from a neighbouring note but usually not so well if there are a couple of notes in between. For that we usually use our throat. One must just be careful to be aware where he or she should finish the glissando and to play with the right intonation in the end. However, usually both techniques are applied at the same time. It helps the glissando to be as smooth as possible.

This glissando for example, I would perform with the throat because of the range of it. On top of that the tempo is much too quick to even try to do it with your keys.

A black and white image of a musical note

Description automatically generated

In this case however, I would simply slowly close the key with my finger since the glissando is only half note apart.

A close-up of a music note

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A black and white image of a music note

Description automatically generatedFinally, in this case I would use both of the techniques combined, since it would help the glissando to be as smooth as possible.

# Chapter three: approaches in working on extended techniques

In this chapter I would like to write about different approaches on the extended techniques I exposed in the second chapter. To begin with, I would like to share some of my approaches in practicing these extended techniques and then explore other possible ways of practice.

## Approaches on extended techniques in *“L’air d’ailleurs - Bicinium”*

### Colour trills / bisbigliando

### 

The first extended technique that we talk about in this piece is the colour trill or bisbigliando. Personally, I start with trying to find a good fingering. Searching and listening to make sure that the colour trill is as close to the actual note as possible. This process gets shorter with experience. I remember a few years ago searching for more than thirty minutes trying to find a good fingering. Adjusting my embouchure and my airflow in an attempt to make a perfect bisbigliando. Now this process goes quite fast. Since a lot of them repeat in other pieces it is easy to remember which fingering to play.

In this case however, this process took a little more time, because I had to focus on the bisbigliando being more open, more closed or as close to the normal tone. In addition to this, I had to make sure that I could play all three with a fingering I could easily switch between. There were a lot of fingerings that would sound better, but I was forced to adapt them to be able to do a smoother transition between them.

One thing worth noting is that the colour trills vary from saxophone to saxophone. There is a place in the score, where the composer writes the fingerings on top of the trill. Unfortunately for me I found them not so accurate on my saxophone, so I was forced to adapt them a bit.

A close-up of a music note

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Fabien Levy. L’air d’ailleurs - Bicinium. Bar 34.

If we now, try and compare the colour trills in L’air d’ailleurs - Bicinium by Fabien Levy and Vincent David’s L’eveil de la Toupie the main difference is the speed of them and their use in the piece. There are only two instances where we actually trill with the bisbigliando in the piece by Fabien Levy, all of the other uses for the bisbigliandos are tones on their own without any trill. As a performer I interpreted the intent of this colour trills not as to trill but to show different colours on the same not and not comparing it to the reference note. In Vincent David’s piece it is exactly the opposite. In my opinion he uses colour trills to make the note more special and to add a bit more sound to the piece. Quite often he pairs the colour trill with the flutter tonguing which make another special effect when combined.

So as an example, we can take a bar from Vincent David’s piece where we can see that the bisbigliando is meant as a trill, meant to add just a bit of new colour to the note.

A close-up of a music note

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Vincent David. L’eveil de la Toupie. Bar 30

And here we can see the colour trill paired with the flutter tonguing.

A close-up of a music note

Description automatically generated

Vincent David. L’eveil de la Toupie. Bar 70 and 71.

In the piece by Fabien Levy it is less about the trill but trying to produce a new colour without making a trill. In a way it makes the switch between the notes more noticeable without the trill which is the effect I think the composer was searching for.

Here is an excellent example of the colour trills without the trills, where we are more interested in the colour not in the trill.

A close-up of a music note

Description automatically generated

Fabien Levy. L’air d’ailleurs - Bicinium. Bars 39, 40.

In conclusion the main difference in colour trills in the pieces is that in L’eveil de la Toupie, we always trill as fast as possible and do not keep one other tone colour, while in L’air d’ailleurs - Bicinium, we are searching exactly for that, and only trill on two separate occasions in the piece.

### Various effects

#### Crescendo with reverse sound

One of the many various effects found in the piece is crescendo with reverse sound. To successfully play it, one must have a tight embouchure, very precise control over airflow and flexible throat. The goal should be to hold your embouchure very tight for as long as possible in the crescendo and then at the very end of it loosen the embouchure. That will allow more air to flow through the instrument which in turn creates this effect of reverse crescendo. The danger here is that when we loosen up our embouchure, we stop blowing, but at that moment we should in fact blow more. The position of your throat also changes from closed to being more open, just like the embouchure. First to make the transition smoother and second, to keep the intonation of the note in tune.

In theory if there exists a crescendo with reverse sound, then surely a decrescendo with reverse sound must exist. It is not present in this piece however, to perform it, one should do the opposite of a crescendo with reverse sound. Now another question arises, what is the difference between a sforzato, forte piano and a decrescendo with reverse sound? In my opinion it all comes down to the attack of the note and the diminuendo afterwards. In sforzato for example, we use a really harsh attack on a note, like it had an accent and a marcato written above it, after that we immediately go to piano, without bridging the loudness gap in-between. In forte-piano we use a softer attack, perhaps just an accent and then go to the piano dynamic, also not bridging the gap. In a decrescendo with reverse sound, we would also play the beginning quite loud, perhaps the most accurate articulation would be an accent with a tenuto. Then we would play a decrescendo from a mezzo-piano all the way down to piano or pianissimo. We would also make a decrescendo between the forte and mezzo-piano, but very fast.

Another approach to the crescendo with reverse sound could be to use just your air. To blow more in simple terms. A softer material would greatly help and improve this effect. It also depends on your saxophone and the mouthpiece you are using. For some people it may be easier to perform this effect than for others.

#### Reverb pedal and moving closer and further away from the microphone

A special extended technique that I also found in this piece is the use of the pedal and moving closer and further away from the microphone. I was hesitating to put these two methods as an extended techniques in the first place, since they are not really a part of saxophone and I felt like an extended technique should be a part of an instrument. The reason why I ultimately did include them was because I realized that they were a part of this piece and in order for me to perform them I need to do things with the saxophone that are not part of it. Something that requires a special or unusual approach in order to be able to perform it, even if it is not part of the instrument. One must nevertheless adapt his or her playing to this extended technique.

Regarding the reverb pedal, one must press it when it is written in the score. Perhaps the easiest allegory is the one of the reverb pedal we find for an electric guitar (ultimately it depends, which kind of pedal are you using). Similarly, we have to press it only half-way sometimes, and other times we let it vibrate. One must get used to the feeling of pressing the pedal, since it is quite unusual at first.

The reverb is made with the help of a computer so we can choose how long the reverb will sound for, and this is perhaps also another special thing about this technique. Choosing the right kind of algorithm for the reverb and testing different kinds of reverb colours.

It also depends on the material we use. Which microphone do we pair together with the speakers, audio-interface, pedal, software and many more things. There are many different combinations and all of them have an impact on how the piece will sound.

And when it comes to moving closer and further away from the microphone, this movement is not really that complicated. Infact many musicians do it naturally when they phrase so it did not pose any great difficulty for me personally. It is also quite logical in the way of writing, and it corresponds with the music perfectly. The only tricky thing maybe is to find a good position for the microphone, since it has to be in a somewhat easy position for the performer to get to but not block the view or be of any disturbance.

#### Aeolian sound / breathing into the instrument

We can again ask ourselves if this is an extended technique in the first place? After all we need to blow into the saxophone to produce a sound. Is that not what we are supposed to do? And yes, I agree, this extended technique may be on the border with not being an extended technique at all, but there are reasons to believe why it could be considered one.

Personally, I think that one of the main reasons I treat is as an extended technique is that you have to change many things in order to get the right kind of blowing effect. It looks quite straightforward, but to play it with the intensity and right kind of sound one would have to adapt his or her embouchure, way of blowing and choose a vowel or consonant on which they will base their blowing on. Different vowels and / or consonants produce different kind of blowing sounds. One could also change the vowels mid crescendo in order to make the crescendo louder or quieter.

For example, one could start the crescendo with the word “su” and then change mid crescendo to “si”. This would amplify the crescendo with a smooth transition between. Couple that with a reverb pedal and you have a wind-like effect.

In conclusion there are a number of things that one must do in order to produce a nice and even blowing effect. Many things need to be in place for it to sound as it is meant to. As easy as it seems it is perhaps not so straightforward. To be fair, it is not so difficult to master this technique, and it is quite easy to replicate after.

#### Key striking with sound

What makes this extended technique special is that it is in fact a mix of various extended techniques sounding together. It is quite complicated to play all the different effects on their own, but combining so many of them together into one big extended technique is quite challenging for the performer. It is difficult to decide which extended technique one will prioritize. In the end, some of the effects are barely noticeable. One must choose which effects he or she wants to showcase more, and which would suit better in that moment of the piece.

To practice this effect, I would recommend firstly to practice each of the effects individually and then gradually add effects together until you can perform this extended technique as it is intended. Perhaps the biggest challenge is to combine the flutter tonguing together with the double tonguing. It takes some time to find a position for your throat that is able to produce both sounds at the same time. For me, blowing is linked with the key striking as I blow more the faster, I produce the key striking's. Then it is just a matter of putting those effects together and making them sound like a flight of a bird.

## Approaches on extended techniques in “Saxophonequartett”

### Quarter tones, Sixth tones and Twelve tones

Working on these extended techniques requires quite a long process to master. There are many ways you can work on these quarter, sixth and twelve tones but in my opinion, there are ultimately just two.

The first option is to find a book or a chart of all the quarter or micro tones and play the fingerings that are notated there. It is a great way to learn all the fingerings fast and does not require a lot of searching. However, it does come with a few setbacks. Since every saxophone is different and many people have different playing styles, the fingerings notated in the book may not be entirely accurate. Often you will have to adapt a fingering for your saxophone.

The second option is to search and discover the options on your saxophone by yourself. It requires much more time than the first option and it can be somewhat tiresome, but I think the result is worth the effort. What you get with this kind of work are unique fingerings that are custom designed for your saxophone and for you as a musician. One can adapt them to their liking and the way they connect with the other notes. One thing is to play the quarter, sixth and twelfth note and another is to connect it with the other notes so that the transition is smooth. Quarter tone fingerings on their own are not so complicated to find, but to make them work with the other fingerings, that is more of a challenge. It also deepens your understanding of the saxophone and its mechanism. The way it works and what could be some non-conventional solutions.

Just to give an example, the quarter tone between sol and sol# is notorious for being impossible to play, due to the way the saxophone is built. However, there is a way around that problem with a slight modification to the saxophone. The idea is to remove a small part of the cork that is located on the back side of the saxophone when you press the sixth key. That will cause one of the holes to not close completely, which will be open just enough to produce this quarter tone effect.

You start to realize that a lot has to do also with the embouchure and where you are blowing into the mouthpiece. That is all part of searching and discovering the fingerings. This could also be another way of working with the quarter tones. The material one is using is in this case very important and can have a big impact on the sound later.

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