# Section V:

# Technique Building

# Understanding Transposition

All instruments used in modern bands have evolved over hundreds of years. Even the youngest instruments, the saxophone and euphonium, are over 150 years old and are based on instrument-making principles and practices that have been around for centuries. Since all the instruments were developed during historical times when widespread communication did not exist, the sizes and specifications of horns has never really been standardized until recently. That has caused the instruments of today to continue to be built in various lengths and sizes relative to each other.

The problem of different sized instruments has been overcome with the concept of transposition. Transposition merely means that various sized instruments play music that is notated in different keys relative to their sizes so that they all play the same actual pitch. That actual pitch is called "concert pitch" and the notated music for each instrument is called "written pitch".

While there could theoretically be instruments built at various lengths for each of the twelve keys, we are far more lucky. In bands, there are only four keys represented by modern instruments (unless your band happens to have a Db piccolo, and not many do!). Those four keys are: C, Bb, F, and Eb. While many bands only require members to know their own instrument's key and how to transpose to it, we will learn all four so that we can speak intelligently about each other's horns and their transpositions.

The chart below shows you how to find the transposition for each instrument based on the chromatic scale, which is fine for now. You should, however, memorize the Master Scale Matrix found later in this section because it is much easier to find an instrument's transposition information in that way.

| **Concert** | **C** | **C#/Db** | **D** | **D#/Eb** | **E** | **F** | **F#/Gb** | **G** | **G#/Ab** | **A** | **A#/Bb** | **B** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **C** | C | C#/Db | D | D#/Eb | E | F | F#/Gb | G | G#/Ab | A | A#/Bb | B |
| **Bb** | D | D#/Eb | E | F | F#/Gb | G | G#/Ab | A | A#/Bb | B | C | C#/Db |
| **F** | G | G#/Ab | A | A#/Bb | B | C | C#/Db | D | D#/Eb | E | F | F#/Gb |
| **Eb** | A | A#/Bb | B | C | C#/Db | D | D#/Eb | E | F | F#/Gb | G | G#/Ab |

You can see that when an E is called for in Concert pitch, the C instruments will play an E (they've got it easy!), Bb instruments will play an F# or Gb (just follow the column down to the Bb instrument line), F instruments play B, and Eb instruments play C# or Db.

By the way, when we say F# or Gb, we are really saying the two different names for one pitch. F# and Gb also look differently when notated on a staff, but they sound and are fingered exactly the same. This is called enharmonic note names – and you have to

pronounce it with an "eh" sound at the beginning because there is something completely different that is called "inharmonic". More on that later, though.

Just like we divide the instruments into families of woodwind, brasswind, and percussion based on how sound is generated on the instruments, there is another set of families to which each instrument belongs. That is its key family. Please memorize the table below so that you will know exactly which key family each instrument belongs in.

| Concert Instruments | Bb Instruments | F Instruments | Eb Instruments |
|---|---|---|---|
| Flute | Clarinet | F Horn | Alto Saxophone |
| Oboe | Bass Clarinet | English Horn | Baritone Saxophone |
| Bassoon | Soprano Saxophone | | |
| Trombone | Tenor Saxophone | | |
| Euphonium | Trumpet | | |
| Tuba | | | |
| Percussion | | | |

Once you memorize the Master Scale Matrix, it will be easy to remember how to transpose all four key families from concert pitch and between each other. For now, just remember the rule that:

C instruments play the given concert pitch; Bb instruments play the second pitch of the major scale on which concert pitch begins; F instruments play the fifth note of that same major scale; and Eb instruments play the sixth note of the major scale. Until you memorize the Master Scale Matrix, though, keep checking transpositions on the chromatic scale table above.

## The Order of the Flats and Sharps (& Math for Monks)

This section is asking you to do a lot of memorization. Whether we like it or not, there is some basic information in every subject that is worth knowing; having that information right there on the tip of our tongues saves us lots of time and energy later on. Nobody wants to go to a doctor who has to check his books to find out you need cough syrup for a cough. As musicians, the information in this section is that kind of basic musical knowledge that all good musicians must have on the tips of their tongues.

Fortunately, the order of the flats and sharps is easy – and kind of fun. To remember the order of the flats - in other words, the order they ALWAYS appear in a key signature (go ahead, go look at any piece of music with flats in the key and you'll see they are always in this order) – just think of the word "bead" and the math term "greatest common factor". The order of the flats is **BEADGCF**.

To remember the order of the sharps, remember the sentence: "Four cops got drunk at Eddie's bar." (Or, as one student told us it would be nicer to say, "Four cops got donuts at Eddie's bakery.") Either way, the order of the sharps is **FCGDAEB**. Again, check out a piece of music to see where the sharps in the key sig fall.

Notice anything about the two? Any patterns? Start looking for patterns in music. It is full of them. And nothing screams "patterns" like the order of the sharps and flats. Because of their mathematical relationship to each other, almost everything in music can be reduced to a pattern or mathematical representation.

In fact, music was once one of seven subjects students studied at European universities. Now, when we say "once", we are talking about centuries ago. Universities in the middle ages were the places that priests and monks – about the only folks at that time besides the very wealthy that got to learn stuff – went to study. Along with arithmetic, geometry, and astronomy, music was considered a math course. The other three courses – grammar, logic, and rhetoric – were actually taken first and had to be passed by everyone before they could move on to the maths. For extra credit, remember that the three beginner courses were called the trivium ("tri" means "three") and the four more advanced courses were called the quadrivium (quad = four; get it?).

# The Circle of Keys & Master Scale Matrix

The following few pages contain what teachers in other classes would call "graphic organizers". These charts are terribly important pieces of each student's musicianship. They are like multiplication tables in arithmetic, the parts of speech in grammar, and the periodic table of the elements in chemistry. In other words, you absolutely have to understand the Circle of Keys and the Master Scale Matrix to be considered even a decent novice musician. In fact, you must have both memorized so well that you can reproduce them from memory if given only a blank sheet of paper and something to write with. It sounds like a tall order, but you will find it easier and easier to do each time you practice.

Once again, none of these ideas is new – almost nothing in music is. They have been borrowed from educators like Ed Lisk, Jamey Aebersold, and Ron Curtis – who, by the way, all borrowed them from someone else. To help you build your own Circle and Matrix on the following pages, here is a graphic organizer from Mr. Lisk that will help you understand how keys and scales relate to each other in music.:

**C – F – Bb – Eb – Ab – Db – Gb – Cb**
**C# - F# - B – E – A – D – G → C**

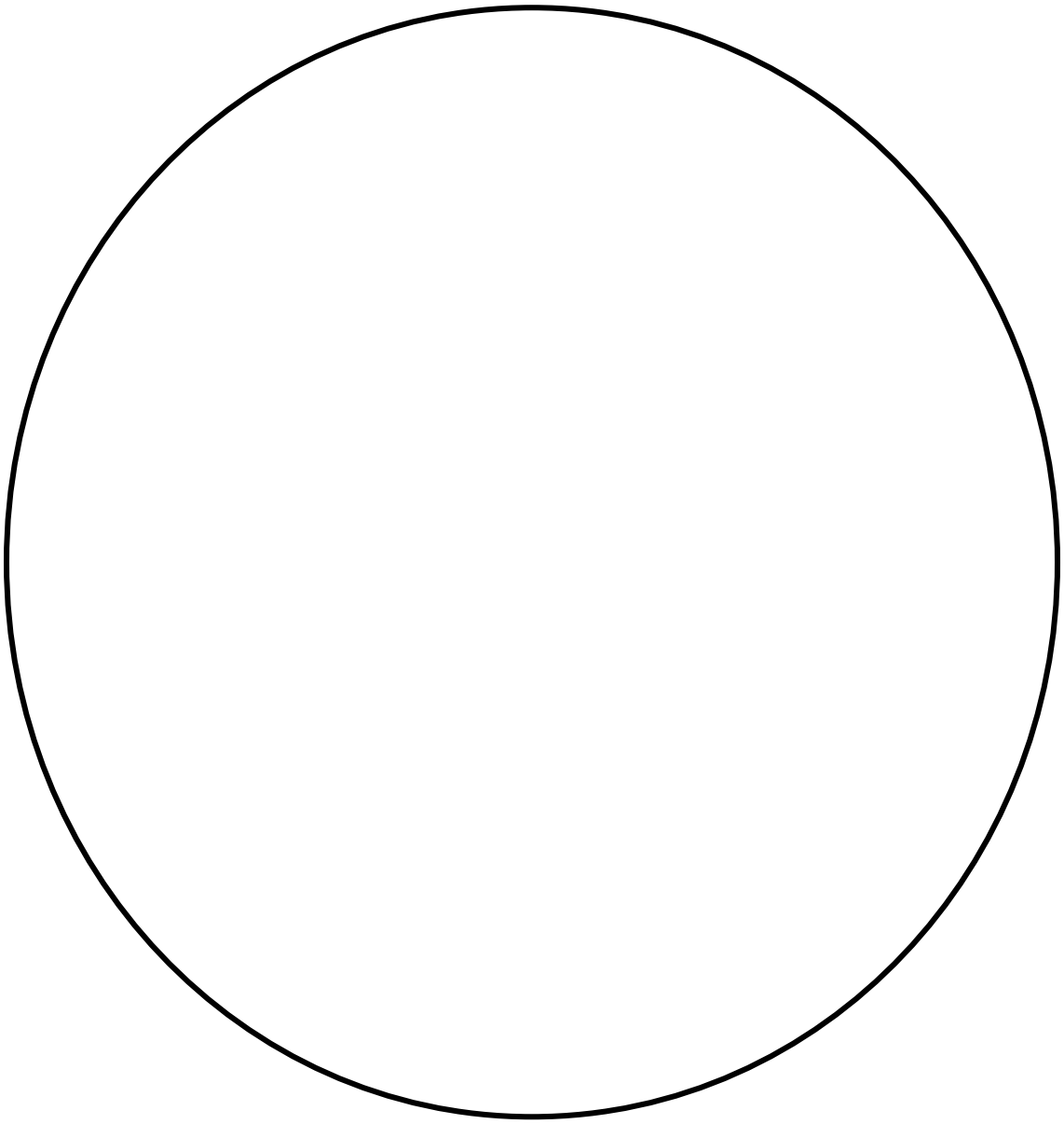
Read the letters (which are key names) from left to right. When you get to the middle, you start running into <u>enharmonic</u> key names like F# and Gb, which are just two names for the same pitch. Really – if you don't believe it, just go look at your fingering chart and you'll see that both names are used for the same fingering or slide position.

If you keep traveling through the Circle of Keys – that's what it is, by the way – you eventually get back to C. That's why it's called a <u>circle</u> of keys.

The most important thing you can do to work on your tonal technique (the technique that deals with pitches and scales and chords) is to learn how to play each note in the above chart and to memorize the order of pitches COLD. Be able to play each pitch in order without hesitation. Everything else you will learn in this section depends on your ability to do that.

# The Circle of Keys

We'll fill this page in together and explain each part as we go. Please place each item exactly where it is supposed to go. Remember, this is the basis for most of the musical knowledge you will ever need – be careful and follow all directions to the letter.



# The Master Scale Matrix

Same as above. Fill this in carefully based on the instructions given in class. You will hopefully refer to this throughout your musical career. Mr. Devos still has the one he made with his beginning band director, Ron Curtis, back in 1976.

| Major/minor | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Transposition | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |

# Scales, Rhythms, and Articulations

Now that we have worked out the background information needed to learn musical technique on your instrument, the following pages contain the actual materials you will need to develop your tonal (scales and chords), rhythmic, and articulation skills.

There are dozens of scales used in music. The melodies and harmonies we play in our literature are based on them. A few types of scales are used so regularly that we should all be able to play them almost automatically. The three main types of scales are chromatic, major, and minor. The minor scale actually has three different forms: natural, harmonic, and melodic. The story of how music in our culture developed the chromatic and major and minor scales is an interesting one, but must wait for another time.

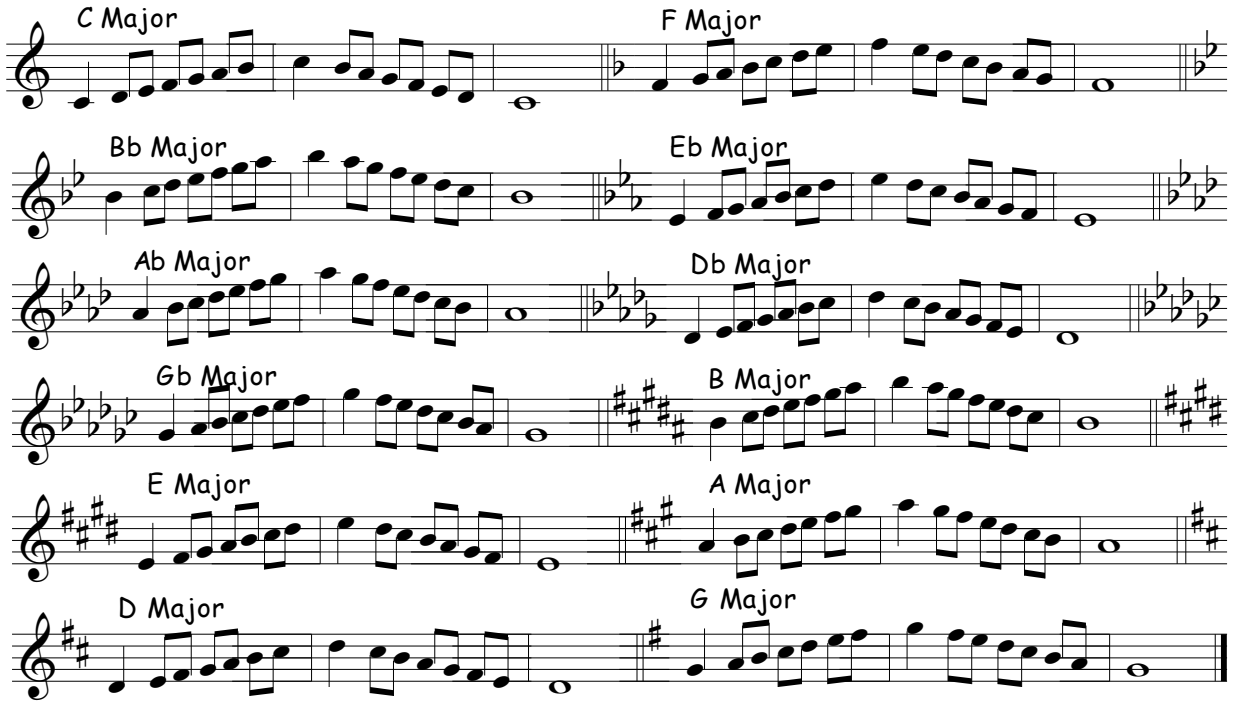
For now, use the following studies of scales, chords, intervals, rhythms, and articulations to build your technique. Do something from this section for even just a minute at least once every single day. (By the way, make sure you know each and every note on your fingering or position chart so you can work through the scale sheets here. If you can play the whole fingering chart from bottom to top, you are able to play the chromatic scale the full range of your instrument. Congrats!)

When practicing the following scales, remember:

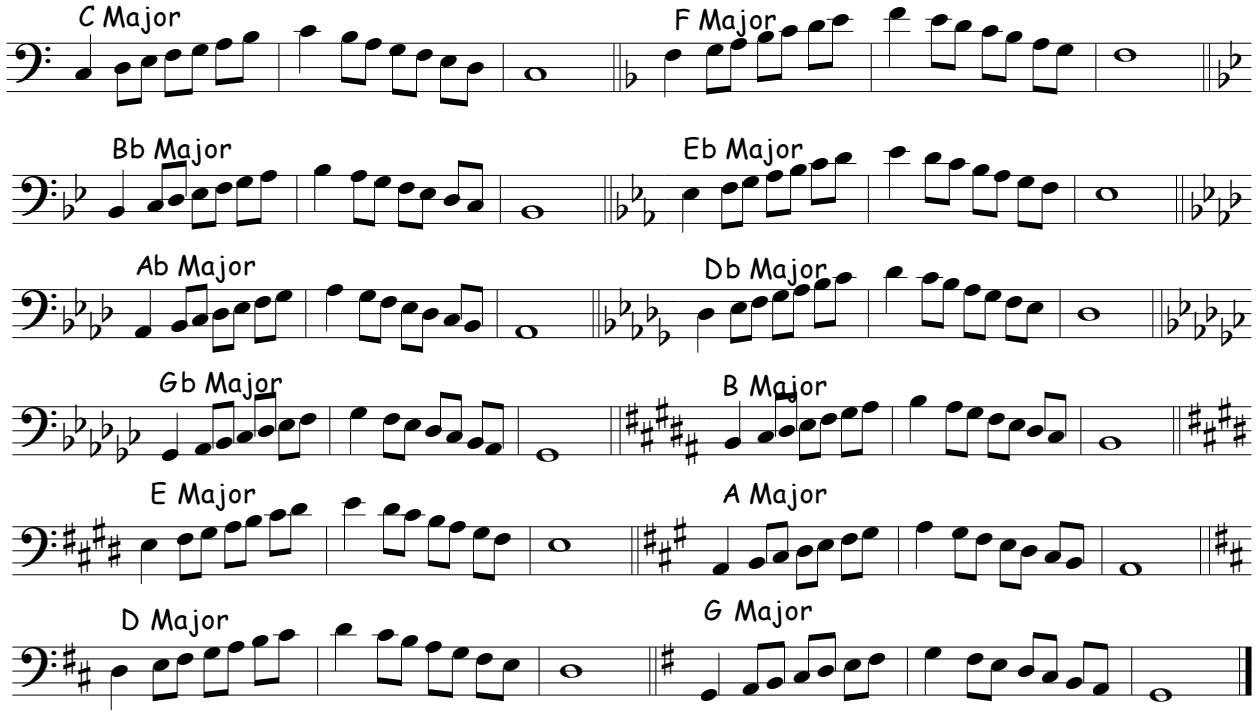
- To focus on your overall sound at all times. Pay attention to the fundamentals of good musicianship (air, embouchure, grip, stroke, posture, etc.) and to the tone quality and intonation of all the pitches of each scale. The tongue and fingers should be coordinated.
- All scale degrees are equally important. Identify the stronger notes (the arpeggio degrees of 1, 3, 5, and 8) and then concentrate on the degrees in between (2, 4, 6, and 7). The $4^{th}$ and $7^{th}$ degrees are the ones to really listen to and adjust.
- To make it easier to learn major scales, study the Matrix and you will find that there are only twelve four-pitch tetrachords that make up all the major scales. Learn the twelve tetras and you will be able to play all twelve majors.
- Become an expert at playing the scales and arpeggios in all keys. Use the Circle and the Matrix to help you with this. Learn to apply the solfege names (do, re, mi, etc.) and degree numbers (1 through 8, or 6 through 6 for minor) to all the scales. Say the numbers or solfege in your head while you play so the relationship of each degree to the others becomes automatic.
- Use the Lisk digital patterns to gain greater awareness of tonal relationships within a key. We will learn the patterns in class once everyone is familiar with all twelve major scales.

## Major Scales

This is exactly what the Master Scale Matrix looks like in music notation for treble clef:

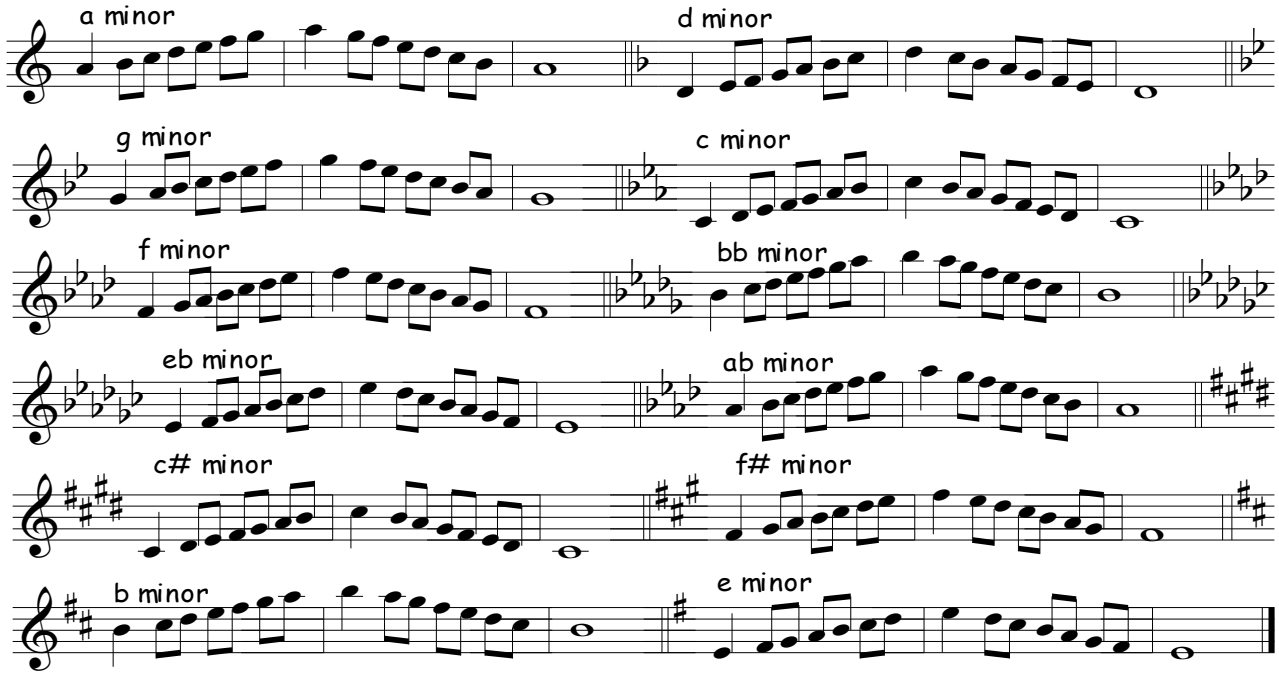



and for bass clef:

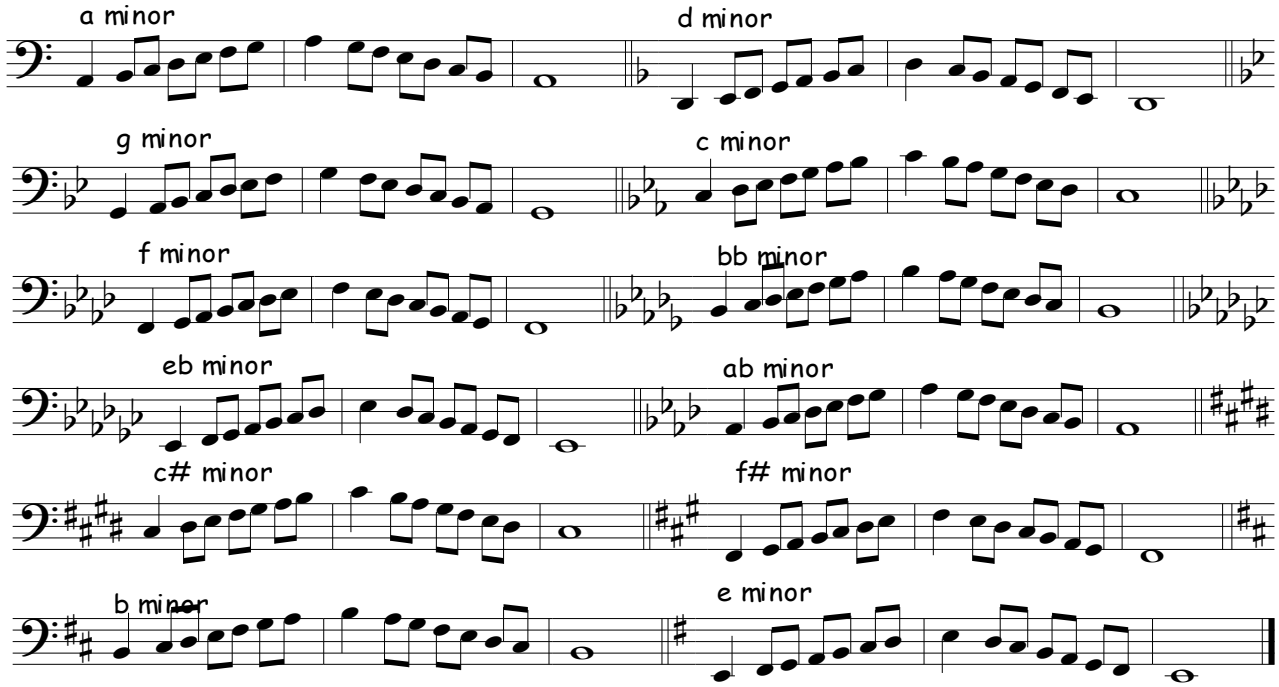


# Natural Minor Scales

The natural minor scales are based on the key signature of their related major scales. Minor scales start on the sixth scale step of their related major scale. Here are the treble clef natural minors:

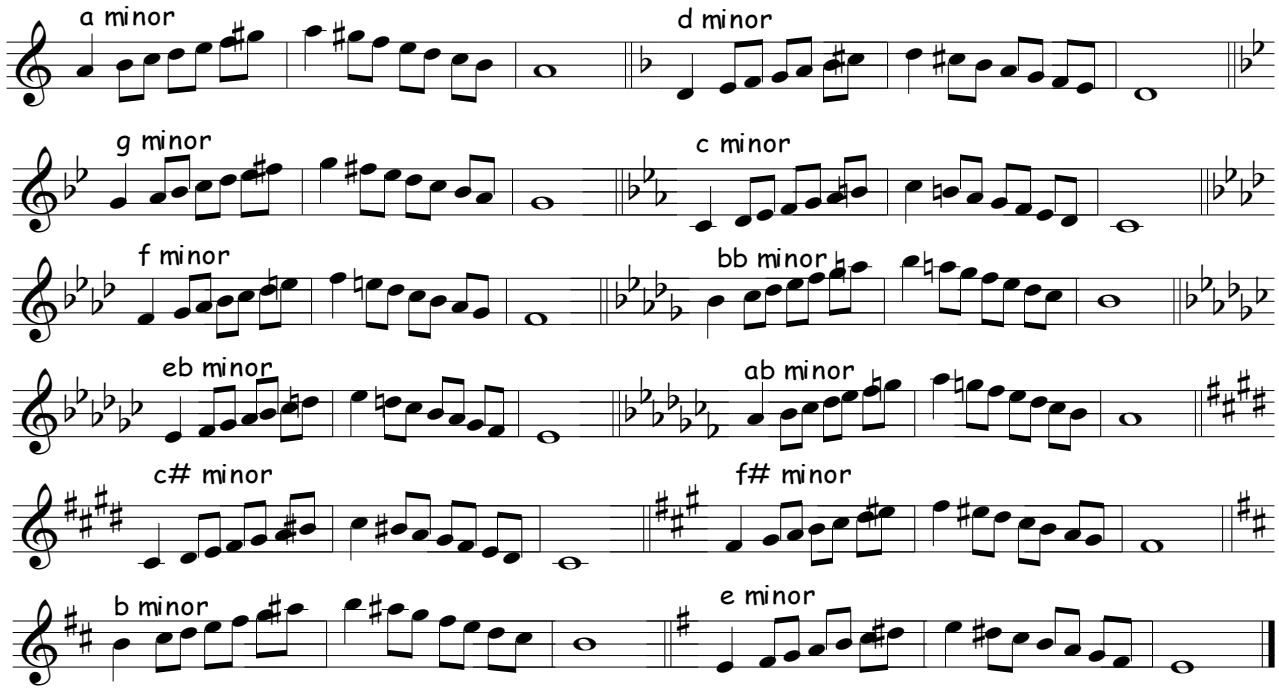



and bass clef:

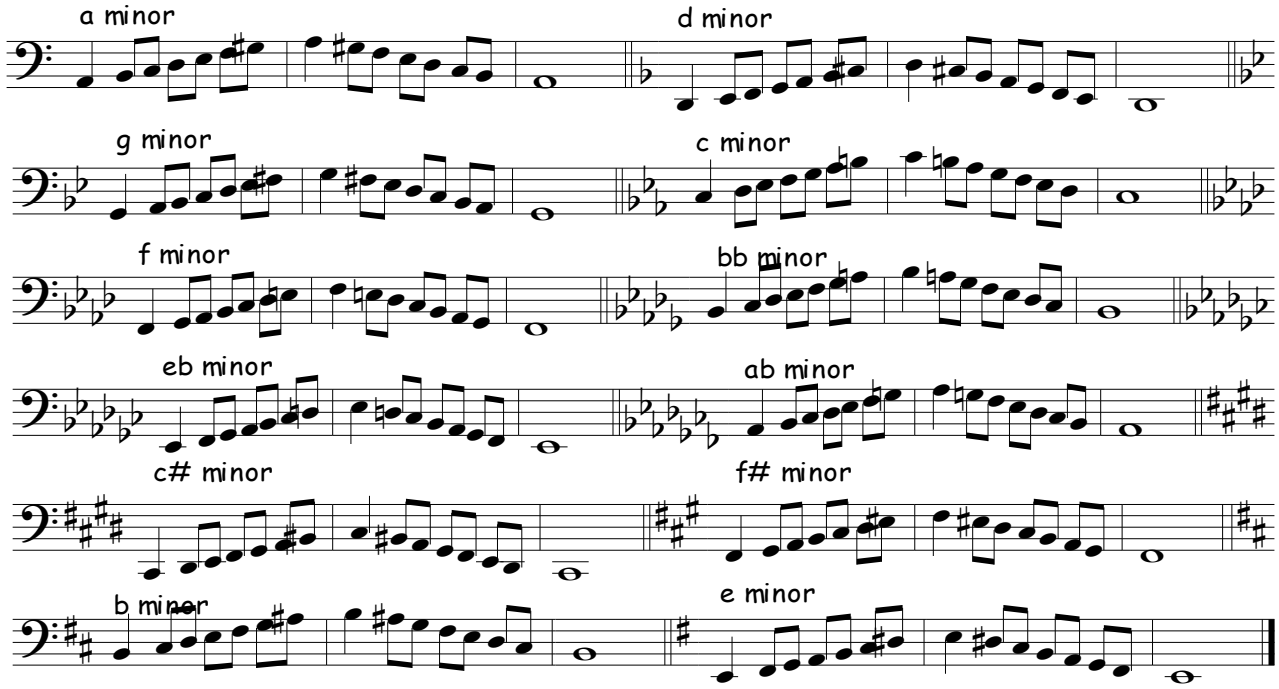


# Harmonic Minor Scales

About five hundred years ago, composers realized they needed to raise the seventh note of the minor scale just a half step to make their harmonies work better. Treble harmonic minors:

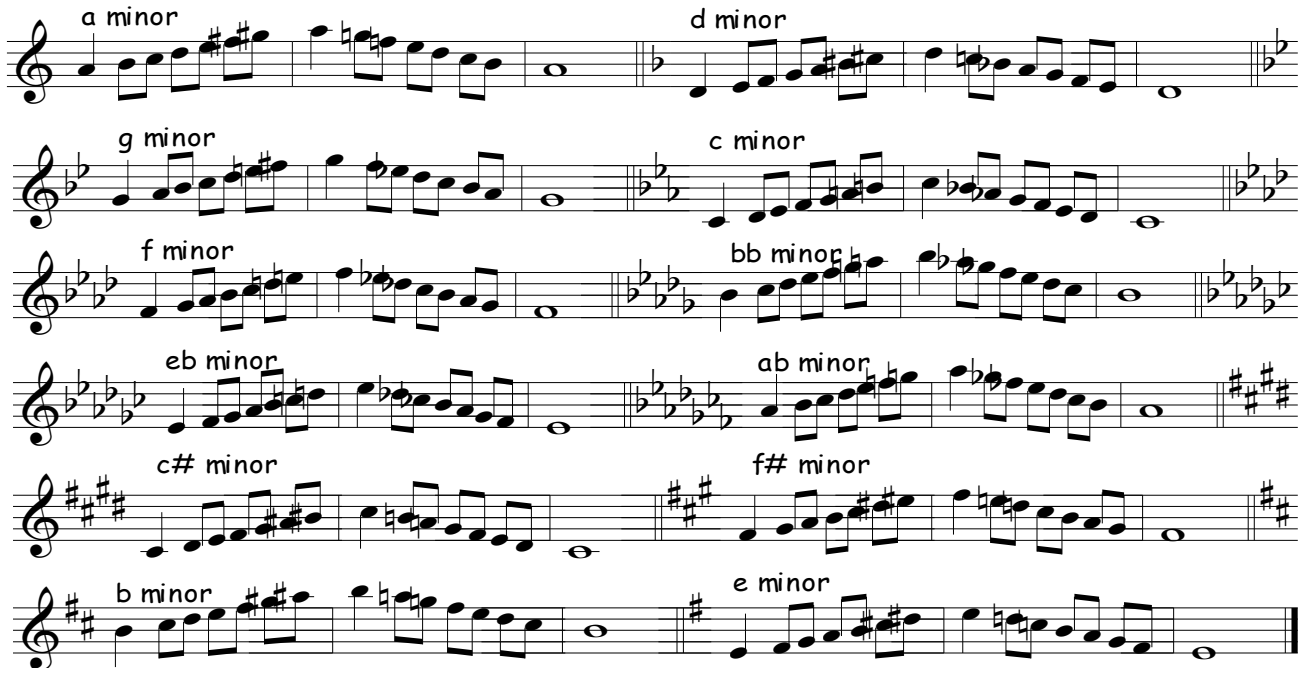



and bass clef:

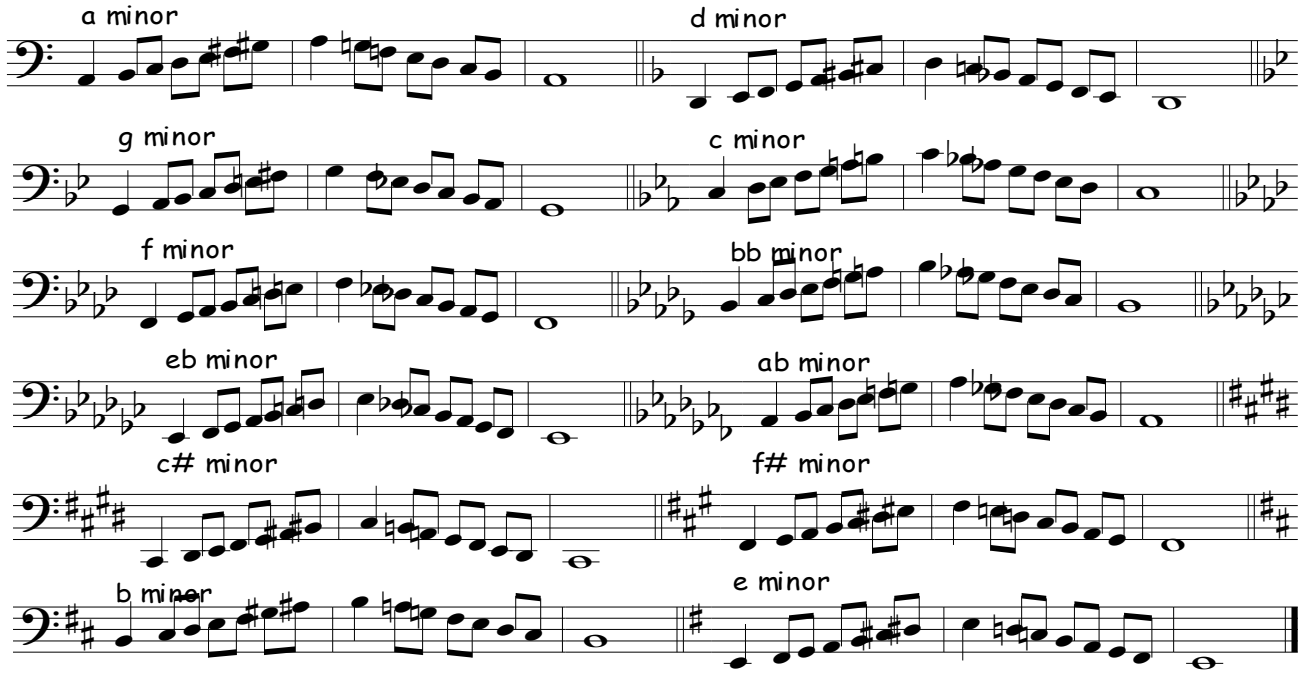


# Melodic Minor Scales

Not content to just make the seventh scale degree sound like its major scale cousin, composers then raised both the sixth and seventh degrees of the natural minor. Notice that they return to a regular natural minor on the descent. This is the All-Region minor form.




bass clef melodic minor:

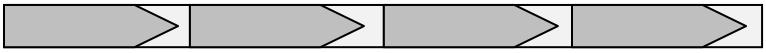


# Articulation Exercises

- **Legato** = Notes touch with a soft start; air never stops.

- **Tenuto** = Notes touch with a definite stop; air never stops.

- **Lifted** = Notes have a definite start; air and energy is short and compact to allow for space between the notes.



- **Staccato** = Notes have a definite start; air and energy is very short and compact to allow for greater space between the notes.

**To begin the note:**

- Start with either a D or T sound.
- Move the tongue up and down, not back and forth.
- Keep the tongue still as you inhale and exhale.
- The tongue must move to the exact same place on the reed or in the mouth with the exact same energy, speed, and strength throughout a given style of articulation.
- The longer the note length, the quicker the movement of the tongue.
- When switching artic styles, the first note in the new style must be exactly correct.
- The tongue does not stop the air, it only interrupts it. The vibration of the lips or reed is only interrupted, never stopped.
- Do not allow the face, jaws, throat, corners, or any other facial feature to move when articulating.

**To sustain the note:**

- Air and energy must remain constant, steady, and smooth.
- The shape of the tongue, throat, sinuses, etc. will determine the quality of the tone. Use the correct vowel positions (aw, ah, oh, oo, ee) to get the best tone.
- Different articulation styles require different lengths of air versus no air.
- Always think of getting the air past the bell.
- The shorter the note length, the quicker the air must get to the end of the note.

**Releasing the note:**

- All notes end with an open throat.
- To stop a note, simply stop the air flow.
- Air should almost never be stopped with the tongue.
- Air should almost never be stopped by "choking off" the throat.
- The body should always remain relaxed and natural.

## Multiple Tonguing

This exercise can be played on any scale. The idea is to get the tongue moving properly. Brass and flutes can double or even triple tongue. Be sure your tongue is properly placed (tip of reed or just behind top teeth on roof of mouth). "Touch with just one taste bud" is a good tip. And make sure your jaw is not moving.