

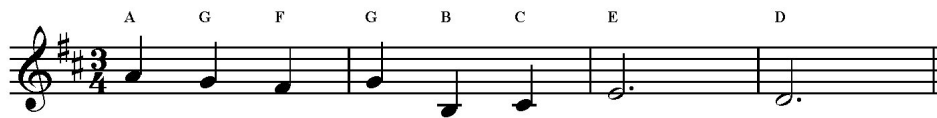
# Clef Transposition

The technique of transposing by changing clef is probably the single best technique to master for the reading of orchestral scores, which typically demand the performance of multiple, simultaneous transpositions. It requires a considerable amount of practice before it becomes comfortable, however, and may in fact seem far too cumbersome to be worthwhile. However, it is definitely a skill which can be acquired, and once practiced, becomes relatively effortless.

## The Basic Technique

A clef-based transposition works by mentally changing the notated clef to some other clef. As a result, the notation on the staff will now refer to different pitches.

Consider this simple treble-clef melody.



The melody begins with the note on the second space of the staff – in this clef, that’s A. Following that are G, F, G, B, C, E, and D. (Don’t worry about sharps or flats right now.)

If I leave the notes precisely where they are on the staff, but change the clef sign to a bass clef, this is what happens:



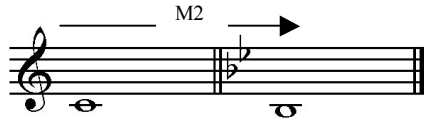
The note on the second space of the staff is now C – and thus the melody is now C, B, A, B, D, E, G, F. The pitches have all moved down a sixth (or up a third) from the original. By changing the clef from treble to bass, but leaving the notes in their positions, I have transposed the melody down a sixth (or up a third).

## Changes of Key

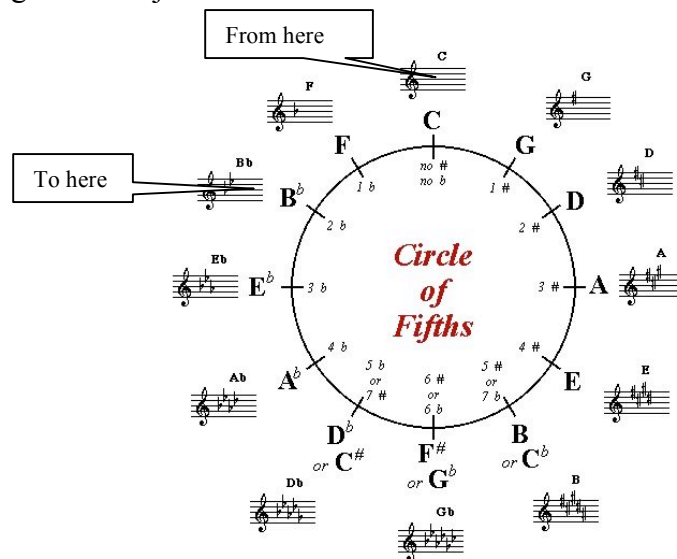
However, as we examine the melody that we’ve transposed above, we realize that the transposition is seriously flawed. Note the distance between the second and third notes of the original: that’s a half-step, from G to F#. However, in the transposition, the interval has become a whole step, from B to A. Similar problems occur throughout. That’s because we’ve changed the pitch names, but not the key signature, which is required to keep the grid of whole and half steps on the five-line staff in proper order.

So alas, we can't just read the notes in the alternate clef and be done with it. We also have to change the key signature as well. How do we figure out how to do that?

Our old friend, the über-key center of C Major, can come to our rescue here, as we use transposition from C Major as a model for transpositions in general. If I transpose down by a major second, a.k.a. a whole step, from C Major, I am transposing downwards from C Major to B-flat Major:



Viewed on the cycle of fifths, we can see that we're moving two 'notches' to the left from the original C Major:



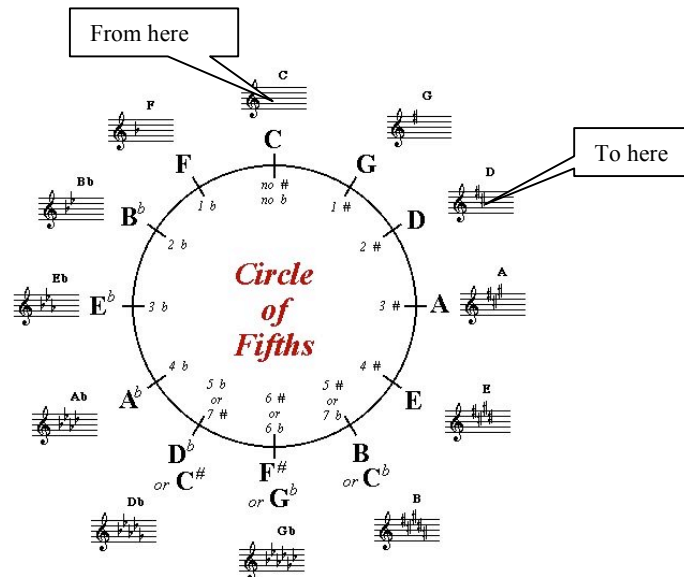
We can apply this model to transposing downwards by one whole step from any key, therefore. Consider an original key of A Major. By applying the same transposition distance – i.e., two ‘notches’ to the left from the original A Major, we arrive at G Major. If we start at, say, E-flat Major, two ‘notches’ to the left takes us to D-flat major, and so forth.

Referring to that model of C Major to B-flat Major, we understand the name for this transposition. We call it a *B-flat transposition* – not because we're necessarily transposing anything into B-flat major, but because the basic direction of the transposition (i.e., two ‘notches’ in the flat direction on the cycle of fifths) is the same as going from C Major to B-flat Major.

***A B-flat transposition means to transpose downwards by one whole step; we call it B-flat because B-flat is one whole step downwards from C.***

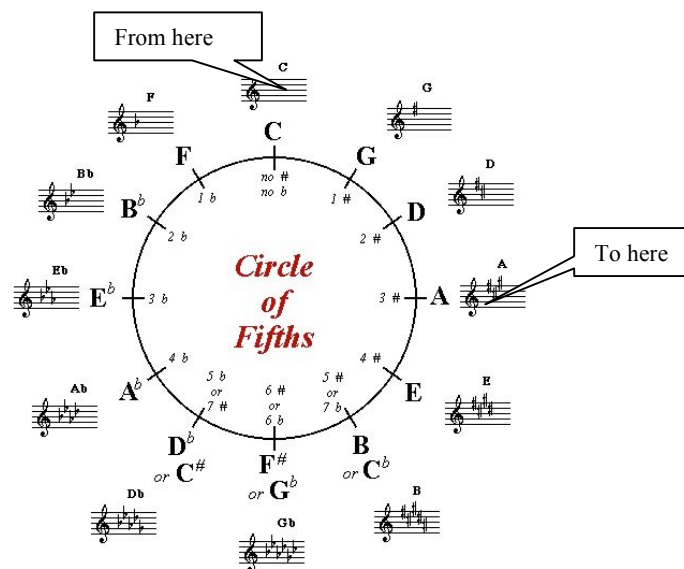
With this in mind, consider the results of transposing different directions:

- Transposing *up* a whole step: going from C Major, this would mean that we were moving upwards to D Major, the key lying one whole step higher from C Major. Therefore, the key change is two ‘notches’ sharpwise (or to the right) on the cycle of fifths:



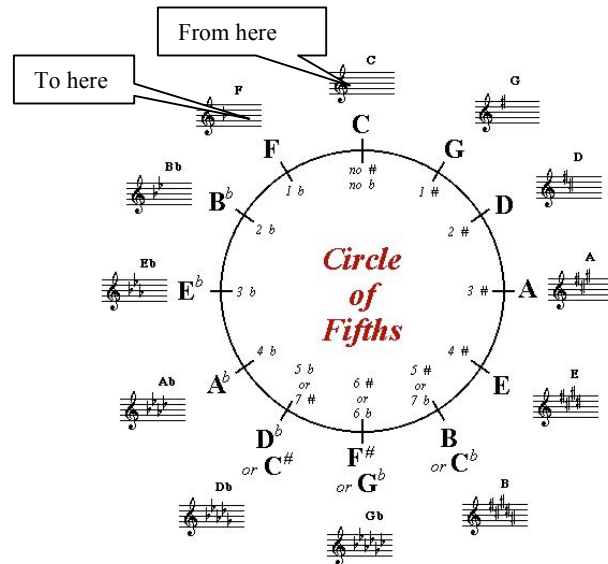
Therefore, whenever transposing upwards by one whole step, the key signature will move two ‘notches’ in the sharp direction on the cycle of fifths. This is a ***D transposition; we call it D because D is one whole step upwards from C.*** Performing a D transposition on a piece in, say, E-flat Major results in a key signature of F Major (move from E-flat two notches to the right on the cycle of fifths.)

- Transposing down a minor third: going from C Major, this would mean that we’re moving to A Major. A Major lies three ‘notches’ to the right on the cycle of fifths from A Major:



Therefore, this is an *A transposition*; we call it *A* because *A* is a minor third down from *C*. Performing the *A* transposition on a piece in F Major results in D Major.

- Transposing down a fifth: going from C Major, this would mean moving to F Major. F Major lies one ‘notch’ to the left on the cycle of fifths:



Therefore, this is an *F transposition*; we call it *F* because *F* is a fifth down from *C*. Performing an *F* transposition on a piece in A Major will result in D Major.

At this point you’re ready to understand what the various transpositions would be called – in fact, you can figure it out easily enough for yourself. You model the name of the transposition on a distance from C. So if you’re transposing downwards by a perfect fourth, think of the note a perfect fourth below C: it’s G. Therefore such transpositions are called **G transposition**, and you can understand the change in key signature by knowing the name: it’s one ‘notch’ in the sharp direction on the cycle of fifths (because G is one notch in the sharp direction on the cycle of fifths from C.)

There’s an even easier mnemonic to remember how to change the key signature: just think of the major key signature for the name of the transposition. In other words, if we call this an *E-flat transposition*, think E-flat Major: that’s three flats. Therefore you move *three notches in the flat direction* on the cycle of fifths. If it’s an *F transposition*, think of F Major: that’s one flat. Therefore you you move *one notch in the flat direction* on the cycle of fifths. For *D transposition*, think D Major: two sharps; ergo, *two notches in the sharp direction* on the cycle of fifths.

### Dealing With Accidentals

So far, we’ve ascertained that you can transpose a passage by mentally changing the clef and also by changing the key signature in accord with the desired transposition. So far, so good.

However, *accidentals* can become a problem. Consider the following melody:

A G F $\sharp$  E F B $\flat$  A C $\sharp$  B $\sharp$  C E $\flat$  D



I would like to perform a ***B-flat transposition*** on this melody – i.e., transpose it down by a whole step. The clef to use is the tenor clef (the second space of the clef being ‘G’ which is the correct first note for the melody; I’ll also need to read it an octave higher.) I know that the key is going to move by two ‘notches’ to the left (flat direction) on the cycle of fifths – from two sharps to no sharps. Therefore, here’s how it comes out:

G F E $\flat$  D E A $\flat$  G B $\flat$  A $\flat$  B D $\flat$  C

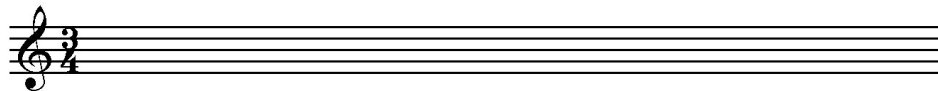


We can see that there are some problems now. The third note is an E-natural: but shouldn’t it be an E-flat, down a whole step from the previous pitch, representing a lowered third scale degree? The next accidental, A-flat, seems to be OK (lowered sixth scale degree), but the B-natural on the third beat of the 2<sup>nd</sup> measure is incorrect – shouldn’t it be a B-flat, representing a lowered seventh scale degree?

Now, there’s nothing to stop you from thinking through the accidentals one by one like this and making the appropriate adjustments, but good luck doing that when reading several transpositions simultaneously, or at any kind of tempo!

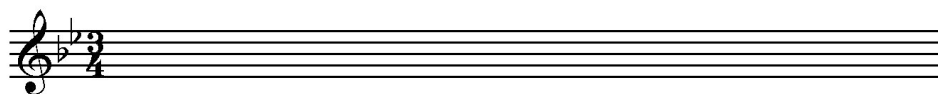
Fortunately, you can apply a simple rule of thumb. Understanding why it works is a little trickier, so fasten your seat belt and follow along.

Consider a treble clef staff in C Major:

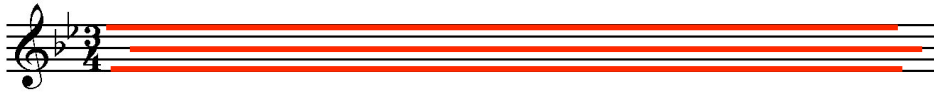


Forget everything you’ve learned about key centers and the like. Just think of it in very simplistic terms: any note that falls on that staff is played without any pitch alteration: if there’s an F on the first space, you play an ‘F’ and not an F-sharp or an F-flat. If you grew up on the piano, you also know that this means *it’s all on the white keys*.

Now consider changing the key signature to two flats:



Again, forget everything you’ve learned about key centers and the like. Think of it in simplistic terms: anything that falls on ‘B’ or ‘E’ is automatically flatted – almost as though it’s just a convenient shorthand so you don’t have to put accidentals around the notes all the time. It’s almost as though certain places on the staff are specially marked:



Any note on those places is “automatically shifted” down to a flat.

So what happens if an accidental falls on one of those “automatic shift” lines? In terms of a transposition, it means that the accidental *compounds* with the “automatic shift” – i.e., the effect of the notated accidental is **added** to the effect of the “automatic” lowering.

So back to our earlier example, which we need to adjust for a B-flat transposition. Because we’re looking at a staff which has had an adjustment made in the key signature (two notches in the flat direction on the cycle of fifths), then we have those “automatic” notes to be flatted at B and E. In this tenor clef, this means that the following lines and spaces are affected:



Accidentals on those particular areas (B or E) are going to be compounded, and therefore each of them needs to be lowered a half step. That means that the E-natural in measure 1 becomes E-flat; the B-natural in measure 2 becomes B-flat, but all the others are unaffected. Therefore our melody comes out this way, which is a correct transposition:



### *Applying This as a Mnemonic*

You can remember the rule for accidentals as a mnemonic, using the same basic technique as the rule for key signatures. Remember the name of the transposition: that not only tells you how to change the key signature, but also what to do about accidentals:

Distance	Name	Key Signature	Accidentals
Down a M2	B-flat Transposition	2 steps in the flat direction	On B or E lowered a half step.
Up a M2	D Transposition	2 steps in the sharp direction	On F or C raised a half step.
Down a m3	A Transposition	3 steps in the sharp direction	On F, C, or G raised a half step.
Down a P5	F Transposition	1 step in the flat direction	On F lowered a half step.
Up a P5	G Transposition	1 step in the sharp direction	On G raised a half step.

Up a m3	E-flat Transposition	3 steps in the flat direction	On B, E, and A lowered a half step.
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The chart above gives, in fact, the most common transpositions involved in orchestral score reading:

#### B-flat Transposition

B-flat Clarinet; B-flat trumpets

#### D Transposition

D Trumpet; Cornet; D Clarinet

#### A Transposition

A Clarinet; Oboe d'Amore

#### F Transposition

French Horn in F (most common)

#### G Transposition

Horns in G (less common)

#### E-flat Transposition

Alto Clarinet; E-flat Horns, E-flat Trumpet

### Which Clefs to Use

In learning clef-based transposition, it's quite comforting to know that the vast bulk of the transposing instruments are notated in treble clef, so you only have to memorize one clef change per transposition. (There are some oddballs hanging around, but they're mostly obsolete.)

B-flat Transposition: Tenor clef (read up an octave)

D Transposition: Alto clef (read up an octave)

A Transposition: Soprano clef (read as written)

F Transposition: Mezzo-Soprano clef (read as written)

G Transposition: Baritone clef (read up an octave)

E-flat Transposition: Bass clef (read up an octave)

### Is it Really Worth the Bother?

In a nutshell – yes. Not as your *only* transposition tool, by any means. But it is the best way to get through reading an orchestral score with multiple transpositions, and it's also a great way to sight-read transposing materials. It can also be a good technique for keeping a mental check-up running on your transposition if you're transposing by ear, or analytically. It seems dreadfully complicated at first, but as you begin to understand the principles involved (best learned by practicing one transposition at a time), it will seem much simpler.