

How to respell accidentals for better readability

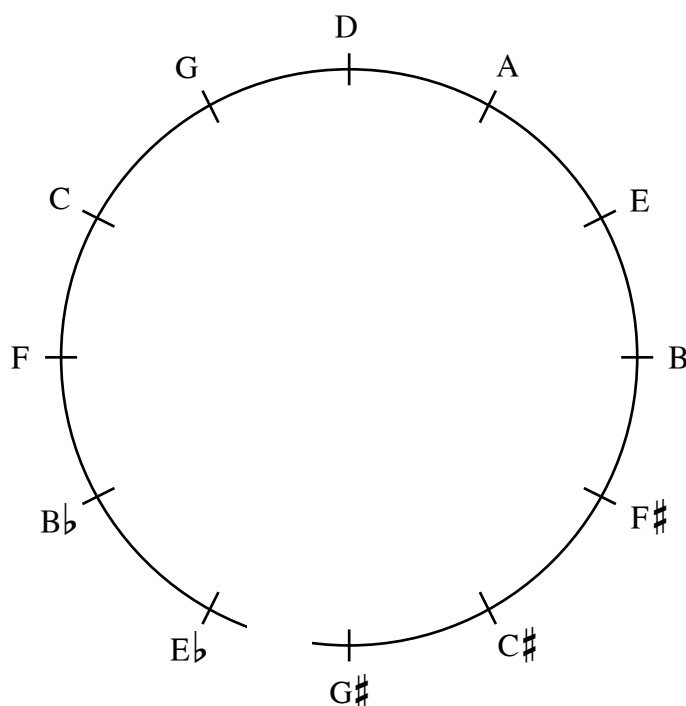


The image shows a musical score with four staves. The key signature is D major (two sharps: F# and C#). The time signature is 3/4. The notation is dense with many accidentals, including sharps, flats, and naturals, which makes it difficult to read. The notes are often beamed together, and the accidentals are placed in a way that is not standard, leading to a high risk of misreading.

A notation like the one above is definitely not a good layout. The performers will have a hard time reading the accidentals correctly. The problem is the weird mixture of key signature, flats and sharps, a mixture that causes a high risk of misreadings.

The music engraver should try to find a good respelling (provided that the composer will allow respelling). Musicians think in keys when they read, so the goal is to find a respelling that indicates some sort of tonal context. A such task may often seem difficult at first. Fortunately there is a method, which I will describe in the following. Unfortunately, the method sometimes leads to more than one solution, and you have to make a choice.

The “tool” in the method is a circle of fifths:



The circle should not be read as the traditional “circle of fifths” where each of the 12 positions on the circle represents a major key (or a minor key). Instead, the circle should be read as a “spelling table” where each of the 12 positions represents a chromatic scale step. In the following I will call it the “Spelling Circle Of Fifths”, SCOF. In the example, the spelling table displays the spelling of the chromatic scale pattern in D tonality (= all the church modes in D: D Lydian, D Ionian, D Mixolydian, D Dorian, D Aeolian, D Phrygian). The 12 chromatic scale steps are circularly connected in 11 perfect fifths. The 12th interval - a diminished sixth - is the exception that breaks the circle and reveals that the circle actually is a spiral:

G# - Eb

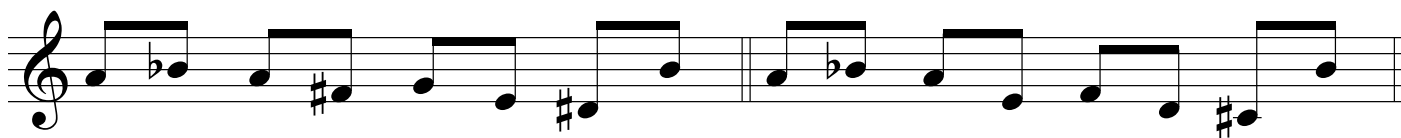
(By The Way: Also in the diatonic scale pattern and in the pentatonic scale pattern you will see that the scale steps are circularly connected in perfect fifths, with one exception that makes the circle a spiral. A diatonic example is the “scale steps with natural”. Chain of fifths: F - C - G - D - A - E - B (= the upper 7 positions on SCOF). The exception is B - F where the interval is a diminished fifth. A pentatonic example: From the previous example, remove F and B, and you get C - G - D - A - E. The exception is E - C where the interval is a minor sixth)

The spelling is unambiguously determined by the diminished sixth, since that interval gives the end points of the chain. An example:
If the diminished sixth is

C# - Ab

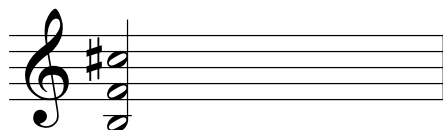
then the chain is Ab - Eb - Bb - F - C - G - D - A - E - B - F# - C#

It is well known that altered intervals (augmented intervals / diminished intervals) are harder to read correctly than unaltered intervals. With the chain of fifths it can be said more precisely: Notes that are far away from each other in the chain constitute intervals that are hard to read correctly. The more fifths the notes are apart, the less frequently occurring is the resulting interval.
An example: A diminished sixth (11 fifths) is less frequently seen (and therefore a more likely candidate for misreadings) than a diminished seventh (9 fifths):



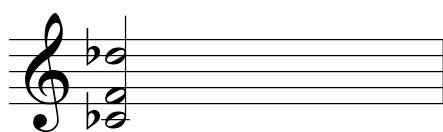
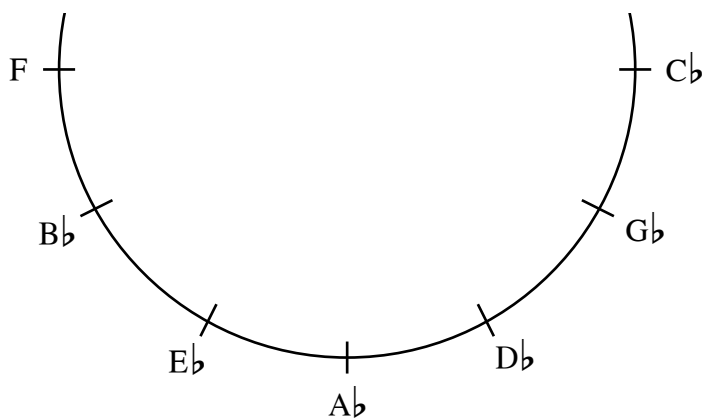
In the first example the performer might see a tonality of E minor by the end of the measure, and therefore, incorrectly, read a minor sixth [D sharp - B natural]. Respelling [D sharp] as [E flat] gives a better layout in this case. It is often a good idea to respell a diminished sixth as a perfect fifth. In the second example, on the other hand, the performer might see a tonality of D minor, and therefore, correctly, read a diminished seventh [C sharp - B flat].

To explain how the SCOF method works, let's take an example:

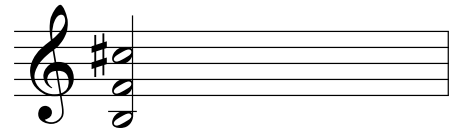
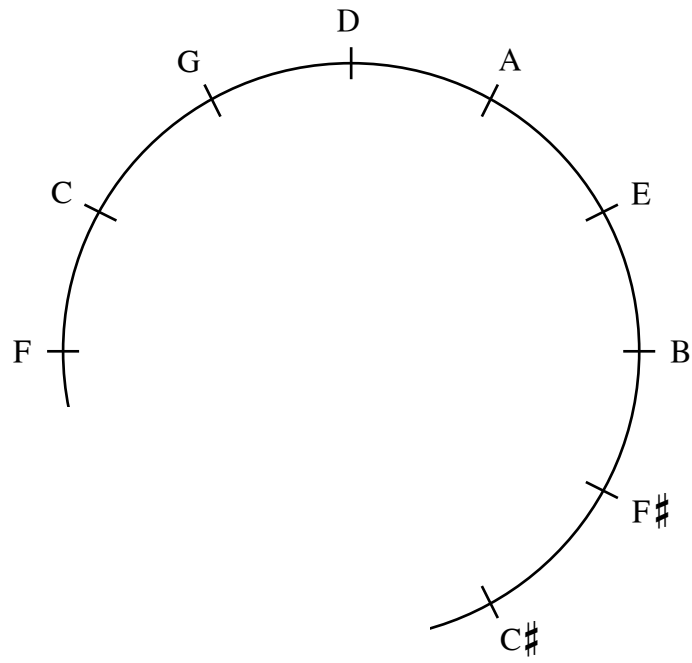


To discuss different spellings of this chord we “take a walk” in perfect fifths along the circle, beginning at one of the chord notes, and continuing until we have been at all the chord notes. Some examples:

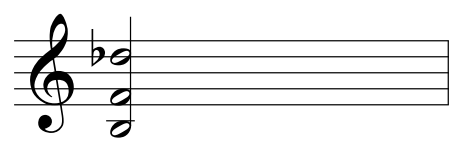
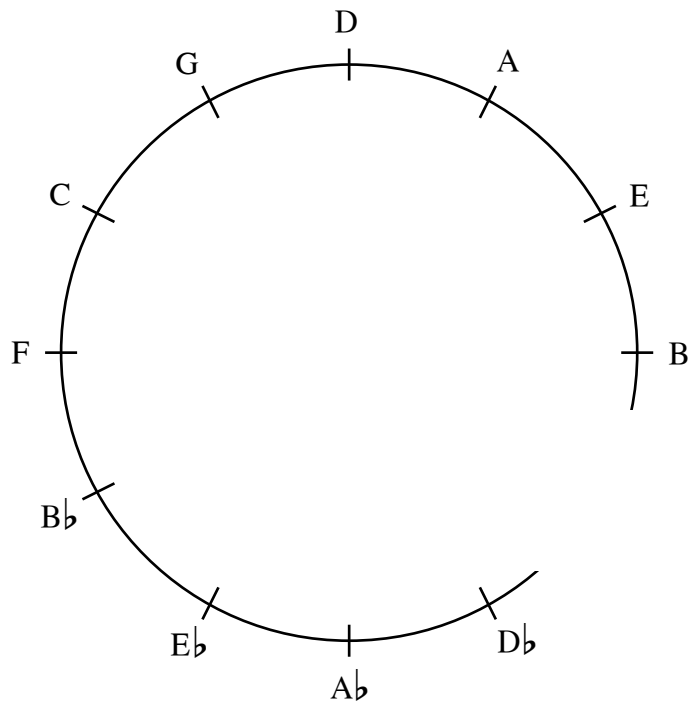
1. If we begin at F, and walk in the “Flat Direction”, we get
F - b \flat - e \flat - a \flat - D \flat - g \flat - C \flat (6 fifths) = spelling [C \flat ; F; D \flat]:



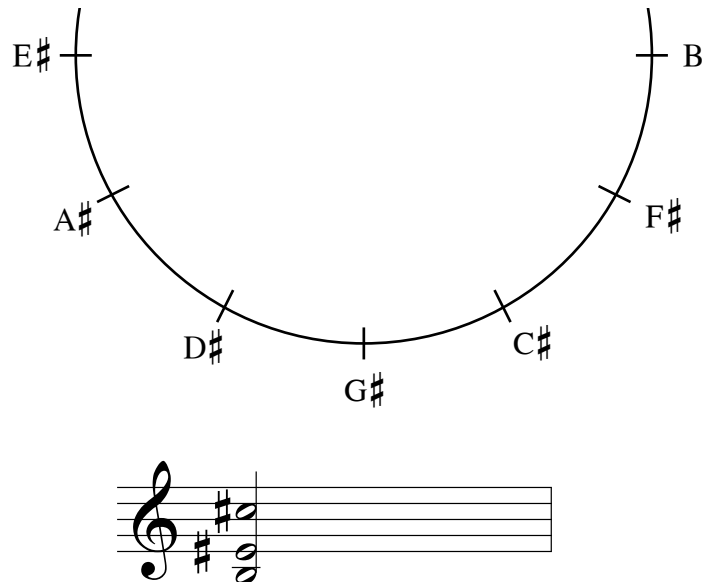
2. If we begin at F, and walk in the “Sharp Direction”, we get
F - c - g - d - a - e - B - f \sharp - C \sharp (8 fifths) = spelling [B; F; C \sharp]:



3. If we begin at B, and walk in the “Flat Direction”, we get
 B - e - a - d - g - c - F - bb - eb - ab - Db (10 fifths) = spelling [B; F; Db]:



4. If we begin at B, and walk in the “Sharp Direction”, we get
 B - f# - C# - g# - d# - a# - E# (6 fifths) = spelling [B; E#; C#]
 (This is an enharmonical equivalent of spelling number 1: [Cb; F; Db]):



Here comes the point:

The shortest walk (in this case 6 fifths) gives the spelling that will probably be the easiest for the performer to read.

If there were no other scale steps in the piece than B, F and C# (not very likely!), then the spelling [Cb; F; Db] or [B; E#; C#] would be the best choice.

With other scale steps in the context, one of the other spellings might be the best choice.

The idea is [a] *to avoid intervals that are hard to read because they “span” a high number of fifths*, like e. g. [diminished sixth] and its inversion [augmented third] (= 11 fifths).

But the idea is also [b] *to, at the same time, avoid drastic changes in the spelling table during the music.*

The best layout is a compromise between these two ideas:

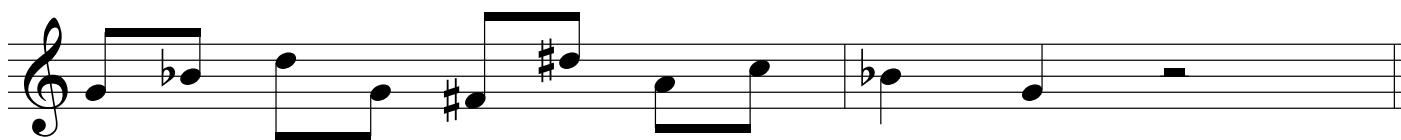
[a] *favor intervals that “span” a low number of fifths,*

[b] *change spelling table as little as possible.*

Using only one of the ideas [a] and [b] can cause weird spellings.

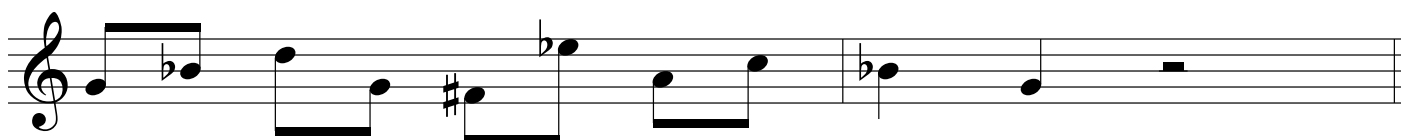
The ultimate use of only [a] is a notation where all intervals are notated as diatonic intervals (= max. 6 fifths).

This can cause frequent changes in the spelling table, and the musician may loose “tonal orientation”:



In this case the D# makes it hard to discover that the whole example is in the key of G minor. The spelling spans 11 fifths: from Bb to D#.

An educated musician would prefer to read Eb, for the sake of tonal orientation:

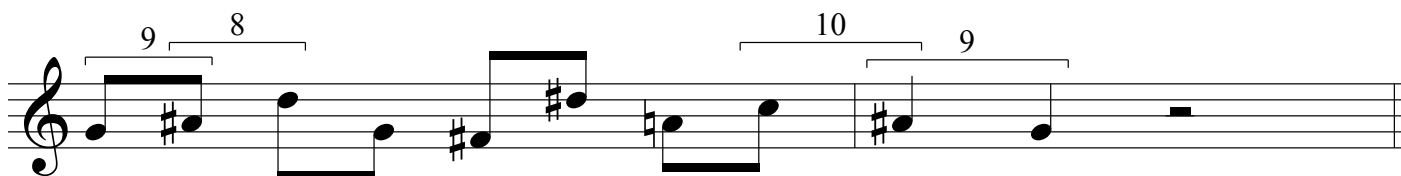


With Eb instead of D# the spelling only spans 9 fifths: from Eb to F#.

A softer variant of [a] is the well known *road sign rule*: Use a [raise scale step] accidental when the next note is a halfstep higher, use a [lower scale step] accidental when the next note is a halfstep lower.

The ultimate use of only [b] is a notation where the same spelling table is used all the way through the music. Well known examples are Finale's spelling commands [Favor Flats] and [Favor Sharps] (see Options menu > Enharmonic Spelling).

This can cause frequent use of intervals that span 7–11 fifths, and the musician may loose “tonal orientation”:



Back to the initial example. For music like this, it's better to use [No Key Signature], also known as [Neutral Key Signature], or the Key of C major. Here is my own solution. Note the bb in measure 2:

