Clef Transposition

Derek Remeš

June, 2015
# Contents

1. **Introduction**  
2. **Methods of Transposition**  
3. **Reading the seven clefs**  
   3.1 The seven clefs  
   3.2 Reference points  
      3.2.1 Other pitches as reference points  
      3.2.2 Mental reference points  
   3.3 The "infinite staff"  
4. **Suggestions for practice**  
   4.1 Fixed-do solfège  
   4.2 Resources  
5. **Transposing music back to concert pitch**  
   5.1 The Three-Step Process  
      5.1.1 Step one: Change the clef.  
      5.1.2 Step two: Change the transposed key signature back to the concert key.  
      5.1.3 Step three: Shift certain accidentals after the clef has been changed.  
   5.2 Application in context  
      5.2.1 Ravel: *Bolero*  
      5.2.2 Regarding horn and trumpet parts  
      5.2.3 Gershwin: *Rhapsody in Blue*  
      5.2.4 Octave adjustments  
      5.2.5 Mendelssohn: *Fingal’s Cave or Hebrides Overture*  
      5.2.6 Stravinsky: *Le Sacre du printemps*  
6. **Transposing music away from concert pitch**  
   6.1 Application in context  
      6.1.1 Schubert: *Der Neugierige*  
      6.1.2 Handel: *Larghetto* from Sonata No. 2 in G minor  
      6.1.3 Hymntune: NICEA  
7. **Conclusion**  
1. **Appendix: Tables of transposing instruments**
### List of Figures

<table>
<thead>
<tr>
<th>Figure</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Clef transposition (Zarlino, <em>Le Istituzioni Harmoniche</em>, 319.)</td>
<td>5</td>
</tr>
<tr>
<td>2</td>
<td>The seven clefs</td>
<td>8</td>
</tr>
<tr>
<td>3</td>
<td>The seven clefs (Diruta, <em>Il Transilvano</em>, 6.)</td>
<td>8</td>
</tr>
<tr>
<td>4</td>
<td>Line and space patterns for even and odd intervals</td>
<td>9</td>
</tr>
<tr>
<td>5</td>
<td>Possible mental reference points for each clef</td>
<td>9</td>
</tr>
<tr>
<td>6</td>
<td>Other possible mental reference points</td>
<td>10</td>
</tr>
<tr>
<td>7</td>
<td>The &quot;infinite staff&quot;</td>
<td>10</td>
</tr>
<tr>
<td>8</td>
<td>The grand staff as a mathematical graph (Savard, <em>Principes</em>, 50.)</td>
<td>10</td>
</tr>
<tr>
<td>9</td>
<td>The &quot;infinite staff&quot; (Diruta, <em>Il Transilvano</em>, 7.)</td>
<td>11</td>
</tr>
<tr>
<td>10</td>
<td>The &quot;infinite staff&quot; (Savard, <em>Principes</em>, 50.)</td>
<td>11</td>
</tr>
<tr>
<td>11</td>
<td>Figure 10 in modern notation with clefs reversed</td>
<td>11</td>
</tr>
<tr>
<td>12</td>
<td>Clefs for each key when starting in treble clef</td>
<td>13</td>
</tr>
<tr>
<td>13</td>
<td>How to alter the transposed key signature when beginning in treble clef</td>
<td>14</td>
</tr>
<tr>
<td>14</td>
<td>The circle of fifths as a dial</td>
<td>14</td>
</tr>
<tr>
<td>15</td>
<td>The order of affected pitches after the clef has been changed</td>
<td>15</td>
</tr>
<tr>
<td>16</td>
<td>Pitches with altered accidentals in each key</td>
<td>15</td>
</tr>
<tr>
<td>17</td>
<td>Shifting accidentals on affected pitches</td>
<td>16</td>
</tr>
<tr>
<td>18</td>
<td>Ravel: <em>Bolero</em>, at rehearsal 8 [original transposed version]</td>
<td>17</td>
</tr>
<tr>
<td>19</td>
<td>Ravel: <em>Bolero</em>, at rehearsal 8 [concert pitch]</td>
<td>18</td>
</tr>
<tr>
<td>20</td>
<td>Ravel: <em>Bolero</em>, at rehearsal 8 [hypothetical transposed version]</td>
<td>19</td>
</tr>
<tr>
<td>21</td>
<td>Ravel: <em>Bolero</em>, at rehearsal 8 [another equivalent concert pitch version]</td>
<td>19</td>
</tr>
<tr>
<td>22</td>
<td>Gershwin: <em>Rhapsody in Blue</em>, mm.16-19 [original transposed version]</td>
<td>20</td>
</tr>
<tr>
<td>23</td>
<td>Gershwin: <em>Rhapsody in Blue</em>, mm.16-19 [concert pitch]</td>
<td>20</td>
</tr>
<tr>
<td>24</td>
<td>Mendelssohn: <em>Fingal’s Cave or Hebrides</em> Overture, mm.202-214 [original transposed version]</td>
<td>21</td>
</tr>
<tr>
<td>25</td>
<td>Mendelssohn: <em>Fingal’s Cave or Hebrides</em> Overture, mm.202-214 [concert pitch]</td>
<td>22</td>
</tr>
<tr>
<td>26</td>
<td>Stravinsky: <em>Le Sacre du printemps</em> Part 1, &quot;Rondes printanières,&quot; at rehearsal 56 [original transposed version]</td>
<td>23</td>
</tr>
<tr>
<td>28</td>
<td>Transposing keyboard music by interval</td>
<td>25</td>
</tr>
<tr>
<td>29</td>
<td>Schubert <em>Der Neugierige</em>, No. 6 from <em>Die Schöne Müllerin</em>, [original key]</td>
<td>26</td>
</tr>
<tr>
<td>30</td>
<td>Schubert: <em>Der Neugierige</em>, No. 6 from <em>Die Schöne Müllerin</em>, [transposed]</td>
<td>27</td>
</tr>
<tr>
<td>31</td>
<td>Handel: <em>Larghetto</em> from Sonata No. 2 in G minor, from <em>12 Solos for Flute, Oboe, or Violin with a Thorough Bass for Harpsichord</em>, mm.1-6 [original score]</td>
<td>28</td>
</tr>
<tr>
<td>32</td>
<td>Handel: <em>Larghetto</em> from Sonata No. 2 in G minor, from <em>12 Solos for Flute, Oboe, or Violin with a Thorough Bass for Harpsichord</em>, mm.1-6 [transposed]</td>
<td>29</td>
</tr>
<tr>
<td>33</td>
<td>John B. Dykes: <em>NICEA</em> [original]</td>
<td>30</td>
</tr>
<tr>
<td>34</td>
<td>John B. Dykes: <em>NICEA</em> [transposed]</td>
<td>31</td>
</tr>
<tr>
<td>35</td>
<td>Interval and direction of most non-octave transposing instruments</td>
<td>33</td>
</tr>
</tbody>
</table>
1 Introduction

Transposition is useful in many situations, and each requires a method suited to its needs. Jazz musicians regularly transpose cadential passages and famous solos by ear to practice improvisation. Class piano and theory curricula often require students to transpose simple melodies and chord progressions through a combination of analysis, aural memory, and hand position. Lastly, instrumentalists, conductors, accompanists, composers, and copyists need to transpose music accurately at sight to adjust for vocal ranges or transposing instruments. This article outlines a system of transposition using clefs which is intended for this last group of musicians.¹

One of the earliest instances of clef transposition is Johannes Ockeghem's Missa cuiusvis toni, the "Mass in Any Mode," published posthumously in 1539.² Notated without clefs, singers must decide on one of four different clef combinations, each of which, when supplied mentally, fixes the notated music in D dorian, E phrygian, F lydian, or G mixolydian.³ Early references directly related to clef transposition as a systematic process include Gioseffo Zarlino's Le istitutioni harmoniche (Venice, 1558), and his student, Girolamo Diruta's Il Transilvano (Venice, 1597).⁴ Figure 1, from Zarlino's Le istitutioni harmoniche, shows how a plainchant in baritone clef can be transposed up a major third when read in tenor clef with a new key signature.

¹ The author's initial exposure to clef transposition was at the European American Musical Alliance summer program in Paris in the classes of Mark Shapiro and Teddy Niedermaier. In addition, the author extends his thanks to Edoardo Bellotti, Robert Wason, and Robert Gjerdingen for their suggestions regarding early sources, and to Jacob Fuhrman, Louis Cruz, and Daniel Pesca for their help in editing this manuscript.

² David Fallows, "Johannes Ockeghem: The Changing Image, the Songs and a New Source," Early Music 12, no. 2 (1984): 219. Lansdowne MS. 763 is an English manuscript dating c.1460 which contains a treatise describing how to improvise vocal polyphony by mentally displacing a notated chant by consonant intervals. While this is a sort of transposition, the source does not mention the use of clefs specifically. See: Sanford B. Meech, "Three Musical Treatises in English from a Fifteenth-Century Manuscript," Speculum 10, no. 3 (July, 1935), 235-269.


Many nineteenth- and twentieth-century publications originating from French and Belgian conservatories make use of clef transposition in a more systematic way than Zarlino and Diruta. Although it contains almost no methodology, one of the earliest French sources to mention clef transposition is Charles Baudiot's treatise *Études de transposition* (Paris, 1838). Perhaps the first systematic description of clef transposition in print is Augustin Savard's *Principes de la musique et méthode de transposition* (Paris, 1875). André Gédalge's solfège method *L'enseignement de la musique par l'éducation méthodique de l'oreille* (Paris, 1922) contains exercises without clef or key signature, where the student (or teacher) is supposed to choose both, effectively transposing each exercise. In addition, Gédalge's famous *Traité de la fugue* (Paris, 1902) uses clefs to transpose fugue subjects (although this forms a very small part of the treatise). In fact, every French source listed in the bibliography uses clef transposition, as opposed to other techniques of transposition described in the next section. Additionally, non-French publications by McHose, Rice, Warriner, and Sweigart also use the clef method. This is all to show that, while the organization and presentation of the material in this article are original, the concept of clef transposition itself is not.

---

2 Methods of Transposition

This article is intended as a practical guide to clef transposition, not a history of transposition itself.\(^6\) The bibliography provides a list of sources that mention transposition in a pedagogical context, but a more detailed survey of the evolution of the practice of transposition remains to be done.

While many sources in the bibliography describe systems of transposition only tangentially, those that do describe a method can be divided thus:

1. **Analysis (scale degrees, solfége, or Roman numerals)**
   
   Scale degrees and solfége are obviously more useful for single line melodies, while Roman numerals are better suited for common-practice homophonic textures.\(^7\) Non-tonal, highly chromatic, or non-homophonic music requires a different method.

2. **Aural memory**

   This method is appropriate when there is time for prior preparation, and usually incorporates some analysis as well. Naturally, it is limited to one’s capacity for memorization. However, it does not allow for reading transposed music at sight.

3. **Hand position and melodic contour**

   Focusing on contour and transfer of hand position is especially useful for theory and class piano instruction, but is best suited to simple, diatonic passages.

4. **Intervallic approach**

   In this method, the reader retains the original clef while mentally displacing the notated music by a certain interval. This system is often advocated by players of

---

\(^6\) For a short history of transposition, refer to chapter one in the dissertation by Esther DeTurk Sweigart.

\(^7\) The combination of these three analytical tools forms the basis of Rees-Davies, Porter, Warriner, and Hunt’s tutorials.
transposing instruments, such as horn, clarinet, and saxophone. However, it is not entirely systematic because it lacks a method for dealing with accidentals. In addition, it is best suited to transposition up or down by smaller intervals (by second or third).

5. **Clefs**

This system accounts for all three variables in the transposition "equation": clef, key signature, and accidentals. In contrast to other techniques for transposition, clefs allow for absolute certainty when transposing difficult passages into any key by sight alone, making this method particularly suited to conductors, accompanists, composers, copyists, and players of transposing instruments. In addition, an advantage of the clef method over the intervallic approach is the consistent correspondence between visual input, instrumental fingerings, and the resulting sound—the new clef allows for reading at pitch. In contrast, the intervallic approach allows the same visual cues on the staff to have many potential fingerings and aural "outputs," which could have a negative effect on sight-reading skills and be an annoyance for those with absolute pitch. The primary disadvantage of the clef method is the time required to learn the seven clefs fluently.

In practice, a secure transposition technique draws from each of the above methods to suit the circumstances.

3 Reading the seven clefs

The following is a brief description of the seven clefs and techniques for learning them.

The ability to read C clefs is useful in other circumstances, apart from transposition, since

---

8. Whitmer, Farkas, and Langenus—all instrumentalists—advocate for the intervallic approach.
C clefs are used by instruments such as viola, cello, trombone, and bassoon, and in older editions of many scores.

### 3.1 The seven clefs

The seven clefs in general use today are shown in figure 2. The position of middle C is indicated by the whole note. The treble clef, also called a G clef, encircles G, whereas the F clefs place their dots around F, indicated with small noteheads. (The baritone clef is sometimes written as a C clef on the top line of the staff, following the pattern established by the other C clefs.)

![Figure 2: The seven clefs](image)

Diruta mentions the same seven clefs (in reverse order) in *Il Transilvano* (1597).

![Figure 3: The seven clefs (Diruta, Il Transilvano, 6.)](image)

### 3.2 Reference points

When beginning to learn new clefs, it is helpful to use reference points to identify unknown pitches quickly, rather than memorizing the letter name of every line and space.
3.2.1 Other pitches as reference points

Recall that all odd generic intervals (thirds, fifths, and sevenths, etc.) will always be on a line/line or space/space, and all even generic intervals (seconds, fourths, sixths, octaves, etc.) will always be on a line/space. Of course, this is true whether the intervals are simultaneous or consecutive, as shown in figure 4.

![Figure 4: Line and space patterns for even and odd intervals](image)

3.2.2 Mental reference points

When learning new clefs, it is beneficial to have three or four reference points on the staff (besides middle C) fixed in one's mind. Then, all other pitches are only a third or fourth removed from a known reference point. In his popular *Manuel pratique*, Dandelot advocates using octaves and fifths above and below middle C as mental reference points.

![Figure 5: Possible mental reference points for each clef](image)

Another option is to use the center line of each clef with the octave above and the octave below, since these three notes will always be the same pitch for that particular clef.
3.3 The "infinite staff"

It is useful to imagine middle C as the center of a mathematical graph, with ledger lines extending infinitely above and below. Augustin Savard describes this idea in his *Principes de la musique et méthode de transposition*, published in Paris in 1875.

The grand staff approximates this idea, especially when the two clefs are close enough to overlap at middle C, as shown in figure 8. Since the treble clef shows the greatest number of lines above middle C, and the bass clef shows the greatest number below, the need for ledger lines is minimized. ("Ut" is "do" in French solfège, as well as the original Guidonian solmization system.)
Figures 9-11 show how staff lines and ledger lines are equivalent in the "infinite staff." In this context, learning seven clefs is less daunting because each clef simply indicates a five-line subsection of the "infinite staff." Though separated by centuries, Diruta (1597) and Savard (1875) use this same concept.

Figure 9: The "infinite staff" (Diruta, *Il Transilvano*, 7.)

Figure 10: The "infinite staff" (Savard, *Principes*, 50.)

Figure 11: Figure 10 in modern notation with clefs reversed
4 Suggestions for practice

4.1 Fixed-do solfège

Fixed-do solfège is especially useful as a practice method because it involves the naming of each letter name on the staff. Simply speaking the letter names in rhythm is valuable practice, without actually playing or singing.

4.2 Resources

The books by Dandelot and Ledout listed in the bibliography are specifically intended for learning new clefs. Both dedicate individual chapters to each clef with progressively more difficult exercises, which is helpful for beginners. However, one disadvantage to these publications is their emphasis on dry exercises rather than repertoire. Musical context provides many subconscious clues that makes reading new clefs easier and more enjoyable. By using the system described in this article to switch clefs mentally, any piece of music can become a resource for practice. For instance, sight-singing anthologies are valuable resources for practicing clef reading, since they contain many single-line melodies and many students are required to purchase one anyway. J.S. Bach’s chorales are also a useful public domain resource, especially for accompanists to practice transposing a grand staff.

5 Transposing music back to concert pitch

5.1 The Three-Step Process

There are three variables in the transposition “equation”: clef, key signature, and accidentals. Each of the following three steps adjusts for one of these variables. The process
CLEF TRANPOSITION

Itself is greatly clarified when applied to real music; therefore, it is advised to read directly through to "Application in Context" on page 17, even if the three steps are not entirely clear yet.

5.1.1 Step one: Change the clef.

It is not a coincidence that there are seven clefs and seven pitches in the diatonic scale. Each clef is suited to transpose music by a generic interval. (Actually there are more than seven clefs, but this is the reason only seven are commonly used.)

Figure 12 shows the clefs associated with each key when the transposed music is written in treble clef. Notice that the keys begin on the left with C major and proceed down in thirds because each clef moves middle C up by one line.

![Figure 12: Clefs for each key when starting in treble clef](image)

For example, if the transposed music is for B-flat trumpet, change the treble clef to tenor clef. If the transposed music is for horn in F, change the treble clef to mezzo-soprano clef. If the transposed music is for alto flute (in G), change the treble clef to baritone clef.

5.1.2 Step two: Change the transposed key signature back to the concert key.

If you know the original concert key, simply read the transposed music in that key. If you do not know the original key, Figure 13 shows the number and type of accidentals that must be added to the transposed key signature. (It is the same number of accidentals as the key signature of the transposing instrument.) Notice that the total number of accidentals for
the two keys of any clef always adds up to seven, with one group of sharps and the other of flats.

**Figure 13:** How to alter the transposed key signature when beginning in treble clef

<table>
<thead>
<tr>
<th>Common Keys for transposing instruments</th>
</tr>
</thead>
<tbody>
<tr>
<td>A Major (+3 sharps)</td>
</tr>
<tr>
<td>F Major (+1 flat)</td>
</tr>
<tr>
<td>D Major (+2 sharps)</td>
</tr>
<tr>
<td>Bb Major (+2 flats)</td>
</tr>
<tr>
<td>G Major (+1 sharp)</td>
</tr>
<tr>
<td>Eb Major (+3 flats)</td>
</tr>
<tr>
<td>Ab Major (+4 flats)</td>
</tr>
<tr>
<td>F# Major (+6 sharps)</td>
</tr>
<tr>
<td>Db Major (+5 flats)</td>
</tr>
<tr>
<td>B Major (+5 sharps)</td>
</tr>
<tr>
<td>Gb Major (+6 flats)</td>
</tr>
<tr>
<td>E Major (+4 sharps)</td>
</tr>
</tbody>
</table>

Less common keys

It is helpful to think of changing the key signature like turning a dial—clockwise adds sharps (or subtracts flats) and counter-clockwise adds flats (or subtracts sharps), just like the circle of fifths.

**Figure 14:** The circle of fifths as a dial

For example, if the transposed key is D major and is written for horn in F, add one flat to the key signature. That is, turn the dial one "click" counter-clockwise, leaving only one sharp in the new key signature. If the transposed key is A major and the music is for clarinet in A, add three sharps to the key signature. That is, turn the dial three "clicks" clockwise, resulting in six sharps in the new key signature.
5.1.3 Step three: Shift certain accidentals after the clef has been changed.

Dealing with accidentals is the most difficult step to conceptualize. It consists of two parts:

1. **Determine which pitches in the original music will be affected.**

   As a rule: if sharps were added in step two (section 5.1.2), begin on F and follow the order of sharps; if flats were added, begin on B and follow the order of flats. This step is summarized in figure 15.

   **Figure 15: The order of affected pitches after the clef has been changed**

<table>
<thead>
<tr>
<th>When adding…</th>
<th>…the affected pitches proceed in this order:</th>
</tr>
</thead>
<tbody>
<tr>
<td>flats…</td>
<td>B, E, A, D, G, C, F</td>
</tr>
<tr>
<td>sharps…</td>
<td>F, C, G, D, A, E, B</td>
</tr>
</tbody>
</table>

   For example, if step two added three sharps (perhaps for clarinet in A), the affected pitches would be F, C, and G. If it added two flats (perhaps for B-flat trumpet), the affected pitches would be B and E. Figure 16 summarizes this system, showing the affected pitches in parenthesis.

   **Figure 16: Pitches with altered accidentals in each key**

---

15
2. **Alter accidentals on affected pitches using figure 17.**

If sharps were added in the previous step, shift accidentals one box to the left; if flats were added, shift them right.

![Figure 17: Shifting accidentals on affected pitches](image)

For example, when transposing a clarinet in A, all accidentals in front of F, C, and G will move right: flats become naturals, naturals become sharps, and sharps become double sharps. When transposing B-flat trumpet, all accidentals in front of B and E move left: sharps become naturals, naturals become flats, and flats become double flats. These changes only apply to the affected pitches in figure 16 after the clef has been changed.9

---

9. Cusenza describes this process of altering accidentals on the inside cover of *Hanon-Cusenza Simplified Transposing and Phrasing Method*. 
5.2 Application in context

5.2.1 Ravel: Bolero

Imagine that a conductor needs to transpose the following passage from Ravel's Bolero back to concert pitch.  

![Figure 18: Ravel: Bolero, at rehearsal 8 [original transposed version]](image)

1. **Step one: Change the clef.**

Since the music is for horn in F and is written in treble clef, change the clef to mezzo-soprano clef.

2. **Step two: Change the transposed key signature back to the concert key.**

The original is in C major, but for sake of demonstration, let's follow the procedure for correcting the key signature. There are no accidentals in the original key signature, so adding one flat (turning the dial counter-clockwise one "click") results in the key of F major.

3. **Step three: Shift certain accidentals after the clef has been changed.**

F major has one flat, so shift accidentals in front of B one box to the left after the clef has been changed. Therefore, the sharps in this example become naturals.

---

10. All excerpts in this article have bar numbers beginning at ‘1’ to facilitate comparison between transposed and concert versions of the score.
Figure 19 shows what the conductor imagines when transposing this passage to concert pitch.

5.2.2 Regarding horn and trumpet parts

Horns and trumpets are often written in C major (or without a key signature) in orchestral scores. This is a holdover from the time before valves, when these instruments were always written in C and players used crooks to alter the key in which the instrument sounded. Do not be tricked into thinking a transposed score is a concert score, in which all transposing instruments are shown in concert pitch. (Often band music and twentieth-century Russian music is in concert score.) In addition, remember that older scores notate horn in F in bass clef, in which case it transposes up a perfect fourth, not down a perfect fifth. Furthermore, non-tonal music is often written entirely without a key signature, meaning a transposed score would also lack key signatures in some cases. In general, it is best to check the first pages of a score, where there will usually state whether the score is transposed or concert—don’t simply rely on the key signature of the transposing instrument.
In the case of *Bolero*, the horn part would have been written in G major under the "normal" rules for transposing instruments, since the piece is in C major.

Figure 20: Ravel: *Bolero*, at rehearsal 8 [hypothetical transposed version]

Adding one flat to the key signature would make the part in C major, and the result would sound the same as in figure 19. (There are no accidentals to adjust.)

Figure 21: Ravel: *Bolero*, at rehearsal 8 [another equivalent concert pitch version]
5.2.3  

Gershwin: *Rhapsody in Blue*

The next example comes from Gershwin’s *Rhapsody in Blue* and is for B-flat trumpet.

Figure 22: Gershwin: *Rhapsody in Blue*, mm.16-19 [original transposed version]

1. **Step one: Change the clef.**

   Since the original music is for B-flat trumpet and is written in treble clef, change the treble clef to tenor.

2. **Step two: Change the transposed key signature back to the concert key.**

   There are no accidentals in the original key signature, so simply add two flats (turn the dial two "clicks" counter-clockwise) to arrive at the key of B-flat major.

3. **Step three: Shift certain accidentals after the clef has been changed.**

   Since two flats were added in the previous step, the affected pitches are B and E. Accidentals in front of these pitches move one box to the left after the clef has been changed. Therefore, the F# in this example become F-natural.

Figure 23 shows the version in concert pitch.

Figure 23: Gershwin: *Rhapsody in Blue*, mm.16-19 [concert pitch]
5.2.4 Octave adjustments

There is a problem with figure 23—it is an octave too low. This is a drawback of the clef system. Sometimes the resulting passage will be an octave too high or too low, depending on the interval of transposition. This problem requires the knowledge of the interval and direction of transposing instruments, shown in the appendix on page 33.

5.2.5 Mendelssohn: Fingal’s Cave or Hebrides Overture

Here is a more difficult example from Mendelssohn using two clarinets in A.

Figure 24: Mendelssohn: Fingal’s Cave or Hebrides Overture, mm.202-214 [original transposed version]
1. **Step one: Change the clef.**

   The original music is for A clarinet and is written in treble clef, so it requires soprano clef.

2. **Step two: Change the transposed key signature back to the concert key.**

   Clarinet in A requires the addition of three sharps, or turning the dial three "clicks" clockwise. Since the transposed version has one flat, the new key signature has two sharps. (Note that the passage is not in D major.)

3. **Step three: Shift certain accidentals after the clef has been changed.**

   Since three sharps were added in the previous step, affected accidentals are F, C, and G. Accidentals in front of these pitches will be shifted one box to the right. That is, the G-naturals will become G#'s.

---

Figure 25: Mendelssohn: *Fingal's Cave or Hebrides Overture*, mm.202-214 [concert pitch]
5.2.6 Stravinsky: Le Sacre du printemps

The final excerpt in this section comes from Stravinsky and is for alto flute.

Figure 26: Stravinsky: Le Sacre du printemps Part 1, "Rondes printanières," at rehearsal 56 [original transposed version]

1. **Step one: Change the clef.**

   Alto flute is a G instrument (transposing down a perfect fourth), and the passage is in treble clef. Therefore, the new clef is baritone.

2. **Step two: Change the transposed key signature back to the concert key.**

   Instruments in G require the addition of one accidental, or turning the dial one "click" clockwise, resulting in a key signature with one sharp.

3. **Step three: Shift certain accidentals after the clef has been changed.**

   Since one sharp was added in the previous step, accidentals in front of F will be shifted one box to the right. That is, the F-naturals will become F#’s.
This process is similar to the previous one in that it involves the same three steps. The difference is that the music is already in concert pitch—that is, it is not for a transposing instrument—but it must be played in a different key than it is written. This situation often arises when accommodating vocal registers in opera, choral, solo, or liturgical settings. Therefore, this section is particularly addressed to collaborative pianists, rehearsal accompanists, harpsichordists, and church organists. For this reason, the organization of this section is slightly different, but the underlying principles are the same.

Keyboard players usually approach transposition for vocal registers from the practical question: *Up or down and by what interval?* Consequently, figure 28 assumes that the music will begin in a grand staff and is organized differently than figure 12, but the information is essentially the same, with the addition of the new clefs when beginning with a bass clef. (Some of the transpositions in figure 28 will always be an octave too high or too low. This quickly becomes apparent in practice, and is easily corrected.)
Figure 28: Transposing keyboard music by interval

<table>
<thead>
<tr>
<th>To transpose...</th>
<th>up a 2nd</th>
<th>up a 3rd</th>
<th>up a 4th</th>
<th>down a 2nd</th>
<th>down a 3rd</th>
<th>down a 4th</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Change the grand staff to...</strong></td>
<td><img src="image" alt="Diagram" /></td>
<td><img src="image" alt="Diagram" /></td>
<td><img src="image" alt="Diagram" /></td>
<td><img src="image" alt="Diagram" /></td>
<td><img src="image" alt="Diagram" /></td>
<td><img src="image" alt="Diagram" /></td>
</tr>
<tr>
<td><strong>and add either...</strong></td>
<td>+2 sharps</td>
<td>+4 sharps</td>
<td>+6 sharps</td>
<td>+5 sharps</td>
<td>+3 sharps</td>
<td>+1 sharp</td>
</tr>
<tr>
<td><strong>or...</strong></td>
<td>+5 flats</td>
<td>+3 flats</td>
<td>+1 flat</td>
<td>+2 flats</td>
<td>+4 flats</td>
<td>+6 flats</td>
</tr>
</tbody>
</table>

In some cases, transposition up or down a half-step can be accomplished simply by leaving the grand staff and changing the key signature. For instance, if a piece is in E major, change the key signature to E-flat major to transpose down a half step; similarly, if a piece is in F major, change the key signature to F# major to transpose up a half-step. Use the same method described in section 5.1.3, but remember the number of affected pitches will always be seven because every pair of keys in this category is seven "clicks" away from the other on the circle of fifths dial (e.g. C major/C# major, D major/D-flat major, G minor/G# minor etc.). Accidentals will still be shifted right if sharps were added, and left if flats were added.

**6.1 Application in context**

**6.1.1 Schubert: Der Neugierige**

The following example from Schubert is intended for collaborative pianists. The given score is the original key of B major. It would not be unusual for a vocalist to request to sing it in C major. (In addition, setting C major as the target key makes our first foray into grand staff transposition a little easier.)
1. **Step one: Change the clef(s).**

   As shown in figure 28, transposing up a second requires alto and a mezzo-soprano clef.

2. **Step two: Add or subtract accidentals from the original key signature.**

   A target key of C major requires adding five flats to the key signature.

3. **Step three: Shift certain accidentals after the clef has been changed.**

   Adding five flats moves the pitches B, E, A, D, and G one box to the left.

   Figure 30 shows what the accompanist imagines in order to transpose this passage up a minor second.
Here we confront the problem of octave displacement. The alto clef staves are an octave too low and the mezzo-soprano staff is an octave too high. In context, simply being aware of this issue makes the adjustment easy.

6.1.2 Handel: *Larghetto* from Sonata No. 2 in G minor

The next example is aimed at harpsichordists and organists who often play on historical instruments, which are sometimes tuned a half or whole step away from A=440. For this passage, imagine that the given instrument is tuned a half-step sharp. To compensate, the player must transpose down a half-step. This can often be accomplished by changing the key signature, as described above; when it cannot, clefs can help.
1. **Step one: Change the clef(s).**

As shown in figure 28, transposing down a second requires tenor and alto clef. (The treble part is included just for sake of practice—the keyboard player only reads the bottom staff and realizes the figured bass with the right hand.)

2. **Step two: Add or subtract accidentals from the original key signature.**

The target key is F# minor, which requires adding four sharps to the key signature.

3. **Step three: Shift certain accidentals after the clef has been changed.**

Adding four sharps shifts accidentals on F, C, G, and D one box to the right.

Again we are faced with the problem of octave displacement. Thankfully, at least the figured bass in this example remains the same. (In some cases, figured bass accidentals may need to be changed, such as flats to naturals, but of course the direction of the alteration remains the same.)
Figure 32: Handel: *Larghetto* from Sonata No. 2 in G minor, from *12 Solos for Flute, Oboe, or Violin with a Thorough Bass for Harpsichord*, mm.1-6 [transposed]

6.1.3 **Hymntune: NICEA**

The final example is of the hymn tune *NICEA*. It reaches a high note of D, which is a reasonable upper limit for most congregations. Just for the sake of demonstration, imagine that the organist wishes to transpose this hymn up a minor third, which would usually occur after a modulation to the intervening key of E major or E-flat major. (Modulating twice during a hymn is often looked down upon, but note that J.S. Bach is known to have modulated twice by half-step on at least one occasion.)

---

11 George Stauffer and Ernest May, eds., *J.S. Bach as Organist* (Bloomington: Indiana University Press, 1986), ix. "Bach played the Creed [the hymn *Wir glauben all' an einen Gott*] in D minor, but for the second verse he lifted the congregation into E-flat minor, and for the third verse, he took those present even higher, to E minor. This could be accomplished only by a Bach and on an organ in Altenberg." [The Altenberg organ was in well-tempered tuning, which was unusual for the time. It was the inauguration of the newly-installed instrument, and it is likely that Bach wanted to show it off.]
1. **Step one: Change the clef(s).**

   As shown in figure 28, transposing up a third requires bass and baritone clefs.

2. **Step two: Add or subtract accidentals from the original key signature.**

   The target key is F major, which requires adding three flats to the key signature.

3. **Step three: Shift certain accidentals after the clef has been changed.**

   Adding three flats shifts accidentals on B, E, and A to the left.
The problem of octave displacement is compounded in this example, with the top staff off by two octaves; the bottom staff is in the correct register, however. Again, simple awareness of the issue solves the problem with practice.
7 Conclusion

Clef transposition is best suited to conductors, composers, accompanists, copyists, and players of transposing instruments—anyone who must transpose complex music regularly at sight. The amount of time required to learn the seven clefs is certainly a hindrance to learning the technique, but its systematic approach towards the three "variables" of clef, key signature, and accidentals makes it useful for chromatic, modulatory, polyphonic, and non-tonal music. Unlike the intervallic approach, clef transposition works equally well no matter the interval of transposition, and it preserves the correlation between visual cues on the staff, instrumental fingerings, and the resulting sound. Additionally, one gains fluency with new clefs, which is useful in itself.

In practice, transposition makes use of a variety of techniques simultaneously: hand position, analysis, aural memory, and common sense. Naturally, some methods are more useful for certain situations. Hopefully, the method using clefs will become more widespread in the United States, as it is a powerful tool for those willing and able to invest the time to master it.
# Appendix: Tables of transposing instruments

Figure 35: Interval and direction of most non-octave transposing instruments

<table>
<thead>
<tr>
<th>Horn in...</th>
<th>Sounds...</th>
<th>Trumpet in...</th>
<th>Sounds...</th>
</tr>
</thead>
<tbody>
<tr>
<td>C {\textit{alto}}</td>
<td>sounds as written</td>
<td>F</td>
<td>perfect 4th up</td>
</tr>
<tr>
<td>B{\textsuperscript{#}} {\textit{alto}}</td>
<td>major 2nd down</td>
<td>E</td>
<td>major 3rd up</td>
</tr>
<tr>
<td>A</td>
<td>minor 3rd down</td>
<td>E{\textsuperscript{#}}</td>
<td>minor 3rd up</td>
</tr>
<tr>
<td>Ab</td>
<td>major 3rd down</td>
<td>D</td>
<td>major 2nd up</td>
</tr>
<tr>
<td>G</td>
<td>perfect 4th down</td>
<td>C</td>
<td>sounds as written</td>
</tr>
<tr>
<td>F</td>
<td>perfect 5th down</td>
<td>B</td>
<td>minor 2nd down</td>
</tr>
<tr>
<td>E</td>
<td>minor 6th down</td>
<td>B{\textsuperscript{#}}</td>
<td>major 2nd down</td>
</tr>
<tr>
<td>E{\textsuperscript{#}}</td>
<td>major 6th down</td>
<td>B{\textsuperscript{#}} cornet</td>
<td>major 2nd down</td>
</tr>
<tr>
<td>D</td>
<td>minor 7th down</td>
<td>A</td>
<td>minor 3rd down</td>
</tr>
<tr>
<td>C {\textit{basso}}</td>
<td>octave down</td>
<td>Eb {\textit{basso}}</td>
<td>major 6th down</td>
</tr>
<tr>
<td>B{\textsuperscript{#}} {\textit{basso}}</td>
<td>major 9th down</td>
<td>D {\textit{basso}}</td>
<td>minor 7th down</td>
</tr>
<tr>
<td>A {\textit{basso}}</td>
<td>minor 10th down</td>
<td>C {\textit{basso}}</td>
<td>octave down</td>
</tr>
<tr>
<td>Bb {\textit{basso}}</td>
<td>major 9th down</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Clarinet in...</th>
<th>Sounds...</th>
<th>Saxophone</th>
<th>Sounds...</th>
</tr>
</thead>
<tbody>
<tr>
<td>E{\textsuperscript{#}}</td>
<td>minor 3rd up</td>
<td>Soprano (Bb)</td>
<td>major 2nd down</td>
</tr>
<tr>
<td>D</td>
<td>major 2nd up</td>
<td>Alto (Eb)</td>
<td>major 6th down</td>
</tr>
<tr>
<td>B{\textsuperscript{#}}</td>
<td>major 2nd down</td>
<td>Tenor (Bb)</td>
<td>major 9th down</td>
</tr>
<tr>
<td>A</td>
<td>minor 3rd down</td>
<td>Baritone (Eb)</td>
<td>octave + M6 down</td>
</tr>
<tr>
<td>E{\textsuperscript{#}} alto</td>
<td>major 6th down</td>
<td>Bass (Eb)</td>
<td>2 octaves + M2 down</td>
</tr>
<tr>
<td>Bass clarinet (B{\textsuperscript{#}})</td>
<td>major 9th down</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Other Woodwinds</th>
<th>Sounds</th>
<th>Other Brass</th>
<th>Sounds</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alto flute (G)</td>
<td>perfect 4th down</td>
<td>Euphonium and Baritone</td>
<td>as written; if notated in treble clef, major 9th down</td>
</tr>
<tr>
<td>English Horn</td>
<td>perfect 5th down</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Oboe d’amore (A)</td>
<td>minor 3rd down</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
References


Anonymous. *A treatise on the transposition of music, with a new-invented circular sliding scale; By which any Person unacquainted with Music, may learn to transpose into all the various Keys in a few Minutes.* London: printed for the author, 1780.


Kern, Alice M. *Harmonization-transposition at the keyboard; for the student and teacher of class or group piano, private piano, music education [and] general education*. Evanston, Ill.: Summy-Birchard Co., 1963.


