

CLEFS AND TRANSPOSITIONS

Alto and Tenor Clefs

As music notation and calligraphy developed over the past four centuries, a system of movable clefs evolved that placed C¹ (middle C) on various lines of the five-line staff. Each of the human voices had its own movable C clef (soprano clef, mezzo-soprano clef, and so on), which tended to place most of the written notes in the general range of the staff, thus eliminating excessive use of ledger lines. This system has remained in use today, with two primary C clefs employed in addition to the treble and bass clefs—the *tenor* and *alto* clefs. Conductors must be able to read alto and tenor clefs with ease. Reading C clefs should not be considered transposition; all notes are at concert pitch. The alto and tenor clefs are shown in Figures 5-1 and 5-2.

FIGURE 5-1
Alto clef.

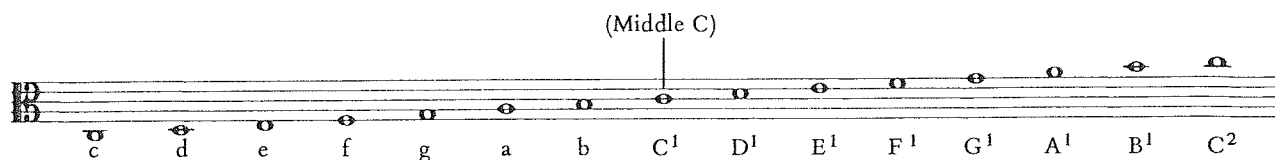
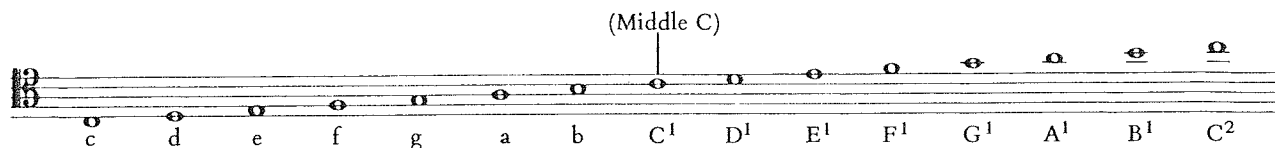


FIGURE 5-2
Tenor clef.



Practice the excerpts in Figure 5-3, singing the names of the notes or playing the notes on the piano.

Additional examples in alto clef can be found in viola parts in orchestral and chamber music; additional examples in tenor clef can be found in cello, trombone, and bassoon parts.

FIGURE 5-3

Reading exercises in the alto and tenor clefs: (a) Peter Ilych Tchaikovsky, *March Slav*; (b) Edward Elgar, *Enigma Variations*; (c) Michael Haydn, *Quintet in F Minor*; (d) Johannes Brahms, *Concerto No. 2 for Piano and Orchestra*, third movement.

(a) *March Slav*.



FIGURE 5-3
(Continued)

(b) *Enigma* variations.

Andante

(c) Quintet in F Minor.

Menuetto allegretto

(d) Piano Concerto No. 2.

Andante

Vocal Transpositions

Vocal music normally uses only one transposed voice, the tenor part, which sounds one octave lower than written.

Instrumental Transpositions

Transposing instrumental or vocal parts to concert pitch is one of the conductor's constant tasks. The individual performer sees only one or two written lines in a part and frequently needs instant confirmation or correction of that part from the conductor.

Understanding the process of transposition requires understanding the system of intervallic relationships that includes the *concert pitch* (the pitch that is heard) and the *transposed pitch* (the pitch that is written at some interval from the concert pitch). An inexperienced performer will frequently think only in terms of the written pitch in the transposed part, not of the concert pitch relationships with the rest of the ensemble. But each performer can become more aware of these ensemble relationships through constant reference by the conductor to concert pitch during rehearsals.

Theoretical and Historical Background

One basis for the transposition process that we use is the *harmonic series*, a succession of pitches produced when a pipe is blown and overblown or a string is set into vibration by being plucked or struck. The lowest pitch of the harmonic series is called the *fundamental*, and the subsequent tones are called *overtone*s. Another term for the fundamental is the *first partial*, with each successive partial numbered consecutively.

The harmonic series of a pipe with a fundamental of C below the bass staff would produce the tones shown in Figure 5-4. The two commonly used systems of enumeration are indicated: the one above the staff is the fundamental with subsequent overtones, and the one below the staff lists each tone by partial number. The noteheads in black—partials 7 and 11—are badly out of tune and must be adjusted by performers.

FIGURE 5-4
Harmonic series in C.



Before the invention of valves for brass instruments, during the second decade of the 1800s, the horns and trumpets of the orchestra and wind band were mainly restricted to the tones of the harmonic series. Pitches between series tones were possible, however, through hand positioning in the horn bell and through lip manipulation with the mouthpiece. When a composition required harmonic or melodic resources other than the tones in the C harmonic series, the performer changed the length of tubing on the instrument through the use of crooks or slides, producing a new fundamental and overtone series. (The trombone is an excellent example of this process; its seven positions produce seven harmonic series—B-flat, A, and so on, through E.) Horn players of the late 1700s used a basic instrument of circular tubing with crooks that put the horn into harmonic series based on B, B-flat, A, A-flat, G, F, E, E-flat, D, C basso, and B-flat basso. Thus it became the performer's task to find a way to perform the part as the harmonic language of the classical period assumed more of a chromatic nature.

The excerpt in Figure 5-5 illustrates the principle of transposition with the famous “horn fifths,” a set of harmonic-series tones that produced a sixth, a fifth, and a major third between the two voices. This is probably the most common open-horn passage of the prevolve era, other than unisons and octaves. The concert-pitch result is shown in Figure 5-6.

FIGURE 5-5
 Franz Joseph Haydn, Symphony No. 103, fourth movement.

Allegro con spirito

Flauti

Oboi

Clarinetti in Bb

Fagotti

Corni in Eb

Trombe in Eb

Timpani in Eb, Bb

Violino I

Violino II

Viola

Violoncello e Basso

FIGURE 5-6
 Haydn, Symphony No. 103, C reduction.

Corni 1

Vln. I

Common Transpositions: C, B-Flat, F, and E-Flat

The conductor will occasionally find other transpositions in various keys in baroque, classical, and impressionist music, but the primary transposition requirements for most nineteenth- and twentieth-century music are:

- *C*. One or more octaves upward or downward
- *B-flat*. Major second, major ninth, major ninth plus one octave lower, minor seventh higher
- *F*. Perfect fifth lower (if in bass clef, perfect fourth up or perfect fifth down as specified)
- *E-flat*. Major sixth lower, major sixth plus one octave lower, minor third higher

Occasional use of A (minor third lower) and G (perfect fourth lower) will also be encountered.

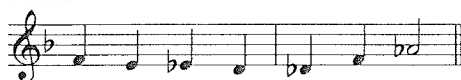
C transpositions are described in Figure 5-7.

FIGURE 5-7

C transpositions, one or more octaves: (a) octave higher; (b) two octaves higher; (c) octave lower in vocal music; (d) octave lower in instrumental music.

(a) Octave higher (8va). Instruments using 8va: piccolo; celesta.

Written:



Sounds:

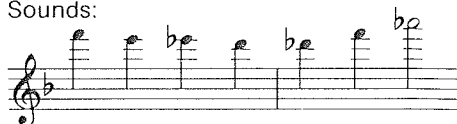


(b) Two octaves higher (15va). Instruments using 15va: orchestra bells (glockenspiel).

Written:



Sounds:



(c) Octave lower (8ba), vocal music. Used for tenor voices.

Written:



Sounds:



(d) Octave lower (8ba), instrumental music.

Instruments using 8ba: guitar, string bass (also uses C_4 for upper tessitura); contrabassoon.

Written:



Sounds:



B-flat transpositions sound a major second (M2), major ninth (M9), or major sixteenth (M16) lower than written and may also transpose upward a minor seventh (m7). The written part uses the key signature a major second above concert pitch; thus, the concert pitch of the example is F and the key signature of the written, transposed part is G. B-flat transpositions are shown in Figure 5-8.

FIGURE 5-8

B-flat transpositions: (a) major second lower; (b) major ninth lower;
(c) major fifteenth lower.

(a) Major 2d lower. Instruments using M2 lower: B-flat clarinet, soprano saxophone,
B-flat trumpet, B-flat cornet, flügelhorn.

Written:



Sounds:

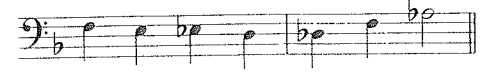


(b) Major 9th (octave plus M2) lower. Instruments using M9 lower: bass clarinet,
tenor saxophone, treble clef baritone.

Written:



Sounds:



(c) Major 16th (two octaves plus M2) lower. Instruments using 16ba lower:
BB-flat contrabass clarinet; bass saxophone.

Written:



Sounds:



F transpositions (see Figure 5-9) sound a perfect fifth (P5) lower than written. The written part uses the key signature a perfect fifth above concert pitch; thus in Figure 5-9 the concert-pitch key signature is F and the key signature of the written, transposed part is C.

FIGURE 5-9

F transposition: perfect fifth lower.

Written:



Sounds:



Transpositions in E-flat (see Figure 5-10) sound a major sixth (M6) or an octave plus a major sixth lower than written. The written part uses the key signature a major sixth above concert pitch; thus, in Figure 5-10 the concert pitch is F and the key signature of the written, transposed part is D. E-flat transpositions also occur upward (E-flat clarinet and E-flat trumpet; concert pitch is a minor third higher than the written pitch).

FIGURE 5-10

E-flat transposition: major sixth lower.

Written:

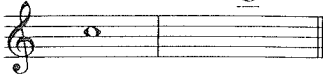
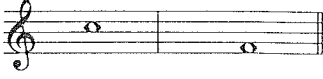
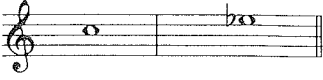



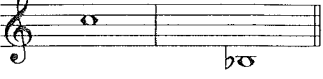
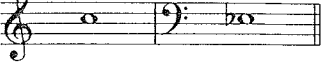
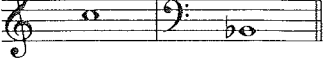
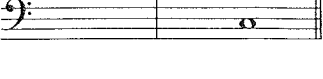



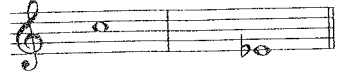



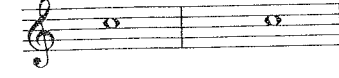
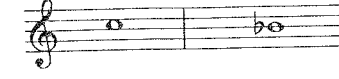




Sounds:



Quick-Check Transpositions for Orchestras and Wind Bands

Today, typical orchestra and band scores include the following instruments and transpositions. All other instruments listed on a score should be assumed to be written and sounding at concert pitch unless a key designation is given.

Instrument	Sounds	Written	Sounds
C piccolo	Octave higher		
English horn	P5 lower		
E-flat clarinet (transposes upward)	m3 higher		
B-flat clarinet	M2 lower		
A clarinet	m3 lower		
Alto clarinet	M6 lower		
Bass clarinet	M9 lower		
EE-flat contra-alto clarinet	M6 plus octave lower		
BB-flat contrabass clarinet	M16 lower (two octaves plus M2 lower)		
Contrabassoon	Octave lower		

Instrument	Sounds	Written Sounds
Soprano saxophone	M2 lower	
Alto saxophone	M6 lower	
Tenor saxophone	M9 lower	
Baritone saxophone	M6 plus octave lower	
F horn	P5 lower	
C trumpet	Concert pitch	
B-flat trumpet	M2 lower	
D trumpet (transposes upward)	M2 higher	
B-flat piccolo trumpet (transposes upward)	m7 higher	
String bass	Octave lower	
Celesta	Octave higher	
Orchestra bells	Two octaves higher (15va)	