

Key Modulation & Key Signatures

Throughout the sixteenth and seventeenth century there had been a growing feeling that music was being restricted by the limitations of both the scale and ecclesiastical music theory. Whilst the addition of accidental notes (particularly the flats) had been accepted from as early as Guido d'Arezzo and the Musica Recta system, it was extremely rare to see more than one in any piece of music. Despite the development of a twelve tone scale, the music being created was still using the concepts of an earlier age. It was into this atmosphere that the concept of key modulation was introduced, thereby heralding the true beginning of modern music theory.

Key Modulation is defined as the act of changing from one tonal centre to another. In terms of the modes of medieval music, this was simply the change from one mode or even one hexachord to another and was known as mutation. However, with the advent of the twelve tone scale, the possibilities for such movement was very much increased.

The French composer and music theorist Jean Philippe Rameau (1683-1764 CE) noted that the first, fourth and fifth notes of a heptatonic scale were the most important in terms of harmony. The chords based on those notes formed the basis of the hierarchies of functional harmony and these chords were built using stacked third intervals. He realised that the triad chords built on these three notes, when viewed in combination, used all notes in the diatonic scale (C-D-E-F-G-A-B-C):

I	C	E	G
IV	F	A	C
V	G	B	D

If the diatonic scale is then rebuilt using the same intervals between the notes, but on the fifth note rather than the first, then these chords become:

I	G	B	D
IV	C	E	G
V	D	F#	A

As the G chord and C chord are present in both cases, they can be used as a pivot point at which to change between the two.

First Note	Fifth Note	Altered Note
C	G	-
G	D	F#
D	A	C#
A	E	G#
E	B	D#
B	F#	A#
F#	C#	E#
C#	G#	B#

Fig 2.29: Cycle of Fifths with introduced sharps

If this process is continued for a series of fifths, each step adds one more sharp (Fig 2.29). In each case, the addition of these sharps takes place on the seventh note of each new heptatonic scale generated by the cycle of fifths.

The same process can be repeated for the fourth note of the scale. When moving from the C diatonic scale, the first movement gives:

I	F	A	C
IV	B \flat	D	F
V	C	E	G

Once again, the series can be extended to add flats into the scale - each step adds one more flat. In the case of the fourths, however, the added note is always the fourth of the new scale (Fig 2.30).

As a result of the combination of these two cycles, a diatonic scale has been constructed for each note in the twelve tone scale.

First Note	Fourth Note	Altered Note
C	F	-
F	B \flat	B \flat
B \flat	E \flat	E \flat
E \flat	A \flat	A \flat
A \flat	D \flat	D \flat
D \flat	G \flat	G \flat
G \flat	C \flat	C \flat
C \flat	F \flat	F \flat

Fig 2.30: Cycle of Fourths with introduced flats

The definition of twelve new diatonic scales meant the addition of multiple accidentals to many new pieces of music written using them. In the case of the D \flat and B diatonic scales, this meant five of the seven notes carried accidentals each and every time they were used in a piece. For those writing long orchestral pieces, this would have become rather tedious very quickly.

Ultimately, the solution that gained popular support was that using *Key Signatures*. By placing sharp or flat symbols immediately to the right of the clef and prior to any notes, the composer specified which of the diatonic scales were being used. These symbols were placed on the relevant line or in the relevant gap for their particular note. Provided the musician knew the scale designated by the key signature, it was possible to play a piece without any need to continually look for accidentals. Indeed, the only accidentals now required were for notes that did not fall inside the scale being used - e.g. any note added chromatically to a piece. A common misconception amongst music teachers is that the term accidental refers to any sharp or flat. The term, however, only refers to those sharps and flats used to alter single notes and not to key signatures.

There is some overlap between the two series of key signatures due to some notes being enharmonic to others. For example, taking B Major:

B C# D# E F# G# A#

Which is enharmonic to C \flat Major:

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

This is also true of two other pairs of keys:

F# Major = G \flat Major
 C# Major = D \flat Major

Because the spelling of the Ionian mode is now that of the Major scale and the spelling of the Aeolian mode is now that of the Minor scale, each Major scale has an associated Minor scale. These are known as the Relative Minor scale. The relative minor of a major scale is based on a note three semitones below the root note of the major - hence, F Major has a relative minor of D Minor and both use the same key signature.

C Major

Fig 2.31: Key Signatures