CHAPTER

4 The Organization of Musical Sounds

"If only the world could feel the power of harmony."

—W. A. Mozart

Here we consider how melody and harmony, two of the essential building blocks of musical compositions, function together to construct a musical system, both in the West and elsewhere.

Pitches are named using the first seven letters of the alphabet (A through G), which just start over again when you reach an octave. As noted earlier, an octave is an interval spanning eight notes of the scale. When we hear any two notes an octave apart, we recognize that they sound "the same." (These two notes take the same pitch name: for example, a C and the C an octave higher.)

KEY POINTS

- An **octave** is the interval spanning eight notes of the scale. In Western music, the octave is divided into twelve **half steps**, the smallest interval; two half steps make a **whole step**.
- The **chromatic scale** is made up of all twelve half steps, while a **diatonic scale** consists of seven whole and half steps whose patterns form **major** and **minor scales**.
- A **sharp** (♯) is a symbol that raises a pitch by a half step; a **flat** (♭) lowers a pitch by a half step.
- The **tonic chord**, built on the first scale note, is the home base to which **active chords** (**dominant** and **subdominant**) need to resolve.
- Composers can shift the pitch level (**key**) of an entire work (**transposition**), or change the key during a work (**modulation**).

One important variable in the different languages of music around the world is the way the octave is divided. In Western music, it is divided into twelve equal semitones, or **half steps**; from these are built different kinds of scales, which have constituted the basis of this musical language for nearly four hundred years.

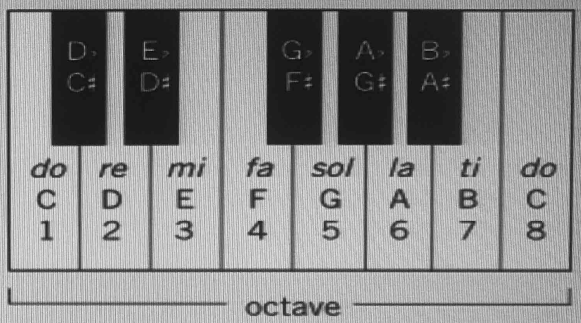
THE CHROMATIC SCALE

The twelve half steps that make up the octave constitute what is known as the **chromatic scale**. You can see these twelve half steps on the keyboard (p. 18), counting all the white and black keys from C to the C above it. Virtually all Western music, no matter how intricate, is made up of the same twelve pitches and their duplications in higher and lower octaves.

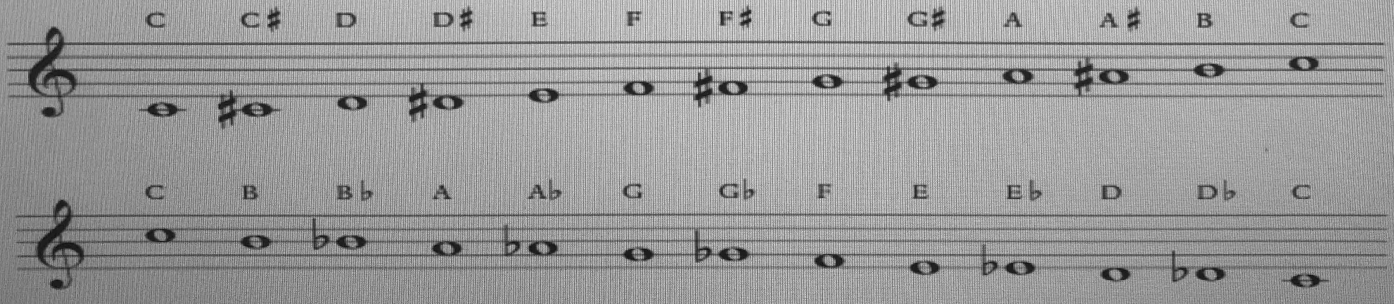
You will notice that the black keys on the piano are named in relation to their white-key neighbors. The black key between C and D can be called C-sharp (♯) or D-flat (♭), depending on the context of the music. This plan applies to all the black keys. Thus, a **sharp** raises a note by a half step, and a **flat** lowers a note a half step. The distance between C and D is two half steps, or one **whole step**.

Names of Tones and Intervals

2 half steps	=	**1 whole step**
C–C# →	=	**1 half step**
C#–D →	=	**1 half step**
C–D →	=	**1 whole step**
12 half steps	=	**1 octave**



Chromatic scale



THE MAJOR SCALE

Chapter 3 introduced the notion that certain notes in music assume greater importance than others; in Western music, the first pitch of the scale, the tonic, is the home base to which the music gravitates. Two main scale types—major and minor—function within this organizational system known as tonality. When you listen to a composition in the **key** of C major, you hear a piece built around the central tone C, using the harmonies formed from the C major scale. Tonality is the basic harmonic principle at work in most Western music written from around 1600 to 1900 and in most popular music.

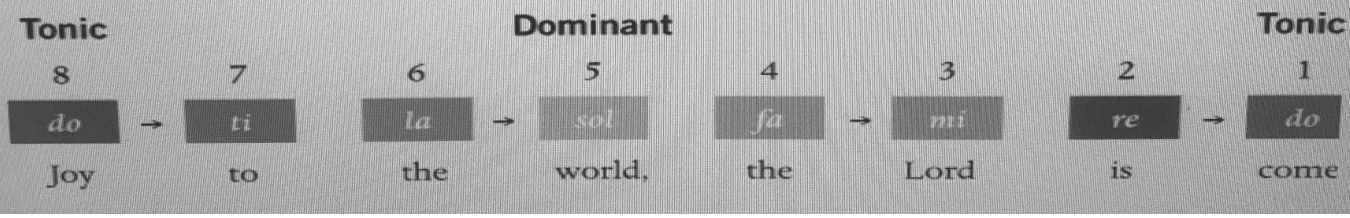
The **major scale** is the most familiar sequence of pitches. You can produce a C major scale (*do–re–mi–fa–sol–la–ti–do*) by playing only the white keys on the piano from one C to the next C. Looking at the keyboard above, you will see that there is no black key between E and F (*mi–fa*) or between B and C (*ti–do*). These notes are a half step apart, while the other white keys are a whole step apart. Consequently, a major scale is created by a specific pattern of whole (W) and half (H) steps— (W–W–H–W–W–W–H)—and can be built with this pattern starting on any pitch, even a black key.

In His Own Words

"There are only twelve tones. You must treat them carefully."

—Paul Hindemith (1895–1963)

Within each major scale are certain relationships based on tension and resolution. One of the most important is the thrust of the seventh pitch to the eighth (*ti* resolving to *do*). Similarly, we feel resolution when *re* moves to *do*; *fa* gravitates to *mi*; and *la* descends to *sol*. You can hear some of these relationships at work in the beginning of the well-known carol *Joy to the World*. It starts on the tonic note (*do*) ("Joy"), then descends and pauses on the **dominant** note (*sol*) ("world"), after which it continues downward, feeling a strong pull to the final *do* (on "come"; see melody on p. 9 and chart below).

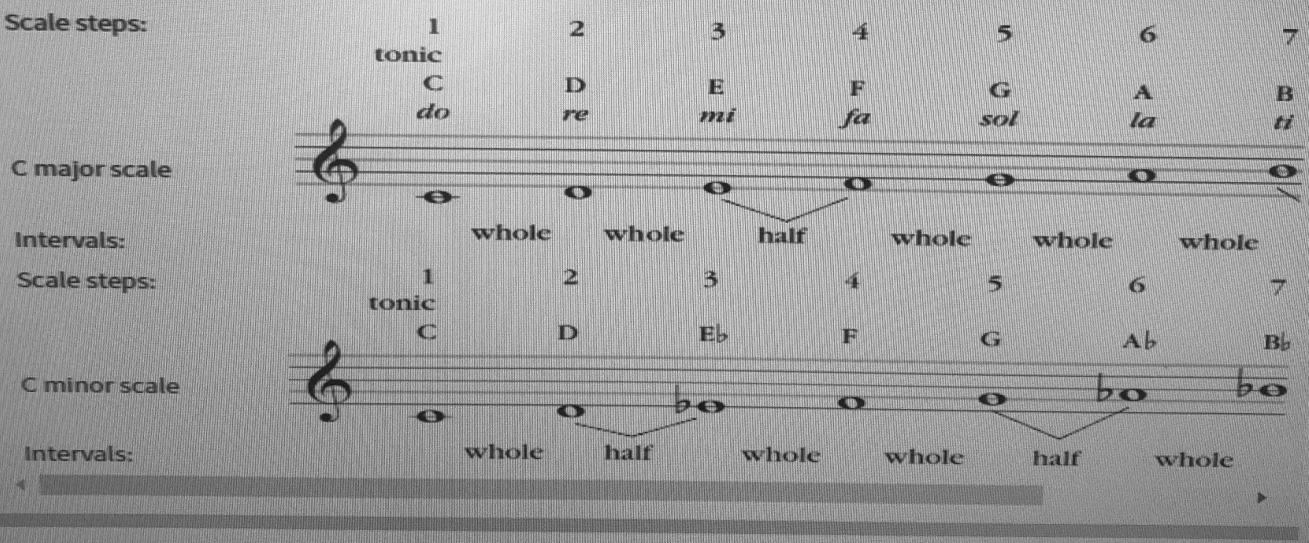


Most important of all, the major scale defines two poles of traditional harmony: the tonic, the point of ultimate rest; and the dominant, which represents the active harmony. Tonic going to dominant and returning to tonic is a basic progression of harmony in Western music. Songs and pieces in a major key, like this carol, generally sound cheerful or triumphant to our ears (more a cultural convention than an absolute trait).

THE MINOR SCALE

The **minor scale** sounds quite different from the major. One reason is that it has a lowered, or flatted, third note. Therefore, in the scale of C minor, there is an E-flat rather than the E-natural (white-key E) of the major scale; the interval C to E-flat is smaller than the interval C to E. Minor-key pieces sound sadder, darker than major-key. In the famous Bach theme to *The Art of Fugue,* you hear the smaller third interval right at the onset, as the melody outlines this interval (a minor third), then descends in a minor scale. The intervals of the minor scale (W–H–W–W–H–W–W) are shown in the table below.

Pattern of Major and Minor Scales

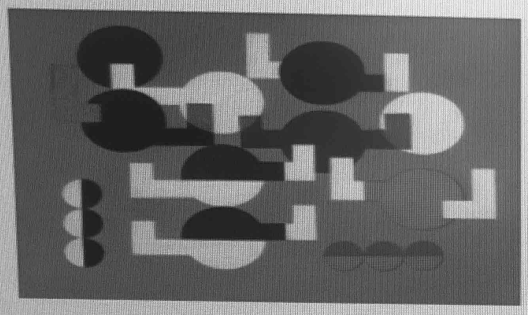


DIATONIC VS. CHROMATIC

Music in a major or minor key focuses on the seven notes of the respective scale and is considered **diatonic**. In diatonic music, both the melody and the harmony are firmly rooted in the key. But some compositions introduce other notes that are foreign to the scale, drawing from the full gamut of the twelve half steps that span the octave. These works are considered **chromatic** (meaning "color"). Romantic-era composers explored the possibilities of chromaticism to charge their music with emotion. In contrast, music of the Baroque and Classical eras is largely diatonic, centering on a tonic note and its related harmonies.

Other Scale Types

The Western musical system is only one way to structure music. The musical languages of other cultures often divide the octave differently, producing different scale patterns. Among the most common is the **pentatonic**, or five-note, scale, used in some African, Asian, and Native American musics. (*Amazing Grace*, on p. 10, is a pentatonic, folk-like melody.)



Sophie Taeuber-Arp (1889–1943), *Composition in Circles and Overlapping Angles* (1930). The overlapping and repeated shapes in this artwork can be compared, in music, to new pitch levels or to modulations to another key.

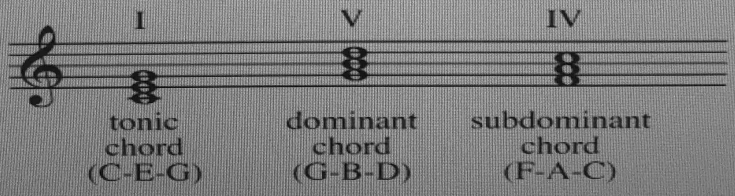
Some scales are not easily playable on Western instruments because they employ intervals smaller than the half step. Such intervals, known as **microtones**, may sound "off-key" to Western ears. One way of producing microtonal music is by an **inflection** of a pitch, making a brief microtonal dip or rise from the original pitch; this technique, similar to that of the "blue note" in jazz (see Chapter 47), makes possible a host of subtle pitch changes.

The musical system and the notes chosen in that system determine the sound and character of each work, whether classical, popular, or traditional. They are what make Western music sound familiar to us and why sometimes the music of other cultures may sound foreign.

THE MAJOR-MINOR SYSTEM

Just as melodies have inherent active and rest notes, so do the harmonies supporting them. The three-note chord, or triad, built on the first scale step is called the **tonic**, or **I chord**, and serves as a point of rest. This **rest chord** is counterposed against other chords, which are active. The **active chords** in turn seek to be completed, or resolved, in the rest chord—the dynamic force in Western music, providing a forward direction and goal.

The fifth scale step (*sol*), the **dominant**, forms the chief active chord (**V**), which brings a feeling of restlessness and seeks to resolve to the tonic. The triad built on the fourth scale step (*fa*) is known as the **subdominant** (**IV**). The movement from the subdominant to the tonic (IV to I) is familiar from the "Amen" sung at the close of many hymns.



Rest chord and active chords in C maior

These three basic triads are enough to harmonize many simple tunes. The Civil War song *Battle Hymn of the Republic* is a good example:

Glo-ry,	glory!	Hallelu-jah!	Glo-ry,	glory!	Halle-lu-jah!
I			IV		I

Glo-ry,	glory!	Hallelu-jah!	His	truth	is	marching	on.
I				IV		V	I

The Key as a Form-Building Element

The three main chords of a musical work—tonic (I), dominant (V), and subdominant (IV)—are the foundations over which melodies and harmonic progressions unfold. Thus, a piece's key becomes a prime factor for musical unity.

At the same time, contrast between keys adds welcome variety. Composers begin by establishing the home key (for example, C major), then change to a related key, perhaps the dominant (G major), through a process known as **modulation**. In so doing, they create tension, because the dominant key is unstable compared with the tonic. This tension requires resolution, which is provided by the return to the home key.

The progression, or movement, from home key to contrasting key and back outlines the basic musical pattern of statement-departure-return. The home key provides unity; the foreign key ensures variety and contrast.

The twelve major and twelve minor keys may be compared to rooms in a house, with the modulations equivalent to corridors leading from one to the other. A composer establishes the home key, then shapes the passage of modulation (the "corridor") into a key area that is not far away from the starting point. Alternately, composers may take an entire work and **transpose** it to a new key (making a transposition). This is convenient when a song's original key is too high or low to sing or play easily. You could begin on a different pitch and shift all the other pitches a uniform distance. In this way, the same song can be sung in various keys by differing voice ranges (soprano, alto, tenor, or bass).

Although we are not always conscious of key centers and chord progressions while listening to music, these basic principles are deeply ingrained in our responses. We perceive and react to the tension and resolution provided by the movement of harmony, and we can sense how composers have used the harmonic system to give a coherent shape and meaning to their works.