Chapter One
What Is Music?

Before we launch our exploration of how the law intersects with music creation, performance, distribution, and sale, we should first understand what music is.

Music is the most abstract of creative works. You can't see or touch it—it exists solely as a sound wave that unless recorded, dissipates within moments. Despite this abstraction (or perhaps because of it), music enjoys an elevated role in our development as human beings. Many researchers and writers believe that music played an adaptive/evolutionary role in the development of speech, other cognitive functions, mate selection, and our social development. Neuroscientists have traced the activities in our brains as music is heard to demonstrate the multiple areas involved in listening and reacting to music, physically and emotionally, and are using music to treat certain brain malfunctions.[1] It is not just something with a good beat that you can dance to (although that is believed to be important itself).

What music actually consists of is not something we tend to think too much about. Daniel J. Levitin, in his fascinating book *This Is Your Brain*

1. *See generally* Daniel J. Levitin, This Is Your Brain On Music (Plume 2006) [hereinafter Levitin, Brain on Music]; Daniel J. Levitin, The World In Six Songs (Viking 2008); Oliver Sacks, Musicophilia: Tales of Music and the Brain (Vintage 2008); Ronald Kotulak, *Rhythm, Melody, Life*, Chi. Trib., Sept. 21, 2003.

on Music, identifies the following as the fundamental elements that comprise musical expression:

(1) Pitch, or the tone of the sound and its relative position in the musical scale;
(2) Rhythm, or the duration of notes and the units into which they are formed;
(3) Tempo, or the overall speed or pace of a musical piece;
(4) Contour, or the overall shape of a melody;
(5) Timbre, or tonal color of an instrument;
(6) Loudness, or the energy created by an instrument; and
(7) Reverberation, or the sense of distance or spaciousness of a sound. [2]

To that list I would add velocity, or the speed by which any of the foregoing elements are accelerating or decelerating. None of these items in and of themselves are legally protectable—they are the basic building blocks of musical expression and no single person can claim rights to control them. The ability to protect them emerges with the way these elements are combined to form higher order musical features, such as melody and harmony.[3] As we shall see, some of these higher order features are protectable and others are not.

The combinations of these elements to create music are limited by what we consider pleasing in Western culture. These physical limits are a consideration whenever a claim is being weighed that a certain piece of music wrongfully copies other music. The following quotation from 1930 reflects the limitations generally expressed in Western music:

> The average composer who indulges in songs has a limited number of tones at his disposal. The combinations and permutations of the thirteen tones give the amazing total of 6,227,020,800 combinations, of which only a small fraction may be used ordinarily. Popular songs, in particular, lie within a very small radius. In a confined space,

2. Levitin, Brain on Music, *supra* note 1, at 15–16.
3. *Id.* at 17–18.

> similarity of tone construction is inevitable. Practically every original idea the composer can think of has appeared somewhere before; it is a matter of probabilities, and every day the number of new possibilities grows less.
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> Since it is generally agreed that the original fund of melodic ideas has been exhausted, serious composers, and others, have turned to the other important elements of music—harmony and rhythm. In the use and treatment of these there is a certain originality to be attained; but even that is necessarily limited by obvious physical limitations. Of the three essential elements—rhythm, harmony, and melody—the first two are usually emphasized, whereas the third is taken as a matter of course; and when it is impossible to invent new melodic ideas, the composer may display his skill in the means he uses to develop what theme he has.[4]

What is Digital Music?

When dealing with music today in a commercial way, it is not enough to understand the artistic components that comprise musical expression. Since digital technology generally governs how music is created, recorded, distributed, and sold, the general practitioner must also have at least a basic understanding of some of the components of digital music formats and files.

Technology has always been put to the demands of the creative impulse. Like photography, sound recordings are an art form that would not exist without supporting technology. And this technology has always had an effect on musical expression. For instance, the three-minute song reflects the upper limit of the recording capabilities of early wax acoustic recording technology. Early acoustic recording technology also favored certain sounds over others and, for example, elevated the clarinet to a featured role in klezmer

4. A. Shafter, Musical Copyright (2d ed. 1930), *reprinted in* A. Latman & R. Gorman, Copyright for the Eighties 328 (1981).

orchestras.[5] Electrical recording technology permitted more intimate forms of singing to be captured, which helped make Bing Crosby a star.[6] LPs, and then CDs, begat longer performances, and boom boxes played a key role in the development of hip-hop culture.[7] Electronic instruments and sound processors such as synthesizers, Linn drum machines, MIDIs,[8] and Auto-Tune have created new sounds and compositional possibilities, making new forms of expression possible, such as "mashups."[9]

When digital music is referenced, it is often referred to in a shorthand way as an "MP3." The term MP3 refers to a format for compressing and then decompressing a digital file representing a sound recording. There are many formats used for the distribution and sale of digital music, but MP3 is the most popular. The MP3 compression format was developed by the Moving Pictures Experts Group in 1988 as part of that group's effort to develop a format for compressing television video and soundtracks generally. The part of the format that described sound compression was Layer 3, which became known as MP3. The specifications for the MP3 standard were developed under the auspices of the International Organization for Standardization (IOS), unlike the proprietary compression formats such as ALAC or WMA developed by Apple and Microsoft, respectively.

When sound is recorded digitally, the analog sound wave is sampled 44,100 times per second. The sound is recorded for the left channel and for the right channel (stereo), and each sample is stored as sixteen bits for frequency (pitch) and amplitude (loudness). As a result, one second of digitally recorded music is made up of 1,411,220 bits. This is what is generally known as a WAV or AIFF file—the raw data from which the recording can

5. Mark Katz, Capturing Sound: How Technology Has Changed Music 39 (University of California Press 2004).

6. Gary Giddins, Bing Crosby: A Pocketful of Dreams—The Early Years 1903–1940, at 117–18 (Little, Brown 2001).

7. Lyle Owerko, The Boombox Project: The Machines, the Music, and the Urban Underground (Abrams Image 2010); *The History of the Boombox*, National Public Radio, Apr. 22, 2009, http://www.youtube.com/watch?v=e84hf5aUmNA.

8. MIDI is an acronym for Musical Instrumental Digital Interface. *See* MIDI Manufacturers Association, www.midi.org (last visited Jan. 20, 2013).

9. Lae, Elina,*Mashups—A Protected Form of Appropriation Art or a Blatant Copyright Infringement?* (December 2011). Available at SSRN: http://ssrn.com/abstract+2003854 or http://DX.DOI.ORG/10.2139/SSRN.2003854.

then be processed. An MP3-formatted version of the raw data file is created by sampling the bits in the file at certain rates. The higher the "bit rate," the more information contained in the MP3 file and, thus, the greater fidelity to the original file. The "art" of the compression format is in how the format decides which bits to include and which to leave out. The format uses psychoacoustics (how people perceive sounds) to discard quieter or non-perceptible sounds and arrive at a playback that is acceptable to the listener. The advantage is a smaller file size. Early compressed digital files were reduced to 128,000 bits per second (128 Kbps), but higher bit rates reproducing recordings with greater fidelity are more common today as file size storage and electronic transmission capabilities increase. There are also other file formats in use today, such as FLAC and ATRAC, which do not lose data and thus can more accurately reproduce the sound of the original file.

As digital files overtake physical products as the means by which music is delivered to and consumed by people, the formats in which such digital products are offered and the interoperability of the devices with which such digital products may be used becomes more important to understand. This is due to the fact that file or format distinctions may implicate different rights for the owners of the recordings and compositions that are featured in such files.