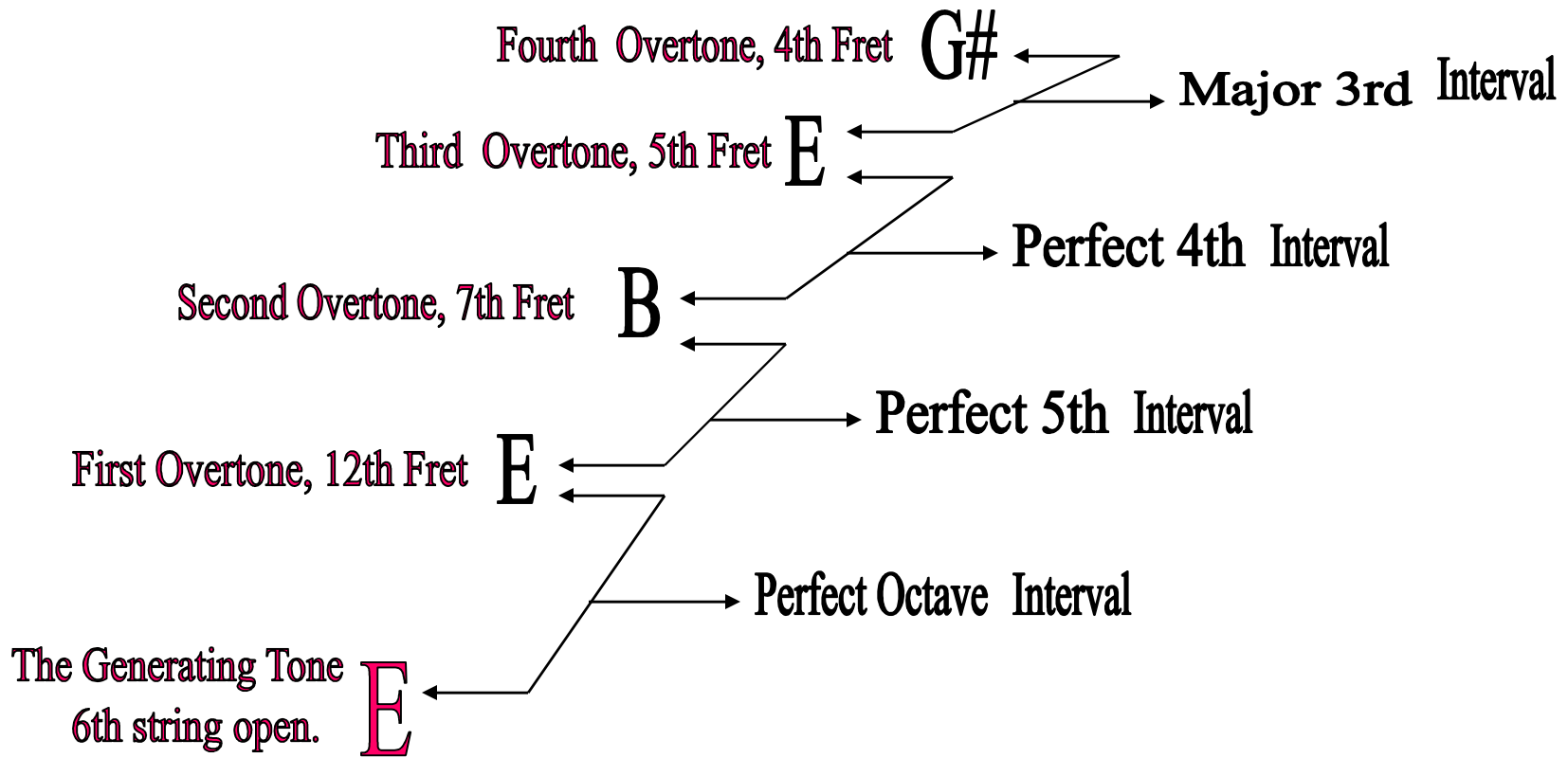


The Overtone Series

Any musical tone gives off a series of overtones. The harmonics on the open strings of the guitar provide an excellent example. Below is the overtone series from E generated by the low E string of the guitar. Each of the six strings of the Guitar gives off the same identical interval sequence of Overtones by touching the string at these same frets. All harmonic and melodic organization of tones in existence today has its beginnings in, and has evolved from the Overtone Series.



The Overtone Series

The ancient Greeks and other schools of musical thought that followed, refer to **4th, 5th, and Octave intervals** generated by the overtone series as **the “perfect” intervals**. This is because they were created by nature. The **major 3rd** was discovered and accepted later which is why it’s not called “Perfect” also.

The Overtone Series from E also generates an E major Triad (three tone chord) **E G# B**. The overtone Series from any other tone will also generate a major triad.

The Overtone Series is a product of nature. Any tone on any instrument capable of sustaining pitch gives off this same exact series of harmonic overtones. The structure of the Overtone Series is invariable, and is the birth place of all tonal organization.

The Generating Tone, it’s vibrations produce the Overtone Series.

The Perfect Octave, is a repetition of the generating tone, and the strongest overtone.. Octaves vibrate at a ratio of 2 to1. Example; “A” 440 vibrates at 440 cycles per second. The “A” an octave higher vibrates at 880 cycles per second, or twice as fast. Played **simultaneously**, they reinforce the identity of “A”. It will sound as a reinforcement of the same tone, not as two different tones.

The Perfect 5th, is the next strongest Overtone. It’s also the **easiest** hearing relationship in music where **two different tones** are concerned. **Formation of the Key Structure begins here.**

The Perfect 4th, is somewhat weaker than the Perfect 5th, because it’s farther away from the generating tone.

The Major 3rd, is weakest because it’s farthest away from the generating tone.

Root Definitive Intervals

The Perfect 5th is a “Root Definitive Interval”. Because the lower tone is a repetition of the generating tone that produces the Overtone Series, *the ear will always be drawn to the lower tone of any Perfect 5th as a “Root” or tonal center when the Perfect 5th is played alone by itself.* The Perfect 5th is the strongest Root Definitive Interval because it’s closest to the generating tone. Play any 5th on the guitar and sing “Home Sweet Home” you’ll end on the lower tone of the 5th interval. If this doesn’t happen, your ear needs a lot of work.

The Perfect 4th is also “Root Definitive but somewhat weaker than the Perfect 5th, because it’s farther away in pitch from the generating tone. Because the upper tone of the Perfect 4th is a repetition of the generating tone, *the ear will always be drawn to the upper tone of any Perfect 4th as a “Root” or tonal center when the Perfect 4th is played alone by itself.*

The Major 3rd is weakest because it’s farthest away from the generating tone. Because the lower tone of the Major 3rd is a repetition of the generating tone *the ear will always be drawn to the lower tone of any Major 3rd as a “Root” or tonal center when it’s played alone by itself.*

The Perfect Octave All Octaves vibrate at a ratio of 2 to 1. A 220 CPS, A 440 CPS, A 880 CPS, and A 1760 CPS, are all octaves of the tone A. Played simultaneously, they sound as one big A. Played individually, they delineate higher and lower registers. Octaves and unisons are the best way to strengthen any melodic line or voice of a chord in orchestrations.

Major "Happy", Minor "Sad" Why?

The Root Definitive Intervals of any chord be it major or minor **are always generating a Major 3rd** in their overtones. The major 3rd overtone is always present. Any major Triad is entirely comprised of Root Definitive Intervals, and generates the full power of the overtone series. This is what makes a major Triad radiate a such a strong positive feeling.

The minor Triad sounds less positive or sad because it contains the **minor 3rd**. However, the overtone Series generated by the **Root** of the minor chord is still generating **the major 3rd in its overtones.**

The **maj.3rd** Overtone and the **min.3rd** in the chord clash. This diminishes the Overtone radiation of the chord, and the clash of the overtones against the **minor 3rd** in the chord is felt by the body as something wrong. This makes the minor Triad feel "sad".