

## **Masters of the Musical Universe: *The Octave, Scales and Overtones***

All the tonal qualities of music are derived from the octave, scales and overtones. The concepts are simple, or as physics would say “elegant”. The application of these concepts is a rich library of music from simple folk tunes to Beethoven and beyond.

### **The Octave**

The octave is the interval between one musical pitch and another with half or double its frequency. The octave relationship is a natural phenomenon. The term “octave” comes from the Latin word “octavus” which means “eighth”. Some college textbooks and some learned authorities call the octave a diapason. Octaves form even ratios.

The octave, or more likely multiple octaves, is the space in which all music occurs. The human brain is hardwired to recognize the octave and to infer from it how music should be organized.

### **Scales**

Scales are subdivisions of the octave. In Western traditional music and most Western pop music, the octave is divided into eight parts. Scales of this type are called “diatonic”. It’s the familiar *do re me fa so la ti do*.

Scales are sequences of tones. They go up. They go down. Tones of a scale are always in a specific sequence or order. Scales NEVER go part way up, double back, then finish the sequence. They ONLY go up or down in a specified order.

Names of tones on the musical scale are different in different cultures. In the US and UK scales are A B C D E F G. But in Germany, Finland, Norway, Sweden, the same scale is A H C D E F G.

### **Overtones**

Overtones are natural phenomena. All natural tones, musical or not, are built of a fundamental frequency that identifies the sound plus various numbers of overtones of varying strength. Overtones allow us to distinguish between an “A” played on a fiddle from the same “A” played on a mandolin. Overtones are what give everyone a distinctive voice. Overtones provide the color in sound.

The only “pure” sound, that is a tone that has only a single frequency, is found only in the laboratory or in analog synthesizers, or as a test tone on some electronic equipment.