

Bass Harmony Numerics - Part One, 1, I.

Music presents an *invisible sound* for the **ear** to hear. The **eye** then sees a *silent visible mark* which “re-presents” the invisible sound.

In music, **marks** are either *signs* or *symbols*. **Signs** tell us “to do” or “not to do” something. **Symbols** are used to represent the sound.

The **1st sign** of music is the **natural** ♮.

The **1st symbol** of music is the “alpha” **letter**, as in alpha-beta or alphabet. There are *seven natural letters* in music: A B C D E F G.

The **2nd sign** of music is **flat** ♭, and the **3rd sign** of music is **sharp** ♯. The flat and sharp signs are called **chromatic**, and they tell us “not” to play a *natural* letter.

Numeric, as in “alpha-numeric”, is the **2nd symbol** of music, and simply means “to measure”. *Numeric* has three parts: the **word**, the **number** and the **numeral**, as in **one, 1, I**. Notice that *word one*, *number 1*, and *numeral I*, all **sound the same** when spoken, but **look different** as silent symbols.

Let’s begin by making the *sound* of the *letter* E, “open” string 4 (on a 4 or 5 string bass) or “open” string 5 (on a 6 string bass). **Open** means “strike the string, but do not place a finger on the string”. This “open E” is the sound of the *fundamental*.

The **fundamental**, also called the **root** or the **tonic**, and is the lowest and **loudest** frequency of a single string vibrating as a whole. The fundamental is the **pitch** by which we identify the **letter** name of *word one*, *number 1* and *numeral I*. Also, the *letter* name of the fundamental “one, 1, I”, is the “**key**”. Remember, the fundamental is the 1st sound in the 1st octave - and it is **not** a *harmonic*.

Harmonics, also called *overtones* or *partials*,

are frequencies higher and more quiet than the fundamental. Harmonics are produced by the vibrations of a string divided into any number of equal parts. In other words, a string not only vibrates as a whole, but it also vibrates in **fractions**. When the fundamental is sounded, there are many other *harmonic frequencies* that naturally vibrate with it.

Harmonics progress in a specific *number order* of sound called the **harmonic series**. Here is the *harmonic series number order*: 8, 12, 15, 17.

To produce loud and clear harmonics on your bass, touch the string *very lightly* “directly above the fret”. This is the exact point that divides the string into equal parts. The string will then vibrate in smaller equal parts and this will produce the sound of the harmonic.

It helps to strike the string near the “bridge” and to *not* push the string down toward the fret. Also, be sure to quickly lift your finger off the string after sounding the harmonic so that you do not dampen the vibrating string.

Now, to hear the **1st harmonic**, lightly touch directly above fret 12. This is tone **number 8** and it sounds *one octave higher* than the fundamental one, 1, I. The **2nd harmonic**, directly above fret 7, is tone **number 12** and sounds *one octave higher* than tone **5**. The **3rd harmonic**, tone **number 15** (*two octaves higher* than the fundamental), is above fret 5. And the **4th harmonic**, tone **number 17** (*two octaves higher* than tone **3**), is above fret 4. **Figure 1.**

There are many more harmonics than these four, in fact, there is an infinity! But that would take eternity...so, let’s convert the **harmonic numbers** (8, 12, 15, 17) into 1st octave **harmony numbers**, 1 8 5 3 - or simply 1 3 5!

Figure 1. Harmonic Order:
Tone Number:
Letter:
Fret:

Fundamental
1
E
Open

1st	2nd	3rd	4th
8	12	15	17
E	B	E	G#
12	7	5	4

Next, let's turn the harmony **letter** into harmony **numeral I**, and then add a *harmony number* to *harmony numeral I*.

Here's an example, when number 1 is added to harmony numeral I, "one-one, I¹" is the result. And even though there are **two symbols** (numeral I and number 1) there is only **one sound!** This is because the sound of "one, 1, I" - whether it's a **word, number** or **numeral** - is the sound of the *same letter*. In other words, in the "key" of C, *word one* is C, *number 1* is C and *numeral I* is C. All the different symbols (one, 1, I), have the same letter and therefore the same sound.

"Two symbols with one sound" is the *interval unison* or **prime**. **Figure 2.**

While it's true that "one-one, I¹" only has one sound, when we combine *other* harmony numbers (8, 5, 3) with harmony numeral I, we create *intervals* that have "two symbols **and** two sounds"!

Here are some "two symbol, two sound" intervals created by adding a *harmony number* (other than 1) to *harmony numeral I*:

Octave, "one-eight, I⁸". **Figure 3.**

Perfect 5th, "one-five, I⁵". **Figure 4.**

Major 3rd, "one-three, I³". **Figure 5.**

Remember, we *learn* harmony "in order" (the harmonic series order), so that we may *play* harmony "out of order". In other words, we are "free to choose" and combine intervals in any order we wish. In a word - **improvise!**

So, till next time, have some **harmonic harmony** fun. I'll be listening... **Figures 6 & 7.**

Figure 2. Unison or Prime - "one-one, I¹"

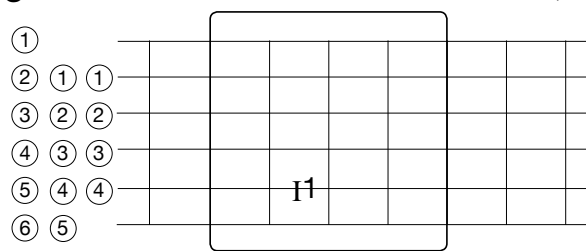


Figure 3. Octave - "one-eight, I⁸"

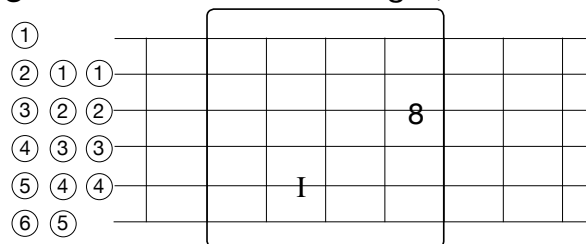


Figure 4. Perfect Fifth - "one-five, I⁵"

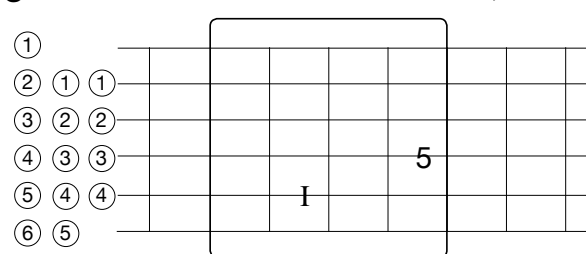


Figure 5. Major Third - "one-three, I³"

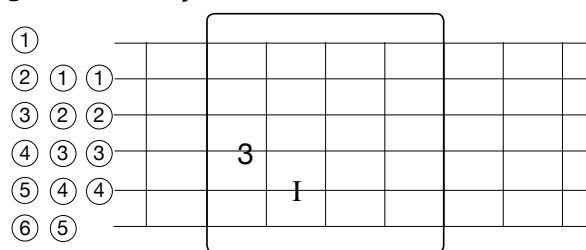


Figure 6.

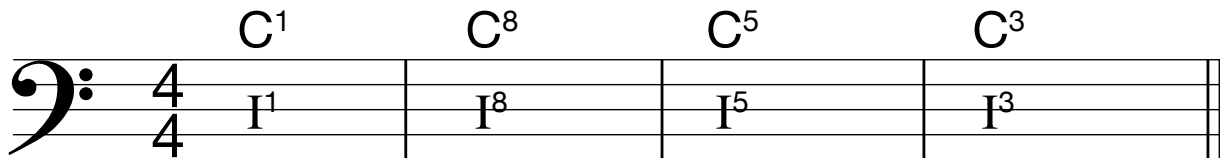
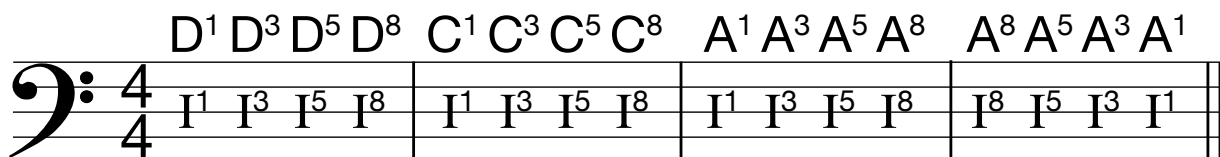


Figure 7.



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