



## **An Introduction to Harmonics**

By Scott Blanchard

What are those beautiful bell-like tones I hear in my favorite acoustic recording? How did that metal guitarist color those red-hot screaming licks? No matter what style of music you play, you've probably heard of *harmonics*. Harmonics are pure, chime-like tones that are produced by picking rather than fretting the string at various points along its length. This article will focus on *natural harmonics*, or harmonics produced on open strings. Understanding the theory behind harmonics and adding them to your bag of tricks will not only make you a more versatile musician, it will allow you to identify musical situations in which playing harmonics can transform the ordinary into the extraordinary.

In this edition of the Theory Corner, we'll take a look at an excerpt from rock virtuoso Tobias Hurwitz's book, *The Total Rock Guitarist*, available through Alfred Publishing. Hurwitz will introduce the concept of harmonics, how to produce a good sound, show you where the most common harmonics are played and give you a few exercises to build up your chops. If you want guidance on all the skills you'll need to be a well-versed guitar rock master, then this book is for you. Hurwitz's clear approach and excellent examples make learning rock guitar fun! The book comes with a CD so you can easily follow along with all the examples. Speaking of audio, be sure to listen to the examples included in this document. Check it out!

### **Harmonics**

Harmonics are pure, ringing tones that are produced by picking the string while gently touching it at various points along its length. In most cases, the finger should touch the string directly above the fret. As soon as the harmonic is picked, the finger should be removed so that the string can vibrate freely, without interference. The root, 3rd and 5th of any string can be produced easily with natural harmonics, or harmonics of the open strings. The best spots to get harmonics are the 12th, 7th, 5th, 19th and 24th frets.

All guitars are not created equally when it comes to harmonic response. Some work much more easily than others. Fresh strings help on any guitar, as does picking close to the bridge. Whether you're using your fingers or a pick, attacking the strings about  $\frac{3}{4}$ 's of an inch from the bridge will make any harmonic ring more loudly and clearly. Also, on electric guitars the bridge pickup usually works best, and high gain distortion may enhance certain harmonics, or create harmonic "sweet spots" where none previously existed. A freshly strung acoustic steel-string guitar produces a wide array of beautiful harmonics.

## Playing a Harmonic:

1. Touch the 6th string directly above the 12th fret with your left-hand 1st finger.
2. Pick the 6th string.
3. Remove the left-hand finger immediately.

◇ = Harmonic

### Roman Numeral Key

V = 5

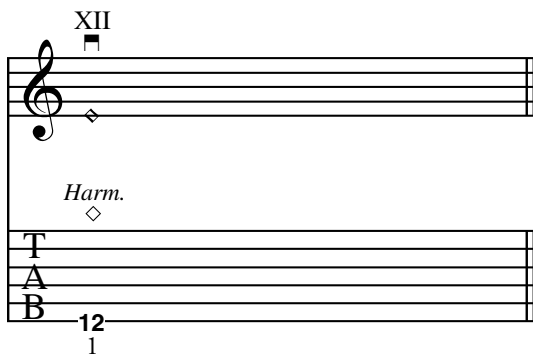
VII = 7

XII = 12

XIX = 19

XXIV = 24

Track  
1



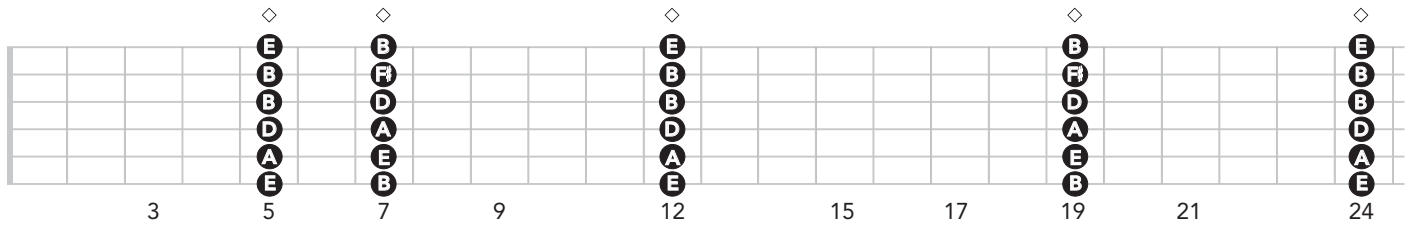
*Playing a harmonic.*

## Sound and The Overtone Series

As you begin to play harmonics, it's important to have a basic knowledge of the properties of sound so you can better understand why harmonics sound the way they do, and how these sounds relate to the open strings. Each note on the guitar is a combination of several frequencies that define the highness or lowness of a particular note. For each open string on the guitar, there is a primary tone or pitch—for example, the open 1st string is an E-note. This primary pitch is called the *fundamental* (the lowest frequency). If we focus our listening, we can hear other pitches ringing out above the fundamental—these other pitches are called *overtones*. Overtones contribute to the instrument's overall *timbre*, or sound quality. The *overtone series* includes the fundamental and its overtones.

Believe it or not, when you play a harmonic, you're really just highlighting an overtone. To produce these, you're dividing the string at specific points that allow the sound to ring out clearly and prominently, just as a fundamental would. At each fret you decide to play your open-string harmonics, a different interval will sound above the fundamental. For example, any natural harmonic played at the 12th fret will sound one octave higher than the fundamental. This occurs because when you hit the harmonic, you are dividing the string in half, or causing the string to vibrate at a ratio of 1:2. In addition, the octave is the first overtone in the series. The 7th-fret harmonics are next in the overtone series, sounding one octave and a 5th above the fundamental, vibrating at a ratio of 1:3. Following that come the 5th-fret harmonics, which sound two octaves above the fundamental, with a ratio of 1:4. The overtone series continues as you divide the string more and more, and you'll notice the clarity of harmonics diminishes as you progress further in this sequence.

The following fretboard chart shows the note names of the easiest natural harmonics. Harmonics played at these frets are by far the most common in all forms of guitar music.



This exercise will get you started playing harmonics on the frets in the chart above. The Roman numerals indicate at which fret to play the harmonic. If you don't have 24 frets on your guitar, you can still get those harmonics by placing your finger where the 24th fret would be if you had one.

Track  
2

8va  
V ----- | VII ----- | XII ----- |

Harm.  
◇ 5 5 5 5 5 5 etc.

(8va)  
XIX ----- | XXIV ----- |



## Conclusion

For more information on harmonics, be sure to check out the Licks and Tricks section of this newsletter for some fun playing examples that'll blow others away at the next jam session!

If you liked this excerpt, order Tobias Hurwitz's book, *The Total Rock Guitarist*, at [www.guitarworkshop.com/books](http://www.guitarworkshop.com/books). In addition, be sure to check out his rock guitar lessons at [www.WorkshopLive.com](http://www.WorkshopLive.com) today!

To learn more about harmonics, guitarists should check out any rock, acoustic or blues lesson having to do with harmonics, which include technique-specific lessons as well as tuning lessons.

Bassists will enjoy the rock bass lessons "Introduction to Harmonics" and "Playing Chord Voicings with Harmonics," taught by Dave Overthrow.

Have fun experimenting with these new sounds—see you in June!