

# Introduction to Harmonics

L.M. van Burken

When you play the flute, you're always aiming to get a beautiful, clear tone. But have you ever wondered what makes the flute sound the way it does? When you play a note on any instrument, whether it's a flute, piano, or trumpet, you're not just hearing one note. In fact, you're hearing a whole range of notes at once. This group of notes is made up of what we call harmonics. Every note you hear on any instrument consists of multiple harmonics. What makes the flute, clarinet, or trumpet sound unique is not only how the sound is produced but also which harmonic frequencies are the strongest in each note played. This is what gives each instrument its distinct sound, or timbre.

In these exercises you will learn how to bring out each harmonic from each note's spectrum. For every note, the harmonic sequence is the same pattern of intervals. It follows a pattern of 5/8.

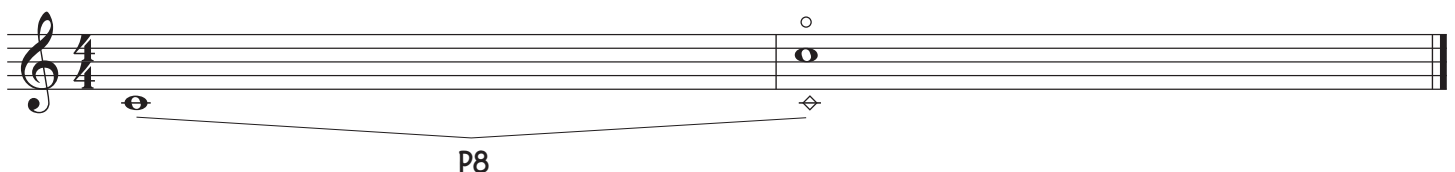
Let's build a harmonic series starting from middle C. Remember, the harmonic series exists for all notes.

The first note is C, which is called the fundamental and also the first harmonic.

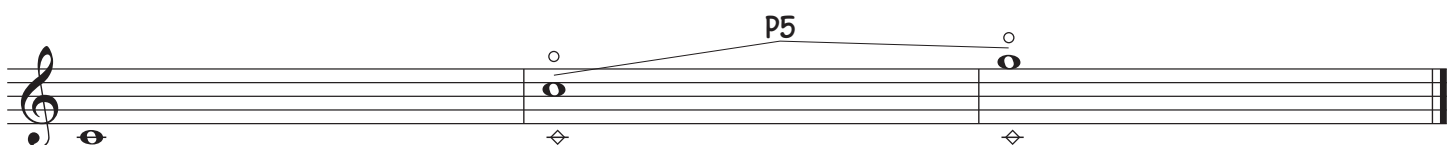
The next note, an octave higher than the C, is known as a Perfect 8th or P8.

This is the second harmonic in the series.

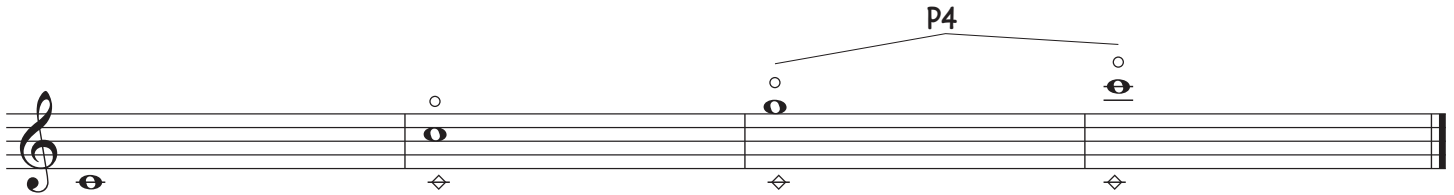
You might also hear harmonics referred to as overtones or partials.



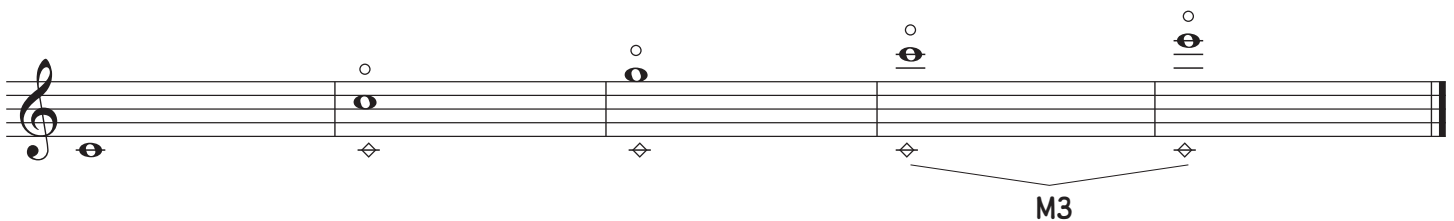
Now, in the third measure, the third harmonic, G, is shown. The intervals are C to C, an octave (or P8), and then from measure two to three, C to G, which is a Perfect 5th (or P5).



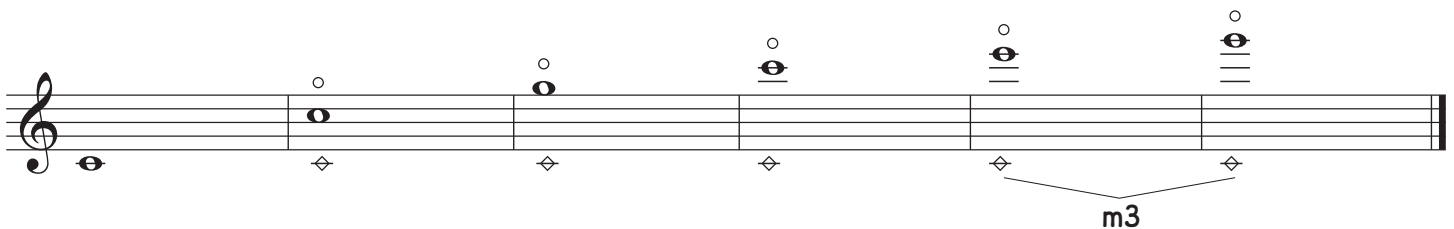
Adding the fourth harmonic in the fourth measure, you will now have an interval of a Perfect 4th (or P4) from measure three to four.



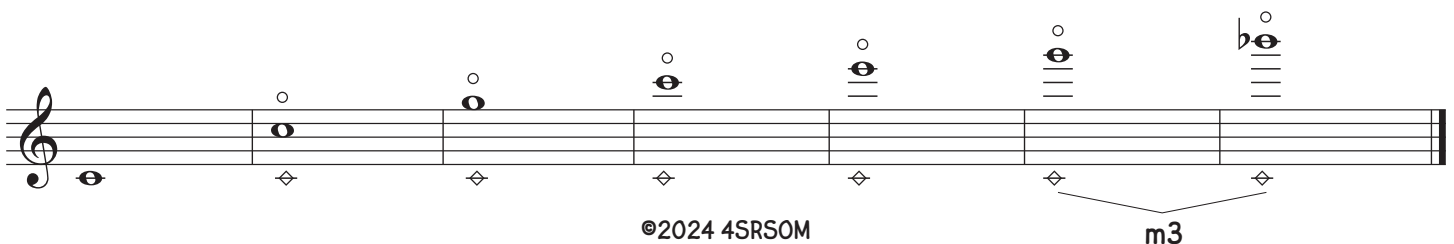
Introducing the fifth harmonic in the fifth measure, the resulting interval from the fourth to the fifth measure is a Major 3rd (or M3).



Moving on to the sixth harmonic in the next measure, this creates a Minor 3rd (or m3) interval from measure five to six.



Finally, the seventh harmonic appears in the seventh measure, producing a Minor 3rd (or m3) from the sixth to the seventh measure.



It's time to start playing harmonics! In this first exercise, finger the first note (the fundamental) in each measure. You will play the other two notes by only changing your mouth position, air direction, and air speed.

Start with an "ah" mouth shape for the first note, then gradually bring your lips forward and together into an "uu" position, as in the word "truth." The higher the note you aim to play, the more pronounced the "uu" position should be.

Use a mirror to check that you are actually moving your lips!

These 1st 4 measures are a bit harder to play.

If you have trouble, start on measure 5 and as you gain confidence start adding these in.

1

The image contains two staves of musical notation. The first staff begins with a circled '1' and contains six measures. The first four measures are grouped by a bracket above them. Each measure contains a fundamental note (diamond-shaped) and two harmonics (circled notes). The notes are: Measure 1: C4 (diamond), G4 (circle), C5 (circle); Measure 2: B3 (diamond), D4 (circle), F4 (circle); Measure 3: G3 (diamond), B3 (circle), D4 (circle); Measure 4: F3 (diamond), A3 (circle), C4 (circle); Measure 5: E3 (diamond), G3 (circle), B3 (circle); Measure 6: D3 (diamond), F3 (circle), A3 (circle). The second staff contains five measures. The first measure has a key signature change to one sharp (F#). The notes are: Measure 1: F#3 (diamond), A#3 (circle), C4 (circle); Measure 2: E3 (diamond), G3 (circle), B3 (circle); Measure 3: D3 (diamond), F3 (circle), A3 (circle); Measure 4: C3 (diamond), E3 (circle), G3 (circle); Measure 5: B2 (diamond), D3 (circle), F3 (circle). A bracket above the fifth measure is labeled 'Use thumb or lever Bb.'

Did you notice that when a note is a harmonic, there's a small circle above it? And that the fundamental note is notated below in a diamond shape? This is one method of notating harmonics.

While the circle above a harmonic is almost always present, the diamond-shaped notation for the fundamental below is not always used.

Keep working on harmonics!  
 Doing harmonics helps you with flexibility, tone production,  
 and intonation. They are like a musical multivitamin.

Can you move up and down?

2

Use thumb or lever Bb.

Move thumb Bb off.

## Extending the Range

Try to go as high as you can. Remember you can come back to this as you gain confidence.

3

Musical notation for exercise 3, consisting of two staves. The first staff contains four measures of music, each with a slur over a series of harmonics. The second staff contains three measures of music, also with slurs over harmonics. The notes are marked with various accidentals (sharps, flats, naturals) and some have small circles above them.

Let's try going up and down the full range of the harmonic spectrum.  
Remember to move your lips, ahh to uu as you go up and uu to ahh as you move down.  
Take a breath when you need to.

4

Musical notation for exercise 4, consisting of three staves. Each staff shows a sequence of harmonics with slurs and breath marks (checkmarks) indicating the direction of the exercise (up and down). The notes are marked with various accidentals and some have small circles above them.

In this next exercise you will have to move from the harmonic, to the actual fingered note, and back to the harmonic.

For example: in measure 1, you will play low C on beat 1, 2nd harmonic on beat 2, C as written, then 2nd harmonic c (fingered with the low c fingering).

As you play, use a beautiful sound, listen to try and match the tone quality, take your time.  
You can add fermatas to the last 3 notes in each slur. Breathe as needed.

5

The musical score for exercise 5 is presented in two systems, each with two staves. The first system is in C major, and the second system is in B-flat major. Each system contains two slurs, each with three notes. The notes in each slur are: a natural note, a natural note with a circle above it (harmonic), and a natural note with a circle above it and a diamond below it (fingered note). The second system uses flats for the natural notes and their corresponding fingered notes.



Time to play some melodies using harmonics.

Do you recognize this one?

Musical notation for the first two measures of 'Eine Kleine Nachtmusik' by Mozart. The piece is in 4/4 time. The first measure contains a dotted quarter note G4, an eighth note A4, a dotted quarter note B4, and an eighth note C5. The second measure contains a dotted quarter note D5, an eighth note E5, a dotted quarter note F5, and an eighth note G5. The bass line consists of a steady eighth-note accompaniment: G3, A3, B3, C4, D4, E4, F4, G4.

That was the first 2 measures of Eine Kleine Nachtmusik by Mozart

Mist in the Valley

L.M. van Burken

Musical notation for 'Mist in the Valley' by L.M. van Burken. The piece is in 4/4 time. The melody is a simple, flowing line: G4, A4, B4, C5, B4, A4, G4, F4, E4, D4, C4, B3, A3, G3. The bass line is a steady eighth-note accompaniment: G3, A3, B3, C4, D4, E4, F4, G4. The melody is marked with a slur over the first two measures and another slur over the last two measures.

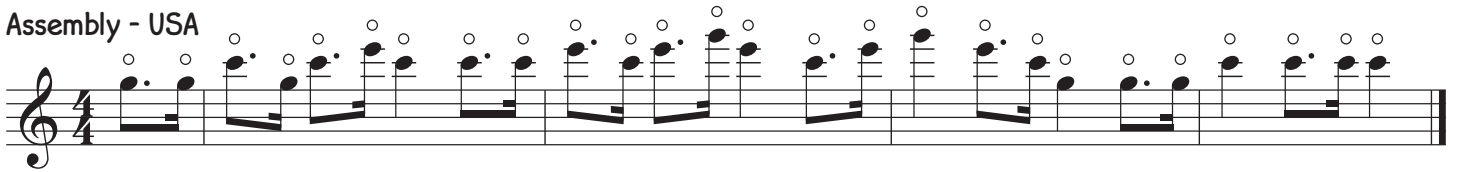
Twinkle

Mozart

Musical notation for 'Twinkle Twinkle Little Star' by Mozart. The piece is in 4/4 time. The melody is a simple, flowing line: G4, A4, B4, C5, B4, A4, G4, F4, E4, D4, C4, B3, A3, G3. The bass line is a steady eighth-note accompaniment: G3, A3, B3, C4, D4, E4, F4, G4. The melody is marked with a slur over the first two measures and another slur over the last two measures.



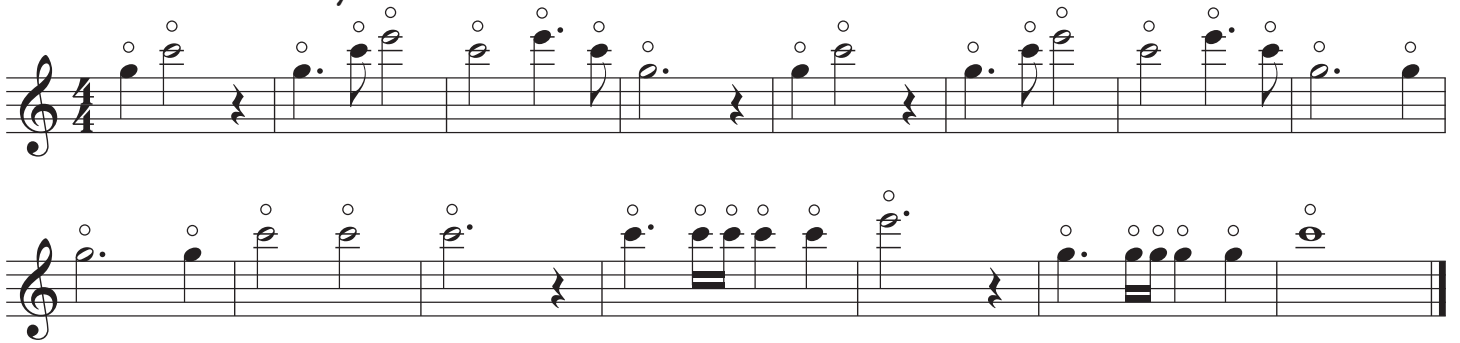
## Assembly - USA



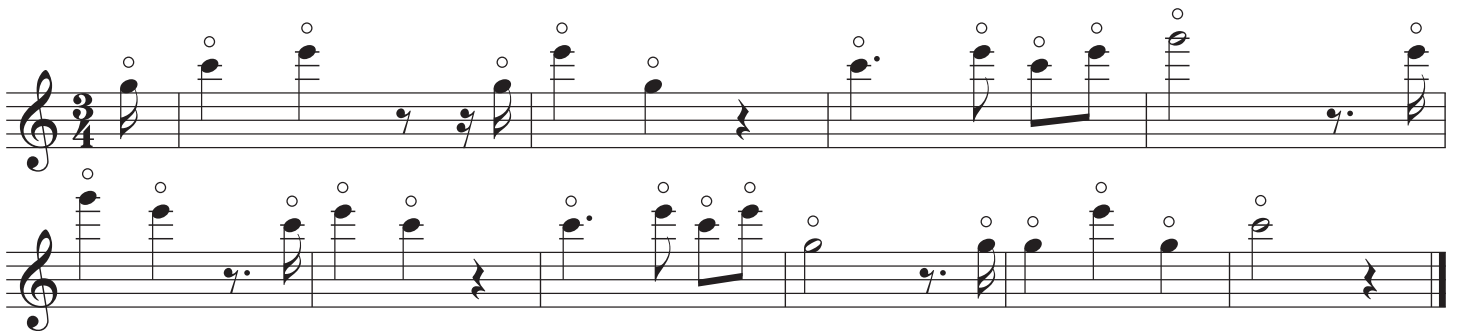
## Signaal Taptoe - Netherlands



## Silenzio d'Ordinanza - Italy



## Pahingalay - Philippines



## Aux Morts - France

