Saxophone Harmonics: Hearing with the Ears and the Embouchure

By John Cipolla

Harmonics provide the intermediate or advanced saxophonist with a comprehensive warm–up that familiarizes the player with the various registers of the instrument. The player essentially learns to "pre–hear" a note both aurally and through the muscular sensation, or "feel" of the vibration of the reed on the lower lip of the embouchure. By learning to anticipate the aural sound of a note and developing a sense of what a note feels like in the embouchure, the player can learn to play with a relaxed and flexible embouchure that works in conjunction with the ears to enable an even tone throughout the various registers of the saxophone.

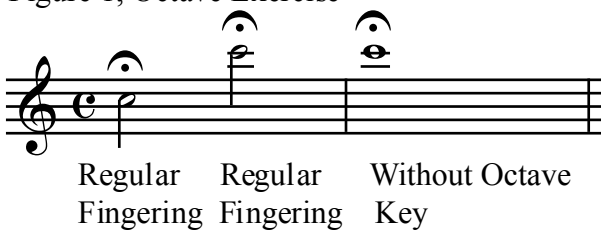
Though specific attention is devoted to numerous aspects of saxophone playing–evenness of timbre throughout the registers, tone development, intonation, and relaxed throat–many of these aspects actually work together simultaneously. Harmonics are therefore an excellent way to streamline practice time and develop each of these areas with a single series of exercises.

Each fingering on the saxophone has the potential to play higher pitches, through the use of the air stream and embouchure. The traditionally fingered notes are called the fundamentals and the higher tones, produced with the same fingering, are called the harmonics or overtones. Saxophone harmonics are played by fingering a note, usually a low note such as a low Bb, B natural, C, or C#, and then redirecting the air for each higher note, with a possible slight change in the embouchure pressure. Ideally, the throat does not move when playing through the various registers of the saxophone.

Middle C Octave Exercise

A good way to begin is by starting in the middle register of the saxophone, as in figure 1. Play a third space C with the regular fingering (left hand, second finger). While playing this note, press the octave key and the higher register C sounds. Next, release the octave key and try to maintain the higher C with a consistent air stream; also note how the lower lip and jaw feel when holding the upper note without an octave key. Pay particular attention to the "feel" of the air stream while holding the upper C. The higher C, played without the octave key, is a harmonic or overtone above the fundamental lower C.

Figure 1, Octave Exercise



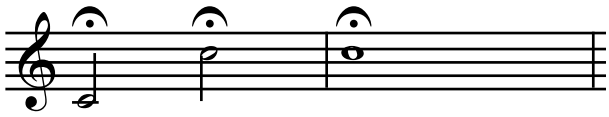
After one is able to do this, try initiating the higher C with the middle C fingering and no octave key. This gives the player a sense of control in these two registers of the instrument. The control comes through the use of the embouchure and air–not the keys pushed or through drastic changes in embouchure pressure (slight embouchure pressure changes are acceptable). Also note that the octaves Cs have a slightly different pitch. The player can experiment with matching pitch between the regular and harmonic fingering, though the pitch will not be perfect between the two fingerings and matching pitch between the two fingerings is not the primary goal of this exercise. The real goal is to

develop a connection between the sensation in the lower lip and actual sound of the note being played.

Low C Octave Exercise

The next step is to play a harmonic from a low note, as in figure 2. Play a low C with a full sound at a mezzo forte dynamic level. Press the octave key to obtain the middle octave with the low note fingering. If the middle C does not speak, play the middle C (third space in the treble clef staff) with the regular fingering (second finger, left hand). Note how the embouchure and air stream feel, then try to match this feeling when playing the middle C with the low C fingering. Once this is comfortable, finger the low note with no octave key, and try to produce the middle octave C (third space C).

Figure 2, Low C Octave Exercise



Low C | Low C with octave key | Low C with no octave key

This is the point at which, if the player is not conscious of their embouchure yet, the teacher can have them pay particular attention to the air stream and embouchure. Ideally, the student strives to keep the air stream constant and the embouchure relaxed. As a matter of review, a good basic saxophone embouchure has the top teeth resting on the top of the mouthpiece–not biting, but resting–and the lower teeth covered by a portion

of the lower lip. The muscles surround the mouthpiece like a donut with only enough pressure to prevent air leakage from the corners of the mouthpiece. Saying the letter Q helps place the muscles in the approximate formation around the mouthpiece. Once the muscles are formed around the mouthpiece properly, saying the letter E helps to maintain the proper formation inside the mouth. The tongue should usually be high in the mouth, with the sides of the tongue touching the top molars. Saying the letter E will achieve this. This type of formation in the mouth helps to keep a focused air stream flowing over the top of the tongue and into the mouthpiece.

The lower lip rests on the reed about 1/3 to 1/4 of an inch back from the tip of the mouthpiece. This is approximately where both the reed and mouthpiece make contact when looking at a side angle of the mouthpiece.

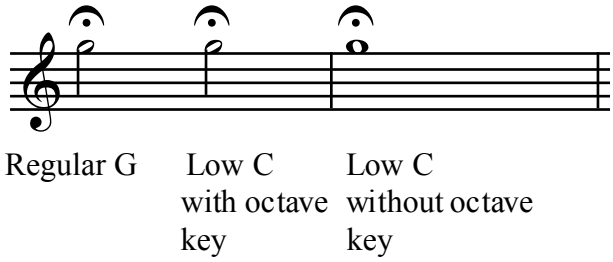
The Fifth Exercise

When the player has enough control to play the middle register C by overblowing the lower octave C, they can then try to play the next note (the fifth) in the overtone series, which is a G (top of the staff) as in figure 3. Play the G with a regular fingering. Then while holding the G and paying particular attention to the muscular sensation in the embouchure (particularly in the lower lip), finger a low C with the octave key and try to continue to sustain the G. Finally, try playing the G with the low C fingering and no octave key.

This may take some practice. It is helpful to practice this a few minutes each day rather than for a long period of time in one or two practice sessions. Frequent practice in short periods of time is always more productive. When the player learns to keep the

embouchure only firm enough to prevent leakage of air, yet firm enough to maintain a steady unwavering tone, they will learn to produce the tones more easily.

Figure 3, Fifth Exercise

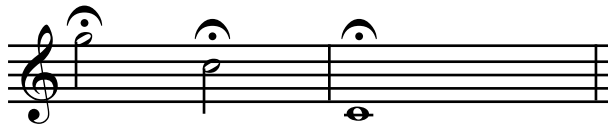


Fifth to Octave Exercise

When the G can be sustained from a low C fingering, try to move from note to note as in figure 4. To do this, play the G with the low C fingering. While holding the G, let the C in the middle of the staff come out gently, with no use of the tongue.
This may take a redirection of the air and a very slight loosening of the lower lip and embouchure, though any embouchure movement should be very minimal. The notes fall naturally one into the next, with virtually no significant embouchure adjustments and no use of the tongue. The only substantial change is the direction of the air focus.

After the G and middle C speak, let the embouchure and air stream refocus to enable the low C to speak; all of these three notes are played with the low C fingering. If the player goes no farther in their harmonic/overtone studies, they can develop a distinct feel for the registers from these three notes alone. This exercise can also be done on low Bb, low B natural, low C#, and low D.

Figure 4, Octave and Fifth Exercise

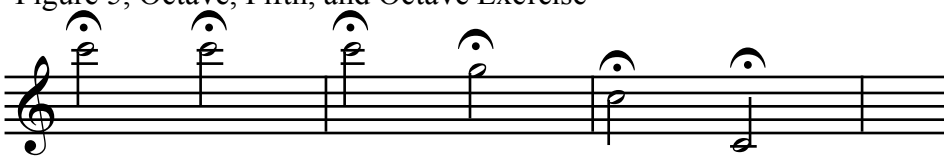


Low C fing. without octave key | Low C fing. without octave key | Low C fing. without octave key

The Octave, Fifth, and Octave Exercise

The next harmonic in the series is the next octave (figure 5). After the low C, middle C, and G, is the first C above the staff. As before, play the high C (two ledger lines above the treble clef staff) with the regular fingering. Then, finger the low C and maintain the upper C. When this is mastered, begin by fingering the low C while sounding the upper C. Next, play the series of harmonics from the high C down to the G (top space on the staff) down to the middle C, and finally down to the low C. Each of the lower notes speak naturally through focus of the air stream and a slight loosening of the lower lip. When doing these exercises it is not necessary to use a metronome. Hold the notes long enough to gain a sense of what the note feels like, both in terms of aural pitch and sensation in the lower lip. This is why I like to think of hearing with the embouchure.

Figure 5, Octave, Fifth, and Octave Exercise

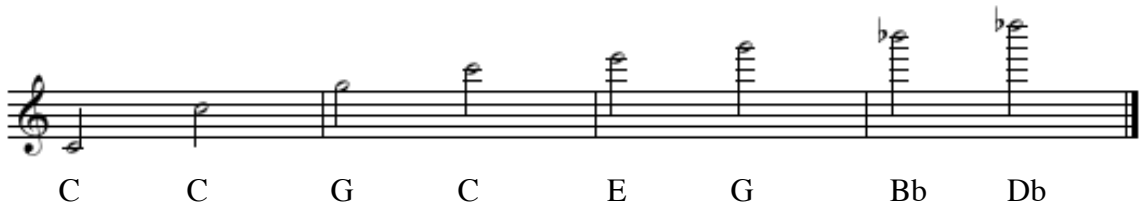


Regular fing. with octave key | Low C with no key | Low C with no key | Low C with no key | Low C with no key | Regular | Low C

These exercises can be expanded to as high a range as the player can attain. As the player strives for higher harmonics, be sure to avoid biting with the lower jaw. The notes are produced with an attention to air stream, very slight embouchure change, NO use of the tongue to articulate each new note, and minimal throat movement. Doing these exercises in front of a mirror helps to minimize throat movement. With little throat movement, the notes are then controlled strictly by subtle changes in the air stream and embouchure pressure.

The Saxophone Harmonic Series

The following example shows the overtones available on the saxophone from a low C up to a high Db. For further practice, the player can also practice this harmonic series beginning on low Bb, B natural, C# and D.



Hearing with both our Ears and Embouchure

Saxophone harmonics teach us to develop a sense of what a note feels like before we play it. We sense what the note feels like in our embouchure and through the direction of the air stream. By coupling the muscular sensations in the embouchure with the feel of the air stream and the aural sound of the note, the player develops an awareness or sense

of pre-hearing for each note on the instrument before it is sounded; this gives the player control and evenness throughout the registers of the saxophone.

Harmonics are one of the quickest and most efficient ways for a player to understand the feel and placement of the notes on the saxophone. They help the player to teach themselves to develop a sensation for lip and embouchure pressure, direction of air stream, and aural awareness of a note before it is played. This is all accomplished through a single series of exercises, which also happen to serve as an excellent warm-up. As a player develops control of the harmonics on the saxophone, they will learn to " hear with both their ears and embouchure."

