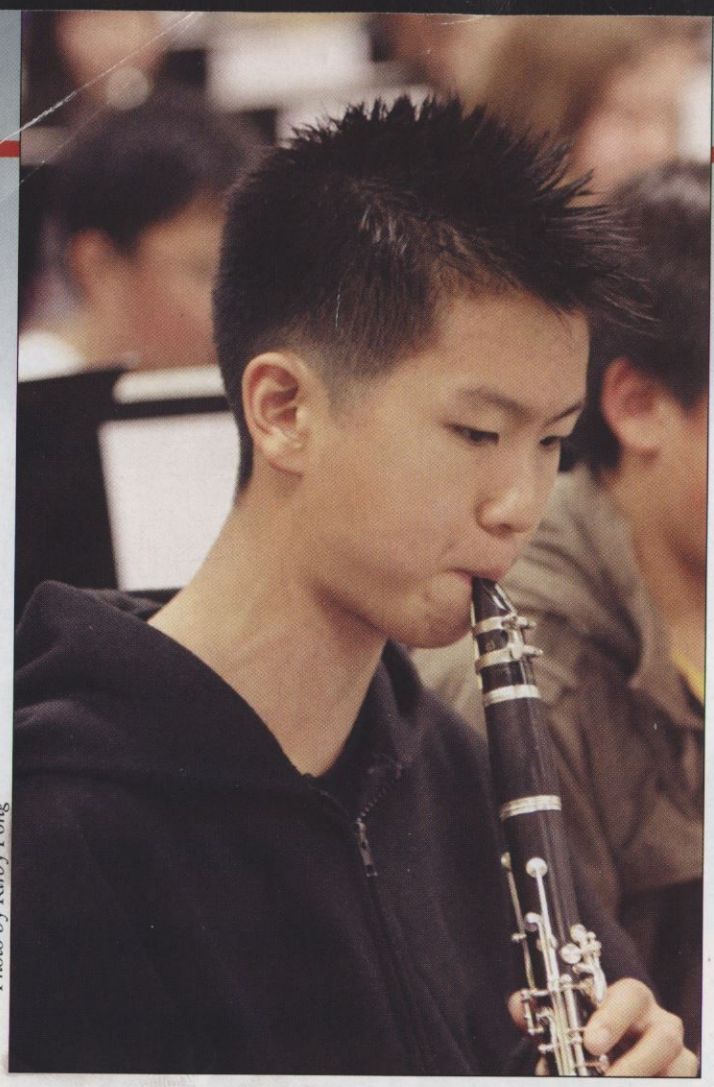

Photo by Kirby Fong

Overcoming Clarinet Tendencies

By Gregory Dufford

As a college freshman majoring in clarinet, I took the usual ear-training classes that included learning to identify intervals, sightsing, and realize melodic, harmonic, and rhythmic dictation. Although these skills are helpful for building a musical foundation, they did not develop my ability to play the clarinet in tune. I needed to learn how to identify whether my pitch was sharp or flat as compared to a reference pitch, and then acquire the skill to adjust my pitch, matching it immediately to what I was hearing.

Sound Sources

In college my goal to play with good intonation began by practicing with a tuning fork (chromatic tuners had not yet been invented). I would hit the tuning fork against the heel of my hand, then hold it to my ear and at the same time grab the clarinet with a free hand to finger the same note. Before the sound of the tuning fork died away a few seconds later, I tried to match the exact pitch of the note. It proved to be an arduous method with only limited results.

I soon tried experimenting with the piano as my sound source, which turned out to be easier. While holding down the sustain pedal with my foot and hammering a note *forte*, I could grab the clarinet with both hands and play the corresponding note. Again, the sustained note on the piano died away quickly, but it was slower than the decay of a tuning fork and gave me a better chance of matching pitches. At least I could check any note on the clarinet with this method.

Playing Sharp

Differentiating flat from sharp notes took careful practice. I quickly realized that a flat pitch seemed sour to my ears and made me impatient and uneasy. I also learned that I was much more tolerant of sharp pitches, although both are out of tune; my response to sharpness was more forgiving. Perhaps flatness suggested a weak, unsupported, unenthusiastic tone while sharpness suggested one that was strong and well supported.

One day when I was rehearsing with the San Francisco Opera Orchestra, a colleague in the clarinet section chimed in that it is always better to play sharp than out of tune. It was a joke of course, a statement that seemed pretty funny at the time; but the more I thought about those words, the more they made sense.

My colleague's statement clearly supported the notion that another professional shared my view toward pitch. The notion that sharpness is better tolerated than flatness soon developed into a playing concept for me. If you are going to have an intonation error, then it is better to err on the sharp side than on the flat side of the pitch.

One day before an opera rehearsal, I noticed the principal horn player marking pencil lines on several tuning slides of his horn. Curious, I asked what he was doing. He explained that he was pretuning some of the tuning slides on his high horn to the sharp side for a particular upcoming solo passage.

I questioned him further, asking whether there was an advantage to

tuning sharp. He explained that to play this particular passage with a full-bodied tone at the required *forte* dynamic, without straining or reaching for the high notes, he preferred to tune those notes sharp. It helped him to open up, relax, and drop into the notes from above.

This was a revelation to me because it related directly to the clarinet's *altissimo* register. Although the clarinet does not have tuning slides like the horn, clarinetists can use alternate fingerings to produce sharp notes and provide the same advantages. These fingerings open up the instrument so players can relax and drop in notes from above. The result is a more full-bodied tone and a greater sense of ease when negotiating difficult *altissimo* passages. It reduces tension in the embouchure and produces a perception of ease and control by the performer to the audience.

Facts About Pitch Perception

By now I thought it would be helpful to review a few basic principles regarding pitch perception. When a musician plays either sharp or flat compared to a sound source, the wave patterns of the sound he produces conflict and create an audible beat or beat pattern. The slower the conflicting beat pattern the closer the musician is to playing in tune, and the faster the beat pattern the farther out of tune he is. The goal is to reduce the beat patterns entirely.

Whether you are sharp or flat on clarinet – or any other woodwind or brass instrument – the best way to practice is to play your note and compare it to a reference note, then experiment by tightening and loosening the embouchure. This allows you to listen to the subtle changes in the speed of the beat patterns. When the beat patterns are silent you are playing in tune, which is the ultimate goal.

With practice, even student musicians can develop the ability to recognize the difference between sharpness and flatness as well as begin to understand how to use the embouchure to raise and lower the pitch of the instrument efficiently as needed.

Electronic Tuners

Years ago the easiest and most reliable instrument to use as a pitch reference was a piano. Today there are a number of tone producing chromatic tuners whose ranges cover every note on a piano keyboard. They give clarinetists just about any reference pitch for an indeterminate length of time.

By practicing with a tone-producing tuner, you will begin to hear the patterns of pitch tendencies of your clarinet, which is a huge step toward gaining control of intonation. All clarinets have individual, distinct pitch tendencies. Since the early instruments made by Louis Buffet in 1839, clarinet designers have made any number of acoustic changes in bore and key placement to improve the response, tone, and intonation of instruments. Even with the use of computers and modern manufacturing technology, however, clarinets do not play in tune throughout their entire range without careful adjustments made while playing.

Qualities of Good Clarinets

Professional-model clarinets have very good pitch characteristics with good, reliable notes, but they are not perfect. What defines a good clarinet is a high percentage of reliable in-tune notes when compared to the number of flat and sharp notes.

The clarinet is ultimately an instrument of acoustic compromises. A manufacturer can position tone holes to produce reliably in-tune notes in the *chalumeau* register, but they become sharp or flat when a player adds the register key producing a note a 12th above in the *clarion* register. Recognizing that most clarinet tone holes serve multiple notes is important.

Adjusting Pitch

The first steps in playing with good intonation include recognizing and memorizing the pitch tendencies of your clarinet. This means every single note and at all dynamic levels. Being able to anticipate the intonation tendencies and adjust them quickly will improve your playing dramatically and help you to control intonation like a professional. For example, if E4 on your instrument tends to be flat, you can immediately compensate by tightening the embouchure and thinking sharper. If the reference pitch is reliable, it helps to anticipate the pitch tendencies of notes as you play and compensate for them, whether sharp or flat; it works most of the time.

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Through practice and experience a player becomes programmed to adjust notes by force of habit. After a while the clarinet will sound like it is playing with improved intonation all by itself when in fact it is the clarinetist's pitch adjustments that make the difference.

You may think that professionals have access to better equipment – brands of clarinets, mouthpieces, barrels, and reeds – than amateurs, but that is not the case. If you wonder why professionals play consistently in tune and amateurs struggle, it is because professionals hear and anticipate pitch tendencies and adjust to them before audiences sense an intonation problem. The difference has little to do with equipment.

Improving Intonation

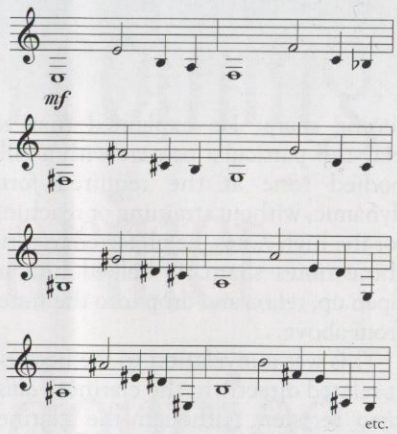
To improve intonation my first suggestion is to chart every note of the clarinet moving chromatically from low E3 up to the highest note in your range. Next calibrate a tuner to A=440 and check to see that the ambient room temperature is 70-72 degrees Fahrenheit.

Turn on your tuner and select the concert pitch D3, which corresponds to the unison low E3 on the B♭ clarinet. Set the tuner to its loudest output level while playing the E3 with the tuner at a *mezzo forte* dynamic level. If you are out of tune, do not immediately adjust your embouchure to the pitch of the tuner. At this point you are trying to determine the pitch tendency of the note being tested.

Listen to the beat pattern and experiment with the pitch by tightening and loosening the embouchure and hearing the changing speed of the beat patterns. If you are flat, for example, tighten your embouchure to raise the pitch, which minimizes or silences the beats, then take note of the effort you applied to the reed. I show students how to chart these physical adjustments numerically using a scale of one to three. Number one represents minor adjustments and number three major adjustments; a zero means the note is in tune. A negative sign can delineate flatness and a positive sign can show sharpness. Record this information on your chart.

When you finish determining and adjusting the pitch tendency for E3, play the octave above and listen to the pitch tendency of E4 in the staff. Later, this will be a good reference when you plot that E in your chart.

A note that is out of tune at the unison will also be out of tune in the same way as a fourth, fifth, or octave, so this might also be a good time to check the fourths and fifths against the E3. It will help with ear training as well as reinforce the pitch tendencies of those notes as you chart them later. Continue to repeat this process through the entire range of the clarinet and then memorize the results.



Other Ways to Alter Pitch

There are several other ways to adjust the intonation of an instrument. First, it is helpful to understand the properties of the harmonic series of the clarinet. The *chalumeau* register (fundamental register) over-blows at the 12th into the *clarion* register and then over-blows again a sixth into the *altissimo* register. You will notice that on a many B♭ clarinets, A3 tends to be sharp. When you activate the register key and over blow the A3, it rises a 12th to E5 in the staff, which also tends to play sharp.

If you release the left-hand index finger and over-blow the E5, you will produce a high C♯6, which also tends to be sharp. Because the pitch is consistently sharp through all three registers, a reliable clarinet repairman can mechanically lower the three pitches by adding material such as epoxy steel to the topside of the tone hole. In this case it is the tone hole played by the right-hand third finger that produces the A3, E5, and C♯6.

The epoxy has to taper at the shoulders of the tone hole so it blends in seamlessly with it while being humped in the middle. This added material physically lengthens the clarinet at the top of the tone hole, thus producing a lower pitch on all three notes in their respective registers.

Throughout this process the repairman should carefully check the pitch with the tuner so that the amount of epoxy material he adds to the tone hole is the best compromise for all three notes being considered. A fine

file can be used to adjust and shape the epoxy material.

There are several other ways to alter clarinet pitch. To raise pitch you can undercut the top of a tone hole and/or raise the height of a pad by reducing the thickness of the bumper cork. To lower pitch you need to add thickness to the bumper cork, which lowers the height of the pad.

A combination of one or several of these adjustment techniques will give you more control over the basic pitch tendencies of the instrument. Always remember, however, that most tone hole adjustments affect several notes, so consider all the notes being affected before making any changes.

An Average Embouchure Range

Another technique is to play the clarinet with an embouchure that accommodates an average range of notes in a given register. For practical purposes this is simply easier than trying to adjust wildly to individual notes.

A good example is the throat tones. I have students adjust their instruments so the pad height or key height of the throat tones, A3, A♭3, and G3, uses the same embouchure. If one of these notes is noticeably out of tune with the others, then the student adjusts it to balance with the others. It improves intonation because the one-embouchure approach can be used throughout a moving passage.

Regulating the resistance of specific notes to balance a range of notes is also useful and is done by adjusting pad height. The lower the pad, the more resistant the response; the higher the pad the less resistant the response. If, for example, C♯4 is sharp but is more resistant than D4 and C4, then it is helpful to raise the pad to free up the resistance and also add epoxy to the top side of the tone hole to lower pitch.

All of these suggestions will give clarinetists the information and tools they need to improve intonation. The two most important skills are training the ears to interpret beat pattern disturbances – out-of-tune notes – and learning the pitch tendencies of every note on your clarinet. It is also helpful to have your clarinet mechanically tuned to correct out-of-tune notes and regulate resistance.

Clarinetists who know about the intonation tendencies of their instrument and work to improve them, will grow to become confident musicians with a uniform approach to the embouchure and to playing. □

Sightreading, *cont. from p. 22*

Solution 1: Give students the flexibility of playing music an octave higher or lower during sightreading. While this will change the textures and chord voicings of a piece, it is better than having the right notes played with poor tone and faulty intonation or even wrong notes.

Solution 2: Include ear training in your warm-up and fundamentals practice. Young students often play with a press-the-button-and-go mentality, never anticipating what will come out of the instrument or whether it is right or wrong. Through ear training, students improve in their ability to predict the sound of a musical line before they play it, so they know what to expect. Singing in class is one of the best ways to develop good ears.

Solution 3: Tension affects range, so be sure your students are relaxed before they sightread. The result will be a better sound in the extreme ranges. Gary Green, director of bands at the University of Miami, Florida, once helped an ensemble of tension-filled student musicians with these simple words: "Relax; it's only music!" The effect on the group was amazing. Once students realized they could make a few mistakes, they made fewer mistakes.

Meters with Large Beat Notes

Meters in which the half note gets the beat, such as $\frac{2}{2}$, $\frac{3}{2}$, etc., often cause sightreading problems from which recovery is nearly impossible. This is especially the case when these meters are mixed with $\frac{4}{4}$ or $\frac{6}{8}$ where shorter durations get the beat.

Solution 1: Before the opening downbeat of a sightreading session, tell the ensemble the note value that gets the beat and relate how you will conduct the work. You don't necessarily have to conduct $\frac{2}{2}$ in two, but you need to decide how you will conduct based on the abilities of your players and the difficulty of the music.

Solution 2: During rehearsals include music in a variety of meters and be sure students understand each one. There is

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a difference between $\frac{3}{2}$ and $\frac{6}{4}$, just as there is a difference between $\frac{3}{4}$ and $\frac{6}{8}$. The more you train students to understand these differences, the more easily they will be able to sightread them.

Mixed Meters

Meters that change frequently can confuse the entire ensemble, particularly if the music moves between even- and odd-measure lengths or between simple and compound meters, such as $\frac{4}{4}$ to $\frac{6}{8}$ or $\frac{2}{4}$ to $\frac{5}{8}$.

Solution 1: Be sure that your conducting chops are up to the task. You will not be able to help your players if too much of your focus goes to beating time correctly.

Solution 2: Before you begin, everyone in the ensemble should know how the different meters relate to one another. If the eighth note prevails, make sure this is something the ensemble knows and understands.

Solution 3: Point out passages that have a continuous pulse and explain that this pulse will be the metronome for the piece, such as when the trombones have repeated eighth notes throughout a work.

Complex Subdivisions

After identifying the primary beat, students should also know the primary subdivision. A piece in $\frac{4}{4}$ with an abundance of eighth notes has a quarter-note pulse and a subdivision of eighth notes. Some players may have quarter notes and eighth notes while others have eighths and 16ths, which means different subdivision levels may be necessary for different players.

Solution 1: During rehearsals be sure all of your players understand how to subdivide. If they do, this means they are using some type of counting system to read rhythms instead of learning them by rote or imitating their neighbors.

Solution 2: Before you begin, point out where subdivision errors are likely to occur. You should tell the band to think ahead: "Woodwinds, you need to start thinking about 16th notes in bar 12 so you are ready for them when you get to bar 13."

Solution 3: Review exercises in subdivision on a daily basis. Have students play a scale with four beats per pitch, then play the subdivision. Hand signals are helpful to switch from one subdivision to another. Use one finger to signify quarter notes, two fingers for eighth notes, and four fingers for 16ths. You can include triple subdivi-

sions and even more complex variations. This will increase students' comfort in switching between subdivisions and give them the tools to sightread and play complex subdivisions.

Extreme Tempos

Very fast and very slow tempos will cause sightreading problems, depending on the complexity of the music. Fast whole notes are not too hard to play, but slow whole notes can be quite difficult. It is usually fine to use a moderate tempo for a while in the first reading of a piece, but be aware that it may be difficult to change to the correct tempo at a later date once students learn the wrong tempo.

Solution 1: Your conducting has to be crystal clear in terms of tempo. Don't create problems with indecisive tempos.

Solution 2: Tempo should be one criterion by which you assess the difficulty of the music. Reducing the tempo will not necessarily make the music easier to play. Think of such technical areas as articulation, melodic motion (stepwise versus leaps), the key, and meter. Select a tempo that retains the character of the music while giving players a chance to do well.

Tempo Changes

Changes in tempo come in two varieties. Unprepared changes are sudden or come from a stop in the music, such as a fermata or caesura. Prepared changes are accelerando or retardando (also ritenuto). Prepared changes may also signal a switch from common time to cut time with the underlying pulse remaining the same.

Solution 1: Know the tempo you want, and then stay with it. Preparatory beats should be clear to everyone.

Solution 2: The entire ensemble should know where each tempo change takes place and the tempos at the beginning and end of the work. I also like to have my students sing through the transition sections.

Solution 3: Add tempo changes – prepared and unprepared – to your warm-up routine. Use your materials in creative ways and find novel ideas to include as you review basic skills with the ensemble.

A part of teaching music is helping students develop the skills to interpret music without your help. Just as English teachers have students read out loud in class to demonstrate their ability, music teachers need opportunities to show that their students are learning musical concepts, not just pieces. □