

Intonation in Woodwind Instruments: Problems and Solutions

Fred J. Allen

Teaching woodwind players to play with good intonation is an important process, but it need not be confusing or overwhelming. The effective teacher is aware that there are both overall concepts and idiosyncrasies that must be taught to the players of the various woodwind instruments.

Overall Concepts

The first step forward toward teaching good intonation is to prioritize the teaching of tone. Daily instruction, reminders and encouragement are necessary to ensure that players are making the best tone possible. Without good tone, all efforts toward good intonation are in vain.

Teach students what “in tune” sounds like. Two instruments playing a pitch in tune will have no waves occurring between their sounds. A player matching a drone with no waves between the two sounds has demonstrated good intonation.

A teacher can demonstrate what “in tune” sounds like easily with two students playing, but it may be done more efficiently with one good student and the teacher: the teacher makes slight changes in intonation until there are no waves between the two instruments. Even better, use a drone and have the students play and adjust until the waves disappear.

Flutes, clarinets and saxophones all pull out to flatten and push in to sharpen pitch. However, double reed specialists suggest that the oboe reed

and the bassoon bocal be placed all the way into the instrument so that there is no “bubble” between the reed or bocal and the instrument. This means that double reeds must have a source for obtaining reeds that play in tune.

All wind instruments are affected the same regarding temperature: cold=flat, hot=sharp. All wind instruments can lip down (flatten) pitch to a greater degree than they can lip up (sharpen) and still maintain an acceptable tone, especially on members of the clarinet family.

All woodwind instruments can use the process of venting (opening closed keys or holes) and damping (closing open keys or holes) to humor problem pitches. Venting raises pitch and damping lowers pitch. [Credit to Dr. Gary Garner for this terminology!]

Crucial Point

It is vital for any wind instrument to tune more than one pitch when working with a tuning mechanism. This is especially crucial in the woodwind family where different parts of the tube may produce different tuning results. On woodwind instruments, check two (or more!) pitches to settle on a good fundamental intonation. For tuning a second pitch, use a note that tends towards flatness: after all, you can lip a sharp note down further than you can lip up a flat note.

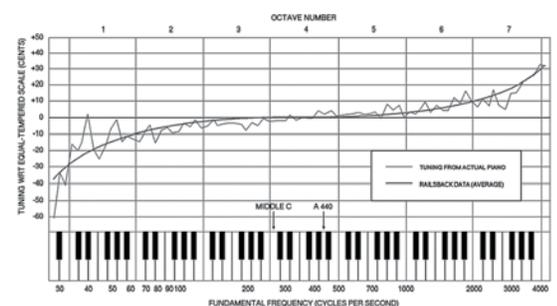
Idiosyncrasies

Even when playing with the best tone possible, players will encounter problems on each of the woodwind instruments.

Piccolo

The body of the piccolo is designed in a reverse conical taper, whereas the body of the flute is cylindrical. This causes “problem notes” on piccolo which differ than the ones commonly encountered on flute.

It is best to NOT tune the upper register of the piccolo to a tuner! If you do, it will sound flat in the ensemble. In equal temperament, the top octave of the piano is stretched upward due to a physics phenomenon known as the Railsback Curve:



In the same manner the piccoloist must humor notes upward in the highest octave. It is best to tune high notes on piccolo by ear—start with the head joint pulled just enough to get your thumbnail in, then adjust from there. Tuning by matching a drone is another good way to find good intonation in the upper register.



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Flute

More than any other factor, air direction on flute affects intonation. Students who play with their heads dipped downward will play flat. However, realize that air direction is both a problem AND a solution! A raised air stream will raise pitch, and a lowered air stream will lower pitch. Some teachers insist on using the corners of the embouchure to control air direction; others insist on using the jaw (forward and back) to affect the pitch.

NEVER TEACH “ROLL IN/ROLL OUT” to adjust pitch. The contact point of the flute to the lip should not be disturbed, nor should the hands be encumbered with unnecessary movement. Be sure students are looking at their music when they tune, since this is the direction their air will travel when they perform.

Extreme range can be expected to have some predictable intonation problems. The lowest 4th of the range tends towards flatness, especially in softer dynamics. The top octave of the range tends towards sharpness, especially in forte, with the exception of D6 (a little flat) and Bb6 (often a bit flat).

Dynamic levels can affect intonation. FF and crescendi = sharpness, and PP and diminuendi = flatness (a big danger on releases). Also, have students periodically use their tuning rods to see if the crown assembly has loosened or slipped. The line on the rod should show in the center of the embouchure hole.

Oboe

Good oboists make their own reeds to play at A=440 with the reed pushed all the way in. If the student has not

yet learned to make reeds, locating a good reed source is crucial to both student and band director.

Hard reeds will tend toward sharpness and soft reeds will tend toward flatness.

Generally, lowest register notes (bottom 4th) tend toward flatness, but the upper register can go either way depending on the reed and player. An experienced player often tends toward sharpness in the upper register.

Dynamics and dynamic changes may make a small change in pitch, with louder being flat and softer tending toward sharpness, assuming the embouchure is formed correctly.

Bassoon

Bocals come in three common lengths, with 2 being standard, 1 being shorter (sharper) and 3 being longer (flatter).

Like on oboe, hard reeds will tend toward sharpness and soft reeds will tend toward flatness. Also like on oboe, dynamics and

dynamic changes may make a small change in pitch, with louder being flat and softer tending toward sharpness, assuming the embouchure is formed correctly.

Clarinet

Standard clarinet barrels are 66mm in length. It is possible to order a longer or shorter barrel if a player is consistently flat or sharp, assuming the embouchure and/or reeds are not the problem.

Regarding range, the most often encountered problem for school-aged players is that the throat tones tend toward sharpness. This would include their written G4, G#4, A4 and Bb4. There are multitudes of fingering alterations



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clarinetists use to bring pitch down as well as improve timbre and/or resonance on these notes.

Dynamics and changes in dynamics affect the clarinetist's intonation greatly. FF and crescendi = flatness and PP and diminuendi = sharpness. This is why flutes and clarinets have so much trouble matching pitch in a diminuendo: their tendencies are leading them in opposite directions!

Hard reeds will tend toward sharpness and soft reeds will tend toward flatness.

A mouthpiece with a closed lay will play sharper and one with an open lay will play flatter. Check the angle of entry: a clarinet held out too far from the body will play flat and one held too close will play sharp.

Saxophone (all saxes)

Most saxophonists experience problems with sharpness in the upper range (their written A5 and higher) and most saxophonists experience flatness in the lower range (their written D4 and lower).

Dynamics and changes in dynamics affect the saxophonist's intonation greatly. FF and crescendi = flatness and PP and diminuendi = sharpness.

Hard reeds will tend toward sharpness and soft reeds will tend toward flatness.

A mouthpiece with a closed lay will play sharper and one with an open lay will play flatter. Check the angle of entry: a saxophone held out too far from the body will play flat and one held too close will play sharp.

Altered Fingerings

Altered fingerings are not necessarily alternate fingerings, but rather small alterations a player can make to a standard fingering to humor pitch. Teachers are encouraged to locate sources for altered fingerings for better intonation and/or resonance for each woodwind instrument's idiosyncratic problem notes. There are numerous sources for these alterations, including these from my web site: Fredjallenmusic.com.



Fred J. Allen is a music teacher, conductor, arranger, composer and author. He is Director of Bands Emeritus at Stephen F Austin State University. Prior to that he taught at Abilene Christian University and in two public school districts. At the university level, he taught numerous courses in the music education and wind conducting curricula, including conducting lessons, wind literature, rehearsal techniques, instrumental methods and orchestration in addition to conducting duties with the wind ensemble. His teaching was recognized in 2012 with the Meritorious Achievement Award by the Texas Bandmasters Association. He is a 2020 inductee into the Texas Bandmasters Hall of Fame, sponsored by the Alpha Chapter of Phi Beta Mu Honorary Bandmasters Fraternity. Allen has conducted All-Region and All-State Bands throughout Texas and the United States, where he is also an active concert clinician and adjudicator. He has often served as guest conductor for bands playing at the Midwest Clinic and the Texas Music Educators Association Convention, and has also conducted in Korea, Taiwan, Hong Kong and Australia. As an arranger and composer, Allen has published several pieces for band, orchestra and flute choir that have drawn upon his experience in teaching in the public schools. His music is noted in The Heritage Encyclopedia of Band Music (Rehrig), Teaching Music Through Performance in Band (Miles, et al) and other band music reference books. He has presented clinics and workshops at conventions of the Midwest Clinic, Texas Music Educators Association, Texas Bandmasters Association, at the Conservatorium of Music in Hobart, Tasmania, and in several public school districts for faculty development. He is an elected member of the American Bandmasters Association, Phi Beta Mu International Bandmasters Fraternity, College Band Directors National Association and ASCAP. He lives in Arlington, Texas.