Symphony of Solutions:

Taming the Unique Challenges of the Clarinet and Bass Clarinet

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What makes the clarinet UNIQUE? And what does this affect?

- Overblows a wider interval than other woodwinds but . . .
- Only one “speaker” hole (register key) on soprano and student model basses
- Vibration originates significantly BEHIND the lips, not at the lips (brass) or in front of the lips (flute).
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What does this mean?

Single speaker hole is an acoustic compromise

- Twelfths on long fingerings tend to be wide and on short fingerings tend to be narrow. (Low E and third line B are too far apart on virtually all clarinets, for example)

- Lowest notes (longest fingerings in the low register) are naturally flat. This becomes more pronounced at loud dynamic and by the bell being held in the knees.

Vibration originates behind the lips . . .

- The back of the tongue (and what we often perceive as the throat) **does not function as it does on the flute or brass instruments.**
- The tongue forms a venturi which controls air speed. That is why we keep the tone high in the mouth always.
- “Open throat” . . . The “road to . . . . paved with good intentions”

Squeaks: Recognize both kinds!

- Voicing on the wrong partial--meaning the tongue is in the wrong position or the leverage on the reed is incorrect

- Pressure squeak—a higher-pitched almost electronic-sounding squeak or whistle that is the fault of the equipment

    - A mouthpiece that is worn or defective
    - A thin spot on the tip of the reed or split on the tip

Learning to avoid squeaking

- Practice squeaking. Start on ”open G” and squeak the third partial (a flat high D-natural) by changing tongue position and leverage on the reed, and then eventually a fifth partial (approximately high G#). Work your way down chromatically as far as you can go to teach yourself where the threshold of the squeak is in the embouchure.

Mouthpiece wear . . . ”rail tilt”

- Natural wear caused by the action of the reed, “sanding” the inside of the fulcrum of the facing on the inside more than the outside. In extreme cases, you can see the tilt as light reflects off the facing.

- Symptoms of rail tilt:
  1. Brightening or thinning of sound quality. Mouthpiece became less resistant
  2. Using increasingly harder reeds to compensate for loss of resistance
  3. Mouthpiece is finicky--Reed selection becomes more difficult
  4. With extreme rail tilt, very high squeaks (“pressure squeaks” that sound like whistles) emerge without warning.

Focus: Tongue position or vowel sound

- Remember: the sound we get out of the clarinet is the sound we put into it!
- “eh” or “ee” and not “ah”
- In addition to squeak studies, play in the clarion register without the register key.
- The tongue focuses the sound. So if you’re practicing “long tones,” add some tonguing so that you’re totally aware of the degree to which the sound is focusing.

Focus: mechanical influences

- Leakage in the upper joint, especially higher on the upper joint. Be sure the upper joint holds a vacuum!

- . . .this can include an inadequate seal of mouthpiece or top joint tenon cork

Focus: reed width

- Reed too wide
  - Often making a reed more “V-shaped” by sanding the stock will improve focus
  - Narrowing the whole reed with 400 grit sandpaper can help, but too much narrowing makes the tone thinner and brighter.
  - In the winter or very dry conditions, a narrower reed may be more satisfactory.

Focus: reed balance

- Reed balance
  - Turning the mouthpiece while playing “open G,” the side of the reed the lip is pushing on when the sound is most colorful, focused and perhaps loudest is the HARD side.
  - Move the hard side toward the center of the facing (off the rail of the mouthpiece) and the sound improves.
  - Use both of the above tests to decide whether to remove cane. If you do, take it from the shoulder to about halfway to the tip. NOT FROM THE TIP

Focus: the ligature

- A more flexible ligature may allow the louder tones to lose focus (spread). You may get better focus with a firmer hold on the reed, as with a metal ligature rather than a plastic one.

- Often, the weight of the screws on top of the reed will stabilize the reed. So for example, an inverted ligature (screws over the mouthpiece) may not focus as well as a standard with screws under the mouthpiece.

- Remember, all ligatures are right-handed.

Focus: The Mouthpiece

- Mouthpiece
  - Some mouthpieces focus more easily than others. Often this is due to facing length but for most of our purposes, just find a mouthpiece type that gives the desirable focus.

Focus: the Barrel

Generally, barrel bores are inversely tapered (i.e. smaller at the exit than at the entrance). The diameter of the bore and the degree and location of the taper affect the focus as well as the tuning of the scale.

- REMEMBER: The barrel's inner dimensions also greatly affect the scale. Don't fall in love with a barrel (or a mouthpiece) for its sound if you have to struggle to play it in tune!!!

- Often, wood barrels become a bit elliptical with time. When the shapes of the upper joint and barrel match the focus is best.

Focusing the Sound (summary)

- Tongue position or vowel sound
- Eliminate Leakage in the top of the instrument in a pad or cork
- Narrow the reed if necessary
- Firm ligature
- Mouthpiece
- Reed balance

Grunts in the upper register (high b&c esp.)

- **Voicing** reasons. Often a byproduct of a less advantageous tongue position/vowel sound

- **Leverage** reasons—high notes are further down the reed than low notes, so the jaw needs to extend slightly (like a filing cabinet drawer)

- **Mechanical/acoustic** reasons—often the register key pad is too far from the seat. Clearance the thickness of a nickel is usually ideal.

- **Length of register tube**—too long (particularly on some A clarinets)

Twelfths too wide or narrow

- Barrel diameter is too large—twelfths are too wide
- Barrel diameter is too small—twelfths are too narrow
- DO NOT FALL IN LOVE WITH A BARREL BECAUSE OF ITS SOUND WITHOUT BEING SURE OF THE INTONATION CHARACTERISTICS!!!!

A particular area in the scale is flat or sharp

- Often this is mouthpiece, especially if the very shortest fingerings are flat.
- Sometimes a mouthpiece maker or technician will remove too much material from the baffle to darken the sound, causing the short fingerings to be flat.
- Short fingerings (e.g. throat tones with fewer fingers down) are more affected by pulling the barrel than longer fingerings (with more fingers down)

Dynamic—the annoying nature of the clarinet

- Loud equals flat
- Soft equals sharp

Gas density

- ”Tidal” air at the beginning of the breath is rich in oxygen and has less Carbon dioxide, a heavier gas. The reed vibrates faster in lighter air and so the pitch is sharper for the first second or two of a breath

- APPLICATION: The first pitch that comes out is always sharp. Wait a few seconds to judge where the instrument will tune while playing.
- “Staggered breathing” is treacherous for clarinets because of pitch and . . .
- An entrance on a very exposed note (especially at a soft dynamic) will be sharp. <u>This can be fixed by altering the fingering or (in a critical recording situation, for example) by expelling a little excess air before the attack.</u>

Intonation challenges (summary)

- Twelfths too narrow or too wide
- A particular area in the scale is sharp or flat
- Misunderstanding the location of the “pull” (always tune “open g” first at the barrel and then “tuning note C” between the hands)
- Dynamic
- Gas density O2 vs. CO2

Principal vs Alternate Fingerings

- The clarinet is a product of design and not evolution. One fingering is PRINCIPAL--DESIGNED to fall ”under the hand.”
- The player has to move “out of position” for the alternate fingering, as for example, alternate E/B on the right and F#/C# on the left.
- The ”Principal” fingering is not always acoustically the best fingering. Low B/F# is a classic example, where the “forked” or “chromatic” fingering has better pitch and tone but is more awkward to get to in most passages.
- Be sure the correct fingerings are marked in the parts!

Resonance fingerings—throat register

- Keeping the antinode inside the instrument

- G#--3L and 1R
- A—23L, 23R and C key (or 3L, 1&3 R and C key)
- Bb—3L, 3R and C key

Bass Clarinet

- Response on lowest notes “thhhh” starting from a slight vibration rather than a completely still reed
- Altissimo register fingerings: Dependent on the mechanism, we use third partial fingerings above “high c” rather than fifth partials when we can.
- Remember—it’s a Clarinet and not a saxophone. Like any other clarinet, we blow at the ”face” of the reed and not “down the tube” like saxophone. A saxophone-like approach to the mouthpiece makes the clarion register much more difficult.

Initial altissimo fingerings on bass clarinet

- C#--Left index finger and register key
- D—Register key only
- D#--Register key and G# key (left index)

Useful reed knowledge: clipping a reed

- When a reed is too soft, we use a reed clipper to bring thicker cane over the resistance curve of the mouthpiece to produce more resistance. We judge the amount to remove by how much cane hangs over the end of the mouthpiece when the resistance is most desirable.

Clipping a reed (cont'd)

- Resistance comes from the middle and back of the vamp—not from the tip, so thin the final 5-8mm of the tip, especially in the center, to regain the tone of the reed. This will not reduce the resistance of the reed.

- The *maximum* tolerable thickness for the center of the tip of a reed is about .005 inch, or slightly thinner than two sheets of notebook paper. When we clip the reed we're clipping up the incline which leaves unacceptably thick cane at the tip of the reed

- Remember that the tip of the reed needs to be thicker in the corners than in the center, resulting from a curved blade clipping further up the incline on the sides than in the center.

Reed resistance

- Convex warpage makes a reed more resistant
- Warpage downward into the tip of the mouthpiece makes a reed less resistant
- Reeds will ALWAYS warp convex if they dry too much or too quickly
- Reeds will Also warp concave if they are soaked much too long or are dried too slowly. This rarely happens in real life

Comparing before and after wet-dry

Before wet-dry

After wet-dry

Convex—green interior touches glass—the edges do not

Reed resistance—balance—use “open G”

- When you twist the mouthpiece pressuring first one side then the other of the reed, the side you are pushing on when the sound is best is the hard side.
- The reed will sound best when the hard side is pushed toward the center of the facing, reducing the amount of rail contacting the reed and thus reducing resistance on that side.
- On bass clarinet and saxophone it’s easier to move the reed to one side and then another to determine which side is hardest.
- Either play the reed skewed on the mouthpiece the desirable direction or remove cane from the scribe mark (where the bark stops) and halfway to the tip. DO NOT take wood off the corner of the tip!