



The United States Army Band

Pershing's Own

Range Extension for the Trombone

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Range extension is an aspect of trombone playing that many exert considerable effort to improve, but often with little success. This article is intended to provide practical advice for trombonists to build both high and low ranges while reinforcing the existing middle range. The topics that will be discussed are: high range extension, low range extension, flexibility, and intonation.

Measure Twice, Cut Once

This is an adage borrowed from the carpentry trade that should be followed for musical practice. All too often, more effort is wasted attempting a note or passage without any mental "measuring." Here are some practice techniques that should be utilized. Practice sessions should be limited to approximately 15-20 minutes and each practice session should have an equal period of rest. This method will limit fatigue and allow time for mental preparation and practice techniques that do not utilize the embouchure, such as: sight singing, breathing exercises, holding the trombone and moving the slide to mimic passages, and score study. Mental preparation should precede the first practice session with the trombone.

High Range Extension

The importance of a well-developed high range has less to do with the highest note that one can play than with the security and timbre of the upper range. Most trombone repertoire does not utilize notes above C5, though occasional notes are written up to F5. Therefore, in order to secure the range around C5 and up to F5, these exercises are intended to exceed F5 and to reinforce the range around C5.

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Ranges in this article are defined as this: C4 is middle C, one line above the bass clef. C5 is one octave above C4 and C3 is one octave below C4.

Once one feels properly warmed up, use this 4-step exercise (a keyboard instrument will be needed.) Perform this exercise slowly, 60 bpm (beats per minute), with one beat per note, perform it at a moderate dynamic, and be attentive to pitch. While ascending, increase the airflow and once Do is reached, sustain for 3 beats. When buzzing, always strive for a strong "buzz" sound and a focused pitch center.

1. Start with Sol, La, Ti, Do in a major key played on a keyboard. The Do, or tonic, of this scale should be one octave below your highest note. For example, if your highest note is a C5, then Do will be C4 and the exercise would begin on G3 (G3, A3, B3, C4).
2. Repeat this scale segment again on the keyboard while simultaneously buzzing the pitches on the mouthpiece.
3. Repeat this same scale segment with mouthpiece buzzing alone.

4. Repeat this exercise on the trombone. A short rest of approximately 30-45 seconds should follow step 4. This exercise should then be transposed one half step upwards until one reaches the point where they can no longer ascend.

It is important to remember that if any pain is felt, one should stop this exercise. As one reaches the upper limit of one's range, one can expect the tone quality to suffer; however, this will improve over time. Follow this exercise with some long tone exercises in the low and middle registers. This exercise, combined with the long tones in the low register, would constitute one 15-20 minute practice session and should be followed by an equal period of rest.

Low Range Extension

As with a well-developed high range, a well-developed low range has less to do with the lowest note that one can play than with the security and timbre of the lower range. Very few tenor trombone parts descend lower than E2 and bass trombone parts seldom descend below Bb1, but newer repertoire is utilizing the trombone's lower register.

This first exercise is a mirror of the previous exercise listed above for the high range. It is an identical 4-step exercise except that the scale segment is a descending Sol, Fa, Mi, Re, Do (also in a major key.) In this exercise, one should start one octave above their lowest note. For example, if their lowest note were a Bb1, Bb2 would be Do, or tonic of the scale, and begin on F3 (F3, Eb3, D3 C3, Bb2.) As with ascending notes, lower notes also require a greater flow of air. While the high range exercise required a low range long tone exercise, this exercise should be followed by middle range, not high range, long tones. One does not feel the same fatigue in the low range as in the high range, but rest is still required after this exercise.

Further Techniques to Improve Range Extension

The exercises given above are designed for range extension in the basic sense, these techniques below are intended to aid in integrating these ranges into practical musical passages. Unless otherwise noted, these exercises will work for both high and low range extension.

1. Articulation: re-articulation of a note is well suited to ensuring the stability of a note. When re-articulating, begin with connected notes, i.e. legato articulation and then move towards more separate notes, i.e. staccato. It is also advisable to begin with longer note values before proceeding to shorter note values.
2. Vibrato: Applying a jaw, or lip, vibrato to a held note is beneficial for note stability. While it is common practice to substitute slide vibrato in the very high range, jaw vibrato is intended primarily as a practice technique.
3. Dynamics: Any note that cannot be played within a musical context of dynamics is useless. Exercises should be practiced with varied dynamics, from fortes to pianos and from crescendos to diminuendos.
4. Glissando: Using a glissando in place of stopping at specific pitches helps with maintaining a constant airflow, which is key to range extension. A glissando should always begin on a stable note and proceed slowly to the desired pitch. It is important to maintain timbre integrity during the glissando. When the glissando reaches a breakingpoint, retry the glissando, but stop short of the break point and hold that pitch, real strength is gained by reinforcing what one can do, while always pushing one's limits.
5. Lip Trills: Beneficial in strengthening high range. Begin trills in the middle register,

approximately C4. Trills should be practiced with a metric acceleration, each section should consist of 2 measures of 4/4 time at 60 bpm. Begin with quarter notes, then 8th notes, 8th note triplets, sixteenth notes, and 16th note triplets. Transpose this exercise upwards a half step until a breaking point is reached.

6. Melodic Transposition: Melodies that are well known to the performer can be transposed chromatically upwards and downwards. This exercise is intended as a practical application of range extension combined with practical musical application.
7. Existing Texts: When using available trombone literature, insert rest. Often these exercises can be a full page of music with little or no rest, which seldom appears in concert trombone literature. Insert short 15-30 second rests to avoid fatigue or actual damage.
8. Learning New Literature: When new literature provides a challenging passage in either a high or low range, it is beneficial to practice the "measure twice, cut once" adage. Play the passage on a keyboard instrument in order to have a pitch model and then play the passage either down or up an octave, as the passage dictates.
9. Phrasing Over Pizzazz: It is a common occurrence to hear a trombonist destroy a phrase because it involves extended range. Often the high or low note is played, but all the notes preceding or following are compromised. Learn the phrase without the challenging note(s) to ensure that one can enter and escape the passage without destroying the phrase.
10. Target Practice: One of the more challenging aspects of expanded ranges is the ability to play a high or low note after a period of rest. The simplest way to prepare for this necessity is to practice attacking notes after a period of rest. There are many examples in repertoire of difficult passages or notes that come after several minutes of rest. After the first practice session and subsequent rest, let the next note be a challenge of target practice.

Flexibility

Flexibility is as important to overall trombone technique as is range. While range extension is the topic of this article, it is important to remember that any added range is useless without the flexibility to connect that range to existing ranges. Flexibility is both the speed and ease with which one can traverse the overall range of the instrument. The related exercises can be compared to the stretching that an athlete might do before a workout. However, trombone related flexibility exercises are best done after a practice session of long tones or mouthpiece buzzing.

There are two primary divisions of flexibility: small interval and large interval. Small interval flexibility can encompass a large overall range, but is done with adjacent overtones. Large interval flexibility is comprised of nonadjacent overtones, i.e. 2nd overtone to the 4th, 6th, or 8th.

An effective small interval flexibility exercise is to slur quarter notes at 60 bpm and hold the ultimate note for 3 beats.

1. Begin the slur on F3 and slur up to Bb3, back to F3, down to Bb2, and back to F3.
2. Repeat this exercise chromatically downwards to 7th position B2.
3. Move this exercise up one partial, while still in 7th position. The progression is now E3, slur up to B3, back to E3, down to B2, and back to E3.
4. Repeat this exercise chromatically upwards to 1st position Bb3.
5. Move this exercise upwards to the next partial and repeat this pattern.

An effective large interval flexibility exercise is to slur quarter notes at 60 bpm and hold the ultimate note for 3 beats.

1. Begin the slur on Bb3 and slur down to Bb2, up to D4, down to F3, up to F4, down to Bb3.
2. Repeat this exercise chromatically downwards to 7th position E3.
3. This exercise can be expanded by adding notes to either end of the slur, i.e. Bb3 and slur down to Bb2, up to D4, down to F3, up to F4, down to Bb3, up to Bb4, Bb3, down to Bb2, down to Bb1.

There are several books on trombone technique that provide examples of lip slurs and flexibility studies, but it is important to recognize one's own weaknesses and develop specific exercises to address those weaknesses. A flaw with many exercises is that they tend to progress from one extreme to the other, i.e. very low to very high. It is often easier to begin in the middle of a desired range and then progress upwards and then downwards and back to the original note. A visual aid for this concept is to imagine walking down the aisle of a grocery store. If one walks close to one side or the other, it is easy to take items from the shelf that one is close to and difficult to reach across the aisle. But if one walks down the center of the aisle, one can reach to either side with the same level of exertion.

Once a specific range of a slur has been accomplished, take those same intervals and change their order. If the slur started in the middle, and then went low then high, begin the next one low, high, middle; the next one high low middle; and any other permutation of the intervals. The repetition of notes approached from different direction improves stability in that range.

Airflow must remain constant during lips slurs. If the airflow is stopped during a lip slur, one is taking away the momentum necessary to connect large intervals. A useful tool in discerning if one is using a constant airflow is to attempt the slur with mouthpiece buzzing. A useful visual aid is to think of pushing a stalled car. If the airflow is constant, then it is like pushing a car that is in motion--all that is required is to continue the force. However, if the air flow stops, it is like the car stops and one has to overcome inertia to resume the car's progress.

Intonation

The topic of intonation is often overlooked, or mentioned only as a footnote in an exercise, as it relates to high range extension. Intonation is integral to playing in every register, but improper intonation in the high range can inhibit development and endurance in high range extension. While some books on trombone technique provide limited guidance on this topic, it is often very general, e.g. 7th partial is very flat. Minor slide corrections are essential to playing in tune above the 5th partial. Not only is each instrument and mouthpiece unique in its pitch tendencies, but each trombonist has a unique physique that will affect any given instrument as well. So while one trombonist may find a pitch to be sharp, another may find it in tune, sharper, or flat.

While there is a wide range of variables, there are constants that must be understood and incorporated into high range extension. A given note has an optimum length required for resonance. When the length of tubing does not correspond exactly to the pitch, the embouchure is forced to compensate for the discrepancy. While other brass instruments like the trumpet and horn often have to compromise their embouchure to accommodate pitch problems, this is an avoidable situation on the trombone. Determining the proper slide placement is affected by proper air support and correct embouchure formation. If there is

insufficient airflow, timbre will be affected and the embouchure will have to compensate to achieve the desired pitch. When the embouchure is compensating for the pitch, it can be heard in the timbre. A pitch may register as in tune, but it will have compromised timbre.

An effective exercise for determining optimum slide placement is the upwards glissando.

1. Starting from a comfortable pitch, i.e. F4 in 6th position, slowly glissando upwards to the desired pitch, i.e. Bb4.
2. To continue this exercise above Bb4, restart this exercise on that Bb4, but in 5th position and glissando upwards to D5.
3. Once D5 is reached, this can be continued upwards by starting the glissando on D5, but in 4th position and glissando to F5.
4. Once F5 is reached, this can be continued upwards by starting the glissando on F5, but in 6th position and glissando to Bb5.

Optimum slide placement can be determined audibly by listening to changes in timbre and with the assistance of a tuner. While a tuner is a useful tool, one must remember that most electronic tuners do not compensate for the necessary pitch adjustments for harmonics, i.e. lowered a major 3rd and a raised minor 3rd. This concept can be practiced while performing a glissando against a constant pitch instrument.

Proper slide placement will greatly improve endurance as intonation corrections can be made with the slide and the embouchure can remain as relaxed as possible. With less effort expended on intonation correction, high range extension can be more effectively practiced.

Conclusion

This article has endeavored to provide practical guidance on the topic of range extension. Range extension is an aspect of trombone technique that requires considerable planning and introspection. Many of the outlined concepts can be applied to existing exercises and individual routines. One must ensure that one is always practicing in a healthy manner and does not compromise one's existing range for the sake of expanded range. Individual growth in this area can progress at any rate and there is no true normal rate for range development. As a final thought, if one only adds a half step a month, that is an entire octave in one year.

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