

# **Playing Multiple Brass Instruments: A Conceptual Approach to Doubling**

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## **Abstract**

In my 13 years as a performer on multiple brass instruments, I have fought against the stigma that brass players cannot “double” like the woodwind doublers popular in the professional scene in Broadway and jazz environments. Despite this, I still maintain a practice regimen, performance schedule, and active teaching on 3 or 4 different brass instruments with frequency. In this paper, I will reflect on my experiences in my student teaching practice. I will also organize a conceptual framework to provide the pedagogical teaching points that any music educator may need to teach a brass student to play another brass instrument, without worrying about the colloquial counter-argument “messing up their chops.” Through my own experience as a player, through my research on brass methodology, and my teaching praxis, this paper will compare and contrast each unique instrument’s instrumental techniques in order to best create a basis by which to approach brass doubling. My practice and pedagogical technique will be limited to trumpet, French horn, and baritone, as these are the most commonly occurring doubles within our current educational system. However, the pedagogical approach taken by this paper can indeed be used to double on any other brass instruments as well. By focusing specifically on similarities and differences in the physicality, characteristic sound/techniques, and the overtone series for each instrument, I hope to synthesize a process that will enable any student to become a brass doubler.

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I dedicate this paper to *Dr.* John Rojak, for seeing some great potential in me. Without him, I never would have attended NYU or found my true passion for playing multiple brass instruments!

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## **Introduction**

The question of whether or not brass doubling is possible has always been an issue that resonates with me. It is found in online forums where students ask “can I play trumpet and trombone?” or “if I switch to French horn, can I still play trumpet?” It is found in the classroom when a band student wishes to play sousaphone in marching band but still play trumpet in the jazz band. The purpose of the research and synthesis in this paper is to help fill a lack of materials available to teachers and players alike that specifically addresses playing more than one brass instrument with proficiency.

The existing literature on doubling is mostly within the field of woodwind doubling, so some analysis of woodwind doubling methods is necessary. Next, it is important to understand the physical processes that are involved in playing a brass instrument, in order to best understand the playing of two or more distinct brass instruments. Finally, I will approach my ideas on pedagogy for brass doublers by addressing the existing pedagogy for each of my target brass instrument: trumpet, French horn, and baritone. Through my research, I found three fundamental ideas that are vital to the successful teaching and playing of multiple brass instruments: physicality/anatomy, characteristic sound/techniques, and understanding the overtone series as it pertains to each distinct instrument.

## **Literature Review**

### **Ideas on Woodwind Doubling:**

#### 1. Woodwind Doubling by Mary Allyn Purtle

This short article lists the similarities and differences between common woodwind doubles: flute, clarinet, saxophones, oboe, and bassoon. Topics of mention are differences in tonguing, vibrato, and embouchure. The similarities between woodwind instruments allow adaptation to the differences to occur with relative ease. Purtle suggests several books for each instrument that will lead to an understanding of characteristic sound and lays out side by side technique differences.

#### 2. Woodwind Doubling on Folk, Ethnic, and Period Instruments in Film and Theatre Music: Case Studies and Practical Manual by Bret Pimental

In Bret Pimental's work writing about doubling on folk, ethnic, and period instruments for theatre and film, he precisely charts out similarities and differences in instrumental technique and fingerings for several types of flutes. Transverse, endblown, and duct flutes are mentioned here, represented across several cultures in several styles of playing. This methodology aligns well with my own, in that understanding how one flute functions in relation to another will ultimately enable the player to perform on both with greater ease and authenticity.

### **The Physical Nature of Playing a Brass Instrument:**

#### 1. Breathing Gym

The breathing gym is a collection of breathing exercises designed to promote increased volume of breath and greater control of breathing. Air control is one of the

most crucial elements in common with all brass instruments. Exercises like those spelled out in *The Breathing Gym* are effective teaching tools. These exercises are important for all brass players in order to play long phrases or at louder dynamics. Learning how to amass a large volume of air to support the sound promotes nuanced control of the sound. By always having sufficient air supply players change dynamic or change registers with ease. “Flow studies” in the book are of note because they support the ideas that to play a brass instrument, the flow of air must be constant, like a water faucet.

## 2. How to Play Trumpet the James Morrison Way (DVD)

In this video masterclass, James Morrison discusses the physics of playing in the highest registers of the trumpet. In order to play high, there is a balance between embouchure and compressed air. Air speed is at the heart of his ideas. Faster air means faster vibration of the lips which results in a higher note, while slower air means slower vibration and a lower note. For Morrison, air speed is independent of volume of air. Whereas airspeed controls pitch, the volume of air used controls musical dynamic. A greater volume of air at a fast airspeed is a louder, higher note. A lesser volume of air at a fast airspeed is a softer high note. This concept applies to the amounts of air and speeds necessary to produce sound on each brass instrument. There must be a balance for each instrument between speed and volume, and this relies on the common term “air column.” It would be nearly impossible to push the volume of air necessary to play the tuba, through a trumpet. The tubing is far too small by comparison. This means conceptually that at any dynamic level the player

must use a volume of air that matches that of the tubing size of the instrument being played. A tuba has large tubing, so for the biggest, most resonant sound, the entire tube of the instrument must be filled with air, no matter the dynamic. A trumpet has much smaller tubing, so the volume of air must fill the smaller tubing. More air than can fill the tubing will cause problems with tone and control.

### 3. An Introduction to Donald S. Reinhardt's Pivot System by David Wilkens

One of the biggest differences physically between playing different instruments is mouthpiece placement. This article discusses the different placements that can exist within just one instrument, in this case the trombone. Pedagogically, there is an average placement that will encourage proper embouchure and characteristic tone. The anatomy of a student's lips will largely determine mouthpiece placement with respects to the average ratio of top to bottom lip recommended for each instrument.

## **Trumpet Methods:**

### 1. Rubank Elementary Method for Trumpet or Cornet

The Rubank Elementary Method for Trumpet or Cornet is edited by A.F. Robinson for "individual or like-instrument instruction." It is important to note that like-instrument refers to the trumpet family of instruments, generally including trumpet, cornet, flugelhorn, and piccolo trumpet. These instruments all use the same fingering system, and require the same type of embouchure. These instruments within the trumpet family are the generally accepted "natural doubles" for a trumpet player because it is expected of a professional to play each member of the trumpet family.



This method is more focused on literacy and skill building than it is on trumpet-specific technique. The music written for this method is supplementary to the presence of a trumpet teacher who can fill in the gaps related to technique. More modern approaches to beginning the trumpet like “Standard of Excellence” tend to lay out, with images, mouthpiece placement and embouchure instructions (Appendix A). However, from a pedagogical standpoint, the materials in this book are laid out in a logically progressing fashion, by which a student can slowly build literacy and range specific to the trumpet. In addition, the fingering chart included (Appendix B) is laid out so that there is a greater understanding of how the trumpet functions both physically and musically. This is essential to playing trumpet as a brass doubler.

## 2. Musical Calisthenics for Brass by Carmine Caruso

Though Caruso’s Musical Calisthenics for Brass is not specifically written for trumpet, because the exercises within are reflecting of a trumpet’s range and overtone series, it is most commonly used by trumpet players. However, Caruso’s ideas on the physicality of brass playing are heavily present in the playing of every brass instrument. The biggest conceptual take away from this source is the “Four Rules.”

They are:

1. Tap your foot
2. Keep the mouthpiece in contact with the lips
3. Keep the blow steady
4. Breathe through the nose

Tapping your foot is to align the physical process of beginning the vibration of the lips with musical rhythm. The more everything is aligned, the faster muscle memory can develop. Creating unique muscle memory for each brass instrument is extremely important in successful performance. Keeping the mouthpiece in contact with the lips strengthens the embouchure through the same process that a weight lifter would strengthen biceps. By repeatedly holding the embouchure for an extended time, the body builds the fine muscles that it takes to produce the sound. Whether it be a trumpet, French horn, trombone/baritone, or tuba embouchure, small muscles are involved in holding a unique lip shape for each instrument within each respective mouthpiece. Building these muscles specifically for each instrument is key to helping the body “remember” what it feels like to play that instrument. Keeping the blow steady refers to playing with a continuous stream of air, often likened to a water faucet left on. Each brass instrument requires a stream of air like this that is well supported with the muscles of the diaphragm. Developing the ability to control airflow will lead to the ability to differentiate the speed and volume of air, which is a distinguishing factor between instrumental techniques of different brass instruments. The final rule is breathing through the nose, which is a topic of debate in the brass playing community. A lesser volume of air can be taken through the nose, and some of this air remains trapped in the sinuses. Without proper air intake, the lips cannot vibrate to their fullest potential, resulting in poor tone and control of sound. Caruso intends for inhalation through the nose to be used as a tool, however, and not a tool to be used in actual performance. To enhance the muscle strengthening and muscle memory building of the first two rules, Caruso’s exercises require nasal breathing so

that the embouchure can stay intact and firm. Caruso's ideas are particularly representative of the similarities between all brass instruments.

### 3. Arban's Complete Conservatory Method for Trumpet

The importance of the Arban book in trumpet pedagogy cannot be understated. Within is written, through words and music, all there is to know about the characteristics of trumpet playing in sound and technique. Arban begins with embouchure and mouthpiece placement, and addressing tonguing, slurs, embellishments, style, as well as extensive writing and diagrams on fingerings possible on the trumpet. Learning the characteristics and function of an instrument are essential to playing and teaching it well. The intonation tendencies of the trumpet are also laid out clearly with suggestions on how to use slides to adjust. With such a focus on trumpet specific technique and tendencies of trumpet players, it becomes apparent that an important emerging theme in brass doubling is understanding these techniques and tendencies for each instrument being undertaken.

## **French Horn Methods**

Through the study of trumpet methods, several themes have emerged and the remaining methods will be analyzed for these themes, indicated below.

### 1. Rubank Elementary Method for French horn

- a. Physicality/Anatomy: The Rubank method for French horn is also intended to be used for mellophone or Eb alto horn. These are instruments with a similar range and mouthpiece but some characteristics of their sound are dissimilar to

that of a French horn. However, due to the range and shape of the embouchure in conjunction with the V shaped mouthpiece of these instruments, the physical natures of playing the French horn, mellophone, or Alto horn are quite similar. The Rubank method provides insight into how to produce a sound through physically buzzing and presents the idea that the lips should be able to buzz independently of a mouthpiece, called “free buzzing.” After this, the instrument is introduced. From a pedagogical standpoint, the scaffolding of this method is clear and not without benefit. Nevertheless, the physical sensation and lip placement of free buzzing is very different from the sensation of buzzing with the mouthpiece. For one, the embouchure setting without a mouthpiece will usually be quite different for a student with no point of reference to the look and feeling of a French horn embouchure. In contrast, buzzing with a mouthpiece gives a direct line of understanding into what it feels like to play the French horn, without the instrument itself. A teacher can assess whether or not the French horn embouchure is properly formed and operating with optimal physical ease in order to promote the most resonant buzz possible.

- b. Characteristic sound/techniques: Though the exercises in the book are reflective of the characteristic playing style and compositional elements for a French horn, the book does little as far as instructional cues into how to sound like a French horn player. However, I believe that due to the specific mention of a “teacher” throughout the book, these elements of instruction are intended to be left to a professional who understands these characteristic techniques.

- c. Overtone series: This method does give implied insight into the workings of the overtone series, though not as clearly as the Rubank trumpet or baritone methods, which both display a chart of the overtone series as it pertains to each instrument. The French horn iteration starts students playing on C, E and G, which are the 3<sup>rd</sup>, 4<sup>th</sup>, and 5<sup>th</sup> overtones in the series respectively. Because the French horn's average range is positioned higher on the overtone series than any other brass instrument, there is much more room for error when it comes to playing on the correct overtone or "partial." The first exercises in the book are based on developing these three partials in order to get the player to feel the small distance between partials from the start. Future issues are alluded to in the fingering chart when the editor states that there are alternate fingerings for each note and the ones chosen have been selected for ease of intonation. The fingerings chosen are also the most centered. Students will be less likely to slip up or down to a lower note.
2. Sixty Selected Studies for Horn by Georg Kopprasch
    - a. Physicality/Anatomy: The Kopprasch is an etude book for the advanced player that truly addresses some of the physical issues that arise with playing the horn across its full range. The French horn embouchure must be such that it can support low ranges reaching into the bass clef, as well as high ranges that rival that of a trumpet. These etudes include large intervallic leaps and passages that include both low and high ranges in order to teach the player the most effective embouchure setting to bridge the distance. A common problem

with horn students is developing a “break” between middle and low registers, much like the break on a clarinet. At this breaking point, students feel they must adjust their embouchure to cross registers. This causes two separate lip settings to develop instead of one fluid physical technique that can balance both high and low. Brass doublers must know this particularly tricky part about learning the French horn.

- b. Characteristic Sound/Techniques: Much like the unique nature of the physical technique involved in playing the French horn, the instrument itself has characteristics and stylistic techniques that are notably different from its other brass family members. The etudes within are very characteristic of French horn playing style; the compositional writing includes trills, turns, and arpeggiated passages. The most important inclusion related to horn specific technique is that of transposition. Though all brass players will need to transpose, French horn players must practice their transposition as they will most often need to transpose in most major orchestral works and in solo repertoire. The etudes are annotated with suggested transpositions “in E, Eb, and Db” or “in D, C, and Bb low.” It is also the common practice of seasoned horn teachers to ask students to play etudes of this kind down one octave, to exercise the low and middle range.
- c. Overtone series: In cases where the vast range of the horn is exploited, as is the case with the Kopprasch, it is particularly important to understand on which portion of the overtone series the etude is written. When in the low range, the horn player is playing close to the fundamental and 1<sup>st</sup> overtones, so

the distance between partials feels wider. This requires compensation on the part of the embouchure, airstream, and even tongue. When in the high register, overtones are far closer, so care must be taken with choice of fingering, attack, and airstream to ensure good intonation and hitting the correct partial.

### 3. The Art of French Horn Playing by Philip Farkas

- a. Physicality: The Art of French horn playing could've been sent with the Golden Record on *Voyager I* into deep space, and another society of intelligent beings could construct and learn to play the French horn with no other materials. I jest, but Farkas writes extensively and usefully on the physical elements of playing the horn, from maintenance to embouchure to air and tonguing. The pedagogy surrounding horn playing in this paper will largely include references to this book.
- b. Characteristic sound/techniques: This is one of the few books that addresses characteristic horn techniques like right hand position, mutes, and ensemble playing.
- c. Overtone series: Though there is a chapter on just about everything involved in horn playing, the overtone series is not charted out like in the Rubank methods. For the French horn, knowledge of the overtone series will mean better control of partials but also the ability to do the characteristic lip trill. Knowing which notes are within the overtone series of any fingering means knowing which notes above and below the note can be played with the same

fingering. This is briefly mentioned in the chapter “Lip Trills” but for a brass doubler, a deeper understanding is necessary.

## **Baritone Methods**

1. Rubank Elementary Method for Trombone or Baritone
  - a. Physicality/Anatomy: Like the trumpet and French horn editions of the Rubank method, there is little in the way of instruction as to how to physically produce a note. This is left up to the inclusion of a teacher in the player’s learning.
  - b. Characteristic sounds/technique: Because it is a book for both trombone and baritone, there is some instruction on technique lost that is again left to a qualified teacher. Trombone slide technique goes beyond moving the slide to the right position, and baritone technique is beyond choosing which fingering to play with.
  - c. Overtone series: This iteration of the Rubank method includes a very meaningful chart (see Appendix B, fig. B-5) on the overtone series as it pertains to slide positions and fingerings. This can be helpful for a doubler coming from trumpet, French horn, and tuba, as well as a trombone player learning baritone and vice versa. Each fundamental and its corresponding overtones are organized by fingering within the playable range of a baritone. This allows a student to discover all the notes available with each fingering depressed, as well as increase awareness of which “partial” each note falls within.



2. Arban's Famous Method for Slide and Valve Trombone and Baritone Bass Clef
  - a. Physicality/Anatomy: Editor Charles Randall, for this trombone/baritone edition, makes remarks about proper embouchure for this group of instruments. Mouthpiece placement is identical to that of the Arban book for trumpet, 2/3rd lower lip, 1/3rd upper. There are other schools of thought in brass pedagogy on baritone mouthpiece placement that including 1/2 upper lip with 1/2 lower lip or 2/3 upper lip with 1/3 lower lip. Included are images of embouchure formation as well as mention of jaw motion, something physically characteristic of the baritone because of the extended low range of the instrument.
  - b. Characteristic sound/technique: The entire book of etudes, because of its original intent to be used for trumpeters, has been revised to be better suited for low brass instruments. The studies originally written for trumpet are very well suited for other valved instruments and represent characteristic valve technique, as is necessary for developing baritone players.
  - c. Overtone series: The included chart of fingering positions as they relate to the overtone series is extremely useful. This same type of chart is within the Rubank Elementary method.
  
2. Melodious Etudes for Trombone by Johannes Rochut
  - a. Physicality/anatomy: This etude book for trombone is frequently recommended for baritone players. The etudes are particularly poignant in

the development of a baritone embouchure as they provide opportunity for development of a steady airstream, and a well-functioning embouchure in all ranges of the instrument. The etudes were originally written by Marco Bordogni, a tenor vocalist and teacher from the early 1800s. Exercising the higher registers in a melodic way builds facial muscle and stamina efficiently, in a way that is unique to the baritone. Because of the larger mouthpiece and tubing size of the instrument, there is far less resistance and back-pressure from the instrument itself. This means that the embouchure and air support must be strong enough to support a full tone in the higher register. A note for doublers: attempting to play in the upper register using an embouchure similar to that of a trumpet will result in a disjuncture between upper range and lower range, which will ultimately break the flow of the melody in a non-musical way.

- b. Characteristic sound/techniques: The “vocalise” style of these etudes is a result of them originally being exercises for the male voice. The smooth, singing nature of a characteristic baritone sound is one of the reasons why John Philip Sousa often wrote exciting countermelodies for the tenor voices in his ensemble. These studies encourage the ear to listen critically to ensure that each phrase is as melodic as possible. The addition of fast moving melodic lines, turns, and appoggiatura is representative of proper valve technique when playing in an embellished style. Rochut, as the editor, also mentions one intent of the exercises to be practice in “special breathing.” Because larger brass instruments require a greater volume of

air for any dynamic level, as explained in the James Morrison video, breathing on the baritone often occurs mid-phrase. Players of low brass instruments must learn to “sneak” breaths and find natural and unobtrusive places to breathe within melodic playing.

- c. Overtone series: Many of the fast passages and arpeggios within the etudes are reliant on slurring between overtones on the same fingering. These can be made easier, often times, with alternate fingerings that will result in a smoother sound. Knowing the overtone series will allow the performer to know all of the options available when it comes to choosing which fingerings will be most in tune and facilitate ease of playing.

## **Methodology**

After reviewing the literature above, I concluded that there was a need for an easy way to compare and contrast the techniques and methods already available for each instrument.

In order to produce an organized chart of concepts, I used the following methodology:

1. Reflect on my student teaching practice in both elementary and middle schools where I taught beginning band
2. Review three methods for each instrument- trumpet, French horn, and baritone, pulling out the most important aspects of each related to physicality, characteristic techniques, and the overtone series.
3. Research woodwind pedagogy related to doubling.
4. Describe from personal experience and research the biggest concepts and teaching points involved in playing multiple brass instruments.
5. Compare and contrast instrumental techniques to create a framework for doubling.

## **A Reflection on Teaching Brass Doubling**

With all of the techniques and information available for each instrument, comparing them in order to teaching doubling can seem a daunting task. There is indeed a method by which any brass player can learn to double! In order to begin learning a second brass instrument, the student must first have at least an elementary understanding of the physicality, characteristic techniques, and overtone series on one brass instrument. This is so the student has a point of reference. Once a student has been playing an instrument long enough to understand how that instrument works, play each note chromatically, and control their embouchure, they can then begin to use similarities and differences to learn a new brass instrument. Through comparison and contrast, a learner can go from the known to the unknown with far more ease than approaching a second instrument blindly.

My ideas on brass pedagogy are rooted in both my years as a brass performer, but also through my observation and field study in beginning band. My first student teaching placement was in a general music program that had an auxiliary beginning band. I ran brass sectionals before school several days a week and in-school private lessons for a student switching from trumpet to baritone. Through this work, I discovered how important it is to have a context for learning, regardless of ability level. Rather than have students memorize fingerings and learn lip slurs without a semblance of meaning, I took the time to explain the why and how behind each exercise or activity. My baritone student made faster progress once I realized he had a point a reference from previously playing the trumpet. At first, the student equated every aspect of technique to that of trumpet, without acknowledging the differences. This led to a thin tone and a dip in musical literacy. Once we started to discuss what was both the same *and* different

between the two instruments, his tone opened up and he was able to sight read baritone music without relating each note back to trumpet fingerings. The fingerings became physically assigned to the baritone notes on the staff and to the feeling of playing the baritone.

From this, we can take away two main points of interest. First, the student was able to double because he had prior experience. Second, the student made greater progress when knowing context; applying the similar and different techniques to his playing. Both of these points play into a third idea which is crucial to all brass playing. *Feel.* Brass playing is a very physical task. The tongue, lips, lungs, ribcage, abdominal muscles, and teeth all play a role. This means having awareness of how all of these physical areas feel when playing is essential. When learning to double, this is doubly important. Take the time to notice how the new mouthpiece feels, how the embouchure feels, and how it feels to breathe while holding the instrument.

During my second student teaching placement, I taught middle school beginning band. In their sixth grade year, students spend 6 weeks trying flute, clarinet, trumpet, and trombone. Within such a short time frame, it would be difficult to teach the sixth graders to read music while trying each of the four instruments. Instead, the focus was on producing sound with proper technique. For the trials on trumpet and trombone, the goal was to produce three different partials without puffing cheeks, making a “fish face,” or blasting without control. Many students noticed that trumpet and trombone were quite similar in how it felt to play, but the trombone required far more air. When teaching, breathing exercises came first, to learn how it feels to breathe like a wind player; next came buzzing on the mouthpiece to learn the embouchure. Then finally, holding the

instrument and learning to feel the three partials (overtones 1, 2, and 3). In narrowing the approach and taking time to notice how each physical element of brass playing felt, students were able to apply their scaffolded skills and accomplish the task.

## Conceptual Framework

There are three main themes that I discovered through literature review that run through all brass playing, regardless of instrument. They are physicality/anatomy, characteristic sound/technique, and the overtone series. For the purposes of creating a conceptual framework of teaching points and organized similarities and differences within these themes, the areas of pedagogy for each theme are as follows:

Physicality/Anatomy	Characteristic Sound/Technique	Overtone Series
<ul style="list-style-type: none"> <li>• Breathing technique</li> <li>• Embouchure formation</li> <li>• Mouthpiece placement</li> <li>• Tongue position</li> </ul>	<ul style="list-style-type: none"> <li>• Articulation</li> <li>• Tone production</li> <li>• Unique instrumental techniques</li> </ul>	<ul style="list-style-type: none"> <li>• Partial</li> <li>• Intonation tendencies</li> <li>• Understanding instrument fingering design</li> </ul>

For each theme the charts that follow will show practical information and side by side similarities and differences for trumpet, French horn, and baritone, with anecdotes on instrument specific teaching points. These are my own view on best practice and technique for these instruments, to be taken with a grain of salt. With each student comes an individual player with different anatomy, tendencies and abilities. There are many ways to play a brass instrument correctly and it is of high importance that the individual student be at the center of the learning, far more than any standard for “correct” technique.



Physicality/Anatomy

Concept	Trumpet	French Horn	Baritone
Breathing	<ul style="list-style-type: none"> <li>a. Breathe as deep and fully as possible</li> <li>b. Open and relaxed throat</li> <li>c. Engage the diaphragm</li> <li>d. As the player inhales stomach should move outward, upper torso expands from the sternum, and ribcage comes up and out.</li> <li>e. As the player exhales, the abdominal muscles contract and move inward, the intercostal muscle of the ribcage contract and move down and in</li> <li>f. The torso will work hard but the neck, throat, and jaw must stay relaxed</li> <li>g. Trumpet players will experience resistance from the instrument as a result of exhaling into a smaller instrument, mouthpiece, and through an embouchure set to buzz at a faster rate.</li> <li>h. The act of contracting the abdominal muscles voluntarily is often called “compression” by trumpet players. Greater compression=faster air speed</li> </ul>	<ul style="list-style-type: none"> <li>a. Breathe as deep and fully as possible</li> <li>b. Open and relaxed throat</li> <li>c. Engage the diaphragm</li> <li>d. As the player inhales stomach should move outward, upper torso expands from the sternum, and ribcage comes up and out.</li> <li>e. As the player exhales, the abdominal muscles contract and move inward, the intercostal muscle of the ribcage contract and move down and in</li> <li>f. The torso will work hard but the neck, throat, and jaw must stay relaxed</li> <li>g. French horn players experience resistance from the small bore of the lead pipe, as well as a small, V shaped mouthpiece.</li> <li>h. Greater compression=faster air speed</li> </ul>	<ul style="list-style-type: none"> <li>a. Breathe as deep and fully as possible</li> <li>b. Open and relaxed throat</li> <li>c. Engage the diaphragm</li> <li>d. As the player inhales stomach should move outward, upper torso expands from the sternum, and ribcage comes up and out.</li> <li>e. As the player exhales, the abdominal muscles contract and move inward, the intercostal muscle of the ribcage contract and move down and in</li> <li>f. The torso will work hard but the neck, throat, and jaw must stay relaxed</li> <li>g. The baritone has far less resistance than trumpet and French horn because of overall larger bore tubing and a wider, deeper mouthpiece. A greater volume of air is required to produce each note, so baritone players will require less compression from the abdomen, as their notes are produced with an overall slower air speed.</li> </ul>
Embouchure formation	<ul style="list-style-type: none"> <li>a. Corners of the mouth are always firm</li> <li>b. Form the embouchure by saying “ehm” and noticing how the lips fall together naturally. Tighten the corners of the mouth</li> </ul>	<ul style="list-style-type: none"> <li>a. Corners of the mouth are always firm</li> <li>b. Form the embouchure by saying “ehm” and noticing how the lips fall together naturally. Tighten the corners of the mouth</li> </ul>	<ul style="list-style-type: none"> <li>a. Corners of the mouth are always firm</li> <li>b. Form the embouchure by saying “ehm” and noticing how the lips fall together naturally. Tighten the corners of the mouth into a</li> </ul>

	<p>inward towards the teeth where the fall naturally.</p> <p>c. Avoid pulling the corners backward, like when smiling</p> <p>d. Keep the lips touching at all times; A buzz is produced by holding them together with firm corners as air passes between the lips</p> <p>e. As notes go higher, roll the lips in towards the teeth, keeping the corners the same. As notes go lower, keep the lips as they fall together naturally and use slower air speed to increase the mass of the lip that is vibrating.</p> <p>f. For a doubler, the setting of the corners for a trumpet player should feel different than other brass instruments, as the trumpet embouchure functions differently as a result.</p>	<p>into a slight pucker, as if saying “ooo.”</p> <p>c. Avoid pulling the corners backward, like when smiling. Avoid pushing the lips outward like a fish to produce low notes</p> <p>d. Keep the lips touching at all times</p> <p>e. As notes go higher, roll the lips in towards the teeth. As notes go lower, use the slight pucker to increase the mass of the lip that is vibrating by engaging the bottom lip</p> <p>f. A greater amount of lip in the mouthpiece will create a fuller sound in the lower register by mimicking a low brass instrument that has the advantage of a larger mouthpiece diameter</p>	<p>slight pucker, as if saying “ooo.”</p> <p>c. Avoid pulling the corners backward, like when smiling. Avoid pushing the lips outward like a fish to produce low notes</p> <p>d. Keep the lips touching at all times</p> <p>e. As notes go higher, roll the lips in towards the teeth. As notes go lower, use the slight pucker to increase the mass of the lip that is vibrating within the mouthpiece</p> <p>f. In the lower register, engage both lips fully. Use the large diameter and cup depth to vibrate the maximum amount of the embouchure possible.</p>
Mouthpiece Placement	<p>a. Center the mouthpiece on lips horizontally. For some students, anatomy such as the angle of the front teeth, an off-center placement may be more effective. Whatever placement will create evenness of muscle control and lip within the mouthpiece</p> <p>b. Generally, for a trumpet player, the mouthpiece is placed where 1/2 of the cup is top lip and 1/2 is bottom lip</p>	<p>a. Center mouthpiece on the lips horizontally.</p> <p>b. Generally, for a French horn player, the mouthpiece is placed where 2/3rds of the cup is top lip and 1/3rd is lower lip.</p> <p>c. For those with a larger upper lip than lower lip, placing the mouthpiece slightly lower may be more effective. For those with a slightly larger lower lip than upper lip, place the mouthpiece higher may be more effective.</p>	<p>a. Center the mouthpiece on the lips horizontally.</p> <p>b. Because the mouthpiece is much larger than a trumpet or French horn mouthpiece, the placement of the mouthpiece vertically is more widely varied. Depending on teeth and lip structure, a baritone player may find one of three positions most effective:</p> <p>i) 1/2 top lip, 1/2 bottom lip</p> <p>ii) 2/3 top lip, 1/3 bottom lip</p>

	<p>c. For those with a larger upper lip than lower lip, placing the mouthpiece lower may be more effective. For those with a larger lower lip than upper lip, placing the mouthpiece higher may be more effective</p> <p>d. For a doubler, the trumpet embouchure should feel unique from other brass instruments because of placement and the smaller mass of the lip vibrating within the mouthpiece.</p>	<p>d. For a doubler, embracing the difference in placement will help muscle memory develop for a French horn-specific embouchure.</p>	<p>iii) 1/ top lip, 2/3 bottom lip</p> <p>c. I recommend starting with 1/2 top lip, 1/2 bottom lip, adjusting for anatomical differences.</p> <p>d. It is important to note that the baritone embouchure setting and placement should feel different from that of other brass instruments in the case of doubling.</p>
Tongue/jaw position	<p>1. The jaw should only be moved when absolutely necessary (most often only moved slightly forward for the lowest notes on the instrument). Otherwise, the jaw should rest in a relaxed position with the teeth approximately 1/3rd of an inch apart.</p> <p>2. The tongue should rise and fall with the range of the instrument in the position of “aah” for low register and “eee” for high register.</p>	<p>a. The jaw should only move for the facilitation of the extreme low register. The jaw can drop slightly and be pushed forward to engage the bottom lip. Otherwise, the jaw should rest in a relaxed position with the teeth approximately 1/3rd of an inch apart.</p> <p>b. The tongue should rise and fall with the range of the instrument in the position of “oh” for low register and “eee” for high register.</p>	<p>a. For the mid and high registers, the jaw should rest comfortably approximately 1/2 inch apart. The jaw should open and move only slightly forward as notes get lower. For the lowest notes on the instrument, the jaw will drop considerably to allow a greater volume of air to pass through the lips. Avoid excessive jaw movement, however, as it will cause an unstable embouchure. Dropping the jaw or pushing the jaw too far in either direction will separate the lips.</p> <p>b. The tongue should rise and fall with the range of the instrument in the position of “uuh” for low register and “eee” for high register.</p>

Characteristic Sound/Technique:

Concept	Trumpet	French Horn	Baritone
Articulation	<p>a. Always play with air behind the tongue. The tongue interrupts the airstream to define each note and it is ultimately the movement of the tongue that “releases” the airstream, like a water faucet being turned on.</p> <p>b. On a scale from 1 to 10, 1 being very light and 10 being very strong, the articulation strength for a “normal” note on trumpet would fall around a 5. This means the force of the tongue and the air behind the tongue will fall right in the middle of light and strong. A lighter or legato articulation can fall anywhere from 1-4 or an accented articulation 6-10, depending on musical context.</p> <p>c. The syllable for articulation types for low, mid, and high range respectively are as follows for single and double tonguing:</p> <ol style="list-style-type: none"> <li>i. “Normal”- toh/ta/tee, toh-koh/ta-ka/tee-kee</li> <li>ii. Legato- doh/da/dee, doh-goh/da-ga/dih-gih</li> <li>iii. Accented- Toh/Ta/Tee, Toh-Koh-Ta-Ka/Tee-Kee (capitol T</li> </ol>	<p>a. Always play with air behind the tongue.</p> <p>b. A “normal” French horn articulation will be about a 4 in strength. Too strong an attack and the note will sound pointed and be susceptible to fluctuation in pitch. A gentler attack will yield more characteristic results. A lighter or legato articulation can fall from 1-3, or an accented articulation 5-10. The strongest articulations are to be reserved for extreme circumstances as they are not characteristic or typical horn playing and do not speak the same way that they would on a trumpet.</p> <p>c. The syllable for articulation types for low, mid, and high range respectively are as follows:</p> <ol style="list-style-type: none"> <li>i. “Normal”- toh/too/tee</li> <li>ii. Legato- doh/doo/dee</li> <li>iii. Accented- Toh/Too/Tee</li> </ol> <p>Here, the “ooo” sound encourages correct embouchure by furthering the slight pucker through articulation.</p> <p>d. Keep a steady airstream with forward motion for slurs</p>	<p>a. Always play with air behind the tongue.</p> <p>b. A “normal” baritone articulation will be a 5 in strength. A lighter or legato articulation can fall anywhere from 1-4 or an accented articulation 6-10, depending on musical context.</p> <p>c. The syllable for articulation types for low, mid, and high range respectively are as follows:</p> <ol style="list-style-type: none"> <li>i. “Normal”- toh/ta/tee, toh-koh/ta-ka/tee-kee</li> <li>ii. Legato- doh/da/dee. doh-goh/da-ga/dih-gih</li> <li>iii. Accented- Toh/Ta/Tee, Toh-Koh-Ta-Ka/Tee-Kee A tuh(-kuh), duh(-guh), or Tuh(-Kuh) articulation is helpful in the extreme low range.</li> </ol> <p>d. Keep a steady airstream with forward motion for slurs</p>

	<p>indicates a stronger attack)</p> <p>d. Keep a steady airstream with forward motion for slurs</p>		
Tone Production	<p>a. The speed of the air passing through the lips when playing will determine the frequency (the note) at which the lips vibrate.</p> <p>b. The volume of air passing through the lips when buzzing a given note will determine the dynamic of that note.</p> <p>c. The tone quality (dark vs. bright) of a note is determined by the position of the tongue and the mass of the lips that is vibrating. High tongue/less mass means a brighter sound, whereas low tongue/more mass means a darker sound.</p> <p>d. A characteristic sound is developed through practice and a mental sound concept that comes from listening to players of the instrument.</p>	<p>a. The speed of the air passing through the lips when playing will determine the frequency (the note) at which the lips vibrate.</p> <p>b. The volume of air passing through the lips when buzzing a given note will determine the dynamic of that note.</p> <p>c. The tone quality (dark vs. bright) of a note is determined by the position of the tongue and the mass of the lips that is vibrating. High tongue/less mass means a brighter sound, whereas low tongue/more mass means a darker sound.</p> <p>d. A characteristic sound is developed through practice and a mental sound concept that comes from listening to players of the instrument.</p>	<p>a. The speed of the air passing through the lips when playing will determine the frequency (the note) at which the lips vibrate.</p> <p>b. The volume of air passing through the lips when buzzing a given note will determine the dynamic of that note.</p> <p>c. The tone quality (dark vs. bright) of a note is determined by the position of the tongue and the mass of the lips that is vibrating. High tongue/less mass means a brighter sound, whereas low tongue/more mass means a darker sound.</p> <p>A characteristic sound is developed through practice and a mental sound concept that comes from listening to players of the instrument.</p>
Unique Instrumental Techniques	<p>a. Like all brass instruments, the fingerings 1-3 and 1-2-3 are very sharp. For trumpet players, this means that low D, low C#, low G, and low F# must be adjusted with</p>	<p>a. The French horn has many alternate fingerings because of its placement on the overtone series and the possibility of having both Bb and F valve slides. Every</p>	<p>a. Like the trumpet, the fingerings 1-3 and 1-2-3 are sharp. Baritone players compensate in two ways. First, the first valve slide is often pulled out about an inch to adjust</p>

	<p>valve slides to play centered and in tune with maximum resonance. This is characteristically done with the first valve slide, the third valve slide, or a combination of both. Players will “kick out” the slide quickly as they press the fingering down to adjust the intonation. It is best to sit with a tuner to learn how far out the slides must go for each of the four notes.</p> <p>b. Trumpet players see the widest range of mutes written for of any brass player. Straight, cup, Harmon, plunger, solotone, and bucket mutes are the most commonly seen. All of these mutes can be made of various materials, but when a mute is placed into the bell of the instrument, it generally makes the entire instrument sharp. Players compensate by adjusting the main tuning slide while the mute is in, making sure to re-adjust once the mute is removed.</p>	<p>French horn is different so it is best to choose the recommended fingerings first until experience enough is gained to notice which fingerings play the most in tune, especially in the high register. Players who use a double horn will often choose whether or not to play a note using the Bb side or not, depending on musical context. The Bb horn sounds brighter and not as broad, but can facilitate a smoother transition from low register to high register if all notes are played on the Bb side. The F horn is richer in the mid and low registers but not easily played in the high register because of the closeness of overtones. As a general rule, the Bb fingerings are used from second line written G# and above, and the F fingerings second line written G and below.</p> <p>b. The right hand in the bell of the French horn is not only part of its characteristic indirect sound, but also a powerful tool for intonation. The hand should be placed approximately halfway into the bell, and cupped slightly. Closing the hand will lower the pitch and vice versa. Instead of lipping pitches up and down, it is usually more effective and controlled to use the</p>	<p>those notes when playing them. Most modern instruments are set up to facilitate this with ease. Second, baritones can have 4 valves. The fourth valve when depressed by itself will lower the pitch 2 1/2 steps, the same as 1-3. This valve is lower in pitch than 1-3, however and should play in tune. 2-4 is an in tune substitute for 1-2-3.</p> <p>b. In some circumstances, the baritone player will read treble clef. This is often because they switched from trumpet and reading the same clef is meant to make the new instrument easier. However, for the purposes of brass doubling, it is necessary for the baritone player to read in bass clef. This will train the embouchure and fingers to react in a unique way to the written notes that will give the player some mental compartmentalization apart from their trumpet or French horn playing. Furthermore, because the baritone is a low brass instrument, it makes more musical sense to read in the bass clef. Doubling on baritone and tuba or baritone and trombone is also made easier through reading bass clef.</p>
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		<p>right hand.</p> <p>c. The right hand can be closed completely, creating a “stopped effect.” There are mutes that accomplish the same sound, but for quick changes and short stopped passages, most players will simply close off the throat of the bell with the hand. The hand or a mute creating the stopped effect raises the pitch of the played note by one half step. The player must compensate by then fingering the note one half step lower (e.g., an E must be fingered as Eb to sound as an E).</p> <p>d. French horn players are very often required to transpose their music, as the French horn of past history had different lengths of tubing, called crooks, to change the fundamental pitch of the instrument. It is important for students to practice transposing on sight; the easiest way is transposing short etudes into various keys.</p>	
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Overtone Series:

Concept	Trumpet	French Horn	Baritone
Partials	<p>a. Partials on a brass instrument are based on the overtone series for that instrument (see Appendix B, figure B-1). Lip slurs are an exercise that promotes flexibility between notes of the same fingering. In reality, these are overtones of the same fundamental pitch. It is necessary for students to understand which partial they are playing on in order to self-correct and critique their own playing. If a student on trumpet were trying to play a third space C in treble clef and played a fourth space E instead, the student should recognize that they were playing too high but also that they were simply one <i>partial</i> too high.</p>	<p>a. The French horn has most notes for each fingering within its playable range because the instrument sits within the overtone series differently than other brass instruments. A written C below treble clef is the 3rd overtone beyond the fundamental, whereas on a trumpet, the same written C is the 2nd overtone (see Appendix B, figure B-3). For the player, this means an awareness of which partials exist of each fingering is even more important. Because the partials are closer in interval, it is much easier to over- or undershoot a note.</p>	<p>a. In relation to the fundamental, the partials on a baritone are in line with that of a trumpet (See Appendix B, figure B-5). However, the partials will feel farther apart and require a greater adjustment of the lips, tongue, and airstream because of the lower range of the instrument. An understanding of these partials will help the player hear and feel the different overtones, especially in the higher register where the partials are closer in interval.</p>
Intonation Tendencies	<p>a. The fourth overtone will always be flat, regardless of fingering. This is because this overtone is a naturally occurring major third from the third overtone.</p> <p>b. The fifth overtone will be sharp, as this is a naturally occurring perfect fifth in relation to the third overtone.</p> <p>c. The sixth overtone is extremely flat and is typically only used as an alternate fingering in a lip trill. It is beneficial to</p>	<p>a. The <i>fifth</i> overtone will always be flat, regardless of fingering. This is because this overtone is a naturally occurring major third from the <i>fourth</i> overtone.</p> <p>b. The <i>sixth</i> overtone will be sharp, as this is a naturally occurring perfect fifth in relation to the <i>fourth</i> overtone.</p> <p>c. The <i>seventh</i> overtone is extremely flat and is typically only used as an alternate fingering in a lip trill. It is beneficial to</p>	<p>a. The fourth overtone will always be flat, regardless of fingering. This is because this overtone is a naturally occurring major third from the third overtone.</p> <p>b. The fifth overtone will be sharp, as this is a naturally occurring perfect fifth in relation to the third overtone.</p> <p>c. The sixth overtone is extremely flat and is typically only used as an alternate fingering in a lip trill. It is beneficial to practice lip</p>



	practice lip slurs including this overtone though, as it will encourage greater control between partials.	practice lip slurs including this overtone though, as it will encourage greater control between partials. d. All brass players, but especially French horn players should practice lip slurs between all partials, even those beyond the seventh overtone to help gain fine motor control between small intervals on the same fingering. Players using a double horn should practice lip slurs on both F and Bb sides.	slurs including this overtone though, as it will encourage greater control between partials.
Understanding Instrument Fingering Design	<p>a. By understanding how the valves work, students can make sense of fingerings and their logic, instead of only memorizing the note and its fingering.</p> <p>b. By depressing a valve, the player is extending the total length of tubing that the air passes through. As a result, the fundamental of the overtone series the instrument is resonating with is also lowered.</p> <p>c. The length of the tubing connected to a valve determines the interval that depressing the valve will lower any given note fingered open (0).</p> <p>d. The second valve lowers each note one half step. The first valve lowers each note one whole step. The third valve lowers</p>	<p>a. The second valve lowers each note one half step. The first valve lowers each note one whole step. The third valve lowers each note 1 1/2 steps.</p> <p>b. Because the third valve by itself is usually flat and stuffy sounding, players should use 1-2 in order to lower any given open note by 1 1/2 steps.</p> <p>c. There are five main fingerings used on the French horn. These five fingerings lower the open fingered note by one half step further as they progress. They are: 0, 2, 1, 1-2, 2-3.</p> <p>d. The remaining two fingerings that are used on other brass instruments (1-3 and 1-2-3), aren't usually used on the French horn because of its placement on the overtone</p>	<p>a. The second valve lowers each note one half step. The first valve lowers each note one whole step. The third valve lowers each note 1 1/2 steps.</p> <p>b. Because the third valve by itself is usually flat and stuffy sounding, players <i>usually</i> use 1-2 in order to lower any given open note by 1 1/2 steps. However, for certain instruments, using the third valve alone for notes normally fingered 1-2 is more in tune.</p> <p>c. There are seven main fingerings used on the baritone. These seven fingerings lower the open fingered note by one half step further as they progress. They are: 0, 2, 1, 1-2, 2-3, 1-3, and 1-2-3.</p> <p>d. With all brass instruments but most</p>

	<p>each note 1 1/2 steps.</p> <p>e. Because the third valve by itself is usually flat and stuffy sounding, players should use 1-2 in order to lower any given open note by 1 1/2 steps.</p> <p>f. There are seven main fingerings used on the trumpet. These seven fingerings lower the open fingered note by one half step further as they progress. They are: 0, 2, 1, 1-2, 2-3, 1-3, and 1-2-3.</p>	<p>series. In the playable range of the instrument, the French horn has smaller intervals between partials, so the 2 1/2 step and 3 steps that 1-3 and 1-2-3 lower the open tone (0) respectively, are not needed. The exception is in the extreme low register on the F side or on a single horn where these fingering are necessary to bridge the intervallic gap between the first and second overtones.</p>	<p>noticeably low brass, more air is needed to produce a full tone as the instrument is made longer (i.e., the more fingers down). 1-2-3 will require significantly more air, as the instrument is made 3 steps longer with a 3 step lower fundamental.</p>
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## How to Use the Conceptual Framework

The framework is organized by technical concept, with each of the three instrument's specific techniques and important teaching points explained side by side. By looking left to right, the comparison can be apparent. Each of these concept groupings can be used for both lesson planning and assessment. Brass playing is a complex matter that has many facets and variables at play. As is the case with any lesson plan, it is best to have a central objective that is to be accomplished, so as to remove potential variables that may create roadblocks to the student's success. Each concept can be taught for an entire lesson in varied and scaffolded ways. The chosen materials for the lesson would then focus on that specific concept and avoid tapping into other irrelevant concept areas (e.g., a lesson on articulation will not discuss fingering design but may touch on tongue position). I suggest the following method when teaching each concept:

1. Pick one or more concepts that complement each other per lesson, time allowing
2. Notice how the concept plays out on the primary instrument
3. Doubling students can either use the same technique for that concept which they developed on their primary instrument, or they must engage with the secondary instrument's technique.
4. If the concept is different between the primary and secondary instruments, take time to discuss how the technique sounds and feels on the secondary instrument. It is of utmost importance to make use of the body's ability to create muscle memory in order to keep the techniques separate.
5. If the concept is the same between the primary and secondary instruments note that both instruments will feel different to play, regardless of whether the concept is formally the same between the two.

While this is a relatively basic outline, it has shown to be effective in my experience. The more thought and practice time is put into realizing the same and different, the more characteristic the student's performance on each instrument becomes. A trumpet player sounds one way playing lip slurs, and a French horn player sounds another way. When the student picks up the trumpet they must become a trumpet player: feel, play, and sound the way a trumpeter would! The same goes for any other instrument.

My last piece of advice on developing a critical ear for what is and isn't characteristic is to listen! Listen to brass music written and played by the instrument in question. Listen to different players of different ability levels and take notes, even if mental, on what sounds are pleasing and what sounds are uncharacteristic. Try to replicate what was heard. How did it feel to replicate the good? How did it feel to replicate the bad?

## Conclusions

As a relatively unexplored topic, brass doubling faces many obstacles from both a performance and a pedagogical perspective. Beside the naysayers who don't believe one person can effectively perform on several brass instruments in one sitting, there are other areas in which problems arise. One of these is the issue of practice. Time must be devoted to each instrument individually, but also side by side. I always recommend organized practice, as famed horn pedagogue Philip Farkas details in *The Art of French Horn Playing*. Here is how he organizes an ideal practice session:

Typical practice chart

	SUN.	MON.	TUE.	WED.	THU.	FRI.	SAT.
WARM-UP	20 min.	20 min.					
MISCELLANEOUS:							
pp attacks	5 "	5 "					
lip trills	5 "						
scales	15 "	15 "					
stopped notes	5 "						
transposition	5 "						
KOPPRASCH No. 15	15 "	20 "					
GALLAY, opus 27 No. 23	20 "	10 "					
MAXIME-ALPHONSE <sup>Bk. 4</sup> No. 17	25 "	30 "					
ORCHESTRAL EXCERPTS	20 "	20 "					
MOZART, Concerto No. 3	30 "	10 "					
SCHUBERT, Octet	10 "	20 "					
TOTAL	2 hr. 55 min.	2 hr. 30 min.					


This is an extremely effective routine for a French horn player. A warmup can cover lip slurs and long tones to build a strong French horn embouchure. The miscellaneous category covers concepts I labelled within the theme "characteristic sound/techniques." The etudes and solos below will give the player a chance to apply their listening and analysis of what is and is not characteristic of a French horn playing.

Another system for daily practice for all brass instruments comes from *The Talking French Horn* by Wayne M. Reger.

**THIS BOOK APPLIES TO THE ENTIRE  
BRASS FAMILY**

USE THE IDEAS PRESENTED HERE *in*

## Everyday CHECKING



**10 & 20 MINUTE  
DAILY ROUTINES**

10 MINUTES	20 MINUTES
ETUDES 1-2-3-4-5-6-7-8-9-10-11-14 (a)	ETUDES 2-3-4-5-6-7-8-9-10-11-12-13-14-16-18-20(e)

**•USE ALTERNATE ETUDES for VARIETY•**

**DAILY DOZEN....**

- WARM UP AT LEAST 20 MINUTES
- PLAY ALL 12 EVERYDAY, EVEN IF FOR ONLY 60 SECONDS EACH

1. WARM UP
2. MAJOR SCALES
3. MINOR SCALES
4. CHROMATIC SCALES
5. INTERVALS
6. TRIPLE TONGUE
7. DOUBLE TONGUE
8. ETUDES
9. SOLOS, DUETS, TRIOS
10. TRANSPOSITION
11. TRUMPETING
12. SIGHT READING

*Refer TO WILLIAMS METHODS FOR ADDITIONAL MATERIAL*

The most important idea with any practice routine is frequency and organization. There is enough practicing to go around on one brass instrument by itself, let alone two or three! Any brass player can master multiple instruments, but that brass player must have a drive to practice and the conceptual knowledge to succeed.

Penultimately, this paper is not enough of a resource to answer all questions or resolve all issues. There is a wealth of pedagogy available for each individual instrument that I have attempted to synthesize into comparisons and contrasts that can assist a learner or a teacher in knowing what it is to be a brass doubler. However, there are so many other brass instruments with uniquely awesome sounds that are yet to be explored. As comprehensive as I have tried to be, the tuba and the trombone have been left out in the rain. Conceptually, the framework can serve as a guide to the type of thinking that would be required to double on trumpet, French horn, baritone, tuba, or trombone, but there are pieces of the puzzle missing. There are also pedagogical pieces of the puzzle missing that can only be accessed through *doing*. Being a brass player is about more than air and lips.

It is more than big metal tubes and technique. There is a culture to each instrument that can only be learned by being with other players: attending master classes, taking lessons, becoming the culture. This culture can be found in Canadian Brass or Mnozil Brass videos on Youtube. It is found in band rooms, at brass conventions, and in online forums.

Ultimately, for teachers and students alike, despite everything else that has been said, brass doublers will have a hard time fitting in. They may ask, “at what point in playing the trumpet do I really become a *trumpet player*?” I urge each brass doubler to think back to the first brass instrument they played. For me, this was French horn. I became a French horn player the moment that I first started to play and identify with the act of creating music using the instrument. Then, I picked up trumpet. I became a trumpet player the moment I started playing trumpet! When any person begins to play music, they become a musician. To become a brass doubler, just play multiple brass instruments in earnest. When so often am I asked, “what is your *primary* instrument?”

I say: **Brass.**

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## Appendices

### Appendix A

Figure A-1, Trumpet Mouthpiece placement: 1/2 top lip, 1/2 bottom lip  
(Pearson, 1993, p. 3)



Figure A-2, French horn mouthpiece placement: 2/3 top lip, 1/3 bottom lip  
(Pearson, 1993, p. 3).



Figure A-3, Baritone mouthpiece placement: 1/2 top lip, 1/2 bottom lip  
(Pearson, 1993, p. 3)



Appendix B  
 Figure B-1, Trumpet fingering and overtone chart (Robinson, 1934, p. 2)

# FINGERING CHART

RUBANK ELEMENTARY METHOD FOR CORNET BY A. F. ROBINSON

The chart consists of four staves of music, each representing a different fingering combination. The notes and fingerings are as follows:

- Staff 1:** F# (1 2 3), Gb (1 3), G (1 3), G# (2 3), Ab (2 3), A (1 2), A# (1), Bb (1), B (2), Cb (2), C (0), B# (0).
- Staff 2:** C# (1 2 3), Db (1 3), D (1 3), D# (2 3), Eb (2 3), E (1 2), Fb (1), F (1), E# (2), F# (2), Gb (2), G (0), G# (2 3), Ab (2 3).
- Staff 3:** A (1 2), A# (1), Bb (2), B (2), Cb (2), C (0), B# (2), C# (1 2), Db (1), D (1), D# (2), Eb (2), E (2), Fb (0).
- Staff 4:** F (1), E# (2), F# (2), Gb (2), G (0), G# (2 3), Ab (2 3), A (1 2), A# (1), Bb (1), B (2), Cb (2), C (0).

# TABLE OF HARMONICS

The table shows seven finger combinations and the tones possible to obtain with each. The notes and fingerings are as follows:

- Combination 1:** open (C), G, C, E, G, Bb, Bb, C (B, F#, B, D#, F#, A, B).
- Combination 2:** Bb (1), F, Bb, D, F, Ab, Ab, Bb (A, E, A, C#, E, G, A).
- Combination 3:** Ab (2 3), Eb, Ab, C, Eb, Gb, Ab (G, D, G, B, D, F, G).
- Combination 4:** F# (1 2 3), C#, F#, A#, C#, E, F#.

This table shows the seven finger combinations of the cornet and the tones possible to obtain with each. Many of the tones played in this manner, however, are badly out of tune. The beginner must use only those fingerings listed in the "FINGERING CHART."

Figure B-2, French horn fingering chart (Pearson, 1993)

# FRENCH HORN FINGERING CHART

The numbers indicate which valves should be pressed down.  
 Use the top fingering if you play an F horn.  
 Use the fingering in parentheses if you play a B $\flat$  horn.

Use either fingering if you play a double horn.  
 Depress the thumb valve to switch from the  
 F side to the B $\flat$  side of your double horn.

E $\sharp$	F	F $\sharp$	G $\flat$	G	G $\sharp$	A $\flat$		
1 (0)		2 (1 2 3)		0 (1 3)		2 3 (2 3)		
A	A $\sharp$	B $\flat$	B	C $\flat$	B $\sharp$	C		
1 2 (1 2)		1 (1)		2 (2)		0 (0)		
C $\sharp$	D $\flat$	D	D $\sharp$	E $\flat$	E	F $\flat$	E $\sharp$	F
1 2 (2 3)		1 (1 2)		2 (1)		0 (2)		1 (0)
F $\sharp$	G $\flat$	G	G $\sharp$	A $\flat$	A	A $\sharp$	B $\flat$	
2 (1 2)		0 (1)		2 3 (2 3)		1 2 (1 2)		1 (1)
B	C $\flat$	B $\sharp$	C	C $\sharp$	D $\flat$	D	D $\sharp$	E $\flat$
2 (2)		0 (0)		2 (2 3)		0 (1 2)		2 (1)
E	F $\flat$	E $\sharp$	F	F $\sharp$	G $\flat$	G		
0 (2)		1 (0)		2 (2)		0 (0)		

Figure B-3, French horn overtone series chart  
 (Williams, King, & Logozzo, 2001, p. 32)

Partials:	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Horn in F <i>Open</i>			(♯)		(b)	(♯)										
Horn in B♭							(extremely flat)				(extremely flat)					
Horn in F 2			(♯)		(b)	(♯)										
Horn in B♭							(extremely flat)				(extremely flat)					
Horn in F 1			(♯)		(b)	(♯)										
Horn in B♭							(extremely flat)				(extremely flat)					
Horn in F 1-2			(♯)		(b)	(♯)										
Horn in B♭							(extremely flat)				(extremely flat)					
Horn in F 2-3			(♯)		(b)	(♯)										
Horn in B♭							(extremely flat)				(extremely flat)					
Horn in F 1-3			(♯)		(b)	(♯)										
Horn in B♭							(extremely flat)				(extremely flat)					
Horn in F 1-2-3			(♯)		(b)	(♯)										
Horn in B♭							(extremely flat)				(extremely flat)					

Figure B-4 , Baritone fingering chart (Pearson, 1993)

# BARITONE B.C. (EUPHONIUM) FINGERING CHART

The numbers indicate which valves should be pressed down.

0 = No valves pressed down.

E	F $\flat$	E $\sharp$	F	F $\sharp$	G $\flat$	G
1 2 3		1 3		2 3		1 2
G $\sharp$	A $\flat$	A	A $\sharp$	B $\flat$	B	C $\flat$
1		2		0		1 2 3
B $\sharp$	C	C $\sharp$	D $\flat$	D	D $\sharp$	E $\flat$
1 3		2 3		1 2		1
E	F $\flat$	E $\sharp$	F	F $\sharp$	G $\flat$	G
2		0		2 3		1 2
G $\sharp$	A $\flat$	A	A $\sharp$	B $\flat$	B	C $\flat$
1		2		0		1 2
B $\sharp$	C	C $\sharp$	D $\flat$	D	D $\sharp$	E $\flat$
1		2		0		1
C $\sharp$	D $\flat$	D	D $\sharp$	E $\flat$	E	F $\flat$
2		0		1		2
E $\sharp$	F					
0						

PW21BC

Figure B-5, Baritone overtone series (Long, 1934, p. 2)

(Fingering for baritone in parentheses)

		Fractions by which Air in Instrument Vibrates									
		Whole	Halves	Thirds	Fourths	Fifths	Sixths	Sevenths	Eighths	Ninths	Tenths
Pedal tones rarely used								See note below			
1st Position Slide all the way in (Open-no valves)	B $\flat$		B $\flat$ A $\sharp$	F	B $\flat$ A $\sharp$	D	F	A $\flat$ G $\sharp$	B $\flat$ A $\sharp$	C	D
2nd Position- Slide extended about 3 1/2 inches (2nd valve)	A	A	E	A	C $\sharp$ D $\flat$	E	G	A	B	C $\sharp$ D $\flat$	
3rd Position- Slide extended about 7 1/2 inches (1st valve)	A $\flat$	A $\flat$ G $\sharp$	E $\flat$ D $\sharp$	A $\flat$ G $\sharp$	C	E $\flat$ D $\sharp$	G $\flat$ F $\sharp$	A $\flat$ G $\sharp$			
4th Position- Slide extended about 11 1/8 inches (1st and 2nd, or 3rd)	G	G	D	G	B	D	F	G			
5th Position- Slide extended about 15 1/8 inches (2nd and 3rd)	G $\flat$	G $\flat$ F $\sharp$	D $\flat$ C $\sharp$	G $\flat$ F $\sharp$	E $\flat$ A $\sharp$	D $\flat$ C $\sharp$	E	G $\flat$ F $\sharp$			
6th Position- Slide extended about 19 1/4 inches (1st and 3rd)	F	F	C	F	A	C	E $\flat$ D $\sharp$	F			
7th Position- Slide extended about 23 1/2 inches (1st, 2nd and 3rd valves)	E	E	B	E	G $\sharp$ A $\flat$	B	D	E			

The higher tones or harmonics in these positions are possible, but they are little used.