

Teacher's Guide

Bravo

Selmer[®]

by Robert W. Getchell, Ph. D.

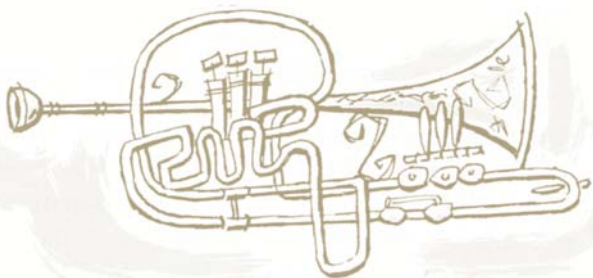
Foreword

This manual includes only the information most pertinent to the techniques of teaching and playing the instruments of the brass family. Its principal objective is to be of practical help to the instrumental teacher whose major instrument is not brass. In addition, the contents have purposely been arranged to make the manual serve as a basic text for brass technique courses at the college level.

The manual should also help the brass player to understand the technical possibilities and limitations of his instrument. But since it does not pretend to be an exhaustive study, it should be supplemented in this last purpose by additional explanation from the instructor or additional reading by the student.

General Characteristics of all Brass Instruments

Of the many wind instruments, those comprising the brass family are perhaps the most closely interrelated as regards principles of tone production, embouchure, and acoustical characteristics. A discussion of the characteristics common to all brass instruments should be helpful in clarifying certain points concerning the individual instruments of the brass family to be discussed later.



TONE PRODUCTION. The principle of tone production in brass instruments is the lip-reed principle, peculiar to instruments of the brass family, and characterized by the vibration of the lip or lips which sets the sound waves in motion. One might describe the lip or lips as the generator, the tubing of the instrument as the resonator, and the bell of the instrument as the amplifier.

EMBOUCHURE. It is imperative that prospective brass players be carefully selected, as perhaps the most important measure of success or failure in a brass player, musicianship notwithstanding, is the degree of flexibility and muscular texture in his lips. These two physical traits cannot be determined by observing the size or thickness of the lips, as is often believed, but only by testing the student on a brass instrument through the medium of sustaining various pitches, simple lip slurs, and similar devices.

There are two main considerations as concerns mouthpiece placement. The question of vertical placement varies with teachers and with the player. Individual differences will dictate the vertical positioning of the mouthpiece on the lips. Usually the most natural

and most comfortable position is the best. However, a two-thirds upper placement is normally recommended for French horn players.

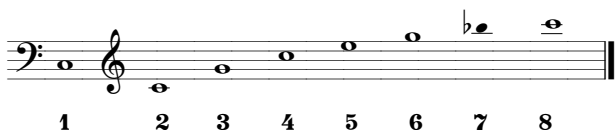
As regards the horizontal placement, the mouthpiece should be centered on the lips with an equal amount of lip on either side. Off-center placement sometimes becomes necessary because of a protruding tooth which would cut into the lip if a centered placement were used.

The upper lip is primarily the vibrating lip. Its tension will govern the speed of vibration and thus the pitch of the sound. When the tension is increased the upper lip muscles should focus toward the center, not toward the corners of the lips. The lower lip is responsible for adjusting the size of the opening. As the pitch ascends, the lower lip will slightly rise in the center, thus decreasing the size of the opening. The reverse is true for descending pitch. In addition, the red tissue in the lip rolls outward slightly, protruding more into the mouthpiece, when pitch descends and gradually rolls inward as the pitch goes higher.

The center of the lips is the section responsible for vibration and size of opening, and thus the player must focus his attention primarily in this area. In forming the embouchure for a note of medium pitch, the player may think of forming his lips to blow a thin stream of vapor through the center of his lips on a cold day. The opening in the center of the lips is analogous to the hub of a wheel, with the lip muscles serving as the spokes, all pointing toward the hub.

The corners of the mouth are back very slightly in a semi-smile position and pulled slightly downward. The corners must always be held firmly enough to “anchor” them in a stationary position, and yet must not be tense or hard. Too much tension in the corners indicates that the muscles are pulling toward the corners instead of toward the center. This takes the control from the center of the lips, where it belongs, and concentrates it in the corners of the mouth. Excess stretch in the corners will result in a “thin” tone and lack of flexibility. This so-called “smile” system encourages excess mouthpiece pressure and consequent lack of endurance and range.

ACOUSTICAL CHARACTERISTICS. A third way in which the instruments of the brass family are closely inter-related is the similarity of their acoustical principles. The following chart outlines the manner in which all brass instruments overblow the partials above their respective fundamental tones. The chart, for purposes of this discussion, extends the range up through the eighth harmonic only, although much brass literature requires a more extended range from the brass player. Of these

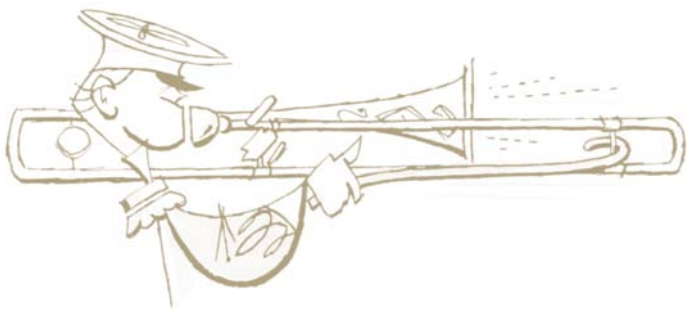


harmonics, the 5th and 7th are flat. The 5th harmonic can usually be adjusted by lipping, but the 7th harmonic is too flat to be useable by all brass instruments except the trombone, which can correct this discrepancy by shortening the slide position. The intervals between the harmonics always retain the same relationship to each other for any given valve combination or slide position.

The term fundamental is applied to the lowest tone possible for a given valve combination or slide position. The number of fundamentals for a given instrument will be determined by the number of valve combinations or slide positions for that instrument. The tenor trombone, for example, with its seven slide positions, has seven different fundamentals. These fundamentals are not always obtainable and are rarely employed in brass writing. All brass instruments derive their pitch names from their open fundamental or their lowest sounding open tone. Thus a brass instrument which, when it plays its lowest open tone, sounds concert F, is said to be built in the key of F.


Another characteristic common to all brass instruments is that of pitch deviation as affected by temperature changes. Pitch, in brass instruments, varies directly with temperature. As the temperature in the tubing of the instrument becomes higher (warmer), the pitch becomes higher.

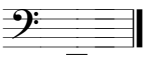
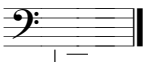
The Tenor Trombone



The trombone is the only commonly used instrument in the brass family which does not employ valves or pistons to obtain various pitches. Rather, the trombone depends upon its slide to accomplish this purpose. This slide principle makes necessary a bore which is mainly cylindrical, with the conical or tapered bell section accounting for only about one-third of the overall length of the instrument.

A non-transposing instrument pitched in $B\flat$, the tenor trombone is normally written for in the bass clef, though advanced etudes and solo literature, as well as orchestral literature, also employ tenor and alto clefs. The tenor trombone is approximately nine feet long when the slide is in first position. Thus the first-position fundamental is

$B\flat$  and the harmonics are built on this fundamental as explained on page 3.

The tenor trombone employs seven different slide positions, each successive position being one semi-tone lower. Thus, the second and third position fundamentals, for example, are A  and $A\flat$  respectively.

It is important to note that the distance between successive slide positions increases as the slide is extended, even though the melodic interval between successive positions remains a semi-tone. We will have occasion to refer to this principle later when discussing intonation discrepancies in valve brass instruments.

It is important that trombone players have four good, even front teeth. The more square the front teeth, the better, as the broader tooth surface provides a better base

for the mouthpiece. Extremely short upper or lower front teeth are not desirable. Neither should the student have an extreme overbite, as this will tend to exert too much mouthpiece pressure on the upper lip, resulting in limited endurance.

A slight overbite is normal in the average person's jaw structure, and in other cases which are not too extreme, an overbite may be remedied by slightly thrusting the jaw forward. In no case is a custom-built mouthpiece recommended unless the malformation is so extreme as to hinder a more natural adjustment. Even then such extreme measures would be recommended only for a more advanced player. Beginners with such a jaw structure would be better advised to start on an instrument other than brass.

Another trait which is not only desirable but crucial for the future success of the trombone player is the ability to discriminate accurately between pitches. This requirement is fully as important as selecting the trombone player as it is in selecting a beginning string player. The trombone is the one instrument in the brass family which can be played the most perfectly in tune or the most horribly out of tune; this sense of relative pitch will determine which it shall be.

It is doubtful if the average beginner is sufficiently developed, physically, to do an adequate job of handling the trombone much before the fifth grade. Such considerations as lung capacity, length of arms, and overall physical development are important in this regard.

It is important that the young student be made aware, at an early stage, of the importance of a smooth, accurate slide technique. This is a separate technique in itself, and its importance becomes greater as the student advances. From his first experience of using the slide, the student should develop the habit of moving the slide very briskly from one position to another. He should avoid the temptation of shortening note values and using the resulting space for a leisurely slide movement. This matter of slide technique will necessarily be slow in its development, but an awareness of its proper execution cannot be introduced too early.

The coordination of tongue and slide assumes an even greater importance a little later in the student's development, when he encounters the legato slur. The trombonist utilizes three types of slurs: the legato slur, the natural slur, and the lip slur. The legato slur can be described as that type of slur in which the slide moves in parallel direction to the notes, as in the example below. It is necessary that the player employ a soft, legato articulation



Legato slur

for each successive note within the slur, e.g., TA-DA OR TA-RA. This tongue action should be executed with the tip of the tongue in the roof of the mouth and should have the effect of merely “denting” the air stream rather than articulating in the usual sense. Here again the complete coordination of tongue and slide movement is extremely important to effect a truly slurred result as differentiated from a passage that is to be tongued in the usual legato fashion.

The natural slur may be described as that type of slur in which the slide moves in contrary motion to the notes, as in the following example. In this type of slur, no tongue action is required as long as the slide movement is brisk and accurate.



Natural slur

The third type of slur, and one which is common to all brass instruments, is the lip slur in which the player slurs two or more notes without changing the slide position:



Lip slur

It is important that, as the trombonist progresses, he gradually acquire an intimate knowledge of alternate positions and how to use them intelligently. As he encounters more and more music of a technical nature, he will find these alternate positions can be used to excellent

advantage in avoiding awkward slide shifts, as well as in improving the intonation and response of certain notes. (See examples below.)



1 6 - 1 2 - 1 6 1 2 3

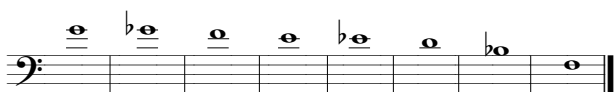
Better: 6 _____



1 - 3 1 3

Better: 1 - 3 \flat 4 3

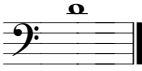
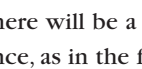
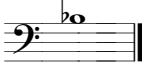
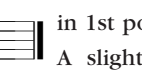
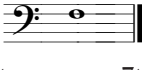
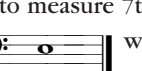
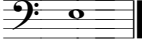
Following are some commonly used alternate positions:



#2 #3 #4 #5 #6 \flat 4 #5 6

- shorten position slightly

\flat - lengthen position slightly

The young student often encounters difficulty in accurately gauging the placement of some of the longer positions when they are first introduced in this method book. Alternate positions can serve as guides. To find 4th position, first play D  in 1st position and then match that  pitch with the same D in 4th position. There will be a very slight discrepancy in pitch in this instance, as in the following examples, but it will serve as a simplified introduction to the 4th position if the student has trouble with the normal procedure. To find 5th position, match B \flat  in 1st position with the same pitch in 5th;  to gauge 6th position, match F  in 1st position with 6th- position F.  A slightly less effective way may be used to measure 7th position by matching 2nd position E  with the same pitch in 7th position.

No attempt will be made here to recommend which type of vibrato should be used by the trombone player. Trombone teachers and players vary in their preference, but the manner in which the vibrato is obtained is actually

secondary in importance to the effectiveness of the vibrato and to the intelligence of its use. As in other wind instruments, the vibrato should not be introduced until the player has developed a full, resonant, and free “straight” tone.

The two types of vibrato most often employed by the trombonist are the slide vibrato and the lip or jaw vibrato. Both types possess certain advantages and disadvantages and either can be effective if used correctly.

The slide vibrato is obtained by a rapid back and forth movement of the slide. A common fault of this type of vibrato is the occasional tendency for the player to oscillate the slide too far, producing a vibrato that is too wide and, consequently, out of tune.

The lip vibrato is obtained by a very subtle movement of the jaw and lips which has the effect of slightly increasing and lessening the pressure of the lips against the mouthpiece. A slight variation of pitch characterizes this style of vibrato. A not uncommon weakness found in players using the lip vibrato is the inability to control its use—that is, to “turn it on and off.” It often becomes a type of nervous reflex that automatically goes into motion the moment the mouthpiece meets the lips.

With proper guidance, either of the above methods can be effective. The student should understand that: 1) the vibrato is not used to cover up an inferior straight tone; 2) the vibrato should be sparingly used and, when used, should not be so prominent that the listener becomes aware of a vibrato, as such.

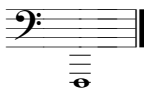
It is important that the player first have an aural conception of how an acceptable vibrato should sound, and then work for the proper evenness of the pulsations well as the proper relationship of the speed of the vibrato to its width (i.e., the amount of pitch variance.) Some teachers recommend approximately six pulsations per second, although the speed will vary slightly in the two extremes of range.

The Bass Trombone



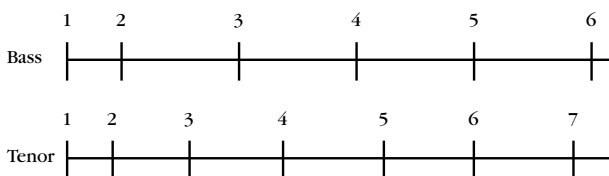
A most valuable addition to the low brass section, the bass trombone is less commonly represented in high school bands and orchestras than in college and professional musical organizations. Although it is often described as a large-bore tenor trombone, the distinction between bass and tenor trombone goes much further than this. In addition to the greater depth of tone resulting from the larger mouthpiece, bore, and bell, the bass trombone player has at his disposal an additional range of four semitones in the lower register.

The bass trombone is pitched in $B\flat$, and its positions and harmonics correspond to the tenor trombone. However, depressing the thumb trigger-valve engages an additional length of tubing sufficient to lower the 1st position fundamental a perfect fourth to F. In effect, the trombone is then no longer a $B\flat$ instrument but an F trombone.



The subsequent positions lower each fundamental one semi-tone respectively, as in the tenor trombone, but the lower range of the bass instrument makes the distance between positions 1 and 2, for example, greater than the distance between these same two positions on the tenor trombone. As explained on page 4, the distance between successive slide positions increases as the slide is extended. The greater distance between bass trombone positions makes possible only six positions as compared to the seven positions on the tenor. The following diagram

illustrates the approximate relationship of slide positions between the tenor and the bass trombone (valve depressed):



The fundamental tones for positions 1 and 2 on the bass trombone (with thumb valve depressed) correspond to the fundamentals for positions 6 and 7 on the B \flat instrument.

An additional advantage of the bass trombone is the greater number of alternate positions at the disposal of the player when he depresses the thumb valve. Following are two examples illustrating how the player, through intelligent use of the F attachment, might improve facility of slide shifts in certain passages:



Tenor: 1 6 4 1 6 1
 Bass: 1 T1 4 1 T1 1
 (T=Thumb)



Tenor: 2 - 7 3 7 2
 Bass: 2 - T2 3 T2 2

Another model of the trombone which has attained a certain degree of popularity rather recently is the B \flat -F trombone. This instrument must not be confused with the bass trombone. It is actually a tenor trombone in its bore and bell dimensions but, like the bass instrument, has an additional length of tubing which may be engaged by depressing a trigger valve.

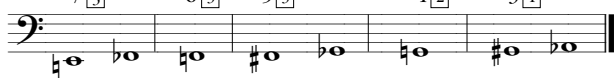
The addition of this extra tubing lowers the natural fundamental from B \flat to F, thereby theoretically making possible the same advantages found on the bass trombone. However, due to the smaller bore of the B \flat -F instrument, the response of the extreme lower tones is not as effective as on the bass trombone.

Position (Fingering) Chart for Trombone and Baritone

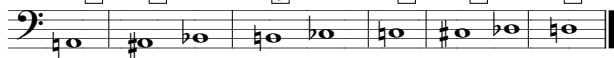
(First figures are Trombone Positions)

(Figures in box are for Baritone)

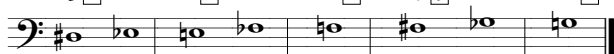
7 $\begin{matrix} 1 \\ 2 \\ 3 \end{matrix}$ 6 $\begin{matrix} 1 \\ 3 \end{matrix}$ 5 $\begin{matrix} 2 \\ 3 \end{matrix}$ 4 $\begin{matrix} 1 \\ 2 \end{matrix}$ 3 $\begin{matrix} 1 \end{matrix}$



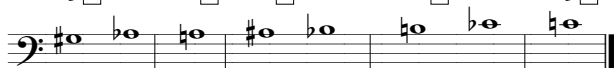
2 $\begin{matrix} 2 \end{matrix}$ 1 $\begin{matrix} 0 \end{matrix}$ 7 $\begin{matrix} 1 \\ 2 \\ 3 \end{matrix}$ 6 $\begin{matrix} 1 \\ 3 \end{matrix}$ 5 $\begin{matrix} 2 \\ 3 \end{matrix}$ 4 $\begin{matrix} 1 \\ 2 \end{matrix}$



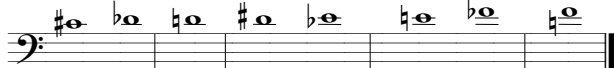
3 $\begin{matrix} 1 \end{matrix}$ 2 $\begin{matrix} 2 \end{matrix}$ 1 $\begin{matrix} 0 \end{matrix}$ 5 $\begin{matrix} 2 \\ 3 \end{matrix}$ 4 $\begin{matrix} 1 \\ 2 \end{matrix}$



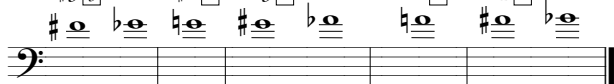
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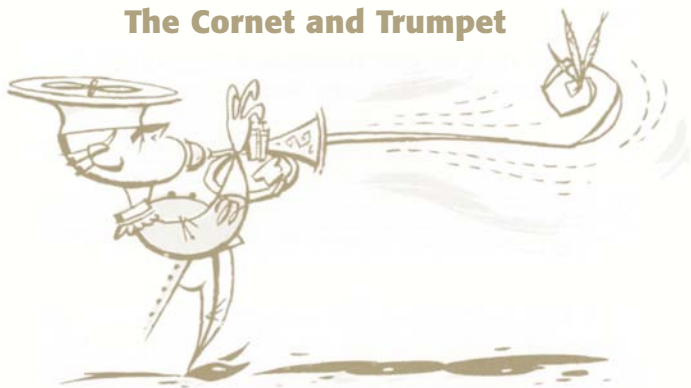
2 $\begin{matrix} 2 \end{matrix}$ 1 $\begin{matrix} 0 \end{matrix}$ 3 $\begin{matrix} 1 \end{matrix}$ 2 $\begin{matrix} 2 \end{matrix}$ 1 $\begin{matrix} 0 \end{matrix}$



$\#3$ $\begin{matrix} 2 \\ 3 \end{matrix}$ $\#2$ $\begin{matrix} 1 \\ 2 \end{matrix}$ 3 $\begin{matrix} 1 \end{matrix}$ 2 $\begin{matrix} 2 \end{matrix}$ 1 $\begin{matrix} 0 \end{matrix}$



The Cornet and Trumpet



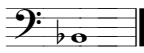
The principal difference between the cornet and the trumpet is in the shape of the bore (or tubing) of the two instruments. This, in turn, affects their tone qualities. The cornet tubing is mainly conical (tapered) while the diameter of the trumpet bore remains constant or cylindrical through most of its length. The cornet bore is not completely conical due to the cylindrical tubing which is necessarily utilized in the four tuning slides. Likewise, the flared tubing in the bell section of the trumpet prevents it from being a completely cylindrical instrument. This difference in the shape of the bore of the two instruments results in a cornet tone quality which may be described as rather mellow in contrast to the more brilliant quality of the trumpet tone.

It should be understood that the tone quality of one instrument is not inferior or superior to the other. The choice between a cornet and a trumpet should be determined by the purpose for which the instrument is to be used. Generally speaking, the characteristic tone quality of the trumpet lends itself best to the demands of the symphony orchestra, studio orchestra, or the dance band, while the cornet tone quality is generally more desirable in the concert band and for over-all use in public school work.

In the average concert band, an overabundance of trumpet tone would lend too much brilliance to the type of ensemble sound that most band directors strive for. Furthermore, the majority of instrumental teachers choose the cornet over the trumpet as a beginning instrument because physically, it fits the average 4th or 5th grader

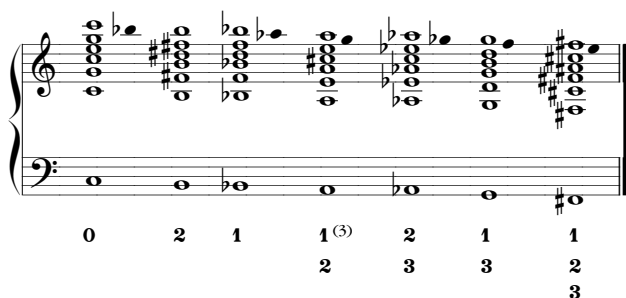
better than the trumpet. Also, many teachers feel that if the beginner first develops a good concept of cornet tone quality before changing to trumpet, he will be less likely to fall victim to the thin, rather harsh tone quality which, though not characteristic of the trumpet, identifies so many young trumpet players. There is no doubt, however, that the professional outlets available to present-day musicians almost invariably demand the use of the trumpet over the cornet.

When held side by side, the average trumpet will extend beyond the length of the average cornet. This is due to the fact that the trumpet is usually compressed more, vertically, and thus is more extended, horizontally. Actually, the total length of tubing in the two instruments is the same. The B \flat cornet and trumpet are approximately 4 1/2 feet long in open position, just one-half the length of the trombone. The open fundamental, therefore, would be one octave higher than the trombone, or concert B \flat .

 Both the cornet and the trumpet, however, are transposing instruments and their notes are written a major second higher than they sound.

The three valves on the cornet and trumpet, when depressed, lower the open fundamental as follows: valve 1, one step; valve 2, one-half step; valve 3, approximately 1 1/2 steps. Depressing the valves singly or in various combinations produces a total of six additional fundamentals. (See example below.)

As written:



0 2 1 1⁽³⁾ 2 1 1

2 3 3 2 3

Harmonic Series for Cornet and Trumpet

Note the relationship of the seven valve combinations on the cornet and trumpet to the seven slide positions on the trombone.

The tubing connected to the 3rd valve is purposely built a little long on valve instruments to compensate partially for certain intonation discrepancies. Because the third valve, when used singly, results in pitches which are flat, valves 1 and 2 are normally employed in place of the 3rd valve.

Another intonation weakness inherent in valve instruments is the sharpness of the tones resulting when valves 1-3 or valves 1-2-3 are used. Of these two combinations, the latter is the sharper. These tones cannot be “lipped” down to pitch without distorting the tone quality, so many cornets and trumpets have a ring on the 3rd valve tuning slide which enables the player to extend this slide on such combinations to lower the notes to their correct pitch. A ring or a trigger device is also often included on the 1st valve-tuning slide for the same purpose. These tuning rings are a most important part of the instrument, and the young player who has not yet reached the point where he is ready to use the device should be instructed to keep the tuning slide clean and well-lubricated so the slide will function smoothly when ready for use.

The beginner should be cautioned against the common habit of “knuckle” fingering. This habit not only will impair smoothness of fingering but will hamper speed of valve movement when the player eventually encounters literature requiring more technical facility. In the desire to avoid this pitfall, players will occasionally fall into one which is undesirable—that of forming their fingers into an extreme arch and fingering on the extreme tip of the fingernail. The fingers should be formed into a slight arch and should contact the valve with the cushiony part of the finger at the end of the first knuckle.

Undoubtedly, the type of vibrato most commonly utilized by cornet and trumpet players is the hand vibrato. This is obtained by a very slight back and forth movement of the right hand which has the effect of alternately increasing and lessening lip pressure on the mouthpiece in the same manner as the lip vibrato on trombone. All other aspects of the use of the vibrato are the same as those recommended in an earlier discussion. See page 8.

Fingering Chart for Cornet, Trumpet, Alto, Baritone

1 2 3 1 3 2 3 1 2 1 2

0 1 2 3 1 3 2 3 1 2 1

2 0 2 3 1 2 1 2

0 1 2 1 2 0 1

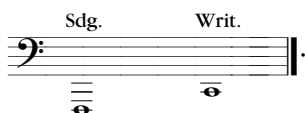
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The French Horn



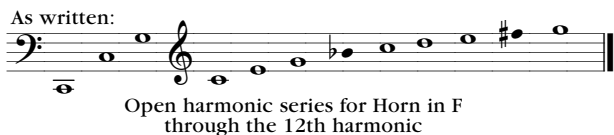
One of the most versatile, and possibly the most intricate, of all the brass instruments, the French horn has a long and noble history, having risen from a simple instrument used primarily on the hunt to its present place of prominence in the band, orchestra, and chamber ensemble. Among the factors contributing to the characteristic mellow, velvet quality of the French horn are its mainly conical bore, its deep conical mouthpiece, and its large bell. The types of French horns most commonly in use today are the single horn in F, the single horn in B \flat , and the double horn pitched in F and B \flat .

THE SINGLE F HORN. The single horn in F is a transposing instrument, written a perfect 5th higher than it sounds. In its open position, the F horn is approximately twelve feet long and has, as its open fundamental, concert F (written C):



Its three valves, used singly and in combination, enable the player to extend the range downward an additional six semi-tones in the same manner as the cornet or trumpet. (See page 13) The long and gradual taper in the horn tubing makes it possible for the horn player to obtain with comparative ease a greater range of pitches, in any given fingering, than is possible on any of the other instruments of the brass family.

Whereas the open 8th harmonic is normally considered to be about the top range of the average high school player on the other brasses, the average high school horn player will normally not reach this point until approximately his open 12th harmonic.



The main problem facing the F horn player is that of tone placement when he reaches the middle to upper part of his harmonic series. As can be seen in the example above, the higher harmonics begin to cluster closely together, and even an advanced horn player, performing on an F horn, can become the victim of “split” tones in this range. For this reason, some school instrumental directors prefer to use the single B \flat French horn at the beginning to intermediate levels. Although it possesses certain disadvantages, it does avoid the pitfalls of uncertain tone placement described above.

THE SINGLE B \flat HORN. The 3-valve B \flat single horn, in open position, is the same length as the trombone—approximately nine feet—and thus has as its open fundamental concert B \flat :



It is a conical-bore instrument, as is the F horn but, because of its shorter tubing, the tones in the upper range of the B \flat horn occur below that point in the harmonic series where the notes begin to cluster. Thus, the problem of tone placement on the B \flat horn is no greater than on the cornet or the trombone.

The main disadvantage of the single B \flat horn is that its tone quality does not compare favorably with the dark, rich tone quality of the F horn, although a player with a proper conception of horn tone can, by adjustment of the right hand, closely approximate the quality of the F horn. Another possible disadvantage of the 3-valve B \flat horn is that the lower range falls five semi-tones short of the lower range of the F horn. This range, however, is rarely, if ever, used by the beginning player.

A second variety of the single B \flat horn is the 4-valve instrument. The 4th valve is an F valve and, when depressed, lowers the instrument a perfect 4th to F, enabling the player to extend his range downward to the lowest range of the F horn and, further, making available a greater choice of alternate fingerings. This instrument is not to be confused with the F-B \flat double horn. It has a B \flat horn mouthpipe and bore and only one set of tuning slides, as compared to the double set of tuning slides on the double horn.

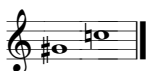
A third variety of single B \flat horn is the 5-valve model. Here the 4th valve serves the same purpose as above. The 5th valve, operated by the thumb, is a mute valve. Hand-muting ("stopping") the B \flat horn raises the pitch by approximately three-fourths of a tone. Since it is impossible to transpose down three-fourths of a tone, and thus compensate for this sharpening, it is necessary to employ the 5th valve, which opens up a sufficient amount of tubing to lower the pitch by the proper amount.

The B \flat single horn has not yet assumed a sufficiently prominent role in our instrumental organizations to justify published parts written expressly for the B \flat instrument. For this reason, it is necessary for players of the B \flat horn to "transpose", in effect, and to play from the regular F horn part. However, the average B \flat horn player does not know he is transposing since, from the first lesson, he has learned his fingerings as they would be played from an F horn part.

THE F-B \flat DOUBLE HORN. The dean of the French horn family is undoubtedly the double horn in F and B \flat . Combined in this one instrument are all of the advantages of the various types of French horns discussed above. Although the double horn is a more expensive instrument than the single horn, its many advantages far outweigh the disadvantage of extra cost. As its name implies, the double horn is a combination of the F single and the B \flat single horns.

In its natural position, it is a single F horn but, in addition to the three regular valves, it also has a fourth valve operated by the thumb which, when depressed, cuts off a sufficient amount of tubing to put the instrument

into B \flat , a perfect fourth higher. Thus, the double horn player can, by depressing the thumb valve, switch to the B \flat side of the horn when he approaches his upper register and avoid the uncertainties of tone placement which are associated with the upper register of the F horn. An experienced double horn player will not always make the change from one side of the horn to the other at exactly the same note. This will be determined by the structure of the melodic line, but the change, in a diatonic passage, will normally occur somewhere between G \sharp and C \flat :



The five semi-tones contained within this interval are fingered the same on both the B \flat and the F horns. Generally speaking, notes below the G \sharp are played on the F side of the double horn and the pitches above the C \flat are played on the B \flat side.

As the player becomes better acquainted with the various possibilities at his disposal there will be certain exceptions to the above rule. It is suggested that the player first learning the intricacies of the double horn not be told that he is actually playing on two horns. Rather should he be taught that when reaching a certain point in the range, he merely adds the thumb valve and includes it with the fingerings above that point. As he gains more understanding and facility with the double horn he should, of course, learn both the B \flat and the F fingerings over the entire range of the instrument.

One of the most important techniques associated with horn playing, and one that should be learned from the first lesson, is that of correct right hand placement in the bell. The right hand serves three main purposes in horn performance: 1) adjusting tone quality; 2) adjusting pitch; 3) hand-muting or "stopping."

Not the least of the factors contributing to the characteristic tone quality of the French horn is that of the placement of the right hand in the bell. If the bell is too open, the horn quality becomes rather blatant; if the bell is too closed, the tone becomes stuffy and lacks resonance. The wrist should be bent in sufficiently to make a slight "cupped" position in the palm. The fingers should be held straight and together, the bottom of the thumb resting on

the side of the index finger with no opening between the thumb and the index finger.

In this position, the right hand should be placed on the far side of the bell, with the thumb knuckle lightly touching the upper part of the bell and the fingers following the contour of the bell. The distance which the right hand should be placed into the bell, and the amount of cupping, will be determined by the size of the player's hand and by the quality of tone desired.

The player should imagine the tone passing along the palm of the hand, but not directly into it. It is important that the player also assume this hand position when tuning. Furthermore, in the interests of matching tone quality, the player should cup the hand slightly more when playing on the B₁ side of the double horn.

The right can do much toward correcting slight intonation problems. Increasing the amount of hand-cupping in the bell can lower the pitch by at least a semi-tone and, conversely, opening up the bell can raise the pitch slightly. Such hand adjustments naturally affect, to some extent, the quality of tone and this technique should be employed only for minor pitch adjustments on isolated tones.

The technique of hand-muting the F horn is commonly referred to as "stopping" the horn and is identified by a plus sign (+) above the note or the passage to be "stopped." Hand-muting is a technique reserved for the advanced hornist, as it requires good lip control, good breath control, and a hand large enough to completely stop up the bell. To accomplish this technique, the fingers should remain in their normal position, but the wrist should be bent in such a manner that the upper part of the hand is at right angles with the fingers. In this position the bell should be completely closed up, with no open spaces between the hand and the bell. The right arm should fit snugly against the body. Hand-muting has the effect of shortening the vibrating column of the air and raising the pitch by a semi-tone. Thus, it is necessary for the player to transpose all "stopped" notes down by the same amount. A player with a small hand often finds, when hand-muting,

that the pitch is raised by more than a semi-tone because he must in effect shove the hand way up into the bell.

A simple method of approximating a hand-muted effect is by using a transposing mute. This type of mute may be identified by the long, slender tube projecting from the lower end. This mute is so-named because it affects the length of the air-column in the same manner as hand-muting, making it necessary to transpose down by a half-step. Also available commercially are non-transposing mutes which produce slightly different tonal results but which do not affect the pitch of the tone.

An instrument sometimes used in school bands-if unsuccessfully-as a substitute for the French horn is the mellophone. This instrument is built in a coiled shape, similar to the French horn, but is fingered with the right hand, while the left hand, acting strictly as a support, is placed palm up in the upper inside portion of the bell. The mellophone, pitched in F, is one-half the length of the F French horn. Although it plays from the regular horn part, it can in no way approximate the beauty and richness of the true French horn tone. With a mouthpiece adaptor, it is possible to use a regular French horn mouthpiece in the mellophone. This does result in a tone more acceptable than that obtained when a regular mellophone mouthpiece is used. The mellophone further serves a purpose as a beginning instrument for future horn players.

The French horn has found little favor as a "parade" instrument because its subdued tone quality contributes little to the brilliance of the marching band. Other disadvantages of the horn, on the march, are the fact that its sound goes back, rather than out, and the problems of uncertain tone placement are increased by brick streets and uneven football fields.

For this reason, instrumental directors often replace their French horns with the upright alto horn during the football season. The upright alto horn is a companion instrument to the mellophone and its upright bell, plus its ease of carrying and blowing, make it a good instrument to place in the hands of the French horn player for parade work.

Notes on French Horn Fingering Chart

Figures above the staff are for F Horn, reading from F parts.

Figures below the staff are for B \flat Horn, reading from F parts.

The teacher who is not familiar with Horn fingerings can use the following short-cuts:

F Horn (reading from an F part) fingers the same as a cornet would finger an octave higher.

B \flat Horn (playing from an F part) fingers the same as a cornet would finger the note a perfect fifth higher.

B \flat Horn (playing from an E \flat part) fingers the same as a cornet would finger the note a perfect fourth higher.

The Baritone and Euphonium



In terms of acoustical properties and tone quality, the baritone has a relationship to the tenor trombone which is similar to the relationship of the cornet to the trumpet. The baritone is a 3-valve instrument with a mainly conical tubing that is of the same length as the tenor trombone. Thus, its open fundamental is the same as the tenor trombone and the three individual valves, when depressed, lower the open fundamental in the same amounts as the other 3-valve instruments. The baritone, because of the register in which it plays, is normally scored in the bass clef.

Although baritone and tenor trombone mouthpieces are interchangeable, it is advisable for the baritone player to select a mouthpiece with a slightly deeper cup than would be used by the average trombone player, in order to obtain all the richness and sonority which characterize the baritone horn.

Most band scores include treble clef parts for the baritone because it remains common practice for instrumental teachers to transfer their cornet, alto horn, and mellophone players to the baritone. Such a transfer is comparatively simple and quick, since the treble clef baritone part is fingered the same way as the cornet, alto horn, or mellophone. The treble clef baritone part is written a major 9th higher than it sounds. As soon as

convenient, the player should learn the bass clef fingerings, for much of the better and more advanced solo and ensemble literature for the instrument is obtainable only in bass clef. Oftentimes, this transition from treble to bass clef parts is accomplished during the summer months when fewer playing demands are placed on the player.

The main difference between the baritone and the euphonium is in the size of the bore. It is possible unfair to say that the euphonium is simply a large-bore baritone, since the euphonium holds a certain place of distinction of its own. However, in over-all length and general appearance the two instruments are identical. Having a larger bore, the other characteristics of the instrument are also proportionately larger, including the bell and the tone quality. Also, the larger euphonium mouthpiece requires a mouthpiece with a deeper cup and bigger shank. Thus, the baritone and euphonium mouthpieces are not interchangeable.

The euphonium is obtainable as a regular 3-valve instrument, although most advanced and professional euphonium players use the 4-valve model. This 4th valve lowers the open fundamental from B \flat to F, affording the player an extra range of tones in the lower register not possible with the 3-valve instrument. With one exception, is thus possible, with various combinations of the four

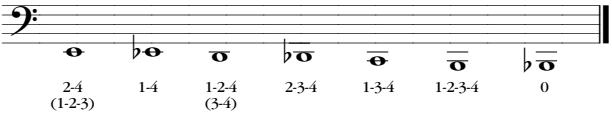


Fingerings for regular 4-valve euphonium

valves, to play chromatically down to the open B \flat fundamental. This one exception is the B \natural , a semi-tone above the open fundamental (see example below.)

This B \natural is unobtainable because there are only five different valve combinations below the 4th-valve fundamental. The reason of this limitation was explained in the discussion of bass trombone,* which is limited to five positions below its thumb-valve fundamental.

One 4-valve euphonium, however, has a compensating device which makes possible the complete chromatic compass down to the open fundamental. (See example below.)



Fingerings for regular 4-valve euphonium
with compensating device

Another advantage of this compensating device is that it automatically corrects the intonation discrepancy which results when valves 1-3 or 1-2-3 are used.*

The fingering chart for treble clef baritone appears on page 15. The bass clef chart is on page 11.

*See pages 13-14

The Tuba



Completing the list of instruments in the brass family in common use today is the tuba or bass. The model which is probably the most popular for concert work is the upright tuba or bass, so-called because of the upright construction of its tubing. The instrument is similar in appearance to the baritone or euphonium. For ease of holding, the player generally uses a stand specially built to hold the instrument. Its weight and size make this particular model impractical for parade work.

Another model of the bass or tuba is the sousaphone. Because of the comparative ease of carrying this model, it is in common use in the marching band although it is also used in many school concert bands. This instrument is identified by its circular tubing which rests on the left shoulder and facilitates carrying the instrument on the march. However, it is recommended that the player be provided with a sousaphone stand for concert work. For the director whose budget does not yet justify the purchase of separate models for concert and marching purposes, the sousaphone is recommended because of its greater versatility. Nevertheless, the director should include in his future plans the gradual addition of the upright models for concert work.

Although the CC tuba is more often preferred by symphony tuba players, the BB \flat instrument has found favor in most school instrumental groups. This instrument has a conical bore and is twice the length of the trombone

and baritone, with a bore, bell, and mouthpiece of proportionately larger dimensions. It sounds B \flat as its open fundamental and its three valves lower



this fundamental in the same way as the other 3-valve instruments already discussed. The BB \flat tuba also may be obtained with a 4th valve which, when depressed, lowers its open fundamental to F with the same advantages and limitations as were associated with the 4-valve euphonium.* Also available is a 4-valve tuba with a compensating device identical, in principle, to that on the 4-valve euphonium.*

The average 4th or 5th grader is probably too small to begin on the tuba. He is less likely to become discouraged if he is started on a cornet, alto horn, or baritone and transfers to the tuba after he grows a little more. To facilitate this transfer, some directors recommend starting a definite tuba prospect on a baritone horn by giving him a tuba book and teaching him tuba fingerings. In this manner, the baritone player would be fingering the part exactly as a tuba player would finger it, but his pitches would sound an octave higher than the tuba. This system would eliminate one major problem of the eventual transfer to tuba—that of learning new fingerings.

Another instrument in the bass-tuba family which, though gradually losing popularity, is still apparent in many school band rooms, is the E \flat tuba, pitched a perfect 4th higher than the BB \flat , and with a proportionately smaller bore. The E \flat tuba plays from the same music as the BB \flat instrument but, because of its shorter length and smaller bore, does not function as effectively as the BB \flat in the register normally relegated to the tuba part. Also the lowest range of the BB \flat tuba is five semi-tones below that of the E \flat .

* For review of this discussion, refer to page 25-26.

For the young student, however, the E \flat instrument presents fewer difficulties in handling and blowing. The E \flat tuba is made in both the circular and the upright models. A 4th valve is obtainable on this instrument, its function being to lower the open fundamental a perfect 4th to B \flat which, theoretically, gives the E \flat model the same range as the BB \flat .

An aid that is sometimes used in transferring cornet or alto horn players to the E \flat tuba is to have them mentally add three sharps to the existing key signature on the tuba part, think treble clef, and finger the part as they would on cornet or alto:

(A)

0 1-3 2 0 1-2 1-3

(B)

0 1-3 2 0 1-2 1-3

Thus, in the above examples, (A) illustrates the music as it would appear on the tuba part, and (B) illustrates the part as the player might visualize it. This, of course, is used only as a temporary measure.

* * * *

For general information regarding cleaning and care of the brass instruments, it is suggested that the reader refer to Chapter VII of the Selmer Band Manual (AV2619) by Nilo W. Hovey.

Robert W. Getchell, Ph.D.

Dr. Robert Getchell, a retired member of the music faculty at Luther College, Decorah, Iowa, holds degrees in instrumental music from Iowa State Teachers College, Eastman School of Music, and The State University of Iowa. This manual is based on more than fifteen years of experience in teaching the brass instruments, both at the high school and college level.

In addition to the present book, Dr. Getchell has written two volumes each of studies for the cornet and trumpet, tuba, and horn, all published by Belwin.



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