The Art of Saxophone Playing

by Larry Teal

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The Art of Saxophone Playing

by Larry Teal

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INTRODUCTION

The saxophone has for many years been the victim of a popular misconception that it is “easy to play. ” This point of view might well be corrected with the addition of a single word—“easy to play *badly.”* The first production of a pseudomusical tone plus mastery of the technical problems involved in playing simple melodies may be accomplished with less effort than on most other wind instruments. The interested amateur, armed with a fingering chart and an elementary instruction book, can in a relatively short time make what appears to be rapid progress. Advancement of this type is deceptive, since it creates the impression that serious study is unnecessary and that concentrated effort is not required. A great deal of the disdain held for the instrument, much of which is justified, can be directly attributed to the lack of earnest effort on the part of saxophone players to treat their instruments with the same scholarly approach necessary for mastery of related instruments.

Although the stature of the saxophone is constantly being improved, there is still plenty of room for advancement before it will become a standard member of the instrumental family. Credit must be given to the dedicated and gifted soloists and performers who, by devoting their lives to the exploitation of its possibilities, have convinced the informed public that, when played artistically, the saxophone has no need to hang its head. It is through the performances of these artists that many composers have become interested in writing for the instrument, and saxophone literature, while not abundant, is increasing at an encouraging rate both in quality and quantity.

Students often inquire why the saxophone is not included in the symphony orchestra. There are several reasons: (1) When the literature of the symphony was first developed, the instrument was not in existence. (2) Early attempts to include it often were unsatisfactory because of the immaturity of the saxophone tone and its inability to blend well with other instruments. (3) Composers avoid the instrument, since they realize that the established symphony orchestra has no regular saxophonist and hesitate to add instruments that will require extra expense. (4) The standard of saxophone playing has not yet reached the point where the composer or conductor can always be assured of a competent performance on the symphonic level.

This last point is of utmost importance and puts the responsibility for this neglect directly on the shoulders of the saxophonists. While encouraging strides in the improvement of performance levels are evident, saxophone playing as an art is still in its infancy.

The ideal learning situation, which the ART OF SAXOPHONE PLAYING cannot replace, is study with a competent teacher. However, it is often impossible for many young musicians to have the advantage of regular lessons with a specialist on his particular instrument or for the music educator to acquire specialized knowledge on every instrument he is required to teach. The object of this book is to make available some of the convictions I have acquired through experience in both performing and teaching, especially in basic procedures. The adaptation of fundamental principles to each individual may require minor alteration by the teacher or student, since we are in noway dealing in specific cases.

While the playing of a musical instrument is certainly an adventure in an art, the truly artistic performance must be supported by craftsmanship. It is to the development of this craftsmanship, or skill and mastery of the instrument, that the true student must dedicate himself. Musical expression will get nowhere unless the performer has the necessary facility to reproduce his ideas.

The author wishes to dedicate this book to his students, whose interest, inquisitiveness, and seriousness of purpose have been the force for continued exploration into the “art of saxophone playing.”

Larry Teal

THE SAXOPHONE FAMILY (Photograph countesy of H. & A. Selmer, Inc.)

THE ORIGINAL INSTRUMENTS OF ADOLPH SAX (Photograph courtesy of H. & A. Selmer, Inc.)

THE INSTRUMENT

The saxophone is one of the few instruments which was “invented.” Whereas other modern-day instruments have had a long history of gradual evolution and their beginnings are difficult to trace, historians agree that Adolph Sax, a Brussels instrument maker, designed and built the saxophone in the early 1840’s. This man, famous for the construction of brass as well as woodwind instruments, decided to cross the two families by fitting a single reed mouthpiece to a brass conical bore body with the woodwind type of fingering mechanism. The basic design of this instrument has never been changed, although many improvements have been made. Minor changes in the bore have since given the saxophone more flexibility and power, and improvements in the key mechanism have introduced the automatic octave key, the articulated G♯, and other technical advantages. The normal register of the saxophone has been only slightly extended. Sax’s instruments ranged from B below the staff to F fourth space above. The modern instrument expands this to low B♭ and high F, with added keys available on some makes to high F♯ (on the alto) and low A (on the baritone).

Sax evidently considered his new invention completed in 1846, for it was then that he went to Paris and obtained a patent for it. Envisaged as an instrument that would blend with both the woodwind and brass sections by producing a tone then described as possessing properties of each, its first trial in ensemble was undertaken by the French military bands. The acceptance must have been immediate, because the year after the patent had been issued, authorities granted permission for its adoption in the standard instrumentation of the military band.

Although acceptance of the saxophone has been slow in the concert orchestra, its use in the concert band and as a solo instrument is now well established, and the horizon seems to be clearing for its use in all forms of so-called “legitimate” ensembles. The recent trend toward including the saxophone in the curriculum of many music schools and conservatories is a major breakthrough. This provides the opportunity for a formal and thorough study of the saxophone on a level with other instruments and eliminates the “catch-as-catch-can” type of training that has formerly been the lot of the serious student. The stature of the saxophone will ultimately be determined on the basis of its performance standards. The instrument, in the hands of a fine artist, has proven itself.

THE SAXOPHONE FAMILY

The family of saxophones in use today consists of:

Soprano in B♭

Alto in E♭

Tenor in B♭

Baritone in E♭

Bass in B♭

Other "cousins" of the family, not considered standard but which, from time to time, have achieved various degrees of popularity, include:

Sopranino in F and E♭

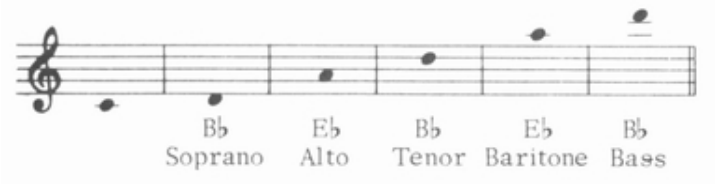
Soprano in C
Mezzo-soprano in F
"Melody" in C

Contra-Bass in E♭

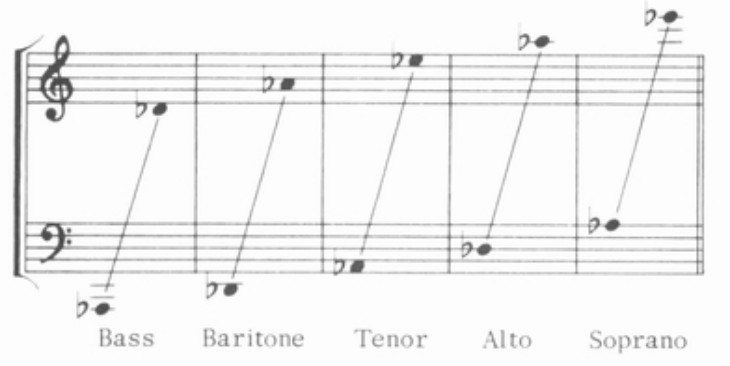
It is interesting to note that Ravel scored the famous passage for soprano saxophone in his "Bolero" for two saxophones, the F sopranino and the B♭ soprano, evidently to keep the instruments in a better range. It is now played in its entirety by either the C or the B♭ soprano. This writer knows of no F sopranino in existence, but it is logical to assume that one was available at the time of Ravel's scoring in 1928.

All members of the saxophone family have the same fingering system—the structural difference is mainly one of size. No great alteration of technique is required to shift from one to any of the others. Although the embouchure requires minor adjustment, the basic concept of tone production remains the same. The transfer is principally a matter of orientation to a different size mouthpiece and reed.

It is common practice to write all saxophone music in the treble clef, even for the baritone and bass instruments. Saxophones are transposing instruments, i.e., the score is written in the key of the saxophone, rather than the "concert" or piano key. To illustrate this, middle C on the piano would be notated in the following manner:



Range of Saxophones in Concert Pitch:



SELECTION OF THE INSTRUMENT

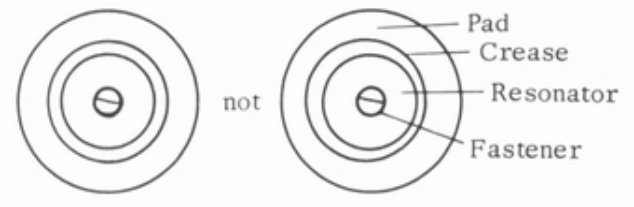
The necessity for an excellent instrument, in a good state of repair and adjustment, cannot be emphasized too strongly. It is far cheaper to obtain a fine instrument from the outset than to endure the frustration of either learning on, or listening to, an inferior saxophone. The often heard expression "good enough to learn on" should be outlawed. A student is entitled to an instrument that is "good enough to play well on" from the very first. Often an experienced teacher is confronted with an instrument in such poor condition that even he cannot produce a scale! The student may have been wrestling with this situation for several months or more, and the effect on the embouchure, his enthusiasm for playing, and the surrounding populace is not difficult to imagine.

If at all possible, *get the advice of an expert*. The purchase of an instrument is in most cases a major expenditure, and should not be treated lightly. The professional musician, private teacher or public school music teacher will be glad to consult with you in this matter. Established makes (such as Selmer, Leblanc, Conn, Martin, Buescher, King, SML, Buffet, Bundy, Pan-American, or Vito) are manufactured by reliable firms who have a good reputation for standing back of their product.

When purchasing an instrument, some pertinent details to be determined are:

1. *Structure of the Instrument*

    a. The *Metal.* Is the metal of sufficient thickness and hardness that it will not bend easily? (Some of the "off-make" instruments have been built with such soft metal that one can actually dent the body with pressure of the thumb.) Does the workmanship on the mechanism look solid and well-machined ? Keys should not bend with ordinary pressure.
    b. *The Pad Job*. Do the pads look neat and well installed? Are the circular impressions where the pad contacts the tone hole centered ? If the pads have resonators, do they fit tightly and smoothly?



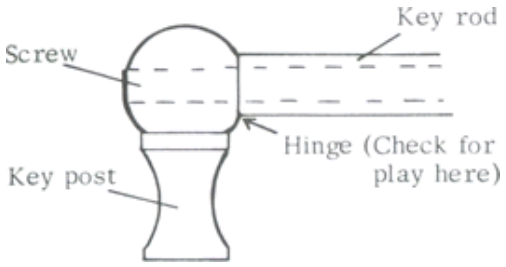
c. *Noise*. Do you hear any clicks of metal against metal? Any type of noise that does not seem normal should be corrected.

d. *The Action*. Does each key have the same spring tension? Does this generally seem too strong or too weak ? Are the keys in each "stack" the same distance above the holes ? Are they all too close or too open ? The exact measurement varies slightly according to make, but a good repairman can advise you on this. The height of the pad over the tone hole has a direct bearing on both intonation and tone quality. A stuffy, dead quality indicates a close action, while a wild, open sound suggests a high action.

e. *Spring Tension*. Do some keys tend to drag? This may be due to a weak spring or a bind in the hinge. Do any notes "bobble" when a key is released? Pull the linger off the side of the key to test this. No key should bound as it reaches the top of the stroke. Any bounding action may be due to a weak spring or an improper bumper. If a spring is weak, insist on a replacement, rather than bending for greater tension, as bending is only a temporary remedy.

f. *Rollers*. Do the rollers work easily, with no play in either direction ?

g. *The Key Hinges*. Is there any play between the key post and the rod ? Check in both directions. This is a very important point, as any play will prevent a uniform seating of the pad. If there is longitudinal play, careless workmanship in the construction of the instrument is indicated. This might be a basis for rejection. The following diagram is shown to stress this point:



2. *The Playing Test*

a. *Testing for Leaks*. Does the sax respond easily on each note down to low B♭ ? Hold down the G♯ key and play F-E-D-C in the lower register. There should be no difference in the response of these notes. Try these tests playing very softly. Try the 1-4 fingering for middle register B♭ and compare it with the onebis fingering. There maybe a slight difference in quality, but the response should be the same.

b. *Intonation*. It is pointless to check a saxophone for intonation if there are leaks of any kind. When you are convinced that the pads cover well, then proceed with the following tests: Tune the instrument to A-440 carefully. An electronic instrument such as a Stroboconn is an invaluable aid. For a detailed discussion of intonation, refer to the chapter on that subject in this book. Bear in mind that the horn may not be completely at fault, and once more enlist the services of another saxophonist if possible. Most of the "name" brand saxophones are well built and can be played in tune, so be cautious about condemning the intonation until it is accurately judged.

c. *Voicing*. This again requires an expert opinion. Is the tone uniform in all registers ? There is an unavoidable quality change between the third space C♯ and fourth line D, but it is more pronounced on some instruments than on others, and so should be considered. Proceed chromatically from fourth space E up to the high C♯. Without altering the embouchure or the air stream, listen carefully to each tone. Is the quality uniform ? Have another player do the same with his mouthpiece. Move a short distance away to judge

this, since the true sound of an instrument is better determined in this manner. Several informed opinions should be solicited on the question of intonation and voicing.

d. *Balance of Volume*. Is the volume output uniform, or is one tone strong while another is weak? Test without humoring or forcing the air stream. Try at all dynamic levels, but especially piano and pianissimo. Listen to this also from a distance.

e. *The Room.* Try out instruments in the same room, if possible, since this has a great deal to do with the sound. A saxophone that sounds dead in one room may be very resonant in a "live" room.

f. *Tuning*. Tune all instruments to the same pitch, whether or not the check is for intonation. When selecting a new saxophone, be reminded that you are still influenced by the previous one, and may have learned to favor certain notes. These tones have been "lipped" for so long that one may not realize he is transferring this adjustment to the new instrument, complicating the pitch factor. Test the instrument with the mouthpiece that has been built for it in addition to your own. The new one may be better for intonation and uniform voicing.

g. *Used or Rebuilt Instruments*. A good used instrument is often a better buy than a new second or third line make, but one must be cautious in this selection. Here again, it is imperative that the counsel of an informed person be followed. Do not buy a "reconditioned" saxophone on name alone. It may look new, but close examination will reveal mechanical wear beyond permanent adjustment.

h. *The Perfect Saxophone* has not yet been built, and there are acoustical reasons why it may never be. However, careful selection and good musical judgment will go a long way in obtaining the best possible instrument for you. There are several fine makes on the market. Instruments of the same make and model vary only slightly, but try as many as possible before making the final decision. A good instrument should pass *all* of the tests indicated here.

CARE OF THE INSTRUMENT

The saxophone requires no great amount of care, but the cultivation of a few daily habits, aimed at protecting it and keeping it clean, should be rigorously followed. When not in use, the instrument should be kept in the case. The mouthpiece and neck should be wrapped in separate small cloths of such size that they fit snugly into the accessories compartment of the case. It should be unnecessary to add that the instrument must be handled with great care, and that it can be severely damaged, even though it is in the case, if it is bumped or dropped.

Since most saxophones are now lacquered, there is no problem of polishing. Wiping with a slightly damp cloth is all that is necessary. Dusting under the keys and rods can be done with an ordinary feather or a yarn-type clarinet swab. Keeping the instrument free from dust will prolong the useful life of the pads and will keep them seating properly. For cleaning the interior of the body and neck, a Sax-Swab is recommended.

A trip to the repair shop for inspection and adjustment should be made once a year, even though there are no apparent difficulties. The repair specialist will detect any pad wear and make the required replacements before they are worn through. The student should not attempt to adjust or repair his instrument, as this demands expert knowledge and skill. Often the “do-it-yourselfer” ends up in the repair shop with a higher bill than would have resulted had the instrument been taken there in the first place.

Sometimes a pad will stick because of a combination of moisture and dust forming in the pad crease. When this happens, place one thickness of a clean handkerchief or a thin cloth under the pad, close the key with gentle pressure, and, while holding the key down, pull the cloth back and forth a few times. A small packet of Sight Savers (eyeglass cleaners) is also fine for this purpose. All of the pads should be cleaned in this manner about once a month. If a pad persists in sticking, it should be replaced with a new one. The G♯ key is the chief offender due to the fact that it is opened by spring tension, and not by the pressure of the finger. Many players make a habit of lifting the G♯ plate before playing, to make sure it has not sealed.

Some people have a great amount of acid in their perspiration, which will eat away the lacquer on the instrument. While this is annoying, it has no effect on the playing qualities of the instrument. Wiping the keys and body of the instrument after each playing will retard this action.

A tiny drop of oil on a toothpick should be applied to all the friction points every six months. The excess must be wiped off immediately after each point is touched, since key oil spreads easily. Extreme care must be taken to prevent any oil from touching the pads, since it will ruin them.

The saxophone is a finely built piece of precision machinery, and should be treated as such. Common sense in the care of your instrument will keep it in top playing condition, prolong its life, and contribute to future playing pleasure.

THE MOUTHPIECE

The search for an ideal mouthpiece will continue as long as wind instruments are used, and it should be understood that no cure-all for your problems can be found. Our aim is to get started in the right direction. At one end of the pole we have the "mouthpiece-itis" sufferer, who spends more time changing mouthpieces than practicing; at the opposite end, the person who is afraid to try anything new or different. Somewhere between these two viewpoints lies the practical approach to this problem.

Just a few of the factors which prevent the use of an identical mouthpiece by all saxophonists are the differences in: (1) the shape and musculature of the face, (2) the bony structure, (3) the teeth, and (4) the size and thickness of the lips. Add to these the varied individual tonal concepts and the various styles of playing, plus demands of many different types of engagements. In spite of the apparent confusion, certain physical principles, which should be considered in the selection of the correct mouthpiece for each individual, are involved in the construction of all saxophone mouthpieces.

The mouthpiece that is supplied with a standard instrument should suffice for the beginner, until his own individuality asserts itself. These mouthpieces are usually of medium facing and chamber, which is desirable for the new student. If there is any reason for a change, the teacher or an experienced saxophonist will be able to discover this immediately. Young students should not run to the music store and purchase a new one unless they have specific instructions as to both make and facing. Much money is wasted by the uninformed in selecting a mouthpiece for its color, material, outside shape, the fancy wrapping, or some other sales gimmick. Often this purchase is exactly the *wrong* one for him, and will do more harm than good. Another trap to avoid is the buying of a mouthpiece because some well-known personality uses "facing X42D of the Shotgun Special." It is just as logical to assume that every little leaguer in the country should go out and buy a bat of the same weight that Babe Ruth used! The mouthpiece is one of the most important elements in the building of an embouchure, and should not be treated casually. It is not a gift that your aunt should buy you for Christmas, unless she has obtained the exact specifications from an expert who is acquainted with the musical status of the prospective user.

THE MATERIAL

Saxophone mouthpieces are made of hard rod rubber (ebonite), glass, metal, and plastic. Each of these has slightly different properties related to manufacture and results. A preference as to material used is up to the individual, and the advantages of each are a matter of controversy. Mouthpieces of various materials which have exactly the same dimensions, including the chamber and outside measurements as well as the facing, play very nearly the same. The feel of the various materials undoubtedly has a psychological effect on the player, but it is difficult for the listener to differentiate between them if the dimensions are the same.

The glass mouthpiece for saxophone is more or less a rarity at present, although it has many adherents among clarinetists. It is quite fragile, and a slight bump on the tip may cause it to chip. Its chief structural advantage is the permanence of the facing.

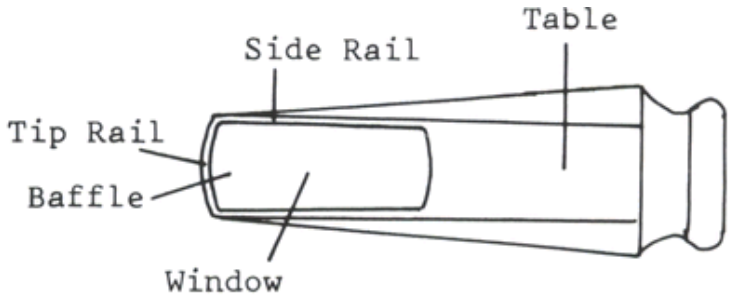
Metal mouthpieces have the advantage of ruggedness and can be tooled to fine tolerances. The outside dimensions can be made smaller, since metal need not be very thick to have the necessary strength. This is an advantage to tenor and baritone players who have a small mouth and prefer the feel of a smaller mouthpiece.

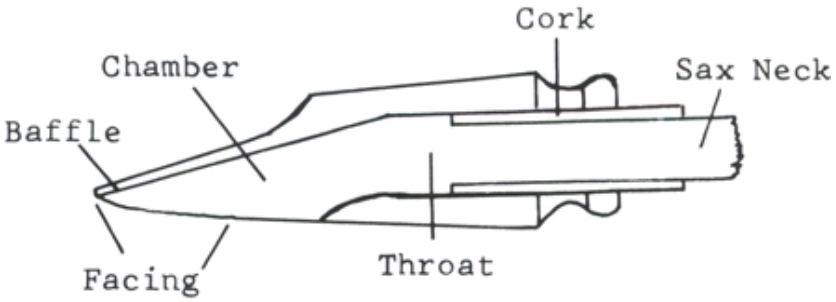
Plastic has proved to be a good material and is in wide use. The quality has been improved, and it no longer has a tendency to crack. Plastic has a high degree of permanence and strength, and is popular in student mouthpieces, where ruggedness and precision are required at low cost.

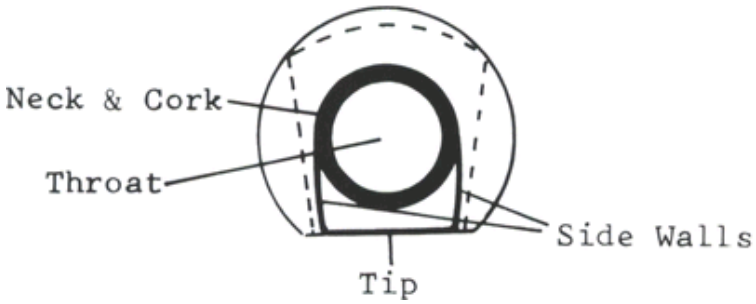
The rod rubber, or ebonite, mouthpiece, which has been the standby for many years, is still universally preferred. It can be refaced and tooled easily, will not crack under ordinary circumstances, and is permanent in holding a facing, if not misused. The tip and facing will be injured if bumped or dropped, and it should always be handled with care.

All mouthpieces should be wiped dry with a soft cloth after each use, both inside and out. They can be washed in soap and lukewarm water—never hot water—at regular intervals. Regular washing is important not only because of the obvious fact that an unclean mouthpiece is an excellent breeding ground for

germs but also because a calcified sediment, which is almost impossible to remove, collects in the inside chamber and changes the inner dimensions.







THE SAXOPHONE MOUTHPIECE

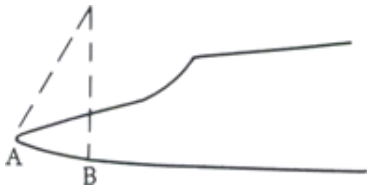
THE DESIGN

Mouthpiece design is a matter for serious consideration, since its dimensions and shape have a definite effect on tone quality, pitch, volume, equality of registers, flexibility, and ease of playing. A knowledge of the factors that control these aspects of tone production is helpful in the selection of a satisfactory mouthpiece. Tone quality has its birth in the inner chamber of the mouthpiece, with the reed and mouthpiece acting as the generating mechanism. This mechanism sets up the relationship of the fundamental tone to its various partials, which affects the nature of the tonal quality.

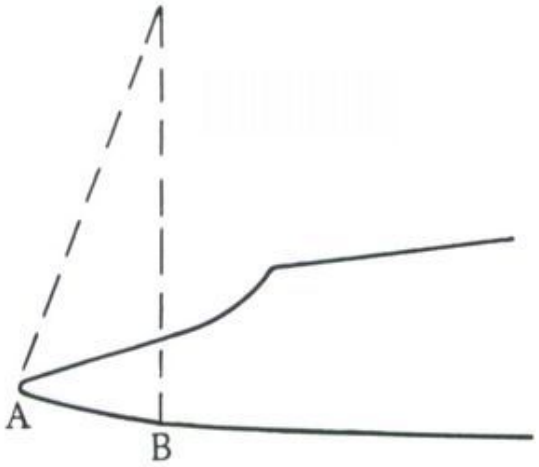
It might be well to clarify "medium facing" before proceeding. The accepted usage of this term defines the measurements with which *most* saxophonists can get the best results. This has been determined by trial and error, which does not imply that it is the perfect design, but only a starting point from which the discriminating musician can proceed. With this in mind, we will discuss the factors which control the performance of a mouthpiece.

1. *The Facing.* The shape of the curve which leaves the flat table of the mouthpiece. Its extent controls the distance between the tip of the reed and the tip of the mouthpiece, known as the *tip opening.* The distance from the tip to the beginning of the curve is known as the length of the facing. The long facing induces biting, as more pressure is needed to close the reed to the point where it will vibrate. It requires a shorter bite and a soft reed, which weakens the high notes. The *short facing* reduces embouchure control and flexibility. The tone is thin and the low tones are inclined to break. It is comparatively easy on the embouchure, but lacks dynamic range. The *wide tip opening* makes soft playing difficult, the tone coarse, and gives a false sense of volume. A soft reed is required unless the embouchure muscles are powerful. *The narrow tip opening* requires the use of a harder reed, produces a thin tone, and the high register is apt to be sharp. The general consensus seems to be that the curve of the facing should be the arc of a perfect circle. This view is supported by scientific findings, discussed in the chapter on reeds, which indicate that the reed actually closes the tip opening. The following diagram, shown to illustrate this principle, emphasizes

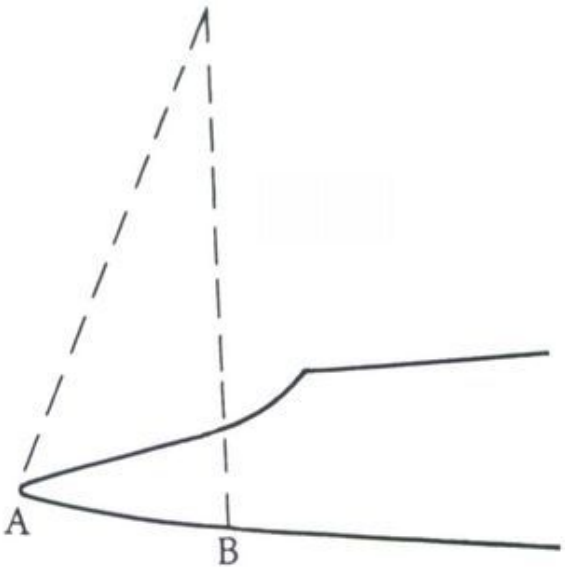
the point that an infinite number of facings can be produced by moving the axis of the arc.



Short



Medium



Long

2. *The Baffle*. The portion of the mouthpiece directly back of the tip which receives the first shock of the vibrations as they leave the reed. A *high baffle* leaves little space at this point between the reed and mouthpiece, and reinforces the upper partials, giving an edge or buzz to the sound. It is likely to be the cause of squeaks. Tone projection is good, but quite rough. The *low baffle* produces a dark, dead sound that lacks carrying power. It creates resistance too close to the tip of the reed and is hard to blow.

3. *The Tip Rail*. The broad rail might be described as a defensive device. It is excellent for soft playing but incapable of projection, emits a pure sound with an absence of higher partials and no edgy quality, but has very little flexibility. *The narrow rail* is a dangerous one, and is probably the main cause of chirps or squeaks. The reed must fit perfectly since the narrow rail offers so little resistance that it is difficult to control. Fine for a buzzy type of projection, and sometimes used by those who are willing to risk an occasional squeak to produce this type of sound. It should be used only by an experienced player.

4. *The Chamber*. This is the primary resonance chamber of the tone. While the facing is of great importance, it is axiomatic that a well-designed chamber will produce good results with any reasonable facing. A small chamber leading directly into the mouthpipe will give more volume and more edge to the sound than a large chamber. Straight side walls allow for more of the higher partials;

curved side walls produce a more mellow tone. There are so many shapes of the inner chamber that it is impossible to make valid generalizations.

The selection of the ideal mouthpiece for you is a difficult and lengthy process. It is best to start with the so-called *medium* or standard type mouthpiece. As your ability on the instrument improves, your style and taste will take definite paths. Moderation and caution is urged so that you do not have to retrace these paths. Bad habits or conditions resulting from improper procedure can be long and costly in their correction. A mouthpiece that is too radical can set your playing back more than you imagine. Consider the case of a young person who, in his early stages of playing, purchases a long, open facing. The only way he can get the upper notes is by biting, and he has to drop his jaw considerably to produce the low tones. Soon this becomes a habit which may take years to correct, even though he has changed to a more moderate type of mouthpiece. This type of situation is not unusual, as any experienced teacher will bear out. The self-taught student is prone to bad habits, but some of them can be eliminated through the use of a moderate or “medium” type mouthpiece.

MISCELLANY

Refacing a mouthpiece will not change its tone quality to any marked degree. It may make playing easier and thus have a psychological advantage for the user. The tone quality depends largely on the mouthpiece chamber and the baffle. A good refacing job will also include the tip rail and the baffle.

***

Use of a rubber pad on the top of the mouthpiece eases the vibration through the teeth, which is annoying to some players. It also opens the mouth more and makes the tone more mellow.

***

If the mouthpiece is too high, it can be cut down carefully with a fine file and repolished. Care must be exercised so that you do not go all the way through. It is best to have a repairman do this for you.

***

It has been the hope of most saxophonists that mouthpiece manufacturers would standardize the system of marking the facings, so that they would have some semblance of meaning to the uninitiated. This, even if approximate, would eliminate some of the confusion. At present it is impossible to sort out the meaning of some of the hieroglyphics pertaining to facings and tip openings.

***

If you are comparing mouthpieces, be sure to tune each one separately. Some mouthpieces are longer than others, and require a different placement on the cork.

***

The basic principle of mouthpiece construction is the same for the entire saxophone family. However, because of the differences in mouthpiece size, you need not always use the same facing and make of mouthpiece if you are doubling.

***

Remember, any mouthpiece will do only so much for you. It will not compensate for a poor embouchure or insufficient air support.

THE REED

The principal task of the reed is its function as an air valve which opens and closes on the mouthpiece at various speeds. The rate of speed, or *frequency*, of this operation controls the pitch of the tone and is governed by the size and shape of the body of air it must set in vibration. A large air chamber will vibrate slower than a small one, since it creates a greater work load on the reed. The steady pressure of the air column in front of the reed is converted into a series of short spurts of air as it passes through the mouthpiece tip, somewhat in the following manner: Considering the formidable task which confronts this small piece of cane, it is not surprising that so much effort must be expended in reed selection and adjustment, since the reed is the only moving part of the generating apparatus for saxophone tone production.

The reed changes its rate of vibration with every new pitch and vibrates at the same frequency as the pitch of the tone; i.e., if A-440 is played for one second, the reed goes through that number of complete cycles, give or take one percent, according to research on this subject. In addition, the reed must be so versatile as to alter speed quickly and efficiently on each new tone, vary amplitude on every change of volume, start and stop with each articulation, plus having the characteristics necessary to produce the best possible sound. It would be interesting, with the aid of an electronic computer, to calculate the number of motions a single reed goes through during a 90-second rendition of "The Flight of the Bumble Bee!"

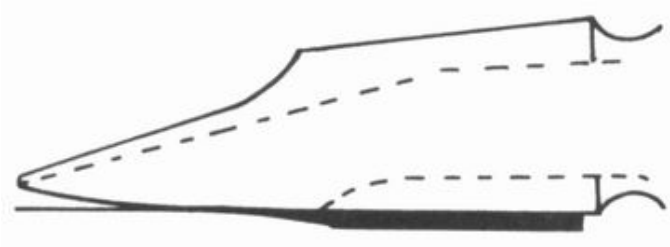
In April, 1941, the *Journal of the Acoustical Society of America* published an article by two physicists, C. S. McGinnis and C. Gallagher, who had succeeded in photographing the time and motion of a single reed while in the process of tone production. The results of this experiment showed the reed functioning as a valve which emits "puffs" of air into the instrument, and also forms an *air tight seal during half of the time of each vibrating cycle.* To quote from this article:

> "The motion of the reed during the complete cycle is of interest. Consider the chink is just on the point of closing. With the aperture closed, the reed appears motionless to the eye for about half of the time of the complete

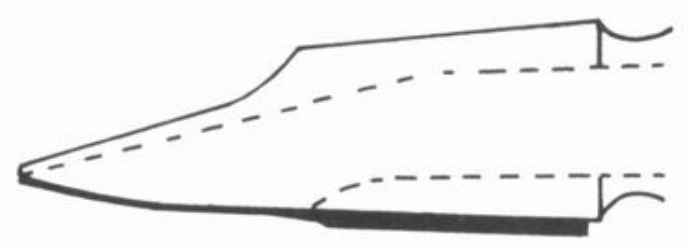
> cycle. It then leaves the mouthpiece with relatively high velocity and reaches its position of maximum displacement in a series of short spurts. The time spent motionless at maximum displacement is roughly a quarter of the fundamental period. The tip of the reed now returns to the mouthpiece in a series of short spurts, and the fundamental cycle is complete. Thus, the actual motion of the reed occupies only about a quarter of the period."[1]

This scientific evidence of the reed's action is a major contribution to both our general knowledge and to the methods of procedure in fitting and shaping the reed to the mouthpiece. The importance of these findings lies in the fact that the reed must close along the *facing* as well as the *tip* of the mouthpiece, and that both sides must seal simultaneously. This explains the need for "balancing" the reed along the curve of the facing, so that the reed will curl around the facing with a sealing effect.

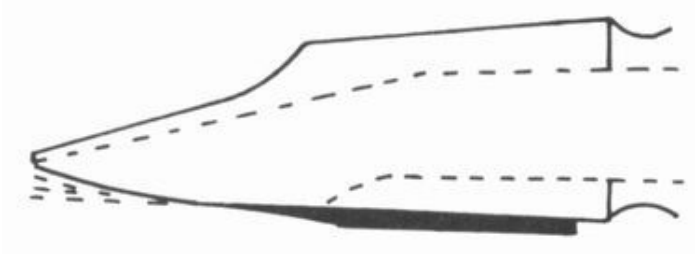
Practically all saxophone reeds are made from cane. While other materials have been tried and marketed, the lone survivor at present is the plastic reed, which is in limited use. The main value of the plastic reed is its durability, but it has neither the tone quality nor the flexibility of a good cane reed. Continued experimentation may one day produce a material which will have both the musical possibilities of a cane reed and permanency. This indeed will be a historic event for all single and double reed instrumentalists! Until this pot of gold lies at our feet, we must commit ourselves to coping with the reed problem in the best manner possible.



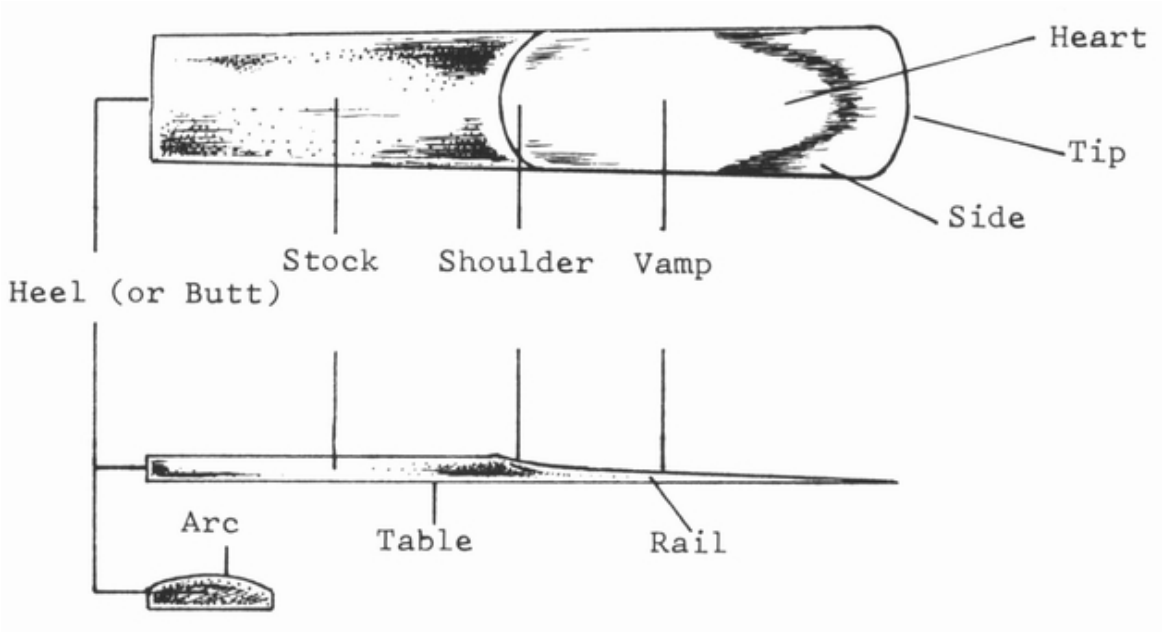
Time open—25%



Time closed—50%



Time in motion—25%



PARTS OF THE SAXOPHONE REED

The finest cane comes from an area known as the “Var” region, which lies along the Mediterranean coast in southern France. Attempts to grow reed cane in Spain, Italy, Mexico and California have been discouraging—just why has not been satisfactorily explained. Fifteen to twenty years are required from the planting of the cane to its peak of maturity. Plants transplanted from France to other areas do not have the same quality, so most efforts in this direction have been abandoned. Cane, like wine, has its good and bad years, depending on the weather, and there is no assurance of uniformity.

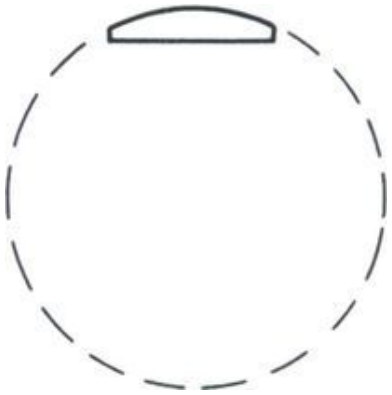
SELECTION OF THE REED

Most saxophonists use commercially made reeds. While a few players are commendably making their own, the practice is not widespread. For those interested in pursuing this subject, I highly recommend the *Handbook for Making and Adjusting Single Reeds* by Kalmen Opperman (New York: Chappell and Company).

Commercial reeds are ordinarily packaged in boxes of 12 or 25, with the reed strength marked on the box. Once the desired strength and make is determined, it is preferable to buy them by the box rather than selecting a few at a time, for the open package may have been picked over and the best looking ones removed. Many dealers refuse to allow reeds to be examined by the young student, but will merely hand him one or two from the top of the box. Since reeds are unpredictable, this is often a disappointing situation. Students and parents should realize that a percentage of reeds bought simply do not work, whereas others that seem to play well at first have a short life. A few suggestions may improve your batting average in choosing playable reeds:

1. Purchase only standard make reeds such as Vandoren, La Voz, Roy Maier, Vibrator, Selmer, or Ciccone.
2. Select a medium or medium soft strength until you determine what is best for you. Grade markings are not uniform for all brands, so seek advice in this matter.
3. A reed that is slightly hard will usually weaken after a short period of playing, so be wary of the reed that blows easily at first.
4. If you have the privilege of selecting reeds from the box, look for a fine-grained reed with straight fibres that run all the way to the tip. Beware of dark streaks in the grain of the cut part. These can be seen by holding the reed up to light.
5. Dark flecks in the smooth bark of the reed are no indication that the reed is poor. These spots are normal in the bark of the cane, and this condition is preferred by many reed players. However, if there are dark pits in the vamp or table, reject the reed.

6. A slightly golden or cream color in the vamp of the reed is a sign of good seasoning. Beware of a green cast or a brown shade.
7. When you find an off-color reed in a box which has been purchased, do not immediately throw it away. It just *might* work, and you have nothing to lose.
8. Look for an even taper on both sides, with greater thickness in the center, the dark shadow blending into light in the form of an inverted U.
9. The shoulder of the reed should break away from the stock uniformly on both sides. A cut that is off-center indicates wrong size or out-of-round cane that should have been rejected by the manufacturer.
10. Examine the shape of the arc on the butt of the reed. This indicates the size of the stalk from which the reed was cut. Neither a high nor a flat arc will produce satisfactory results.



Flat arc—cane too large

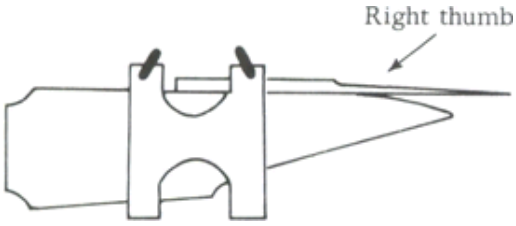
Medium arc—correct

High arc—cane too small

REED CANE

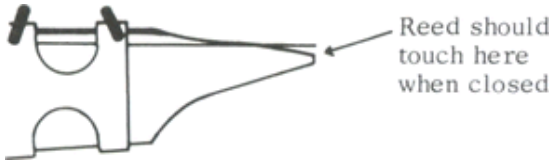
Reed cane is composed of a series of small hollow tubes known as fibres which run lengthwise and are held together by a softer pithy substance that absorbs moisture and forms the bed on which the fibres vibrate. Reeds will last longer and play better if given proper care. The chemicals in human saliva react on the soft inter-fibre structure and upset the proper relationship between the hard and soft materials. This ultimately results in the reed wearing out. This deterioration can be postponed if the open ends of the tubes are sealed by polishing the vamp of the reed, forming a hard surface that protects the soft pithy material from excessive moisture. Massaging this area with an improvised tool (such as the back of a teaspoon or the handle of an automatic pen or pencil) until the vamp feels hard and smooth is an effective method of producing this seal. Some saxophonists use the thumb and forefinger to stroke the vamp of the reed toward the tip.

Never handle the reed by the tip. This is the most common cause of reed injury, and often occurs during the placement of the reed on the mouthpiece. The ligature should be loosely put on the mouthpiece first, then the reed slipped under the ligature and adjusted on the mouthpiece.



Hold the mouthpiece and ligature in the left hand. Slide the reed in position with the right thumb.

The reed should be well centered on the mouthpiece table and facing with the tip adjusted so that, when in closed position, it reaches the point where the mouthpiece breaks to the facing.



The ligature should be tightened only enough to hold the reed in place properly. Too much tension tends to stifle the vibration. When removing the reed, loosen the ligature first and slip the reed from under it, in the direction of the tip.

Sometimes a reed will wave or curl at the tip when it is remoistened, but will straighten out again in two or three minutes. This is caused by the soft material between the fibres absorbing moisture at varying rates, and has nothing to do with the reed's quality. It is a good plan to have three or four playable reeds on hand and alternate the use of them, since this prevents their becoming water soaked. The flat side of the reed should be placed against a flat surface when it is not in use. There are several good reed holders on the market, such as the Maier "Reed Guard," which are very satisfactory. Do-it-yourselfers can easily make one out of a piece of glass and a wide rubber band. The glass should be ground on the edges for safety.

Deteriorating reeds may be restored somewhat by soaking them overnight in a 3% solution of hydrogen peroxide, which is available at any drugstore. The reed should then be rinsed with water and left to dry before using. *A very light* scraping with a knife or razor blade will remove much of the surface sediment that may collect on the vamp but must be done with caution to prevent changing the balance.

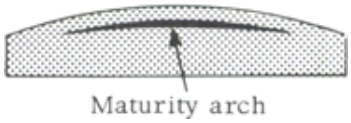
The mouthpiece cap should always be kept on when not playing even though the instrument is going to be used again soon. This habit should be developed from the first day of saxophone study.

ADJUSTING THE REED

It is useless to spend time adjusting a reed if the cane has not been properly matured, and the following simple tests can save considerable effort in this respect:

Press the thumb nail into the stock of the reed. If it resists altogether, the cane is old and overcured. If it feels soft and marks easily, it is still green. A light mark that has a springy feeling indicates properly aged cane.

Another excellent test involves recognition of the "maturity arch."



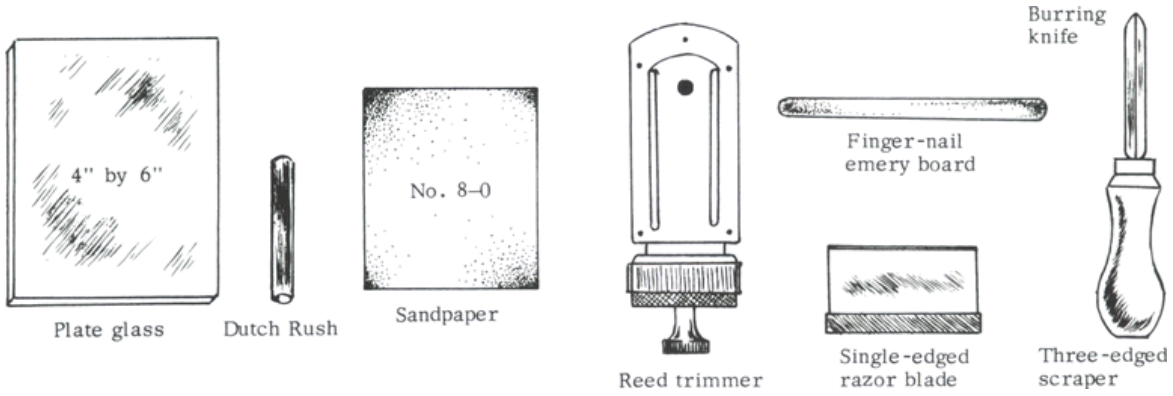
Properly cured cane will develop a dark streak just below the stock when the butt end is immersed in about an inch of water for a few minutes. This streak should be brownish-orange in color. If it has a green or yellow caste, or if there is no streak at all, the cane is not ready for adjustment, and should be put away for a year or more before retesting. It is wasteful to throw these reeds away, as they may turn out to be your "pets" when properly aged and adjusted.

If, after wetting the butt of the reed as described above, you blow on the butt end, small bubbles will appear along the vamp of the reed. These bubbles should not be large or profuse, as this indicates a reed that is too porous. One must be reminded, however, that the large reed will have bigger tubes than the small reed. It is a good idea to select a reed that resists the passage of air through its tubes, but does not completely close it off. A little experimentation as to the proper amount will prove helpful. These tests work with *new* cane only. A minimum list of tools necessary for saxophone reed adjustment includes:

1. *A piece of plate glass* about four by six inches. The edges should be ground smooth to prevent cutting the hands.

2. *A reed trimmer*. This should be selected with care, for in the long run it is more economical to purchase the best obtainable. The shape of the cut must match your mouthpiece tip. If there is any indication of a ragged edge in the cut, the trimmer should be rejected. It is a good idea to take some old reeds and your own mouthpiece to the store to determine a matching shape of cut.
3. *A scraping or "burring" knife*. This can be obtained at a jewelry supply store, and is a three-sided piece of smooth, tempered steel, tooled with sharp edges for scraping. The shape of the edge prevents gouging the cane. A satisfactory substitute can be made at home by purchasing a small three-cornered file with a wood handle. The sides are then ground smooth and finished by hand on a stone.
4. *Dutch Rush*, for finishing and sensitive alterations. This can be found along streams and marshy lands in certain parts of the country. It is quite inexpensive, and uniform quality is assured if it is purchased from a wind instrument supply house.
5. *Number* 8-0 *Sandpaper*. A few sheets will last a long time.
6. A *single-edged razor blade*.
7. *Fingernail emery boards.*

If a reed is reasonably playable, the finer balancing and adjusting should be postponed until the cane has gone through a "breaking-in" period. Cane changes its character rapidly when first used, and an adjustment made before it is properly broken in may be difficult to correct later. The suggested procedure is to use the reed only a short time at its first playing, then set it aside for a day. Try playing for a little longer on the second day and on successive days until you feel that the cane has stabilized its character. Usually the reed will be softer after the first few playings, but this does not always follow. (Sometimes it will become stiffer!) It is presumptuous to assume that specific directions can be given for solving the reed problem, since it is a matter of trial and error for each individual, which may seem mostly error at first. Much can be learned over a long period of time, however, and if one considers his first efforts as part of his schooling, he will be rewarded.



MINIMUM TOOLS FOR REED ADJUSTMENT

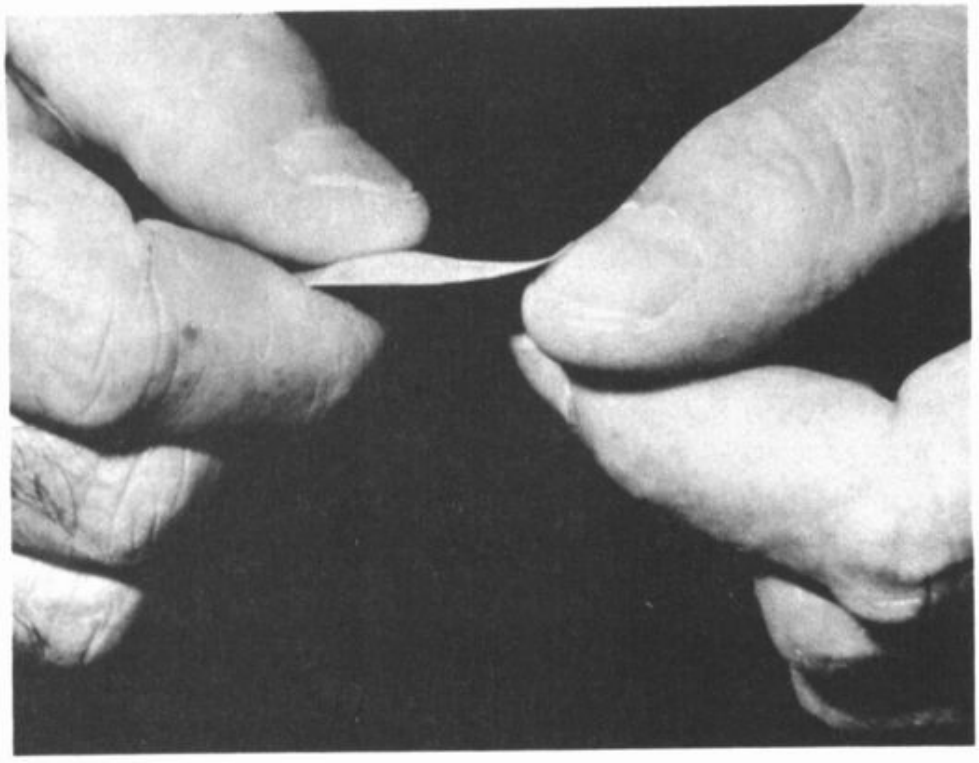


FIGURE 1

FIGURE 2

A preliminary test for flexibility and balance may be made by pressing the reed lightly against the thumb nail and sliding the nail over the tip portion, as shown in Fig. 1, above. Then check the balance of the two sides with the forefinger, as indicated in Fig. 2.

REED TOO SOFT

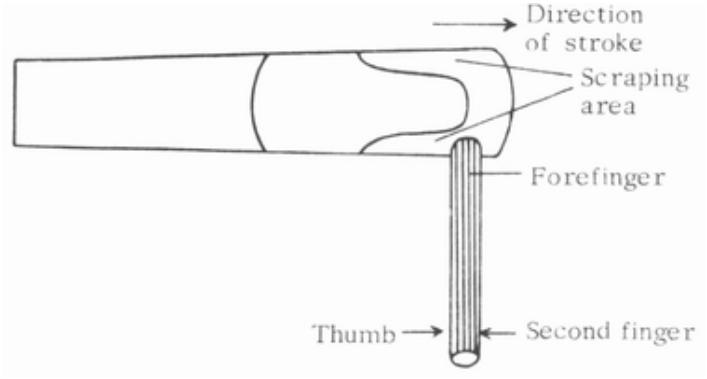
The first thing to do is clip the reed, taking off a very little at a time and testing after each cut. Moisten the reed thoroughly before clipping, and make sure that it is centered properly. Most clippers have a spring which holds the reed, but in some the reed must be held by hand. If the latter is true, be sure that the grip is firm as you press the cutting lever. Haste in this procedure often ruins the reed; it is easy to take a little more off the tip of a reed, but impossible to add. One should also bear in mind that each clip shortens the vamp of the reed, so there is a point at which further clipping is useless. Usually about one-sixteenth of an inch is the limit that a reed can be trimmed successfully.

After the reed has been clipped, the corners should be rounded and the curve adjusted to the mouthpiece. For this, use the emery board, stroking very lightly toward the center portion of the reed. Proper shaping in this area will improve the chance of perfect balancing. If the reed is strong enough so that no trimming of the tip is indicated, it is still desirable to match the tip to the mouthpiece before the balancing adjustment is started.

After a reed has been in use for a long time and starts to become soggy, it may be improved temporarily by trimming, but usually the cane has lost much of its resiliency and any rejuvenation will be short lived. The purchase of a proper strength reed will eliminate the necessity of radical adjustment, and save much time.

REED TOO STIFF

A reed that seems too stiff may be stronger on one side than the other, so it is possible to have a reed with the desired strength on one side only. This type of reed will feel hard to blow and should be balanced. It can be checked by turning the mouthpiece in the embouchure so that only one side of the reed will vibrate, then alternate to the other side. When both sides are nearly the same, but too stiff, then a general adjustment should begin. If one side of the reed blows harder, this should be balanced before carrying the adjustment further. A look at the tip in front of a strong light will indicate just where the thinning should begin. Dutch Rush is best for balancing the tip and sides of the reed. Before using, soak the end portion of the rush in water until it is pliable; then pinch one end together and cut it off with scissors or a razor blade. Use the flattened end of the rush over the forefinger, making sure that the fibres run at a right angle to the reed, as in the following picture.

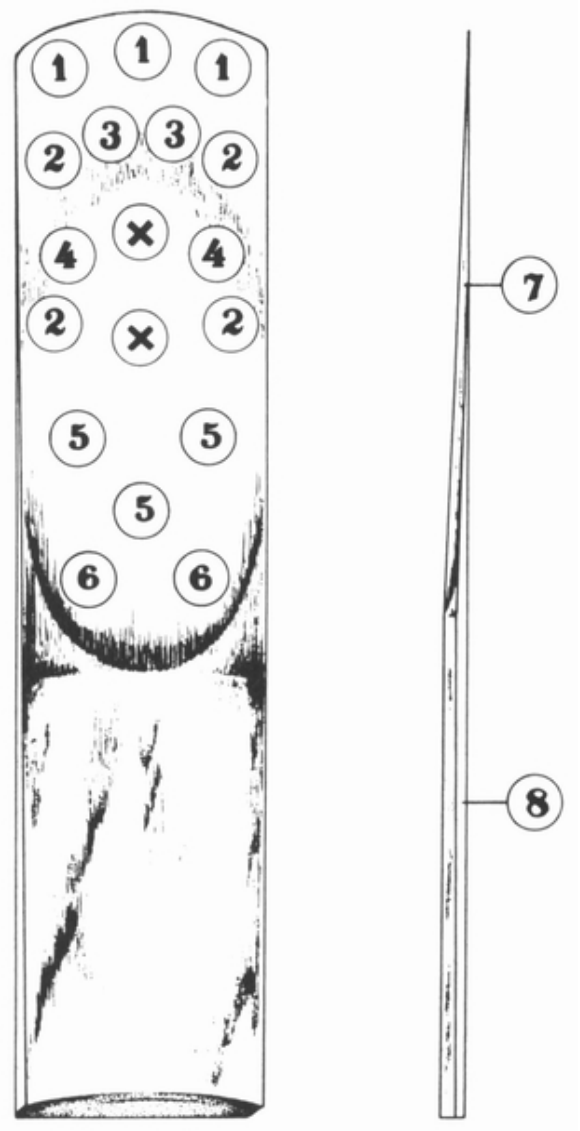


POSITION FOR USE OF DUTCH RUSH

Always stroke in the direction of the tip, but leave the thinning of the extreme end of the tip until last. In balancing, the portion of the reed to thin is from

approximately five-eights of an inch to one-eighth of an inch from the tip. Shade the cut from the center to the sides so that the heart of the reed is not disturbed. The heart is the start of the resistance area and should rarely be touched. The reed should always be balanced correctly before this area is considered.

If the reed is still too stiff after balancing, scrape lightly with the burring knife along the sides of the vamp. If this does not accomplish the purpose, take a little off the entire vamp of the reed, but *very lightly* over the heart. It must be graduated evenly from the center to the sides of the vamp toward the tip. If a light spot appears in the heart of the reed, the best thing to do is throw the reed away—its "heart trouble" was fatal.



Fault	Area	Tool	Remarks
Too soft	Tip	Trimmer	Clip small amount. Test after each clip.
Buzzy or edgy	Tip	Trimmer	Same as above.
Lack of resonance	1 & 2	Dutch Rush	Balance.
Dull sound when playing softly	1 & 2	Dutch Rush	Balance; take more off both sides if still too hard.
Blows hard	2	Dutch Rush	Thin both sides and balance.
Lower register lacks resonance	2	Dutch Rush	Balance and thin if necessary.
Tip too thick after clipping	Under side of tip	Sandpaper	Lay sandpaper on glass and stroke lightly with grain on the flat table side of reed to about 3/8 inch back from tip.
Reed whistles	2	Dutch Rush	Balance.
High tones hard to attack softly	2 & 1	Dutch Rush	Thin gradually with light stroke.
Thin high register	3	Dutch Rush	Test after each few strokes.
Lacks projection in upper register	3	Dutch Rush	Move 3 back from the tip. (This may shorten the life of the reed.)
Lack of resonance in middle register	4	Dutch Rush	Lightly on 3 also.
Heavy low register	6	Scraping knife	Finish with Dutch Rush.
General lack of resonance	7 & 8	Sandpaper on glass	Sand rails of reed if reed is too wide for mouthpiece.
After balancing, reed plays well but blows hard	6-5-4-3	Scraper	Thin evenly all indicated areas.
Table not flat	Table	Razor blade	Stroke lightly towards tip.
Table not smooth	Table	Sandpaper on glass	Rub lightly back and forth, always in the direction of the grain.

REED ADJUSTMENT CHART

Sitting—front

Standing

Sitting—side

THE PLAYING POSITIONS

PLAYING POSITION

Posture and instrument position, often ignored aspects of wind instrument study, play important roles. The saxophone must be considered as a part of the performer, and an intimate and comfortable physical association creates a more unified feeling for the musical performance. When the body assumes a tense attitude during a lengthy rehearsal or practice period, the resultant discomfort retards both the mental and physical aspects of musical progress. A relaxed and efficient playing position leaves the performer free to concentrate on the artistic and technical problems involved.

Weight and balance dictate the manner of holding the instrument, which is determined by: (1) the size of the instrument; and (2) the size of the player. In considering the various types of saxophones, the *soprano* is always held in front, out from the middle of the body (in much the same manner as the clarinet or the oboe), except that the bell of the instrument is farther away from the body. This is dictated by the more horizontal position of the saxophone mouthpiece, which is at an approximate angle of 45 degrees as compared with 30 degrees for the clarinet. The *tenor* saxophone is best held against the body at the right side. In the case of a small player, the right hand may be as far back as the hip, but as he grows and his arms lengthen, the instrument should be pushed forward gradually. This situation also requires an alteration of the head position in order to maintain the same angle of the mouthpiece. *The baritone*, while sometimes held with the neck strap, is more comfortable when supported by a sax stand, which carries the entire weight and also positions the horn at the correct angle. The *bass* saxophone must be played from the sax stand, as it is much too heavy and cumbersome for a performer to hold. The *alto* seems to be the wrong size for generalization, and the holding position must be governed by the size of the individual. An adult usually holds the instrument in front, whereas a smaller person must use the side position. The length of the arms is a determining factor when one decides on his particular placement. If the arms are comfortable and the mouthpiece angle is correct there is no particular reason for concern.

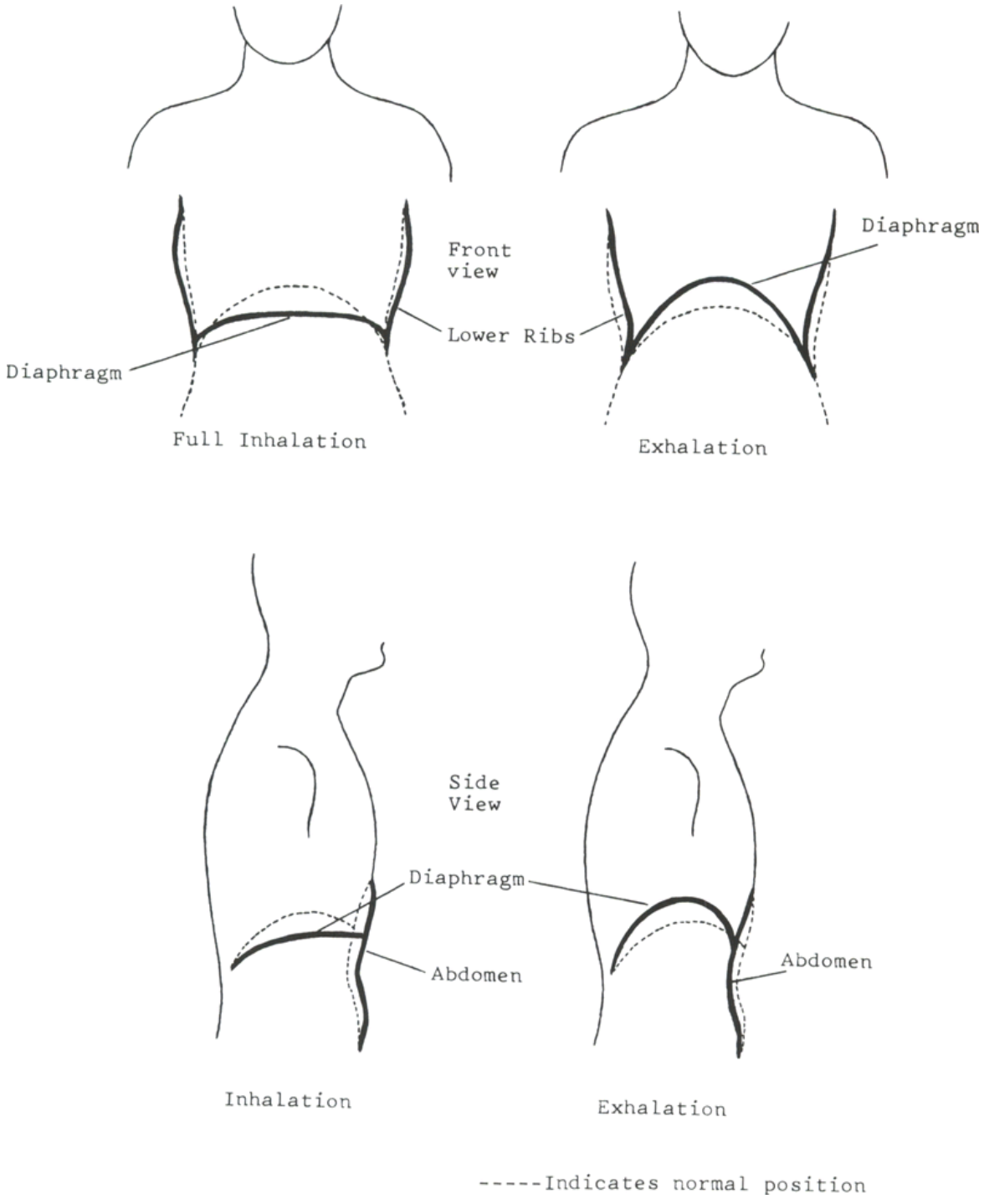
Good posture, both sitting and standing, should not be neglected. The head should be erect and the back straight, but avoid a stiff, military appearance. Keep both feet flat on the floor when sitting. When standing, distribute the weight of the body equally between both feet, which should be spread slightly for stability and balance. The neck strap should be adjusted to support the entire weight of the instrument, eliminating any possibility of stress on the hands and arms. The hands must steady the saxophone but should not support it.

The angle of the head in relation to the music rack should be considered. A great number of students form the habit of looking at the music out of one eye, owing to crowded rehearsal conditions that prevent placing the music stand directly in front of the player. When two (or sometimes three) people are forced to use the same music rack and at the same time watch the conductor, in addition to sitting in chairs that must be kept in a straight line, it is not surprising that incorrect position and poor posture result.

Points to bear in mind in the establishment of a good playing position are:

1. Stand or sit erect, but relaxed.
2. Keep both feet flat on the floor.
3. Place the music rack so that when looking straight ahead the music can be read clearly with either eye.
4. Adjust the neck strap so that it supports the weight of the instrument.
5. Hold the saxophone at the side or in front, depending on the size of the instrument and its relation to your body and arms.

Tone quality, intonation, technique, and interpretation are affected if the playing position causes discomfort. While just “getting comfortable” will not solve all the problems, it will set up a condition which encourages alertness, and a physical climate conducive to improvement.



POSITION OF THE DIAPHRAGM, ABDOMEN, AND LOWER RIB CAGE DURING THE BREATHING PROCESS

THE BREATHING TECHNIQUE

Breathing is such a natural function that it is apt to be taken for granted. Under ordinary circumstances the respiratory organs adjust their activity to the needs of the human body in an efficient and unassuming manner. Conscious use of the breathing apparatus is a non-normal situation. If we consider the year-old child who attempts to blow out the candle on his first birthday cake, we will note that there is no concept of blowing, and that he has to be taught this skill, just as he has to be taught to walk and talk. Any use of the respiratory apparatus for activities which are beyond the scope of supplying the blood stream with the correct amount of oxygen requires a conscious effort, and this is a most important element in the field of wind instrument playing.

The nature of a musical sound involves uniformly vibrating waves in the air which exert pressure on the human ear. Creating these waves requires the use of a device which will in some manner start the air in motion at the desired rate of speed. In the case of the piano, the vibrating medium—the string—is struck with a felt hammer. Stringed instruments are either plucked or bowed. The use of the bow allows the tone to be sustained, since it keeps the string vibrating at a uniform amplitude, whereas a string that is struck or plucked will have its greatest volume on the initial impact, followed by a gradual diminuendo. Brass players set up a lip vibration by forcing an air stream through a small opening in the lips. Reed instruments are divided into two categories. The double reeds, such as oboe and bassoon, have two small pieces of cane vibrating against each other. The single reeds, saxophone and clarinet, have one reed vibrating against a solid surface, i.e., the mouthpiece. The air stream which sets this reed in motion is as critical to its correct performance as is the carburetor in an automobile to a smoothly-running motor.

Anyone who has observed the practice methods of student violinists is well acquainted with the emphasis and time spent in the development of proper bowing procedures. The importance of this phase of violin playing continues throughout the life of the serious violinist. A fine performer draws the bow slowly with proper tension and produces a beautiful tone, whereas the novice uses much more bow length with a scratchy, unmusical result. The preceding applies directly to the saxophone, as the air stream is the saxophonist's "bow." Too often, young musicians will attempt to play for several years without giving serious thought to the method and control of the air stream, and this void in their training can be the cause of many musical frustrations. The player blames the mouthpiece, the reed, and (most of all) the embouchure. All of these are very important, but they all depend directly on the air stream for their successful operation. They will in no

case function properly if the breath is unable to activate the vibrating medium in a controlled manner.

It is questionable whether the Creator had in mind the blowing of a saxophone when he invented that intricate machine known as man. Fortunately, he left an excess of capacity so that a human being can train the various parts of the body to operate in a tremendously versatile manner. From the standpoint of the wind instrument player, breathing cannot be viewed as a normal function. Strenuous exercise calls for faster and deeper breathing, but this still adheres to the original purpose of supplying oxygen to the blood stream. Performance on a wind instrument requires a slower, but *not uniform*, respiration rate, deeper breathing and increased pressure of the chest cavity, in addition to maintenance of the correct oxygen-blood stream relationship. If an excess of oxygen enters the blood we will become light-headed and dizzy. This can be simply demonstrated by standing perfectly still and taking fast, deep breaths continuously. Two or three minutes of this will convince most of us, but it is not suggested as a pastime!

THE BREATHING APPARATUS

The thorax, or chest cavity, contains the heart, lungs, esophagus, and trachea (windpipe). It is surrounded by the bony structure consisting of the spine, breastbone, and the ribs (costals). Between the ribs there are many small muscles known as the inter-costals, which function to expand and contract the ribs. The floor of the chest cavity is a muscular, membranous partition known as the diaphragm, that operates involuntarily and is controlled by the action of the surrounding muscles. The diaphragm completely shuts off the chest cavity from the abdomen. It is in the shape of a dome, which tends to flatten out on inhalation, but is disposed to return to its normal state. Once it has assumed this flat position through inhalation, it will force air out merely by relaxing. The intercostal muscles function differently, as they are voluntary and directly control the expansion and contraction of the ribs. The trachea is a cartilaginous, membranous pipe through which the air passes in and out of the lungs. At its upper extremity is the larynx, containing the organs which control the passage of the air through the windpipe. The uppermost of these organs is the epiglottis, a valve which directs food into the stomach and air into the lungs. The trachea divides into two branches, going to the left and right lungs. The esophagus is located behind the trachea and passes directly through the chest cavity into the stomach.

Although the use of the chest and intercostal muscles is apparent, some additional discussion of the diaphragm and its purpose might be in order. The most natural way to move the diaphragm is by pushing the abdomen forward. This is the action that takes place when we breathe naturally. Anyone who watches a sleeping person will observe that the stomach moves rather than the chest. The average person, however, when asked to take a deep breath, will do just the opposite. He will expand his chest as he inhales and push out the stomach during exhalation. This amounts to the same action as squeezing a tube of toothpaste in the middle; the back end of the tube will bulge out, and, even though some of the paste is ejected, about half of the energy is used on the dead end of the tube.

Our first task is to get the maximum amount of air into the lungs. It is a fundamental physical law that air will flow only from a greater to a lesser

pressure area. When the chest cavity is enlarged, the pressure is lowered, and the outside air rushes in. When blowing out, we raise the pressure on the inside of the cavity, thus reversing the process. This is the same principle on which an old-fashioned bellows or a tire pump operates. Posture plays an important part in an efficient breathing action. A slumped position will not allow the chest cavity to expand to its full capacity. This can be demonstrated if one pushes his shoulders back. He will immediately feel that the chest is larger, even though he has not taken in any air. The first consideration should be to develop the habit of standing or sitting erect. The chest should be held high. Then start the muscular action from the floor of the chest cavity by expanding the muscles which surround this area. Pushing the walls of the abdominal cavity forward and out to the sides is a most natural way to accomplish this. The back muscles can be brought into play also, so that an imaginary circle is expanded all around the waistline. Such expansion has but one purpose: to flatten down the dome-shaped diaphragm. This is done simultaneously with expansion of the lower chest in the quick intake of a full breath.

DEVELOPING THE BREATHING PROCESS

Changing one's breathing habits is usually a slow process, and may require patience and continued attention. In its developmental stage, breathing should be practiced away from the instrument until the action is well under control. One of the methods for establishing the movement of the proper muscles requires lying flat on the back in a relaxed manner. Inhale, hold the breath for a few seconds, then exhale. It should be apparent that the area around the stomach is moving, not the chest. A heavy weight on the stomach, such as a large dictionary, will emphasize this action. If another person will push down on the book while the inhalation is taking place, this will demonstrate the tremendous strength of these muscles. When this motion is in control, gradually start filling the lower and upper chest, in that order. The entire procedure works better at first while in a supine position, and points up the fact that the full breath is an action which involves the entire torso rather than just the upper chest area.

When one is adept at the process of breathing outlined above, then he should practice while standing erect, first with a light breath and gradually working into a full breath intake. A short time lapse between inhalations is suggested, so that the blood is not overloaded with oxygen. If any dizziness is felt, it is time to take a short rest. Another helpful exercise for gaining control is alternating the area of the intake. Put the hands on the abdomen and inhale in the upper part of the chest only, keeping the abdomen stationary. Then try the reverse, with the hands on the upper chest. Also, expand the lower chest without moving the upper chest or abdomen—a more difficult feat, but excellent practice. This points up the desirability of complete control of all the factors which make up the correct breathing process.

It has been the author's observation that many fine performers like to walk. This is a healthful way to relax and practice breathing at the same time.

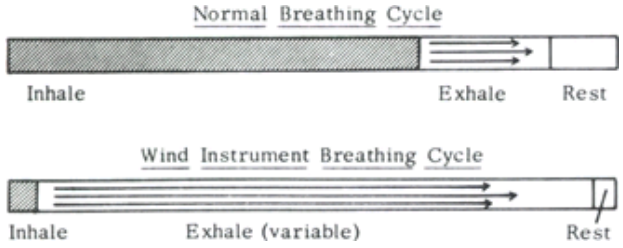
1. Walk slowly, keeping the body loose. Do not carry anything heavy.
2. Stand erect, but comfortably. Shoulders and arms should be relaxed. Swing the arms while walking.
3. Take in a full breath quickly, on one step.
4. Hold this breath for two steps.

5. Exhale through the mouth slowly for eight to ten steps.
6. Take two more steps before the next inhalation.

You will notice that, in the above exercise, the inhalation is fast and the remainder of the cycle is much slower. This emulates the breathing process as used in instrumental playing, with one important exception—in wind instrument performance, you do not have the opportunity to breathe at regular intervals. Maintaining the balance between the needs of the body and the requirements of the music imposes quite a complicated task on the respiratory system.

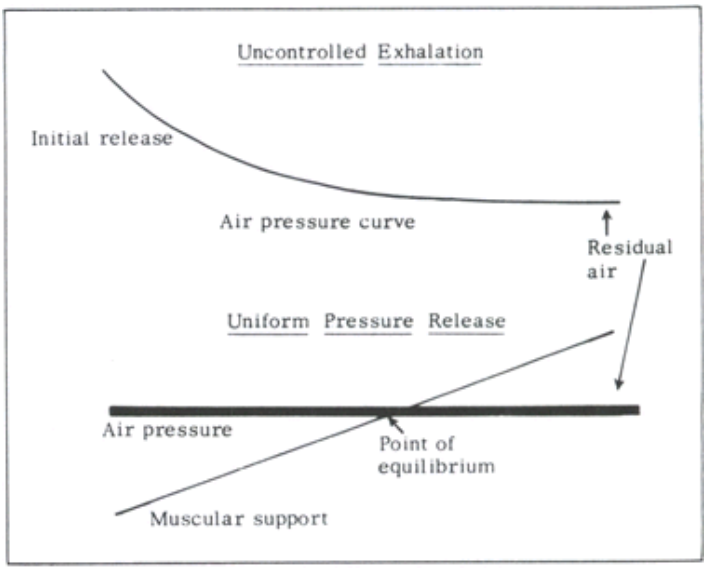
The diagram below is included to compare the timing of the normal respiratory process with that used in wind instrument playing. It should be noted that, in normal breathing, a greater portion of the time is used on the intake, with much less on the exhalation. The exact opposite is true when playing a wind instrument. Other factors to consider are:

1. Normal breathing is rhythmic, at a rate of 15 to 17 times a minute. The instrumental breathing rate is not rhythmic, but is governed by the length of the musical phrase.
2. The rate of respiration may be reduced considerably by the demands of the music, so that we must breathe more deeply than normal in order to supply sufficient oxygen to the blood stream.



One of the problems in the use of the breath as a motive power is that we are working in a medium of *decreasing* pressure, similar to letting the air out of a toy balloon or an automobile tire. When the air is first released, there is a high concentration of pressure, velocity and volume, which decreases rapidly until the air pressure is the same on both the inside and the outside. But the balloon or tire still has some air, known as *residual* air, remaining. This residual air is necessary for the next inflation, as it keeps the walls of the container in a receptive shape to take in air again. The same pattern is followed in the case of the lungs. When they

deflate beyond a certain point, it is difficult to inhale due to loss of residual air. This is what happens when an athlete "gets his wind knocked out, "and he has great difficulty in catching his breath. The wind instrument player who has to use the last bit of breath to complete a phrase will find himself in a similar predicament. There will be difficulty in starting the next inhalation in addition to fatigue and loss of breath control. Most of this is preventable if the player will acquire the habit of *playing on a full breath*. In other words, keep the lungs as well inflated as possible, so that the natural elasticity of the chest muscles will work for you. Once the point of equilibrium is reached, it is necessary to start pushing *in* and *up* with the abdominal muscles in order to maintain air pressure.



An examination of the above diagram should demonstrate that at the point of initial release we have a greater velocity of air stream than is needed, so the problem at first is to hold back the pressure at a uniformly reducing rate until the point of equilibrium is reached. After this, additional support must be furnished by the diaphragm and chest muscles. It is seldom necessary, if one acquires proper breathing habits, to use the residual air.

THE INTAKE

The position of the mouth and throat during inhalation is a matter for consideration. A large amount of air must enter the chest cavity quickly and noiselessly, without disturbing the embouchure. We have all been annoyed at one time or another by a performance in which there was so much noise when the soloist inhaled that the musical value of the composition was forgotten. This is usually the result of attempting to pull a lot of air through a small space, due to a tight throat or an improper release of the embouchure. To insure the passage of a large amount of air into the lungs quickly, both the lips and the throat must have a good sized aperture. Breathing through the corners of the mouth restricts the size of this opening and also tends to constrict the throat. This type of inhalation is usually accompanied by considerable noise, and too much time is required to obtain a full breath. If one simply drops the lower jaw, still keeping the upper teeth anchored, the throat should assume the full opening similar to its position while yawning. This can be done so that the embouchure returns to playing position retaining its original shape.

Use of the back muscles can do much to help the diaphragm flatten out. The control of these muscles just below the ribs should be developed. Try to push the sides and back muscles away from the body as you push the abdomen forward. In other words, expand the waistline in *all* directions. To sum up the full inhalation procedure, one should:

1. Sit or stand erect and keep the chest high.
2. Open the mouth by dropping the jaw.
3. Keep the throat in the shape assumed when yawning.
4. Expand the entire waistline simultaneously.

The foregoing is a composite action, and should be practiced so that it is accomplished in the shortest time possible. It should be done both with and without the instrument. Much can be gained, as with the other muscular exercises, by spending odd moments throughout the day practicing this procedure.

THE RELEASE

The release of the air stream can be easily examined by blowing on the back of the hand with the lips pursed, noting the pressure of the air stream. To keep this stream equalized, an increasing support from the diaphragm is necessary, and regular drill in this process is valuable. The timing of the release is helpful, with the effort directed toward extending the duration of the exhalation while maintaining a steady pressure. Uniform pressure permits the playing of longer phrases which contribute to greater beauty and more control of the tone.

Breathing exercises should be practiced in both standing and sitting positions. If the posture is correct, no great difference in result will be noted. However, a slouched sitting position reduces the chest capacity and inhibits the action of the abdominal muscles. People who always practice while standing must realize that the muscular arrangement is slightly different when sitting. As most performing takes place while seated, it is logical that this position should also be used when practicing. One must learn to breathe efficiently in either position.

It is beneficial to learn to stop and start the air without taking a new breath. This procedure is very common in actual performance, and the physical action which takes place is worth examination. There are two ways by which the air release may be controlled. One is by the alteration of the size of the throat; the other is a change in the pressure on the chest cavity. The mastery of both methods is desirable, as each has its place in the art of musical phrasing. A rudimentary exercise for the development of these skills may easily be invented by the student, and the same exercise can be used for both methods. This also should be practiced without the instrument at first:

1. Keep the lips open and try stopping the air stream by freezing the muscles of the chest and abdomen. Train these muscles to restart the stream with the same pressure. The throat should remain open at all times.

2. Do just the opposite of the above. The air pressure stays constant, but the stream is cut off by closing the throat. The lips should remain open throughout.

3. Alternation of these two methods should be practiced in the same exercise until one is adept at both.

A fine demonstration which points up the use of the air stream consists of placing the hands on the sides of the abdomen and starting to count to ten, beginning with a whisper and ending with a shout. You will discover that most of the air will be used on the whisper, as there is no resistance from the vocal chords. Doubters should try counting as many numbers as possible in a normal tone of voice, then repeat the same thing in a whisper.

SUMMARY

The above discussion of the structure and the functions of the breathing apparatus has but one aim—to awaken the consciousness to the importance of the force which produces the tone, and to use all the available facilities at hand with the utmost efficiency. A few reminders may point up these thoughts:

1. Play on a full breath as much as possible.
2. Get the feel of the rhythm of the breathing procedure.
3. The inhalation should be a quick, composite, and complete action.
4. The upper chest should be kept high, but relatively motionless.
5. The muscles involved should be flexible and relaxed, but always controlled.
6. Shoulders must remain stationary, not raised on the intake. Think of breathing as a horizontal motion, not vertical.
7. Use spare moments to practice the breathing techniques.
8. Invent procedures of your own. Any exercise which emphasizes control is valuable.
9. Keep the body relaxed to conserve air and reduce fatigue.
10. Use the natural elasticity of the muscles as much as possible to avoid forcing.

THE EMBOUCHURE

The word embouchure, which has been adopted by our language from the French, has the literal meaning “opening into.” This gives only a slight clue to the usage of the word as it relates to wind instrument playing. For our purpose, the embouchure may be defined as the formation of the lips around the mouthpiece together with the surrounding physical factors which affect tone production. These include the muscles of the lips and chin, the tongue, and the bony structure of the face.

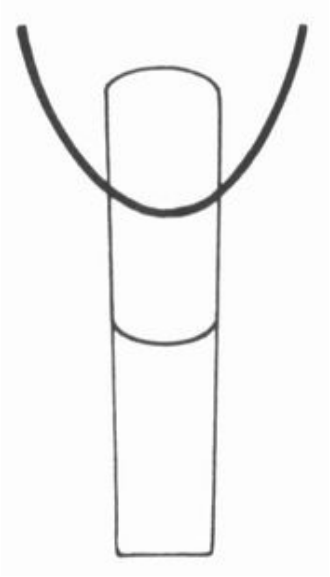
The most obvious duty of the embouchure is to serve as an airtight connection so that the pressure of the air column is maintained and transfers its energy efficiently to the mouthpiece and reed. However, this is only the beginning, since this small area is also the “control center” of the tone. The lip and jaw formation must supply the correct stress to bend the reed slightly so that it vibrates on the mouthpiece facing properly, acting as a cushion for this vibration. This cushion must be so sensitive as to make adjustments for each new reed, and must furnish the necessary foundation for control of the volume, pitch, and tone.

THE FACIAL MASK

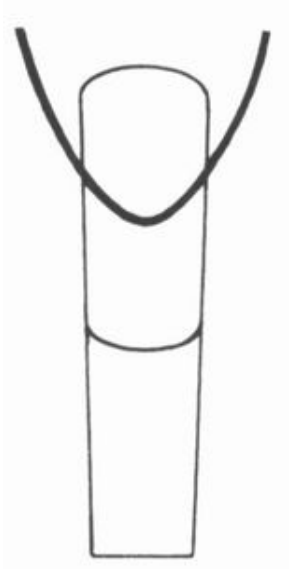
A consideration of facial anatomy is essential to the understanding and formation of an embouchure. The bone structure of the face is the framework on which the muscles of the embouchure operate, and the shape of this framework varies with each individual. The condition and alignment of the teeth is also a consideration. Facial structure is especially important with young people, since it is possible that the fundamental framework may be of the wrong shape to support the saxophone embouchure. While a normal or average jaw should present no problem in adaptation, certain deviations which should be considered are:

1. *The Square Jaw*. This type has an advantage in playing the larger saxophones such as the tenor, baritone, and bass, since larger mouthpieces are better accommodated by a broad lip and jaw line.

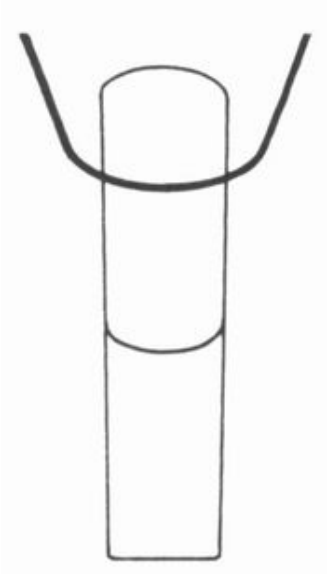
2. *The Pointed Jaw*. Careful consideration of this shape is in order when choosing an instrument. While it may be possible to adapt to the soprano or alto saxophone, persons with a pointed jaw should avoid the larger mouthpiece instruments. The curve of the lips is too radical for a proper adaptation to the wide reed.



Normal



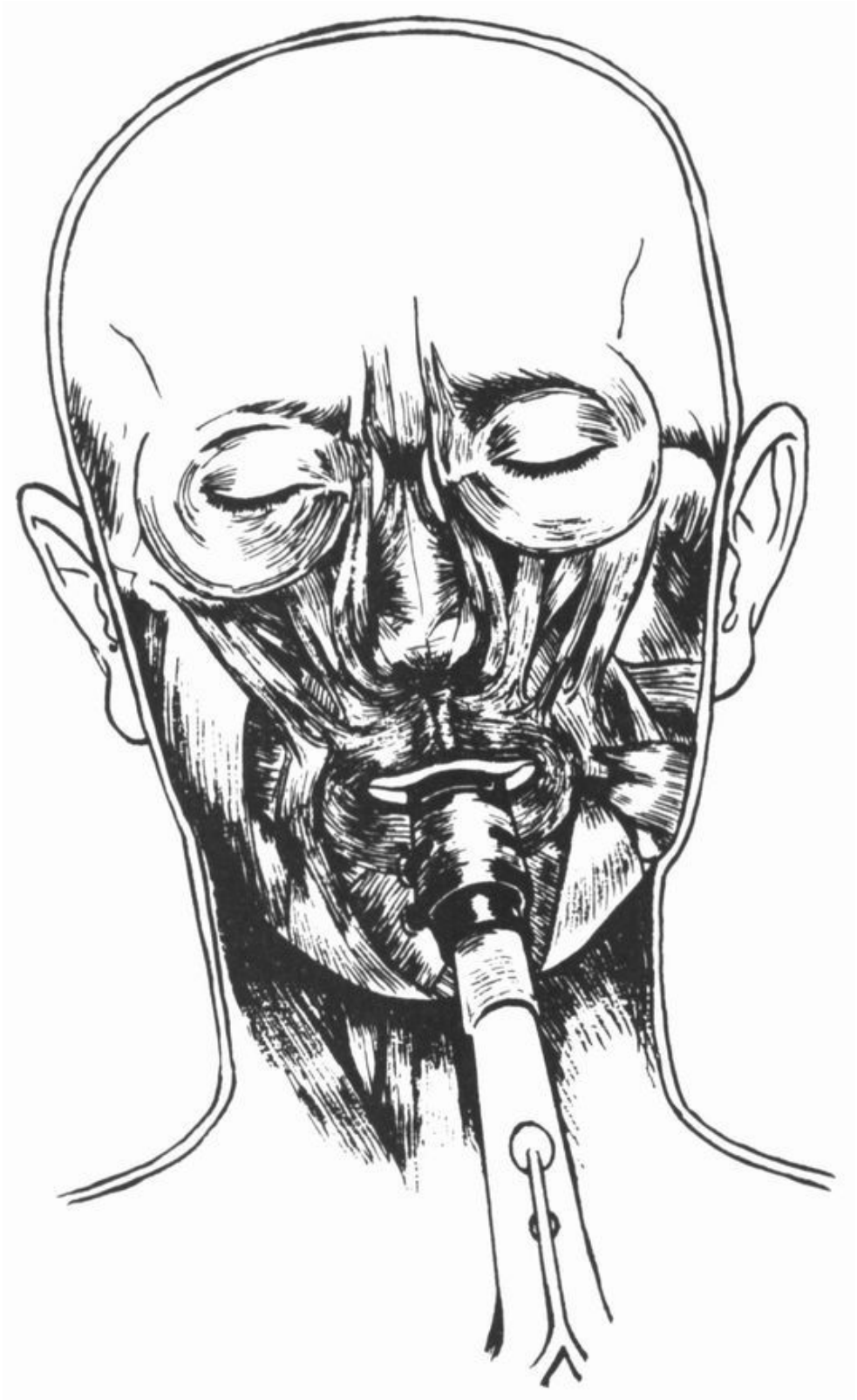
Pointed



3. *The Overbite*. Most people have a slight overbite, which adjusts to the embouchure easily. If the overbite is extreme, however, it will become a definite handicap, as the mouthpiece will have to be inserted too far in order to bring the lower lip to the proper position. The embouchure placement for saxophone calls for the upper and lower teeth to be in alignment. If this cannot be done in comfort, it is questionable whether the individual should attempt serious saxophone study.

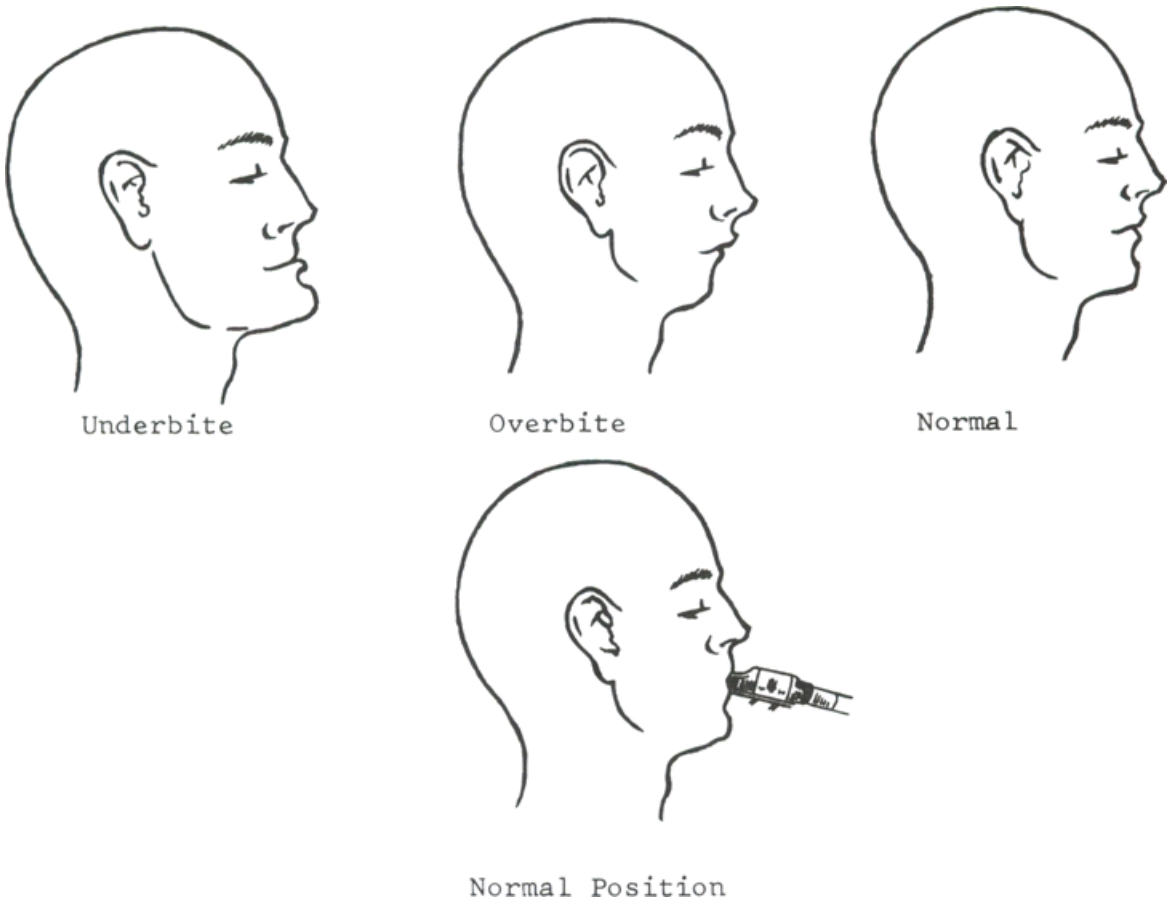
4. *The Underbite*. The "lantern jaw" shape is an advantage up to a point, especially for the large instruments, as it allows the lower lip to assume the proper position without a wide opening of the mouth. An extreme underbite condition requires very little insertion of the upper lip to compensate for the correct lower lip placement, which might cause difficulty when attempting to adjust to a small mouthpiece.

Judgment of the foregoing should be made on the basis of the severity of the malformation. While on occasion one will meet a fine performer who has overcome extreme conditions, it is a wise policy to examine the facial contour when advising a student as to the selection of the proper instrument.



MUSCLES USED IN THE SAXOPHONE EMBOUCHURE
Front view

MUSCLES USED IN THE SAXOPHONE EMBOUCHURE
Side view



CONSIDERATIONS OF JAW AND TOOTH ALIGNMENT

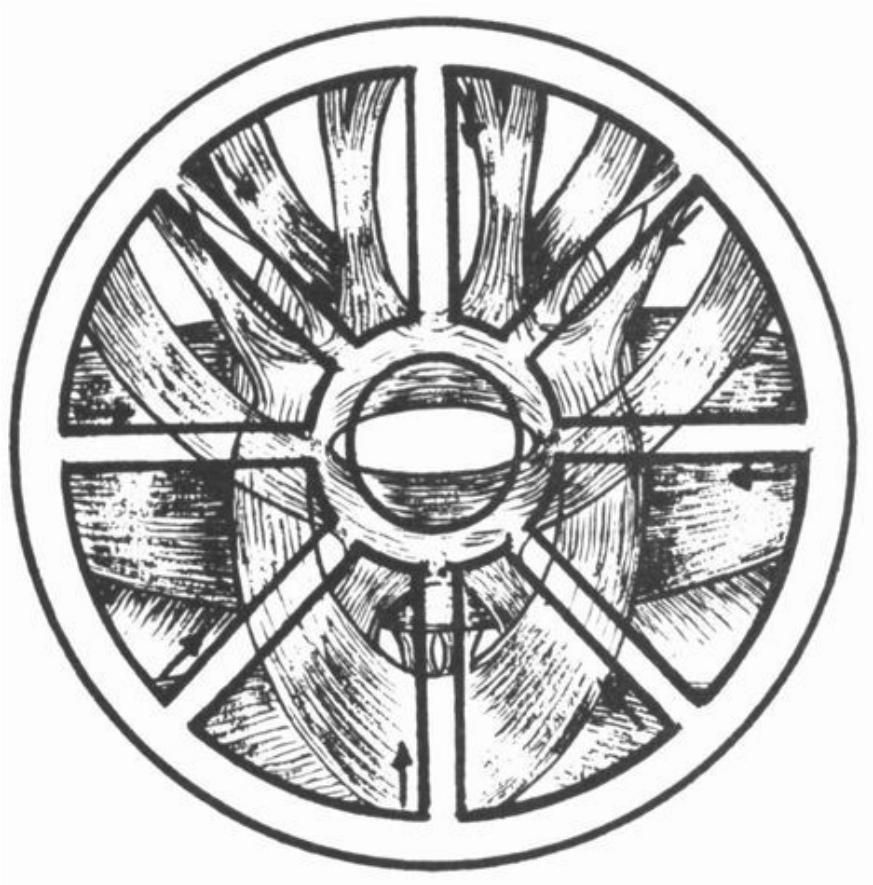
THE TEETH

Normal teeth should pose no problem if the muscular support of the embouchure is sufficient. If these muscles fail to maintain the correct position, the lower lip collapses on the teeth, which bite into the flesh. This condition is a serious one and permanent damage to the finely-textured muscles and nerves may result if it continues over a long period. One who has a chronic sore lip should immediately take steps to eliminate the cause. The discomfort alone is sufficient to inhibit the musical performance.

People with irregular lower teeth are more susceptible to a sore lip, owing to the exposed corners, which are often quite sharp. A few saxophonists have had their dentists make removable shields out of metal or plastic to provide a smooth contact with the flesh. Temporary relief may be obtained by folding a small piece of paper or cellophane over the teeth, but this is somewhat like taking a headache remedy; it may relieve the pain but will not cure the malady.

A well-developed embouchure should provide the support required without resorting to the above methods for protection of the lip. The muscles should remain flexible as well as strong, for pressing against the hard surface of the teeth will reduce the sensitivity of the lower lip cushion so necessary in artistic performance.

Irregular upper teeth often cause a poor mouthpiece position, such as angling the mouthpiece to one side. A single upper tooth which is long or protruding may make it difficult to anchor the upper teeth properly, a type of condition which can be improved by fastening a small square of soft rubber over the point on the mouthpiece where the teeth are placed. Commercial pads are obtainable at most music stores for just this purpose. A piece of tire patch cut about ½ by ¾ inches will also serve this purpose.



THE EMBOUCHURE “WHEEL”

THE SUPPORTING MUSCLES

The muscles surrounding the mouth may be compared with the spokes of a wheel, which fan out from the hub. Examination of the muscles that support and control the saxophone embouchure, as shown in the diagram above, will illustrate this point. The effectiveness of this embouchure is dependent upon muscle development in which the lower lip supports itself independently of the lower jaw. The lips should circle the mouthpiece with an equal pressure toward the center, much the same as an elastic band. The chin muscles serve to hold the lower lip in this position so as to relieve the pressure on the lower teeth, while the lip and cheek muscles contract to furnish the required tension around the remainder of the circle.

The upper teeth rest on the point of the mouthpiece about ½ inch from the tip. This anchor point should be firm enough so that there is no problem of the teeth slipping on the mouthpiece. The weight of the head should rest here. The mouth corners should be pushed *in*, the lower lip *up*, and the lower teeth and jaw *down*. If we can visualize a wheel, with all the spokes pressing toward the hub, we can easily illustrate this type of action, with the hub of the wheel being an imaginary point in the center of the mouthpiece. The reason for dropping the lower jaw is that it should not be a part of the muscle support. It must be free for use in vibrato, and dropped out of the way so that the mouth cavity can accommodate the mouthpiece. The lower lip should be *above* the teeth, in a rolled position, but supported entirely by the chin muscles and aided by the compact position of the mouth corners, which, when drawn in, furnish a firmer cushion for control of the reed's vibration.

MUSCLE DEVELOPMENT

As the above-described embouchure relies solely on the musculature of the face for support and endurance, certain exercises for the development of the muscles can be profitable. A few minutes each day, if continued for months, will strengthen this area so that the embouchure can be held in the proper position indefinitely.

1. *The mouth corners.* Whistle. Notice that the mouth corners automatically move toward the center. Now produce your broadest smile, bringing the corners back as far as possible. You should feel tension in the corners at this point. Alternate the whistle position and the smile, slowly at first, but in a regular rhythm. After about 50 times, these muscles will probably feel tired, evidence that they are weak and need this sort of exercise. Repeat this process three times daily and soon you will feel the muscles growing stronger. This exercise can be used indefinitely for continued development and keeping up the muscle tone. (Note: It is not necessary that you actually whistle; the position of the lips is the important factor.)

2. *The chin muscles*. (a) Push the lower lip tightly against the upper. Keep the line of the lips straight, with no protrusion of the lower lip, but press as hard as possible. You will notice that the chin muscles bunch up—a normal condition for this exercise. A mirror is helpful for this drill so that you will be able to observe this position. Hold for about 10 seconds, then repeat 25 times.

(b) Retaining the above position, drop the *jaw while still keeping the lips pressed together*. Now open the mouth about half an inch, but maintain the same relationship between the jaw and the lower lip. Place the forefinger against the lower lip and press downward with firmness. The lower lip should resist the pressure of the finger, supporting itself without any help from the lower jaw. If you can feel the lower teeth beneath the lip, the chin muscles are not yet supporting properly. The chin muscle exercises should also be practiced regularly, and are time-savers in embouchure development when faithfully employed.

Correct—firm but relaxed

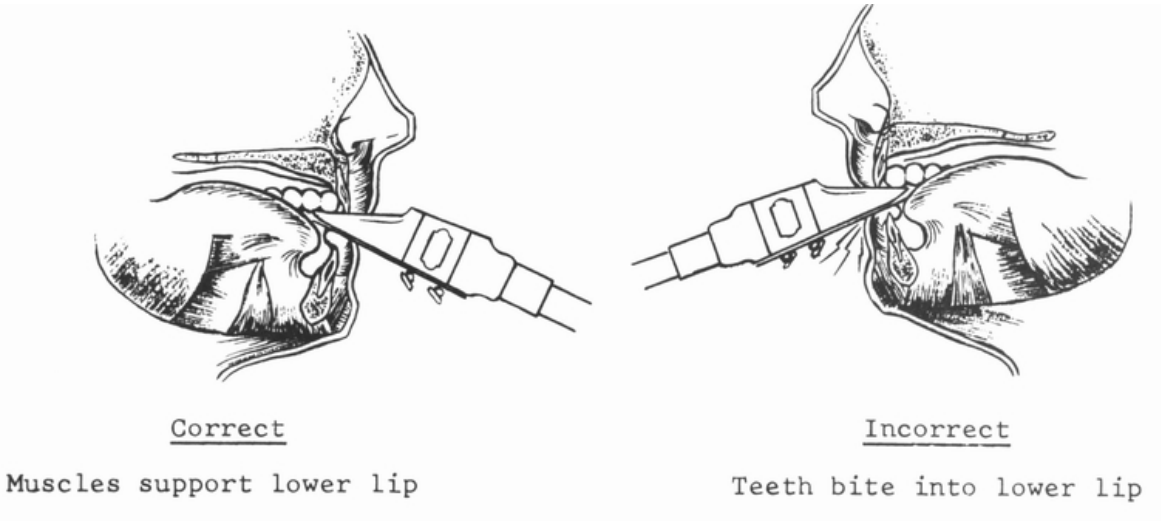
Incorrect—corners drawn back too far

Incorrect—chin muscles bunched

Incorrect—cheeks puffed out

Incorrect—lower lip protrudes

CORRECT AND INCORRECT EMBOUCHURES



SUPPORT OF THE LOWER LIP

ALIGNMENT OF THE JAWS

The average facial structure has a slight overbite, while the desired embouchure position requires the lips to be in alignment. This necessitates a slight adjustment in the jaw alignment. A simple check can be made by bringing the front teeth together and noting the change, if any. Another easy method to bring the lower jaw forward into proper position is to blow a small stream of air at the tip of the nose. This jaw position must, of course, be transferred to the mouthpiece when playing.

MOUTHPIECE PLACEMENT

The exact amount of mouthpiece insertion depends on the mouthpiece facing, the strength of the reed, the contour and size of the mouthpiece, and any physical peculiarities in the facial structure. The basic embouchure remains the same for all saxophones, with adjustments depending on the size of the mouthpiece. Trial and error will soon make the correct compensation if the muscles have been developed properly.

An important aspect of mouthpiece placement is the problem of centering. If the mouthpiece is not in the center of the embouchure circle, it is difficult to obtain an equal tension on both sides of the reed. While tooth structure may encourage the student to play slightly "off-center," concentration can do a lot to correct this. Worse than this fault is the habit of playing with the mouthpiece at an angle, which results in a different amount of playing surface on the two sides of the reed. This can be corrected very simply by adjusting the body position, the saxophone neck, or the angle of the mouthpiece on the neck. The feel of the centered embouchure can be studied with the mouthpiece and neck only, lining up the position for observation in front of a mirror, so that the balance is established before the mind is occupied with performance. No reed will respond at its best if it has unequal segments vibrating on opposite sides.

THE CHEEKS

The side walls of the mouth cavity, which form a part of the tonal chamber, should remain in a normal position. Some players are prone to cheek puffing due to insufficient muscular strength to maintain the normal position when air pressure builds up in the oral cavity. This produces a looseness in the musculature of the face and interferes with effective control. Players who puff out their cheeks invariably have difficulty producing a centered tone, due to the effect of the alteration of the inner resonance chamber. Dynamic changes become troublesome, and a clean attack is almost impossible. Once established, this condition is difficult to correct, but the effort is worthwhile. Trying to play while making the opposite error—i.e., pulling the cheeks in so far that they press against the back teeth—often helps. With young students, the situation can usually be corrected with a simple reminder, but it should be given immediate attention.

THE TONGUE

The tongue should maintain its natural resting position at the bottom of the oral cavity. If it is quite large at the base, or has an inclination to raise when blowing, it will affect the flow of the air in the same manner as the closed throat. The practice of completely relaxed blowing will improve this.

SUMMARY

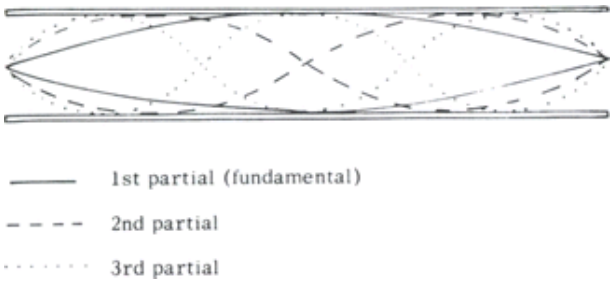
Control and relaxation are inseparable partners, but relaxation does not mean collapse. The embouchure must be relaxed and cushioned, but supported. The formation and organization of these elements should be pursued with the aim that, eventually, the musculature will have the necessary development so that all the muscles affecting the embouchure become the servants of the player. Attainment of a fine embouchure requires patience combined with intelligent self-supervision.

TONE QUALITY

Beauty in any art is much easier to recognize than to describe, and this is doubly true of a musical tone. Webster defines a musical tone as “a sound of such regularity of vibration as to impress the ear with its individual character, especially as regards pitch, and to enter into harmonic relations.” While this definition may satisfy the scientific and literal aspects of musical sound, it omits mention of tone quality, which is the feature concerning most serious musicians. In order to create and improve a beautiful tone, an understanding of the physical factors which influence tone quality is essential.

THE NATURE OF WIND INSTRUMENT TONE

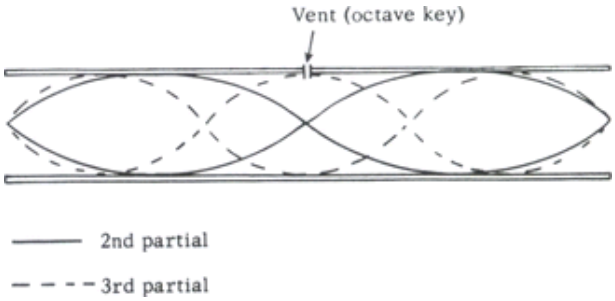
A vibrating air column in a wind instrument not only vibrates at the full length of the instrument chamber, but also divides into segments of 2, 3, 4, 5, etc. The sound produced by the long vibration is known as the fundamental, or first partial, and the sounds produced by the shorter segments are called overtones, or upper partials. The varying strength of overtones furnishes the mixture which allows us to distinguish between the tones of different instruments, and also the variance in tone quality on the same instrument. A rudimentary knowledge of this phenomenon is essential for an understanding of the nature of the saxophone tone.



The above is not to be considered a picture of the tone itself, but merely a diagram to illustrate the energy movements of the tone wave. The solid line represents the fundamental vibration pattern which is dominant when the saxophone is played in the lower register.

If the capability of the air column to vibrate at the fundamental frequency is destroyed, the second partial becomes the most prominent. This results in a pitch an octave higher. This can be done by opening a vent (octave key) at or near the middle of the wave length, which “breaks the back” of the fundamental, or by pinching the reed with the lips so that it cannot go through its normal cycle. The ideal placement for an octave key opening is at the halfway point of the first partial, which would require a separate vent for each note in the chromatic scale. It is obvious that twelve octave keys would be mechanically impractical. The

saxophone is constructed with but two register keys, which automatically shift as the scale goes from C♯ to D and from G♯ to A in the upper register. This is by no means an ideal solution, and is the reason why some intervals are more difficult than others from the standpoint of embouchure control. The saxophone in its normal range uses only the first and second partials, while the other woodwind instruments use many more. Brass instruments rarely play in the fundamental range, as their more normal register lies within the overtones.



Researchers in the science of acoustics have done extensive work in analyzing the musical tone, and their findings have been of great value in the advancement of wind instrument performance. The complexities in the relationship of the overtones of different instruments have been measured and recorded. Agreement has been reached that the relative prominence of partials of the fundamental tone is a major factor in determining the characteristic sound of each instrument. Saxophonists interested in pursuing the study of the acoustical aspects of wind instruments will find *Horns, Strings*, *and Harmony,* a book by Arthur Benade (New York: Doubleday and Co.), a valuable source of information in non-technical terms.

THE TONAL CONCEPT

The saxophone is probably capable of producing more variety in tone quality than any other wind instrument. It is an instrument of great flexibility, and the tone produced is radically influenced by:

1. Tonal Concept
2. Reed and Mouthpiece
3. The Respiratory Organs
4. Embouchure

The concept of tone must be given priority, since this dictates the selection of the reed and mouthpiece as well as adjustment of the embouchure to attain the desired tone quality. There is certainly no agreement at present as to what constitutes an ideal saxophone tone. We hear such terms as "recording tone, dance-band tone, solo tone, band tone," to name only a few. Because of its multiplicity of use, the tone used in one field of saxophone playing may not fit in some of the other areas. This should not discourage the serious student, as the principles of tone production are basically the same. While the quality of tone produced may vary, the physical aspects of tone production remain substantially the same, and the mature instrumentalist should endeavor to achieve the necessary flexibility to cope with every musical requirement. A medium-faced, well-designed mouthpiece with a medium strength reed has great versatility and is capable of use in a variety of styles, provided the player has developed the proper control and concept for his special requirements.

Response to tone quality is a highly personal matter, and it is doubtful whether any two people hear precisely the same thing in a musical sound. We have learned to identify certain elements in tone quality by a host of adjectives: "mellow, edgy, cool, warm, refined, raw," etc. Proof that we are all hearing the same thing is not at all conclusive, as the aesthetic senses of the listener and the performer are certainly affected differently. A tone quality which impresses one individual as refined and beautiful may sound thin and anemic to another. This condition results from the effect of individuality on tone quality. An examination of the speaking voice of a performer often reveals his future tonal tendencies. Players

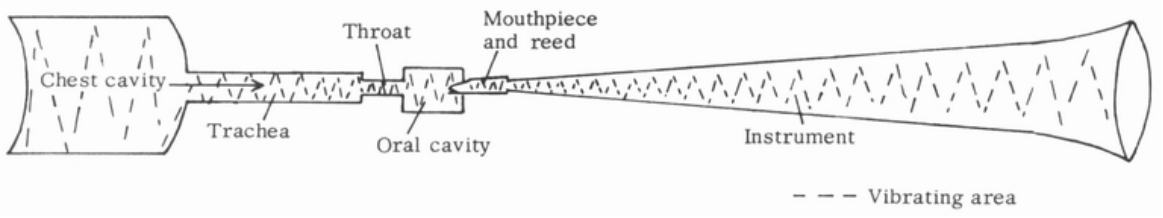
who speak quietly are inclined to produce a small tone, while the boisterous personality will tend to overblow his instrument. It is apparent that the musical learning process should be geared to expansion of the natural leanings, so that the student is able to perform well in a wide scope of dynamic and tonal ranges; the introvert must learn to “come out of his shell” and the extrovert to refine and restrain his natural tendencies.

THE BODY AS PART OF THE INSTRUMENT

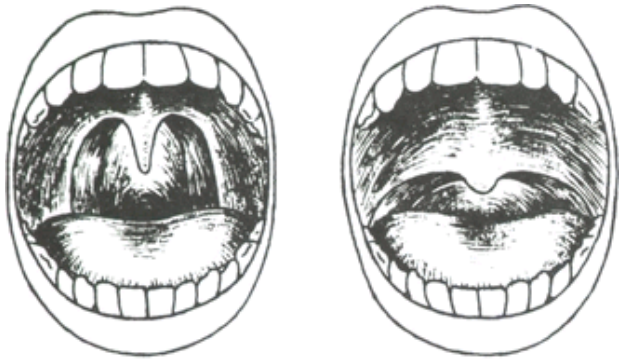
Sound, which travels at a speed of 1080 feet per second, will move *against* an air current as well as with it. This can easily be demonstrated by whistling or making a sound with the vocal chords while inhaling, since the only possible way for the sound to get out is by traveling "upstream" against the air current. When a saxophone tone is produced, the sound vibrations are active behind the reed as well as in front.

The oral cavity, the throat, and the lungs are vital contributors to tonal quality. In addition to supplying the reed with the necessary pressure to make it vibrate, they also furnish a very important resonance chamber. The bottleneck in the utilization of the chestcavity as a resonance chamber is the throat. If one observes the traffic pattern on a busy highway when it is suddenly reduced to one lane, it is easy to see that while there is a great amount of pressure on one side, only a trickle of cars leaves the point beyond the obstruction. A similar situation exists when the wind instrument tone is hampered by a tight or constricted throat. Both the pressure of the air stream and the vibrations from the resonance chamber are stifled.

The normal, quite open position of the throat is one of relaxation, but this position is easily influenced by any unusual condition, such as nervousness (from which we get the expression "choked with emotion") or tension. A completely relaxed approach to tone production is the first requirement for playing with an open throat, with the open position assumed similar to that formed by *whispering* the word "ah." Speaking the same word utilizes the vocal chords, which must tighten slightly to produce the sound.



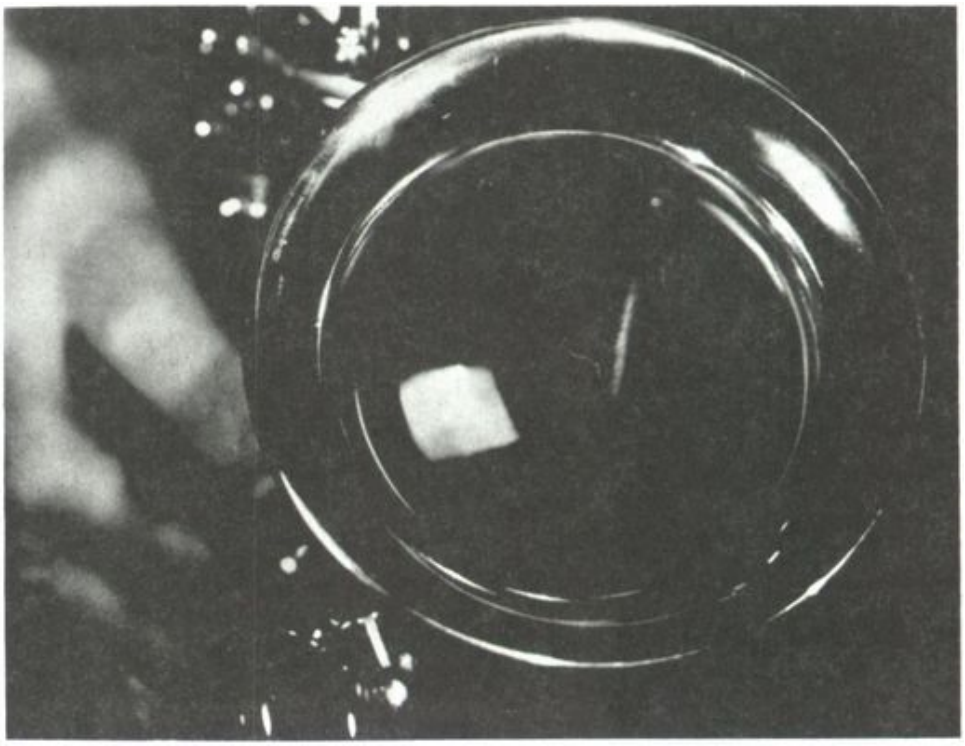
INFLUENCES IN THE PRODUCTION OF THE SAXOPHONE TONE



THE THROAT POSITIONS

The primary purpose of the air stream is to set the reed in vibration. This fact should always be kept in mind during tone production, rather than thinking of blowing air *through* the instrument. The forward motion of the column of air has very little force after it passes the reed. The nature of the change of energy can be demonstrated in the following manner: Take a one inch square of tissue paper and place it above the inverted neckpiece of the saxophone. Blow through the opposite end of the pipe and it will be immediately forced off. Now place the mouthpiece and reed upside down on the neckpiece and repeat the procedure while producing a tone. You will observe that the tissue will now stay in suspension and that it is impossible to blow it off. The energy created by the sound waves not only holds the paper in the air, but also maintains an equilibrium which will prohibit it sliding off the side.

If the same tissue is dropped in the bell of the horn when sustaining a low B♭, it will remain in equilibrium while suspended in the bell. Attempts to blow it out of the bell only result in a more stable suspension.



TONAL TERMINOLOGY

Since certain terms used in reference to tone quality are apt to be a bit vague, the following definitions, as they pertain to this discussion, are included:

Intensity. The energy of the sound produced. Depends on the degree of efficiency with which the available air stream is used, and is directly proportional to the amount of breath support.

Resonance. The degree of utilization of the breath support by the generating mechanism (mouthpiece and reed). The point at which this mechanism goes into its most efficient air stream-vibration relationship is known as the *point of resonance*. This point gives the tone projection without the necessity of great volume, and may be identified by a ringing quality in the tone. Support of the air column and embouchure position are vital factors in controlling the degree of resonance.

Core. A term often used to refer to a tonal center. Core is an ingredient of resonance, and is necessary to contribute stability of intonation and solidity to the tone.

Edge. The prominence of higher partials in the tone, which produces projection but introduces a buzzy quality. A certain amount of edge is desirable, and the proportion is a matter of musical judgment. Edge in a tone is influenced by the mouthpiece-reed relationship.

Color. A term used to describe the tone as dark or bright, and which includes all the colors of the spectrum. A bright sound emphasizes the higher partials, while the dark sound dampens them. Total elimination of the upper partials is unmusical to the human ear (e.g., the electronically-produced radio time signal).

Timbre. The general relationship of the various overtones. It is this characteristic which allows us to distinguish between tones of musical instruments, or different types of tones on the same instrument.

Imitation has no equal in awakening the tonal concept. All the words in the dictionary cannot substitute for the actual hearing of a fine tone, and if the image of this sound is retained, the student will have a goal in mind to steer him in the right direction. It is logical to assume that the young student is attracted by the tone of the saxophone or he would not have taken up the study of the instrument.

However, the real tonal concept at this point is apt to be rudimentary, and during the process of musical development, many changes will take place which will influence tonal concept. An acquaintance with the recordings of some of our fine soloists should be a part of each student's training.

While much is gained by listening to fine saxophonists, one should not neglect other instrumentalists. A great artist on any instrument has much to offer in the way of tonal quality and interpretation which can be transferred to the saxophone. One good example is the great recording of the Bach cello sonatas by Pablo Casals. The tonal intensity of a fine symphony brass section or the great woodwind playing which is heard on radio and records should be examined carefully. Principles of tone quality are basically the same on all instruments, and hearing the best of music has no equal for acquiring a tonal concept.

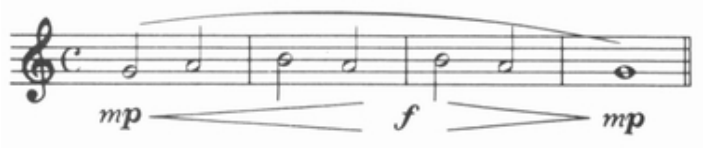
THE VOCAL APPROACH

Saxophone tone is so similar in quality to the human voice that it is important to examine the parallel factors in tone production, both physical and mental:

1. Breathing procedures are similar.
2. The reed and the vocal chords in singing serve the same purpose.
3. Both have "free resistance chambers." (This refers to the radically conical bore, as compared to the cylindrical bore of the clarinet and bassoon, and the slightly conical oboe.)
4. Great flexibility of sound is a characteristic factor in both.

An example of the similarity of the saxophone tone to the voice is demonstrated in the opera *Turandot,* where Puccini used the alto saxophone to keep a chorus of girls' voices on pitch. The chorus is off-stage, so far removed from the pit orchestra that the singers cannot hear the accompaniment. The alto saxophone blends so well with the female voices that its presence is not heard in the audience. Ravel, in his orchestration of Moussorgsky's *Pictures at an Exhibition*, chose the saxophone to depict a troubadour singing in the distance.

Singing is the most personal method of producing music, since the tone quality and pitch changes are produced solely by the efforts of the performer rather than with the aid of an instrument. It is highly recommended as a prerequisite or as an adjunct to instrumental study. In certain European schools the study of solfège—the learning of music fundamentals with the voice—is mandatory before taking up an instrument. This creates a musical image before attempts at instrumental performance. The study of solfège has unfortunately been neglected in this country, possibly due to our practice of performing publicly at a very early stage of musical development. It is not necessary to have a trained voice to sing phrases before playing them, and, even though the tone is mostly in the imagination, this emphasizes the tonal factor in both the mind and the body. A very simple melodic progression is sufficient for a first attempt:



Sound only the first tone on the instrument; then sing the phrase, observing the expression marks; then play it. Repetition, alternating the voice and the instrument, should follow. Insistence on correct pitch with the voice is mandatory. If this seems impossible, part of one's study should be devoted to developing pitch perception with the voice. The syllable "ah" or "oh" is recommended, as these formations keep the throat open and are the correct positions for playing the saxophone. While the quality of the singing voice may be poor, it is not a prime consideration. Many great conductors sing to their orchestras during the rehearsals as the best means of communication. The audience was often aware of this during performances by the late Toscanini. His voice can even be heard in a few recordings. One of his favorite exhortations to his players was to "sing in your instrument."

Development of tone quality is helped by the vocal approach because of its stress on the importance of the proper shape of the oral cavity and the correct function of breath support. The student should try to sing as well as possible, and note the effect that a change of physical factors has on the tone. Emotions come from within, and an instrumentalist has to transfer them with the aid of an instrument. It is impossible to achieve an artistic performance merely by generating a sound and manipulating the keys of a mechanical device. All of us have listened to mechanically produced music which was correct in all its technical aspects but which became monotonous after a short time because of the lack of emotional or human content. Singing, whether it be poor or great, is at least one hundred percent human.

The first rule in tonal development should be *create the tonal concept.* If this image is absent, groping in the dark to adjust one's physical and mental equipment is fruitless.

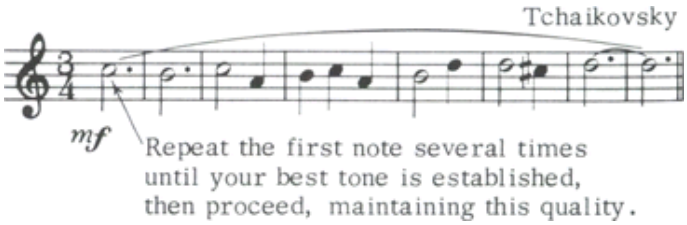
THE PHYSICAL PROBLEM

The shape of the face, the strength of the facial muscles, the thickness of the lips, the size and shape of the oral cavity, the structure of the teeth, and the capacity of the entire breathing apparatus are a few of the factors which must be adjusted individually. The final answer is in the result, and the proper combination of these elements is a matter of intelligent trial and error. However, certain principles of tone production prevail and it is on these that one must proceed.

The application of the air stream to the tone, which has been discussed in a previous chapter, is traditionally concerned with long tone practice, using a crescendo-diminuendo approach. This is a fine study, but can do as much harm as good if not properly used. The following qualifications should be met before the study of long tones is attempted:

1. The embouchure must be well developed, and the muscular support adequate to hold throughout the entire range of the instrument without biting.
2. The throat should be relaxed, open and able to maintain this position to insure uniform tone quality.
3. The proper position of the jaw must be uniformly maintained.

The study of long tones is an *advanced* study, and should not be attempted before both the physical conditions and the tonal concept have been established. It is better to approach tone study through the playing of melodies until the student has a feeling for quality and has had time to set the embouchure. Familiar tunes which avoid wide intervals are best for this purpose. One should play the first tone of the melody until he feels that he has produced his best possible tone for the moment, and then proceed into the melody while maintaining the same embouchure and while supporting the air stream properly. This should be tried repeatedly, each time experimenting and listening for an improvement. A simple example follows:

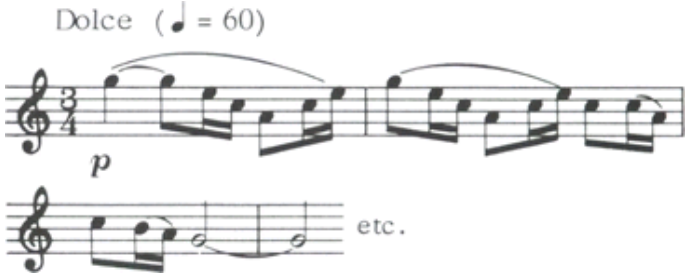


It is well to make a *mental check list of*:

1. The tonal concept.
2. Embouchure position.
3. Relaxed throat.
4. Breathing procedure.
5. Musical vibrato.
6. Intonation.

The above are not given in order of importance, since each is dependent on the others. As progress is made, try melodies with wider intervals and at various volume levels, but only to the degree which will retain a uniformity of quality. If the tone changes quality, first check on the air support to see if the air stream made the volume change as it should. Quality change is usually the result of an alteration of the embouchure pressure or a change in the shape of the throat.

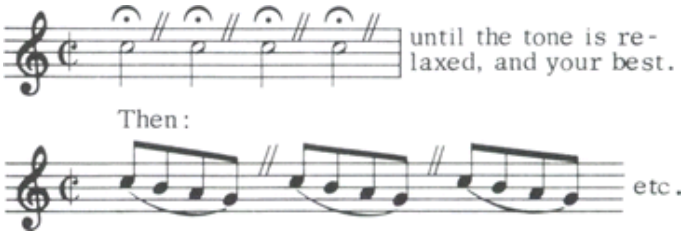
Melodies utilizing wider intervals should be the next step, such as this excerpt from Debussy's "Girl With the Flaxen Hair."



In a more popular vein, Hoagy Carmichael's "Stardust" or Victor Herbert's "Kiss Me Again" are also good examples of melodies with wide interval changes.

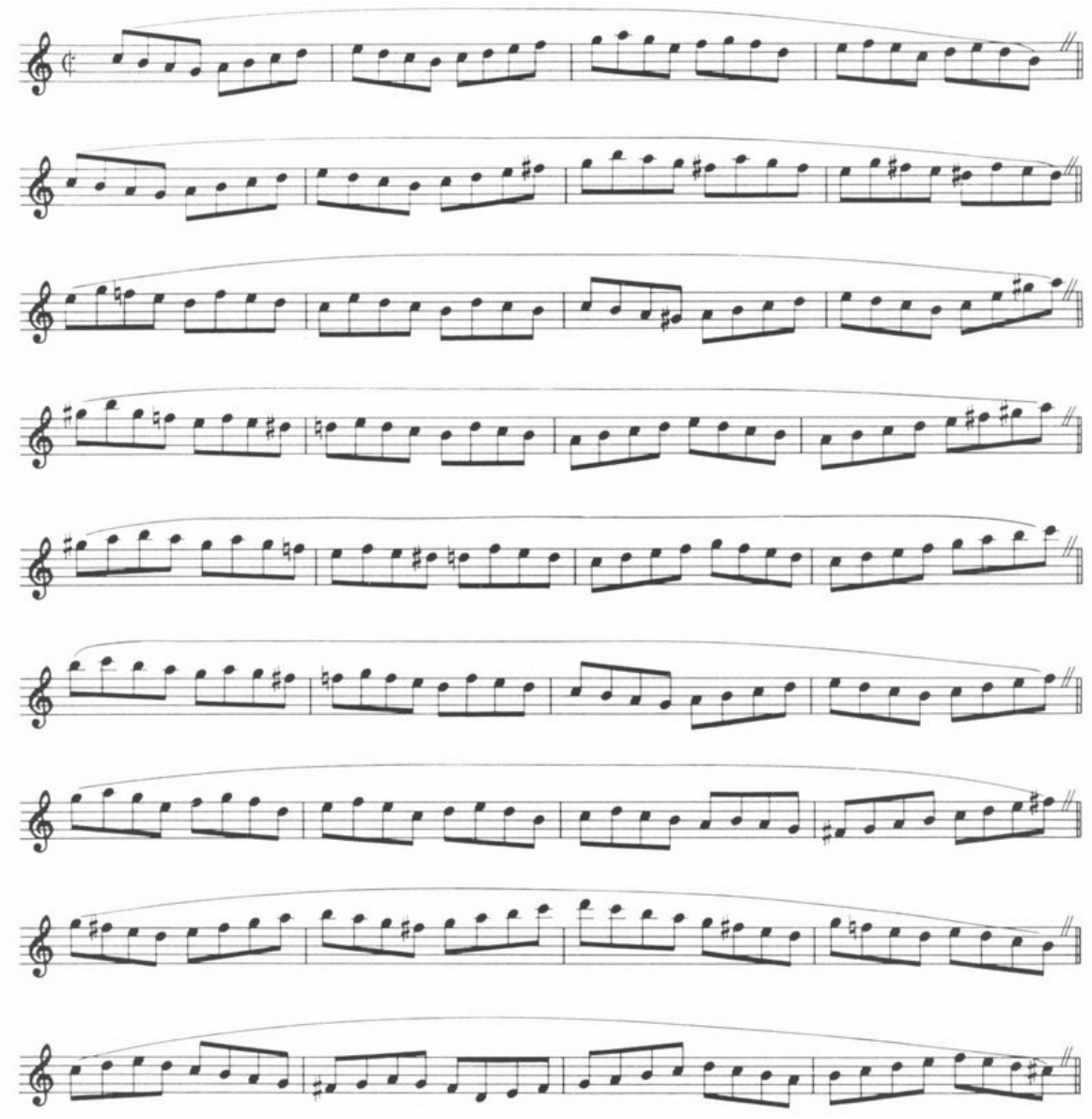
From this point, it is valuable to go into a running-style pattern such as is used in the Klosé "25 Daily Exercises for Saxophone" published by Carl Fischer and

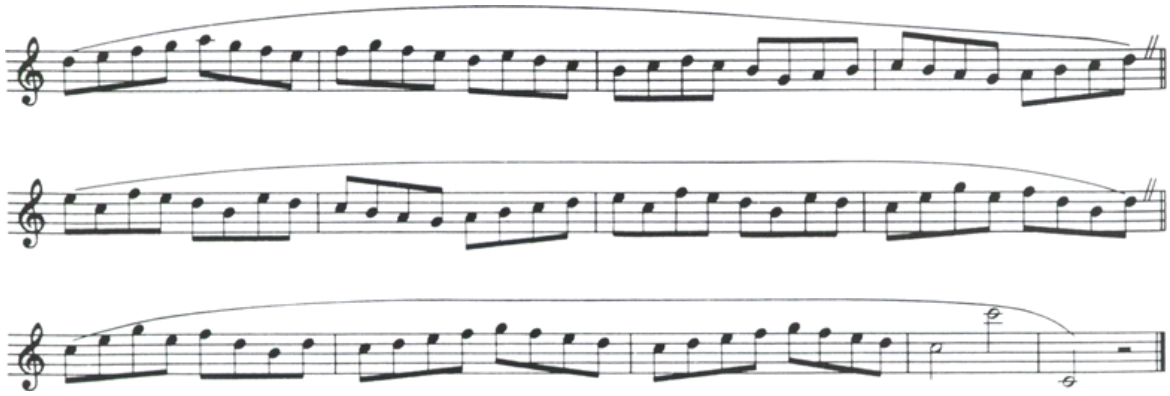
by the Windsor Music Press. This is an excellent book to use as a tone study coupled with technique. The method of practice is important:



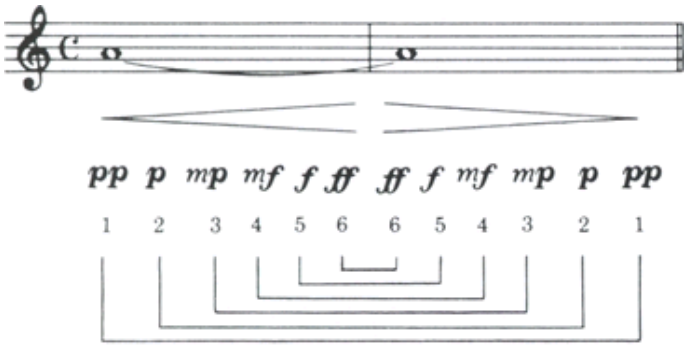
Then play several measures in one breath, with the same tonal concept. After each breath, repeat the above procedure before starting the next phrase. Disregard articulations at first and play the entire phrase legato until it is smooth and free. Next, observe the indicated articulations while keeping the tone quality uniform.

Repeat each phrase in accordance with the procedure indicated above.

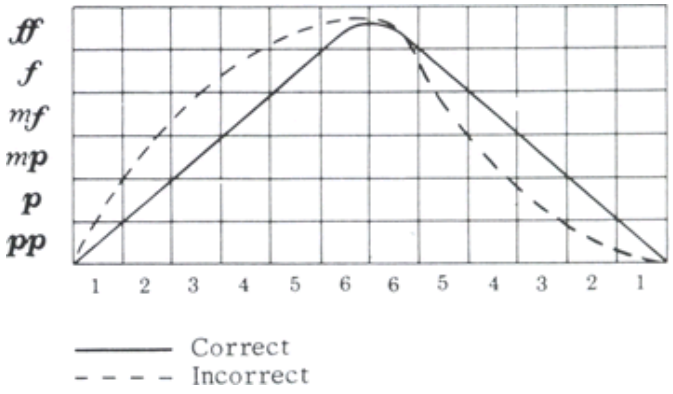




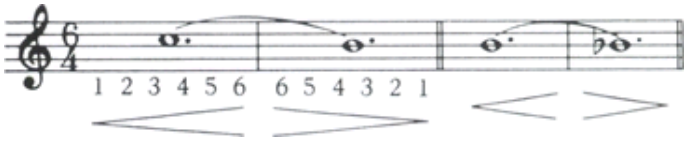
A technical passage should be played with the same tone quality as a melodic phrase, except that vibrato is not used. Bear in mind that the vibratoless tone must not be tight, and that the embouchure retains its normal position. One should never divorce tone from technique, as all studies are tone studies, and a resonant tone helps to promote technical facility. The above procedure should be applied to the practice of scales, thirds, arpeggios, and etudes. Only after competence is gained in these procedures should long tones be attempted, in the following manner:

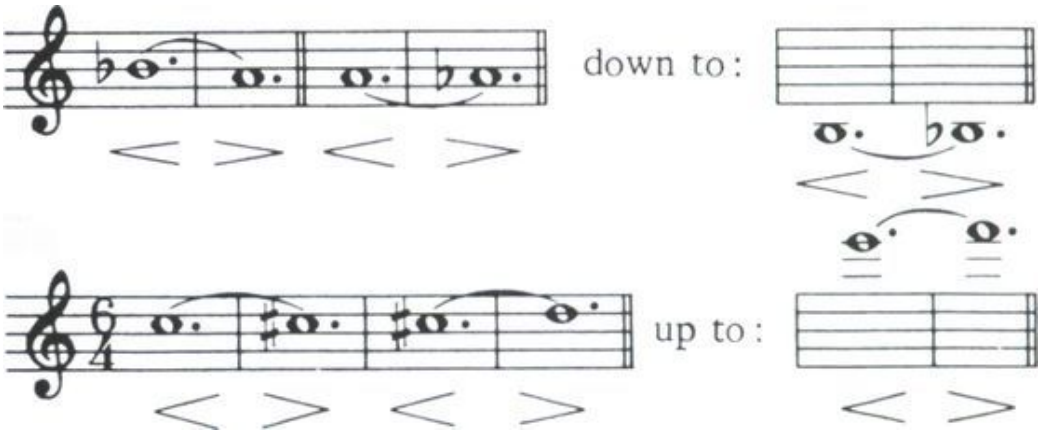


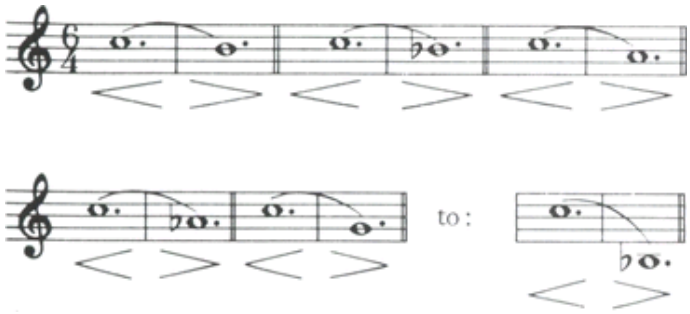
The rate of crescendo and diminuendo should be the same, so that the volume of each count in the first measure should equal its corresponding number in the second. The top of the crescendo should be rounding, not peaked. The tendency is to make both the crescendo and the diminuendo too soon, and to start louder than the finish. Graphically it assumes this form:

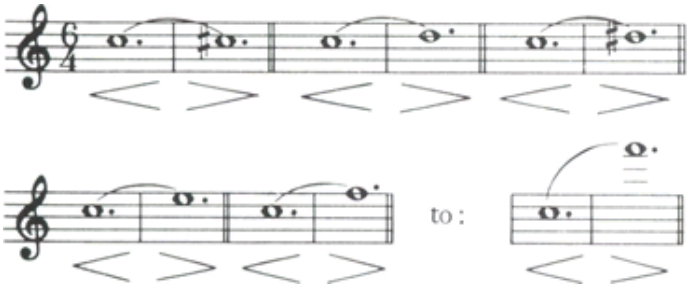


Volume change should involve only an alteration in the speed of the air stream. Any change of embouchure will have an adverse effect on both pitch and tone quality. The following group of long tone studies may serve as practice patterns:

1. 

2. 

3. 

4. 

FOCUSING THE TONE

Most of us have had the experience of taking or seeing pictures which are out of focus. Simply stated, an out-of-focus picture is caused by incorrect adjustment of the camera mechanism to the subject and to the light conditions. Tone quality is similarly sensitive to the mechanism which produces it. Adjusting the embouchure, oral cavity, and air support so that the tone is "in focus" in accordance with our concept helps the tonal picture. A tone may be clear or fuzzy, thin or dense, light or dark, meaningful or vague, the same as a picture. A fine tone will have both a beautiful quality and carrying power, just as a good picture will be clear in both the foreground and the distance.

TONAL BLEND

Blending with other instruments does not mean sacrificing the character of the saxophone tone, but rather utilizing its flexibility to improve the musical result. One must study the characteristic sounds of the instrument or instruments with which he has to fuse and work for a good composite sound. A fundamental of ensemble playing is to contribute to the total sound without being heard as an individual.

The first steps in blending should take place within the saxophone section itself, where each player should strive to match his sound with the others. One member of a section who has a peculiar tone quality and refuses to adjust can destroy much of the good playing of his colleagues. Often the culprit in this situation is the player with a loud, buzzy tone that has projection but which does not blend with the ensemble. The beautiful tone quality of a concert band is sometimes ruined by a saxophone section which has a cutting quality that is allowed to predominate. A great deal of the trouble can be eliminated by a better choice of mouthpiece and reed, but most important is the acquisition of a more musical approach to tone.

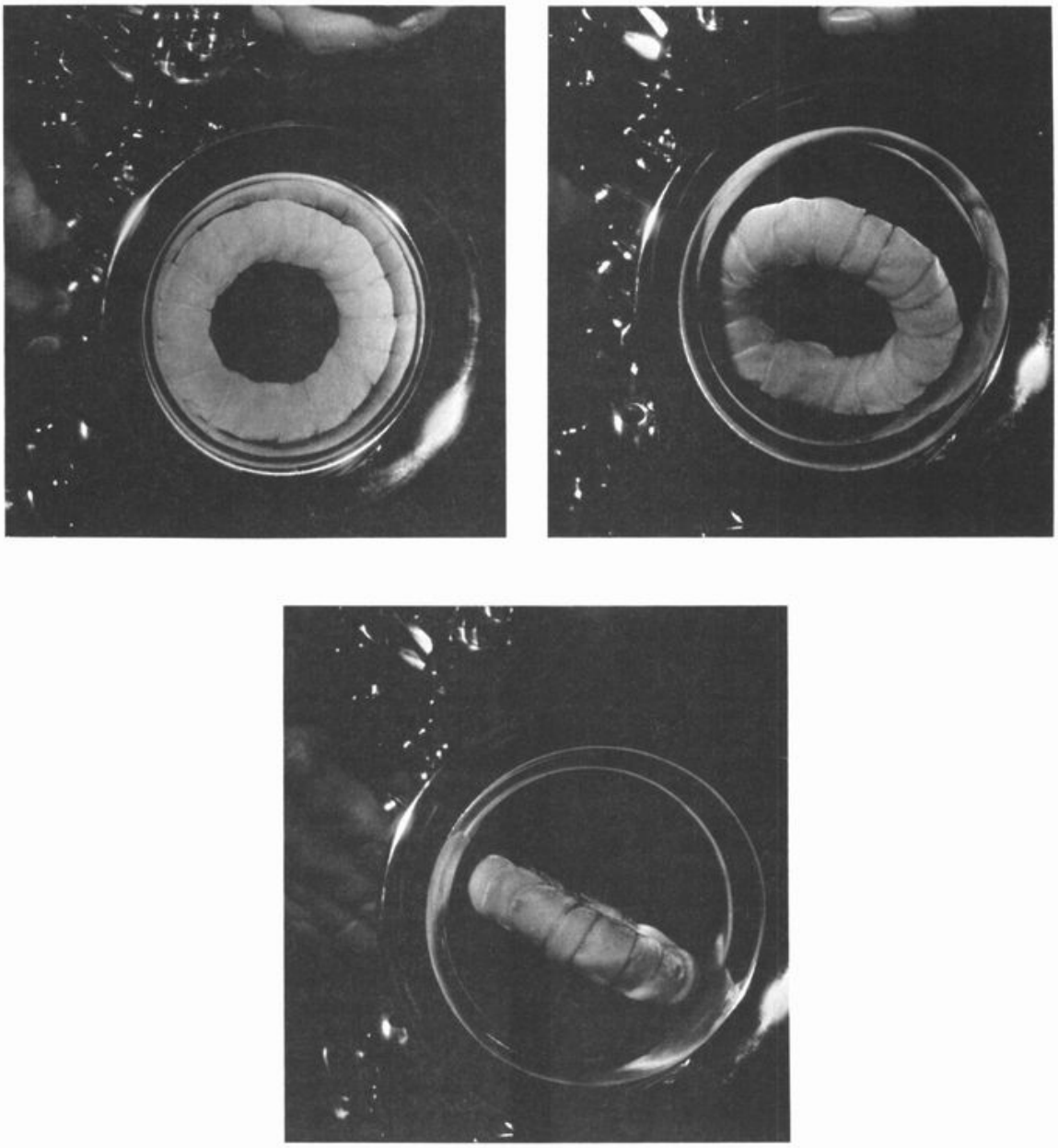
SUMMARY

1. Improve the tonal concept by listening to fine saxophonists and other instrumentalists and singers.
2. Start the tone from the diaphragm—blow from the *bottom up*.
3. *Relaxation* should be the result of acquiring sensitive control. It does not mean total collapse.
4. Vibrato is characteristic of the saxophone tone, but should be considered as a manipulation, rather than a part of the tone. A good *basic* tone must be the core of any musical sound.
5. Keep the tone in focus.
6. *Blending* with other instruments is of extreme importance.
7. *All* studies are tone studies. Never divorce tone quality from technique.
8. *Fill the instrument with tone*, not with wind.
9. Think of the tone quality *before* you play; avoid blowing and then adjusting later.
10. Make *yourself* responsible. After a good mouthpiece and reed are obtained, the rest is up to the individual.

THE SAXOPHONE MUTE

Various methods of muting the saxophone are available and sometimes desirable as a means of diversifying tone quality. The purpose of the mute is twofold: to reduce the volume and to absorb some of the higher overtones, giving the tone a more mellow character. Use of the saxophone mute tends to equalize the resistance in the instrument, and makes certain notes easier to control when playing softly. The disadvantage of most mutes lies in the fact that they lower the pitch of the bell tones (low C, B, and B♭) in increasing degrees, making it necessary to avoid certain melodic passages.

The simplest method of muting consists of placing a loosely-wadded handkerchief or similar cloth in the bell—a satisfactory arrangement if none of the bell tones are required. A commercial mute consisting of a thick piece of felt about the shape and size of a doughnut is also useful, but has the same drawbacks as the handkerchief type. The most satisfactory device, introduced into this country by Marcel Mule, consists of a wooden drapery ring wound with velvet ribbon sewed in place. The advantage of this type is its capability of adjustment to different degrees of muting. In the open position, even the low B♭ can be played within the limits of pitch tolerance. Photos below indicate the manner in which this type of mute may be used.



Open

MUTE POSITIONS

THE VIBRATO

No other element in the field of music is more controversial than the subject of vibrato. The nature, use, and artistic value of a pulsating tone as opposed to the straight or "pure" sound is bound to generate argument in any musical discussion. In spite of the fact that singers have used vibrato probably as long as there has been singing, its acceptance in the instrumental field has been slow. String players have developed its use to a greater degree of standardization than have wind players, and it has been only in the present century that wind instrumentalists will admit to a conscious study of the vibrato.

In *In Search of Beauty in Music*, Dr. Carl E. Seashore, one of the best-known authorities on the scientific aspects of music, confines his definition to the GOOD vibrato. He says: "A good vibrato is a pulsation of pitch, usually accompanied by synchronous pulsations of loudness and timbre, of such extent and rate as to give a pleasing flexibility, tenderness, and richness to the tone."[2]

In professional singing the vibrato is practically always present, even though the performer may deny using it. A great many musicians believe the vibrato to be a natural consequence of emotion or expression, like a smile or a frown. They feel that this is the only true artistic form, and decry the present-day trend toward studying and learning the vibrato. Violinists, however, who have spent many hours of intelligent practice and study in its development, will admit that the acquisition of a good vibrato comes only after much thought and work.

The saxophone is essentially a lyric instrument, whose tone and use is associated with the human voice. Inasmuch as vibrato is universally accepted as a natural embellishment for the voice, it is logical that the saxophone should be treated likewise. The problem, then, is not to attempt to justify the use of vibrato, but to achieve a good vibrato that can be used in the very best musical taste.

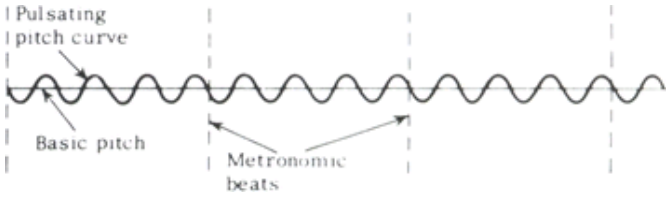
THE NATURE OF GOOD VIBRATO

The characteristics of a good vibrato should be understood before the mechanics of its study are pursued. There should be a flexibility of tone without an overemphasis of the pulsating quality. A fine musician once said to me: “Vibrato is like the salt in your potatoes. If there is none, the taste is flat, but if you can taste the salt, there is too much.” The vibrato should have an even rate, without being so wide that it becomes monotonous. A variation in rate and extent is desirable. This should be determined by the type of music played and by the emotional quality of a particular phrase. It should be an honest, sincere utterance based on a sensitive control of all the instrumental, musical, and artistic knowledge of the performer.

THE VARIABLES OF VIBRATO

What actually happens during the pulsation of a good vibrato? We use the terms “intensity vibrato,” “pitch vibrato,” or “timbre vibrato” without realizing that they are not isolated from each other. Rather, a pulsating tone contains some of all of these characteristics. Acoustical researchers have succeeded in measuring these factors. The results have been most interesting and sometimes startling. It is hard to believe that the average amplitude of the vibrato in concert singers is nearly a half step. This much deviation from the pitch would certainly be intolerable in a straight tone.

The graphic illustrations following may aid in achieving a correct concept of the vibrato. It is obvious that diagrams can only suggest what one actually hears. However, for purposes of our study, they may prove helpful. The pitch and rate curve of any given tone has been plotted in the laboratory in the following manner:



This diagram approximates an actual laboratory test of the singing voice, and may seem exaggerated in the amplitude and sharpness of the curve. However, it serves to demonstrate the relationship of pulsation and rate to the pitch and beat. Notice that the first direction of the pitch line is *down* from the point of the beat. The intensity aspect of the vibrato is similar to the following:

This also should coincide with the pitch and rate curve. The timbre of the tone will parallel the above components of the vibrato, and the sum total of these characteristics is known as *sonance.* This term is defined by Seashore as: "The successive presence and fusion of changing timbre, pitch, and intensity in the tone as a whole."[3]

The training of the ear is of prime importance in vibrato development, and the best directions in this respect are presented by Carl Seashore. In answer to the question, "How can we approach the ideal vibrato?" he says: "Three stages recommended for ear training for vibrato are:

1. The acquiring of factual information such as musical terminology and nomenclature, analysis of the problem, demonstration of specific aspects;
2. The taking of practical exercises in the recognition, description, and evaluation of the elements involved in each skill;
3. The taking of drill exercises for the development of speed and accuracy in each operation."

The ultimate goal of ear training is the appreciation and mastery of musical feeling. Only after the above three stages have been pursued successfully can we assume the possibility of a fine vibrato.

ACQUIRING THE CORRECT CONCEPT

So much depends on hearing the "sonance" properly that preparatory listening is indispensable. One must decide for himself whether the rate, pitch, and intensity variations are acceptable. Phonograph records of both the voice and of instruments are the most valuable aid in this respect, because unlimited repetition of phrases is possible. With the aid of a metronome, it is quite simple to measure the vibrato rate. Try also to recognize and identify the extent of the pitch deviation. While this will take time and experience, it is surprising how this pitch awareness will be identifiable. Notice also the variance in intensity and how it affects the total sound, or "sonance." Although imitation alone is not the only approach, it will serve as a springboard to the acquisition of concept and ability.

It is worth reiterating that a *combination* of qualities is our goal. Rarely does one exist without the other, and all of these must be combined and added to a fine *basic tone quality* before a beautiful, flowing sound can be expected.

TYPES OF SAXOPHONE VIBRATO

The physical factors directly concerned with the production of the vibrato are the lips, the throat, the jaw, and the muscles controlling the diaphragm. Although we may not consciously use all of these in its production, the function and task of each should be understood.

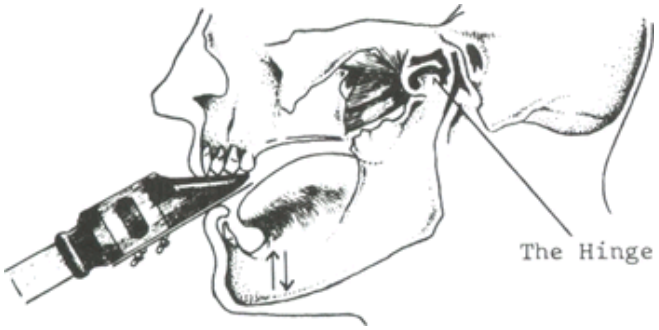
1. The lips, as the cushion which supports the embouchure, become the recipient of changing pressures when the jaw moves. The lips then transfer this change in pressure to the reed, which responds with a change in vibration rate. This, in turn, brings about a variance in pitch, timbre, and volume. The generally accepted term for this type of pulsation is the *jaw vibrato*. This type of vibrato is generally conceded to be the most satisfactory method for saxophone, and is used by the majority of successful performers.
2. The *lip vibrato*, which is often confused with the jaw vibrato, is produced by moving the lips in something like a "wa-wa-wa---" motion. However, this is more difficult to control, as it causes a greater disturbance to the basic embouchure. This type of pulsation tends to dominate the tone so much that the listener hears more vibrato than tone. We must always bear in mind that the esence of good vibrato is subtlety, and no vibrato which "takes over" the musical sound will satisfy an artistic taste.
3. The *throat vibrato*, which is seldom used any more, was at one time prevalent in wind instrument performance, especially among brass players. This is a type of "spasm" generated by tensing the throat muscles, and results in a sort of "quiver." This vibrato has at various times been described disparagingly as the "whinny" or the "nanny-goat" type. A collector of old phonograph records will have little trouble in identifying this sound if he listens to instrumentalists of the early part of this century. A different set of throat muscles is sometimes used by flute players in combination with the diaphragm. They employ the same muscles one would use to say "gha-ghagha---" in an even manner. This method has been very successful, and is employed by some of the finest flutists.

4. *The diaphragm vibrato,* which is predominantly an intensity vibrato, is induced by a changing of the rate of the air pressure on the reed, and accomplished by moving the abdominal muscles, which in turn put pressure on the diaphragm, much as one would say "huh-huh-huh---." This vibrato has proved to be quite satisfactory in a few cases, but its use is restricted, since it is difficult to attain a sensitive control of either the rate or the amplitude. The diaphragm vibrato is in much more general use on flute, oboe, and brass instruments than on saxophone.

Considering all aspects of the situation, it is apparent that the jaw vibrato is most adaptable for the saxophone. Its employment results in greater control of the rate, amplitude, and shape of the oscillation. At the beginning, it is developed as a mechanical skill, but ultimately this skill can be adapted to a more controlled and artistic degree.

THE PRELIMINARY STEPS

After the embouchure has been formed, as outlined in a previous chapter, and only then, should the study of the vibrato be undertaken. The success of this method is dependent on the position of the jaw, a relaxed throat, and the support of the lips.



JAW MOTION OF THE SAXOPHONE VIBRATO

The primary task here is to achieve an even, controlled motion of the lower jaw, which must be relaxed. It should operate without disturbing the basic embouchure. True, a slight pressure change in the lower lip occurs, but no further alteration in lip position should take place. Practice should begin by forming the correct embouchure with the lips parted about half an inch, as if the mouthpiece were inserted. Start saying “ah-ah-ah-ah” in groups of four, moving the jaw up and down, *not* backward and forward, through an arc of about three-fourths of an inch. This should be practiced rhythmically (with a metronome, if possible) at about four pulsations per second. Some difficulty may be encountered in attaining a smooth motion, even at this slow tempo. The hinge of this motion is the joint that attaches the lower jaw to the skull. Often it is not as free in operation as one would think. Sometimes a “hitch” in the joint makes the jaw jump, and extended

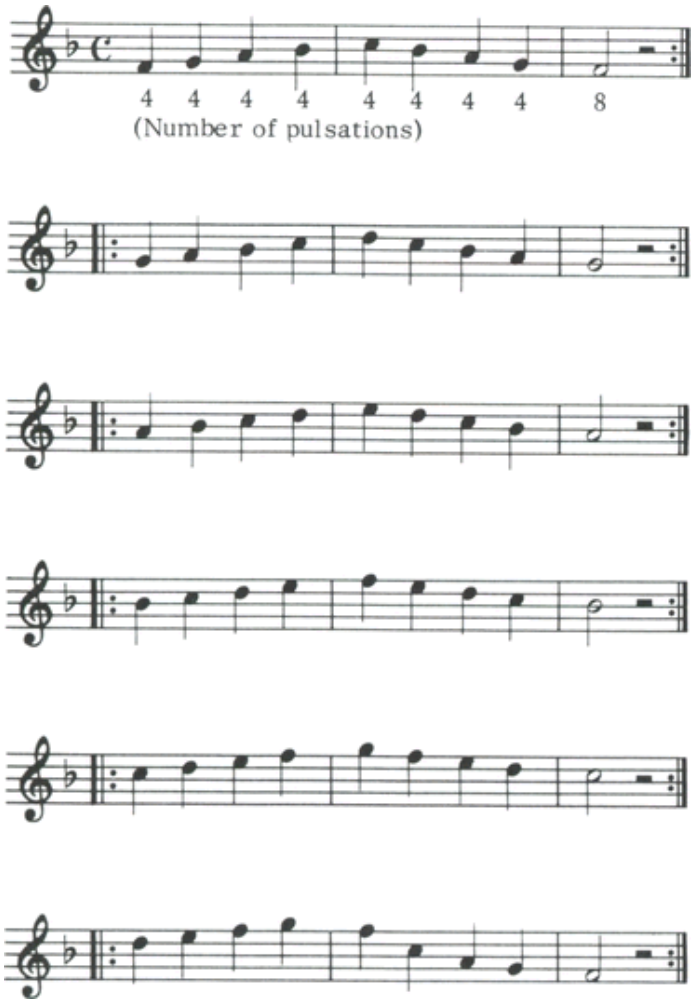
practice may result in a soreness or a tired, aching joint. This condition is a normal consequence of the use of small muscles that have been inactive for many years. It is important that this exercise be repeated several times each day until the hinge feels lubricated and the motion smooth, in this manner:

This should be practiced in rhythms of 4, 3, 6 and 5 pulsations per beat. The tempo of the beat is changed to adjust to the particular rhythm involved. Later, the tempo is gradually increased until any speed between is comfortable and can be done for a reasonable length of time without fatigue. Up to this point, these drills should be practiced away from the instrument, the sole objective being to free the jaw motion and to obtain an improved control.

Clarinet players may find this exercise quite difficult, since after years of playing the jaw often becomes locked in one position. However, there is no evidence that the freeing of this joint will in any way affect the clarinet embouchure.

TRANSFER OF THE MOTION

The transfer of this motion to the saxophone may be disappointing at first, and it is common for the teacher to hear “My gosh, not that!” on the first few attempts. In the actual blowing, the lower jaw should move only about 1/32 of an inch, but usually it is better to start with about a 1/4 inch motion. First results are usually raucous, primitive, unmusical and frustrating. We are attempting only to gain the mechanics of the technique, with no regard at the moment for artistic attainment. The following exercise or any simple scale can be used for an initial venture:



Play the above with full tone but no vibrato, then repeat each three-measure phrase, using four pulsations per beat as indicated. The lip position should remain the same whether or not the vibrato is used, the only change being the motion of the lower jaw. This motion should not stop in passing from one note to the other, but should remain an even pulsation. As soon as the pulsation seems even and rhythmical, the amount of jaw motion should be cut down and the rate increased, so that a musical fluidity starts to form. This may start in a short time or, again, it may be patience-trying. As beauty is a relative thing, the ideal attitude can only be a sincere desire for consistent progress. No real musician ever feels that any phase of his art cannot be improved.

The rate of the quarter note at 60—four pulsations per beat—is gradually increased until the metronome can be set at any speed up to 90. It is important that the performer be able to vary the speed between these limits. The speed of the vibrato used in a performance should be dictated by the music rather than by

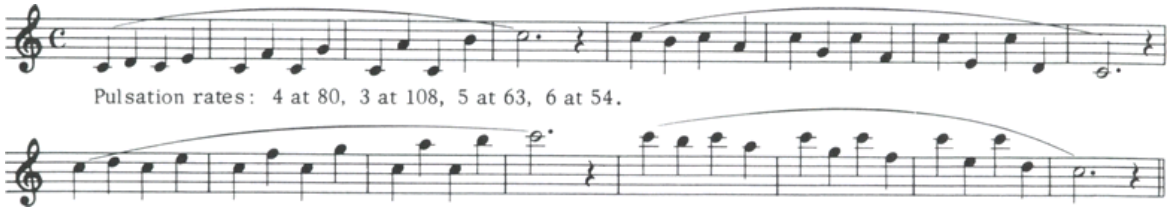
the limits of the player's ability. Rates of pulsation vary slightly from one performer to another. Tests were made of several fine saxophone artists by taping records of solos, then slowing the tape down for measurement. It was found that the vibrato rate varied in the different soloists from 6.4 cycles per second down to 5.2 cycles. While each soloist varied his rate somewhat, he also seemed to have a basic rate which was a characteristic part of his tonal individuality. In metronomic terms this means that the fastest pulsation was 4 to 96, and the slowest, 4 to 78. The average rate was about 4 to 82. The trend in vibrato for the past several years, both in concert and popular music, has been toward the slower and narrower vibrato. Thus, four pulsations to 80-84, or three to 120-126, might be considered the "going rate" at the time of this writing.

IMPORTANT! The writer wishes to make it very clear that the above discussion refers only to the rate of the pulsation and that this type of study is pursued to gain control. Under no circumstance should the impression be given that each quarter note gets a set number of pulsations. The vibrato should move at an even rate, regardless of the tempo of the music. Practicing the vibrato to a beat is encouraged only to gain control and evenness.

PRACTICE PATTERNS

The following are submitted only as patterns for practice. Students are urged to invent or use material available. Bear in mind that the vibrato, while an embellishment of the sound, should be part of the tone, and not just a "fringe benefit."

1 .



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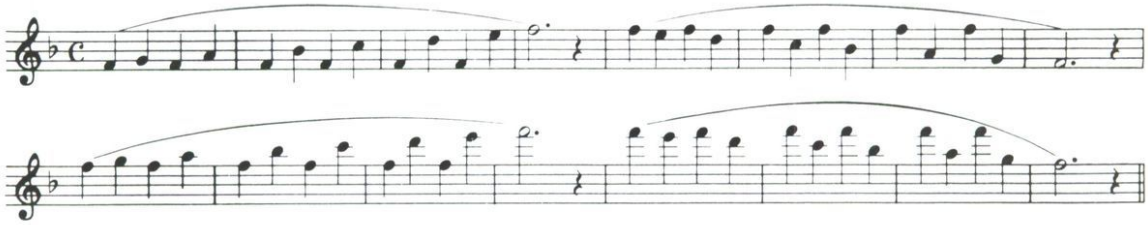

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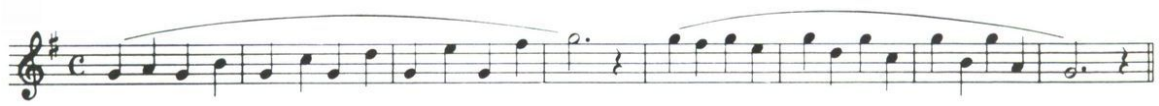

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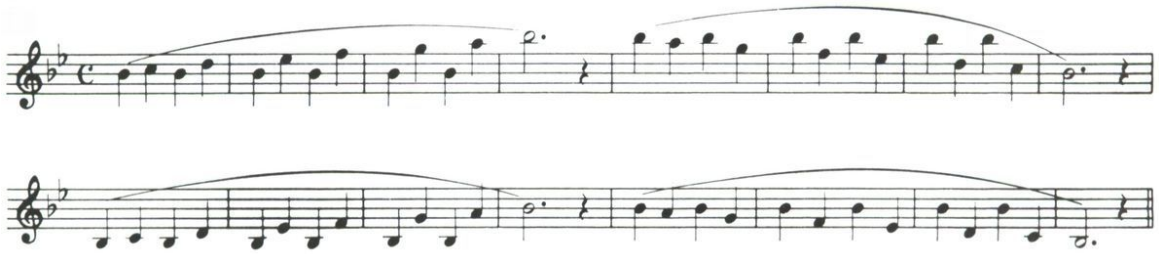

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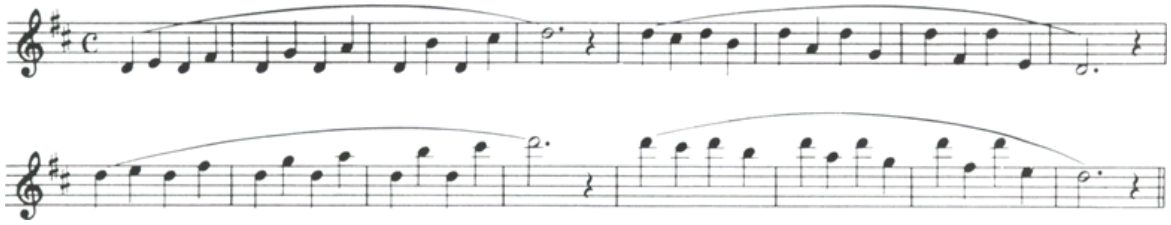

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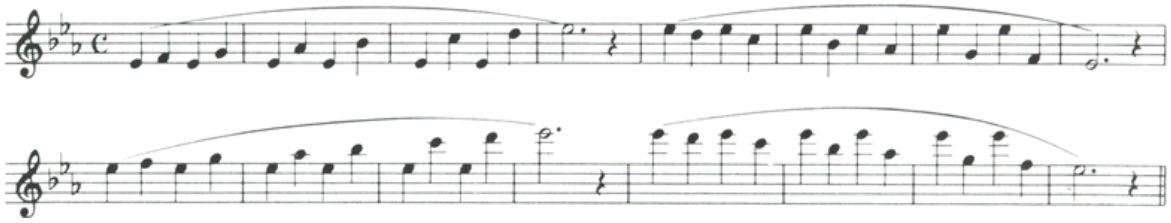
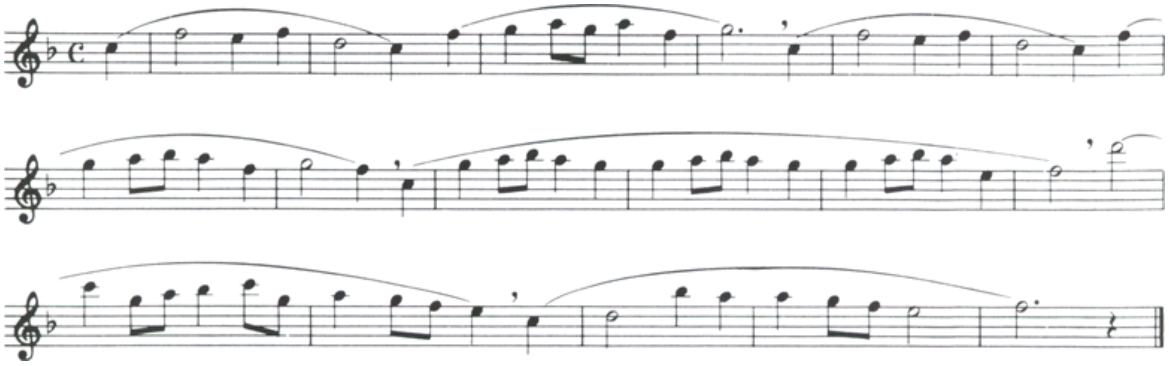


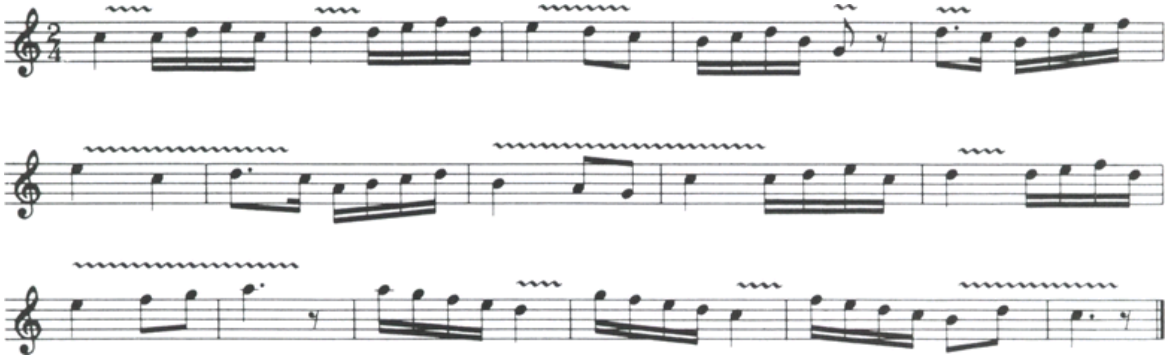
The preceding patterns should be played with a full tone, uniform volume, and with particular attention to intonation. Keep the vibrato in motion while changing

the interval. As soon as the pulsations are even, the amplitude should be narrowed by shortening the stroke of the jaw. The final result must be a liquid tone, without obvious vibrato.

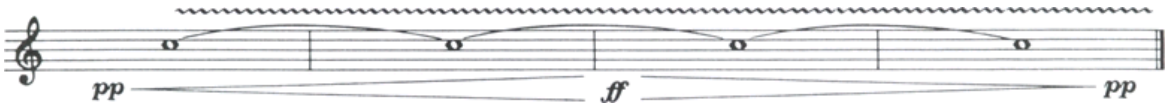
Ex. 2 Simple melodies, with emphasis on tone connection and phrasing. First, practice at a definite pulsation rate, such as four to a beat. Then try playing at an *even* rate, but do not think of actual pulsations per beat. The following melody (with apologies to Brahms) is an example:



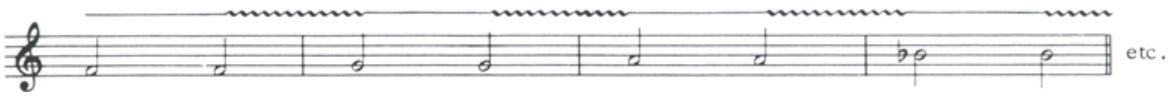
Ex. 3 Alternate a long pulsating tone with an articulated or technical passage:



*E*x. 4 Long tones with crescendo and diminuendo, keeping the vibrato rate and amplitude constant:



Ex. 5 Alternate a straight tone with vibrato. Try to keep the basic tone the same in both cases:



TEN SALIENT POINTS

1. The vibrato must be combined with a good basic tone; it is not an end in itself.
2. Mechanical adequacy is essential before a satisfactory result can be expected.
3. The first attempts will probably be discouraging. Gradual refinement should parallel good practice habits.
4. After reasonable control is achieved, think of what is desirable musically, and follow your artistic dictates.
5. For study, imitate the best artists (not only saxophonists, but other instrumentalists and vocalists).
6. Avoid consciously playing any given number of pulsations to the beat. The vibrato must be even in rate, but the rate is not dependent on the tempo of the music.
7. When the pulsation is sufficiently refined, it should melt into the sound, producing an enriched, liquid tone.
8. In a lyrical phrase, pass from one tone to the next without disturbing the flow of pulsation.
9. The tone, of which the vibrato is an important ingredient, can be improved only through intelligent and patient study.
10. Bear in mind the original definition: "---pulsations of loudness and timbre, of such extent and rate as to give a pleasing flexibility, tenderness, and richness to the tone."

INTONATION

"If you want to keep a friend, never criticize his family, religion, politics, or intonation." This remark, often made by the old time musician, emphasizes the point that intonation is a matter of such personal pride that lasting friendships have been known to disintegrate when diverse opinions have met head on. During a performance, there is no way of measuring intonation except by hearing—so it becomes a matter of judgment. Since most performers consider their own judgment to be sound, the matching of pitch levels calls for cooperation and tolerance, in addition to the lifetime quest for a more accurate pitch perception.

A study made by this writer in 1943 examined the intonation tendencies of saxophonists, all of whom were professionals or advanced students. Measurements for 26 alto and 17 tenor saxophones of various makes were recorded. The survey was aimed at the tendencies of the players, rather than the make of instrument. The results point up the inclination of performers to play sharp in the upper register to an increasing degree as they approach the top notes. (In fairness to several of the saxophonists, it should be mentioned that some played in tune remarkably well, and that the readings shown are only averages.)

While the chart shows a similarity between the alto and tenor saxophone deviations, it should be evident that this in no way reflects accurate unison playing between the two. They are sounding different pitches when playing the same written note. Upper C♯ on the tenor shows plus 20, while the G♯ on the alto which sounds the same (B♮ concert) is plus 1, a difference of 19 cents. This is beyond the limits of pitch tolerance.

Reasons for this condition were found to be:

1. Hearing the pitch incorrectly.
2. Incorrect embouchure.
3. Changing jaw position for different registers.
4. Incorrect mouthpiece placement.
5. Mouthpiece unsuited to the instrument or embouchure.
6. Instrument out of adjustment.

Every sincere musician strives to play in tune, but is sometimes overwhelmed by the imperfections of his instrument, the dilemma of the just versus the tempered scale, and adaptation to the ensemble. Intonation problems of the saxophone, which are often complex, are a matter of intelligent adjustment to a

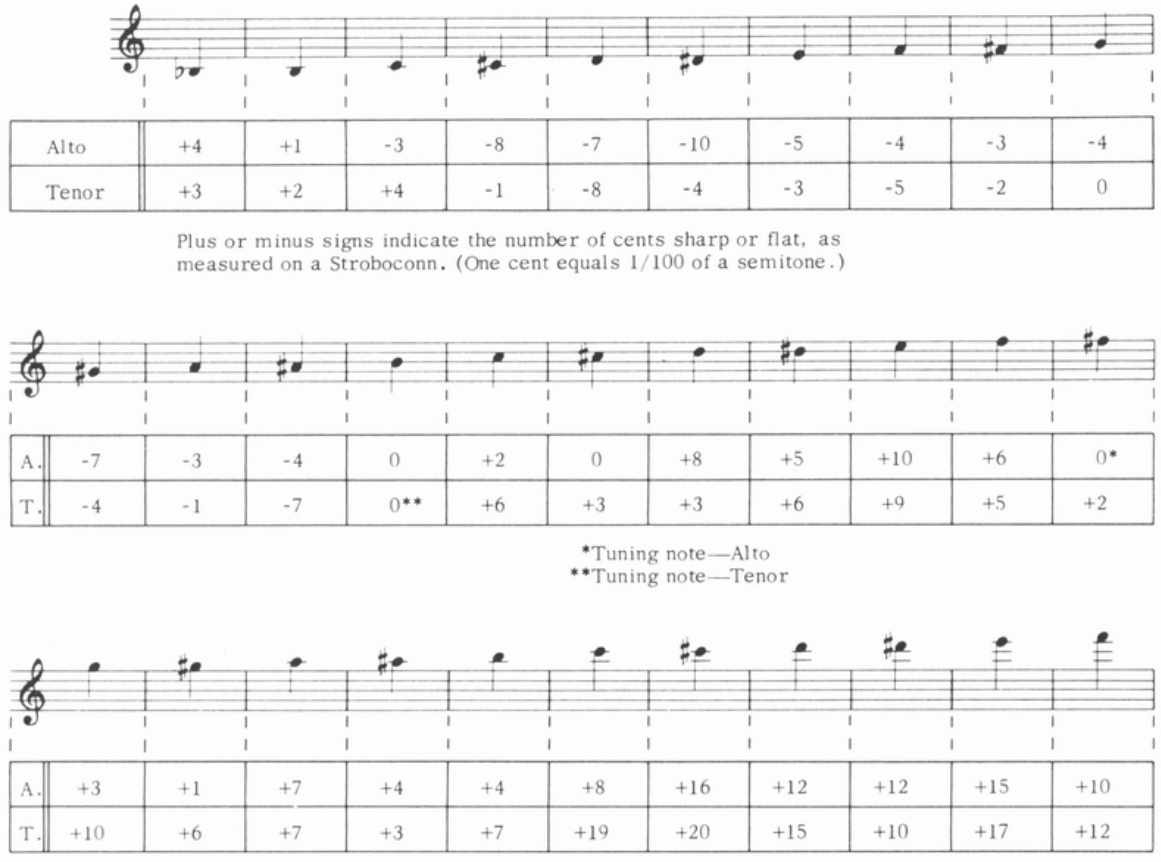
constantly shifting condition. A realization of this situation should point up the necessity for the establishment of a basic scale that is in correct pitch relationship with itself. Once this basic scale is well established, the necessary adjustments can be accomplished with more stability and with a better sense of proportion.

Modern intonation is based on a compromise scale that is in itself imperfect. This scale is known as the "tempered" scale, in which the octave is divided into twelve equal parts. The development of this scale, of which Bach was an important advocate, was necessary to simplify the pitch relationship when changing from one key to another. Use of the acoustically correct or "just" scale, based on the overtone series, involves so many pitch values in an octave that it is impractical when building an instrument. Wind instruments are tuned as nearly as possible to the tempered scale, but since the overtone series is employed as the means of tone production, it is impossible to completely resolve the disparity between the two. The resulting confusion should not, however, serve as the excuse for out-of-tune playing. The saxophone can be played in tune, and the performer must assume the responsibility. The fact that the instrument has such great flexibility is an advantage when pitch adjustment is necessary, and the primary problem is in "tuning the player" before we condemn the instrument.

The tendency of the human ear to accept sharpness in a melodic or solo line, while at the same time being quite intolerant of flatness, is well known. Why this is true is a matter for the psychologist to explain. It is also true that many players will resort to sharp playing merely to be heard above the ensemble—a despicable practice which leads to musical chaos. The good ensemble player blends so well that his tone becomes a part of the whole, neither predominating nor leaving a weak spot in the musical structure.

HEARING THE PITCH CORRECTLY

Pitch sensitivity varies widely between individuals, from the few who have an uncanny gift for pitch recognition to the last vibration, to the so-called “tone deaf” who have no reaction to intonation discrepancies. The study of music should be limited to those people who have at least an average or better ability of pitch recognition. From this point on ear training can do wonders if properly studied, and the development of a sensitive musical ear is by no means an impossible undertaking. Hearing is an exercise of the mind as well as the ear, and progress may be made in perception capabilities through proper discipline and training. Solfege or other ear training courses are recommended, either preceding or during the study of saxophone.



Alto	+4	+1	-3	-8	-7	-10	-5	-4	-3	-4
Tenor	+3	+2	+4	-1	-8	-4	-3	-5	-2	0

Plus or minus signs indicate the number of cents sharp or flat, as measured on a Stroboconn. (One cent equals 1/100 of a semitone.)

A.	-7	-3	-4	0	+2	0	+8	+5	+10	+6	0*
T.	-4	-1	-7	0**	+6	+3	+3	+6	+9	+5	+2

*Tuning note—Alto
**Tuning note—Tenor

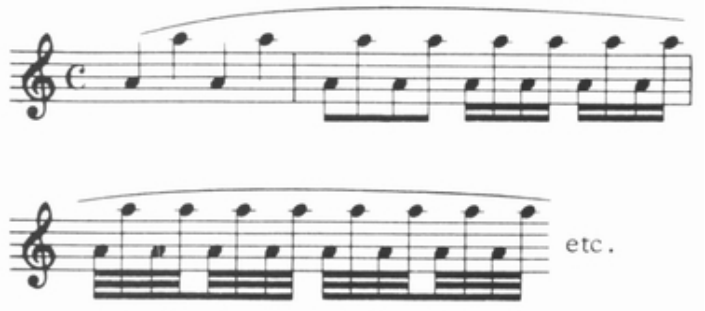
A.	+3	+1	+7	+4	+4	+8	+16	+12	+12	+15	+10
T.	+10	+6	+7	+3	+7	+19	+20	+15	+10	+17	+12

INTONATION TENDENCIES OF THE ALTO AND TENOR SAXOPHONES

The human ear is a fickle organ, and if not coached by the mind, it can easily become accustomed to out-of-tune playing. An independent source of pitch measurement is a great aid in laying the foundation for pitch and interval relationship. The Stroboscope, which measures vibrations electronically, has proved to be a valuable accessory in this respect, as it gives the performer a visual, as well as aural, answer to his intonation problems. When this instrument is used, it is well to realize that the *sound* of the correct reading must be established in the musical memory. A well tuned piano may also be a valuable adjunct, both for matching the intonation and for checking critical interval relationships. Retention of the pitch in the mind when one has heard it correctly will develop only after training and practice, and this is where memory comes into the picture. The habit of listening critically, if properly cultivated, is an indispensable aid in developing a sense of pitch discrimination. Sensitivity is best acquired through constant attention.

EMBOUCHURE TENSION

One of the methods of checking embouchure position for intonation is through the use of the octave key. If the register change can be made by the use of this key alone, with no alteration of lip pressure, this is a strong indication that the embouchure tension is in the correct area. A simple exercise such as is helpful for determining the correct pressure. Use the forefinger of the right hand to operate the octave key, as this allows better concentration on uniform embouchure tension. Too much pressure will produce only the upper A, while too little pressure will produce only the lower tone. In other words, let the octave key do the work. If the embouchure position is correct, a perfect octave will result, and a feeling of stability in the register shift will be produced. After an accurate octave relationship is established, play the A major arpeggio, using the same embouchure tension throughout. Particular attention must be given to the outside notes, which should be checked with a Stroboscope, if possible. Various scale studies logically follow in this practice procedure, with emphasis on retention of a stable embouchure.



HOLDING THE JAW POSITION

Self-taught players often acquire the habit of moving the jaw forward and back as they play ascending and descending scales and intervals. The result is a different embouchure for each note, which has a disastrous effect on both intonation and tone quality. Inaccuracy in the interval relationships makes it extremely difficult to pass from one tone to another without distortion. Once this habit is ingrained, its elimination requires determination and patience. A mental as well as a physical problem is involved, since the player is subconsciously convinced that the intervals will not respond unless the jaw is moved. One method of proving otherwise requires the services of a teacher or another saxophonist, who stands behind the player and fingers the instrument without revealing the course of the music—a crude demonstration that may be a starting point for the improvement of this condition. After a little experimentation, the "blower" should discover that he can play both registers with the same embouchure position. Any progress in the elimination of a movable jaw requires a re-examination of the fundamentals of embouchure position and musculature, and the task, while not an easy one, is certainly worth the effort.

MOUTHPIECE PLACEMENT

Wind instruments are built to exacting measurements, and if these are disrupted to any marked degree the instrument becomes out of tune with itself. While *slight* changes are sometimes necessary, we often find an individual who has to push his mouthpiece far in on the cork, or vice versa, to reach the prevailing pitch. The fault may lie in an incorrect embouchure position (assuming that the prevailing pitch is at or near A=440). The player who has to pull the mouthpiece out from the normal position is probably biting and playing on the sharp side of his tone. The opposite condition, playing on the flat side of the tone, is the result of insufficient muscle development. This requires pushing the mouthpiece in so far that the instrument loses its proper interval relationship.

As an example of the above, if we assume that the mouthpiece is pushed in 1/4 inch beyond its normal position and the length to the open key is twenty inches, then the tube is shortened by 1/80th of its length. This will raise the pitch of the tone to that degree. However, the same mouthpiece placement will change the length of a ten-inch key opening by 1/40th, or twice as much. While the flexibility of the instrument allows for slight changes of mouthpiece placement, the student should check his embouchure position when more than a small change from normal is necessary to produce an A=440. A pencil mark on the cork indicating the normal position for A=440 will establish a basis from which to work.

MOUTHPIECE SUITABILITY

Most manufacturers of saxophones supply a mouthpiece which has been fitted to the instrument for both tone quality and intonation. It is based on a sane design matched to that particular instrument. Often, when the radically open or long facing mouthpiece is used, correct intonation goes out the window in favor of greater volume or projection. While the user may at first be enthusiastic about his discovery, he usually runs into control and intonation problems. There are many cases where a different mouthpiece is an improvement for the particular individual, but the selection should be made with care, discrimination, and with a special check on the intonation characteristics.

CORRECT KEY ADJUSTMENT

Saxophones should be checked at regular intervals, not only for leaks, but also to determine if the keys raise at equal and proper heights from the socket openings. Raising the key action raises the pitch, but at a different rate throughout the instrument. So, any change in the action from the measurement recommended by the manufacturer will throw the saxophone out of tune with itself and will affect the tone quality. Players who open up the action to gain more volume and brilliance must realize that they are flirting with intonation troubles on the sharp side, while a closed action will produce a stuffy tone that will be flat in varying degrees. The upper tones (from high D to F) are especially sensitive to the height of the action and should be checked at frequent intervals, since the corks and bumpers wear and cause a wider opening and sharpness. Adjusting the action is a job for a repairman, since the change in the height of one key affects the mechanism and intonation of the others. The entire stack of keys must be considered rather than adjustment of a single key.

EFFECT OF TEMPERATURE CHANGES

Sound waves travel faster at high temperatures, and so will produce a higher pitch. Saxophones which are built to be played in a room temperature of 72° Fahrenheit will have a pitch distortion at any other temperature, quite a frightening thought if taken literally. There may be some solace in the fact that all other instruments are also in the same predicament, but are not all affected the same. In keyboard instruments, a rise in temperature expands the string or bar to such an extent that the instrument becomes flatter, while wind instruments sharpen in varying degrees.

Under extreme conditions, such as playing on a football field in freezing weather or on a lighted stage where the temperature becomes 90° or higher, it is almost impossible to play an instrument in tune, regardless of the amount of embouchure adjustment and re-positioning of the mouthpiece. While such extremes are rare, it is also a fact that the ideal condition is not often present and that room temperatures change during a performance. The instrument, when brought into a warm room during cold weather, is in no condition to be played immediately, and should be brought to room temperature first. The best method for warming the saxophone is to open the case for a few minutes. Being metal, it will absorb the heat of the room rapidly. Blowing through an extremely cold instrument is not recommended, since this causes an abnormal amount of moisture to collect on the inside of the chamber, and soon the pads close to the mouthpiece are dripping. Another consideration is that, since the temperature of the breath is warmer than the temperature of the room, the area near the mouthpiece will be warm but the instrument will become progressively cooler toward the bell. In abnormal temperatures there will be a disparity between the tones which leave the saxophone close to the mouthpiece and those which come out near the bell. A change in mouthpiece placement can only partially compensate for this situation, so it is advisable to tune to at least two other notes in addition to the regular tuning note, such as C and D in the staff. These notes are chosen because they use a short and a long vibration length. This is merely a compromise tuning, but approaches an average intonation from which further adjustments are possible. If it is necessary to warm the instrument with the breath,

put a handkerchief in the bell of the horn and blow slowly, at the same time fingering the B♭. The heat of the breath will distribute through the saxophone more evenly and quickly if the keys and bell are closed. Problems of tuning are continuous during a performance, for the temperature of both the stage and the instrument are bound to change. Since the average pitch of any ensemble rises during a concert, constant adjustment is often necessary to conform to the pitch of the group.

THE JUST VERSUS THE TEMPERED SCALE

Using corrective measures to alter the tempered scale so that it conforms with the just scale is in the province of the mature musician. The wind instrument player encounters this problem head-on when playing with string players, who endeavor to use just intonation. Most books on musical acoustics have excellent explanations of this subject, which, though quite involved, are valuable to the serious musician. *Musical Acoustics*, by Charles Culver (New York: McGraw-Hill Book Company), is recommended as a book for students interested in this aspect of playing.

The problems of playing the saxophone in the tempered scale, for which it is built, should definitely be solved before attempting the complications of the just scale. Learning to play in the just scale, best demonstrated by fine string quartet playing, requires an advanced knowledge *plus* a sensitive musical ear by *all* the members of an ensemble. Attempts to oversimplify this situation will result in much confusion. However, awareness of acoustical facts can be of value if used with discretion:

1. Perfect fifths are slightly sharper than in the tempered scale—about 1/50th of a semitone.
2. Perfect fourths are slightly flatter, to the same degree, as the sum of the two makes a perfect octave.
3. The major third is flatter, and the minor third sharper.
4. Sharps are higher than flats, i.e., G♯ is higher than A♭.
5. Augmented and major intervals should be enlarged in size.
6. Minor and diminished intervals should be contracted.

Sensitivity to the harmonic structure of the music is necessary if this type of intonation is to be employed. Its use is so involved that it should be attempted only after exhaustive study, plus a mastery of the tempered scale.

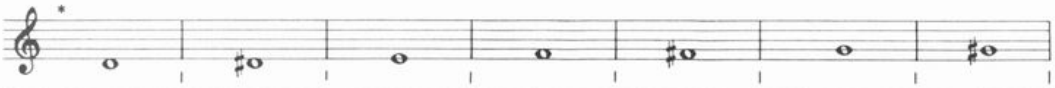
PITCH ADJUSTMENT BY SPECIAL FINGERINGS

Use of special fingerings to alter the pitch has certain advantages over "lipping" the note, namely:

1. Preservation of the embouchure position.
2. Greater control of the tone quality.
3. Stabilization of the tone connection.

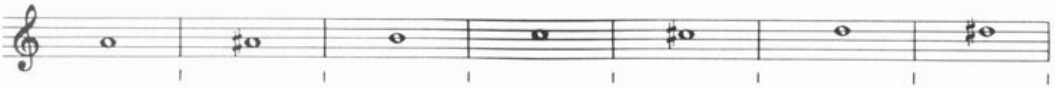
While embouchure alteration is still necessary at times, a knowledge and use of the available fingerings for pitch alteration has distinct advantages. The chart included here indicates fingering positions which are of value in this respect. Results may not be the same for all makes of instruments, so some experimentation may be required to get the best results from a particular saxophone.

Depress key indicated in addition to regular position unless otherwise noted.



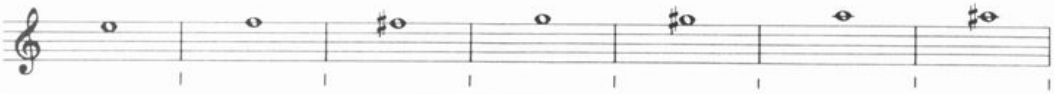
To raise pitch	C♯	C♯	C♯	D♯	D♯	sF♯	sF♯
To lower pitch	None	None	B or B♭	C	C	C	None

*There are no pitch alteration fingerings below low D.

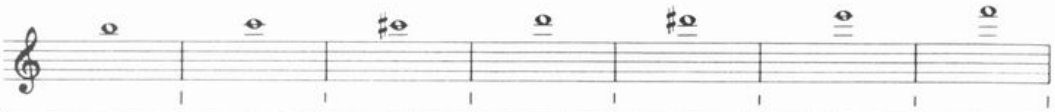


Raise	G♯	G♯	G♯ or sB♭	sB♭	sC or "long."**	C♯ or high D	High E♭
Lower	6	4, 5, or 6	3	4, 5, or 6	4, 5, and 6	B	B

**See regular fingering chart for this fingering.

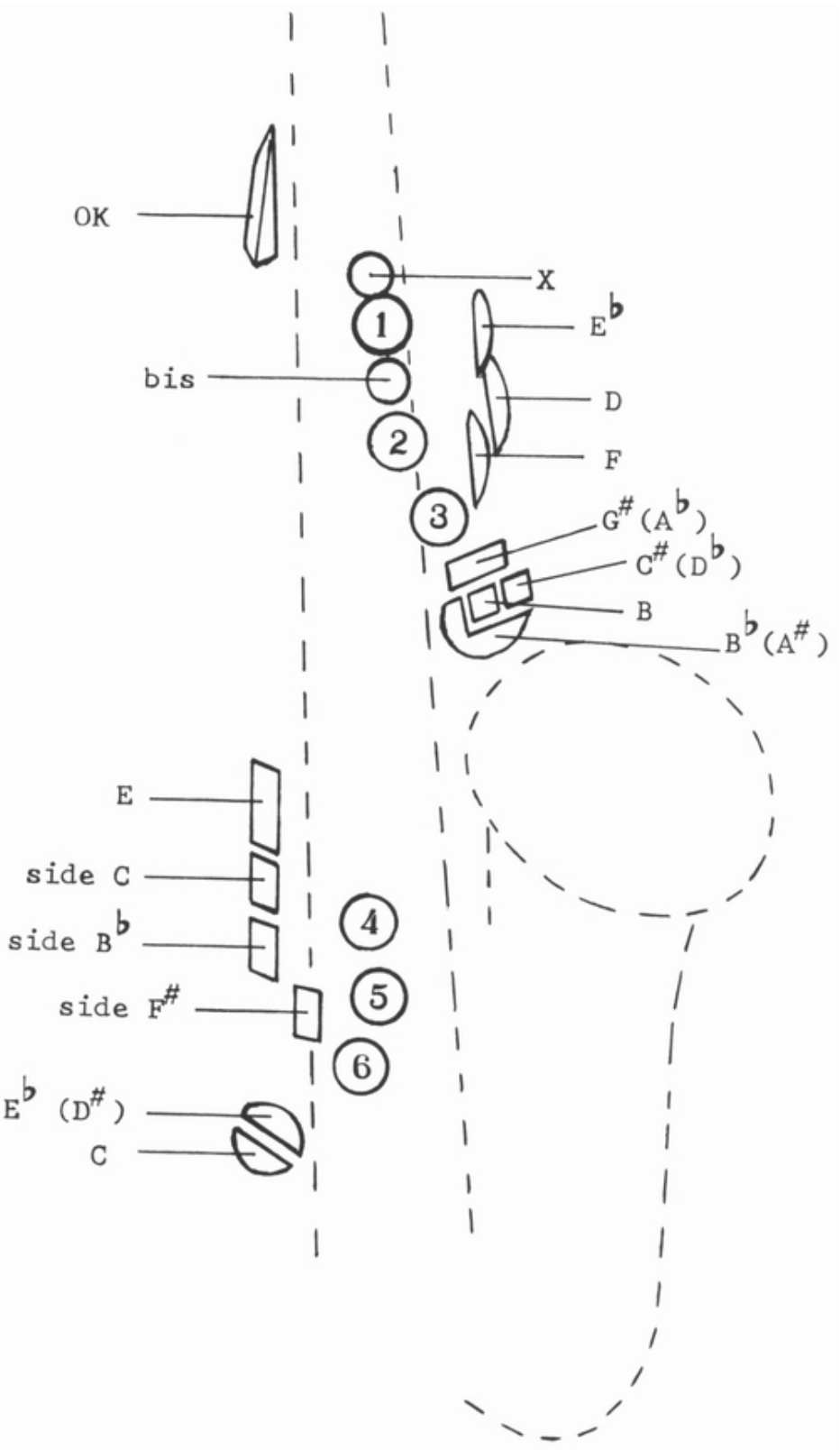


Raise	D♯	D♯	D♯	F♯	F♯	G♯	G♯
Lower	B♭	C	C	C	C and B♭	6	Try alt.

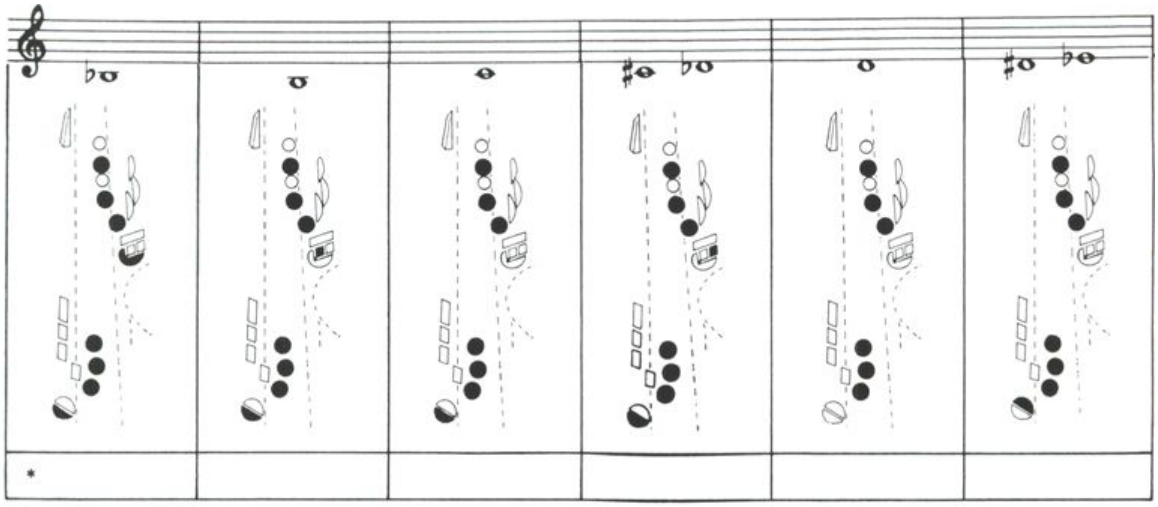


Raise	G♯ or sB♭	sB♭	sC	sC	sC	None	None
Lower	None	4, 5, or 6	4 and 6, or 4, 5, and 6	4, 5, and 6	Close D key	Close D♯ or D key. Try F key only.	Use D-E-F or D♯-E-F or D-D♯-F

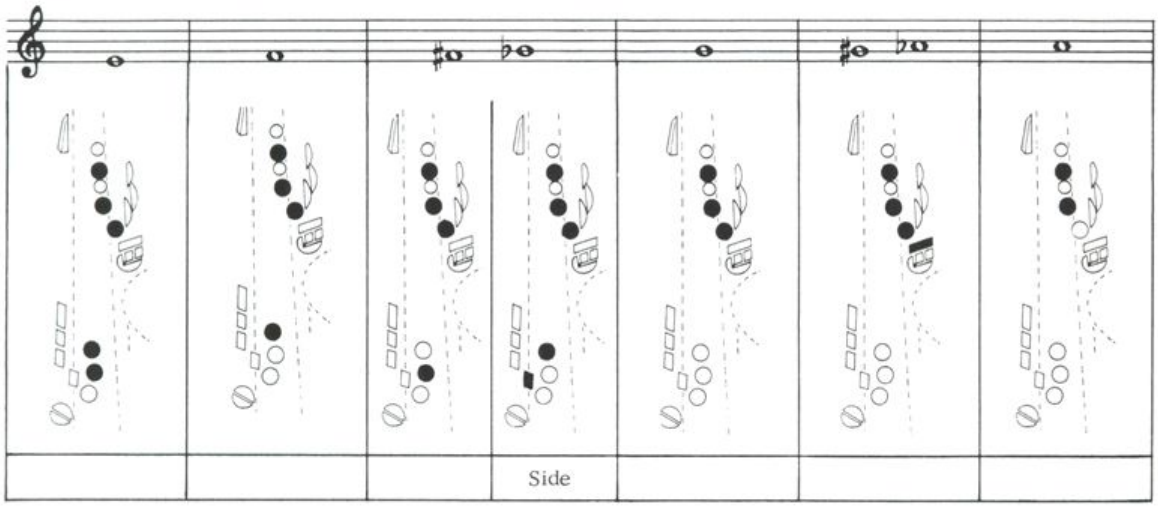
FINGERINGS FOR PITCH ALTERATION

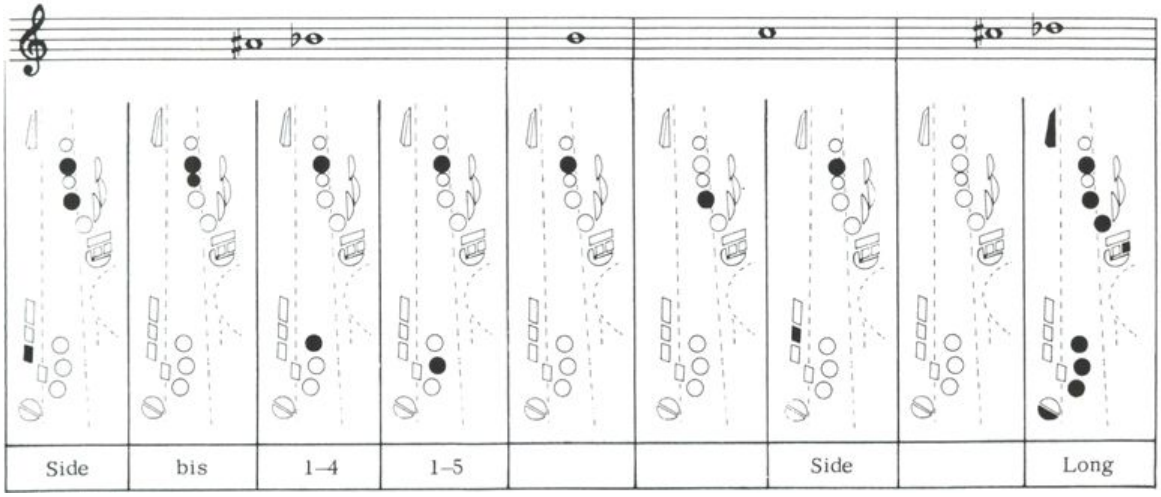

OK
X
1
E♭
bis
D
2
F
3
G♯ (A♭)
C♯ (D♭)
B
B♭ (A♯)
E
side C
side B♭
4
side F♯
5
6
E♭ (D♯)
C

NOMENCLATURE OF KEYS

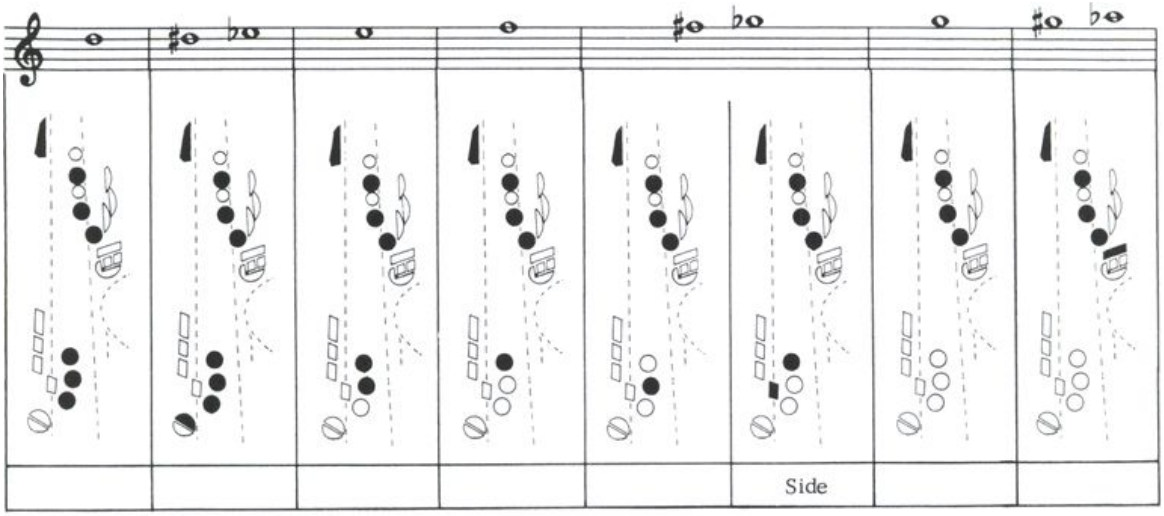


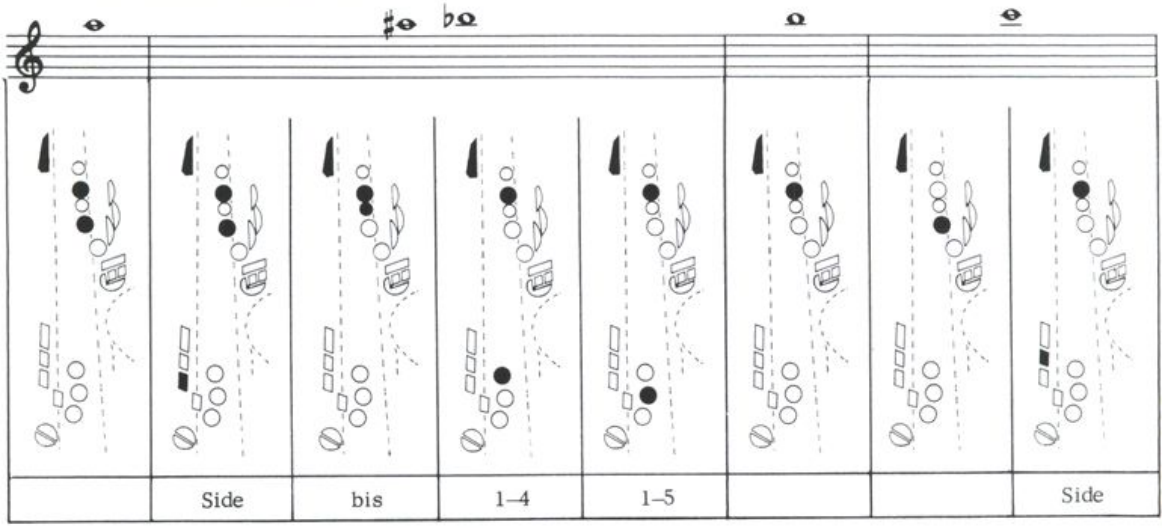
*Identification in this column when there is more than one fingering position.

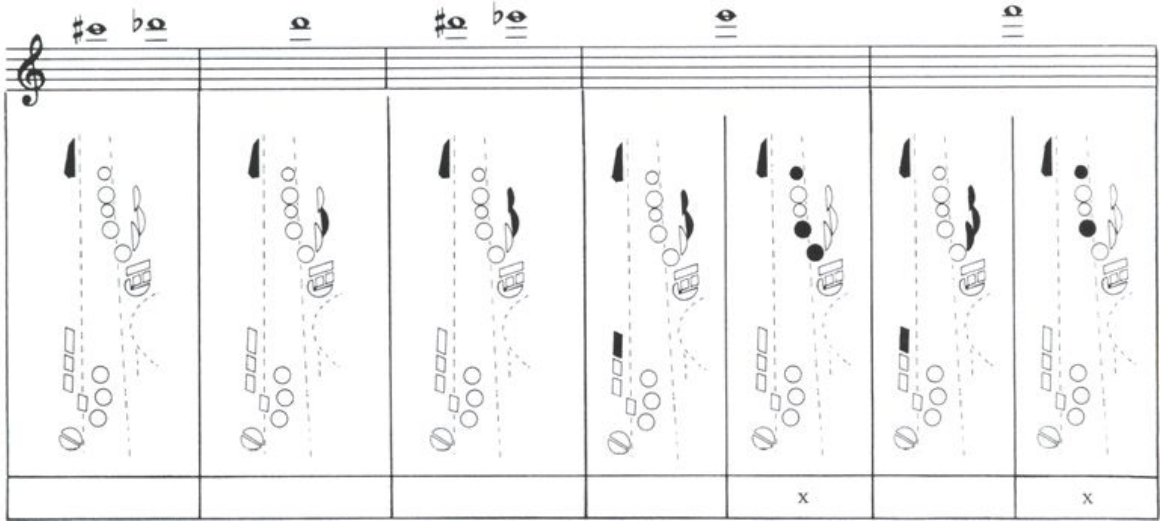




FINGERING CHART


Side


Side
bis
1–4
1–5
Side


x
x

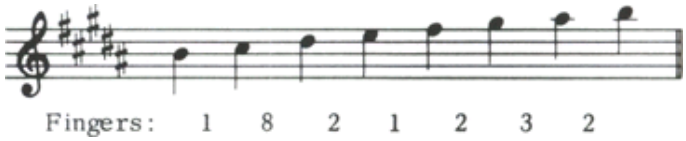
DEVELOPING THE TECHNIQUE

The development of a fine technique is basically dependent on:

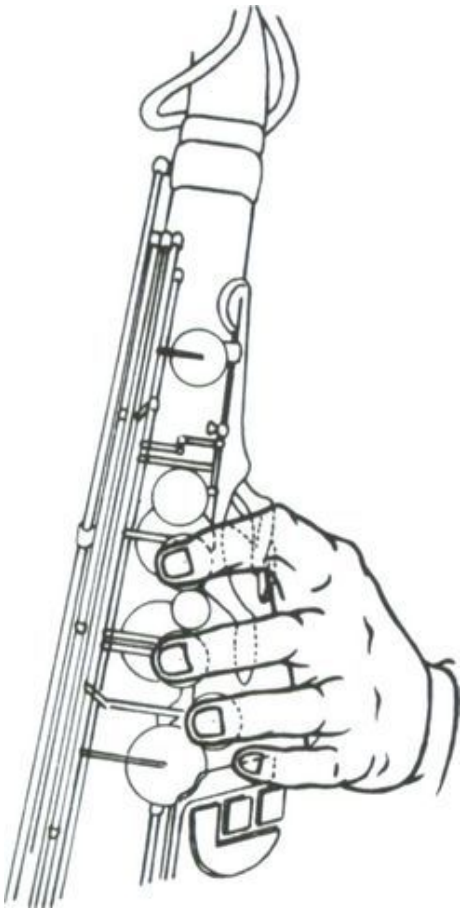
1. Proper hand position.
2. Finger dexterity.
3. Coordination.
4. Rhythm.

Hand position is of prime importance and must be insisted upon, especially for beginning students. The fingering action should occur at right angles to the closed pad and each finger must be directly above the key pearl. The stroke should be positive but relaxed. Stroking the keys at an angle is not only inefficient but may prevent the pads from seating properly and also cause extra wear on the mechanism of the instrument. The finger stroke should ideally confine itself to the distance the keys move or, in any case, clearance should be no more than 1/8 inch between the key and the raised finger. *All fingers must raise the same height.* This is a most important consideration in acquiring technical accuracy. The hinge of all the fingers should be at the third (knuckle) joint, and the curve of each finger adjusted to compensate for the distance from the knuckle to each key. No movement of the first or second finger joint is necessary or desirable in operating the 1-2-3 or 4-5-6 keys. Observation of the hand position in a mirror while executing slow scale passages is an excellent method of checking on the finger motion. The following sketches of the hand position should be carefully studied to observe the relationship of the hands and fingers to the saxophone. Note the *exact* location of the finger tips and the angle of the wrists.

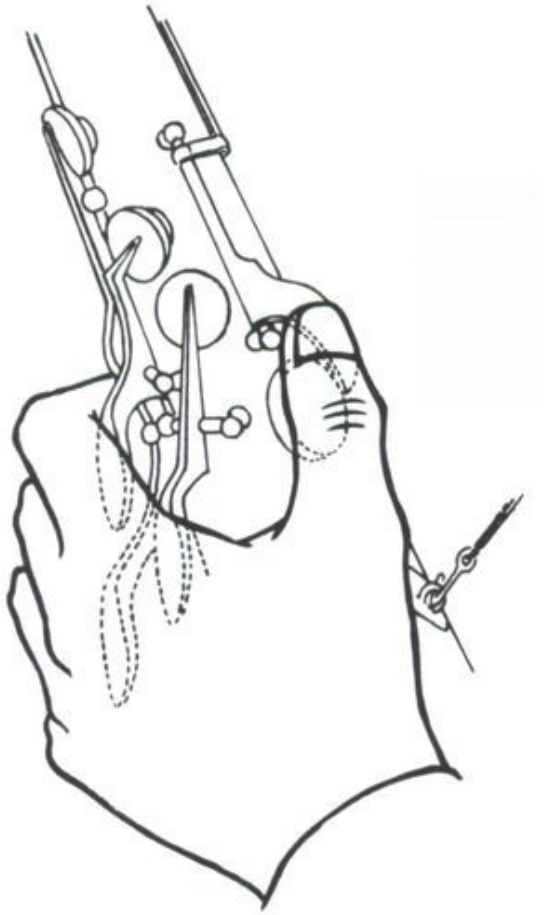
Cultivation of correct finger position and motion through *slow* practice pays big dividends, and should be stressed at all stages of advancement. The formation of incorrect habits, often the cause of an uneven technique, may take years to correct. Since the saxophone requires various fingering combinations to produce a single tone, coordination must be developed to a high degree. An examination of the number of fingers used for the scale of B major reveals the following:



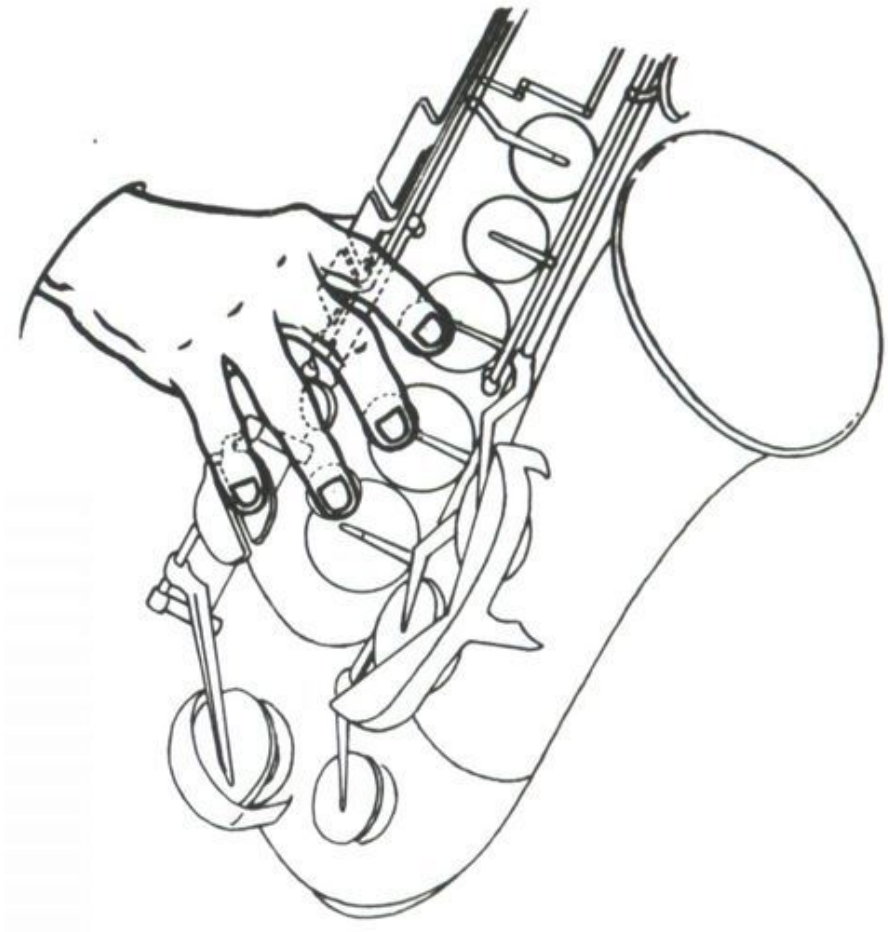
B to C♯ requires one finger motion, C♯ to D♯ eight, etc. In addition to this, some of the keys must be closed and others opened, requiring perfect mastery of both the up and down stroke if clean tonal connection is expected. A few exercise patterns follow to illustrate the necessity for a positive finger motion and perfect coordination. They should be practiced in a slow tempo, but in steady rhythm.



The left hand

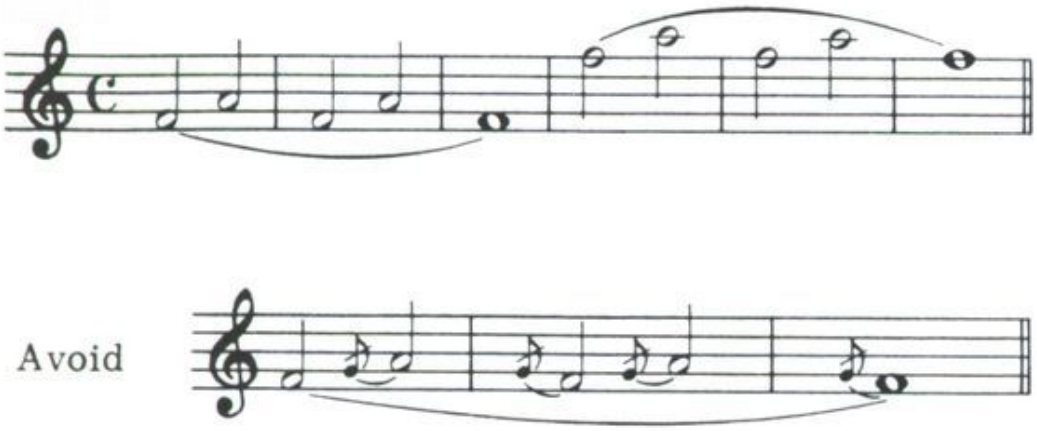


The left-hand thumb HAND POSITIONS



The right hand

Ex. *1*

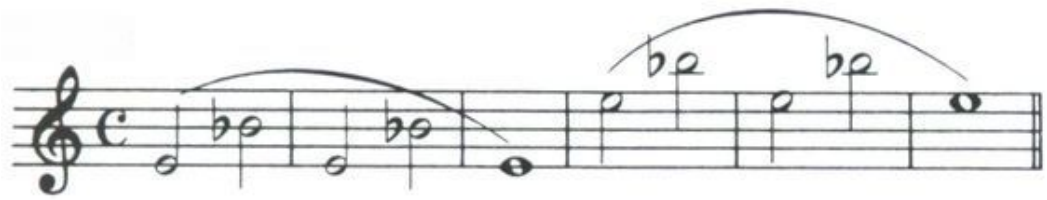


which is the result of the left hand third finger being late on the approach to the A and early on the approach to the F.

Ex. 2

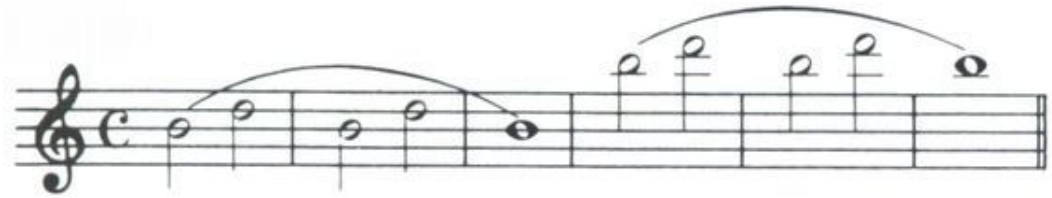
Delay in picking up any of the fingers of the right hand will result in a B$^{\flat}$ approaching the B, and vice versa on the return.

Ex. 3



Finger the B♭ with the 1-4 (first finger of each hand) to check the coordination of the middle fingers.

Ex . 4



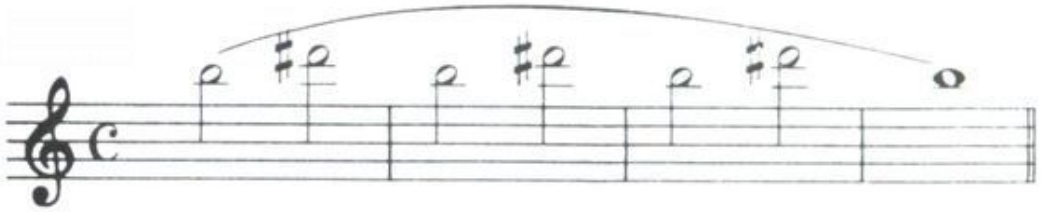
Listen for false “grace note” C♯.

Use a rocker action between the end and the third joint of the first finger.

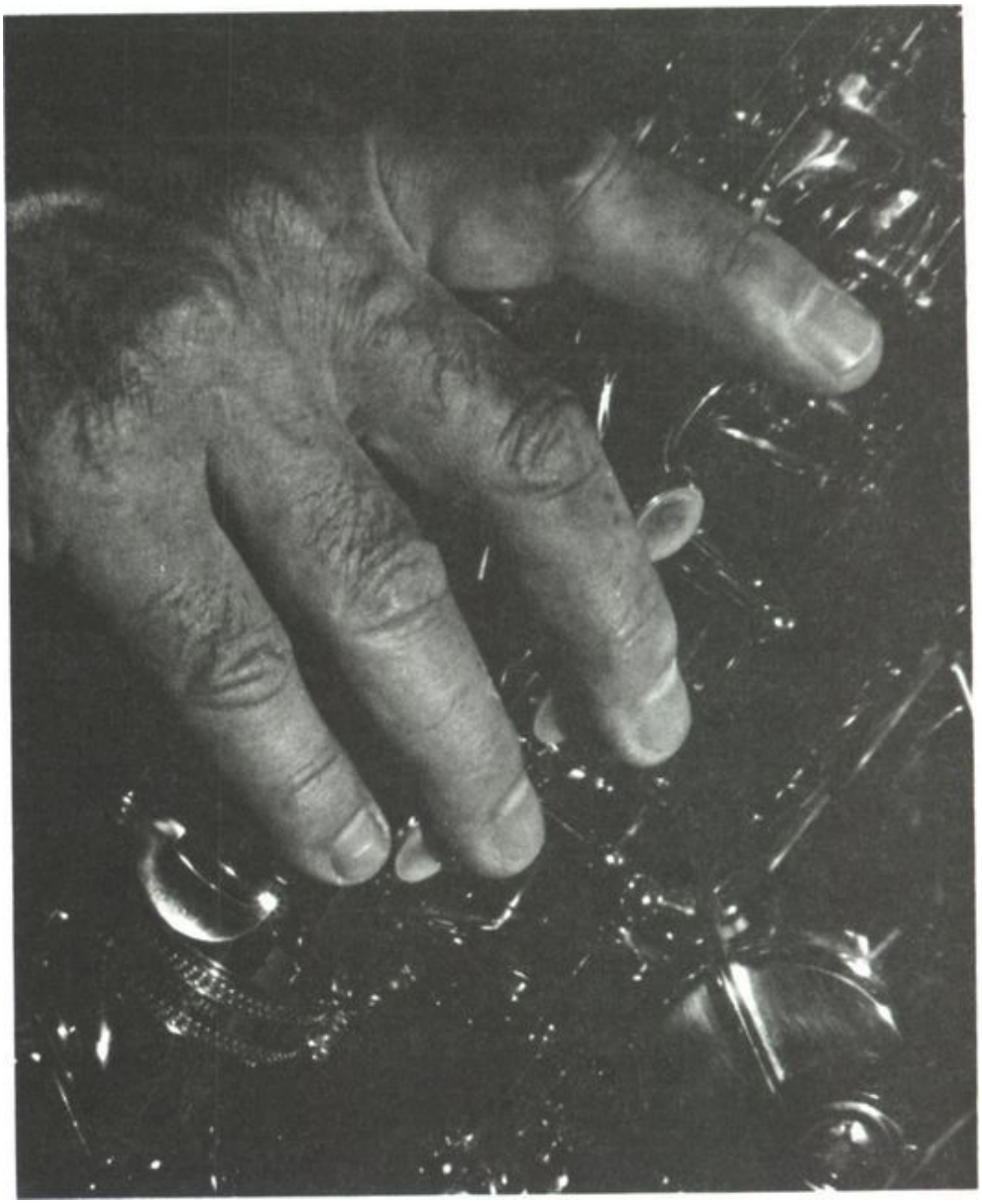
Ex. 5

Practice without using the articulated G♯, to coordinate the little finger (L.H.) and the first two fingers of the right.

Ex . 6

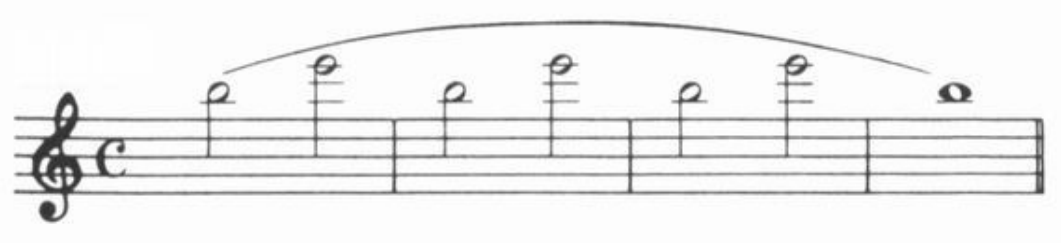


Employ the rocker action as in Ex. 4, but note that the angle of the forefinger between second and third joints must be such that it strikes both keys simultaneously. This may require a small amount of wrist movement.



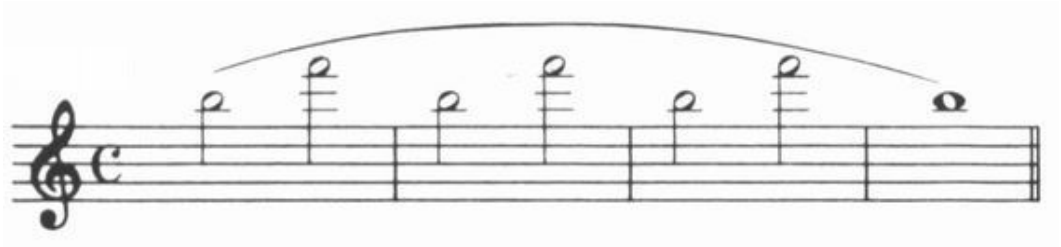
HAND POSITION FOR HIGH E KEY

Ex. 7



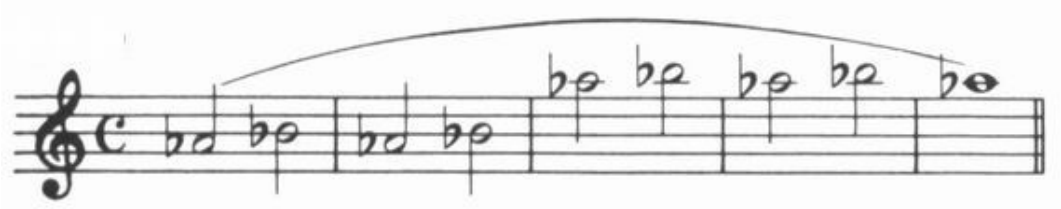
Beware of an intermediary D♯ when connecting these tones. Note the position of the right hand for the operation of the high E key.

Ex. 8



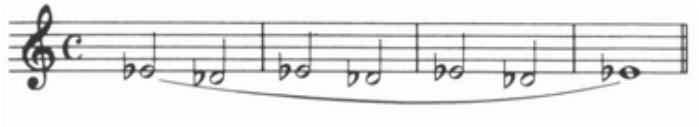
Observe the left hand position. All the keys must open with one motion and some wrist action is required.

Ex. 9

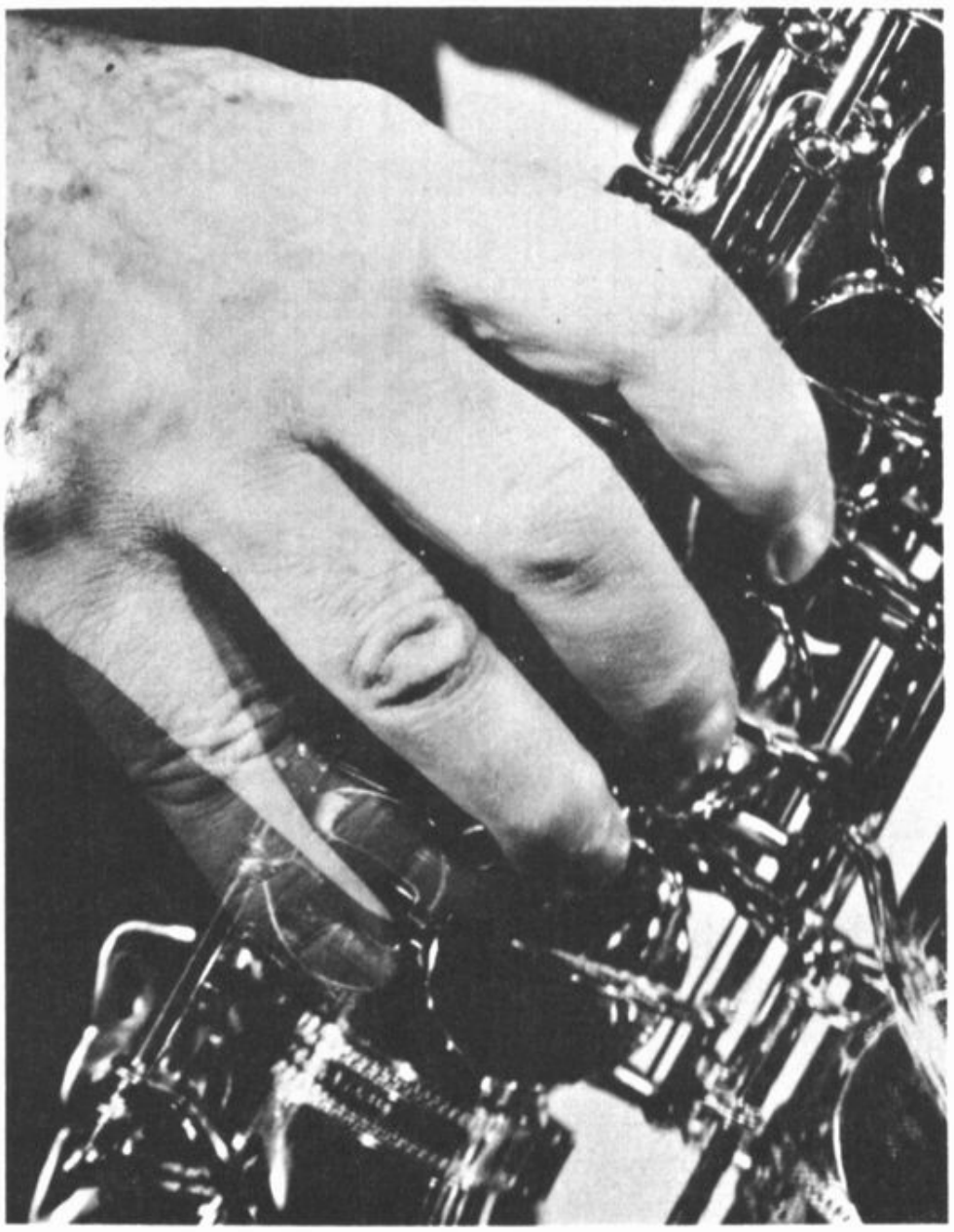


Use the side B♭ fingering for this exercise. Notice that in approaching the upper note the G♯ *key closes* by spring tension, the G key *opens* by spring tension, and the B♭ key opens by finger pressure. This finger shift is important for a smooth technique.

Ex. 10

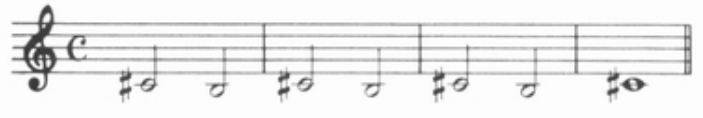


The little finger of the right hand should be straight, with a sliding motion over the key rollers, as illustrated in the photograph below. Timing of the left hand little finger must also be accurate.



THE E♭-D♭ SHIFT

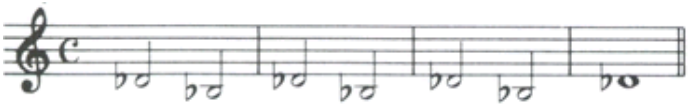
Ex. 11



The first joint of the little finger (L. H.) must bend to permit complete closing of the low C♯ key when going to the B♮, as illustrated below.

LOW C♯ TO B♮

Ex. 12



Keep the little finger slightly curved and slide across the keys, rather than lifting the finger. The curvature is necessary to completely close the D♭ key during the shift.

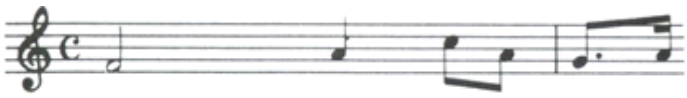
Many more interval changes may be practiced in this manner. This representative group was selected to point up the principles of finger position and coordination together with an efficient practice procedure.

RHYTHM AND TECHNIQUE

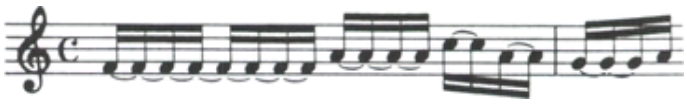
The development of a fine technique is so dependent on rhythmic accuracy that it is impossible to discuss one without the other. To anyone who has walked a flight of stairs where the steps were of different heights, it is obvious that the psychological effect of improper division in a musical scale is equally disturbing. To draw another comparison, if we liken the musical score to a complicated machine, it is easy to understand the necessity for precision measurements if the machine is to function efficiently. Single notes are the "gear teeth" in our musical structure, and if these fail to mesh correctly the result is bound to be artistic disaster.

Playing rhythmically is not merely arriving at each beat on time. The accurate performance of each note value *within* the beat is what imparts to the phrase a sense of security and authority. Although it is true that some persons have a more natural rhythmic sense than others, proper training can develop an accurate perception of time values, especially when this is tied to some bodily action. Witness the first steps of a child, which throw him off balance until the steps become rhythmic. From that stage on, he is able to walk. One of the important points in building a technique is learning to "walk" by slow practice before trying to "run."

Since it is easier for the human mind to concentrate a short length of time than a long one, it is logical to *build up* time values as the sum of short segments rather than attempting to divide the relatively long beat into equal smaller parts. As a practical means of approach, sixteenth-note values are used, thus:



should be thought of as



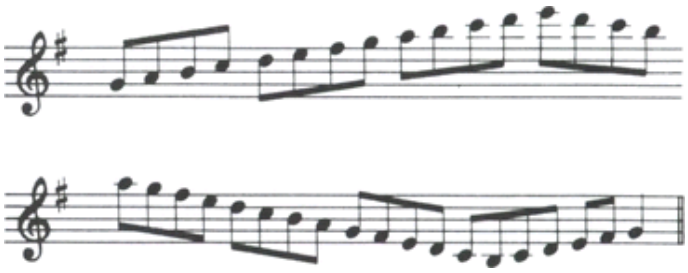
Sufficient practice of this method will develop in the mind a sixteenth-note pulsation that promotes a more exact basis from which to establish both an even technique and rhythmic stability.

INCREASING THE SPEED

While the daily practice of scales, intervals, and arpeggios is considered by some to be old-fashioned drudgery, this is still the most efficient method of acquiring a fine technique. Analysis of musical scores will reveal that the technical passage work can in most cases be reduced to very fundamental patterns. The experienced musician automatically recognizes these, in much the same manner as the child who is taught to read words rather than individual letters. The transference of these musical "words" into fingering motion is merely increasing the technical vocabulary so that one is able to concentrate more readily on the unusual. When a student remarks "I'm getting so I enjoy practicing the scales," it is apparent that a new plateau in his practice habits has been reached.

As soon as possible, basic technical patterns should be practiced throughout the entire normal range of the saxophone, since equal facility throughout the complete range is essential. The fact that the extreme upper and lower register fingerings are more difficult to manipulate emphasizes the point that these areas should be *stressed* rather than *avoided.* Tonic-to-tonic scale practice confines us to but one octave in many instances, such as the keys of F♯, G, A♭, and A. In the scale of G major

the tonic-to-tonic approach utilizes less than half of the range. It should be practiced:



The procedure is as follows: Start from the keynote, proceed to the highest tone in the normal range, then down to the lowest note, and return to the tonic. In other words, each scale should involve a "circle tour" of the range of the instrument. Scale studies should be learned in *all* keys at a fairly early stage of advancement. *Scale and Arpeggio Studies* (3 vols.) by Marcel Mule (Paris: Alphonse Leduc) and *The Saxophonist's Workbook* by this author (Ann Arbor, Michigan: University Music Press) have expanded this phase of the technical problem.

CHOICE OF FINGERING POSITION

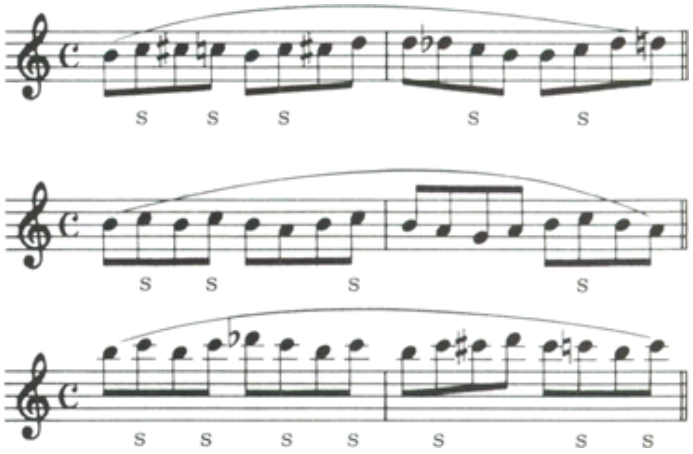
A physician once told me, “When there are many treatments for a disease, you maybe sure that no single remedy will always be successful.” We have a parallel in wind instrument technique; the reason for several fingering positions for many notes is that *no single position will always work*. The choice must be determined on the basis of intonation and tone quality as well as technical expediency. Final judgment often requires the sacrifice of one of these qualities in favor of the others, and the answer must be found by the performer. Before a final judgment can be intelligently made, all the possible combinations should be integrated in the technique so that an unusual fingering does not feel cumbersome solely because of its unfamiliarity. Knowledge of the idiosyncracies of ones particular instrument is also to be considered, since fingering choices must be adapted to each saxophone. The overall result must always be the governing factor. In laying down principles for fingering patterns, it should be stated that these are not inviolate “rules” but only basic fingering routines which have proved valuable.

The fingering chart at the beginning of this chapter will indicate a means of identification of the various positions. The first position shown may be considered best for general purposes, and is the one which should be used in teaching beginning students.

THE ALTERNATE FINGERINGS

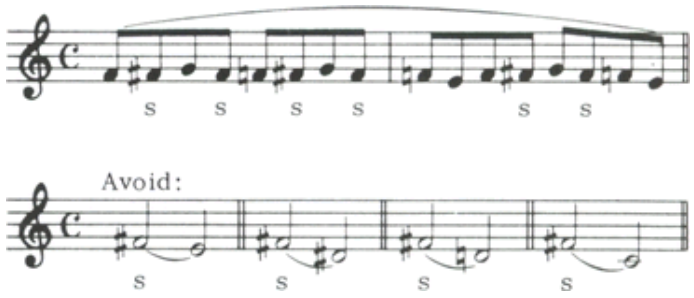
The examples which follow are based on the technical advantages both in finger facility and the mechanics of the instrument, so as to work for the smoothest possible interval change. A good instrument should have no intolerable intonation discrepancies with the fingerings shown here. Slight differences in tone quality are sometimes more apparent to the performer than the audience, due to the fact that the tone leaves his instrument from different points, and the proximity of the player's ear will detect this. If it is practical, have another saxophonist play the alternate positions on your instrument and listen at a distance before rejecting any fingering solely on the basis of quality.

Side C. A chromatic fingering which should be used both ascending and descending, as well as in the progression B-C-B in the middle and upper registers. The following examples illustrate this usage:



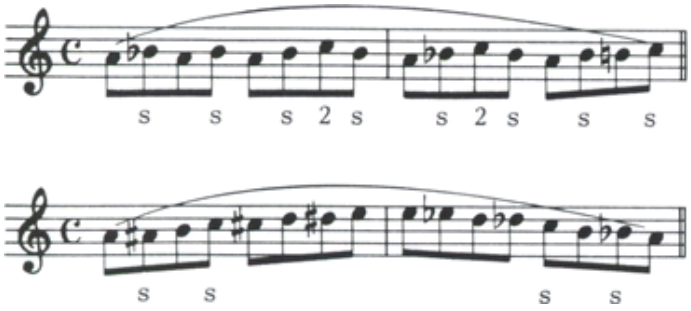
Side F♯ (*G♭*). The side F♯ position must be used with caution, as it pulls the third finger R. H. out of line with the top keys and makes it difficult to return this finger to its normal position. Thus, it should never be used if there is an F♯-D or

F♯-E♭ shift. In the early stages of study, this position is best avoided altogether except for the F-F♯ trill. It may be used to advantage in the chromatic scale and as a smooth connection in melodic passages.

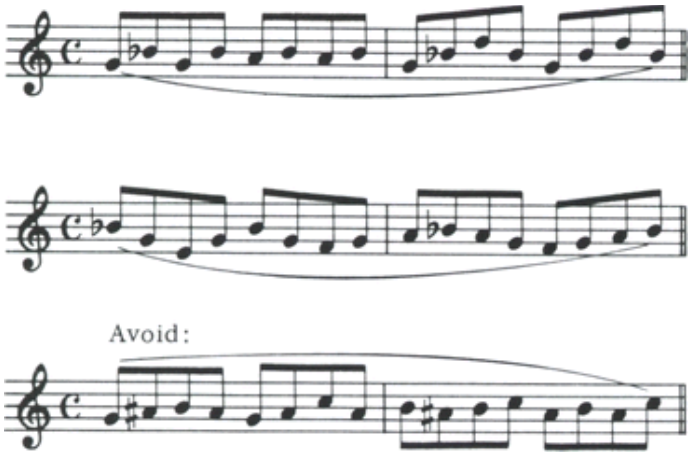


The B♭ (A♯) Positions.

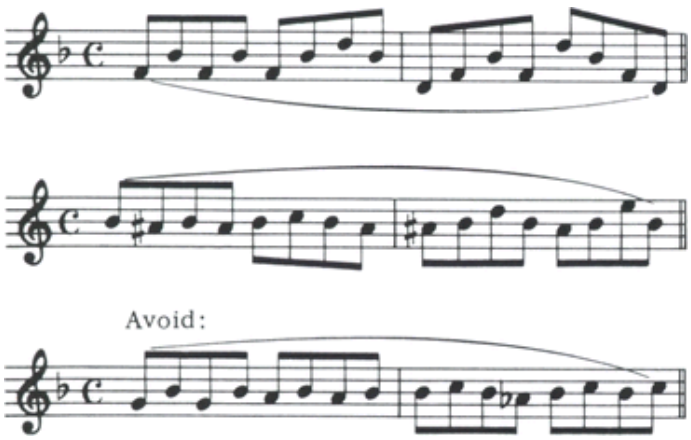
1. *The Side.* This position should be considered the basic fingering for beginners. The location of the side key in respect to the first finger R.H. is not out of line with the correct hand position. Adeptness in the use of this key is a fundamental requirement of adequate technique. It is a must in the chromatic scale, and the best available in the B♭-C shift.



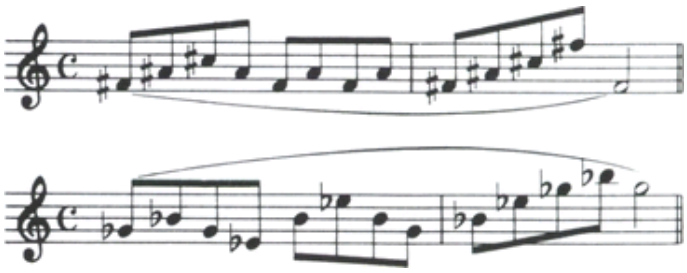
2. *The "bis."* The bis fingering requires a shift of the first finger L.H. so that the same finger closes both the 1 and the bis key. It is advantageous when the G-B♭ or A-B♭ interval is used, provided the B♭ is not followed or preceded by a Cor B♮. Avoid sliding from B♭ to B♮ (or vice versa) with this fingering.



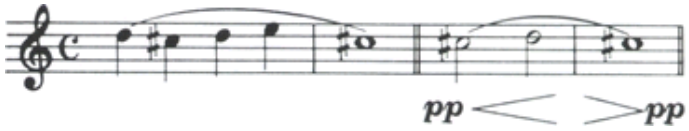
3. *The "* 1-4. " Essentially, the 1-4 fingering is used in flat keys to pass from F to B♭ and the reverse. It is also the smoothest fingering for B-A♯-B. The use of this position is dependent upon correct adjustment of the instrument, and if the tone fails to respond properly, the teacher or repairman should be consulted.



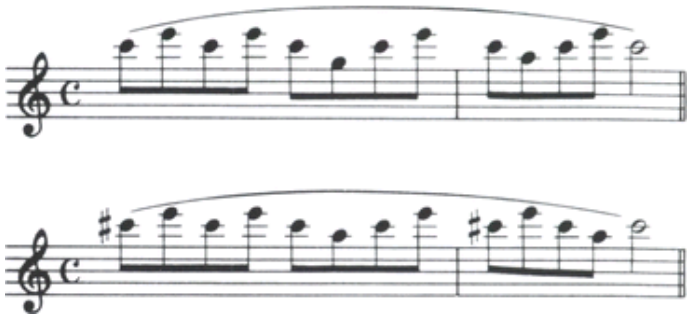
4. *The* "1-5." This position has a usage similar to the 1-4 except that it is employed for the F♯ -A♯ (G♭-B♭) shifts. Here, too, the instrument must be in good adjustment.



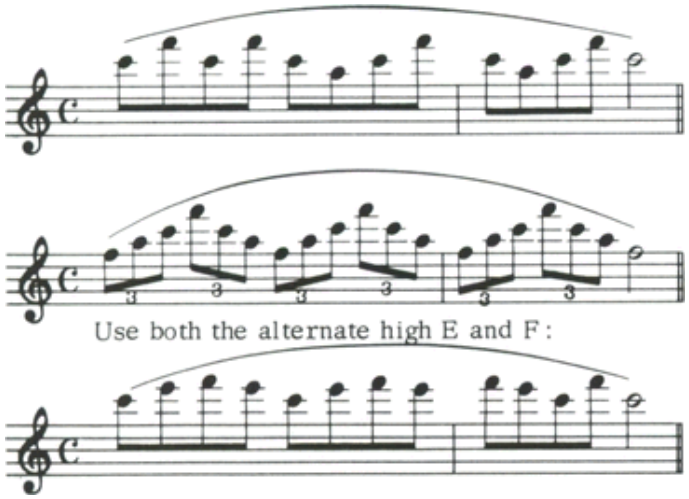
The "Long" C♯ (D♭). The long C♯ is fingered the same as the low register C♯ with the addition of the octave key. The tone quality of this fingering matches the fourth line D better than the regular position, so that it is valuable in phrases similar to those indicated below. Intonation is a problem when using this position, since on some makes of instruments it is sharp and must be lipped down. However, the regular open position is often on the flat side, so a choice must be made. The long C♯ is seldom used as a technical expedient, but is valuable in improving intonation and solving problems of matching tone quality in melodic phrasing, especially when a covered tone is desired, or when making a fine diminuendo. Some lip alterations are often necessary to reduce the amount of the fundamental (low C♯) in the tone.



The Alternate High E. This position employs the use of the key marked "x" in the chart. Since the vibrating column of air changes shape for this note, it must have adequate air support. The alternate high E is valuable from a technical standpoint when going from high C or C♯ to E and back, or when progressing on to the altissimo register, since it prepares the embouchure for the higher tones. It is not recommended for sustained tones.

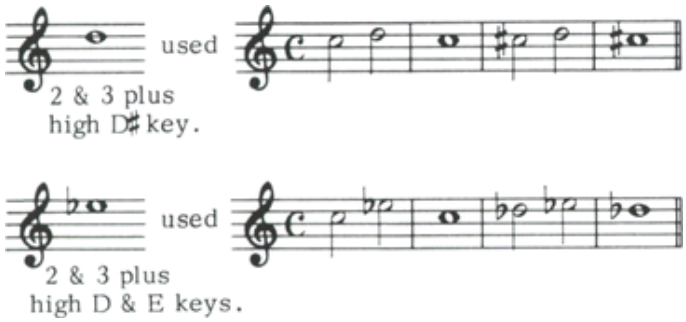


The Alternate High F. The alternate high F is used in much the same manner as the alternate high E. The tone quality is slightly better and it is sometimes used on sustained tones. Mechanical adjustment of the instrument must be perfect in order to produce the correct response.

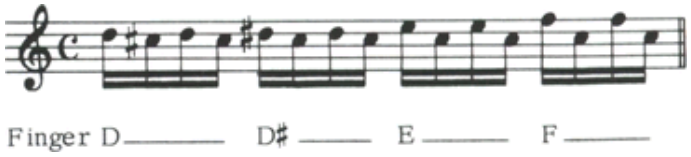


Fingering Options

In an effort to obtain the maximum in tonal uniformity, the following positions are valuable for melodic playing, especially in pianissimo passages:



For rapid passages, the following phrase may be fingered by moving the first two fingers of the left hand only. *The octave key must remain open.*



NOTE: The false C♯ will not bear sustaining, so use the regular fingering if the tone must be lengthened.

SUMMARY

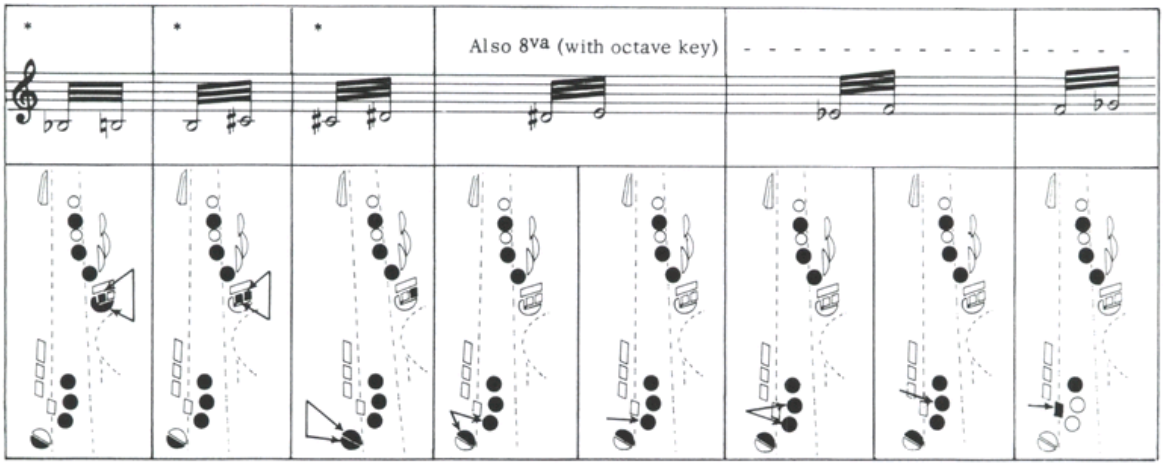
1. Keep the fingers close to the keys, and always directly above them, whether or not they are in use at the moment.
2. Press the keys with a positive motion, but do not slap them. A light but decisive motion is all that is necessary. If the keys require excess pressure, the pads are not seating properly.
3. Develop the technique through *slow* playing, never sacrificing clean tone connection or rhythmic accuracy for speed.
4. Choice of fingering position must always depend on the best musical result. The decision should be determined by intonation, tone connection, and homogeneity of the tone quality in the particular phrase.
5. Acquire adeptness in *all of the possible positions*. This is the only way in which an intelligent choice can be determined.
6. Always practice in perfect rhythm. Use a metronome if possible, and listen at all times to the relative note values *within the beat.*
7. Use your best possible tone at all times, and always observe the effect of technique on intonation.
8. Try to remain relaxed during difficult passages. Tension will only make them more difficult.
9. Mentally prepare the succeeding notes so that there is a concept of the entire passage, rather than of only the tone being produced.
10. The building of a fine technique is a lifetime job, so patience is required. Try to eliminate later remedial work by practicing as correctly as you can.

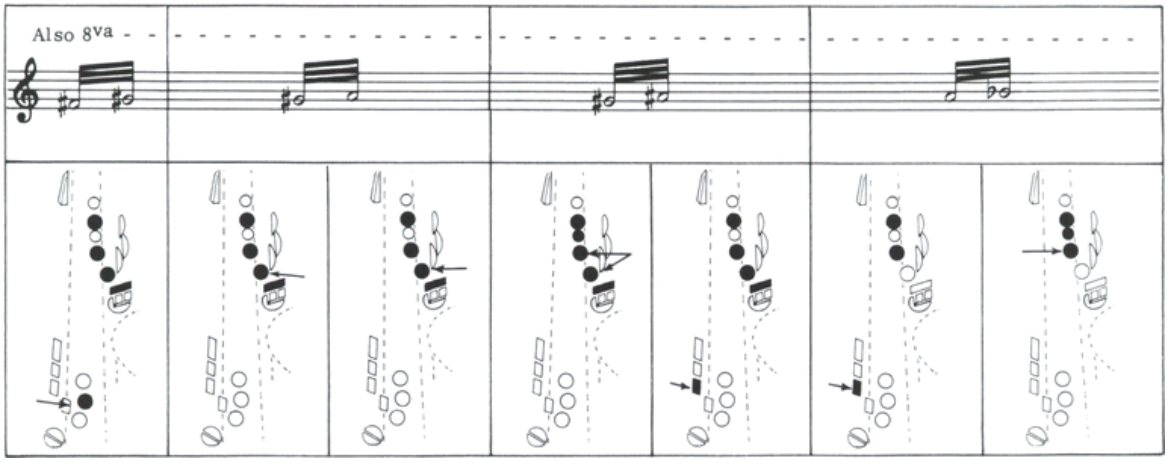
*Impractical. Impossible at high speed.

→ Trill Key.

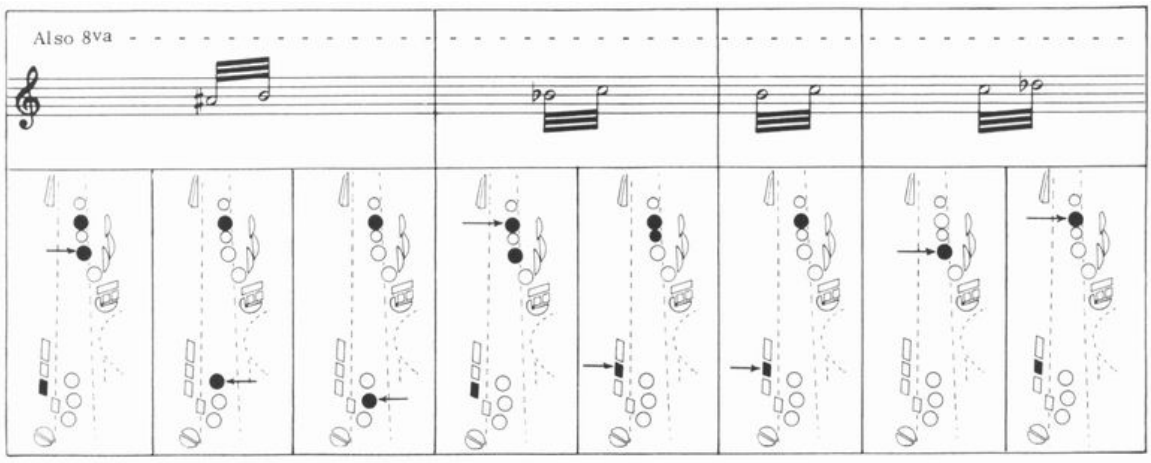
Both keys together.

Alternate, using same finger.





TRILL CHART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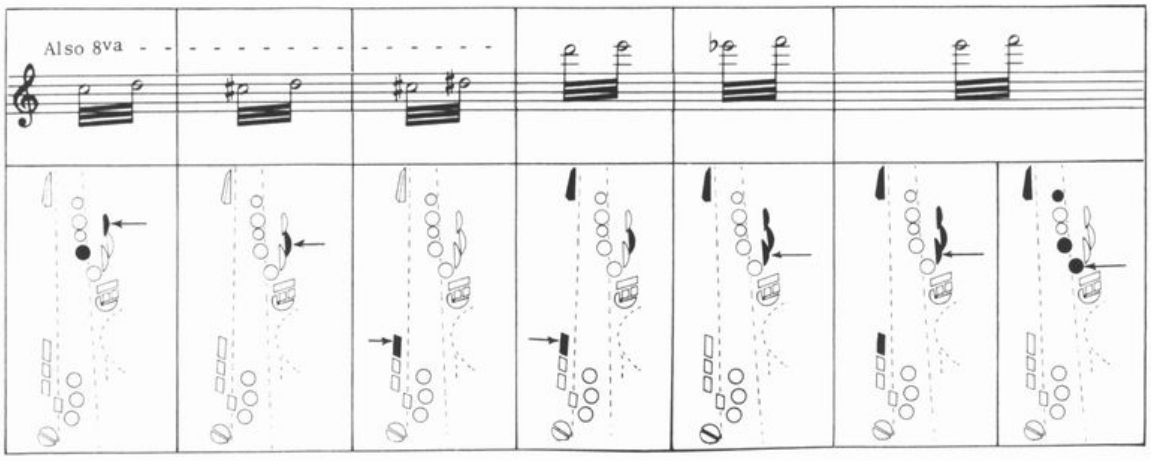
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ATTACK AND RELEASE

Use of the word “attack” for the start of a tone implies an explosive or forceful assault which, except in isolated instances, has no place in artistic performance. A more appropriate terminology would be “start” or “entrance” of the tone. A study of the procedures involved should have but one goal: to start the tone with the desired quality, intensity, and pitch at precisely the right moment. There should be no correctional adjustments required once the tone is started, since an unmusical start creates a dominating first impression. Later improvement is lost on the hearer. One of the cruel aspects of musical performance is that a mistake, once made, cannot be corrected. So the musician finds himself in the same predicament as the man who jumps out of a plane and then remembers that he should have strapped on the parachute. Proper *preparation* would have saved the jumper and will save the tone, but once the start is made, there is no returning.

In starting the saxophone tone, certain factors which appear to act simultaneously must be carried out rapidly and in the proper sequence. Neglect of this sequence results in a faulty entrance which might be described as scooping, splashing, or sliding into the tone. The physical factors for a correct start occur in the following order:

1. Inhale.
2. Place upper teeth on mouthpiece.
3. Assume embouchure position.
4. Touch tip of reed with tongue and hold it there.
5. Bring air stream to point of reed.
6. Release tongue.

The first three steps should need no explanation, as they have been previously discussed. As to step four, the directions are: *touch* the tip of the reed with the tongue and *hold it there*. The contact of the tongue is not meant to serve as an air valve, but to prevent the reed from vibrating.

POSITION OF THE TONGUE

Placement of the tongue on the reed for the purpose of starting and stopping the tone may be slightly confusing if the student has sought opinions as to which portion of the tongue should be used. An expert performer will usually base his advice on the system that he has found most successful for his personal needs. The same question will produce different answers from different experts. These may be divided into three general types:

1. Tip of tongue to tip of reed. (Fig. 1)
2. Slightly back of tip of tongue to tip of reed. (Fig. 2)

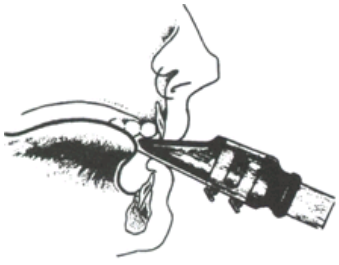


Fig. 1


Fig. 2


Fig. 3

TONGUING POSITIONS

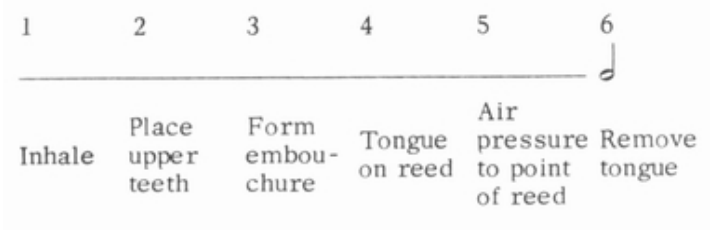
3. Anchoring the tip of tongue on lower teeth and bending the tongue to the tip of reed. (Fig. 3)

The method used should be determined by the shape and size of the player's tongue and oral cavity. The important consideration in the use of the tongue is that *the point of the reed* be contacted, regardless of the portion of the tongue used. Persons with a large oral cavity and short tongue will find that tip-to-tip tonguing is advantageous, while if the cavity is small and the tongue long, the third method works best. The great majority of players find that the best results

are produced by touching the tip of the reed with the top part of the tongue at a point slightly back from its tip. The placement should be determined by experimentation to find where the tongue is in the most relaxed position, from which it can most comfortably be manipulated. The effect of an unnatural position also has a bearing on the throat opening. If the tongue is crammed into the back part of the throat, it will close the opening. If forced too far forward, it will pull on the throat muscles and make them rigid.

Emphasis must be placed on the fact that it is the *removal* of the tongue from the reed which starts the tone, assuming that proper air pressure is at the point of the reed. When not in use, the tongue should remain in the bottom of the mouth cavity, close to the reed, so that the stroke of the tongue is through a small arc of approximately 1/8 inch.

In releasing the air stream to the point of the reed, one must determine the *amount* of air support needed to produce the desired volume. This is a matter of trial and error which requires considerable practice, but must be perfected to produce a clean, smooth start to the tone. While first attempts at this procedure may produce no tone at all, due to insufficient air support, after a few trials it should present no particular problem. The study of the initial attack can be practiced in the following series of slow counts:



THE RELEASE

The termination or release of the musical tone has special problems which are sometimes neglected. Incorrect release results in alteration of pitch, spreading the tone, poor timing, and a host of other unacceptable tonal distortions. The release is as important as the attack, and should be developed with great care.

Two methods of stopping the tone are in general use: (1) slowing or stopping the air stream and (2) touching the reed with the tongue. Each of these has advantages, depending on the musical situtation. The air release is preferable when the tone is followed by a rest or if the sound needs a tapering off near the end. When there is insufficient time to employ the air release between notes, such as in legato-staccato or rapid tonguing, the tongue must be used to stop the tone, since the same stroke of the tongue which stops one tone must start the next. Regardless of the method used, the embouchure must hold its position until the tone is fully terminated.

The air release is controlled by the diaphragm and throat, usually in combination. It creates the effect of rounding off the tone at the end and has real value, since the shape of the tone is important to the character of the musical phrase. The tongue release gives the impression of a block-type sound, for the termination is as abrupt as the attack. In slow passages, this imparts a kick-back that might be described as “toot.”

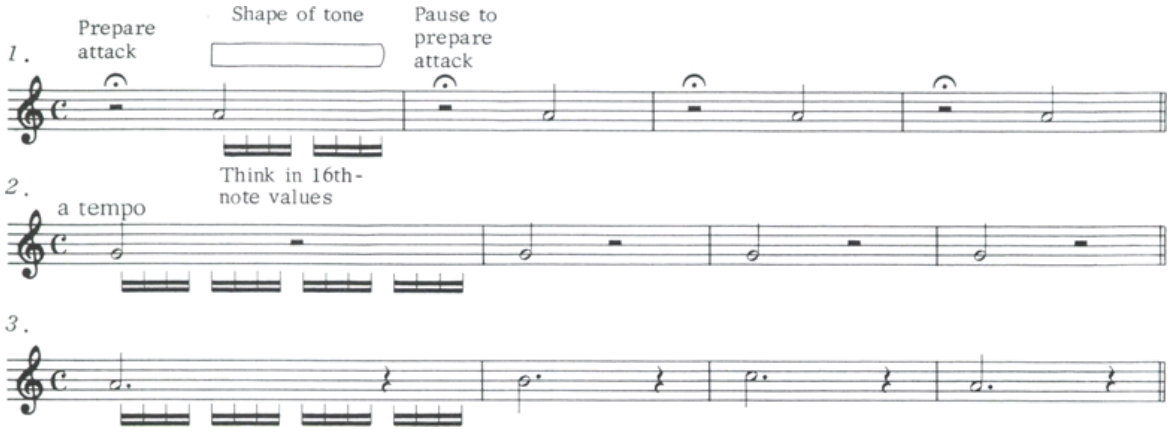
As might be expected, there are many degrees of variance in types of tone stoppage, some of which include the use of both tongue and air. Choice of the particular type or combination must always be determined by its suitability to the musical situation. Mastery of all forms and degrees of release is a prerequisite to the most desirable selection.

Attack and release should be practiced in the same exercise. The following may serve as a pattern for this type of study.

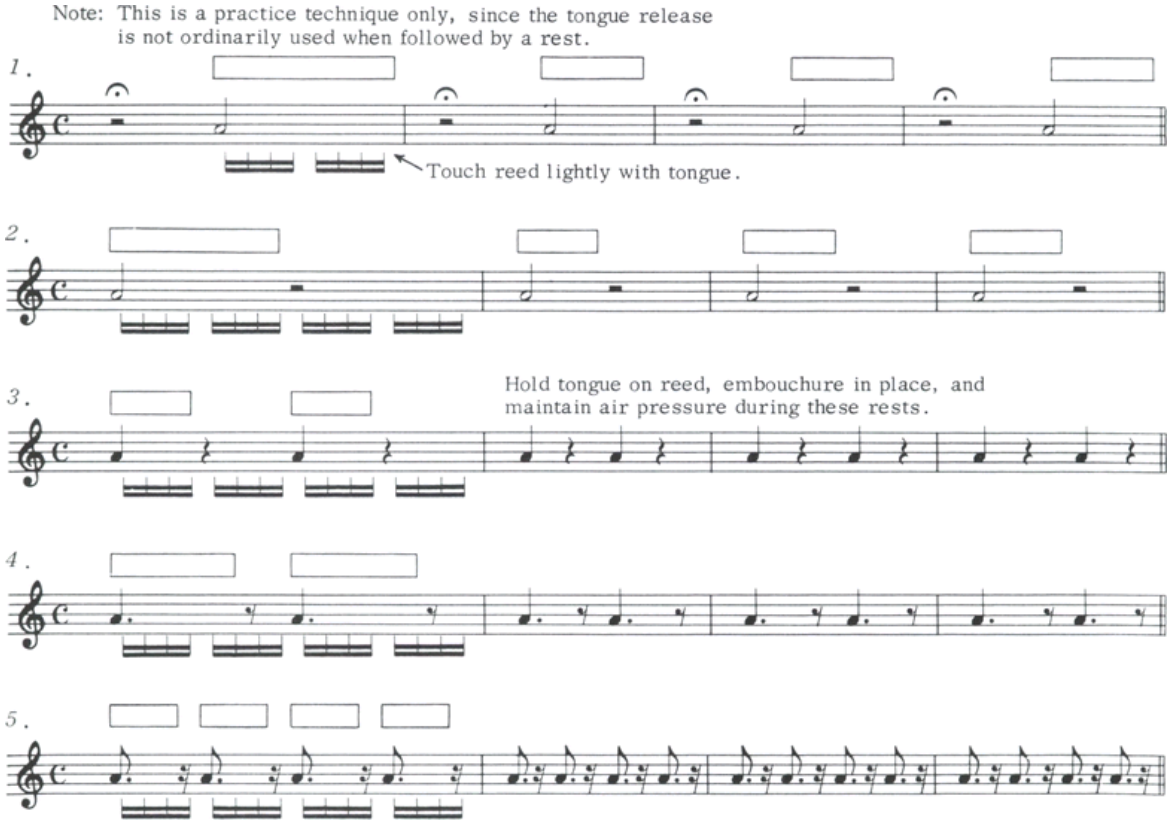
1. Embouchure position must be maintained until the tone is completely terminated. Beginning students often open their mouths for the release. This results in a distortion of both tone quality and pitch.
2. Air support must be maintained during the release. This is especially important when the tongue is used to stop the tone. The air support must

be continuous if the volume of the termination of one tone is to be the same as the start of the next.

3. The tongue should touch the reed *lightly,* only enough to stop the reed's vibration. Any unnecessary force on the reed will result in an unmusical kick-back at the end of the tone.
4. Uniform intonation and tone quality must be maintained.
5. Rhythmic precision. Correct timing of the release must always be considered, since this seems to be an area of universal neglect. Timing of the attack usually receives more attention than the release, and inattention to the exact duration of note values is the cause of a lack of musical precision, especially in ensemble performance.



ATTACK AND RELEASE: AIR COLUMN



ATTACK AND RELEASE: TONGUE

STACCATO

The staccato or detached type of playing is, in its simplest form, a repetition of the attack and release process. If there is a thorough knowledge of the function of the tongue, regulating the stroke and acquiring the necessary dexterity will only be gained by concentrated study and practice. A good staccato must have the best possible tonal quality at all times-a point that is often overlooked when notes of short duration are employed. A student who may play a legato phrase beautifully sometimes abandons all thought of tone quality when tonguing the same phrase, despite the fact that staccato notes need the *maximum* resonance to respond quickly. Wind players are prone to confuse *staccato* with *tonguing*. Staccato indicates the separation of musical tones, while tonguing is the *means* of obtaining this separation. It is this use of the tongue to obtain the proper staccato with which we are concerned.

The tongue, composed of finely-textured muscles capable of tremendous flexibility and control, is a more complex organ that is sometimes imagined. Its use in speech as well as in proper mastication of food should make this point obvious. While its function in producing the staccato is essentially concerned with the area near the tip, the rear portion must also be considered. An examination of an animal's tongue in a meat market will remind us of the bulky portion at the base which must also be controlled. When raised too high, this section of the tongue will impede the supply of air, and so it must be kept as flat as possible. The base of the tongue should be motionless during the staccato action, since any movement will affect the shape of the oral chamber and will encourage the jaw to move with every stroke. Moving the jaw with each attackchanges embouchure tension, causing an alteration in both pitch and tone quality. A correct tonguing stroke requires that *the front portion of the tongue be controlled independently of any of the other factors which make up the embouchure.* This control may be practiced by reciting the syllable "ta-ta-ta" with the mouth open about 3/4 inch, without *moving the* jaw or throat muscles. (This is to approximate the position of the jaws, lips, and throat muscles when the mouthpiece is inserted.) If the hand is placed across the throat during this practice, any jaw or throat motion will be apparent.

TONGUING SYLLABLES

The three principal syllables used for saxophone tone separation are “too,” “doo,” and “la.” The “too” syllable is the most used for the normal to the crisp staccato and for rapidity. The “tou-too-too-too,” as it gains speed, becomes “tootootootoo” so that the release of one tone becomes the attack of the next. This syllable should be used as the basic tonguing stroke, since it promotes stability and directness in the action.

The “doo” type of tonguing produces a softer and more connected style, as the pronunciation of the word indicates. This type of staccato is prevalent in the phrasing of lyrical melodies and in situations where the legato-staccato is used. The “doo” position requires that the tongue be in a slightly flatter and more rounded shape at the tip, creating a softer attack. Care must be exercised to avoid hitting the flat underside of the reed, for this will produce an indefinite “th-th-th” sound.

The “la-la-la” type, while seldom used, is a valuable acquisition for certain subtle phrases. The tongue merely brushes the reed tip and the result is the lightest possible separation—the effect is really felt rather than actually heard. It must be an extremely delicate stroke and requires much practice to control, but is used by advanced players to artistic advantage. Some artists go so far as to touch but one side of the reed.

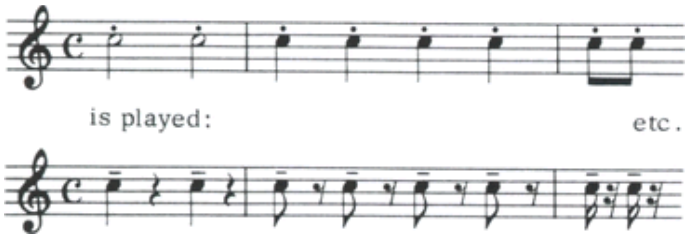
Correct interpretation requires the mastery of all the various tonguing styles and the many degrees of gradation between them. Each must overlap to the next slightly if complete control of the tongue is to be acquired.

DEVELOPING SPEED

The acquisition of a rapid staccato is both desirable and necessary, but its use should be dictated by artistic requirements. Emphasis on rapid tonguing merely for the purpose of showing off the performer's agility reduces music to a form of gymnastics. Before speed is attempted, it is advisable to concentrate on a *slow rhythmic* approach, focusing attention on the physical aspects of the stroke. Particulars to observe are the arc of the tonguing motion, the distance of the motion, and the point at which the reed is hit. This motion must be practiced until it is uniform, rhythmically stable, and relaxed. Analysis of this motion is more effective at a slow tempo, gradually working into a moderate tempo, rather than forcing the speed of the staccato before the controlled stroke is acquired.

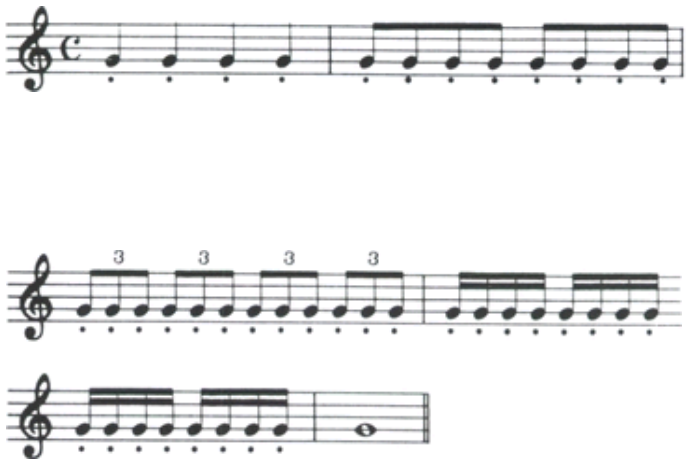
Uniformity of attack and the resultant even staccato can only be developed if the tonguing motion goes into a rhythmic cycle which moves the same distance and through the same arc on each stroke, with the same impact on the reed. Speed should be attempted only after one has been successful in attaining the correct stroke. It is impossible to overstress the importance of the air stream in producing the staccato, since a perfect tongue action will come to naught when improper air support and velocity prevent the reed from responding in the short time it is free to do so. Sufficient movement of the air stream also creates the response necessary to relax the tongue. This results in a psychological atmosphere of control and accuracy.

The ratio of tone to silence indicated by a staccato mark (·) is generally accepted as a half-and-half division, but this may be altered somewhat for interpretative purposes. However, for study of the motion and the physical aspects, this is a most satisfactory division. Rhythmic accuracy in this respect should be carefully maintained, thus:



The tenuto marks (dashes) over the notes indicate that each note must be held for its full length, i.e., interpret the quarter note as  and the eighth note as  .

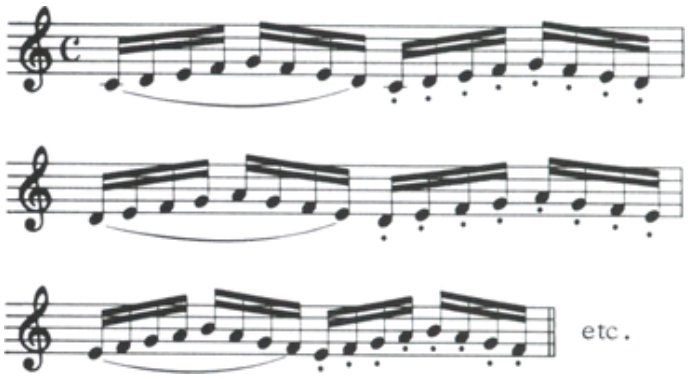
Success in gaining proficiency in staccato depends on the ability to produce a good tone of short duration with no extraneous sounds, either on the attack or release. This is best acquired through regular, slow practice. Ten or fifteen minutes of tonguing practice at a time are sufficient, since the tongue will become fatigued and heavy and little will be accomplished after this length of time. Regular practice of the staccato as a part of the daily warm-up is recommended. This can begin with a simple exercise, such as:



The above pattern should be used throughout the entire range of the instrument, followed by alternating each tone in intervals of seconds, thirds, fourths, etc.

Only after the tonguing action is under control should endurance and speed be attempted, and the increase in speed should be gradual. Practice with a metronome to check both rhythm and tempos. An advance in tempo should be attempted only when the preceding pace is relaxed and smooth. Scale studies are a logical step from the preceding patterns, alternating the staccato with legato.

Tone production must be the same in both instances, and the rhythm of the legato phrase must be accurate before the tongue and fingers can synchronize. Often, tonguing ability is blamed when the real culprit is an unstable technique. Synchronization of the fingers and tongue is an exercise of the mind also, and the cultivation of careful listening habits is necessary to recognize which of the various elements needs correction. A rudimentary scale pattern, which will expose this problem, can be invented and memorized:



An exercise of this nature is valuable when practiced in all keys, both major and minor. Almost any standard exercise book will have studies which may be used for tonguing development. The Klosé 25 Daily Exercises (New York: Carl Fischer) is an excellent medium for staccato practice, both for endurance and for facility. The only alteration required is the elimination of the printed articulation marks.

A review of the pertinent points in connection with the tonguing action must constantly be kept in mind when practicing tonguing. These points are:

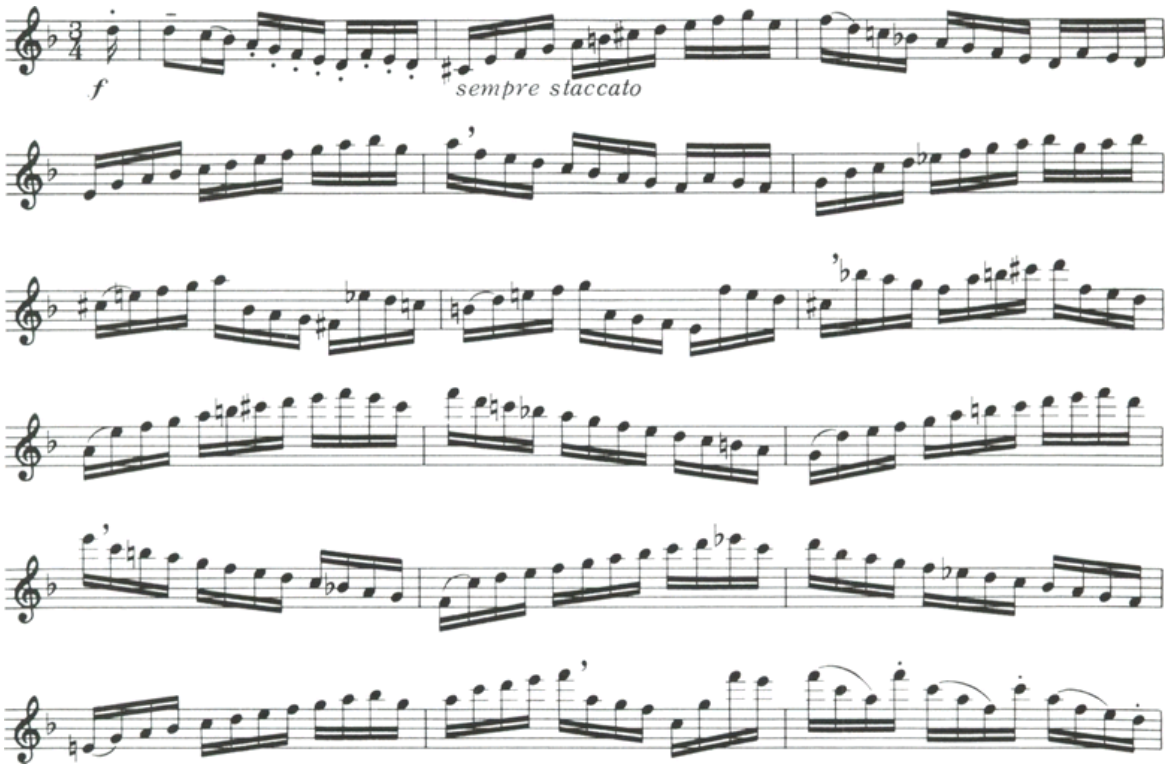
1. The removal of the tongue from the reed starts the tone. The tongue is used to prevent the vibration, not to produce it.
2. Air support must remain constant at the point of the reed during rapid tonguing. Think of keeping the air pressure in the front of the mouth.
3. A *light* touch on the tip of the reed will stop its vibration all that is necessary. The impact of a forcible stroke will "shock" the reed and result in an unmusical attack, as the reed cannot immediately continue at its normal vibration rate.
4. The stroke of the tongue should be short but positive, moving only in the front part. Movement of a large portion of the tongue changes the size and

shape of the oral chamber, which distorts the tone in addition to slowing up the tonguing action.

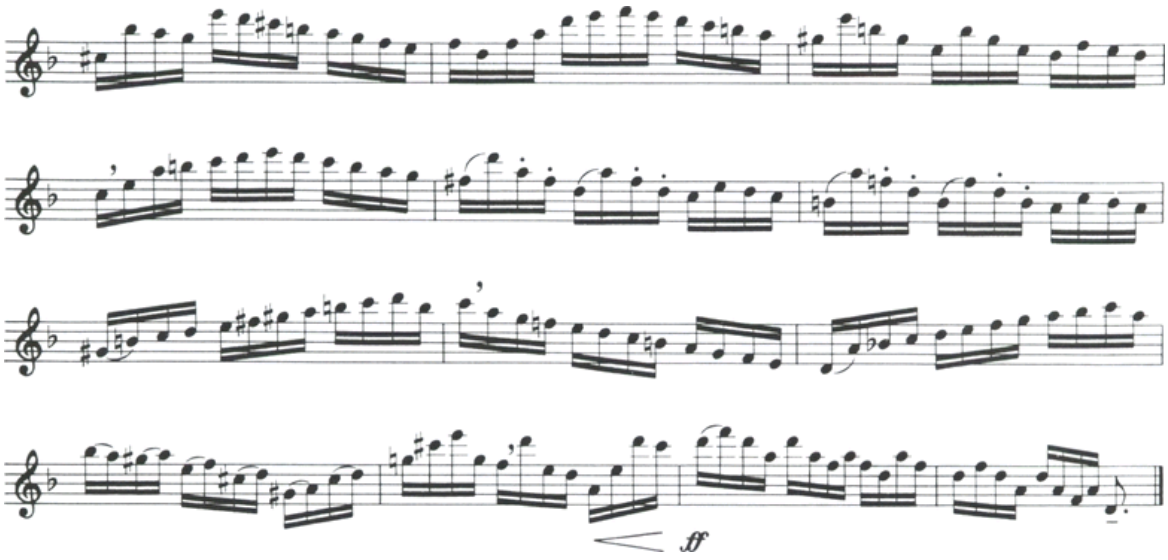
5. Rhythm of the stroke is the basis for rapidity, and a metronome is a valuable accessory in the practice of staccato.
6. Moving staccato phrases or scales should be practiced *after* the technique of the phrase is smooth and perfectly rhythmic. It is useless to tongue smoothly on an insecure technique.
7. Compare the tongue to the clutch in a car. The tongue throws the reed "in and out of gear" but the motor (air support) must keep running.
8. The embouchure and throat muscles must remain relaxed and in the same position as when a lyrical phrase is played.

Daily practice of the staccato is necessary for the acquisition of endurance and speed, since the tongue is a complex muscle and must be kept in condition. A well-planned daily routine should include:

1. Warm-up on single notes such as indicated earlier in this chapter.
2. Scales in all keys and in various tempi.
3. Study of music which involves use of the staccato, such as the following excerpt:



Presto (♩ = 126)

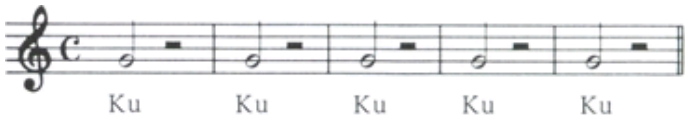


DOUBLE-TONGUING

Double-tonguing on the saxophone requires the alternate use of two radically different methods of attack and release. The usual method of stopping the reed's vibration (with the tongue) is alternated with a closing off of the air column with the throat. This presents two different types of attack which must be perfected to the point where the character of each is so similar that the difference is imperceptible to the ear. Development of this type of staccato requires intensive study and practice over a long period before it reaches the degree of useful perfection.

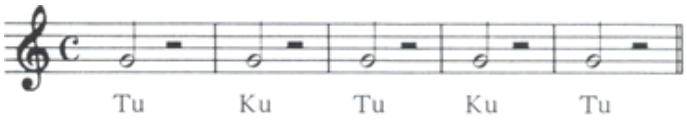
The physical problem is somewhat complicated by the fact that the saxophone mouthpiece occupies a considerable portion of the oral chamber, and restricts the freedom of motion between the tip of the tongue, the throat muscles, and the base of the tongue. Rhythm is also a factor since, when the air stream is controlled from the throat, it must travel to the point of the reed before there is any response. Thus, we are attempting to match two radically different modes of staccato which by their very nature produce unequal results. Throat muscle development is perhaps the first step in attempting the double-tongue procedure.

Preliminary practice should begin with slow, successive attacks using the "ku" syllable only, much in the manner of a polite cough. The throat muscles will have to be trained to contract and expand without affecting embouchure pressure. The lower jaw must remain in the same position, though it may have a strong inclination to drop as the "ku" is pronounced, especially in the upper register.



This is a tedious exercise but, to the author's knowledge, no short cuts have been discovered. Concentrate on a solid tone and a clean entrance. Beware of "scooping" into the tone, i.e., attacking below the pitch and pulling it up later. Starting with the "ku" must be developed to the point where it is difficult to

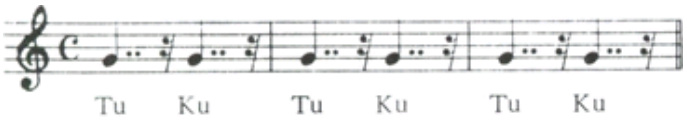
differentiate from an ordinary attack before proceeding to the next simple exercise:



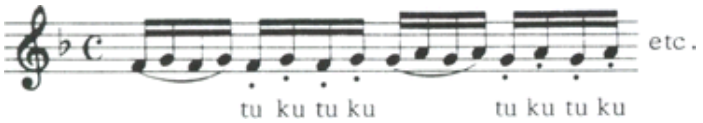
The balance and similarity of sound between the two syllables is of prime importance. It is useless to proceed until reasonable perfection has been attained. At first this should be practiced in the register from F to C in the staff, as these notes adapt themselves more easily to this mode of tonguing.

IMPORTANT: Several months of practice may be required to attain the necessary facility before proceeding to more complicated techniques.

The reason for the half note-half rest ratio is that the long rest allows time to prepare the throat muscles correctly. As skill is gained, the next step should be shortening the rest, *not the body* of the note.



At this point, the duration of the rest can be gradually shortened until a normal tonguing ratio is attained. Only when this sounds even in rhythm, balanced in volume, and the attacks are so similar that a person standing a short distance away cannot distinguish between the sound produced by the syllables should speed be gradually incorporated into the practice. A practical exercise pattern, starting with major seconds and alternating between legato and double staccato, follows:



If a softer attack is desired, the “da-ga” syllable is useful. This creates no particular problem if the basic tongue-throat action is well formulated. The double-tongue technique must be mastered at various speeds, including slowing up to the point where the single and double methods can cross or overlap. In other words, if single tonguing reaches  = 132, one should be able to slow the double tonguing to  116, as it is not always practical to shift from one to the other at a given point.

The release in this type of staccato presents no special difficulty. At the speed in which it is employed, the release of one tone becomes the attack of the next.

The art of double tonguing should not be approached lightly. Ordinarily it is a task requiring several years of study, and should not be considered a panacea to cover up a sluggish single tongue. A good single staccato must be acquired before attempting to develop the double tongue. It is a controversial type of articulation, and should be considered only as an *addition* to the basic tools in the performer’s kit. Some find it quite natural, while others experience all kinds of frustrations. It is up to the individual whether or not he feels this staccato is worthwhile.

Triple staccato, or “triple-tonguing,” logically follows the study of double-tonguing. The method is the same, with the exception of the alternation of the syllables. Three patterns are used, each with advantages, depending on the rhythmic situation. They are:

1.	tu	tu	ku	tu	tu	ku	tu	tu	ku	tu	tu	ku
2.	tu	ku	tu	tu	ku	tu	tu	ku	tu	tu	ku	tu
3.	tu	ku	tu	ku	tu	ku	tu	ku	tu	ku	tu	ku

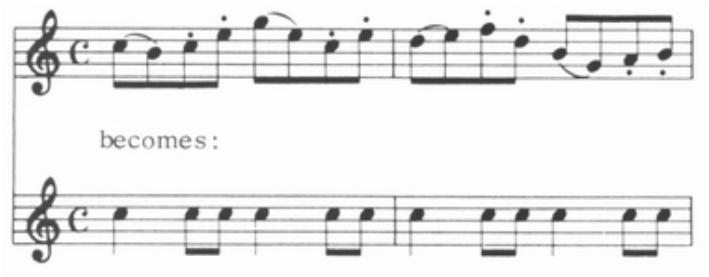
ARTICULATION

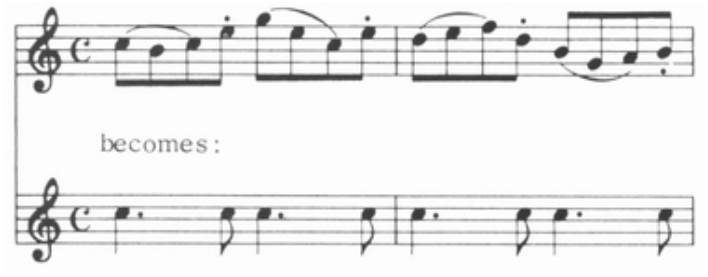
Articulation might be defined as the art of note grouping by the use of legato and staccato. The development of this skill is vital for artistic expression, since it imparts character to the musical phrase.

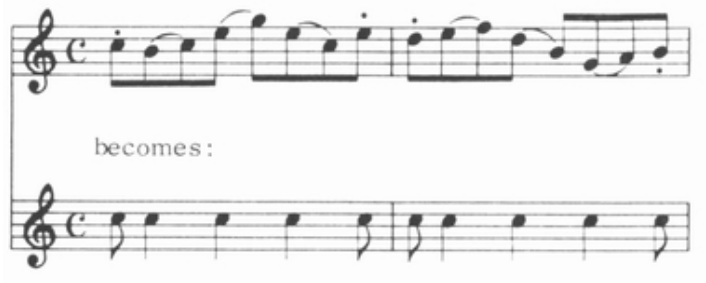
In speech, articulation is characterized by clear and distinct words. The public speaker or vocalist must learn to articulate clearly if his message is to be understood. I once read an article by a United States Senator who stated that he never listened to President Franklin D. Roosevelt speak. He said “If I listened to him he would convince me. I read his speech in the papers the next day to find out what he really said.” Correct articulation in music is equally important for a convincing performance, since it creates a feeling of clarity and coherence in the listener.

RHYTHM IN ARTICULATION

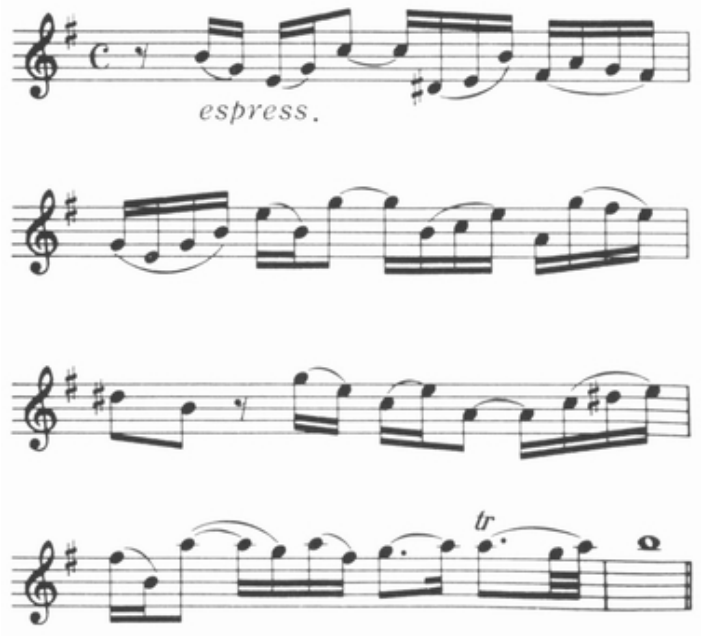
A primary function of articulation is its underlining of the rhythmic structure. If we observe the effect of different articulations of the same phrase, it becomes apparent that the note groupings control the character of the musical message. For example:

1. 

2. 

3. 

The musical impression created by the syncopation (Fig. 3) is quite different from the simple rhythmic pattern in Figure 1. Articulations are doubly important in the case of wind instruments due to the fact that there is but a single melodic line. A few measures from the Bach *E minor Sonata* will point up the advantages of correct articulation. The marks here serve to emphasize the harmonic as well as the rhythmic structure:



Adagio ma non tanto (♪ = 84)

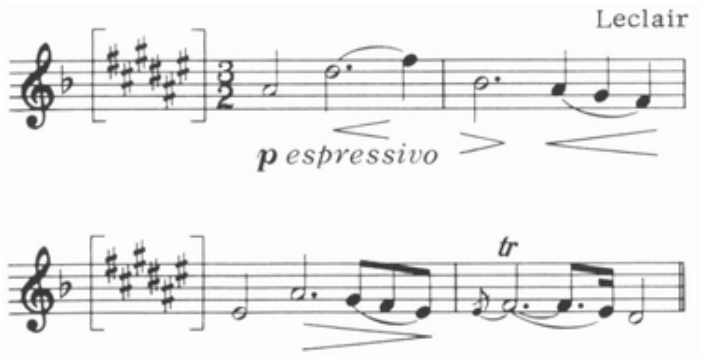
One has only to play this, ignoring the marks of articulation, to realize the value of articulation to the musical meaning.

LEGATO

The legato (slurred) type of tone connection requires stability of air support coupled with excellent finger coordination. The essence of a pure legato involves the binding of tones in such a manner that only the pitch change is perceptible. The tonal flow must be uninterrupted. Those instruments which employ a vibrato may have a slight advantage in establishing a fine legato, since a continuous oscillation of the tone creates an illusion of better note connection. Vibrato alone is not the answer to good legato playing, however, and can definitely detract from a smooth tonal line when used incorrectly. In no case should the saxophonist rely on vibrato to cover any basic defects, and as a practice routine it is best to eliminate vibrato altogether until other deficiencies are corrected. Some of the most common faults are:

1. Lack of finger synchronization.
2. “Bumping” the air column at the point of tone connection.
3. “Beating time” with the air column.
4. Relaxing air support at the end of each tone.
5. Unnecessary alteration of embouchure for the new pitch.
6. Unequalized finger pressures and poor choice of fingering positions.

Scales and progressions of thirds, played slowly, form an excellent basic study for legato development. Gradually expand this study to include wider intervals. The practice of melodic phrases in unusual keys also provides an interesting device for this study, and can be done in the following manner:



Largo

First play in the key of D minor, then repeat in the key of D♯ minor, using the key signature in the brackets. This procedure may be applied to many melodies or etudes by simply changing the key signature and using the same written notes, i.e., C major to C♯ major (adding seven sharps), D major to D♭ major (cancelling the two sharps and using the five-flat signature), etc. Written accidentals must also be altered to fit the particular case.

"Pushing" or "bumping" the new tone with the air stream must be avoided in playing a legato. Sometimes this is accompanied by a relaxation of the air column at the end of each tone. This only accentuates the fault. A smooth legato requires a change to each new tone with no perceptible alteration of the air speed or embouchure. *Let the fingers make the change*.

Accenting the beat with the breath is an inartistic habit which must be avoided. Occasionally this has value from a phrasing standpoint, but it should not be done unless indicated or required by the style of the music. "Beating time" with the air column ordinarily has no place in a mature performance.

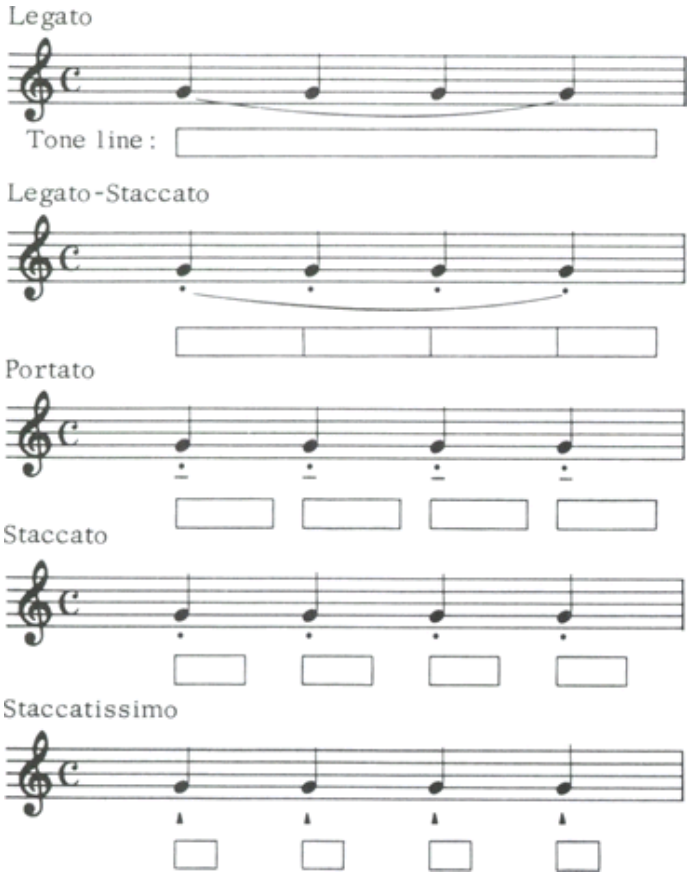
A precise but uniform finger pressure action, together with finger coordination, is most essential to the legato phrase. Fingers must move the same distance above the keys with a light but equalized pressure. Slapping one key down while oozing into the stroke on another has an obviously uneven result. The object of the technique in legato is solely to connect tones, without either percussiveness or indecision. One must also consider the fact that the manner of *raising* the fingers is an important factor. While it is impossible to produce any percussive effect by raising the fingers, an indecisive action here can cause a sliding action into the new tone, making it essential that the up and the down strokes of the fingers be

equalized. The value of the correct finger stroke is apparent when we understand that many pitch changes are brought about by a combination of opening and closing keys, and not by a single action in one direction.

A fine legato is essential as a foundation for the development of the staccato articulations, since the connected phrase must be accurate before the articulations can be effective.

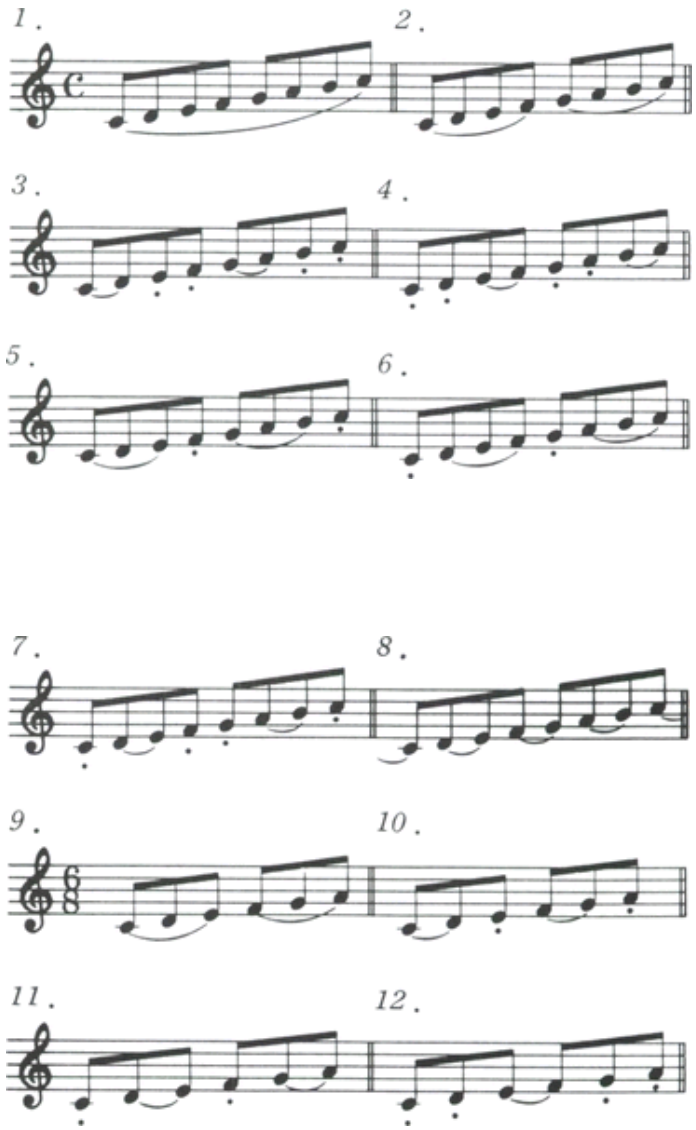
MARKS OF ARTICULATION

While there area few marks to indicate the composer's intent as to the treatment of a single tone, the exact length of a given mark is arbitrary at best, and inadequate to convey the total meaning. The final space-tone relationship is left up to the interpreter. Five most common indications of articulation are:



The above values are in no sense to be considered absolute, but should only serve as a departure point from which to interpret any given musical example.

Certain basic articulation patterns must be well established in the saxophonist's technique. These, indicated by the dot in the following example, should be practiced in all of the forms shown above. These patterns maybe applied to scale studies as well as to the "running" type of exercise, such as the Klosé 25 *Daily Exercises* (New York: Carl Fischer), by merely substituting the various patterns for the printed marks.



The possible combinations of articulations are many, but the above will serve as a guide for study so that the student will become skilled in the basic groupings. Important points to consider are:

1. Maintain rhythmic structure. The *entrance* must always be correct. The shortened duration of a tone is always taken from the end, not the beginning, of the note.
2. Entrance and release must be neat. Any false or fuzzy sounds must be eliminated.
3. Good articulation is free from false accents. A note should not be accented merely because it is the first note of a slurred group, and, though stress may be implied on certain tones, it is not a part of the articulation itself—rather a part of musical phrasing.
4. Staccato and legato should have a uniformity of volume, unless indicated otherwise.
5. Good tone quality must be maintained at all times. A resonant tone lends itself to articulation more readily than a dead tone.

ADAPTING TO THE ENSEMBLE

Types and styles of articulation have a direct relationship to the performing ensemble. Solo playing, in which the burden of the musical composition is in the hands of a performer and accompanist, lends itself to the most subtle nuances and most delicate gradations of staccato and legato. In a large organization such as a symphony orchestra or a concert band we are dealing with a large mass of sound, to which each musician contributes but a small fraction. The total sound has much greater resonance and will bounce around an auditorium in such a manner as to lose its definition. In order to compensate for this, the musician in a large ensemble must articulate more clearly and definitely than he would in chamber music or solo renditions. This is especially important in wind groups, where the individual tones are not as transparent as are the strings of a symphony orchestra. A crisp articulation is necessary in any large ensemble to project clarity of the musical structure. The student must always bear in mind that the meaning of a mark of articulation is dependent on the character of the musical score and the size and nature of the musical ensemble with which he is performing.

PHRASING AND INTERPRETATION

MUSICAL NOTATION

Grove's *Dictionary of Music and Musicians* defines notation as "the art of expressing musical ideas in writing." When applied to the art of interpretation and phrasing, the inadequacy of the present system of notation leaves much to be desired. This has a hidden advantage, however, since it permits the performer to superimpose his own experience and artistry on a musical score. The primary obligation of the musician must be to follow the printed indications faithfully, for the composer's wishes must always be the first consideration. Fine performers endeavor to enhance and clarify the composer's intentions, rather than change them. Care in following the notation should not, however, rule out the performer's right to interpret. Rendition of the same composition by Heifetz, Stern, and Milstein will have subtle differences, each of which is most artistic, but they will all conform to the wishes of the composer. Individuality in musical expression contributes to the retention of interest and to the perpetuation of great music. The performer must be allowed to inject his own artistry, or all renditions of the same score would sound so similar as to become monotonous.

EXPRESSION

Musical expression can be learned. It is not some mysterious emotional feeling possessed by the gifted few. While some fortunate individuals have an instinct for expression which surpasses the average, it has also been proved that the latent desire for artistic performance may be nurtured through a study of the basic elements of phrasing. This will instill confidence in the serious student so that he feels on solid ground in his efforts to interpret. Cultivation of the expressive factors in music is both an intellectual and an emotional exercise. The musician must first attempt to find out what the composer is trying to say, and the score must have a meaning to the performer if he is to communicate a message to his audience.

While the title of a musical score may often give a clue as to the composer's intent, much music is written with no more indication than "Sonata No. 2" or "Fourth Concerto in D minor." This imposes an obligation on the interpreter to investigate the era in which the music was composed, the style of other writings of the same composer, and interpretations of fine artists in connection with the particular composition. Groundwork for successful interpretation must include a familiarity with the particular styles of the great masters. Since the saxophone was not yet in existence when much of this music was composed, it is necessary to use transcriptions. Adaptations by Sigurd Rascher, Marcel Mule and others are a valuable contribution to saxophone literature, and they should be studied by all saxophonists. Music of masters such as Bach, Wagner, and Debussy has individual characteristics which are apparent to the schooled musician. Beyond the compositional techniques of each, there is an accepted interpretational style for each composer. The student should be exposed to these various styles, even at the early stages of his musical career.

If a composition can be compared to a picture within a frame, it is obvious that there are subjects that belong within the frame and others that have no place there. The use of the taxi horns in Gershwin's *American in Paris* would be ridiculous in Tchaikovsky's *Swan Lake* ballet, yet an uninformed performer sometimes reaches this point of musical vulgarity. Phrasing must remain within the framework of artistic bounds, but this should not rule out the element of

surprise. Sudden changes of mood sustain interest, but must be carried out with logic and good taste.

THE TOOLS OF PHRASING

Basic elements which are employed in the art of phrasing include dynamics, movement and breathing, tone color, articulation, and vibrato.

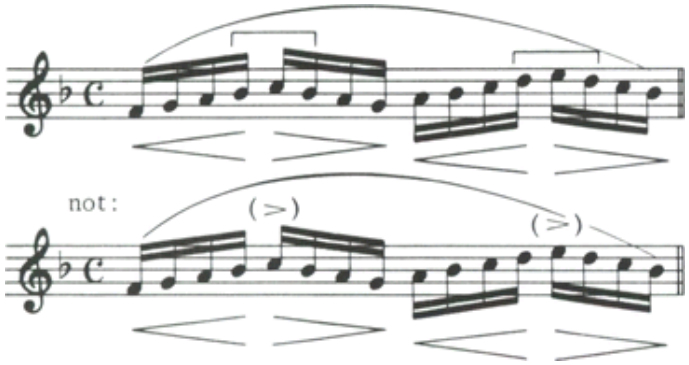
DYNAMICS

Observance of indicated dynamics is mandatory, although in most instances they are inadequate. It is impossible to indicate the delicate nuances necessary for artistic performance. In addition, the strength of the dynamic is dependent on the nature of the particular composition. A forte in a Sousa march is certainly much stronger than in a Handel sonata, so that one mustalways decide what the dynamic mark means relative to the prevailing mood of the music being played. Minor inflections which contribute so much to musical meaning are seldom indicated, since they are so subtle that no way of marking them has yet been devised. Composers feel that the music itself should inspire the performer in the direction of meaningful nuances.

Indicated dynamics tell only part of the story. The familiar symbol for crescendo-diminuendo

suggests a point at the apex which is often falsely accented, and might more correctly be

In other words, the crescendo-diminuendo flows more naturally when the peak of volume is curved rather than pointed. To obtain an effect of smoothness at the top of the crescendo, finish the increase in air speed on the note *preceding* the topmost tone and maintain this volume through the three top tones:

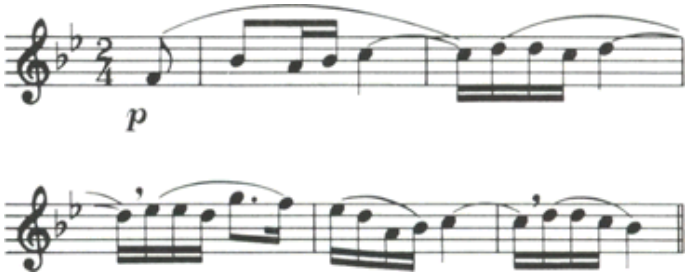


Accenting a note merely because it is on the beat (sometimes necessary in training elementary students) should be abandoned at the earliest possible stage, as it is a distinct enemy of smooth melodic playing. The student should be taught to think the beat without accenting it. Another common practice is the playing of long tones louder than short ones. While this is effective as a matter of style in certain music, such as a 6/8 march, it should not be considered a rule of phrasing. The long tone has strength because of its duration, and the short notes must be accorded equal consideration in order to be heard and in order to impart the correct character to the tonal line.

MOVEMENT AND BREATHING

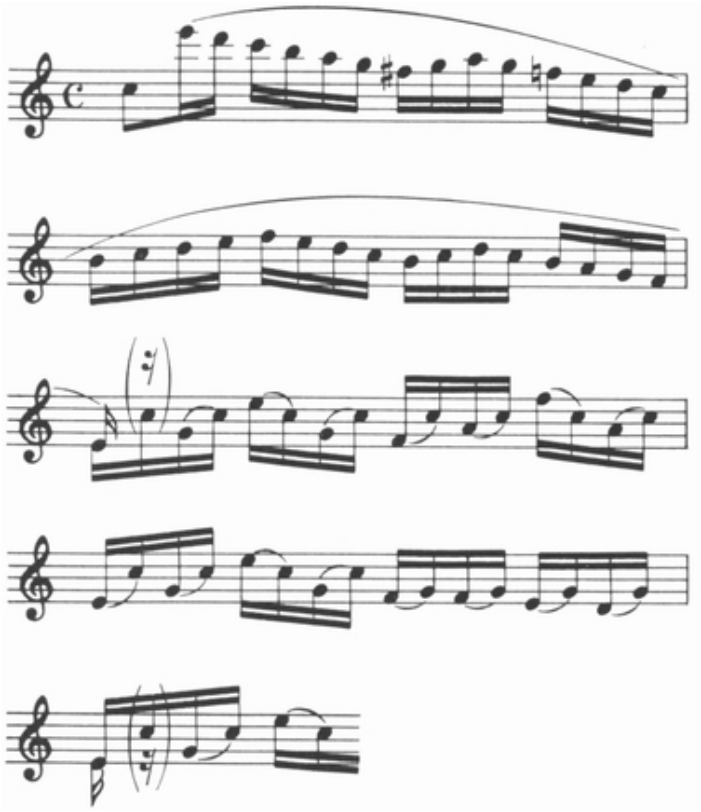
Unfortunately for wind instrumentalists, many musical phrases are too long for their breathing capacities, so methods must be devised to disguise breaks in the tone line lest they detract from the total effect. The aim of good breathing habits is to improve the meaning of a phrase, rather than lessen its force. Aline from *America*—"My country, 'tis of thee, Sweet land of liberty," if sung (or played): "My country, 'tis (breath) of thee, Sweet (breath) land of liberty," would have little meaning. We must plan our musical phrase so that the pauses for breath do not commit mayhem on the tone line. While most violations of taste are not this obvious, it is the duty of the performer to dissect and analyze a musical score so that, when finally assembled, it conveys an intelligible musical thought.

Melodic phrases are generally divided into sections of motion and repose, and the motion section should be completed before pausing for breath. When this is impossible, it is necessary to take into account both the melodic and the harmonic structure of the music. Do not consider the bar line as a breathing point. In fact, the bar line is usually one of the worst places to breathe, since the resolution of a cadence most often occurs on the first beat of the measure. The breath should be taken *after* the resolution, with subsequent notes attached to the new phrase, as in the following excerpt:



Chopin, *Nocturne No . 2*

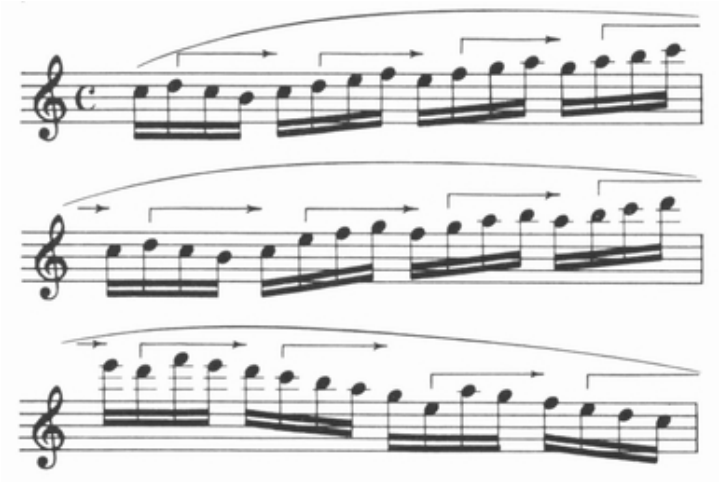
When a choice must be made between disturbing the continuity of a phrase or breaking into a slur for a breath, it is usually preferable to retain the structure of the phrase. Time for the breath is taken away from the end of a long tone, so that the entrance of the next note will conform to the rhythmic pattern. Pausing for breath between short notes will invariably result in a late entrance, and is a dangerous procedure. It is often wise to omit a single note altogether. Such procedure, when deftly managed, is less disturbing than a hurried gasp followed by rhythmic instability. In the following example, observe that the note omitted is the one following the resolution (often the second note in the measure). Experimentation in locating the proper breathing points will prove helpful in keeping the breathing from intruding on the musical thought.



Berbiguier, *Etude*

Generally the motion of a moving note phrase is improved when carried into the first note of the succeeding beat. This should be more or less a mental procedure

as far as the performer is concerned, and should not be carried to the point where actual accents are heard. In the example that follows, it is wise to think of each "sub-phrase" as the last three notes of each beat progressing into the first note of the follow-ingbeat. This type of procedure, i*f not overdone*, gives the progression a more natural flow and imparts a clarity to the general design.



J. Anderson, Opus 41

TONE COLOR

It is safe to state that the saxophone is without peer in its ability to produce tonal variety. A veritable spectrum of tonal colors is possible with this instrument, and these should be utilized to their best advantage. The use of a single type tune for all purposes is both unnecessary and unmusical. Certain generalizations referring to tone quality—"dance" tone, "studio" tone, "legit" tone—are but vague terms which are at best indefinite connotations brought about by the requirements of a particular style, often influenced by a particular type of mouthpiece and reed.

Developing tonal variance without changing the mouthpiece or reed is one of the obligations of the instrumentalist. Experimentation with slight alterations of the embouchure, air column, and oral chamber is a fascinating method of producing variety and interest in musical performance. When used sensitively, it goes a long way in separating the artist from the novice. The necessity for tonal variety is especially important in ensemble playing, for at one moment the saxophone must blend with a flute or violin and the next instant must match its tone to the lower brass. On many occasions it is necessary to submerge the tone in the ensemble to the extent that it loses its particular identity, while in solo passages it must project through the ensemble without giving the impression of merely being loud.

The use of various tonal colors opens up a new and interesting field for the saxophonist which the mature musician constantly takes into consideration. Coupling of tonal variety with musical experience goes a long way in lifting the level of instrumental performance to that of an art.

ARTICULATION

Since the mechanics of articulation have been discussed in the previous chapter, it is perhaps sufficient to add that the exact interpretation of the written articulation is the decision of the performer. One must always be guided by the general character of the music in deciding the extent to which marks of staccato, legato, etc., are observed. It is advisable to try each phrase in many different ways before a final choice is made, and the student is urged to acquire the habit of making *every* phrase have a real meaning, both within itself and in its relation to the piece as a whole.

VIBRATO

Use of the vibrato as a means of expression is a matter of musical taste. Since vibrato characterizes the saxophone tone, care must be taken that it is not overdone. Continuous use of one particular vibrato style for all types of music should be avoided. The degrees of vibrato are many, both as to speed and amplitude, and the character of each phrase should be examined to determine both the amount and the nature of the pulsation which will add the most to the musical meaning. Many performers ignore the impact of nonvibrato or “straight tone,” which has great value in lending variety, interest, and emphasis to certain nuances and phrases. The saxophonist should not be afraid to turn off the vibrato completely when encountering progressions that might be improved through its elimination, or when blending with instruments which use none. Control of the physical elements of the vibrato should be mastered to the degree that the performer can use the type of vibrato best suited to the music. Fine control of this aspect of tone can be a precious asset, but a tone quality which is a slave to vibrato is a distinct liability.

DOUBLING

No treatise on saxophone playing would be complete without the inclusion of the problem of doubling—an inadequate term, since the word "double" implies only two. Demands on both the present day music educator and the professional performer often require that he be a "tripler" or a "quadrupler" and sometimes more. The extent of the task of the modern music educator is overwhelming, and much credit must be accorded the individual who acquires a working knowledge of all the wind instruments, including the brass, plus percussion and strings.

The saxophonist seems to have been the most vulnerable in the field of doubling, and success in the field requires proficiency on additional instruments, usually those of the woodwind family. Study of another woodwind in addition to the saxophone has definite advantages other than economic. It brings to the saxophonist a wealth of literature and a more complete knowledge of the entire scope of woodwind playing, much of which can be transferred back to the saxophone. We must realize that the standards of saxophone playing have not yet reached heights comparable to those of other instruments, due to the fact that it is relatively young and has not yet achieved total acceptance in symphonic and concert circles. We have much to learn from the traditions of woodwind performance, and the study of additional instruments cannot but improve both musicianship and concept.

The disadvantages of doubling are apparent: practice time must be divided, embouchures must remain flexible, additional instruments are expensive to purchase and maintain, reed making is time consuming in the case of the double reeds, and fingering systems may become confusing. However, the limits of individual versatility are constantly being extended, and there are many examples of a high degree of artistry on several instruments. A realistic view of the musical scene will reveal that the advantages outweigh the disadvantages. From a practical standpoint, it is imperative that the saxophonist explore this field.

Some of the primary requisites for the "doubler" are:

1. Possession or development of a sensitive musical ear. Relative pitch perception is very important, since many of the instruments are transposing and it is necessary to orient to the sound of several pitches from the same written note. Those people gifted with absolute pitch may find this a detriment, as they hear only in concert pitch. This poses special problems.
2. Flexibility of the embouchure and supporting muscles, plus development and control of all the muscles affecting the various lip positions, as each

embouchure uses a different combination.

3. Some mechanical ability to acquire skill in keeping the various instruments adjusted. In the case of oboe and bassoon, reed making and trimming are also a necessity.
4. Muscular co-ordination and flexibility of the fingers and hands.
5. Realization that practice time must be expanded to accommodate the added burden, and that each instrument must be practiced regularly.

ADAPTATION TO THE VARIOUS SAXOPHONES

Shifting from one saxophone to the others is a relatively simple change, since the embouchure is basically the same and there is no fingering problem except for the alteration of the finger stretch. The smaller saxophones require greater embouchure control, for any modification in tension will affect the pitch. Thus, the soprano player will require an especially sensitive ear coupled with the physical adjustment of the lips to the small mouthpiece. The same general type of mouthpiece is advantageous to the doubler, but it is not absolutely necessary that he use the same facing of the same make, since the size of the embouchure must be altered for each instrument. Since the smaller mouthpiece responds more sensitively to any variation in lip pressure, it is easier for the alto player to transfer to tenor or baritone than vice versa. On the baritone and bass, changes in pitch through lip pressure are much smaller and the player is apt to become careless in maintaining a correct embouchure. Then, when he shifts to one of the smaller saxophones, he may have problems in tone and intonation control. Ordinarily, doubling on other members of the saxophone family is merely a matter of acquaintance with the new instrument and should pose no real problem.

SAXOPHONE AND CLARINET

Most saxophone players are expected to play clarinet, and from a commercial angle this is practically a necessity. One of the frustrating features of this combinationis that, while the two instruments are quite similar, the aspects of tone production are far apart. The clarinet with its cylindrical bore and the saxophone with its radically conical bore are markedly different in the amount of resistance in the instrument. This resistance is much more uniform in the clarinet, and its bell tones can easily be played pianissimo, whereas on the saxophone this is extremely difficult. The mouthpieces of the clarinet and the saxophone are built on different acoustical principles, which affect the resistance and the "feel" of the tone during performance. Saxophonists who take on the clarinet double should work to develop a true concept of clarinet tone, and carefully avoid playing both instruments in the same manner. This is especially true of the vibrato, which is not often used on clarinet. While an occasional clarinet vibrato is coming into the musical scene, it is used with much restraint by most concert players. The clarinet embouchure is based more on a "smile" position and rests on the front of the lower teeth. It is not our intention to go into a complete explanation of the clarinet embouchure, but the doubler must be made aware of the problem, and the adaptation to the clarinet embouchure should be made only under the direction of a competent clarinet teacher. The embouchure is *not* transferable, and the performer must constantly be aware of the instrument he is playing. Often we hear the remark "when I practice the clarinet, my saxophone embouchure suffers." If the embouchure is allowed to freeze in one position this condition is bound to appear. The doubler must endeavor to establish the correct embouchure for both instruments, and be able to make the shift instantaneously. This calls for flexibility in the embouchure muscles, never allowing them to become set so their position cannot be altered.

Tonguing the two instruments poses problems of adjustment due to differences in the size of the mouthpieces, the angle at which the reed is placed in the oral cavity, and the distance the mouthpiece extends back of the lips. In adapting to a particular mouthpiece and reed, the important consideration is the portion of the reed touched, rather than the part of the tongue involved.

FLUTE

The saxophonist who plans to study flute as a double should be aware of the fact that he probably will have to start from the ground up. There is not enough similarity, with the exception of a few fingerings, to give the saxophonist an advantage. It may take some time before the individual can produce any kind of musical sound, much less a good tone. The time element in developing a flute embouchure varies greatly from one individual to another, and the best way to determine one's potential is to give the instrument a fair trial. Producing a flute tone requires blowing across an open space and, until the embouchure is developed so that the air stream is compact and efficient, much air will be wasted. This loss of air will require rapid breathing, which often will make the beginner dizzy owing to over-oxygenation of the blood stream. As the embouchure improves and the use of the air stream becomes more efficient, this condition will disappear.

The third octave of the flute has technical difficulties which are necessary to overcome, since much present-day scoring is in this register. A great deal of study is required to develop a pianissimo in the upper register and a forte in the low register. Double and triple tonguing are necessary techniques on the flute, since these forms of articulation are mandatory in the negotiation of many of the passages scored for this instrument. Most flute players use a combination of diaphragm and throat vibrato by varying the speed of the air stream through muscular pulsation.

OBOE

The size of the oboe reed seems to be the first obstacle which confronts the saxophonist, for it uses the embouchure muscles in an entirely different manner. The embouchure may be roughly described as setting the lips in a “firm whistle” position. Single reed players are not accustomed to the use of both lips for reed control and are inclined to insert the reed too far into the mouth. Air resistance is much greater than in any of the other instruments, since the oboe reed will accept only a small stream of air and builds up a comparatively greater amount of pressure. After finishing a long phrase, it is common for the oboist to expel the stale air from his lungs before the next inhalation. The recommended tonguing stroke is the tip of the tongue to the tip of the reed, with the lower register being least responsive to articulation. A pianissimo in the lower register is extremely difficult. For the novice, the high tones will tend to be sharp, while the lower register will be flat and coarse.

Technically the instrument is somewhat similar to the saxophone, but it has two register keys and a half-hole which must be manipulated. Professional oboists use a turkey feather for cleaning rather than a commercial swab. The instrument should be handled with great care, as the mechanism is delicate, and it is important that it be protected from sudden changes in temperature, since the wood cracks easily. Adjustments should be made by an expert.

BASSOON

The bassoon embouchure is quite different from the other woodwinds, with the lower jaw pulled back, and a great amount of lip used over the lower teeth. The lower lip is altered from one register to the other while the upper lip remains stationary, and very little pressure is used on the reed. Most of the control is obtained from the diaphragm, also employed in vibrato, which should be quite narrow in its amplitude. Air resistance in this instrument is considerable, although not as great as in the oboe.

The staccato involves a movement of the lower jaw along with the tongue in a sort of bouncing motion. Release of the staccatois produced by stopping the air stream, never with the tongue, except in extremely fast passages. Tonguing is tip to tip or slightly to the top of the tongue.

Bassoon technique is complicated. The fingers are held straight, contrasting with a certain amount of curve for the other woodwinds. The right thumb has four keys to manipulate, and the left thumb eight! Many cross fingerings and alternate positions are necessary to manage certain passages.

Reed making and adjusting is very important for double reed players, and these skills must be considered as a part of oboe or bassoon study. While commercial reeds are obtainable, most experienced double reed players prefer to make their own. Reed making is an art in itself, time consuming but well worth the effort.

SELECTION OF INSTRUMENTS

The use of the best possible instrument is paramount for the doubler, as he has enough problems without the added handicap of an inferior instrument. If a used instrument is purchased, it should be only on the advice of a competent performer or teacher. Even the best of instruments can become so worn that it is impossible to keep them in adjustment for any length of time, and the novice may have neither the knowledge nor the time to constantly fuss with the mechanical deficiencies of his double. It is better to wait until the necessary finances are available than to purchase a cheap instrument which will produce only frustration and disappointment.

	Saxophone	Flute	Clarinet	Oboe	Bassoon
Embouchure	Cushioned but firm	Flexible and controlled	Fairly firm	Firm	Flexible and controlled
Resistance	Variable in different registers	Slight	Most of the single reeds	Considerable	Considerable but less than oboe
Vibrato	Jaw	Diaphragm, throat or combination	None; jaw in dance work	Diaphragm or jaw	Diaphragm
Tonguing	Tip of reed with tip or upper part of tongue	Back of upper teeth with tip of tongue	Tip to tip or slightly away from tip of reed	Tip to tip	Tip to tip with jaw motion
Technical Problems	Extreme upper and lower registers	Upper register	Throat tones and upper register	Upper register. Response in lower register.	Many in all registers
Reeds	Selection and adjusting	None	Selection and adjusting	Making desirable. Trimming necessary.	Making desirable. Trimming necessary.

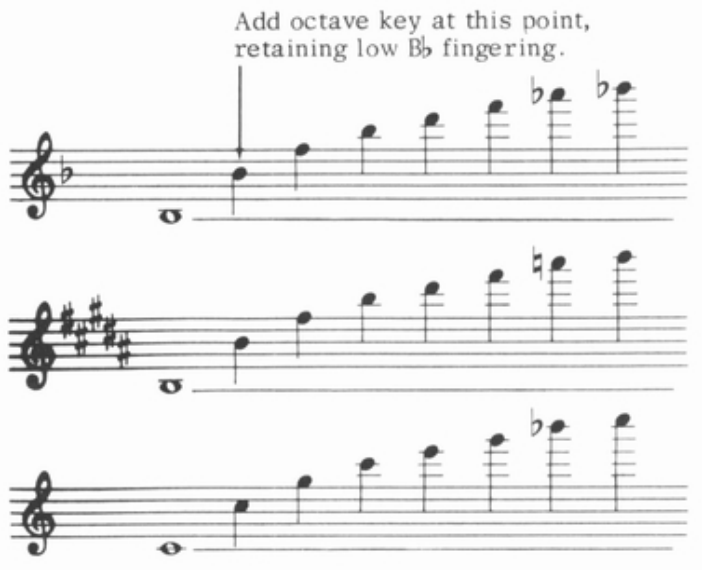
COMPARISON OF PERFORMANCE TECHNIQUES FOR THE DOUBLER

THE ALTISSIMO REGISTER

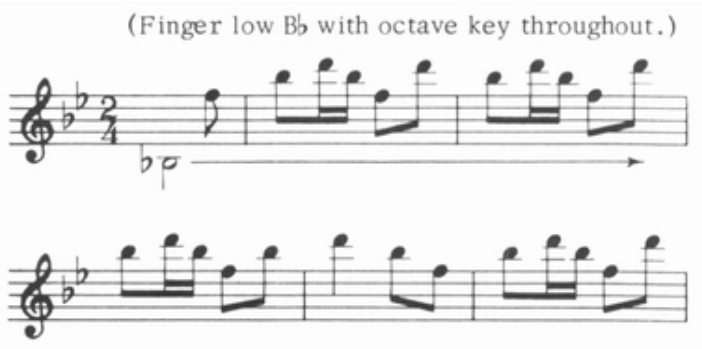
Extending the upper range of the saxophone has been a controversial subject for some time, but a gradual trend toward study of the upper register is steadily gaining momentum. Pioneering efforts of a few soloists are largely responsible for this development and, with the increasing number of young musicians who are seriously studying the instrument, there is no question that the saxophone player of the future will be expected to play beyond the normal range of two octaves and a fifth. The addition of even a few notes to the range of the saxophone contributes greatly to its scope and capabilities. Usage of the extended range must be determined solely on musical value. It should never be employed as a stunt. If these tones can be produced with beauty, good intonation, and accurate control, they are a boon to the instrument. However, if the result is merely an unmusical squeak of uncertain pitch, the reputation of both the saxophone and the performer will suffer. Much study and preparation is required in this facet of saxophone playing to reach a good performance level.

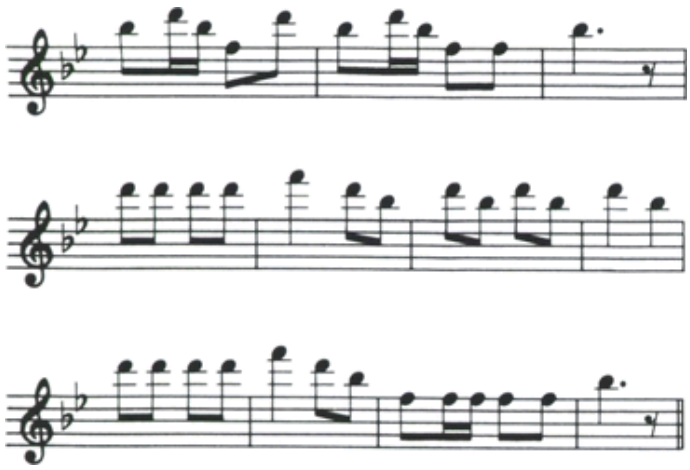
High tones should be attempted only by advanced saxophone players who have a well-developed embouchure and an accurate sense of pitch discrimination. The latter is of utmost importance, since tones in this register must be heard *ahead* of their sounding. Fingering positions in this register only set up the acoustical possibility of producing the desired note, but will in no way guarantee it. The actual pitch is attained from a strengthened lip position, which must be slightly altered for each tone. Premature efforts in this direction, before the embouchure muscles are well developed, will not only retard progress but will also actually injure the delicate nerves and muscles of the lip to the point of permanent damage.

Since the tones above the normal register require a manipulation of the fundamental tone into the upper partials, preliminary exercises which point up the adaptability to the harmonic series should be studied first. The first eight partials of this series are adequate to accustom the embouchure to this type of tone production and, if mastered, will serve as a foundation on which to continue the study. In the following, retain the fingering of the fundamental tone throughout the series, but add the octave key beginning with the first overtone.



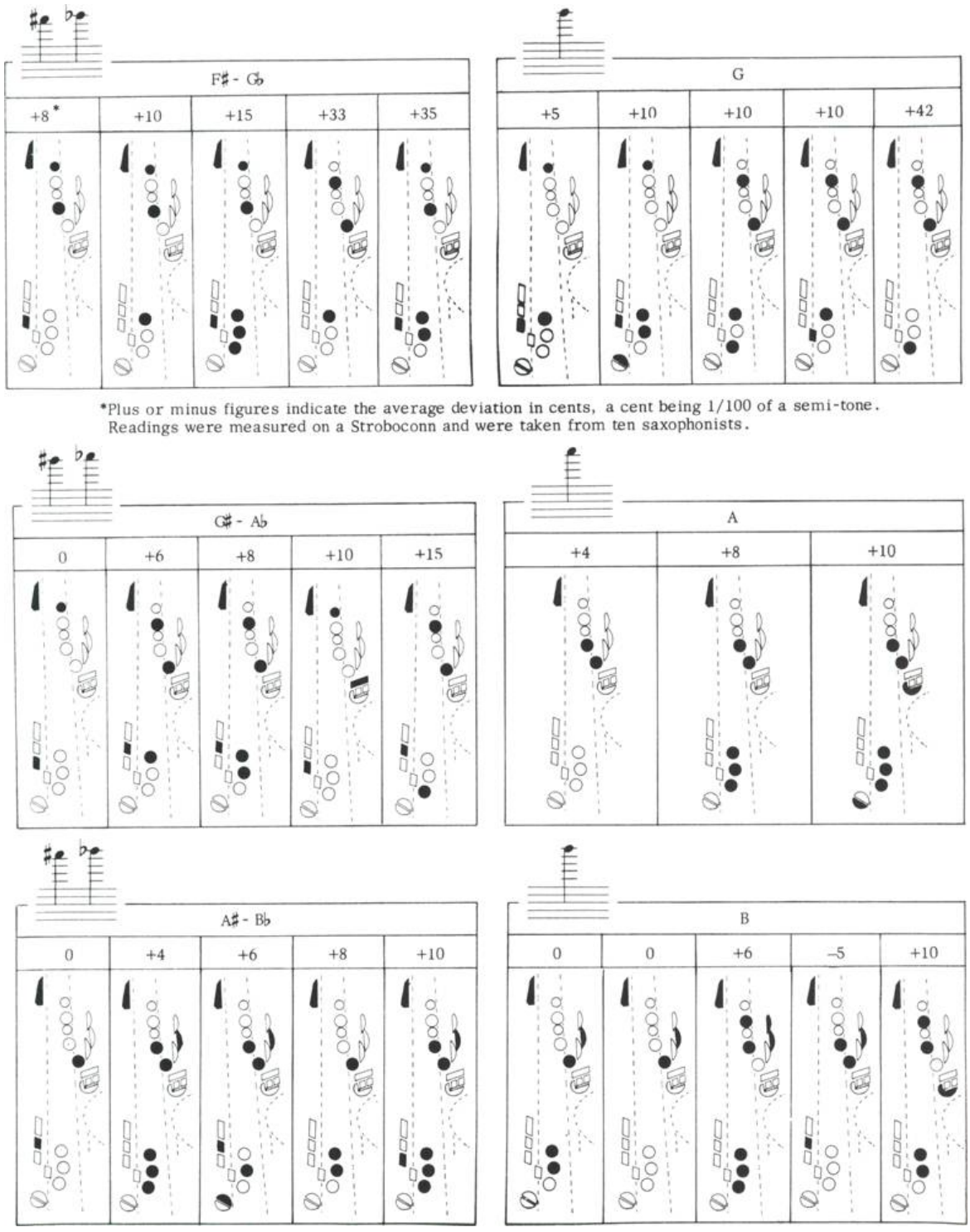
Trial and error must be the determining factor as to the correct mixture of embouchure pressure, air support, and throat position. Increased tension of the embouchure should not be confused with biting, since this accomplishes very little except to produce a sore lower lip. Added support must come from the muscles surrounding the lips, and especially those of the mouth corners. The additional tension closes the reed slightly, and more air velocity is necessary to vibrate the reed at the required speed. A slight assist can be given if the throat assumes an “ee-ee” position. An amusing little exercise based on a bugle call is good practice for training the embouchure to produce different pitches with the same fingering.



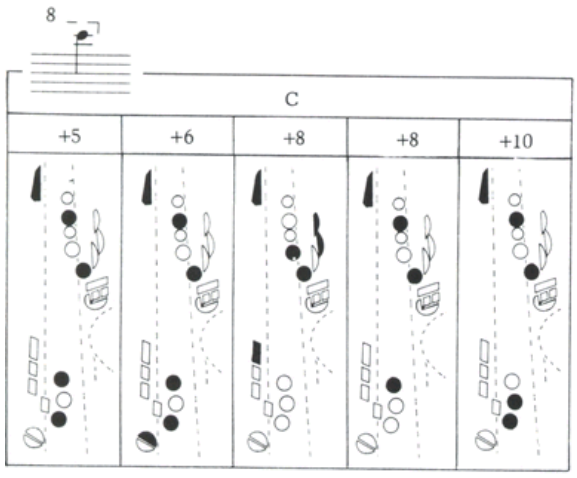


The area from the third to the sixth partials is most important in obtaining the "feel" of the embouchure for the harmonic register. Only after these tones are playable with confidence should one endeavor to use the fingerings in the chart. Choice of fingering positions will depend somewhat on the individual mouthpiece, the reed, and the make of instrument.

The ability to play a fine harmonic register is a long-term effort which requires patience and determination coupled with a discriminating sense of musical values and a sensitive musical ear. Two excellent methods are available on the subject of developing the harmonic register: *Top Tones for Saxophone* by Sigurd Rascher (New York: Carl Fischer) and *Studies is* High *Harmonics* by Ted Nash (New York: Leeds Music Corp.). The latter work is especially adaptable for tenor saxophonists.



ALTISSIMO REGISTER FINGERINGS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C
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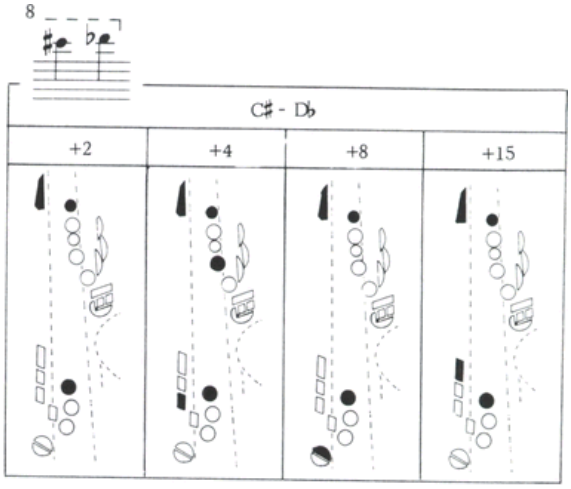
+6
+8
+8
+10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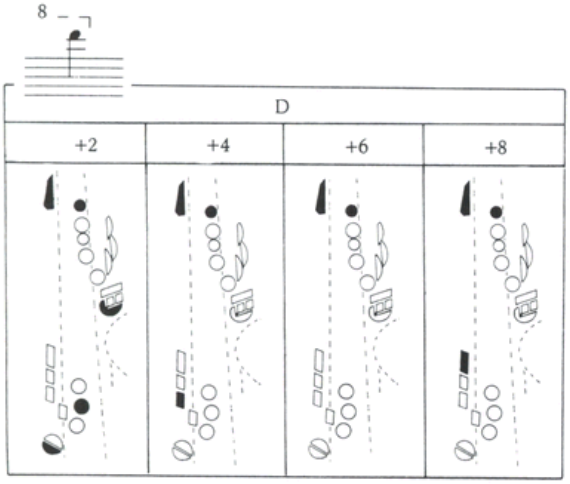
C♯ - D♭
+2
+4
+8
+15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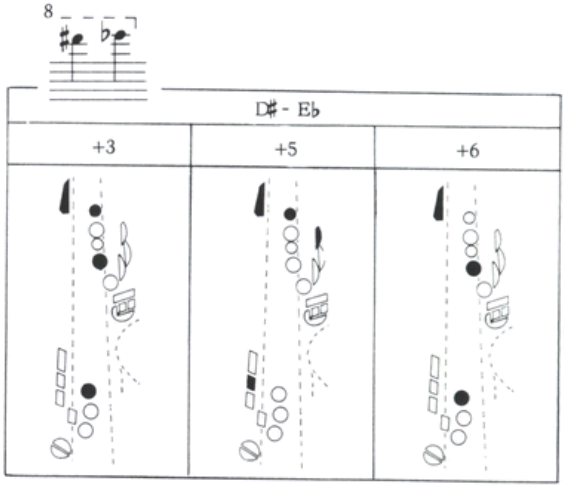
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D♯ - E♭
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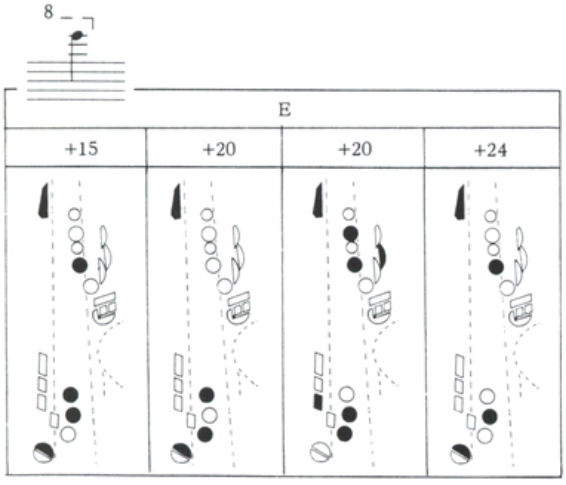
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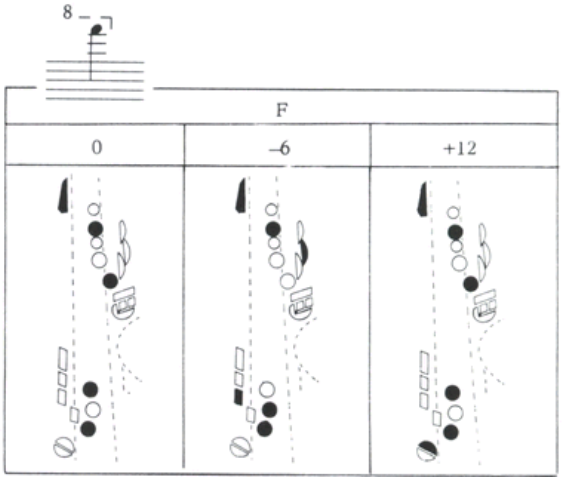
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–6
+12

SELECTED LITERATURE

Revised May 1976

The lists included here are composed of representative materials which may be used in the serious study of saxophone. They are not complete, since the size of this volume prohibits inclusion of all available literature. It is suggested that the student be exposed to many types of saxophone music at an early stage in his development, and that etudes, solos, duets, and quartets be used along with the method books, if possible. A variety of material not only sustains interest but also allows the student the necessary repetition in various forms at his level of advancement, so that he does not try to proceed too rapidly. Pacing of the progress is important, and the student who attempts difficult music before he is properly prepared is apt to be doing himself more harm than good.

Foreign publications are most easily obtained through importers. Names of music dealers who handle imported saxophone music are included at the end of this section.

METHODS AND ETUDES

Beginning

Anzalone	Breeze-Easy Method (2 vols.) (For the very young student, pleasant and entertaining material.)	Witmark, I
Bichon	Jouez du Saxophone, Vol. I (Recommended for a beginner of high school age)	Peters, I-II
Drouet	L' Ecole Française du Saxophone (The French approach. Moves slowly but solidly)	Fischer, I-II
Endreson	Supplementary Studies (Interesting etudes to be used with any beginning method)	Rubank, I-II
Froseth	The Individualized Instructor (Part of a band method, but is sound in the fundamental approach)	GIA Publications, I
Gekeler-Hovey	Belwin Saxophone Method (2 vols.) (Excellent for grade school students. Progresses slowly and logically)	Belwin, I-II
Hegvik	Modern Course for the Saxophone, Vol. I (Highly recommended. Interesting information about the saxophone, along with valuable playing hints)	Elkan, I
Hovey	Elementary Method for Saxophone (This method has been standard for many years, and still is excellent)	Rubank, I
Hovey	Practical Studies for Saxophone (Just what the title says. Excellent material)	Belwin, I-II
Phillips	Play Now (The melodic approach. Valuable for young students)	Silver Burdett, I
Rousseau	Saxophone Method for Beginning Students (Fine basic material and approach. Highly recommended)	Leblanc, I-II

Intermediate

Bichon	Jouez du Saxophone, Vol. II (Continuation of the Vol. I method)	Peters, III-IV
Blemant	20 Melodic Etudes (two volumes) (A well planned group of studies emphasizing legato phrasing and simple articulations)	Leduc, III-IV
Gekeler-Hovey	Saxophone Method (Logical continuation of the Gekeler beginning method)	Belwin, II
Hegvik	Modern Course for Saxophone, Vol. II (Follows Vol. I in an excellent presentation)	Elkan, II
Hovey	Daily Exercises for Saxophone (Fundamental scale and arpeggio exercises)	Belwin, II-IV
Klose	25 Daily Exercises (Technical studies in easy keys. A very fine book)	Fischer, III-IV
Pares-Whistler	Modern Pares Foundation Studies (Introduction to scale and articulation studies)	Rubank, II-IV
Samie-Mule	24 Easy Etudes from Samie (Musical and progressive etudes. Not of uniform difficulty.)	Leduc, I-III
Small	27 Melodious and Rhythmical Exercises (Some of the best studies for the improvement of accurate time division)	Fischer, III-IV
Skornica	Intermediate Method (Follows the Hovey Elementary Method)	Rubank, II
Voxman	Advanced Method for Saxophone (two volumes) (Two excellent methods to follow the Intermediate Method of Skornica.)	Rubank, III-IV

Advanced

Berbiguier	18 Exercises or Etudes	Leduc, IV
Bozza	12 Etudes Caprices	Leduc, VI
Cavallini-Iasilli	30 Caprices	Fischer, VI
Douse	How to Double and Triple Staccato	Baron, V
Ferling	48 Studies for Oboe or Saxophone	Southern, III-V
Gabucci-Allard	60 Varied Etudes	Ricordi, IV-V
Gatti-Iasilli	27 Virtuoso Studies	Fischer, IV
Karg-Elert	25 Caprices and Sonatas (two volumes)	Peters, VI
Koechlin	15 Etudes	Edition Français, V-VI
Lang	Studies in the Altissimo Register	Lang, IV-VI
McCathren	Daily Routine for Saxophone	Leblanc, IV
Mule	Scales and Arpeggios (3 vols.)	Leduc, III-V
Nash	Studies in High Harmonics	Leeds, V
Rascher	Scales for Saxophone	McGinnis & Marx, III-V
Rascher	Top Tones for Saxophone	Fischer, V
Soussman-Mule	Thirty Grand Exercises or Studies after Soussman	Leduc, V-VI
Teal	The Saxophonists Workbook	University Music Press, III-V
Teal	Daily Technical Exercises	University Music Press, IV-V
Terschak-Mule	Daily Exercises	Leduc, IV
Traxler-Lazarus	Virtuoso Studies	Belwin, IV
Viola	The Technique of the Saxophone	Berklee, V-VI
Voxman	Selected Studies	Rubank, IV

ALTO SAXOPHONE SOLOS WITH PIANO ACCOMPANIMENT

Easy

Bataille	Badine-Badine	Billaudot
Benson	Cantilena	Boosey & Hawkes
Bozza	Le Campanile	Leduc

Dedrick	A Tune for Christopher	Kendor
Dorsselaer	Conte de Versailles	Presser
Frankiser	Moraine	Belwin
Gee	Ballade	ProArt
Gluck-Mule	Orphée, Scène des Champs Elysées	Leduc
Gossec-Dawson	Gavotte	Southern
Gretchaninoff-Voxman	Evening Waltz	Rubank
Leclair-Mule	Andante	Leduc
Lully-Mule	Le Bourgeois Gentilhomme	Leduc
Marc-Carles	Cantilène	Leduc
Martini-Brehme-Rascher	Gavotte	Chappell
Mendelssohn-Mule	Romance sans Paroles, **No. 1**	Leduc
Schubert-Mule	Serenade	Leduc
Walker	Reminiscence	ProArt

Medium-Easy

Absil	5 Pièces Faciles	Lemoine
Bach-Mule	Suite in Ut, Bourrée	Leduc
Bach-Rascher	Minuet	Belwin
Beaucamp	Chant Elégiaque	Leduc
Bournonville	Danse pour Katia	Southern
Bozza	Chanson à Bercer	Leduc
Bozza	Gavotte des Demoiselles	Leduc
Bozza	Rêves d'Enfants	Leduc
Chopin-Chauvet	La Tristezza	Baron
Corelli-Chauvet	Sarabande et Gigue	Baron
Corelli-Mule	Adagio	Leduc
Glazounov-Leeson	Serenade Espagnol	Baron
Gluck-Mule	Armide, Chaconne	Leduc
Gossec	Gavotte	Southern
Golterman	Cantilena, from A minor Concerto	Belwin
Handel-Buchtel	Cantilena	Kjos
Haydn-Mule	Les Saisons, Canzonetta	Leduc
Kuhlau-Buchtel	Menuett	Kjos
Lane	Suite for Saxophone	Boosey & Hawkes
Leclair-Mule	Adagio and Aria	Leduc
Mana-Zucca	Walla-Kye	Leeds
Mignion	Elegie and Pastorale	Presser
Mortari	Melodia	Leduc
Mozart-Voxman	Minuet	Rubank
Pergolesi	Nina	Southern
Purcell-Maganini	Suite in F Major	Musicus
Schumann-Mule	Träumerei	Leduc
Tchaikovsky-Seay	Impromptu	Jack Spratt
Thiret	Adagio	Leduc
Tournier	Variations	Leduc
Young	Contempora Suite	Belwin

Medium

Ameller	Jeux de Table	Lemoine
Bach-Leeson	Air from Suite in D major	Baron
Bach-Mule	Andante and Allegro	Leduc
Beethoven-Mule	Petite Valse	Leduc
Benson	Aeolian Song	MCA
Benson	Farewell	MCA
Bozza	Aria	Leduc
Ciry	Capriccio	Schott
Couperin-Mule	Berceuse et Rondo	Leduc
Dukas	Alla Gitana	Leduc
Dyck	Première Légende Hébraïque	Costellat
Dyck	Deuxième Légende Hébraïque	Costellat

Fiocco-Rascher	Allegro	Bourne
Hennessy	Sonatine Celtique	Eschig
Ibert	Aria	Leduc
Iannaccone	Remembrance	Tenuto-Presser
Lantier	Sicilienne	Leduc
Lecail	Fantasie Concertante	Leduc
Mozart-Mule	Adagio, from Concerto for Clarinet	Leduc
Mozart-Webb	Sonatina	Belwin
Pessard-Buchtel	Andalouse	Kjos
Pierné	Canzonetta, Op. 19	Leduc
Ravel	Pièce en Forme de Habanera	Leduc
Reed	Ballade	Southern
Rueff	Chanson et Passepied	Leduc
Schumann-Hemke	Three Romances	Southern
Telemann-Londeix	Sonata	Leduc
Ward	An Abstract	Southern
Zambarano	Neapolitan Tarantella	Shawnee

Medium-Difficult

Aubert	Solo de Concours	Alfred
Bach-Mule	Andante and Allegro	Leduc
Bach-Mule	Fourth Sonata	Leduc
Bilotti	Sonata	Presser
Brindel	Suite	Presser
Coates	Saxorapsodie	Chappell
Cowell	Air and Scherzo	AMP
Eccles	Sonata	Fischer
Glaser-Rascher	Variations on a Gavotte by Corelli	Chappell
Handel-Mule	Allegro, Largo and Finale	Leduc
Handel-Mule	Fourth Sonata (flute)	Leduc
Hindemith	Sonata	Schott
Leclair-Mule	Gigue	Leduc
Maurice	Tableaux de Provence	Lemoine
Milhaud	Scaramouche Suite	Salabert
Milhaud	Danse	International
Moritz	Sonata, Op. 96	Shawnee
Myers	3 Short Pieces	Artisan
Pares	Premier Solo de Concours	Alfred
Russell	Particles	Bourne
Saint-Saëns-Teal	Sonata (clarinet)	Etoile
Tcherepnin	Sonatine Sportive	Leduc
Tuthill	Sonata, Op. 10	Interlochen
Vivaldi-Ostrander	Concerto in A minor	Musicus
Whitney	Introduction and Samba	Bourne
Whitney	Rhumba	Bourne
Wilder	Sonata	Fischer

Difficult

Adler	Canto IV (unaccompanied)	Dorn
Bach-Mule	Sixth Sonata (flute)	Leduc
Bariller	Rapsodie Bretonne	Leduc
Bassett	Music for Sax and Piano	Peters
Benson	Concerto	MCA
Bilik	Concerto with Band (piano red.)	Bilik
Bonneau	Pièce en Forme du Valse (unacc.)	Leduc
Bonneau	Concerto	Leduc
Bonneau	Suite	Leduc
Bozza	Concertino	Leduc
Caravan	Sketches	Seesaw
Charpentier	Gavambodi II	Leduc
Couf	Introduction, Dance, and Furioso	Belwin
Dahl	Concerto for Alto	MCA

Debussy-Rousseau	Rapsodie	Etoile
Denisov	Sonata	Leduc
Desenclos	Prelude, Cadence, and Finale	Leduc
Diemente	Mirrors IV	Dorn
Despalj	Concerto	Southern
Engleman, Hans	Integral	Ahn & Simrock
Glazounov	Concerto	Leduc
Handel-Mule	Sixth Sonata (violin)	Leduc
Hartley	Duo	Presser
Heiden	Sonata	Leduc
Husa	Concerto	AMP
Husa	Elégie et Rondeau	Leduc
Ibert	Concertina da Camera	Leduc
Lantier	Eskaldunak	Billaudot
Larson	Concerto	Hansen
Leonard	Recitative and Abracadabra	Bourne
Muczynski	Sonata	Schirmer
Noda	Improvisation	Leduc
Rueff	Concertino	Leduc
Tomasi	Concerto	Leduc
Tomasi	Introduction and Danse	Leduc
Vellones	Rapsodie pour Saxophone Alto	Lemoine

COLLECTIONS — ALTO SAXOPHONE SOLOS

A convenient and certainly the least expensive means of introducing a student to solo playing is through the use of the solo collection books available.

Arnold, ed.	Easy Saxophone Solos	AMSCO, (Grade I)
Arnold, ed.	More Easy Saxophone Solos	AMSCO, (I)
Arnold, ed.	Everybody's Favorite Alto Saxophone Solos	AMSCO, (II-III)
Dahm, ed.	Concert Album	Musicus, (II-III)
Nivard	Six Petite Pièces de Style	Andrieu, (II-IV)
Teal, ed.	Intermediate Solo Series for Alto Saxophone (with cassette tape performance and acc.)	Hal Leonard, (II-IV)
Teal, ed.	Program Solos for Alto Saxophone	Presser, (II-IV)
Teal, ed.	Solos for the Alto Saxophone	Schirmer, (III-V)
Voxman, ed.	Concert and Contest Collection	Rubank, (III-IV)
Wurmser	Petite Pièces de Style	Andrieu, (I-III)
Various	Soloist Folio for Alto Saxophone	Rubank, (II-III)

TENOR SAXOPHONE SOLOS WITH PIANO ACCOMPANIMENT

Easy

Bach	Arioso	Fischer
Bach-Londeix	Scherzetto	Leduc
Cirri-Maganini	Arioso	Musicus
Clerrisse	A l'Ombre du Clocher	Leduc
Godard	Berceuse	Fischer
Grétry-Londeix	Panurge, Ariette	Leduc
Lully-Londeix	Ballets du Roi	Leduc
Mozart-Londeix	Divertissement en Ré, Menuet	Leduc
Schubert-Londeix	Impromptu	Leduc
Schubert-Londeix	Suite de Valses	Leduc
Wagner-Roberts	Song to the Evening Star	Fischer

Medium-Easy

Ameller	La Plata	Philippo
Berlioz	Three Songs from "The Damnation of Faust"	Musicus
Corelli	Air and Dance	Musicus
Couperin-Mule	Berceuse	Leduc
Debussy-Maganini	Air de Lia	Musicus
Debussy-Forst	Mandoline	Musicus
Eyemann	Pastoral Portrait	Belwin

Frangkiser	Theme from "Alaskan Night"	Belwin
German-Voxman	Pastorale and Bourrée	Rubank
Gluck-Mule	Gavotte	Leduc
Gluck	Two Classic Airs	Musicus
Houlik	Two Lyric Pieces	Southern
Lully-Felix	Dances for the King	Musicus
MacDowell	To a Wild Rose	Fischer
Mozart-Mule	Ballet des Petits Riens	Leduc
Philidor-Mule	Chant d'Eglise	Leduc
Pierné-Gee	Piece in G minor	Southern
Rameau-Mule	Tambourin	Leduc
Saint-Saëns	Two Pavanes	Musicus
Schumann-Merriman	Andantino, Op. 94	Southern
Schwartz	International Folk Suite	Southern
Tartini-Reff	Larghetto	Elkan
Veracini-Felix	Two Classic Dances	Musicus

Medium

Andrieu	First Solo de Concours	Alfred
Bach-Mule	Suite in C, Bourrée	Leduc
Ben-Haim	Three Songs Without Words	MCA
Bennett	Concerto in G minor	Fischer
Blemant	Sous les Sapins	Leduc
Boccherini-Mule	Adagio	Leduc
Chopin-Mule	Prelude No. 15	Leduc
Combelle	1st Concert Solo	Alfred
Couperin-Mule	Berceuse and Rondo	Leduc
Handel-Londeix	Sonata No. 1	Leduc
Jeanjean	Capriccioso	Alfred
Koepke	Intermezzo	Rubank
Lully-Mule	Phaeton, Passacaille et Passepied	Leduc
Maury	5th Contest Solo	Alfred
Monroe	Rhapsodie	Belwin
Mozart-Mule	Adagio, from Clarinet Concerto	Leduc
Prokofieff	Kije's Wedding	Marks
Rameau-Mule	Tambourin	Leduc

Medium-Difficult

Bach	2nd Sonata (viola da gamba)	International
Beethoven-Bellison	Variations on a Theme of Mozart	Fischer
Brancour	Suite for Tenor Saxophone	Evette-Schaeffer
Clerisse	Prelude and Divertissement	Musicus
Fiocco-Balbo	Allegro, from First Suite for Clavecin	Fischer
Gailliard-Rascher	Sonata	Peters
Handel-Londeix	Sonate en Sol Mineur	Leduc
Lacome	Rigaudon	Southern
Singelee	Concerto No. 1	Alfred
Singelee-Voxman	Solo de Concert	Rubank
Strimer	Serenade	Leduc

Difficult

Anderson	Sonata	Southern
DiPasquale	Sonata	Southern
Hartley	Poem	Presser
Karlins	Music for Tenor Saxophone	Southern
Maury	Fifth Contest Solo	Alfred
Monti	Czardas	Fischer
Paul	Estilian Caprice	Rubank
Pierné	Piece in G minor	Southern
Reilly	2 Pieces	Southern
Stein	Sonata	Southern
Tuthill	Sonata, Op. 56	Southern
Tuthill	Concerto	Southern

COLLECTIONS — TENOR SAXOPHONE SOLOS WITH PIANO

Easy

Arnold, ed.	Elementary Tenor **Saxophone** Solos	Southern
Kinyon	Breeze-Easy Recital **Pieces**	Witmark

Easy-Medium

Dahm, ed.	Concert Album of **French Classics**	Musicus

Medium-Difficult

Dailey, ed.	Concert Pieces for Tenor Saxophone	Wahr
Teal, ed.	Solos for the Tenor Saxophone Player	Schirmer

BARITONE SAXOPHONE SOLOS WITH PIANO ACCOMPANIMENT

Easy to Medium-Easy

Bernard	Panda Dance	Belwin
Brahms-Rascher	Theme from 1st Symphony	Belwin
Buchtel	Golden Glow Waltz	Mills
Corelli-Coggins	Gavotte	Belwin
Massenet	Elégie	Belwin
Rocereto	Meditation	Volkwein
Schultz-Rascher	Little March	Belwin
Schumann-Rascher	The Happy Farmer	Belwin
Weber	Deep River	Belwin
Weber	Elephant Dance	Belwin

Medium

Bach-Johnson	Andante	Belwin
Clerisse	Chanson à Bercer	Leduc
Clerisse	Rêverie	Leduc
Clerisse	Sérénade Variée	Leduc
Fontaine	Interlude Melodie	ProArt
Franck-Leonard	Panis Angelicus	Belwin
Frankiser	Canzona	Belwin
Grieg-Rascher	Waltzer	Belwin
Handel-Rascher	Hornpipe	Belwin
Khachaturian	Sabre Dance	Leeds
Klughart	Romanze	Spratt
Petrie	Asleep in the Deep	Rubank
Singelee	Concerto No. 2	Alfred
Telemann-Coggins	Vivace	Belwin
Tchaikovsky	Impromptu	Spratt
Walters	Forty Fathoms	Rubank

Medium-Difficult to Difficult

Andrieu	Premier Solo de Concours	Alfred
Combelle	First Solo de Concours	Alfred
Hoffman	Sérénade Basque	Belwin
Long	Undercurrent	Rubank
Maury	Fifth Contest Solo	Alfred

Note: Many of the alto saxophone solos are well suited to the baritone, and that literature is worth investigating.

SAXOPHONE DUETS

Easy

Berbiguier	Six Easy Duets	Musicus
Mueller	Easy Duets for Treble Clef Instruments	University Music Press
Voxman	Selected Duets, Vol. I	Rubank

Medium

Aubert	Suite	Leduc
Bach-Smim	Canon No. 4 (Alto and Tenor)	Musicus
Bach-Teal	15 Two Part Inventions (2A, 2T or A & T)	Presser
Cragun	Eight Concert Duets	Rubank
Sellner	Douze Duos (4 vols.)	Billaudot
Voxman, ed.	Selected Duets for Saxophone, Vol. II	Rubank

Difficult

Ferling	Three Duos Concertant	Southern
Gatti-Iasilli	Thirty Progressive Duets	Fischer
Gurewich, ed.	Seventeen Classic Duets	Fischer
Kuhlau-Teal	Three Concert Duets, Op. 10 (2A, 2T, or A & T)	Presser
Lazarus-Traxler	Grand Artistic Duets	Belwin
Leclair-Londeix	Sonata in C	Leduc
Leclair-Londeix	Sonata in D	Leduc
Leclair-Londeix	Sonata in A flat	Leduc
Luft	Twenty-four Etudes in Duet Form	Fischer
Massias	Dialogues	Billaudot
Ruggiero	Trois Pièces	Leduc
Traxler	Grand Artistic Duets	Belwin

SAXOPHONE QUARTETS (2 Altos, Tenor, Baritone)

Easy

Dedrick	Waltz for Four	Kendor
Grieg-Taylor	Elégie	Mills
Handel-Williams	Sarabanda	Southern
Hudakoff	24 Saxophone Quartets (coll.)	ProArt
Maganini	Beginners Luck (coll.)	Musicus
Ostling	Quar-Tête-à-Tête	Belwin

Medium-Easy

Cailliet	Quartet Album for Saxophones	Belwin
Dvořák-Thompson	Largo, plus Deep River	Alfred
Holmes	Saxophone Symphony (coll.)	Rubank
Massenet	Angelus	Alfred
Mozart	Minuet	Alfred
Schubert-Ostling	Theme from Symphony No. V	Belwin
Thompson, arr.	Swing Low, Sweet Chariot	Alfred
Voxman, arr.	Quartet Repertoire	Rubank

Medium

Chaminade	The Flatterer	Alfred
Cowell	Sailors Hornpipe	Peer International
Handel-Hervig	Adagio and Allegro	Rubank
Haydn-Hervig	Finale, from Quartet, Op. 9	Rubank
Järnefelt-Thompson	Praeludium	Alfred
Lecuona-Klickman	Andalucia	Marks
Miller	Quartet No. 2	ProArt
Schumann-Rascher	Quartettino	Southern

Medium-Difficult

German-Thompson	Torch Dance	Alfred
Johnson	Impromptu	Belwin
Mielenz	Scherzo	Rubank
Ramsoe	Quartet No. 5	Rubank
Rex	Shenandoah	Mills
Teal, arr.	10 Saxophone Quartets (med. diff.-diff.)	Schirmer
Walker	Four Fancies	Belwin

Difficult

Bennett	Saxophone Symphonette	Fischer
Mozart-Thompson	Marriage of Figaro, Overture	Alfred
Schmutz	Introduction, Recitative, and Choral	Associated
Weber-Thompson	Oberon, Overture	Alfred
Weber-Thompson	Overture to Der Freischütz	Alfred

SAXOPHONE QUARTETS (Soprano, Alto, Tenor, Baritone)

Easy

Bach-Evertise	Chorale, from **Cantata 147**	Elkan
Bach-Rosenthal	**Fuga IV**	WIM
Decruck	Pavane	Edition de Paris
Dyck	5 Quartets "Le **Blanc" (Bach**, Beethoven, Handel, Mozart, Schumann)	Billaudot
Handel-Lemarc	Menuet	Elkan

Medium-Easy

Bach-Cunningham	Rondo	Etoile
Berthomieu-Letellier	Rondo	Lemoine
Haydn-Hautvast	Meister-Perlin	Elkan
MacDowell-Patrick	Two Woodland Sketches	Presser
Pierné-Mule	Chanson d'Autrefois	Leduc
Pierné-Mule	Chanson de la Grand Maman	Leduc

Medium

Albeniz-Cailliet	Trois Pièces	Leduc
Bach-Cunningham	Mazurka	Etoile
Debussy-Mule	Le Petit Nègre	Leduc
Frackenpohl	Ragtime Suite	Shawnee
Gibbons-Hemke	Fantasia	Southern
Zajac	Five Miniatures	Etoile

Medium-Difficult

Clerisse	Introduction and Scherzo	Leduc
Dubois	Petit Quatuor	Leduc
Jeanjean	Quartet for Saxophones	Ricordi
Kaderavek	Introduction and Allegro	Presser
Mazellier	10 Fugues	Elkan-Vogel
Pierné	Trois Conversations	Costellat
Stein	Suite	Southern

Difficult

Bozza	Andante and Scherzo	Leduc
Bozza	Nuages	Leduc
Debussy-Teal	Two Movements from String Quartet, Op. 10	Etoile
Dubois	Quatuor	Leduc
Ficher, Jacobo	Quartet, Op. 89	Southern
Glazounov	Saxophon Quartett, Op. 109	Boosey & Hawkes
Marshall	Goldrush Suite	Shawnee
Pierné	Introduction et Variations sur une Ronde Populaire	Leduc
Schmitt	Quatuor pour Saxophones, Op. 102	Durand
Simonis	Boutades	Billaudot
Shrude	Quartet	Southern

SAXOPHONE WITH OTHER INSTRUMENTS

Amram	Trio for Tenor Saxophone, Horn, and Bassoon	Peters
Benson	Dream Net (a. **sax** and string quartet)	Belwin-Mills
Bentzon	Racconto (**fl, a. sax, bssn,** str. bass)	Baron
Chatman	O Lo Velo (a. **sax, percussion**)	Etoile

Dubois	Duet for Alto Sax and Percussion	Leduc
Dubois	Les Tréteaux (fl, a. sax, piano)	Peters
Dubois	Sinfonia da Camera (a. sax and ww., quintet)	Leduc
Hartley	Double Concerto for Alto Saxophone, Tuba and Wind Octet (piano reduction)	Crescendo
Hartley	Chamber Music for Alto Saxophone and Woodwind Quintet	Crescendo
Hindemith	Trio, Op. 47 (viola, tenor saxophone, piano)	Schott
Hovhaness	The Flowering Peach (a. sax & clar, harp or piano, 2 percussion)	Associated
Iannaccone	Biciana (flute and a. sax)	Fischer
Karlins	Quintet (a. sax & string quartet)	Southern
Koechlin	Epitaphe de Jean Harlow (fl, a. sax, piano)	Eschig
Myers	Fantasy Duos (a. sax, percussion)	Atlantic
Raphael	Divertimento, Op. 74 (a. sax and cello)	Boosey-Hawkes
Rivier	Concerto (a. sax, trumpet, and str. orch (piano red.)	Billaudot
Stein	Quintet for Alto Saxophone & String Quartet	American Composers Alliance
Stein	Sextet for Alto Saxophone and Woodwind Quintet	Am. Comp. Alliance
Stein	Trio for Violin, Alto Saxophone, and Piano	Am. Comp. Alliance
Tomasi	Printemps (a. sax and ww. quintet)	Leduc
Vellones	Rapsodie pour Saxophone Alto, Op. 92 (alto sax, harp, celeste, percussion)	McGinnis & Marx
Webern	Quartet, Op. 22 (violin, clar., tenor sax, piano)	Universal

SUGGESTED READING MATERIAL

Baines, Anthony. *Woodwind Instruments and Their History.* W.W. Norton & Co., 1957

Bartholomew, Wilmer T. *Acoustics of Music*. Prentice-Hall, 1946

Benade, Arthur. *Horns, Strings, and Harmony.* Doubleday & Company, 1960

Bonade, Daniel. *The Art of Adjusting Reeds.* Leblanc Educational Pub.

Culver, Charles. *Musical Acoustics.* McGraw-Hill Book Co., 1956

Lloyd, L. S. *The Musical Ear*. Oxford University Press, 1951

Miller, D.C. *The Science of Musical Sounds*. Macmillan, 1916

Opperman, Kalmen. *Handbook for Making and Adjusting Single Reeds.* Chappell & Co., 1956

Perrin, Marcel. *Le Saxophone, Son Histoire, Sa Technique et Son Utilization dans l'Orchestre, (in French)*. Editions Fischbacher, 1955

Seashore, Carl. *In Search of Beauty in Music.* Ronald Press, 1947

Stauffer, Donald. *Intonation Deficiencies of Wind Instruments in Ensemble*. Catholic University of America Press

Thornton, J. *Woodwind Handbook.* University of New Mexico Press, 1960

Young, T. Campbell. *The Making of Musical Instruments.* Oxford University Press, 1939

IMPORTERS OF SAXOPHONE MUSIC

M. Baron Co., Box 149, Oyster Bay, New York 11771

Dorn—Saxophone Service, P.O. Box 704, Islington, Mass. 02090

Henri Elkan, Music Publisher, 1316 Walnut Street, Philadelphia, Pa. 19107

Southern Music Co., 1100 Broadway, San Antonio, Texas 78206

University Music Press, P.O. Box 1267, Ann Arbor, Mich. 48106

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