

The Tuba

Historical Sketch

Tubas and their relatives were the latest instruments in the brass family to develop. Early technologies did not allow for a practical lower voice in the brass family, although there were several instruments that attempted to fill this role. Bass and (rarely) contrabass sackbuts/trombones existed, but the contrabass especially was quite rare and unwieldy, and the bass had neither the range nor the timbre to provide a solid foundation for the brass section in the way that the tuba later would.

The serpent, a low-pitched, relative of the cornett normally with six finger holes and/or keys, had been in use since the late sixteenth century. Although made of wood, this instrument had a cup-shaped mouthpiece, and thus the tone was produced using the same buzzing technique as on brass instruments. The serpent was quite effective in doubling voices in church services, but could not produce a substantial volume level. During the late eighteenth century metal serpents were made, with keys in addition to or replacing finger holes. Other models were made in the shape, more or less, of bassoons. These were somewhat louder than previous serpents and found some limited use in military bands, but the serpent was never truly adequate to provide a bass voice for the increasingly larger and louder brass sections of bands and orchestras.



Serpent

During the late 1810s another keyed brass instrument, the ophicleide, was invented. Made of brass, this instrument very loosely resembles a metal bassoon, with a key system similar to that of the later saxophone. Most had anywhere from 9 to 12 keys. It was the preferred bass brass instrument of Hector Berlioz (1803-1869) for a time, and was used by Felix Mendelssohn (1809-1847), Richard Wagner (1813-1883), and others. As a keyed instrument, however, it lacked the capacity for projection enjoyed by the tuba, which these composers and their contemporaries quickly adopted after its invention.



Ophicleide

The valve, invented by Heinrich Stölzel (1777-1844) and Friedrich Blühmel (1777-1845) in the mid-1810s, made the development of the tuba possible. Keyed instruments never produced sufficient volume to balance the band and orchestra, and making a functional bass brass instrument before the invention of the valve would have been difficult, if not impossible.

Prussian bandmaster Wilhelm Wieprecht (1802-1872) and instrument maker J.G. Moritz (1777-1840) are generally credited with the invention of the first bass tuba (in F), which was patented in 1835. It was fitted with five *Berliner Pumpen*, a type of piston valve of Wieprecht's invention. These valves were an improvement over earlier pistons, but were soon supplanted by piston valves designed by Etienne Périnet in 1838; this is the predominant piston valve design still in use today. Blühmel created the first rotary valve in the 1820's, and makers in Prague and Vienna quickly refined the design. Soon tubas (and all the other brasses) were available with piston or rotary valves, as is the case today.

A standard shape and valve arrangement for tubas did not develop initially, but eventually a design resembling that of the saxhorn family (named for its inventor, Adolphe Sax [1814-1894]) with three, four, five, or six

valves became most common. Marching versions of the instrument such as the helicon and later sousaphone developed toward the end of the nineteenth century.

The invention of the tuba filled a definite void in band and orchestral instrumentation, and it should be no surprise that one or more of these instruments quickly became a standard part of these ensembles. Tubas and sousaphones played a vital role in early jazz, as well, since early recording technologies did not record string basses as easily as the louder and more direct sound of the tuba. As recording technology developed, the bass role in jazz ensembles was increasingly given to the string bass.

Today's tubas have anywhere from three to six valves, and use piston or rotary valves (or a combination of the two). The function of the first four valves has become standardized, but fifth and six valves, when employed, have different functions depending upon the particular instrument used. As a rule, tubas are available in the keys of BBb and CC (contrabass), and Eb and F (bass). The instrument used depends on the player's preference and the ensemble—bass tubas usually for small ensembles and most solo work, and contrabass tubas for large ensembles.

Tuba solos, except for novelty pieces such as Andrea Catozzi's *Beelzebub*, were rare for most of the twentieth century, but the composition of the one-movement *Concerto* and *Concert Allegro* by Alexei Lebedev (1924-1993) in 1947 and 1949, respectively, the *Concerto for Bass Tuba and Orchestra* by Ralph Vaughan Williams (1872-1958) in 1954, the *Sonata for Tuba and Piano* by Paul Hindemith (1895-1963) in 1955, and other works sparked a new (and continuing) interest in the tuba as a solo instrument.

Chamber ensembles of tuba and euphonium players are also now quite common, especially on American college and university campuses. These ensembles present challenging music to players whose parts in large ensembles tend to be rather boring, thus further developing their musicianship and at the same time increasing the visibility of the tuba family through performing opportunities of all types.

Instruments

Contrabass tuba in BBb or CC. These largest tubas are the standard bass instruments in bands and orchestras, with BBb instruments being most common in school bands. CC tubas are generally preferred by American professional tubists.

Bass tuba in Eb or F. Bass tubas are preferred for small chamber ensembles and for solo playing. F tubas are more common in America, though the Eb is perhaps a more versatile instrument.

Cimbasso, usually in F, though sometimes in Eb, CC, or BBb. This instrument is essentially a contrabass valve trombone. The "slide" section extends downward and rests on the floor, however, and the large mouthpiece combined with the valve system perhaps makes it best suited to being played by a tubist. The term cimbasso has long been misunderstood—it was applied to a number of instruments during the nineteenth century, but gradually came to refer to the contrabass trombone preferred by Verdi and his contemporaries in Italian opera instead of the tuba. The modern version of this instrument is an attempt to, in sound if not in physical appearance, obtain an authentic bass voice for the brass section in these works.

Marching instruments. While some concert tubas are fitted with rings for attaching harnesses to enable marching and playing, the need for an alternative instrument for marching purposes has been recognized almost from the beginning of the tuba's existence. The first *helicons*, tubas



F Tuba (left) and CC Tuba (right)



Cimbasso

designed to wrap around the player's body, were developed in the mid- to late nineteenth century. The *sousaphone*, developed around the turn of the twentieth century, was a larger and more refined version of the earlier helicon. The earliest sousaphones were bell up, but later models were made bell front (the bell up is still an option on some models, and Sousa always preferred this type, which was affectionately known as the "raincatcher"). These instruments are usually in BBb, using the same fingerings as the BBb concert tubas. Eb sousaphones also existed but were discontinued for a long time before being reintroduced by the British/Chinese firm Wessex Tubas in recent years. In drum and bugle corps a *contrabass bugle*—in its modern version essentially a BBb concert tuba with the leadpipe placed to allow for playing with the instrument on the player's shoulder—is the rule. While the sound of this instrument is arguably superior to the sound of the sousaphone, younger and smaller players tend to have more difficulty marching and playing with these instruments than with sousaphones. Many band directors therefore eschew the use of "contras" in their ensembles, despite their increasing popularity among some high school groups. Dr. Everett agrees with this assessment. Very few fourteen-year-old kids will be able to march and play well with a contra. If budgets will simply not allow for the purchase of separate marching and concert instruments convertible instruments are available. These have a leadpipe which can be repositioned so that the instrument can be played either upright (like a concert tuba) or on the shoulder (like a "contra"). This is not an ideal solution (partly due to the aforementioned difficulties with "contras") but it does exist.



Convertible Tuba

Choosing Students for the Tuba

Starting with the tuba? It *is* possible to start on the tuba, though some teachers do not recommend it. As long as a small enough instrument and mouthpiece are used students can start very successfully on tuba, and you may have better luck getting good tubists by starting students on the instrument, rather than transferring second-rate trumpeters or trombonists after a few years. That said, a student that plays another instrument and becomes ill-suited to it as he or she develops—for example, a trumpeter whose lips “fill out” too much for the trumpet as he or she grows older—may become a good tuba player with sufficient practice.

Facial structure. Potential tubists usually have somewhat large lips, though not always. That said, a very large-lipped individual will probably have more success with the tuba than other brass instruments. The mouth must be wide enough that it is not entirely swallowed by the mouthpiece. Extreme overbites or underbites can be a problem on brass instruments but can in some cases even be beneficial for woodwind players. A student with a lisp may have difficulty articulating properly on any wind instrument, but more so with the brasses.

Physical stature. It's hard to tell with young students, though students who are REALLY small at age 10-12 might never “grow into” the instrument. It's a good idea to have a parent meeting before choosing instruments for many reasons, one of which is to take a look at the stature of students' parents to see if those students are likely to be able to physically manage a large and heavy instrument.

Caveats. Of course, all of the suggestions above are “general guidelines” to help in guiding students to finding appropriate instruments for them. Sometimes a child who “on paper” seems like a poor candidate for a given instrument will sound great and seem to do well with a given instrument despite “breaking the rules.” In such cases, “go with it,” though it might be worth observing a bit more closely for a bit to make sure the instrument really is a good fit. Also, though it should go without saying, any stereotypes regarding particular instruments based on gender, race, etc. are irrelevant and should be ignored.

“Trying Out” the Tuba.

- When allowing students to try instruments, have them try to create a buzz first of all. No really special embouchure formations—just buzz the lips, then do it in the mouthpiece. If a student can get at least an octave or so, he or she may be a good candidate for the tuba. If higher or lower ranges are favored, try the trumpet, horn, trombone, or euphonium, as needed. If the student can’t buzz at all, strings, percussion, or woodwinds may be better.
- After having the student buzz the mouthpiece, you can let him or her play the instrument while you manipulate the valves.
- A student that gets a reasonably good sound on the mouthpiece and/or instrument, favors its middle register when play-testing, and LIKES the tuba will probably be okay.
- Start more tubists than you think you will need, and always encourage them to “stick with it” and excel. The low brasses have a high dropout rate, unfortunately, and you will need to anticipate this and try to counteract it, if possible.

The First Day (or Two, or Three)

On the first day “with instruments” tell students they should leave their instruments in their cases (if they have cases). Before removing instruments, begin the rehearsal with some breathing exercises such as those found in *The Breathing Gym*. If possible, every rehearsal should begin with some of these exercises.

After breathing, have students get their mouthpieces only. Have them buzz “any note,” and then have the class match pitches in simple patterns (i.e. middle register whole notes).

Have students place their cases (if applicable) on the floor, and “walk them through” removing and assembling the tuba.

Show students how to lubricate the valves. (See below under “Assembly, Lubrication, Care”), and have them do so.



Correct holding position. Instrument resting with mouthpiece at mouth height without moving or stretching.

Demonstrate the correct holding position for the tuba. The left arm should be responsible for providing balance so that the right hand is mostly free to operate the valves. Most of the weight of the instrument will rest on the chair, the thighs, or a tuba stand. The fingertips on the right hand should be placed on the piston valve caps or rotary valve paddles, with the hand gently curved (as if holding an aluminum beverage can). For younger students, often the best holding position is achieved by sitting at a 45-degree angle to the front of the chair so that the bottom bow of the tuba can be placed on the corner of the chair. This should place the mouthpiece at about “mouth height” for most young students.

****If at all possible, though, an even more desirable situation would be to have the tubas**

placed on tuba stands for the first year if not the second, as well. One type of stand holds the sides and bottom of the instrument so that

the player is not responsible for holding or balancing the instrument at all; he simply has to place his lips on the instrument and play. Another type is an adjustable rest that supports



Wenger “Tuba Tamer”

the bottom of the tuba and carries its weight, while the player is responsible only for balancing the instrument. The former type of stand is probably best for young students.**

After you explain briefly to students which of the valves is the first, second, third, and fourth (if applicable), beginning on the F at the bottom of the staff, teach students a Remington pattern whole-note exercise by rote. Repeat beginning on low Bb. If time allows, try doing the same starting on the Bb on the second line of the staff. This gets the students' "playing range" well ahead of their "reading range." While not all students will be able to play this whole range of notes from day one, the attempt is still good, and places you in a situation where each "new note" introduced in students' reading is one that they have already played in a rote exercise, at least for the first few months.

If time allows, distribute warm-up sheets and have the students repeat the "rote" Remington exercise while looking at it on the sheet. Hopefully some associations between reading and playing will begin to develop.

Lastly, "walk students through" disassembly of the instrument, and placement in the case (if applicable).

Assembly, Lubrication, Care

Assembly. Assembling the tuba is simple—place the mouthpiece in the receiver and twist. Do NOT hit the mouthpiece.

Lubrication. Any standard valve oil is acceptable for piston valve instruments. Pull the piston out slightly, place a few drops of oil, and replace. Rotary valves should have thicker rotor oil placed on the spindle under the valve cap and under the stop screw, and on all moving parts. Remove the valve slides and squirt some regular valve oil down into the valves for even faster action (excess will have to be emptied). Do NOT allow students to remove rotary valves. You can do this to clean them if you so desire—instructions for the process can be found on various internet sites. If in doubt, leave this to repairmen. Tuning slides require just a small amount of tuning slide grease to keep them moving.

Care. It is a good idea to wipe out the valve casings periodically. Simply remove the pistons, bottom valve caps, and springs, and then use a rolled up paper towel (shop towels are recommended) to clean the casings. A valve casing brush may also be used as desired. After this, reassemble the valves, placing a generous amount of valve oil on each piston before reinserting it. Make sure to place the correct piston in each casing; the instrument might not play if one or more pistons are inserted in the wrong casings. In case of a mix-up manufacturers typically indicate the number of each valve on the top of the piston. Cleaning of rotary valves should be left to professional repair technicians.

Pedagogical Concepts

Instrumentation. Again, it is perfectly reasonable for beginners to start on tuba, provided that they are able to handle the size of the instrument. BBb tubas are appropriate for school band programs, although advanced players who wish to purchase instruments for themselves should be encouraged to try both BBb and CC tubas to find the instrument that is best for them. Purchase of Eb or F tubas is usually best left until college. Four-valve instruments are HIGHLY desirable because of their superior intonation, and should be employed as early as possible. Students looking to purchase a BBb or CC tuba should be encouraged to try five-valve models.

If students do wish to purchase their own instruments, they need to personally try as many tubas as possible, again showing preference for four- and five-valve instruments. Inconsistencies in tubas abound, even from the same maker, and several of the same model might need to be tried before a suitable instrument is found. Dillon Music in New Jersey, Tuba Exchange in North Carolina, and Ferguson Music in California all keep a reasonably large selection of tubas on hand, and you MIGHT be able to get them to ship them out to let you try

them (although this will incur substantial shipping cost). Joe Sellmansberger at Mid-South Music in Williston, Tennessee, is nearby and usually has a few new and used tubas in stock.

Rotary valves versus piston valves. For school instruments, buy piston-valve instruments if at all possible—they have fewer moving parts to damage, and are much easier to properly lubricate. In short, they last better in conditions of questionable care. Nevertheless, some of the better models (such as the Miraphone 186) only come with rotary valves, and in any case the instrument that gets the “low bid” will be the one you need to purchase regardless of the type of valves. For individual purchases, players shouldn’t choose an instrument based solely upon the type of valves—there are much more significant factors that go into making a good instrument!

Tuba parts are ALWAYS written in concert pitch, except in a few rare instances (such as British brass band music). This means that whether the player plays a BBb, CC, Eb, or F tuba, the part will be the same. Transposition is simply not an issue for tubists—each player is responsible for learning and mastering the fingerings for the instrument he or she is playing. If you have a player that chooses to purchase a CC tuba, for example, you will not have to find different “CC tuba” parts for him. It will be that player’s responsibility to master his new fingerings. Chances are that a student who is sufficiently motivated to purchase a CC tuba will also practice enough to learn those fingerings, preferably with the help of a private teacher.

Mouthpieces. Students that use school-owned instruments should still own their own mouthpieces, as they will be more likely to care for their own belongings, and will be able to get the best individual mouthpiece for each student.

Intonation can be especially problematic on these larger instruments, and players should be aware that the 1-3 or 1-2-3 valve combinations are VERY sharp, and need to be compensated for, either by using the fourth valve instead of these combinations, or by “lipping” the pitch in order to correct intonation.

Staying motivated. As with all instruments, individual practice is necessary, and obtaining a private teacher is highly desirable. This may be most important for low brass players, as they will need to be exposed to challenging material in order to offset the rather boring parts they most often receive in music for young bands. Retention of good players becomes a problem if students are bored into quitting band. As a teacher, do your best to choose at least some pieces that include challenging and/or enjoyable parts for tubists, in addition to encouraging private lessons and practice of solo and chamber pieces. As mentioned above, starting more tubists than you think you will need will help you to better weather the sadly inevitable attrition in the tuba section.

Mutes. Straight mutes are available for tuba, but are very expensive and rarely used. The odds of needing one of these in high school literature are slim.

Suggested Method Books for Individual Practice

Arban, Jean-Baptiste/Jacobs, Young: *Complete Method*
 Blazhevich, Vladislav/King: *70 Studies for BBb Tuba*
 Bordogni, Giulio Marco/Jacobs: *Complete Solfeggi*
 Concone, Giuseppe/Jacobs: *The Complete Solfeggi: Legato Etudes for Tuba*
 Getchell, Robert W./Hovey.: *Practical Studies for Tuba*, vols. 1 and 2
 Gower, William and Voxman, Himie: *Rubank Advanced Method for Tuba*, vols. 1 and 2
 Hovey, N. W.: *Rubank Elementary Method for Eb or BBb Bass*
 Jacobs, Wesley: *Low Register Studies*
 Tyrell, H.W.: *40 Advanced Studies for BBb Bass*
 Vining, David: *The Breathing Book*

Suggested Reading

- Ahrens, Christian. *Valved Brass: The History of an Invention*. Translated by Steven Plank. Hillsdale, New York: Pendragon Press, 2008.
- Baines, Anthony. *Brass Instruments: Their History and Development*. New York: Dover Publications, Inc., 1993.
- Bevan, Clifford. *The Tuba Family*. Second Edition. Winchester, UK: Piccolo Press, 2000.
- Bird, Gary. *Program Notes for the Solo Tuba*. Bloomington, IN: Indiana University Press, 1994.
- Farkas, Philip. *The Art of Brass Playing*. Rochester, New York: Wind Music, Inc., 1962.
- Frederiksen, Brian. *Arnold Jacobs: Song and Wind*. Gurnee, Illinois: WindSong Press Limited, 1996.
- Griffiths, John R. *Low Brass Guide*. Roswell, Georgia: E. Williams Publishing Company, 1991.
- Herbert, Trevor and John Wallace (eds.). *The Cambridge Companion to Brass Instruments*. Cambridge, U.K.: Cambridge University Press, 1997.
- Morris, R. Winston and Daniel Perantoni, eds. *Guide to the Tuba Repertoire: The New Tuba Source Book*. Bloomington, Indiana: Indiana University Press, 2007.
- Nelson, Bruce. *Also Sprach Arnold Jacobs: A Developmental Guide for Brass Wind Musicians*. Mindelheim, Germany: Polymnia Press, 2006.
- Phillips, Harvey and William Winkle. *The Art of Tuba and Euphonium*. Seacaucus, New Jersey: Summy-Birchard, Inc., 1992.
- Stork, John and Phyllis Stork. *Understanding the Mouthpiece*. Vuarmarens, Switzerland: Editions Bim, 1989.
- Vining, David. *What Every Trombonist Needs to Know About the Body*. Flagstaff, Arizona: Mountain Peak Music, 2010.
- Whitener, Scott. *A Complete Guide to Brass*. Second Edition. Belmont, California: Wadsworth/Thomson Learning, 1997.

Recommended Instruments (in Everett's Order of Preference)

Beginner (BBb, 3 valves, small 3/4 size, accessible to young players)

- Yamaha YBB-105
- Eastman EBB231
- John Packer JP078

Intermediate (BBb, 4 top-mounted piston valves—more durable due to protected placement, medium 4/4 size)

- Yamaha YBB-321
- Eastman EBB431

Advanced (BBb, 4 front-mounted valves; some piston, some rotary—accessible slides improve tuning, but valves are more vulnerable to damage, medium 4/4 size)

“Bargain”-Priced

- St. Petersburg 202, 203
- Mack Brass TU200, TU210

Moderately-Priced

- Eastman EBB534
- Jupiter JTU-1110
- John Packer JP379BB

High-Priced

- Miraphone 186, 1291, 191
- King 2341
- Meinl-Weston 25, 195
- Willson 3100

Sousaphones (BBb, brass; if budget constraints demand it seek fiberglass models from the same manufacturers)

- Yamaha YSH-411
- Eastman EPH495
- Conn 20K
- King 2350
- Jupiter JSP-1100

Convertible Tubas (BBb, single instrument with marching and concert configurations)

- Yamaha YBB-201M
- Eastman EBB231M, EBB331M
- Jupiter JTU-1030M

Recommended Mouthpieces

Bach 18, 22, 24AW*, 25*

Conn Helleberg, Helleberg 7B

Schilke Helleberg, 66, 67, 69C4*

Wick 4L*, 3L*, 2L, 1L

Perantucci PT50, PT88, PT70

*Any of these marked with an asterisk will make acceptable beginner mouthpieces. Try not to go too big—many band directors use the Conn Helleberg as a “standard” tuba mouthpiece, but while it is a good mouthpiece it is too large for many players. The Bach 18 or other similar-sized mouthpieces make better “basic” mouthpieces for high school players.

Prominent Players (not a comprehensive list, but you can start here)

- ****Arnold Jacobs****
- Alan Baer
- Pat Sheridan
- Gene Pokorny
- Øystein Baadsvik
- Carol Jantsch

- David Zerkel
- Tim Buzbee
- Velvet Brown

**Arnold Jacobs (1915-1998), former Principal Tubist of the Chicago Symphony Orchestra, is perhaps the most highly regarded brass pedagogue—for any brass instrument—of the twentieth century. His research into breathing and physiology in relation to playing revolutionized the playing and teaching of the tuba and all brass instruments, and even led woodwind players, singers, and medical doctors to seek his advice and counsel. If you only remember the name of one prominent brass player and teacher, that name should be Arnold Jacobs.

Online Resources

International Tuba-Euphonium Association. www.iteaonline.org

Tuba Forum. www.tubaforum.net

Sean Chisham's TubeNet BBS. www.chisham.com

David Werden. www.tubaeuph.com

Tuba/Euphonium Facebook Group. [/www.facebook.com/groups/tubaeuph/](https://www.facebook.com/groups/tubaeuph/)

Dr. Everett's Blog. thereformingtrombonist.wordpress.com