

Clarinet Miscellany (Aug 2025)

The Clarinet was invented at the beginning of the 1700's by the Denner family in Nuremberg. Their genius was to add a 'register' key to the existing reed instrument known as the 'Chalameau' giving the instrument a second register – thus the Clarinet's lowest register is known as the Chalameau register and it's second register is the 'Clarion' register (the third register is the altissimo). Denner's clarinet had two keys but by 1750 the standard 'Classical' era clarinet had 5 keys. The instrument maker Muller further developed the design in 1810 to create the 13 keyed Clarinet of the early 'Romantic' era.

Clarinet systems

There are three key-work mechanisms still in use.

The **Boehm/Klose system** – this is most common system, used in UK, France, USA and most of the world. It was designed by H Klose and Auguste Buffet; they abandoned the old (Muller) system and based the new design on principles established by Boehm in the mid 1800s

The **Oehler (or Öhler) system** – this is common in Germany and Austria. Oskar Öhler refined the old Muller system by modifying the tone holes to correct intonation and acoustic deficiencies. The system has more keys than the Boehm system. Major developments include the patent C#, low E-F correction, fork-F/Bb correction.

The **Albert system (Simple system)** – this was a simpler development (compared to Oehler's development) of the Muller system created by Eugene Albert - a pupil of Adolphe Sax (who contributed some of the design). It was popular in early Jazz, and may still be found in Klezmer music, Turkish music, and Eastern European Folk music. Most instruments are high pitch but later ones were produced at A440. They were considered better than the early Boehm/Klose instruments.

The Boehm/Klose system

The vast majority of Boehm/Klose system clarinets have a standard mechanism that does not have all the keys originally intended for the system. The 'full' Boehm system clarinet requires some additional mechanism (as listed below). A few professional instruments have some or all of the additional mechanism.

- **Alternate G#/d# key** for the left hand fourth finger, allowing more efficient fingering of certain passages. This key is a common addition on professional Clarinets.
- **Articulated C#/G# key**; permitting a B/C# (and F#/G#) trill to be made in nearly perfect pitch with a much simpler fingering pattern.
- **Low Eb** (sounding Db) to extend range downwards as required by some composers. With a full Boehm Clarinet the matching 'A' Clarinet becomes theoretically obsolete (although some passages of music would be easier to play on the 'A' clarinet and the 'A' clarinet does have a different quality of sound). This key is more or less standard on all modern large clarinets but not the soprano.

Further development of the Boehm system

Numerous other attempts have been made to create new Clarinet key systems based on the Boehm system. None has achieved substantial acceptance, though some are still in use.

The **Mazzeo system** was invented by Rosario Mazzeo in 1961. Its main feature is a linkage operated by any one of the right-hand ring-key fingers (via the bridge to the 2nd ring key on the top joint) which opens the 2nd trill key cup to sound 'throat' B flat, instead of using the register key, thereby avoiding the tonal compromise that comes from using the small register key hole for sounding 'throat' B flat. Selmer (USA) manufactured 1300 models. Although the Mazzeo mechanism does achieve its aim it introduces extra mechanism that is likely to be unreliable, furthermore if a player wants to play a sustained 'throat' Bb without a tonal compromise they usually use the 2nd trill key (although this depends on the vent height of the 2nd trill).

Technician's notes: On the Selmer Bundy student models the Mazzeo system has a Thumb-plate (instead of a Thumb-ring) an additional 'rocker' key, a 2nd trill lever (instead of a 2nd trill key) and the 'Mazzeo' key which is fitted with a pad and lightly sprung shut. The register key is set with lower venting than usual.

When the thumb-plate is closed the 1st ring key shuts as usual and the rocker key also moves to keep the Mazzeo key shut. When the thumb-plate is left open the 1st ring key operates independently as usual, the rocker key is inoperative, and the 2nd trill lever can lift open the Mazzeo key to sound the trill when required.

The Mazzeo key has an articulation arm that corresponds with an articulation screw fitted to the 2nd ring key. When the thumb-plate is open (so the rocker key is inoperative) the closing of the 2nd ring key forces the Mazzeo key to open to sound Bb. When the thumb-plate is closed (so the rocker key holds the Mazzeo key shut) the closing of the 2nd ring key cannot force the Mazzeo key open - **however** the 2nd ring can still close because the articulation screw on the 2nd ring key is spring-loaded!

To avoid the feel of 'double action' this spring-loaded articulation 'screw' is in constant contact with the Mazzeo key articulation plate – when the 2nd ring key is open the 'stub' of screw is in contact with the plate (so long as the vent height of 2nd ring key is set correctly by the vent height of the ring keys on the bottom joint) and when the 2nd ring key is depressed it is also in contact with the plate.

The whole mechanism can be disabled if it proves unreliable and the register key can be used to sound Bb in the conventional manner.

The **McIntyre system** was patented in 1959 by Robert and Thomas McIntyre. They developed a new mechanism for control of the throat notes (A flat, A, and B flat) using only the left hand rings, allowing these notes to be played without the need to move the position of the left hand. There are only three trill keys, rather than the standard Boehm system's four, for the right first finger. Otherwise the fingerings are the same as in the standard Boehm system. The McIntyres produced and sold clarinets using their system, but no major manufacturer took up the design.

The **NX system** was developed by acoustician and Clarinetist Arthur Benade from the 1970s until his death in 1987. The NX clarinet has a distinct bore shape. In addition, differences from the standard Boehm system include: separate holes for the register key and for throat B flat, operated by a single left thumb key via an automatic mechanism; elimination of some redundant tone holes, with some resulting changes in fingering; and modifications of tone hole spacings, tone hole depths, and key pad heights to minimize turbulence in the bore. Canadian Clarinet maker Stephen Fox has done further research along Benade's lines, and now offers custom built NX system clarinets for sale.

The **Wurlitzer Reform-Boehm system** was developed around the middle of the 20th century by Fritz Wurlitzer, and Reform-Boehm Clarinets are currently made by Herbert Wurlitzer Kunstwerkstatt für Holzblasinstrumente GmbH. The system combines the bore characteristics of Oehler system clarinets with Boehm fingerings. Differences between this system and standard Boehm in actual use include different altissimo fingerings, a smaller hand position, and greater bore resistance requiring more air to play.

The **Quarter-tone Clarinet** was invented by the German maker Fritz Schüller (1883-1977) and uses two bores to create quarter tones that are otherwise difficult on conventional Clarinets.

Sizes of Clarinet

Since the invention of the instrument there have been many sizes of clarinets. Some existed for only a short while and never caught on with composers or players; some were very popular but have since died out; some exist today but only as reproductions of historical instruments; some have remained in use being constantly improved; and some are new – particularly the larger instruments.

Sopranino Clarinets (small Clarinets): small Clarinets are called Sopranino Clarinets, although due to the considerable lower range of the Clarinet (even with no extension keys) they are closer to the soprano voice range. They are sometimes also known as Octave or Piccolo Clarinets.

The three commonly manufactured Sopranino Clarinets (in descending order) are Ab, G, Eb, D.

- Ab - 6 fingers sounds Eb; lowest note referred to as E sounding middle C(4). Used by military bands and clarinet choirs. It has a theoretical G companion in La Traviata. Lowest note matches concert flute.
- G - 6 fingers sounds D; lowest note referred to as E sounding B3 (below middle C). Sister to Ab instrument to form pair; scored for in La Traviata but now used in a form of Austrian folk music called Schrammelmusik
- F - 6 fingers sounds C; lowest note referred to as E sounding A3 (below middle C). Obsolete
- E - 6 fingers sounds B; lowest note referred to as E sounding Ab3 (below middle C). Obsolete (sister to F instrument to form pair)
- Eb** - 6 Fingers Sounds Bb; Lowest note referred to as E sounding G3 (below middle C) Common in English military bands; scored for by Berlioz and Mahler. **Most common Sopranino Clarinet** (although sometimes referred to as the Eb Soprano Clarinet).
- D - 6 fingers sounds A; Lowest note referred to as E sounding F#3 (below middle C). Sister to Eb instrument to form pair; used by German composers pre-Mahler - particularly Wagner and Strauss; has sweeter sound than Eb. Sometimes referred to as the D soprano clarinet.

Soprano Clarinets (normal size and bore): The defining aspect of the soprano Clarinet is the diameter of the bore; taking the Bb soprano instrument bore as the standard then all the other soprano clarinets have the same bore but are longer (or shorter in the case of the C soprano)

- C - 6 fingers sounds G; lowest note referred to as E sounding E3 (below middle C). Common in classical era and opera.
- Bb** - 6 fingers sounds F; lowest note referred to as E sounding D3 (below middle C). **The most common member of the family**; also available with covered holes (plateaux) for smaller fingers.
- A - 6 fingers sounds E; lowest note referred to as E sounding C#3 (below middle C). Sister to Bb instrument to form pair.
- G - 6 fingers sounds D; lowest note referred to as E sounding B2 (9th below middle C). Popular in Turkish Folk music.

The C, Bb, and A soprano Clarinets have also been manufactured with curved metal barrels and upward tuned metal bells and marketed as **Saxonettes** (also called **Claribels** or **Clariphones**). They usually have the simple system (Albert system) key mechanism but they were also manufactured with the Boehm system. They look similar to Saxophones and the mouthpiece enters the mouth at an angle similar to a Saxophone mouthpiece and so perhaps these instruments were intended to complement Saxophones in military bands.

Long Soprano Clarinets – Clarinettes d’amour: Also known as Clarinets d’amore, this was a group of instruments existing in the C18 that matched the other d’amore woodwinds. They were pitched a minor 3rd down from their soprano counterparts (they are sometimes referred to as mezzo-soprano instruments) and had a more tender sound, this was achieved by having a narrower bore than the soprano instrument and a pear shaped bell. The G pitched instrument was the most common. It is believed these instruments were the precursor of the Basset horn. There is no modern equivalent

- A -6 fingers sounds E; lowest note referred to as E sounding C#3 (below middle C).
- G -6 fingers sounds D; lowest note referred to as E sounding B2 (9th below middle C).
- F -6 fingers sounds C; lowest note referred to as E sounding A2 (below middle C).

Long Soprano Clarinets with extended key-work – Basset Clarinets: Basset Clarinets are soprano Clarinets, with the same soprano bore diameter, and maintaining the shape of the instrument, but with 4 extension keys. These instruments were developed in the eighteenth century but are still made; the instrument in A is the most common form.

- C -6 fingers sounds G; lowest note via 4 additional extension keys referred to as C sounding C3 (Octave below middle C).
- Bb -6 fingers sounds F; lowest note via 4 additional extension keys referred to as C sounding Bb2 (9th below middle C).
- A** -6 fingers sounds E; lowest note via 4 additional extension keys referred to as C sounding A2 (10th below middle C). **The most common pitch of Basset Clarinet**

Basset Horns: All the larger Clarinets from Basset Horn downwards have a larger bore than the Soprano Clarinet. Essentially Basset horns derive from a C18 development of the soprano Clarinet and are commonly in F (whereas Alto clarinets are part of the Boehm/Klose development of the family and are commonly in Eb).

The Basset horn was an Eighteenth Century instrument favoured by Mozart and later Strauss and thus is still in use. Originally the instrument had a soprano bore but was in F, the barrel was bent and the body was also bent or curved. The instrument has 4 extension keys: German instruments operate these extra keys with the RH thumb; French instruments have 2 keys for the thumb and 2 for the little finger. Basset Horns were originally made in a number of pitches.

- A -6 fingers sounds E; Lowest note via 4 additional extension keys referred to as C sounding A2 (10th below middle C). This would have the same pitch and range as the Basset clarinet in A but the typical 'crooked' Basset horn design.
- G -6 fingers sounds D; Lowest note via 4 additional extension keys referred to as Bb sounding G2 (11th below middle C). This would have the same pitch as the G soprano but an extended lower range because of the 4 extension keys.
- F** -6 fingers sounds C; lowest note via 4 additional extension keys referred to as C sounding F2 (12th below middle C). **This is the instrument commonly manufactured today.**
- E -6 fingers sounds B; lowest note via 4 additional extension keys referred to as C sounding E2 (13th below middle C).
- Eb -6 fingers sounds Bb; lowest note via 4 additional extension keys referred to as C sounding Eb2 (14th below middle C).
- D -6 fingers sounds A; lowest note via 4 additional extension keys referred to as C sounding D2 (15th below middle C).

Modern basset horns all have bores larger than a soprano and are effectively alto Clarinets in F (though with a different design for the barrel, bell, and lower keys); they can be divided into three basic types, distinguished primarily by bore size and consequently the mouthpieces with which they are played:

- The small bore basset horn has a bore diameter in the range of 15.5 to 16.0 mm (a little larger than a soprano clarinet bore). It is played with a Bb soprano mouthpiece. Selmer (Paris) and Stephen Fox (Canada) currently make this model.
- The medium bore basset horn has a bore diameter in the region of 17.0 mm. This is the most common type made by German-system manufacturers and requires a matching German basset horn mouthpiece. Stephen Fox (Canada) currently makes this model also. The current Buffet basset horn has a bore diameter around 17.2 mm and uses an alto clarinet mouthpiece.
- The large bore basset horn has a bore diameter of about 18.0 mm and is played with an alto clarinet mouthpiece. The Leblanc basset horns (bores c. 18.0 to 18.2 mm) are of this type.

Alto, Bass, and larger Clarinets: The Clarinet family was extended with larger instruments using the pitches of Bb and Eb in the following pattern: Bb soprano; Eb Alto; Bb Bass; Eb Contra-alto; etc. The instruments are commonly available with standard key-work (to E) or with one extension key (to Eb) or 4 extension keys (to C). The instruments usually have a metal crook and a metal upturned bell. Octave mechanisms vary.

Alto

F -6 Fingers Sounds C; Lowest note referred to as E sounding A2 (10th below mid C); 1 ext key referred to as Eb sounding Ab; 4 ext keys referred to as C sounding F2 (12th below middle C). This would have the same pitch and range as the Basset Horn in F but not the typical 'crooked' Basset horn design. Now Obsolete.

Alto

E -6 Fingers Sounds B; Lowest note referred to as E sounding G#2 (11th below mid C); 1 ext key referred to as Eb sounding G; 4 ext keys referred to as C sounding E2 (13th below middle C). This would have the same pitch and range as the Basset Horn in E but not the typical 'crooked' Basset horn design. Now Obsolete.

Alto

Eb -6 Fingers Sounds Bb; Lowest note referred to as E sounding G2 (11th below mid C); 1 ext key referred to as Eb sounding Gb; 4 ext keys referred to as C sounding Eb2 (13th below middle C). Pitched Octave below Sopranino Eb; originally used by military bands but now substituted by the Sax. **Most commonly available pitch today**

Bass

C -6 Fingers Sounds G; Lowest note referred to as E sounding E2 (14th below mid C Octave below C soprano); 1 ext key referred to as Eb sounding Eb/D#; 4 ext keys referred to as C sounding C2 (two octaves below middle C).

Bass

Bb -6 Fingers Sounds F; Lowest note referred to as E sounding D2 (octave below Bb soprano); 1 ext key referred to as Eb sounding Db/C#2 (octave below A soprano); 4 ext keys referred to as C sounding Bb1 (17th below middle C). **Commonly available pitch today**

Bass

A -6 Fingers Sounds E; Lowest note referred to as E sounding Db/C#2 (nearly 2 octaves below mid C, 1 Octave below A soprano); 1 ext key referred to as Eb sounding D/C2; 4 ext keys referred to as C sounding A1 (18th below middle C). **Commonly available pitch today**

Contra-Basset Horn

F -6 fingers sounds C; lowest note via 4 additional extension keys referred to as C sounding F1 (Oct below Basset horn). This short-lived instrument developed into the contra-alto in Eb.

Contra-alto

Eb -6 Fingers Sounds Bb; Lowest note referred to as E sounding G1 (Octave below Alto); 1 ext key referred to as Eb sounding Gb1 (Octave below Alto); 4 ext keys referred to as C sounding Eb1 (Octave below Alto). Championed by Selmer.

Contra-bass

C -6 Fingers Sounds G; Lowest note referred to as E sounding E1 (two octave below C Soprano; 1 ext key referred to as Eb sounding Eb/D#1; 4 ext keys referred to as C sounding C1 (1 octave below Bass in C).

Contra-bass

Bb -6 Fingers Sounds F; Lowest note referred to as E sounding D1 (two octave below Bb Soprano; 1 ext key referred to as Eb sounding Db/C#1 (2 octaves below A soprano); 4 ext keys referred to as C sounding Bb0 (1 octave below Bass). Sometimes called a double Bass or Pedal Clarinet (in reference to Organ Pedal notes). **Most commonly available pitch.**

Contra-bass

A -6 Fingers Sounds E; Lowest note referred to as E sounding C#1 (two octave below A Soprano; 1 ext key referred to as Eb sounding D/C1; 4 ext keys referred to as C sounding A0 (1 octave below Bass in A). Although designed this instrument was not actually made.

Sub Contra-alto

Eb -6 Fingers Sounds Bb; Lowest note referred to as E sounding G0 (2 Octaves below Alto); 1 ext key referred to as Eb sounding Gb0 (2 Octaves below Alto); 4 ext keys referred to as C sounding Eb0 (2 Octaves below Alto). Also known as an 'Octo' Contra-alto; only 3 made (by Leblanc).

Sub-contrabass

Bb -6 Fingers Sounds F; Lowest note referred to as E sounding D0 (3 octaves below Bb Soprano; 1 ext key referred to as Eb sounding Db/C#0 (3 octaves below A soprano); 4 ext keys referred to as C sounding Bb-1 (2 octaves below Bass). Sometimes called an 'Octo' contra-bass, lowest sounding orchestral instrument playing Bb below the lowest Piano note.

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