

## Flute Miscellany

### Early Flutes

Early Flutes include: Renaissance Flutes (fully cylindrical bore); 1 keyed Baroque Flutes (cylindrical bored head, reverse conically bored body); and early Classical Flutes. Classical Flutes developed from the Baroque Flute - keeping the bore design but splitting the Flute into joints (so the bore could be engineered with more precision) and adding extra chromatic keys so the instrument might have up to 6 in total (the original Eb from the Baroque design plus [short] F, G#, Bb and Low C & C#). Modern copies of all of the above period Flutes are available in old and modern pitches.

### Development of the Classical Flute in C19

Classical Flutes were Simple System Flutes - these are defined as having 6 finger holes that are covered directly by the fingers. The necessity for the fingers to be able to cover the holes, and for the instrument to have reasonable intonation over a compass of three octaves, determines the shape of the bore (cylindrical head bore and reverse conical body bore); the combined influences of the size of the finger holes and the bore shape determine the tone and volume of the instrument.

The Classical Flute developed in three different directions: the Flute for marching bands; the English Concert Flute; and the continental Concert Flute.

**Marching Band Flutes:** Marching Flute bands were very popular in the European military and many examples of the Flutes used still exist. These simple system Flutes were typically six keyed instruments but with no low C or C# (the keys are Eb, short F, long F, G#, Bb, and [high] C). Marching Bands use the following system for naming the pitch of a Flute: the pitch is the lowest note produced by the instrument (which is with all 6 finger-holes covered and no keys operated). The Flutes were made in the following pitches: F (piccolo); Eb (Piccolo); Bb - also referred to as a fife (it carries the melody); F Flute; Eb Flute; Bb bass Flute; F bass Flute; and Eb bass Flute. Marching bands still exist although some have converted to Boehm system Flutes and now use: piccolo; G treble Flute (melody); C soprano (concert) Flute; Alto Flute; and Bass Flute.

**English Concert Flutes:** Concert Flutes are pitched in C. In England, by the first half of the 19<sup>th</sup> century, the 8 keyed Concert Flute had become standard; it was very similar to a marching band Flute but had a foot-joint with Low C & C# and was better made.

**Continental Concert Flutes:** On the continent the classical Flute developed with the addition of even more keys, including keys for particular trills and often a low B - as many as 13 keys in all. Essentially however it was still a Simple System Flute with its characteristic tone and Simple System fingering.

### C19 Departure from the Simple System Flute – the “Conical Boehm” Flute

During the 19<sup>th</sup> century the Concert Flute was completely re-designed. The intonation and volume of Simple System Flutes is compromised by the position and size of the finger holes and so a way of improving the size and location of the holes but at the same time still allowing the player to be able to play the instrument had to be devised. Theobald Boehm led the way and produced a ground-breaking instrument.

Boehm's **1832 system** (also known as the Conical Boehm) had the cylindrical bored head-joint and reverse conically bored body of the Classical Flute, but had slightly larger and better placed tone-holes that, by means of a sophisticated mechanism of rings and plates, the player's fingers could cover directly or indirectly.

The intonation and volume of the instrument was improved but the tone was still similar to a Simple System Flute, however, because some tone-holes had been enlarged and re-located the instrument had to be played with a fingering pattern significantly different to the Simple System fingering pattern: the G# key was sprung open and so when the three left-hand fingers were held down the instrument sounded G# and with four sounded G – this was the opposite of what players were used to; the left-hand thumb now normally held closed a key and was primarily only lifted to play C5, C6, C#5 and C#7, again this was the opposite of what players would normally do if they had a C key; the F, F#, and Bb fingerings were slightly altered; and some 3<sup>rd</sup> register and trill fingerings were different. Players were initially reluctant to adopt a new fingering pattern but with a modification invented by the player **Dorus** so that the G# key was sprung closed many players adapted to the instrument and it became relatively popular.

Boehm's innovations on his 1832 Flute and further developments in key design by among others Auguste Buffet, inspired other makers to continue on this path of development. Critically makers kept the same bore shape to retain the tone of the instrument but selectively relocated and enlarged some tone-holes using rings and/or plates to cover the holes indirectly. The fingering of these instruments tended to be similar to Simple System Flutes but not exactly the same. There were many different designs, the simplest perhaps being one of **Siccama's** early flutes, which relocated the 3<sup>rd</sup> and 6<sup>th</sup> finger-holes so they were closed indirectly by plates, but was otherwise a standard 8 keyed Concert Flute; a famous C19 Flute player **Robert Pratten** endorsed Siccama's Flute and later went on to produce his own Flutes likewise with a similar bore and near Simple System fingering. German makers took this approach to the extreme to produce the **German reform flutes** which have very complicated key mechanisms.

## The creation of the modern Boehm Flute

Boehm's second major re-design of the Flute was his **1847 system**; the fingering pattern was similar to the 1832 model but the bore of the instrument was radically changed to improve intonation and volume further although this also changed the tone of the instrument.

The new instrument had a foot-joint, body, and head-joint made of metal (although later Boehm preferred a wooden head-joint); the head-joint had a parabolic bore while the body and foot-joint had a cylindrical bore; and the left-hand fingers 2 & 3 and right-hand fingers 1,2, & 3 operated key plates with centre holes (perforated plates). The radical change in bore design also necessitated a re-design of the mechanism (but not the fingering pattern). Like the 1832 system, the 1847 system also initially had an open G#, but soon a modified 1847 system with a closed G# became the popular model (although the 1832 model was still manufactured because some players preferred the sweeter tone that was closer to the old Simple System Flutes).

Boehm's innovative bore design inspired yet two more paths of development: Flutes with a cylindrically bored body but fitted with a mechanism enabling a fingering pattern closer to the old Simple System fingering pattern such as **Richard Carte's 1851 system** and **Radcliff's 1870 system** and some of Pratten's later Flutes; and Flutes with a cylindrically bored body fitted with a mechanism enabling fingering patterns considered superior to the Boehm system such as **Rudall Carte's 1867 system** which incorporated elements of Boehm and Simple System fingering patterns.

## Further development of the Boehm Flute

Boehm himself manufactured several versions of his 1847 system and manufacturers in France, Germany, and Britain experimented with his basic design, refining, improving, and adding to his system over decades. Different manufacturers have added new mechanism and keys that did not last but two keys have become standard: firstly the **Bricaldi key** – which is an extra thumb key to play Bb (the standard location of the touch-piece for this key is above the B key touch-piece closer to the Head-joint, but sometimes it located below the B key touch-piece); and secondly the **Bb trill key** operated by the side of the right-hand first finger.

The standard model today has covered holes (holes covered by key plates with no centre holes) and a closed G# but this has compromised the intonation of some of the notes and so manufacturers offer optional further mechanism the most common being the **Split E** to enable a good 3rd register E (but at the sacrifice of the 3rd register G/A trill).

## The Complete Boehm Flute Family

- Piccolo in Db -6 fingers sounds Eb; lowest note Eb referred to as D sounding Eb5. Boehm equivalent of Eb simple system marching flute, popular in early C20 military bands, no longer made.
- Piccolo in C -6 fingers sounds D; lowest note D referred to as D sounding D5. Has also been known as the Ottavino – due to role of doubling flute & Violin parts at octave in orchestra.
- Treble flute -6 fingers sounds A; lowest (standard) note C referred to as C but sounding G(4) above middle C; Boehm version of marching band flute and now common in marching bands that have converted to Boehm system flutes.
- Soprano flute in Eb -6 fingers sounds F; lowest (standard) note C referred to as C but sounding Eb(4) above middle C; common in 1940s US bands as alternative to Eb clarinet; now used by Alto sax players wanting to use same scores as for their saxophones.
- Soprano flute in C -6 fingers sounds D; lowest (standard) note C referred to as C; sounding middle C(4) can have extension down to B or even Bb (Haynes, scored by Mahler); also referred to as *the concert flute*.
- Flute d'amore in Bb -6 fingers sounds C; lowest (standard) note C referred to as C but sounding Bb(3) below middle C; normally transposing instrument; rare historical instrument sometimes called Bb tenor flute in England (D'amore flutes are effectively the mezzo-soprano of the family).
- Flute d'amore in A -6 fingers sounds B; lowest (standard) note C referred to as C but sounding A(3) below middle C; normally transposing instrument (the traditional minor third of d'amore instruments) widely used historical instrument but also currently made commercially.
- Flute d'amore in Ab -6 fingers sounds Bb; lowest (standard) note C referred to as C but sounding Ab(3) below middle C; normally transposing instrument; rare historical instrument.
- Alto (in G) -6 fingers sounds A; lowest (standard) note C referred to as C but sounding G(3) below middle C (this is sometimes erroneously called a Bass G flute); sometimes written as transposing instrument; straight or curved head-joint. Scored for by Stravinsky and Holst, works well with microphones, several commercial manufacturers.
- Bass (in C) -6 fingers sounds D; lowest (standard) note C referred to as C; sounding an C3 (octave below middle C); several commercial manufacturers.
- Contra-alto (in G) -6 fingers sounds A; lowest (standard) note C referred to as C but sounding G3 an octave below alto flute; currently made by Kingma, and Kotato & Fukushima.
- Contra-bass (in C) -6 fingers sounds D; lowest (standard) note C referred to as C; sounding C2 two octaves below middle C; sometimes called Octobass; made by Kingma, and Kotato & Fukushima.
- Sub contra-Bass in G -6 fingers sounds A; lowest (standard) note C referred to as C; sounding G2 an octave below Contra-alto; would be best referred to as sub contra-alto flute (see Alto above)
- Sub contra-Bass in C -6 fingers sounds D; lowest (standard) note C referred to as C; sounding C1 three octaves below middle C; sometimes called double contra-bass or Octocontra-bass; made by Kingma, and Kotato & Fukushima.
- Hyperbass- (in C) -6 fingers sounds D; lowest (standard) note C referred to as C; sounding C0 four Octaves below Middle C.