

Staldophone (Eco)

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Preamble

The origin of the Tenorstaldophone lies in the tenor saxophone. In contrast to the saxophone, the Staldophone relies on playing overtones. Of course, this requires an adapted learning method. Instead of around 22 keys and pushers, the Staldophone only has ten keys (peeling the onion). With these few keys and a few special grips, all tones can be generated over several octaves in semitone steps. The remaining attachments, such as buttons and the whole mechanism, as well as the thumb rest / thumb hook are therefore reduced to a minimum. Therefore, the horn can be constructed with just a few assemblies, from the music stand holder (marching fork holder) to the horn bow. This allows the horn to vibrate more freely the entire way. This contributes significantly to the sound improvement. A Staldophone (Eco) replacement horn can be inexpensively made from a discarded saxophone. To put it bluntly, the original Staldophone Eco-Horn is a fine-sounding horn that is far more than just a “stripped down” tenor saxophone.

1. The advantages of the Staldophone at a glance

- ▶ The Staldophone has a beautiful, singing sound that is rich in overtones.
- ▶ The Staldophone is lightweight.
- ▶ The Staldophone only needs a few fingerings (around 90 for the saxophone).
- ▶ The Staldophone has a simple button and valve mechanism.
- ▶ The Staldophone can also be learned by beginners.



Constructed by the company Inderbinen Blasinstrumente AG
5033 Buchs / Aarau, Switzerland
<https://www.inderbinen.com>

The present instrument deliberately experienced some deviations from the following documentation.

2. History of the origin of the Staldophone and Copyright

Building the Staldophone in its original version requires a lot of basic research. This is associated with a lot of effort and costs.

As a result, the "Staldophone (Eco)" was developed.

The following link shows how the Staldophone was intended in its original version and its history of development:

<https://www.quantophon.com/Staldophone-Hist.pdf>

The designation "Staldophone" (German: Staldofon / Staldophon) with the underlying musical instrument is protected by copyright.

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3. Terminology

Various wind instrument explanations make no difference between buttons and valves. In this documentation buttons are assigned to the fingers and valve cover the tone holes. In this documentation, the "Staldophone Eco" will only be referred to as Staldophone in the following.

4. Focus

The Staldophone (Staldofon, Staldophon) is a modified saxophone with the following features:

- The middle piece (resonance pipe) only has five tone holes;
- In total there are only ten holes on the instrument;
- All tones can be played over several octaves with just ten keys;
- Each tone hole can be closed or opened individually across the entire instrument;
- Because each key is assigned to a tone hole flap, extraordinary sound images can be generated.

5. General overview of the Staldophone

The tone holes of the Staldophone begin with the Bb and the last tone hole is the A (no buttons are pressed, so the A sounds). The Staldophone has no G-tone hole, which is why a replacement-fingering is used here.

Only five tone holes and its mechanic, namely those for D, E, F, G sharp and A, therefore influence the resonance behaviour.

The Staldophone focuses on a sound that is as rich in overtones as possible. Therefore the G-tone is omitted. This is reflected in the fingering of the individual notes.

6. Playing the Staldophone

The following link leads to a complete list of all finger grips:

<https://www.quantophon.com/Staldophone-Fingering-chart-Tenor.pdf>

Further explanations

Every single button operates a single key (compared to the saxophone there are no valve connections). This makes it possible, in the case of poorly responding overtones, to make the desired tone sound by slightly lifting a single key.

The little finger of the left hand, however, has two buttons to operate. Since both buttons can be pressed together, the principle that all flap combinations are possible is taken into account.

Since each key can be operated individually, a multiphonic sound is possible. And with the option of having different timbres sound, an individual sound image can be created.

In order to be able to play the Bb, all valves must be closed. Expressed in a simple way, except for the C#, D# and G# buttons, all buttons must be pressed.

The keys are all arranged in ascending order, with the exception of the Dis key and those on the little finger table. The little finger table only contains the Cis and H (B) buttons. The top key belongs to A#1 (Bb1) and this is where overtone play begins.

Assignment of root tone to keys

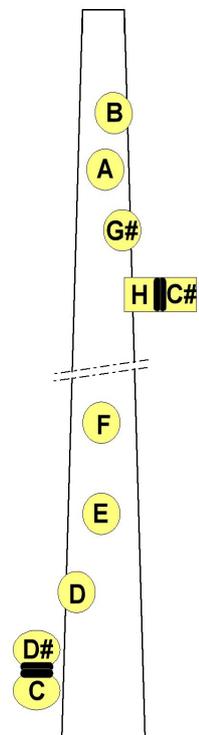
The following list shows the relationship between the (noted) tones and the keys to be pressed. These fingerings apply to the fundamental tones (1st partial), the first overtones (2nd partial) and the third overtones (4th partial). Above the fourth partial tone, the fingering becomes individual. This depends on the tone to be played (sounding as overtone), the skill level of the player, the intonation and the desired timbre.

The keys in brackets allow intonation and timbre adjustments.

The second overtone (the third partial tone) is the duodecim (for c the g₂) and has the same fingering as in the first column.

Nomenclature: German H / B = English B / B_b

Notated tone		Keys pressed	
Root	Duodezim	Left hand	Right hand
B (Ais1)	<i>F</i>	A, B	F, E, D, C
A	<i>E</i>	(B)	(C) (F)
Gis	<i>Dis</i>	A, Gis	
G	<i>D</i>	A, Gis (B)	F, E (D+C)*
Fis	<i>Cis</i>	A	(E)
F	<i>C</i>	A	F
E	<i>H</i>	A	F, E
Dis	<i>B</i>	A, H	F, E, D, Dis
D	<i>A</i>	A	F, E, D
Cis	<i>Gis</i>	A, Cis	F, E, D
C	<i>G</i>	A	F, E, D, C
H	<i>Fis</i>	A, H	F, E, D, C



* only applies to the lowest G

We are looking for a certain overtone (e.g. a₁): you “press” the D and play it as the second overtone (ie the “a₁”). This gives the same tone as if the A had been played as the first overtone (the octave) - but with a different timbre.

At the third overtone you have the root again, but two octaves higher.

If the tone you are looking for lies between two natural tones, woodwinds shorten the air column by opening holes.

You can download an overtone slide via the following link (two PDF files). The starting tone is the noted tone according to the table: "Assignment of tone to fingering".

<https://www.oberton.org/portfolio-item/obertonschieber-und-weiteres-lehrmaterial/>

7. Characteristics of the Staldophone

The origin is the tenor saxophone

Weight of the Staldophone, approx.	2.6 kg (compared to 3.3 kg for the tenor sax.)
Keys, tone holes and keys	10 (compared to about 22 on the tenor saxophone)
Length of resonance tube	61 cm (with only five tone holes)
Resonance pipe diameter above	3 cm
Resonance pipe diameter below	6 cm

8. Staldophone construction instructions

The prototype is only built with known materials and techniques, hence raw brass and the flap mechanism made of “gold” lacquered brass. As a basis, the dimensions of an existing tenor saxophone are to be taken. Most of the buttons, their mechanics and the flaps can be adopted directly. Existing technology can at least be used where a new construction is required.

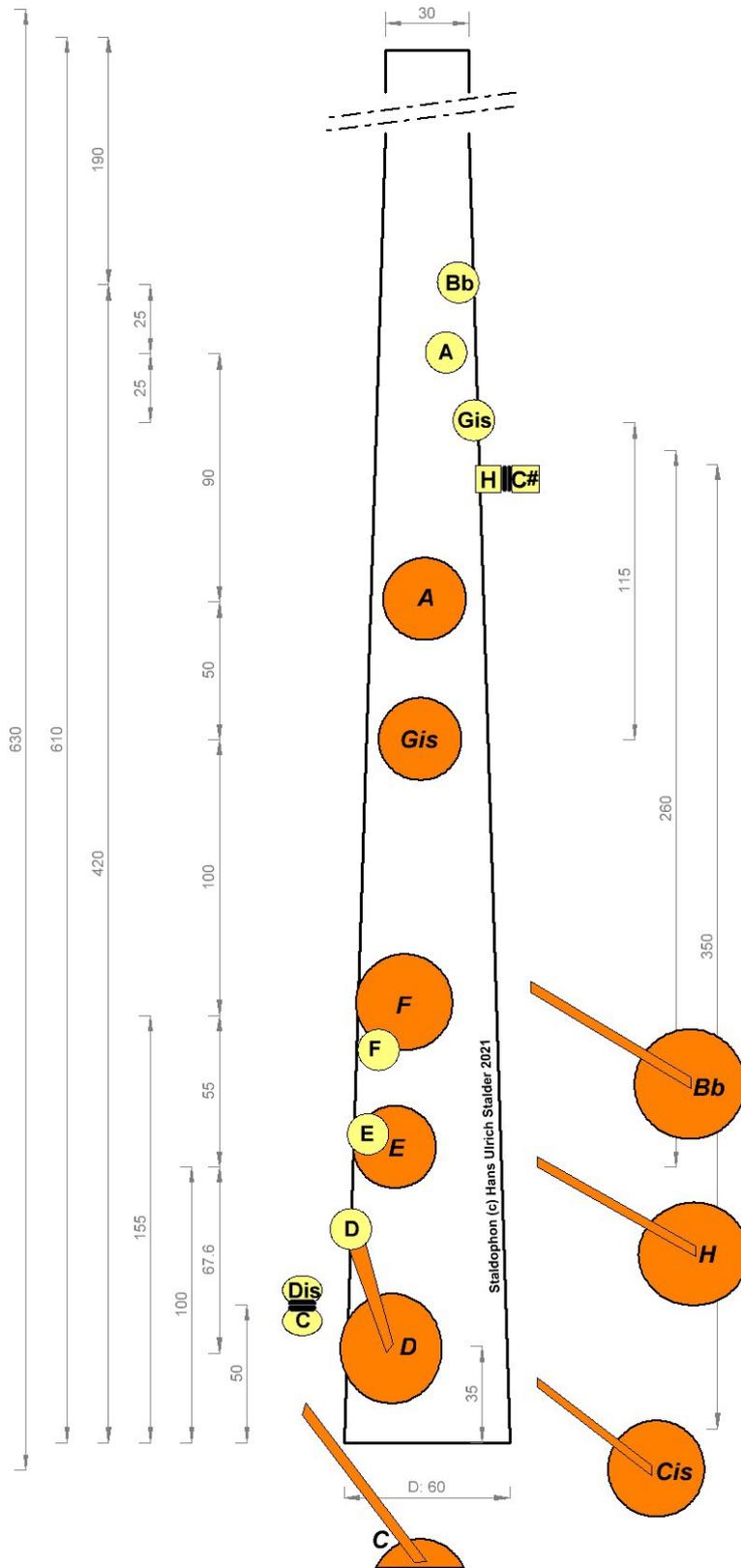
The upper thumb rest can also be realized with a sliding thumb hook. This has the advantage that the Staldophone can now also be held by the middle section. In addition, the sliding thumb hooks can be adapted to the needs of the player.

For the prototype of the Staldophone, an inexpensive existing tenor saxophone can be assumed. This means that only the middle resonance tube with the five tone holes has to be exchanged. In the existing neck the octave key driver has to be removed and the interference hole has to be closed permanently.

9. Detailed technical drawing

The length specifications in the following drawing are only guidelines. For experienced instrument makers, the information given here should suffice to allow the instrument to grow “organically” during construction.

For the mechanics of C#, D \sharp and G \sharp , where the flaps are closed in the idle state, a reverse construction is necessary. Existing technology, including the existing pipe connections, can be built on.



10. Epilogue

Notes and parallels to the saxophone

- The most common Saxophone types and their tuning are:
Soprano (B-flat), alto (E-flat), tenor (B-flat), baritone (E-flat), bass (B-flat);
- The fingerings are basically identical for all Saxophone types;
- The Saxophone is a closed pipe (closed on one side);
- The Saxophone is a transposing instrument, and for example the Tenor Saxophone the instrument sounds a ninth lower than notated;
- The tube construction is conical, which means that the lowest note sounds a little deeper than the calculated tube length would result; therefore a physically correct intonation is not possible at all;
- The saxophone generally requires good “air management”;
- With the soprano Saxophone, the upper notes are very close together, so this instrument is not suitable for beginners;
- With the tenor Saxophone and the lower tuned Saxophones, the weight of the instrument must be taken into account;
- From a physical point of view, playing the Saxophone is also an instrument-human relationship and extends from the horn, mouthpiece and wooden plate to the teeth, bones, lips, jaw, tongue, throat, larynx, lungs, chest, diaphragm and stomach, and also over the sound presentation from the player.

The Staldophone compared to the Saxophone

The physics of the Staldophone is largely identical to that of the Saxophone. The Staldophone is almost a third less weight. When playing in the high registers, the Staldophone makes higher demands on the player, but as mentioned at the beginning, this is offset by a nicer sound and far more sound possibilities.

And here is the most important thing, the series number of the Staldophone is structured as follows:

IT& 0000 (U + 015D = \hat{s}), 0000 is the prototype of the Staldophone.

In the case of the present instrument, however, the designation is limited to the series number “0000”.

11. Exclusion of liability / disclaimer

The truthfulness of this documentation has not been verified by third parties. No legal responsibility or liability of any kind can be assumed for incorrect information and its consequences. Subject to changes.

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