

the one handed flute of Edit van der Burg-Mayer built by Maarten Visser

submission for the 2014 edition of the OHMI-Ars
Electronica One-handed Musical Instrument
Competition, Playable Category

by Maarten Visser

Edit plays for the first time on the newly built flute (2007)



Edit's Story

Edit was a well talented young flutist when she was knocked down 25 years ago in the street in Szeged (Hungary). When she came home in Cegléd she could not talk and went to the doctor with her father. She had a brain damage and it had taken too long before it was acknowledged..

2 Weeks coma, 2 brain surgeries, many years of recovery followed, with her willpower to get better. After 7 years she tried the old flute again, with one hand.

In 1998 Edit and her husband Theo came in contact with Maarten Visser, and he did the impossible: he invented, designed and build a one-handed flute for Edit. It took Edit three days to learn the basics of this instrument and to give her first little concert. About six major changes were made to the flute in the following years. In 2007 Maarten Visser created a new flute for her, with a better sound and more possibilities: "A Stradivarius with the looks of a Harley Davidson" as a Dutch flute-reporter wrote. Edit can play everything on her flute and she is still improving.



G and #G keys and adjustment system

Science and flute playing

In learning to play a musical instrument, we turn to musical instrument teachers. They, in turn, derive their wisdom from musical paedagogics, a science probably as old as music itself. But what if that instrument is yet to be invented? Then we must turn to science and hear what is known about motor learning: our capacity to learn movement skills. Time forbids a treatment as thorough as the subject requires, but the basics of the matter are well known. Motor learning is based on rule learning. The fewer and simpler the number of rules, the easier it is to learn the task.

Unlearning an old skill is more difficult than learning a new skill.

Motor skills are learned by repetition. After sufficient repetition, the brain is capable of carrying out the task almost automatically, allowing one to diverge his or her concentration on other things. This way we can play music, while reading music at the same time and keeping an eye on the conductor.

Armed with this knowledge about instrument learning

I set about to invent an instrument for Edit van der Burg-Mayer.

Strategies employed in the design



Altered thumb keys: the former bB key is now B key, and the former B key is now the special key which closes all upper keys.

Controlling 16 tone holes with 5 fingers does require a strategy in distributing all these functions. As a start, it helps enormously to design a system to play a diatonic C scale, and assign the accidentals to side keys. From this point, a fundamental choice has to be made: either assign 2 keys to one finger, or create keys that control 2 tone holes at once.

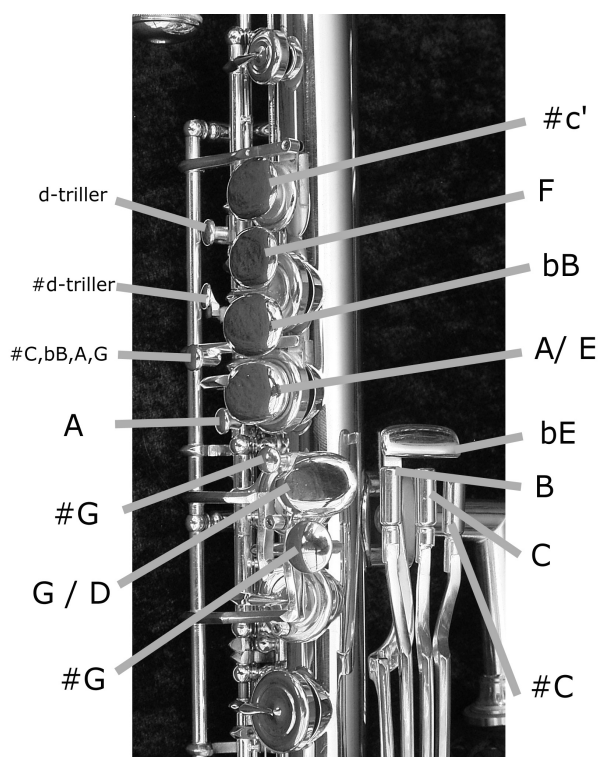
The first system has, for example, two touchpieces under the tip of the ring finger: one for the D key, one for the G key. Ascending the scale, for D-E the finger must release the D key, but at the same time keep the G key pressed down. This system is quite straightforward to build, but difficult to control for the player. Once mastered, it allows every possible hole combination.

The second system echoes the work of Theobald Boehm, inventor of the modern flute. Boehm set out to invent a system based on one finger-one position. This did away with the extensive finger sliding of the old system flute, and led to the instrument that has become the standard to this day ¹. Again here the ringfinger controls D and G. But now with only a single touchpiece to press. Unfortunately, when playing D-E, both the D and the G key would open, and the resulting sound would be more like bA . So somehow we need to tell the higher keys (G and up) to remain closed while the lower keys (DEF) are being operated by the double-function keys. To do just that I added a special thumb key that closes the entire top section. With this thumb key depressed, the fingers can play up to G. With the thumb key released, the range G- $\#C$ can be played.

Deciding on the system

Knowing that Edit had already played the flute, it was essential that the new system would not collide with what she already knew.

The most simple way to attain this was to just ask her: I offered fingering tables of the different systems and asked her to imagine herself playing scales and passages using those fingerings. And then tell me which one she found easiest to operate. Edit replied swiftly: she had a clear preference for the second system, no doubt about it. It turned out to be the right choice.



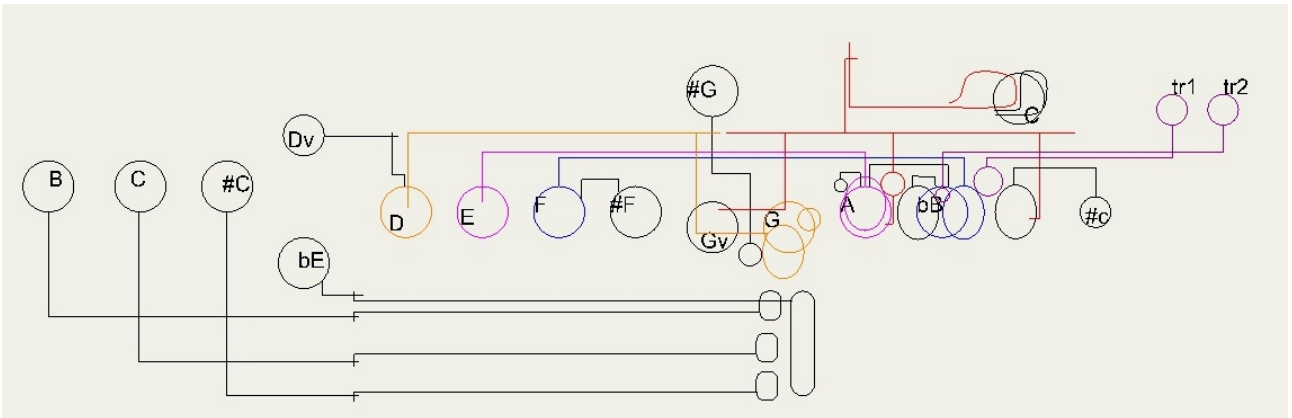
key functions

A second instrument

After 9 years, numerous concerts and two recorded CD's Edit asked me to build a new instrument for her. There was a list of improvements she wanted to have implemented, most notably a low B and a better embouchure. The system around the G key was simplified, and the new flute is overall much more reliable than the old one. The photos in this document are of this last instrument, which I consider my masterpiece.



the one hand flute completed



schematic overview of key connections

notes

1 Theobald Boehm, The Flute and Flute Playing, Dover edition , page 61.

reading

article "First Love" by David Nabb, Flutist Quarterly (USA), spring 2007

download link: <http://flutelab.com/flutelab.com/wp-content/uploads/FlutistQ1.pdf>

article "A Boehm Flute for a One-handed Player" by Maarten Visser, Pan, march 2008

download link: <http://flutelab.com/flutelab.com/wp-content/uploads/PAN.pdf>

web links

Edit plays Debussy, Clair de Lune http://youtu.be/a0_p51bCHpY

Edit plays Vivaldi, Sonata in G minor <http://youtu.be/uWZL8stq7jU>

Edit plays Génin, Carneval de Venise <http://youtu.be/ZD68LZTIDbI>

web site of Edit van der Burg-Mayer <http://www.editflute.com/>

web site of Maarten Visser <http://www.flutelab.com/>

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right Edit, middle Maarten Visser, explaining the instrument, left Mia Dreese of the Dutch Flute Society