



SABRE

Alastair Penman reports from the first ever SABRE day in Zurich, which brought together a group of expert performers and technologists to discuss and showcase the potential of this remarkable device used in conjunction with the clarinet and saxophone

What is a SABRE, I hear you ask? Apart from being a slightly tenuous acronym for **S**ensor **A**ugmented **B**ass **C**larinet **R**esearch, the SABRE Multi Sensor is a clever device that can be attached to any clarinet or saxophone (or other

instrument for that matter) and used to control

electronic sounds and effects via a computer. The SABRE Multi Sensor comes in two parts: the sensor unit and the remote unit. The sensor unit is a black box that, when attached to the clarinet barrel or saxophone/bass clarinet crook, detects the performer's movements as they play. Data recorded

includes pitch (up/down movements), roll (rotation) and yaw (side-to-side), as well as breath pressure via a small tube fitted under a special mouthpiece cushion. The sensor also has two buttons, which can be set to trigger effects on a computer. The remote is a smaller unit, typically mounted on the instrument below one of the thumbs, and it simply has two buttons on it. What the performer does with the data collected by the sensors is limited only by the performer/composer's imagination (or programming skills). For example, one can control electronic effects including harmonisers, reverb, delay and ring modulation, or, as demonstrated by one performer, you can even navigate through a computer game! The SABRE comes with software that can be used to control some effects, although most performers use more sophisticated programs for audio processing.

SABRE research first began in 2010 at the Institute of Computer Music at Zurich University of the Arts (ZHdK) and has seen many exciting developments over the past nine years. 2018 was somewhat of a milestone with the launch of the first commercial product – the SABRE Multi Sensor – and 2019 saw the first SABRE

Day, held at ZHdK in Zurich. Hosted by Matthias Mueller, the event was the first international gathering of SABRE users for a day of performances and discussions about the device. I was honoured to be invited to perform at the event, alongside many other top musicians who are using the device, and to meet the developers of the SABRE.

The first session of the day was a round table for performers and composers to discuss their experiences with the SABRE and further developments they would like to see. There was a sense of gratitude for the tireless work of the SABRE developers – in particular, Matthias Mueller, Sébastien Schiesser and Isai Angst, who have invested so much of their time in developing the device. The feature that seemed to excite the performers the most is the ability to integrate the SABRE

seamlessly into their performances, allowing natural and organic movements to control electronics in an uncontrived way. It was fascinating to hear from the developers the reasons behind a few common glitches that users had found, and the solutions to these.

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SABRE IN CONCERT

The opening concert was given by students from ZHdK. It was great to see so many excellent performers starting to work with the SABRE at an early stage in their careers. Although most of the performances were on clarinet, there was also a violist who demonstrated how the SABRE can also be used on a very different instrument. Unfortunately, a performance on accordion was cancelled due to illness. In this concert, almost all performers used the SABRE software alone, showing that the device is accessible to musicians who may have limited technical knowledge.

The second concert of the day showcased a huge variety of uses of the SABRE. The concert opened with bass clarinetist Marcella Barz performing *Stung* by the Irish composer Frank Lyons. The piece originally required the composer to be present to control electronics, but the SABRE enabled Marcella to control the electronics through her movements while playing. The piece was effective and really lent itself to the SABRE. Following Marcella was the Spanish saxophonist and composer Joan Jordi Oliver. Joan came across

the SABRE while studying at ZHdK and has really embraced the technology. His piece for soprano saxophone was truly engaging and held the audience on the edge of their seats throughout, despite not featuring a single true note on the instrument! The performance saw Joan making various breath and articulation noises into the saxophone, which he controlled by moving the saxophone (with SABRE attached). At times, it was as though Joan was a wizard using his soprano saxophone as a wand, making sweeping movements to sculpt the sounds around him.

To end this concert, Stephan Vermeersch performed two of his own compositions for bass clarinet, demonstrating his versatility as a performer and showcasing the SABRE's capabilities. In the second piece, Stephan used dynamic visuals on a projector. It was fascinating to watch Stephan improvising, both responding to and influencing the visuals on the screen.

I was privileged to share the third concert with the fantastic Dutch bass clarinettist Marij van Gorkom. The final piece in



Marij's programme, *s.laag* by Ricardo Climent, was a real highlight of the day. Marij used the SABRE to navigate through a computer game, interacting with the virtual world in a number of ways, including firing shots from her virtual bass clarinet to hit various targets, each triggering different sounds. This really had to be seen to be believed; it was a fascinating insight into the cutting edge of music and game technology. After Marij, it was my turn to perform my own compositions for alto saxophone and SABRE. As well as premiering two pieces written for the event, I also performed existing works that I had reformulated to utilise the SABRE.

The final concert of the day showcased the SABRE in yet another different context. CASSGB's own Sarah

Watts premiered works for contrabass clarinet and SABRE by Miroslav Spasov and Sohrab Uduman. Both composers had had access to the SABRE only weeks before the event and it was great to see how deeply they had already delved into the technology. Both composers focused solely on the SABRE's breath sensor, and both pieces were highly original, not only in their use of the technology but also in terms of the contrabass clarinet writing. Both compositions really pushed the instrument's technical limits, and Sarah was the perfect exponent.

It was fitting that the final performances of the day should come from Matthias Mueller, the driving force behind the SABRE project. Matthias opened the concert with a piece by Thomas Kessler, which he began playing while lying on his back. As the piece developed, he gradually rose and it was obvious that his movements were having an effect on the sounds produced. For the final performance of the day, Matthias was joined by his son Basil, a young dancer who has recently earned a position at the Czech National Ballet. This composition featured two SABREs – one strapped to Basil's

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chest and the other on Matthias' bass clarinet, controlling the electronics in tandem. Basil's dancing was truly a treat to watch, and it was a delight to see the father and son team working together to produce this wonderful work of art.

Overall, the SABRE day was tremendously enjoyable, and the SABRE is a triumph of technology that really does open up new possibilities for performers. It must be said that the day was not without its technical challenges – there were occasional delays due to problems connecting different technologies and calibration issues with the SABRE. However, the problems were short lived and none prevented performances from going ahead. Teething problems are to be expected with new devices, and I'm sure that these will be ironed out in due course. The problems are certainly not great enough to prevent me from feeling confident using the device in live performances (in fact, I am writing this on a plane to the USA where I will use the device in a masterclass at UCLA!). I hope that the SABRE will soon be widely available to performers and composers during their studies so that they can begin to gain confidence with the device from an early stage and take it into their professional careers. ■

Alastair Penman is a saxophonist and composer who holds masters degrees in both information and computer engineering (Cambridge) and saxophone performance (RNCM). He is visiting professor of saxophone and electronics at Guildhall School of Music and Drama, and his debut album, Electric Dawn, features new works for woodwind and electronics.

*For more information about the SABRE, visit <http://sabre-met.com>
To view performances from the SABRE day, visit <http://sabre2019.alastairpenman.co.uk>*

FOR THE TECHIES: HOW THE SABRE WORKS

The SABRE sensors capture data (pitch, roll, yaw, breath pressure and button presses) which are sent via Bluetooth to a computer (Mac or PC), where it arrives as Open Sound Control (OSC) data. At this point, it is very much up to the user what they do with the data. The SABRE software allows the control of various effects, but to realise the device's full potential, the data can be taken into MAX/MSP, where patches can be written to use the data however one wants. Almost all performers at the SABRE day used MAX, but it is also possible to take the data into other DAWs such as Ableton Live, Max for Live and Cubase. I believe I am currently unique in my approach of converting the OSC data to MIDI before sending the data to MainStage (essentially a live performance version of Logic Pro) to control various effects.