

Rolf Gehlhaar

## **HEAD=SPACE 2000**

A virtual instrument for a quadriplegic musician

In 2000 I was approached by my good friend John Kenny, the renowned Scottish trombonist and reviver of the ancient *Carnyx* ([www.carnyx.musicscotland.com](http://www.carnyx.musicscotland.com)), whether I might be interested in developing a virtual musical instrument for a disabled friend of his, Clarence Adoo.

Clarence, solo trumpeter of the Northern Symphonia, had been involved in an automobile accident which had left him paralysed from the neck down. He had expressed a great desire to make music again but did not know where to turn.

John Kenny knew of my SOUND=SPACE (Gehlhaar 1.,2.), the interactive musical environment which I had developed in 1985 and with which I was running musical creative workshops for groups of disabled children all over the UK. He asked me if it would be possible to adapt the sensor system and software of SOUND=SPACE so that a single disabled person could use it as a sufficiently controllable and resourceful instrument for musical expression.

The sensor system in question is an ultrasonic echo-location system, designed to survey and measure the movement (activity) of numerous people over a relatively large area, say 60-100 square metres. The positions of the users and their movement (level of activity) is measured precisely and employed to trigger sounds or to initiate processes of algorithmic composition.

Clarence, on the other hand, would have to control whatever virtual instrument I could provide entirely and only by moving his head. I decided that to shrink the area of measurement down to perhaps only 200 square cm, the area within which Clarence would be able to move his head, would not allow sufficient access to musical resources nor expressive control over them.

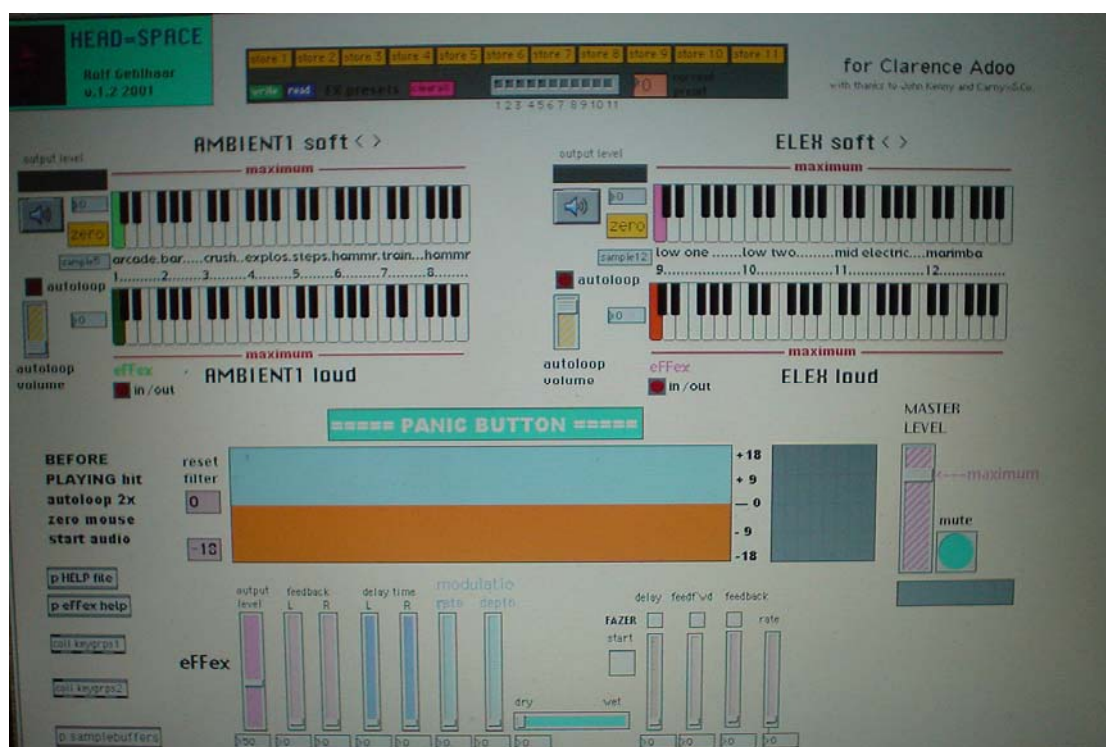
Having decided that the sensor technology for SOUND=SPACE did not offer the means towards our goal, I looked about for other possible solutions means, finally discovering the *HEADMASTER 2000* ([www.spd.org.sg/atc\\_alternativemouse.html](http://www.spd.org.sg/atc_alternativemouse.html)). This is a head pointing system that takes the place of a mouse. Move your head and the mouse cursor moves on the screen. Puff on the tube to make selections. Pointer control is fast, smooth and accurate.

As a result of this discovery I was able to develop the virtual instrument HEAD=SPACE employing the object oriented musical programming environment MAX/MSP, as illustrated below.

Picture of HEADMASTER 2000:



sample screenshot of HEAD=SPACE:



In fact, HEAD=SPACE is a large library of instruments of which the above screenshot is one version. Each version is further programmable to generate, process and manipulate sounds in different ways, but each with the same 'front end'. The player is able to manipulate the instrument in completely predictable ways, employing both the visual and aural skills that any musician has acquired.

The first public performance by Clarence Adoo with HEAD=SPACE took place at the St.Magnus Music Festival, Pickaquoy Centre, Kirkwall, on 22 June 2005. His reaction to his own performance was "This is the first time I felt like a musician again, not a disabled musician."