Compound No.6 : VOICE ALARM AIR MACHINE

Using the MaxMSP Patch

1. What You Need To Have

Equipment

1. A computer running MaxMSP (at least version 5). (If for some reason the fiddle~ object supplied with the patch does not work on your system, you can download it from maxobjects.com.)

2. An audio interface with at least 4 inputs and 4 outputs.

3. Three Loudspeakers

4. Headphones, possibly connected using a Headphone Amplifier.

5. 4 Microphones: One to pick up the flute, one for the bellow and two for the microphone box.

6. It is recommended to use a MIDI controller with faders or knobs to control the patch. The device must have at least 8 individual control elements.

7. With the microphone box there comes another small box, the converter box, that is needed for the connection of the triggers in the microphone box to the computer via USB. In order for the computer to recognize the converter box you have to make sure the FTDI Drivers are installed on your system. (http://www.ftdichip.com/FTDrivers.htm)

Soundfiles

The Patch does not work without the proper audio files. If you want to perform the piece and received the patch without them, please write to mail@maximilianmarcoll.de .

2. What You Need To Know

Compatibility

The patch was developed and tested in Max 5 (v.5.0.8) on an iMac 2.5GHz Intel Core i5, Mac OS 10.6.8. Further testing was done using a MacBook Air, 1.6GHz Intel Core i5, MacOS 10.7.4 with MaxMSP 5.1.9 .

Layers

The electronics part of VOICE ALARM AIR MACHINE consists of six "layers", all of which are represented by one fader in the patch.

Gates

Throughout the duration of the piece there is a three channel playback running in the "Gate-Layer". Each of the three channels is connected to one of the three speakers (Left, Center and Right). The audibility of each of the channels is dependant on the state of one of three respective gates, which are controlled be the flute player. The left and right channels are controlled by the flute player's actions inside the microphone box. If the player blows directly through the flute onto one of the two microphones in the box, the respective gate should open. The third gate (center) is opened by stepping on the bellow, which is supposed to blow directly onto a third microphone (see the Stage Setup for details). To secure the detection of the flute player's actions in the microphone box, there are two triggers in the boxes inner bottom left and right corners that have to be activated in order for the gates to open. The player is supposed to activate them by pushing the flute against the left and right inner cushions of the box. The usage of these buttons is, however, optional and if you have no trouble detecting the signal of the flute player, you can of course play without this "safety net". In that case you do not need to worry about the converter box at all.

Center & Stereo

The next two layers are a simple three channel playback that is divided into a stereo playback (left and right speakers) and a mono playback (center speaker).

Ingo

The "Ingo" Layer is another three channel playback, that exclusively contains recordings of a shouting neighbour of mine, whom, in the lack of knowledge of his real name, I call Ingo.

InvertGate

At one point in the piece, the functionality of the gates is inverted: the gates only open if the flute player does NOT produce significant sound levels in the microphone box. The playback for this part is an independant additional playback, so the patch provides an additional fader for this layer.

Pitcher

There is a fourth microphone needed that ought to pick up the flute outside of the microphone box. The patch analyses the frequency of this signal and uses the pitch data to change the playback speed of another stereo playback in realtime.

3. What You Need To Do

Connections & Signal Routing

Please connect the audio interface as follows:

Inputs

Left microphone box mic	Input 1
Right microphone box mic	Input 2
Bellow mic	Input 3
Flute mic	Input 4

Outputs

Left Speaker	Output 1
Right Speaker	Output 2
Center Speaker	Output 3
Headphones (Click)	Output 4 or 4 & 5 or 5 & 6

Buttons and Settings

DSP settings

By clicking on the DSP settings button in the upper left portion of the patch, you open the standard MaxMSP DSP settings window, where you can choose your audio hardware and other performance relevant settings.

Midi Learn

The patch comes with a MIDI learn function to simplify the setup. To connect your controller: Click on the MIDI Learn button. It should then read "Listening...". Now move the control elements you want to use. As soon as the patch received midi control messages with eight different controller ids, the connections will be made automatically. The mapping of the controller ids to the faders of the patch is independant from the order in which the messages are received. The patch looks for eight different controller ids, sorts them in ascending order and connects them to the respective faders. The 7th of your midi control elements will not be connected in order to secure a unique position of the master fader, which will be connected to your 8th control element.

Parameter Feedback

If you have motor faders and want to receive parameter feedback from the patch, click on the Parameter Feedback Button to turn it on and choose your device from the menu to the right of the button.

Set Faders to Zero

Sets all Faders to 0dB.

Load sounds

Choose the directory in which the soundfiles are stored. After loading the soundfiles succesfully, the button reads "SoundsLoaded" and its color switches to green.

Set Detection Levels

You can set the detection threshold for the gates seperately.

Set detection "Stickyness"

The Stickyness parameters change the thresholds of the gates dynamically. If the gate is open, the signal level has to fall beneath a new threshold that is made up of the given original threshold *minus* the "down stickyness". If the gate is closed, the signal level has to rise above the given original threshold *plus* the "up stickyness". Set both values to 0 for a normal gate behaviour.

Gate Frequency Range

The signal that is measured for the control of the gates is being band limited before it is analysed. Set the low and high limits here.

Pitcher Threshold, Base Pitch and Transposition Factor

The Pitcher layer is activated automatically during the piece. In order for the realtime pitching to work, another gate has to open. You need to find a setting where the Pitcher-Gate opens if the player plays in a range of mp-mf.
The Base Pitch and Transposition Factor settings are set automatically. Do not touch them unless you are perfectly sure you know what you are doing.

Gates Open Separately / Gates Closed / Pitcher Off

These toggles activate/deactivate parts of the patch. They are set to the correct states automatically during the piece. You will, however, need to use two them to test if your setup is working. Use the "Gates Closed" toggle to open the Gates to test if the triggering inside the microphone box is working. Use the "Pitcher Off" toggle to turn on the realtim pitch detection ("Pitcher Layer").

Use Arduino

As mentioned before, there are triggers inside the microphone box.
The usage of the triggers is optional. If you wish to use the triggers, you need the converter box to connect the triggers to the computer via USB. The triggers are connected to the converter box using standard 2-pole 3.5mm connectors. Inside the converter box there is an Arduino board to convert the signals. You have to make sure you have the FTDI Drivers (http://www.ftdichip.com/FTDrivers.htm) installed on your system. Click on the "Use Arduino" toggle to activate the respective parts of the patch. Please note that as long as the patch uses the converter box, the gates for the Gate-Layer of the piece only open if the triggers are activated.

Audio OFF / ON

Turn the Audio Processing Engine on or off.

Start / Stop / Start with Countdown

As an alternative to starting the piece immediately after hitting the START button, you can choose to start the patch with a countdown of ten seconds to the beginning of the piece. You can stop the countdown at any time by clicking on the button again (that now reads "Stop Countdown").

Click

There is a click track for the flute player. In the lower right portion of the patch, there are its controls. You can set the level and routing of the click track. By default it is routed to output channels 4, 5 and 6. The signals on output channels 4 and 6 are identical. If you want to use the click track in stereo, you can either use channels 4 & 5 or 5 & 6. To test the click and click levels, or for practising, you can also route the click to all other channels by clicking on the toggle reading ch 4 5 6.

Start in Measure

You can start the patch at any measure of the piece. Simply enter the measure number and click on start to commence playback at the given measure.

Tempo

To support the practising process, you can change the tempo of the piece and of all the related audio playbacks. Please note that siginificant deviations from the original tempo will result in significant loss of audio quality. The original tempo is set to be 120 bpm and deviations are to be entered relative to 120 bpm, although there is a part of the piece that is actually written in 137.67 bpm. **The tempo is to be decreased during practising only!**

Save / Reload Settings

To make sure everything is in place, you can save and reload your settings once you found suitable values for the various parameters. Simply click on the "Save Settings" button in the top portion of the patch to store your settings. You can recall them later by clicking on the "Restore Settings" button. All of your parameter settings, the soundfile directory as well as your midi connections will be restored.

Acknowledgements

The patch makes use of the external object "fiddle~", originally developed by Miller Puckette and ported to MSP by Ted Apel and David Zicarelli. The connection to the Arduino board is done using the Arduino2Max patch by Daniel Jolliffe.