# Operational Guide & Evaluation

## MA Music

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# A.1: Introduction

During the course of this text, the operational functions of the Max/MSP patch entitled 'The Server Room' shall be described. An introduction will be given to describe the nature of the patch, in addition to how it may be used for the creation of audio assets for both composers, and sound designers. A brief introduction to the recorded material that accompanies the submission contents will be provided. Moreover, the paper will conclude with an evaluation of the strengths and weaknesses of the project, in addition to the proposed modifications and continued development of derivative patches.

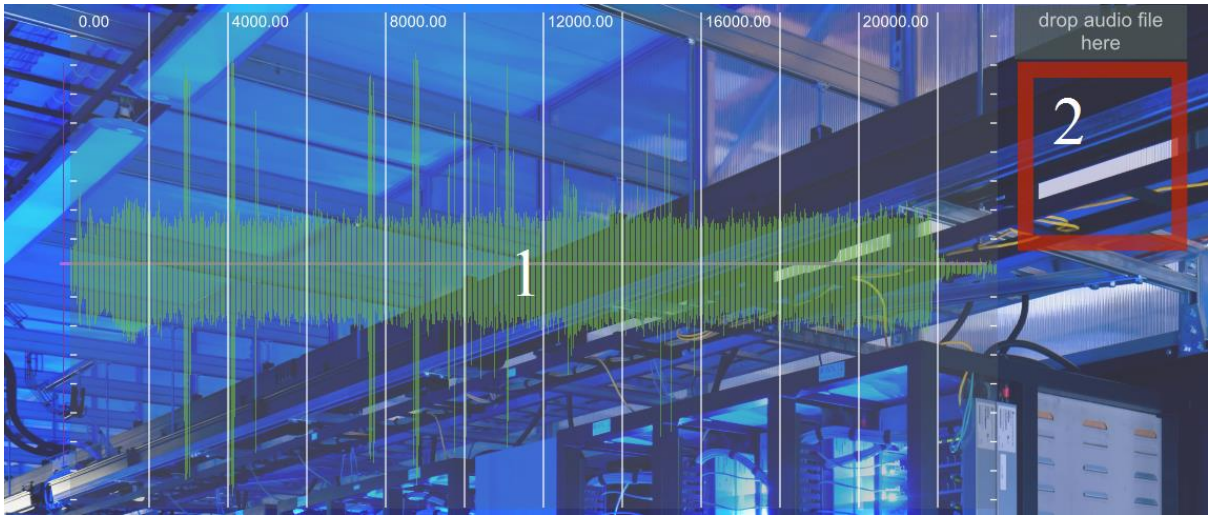
## A:2 The Server Room: Max/MSP Granular Audio Effects Processer Introduction

The Server Room is a patch that has been created using Cycling '74 Max 7 version 7.0.1. The patch is a dual bank, two channel granular effects processor that allows the user to manipulate one or two WAV or AIFF files to create unusual evolving soundscapes, textures and sound effects. The processor provides the user with the ability to record the performance/audio to hard disk in real-time for further manipulation within a DAW or other software instrument. Granular processing breaks the audio up into small quantities of time called grains, of which the size can be altered in real time. Furthermore, these sound particles can be re-arranged, played backwards, or time-stretched. If one uses a specific set of parameters, sound can be 'frozen in time' as it is still playing, retaining the instantaneous timbre at the time of pausing. This technique can be used to create infinite sustain effects, useful for pads and textures. Although the audio has not actually been paused (one would hear silence), the small grain, which is a micro loop, continues to cycle until intervention by the user or an automation function alters the parameters.

The Server Room can be used by both composers and post production sound designers to create an infinite variety of unique sounds by altering audio recordings. The name and visual theme of the patch was established from an occurrence during the developmental stage whereby two recordings of the internal workings of a computer and a hard drive were manipulated, creating what one imagines the sonic characteristics of a large server room or 'sci-fi' computer lab to sound like. The default pre-sets within the patch demonstrate the effects of this. The parameters that have been set generate a soundscape that would ideally represent a server room or computer lab within a film or computer game. Moreover, the user is not limited to the creation of these types of sounds alone; any sample can be loaded into the two banks for manipulation into many distinctive creations. The material that has been included in the audio portfolio with this submission demonstrates how the patch is equally suited to both post production sound design and musical disciplines.

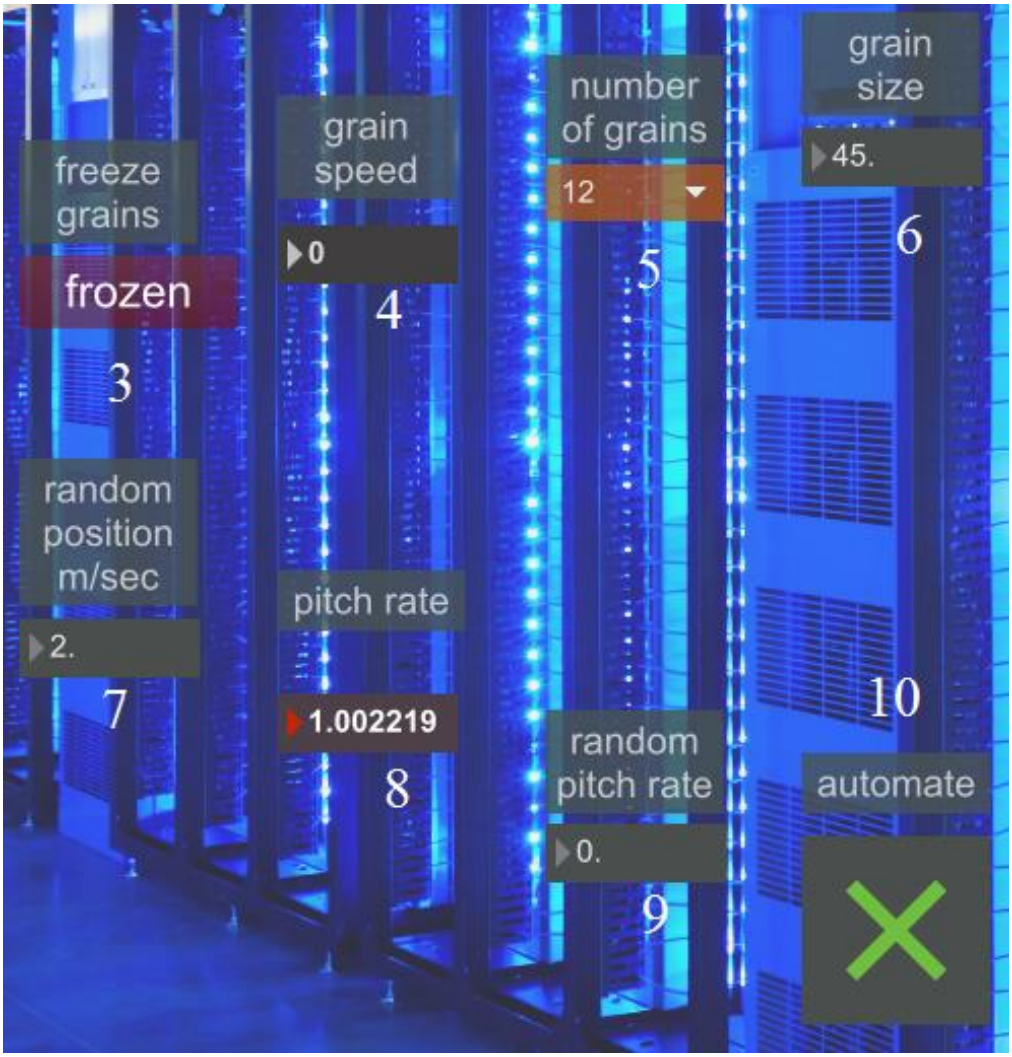
# B.1: Operational Guide


**Overview**



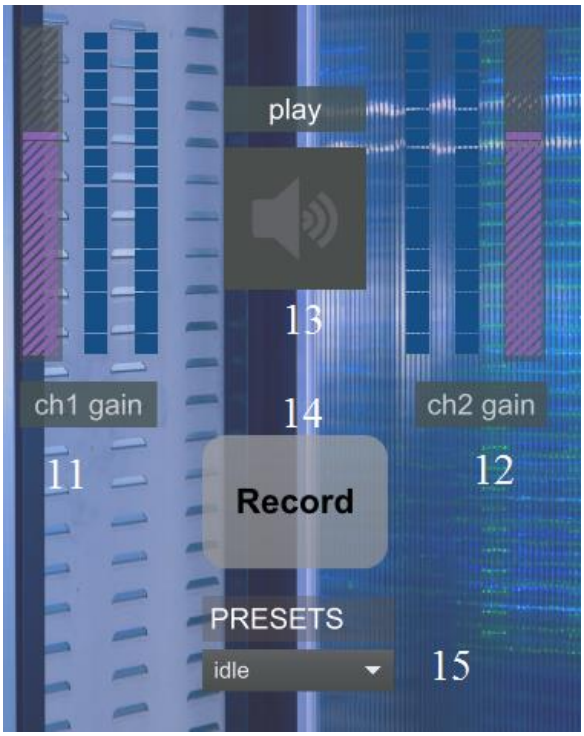

Upon first opening The Server Room, two default samples will be loaded into the buffer.

1. **Wave Display:** The **Wave Display** provides a visual of the currently loaded waveform. Additionally, the grain size and pitch is represented graphically here. The mouse can be used to manipulate the grain position and pitch. This is achieved by clicking and dragging around the display.
2. **Sample Loader:** Drop WAV or AIFF files into the red square to load into the audio buffer. The **Wave Display** will update itself, visually reflecting the file currently stored in the audio buffer. To load another sample, drop the new file into the **Sample Loader**, which will remove the current file from the buffer.




3. **Freeze Grains:** The **Freeze Grains** button will freeze the grain(s) in time. When unfrozen, the grain(s) will progress through the audio sample at the speed and direction specified by the **Grain Speed** parameter. Clicking the button will change the state.
4. **Grain Speed:** The speed at which the grains progress through time. Positive values will progress the grain(s) forward, with higher values increasing the speed of movement. Negative values will reverse the movement of the grains, allowing the regression backwards through the recorded material. The values can be changed by clicking and dragging the number object upwards or downwards. The **Freeze Grains** button will become 'unfrozen' when movement occurs.
5. **Number of Grains:** The user may change the amount of grains that are operating by clicking the orange drop-down menu.

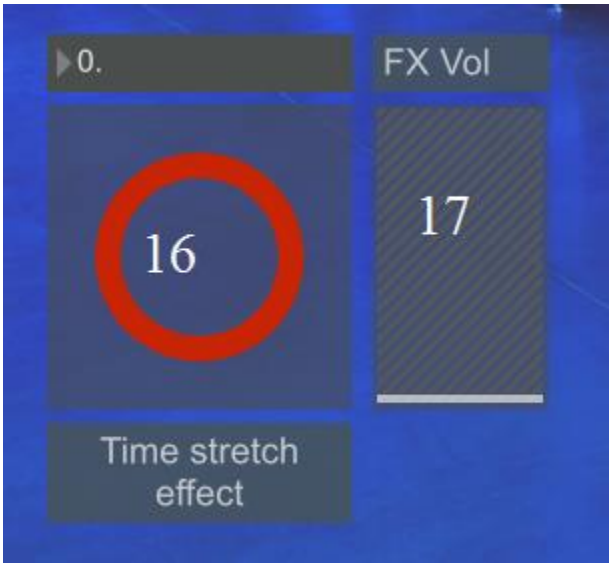
6. **Grain Size:** Changing this value will increase or decrease the grain size. Large grain sizes will preserve more of the original characteristic of the audio. Smaller grain sizes are useful for creating infinite sustain effects as only a small particle of the audio will be heard continually.
7. **Random Sample Position:** The grains will alter their sample position randomly. Increasing the value will increase the rate of movement between positions.
8. **Pitch Rate:** Increasing this value will alter the pitch within the grains.
9. **Random Pitch Rate:** Increasing this value will randomise the rate at which the grains alter their pitch.
10. **Automate:** The **Automate** toggle has been programmed to automate the **Grain Size**, **Random Sample Position** and **Random Pitch Rate** values using randomly generated integers. This allows the patch to automatically compose evolving soundtracks.




11. **Ch1 Gain:** The gain control and level meter for channel 1. The gain is increased by sliding the fader.
12. **Ch2 Gain:** The gain control and level meter for channel 2.
13. **Play:** Toggles the audio on or off.
14. **Record:** To record audio, click the **Record** button. This will open a **Save As** window. The audio can then be named and saved to a specific location in WAV or AIFF. The window will

close and the recording will begin in the background as the user operates the patch. To stop recording at any time, click the **Record** button once again. The audio will now be saved in the location specified earlier.

15. **Presets:** Five default pre-sets that demonstrate various 'server' themed soundscapes using the default samples loaded into the buffer. These are accessed by clicking the drop down menu under the **Record** button. The functionality to store one's own pre-sets has been hidden from the presentation mode in the default state. To access this, unlock the patcher, then right click and add the **Preset Object** to the presentation.




16. **Time Stretch Effect:** This effect will stretch audio out over a ten second ramped period. Use the **FX Vol** fader to increase the gain of the effect.
17. **FX Vol:** Increase the gain of the **Time Stretch Effect**.

## B.2 Recordings

- **Main composition:** Granular Science Research Facility.

  The main composition has been composed using elements of the soundscapes that have been included in this portfolio. Small sections have been cut from the textures. These have been arranged within Cubase 8 Pro and affected to form a seven minute piece. The piece demonstrates how the patch can be used to create sound assets for use within a musical context. The piece has been inspired by the film Alien, in addition the underground science complex that is featured in the computer game Portal 2. Other influences include the 1984 album *Zoolook* by Jean Michel Jarre. (Jarre, 1984)

- **Soundscapes:** Textures and evolving compositions created and performed within The Server Room. These pieces can be appreciated in their existing form, or edited to create sound assets for post-production sound design or musical arranging.

  **1: battle_guns_sealed_knot.wav**

  This soundscape utilises two recordings that were taken during a battle re-enactment from the Sealed Knot society. There were approximately 1000 members using replica firearms and percussion.

  **2: brush_stick_piano.wav**

  An antiquated piano found in the Band Room at the University of Salford was manipulated with wire brushes and drum sticks.

  **3: duduk_guitar.wav**

  I had performed textures and passages using an Armenian Duduk. These were then morphed with a performance of a guitar.

  **4: mechanical_prague.wav**

  Recordings captured at various locations in Prague in 2011.

  **5: piano_inner_wood.wav**

  A manipulated piano cabinet.

  **6: pots_pans_liquid.wav**

  A combination of pots and pans being washed and hit. Running water has also been added to the patch.

  **7: railway_siding_birds.wav**

  Location recordings captured near a freight container base in Trafford Park.

  **8: server_1.wav**

  Recordings of the inner workings of a computer and hard drive were captured using a self-made contact mic and a pickup. The following server pieces have been made using the default pre-sets within the patch.

  **9: server_2.wav**

  **10: server_3.wav**

  **11: server_4.wav**

  **12: server_meltdown.wav**

**13: violin_glass.wav**

The combination of a manipulated violin and a crystal glass.

## C. Conclusion

Further development of the patch will be undertaken to integrate an interface for sequencing events over time. This will allow certain parameters to be altered at specific intervals. The patch has fulfilled the original intended purpose of manipulating audio using granular algorithms. Furthermore, the Server Room is being used on a number of commercial film scoring projects, establishing underscoring elements to work within traditional arrangements. In spite of this, given more time for development, a refined pre-set management system may be coded to improve upon the rather limited functionality currently embedded. At present, the configuration is not able to save the automation parameters that are triggered by the toggle switches. Many of the complex granular components are nested within sub-patches, requiring a greater level of interaction from the 'pattr' Max object.

There are elements that are currently being re-developed to be integrated into a separate patch. The parameters within the patch will be controlled by an electroencephalograph (EEG) and an Arduino rapid prototyping board as part of a research project into cognitive responses and music.

**Bibliography**

Dude837. (2015). *Delicious Max Tutorials*. Retrieved from You Tube: https://www.youtube.com/playlist?list=PLD45EDA6F67827497

Giri, M. (2012, November 28th). *Max MSP: 3 non-obvious audio effects with the delay~ object*. Retrieved from You Tube: https://www.youtube.com/watch?v=PtL8vjYyAm8

Jarre, J. M. (1984). Zoolook [Recorded by J. M. Jarre].

Price, S. (2005, December). *Granular Synthesis*. Retrieved from Sound On Sound: https://www.soundonsound.com/sos/dec05/articles/granularworkshop.htm

Roads, C. (2006). The evolution of granular synthesis: an overview of current research. *International Symposium on the Creative and Scientific Legacies of Iannis Xenakis* . Toronto : University of Guelph.

Sakonda, N. (2015). *Nobuyasu Sakonda Sugar Synth*. Retrieved from Nobuyasu Sakonda: http://web.mac.com/nsakonda/sakoweb/profile.html

Scott, R. (Director). (1973). *Alien* [Motion Picture].

Valve. (2011). Portal 2. Valve Corporation.