

# INSTRUCTIONS MANUAL

## PREFACE:

**Granulera** is a granular synthesizer with focus on randomized textures developed by Caio M. Jiacomini.

The instrument was developed using the Csound language and the Cabbage Audio framework. The Github repository with the source code can be found here (<https://github.com/CaioMJ/Granulera>) .

If there are any doubts about its workings after reading this, feel free to contact me by email ([caiojmini@gmail.com](mailto:caiojmini@gmail.com)).

## INSTRUCTIONS:

Double click a parameter to reset its value

Use the mouse wheel to fine tune parameter values

Granulera is divided in three sections: **Left, Center, and Right**

## LEFT

### PRESETS

Click the **save** button to store the current settings as a preset

Use the drop-down menu to select between your saved presets

### OSCILLATORS

Granulera offers three oscillators that can output simple wave forms. They offer independent control for waveform selection, volume, and tuning (divided between semitone and cents sliders)

### PANIC

Panic button. Press it once to cut all instrument instances if there are stuck keys or weird stuff happening. Press it again to enable the instrument

## CENTER

### GRAINS

This section offers control for the granulation parameters

**Windowing:** selects the envelope shape for individual grains

**Grain Duration:** determines the size of individual grains in seconds

**Grain Density:** determines how many grains are played in one second

**Pitch Variation:** determines the pitch variation between individual grains

**Phase Variation:** determines the starting phase variation between individual grains

### RANDOMIZATION

**Duration Range:** determines the randomization range for the Grain Duration parameter. If the range is set to 0.5, it will generate random values between 0.5 and -0.5

**Duration Rate:** determines the rate at which new random values are generated for the Grain Duration parameter

**Density Range:** determines the randomization range for the Grain Density parameter. If the range is set to 0.5, it will generate random values between 0.5 and -0.5

**Density Rate:** determines the rate at which the new random values are generated for the Grain Density parameter

**Frequency Range:** determines the randomization range for the overall tuning of the synthesizer. If the range is set to 0.5, it will generate random values between 0.5 and -0.5

**Frequency Rate:** determines the rate at which new random values are generated for the overall tuning of the synthesizer

### FILTER

**Filter Type:** Selects the type of filter between lowpass, highpass, and bandpass

**Key Tracking:** if on, the filter frequency changes based on which notes are played so every note has the same relative timbre

**Frequency:** controls the filter cutoff/center frequency

**Start/End Freq:** sets the start and end frequency for the frequency envelope

**Resonance:** control the lowpass and highpass filter resonance

**Bandwidth:** controls the bandpass filter bandwidth

**Attack, Decay, Sustain, Release:** sets the filter envelope

## MODULATION

Provides parameters for ring and amplitude modulation with a sine modulator.

**Amount:** wet/dry balance between the modulated signal and the dry signal

**Tuning:** tuning of the modulator wave in cents. Relative to the MIDI pitch

## LFO

Provides Low Frequency Oscillators for key parameters of the instrument with a sine shape.

**Frequency:** LFO frequency in cycles per second

**Amount:** range of the LFO signal

## RIGHT

### GLOBAL

**Volume:** sets the overall volume for the instrument

**Stereo Pan:** sets the overall pan position for the instrument

**Tuning:** sets the overall tuning in cents for the instrument

### AMP ENVELOPE

**Attack, Decay, Sustain, Release:** sets the overall amplitude envelope for the instrument

## REVERB

**Bypass:** turns off reverb effect

**Send:** volume of the affected (wet) signal

**Mix:** blends between the dry signal (0) and wet signal (1)

**Size:** reverb duration

## DELAY

**Bypass:** turns off delays effect

**Send:** volume of the affected (wet) signal

**Mix:** blends between the dry signal (0) and wet signal (1)

**Time Left / Time Right:** sets the delay time in seconds for the left and right side delays independently

**Feedback:** sets the feedback amount for the delay

## SIGNAL FLOW:

### Oscillators > Grains > AM/RM Modulation > Filter > Reverb/Delay > Output

The dry signal is sent in parallel to the reverb and delay effects. The final audio output is then an independent sum of the dry/wet mixes of both effects.

It's important to note that, if an effect is not bypassed, it will always output the dry signal if the mix parameter value is less than 1.

In any case, the volume of the wet signal will be determined by the send parameter, so if you have the mix set at 1 and the send set at 0, there will be no sound coming from that effect's output.

A practical example: if you want the reverb mix to dictate the overall balance between the dry and wet signal and want to output only the wet signal through the delay, you should: set the reverb send at 1, set the reverb mix to taste, set the delay mix at 1, and use the delay send to control the volume of the delay effect.