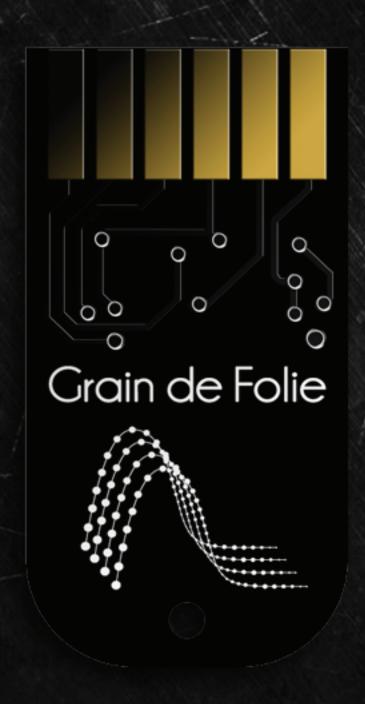# Grain de Folie

Granular Effects for Tiptop Audio Z-DSP

Grain de Folie

TIPTOP audio

Grain de Folie - Granular Effects for Tiptop Audio Z-DSP

Background:

Granular Synthesis uses small slices of sounds ('grains') to compose new sounds from existing material. By combining multiple grains of differing lengths, amplitude, pitch and speed creates very characteristic sounds of modern music.

Xenakis claims to have invented the technique and indeed his 'Analogique A-B', composed of tiny tape splices of pure tones, is credited as the first piece of granular music in 1959. Tape editing proved extremely time consuming, but by the 1970s digital processing could take the place of tape splicing. Curtis Roads dove into the early computer based granular synthesis and made some of the classic techniques known through his recordings, teaching and texts like 'Microsound'. Today, most computer audio programs have some sort of granular synthesis engine or plugin. Dr. Richard Boulanger has used granular synthesis in CSound to great effect and he is also a beta tester for this card.

The French phrase for the cartridge is "Grain de Folie" which could be translated as "seeds of madness", but in French "grain" also translates to "grain", and "madness" evokes the strange disassembling/reassembling granular process.   Also, "avoir un grain de folie" is a typically French expression to describe people behaving in a non conventional way, thus a fitting play on words.

How it works:

Granular processing requires a block of memory to hold digital samples for playback, and the Z-DSP has one second of memory for the audio used in processing. From this audio buffer the grains will sample smaller sections for playback.

The number of grains in the process determine how dense the overall output sounds. These programs have 3, 4 or 6 grains for playback. Each grain plays from a random point in the audio buffer and have an independent envelope controlling their duration. The envelope time is the 'grain size' parameter in many of the programs.

In the context of the Z-DSP, the FV1 (the DSP brain) is really not designed for grain synthesis (due to technical choices like a "circulating" delay memory, and the lack of indirect memory access), but the chip also has other design niceties that help overcome its limitations…

This cartridge implements a simple and customised granular synthesis with a limited number of grains, and parameters that mainly control the size of grains and their positions in the sample. One nice aspect of the Z-DSP is that it uses live inputs (granular synthesis is usually based on a pre-recorded sample), so it can disassemble live input and reassemble it in real-time into a different order resulting in a (usually !) nice sonic transformation of both texture and the rhythm.

Controls:

The left control knob and CV input has the same function on each program and controls how audio is sampled into the granular process. There are four sections of this control:

Off - Live input processing. Audio is continually fed through the delay line.
1-25% - Freeze buffer. No audio is input to the buffer delay line.
26-100% - Audio is put back into the buffer from the grains. The higher the level the more audio is fed back. High levels tend to create glitches in the output as it fades into nothing.

NOTE: When a program is changed or the Z-DSP powers on there is no audio in the buffer to Freeze, and no sound will be output. The Freeze+ control MUST be at 0 for a short time to process any audio before freezing!

Programs:

1> Four Spread Grains 1

Four independent grains have a random playback position with control over the length of each grain and the randomness of the position. Two grains are sent to Left output and the other two to the Right creating a spatial spread.

VC-DSP1 - Live / Freeze / Feedback. See the Control section above
VC-DSP2 - Grain size. Sets the maximum size of the grain.
VC-DSP3 - Spread. Grain Dispersion.

2> Four Spread Grains 2

Four independent grains have a random playback position with control over the length of each grain and the randomness of the position. The grains all have the same size which lessens the stereo spread. This program is very useful for rhythmic processing.

VC-DSP1 - Live / Freeze / Feedback. See the Control section above
VC-DSP2 - Grain size. Sets the maximum size of the grain.
VC-DSP3 - Spread. Grain Dispersion.

3> Pitch Modulated Grain1

Four independent grains have a random playback position with control over the pitch of each grain (LFO modulates the pitch). Two grains are sent to Left output and the other two to the Right creating a spatial spread.

VC-DSP1 - Live / Freeze / Feedback. See the Control section above
VC-DSP2 - Grain size. Sets the maximum size of the grain.
VC-DSP3 - Pitch. The amount of pitch shift applied to the grain

4> Pitch Modulated Grain2

Four independent grains have a random playback position with control over the pitch of each grain. The difference to program 3 is that the pitch shift amount is lower.
Two grains are sent to Left output and the other two to the Right creating a spatial spread.

VC-DSP1 - Live / Freeze / Feedback. See the Control section above
VC-DSP2 - Grain size. Sets the maximum size of the grain.
VC-DSP3 - Pitch. The amount of pitch shift applied to the grain

5> Three Pitched Grains

Three independent grains have a random playback position with control over the pitch of each grain (pitch shift is a fixed amount for all grains). One grain is sent to Left output, one to the Right and the third circulates in the stereo field.

VC-DSP1 - Live / Freeze / Feedback. See the Control section above
VC-DSP2 - Grain size. Sets the maximum size of the grain.
VC-DSP3 - Pitch. The amount of pitch shift applied to the grain

6> Six Grains Stereo

Six independent grains have a random playback position with control over the size of each grain. The two size controls each set the size for half the grains so two different textures or rhythms can happen at the same time. Three grains are sent to Left output and the other three to the Right creating a spatial spread.

VC-DSP1 - Live / Freeze / Feedback. See the Control section above
VC-DSP2 - Grain size 1. Sets the maximum size of half the grains
VC-DSP3- Grain size 2. Sets the maximum size of half the grains

7> Three Flying Grains

Three independent grains have a random playback position with control over the size of each grain and the panning speed. The panning creates a stereo spread.

VC-DSP1 - Live / Freeze / Feedback. See the Control section above
VC-DSP2 - Grain size. Sets the maximum size of the grain.
VC-DSP3 - PanMod. The amount of panning applied to the grain

8> Three Modulated Grains

Three independent grains have a random playback position with control over the size of each grain and modulation of the size. Modulation of the size makes the duration of each grain less static for more variation in rhythm and texture. The grains are spread out in stereo.

VC-DSP1 - Live / Freeze / Feedback. See the Control section above
VC-DSP2 - Grain size. Sets the maximum size of the grain.
VC-DSP3 - SizMod. The amount of variation in the size of the grain