# Torsion Texture Lab

## Operation Manual

Version 1.0.0

# Table of Contents

# Introduction

Torsion is a granular audio device.  Samples are played back in small segments called grains.  Many grains can play back at the same time, each with its own snapshot of parameters.  This simple mechanism can create complex and psychedelic sounds including drone synthesis, stutters, glitches, reverbs, pitch smearing, time smearing, chord generation, texture clouds, sonic bursting, and many sounds that are too strange to be named.

There are 3 grain engines and 6 user audio samples.  Each grain engine can use any of the 6 samples.  Each grain engine also has a dedicated loop LFO that is used to loop over samples.  Torsion has 6 Stereo LFOs, 3 Stereo Drift Modulators, 3 Stereo Noise Modulators, and a 32 point Modulation Matrix.
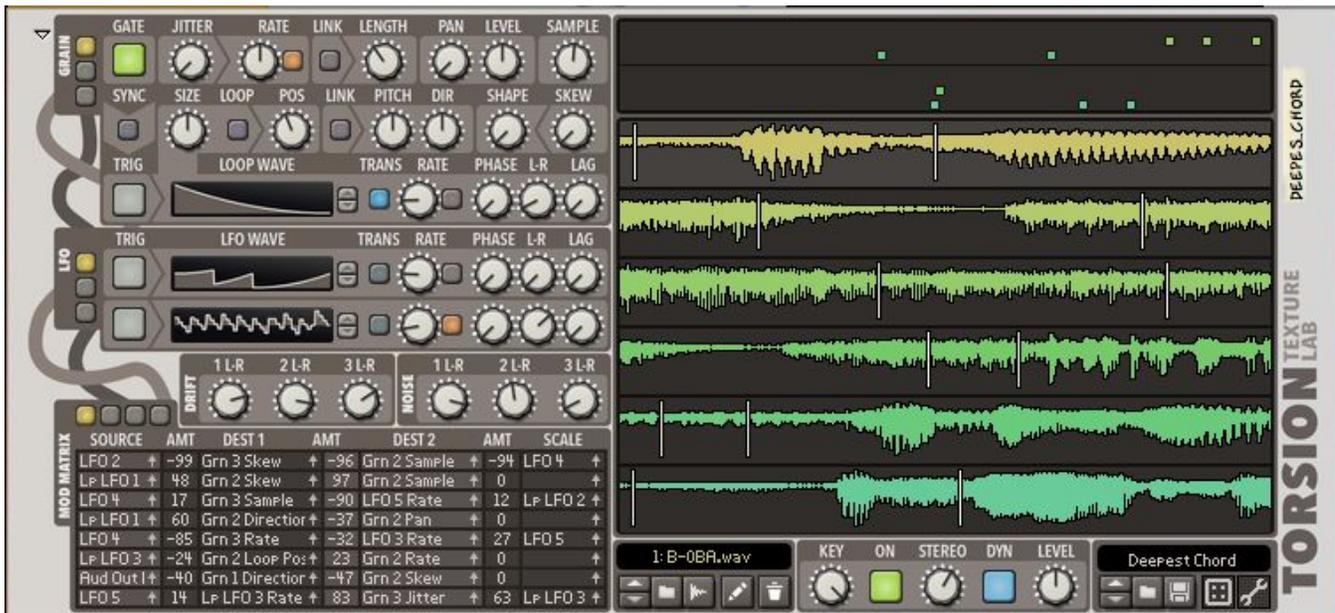


*Front Panel*



*Back Panel*

# Grains

Many grains can be active and overlapping at the same time.  When a grain is created, its parameters are locked in place.  So while there can be constant parameter modulation, a single grain plays back with the snapshot of those parameters from when it was created.

# Stereo Handling

Torsion has two separate granular systems running in parallel, one for each stereo channel.  All modulation sources are in stereo and can be adjusted with **L-R Phase Stereo** controls.  Grains can fade over to the other channel using their **Pan** parameter.  The **Stereo Width** parameter adjusts the output stereo field width.

# Main Section



## Key



**Key** is the amount of key to pitch tracking applied to samples.  At 0%, all samples will ignore the played key-note and the root-note of the sample.  A 100%, all samples will be pitched using the samples root-note and the last pressed key-note.

## On





**On** is the master gate control for the three grain engines.  If this is off, no grains will be generated.  **On** can also controlled via a CV gate on the back panel.  Incoming MIDI will trigger this gate as well.

## Stereo



**Stereo** spreading of the output signal.  0% will mix both channels and create a mono output.  200% will invert some stereo signals and create a very wide stereo projection.

## Squeeze



**Squeeze** enables Torsions internal gain leveler.  Under the hood is an upwards compressor to raise quiet signals followed by a downwards compressor / limiter to smooth transients that a burst of grains can generate.

## Level



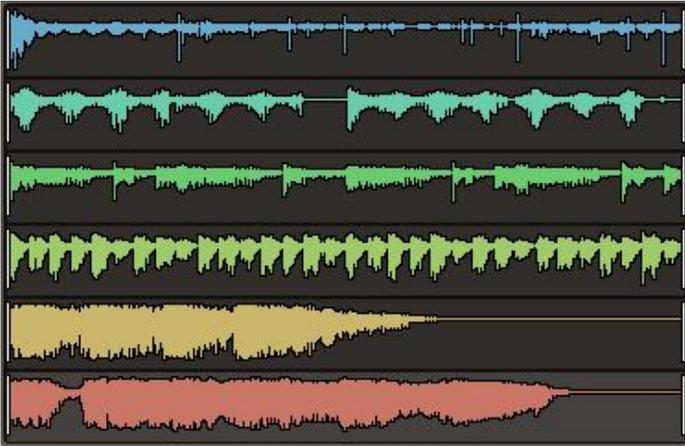Master volume **Level** of the device.

# Patch Section



*Patch Section Front Panel*

Standard Patch loading and saving.  Please see the **Random Patch Generation** section for more information about the die and tool button.

# Sample Section



*Sample Display*



*Sample Browser and Tools*

## Sample Slot
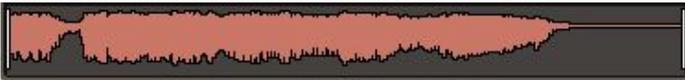


Torsion holds up to 6 user samples for grain source material.  Clicking on a sample slot will give focus to that slot in the sample browser.



Samples can be dragged and dropped from the browser into a slot.

Multiple samples can be loaded at once and will fill the currently selected slot and the reset.  For example, if you have slot 2 selected and you drag in 3 samples, slots 2,3, and 4 will be populated with the new samples. To load all 6 samples, be sure to select slot 1 before drag and dropping.

**Loop Markers**



Once a sample is loaded the loop markers can be set by Click-Dragging on the sample area.
Dragging up and down will grow and shrink the loop area.  Dragging left and right will move the loop area left
and right.  The start loop marker sets the initial **Position** in this sample.  The start and end marker define the
loop area the grain engine will use in this sample when **Loop** is enabled.

**Sample Zoom**

Holding down [Shift] while Click-Dragging the sample area allows for panning and zooming into a specific
region of the sample.  This is independent of the loop markers.
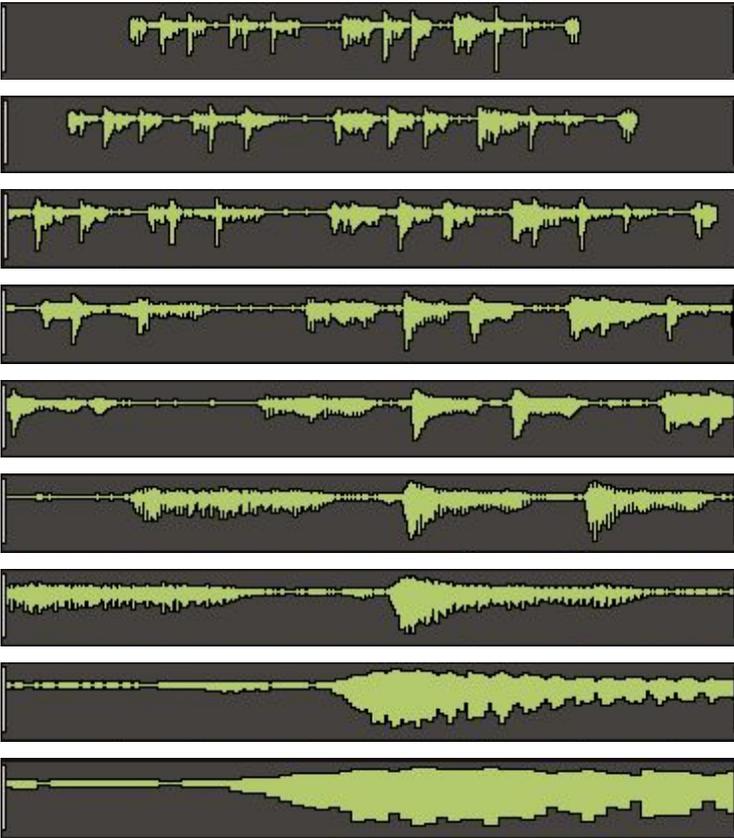


*Zooming in with [Shift]+Click-Dragging*

# Grain Display

The grain display has 3 modes that can be cycled by clicking on the display.

## Stereo Channel Mode



Stereo mode shows two lanes, one for each stereo channel.  The top lane is the left channel, the bottom lane is the right channel.  The rows are then ordered by sample slot.

## Grain Engine Mode



Grain Engine mode shows three lanes, one for each grain engine.  The top lane is grain engine one, the bottom lane is grain engine three.  The rows are then ordered by sample slot.
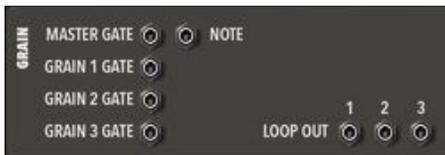
## Sample Mode



Sample mode shows six lanes, one for each sample slot.  The top lane is sample slot one, the bottom lane is sample slot six.  The rows are then ordered by stereo channel.

# Grain Section



*Grain Section Front Panel*



*Grain Section Back Panel*

## Grain Selection



Selects the grain engine panel.

## Gate



**Gate** determines whether the engine is active or not.  If **Gate** is off, no grains will be created.  Each grain engine has an additional CV gate input on the back.  If you wish to use the CV gate, the front panel button based gate should be turned off.

A Grey gate indicator means the gate is off.  A Green gate indicator means the gate is on.  An Orange gate indicator means the gate is on, but the **Master Gate / On** is off.

## Rate



Sets the frequency at which grains are created.  When tempo sync is disabled, the range is from 0Hz (Off) to 500Hz.  When tempo sync is enabled, the available rates are: 32/4, 28/4, 24/4, 20/4, 16/4, 12/4, 8/4, 7/4, 6/4, 5/4, 4/4, 7/8, 3/4, 5/8, 2/4, 7/16, 5/8T, 3/8, 4/8T, 5/16, 1/4, 3/16, 2/8T, 1/8, 1/8T, 1/16, 1/16T, 1/32, 1/32T, 1/64, 1/128.

# Rate Length Link



Enabling the **Rate Length Link** will cause the **Length** of grains to be inversely proportional to the **Rate**. If the **Rate** goes up, the **Length** of the grains decreases. If the **Rate** goes down, the grain **Length** increases. This helps create a steady number of active grains when the rate fluctuates.



*Rate change with Link enabled. Rate increases cause length decreases.*



*Rate change with Link disabled. Rate increases does not affect length.*

# Length



Sets the duration of the grain. If **Rate Length Link** is disabled, the **Length** range is 0ms to 1sec. If **Rate Length Link** enabled, then the **Length** range is from 0% to 1000%. When it is set to 100%, the audio will be smooth and continuous as long as all other parameters are at their default state.



*Link enabled. 200%*



*Link enabled. 100%*



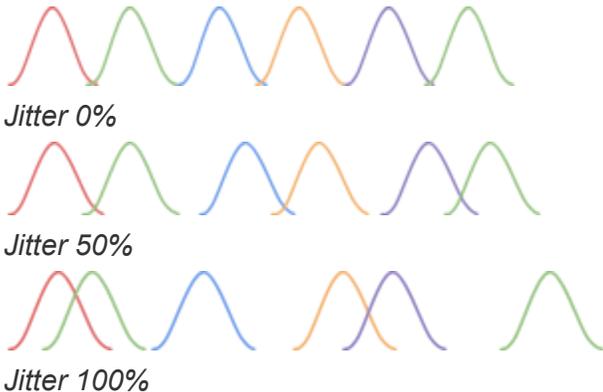*Link enabled. 50%*



*Link enabled. 25%*



Noise modulated length

## Jitter



**Jitter** is random noise added to the rate clock timing.  If the **Rate** is set at 10Hz, a grain will be emitted every 100ms.  A **Jitter** of 100% would cause each grain's start to randomly be shifted 0ms to 100ms.  **Jitter** does not affect **Length**, only emission time.



*Jitter 0%*



*Jitter 50%*



*Jitter 100%*

## Pan



Torsion has two separate granular systems running in parallel, one for each stereo channel.  Grains are always emitted from a single channel in the sample.  Grains can fade over to the other channel using their **Pan** parameter.  At a **Pan** of 0%, grains will remain in their channel.  At a **Pan** of 50%, grains will be mixed equally into both channels.  At 100%, the grain will be written to the other channel.  Modulation of **Pan** will spray the grains across the stereo field.



*Grain Pan at 0%, Maintain Channel*
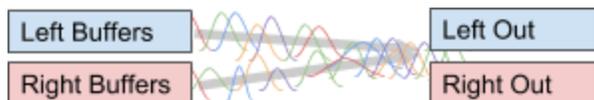


*Grain Pan at 50%, Mix Channels, Mono*
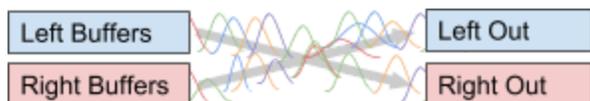


*Grain Pan at 100%, Swap Channel, (Ping Pong Style Delays)*



*Grain Pan at 50%, Modulated Pan, Stereo Spray*

## Level



**Level** sets the amplitude of each grain.  Modulating this parameter can give interesting pulsing effects.



*Grains with noise modulation on level.*

## Sample



**Sample** controls which sample is being used for the grain.  The range of the knob is evenly divided among the loaded user samples.  Modulating this can smear grains across multiple samples.



*Sample parameter range with 1 Sample, 2 Samples, 4 Samples, and 5 Samples*

## Position



Grain start **Position** offset in the user sample.  This is an offset to the samples loop start position.

## Loop LFO



The **Loop LFO** is a dedicated LFO that modulates **Position** if **Loop** is enabled.  See **LFO Section** for parameter details.

## Loop Enable



Enables the modulation of **Position** with the **Loop LFO**

## Loop Size

Can be used to scale the size of the Sample loop points. The loop points will be scaled from the midpoint of the start and end markers.  The range is scaling is 0 to 2.

## Loop Gate Sync

Synchronizes the Loop LFO **Trig** to the grain **Gate**.  This is useful if you have **Loop Enabled** and are using the grain engine to play loops.  Then, using CV or MIDI to trigger the grain **Gate**, this acts as a loop player restart trigger.

## Pitch

**Pitch** adjusts the grain pitch up to +/- 12 Semitones.

## Direction

Sets the direction of the grain.  Positive values are forwards, negative are backwards.

## Position Pitch Link

Sets the grain pitch based on the change in position.  This creates the effect of tape or vinyl being slowed down and speed up.  To hear the effects of this, adjust the rate of the **Loop LFO** with **Loop Enable.**

## Shape



**Shape** determines the amplitude envelope shape of a grain. At a **Shape** of 0%, the envelope is a cosine curve. At a **Shape** of 50%, a smooth trapezoid.  At a **Shape** of 100%, a rectangle.



*The Shape at values 0%, 50%, 100%.*
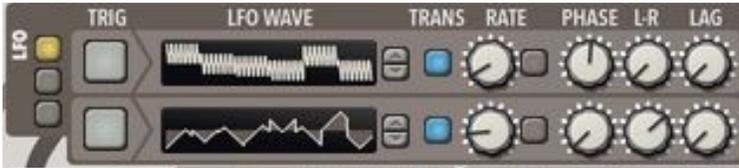
## Skew



**Skew** will shift the **Shape** of the envelope in either direction.  At -100%, it creates a sharp attack like a ping or pluck sound.  At 100%, it creates a reverse sounding grain.  Extreme values can sound harsh.



*Skew values at -100%, 0%, 100%*

# LFO Section



Torsion contains six LFOs and 3 Loop LFOs, each with 1000 waveforms.

## Trig



Trig will cause the LFO to move to its initial position.

## Waveform



Selects the LFO waveform.

## Transport Sync



Locks the waveform to the transport song position.

## Rate



Sets the cycle rate of the LFO.  Free rates range from 0.0Hz to 50.0Hz.  Available Synced Rates: 32/4, 28/4, 24/4, 20/4, 16/4, 12/4, 8/4, 7/4, 6/4, 5/4, 4/4, 7/8, 3/4, 5/8, 2/4, 7/16, 5/8T, 3/8, 4/8T, 5/16, 1/4, 3/16, 2/8T, 1/8, 1/8T, 1/16, 1/16T, 1/32, 1/32T, 1/64, 1/128.

## Phase



Sets the **Phase** of the LFO waveform which is also the Initial phase on a reset.

## Phase Stereo



Sets the phase difference between the LFOs feeding the Left and Right channels.
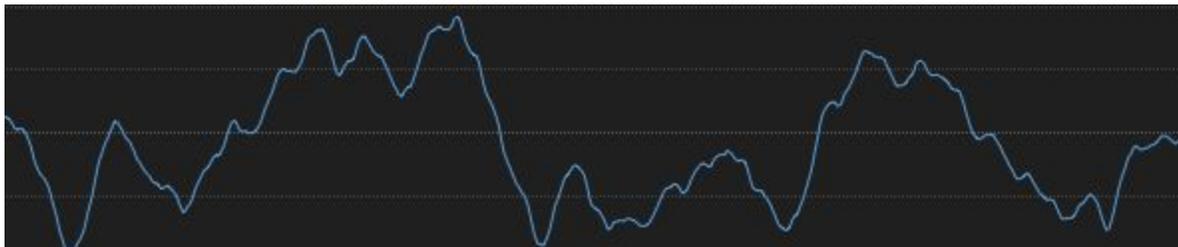
## Lag



Limits how fast the LFO value can change its output value.

# Drift Section



The Drift modulation source uses a physical modeling of a mass with random accelerations applied attached to a spring.  This creates some very slow natural motions.
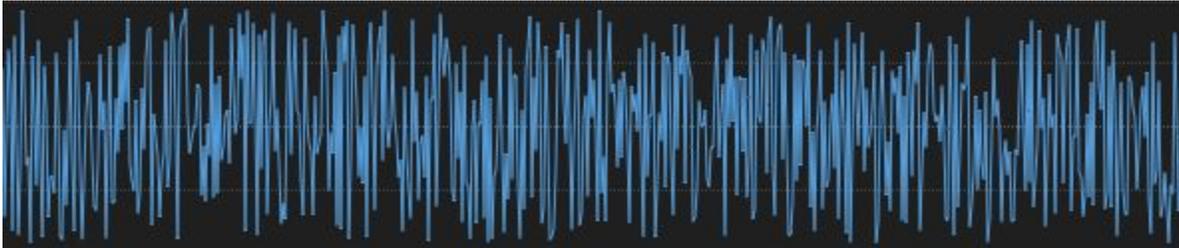


*Drift modulation captured with Skope.*

# Phase Stereo



Crossfades between to stereo drift sources, each feeding the left and right channels.  A value of 0 will produce a single mono source.  A value of 100 will produce two separate stereo modulation sources.

# Noise Section

The Noise modulation source generates random values between -1.0 and 1.0 without any smoothing.  This is a good source if you want lots of variation for each generated grain.



*Noise modulation captured with Skope.*

## Phase Stereo



Crossfades between to stereo noise sources, each feeding the left and right channels. A value of 0 will produce a single mono source.  A value of 100 will produce two separate stereo modulation sources.

# Modulation Section



The modulation matrix is used to connect a modulation source to modulation destinations. The source modulation can be scaled via an optional scale amount.

Sources and Destinations can be selected either by clicking in the relevant column and selecting an item from the pop-up menu, or by clicking on the arrow next to it, dragging the mouse over a control and letting go of the mouse button. Note that some items, like "Audio - Output Envelope Follower" can only be selected through the menu, as it has no corresponding control on-screen.

To quickly delete an entry in the Mod Matrix (or to reset an amount to "0"), simply [Command]/[Ctrl]-Click it.

## Modulation Matrix Panel Select



Selects which modulation panel is visible.

## Modulation Sources

| Source Parameter | Description |
| --- | --- |
| LFO 1, LFO 2, LFO 3, LFO 4, LFO 5, LFO 6, Loop LFO 1, Loop LFO 2, Loop LFO 3 | Torsion LFO Modulation sources<br>Range:-100 to 100 |
| Drift 1, Drift 2, Drift 3 | Slowly drifting random modulation sources<br>Range: -100 to 100 |
| Noise 1, Noise 2, Noise 3 | Fast random modulation sources<br>Range: -100 to 100 |
| CV1 - CV8 | CV Modulation Inputs on back panel. |
| -200,-100,100,200 | Constant Values.<br>Scaling with 200 will double the amount of modulation from source. |
| Audio Output Envelope | Tracks the output audio's level. |
| Key Velocity | Velocity of note<br>Range: 0 to 100 |
| Key Note Full | Note value (whole keyboard) mapped to range: -100 to 100. |
| Key Note Oct | Note value (octave-wrapped) mapped to range: -100 to 100. |
| Key Gate | 100 when key held, 0 when key released. |

## Modulation Destinations

The details of these destinations are documented in their respective sections. They are listed here for reference.

| | |
|---|---|
| LFO 1-6 | Gate, Phase, Rate, Lag |
| Loop LFO 1-3 | Gate, Phase, Rate, Lag |
| CV Out | CV Out 1-8 |
| Grain 1-3 | Rate, Length, Jitter, Gate, Loop Size, Loop Position, Pitch, Direction, Shape, Skew, Level, Pan, Position, Sample |

# Random Patch Generation



Quite possibly the most important button on Torsion is the random patch generator.  It is the icon of a die next to the patch loading and saving.  Load some samples into Torsion and keep clicking the die to come up with endless permutations of granular sounds.  Please see the **Random Patch Generation** section for more information.

# Tools Menu

Reset Grain ▶
Reset LFO ▶
Reset Mod Matrix
Reset Drift & Noise
Reset Sample Loop & Zoom
Reset All

Copy Grain ▶

Random Section ▶
Random Parameter ▶
Random Amount ▶
Random Complexity ▶
Modulation Source Pool ▶
Modulation Dest Pool ▶
Modulation Scale Pool ▶

Color Theme ▶

## Reset Parameters

| | |
|---|---|
| Reset Grain | ▶ |
| Reset LFO | ▶ |
| Reset Mod Matrix | |
| Reset Drift & Noise | |
| Reset Sample Loop & Zoom | |
| Reset All | |

Allows for the resetting of parameters by section.

### Reset Grain

```
1
2
3
─────
All
```

### Reset LFO

```
1
2
3
4
5
6
──────────
All LFO
──────────
Grain Loop 1
Grain Loop 2
Grain Loop 3
──────────
All Grain Loop
```

## Copy Grain

Copy Grain ▶

| |
|---|
| 1 > 2 |
| 1 > 3 |
| 1 > All |
| 2 > 1 |
| 2 > 3 |
| 2 > All |
| 3 > 1 |
| 3 > 2 |
| 3 > All |

Allows all parameters from a grain engine to be copied.

# Random Options

| | |
|---|---|
| Random Section | ▶ |
| Random Parameter | ▶ |
| Random Amount | ▶ |
| Random Complexity | ▶ |
| Modulation Source Pool | ▶ |
| Modulation Dest Pool | ▶ |
| Modulation Scale Pool | ▶ |

**Random Section**

| |
|---|
| ✓ LFOs |
| ✓ Drift |
| ✓ Noise |
| ✓ Grain 1 |
| ✓ Grain 2 |
| ✓ Grain 3 |
| ✓ Sample Zoom |
| ✓ Loop Points |
| ✓ Modulation Matrix |
| Select All |
| Clear All |

Selects which sections will have their parameters randomized.

**Random Parameter**

✓ Gate/On
✓ Jitter
✓ Rate
✓ Rate Sync
✓ Rate Length Link
✓ Length
✓ Pan
　 Level
✓ Sample

✓ Loop Gate Sync
✓ Loop Size
✓ Loop Enable
✓ Position
✓ Pitch Position Link
　 Pitch
✓ Direction
✓ Shape
✓ Skew

✓ Loop Wave
✓ Loop Transport
✓ Loop Rate
✓ Loop Rate Sync
✓ Loop Phase
✓ Loop Phase Stereo
✓ Loop Lag

✓ LFO Wave
✓ LFO Transport
✓ LFO Rate
✓ LFO Rate Sync
✓ LFO Phase
✓ LFO Phase Stereo
✓ LFO Lag

　 Select All
　 Clear All

Selects which parameters to randomize.

**Random Amount**

```
   10%
   20%
   30%
   40%
   50%
   60%
   70%
   80%
   90%
 ✓ 100%

   Random
```

After parameters are randomized, this sets how much to actually apply.  Lower values will slowly morph patches.

**Random Complexity**

```
   10%
   20%
   30%
   40%
   50%
   60%
   70%
   80%
   90%
   100%

 ✓ Random
```

Adjusts how "complex" the generated patches are.  The more complex the patch, the more parameters will be displaced from the default settings and the more modulation routings will be generated.

**Modulation Source / Scale Pool**

```
✓ LFO
✓ Random Drift
  Noise

✓ Output Envelope Follower

✓ CV Input 1
✓ CV Input 2
✓ CV Input 3
✓ CV Input 4
✓ CV Input 5
✓ CV Input 6
✓ CV Input 7
✓ CV Input 8

  Select Common
  Clear All
```

Selects the Modulation sources to use in the random patch generation.  CV inputs will only be used of they are connected.

## Modulation Dest Pool

```
  LFO Gate
  LFO Phase
✓ LFO Rate
  LFO Lag

✓ Grain Emit Rate
✓ Grain Emit Length
✓ Grain Emit Jitter
  Grain Emit Gate
✓ Grain Loop Size
✓ Grain Loop Pos
  Grain Pitch
✓ Grain Pitch Direction
✓ Grain Shape
✓ Grain Skew
  Grain Level
✓ Grain Spread
✓ Grain Position Mod
✓ Grain Sample

✓ CV Output 1
✓ CV Output 2
✓ CV Output 3
✓ CV Output 4
✓ CV Output 5
✓ CV Output 6
✓ CV Output 7
✓ CV Output 8

  Select Common
  Select Pitched
  Select All
  Clear All
```

Selects the Modulation destinations to use in the random patch generation. CV outputs will only be used of they are connected.

## Color Theme

# Torsion Grain Flow Chart

**Torsion Grain Flow**

| | | |
|---|---|---|
| **Gate** Grain creation state. | | |
| **Jitter** Random variation in rate | → | **Rate** Grain creation Frequency |
| **Rate Length Link** Length depends on inverse of Rate | → | **Length** Grain duration |
| **Sample** User Sample audio data | ┈┈ | **Sample Loop Points** Loop markers on user sample |
| **Loop LFO** Dedicated Loop LFO | → | **Loop Size** Expand or contract sample loop points → **Position** Location of data inside user sample |
| **Position Pitch Link** Set pitch based on position movement | | |
| **Loop Enable** Use loop LFO to modulate position. | | |
| **Direction** Forwards or backwards playback | → | **Pitch** Playback speed of grain |
| **Skew** Shift of grain envelope shape | → | **Shape** Grain envelope |
| | | **Pan** Grain placement in stereo filed |
| | | **Level** Grain amplitude |
| | | **Single Grain** |