
Mutation Collider Rack Extension

# OPERATION MANUAL v 1.0.0

# Revision history

### Version 1.0.0 - Initial Release

# Contents

## About Mutation Collider

Mutation Collider Rack Extension is an innovative and creative device which lets you collide/mix 4 separate audio signals on a two-dimensional plain across X and Y axes by using the “Mix Indicator” (a graphical pointer of the current position), and additionally modulate the position of the mix indicator.

Additionally, Mutation Collider consists of (and can be used as) a Stereo Imager, 2 Multi-Mode Filters (including Low Pass 12, Low Pass 24, Low Pass +, Band Pass 6, High Pass 12, High Pass +, Comb+, Comb- and State Variable Filters), Mix Control (comprised out of 4 frequency-splitting DJ-Kill-Style mixers and one additional Main DJ-Kill-Style mixer for the combined signal), Standard Channel Controls (pan, gain, mute, solo), Volume Lock control, Compressor, Limiter/Maximizer. Finally, Mutation Collider has two LFX LFO modules built-in, and these LFOs control the horizontal and vertical position of the mix indicator, respectively.

## Need to Know and How-to

Collider should be attached to an instrument.

After you create Mutation Collider, **the best start would be to copy the notes from your source instrument and paste them into the Collider’s note lane (or draw your own notes or draw one long note)**. This is how the 2 LFO modules are triggered. They are an essential part of Collider’s core function (the mix). The two LFOs can modulate the position of the mix and they only work while a note is running in Collider’s note lane.
In other words: COLLIDER’S NOTE IS PLAYING = LFOs ARE RUNNING!

You can re-arrange the notes rhythmically in Collider to match your own feel and groove. Note key is not important, it’s only important if a note is played and for how long. You will be able to see that the LFOs are working, it will be indicated on the mix indicator which will change its shape from a square to a 3D cuboid.

You don’t need to put in any notes if you will not use LFOs.

**Patches** - The patches are assuming that Collider is receiving 4 input audio signals and that its main output is properly connected (as per Reason’s rules).

**Main Function (the Collision Mixer Core)** - To use the Collision Mixer Core, try clicking on the mix indicator (white square/cuboid) and dragging it across the display. Each corner represents one audio source. The closer the mix indicator is to a source, the higher the source’s volume is. The volume of a source is kept at 100% until the mix indicator crosses half the screen distance (either vertically, horizontally or diagonally). After the mix indicator passes half of the screen distance the volume starts decreasing and the further away from the source’s corner it is, the lower the source’s volume is. The full screen distance (horizontally, vertically or diagonally) away from a source sets the source’s volume to 0.

To draw a custom LFO modulation, make sure you turn on “Custom” wave type for the particular LFX LFO module.

**When “Retrigger” is OFF on the LFO, an initial note is still required in Collider’s note lane to initialize the modulation.**

**First Steps:**

Organic bass:

- Try connecting 4 bass instruments all playing the same notes (same pitch etc.)
- Use different sounding patches (i.e. calm, agressive, deep and something with mids)
- Pres play and start dragging the Mix Indicator (white square) across the Collision Mini-Display
- Try doing some fast, agressive strokes, try some stirring and then try some very gentle and slow moves to get the feel of the controller and of the 4 basses coming together.

Rhythm stirring with LFOs:

- Connect 4 similar rhythms but with different characters (works best on break beats) from i.e REX or WAV
- IMPORTANT: Draw a long note in the Colliders note lane (to cover your loop)
- Load any of the “Amen” or “Stir” patches
- Press play, enjoy!

Use an LFO:

- Reset the device
- IMPORTANT: Draw a long note in the Colliders note lane (to cover your loop)
- Have four instruments connected (from either example from above)
- Turn the LFOs ON
- Turn the “Depth” on both LFOs all the way down (no modulation) and press play
- Now start increasing “Depth” on the left LFO and notice how it’s modulating the indicator on the main display across the X-axis (horizontally).
- Now raise the “Depth” of the second LFO to what suits you
- To get a natural sound, play around with depths, rate, wave type, time mode, phase etc. on both LFOs
- With LFOs you can achieve truly amazing mixes OR you can do the mix manually and use the LFOs just to give it that organic “movement”.

Stereo image:

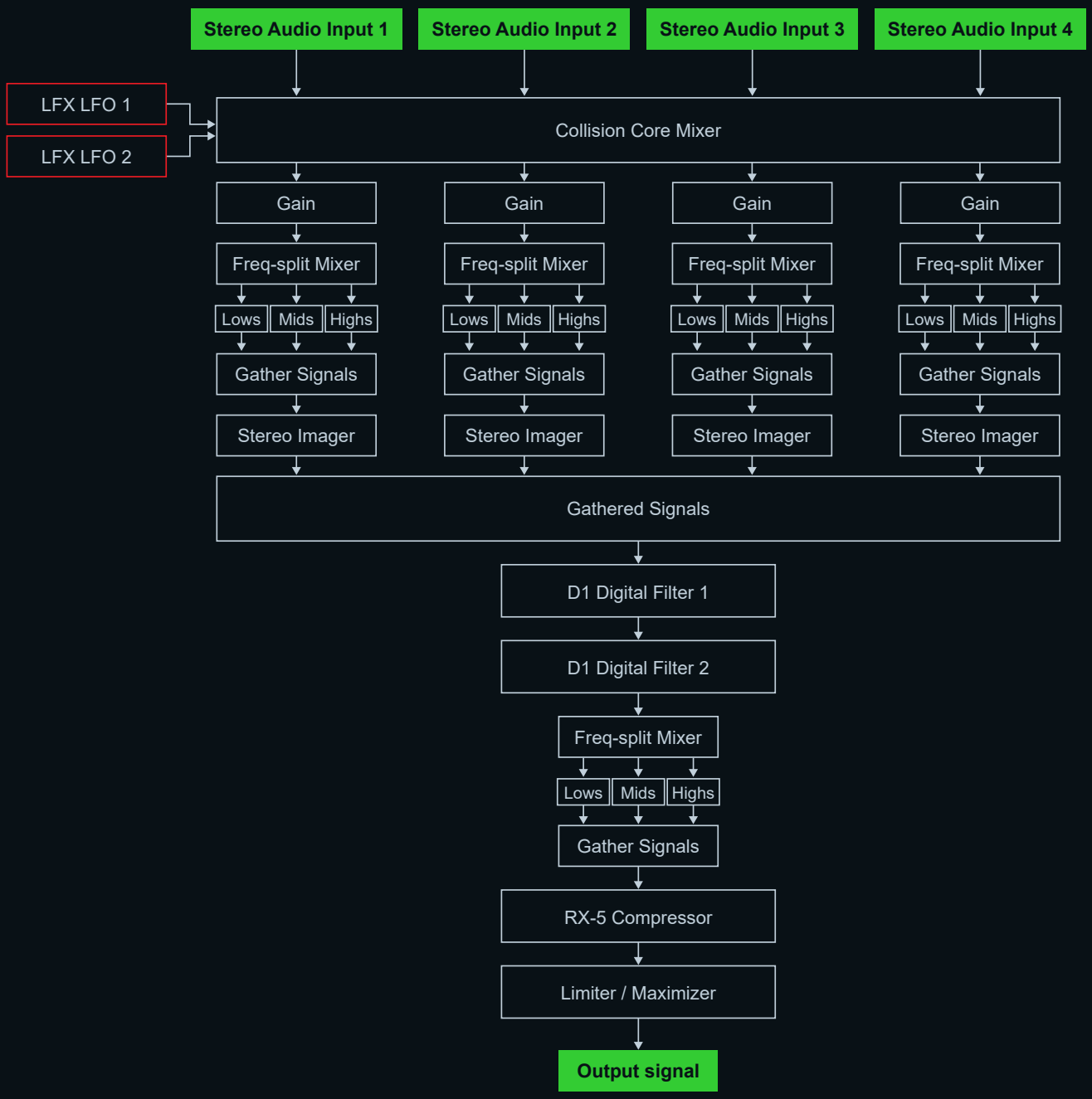
- Listen to what type of sounds you bring in and use the Stereo Width (and pan if needed) to spread your mix naturally and utilize the entire stereo spectrum. Use the Stereo Image Mini-Display (just under the main display) for a graphical representation of your stereo mix.

Filters:

- You can use filters both technically and creatively
- Use them technically to achieve a cleaner sound
- Use them creatively to shape your sound into something new (CV mod of Filter Cutoff does wonders)

# Device Block Diagram

### Audio signal flow diagram with LFO modulation indication



# Navigation

Collider comes with a large selection of effects. This is an overview / quick explanation of the modules.

### Effect Tabs

Navigate the devices master sections. Each master section represents a logical group of effects.
“Studio”, “Mix” and “LFO” tabs let you navigate over device tabs. There are also “Tips” and “About” info tabs.
The Collision Mixer Core is always shown.

# Master Sections

### Studio Master Section

- Collision Mixer Core (always visible, includes Main Collision Display, Stereo Imager Mini-Display, Channel Controls for each Audio Input including Gain, Pan, Stereo Width, Volume Lock, Mute, Solo, Label and Color control)
- 2x D1 Digital Multi-mode filter
- RX-5 Compressor
- Limiter & Maximizer (always visible)

### Mix Master Section

- Collision Mixer Core (always visible)
- 4x Kill-Style / DJ-Style frequency-splitting mixer / crossover, one for each audio source
- 1x Main 4x Kill-Style / DJ-Style frequency-splitting mixer / crossover for the combined output

### LFO Master Section

- Collision Mixer Core (always visible)
- 2x LFX Free-Draw Advanced LFO modules

# Components, Effects & Control

## Collision Mixer Core


## Audio Input Source Channel Control


- Mix Indicator: Dual control that controls Coordinate X and Coordinate Y properties - Controls audio levels of input audio signals.
- Source A (B, C & D) Gain: Volume gain of the audio input signal
- Source A (B, C & D) Pan: Pans the audio signal across across left and right channels
- Source A (B, C & D) Stereo Width: Adjust stereo width using an M-S matrix (no effect on mono signals).
- Source A (B, C & D) Volume Lock: Locks the source volume and bypasses Collision Mixer for this source
- Mute Source A (B, C & D): Mutes the corresponding audio input source
- Solo Source A (B, C & D): Solos the corresponding audio input source
- Channel Control Label Display: Lets users add labels for each source
- Source A (B, C & D) Red (Green & Blue): Sets the source color using the RGB color system

# Effects & Controls

### RX-5 Comressor


- Comp Enabled: Enables/Disables compressor effect
- Comp Threshold: Audio level above which compression is applied
- Comp Ratio: Amount of gain reduction to apply
- Comp Soft Knee: Gradual increase in ratio as signal level crosses threshold
- Comp Attack: Controls how fast compression will start when the threshold is reached
- Comp Release: Controls how fast the compression will stop when input gets below threshold
- Comp Output: Controls the output volume after compression

### D1 Digital Filters / Filter 1 & Filter 2


- Filter 1(2) Enabled: Enables/Disables the filter effect
- Filter 1(2) Type: Type of filter to apply
  - LP12: 12 dB/oct lowpass
  - LP24: 24 dB/oct lowpass
  - LP+: Brickwall lowpass (no resonance)
  - BP6: Bandpass with 6 dB/oct roll-offs
  - HP12: 12 dB/oct highpass
  - HP+: Brickwall highpass (no resonance)
  - Comb+: Comb filter
  - Comb-: Comb filter with inverted phase
  - SVF: State Variable filter
- Filter 1(2) Cutoff: Cutoff frequency
- Filter 1(2) Resonance: Strength of resonant peak at cutoff frequency

### Limiter


- Low-CPU safety limiter with a fixed 0 dBFS threshold.
- Limiter Enabled: Enables/Disables the effect
- Limiter Release: Recovery time.
- Limiter Mode: Soft knee, hard knee, or hard clipping.

### Maximizer (within Limiter)

- Maximizer On Off: Enables/Disables the Maximizer within Limiter
- Maximizer Drive: Maximizer input level (only has an effect when Maximize is On).

### Mix Control


- Low X Point A (B, C, D & Main): Frequency that devides the low and mid frequency bands
- High X Point A (B, C, D & Main): Frequency that devides the mid and high frequency bands
- Kill Low(Mid, High) A (B, C, D & Main): Completely "kills" the volume of the corresponding frequency band (as a DJ mixer would)
- Low(Mid, High) Level A (B, C, D & Main): Level of the corresponding frequency band (as in a DJ mixer)
- Out Level: Final out volume.

### LFX LFO 1 & 2 (or X & Y / Horizontal & Vertical)

2x LFX - Advanced LFO Modules, description below applies to both LFOs


- LFO 1 modulates the X Coordinate property (or the horizontal position of the Mix Indicator), and LFO 2 modulates the Y Coordinate property (vertical position of the Mix Indicator).
- LFO 1 Unipolar: Bipolar LFO covers the entire range of the modulation, in other words, it can modulate the position of X (or Y, respectively) coordinate fully by the length of the screen in both directions (left-right or up-down, respectively). Unipolar LFO only modulates X (or Y) coordinate across one side (or the opposite side if Invert is ON).
- Retrigger LFOs:
  - Applies to both LFOs at once, there are no LFO 1 and 2 options, one options controls both.
  - OFF: Trigger/Initialize the LFO with a single note in the note lane and it runs independently
  - ON: Each note in the note lane re-triggers the LFO and the LFO modulates while note is held.
- LFO 1 Time Mode: Set Rate units to Time (Hz - cycles per second) or Beats (quarternotes per cycle)
- LFO 1 Rate: Sets the duration of 1 cycle of the LFO waveform (relative to Time Mode)
- LFO 1 Wave Type:
  - Sine
  - Triangle
  - Square
  - Saw
  - Random (random steps)
  - Drift (smooth random)
  - Saw Up
  - Saw Exp (exponential decay)
  - Custom: a wave created by what you draw on the LFX display

  LFO 1 Start Phase: Position of the LFO wave (from start to end, in degrees) on which to start modulating. 180 degrees will start from the middle of the LFO wave.

  LFO 1 Depth: Amount of modulation. 0% = no modulation, 100% = full amount.

- LFO 1 Smooth: Smoothing of parameter changes, useful for very slow LFO rates. At the maximum setting the initial value is held forever.
- LFO 1 Invert: Inverts the modulation
- Custom LFO 1 Steps Curve: A custom, 64-step column(bar)-type interactive display that lets you draw your own LFO modulation curve. Note: On LFO 2, only the first 35 out of the 64 steps can be automated due to Reason’s limitations (the number of properties that can be automated per device).

Even though the custom waveform is created from 64 steps, the device's algorithm will make the actual modulation smooth. In extreme cases, on extremely low rates and with no smoothing applied, the actual modulation might be stepped so a tiny amount of smoothing is required in order to smooth out the modulation.

Modulation indicator (the white dot in the white square): follows the modulation wave (phase and velocity) of the currently selected Wave Type, in real-time.

Custom Modulation Steps (columns, bars) Curve: A free-hand controlled parameters that create a custom-drawn modulation wave. The custom wave you create must be activated by selecting "Custom" in the Wave Type (display will read: Custom Wave: ON, and the modulation curve will turn red).

### Back Panel & CV

2x LFX - Advanced LFO Modules, description below applies to both LFOs


Mutation Collider comes with a range of CV input options. The following CV Inputs are available:

- LFO 1 (and 2) Rate Input
- LFO 1 (and 2) Start Phase Input
- Filter 1 (and 2) Cutoff Input
- Filter 1 (and 2) Resonance Input
- Source A (B, C & D) Low Level Input - controls the level of the low frequency band in the mixer
- Source A (B, C & D) Mid Level Input - controls the level of the mid frequency band in the mixer
- Source A (B, C & D) High Level Input - controls the level of the high frequency band in the mixer
- Source A (B, C & D) Pan L/R Input

## Support

For support regarding Mutation Collider, please visit https://www.bassgrid.com/support-section.html

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