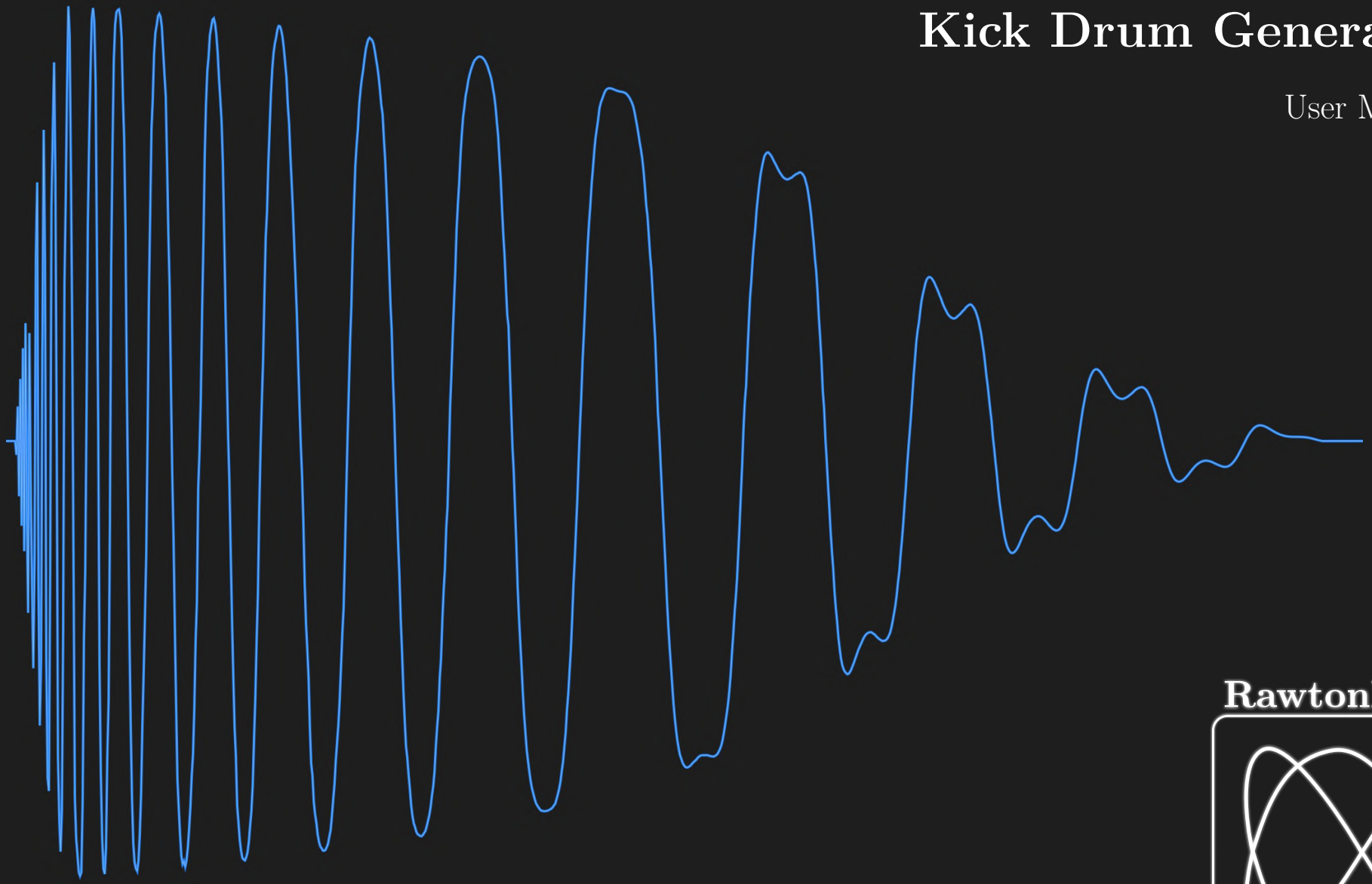
Rupture

Kick Drum Generator

User Manual



RawtonForge

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Rupture is a powerful and expressive kick drum generator, designed to deliver everything from clean analog subs to sharp, aggressive impacts, all within an intuitive and modular interface.

Built from the ground up for sound designers and producers, Rupture combines flexible waveform shaping, precise envelopes, FM control, and dynamic filtering in a unified toolkit. Whether you're sculpting punchy techno kicks, warm lo-fi thumps, or glitchy experimental basses, Rupture offers full control over every stage of your kick's shape and evolution.

Each sound is generated in real time from a pure sine oscillator, then transformed through a series of waveshapers, envelopes, filters, and harmonic sculpting tools. With parameter randomization, an intuitive snapshots system, and a highly accurate built-in oscilloscope, Rupture makes complex kick synthesis both accessible and inspiring.

This manual walks you through each section of the plugin in detail, from oscillator shaping to dynamic filtering, to help you unlock its full creative potential.

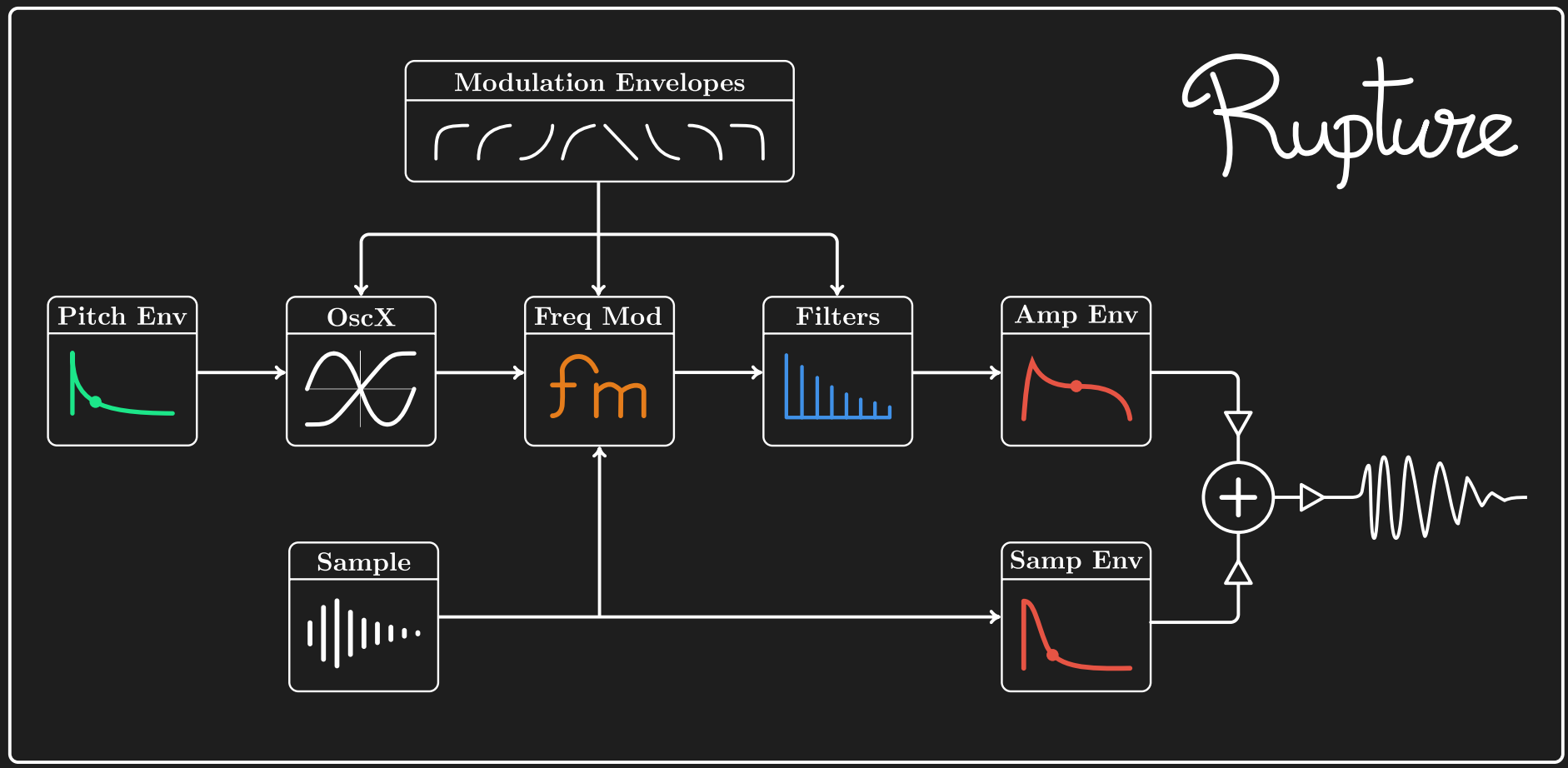
Let's break the silence.

Interface Overview

Each interactive zone in the diagram links to the relevant section for a detailed explanation of that component.

Architecture Diagram

This diagram illustrates the general architecture of the synthesizer. Each block represents a functional module (oscillators, filters, envelopes, modulation sources, etc.) and shows how these elements are interconnected. The purpose of this overview is to provide a clear understanding of the signal flow and modulation paths within the instrument.



The OscX oscillator combines a classic waveform generator and a real-time waveshaper. The principle is simple: it starts with a basic sine wave and shapes it to create rich harmonics. This flexible design allows you to generate a wide range of waveforms in real time.

A Pitch Envelope controls the oscillator's fundamental frequency, creating dynamic pitch movement that turns a simple oscillator into a powerful KickDrum engine. The carrier frequency can also be modulated by a second sound source (the Modulator), enabling FM to add extra character and complexity.

The Filter section sculpts the harmonic content. It can remove the fundamental, apply a low-pass filter to soften high frequencies introduced by saturation, or boost the attack using an exciter that enhances the highs.

An amplitude envelope shapes the dynamics of the sound after all processing. Thanks to its S-shaped curve options, you can push saturation as hard as you like without losing punch, the envelope keeps full control over the dynamics.

A sample-based noise generator (pre-recorded for consistency) lets you add a click, dirt, or subtle texture. This noise can also modulate the oscillator through FM to add grain. You can load your own noise samples via drag and drop, and a dedicated envelope controls its level independently.

Many parameters can follow a master modulation envelope, and the ModKnobs allow you to adjust the modulation curve individually for each parameter. This system lets your kick evolve dynamically over time, the waveform twists and changes shape from start to finish.

With the Randomize function, you can explore countless combinations of settings. Every kick will sound different. And once you find the perfect kick, it stays 100% consistent and identical with every hit, down to the sample.

OscX: Oscillator & Waveshaper

6 ModKnobs to control 6 different waveform shapes, each with its own independent envelope.

Modulation Amount
controls the intensity of the effect

Modulation Curve
adjusts the shape or response of the modulation, from convex to concave

Modulation Direction
sets whether the waveform evolves from sine to shaped, or shaped back to sine

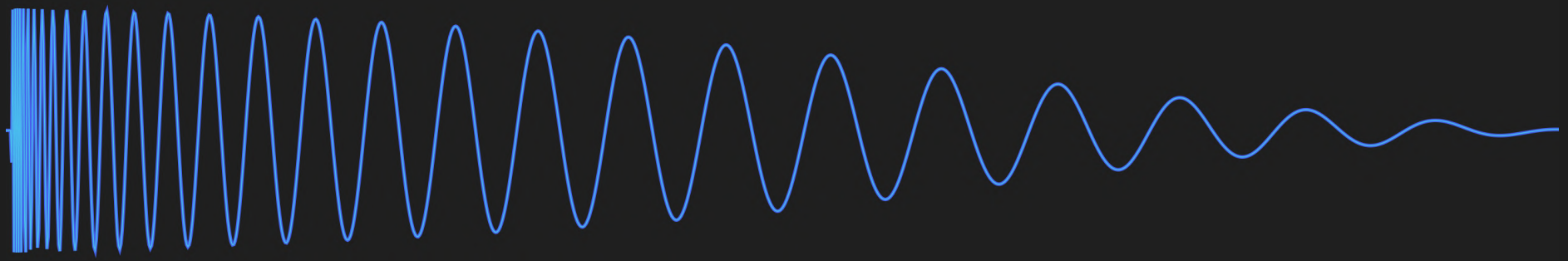
OscX is a versatile oscillator designed for precise control over waveform shaping. Starting from a pure sine wave, it allows you to sculpt rich and punchy waveforms tailored to kick design and beyond.

The core of **OscX**'s sound-shaping power lies in its six **ModKnobs**. Each one applies a specific transformation to the base waveform, bending, folding, or distorting it in a unique way. Modulation is applied in real time and shaped by three internal parameters: amount, curve, and direction, allowing for subtle movement or extreme reshaping over time.

Modulations are typically linked to the amplitude envelope, so the waveform can evolve dynamically through the kick's attack, body, and tail. This lets you emphasize the transient, reinforce the body, or add motion and texture to the decay, all within a single sound.

Sine

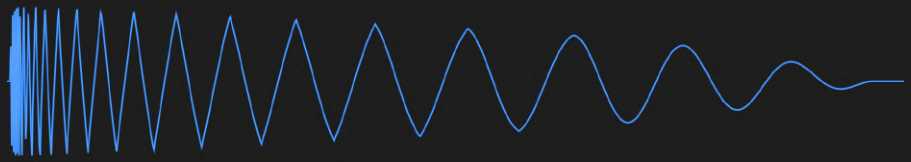
With no modulation at all, the waveform is a perfectly stable sine wave. This means there are no extra harmonics in its spectrum, only the fundamental frequency is present.



In the following examples, we'll see how applying waveform modulation can transform a pure sine wave into a dynamically reshaped signal throughout the evolution of the kick. Each example illustrates a different modulation type in action.

Triangle

Morphs the oscillator from a sine wave to a triangle. Adds linear rise and fall, clarity, and a sharper tone without strong harmonics. At full amount, the waveform becomes a perfect triangle.



Sawtooth

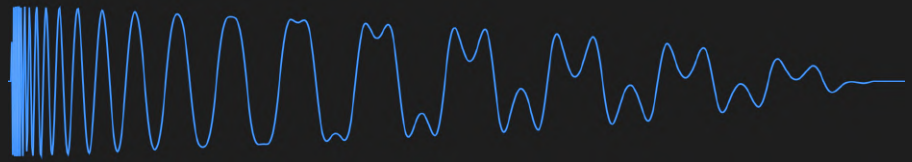
Morphs the oscillator into a sawtooth. Replaces smooth curvature with a sharp downward ramp, adding both odd and even harmonics. At full amount, forms a classic sawtooth shape.

Square

Morphs into a square waveform. Flattens the top and bottom, creating strong odd harmonics and a hollow, punchy tone. At full amount, forms a true square.

Fold

Applies wavefolding. The waveform reflects back on itself beyond a threshold, adding rich harmonics. Creates a metallic texture with adjustable density.



Spike

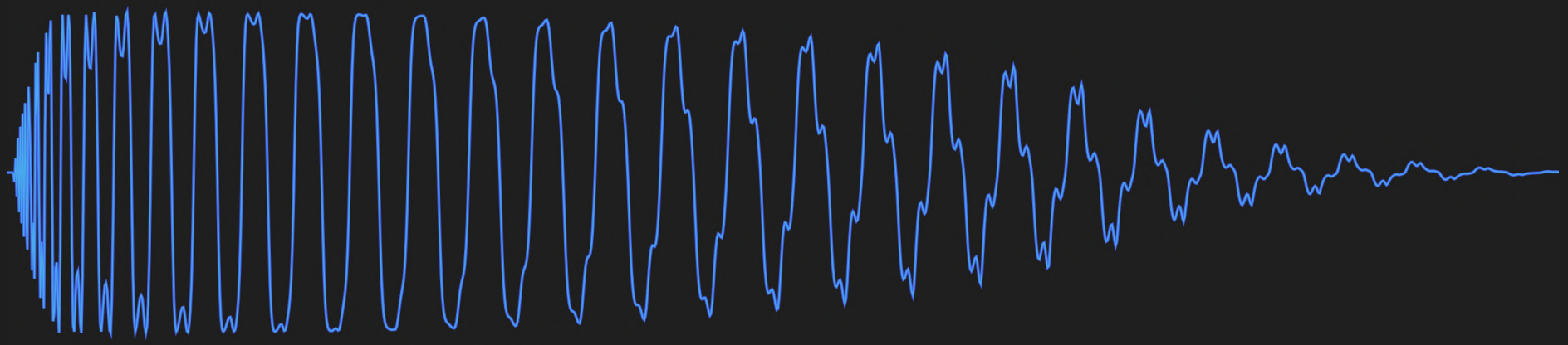
Adds a sharp spike in the waveform. Boosts upper harmonics and reduces the fundamental, creating a brighter, sharper tone. At high settings, reduces low-end presence.

Drive

Applies saturation. Soft-clips the signal for added warmth, loudness, and presence. At full amount, gives a compressed, rich sound without harshness.

Each **ModKnob** can perform three operations: control how deep the waveform is transformed, define the modulation curve over time, and reverse the direction of the modulation.
These three aspects respectively correspond to: **Amount**, which sets the depth of the transformation; **Slope**, which defines how the modulation evolves over time, from exponential (fast start) to logarithmic (slow buildup); and **Invert**, which flips the modulation direction (e.g. from sine → square to square → sine).
We will explore the internal behavior of a ModKnob in more detail in the following section.

These modulators can be used independently or combined to create unique waveforms that evolve over time, adding punch, saturation, brightness, or harmonic complexity to your kick.



In this waveform, a bit of each transformation has been applied, each with its own amount and direction. As you can see, the generated kick is never static. This evolution over time gives the sound its character and depth.

Pitch Envelope

XY Pad

Provides direct control over Curve (X-axis) and Shape (Y-axis). Allows for expressive and efficient pitch shaping with a single movement.

Shape

Controls the vertical shaping of the pitch drop.
Lower values generate a convex–concave shape (fast then slow), while higher values create a concave–convex shape (slow then fast).

Pitch

Sets the starting frequency of the pitch envelope.
Higher values result in a more pronounced pitch drop and a sharper, more aggressive transient.

Curve

Controls the horizontal shape of the pitch drop.
The curve remains convex, but lower values make the drop faster and more immediate, while higher values smooth out the transition.

Time

Defines the duration of the pitch envelope relative to the amplitude envelope (Amp Time).
At 50%, the pitch envelope lasts half as long as the volume envelope.
At 100%, both envelopes are equal in length. Values above 100% extend the pitch movement beyond the amplitude envelope.

The **Pitch Envelope** controls how the oscillator pitch evolves over time, shaping the kick's attack, impact, and tonal movement.

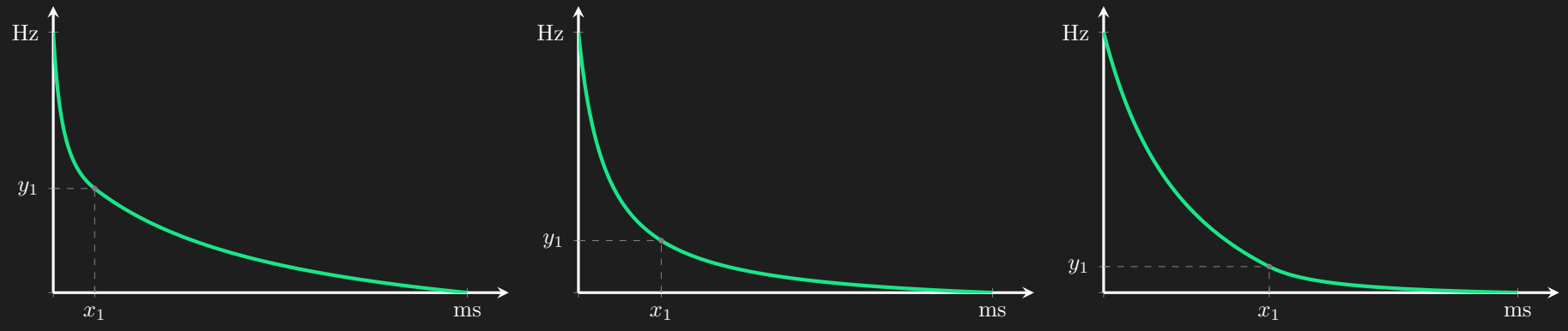
Pitch Envelope Curve

This innovative curve was developed specifically for kick drum synthesis. It is defined as a *piecewise rational function*, composed of two homographic branches that meet with smooth curvature:

$$P(x, x_1, y_1) = \begin{cases} \dfrac{a_1 x + b_1}{c_1 x + d_1}, & \text{if } 0 < x < x_1 \\ \dfrac{a_2 x + b_2}{c_2 x + d_2}, & \text{if } x_1 < x < 1 \end{cases}$$

The coefficients are dynamically computed to ensure that both the value and the slope match perfectly at the junction point x_1, guaranteeing a smooth and expressive transition.

The curve's behavior is intuitively controlled by an XY pad, allowing you to shift the point of maximum curvature along both axes—like pressing on a tight elastic band and sliding your finger left or right to reshape the curve.



Pitch envelope curves generated from the true function for different (x_1, y_1) values

Frequency Modulation

FM Visualizer

You can visualize the selected waveform, its amplitude, and its frequency ratio relative to the fundamental.
In this example, there are three oscillations, which means the waveform has a frequency three times higher than the fundamental.

Amount (ModKnob)

Sets the depth of the FM effect, while also shaping how the modulation evolves over time from convex to concave curves. It also controls the direction of the modulation, either rising from 0 to full or falling from full to 0 across the decay envelope.

Speed

Controls the frequency ratio between the modulator and the carrier oscillator. The ratio ranges from 1x to 4x the base frequency.
This parameter is governed by a custom staircase-shaped function that allows for smooth transitions between discrete harmonic ratios. It helps the user lock easily onto musically useful FM ratios while avoiding unstable in-between values, maintaining a continuous feel across transitions.

Source

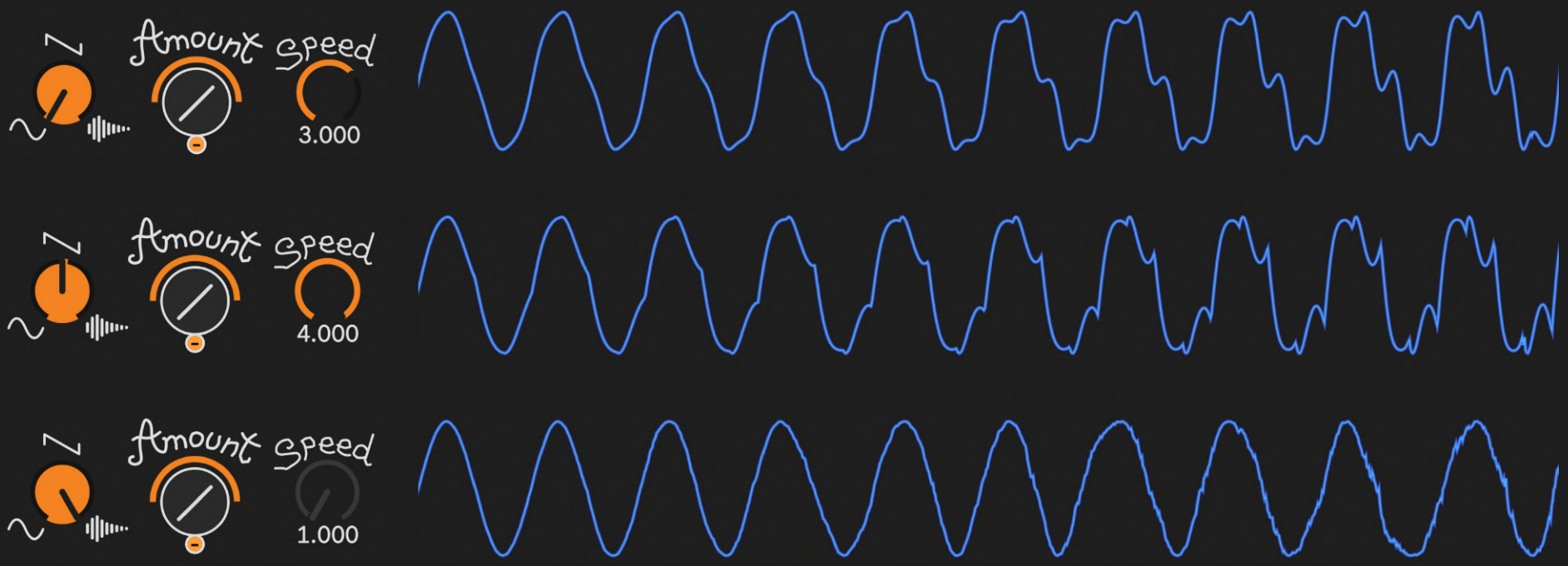
Selects the waveform used as the FM modulator.
Three positions are available :

- Sine : smooth and controlled harmonic addition.
- Saw : more bright, sharp, and aggressive overtones.
- Noise : introduces chaotic and textured modulation. It is possible to access the Sample Panel to edit this noise source, and even drag and drop an external sample.

The **FM** adds rich harmonic complexity and aggression to your kick by modulating its frequency with another signal.

FM modulation effect

Here are three examples of frequency modulation: a sine wave with a ratio of 3, a saw wave with a ratio of 4, and noise. All three are set to a rising envelope, so you can clearly observe how the modulation progressively affects a pure sine wave and alters its shape throughout the evolution of the kick.



Note that when the modulation source is set to Noise, the Speed parameter becomes unavailable, since timing control is handled in the Sample section.

Filters

The **Filter Page** offers advanced tools to sculpt the tonal balance and harmonic content of your kick. It includes three key modules: a harmonic suppressor, a dynamic lowpass, and an exciter.

Waveform Visualizer

You can visualize a single oscillation cycle, allowing you to clearly observe how the waveform's shape evolves over time based on modulation parameters such as FM, waveshaping, or filtering.

Harmonic Mixer

This parameter controls the balance between the fundamental and its harmonics. At minimum, only the fundamental is present. As the value increases, the fundamental fades out, letting the harmonics take over. This allows precise shaping of the kick's spectral content.

Dynamic Filter

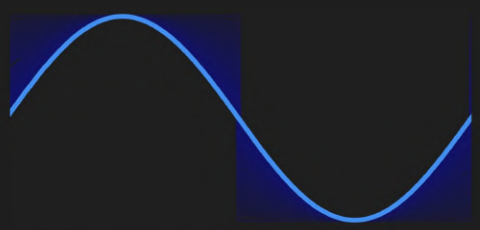
A one-pole lowpass filter whose cutoff dynamically tracks the oscillator's frequency.
The filter starts wide open and progressively closes as the modulation decays, shaping the envelope of brightness.
You can control the starting point of the tracking multiplier (from 1× to 10× the fundamental frequency), as well as the curvature of its evolution.
The lowpass can also be enabled or disabled using the small switch.

Exciter

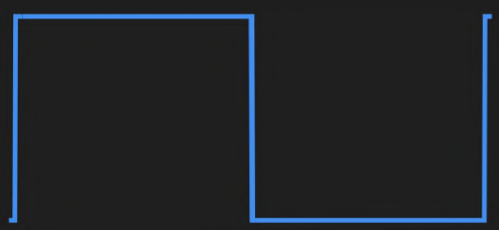
Enhances high frequencies and transients by applying a 1-sample delay and reinjecting the difference into the signal, This adds crispness and clarity, making the attack more defined.

Filter Tools: Harmonic Mixer

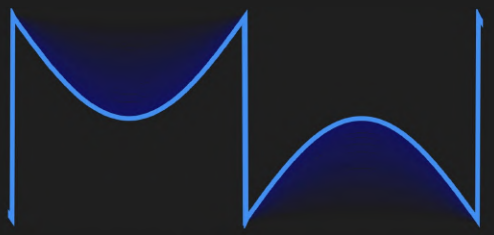
To illustrate the effect of the Harmonic Suppressor, here we apply it to a square wave. You can see how this tool allows you to isolate the sine wave (the fundamental) contained within the square, or do the opposite: remove the fundamental and leave only the harmonics.



Harmonics at ***−100%,*** isolates only the fundamental.



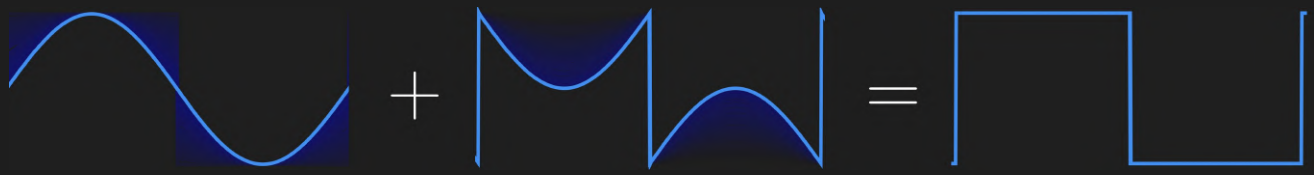
At ***0%,*** the signal remains unchanged.



At ***100%,*** the fundamental is removed, leaving only the harmonics.

Tip: Try duplicating your kick onto a second track within the same group in Live: one with Harm set to −100% and the other to +100%. This lets you process the harmonic and fundamental parts separately. For example, you can apply reverb only to the harmonic layer while keeping the fundamental clean and punchy.

You can also think of it this way: by adding the two separated signals (one with only the fundamental, the other with only the harmonics), you can perfectly reconstruct the original sound.



Note: The Harmonic Suppressor does not affect the harmonics generated by frequency modulation (fm).

Filter Tools: Dynamic Lowpass

This example shows two square waves: one unaffected by the filter (with the lowpass switch turned off), and one shaped over time by the dynamic lowpass filter. As the modulation decays, the filter progressively closes, following the oscillator's frequency. You can notice that even at the beginning, where the cutoff is set to 10 times the fundamental, the filter slightly smooths the sharp edges of the square. By the end, with the same ratio but a much lower base frequency, the effect becomes clearly audible and softens the waveform.

Why use a dynamic frequency filter?

Unlike a standard lowpass, which uses a fixed cutoff, this filter follows the fundamental pitch, adjusting the cutoff proportionally. In a kick drum, the frequency often drops dramatically, for instance, from 20kHz to 20Hz. If the cutoff were fixed, the effect would vary unpredictably with pitch. By tying the filter to the frequency, the waveform remains consistently shaped, regardless of how fast or slow the kick evolves.

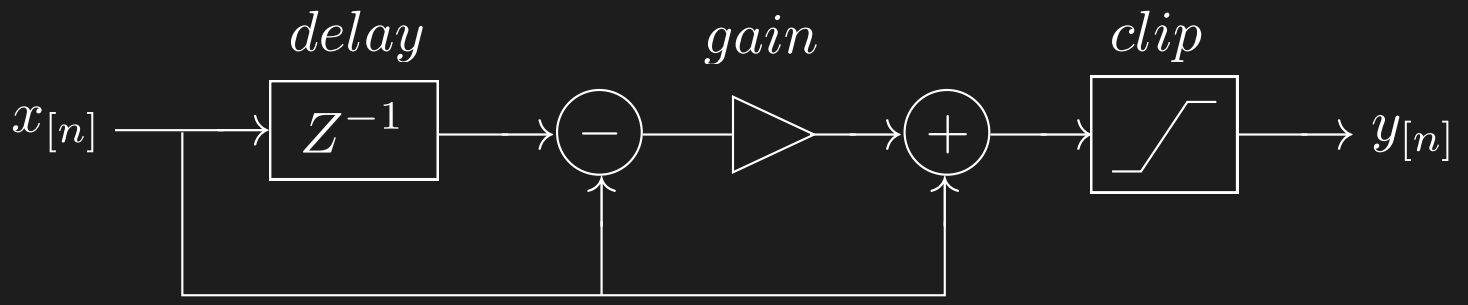
Filter Tools: HF Exciter

The Exciter enhances the attack phase of your kick by emphasizing the very high-frequency transients typically present at the start of the sound. It works by detecting rapid changes in the waveform and adding a boosted, saturated version of those changes back into the signal.

Technically, the process involves delaying the signal by one sample and subtracting this delayed version from the original. This operation isolates the high-frequency content (essentially a simple differentiation). The resulting transient is then amplified, added back to the original signal, and passed through a clipper to keep the output within the normalized range.

This technique allows you to bring out the sharpness and definition of the attack without affecting the body of the kick. It's especially useful for making kicks cut through a mix more clearly.

Tip: Apply the Exciter to restore brightness that heavy filtering has removed, or add presence to soft, rounded kick drums—without inserting another EQ. And if you've given your kick a long volume-attack, use the Exciter to reclaim transient sharpness on the initial hit.



Schematic diagram of the exciter. The "Excite" parameter controls the gain applied to the differentiated signal before it is added back and clipped.

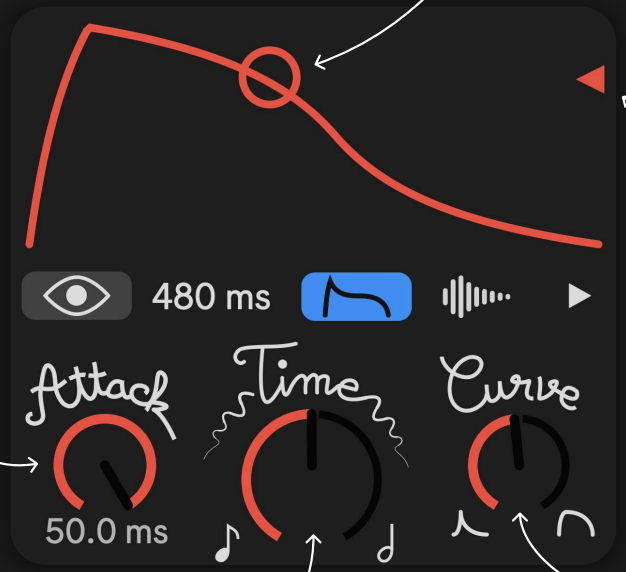
Amplitude Envelope

Attack

Sets the attack time of the volume envelope.
Higher values result in a softer onset (up to 50 ms), useful for smoothing transients or layering.

XY Pad

Provides direct control over Curve (X-axis) and Shape (Y-axis).
Allows for expressive and efficient volume shaping with a single movement.



Shape

Controls the flexion of the amplitude envelope.

- Lower values generate a convex–concave shape (fast attack, slow decay),
- Higher values create a concave–convex curve (slow attack, fast decay).

Curve

Controls the curve of the amplitude drop.

- Lower values create an exponential decay, resulting in a fast and sharp fade.
- Higher values produce a more gradual, logarithmic decay with a slower fade-out.

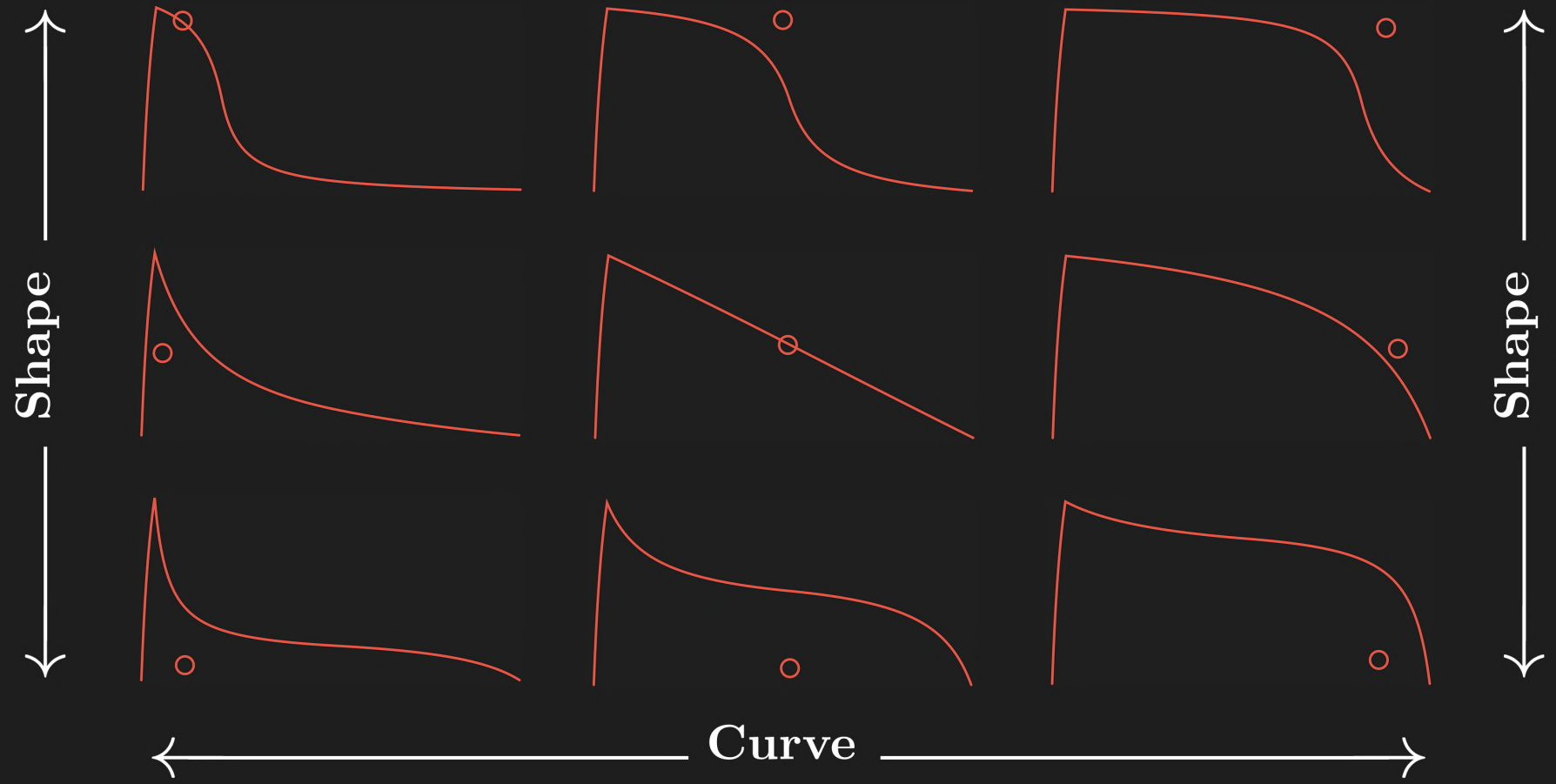
Time

Sets the duration of the amplitude envelope.
Synced to the project BPM:

- Minimum = 1/8 note
- Middle = 1/4 note
- Maximum = 1/2 note

This defines the rhythmic length and decay of the kick. The resulting duration is displayed in milliseconds, for example: 480 ms.

This innovative envelope function allows you to sculpt the amplitude of your kick with precision and speed. It was specifically designed to produce musical and natural-sounding decays tailored for kick drum synthesis.



This image displays 9 envelope shapes generated by combining the two main parameters of the XY Pad

Samples & Noise

This module lets you layer a short sample with the main oscillator to enhance the attack by adding a click, or to bring atmosphere. You can adjust how the sample is played, its start point, length, speed, and envelope. Route it to the oscillator's FM input via Noise Input to inject your sample's texture into the kick. Adjust the sample volume directly in the Mixer.

Sample Display

Shows the sample as it's played, after all parameters are applied.
Useful to see how the envelope shape the signal.

XY Pad

Lets you shape the envelope curve in a highly flexible way.
The X axis moves the inflection point horizontally.
The Y axis adjusts the curvature — above 0.5, it sharpens the slope at the inflection point; below 0.5, it inverts the envelope shape.

Start

Sets where playback begins in the sample (0–50 ms).
For example, 25 ms means the first 25 ms are skipped.

Access

Click the Access button to show or hide the Sample section.

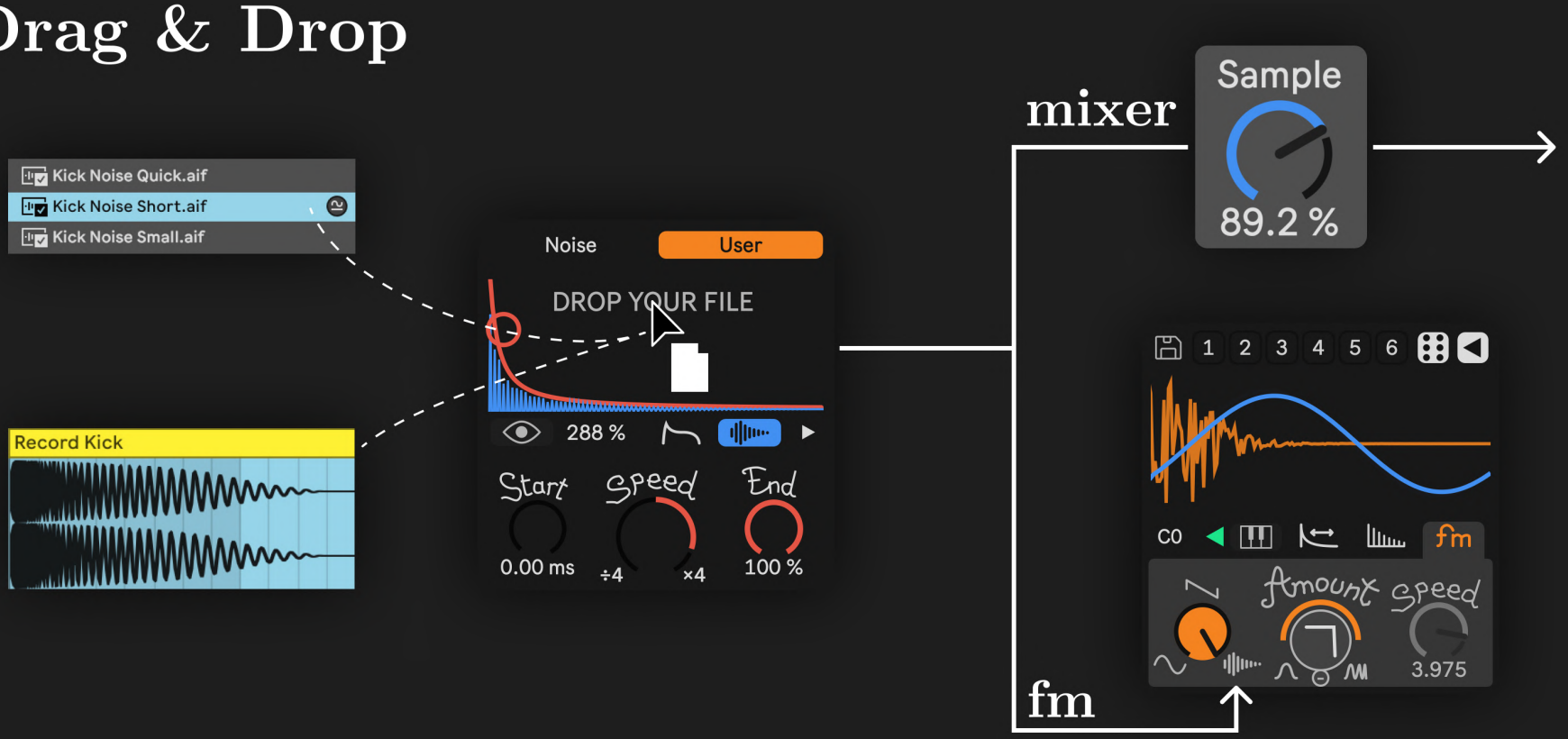
Speed

Sets playback speed from ÷4 (= 25%) to ×4 (= 400%).
The higher the value, the higher the pitch — and the shorter the sample.
For example: ×2 (= 200%) plays 1 octave up and twice as fast; ÷2 (= 50%) plays 1 octave down and takes twice as long.

End

Sets the volume envelope length of the sample, as a % of the oscillator's amp envelope Time.
For example, 50% with a Time of 300 ms means a 150 ms sample envelope.

Drag & Drop



You can switch the Noise selector to User to load your own sample. Simply drag and drop any audio file into the sample engine — it will replace the default white noise. Want to go back? Just switch back to Noise to restore the original signal.

This opens up a wide range of creative possibilities: try using field recordings, textures, or even a synthesized kick you've consolidated and dragged back into the sample engine. Speed it up to sharpen the attack like in a trance kick, or slow it down for a heavier, slower punch. Thanks to its dedicated envelope — separate from the oscillator's — the sample can evolve differently, giving you more control over its shape and timing.

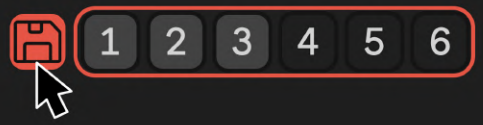
Snapshots

Snapshots are internal memory slots that let you save and recall up to six variations of your kick, directly within the device. Think of them as "hot presets" quick to access, lightweight, and entirely self-contained.

Unlike global presets, snapshots are stored inside the device itself. If you copy/paste the device or drag it to another track, your snapshots remain intact. However, if you load a new instance of the device from your library or browser, it will start blank, with no saved snapshots.

To preserve your snapshot collection across sessions, simply use Live's preset save button. All six snapshots will be embedded in the saved device. This is a great way to create and maintain a compact personal bank of kick variations—all within a single instance.

How to Save a Snapshot



Step 1 – Enable Save Mode

Click on the save icon to enter Save Mode.
→ A red outline will appear around the six snapshot slots, indicating that you can now save a configuration.

Step 2 – Click a Slot

Click on any of the six slots:

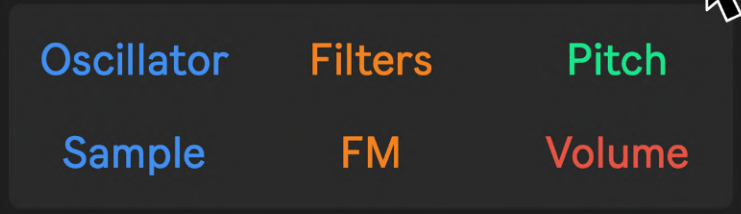
- If the slot is empty, your current kick parameters will be saved there.
- If the slot is already used, it will be overwritten with the new settings.

Randomization

Randomization gives you a powerful way to discover new kick sounds in just a few clicks.

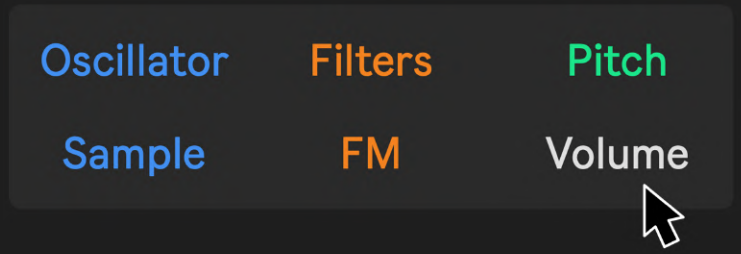
Randomize

instantly generates new values for a selection of parameters, carefully curated to always produce musically usable results, no wild or broken settings.



Random Matrix

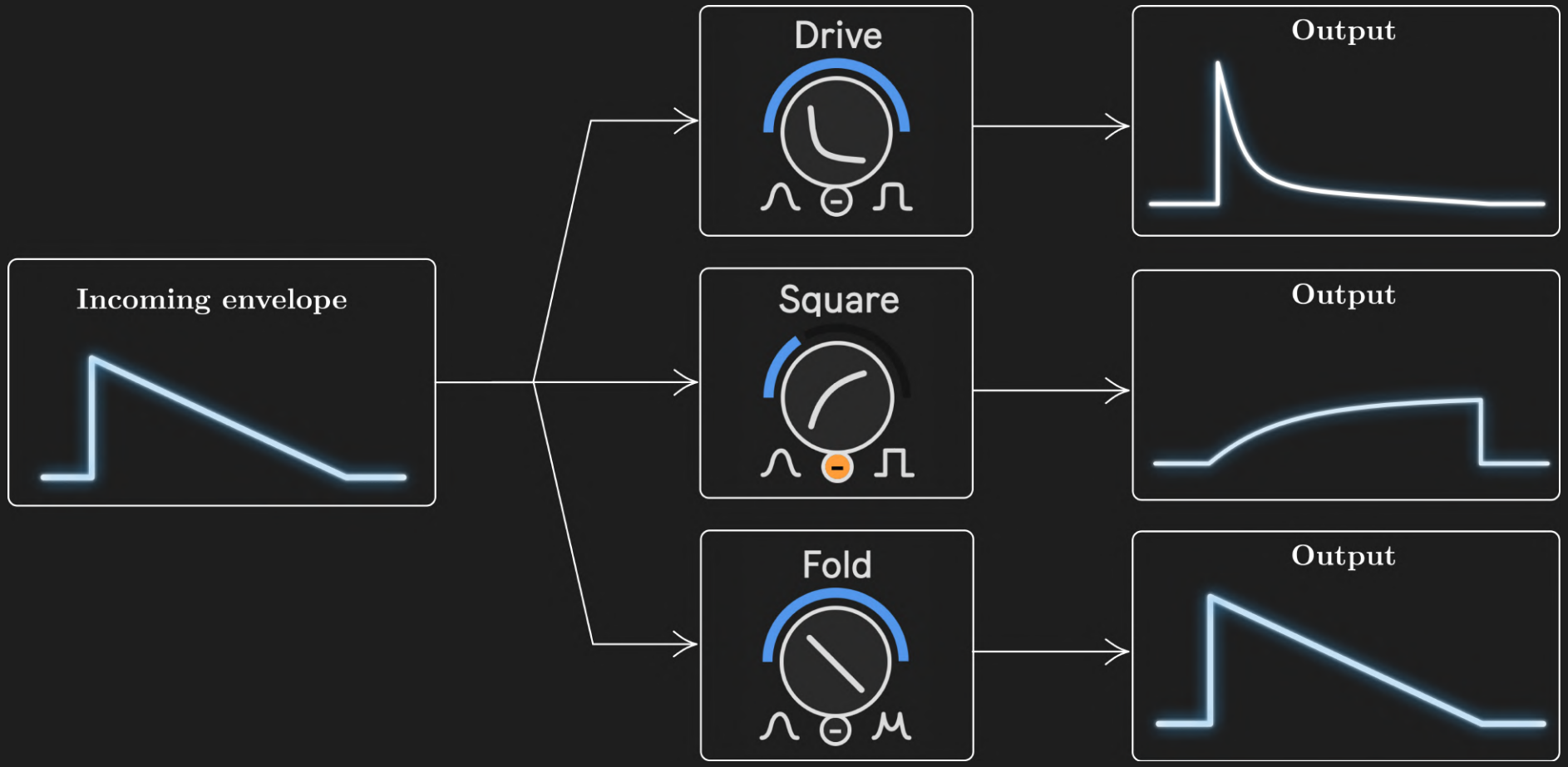
lets you choose which sections of the device are affected by randomization.



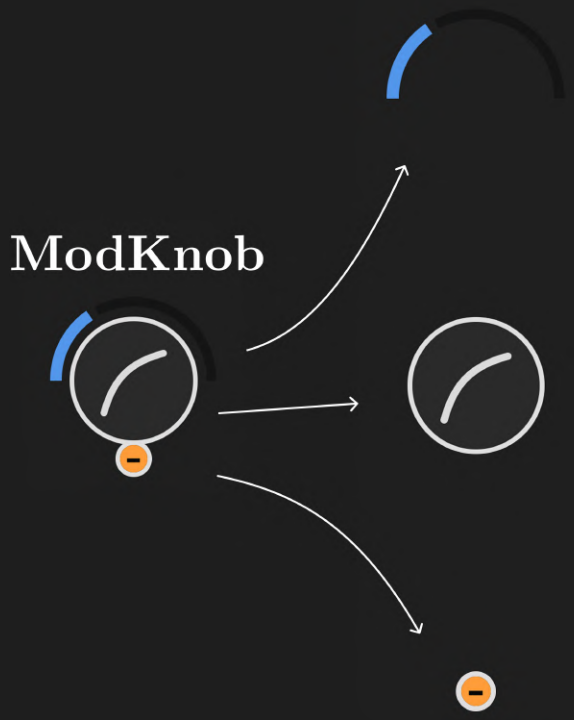
You can toggle individual modules : Oscillator, Sample, FM, Filters, Pitch, and Volume, on or off via the dropdown menu. Disabled sections will be excluded from randomization.

Modulation Control: ModKnobs

A single master envelope linked to the Amp Envelope, is sent to all ModKnobs. Each ModKnob then adapts, reshapes, or transforms this signal to generate multiple distinct envelopes from just one source.



They are composed of three separate controls to shape the incoming envelope :



Depth

Adapt the Depth of the incoming envelope. At 0%, no modulation occurs; at 100%, full modulation depth is applied.

Curve

Reshapes the incoming envelope: at its default position the curve is linear; turning the knob down makes it convex (exponential), and turning it up makes it concave (logarithmic).

Direction

Set the direction of the incoming envelope. When the LED is yellow, the envelope is read in reverse (end to start); when it's off, it plays normally (start to end).

Note: To make this knob behave like a simple static control with no modulation, turn the Curve parameter all the way up. The curve becomes so concave that the value stays constantly at the maximum : The Depth Level

Mixer

Sample :

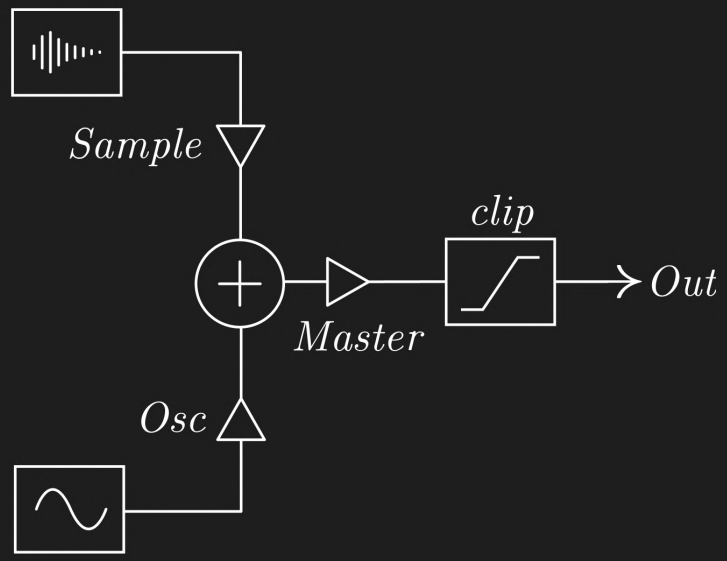
Adjusts the level of the sample layer.

Osc :

Sets the volume of the synthesized oscillator.

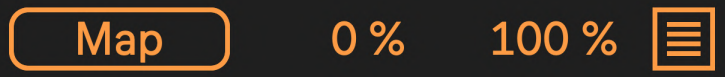
Master :

Controls the overall output level of the device.



A soft clipping stage is applied at the output to prevent unwanted saturation—especially useful when layering noise or combining intense elements. This ensures your kick remains punchy without overloading.

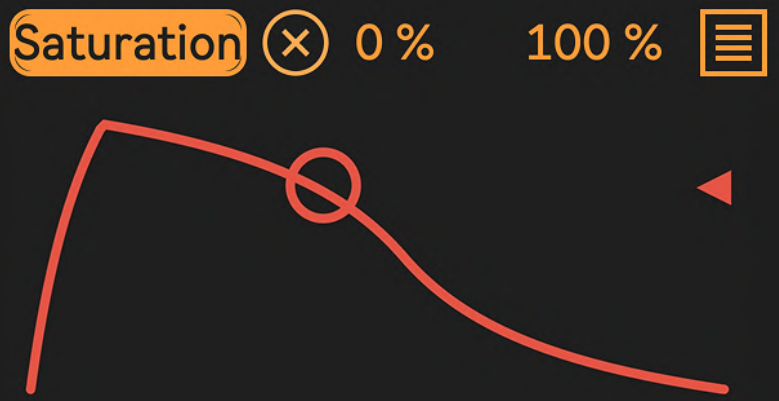
Mapping



Just like Live's LFO device, the Mapping feature lets you control any parameter in your Live Set using the kick's volume envelope as a modulation source. The concept is simple: The amplitude envelope that shapes your kick can also be used to modulate external parameters — from distortion amount to filter cutoff or even track volume — either on the same track or across other tracks.

This is especially useful for applying saturation or effects in sync with the amplitude of the kick. or creating sidechain-style ducking directly on a bass track — without compressors or routing.

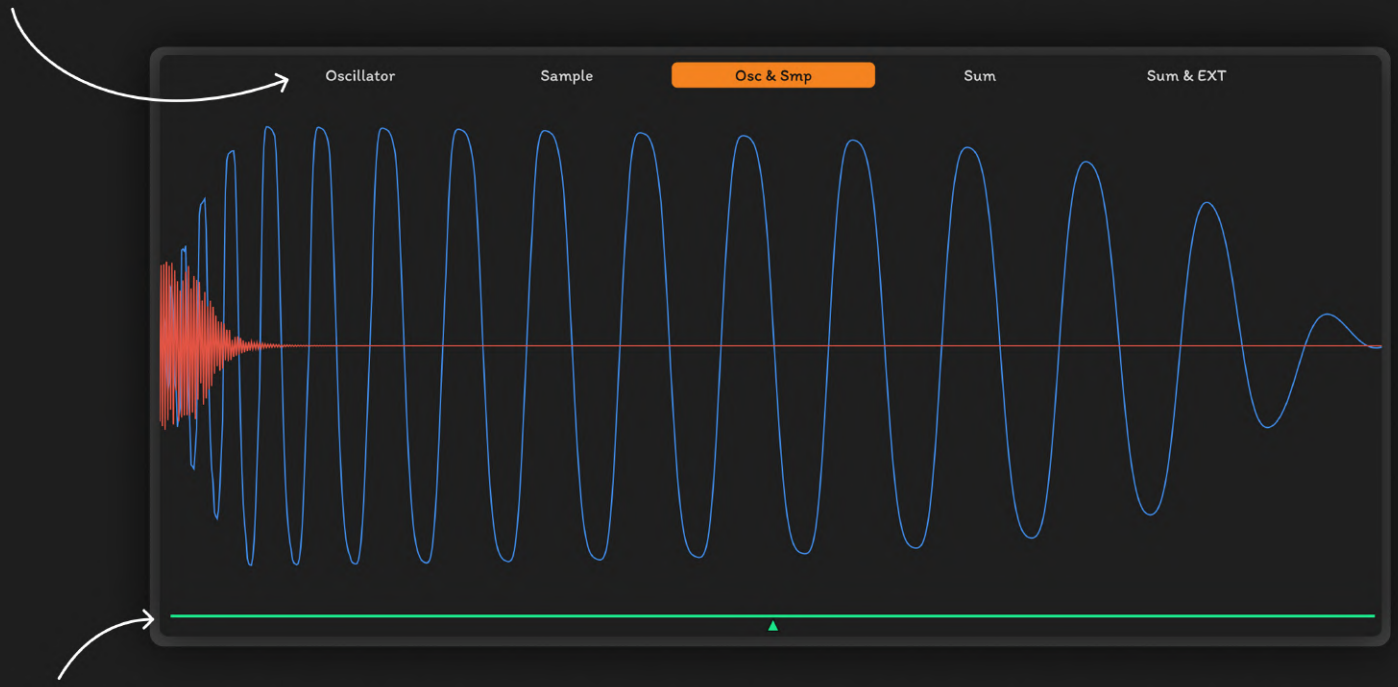
In the first image, the amplitude envelope is mapped to a Saturation parameter. You can see the red envelope curve directly on the interface for visual feedback. In the second image, we show the dropdown menu that allows you to access up to 5 additional mapping slots, enabling multiple simultaneous modulations driven by your kick envelope.



Oscilloscope (Visualizer)

Click the Open button to launch the oscilloscope in a resizable floating window. This view gives you a real-time visual of the kick's waveform.

Source selector : Selects the signal to display — Oscillator (blue), Sample (red), both, their sum, or Oscillator + external input.



Zoom slider : Adjusts oscilloscope scale, center = 1/4 note, right = zoom in (attack), left = 1 bar (4 kicks).

Tuning & MIDI

The MIDI Enabled section lets you control the final pitch of the kick in two different ways:

By default, a manual tuning knob (from C-1 to C3) lets you set the final frequency of the kick. This is the note that the pitch envelope will resolve to at the end of its decay.

Manual Tuning (midi off)

Clicking the keyboard icon (showing 5 piano keys) activates MIDI input instead. When enabled, the device listens to incoming MIDI notes and uses them to set the kick's final pitch dynamically. The manual tuning is disabled while MIDI mode is active.

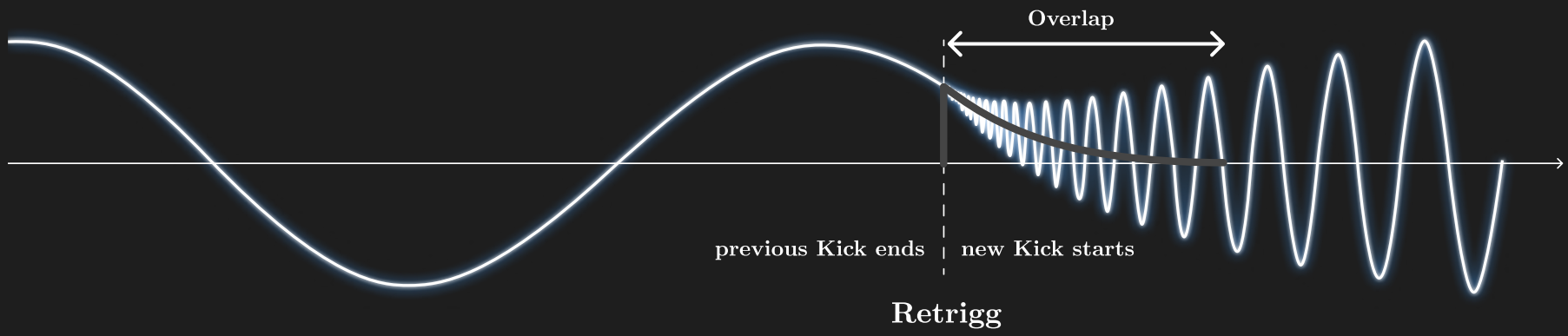
Keyboard Tuning (midi on)

This makes it easy to tune your kick to a specific note within your track, or even turn the device into a powerful percussive synth.

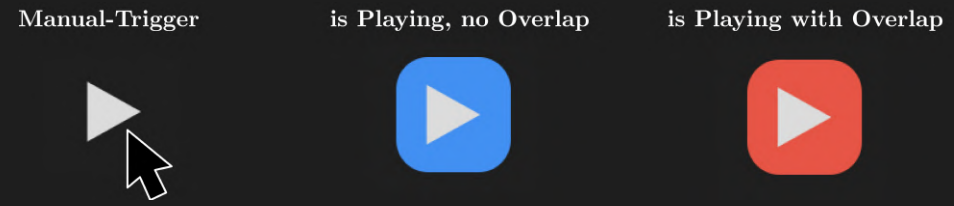
Tip: To use Rupture as a bass synth, lower the pitch envelope depth (or turn it off entirely) so that only the final tuned note plays—perfect for punchy low-end lines.

Triggering & Overlap

Rupture is a monophonic kick-drum synthesizer, which means only one kick voice can play at a time. To guarantee that each new kick hits exactly the same way, the oscillator must be resynchronized to the start of its phasor on every trigger. Normally, resetting the phase of an oscillator mid-cycle produces an audible click—so if you trigger a second kick before the first one has finished, that click will be very noticeable.



To avoid clicks without resorting to a CPU-heavy polyphonic engine, Rupture uses an intelligent **overlap algorithm**: when a new trigger arrives while the previous cycle is still playing, the algorithm lets the current waveform complete its cycle and then smoothly overlaps its end with the start of the next kick. The manual-trigger LED turns red (instead of blue) whenever this overlap routine is engaged. You may see this happen if you set the kick length longer than a quarter note while triggering kicks every quarter note (as in many techno patterns). It's not an error, but the red LED simply lets you know the overlap routine is active.



About

Developed by RawtonForge (Tony Crivello)

**If you have any questions, feedback, or just want to say hi,
feel free to write to me:**

rawton.forge@gmail.com

Tested with Ableton Live 11+ on macOS Big Sur and newer.