Deviation v1.0

Asymmetric Binaural Waveshaper

Max for Live Device for Ableton Live

by Rawton Forge

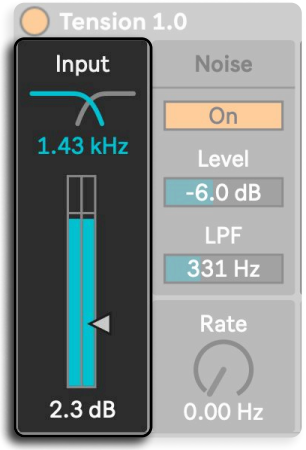
INTRODUCTION

Deviation is an asymmetric waveshaper.
It stretches the waveform around a movable pivot point, making positive and negative alternations unequal. A sine wave gradually becomes a pulse whose width tracks the input amplitude.

The deformation generates even harmonics that symmetric saturators cannot produce, and responds to input level: stronger signals get shaped more.
Deviation is applied independently on the left and right channels. The Binaural parameter offsets the two sides against each other for stereo width. An internal LFO can modulate Tension over time, in phase quadrature between channels.

A homographic function keeps the signal bounded by construction. A soft clipper with ADAA-1 anti-aliasing handles peaks, with a knee adjustable from soft to hard.

Tension processes only the low band of the signal. The crossover offers perfect magnitude reconstruction with phase coherence between the two bands.



INPUT

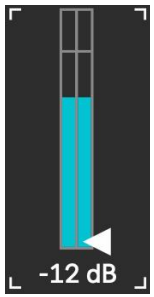
This section defines what enters the processing chain and at what level.

The crossover splits the signal into two bands: only the low band is processed, the high band passes through untouched. It uses a Linkwitz-Riley topology with phase-coherent, magnitude-flat reconstruction, specifically tuned for this processing chain.

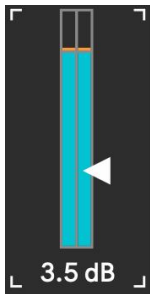
The Input gain then sets the level entering the chain, calibrated to work best around 0 dB.

Crossover Frequency
Cutoff of the internal crossover. The low band is sent into the processing chain. The high band passes through untouched.
Adjustable up to 10 kHz.

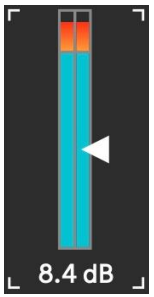
Input Gain
Gain applied to the **low band** before processing.
Push it until the level gets as close to 0 dB as possible. Tension's transfer function is calibrated to work best around 0 dB.



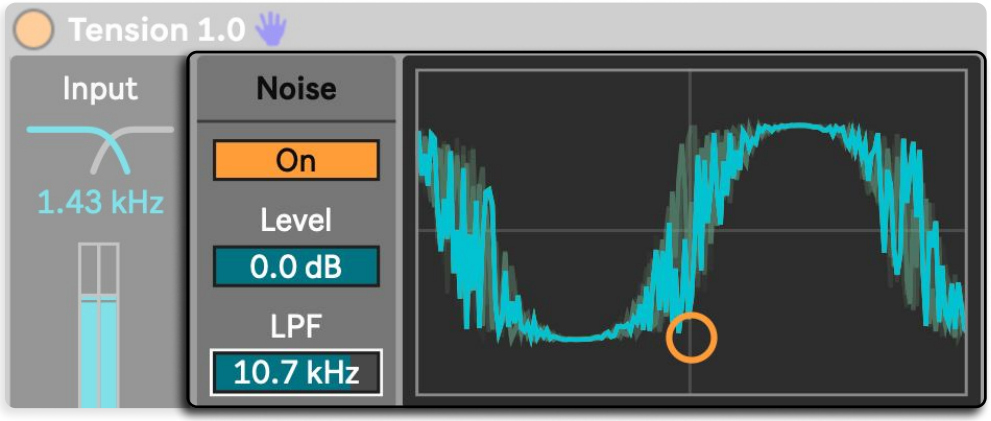
Too Low
[Rise the Gain]



Perfect



Too high
[Reduce the Gain]



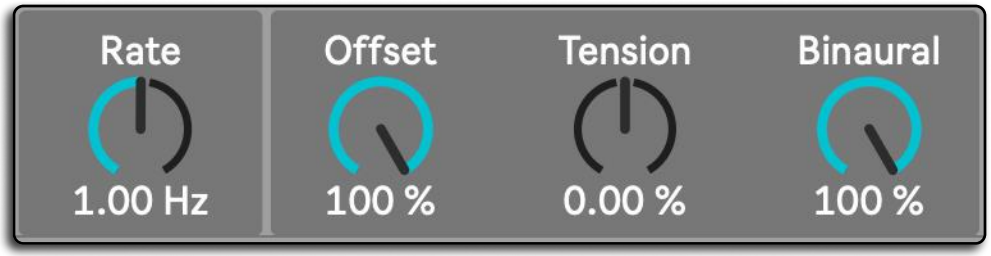
NOISE INJECTION

Injects shaped noise into the low band. The noise level follows the envelope and the waveform of the signal: it only appears in the dips, never on the peaks.
The behavior is similar to a sidechained ring modulation between the signal and a noise generator.

On/Off
Enables noise injection.

Level
Amount of noise injected.

LPF
Low-pass filter applied to the noise before injection. At 20 kHz, full white noise. Lower values make the noise darker.



MAIN PARAMETERS

Tension
Stretches the waveform around a movable pivot point. At 0%, the signal passes through untouched.
Turning the knob makes positive and negative half-cycles unequal, brings in even harmonics, and gradually turns a sine wave into a pulse whose width tracks the amplitude.
The heart of the device.

Offset
Modulates the amount of DC compensation depending on the signal envelope.
At 0%, the signal stays centered whatever Tension does. At 100%, the louder the input, the more the waveform shifts off-center.

Binaural
Offsets Tension between the left and right channels.
At 0%, both channels share the same value. At 100%, full opposition.
When the LFO is active, the two sides move in phase quadrature.

Rate
Speed of the internal sine LFO modulating Tension.
At 0 Hz, Tension stays static. Above, it oscillates continuously and produces a PWM-like effect.

CLIPPER

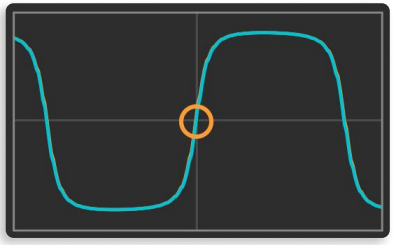
Once the signal has been shaped by Deviation, it passes through a soft clipper. Exponential transfer function with adjustable knee. Anti-Derivative Anti-Aliasing (ADAA) algorythm preserves fidelity at any setting.

Pre DC
Removes the DC offset between Deviation and the clipper. Enable for symmetric clipping. Disable to preserve the offset and let the clipper bite asymmetrically.

Drive
At 0%, No gain is applied. At 100%, the drive goes to infinity and the signal collapses into a square wave.

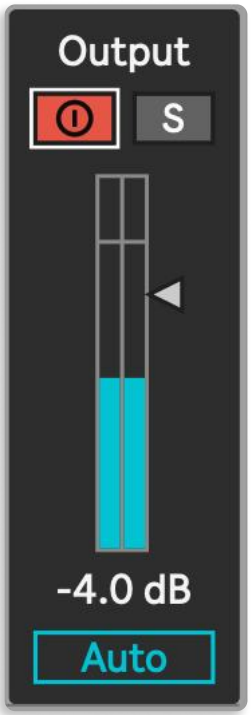
Post DC
Removes residual DC offset after the clipper.
Generally leave it on. Only disable it if you're using the clipper alone without Tension's asymmetric deformation.

Soft / Hard
Shape of the clipper curve. Left, gentle rounded saturation. 100% is hard clipping. All intermediate grains in between.



Soft Clip
[0%]

Hard Clip
[100%]



OUTPUT

S (Solo)
Listens to the processed low band in isolation, without the unprocessed highs.

ⓘ (Mute)
Mutes the processed low band and lets only the unprocessed highs through.

Output Gain
Manual output gain. Sets the final level independently of the processing. In Auto mode, replaced by automatic compensation.

Auto
Automatically matches the device's output level to its input via continuous RMS measurement.
Lets you A/B the bypass at equal volume.

SUPPORT PUSH STANDALONE

Deviation is a Max for Live Device
compatible with Ableton Live 11 and Ableton Live 12.

Developed by Rawton Forge.
https://rawton.gumroad.com/

For questions, feedback, or support, please contact:
rawton.forge@gmail.com