

Tape Emulator

Analog Tape Machine

USER MANUAL

VST3 / AU · MAC / WINDOWS

Viator DSP

Overview

Tape Emulator models the sound of an analog tape machine: bias and tape saturation, tape-speed frequency response, wow & flutter pitch modulation, tape hiss, channel crosstalk, and a character/tone EQ. Each stage contributes a piece of the classic tape signature, from gentle warmth to heavy, unstable degradation.

Signal Chain Order

Audio passes through each stage in the following order:

- Input Gain
- Cross Talk
- High-Emphasis Filter
- [Oversample]
- Bias
- Compressor
- Saturation (sine-fold)
- [Downsample]
- Blend (parallel dry/wet)
- DC Blocker
- High-Compensation Filter
- Character EQ
- Tape Hiss
- Wow & Flutter
- Tone EQ
- Output Gain
- Phase (polarity invert)

Note Only the bias, compressor, and saturation stages run oversampled. HQ off runs them at the base rate (1×); HQ on runs them at 4× to reduce aliasing from the nonlinear saturation. The high-emphasis filter before the saturation and the matching high-compensation filter after it shape what the saturation acts on. Blend mixes that oversampled core against a dry tap taken before oversampling and delayed to stay phase-coherent, so it lands just after downsampling.

Header

The header runs across the top of the plugin and holds global controls and the preset system.

Control	Range	Default	Notes
Power	On / Off	On	Bypasses the entire plugin with a smooth fade. Shares its state with the I/O In/Out switch.
HQ	Off / On (4×)	Off	Oversampling for the bias, compressor, and saturation stages. On reduces aliasing from heavy drive at the cost of more CPU.
Stereo Mode	Stereo Only, Mids Only, Sides Only	Stereo Only	Routes only the mid or side component through the tape path. No effect on mono material.
Phase	On / Off	Off	Flips the polarity of the whole output. Counts as part of the effect, so it drops on power-off.
Window Size	70%–130%	100%	Scales the entire UI (70 / 85 / 100 / 115 / 130 %), set in the Settings overlay.

Note Preset A / B are two slots for quickly comparing two full parameter sets; the preset browser saves and loads named presets, and bundled factory presets appear under a Factory submenu grouped by category. The Settings overlay (gear) also holds the Tooltips, Metering, and Accent options.

Input & Output

Level trims into and out of the tape path, plus the machine power switch. The In/Out switch drives the same power state as the header Power tile.

Control	Range	Default	Notes
In (Input)	−30 to +30 dB	0 dB	Gain into the tape path. Drives how hard the signal hits bias and saturation.
Out (Output)	−30 to +30 dB	0 dB	Final gain trim after the entire chain, before the polarity/bypass stage.
In / Out (Power)	In / Out	In	In engages processing; Out bypasses the plugin. Same state as the header Power.

Saturation

Control	Range	Default	Notes
Drive	0–10	0	Amount of tape saturation through the sine-fold shaper. 0 is clean.
Bias	−1 to +1	0	DC offset pushed into the fold to make it asymmetric, adding even harmonics; the downstream DC blocker removes the residual offset. Negative and positive values move the asymmetry to opposite sides of the waveform, and 0 is symmetric.
Blend	0–100 %	100 %	Parallel mix of the saturation core (bias, compression, fold) against a delay-compensated dry tap. At 100% the signal is fully processed. At 0% the harmonic core is dropped but tape tone, hiss, crosstalk, EQ, and wow/flutter remain, so it is not a full bypass.

Switches

Speed — Tape transport speed — each has its own frequency response:

- 15 ips — slower, with more low-end weight and head bump.
- 30 ips — faster, tighter low end and extended top (default).

Level Mode — Gain-staging switch, not a drive control. It drives the fold harder at a matched output level so quieter tracks saturate without raising Input:

- Channel — pre-boosts and post-trims the fold by 6 dB so a normally-staged track reaches useful saturation.
- Bus — unity, for material that already arrives hot (default).

Link — GUI-only convenience under the Drive dial: while on, Drive is mirrored onto Output inversely — a Drive of 10 pulls Output down by 10 — so pushing more saturation trims the makeup automatically. The DSP never reads it. Default off.

Transport

Speed instability from the tape transport — the slow drift and fast wobble of a machine whose capstan never ran perfectly. Both default to 0, so a fresh instance adds no pitch modulation until dialed in.

Control	Range	Default	Notes
Wow D (Wow Depth)	0–10	0	Depth of slow pitch drift (wow).
Flutter D (Flutter Depth)	0–10	0	Depth of fast pitch instability (flutter).

Note Only the depths are adjustable. The modulation rates are fixed at 0.5 Hz for wow and 6 Hz for flutter, chosen to sit in the range a real transport drifts and wobbles at. Flutter is also randomly gated, so it comes and goes rather than running continuously.

Heads

Artifacts of the head stack and the tape itself: the noise floor of the medium and the bleed between adjacent tracks. Both default to 0.

Control	Range	Default	Notes
Noise (Noise Level)	–20 to +20 dB	0 dB	Level of the pink-noise tape hiss. Signal-gated, so it follows the input and fades to silence when nothing is playing.
X Talk (Cross Talk Level)	–20 to +20 dB	0 dB	Analog channel crosstalk — subtle L/R bleed. Only affects stereo material.

Tone EQ

A four-band tone EQ at the end of the chain for shaping the final balance. Each band is gain-only around a fixed frequency, spanning cut to boost.

Band	Range	Default	Notes
Low	–12 to +12 dB	0 dB	Low-band shelf/bell.
Low Mid	–12 to +12 dB	0 dB	Lower-midrange band.
High Mid	–12 to +12 dB	0 dB	Upper-midrange band.
High	–12 to +12 dB	0 dB	High-band shelf/bell.

Note This is the tone EQ at the tail of the signal chain, distinct from the internal character EQ that shapes the tape colour earlier in the path.

Tips

Pick a tape speed first

Speed sets the underlying frequency response. 30 ips is tighter and more extended; 15 ips has more low-end weight and head bump. Choose the speed that fits the source before dialing drive and tone.

Bias shapes the distortion

Dial Bias away from 0 to push an asymmetric operating point into the saturation, adding even harmonics and shifting the character. Positive and negative Bias move the asymmetry to opposite sides of the waveform. Small moves here make a big difference before you reach for Drive.

Blend in parallel drive

Lower Blend to mix the saturation core back against the dry signal for a parallel-drive sound. Because tone, hiss, and wow/flutter sit outside the blend, they stay put while you dial the harmonic core in and out. Blend at 0% is not a full bypass — it only drops the saturation core.

Transport and Heads in moderation

Wow, Flutter, Noise, and Cross Talk all start at 0. A little wow/flutter adds vintage instability; a touch of hiss and crosstalk adds analog glue. Push them for lo-fi character, keep them low for a clean tape sheen.

Engage HQ when driving hard

The bias, compressor, and saturation stages generate harmonics that can alias. If you hear harshness at high Drive, switch HQ on to run those stages at 4× and clean it up, at the cost of more CPU.

Mid/Side processing

Set Stereo Mode to Mids or Sides to tape-process only that component — for example, keeping the center clean while degrading the sides, or vice versa.