



Adrestia Audio

Audio plugins built for engineers.

Saturation Box

Saturation Box is four analog saturators built on circuit and magnetics physics: a 12AX7 triode preamp stage, an EL84 push-pull output stage, magnetic tape, and an iron-core transformer. Each is a model of the thing itself, not a curve that approximates it, so it responds to how you play. The triode's bias shifts under a hard hit and swells back. The pentode's supply sags and recovers. Tape saturates its highs first, so transients round instead of clip. Iron folds the low end first and leaves the top alone.

Free. AU and VST3 for macOS 11 and later, Apple Silicon and Intel. No account, no dongle, no subscription.



Index

Page 3: At a glance

Page 4: The panel

Page 7: The four models

Page 9: Terms of Use



At a Glance

Pick a model: **TRIODE**, **PENTODE**, **TAPE**, or **XFMR**.

- Turn **DRIVE** up until it sounds right. With **AUTO GAIN** on (the default), the level stays put, so what you hear changing is the character, not the volume.
- Pull **MIX** back until the effect sits in the track.
- Tap **BYPASS** to hear what you started with. The light goes dim and the sound goes clean, at the same level and in time with the track.

That's the whole method. Everything else on the panel is for shaping where and how the saturation lands.

Installing

Requirements:

- macOS 11 (Big Sur) or later
- Apple Silicon or Intel (one universal installer)
- A host that loads Audio Units or VST3: Logic Pro, Ableton Live, Cubase, Reaper, Studio One, Bitwig, and others

Steps:

1. Download Saturation Box from adrestia-audio.com/plugins/saturation-box.
2. Open the installer. It is signed and notarized by Apple, so there is no Gatekeeper workaround.
3. It installs to the system plugin folder '/Library/Audio/Plug-Ins/Components/Saturation Box.component' '/Library/Audio/Plug-Ins/VST3/Saturation Box.vst3'
4. Restart your DAW, or rescan plugins. In Logic: Preferences > Plug-in Manager > Reset & Rescan Selection.
5. Find it under Adrestia Audio > Saturation Box.

Updating:

Run the newer installer over the old one. Sessions keep loading; presets and settings carry over. Sessions saved with 0.2.0 open in 0.3.0 with Bypass off, so nothing goes quiet.

Uninstalling:

Drag the two files above to the Trash.

The Panel



Model: Triode / Pentode / Tape / Xfmr.
Default: Triode.

Which circuit the signal goes through.

Drive: 0 to +36 dB. Default: 12 dB.
Gain into the circuit; the amount of saturation.

Tone: -100 to +100. Default: 0.
Tilt EQ before the saturator: dark left, bright right (± 6 dB shelves at 100 Hz and 10 kHz).

Output: -12 to +12 dB. Default: 0.
Trim on the wet signal only.

Mix: 0 to 100%. Default: 100%.
Dry/wet blend, phase-coherent.

Low Cut: 20 Hz to 2 kHz. Default: 20 Hz.
Below this, the signal bypasses the saturator.

High Cut: 1 kHz to 20 kHz. Default: 20 kHz.
Above this, the signal bypasses the saturator.

Auto Gain: on / off. Default: on.
Holds the level as Drive changes.

Vintage: on / off. Default: off.

Deeper bias wander and a noisier tube on Triode and Pentode. On Tape, an older stock that saturates sooner and hisses more. On Xfmr, a noisier line amp.

Bypass: on / off. Default: off.

True bypass. The signal takes the same latency-matched path the host's bypass uses, so nothing shifts in time and nothing clicks. Your DAW's bypass button drives it too.

The Panel (Cont.)

Drive

The one knob that matters. Everything downstream - harmonics, bias shift, the Pentode's supply sag, tape rounding the transients, iron folding the low end - scales with how hard the circuit is hit. Each model loses to the way its own circuit does, so Drive changes the character, not the bandwidth.

With Auto Gain on, turning Drive up does not turn the track up. Judge the character; set the level with Output.

Tone

A tilt applied before the saturator, so it changes what the circuit is fed rather than equalising the result. Brighter Tone means the highs saturate harder; darker means the lows do. There is a light detent at zero.

Output

Wet-side trim, ± 12 dB. Applies after the model, before the Mix blend, so it does not touch the dry signal in a parallel setup.

Mix

The dry path is delayed by exactly the plugin's latency, and the oversampling is linear-phase, so the blend is phase-coherent at every frequency. You can run 30 % Tape on a mix bus without comb filtering.

Low Cut & High Cut

Everything between the two cutoffs goes through the model; everything outside bypasses it on a phase-matched clean path (Linkwitz-Riley crossovers with an all-pass on the low band, so there are no notches at the crossover points).

Use it to saturate a kick without fuzzing the sub, or a vocal without adding grit to sibilance. The bypassed bands do not receive makeup gain, so with a narrow band the level effect of Drive is naturally smaller.

The Panel (Cont.)

Vintage

On the tube models, the bias drift (a slow, sub-audio wander of the operating point, always present at a low level) is four times deeper. On the Pentode the two tubes wander independently, so their balance breathes too.

Each model has its own noise, placed where the circuit makes it. Vintage makes the tubes about 8 dB noisier, swaps the tape for an older stock that saturates sooner and hisses more, and gives the transformer a noisier line amp. The noise runs only while signal passes and fades out in the gaps. The hiss of a machine that has been loved, not neglected.

VU Meter

Reads how hard the selected model is being driven, from both channels, with fixed ballistics. The top quarter of the scale is “hot”; the red zone means the circuit is working hard, not that anything is clipping - there is no hard clip anywhere in the chain.

Knob Handling

- Drag up/down to turn.
- Shift or Command while dragging: fine control.
- Double-click: reset to default.
- Click the readout: type a value.
- Mouse wheel over a knob nudges it.

The Four Models

All four share the same surrounding chain. They differ in what happens to the signal in the middle.

TRIODE

A class-A 12AX7 gain stage modelled as the circuit it is: grid, coupling cap, cathode resistor with its bypass cap, and a 100 k Ω plate load on 250 V.

Sound: warm, second-harmonic dominant. Nearly clean at Drive 0, under 1% at Drive 12, about 3% at Drive 24. Third and higher harmonics only arrive when both ends of the stage run out of room.

Behaviour: peaks compress rather than clip (soft grid conduction). A hard hit charges the coupling cap and shifts the bias, so the stage is held down and swells back over about 220 ms. Average cathode current shifts the bias too, the slower bloom. There is no supply sag here; a preamp stage draws too little current to pull its rail.

PENTODE

A cathode-biased pair of EL84s in push-pull, the circuit behind the classic British combos, each half driving its side of the output transformer.

Sound: odd-harmonic. The two halves cancel the evens, so it is brighter and more aggressive than the triode, with a trace of second from the mismatch between tubes. Around Drive 18 to 24 it crunches; above that the higher odd orders arrive.

Behaviour: when hit hard the pair draws more current and the supply sags, so the stage gives a couple of dB over the first 150 ms, then recovers. The shared cathode runs the pair colder under sustained level. Grid blocking is brief, about 10 ms, because output stages recover fast. No thump after a hit; push-pull cancels it.

The Four Models (Cont.)

TAPE

An oxide saturation curve fitted to a 456-class tape at 15 ips, with record emphasis before it and the playback head's bump and low-frequency roll-off after it.

Sound: third-harmonic, gentle and symmetric. At Drive 0 a -18 dBFS signal sits at reference level, where the tape measures 0.1% third harmonic. Drive is record level, and the 3% “maximum output level” lands near Drive 18. The highs saturate a few dB earlier than the mids, as on tape, which is what rounds transients.

Behaviour: instantaneous. Tape has no attack or release. What people call tape compression is the curve itself, so transients keep their shape and nothing pumps.

XFMR

A line amplifier driving a nickel-core line transformer. The core's magnetising current is drawn through the amplifier's source impedance, and that drop is the distortion. Flux grows as frequency falls, so the lows hit the core first, and the primary inductance gives the authentic 20 Hz roll-off of real iron.

Sound: clean until it isn't; the grit lives in the low end. At Drive 0 a -18 dBFS signal behaves like +4 dBu into a good line transformer: nothing measurable at 1 kHz. Push it and the lows thicken with odd harmonics while the mids stay clean, until at high Drive the line amplifier itself runs out of rail and clips the mids.



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Questions: hello@adrestia-audio.com.

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