



BIAS-X

COMPONENT - MODELLED TUBE PREAMP

Two cascaded triodes, dynamic bias, transformer iron and capacitor ageing — modelled at component level, with a live view of the signal as it moves through the circuit.

VERSION 1.0.0

VST3 • STANDALONE

WINDOWS 64-BIT

40 PRESETS

FREE

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01 Getting started

What Bias-X is, what it is not, and how to get a sound out of it in about thirty seconds.

What it is

Bias-X is a **saturation and colour** plugin built from a component-level model of a valve preamp: two cascaded 12AX7 triode stages with a real Koren plate-current model, a dynamic bias network that shifts the operating point with signal level, a supply-sag model, two transformer stages, and an ageing-capacitor filter.

It is **not** a transparent preamp, and it does not have a clean setting. Even with every control at minimum it produces around 1.9 % distortion on a –18 dBFS signal — that is the floor, and it is deliberate. If you want a genuinely untouched signal, bypass the plugin or pull *Mix* down. Everything from there upward is colour.

Installing

Run the installer. It offers a **VST3** plugin and a **Standalone** application; you can install either or both, and choose where each goes.

FORMAT	DEFAULT LOCATION
VST3	C:\Program Files\Common Files\VST3\Bias-X.vst3
Standalone	C:\Program Files\Bias-X\Bias-X.exe
Your presets	%APPDATA%\Bias-X\Presets
Your banks	%APPDATA%\Bias-X\Banks

Rescan plugins in your DAW after installing. The factory presets are built into the plugin — nothing is copied to disk for them, so they can never go missing.

Thirty seconds to a sound

1. Put Bias-X on a track and open the **preset menu** in the header.
2. Pick the category that matches your source and load the first preset in it.
3. Turn **Drive** until you like it. That is the only control you need.
4. If it is now too much, pull **Mix** back rather than turning Drive down — you keep the character and lose the amount.

Every factory preset is **level-matched to within 1.5 dB of unity**, so bypassing tells you what the plugin is actually doing rather than just whether it is louder. Use bypass constantly.

02 The interface

One window, five control groups, and a live display of the circuit at the top. Nothing is hidden in a menu you have to find.



The full interface at 900 × 610. The window is resizable from 0.5× to 2×.

1 Brandmark

The filament glows with signal — a quick "is audio reaching me" check.

2 Preset transport

Previous / name / next, plus save, new, init and the library button.

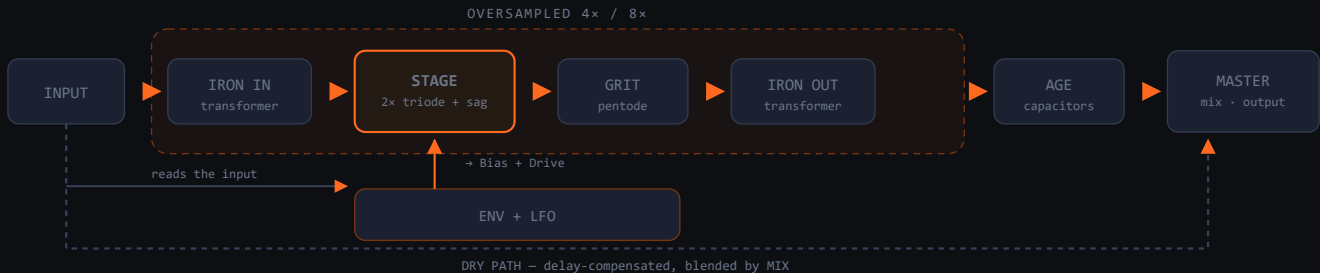
- 3 **Signal Flow & About**
The two overlays: an interactive circuit diagram, and version info.
- 5 **Signal path scope**
Four taps down the chain — in, post-tube, post-grit, out.
- 7 **GRID meter**
Grid-conduction activity. Pinned white-hot means deep clipping.
- 9 **CHARACTER**
Grit and the two Iron controls.
- 11 **MOD**
Envelope depth and the LFO.
- 4 **IN meter**
Real peak and RMS in dB, before anything happens.
- 6 **Transfer curve**
The live tube curve with an operating-point dot on it.
- 8 **STAGE**
Drive, Stage 2, Bias, Sag — the tube itself.
- 10 **AGE**
Capacitor ageing and cap size.
- 12 **MASTER**
Mix, Output, Auto Gain, A/B and oversampling quality.

Working with the controls

ACTION	WHAT IT DOES
Drag a knob	Vertical drag changes the value.
Shift + drag	Fine adjustment.
Double-click	Reset that control to its default.
Mouse wheel	Step the value under the cursor.
Hover	Tooltip explaining the control.
Drag a window edge	Resize the whole interface, 0.5× to 2×.

03 Signal path

Five stages in a fixed order. Knowing the order explains most of the interactions between controls.



Order matters: everything after the tube is affected by how hard the tube is driven — and by the Output trim.

Four consequences worth knowing:

- **Iron In is before the tube**, so its low-end lift also drives the tube harder in the bass. Iron Out is after, so it only shapes what comes out.
- **Grit is after the tube**. It hears whatever the tube produced, including the Output trim — see below.
- **Age runs outside the oversampled region**, deliberately: it is a near-linear filter that was measured not to alias, so it costs nothing to run at the base rate.
- **The dry path is delay-compensated** against the oversampler, so Mix blends two time-aligned signals rather than comb-filtering.

WHERE OUTPUT SITS

The **Output** control is at the end of the tube stage, not the end of the plugin — Grit, Output Iron and Age are all downstream of it. With Grit at zero it is a perfectly clean trim: measured identical distortion at every setting across its whole range. With Grit up, feeding the pentode less signal naturally distorts it a little less (measured 17.1 % down to 8.9 % across an 18 dB sweep) — ordinary level-dependence rather than a hidden drive control. Before v1.0.0 that same sweep moved distortion 15.8 % to 3.4 %, which quietly made "Output" one of the strongest tone controls in the plugin.

04 How hard you feed it

The single most important thing to understand about this plugin: input level is a tone control.

The modelled triode swings its grid 1.2 volts per unit of input, on a -1.2 volt operating point. In plain terms: a full-scale signal drives the modelled 12AX7 to *its rated maximum*. Everything below that is proportionally gentler — so the same preset behaves very differently on a quiet track and a hot one.



Measured distortion versus input level, 1 kHz sine, 48 kHz. Note that even the bottom curve never reaches zero — that is the plugin's floor.

What this means in practice

- **Gain-stage before Bias-X, not after.** A trim plugin in front of it is a distortion-amount control. That is the intended way to work.
- **Mixed material sits around -18 dBFS RMS.** That is the level every factory preset is voiced at, and the level the preset documentation quotes.
- **A preset on a hot track will be much dirtier** than the same preset on a quiet one. If a preset feels heavier than described, check your input level first.
- **Loud passages distort more.** That is the tube behaving like a tube, and it is most of why the plugin sounds dynamic.

Reading distortion figures

< 0.1 % clean	0.3 – 1 % valve idling	1 – 3 % warmth	3 – 10 % saturation	> 10 % distortion effect
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Used throughout this manual and in the preset tables. Worth knowing: with every control at minimum Bias-X still measures **1.92 %** — the modelled triode always conducts, so the plugin has a floor in the middle of “warmth”. **Mix is the only control that reaches below it**, which is why every preset aimed at the gentle end runs Mix under 100 %.

05 STAGE — the tube

Two cascaded triodes on a real Koren plate-current model. This is where most of the sound comes from.

Drive

0 ... 40 dB • default 12

How hard the first triode is pushed. This is the main control, and for most work it is the only one you need to touch. Higher settings mean earlier clipping and denser harmonics. The knob's taper is deliberately non-linear because the tube stops responding meaningfully past about 32 dB — the useful range is spread across more of the travel.

MEASURED At -18 dBFS input: 0 dB → 1.9 % • 6 dB → 3.8 % • 12 dB → 7.5 % • 16 dB → 11.7 %

Stage 2

0 ... 40 dB • default 6

Gain into the *second* cascaded triode, after the first has already shaped the signal. It compounds the first stage's harmonics rather than simply adding volume, so a little goes a long way. Most factory presets leave it at 0 and use Drive alone; raise it when you want density rather than more of the same.

MEASURED Adds roughly 17–23 % to the distortion figure per 3 dB, on top of Drive

Bias

-1 ... +1 • default 0

Shifts the tube's grid operating point — the single most character-changing control here, and it barely affects loudness. **Negative** runs the grid cold: harder, spikier, more odd-order, and at extreme settings the tube stops conducting except on peaks (which is how the Gated Cutoff preset works). **Positive** runs it warm and smooth.

WORTH KNOWING

Contrary to the usual folklore, positive Bias here moves the harmonic mix toward *odd* order, not even — measured, the even/odd ratio runs 1.42 at Bias -1 down to 0.07 at +1. Use your ears rather than the theory; both directions are musical, they are just different.

Sag

0 ... 1 • default 0.2

Models the power supply drooping under load, exactly as a real valve amp's supply does. Turning it up *reduces* gain as the signal gets louder — that is not a fault, it is what supply sag is. The result is compression with a slow, musical recovery, which is what makes held notes bloom.

MEASURED Output peak on a driven signal: Sag 0 → 0.506 • 0.4 → 0.395 • 1.0 → 0.354

TWO PRESETS, OPPOSITE SAG

Lead Sustain uses Sag 0.55 so notes bloom and decay. *Snare Snap* uses Sag 0.14 so the supply **doesn't** droop and the transient survives. Same control, opposite intent.

06 CHARACTER — grit & iron

One control adds edge. The other two add weight. They are not interchangeable, and the difference is bigger than the panel suggests.

Grit

0 ... 1 · default 0

A pentode distortion stage after the triodes. This is the plugin's aggressive voice — brighter and harder than the tube on its own, and the fastest way to get an obviously distorted sound.

MEASURED At -18 dBFS: 0 → 3.8 % · 0.15 → 5.3 % · 0.30 → 7.1 % · 0.50 → 9.9 % · 0.75 → 13.9 % · 1.00 → 18.5 %

Level across the whole knob: within 0.3 dB, at every input level from -30 to -3 dBFS

A LITTLE GOES A LONG WAY

Grit is **about three times as strong as it was before v1.0.0** at the same knob position, and that is a fix rather than a re-voicing. The pentode's harmonics used to sit in anti-phase with the tube's and partially cancel them, so the lower third of this control measurably *reduced* distortion before finally climbing — you had to reach 0.6 or so before it did anything obvious. The two stages now add instead of fighting, and every increment counts.

It is also **level-neutral** as of v1.0.0: the whole knob stays inside 0.3 dB at any input level. Earlier builds lost up to 13 dB across it, so turning Grit up sounded like turning the plugin down — which is exactly why it read as doing less than it was.

In practice: **0.10–0.30 is a normal working range** and 0.55+ is a lot. If you are re-dialling a patch from an older version by eye, expect to want a much smaller number.

Input Iron / Output Iron

0 ... 1 each · default 0

Transformer stages before and after the tube. **At normal levels these are low-shelf weight controls, not saturation controls.** Measured across their whole travel they change distortion by 0.03 percentage points — essentially nothing — while adding real low-end lift. They are the cheapest thing in the plugin: no distortion, no aliasing, no CPU worth mentioning.

MEASURED At full: +4.2 dB @ 60 Hz · +2.2 dB @ 120 Hz · +0.2 dB @ 250 Hz · nothing above 500 Hz



Measured tone change. Iron lifts only the bottom two octaves; Age takes the top off and is much stronger than half-travel suggests.

CHOOSING BETWEEN THEM

Want it **bigger**? Iron. Want it **dirtier**? Grit or Drive. Reaching for Iron to add grit will just make things boomy, and reaching for Drive to add weight will just make things distorted.

07 AGE — the capacitors

A model of coupling and supply capacitors going out of spec with age. In practice: a darkener with a character.

Age

0 ... 1 • default 0.3

How far out of spec the capacitors have drifted. At 0 the filter is transparent; from there it sweeps a low-pass down while a coupling high-pass thins the very bottom. This is a **strong** control — much stronger than its position on the panel suggests.

MEASURED At 0.50: -3.6 dB @ 4 kHz • -8.6 dB @ 8 kHz • -12.5 dB @ 12 kHz • -3.1 dB @ 60 Hz

USE SPARINGLY

Half travel already removes 8.6 dB at 8 kHz. Most factory presets stay at or below **0.26**; only the three where darkening *is* the point — Tired Electrolytics, AM Broadcast and Bit Rot — go higher, and they say so in their names. If a preset sounds dull, Age is the first place to look.

Cap Size

Small · Medium · Large

Sets which filter pair the ageing acts on — the physical size of the modelled capacitors.

SETTING	FILTER PAIR	CHARACTER	USE FOR
Small	8 kHz / 80 Hz	Bright and thin	Vocals, cymbals, acoustic
Medium	4 kHz / 30 Hz	Neutral	Most things
Large	2 kHz / 10 Hz	Dark and full	Bass, kick, sub

The low-pass side only colours the sound once Age is raised above zero, but the coupling high-pass is size-dependent at any Age setting — which is real circuit behaviour, and is what makes Cap Size useful even with Age near zero.

08 MOD — envelope & LFO

Two modulation sources, both hard-wired to the tube's Bias and Drive. They move the operating point, so the *tone* changes, not just the level.

Env Depth

-1 ... +1 · default 0

An envelope follower reading the input, driving the grid. **Positive** opens the tube up as you play harder — the plugin gets brighter and more driven exactly when you dig in. **Negative** inverts it: loud passages back the tube off, giving a pumping, ducking movement without any sidechain.

This does nothing at all on a source with no dynamics, which is itself useful information — if Env Depth seems inert, your source is already squashed.

LFO Rate 0.02 ... 8 Hz · default 0.5

Free-running speed. The small **S** button beside the label switches to tempo sync, at which point the Division control takes over and the LFO follows the host.

LFO Depth -1 ... +1 · default 0

How far the LFO moves the operating point. Negative inverts the waveform. Small values are drift; large values are tremolo.

DEPTH IS A THRESHOLD, NOT A DIAL

Below about **0.2** you get wow and flutter — the sound of a tired tape machine. Above it you get tremolo. There is not much in between, so pick which one you want. *Tape Wow* uses 0.12; *Tube Tremolo* uses 0.55.

LFO Shape Sine · Triangle · Square

Sine for smooth movement, Triangle for a more linear sweep, Square for hard gated chopping. Because the LFO moves the tube's bias rather than a volume stage, Square does not click — it switches between two different tube characters.

LFO Division 1/1 ... 1/16, dotted, triplets

Active only when sync is on. Nine divisions from whole notes down to sixteenths,

FIXED IN V1.0.0

The modulation sources used to update only once per audio block, so the host's buffer size *was* the modulation sample rate — at 1024 or 2048 samples the fastest synced divisions turned into a slow, arbitrary wobble, and the same session sounded different monitored and bounced. Bias-X now subdivides its processing whenever the LFO or envelope is active, so every division holds at every buffer size, and it costs nothing when both are at zero depth.

09 MASTER — mix & output

Where you decide how much of all that actually reaches the mix.

Mix

0 ... 100 % · default 100

Global dry/wet. **This is the most useful control in the plugin after Drive**, for two reasons.

First, it is the only control that can take Bias-X *below its own floor* — with every knob at minimum the chain still makes about 1.9 % distortion, and only Mix goes under that.

Second, it turns any setting into parallel processing: drive the wet path as hard as you like and blend it back underneath an untouched dry signal, so the transient survives intact. Several factory presets are built this way.

The dry path is delay-compensated against the oversampler, so

FIXED IN V1.0.0

Mix used to be the one control applied without a ramp, so auditioning presets over playing audio clicked whenever the Mix value changed, and automating it zippered. It is now smoothed like everything else.

Output

-24 ... +6 dB · default -6

Level trim at the end of the tube stage. With Grit at zero it is perfectly clean — measured identical distortion at every setting across its whole range. With Grit engaged it also sets how hard the pentode downstream is driven, so it becomes a tone control as well. See [Signal path](#).

Auto Gain

on / off · default off

Continuously matches output level to input level so you can judge tone rather than

FIXED IN V1.0.0 – AND WHY NO PRESET USES IT ANYWAY

Auto Gain used to collapse to its –12 dB floor after about a second of silence, so the first ~0.3 s after every transport stop swelled up from too quiet. It now holds at unity below the noise floor, and its timing no longer depends on your host's buffer size.

Every factory preset is still **statically level-matched** to within 1.5 dB of unity rather than relying on Auto Gain. That is a deliberate choice: a fixed trim is exactly predictable, and the conservative voicing barely changes level anyway. Auto Gain is there for you to use when comparing settings, not something the library leans on.

A / B

two slots

Two scratch snapshots of every parameter. Click to swap; the slot you leave keeps what you had. The first time you visit the second slot it starts identical to the first, so you can make a change and flip back and forth immediately.

A/B is a scratchpad, not storage — it is not written to disk. Use Save or Save As for anything you want to keep.

Quality

Standard 4x · High 8x

Oversampling factor for the whole non-linear chain. **Standard is plenty for mixing.** High squeezes out the last of the aliasing on the most extreme settings at roughly double the CPU cost, and reports a slightly different latency to the host (5 samples at the base rate, automatically compensated).

Only five factory presets use High, all of them heavily driven. A sensible workflow is Standard while writing and mixing, High for the final

FIXED IN V1.0.0

Switching Quality during playback used to produce a brief burst — the internal smoothers were slammed back to their factory defaults rather than keeping your settings, so for about 20 ms you heard a patch you did not have. It now switches cleanly.

10 Reading the display

The top half of the window is not decoration — every element shows something you can act on.



The same interface at a gentle setting — compare the transfer curve and the GRID meter with the driven state shown earlier.

The signal-path scope

Four horizontal traces, one per tap point down the chain: **IN**, **STAGE** (after the tube), **GRIT** (after the pentode) and **OUT**. Watching where the waveform first starts to flatten tells you which stage is doing the work — if the STAGE trace is already squared off, turning Grit up will not add much, and Drive is what you want to change.

The transfer curve

The live tube transfer function, drawn from the *same* model the audio path uses — not an approximation of it. The straight diagonal is the "no distortion" reference; the distance between the curve and that line is your distortion. The **dot** is the current operating point, and it moves

in real time with Bias, Drive and any modulation, so you can see exactly where on the curve the signal is sitting.

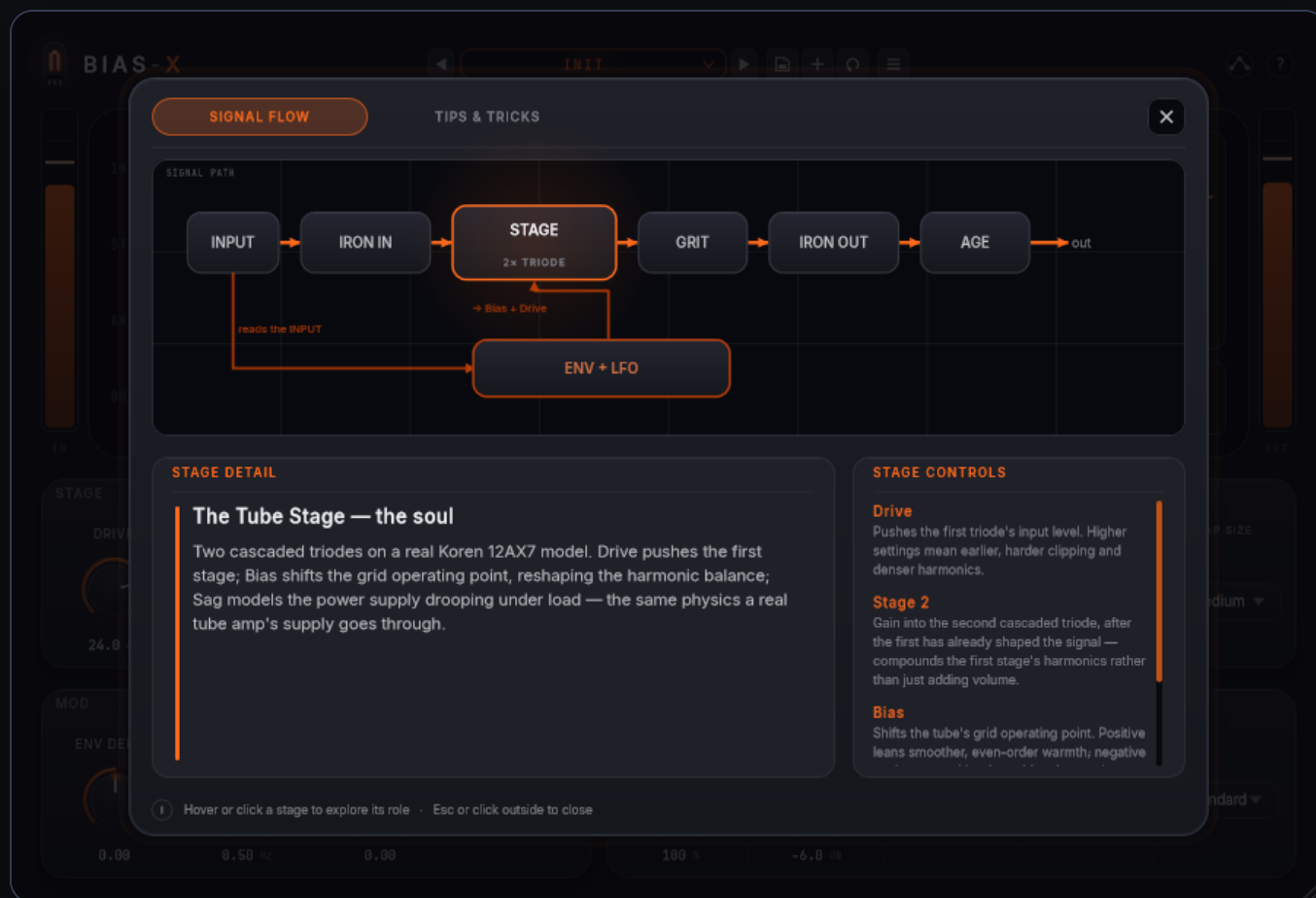
The GRID meter

A heat-ramp showing grid-conduction activity — how often and how hard the tube's grid is drawing current, which is the physical event behind valve clipping. Dim means you are in the linear region. Warm means real saturation. **Pinned white-hot means you are deep into clipping**, which may be exactly what you want, but you should know you are there.

IN and OUT meters

Real peak and RMS in dB, flanking the display. The IN meter is your reference for everything in [section 4](#) — get used to reading it before deciding a preset is too heavy.

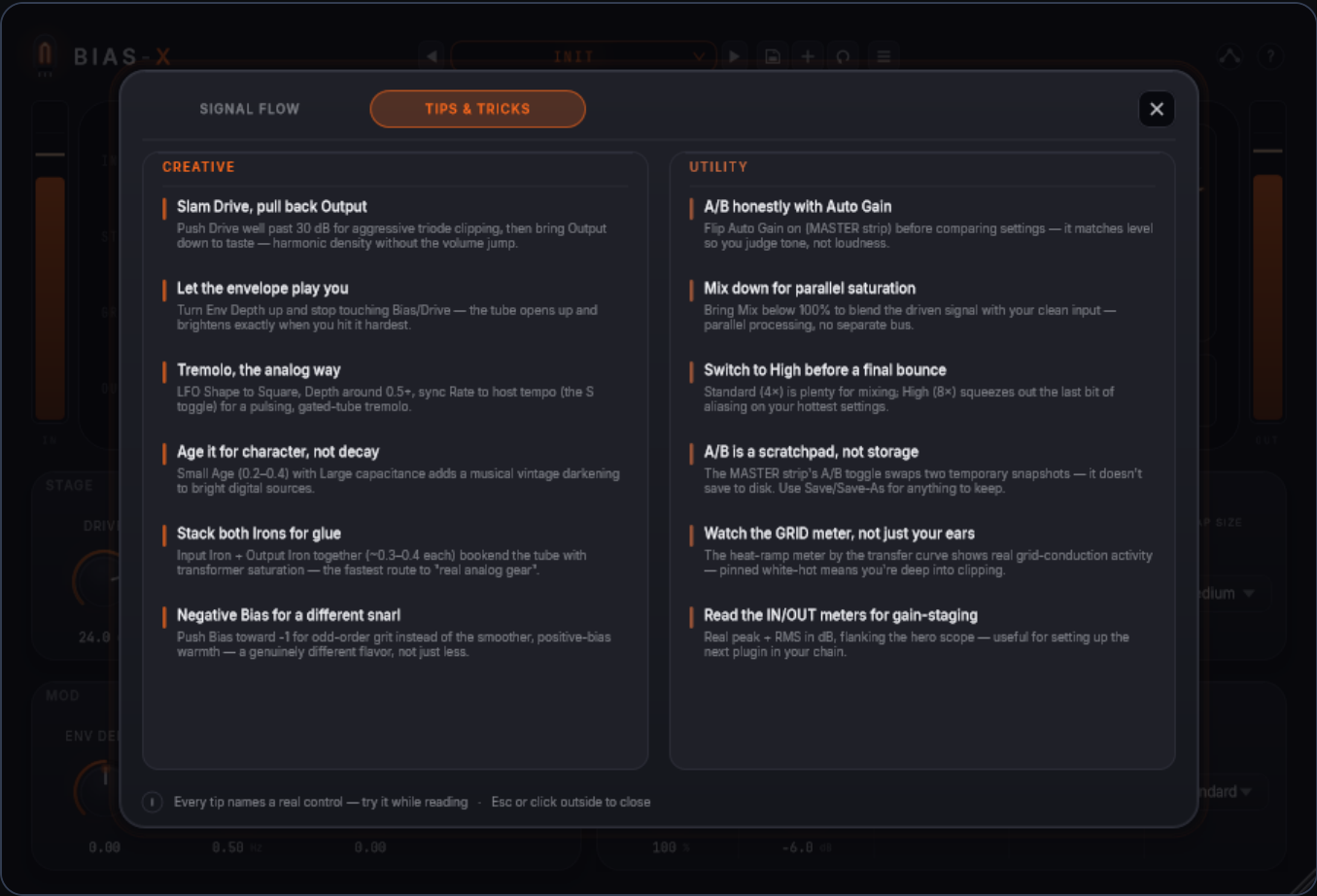
The Signal Flow overlay



Hover or click any stage to read what it does and see its real controls.

Click the circuit icon in the header. The diagram is interactive: hover or click a stage to see a description of what it does and a live list of the controls that belong to it. The second tab holds

a set of practical tips.



Tips & Tricks — every tip names a real control, so you can try it while reading.

11 Presets

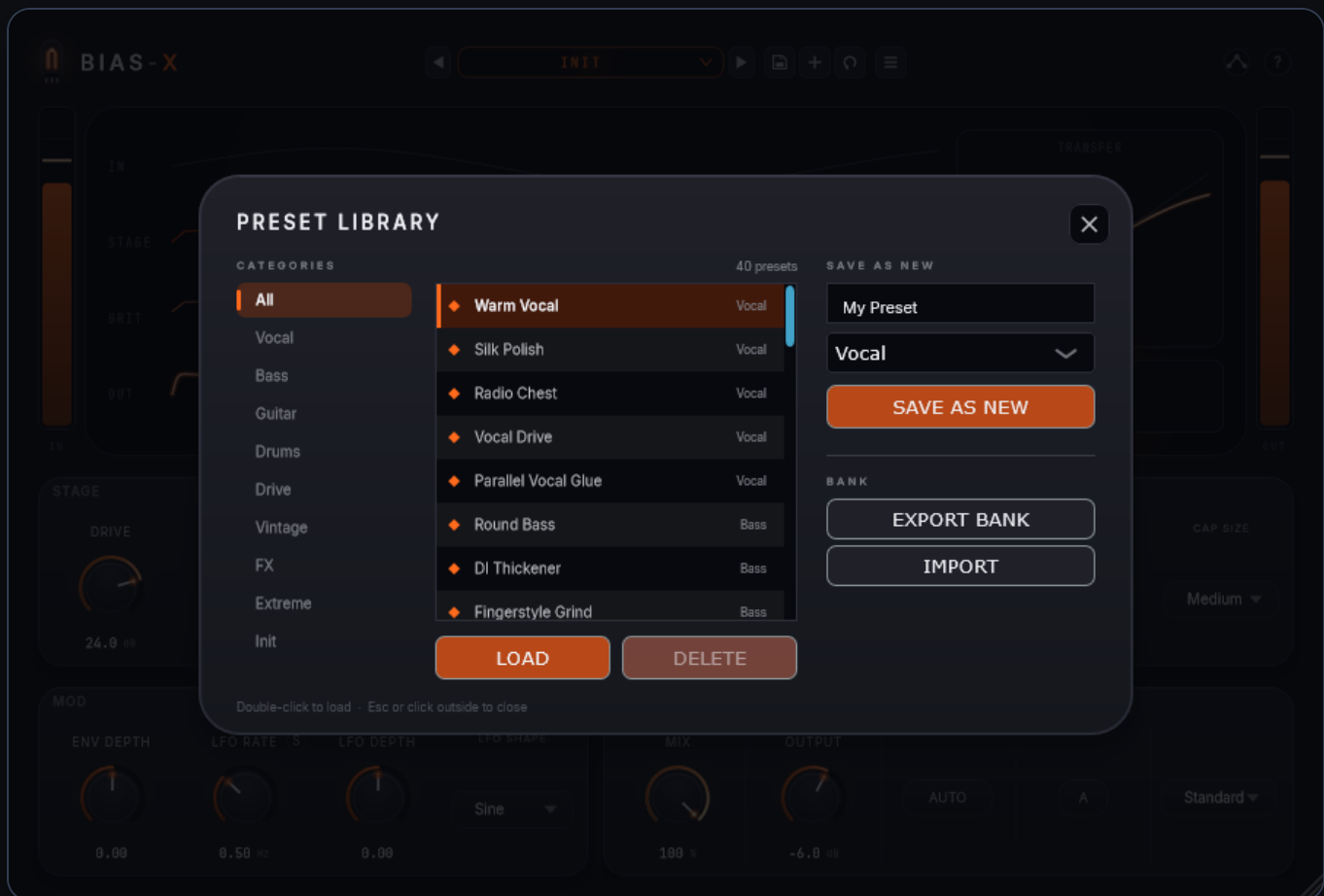
Forty factory presets built in, plus your own library on disk.

The header transport

CONTROL	WHAT IT DOES
◀ / ▶	Step to the previous or next preset in the library.

CONTROL	WHAT IT DOES
Name display	Click for a menu, organised by category.
Save	Overwrite the current user preset in place. Factory presets are read-only, so this becomes Save As.
+ (New)	Save the current settings as a new preset.
↺ (Init)	Reset every parameter to its default.
≡ (Library)	Open the full browser.

The library browser



Categories on the left, presets in the middle, save and bank tools on the right.

Factory presets are marked and cannot be deleted or overwritten — they are compiled into the plugin, so they can never go missing or get corrupted. Your own presets sit alongside them and are fully editable.

- **Double-click** a preset to load it, or select and press Load.

- **Save As New** writes a new `.biaspreset` file; if the name is taken it adds a suffix rather than overwriting.
- **Export Bank** writes your whole user library to one `.biasbank` file for backup or sharing. Factory presets are never included — they ship with every install.
- **Import** merges a bank back in.
- **Esc** or a click outside closes the browser.

FIXED IN V1.0.0

A **damaged or incomplete** `.biaspreset` used to load silently as a success, leaving you with a hybrid of the previous preset and whatever fragment survived. Preset files now record how many parameters they should contain, and a short one is refused with a clear message instead of being half-applied.

Your session also now remembers *which* preset it is on, so reopening the plugin window shows the right name — and Save keeps overwriting that preset instead of quietly turning into Save-As and duplicating it.

12 The factory library

Forty presets, five per category. Every one measured at mixing level and level-matched so bypass tells you the truth — and every one built to a **declared distortion budget** for its category rather than to taste alone.

Vocal, Vintage and FX are held inside “a valve stage idling”, because those three land on the least forgiving material: voices, whole mixes, pads and textures. Drums is the one category allowed to be aggressive. The budgets are enforced — `BiasMeasure` fails if a preset exceeds its category, or if any two presets in a category are too similar to each other.

The **THD@-18** column is measured distortion at a realistic program level — how the preset behaves in a mix. **THD@-8** is the same measurement on a hot signal, roughly what you get on peaks. The gap between the two columns is how dynamic the preset is.

PRESET	CATEGORY	WHAT IT'S FOR	THD@-18	THD@-8	LEVEL
Silk Polish	VOCAL	The lightest thing here, at a quarter Mix	0.37 %	1.11 %	-0.47 dB
Sub Glue	BASS	Harmonics under an untouched sub, for small speakers	0.59 %	1.74 %	-0.59 dB
Acoustic Sheen	GUITAR	Acoustic guitar and anything that must not thicken	0.62 %	1.83 %	-0.57 dB
Slow Breather	FX	A six-second cycle under pads and rooms	0.72 %	2.13 %	-0.34 dB
Tired Electrolytics	VINTAGE	Forty-year-old capacitors, deliberately	0.74 %	2.09 %	-0.49 dB
Tape Wow	VINTAGE	Slow, shallow drift of a tired tape machine	0.80 %	2.14 %	-0.92 dB
Warm Vocal	VOCAL	The everyday pass — start here for voice	0.88 %	2.54 %	-0.60 dB
Ducking Iron	FX	Inverted envelope — pumping without a sidechain	0.89 %	2.44 %	-0.95 dB
Square Chop	FX	Tempo-locked eighth-note gating	0.94 %	3.24 %	+0.54 dB
AM Broadcast	VINTAGE	A narrow midrange band, the way AM hears	0.95 %	2.49 %	-0.68 dB
1964 Console	VINTAGE	Transformers on every input and output	0.96 %	2.74 %	-0.65 dB
Radio Chest	VOCAL	Broadcast chest and density on a thin vocal	0.97 %	2.73 %	-0.75 dB
Parallel Vocal Glue	VOCAL	Density on a vocal without softening the attack	1.02 %	2.08 %	+0.18 dB
Vocal Drive	VOCAL	Rock and rap edge that survives a dense mix	1.07 %	2.60 %	-0.39 dB
Envelope Amp	FX	Opens up as the player digs in	1.08 %	3.05 %	-0.44 dB

PRESET	CATEGORY	WHAT IT'S FOR	THD@-18	THD@-8	LEVEL
Tube Tremolo	FX	Tremolo by moving the operating point, not a VCA	1.09 %	3.33 %	+0.51 dB
Round Bass	BASS	Size from the transformer shelf; almost no drive	1.18 %	3.45 %	-0.88 dB
Clean Combo	GUITAR	A clean amp channel only just working	1.25 %	3.59 %	-0.55 dB
DI Thickener	BASS	For a DI that is clean and musically thin	1.28 %	3.68 %	-0.55 dB
Valve Broadcast	VINTAGE	The most present of the five, and the brightest	1.30 %	3.54 %	-0.46 dB
Motown Round	BASS	Flatwounds, foam and an old amp's sag	1.46 %	4.14 %	-0.46 dB
Drum Bus Glue	DRUMS	Rounds the peaks, keeps the stick	1.56 %	4.40 %	-0.43 dB
Overhead Tape	DRUMS	Character by bandwidth — Age does the work	1.71 %	4.42 %	-0.18 dB
Fingerstyle Grind	BASS	Pick and string noise brought forward	1.75 %	4.15 %	-0.26 dB
Kick Weight	DRUMS	Character by low shelf — both irons hard up	1.75 %	4.90 %	-0.69 dB
Lead Sustain	GUITAR	Large caps and heavy Sag — the thickest guitar here	1.97 %	4.35 %	-0.35 dB
Edge of Breakup	GUITAR	Breaks up when you pick harder, not before	2.11 %	5.30 %	-0.39 dB
Crunch Rhythm	GUITAR	Small caps and tight — rhythm, against Lead Sustain	2.39 %	5.47 %	+0.08 dB
Stacked Iron	DRIVE	Both transformers up, no pentode — weight not fuzz	3.17 %	9.08 %	-0.04 dB
Warm Overdrive	DRIVE	A properly worked valve stage	4.42 %	10.97 %	+0.20 dB

PRESET	CATEGORY	WHAT IT'S FOR	THD@-18	THD@-8	LEVEL
Snare Snap	DRUMS	The only negative Bias here — crack, not fuzz	4.50 %	10.77 %	+0.23 dB
Cold Bias Bark	DRIVE	Cold grid: hard, spiky, odd-order snarl	5.82 %	15.85 %	-0.08 dB
Parallel Saturator	DRIVE	Hard-driven wet path at half blend, transient intact	6.08 %	8.64 %	+0.77 dB
Room Crush	DRUMS	Room mics worked hard, blended back under the dry	6.39 %	12.30 %	+0.06 dB
Hot Plate	DRIVE	Both stages compounding, HQ oversampling	6.91 %	15.58 %	+0.76 dB
Gated Cutoff	EXTREME	Gated fuzz — the gate is the tube physics	8.64 %	19.27 %	-0.01 dB
Bit Rot	EXTREME	Damage by bandwidth rather than by distortion	10.77 %	16.96 %	-0.36 dB
Screaming Envelope	EXTREME	Chaotic, entirely input-dependent	15.36 %	32.89 %	-0.24 dB
Total Meltdown	EXTREME	Everything at once — a re-amp texture	17.18 %	28.28 %	-0.13 dB
Siren Bias	EXTREME	The grid slides between two different tubes	22.94 %	36.86 %	+0.15 dB

By category

CATEGORY	PRESETS	THD RANGE @-18	CHARACTER
Vocal	5	0.37 - 1.07 %	Held to valve-idling; every one under 100 % Mix
Bass	5	0.59 - 1.75 %	Weight from the irons, which cost no distortion
Guitar	5	0.62 - 2.39 %	The widest spread — a third of a percent to the ceiling
Drums	5	1.56 - 6.39 %	The loose one. Each by a different mechanism

CATEGORY	PRESETS	THD RANGE @-18	CHARACTER
Drive	5	3.17 – 6.91 %	Allowed to be obvious — still mix tools
Vintage	5	0.74 – 1.30 %	The mix-bus category. Tone and bandwidth, not dirt
FX	5	0.72 – 1.09 %	Textures and pads. The movement is the effect
Extreme	5	8.64 – 22.94 %	Sound design. The only category that tears.

FULL DETAIL

Every preset has a longer description, its intended sources and its complete control settings in [docs/PRESETS.md](#) alongside this manual.

13 Recipes

Nine things worth knowing how to do, described in terms of the controls.

Parallel saturation, without a bus

Drive hard — 12 dB or more, Grit above 0.6 — then bring **Mix** down to 30–45 %. You get the harmonics without losing the transient, and you did not have to set up a send. This is how *Sub Glue*, *Room Crush* and *Parallel Saturator* are built.

Weight without mud

Both Iron controls to 0.4–0.6, Drive low, Cap Size Large. The irons add +4 dB at 60 Hz and nothing above 250 Hz, so you get size in the octave that matters without the low-mid build-up an EQ shelf would give you. *Stacked Iron* is this idea on its own.

Let the performance drive the distortion

Env Depth to +0.3 or so, Drive somewhere near breakup. The tube opens up exactly when the player digs in, so soft passages stay clean and loud ones bite. Works on anything that has not already been compressed flat.

Honest A/B

Turn **Auto Gain** on before comparing settings, so you judge tone instead of loudness — and turn it off again before you commit. Use the **A/B** slots to hold two candidate settings side by side.

Get more distortion without more level

Raise **Stage 2** rather than Drive. It compounds the first stage's harmonics inside the tube instead of pushing more signal through, so density rises faster than level.

Get less distortion without losing character

Pull **Mix** back. Turning Drive down changes *what* the plugin does; turning Mix down changes *how much*. They sound different, and Mix is usually what you wanted.

Tape flutter, not tremolo

LFO Shape Sine, Rate 0.2–0.4 Hz, and Depth no higher than **0.15**. Past about 0.2 it stops being drift and becomes an effect anyone can name.

Something genuinely nasty

Push **Bias negative** — toward –0.5 or beyond. Cold bias gives a hard, odd-order snarl that is a different flavour from the smooth positive-bias warmth, not just more of it. Go past –0.8 and the tube stops conducting except on peaks, which gates.

Before a final bounce

If you have used a lot of Grit or very high Drive, switch **Quality** to High while the transport is stopped. For everything else Standard is genuinely enough.

14 Standalone app

The same plugin, running on its own audio device — useful for practice, for processing a live input, or just for auditioning presets without opening a DAW.

- **Audio setup** is in the app's own menu: pick your device, sample rate and buffer size. ASIO is supported and recommended on Windows.
- **The window closes to the system tray** rather than quitting, so the audio keeps running. The tray icon's right-click menu has Show and Exit.
- **Presets are shared** with the plugin version — the same `%APPDATA%\Bias-X\Presets` folder.

FIXED IN V1.0.0

With the window hidden to the tray, launching the shortcut again used to start a *second* copy — two tray icons, two processes competing for an exclusive ASIO device. Relaunching now simply restores the window you already had.



BIAS - X

By VybeCode DSP

<https://vst.tools>

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The About panel — version, build and links.

15 Troubleshooting

Common questions

SYMPTOM	CAUSE AND FIX
Even at minimum it still colours the sound	Correct and expected. Bias-X has no transparent setting — its floor is about 1.9 % distortion. Pull Mix down to go below that, or bypass.
A preset is much heavier than the manual says	Your input is hotter than –18 dBFS. Check the IN meter and trim before the plugin — see section 4 .
The Iron knobs seem to do nothing	They are low shelves, not distortion. Listen below 250 Hz — there is +4 dB at 60 Hz at full travel and nothing above 500 Hz.
Grit feels much stronger than it used to	It is — roughly 3× at the same knob position. v1.0.0 fixed two separate faults here: the pentode and the tube were cancelling each other's harmonics, and the stage lost level the harder it was driven, so the knob got quieter as it got dirtier. Both are gone. Use smaller settings; 0.10–0.30 is a normal range.
A click when I load a preset	Fixed in v1.0.0 — Mix is now ramped. If you still hear one, check for a different plugin in the chain.
Audio swells up after I hit play	Fixed in v1.0.0. No factory preset needs Auto Gain in any case.
The preset name says INIT but my sound is right	Fixed in v1.0.0 — the session now stores which preset it is on.
A synced LFO is at the wrong rate	Fixed in v1.0.0 — synced rates now hold at every buffer size.
Sounds different bounced than monitored	Fixed in v1.0.0. Auto Gain's timing and the modulation rate are both derived from wall-clock time now, so buffer size no longer changes the result.

SYMPTOM	CAUSE AND FIX
The plugin does not appear in my DAW	Rescan plugins, and confirm the VST3 is at <code>C:\Program Files\Common Files\VST3\Bias-X.vst3</code> . Bias-X is 64-bit only.

Fixed in this version

Nine faults found by the v1.0.0 audit are fixed. They are listed here because some of them changed how a control behaves, and if you have used an earlier build you will notice.

WHAT WAS WRONG	WHAT CHANGED
Grit measurably <i>reduced</i> distortion over its lower third	The pentode's harmonics were in anti-phase with the tube's. Aligned — Grit is now monotonic and about 3× stronger at the same setting
Grit dropped the output level as it was turned up — −4.4 dB at mixing level, −13.3 dB on hot material	The pentode normalised itself by its small-signal gain, which over-corrects as soon as it starts saturating. It now measures its own output and matches it to its input, so the whole knob sits inside 0.3 dB at any level
Auto Gain swelled after more than a second of silence	Holds at unity below the noise floor; timing no longer depends on buffer size
Mix clicked when a preset changed it	Now ramped like every other control
Quality switch burst for ~20 ms	The switch no longer resets your settings to factory defaults
Synced LFO was wrong at 1024+ sample buffers	Modulation now updates within the block, at any buffer size
Corrupt preset files loaded silently	Rejected with a clear message
The session forgot which preset it was on	Stored with the session; Save overwrites again instead of duplicating
Standalone could launch a second copy	Relaunching restores the existing window
Sag stepped rather than ramping on recall	Now smoothed

WHAT WAS WRONG	WHAT CHANGED
A single NaN from an upstream plugin could silence or crash it	Non-finite input is scrubbed at the boundary and the chain recovers

16 Specifications

Formats	VST3, Standalone application
Platform	Windows 10 / 11, 64-bit
Channels	Mono and stereo
Sample rates	44.1 kHz to 192 kHz
Oversampling	4× (Standard) or 8× (High), around the whole non-linear chain
Latency	5 samples at the base rate in High; reported to the host for automatic compensation
Parameters	32, all host-automatable
Factory presets	40, across 8 categories
Preset format	<code>.biaspreset</code> · banks <code>.biasbank</code>
Interface	900 × 610 at design size, resizable 0.5× – 2×
Validation	pluginval strictness level 10

The model

STAGE	MODEL
Triode ×2	Norman Koren plate-current model, 12AX7 constants, with grid-conduction limiting

STAGE	MODEL
Dynamic bias	Cathode-network charge, ~5 ms attack / ~80 ms release
Supply sag	Shared ~50 ms envelope across both stages
Interstage coupling	10 Hz high-pass per stage
Pentode (Grit)	Asymmetric shaper with tone control, post-triode
Transformers ×2	Jiles-Atherton hysteresis plus a magnetizing-inductance low shelf
Capacitor ageing	Coupled low-pass / high-pass pair with an all-pass and a light non-linearity

Measured performance

SETTING	THD @ 1 KHZ	ALIASING @ 11 KHZ	DC OFFSET
Clean	20.7 %	-98.5 dB	-77.3 dB
Driven	37.4 %	-31.0 dB	-76.4 dB
Gritty	40.3 %	-23.0 dB	-76.8 dB
Full	28.2 %	-20.0 dB	-78.4 dB

Measured with a hot -6 dBFS test tone at 48 kHz — these are worst-case figures, not typical ones. At mixing level the same settings measure roughly a third of these values; see [section 4](#).