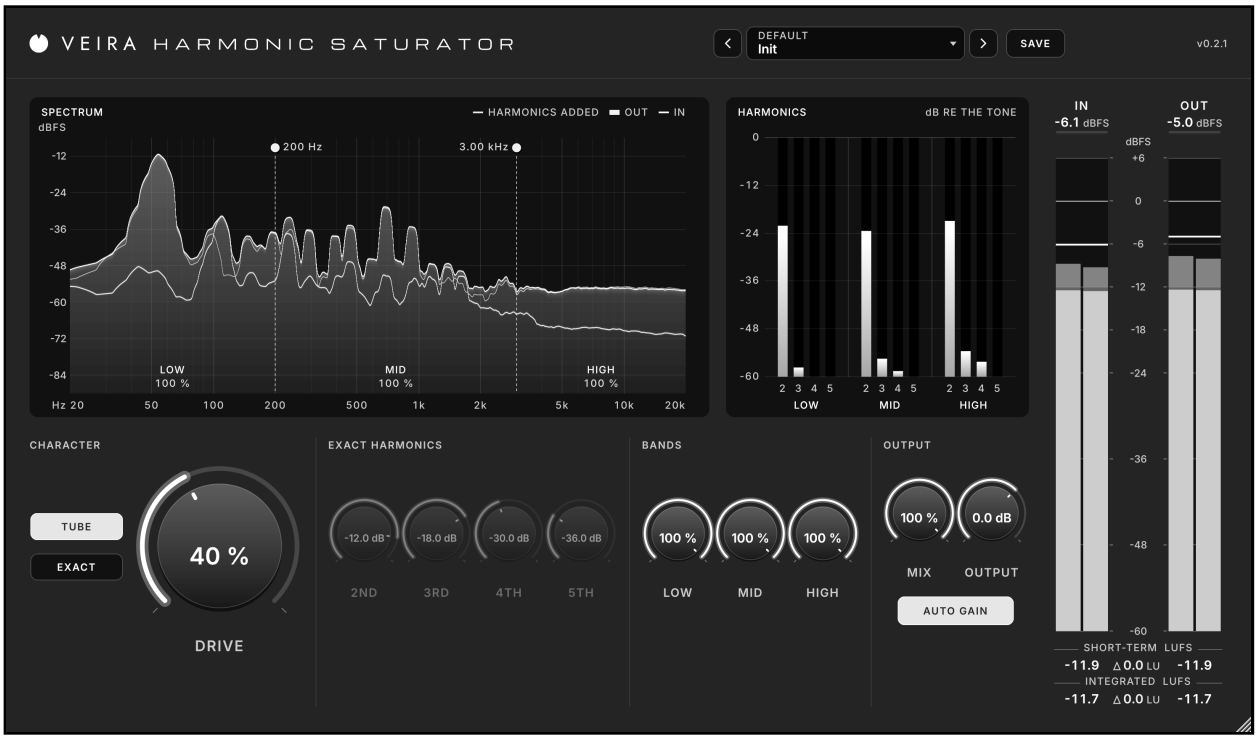
VEIRA

HARMONIC SATURATOR

VEIRA Harmonic Saturator

User Manual

Harmonic colour, by the band. TUBE drives a warm triode curve; EXACT adds exactly the 2nd, 3rd, 4th and 5th harmonics you set. Warm only the lows, add edge only to the mids or air only to the top, at the level it came in.



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Welcome

Thank you for choosing **VEIRA Harmonic Saturator**. Saturation is what happens when a signal passes through something that can't follow it perfectly: a valve, a transformer, a tape, a console's input stage. The sound picks up **harmonics**, quieter copies of each note at two, three, four and five times its pitch, and that's what we hear as warmth, thickness, edge or air. Engineers reach for it on almost everything: to make a bass heard on a phone, a vocal come forward, a drum bus feel denser or a mix sound "analog".

VEIRA Harmonic Saturator gives you two kinds of colour and puts them exactly where you want them:

- TUBE drives a warm triode curve. It adds mostly the 2nd harmonic, more of the 3rd and above as you push it, and it rounds the peaks softly, like a real valve stage.
- EXACT adds exactly the 2nd, 3rd, 4th and 5th harmonics you set on four knobs, at the same ratio at any level, without rounding anything.

DRIVE sets how much. The signal is split into three bands, **LOW**, **MID** and **HIGH**, and each band's knob sets how much of the colour is made from it: warm only the lows, add edge only to the mids, or air only to the top. You move the two splits by dragging their handles on the SPECTRUM display. MIX blends with the dry signal, **AUTO GAIN** keeps the loudness where it was, and OUTPUT sets the level.

What makes it different

- **Two kinds of colour.** A tube curve that reacts to how hard you play, and an exact harmonic generator that never changes its balance with level. Switch between them while the music plays.
- **Colour by the band.** Choose what the harmonics are made from, band by band, with linear-phase splits that stay perfectly in time with the dry signal.
- **The dry signal is never filtered.** What you hear is your input, untouched, plus the harmonics. At DRIVE 0 % or MIX 0 % the output is the input, bit for bit.
- **The level stays put.** AUTO GAIN takes back the loudness the harmonics add. Measured at 15 to 100 % DRIVE on a mix, drums, a vocal and a master: TUBE within 0.45 dB, EXACT within 0.25 dB.
- **The same on a quiet track and a loud one.** TUBE drives each band against that band's own long-term level, so it does the same on a quiet recording and a hot one, while louder moments still get more.
- **70 measured presets** in 12 folders, sorted by instrument and by job (Mix Bus, Mastering, Creative FX).
- **A clean, legible face.** Knobs with their value in the middle, text you can read at a glance, and a window you can scale from 75 % to 200 %.

How this manual is organised. *Getting started* covers installing and activating. *The panel at a glance* names every part of the window. *How harmonic saturation works* explains, without maths, what harmonics are, what each one sounds like and what happens inside the plugin. *Controls* explains TUBE and EXACT, DRIVE, the four harmonic knobs, the bands and the output section with drawings of what they do, *Displays* teaches you to read the SPECTRUM and HARMONICS displays, and *Presets*, *Recipes*, *Specifications* and *Troubleshooting* follow.

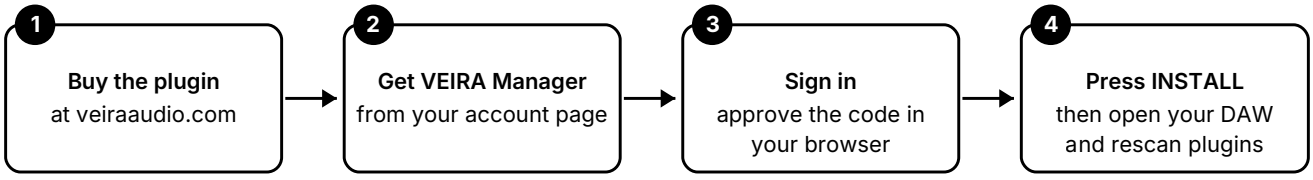
Getting started

What you need

macOS	macOS 11 Big Sur or later. Native on Apple silicon and Intel Macs (universal).
Windows	Windows 10 or 11, 64-bit.
Plugin formats	VST3 (macOS and Windows), Audio Units (macOS), and a standalone app. Pro Tools (AAX) versions arrive once they are signed for Pro Tools.
Hosts	Any DAW that loads VST3 or Audio Units: Logic Pro, Cubase, Nuendo, Ableton Live, Studio One, Reaper, FL Studio, Bitwig and others.
Account	A VEIRA account at veiraaudio.com, and the free **VEIRA Manager** app.
Internet	Needed to install and to refresh the licence. The plugin itself never goes online.

Install with VEIRA Manager

VEIRA plugins are not downloaded from the website one by one. You install them with **VEIRA Manager**, the free VEIRA app that installs, updates and activates everything you own. Its own manual covers it in full; the short version is:



One account works on up to three computers. Updates are free for life.

FIGURE 1 From purchase to first sound in four steps.

1. **Buy** VEIRA Harmonic Saturator at **veiraaudio.com**. It's a one-time purchase: you own it for good, with free updates.
2. **Download VEIRA Manager** from your account page (or veiraaudio.com/manager) and install it.
3. **Sign in.** VEIRA Manager shows a short code and opens your browser; confirm the code there. Your password is never typed into the app.
4. Find VEIRA Harmonic Saturator in the list and press INSTALL. When it says SHOW, it's installed. Open your DAW and let it rescan its plugins.

After installing, VEIRA Harmonic Saturator appears in your DAW under the manufacturer **VEIRA** (in Logic Pro: Audio Units ▸ VEIRA ▸ VEIRA Harmonic Saturator).

Activation and the licence

VEIRA Manager keeps a licence on your computer that the plugins check. It is refreshed every time VEIRA Manager opens and stays valid for 30 days offline, so you can work without internet as long as you open VEIRA Manager now and then.

Without a valid licence, VEIRA Harmonic Saturator still loads and works, but **its sound fades out for 1.5 seconds every 30 seconds**, and a strip along the bottom of its window says why (for example, *NOT ACTIVATED ON THIS COMPUTER. SIGN IN WITH VEIRA MANAGER.*). Clicking the strip opens your account page.

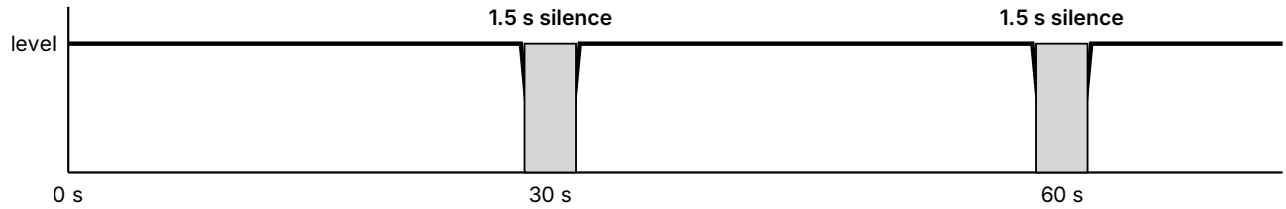


FIGURE 2 What an unlicensed copy does. With a valid licence the audio is never touched.

- **Activating while your DAW is open** takes effect within about two minutes. You don't need to reload the plugin.
- **"Not activated on this computer"**: open VEIRA Manager and sign in.
- **"Expired"**: open VEIRA Manager while online; it renews the licence at once.
- **"Not included"**: the signed-in account doesn't own VEIRA Harmonic Saturator. Check that you're signed in with the account you bought it with.

Formats and where the files go

VEIRA Manager puts every format in the standard place, so you never need to copy files by hand:

Format	macOS	Windows
VST3	`~/Library/Audio/Plug-Ins/VST3` (just for me, the default) or `/Library/Audio/Plug-Ins/VST3` (all users)	`C:\Program Files\Common Files\VST3` (all users, the default) or `%LOCALAPPDATA%\Programs\Common\VST3`
Audio Units	`~/Library/Audio/Plug-Ins/Components` or `/Library/Audio/Plug-Ins/Components`	(Audio Units are macOS only)
Standalone	`~/Applications/VEIRA` or `/Applications/VEIRA`	`C:\Program Files\VEIRA` or `%LOCALAPPDATA%\Programs\VEIRA`

You choose *just for me* or *all users* in VEIRA Manager's install settings.

The standalone app runs VEIRA Harmonic Saturator on its own, with your audio interface's input and output, which is handy for trying presets without a DAW.

The panel at a glance

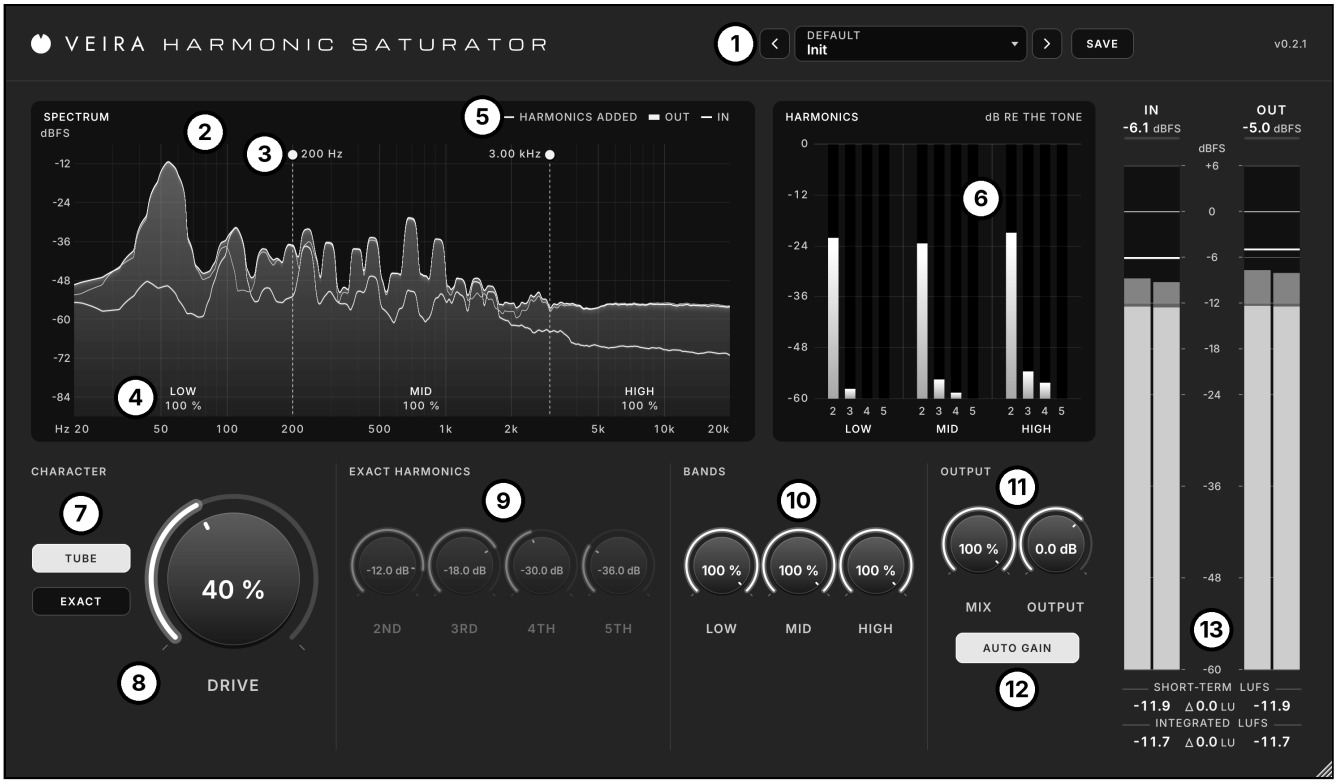


FIGURE 3 VEIRA Harmonic Saturator with the factory preset *Default: Init* loaded (TUBE, DRIVE 40 %, every band at 100 %) while a mix plays.

The window has three areas: the **SPECTRUM** and **HARMONICS** displays across the top, the controls underneath in four groups captioned CHARACTER, EXACT HARMONICS, BANDS and OUTPUT, and the **meter bridge** down the right.

	Part	What it does
1	Preset browser	Steps through and saves presets. See *Presets*.
2	SPECTRUM display	The input, the output and the harmonics the plugin adds, from 20 Hz to 20 kHz.
3	Split handles	LOW | MID and MID | HIGH: drag them to set where the bands meet.
4	Band names	LOW, MID and HIGH with their amounts; a band turned down is veiled.
5	Legend	Names the three lines: HARMONICS ADDED, OUT, IN.
6	HARMONICS display	Per band, how loud the 2nd to 5th harmonics are right now.
7	TUBE / EXACT	The kind of colour.
8	DRIVE	How much colour.
9	EXACT HARMONICS	2ND, 3RD, 4TH, 5TH: four knobs, the level of each harmonic in EXACT (dimmed in TUBE).

	Part	What it does
10	BANDS	LOW, MID, HIGH: how much of the colour is made from each band.
11	MIX and OUTPUT	The saturated signal against the dry one, and the final level.
12	AUTO GAIN	Keeps the loudness where it was.
13	Meter bridge	Input and output level and loudness.

Using the controls

Every VEIRA plugin is played like a piece of hardware. The same few parts appear on every panel:

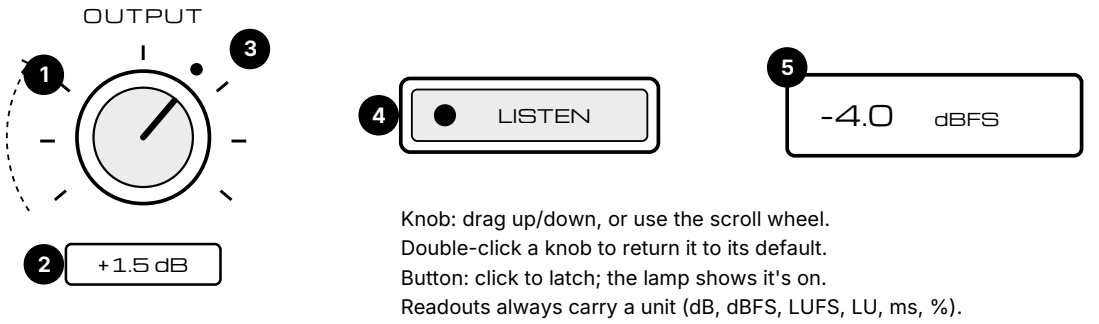


FIGURE 4 The parts you'll find on every VEIRA panel (the labels are examples).

- 1 **Knob.** Drag up to turn it clockwise, down to turn it back, or use your mouse wheel. **Double-click** returns it to its default. The engraved pointer and the small dot on the scale show where it's set.
- 2 **Value window.** The backlit window under each knob shows its exact value with its unit.
- 3 **Silkscreen label.** The control's name, as it appears in your DAW's automation list.
- 4 **Push button.** Click to switch on; the lamp lights and the cap sits lower in its bezel. Click again to switch off.
- 5 **Readout.** Live numbers update ten times a second so you can read them while the meters move. A value over 0 dBFS shows as a warning.

Tooltips: hover over any control or display for a short explanation. On displays, the tooltip depends on where you point.

Automation: every knob and button is a host parameter, so you can automate it in your DAW and control it from a MIDI controller or control surface that your DAW maps.

Units: VEIRA never shows a bare number. **dBFS** is level against digital full scale (0 dBFS is the loudest a digital signal can be); **dB** is a change in gain; **LUFS** is loudness as streaming services and broadcasters measure it; **LU** is a difference in loudness (1 LU = 1 dB).

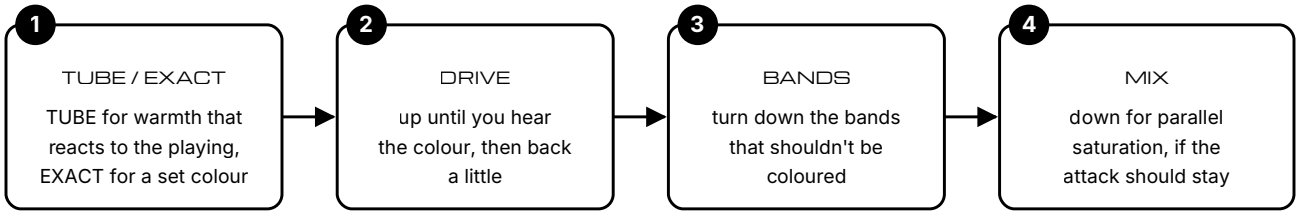
On VEIRA Harmonic Saturator's panel the parts look a little different from the drawing above:

- **Knobs** show their value **in their middle**, and a lit ring (blue on screen; in print, the lighter arc) shows how far each is turned. Drag, use the wheel, or double-click (or Alt/Option-click) for the default, as on every

VEIRA knob. The four EXACT HARMONICS knobs (2ND to 5TH) were vertical faders in earlier versions; they work exactly as before and read Off at the bottom of their travel.

- **Type a value:** right-click a knob (Control-click on a Mac). A field opens over the knob with the current value; type the new one and press Return. The number is enough: **40** for DRIVE, **-14** for 3RD, **-0.5** for OUTPUT; type **off** to switch a harmonic off. Press Escape or click elsewhere to leave it unchanged.
- **Buttons** have no lamps. TUBE and EXACT work like radio buttons: the selected one is filled (orange on screen; in print, the solid, lighter button) and the other is dark with an outline. AUTO GAIN is filled the same way when it's on.
- **Resize the window:** drag its bottom-right corner (the small diagonal lines). It scales from 75 % to 200 % of its normal size and keeps its proportions, so everything stays sharp. Your DAW saves the size with the session.

Quick start: colour in four moves



AUTO GAIN keeps the level, so compare with bypass: what changes is the colour, not the volume.

FIGURE 5 The quickest way to a good result. Or load a preset for your instrument, the mix bus or the master.

How harmonic saturation works

If you already use saturation every day, skim this chapter; it explains what harmonics are, what each one sounds like, and what happens inside VEIRA Harmonic Saturator.

Harmonics: the copies above every note

Play a note at 100 Hz on almost any instrument and you hear more than 100 Hz. There are quieter tones at 200, 300, 400, 500 Hz and up, whole-number multiples of the note: its **harmonics**. Their balance is what makes a cello sound different from a flute on the same note. When a signal is saturated, new harmonics are added on top of the ones already there, and the ear hears that as colour.

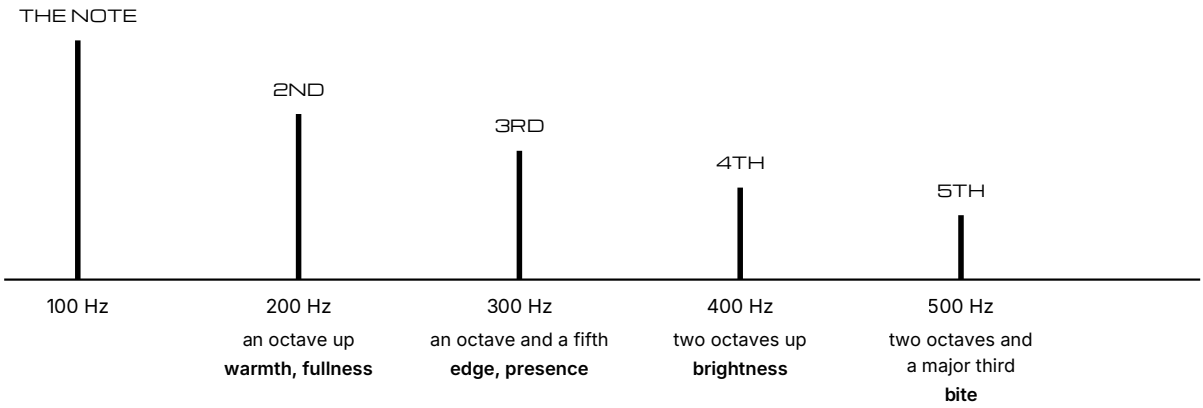


FIGURE 6 A note at 100 Hz and the four harmonics VEIRA Harmonic Saturator works with. The heights are only an illustration.

- **The 2nd harmonic** is an octave above the note. It blends with the note so well that the ear hears it as part of it: the sound gets **warmer and fuller**, not brighter. It's the classic sound of a valve stage or tape.
- **The 3rd harmonic** is an octave and a fifth up. It adds **edge and presence**, a slightly hollow, reedy colour (a clarinet is rich in odd harmonics). Too much sounds hard.
- **The 4th** is two octaves up, another octave of the 2nd: it adds **brightness** on top of the warmth.
- **The 5th** sits two octaves and a major third up. It adds **bite** and grit; with the 3rd it moves the colour towards a fuzz.

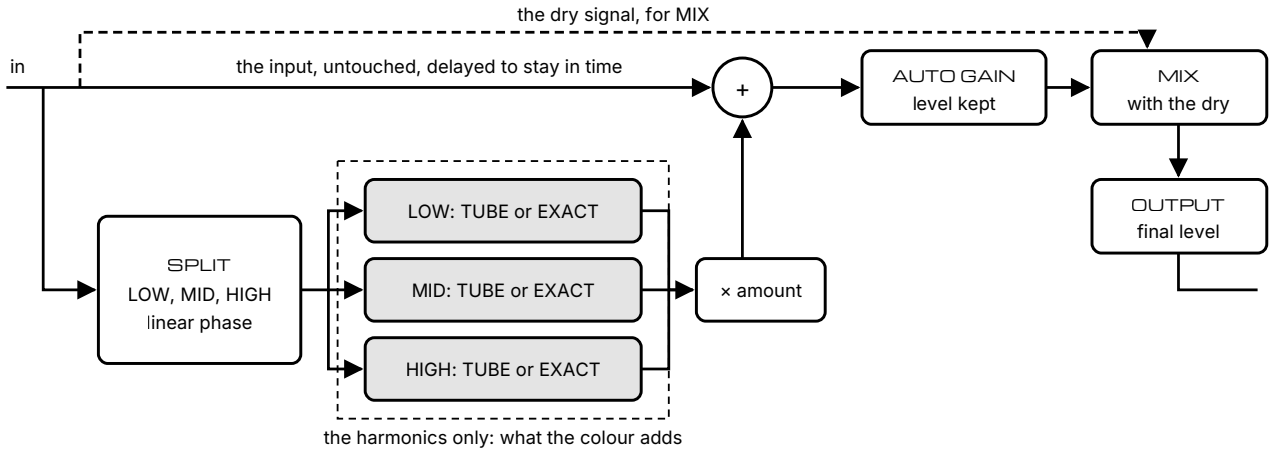
Even harmonics (2nd, 4th) generally sound sweet and musical, odd ones (3rd, 5th) more aggressive. A **symmetric** curve, one that treats the top and bottom of a wave alike, makes only odd harmonics; a **lopsided** one, like a triode valve's, makes even ones too. On music with many notes, any saturation also creates tones at the sums and differences of the notes, exactly as an analog stage does.

Two ways to add harmonics

A curve is how hardware does it: the signal passes through something whose output doesn't rise in a straight line with its input. Quiet signals pass almost unchanged, loud ones are bent, and the bending creates harmonics. The louder the signal, the more harmonics, and the peaks get rounded off on the way (a little like a compressor). That's TUBE.

A generator makes each harmonic directly, at a level you choose, from the signal itself. Nothing is bent, the peaks aren't rounded, and the balance doesn't change with level: a whisper and a shout get the same colour. That's EXACT. It can make colours no curve can, such as only a 3rd and 5th, or a 2nd with no 3rd at all.

What happens inside VEIRA Harmonic Saturator



The bands decide what the harmonics are made from. The input itself never goes through them.

FIGURE 7 The signal flow. The input goes straight through; the harmonics made from each band are added to it. MIX blends the result with the dry signal, which is delayed by the same amount so the two stay in time.

Step by step:

1. **The input goes straight through**, only delayed by the plugin's latency. It's never filtered, so the plugin can't change its tone except by what it adds.
2. **The split** divides a copy of the signal into three bands, **LOW**, **MID** and **HIGH**, with linear-phase filters (the ones in VEIRA Multiband Compressor). The three bands add up exactly to the input and stay in time and in phase with it.
3. **Each band makes its colour**, with TUBE or EXACT, from its own signal. Only **what the colour changes** is kept: the harmonics added and, with TUBE, the peaks rounded.
4. **Each band's knob** (LOW, MID, HIGH) sets how much of that band's colour is used, and the three are added to the input.
5. **AUTO GAIN** takes back the loudness the harmonics add, so turning DRIVE changes the colour, not the level.
6. MIX blends this with the dry signal, and OUTPUT sets the final level.

Why the bands are linear phase. Because every band is exactly in time and in phase with the dry signal, the peaks TUBE rounds in a band land exactly on that band's peaks in the input, and the harmonics EXACT makes from neighbouring bands add up cleanly near a split. The price is latency: 1,216 samples at 44.1 and 48 kHz (about 25 ms), reported to your DAW so it can compensate. See *Specifications*.

Controls

CHARACTER: TUBE, EXACT and DRIVE

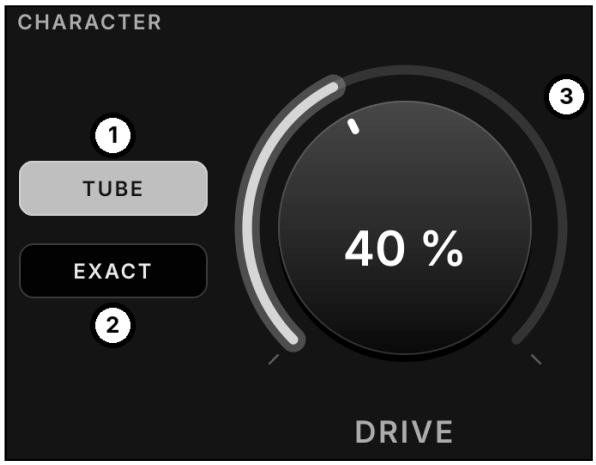


FIGURE 8 The CHARACTER group: 1 TUBE (selected), 2 EXACT and 3 the DRIVE knob, with its value (here 40 %) in its middle.

Control	Range	Default	What it does
TUBE / EXACT	TUBE, EXACT	TUBE	The kind of colour: a triode curve, or the four harmonics set on the 2ND to 5TH knobs.
DRIVE	0 to 100 % in 1 % steps	40 %	How much colour. TUBE: how hard each band drives the curve. EXACT: all four harmonic knobs together.

Switching is smooth. A change between TUBE and EXACT crossfades over 30 ms, with both running during the change, so you can switch while the music plays, or automate the switch, without a click. Every knob glides over about 50 ms.

At DRIVE **0 %** the plugin makes nothing: the output is the input, bit for bit, delayed by the latency.

TUBE

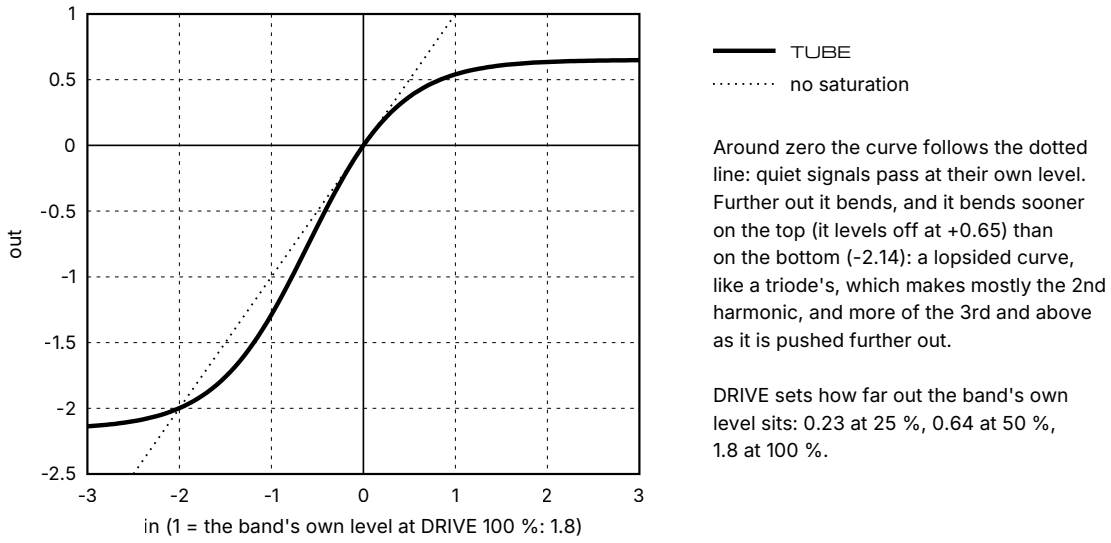


FIGURE 9 TUBE's curve, drawn from the plugin's formula: (tanh (u + 0.6) − tanh 0.6) / (1 − tanh² 0.6). The 0.6 makes it lopsided.

TUBE passes each band through a warm triode-style curve. It's **lopsided**: the top of the wave bends sooner than the bottom. That's why it makes **mostly the 2nd harmonic**, with more of the 3rd and above as you drive it harder, and why it rounds the peaks softly, as a valve does.

DRIVE sets how hard each band drives the curve, measured against **that band's own long-term level** (its level averaged over about 2.5 seconds while it plays). So a quiet recording and a loud one saturate alike, and you never have to gain-stage into the plugin, while within a performance the louder moments still saturate more, as with real hardware.

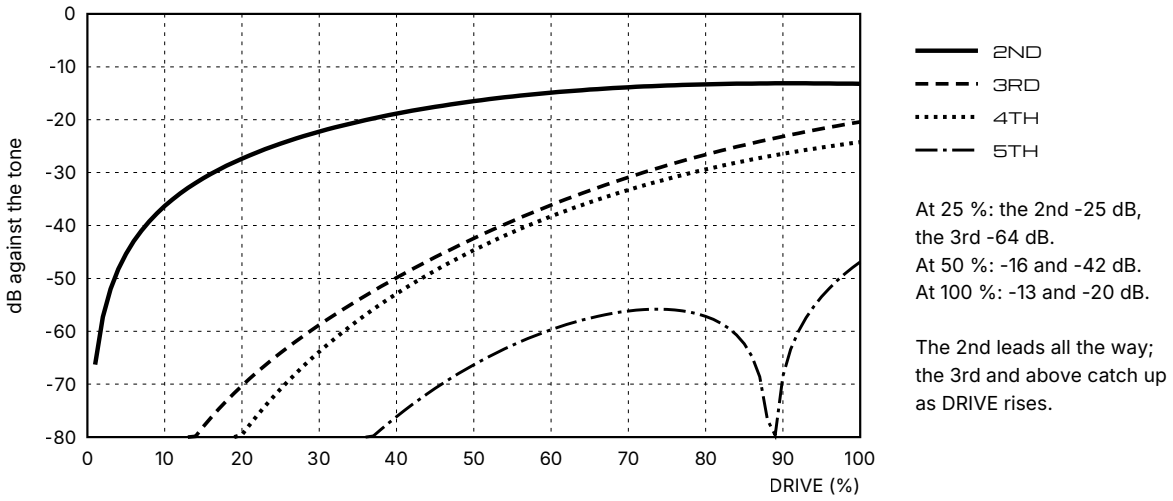


FIGURE 10 The harmonics TUBE gives a tone at its band's usual level, as DRIVE turns, computed from the plugin's curve. Measured on a 220 Hz tone, the plugin gives the 2nd at −24 dB and the 3rd at −61 dB at 25 %, and −16 and −39 dB at 50 %.

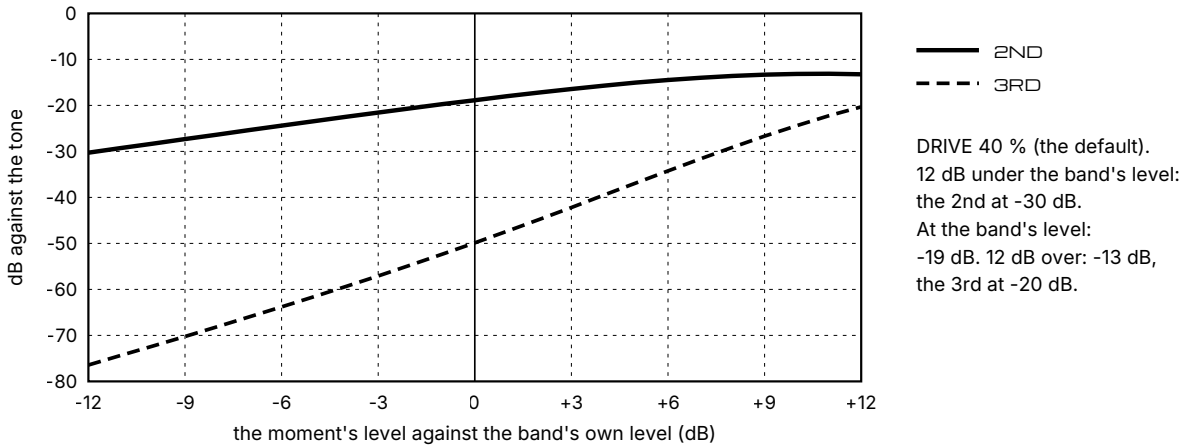


FIGURE 11 TUBE reacts to the playing: at the default DRIVE (40 %), a moment 12 dB louder than the band's usual level gets a much louder 2nd and 3rd, a quieter one much less. Computed from the plugin's curve.

A few things to know about TUBE:

- **It's also a peak rounder.** On drums and other sharp material, the hits sit far above the band's usual level, so TUBE rounds them quickly. That can be exactly what you want on a drum bus (density, softer transients); if it isn't, keep DRIVE moderate, use MIX for parallel saturation, or use EXACT, which rounds nothing.
- **It's not the way to add air.** Used on the HIGH band alone, TUBE tends to make the top **darker**, not brighter: rounding the cymbals' and consonants' peaks takes off more than its harmonics add. For air, use EXACT (every factory "air" preset does).
- **On a limited master, watch the peaks.** The lopsided curve can **raise** the peaks of an already limited master, by up to 2 dB at high DRIVE. The Mastering presets that use TUBE stay at 12 to 14 %. Keep it gentle before a limiter, or put the limiter after the plugin.

What the curve changes is computed at a higher sample rate (four times at 44.1 and 48 kHz, twice at 88.2 and 96 kHz) and added back, so nothing **aliases** (no harsh, out-of-tune tones folding back down from the harmonics).

EXACT

EXACT makes the 2nd, 3rd, 4th and 5th harmonics of each band directly, at the levels set on the four harmonic knobs, **against the signal**: a knob at −12 dB means that harmonic is 12 dB quieter than the note it comes from, whether the note is loud or quiet. Nothing is bent, so the peaks aren't rounded and the balance between the harmonics never changes with level (tested within 0.35 dB of the settings at 0, −20 and −40 dBFS).

In EXACT, **DRIVE** moves all four harmonic knobs together: at 100 % the harmonics are as set, at 50 % 12 dB under, at 25 % 24 dB under.

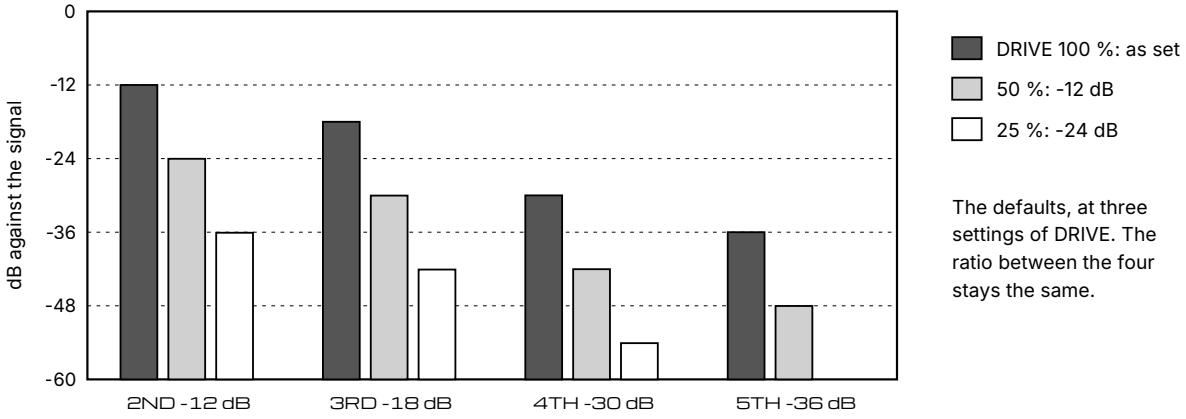


FIGURE 12 What DRIVE does in EXACT, from the plugin's formula: every harmonic moves down by the same amount, so the colour's balance stays and only its strength changes.

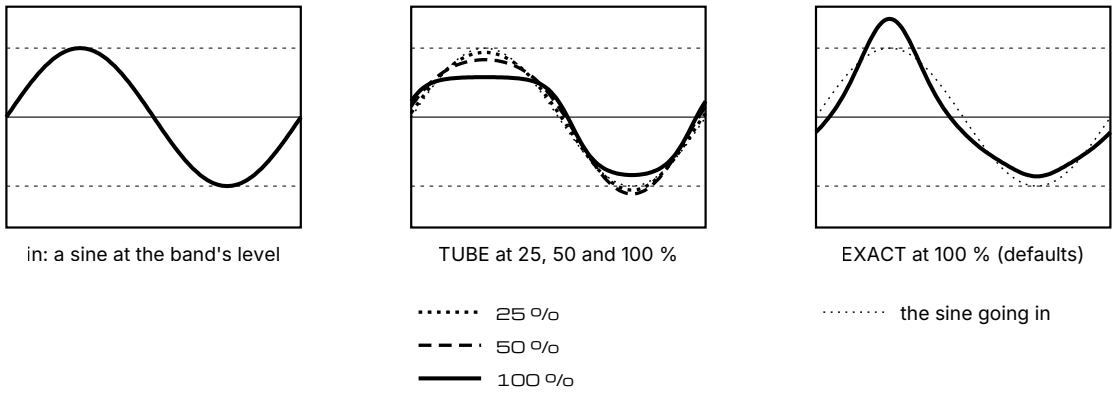


FIGURE 13 One cycle of a sine, from the plugin's own formulas. TUBE flattens the top more than the bottom (the wave is centred again afterwards, as the plugin's 20 Hz high-pass does). EXACT with the default settings changes the wave's shape but rounds nothing.

Music is many notes at once, so EXACT also creates their sum and difference tones, as any analog stage does. To keep everything clean, it makes the 2nd and 3rd only from what is under **6.4 kHz** (at 44.1 and 48 kHz; more at higher sample rates), and the 4th and 5th from what is under **3.84 kHz**, so no harmonic lands above what the session can hold (a 7 kHz tone with every harmonic at −6 dB: nothing above −71 dB where folded harmonics would land). See *The bands and EXACT* below.

EXACT HARMONICS: 2ND, 3RD, 4TH, 5TH

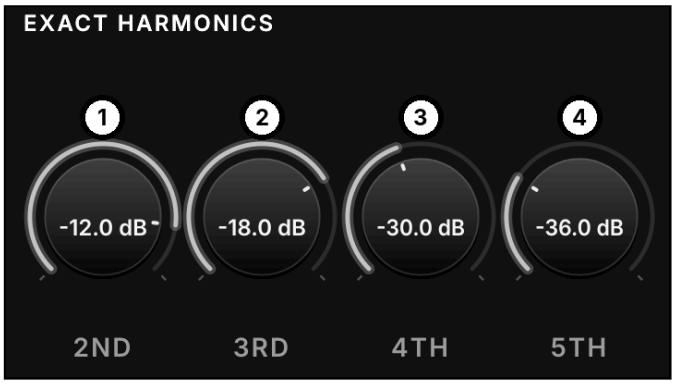


FIGURE 14 The EXACT HARMONICS knobs: 1 2ND, 2 3RD, 3 4TH and 4 5TH, at their defaults, each with its value in its middle. Here TUBE is selected, so they're dimmed.

Control	Range	Default	What it does
2ND	Off (−48 dB) to −6 dB in 0.5 dB steps	−12 dB	Warmth and fullness, an octave up.
3RD	Off to −6 dB	−18 dB	Edge and presence, an octave and a fifth up.
4TH	Off to −6 dB	−30 dB	Brightness on top of the 2nd, two octaves up.
5TH	Off to −6 dB	−36 dB	Bite and grit.

The four knobs work in EXACT only; in TUBE they're **dimmed** (drawn darker, as in the picture; you can still set them, ready for when you switch). Each is in dB against the signal, then scaled by DRIVE and by each band's amount. Turned fully down, a knob reads Off: that harmonic isn't made at all.

Some starting points, all from the factory presets:

- **Warmth:** the 2nd alone or nearly alone (2ND −10, 3RD −30): *Vocal Warmth*, *Piano Warmth*, *Acoustic Body*.
- **Presence and bite:** the 3rd above the 2nd (2ND −20 to −24, 3RD −12 to −14): *Vocal Presence*, *Bow Presence*, *Mix Bus Presence*.
- **Air:** a loud 2nd with a little 4th, made from the HIGH band only (2ND −6 to −8, 4TH −14 to −24): *Vocal Air*, *Master Air*.
- **Fuzz:** only odd harmonics (3RD −6, 5TH −10): *Odd Harmonic Fuzz*.

> **Tip:** Set the balance of the four knobs first with DRIVE at 100 %, then bring DRIVE down until the colour sits. The balance you chose stays as you move DRIVE.

BANDS: LOW, MID, HIGH and the splits

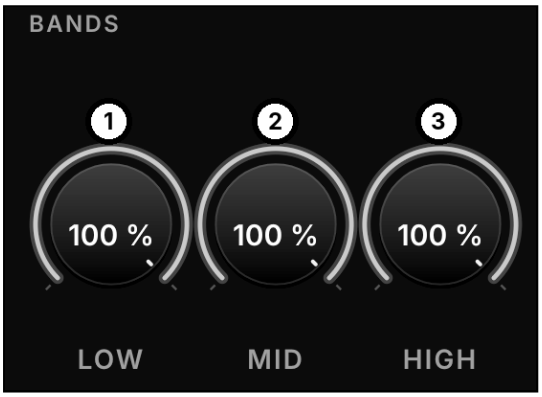


FIGURE 15 The BANDS knobs: 1 LOW, 2 MID and 3 HIGH, all at 100 %. The splits between the bands are set on the SPECTRUM display.

Control	Range	Default	What it does
LOW	0 to 100 % in 1 % steps	100 %	How much of the colour is made from the band under the LOW | MID split.
MID	0 to 100 %	100 %	How much is made from the band between the splits.
HIGH	0 to 100 %	100 %	How much is made from the band over the MID | HIGH split.
LOW | MID split	40 Hz to 1 kHz	200 Hz	Where LOW ends and MID starts. A handle on the SPECTRUM display.
MID | HIGH split	1 to 12 kHz	3 kHz	Where MID ends and HIGH starts. A handle on the SPECTRUM display.

The three knobs choose **what the colour is made from**. At 0 % a band is left clean: nothing is made from it. Turn LOW up alone to warm only the low end, MID alone for edge on the mids, HIGH alone (with EXACT) for air on top.

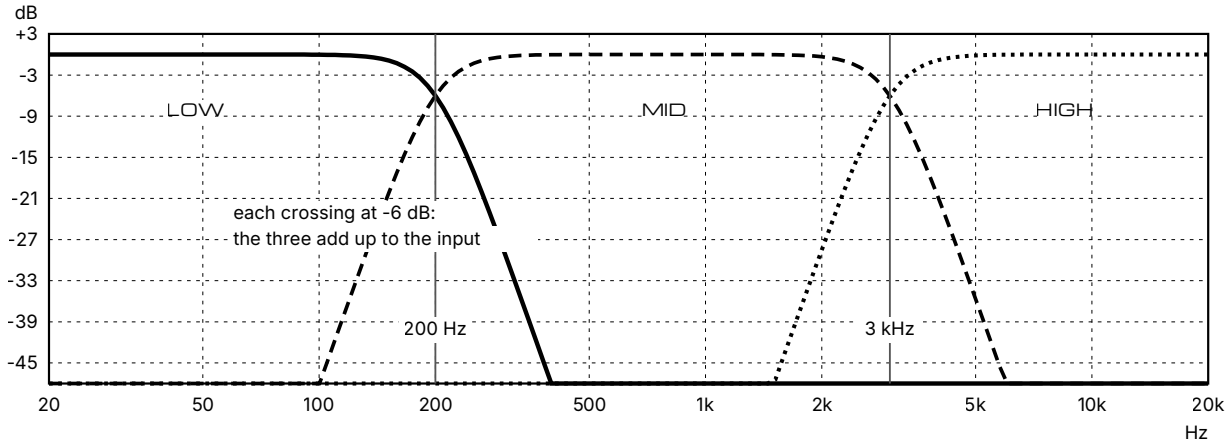


FIGURE 16 The three bands at the default splits, drawn from the plugin's filters: steep (48 dB per octave at the splits), crossing at −6 dB, and adding up exactly to the input.

Moving the splits. Drag the round handles at the top of the SPECTRUM display left or right; the value shows beside each handle. Double-click a handle to return it to its default (200 Hz and 3 kHz). The MID | HIGH split always stays at least 1.5 times above the LOW | MID one. The splits glide as they move, and the filters are redesigned with a crossfade, so you can move them while the music plays. In your DAW's automation list they're called *Low | Mid Split* and *Mid | High Split*.

Each band's colour stays in its band. Saturation also creates tones *below* the notes it's made from (difference tones, and a thump that follows the music's envelope). So that air on HIGH stays on top and a band at 0 % stays clean, what MID's and HIGH's colour makes below the band is filtered out an octave under the band's lower split (12 dB per octave). With the default splits that's under 100 Hz for MID and under 1.5 kHz for HIGH. The lowest band's colour, and everything the plugin adds, is also cleared of anything under 20 Hz.

The bands and EXACT

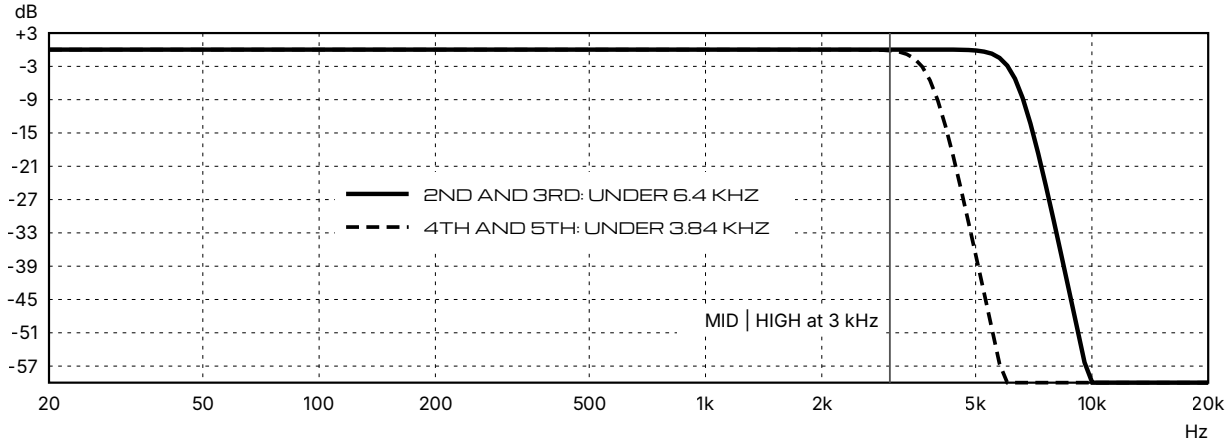


FIGURE 17 What EXACT makes its harmonics from at 44.1 and 48 kHz, drawn from the plugin's filters: the 2nd and 3rd from what is under 6.4 kHz, the 4th and 5th from what is under 3.84 kHz. Above that, nothing is made, so nothing can fold back.

Because EXACT makes its 2nd and 3rd only from what is under about **6.4 kHz** (at 48 kHz), its HIGH band works on what lies between the MID | HIGH split and 6.4 kHz. At the default 3 kHz split that's the 3 to 6.4 kHz octave, where a voice's and an instrument's upper harmonics and consonants live. With the split above about 6 kHz, EXACT's HIGH band has little left to work on. That's why the factory air presets set the MID | HIGH split between 1.8 and 3 kHz.

> **Tip:** For air with EXACT, set LOW and MID to 0 %, HIGH to 100 %, and drag the MID | HIGH split down to 2 to 3 kHz. The 2nd harmonic of that octave lands at 4 to 12 kHz.

OUTPUT: MIX, OUTPUT and AUTO GAIN

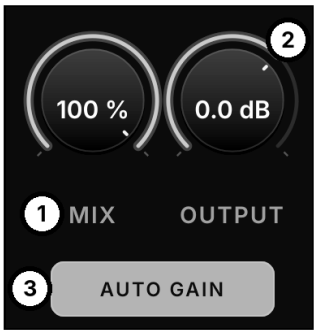


FIGURE 18 1 MIX, 2 OUTPUT, 3 AUTO GAIN (on).

Control	Range	Default	What it does
MIX	0 to 100 % in 1 % steps	100 %	The saturated signal against the dry one, in time with it.
OUTPUT	−24 to +12 dB in 0.1 dB steps	0.0 dB	The final level, after MIX: small trims (presets −0.5 to +0.7 dB).
AUTO GAIN	on, off	on	Takes back the loudness the harmonics add, so you hear the colour, not the level.

MIX blends the saturated signal with the dry one. The dry signal is delayed by exactly the same amount as the saturated one, so the two stay in time and add up cleanly. At 0 % the output is the input, bit for bit.

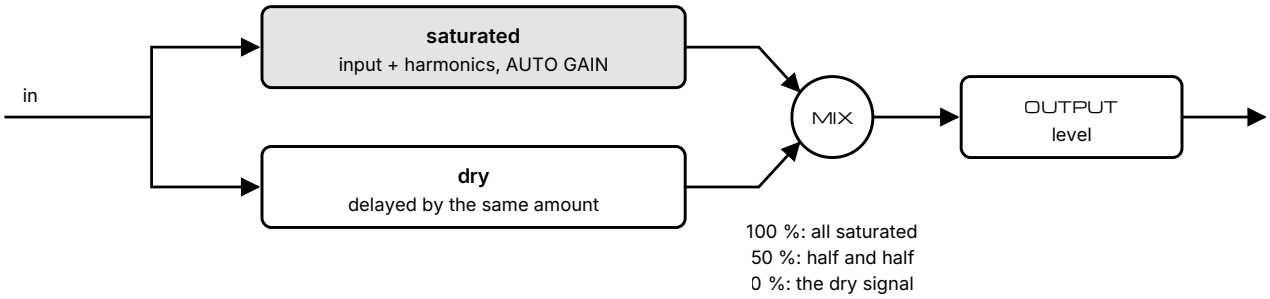


FIGURE 19 MIX as parallel saturation: drive hard, then blend it under the clean signal to keep the attack.

Parallel saturation. Setting DRIVE high and MIX between 30 and 50 % gives you the density and the harmonics of a hard-driven tube, while the dry signal keeps the original attack. Many factory presets work this way (*Parallel Drum Crush*, *Parallel Crunch*, *Parallel Vocal Grit*, *Lo-Fi Parallel Smash*). The blend is linear: at 50 % you get about half of TUBE's peak rounding and all of its character.

AUTO GAIN takes back the loudness the harmonics add (or, with TUBE, the loudness the rounding takes off), so turning DRIVE changes the colour, not the level. For EXACT it knows the energy of the harmonics exactly; for TUBE it also measures the level in and out (over about 3 seconds) and gives back the difference, up to 4 dB. At 15 to 100 % DRIVE on a mix, drums, a vocal and a master, the loudness stays within 0.45 dB with TUBE and 0.25 dB with EXACT. It's on in every factory preset; switch it off to let the saturation make things louder, as a real drive stage does.

Displays

The SPECTRUM display

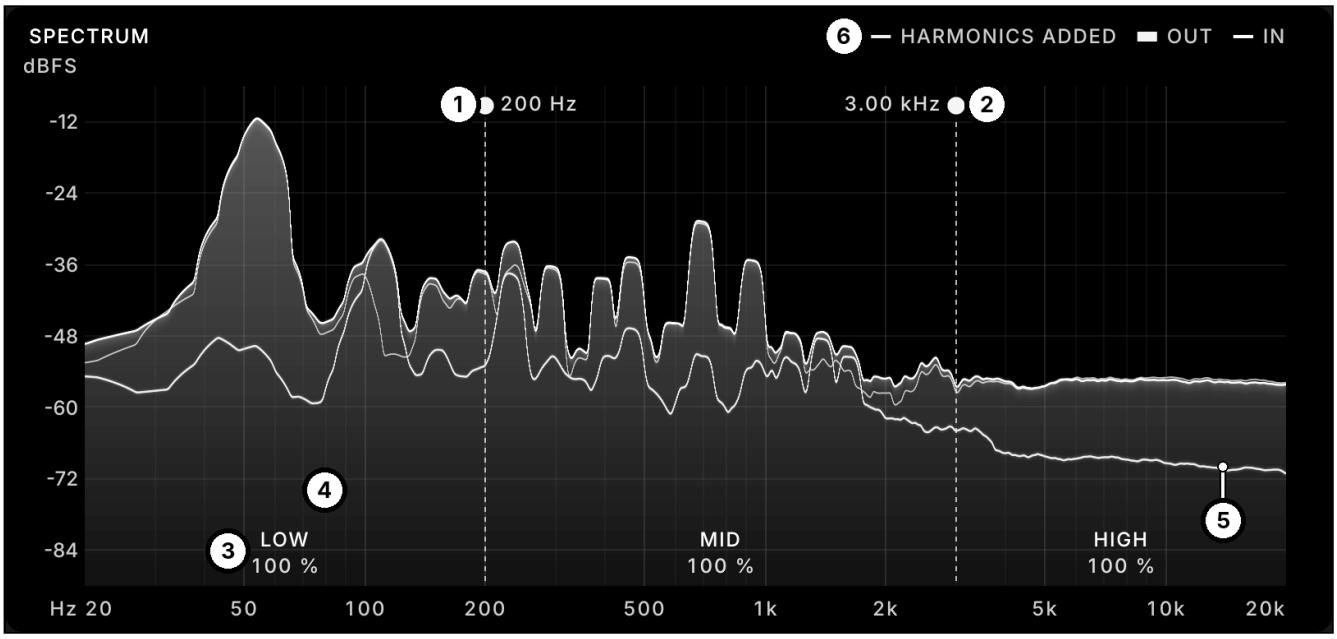


FIGURE 20 1 The LOW | MID split handle (200 Hz), 2 the MID | HIGH split handle (3 kHz), 3 a band's name and amount, 4 the output's spectrum (amber on screen, filled), 5 the harmonics the plugin adds (teal on screen, a line) and 6 the legend. The input is a thin grey line that mostly runs along the top edge of the output.

The SPECTRUM display shows the sound from 20 Hz to 20 kHz, the lows on the left and the highs on the right, on a musical scale (each octave the same width), read on the **dBFS scale at the left**.

- **The output** 4 is the filled shape (amber on screen) and **the input** a thin grey line (IN in the legend). Where the output's edge rises above the input line, the plugin added level there; where the line shows above the fill, it took level away (TUBE rounding peaks).
- **The harmonics added** 5 (teal on screen, HARMONICS ADDED in the legend) are drawn as a line on their own: exactly what the colour adds, before AUTO GAIN. Without colour, tell the three apart by their shape: the output is the **filled** area, the input a thin line along its top, and the harmonics a separate line, usually well below both.
- **The bands** are named along the bottom 3 with their amounts (LOW 100 %). A band turned down is **veiled** (drawn darker), more the lower its amount.
- **The split handles** 1 and 2 sit at the top of dashed lines, with their frequency beside them. Drag them to move the splits; double-click to return to 200 Hz and 3 kHz.

Hover over the display for a tooltip that names the frequency under the mouse, and over a handle to see which split it is.

What to look for: the harmonics line rising as you turn up DRIVE, and staying low in a band you've turned down. With TUBE on drums, look at the peaks of the output against the input: the rounding shows as the input line poking above the fill.

The HARMONICS display

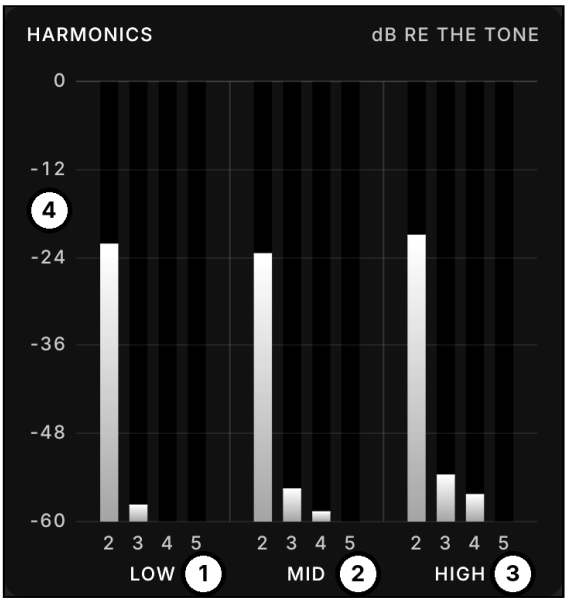


FIGURE 21 The HARMONICS display: the 2nd to 5th harmonic for 1 LOW, 2 MID and 3 HIGH, read on 4 the scale in dB against the tone (0 at the top, −60 at the bottom).

For each band, four bars show how loud the **2nd, 3rd, 4th and 5th** harmonics are right now, **against the tone** they come from (the scale reads dB RE THE TONE, from 0 at the top to −60 at the bottom). The numbers 2 3 4 5 under each group name the harmonics, and LOW, MID and HIGH the bands.

- **With** TUBE the bars show what a tone at the band's current level gets from the curve. They **move with the music**: louder moments drive the curve harder and the bars rise, quieter ones fall. A tall 2nd bar with short 3rd, 4th and 5th bars is TUBE's typical shape.
- **With** EXACT the bars are the four harmonic knobs, scaled by DRIVE and by the band's amount. They stay put while the music plays, because EXACT doesn't depend on level.
- A band turned to 0 % shows no bars. Bars rise at once and fall back at 30 dB per second.

How much is a lot? Measured as all the harmonics together against the whole signal, the factory presets add from about 36 dB under the signal (Mastering) to as loud as the signal (Creative FX): around **−30 dB** is a touch, **−20 dB** clearly coloured, **−10 dB** driven. The bars show single harmonics, so read them as a picture of the colour's balance rather than of that total.

Meter bridge (IN | OUT)

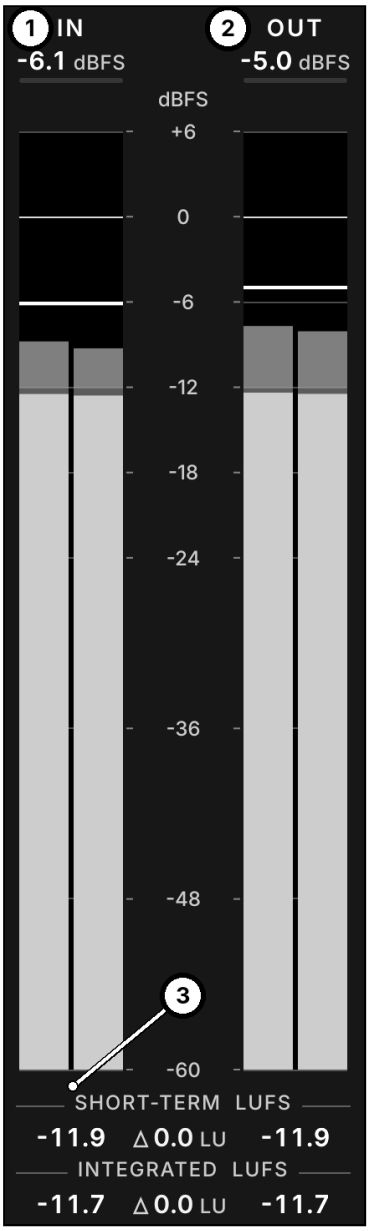


FIGURE 22 The meter bridge: 1 input and 2 output level, 3 short-term and integrated loudness with the OUT − IN difference.

VEIRA Harmonic Saturator's meter bridge is the standard one, measured on the plugin's input and output. With AUTO GAIN on, the Δ readings stay close to 0 LU as you turn DRIVE: a useful check that you're comparing colour, not level. On a mono track, both bars of each meter show the same mono signal.

Reading the IN and OUT meters

The meter bridge measures what goes into VEIRA Harmonic Saturator and what comes out, in level and in loudness. The drawing shows the input and output columns; any extra column on your plugin's bridge is described above.

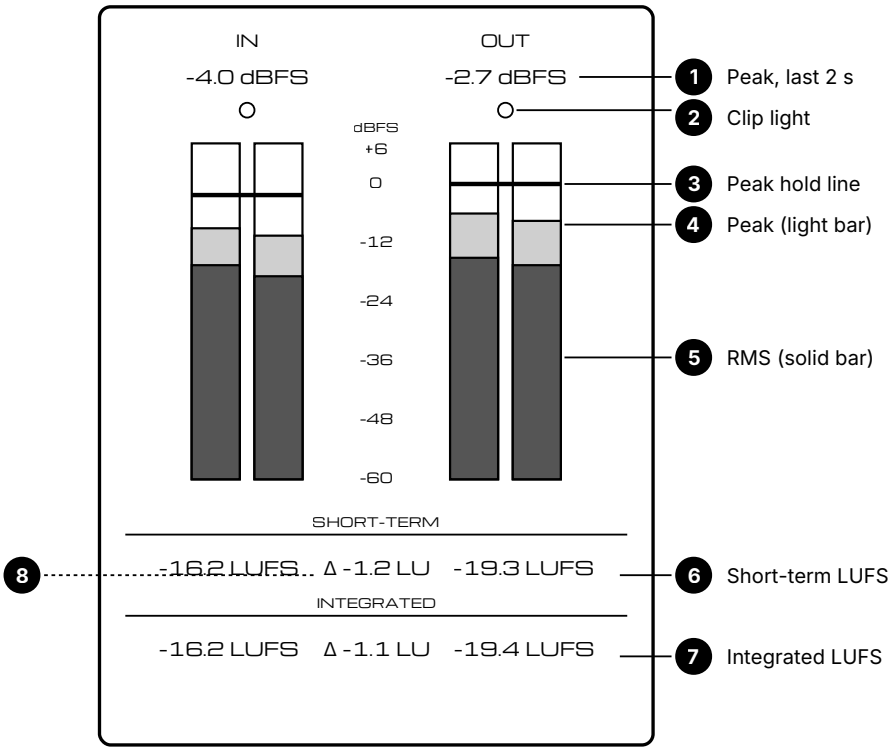


FIGURE 23 The meter bridge, left and right channel bars for input and output, with loudness below.

- 1 **Peak readout:** the highest sample peak of the last two seconds, in dBFS. It turns to a warning above 0 dBFS.
- 2 **Clip light:** lights on any sample at or over full scale. It stays lit until you click the meter.
- 3 **Hold line:** marks the recent peak on the bar.
- 4 **Peak bar** (the lighter part): the instantaneous sample peak of each channel.
- 5 **RMS bar** (the solid part): the average level over 300 ms, closer to how loud it sounds.
- 6 **SHORT-TERM:** loudness over the last 3 seconds, in LUFS, for the input (left) and the output (right).
- 7 **INTEGRATED:** loudness of everything since the measurement started, gated as the ITU-R BS.1770-4 and EBU R 128 standards require.
- 8 **Δ (delta):** OUT minus IN, in LU. It tells you how much louder (+) or quieter (−) VEIRA Harmonic Saturator made the signal, so you can match levels fairly when you compare with bypass. It reads `--` while either side is too quiet to measure (below −70 LUFS).

The scale: on screen the bars are coloured like a studio console: green below −12 dBFS, yellow from −12 to −3, orange from −3 to 0 and red above 0 dBFS.

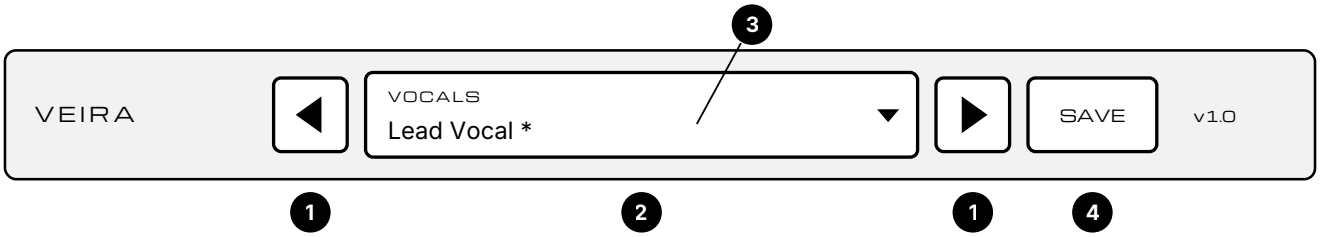
Clicks: click a level meter to reset its hold and clip light. Click the loudness readouts to restart the integrated measurement, for example at the start of a song.

Presets

VEIRA Harmonic Saturator comes with **70 factory presets** in 12 folders. Each one is a starting point made for a real job. Load one close to what you need, then adjust the first control its note mentions.

The preset browser

The preset browser sits in the header, at the top of the window.



The header: logo and plugin name, then the preset browser, then the version.

FIGURE 24 The preset browser.

- 1 ◀ ▶ step to the previous or next preset, through every folder in order.
- 2 **The display** shows the folder (small, above) and the preset's name. Click it to open the preset menu. Hover over it to read the preset's note: what it's for and what to adjust first.
- 3 **An asterisk (*)** after the name means you've changed something since the preset loaded.
- 4 SAVE stores your current settings as a user preset.

The preset menu

Clicking the display opens a menu with:

- one submenu per **factory folder**, in the order shown below;
- **User Presets**, with your own presets in their folders;
- **Save...**, **Delete** (only for user presets: factory presets can't be deleted), **Rescan** (re-reads the user folder, if you copied presets in by hand) and **Show User Preset Folder** (opens it in Finder or Explorer).

Saving your own presets

1. Set VEIRA Harmonic Saturator the way you like it.
2. Press SAVE. A dialog opens inside the plugin window.
3. Type a name, choose a folder or type a new folder name, and confirm.

Each user preset is one small .veirapreset file:

	Folder
macOS	~/Library/Audio/Presets/VEIRA/VEIRA Harmonic Saturator/<Folder>/
Windows	%APPDATA%\VEIRA\VEIRA Harmonic Saturator\Presets\<Folder>\

Copy these files to move your presets to another computer, or to back them up. Presets keep loading in future versions: any control added later simply starts at its default.

Presets in your DAW

The factory presets also appear in your DAW's own preset or program menu, named *Folder: Name* (for example *Vocals: Lead Vocal*). Whatever preset is selected is saved with your session and comes back when you reopen it, including the asterisk if you'd changed it.

The **Default ▸ Init** preset equals a fresh instance of the plugin: every control at its default.

The factory folders

Folder	Presets
Default	Init
Drums	Kick Weight, Snare Crack, Drum Bus Warmth, Parallel Drum Crush, Overhead Sheen, Room Mics Grit
Bass	Bass Warm Lows, Bass Mid Growl, Small Speaker Bass, Tube DI Round, Parallel Bass Drive, Synth Bass Edge
Guitar	Acoustic Body, Acoustic Sparkle, Clean Electric Warmth, Amp Edge, Rhythm Odd Bite, Parallel Crunch, Lead Guitar Thick
Keyboards	Piano Warmth, Electric Piano Bark, Organ Drive, Synth Pad Glow, Bright Keys Air, Felt Piano Soft
Strings	Warm String Section, Cello Body Tube, Bow Presence, Strings Silk Air, Solo Violin Tube, Synth Strings Thicken
Brass	Brass Warmth, Brass Blat, Horn Section Glue, Trombone Weight, Muted Trumpet Edge, Brass Parallel Bite
Woodwinds	Sax Growl, Clarinet Wood, Flute Breath Air, Warm Reed, Oboe Reed Edge, Sax Parallel Grit
Vocals	Vocal Warmth, Vocal Presence, Vocal Air, Tube Vocal Chain, Rap Vocal Edge, Parallel Vocal Grit, Backing Vocal Blend
Mix Bus	Mix Bus Glow, Mix Bus Warm Lows, Analog Summing, Mix Bus Presence, Mix Bus Silk Top, Parallel Bus Drive
Mastering	Master Gentle Tube, Master Exact Warmth, Master Low End Bloom, Master Air, Master Mid Focus, Master Tube Lows
Creative FX	Hard Tube Drive, Odd Harmonic Fuzz, Octave Up Shimmer, Midrange Crunch, Lo-Fi Parallel Smash, Full Harmonic Stack, Sub Harmonic Thicken

The folders follow the usual order of a session:

- **By instrument**: *Drums*, *Bass*, *Guitar*, *Keyboards*, *Strings*, *Brass*, *Woodwinds* and *Vocals*. Most have a warmth preset, a presence or edge preset, an air preset where it makes sense, and a parallel one.
- **Mix Bus** and **Mastering** are gentle: harmonics 15 to 30 dB under the signal on the mix bus, 27 to 36 dB on a master. The Mastering presets keep TUBE at 12 to 14 % (see *TUBE* about a limited master's peaks).
- **Creative FX** goes all the way: a tube flat out, odd-harmonic fuzz, an octave-up shimmer, a full harmonic stack.

Each preset's note (in the preset menu) says which control to move first. 34 presets use TUBE (*Init* among them) and 36 EXACT; AUTO GAIN is on in all of them.

Levels. TUBE drives each band against its own level, and EXACT works in dB against the signal, so the presets behave the same on a quiet track and a hot one; you don't need to gain-stage into the plugin. Every preset was measured on material that matches its folder: on tracks they stay within −0.30 to +0.22 dB of the input's loudness, Mix Bus within 0.05 dB, Mastering within 0.03 dB, and the sample peak changes by −2.7 to +1.0 dB on tracks, at most +0.1 dB on the mix bus and +0.2 dB on Mastering. Real material differs, so trim OUTPUT by ear if a preset jumps out.

Recipes

Step-by-step starting points. In each, listen in the mix as well as solo, and compare with the plugin bypassed: the meter bridge's Δ reading tells you the levels match.

Warm up a vocal

1. Insert VEIRA Harmonic Saturator on the vocal and load **Vocals ▸ Vocal Warmth** (EXACT, the 2nd on the voice's body, the consonants clean).
2. Raise the 2ND knob for a fuller, closer voice; lower DRIVE if it gets thick.
3. If the vocal needs to come forward rather than get warmer, load **Vocal Presence** instead, and lower the 3RD if it gets harsh.
4. For a tube-like vocal chain that softens the peaks a little, try **Tube Vocal Chain**.

Add air to a vocal, keys or a mix

1. Load **Vocals ▸ Vocal Air**, **Keyboards ▸ Bright Keys Air** or **Mix Bus ▸ Mix Bus Silk Top**. All three use EXACT on the HIGH band only.
2. Drag the MID | HIGH split to set where the air comes from: lower for more presence, higher for a finer top (keep it under about 3 kHz; see *The bands and EXACT*).
3. Lower the 4TH knob if the S's or the cymbals start to rise.

Make a bass or a kick heard on small speakers

1. On a bass, load **Bass ▸ Small Speaker Bass**; on a kick, **Drums ▸ Kick Weight**. Both build the low notes' harmonics with EXACT, the rest of the sound untouched.
2. Listen on small speakers, or on one earbud at low volume, and raise DRIVE until you can follow the line.
3. Move the LOW | MID split to the note's body if needed: around 120 to 160 Hz.
4. Watch the OUT peak: the 2nd harmonic lines up with a bass's peaks, so *Small Speaker Bass* raises them by about 1 dB.

Glue and density on the drum bus

1. Load **Drums ▸ Drum Bus Warmth** (TUBE 22 %): a gentle warmth that softens the hardest hits a little.
2. Raise DRIVE carefully: TUBE rounds the transients quickly on drums.
3. For more density with the punch kept, load **Parallel Drum Crush** instead: TUBE at 85 % blended in at MIX 30 %. Set MIX for how much.

Analog warmth on the mix bus

1. Load **Mix Bus ▸ Analog Summing** (EXACT, a balanced 2nd and 3rd) or **Mix Bus Glow** (TUBE 18 %).
2. Raise DRIVE in small steps. Past about 30 % TUBE starts to round the drums; EXACT doesn't.
3. For warmth on the low end only, the vocal and the top clean, use **Mix Bus Warm Lows**.

A touch of colour on a master

1. Load **Mastering ▸ Master Gentle Tube** (TUBE 12 %) or **Master Exact Warmth** (EXACT 40 %, the top untouched).
2. Raise DRIVE 2 to 3 % at a time.
3. Put your limiter after VEIRA Harmonic Saturator. If you must use it after a limiter, prefer EXACT: TUBE can raise a limited master's peaks.

Specifications

Type	Harmonic saturator: a triode curve (TUBE) or the 2nd to 5th harmonics set exactly (EXACT), by the band, with automatic gain
Channels	Mono and stereo
Latency	1,216 samples at 44.1 and 48 kHz (about 25 ms: the linear-phase band split and TUBE's oversampling filters); 2,368 at 88.2 and 96 kHz; 4,608 at 176.4 and 192 kHz. Constant, reported to the host for delay compensation
Transparency	DRIVE 0 %, MIX 0 % and bypass: the input delayed by the latency, bit for bit
Level	AUTO GAIN, on by default. Measured at 15 to 100 % DRIVE on a mix, drums, a vocal and a master: TUBE within 0.45 dB, EXACT within 0.25 dB
TUBE / EXACT	Default TUBE; a change crossfades over 30 ms
DRIVE	0 to 100 % in 1 % steps (default 40 %). TUBE: against each band's long-term level (about 2.5 s). EXACT: 100 % as set, 50 % 12 dB under
2ND, 3RD, 4TH, 5TH	Off (−48 dB) to −6 dB against the signal in 0.5 dB steps (defaults −12, −18, −30, −36 dB); EXACT only
LOW, MID, HIGH	0 to 100 % in 1 % steps (default 100 %)
Splits	LOW | MID 40 Hz to 1 kHz (default 200 Hz); MID | HIGH 1 to 12 kHz (default 3 kHz), at least 1.5 times the other; linear phase, 48 dB/oct at the splits
MIX	0 to 100 % in 1 % steps (default 100 %); the dry signal is delayed to stay in time
OUTPUT	−24 to +12 dB in 0.1 dB steps (default 0.0 dB)
TUBE	$(\tanh(u + 0.6) - \tanh 0.6) / (1 - \tanh^2 0.6)$; what it changes computed at 4x (2x at 88.2/96 kHz)
EXACT	Each harmonic made exactly, the same ratio at any level (within 0.35 dB at 0, −20 and −40 dBFS); the 2nd and 3rd made from under 6.4 kHz, the 4th and 5th from under 3.84 kHz (at 48 kHz)
Bands' colour	High-passed (12 dB/oct) an octave under the band's lower split for MID and HIGH; everything added high-passed at 20 Hz
Displays	SPECTRUM (20 Hz–20 kHz: output, input and harmonics added, dBFS; the bands and their split handles); HARMONICS (per band, the 2nd to 5th harmonic, 0 to −60 dB against the tone)
Metering	IN and OUT meters (sample peak, RMS); short-term and integrated loudness per ITU-R BS. 1770-4 / EBU R 128
Presets	70 factory presets in 12 folders, plus your own
Window	1480 × 860 points; resizable from 75 % to 200 %, saved with the session
Formats	VST3, Audio Units, standalone; AAX once signed
Plugin ID	Manufacturer Veir, plugin Vhrm

Troubleshooting and questions

The sound drops out for a moment every 30 seconds. The plugin isn't activated on this computer. Open VEIRA Manager and sign in; the strip at the bottom of the plugin's window says exactly what's wrong. See *Getting started ▸ Activation and the licence*.

I don't see VEIRA Harmonic Saturator in my DAW. Make sure VEIRA Manager shows SHOW (installed) for it, then rescan plugins in your DAW. In Logic Pro, open the Plug-in Manager and choose *Reset & Rescan Selection* if needed. Look under the manufacturer **VEIRA**.

I turn DRIVE and hardly hear a difference. That's AUTO GAIN doing its job: the level doesn't rise, so the change is in the colour. Compare with bypass at matched level, listen on small speakers, or switch AUTO GAIN off for a moment to hear how much is being added. Check also that the band you want coloured isn't at 0 %.

There's a delay when I play through it live. The linear-phase band split needs 1,216 samples at 44.1 and 48 kHz (about 25 ms). Your DAW compensates for it on playback, but it's too much to play or sing through while recording. Insert the plugin after recording, or bypass it while tracking (bypassed, it still delays the signal by the same amount so the timing stays steady).

The peaks went up on my master. TUBE's lopsided curve can raise an already limited master's peaks, by up to 2 dB at high DRIVE. Keep TUBE at a low DRIVE (the Mastering presets use 12 to 14 %), use EXACT, or put the limiter after the plugin. With EXACT, a loud 2nd harmonic can also raise the peaks of a bass or a master a little, because it lines up with the fundamental's peaks.

TUBE on the HIGH band makes the top duller, not brighter. TUBE rounds the peaks of the cymbals and consonants, and on the top that takes off more than its harmonics add. For air, use EXACT with LOW and MID at 0 %, as the air presets do.

EXACT's HIGH band does nothing. EXACT makes its harmonics from what is under about 6.4 kHz (at 48 kHz). With the MID | HIGH split above about 6 kHz, there's little left for it to work on. Drag the split down to 2 to 3 kHz.

My drums lost their punch. TUBE rounds transients quickly, because a hit sits far above the band's usual level. Lower DRIVE, use MIX at 30 to 50 % for parallel saturation, or switch to EXACT, which rounds nothing.

Where should it go in my chain? Usually after EQ and compression, where it colours a finished tone. Before a compressor it gives the compressor a denser signal to work on. On the mix bus and the master, put it before the limiter.

The window is too small (or too big) on my screen. Drag its bottom-right corner. It scales from 75 % to 200 % and keeps its proportions; the size is saved with your session.

Do my sessions keep my settings? Yes. Every control, both splits, the selected preset and the window size are saved with your session, and every control can be automated.

Contact: support@veiraaudio.com. Mention your computer (Mac or Windows and its version), your DAW and version, and what you see.



VEIRA Harmonic Saturator · User Manual · Version 0.2.1

Support: **support@veiraaudio.com** · Web: **veiraaudio.com**

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