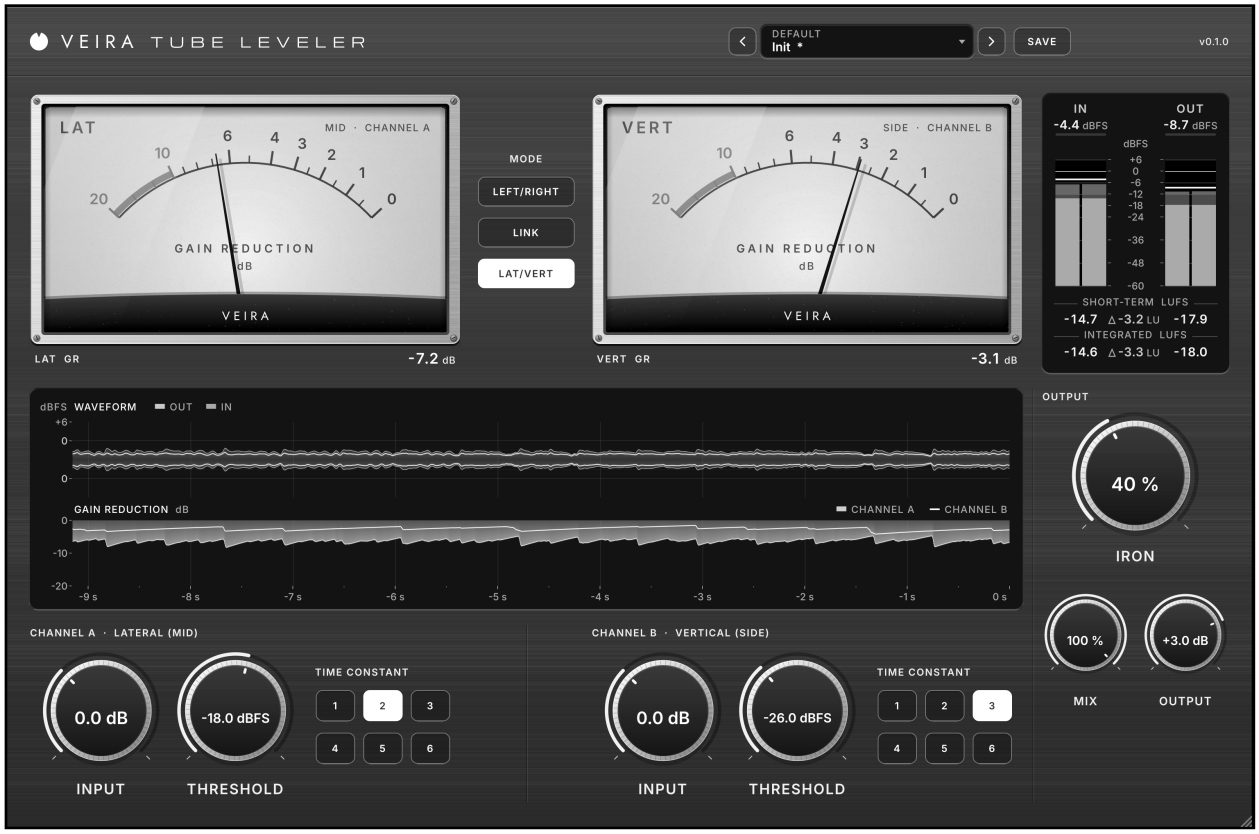
VEIRA

TWIN-CHANNEL TUBE LIMITER

# VEIRA Tube Leveler

## User Manual

VEIRA's flagship tube limiter, in the tradition of the classic twin-channel vari-mu limiters of the late 1950s: two complete channels, LEFT/RIGHT, LINK or LAT/VERT, a tube cell whose sound grows with the bias, transformers, and two big needle meters.



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# Welcome

Thank you for choosing **VEIRA Tube Leveler**, VEIRA's flagship. It is a twin-channel vari-mu tube limiter in the tradition of the classic twin-channel vari-mu tube limiters of the late 1950s: two complete channels, each with its own INPUT, THRESHOLD and TIME CONSTANT, that work independently, linked, or as lateral and vertical (mid and side); a push-pull tube gain cell whose own sound grows as it works harder; input and output transformers; and two big gain-reduction needle meters at the heart of the panel. It holds a mix, a master or a single part together with the weight and depth of tubes and iron, and stays clean enough at light settings to sit on a master.

**What makes it different**

- **Two complete channels.** Channel A and channel B each have INPUT, THRESHOLD and the six TIME CONSTANT settings, as on the original. MODE runs them as LEFT/RIGHT (independent), LINK (A's controls drive both; one control voltage, so the stereo image never moves) or LAT/VERT (A on the mid, B on the side, each with its own side chain).
- **A tube cell you can hear working.** The tubes turn the music down by changing their bias, and the further they are biased, the more harmonics they make: clean at rest, mostly odd and low-order as they work, a little 2nd from the pair's imbalance. At the same reduction it is about four times as rich as VEIRA Comp Blue.
- **Iron.** IRON sets the transformers and the output stage: heavy bass saturates and thickens, the top rolls off gently. At 0 % the plugin is transformerless and, with no reduction, bit-for-bit clean.
- **Big needle meters.** One gain-reduction meter per channel, with VU ballistics, named for what each channel is doing (LEFT / RIGHT, LAT / VERT).
- **A ratio that rises with level and six time constants,** two of them programme-dependent, measured against the published table.

**How this manual is organised.** *Getting started* covers installing and activating. *The panel at a glance* names every part of the window. *How a compressor works* is a short primer, and *How a twin-channel tube limiter works* explains the tubes, the time constants, the three modes and the iron. *Controls* and *Displays* explain every knob, button and meter with drawings. *Tube Leveler or Comp Blue?*, *Presets*, *Recipes*, *Specifications* and *Troubleshooting* close the manual.

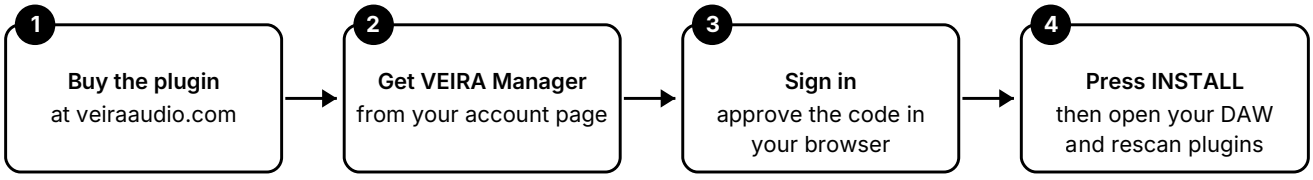
# Getting started

## 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 Tube Leveler 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 Tube Leveler 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 Tube Leveler appears in your DAW under the manufacturer **VEIRA** (in Logic Pro: Audio Units ▸ VEIRA ▸ VEIRA Tube Leveler).

## 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 Tube Leveler 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.

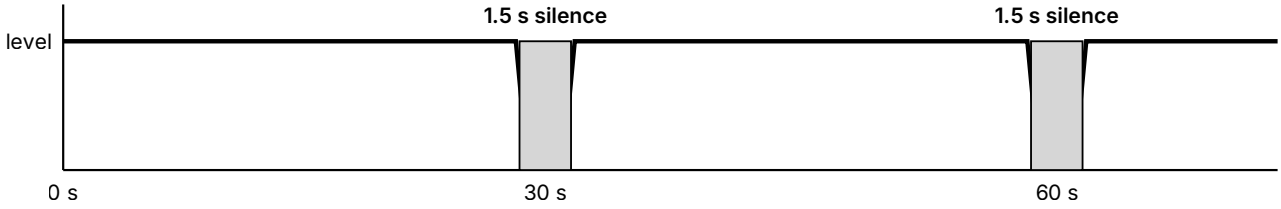



FIGURE 2 What an unlicensed copy does. With a valid licence the audio is never touched.

- **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 Tube Leveler. 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 Tube Leveler 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

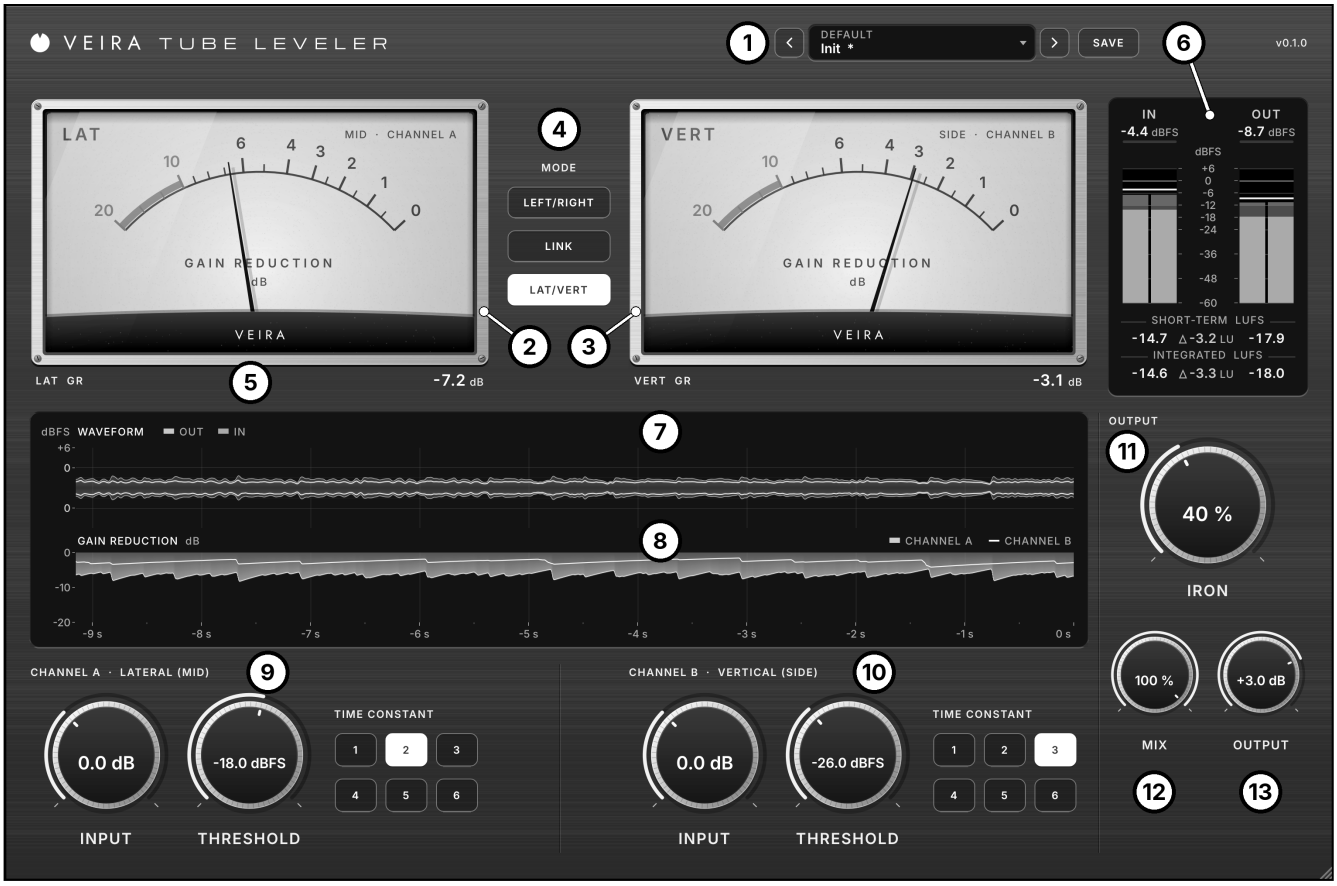



FIGURE 3 VEIRA Tube Leveler on a pop mix in LAT/VERT: channel A (the lateral, the mid) at THRESHOLD −18.0 dBFS and TIME CONSTANT 2, channel B (the vertical, the side) at −26.0 dBFS and TIME CONSTANT 3, IRON 40 % and +3.0 dB of OUTPUT. The mid is being turned down 7.2 dB, the side 3.1 dB.

| | Part | What it does |
|---|---|---|
| 1 | Preset browser | Steps through and saves presets. See *Presets*. |
| 2 | Channel A meter | Channel A's gain reduction, on a big needle meter. |
| 3 | Channel B meter | Channel B's gain reduction. |
| 4 | MODE | LEFT/RIGHT, LINK or LAT/VERT. |
| 5 | Read-outs | Each channel's reduction in dB, under its meter. |
| 6 | Meter bridge | Input and output level and loudness. |
| 7 | WAVEFORM | The last nine seconds: the output in front, what was taken off behind it. |
| 8 | GAIN REDUCTION lane | Both channels' reduction over time. |
| 9 | Channel A strip | INPUT, THRESHOLD and TIME CONSTANT for channel A. |

| | Part | What it does |
|---|---|---|
| 10 | Channel B strip | The same for channel B. |
| 11 | IRON | The transformers and the output stage. |
| 12 | MIX | Parallel compression: the compressed signal against the dry one. |
| 13 | OUTPUT | The final level. |

The two meters sit side by side at the top with MODE between them, as on the original's face, and the meter bridge at the right. Under them runs the history display, and under that each channel's controls sit beneath its own meter. The output section (IRON, MIX, OUTPUT) is at the bottom right.

## Quick start: glue on the mix bus in four moves

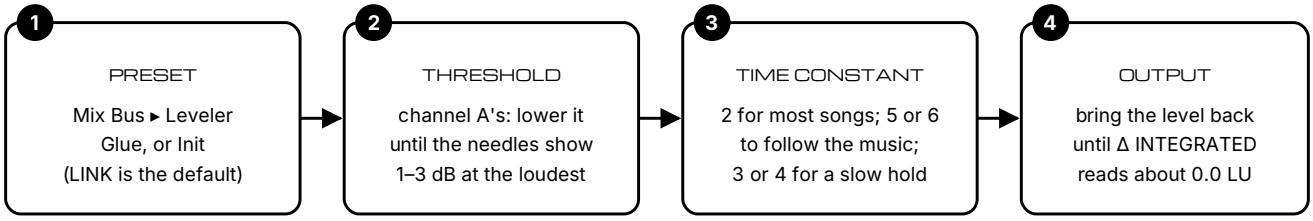



FIGURE 4 The quickest way to tube glue. *Default* ▸ *Init* is a neutral start: LINK, INPUT 0 dB, THRESHOLD −10 dBFS, TIME CONSTANT 2, IRON 30 %, MIX 100 %.

## Using the controls

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

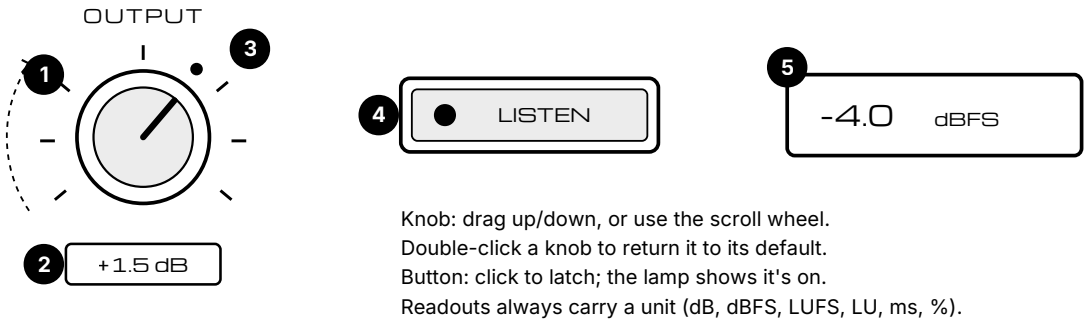



FIGURE 5 The parts you'll find on every VEIRA panel (the labels are examples).

- 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 Tube Leveler's panel** the parts look a little different from the drawing above:

- **Knobs show their value in the middle** ([0.0 dB], [-18.0 dBFS], [40 %]). The knobs are black caps in knurled aluminium skirts, and a ring printed in cream around each one (in print, the light arc) shows how far it is turned. The control's name is printed under the knob.
- **Type a value:** right-click a knob (Control-click on a Mac). A field opens over it with the current value; type the new one and press Return. The number is enough: **-18** for a −18 dBFS threshold, **3** for 3 dB of [INPUT]. Press Escape or click elsewhere to leave it unchanged.
- **Buttons have no lamps:** the selected [TIME CONSTANT] and [MODE] buttons fill with cream with dark lettering (in print, a light button); the others are dark wells with cream lettering.
- **Controls that do nothing are dimmed:** in [LINK], and on a mono track, channel B's controls are drawn dimmer (their rings go out, their text stays readable), because channel A is doing the work. You can still set them; they take effect when you switch to [LEFT/RIGHT] or [LAT/VERT].
- **Resize the window:** drag its bottom-right corner (the small diagonal lines). It scales from 75 % to 200 % of its normal size (1520 × 1000 points) and keeps its proportions. Your DAW saves the size with the session.
- **The face:** VEIRA Tube Leveler has its own look, not one of the colour series': warm graphite enamel with a fine brushed grain, cream print, and the meters in brushed-aluminium bezels. The meter bridge and the history display are dark screens set into the panel, so the meters keep their usual colours. Every label on the panel stands at least 5:1 against it (above the WCAG AA contrast for text).

# How a compressor works

If you already know compressors, skip to *How a twin-channel tube limiter works*.

A compressor is an automatic hand on a fader. It listens to the signal, and whenever the signal gets louder than a level you choose (the **threshold**), it turns it down by an amount set by the **ratio**. Loud moments come down, quiet ones are left alone, so the difference between them gets smaller. Then you turn the whole thing back up with OUTPUT, and the quiet details become easier to hear. How quickly the hand moves down is the **attack**; how quickly it lets go, the **release**. A **limiter** is simply a compressor that holds the loudest moments firmly; the classic tube limiters do both jobs, gently at first and more firmly the harder you push them.

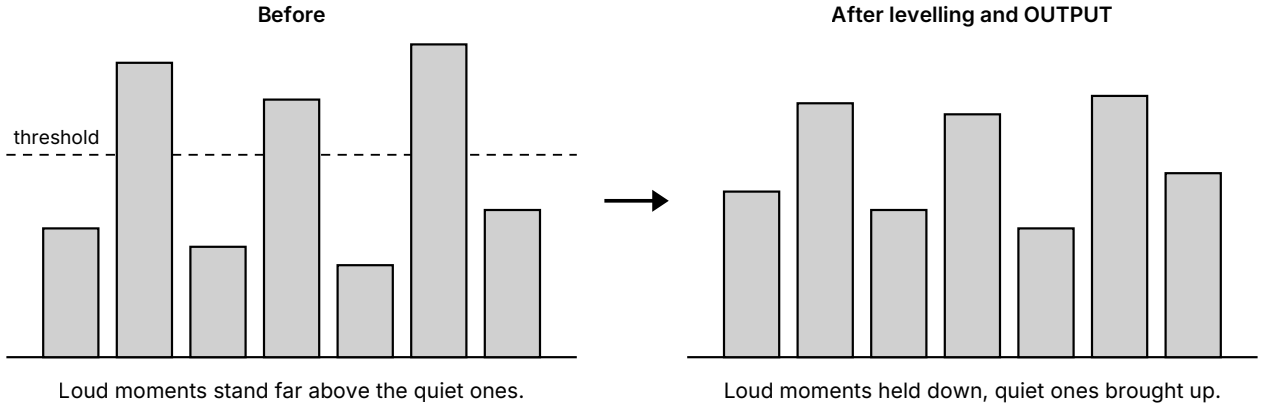


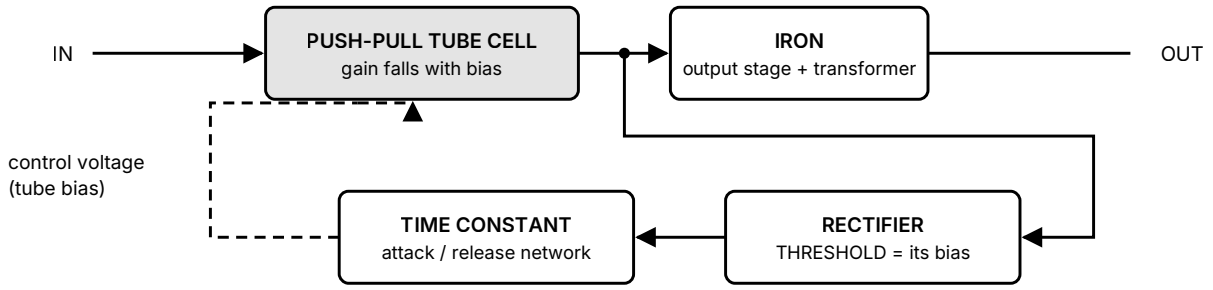

FIGURE 6 Levelling narrows the gap between loud and quiet moments; output gain then brings the whole track back up.

On many compressors the ratio is a fixed number and the knee a separate setting. On a vari-mu limiter they are one thing, set by the tubes themselves, as the next chapter explains.

# How a twin-channel tube limiter works

## The tube is the gain control

In a vari-mu (“variable mu”, mu being a tube’s gain) limiter, the audio passes through tubes whose gain falls as their grid bias rises. The side chain rectifies the music into a control voltage and feeds it to the tubes as bias: the louder the music, the more bias, the less gain. The tubes chosen for the job (remote-cutoff types) turn their gain down smoothly, nearly in proportion to the bias in dB, so there is no switch-on point and no hard corner. VEIRA Tube Leveler does this in each channel: 10 dB of reduction per unit of control voltage.




Feedback: the side chain reads the output of the tube cell, as the hardware's does. One of these per channel.

FIGURE 7 The vari-mu principle, in one channel. The rectifier turns the music into a control voltage; the time-constant network sets how fast it charges and discharges; the voltage biases the tubes, whose gain falls with it. Because the side chain listens after the tubes (feedback), the ratio isn’t fixed: it rises with level.

## INPUT and THRESHOLD: the AC and DC thresholds

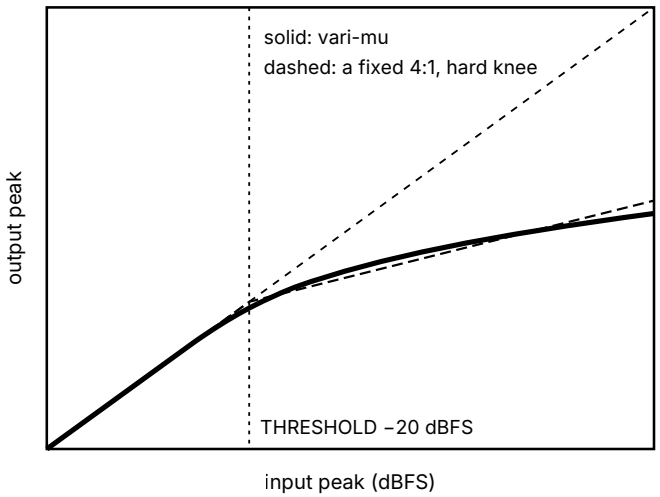
The original has two threshold controls per channel. The **AC threshold** is the input attenuator: how much of the music reaches the tubes and the side chain. The **DC threshold** is the bias the side chain must overcome before it turns the tubes down. On VEIRA Tube Leveler these are INPUT and THRESHOLD:

- INPUT sets how hard the music hits the tubes. More INPUT means more compression *and* more tube sound, because the tubes’ harmonics depend on how much signal reaches their grids; OUTPUT brings the level back.
- THRESHOLD sets where compression begins, in dBFS on the output of the tube cell. It changes how much the tubes work, not how hard they are driven.

So for the same reduction you can choose: low INPUT and a low THRESHOLD for clean levelling, or more INPUT and a higher THRESHOLD for a thicker, more saturated sound.

## A ratio that rises with level

The rectifier’s bias makes the threshold, and it switches on softly: it starts to conduct a few dB under THRESHOLD and is fully on a few dB over it. Through the feedback, the ratio then keeps rising the harder you push. So near the threshold the limiter barely touches the music; a few dB over it is a gentle 2–3:1; driven hard, about 4:1 and beyond. That gradual bend is the classic “glue”: nothing is ever grabbed.




**Measured, THRESHOLD −20 dBFS**

| input | reduction | local ratio |
|---|---|---|
| −20 dBFS | 0.6 dB | 1.2:1 |
| −16 | 2.3 | 1.8:1 |
| −12 | 4.7 | 2.5:1 |
| −8 | 7.3 | 2.9:1 |
| −4 | 10.1 | 3.4:1 |
| 0 | 13.2 | 4.5:1 |
| +6 | 18.3 | 6.7:1 |

FIGURE 8 The vari-mu knee, measured (1 kHz sine, steady state, IRON 0 %). The ratio climbs from about 1.2:1 at the threshold to about 4:1 at 0 dBFS; driven far over it, the tubes themselves squeeze a little more and it becomes a limiter.

## The six time constants

The original's time constants are a capacitor network switched by one knob: each position is an attack and release pair. Each channel of VEIRA Tube Leveler has the same six:

| TIME CONSTANT | 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|---|
| Attack | 0.2 ms | 0.2 ms | 0.4 ms | 0.4 ms | 0.4 ms | 0.2 ms |
| Release | 0.3 s | 0.8 s | 2 s | 5 s | 2 s after single peaks, 10 s after several | 0.3 s after single peaks, 10 s after several, 25 s after consistent heavy compression |

Releases are RC time constants: 63 % recovered in that time. **1 to 4** are fixed pairs, from a quick 0.3 s to a very slow 5 s. **5 and 6 are programme-dependent:** extra capacitors charge only while the music is being compressed, so a single peak barely touches them, but several peaks, or sustained heavy compression, fill them and the release lengthens with them.

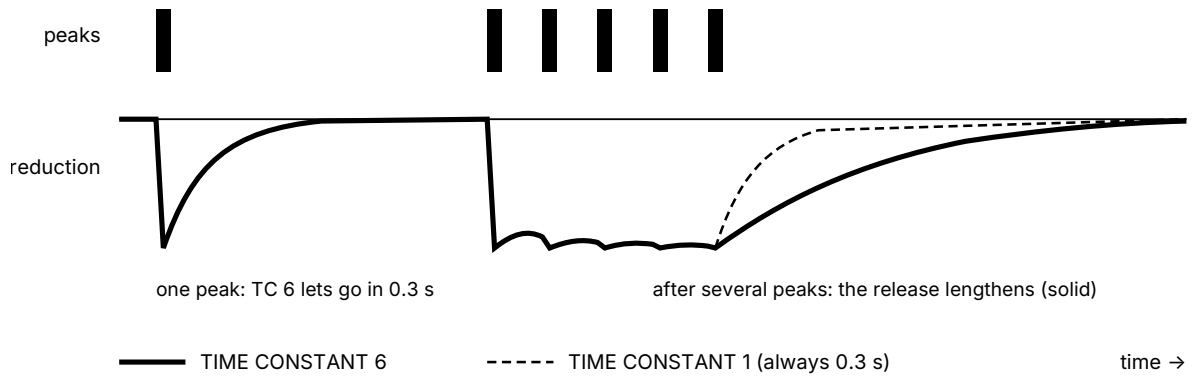



FIGURE 9 A programme-dependent time constant, roughly (down = more reduction). After a single peak, TIME CONSTANT 6 lets go as fast as 1; after a run of peaks it holds on much longer, so dense passages are held steadily and never pump, while isolated peaks recover quickly.

**Measured against the published table** (1 kHz sine, THRESHOLD −20 dBFS; release = 63 % of the reduction recovered):

| TC | Attack (published) | After one peak | After several | After 10 s heavy |
|---|---|---|---|---|
| 1 | 0.15 ms (0.2) | 0.30 s (0.3) | 0.30 s (0.3) | 0.30 s (0.3) |
| 2 | 0.15 ms (0.2) | 0.80 s (0.8) | 0.80 s (0.8) | 0.80 s (0.8) |
| 3 | 0.19 ms (0.4) | 2.00 s (2) | 2.00 s (2) | 2.00 s (2) |
| 4 | 0.19 ms (0.4) | 5.00 s (5) | 5.00 s (5) | 5.00 s (5) |
| 5 | 0.19 ms (0.4) | 2.00 s (2) | 7.99 s (10) | 9.77 s (10) |
| 6 | 0.15 ms (0.2) | 0.30 s (0.3) | 7.91 s (10) | 23.0 s (25) |

The attacks measure a little quicker than the network's own time constant because the side chain is feedback: as the output falls, the rectifier stops charging sooner.

**Choosing one:** 1 for drums and anything that should recover between hits; 2, the most used, for mix buses, vocals and bass; 3 and 4 for a slow, steady hold over whole sections; 5 and 6 when the music changes a lot: quick on transients, slow through dense choruses. On a master, 5 and 6 are especially natural.

## Two channels, three modes

The original is two complete limiters in one box, and so is VEIRA Tube Leveler. MODE decides how the two channels share the stereo signal.

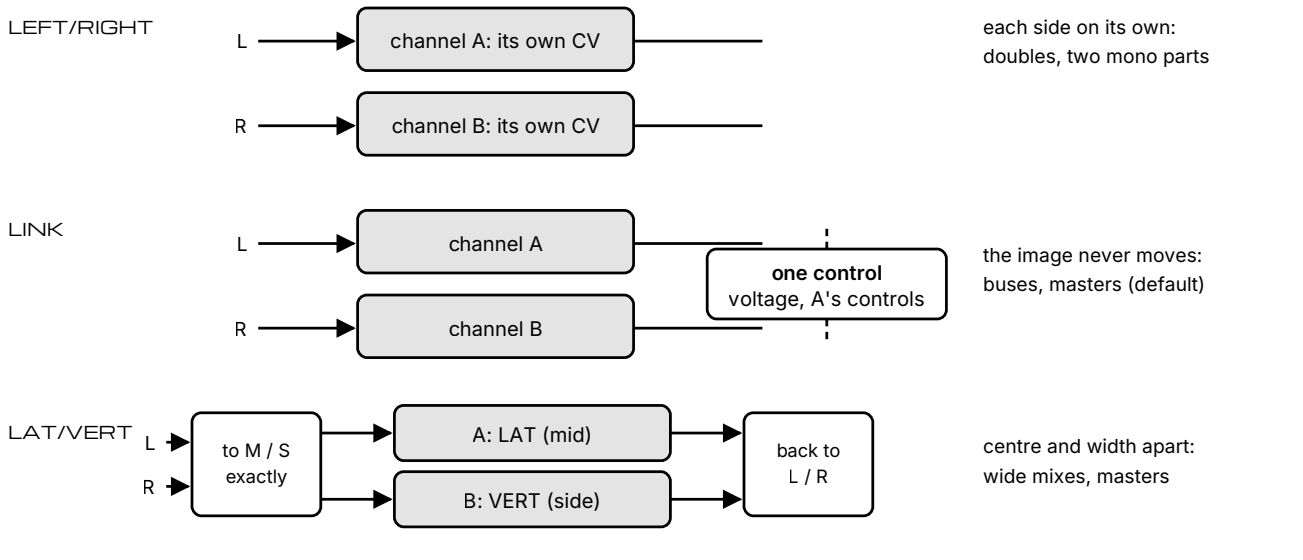



FIGURE 10 The three modes. In LEFT/RIGHT each side has its own controls and side chain. In LINK channel A's controls drive both sides through one control voltage. In LAT/VERT channel A works on the mid and channel B on the side.

- LEFT/RIGHT**:** two independent limiters. Channel A on the left, channel B on the right, each with its own INPUT, THRESHOLD, TIME CONSTANT and side chain. Use it on hard-panned doubles, on two mono parts sharing a stereo track, or for a deliberately moving image. On a normal stereo mix it can pull the image towards the quieter side when one side is louder: for buses and masters, use LINK.
- LINK (the default): channel A's controls drive both sides, and one control voltage, from whichever side is louder, sets both gains. The stereo image never moves. Channel B's controls are dimmed and do nothing.
- LAT/VERT**:** the classic lateral / vertical mode, named after the two directions of a record groove. Lateral is the sum of the channels (the **mid**, what is in both speakers), vertical the difference (the **side**, what makes it wide). Channel A works on the mid and channel B on the side, each with its own controls and side chain, and the result is turned back into left and right exactly. Loud wide parts (doubled guitars, wide pads, reverbs) can be held without pulling down the vocal, kick and bass in the centre; or the centre held steady without touching the sides. Because the side gets its own THRESHOLD, you decide how much each one is held.

Measured, a quiet centred tone under a loud side-only tone: in LAT/VERT the centre tone changes by 0.00 dB, while in LINK the loud side pulls it down 9.0 dB. With no reduction the round trip through mid and side is exact, bit for bit. Switching to or from LAT/VERT while the music plays fades the compressed signal out and back in over 196 samples (4 ms at 48 kHz) around the change, so it never clicks.

## The sound of the tubes and the iron

On the original, the tubes that do the levelling are also part of the sound. A push-pull pair of remote-cutoff tubes is linear at rest; as the side chain biases it towards cutoff, its curve tightens and the two halves of the pair drift apart. VEIRA Tube Leveler models that: **the more reduction, the more harmonics**, mostly odd and low-order (the 3rd leading), with a little 2nd from the imbalance, and the higher ones growing faster than the 3rd as the bias rises, so the colour changes character, not just amount. The control voltage itself is the same on both halves of the pair and cancels in the output transformer, as on a well-balanced unit, so fast gain changes never thump.

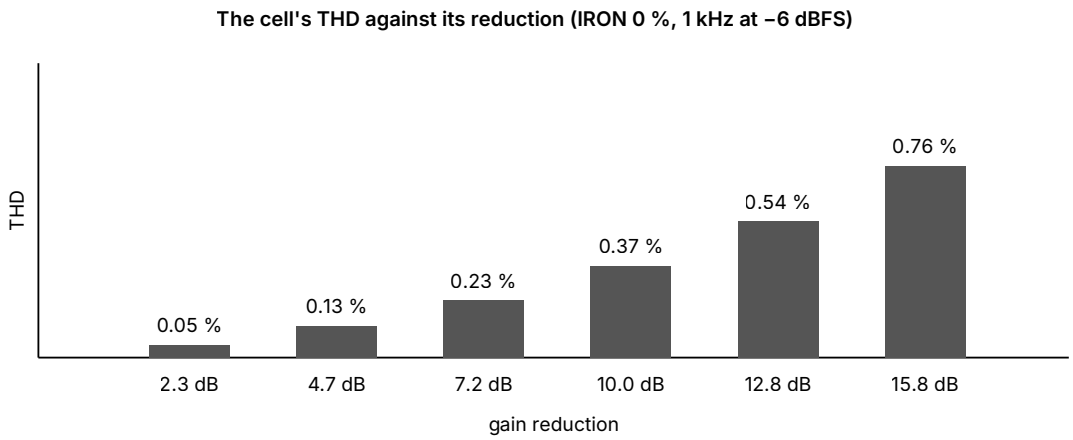



FIGURE 11 At rest (no reduction, IRON 0 %) the cell adds nothing (under 0.0001 %). As it works, its harmonics grow with the bias: 0.05 % at 2 dB, 0.37 % at 10 dB, 0.76 % at 16 dB, the 3rd always 15–23 dB above the 2nd.

**The iron** is set with IRON: the input and output transformers, whose cores saturate on heavy low frequencies (the bass gets thicker, with more 3rd harmonic), an output stage that adds a little 2nd and 3rd, and the gentle high-frequency roll-off of the transformers. At 0 % there is no iron at all.

Everything that makes harmonics runs at eight times the sample rate, so nothing folds back as aliasing, and only what the curves add goes through the oversampling filters: the clean signal never passes a filter.

## What happens inside VEIRA Tube Leveler

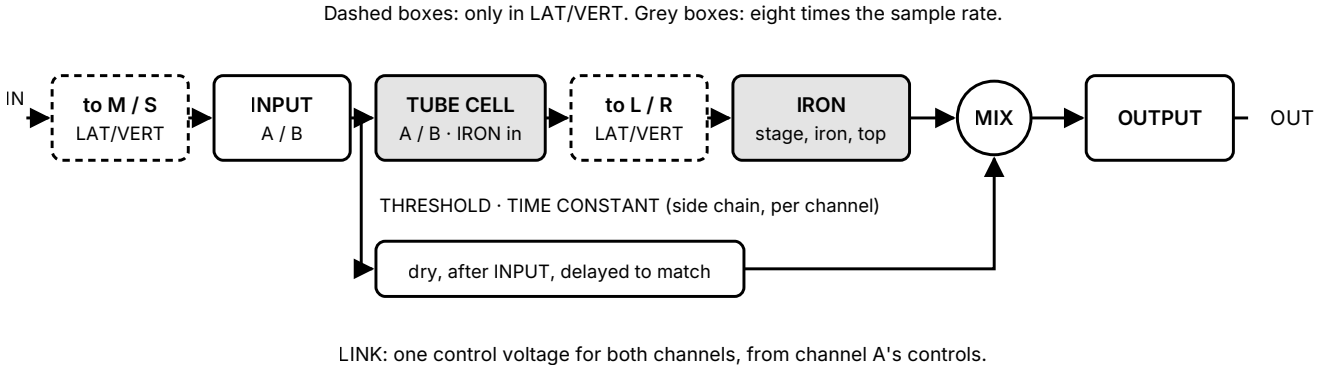



FIGURE 12 Signal flow. In LAT/VERT the music is turned into mid and side; each channel's INPUT, then the input transformer and the tube cell (its gain set by the channel's side chain), back to left and right, the output stage and transformer and the gentle top roll-off (IRON), MIX against the dry signal and OUTPUT.

- **Latency: 98 samples** at every sample rate (2.0 ms at 48 kHz): the oversampling filters. It is constant whatever the settings and reported to your DAW. The dry signal for MIX and the host's bypass are delayed by the same amount.
- **Clean when idle:** with IRON at 0 % and no reduction (INPUT and OUTPUT at 0 dB), the output is the input, delayed, bit for bit, in every MODE, at any MIX. MIX 0 % is the dry signal however hard the tubes work.

# Controls

## The channel strips: INPUT, THRESHOLD and TIME CONSTANT




FIGURE 13 Channel A's strip: 1 INPUT, 2 THRESHOLD and 3 the TIME CONSTANT buttons (2 is lit). The title above names what the channel is doing in the current MODE. Channel B's strip, under the right-hand meter, is the same.

| Control | Range | Default | What it does |
|---|---|---|---|
| INPUT (A, B) | −12 to +24 dB | 0.0 dB | How much signal reaches the channel's tubes and side chain (the AC threshold). |
| THRESHOLD (A, B) | −40 to 0 dBFS | −10.0 dBFS | Where the channel's compression begins (the DC threshold). |
| TIME CONSTANT (A, B) | 1 to 6 | 2 | The channel's attack / release pair. |

**THRESHOLD** is where the compression begins. Lower it until the channel's needle shows the amount you want: 1–3 dB on a mix bus or master, 3–6 dB on a vocal, bass or drum bus, 10 dB and more for an effect. Because the knee is so soft, the needle starts moving gently a few dB before the threshold.

**INPUT** drives the music into the tubes: more INPUT means more compression *and* more harmonics, and OUTPUT brings the level back. For glue, leave it at 0 dB and set THRESHOLD; for a thicker, more saturated sound, add a few dB of INPUT and raise THRESHOLD to keep the same reduction.

**TIME CONSTANT** chooses the attack / release pair (see *The six time constants*). A fast release on low notes (1, and to a lesser degree 2) lets the gain ripple with the bass wave, as the hardware's does; that is part of the vintage sound on drums, but use 3 or 4 for a cleaner low end.

**The strip titles follow MODE:** CHANNEL A · LEFT and CHANNEL B · RIGHT in LEFT/RIGHT; CHANNEL A · BOTH SIDES (LINK) and CHANNEL B · FOLLOWS A IN LINK in LINK (channel B dimmed); CHANNEL A · LATERAL (MID) and CHANNEL B · VERTICAL (SIDE) in LAT/VERT. On a mono track channel A reads MONO and channel B NOT IN USE ON A MONO TRACK.

> **Tip:** In LAT/VERT the side is usually much quieter than the mid, so channel B's THRESHOLD normally sits lower than channel A's: 6 dB lower holds both about equally; 14 dB lower (as in *Lat-Vert ▸ Tame Wide Sides*) holds mostly the side.

## MODE




FIGURE 14 The MODE buttons: LEFT/RIGHT, LINK and LAT/VERT (lit).

| Control | Values | Default | What it does |
|---|---|---|---|
| MODE | LEFT/RIGHT, LINK, LAT/VERT | LINK | How the two channels share the stereo signal. |

See *Two channels, three modes*. On a mono track MODE makes no difference (the buttons are dimmed): channel A does the work.

## OUTPUT: IRON, MIX and OUTPUT

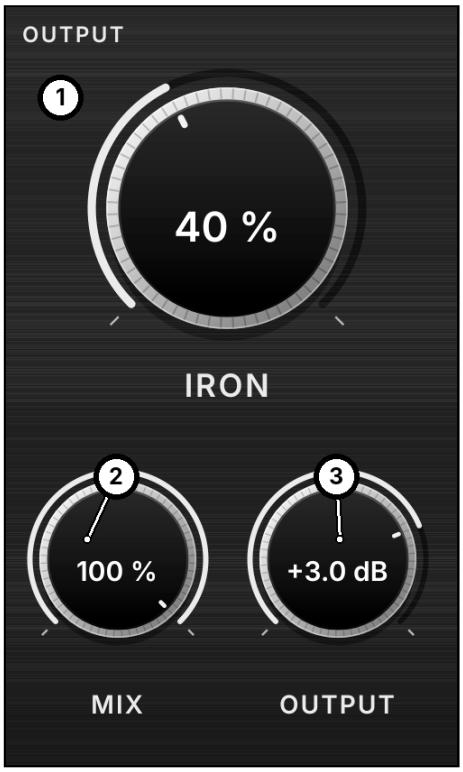
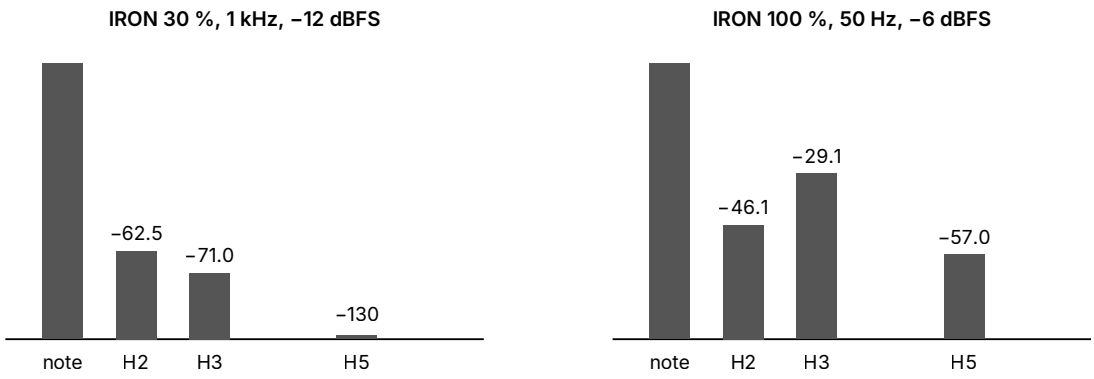



FIGURE 15 The OUTPUT section: 1 IRON, 2 MIX and 3 OUTPUT.

| Control | Range | Default | What it does |
|---|---|---|---|
| IRON | 0 to 100 % | 30 % | The transformers and the output stage. 0 % is transformerless and clean. |
| MIX | 0 to 100 % | 100 % | Parallel compression: the compressed signal against the dry one (after INPUT, delayed to match). |
| OUTPUT | −24 to +12 dB | 0.0 dB | The final level. |

### IRON

IRON sets how much of the transformers and the output stage you hear. The cores saturate on heavy bass, which adds 3rd harmonic and weight to the low end; the output stage adds a little 2nd and 3rd across the range; and the top rolls off gently, like real iron. At light levels and moderate settings it stays clean: the default 30 % adds 0.08 % THD to a 1 kHz tone at −12 dBFS.




Measured, no compression, in dBc (heights roughly to scale).

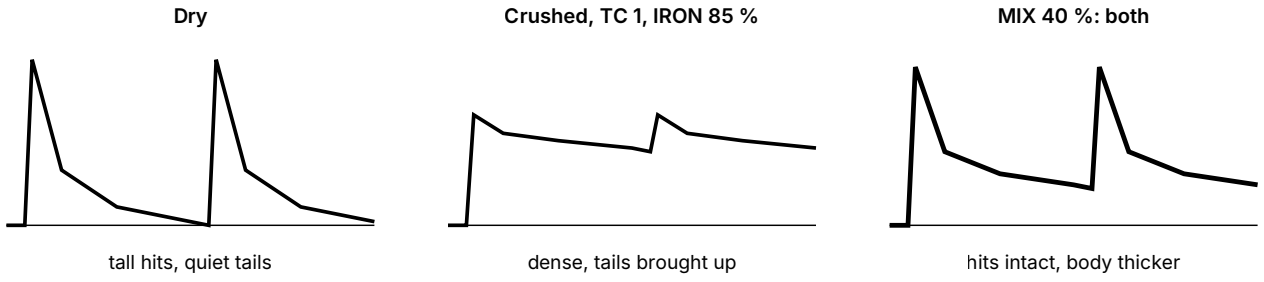
FIGURE 16 What IRON adds: on a mid tone at the default 30 %, a whisper of 2nd and 3rd (0.08 % THD); on a loud bass note at 100 %, much more 3rd and 5th as the transformers saturate (3.6 %).

| Measured, no compression | THD | H2 | H3 | H5 |
|---|---|---|---|---|
| IRON 30 %, 1 kHz, −12 dBFS | 0.080 % | −62.5 | −71.0 | −130 dBc |
| IRON 30 %, 50 Hz, −6 dBFS | 1.04 % | −56.8 | −39.8 | −67.7 dBc |
| IRON 60 %, 1 kHz, −6 dBFS | 0.37 % | −50.7 | −53.1 | −100 dBc |
| IRON 100 %, 50 Hz, −6 dBFS | 3.6 % | −46.1 | −29.1 | −57.0 dBc |
| IRON 100 %, 50 Hz, 0 dBFS | 9.4 % | −40.0 | −20.7 | −40.1 dBc |

At 100 % the top is about 0.7 dB down at 10 kHz and 1.5 dB at 16 kHz; at 0 % the response is flat. The tube cell's own harmonics (which follow the reduction) come on top of the iron's.

### MIX: parallel compression

MIX blends the compressed signal with the dry signal. At 100 % you hear only the limiter; at 0 % only the dry signal; in between, both. **Parallel compression** keeps the dry signal's natural attack while the compressed one fills in the body: the whole *Parallel* folder uses it (35–50 %). The dry signal is taken after INPUT, so INPUT changes both paths' level together, and it is delayed by the same 98 samples, so nothing smears.




The dry path is delayed by exactly the plugin's latency, so the two blend without phasing.

FIGURE 17 Parallel compression with MIX, as in *Parallel* ▸ *Parallel Drum Crush*: the dry hits keep their attack and the crushed, saturated copy brings up the body.

### OUTPUT

OUTPUT sets the final level, after MIX. Set it so the meter bridge's Δ INTEGRATED reads about 0.0 LU, then compare with bypass: louder always sounds better, so compare at equal loudness.

# Displays

## The gain-reduction meters




FIGURE 18 The two meters in [LAT/VERT]: 1 the channel's name ([LAT]; [VERT] on the right), 2 the gain-reduction scale in dB, 3 the heavy end (10–20 dB), 4 the read-out, 5 [MODE] between the meters, 6 the channel's role ([SIDE · CHANNEL B]).

Each channel has its own big needle meter, the heart of the panel, as on the original.

- **The scale** reads [GAIN REDUCTION] in [dB]: the needle rests at [0] on the right and swings left as the tubes turn the music down, through [1 2 3 4 6 10] to [20]. Like a VU meter's, the first few dB take the most room, so gentle mix-bus levelling (1–3 dB) is easy to read. The heavy end from [10] to [20] is marked with a red arc (in print, the thicker arc at the left).
- **The movement** has VU ballistics (IEC 60268-17): it reaches 99 % of a step in 300 ms with a slight overshoot, so the needle shows how hard the tubes are working on average, the way the original's meters do, rather than every peak.
- **The name** in the face's top-left corner follows [MODE]: [LEFT] and [RIGHT] in [LEFT/RIGHT] and [LINK] (the caption at the right then reads [CHANNEL A] / [CHANNEL B], or [LINKED], when both needles move together), [LAT] and [VERT] in [LAT/VERT] ([MID · CHANNEL A], [SIDE · CHANNEL B]). On a mono track the left meter reads [MONO] and the right one rests.
- 4 **The read-out** under each meter gives the reduction in dB, the most over the last quarter of a second, for example [LAT GR -7.2 dB].

## WAVEFORM and GAIN REDUCTION

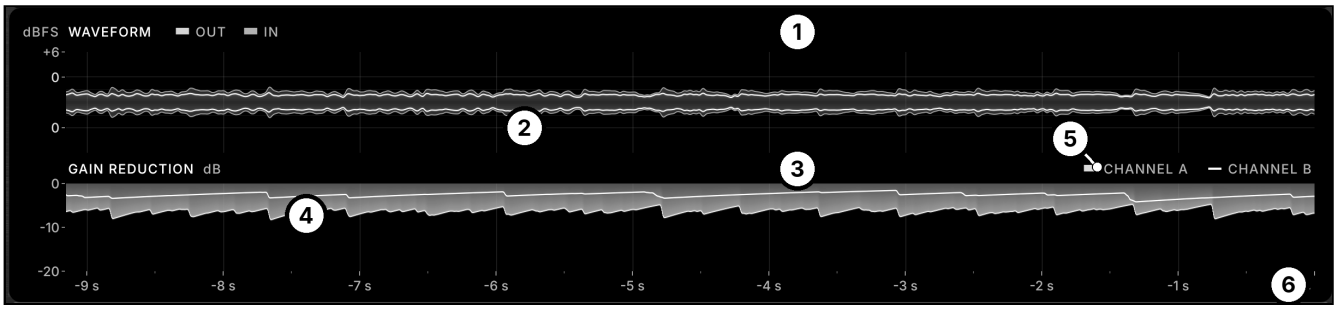



FIGURE 19 1 Legend, 2 the output in front with the input behind it, 3 the GAIN REDUCTION lane, 4 channel A's reduction (the fill), 5 the key (CHANNEL A, CHANNEL B), 6 time scale.

The display shows the last nine seconds or so, newest at the right edge (0 s).

- **Waveform.** 2 The **output** is drawn in amber, in front, mirrored around the centre line; the scale is linear, with +6 dBFS at the edges and 0 halfway. Wherever the input rose above the output, it shows **behind** it in grey: what the tubes took off. In print the output is the band in the middle and the input the paler shape beyond it.
- **GAIN REDUCTION.** 4 Channel A's reduction over time, hanging from 0 at the top down to -20 dB as an orange fill (in print, the grey area). When the channels work apart (LEFT/RIGHT, LAT/VERT), channel B's reduction is drawn over it as a cream line (in print, the light line); in LINK the two are the same and only the fill is drawn. With TIME CONSTANT 5 or 6, watch the release lengthen after sustained compression.

**Hover** anywhere on the two plots for a read-out of that moment: TIME, IN and OUT peaks (dBFS), GR (dB; GR A and GR B when the channels work apart) and SHORT-TERM loudness (LUFS).

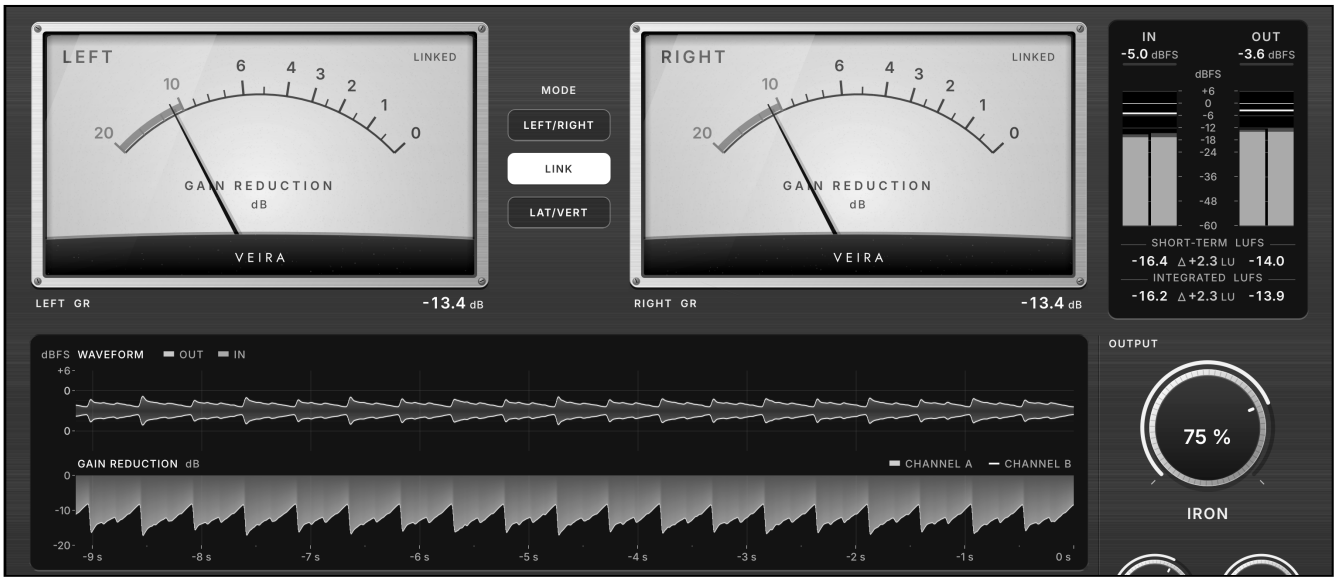



FIGURE 20 A drum bus in LINK with INPUT +6.0 dB, THRESHOLD −26.0 dBFS, TIME CONSTANT 1, IRON 75 %, MIX 60 % and OUTPUT +2.0 dB: both needles read the same 13.4 dB, and the fast TC 1 recovers between hits (the saw-tooth in the lane).

## Meter bridge (IN | OUT)

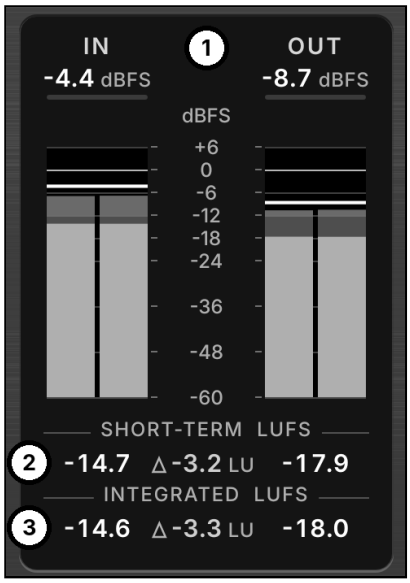



FIGURE 21 The meter bridge: 1 input and output columns, 2 short-term and 3 integrated loudness, with the OUT − IN difference between them.

VEIRA Tube Leveler uses the standard VEIRA meter bridge, with an input and an output column and no gain-reduction column (the two needle meters show that). Δ shows how much louder or quieter the plugin made the music, in LU: aim for about 0.0 LU when you compare with bypass. Everything else works as described below.

### Reading the IN and OUT meters

The meter bridge measures what goes into VEIRA Tube Leveler 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.

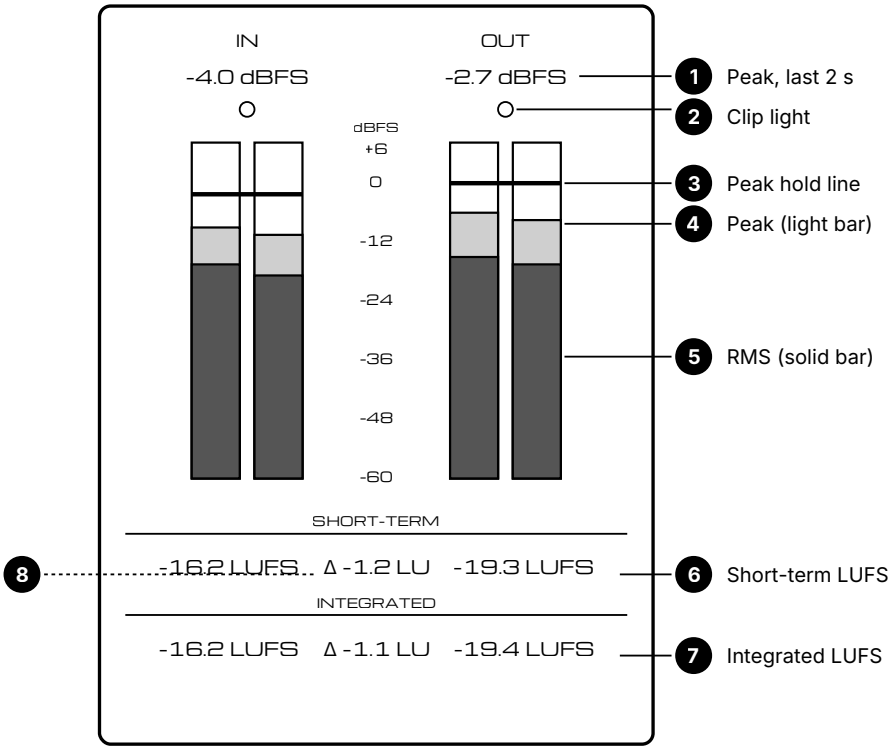



FIGURE 22 The meter bridge, left and right channel bars for input and output, with loudness below.

- 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 Tube Leveler 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.

# Tube Leveler or Comp Blue?

VEIRA also makes **VEIRA Comp Blue**, the vintage one of the four colour compressors, in the same vari-mu tradition. Both have the ratio that rises with level, the six time constants and LAT/VERT. The Tube Leveler is the flagship:

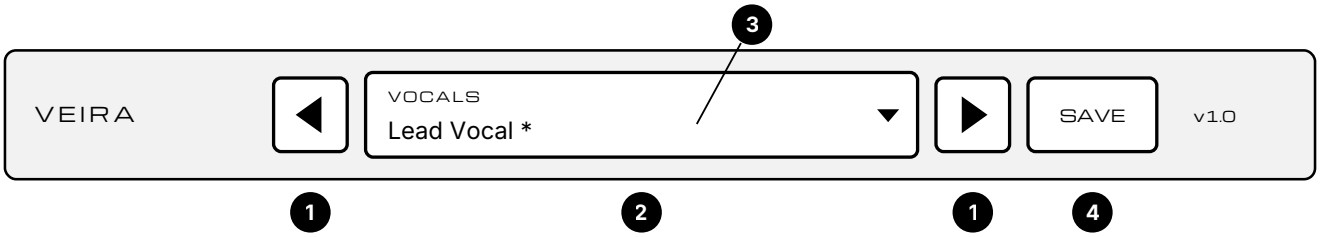
| | VEIRA Comp Blue | VEIRA Tube Leveler |
|---|---|---|
| Channels | One set of controls, both sides linked, or mid and side | Two complete channels: LEFT/RIGHT, LINK or LAT/VERT, each with its own INPUT, THRESHOLD and TIME CONSTANT |
| Tube sound | COLOUR: a fixed output stage you dial in | The cell's harmonics follow the reduction (about four times Comp Blue's at the same 8.5 dB), plus IRON for the transformers |
| Meters | A gain-reduction bar and a static curve | Two big needle meters, one per channel |
| Best for | Quick, gentle glue with a little vintage colour | Mix buses and masters that want weight and depth; independent mid and side control; parts that should sound like tubes |

# Presets

VEIRA Tube Leveler comes with **67 factory presets** in 14 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 23 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 Tube Leveler 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 Tube Leveler/<Folder>/ |
| Windows | %APPDATA%\VEIRA\VEIRA Tube Leveler\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 | Drum Bus Glue, Kick Weight, Snare Body, Overheads Tame, Room Squeeze |
| Bass | Vintage Bass, Round Bass, 808 Sustain, Bass Iron Drive |
| Guitar | Strummed Acoustic, Rhythm Glue, Doubles Left/Right, Lead Sustain |
| Keyboards | Piano Glue, Electric Piano Tube, Organ Hold, Synth Pad Even |
| Strings | String Section, Solo Cello, Pizzicato Even, Lush Strings |
| Brass | Brass Section, Trumpet Bite, Horn Stab Glue, Warm Trombone |
| Woodwinds | Sax Smooth, Flute Air, Clarinet Even, Breathy Sax |
| Vocals | Vintage Vocal, Velvet Ballad, Vocal Ride TC5, Rap Vocal Hold, Backing Stack, Tube Vocal Push |
| Mix Bus | Leveler Glue, Programme Glue TC5, Slow Bus TC4, Gentle Leveler TC6, Heavy Iron Bus, Rock Bus, Hip-Hop Bus, Acoustic Bus |
| Mastering | Master Glue, Master TC5, Master TC6, Master Slow Ride, Master Iron Warmth, Master Clean Leveler, Loud Master Hold, Master Twin Glue |
| Parallel | Parallel Drum Crush, Parallel Mix Weight, Parallel Vocal Thick, Parallel Bass Growl, Parallel Room Smash |
| Lat-Vert | Lat-Vert Bus Glue, Lat-Vert Master, Tame Wide Sides, Steady Centre, Lat-Vert Guitars |
| Creative FX | Pumping TC1, Tube Drive, Side Squeeze Pump, Lo-Fi Squash, Wandering Image |

**Levels matter.** Each preset's channel A THRESHOLD was fitted so its folder's material (tracks peaking at −8 dBFS, drums and buses at −4 dBFS, premasters at −3 dBFS) reaches the preset's designed reduction (in LEFT/RIGHT and LAT/VERT, channel B's THRESHOLD keeps its distance from A's), then OUTPUT so the material comes out as loud as it went in: every preset outside Default and Creative FX within 0.10 dB of bypass. On your music, set THRESHOLD by the needles first, then OUTPUT by ear. On a dense, already-loud mix, the Mix Bus presets compress about 0.5–1 dB more (and come out 0.6–1.5 LU quieter until you raise OUTPUT).

# Recipes

Step-by-step starting points. In each, set OUTPUT last, so the Δ INTEGRATED reading is near 0.0 LU when you compare with bypass.

## Mix-bus glue with weight

1. Load **Mix Bus ▸ Leveler Glue** (LINK, TIME CONSTANT 2, IRON 30 %).
2. Lower channel A's THRESHOLD until the needles show 1–3 dB in the loudest section.
3. If the choruses pump, try **Programme Glue TC5**: quick on transients, slow through dense sections.
4. For more weight, raise IRON (or load **Heavy Iron Bus**); for more tube, add INPUT and raise THRESHOLD to keep the same reduction.

## A gentle master

1. Load **Mastering ▸ Master Glue**, or **Master TC5** / **Master TC6** for programme-dependent release.
2. Keep the reduction around 1 dB, 2 at most.
3. For warmth with almost no levelling, use **Master Iron Warmth**; for no iron at all, **Master Clean Leveler** (IRON 0 %).

## Steady centre, held sides

1. On a mix or a wide bus, load **Lat-Vert ▸ Lat-Vert Bus Glue** (LAT/VERT, channel B's THRESHOLD 6 dB under A's).
2. Watch the two needles: LAT is the centre, VERT the width.
3. If wide reverbs, synths or doubles jump out, lower channel B's THRESHOLD (or load **Tame Wide Sides**); if the vocal and bass move too much, lower channel A's (or load **Steady Centre**).

## Hard-panned doubles, each on its own

1. On a stereo bus of two guitar takes panned left and right, load **Guitar ▸ Doubles Left/Right** (LEFT/RIGHT).
2. Set each side's THRESHOLD by its own needle, so both takes are held the same amount even if one is played louder.

## A tube drum bus

1. Load **Drums ▸ Drum Bus Glue** (TIME CONSTANT 2, IRON 40 %).
2. For more snap between hits, try TIME CONSTANT 1; for more weight, add INPUT and IRON.
3. For crushed parallel drums, load **Parallel ▸ Parallel Drum Crush** and set MIX to taste.

## A vocal held in place

1. Load **Vocals ▸ Vintage Vocal**, or **Vocal Ride TC5** for a programme-dependent ride.

2. Lower THRESHOLD for 3–6 dB on the loud phrases. For a thicker, more forward sound, try **Tube Vocal Push**.

## Tubes and iron as an effect

1. Load **Creative FX ▸ Tube Drive** (INPUT +12 dB, THRESHOLD 0 dBFS, IRON 100 %).
2. Set the drive with INPUT and the level with OUTPUT.

# Specifications

| | |
|---|---|
| Type | Twin-channel variable-mu tube limiter: two channels with feedback side chains and six-position time-constant networks (two programme-dependent), push-pull tube cell whose harmonics follow the bias, input and output transformers and output stage |
| Channels | Mono and stereo. LEFT/RIGHT (independent), LINK (one control voltage from channel A's controls) or LAT/VERT (mid and side, each with its own channel); a mono track uses channel A |
| Latency | 98 samples at every sample rate (2.0 ms at 48 kHz), constant, reported to the host; the dry signal and the DAW's bypass are delayed by the same amount |
| Clean when idle | With IRON at 0 % and no reduction (INPUT and OUTPUT at 0 dB), the output is the input, delayed, bit for bit, in every mode, at any MIX |
| Knee | Ratio about 1.2:1 at the threshold, rising to about 4:1 at 0 dBFS in (measured) |
| INPUT A, B | −12 to +24 dB (default 0.0 dB) |
| THRESHOLD A, B | −40 to 0 dBFS (default −10.0 dBFS) |
| TIME CONSTANT A, B | 1 to 6 (default 2): attack 0.2 / 0.2 / 0.4 / 0.4 / 0.4 / 0.2 ms, release 0.3 / 0.8 / 2 / 5 s; 5: 2–10 s; 6: 0.3–25 s |
| MODE | LEFT/RIGHT, LINK or LAT/VERT (default LINK) |
| The tube cell | Linear at rest; THD 0.05 % at 2 dB of reduction, 0.37 % at 10 dB, 0.76 % at 16 dB (1 kHz, −6 dBFS), mostly 3rd |
| IRON | 0 to 100 % (default 30 %); transformer saturation on the lows, output-stage 2nd and 3rd, −1.5 dB at 16 kHz at 100 % |
| Oversampling | 8× for every non-linear stage; worst aliasing −97 dBc (IRON 100 %, 12 dB of reduction, −1 dBFS high tones) |
| MIX | 0 to 100 % (default 100 %) |
| OUTPUT | −24 to +12 dB (default 0.0 dB) |
| Metering | Two gain-reduction needle meters (0–20 dB, VU ballistics) with read-outs; waveform (about 9 s) with both channels' reduction; IN and OUT meters (peak, RMS, short-term and integrated loudness per ITU-R BS.1770-4 / EBU R 128) |
| Presets | 67 factory presets in 14 folders, plus your own |
| Window | 1520 × 1000 points; resizable from 75 % to 200 %, saved with the session |
| Formats | VST3, Audio Units, standalone; AAX once signed |
| Plugin ID | Manufacturer Veir, plugin Vtlv |

# 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 Tube Leveler 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**.

**Channel B's controls do nothing.** You are in LINK (the default), where channel A's controls drive both sides; channel B's are dimmed. Choose LEFT/RIGHT or LAT/VERT to use them. On a mono track, only channel A is used.

**The stereo image leans to one side.** That is LEFT/RIGHT turning the louder side down more. Use LINK on mixes and buses, or match the two channels' settings.

**The image gets narrower (or wider) on loud passages.** That is LAT/VERT holding the side more than the mid (or the mid more than the side). Raise channel B's THRESHOLD to hold the side less, or switch to LINK.

**Where is the ratio control?** There isn't one, as on the original: the tubes set the ratio, and it rises with level. For a firmer hold, lower THRESHOLD (or add INPUT); for a gentler one, raise it.

**Nothing is being compressed.** THRESHOLD is above your music's peaks. Lower it until the needle moves. In LINK, it is channel A's THRESHOLD that counts.

**The level stays down after a loud section.** With TIME CONSTANT 4, 5 or 6 the release is long, and after sustained compression 5 and 6 lengthen it on purpose (up to 25 s with 6). Choose 2 or 3 if it holds on too long for your song.

**The bass sounds grainy or too thick.** A fast time constant (1) lets the gain ripple with the bass wave, and IRON saturates heavy lows. Use TIME CONSTANT 3 or 4, or lower IRON.

**It sounds cleaner than I expected.** The tubes' harmonics grow with the reduction and with how hard INPUT drives them; at 1–2 dB of reduction they are very light, on purpose. Add INPUT (and raise THRESHOLD to keep the same reduction), or raise IRON.

**Does VEIRA Tube Leveler add latency?** Yes: 98 samples at every sample rate (2.0 ms at 48 kHz), always the same, and reported to your DAW, which compensates automatically. The host's bypass is delayed by the same amount, so bypassing keeps the track in time.

**The window is too big (or too small) 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.

**How do I type an exact value?** Right-click the knob (Control-click on a Mac), type the number and press Return.

**Do my sessions keep my settings?** Yes. Every control, the selected preset and the window size are saved with your session.

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



VEIRA Tube Leveler · User Manual · Version 0.1.0

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

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