P410 Joyride

Tone Flux Graphic Equalizer

A 10-band tone-sculpting equalizer fusing harmonic coloration, flexible proportional Q, and musically scaled frequencies.

Preface

Graphic equalizers have a reputation that spans decades. For some, they bring back images of 1980s hi-fi stacks—cassette decks, turntables, and brushed-aluminum preamps flanked by slider-filled front panels. Others consider them to be tools for taming room acoustics in live rigs. And truthfully, that's where most graphic EQs remained: useful, but too rigid for the critical demands of mixing and mastering. With fixed frequency points and inflexible bandwidth, they lacked the precision and adaptability that parametric designs made standard in high-end studios.

P410 Joyride was born from the idea of reinventing what a graphic EQ can be. It's equally at home shaping the tone of a single instrument, giving weight and clarity to groups, energizing the mix bus, or delivering the subtle precision required in mastering. By combining the immediacy and visual clarity of sliders with innovations like variable proportional-Q, scalable gain structures, harmonic drive engines, and multiple frequency layouts, Joyride turns a once "limited" format into a tone-shaping, mixing-and-mastering-grade processor.

I call P410 Joyride a "Tone Flux Graphic Equalizer": the word *Flux* captures the dynamic, fluid interplay between tone, color, and harmonic motion within P410's design. Each EQ band models an LC (inductor-capacitor) resonant circuits instead of purely RC (resistor-capacitor) networks like most modern EQs. This gives it that distinctive "smooth yet weighty" tone associated with vintage passive or semi-passive equalizers.

The result is an equalizer that doesn't just show you ten sliders; it invites you to shape sound in bold, musical strokes and without compromise. Whether you're making subtle mastering refinements, sculpting a bus, or pushing creative boundaries on individual tracks, P410 Joyride delivers precision, character, and joy in equal measure.

P410 Joyride turns EQ into an experience—part precision, part adrenaline, and all about the joy of pushing sound further than you thought possible.

Ziad Sidawi—Audio Equipment Designer & CEO
Pulsar Modular

The Outer Controls

Turn off to bypass the plugin.

EQ+Spectrum or EQ+Curves or Equalizer

Voices the signal toward a more forward or laid-back tone before hitting the EQ

Applies subtle odd harmonics to the VOICE before signal is EQed

Show the EQ page

Show the DRIVE page

Choose to process in Stereo, L, R, Mid or Side

Flips the 10 bands over the 0 dB axis as a creative or corrective tool

Change the fixed bands' freq. points

Scales all EQ bands for quick auditioning of curve variations

Scales intensity of all 6 DRIVE sliders to explore more or less saturation

Controls the overall amount of DRIVE applied from the 6-slider curve, with 0% being bypassed

Applies subtile odd & even harmonics to the EQed signal

Compensate for EQ gain and maintain proper gain staging

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The 10-Band Equalizer
EQ+Spectrum

The EQ+Spectrum view combines the 10 EQ sliders with real-time colored bars that respond to your audio. Acting as a built-in spectrum analyzer, it shows the energy at each band so you can see how your EQ moves interact with the signal as you work.

Qmax sets the narrowest the band can be at highest gain

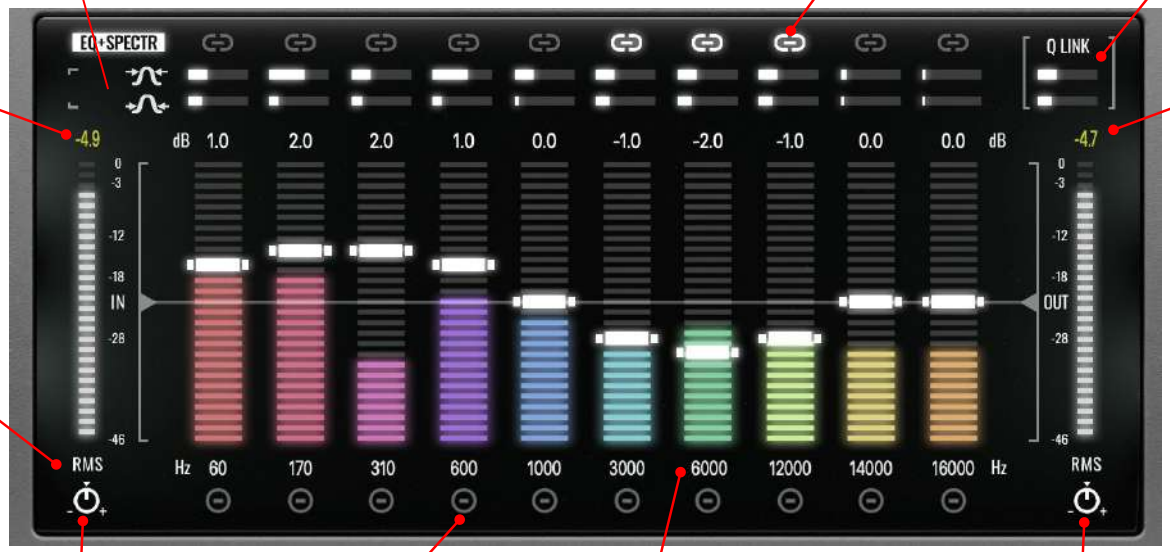
Qmin sets the widest the band can be at lowest gain

The first band you link becomes the master, and all other linked bands will follow its Qmin and Qmax settings

Q value at current gain level

Each band has its own Qmin and Qmax controls, giving you full control over proportional-Q behavior.

Controls Qmin & Qmax for all linked bands



Peak input hold reading

Peak output hold reading

Click to flip between RMS and Peak reading

TRIM IN gain control
Shift-drag to balance against the Trim OUT

Bypass the band gain

Fixed frequency points of the chosen SCALE

TRIM OUT gain control
Shift-drag to balance against the Trim IN

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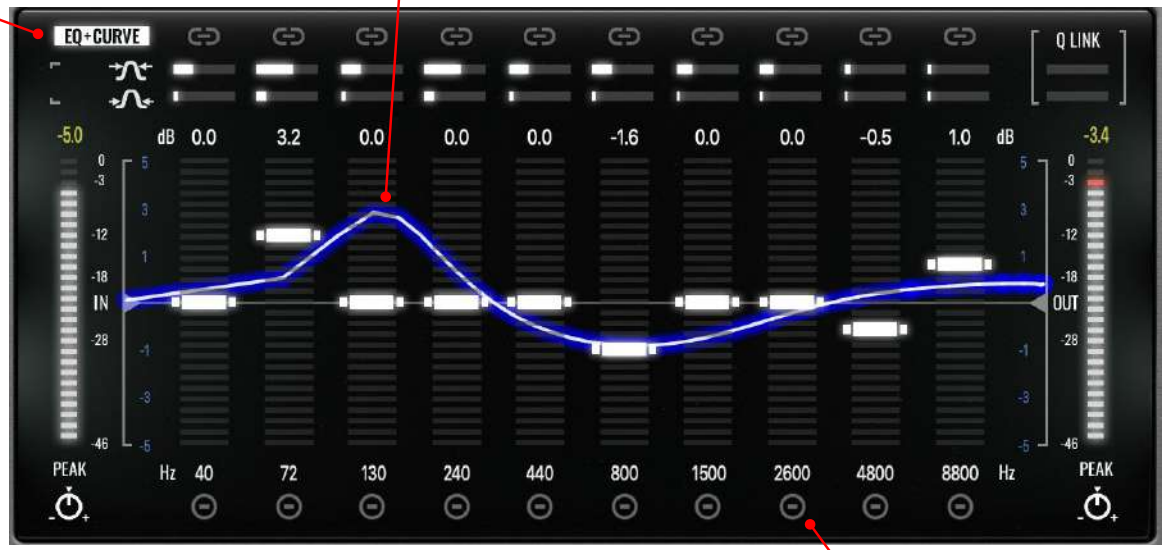
EQ+Curve View

The EQ+Curve page shows the 10 EQ sliders alongside a superimposed **frequency response curve**. While several low-frequency bands are close together—so the curve doesn't always pass exactly through every slider point—it provides a clear visual representation of the overall EQ shape. You can easily see how your gain adjustments interact with the band's Qmin and Qmax, giving intuitive insight into how the EQ will affect your sound.



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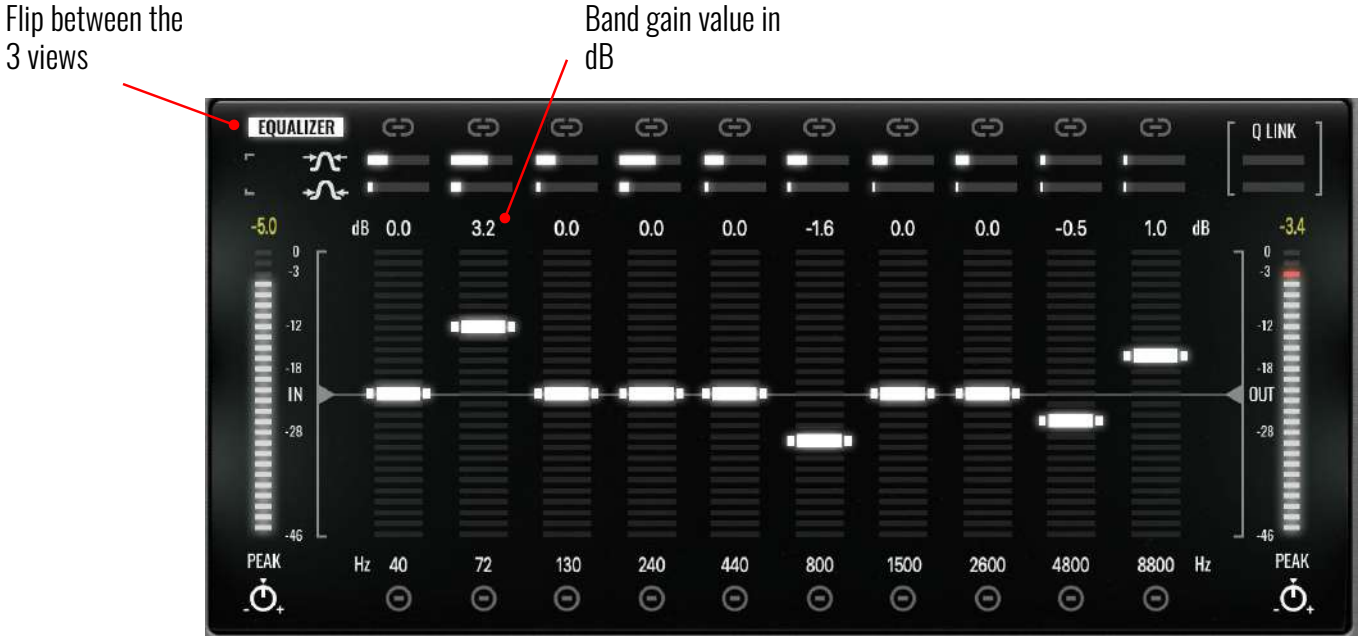
Equalizer View

The EQ view presents a classic graphic equalizer layout: ten band sliders with no additional overlays, curves, or spectrum bars. This minimalist view lets you focus purely on the gain moves themselves—and on hearing how the shape of the EQ emerges—without visual distractions.



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The bypass button allows the unaffected audio signal to flow through without processing.

Dry polarity inverts the unaffected dry audio signal.

A/B enables temporary storage (not stored within the preset) to facilitate quick comparisons between A and B. Click on the A | B area to alternate between the two (no need to move the mouse). The arrow button allows for copying the active side to the inactive side. Presets can also be loaded into either of the A or B placeholders for comparison.

Change the Concert Pitch for A4 The standard tuning for A4 is 440 Hz. This parameter is preset-dependent. If you want your tuning preference to load automatically whenever you insert the plugin on a new track, save your desired tuning value in the Default preset.

Turn on/off the help tooltip.

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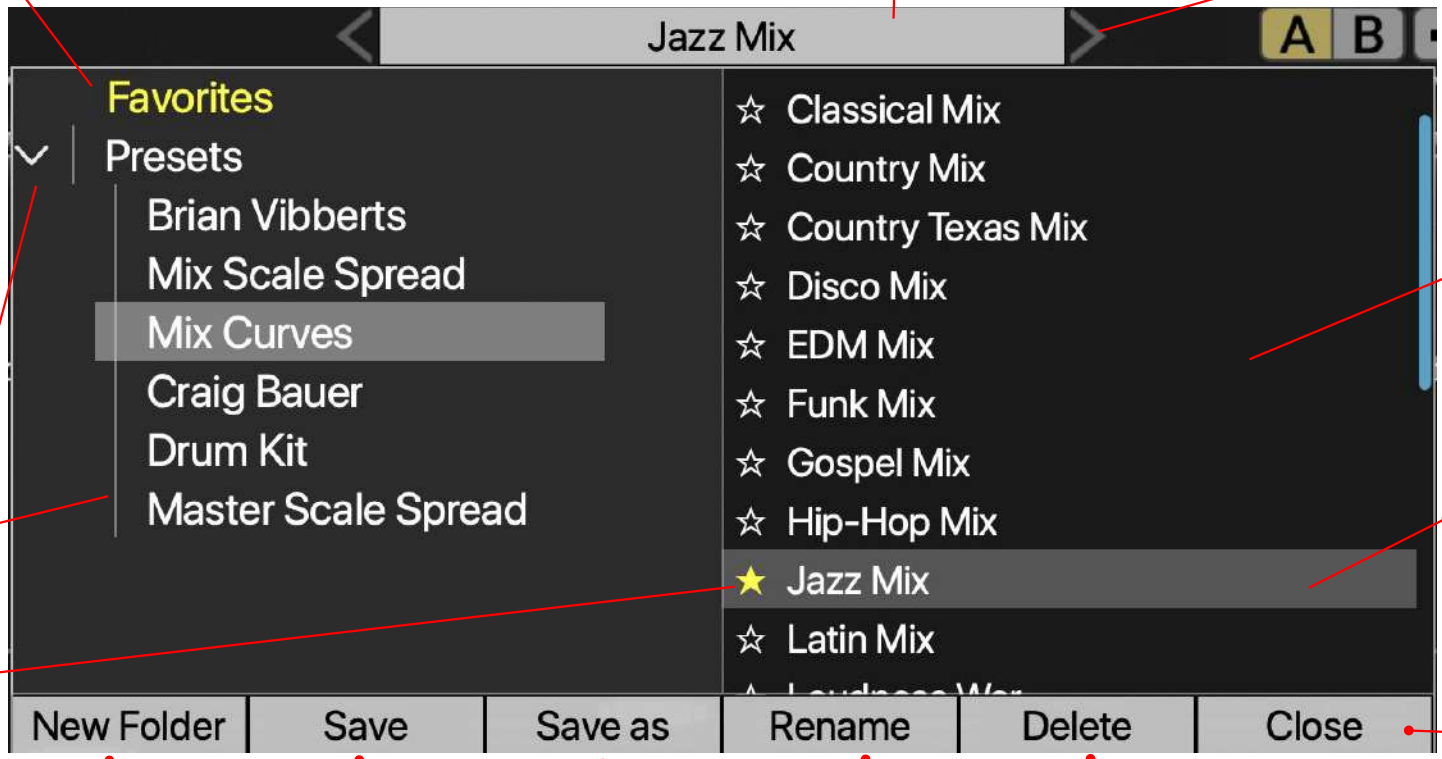
The Preset Manager

Favorites Folder Automatically shows your favorite presets

You can drag and drop presents between the different folders/subfolders/root. Click to load a preset, and double-click to load and close the preset manager window.

Preset Name Field – Displays the currently loaded preset name and opens the Preset Manager when clicked.

Arrow Buttons – Navigate to the previous or next preset within the same folder.



Expand/Collapse Arrow – Opens or closes the folder/subfolder.

Left Panel (Tree View) – Displays folders and subfolders

★ **(Active Star):** The preset is also in your favorites.

Right Panel (List View) – Shows presets contained in the selected folder.

Selected Preset – Single-click loads it; double-click loads and closes the Preset Manager.

Close: Close the Preset Manager window.

New Folder: Create a new folder.

Save: Overwrite the selected preset.

Save As: Save current settings as a new preset.

Rename: Change the preset or folder name.

Delete: Remove the selected preset/folder.

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Proportional Q Behavior

What is Proportional Q?

Small boosts or cuts produce a broad bandwidth, gently shaping the tone.
Larger boosts or cuts produce a narrower bandwidth, allowing more surgical control.
Qmin and Qmax define the bandwidth limits, with the EQ curve smoothly interpolating between them as gain is adjusted.
In traditional proportional Q designs, these limits are fixed by the audio designer.

P410 Joyride Variable Proportional Q Equalizer

Joyride breaks that limitation of traditional proportional-Q. With Qmin and Qmax, you decide how broad a band is at subtle moves and how narrow it becomes when pushed harder. This means each band has its own adjustable personality. Instead of being stuck with a fixed proportional law, you shape how wide or tight each band is allowed to behave across its entire gain range.

Why This Matters

This system gives you precision without losing musicality:

- Keep lows and subs broad for natural warmth, while tightening higher bands for sparkle control.
- Make Mid/Side EQ more expressive: broad Mid shaping with tighter Side carving.
- Design custom EQ personalities by setting different Qmin/Qmax ranges per band.
- Experiment by linking multiple bands with Q-Link and shifting their ranges together. it's like changing the EQ's overall "character" in one move.

Proportional or Traditional: Your Choice

In Joyride, each band can act like a proportional-Q or a traditional fixed-Q band:

- Qmin ≠ Qmax: The band behaves proportionally, widening on small moves and narrowing on larger ones.
- Qmin = Qmax: The band holds a constant Q across all gain levels, just like a traditional fixed-Q EQ.

This flexibility means you're never locked into one design philosophy; you can blend proportional and traditional behavior across the 10 bands to suit the material.

SCALE

The SCALE button in P410 Joyride redefines how the 10 EQ bands are distributed across the frequency spectrum. Instead of fixed, rigid points, you can choose from different band layouts that better suit the material you're working on. Joyride becomes a musical tool that adapts to the key of the song, the tonality of the arrangement, or the overall energy of the mix.

Available SCALE Modes

- **ISO 266 Standard**
  Based on the ISO 266 reference frequencies used in classic graphic equalizers. This is the familiar "studio standard" layout for broad tone shaping.
- **Chromatic Key Scales (12 options)**
  Each chromatic key (C through B) distributes the 10 EQ bands as harmonics of the chosen root note. This makes the EQ bands "line up" musically with the key of the song, giving more natural resonance and harmonic reinforcement.
- **Mix Scale Spread**
  Bands are distributed to provide a balanced spread across the spectrum, optimized for full-range material like stereo mixes or group buses.
- **Master Scale Spread**
  A more subtle, broad-spaced distribution of bands designed specifically for mastering tasks, where smoothness and transparency are key.

Tips for Musical Use

- **Match the Root Scale of the Song**
  For the most natural tone shaping, select the SCALE that matches the root key of your track. This aligns EQ bands with the harmonic content of the music, making boosts and cuts feel more “in tune” with the material.

- **Switch Scales for Creative Contrast**
  Try changing to the 5th of the root key (for example, switch from G to D) during a bridge or chorus. This slight shift realigns the EQ bands to harmonics that emphasize energy and excitement—perfect for transitions.

- **Experiment with the Mix vs Master Scales**
  Use Mix Scale Spread while balancing stems or groups to get a strong, clear distribution of frequencies. Then switch to Master Scale Spread when fine-tuning the final 2-bus for subtle polish.

- **Combine with Flip EQ**
  After dialing in a scale-based EQ, try using FLIP EQ. In a musical scale layout, flipping the curve can act almost like an inverse harmonic reshaping—a great creative tool for breakdowns or alternate sections.

Most graphic EQs treat frequencies as fixed technical points. Joyride treats them as musical intervals, giving you the freedom to:

- Tune the EQ to the key of the track.
- Shift the spectral “root” of your tone shaping.
- Apply creative changes that feel like part of the arrangement rather than just an EQ curve.

EQ FLIP

The **EQ FLIP**—flipping all 10 bands of P410 Joyride over the 0 dB axis—is a powerful creative and corrective tool when used intentionally.

- A boost at +4 dB becomes a cut at –4 dB.
- The frequency centers and Q values stay the same.
- The tonal curve shape is mirrored, but its effect is inverted.

Practical, Musical, and Technical Applications

1. A/B Comparative Listening

- Instantly hear what the *inverse* of your EQ curve sounds like.
- Helps spot over-EQing or tonal overcompensation.
- Reveals alternative, complementary tonal balances.

2. EQ Matching Between Tracks (Manual "Subtract & Add")

- Flip the EQ from Track A to create the opposite curve for Track B.
  Useful for parallel stem balancing (e.g., vocals vs. instruments) or Drum kick vs. bass guitar.
- Perfect for double-tracked guitars—one gets +3 dB at 3.1 kHz, the other gets –3 dB at 3.1 kHz.

3. Dynamic Contrast (Automation & Scene Swapping)

- Automate EQ FLIP to create tonal shifts between sections.
- Example: Verse = cut low end → Bridge = flip → warm and full.
- Useful for film scoring, EDM drops, or theatrical sound changes.

4. Mastering: Opposite Curve to an EQ'd Reference

- Match a reference track with an EQ curve, then flip it.
- Apply subtly to "de-master" a premaster that's already been heavily processed.

5. Mix Rebalancing

Sometimes, an EQ curve that sounds perfect on its own or within a subgroup doesn't hold up once you hear it in the full mix. EQ FLIP instantly flips your EQ curve—turning boosts into cuts and cuts into boosts—without resetting sliders or losing your carefully shaped balance. For instance, you might boost 250 Hz and 500 Hz to give a guitar bus more body, but once you hear it in context, the same energy makes the mix muddy. Instead of starting over, press EQ FLIP, and your EQ now mirrors the same shape but in the opposite direction, instantly rebalancing the tonal energy while preserving your proportional relationships.
In short: EQ FLIP lets you reimagine your EQ curve from the opposite perspective, keeping your workflow fast, musical, and intuitive.

6. Creative Sound Design

- Flipping can yield unexpected, inspiring tones.
- Boost high-end air, then flip for a darker, tape-like tone.
- Cut low mids, then flip for a big, warm low-mid push—perfect for lo-fi textures.
- Even more dramatic when combined with Joyride's nonlinear saturation.

7. EQ Subtraction Trick for Parallel Processing

- Flip the EQ curve and blend it with a copy of the original raw signal.
- Works like a frequency-selective cancellation filter.
- Ideal for subtle de-cluttering in dense mixes.
- Acts as a phase-free subtractive EQ layer.

MATRIX: Processing L/R or M/S

When it comes to stereo processing, whether **Left/Right** or **Mid/Side**, we've chosen two separate plugin instances. This decision wasn't arbitrary—it was made for **three critical sonic and creative reasons**

1. Visual Clarity & Better Workflow

When working on stereo material, especially in mastering, it's crucial to **see what's happening on each channel independently.** Using two plugin instances, one for Left and one for Right (or Mid and Side), allows you to:

- View both EQ curves at once.
- Compare differences visually, instantly.
  Make fine adjustments with full awareness of stereo balance.

This is far more intuitive than toggling between "L" and "R" or "Mid" and "Side" views in a single GUI window.

2. Independent DRIVE Saturation Per Channel

When using **two plugin instances,** users can:

- Apply different DRIVE settings per channel.
- Shape saturation independently for Left and Right or Mid and Side.
- Use DRIVE creatively (e.g., warmer SIDE, cleaner MID) in ways a single-instance plugin cannot support.

3. True Analog-Inspired M/S and L/R Behavior

In analog studios, when you process audio in **Mid/Side or L/R,** you run the stereo signal through **two separate mono equalizers.** Those pieces are rarely perfectly matched, which introduces subtle variations in tone, phase, and harmonic content, which causes a the lively, wide, analog-feel we all love.

The MATRIX Selector

Assigns which part of the signal is processed by P410 Joyride. By default, Joyride always outputs a full stereo signal, even when only one channel or matrix component is being processed. This allows you to hear your EQ moves in musical context rather than in isolation.

- Mid (M): You'll hear the combined Mid and Side output, with only the Mid being processed. This lets you judge EQ changes against the unprocessed Side information, making decisions that better fit the full mix.
- Left (L): The output will be the processed Left plus the unprocessed Right. This keeps stereo balance intact while you work.
- (Same logic applies for Right and Side modes.)

Solo Button (Isolation)
If you prefer to hear only the active Matrix channel, use the Solo button:

- In Mid mode, Solo plays the Mid channel alone.
- In Left mode, Solo plays only the Left channel, muting the Right.
- The same applies to Right and Side modes.

This dual approach—context monitoring with the option to solo-isolate—makes it easy to both refine EQ moves musically and inspect your processing precisely.

EQ MULT (Multiplier Dial)

It's like having a macro "zoom control" for tonal shaping. Super elegant.

- **What it does:** Scales the gain values of all 10 bands proportionally while keeping the "shape" of the curve intact. The signs (boosts stay boosts, cuts stay cuts).
- **Range:** –50% to +50%
  Examples:
  - A +6 dB boost becomes **+3 dB** at –50%, and A –4 dB cut becomes **–2 dB** at –50%.

DRIVE MULT (Multiplier Dial)

- **What it does:** Scales the saturation amount across all **6 DRIVE engines** proportionally, preserving your per-engine balance.
- **Range:** -50% to +50%
- **Behavior:** Turning **negative** reins in harmonic density for subtler coloration; turning **positive** increases harmonic content and perceived punch. Engines are **not bypassed** by negative values; they respect their per-engine minimums.

P410 Joyride solves, with the Multiplier dials, the problem of "graphic EQs are too coarse for mastering" because with the multiplier, you can design exaggerated presets (easy to hear) and then dial them back into mastering territory preserving the EQ shape while refining the intensity.

Why use Multiplier?

- **Fast refinement & A/B:** Nudge overall impact without redrawing curves or rebalancing drives.
- **Mastering precision:** Scale the same curve down to subtle ±0.3–0.8 dB moves in one twist.
- **Creative moves:** Explore **up to ±50%** for dramatic shifts while keeping your carefully shaped relationships intact.

DRIVE Page

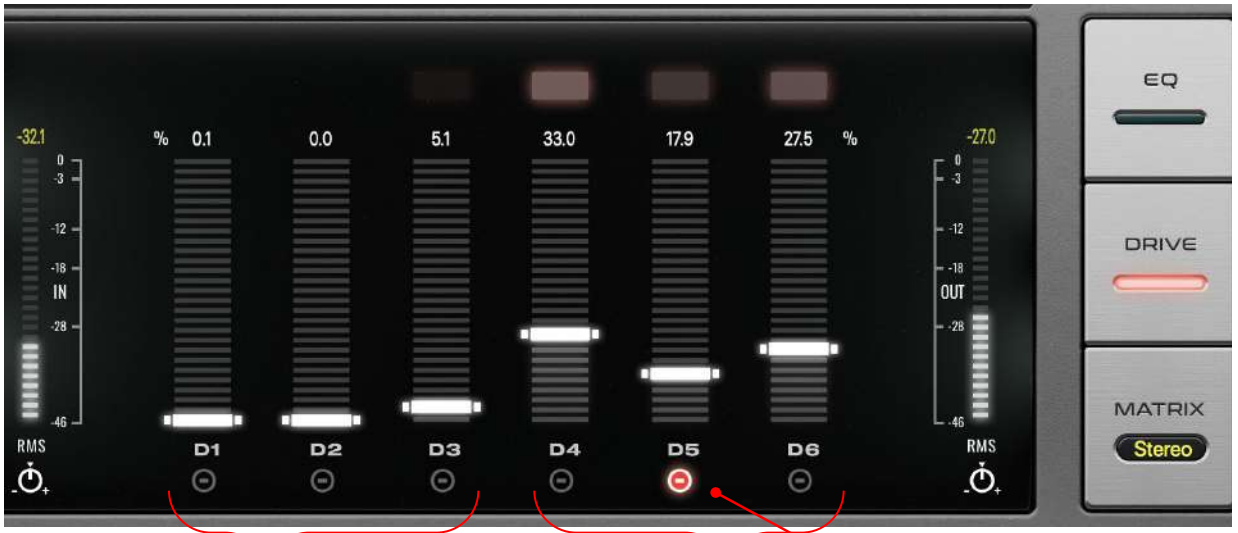
My original plan was to design a custom input transformer using the six Drive engines and then lock that combination as the fixed input stage. However, as the work progressed, I discovered that each Drive engine color uniquely complemented the 10-band EQ. I therefore decided to keep that creative power in the hands of the users.

To temporarily reset multiple engines's gain level, hover and drag over their sliders while holding **Cmd+Opt (Mac)** or **CTRL+ALT (Win)**. Alternatively, turn the DRIVE knob to 0%

To temporarily disengage the Drive engines, hover the mouse over the DRIVE knob and press Cmd+Opt (Mac) or CTRL+Alt (Win).

Psychoacoustic Relationship Of The DRIVE Stages:

- D 1 – *Foundation*
- D 2 – *Weight*
- D 3 – *Body*
- D 4 – *Edge*
- D 5 – *Presence*
- D 6 – *Air*



Low sliders
Low harmonic emphasis
Warmth, punch, body.

High sliders
More upper harmonics
Clarity, presence, sparkle.

Disengage engine
Takes it outside the Drives series.

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DRIVE

Audio In → TRIM IN → **DRIVE** Engines (x6 in series) → VOICE → VOICE BIAS → 10-Band EQ → BIAS EQ → MAIN OUT → TRIM OUT

Comprised of six saturation engines (D1–D6) arranged in series, each DRIVE slider adds progressively richer harmonic content, enhancing different tonal regions of your audio. The DRIVE section sits at the very start of the chain, forming the harmonic foundation for everything shaped by the VOICE and EQ stages.

DRIVE Knob (0–100%) controls how much of the combined DRIVE effect is applied. At 0%, the engines are bypassed; at 100%, their full assigned gains are active.

Note: Setting a DRIVE slider to zero doesn't remove that engine—it remains in the signal path with minimal effect. To fully bypass an engine, use its disengage icon. Each active combination changes the tone, as the signal now runs through a different number of engines in series. This multi-stage design lets you craft a finely tuned input transformer sound—from deep, warm lows to airy, harmonically rich highs.

TIP: Subtle adjustments across multiple DRIVE engines often yield more natural harmonic balance than pushing a single stage hard. Experiment with distributing drive unevenly—e.g., more in D1–D2 for warmth, more in D5–D6 for air and presence.

Design Insight: The DRIVE section behaves like a modular input transformer—its serial topology allows each engine to build upon the harmonics of the previous one, creating depth and dimension rather than simple distortion.

Workflow Suggestion: While traditional workflow suggests shaping tone before saturation, many engineers prefer the opposite with Joyride—EQ first, then add DRIVE to fatten or open up the signal. Both approaches yield unique results; experiment to find your preferred order.

VOICE

Audio In → TRIM IN → DRIVE Engines (x6 in series) → **VOICE** → **VOICE BIAS** → 10-Band EQ → EQ BIAS → MAIN OUT → TRIM OUT

The VOICE knob adjusts the overall *voicing* of P410 Joyride's EQ, shaping how present or laid-back the equalizer feels in the mix.

- **Counterclockwise (Laid-Back):** The EQ adopts a clean character. Upper mids and highs are pristine for a snappy feel, while bass is anchored low and center to add depth. Perfect for adding polish without bringing elements too far forward.
- **Center (Neutral):** The EQ operates without additional voicing—as the designer intended, with no tilt forward or back.
- **Clockwise (Forward):** The EQ becomes more present and immediate, with greater emphasis on color and roundness. This voicing pushes details slightly forward in the soundstage, making tracks feel more upfront and smooth in the mix.

Bias Controls (VOICE & EQ)

The **Bias** section introduces two global saturation stages that complement the Drive engines. Both dials operate from **0% to 100%** and feature **automatic gain compensation**, so what you hear is purely tonal change, not volume change.

VOICE BIAS

- **Type:** Increases **Class AB saturation (odd harmonics) applied to the VOICE**
- **What you hear:**
  - VOICE BIAS adds a fine layer of odd harmonics that give sounds more **presence and articulation.**
  - Turning it up makes vocals, guitars, and drums feel **closer and more defined,** with added edge and clarity in the upper mids.
  - At 100%, harmonics are voiced forward, producing an **energetic, upfront character** without harshness.

EQ BIAS

Audio In → TRIM IN → DRIVE Engines (x6 in series) → VOICE → VOICE BIAS → 10-Band EQ → **EQ BIAS** → MAIN OUT → TRIM OUT

EQ BIAS

- **Type:** Increases **Class AB + Class A (odd and even harmonics)** applied to the EQ-ed signal (think of it as the output transformer).
  What you hear:
  - Even at low settings, EQ BIAS gives the signal a sense of **thickness and cohesion.**
  - Increasing the dial adds **richness and harmonic density**, making the overall sound fuller and more polished.
  - At higher values, EQ BIAS produces a noticeable **push in the low-mid frequencies**, adding weight, warmth, and solidity while smoothing the highs with a gentle analog sheen.
  - Ideal for mix bus or mastering when you want to add body and glue.

Practical Uses

- Use **EQ BIAS** to add body, polish, and harmonic weight *after* EQ—especially effective for rounding out mixes or masters that feel thin.
- Together (DRIVE & EQ BIAS), let you sculpt both the **placement** (VOICE BIAS) and the **density** (EQ BIAS) of harmonics for maximum control.

SCALE: MIX Spread

This is a **musically and psychoacoustically intelligent spread**. Here's why:

1. **Low-End Control:**
   - 40 Hz: Excellent for **sub-bass shaping**, providing effective tone-shaping without pushing the extreme low end.
   - 72 Hz: Smart midpoint between 63 and 80 Hz—targets **bass definition** without overwhelming.
2. **Clarity Zone (Low-Mids and Mids):**
   - 130, 240, 440 Hz: These frequencies are **critical for muddiness, warmth, and body**. Compared to ISO's 125 and 250, your additions (esp. 440 Hz) are musically on point.
   - These are better spaced for **addressing buildup or boxiness** in complex mixes.
3. **Presence and Intelligibility (Upper Mids):**
   - 800, 1500, 2600 Hz: These are perfectly chosen for controlling:
     - **800 Hz:** Honkiness/mid congestion.
     - **1.5 kHz**: Nasality, vocal presence.
     - **2.6 kHz:** Harshness/edge on vocals and guitars.
     - These are more surgical than the ISO 1k/2k/4k split.

4. **High-End Control (Highs):**
   - 4800 Hz: Hits the **sibilance/brightness** zone directly.
   - 8800 Hz: A musical alternative to 8k/16k—smoother, better suited for **air and shimmer** without harshness.

Comparison with ISO 10-Bands

Band	ISO (Hz)	Mix (Hz)	Comment
1	31.5	40	More usable sub control
2	63	72	Slightly tighter low-end shaping
3	125	130	Nearly equivalent
4	250	240	Matched well
5	500	440	Slight shift downward — tighter low-mid
6	1k	800	More useful for congestion
7	2k	1500	Better for vocal control
8	4k	2600	Less harsh, more mastering-friendly
9	8k	4800	Tames presence without spikiness
10	16k	8800	Smooth, less brittle high-end boost

- Target **critical mix regions** with more precision than ISO.
- Avoid harsh overlapping or redundant bands.
- Offer smooth control for tonal shaping in subtle ±1–2 dB adjustments.

SCALE MASTER Spread:

This is a psychoacoustic & mastering-focused Layout. **Why it works for mastering:**
Wide, deliberate spacing prevents over-correction and phase buildup.
Focuses on psychoacoustically critical regions rather than evenly spaced bands.
Allows surgical but gentle tonal shifts, essential for preserving mix integrity.

1. **Low-End Precision:**
   - **60 Hz** – Ideal for mastering-level sub/bass shaping. Above the deep-rumble zone, making it easier to control low end without destabilizing the mix's foundation.
   - **170 Hz** – Right in the "mud zone," perfect for taming boominess and excess warmth in a subtle, broad-stroke mastering context.
2. **Low-Mid / Midrange Balance:**
   - **310 Hz** – Targets boxiness and resonance build-up. This frequency is high enough to avoid hollowing the mix but low enough to maintain fullness.
   - **600 Hz** – The critical low-mid/mid crossover point for controlling mix density. Tames thick lower mids without harming clarity.
   - **1 kHz** – Classic mastering pivot point. Adjustments here subtly shift focus between rhythm section and lead elements without introducing tonal imbalance.
3. **Upper Midrange Clarity:**
   - **3 kHz** – The human ear's most sensitive presence region. Fine-tune intelligibility, vocal forwardness, and instrument definition without over-brightening.
4. **High-Frequency Control & Air:**
   - **6 kHz** – Smoothly reduces or enhances brightness and sibilance. A safer zone than 8 kHz for avoiding harshness in a mastering pass.**12 kHz** – Lifts "air" and openness without adding grit. Perfect for enhancing stereo width perception and depth.**14 kHz & 16 kHz** – The sparkle zone. These work in tandem to either add ultra-high gloss or gently smooth out digital edge while retaining natural brilliance.

Comparison with ISO 10-Bands

Band #	ISO 266 (Hz)	Master Spread (Hz)	Short Description Psychoacoustic Focus
1	31.5	60	60 Hz: Tighter low-end control; avoids extreme sub rumble of 31.5 Hz.
2	63	170	170 Hz: Targets boominess/mud vs. 63 Hz's deeper bass emphasis.
3	125	310	310 Hz: Addresses boxiness; more mid-focused than 125 Hz warmth zone.
4	250	600	600 Hz: Controls low-mid thickness; ISO 250 Hz focuses on warmth/mud.
5	500	1000	1 kHz: Mid pivot point for tonal balance; ISO 500 Hz is lower midrange.
6	1k	3000	3 kHz: Presence/clarity zone; ISO 1 kHz is central mid.
7	2k	6000	6 kHz: Smooth brightness/sibilance control; ISO 2 kHz is upper-mid edge.
8	4k	12000	12 kHz: Adds air and openness; ISO 4 kHz is high-mid presence.
9	8k	14000	14 kHz: Sparkle and high sheen; ISO 8 kHz is brightness/sibilance zone.
10	16k	16000	16 kHz: Extreme air and gloss; both scales end here but with different emphasis.

Acceleration Limiters

The Problem: Stylus Acceleration

During the vinyl era, engineers faced a unique physical limitation, the cutting stylus.
Sharp transients and bright high-frequency content could cause excessive acceleration of the cutter head.
If the acceleration became too extreme, the head could distort, overheat, or even skip the groove entirely.

A simple solution was to roll off the top end, but that killed brightness and presence.
To preserve musicality, engineers developed smarter methods to control acceleration without dulling the signal.

Two Classic Solutions

1. **Acceleration Limiters**
   A dynamic high-frequency limiter that gently tames excessive transients in the top end.
   It works by dynamically reducing HF amplitude when acceleration thresholds are exceeded; it's effective, but it can change the timbre if overused.
2. **Phase Rotation Networks**
   These use cascaded all-pass filters to reshape the waveform without altering level. Instead of turning down the highs, they redistribute phase so transients are spread out over time.
   The result feels smoother and less harsh, yet remains bright—a more natural form of control.

In practice, many mastering chains combined both approaches: phase rotation for transparency and HF limiting for safety.

Joyride's Take on Acceleration Limiting

P410 Joyride recreates the musical feel of phase rotation, not by imitation, but through its own harmonic and spectral architecture.
When driven properly, Joyride's internal behavior achieves the same psychoacoustic outcome: a softer, more cohesive top end without the lifelessness of static EQ roll-off.

The subtle interplay between Drive engines, Voice Bias, and EQ curvature determines how much "phase-like" smoothing occurs.
The process is fully material-dependent: the harsher the source, the more naturally Joyride's high frequencies will soften.

Stylus Kiss & Stylus Kiss Hi-Fi Presets

With the Stylus Kiss presets, P410 Joyride captures the elusive balance of vintage lacquer mastering: the smooth transients and integrated vocals of phase rotation, combined with the natural spectral control of acceleration limiting.

Stylus Kiss: Designed to emulate the vinyl mastering acceleration limiter behavior.
Produces a silky, relaxed top end where transients feel glued—as *if a soft compressor were working invisibly in the highs.*

Stylus Kiss Hi-Fi: A modern variation that keeps the phase-diffused smoothness but adds a touch of clarity in the 3–6 kHz region for greater articulation on digital playback.

Using Stylus Kiss

1. Load the preset "Stylus Kiss" (or "Stylus Kiss Hi-Fi").
2. Set the DRIVE knob to around 9% for a typical program. For gentler material, reduce to 2%.
3. If the sound remains too bright or harsh, open the Drive Engine page and lower Engine D4 or bypass it (– icon).
   If more sparkle is desired, raise D4 slightly; it contributes the most to the upper harmonic sheen.
   In the EQ section, the two highest bands are set at approximately –1 dB. You can adjust them between –0.5 dB and –1.5 dB, depending on the material.
4. Finally, use the Voice Bias knob *to taste*. This adds subtle odd-harmonic density before the EQ, enhancing definition without edge.

Modifier keys

Temporarily bypass a parameter
CTRL+ALT (Windows) or CMD+OPTION (macOS) + Mouseover:

- All the dials
- All 10 band EQ faders
- All 6 DRIVE faders

Cycle between options
Left-Click for forward, Right-Click for backward.

- SCALE (outside the center area)
- MATRIX (outside the center area)

Gain compensate
SHIFT

- TRIM IN (countered by the TRIM OUT)
- TRIM OUT (countered by the TRIM IN)

Enable parameters for automation (**Pro Tools only)**
Control + command + option (^ + ⌘ + ⌥) on macOS or CTRL + ALT + START on Windows.

Fine adjustment of knobs, sliders and other controls
Hold control (^) on macOS or CTRL on Windows, then click and drag. Alternatively, right-click and drag without a key modifier.

Return controls to their default state
Press option (⌥) on macOS or ALT on Windows and left-click. Alternatively, double-click without a key modifier.

Managing Presets

Installation

If you keep the *Install Presets* option selected during installation, factory presets will be overwritten. Your own presets will remain intact. To keep any edits to factory presets, simply deselect “Install Presets” during updates.

Saving Presets

Use Save As in the Preset Manager to create your own presets. This prevents them from being replaced in future updates. You can also organize presets into folders and subfolders within the Preset Manager.

Your presets are stored here:

- Windows: C:\Users\Public\Documents\Pulsar Modular\P410 Joyride\Presets
- macOS: /Users/Shared/Pulsar Modular/P410 Joyride/Presets

You can organize, rename, or create folders and subfolders, and all changes will appear automatically in the Preset Manager.

Pro Tools Preset Management

When using P410 Joyride in Avid Pro Tools, note that Pro Tools handles plugin preset management differently from most other DAWs. To ensure P410 Joyride's internal preset system works seamlessly with Pro Tools' own preset management, follow these steps:

1. Set Plugin Default Behavior
    - In the plugin's header bar (top of the plugin window), open the Preset drop-down menu in Pro Tools.
    - Navigate to Settings Preferences ➜ Set Plug-In Default to ➜ User Setting.
    - This ensures that P410 Joyride recalls your most recent or user-defined settings instead of reverting to the factory default every time the plugin is inserted.
2. Save Presets to the Session Folder
    - Again, open the Preset menu and go to Settings Preferences ➜ Save Plug-In Settings to ➜ Session Folder.
    - This ensures all custom P410 Joyride settings are stored within the current Pro Tools session folder, rather than the global root settings directory.
    - This is especially useful when collaborating or moving sessions between systems, as your Joyride settings will automatically travel with the session.

Tip: Enabling both options allows Pro Tools and P410 Joyride's internal preset browser to work hand in hand, ensuring consistent recall and smooth preset workflow across sessions.

Uninstalling P410 Joyride

For Windows

- VST3: 'C:\Program Files\Common Files\VST3\Pulsar Modular', locate the 'P410 Joyride.vst3' folder and delete it.
- AAX: 'C:\Program Files\Common Files\Avid\Audio\Plug-Ins\Pulsar Modular', locate the 'P410 Joyride.aaxplugin' folder and delete it.
- Shared: 'C:\Users\Public\Documents\Pulsar Modular', locate the 'P410 Joyride' folder and delete it. This folder contains the user guide and presets. If no other folders exist under 'Pulsar Modular', this can be deleted as well.

For macOS

- AU: '/Library/Audio/Plug-Ins/Components', locate the 'P410 Joyride.component' file and delete it.
- VST3: '/Library/Audio/Plug-Ins/VST3/Pulsar Modular', locate the 'P410 Joyride.vst3' file and delete it.
- AAX: '/Library/Application Support/Avid/Audio/Plug-Ins/Pulsar Modular', locate the 'P410 Joyride.aaxplugin' folder and delete it.
- Shared: '/Users/Shared/Pulsar Modular', locate the 'P410 Joyride' folder and delete it. This folder contains the user guide and presets. If no other folders exist under 'Pulsar Modular', this can be deleted as well.

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GUI Development:	Max Ponomaryov / azzimov GUI design – www.behance.net/azzimov
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Please kindly report any errors or omissions in this user guide to psupport@pulsarmodular.com

P/N: 31726, Rev. 1.0

Restrictions

The USER may not reverse engineer, disassemble, resample, create Impulse Response profiles or re-record, decompile, modify, or alter in whole or in part Pulsar Modular audio plugins for the intent of renting, leasing, distributing, or repackaging (whether for profit or not).

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