

SHARK TRIAD

User manual / Version 0.3.0



Three-band compression with a connected analog and digital interface.

Use this guide for the v0.3.0 source checkpoint. Exact numerical readouts take precedence over printed dial markings. Compatibility and release status are described at the end of this guide.

Purpose

Triad splits stereo or mono audio into low, middle and high bands so bass movement, midrange density and treble peaks can be controlled separately. Its main intended jobs are mix bus, mastering experiments, drum buses and stems. It can also work on bass and vocals. Start gently; this is a compressor, not a final output limiter.

Signal flow

Input / first fourth-order Linkwitz-Riley crossover / second crossover for the upper branch / low-band all-pass phase alignment / three independent compressors and band gains / sum / optional Drive / phase-aligned dry/wet blend / Output / Gain Match / Bypass crossfade.

The low branch is aligned with the upper crossover so recombination has flat magnitude when all bands are unchanged. During ordinary parallel operation, dry is the phase-matched recombined signal. There is no reported buffering latency; the IIR filters do have frequency-dependent phase. This is not linear-phase processing.

Init uses an exact original-audio route. Entering or leaving the active crossover path uses a short transition, which may momentarily blend two phases. Mix=0 settles to the original path. Crossovers, gains, dry/wet and bypass are smoothed. Switching channel topology during sustained audio still requires listening/automation QA.

Band controls

Control	Range / behavior
IN	Enables that band's compression; its band gain remains active.
SOLO	Auditions this band. Multiple solos sum. Gain Match is disabled during solo.
Threshold	-60 to 0 dBFS detector level. Lower values cause more compression.
Attack	0.03-100 ms. Longer values preserve more transient attack.
Ratio	1:1-20:1 continuously variable. 1:1 is uncompressed unless Smash is enabled.
Release	20-3000 ms. Longer values recover more slowly.
Link	0-100% stereo detector coupling. 100% uses the stronger detector for both channels. Applies to Stereo mode.
SC HPF	Off to 600 Hz, detector only. Protects low-frequency energy from triggering compression; it does not high-pass the audio output.
Gain	-12 to +12 dB band gain, active even when IN is off.
Stereo	Compress left and right, with Link controlling their interaction.
Mid	Encode M/S and compress only the center. Side is left dynamically unchanged.
Side	Encode M/S and compress only the side. Center is left dynamically unchanged.

The M/S transform is energy-normalized. Gain still affects the entire band. On a mono input, Side compression has no meaningful signal to compress. The user-visible numerical value is authoritative; the current artwork's dial graduations are provisional.

Tone and global controls

- **Knee:** Soft is 6 dB wide; Medium is 3 dB; Hard has no soft transition.
- **Detector:** Flat leaves the detector spectrum alone. Low Cut applies at least 90 Hz detector filtering. Tilt reduces low-frequency detector weight and emphasizes highs.
- **Style:** Feed Forward measures the input to compression. Feed Back measures the previous compressed sample before makeup. The feedback gain law is adjusted to retain the intended steady-state ratio. These are original algorithms, not recovered hardware circuitry.
- **Compress:** Turns all compression off while retaining crossovers, gains, Drive and mixing.
- **Smash:** Uses at least a 12:1 ratio and 8 dB extra detector drive. Begin with a low Mix value on room mics or creative sources.
- **Output:** -24 to +24 dB output trim. It does not guarantee a ceiling.
- **Mix:** 0-100% wet. Normal parallel operation uses the phase-aligned dry branch.
- **Drive:** 0-10 dB, compensated tanh color. Zero is transparent. There is no oversampling yet; high drive can alias and is not release-approved for transparent mastering.
- **Gain Match:** Smoothed input/output power comparison, with compensation limited to approximately +/-12 dB. It settles over time and is frozen toward unity for silence or solo. This is not LUFS matching.
- **Bypass:** Smoothly returns to unchanged input. Once settled it is exact. DAW bypass may use the host's own mechanism.

Crossovers

LOW / MID: 40-1000 Hz. MID / HIGH: 1200-12000 Hz, internally limited to 40% of sample rate. The disjoint ranges prevent crossing the bands. Default: 120 Hz and 2.5 kHz. Use SOLO while choosing boundaries, then turn SOLO off before judging the full mix.

Meters

Three actual signal-driven meters share the selected menu mode. Input and Output show band RMS level with visual smoothing; 0 VU corresponds to -18 dBFS RMS. Gain Reduction shows attenuation in dB. Meter movement is indicative with prototype ballistics, not certified hardware VU compliance. No LUFS or true-peak measurement is included.

Digital multiband graph

GRAPH, beside the bottom crossover strip, opens an optional panel beneath the analog interface. Purple, green and blue regions represent Low, Mid and High. The horizontal axis is logarithmic from 20 Hz to 20 kHz. Drag the divider lines horizontally within the same legal crossover ranges as the analog knobs.

The three threshold sliders below the plot control the existing band thresholds. Lower the threshold to engage more compression; ratio, attack, release and the source material determine how much reduction occurs. Automation and undo use the same parameters as the analog controls. Changing a preset or turning a knob updates the display.

The gold trace and colored fill interpolate measured per-band gain reduction across the displayed regions. This is a visual band envelope with smoothed crossover transitions, not an FFT analyzer or exact transfer-function plot. The vertical plot range is 0 to -24 dB; numeric GR readouts can exceed that range. Makeup gain, output trim, dry/wet and drive are not included in this visualization. Bypass, global Compress off and individual IN off flatten the associated GR indication.

Graph visibility is recalled with sessions. Fullscreen keeps the same live panel and fits the combined 1536x1444 logical canvas with dark margins when needed. Hiding the graph returns to the original 1536x1024 analog canvas. The graph stops repainting when hidden.

Presets and comparison

The 48 factory presets are: Init (1), START HERE (6), Mastering (10), Mix Bus (8), Drum Bus (6), Bass (5), Vocals (4), Guitars and Keys (4), Creative (4). The included JSON lists every recipe. Preset names describe intended use, pending audition on real program material.

Click the preset field to search by name or category. Previous/next traverses the full bank. Favorite marks are persisted. Enter a name and Save new for a user preset. Rename/Delete affect user presets only; deletion moves the preset file to the system trash. A factory setting can be saved as a new user preset. User presets live under the system application-data folder in Shark Plugs/Triad/Presets.

A/B/C saves the outgoing slot before loading the next. Slots and the active slot are session-recalled. Audio controls, including bypass and gain match, belong to slots. Theme and zoom are session preferences. Undo/redo is parameter history; file operations and theme changes are not undoable through the audio Undo button.

Interface

Hover or drag a knob to display its exact value. Shift-drag adjusts finely; double-click resets. The black collar, brushed cap and shadow stay fixed while the live pointer rotates.

The logo cycles black, brushed silver, rough green and rough purple materials. Themes must not affect sound. Zoom menu options are 60%, 75%, 90% and 100%; drag-resize follows the current analog or combined-view proportions. The analog default is 1152 x 768. The expand button uses the current monitor, preserves aspect with dark margins and shares the same processor. Escape closes the browser or exits full screen.

Installation, ownership and support

Build instructions are in README.md. Configured formats: AU, VST3 and Standalone; configured Mac architectures: arm64 and x86_64; minimum target macOS 12.0. Configured support is not proof of Mac or DAW testing. There is no activation flow or purchase button because no product SKU/license system is defined for this development checkpoint.

To remove a locally installed prototype, remove only its Shark Triad .component, .vst3 and standalone app. User presets may be retained. Do not remove other Shark products. Project/support identity: www.sharkplugs.com. No email address or commercial warranty is invented.

Practical examples

1. **Mix bus glue:** START HERE - Gentle Three-Band Glue. Adjust thresholds for 1-3 dB reduction, compare with Gain Match, then lower Mix if transients lose energy.
2. **Stable bass:** START HERE - Low-End Authority. Set LOW / MID above the uneven bass range. Keep mids and highs lightly compressed so the kick does not suppress the whole mix.
3. **Drum parallel density:** Drum Bus - Parallel Smash. Start at 25% Mix; listen for cymbal harshness and lower high-band Ratio or Drive as needed.

Troubleshooting and limits

If Projucer cannot find modules, set its global JUCE path. If a DAW does not see the plugin, confirm the format's installation directory and rescan. For an Xcode failure, retain the first compiler error and report it with JUCE/Xcode versions. Do not alter deployment targets blindly; both configurations already request 12.0.

If level rises unexpectedly, check Output, band gains, Gain Match settling and Solo. Triad is not a limiter. If CPU rises, set Drive to zero for sonic comparison, close the editor to separate GUI and DSP load, and record buffer/sample rate/instance count. Extreme-settings tests are not a substitute for a real session.

Outstanding release gates: real-material audition, preset leveling, exact live artwork matching and dial-scale correction, meter ballistics, host automation/recall, Mac architecture builds, AU validation, multiple DAWs, Retina/two-monitor full-screen behavior, long-session CPU testing, signed/notarized installer and licensing.