

WaveFront EQ

A 16-band linear-phase surgical equalizer with per-band mid/side/left/right routing, dynamic EQ, and a resonance hunter built for mastering-grade decisions.

Formats • AU, VST3 (macOS) • AUv3 (iPadOS) Version • 0.1.2 Manufacturer • Smash Happy Audio

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What WaveFront EQ is for

WaveFront EQ is a true linear-phase parametric equalizer built for the last, most careful EQ move in a master. Every band is designed in the frequency domain and applied as a linear-phase FIR filter, which means the harmonic relationships in the source are never smeared by the filter's own phase response — a cut at 3 kHz doesn't quietly shift the timing of everything around it.

That precision comes at the cost of a fixed processing latency (see **Phase Modes**), which is why WaveFront also ships a Zero Latency mode built on the same band math for tracking and quick decisions, so you're never stuck waiting on the linear-phase engine when you don't need it.

Sixteen bands, nine filter shapes, per-band routing to Stereo, Mid, Side, Left, or Right, optional per-band dynamic (level-triggered) EQ, a one-click resonance suggestion engine, an always-on adaptive de-resonator, and a drag-and-drop tonal reference matcher round out the toolset.

The interface

The window is built around a single EQ graph: drag on the curve to shape it, and every control you touch elsewhere updates the graph live.

TOP RAIL

Plugin identity, **UNDO**, **ALT** (A/B compare), and the **ENGAGED** / **BYPASSED** switch.

EQ GRAPH

Log-frequency, dB-gain plot. Pre/post spectrum overlay, freeze, and every band's colour-coded curve and node live here.

BAND STRIP

A 16-chip quick-select row under the graph. A lit chip is an active band; its colour matches its node on the graph.

BAND DETAIL PANEL

Full controls for whichever band is selected: shape, frequency, gain, Q, channel target, and its dynamic-EQ section.

READING THE GRAPH

Each band fills the area between its own curve and 0 dB in its own colour — pull a bell down and the dip fills, push it up and the peak fills, so you can see at a glance which band is doing what to the composite curve (the bright line running through all of them).

ON IPAD

The iPad version is the same layout, not a reduced one — the whole interface is drawn at its full design size and scaled to fit whatever the host gives it, so every control sits exactly where it does on the desktop. The graph takes up the vertical difference, so it is shorter on a short window and taller on a tall one. Q is reached by pinching rather than scrolling (see section 03).

Adding & editing bands

WaveFront gives you 16 bands. On a fresh load, only two are active: a High Cut and a Low Cut, parked at 20 kHz and 20 Hz where they sit flat and do nothing until you move them — every other band starts off.

- **Double-click** anywhere on the graph to add a bell band at that frequency and gain.
- **Drag a node** to move frequency (horizontal) and gain (vertical) together.
- **Scroll on a node** to widen or narrow its Q.
- **Pinch two fingers on the graph** (iPad) to do the same — spread to widen the band, pinch in to tighten it. A touchscreen has no scroll wheel, so this is how Q is reached there.
- **Right-click a node** to delete that band entirely and free its slot.
- **Click a band's chip** in the strip below the graph to toggle it on or off without losing its settings — a disabled band stays visible on the graph as a hollow node so you can bring it back exactly where you left it.

Every band remembers whether it's been placed in the mix at all, so disabling a band never causes the next double-click to silently reclaim its slot — deleting (right-click) is the only way to truly free a band up.

Filter shapes & slopes

Pick a band's shape from the strip in its detail panel. Every shape shares the same Frequency, Gain, and Q controls where they apply.

SHAPE	WHAT IT DOES	USES GAIN?
Bell	Symmetric boost or cut centred on a frequency — the everyday surgical move.	Yes
Low Shelf	Boosts or cuts everything below the frequency.	Yes
High Shelf	Boosts or cuts everything above the frequency.	Yes
Low Cut	Removes content below the frequency. Slope-selectable.	No
High Cut	Removes content above the frequency. Slope-selectable.	No
Notch	A narrow, deep cut for isolating and removing a specific resonance.	No
Band Pass	Passes only a narrow band around the frequency; everything else is removed.	No
Tilt Shelf	Rotates tonal balance around the frequency — one side lifts as the other falls.	Yes
Flat Tilt	The same tilt, energy-balanced so the overall level doesn't drift as you tilt.	Yes

Low Cut and High Cut bands (including bands 1 and 16, WaveFront's default bookends) offer a **Slope** choice from 12 to 96 dB/octave in 12 dB steps. Every other shape also honours Slope as a cascade — the same shape stacked in series — so a steeper Bell or Shelf reaches its target gain faster on either side of centre.

Channel routing

Every band independently targets one of five channel contexts, set from its detail panel:

STEREO Both channels equally	MID L+R sum only	SIDE L–R difference only	LEFT Left channel only
RIGHT Right channel only			

This is how you cut a resonance that's only sitting in the side image, or tuck in a touch of low end on the mid without narrowing the stereo field. A band's channel target is shown as its node colour on the graph and as a coloured tag on its chip, so the routing is always visible without opening the detail panel.

Dynamic EQ

Any band can be switched into Dynamic mode from its detail panel. Instead of a fixed cut or boost, the band's gain moves in response to how loud its own frequency area gets — a compressor riding just that one band.

- **Threshold** — the level the band's own detector has to cross before gain reduction starts.
- **Ratio** — how hard the band reacts once it's over threshold.
- **Attack / Release** — how quickly the reduction engages and lets go.

The detector listens in whatever channel context the band is already routed to, so a Side-routed dynamic band only reacts to resonances in the side image. Its live gain reduction is shown on the graph as a marker on the band's own curve, and on a dedicated meter in the detail panel.

REACTION TIME

Because the whole EQ is linear-phase, a dynamic band's gain change can't take effect instantly — it's folded into the next filter redesign, which happens roughly every 10–50 ms. This is a property of doing dynamics inside a true linear-phase filter, not a bug, and it's fast enough for anything short of hard limiting duties.

Phase modes & latency

WaveFront runs in one of two modes, switched from the top rail:

LINEAR PHASE

The default. Every band is realised as a linear-phase FIR filter with zero phase distortion.

Reports a fixed latency of roughly **160 ms at**

48 kHz (scales with sample rate to hold frequency resolution constant) — your DAW compensates for this automatically once the plugin is inserted.

ZERO LATENCY

The same bands rebuilt as a minimum-phase filter chain. Zero reported latency, instant parameter response — useful while tracking, comping, or auditioning a move quickly before committing in Linear Phase for the final pass.

Switching modes clears both engines' internal state so there's no leftover tail or click on the switch. The reported latency updates automatically — most hosts will show a brief re-sync when it changes.

Bypass is a true bypass in both modes. Because Linear Phase runs at a fixed latency, a bypassed signal has to be delayed by exactly the same amount or it would land early against the rest of your session and read as a level or tone change rather than a delay. It is, so switching ENGAGED / BYPASSED is an honest A/B: what you hear is the EQ, not a timing shift.

Resonance Hunter

Press **HUNT** in the top-right of the graph and WaveFront listens for about six seconds, analysing the Mid and Side spectra separately for problem frequencies — narrow buildups that stick out above their local surroundings.

It surfaces up to six suggestions as ghost nodes on the graph, each with a proposed frequency, Q, cut amount, and channel routing (Mid, Side, or both) already worked out. Nothing is applied automatically — click a ghost node to claim it as a real band with those settings, or ignore it and hunt again.

SURGEON

SURGEON is a continuous, always-listening companion to the static bands — a dynamic resonance suppressor modelled on the "draw a threshold curve, cut anything that pokes above it" workflow of tools like Soothe or Equator, folded into WaveFront's own linear-phase engine rather than running as a separate process.

It builds a threshold curve one of two ways:

- **Adaptive** — a rolling ~8-second average of the program material itself, so the threshold follows the mix as it evolves.
- **Captured** — press **LEARN** to freeze an 8-second snapshot as a fixed reference; the button reads **RE-LEARN** once a capture is held.

Anything in the live spectrum that pokes above the threshold gets a smooth, proportional cut — downward only, never a boost — shown on the graph as amber markers hanging from the cut. Turn it up for a firmer hand on resonances, or leave it low as a gentle safety net under your manual bands.

MATCH

MATCH gives WaveFront a tonal target to reach for. Drag any audio file onto the MATCH panel and it's analysed offline (the first 90 seconds) to build a target spectral curve; drop nothing and it falls back to a pink-noise target.

MATCH then applies a smoothed, clamped correction curve that nudges your material's own spectrum toward the target — visualised as a dashed curve on the graph's gain scale. It's a starting point for tone-matching a reference, not a substitute for listening; dial the amount down once you're in the neighbourhood you want.

Undo & A/B compare

UNDO

Steps back your last change — a knob move, a toggle, a band added or deleted. Related edits within about half a second of each other are grouped into one undo step, so a knob drag undoes in one press.

ALT

A/B compare. First press stores your current settings as the alternate; press again to flip between the two and compare by ear. Both states are saved with your project.

Specifications

Formats	Audio Unit, VST3 (macOS) · AUv3 (iPadOS)
Platform	macOS 10.13+, Apple Silicon and Intel (universal) · iPadOS
Bands	16, independently routable and switchable
Filter shapes	Bell, Low/High Shelf, Low/High Cut, Notch, Band Pass, Tilt Shelf, Flat Tilt
Slope range	12–96 dB/octave in 12 dB steps
Routing	Stereo, Mid, Side, Left, Right — per band
Linear Phase latency	~160 ms at 48 kHz, fixed and reported, scales with sample rate
Zero Latency mode	0 samples reported, minimum-phase
Processing	Double-precision filter design throughout
Channel configuration	Stereo in / stereo out

Troubleshooting

My DAW clicked or re-synced when I opened WaveFront

That's your host compensating for WaveFront's Linear Phase latency (see [Phase Modes](#)) — expected the first time the plugin reports its delay. Switching between Linear Phase and Zero Latency will do it again each time, since the reported latency changes.

A dynamic band doesn't seem to react instantly

Expected — see the callout in [Dynamic EQ](#). The linear-phase engine folds gain changes into its next filter redesign rather than applying them sample-by-sample.

I disabled a band and now I can't find it

Disabled bands stay on the graph as hollow, clickable nodes and stay lit-but-dim in the band strip — click either to bring the band straight back with its old settings intact. Only a right-click delete removes a band for good.

SURGEON or MATCH doesn't seem to be doing anything

Check their amount/strength control isn't at zero, and for MATCH, confirm a reference file has actually been dropped (it falls back to a flat pink-noise target otherwise, which produces a much smaller correction on already-balanced material).