

MOD-07 / SPECTRAL

AURORA

SPECTRAL

FREE · AGPLV3

VST3 · AU

AURORA gives **each frequency band its own azimuth** — lows centred, highs fanning to the sides, or any curve you draw. It turns mono into ultra-wide stereo where the spectrum is physically unfurled across the field, like an aurora spreading its colours. No Haas, no delay tricks: real spectral re-placement by **per-bin phase de-correlation** — crystalline width that actually survives mono.

// ANATOMY



// CONTROLS — COMPLETE REFERENCE

SOUND

SPREAD — How far the bands separate — scales the angle assigned to each bin. 0 = mono; 100 = maximum unfurl.

TILT / MAP — The frequency→position curve of the fan. Centre = lows-centre / highs-edges; negative leans the width into the lows and reins the air back toward the centre. The character of the fan.

MOTION / SYNC — The spectral fan opens and closes by modulating the map. With SYNC it locks to tempo — the unfurl pulses with the track (capped under ~20 Hz, no audible AM).

MONO SAFE — AURORA's own net: ties the lows to the centre below a cut (50→400 Hz). The ILD is useless under ~1 kHz, so the bottom never widens itself apart.

DUCK — The fan closes when the dry hits and reopens in the gaps — the width breathes with the performance instead of sitting static.

MIX · IN PHASE — Dry/wet by power law (the dry is delay-aligned to the block). IN PHASE folds the wide image to mono-safe in one click.

GLOBAL & I/O

IN / OUT — Input and output gain trim, smoothly ramped, with a true-peak-safe meter.

SIZE · S/M/L — Three interface scales; your choice is remembered across every OVNI plugin.

PRESETS — Save your own and browse the bank with ◀ name ▶.

A/B — Hold two settings and flip between them to compare.

BYPASS — The power icon bypasses the effect for a clean A/B against the dry signal.

// PARAMETERS · EXACT RANGES

	RANGE	DEFAULT
SPREAD	0-100%	55%
TILT	-100...+100	0
MOTION	0-100%	0%
MONO SAFE	0-100% → 50-400 Hz	0%
DUCK	0-100%	0%
MIX	0-100%	100%
MOTION RATE (FREE)	0.02-8 Hz · log	0.3 Hz

	RANGE	DEFAULT
MOTION SYNC	0ff · 0n	0ff
MOTION DIV	1/4 · 1/2 · 1 · 2 bar	1 bar
INPUT GAIN	-24...+24 dB	0 dB
OUTPUT GAIN	-24...+24 dB	0 dB
IN PHASE · MONO-SAFE	0ff · 0n	0ff
BYPASS	0ff · 0n	0ff

// HOW IT WORKS

Spectral panning by phase de-correlation.

The most PRO tool of the catalog: real width without the tricks that break mono — STFT re-placement with per-bin phase de-correlation, not a Haas delay.



// UNDER THE HOOD

STFT / OVERLAP-ADD

A Hann window at 75% overlap with COLA runs analysis/synthesis per block. There is no full phase vocoder — it never stretches time — which keeps the risk low and the sound clean.

PER-BIN PANNING

Each bin is assigned an azimuth θ from the Tilt/Spread curve; its magnitude is split L/R by constant power and its phase is preserved, giving ultra-wide width with no comb-filtering.

ANTI-AM LIMIT

The mapping angle must vary slower than ~20 Hz or audible AM appears, so Motion and the fast SYNC divisions are clamped under that bound — honest by design. The MOTION sideband toll is -34.2 dBFS (declared).

LOWS-CENTRE NET

Below the Mono Safe cut (50-400 Hz) bins collapse toward the centre, guaranteeing the mono sum — because real low-end width comes from de-correlation, not level.

DRY SIDECCHAIN (DUCK)

An envelope-follower on the dry scales the global angle toward zero on transients — multiplicative on the angle only, never touching phase or the power split, so the width breathes with the music.

HONEST LATENCY

Block latency ($N/2 = 2048$ smp) is reported to the host and PDC-compensated — the trade-off for real spectral unfurling versus a zero-latency mid-side widener. Alias floor is -101.22 dBFS at rest.

// MEASURED PERFORMANCE

Alias floor · clean (still)	-101.22 dBFS	MOTION sideband · modulation toll	-34.2 dBFS · declared
Image correlation · Spread 100%	+0.006 (audible, opens)	IN PHASE / low bins · mono-safe	low-side → centre
Anti-clip true-peak	0.850 · = ceiling	CPU · 48 kHz / 512	0.30%
Latency	2048 smp · 42.7 ms@48k · PDC		

Conditions – alias floor measured still (no Motion); the MOTION sideband is the declared modulation toll. Image correlation on pink noise at Spread 100%; true-peak swept across 44.1 / 48 / 96 kHz. CPU = 48 kHz / 512-sample blocks.

// LATENCY · PER SAMPLE RATE

	44.1 KHZ	48 KHZ	96 KHZ
REPORTED LATENCY	2048 samples / 46.4 ms	2048 samples / 42.7 ms	2048 samples / 21.3 ms

PDC-reported to host (constant 2048-sample STFT block).

// SPECIFICATIONS

SYSTEM · FORMATS		AUDIO · PROJECT	
FORMATS	AU · VST3 · Standalone	SAMPLE RATES	44.1 – 192 kHz (host)
SYSTEMS	macOS 11+ · Windows 10+	PRECISION	64-bit float
ARCHITECTURE	Universal · Apple Silicon + Intel	LATENCY	2048 smp · 42.7 ms @48k · PDC
I/O	mono / stereo in → stereo out	PRESETS	6 · 5 Production + 1 Sound Design
MIDI	Program Change · preset recall	LICENSE	AGPLv3 · open-source · github.com/ovniaudio

// TRANSPARENCY & HONESTY

Dry path stays clean — the dry is delay-aligned to the block and Bypass is a chassis pass-through. The alias floor is -101.22 dBFS at rest; the MOTION sideband (-34.2 dBFS) is the declared modulation toll, clamped under the ~20 Hz anti-AM bound. Latency is reported and PDC-compensated. No analog modeling. THD+N, frequency response and SNR are not characterised.

// INSTALL (FREE & OPEN-SOURCE)

Free & open-source (AGPLv3), not yet code-signed: on macOS, right-click → Open the first time (or `xattr -cr` on the `.component/vst3`); on Windows, allow it in SmartScreen. Source & downloads at github.com/ovniaudio.