

MOD-00 / PRIMARY SIGNAL

ORBIT

MOVEMENT

FREE · GPLV3

VST3 · AU

ORBIT is the flagship: a full binaural spatial engine. Place a sound anywhere in 3D, set it orbiting, or fly it past with real Doppler. Headphones or speakers — always mono-safe.

// ANATOMY



// CONTROLS — COMPLETE REFERENCE

SOUND

THE RADAR — Drag to place the source in 3D — angle and distance. The whole field on one screen.

DOPPLER — Bends the orbit eccentric: the source flies close then far, pitch rising and falling. A real fly-by.

RATE / SPEED — Free, tempo-synced (1/4–1 bar), or Fixed placement. The orbit follows your track.

CHAOS — Erratic, alien motion — darting speed and azimuth wobble.

WIDTH / ROOM — Ear-shadow width plus decorrelated early reflections that push the sound outside your head.

OUTPUT / IN PHASE — Headphones or speakers (crosstalk-cancelled). IN PHASE guarantees mono.

MIX — Dry/wet balance of the spatialised signal.

SHAPE — The orbit path — clean circle, pendulum or figure-of-eight.

DIRECTION — Sends the orbit clockwise or counter-clockwise.

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
DOPPLER	0-100%	0%
CHAOS	0-100%	0%
WIDTH	0-100%	50%
ROOM	0-100%	30%
MIX	0-100%	100%
RADAR · RADIUS	0-100%	60%
RADAR · HEIGHT	-100...+100%	0%
RADAR · SPREAD	0-100%	35%
SHAPE Circle · Ellipse · Spiral · Pendulum · Pend-back		Ellipse

	RANGE	DEFAULT
RATE	1/4 · 1/2 · 1 bar · Free · Fixed	Free
SPEED (FREE)	0.05-8 Hz	0.5 Hz
FIXED ANGLE	-180...+180°	0°
DIRECTION	CW · CCW	CW
OUTPUT MODE	Phones · Speakers	Phones
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

Real binaural, measured.

ORBIT is the conservative, pure binaural core — no tricks, just acoustics.



// UNDER THE HOOD

MINIMUM-PHASE HRIR RING

Convolution against a ring of head-related impulse responses; minimum-phase design flattens group delay so the source moves without clicks or transient smear.

WOODWORTH ITD

Inter-aural time difference from the Woodworth spherical-head model (~0.66 ms max) supplies the timing cue that fixes lateralisation beyond level panning.

NEAR-FIELD PROXIMITY

Below one metre the Duda-Martens model bends the low end and ear-shadow asymmetrically — the intimacy of a source close to the head.

EMERGENT DOPPLER

Pitch is never shifted; it falls out of modulating the propagation delay line in real time, like a true fly-by, with zero added latency.

RACE CROSSTALK CANCEL

On speakers a recursive, latency-free crosstalk canceller rebuilds the binaural image; IN PHASE bypasses it for a guaranteed mono fold-down.

TRUE-PEAK CEILING

A stereo-linked limiter reads inter-sample peaks, so the spatial image never clips or collapses on the master bus.

// MEASURED PERFORMANCE

Phase correlation · front, Width 0→100%	+1.00 → +0.92	Phase correlation · at ±90°	≈ +0.52...+0.56
IN PHASE correlation	+0.99	Mono-sum · L+R, Width 0→100%	0 → -0.30 dB
Output true-peak · limiter 0.85	0.874 ≈ -1.2 dBFS	Doppler pitch shift · max	up to 3.74 st
Near-field bass tilt · near→far	-3.8 → -6.0 dB	Latency	0 samples

Conditions — pink noise · 48 kHz · 512-sample blocks · 500 blocks (100 discarded as warmup) · Rate = Fixed.

// LATENCY · PER SAMPLE RATE

	44.1 KHZ	48 KHZ	96 KHZ
REPORTED LATENCY	0 samples / 0.0 ms	0 samples / 0.0 ms	0 samples / 0.0 ms

// 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	0 samples · zero-latency
I/O	mono / stereo in → stereo (binaural) out	PRESETS	40 · 15 Production + 25 Sound Design
MIDI	Program Change · preset recall	LICENSE	GPLv3 · open-source · github.com/ovniaudio

// TRANSPARENCY & HONESTY

Dry path is bit-transparent — bypass is true pass-through (mono input duplicated to R); the dry signal is never processed. No analog modeling: no added noise, harmonics or THD. THD+N, frequency response and SNR are not characterised.

// INSTALL (FREE & OPEN-SOURCE)

Free & open-source (GPLv3), 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.