DOTMATRIX

DOTMATRIX / LIGHTWEIGHT AUDIO PLUGINS

ROHAKIGUN

A dual filter bank:
two resonant filters, envelopes, an LFO and a VCA, built for movement.



Rohakigun by Dotmatrix

USER GUIDE | VERSION 1.0.1 | AU | VST3 | CLAP | macOS 10.14+ | INTEL + APPLE SILICON

Two filters that sweep from low-pass to high-pass, driven, modulated and locked together at musical ratios.

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— ABOUT ROHAKIGUN

Rohakigun is a dual filter bank from Dotmatrix: two resonant filters that sweep smoothly from low-pass through band-pass to high-pass, with a driven tube-style input, an ADSR or envelope follower, an AR envelope on a VCA, an LFO that runs from very slow to audio rate, FM and AM from the signal itself, and pitch tracking. Run the filters side by side or one into the other, lock them together at musical ratios, or split them left and right. Draggable filter points on the glass, two VU needles and lights for every trigger and envelope show what's moving, and 50 factory presets lean on movement, from sixteenth-note gates to eight-bar tides. AU, VST3 and CLAP for macOS, universal.

— QUICK FACTS

Type	A stereo dual-filter effect: two state-variable filters with drive, envelopes, an LFO, FM, AM, a VCA and pitch tracking.
Formats	Audio Unit, VST3 and CLAP effects, with a sidechain input. Universal: Apple Silicon and Intel, macOS 10.14 Mojave or later on Intel, macOS 11 or later on Apple Silicon.
Heritage	Classic analogue dual filter banks of the 1990s, read from their published manuals. The circuits, curves and times are our own.
Clean	Oversampling AUTO by default: 4x at 44.1 and 48 kHz, 2x at 88.2 and 96 kHz, 1x above. The overdrive, audio-rate FM and an audio-rate LFO stay free of aliasing.
Presets	50 factory presets: start, filter shapes, rhythm, movement, slow movement, character and tracking. Your own are saved in ~/Music/Rohakigun Presets.
Identity	Manufacturer Dotmatrix (Dtmx). AU code: Rhkg.

SECTION 01

Getting started

Put it on a track, start from Init Parallel, then make it move.

— NEW IN VERSION 1.0.1

1.0.1	Clicking the LCD steps forward through its views again, and scrolling a filter point steps L-B-H by the right amount. Dragging a filter point is now one move in your host's undo and automation.
1.0	The first release: two filters with L-B-H and correction, HARMONICS sync, parallel to serial, the tube input with HI BOOST / CUT and LIMIT, ADSR or follower, the AR VCA, an LFO from 0.02 Hz to 2 kHz with tempo sync, FM with +5TH and +OCT, AM, pitch tracking, sidechain, STEREO / MONO / SPLIT, draggable filter points, two VU needles, dark and light panel, 50 factory presets.

— INSTALLING

Copy each plug-in from the download's **Plug-Ins** folder into its folder: **~/Library/Audio/Plug-Ins/Components** (Audio Unit), **~/Library/Audio/Plug-Ins/VST3** and **~/Library/Audio/Plug-Ins/CLAP**. The release is not yet signed through Apple's developer program, so macOS needs one Terminal line before it will load it; **READ ME FIRST.txt** in the download has the exact steps. Logic Pro checks new Audio Units the first time it starts; Rohakigun appears under **AU Effects > Dotmatrix**.

— FIRST STEPS

1	**Insert it**	Put Rohakigun on a track or a bus (in Logic: Audio FX > Dotmatrix > Rohakigun). Drums, basses, pads and loops all work.
2	**Start plain**	Choose **Init Parallel**: filter 1 a low-pass at 1.2 kHz, filter 2 a band-pass at 320 Hz, summed. Set **INPUT** so the TRIG light flickers with the beat; 4 is unity gain.
3	**Shape the filters**	Turn **FREQ** and **RESO** on each filter, or drag its numbered point on the glass: across for the frequency, up for resonance, scroll for L-B-H. Sweep **L-B-H** from low-pass through band-pass to high-pass.
4	**Make it move**	Turn up **ENV AMOUNT** to let each hit open the filter, or **LFO DEPTH** for a sweep. Press **SYNC** to lock the LFO to your song. The dashed lines on the glass show where the cutoffs are right now.
5	**Blend and finish**	Turn **PAR <> SER** towards SER for a steeper, more vocal sound, **BYP <> EFF** to mix in the dry signal, and set **OUTPUT** by ear.

— BASIC HANDLING

Dials	Drag up or down. Double-click to reset. Click the value under a dial to type one (frequencies take "k", e.g. 2.4k).
Glowing dials	INPUT (orange), FREQ 1 (blue) and FREQ 2 (violet) have a light ring that grows around the knob with the value.
Knob colours	The small knobs are colour-coded by what they do: orange for drive and resonance, yellow for the ADSR, white for balance and L-B-H, red for correction, green for the VCA and levels.
Switch rows	HIGHS, TRIGGER, TRANSPOSE, TRACKING, LFO SHAPE and OUTPUT are rows of three keys; the lit one is in use. OFF or NORM is the middle.
The glass	Draws the response as set: filter 1 blue, filter 2 violet and the MAIN output dark. The header shows PARALLEL or SERIAL, FREE or SYNC, and the tracked note.
Filter points	Drag point 1 or 2 across for FREQ and up or down for RESO. Scroll over it for L-B-H, hold Shift for fine, double-click to reset. While HARMONICS is synced, point 2 moves filter 1. The dashed lines show where modulation has each cutoff now.
VU needles	Real VU ballistics on the left and right outputs (OUT 1 and MAIN in SPLIT). MAX holds the highest reading.
Lights	OVER L and R at 0 dBFS; TRIG when the trigger is on; ADSR yellow while the envelope is up, red once attack has reached its peak; AR; LFO green positive, red negative; SYNC; LOCK when tracking has a pitch; SC when the sidechain is in use; EFF ON.
LCD	Shows the control you touch, its value and its unit. Click it for the output peak.
Help line	Hover over any control and the strip at the bottom of the panel says what it does.
Light and size	LIGHT switches to the light panel and back; every window remembers it. Drag the window's corner for any size from 60 to 200 %.

SECTION 02

The panel

The response glass and meters across the top, then six bays left to right: input, the two filters, envelopes, modulation and output.



Header	LIGHT, the preset name with its arrows, SAVE, and the LCD.
Response	The glass with the two filter points, two VU needles, the lights, and the status (oversampling, latency, output mode).
Input	INPUT, FM, and the HIGHS, TRIGGER, TRANSPOSE and TRACKING keys.
Filter 1, Filter 2	FREQ, RESO, ENV AMOUNT, L-B-H and correction (-B / -B+LH); HARMONICS under filter 2.
Envelopes	ADSR or FOLLOW with A, D, S and R; the AR envelope's A and R, and AR > VCA.
Modulation	LFO SPEED (or the SYNC division), LFO DEPTH, AM, SYNC, LFO SHAPE and SIDECHAIN.
Output	PAR <> SER, BYP <> EFF, OUTPUT, the STEREO / MONO / SPLIT keys, BYPASS and oversampling.

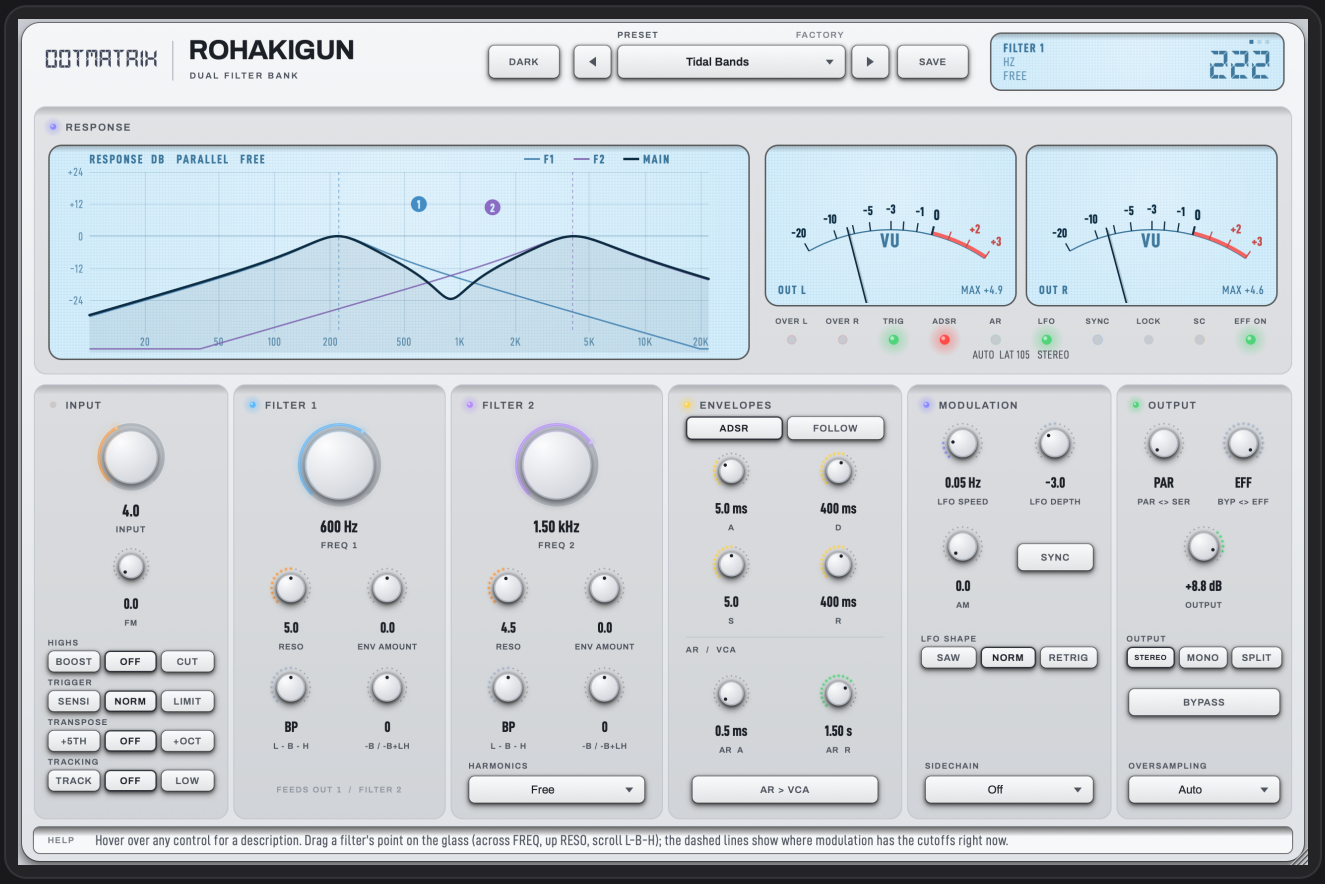
SECTION 03

Dark or light

The same panel, lit two ways. LIGHT switches it; drag the window's corner for any size from 60 to 200 %.

— LIGHT

A light panel with light grey dials and keys, for bright rooms. The glass, the VU meters, the LCD, the lights and the glowing rings stay lit the same way.



SECTION 04

Where it comes from

Rohakigun is our own design after the control set of classic analogue dual filter banks of the 1990s: two filters with continuous L-B-H, an overdriven input, envelopes, an LFO and a VCA, all patched together inside one box. It was written from the published owner's manuals only. No schematic, code or internals of any hardware model or plug-in were used.

— TWO FILTERS, ANY SHAPE

Each filter is a state-variable filter, so it gives low-pass, band-pass and high-pass at once. L-B-H crossfades between them, and the correction knob adds the classic arithmetic: band-pass minus itself is silence, band-pass plus (low + high - band) is a notch, and half of it lets everything through at half level, with the peak only where RESO puts it.

— RESONANCE THAT FIGHTS BACK

The damping grows with the level inside the filter. Quiet signals see a clean filter; a hot input pushes the resonance away, and near 10 the filter sings on its own at a steady level. Filter 2 resonates harder than filter 1. LIMIT holds the input stage back so the filters keep room to resonate.

— EVERYTHING MODULATES THE CUTOFFS

The two envelopes, the LFO, FM from the signal itself and pitch tracking all move both cutoffs, every oversampled sample. That is why an audio-rate LFO or FM stays clean, and why fast envelopes click into a filter the way a hardware one does.

SECTION 05

Input

The first bay: level, drive and what the filters listen to.

— CONTROLS

CONTROL	RANGE	DEFAULT	WHAT IT DOES
Input	0 to 10	4.0	The level into the tube stage: -20 dB at 0, unity at 4, +30 dB at 10. Push it to distort. It also sets how easily the triggers fire.
FM	0 to 10	0	Modulates both filters' frequency from the input itself (or the sidechain), at audio rate. With TRACK on, it sets the tracking depth instead: 4 is exact.
Highs	BOOST, OFF, CUT	OFF	BOOST lifts the highs 9 dB into the stage, so they distort first. CUT adds the same lift and its exact cut after the stage: flat when clean, smoother when driven.
Trigger	SENSI, NORM, LIMIT	NORM	NORM fires the triggers above -20 dBFS after INPUT; SENSI at -26 dBFS, for soft material. LIMIT holds the stage to -6 dBFS so the filters keep room to resonate.
Transpose	+5TH, OFF, +OCT	OFF	Changes the FM source: +OCT is the input an octave up, +5TH its sub-octave times its octave, a fifth above. Open FM a little. Monophonic sources; it's meant to be dirty.
Tracking	TRACK, OFF, LOW	OFF	Filter 2 follows the input's pitch (LOW: an octave down). FREQ 2 at 100 Hz sits on the note, 200 Hz an octave above. With HARMONICS synced, filter 1 follows at the ratio. The LOCK light shows a pitch.

GRIT INPUT 6 to 7 with HIGHS on CUT: the drive thickens without getting fizzy.

SINGING BASS TRACK on a bass line, FM at 4, FREQ 2 at 200 Hz and RESO 2 around 8: the resonance follows every note.

SECTION 06

Filter 1 and Filter 2

The two filters share the same controls. HARMONICS sits under filter 2.

— EACH FILTER

CONTROL	RANGE	DEFAULT	WHAT IT DOES
Freq	0.6 Hz to 20 kHz	1.2 kHz / 320 Hz	Fifteen octaves, exponential. FREQ 2 does nothing while HARMONICS is synced.
Reso	0 to 10	4.0 / 3.0	From a gentle Q of 0.5 to self-oscillation near 10.
Env Amount	-10 to +10	0	How far the ADSR (or follower) moves this filter, up to 7 octaves either way.
L-B-H	L, B, H	LP / BP	Sweeps low-pass, band-pass, high-pass. Quick sweeps are the point.
-B / -B+LH	-B, 0, -B+LH	0	Correction: left adds -B, right adds -B+L+H. On B: fully left is silence, fully right a notch, half right flat at half level. Leave it at 0 to start.

— HARMONICS

CONTROL	RANGE	DEFAULT	WHAT IT DOES
Harmonics	FREE, 1, 1.5, 2, 3, 4, 5, 6, 7, 8, 9, 16	FREE	FREE runs the filters independently. A number locks filter 2 to filter 1 divided by it (1.5 a fifth down, 2 an octave, 3 a twelfth), and the SYNC light comes on.

VOWELS Two band-passes in parallel with RESO 6 to 8, around 750 Hz and 1.2 kHz, give an "ah"; 300 Hz and 2.3 kHz an "ee". Sweep one with the LFO.

HARMONIC RESONATOR HARMONICS on 2 or 1.5 with both RESO high: one FREQ knob plays a chord of resonances.

SECTION 07

Envelopes

An ADSR (or envelope follower) for the filters and an AR envelope for the VCA, both fired by the trigger.

— CONTROLS

CONTROL	RANGE	DEFAULT	WHAT IT DOES
ADSR / Follow	keys	ADSR	ADSR fires from the trigger: attack rises to its peak, then decays to sustain while the trigger stays on. FOLLOW turns it into an envelope follower.
A	0.5 ms to 40 s	5 ms	Attack (follower: how fast it rises). A long attack misses fast triggers.
D	0.5 ms to 40 s	400 ms	Decay to the sustain level. Not used by the follower.
S	0 to 10	5.0	The sustain level, or the follower's sensitivity.
R	0.5 ms to 40 s	400 ms	Release once the trigger stops (follower: how fast it falls).
AR A, AR R	0.5 ms to 10 s, 1 ms to 20 s	0.5 ms, 1.5 s	The VCA envelope. Both fully left give a rhythmic gate.
AR > VCA	on / off	off	Lit, the AR envelope works the output VCA, so the sound opens with each trigger and closes when it stops. Off, the VCA stays open.

GATE AR > VCA on, AR A and AR R short: drums and loops chop to the trigger.

WAH FOLLOW with ENV AMOUNT +5 on a band-pass: playing harder opens it.

SECTION 08

Modulation

The LFO, AM and the sidechain.

— CONTROLS

CONTROL	RANGE	DEFAULT	WHAT IT DOES
LFO Speed	0.02 Hz to 2 kHz	1 Hz	Left half 0.02 to 20 Hz, right half audio rate, 20 Hz to 2 kHz.
Sync	on / off; 8 bars to 1/32	off; 1/4	Locks the LFO to the host tempo and song position. The speed knob becomes the division, with triplets.
LFO Depth	-10 to +10	0	Up to 5 octaves. Right moves both filters together; left moves filter 1 the opposite way.
LFO Shape	SAW, NORM, RETRIG	NORM	A rising ramp, a sine, or a sine that restarts from each trigger at its lowest point (pumping grooves).
AM	0 to 10	0	Filter 2's output (or the sidechain) works the VCA too: warm and fat to ring-mod aggressive. Needs signal and some RESO 2. It can overrule the AR.
Sidechain	OFF, TRIG, FM, AM	OFF	Where the plug-in's sidechain input goes: TRIG fires the envelopes from it, FM modulates the filters with it, AM works the VCA with it.

SLOW TIDES SYNC on, 4 or 8 bars, DEPTH 3 to 5 on a pad: the filter breathes with the song.

DUCKED BY THE KICK Route the kick to the sidechain and choose TRIG: the envelopes follow the kick, not the track.

SECTION 09

Output

Routing, mix and level.

— CONTROLS

CONTROL	RANGE	DEFAULT	WHAT IT DOES
Par ‹› Ser	PAR to SER	PAR	Parallel: both filters from the input, summed. Serial: input, filter 1, then filter 2, 24 dB per octave when they match. In between, a blend.
Byp ‹› Eff	BYP to EFF	EFF	The dry signal against the processed one, latency-aligned.
Output	-24 to +12 dB	-2 dB	The output level.
Stereo / Mono / Split	keys	STEREO	STEREO: two linked channels, one set of envelopes and LFO. MONO: the input is summed. SPLIT: filter 1 on the left, MAIN on the right, and filter 1 leaves MAIN.
Bypass	on / off	off	Bypasses everything, latency-matched and click-free.
Oversampling	Auto, 1x, 2x, 4x, 8x	Auto	AUTO is 4x at 44.1 and 48 kHz, 2x at 88.2 and 96, 1x above.

WIDE FILTERS SPLIT with opposite LFO DEPTH (left of centre): the two filters sweep against each other across the stereo field.

SECTION 10

Presets

Fifty factory presets. Start has a plain parallel and a 24 dB serial setting; Filter Shapes holds fixed curves and resonators; Rhythm, Movement and Slow Movement make it move, from sixteenths to eight-bar tides; Character adds drive and ring modulation; Tracking follows the pitch. SAVE stores your own in ~/Music/Rohakigun Presets; they appear in the menu under User presets.

CATEGORY	51 PRESETS
Start	Init Parallel, Init Serial 24 dB
Filter Shapes	Variable Bandwidth, Phasing Variable Gap, Two Notch Dips, Formant Vowel, Telephone Band, Dual Formant Ah, Dual Formant Ee, Fifths Resonator, Octaves Resonator
Rhythm	Acid Squelch, Kick Bassline, Syncussion, Gate Chop, Retrig Pump, Synced Sweep 1/8, Sixteenth Gate, Triplet Attack, Quarter Wobble, Half-Bar Saw Rise
Movement	Slow Loop Sweep, Envelope Wah, Stereo Split Drift, Opposite Sweeps, Notch Phaser, Breathing Pad, Envelope Closes, Split Ping-Pong
Slow Movement	Glacial Low-Pass, Tidal Bands, Drifting Vowels, Glass Phaser, Underwater Drift, Wandering Resonance, Dusk Low-Pass, Eight-Bar Rise, Four-Bar Tide, Two-Bar Breath, Split Tide, Slow Bloom, Long Follower Swell
Character	Ring Mod Growl, Self-Osc Drone, Lo-Fi Radio, Warm Bus Drive
Tracking	Tracking Bass, Track Overtones, Track Fifth Above, Track Low Sub Filter
Yours	Every preset you save, listed under User presets

— RECIPES

01	**Acid line**	**Acid Squelch**: a resonant low-pass with ENV AMOUNT up and a short decay. Turn INPUT up for more bite.
02	**Talking pad**	**Drifting Vowels**: two band-passes as formants, moved slowly by the LFO.
03	**Hit gate**	**Sixteenth Gate**: AR > VCA with a very short release and SENSI triggering chops a loop to its own hits.
04	**Eight-bar rise**	**Eight-Bar Rise**: a synced saw opens the filter over eight bars, then starts again.
05	**Tracked bass**	**Tracking Bass**: TRACK LOW puts filter 2 on the bass line's pitch, with filter 1 an octave above, so the resonance stays in tune.

SECTION 11

Reference and troubleshooting

— TECHNICAL NOTES

Signal flow	INPUT, HI BOOST or CUT, the tube stage and LIMIT (oversampled), then the two filters in parallel, serial or between, the VCA (AR and AM), BYP <> EFF, OUTPUT and the latency-matched bypass. The trigger, envelopes and pitch tracker read the input at the base rate.
The filters	Topology-preserving state-variable filters whose damping rises with the level inside them, so self-oscillation stays bounded and a hot input pushes the resonance away. The cutoff is recomputed every oversampled sample.
Latency	The oversampling filters only: 105 samples at 4x. Rohakigun reports it to the host, which compensates. 1x has no latency.
CPU	About 3 % of one core for a stereo instance at 4x (48 kHz, Apple Silicon).
Sessions	A project stores every parameter, the preset, the LCD view and the window size. Presets are small XML files.
Not in 1.0	A noise or feedback generator, an extended range switch, MIDI control and linking two units.
Compatibility	Universal (Apple Silicon and Intel). VST2 is not available: Steinberg no longer licenses it. CLAP is built with the open-source clap-juce-extensions.
Trademarks	All product names are trademarks of their respective owners and are used only to identify the products studied. Dotmatrix is not affiliated with or endorsed by any of them.

— TROUBLESHOOTING

Nothing moves	ENV AMOUNT and LFO DEPTH are at 0, or the TRIG light never fires: raise INPUT or choose SENSI.
The envelopes fire on everything	INPUT is high or SENSI is on. Choose NORM, lower INPUT, or route a cleaner signal to the sidechain with TRIG.
It whistles on its own	RESO near 10 self-oscillates. Turn it down, or use LIMIT if you want the whistle under control.
It goes quiet between hits	AR > VCA is on: the VCA closes when the trigger stops. Turn it off, or lengthen AR R.
Tracking wanders	Tracking needs one note at a time. Chords and noisy sources can't lock; the LOCK light shows when it has a pitch.
It does not appear in Logic	Run the Terminal lines in READ ME FIRST.txt, then restart Logic. In Logic > Settings > Plug-in Manager, select it and click Reset & Rescan Selection.
My presets are missing	They live in ~/Music/Rohakigun Presets. Copy the .xml files there on another Mac.



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Lightweight audio plugins. Documentation for version 1.0.1.