

МАГИЕТА

In space, everyone will hear you scream

User Manual



NERVE

AU · VST3 · Standalone, Manual v1.0

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1 Introduction

1.1 What is Magnetar?

Magnetar is a polyphonic **drone and sound-sculpture synthesizer**. Rather than being played note-by-note, it is built around sustained voices that you switch on and then shape over time, a semi-modular, microtonal instrument for evolving pads, generative textures, cinematic beds and rhythmic sequences.

Its architecture is deliberately unusual. Triggering is **decoupled from MIDI**: six **DRONE** voices are latched on with their own on-screen switches (OSC 1 to 6) and tuned in fractional cents or harmonic ratios, while the **LEAD** voices (polyphonic, up to 12) respond to your keyboard in the traditional way. On top of this sit a dense modulation system (a routing matrix, two LFOs, four macros, three pulsers, two sample & hold units, two sequencers and four drawable MSEG envelopes) and a full effects rack. The result is an instrument that *lives*: even a single held chord never sits perfectly still.

1.2 Design philosophy

Three principles guide every part of Magnetar:

Pillar	What it means
Analog instability	Per-voice, decorrelated pitch and amplitude drift, component-tolerance detuning and native microtonality. Nothing is quantised to perfection unless you ask for it.
Modulation density	A deep, interacting modulation system: two LFOs, four macros, three pulsers, two sample & holds, two sequencers, four MSEG envelopes and an XY joystick, all freely assignable through the 8-slot matrix. Enough to keep each of the 18 voices (12 lead + 6 drones) evolving continuously.
The Polivoks filter	An aggressive, non-linear OTA-style filter cell (dual, one per channel) that is the instrument's primary sonic signature, from creamy lowpass to screaming self-oscillation.

1.3 Formats & installation

Magnetar ships as an **Audio Unit (AU, macOS only)**, a **VST3** and a **Standalone** application (macOS and Windows). Copy the plug-in to your system's plug-in folder (or run the installer), then rescan plug-ins in your DAW. The Standalone build runs without a host and provides its own audio/MIDI settings (audio device and MIDI input).

HOST TEMPO

The Standalone build has no host transport. Any control marked **HOST SYNC** is therefore greyed out in Standalone; use the modules' **SYNC** buttons instead (and **SEQ SYNC** for the MSEG), which then follow Sequencer 2's CLOCK. In Standalone, Sequencer 2's **RUN** switch acts as the master transport: synced modules stay frozen while it is stopped, and resume in phase when it restarts. In a DAW, HOST SYNC and SYNC lock the relevant module to your project tempo and transport.

Activation & demo

On first launch, Magnetar shows an activation screen: paste the licence key you received after purchase and click **ACTIVATE**. Validation is entirely offline. **TRY DEMO** starts the trial: the sound is complete, but short bursts of noise come back periodically (a banner at the bottom of the interface reminds you). Until either the licence or the demo is activated, the instrument stays silent.

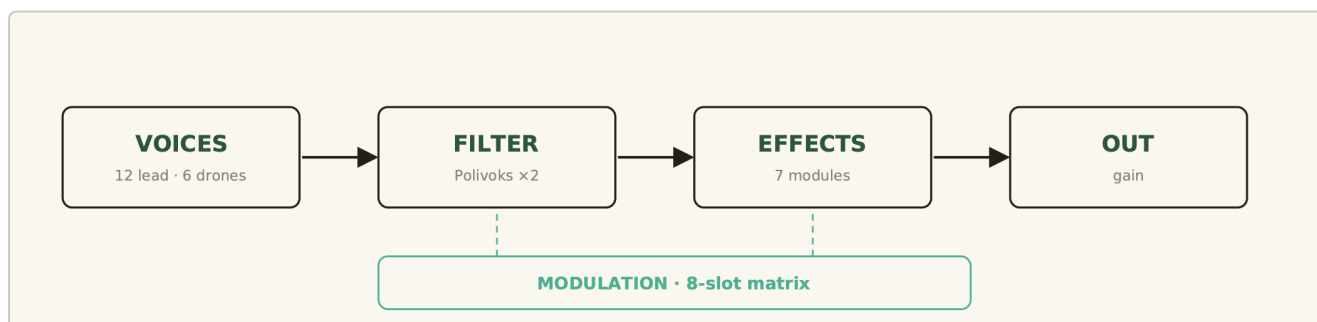
Once activated, the licence is remembered. Demo mode is not: every new instance (or project reopen) shows the activation screen again. Clicking the DEMO MODE banner reopens it at any time to enter your key (**Enter** confirms), and the banner turns red during the noise bursts.

2 Getting Started

2.1 The three screens

The interface is divided into three full-window pages, selected by the icon buttons at the top-right of the header.

Screen	Contents
SYNTH	The sound engine: the VOICE row (settings shared by the oscillators), LEAD, the Polivoks FILTER, the Pulsers, the Sample & Hold, SEQUENCE 1, and the six DRONE oscillators.
SEQUENCE 2 / MSEG	The 16-step sequencer 2 and the four drawable MSEG envelopes.
MODULATION / FX	The 8-slot modulation matrix, on-panel sources (LFO 1&2, Macros), the NOISE generator, the XY joystick, the FX ORDER screen and the effects rack (Fixed Filter Bank, Drive, Phaser, Chorus, Ring Modulator, Delay, Reverb).



The signal path: voices run through the filter, then the effects rack, to the output; modulation drives it all.

2.2 Loading a preset

Use the preset selector in the header (see §3). Presets are grouped by category (**Sequences, Pads & Drones, Chord Progressions, Textures, Bass, Percussion...**), and the arrow buttons step through them. The factory bank is a good map of what the instrument can do; open one, then reverse-engineer it.

3 The Header

The header runs across the top of every screen and never changes.

Control	Function
NERVE logo	Brand mark (left). Click it to flip the instrument over and see its back panel (model, version, licence status and owner); click again to return.
MIDI IN	Activity LED that lights on incoming MIDI.
SAVE / LOAD	Save or load all parameters and MSEG shapes as a <code>.json</code> preset file on disk, independent of the factory bank. The FX ORDER and MIDI Learn assignments are not included: they stay in your DAW session.
Preset selector	Browse the factory bank, grouped by category. The ◀▶ arrows step to the previous/next preset. The name of the last chosen preset is remembered and shown when you reopen the plug-in.
Tuning selector	Choose the active tuning table from the built-in scales (e.g. 12-TET). The ◀▶ arrows step through them. See §4.7.
FIT	Instantly tunes the six DRONE oscillators to the degrees of the active scale (a working base). See §4.7.
Page buttons	Switch between the three screens (SYNTH · SEQUENCE 2-MSEG · MODULATION-FX). The active page is highlighted in green.
OUTPUT (knob)	The master output level, duplicated here so it stays within reach on every page. It's the same parameter as the OUTPUT knob on the VOICE row (§4.1); its range runs from -60 to +18 dB , enough to push the signal hard.
Clip LED	The small red LED between the knob and the VU meter. It lights the moment the output reaches or exceeds 0 dBFS (digital clipping) and holds briefly. Since there is no output limiter (see the warning below), keep an eye on it: if it lights, turn OUTPUT down.
VU meter	Far right, two rows of round LEDs (left / right) show the output level, calibrated in dB; the right-most LED is 0 dBFS. A simple peak indicator to keep an eye on what the instrument is putting out.

⚠ A RAW INSTRUMENT, NO SAFETY NET

Despite its polished looks, Magnetar behaves like a real analog machine: **there is no output limiter or compressor**. The Polivoks filter can go into self-oscillation and **scream**, DRIVE and the distortions add level, OUTPUT reaches +18 dB: nothing stops the signal from overloading your chain. That's deliberate. It's where the bite comes from. But watch the clip LED and the VU, keep headroom on the track, and be careful with resonance and DRIVE sweeps, especially on headphones.

MIDI LEARN: EVERYWHERE

Right-click (or **Ctrl-click** on macOS) on almost any knob, switch or selector to assign it to a MIDI CC controller. See §8.

UNDO / REDO

The two arrows to the left of **SAVE** undo and redo your latest gestures (knobs, switches, lists, preset changes, LOAD, MSEG drawing), up to 100 steps. Shortcuts: **Cmd-Z** / **Shift-Cmd-Z** or **Cmd-Y** (Ctrl on Windows). DAW automation is not recorded.

TOOLTIPS

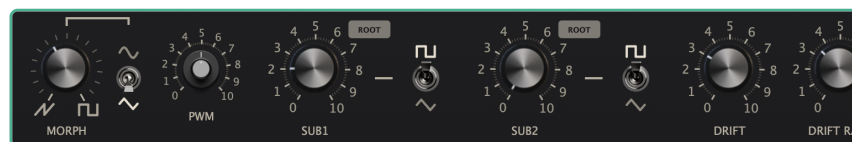
Hover over a control for a moment (or click it): a green tooltip shows its name and exact value, updated live while you turn it. On the MSEG drawing screen, it shows the number of the point you hover or drag, its position (in grid cells, or in seconds in free mode) and its value, the handle position (as a % of the segment) while you bend a segment, and the MSEG's modulation destinations in the matrix, with the value produced at that point in each destination's unit (semitones, filter Hz, dB, pan...). For ROOT, the tooltip shows the note.

4 Screen 1: SYNTH



The SYNTH screen: VOICE, LEAD, FILTER, PULSE, SAMPLE&HOLD, SEQUENCE 1 and the six DRONE oscillators.

4.1 VOICE



The VOICE row, shared by all oscillators: waveform (MORPH), PWM, sub-oscillators and drift.

The VOICE row (top of the screen) sets the shared character of every oscillator, the raw waveform and the analog-style instability that makes voices drift apart.

Control	Function
MORPH	Continuously morphs the band-limited (PolyBLEP) waveform from saw → triangle → square.
TRI / SIN switch	Sets what the middle of the morph plays: a triangle (default) or a pure sine . In SIN, the midpoint of the sweep becomes a round, harmonic-free wave, ideal for soft voices and gentle drones.
PWM	Pulse-width of the square portion of the morph.
SUB 1 & buttons	Level of sub-oscillator 1, one octave below the note; the switch sets its shape (square / triangle). The ROOT button (top-right of the knob) collapses this sub into a single oscillator locked to the drone fundamental (the ROOT of the DRONES section), laying a common bass under the whole chord.
SUB 2 & buttons	Same for sub-oscillator 2, two octaves below the note: level, shape (square / triangle) and a ROOT button.
DRIFT	Depth of the pitch drift : a slow pitch fluctuation, random and independent for each voice, that mimics the instability of analog oscillators (never perfectly in tune, they wander gently around their note). It keeps the voices from sounding frozen and identical; pushed high, the tuning becomes openly unsteady.
DRIFT RATE	Speed of that drift.
WANDER	A second, independent per-voice drift applied to amplitude .
MASTER TUNE	Global reference pitch (concert A), 400–480 Hz.
OUTPUT	Master output level (–60 to +18 dB). The same control is duplicated in the header (see §3), reachable from any page.



Two details of the VOICE row: ① the **TRI / SIN** switch at the centre of the morph · ② the **ROOT** button (on each sub) that locks the oscillator to the drone fundamental.

To the right of this row sit the **MAGNETAR** name plate and a row of **activity LEDs** that pulse in time with the modulators (LFO 1/2, the three pulser, the two S&H units, both sequencers and the MSEG) so you can see the instrument breathing at a glance.

4.2 LEAD



The LEAD module: ① MODE selector (voice allocation) · ② **KBD / AUTO** switch · ③ **HOLD** button · then LEVEL, ATTACK, RELEASE, PAN, COARSE, FINE, UNISON DETUNE.

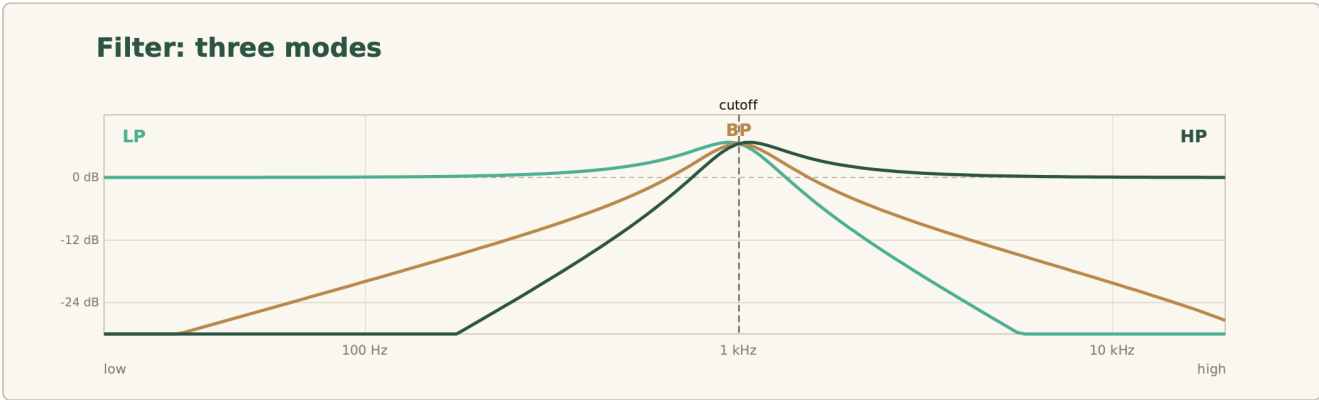
The LEAD voices are the melodic, MIDI-played part of Magnetar (as opposed to the latched drones), polyphonic up to 12 voices. They share a simple AR amplitude envelope, which also shapes how the drones fade in and out.

Control	Function
MODE	Voice-allocation mode: Poly 4 / Poly 8 / Poly 12 (polyphony), Unison, Mono .
KBD / AUTO switch	Between the MODE selector and the LEVEL knob. In KBD (default), the lead plays from the MIDI keyboard as usual. In AUTO , the keyboard no longer drives the lead: the clock modules trigger it instead. Every pulse from a source fires a lead voice (attack/release envelope, no latch) at the drones' root (ROOT) offset by its own Coarse/Fine. Sources taken into account: the Pulsers, S&H, SEQUENCE 1 and the MSEGs , but only when they are routed in the matrix to a LEAD destination (Lead Pitch, Lead Level, Lead Pan, Lead Coarse or Lead Detune), plus SEQUENCER 2 when its LEAD route is on. Turns the lead into a generative voice driven by the patch.
HOLD button	Just below KBD. A persistent button (saved with the preset): when engaged, notes played from the master keyboard stay held even after the keys are released (note-offs are ignored). Turn it off to release the held notes. Handy to freeze a chord or pad on the lead and keep your hands free.
LEVEL	Lead output level.
ATTACK / RELEASE	The amplitude envelope (attack and release times). It applies to the lead voices and also sets how the drones fade in and out when you switch them on or off.
PAN	Stereo position (equal-power, with a centre detent).
COARSE / FINE	Pitch offset in semitones (coarse) and cents (fine).
UNISON DETUNE	Spread of stacked voices in Unison mode.

4.3 FILTER (Polivoks)



① LP/BP/HP mode · ② Cutoff · ③ Resonance · ④ Drive (OTA saturation) · ⑤ Stereo spread · ⑥ SWARM button.



The three filter modes, on either side of the cutoff frequency.

The heart of the instrument: a dual (per-channel) non-linear filter modelled on the aggressive OTA cell of the Polivoks. A `tanh` non-linearity in the feedback loop gives it its characteristic bite and bounded self-oscillation at high resonance. It runs with 8× local oversampling to keep it clean when pushed.

Control	Function
MODE	Filter type: LP (low-pass), BP (band-pass) or HP (high-pass).
CUTOFF	Cutoff frequency (20 Hz to 18 kHz).
RESONANCE	Emphasis at the cutoff; high settings drive the filter into self-oscillation.
DRIVE	Input saturation into the filter cell, from subtle warmth to overt distortion.
SPREAD	Stereo spread of the six drones (OSC 1 toward the left ... OSC 6 toward the right), added to their individual PAN; the LEAD voices are not affected.
SWARM (badge)	The SWARM button, in the FILTER badge, swaps the filter cell (see §4.3.1 right below). Off: the Polivoks OTA cell described above, with its bite and its bounded self-oscillation. On: a clean, open state-variable SVF , linear and uncoloured as long as DRIVE is at zero (DRIVE adds a soft input saturation). The oscillator count does not change: your drones and leads remain your native oscillators.

SELF-OSCILLATION

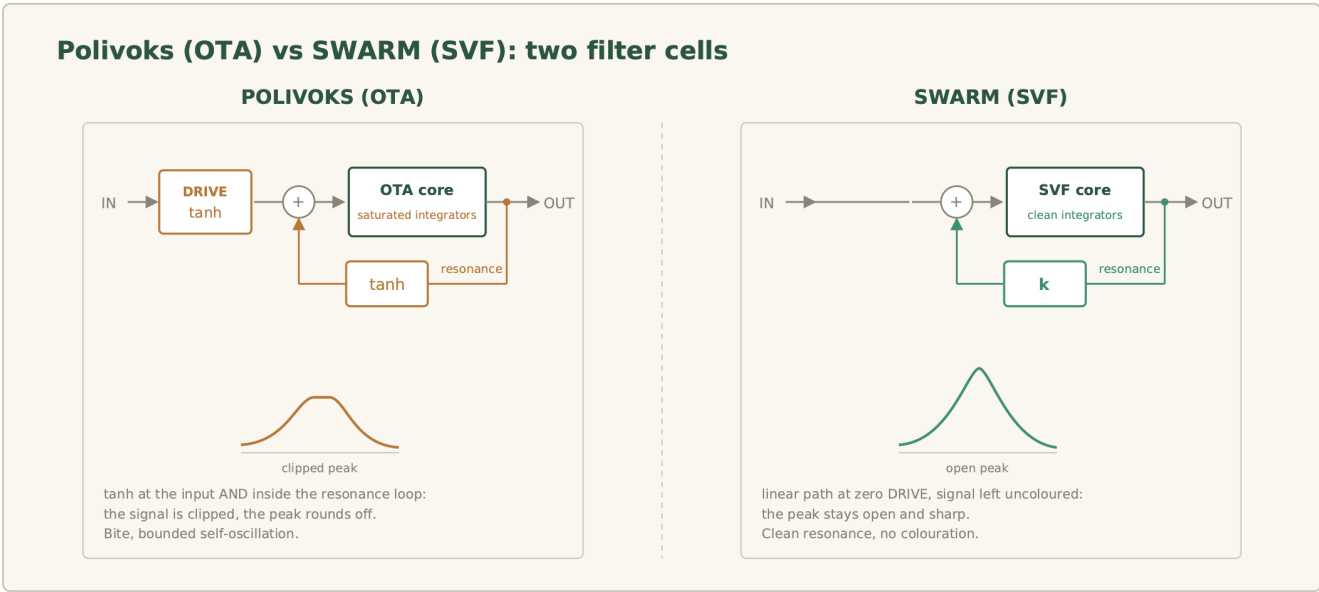
At maximum RESONANCE the filter sings on its own. Combine with a low CUTOFF and modest DRIVE to use it as an extra sine-like voice tuned by CUTOFF.

4.3.1 SWARM mode

SWARM mode works on the **filter** and on the **voicing**. The SWARM button replaces the Polivoks OTA cell with a clean **state-variable SVF**: a linear path that lets the cloud breathe without colouring it.

The idea: a handful of oscillators tuned almost in unison, which a single control spreads apart or pulls back together. It is not a chord, it is a **mass**: the oscillators beat against each other, rub together, and the whole thing hums like a swarm.

In Magnetar, that swarm is your **six drones**. You tune them one by one, down to the cent if you like, and **CLUSTER** spreads them apart or pulls them together around the root. It is that living mass the filter then bites into.



The two filter cells: on the left the Polivoks OTA (tanh at the input and inside the loop), on the right the SWARM mode SVF (linear path, clean uncoloured resonance).

Setting	Effect in SWARM mode
MORPH at centre, switch on SIN	The cloud sounds round and airy , a choir of angels. We deliberately leave a touch of sawtooth in it so the filter has something to bite on.
MORPH: toward SAW	The cloud turns buzzing and swarming , a hive of bees: this is where the cloud is densest, full of harmonics and chaos.
CLUSTER	Acts as the swarm's SPAN : from near-unison (tight, thick cloud) to a wide microtonal spread (blown-out cloud). The knob behaves the same whether SWARM is on or off; it opens progressively from the centre to avoid abrupt jumps.
CUTOFF · RESONANCE · DRIVE · MODE	The filter stays fully active and resonant over the swarm (LP/ BP/HP). Push resonance and the cloud starts to sing: it's that contrast between the swarming mass and the screaming filter that makes the mode.

4.4 Pulsers & Sample & Hold

Two independent modules provide clock-rated modulation sources: three **Pulsers** (square gate generators) and two **Sample & Hold** units. Each has its own clock and only produces a signal when routed in the modulation matrix.

Control	Function
P1-P3 RATE / WIDTH	Three independent pulsers (square gate generators): rate and pulse width each.
S&H 1 / S&H 2	Two sample-and-hold units that sample internal noise at their own rate, classic random stepped modulation.
SYNC	One SYNC button in the PULSE badge, another in the SAMPLE & HOLD badge. When enabled, the pulsers / S&H follow a rhythmic division of the clock: Sequencer 2's CLOCK in Standalone (where they stay frozen while Sequencer 2 is not running), the host tempo and transport in a DAW. The RATE knobs then become division selectors: 1/1, 1/2, 1/4, 1/8 (default), 1/16, 1/8T, 1/16T.

4.5 SEQUENCE 1

An 8-step CV sequencer used as a modulation source (it is *not* a note sequencer; for notes, use Sequencer 2).

Control	Function
CLOCK	Step rate. The SYNC button in the SEQUENCE 1 badge locks it to the clock: CLOCK then becomes a division (1/1 ... 1/16T, like the pulsers).
Steps 1-8	Each step has a value knob, an On / Off (play / mute) switch and a playhead LED.

Route SEQUENCE 1 (source **Sequence**) in the matrix to pitch, cutoff, level or any destination to create stepped patterns. If it is routed to an oscillator's pitch or level, muted steps produce true silence on that destination.

4.6 DRONES



A DRONE oscillator: ① Root (shared fundamental) · ② Ratio/Cents mode · ③ Tune (degree or offset) · ④ Pan · ⑤ Level · ⑥ Cluster (squeezes or spreads the pitches).

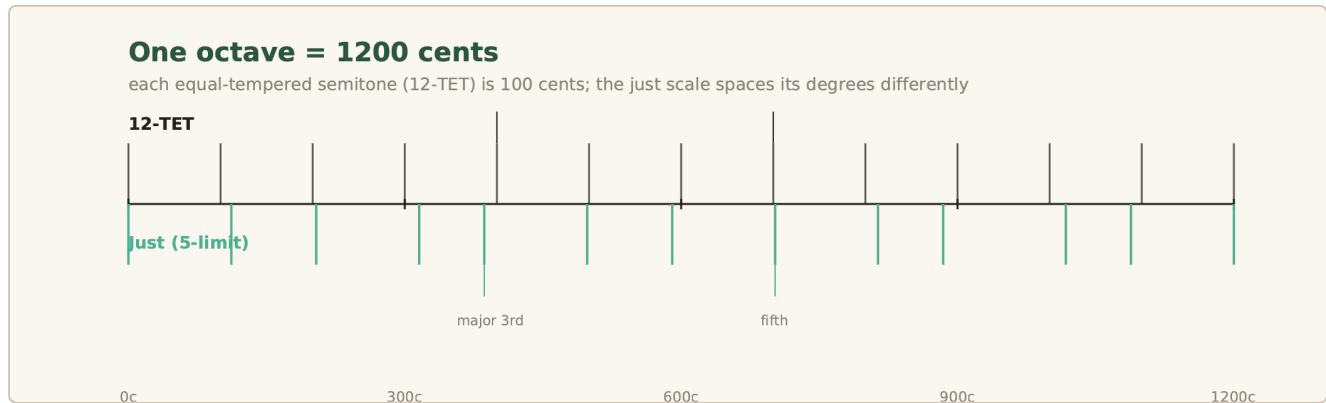
The six DRONE oscillators are Magnetar’s signature: latched, microtonal voices you tune into chords, clusters and just-intonation stacks. They fill the lower half of the SYNTH screen.

Control	Function
ROOT	Global root note for the drones, C1 to C6 (the base all tunings are measured from); the note name is shown while you turn it.
Cluster	Large unlabelled knob, below ROOT in the left column. Bipolar: at centre, the chord as tuned; turn left to squeeze the drones toward unison, right to spread them wide around the root (see §4.3.1).
OSC 1-6 on/off	Switch each drone voice on (latched) or off. A green LED shows its state.
TUNE / RATIO	Per-voice tuning. In Cents mode this is a fractional offset of ± 24 semitones; in Ratio mode it is a harmonic ratio relative to the root (0.25 to 8). The knob and its scale change with the mode.
FINE	Fine detune of the voice (± 50 cents).
PAN / LEVEL	Stereo position and level of each drone voice.
Cents / Ratio switch	Chooses whether all drone tunings are read as cents or as harmonic ratios.

4.7 Microtonality & Tuning

New to microtonality? In Western music the octave is split into twelve equal semitones (“12-TET”). That is only a convention: you can divide the octave differently, and that is where Magnetar comes alive.

Pitch is measured in **cents**: an octave is 1200 cents, a standard semitone 100 cents. A **just scale** places its notes on simple frequency ratios (3/2 for the fifth, 5/4 for the third), which sounds “purer”, beat-free; equal temperament instead rounds everything to 100 cents so you can play in any key.



Same octave, two divisions: 12-TET (even) and the just scale (degrees placed on simple ratios).

Magnetar is microtonal to the core. Three layers of control work together:

- **MASTER TUNE** (VOICE row) sets concert A from 400 to 480 Hz.
- The header **Tuning selector** chooses the active tuning table from the built-in microtonal scales (just, Pythagorean, meantone, 24-TET...), alongside **12-TET**.
- Per-drone **TUNE / RATIO** offsets add fractional cents or harmonic ratios on top.

The chosen scale is applied globally through the tuning table; return to **12-TET** at any time from the selector.

MODULATION SPEAKS THE SCALE

The matrix pitch destinations (**Pitch, Osc 1-6 Pitch, Lead Pitch**) count in **degrees of the active scale**, not semitones: ± 12 at full depth. A stepped MSEG, Sequence 1 or a S&H routed to pitch therefore stays in the scale (in 12-TET, one degree = one semitone). Between two degrees the pitch is interpolated, so an LFO glides along the scale. Only the **pitch wheel** and the analog drift and tolerance stay in semitones/cents, identical whatever the scale.

The **FIT** button, next to the tuning selector, instantly tunes the six DRONE oscillators to the degrees of the active scale: OSC 1 on the root, OSC 2 to 6 spread upward across the scale degrees. It gives an immediate working base in the scale, writing the **TUNE** values in Cents mode, or the ratios in Ratio mode (it respects the current mode), which you can then adjust freely.

Built-in scales

Tuning	Description
12-TET	12-tone equal temperament: the octave split into twelve identical semitones, the modern Western standard.
Just (5-limit)	5-limit just intonation: simple whole-number ratios ($3/2$, $5/4$...), pure beat-free chords.
Pythagorean	Pythagorean tuning, built by stacking pure fifths ($3/2$); brighter, tenser thirds.
Meantone 1/4	Quarter-comma meantone: slightly narrowed fifths for pure major thirds (Renaissance, Baroque).
24-TET	24-tone equal temperament (quarter-tones); Arabic and contemporary micro-intervals.
Harmonic	Scale drawn from partials 8 to 16 of the harmonic series.
19-TET	19-tone equal temperament; close to meantone, with near-just thirds.
31-TET	31-tone equal temperament; excellent meantone and just-ratio approximation.
53-TET	53-tone equal temperament; very close to just intonation and Pythagorean.
Bohlen-Pierce	Non-octave scale based on the tritave ($3/1$) split into 13 steps; unusual colour.
Carlos Gamma	Wendy Carlos's Gamma tuning, ~35-cent steps; neither pure octave nor fifth.
Slendro	Near-equal pentatonic scale of the Javanese gamelan.
Pelog	Heptatonic gamelan scale with unequal steps, Indonesian character.
Shruti 22	The 22 shrutis of Indian classical music: microtones spread across the octave.

5 Screen 2: SEQUENCE 2 & MSEG



The SEQUENCE 2 screen: the 16-step sequencer (top) and the four drawable MSEG envelopes (bottom).

5.1 Sequencer 2

Sequencer 2 is a 16-step analog-style sequencer that plays actual **notes** (pitch, duration and velocity per step) and can drive the LEAD voice and/or any of the six DRONE oscillators. Its title badge carries a **HOST SYNC** button (DAW-only; greyed in Standalone).

Transport control	Function
DIVISION	Rhythmic division of the steps relative to CLOCK (1/4 by default: one step per beat). Synced modules keep their own division; only the MSEG in SEQ SYNC follows Sequencer 2's step.
CLOCK	Internal clock tempo (shown in BPM while you turn it); the step rate is this tempo divided by DIVISION. Greyed when HOST SYNC is on.
SHUFFLE	Swing: delays every other step.
DRIFT	"Electric tension": slow, gentle drift of step duration and velocity (does not touch tempo).
DIR	Play direction: Forward, Reverse, Pendulum, Random.
QUANTIZE	Pitch quantisation of the note row: Off, Scale degree, or Octave.
ROUTES	Assign the sequencer's output to LEAD and/or OSC 1-6 . Each active route drives both pitch and level of its destination.
LENGTH	Pattern length: number of steps played (1 to 16), regardless of the steps' On/Off switches.
GLIDE	Portamento: glides pitch from one step to the next (0 to 0.5 s), on every step. To glide only on some notes, use the grid's SLIDE buttons.
VCF EG AMT	Amount (bipolar, ± 4 oct) of the VCF envelope on the global filter cutoff . Centre: no action; to the right each step opens the filter, to the left it closes it. Active only while Sequencer 2 is running and routed to at least one voice (ROUTES).
VCF ATTACK / VCF DECAY	Attack and decay of the filter AD envelope, retrigged on the onset of every active step.
VCA ATTACK / VCA DECAY	Attack and decay of the level AD envelope (VCA), retrigged on each step. VCA DECAY at maximum = hold: the note no longer falls between steps (continuous drone). The DURATION row modulates this decay step by step (articulation).
RUN / TRIGGER	RUN starts/stops the sequence; TRIGGER advances one step manually and plays it, even when the sequence is stopped. In Standalone, RUN is also the master transport for synced modules (see §1.3).

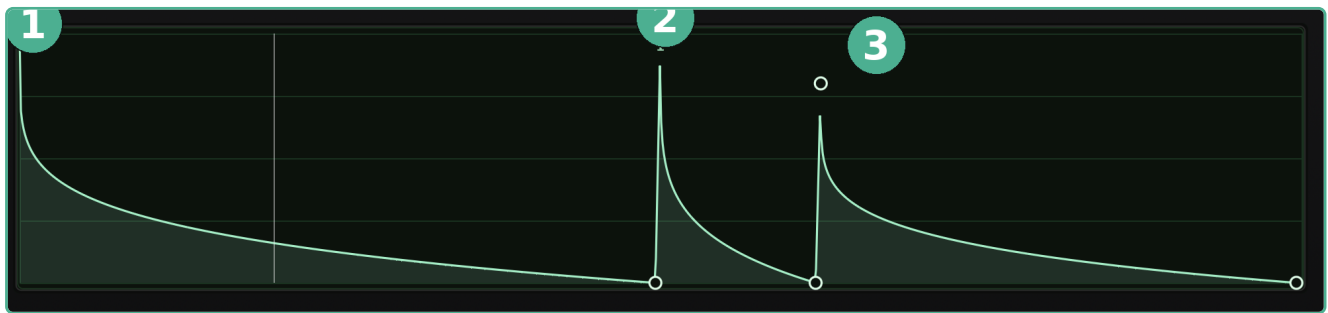
The step grid itself has three rows of knobs, **NOTE** (pitch), **DURATION** and **VELOCITY**, plus an On/Off (play / mute) switch, a **SLIDE** button and a playhead LED per step. Above each switch, a green LED shows whether the step is within the pattern length (LENGTH).

SLIDE (the small button below the VELOCITY knob, above the LED row) makes the step glide into the **next** note, acid-bassline style: the note is held until the next step, which is not re-attacked (no new VCF/VCA or LEAD attack) and whose pitch glides in about sixty milliseconds (or following GLIDE if that is longer). If the next step is muted, SLIDE has no effect. On the MIDI output, tied notes overlap (legato).

RECORDING THE SEQUENCE AS MIDI

Sequencer 2 also **outputs MIDI notes**, so you can capture the pattern onto a MIDI track in your DAW. Sequencer 2 sends on MIDI channel 2, Sequencer 1 (when routed to pitch) on channel 1. See §8.

5.2 The MSEG envelopes



The MSEG editor: ① start point · ② and ③ envelope nodes (double-click to add a point, drag to move it).

Four **Multi-Segment Envelope Generators** provide freely drawn modulation shapes. Select the active envelope with the **1-4** buttons; edit it in the graphical display.

Drawing

Action	Gesture
Add a point	Double-click on the display (or right-click → Add point here).
Move	Click and drag a point. When several points are selected, the whole group moves (spacing kept).
Select	Cmd (Mac) / Ctrl (Windows) + click a point to add or remove it; Cmd/ Ctrl + drag in an empty area for a lasso; Cmd/Ctrl+A selects all, Esc clears the selection.
Delete	Delete / Backspace removes the selected points, or right-click → Delete point (end points cannot be deleted).
Curve a segment	Move the mouse close to a curve segment: a small diamond handle appears on the curve . Drag it freely, up/down and left/right: the curve always passes through the handle, so you choose where it starts, where it bends and how tight it gets (late rise, fast attack then plateau, S-shape...). Hold Alt for fine adjustment; Reset curve (right-click) straightens it.
Keyboard	← → step to the previous / next point (with Shift : extend the selection); Cmd (Mac) / Ctrl (Windows) + arrows move the selection by one grid step (← →) or one semitone / 0.05 (↑ ↓); add Shift for a fine step without snapping.
Precision	Shift while dragging = no snapping; Alt = fine movement (×0.1).
Menu	Right-click (or Ctrl-click on Mac) a point or a segment: numeric entry, sustain, segment type, Reset curve , deletion; on a segment, also Add point here and Select all . With several points selected, the chosen type applies to the segments following each of them.

Segment types. Each segment (from one point to the next) has a type, chosen with a right-click: **Curve** (the adjustable curve, default), **Step** (the point's value is held until the next point, then jumps — ideal for pitch sequences and gates) and **Smooth (S)** (eases in and out). An envelope holds up to **128 points**.

Numeric entry. Right-click a point → **Edit value...**: type its position (in grid cells when the MSEG is synced, in seconds otherwise) and its value. When the MSEG drives a **pitch** in the matrix, the value is typed directly in **semitones** (or in degrees of a non 12-TET scale); otherwise from 0 to 1, or −1 to +1 in BIPOLAR.

Sustain point. Right-click a point → **Sustain point** (dotted “S” line). In **NOTE ON** and **KEY ON** modes, the envelope stops on this point while a key is held, then plays the rest on release: the MSEG becomes a true multi-segment envelope (drawn attack, hold and release). No effect in LOOP.

Scales. At the bottom, a time ruler: a tick on every grid line and markers in cells (“1”, “1.2”, “1.3”...) when the MSEG is synced, in seconds otherwise. On the vertical axis, the scale follows what the MSEG drives in the matrix, in the destination’s unit: semitones (pitch), Hz (cutoff, ring), dB (level), L/C/R (pan), the resulting value (resonance, morph, levels...), or the raw output when it is not routed anywhere. With several destinations, each has its own colour in the **legend** (top right): the active destination gives the left scale and the grid lines, the next one the right scale; **click a destination in the legend** to show its scale on the left. Each destination in the legend also has its own small **AMT** knob (the matrix slot depth, without changing screens): drag vertically to set it (**Shift** = fine), double-click to reset it to 0; the scale follows live.

Toolbar

Control	Function
GRID	Grid resolution as note values, one cell being a quarter note: 1/1, 1/2, 1/4, 1/8, 1/16, 1/32 and their triplets (<i>1/2 triplet ... 1/32 triplet</i>); 1/16 by default. Sets the fine lines on the display and the snapping step.
SNAP	Snapping (on by default): points land on the grid in time and, in value, on semitones when the MSEG drives a pitch (semitone lines shown, octaves highlighted), otherwise in steps of 0.05. Shift inverts it for one gesture.
BIPOLAR	Output from −1 to +1 instead of 0 to 1 (zero line in the middle): the MSEG then modulates around the setting, up and down, like an LFO.
COPY / PASTE	Copies the current shape and pastes it onto another MSEG, another instance or another project (clipboard). Also Cmd/Ctrl+C / Cmd/Ctrl+V in the display.
REPEAT	Repeats the beginning of the shape over the whole length: first half ×2, first third ×3, first quarter ×4, first eighth ×8.
Fullscreen	The small button on the right enlarges the display to the whole page (the header stays visible); click again to return to the normal view.

The **Shape** selector offers 60 factory shapes (ramps, gates, trance gates, ratchets, random patterns...), also stepped through with its ◀▶ arrows (which only visit the factory shapes); **SAVE** adds the current shape to your own library (the “User Shapes” section of the selector). Each user shape is a **.mseg** file in the **Magnetar/MSEG Shapes** folder (under **~/Library** on macOS, **%APPDATA%** on Windows): delete or rename it there to manage your library. **INVERT** and **REVERSE** flip the current envelope and stay remembered; **CLEAR** flattens it. The MSEG is computed every ~1.3 ms (64 samples): steps and attacks land on time whatever the host’s buffer size.

Clock: CLOCK, LENGTH & SYNC

Two knobs and a switch set the timing:

Control	Function
LENGTH	Duration of the envelope, 1-32 (stepped). In HOST SYNC this is a number of bars (4 beats); in SEQ SYNC it counts cells of 4 Sequencer 2 steps; free-running it is the base duration in seconds.
CLOCK	Free-running clock speed, $\times 0.05$ to $\times 40$ ($\times 1$ by default), shown in BPM while you turn it ($\times 1 = 60$ BPM). Free-running, one cycle lasts $\text{LENGTH} \div \text{CLOCK}$ seconds. Disabled and greyed while a sync is active.
SEQ SYNC	Locks the envelope to Sequencer 2's step (it then only runs while Sequencer 2 is running); the display grid switches to a musical grid. HOST SYNC (in the title badge, DAW only) locks it to the host transport instead and takes priority over SEQ SYNC.

When **SYNC is off** the grid is shown as equal **time** columns; when a **SYNC is on** it becomes a **musical** grid of LENGTH cells, with a stronger bar line every 4 cells.

MODE

The MODE knob (its small display shows the chosen mode) sets how the envelope is triggered:

Mode	Behaviour
LOOP	The envelope loops continuously on its clock. (This is the classic LFO-like behaviour.)
NOTE ON	One-shot, retriggered on every incoming MIDI note-on (keyboard) and on every note the LEAD plays in AUTO (Sequencer 2, pulsers...); plays through once and holds the last point.
NOTE OFF	One-shot, triggered when a MIDI keyboard key is released.
KEY ON	One-shot, retriggered only on the first key press (after all keys are released) — playing legato does not retrigger it. In AUTO, every LEAD note retriggers it, except notes tied by a SLIDE.
TRIGGER	One-shot, fired from the matrix: route a source to the MSEG n Trig destination; a rising edge triggers the envelope.

6 Screen 3: MODULATION & FX



The MODULATION / FX screen: the 8-slot matrix on top, on-panel sources (LFO, Macros), the NOISE generator, the joystick and the FX ORDER screen in the middle, and the effects rack below.

6.1 The Modulation Matrix



One matrix slot: ① Source · ② amount (AMT, bipolar) · ③ Destination · ④ #n badge (slot bypass).

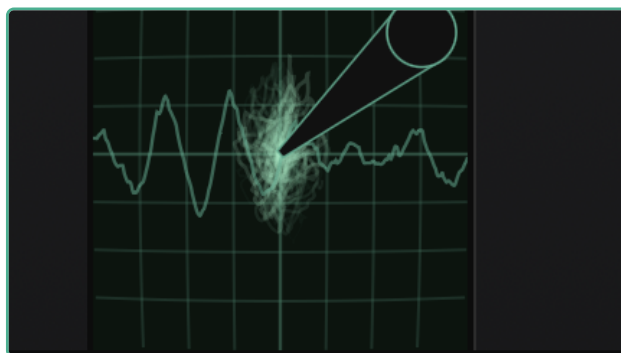
The matrix is the routing brain of Magnetar. It has **eight slots**, each a single connection:

SOURCE → DESTINATION × AMOUNT

Per-slot control	Function
SOURCE	Dropdown selecting the modulation source (see §6.2 and the reference table in §7).
AMT	Bipolar depth (−1 ... +1). Negative values invert the source.
DESTINATION	Dropdown selecting the target parameter (filter cutoff, pitch, morph, FX parameters, MSEG triggers..., see §7).
#n (bypass)	The slot's numbered badge is clickable: it bypasses the slot (its contribution drops to zero) without losing the routing . Badge lit = slot muted. Handy to cut a modulation with one click and bring it back later. It is a full parameter: automatable, saved in the state and presets.

Modulation is recomputed every ~1.3 ms (64 samples), whatever the host's buffer size. Several slots may target the same destination; their contributions add up.

6.2 Modulation sources



The XY joystick: two modulation sources (X and Y), mouse-draggable (double-click to recentre) and automatable. Its screen also shows a vectorscope of the output.

Some sources have dedicated controls on this screen; all sources are available in every SOURCE dropdown.

LFO 1 & LFO 2

Two low-frequency oscillators. Each has a **rate** and a **shape** (sine · triangle · saw · square · sample-and-hold). A single **SYNC** button, in the LFO badge, locks both to the tempo: their RATE knobs then become division selectors (1/1 ... 1/16T). An LFO only runs when it is patched somewhere in the matrix, and re-triggers its phase when connected.

Macros 1-4

Four manual controllers (**M1-M4**). They do nothing on their own: assign them as matrix sources to create hands-on “meta” controls that sweep several parameters at once. **M1 is the default target of the modulation wheel** (see §8).

NOISE

Not a modulation source but an audio generator: a stereo noise bed injected before the filter. **Pink / White** selects the colour; **AMOUNT** sets its level and **WIDTH** its stereo spread. Noise Amount and Width are themselves matrix destinations.

Other sources

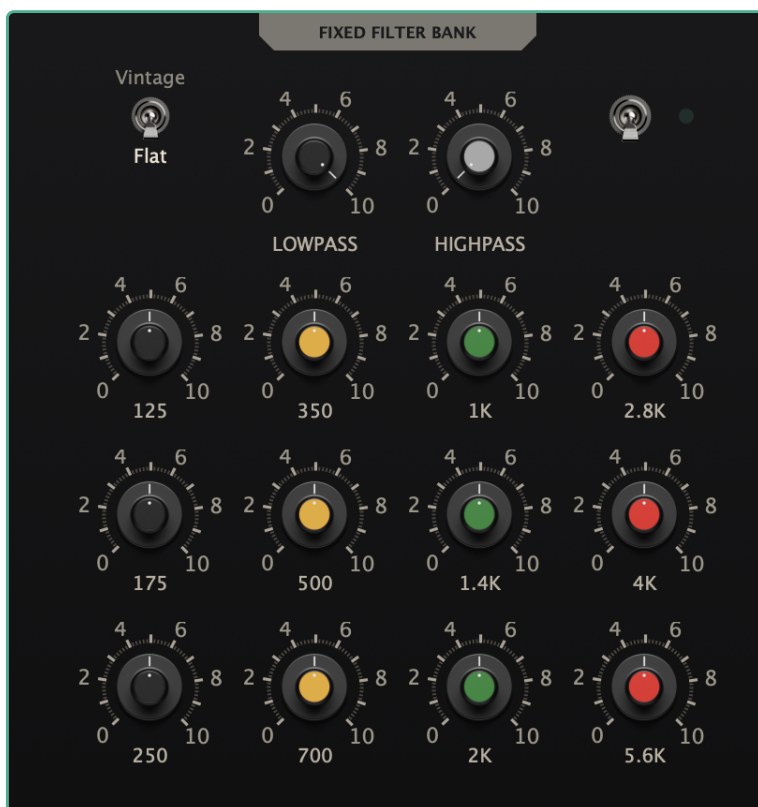
Also selectable in any slot: **Joystick X / Y** (an automatable XY controller), the three **Pulsers**, the two **Sample & Hold** units, **SEQUENCE 1** (source **Sequence**) and the four **MSEG** envelopes.

6.3 The effects rack

Seven effect modules, chained in series, process the master output. Each has an on/off switch.

Fixed Filter Bank

A fixed filter bank for shaping the spectrum before the time-based effects. The **Vintage / Flat** character colours the response, the **LOWPASS** (500 Hz–20 kHz) and **HIGHPASS** (20 Hz–1 kHz) filters bound the extremes, and the **12-band** graphic EQ (125 Hz to 5.6 kHz) cuts or boosts each region.





Drive

Valve/transistor saturation. **DRIVE** pushes the input gain, warmth to distortion; **TONE** colours the top end; **BIAS** adds asymmetry (even harmonics); **MIX** blends.



Chorus

Ensemble-style widening. **RATE** (**Sync** button: one-click snap to the clock) and **DEPTH** set the wobble; **SPREAD** offsets the L/R LFOs for stereo width; **MIX** blends.



Phaser

Sweeping notches from a chain of all-pass filters. **RATE** sets the speed (the **Sync** button snaps it to the clock in one click); **FEEDBACK** sharpens the notch resonance; **WIDTH** the sweep depth; **MIX** blends.



Ring Modulator

Ring modulation (metallic, bell-like timbres). **FREQ** 0.5 Hz–2 kHz (the **Sync** button snaps it to the clock in one click), **SHAPE** bends the carrier, **SPREAD** (L/R) and **MIX**.

Delay

Tape-style echo. **L TIME** and **R TIME** (20 ms to 1 s) are independent and become rhythmic divisions when the module's **SYNC** is on (capped at 1 s: a whole note at a slow tempo is shortened), **FEEDBACK** sets the number of repeats, **WIDTH** the stereo spread; **TAPE** saturation and **WOW** flutter add analog grain, **MIX** blends. The **Ping-Pong**, **Hi-Cut** and **Lo-Cut** switches refine the character.



Reverb

Freeverb-style reverb. **TIME** sets the length, **COLOR** the spring character, **WIDTH** the stereo image and **MIX** the blend; the **Room** / **Chor(ale)** / **Deep** variants change the length, damping and width of the tail.



All of the effect knobs are themselves valid modulation destinations, so you can, for example, sweep the Ring Modulator frequency from an LFO or step the delay feedback from Sequencer 1.

6.4 Effects order (FX ORDER)



The FX ORDER screen: the seven modules in their processing order, with active (ON) effects highlighted in green with their LED.

The seven rack modules are chained in **series**: the output of one feeds the next. The **FX ORDER** screen, to the right of the joystick on the MODULATION page, shows that chain and lets you **reorder** it.

Element	Function
Handle ≡	Grab a row (anywhere outside the arrows) and drag it up or down to move it in the chain.
Arrows ▲ / ▼	Move the module up or down one slot with the mouse (an alternative to dragging).
ON highlight	Active modules stay highlighted in green, with their LED; disabled modules are dimmed but keep their place in the order.

PRESETS & RESET

Effects order is part of the plug-in state: it is kept with your DAW session (but not in SAVE/LOAD .json files). Loading a preset restores the default order (Filter Bank → Drive → Phaser → Chorus → Ring Modulator → Delay → Reverb), or the order the preset defines if it specifies one.

7 Modulation Reference

Sources

Available in every matrix SOURCE dropdown (names roughly as shown in the menu):

Source	Description
LFO 1 / LFO 2	Multi-shape low-frequency oscillators (§6.2).
Macro 1-4	Manual meta-controllers (M1 = mod-wheel default).
Joystick X / Y	Automatable XY pad axes.
Puls1-3	Square gate generators (PULSE module).
S&H 1-2	Sample-and-hold random steppers.
Sequence	The 8-step SEQUENCE 1.
MSEG 1-4	The four drawable envelopes.

Destinations

Available in every matrix DESTINATION dropdown (abbreviated):

Group	Destinations
Filter	Cutoff (± 4 oct), Resonance.
Voice (global)	Morph, PWM, Pitch (± 12 degrees), Level, Cluster.
Per drone osc	Osc 1-6 Pitch (± 12 degrees), Osc 1-6 Level, Osc 1-6 Pan.
Lead	Lead Pitch (± 12 degrees), Lead Level, Lead Pan, Lead Coarse, Lead Detune.
Drive	Drive Amt, Tone, Bias, Mix.
Phaser	Rate, Width, Feedback, Mix.
Chorus	Rate, Depth, Spread, Mix.
Ring Modulator	Freq, Shape, Spread, Mix.
Delay	Time L, Time R, Feedback, Width, Sat, Wow, Mix.
Reverb	Size, Colour, Width, Mix.
Filter Bank	LP, HP and the 12 EQ bands.
Noise	Noise Amount, Noise Width.
MSEG triggers	MSEG 1-4 Trig (for the MSEG TRIGGER mode, §5.2).
Sequencer 2	VCF EG AMT, VCF ATTACK, VCF DECAY, VCA ATTACK, VCA DECAY (Sequencer 2 envelopes, §5.1).

8 MIDI

Keyboard & wheels

A MIDI keyboard plays the **LEAD** voices (in KBD mode; in AUTO the lead ignores the keyboard). From a connected master keyboard:

- The **pitch wheel** bends the whole synth (± 2 semitones, fixed range).
- The **modulation wheel** (CC 1) controls **Macro 1** by default; assign Macro 1 in the matrix to route the mod wheel anywhere.

MIDI Learn

Almost every knob, switch and selector can be mapped to a MIDI CC:

1. Right-click (or **Ctrl-click** on macOS) the control. A small menu appears with the parameter name.
2. Choose **MIDI Learn**, then move a controller on your hardware: that CC is now bound to the parameter.
3. Choose **Forget (CC x)** to remove the assignment; while learning, **Cancel learning** aborts it.

Each parameter takes a single CC; re-learning replaces the previous binding. Assignments are saved with the plug-in state (DAW session). By default CC 1 (mod wheel) is mapped to Macro 1; this default can be re-learned like any other.

MIDI Out: capturing the sequencers

Magnetar produces MIDI so you can record its sequencers onto a DAW MIDI track:

- **Sequencer 2** outputs its notes on **MIDI channel 2** (pitch follows the drone root and the QUANTIZE setting; velocity follows the VELOCITY row).
- **Sequencer 1**, when routed to a pitch destination, outputs one note per active step on **MIDI channel 1**.

When synced to the host (HOST SYNC on Sequencer 2, SYNC on Sequencer 1), both stop with the DAW transport; otherwise Sequencer 2 plays as long as RUN is on.

9 Presets

The factory bank holds **150 presets**, organised by **category** so you can browse by intent. Use the header selector and its ◀▶ arrows to move through them.

Category	Character
Init	A neutral starting point.
Sequences	Rhythmic, motion-driven patches built around the sequencers, pulsers and S&H.
Pads & Drones	Sustained beds and chords, and slow-evolving sound sculptures.
Chord Progressions	Progressions of more than two chords that unfold on their own: chorales, romantic and impressionist harmony, sequenced changes.
Textures	Noisy, abstract, shifting sound-beds, and living environments: machinery, storms, ice, radio static.
Bass	Heavy basses, round or biting, played on the keyboard or driven by Sequencer 2, shaped by the MSEGs.
Percussion	Tuned and noise-based percussive hits built with the MSEG envelopes.

SAVE / LOAD in the header store and recall all parameters and MSEG shapes as a `.json` file on disk, independent of the DAW session and the factory bank, useful for sharing patches or building your own library.

SEQUENCER 2 & PRESETS

The Sequencer 2 **RUN** switch is off by default and is only turned on in presets that actually use Sequencer 2. Opening a preset that does not use it leaves RUN off.

10 Shortcuts & Specifications

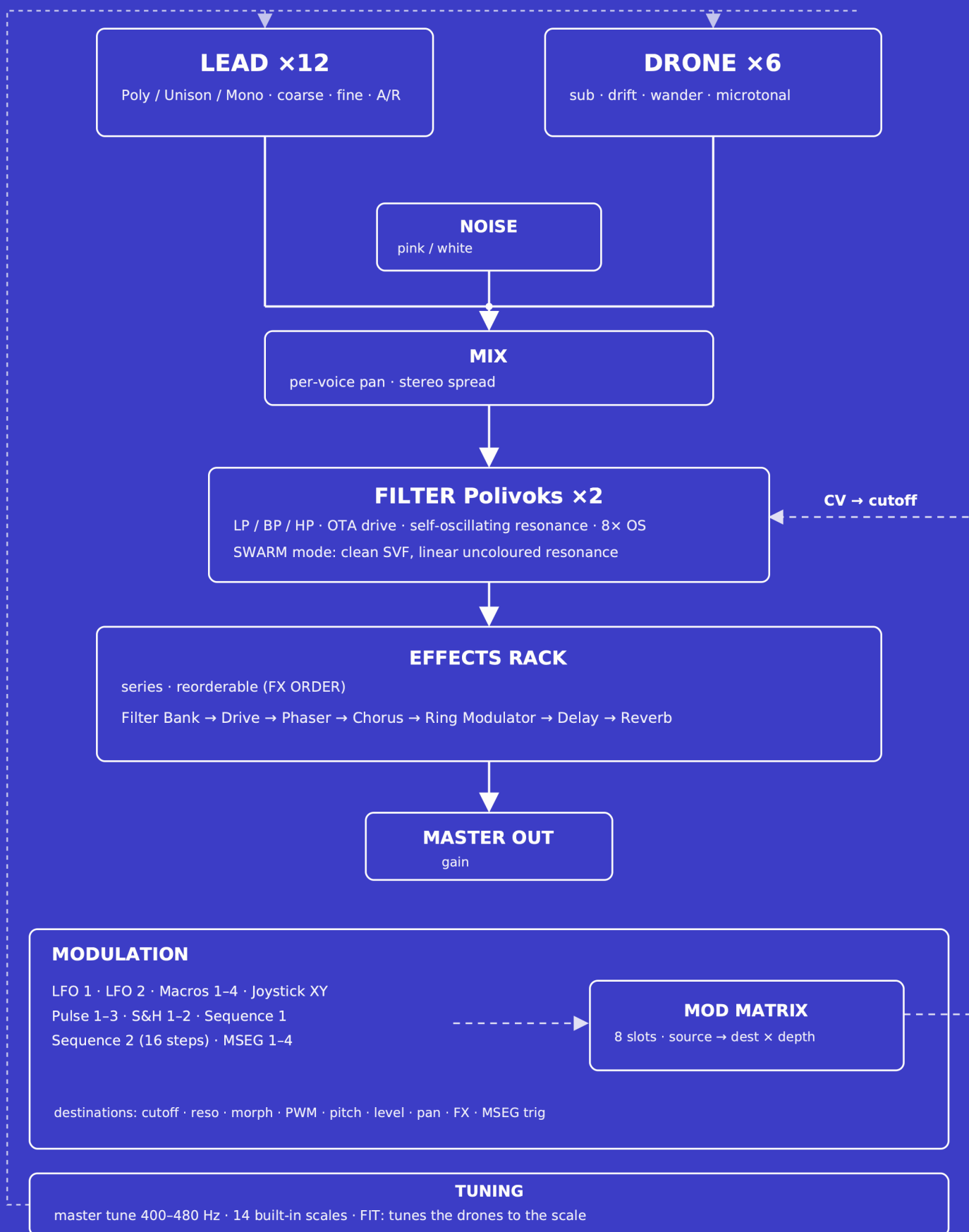
Mouse & keyboard shortcuts

Action	Result
Right-click / Ctrl-click a control	MIDI Learn menu.
Double-click MSEG display	Add an envelope point.
Right-click an MSEG point / segment	Menu: numeric entry, sustain, segment type, Reset curve, add, select all, deletion.
Cmd/Ctrl + click / drag (MSEG)	Multiple selection / lasso; Delete removes the selection.
Shift / Alt while dragging (MSEG)	No snapping / fine movement.
Drag a curve segment's handle (MSEG)	Bend the segment freely, up/down and left/right (Alt = fine).
← → (MSEG)	Previous / next point; with Shift, extend the selection.
Cmd/Ctrl + arrows (MSEG)	Move the selection by one grid step (← →) or one semitone / 0.05 (↑ ↓); with Shift, fine step without snapping.
Cmd/Ctrl+A, C, V · Delete · Esc (MSEG)	Select all, copy, paste · delete the selection · clear the selection.
Click a destination in the MSEG legend	Show its scale on the left.
MSEG legend AMT knob	Drag vertically (Shift = fine); double-click = 0.
Click a #n badge (matrix)	Bypass / restore the slot.
Cmd/Ctrl+Z · Shift+Cmd/Ctrl+Z or Cmd/Ctrl+Y	Undo · redo.
Double-click the joystick	Recentre the point.
Drag an FX ORDER row	Move the effect in the chain (or use the ▲ / ▼ arrows).
Click the NERVE logo	Show the back panel (info and licence).

Specifications

Voices	6 latched DRONE voices + LEAD of up to 12 voices (Poly 4 / 8 / 12, Unison, Mono).
Oscillators	Band-limited PolyBLEP morph (saw-tri/sine-square) + 2 sub-oscillators, per-voice drift.
Filter	Dual non-linear Polivoks-style OTA (LP/BP/HP), self-oscillating, + clean SVF cell (SWARM mode); 8× oversampled.
Modulation	8-slot matrix · 2 LFO · 4 Macros · Joystick · 3 Pulsers · 2 S&H · 2 sequencers · 4 MSEG (128 points, 5 trigger modes).
Interface	Resizable from 0.6× to 2× (fixed proportions); 100-step undo.
Effects	Fixed Filter Bank, Drive, Phaser, Chorus, Ring Modulator, Delay, Reverb.
Tuning	Microtonal; 14 built-in scales; master tune 400–480 Hz.
MIDI	MIDI in (keyboard, pitch/mod wheel), MIDI Learn, MIDI out (sequencer capture).
Formats	AU (macOS) · VST3 · Standalone (macOS and Windows).

SIGNAL ARCHITECTURE



NERVE AUDIO

Magnetar, polyphonic drone synthesizer

AU · VST3 · Standalone

МАГИЕТАЯ

NΞRVΞ