KNIGHTSNARE

Knight Expander 74

Synthesizer Module — User Manual



Synthesizer plugin for Mac (AU, VST3, Standalone), Windows (VST3) and Linux (VST3).
knightsnare.com
Inspired by the 1974 Oberheim SEM. Knight Expander 74 is an independent Knightsnare product: not affiliated with or endorsed by Oberheim. No samples are used.

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1. Welcome

Knight Expander 74 is a two-oscillator analog-style synthesizer modelled on the classic 1974 expander module, famous for its fat oscillators and its unique filter that sweeps smoothly from low-pass through notch to high-pass. Everything runs oversampled for a clean, rich sound.

On top of the original's design it adds an 8-voice POLY mode, an arpeggiator, vibrato, glide, delay and reverb.

2. Installing

Mac

Open the downloaded zip and double-click the installer. It installs the Audio Unit (Logic, GarageBand) and the VST3 (Ableton Live, Cubase, Studio One, Reaper and others). Then open your DAW and let it rescan its plug-ins. The installer is signed and approved by Apple, so macOS won't warn you. macOS 11 or later, Apple Silicon and Intel.

Windows

Unzip the download and copy the **.vst3** into `C:\Program Files\Common Files\VST3`, then rescan plug-ins in your DAW. 64-bit Windows 10 or 11.

Linux

Unzip the download and copy the **.vst3** into `~/.vst3` (create the folder if needed), then rescan in your DAW (for example Reaper or Bitwig). 64-bit, Ubuntu 22.04 or newer, or a similar distribution.

> **Tip** This is an instrument. Load it on an instrument or MIDI track, not as an audio effect.

3. The panel



Knight Expander 74.

Section	What it does
PERFORMANCE	GLIDE, TUNE, VIB RATE and VIB DEPTH.
LFO	RATE, with a lamp that blinks at the LFO speed.
VCO 1, VCO 2	FREQUENCY, RANGE, PULSE WIDTH, MODULATION and MOD SOURCE; VCO 2 also has SYNC.
VCF	FREQUENCY, RESONANCE, MODE (low-pass to high-pass), BAND PASS, MODULATION, MOD SOURCE and KEY TRACK.
ENV 1 > VCA, ENV 2 > VCF	ATTACK, DECAY and SUSTAIN for each envelope.
VCF INPUT	One knob per oscillator: saw to the left, pulse to the right.
OUTPUT	The VCA switch (ENV 1 or ON) and VOLUME.
KEYBOARD	TRANSPOSE (-2 to +2 octaves, click the lamps) and VOICES (MONO, LEGATO, POLY).
ARPEGGIATOR	STATE, OCTAVES, MODE and RATE.
EFFECTS	DELAY (TIME, REPEATS, MIX) and REVERB (SIZE, TONE, MIX).
PROGRAM	Click the red display for the preset list; the arrows step through presets.

4. How the sound is made

Like a classic analog synth, the sound flows through a chain: the **oscillators** make the raw tone, the **mixer** blends them, the **filter** shapes the brightness, and the **VCA** (shaped by ENV 1) controls the volume over time. The **envelopes** and **LFO** move things automatically, and the effects add space at the end.

5. Oscillators (VCO 1 and VCO 2)

- Each oscillator has a **saw** wave (bright and buzzy) and a **pulse** wave whose width runs from 10% to 90% (hollow at 50%, thin and nasal near the ends).
- **RANGE** picks the octave: 32', 16', 8' or 4' (lower number = higher).
- **FREQUENCY** tunes it up or down by up to a fifth. Detune VCO 2 slightly against VCO 1 for the classic fat sound.
- **MODULATION** is a two-way knob: turn left for pitch modulation (vibrato, sirens, sweeps) and right for pulse-width modulation (a moving, chorus-like pulse). The source is ENV 1 or the LFO for VCO 1, and ENV 2 or the LFO for VCO 2.
- **SYNC** locks VCO 2 to VCO 1. Then sweep VCO 2's frequency for the hard, tearing sync lead sound.
- The oscillators drift very slightly, like real analog circuits.

The VCF input mixer

One two-way knob per oscillator: left blends in its **saw**, right its **pulse**, and the centre is off.

6. The filter (VCF)

- **Frequency** sets the brightness. **RESONANCE** adds a peak at that point; it gets vocal and squelchy but, like the original, never whistles on its own.
- **MODE** sweeps smoothly from **low-pass** (warm, dark) through **notch** (hollow, phaser-like) to **high-pass** (thin, airy). This is the filter's signature: automate it for sounds no ordinary synth can make.
- The **BP** switch gives the **band-pass** output instead: a nasal, telephone-like tone.
- **Modulation** from ENV 2 or the LFO opens and closes the filter automatically.
- **Key tracking** (Off / Half / Full) makes the filter follow the notes you play, so high notes stay as bright as low ones.

7. Envelopes, LFO and the VCA

- Each envelope has **ATTACK** (fade in), **DECAY** (fall to the sustain level, and also the release after you let go) and **SUSTAIN** (the level while you hold the key).
- **ENV 1** shapes the volume through the VCA. Set the VCA to **ON** for a drone that sounds without any key held.
- **ENV 2** is for the filter and VCO 2.
- The **LFO** is a triangle wave: slow for sweeps, fast for wobble and vibrato.

8. Playing: voices, glide, vibrato and transpose

Control	What it does
MONO	One note at a time; the last note played wins and every note restarts the envelopes. Classic bass and lead.
LEGATO	One note at a time, but overlapping notes glide on without restarting the envelopes. Smooth leads.
POLY	Up to 8 notes at once for chords and pads; when you play a ninth, the oldest note is taken.
GLIDE	Slides smoothly from note to note.
VIB RATE, VIB DEPTH	Vibrato speed and amount; the mod wheel adds vibrato too.
TUNE	Fine-tunes the whole synth.
TRANSPOSE	Click a lamp to move the keyboard up or down by up to 2 octaves.
Pitch bend	Plus or minus 2 semitones.

9. Arpeggiator

- **STATE** Off / On / Hold: On plays the held notes one after another; Hold keeps playing after you let go.
- **MODE**: Up, Down, Up/Down or Random. **OCTAVES**: 1 to 4.
- **RATE**: note length from 1/4 to 1/32, including triplets, locked to your DAW's tempo (120 BPM in the standalone app).

10. Delay, reverb and output

- The **DELAY** (TIME, REPEATS, MIX) bounces between left and right, and each repeat gets a little darker, like tape.
- The **REVERB** has SIZE, TONE and MIX. VOLUME in the OUTPUT section sets the overall level.
- A transparent limiter at the output stops it ever going over 0 dBFS, however loud the patch.

11. Presets

Click the red PROGRAM display for the list of 80 presets, or step through them with the arrows. Each one sets every control, and they're level-matched so nothing jumps in volume when you switch.

12. Getting good results

Sound	Starting point
Fat bass	MONO, both VCOs on saw at 16', VCO 2 slightly detuned, low-pass with medium resonance, short ENV 2 decay into the filter.
Sync lead	MONO or LEGATO, SYNC on, ENV 2 or the LFO sweeping VCO 2's frequency, a little glide.
Poly pad	POLY, pulse waves with LFO pulse-width modulation, slow attack and decay, reverb up.
Notch sweep	Any sound with the LFO slowly moving MODE between low-pass and high-pass.
Arpeggio	POLY or MONO, arpeggiator On at 1/16, Up/Down over 2 octaves, delay on.

About

Knight Expander 74 is made by Knightsnare. It is inspired by the 1974 Oberheim SEM and written from scratch; no circuits, sounds or code from the original are copied. Oberheim and SEM are trademarks of their respective owners. Knight Expander 74 is an independent product: not affiliated with or endorsed by them.