HEXADRUM

User manual · version 0.3



Six FM drum machines on an OPL-style chip, with a 16-step sequencer built around tricks that suit this kind of synthesis.

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Quick start

- Press **Space** or the **play button** in the top bar to run the built-in sequencer. In a DAW with **Sync** set to Host, it follows the DAW's transport and tempo.
- Click a drum's **name** to hear it once.
- Click a step in the grid to switch it on; click a lit step again to switch it off. Clicking a step also selects it in the **Step Inspector**.
- The small **arrow** after a drum's name opens its presets. Hover over one to hear it, click to use it.
- The small **arrow** after SEQUENCER opens the pattern menu, where you can also generate a new pattern in a style.
- MIDI notes **C1 to F1** (36–41) play Kick, Snare, Tom, Hat, Cymbal and Free; **F#1** (42) plays an open hat.

The top bar

Control	What it does
Engine	**HexaFM**: the original FM drum engine. **Chip**: each drum runs on its own emulated YMF262 chip. **1-Bit**: an 80s home computer's beeper. **OPN2**, **2A03** and **6581**: more classic chips (see Engines).
History	Undo and redo for the whole plugin, up to 10 steps: knobs, menus, patterns, kits and names.
Preset	A whole setup: kit, all four patterns, line settings and tempo. Save, save over, or load.
Kit	The six sounds and chip settings. Factory kits, your kits, **Random kit**, save and load.
Pattern	Patterns A–D, factory patterns, clear, save and load.
Sync	**Host** follows the DAW; **Internal** uses the plugin's own tempo (drag the box up or down to change it).
Play / Stop	Runs the internal clock; stopping returns to the start. Dimmed when synced to the host.
Master	Output level.
?	This manual, About, licence and copyright.

The chip screen

The screen under the top bar holds the settings the six drums share, like the registers of one sound chip. Click a value for its menu.

Setting	What it does
Chip rate	Sample rate of the output crusher, from 49.7 kHz (clean) to 8 kHz (gritty).
Bit depth	Output resolution, from 16 bit down to 4 bit.
Env rates	**OPL coarse** steps envelopes like the chip; **Smooth** does not. (HexaFM engine.)
Phase	**Free-run** lets oscillators keep running between hits; **Reset** starts each hit from zero. (HexaFM engine.)
LFSR seed	Seed of the noise generator, and of the probability dice in the sequencer. The die rolls a new one.
Trem / Vib	The chip's tremolo and vibrato rate, and **Deep** for the stronger depth.

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Setting	What it does
Key follow	Play a keyboard to set the tonality. With it on, notes from **C2 up** set a key (C1–F#1 still play the drums): the notes you hold together become the chord, the lowest one its root, and it stays after you let go. Kick and Snare tune to the root; Tom, and Free in Perc or 2-Op mode, take turns on the chord's notes, so their rhythms turn into small arpeggios. Hat, Cymbal and clap stay as they are, and the Tune knob still picks the register. The menu can also set a minor or major key, and the switch and key save with the session and with presets.

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The six drums

Each drum has its own panel. From the top:

- **Die**: rolls a new sound for this drum, inside a useful range, including its Retrig target, retrig feel and both LFOs. Level and Pan stay put.
- **Name**: plays the drum. **The small arrow**: its presets (Init, six factory presets, yours, and Save drum preset). Highlighting a preset plays it without changing anything.
- **M** and **S**: mute and solo (the same as M and S on the sequencer line).
- **MOD** and **CAR**: the eight OPL waveforms for the modulator and carrier.
- **Six knobs**: listed below. Double-click a knob to reset it.
- **Level** and **Pan**, then **Retrig** (the label opens the drum's retrig feel; it turns amber when any is set) and → the menu for what a retrig ramp changes on this drum (pitch, noise, ratio, FM or feedback).
- **LFO 1 and 2**: target, waveform, speed (locked to the song from 4 bars to 1/32, or free from 0.1 to 40 Hz) and depth (drag). Knob targets reshape a drum while it rings.

Drum	Knobs (HexaFM engine)	Differences on the Chip engine
Kick	Tune, Sweep, Sw.Time, FM, Fdbk, Decay	Chip bass drum, 2-op FM on channel 6
Snare	Tune, Snap, Noise, FM, T.Dec, N.Dec	Chip snare noise plus a 2-op body; FM becomes **Body**
Tom	Tune, Sweep, Ratio, FM, Fdbk, Decay	Chip tom; FM becomes **Fdbk**, Fdbk becomes **Vib**
Hat	Ratio, Metal, Cl.Dec, Op.Dec, Noise, HP	Chip hi-hat; Ratio moves the metal, Metal spreads it
Cymbal	Ratio, Inharm, Decay, Shimmer, Noise, Tone	Chip top cymbal; Shimmer turns on vibrato
Free	Tune, Ratio, FM, Fdbk, Decay, Bursts, with Clap, Perc or 2-Op mode	Clap from chip snare bursts; Perc and 2-Op on a 2-op chip voice

Hats play closed below 50% gate and open from 50% (a step's gate is set in the Step Inspector).

Engines

HexaFM is the original engine: our own reinterpretation of OPL-style percussion, with smooth controls. **Chip** runs each drum on its own emulated YMF262, so the chip's own operator tables, envelope steps, waveforms and rhythm mode shape the sound; decay changes in the chip's coarse steps. Everything else (sequencer, PERF, LFOs, effects) works with both, and the engine is saved with kits and presets.

1-Bit is the beeper of 80s home computers: a speaker switched on and off, so drums fade by narrowing their pulses and noise is a stream of random bits. The Mod and Car menus, Env rates and Phase only apply to HexaFM and Chip.

More classic chips, each with its own captions on the knobs: **OPN2** is four-operator Yamaha FM from a 16-bit console, with snares and hats made from feedback hiss. **2A03** is an 8-bit console's chip, with its stepped triangle and metallic short noise. **6581** is a SID-style chip with ring modulation and its resonant filter. All of them are levelled to sit near HexaFM.

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Sequencer

Six lines of 16 steps, one per drum. Every line runs its own clock.

- **The arrow after SEQUENCER**: switch between patterns A–D, load a factory pattern, clear, or **Generate** a pattern in a style. The chosen style stays selected, and the dice roll in it. With Sync on **Internal**, generating (and the die that rolls every line) also sets a random tempo within the style's range (Techno 125–140 BPM, Glitch 120–140, Breakbeat 120–136, Drum & Bass 170–176, Chaotic anything from 60 to 200).
- **Clear**, **undo** and **redo**: for the pattern and line settings (up to 10 steps).
- On each line: a **die** rolls a new rhythm for that line, **M** and **S** mute and solo, **Len** sets how many steps the line plays (1–16), and **Spd** its speed (1/8x to 2x, or Fit, which spreads the line over one bar). Different lengths make polymeters.
- The multicoloured die next to SEQUENCER rolls all six lines.

Style	What it writes
Techno	Straight and driving: four-on-the-floor kicks, a backbeat clap, sixteenth, eighth, offbeat or galloping hats, ride and shaker figures, clave-like percussion.
Glitch	The groove of the original generator (mostly four-on-the-floor, polymeter toms and percussion, rolls and conditions), with its glitches gathered on the last beat: stutters, buzzes, drop-outs and wave changes that line up into one fill.
Breakbeat	After the funk breaks of '90s big beat: nine kick patterns, snare on 2 and 4 with classic ghost-note figures, swung hats in four feels, tom fills and rides.
Drum & Bass	Two-step, rolling and jump-up kicks, snare backbeat with chopped or ghosted figures, eighth, sixteenth or shuffled hats with rolls, tom runs.
Chaotic	Random lengths and speeds, dense rolls, conditions, drifting microtiming and locks.

Techno, Breakbeat and Drum & Bass pick from a bank of rhythms for each drum, then vary it slightly, so no two generations are alike, while the kick's beats and the snare's backbeat stay where the style puts them.

Retrig feel: click **Retrig** on a drum to shape all of its rolls. Repeats replay the drum's own sound from the hit, like a beat repeat: **Stutter** plays it as it was, and **Tape** does the same while the pitch sinks an octave across the roll. **Curve** makes a roll speed up or slow down while it still ends on the grid. **Fade** lets the repeats die away, or swell from soft into the next beat. **Chop** shortens the repeats, more towards the end. **Move** bounces the repeats left and right, jumps their pitch by semitones and leaves the odd one out. A Pitch ramp on the step changes the playback speed; other ramp targets only shape rolls before the step. The feel saves with kits, and the drum's die rolls it too. Rolls before the step (B) always strike.

Letters on steps: **R** retrig, **B** retrig before the step, **L** lock, **P** phase reset, % probability, and A:B conditions such as **1:4**. A small bar at the bottom of a step shows its microtiming.

Step Inspector

Control	What it does
Probability	Chance the step plays (repeats exactly bar by bar from the LFSR seed). **Every** opens the A:B conditions: play on loop A of every B loops.
Velocity	How hard the step plays.
Gate length	How much of the drum's own decay it keeps. 100% rings freely.
Microtime	Moves the step early or late, −100 to +100 (100 is 23/24 of a step). Hold Cmd, Ctrl or Alt to drag finely; double-click to centre.

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Control	What it does
Lock 1, Lock 2	Lock one knob to its own value on this step, and lock a waveform.
Retrig rate, Count, Ramp	Ratchets: from 1/24 to 1/128, or 100–800 Hz for buzz. Ramp moves the drum's Retrig target across the roll. How the roll feels is set per drum (see Retrig feel).
Roll	**After** follows the step; **Before** builds into it, getting louder and landing on the step.
Phase reset, Couple	Restart the oscillators on this step; nudge another drum's phase when this step plays (HexaFM engine).
Reset, undo, redo, die	Reset the step, undo or redo step edits (last 5), or roll new settings for this step.

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PERF

Eight knobs that change one setting on all six drums at once. Centre means no change; turn left or right. Click a knob's name to assign it, double-click to centre. The strip knobs don't move, so returning to centre always brings your sound back.

Setting	What it does
Filter (default)	DJ filter on the whole output: left of centre low-pass, right of centre high-pass.
Tune, Decay, Color, Grit	Pitch, length, FM brightness and grit (feedback or noise) on every drum.
Echo	A cheap early-'90s digital echo at 16 kHz and 12 bits. Right: dotted-eighth ping-pong; left: sixteenth slapback.
Reverb	A subtle room ambience. Right: a soft room; left: a tighter, darker one.
Width	Narrows the pan positions to mono or spreads them wider.
Level, LFO amt, Gate, Prob	All levels, all LFO depths, all step gates, all step probabilities.

Echo and Reverb work like an aux send: turning back to centre stops new sound going in and lets the tail ring out.

Presets, kits and patterns

Type	Holds	Saved in Documents/HexaDrum/
Drum preset	One drum's knobs, waveforms and Free mode	Drums/<drum>/*.hexaddrum
Kit	All six sounds, LFOs, chip settings, PERF and engine	Kits/*.hexadkit
Pattern	One pattern with its line lengths and speeds	Patterns/*.hexadpattern
Preset	A kit, all four patterns, line settings and tempo	Presets/*.hexadpreset

Every save dialog opens with a suggested name, two words from the world of sound chips and drum machines (a kick might be Static Punch, a pattern Crooked Hustle); keep it or type your own. Kits rolled with Random kit get a name the same way.

Your DAW also saves the whole plugin state with every project.

Separate outputs

Besides the main stereo output, HexaDrum has six stereo outputs, one per drum, named Kick to Free. In a drum's chevron menu, **Output** chooses **Main mix** or **Own output**. On its own output a drum leaves the main mix (an amber arrow appears after its chevron) and plays there after its Level, Pan and the chip crusher, without the master Echo, Reverb and DJ filter. In Ableton, create an audio track, set its input to HexaDrum and pick the drum's output. If the host has that output switched off, the drum stays in the main mix.

MIDI and automation

Notes C1–F1 (36–41) play the six drums and F#1 (42) an open hat, with velocity. Notes from C2 (48) up set the key for **Key follow**. Every knob, menu, PERF knob and LFO setting can be automated from the DAW.

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Demo and licence

The demo plays everything, with 2.5 seconds of silence every 45 seconds, and kits, patterns and presets can't be saved. To unlock it, choose **Unlock full version** in the **?** menu (or click the line under the logo) and paste the licence key from your purchase email. The key is activated once over the internet; after that the plugin works offline. To move your licence to another computer, choose **Deactivate this computer** in the **?** menu first.

Credits and legal

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- The Chip and OPN2 engines use **ymfm** by Aaron Giles, under the BSD 3-Clause License. Copyright © 2021, Aaron Giles. Its full licence text is included with the plugin (ymfm-LICENSE.txt).
- HexaDrum includes **ayumi** by Peter Sovietov, under the MIT License. Its full licence text is included with the plugin (ayumi-LICENSE.txt).
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