PATTERN ENGINE

MANUAL + USER GUIDE

Pattern Engine
Obligatory Legal Stuff

Pattern Engine
Change Log

v1.8

- Added cycle cell step grid

v1.7

- Added support for Live 12 Scale Awareness
- Updated GUI

v1.6

- Added the ability to multiply and/or divide the base rate for more rhythmically interesting clock times, with changes quantized to quarter note beats
- Bug fixes and output timing improvements

v1.5

- In the new default Relative mode, a value of 0 on any pitch dial will be updated to the root note of the currently selected key (in MIDI octave 3), ie., in the key of F#, all step pitches will be oriented to F#3 as 0; revert to the legacy behavior where 0 corresponds to C3 regardless of the current key by switching the new toggle to the left of the Receive/Internal button from "/" to "-"
- Step pitch randomizations now remain relative to the currently selected key in the newly default Relative key mode
- Added a new advanced pitch randomization mode, Decide, which is accessible by clicking the pitch settings Gear toggle; in Decide mode, a step's pitch will be randomly chosen between two possible notes determined by the current per-step minimum and maximum randomization range values
- With step pitch advanced mode enabled, the reset all step pitches button is replaced by a dice button that randomizes each step's minimum and maximum ranges within the global minimum and maximum range constraints for a more compelling starting point, particularly in the new Decide pitch randomization mode
- The global key button features a more useful toggle behavior which will now lock all unlocked locks before then unlocking all locked locks.
- Per-Parameter lane Key buttons to toggle all locks on or off on a per-parameter basis (ie., all velocities, all lengths, etc.)
- With the advanced gear toggle enabled to provide access to Step Pitch Randomization settings, clicking the otherwise hidden Range Randomization Dice also randomizes all step pitches within their newly randomized ranges
- Swing timing significantly improved, and no longer forces quantization
- Various performance optimizations

v1.1

- Added Time option to toggle from the default metrical Grid mode to unsynchronized millisecond sequencer clock rates, with seamless tempo-matching takeover
- Clicking Global Dice for randomize all functionality now leaves step pitches assigned to LFO control in place
- Added bundled Global Hub compatibility, with local pin option to ignore Global Hub settings
- Added Live 11 scales
- Bug fixes and optimizations

Pattern Engine
Important Info

Pattern Engine is a MIDI effect, which means it *cannot* be used on audio tracks, and *must* be placed *before* instruments.

The device requires Live Suite with Max for Live installed; we strongly recommend Live 10.1.x or higher with Max 8.1.x or higher.

Since it is a single-panel device, some controls may appear small. In Live's preferences, increase the display zoom to taste; we recommend 125% for ideal usage and intended appearance.

An audio buffer size of 512 samples or higher is recommended for optimal performance, particularly when using ongoing auto-randomization features at short intervals.

Pattern Engine
Installation Instructions
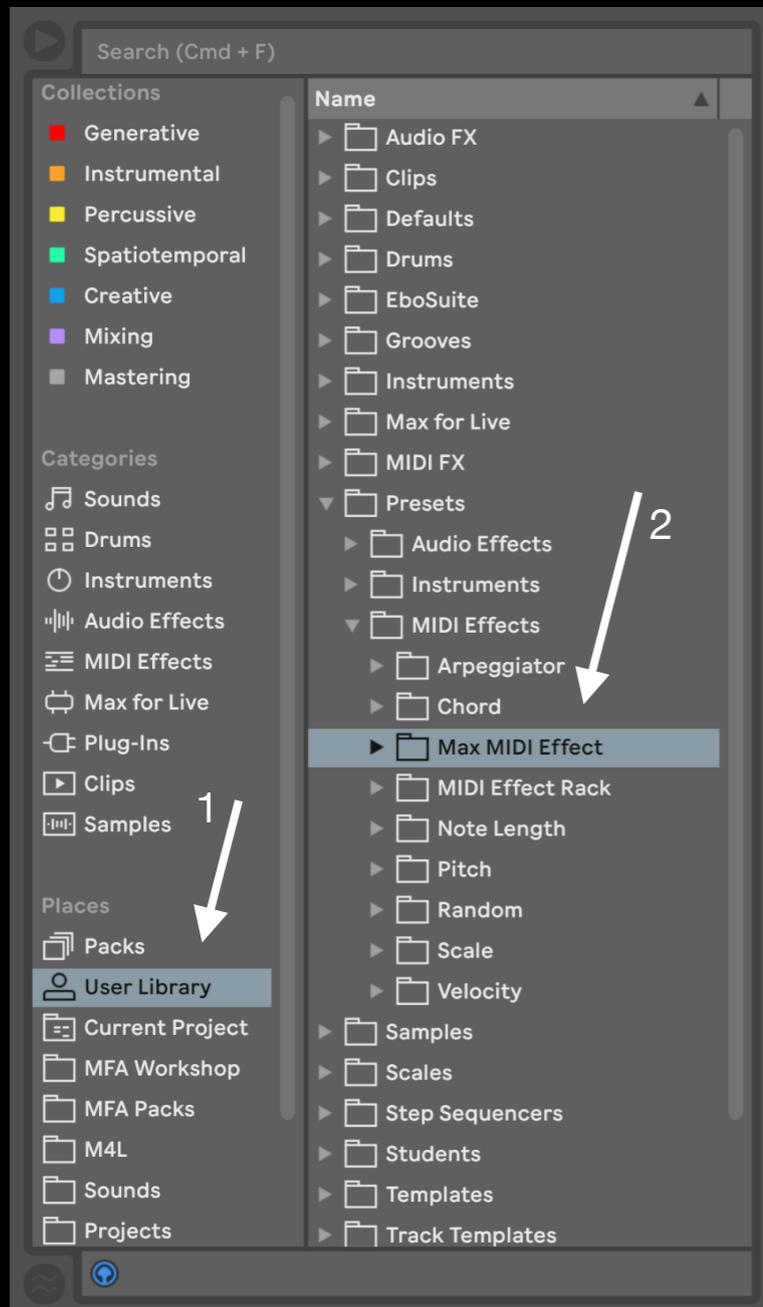
To install Pattern Engine, first double-click to decompress the ZIP archive it arrived in. Presumably you've already done this, because you're reading the manual, also included in said ZIP — good job!

From Finder (Mac) or Explorer (Windows), drag the Pattern Engine folder, including the Presets folder, which contains the Max MIDI Effect folder and all .adv preset files, to the User Library in the Places section of Live's Browser (Arrow 1 pictured left). This will copy the required files to your User Library. We recommend dragging it to the Max MIDI Effect subfolder of the User Library MIDI Effects folder (Arrow 2 pictured left).

For the Pattern Engine Presets to load correctly, the included "MFA Pattern Engine.amxd" file must be copied to both of the following folders:

· User Library → Presets → MIDI Effects → Max MIDI Effects
· User Library → Presets → MIDI Effects → Max MIDI Effects → Imported

Once installed, we might humbly suggest adding it to an appropriate Browser Collection, if applicable.

Pattern Engine
Device Overview

Combining generative features with performance-friendly interaction design, Pattern Engine is geared for instant inspiration.

Simply click the global dice to seed new musical ideas with minimum effort, or engage auto-randomization to unfurl endless worlds — without sacrificing intricate per-step control.

Each of Pattern Engine's 16 steps can be manipulated and randomized across five dimensions: Mute (on/off), Pitch, Velocity, Duration, and Tie (for monophonic glides). Each of these parameters can also be locked on a per-step basis to exempt them from randomization. Auto-randomization can be set to occur globally at intervals measured in bars — or at different bar intervals for each auto-randomizing parameter.

Four tempo-syncable LFOs are available to govern the pitch of selected steps, creating dynamic melodic contours in a variety of shapes, with per-step LFO control offering amount with direction, and central offset.

Outgoing note pitch values can be transposed internally and via incoming MIDI for dynamic performance — within 50 scales, in any key. Sequence direction, length, reset, step grid size, and swing are all included as expected, along with handy global settings and six playback modes to interact with MIDI input in a variety of ways.

Devised by an accomplished musician, producer, and Ableton Certified Trainer as a source of inspiration, Pattern Engine provides immediate access to new realms of musicality.

Pattern Engine Visual Guide

MANIFEST AUDIO

1 · These are the **Global Play** controls.

Play or pause the sequence by toggling the Play triangle. Reset to the start of the sequence on the first beat of the next bar received from Live's transport with the Loop cycle - or manually re-trigger the sequence start with the Double Triangles.

Click the Disk icon to toggle all parameters into a state that can be saved with your Live set.

Select Grid step size (the metrical length of all steps) with the Grid selector. Click Grid to toggle into unsynchronized millisecond Time rate clock mode.

Use the Mode selector to choose between the default Free playback, Gate which only plays the sequence while an incoming MIDI note is held, Side which does the opposite (only playing between incoming MIDI notes), Trig which advances from one step to the next with each new MIDI note on for vintage step bank triggering, Back mode which restarts the sequence with each note on and keeps playing regardless of note off, and Arp mode which only plays while notes are held and restarts the sequence from the beginning with each note on, making it an effective arpeggiator.

Forward, Reverse, Circular, and Random modes adjust the playhead motion in the direction selector. Finally, at bottom, adjust the swing amount percentage and base swing interval.

2 · Here we find our **Global Step** settings.

The first selector changes the pitch control state of all steps simultaneously. Please note pitch values for steps in Chance mode will not be saved with your Live set. Switching to "All Chance" will also randomize note pitches.

The second selector sets the randomization algorithm for all steps in Chance mode: pure Luck, Drunk for random walk to neighboring values, or Fluid for lyrical quantum chaos.

The global percentage slider adjusts the randomization amount for all parameters simultaneously, while the global interval slider changes all parameter auto-randomization intervals in unison.

The global dice instantly randomizes all unlocked step parameters and note pitches — setting all step pitch modes to Chance in the process, instantly generating a fresh sequence. The two intersecting arrows toggle all auto-randomizations, perfect for freezing an auto-generated sequence by preventing further randomization.

The Key unlocks all currently locked parameter locks. The Reversion toggle resets all steps to their initialized default state - use with caution.

3 · These are the **Global Randomization** controls.

Each parameter can be instantly randomized by clicking the Dice, or auto-randomized via the shuffle arrows. Each parameter randomization amount can be changed with the percentage slider, with its own auto-randomization interval set in bars by the slider below that.

Mutes feature two extra toggles. The Up/Down arrows turn all muted steps on before muting all steps, after which it functions as an On/Off toggle for all unlocked steps. The Left/Right arrows invert current unlocked step mute states.

Pitch features global Minimum and Maximum values to specify the randomization range, and a reset toggle to set all note values back to their default of C3. The gear icon opens advanced per-step randomization features for all steps in Chance mode, offering ranges, algorithm, and probability on a per-step basis.

Velocity features a base value slider to adjust the velocity of all unlocked steps simultaneously, along with Minimum and Maximum randomization range controls.

Length features a global Length selector to set the length of all unlocked steps at once, along with Minimum and Maximum randomization range controls.

Finally, Tie has a reset button to disable note ties for all unlocked steps, and a Hold toggle to engage sustain for all steps until disabled.

The Key toggle for each parameter enables or disables all locks for that step parameter.

Pattern Engine

Visual Guide
Continued
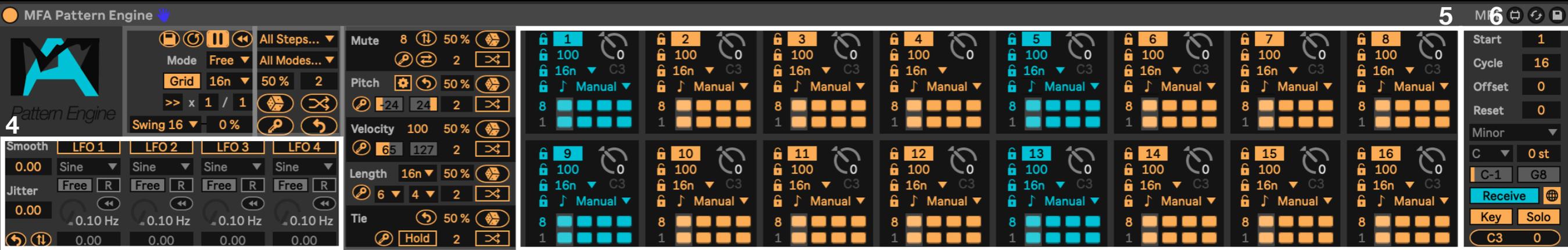
4 · This the **Global LFO** section.

At left are global smoothing and jitter sliders for all four LFOs simultaneously. Below this is the global LFO step parameter reset toggle to return any steps in LFO mode to their default Motion and Center values of 0.

All four LFOs are deactivated by default to save on CPU, but are automatically activated whenever a step is assigned to one of them; toggle an LFO off to freeze the state of LFO-controlled steps in real-time — or use the all-LFO state toggle with the two arrows at bottom left to simultaneously active or deactivate all LFOs.

Each LFO offers seven waveforms: Sine, Saw up, Saw down, Triangle, Square, random S&H, and random Bins. LFO rate can be set in Hertz in the default Free mode, or synchronized to Live with metrical values in BPM mode.

Click the R button to reset the LFO cycle with each note on, or reset manually with the double-back arrows. An LFO Phase offset slider is available below.

5 · This is the main **Step Control** area.

Each step features Mute on/off, Velocity, Duration, and Tie, all with optional locks, along with Note Pitch via the dial, Pitch Mode, via the selector, Cycle Length, and Cycle Pattern grid.

Manual mode is the only mode that saves exact current note pitch values with the Live set — and also exempts them from randomization, so Manual mode can be considered the equivalent of a lock for note pitch.

The Cycle Length in combination with the Grid allows you to program a pattern of which loop cycles a particular step will play on, with loop cycle governed by the Cycle length and Reset in the Global Output settings, and not necessarily measured in bars.

Advanced per-step randomization features only appear for steps set to Chance mode with the Pitch Advanced gear icon enabled to view them.

Similarly, LFO Motion and Center modulation controls only appear for steps assigned to an LFO. Modulation controls are not LFO-specific: the same values are retained when switching a step's LFO assignment.

The raw note values displayed with each step are prior to outgoing Scale and Key quantization.

6 · These are the **Global Output** controls.

Adjust the sequence Start step, Cycle length, and Offset, along with a Reset interval, in bars.

Specify the output Scale and Key via their selectors. Transpose output via the semitone slider, and specify Minimum and Maximum output note ranges. Use the globe icon to toggle whether scale and key are set by Live 12 or an instance of Global Hub, or pinned locally.

In default Receive mode, incoming MIDI notes transpose output; toggle to Internal to ignore MIDI input. Sequence mode allows for transposition of the sequence via MIDI input — or toggle into Accompany mode to play notes alongside the sequence; doing so automatically switches from Receive to Internal. You can also toggle from Receive to Internal to reset the internal transposition buffer to the default C3. The / toggle indicates pitches set to zero will correspond to the current Key in octave 3; toggle it to - to switch to former behavior where pitches of zero always correspond to C3, regardless of current Key.

The display at bottom shows actual outgoing MIDI note pitch and velocity, accounting for current scale and key, unlike the raw note values shown with each step. You can also click here to Flush stuck MIDI notes.

All of Pattern Engine's parameters are Info View annotated, so if you ever need a reminder, just open Live's Info View and hover over the parameter in question for further details.

Pattern Engine
Parameter Automation & Storage

Due to a longstanding issue with how Max for Live devices are made visible to Live, continuously randomizing parameters can't be stored with a Live set.

To ensure specific step note pitches are saved with your Live set, the pitch mode of those steps must be set to Manual, not Chance. To ensure other step parameters are saved with your Live set, disable auto-randomization or lock specific step parameters to allow them to be stored.

As a result of the same phenomenon, parameters with auto-randomization enabled are also unavailable for automation or mapping, and will not appear in Live's Undo history. To allow automation and re-enable MIDI, key, or macro mapping for particular steps while leaving auto-randomization otherwise active, engage the appropriate step parameter lock.

MIDI and Audio tracks set to record output from Pattern Engine

Click this Disk icon to allow your sequence to be stored when you save your Live set
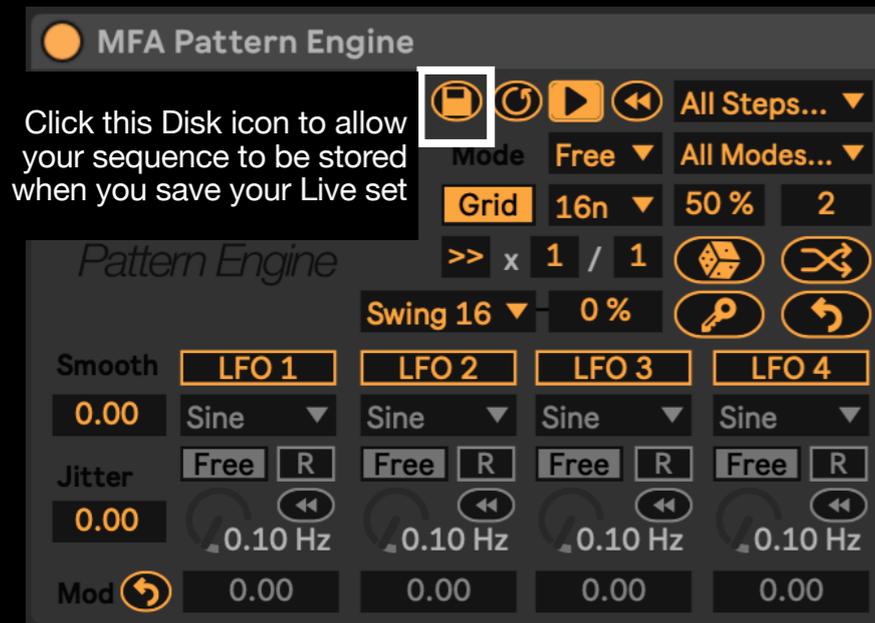
You can also simply click the Disk icon (pictured left) at the upper left of Pattern Engine's GUI to set all Chance-enabled step note pitches to Manual mode while leaving LFO-controlled steps unaltered and simultaneously disabling any auto-randomizations. This allows your precise current sequence state to be saved with your Live set.

To store Pattern Engine output and continue editing it elsewhere, you can also record Pattern Engine output as MIDI or audio to other tracks in your Live set (pictured above right).

Pattern Engine
Advanced Usage

Pattern Engine parameters are available for MIDI or Key mapping and automation — with the exception of note pitches set to Chance, or any unlocked step parameters for which auto-randomization might be engaged. This is due to a longstanding issue with how Max for Live devices are made visible to Live and necessary to avoid crashing.

To ensure specific step note pitches are saved with your Live set, make sure they are set to Manual and not Chance mode. To ensure other unlocked step parameters are saved with your Live set, disable auto-randomization — or lock specific step parameters.

You can also click the Disk icon at the upper left of Pattern Engine's GUI to set all Chance-enabled step note pitches to Manual mode while leaving LFO-controlled steps unaltered and simultaneously disable any auto-randomizations in order to allow your current sequence state to save with your Live set.

Another option is to record the sequence output as MIDI to another track in your Live set — which allows for further editing and control via Live's Note Editor.

Transposing in real-time via MIDI controller is a super fun way to interact in real-time as a performer with Pattern Engine's generative sequences. You can also feed an ongoing transposition sequence into Pattern Engine via pre-programmed MIDI clips, expanding the melodic narrative of any sequence. Received MIDI pitches below C-1 (C-2 to B-2) will change the Key.

We also recommend experimenting with the different sequence Modes such as Trig to expand the length of a sequence, or Arp to turn Pattern Engine into a highly-programmable generative arpeggiator.

While restricted to 16 steps, this limitation can inspire creativity by forcing use of LFO cycles to apply longer melodic contours, often resulting in dynamic musical structures that would be difficult to achieve through more traditional means.

All Pattern Engine parameters are annotated in the Info View, and mapped to banks for control via Push.

What are you waiting for? Dive into Pattern Engine to discover infinite new realms of music at your fingertips.

Pattern Engine   Example 1

MANIFEST AUDIO

In this example, step 1 is on with a pitch of A: in relative mode with a key of D plus 7 semitones. Steps 2, 4, 5, 7, 9, 10, and 14 are all off. Due to their locks, step 3 will remain on and step 4 will remain off regardless of any incoming randomization; however, locks still allow randomized changes, with the exception of step 4's mute setting. It is set to a four-loop cycle and will only play on the second and fourth cycles.

Due to its velocity lock being enabled, step 13's velocity will stay at 106 regardless of randomization input, but again, can still be changed manually. Step 14 is off but its length will remain at 32nd, ignoring any randomization due to its length lock, while Step 15 will remain tied until manually changed, due to its tie lock.

Step 3 is in Chance mode using the Luck algorithm, with a 38% chance of randomization at a given dice roll or auto-randomization interval, all within a range of -24 and 12 semitones (with D3 as 0). Step 5 is muted, but is set to the Drunk randomization algorithm with 50% chance of randomization within the standard range of -24 to 24, while step 6 is set to use the Fluid algorithm with an 87% chance of randomizing between 0 and 24 semitones and therefore residing at higher octave ranges.

Step 8 note pitch is governed by LFO 1, moving 12 semitones above and below a low note center of -24 semitones in a positive direction, while step 11 is controlled by LFO 2, moving 24 semitones above and below a higher note center of 12 semitones, also in a positive direction. Step 12 will play only on the second, fourth and seventh cycles of a 7-loop cycle. Step 16 will only play every third loop cycle.

All output will be quantized to D Pentatonic minor, which is pinned locally to save directly with the device.

Pattern Engine   Example 2

MANIFEST AUDIO

This is an example of a shortened sequence. Steps outside the Cycle range are darker grey. The cycle starting step, with Offset enabled, is a slightly lighter shade of grey.

The Cycle is set to 5 steps, so the sequence is only 5 steps long. The Start step is set to 3, so that is where the sequence begins. However, the Offset is set to 2, so the sequence begins on step 5, before cycling around to step 3 which has effectively become the fourth step in this particular sequence. With Reset set to 4 bars, every fourth bar the cycle will reset to its first step, which in this case, is offset to step 5. Step 5 is also set to a 5 loop cycle, and will play only on the first and third of those cycles; in this case the cycle length is only 5 steps so that is the length loop cycles will be calculated at.

Step 3 is locked to mute unless manually changed while step 5 is locked in an unmuted state. Step 5 is also manually set to -23 semitones. Steps 4 and 6 are eligible for note pitch randomization, both in Decide mode; step 4 will decide between -5 and 15 64% of the time, while step 6 will decide between 36 and 7 semitones above zero 42% of the time. Step 7 is controlled by LFO 3 moving 12 semitones above and below a high center value of 24 semitones, in a negative direction.

All steps will be transposed -12 semitones down and quantized to a G Blues scale, which is pinned locally. Notes above C8 and below C0 will be forced within that range.

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Pattern Engine   Example 3

This final example is only using a single step, with the Cycle length set to 1 single step. All output is quantized to an F Persian scale, pinned locally to be saved as a preset, and transposed up an octave, or +12 semitones.

The note pitch of our single step is then assigned to control by LFO 1, which is set to a Square wave, which means that step 1's Motion control determines the distance between the minimum and maximum Square wave values, while step 1's Center effectively transposes the entire affair up or down.

We can change the oscillation of this pattern via LFO 1's unsynchronized rate, in Hertz; however, since it has Retrigger enabled, if we send it a MIDI clip with a single note, it will reset predictably whenever the clip loops around to its note on, harnessing unsynchronized LFO rates to still produce a rhythmically predictable result.

Note length, velocity, and tie could all be manipulated or randomized to add further dynamism to this single-step recipe which hopefully shows some of the boundless possibility contained within Pattern Engine.

Pattern Engine   FAQ

The sequence is out of sync with Live's transport - how do I realign it?

Click the Reloop button next to Play/Pause in the GUI's upper left to realign the starting step with the start of the next bar.

The mute buttons don't seem to work - why not?

Mute buttons are superseded by a step's cycle grid; if all cycle grid steps are off, the mute button will not do anything - so make sure cycle steps are activated.

Output keeps transposing when I play MIDI notes - how can I stop this?

Disarm record input for the MIDI track containing Pattern Engine, or toggle from Receive to Internal mode.

Note output seems transposed lower or higher than it should be — how do I reset it?

If Pattern Engine was receiving MIDI notes to transpose in Receive mode and then stopped receiving, it may be "stuck" on the last received note; to fix this, toggle the Receive mode button to Internal — and back to Receive, should you wish — to reset the internal note setting. Alternatively, you could feed it the note C3 in Receive mode.

Why do low MIDI notes change Pattern Engine's Key?

Received note pitches below C-1 (C-2 to B-2) are used to change the base Key, so be sure not to trigger such low notes. Disable MIDI input or switch to Internal mode to avoid accidentally triggering Key changes.

MIDI notes are getting stuck for some reason — what should I do?

The MIDI note output display in the lower right of Pattern Engine's GUI doubles as a MIDI flush button — in the rare case of emergency, just click there to flush any stuck notes.

Certain parameters are unavailable for automation — why?

When a parameter is auto-randomized (or a step note pitch is set to Chance mode), it cannot be seen by Live's automation system. To allow automation for a particular step, engage the lock for any auto-randomizing parameter — or simply disable auto-randomization, if possible.

I don't want Pattern Engine to conform to Live 12 or Global Hub's scale and key — is this possible?

Any device that can be impacted by Global Hub has a Global toggle; click this to pin the scale and key to Local Pattern Engine settings. Toggling from Local back to Global mode will automatically force the device to inherit Global Hub or Live 12 settings. However, so long as there is an instance of Global Hub in a Live Set, the scale and key will be saved with that Global Hub so pinning locally is not necessary in this case.

Pattern Engine scale and key are not saved with my Live set or presets — what's wrong?

For device scale and key to be stored locally with a set in Live 11 or older without an instance of Global Hub, or with a preset, the scale and key Global mode must be toggled to pin the scale and key to Local Pattern Engine settings first. Toggling from Local back to Global mode will automatically force the device to inherit Global Hub or Live 12 settings.

Pattern Engine looks small — how do I make it bigger?

In the Look/Feel tab of Live's Preferences pane, simply increase the Zoom Display percentage slider to 125% or 150%.

I'm getting glitches and drop-outs in Live — how can I avoid this?

In the Audio tab of Live's Preferences pane, increase the Buffer Size to at least 256 samples; we recommend 512.

I'm getting errors attempting to load the included .adv presets — how can I fix this?

For the Presets to work, you must copy the included "MFA Pattern Engine.amxd" file to both locations: 1. *User Library → Presets → MIDI Effects → Max MIDI Effects*; and 2. *User Library → Presets → MIDI Effects → Max MIDI Effects → Imported*

Thank you for supporting us by purchasing this device — we hope it inspires your creativity!

For more information, video tutorials, and other devices, please visit us online at: **manifest.audio**

MANIFEST AUDIO