

# Step Farther

8-Stage Pitch & Gate Sequencer for Reason



*Step Farther — front panel.*

Step Farther is a hands-on step sequencer built around a classic eight-stage vintage-hardware architecture, extended with a fluid acid-style slide engine, per-stage ratchets, thirty quantizer scales, sixteen direction modes, a built-in Random engine, and a two-input AUX modulation matrix. It generates Pitch and Gate control voltages — it makes no sound itself — and drives any instrument in the rack.

This manual is a complete reference. Each control is described in plain terms: what it does and how it interacts with the rest of the device. For a one-minute introduction, read the separate *Quick Start Guide* first.

## At a glance

8 stages • per-stage pitch, pulse count, gate mode, ratchet, slide and skip • 30 scales • 16 direction modes • internal or external clock • swing • Random engine • AUX A/B routing • full per-parameter CV • patch support.

## 1 Overview & signal flow

Step Farther advances through up to eight **stages**. Each clock tick produces a **pulse**; a stage holds for as many pulses as its PULSE knob specifies, then the sequence moves to the next stage in the order set by the **direction** mode. On the first pulse of each stage the device emits that stage's **pitch** (quantized to the current scale and root) on PITCH OUT, and articulates a **gate** on GATE OUT according to the stage's gate mode, ratchet pattern and the global gate-length setting.

The clock is either internal (Step Farther runs on Reason's tempo) or external (it steps from pulses arriving at CLOCK IN). On top of the core sequence sit three optional layers: the **Random** engine, which re-rolls chosen parameters over time; the **AUX** matrix, which routes two CV inputs to musical targets; and the full per-parameter **CV** inputs on the back panel, which let any other device modulate Step Farther in real time.

The front panel is organised into five areas:

<b>Display</b>	Green LCD showing the live sequence — stage bars, transport readout, scale and direction.
<b>Stage grid</b>	The right-hand block: eight columns (stages) × six rows (pitch, pulse, gate, ratchet, slide, skip).
<b>Random panel</b>	The centre block with the “%” header: per-parameter chance and range, cycles, mode and on/off.
<b>Transport &amp; globals</b>	Lower row: RUN / RESET, the clock and octave switches, and the global tempo, scale, direction and AUX knobs.
<b>Patch browser</b>	Top of the panel: load, save and step through patches.

## 2 Installation & connections

Create Step Farther from the rack's device browser; it appears among the CV and utility devices. Because it is a CV source, it needs an instrument to sound. Creating a synth directly below Step Farther auto-wires the two main outputs. To wire by hand, press Tab to flip the rack and connect:

- **PITCH OUT** → the instrument's CV / Sequencer Pitch input (1V/oct).
- **GATE OUT** → the instrument's Gate or amplitude-envelope Gate input.

PITCH OUT follows Reason's 1V/oct convention, so it reads correctly on every stock synth, Pianoteq and the CV instruments. SYNC OUT provides a clock pulse for chaining a second Step Farther or any clockable device. All other jacks are optional modulation — see *Chapter 11, Back-panel CV reference*.

## 3 The display

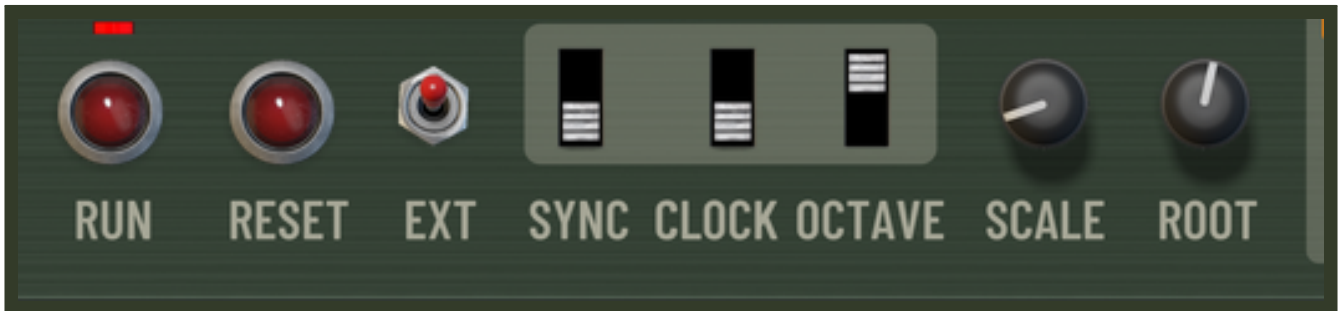


The LCD redraws on the first pulse of every stage and shows the current state of the running sequence.

- **Stage bars 1–8** — each bar's height represents that stage's pitch; the highlighted stage number is playing now.
- **RATE / DIV / LEN / BPM** — clock division, step divider, active sequence length, and the tempo in use.
- **Direction** — the current mode (e.g. ■ FWD).
- **Scale & ROOT** — the active quantizer scale and key centre.
- **Keyboard** — the notes belonging to the current scale are lit.
- **RND bar** — progress toward the next Random re-roll.

The display is a read-out only — all editing happens on the physical knobs, faders and switches. Hovering a control shows its exact value in Reason's tooltip.

## 4 Transport & clock



The transport and global switches, lower-left of the panel.

**RUN** starts and stops the sequencer. In internal-clock mode it starts the internal clock; in external mode it arms the device so it advances on incoming clock pulses. **RESET** jumps to the first stage with its pulse counter cleared and restarts the slide and gate state. Both buttons can also be driven from the back panel (see Chapter 11).

Three vintage flip switches sit beside the transport buttons:

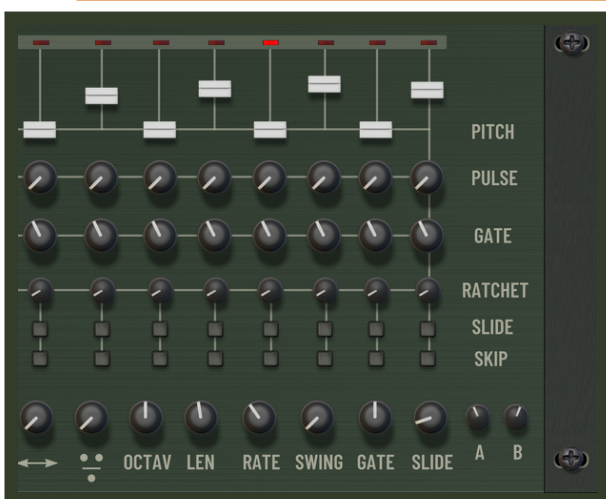
Switch	Positions	Function
<b>CLOCK</b>	Internal / External	Internal: Step Farther runs on Reason's tempo. External: it steps from pulses at CLOCK IN.
<b>SYNC</b>	First Pulse / Last Pulse	Chooses whether re-sync and reset align to the first or last pulse of a stage.
<b>OCTAVE</b>	1 / 2 / 3 octaves	Sets how many octaves the per-stage PITCH control spans. Default: 3 octaves.

**RATE** sets the clock division — the musical length of one pulse:

Value	1/1	1/2	1/4	1/4T	1/8	1/8T	1/8D	1/16	1/16T	1/16D	1/32	1/32T
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**STEP DIV** (the divider control, shown as DIV on the display) further divides the rate by 1, 2, 4, 8, 16 or 32, for slow or very fast variations of the same groove. **SWING** delays the off-beat (odd) pulses while shortening the on-beat pulses so the average tempo is preserved — from 0 (straight) up to roughly a one-third shuffle at maximum. **LEN** sets the active sequence length from 1 to 16: lengths above 8 wrap back through the stages (length 10 plays stages 1–8 then 1–2 before resetting), a vintage-hardware-style extension that produces evolving, non-power-of-two phrases.

## 5 The stage grid



Each of the eight columns is one stage; the six rows set everything about how that stage behaves. Pitch and pulse are covered here; gate, ratchet, slide and skip in Chapter 6.

**PITCH** — the note the stage plays. The fader's range is set by the OCTAVE switch (1–3 octaves) and the value is quantized to the current scale and root, so the stage always lands on an in-key note. The display's stage bar and keyboard reflect the result.

**PULSE** — how many clock pulses the stage lasts, from 1 to 8. A stage with pulse 4 holds for four ticks before the sequence advances. In the *Fixed* direction modes the pulse count is ignored and every stage lasts exactly one pulse.

## 6 Gate, ratchet, slide & skip

**GATE** mode sets how a stage articulates over its pulses:

Gate mode	Behaviour
<b>Hold</b>	The gate stays high for the entire stage, across all its pulses. Ratchet has no effect.

Gate mode	Behaviour
<b>Multiple</b>	A fresh gate fires on every pulse of the stage. Ratchet patterns apply to each pulse.
<b>Single</b>	One gate fires on the first pulse only; the remaining pulses are silent.
<b>Rest</b>	The stage is silent. It still occupies its pulses and the sequence advances normally.
<b>Dotted</b>	A gate on the first pulse, then a second gate at 1.5× the pulse interval — a dotted feel.
<b>Random</b>	Each pulse independently gates or rests at random, for sparser, shifting patterns.

**RATCHET** subdivides each gated pulse into multiple hits:

Ratchet	Behaviour
<b>1 / 2 / 3 / 4</b>	That many evenly-spaced gates within the pulse — the classic vintage-hardware ratchet.
<b>Accent</b>	Four gates with the first one accented (longer / emphasised).
<b>Front</b>	Four gates clustered into the first half of the pulse; the second half is silent.
<b>Back</b>	Four gates clustered into the second half of the pulse; the first half is silent.
<b>Bounce</b>	Four gates with accelerating spacing — like a ball settling as it bounces.

**SLIDE** turns on a classic acid-style glide *into* the stage: the pitch ramps smoothly from the previous stage's note to this stage's note over the first pulse. The glide time is set globally by the **SLIDE** knob, and is automatically capped so it never overruns the pulse. The slide flag belongs to the destination stage — it affects how the sequence arrives *at* that stage. **SKIP** removes the stage from the sequence entirely; the playhead passes straight over it.

## 7 The pitch system

Every stage's pitch passes through a quantizer before it reaches PITCH OUT. **SCALE** selects one of thirty scales and **ROOT** sets the key centre (any of the twelve notes; default C). Notes that fall outside the scale are snapped to the nearest scale tone, so the sequence stays in key no matter how the faders are set.

Chromatic	Major	Minor
Dorian	Mixolydian	Lydian
Phrygian	Locrian	Diminished
Whole-Half	Whole Tone	Min Blues
Pent Minor	Pent Major	Harm Minor
Mel Minor	Super Locrian	Arabic
Hung. Minor	Minor Gypsy	Hirajoshi
In-Sen	Iwato	Kumoi
Pelog	Spanish	Tritone
Prometheus	Augmented	Enigmatic

*The thirty scales, in selector order.*

**OCTAVE** (the clock-area switch) sets the span of the pitch faders — 1, 2 or 3 octaves. **OCTAV** (the global knob) is a separate octave transpose of -2 to +2 octaves applied after quantizing, with its own back-panel CV input; use it to move the whole sequence up or down without retuning every stage. Octave transposes always stay on whole octaves, so they never break the key.

### External pitch (slave) mode — the EXT button

The **EXT** button enables external pitch. When it is on (the default), any per-stage Pitch CV patched into the back-panel matrix **IN** row overrides that stage's own fader — another device can feed notes into individual stages while Step Farther still handles timing, gates, ratchets and slide. Turn EXT off to ignore those inputs without unplugging. The matrix **OUT** row emits each stage's finished, post-quantize pitch, so you can chain or layer instances.

## 8 Direction modes

The **direction** control sets the order in which stages play. Sixteen modes are available. Modes that have a *Fixed* partner come in pairs: the normal mode honours each stage's pulse count, while the Fixed variant ignores pulse counts and advances exactly one stage per clock pulse — useful for tight, even patterns.

Mode	Order of play
<b>Forward</b>	Stages 1→2→...8, then repeat. The default.
<b>Reverse</b>	Stages 8→7→...1, then repeat.
<b>Ping-Pong</b>	Up to 8 then back down to 1; the end stages play once per bounce.
<b>Random</b>	A uniformly random pick among the enabled (non-skipped) stages each step.
<b>Brownian</b>	A random walk: step ±1 or stay (25% / 50% / 25%).
<b>Drunken</b>	A three-state walk — 25% back, 50% stay, 25% forward; looser than Brownian.
<b>Pendulum</b>	Like Ping-Pong, but the end stages play twice as the direction turns.
<b>Odd-then-Even</b>	All odd stages (1,3,5,7) in turn, then all even stages (2,4,6,8).
<b>Pivot</b>	Zig-zags from the outside in: 1, 8, 2, 7, 3, 6 ...
<b>Shuffled</b>	A random permutation — every stage plays once per cycle, then the order reshuffles.
<b>Chord-order</b>	Stages are visited in ascending pitch order, lowest note first.

**Forward**, **Reverse**, **Ping-Pong**, **Random** and **Brownian** each also appear as a *Fixed* variant (e.g. *Forward Fixed*) immediately after the standard version in the list — sixteen positions in total. Random and Brownian directions, like the Random engine, give a different result on every pass.

## 9 The Random engine



The centre panel (marked “%”) introduces controlled, evolving variation. For each of four parameters you set a **chance** (the left “%” column — how likely a re-roll is) and a **window** (the right “↔” column — how far the value may move from its stored setting). At zero chance the parameter is untouched and the stored value plays as set.

- **Pitch** — window 0–24 semitones.
- **Pulse** — window 0–7 pulses.
- **Gate** — window across the gate modes.
- **Ratchet** — window across the ratchet variants.

The lower controls govern timing and behaviour:

<b>CYCLES</b>	How often the engine re-rolls — every 1 to 10 complete sequence cycles.
<b>RND</b>	Re-rolls the chosen parameters once, immediately — a manual “roll the dice” button.
<b>R MOD</b>	How random ratchets apply: <i>Variant</i> changes the stored ratchet, <i>Trigger</i> adds extra hits without changing it, <i>Both</i> does each.
<b>ON/OFF</b>	Enables continuous re-rolling. With it off, the engine is idle except for a manual RND press.

Every Random parameter also has a CV input on the back panel (the *Random Mods In* row), so chance, window, cycles and on/off can themselves be modulated or sequenced. The RND bar on the display tracks progress toward the next automatic re-roll.

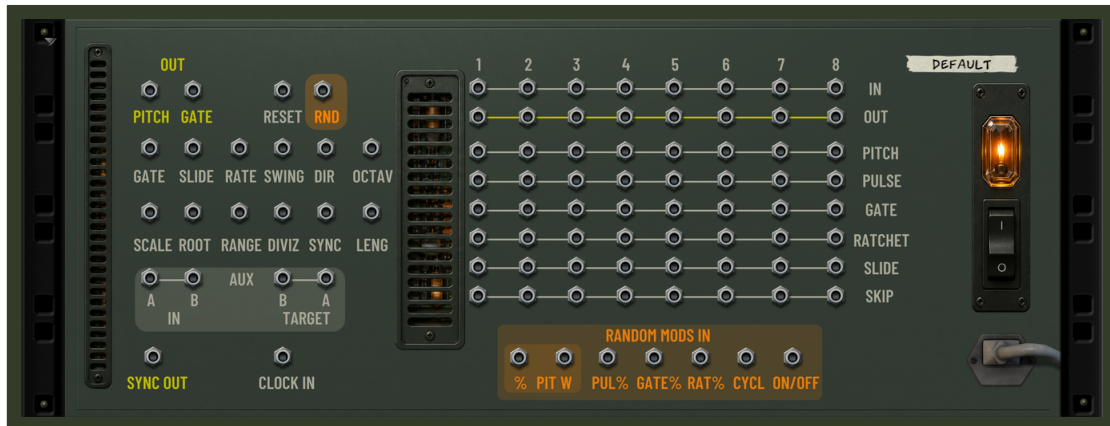
## 10 AUX A / B modulation

Step Farther has two general-purpose modulation inputs, **AUX A** and **AUX B**, on the back panel. Each is routed to a destination you choose with the front-panel **A** and **B** knobs (the target can also be selected by CV). A CV patched into an AUX input then modulates that target in real time. By default AUX A is set to *P.Pre* (transpose) and AUX B to *P.Oct* (octave) — reflected in the jack labels on the back. The eleven targets:

Target	Effect
<b>Gate Len</b>	Modulates the global gate length.
<b>Stages</b>	Adds to the active sequence length (clamped to the 1–8 region).
<b>Step Div</b>	Shifts the step divider up or down its range.
<b>Ratchet</b>	Shifts every stage's ratchet variant together.
<b>P.Pre</b>	Transpose added to all pitches <i>before</i> quantizing (semitones).
<b>P.PreL</b>	As P.Pre, but locked to the current scale.
<b>P.Oct</b>	Octave shift applied to all pitches ( $\pm 2$ octaves).
<b>P.Post</b>	Transpose added to all pitches <i>after</i> quantizing.
<b>P.PostL</b>	As P.Post, but locked to the current scale.
<b>Root</b>	Modulates the global root note.
<b>RootL</b>	As Root, but constrained to the current scale.

If a target also has its own dedicated CV input, the AUX contribution is *added* on top. The “L” (locked) variants keep modulated pitches inside the current scale, which is the easiest way to get musical transposition from an unquantized CV source such as an LFO.

## 11 Back-panel CV reference



Step Farther — back panel.

All CV is bipolar where it makes sense and is clamped to each parameter's range internally, so modulation can never push a value out of bounds.

### Outputs

- **PITCH OUT / GATE OUT** — the playing stage's pitch (1V/oct) and gate.
- **SYNC OUT** — a clock pulse for chaining downstream devices.
- **Matrix OUT row (1–8)** — each stage's finished post-quantize pitch, one jack per stage.

### Core inputs

- **CLOCK IN** — external clock pulses (used when CLOCK is set to External).
- **RESET** — a rising edge jumps the sequence to stage 1. **RND** — triggers one Random re-roll.
- **AUX A In (Transpose) / AUX B In (Octave)** — the two modulation inputs; **TARGET A / B** select their destinations by CV.

### Global modulation inputs

One jack each for **GATE** (gate length), **SLIDE** (slide time), **RATE**, **SWING**, **DIR** (direction), **OCTAV** (octave transpose), **SCALE**, **ROOT**, **RANGE** (octave range), **DIVIZ** (step divider), **SYNC** (sync mode) and **LENG** (length).

### Per-stage matrix & Random mods

The 8-column matrix carries per-stage CV: an **IN** row (external pitch / slave), an **OUT** row (per-stage pitch out), and rows for **PITCH**, **PULSE**, **GATE**, **RATCHET**, **SLIDE** and **SKIP** modulation. The **Random Mods In** strip exposes the Random engine: **%** (pitch chance), **PIT W** (pitch window), **PUL%**, **GATE%**, **RAT%** (pulse / gate / ratchet chance), **CYCL** (period) and **ON/OFF** (enable).

## 12 Patches & tips

Step Farther supports patches. Use the browser at the top of the panel to load, save and step through grooves; the device ships with a sensible default patch. A few ways to get more out of it:

- **Polyrhythms** — set LEN to a value such as 6, 10 or 12 against a 4/4 host for phrases that drift and resolve over several bars.
- **Acid lines** — a minor or pentatonic scale, a few stages with SLIDE and Accent ratchets, and a short gate length give an instant acid feel.
- **Living patterns** — a low Pitch chance with a small window (2–3 semitones) and CYCLES set high adds gentle melodic variation that never leaves the key.
- **Chaining** — wire SYNC OUT and the per-stage matrix OUT row into a second Step Farther or a synth's sequencer input to build stacked, self-syncing parts.

## 13 Specifications & quick reference

Item	Value
<b>Device type</b>	CV processor / step sequencer (helper). 4U panel. Patch support.
<b>Stages</b>	8, each with pitch, pulse count (1–8), gate mode, ratchet, slide and skip.
<b>Sequence length</b>	1–16, with wrap-around past stage 8.
<b>Scales</b>	30 quantizer scales; root selectable across all 12 notes.
<b>Octave controls</b>	Pitch span 1–3 octaves; global octave transpose $\pm 2$ octaves.
<b>Gate modes</b>	6 — Hold, Multiple, Single, Rest, Dotted, Random.
<b>Ratchet variants</b>	8 — 1, 2, 3, 4, Accent, Front, Back, Bounce.
<b>Direction modes</b>	16 — Forward / Reverse / Ping-Pong / Random / Brownian (each with a Fixed variant) plus Drunken, Pendulum, Odd-then-Even, Pivot, Shuffled, Chord-order.
<b>Clock</b>	Internal (host tempo) or external; rate 1/1–1/32T; step divider $\div 1$ – $\div 32$ ; swing 0–33%.
<b>Random engine</b>	Per-parameter chance + window for pitch, pulse, gate and ratchet; re-roll every 1–10 cycles, or on demand.
<b>AUX routing</b>	2 CV inputs, each routable to one of 11 targets (CV-selectable).
<b>CV outputs</b>	11 — Pitch, Gate, Sync, and 8 per-stage pitch outputs.
<b>CV inputs</b>	80+ — clock / reset / random triggers, AUX A/B and their targets, all global parameters, all per-stage parameters, 8 external-pitch (slave) inputs, and the Random engine.
<b>Version</b>	1.0 • com.doodov.StepFarther • Doodov Digital Design.

Step Farther • Doodov Digital Design • This manual documents version 1.0. Specifications and behaviour may be refined in later releases.