# Vinx PER|FORMER User Manual

Printable black-and-white reference generated from the current online manual.

Firmware line: Vinx PER|FORMER. Website: vinxscorza.github.io/performer

# User Manual

This manual is the main practical reference for the Vinx Scorza fork. It explains how to use the firmware, how the main workflows behave, and where the current validation limits are.

The Home page gives the quick overview, and Features gives the curated feature map. This manual is where operational detail belongs: page behavior, generator semantics, routing targets, Launchpad workflows, calibration, firmware update procedure, and practical notes.

It is intentionally practical rather than promotional: it avoids release-note repetition, but keeps concrete controls, mappings, limits, and exception rules whenever they affect how the firmware is actually used.

Known limits and hardware validation status are tracked in Known Limits / Validation Scope.

Scale and Voltage Mode behavior are covered in User Scale, with current hardware-validation status tracked separately.

Search, sidebar navigation, and appendix tables are intended to make this manual usable as both a learning path and a reference while working on the module.

A printable black-and-white PDF version of this manual is available here: vinx-performer-user-manual.pdf.

Historical upstream reference: Mebitek User Manual

# Known Limits / Validation Scope

This table is the canonical validation snapshot for the firmware line. It is intentionally explicit about what is already confirmed in real use and what still needs broader hardware coverage.

| Area | Status | Current scope / practical note |
|---|---|---|
| 16-step Editing Mode (LCXL) | Validated | Maintainer-side on-device validation is on Launch Control XL using Factory Preset #1. |
| 16-step Editing Mode (BSP) | Pending hardware test | Template/mapping is code-supported; dedicated maintainer-side on-device validation is still pending. Template download: PERFORMERstep16_BSP.beatsteppro. |
| Voltage Mode (Note/Arp/Stochastic) | Partially validated | Cross-track behavior is aligned (including octave wrapping on 1.2V span). Additional field testing is still useful for uncommon scales, especially notesPerOctave > 12 on Arp/Stochastic paths. |
| External clock modes | Partially validated | Reset Pulse / Reset Gate behavior is stabilized, but broader hardware testing across different clock sources/modules remains recommended. |
| Desktop Simulator USB MIDI | Partially validated | Validated on macOS / OS X with Launchpad Mini MK3; coverage on other Launchpads and OS combinations is still incomplete. |
| External controller concurrency | Known architecture limit | One active external USB controller workflow at a time. USB hubs (including powered hubs) are not supported by the current firmware USB host stack. |
| Save/Load reboot issue hardening | Strong partial hardening | Save/Save As/Load races were strongly mitigated (serialized tasks + UI-thread result dispatch), but full architectural closure is still in progress. |

# Video Walkthrough

Quick walkthrough video for the current Vinx workflow: watch on YouTube.

# Table of Contents

Use this compact outline for the main structure. For detailed navigation, use the sidebar and search.

- Launchpad Generators Mode
- 16-step Editing Mode
- Init Semantics
- Chaos Family
- Generator Input Semantics
- Safety / Fail-Closed
- Controller Concurrency Limits
- Desktop Simulator
- Clock Input Modes
- Firmware Update

PER|FORMER is an open source and open hardware eurorack sequencer module. It packs a lot of functionality into a small form factor and was designed both as a versatile sequencer in the studio as well as for live performance. To fully take advantage of all the features available in this module, it is highly recommended to study this document carefully.

The Concepts chapter introduces the overall architecture and functionality of the sequencer. The User Interface chapter gives an overview of the user interface and introduces key concepts of how to use the sequencer. The Pages chapter goes into more detail in terms of functionality and user interface of the various modes and contexts in the sequencer and introduces common workflows. Finally, the Appendix contains reference tables for some of the parameters commonly used in the sequencer as well as additional information on how to use the Novation Launchpad, calibrate the CV outputs and update the firmware.

## If You Come from Westlicht or Mebitek

The Vinx line keeps the overall PER|FORMER workflow intact, while extending generator semantics, external-controller workflows, scale/voltage behavior, and the documentation/simulator ecosystem.

- Generator workflow is explicitly preview/apply-oriented: Random, Acid, Euclidean, and the Chaos family use compare/cancel/apply paths instead of silent destructive edits; generators enter on ORIGINAL and create preview only after explicit reroll or preview arming.
- The generator family has diverged further: Acid is split into Layer/Phrase/Eucl Phrase, Chaos into Vandalize/Wreck, and non-Note tracks use Entropy as the local Chaos subset.
- Voltage Mode handling is hardened beyond legacy behavior; see User Scale for the detailed scale/octave semantics.
- Step-edit ergonomics include quick-access First/Last fields with 16-step bank paging via PREV/NEXT, and chain-aware Note ties for unified tied-note pitch edits.
- Track outputs gained explicit gate shaping via per-track Gate Out Mode (Gate/Trigger) with global trigger-length control in System settings.
- Project file operations (Load/Save/Save As) were hardened against overlap races by serialized task flow and UI-thread result delivery.
- External control is broader than upstream Launchpad-only workflows: Launchpad integration is much deeper, and the experimental 16-step Editing Mode adds direct 16 knobs + 16 pads per-step control on Note tracks.
- The fork is maintained as a standalone Vinx line (v0.x.y) with aligned manual, LP cheatsheet, Web/Desktop simulator pages, and a tracked feature/release history.

## Shortcuts and Key Combinations

In this manual, shortcut references are shown explicitly whenever they are relevant to the workflow being described.

- Machine shortcuts are written with panel key names, for example PAGE + SHIFT + F5, PAGE + S7, or SHIFT + step.
- Launchpad shortcuts use the local LP naming convention: TOP, TRK, and GRID (for example TOP 8 + TOP 4).
- When a function has both machine and Launchpad access paths, both are listed where useful; when only one side is available, it is stated directly.
- Common examples: open machine GEN with PAGE + SHIFT + F5; toggle LP Generators Mode with TOP 8 + TOP 4; undo/redo on supported step pages with machine PAGE + S7 or LP TOP 7 + TOP 8.

### Machine Shortcut Reference

| Shortcut | Scope | Action |
|---|---|---|
| SHIFT + PAGE (or double-click PAGE) | Current page | Open page context menu. |
| PAGE + PLAY | Global | Toggle record mode. |
| SHIFT + PLAY | Global | Pause/continue or restart clock depending on Clock page Shift Mode. |
| PAGE + page key | Global | Jump directly to target page (Clock, Pattern, Performer, Project, Layout, Routing, MIDI Output, User Scale, Steps, Sequence, Track, Song, Monitor, System, Overview). |
| Double-click F1..F5 | Where supported | Quick page access: Project, Layout, Routing, MIDI Output, User Scale. |
| PAGE + SHIFT + F5 | Steps editors | Open machine GEN selector. |
| PAGE + S7 | Step editors | Undo/Redo (1-level) on Note/Curve/Logic; on Stochastic it toggles loop behavior. |
| SHIFT + step, then SHIFT + step | Step editors | Create step-range selection (also across banks via PREV/NEXT). |
| SHIFT + F3 after range selection | Note step editor | Tie selected step range. |
| Hold step + F1..F5 | Note step editor | Set octave quickly (1V..5V) for that step. |
| F2 | System (Calibration / User Settings) | Direct save to flash. |

Some machine combinations are context-dependent by design: for example PAGE + S7 is Undo/Redo on Note/Curve/Logic step pages, but performs loop-related behavior on Stochastic. This split is historical lineage behavior, not a recent Vinx regression.

# Overview

Here is a brief summary of what you get with the PER|FORMER sequencer.

### Features

- 8 track sequencer
- 16 sequences per track
- 64 steps per sequence
- Multiple track and sequence modes
- Note and modulation sequencing
- Arpeggiator
- Snapshot system
- Sequence generators
- Routing system for CV inputs and external MIDI controllers
- Novation Launchpad support
- MIDI output generation from multiple sequences
- Flexible clock system

### User Interface

- Large and bright 256x64 pixel OLED display
- Encoder with push button
- 32 buttons with bi-color LEDs
- 5 function buttons with labels on display

### Inputs and Outputs

- 8 CV outputs (-5V to 5V)
- 8 gate outputs (5V)
- 4 CV inputs (-5V to 5V)
- Clock and reset/run input

- Clock and reset/run output
- MIDI input and output (MIDI TRS 3.5mm jacks)
- USB Host for MIDI over USB
- microSD Card Slot

### Specifications

- Width: 34 HP
- Depth: 25mm
- Power: 100mA @ +12V, 15mA @ -12V (not including USB host power)

This chapter introduces the basic concepts of the sequencer and should familiarize readers with the overall functionality of the sequencer. More in-depth information about specific features are provided in the following chapters.

## Project

A project represents the complete state of the sequencer, with the exception of calibration data. Only one project can be loaded at any given time and all data is volatile, meaning that all changes are lost when the unit is powered off. To persist a project it needs to be stored to the SD card (see Project page).

Projects are split into two data regions. The first region contains all the global data such as project settings, layout settings, MIDI output settings, routing settings, song data and play state. The second region contains the data for the 8 tracks, where each track contains the track settings and 16 sequences. Each sequence in turn contains the sequence settings and up to 64 steps.

Note: Calibration data is stored in the flash memory of the microcontroller and can be backed up and restored from the SD card. This allows exchanging the SD card while running the sequencer or running the sequencer without an SD card at all and still having it properly calibrated.

## Track

A track is responsible for generating note or modulation signals used to control other modules in the eurorack system using the CV/gate outputs. The PER|FORMER sequencer can run up to 8 tracks, that primarily use step sequencing to generate these signals, where each track can run independent of the other tracks. This means that every sequence in a track can have a different time division, run mode, duration or scale among other properties.

### Track Mode

Each of the 8 tracks can be configured to one of the following modes:

- Note
- Curve
- MIDI/CV
- Stochastic
- Logic
- Arpeggiator

In Note mode, the default mode, a track uses advanced step sequencing to generate rhythms and melodies. Curve mode also uses step sequencing, but each step is defined as a curve shape, making this mode very versatile for generating modulation signals. In MIDI/CV mode, a track acts as a MIDI to CV converter, which can be useful when attaching a MIDI keyboard to play some voices live or sequence them from an external MIDI sequencer. In Stochastic mode the track acts as a stochastic CV generator based on note probabilities. In Logic mode the track uses two Note tracks as inputs to perform logic operations on gate and note data. In Arpeggiator mode the track generates arpeggios based on selected steps or input notes.

### Track Routing

In the default configuration, each track controls one of the CV/gate output pairs of the sequencer to control a single voice. However, this configuration can be changed to allow for more flexible routing of the virtual track outputs to the physical CV/gate outputs. For example, a MIDI/CV track can control more than one physical CV/gate output to allow polyphonic operation or output a velocity signal in addition to the pitch signal.

### Track Linking

In Note or Curve mode, a track generates a single CV signal, typically a pitch or modulation signal. To control a voice with multiple signals, for example a pitch and velocity signal, two tracks have to be used in combination. The first track is used to generate the pitch signal while the second track generates the velocity signal. Using two tracks allows different sequence lengths, time division and other properties that affect playback. If that is not desired, the second track can be linked to the first track, essentially doubling the playback behavior.

Track modes, the physical routing to CV/gate outputs and track linking can be configured on the Layout page.

## Note Track

By default, all tracks are configured as note tracks. In this mode, the track uses step sequencing to generate gate and CV signals. A sequence consists of a maximum of 64 steps and there is a total of 16 sequences per track.

Each step is defined through a number of properties, also called layers, to control the generated gate and CV signals.

The Gate layer defines what steps of the sequence create a gate signal. To introduce some random variation, the Gate Probability layer is used to control how often an active gate is actually generated.

The Gate Offset layer is used to offset gate signals into the future, adding a positive or a negative delay before triggering a note.

The Length layer controls the duration of the gate signal and allows tying notes together if set to the maximum. Again, to introduce some random variation, the Length Variation Range and Length Variation Probability layers control a maximum random deviation of the gate length and the probability of actually randomizing the gate length.

The Retrigger layer allows each gate signal to be retriggered multiple times within the duration of the step, allowing for faster gates and ratcheting effects. Retriggered notes are only output within the current Length of the step. This allows outputting a burst of notes only at the beginning of the step. Retriggering can also be randomized using the Retrigger Probability layer.

Inside the Retrigger layer a Metropolix-style mode can be activated when the track is in Free play mode.

The generated CV signal is controlled by the Note layer, which basically defines the voltage to be output for each step. Each note is stored as an index to an entry in a Scale, allowing the generated CV signals to be used both for controlling note pitch as well as other arbitrary modulation signals. In the current Vinx UI, the associated variation layers are shown as Note Range and Note Prob, which together control the amount of note variation and the probability of applying it. The Slide layer controls whether the generated CV signal changes immediately at the start of a gate or glides to the new voltage. Activating a step in the Bypass Scale layer allows bypassing the selected scale and entering one of the 12 chromatic notes directly.

Finally, the Condition layer is used to conditionally trigger steps based on certain rules. This allows relatively short sequences to feel more complex, for example by only playing steps every few iterations. See Step Conditions for additional information.

The playback of the sequence is controlled by additional parameters:

- Divisor controls the rate at which steps are played back
- Run Mode controls the order in which steps are played back
- First Step and Last Step control what range of the sequence is played back

Sequences are edited on the Steps page and sequence parameters can be edited on the Sequence page.

## Curve Track

In Curve mode, a track also uses step sequencing with similar playback features to the note track. However, in this track mode the CV signal is defined by a series of curve shapes, making this mode useful for generating modulation signals. This mode also allows outputting gate patterns, but it is different from how the Note mode works.

The generated CV signal is controlled by the Shape layer, which defines a curve shape to be output over the duration of one step. The Minimum and Maximum layers define the lower and upper voltage that is output for each step. To introduce some random variation, the Shape Variation and Shape Variation Probability layers can be used to define altered shapes that are used instead of the primary shape with some probability.

The generated gate signal is controlled by the Gate layer group. It allows defining a pattern of up to 4 gate triggers per step. The associated Gate Probability layer controls how often a trigger is actually played, Gate Offset shifts the trigger timing earlier or later inside the step, and Length controls the duration of each gate pulse inside the step.

The playback of the sequence is controlled by the same set of parameters as in the note track.

## MIDI/CV Track

In MIDI/CV mode, a track acts as a MIDI to CV converter, taking MIDI note data from either the MIDI or USB MIDI input and converting it to voltages at the CV/gate outputs. This allows playing voices live from a keyboard or using an external MIDI sequencer to control them. MIDI/CV mode also provides a powerful arpeggiator to further help during live playing.

Note: MIDI/CV mode allows using the PER|FORMER module as a pure MIDI/CV converter with up to 8 CV/gate outputs.

## Stochastic Track

In Stochastic mode, a track acts as a stochastic CV generator based on note probabilities. Unlike other sequencer views which show blocks as sequence steps, the stochastic sequencer view shows 12 blocks with each block representing the 12 semitones in a western chromatic scale.

The Gate layer can be used to enable a note in the scale shown in the Note layer. This layer is also used to configure the probability that a gate is output when the corresponding note is played. Each gate can be configured with an offset which causes the gate to be output before or after the corresponding sequence step.

Retrigger, Length, and the related probability/range controls reuse the same broad layer logic described for Note tracks, but applied to stochastic note events rather than fixed melodic steps.

The Note layer defines the probability that an enabled note is chosen. It also carries slide, octave, and octave-probability controls. Stochastic note slots are chromatic internally, but selected musical scales can mask that source material in the current firmware.

## Logic Track

In Logic mode, a track acts as a logic operator using two Note tracks as inputs. This mode inherits all Note-track features and adds two new layouts for the Gate and the Note layer.

In the Gate layer there is a new Gate Logic layout defining the boolean logic operator for each step. The gate logic elaborates the stored gate values coming from the two track inputs.

In the Note layer there is a new Note Logic layout defining the logic operation for each note step. The note logic elaborates the stored note values coming from the two track inputs.

Note: A Note track can only be linked to a subsequent logic track due to the internal architecture of the sequencer. This means that the first available logic track must be track 3, linking to note track 1 and 2.

## Arpeggiator Track

In Arpeggiator mode, a track generates arpeggios based on the selected gates and the input notes coming from the key steps, Launchpad or an external MIDI keyboard. All Note-track layers are available. In addition the track mode offers control over arpeggiator rest, mode, rate, octaves and hold control.

## Pattern

In Note and Curve mode, each of the 8 tracks contains up to 16 sequences, also referred to as patterns. During playback, each track is playing one of its 16 patterns. When switching patterns, all tracks can be switched to the same pattern number or specific patterns can be selected for individual tracks. Patterns are controlled from the Pattern page.

## Snapshot

In addition to the 16 patterns per track, there is an additional snapshot pattern which can temporarily be used to edit sequences without affecting the original. When taking a snapshot, all patterns that are currently playing in each track are copied to the snapshot. Snapshots come in handy during live performance for quickly changing sequences on the fly. The changes can later be committed or reverted. Snapshots are controlled from the Pattern page.

## Fills

Fills can be used as an effective tool during live performance. They allow temporarily changing the playback of a sequence to add some variation or tension. Each track can be configured with a specific fill mode. The default mode will simply trigger every step of a sequence no matter if the gate is enabled or disabled. Other fill modes allow temporarily playing steps from the next sequence or triggering steps that have the Fill condition set. To make things more interesting, each track also has a Fill Amount associated which is a probability value that controls how often a step is affected by the selected fill mode. This for example allows morphing between two patterns by selectively playing a given amount of steps from either pattern. Fills can then be controlled from the Performer page.

## Song

Songs are used to chain together a sequence of patterns for each track. This can either be used to quickly chain together patterns during a live performance to get more variation or to create an entire arrangement of a song.

A song consists of up to 64 slots, each holding a set of patterns to be played on the 8 tracks in addition to specifying for how many bars or measures the slot is played for. Songs are controlled from the Song page.

## Scale

In contrast to many other sequencers that directly operate on chromatic note values, the PER|FORMER sequencer is using the concept of voltage tables. Each note is stored as an index into a voltage table that does not necessarily have a specific musical meaning. While offering many of the more commonly used scales in form of presets, the sequencer also provides some scales beyond the typical western chromatic variants, for example a 24-tone equal temperament scale. The additional 4 user scales allow for even more experimentation as well as setting up voltage tables to specifically address discrete values of a CV input on another module. This allows for example selecting a specific sample slot, choosing a wavetable or similar applications.

A global default scale and root note can be specified on the Project page which can be overridden for individual sequences in the Sequence page. The user scales can be edited on the User Scale page. See Scales appendix for a list of all preset scales.

## Clock

The sequencer is driven by a flexible clock system. In master mode, the clock is generated internally and can be sent to external gear and modules using MIDI clock and analog clock signals. In slave mode, the clock is received from an external source via MIDI or analog clock signals. For convenience, the clock is set to an auto mode by default that automatically switches to master mode when the sequencer is started manually or switches to slave mode when an external clock signal is detected.

To allow for accurate timing, the internal clock is running at a resolution of 192 parts per quarter note (PPQN). In master mode, a hardware timer is used to generate a low-jitter clock signal. To drive external clock signals, the internal clock is divided down to the required PPQN of the external clock signals. In slave mode, the external clock signal is multiplied internally to generate the 192 PPQN internal clock resolution, which in turn is used to clock the sequencer as well as the external clock signals.

The clock system is configured on the Clock page.

## Routing

Many of the parameters in the sequencer can be controlled from external signals. This is useful for both experimentation and for controlling the sequencer with additional controllers in a live performance. The following sources can be used in the routing system:

- 4 CV inputs
- 8 CV outputs (allows for cross modulation without patching)
- MIDI controllers (pitch bend, controller change, individual notes)

Each route is a mapping from a source signal to a parameter, including a mapping of the source range to a parameter range. For example, an external CV signal can be mapped to the master clock tempo such that -5V to +5V maps to 100 to 140 BPM.

The routing system also implements a MIDI learn function, which allows easily mapping MIDI controllers to specific parameters. Routes can be created and edited on the Routing page.

## Controller

In addition to the routing system, specific MIDI controllers can be used as dedicated control surfaces for parts of the sequencer workflow. This includes sequence editing, mutes, fills, pattern launch, and dedicated external edit flows.

There are two distinct external controller workflows: the Novation Launchpad family, and an experimental 16-step Editing Mode path for 16-knob/16-pad controllers. 16-step Editing Mode focuses on direct Note-track editing: knobs drive note values, pads toggle gates, and longer loops are navigated in 16-step banks.

See Launchpad and 16-step Editing Mode for details.

## File Management

The SD card can be used to store various resources such as projects, sequences, user scales and system settings. Resources are stored into slots, with each type having a total of 128 slots available. The actual content on the SD card looks as follows:

- PROJECTS/ 001.PRO 002.PRO ...
- SEQS/ 001.NSQ 001.CSQ
- SCALES/ 001.SCA 002.SCA ...
- SETTINGS.DAT

where 001.PRO is the first project slot, 001.NSQ is the first note sequence slot, 001.CSQ is the first curve sequence slot, 002.SCA is the second user scale slot and SETTINGS.DAT is the backup of the system settings, also stored in on-chip flash memory.

The reason for using a slot system rather than traditional filenames is in order to allow for a smooth user experience while preserving the limited resources on the system.

Note: The SD card can easily be backed up to a computer by just copying the files. Slots can freely be rearranged by simply renaming the files.

# Overview

The user interface of the PER|FORMER sequencer is made up from the following components:

- OLED display
- Rotary encoder with button
- 5 function buttons
- 32 buttons with bi-color LEDs

The rotary encoder is referred to here as ENCODER. The remaining buttons are grouped into function buttons, global buttons, track buttons and step buttons.

## Function Buttons

There are 5 function buttons below the display: F1, F2, F3, F4 and F5. The function associated with each button depends on the currently selected page and context. Because each function button is dynamically labeled on the display, it is always possible to see its current assignment directly on screen.

## Global Buttons

There are 8 global buttons: PLAY, TEMP, PATT, PERF, PREV, NEXT, SHIFT and PAGE.

All global buttons have fixed functions associated with them:

| Button | Function |
|---|---|
| PLAY | Starts or stops the master clock. |
| SHIFT + PLAY | Pause/continue or restart master clock depending on the configured Shift Mode on the Clock page. |
| PAGE + PLAY | Enable or disable recording mode. |
| TEMP | Shows the Tempo page while held. |
| PATT | Shows the Pattern page while held. |
| PERF | Shows the Performer page while held. |
| PREV, NEXT | Navigate within the current page or context. |
| SHIFT | Enable alternate functions depending on the current context. |
| PAGE | Switch between pages. |
| SHIFT + PAGE | Show the context menu for the active page. |

## Track Buttons

There are 8 track buttons: T1 to T8. These buttons are generally used to select the active track, but they are also used to select pages in combination with PAGE and to trigger additional functions depending on the active page.

## Step Buttons

There are 16 step buttons: S1 to S16. These buttons are generally used to select steps in a sequence, but they are also used to select pages in combination with PAGE and to trigger additional context-specific functions.

# Navigation

The user interface is organized into multiple pages, each giving access to a different part of the sequencer, including configuration, sequence editing, performance controls and system information.

The active page is selected by holding PAGE and pressing the corresponding page button.

| Button | Page |
|---|---|
| PAGE + CLOCK (TEMP) | Clock |
| PAGE + PATT | Pattern |
| PAGE + PERF | Performer |
| PAGE + PROJECT (T1) | Project |
| PAGE + LAYOUT (T2) | Layout |
| PAGE + ROUTING (T3) | Routing |
| PAGE + MIDIOUT (T4) | MIDI Output |

| Button | Page |
|---|---|
| PAGE + U.SCALE (T5) | User Scale |
| PAGE + STEPS (S1) | Steps |
| PAGE + SEQ (S2) | Sequence |
| PAGE + TRACK (S3) | Track |
| PAGE + SONG (S4) | Song |
| PAGE + MONITOR (S8) | Monitor |
| PAGE + SYSTEM (T8) | System |
| PAGE + PREV | Overview |

There are 3 special pages that can be entered temporarily by simply holding a single button: Tempo, Pattern and Performer. These are optimized for live performance and quick access.

Note: while holding PAGE, the LEDs indicate the currently selected page and mark the buttons associated with available pages.

# Page Layout

Pages are divided into three sections: header, body and footer.

The header displays the global state of the sequencer and information about the active page and context. The body displays the main content for the active page. The footer displays the labels of the function buttons for the current page.

## Header

The header shows the current clock mode and tempo in the top-left corner. The clock mode can be one of the following:

- A Auto
- M Master
- S Slave

Instead of the clock mode, R is displayed when recording is enabled.

The currently selected track is shown by name. The currently playing pattern on the selected track is shown as P1 - P16. If a song is currently playing, the playing pattern is highlighted. The currently edited pattern is shown as E1 - E16 and is highlighted if it matches the pattern currently playing. If a snapshot is active, the pattern info is replaced with SNAP.

The active page is shown in the top-right corner, optionally with a sub-page or mode immediately to its left.

In follow pattern mode, an indicator of the current mode is displayed in the top-right corner:

- F Follow mode
- F:LP Launchpad follow mode
- F:D+LP Follow mode on display and Launchpad

On a stochastic track, an L is displayed in the top-right corner when loop mode is engaged.

## Body

The body displays the main content for the active page.

## Footer

The footer displays the labels of the function buttons for the current page.

On pages such as Layout, the function buttons are used to switch between sub-pages. In that case, the active sub-page is highlighted in the footer.

On pages with a context menu, the labels dynamically change to the context-menu actions when holding SHIFT + PAGE or when double-clicking PAGE to enter the context menu for 2 seconds.

Some workflow pages repurpose the footer more aggressively. For example, generator pages use the footer both for direct parameter access and for preview comparison functions such as A/B.

# List Pages

Pages that expose configuration options are typically presented as a list of items, each having the name shown on the left and the value on the right side.

Rotate the ENCODER or use PREV, NEXT to navigate through the list. Press ENCODER to enter and leave edit mode, indicated by moving the highlight from the item name to the item value and back. While in edit mode, rotate the ENCODER or use PREV, NEXT to adjust the value. Hold SHIFT to change the value in larger or smaller steps depending on the item being edited.

# Copy/Paste

To allow moving and copying data, a copy/paste system is implemented that allows acting on tracks, sequences, steps, patterns and user scales.

Copy/paste actions are available in the context menu when holding SHIFT + PAGE or by double-clicking PAGE.

This applies throughout the manual, especially on Track, Sequence, Steps, Pattern and User Scale.

Note: due to memory limitations, the clipboard can only hold one object at a time and shares memory across all different object types. Copying a new object always clears the previously copied one.

This chapter summarizes the main operating pages of the sequencer and is aligned with the current Vinx behavior.

# Project

The Project page is entered with PAGE + PROJECT. It contains project-wide parameters such as tempo, swing, time signature, scale defaults, monitoring, recording behavior and MIDI integration.

It is also the main place for loading, saving and initializing projects. Its context menu provides project initialization, SD load/save functions and route creation for the currently selected routable parameter.

| Parameter | Range | Description |
|---|---|---|
| Name | - | Project name edited with the text editor. |
| Tempo | 1.0 - 1000.0 BPM | Master clock tempo. |
| Swing | 0% - 99% | Global swing amount. In the Vinx fork the UI is rescaled to 0% - 99%, while the underlying timing behavior remains compatible with earlier projects. |
| Time Signature | Beats/Note | Defines musical bar length for sync and song behavior. |
| Sync Measure | 1 - 128 bars | Measure multiple used for synced actions. |
| Scale | Preset or user scale | Default project scale for note-based tracks. |
| Root Note | C - B | Default root note. |
| Monitor Mode | Always, Stopped, Off | Controls live monitoring behavior. |
| Record Mode | Overdub, Overwrite, Step Record | Selects the recording mode. |
| MIDI Input | Off, All, MIDI, USB | Source used for monitoring and recording. |
| MIDI Integration | Off, Program Changes, Malekko | Program change or bus integration mode. |
| CV/Gate Input | Off, CV1/CV2, CV3/CV4 | Enables CV/Gate monitoring and recording. |
| Steps to Stop | Off, 1 - 64 | Auto-stop after a set step count. |
| Record Delay | Off, 1 - 64 | Delayed recording start. |
| Reset CV | Off, On | Determines whether Note-track CV outputs reset when playback stops. In the Vinx fork the default is Off, so the last CV value is held on stop. |

In practical use, Monitor Mode, Record Mode, MIDI Input, and CV/Gate Input define the live-input behavior for the whole project. They are the first place to check when monitoring, recording, or external note entry does not behave as expected.

Double-clicking F1 - F5 provides shortcuts into Project, Layout, Routing, MIDI Output and User Scale.

## Context Menu

Hold SHIFT + PAGE or double-click PAGE to open the context menu and access the following functions:

| Button | Function | Description |
|---|---|---|
| F1 | Init | Initialize the project to its default state. This reverts all unsaved changes. |
| F2 | Load | Load a project from the SD card. |
| F3 | Save | Save the project to the SD card and overwrite the previous slot automatically. |
| F4 | Save As | Save the project to a new slot on the SD card. |
| F5 | Route | Show or create a route for the currently selected parameter, when routable. |

File operations in this page are guarded against overlap: while a Load/Save/Save As task is running, the slot list can show a temporary (busy) placeholder and concurrent requests are rejected instead of overlapping in undefined order. This hardening is meant to reduce intermittent reboot-risk paths during SD operations.

This is intentionally documented as a strong partial hardening, not yet a full architectural thread-safety closure across every legacy file-operation path.

# Layout

The Layout page is entered with PAGE + LAYOUT. It is used to configure how tracks are structurally connected to the hardware outputs and to one another.

- Track Mode: selects Note, Curve, MIDI/CV, Stochastic, Logic or Arpeggiator mode per track.
- Link Track: links a track to a previous track so it follows the same playback behavior.
- Gate Output: maps virtual gate outputs to physical outputs.
- CV Output: maps virtual CV outputs to physical outputs.

This page is especially important for polyphonic MIDI/CV setups, linked tracks and custom CV/gate assignments.

| Tab | Purpose |
|---|---|
| Track Mode | Assigns the operating mode of each track. Changing mode clears data for that track and must be committed. |
| Link Track | Links a track to a previous one so playback behavior is inherited. |
| Gate Output | Maps track gate outputs to physical gate jacks. |
| CV Output | Maps track CV outputs to physical CV jacks, useful for polyphony and extra modulation lanes. |

Changing track mode erases all data associated with the affected track. For that reason, a new track mode only takes effect after manually committing the change with F5.

Note: a track can only be linked to a preceding track due to the internal architecture of the sequencer. Track 1 cannot use track linking, track 2 can only link to track 1, and track 8 can link to any of tracks 1-7.

# Track

The Track page is entered with PAGE + TRACK. It exposes parameters that affect the selected track as a whole, and the available parameter list depends on the active track mode.

In Note, Logic and Arpeggiator related modes this includes parameters such as play mode, fill mode, slide time, octave, transpose, rotate and multiple performance-oriented probability biases. In Curve mode it additionally includes voltage behavior such as offset and min/max handling. In MIDI/CV mode it becomes a converter and arpeggiator setup page with voice count, note priority, ranges and modulation behavior.

Note/Curve/Stochastic/Logic/Arp tracks expose Gate Out Mode (Gate or Trigger). This is a per-track output mode, not per-step trigger editing. In Trigger mode, gate output is converted at output stage to fixed pulses on rising edges; internal sequencing semantics (step length, retrig, ratchet) stay unchanged.

The track context menu provides initialization, copy, paste and route creation for routable parameters.

## Context Menu

| Button | Function | Description |
|---|---|---|
| F1 | Init | Initialize the selected track and all its content to the default state. |
| F2 | Copy | Copy the selected track and all its content to the clipboard. |
| F3 | Paste | Paste the clipboard contents onto the selected track. |
| F4 | Route | Show or create a route for the currently selected parameter, when routable. |

## Note Track

| Parameter | Range | Description |
|---|---|---|
| Track Name | - | Press ENCODER to edit the track name. |
| Play Mode | Play Modes | Mode used for playing sequences in this track. |
| Fill Mode | None, Gates, Next Pattern, Condition | Determines what the track does when fill is engaged. |
| Fill Muted | Yes, No | Determines whether fills can still affect the track while it is muted. |
| CV Update Mode | Gate, Always | Updates CV only on active gates or on every step. |
| Slide Time | 0% - 100% | Duration of pitch slides for steps with Slide enabled. |
| Octave | -10 - +10 | Octave transposition amount. |
| Transpose | -100 - +100 | Note transposition amount, relative to the active scale. |
| Rotate | Rotation | Playback rotation applied to the sequence. |
| Gate P. Bias | -100% - +100% | Gate probability bias added to the sequence. |
| Retrig P. Bias | -100% - +100% | Retrigger probability bias added to the sequence. |
| Length Bias | -100% - +100% | Length bias added to the sequence. |
| Note P. Bias | -100% - +100% | Note variation probability bias added to the sequence. |
| Pattern Follow | Off, Display, Launchpad, Display+LP | Enable pattern follow; use PAGE + S16 to cycle modes. This is a per-track setting and is saved with the project. |
| Logic Track | 1 - 8 | Select the Logic track whose values should be output. |
| Logic Track In | 1 - 2 | Select the input of the Logic track. |

Logic wiring is configured from Note tracks. Set Logic Track to the target logic track, then set Logic Track In to input 1 or 2. On the Logic track page, Input Track 1/2 are read-only mirrors of those assignments.

If no Note track is assigned yet, Input Track 1/2 on the Logic track remain -. Also note that Note-to-Logic assignment is forward-only: a Note track can only link to Logic tracks with a higher track index.

## Curve Track

| Parameter | Range | Description |
|---|---|---|
| Track Name | - | Press ENCODER to edit the track name. |
| Play Mode | Play Modes | Mode used for playing sequences in this track. |
| Fill Mode | None, Variation, Next Pattern, Invert | Determines curve behavior when fill is engaged. |
| Mute Mode | Last Value, 0V, Min, Max | Voltage behavior when the track is muted. |
| Slide Time | 0% - 100% | Global slide time applied to the curve. |
| Offset | -5.00V - 5.00V | Voltage offset applied to the CV output. |
| Rotate | Rotation | Playback rotation applied to the sequence. |
| Shape P. Bias | -100% - +100% | Shape probability bias added to the sequence. |
| Gate P. Bias | -100% - +100% | Gate probability bias added to the sequence. |
| Pattern Follow | Off, Display, Launchpad, Display+LP | Enable pattern follow; use PAGE + S16 to cycle modes. This is a per-track setting and is saved with the project. |
| Curve CV Input | Off, CV1, CV2, CV3, CV4 | Select CV input for curve recording. |
| Min | 0 - 100% | Minimum output voltage percentage for the curve track. |
| Max | 0 - 100% | Maximum output voltage percentage for the curve track. |

## MIDI/CV Track

| Parameter | Range | Description |
|---|---|---|
| Track Name | - | Press ENCODER to edit the track name. |
| Source | MIDI, USB | MIDI source port; hold SHIFT and rotate ENCODER to select channel. |
| Voices | 1 - 8 | Number of voices generated. |
| Voice Config | Pitch, Pitch+Vel, Pitch+Vel+Press | CV signals generated for each voice. |
| Note Priority | Last Note, First Note, Lowest Note, Highest Note | Determines which notes have priority at the outputs. |
| Low Note | C-1 - G9 | Lower bound of the key range listened to by this track. |
| High Note | C-1 - G9 | Upper bound of the key range listened to by this track. |
| Pitch Bend | Off, 1 - 48 semitones | Pitch bend range. |
| Mod Range | 1-5V Unipolar, 1-5V Bipolar | Output range for modulation signals such as velocity and pressure. |
| Retrigger | No, Yes | Retrigger voices on every received Note On message. |
| Slide Time | 0% - 100% | Pitch slide duration for legato notes in monophonic operation. |
| Transpose | -100 - +100 | Note transposition amount. |
| Arpeggiator | No, Yes | Enable arpeggiator mode. |
| Hold | No, Yes | Hold chords in the arpeggiator after keys are released. |
| Mode | Arpeggiator Modes | Arpeggiator playback mode. |
| Divisor | Divisors | Arpeggiator divisor. |
| Gate Length | 1 - 100% | Gate length of generated notes. |
| Octaves | Off, Up 1-5, Up Down 1-5, Down 1-5, Down Up 1-5 | Octave order and range for the arpeggiator. |

Note: Low Note and High Note can be used to create split-keyboard setups with multiple MIDI/CV tracks.

## Stochastic Track

| Parameter | Range | Description |
|---|---|---|
| Track Name | - | Press ENCODER to edit the track name. |
| Play Mode | Play Modes | Mode used for playing sequences in this track; fixed to Aligned in practice. |
| Fill Mode | None, Gates, Next Pattern, Condition | Determines what the track does when fill is engaged. |
| Fill Muted | Yes, No | Determines whether fills can still affect the track while it is muted. |
| CV Update Mode | Gate, Always | Updates CV only on active gates or on every step. |
| Slide Time | 0% - 100% | Duration of pitch slides for steps with Slide enabled. |
| Octave | -10 - +10 | Octave transposition amount. |
| Transpose | -100 - +100 | Note transposition amount, relative to the active scale. |
| Rotate | Rotation | Playback rotation applied to the sequence. |
| Gate P. Bias | -100% - +100% | Gate probability bias added to the sequence. |
| Retrig P. Bias | -100% - +100% | Retrigger probability bias added to the sequence. |
| Length Bias | -100% - +100% | Length bias added to the sequence. |
| Note P. Bias | -100% - +100% | Note variation probability bias added to the sequence. |

## Logic Track

| Parameter | Range | Description |
|---|---|---|
| Track Name | - | Press ENCODER to edit the track name. |
| Play Mode | Play Modes | Mode used for playing sequences in this track. |
| Fill Mode | None, Gates, Next Pattern, Condition | Determines what the track does when fill is engaged. |
| Fill Muted | Yes, No | Determines whether fills can still affect the track while it is muted. |
| CV Update Mode | Gate, Always | Updates CV only on active gates or on every step. |
| Slide Time | 0% - 100% | Duration of pitch slides for steps with Slide enabled. |
| Octave | -10 - +10 | Octave transposition amount. |
| Transpose | -100 - +100 | Note transposition amount, relative to the active scale. |
| Rotate | Rotation | Playback rotation applied to the sequence. |
| Gate P. Bias | -100% - +100% | Gate probability bias added to the sequence. |
| Retrig P. Bias | -100% - +100% | Retrigger probability bias added to the sequence. |
| Length Bias | -100% - +100% | Length bias added to the sequence. |
| Note P. Bias | -100% - +100% | Note variation probability bias added to the sequence. |
| Pattern Follow | Off, Display, Launchpad, Display+LP | Enable pattern follow; use PAGE + S16 to cycle modes. This is a per-track setting and is saved with the project. |
| Input Track 1 | Not selectable | Shows the related Note track as input 1. |
| Input Track 2 | Not selectable | Shows the related Note track as input 2. |
| Detailed View | Yes, No | Show a detailed view of the logic track including the two input tracks. |

Input Track 1 and Input Track 2 are intentionally not editable here. They are populated by the Note tracks that point to this Logic track via Logic Track and Logic Track In, and they show - until those links exist.

## Arpeggiator Track

| Parameter | Range | Description |
|---|---|---|
| Track Name | - | Press ENCODER to edit the track name. |
| Play Mode | Play Modes | Mode used for playing sequences in this track; fixed to Aligned in practice. |
| Fill Mode | None, Gates, Next Pattern, Condition | Determines what the track does when fill is engaged. |
| Fill Muted | Yes, No | Determines whether fills can still affect the track while it is muted. |
| CV Update Mode | Gate, Always | Updates CV only on active gates or on every step. |
| Slide Time | 0% - 100% | Duration of pitch slides for steps with Slide enabled. |
| Octave | -10 - +10 | Octave transposition amount. |
| Transpose | -100 - +100 | Note transposition amount, relative to the active scale. |
| Gate P. Bias | -100% - +100% | Gate probability bias added to the sequence. |
| Retrig P. Bias | -100% - +100% | Retrigger probability bias added to the sequence. |
| Length Bias | -100% - +100% | Length bias added to the sequence. |
| Note P. Bias | -100% - +100% | Note variation probability bias added to the sequence. |
| Pattern Follow | Off, Display, Launchpad, Display+LP | Enable pattern follow; use PAGE + S16 to cycle modes. This is a per-track setting and is saved with the project. |
| Mode | Arpeggiator Modes | Arpeggiator mode. |
| Hold | No, Yes | Hold chords in the arpeggiator after keys are released. |
| Octaves | Off, Up 1-5, Up Down 1-5, Down 1-5, Down Up 1-5 | Octave order and range for the arpeggiator. |
| Gate Length | 1 - 100% | Gate length of generated notes. |
| Rate | Divisors | Arpeggiator divisor. |

# Sequence

The Sequence page is entered with PAGE + SEQ. It controls the settings of the currently edited sequence or pattern on the selected track.

Typical sequence parameters include first step, last step, run mode, divisor, reset measure and scale or range selection, depending on the track mode. On Note, Stochastic and Arpeggiator tracks, scale and root note are especially important because they define how note indexes become voltages.

On Note and Curve tracks, the sequence page also defines the effective working window of the pattern. This becomes especially relevant when editing across sections and when using generators that depend on the active first/last step range.

The context menu allows you to initialize, copy, paste and duplicate whole sequences. On Note and Curve tracks, save/load shortcuts for sequence files are also available.

## Context Menu

| Button | Function | Description |
|---|---|---|
| F1 | Init Seq | Initialize the selected sequence and all its content to the default state. This is a whole-sequence action, not a selection-aware step action. |
| F2 | Copy | Copy the selected sequence and all its content to the clipboard. |
| F3 | Paste | Paste the clipboard contents onto the selected sequence. |
| F4 | Duplicate | Copy the selected sequence to the next sequence slot on the selected track. |

On Note or Curve tracks, double-clicking SHIFT opens the save/load context menu:

| Button | Function | Description |
|---|---|---|
| F1 | Load | Load a sequence from the SD card. |
| F2 | Save | Save the sequence to the SD card and overwrite the previous slot automatically. |
| F3 | Save As | Save the sequence to a new slot on the SD card. |

## Note Track

| Parameter | Range | Description |
|---|---|---|
| Name | - | Press ENCODER to edit the sequence name. |
| First Step | 1 - 64 | First step to play. Hold SHIFT to edit first and last step together. |
| Last Step | 1 - 64 | Last step to play. Hold SHIFT to edit first and last step together. |
| Run Mode | Run Modes | Sequence run mode. |
| Divisor | Divisors | Time divisor for the sequence. |
| Reset Measure | Off, 1 - 128 bars | Number of bars at which the sequence resets. |
| Scale | Scales | Scale used by the sequence; if set to Default, uses the Project page scale. |
| Root Note | C, C#, D, D#, E, F, F#, G, G#, A, B | Root note used by the sequence; if set to Default, uses the Project page root note. |

First Step and Last Step define the active pattern window used for playback and many editing operations. In the Vinx fork this range is also important for generator behavior: when Acid is used with no explicit step selection, it operates inside this current pattern window.

## Curve Track

| Parameter | Range | Description |
|---|---|---|
| Name | - | Press ENCODER to edit the sequence name. |
| First Step | 1 - 64 | First step to play. Hold SHIFT to edit first and last step together. |
| Last Step | 1 - 64 | Last step to play. Hold SHIFT to edit first and last step together. |
| Run Mode | Run Modes | Sequence run mode. |
| Divisor | Divisors | Time divisor for the sequence. |
| Reset Measure | Off, 1 - 128 bars | Number of bars at which the sequence resets. |
| Range | 1V - 5V Unipolar, 1V - 5V Bipolar | Voltage range used by the sequence. |

### Stochastic Track

| Parameter | Range | Description |
|---|---|---|
| Run Mode | Run Modes | Sequence run mode. |
| Divisor | Divisors | Time divisor for the sequence. |
| Reset Measure | Off, 1 - 128 bars | Number of bars at which the sequence resets. |
| Scale | Scales | Scale used by the sequence; if set to Default, uses the Project page scale. |
| Root Note | C, C#, D, D#, E, F, F#, G, G#, A, B | Root note used by the sequence; if set to Default, uses the Project page root note. |
| Rest Prob. 2 | 0 - 100% | Probability that the sequence rests every 2 steps. |
| Rest Prob. 4 | 0 - 100% | Probability that the sequence rests every 4 steps. |
| Rest Prob. 8 | 0 - 100% | Probability that the sequence rests every 8 steps. |
| Seq First Step | 1 - 64 | First step of the active stochastic playback window. |
| Seq Last Step | 1 - 64 | Last step of the active stochastic playback window. |
| L Oct. Range | -10 - 10 | Lower octave bound used for random pitch generation. |
| H Oct. Range | -10 - 10 | Upper octave bound used for random pitch generation. |
| Length Mod | -200 - 200% | Stochastic length modifier added to the step length. |

### Logic Track

All available options on the Note sequence page are also available on the Logic sequence page.

### Arpeggiator Track

| Parameter | Range | Description |
|---|---|---|
| Name | - | Press ENCODER to edit the sequence name. |
| Divisor | Divisors | Time divisor for the sequence. |
| Reset Measure | Off, 1 - 128 bars | Number of bars at which the sequence resets. |
| Scale | Scales | Scale used by the sequence; if set to Default, uses the Project page scale. |
| Root Note | C, C#, D, D#, E, F, F#, G, G#, A, B | Root note used by the sequence; if set to Default, uses the Project page root note. |
| Rest Prob. 2 | 0 - 100% | Probability that the sequence rests every 2 steps. |
| Rest Prob. 4 | 0 - 100% | Probability that the sequence rests every 4 steps. |
| Rest Prob. 8 | 0 - 100% | Probability that the sequence rests every 8 steps. |
| Seq First Step | 1 - 64 | First step of the active stochastic playback window. |
| Seq Last Step | 1 - 64 | Last step of the active stochastic playback window. |
| L Oct. Range | -10 - 10 | Lower octave bound used for random pitch generation. |
| H Oct. Range | -10 - 10 | Upper octave bound used for random pitch generation. |
| Length Mod | -200 - 200% | Stochastic length modifier added to the step length. |

## Steps

The Steps page is entered using PAGE + STEPS.

This page allows editing the currently selected sequence on the currently selected track. Depending on the track mode of the selected track, this page shows a different graphical representation of the sequence. If track mode is set to MIDI/CV, the page is not available and selecting it will jump to the Track page.

On Note-like step views, the inner box of each step is used as a compact visual summary: Gate Offset shifts the box left or right inside the step and Length changes its width. A full-width box still corresponds to 100% length, as in earlier firmware versions.

Additional compact cues are layered onto this view: a small condition mark appears next to the step number when a step condition is active, retrigger marks are shown directly inside the step box when other layers are being viewed, and slide is hinted with a small tie between adjacent step boxes. The result is still shorthand rather than a literal event diagram, but it gives a denser at-a-glance overview than the earlier striped retrigger-only representation.

In a Logic track, if detailed view is enabled, a visual representation of the input tracks is visible for each step: a dot means input track 1 has gate on, an empty square means input track 2 has gate on, a combination of dot and empty square means both input tracks have

gate on and finally the full square means logic gate is on. A visual feedback is shown when the logic gate output is on. Use SHIFT to show the status of the inputs instead of the sequence gates.

## Step Visualization

The Vinx line uses a dense step visualization model. The goal is to keep the 16 visible pads readable in performance, while still exposing timing and behavior details without opening extra pages.

| Visual Element | Meaning |
|---|---|
| Step inner box | Compact event summary. Horizontal position reflects Gate Offset; width reflects Length. Full-width still corresponds to 100% length. |
| Step number highlight | Shows selected steps directly on the display. Hardware step LEDs mirror this selection state. |
| Condition / Retrig / Slide cues | Condition marker appears next to step index, retrigger cues are drawn inside step boxes, and slide is indicated by a tie between adjacent steps. |
| 16-step section framing | The active section (1..16, 17..32, 33..48, 49..64) is explicit through section navigation and per-step numbering. |
| Logic input glyphs | In Logic tracks, dot/square combinations show input-track gate states; logic output state is also highlighted for each step. |
| Generator preview on Steps | When entering LP Generators Mode from Sequence, Steps can show a lightweight overlay map; this is reference-only and does not change input semantics. |

This visual layer is intentionally compact: it is designed to keep edit intent, timing shift, and selection scope visible at a glance during live use.

## Layer Selection

Sequence data is organized in layers. Press F1, F2, F3, F4 or F5 to select different layers. The currently selected layer is shown in the header and the graphical representation of the sequence will change accordingly. Note that each function button can represent a group of layers, in which case pressing the same function button repeatedly will cycle through the layers contained in the group. Press SHIFT + F1 to F5 to quickly switch to the first layer of a group.

The following layers are available in Note mode:

| Button | Layers |
|---|---|
| F1 | Gate, Gate Probability, Gate Offset |
| F2 | Retrigger, Retrigger Probability, Repeat, Repeat Mode |
| F3 | Length, Length Variation Range, Length Variation Probability |
| F4 | Note, Slide, Note Range, Note Prob, Bypass Scale |
| F5 | Condition |

Note: See Step Conditions for a description of the different step conditions.

Note: See Metropolix Mode for a description of this feature.

The following layers are available in Curve mode:

| Button | Layers |
|---|---|
| F1 | Shape, Shape Variation, Shape Variation Probability |
| F2 | Minimum |
| F3 | Maximum |
| F4 | Gate, Gate Offset, Gate Probability, Gate Length |

On Curve tracks, the gate group includes per-step Gate Offset and Gate Length, so each curve step can shift its trigger earlier or later and define its own gate duration.

The following layers are available in Stochastic mode:

| Button | Layers |
|---|---|
| F1 | Gate, Gate Probability, Gate Offset |
| F2 | Retrigger, Retrigger Probability |
| F3 | Length, Length Variation Range, Length Variation Probability |
| F4 | Note Probability, Octave, Octave Probability, Slide |
| F5 | Condition |

The following layers are available in Logic mode:

| Button | Layers |
|---|---|
| F1 | Gate, Gate Logic, Gate Probability, Gate Offset |
| F2 | Retrigger, Retrigger Probability, Repeat, Repeat Mode |
| F3 | Length, Length Variation Range, Length Variation Probability |
| F4 | Note Logic, Note Variation Range, Note Variation Probability, Slide |
| F5 | Condition |

The following layers are available in Arpeggiator mode:

| Button | Layers |
|---|---|
| F1 | Gate, Gate Probability, Gate Offset |
| F2 | Retrigger, Retrigger Probability |
| F3 | Length, Length Variation Range, Length Variation Probability |
| F4 | Note Probability, Note Variation Range, Note Variation Probability, Octave, Octave Probability, Slide |
| F5 | Condition |

## Section Selection

Sequences contain up to 64 steps, of which only 16 are shown on the page. Press PREV and NEXT to select one of the available 16-step sections: 1-16, 17-32, 33-48 and 49-64 as needed by the current pattern length. The currently selected section is indicated by the 4 LEDs in the bottom-left corner as well as with the step indices above each step on the page.

## Editing Steps

To adjust the values of the currently selected layer, hold S1 to S16 and rotate the ENCODER. To adjust multiple steps at the same time, hold multiple step buttons and rotate the ENCODER. The currently selected steps are visualized both on the page by highlighting the step indices as well as on the step LEDs which turn orange. When adjusting multiple steps, the values are adjusted relative to their current value. Depending on the track mode and the selected layer, additional functionality is available:

- When editing the Gate layer on a sequence of a Note track, pressing S1 to S16 enables or disables the gate values.
- When editing a note sequence, double pressing S1 to S16 can be used to toggle the step gate no matter what layer is edited, other than Gate or Slide.
- When editing any other layer on a sequence of a Note track, holding one or multiple step buttons and pressing the ENCODER enables or disables the gate values. This is handy for example when editing note values.
- When editing any layer on a sequence of a Note track, select with SHIFT + step the first step, then again SHIFT + step, also switching page with NEXT or PREV, for the last step. Clicking SHIFT + F3 ties all steps in the range: full step length except the last step, same note value to all steps.
- When editing the Note layer, notes can be entered with hold S1..S16 + play MIDI key on an external keyboard.
- When editing the Note or Note Range layer on a sequence with a chromatic scale, holding SHIFT and rotating the ENCODER moves notes up and down by octaves.
- When editing layers on a sequence of a Curve track, pressing and rotating the ENCODER adjusts the values in smaller steps.
- When editing the Min or Max layer on a sequence of a Curve track, pressing SHIFT or the ENCODER while rotating adjusts the value in smaller steps.
- When editing the Min or Max layer on a sequence of a Curve track while holding F2 or F3, the curve shape is offset up and down by adjusting Min and Max at the same time.
- When editing a Curve track, select multiple steps with SHIFT + step, then hold SHIFT and turn the ENCODER to select a shape. The shape will be spread across the selected steps.
- When editing a Curve track, select multiple steps with SHIFT + step and press SHIFT + ENCODER to reverse the shapes.
- When editing a Note track, select any steps you want and press SHIFT + NEXT or PREV to move the selected step by 1 step.
- When editing a sequence page, Init Layer on the Steps page uses the current persistent selection first and otherwise initializes the whole track layer; Init Seq on the Sequence page context menu still initializes the whole sequence.
- When editing a Note or Curve track, pressing PAGE + S7 undoes the last change.
- When editing a Note track, holding a step and pressing F1 to F5 sets the note octave respectively to 1V, 2V, 3V, 4V or 5V. This can be used to quickly create accents.
- When editing a Stochastic track, pressing PAGE + S7 loops the sequence. Length is calculated by Sequence First Step and Sequence Last Step.
- When editing a Stochastic track, pressing PAGE + S6 clears the loop and enters a new one.

- When editing a Stochastic track, pressing PAGE + S5 reseeds the stochastic generator and picks a random value for the Note Probability Bias parameter.
- When editing a Logic track, all Note-track features and shortcuts are still available.
- When editing an Arpeggiator track, pressing PAGE + S16 enables keyboard mode. In this mode you cannot edit the sequence but you can play additional arpeggio notes using the step buttons, the Launchpad or an external MIDI keyboard.

## Advanced Step Selection

When holding SHIFT and pressing step buttons, steps are selected in a persistent mode and remain selected after the buttons are released. This makes it possible to build selections across multiple sections. Pressing a selected step again while holding SHIFT removes it from the selection. Press any step without SHIFT, or double-tap SHIFT, to clear the selection. When the selection is empty, double-tap SHIFT to select all 64 steps.

There are two additional functions for selecting groups of steps. To select a series of steps, for example steps 1, 5, 9 and 13, hold SHIFT and one step button and then double-tap the second step of the interval while holding the other buttons. To select all steps that have the same value on the currently selected layer, hold SHIFT and double-tap one of the step keys.

Note: When selecting groups of steps they are added to the current selection. This allows quickly combining multiple groups of steps into a single selection.

This selection is also the primary target area for generators. If a persistent selection exists, generator preview and apply actions work on that selection first. When the selection is empty, the generator falls back to its generator-specific default scope.

## Shifting Steps

Press SHIFT + PREV or SHIFT + NEXT to shift all steps in the sequence between the current first and last step to the left or right. Steps will wrap around on both sides. This has a similar effect as Rotation, but instead of changing the playback position, shifting actually moves the steps in the sequence itself.

## Context Menu

| Button | Function | Description |
|---|---|---|
| F1 | Init Layer | Initialize only the active layer. If a step selection exists it is applied there first; otherwise the whole current track layer is initialized. |
| F2 | Copy | Copy the selected steps to the clipboard. |
| F3 | Paste | Paste steps in the clipboard to the selected steps. |
| F4 | Duplicate | Doubles the length of the sequence between First Step and Last Step and copies the first half to the second half. |
| F5 | Gen | Open the generator workflow for the active layer. If a persistent step selection exists, generators target that selection first. |

Copy and paste only works with steps selected in persistent mode. When more steps are pasted than copied to the clipboard, the steps are repeated multiple times. This means that for example one can copy 2 steps and then paste them to 8 steps, creating a repetition of the two copied steps.

In generator pages, double-tapping SHIFT keeps the same selection logic: if nothing is selected it selects all available steps, and if a selection already exists it clears it. This is especially useful when switching between tightly targeted generation and whole-range preview.

## Quick Access

The Steps page is one of the most frequently used pages when operating the sequencer. To change sequence parameters such as Run Mode, First Step, Last Step and others, one normally needs to temporarily switch to the Sequence page. To improve this workflow, most sequence parameters can be accessed through a quick access function. To access a parameter, hold PAGE and press S9 to S16, similarly to switching between pages, but keep holding the PAGE button. The page is overlaid with the selected parameter.

| Button | Note Track | Curve Track |
|---|---|---|
| S9 | First Step | First Step |
| S10 | Last Step | Last Step |
| S11 | Run Mode | Run Mode |
| S12 | Divisor | Divisor |
| S13 | Reset Measure | Reset Measure |
| S14 | Scale | Range |
| S15 | Root Note | - |
| S16 | - | - |

While holding the PAGE button, the selected sequence parameter can be adjusted by rotating the ENCODER or by pressing S1 to S16 to select the most common values. For First Step, Last Step, Seq First Step, and Seq Last Step, PREV/NEXT moves between 16-step banks (1-16, 17-32, 33-48, 49-64), then S1..S16 selects inside the active bank. Releasing PAGE returns to the normal state of the Steps page.

Note: When quick access is active, the step LEDs indicate the range of values that can be selected in green as well as the current selection in red.

Note: Pressing the ENCODER while rotating it has the same effect as pressing SHIFT when editing the same parameter through the menu.

Note: In an Arpeggiator track S9 changes the arpeggiator rate, S10 the arpeggiator mode and S11 the arpeggiator octaves.

# Generators

Generators are available on sequence pages to produce or reshape step data on the fly. The exact generator set depends on the current track mode and active layer.

You can access generators in each sequence layer to generate their values through the context menu with SHIFT + PAGE.

In the Vinx fork, generator work is preview-oriented: enter on ORIGINAL, create or arm a preview intentionally, compare with A/B, then Cancel or Apply. Generator-specific exceptions and input behavior are summarized in Generator Input Semantics.

## How to Think About the Vinx Generators

In practice, these generators are not all trying to solve the same problem. The easiest way to approach them is to treat each one as a different kind of intervention on existing material.

- Random is the most neutral reshaping tool: good for reworking a single active layer while still blending against the original material.
- Acid is the character generator: it is meant to push Note-track material toward acid-like phrasing, either across a full phrase, through a Euclidean phrase shape, or only on the active layer.
- Euclidean is the structural rhythm tool: it is the clearest choice when you want an intentional pulse distribution defined by Steps, Beats, and Offset.
- Chaos is the rough exploratory tool: it works across multiple Note-track layers at once and is best treated as a deliberate vandalism pass rather than a harmonically careful generator.
- Entropy is the local Chaos subset used in non-Note Launchpad generator flows: same ORIGINAL -> CHAOS -> A/B logic, but scoped to the current non-Note track.
- Init Steps is the step reset tool inside the generator chooser; for the exact scope rules of Init Layer, Init Steps, and Init Seq, see Init Semantics.

Note: Acid and Chaos appear only on Note tracks. Other track modes keep the smaller generator set appropriate to their data model.

The Note-track generator order is Random, Acid, Chaos, Euclidean, Init Steps. The current firmware keeps Init Layer on the step-page context menu and Init Steps in the generator chooser distinct.

Performer GEN menu labels are explicit by context: on Note tracks you will see Acid Layer/Phrase/Eucl and Chaos Vandalize/Wreck; on non-Note tracks, Chaos appears as Chaos (Entropy).

## Context Menu

Hold SHIFT + PAGE or double-click PAGE in a generator page to open its context menu. F3/F4/F5 are normally ResetGen/Cancel/Apply. The quick-edit slots differ by generator: Random uses F2 = SMOOTH, Acid Phrase uses F2 = DENS, Acid Eucl Phrase uses F2 = RNG, and Chaos/Entropy use F1 = PIVOT, F2 = SPAN.

Generator pages enter on ORIGINAL. The first generated preview is normally created only after an explicit reroll action; Euclidean and Acid Eucl Phrase are the exceptions for direct parameter editing, because changing Offset, Steps, or Beats arms a valid preview that can be applied immediately.

On seed-driven generators, F1 on the page itself toggles A/B between the original sequence and the generated preview. While the original is shown, the seed field reads ORIGINAL, making it easy to compare the generated result with the untouched source material. On Random/Acid/Euclidean, parameter edits update the preview continuously; on Chaos/Entropy, target/selection/amount edits require an explicit CHAOS press for the next valid preview.

On Random, Acid, and Euclidean, ENCODER press commits the generator directly, mirroring Apply from the context menu (where F5 is Apply) without needing to open that menu.

Encoder rotation is intentionally generator-specific. The complete reference table is kept in Generator Input Semantics; the sections below describe only the generator-specific controls that matter during normal use.

Outside the LP Generators Mode mini-mode, Launchpad track/scene retarget is locked across the Performer GEN menu path: the main GEN chooser, Acid/Chaos sub-selectors, and active generator pages. In practice, those choices stay bound to the current track until you explicitly cancel or confirm on the machine, preventing wrong-target apply/cancel edge cases.

ResetGen is intentionally separated from reroll actions: Random resets to Smooth 0, Bias 0, Range 5, Var 100; Acid resets to Density 50, Slide 10, Range 35, Var 100, and for Eucl Phrase also Steps 16, Beats 4, Offset 0; and Euclidean resets to Steps 16, Beats 1, Offset 0. Rerolling remains an explicit action via NEW RAND, NEW EUCL, or CHAOS.

Generator pages and their related modal menus keep the transport controls active, so PLAY/STOP and TEMPO continue to respond without leaving GEN.

## Chaos

Chaos is currently an experimental generator available only on Note tracks. Unlike Random, which works on the active layer, Chaos can randomize multiple Note-track layers together from a single page.

Entering Chaos opens a CHAOS MODE submenu with two choices: Vandalize Sequence keeps the classic single-sequence Chaos workflow, while Wreck Pattern applies the same destructive idea across all Note tracks in the current pattern.

Both Chaos modes enter on ORIGINAL. Their scope, target mask, and amount defaults are loaded immediately, but no generated result is shown until you explicitly press CHAOS. Before that first reroll, A/B stays on the original view instead of pulling a hidden preview forward.

Once a Chaos preview exists, both Vandalize Sequence and Wreck Pattern show the current seed in the page footer just like the other seed-based generator flows; when you switch back to the untouched source, the footer reads ORIGINAL.

The generator page uses a target matrix of direct layer toggles. The available targets are Gate, G Offset, G Prob, Retrig, Length, L Range, L Prob, R Prob, Note, N Slide, N Range, N Prob, N Bypass, and Cond, plus dedicated All On and All Off cells.

For Note and N Range targets, generated note-domain values follow the active Pivot/Span window (span quantized by octave steps up to the configured maximum) instead of a single fixed hardcoded range.

Vandalize Sequence is selection-aware like the other generators: if a persistent step selection exists it is used as the target area first; otherwise the generator falls back to the current sequence First Step / Last Step range. Wreck Pattern keeps the same non-destructive preview model, but expands the target to all Note tracks in the current pattern. With an explicit step selection, that selection is shared across the affected Note tracks; without one, each Note track uses its own First Step / Last Step window.

On the page, encoder rotation moves through the target matrix, encoder press toggles the selected target, F1 compares A/B, F2 edits Amount, F3 performs CHAOS, F4 cancels, and F5 applies.

Variation vs Amount: these controls are intentionally not identical. Variation (used by Random and Acid) is a per-step keep/replace control against the original material. Amount (used by Chaos and Entropy) is a global intensity control applied to enabled targets in the target matrix.

Changing target/selection/amount does not auto-reroll Chaos. A new valid preview requires explicit CHAOS press; APPLY remains blocked until then. The page stays in its current A/B view when those parameters change.

Chaos context actions also expose register controls: F1 = PIVOT, F2 = SPAN, F3 = ResetGen, F4 = Cancel, F5 = Apply. Pivot/Span are persisted and reused on next entry.

Practical rule: Variation decides how many steps stay original, while Amount decides how hard Chaos/Entropy pushes enabled targets.

System -> Chaos Defaults stores separate target matrices for Seq Layers to Vandalize, Pat Layers to Wreck, and Entpy Layers To Unleash (header: ENTPY LAYER TO UNLEASH). Non-Note Entropy targets can represent one or more concrete layers depending on track type:

| Entropy Target | What It Controls | Track Types |
|---|---|---|
| Gate | Gate | Curve, Stochastic, Logic, Arp |
| G Offset | GateOffset | Curve, Stochastic, Logic, Arp |
| G Prob | GateProbability | Curve, Stochastic, Logic, Arp |
| Retrig | Retrigger | Stochastic, Logic, Arp |
| R Prob | RetriggerProbability | Stochastic, Logic, Arp |
| Ev Length | GateLength on Curve, Length on Stochastic/Logic/Arp | Curve, Stochastic, Logic, Arp |
| Ev L Range | LengthVariationRange | Stochastic, Logic, Arp |
| Ev L Prob | LengthVariationProbability | Stochastic, Logic, Arp |
| Prmry Val | Shape on Curve, NoteLogic on Logic, Note on Arp | Curve, Logic, Arp |
| P Val Rng | ShapeVariation on Curve, NoteVariationRange on Logic/Arp | Curve, Logic, Arp |
| P Val Prob | ShapeVariationProbability on Curve, NoteVariationProbability on Stochastic/Logic/Arp | Curve, Stochastic, Logic, Arp |
| Register | Min + Max on Curve, NoteOctave + NoteOctaveProbability on Stochastic/Arp | Curve, Stochastic, Arp |
| Motion | Slide + Condition | Stochastic, Logic, Arp |
| Logic/Rpt | StageRepeats + StageRepeatsMode on Stochastic, GateLogic + StageRepeats + StageRepeatsMode on Logic | Stochastic, Logic |

Entering Wreck Pattern now opens the generator page directly. There is no intermediate warning page; use Cancel to back out before applying, or Apply only after checking the preview.

WARNING: Chaos -> Wreck Pattern is a wildly experimental feature: a pattern-wide chaos process that should be used only after saving your project.

## Euclidean

The following options are available:

| Option | Range | Description |
|---|---|---|
| Steps | 1 - 64 | Sets the steps of the Euclidean sequence. |
| Beats | 1 - 64 | Sets the gate division of the sequence. |
| Offset | 0 - 63 | Sets the offset of the sequence. |

Euclidean keeps context actions focused on ResetGen, Cancel, and Apply; rerolling is explicit from the main page via NEW EUCL or encoder rotation (with no parameter key held). Direct edits to Offset, Steps, or Beats also arm the preview, so setting the Euclidean shape and then pressing Apply works without first pressing NEW EUCL.

Euclidean supports A/B comparison directly on the main page and keeps Beats <= Steps enforced while randomizing.

## Random

The following options are available:

| Option | Range | Description |
|---|---|---|
| Seed | 32-bit hexadecimal | Seed used to generate random values. The displayed value is an 8-digit hexadecimal number. Turning the encoder on Seed only changes the seed itself. |
| Smooth | 0 - 10 | Sets how smoothly each step changes in front of the next one. |
| Bias | -10 - 10 | Offsets the generated value distribution. In the Vinx fork it always enters centered at 0. |
| Range | 0% - 100% | Scales the generated distribution. In the current UI this is shown as a percentage rather than the old Scale name. |
| Variation | 0% - 100% | Per-step keep ratio against the original material. 0% keeps original values, 100% applies generated values, and intermediate values keep or replace each step probabilistically. In the footer this parameter is abbreviated as Var. The current Vinx default on entry is 100%. |

Note: if steps are selected, Random applies to the selection only. On sequence pages where no steps are selected, entering Random first selects all available steps, so the generator effectively works on the full editable range rather than only the current pattern length.

The easiest way to use Random in the Vinx fork is to treat it as a layer shaper rather than a total replacement generator: Seed chooses the base state, Smooth and Bias change the character of that state, Range limits how far it can push, and Variation decides how strongly the result departs from the original layer.

On the Note layer specifically, Range behaves like a musical span around the current register, while Bias shifts that center lower or higher. Generated notes are also weighted toward the center of that window, making small and medium range values easier to aim musically. Other Random layers keep the historical generic mapping.

## Acid

Acid is available only on Note tracks. After selecting it, a mode selector appears with Layer, Phrase, and Eucl Phrase, where relevant.

| Mode | Description |
|---|---|
| Layer | Projects acid-like motion only onto the active layer, typically Gate, Note or Slide. |
| Phrase | Generates a coordinated acid phrase by writing Gate, Note and Slide material together. |
| Eucl Phrase | Generates a coordinated acid phrase whose gate structure is shaped by Euclidean-style Offset, Steps, and Beats controls. |

The following options are available in Acid -> Phrase:

| Option | Range | Description |
|---|---|---|
| Seed | 32-bit hexadecimal | Phrase seed shown as an 8-digit hexadecimal number. |

| Option | Range | Description |
|---|---|---|
| Dens | 0% - 100% | Target gate density across the selected area or current pattern length. |
| Slide | 0% - 100% | Target amount of slide transitions, constrained by the transitions that actually exist. |
| Range | 0% - 100% | Controls overall melodic span and how large the step-to-step note jumps may become. |
| Var | 0% - 100% | Per-step keep ratio against the original material. 0% keeps original values, 100% applies generated values, and intermediate values keep or replace steps probabilistically. The UI label is abbreviated as Var; default on entry is 100%. |

In Acid -> Layer, only the parameters that make sense for the active layer are shown. For example, Gate exposes seed, density and variation, Note exposes seed, range and variation, and Slide exposes seed, slide and variation. Some labels are intentionally abbreviated in the UI, such as Dens and Var.

In Acid -> Eucl Phrase, the main page exposes Seed, Offset, Steps, Beats, and NEW RAND. The context menu exposes RNG as the quick edit for melodic range. Slide is generated from the seed with an internal 0% - 25% distribution rather than as a separate visible parameter.

On Acid -> Eucl Phrase, direct edits to Offset, Steps, or Beats arm and show a valid preview immediately, so Apply can write the phrase without pressing NEW RAND first. Pressing NEW RAND randomizes the seed, Offset, Steps, Beats, RNG, and the hidden slide distribution; plain encoder rotation without a held parameter key changes only the seed.

Note: if steps are selected, Acid works on the selection only. If no steps are selected, it works on the current pattern length defined by the sequence First Step and Last Step. Phrase is intended to generate a coordinated result across Gate, Note and Slide, while Layer keeps the action constrained to the active layer.

The practical distinction is simple: use Phrase when you want a whole acid idea to appear at once, use Eucl Phrase when you want that idea anchored to a deliberate Euclidean pulse layout, and use Layer when the existing phrase is already good but one aspect of it, such as gates, note motion, or slides, needs to be pushed harder.

# Song

The Song page chains pattern sets across tracks into a longer arrangement. A song consists of slots, and each slot stores which pattern each track should play plus the number of bars for which the slot remains active.

Song playback can be started independently of normal sequencer playback, making it useful both for live pattern-set switching and for full arrangements.

A song consists of up to 64 slots, each referencing a set of 8 patterns to be played across the 8 tracks. Each slot is played for a number of bars whose duration is defined by the Time Signature on the Project page.

## Context Menu

| Button | Function | Description |
|---|---|---|
| F1 | Init | Initialize the song. |

## Pattern Chaining

Pattern chaining is a quick way to create songs on the fly. Hold F1 and press S1 - S16 to append patterns as slots. Repeatedly pressing the same pattern increases the bar count of the last slot instead of creating a new one.

Pattern chains can also be created from the Pattern page with hold pattern + press pattern to define the chain range.

Note: when creating a pattern chain, song playback is activated immediately and the sequencer clock is started if not already running.

| Action | Description |
|---|---|
| Insert / Remove / Duplicate | Manage song slots directly from the page. |
| Adjust Slot Length | Set how many bars a slot should play. |
| Assign Patterns | Set patterns globally or per selected track group. |
| Mute per Slot | Store track mute state inside the slot. |
| Start / Stop Song | Launch immediately or in sync with the global sync measure. |

## Playback

Press F5 to start playback of the song from the currently selected slot. This also starts the sequencer if needed. Playback is immediate by default; use SHIFT + F5 to start on the next Sync Measure. Press F5 again to stop playback.

Playback can also be started by selecting a slot and pressing ENCODER. Hold SHIFT while pressing ENCODER to switch slot on the next sync boundary.

During playback, the current slot is indicated with a small arrow and a progress bar. The global mute setting of a track is only overridden during song playback if at least one song slot contains a mute for that track.

Note: Song mode can also be used to toggle between different sets of patterns. Define pattern sets as slots and use song playback start/stop as a fast scene-switching mechanism.

# Tempo

The Tempo page is shown while holding TEMP. It is used for quick tempo adjustment, tap tempo, nudging and swing editing.

| Function | How It Works |
|---|---|
| Tempo Edit | Rotate the encoder, with fine or coarse adjustment available. |
| Tap Tempo | Tap PLAY while holding TEMP. |
| Nudging | Hold TEMP and PREV/NEXT for temporary tempo shifts. |
| Swing Edit | Hold PERF while on the Tempo page. |

Note: the tempo is incrementally increased or decreased up to 10% during nudging, so both buttons must be held briefly before the effect becomes obvious.

# Pattern

The Pattern page manages pattern launching, edit-target selection, latching, synced changes and the snapshot workflow. It can be entered permanently or used temporarily during performance.

Pattern changes can be scheduled either by latching or by sync. The page also lets you select which pattern is currently being edited independently of the one currently playing.

The easiest way to think about the Pattern page is as a three-part live tool: it launches patterns, chooses the current edit target, and manages the snapshot safety layer for on-the-fly pattern surgery.

| Feature | Description |
|---|---|
| Edit Pattern Select | Choose which pattern is edited, independently of the one currently playing. |
| Immediate Launch | Press a step button to switch patterns instantly. |
| Latching | Hold F1 to queue multiple pattern changes and release together. |
| Synced Launch | Hold F2 to execute pattern changes on the next sync boundary. |
| Snapshots | Create a temporary editable copy of the currently playing pattern set and commit or revert later. |

## Live Workflow

For direct performance use, the logic is simple: use immediate launches when you want a hard cut, use F1 latching when you want to prepare multiple pattern changes and fire them together, and use F2 sync when you want the change to land cleanly on the next musical boundary.

Snapshots are the safety net in that workflow. They let you temporarily tear into the currently playing material, then either commit the result back or abandon it without having touched the original pattern set.

## Editing Pattern

To change the pattern currently selected for editing, rotate the ENCODER or use PREV and NEXT. Alternatively, use SHIFT + S1 - S16. The editing pattern is highlighted when it matches the currently playing pattern.

## Latching Pattern Changes

Hold F1 while scheduling pattern changes. All changes are executed together when F1 is released. While F1 is held, press F5 to cancel the queued changes.

## Synced Pattern Changes

Hold F2 while scheduling pattern changes. A progress bar indicates the time until execution. While F2 is held, press F5 to cancel the queued changes.

Note: synced actions are triggered at the beginning of a musical measure, configured on the Project page using Sync Measure.

### Snapshots

Press F3 to create a snapshot of the patterns currently being played. While snapshot mode is active, the header shows SNAP. After editing the snapshot, press F4 to commit it back to the original patterns, or press S1 - S16 + F4 to commit it to a new pattern set.

Press F3 again to revert the snapshot. Press S1 - S16 + F3 to revert it while switching to a different pattern set.

## Performer

The Performer page is designed for live interaction: mutes, solos, fills, fill amount and fast tempo access. Like the Pattern page, it supports immediate, latched and synced actions.

The page visualizes the mute state of every track, the currently playing steps and a percentage bar representing fill state and fill amount.

If the Pattern page is where structure changes are prepared, the Performer page is where pressure and contrast are applied in real time. It is the faster page for mutes, fills, and crowd-pleasing tension control during playback.

| Feature | Description |
|---|---|
| Mute / Unmute | Toggle tracks with T1 - T8. |
| Solo | Use SHIFT + track buttons. |
| Latch Actions | Hold F1 to group performer actions. |
| Sync Actions | Hold F2 to execute on sync measure. |
| Fill | Trigger temporary or latched fills per track or globally. |
| Fill Amount | Hold step buttons and turn the encoder to adjust fill probability per track. |

### Live Workflow

A practical performance approach is: use direct mutes for immediate subtraction, use latched actions when you want several state changes to land together, and use synced actions when the musical grid matters more than raw immediacy.

Fills are especially powerful when treated as temporary energy controls rather than binary switches. Short held fills create tension; latched fills can temporarily reframe a whole section; and per-track fill amounts let that tension be dialed rather than simply turned on or off.

### Tempo

ENCODER turn changes project tempo. ENCODER press returns to the last tempo value set on the Project page.

### Mutes and Solos

Press T1 - T8 to mute or unmute tracks. Use SHIFT + track buttons to solo or unsolo a track. Press F3 to unmute all tracks at once.

### Latching and Synced Actions

Hold F1 to latch performer actions and release them together. Hold F2 to execute performer actions on the next sync boundary. In both cases, F5 cancels pending actions.

### Fills

Hold S9 - S16 to temporarily enable fills per track. Use SHIFT + S9 - S16 to latch fill on a track. Hold F4 to fill all tracks temporarily, or use SHIFT + F4 to latch fill globally.

## Routing

The Routing page manages up to 16 routes between signal sources and target parameters. Sources include CV inputs, CV outputs and MIDI events; targets include global, track and sequence parameters.

It also includes MIDI learn and commit-based editing, so changes only become active once confirmed.

There can be up to 16 routes. Use F1 and F2, or hold SHIFT and rotate the encoder, to select the route being edited.

The simplest way to think about a route is: take one external signal, decide what parameter it should move, then define how strongly and across what range that movement should happen. In live use, routing is less about deep modulation theory than about giving hands, pedals, CV, or MIDI controllers access to the few things that matter most in performance.

Routable parameters are marked with an arrow on their home pages.

| Parameter | Description |
|---|---|
| Target | Parameter affected by the route. |
| Min / Max | Mapped output range for the target. |

| Parameter | Description |
| --- | --- |
| Tracks | Track selection when the target is track-scoped. |
| Source | CV In, CV Out or MIDI. |
| Range | Voltage interpretation for CV sources. |
| MIDI Source / Event | Port, channel and event type for MIDI-based routing. |
| CC Number / Note | Specific MIDI control or note source. |

Press F5 to commit routing changes. Press F3 to reset the selected route to its default state. Press F4 to enter MIDI learn mode and assign a MIDI source directly from the controller.

For the current target list and scope reference, see Routing Targets.

### Practical Use

Good first routing targets are usually the ones that are already musically meaningful on their own: tempo, swing, fill amount, mute/fill state, track transposition, probability biases, or sequence boundaries. A route becomes useful when it gives you fast external access to a parameter you would otherwise keep reaching for during performance.

The commit-based behavior matters here: editing a route does not immediately destabilize the running patch. You can set up the source, target, and range first, then commit when the mapping actually looks right.

## MIDI Output

The MIDI Output page configures up to 8 generated MIDI outputs derived from sequencer tracks. Outputs can emit note events or control changes to either MIDI TRS or USB MIDI destinations.

Use F1 and F2, or hold SHIFT and rotate the encoder, to select which MIDI output is being edited.

Note generation can combine multiple sequencer tracks, for example using different tracks as gate, note and velocity sources.

| Mode | Main Parameters |
| --- | --- |
| Note | Target, Gate Source, Note Source, Velocity Source. |
| Control Change | Target, Control Number, Control Source. |

The Gate Source controls MIDI Note On/Off generation. The Note Source is derived from a V/Oct CV signal, with 0V corresponding to C4. The Velocity Source is derived from a unipolar 5V signal mapped to 0-127. If the Gate Source contains Slide data, slides are emitted as MIDI CC 65 events.

Press F5 to commit MIDI output changes. Press F3 to reset the selected output configuration.

## User Scale

The User Scale page edits the four project user scales. These can be chromatic or arbitrary voltage tables and are useful both for conventional tuning and for modular-specific CV-addressing tasks.

User-scale slots default to INIT1..INIT4, and the same custom names are shown directly in all Scale selectors across project/sequence pages (instead of generic User1..User4 labels when names are set).

| Function | Description |
| --- | --- |
| Chromatic Mode | Build a scale from 12-tone semitone choices. |
| Voltage Mode | Create arbitrary voltage tables. |
| Size | Up to 32 scale items. |
| Context Menu | Init, Copy, Paste, Load and Save user scales. |

In Chromatic mode, each item is one of the 12 semitones. In Voltage mode, each item can be assigned a voltage between -5V and +5V with millivolt accuracy.

Note: the items defined in a user scale represent a single octave of the scale. The remaining octaves are inferred by repetition.

MIDI note capture on Note, Stochastic and Arpeggiator tracks follows the octave span of the active scale, so voltage-mode user scales are interpreted according to their own octave range instead of assuming fixed 1V/oct. Validation scope for these cross-track Voltage Mode workflows is tracked in Known Limits / Validation Scope.

On Stochastic and Arpeggiator tracks, routed transpose stays inside the selected scale/root context on the covered paths instead of shifting the selected scale root chromatically. Explicit Semitones keeps the chromatic legacy behavior.

Known limit: some Arp/Stochastic paths still rely on a 12-slot-per-octave data model, so user scales with notesPerOctave > 12 are not yet fully represented in every path.

### Context Menu

| Button | Function | Description |
|---|---|---|
| F1 | Init | Initialize the selected user scale. |
| F2 | Copy | Copy the selected user scale to the clipboard. |
| F3 | Paste | Paste the clipboard contents to the selected user scale. |
| F4 | Load | Load a user scale from the SD card. |
| F5 | Save | Save the selected user scale to the SD card. |

## Overview

The Overview page provides a dense representation of all currently running sequences, showing patterns, sequence activity and output state at a glance. It also supports a limited set of quick edits.

The left section shows the currently playing pattern for each track. The middle section shows a dense representation of sequence data. The right section visualizes current gate and CV output state.

The encoder switches between tracks. On Note tracks, STEP + ENCODER changes note values; on Stochastic tracks, the same combination changes note probability. Curve and Logic tracks expose additional quick editing behaviors from this overview page.

## Monitor

The Monitor page contains tabs for CV inputs, CV outputs, incoming MIDI messages and general system stats.

| Tab | Purpose |
|---|---|
| CV Inputs | Shows live input voltages. |
| CV Outputs | Shows live output voltages. |
| MIDI | Shows incoming MIDI messages. |
| Stats | Shows uptime and internal message queue diagnostics. |

## Clock

The Clock page configures master/slave behavior, input and output divisors, run/reset logic, pulse width and MIDI/USB clock receive or transmit options.

| Parameter | Description |
|---|---|
| Mode | Auto, Master or Slave. |
| Shift Mode | Determines how SHIFT + PLAY behaves. |
| Input Divisor | Clock interpretation for incoming pulses. |
| Input Mode | Reset Gate, Reset Pulse, Run, or Start/Stop control logic for the reset jack while slaving to external clock. Reset Pulse reacts only to the rising edge of the reset input, while Reset Gate keeps the older gate-style reset/run behavior. |
| Output Divisor | Outgoing clock pulse timing. |
| Output Swing | Applies project swing to analog clock out. |
| Output Pulse | Pulse width in milliseconds. In the Vinx fork the default is 10ms. |
| Output Mode | Reset or Run signal on the clock control output. |
| MIDI RX/TX, USB RX/TX | Clock receive or transmit over MIDI and USB. |

Note: to set up a 24 PPQN input or output clock resolution, set the divisor to 2. In this context, the divisor is applied to 48 PPQN rather than the internal 192 PPQN resolution.

In practical terms, Reset Pulse is the safer choice when you want incoming reset pulses to resync the slave clock without using the falling edge as an implicit start command.

## System

The System page groups calibration, settings save/restore, SD utilities, firmware update entry and user settings such as display brightness, screensaver and Launchpad behavior.

Entering System lands on the Settings tab by default instead of Calibration.

| Tab | Purpose |
|---|---|
| Calibration | Millivolt calibration of the 8 CV outputs. |
| Utilities | SD card utility functions. |
| Update | Shows firmware version and enters bootloader. |
| User Settings | Brightness, screensaver, wake mode, dim sequence, Launchpad style, pattern change behavior, menu wrap, and the Chaos Defaults entry. |

The System page requires confirmation before opening to prevent accidental entry.

## Save Shortcut

On both Calibration and User Settings, F2 is a direct SAVE shortcut for writing the current machine settings to flash.

This persistent save writes the current machine settings state to flash memory, including any changes made in Chaos Defaults, so those values are restored again after reboot.

When leaving the User Settings tab after changing any user setting, including Chaos Defaults, the firmware asks whether you want to save. This prompt appears both when moving to another System tab and when leaving the System page entirely. Choosing NO skips the save and continues the navigation. This automatic prompt applies to User Settings, not to Calibration.

## Calibration

The Calibration tab is used to calibrate the 8 physical CV outputs to millivolt accuracy. Press T1 - T8 to select the output channel. Each calibration entry stores the DAC value used for a given voltage between -5V and +5V.

By default, entries are set to auto, which either uses a reference table or interpolates from nearby manually calibrated values.

## Context Menu

| Button | Function | Description |
|---|---|---|
| F1 | Init | Initialize the settings to their default state. |
| F2 | Backup | Back up the settings to the SD card. |
| F3 | Restore | Restore the settings from the SD card. |

## User Settings

| Setting | Range | Description |
|---|---|---|
| Brightness | 0 - 10 | Reduce overall display brightness. Lower brightness may reduce noise. |
| Screensaver | Off, 3s, 5s, 10s, 30s, 1m, 5m, 10m, 15m, 30m | Blank the display after a period of inactivity. The default is 15m. |
| Wake Mode | Always, Required | Determine when the display wakes from the screensaver. The default is required, so the first panel gesture after wake restores the display without also triggering the underlying action. Launchpad input also wakes the display. |
| Dim Sequence | off, dim, dim+ | Reduce sequence-page brightness using three display-intensity levels. In the Vinx fork the default is dim, mainly to help tame display noise leaking into the audio band. |
| LP Style | Classic, Blue | Select Launchpad color scheme. The default is Blue. This is a machine setting stored in flash when saved from System. |
| Pattern Change | Immediate, Sync | Swap the default pattern launch behavior. |
| LP Note Style | Classic, Circuit | Select the Launchpad note editor style. The default is Circuit. This is a machine setting stored in flash when saved from System. |
| Menu Wrap | Off, On | Choose whether list-based menus and selector pages based on lists wrap cyclically from last to first and from first to last. The default is on. This does not turn ordinary inline value selectors into cyclic controls. |
| Trigger Length | 1 - 15 ms | Global pulse length used when a track is set to Gate Out Mode = Trigger. Default is 4 ms. |
| Chaos Defaults | open | Open the dedicated Chaos defaults page, where Seq Layers to Vandalize, Pat Layers to Wreck, and Entpy Layers To Unleash are edited with the same target-matrix workflow used by the generator family. |

These two Chaos defaults are machine-level user settings, not project data. They define which layer toggles are active by default when entering Vandalize Sequence or Wreck Pattern. Like the other machine settings, they must be saved from System if you want them to survive reboot.

Leaving the User Settings tab after changing them triggers the same save prompt used for the rest of the machine settings.

### Project vs Machine Settings

This distinction matters a lot in practice. Track parameters, sequence data, user scales, and per-track follow behavior belong to the current project. By contrast, entries under System -> User Settings are machine-level values stored in flash, so they survive reboot once saved.

This means settings such as LP Style, LP Note Style, Menu Wrap, Trigger Length, screensaver behavior, and Chaos Defaults should be thought of as part of the instrument configuration itself, not as part of a single song or project file.

This appendix collects reference material and workflow notes for setup and performance, including inherited material where it remains technically relevant.

## Recording

Recording can be done live or in step-record mode using an external MIDI keyboard. Live recording writes notes into the active sequence while the sequencer is running. Step record advances one step at a time and is better suited to deliberate entry.

Recording mode is selected on the Project page. Recording itself is armed or disarmed with PAGE + PLAY.

The important split is this: the Project page decides how incoming notes are monitored and recorded globally, while the selected track mode and sequence settings decide what those notes mean once they are interpreted or written.

### Live Recording

Overdub and Overwrite enable live recording. In Overdub mode, played notes are added to the existing sequence, potentially replacing existing steps. In Overwrite mode, steps are cleared as the play head advances and replaced by incoming notes. The sequence length is not changed automatically, so it must be set in advance.

Recording can also be controlled through a route, which is useful for foot-pedal punch-in / punch-out style workflows.

Note: incoming notes must still be translated into the fixed step grid of a sequence. Best results are usually obtained with monophonic, well-quantized playing.

### Step Recording

In Step Record mode, each played note fills the next step in the active Note sequence. Slides can be recorded by moving pitch bend while holding a note, and ties can be recorded by moving the modulation control while holding a note. Recording starts at the first step and wraps around at the last step.

### Project Input Settings

Monitor Mode controls whether incoming notes are heard immediately, only while stopped, or not monitored at all. Record Mode decides whether incoming notes are layered on top of existing steps, overwrite what the playhead reaches, or advance one step at a time in step-record mode. MIDI Input selects whether the project listens to DIN MIDI, USB MIDI, both, or neither for monitoring and recording.

So if live input feels wrong, start on the Project page first; if the musical result feels wrong, then inspect the current track mode, scale, root note, and sequence context.

### Scales and Incoming Notes

On Note, Stochastic, and Arpeggiator tracks, incoming note data is not treated as raw chromatic pitch alone. It is interpreted through the active scale and root note, because the sequencer fundamentally stores note indexes into voltage tables rather than fixed semitone values.

This also applies more correctly to user scales in Voltage Mode: MIDI note capture follows the octave span of the active scale instead of assuming fixed 1V/oct. This matters when the scale is being used for Buchla-style or other non-standard voltage tables.

### MIDI/CV Use

A MIDI/CV track is not the same thing as recording notes into a Note sequence. In MIDI/CV mode, the track behaves as a live converter from incoming MIDI notes to CV/gate outputs, optionally with voice allocation, note priority, split ranges, and its own arpeggiator behavior.

This makes MIDI/CV useful for external sequencing or live keyboard playing even when you are not trying to write notes into a PER|FORMER sequence at all.

### Arpeggiator and Stochastic Input Notes

The Arpeggiator track can work both from programmed step content and from live input notes. Stochastic and Arpeggiator note entry also inherit the active scale logic, which is why scale and root-note settings matter even outside plain Note sequencing.

For these less standard note-entry workflows, especially with user scales in Voltage Mode, refer to Known Limits / Validation Scope for the current hardware-validation perimeter.

## Clock Input Modes

When the sequencer is slaved to an external clock, Input Mode defines how the reset jack is interpreted. This matters more here than in older upstream documentation, because Reset Gate and Reset Pulse are intentionally separate behaviors.

| Mode | Practical meaning |
|---|---|
| Reset Gate | Best for older gate-style reset/run signals where the reset line may remain high rather than arriving as a short pulse. |
| Reset Pulse | Best for short reset pulses when you want the rising edge to resync the slave clock without using the falling edge as an implicit start command. |
| Run | Use when the external source provides a dedicated run-state signal rather than distinct reset pulses. |
| Start/Stop | Use when the external source behaves more like a transport command source, explicitly starting and stopping playback. |

If you are unsure, the practical choice is usually between Reset Gate and Reset Pulse. If the source emits clean reset pulses, prefer Reset Pulse. If the source behaves more like a held reset/run gate, Reset Gate is usually the safer match.

## Divisors

Divisors map the internal clock resolution to musical note lengths. They are used throughout the sequencer for sequence timing, clock input/output behavior and arpeggiator rate.

| Divisor | Note | Name |
|---|---|---|
| 2 | 1/64T | Triplet sixty-fourth note |
| 3 | 1/64 | Sixty-fourth note |
| 4 | 1/32T | Triplet thirty-second note |
| 6 | 1/32 | Thirty-second note |
| 8 | 1/16T | Triplet sixteenth note |
| 9 | 1/32. | Dotted thirty-second note |
| 12 | 1/16 | Sixteenth note |
| 16 | 1/8T | Triplet eighth note |
| 18 | 1/16. | Dotted sixteenth note |
| 24 | 1/8 | Eighth note |
| 32 | 1/4T | Triplet quarter note |
| 36 | 1/8. | Dotted eighth note |
| 48 | 1/4 | Quarter note |
| 64 | 1/2T | Triplet half note |
| 72 | 1/4. | Dotted quarter note |
| 96 | 1/2 | Half note |
| 128 | 1T | Triplet whole note |
| 144 | 1/2. | Dotted half note |
| 192 | 1 | Whole note |
| 256 | 2T | Triplet double note |
| 288 | 1. | Dotted whole note |
| 384 | 2 | Double note |
| 512 | 4T | Triplet quadruple note |
| 576 | 2. | Dotted double note |
| 768 | 4 | Quadruple note |

## Run Modes

Run modes define the order in which a sequence is traversed. The main choices are Forward, Backward, Pendulum, Ping Pong, Random and Random Walk.

| Mode | Behavior |
|---|---|
| Forward | Plays from first to last step and repeats. |
| Backward | Plays from last to first step and repeats. |
| Pendulum | Alternates forward and backward, repeating the end points. |
| Ping Pong | Alternates direction without repeating the end points. |
| Random | Picks a new random step each advance. |
| Random Walk | Moves left or right from the previous step with wraparound. |

```
Forward: 1 2 3 4 5 6 7 8 | 1 2 3 4 5 6 7 8 | ...
Backward: 8 7 6 5 4 3 2 1 | 8 7 6 5 4 3 2 1 | ...
Pendulum: 1 2 3 4 5 6 7 8 8 7 6 5 4 3 2 1 | ...
Ping Pong: 1 2 3 4 5 6 7 8 7 6 5 4 3 2 | ...
Random: 4 7 5 3 5 7 5 3 5 6 8 6 4 2 4 1 ...
Random Walk: 7 8 7 8 1 2 1 2 3 2 3 4 5 4 3 4 ...
```

## Play Modes

Aligned mode computes the current step from elapsed time since reset and keeps behavior deterministic. Free mode advances from the previously played step and behaves more like an analog sequencer, which can produce more experimental results when parameters change during playback.

Example: on a 16-step sequence running in Forward mode, changing the divisor from quarter notes to half notes while the sequence is already running causes different results in the two modes. In Free mode, playback continues from the current step but advances more slowly. In Aligned mode, the current step is recalculated from the elapsed time since reset, so playback can jump to a different position that matches the new divisor mathematically.

In practice, Free mode behaves more like an analog sequencer and can produce happy accidents when parameters change during playback, while Aligned mode is usually the safer choice.

Note: if play mode is changed during playback, misalignment with other Free-mode tracks can occur. Restarting playback is strongly recommended if tight synchronization matters.

## Rotation

Rotation shifts the effective playback start point of a sequence without changing the underlying stored step data. Positive values rotate to the right and negative values rotate to the left.

## Step Conditions

Step conditions allow a gate to be played only when a rule is satisfied. Available condition types include fill-only, not-fill, first pass, previous-condition result and numbered iteration rules such as N:M.

| Condition | Description |
|---|---|
| Fill | Only plays when Fill is enabled and the track Fill Mode supports conditions. |
| !Fill | Only plays when Fill is disabled. |
| Pre | Only plays if the previously evaluated condition was true. |
| !Pre | Only plays if the previously evaluated condition was false. |
| First | Only plays on the first iteration. |
| !First | Plays on all but the first iteration. |
| N:M | Plays on the Nth iteration every M iterations. |
| !N:M | Skips the Nth iteration every M iterations. |

## Metropolix Mode

In Free play mode, the retrigger area can expose a Metropolix-style repeat workflow. This adds repeat counts and repeat gate modes such as Each, First, Middle, Last, Odd, Even, Triplet and Random.

| Repeat Mode | Description |
|---|---|
| Each | Sends a gate for each repeat. |
| First | Sends the first gate and waits for the remaining pulses. |
| Middle | Places the gate in the middle of the repeated span. |
| Last | Sends only the final gate. |
| Odd | Sends gates on odd repeats. |
| Even | Sends gates on even repeats. |
| Triplet | Places gates every third repeat position. |

| Repeat Mode | Description |
|---|---|
| Random | Chooses among repeat gate modes randomly. |

## Scales

The original manual includes extensive voltage tables for the preset scales. The key idea is that note values are stored as indices into a voltage table rather than as raw chromatic note numbers.

| Scale | Voltages |
|---|---|
| Semitones | 0.000, 0.083, 0.167, 0.250, 0.333, 0.417, 0.500, 0.583, 0.667, 0.750, 0.833, 0.917 |
| Major | 0.000, 0.167, 0.333, 0.417, 0.583, 0.750, 0.917 |
| Minor | 0.000, 0.167, 0.250, 0.417, 0.583, 0.667, 0.833 |
| Major Blues | 0.000, 0.250, 0.333, 0.583, 0.750, 0.833 |
| Minor Blues | 0.000, 0.250, 0.417, 0.500, 0.583, 0.833 |
| Major Pent. | 0.000, 0.167, 0.333, 0.583, 0.750 |
| Minor Pent. | 0.000, 0.250, 0.417, 0.583, 0.833 |
| Folk | 0.000, 0.083, 0.250, 0.333, 0.417, 0.583, 0.667, 0.833 |
| Japanese | 0.000, 0.083, 0.417, 0.583, 0.667 |
| Gamelan | 0.000, 0.083, 0.250, 0.583, 0.667 |
| Gypsy | 0.000, 0.167, 0.250, 0.500, 0.583, 0.667, 0.917 |
| Arabian | 0.000, 0.083, 0.333, 0.417, 0.583, 0.667, 0.917 |
| Flamenco | 0.000, 0.083, 0.333, 0.417, 0.583, 0.667, 0.833 |
| Whole Tone | 0.000, 0.167, 0.333, 0.500, 0.667, 0.833 |
| 5-tet | 0.000, 0.200, 0.400, 0.600, 0.800 |
| 7-tet | 0.000, 0.143, 0.286, 0.428, 0.572, 0.714, 0.857 |
| 19-tet | 0.000, 0.053, 0.105, 0.158, 0.210, 0.263, 0.316, 0.368, 0.421, 0.474, 0.526, 0.579, 0.632, 0.684, 0.737, 0.790, 0.842, 0.895, 0.947 |
| 22-tet | 0.000, 0.046, 0.091, 0.136, 0.182, 0.227, 0.273, 0.318, 0.364, 0.409, 0.454, 0.500, 0.546, 0.591, 0.636, 0.682, 0.727, 0.773, 0.818, 0.864, 0.909, 0.954 |
| 24-tet | 0.000, 0.042, 0.083, 0.125, 0.167, 0.208, 0.250, 0.292, 0.333, 0.375, 0.417, 0.458, 0.500, 0.542, 0.583, 0.625, 0.667, 0.708, 0.750, 0.792, 0.833, 0.875, 0.917, 0.958 |
| Voltage | 0.000, 0.100, 0.200, 0.300, 0.400, 0.500, 0.600, 0.700, 0.800, 0.900, 1.000, 1.100 |

## Shapes

The upstream Shapes appendix is entirely graphical. Because this local manual intentionally removes all images, the visual shape atlas is omitted here, but the Curve track still uses the same indexed shape model described in the Mebitek manual.

| Reference | Notes |
|---|---|
| Shape Indexes | The original manual presents indexed curve shapes from 1 upward as visual references for Curve track programming. |
| Local Adaptation | Image-only tables have been removed from this version of the manual. |

## Arpeggiator Modes

| Mode | Behavior |
|---|---|
| Play Order | Uses note entry order. |
| Up | Lowest to highest. |
| Down | Highest to lowest. |
| Up Down | Ascends then descends without repeating extremes twice. |
| Down Up | Descends then ascends. |
| Up & Down | Ascends and repeats the top before coming down. |
| Down & Up | Descends and repeats the bottom before going back up. |
| Converge | Alternates from outer notes toward the center. |
| Diverge | Alternates from center outward. |
| Random | Random note order. |

## Routing Targets

This table lists the main routing destinations exposed by the current firmware. Most entries are self-explanatory in context, but the scope column helps clarify whether a target affects the whole project, a track, or a specific sequence.

| Target | Scope | Notes |
|---|---|---|
| Play | Global | |
| Play Toggle | Global | Toggle playing while allowing use of the physical PLAY button. |
| Record | Global | |
| Record Toggle | Global | Toggle recording while allowing use of the panel shortcut. |
| Tap Tempo | Global | |
| Tempo | Global | |
| Swing | Global | |
| Mute | Track | |
| Fill | Track | |
| Fill Amount | Track | |
| Pattern | Track | |
| Slide Time | Track | |
| Octave | Track | |
| Transpose | Track | |
| Offset | Track | |
| Rotate | Track | |
| Gate P. Bias | Track | |
| Retrig P. Bias | Track | |
| Length Bias | Track | |
| Note P. Bias | Track | |
| Shape P. Bias | Track | |
| First Step | Sequence | |
| Last Step | Sequence | |
| Run Mode | Sequence | |
| Divisor | Sequence | |
| Scale | Sequence | |
| Root Note | Sequence | |
| Rec Step | Sequence | Controls the current recording step in step-record mode and can be used to insert rests. |
| Reseed | Stochastic Sequence | |
| Rest Prob 2 | Stochastic Sequence | |
| Rest Prob 4 | Stochastic Sequence | |
| Rest Prob 8 | Stochastic Sequence | |
| Seq First Step | Stochastic Sequence | |
| Seq Last Step | Stochastic Sequence | |
| L Oct. Range | Stochastic Sequence | |
| H Oct. Range | Stochastic Sequence | |
| Length Mod | Stochastic Sequence | |

## Logic Operators

| Operator | Type | Description |
|---|---|---|
| 1 | Gate/Note | Select input 1. |
| 2 | Gate/Note | Select input 2. |
| AND | Gate | Boolean AND between inputs. |
| OR | Gate | Boolean OR between inputs. |
| XOR | Gate | Exclusive OR between inputs. |
| NAND | Gate | Negated AND between inputs. |
| Random Input | Gate/Note | Randomly selects input 1 or 2. |
| Random Logic | Gate/Note | Randomly selects an available logic operation. |
| Min / Max / Sum / Avg | Note | Combines note values numerically. |

# MIDI Program Change

The sequencer can send and receive MIDI program change messages when that behavior is enabled in the Project settings. Program changes are associated with global pattern changes rather than with per-track pattern selection.

In sync mode, they are sent slightly before the end of the sequence so the receiving hardware has time to acknowledge the request.

# Launchpad

The Novation Launchpad can be used as an advanced control surface for the sequencer, allowing for editing sequences and launching patterns via the 8x8 button matrix. When a Launchpad is connected to the USB port, the sequencer automatically detects the device and immediately starts using it as a control surface.

This section is aligned with the current Vinx fork implementation and updated together with firmware behavior changes.

Validation status for Launchpad hardware coverage is tracked in Known Limits / Validation Scope. This chapter uses Launchpad Mini MK3 as the primary reference workflow.

The following Launchpad controllers have been tested and are working:

- Launchpad Mini MK1/MK2/MK3
- Launchpad S
- Launchpad Mk2
- Launchpad Pro
- Launchpad Pro MK3
- Launchpad X

Note: Support for the very first version of Launchpad will never happen, as it is not a USB MIDI class compliant device.

Launchpad controllers are exclusively used as control surfaces and cannot be used as standard MIDI devices for the routing system or live recording.

When using a Launchpad Mini or Launchpad S, it should preferably be configured to operate in Low Power mode. This is important in order to not draw too much current which can lead to the Launchpad spuriously disconnecting. In addition, make sure that the Launchpad is configured to use ID 1, otherwise it will be detected as a general MIDI controller by the sequencer. The procedure to switch between Low Power and Full Power mode and setting the ID can be looked up here: Launchpad S and Mini Advanced Features Guide.

For a faster local overview, see also the Launchpad Cheat Sheet.

On the web manual, use the embedded reference and the linked cheatsheet as the visual map and full per-mode function reference.

In this manual, Launchpad controls are named as in the local cheat sheet: TOP 1..8 for the top row, TRK 1..8 for the scene / track side buttons, and GRID for the 8x8 pad matrix. When a bare number is used in a Launchpad shortcut, it refers to a pad on the GRID.

In the Vinx fork, Launchpad is best thought of as a dedicated performance surface for the pages that really support it well: Sequence, Pattern, and Performer. It is not meant to replace the whole front panel or every system/menu interaction.

The machine-level settings LP Style and LP Note Style are part of this workflow. LP Style changes the controller color language, while LP Note Style changes how note-oriented editing is presented on compatible note editors.

## Global Functions

TOP 8 acts as the main global modifier for mode entry and transport shortcuts, while TRK 1..8 select tracks and participate in mute/fill/solo gestures.

| Button | Function |
|---|---|
| TOP 8 | SHIFT / main Launchpad modifier. |
| TOP 8 + TOP 1 - TOP 3 | Enter Sequence, Pattern, or Performer mode. |
| TOP 8 + TOP 7 | Toggle PLAY / STOP. Hold TOP 8 first, then press TOP 7. |
| TOP 7 + TOP 8 | Undo / Redo (1-level) on supported Steps edit pages (Note, Curve, Logic); same action as machine PAGE + S7. Hold TOP 7 first, then press TOP 8. |
| TRK 1 - TRK 8 | Select track. These buttons are also used with mute, fill, and solo modifiers. |

Because the 8x8 grid can only represent part of the editable data, it acts as a window into a larger virtual 64x64 space. Hold TOP 1 to enter navigation mode:

Navigation is available in Sequence, Pattern, and Performer Overview mode. Direct map selection with TOP 1 + GRID is the preferred workflow; the old TOP 1 + TOP 2..5 arrows remain available as legacy shortcuts.

| Button | Function |
| --- | --- |
| TOP 1 + TOP 2 | Move window left (legacy shortcut). |
| TOP 1 + TOP 3 | Move window right (legacy shortcut). |
| TOP 1 + TOP 4 | Move window up (legacy shortcut). |
| TOP 1 + TOP 5 | Move window down (legacy shortcut). |
| TOP 1 + GRID | Move window directly to a specific position in the larger virtual grid. |

Sequence and Performer allow mute, solo, and fill from the Launchpad surface; Pattern allows mute and fill. Scene LEDs do not currently expose a dedicated SOLO-only color state, so solo status is read from behavior/context rather than a separate fixed color cue.

| Button | Function |
| --- | --- |
| TOP 7 + TRK 1 - TRK 8 | Momentary fill for the selected track while held. Releasing TRK or TOP 7 clears the fill. |
| TOP 8 + TRK 1 - TRK 8 | Mute or unmute track immediately. |
| TOP 6 + TRK 1 - TRK 8 | Toggle track solo in Sequence and Performer modes. Not available in Pattern mode. |

The TOP 7 gesture is not a general global shortcut. In the Vinx implementation it is used contextually on compatible Note editors and on Note-track rows in Performer Overview. On Note Gate pages it applies to the visible grid; on circuit-style Note pages it applies only to pads 1..16, where it switches between the scale base note and the same note at octave +5. This behavior is considered Legacy / Deprecated and is kept for compatibility.

Note: synced or latched mute launching is available from the panel Performer page, but not from the Launchpad surface in the current Vinx implementation.

## Sequence Mode

Sequence mode edits patterns on the active track/layer and exposes track, layer, first/last step, run-mode, follow-mode, and generator shortcuts. The complete pad map is intentionally kept in the cheatsheet; this manual keeps only the behavioral notes that are easy to miss.

| Button | Function |
| --- | --- |
| TRK 1 - TRK 8 | Select active track. |
| TOP 2 + GRID | Select active layer. |
| TOP 3 + GRID | Select first step. On Stochastic, this edits Seq First Step (first step index 1..64 of the active stochastic playback window). |
| TOP 4 + GRID | Select last step. On Stochastic, this edits Seq Last Step (last step index 1..64 of the active stochastic playback window). |
| TOP 5 + GRID | Select run mode; on Arpeggiator tracks this selects arpeggiator mode instead. |
| TOP 6 + GRID | Select follow mode on Note, Curve and Logic tracks; on Stochastic and Arpeggiator tracks this opens the Rest Probability editor for the editable Rest Prob 2/4/8 ranges. |

On Stochastic, Seq First Step / Seq Last Step define the step-window boundaries used for playback and editing context. They are step-position limits (1..64), not note or octave limits.

The visualization on the grid depends on the selected layer. Binary layers such as Gate and Slide can be visualized directly on the 8x8 grid without the need for navigation. Other layers use navigation to various degrees in order to allow programming the steps. When editing the Note layer, the base note, first note per octave, is visualized to help orientation.

In the current fork, LP Note Style can be set to Classic or Circuit. Circuit is the current default and the main Launchpad workflow of the fork: it enables the dedicated note overlays on the Note track note layer, on the Stochastic Note Prob editor, and on the Arpeggiator Note layer. Classic remains available as the compatible non-overlay form, keeping those editors in their normal layer/navigation view.

Double-press behavior is not global across all Launchpad editing. In the current Vinx implementation it is used on the Stochastic and Arpeggiator Circuit note editors (double-press GRID 26..40), where it toggles the selected note state and writes the current octave context back into the step. On the Arpeggiator Circuit note editor this gesture also adds or removes the note from the arpeggiator when MIDI Keyboard mode is OFF.

The Launchpad color language should also be read relative to LP Style, not as a fixed universal set of absolute colors. The controller still communicates mute, selection, playback and pattern state, but the visible palette changes with the selected Launchpad style.

Sequence step editors also have an experimental Launchpad Generators Mode, toggled with TOP 8 + TOP 4. For the full pad map, activation semantics, reroll behavior, immediate init actions, retarget rules, and fail-closed behavior, see Launchpad Generators Mode and Safety / Fail-Closed.

## Pattern Mode

Pattern mode launches patterns per track or across all tracks. Pattern state colors depend on LP Style; requested patterns due to latching or syncing use their own state cues, distinct from the currently playing pattern.

| Button | Function |
|---|---|
| GRID | Launch track patterns. Each column is a track and each row is a pattern. |
| TRK 1 - TRK 8 | Launch the same pattern number on all tracks. Launch timing follows the current execute type. |
| Hold TOP 2 | Use latch execute type. Requested changes are committed when TOP 2 is released. |
| Hold TOP 3 | Toggle Immediate / Sync relative to the current Pattern Change default. |
| TOP 7 + TRK 1 - TRK 8 | Momentary track fill while held. |
| TOP 8 + TRK 1 - TRK 8 | Mute or unmute track immediately. |

## Performance Mode

Performance mode has two layers: Sequence Length and Overview.

| Button | Function |
|---|---|
| TOP 2 + GRID 1 | Enter Sequence Length. |
| TOP 2 + GRID 2 | Enter Overview. |
| TOP 6 + TRK 1 - TRK 8 | Toggle track solo. |
| TOP 7 + TRK 1 - TRK 8 | Momentary track fill while held. |

Sequence Length temporarily overrides first/last step across all Note, Curve, Stochastic, and Logic tracks. Hold one pad to loop a single step, or hold two pads to define a temporary first/last range. Releasing the held pad(s) restores the original range.

In Overview, each row represents one track and the columns map the currently visible steps. TOP 6 + GRID selects per-track follow mode for Note, Curve, and Logic tracks, while pad 17 toggles Performer follow. On Note-track rows, TOP 7 + GRID switches the pressed step between the scale base note and the same note at octave +5 (Legacy / Deprecated, compatibility-only).

## Circuit Note Editor

Circuit note editing splits the grid into gate pads, a note keyboard, octave selectors, and 16-step bank selectors. Available notes in the current scale are highlighted, while chromatic bypass-scale entry remains possible.

- GRID 1..16 edits gates for the current 16-step section.
- GRID 26..39 is the note keyboard. Available notes in the current scale are highlighted; notes outside the current scale remain available through chromatic bypass-scale entry.
- GRID 49..56 selects octave from -4 to +3.
- GRID 57..60 selects one of the four 16-step banks.
- Pressing a pad in GRID 1..16 toggles the corresponding gate.
- Holding a valid note pad in GRID 26..39 and then pressing a pad in GRID 1..16 writes that note into the step and enables the gate if needed.
- TOP 7 + GRID 1..16 switches the pressed step between the scale base note and the same note at octave +5 (Legacy / Deprecated, compatibility-only).

## Stochastic Circuit Note Editor

This editor is used only when LP Note Style is Circuit and the selected Stochastic layer is Note Prob. It combines note-target selection, note probability editing, octave controls, stochastic shortcuts, and double-press note toggling.

- GRID 1..16 edits Note Variation Probability for the currently selected note target. If that probability is 0, the pads remain dark.
- GRID 17..24 shows the running stochastic index.
- GRID 26..40 selects the note target, with scale-aware highlighting and chromatic fallback for notes outside the current scale.
- In this editor, GRID 32 raises the global Track octave by +1 and GRID 40 lowers it by -1.
- GRID 49..56 selects local octave from -4 to +3.
- GRID 57..59 selects the stochastic shortcuts currently implemented in the fork: use loop, clear loop, and reseed.
- Double-press on a note target toggles the selected note state and writes the current octave back into the stochastic step.

### Arpeggiator Circuit Note Editor

This editor is used only when LP Note Style is Circuit and the selected Arpeggiator layer is Note. It combines note-target selection, gate-probability editing, octave controls, MIDI Keyboard options, and double-press note add/remove behavior.

- GRID 1..16 edits gate probability for the currently selected arpeggiator note target. If that probability is 0, the pads remain dark.
- GRID 17..24 shows the running arpeggiator index.
- GRID 26..40 selects the note target. In this editor, GRID 32 raises the global Track octave by +1 and GRID 40 lowers it by -1.
- GRID 49..56 selects local octave from -4 to +3.
- GRID 57..58 selects the MIDI Keyboard options currently implemented in the fork: keyboard input mode and hold mode. Hold works only when MIDI Keyboard mode is ON.
- When MIDI Keyboard mode is OFF, double-press on a note target toggles the note state and also adds or removes that note from the arpeggiator. When MIDI Keyboard mode is ON, no double-press action is implemented.

## Launchpad Generators Mode

This experimental mini-mode is available in LP Sequence mode and is toggled with TOP 8 + TOP 4. Entering can force the machine view to Steps; exiting forces Cancel and returns to plain Steps.

When active and no generator page is currently open, the Steps page shows a lightweight reference overlay. The overlay is informational only and does not change control semantics.

| Control | Behavior |
|---|---|
| TOP 5 | A/B compare. |
| TOP 6 | ResetGen. |
| TOP 7 | Cancel. |
| TOP 8 | Apply. |

The generator map is track-type specific:

| Track type | Grid map |
|---|---|
| Note | GRID 1 / 2 / 9 / 10 / 3 / 11 / 4 / 8 / 16 = Random, Acid Layer, Acid Eucl Phrase, Acid Phrase, Vandalize, Wreck, Euclidean, Init Layer, Init Steps |
| Curve, Stochastic, Logic, Arp | GRID 1 / 3 / 4 / 8 / 16 = Random, Entropy, Euclidean, Init Layer, Init Steps |

Activation is consistent: all generator pads enter on ORIGINAL at first press, and a second action on the selected generator triggers first preview generation.

Pressing the selected generator pad rerolls in place: NEW RAND on Random/Acid Layer/Acid Phrase/Acid Eucl Phrase, CHAOS on Vandalize/Wreck/Entropy, NEW EUCL on Euclidean. In this split, Entropy uses the same ORIGINAL -> CHAOS -> A/B logic as Chaos but stays track-local on non-Note tracks.

Init Layer and Init Steps are immediate in this mini-mode; their exact scope and exit behavior are covered in Init Semantics.

## 16-step Editing Mode

This is an experimental external-controller workflow for per-step editing with 16 knobs plus 16 pads. It is currently intended for Launch Control XL and BeatStep Pro style mappings, and remains field-test status.

On Launch Control XL, use Factory Preset #1. For BeatStep Pro, import PERFORMERstep16_BSP.beatsteppro.

Operational intent: use the 16 knobs to edit Note values and the 16 pads to toggle Gate states on the currently visible bank (steps 1..16 in the current section).

Validation status for Launch Control XL and BeatStep Pro on this workflow is maintained in Known Limits / Validation Scope.

Entry/exit is explicit through controller-side Prev + Next together. On Launch Control XL this is Track Select < + >. In common BeatStep Pro templates it is Ptn 1 + Ptn 2.

While armed, the mode forces loop to the current 16-step bank, accepts knob/pad edits, and uses Prev/Next to move between banks; on exit it restores the previous loop range.

The target is always the currently selected Note track. Knobs are active only while the machine layer is Note; pads for gate toggle remain active on that same track context across layers.

| Input | Behavior |
|---|---|
| 16 knobs | Edit note value per visible step (step 1..16 of current bank), with immediate pickup, current-scale quantization, and a two-octave equivalent clamp (-1V..+1V, equivalent to about -12..+12 semitones in standard 1V/oct interpretation). |
| 16 pads | Toggle gate on/off on those same 16 visible steps. |
| Prev / Next | Move 16-step bank window. |

Root note is applied in the normal output path; the controller mapping itself does not hardcode a root offset.

Compatibility is map-driven, not brand-driven: any controller can work if it emits the expected map on MIDI channel 9 (CC 13..20, CC 29..36, notes 41..44, 57..60, 73..76, 89..92, and CC 106/107). Messages outside that map are ignored.

| MIDI input | 16-step function |
|---|---|
| Channel 9, CC 13..20 | Step knobs 1..8. |
| Channel 9, CC 29..36 | Step knobs 9..16. |
| Channel 9, Notes 41..44 / 57..60 / 73..76 / 89..92 | Gate pads 1..16. |
| Channel 9, CC 106 / 107 | Previous / next 16-step bank. |
| CC 106 + CC 107 together | Arm / disarm 16-step Editing Mode. |

Current LED scope is gate-focused: step gate states are reflected on controller pads (and mode/section function buttons have feedback), while note-value edits from knobs have no dedicated LED rendering. Dedicated knob-row LED behavior is not driven by firmware and remains device-local.

## Init Semantics

The firmware keeps three distinct reset actions. They are intentionally separate and should not be treated as aliases.

| Action | Where | Scope |
|---|---|---|
| Init Layer | Steps context menu and LP Generators Mode (GRID 8) | Only active layer. Uses persistent step selection first; if empty, falls back to whole current track layer. |
| Init Steps | GEN chooser and LP Generators Mode | All step layers of current track scope. Uses persistent step selection first; if empty, falls back to whole current track. |
| Init Seq | SEQ page context menu | Whole sequence for the current track. |

On LP Generators Mode specifically, both actions are immediate: Init Layer (GRID 8) applies and stays in mode, while Init Steps (GRID 16) applies and exits to plain Steps.

## Chaos Family

In the Vinx line, Chaos is not a single page but a family of related destructive-preview workflows with explicit compare and explicit commit.

| Mode | Scope | Flow |
|---|---|---|
| Vandalize Sequence | Current Note sequence | ORIGINAL -> CHAOS -> A/B -> Cancel/Apply |
| Wreck Pattern | Pattern-wide across Note tracks | ORIGINAL -> CHAOS -> A/B -> Cancel/Apply |
| Entropy | Current non-Note track in LP mini-mode | ORIGINAL -> CHAOS -> A/B -> Cancel/Apply |

Machine defaults for Chaos are stored in System -> Chaos Defaults with dedicated target matrices per family branch. Entropy uses its own persisted defaults and target composition for non-Note track data.

## Generator Input Semantics

Encoder rotation is generator-specific by design. This is intentional and not a UI inconsistency.

| Generator page | Encoder rotation |
|---|---|
| Random | Seed change only. |
| Acid Layer / Acid Phrase | Seed change only. |
| Acid Eucl Phrase | Seed change only with no parameter key held; Offset/Steps/Beats edits arm preview directly when their parameter key is held. |
| Euclidean | NEW EUCL reroll with no parameter key held; Offset/Steps/Beats edits arm preview directly when their parameter key is held. |
| Vandalize / Wreck | Target-matrix navigation; with F2 held, edits Amount. |

| Generator page | Encoder rotation |
|---|---|
| Entropy | Target-matrix navigation; with F2 held, edits Amount. |

Apply semantics are also explicit: on Random, Acid, and Euclidean, encoder press mirrors context-menu Apply; Chaos-family pages keep apply on their page actions.

## Safety / Fail-Closed

Generator and selector paths are hardened to avoid wrong-target commits when context changes during interaction.

- While machine generator selector paths are active, LP track/scene retarget is locked.
- Inside LP Generators Mode, retarget is allowed only on supported track types and cancels active preview before retarget.
- If context becomes invalid during an open generator preview, operation fails closed as GEN CANCELED instead of applying to the wrong target.
- LP mini-mode init actions follow the immediate behavior described in Init Semantics.
- Modal close/redispatch behavior is hardened so selector closes do not leak the same key event into the underlying page.

## Controller Concurrency Limits

The current architecture uses one active external controller context at a time. In practice this means Launchpad workflow and 16-step Editing Mode are separate and are not designed for simultaneous concurrent ownership in the same UI path.

If your setup includes multiple USB MIDI devices, keep this as the operational rule: use one external control workflow as primary at a time, and treat switching as an explicit mode change.

Architecture limit: the current firmware supports exactly one external USB controller at a time, and that controller must be connected directly to the module USB host port.

USB hubs, including externally powered hubs, are not supported. The current firmware architecture does not implement hub-based multi-device handling on top of the STM32 USB Host stack, so devices connected through a hub are not enumerated by the firmware and cannot establish a usable controller connection.

## Desktop Simulator

The Vinx fork is maintained with two simulator contexts: the browser-based Web Simulator published on the site, and the native local Desktop Simulator built from the repository. Only the Desktop Simulator is intended for real MIDI and Launchpad integration.

The Desktop Simulator accepts separate DIN and USB MIDI port assignments from the command line, starts with MIDI disabled by default, and exposes lightweight status indicators plus terminal tracing for MIDI and digital outputs. This makes it useful not just as a demo build, but as a real development and testing tool for clock, MIDI, USB, and Launchpad behavior.

Desktop Simulator USB MIDI validation scope (including OS/device coverage) is tracked in Known Limits / Validation Scope.

For concrete build and launch commands, see the Build Guide and the Web Simulator page.

## USB MIDI Devices

The following USB MIDI devices are known to be compatible with the PER|FORMER sequencer:

| Manufacturer | Device |
|---|---|
| AKAI | APC Mini |
| Arturia | MiniBrute, MiniLab MK2, Keystep |
| Arturia | BeatStep Pro (experimental for 16-step Editing Mode; broader hardware validation still pending) |
| CME | XKEY37 |
| Keith McMillen | QuNexus |
| Korg | microKey 2, R3 |
| Moog | Minitaur |
| Novation | Launchkey Mini |
| Novation | Launch Control XL (experimental for 16-step Editing Mode; best-validated external controller in this path) |
| Novation | Launchpad Mini MK1/MK2/MK3, Launchpad S, Launchpad Mk2, Launchpad Pro, Launchpad Pro MK3, Launchpad X |
| Yamaha | Modx7 |

The following USB MIDI devices are known not to be compatible:

| Manufacturer | Device |
|---|---|
| AKAI | MPK Mini |
| Novation | Launchpad |
| Synthstrom | Deluge |

## Calibration Procedure

The following method allows quickly calibrating the 8 CV outputs of the sequencer to millivolt accuracy. In order to achieve good results you have to use a volt meter capable of measuring within millivolt accuracy.

The calibration will only be as good as the volt meter used to measure the voltages.

Enter the System page using PAGE + SYSTEM.

For each of the 8 channels, perform the following steps:

- Select the channel by pressing T1 to T8.
- Connect the volt meter to the given CV output.
- Select the -5.0V entry and adjust the calibration value such that the volt meter measures as close to -5.000V as possible.
- Repeat the previous step for the +5.0V entry and then for the +0.0V entry.
- At this point, calibration should be good enough with all other entries set to auto.
- Check each entry in-between the calibrated ones and adjust them if the measured voltage deviates too much from the expected value. In general it is a good idea to do this recursively by always selecting the voltage in the middle of two calibrated entries. For example, with +0.0V and +5.0V calibrated, continue with either +2.0V or +3.0V.

With all channels calibrated you should save the data to flash memory by holding SHIFT + PAGE and pressing F2. You can also save the calibration data as a backup to the SD card by holding SHIFT + PAGE and pressing F3.

## Firmware Update

Use the following steps to update the sequencer firmware:

- Download the latest UPDATE.DAT file from Vinx Scorza Releases.
- Copy the UPDATE.DAT file to the root directory of the SD card.
- Insert the SD card into the sequencer's SD card slot.

The update procedure is performed by the bootloader. There are two ways to enter it:

1. Power up the sequencer while pressing down the ENCODER.
2. Enter the System page and go to the update tab, then press and hold the ENCODER which will initiate a reset and jump to the bootloader.

The bootloader verifies the integrity of the UPDATE.DAT file using an MD5 hash. Once verification succeeds, a confirmation is requested before the update actually starts. Rotate the ENCODER to select YES, then press the ENCODER to begin.

After the firmware is written to flash memory, it is verified again to ensure it was written correctly. If verification fails, the firmware is erased from flash memory. In that state the sequencer will always boot back into the bootloader, allowing a different firmware image to be loaded.

SD boot robustness note: startup tolerances for slower cards include a longer SD-init wait window and watchdog feed during long init waits, reducing loading-screen reboot loops on borderline media while keeping runtime watchdog behavior strict.

For release history and fork-specific changes, see the Features page.