Vector Sequencer

User Guide

FIVE12

v2.0a

Getting Started

The Vector Sequencer is a digital sequencer in the Eurorack modular format. It provides a flexible sequencing engine with support for eight independent parts. Parts may be monophonic, chords or drum types. There are two sub-sequencers per part for internal modulation, as well as chance operations, and presets with a playlist function. The Vector has both MIDI and CV connections for interfacing with a wide variety of electronic musical instruments.

An optional Jack Expander module adds support for 4 more analog voices (Pitch, Gate, Velocity), 8 more trigger outputs (6 can also be used for input), MIDI in and out on DIN jacks, and dedicated jacks for DIN Sync (in and out).

Installation

Take the Vector out of its protective anti-static bag and have a look at the back. The power connector is on the right side of the circuit board and is labeled 'Power'. Connect a 16-pin Eurorack power cable if you have not already, red stripe DOWN per usual.

If you have the Jack Expander module, you should connect it to your Vector before adding them to your case. Lay both the Vector and the Expander face down in front of your case, with the Expander just to the left or the right of the Vector. Identify the two 20-pin connectors on the Vector labeled '**J20**' and '**J13**'. On the Expander, the matching connectors are '**J200**' and '**J130**'. Using the two ribbon cables that come with the Expander, connect **J20** to **J200** and **J13** to **J130**. Make sure to keep the orientation of the red strip **UP** for these connections.

Now add the Vector (or Vector/Expander combo) to your Eurorack-format case. Don't forget to power down first! The Vector consumes 140mA on +12V, 20mA on -12V. The Expander adds 30mA on both +12

and -12. Anything plugged into the USB A 'to device' jack may draw additional current on +12V. Most controllers (including Launchpads) pull less than 100 mA, but a cellphone or tablet may pull up to an additional 210 mA.

Firmware Updates & Support

It is a good idea to check regularly for firmware updates at http://vector.five12.com. For questions & support, and to be added to a mailing list for announcements (firmware, videos, etc), email info@five12.com.

Limited Warranty

Five12 warrants the Vector Sequencer to be free of defects in assembly or materials for one year from the date of purchase by the owner. This warranty does not cover damage due to misuse such as: Incorrect power supply voltages, extreme heat or moisture, modified firmware or physical damage. Determination of misuse is at Five12's discretion. During the warranty period, defective products will be repaired or replaced as determined by Five12.

To return the Vector for repair, contact info@five12.com for further instructions. The owner is responsible for shipping fees to Five12. Return shipping will be paid for by Five12.

Acknowledgments

A very special thank you goes to Joe Grisso, without whom this could not have happened. Many thanks also to Joshua Baker, Charles Buckingham, Jason Fink, Michael Koehler, Henry Jackson, Judy Marquez, Chris Meyer, Cody Murray, Eric Williamson, Jeff Wojciechowski, David Small, Michael Stearns, Ron Sunsinger, Steve Turner and Andy Yih. Also, a shout out to Robert Rich for help with alternate tunings.

Front Panel Tour

USB A 'To Device'
Plug in a MIDI Keyboard for programming sequences, or send MIDI to a synth. Devices only, no hubs!

USB B 'To Host'
Hook up to a computer or iOS device for MIDI I/O. Hold down **Shift** on startup to run in **Disk Mode**.

The 9th Encoder
Edits values for all steps in most edit modes. Select steps to edit just those steps as a group.

Globals
Tempo & sync settings, default key & scale, part names and types, output assignments.

Parts
View part activity, switch between parts, mute & solo parts. The current part name is shown top-left of the 2nd OLED.

Run, Clock, Reset
Sync In or Out, Triggers In or Out, Set operating mode in **Global**.

Mod CV In
0-5V, set mapping in **Modulation**.

CV and MIDI Outputs
Flexible output assignments, setup in **Globals.**

Sequence Editing
Main edit pages for sequences: **Rec**, **Pitch**, **Gate**, **Velocity**, etc.

Presets & Scenes
Per-part presets, and a preset playlist w/ looping. Use **Scene** mode for ad-hoc arrangements.

Two HiRez OLEDs
Status readouts across the top, values for the current edit page along the bottom.

8 Encoders
Twist to edit values displayed on-screen. **Shift + Twist** for quantized value jumps.

Shift : Sequence Ops
Use **Shift** + other buttons to trigger operations global to a sequence. **Shift+Pitch** to reset all pitch values to their defaults, ditto for gate, velocity, etc. Use **Shift** + [skip|mute|select] to *un-*[skip|mute|select] all steps.

One-Octave Keyboard
Use for step-recording & transposing in **Rec** mode. Use white keys for skip, mute & select in other modes.

Skip, Mute, Select
In most sequence editing modes, sets the behavior of the white keys in they keyboard. This sub-mode is displayed top-center of the 1st OLED.

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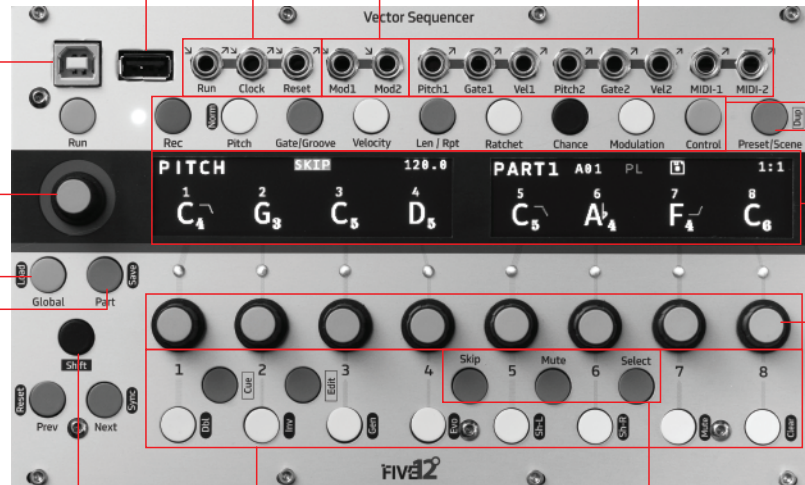
Sequence Editing

For your first sequence, connect the **Pitch1** and **Gate1** outputs of the Vector to other modules in your system, such as an oscillator for pitch and an envelope generator for gate. If you want to connect via MIDI, use one of the included 3.5mm to DIN MIDI adapters to connect **MIDI-1** on the Vector to a MIDI synthesizer.

Press **Pitch** to see the pitch values for the sequence. You may notice that the pitch values are darker than any other text on the display. This means these steps are muted. To un-mute them, press any of the 8 main encoders. To set the pitch values for each step, just turn the encoders.

Now press **Gate** and turn the encoders on this page to edit the note lengths for each step. By default, all of the gates for all parts are off, but when you push the encoders, it will set the gate length to 50% of the step. If you push an encoder again, it will mute the step, but leave the gate value alone. Now is a good time to note that the 'push' behavior for the main 8 encoders can be customized, more on that in the section on **GLOBALS**.

The most common parameters for sequence editing are accessed via the **Pitch**, **Gate**, **Velocity**, **Len/Rpt** and **Ratchet** buttons. Repeatedly pressing those buttons will cycle into secondary pages such as **Glide** and **Groove**. The current edit mode is shown top-left of the 1st OLED, and each page has a distinctive graphic value readout that makes it easy to keep track of where you are. Use **Next** & **Prev** to edit steps other than the first 8.

Pitch: Sets the pitch value for each step in semitones from C1 to C9.

Glide: For monophonic parts, sets the glide time for pitch from 0% to 100%. Use longer gate times for smooth glides.

Chord: For chord-based parts, sets the output chord, from unison through all dyads to an octave, then triads and seventh chords. To set a part to chord mode, see **Parts** on page 11.

Gate: Sets the gate time for each step, from muted, to very short, up to a tied (legato) note. When the gate is off, no MIDI notes are generated.

Groove: Adjusts the time of the step forward or backward just a touch.

TIP: On the Pitch page, hold the **Shift** button while turning the encoders to change pitch by octaves. For **Gate**, **Shift+Twist** will move between 1%, 50% and 99% gate values. Also, if you hold **Shift** and push the **Pitch** button, it will 'normalize' all pitches to their starting values. The same goes for all the other edit pages: **Gate**, **Velocity**, etc.

Pitch   Gate   Velocity   Len/Rpt   Ratchet

Velocity: Sets the velocity CV output level and MIDI note velocity. To mute a note, use a zero gate or mute the step.

CC1, CC2, CC3: Sets the value for up to three lanes of MIDI CC outputs (Chord Parts only have 2 CC lanes). If a CC number is set for a lane (see **Sequence Controls** on the next page), a CC message is generated for every step that is not muted.

Step Len: Sets the length of a step in multiples of the base step time.

Repeat: Sets the step to repeat up to 8 times.

Ratchet: Sub-divides the step up to 4 times.

On the **Step Len** and **Seq Ctl** pages, the Vector will calculate the length of the sequence in beats and display it in the top-right corner of the 1st OLED.

Sequence Controls

Press the yellow **Control** button above the 2nd OLED to access the **Seq Ctl** pages. These are overall settings for the sequence, such as sequence length and rate. There are 3, somtimes 4 pages here, turn encoder **9** to move between them. The most commonly accessed settings are on the first page.

```
┌SEQ CTL              1:1      PART1  A01    ⊡→⊡   ⌂PROJ002
 START    LEN    DIR    RESET   RATE   MODE    OCT    TRNS
  1       8      FWD    AUTO    /16    MDV     0      0
```

START, LEN: Sets the starting step and pattern length within the maximum sequence length for the part.

DIR: Sets the sequence direction: Forwards, backwards, alternate with or without repeating the ends, or run randomly.

RESET: Sets the sequence to reset automatically, every **n** beats, or externally (**EXT**). For external reset, see **Tips & Tricks** on page 25.

RATE, MODE: The default rate for sequences is set using common musical divisions (**MDV**), but there are several alternate modes:

MDV: Musical Division   **X16, X8T, X8:** Crossfade modes
PCT: % of a beat   **P16, P8T, P8:** Phase modes
SPD: Speed, higher is faster   **1/1 - 16/16:** Fractions of a beat

The **X** and **P** modes are phase-based, where the rate deviates (faster or slower) from a default rate of 16th, 8th note triplets or 8th notes. The **X** modes have a wider range than the **P** modes.
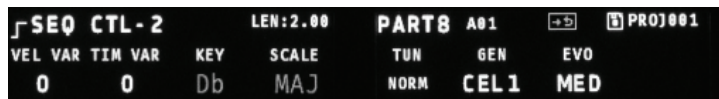
OCT, TRANS: Add an octave or semitone transposition to all notes.

TIP: On the Seq Ctl page, the mini keyboard can be used to set the transposition. Use Prev and Next to shift the keyboard down or up an octave.
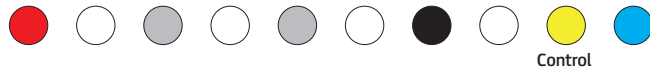
Sequence Controls: Page 2

VEL VAR, TIM VAR: Add random variations to Velocity and Timing (groove).

**Key, Scale:** Override the global settings for key and scale.

TIP: The master tempo for the Vector, and the default key and scale settings for all parts are in Globals.

TUN: Sets the tuning. See the next page for details.

GEN: Sets the algorithm for pattern generation. See **Generate & Evolve** on Page 11 for details.

EVO: Sets the amount of change the evolve operation has: Low, Medium or High.

Sequence Controls: Page 3
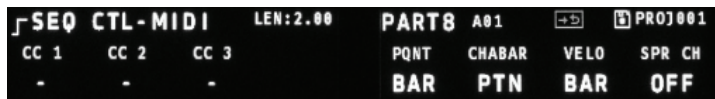
CC 1-3: Sets the CC numbers for the three CC lanes in the Velocity pages.

PQNT: Preset Quantization, sets whether presets change immediately, on the next beat, or on the next bar.

CHABAR: Chance Bar Mode, sets whether the settings on the **CHNC BAR** page count by musical bars, or by pattern repeats.

VELO: Controls display of Velocity. BAR is the standard setting, NUM will display velocity as numeric values. *TIP:* Use **EDIT+Twist** to edit Velocity values in smaller increments in **NUM** mode.

SPR CH: Spread MIDI Channels. This setting only appears for Chord and Drum parts. If it is on, MIDI notes from those parts will be spread across 4 MIDI channels, starting with the one assigned for the MIDI output on the Routing page. So if you have a Chord part and the MIDI output references channel 10, your four voices will be spread across MIDI channels 10 through 13.

Sequence Controls: Page 4

This page only appears for Drum Parts. Use this page to set the MIDI notes generated for each of the 4 drum voices. Use encoder **1** to set the voice to work with, encoder **2** to select the MIDI note, and encoders **3 & 4** to set a two character name for the voice. That name will appear in the title of the **DRUM** edit page.

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Keys, Scales & Tunings

Control
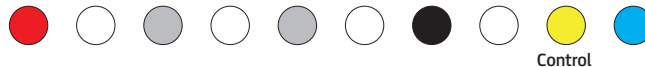
Keys & Scales:

On the Vector, all pitch values are stored internally as either a note number (similarly to MIDI), or an offset from a default note number. The **Key** sets what the default note is for a sequence. For the key of C, that note is MIDI note number 60, which becomes 2V from a Pitch CV out. Pitches within a sequence are actually stored as offsets from the default note, which makes it easy to change or offset the default note for a sequence. You can set the global Key (and Scale) for your project on the first page of **Globals**, or also per-Part on the 2nd **Seq Ctl** page.

A **Scale** limits the note/pitch offsets that are available to use in a sequence. In the Chromatic scale, all notes are available, in other scales, some are not. When you pick a new scale, all pitch values for the sequence are adjusted to fit the new scale. The scales available on the Vector are those that are commonly used with 12-tone Equal Temperament tunings. The built-in scales are:

CHR: Chromatic
MAJ: Major
MIN: Minor
DOR: Dorian
PHY: Phrygia
LYD: Lydian
MIX: Mixolydian
LOC: Locrian

HM: Harmonic Minor
MM: Melodic Minor
WT: Whole Tone
O1: Octatonic 1,2
O2: Octatonic 2,1
PT: Pentatonic
PTM: Pentatonic Minor
M7: Major 7th Chord
D7: Dominant 7th Chord

Alternate Tunings & Notation:

A **Tuning** assigns, for Pitch CV outputs, a voltage value to each note, which then becomes a frequency when sent to an oscillator. The default tuning is 12-tones per octave, equal temperament.

You can set an alternate tuning on the 2nd page of **Seq Ctl** settings. There are several options built-in and you can load tunings in the MIDI Tuning Specification (MTS) format. Many of the built-in tunings use alternate numeric notations. The built-In tunings include:

NORM: 12TET, displayed as note names.
ITVL: 12TET, displayed as roman numerals.
NUMS: 12TET, displayed as MIDI note numbers.

-3+7: 12TET, displayed as voltage values from -3 to +7 volts.
-3+3: Volt range of -3 to +3 volts, 20 divisions/octave.
0-5: Volt range 0 to 5 volts, 24 divisions/octave.

ET13, ET14, ET15, ET16, ET19, ET24, ET31: Equal temperament tunigns, displayed with numeric note numbers and octave subscripts.

HRM12: Harmonic series.
HRM60: Wendy Carlos Harm. Twelve Tone
JIA7T: JI scale with 7-limit Tritone at D#
LAT35: JI, 3-5 Lattice from Carter Scholz
LAT37: JI, 3-7 Lattice from Carter Scholz

MEANT: Meantone temperment
OTHR7: Other Music 7-Limit, JI
PARCH: Harry Partch 11-limit 43 Note, JI
PELSL: Dan Schmidt Pelog/Slendro, Gamelan
PYTHA: Pythagorean

To load your own MTS format tunings stored as .MID files, copy them to the F12_VS/TUNING folder on the SD Card. Make sure each filename, minus the extension, is 5 characters or less. You can then load 2 of them per-project on the 2nd page of **GLOBALS: GENERL**, and then select them per-Part on the 2nd page of **Seq Ctl**.

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The **GLOBALS** pages have a wide range of configuration options for the Vector. There are three main sections: **GENERL**, **PARTS**, and **ROUTING**. Use **Prev & Next** to move between them. Use encoder **9** to dial through the pages of each section. This page covers general settings, Routing is on the next page, and Parts are covered on pages 14 & 15.

TEMPO, SYNC, KEY: Set the global tempo, swing amount, sync mode, key and scale. This is also where you turn the Preset Playlist on and off. For more on sync, see **External Sync** on page 19.

TUNING: You can load up to 2 tunings in MTS format from the SD card. For more on tunings, see page 6.

    MISC-ellanious settings:
       AUTO LD: Automatically load the previous project on power-up.
       AUTO SV: Automatically save the current project each
    time the Vector is stopped.
    ENC SW: Sets the behavior of the Encoder switches:
      NORM: Follow the behavior of the white keys on the mini-keyboard.
   **GATE:** Add or remove gates to sequence steps.
      SKIP, MUTE, SEL: Skip, Mute or Select sequence steps.
      PART: Pick which of the 8 Parts to edit.
      OFF: Do nothing.

FOLLOW: When on, the OLEDs will automatically page to follow the current step of the sequence. You can also toggle this setting on and off from any of the sequence edit pages by holding CUE and pushing Encoder 9.

SLEEP: Sets the time before the OLED displays are put to sleep, in minutes. '5-NR' sets a sleep time of 5 minutes when not running, and leaves them on when running.
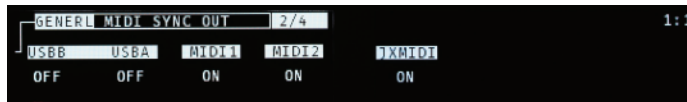
MIDI SYNC OUT: MIDI Clock on/off for all MIDI outputs.

MIDI PROG IN: Enable reception of MIDI program change or note number messages to change Presets and Scenes on the Vector. MIDI Channels 1-8 control parts 1-8, channel 16 is for scenes. **NN48** mode starts with note number 48 (C4), **NN60** starts with note 60 (C5).

USB STATUS: Connection status for both USB ports. To connect an iOS device, use Apple's Camera Adapter. If you experience any strange behaviour with your connected MIDI device ensure that it has been identified correctly on this page.

Routing

The Vector sequencer has very flexible routing options that are saved with each Project. For every output, CV or MIDI, you can set which Part that output 'listens' to. MIDI outputs can listen to up to all 8 Parts, CV outputs can only listen to any one Part. The trigger jacks on the Vector (labeled Run, Clock & Reset) and on the Expander (Trigger 1-8) are a bit special. They can output clock signals at a variety of rates, as well as gate and reset outputs from a Part. They can also be used as inputs. Run, Clock & Reset can be used for sync input (see previous page), and the Expander's Triggers can be used as inputs to manually clock sequences.

To get to the Routing pages, press **Global**, then **Next** twice. You can then use Encoder **9** to move between the pages of this section. There are 6 pages for the Vector, and 3 more if you have a Jack Expander connected.
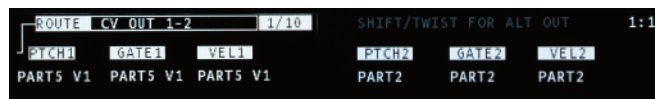

CV OUT: These are two sets of Pitch, Gate & Velocity outputs on the Vector, and four more on the Expander. Use the encoders to set the Part assignment for each output. For Chord and Drum parts, which are polyphonic, hold **Shift** and twist the encoder to set which voice to output.

Velocity outputs can also be set to directly output one of the two sub-sequencers for a part. Hold Shift and twist the encoder to pick those alternate outputs. The notation for them is '**S1**' and '**S2**'.

RUN, CLOCK, RESET: When not used for sync, these jacks can generate clock pulses from a wide range of rates based on the main tempo. They can also generate step triggers (**ST**), gates (**GT**) and sequence reset (**RS**) triggers from a Part. These output modes are labelled **ST**x, **GT**x and **RS**x where x is the Part number. These outputs as well as Trigger outs use a 'CUE' based editing system. Turn the encoder to pick a new value, then push the encoder to activate the new value.
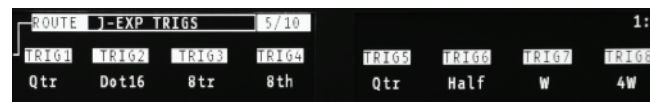

J-EXP TRIGS: For the optional Jack Expander module, these are set to output clock divisions by default. Just like the R/C/R jacks, these triggers can also output Part-based triggers. The first 6 triggers can also be configured as inputs, see page 26 for more details.
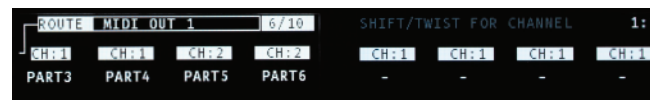
MIDI, USB: Each MIDI Output (**USB A**, **USB B**, **MIDI-1**, **MIDI-2** and Expander **JX MIDI** Ports) has 8 'slots' to output up to all 8 parts. **Shift + Twist** an encoder to set the MIDI channel for that slot.

Recording
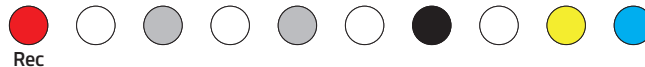
On the **Rec** page, you can enter or modify sequences using the built-in one-octave keyboard, a Launchpad, any USB MIDI Class-compliant host or device, or, if you have the Jack Expander module attached, a MIDI keyboard connected via a traditional 5-pin MIDI cable.

There are 3 parameters here. The first one turns **REC** mode on and off. This setting is global for all Parts on the Vector. This means you can have **REC** mode running for more than one Part.

The second parameter sets the **REC MODE** for the current Part. These modes are listed below. The third param sets the **REC SOURCE**.

The right OLED will change based on the recording mode you have selected. The recording modes are:

OFF: No recording activity for this Part.

STEP: MIDI notes are used to program the pitch values for each step of the sequence one by one. The 2nd OLED will display the notes being programmed, but you can also switch to the **Pitch** page to see them as well. The next step to be programmed will be highlighted, this highlight is called the 'cursor'. You can move the cursor with Encoder **9**. On the **Pitch** page, use **Shift+Encoder 9** to move the cursor. **STEP REC** is avalable for Mono and Chord parts. It is particularly useful for programming in custom chords.

ST+T: Step+Thru: This mode combines step recording, and the behavior of the **THRU** mode described below.

TRANS: Incoming MIDI notes are used to transpose the sequence. MIDI note number 60 is used as the center point.

THRU: Incoming MIDI notes are sent directly to the outputs for the current part, both CV and MIDI, they also override any notes generated by the sequence for this Part. Use this mode to have the Vector act as a MIDI to CV converter. In this mode, the 2nd OLED displays a log of the incoming MIDI message.

RT-G: Realtime Grid: This mode is available for Mono and Drum parts. As the sequence is playing, pitch values will be assigned to steps as you play them on the source keyboard. For a Mono Part, if you hold a note across steps, the Vector will tie the gates for those steps togther.

The **SRC** param sets which MIDI Source to use:

VKBD: The one octave keyboard on the Vector.
**USBA:** The USB A 'to device' connection.
USBB: The USB B 'to host' connection.
JEXP: The **DIN MIDI** jack on the Expander.

When using the mini keyboard, the **Next** and **Prev** buttons shift the keyboard up and down by octaves. The current octave is always shown in the top-middle of the first OLED display.

If you have a Launchpad connected, pick **USB A** as the source to allow recording from the keyboard page of the Launchpad mapping.

9
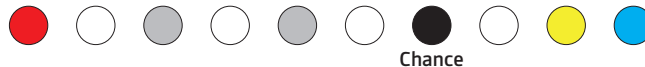
Chance Ops

Chance operations allow you to add variability to a pattern, such as randomly skipping or muting a step, jumping to another step, or changing the pitch. For each step in a sequence, you can pick an operation and the probability that it will happen. You can also set the operation to happen only on even bars, odd bars, or every 3rd or 4th bar.

Chance operations are represented by icons. Their probability of occurring ranges from 0% to 100% and is represented by a circle around the operation icon. The bar setting is represented by a letter or number below and to the right of the operation icon.

There are three pages for chance ops, use the Chance button to cycle between them.

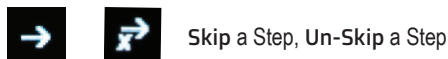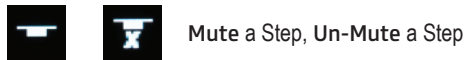**CHANCE TYP:** Pick an operation (the default is mute).
CHANCE PROB: Set the probability that op will happen.
CHANCE PTN: Limit the operation to specific pattern repeats or bars.

A couple examples:

Mute, 30% of the time.

Jump backwards, 50% of the time, only every 4 bars.

All Operations:

Mute a Step, **Un-Mute** a Step

Skip a Step, **Un-Skip** a Step
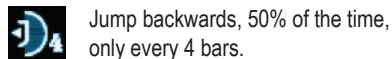
Jump: Backwards, Anywhere, Forwards

Velocity: Less, More, Max

Gate: Shorter, Longer, Tie

Ratchet: 2, 3, 4

Pitch Up: Random, Random Shift Up, Shift Up by Semitone

Pitch Down: Random, Random Shift Down, Shift Down by Semitone

Jump: To a Specific Step

Mute One or More: (Drum Parts only), Mute one or more random voices

Mute Voice: (Drum Parts only), Mute one or more specific voices

Swap Voice: (Drum Parts only), Swap any two voices

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Shift

Sequence Operations

A variety of sequence transformations can be triggered by holding down the **Shift** key and pushing any of the white keys on the mini keyboard. The names for these operations are printed vertically just to the right of each button.

Dbl: Doubles the current pattern.

Inv: Invert all pitches, using the base pitch as the center point.

Gen: Generates a new sequence.

Evo: Modifies (evolves) the current sequence. Set the amount of variation on the 2nd **Control** page.

Sh-L: Shifts the sequence one step to the left.

Sh-R: Shifts the sequence one step to the right.

Mute: Mutes the current part. This is the same as muting a part on the **Part** page.

Clear: Restores all parameters of a sequence to their original value, and marks the current preset as 'empty'.

TIP: Hold **Shift** and press any the edit mode buttons to 'normalize' that parameter, which will reset it to its original value.

Generator Algorithms

To set the algorithm used for sequence generation look at the 2nd **SEQ CTL** page.

ACD1: Acid 1: Generates a 16 step sequence at 1/16th notes with a variety of pitch tones, including minor seconds and tritones. Gates and Velocity steps are set to %50, and then a few accents (Velocity @ 100%) are added.

ACD2: Acid 2: similar to **ACD1**, but adds in a few pitch glides.

ACD3, ACD4 : Similar to **ACD1 & 2**, but no changes to **SEQ CTL** settings.

BRL1: Berlin School 1: Generates an 8 step sequence at 1/8th notes, emphasis on octaves and fifths.

BRL2: Similar to **BR1**, but no changes to **SEQ CTL** settings.

357: Generates a 'cell' based pattern that is 3, 5 or 7 steps long, repeated out to 16 steps.

OBL1: Obliq 1: Generates a cell based pattern that anywhere from 2 to 7 steps long, repeated out to 16 steps and evolved. Affects Pitch, Gate, Velocity & Step Length.

OBL2: Obliq 2: Generates more radical sequences than **OBL1**.

RND1: Randomize Pitch & Gate.

RND2: Randomize Pitch, Gate, Velocity.

RND3: Randomize Pitch, Gate, Velocity, Step Length, & Ratchet.

ECLG: Euclidean Gate: Applies a Euclidean pattern to just gate values.

TIP: You can push generated sequences in very different directions by pre-adjusting unaffected parameters, such as **Glide** and **Rate**. For continuous variation, use lots of **Chance Ops**. To widen the pitch range, set a **Sub Sequencer** to modulate semitones or octaves.
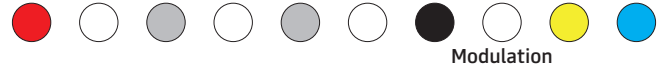
In addition to the main sequence, each Part on the Vector Sequencer has two simpler CV-only sub-sequencers for internal modulation. These sequencers are limited to a maximum length of 8 steps and a range of speeds based on standard musical divisions. They can be used to modify the transposition, rate, length and other parameters of the main sequence. You can also assign any of the **Velocity** outputs on the Vector to one of the modulation sequencers for direct output of the sub sequencer's CV values.

There are five pages in the **Mod** section, two for each sub-sequencer and one for setting up external modulation. Turn encoder **9** to move between them. The first page for a sub-sequencer has settings for length, direction, rate and target parameter, the second has settings for the value of each step.

To setup modulation of a parameter:
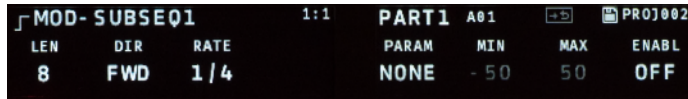
1. Set the length and rate of the sub-sequence.

2. Pick the parameter you want to modulate. The **Min** & **Max** values will automatically update to match the range of the target parameter. Also, the initial values of the sub-sequence will be set to the current value of that parameter.

3. Enable the parameter modulation by turning encoder **8** to ON.

4. Turn encoder **9** to page over to the steps for the sub-sequence so you can edit them. There are three rows of numbers here. The top row are the step numbers, of course. The bottom row are the sub-sequence actual values, which will be offset amounts. The values in the middle row, which are gray, will show the caculated, modulated value of the target parameter.
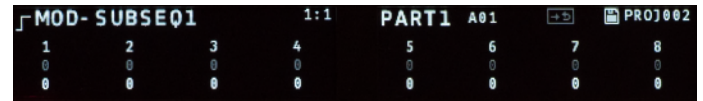
Parameters targeted by sub-sequence modulation will display a super-script s1 or s2 to indicate their values are modulated by a sub-sequencer.

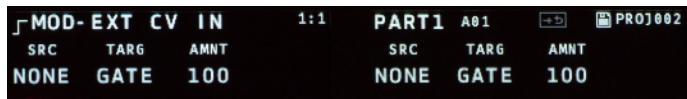*TIP:* To directly route the output of a sub-sequencer to a velocity output, navigate over to the **Route** page in **Globals,** and use encoder **9** to move to the page with the velocity output you would like to assign. Turn the encoder to select the part, then hold **Shift** and turn the encoder again to select **S1** to output the fiirst sub-sequence or **S2** for the second sub-sequence.

CV Modulation
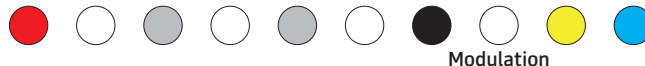
The Vector Sequencer has two CV inputs (**Mod1** and **Mod2**) that can be used to control a variety of parameters such as gate time, velocity scaling or the probability for chance operations. The input voltage range is -5 to +5V. Each of the 8 parts of the Vector has two modulation busses that can listen to either or both of the external modulation inputs.

To navigate to the external modulation page, press Mod, then turn encoder **9** to navigate over to the fifth modulation page.

```
┌MOD- EXT CV IN      1:1    PART1 A01    →↩   📄PROJ002
  SRC    TARG   AMNT          SRC    TARG   AMNT
 NONE   GATE   100           NONE   GATE   100
```

To setup external modulation for a part:

1. Pick a mod source (**EXT1** for Mod1, **EXT2** for Mod2, or **OFF**).

2. Pick a target parameter.

3. Set the amount of modulation, which ranges from -100% to 100%. For most parameters, 50% is a good starting point. At 100% the amount of modulation will be enough to range from the smallest value for the parameter to the largest.

Modulation Targets:

PIT2: Pitch mod, 2 octave range.
PIT5: Pitch mod, 5 octave range (approx 1V/oct).
POCT: Pitch mod, octaves only.
P712: Pitch mod, octaves and fifths.
VELN: Velocity mod, narrow range.
VELW: Velocity mod, wide range.
GATE: Gate time.
STLN: Step Length.
STRP: Step Repeat.
RCHT: Number of ratchets.
PROB: The probability amount for **Chance Ops**.
STRT: Start step.
LEN: Sequence length.
DIR: Sequence direction.
RATE: Sequence rate.

For all targets, modulation is calculated at the start of each step. The current value for the modulated param is read and then adjusted up or down based on the input voltage and modulation amount. Parameters with CV modulation will display a super-script **X1** or **X2**.

TIP: For best results, it helps to know what the voltage range of your modulation source is. Attenuator modules (or cables) and level shifters (for bipolar voltages) can be handy for getting a CV source into the -5 to + 5V range of the Vector's modulation inputs.

TIP: Using a VCA controlled by a pitch or velocity CV from the Vector can be both a handy and interesting way to control the voltage level of a CV.

Parts

The Vector sequencer has 8 Parts, each of which has a main note-based sequencer and two sub-sequencers for modulation. All of the sequencers for all Parts start and stop with the **Run** button (or external sync), and they all share a common tempo, but are otherwise independent. They can have independent run rates, lengths, directions, etc. Each Part also has its own set of Presets and Playlist settings. Parts 5-8 can be configured as polyphonic Chord or Drum sequences. For an overview of how all this fits together, look at the diagram on the back cover of this manual.


Use the **Part** button to view the names and activity for all 8 Parts on the Vector at once. On this page, the white keys of the mini-keyboard can be used to **SELECT** which Part you are currently editing. The **PART** page can also run in **MUTE** or **SOLO** sub-modes. Use the gray buttons between steps 4-7 to select which of the three modes to use.

TIP: From any sequence edit page, hold down the **Part** button and press one of the white mini-keyboard keys to directly jump to the other Part.

PART SETUP

To edit the name, colors, maximum length or type of a Part, look in **GLOBALS:** Press **Global** and use **Next/Prev** to find the 2nd page, titled **PARTS**. There are two sub-pages here, use the encoder **9** to move between them.
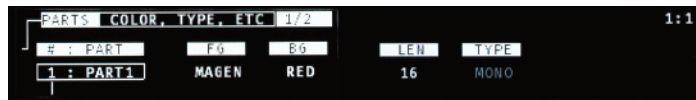
On the first **PARTS** page, use encoder **1** to select the Part you want to modify. Using encoders **3 & 4** you can set the LED colors for the foreground (current step) and background (other steps).

The main sequence for each Part has a maximum length of 16, 32 or 64 steps, but longer sequences mean fewer Presets. To change the max length, use encoder **5**. Parts 5-8, can also be set to chord or drum types (encoder **6**). When you change the max length or type of a Part, you will be prompted to use **Shift+Clear** to initiate the change, and then the **Next** button to confirm. Warning: this process will erase ALL existing Presets for that Part!

To rename a Part, use encoder **9** to move to the second **PARTS** sub-section in **GLOBAL**. On this page, use encoder **1** to select the Part you want to rename, and encoders **2-6** to edit the name.

PARTS & ROUTING

The routing options for CV and MIDI outputs are very flexible. For details on setting up Part assignments for outputs, see **Routing** on page 8.

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Chord & Drum Parts

Global   Part

In addition to the default monophonic sequences, Parts 5-8 can be formatted as four voice Chord or Drum sequencers. This can be done on the 2nd **GLOBALS** page: Press **Global**, then **Next**, the page title will be **PARTS**. Turn encoder **1** until you are viewing Part 5 or higher, turn encoder **6** until it says **CHORD** or **DRUM**, then hold **Shift** and press **Clear** to initiate the change. Press **Next** to confirm. All data that was in that part will be erased and it will be reformatted into the new sequence type.
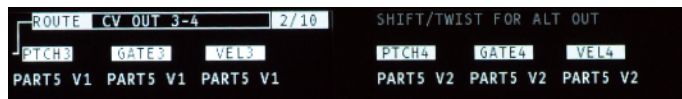
CHORD PARTS

All the edit pages for a Chord Part are just like a Mono Part, except for the **PITCH** page. Here Chord Parts display a base note for each step, and either a single superscript indicator for the type of built-in chord, or three semitone offsets for a custom chord. A small, vertical gray cursor always appears to the left of one of these editable values. Use encoder **9** to move the cursor, which sets the value to be changed with any of the 8 main encoders. Push encoder **9** to switch to selection mode to edit all steps at once.

The base note is always the lowest note of the chord. By default, the chord type is 'unison', which means one note only. To edit the chord type, turn encoder **9** to move the cursor to the right of the base note, and turn an encoder to pick one of the built in chords. These chords progress through all dyads (two note chords) up to an octave, represented by semitone values from **1** to **12**, followed by triads (**M:** major, **m:** minor, **A:** augmented, **D:** diminished, **S2:** sus2, **S4:** sus4), then seventh chords (**M7** : maj 7th, **D7**: dominant 7th, **m7:** min 7th, **h7:** half-diminished, **d7:** fully diminished).

If you want to make a custom chord, which allows much greater flexibility in both note selection and pitch range, hold the **Edit** button and push the encoder for any sequence step, or push encoder **9** to convert all chords to custom. Repeat the process to convert back to the built-in chord selection. In a custom chord you can edit up to 3 semitone offset values for each chord. Offsets greater than an octave (12 semitones) are indicated with small arrows to the right of the semitone value. The maximum offset is 60 semitones.

To setup CV outputs for a Chord Part, navigate to the 3rd page of **GLOBALS:** Press the **Global** button, then **Next** twice, to the page titled **ROUTE**. Turn encoder **9** to get to the appropriate sub-page, such as **CV OUT 3-4** or **CV OUT 5-6**. Turn the encoder for the desired output to pick a Part. Then hold **Shift** and turn the encoder again to pick the Voice. The base note for the chord is Voice 1, and, depending on the chord type, up to 3 more Voices can be generated.

To setup a MIDI output for a Chord Part, use encoder **9** to scroll to one of the MIDI outputs on the **ROUTING** page, then turn any encoder to select the Part.

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Chord & Drum Parts

DRUM PARTS

As with Chords, Drum Parts have four voices (a.k.a. 'lanes'), but no pitch value, instead each Voice has a velocity level, which you can edit on the **PITCH** page (re-titled **DRUM** on the display). The level values are indicated by 4 columns on each sequence step, one per voice. Below the value columns, there is a horizontal cursor, which indicates the current Voice to edit. It works just like in a Chord Part: Turn encoder **9** to move the cursor, push encoder **9** to switch to selection mode. You can also use the **MUTE** sub-mode to edit the pattern using the white keys on the mini-keyboard.

There are several ways to setup CV outputs for a Drum Part. You can use 4 Gate and Velocity outputs on the Jack Expander module, or use 4 trigger outputs only, or even combine 4 trigger outputs with 4 velocity CVs. Setting up a Gate or Velocity output for a Drum Part is the same as for a Chord Part, except there is no need to route for pitch.

To setup a Trigger out to work with a Drum Part, use encoder **9** to scroll to the **ROUTING** sub-page for **RUN**, **CLOCK**, **RESET** or **J-EXP TRIGS**. Hold **Shift** while turning the encoder for the trigger you want to map, and turn until you see **D5.1**, about 4 clicks depending on where the trigger was set originally. The **'D'** is for drums, **'5'** is for Part 5, and **'1'** is the first Drum Voice. From there, release the **Shift** key and turn the encoder to pick the Drum Part and Voice you want the trigger to output. Then push the encoder to 'latch' the mapping change.
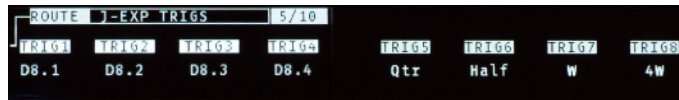
To setup a MIDI output for a Drum Part, use encoder **9** to scroll to one of the MIDI outputs on the **ROUTING** page, then turn any encoder to select the desired Drum Part.

To set which MIDI notes are output for each Drum Voice, Go to the **SEQ CTL** page for the Drum Part. Then turn encoder **9** until you get to the **DRUM MAP** page. Turn encoder **1** to pick the Drum Voice, then turn encoder **2** to set the note, and encoders **3 & 4** to pick a two letter name.

Drum Parts also come with their own set of generator algorithms, as listed below. Cell based algorithms use short, randomly generated patterns, typically 2 - 8 steps long, repeated out to the full length of the sequence, and then evolved in various ways.

CEL1, CEL2, CEL3: Cell-based algorithms with increasing levels of pattern density and complexity.
MAL1, MAL2: Two dual-cell algorithms.
ECL1: Euclidean with random 'k' amount per part, up to 16.
ECL2: Euclidean with less density on voices 1 & 2, and velocity randomization.
HYB: Hybrid, voices 1 & 2 use cell based algorithm, voices 3 & 4 are euclidean.
SPRS: Sparse: A cell based algorithm tuned for longer patterns.
RND1, RND2, RND3: Increasing amount of randomization.

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Projects

PROJECTS

The Vector stores Projects on a micro-SD card located on the back of the module. By default, Projects are auto-loaded when the Vector is powered on, and auto-saved each time the transport is stopped. To adjust those settings, see **Globals**. There is an icon for the SD card near the top-center of the 2nd OLED. When a Project is changed, the icon will have a dot in its center. For a saved Project, the icon will show a solid rectangle.

To manually save a Project, hold down the **Shift** button and press **Part**. Use encoders **1-7** to edit the Project name, then push **Next** to save. If you change the name of a Project to the name of another existing Project, you will see an overwrite warning.

Each Project gets its own folder on the SD card. The Vector keeps the most recently saved version of a Project, along with several backups. Projects that are saved manually end in the extension **.VSM**, autosaves use **.VSA**.

To load a Project, hold **Shift** and press **Global**. Use encoder **9** to select the project and **Next** to load it. To make a new Project, use **Shift+Global** and pick '**New Project**'. A name for the new Project will be automatically generated.

DISK MODE

Running the Vector in disk mode allows you to mount the contents of the SD card onto your computer, which makes it very quick and easy to back up copies of your Projects and calibration files, and for loading new firmware.

To run the Vector in disk mode, connect it to your computer (Mac, PC, Linux) with a USB A - B 'Printer' cable, and hold down the **Shift** button while powering up. The Vector will start with large '**Disk Mode**' titles on both OLED screens. After a few seconds the Vector's SD card will mount onto your computer. Look in the **F12_VS** folder for the PROJECT folder, PREFS and calibration files.

For information on firmware updates, visit vector.five12.com.

Calibration Files

The Vector sequencer comes with one or two data files that store calibration data for the Pitch CVs. The VSCAL.DAT is for the Vector, EXCAL.DAT is for the expander. If you purchased your Vector and Expander together, the two files may be pre-loaded. If you purchased an Expander separately, you can download the file from http://vector.five12.com.

About SD Cards

Your Vector Sequencer comes with a high quality SD card that has been tested to work both speedily and reliably. SD cards from SanDisk and Transcend are recommended, in sizes from 8GB to 32GB.

PRESETS

Each Part on the Vector supports up to 20 Presets, depending on the maximum length of the sequence. Press the **Preset** button to see all the Presets for the current Part in a grid. Empty Presets are shown as "..", non-empty Presets are shown by name. To select a new Preset on the current row, use the white mini keyboard buttons. To change rows, use encoder **9**.

Use **Shift+Preset** to duplicate the current Preset into an empty Preset 'slot'. Use **Shift+Clear** to empty out a Preset. Preset changes are quantized to bars by default. This setting, called **PQNT** (Preset Quantize) can be changed on the 3rd **Seq Ctl** page for each Part.

PLAYLISTS

To edit the name and Playlist settings for a Preset, push **Preset**, then **Prev** or **Edit**. Alternatively, use **Prev/Next** to move between **Preset Edit**, **Preset** and **Scene** pages.

The Playlist is simple in concept, but very flexible. Each Preset can:

- Play forever (by default).
- Play for x beats/bars then go to a later Preset.
- Play for x beats/bars then go to an earlier Preset and repeat y times.

Use encoders **4-8** to edit the Playlist settings for a Preset. The master on/off switch for all Playlists is on the first **GLOBALS** page.

SCENES
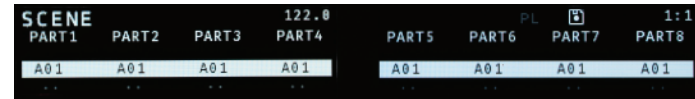
The **Scene** page displays the current Presets for all 8 Parts. You can directly set the Preset for a Part in the current Scene using the 8 main encoders. Use encoder **9** to move between Scenes. To trigger a new Scene, use the **Cue** button or push encoder **9**. Scene changes are always quantized to a bar. Dialing a Preset all the way left will generate a rest symbol indicating no Preset will be played for that Part within this Scene.
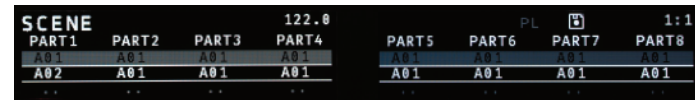
External Sync

In addition to its internal clock, the Vector can synchronize to DIN Sync, MIDI Beat Clock, or an external clock pulse. If the clock source in your modular can generate a run/stop CV and clock ticks at 24PPQN (parts per quarter note), you can use the **Run & Clock** jacks for DIN Sync. For all sync sources, the Vector will internally up-rez the signal to 480PPQN for accurate rendering of features like Pitch Glide, Groove and Ratcheting. Sync settings are on the first page of **GLOBALS**.
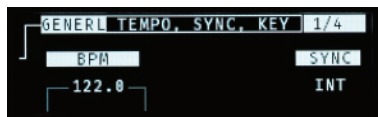
DIN Sync:

1. Connect a DIN Sync source to the Vector through the **Run & Clock** jacks, the **STG Sync** connector on the back panel, or the **DIN IN** Jack on the Jack Expander module.

2. Select **'RC24'** for sync via the **Run & Clock** jacks, **'STG'** for sync via the STG Sync connector on the back panel, or **'JxDIN'** for DIN Sync via the **DIN** input connector on the Jack Expander.

3. Start playback from your DIN Sync source per usual.

MIDI Beat Clock:

1. Connect a MIDI Clock source to the Vector via the **USB A** or **B** jacks on the front panel, or use the 5-pin MIDI Input connector on the Jack Expander.

2. In **Globals**, page 1, select **'USB-A'** for sync via the USB 'to device' jack, **'USB-B'** for sync via the USB 'to host' jack, or '**JxMID**' for sync via the MIDI Input on the Jack Expander.

3. Start playback from your MIDI Clock source.

External Clock Pulse:

1. Connect a clock pulse (gate or trigger) running at either 1 or 4 pulse(s) per beat (PPQN) to the **Clock** jack on the Vector. Optionally connect a reset pulse to the **Reset** jack.

2. Select '**CR/1**' (for a 1 PPQN incoming clock) or '**CR/4**' (for a 4 PPQN clock) to use the **Reset** input as a global reset for all parts, or use '**Cr/1**' or '**Cr/4**' for optional reset. To set a part to reset in **Cr/1** or **Cr/4** sync modes, on the **Control** page for that part, pick '**EXT**' for **Reset**.

3. Start and stop the Vector using the **Run** button.

TIP: For primary sync, the Vector will track smooth tempo changes well, but for random or 'patterned' triggering of sequences, see page 26, **External Resets & Triggers**.

The Dashboard

On the **Seq Ctl** page for any part, you can edit eight parameters at a time for a single Part. The Dashboard is a series of pages that let you edit one parameter for all eight Parts at once. The Dashboard provides an efficient way to modify parameters on the fly during recording or performances.

To get to the Dashboard, press **Part** to go to the **PART** page, and then press **Next**. The top-left of the first OLED will list the parameter being edited (**START** step), the top-left of the second OLED will be **D-BRD**, for Dashboard. Each of the values for the 8 encoders will list the Part name and the current value for the parameter.

To change the parameter being edited, you can turn encoder **9**, or press any of the white keys on the mini-keyboard. The white keys will page through the parameters in the same order that they appear on the **Seq Ctl** page: **START**, **LEN**, **DIR**, etc.

In addition to the 8 parameters from **Seq Ctl** , there are 3 additional parameters only available in the Dashboard. You can reach them using encoder **9**, or by pressing **Next**. These parameters are:

  GATE SCL: Scale all gate values.
  VEL SCL: Scale all velocity values.
  CHAN SCL: Scale the probability for all chance operations.

Keep in mind: These scale values affect every step for that Part.

TIP: Launchpad integration allows for speedy navigation between Dashboard pages using the bottom row of the Session screen.

Launchpad: Session

Connecting a Launchpad

If you connect a recent-model Novation® Launchpad® to the Vector, you can use it as a pre-programmed control surface. Supported models include the Launchpad X, Mini Mk3, and Pro Mk3. For all models, be sure to first update the firmware on the Launchpad Connect website. Then connect the Launchpad via USB to the Vector and after a few seconds it will 'sync up' and display the Session page.

The diagrams on these pages directly map to the buttons on the Launchpad Mini Mk3 and X, though the names printed on those buttons differ slightly. On the Pro Mk3, the arrow buttons are moved over a bit, so the Session button starts in the 3rd column instead of the 5th.

Session Page

The session page provides top-level control of the Vector project. Use the top row to select a Part, the second row to enable per-Part **REC** modes, and the third row to mute or un-mute them. If you have any Parts formatted as Chord or Drum parts, you can use buttons on rows 4 & 5 to mute individual voices for those Parts.

On rows 6 & 7 you can select a Scene. The current Scene is yellow, the selected/next Scene is red and the rest are purple. If you have not created any Scenes, you'll just see one yellow box. Row 8 gives you direct navigation to the first eight pages of the Dashboard.
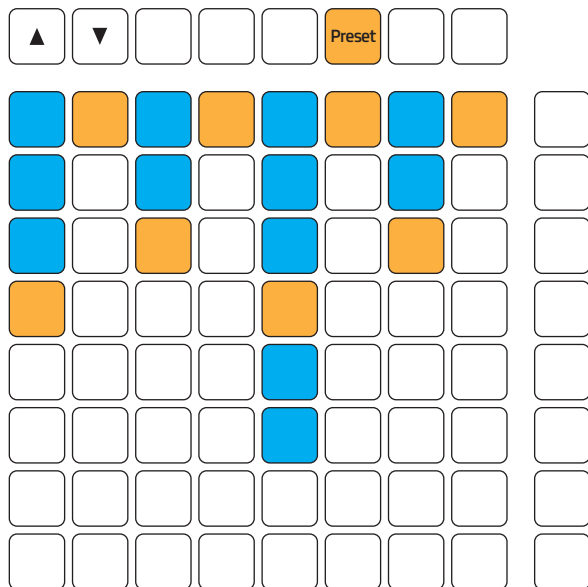
Session Page
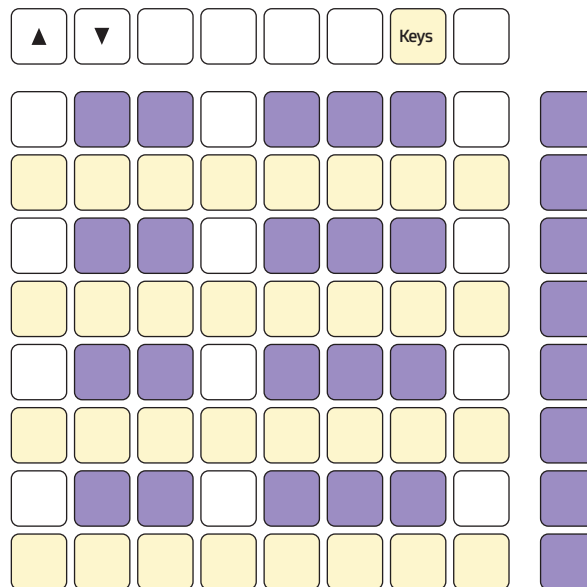
Launchpad: Presets & Keys

Preset Page

The Preset page is arranged in columns and lets you select Presets for each Part. Active Presets are in amber, all others that exist in blue. Use the Up and Down buttons to scroll to presets other than the first 8. Use buttons in the rightmost column to select all Presets in that row.
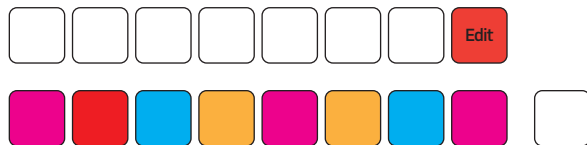
Keys Page

The Keys page works as a 4 octave keyboard for use with the Vector's **REC** modes. Use the buttons to the right of the main grid to set the velocity level On the Launchpad X and Pro, all pads are velocity sensitive. Use the up and down buttons to transpose the keyboard.
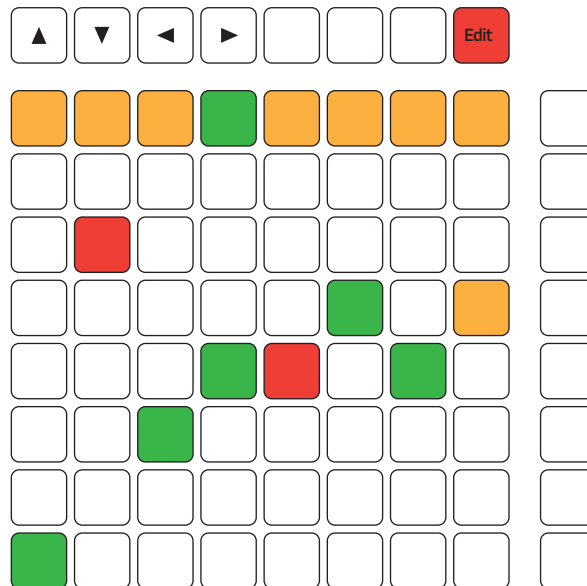
Launchpad: Edit

Nav Page

The Edit pages allow you to select and edit a Part independently of the Vector's main UI. For instance, you could be editing a monophonic pitched part on the Vector, while editing a Drum part on the Launchpad.

The first of the Edit pages is for navigation: It displays one row of buttons, colored to match the Parts on the Vector. Push one of them to edit that Part. To return to the Nav page at any time, push the Edit button again.

Editing Mono Parts

For editing pitched parts, the top row of the grid is used for selecting the octave within which you wish to enter notes, while the lower 7 rows are used for entering pitches. Each column is one step, and each row is one pitch value, starting with the unison (scale degree I) pitch on the bottom row, then proceeding through scale degrees as you go up: II, III, IV, V, VI, VIII. To enter a sharped or flatted note, hold the pad for a that note, then press the pad above or below it. Pitches that are in the current octave are shown in green. As you shift the octave around, pitches below the current octave will be red, pitches above will be amber.

Edit Mono/Chord Page

In addition to the buttons on Row 1, you can use the up and down buttons to change octave. Use the left and right arrow buttons to scroll through longer sequences.

Launchpad: Edit

Editing Chord Parts

Chord Parts are edited one voice at a time. Use the bottom 4 buttons in the rightmost column to pick the voice. The current voice will be blue, the others will be light pink. Notes that belong to the current voice will show up in the same colors as for a Mono Part, the other notes will be light pink. In a Chord Part, the first voice must always be the lowest. If you try to program a note in voices 2-4 below the 1st one, it will be placed on octave higher.

Editing Drum Parts

The edit page for Drum Parts allows you to edit 16 steps across 4 voices. Each voice is allocated two rows with alternating colors. Voices 1 & 3 are red, 2 & 4 are amber. Use the left and right arrow keys to page through sequences longer than 16 steps. Drum sequences progress left to right across the first row per voice, and then move to the second row, before moving to the adjacent page for Patterns longer than 16 Steps.

Drum Edit Page
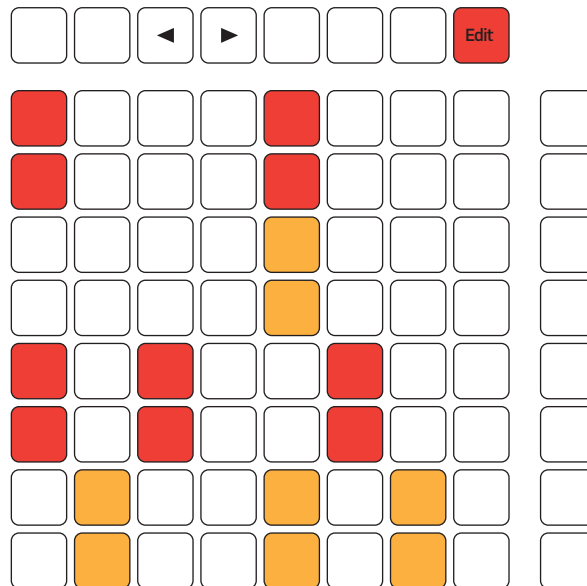
Shift + Prev : Reset All

Hold **Shift + Prev** and the Vector will reset all internal sequences (including sub-sequences) to step 1 when crossing the next barline.

Copy & Paste

You can copy a preset from one 'slot' to another: Hold **Edit** and press **Select**, to copy the Preset. Then move to the other Preset using one of the white keys on the mini-keyboard. Hold **Edit** and press **Skip** to paste the Preset. You can also copy and paste Presets between Parts, as long as the destination Part has the same sequence type (**MONO**, **CHORD**, **DRUM**) and size (**16**, **32**, **64**) as the source Part.

Use **Edit + Skip** to insert a Preset. This combination will duplicate the current Preset to the next preset slot, while moving all the following Presets out of the way.

Those same key combinations also work for Scenes: Use **Edit + Select** to copy the currently selected Scene, then **Edit + Skip** to paste it to a new location. You can also use **Edit + Skip** to insert a blank Scene.

Shift+Twist

Holding the **Shift** key while turning an encoder will usually allow you to jump quickly around the range of values available. For pitch values, it increases or decreases the pitch by one octave. For values like gate and velocity, it jumps between low, medium and high values. When naming Parts and Projects, **Shift+Twist** will jump between vowels, the number 0, the symbol + and a space character. **Shift+Twist** is especially helpful for assigning the output of trigger jacks, which have a very wide range of parameters.

Warm Reboot

Press and hold Encoder **9** for 5 seconds to restart the Vector. This is very handy for getting into and out of disk mode without having to power cycle your entire system.

Disk Mode

Hold **Shift** while starting up and the Vector will run in **Disk Mode**. Then connect the Vector to a computer via USB to access the contents of the SD card without having to remove the Vector from your case.

Presets for Skip, Mute, Select

This is a very esoteric trick, but one that is great for live performance, once you are comfortable with the key combinations. For each Part, you can store a set of steps as muted, skiped or selected, then recall them at will. Start in any 'step edit' mode (Pitch, Gate, etc) with some steps skipped, muted, or selected. Use **Shift + Cue + (Skip/Mute/Select)** to save the preset, then **Cue + (Skip/Mute/Select)** to recall it. You can also use **Edit + (Skip/Mute/Select)** to 'invert' the currently skipped / muted / selected steps.

Tips & Tricks

Follow On-The-Fly

Hold **Cue** & push Encoder **9** to turn Follow mode on and off. When follow is active, the Vector display will follow the current step of a sequence as it plays.

External Resets & Triggers

The **Reset** jack and triggers **T1 - T6** on the Jack Expander can be used to reset individual Parts. First, on the **ROUTING** page in **GLOBALS**, set the mode for the jack to be **EXT**. Then, on the **Seq Ctl** page for the Part, set **Reset** to **EXT** (for the Reset jack) or **T1 - T6** for jacks on the Expander.

The **T1 - T6** triggers on the Jack Expander can be used to manually step a sequence from an external source. Set the mode for the trigger to **EXT**, then on the **Seq Ctl** page for a Part, set the **Rate Mode** to **T1 - T6**. The Vector will use the **Rate** setting to estimate gate lengths. When using **RC24**, **CR/1** or **Cr/1** sync modes, triggers **5 & 6** on the Expander can only be used as outputs.

Firmware Updates

To find the latest firmware updates, visit http://vector.five12.com.

• Download and un-zip the Vector firmware file (VECTOR.BIN.zip).

• Press and hold the Shift button while powering up the Vector to enter USB Disk mode.

• Use a USB 'A to B' cable to connect the Vector to your computer. After a few seconds, the SD Card for the Vector will show up as a new disk.

• Unzip VECTOR.BIN.zip. On a Mac, the Finder may do that automatically. Do not double-click on VECTOR.BIN, which the Finder will try to de-compress into something not useful.

• Make sure the filename is *exactly* VECTOR.BIN, and copy it to the root directory of Vector's SD Card – Delete or move any previous VECTOR.BIN firmware files.

• Now is also a good time to backup your Vector's PROJECT directory.

• Unmount/Eject the Vector's SD Card from your computer, and power off your eurorack system.

• Hold down the **Rec** button on the Vector while powering up your system.

• Press **Next** to load the new Firmware, which takes about 20 seconds.

• Verify the Firmware is the correct version in **Globals** -- first page, 2nd OLED, top-left corner.

Vector Sequencer Project – All projects stored on micro-SD Card

Part – Eight parts per project

Preset – Up to 20 presets per part depending on sequence length

Note Sequence - 16, 32, or 64 steps long

Sub-Seq 1

Sub-Seq 2

Ext Mod

Preset Playlist

Scenes

Globals – Tempo, Key, Scale, Sync, Output Routings, etc.

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