Introduction

About Zebralette

Zebralette is a single oscillator plucked from Zebra2 and transplanted into a very simple and easy-to-learn framework. However, the Zebra2 oscillators are so powerful that Zebralette is a great little synth in its own right – with the same pristine basic sound as Zebra2. The LFOs, MSEG and effects are also simplified versions of some in Zebra2.

Most of the parameters are immediately visible in the window. Only the panels used for modulation parameters and effects as well as the preset browser are ‘tabbed’.

Zebralette doesn’t have any ‘virtual analogue’ filters, but the pair of spectral effects are flexible enough to make some very squelchy filter-like sounds.

After having learned how Zebralette works, you will also have learned a lot about the most important module in Zebra2.

Online resources

For u-he product information, downloads etc., go to the u-he website
For a lively discussion about u-he products, go to the u-he forum
For friendship and informal news updates, visit our facebook page
For u-he tutorials and much more, go to our youtube channel
For u-he presets (free and commercial), go to our patch library

Installation

Go to the Zebralette webpage, grab the appropriate installer for your system, double-click on the downloaded file and follow further instructions. Note that the installer also includes a demo version of Zebra2 (in fact it is the same installer). To uninstall Zebra2 and Zebralette, see the Zebra2 User Guide.

You will find Zebralette presets in the following directories:

Windows
C:\Users\[you]\Documents\u-he\Zebra2.data\Presets\Zebralette\ (user folder)  C:\Users\[you]\Documents\u-he\Zebra2.data\UserPresets\Zebralette\ (user folder)

Mac OSX
MacHD/Library/Audio/Presets/u-he/Zebralette/ [you]/Library/Audio/Presets/u-he/Zebralette/

GUI settings

You can change the size by right-clicking anywhere in the background and selecting from the list (70% to 200% in 10% increments).

Text Antialiasing switches the smoothing of labels and values on or off (normally left on). Use the options in the Gamma sub-menu to adjust the overall brightness.

↓Hyperlinks↓  click here for quick navigation when using this manual as a reference
Presets

To keep this chapter short, only the basic functions are mentioned. For a more in-depth explanation, please refer to the appropriate chapter in the Zebra2 user guide.

Loading

Click on the Presets tab in the lower left of the window. Select a folder, then a preset. After having clicked on a preset, you should be able to use the up/down cursor keys on your computer to scroll through the others.

Saving

Save Patch

Clicking on the Save Patch button opens a window in which you can give your sound a name, enter your name (as author) and any details you want to add: preset description, preset usage etc.. Then confirm via the Apply button. The preset will be saved in the root of the User folder by default.

Patch Format

This switch specifies the way patches are saved. The default setting is u-he’s own .h2p format, recommended because it is platform-independent. If you must use your plugin version’s native format (e.g. aupreset or vstpreset) for whatever reason, select native.

MIDI Programs

Local also contains a special folder called MIDI Programs, which can contain up to 128 patches (loaded when Zebralette starts) selected by MIDI Program Change messages. MIDI Programs can also contain up to 127 subdirectories, switchable via Bank Select messages – for more details, please refer to the Zebra2 User Guide.

Context menu functions

To refresh, create, rename or reveal a folder in your OS, right-click in the folders pane. After using Windows Explorer to manipulate files, make sure you refresh the folder list.

To mark patches as ‘Favourite’ or ‘Junk’, select multiple patches or reveal a patch in Finder (Mac) / Explorer (Win), right-click in the files pane. Junked patches can be made visible by selecting ‘show Junk’.

‘Select All’ marks all patches within the current folder, and ‘Deselect’ cancels the selection. Use cmd+click (Mac) or ctrl+click (Win) to select or deselect individual patches.
Multiple selection, drag & drop

You can select a block of adjacent presets via shift+click, and individual presets can be added to an existing selection via cmd-click (Mac) / alt+click (Win). Presets can then be moved or copied via drag & drop, even between Zebra and your computer’s system folders: Use SHIFT etc. on your keyboard to highlight files, then drag the selected files onto a target folder. To copy instead of move, use opt+click (Mac) / ctrl+click (Win).

Search Bar

Enter text here to find presets. Not only the name or parts thereof, but also the information entered while saving the preset is included in the search. For more details, please refer to the Zebra2 manual.

Control Bar

The u-he badge

Clicking on the u-he ‘badge’ on the left opens a popup menu containing links to this user guide, to our homepage, to our user support forum as well as to our presence in various social networks.

Note: Instead of directly opening the document, selecting ‘user guide’ displays the containing folder so you can access other Zebra2-related text files (e.g. ‘ReadMe’).

Data Display

The central display has several uses. Primarily, it shows the name of the currently selected patch. Clicking on the triangles either side of the display steps through patches. Clicking on the name will open a drop-down list containing all the patches in the current directory – a convenient way of jumping to another patch without having to open the Presets panel.

Voices

few  =  4 notes, medium  =  8 notes, many  =  16 notes

Specifies the maximum number of notes that Zebralette will attempt to play in parallel. As Zebralette is very CPU-friendly, this parameter is not overly important.

Mode

poly  normal polyphonic (see Voices parameter above).
mono  monophonic, each new notes triggers the envelopes.
legato. like monophonic, but envelopes are not retriggered until you leave a space between consecutive notes.

PB

Pitch bend range up / down, from 0 to +24 semitones. The default value is +/-2.
Knobs

Values are adjusted via the usual click-and-drag, often allowing finer resolution via the SHIFT key on your computer. Note that several of the knobs are bipolar (i.e. zero is in the center so you can set negative values). Knobs can be reset to their default values via double-click, or remote-controlled / automated via right-click (MIDI learn function).

Tip for wheel-mouse owners: You don’t even have to click on knobs and switches to change values – just ‘mouseover’ and roll the wheel. Use SHIFT for fine tuning.

And if you can feel slight ‘notches’ while rolling your mouse wheel, right-click on any knob and activate the MouseWheel is rastered option. This ensures that each notch corresponds to a sensible step (e.g. integer).

Mod

Dotted around the interface are several knobs all labeled Mod. These are definable modulation depth controls for the following parameters: OSC Tune, FX1, FX2, Sync-Tune, Phase, WaveWarp, Pan, Volume and LFO1 depth. Click on the associated button (‘none’ by default) to select a source, then adjust the value of the knob.

Parameter locking

A recent feature added to all u-he plugins, parameter locking lets you stop the values of any controls from changing when you switch presets. Right-click on a control and select ‘Lock’. To unlock again, right-click and untick ‘Locked’

Quick Tutorial

Part 1 of 2

• Click on the display at the top of Zebralette’s window, and select initialize. Play a note.
• Go to the VCA panel on the right, click on the word Single and change it to Dual.
• Go to the Tune panel on the left and take Detune up to about 15. Play a note or two...
• Go to the central FX area, click on the field just below the FX1 knob and select Filter.
• Turn the FX1 knob slowly up and down while playing a low note. Turn it down to -50.
• Below the FX1 knob is another one called Mod, and next to that is a field with the word none in it. Click on that field and change it to LfoG1. Turn Mod up to around 16 and play a chord... If you get distortion, go back to the VCA panel and turn Volume down to 50.
• To the left of the lower panel is a tab called Modulation. If it isn’t already highlighted, click on it. Turn R up to 60 for a longer release time.
• In the LFO panel on the far right, click on the upper Sync button and select 3/1 (instead of 1/4) for LfoG1. Play that chord again, which now has slower cutoff modulation. Relax...
• In the LFO panel, make the lower Sync value faster: 1/8 instead of 1/4 for LFO1
• Go back to the Tune panel and turn Vibrato up to maximum. Back in the LFO panel, turn the Depth Mod knob up to maximum – now there is no vibrato until you push the mod wheel on your keyboard.
Part 2 of 2

- Go to the **FX** panel and select *Exophase* for FX2 (*Exophase* is about 3/4 down the list).
  Play a low note and slowly turn FX2 down to -80. Take FX1 back up a bit e.g. to -40.
- Go to the **VCA** panel and take Width to maximum. Click dual and change it to eleven.
- Play your keyboard. Go to the **Tune** panel and increase Detune to taste...
- Go to the **FX** panel and select PitchW as the FX2 modulation source. Turn Mod up to 60,
  play your keyboard and use the pitch bend wheel. Go to the top right corner and change PitchBend to 0.
- Click on the Effects tab (lower left, next to Modulation). In the lefthand panel (ModFX),
  find the knob next to the EQ button and turn it up to 50. Play a very low note and slowly turn
  up the knob to the right of that (low Boost). Stop when you get too much bass...
- Go to FX2 and remove the *exophase* effect: click on it and select none.
- Go back to the left Effects panel and slowly turn Mix up to 60% while playing low notes
  (you will lose some bass frequencies).
- Turn high Boost (two knobs to the right) up to 6.00, play a very low note and slowly turn
  down high CutFreq until you find a ‘beefy’ sound (adjust **VCA** Volume if it gets too loud!)
- Go to the Delay panel to the right. Have a look around...
- Turn Mix up to 30%. Stab a high chord.... then go back to the Modulation tab.
  Turn R back down to 20. Stab another high chord.
- Click on the Effects tab again, change Sync2 (in the Delay panel to the right) to 1/4 dot.
  Play some more...
- Go to FX1 and replace LfoG1 with PitchW. Turn the Mod knob up to 70.
  Play chords while pushing the pitch bender...

Part 3 of 2 :-)

- Immediately above the Modulation and Effects tabs is a long button. Click on it. Have a
  look around, try out a few of the oscillator presets.
- When you find something interesting, close the floating window. Go to the **Waveform**
  panel, turn up Resolution and play with the WaveWarp value.
- Now work out how to modulate WaveWarp from LfoG1...

Enjoy!
Team 2020

Urs Heckmann (boss, concepts)
William Rodewald (student life-support code)
Sebastian Greger (GUI design, 3D stuff)
Thomas Binek (QA, bug-hunting, presets)
Howard Scarr (user guides, presets, necessary grump)
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Viktor Weimer (support, presets, the voice)
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Sascha Eversmeier (code, bad puns)
Frank Hoffmann (more framework, new browser)
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Jayney Klimek (office management)
Alf Klimek (tagging & repairs)
Melina Garbisch (studio attendant)
Oddvar Manlig (everything else!)

Special thanks to Brian Rzycki for maintaining the patch library
The Wave Editor

The Wave Editor is where you can create your own waveforms. As the editor needs to manage up to 16 different waves, it includes a **Wave Selector** immediately below the main editing area...

![wave selector](image)

wave 11 is selected

The wave selector is (almost) the same as the *WaveWarp* knob in the Tune panel – if you adjust one, the other will also move. The main difference is that, unlike the WaveWarp knob, the selector doesn’t give you any intermediate values (e.g. wave 1.5).

**Mouse operations in the Wave Selector**

- **rearrange**
  - (Mac) alt + drag
  - (PC) ctrl + drag

- **morph (or blend)**
  - (Mac) cmd + click on the desired target wave
  - (PC) alt + click on the desired target wave

- **duplicate**
  - (Mac) alt + cmd + click on the desired target wave
  - (PC) ctrl + alt + click on the desired target wave

- **context menu (right-click)**
  - Morph, duplicate or exchange the clicked wave with the already highlighted one.

**GeoMorph & SpectroMorph**

Although there are four oscillator modes, only two editing methods are required. This section describes the two ‘Morph’ waveform modes, and how to edit them...

**GeoMorph**

![GeoMorph](image)
GeoMorph mode lets you draw waveforms by defining up to 32 handles, and (if you like) adjusting the curvature of the lines connecting them. Note that the first and last handles define the level at 0° phase – they cannot be deleted or moved horizontally. The minimum number of handles is 4, and all waves in the waveset adopt the same number of handles.

SpectroMorph

Although it looks and feels like GeoMorph, SpectroMorph is a completely different animal! It does not depict a waveform directly, but rather its spectrum. 1023 harmonics in the horizontal axis are scaled logarithmically, for a total span of about 10 octaves. In this mode, a horizontal line spanning the width of the editor (i.e. all harmonics have equal levels) describes a bright saw wave.

Mouse operations in GeoMorph and SpectroMorph modes

create or remove a handle
(Does not work in SpectroMorph)
(Mac) cmd + right-click
(PC) alt + right-click

multiple selection
Click in the background and drag over one or more handles
Shift + click on a handle to add or remove it from the selection
To move all selected handles, click and drag one of them

adjust curvature (left, right)
(Mac) alt + drag, cmd + drag
(PC) ctrl + drag, alt + drag

Experimenting with line curvature is better than a (necessarily) long-winded explanation here!

click menu (right-click in the editor)
insert point....................creates a new handle
smooth.....................adjusts all curves in the selection for minimum spikes.
linear........................straightens all curves in the selection
peaks........................adjusts all curves in the selection for maximum spikes
distribute all...............adjusts horizontal positions of all handles for even spacing
line up selected........lines up selected handles with the first and last in the selection
clear............................resets all handles to minimum level
copy / paste...............transfer wavesets between patches
GeoBlend & SpectroBlend

This section describes the two ‘Blend’ waveform modes, and how to edit them...

GeoBlend

A single cycle is defined by 128 columns. GeoBlend is similar to GeoMorph in that it reflects the actual shape of the wave. However, when the morph function is used or Wave-Warp is modulated, waveforms are not morphed, they are blended. The main advantage of GeoBlend over GeoMorph is that waveforms can be drawn freehand.

Note: GeoMorph wavesets can be extracted from audio sources. A few third-party utilities are available for this purpose – try googling ‘Wav2Zebra’ and ‘Blueberry Thing’.

SpectroBlend

The spectrum is represented by 128 (bipolar) columns. Similar to SpectroMorph except that it has fewer harmonics, which are scaled linearly for a total range of six octaves.

The lower half is anti-phase, so the same harmonic in adjacent waves (e.g. 1 and 2), but with opposite phases, can cancel each other out (at exactly 1.50 in this example). This cancellation effect can be put to good use – see the oscillator preset ‘Bells Flipper’.

The main advantage of SpectroBlend over SpectroMorph is that you have total control over individual harmonics, including polarity. Waves are not morphed in this mode, they are blended.
Mouse operations in GeoBlend and SpectroBlend modes

draw freehand
  click + drag

draw a straight line
  (Mac) alt + drag
  (PC) ctrl + drag

reset sections to zero
  (Mac) cmd + drag
  (PC) alt + drag

context menu (right-click)
  blur.............................. softens transitions between columns
  sharpen.......................... accentuates transitions between columns
  maximize...................... sets the highest column to maximum and scales the rest accordingly
  copy / paste.............. transfers wavesets between oscillators (even between patches)

If you would like four of these, plus a whole heap more, check out the mighty Zebra2…
Oscillator Panels

Waveform

WaveWarp

Position (index 1–16) in the waveset. Unlike the row of selectors below the wave editor (see the previous chapter), the WaveWarp knob lets you set intermediate values.

Mod

The Mod knob is for WaveWarp modulation (+/-16), and the source is selected in the field to its right (‘none’ by default). How smoothly or precisely waves are interpolated depends on the Resolution setting...

Resolution

This parameter controls the interval (in time) between successive waveform calculations. This trick ensures that Zebralette is very CPU-efficient compared with other spectral synthesizers that calculate their waveforms in realtime.

The range is from 4 seconds (at 1.00) to less than one millisecond (at 9.00). Theoretically, high resolution leads to more precise transitions at the cost of higher CPU load.

Low resolution can actually make transitions smoother (intermediates are interpolated), but can also introduce other unwanted effects (e.g. during rapid pitch-modulation). For most purpose, the default value of 5.00 is best.

Oscillator Preset

The button at the bottom left of the Waveform panel lets you load or save Zebra2 oscillators. Left-click to select a preset from a floating window. Right-click to open a drop-down menu. Select save oscillator settings from this menu to store the oscillator.

Note that modulation assignments (e.g. WaveWarp modulated by LFO1) are oscillator settings, but the settings in the modulation sources themselves are not. This means that an oscillator preset might not sound the same as when you saved it – for instance if the original LFO1 was a 1/16 square wave and the current one is a 10s sine.

Oscillator preset file locations:

Win: C:\Users\[you]\Documents\u-he\Zebra2.data\Modules\Oscillator
Mac: .../Library/Application Support/u-he/Zebra2/Modules/Oscillator
Tune

OSC Tune
Oscillator pitch offset (+/- 48 semitones).

Mod
Tune modulation (+/- 48 semitones). Click on the label to select a source.

Detune
Detune describes two slightly different jobs. In single mode, it is for fine tuning (+/- 50 cents). In Dual, Quad or Eleven modes it does not lower or raise the overall pitch of the oscillator, but spreads detuning equally. Of course you can still do normal fine tuning via SHIFT + OSC Tune.

Vibrato (LFO1)
The amount of pitch modulation directly from LFO1 (0 – 100). The maximum depth here is only +/- 50 cents – for deeper vibrato, use the Mod knob with LFO1 as source.

Portamento
Portamento is a smooth slur (or ‘glide’) between consecutive notes. The Portamento knob adjusts the speed of this effect.

Spectral FX

FX1, FX2
The waveform can be radically transformed via a pair of spectral effects routed in series (FX1 > FX2), often with very surprising results. Note that many of the effects are highly dependent on the waveform Resolution. To select an effect, click on the label below the FX knob.
Mod

The two lower knobs are for modulating the depth of each spectral effect. Click on the label to select a Mod source, then adjust Mod to taste.

Norm

Normalize: The output level of the generated wave is analyzed (RMS), then low-level waves are boosted so that the final level would be 0dB if Norm were at 100%. High normalization values are fine for boosting most low-level waves, but please keep Norm relatively low on very spiky waves – unless of course you enjoy blasting a lot of high frequencies through your system!

List of spectral effects

<table>
<thead>
<tr>
<th>Spectral Effect</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fundamental</td>
<td>Adjusts the level of the fundamental. Range = -200% (inverted) to +200%. At the central position, the fundamental is inaudible.</td>
</tr>
<tr>
<td>Odd for Even</td>
<td>Even-numbered harmonics are cross-faded to odd harmonics, resulting in a more ‘squarish’ waveform. With negative values, the odd harmonics become even harmonics.</td>
</tr>
<tr>
<td>Brilliance</td>
<td>Boosts (positive) or attenuates (negative) higher harmonics, resulting in brighter or darker waveforms.</td>
</tr>
<tr>
<td>Filter</td>
<td>A combination of lowpass (negative values) and highpass (positive values) filters. Because in reality the ‘filter’ code only manipulates amplitudes, its slope is more than 100dB/octave.</td>
</tr>
<tr>
<td>Bandworks</td>
<td>A combined bandpass (positive) and notch filter (negative).</td>
</tr>
<tr>
<td>Registerizer</td>
<td>Boosts any octaves of the fundamental while attenuating all other harmonics, often resulting in an organ-like sound.</td>
</tr>
<tr>
<td>Scrambler</td>
<td>Similar to operator feedback in FM synthesizers: the phase of the waveform is modulated by the wave itself, creating many new overtones. If you need dirty-sounding digital oscillators, this is the one.</td>
</tr>
<tr>
<td>Turbulence</td>
<td>Periodically shuffles the harmonics at random. Even if not modulated, the speed of this effect is dependent on the oscillator Resolution. Turbulence is useful in SpectroBlend mode with only a few harmonics.</td>
</tr>
<tr>
<td>Expander</td>
<td>Expands (or contracts when negative) the spectrum. Similar to brilliance if the harmonics are distributed evenly.</td>
</tr>
<tr>
<td>Symmetry</td>
<td>Contracts the waveform towards the beginning or end of its cycle. Often sounds like PWM – and for a square wave, that’s what it is!</td>
</tr>
<tr>
<td>Phase Xfer</td>
<td>A variant of PD (phase distortion) synthesis. The original waveform is not output directly, but is used as the phase response of an extra sine wave – which you can hear when the value is zero.</td>
</tr>
<tr>
<td>Phase Root</td>
<td>The original wave multiplies the phase response of the sine wave.</td>
</tr>
<tr>
<td><strong>Trajector</strong></td>
<td>Mild FM (sine carrier modulated by the oscillator waveform)</td>
</tr>
<tr>
<td><strong>Ripples</strong></td>
<td>Multiplies the waveform with a harmonic, for quasi-resonant sounds.</td>
</tr>
<tr>
<td><strong>Formanzilla</strong></td>
<td>Multiplies the spectrum with a variable harmonic, resulting in formant-like spectra with several strong peaks and troughs.</td>
</tr>
<tr>
<td><strong>Sync Mojo</strong></td>
<td>Simulates hard sync by contracting the time axis then writing the waveform back into wave memory.</td>
</tr>
<tr>
<td><strong>Fractalz</strong></td>
<td>Like Sync Mojo, except that the contracted wave is contracted again and again for even more harmonics than Sync Mojo.</td>
</tr>
<tr>
<td><strong>Exophase</strong></td>
<td>A classic 7-stage phaser is applied to the original wave. This effect is equally useful for static coloration or resonant sweeps.</td>
</tr>
<tr>
<td><strong>Scale</strong></td>
<td>The relative amplitudes of harmonics are scaled, either to the power of 2 (negative, softer) or 3 (positive, brighter). This results in finer resolution of quieter harmonics, and therefore more precise control over the overtone structure.</td>
</tr>
<tr>
<td><strong>Scatter</strong></td>
<td>Similar to the Scrambler effect (see above), but in this case the phase of the waveform is modulated by itself squared (i.e. to the power of 2). An FM triangle or square from a pure sine or absolute chaos from a sawtooth – Scatter is flexible.</td>
</tr>
<tr>
<td><strong>ChopLift</strong></td>
<td>Negative values raise an amplitude threshold below which all harmonics are faded out (Chop). Positive values raise the levels of fainter harmonics (Lift).</td>
</tr>
<tr>
<td><strong>HyperComb</strong></td>
<td>Adds 3 copies of the original wave to the wavetable. For positive values (only), the phases are randomly shifted, resulting in a subtle to dramatic effect similar to chorus. Even when not modulated, positive HyperComb is dependent on the value of oscillator Resolution.</td>
</tr>
<tr>
<td><strong>PhaseDist</strong></td>
<td>Phase distortion, as in the ’80s Casio CZ series of synthesizers. The wave acts as a function for the phase of an inverse cosine. The amount knob crossfades between no effect and full effect, so the most dramatic uses of this effect involve modulating the Wave index.</td>
</tr>
<tr>
<td><strong>Wrap</strong></td>
<td>Inverts those parts of the wave that extend above or below a certain threshold. Negative values allow greater limits for multiple wrapping.</td>
</tr>
<tr>
<td><strong>DX</strong></td>
<td>Same as Trajector (see above) but about 10 times stronger!</td>
</tr>
<tr>
<td><strong>Smear</strong></td>
<td>Blurs the spectrum in one direction (negative = down, positive = up).</td>
</tr>
</tbody>
</table>
Phase

**SyncTune**
Offset for the oscillator-internal hard-sync effect. This classic ‘analogue’ sync adds a lot of upper harmonics, and is probably why it was often used to imitate screaming guitar sounds back in the shoulder-padded and hairsprayed 1980s.

**Sync**
Switches the sync effect on / off.

**Mod (left)**
User-definable SyncTune modulation.

**Reset**
Reset causes the wave to start at the same position (set by Phase) every time a note is played.

**Phase**
Adjusts oscillator phase for the following two parameters:

**PWM**
The PWM switch adds an upside-down copy of the oscillator to itself...

**Mod (right)**
... and this is user-definable phase modulation. If the PWM switch is on, the effect is very similar to classic pulse width modulation (because only the phase of the original wave is modulated).
This is Zebralette’s “Output” panel....

Pan
Pans the sound to the left or right.

Stack Mode

\textit{single} / \textit{dual} / \textit{quad} / \textit{eleven}

Selects single or stacked (2, 4 or 11) oscillators. The \textit{eleven} mode could be called a superwave (not a supersaw, hypersaw, terrorsaw etc.) because the stacking effect works with any wave the oscillator can deliver.

Mod (left)
User-definable Pan modulation. Click on the label to select a source.

Width
If the oscillator is in dual, quad or eleven mode, this knob controls the stereo separation of the stacked oscillators. Does nothing if Zebralette is in Single mode.

Volume
Main output level.

Envelope selector
Choose either the \textit{Gate} or \textit{Env1} as your audio envelope. Selecting the gate here frees up the envelope for other duties. Note: \textit{Gate} is a simple on/off whenever a note is played/released, but with a short but noticeable release time.

Mod (right)
User-definable Volume modulation. Scales the level from 0\% through 100\% (center) to 200\%. Click on the label to select a source.
Modulation

Envelope

Shape

The switch below the panel name sets the curvature of all time-based envelope stages:

quadric .... Exponential curves. Attack is convex, Decay and Release are concave.
linear .......... Straight lines, as in the image below. Linear envelopes can sound unnatural.
v-slope...... Exponential curvature via the Slope parameter:

Slope

Only works in v-slope mode. The far left position is extremely concave, -50 is close to quadric, the center is linear, the far right is extremely convex.

A

Attack: The time it takes to rise from zero to maximum

D

Decay: The time it takes to drop from maximum to the Sustain level

S

Sustain: The level after Decay. Normally stays at that position until the note is released.

F/R

Fall/Rise: Fall to zero (negative values) or rise to maximum (positive values). Extreme values make this transition very short, values close to zero (use SHIFT to fine-tune) can be quite long.

R

Release: The time it takes to drop to zero after a note is released.

Vel

Velocity for envelope dynamics: keyboard velocity scales the envelope’s output level.
The Multi Stage Envelope Generator is a complex modulation source offering total control of the shape as well as continuous control over the timing. Many different uses for MSEGs can be found in the factory presets. If you find shapes you would like to use elsewhere, save them as Presets...

MSEG preset

MSEG settings can be loaded and saved. Click on the MSEG button to load, right-click to select from a drop-down menu or save to the current folder. Unlike Zebra2, the Zebralette MSEG has no rate / synchronization controls. MSEG preset locations:

Mac: Macintosh HD/Library/Application Support/u-he/Zebra2/Modules/MSEG
Win: C:\Users\[you]\Documents\u-he\Zebra2.data\Modules\MSEG

Velocity-MSEG
For dynamic envelopes – velocity scales the level of MSEG output.

Switches
Below the editing window are three small blue icons. From left to right, these are:

Single..........moves individual handles, all other handles remain fixed
Shift...........moves individual handles, all following handles also move
Draw..........moves multiple handles vertically – click on a handle and ‘draw’
Handles jump to the nearest unit snap and value snap positions (see Context Menu).

The Edit Window

Insert Point
Creates new handles. The maximum possible is 33.

Mac.........cmd + click on the background
PC............alt + click on the background

Curvature
To adjust line curvature, click on a line and drag it away. S-curves are also possible: learning-by-doing is better than a long-winded explanation here!

Zoom & Scroll
To zoom in or out, click on the background and drag up / down. For ‘optimum’ zoom, double-click. To scroll to invisible sections of the envelope, click and drag left / right.
Context Menu (right-click on a handle)

*Remove Point, Loop Start and Loop End* are self-explanatory. To make a loop of zero length (you might need this from time to time), simply delete the 'loop end' handle.

Context Menu (right-click in the background)

- *copy / paste* ................. clipboard functions for the waveset
- *half size* ....................... shortens the envelope
- *double size* ..................... lengthens the envelope
- *upside down* .................... inverts the envelope
- *unit snap* ....................... horizontally restricts new input to 3, 4, 6 or 8 steps per unit
- *value snap* ...................... vertically restricts new input to 12, 24, 36, 48 or 15 levels
- *quantize to snap* ............ quantizes all handles to the nearest step (see *unit snap*)
- *unit spacing* .................... distributes all handles to successive units
- *even spacing* ................. evenly distributes all handles between the leftmost and rightmost.
- *pointer* ........................ resolution of the position indicator. Reverts to *Course* by default

**LFOs**

Zebralette has two LFOs (low frequency oscillators). Alongside envelopes, LFOs represent THE classic modulators – for vibrato or any kind of cyclic movement.

**LFO Global**

The global LFO is a bit simpler than LFO1 (see below). LFO Global does not retrigger per voice, it is quasi ‘monophonic’.

**Sync**

LFO rate:

- 0.1s, 1s, 10s...... absolute times – adopted directly from Zebra2, no scaling factor yet!
- 1/64 – 8/1........ sync to song tempo, up to eight bars. Includes dotted and triplet values.

**Waveform**

- *sine* ......................... pure sine wave
- *triangle* ..................... pure triangle wave
- *saw up* ...................... rising saw ('ramp')
- *saw down* ................. falling saw
- *sqr lo-hi* ................. square wave, restarted at the lower level
- *sqr hi-lo* ................. square wave, restarted at the higher level
- *rand hold* ............... random steps
- *rand glide* .............. random curves

**Phase**

Sets the position within the LFO cycle at which it will Restart (see below). This parameter is meaningless if Restart is set to *off*.
Restart

*off, each bar...32 bars:* The GLFO is automatically restarted after a defined number of bars. Future versions of Zebralette may include gate-retriggering (like in the standard LFO module).

LFO1

This module is called a ‘voice’ (polyphonic) LFO because, unlike the global one, it is instantiated per voice. Every note you play gets its own LFO. So the main advantage is that different notes in a chord can have different phases.

Sync

LFO rate. The list of synced values includes dotted and triplet note lengths.

0.1s, 1s, 10s......absolute times – adopted directly from Zebra2, no scaling factor yet!
1/64 – 8/1 ..........sync to song tempo, up to eight bars

Waveform

- *sine:* pure sine wave
- *triangle:* pure triangle wave
- *saw up:* rising saw (‘ramp’)
- *saw down:* falling saw
- *sqr lo-hi:* square wave, restarted at the lower level
- *sqr hi-lo:* square wave, restarted at the higher level
- *rand hold:* random steps
- *rand glide:* random curves

Phase

Sets the position within the LFO wave where it will restart each time a new note is played. Phase is ignored if Restart is set to *free.*

Restart

- *sync:* LFO1 phase is offset for each note to synchronize best with the song
- *gate:* LFO1 starts at the same phase for each note (see Phase above)
- *single:* LFO1 becomes monophonic, it has the same phase for all notes
- *random:* LFO1 starts at a random phase for each note

Depth Mod

This label refers to both the field above it as well as the knob to the right. User-definable amplitude modulation of LFO1. Note that LFO1 is directly connected to Vibrato in the Tune panel: For traditional vibrato depth control, set the source to *ModWhl.*

Delay

Actually a ‘ramp-up’ time for the LFO1 amplitude. Typically used for ‘delayed vibrato’.

However: If you need an extra little envelope at the expense of an LFO, try this: Set Sync to 8/1, set Reset to *Gate* and adjust Delay (ramp time). Use negative modulation levels for ‘ramp-down’ envelopes.
List of Modulation Sources

Many of the knobs in Zebralette (those labeled ‘mod’) are user-definable and, once assigned, these set the amount of modulation applied to a nearby parameter. Click on the button (initially set to ‘none’) to open the following list of possible modulation sources:

<table>
<thead>
<tr>
<th>Modulation Source</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>none</td>
<td>no modulator</td>
</tr>
<tr>
<td>ModWhl</td>
<td>modulation wheel, MIDI CC#01</td>
</tr>
<tr>
<td>PitchW</td>
<td>pitch wheel (pitch bender)</td>
</tr>
<tr>
<td>Ctrl A</td>
<td>MIDI control A, default = Breath (C#02)</td>
</tr>
<tr>
<td>Ctrl B</td>
<td>MIDI control A, default = Expression (C#11)</td>
</tr>
<tr>
<td>LfoG1 *</td>
<td>global Low Frequency Oscillator</td>
</tr>
<tr>
<td>Gate</td>
<td>simple on/off envelope</td>
</tr>
<tr>
<td>KeyFollow</td>
<td>MIDI note number. Breakpoint is E2</td>
</tr>
<tr>
<td>KeyFollow2</td>
<td>in Zebralette this is practically the same as KeyFollow</td>
</tr>
<tr>
<td>Velocity</td>
<td>MIDI velocity</td>
</tr>
<tr>
<td>Pressure</td>
<td>aftertouch (channel or poly, depending on which is received first)</td>
</tr>
<tr>
<td>Env1 *</td>
<td>envelope</td>
</tr>
<tr>
<td>MSEG1 *</td>
<td>multi-segment envelope generator</td>
</tr>
<tr>
<td>Lfo1 *</td>
<td>per voice Low Frequency Oscillator</td>
</tr>
</tbody>
</table>

* the index ‘1’ is for the sake of compatibility with Zebra2.

MIDI Control

Zebralette can be remote-controlled / automated via MIDI messages from a hardware controller unit or from your sequencer app. Right-click any knob to open a menu containing MidiLearn and MidiUnLearn. For further details, please refer to the Zebra2 user guide.
Effects

ModFX

Analogue purists may shudder at the mention of built-in chorus effects (which often signify a lack of ‘beef’ in other departments), but we think no synthesizer should be without one. So here it is, with a built-in equalizer…

**Mode**

*Chorus*......chorus / flanger using short delay lines  
*Phorus*......chorus / flanger using allpass filters  
*Phaser*......classic phaser unit

**Center / Speed / Depth**

*Center*......nominal delay time / allpass cutoff, i.e. before modulation  
*Speed*......modulation LFO rate (from 0.1Hz to 1Hz)  
*Depth*......modulation LFO amount

**Feedbk**

Bipolar feedback control for ‘flanger’ type resonances – especially at extreme values.

**Mix & Stereo**

*Mix*..............balance between dry and wet signal  
*Stereo*.............modulation LFO phase offset between the two stereo channels.  
Note that 50% is often more ‘stereo’ than 100%.

**Quad & Q-Phase**

*Quad*.............volume of an extra chorus effect, with independent LFO  
*Q-Phase*......modulation LFO phase offset (see Stereo above) for the Quad effect

**Equalizer**

This unique feature can e.g. preserve the stereo image of bass frequencies via low cut, while at the same time making the chorus effect sound less harsh via high cut.

*EQ*..............switches ModFX equalization on/off.  
*LowFreq*......low crossover frequency  
*HiFreq*......high crossover frequency  
*Boost*.............cut/boost controls for the two frequency ranges
Delay

The delay module in Zebralette is the same as in Zebra2, except that the parameters are not freely modulatable. It has four delay lines, each with time scaling and pan controls. Two flavours of feedback with inserted low and highpass filters can run at the same time, feeding each other...

Mode

- **stereo 2**..............stereo delay, uses delay 1 and 2 only
- **multitap 4**..............all four delays in parallel
- **dubby 2+2**..............like two instances of stereo 2 in series
- **serial 2**..............ping-pong delay, uses delay 1 and 2 only

Feedback & X-back

- Normal regeneration, cross-regeneration.
- In multitap mode, X-back is 1>2, 2>3, 3>4, 4>1

Mix

- Cross-fade between the dry and wet signal

Lowpass & Hipass

- Simple filters in the feedback paths for changing the tonal quality of successive repeats.

Sync1...Sync4

- The button above each % knob sets either a synchronized note value (1/64th to 1/1 triplet) or absolute time (nominally 1 second)

%  
- The ratio (%) knobs scale the Sync values from 0% to 200%

Pan

- A panorama position for each delay line

The End