



# ZEBRALETTE

## USER GUIDE

version 2.5.4



Howard Scarr, 2010 – 2012

●	<b>Introduction</b>	<b>3</b>
	About Zebralette _____	3
	<i>Online resources</i> _____	3
	<i>Installation</i> _____	3
	Presets _____	4
	<i>Load</i> _____	4
	<i>The MIDI Programs folder</i> _____	4
	<i>Save</i> _____	4
	<i>Favourites and Junk</i> _____	4
	Control Bar _____	5
	Knobs _____	5
	<i>Mod</i> _____	5
●	<b>Quick and Easy Tutorial</b>	<b>6</b>
●	<b>The Wave Editor</b>	<b>8</b>
	GeoMorph & SpectroMorph _____	8
	GeoBlend & SpectroBlend _____	10
●	<b>Oscillator Panels</b>	<b>12</b>
	Waveform _____	12
	Tune _____	13
	Spectral FX _____	13
	<i>List of spectral effects</i> _____	14
	Phase _____	16
	VCA _____	17
●	<b>Modulation</b>	<b>18</b>
	Envelope _____	18
	MSEG _____	19
	<i>The Edit Window</i> _____	19
	LFOs _____	20
	<i>LFO Global</i> _____	20
	<i>LFO1</i> _____	21
	List of Modulation Sources _____	22
●	<b>MIDI Control</b>	<b>23</b>
	<i>MidiLearn and MidiUnLearn</i> _____	23
	<i>MIDI controllers</i> _____	23
●	<b>Effects</b>	<b>24</b>
	ModFX _____	24
	Delay _____	25

# Introduction

## About Zebralette

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Zebralette is a single oscillator plucked from Zebra2 and transplanted into a much simpler, easy-to-learn framework. As the Zebra2 oscillators are so powerful, Zebralette is a great little synth in its own right – with the same pristine basic sound as Zebra2. The LFOs, MSEG and effects in Zebralette are also simplified versions of those 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 u-he tutorials and 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).

The installer doesn’t write anything into e.g. your Windows registry, it doesn’t create hidden files or otherwise modify your system. To uninstall Zebra2 (and Zebralette), see the [Zebra2 User Guide](#).

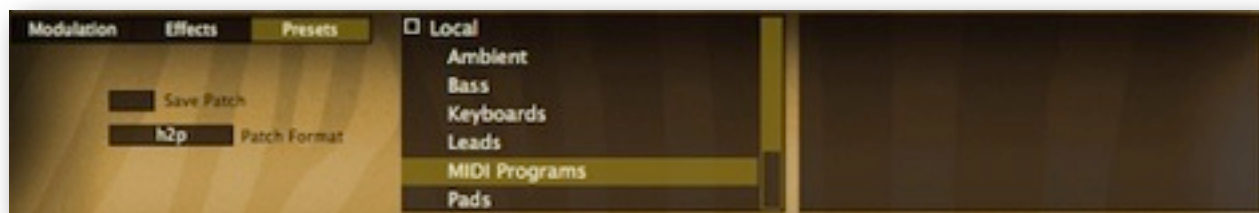
If Zebralette doesn’t appear in the plug-in list, installation causes error messages or even crashes the host, do the following: Move the file **Zebra2.data** from the *VstPlugins* directory to *C:\Users\[you]\Documents\* and put a shortcut (also called **Zebra2.data**) to that file in your standard *VstPlugins* directory instead. You will find step-by-step instructions at the beginning of the Zebra2 manual.

You will find Zebralette presets in the following directories:

<b>Windows</b>	...\VstPlugins\u-he\Zebra2.data\Presets\Zebralette\
<b>Mac OSX</b>	MacHD/Library/Audio/Presets/u-he/Zebralette/
(user folder)	[you]/Library/Audio/Presets/u-he/Zebralette/

↓ **Hyperlinks** ↓ for quick navigation when using this manual as a reference work!

## Presets



the 'Presets' panel

## Load

To browse through Zebralette's presets, 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.

## The MIDI Programs folder

**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.

## Save

### Save Patch

Select the folder where you want to put your sounds (the *User* folder is probably the best place – you will find it at the very bottom of the folder list). Click on the *Save Patch* button. A window opens 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.

Right-click in the *Folders* window whenever you need to create a new folder or refresh the list (necessary whenever folders or presets are added from Explorer / Finder).

### 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. To save patches in your plugin version's native format, select *native*.

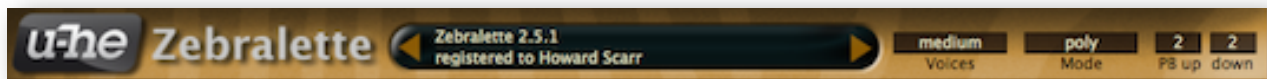
Note that .h2p files are readable text (except for a block of data at the end). More readable still is the **.h2p extended** format, which includes comments for each line.

## Favourites and Junk

Right-click in the *Presets* panel to open a context menu: You can classify the current selection as *Favourite* or *Junk*. Favourites are marked with a bright star. Junk will disappear immediately, but can be made visible (appears with a 'Stop' sign) by selecting *show Junk* in that same menu.

## Control Bar

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### 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*

also monophonic, but envelopes continue i.e. they are not retriggered until you leave a space between consecutive notes. Legato is essential for nuanced phrasing.

### PitchBend

Pitch bend range up / down, from 0 to +12 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 (MidiLearn function – see below).

Tip for wheel-mouse owners: Unless you need very fine control, you don't even have to click on knobs and switches to change values – just 'mouseover' and roll the wheel.

## 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, SyncTune, 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.

# Quick and Easy 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.

*Here endeth part 1*

**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 have found 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!



# 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...



*the wave selector bar, wave 11 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 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



*Typical GeoMorph wave*



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***



*Typical SpectroMorph wave*

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*

(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!

*context 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

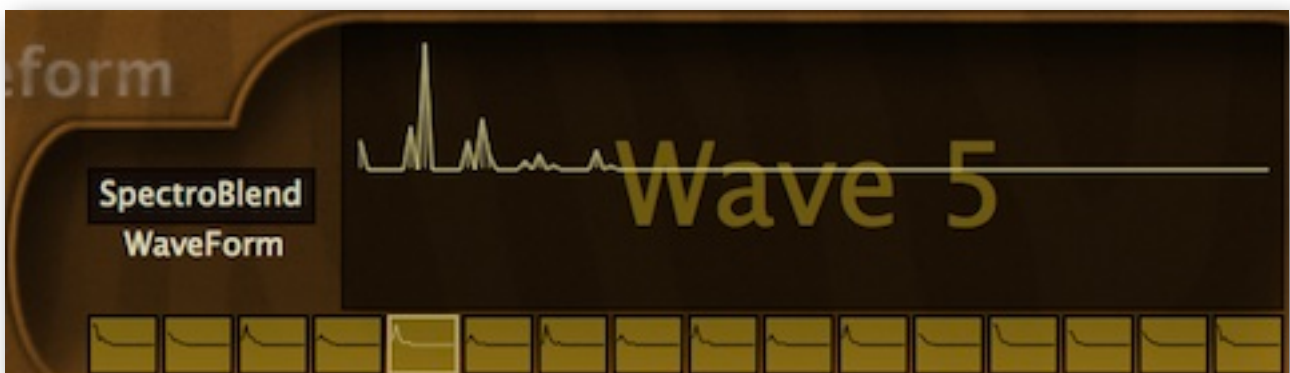


*Typical GeoBlend wave*

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 WaveWarp 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



*Typical SpectroBlend wave*

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!  
Note that the demo version will crackle every so often until licensed / registered.



# Oscillator Panels

## Waveform

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### 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 ( $\pm 16$ ), 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.

Please 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: ...\\VstPlugins\\u-he\\Zebra2.data\\Modules\\Oscillator

Mac: .../Library/Application Support/u-he/Zebra2/Modules/Oscillator

## Tune

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*the Tune panel*

### 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)

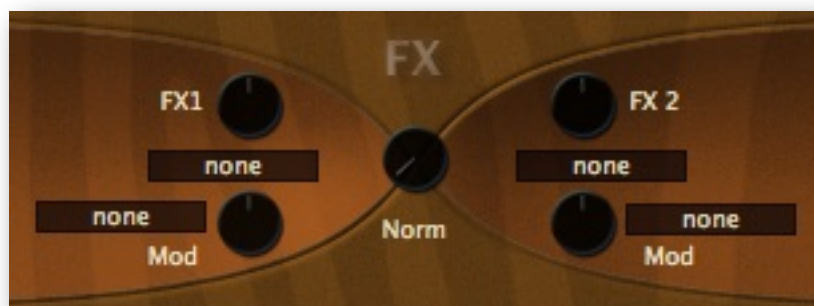
The amount of pitch modulation directly from LFO1 (0 – 100). The maximum depth here is only +/- 50 cents – for deeper vibrato, use the Mod knob with LFO1 as source.

### Portamento

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

## Spectral FX

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*spectral FX panel*

### 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**

<i>Fundamental</i>	Adjusts the level of the fundamental. Range = -200% (inverted) to +200%. At the central position, the fundamental is inaudible
<i>Odd for Even</i>	Even-numbered harmonics are cross-faded into odd harmonics. This results in a more 'suarish' waveform (square waves contain only odd harmonics). With negative values, the opposite applies – odd harmonics become even.
<i>Brilliance</i>	Boosts (positive) or attenuates (negative) higher harmonics, resulting in brighter or darker waveforms
<i>Filter</i>	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.
<i>Bandworks</i>	A combined bandpass (positive) and notch filter (negative).
<i>Registerizer</i>	Boosts any octaves of the fundamental while attenuating all other harmonics, often resulting in an organ-like sound.
<i>Scrambler</i>	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 a dirty-digital sound, this is one way to get it in Zebralette.
<i>Turbulence</i>	Turbulence periodically shuffles the harmonics at random. The speed of this effect is highly dependent on the Resolution parameter. Tip: Turbulence is quite useful in Spectroblend mode with only a few harmonics
<i>Expander</i>	Expands (or contracts when negative) the spectrum. Similar to brilliance if the harmonics are distributed evenly.
<i>Symmetry</i>	Contracts the waveform towards the beginning or end of its cycle. Often sounds like pulse width modulation – for a square wave, that's what it is!

<i>Phase Xfer</i>	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.
<i>Phase Root</i>	The original wave multiplies the phase response of the sine wave.
<i>Trajector</i>	The original wave adds to the phase response of the sine wave. Like phase modulation in ‘FM’ synthesizers – try Trajector on a pure sine.
<i>Ripples</i>	Multiplies the waveform with a harmonic, resulting in resonant sounds.
<i>Formanzilla</i>	Multiplies the wave spectrum with a variable harmonic, resulting in ‘formant’ sounds with a number of strong peaks and troughs.
<i>Sync Mojo</i>	Simulates hard sync by contracting the time axis then writing the waveform back into wave memory.
<i>Fractalz</i>	Like Sync Mojo, except that the contracted wave is contracted again etc.. This results in a fractal waveform with even more harmonics than Sync Mojo.
<i>Exophase</i>	A classic 7-stage phaser is applied to the original wave. This effect is equally useful for static coloration or resonant sweeps.
<i>Scale</i>	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, i.e. more precise control over the overtone structure.
<i>Scatter</i>	Similar to the Scrambler effect, 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.
<i>ChopLift</i>	Negative values raise an amplitude threshold below which all harmonics are faded out (Chop). Positive values raise the levels of fainter harmonics (Lift).
<i>HyperComb</i>	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 <a href="#">Resolution</a> .
<i>PhaseDist</i>	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 cross-fades between zero and full effect, so the most dramatic uses of this effect involve modulating WaveWarp.
<i>Wrap</i>	Inverts any parts of the original wave that extend above or below a variable threshold. The limits for multiple wrapping are greater for negative values.



## Phase

---



*the Phase panel*

### **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).

## VCA

---

This is Zebralette's "Output" panel....



### **Pan**

Pans the sound to the left or right.

### **Stack Mode**

*single / dual / quad / eleven*

Selects single or stacked (2, 4 or 11) oscillators. The *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 *Gate* or *Env1* as your audio envelope. Selecting the gate here frees up the envelope for other duties. Note: *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



*modulation panel, 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

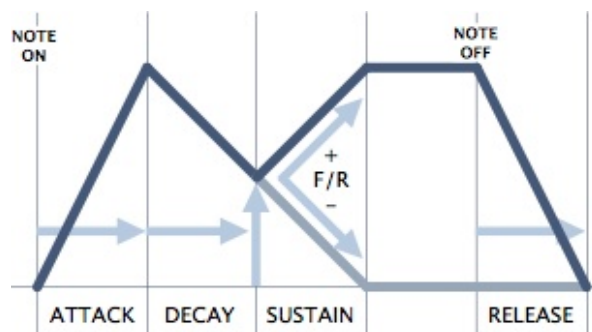
Fall/Rise: Fall to zero (negative values) or rise to maximum (positive values). Extreme values make this transition very short, values close to zero (use SHIFT to fine-tune) can be quite long.

### R

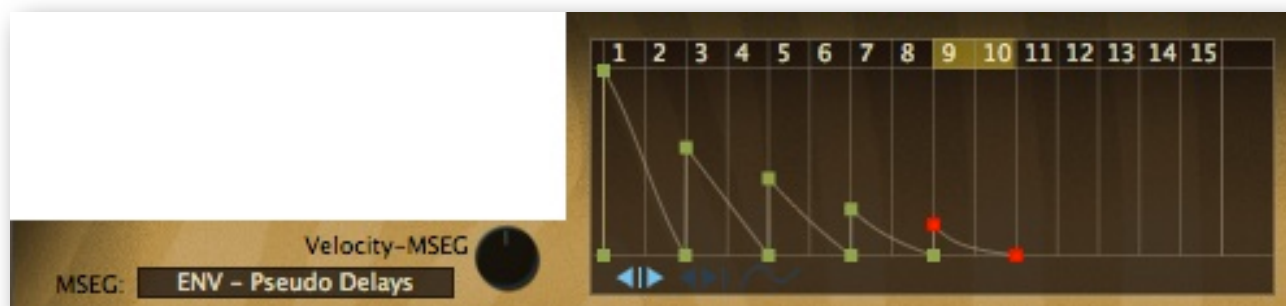
Release: The time it takes to drop to zero after a note is released.

### Vel

Velocity for envelope dynamics: keyboard velocity scales the envelope's output level.



## MSEG



*modulation panel, MSEG*

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 / synchronisation controls. MSEG preset locations:

Mac:        *MacHD/Library/Application Support/u-he/Zebra2/Modules/MSEG*  
 PC:        *...\VstPlugins\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

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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:

<i>none</i>	no modulator
<i>ModWhl</i>	modulation wheel, MIDI CC#01
<i>PitchW</i>	pitch wheel (pitch bender)
<i>Breath</i>	breath control, MIDI CC#02
<i>Xpress</i>	expression control, MIDI CC#11
<i>LfoG1</i>	global Low Frequency Oscillator
<i>Gate</i>	simple on/off envelope
<i>KeyFollow</i>	MIDI note number. Breakpoint is E2
<i>KeyFollow2</i>	in Zebralette this is practically the same as KeyFollow
<i>Velocity</i>	MIDI velocity
<i>Pressure</i>	aftertouch (channel or poly, depending on which is received first)
<i>Env1</i>	envelope
<i>MSEG</i>	multi-segment envelope generator
<i>Lfo1</i>	per voice Low Frequency Oscillator



# MIDI Control

## MidiLearn and MidiUnLearn

Zebralette can be remote-controlled / automated via MIDI messages from a hardware controller unit or from your sequencer program. Right-click any knob to open a menu containing *MidiLearn* and *MidiUnLearn*. Currently undergoing a major redesign, the extra functionality described below should be considered ‘beta’.

## MIDI controllers

The expanded *MidiLearn* functions let you define **how** parameters will react to MIDI continuous controller (CC) messages. Before you use *MidiLearn*, right-click on the data display and select the *MIDI Controllers* entry from the top of the list. The options are:

- **none** – practically “MidiLearn Off”, prevents accidental MIDI learns
- **normal** – full range (most commonly used)
- **integer** – whole numbers only
- **fine** – between nearest integers, in 0.01 steps
- **octaves** – 32’ to 2’ without changing fine tune
- **semitone** – semitones/cents between octaves
- **fineSelected** – like fine, but controls the most recently selected element. Switch the mode to *fineSelected* and *MidiLearn* the knob/slider you would like to use as a general-purpose fine controller. It doesn’t matter which knob you right-click to do this.

The seven **page** options are not implemented yet, and should be ignored for now.

- **Encoder 127** – unipolar encoders
- **Encoder 64** – bipolar encoders
- **Continuous 7bit** – 7-bit MIDI CC (standard)
- **Continuous 14bit** – 14-bit MIDI CC

Note: MIDI remote control is **channel sensitive**: Map up to 16 channels of any CC except *ModWheel*, *BankSelect*, *Hold* or *AllNotesOff* – over 1,900 mappable controllers!

# Effects

## ModFX



*the ModFX panel*

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

### 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 panel*

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*

*Many thanks to u-he forum members for ideas and proof-reading – Howard Scarr 2010*