Howard Scarr's

Zebra² Science
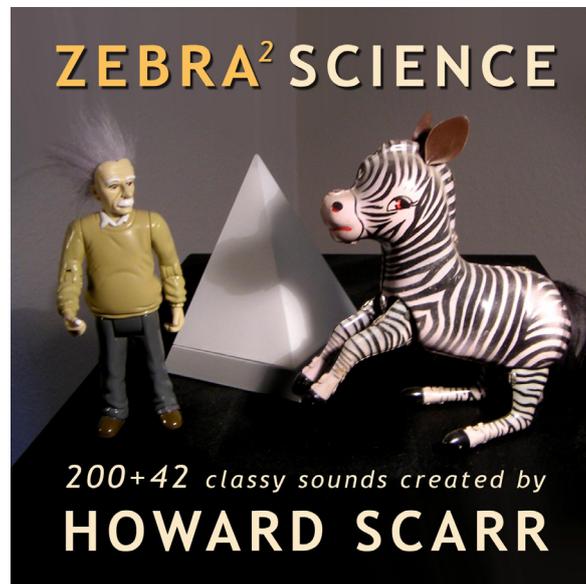
Installation Guide & Programming Tips

Content

"If you like Howard's new presets, or the Zebra2 sounds he programmed for Batman - The Dark Knight (opening July 2008), you'll love his latest Zebra Science sound set. Chock full of wierd and wonderful (but eminently playable) instruments, plus a bunch of fine analog emulations - string machines, warm pads, classic leads and basses. Several of these patches make use of the X/Y pads for an unlimited supply of variations.

As well as the 242 sounds, Zebra Science also includes 48 oscillator templates and 35 envelope (MSEG) templates, plus a few tips and tricks to help you make the most of Zebra2.

Enjoy!"

Installation

If you can read this, you have already unzipped the archive that contains this document. Next to this document are 3 directories with the contents of the Zebra² Science patch library:

MSEG - contains MSEG templates
OSC - contains Oscillator templates
Zebra Science - contains the Zebra Science patch library

Note: The patches are organized in the same folder structure as the factory presets. When you copy the presets, make sure you do not overwrite the factory library. You can however if you choose to do so merge both libraries!

On **MacOS X**, simply copy the contents of these folders to these locations:

MSEG: MacHD/Library/Application Support/u-he/Zebra2/Modules/MSEG/

OSC: MacHD/Library/Application Support/u-he/Zebra2/Modules/Oscillator/

Zebra Science: MacHD/Library/Audio/Presets/u-he/Zebra2/Zebra Science

On **Windows**, copy the contents of these folders to the following locations:

MSEG: C:\Program Files\u-he\Zebra2\Modules\MSEG\

OSC: C:\Program Files\u-he\Zebra2\Modules\Oscillator\

Zebra Science: C:\Program Files\u-he\Presets\Zebra2\Zebra Science

Note: Some people have these files in a directory called "Zebra2.data", i.e. for running Zebra2 on Receptor hardware, or to have everything located within the Vstplugins directory. In this case all files have to be copied to the corresponding location within Zebra2.data

20 Programming Tips and Tricks

Howard Scarr 2007

If you have any questions, feel free to ask them in u-he's forum: www.kvraudio.com/forum (scroll down a few pages and select u-he)

Pulse Width Modulation (PWM)

The easiest way to achieve this classic effect is to go into an oscillator's Phase tab, switch INV (invert) on, adjust the Phase parameter and modulate it with e.g. an LFO. For a ready-made example, open the oscillator library and select PWM thru 25.

Another method is to modulate a waveset consisting of narrowing pulse waves. Although this method requires more effort and may require setting the oscillator Resolution higher (more CPU-intensive – see More OSC tabs) for smooth morphing, the oscillator template Pulse Table has the advantage that the highest waves in the table become so "thin" as to disappear entirely – great for rhythmic effects.

Copying wavesets

You may have set up an oscillator (e.g. OSC 1) with complex Mix, FX and Phase parameters, and suddenly decide to exchange the waveset (and nothing but the waveset) for something else. You can use the context menu of the oscillator for this – let's take a look in there: Open a More OSC tab, right-click in the window and look at the available functions. The bottom one reads Copy Waveset. Once a waveset is copied , Paste Waveset will also appear.

There are two possible scenarios: If the waveset you want is in the oscillator library (click on the left of the oscillator's central bar to see this), create a temporary new oscillator e.g. OSC 4 anywhere in the grid (click anywhere), load the required template from the library, then copy/paste the waveset from OSC 4 to OSC 1. Finally, delete OSC 4. If the waveset you want is only available from another sound, save the current one, load that other sound and copy the waveset. Reload your new patch and paste it in.

Copying complete oscillators

To include all parameters in an oscillator, simply save it in the oscillator library. If you only want to use the same settings in a second oscillator, save it under the name "…" (three full stops – this is the default name) to avoid cluttering up the library with temporary files. Right-click on the left of the oscillator's central bar and confirm save oscillator settings. Then create / select your second oscillator and choose "…" from the library.

Detuned Oscilators and KeyScale

Sounds in which (for instance) two oscillators are detuned against each other often beat too quickly when you play high notes. To tame this effect, you need to adjust the key-tracking of the detuned oscillator. Note that KeyScale, key-tracking and key-follow all mean the same thing.

While we're at it, here's a little experiment to find Zebra's breakpoint i.e. the note around which key-tracking is (always) applied: Load HS INIT and add an oscillator (OSC2) below the first one. Open OSC2's Phase tab and turn the KeyScale parameter up to maximum (200%). Play some notes on your keyboard. You should find that one particular E is in perfect unison. That's Zebra's fixed breakpoint – keytracking always pivots around this note.

Double-click on the KeyScale knob to change it back to 100%. Turn oscillator 2 Detune up to 20.00 and, while playing a high note, reduce oscillator 2 KeyScale slightly (use SHIFT). To my ears, 99.55 sounds about right. A hold/sustain pedal can be very useful while making fine adjustments!

You can use a similar method for Dual and Quad mode oscillators. Delete OSC2, open the Mix tab in oscillator 1 and change single to dual or quad. Turn up Detune to a pleasant value when playing mid-range notes. In the ModMatrix, set the top destination to Oscillator1 / Detune and the modulator to KeyFol. Adjust the modulation amount (negative) such that high notes don't warble too much.

Polyphonic phasing

Try this: Load HS INIT, right-click on the empty box below OSC1 and select VCF1 from the list. In VCF1, change the mode to AP Phaser 8. Play a chord while moving the Cutoff knob. Hmmm – doesn't sound much like a classic phaser stomp-box. Take the Resonance up to 50 or higher and try again. That's more like it, but sometimes you don't want so much resonance. Turn the Resonance knob back down again. Now grab the VCF1 icon and move it one box to the right. Right-click on the icon and select Input 1 from the list so that OSC1 is connected to VCF1. Zebra now has two signals in parallel: Column 1 is just the oscillator, column 2 is the filtered oscillator. Play a chord and move the Cutoff knob again… aha! Of course you should also try higher Resonance and/or modulating cutoff via e.g. an LFO.

Reverb Predelay

Just because the Reverb module doesn't have a built-in "predelay" parameter doesn't mean you can't do it. Load HS INIT, go to the Envelope1 module and take Sustain to minimum for more of a plucked sound. Might as well make the sound a little more interesting using an oscillator effect: Open the oscillator's FX tab, click on the label below FX1 and select Filter from the list. Click on the knob to the right of the Value knob and select Env1 from the list. Click on the same knob and take it up to about 60. Adjust the Value knob to taste.

Now to the Reverb with pre-delay. Open the Global FX tab (if necessary), click on the uppermost central cell and select Delay1. Take the Feedb and X-back parameters to minimum and Mix to maximum. Take both Send1 and Return1 to maximum, and play a note. You should now hear a single delay. Click below Delay1 and select Rev1 (reverb). Take the Dry knob down to minimum (or thereabouts), click on the Delay1 icon and select faster delays: Set both Sync1 and Sync2 to 1/16. Change Ratio1 slightly (e.g. 110.00) to smear the delay and change to tonal quality of the reverb (phase cancellation effects!). Click on the Rev1 icon and adjust all the reverb parameters to taste.

Organ Percussion

An important signature of classic electric organs is the so-called percussion register – a rapidly decaying stab of higher harmonics sent through a single, non-retriggering envelope. Load the preset

HS 16 Perc and take a look in the Mix tab of oscillator 2: Volume (nominally zero) is modulated by MSEG1 – so open the MultiStageEG tab, select MSEG1 and take a look at the settings. TimeUnit is in Seconds so that the BPM of the host application makes no difference to the envelope's length. The Trigger mode is Single, which ensures that the envelope doesn't retrigger whenever an additional note is played. Try changing the mode to Mono to see what difference that makes.

Before leaving this patch behind, look in the ModMatrix and work out for yourself what MSEG1 is doing in there. It might help to mute lanes 1, 3 and 4 in the grid – click on the little grey squares immediately below each lane (so they turn red).

Go easy on your CPU

by using as few CPU-intensive devices (e.g. XMFs, high-Resolution and/or Quad mode oscillators) as necessary. In fact you should use as few modules as necessary. Remember that you can make some very interesting sounds just with one oscillator and a few global effects. There are plenty of examples in the presets.

If you find that certain patches hog your CPU too much, try editing them. For instance, although HS Aquabats is only a dual mode oscillator and little else, the oscillator's Resolution is set to maximum – which always hogs CPU. Open the MoreOSC1 tab and double-click on the Resolution knob to set the default value of 5.00. If you don't hear enough difference to merit using the original, higher resolution version, save the edited patch in your own folder (if you haven't created one already, right-click in the browser). Call it "Frugal Aquabats".

More lefthand control

Your MIDI keyboard is likely to include a so-called pitchbender, but this centrally-sprung control can be used for anything you assign it to. Load the patch called Jeanne d'Arc II and try it out. Pulling the pitchbender towards you closes the filter, while pushing bends the overall pitch up a semitone. A peek in the Global/FX tab (pitchbend down is set to 0) and at the filter (VCF1 cutoff is modulated by PitchW) explains how it's done.

Modulation mixers can

solve seemingly impossible modulation problems. Note that most of the simpler ones are quite easily solved by using Via in the ModMatrix.

Here's a real-life example for gigging musicians (perhaps you own a Muse Receptor or two). Scenario: You need a lead sound with control over vibrato depth via modulation wheel OR aftertouch (i.e. while your left hand is playing chords on another keyboard). You don't want modulation wheel PLUS aftertouch – they need to stay out of each other's way.

Solution: Load HS INIT, take OSC1 Vibrato to maximum and LFO1 Amp to minimum. Open the ModMatrix, click on the first Modulator knob and select MMix1. Click on the same knob and take the value up to maximum. Click on the Target field and select Lfo1 / Amplitude. In ModMixer1 (which has magically appeared), change the mode to fade1/2 by 3xC – which means use slot 3 to fade between slots 1 and 2. Set slot 1 to ATouch, and both the other slots to ModWhl. Turn Constant to maximum and try it out. Yes, I know it's a boring sound, but that's not the point of the exercise!

How it works: The more mod wheel (slot 3) you apply, the less aftertouch (slot 1) will be in the mixer's output, because it is faded out while mod wheel (slot 2) is faded in.

Dedicated knobs or modulation matrix?

For smoothest / fastest modulation, use the dedicated knobs in the modules in preference to the mod matrix. On the other hand, whenever you need to apply extreme modulation, use the mod matrix instead (because of its wider range).

Random notes, random cutoff etc..

LFOs can be used as a static (per note) random sources. Load HS INIT, click on the knob between Tune and Detune in the oscillator and select Lfo1 from the list. Click on the same knob and set it to 12.00. In the LFO1 module, change the mode to rand hold, the sync to 8/1 and Restart to gate. Play your keyboard.

Add subtle random elements

Science's MSEG library contains three Wobbulator templates for this purpose. Wobbulator 3 is mainly for modulating pitches, as it adds little positive offset. Of yourse you can use LFOs set to rand glide mode, but you might need them for other jobs. There is also the Turbulence oscillator effect, which reacts very interestingly to lower Resolution settings, by the way.

Emulating Tape delay

Modulate one or two of the Ratio values from a random, monophonic source (e.g. a global LFO set to Random Glide or one of the Wobbulator templates from the MSEG library – or both). Also adjust the Lowpass and Highpass filters in the delay module to simulate regeneration losses.

Experiment with multiple oscillator FX

This can deliver very surprising results. Listen to Cymple Sample or the strange attack of Toy Piano in the preset oscillator library, or Rolling Thunder in the Science oscillator library, and look at the effects involved. Note that the output of FX1 is routed to FX2 – the same two effects can sound quite different if their positions are swapped around.

Using the EQ module is not cheating

It is there to be used. Would you like a multiple filter with independent cutoff modulation? Use an EQ module.

Formant shaping

LP Formant isn't the only filter mode you should try when looking for strange formants – AP Phaser 8 with high resonance does a pretty good job as well. Note that when it is used as a global effect, the knob labelled Drive is actually the Split parameter.

Manipulating reverb or other effects via multiple buses

Using bus 1 (the central effects lane) for reverb instead of placing the Rev1 module in the main lane gives you a lot of control over how it sounds. For example, you could compress a percussive sound first to remove the initial spike. Or filter the reverb only, or use a completely different envelope (see the experiment below)… the possibilities are mindboggling.

Load HS INIT, take Envelope1 Decay down to about 16 and Sustain to minimum for a short "blip". Click on any box in lane 2 and select Mix1 (this creates a "side chain" of the oscillator). Change the output routing in lane 2 from main to bus1 and this lane's envelope from Env1 to Env2. In the Global/FX tab, click anywhere in the central FX lane (this is bus 1) and select Rev1 from the list. Take Return1 up to maximum and Dry (in the reverb module) to minimum. Result: envelope 1 output remains dry, envelope 2 output is all reverb.

Sustain can be modulated in realtime

If you are using both aftertouch and an envelope to modulate Cutoff, try using aftertouch to modulate the sustain level of that envelope instead.

Lower cutoff

If you find that, after modulation, a filter's cutoff is still too high at 0.00, add some negative modulation from an "empty" ModMixer.

Enjoy!