

# LaunchEon

Version 1.0.0

Tutorials Reference



# ENLIGHTENSPEED

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# Introduction

Hello and welcome to LaunchEon by Enlightenspeed!

This tutorial set is intended to give a greater understanding of LaunchEon first and foremost, but also CV in general. Besides needing Reason and LaunchEon, we highly recommend that you get the CVA-7 RE plugin from Pongasoft; this plugin is free and is the best-in-class analysis tool available for CV signals, allowing you to visualise what is happening with your signal in numerous important ways, and highlight a few hidden gems within the Reason Rack itself.

We won't be covering every LFO and Envelope type here but will aim to further your understanding of how to check these signals yourself, and this should in turn make you a better instrument and patch designer.

## Conventions used in this manual

We employ some symbols for showing routing setups to make it clearer and less wordy. The following is an example of this:

```
Matrix==Gate CV >> Subtractor||Gate
```

**Matrix==Gate CV** denotes that the port we are using is the output port Gate CV on the Matrix.

**Subtractor||Gate** denotes that the port we are using is the input port Gate on the Subtractor.

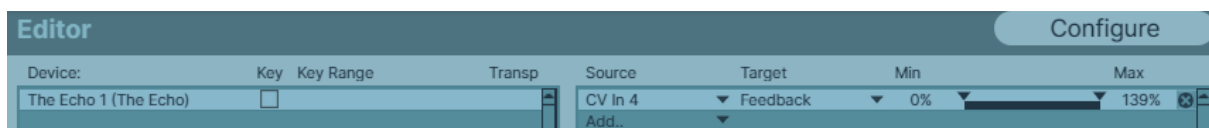
**>>** denotes the signal flow direction, so in the above case the signal goes from the Matrix to the Subtractor.

Hence, the meaning of **Matrix==Gate CV >> Subtractor||Gate** is that there is a connection between the Matrix and the Subtractor, running from the Matrix' Gate CV out to the Subtractor Gate in. As these are tutorials, this should usually be taken as an instruction to make this connection yourself.

We also have used some syntax for the Combi Programmer, and the Thor Modulation Matrix.

In the Combinator we shall use this:

```
The Echo 1 => CV In 4 => Feedback>Feedback [0%-139%]
```



For Thor we have the following:

```
CV In 1 => 100 => CV Out 1 => 100 => Rotary1
```



The combination of these syntax schemes should make it fairly straight forward to read the routing and programming instructions in this manual.

## Part A

### Tutorial 1 - Beginners guide to CV – Part 1

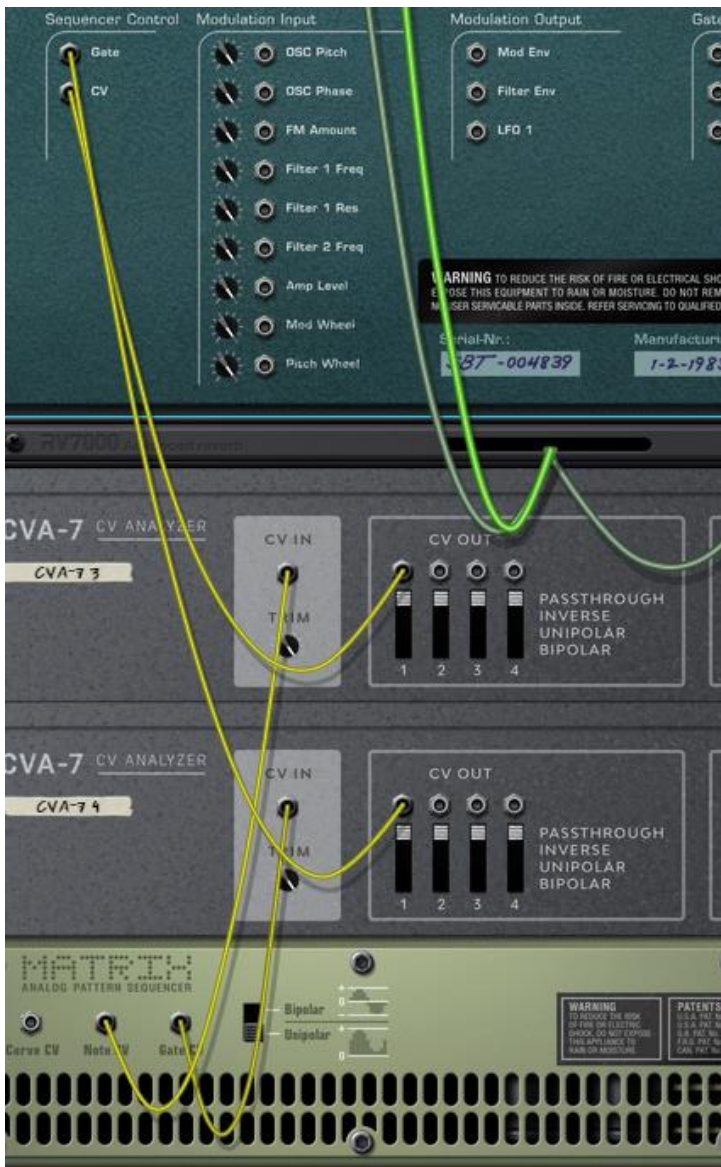
This tutorial focuses on a basic setup for CV usage and analysis. There is no LaunchEon learning here, so if you are already good with CV then there is no need to spend much time with this one.

#### The Recipe

1. Start with an Empty Rack.
2. From the Browser window, drag in a Subtractor and a Matrix.
3. Flip the rack and we see that along with the audio connection from the Sub to the Mix Channel, we have 2 CV connections:  
**Matrix==Gate CV >> Subtractor||Gate**  
**Matrix==Note CV >> Subtractor||CV.**
4. Press Play and you get a basic of playback of 1/16<sup>th</sup> notes. You may wish to quickly change the Subtractor patch and the Matrix program to something a little more listenable at this point, as we may be listening for a while. PRO-TIP: If you have any decent Player devices that you want to throw in, and these can receive CV and pass the Matrix data to the Subtractor, then go right ahead. If doing this remember to set the Subtractor polyphony to >1.
5. Ok, let's quickly analyse the pattern. Add 2 CVA-&'s to the stack and disconnect the two existing connections.
6. Cable the devices up as follows:

```
Matrix==Gate CV >> CVA-7(1)==CV In  
CVA-7(1)==CV Out 1 >> Subtractor||Gate CV  
Matrix==Note CV >> CVA-7(2)==CV In  
CVA-7(2)==CV Out 1 >> Subtractor||Note CV
```

You should see that these connections are the same as they were, but the CVA-7 devices are now inserted into the path of the CV signal.



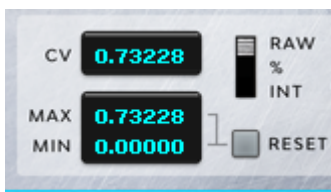
- Flip the rack back to the front and set the zoom of each CVA-7 to 50, then press play again. You should be able to perceive that each CV signal is visible as a simple repeating waveform.



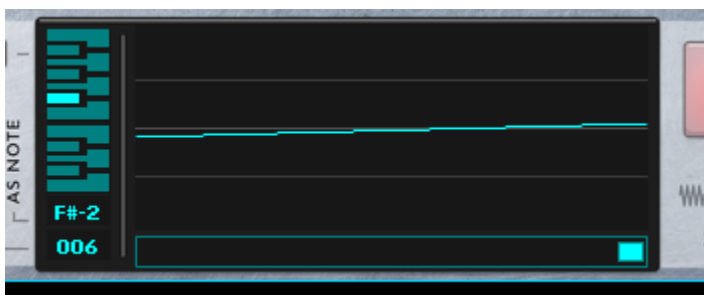
- For each of the CVA-7's, on the left-hand side you will see the numerical output of the CV, which is, when playing, a constantly changing integer when in INT mode, the default setting.



- Set the type to RAW and you will see that the number changes from integers to a floating-point number always in the range of 0.0 to 1.0. This is the number that is being transmitted between devices, and the Reason CV standard allows this number to change once per sample batch.



- Without going deep into how digital audio works, if we assume a sample rate of 44.1kHz, the same as a CD, and note that Reason's internal processing buffer size is always 64 samples regardless of your audio card settings, then we divide 44100 by 64 to get the number of batches per second = 689.0625. To put it another way, we know that the maximum number of changes to a CV number in a second is 689.0625 when using 44.1kHz as the sample rate, and higher sample rates result in more CV changes. This is always enough to give clear audio resolution because the CV doesn't generate the audio, it merely changes a parameter that governs the audio generation. Looking at an LFO signal confirms this.
- Drag in a Pulsar LFO, and a third CVA-7 then cable up the following:  
**Pulsar==LFO CV Output 1 >> CVA-7(3) || CV In**
- Flip to the front, and on the Pulsar switch off the LFO 1 Tempo Sync (bottom left corner), set the Rate to the lowest value, which is 0.06Hz, and set the Level to 100%. Now on the CVA-7, set the Zoom to 100. You should now be able to see clearly that the value is stepping, rather than perfectly smooth.



DISCLAIMER: Ok, there is a lot more going on with the underlying technology here than meets the eye and this section is a bit artificial, but just take away from this that the values change at predetermined points and stay the same until there is a batch which changes the value.

- Now let's hook up the LFO to the Subtractor like this:  
**CVA-7(3)==CV Out 1 >> Subtractor || Filter 1 Freq**

14. On the Pulsar, switch the LFO1 Tempo Sync back on and set the rate to 2/4. You'll notice that the sound is changing and cutting out a lot. This is expected and is the effect of the Subtractor's filter being told to go low (or high if the Filter 1 mode is set to HP). To reduce the effect of this there are two ways to go about it, either by turning down the LFO 1 Level on the Pulsar or by reducing the Input Trim control of Subtractor | Filter 1 Freq. The crucial difference is that the LFO Level can be automated, while the rear input trims of any port in the rack cannot. So, let's use the front panel solution, and remember that this is always the way to go where possible. In a later tutorial we'll show you a way of getting around this limitation if needed.
15. Lastly, to make the sonic change more obvious, carefully turn up the Filter 1 Res until you hear the change in timbre over time.

Feel free to experiment with the different settings on the LFO such as the rate, level, and wave shape, along with the front panel settings on the Subtractor.

### Further Observations

The sharp eyed among you may have also noticed when looking at the output of the Pulsar LFO in CVA-7 that the output isn't limited from 0.0 to 1.0, but from -1.0 to 1.0 when reading the RAW values. This is because the output from the Pulsar LFO is Bipolar, while the Note and Gate CV from the Matrix are both Unipolar. The distinction is exactly that, Unipolar will run from 0.0 to 1.0, and Bipolar will run from -1.0 to 1.0.

It's worth asking what the resulting change is within the Subtractor Filter of this setup, and what is the difference between Unipolar and Bipolar in this scenario. It is relatively simple to see the change in the integer values by setting the left-hand display of the CVA-7 to INT, and if we set the Pulsar waveform to Square then we see it oscillating between two values, one positive and the other its negative inversion. While writing this I'm looking at an output which is switching from 34 to -34, and the front panel value of the Subtractor's Filter 1 Freq is 66. It's simple arithmetic from here, when the output CV from Pulsar is 34 then the resulting Filter Freq value is  $66+34=100$ , and when it is -34 the resulting value is  $66-34=32$ .

This holds up because the range of the filter is from 0-127, and it is worth noting here that if the number of increments is different from the 0-127 range, supposing there are only a few options on a particular switch such as the number of waveforms available on the LFO, then the receiving device will set the output accordingly, and almost always to scale. I say almost, I've never seen any CV receiving device working differently to this, but there is no SDK constraint to keep it this way.



## Tutorial 2 - Introduction to LaunchEon - CV

This tutorial discusses the differences between connecting directly to the exposed ports on a device and connecting to ports via the Combinator, as CV ports or Controller ports.

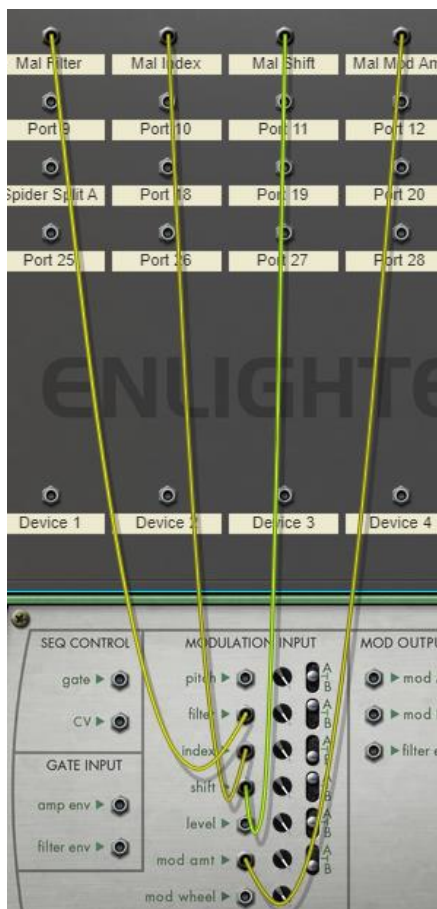
### The Recipe

1. Start with an empty rack and drag in a LaunchEon and a Malstrom.
2. With both devices highlighted, right-click and select Combine. Ensure that the audio cables from the Malstrom go into the Combi "From Devices" port area, and that the Combi in turn connects to the Mix Channel input.
3. Now it is time to connect LaunchEon, and we are going to connect some exposed parameter input ports on the Malstrom to LaunchEon's first four ports.

As follows:

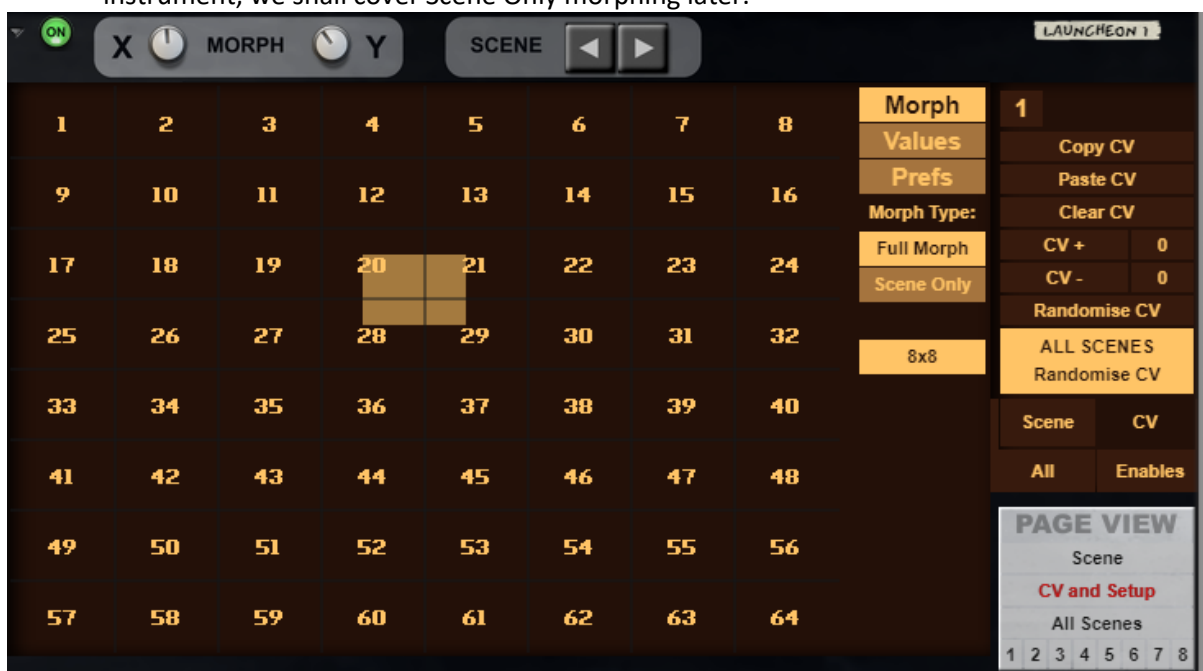
```
LaunchEon==Port 1 >> Malstrom||filter
LaunchEon==Port 2 >> Malstrom||index
LaunchEon==Port 3 >> Malstrom||shift
LaunchEon==Port 4 >> Malstrom||mod amt
```

Notice that we have not connected the pitch or level parameter ports; for building general instruments these controls would be too wild for usage, causing extreme pitch drifts and silences. These two parameters should change when there is a specific reason for doing so, otherwise the results will be messy and chaotic (of course, you may want this).



The set of four connections above just give control over the oscillator and filter parameters, but at present the oscillator inputs affect both OSC A and OSC B, and the filter does likewise with Filter A and B. To make things move with more independence, I am going to set the filter to A, the index to B, the shift to A, and the Mod Amt to B. We will revisit the others later, but for now let us get LaunchEon interaction happening.

4. Pick any patch for Malstrom, I will use the patch “Colorful Fire” from the Polysynths folder in the Factory Sound Bank.
5. Now go into LaunchEon and set the Page View to CV and Setup, click on the Morph tab, and set the Operations Panel to the CV tab.
6. In the Main Display area, the default Grid Size value is ‘4x4’, which is fine for this type of instrument in most cases, but for the purposes of demonstration we will set the Grid Size to ‘8x8’.
7. Next, we set the Morph Type to Full. Again, this would be a normal setting for this type of instrument; we shall cover Scene Only morphing later.



8. On the Operations Panel, hit the big yellow button “ALL SCENES Randomise CV”.
9. Now play some notes in and move the morph rectangle around the display (or of course you can use the Morph X/Y knobs, which are Remoteable). You should hear the timbre changing as the morphing position is moving. The amount of the change is really decided by the type of patch you loaded but for the “Colorful Fire” patch the effect is noticeable, but mild.

Moving further on, we can note immediately that if we want to have the rest of the OSC A & B parameters available, but independently of the original connections, then we cannot do this on the rear panel of the Malstrom. Instead, we must use the Combinator to set this up.

There are two options when connecting LaunchEon to the Combinator; we go from any of LaunchEon’s output ports (although in this case it is much more sensible to use a normal CV port rather than a pattern device port), and we connect to either a Combinator Controller Port, which is specifically mapped to a front panel control, or a “blind” CV port, which needs to be assigned as a source in the Combinator programmer.

## Controller Ports Vs CV Ports

If you are already aware of the differences between the port types in the Combinator then you can skip this section; otherwise, this is a worthwhile detour. Given the simplicity of this sub-section, I'm just going to use a Spider CV Splitter and the Line Mixer 6:2 to help with visualisation.

1. Hold down Shift and add a Spider CV and a Line Mixer 6:2 from the Built-In devices section of the Utilities Browser area.
2. Connect the following:

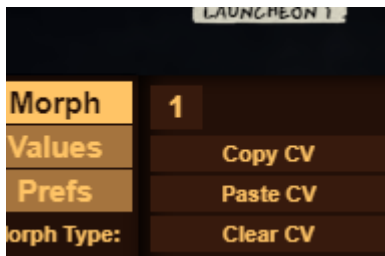
```
LaunchEon==Port 17 >> Spider CV||Split A Input  
Spider CV==Split A Out 1 >> Combinator||Control CV In 1  
Spider CV==Split A Out 2 >> Combinator||CV Input 1
```

3. Now we go to the Combi Programmer and add the following:

```
Line Mixer => Control 1 => Channel 1 Level [0-127]  
Line Mixer => CV In 1 => Channel 2 Level [0-127]
```



4. From this point, we also need a “base value” to make sense of the outputs, so set the amount for Control 1 (i.e., Control 1 itself on the front panel of the Combinator) to 0.
5. In LaunchEon’s All Scenes page, set the Scene to 1, and in the Operations Panel set the Edit Select to 1.



6. Now go back to CV and Setup, and then into the main Values tab, then select the Controllers tab, so we can see the CV output controller bars. Now scroll all the way down until we have the bottom half of the values – Port 17 should now be at the top of the list. Set Port 17 to 0.
7. If we look at the Line Mixer 6:2 and sweep LaunchEon's Port 17 bar from left to right, we start to get a picture of how the Combinator scaling affects the values incoming from the ports. Channel 1 is a Unipolar connection and thus only affected by half of the value range, while Channel 2 is Bipolar and the whole range [-127 : 127] is scaled into the range of [0:127]. Now change the "base value" Control 1 to 127 and observe the difference. Now change it to 63 and observe the difference.



As well as the importance of the differences in the Combinator controls, it is crucial to understand that analysing signals is the key to really knowing CV and being able to predict how it will work in complex instrument design.

As a further exercise, set up connections for the remaining OSC A and OSC B parameters that are not available via the rear panel of the Malstrom, by using the Combinator inputs.

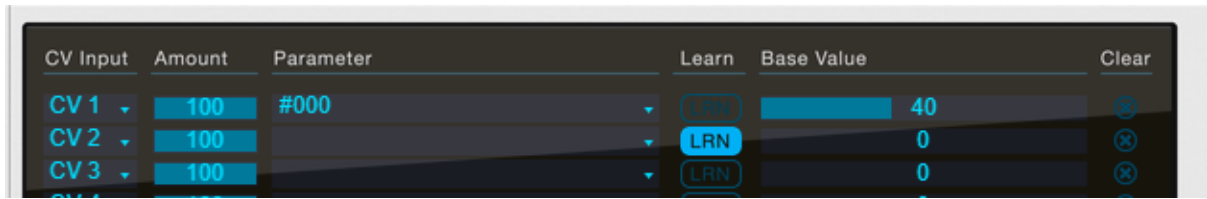
### Setting up VSTs and other plugins

When Reason Studios implemented their VST wrapper they did everything possible to make life easier for long term Reason users to work with, but there are still some talking points when setting them up as complex Combinators using morphing.

Firstly, the wrapper gives you 8 CV Modulators as standard, and these typically are best learned via the GUI using the LRN button on the wrapper and then moving the control you wish to connect. Some more complex VSTs will require you to assign them in the VST first so that they can be picked up by the wrapper.

By a similar token we can get the same available parameters in the Combinator, but due to a lack of VST labelling conventions this can be difficult, so typically the best workflow is to find out if a parameter is available via the LRN for the CV modulators and then, use those label

names to get Combinator references for them. Again, this may require getting the VST plugin to “expose” the parameter to the interface.



The picture above is taken from the wrapper when connected to NI’s Battery. This is all we get to see, the parameter number as assigned by Battery, plus Reason’s CV controls. From this perspective it tends to be worth hooking parameters up to Combinators and LaunchEon’s just to get some better labelling :D

For further details on how best to connect the VST to Reason, or indeed any DAW, consult the manual for the plugin in question.

Note, that the most important drawback of using VST’s in Reason at present is that they are not available for usage in the Reason Rack Plugin. This means that Combinators saved with VSTs in them will not work in other plugin hosts such as Cubase or Logic when you try and open them in RRP.

## Tutorial 3 - Introduction to LaunchEon - Patterns

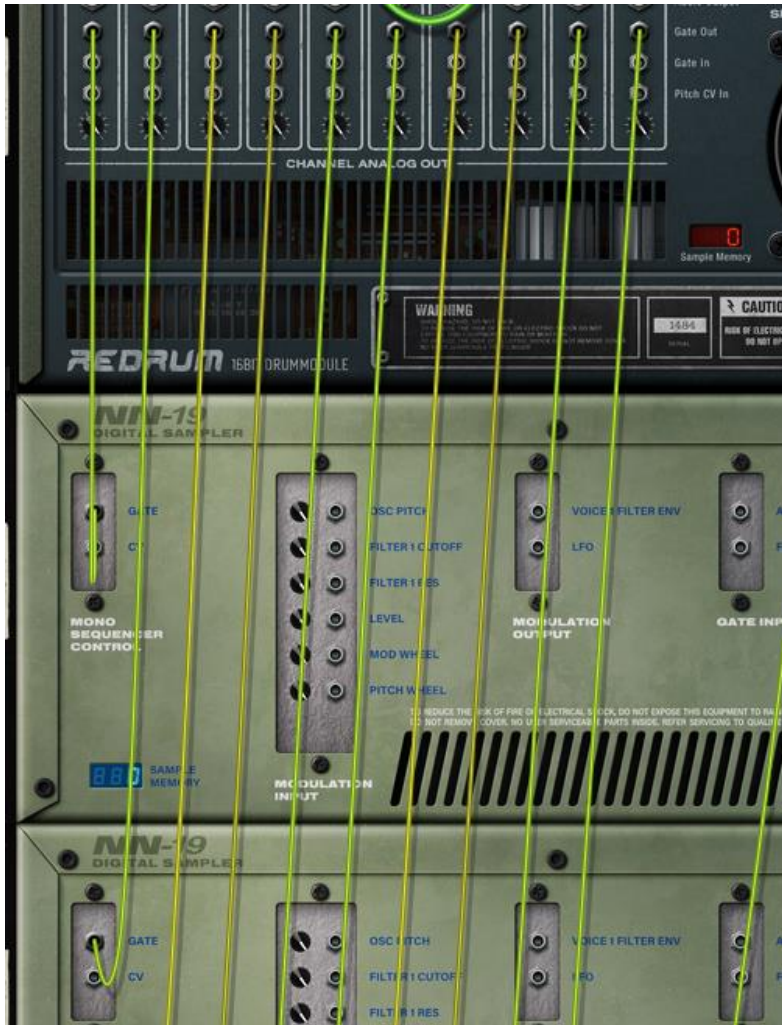
Pattern devices are a major part of Reason, and of electronic music in general. In recent years, Reason Studios introduced the Players standard which empowered a new generation of these devices, and LaunchEon is partially designed to provide some extra power. This tutorial will explain basic set-up and discuss some important caveats of working this way.

Patterns are crucial for drum machines, but we will do this with simpler components here, and then you can build more complex things using your big mega-VST beat machines and Player combinations once you get the general idea of LaunchEon is bringing to the table.

### The Recipe

1. Start with an empty rack and without holding shift, drag in a Combinator, and then within the Combi, add a LaunchEon, and a 14:2 Mixer. Next, we're going to add 10 NN-19s below the Mixer, but before we do this, if your Reason Preferences are set to "Load default sound in new devices" then you should go into Preferences and uncheck this before you drag in the NN-19s. Ensure that the 10 audio outputs have cabled directly to the first 10 channels of the 14:2. Next go into the Drum Supply Refill from each of the NN-19 single sample browsers and load up a single sample hit for each sampler in order to build up a kit that is to your liking.
2. Next, we drag in a Redrum which will provide the patterns, via its gate outs. We're going to use the gate outs of the Redrum to trigger the NN-19's, so connect the following:

```
Redrum==1 Gate Out >> NN-19 1 ||Gate  
Redrum==2 Gate Out >> NN-19 2 ||Gate  
Redrum==3 Gate Out >> NN-19 3 ||Gate  
Redrum==4 Gate Out >> NN-19 4 ||Gate  
Redrum==5 Gate Out >> NN-19 5 ||Gate  
Redrum==6 Gate Out >> NN-19 6 ||Gate  
Redrum==7 Gate Out >> NN-19 7 ||Gate  
Redrum==8 Gate Out >> NN-19 8 ||Gate  
Redrum==9 Gate Out >> NN-19 9 ||Gate  
Redrum==10 Gate Out >> NN-19 10 ||Gate
```



We now have a slight conundrum. The note number that the NN-19s will default to is 64, which is E3, but the default root note of the NN19 is C3, so we can either leave it as is, meaning we change the root note every time we change the sample, or we can get exotic and allow ourselves a master control over this that we can then change whenever we choose for all devices, or even each device individually. In this scenario I'm just going to set up a single LaunchEon port to control them all, but there are many ways to do this which are better musically; this is the simple version and something you can get quite creative with going forward.

3. Beneath LaunchEon, drag in 3 Spider CV modules and connect LaunchEon's Port 32 to the first split of the first Spider. I'm going to leave you to figure out the rest for yourself. My final version of the Combi patch is included with LaunchEon, but this is one of those times when stretching your synapses is the best idea, so you should attempt to do it yourself first before going looking for the "answers page". The end result is the signal from LaunchEon Port 32 going to the sequencer CV input of all 10 NN-19s.
4. Next, with LaunchEon's main display page set to "CV and Setup", go to Values and then Settings and scroll down to Port 32. Set both Rnd Min and Rnd Max to 60, and then lock the port. Now every time the relevant Randomise functions are called, the output value will always be 60 (C3). IMPORTANT – If you have already randomised, then locking the port first will stop any further changes, so switch the Lock off, randomise again, then re-lock it. If for any reason you don't want to randomise the whole of LaunchEon, then you can just do it for

this one port by clicking into the “Rand Ports” mode while the port is unlocked, and then clicking on ‘RAND PORT’ for Port 32.



- Next, we drag in a Dr.OctoRex, which, when adding a patch should ideally host a lot of Rex files, either a full or nearly full set of 8. Find a Rex patch you like that has this.

We’re now at the stage where we can set up the Pattern control, but only the Dr.OctoRex will give an output. To remedy this, the quickest way to set up a set of coherent patterns is to go to Pattern A8 and fill it up with the rhythm of a genre of your choice, and make sure to have entries for every NN-19. Once you have a full pattern, then copy paste it to Pattern 7 and remove something, then pattern 6 and remove something else, and perhaps alter something too. Keep doing this until you get to Pattern 1. You should now have a set of Patterns which are related to each other and build from a minimal pattern on A1 to a full pattern on A8. Now let’s set up the pattern controls in LaunchEon.

- Make the following connections:

```
LaunchEon==CV Patterns 1 >> Combinator||CV Input 1
LaunchEon==CV Patterns 2 >> Combinator||CV Input 2
```

- On the Combinator, set these two ports to Unipolar input.
- In LaunchEon’s main display CV and Setup page, go into Prefs, and then Patterns, and click on the box next to Device 1, which should currently say Player and 1 click will set it to Classic mode. This lets LaunchEon know that it is outputting to a device with 32 patterns rather than 8. You use this same method for any Matrix Pattern Sequencers too.



In the previous tutorial we discussed the different port types of the Combinator, and you may notice that there is no reason not to use a Controller port; it’s simply a matter of taste for me to use the CV



Input port, and you should consider this from the outset when designing your instrument as to which port is best for that design.

Now we're ready to start randomising and adding effects etc. From this point on it is a matter of taste as to what you add and change and the ranges you set in the randomiser settings but be sure to consider how you intend to achieve your design, and always try to keep the ports usage low on the Combi and high on the nested device where possible.

9. Let's now add some mix level controls so that LaunchEon can really start to move the sound around. Connect the following:

```
LaunchEon== CV Port 1 >> Mixer 1 | |Channel 1 Level CV
LaunchEon== CV Port 2 >> Mixer 1 | |Channel 2 Level CV
LaunchEon== CV Port 3 >> Mixer 1 | |Channel 3 Level CV
LaunchEon== CV Port 4 >> Mixer 1 | |Channel 4 Level CV
LaunchEon== CV Port 5 >> Mixer 1 | |Channel 5 Level CV
LaunchEon== CV Port 6 >> Mixer 1 | |Channel 6 Level CV
LaunchEon== CV Port 7 >> Mixer 1 | |Channel 7 Level CV
LaunchEon== CV Port 8 >> Mixer 1 | |Channel 8 Level CV
```

10. In LaunchEon's Operations Panel select the All tab, and then hit the big yellow button marked "RANDOMISE EVERYTHING!". PRO-TIP: Don't jump right in with the Randomisers until you are quite close to your final instrument design. Another useful approach is just to experiment a bit and then reset LaunchEon (and remembering what port types were changed). Arguably the best method for "getting back to normal" is to lock off a particular scene so it isn't changed by the Randomisers, usually 1 or 64 works best, and then you just set the scene back to that number when you want to move back to the design phase.

In the next tutorial we'll move this instrument much further forward by looking at a few more important things that the builder should be aware of. For now, there are a few important notes to discuss for maximising the potential of patterns with LaunchEon.

### **Patterns need the Combinator**

Even the simplest pattern device set up needs a Combi to control it. This is because (nearly) all pattern devices do not supply CV input support for the patterns. So, if you wish to build a Pattern controlled device then a Combinator is a necessary component, for now at least.

### **The Audio Card Buffer size and Automation**

There are some serious challenges to overcome when developing a device such as LaunchEon, and the more problems that the device solves, the more caveats you have to introduce.

In general, LaunchEon requires two pieces of knowledge when setting up and using pattern devices. The first is that you need to set your audio card buffer size, and then give LaunchEon the same setting (or the first higher setting) in the Prefs tab of the CV and Setup page.

The second, and probably most important piece of info is that automation cannot react quickly enough when using a CV device to control pattern devices. This is the reason why so few pattern devices offer CV control over the Patterns. The way that LaunchEon works is very much in “Live mode”, where you click for the patterns to change on the next applicable bar, and they do so at that point. If you record this as an automation it would work correctly, if it played back correctly when recording.

BUT, if you use Automation Cleanup, which may quantize it, or you draw the automation directly into the sequencer with Snap on, then it will more than likely quantize it to the start of a beat or bar, and this has the knock on effect that because the receiving device cannot process the command until the following audio processing batch, then the change happens at the end of the buffer size, which can be quite a long time later as far as the music is concerned, and always means that the change isn't made in time for the start of the bar.

One solution is to draw automation, and then push it all forward in time by a small increment, but the best and most musical way to do things is to record it live.

### Ok then, the solution for 3.

The simplest setup is this:

```
LaunchEon==Port 32 >> Spider CV 1||Split A Input
Spider CV 1==Split A Output 1 >> Spider CV 1|| Split B Input
Spider CV 1==Split A Output 2 >> Spider CV 3|| Split A Input
Spider CV 1==Split A Output 3 >> Spider CV 3|| Split B Input
Spider CV 1==Split B Output 1 >> Spider CV 2|| Split A Input
Spider CV 1==Split B Output 2 >> Spider CV 2|| Split B Input
```

```
Spider CV 2==Split A Output 1 >> NN-19 1||Mono CV Input
Spider CV 2==Split A Output 2 >> NN-19 2||Mono CV Input
Spider CV 2==Split A Output 3 >> NN-19 3||Mono CV Input
Spider CV 2==Split B Output 1 >> NN-19 4||Mono CV Input
Spider CV 2==Split B Output 2 >> NN-19 5||Mono CV Input
Spider CV 2==Split B Output 3 >> NN-19 6||Mono CV Input
```

```
Spider CV 3==Split A Output 1 >> NN-19 7||Mono CV Input
Spider CV 3==Split A Output 2 >> NN-19 8||Mono CV Input
Spider CV 3==Split A Output 3 >> NN-19 9||Mono CV Input
Spider CV 3==Split B Output 1 >> NN-19 10||Mono CV Input
```



Note that with the image above several cables had to be removed to make this visible.

There are 2 useful workflow tricks that you should get well acquainted with. One is to use 'K' on the Qwerty keys to make the cabling toggle between full and reduced modes; note that you need to switch off the onscreen keyboard to use this, so you should also get used to toggling F4 on and off.

The 2<sup>nd</sup> is simply to remember that because CV devices have no auto-routing, they can be freely moved around inside the Combinator to suit whatever you are doing at the time. So, if you are connecting LaunchEon to a bunch of NN-19s and a mixer, then move LaunchEon to where the NN-19s are, get that job done, and then move LaunchEon to where the mixer is and do the required work there.

## Tutorial 4 - When to use the major options

Ok, at this point we're going to assume that you have built the Drum Machine instrument up a little, adding sends and a few more CV connections etc. If you haven't then, go ahead and do so then hit 'RANDOMISE EVERYTHING!' once you are ready to take it for a spin.

This tutorial will look at the highest impacting global options in LaunchEon, and get a feel for when the most appropriate time is to use "setting x" etc.

### Full Morph Vs Scene Only

As with most possible decisions in any creative endeavour, there is no "correct choice", only what suits you best at the time.

Full Morph is excellent for building Complex synth patches and then setting up self-oscillation of the XY co-ordinates really takes this workflow to the next level, the sounds can really come alive. It also tends to be better for experimenting in the early phases of a sound design session, or a musical project as the output can very quickly go to multiple extremes.

Scene Only is a much more controlled expression of morphing, where the sound is only ever at point A, point B, or somewhere in between. Again, there are no hard rules, but it's easy to see why most people would want to use this mode for controlling a drum mix, a bus mix, or even a whole song mix.

1. Click through the scenes on your LaunchEon instrument while Play is active on the transport, and you should notice that the mix is changing very significantly, along with the Pattern combinations between the Redrum and the Dr.OctoRex, to give a lot of possibilities. So far so good.
2. In the CV and Setup page, go into the Morph tab, and select Full Morph, then set the Grid size to 8x8, this ensures you have the mix for the active scene available, as well as all other scenes.
3. Drag the Morph Rectangle around the screen. If you've been reasonably adventurous in your connection and FX choices, then you should be able to find plenty of scenes where the output result is not recognisable as being from the same pattern; note that the pattern is exactly the same here! Only the mix, and other CV connection dependent parameters can have changed.
4. Find 2 scenes that sound nothing like each other, in my copy I have good examples of this on 3 and 53. Once you find a good set, then drag the Morph Rectangle back and forth between them. As there have been no refinements at this stage, the result should be a pretty chaotic set of micro mixes from scene to scene.
5. Now switch the morphing mode to Scene Only and perform the same drag moves. You should notice this time that the mix moves are much smoother and more palatable.

1	2	3	4	5	6
9	10	11	12	13	14
17	18	19	20	21	22
25	26	27	28	29	30
33	34	35	36	37	38

### Grid Size – 2x2, 4x4 or 8x8

The Grid Size option is very useful for management of the grid, particularly as the project develops and you become less experimental with the usage of LaunchEon. Starting with a full set of 64 scenes gives you lots of room to manoeuvre experimentally with different parameter values, and when you're settled on what scenes you will actually use, you can reorganise the grid positions of each if you wish and change the grid to a smaller size making it easier to work with and giving higher resolution.

1. Find 4 scenes you like that you can relate reasonably well to each other – I'm going to use 3, 4, 40 and 53.
2. The 2x2 grid operates on the first 4 scenes, so I will copy Scene 40 to Scene 1, and Scene 53 to Scene 2. We do this on the Operations Panel by dragging the Edit Scene Number at the top to 40, then selecting the All tab and pressing Copy Scene. Next, we change Edit Scene Number to 1 and press the Paste Scene button. Now we do the same for Scene 53 to Scene 2.
3. Set the Grid Size to 2x2 and move the morph rectangle around. You now have a much more manageable set of morphs.

Something you may be noticing is that there are quieter and louder patches when the morph rectangle is moving. This is probably because certain mix elements have been turned down while others are up, and then you move to a scene where different elements are louder and quieter. This is actually a good reason start fine tuning a patch by making some of the possible randomize values less extreme, and this technique works best by starting with a small grid and working much more cerebrally than simply using the randomize all the time.

4. In the main display CV and Setup page, go into Values and select Controllers. Make sure to scroll to the top of the ports list. Now toggle between Scenes 1 and 2 on the left. You should notice that many of the values are different, as is to be expected. You will notice that for many scenes the ports which control a mixer level are way down, and this will undoubtedly have a huge effect on the output sound and cause silencing in places. You can remedy this by changing a few channels scene by scene, but if you're going to do more randomising then it's better to set limits to the ranges.
5. Still in the Values tab, select the Settings inner tab, and set the Rnd Min for each of the first 8 channels to 0, by dragging each up from -127. Do the same for any other channel which you have set up a level control for. You can lock all of these channels after randomising if you wish. Notice here that these numbers pay no attention to gain staging and are purely as an example; setting levels for randomising is very dependent on the device you are connected to.

1	Rnd Min	0	Rnd Max	50	LOCKED
2		0		50	LOCKED
3		0		50	LOCKED
4		0		50	LOCKED
5		0		50	LOCKED
6		0		50	LOCKED
7		0		50	LOCKED
8		0		50	LOCKED

6. Back in the Morph tab, set the grid size to 8x8 again, and hit 'Randomise Everything!' again. Now if you move the Morphing rectangle you will notice plenty of sonic change, but there are no silences, and the changes are audibly smoother. Ultimately, we have made it less random, which is good sometimes but inherently less experimental; Fine tuning a LaunchEon patch is often just about finding the bits you wish to make more and less random, and the grid size options allow you different levels of management.

### The Enables Buttons

The Enables Buttons are probably the least glamorous of all features available in LaunchEon but have a surprisingly powerful effect once you get your songs and remixes near completion. Hooking up these buttons is simple but isn't recommended until you have at least 4 or 5 pattern devices connected, ideally all 8.

All they do is mute a pattern device within a chosen scene. This obviously doesn't need much demonstration, but you should try it on a remix of one of your existing tracks that has a lot of pattern devices once you feel confident enough using LaunchEon. The results are surprisingly useful, allowing a mix to be "less is more", and helping you explore new mix territories.

## Tutorial 5 - Taking care with Randomising

When you use a lot of randomising of parameters there are some sonic risks being taken. In the previous tutorial we touched on a rudimentary method of mitigating quiet spots in a patch, which still needed a little fine tuning, but showed how easy it is to do.

To keep things healthy, the first tool provided is the Scene Locking, which is part of the Micro Controller area on all pages except 'CV and Setup'. A very simple mechanism, it simply stops any accidental erasure or changes being made to what is in the LaunchEon memory for that scene.

There are times, however, that randomising is a much riskier business. Sound can get out of control very easily, and if we intend to randomise a few parameters in particular, then sensible limits are necessary, or we shall very quickly run into problems. So rather than a management tool, we need some strategy and a little knowledge of the problem areas. We shall discuss two areas here: **resonance** and **feedback**.

In the current build drum machine Combinator "3 - Introduction to LaunchEon - Patterns.cmb", I still have one send left on my own build, so let's resave it as "5 - Taking care with Randomising.cmb" and use it to demonstrate these final issues. We'll build an entirely new "proper" drum machine in Part B of the tutorials set.

1. In the Drum machine combi, hold shift and drag in a ECF-42, and an instance of The Echo.
2. Connect the audio sends as follows:

**Mixer 1==Send 4 Left >> ECF-42 || In Left** (If you need a different send that's fine)

**ECF-42==Out Left >> The Echo || Main Input Left**

**The Echo==Main Output Left >> Mixer 1 || Return 4 Left**

For all three of the above, the right channel should route automatically.



The above image is less cluttered, but less obvious where things go. If you want to know where something routes, just pull the port cable and hold it without actually releasing it; you should now be able to see where it routes. Sadly, it doesn't appear to be possible to get a good screen shot of this.

3. Press play, then for each channel that you intend to add the effect, set the send to 75 – for mine, I've muted off the kicks and reverb send and won't add any of the send to them. You should notice the difference between the send and non-send version as a low dulled delay effect. You can make this more apparent by toggling the Return knob between 0 and 100 to audition the sound.
4. Set the ECF-42 Freq to 127. Now you hear much more high-end in the delay.
5. Set the Freq to 100, and slowly push up the Res. You should notice that the sound from the Res begins to dominate everything else from somewhere about 65 and upwards, depending on the source material. Worse than this it becomes unpleasant by the time you get to 100 and above. Sweeping back and forth slowly on the Freq between about 100-127 with the Res at 100 is not pleasant to an audio enthusiast, so imagine what an average audience thinks of it!
6. We want to be able to randomize these, so let's do so with some pre-defined limits. We'll allow the Res to go no higher than 55, and the Freq to go no higher than 110, and no lower than 70. The lower limit is dependent on the track, but in my case, it will only add mud to the bottom end below 70 and not add anything of value.
7. So, we have 3 things to add in LaunchEon. First hook up the Freq, Res, and the first available port in the Combinator:

```
LaunchEon==Port 21 >> ECF-42 || Freq
LaunchEon==Port 22 >> ECF-42 || Res
LaunchEon==Port 23 >> Combinator || CV Input 3
```

Now in the Combi programmer add the following:

```
Mixer 1 => CV In 3 => Return>Aux 4 Return Level [0-127]
```

On the ECF-42 set the Freq to 90 and the Res to 0

On the Mixer set the Aux 4 Return to 0.

(Note: You may have used different Port numbers, or possibly used a mixer channel for the Return. This is fine, just be sure to change the above details accordingly)

8. We now need to set the appropriate randomizer range values in LaunchEon, having already set our base values above. Note here that any scenes which are already locked will not be affected by the new addition. In the CV and Setup page, in the Values tab, go into the Settings tab and scroll to the bottom half. The ECF-42 Freq has a base value of 90 and we want the range to be from 70-110, so we can set the Rnd Min to -20 and Rnd Max to 20. The Res has a base value of 0, so we set the Rnd Min to 0 and Rnd Max to 55. The Aux 4 Return has a base of 0, and we are probably best with a range of 0-100, so just set the Rnd Max for Port 23 to 100.

21	-20	20	UNLOCKED
22	0	55	UNLOCKED
23	20	100	UNLOCKED

## How a randomiser actually works

In the above example we have set the Rnd Min for the ECF-42 Res to 0 and left the range for the Mixer Aux 4 Return at -127. The lowest value that the Aux 4 Return can go to is 0, so does it make any difference that we have set it to -127. Actually, yes, it does.



When you call a randomiser function, you enter the highest and lowest numbers that are permissible, and if we call the randomiser an infinite number of times then you should theoretically get a state where each possible number in the range is returned the same number of times.

In practice, computer algorithms don't get this level of accuracy, and library functions in the "C family" of languages (where most audio apps are built) will tend to go towards lower numbers a tiny amount more than they go towards higher, but it's good enough for the majority of applications.

The important thing to note is that if we set a randomiser function call with -50 to +50 as the range then roughly half of the time it will return a value of 0 or less. This affects what we have done above because the final value Aux 4 Return will thus be at 0 for roughly half of the scene. In the case of this particular design this is ok, it's just adding another little layer of filter and delay, so it's not a big deal. If it was the case that this was a major component of the sound then this wouldn't be feasible.

9. Decide for yourself whether you want to change the value of the Rnd Min on Port 23.

Lastly, we will set a similar value on the Feedback of The Echo but using a slightly different method.

10. Connect this – **LaunchEon==Port24 >> Combinator||CV Input 4** and go into "CV and Setup" then Values and then Controllers.
11. In the Combi Programmer add:  
**The Echo 1 => CV In 4 => Feedback>Feedback [0%-139%]**
12. In LaunchEon, the value control bar for Port 24 is now controlling the Feedback amount directly but in the scale and units that it understands. From this vantage point you don't need to know percentages etc, you just listen and adjust. For my Combi, the range is [-80,55].
13. Once you have your preferred range extremes you can program them in the Settings tab, and all subsequent randomises will stay within this range.

In Part B, Tutorial 7 we build a bigger, better, faster, more, type drum machine.

## Part B

### Tutorial 6 - Beginners guide to CV – Part 2

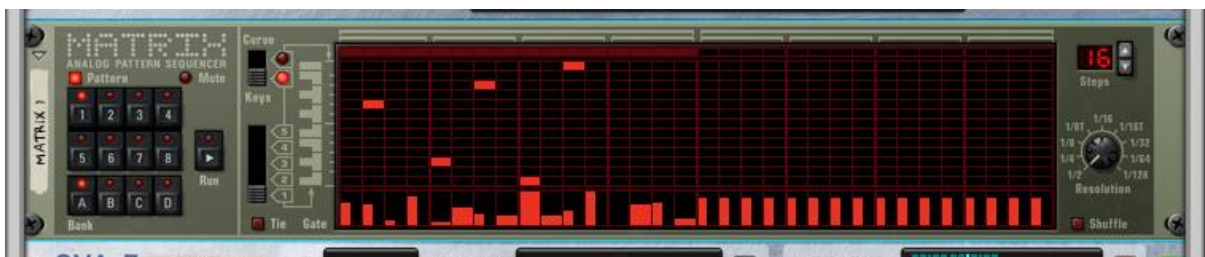
Rather than building anything specific in this tutorial, we are just going to go through some further important points of using CV and try to shine light on some less obvious facets. We'll be using CVA-7 a lot here as the purpose is to enlighten. At speed. Yay!

But seriously folks, the whole point of this tutorial is to analyse what is happening with the CV, so if you aren't using CVA-7 then it might be a bit of a struggle to understand what is going on here – again we recommend using this free plugin.

If you're following along using the fully built Combi's in the LaunchEon patch bank, you will probably find this Combi to have absolutely no musical value :D

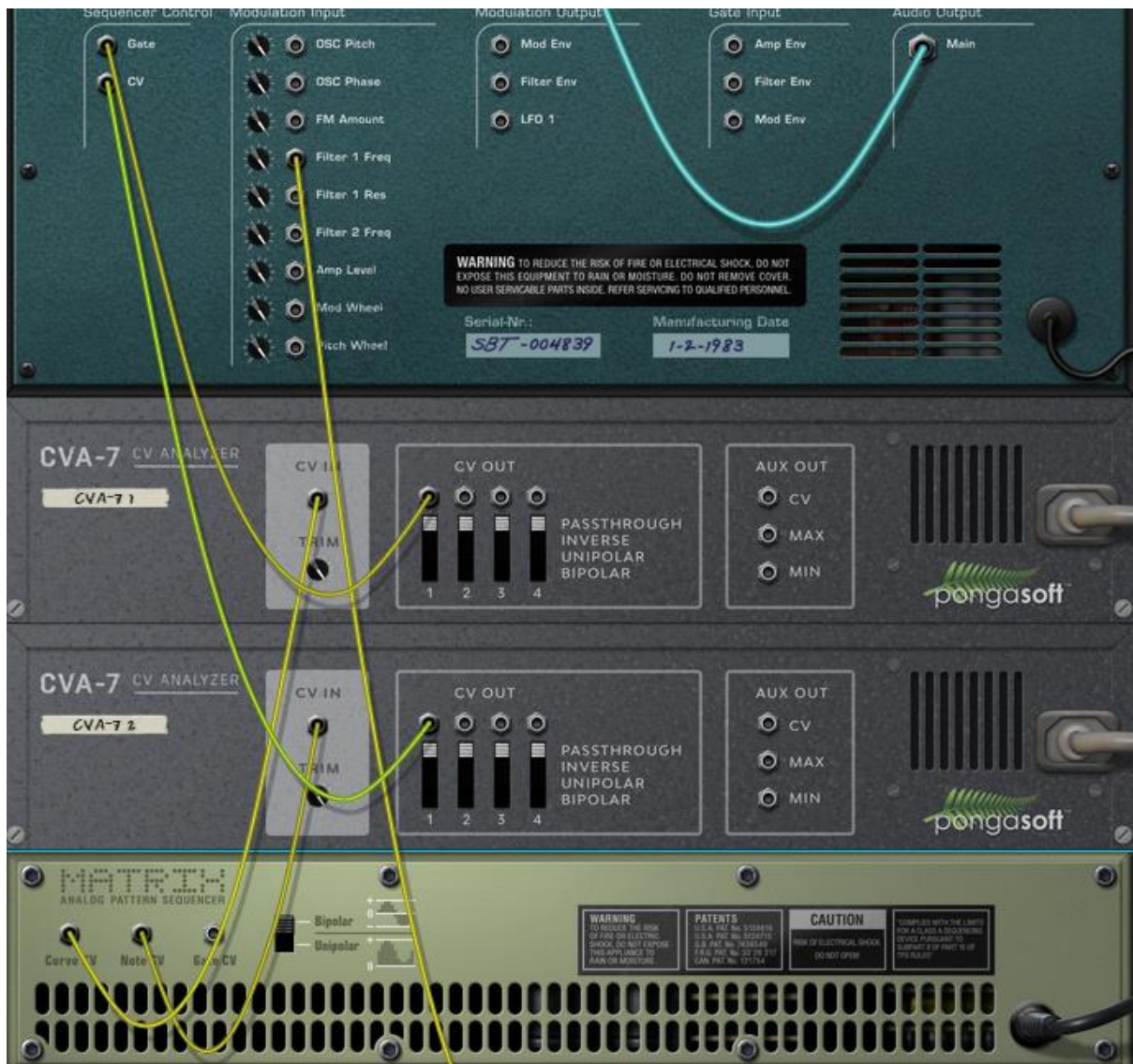
Let's start with the oldest trick in the book.

1. In an empty rack, drag in a Subtractor, 2 x CVA-7's, and a Matrix. Let them auto-route, and you should see that the auto-routing ignores the CVA's.
2. Disconnect the Gate CV cable and reconnect it as:  
`Matrix==Gate CV >> CVA-7 1||CV In`  
`CVA-7 1== CV Out 1 >> Subtractor||Gate`
3. Disconnect the Note CV cable and reconnect it as:  
`Matrix==Note CV >> CVA-7 2||CV In`  
`CVA-7 2== CV Out 1 >> Subtractor||CV`
4. On the Matrix, Set the resolution to  $\frac{1}{2}$ , and then press Ctrl-R to randomise the pattern.
5. Now with the pattern randomized, set one of the gates to max then set the next gate to completely off. Next, set one of the notes to the highest entry in Octave 5, then set the next note to the lowest entry in Octave 1.



This time you should be paying attention to the numbers on the left rather than the graph. You should, in CVA-7 1, see the gates coming in as 126 for highest and 0 for lowest, while the notes in CVA-7 2 are 96 for the highest and 36 for the lowest. So, the Matrix has near enough full gate range, and a 5-octave range; with the exception of the top number being 126 rather than 127 there is nothing surprising here at all.

6. Now on Matrix, disconnect the cable from the Gate CV port and move it to the Curve CV port, and change the output type to Bipolar.
7. Set the resolution back to  $\frac{1}{16}$ , press play, and move the cable back and forth between the Gate and Curve inputs.



8. Lastly, for this section, while play is active, pull the cable from the CV port and listen. You can hear that the Subtractor does not actually need the CV to generate the note as it can just use the 63.

People's tastes will vary, but for me the Curve CV port gives a much more musical output than the Gate CV output, when in Bipolar mode. This is simply because it will transmit a gate less often and become less frantic.

But why stop there? How about attaching a Pulsar LFO set to square mode, with the 2<sup>nd</sup> LFO modulating the rate? Why not use a Player to pick up the CV and filter notes (SHAMELESS PLUG - Note Filter) or have foldback control the pitch range (SHAMELESS PLUG - MeloDramatik). The important thing to remember is that CV is there to be used in whatever way you see fit.

### Summing an LFO with a LaunchEon output

As of v1.0 of LaunchEon, there is no onboard modulation of the outgoing port values – all outputs are static if there is no morphing going on. This means that you can use LaunchEon to provide a base value of sorts to an external modulator such as Pulsar.

9. Hold down shift and drag in another CVA-7, a LaunchEon, a Spider CV, and a Pulsar LFO, placing them all beneath the Matrix – make sure you can see the LaunchEon and the CVA-7 at the same time. Make the following connections:

```
Pulsar==LFO 1 CV Out 1 >> Spider CV||Merge Input 1
LaunchEon==Port 1 Out >> Spider CV||Merge Input 2
Spider CV==Merge Output >> CVA-7 3||CV In
CVA-7 3==CV Out 1 >> Subtractor||Filter1 Freq
```

10. In the LaunchEon, go into the Values tab, then into Controllers.
11. Drag the bar for Port 1 to the left and right of the centre point, while observing the result on the CVA-7, along with listening to the output.

You don't need LaunchEon to do this, it can be done with any CV device even another LFO or a Synchronous, or one of Europa's envelope generators routed to a CV Out port. What is important to understand is that the result is always a sum of the two output numbers.

### CV Scaling

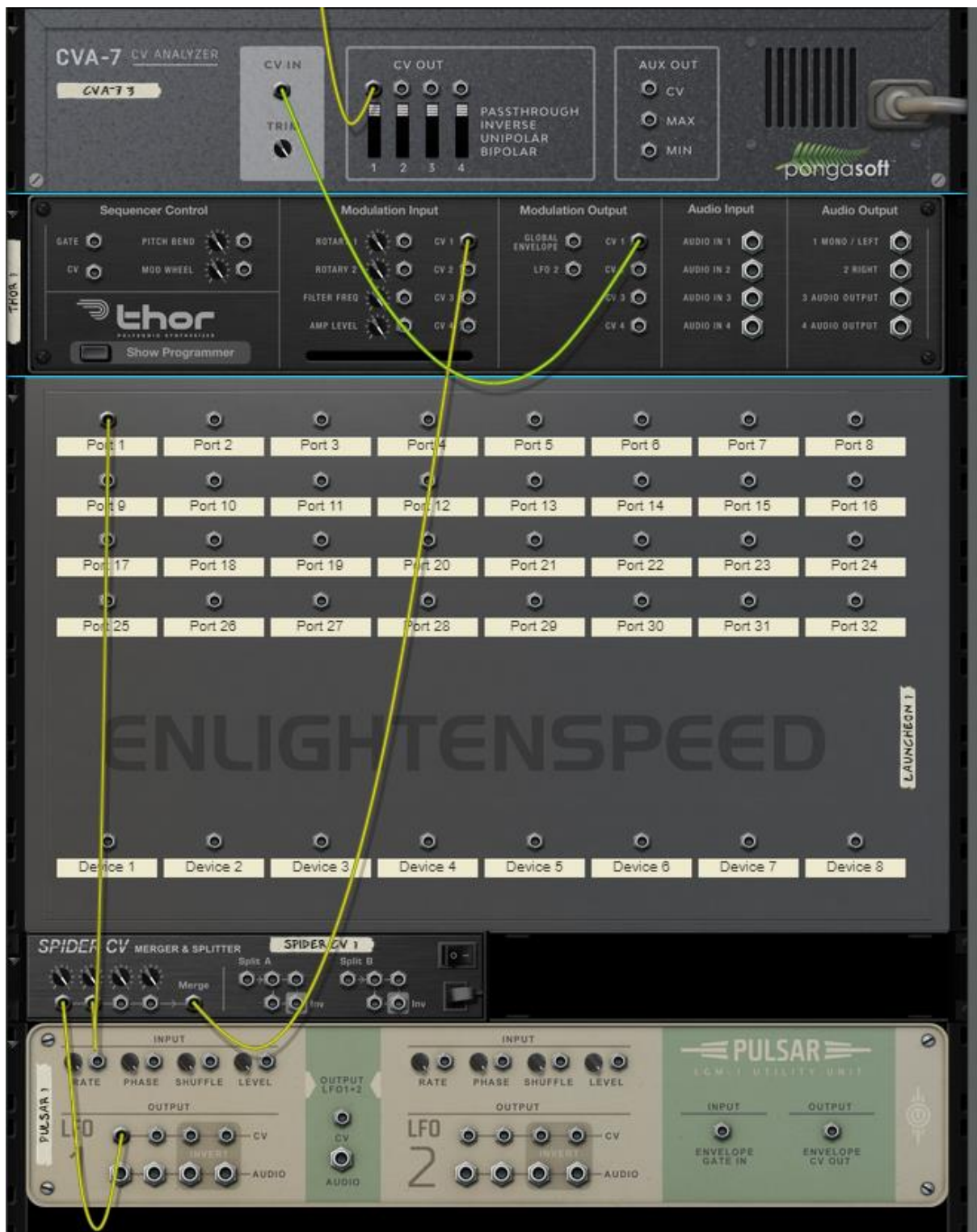
Given the above, scaling of a CV signal can often be important. If we listen to the output of the above setup by pressing play and sweeping the Port 1 controller across the range, the signal becomes almost entirely inaudible at around -90, and it becomes very difficult to discern any effect of the filtering at roughly 65 or above; you may hear things slightly differently from me, of course.

If we decide that the useful range is, for example, from -30 to +30, then we can use various devices with throughput capability to get control of this. This can be of use should we need one controller to effect multiple parameters but to different degrees – otherwise we could just limit the port randomiser range.

Let's demonstrate the setup.

12. Hold shift and drag in a Thor between the LaunchEon and the third CVA-7.
13. Disconnect the cable that runs from the Spider to the CVA-7, then reconnect as follows:

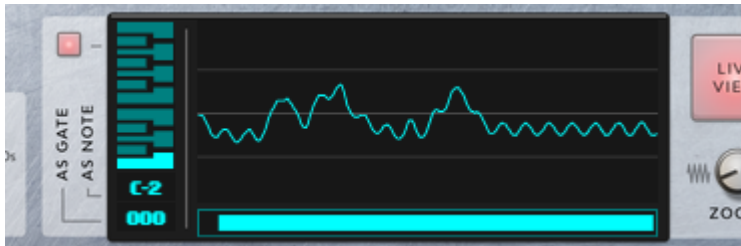
```
Spider CV==Merge Output >> Thor||Mod Input CV 1
Thor==Mod Output CV 1 >> CVA-7 3||CV In
```



14. Bypass all off Thor's modules, then on the front panel program in the following:

**CV In 1 => 65 => CV Out 1**

15. Sweep across the controller for Port 1 on LaunchEon again. You should notice that this time the whole range is useful – it has been scaled to fit.



The output from 15 should look something like this when moving the controller around.

You may be thinking that 65 is a rather odd value for this to be achieved at, given the desired input numbers. This is because in a normal throughput situation, Thor's Amount control in the panel is not linear. I'll give you an exercise here: try and route a Thor into a CV analyser so that you can see the actual shape that is produced. If you succeed, try the same experiment with Europa (which is a different kind of non-linear) and see the difference between them.

In most situations this difference is too small to make that much of a difference, but if you need a linear solution, see section 15 of tutorial 9, and the asterisked section.

The importance of this section is to point out that analysis of the signals is crucial. Not only will this practice help get you further, and faster, when building advanced instruments, but it will also help highlight that Reason has a lot of hidden little treasures that it's worth spending some time finding.

## Tutorial 7 – A Bigger Drum Machine

In this tutorial we shall build a much more powerful drum machine, and this time the “Reason 11 Suite//Reason+” brakes are off.

While we appreciate that some users are still on Reason 10 or 11 Standard, the extra Rack Extensions allow us to stretch the sonic capabilities of LaunchEon based Combi’s. After all, LaunchEon’s sonic capabilities are entirely at the mercy of the devices that actually make the sounds; LaunchEon just manipulates what’s there to get the best out of it. Indeed, many users will be using various plugin formats via RRP in DAWs, or even in future versions of Reason that are hosting “format X” as a plugin type. If you are on R10/11 you will still get benefit from reading through the tutorial, so build something with as near like-for-like components as you can, including VST if absolutely necessary.

So, we will go a bit fancier in terms of sonic modules, but we will also introduce more players as a way of making pattern manipulation easier, and possibly even a shameless self-promotion for an Enlightenspeed Player device or two.

### The Recipe

Let’s give a little thought to what we want. I’m going to go relatively genre specific and create an organic House drum machine; this will be mainly acoustic sounding but with some electronic vibes thrown in. Obviously feel free to go for your own genre if you know what sounds to go for, but if you’re still in the learning phases it won’t hurt to follow me first, then redo the tutorial later with your own selected sounds.

1. From an empty rack position, drag in a Combinator, then without holding shift, drag in a Line mixer 6:2 and ensure it routes to the first Mixer Input on the Combi, and then hold shift and we drag in two Mixer 14:2’s.
2. Connect the mixers as follows:  
**Mixer 1==Master Out Left >> Line Mixer||Channel 1 Left**  
**Mixer 2==Master Out Left >> Line Mixer||Channel 2 Left**  
Both stereo channels should connect automatically.
3. For the acoustic kit I’m going to use Reason Drum Kits, but I’ll make a few adjustments – I’ve picked out the patch “The Blue Note.repatch”. Hold Shift and drag the RDK into the Combi beneath the first mixer and reset the volumes for Kick, Snare, Toms, and Hat to 0.0dB, then set the Overhead and Room microphones to -infinite dB, and the Master to 0.0. Set the reverb sends to -infinite dB and the return to 0.0dB.

I made a few changes to the samples used, and also the settings, but I’ll leave this up to you as the changes should really be decided by your own ears here. For cleanliness, however, in what will become a very busy mix in places, I’d recommend reducing the Decay times of the Toms, Ride and Crashes for now.

4. Now connect the RDK to Mixer 1 as follows:  
**RDK==Kick >> Mixer 1||Channel 1 Left**  
**RDK==Snare >> Mixer 1||Channel 2 Left**  
**RDK==Toms >> Mixer 1||Channel 3 Left**  
**RDK==Hi-Hat >> Mixer 1||Channel 4 Left**  
**RDK==Cymbals >> Mixer 1||Channel 5 Left**  
**RDK==Overhead >> Mixer 1||Channel 6 Left**

```
RDK==Room >> Mixer 1||Channel 7 Left
RDK==Master Out >> Mixer 1||Channel 8 Left
```

All stereo connections should route automatically.

Note that the Master Out channel is optional, and it depends on what other adjustments you make as to whether it will really make that much of a difference.

5. Hold shift and drag in an Umpf Club Drums and place it below Mixer 2. For my project I have selected "Embellishment Kit.repatch" as it allows me a reasonably hard 4/4 beat to give me the main framework for the house beat.

6. Set the level of all channels on Mixer 1 and Mixer 2 to 65. Connect as follows:

```
Umpf==Separate Out 1 >> Mixer 2||Channel 1 Left
Umpf==Separate Out 2 >> Mixer 2||Channel 2 Left
Umpf==Separate Out 3 >> Mixer 2||Channel 3 Left
Umpf==Separate Out 4 >> Mixer 2||Channel 4 Left
Umpf==Separate Out 5 >> Mixer 2||Channel 5 Left
Umpf==Separate Out 6 >> Mixer 2||Channel 6 Left
Umpf==Separate Out 7 >> Mixer 2||Channel 7 Left
Umpf==Separate Out 8 >> Mixer 2||Channel 8 Left
```

7. Now we'll connect the CV's from LaunchEon for controlling the Mixer levels, as follows

```
LaunchEon==Port 1 >> Mixer 1||Channel 1 Level CV
LaunchEon==Port 2 >> Mixer 1||Channel 2 Level CV
LaunchEon==Port 3 >> Mixer 1||Channel 3 Level CV
LaunchEon==Port 4 >> Mixer 1||Channel 4 Level CV
LaunchEon==Port 5 >> Mixer 1||Channel 5 Level CV
LaunchEon==Port 6 >> Mixer 1||Channel 6 Level CV
LaunchEon==Port 7 >> Mixer 1||Channel 7 Level CV
LaunchEon==Port 8 >> Mixer 1||Channel 8 Level CV
```

```
LaunchEon==Port 9 >> Mixer 2||Channel 1 Level CV
LaunchEon==Port 10 >> Mixer 2||Channel 2 Level CV
LaunchEon==Port 11 >> Mixer 2||Channel 3 Level CV
LaunchEon==Port 12 >> Mixer 2||Channel 4 Level CV
LaunchEon==Port 13 >> Mixer 2||Channel 5 Level CV
LaunchEon==Port 14 >> Mixer 2||Channel 6 Level CV
LaunchEon==Port 15 >> Mixer 2||Channel 7 Level CV
LaunchEon==Port 16 >> Mixer 2||Channel 8 Level CV
```

8. Add 2 Drum Sequencers above RDK, and 1 Drum Sequencer above UMPF. Now connect:

```
LaunchEon==Device 1 >> Combinator|| CV Input 1
LaunchEon==Device 2 >> Combinator|| CV Input 2
LaunchEon==Device 3 >> Combinator|| CV Input 3
```

Remember to set all three of these ports to Unipolar mode.

9. We also need the Combinator routings for the Drum Sequencers, as follows:

```
DrumSeq1 => CV In 1 => Pattern Select [Off - 8]
DrumSeq2 => CV In 2 => Pattern Select [Off - 8]
DrumSeq3 => CV In 3 => Pattern Select [Off - 8]
```

10. Use the technique demonstrated earlier in Tutorial 3 to fill the patterns up quickly, but this time make sure that Pattern 8 is cohesive for all three sequencers. Remember, of course that there are note numbers too that will need to be changed in the second sequencer for RDK; it's best to use one sequencer for the main elements, such as Kick, Snare, Hat, Toms,



and the 2<sup>nd</sup> for more percussive sounds and all other hidden gems not visible on the interface.

OK, almost there, we're just going to add some sends now, and then we'll start looking at some important stuff.

11. Hold shift and drag in a RV-7000. Drag a Spider Audio in below Mixer 2, it shouldn't auto-route. We want to have all sends available to the RDK, but the Umpf is only getting this Reverb, so connect the following:

```
Mixer 1==Send 1 Left >> Spider Audio||Merge Input 1 Left  
Mixer 2==Send 1 Left >> Spider Audio||Merge Input 2 Left  
Spider Audio==Merge Output Left >> RV-7000||Left Input  
RV-7000==Left Output >> Mixer 1||Return 1 Left
```

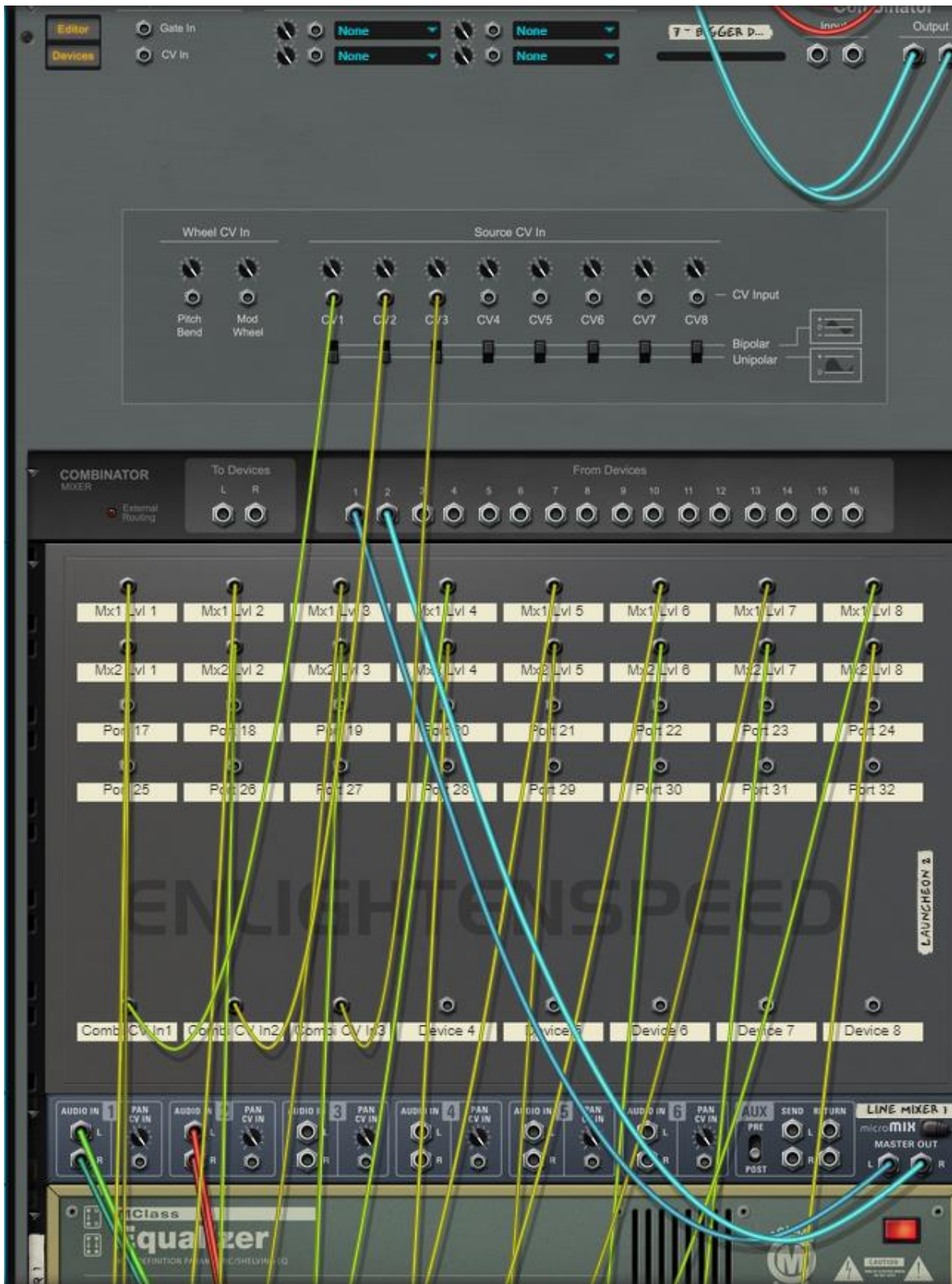
Again, all stereo connections should route automatically.

This routing allows us to have the same reverb effect on the sends of both mixers, without meaning all sends are the same. If you want all the same, then back at the point of creating the second mixer you simply wouldn't hold shift down and this would auto-route the cabling for the Chaining Aux and Chaining Master. If you want none the same, then you hold shift at the point of creation and don't perform any fancy cabling as per above.

12. Without holding shift drag in an Echo, and a Quartet, all below Mixer 1. They should auto route to Sends 2 and 3.
13. Set the RV-7000 patch to "DRM Dark Chamber.rv7", and the Quartet patch to "Metal Wide Lead.repatch". Leave the Echo on the initial patch but change the Delay Time to 1/16.

So, we should now have two drum modules with patterns coming in from the 3 sequencers, and some sends to be added.

The full routing should look something like the following set of images:







We have set a basic static mix without being too worried about gain staging. If you want to set some basic gain staging, then now is the time to do it before we start messing around with the levels in LaunchEon. Remember that because there is no input gain on the channels of the Mixer 14:2, gain staging should be dealt with on the output volume of the individual channels of the modules, or with some other gain staging module in between.

You should also mix in your send effects to taste at this stage. Make the decisions when doing this as to whether you wish to add any of these for morphing later. We'll definitely add controls for the parameters of the effects themselves, but it doesn't hurt to note at this stage what bits you fancy having either LaunchEon or Combinator control over.

At this stage we have 16 CV Morph output ports used on LaunchEon, and 3 device ports. We have also used 3 CV Input ports on the Combinator. Once you have finished whatever pre-LaunchEon mixing you are doing, it's worth asking yourself about the strategy for ports at this stage.

- Are there any channels in either drum module that it's best not to connect?
- Are there any controls on either drum module that it's best to have standard explicit Combinator connections rather than LaunchEon morph control?

These two questions are the central theme of a strategy to achieve the most elegant instrument build.

Having a predetermined plan can help avoid running out of ports early in the build, but it can also become apparent when a parameter should be mapped to a standard Combi control, rather than to a LaunchEon morphing port.

Earlier, we noted that the decay time for several of the RDK's internal drum samplers was better off turned down to achieve a cleaner mix. As a general rule envelope controls of all types are typically the ideal candidates for setting up as Combinator controls rather than as morphing parameters. There is no hard and fast rule for this of course, but should you be using generative players for example, then changing the parameters of the sound shape will give very difficult to control results, particularly if using a modulation source to control the morphing itself. Similarly, playing a pre-established piece in this scenario would struggle to get good results, not least because it would be confusing for the player.

For this device, and for most drum machines, the decision needs to be made whether it is safe or not to morph the volumes of the Kick, the Snare, and the main Hi-Hat, along with any musically significant sample that is in the drum machine. Usually if you are going for this, then it is safe to reduce the volumes with morphs, but only ever raise them very slightly. Dependent on the type of music you are trying to make though, sometimes this just might not be plausible. So, depending on what you intend to do with the device you are building right now, you might want to remove a significant number of ports.

In the case of this tutorial build machine we are keeping all the ports and putting all the important RDK envelope controls on the Combinator Panel. We will also limit down the maximum value that certain ports can randomise to – in other words we will stop the major drum parts from going too loud and overpowering the mix.

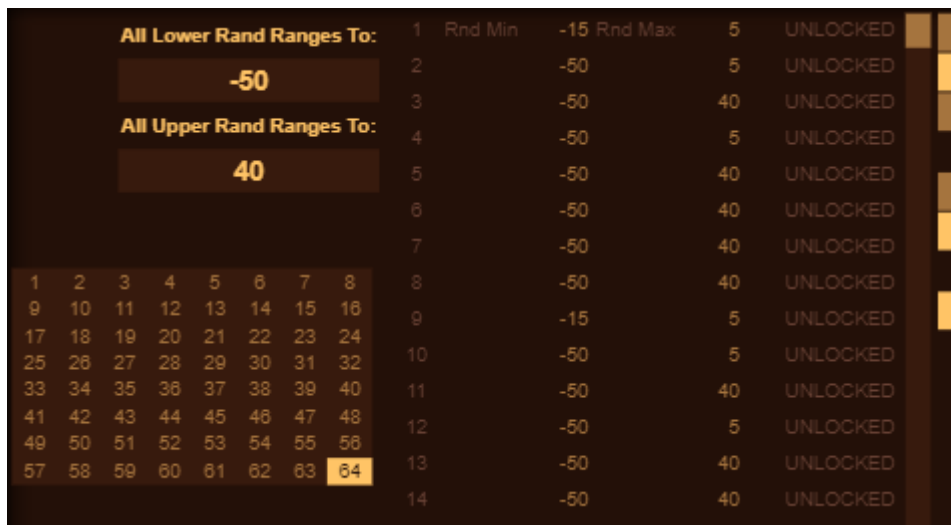
14. For now, we shall just add one master control for all the "messy" RDK decays – Toms, Ride, Crash 1, and Crash 2. Setup a controller called RDK decays and assign the following:

**The Blue Note => RDK Decays => Toms Decay [60.1%-100%]  
The Blue Note => RDK Decays => Ride Decay [73.0%-100%]**

**The Blue Note => RDK Decays => Crash 1 Decay [56.0%-100%]  
 The Blue Note => RDK Decays => Crash 2 Decay [59.1%-100%]**

(Your patch name may not be the same by now, of course).

- In LaunchEon, go to CV and Setup, then the Values tab, then Settings. Set “All Lower Rand Ranges To” -50, and “All Upper Rand Ranges To” 40. This gives us a good generic start point that isn’t too crazy for levels, but we still need to have more controlled versions for heavy hitter sounds. These are located on Ports 1, 2, 4, 9, 10, and 12. We’ll set each of these ports to have its own Rnd Max level of 5. Note what we stated earlier, and that with a range of -50 to 5, only 1 in 11 randomises will give a rise in the values; that’s fine for raises most of the time, but the Kick Drums should maybe be less harsh with the potential for negative values on both RDK and Umpf, so for Port 1 and Port 9 set the Rnd Min value to -15.



Before we hit Randomise, there is one final adjustment to make. We want to have a set of scenes which use the flow of patterns 1-8 for each device. For this we should use either the first 8 or the last 8 scenes in LaunchEon. This gives us a useful hint about strategy. LaunchEon will default to 16 scenes of CV when in 4x4 mode, which can easily be changed, but it’s not as easy to remember 64 different mix states, so 16 suits a particular method of working.

If you use the first 16 scenes as the mix morphing scenes, then you can then quite easily fill the Pattern scenes independently from 64 downwards, even all the way to 1. The advantage that keeping disciplined like this gives is that each Scene of patterns, gets 16 easy to find mix settings, which will have different effects on the overall output for each of the scenes, even more so when sends start coming into the equation. You don’t have to do this, of course, but it’s a useful management method.

- Let’s add the 1-8’s. In LaunchEon, go to Scene, then click on Micro Controller 57 in the bottom left corner of the main panel. It should go green, and the Edit button will automatically jump to the same number. For Devices 1, 2, and 3, set the Pattern to 1. Now move to Micro Controller 58, and set Devices 1, 2, and 3 to Pattern 2. Work your way along the row, repeating this until you get to Micro Controller 64, and setting them to Pattern 8.
- Finally, before we Randomize, Lock each of Scenes 57-64 on their respective Micro Controllers.
- In the Operations Panel, click on the All tab and then click “Randomise Everything!”. Go to the ‘All Scenes’ page and listen to the various different scenes which have now been generated. Have fun listening to different scenes for a bit.

**So, where to go next with this?**

The obvious answer from a building point of view, would be to start looking at the parameters on the send effects, connecting some for morphing, and programming others on to Combinator controls etc.

The other path is to refine what is already there. Part of this is the process of listening and making minor adjustments to smooth harsher settings out. This will make finishing a song project off a lot easier in the short term, but it also has the advantage that it can strengthen the ability of the built machine to be reused. Obviously, patterns are easy enough to reprogram, but many drum sound module devices lend themselves really well to changing patches and completely redoing everything as a result. This is certainly the case with the Umpf devices, although maybe not so much with RDK as there aren't that many kits onboard it.

Many devices of other plugin formats will also work well in this regard but note again that these cannot at this time be saved directly into RRP. However, using LaunchEon inside an RRP and sending it out to another DAW is certainly easy enough to do, assuming you know your DAW well enough and that it has decent routing facilities.

Regardless of the format it is an important work ethic to be able to reuse old designs, and simply switch out the sounds and patterns while the controlling template remains intact.

To finish off, change out your sounds and patterns and have a go at setting up sends as both Combinator controls and morph controls. Be mindful of which control works best for each parameter that you experiment with. Perhaps you might want to add a bass synth or a vocal sampler to your version – the choice is yours!

## Tutorial 8 - Advanced Mix/Remix Workflows

Ok, let's ease off on the hard learning for this bit, and have some serious fun using the Scene Only morph for creative mixing. We need to discuss the power of LaunchEon as a mixing tool, in particular for remixes, so what better way than to pick out a remix competition from the web and have at it!

The surprising part is just how effective this is, and you can either use the results as a template for a full remix, or you can find just a single scene that works well playing through the track and use that as the starting point that you pivot the remix around.

First of all, go to a remix competition website and download some stems. There are many of these sites around and they cover various genres – a simple Google for “Best Websites for Remix Competitions” will get you in the right direction. Be advised that these sites aren't free, and the stems that you download are strictly the property of the original artist, so mess around and have fun, but if you don't plan on submitting then under no circumstances should you release the finished product yourself. For this tutorial I can't give you the stems etc for the same reason.

You need to know the BPM and time signature of the tracks, so if this isn't easily available on the site you are using, then you should immediately consider using another site.

1. Set Reason's tempo
2. Gain stage the audio stems to -10dB for all tracks.
3. If the stems have a beat track/s, then mute it/them off for now
4. Add the Combinator that we built in Tutorial 7, and then reset the Umpf, the RDK, and the Drum Sequencers to the default state. If you've added anything else such as bass synths then remove them but keep any extra sends or insert FX you may have added.
5. Reset LaunchEon, but you should keep the port connections, and leave the Combinator programming as it is for now.
6. Find a nice crescendo or chorus like section of the original stems and loop it.
7. Audition some kits on the RDK and Umpf, or any other module you may be using, by using single hits of each sound and seeing if the sounds match up to what is on the stems at present, or perhaps if they go well with what you envision for the track.
8. Build your Pattern 8 for each Drum Sequencer or fill up your patterns in another way if you prefer. It's quite often good to do steps 7 and 8 as a single part, where you add the sounds and patterns as one-piece drum by drum.
9. Next, we are going to add CV controllers for the levels of the audio tracks, so for each of them connect:

```
LaunchEon==Port 25 >> <Audio Track Name>||Level CV In
```

Simply add a new connection for each Level CV In, and of course, by this stage your LaunchEon port numbers may vary. Also consider again if the channel will really be likely to see much usage here – is the channel only holding a one-off audio event, or nearly that?

### Multiple LaunchEons

By this stage of the proceedings there is a reasonable chance that you are running out of LaunchEon ports. If you need more, just add another LaunchEon to another set of 32 + 8. This will almost inevitably be required if you are also using the pans to mess with the stereo field – this is almost always a good idea in my experience.



It is a very wise tactic to try and ensure that all connections for one device, such as a send etc are all on the same LaunchEon when using more than one – this is partially because the devices themselves can only be part of one Combinator.

If you start using more than one LaunchEon, then getting both of them to change Scene at the same time may become very important. An obvious choice of how to do it is to set it up as a Combinator control that governs both of them, but this isn't the most elegant should you be sending change data to the control via a Remote connection from a Rotary. It's better, where possible to use the MIDI keyboard, or perhaps pads.

### **Using the keyboard/MIDI for Scene selection.**

This is a nice simple process which sends Notes to the LaunchEon device via the Combinator, and translates them to scene numbers, changing them as appropriate.

For demonstration purposes we'll assume that you wish to have 16 scenes mapped for key triggering, and that this is the first 16 scenes in LaunchEon; note that there is no reason for strict adherence to this, it could just as easily be 5 scenes mapped from 35-39. We shall also assume that the desired range on the MIDI keyboard is from C1 -D#2 (MIDI Note numbers 36-51), again there is nothing mandatory about this range, but is however crucial that you have the correct number of keys available, so if it's 5 scenes over 5 keys then the source must have a range of 5 discrete values – be sure not to confuse this with 5%.

In the Combinator program the following:

**LaunchEon => Key => Scene Number [0-15]**

Now in the Source Range area below the Mappings area of the Combinator programmer set the left marker to 28% (36) and the right marker to 40% (51).

You now have your scenes triggering from the keyboard, have fun!

## Tutorial 9 - Advanced Synth Building

Building a synth with LaunchEon is quite easy relative to a drum machine, as there is far less repetition. The principles of building one are also fairly simple and if you have much experience of building advanced Combi patches then there is little more for you to learn here, so we will cover this section reasonably quickly then discuss how to use LaunchEon for enhancing this, from number 8 onwards.

Synthesis is really where morphing comes into its own and when we look at the morphing grid of all 64 squares what we are effectively looking at is a 2D capability for advanced wavetable synthesis. Wavetables originally came out in the early 1980's in the form of the PPG Wavecomputer 360 and were a rather spartan linear affair that could take a long time to program compared to modern standards. What they allowed you to do was to morph between basic waveforms stored in a table, thus the name. Thor's wavetable oscillator is a fond resurrection of the older technology, and it can give you some ideas of what wavetables are, but it also points out rather starkly how limited the PPG synths were.

Digital audio synthesis morphing of any sort can be thought of as a wavetable, albeit a far more complex one. Whereas with classic wavetable synthesis the wave would sweep through a small collection of up to 64 basic sinusoids giving 127 continuous waves, the LaunchEon morph tech allows you to sweep between up to over 173,000 different continuous waves, and these can change in a myriad of different fashions, and if we click on "ALL SCENES Randomize CV" then we generate a completely different 173,000. The full number of "wavetables" is technically infinite as it doesn't rely on real wavetables at all, and maximum amount of different possible combinations in a fully cabled up LaunchEon base Combi is one of those silly numbers with hundreds of 0's.

### So where to start?

Given the details above, there are two general paths we can go down. We can either try and cover as much sonic ground as possible in any single patch or try to cover a more limited domain with much greater resolution.

The latter path will tend to yield more musical results, and also encourages you to build a set of focused super instruments rather than some monstrosity that is difficult to wield for the purposes of entertainment. The former path, however, also has great benefit in that maintaining a level of genericness will allow you to build reusable instruments that you can easily just flick the patches and get different completely different base sounds with which to experiment.

So, our strategy for this tutorial will be to aim for "generic synth" and not pigeonhole things – if you like what you hear for a specific purpose or project, then you can always add specific refinements later. Conversely, we won't be aiming for something can smoothly sweep between realistic sweet bird song noises and nosebleed grade industrial cacophony.

Let's get started.

### The Recipe

1. Drag in the following to the rack:
  - A Combinator, then inside it drag in
    - A Mixer 14:2
    - A LaunchEon
    - 2 Malstroms

## A Subtractor

Check the instruments routed to the Mixer channels, that the Mixer routed to Combi outputs 1 and 2, and that the Combi routed to the Mix Channel. LaunchEon shouldn't have routed to anything yet.

2. Hold shift and drag in an RV-7000 Reverb between the Mixer and the Combi outputs. Reconnect the Mixer outputs to the RV-7000 inputs, then the RV-7000 outputs to the Combi outputs 1 and 2.
3. Open the Combinator programmer and you'll see the names of the Instrument patches, plus their key ranges etc. Transpose the 2<sup>nd</sup> Malstrom up to 12, and then transpose the Subtractor down to -12. This is an old classic sound design tactic, meaning your sound will have its own "bass, middle and treble" layers.
4. Set the patches for each of the instruments to something from the Polysynths folder of each of their respective browser focuses i.e., hit the folder button on the device browser then find the polysynth folder of that device type in the Factory Sound Bank and set each of the device patches to an entry in that folder. In my version I actually set the Subtractor to a pad patch, and you can change this if you want to, but make sure that an FSB folder is in the background basically, don't use a patch from a Desktop folder.
5. Change the names of the 4 standard Combi controls to A, D, S, and R respectively. If you're on R12 or R+ then change each control type to Red Tic-Tac then drag the controls to the right and align them.
6. We want to now set up the amp envelopes of the instruments to be controlled by the ADSR controls we've just set up. If you're not sure how to do this then I'll refer you to your Reason Help document in the Help menu – this is because the setup of this is now a lot easier in R12 but requires a completely different explanation that's best off described by RS.

PRO-TIP – This one is only available to R12 users I'm afraid.

A really useful tactic which will save endless frustration when auditioning different sound patches is to set up a "Quick" button that will set particular parameters, in this case the envelopes in one click, and make patch flicking a whole lot quicker and easier. Rename one of the standard switches to "Quick".

In our case we're building a generic polysynth, so I'm going to assume four basic settings that will work for most patches and keep the instruments regulated, at least for now: Attack=12, Decay=127, Sustain=127, Release=44. This should give a good solid keyboard sound that is not too clicky and doesn't hold each voice for ages and get messy.

This takes a little while to set up, but if you go through each of the Amp ADSR's on the instruments, remembering to do BOTH ADSR's on each Malstrom, set it so that the Quick button sets the parameter to the value above, regardless of which click it is, for example:

```
<MalstPatchName> => Quick => Oscillator A Attack[12-12]
```

This means any click on Quick will reconfigure a newly loaded patch so that it is immediately of the sound shape format that we're aiming for. It's 5 minutes work now to save you an hours' worth of work broken down into little recurring 10-second intervals which can be really annoying and inconvenient. You are best to remove this switch before putting the built Combi "into production", because it can mess with the rest of the parameters if loaded at run time. Think of this switch, and any like it, as a refinement for the building process.

NESTED PRO-TIP – If you're just doing sound design and don't have anything particular in mind yet, or even better are designing a template, why not set it so that the 'off' click gives

you polysynth settings, or maybe even percussive settings and the 'on' click gives you pad settings.

7. Ok, before we start cabling up LaunchEon, let's have a little play around with the patches, just changing patches on each at random and adjusting the ADSR (or using the "Quick" button), and find a sound that interests you, or at least is comfortable to work with (LaunchEon will find plenty of interesting stuff anyway).
8. Ok, let's cable up LaunchEon as follows, starting with the Instruments:

```
LaunchEon==Port 1 >> Malstrom 1||Index Mod Input
LaunchEon==Port 2 >> Malstrom 1||Shift Mod Input
LaunchEon==Port 3 >> Malstrom 1||Mod Amt Mod Input
LaunchEon==Port 4 >> Malstrom 1||Filter Mod Input
```

```
LaunchEon==Port 5 >> Malstrom 2||Index Mod Input
LaunchEon==Port 6 >> Malstrom 2||Shift Mod Input
LaunchEon==Port 7 >> Malstrom 2||Mod Amt Mod Input
LaunchEon==Port 8 >> Malstrom 2||Filter Mod Input
```

```
LaunchEon==Port 9 >> Subtractor||FM Amt Mod Input
LaunchEon==Port 10 >> Subtractor||Osc Phase Mod Input
LaunchEon==Port 11 >> Subtractor||Filter 1 Cutoff Mod
Input
LaunchEon==Port 12 >> Subtractor||Filter 1 Res Mod Input
```

```
LaunchEon==Port 14 >> Malstrom 1||Mod Wheel Mod Input
LaunchEon==Port 15 >> Malstrom 2||Mod Wheel Mod Input
LaunchEon==Port 16 >> Subtractor||Mod Wheel Mod Input
```

```
LaunchEon==Port 17 >> Mixer 1||Channel 1 Level CV
LaunchEon==Port 18 >> Mixer 1||Channel 2 Level CV
LaunchEon==Port 19 >> Mixer 1||Channel 3 Level CV
LaunchEon==Port 25 >> Mixer 1||Channel 1 Pan CV
LaunchEon==Port 26 >> Mixer 1||Channel 2 Pan CV
LaunchEon==Port 27 >> Mixer 1||Channel 3 Pan CV
```

This is a good point to save this as a template patch.

9. Let's get a listen to the sort of sonic range we now have when we randomise LaunchEon, by selecting the CV tab in the operations panel and clicking on ALL SCENES Randomise CV. Play notes on the keyboard while moving the morph rectangle around, the purpose of which is to discover where there are any harshness's at the extremes. The other possibility is "duds", where you get no sound at all, typically because all the levels are too low at the same time.
10. Let's first suppose that you are dealing with a "harsh" result, and let's assume that this happens in the Scene 1 area. If we can ascertain that the harshness is caused by clipping, and this is easy to diagnose simply by reviewing the Mixer, then we can limit the randomise range of the channels to not go above a certain amount each.
11. Let's then suppose that you have a silent or near silent result on Scene 2; in this instance you can limit the randomise range of the channels to not go below a specified value.

The best tactic for controlling the results that the randomise will give you, is to narrow the ranges of the randomisers every time you find something that is a little out of bounds (or a lot!), and then randomising again. For the levels it is often wise to do this to control the dynamic range of the Combi instruments output, so for all LaunchEon ports which are controlling a levels CV mixer port, narrowing the randomiser ranges down significantly will make for a more even balance. In my version I have set the Rnd Mins to -40 and the Rnd Max' to 0; you may wish to use slightly different settings.

12. In our version we have linked up the Mod Wheel CV's to ports 14, 15, and 16. What if you are the type of keyboardist who reaches to the wheels instinctively? Well, it's your instrument, just remove those ports if you prefer. Another possibility is to keep the routing but set both the Rnd Min and Rnd Max values to 0, meaning that for now they will not be able to randomise to anything which has an effect.

Almost immediately after saving, we have ventured into customization of the instrument, and this is how it should be because every randomise will take the instrument in different directions. We can't add sends as we haven't stayed general enough to know which sends are the most appropriate; you may be toying with a delicate piano while I am trying to get you to set up a Bass Amp, and this usually wouldn't work.

What can we still do in a general sense from this point that isn't too instrument specific?

### Self-Morphing and scaling

One of the coolest tricks that LaunchEon has available is having CV come back in via the Combinator to control the X and Y morph positions. For version 1.0 there is not any self-morphing built in yet, so the best available random modulator in Reason is the LFO's in Subtractor. I chose this as the desire for the self-morph, in this instance, is to get the morph rectangle to just "go for a stroll" around the grid. More specific movements can easily be achieved using different tools, typically in combinations of Pulsar and one of the many available envelope types.

13. Hold down shift and drag in two Subtractors and 1 Thor, then relabel the Subs as LFO 1 and LFO 2, then label the Thor as Scale.
14. Connect up the following:

```
LFO 1==LFO 1 Mod Output >> Scale||Mod Input CV 1  
LFO 2==LFO 1 Mod Output >> Scale||Mod Input CV 2  
Scale==Mod Output CV 2 >> Combinator 1||CV Input 1  
Scale==Mod Output CV 2 >> Combinator 1||CV Input 2
```

15. In the Thor Programmer (left side) program the following:

```
CV In 1 => 100 => CV Out 1 => 100 => Rotary1*  
CV In 2 => 100 => CV Out 2 => 100 => Rotary1*
```

16. Now in the Combi, set-up a knob called "Self-Morph Scale", and then program the following:

```
LaunchEon => CV In 1 => Morph X [0-503]  
LaunchEon => CV In 2 => Morph Y [0-343]  
Scale => Self-Morph Scale => Rotary1 [0-127]
```

17. On each of LFO 1 and LFO 2, set LFO 1 wave to the random curve (the bottom entry in the list), and then set the rate really low, usually anywhere up to about 5 will do.

So, what's actually happening with the above is that there are two LFO's coming straight out of the Subtractors that are then going through the Thor, and on to the Combinator ports which give them access to the X and Y morph on LaunchEon.

■ The purpose of the Rotary control to scale them, rather than just setting a Combi control direct to the modulation amount, is so that we avoid the problem with Thor's throughput linearity initially discussed in tutorial 6.

18. Enter some MIDI notes for the Combi, loop the transport playback and set the Self-Morph Scale to 127. You should now be moving reasonably slowly over the grid, and you should hear the timbre of the synth changing.

So, we have now gone quite far into customizing the device, and you may have added quite a few more steps of your own choosing. If you have, and like it, then save it at this point as we shall move on to a more pigeon-holed approach from this point onwards to show some specifics.

19. After saving your patch, we're going to load in some specific instrument patches to get a particular sound. In Malstrom 1, load the patch "Colorful Fire" from the PolySynths folder of the Malstrom area in the Factory Sound Bank. In Malstrom 2, load "DreamSong" from the same folder. In the Subtractor, load "SweeperSwell Pad" from the Pads folder of the Subtractor area in the Factory Sound Bank.
20. Below the Mixer, drag in an Audiomatic Retro Transformer from the FX area. Ensure that it has routed as a send, then break the Return connections, and reroute them to Channel 11. This means we can get Level and Pan CV control over the send without having to use a CV port on the Combinator. Connect them as follows:

```
LaunchEon==Port 20 >> Mixer 1||Channel 11 Level CV  
LaunchEon==Port 28 >> Mixer 1||Channel 11 Pan CV
```

21. Set the Audiomatics' Transform, Dry/Wet and Volume controls to their maximum values, which are 100%, 100% and 12.0dB respectively.
22. For Port 20 set LaunchEons' Rnd Min to -40 and Rnd Max to 0 in the Settings page.

## Port Types

I'm now going to give a practical demonstration of changing the port type. I shall use Port 13 which on my Combi is still free and connect it to CV Input 3 on the Combi. If yours isn't just add it on any other free port. Next, set the connection type to Unipolar on the Combinator.

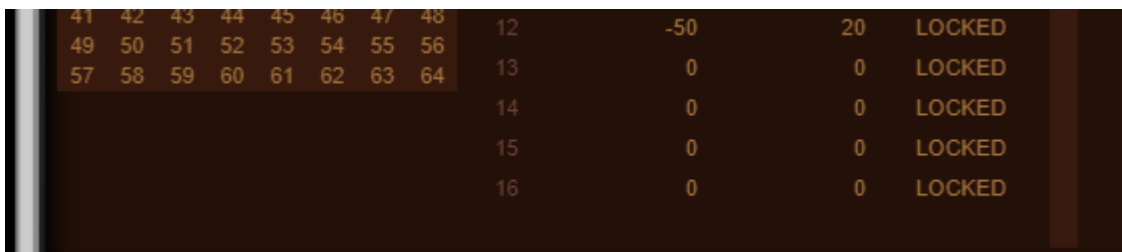
```
LaunchEon==Port 13 >> Combinator 1|| CV Input 3
```

The Audiomatic is predominantly controlled by its Preset selector buttons, which change the kind of tones that it generates. There is no smooth way to Morph between them unless you set up an audio crossfader of some description; you can do this if you really wish, of course, but sonically it is often smarter to just recognise some parameter as a different mode and treat it as such. There are many parameters in Reason for which this is the case: LFO shapes, and Modulation Target controllers

being two of the most obvious when looking just at Subtractor, and more universally when looking at things like legato modes and external modulation input types.

We can use the port typing to our advantage here, by setting it to “Scene” should any of these types of parameters be connected to LaunchEon. What this achieves is that the port will not react to any morphing changes, only changes made when the Scene is changed explicitly. Effectively this means that you have 2 entirely different setups that are only changed by specific gestures, and thus you have 2 different morphs. Let’s set this up and explore.

23. In LaunchEons Prefs tab go to the Morphs inner tab, scroll until Port 13 is visible and then drag the control up from All to Scene.
24. Now in the Values tab, under Settings, set both the Rnd Min and Rnd Max to 0 for Port 13 and then randomise this individual port and lock it. Port 13 is now set to 0 for all entries and can no longer Randomise, so we can apply different specific settings to it directly.



41	42	43	44	45	46	47	48	12	-50	20	LOCKED
49	50	51	52	53	54	55	56	13	0	0	LOCKED
57	58	59	60	61	62	63	64	14	0	0	LOCKED
								15	0	0	LOCKED
								16	0	0	LOCKED

25. Set the editor focus to Scene 1 and go into Controllers, then set Port 13 to 1. Next set the editor focus to 64 and set Port 13 to 127.
26. Now for the Combi programmer. Set up the following:

**Audiomatic 1 => CV In 3 => Preset [Vinyl-PVC]**

(Vinyl is just before the halfway mark and PVC is near the end)

27. The other part of the Combi programming requires R12/+. Below the section we just added in you will see a bar labelled “Source Range”. Set the minimum value to 1% and leave the top value at 100%. This means that the Combinator will only react when the LaunchEon output value is greater than 0, and thus only Scenes 1 and 64 will have any effect with this setup. As there are only two settings, we are using it makes sense to limit down the range in the Combi and just use 1 and 127 as “min and max” controls, but if you leave the full range open in the Combinator then LaunchEon can send out multiple settings for different scenes.

*N.B. – Should you require to use this functionality in a Reason version less than 12 then you must set all values in LaunchEon explicitly, as source ranging is not available in the older Combinator versions.*

## When to use “Morph” as the port type?

The other port type is simply the opposite behaviour from Scene. It is used to set up ports that will not react to scene change commands, only to morphing gestures. This is often best used in tandem with other ports that are set to Scene only, but basically the use is for when you want the morphing elements to stay smooth when the scene elements change; perhaps the most useful way of doing

this would be with a drum machine. For this synth, as we have already picked out the patches and know it has a smooth sound it will also work here, when we are trying to be less abrasive sonically.

We're going to switch off the scene changing the values for every port other than Port 13, meaning that the Scenes will be almost entirely independent from morphing, which is quite desirable as this is a more delicate synth.

28. Go back into LaunchEon's Prefs tab, under Morphs, and set every other port to Morph.



29. Now flick the scenes between 1 and 64 while there is MIDI playing through. You should notice a big difference in how subtle the changes are.

30. Our last task is to listen to the patch and limit down the randomise ranges in order to get a smoother sound. The process is simple:

Listen > Isolate the cause > Limit the range > Randomise > Repeat

Using "All Lower Rand Ranges To" and "All Upper Rand Ranges to" settings should prove to make this process more efficient.

You should now have a cool jazzy organ thing going on!!!

For extra sauce, why not add in some Player devices.



## Tutorial 10 - Adding LaunchEon to other Combinator Synths

Our last tutorial is another quick and fun one, to show how easy it is to add a LaunchEon into another synth from the Reason soundbank. Part of what makes this practice so fulfilling is the overview it gives of how other complex synths are really built.

So, I've decided to just pick a synth at random from the Reason Sounds Refill and go for it. To follow exactly go to the Reason Sounds Refill, then select: Pluck & Mallets > Bells > KlangNBells.

This suits our purposes really well as it has multiple Subtractors, and thus tonnes of target ports to plug LaunchEon into without having to use too many Combinator ports.

1. Connect LaunchEon as follows:

```
LaunchEon==Port 1 >> Subtractor 1||Osc Phase  
LaunchEon==Port 2 >> Subtractor 1||FM Amount  
LaunchEon==Port 3 >> Subtractor 1||Filter1 Freq  
LaunchEon==Port 4 >> Subtractor 1||Filter2 Freq
```

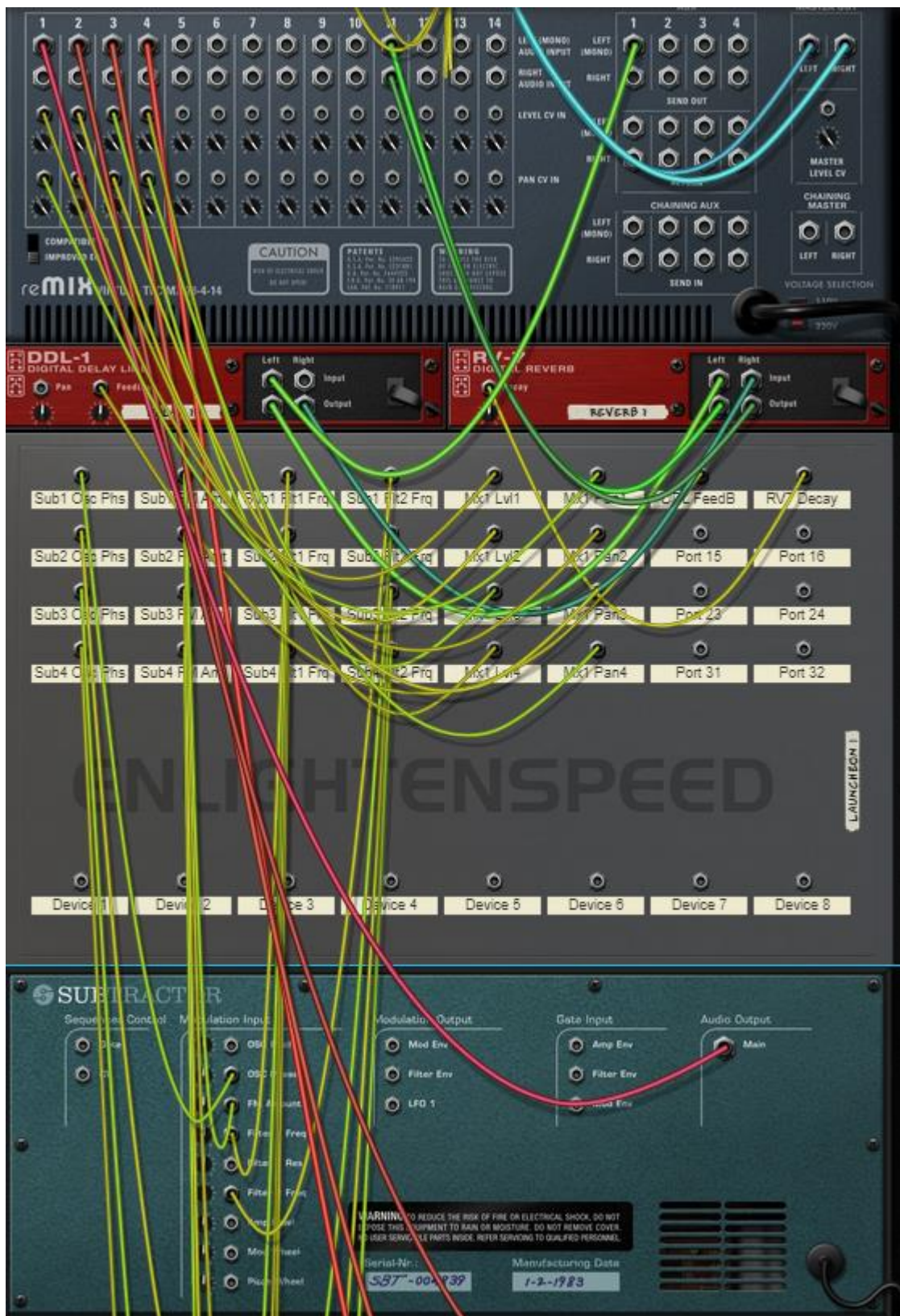
```
LaunchEon==Port 9 >> Subtractor 2||Osc Phase  
LaunchEon==Port 10 >> Subtractor 2||FM Amount  
LaunchEon==Port 11 >> Subtractor 2||Filter1 Freq  
LaunchEon==Port 12 >> Subtractor 2||Filter2 Freq
```

```
LaunchEon==Port 17 >> Subtractor 3||Osc Phase  
LaunchEon==Port 18 >> Subtractor 3||FM Amount  
LaunchEon==Port 19 >> Subtractor 3||Filter1 Freq  
LaunchEon==Port 20 >> Subtractor 3||Filter2 Freq
```

```
LaunchEon==Port 25 >> Subtractor 4||Osc Phase  
LaunchEon==Port 26 >> Subtractor 4||FM Amount  
LaunchEon==Port 27 >> Subtractor 4||Filter1 Freq  
LaunchEon==Port 28 >> Subtractor 4||Filter2 Freq
```

2. Let's make life easier for ourselves; disconnect the Spider Audio and the Line Mixer and delete them. Add in a Mixer 14:2, and then connect the Subtractors to the first 4 channels, then connect up the DDL-1/RV-7 chain to Send 1 and Return it to Channel 11. Remove the right channel from the send, but let the return be stereo.
3. Add the Mixer on to LaunchEon as follows

```
LaunchEon==Port 5 >> Mixer 1||Channel 1 Level CV  
LaunchEon==Port 6 >> Mixer 1|| Channel 1 Pan CV  
LaunchEon==Port 13 >> Mixer 1||Channel 2 Level CV  
LaunchEon==Port 14 >> Mixer 1|| Channel 2 Pan CV  
LaunchEon==Port 21 >> Mixer 1||Channel 3 Level CV  
LaunchEon==Port 22 >> Mixer 1|| Channel 3 Pan CV  
LaunchEon==Port 29 >> Mixer 1||Channel 4 Level CV  
LaunchEon==Port 30 >> Mixer 1|| Channel 4 Pan CV
```



4. Set all the relevant mixer levels to 80 and set the send levels for channels 1-4 to 100.
5. Connect LaunchEon to the FX:

**LaunchEon==Port 7 >> DDL-1||Feedback**  
**LaunchEon==Port 8 >> RV-7||Decay**

We only have 6 ports left now, and we don't have much "original Combi" to play with as it was made pre-12, so we can either stay within the parameters of the original patch, and not use any more than 4 knobs and 4 buttons or go big. I'm going to stay inside the original boundaries for this exercise.

6. We'll keep the Modulator Tune and Carrier Tune knobs but delete everything else that doesn't relate to them in the Combi programmer including the labels. Now all blank switches and knobs should do nothing.
7. Set up a self-morphing solution of your own choice and set the self-Morph amount control to knob 1. See Tutorial 9 if you skipped to this bit. Use Knob 1 to control it, and Label it Self-Morph Amt,

After analysing the original patch, it becomes obvious that most of the original movement in the patch is being controlled by the Mod Envelope in each Subtractor. The three controls that are having the strongest effect are the Amount, the Env Attack, and the Env Dest, so we'll give these their own controls but keep them global, i.e., the amount will be 1 Combi control for all Subtractors etc.

8. Label Knob 4 Mod Amt, then label Button 4 as "Slow Attack", and Button 3 as "Alt targets"
9. For each Subtractor set up the following in the Combinator:  
**Subtractor => Mod Amt => Mod Env Gain [0-127]**
10. For each Subtractor set up the following in the Combinator  
**Subtractor => Mod Env Attack => Mod Env Attack [0-73]**  
 Feel free to alter the long attack time per Subtractor, I used 73, 92, 53, and 108 respectively. These were chosen at random so play around all you want.
11. For each Subtractor set up the following in the Combinator  
**Subtractor => Mod Env Dest => Mod Env Dest [3-2]**  
 Note that the 4<sup>th</sup> Subtractor actually starts on target 1, not 3, and it's wise to have this as the "off value" too. Feel free to randomise the on values.
12. Back to LaunchEon. In Values > Settings page we now need to start getting the randomisers into a more controlled state as everything is quite wild right now if you haven't limited the ranges yet. Use the global controllers to set sensible limits quickly, for example, set all ports that are connected to mixer levels to [-40,10], then lock those channels and move on the next set of controls. At the end, unlock the ports and randomise.

For reference we used the following:

To:	1	Rnd Min	-50	Rnd Max	50	UNLOCKED
	2		-60		20	UNLOCKED
	3		-50		50	UNLOCKED
To:	4		-50		50	UNLOCKED
	5		-25		0	UNLOCKED
	6		-75		75	UNLOCKED
	7		0		75	UNLOCKED
8	8		-25		60	UNLOCKED
16	9		-50		50	UNLOCKED
24	10		-60		20	UNLOCKED
32	11		-50		50	UNLOCKED
40	12		-50		50	UNLOCKED
48	13		-25		0	UNLOCKED
56	14		-75		75	UNLOCKED
64	15		-75		75	UNLOCKED
	16		-75		75	UNLOCKED

17	Rnd Min	-50	Rnd Max	50	UNLOCKED
18		-60		20	UNLOCKED
19		-50		50	UNLOCKED
20		-50		50	UNLOCKED
21		-25		0	UNLOCKED
22		-75		75	UNLOCKED
23		-75		75	UNLOCKED
24		-75		75	UNLOCKED
25		-50		50	UNLOCKED
26		-60		20	UNLOCKED
27		-50		50	UNLOCKED
28		-50		50	UNLOCKED
29		-25		0	UNLOCKED
30		-75		75	UNLOCKED
31		-75		75	UNLOCKED
32		-75		75	UNLOCKED

Once you find a reasonable set of values and are happy with the patch, you can save it down. Once you've saved it you should maybe try experimenting with throwing different base patches in to each Subtractor. Now that the various connections have been made this will give you all sorts of crazy results. You can also fill up the sends, and potentially break the original custom backdrop out and big it up if you want. For now, this is where we will finish up and leave you to have fun with LaunchEon.

Enjoy!

Any questions? As in, reasonable ones not answered by this document?

We might not answer at all, if you send us a line to [enlightenspeed@gmail.com](mailto:enlightenspeed@gmail.com)



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