

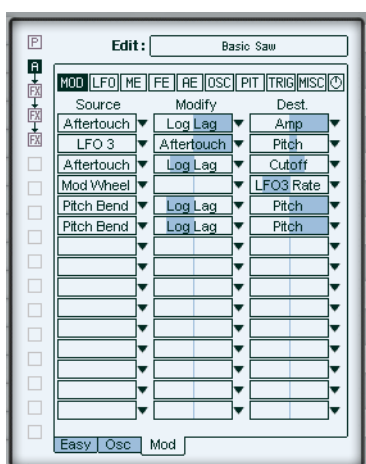
Hypersonic 2
Mod Page Addendum

The Mod Page

The Mod page can be located via the „Mod“ tab at the bottom of the element's edit page.

The Mod page has endless flexible and sophisticated modulation possibilities for shaping your patches. There are also some extra power user parameters in here for those of you that like to get your hands dirty.

The Modulation Matrix



In the modulation matrix you'll see 3 vertical columns of 15 cells for assigning mod sources, modifiers, amounts and destinations. Sounds a little complicated, but actually the mod matrix is pretty easy to master. Probably the best way to learn how it works is by using it, so let's do a few simple tutorials and check it out.

Load the patch „70s Analog Lead 1“ - first patch from the „Soft Leads“ folder.

Some Simple Mod Matrix Editing Examples.

Adding an LFO for vibrato:

1. Click on the small triangle to the right of the first empty cell in the Source column.

2. Select LFO 1 from the drop down menu.
3. Click on the small triangle to the right of the Destination column in the same line.
4. Select Pitch from the drop down menu.
5. Click and drag your mouse on the slider (the blue line under the text) of the destination column to set an amount.
Now the pitch is being modulated by LFO 1.

Changing the mod wheel settings to pitch bend and pan.

1. Click on the small triangle to the right of the cell in the Destination column that is displaying LFO3 Rate.
2. Select Pitch from the drop down menu.
3. Set the range by clicking and dragging the slider in the same destination cell.
4. Click on the small triangle to the right of the first cell in the Source column and select ModWheel.
5. Click on the small triangle to the right of the first cell in the Modify column and select Off.
6. Click on the small triangle to the right of the first cell in the Destination column and select Pan from the drop down menu.
7. Set the panning range and direction with the slider in the same destination cell.
Now the Mod wheel bends pitch and pans your patch.

OK let's try something a little more complex.

Reload or reset your patch.

Setting a delayed vibrato with slow attack.

1. Click on the small triangle to the right of the first available cell in the Source column.
2. Select LFO 1 from the drop down menu.

3. Click on the small triangle to the right of the Destination column in the same line.
4. Select Pitch from the drop down menu.
5. Click and drag your mouse on the fader in the Destination column to set the amount, +1.61 for example.
6. Click on the small triangle to the right of the Modify column in the same line.
7. Select Delay Ramp from the drop down menu.
8. Click and drag your mouse on the fader in the Modify column to set the amount, +640 ms for example.
Now your patch will play a vibrato that has a delay and slow attack that starts 640 milliseconds after you play each note.

☐ Those were just a few examples of what the Mod Matrix can do. For a full description of all modulation sources, modifiers and destinations see the 'Modulation Sources, Modifiers and Destinations Table' at the end of the Mod Page manual.

Control Sequences

	Note	Vel	Seq 1	Seq 2
1	+0	108 %	+2	-65
2	+0	36 %	+0	-65
3	+0	100 %	+0	-88
4	+0	100 %	+0	-61
5	+0	70 %	+0	-73
6	+0	100 %	+0	-95
7	+0	80 %	+0	-65
8	+0	100 %	+0	-61
9	+0	69 %	+0	-65
10	+0	100 %	+0	-80
11	+0	100 %	+0	-58
12	+0	100 %	+0	-80
13	+0	23 %	+0	-92
14	+0	75 %	+0	-80
15	+0	100 %	+0	-84
16	+0	100 %	+0	+96

OK

Control sequences are one of the most powerful and creative tools available in HS2, they allow you to shape and mold your sounds in countless ways, from simply automating panning and creating gating effects to sweeping wavetables and sync amounts or generating luscious evolving pads.

The applications are endless but the principal is simple, a control sequence let's you create and mold the shape of a modulation source that can be applied to any parameter(s) available in the Mod Matrix.

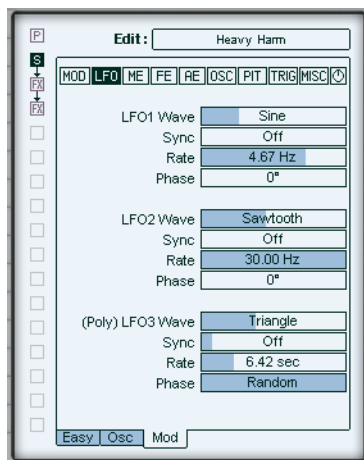
Let's learn by doing. Load the first patch from the Arpeggios bank, it's called Metal Pipes, this patch is already using control sequences.

1. Click Edit.
2. Select the Patch Settings page.
3. Click Edit in the Arpeggiator section.

Control Sequences 1 and 2 are displayed as columns, each with sixteen step values. Hold a note down on your keyboard and try randomly changing values in the Seq 2 column, you'll notice that the panning of the notes being played is changing for the steps that you have edited. Control Sequence 2 in this patch is modulating panning in the Mod Matrix.

-
- The Control Sequences can be applied to any parameters available in the mod matrix and you can use them many times in any patch.
-

LFO View



Every patch that you use has 3 identical LFOs (Low frequency oscillators). These are most commonly used for vibrato, tremolo and panning etc but the range of applications for LFO's is unlimited and they are an integral part of most patches.

LFO Wave

Each LFO has a palette of 9 different wave shapes:

- Constant: Full maximum constant value.
- Sine: Soft smooth curved modulation.
- Triangle: Soft & smooth sounding like the sine but with pointed peaks and valleys as opposed to curving ones.
- Sawtooth: Jumps immediately to it's peak and then descends in a straight line to the bottom before repeating.
- Square: Trilling Up/Down Modulation.
- S&H Random: Random steps.
- S&H Alternate: Alternating random and low valued steps.
- Random Drift: Random variations.

- Slow Drift: Random variations but with only small increments between values.

Sync

Each LFO has 5 different methods to determine how its speed and phase respond to your notes and tempo:

- Off: The LFO is free running at the speed set by the rate control.
- First Note: The LFO is restarted when a note is pressed, if no other notes are held.
- Each Note: The LFO is restarted whenever a note is pressed.
- Tempo + Note: The LFO runs in sync with the song tempo and is restarted when a note is pressed.
- Tempo + Beat: The LFO runs in sync with the song tempo and lines up with the song beats.

Rate

Sets the speed at which the LFO oscillates.

-
- When using tempo sync modes LFO rate is shown in fractions of a beat rather than Hertz.
-

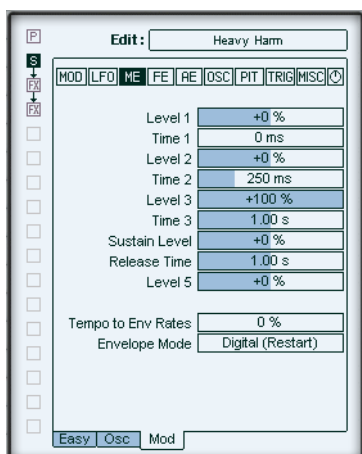
Phase

LFO phase is the position in the waveform cycle where the LFO is restarted when the LFO is triggered.

Turning the Phase control all the way to the right randomizes the LFO's restart phase.

-
- LFO-3 is polyphonic, which means that each note can have independent LFO phase and speed.
-

ME View-The Modulation Envelope.



Fully featured Modulation Envelope for intricate control over many parameters via the mod matrix. To use the Modulation Envelope simply select Mod Env in the Source or Modify column in the Mod Matrix.

The modulation envelope is a little different to the Filter and Amplitude envelopes because it has five Level and four Time controls, allowing for very intricate control:

- Level 1: Sets the initial volume of the Mod Envelope.
- Time 1, 2 + 3: Control the length of time taken for the envelope to reach Levels 2, 3 and the Sustain Level.
- Sustain Level: Is the final volume that is reached when a note is held after Levels 1-3 and Times 1-3 have been completed.
- Release Time: Is the time taken for the Mod Envelope to reach Level 5, once the note is released.
- Level 5: Is the final level reached after a note is released.
- Tempo To Envelope Rates: This control adjusts to what extent the Time parameters of envelopes 1, 2 and 3 sync to song tempo. Allowing you to adjust your song tempo and have your envelope times adjust by the same amount.

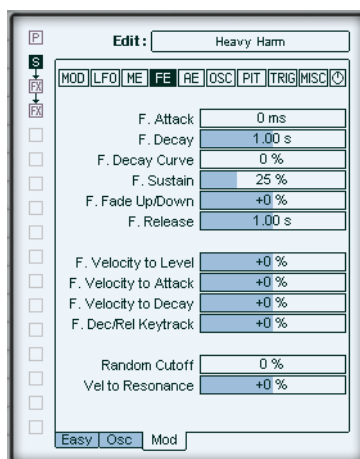
Envelope Mode

Digital: Normal Envelope behavior for envelopes 1,2 and 3. Each new voice starts it's attack portion from a level of zero.

Analog: If a released note is still sounding, new notes begin their envelope attack portion at the level of the previous note, instead of starting at a level of zero.

- In Poly mode this only occurs with notes of the same pitch. In mono mode this occurs with all notes played.

FE View - Filter Envelope



The filter envelope controls seen on the top half of this view are simply the same controls for the Filter Envelope shown on the Easy page. They have been repeated here for programming convenience.

- See the descriptions in the Easy page section of the Hypersonic 2 manual.

Velocity to Level

Determines the amount that velocity controls the effect of the filter envelope levels on the cutoff. With a positive setting, higher velocity produces deeper cutoff modulation.

Velocity to Attack

Allows you to control the filter envelope attack time with key velocity. This is a very effective feature particularly for example for pads, whereby you can have a slow attack time for lower velocities and a fast attack time for higher velocities.

Velocity to Decay

Allows velocity to influence the filter envelope decay time.

Decay Keytracking

This control determines how the pitch of the MIDI notes played influences the filter envelope decay time parameter.

This is a very useful feature when for example emulating the behavior of real instruments, where the lengths of notes generally become shorter as the pitch becomes higher.

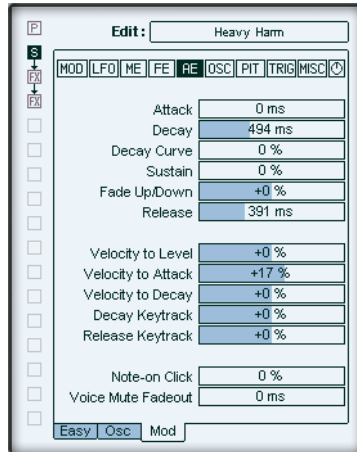
Random Cutoff

Randomizes the filter cutoff setting for each note played.

Vel to Resonance

Sets the amount that higher velocity values increase the level of the resonance.

AE View-Amp Envelope



The amplitude envelope controls seen on the top half of this view are simply the same controls for the VCA shown on the Easy page. They have been repeated here for programming convenience. See the descriptions in the „Easy Page“ section of the Hypersonic 2 manual.

Velocity to Level

Determines the amount that velocity controls the volume of each note played. With a positive setting, higher velocity produces a higher volume.

Velocity to Attack

Allows you to control the attack time of the amplitude envelope with key velocity. A positive setting produces a faster VCA attack time for higher velocities.

Velocity to Decay

Allows velocity to influence the VCA decay time.

Decay Tracking

This control determines how the key played influences the VCA decay time parameter.

This is a very useful feature when for example emulating the behavior of real instruments, where the lengths of notes generally become shorter as the pitch becomes higher.

Release Tracking

Allows you to adjust the release times of notes relative to the key played.

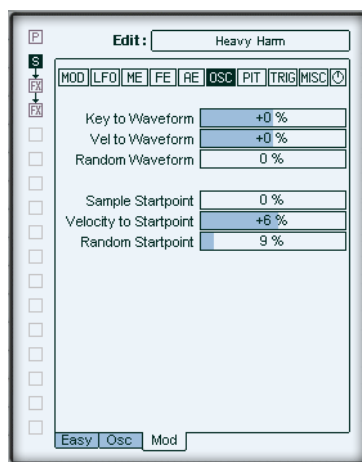
Note-on Click

Applies an audible percussive click to the attack of your patch when attack time is zero.

Voice Mute Fadeout

When voice stealing occurs due to polyphony limits being reached or because your patch is set to mono mode, this feature allows you to apply a fade out time to the notes being cut.

OSC View-Extra Oscillator Parameters



In the Oscillator view you will find the extra 'expert' oscillator features described below.

Key to Waveform

Varies the oscillator 1 wave parameter according to the MIDI key position of notes played.

Vel to Waveform

Varies the oscillator 1 wave parameter according to Note On Velocity.

Random Waveform

Introduces random variation to the oscillator 1 wave parameter.

Sample Startpoint

Adjusts the point in the sample waveform that playback starts. This can often be used to soften the attack. In other Element types this control sets the initial phase of the waveform.

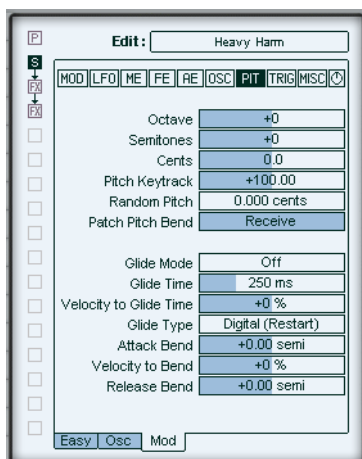
Vel to Startpoint

Varies the start position for waveforms in response to note on velocity.

Random Startpoint

Introduces random variation to the start position for the patch. In classic analog synthesizers the oscillators were always free running, this parameter lets you emulate this characteristic by starting the oscillator's phase randomly each time a note is played.

PIT View-Extra Pitch Parameters



In the Pitch view you will find the pitch and glide settings.

Octave

Offsets the pitch of the patch up or down by octaves.

Semitones

Offsets the pitch of the patch up or down by semitones.

Cents

Offsets the pitch the patch up or down by cents.

Pitch Keytracking

Determines how the pitch tracks incoming MIDI notes. + 100% is normal response. 0% gives a constant pitch across the keyboard

Random Pitch

Introduces random pitch variations to each individual note.

Patch Pitch Bend

Sets the patch to respond to the pitch bend range in the patch settings or to ignore it.

Glide Mode

Glide creates a smooth change in pitch between a previously played note and a newly played note.

There are 4 glide modes.

- Off: No glide.
- Bend Only: Enables the bend settings (described below).
- Fingered: Applies glide only when subsequent notes are played legato (i.e. a note is still held when a new note is played)
- On: All notes played will pitch glide from the previously played note.

Glide Time

Determines the time it takes for the pitch to glide between subsequent notes played.

Velocity to Glide Time

Allows key velocity to influence the speed of the pitch glide between notes.

Glide Type

There are three distinct glide types.

- Analog: Emulates the behavior of classic analog synthesizers. When no notes are held the glide stops, and resumes gliding when the next note is played.
- Digital: When a note is played, glide always starts from the pitch of the previously played note.

Attack Bend

Allows you to set an additional slide in pitch to the attack. This can be used as a simple pitch envelope. The bend time is governed by the glide time parameter.

-
- When used in conjunction with a glide setting, the bend and glide values add together.
-

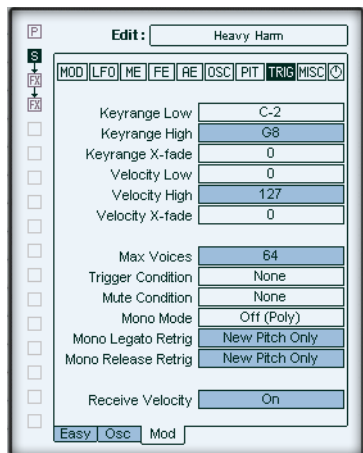
Velocity to Bend

Allows key velocity to influence the depth of the attack bend.

Release Bend

Allows you to set an additional slide in pitch when a note off is received.

TRIG View-Trigger Parameters



In the Modulation page Trigger view you will find the parameters that govern whether a note is played or ignored by the patch.

Keyrange Low

Sets the lowest Midi note that will play. All notes below this key are ignored.

Keyrange High

Sets the highest Midi note that will play. All notes above this key are ignored.

-
- If Keyrange High is set lower than Keyrange Low then notes between these settings are ignored.
-

Keyrange X-Fade

Sets the number of notes over which the sound fades out, above and below the specified keyrange.

Velocity Low

Sets the lowest velocity value at which the patch will play. All velocities below this are ignored.

Velocity High

Sets the highest velocity value at which the patch will play. All velocities above this are ignored.

Velocity X-Fade

This has a similar effect to the Keyrange X-Fade but affects velocity.

Max Voices

Sets a polyphony limit for the patch.

-
- Polyphony limits can also be set per patch on the Hypersonic MIDI page.
-

Trigger Condition

Sets the situations in which the incoming MIDI notes are used.

- Mod Wheel Up: The patch only plays when the mod wheel is set to a value of between 64 and 127.
- Mod Wheel down: The patch only plays when the mod wheel is set to a value of between 0 and 63.
- Sustain Up: The patch only plays when the sustain pedal is up.
- Sustain Down: The patch only plays when the sustain pedal is pressed.
- Odd Patch Note: The patch only plays alternate notes, starting with the first incoming note.
- Even Patch Note: The patch only plays alternate notes, starting with the second incoming note.
- Odd Elem Note: The patch only plays alternate notes that fall within the keyrange and velocity range settings, starting with the first incoming note.
- Even Elem Note: The patch only plays alternate notes that fall within the keyrange and velocity range settings, starting with the second incoming note.

Mute Condition

Sets the situations in which the patch will mute existing notes when a new note is received.

- Mute Same Note: Anytime a note is repeated the previous note is muted.
- Mute Other Elems: Any notes playing in other elements in the patch are muted.
- Mute Whole Patch: All other notes playing in the patch are muted.
- Mute Groups 1-8: These are the 8 monophonic exclusive groups for each patch.

An obvious use for these is controlling monophonic hihat groups.

Mono Mode

This is where you select whether your patch will play polyphonically or monophonically.

- (Off) Poly: As the name suggests this allows to play polyphonically up to the voice limit set in the Max Voices parameter.
- Lowest Note: Monophonic mode. The lowest of any held notes is always played.
- Highest Note: Monophonic mode. The highest of any held notes is always played.
- First Note: Monophonic mode. The oldest of any held notes is always played.
- Last Note: Monophonic mode. Any new note is always played, regardless of which notes are already held.

Mono Legato Retrig

Determines what happens when notes are played legato in a monophonic mode.

- Start New Voice: No Legato. The previous voice is muted and a new voice started.
- All Modulation: The previous voice takes the pitch of the new voice and all envelopes and LFOs are retriggered.
- Filt + Amp Envelope: The previous voice takes the pitch of the new voice and the filter and amplitude envelopes are retriggered.
- Filt Env: The previous voice takes the pitch of the new voice and only the filter envelope is retriggered.
- New Pitch Only: The previous voice takes the pitch of the new voice but no modulation is retriggered.

Mono Release Retrig

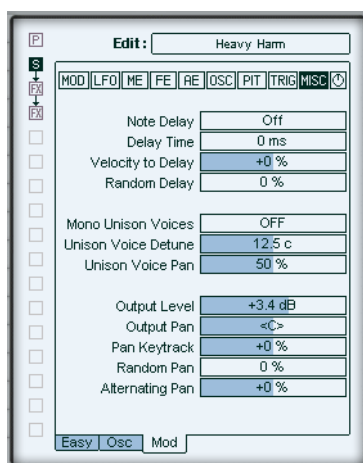
Determines what happens when a note is released in a mono mode and other notes are still held.

-
- The modes available in this field act in exactly the same way as described for the Mono Legato Retrigger parameter above.
-

Receive Velocity

When set to Amp Env Only all velocity information is ignored for modulation, except by the amplitude envelope.

Misc View-Miscellaneous Parameters



Note Delay

Forces a delay set either in milliseconds or fractions of a beat, or only when it receives a MIDI note off.

Delay Time

Sets the delay time for the parameter above.

-
- In note off mode this controls the fade out time.
-

Velocity to Delay

Key Velocity controls the length of the Note Delay parameter.

Random Delay

Introduces a random variation in the Note Delay parameter.

Mono Unison Voices

Determines the number of voices that play in Unison in monophonic modes.

Unison Voice Detune

Determines the detuning width of the Unison voices.

Unison Voice Pan

Controls the stereo spread of the Unison voices.

Output Level

Sets the master volume for the patch.

Output Pan

Sets the stereo image position of the patch.

Pan Keytracking

Pans the voices in the stereo image in relation to the pitch of the MIDI notes played.

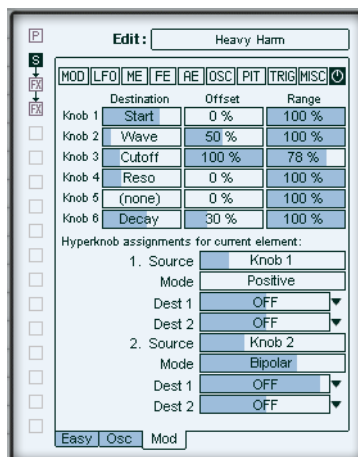
Random Pan

A random variation influences the stereo position of each note played.

Alternating Pan

Each odd and even numbered note played will be panned towards opposite sides of the stereo image.'

Knob View - Hyperknob Assignment



Clicking the knob symbol brings up the Hyperknob Assignment Page. On this page you can edit and create Hyperknob-Assignments for the patch, this view is also found in FX elements and on the FX page which is explained later on.

There are three vertical columns: Destination, Offset and Range with six cells each. For each of the six Hyperknobs you can assign parameters to these categories. The descriptions Knob 1-6 stand for the six Hyperknobs from the left to the right. These settings affect the whole patch. Further below you see „Hyperknob Assignments for current element“, as the name suggests, here you can assign two Hyperknobs to parameters that only affect the currently selected element.

Destination

Move the slider to select which parameter you want to assign to the Hyperknob. The name of the parameter is displayed in this field.

Offset

Sets the Hyperknob position that will have no effect on the selected destination parameter. For example setting the offset to 50% allows the destination parameter to be adjusted both above and below the current setting. With an offset of 0% the Hyperknob will only increase the destination parameter value.

Range

Set the range in which the Hyperknob takes effect on the parameter.

Hyperknob assignments for current element

Basically the same functions as mentioned above, but these settings will make the Hyperknob only affect the current element, not the whole patch.

Source

Move the slider to select the Hyperknob you want to assign.

Mode

Select the functionality of the Hyperknob:

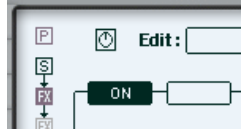
- Positive
 - Negative
 - Bipolar
 - Switch
-
- Read the chapter „User Interface“ in the Hypersonic 2 manual to learn more about knob functionalities.
-

Dest 1 & 2

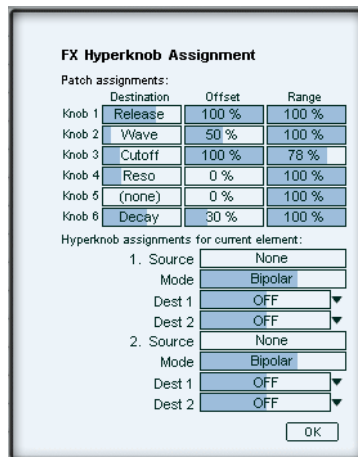
Click on the triangle on the right to select any parameter from the appearing list to assign it to the Hyperknob.

Move the slider to adjust how much the Hyperknob affects the parameter.

Hyperknob Assignment for FX



Click the knob symbol in FX elements or on FX page's Patch FX settings to bring up the Hyperknob assignment for FX. The following window will appear.



Patch assignments on top of the page is the same as the Hyperknob Assignment on the Mod page. Please read the corresponding chapter the chapter “Knob View - Hyperknob Assignment” to learn more about this.

Hyperknob assignments for current element

Source

Move the slider to select the Hyperknob you want to assign.

Mode

Select which type of functionality the Hyperknob has.

- Positive
- Negative

- Bipolar
- Switch

-
- ❑ Read the chapter „User Interface“ in the Hypersonic 2 manual to learn more about knob functionalities.
-

Dest 1 & 2



Click here to bring up a drop down list that offers you a number of standard destinations for the Hyperknob:

- OFF: No parameter assigned
- FX Parameters: Here you find all parameters of the current Effect. Use these to assign any parameter of an FX to a Hyperknob!

Modulation Sources, Modifiers and Destinations Table

The following Table describes briefly how the various modulation sources, modifiers and destinations available in the Mod Matrix function.

The following sources are available in both the Source & Modify sections of the Mod Matrix.

Function	Description
Constant	A constant unchanging value.
Random	New random values are generated for each note on.
Velocity	Note on velocity.
Key	MIDI key position.
Pitch	MIDI key position including pitch bend and glide.
Mod Wheel	Mod Wheel position.
Aftertouch	Aftertouch value.
Pitch Bend	Pitch Bend wheel position.
Breath Ctl	MIDI Breath Control Information.
Wheel 3	Mod Wheel 3 or CC 3.
Foot Ctl	MIDI Foot Control Information.
Sus Ped	Sustain Pedal position.
Soft Ped	Soft Pedal position.
Knobs 1-6	Hyperknobs 1-6.
Seq 1 peggio/Edit).	Control Sequence 1 (found in the Patch Settings/Ar-
Seq 2 peggio/Edit).	Control Sequence 2 (found in the Patch Settings/Ar-
LFO 1-3	LFO's 1,2 and 3.
Mod Env	Modulation Envelope.

Filt Env	Filter Envelope.
Amp Env	Amplitude Envelope.

The Row sources below are only available in the Source column.

Rows 1-15	The value of the output generated by the Mod Matrix row chosen.
-----------	---

The following functions are only available in the Modify section and process the Source value according to the Modify slider value.

Function	Description
Add	Adds or subtracts a constant amount from the source.
Multiply	Multiplies the source by a constant amount.
Drive	Multiplies the source by a constant amount but prevents the output going beyond +/- 1.0.
Clip +	Limits the maximum value that the source can output.
Clip -	Limits the minimum value that the source can output.
Rect + value.	Inverts the source signal if it goes above the specified value.
Rect - value.	Inverts the source signal if it goes below the specified value.
Curve convex.	Waveshapes the source from concave though linear to convex.
Sine	Waveshapes the source using a sine wave.
Exp	Applies an exponential curve to the source.
Log	Applies a logarithmic curve to the source.
Switch	Switches the output between on or off when the source passes the threshold.
Quant 1	Rounds the source values to the specified number of steps. Equal lengthed steps for a saw input.
Quant 2	Rounds the source values to the specified number of steps. Equal lengthed steps for a triangle input.

- S+H Freezes the source signal and updates it at the interval set by the Modify slider.
- Drift Randomly varies the source.
- Sine Amp The source controls the level of a sine wave whose frequency is set by the Modify slider.
- Sine Freq The source controls the fine frequency of a sine wave and the Modify slider sets the coarse frequency.
- Lin Ramp A linear ramp is triggered at note on. The Modify slider sets the ramp time. A positive value produces a ramp up, a negative value a ramp down. The source signal is multiplied by the ramp value.
- Delay Ramp Similar to Lin Ramp but with a delay equal to the ramp length before the ramp begins.
- Exp Ramp Similar to the Lin Ramp but with an exponential shape.
- Log Ramp Similar to the Lin Ramp but with a logarithmic shape.
- Tri Env Similar to the Lin Ramp but followed by a ramp down.
- Gate Env Holds at full value for the time set by the Modify slider then switches to zero instantly. For negative time settings the value is zero and then switches to full.
- Log Lag Slows the rate of change of the source. The rate of change slows as the source value is approached.
- Lin Lag Ramps at a constant rate towards the source value and stops when the source value is reached.
- Peak Hold Tracks the peaks in the source signal and decays slowly towards zero until the next peak is detected.
- Diff Hold Tracks sudden changes in the source signal and decays slowly towards zero until the next peak is detected.

The following are the possible Mod Matrix destinations affected by the source and modifier.

Function	Description
----------	-------------

Pitch	US-1 master pitch.
Osc 1 Wave	Wave knob position for oscillator 1.
Osc 2 Wave	Wave knob position for oscillator 2.
Cutoff	Filter Cutoff is modulated.
Reso	Filter Resonance is modulated.
Amp	US-1 Volume is modulated.
Pan	Stereo image position.
LFO3 Rate	Modulates the speed of LFO 3.
Mod Env Rate affected.	All Time parameters for the Modulation Envelope are affected.