SHAPEMASTER

USER MANUAL

CONTENTS

What we are doing in modular is drawing shapes... with voltage on one axis and time on the other.

Jakub Ciupinski

MindMeld would like to thank: Latif Fital (Eurikon), Omri Cohen, Jakub Ciupinski, Simon Bader (Circadian Sound), Artem Leonov (VCV Rack Ideas), Jeremy Wentworth

Overview

What is ShapeMaster and what does it do?

MindMeld ShapeMaster is a powerful and versatile 8 channel Multi-Stage Envelope Generator (MSEG), complex LFO, step sequencer and voltage processor. It allows you to precisely sculpt voltage over time using a WYSIWYG graphical editor.

You can draw in your own envelope shapes using up to 270 nodes, generate random shapes with control over which shape parameters are randomised, or select from one of the many built-in presets and shapes, including some made by talented members of the VCV community.

ShapeMaster is a 'freemium' module - there is a free version and a paid version called ShapeMaster Pro. In the free version, envelopes can run freely (unsynced) with cycle lengths from a fraction of a millisecond (audio rate) to 30 minutes long. In ShapeMaster Pro, they can also be hard synced and quantised to external clock with cycle lengths from 1/128 to 128 bars long.

Envelopes can be set to run automatically, when sent triggers/gates, or when triggered by audio from the sidechain input.

Nearly all the controls on ShapeMaster can be set independently per channel - the only global controls are the run, reset and clock inputs. ShapeMaster's controls allow envelopes to be reversed, inverted, frozen, sustained, looped, repeated, delayed, phase-shifted, curved, warped, attenuated, slewed and smoothed.

ShapeMaster has a built-in poly VCA on each channel for amplitude modulation (including an integrated crossover) and a CV output on each channel for modulating anything else.

What does ShapeMaster do?

ShapeMaster is like a musical Swiss army knife – It can be used for sequenced volume patterns, rhythmic gating, stutter effects, quantised pitch sequences (with glide), polyrhythmic trigger/gate sequences, frequency based ducking/sidechaining, dynamics control, groove extraction, voltage processing, arrangements, automation and more.

ShapeMaster can even be used as a draw-your-own-waveform VCO that tracks 1V/Oct. It does alias when used as a VCO though - sorry Bruce ;-)

What's the difference between the free version of ShapeMaster and ShapeMaster Pro (the paid version)?

There is just one difference between the free ShapeMaster module and ShapeMaster Pro, but it's a significant one... The free version cannot be synced to an external clock, whereas the commercial version can.

ShapeMaster Pro also comes with two expanders which are not included in the free version:

SM-Triggers: Trigger outputs on each channel for SOS/L (Start of Sustain/Loop), EOS/L (End of Sustain/Loop) and EOC (End of Cycle). Great for chaining envelopes in sequence or cascading them in overlapping waves.

SM-CV: Poly CV inputs for external control of most parameters and an additional V/Oct input for using ShapeMaster Pro as a VCO.

uMeld: The ShapeMaster Pro plugin also includes a new utility module called uMeld, which is an 8 channel version of Meld, our poly merge module, tailored for use with the SM-CV expander.

SHAPEMASTER

Key Features

- 8 channels - all controls set per channel
- Built in polyphonic VCAs each channel
- Monophonic CV outs on each channel
- Draw complex shapes with up to 270 nodes
- Hundreds of built in Shapes and Presets
- Powerful random shape generation
- Freeze, Sustain and Loop envelopes
- Flexible Trigger modes
- Play forward, reverse or pingpong
- Repeat count from 1 to 99 or Infinite (LFO)
- Integrated dual band crossover
- Unsynced lengths from 0.56ms to 30 minutes
- Built-in scope shows pre and post envelope
- Gain adjustment (Trim) on every track (± 20dB)
- Editable Channel Labels
- Trigger generation from sidechain audio

MIND MELD

SHAPEMASTER PRO

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- 8 channels - all controls set per channel
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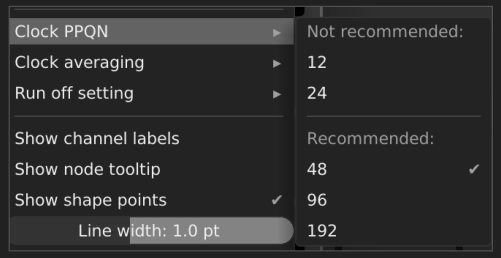
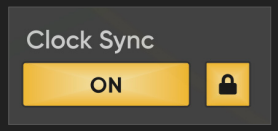
- Repeat count from 1 to 99 or Infinite (LFO)
- Integrated dual band crossover
- Unsynced lengths from 0.56ms to 30 minutes
- Built-in scope shows pre and post envelope
- Gain adjustment (Trim) on every track (± 20dB)
- Editable Channel Labels
- Trigger generation from sidechain audio
- Sync and quantise channels to clock
- Synced lengths from 1/128 to 128 bars
- Includes triplet and dotted lengths
- CV Visualisation
- SM-CV expander for CV control
- SM-Triggers expander
- uMeld - 8 channel poly merge

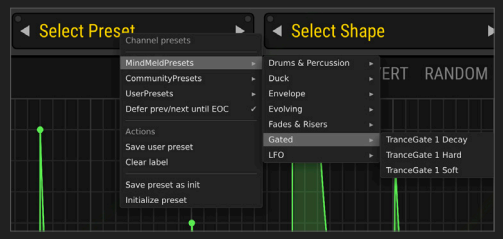
MIND MELD

Quick Start

The main things you need to know about ShapeMaster...







CLOCK PPQN (Pro version only)

ShapeMaster Pro requires a fast clock to behave correctly in all scenarios. **The default clock ratio is 48ppqn** (x48 from Impromptu's Clocked for example). The Clock PPQN can be changed in the global settings (right-click) menu of the module. Run must be off to change PPQN.

SYNC & LOCK (Pro version only)

Sync requires a clock to be connected to the clock input. When sync is activated, the cycle length is displayed in BPM rather than seconds/Hz, and the cycle length is hard synced to the clock (a cycle with length of 1/4 at 48ppqn will take exactly 48 clock pulses to complete)

When sync lock is on, triggers and length changes are quantised. They are treated as 'early' and the action will take place on the next 'main' clock pulse. Eg. with a length of 1/4 at 48ppqn, pulse 1 of the 48 is the 'main' pulse.

PRESETS MENU

Left-click on the presets menu to open it. A preset contains information relating to a single ShapeMaster channel. It is comprised of a shape plus all of the channel's front-panel controls including the Randomise settings - it does not however include the Channel Menu settings like label and colour. Use this menu to load existing presets or save your own.

SHAPES MENU

A Shape contains only the information relating to a shape itself. When a Shape is selected from the Shapes Menu, all of the channel's settings and controls remain unchanged, enabling you to audition different shapes without affecting anything else. Use this menu to load existing shapes or save your own.

CHANNEL BUTTONS & MENUS

Click on a channel button to select one of ShapeMaster's eight channels. Right-click on a channel button to access its channel menu. This is where you can find various channel level settings and edit the channel label (Command/Ctrl+L to show/hide the label in the graph window). You can also use this menu to copy, paste and initialise a channel.

NODE MENU

Right click on a node to show the node menu. The node menu allows you to enter precise coordinates for accurate positioning of the node. You can also use it to delete a node.

GRID CONTROLS

Grid-X

The Grid-X value defines the number of vertical lines in the graph which represent time-divisions of the cycle length.

Grid-X Menu: Left click on the Grid-X value to open a dropdown menu showing commonly used divisions which you can select from or type in your own custom value.

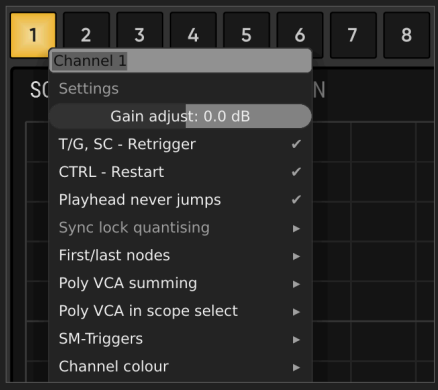
Range

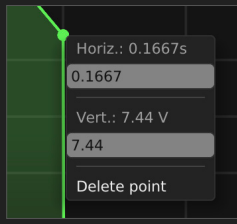
The Range value defines the voltage range that will appear at the CV output. The horizontal grid lines will adjust based on the selected range value.

Range Menu: Left click on the Range value to open a dropdown menu showing the available unipolar and bipolar voltage ranges

RUN & PLAY

For channels to play, both the global Run and the channel's Play button must both be on.





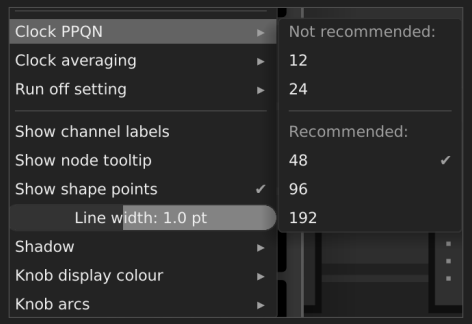
Inputs & Outputs

Clock, Reset, Run, Trigger/Gate inputs, VCA in/out, CV out

When first instantiating ShapeMaster, connect the Clock, Reset and Run jacks. Clock, Reset and Run are global and are used by all 8 channels.

CLOCK, RESET & RUN

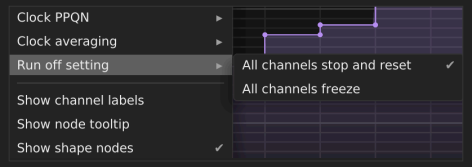
Clock (Pro version only)
ShapeMaster accepts clock resolutions of 12, 24, 48, 96 and 192 PPQN. A minimum clock resolution of 48 PPQN is required for all synced lengths to quantise correctly, and this is the clock resolution that ShapeMaster is set to by default. At 24 PPQN, 1/128 is not available and at 12 PPQN both 1/64 and 1/128 are unavailable. When unavailable, these lengths are greyed out.



Clock PPQN (Global Setting)

Select your Clock PPQN setting in the global right-click menu

NB: Run must be off to change your PPQN setting otherwise the PPQN settings will be greyed out.



Reset
Global Reset can be triggered by pressing the Reset button or by sending a trigger to the Reset input. This will reset all 8 channels.

Run
Global Run can be toggled by pressing the Run button or by sending a trigger to the Run input.

NB: Run must be active for channels to play.

Run off setting (Global Setting)

Select whether all channels stop and reset (default) or freeze when run is turned off.

CHANNEL INPUTS AND OUTPUTS

Trigger / Gate inputs (T/G)
Each ShapeMaster channel has a corresponding Trigger/Gate input which is used to start the playhead in Trigger/Gate mode or Gate Control mode. These inputs are also used for the CV source when ShapeMaster is in CV mode.

VCA in/out
Each ShapeMaster channel includes a VCA, enabling shapes to be used for amplitude modulation. Connect audio sources to the Channel VCA inputs on the left side of the module and take the modulated audio from the corresponding VCA outputs on the right. Shapes always modulate the amplitude of audio passing through the VCA using 0-10V, regardless of the range setting.

Gain Adjust (Channel Setting)

Adjusts the signal gain at the VCA input by ± 20dB. Very useful when summing poly signals.

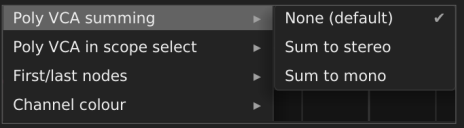
Poly VCA summing (Channel Setting)

There are three options for how poly signals are summed at the VCA inputs:

None: No summing - poly channels will remain poly.

Sum to stereo: Poly signals will be summed to stereo - odd numbered channels will be output on poly channel 1 and even numbered channels will be output on poly channel 2.

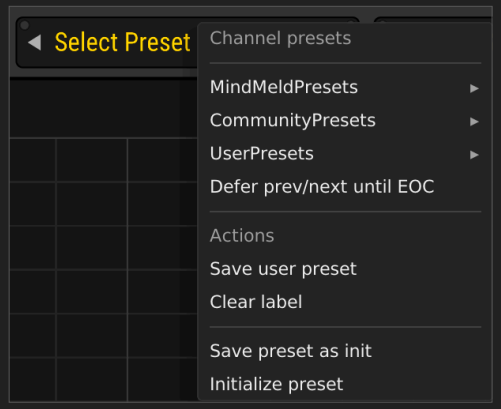
Sum to mono: Poly signals will be summed to mono.



CV Out
The control voltage represented by the shape (and as defined by the range setting) is output here.

Preset & Shape Menus

The main things you need to know...



Previous/Next arrows

Use the prev/next arrows to move between Presets that are in the same directory.

- **Defer prev/next until EOC**: When this setting is active, a preset change that is initiated while the envelope is cycling will be deferred until after the current shape completes its cycle. To indicate that the preset change is 'armed', a small red LED next to the arrow will light. If you initiate a deferred preset change but then want to cancel it, right-click on the arrow.

NB: Changing to a preset that has Sync Lock enabled can sometimes result in a delay before it starts playing (depending on current cycle length and when the change is initiated) as the start time of the new preset will be quantised.

PRESETS MENU

A preset is comprised of a shape plus all of the channel's front-panel controls including the randomise settings. When a preset is selected from the presets menu, all of the channel's controls can change. Channel Menu settings such as label and colour are not saved however.

- **Left click on the presets menu** to open a drop-down menu which enables you to browse through folders of presets or save a user preset.

Presets in the menu are split into three main groups:

MindMeld Presets: These are the factory presets created by MindMeld and are organised into categories based on function/usage.

Community Presets: These are presets created by members of the VCV community..

User Presets: These are presets created and saved by you. To save a preset, select "Save user preset" from the Presets menu. You can create your own sub-directories inside the User Presets directory to organise your presets however you like. When Rack loads or the module is placed/initialised, the User Presets menu hierarchy is built dynamically based on the those sub-directories and the presets stored within them.

NB: User presets are saved to the UserPresets folder. The UserPresets folder can be found in the following location:

MAC: <user>/Documents/Rack/MindMeldModular/ShapeMaster/UserPresets/PresetName.smpr

PC: <user>\ Documents\Rack\MindMeldModular\ShapeMaster\UserPresets\PresetName.smpr

SHAPES MENU

A Shape contains only the information relating to the shape itself. When a Shape is selected from the Shapes Menu, all of the channel's controls remain unchanged, enabling you to audition different shapes without affecting anything else.

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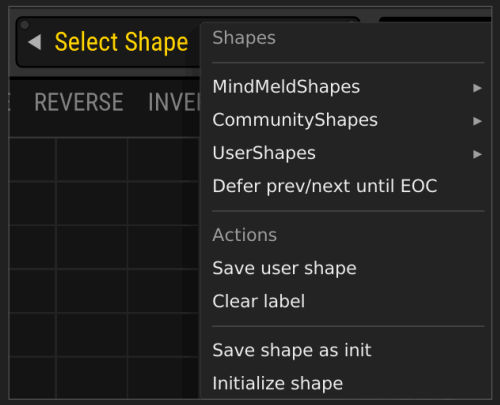
PC: <user>\Documents\Rack\MindMeldModular\ShapeMaster\UserShapes\ShapeName.smsh



Previous/Next arrows

Use the prev/next arrows to move between Shapes that are in the same directory.

- **Defer prev/next until EOC**: When this setting is active, a shape change that is initiated while the envelope is cycling will be deferred until after the current shape completes its cycle. To indicate that the shape change is 'armed', a small red LED next to the arrow will light. If you initiate a deferred shape change but then want to cancel it, right-click on the arrow.

The Graph Window

Grid-X, Range and Scope

The graph window is where the magic happens in ShapeMaster - it allows you to draw up to 8 custom shapes - one on each channel. The X axis of the graph represents time and the Y axis represents voltage.

GRID CONTROLS

Grid-X

The Grid-X value defines the number of vertical lines in the graph which represent time divisions of the cycle length.

Grid-X Menu: Left click on the Grid-X value to open a dropdown menu showing commonly used divisions which you can select from.

At the bottom of the menu is a text field which allows you to enter a custom Grid-X value from 2 to 128 (press Return to submit).

Range

The Range value defines the voltage range that will appear at the CV output. The horizontal grid lines will adjust based on the selected range value.

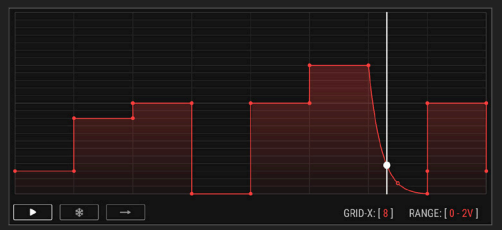
Range Menu: Left click on the Range value to open a dropdown menu showing the available voltage ranges which are:

Unipolar: 0-10V, 0-5V, 0-3V, 0-2V, 0-1V

Bipolar: ± 5V, ± 3V, ± 2V, ± 1V

NB: The range value only affects the range at the CV output. When using ShapeMaster's built in VCAs for amplitude modulation, the Shape CV is always applied to the VCA at a range of 0-10V (unless attenuated by the Amount knob).

Semitone quantising: When a unipolar or bipolar voltage is selected that has a range of 4V or less, each volt is divided into 12 sub-grid lines representing semitones. When combined with stepped shapes and Command/Ctrl clicking to snap to the horizontal grid lines, ShapeMaster can be used as a pitch sequencer. Introducing curves at some places in the stepped pattern can create a glide/portamento effect.



SCOPE

Each ShapeMaster channel includes a built in scope which shows the audio's amplitude both pre- and post-envelope.

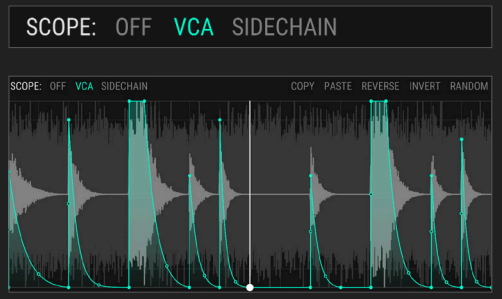
Scope Buttons

The scope has three settings - Off, VCA and Sidechain, which can be selected using the buttons on the top left of the graph window.

Off: Scope is not shown.

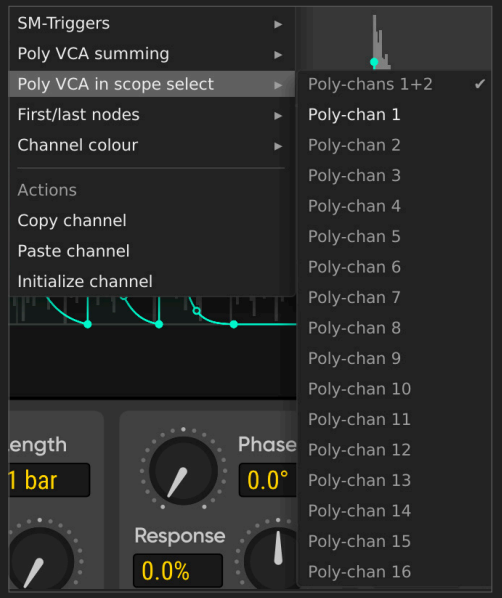
VCA: Scope shows the audio from the channel's VCA input.

Sidechain: Scope shows the audio from the channel's sidechain input.



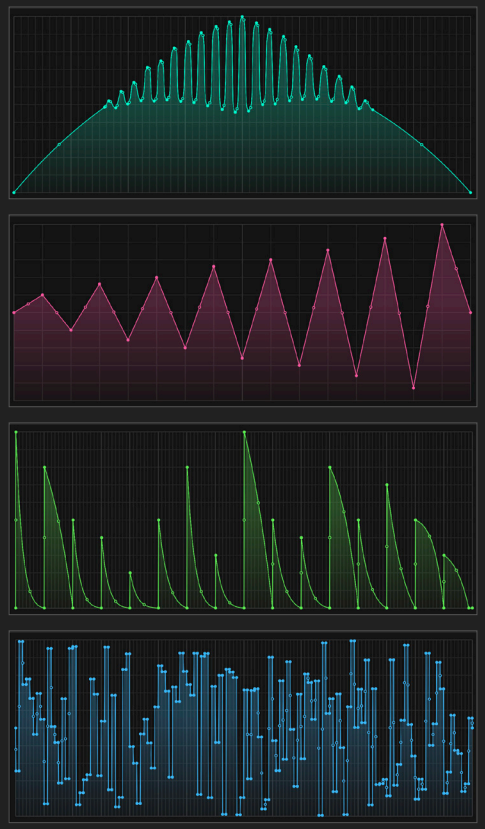
Poly VCA in scope select (Channel Setting)

If a polyphonic audio source is present at the VCA input, you can select which of the 16 channels the scope shows. By default the scope shows a combination of channels 1 + 2 which is good for both mono or stereo sources.



Drawing & Editing Shapes

Nodes and Curve Control Points



ShapeMaster offers intuitive drawing tools which make it easy to draw even the most complex of shapes. Shapes in the graph window consist of Nodes, Line Segments and curve Control Points. Each shape can contain up to 270 nodes.

NODES

Add a node: Double click in the graph window to add a node at the location of the cursor.

Delete a node: Double click on a node to delete it, or right-click on the node and select "Delete node" from the menu.

Move a node: Click and drag the node to the desired location.

Undo: Command+Z (Mac) or Ctrl+Z (PC).

Stepped Patterns: Shift click/drag to quickly draw in stepped patterns defined by the Grid-X setting.

Snap to Grid-X: Option (Mac) or Alt (PC) click/drag to snap a node to the vertical Grid-X lines.

Snap to Grid-Y: Command (Mac) or Ctrl (PC) click/drag to snap a node to the horizontal voltage lines.

NODE MENU

Right click on a node to show the node menu. The node menu allows you to enter precise coordinates for accurate positioning of the node. You can also use it to delete a node.

Horiz field: Enter the horizontal position of the node in seconds.

Vert field: Enter the vertical position of the node in volts, Hz or note value. Values <10 are parsed as volts, values >10 are parsed as Hertz, and values starting with a letter are parsed as notes (Eg. D#3).

First/Last nodes (Channel Setting)

By default, the first and last nodes in a shape are 'Coupled' - meaning they share the same voltage - this prevents clicks when cycling. However in certain scenarios, such as when using CV trigger mode or pingping play mode, this can cause glitches at the end of the cycle. Selecting the 'Decoupled' setting allows them to have different voltages.

CURVE CONTROL POINTS

In the middle of each line segment you will see a curve Control Point (providing the line segment is not vertical or horizontal). Click and drag the Control point up or down to create and adjust smooth curves in your shape.

CONTROL POINT MENU

Right-Click on a control point to show the control point menu. Here you can change the curve type from smooth to S-Shape which can make wave type shapes faster to draw. There is also a menu option to Reset the curve.

Tip: If you are drawing complex shapes it can often be helpful to make the line segments thinner and nodes/points smaller (or hide them altogether) enabling you to do more detailed work.

Show node tooltip (Global Setting)

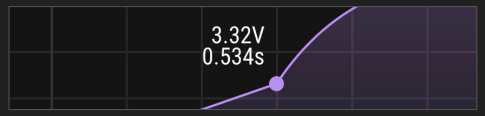
When active, the node tooltip displays the voltage and time position of a node when hovered over.

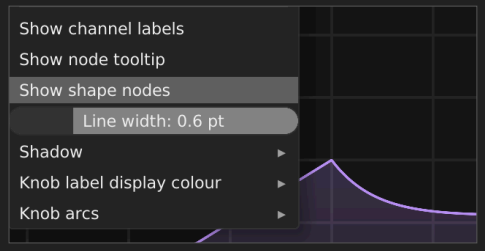
Show shape nodes (Global Setting)

Use this setting to hide/show all shape nodes and control points. When hidden, individual nodes and points will still show when hovered over.

Line Width (Global Setting)

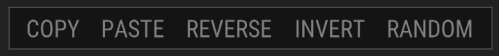
The Line Width slider adjusts the width of the line segments from 0.3pt to 2pt.



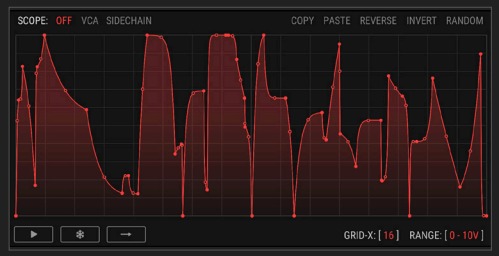


Shape Buttons

Copy/Paste, Reverse, Invert & Random



Random can be very random...



SHAPE MODIFIER BUTTONS

Copy/Paste: Copies the current shape so it can be pasted to another channel

Reverse: Reverses the shape (Flips it in the horizontal axis)

Invert: Inverts the shape (Flips it in the vertical axis)

RANDOM BUTTON & SETTINGS

The Random button generates random shapes and stepped patterns.

Random Settings Menu

Click on the button to open the random settings menu which enables you to specify the parameters of the random shape or stepped pattern that will be created.

There are sliders for:

- **Min segments**: the minimum number of segments.
- **Max segments**: the maximum number of segments.
- **Curve ratio**: The percentage of segments that will be curved.
- **0V ratio**: The percentage of segments that will have zero voltage.
- **MaxV ratio**: The percentage of segments that will have maximum voltage.

Tip: The 0V ratio slider and the MaxV ratio slider are related such that the sum of their percentages cannot exceed 100%. If you set the combined ratios sum to 100%, you can quickly create random gated patterns.

There are binary options for:

- **Stepped**: Creates a stepped pattern - it can also include some curves depending on Curve ratio setting.
- **Lock to Grid-X**: Nodes will be locked to Grid-X. When the number of nodes is less than the Grid-X value, a Euclidean algorithm will determine segment placement (with rotation randomised). When the number of nodes is greater than the Grid-X value, the grid value will be effectively doubled (some nodes may appear halfway between Grid-X lines)
- **Quantized**: Nodes will be quantized to semitone voltages on the Y axis.
- **Quantization scale**: Use the quantization scale submenu to select which notes are used (or not) in the random shape when the 'Quantized' option is turned on.

Tip: Once you like the settings, you can Option (Mac) or Alt (PC) + Click the random button and it will randomise the shape based on those settings without having to open the menu again.

Tip: For stepped patterns that perfectly fit the grid (like the example bottom right), set both Min and Max segments to the same value as Grid-X, and check Stepped and Locked to Grid-X (and quantized if required).

Tip: Random settings are per channel and are saved with presets – so you can save presets with stepped random settings and quantised scales, then load them and just Option/Alt + Click the Random button for instant random melody generation in your chosen scale.

... but it can also be tightly controlled

Transport Buttons

Play, Freeze, Sustain & Loop

PLAY BUTTON

The Channel Play button controls whether the playhead will play when the shape is triggered (providing global run is active). If the play button is pressed while a channel is playing, the playhead will stop and reset. When stopped, the initial voltage will be output from the CV out.

Tip: If you don't want audio to pass through the VCA when the envelope is not playing, set the initial voltage (the first node) to 0V. If you do want audio to pass freely through the VCA, then set it to 10V.

Channel Reset: Option/Alt clicking on the Play button will perform a channel reset.

NB: When starting play or doing a channel reset in Sync Lock mode, the playhead will wait for a main clock pulse to start playing. Depending on settings, it will be quantised to either cycle length or a maximum of 1 bar).

FREEZE BUTTON

The Freeze button freezes the playhead in place. The current voltage at the playhead will be output from the CV out while the playhead is frozen. To unfreeze the playhead, press the freeze button again.

Tip: Try freezing the playhead and modulating parameters like Phase, Response and Warp over it.

SUSTAIN & LOOP BUTTON

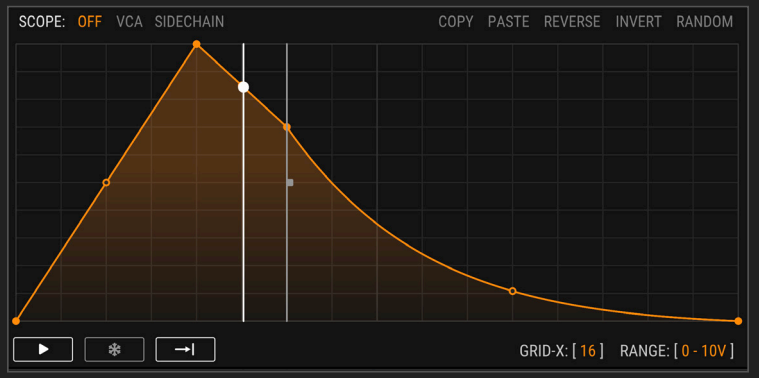
Sustain/Loop button
The sustain/Loop button has 3 states: Off, Sustain and Loop

Sustain: When the button is set to Sustain, a vertical grey line appears on the graph showing the sustain position. To move the sustain position, click on/near the small grey tab in the centre of the line and drag the line to the left or right. To snap the sustain marker to a Grid-X line, hold the Ctrl/Command key down while moving it.

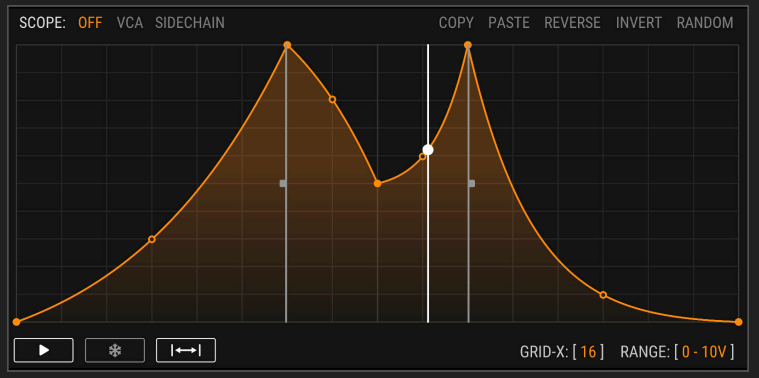
If gate is high at the T/G input when the playhead arrives at the sustain position, the playhead will hold at that position until gate goes low. It will then complete the 'release' part of the cycle in T/G mode, or the cycle will immediately end in CTRL mode.

Loop: When the button is set to Loop, two vertical loop markers appear on the graph showing the loop start and loop end positions. To move a loop marker, click on/near the loop marker and drag it to the left or right. To snap a loop marker to a voltage that exactly matches the voltage of the other marker for seamless looping, hold the Ctrl/Command key down while moving it.

If gate is high at the T/G input when the playhead arrives at the loop end marker, the playhead will jump back to the loop start and play. It will keep doing this until it reaches the loop end marker and gate has gone low. It will then complete the 'release' part of the cycle in T/G mode, or the cycle will immediately end in CTRL mode.



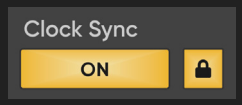
Tip: ShapeMaster's Sustain feature enables classic ADSR envelope behaviour when playing notes from a keyboard and connecting its gate output to a T/G input on ShapeMaster.



Tip: ShapeMaster's Loop feature enables you to create a tremolo effect when notes are held down on a keyboard and its gate output is connected to a T/G input on ShapeMaster.

Sync, Lock and Trigger Modes

Running unsynced, syncing to clock and triggering shapes



Please note that the free version of ShapeMaster included in the MindMeld plugin only runs in unsynced mode. Sync (and Sync Lock) are only available in ShapeMaster Pro.

SYNC & SYNC LOCK

Sync Off (Unsynced)
When sync is off, cycle length is set in milliseconds, seconds and minutes. Available lengths range from 0.56ms to 30 minutes. No global clock is required/used when sync is off.

Sync On (Pro version only)
When sync is turned on, length is set in BPM divisions/multiplications. Available lengths range from a minimum of 1/128 to a maximum of 128 bars. Cycle length is hard synced to the global clock, so at 48 PPQN with a length of 1/4 for example, the cycle will last for precisely 48 clock pulses. If BPM changes at the Clock input, ShapeMaster will track the BPM changes and remain synced.

NB: Sync requires a clock pulse to be present at the Clock input. Default clock resolution is 48ppqn.

Sync Lock Off
When the sync lock icon is off, the channel will sync to the *closest* clock pulse. So using the 1/4 length cycle at 48 PPQN example, if a trigger is sent (in any trigger mode other than auto) on say the 17th (or whatever) pulse of the global clock, then the channel will remain synced to that 17th clock pulse throughout all repeated cycles. This is useful if you want the channel to run offset ('early' or 'late') relative to the main global beat.

Sync Lock On (Quantised)
When the sync lock icon is on, the cycle will be **quantised** to *main* clock pulses. So using the 1/4 length cycle at 48ppqn example again, if a channel is triggered (in any trigger mode other than auto) on say the 17th pulse of the global clock, then this trigger is treated as 'early' and it will wait until pulse 1 of the next beat to trigger.

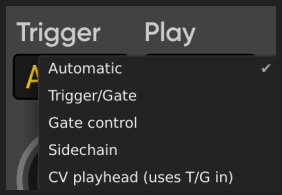
This means that in locked mode you can manually trigger a channel and that trigger will be quantised so it will start on the beat. There is a grace period of 150 samples during which it will lock to the previous main pulse rather than the next main pulse - this is to allow for very short delays caused by clock divider modules and cables etc. which may cause triggers to arrive a few samples late relative to the global clock.

NB: Whether Sync Lock is on or off makes a big difference when making length changes while the playhead is running - see notes on Length on page 13 for more details.

Sync Lock Quantising (Channel Setting)

The Sync Lock Quantising setting determines how lengths longer than 1 bar are quantised. They can either be quantised to 'max 1 bar' or to 'cycle length'. To give an example - let's say you have a cycle length of 8 bars - when set to 'cycle length', this means the cycle can only start on bars, 1, 9, 17, 25 etc. (relative to the global clock and counted from when Run is turned on). However when set to 'max 1 bar' (default), then the 8 bar cycle can start at any bar.

Lengths of 1 bar or shorter are always quantised to cycle length when sync lock is on.



TRIGGER MODES

Automatic (AUTO)
In automatic mode, a shape will self-trigger and play when global Run is active, the channel's Play button is on and a clock pulse is present at the Clock input if Sync is active. When Automatic is selected, Repeat count defaults to INF (Infinite) which creates a cycling LFO.

Trigger/Gate (T/G)
In Trigger/Gate mode, a shape will play when either a trigger or gate is received at its T/G input (a gate is required for sustain or loop to work). When Trigger/Gate mode is selected, Repeat count defaults to 1 which creates a single cycle envelope.

Retrigger (Channel Setting)

- **Retrigger on**: The channel will retrigger when a new trigger/gate is received at the T/G input.
- **Retrigger off**: New triggers/gates will be ignored until the current cycle has completed (one-shot).

Effect of Sync Lock on Trigger/Gate mode
When triggering an envelope with Sync on, whether Sync Lock is on or off makes a significant difference to playhead behaviour.

Sync Lock Off: The envelope can sync to *any* clock pulse – it will start playing immediately.

Sync Lock On: The envelope will sync to a *main* clock pulse – it may not start immediately as start time will be quantised to the global clock.

Gate Control (CTRL)
In Gate control mode, a shape will play when gate goes high at the T/G input, and it will stop when gate goes low. This is useful for turning an envelope/LFO on and off using a gate. When Gate control mode is selected, Repeat count defaults to INF (Infinite) which creates a cycling LFO while gate is high.

CTRL Restart (Channel Setting)

- If Gate Restart is checked, the cycle will start from the beginning with each new gate.
- If Gate Restart is unchecked, the cycle will continue from the position where it stopped when previous gate went low.

Sidechain (SC)
Sidechain mode is very similar to Trigger mode, except its triggers are derived from the Sidechain input rather than the channel's trigger input. (See notes on Sidechain input for more details)

CV Playhead (CV)
CV mode allows you to control the position of the playhead using a control voltage at the channel's T/G input. When CV mode is selected, the options in the Play mode selector change to Unipolar (UNI) and Bipolar (BI).

With a unipolar 0-10V signal, 0V is fully left, 5V is centre and 10V is fully right. With a bipolar ± 5V signal, -5V is fully left, 0V is centre and +5V is fully right - BI mode can be used to process bipolar audio rate signals.

NB: For shapes to play in any trigger mode, Global Run must be active, the channel's Play button on and a clock present if Sync is active.

Play Modes, Repeats & Length

And how Sync Lock can effect Length changes

PLAY MODES

Forward (FWD)
The Shape will play from left to right

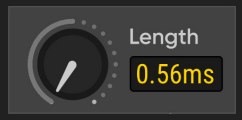
Reverse (REV)
The Shape will play from right to left

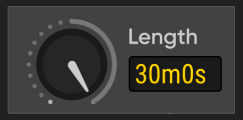
PingPong (PNG)
The shape will play from left to right and then back from right to left. This counts as one cycle.

REPEATS

The repeats knob controls how may times the shape will cycle once it starts playing (in all Trigger Modes).

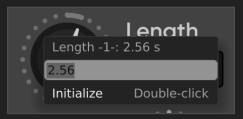
Repeat count can be set from 1 to 99. In its fully right position, the knob value becomes INF (Infinite) which will endlessly repeat (LFO).



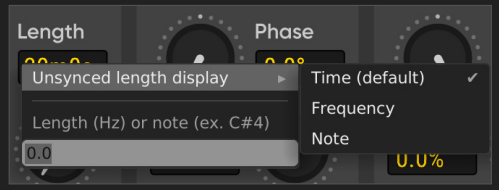


UNSYNCED LENGTH

The Length knob determines the length of the cycle. Cycle length is displayed in milliseconds, seconds and minutes. Available lengths range from a minimum of 0.56ms to a maximum of 30 minutes



NB: If you right click on the length knob to enter a specific length, it must be entered in seconds (as this is a Rack parameter). To enter as Hz or note, use the length menu.

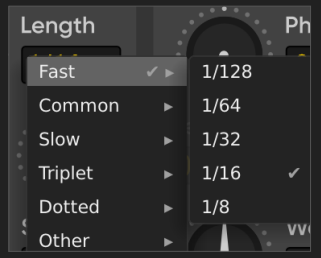


Unsynced Length menu: Left or right-click on the Length value field to open the length menu. When sync is off, the length menu lets you set whether the unsynced length is displayed as Time (seconds), Hz or Note. You can use the field here to enter Hz or note (eg. F#3) lengths directly.

SYNCED LENGTH (Pro version only)

Cycle length is displayed in BPM divisions/multiplications. Available lengths range from a minimum of 1/128 to a maximum of 128 bars and include Triplet and Dotted timings.

Synced Length menu: Left or right-click on the Length value when sync is on to select from list of all available synced lengths.



Effect of Sync Lock on Length changes
When you change/modulate length as an LFO is playing, whether Sync Lock is on or off makes a significant difference to playhead behaviour.

Sync Lock Off: length syncs to *any* clock pulse, therefore an LFO that started on the beat will very likely not remain on the beat as changes to length are made. Length changes happen immediately.

Sync Lock On: length syncs to *main* clock pulse and therefore the LFO will always remain on the beat. In order to achieve this, length changes do not happen immediately as they need to be quantised.

Synced Lengths include:

Fast: 1/128, 1/64, 1/32, 1/16, 1/8

Common: 1/4, 1/2, 1 bar, 2 bars, 4 bars

Slow: 8 bars, 16 bars, 32 bars, 64 bars, 128 bars

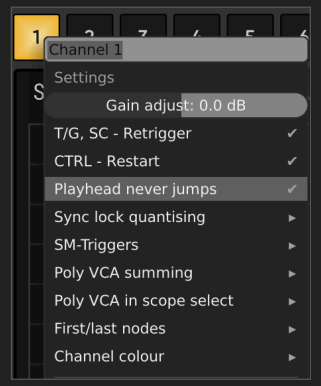
Triplet: 1/16T, 1/8T, 1/4T, 1/2T, 1 barT

Dotted: 1/16d, 1/8d, 1/4d, 1/2d

Other: 5/16, 5/8, 7/8, 1.5 bars, 3 bars, 6 bars, 12 bars, 24 bars

Playhead Never Jumps (Channel Setting)

When sync lock is on, this setting controls whether the playhead is allowed to jump or not when length changes are made. If playhead never jumps is on (default), then the current cycle will need to complete before a length change activates. If the current length is very long - say 64 bars, and you make a length change after just 1 bar, then the length change will not take place until the end of the cycle is reached 63 bars later! When Playhead never jumps is turned off, then length changes can happen faster, usually within a maximum of 1 bar, but the playhead needs to jump to achieve this.

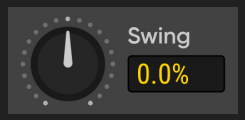


Shape Modifiers & Crossover

Main panel controls

TRIG DELAY

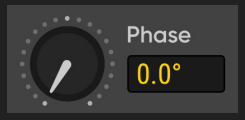
Trigger Delay works in Trigger and SC modes only and adds a delay of up to 8192 samples after a trigger is received before the shape plays. This can be useful if you want to slightly delay a percussion sound for example.



SWING

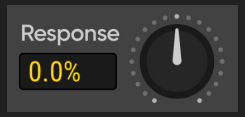
The Swing control adds swing/groove to the cycles such that alternating cycles play faster/slower. Typically swing is used with synced lengths set to 1/8 or 1/16 but it works at any length and also works with sync off.

Effect of Swing on Sync Locked Length changes
When swing is turned on, cycles need to be counted in pairs due to the uneven timing of odd and even cycles. This means that a length change may not happen until the completion of two cycles rather than one (depending on whether the change was made during an odd or even cycle).



PHASE

The Phase control adjusts the phase of the shape from 0 to 360 degrees.



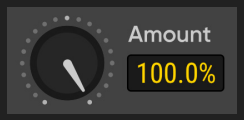
RESPONSE

The Warp control exponentially stretches or compresses the shape vertically, either up or down.

WARP

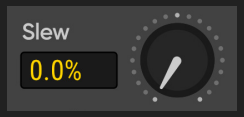
The Warp control exponentially stretches and compresses the shape horizontally over time, either to the left or to the right.

NB: When adjusting Phase, Response, Warp and Amount, the nodes and lines of the shape do not move, so they remain easily editable. Instead, the shaded area of the shape will move to display the resulting output CV.



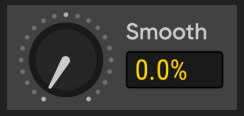
AMOUNT

The Amount control is an attenuator which reduces the level of the output voltage.



SLEW

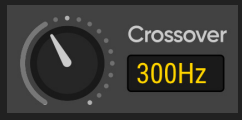
The Slew control adds slew/lag to the output voltage so that the change in voltage level cannot exceed a certain number of volts per second. Slew in ShapeMaster is calculated relative to cycle length which gives a consistent effect on the shape, regardless of length (frequency). A 50% slew will always turn a square wave into a triangle.



SMOOTH

The Smooth control is a filter that can help reduce clicks/pops caused by extreme vertical changes in the shape.

NB: The Slew control and Smooth control both have a smoothing effect on the output voltage but they do so in different ways with different results.]



CROSSOVER

The Crossover splits audio passing through the VCA into high and low bands, determined by the crossover frequency. The Crossover is off by default. To turn it on, turn the knob to select a crossover frequency between 20Hz and 20KHz.

HIGH

Attenuates the amount by which the high frequency band is amplitude modulated by the shape (default is 100%).

LOW

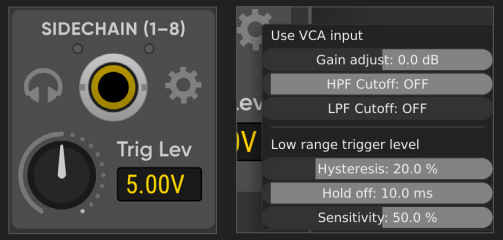
Attenuates the amount by which the low frequency band is amplitude modulated by the shape (default is 100%).

Tip: The crossover is useful for frequency based ducking. For example, if you want to duck a bass to make room for a kick, rather than duck the entire bass signal, you can just duck the low frequencies in the bass while leaving the higher frequencies relatively untouched.

Sidechain

Generate triggers from external audio

ShapeMaster's sidechain input enables triggers to be generated from an external audio signal. These will trigger the channel's envelope when ShapeMaster is in Sidechain (SC) Trigger mode.



The sidechain input is polyphonic. Channels 1-8 on the input correspond to channels 1-8 on ShapeMaster.

Audition Button (Headphones icon)
Sends the audio from the Sidechain input to the channel's VCA output for auditioning - useful when setting the filter or extracting grooves.

Trigger Level
Sets the threshold for the envelope follower, above which a trigger will be generated (subject to additional advanced sidechain settings below).

Tip: Audio from the sidechain input can be viewed on the scope by clicking the Scope's 'Sidechain' button - this can help you set the appropriate trigger level.

ADVANCED SIDECHAIN SETTINGS

Click on the cog icon to the right of the sidechain input to open the advanced sidechain settings menu

Use VCA Input: When this setting is checked, a copy of the audio from the channel's VCA input is routed to the sidechain (and it will take priority over any existing external audio signal on the channel's sidechain input). This allows the VCA audio to be sidechained by itself!

Gain Adjust: Adjusts the gain of the sidechain audio by ± 20dB

HPF Cutoff: 20Hz to 10kHz 24dB/Octave filter that removes low frequencies from the sidechain audio to prevent them from generating triggers.

LPF Cutoff: 20kHz to 100Hz 24dB/Octave filter that removes high frequencies from the sidechain audio to prevent them from generating triggers.

Hysteresis: Prevents retriggering until the input level has fallen this percentage below the Trigger Level. Use this to stop unwanted double triggering.

Hold Off: Prevents retriggering until this amount of time has passed. Use this to stop unwanted secondary triggers.

Sensitivity: Acts as a slew limiter on the envelope follower that can be used to adjust responsiveness

Patch: Groove extraction - Send a groovy percussion loop from a sampler into the sidechain input. Adjust trigger level and sidechain settings until it generates the triggers you want. Use a simple gate shape envelope and take the channel's CV out to trigger a drum module in VCV. Click the headphones icon to audition the original loop.

Patch: Decay reduction - Send a high hat or percussion loop with long decays and irregular timing into a channel's VCA in. In Sidechain settings, activate 'Use VCA input' and adjust trigger level and settings until triggers are generated for each hit. Use an exponential AD envelope to set the desired decay amount.

Patch: Drum hit extraction - Send a drum kit loop into a channel's VCA in. In Sidechain settings, activate 'Use VCA input' and use the filters to isolate the frequency range of the drum you want to extract. Set the trigger level and other settings to generate triggers for this drum only and use a simple AD envelope.

Expanders & Utilities

SM-CV, SM-Triggers & uMeld (Pro version only)

SM-CV

The SM-CV Expander enables CV control of most ShapeMaster Pro parameters. It also has a V/Oct input for using ShapeMaster Pro as a VCO. It must be placed directly to the left of the main module.

The jacks on SM-CV are polyphonic, each carrying 8 channels of CV. These channels correspond to ShapeMaster Pro channels - so to modulate the Warp on ShapeMaster channel 3 for example, you would send CV into poly channel 3 of SM-CV's Warp input.

uMELD

uMeld is a smaller 8 channel version of our Meld poly merge utility (it is not an expander). It has been tailored for use with SM-CV with the addition of an editable label that makes it easy to see which parameter is being modulated.

Right-click on the label to display and select from a list of all SM-CV's jack labels. There is also a label for ShapeMaster's sidechain input.

uMeld also includes bypass buttons for each jack. When bypassed, a jack will revert to sending 0V.

SM-TRIGGERS

The SM-Triggers expander offers three additional trigger outputs for each ShapeMaster Pro channel and an OR logic output for each of those. It must be placed directly to the right of the main module.

SOS/L and EOS/L Outputs

When using sustain: An SOS/L (Start of Sustain/Loop) trigger will be fired when the playhead arrives at the sustain position and an EOS/L (End of Sustain/Loop) trigger will be fired when the playhead leaves the sustain position.

ShapeMaster Pro's sustain control has a second purpose when SM-Triggers is connected.
It can be used to set a custom time on the shape at which an EOS/L trigger will be generated regardless of whether gate is high at the T/G input or not. This is why sustain is also available in auto trigger mode for example (even though no gate is present).

When using loop: An SOS/L (Start of Sustain/Loop) trigger will be fired when the playhead arrives at the loop end marker but does not cross it, and an EOS/L (End of Sustain/Loop) trigger will be fired when the playhead crosses the loop end marker.

EOC Outputs

The EOC (End of Cycle) trigger fires when the playhead reaches the end of the cycle.

OR Outputs

OR logic outputs for the three sets of channel triggers - SOS/L, EOS/L and EOC

SM-Triggers (Channel Setting)

When SM-Triggers is connected, a new setting for it appears in the Channel Settings Menu.

EOC on last cycle only: Enable this when using repeats to make the EOC trigger only after the last cycle, rather than at the end of every cycle.

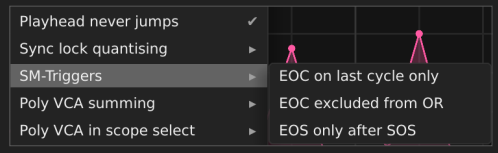
EOC excluded from OR: excludes this channel's EOC from the OR logic output.

EOS only after SOS: By default ShapeMaster Pro outputs a EOS trigger when the playhead leaves the sustain point even if no gate is high at the T/G input. If you do not want this to happen, enable this option which makes EOS only trigger after an SOS has triggered (which requires a gate high).

Patch: Chained envelopes
Use the EOC outputs to create chained sequences of envelopes by using the EOC output of one channel to trigger the next. Here four envelopes are chained in sequence.

Patch: Overlapping envelopes
Use the sustain marker as a custom trigger point and EOS/L output to create overlapping envelopes by using the EOS trigger to fire the next envelope in the sequence. Here envelope 4 will be triggered as the playhead on envelope 3 crosses the sustain marker, half way through its cycle.

Patch: Polymetric sequences
You can use the sustain marker and EOS/L output to create polymetric sequences (when the required synced length is unavailable) by snapping the sustain marker to a Grid-X line and using the EOS trigger to reset the channel (make sure Lock is off). Here the channel is resetting after the 6th 'step' of an 8 'step' bar.



MIND MELD

MindMeld Modular is a designer/ developer collaboration for VCV Rack between Steve '*Make it so*' Baker (concept, design and development) and Marc '*Spock*' Boulé (development and coding).

facebook.com/MindMeldModular