Marie's LFO

Cikaon Instruments

As the name implies, this LFO was inspired by an idea from Marie Ann Hedonia, herself inspired by Daphne Oram: draw the oscillator's waveform. Literally.

Instead of messing around with sine, square, triangle and sawtooth waveforms, you can define exactly the shape you want !

Are you familiar with vector-drawing software like Adobe Illustrator™ or Inkscape ? This is exactly the same drawing process, in Eurorack format :)

This module uses Bézier paths to let you draw what you need.

And as a special feature, Marie's LFO can also output signal at audio rates !

DRAWING A CURVE

A curve is made of points located on the curve itself, and to each point are associated two control points which allow you to pull the curve away from a point into a certain direction. The first and last points only have one control point.

MANIPULATING POINTS

The point selection is achieved by turning the Navigation encoder of the module on the right of the screen.

When a curve point is selected, an animated circle is visible around it. You can move it around (along with its control points) by turning the X and Y encoders on the module.

If the selected point is a control point, it is represented as a square, and moving it with X and Y will pull the curve into the wanted direction.

A point and its control points can be rotated by pressing and turning the Navigation encoder.

ALIGNING END AND START

Sometimes we want a hard, vertical break between the end and start of the waveform, sometimes not.

When the start or end point is selected, a horizontal line is visible. It helps you align the two extreme points if you want a smooth voltage transition between the end and start of the wave.
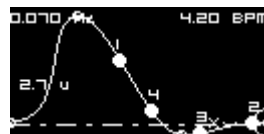
Alignment guide

LFO OUTPUTS

When configured in LFO mode, the module has four outputs. You can see them move along the curve when the frequency is low enough.

Notice that these outputs are offset in time. It means that you can define, for outputs 2, 3 and 4, a time offset from the output 1. To do this, simply press the offset button number you want to move, and turn the navigation encoder into the wanted direction while the button is pressed. The value above each output indicates how far it is from the output number 1 (from 0 to 100)

The LFO frequency can be controlled with the FM port.
The frequency can also be manually defined by pressing and turning the X encoder.

Output offsets

AUDIO OUTPUT

In audio mode, only the Audio output is available. The LFO outputs will keep their last values as a fixed voltage.

The audio signal frequency can be controlled with a MIDI device (TRS *MIDI* port).

NOISE GENERATOR

To make things even funnier, Marie's LFO includes a noise generator. The noise is driven by two parameters : amplitude and density.

To change these parameters, press the *Noise* button and turn X (noise density) or Y (noise amplitude) while the *Noise* button is pressed. Or use the dedicated CV inputs !

CV INPUTS

CV inputs allow 0-10v external controls for :
• Frequency modulation
• Noise density
• Noise amplitude

SYNCHRONIZATION

When running in LFO mode, the module can run in three synchronization modes:

• No synchronization,
• MIDI synchronization, via the TRS MIDI port (see warning on next page),
• Trigger synchronization, via the Trig port.

When the module is synchronized to an external device, click+tuning the X encoder will multiply or divide the source clock frequency.

PRESETS

Marie's LFO offers 32 memory slots to save your wave shapes, numbered 0 to 31. The slot 0 is always loaded by default when the module is powered on.
Select the memory slot with the navigation encoder, and preview the curve by clicking the navigation encoder.

To load the selected preset, press the Offset 2 (load) button.
To save the playing curve into the selected preset, press the Offset 3 (floppy) button.

SYSTEM PARAMETERS

As promised, there is no menu diving.
Just 7 parameters :

Speed mode : LFO or AUDIO.
In LFO mode, the four outputs are available ; in audio mode only the Audio output is available.

Synchro : none, MIDI or trigger (LFO mode only)
When none, the frequency is manually defined by click+turning the X encoder, or by sending a CV into the FM input.
**NEVER PLUG ANYTHING ELSE THAN MIDI SIGNAL IN THE TRS MIDI PORT !
It would certainly burn the LED inside the optocoupler (the white chip on the back PCB)**

When MIDI, the midi clock received in the MIDI port is used to set the LFO frequency. Click+turning the *X* encoder will multiply or divide the received clock speed.

Trigger sync behaves the same as MIDI, except that the clock signal is expected in the Trig input.

Accept MIDI : on or off (Audio mode only)
When on, the oscillator will play notes from the MIDI input. When off, it will play notes from the FM input.

Frequency unit : Hz or BPM.
Sets the unit to be used when manually changing the frequency.

Frequency increment : 0.001 to 1000
Amount of Hz (or BPM) added or subtracted when changing the frequency manually.

Segment count : 1 to 16
Number of Bézier segments in the current curve. It allows you to add details to the shape.

Voltage range : 1 to 12

NOTE ON PRESETS

The presets contain the curve shape, but also the frequency, noise parameters, offsets and synchro mode.

The 4 LFO outputs

- Frequency Modulation for LFO
- 1v/oct for Audio (experimental)

Noise density modulation
Noise amplitude modulation

Switch between modes :
- **Curve**
- **Menu**
- **Presets**

- Move the selected point horizontally
- Frequency change (when pressed)
- Noise density (when noise is pressed)

Output offsets

Load preset

Save/overwrite preset

Sync by trigger

Sync by MIDI, or MIDI notes in audio mode

Audio output

Navigation encoder.

Change the selected point.

Change output offset when an offset button is pressed.

Change menu value when pressed+turned.

Select preset, preview when pressed.

- Move the selected point vertically
- Noise amplitude (when noise is pressed)

Keep pressed and turn X and Y to set the noise parameters