

Liber ex Doctrina



Liber version 2.0.0

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## The Modules

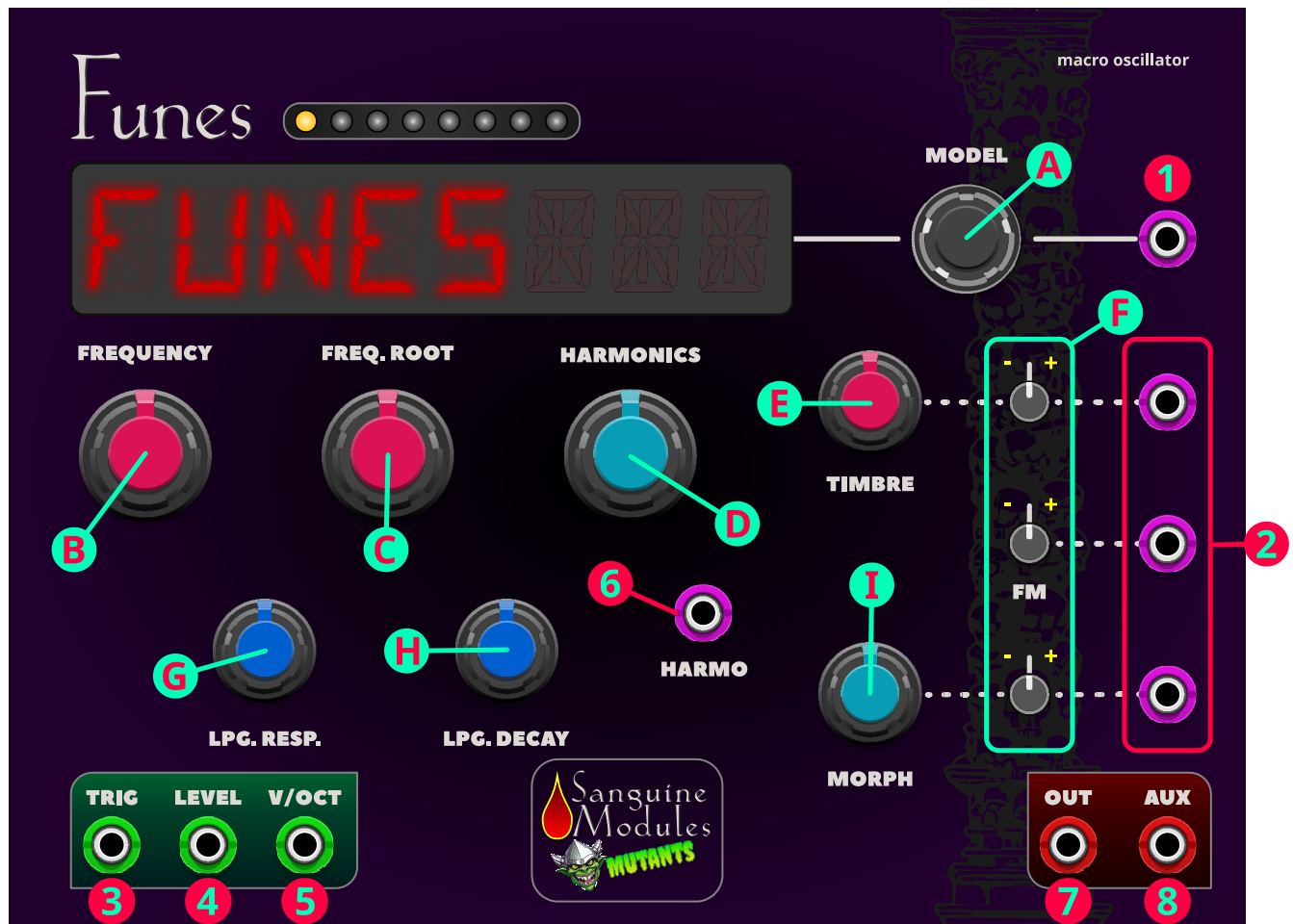
### Funes

Featuring twenty four synthesis models that range from filtered classic wave shapes to synthetic hi-hats, Funes is a polyphonic macro oscillator that caters to your every musical need.

Funes is based on Mutable Instruments' well known macro oscillator "Plaits", with the latest 1.2 released firmware.

This manual covers basic operation; but a lot of enjoyment comes from experimentation and discovery. Have fun!

### The Controls





## Knobs

- A. MODEL:** twist it back and forth to select the synthesis model. The models are separated in three banks: pitched (green LEDs are lit), noise/percussive (red LEDs are lit) and new synthesis (orange LEDs are lit). The character display and LEDs above it change to reflect your selection.

The available synthesis models are:

| Model # | Model                           | Display  | LEDs color | Note <sup>1</sup> |
|---------|---------------------------------|----------|------------|-------------------|
| 1       | Classic waveshapes with filter. | FLTRWAVE | Orange     | C0                |
| 2       | Phase distortion                | PHASDIST | Orange     | C#0               |
| 3       | 6-operator FM 1                 | 6 OP.FM1 | Orange     | D0                |
| 4       | 6-operator FM 2                 | 6 OP.FM2 | Orange     | D#0               |
| 5       | 6-operator FM 3                 | 6 OP.FM3 | Orange     | E0                |
| 6       | Wave terrain synthesis          | WAVETRRN | Orange     | F0                |
| 7       | String machine                  | STRGMACH | Orange     | F#0               |
| 8       | Chiptune                        | CHIPTUNE | Orange     | G0                |
| 9       | Pair of classic waveforms       | DUALWAVE | Green      | G#0               |
| 10      | Waveshaping oscillator          | WAVESHAP | Green      | A0                |
| 11      | Two operator FM                 | 2 OP.FM  | Green      | A#0               |
| 12      | Granular formant oscillator     | GRANFORM | Green      | B0                |
| 13      | Harmonic oscillator             | HARMONIC | Green      | C1                |
| 14      | Wavetable oscillator            | WAVETABL | Green      | C#1               |
| 15      | Chords                          | CHORDS   | Green      | D1                |
| 16      | Vowel and speech synthesis      | VOWLSPCH | Green      | D#1               |
| 17      | Granular cloud                  | GR.CLOUD | Red        | E1                |
| 18      | Filtered noise                  | FLT.NOIS | Red        | F1                |
| 19      | Particle noise                  | PRT.NOIS | Red        | F#1               |
| 20      | Inharmonic string modeling      | STG.MODL | Red        | G1                |
| 21      | Modal resonator                 | MODALRES | Red        | G#1               |
| 22      | Analog bass drum                | BASSDRUM | Red        | A1                |
| 23      | Analog snare drum               | SNARDRUM | Red        | A#1               |
| 24      | Analog hi-hat                   | HI-HAT   | Red        | B1                |

Synthesis models can also be selected directly using the context menu (see below).

Depending on the selected model, the module controls change different parameters.

For a detailed explanation of the specific models and how the controls behave when they are selected, please refer to the original “Plaits” manual and its 1.2 firmware addendum.

<sup>1</sup> Only available when “C0 model modulation” is checked in the context menu.



Plaits manual (covers Pitched and Noise/percussive models):

<https://pichenettes.github.io/mutable-instruments-documentation/modules/plaits/manual/>

Plaits firmware addendum (including New synthesis models manual):

<https://pichenettes.github.io/mutable-instruments-documentation/modules/plaits/firmware/>

- B. FREQUENCY** (coarse): its range can be adjusted using the “Frequency mode” item in the context menu. By default it is eight octaves (C0-C8). It also offers “Octaves” and “LFO” modes.
  - C. FREQUENCY ROOT:** when “Octaves” is selected as the “Frequency mode” this knob controls the root note.
  - D. HARMONICS:** model dependent tone control. In general it controls the frequency spread in the tone.
  - E. TIMBRE:** model dependent tone control. In general it controls the “darkness” of the tone.
  - F. Attenuverters** for the **TIMBRE**, **FM** and **MORPH** CV inputs. When the **TRIGGER** (3) input is patched and the corresponding CV is left unpatched, the attenuverters adjust the modulation amount from the internal decaying envelope generator. So... be warned, if you disconnect a CV input and the **TRIGGER** (3) patched, any attenuverter value other than “0” will allow the internal envelope to take over.
  - G. LOW PASS GATE RESPONSE:** controls the response of the internal low pass gate from VCFA (counter clockwise) to VCA (clockwise).
  - H. LOW PASS GATE DECAY:** adjusts the ringing time of the internal low pass gate and the decay time of the internal envelope.
  - I. MORPH:** model dependent tone control. In general it controls lateral timbral variations.
- 

### *Inputs and outputs*

- 1. MODEL selection CV:** this input has two modes of operation that depend on your context menu selection:
  - **C0 model modulation (monophonic)** unchecked (default): when the input is patched, two or more LEDs (depending on polyphony) light up. The blinking LED indicates the central value (the selected model) while the steady LEDs indicate the currently active one for each polyphonic channel. The input voltage functions as an



offset to the currently selected central value: negative voltages decrease it and positive voltages increase it. This behavior is the closest to the original “Plaits” with the addition of polyphony.

- **C0 model modulation (monophonic)** checked: when the input is patched, the notes C0 to B1 select the current model. Selection is absolute and not influenced by the manually selected model.

In both modes the display updates, by default, to reflect the currently active model for the first, if polyphonic, or only channel connected to the input. This behavior can be disabled in the context menu (see below).

2. **CV Inputs** for the **TIMBRE**, **FM** and **MORPH** parameters.

3. **TRIGGER**: serves four different purposes:

- Triggers the internal decaying envelope generator.
- Excites the physical and percussive models.
- If the **LEVEL** input (4) is not patched, it strikes the internal low-pass gate.
- Samples and holds the value of the **MODEL CV input** (1).

4. **LEVEL**: opens the internal low pass gate; it also acts as an accent control when triggering physical or percussive models.

5. **V/Oct**: controls the fundamental frequency of the produced sound, from -3 to +7 octaves relative to the root note set by the **FREQUENCY** (B) knob.

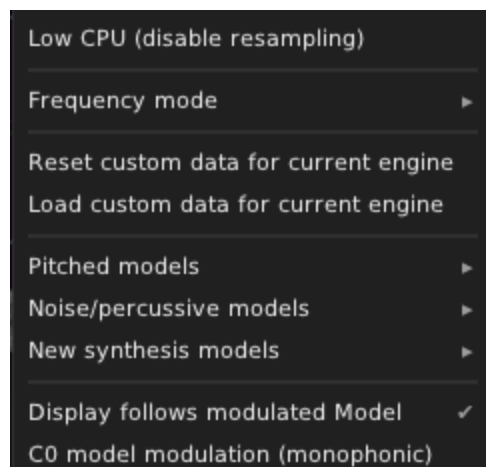
6. **CV Input** for the **HARMONICS** (D) parameter.

7. **OUT**: main output signal (model dependent).

8. **AUX**: carries a variant or by-product dependent on the **OUT** (7) output signal (model dependent).

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## The context menu





The Funes context menu offers the standard VCV Rack standard context menu with several additions:

- **Low CPU (disable resampling):** if your computer is struggling enabling this will save some CPU at the expense of sound quality.
- **Frequency mode:** sets the mode for the **FREQUENCY** (B) knob.
- **Reset custom data for the current engine:** some of the models of the “New synthesis models” bank allow you to use of custom data. This menu option clears it and loads the built-in default.
- **Load custom data for current engine:** loads custom data for one of the following models:
  - 6-operator FM models.
  - Wave terrain synthesis.
  - Wavetable synthesis.

Data must be prepared as a .bin file using the editor available here:

<https://github.com/tobiza/Plaits-Editor/tree/8190119e5c0e06b495e46eef62d8ed5ce874b53b>

In order to use the editor you need to download the code and run it locally in your web browser (tested with Firefox).

- **Pitched models, Noise/percussive models and New synthesis models:** the items in the sub-menus directly select a specific synthesis model.
- **Display follows modulated model:** when enabled, the LED display changes to reflect the model currently selected by the voltage present in the **MODEL CV input** (1). If you want the display to only reflect the manually selected model or don't like the effect, disable this option. Enabled by default.
- **C0 model modulation (monophonic):** when enabled, the selected model is changed by sending note voltage values to the **MODEL CV input**. Selection is absolute. This disables the default Plaits-like behavior and is monophonic only. Disabled by default.



## Acknowledgments & thanks

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