

plume

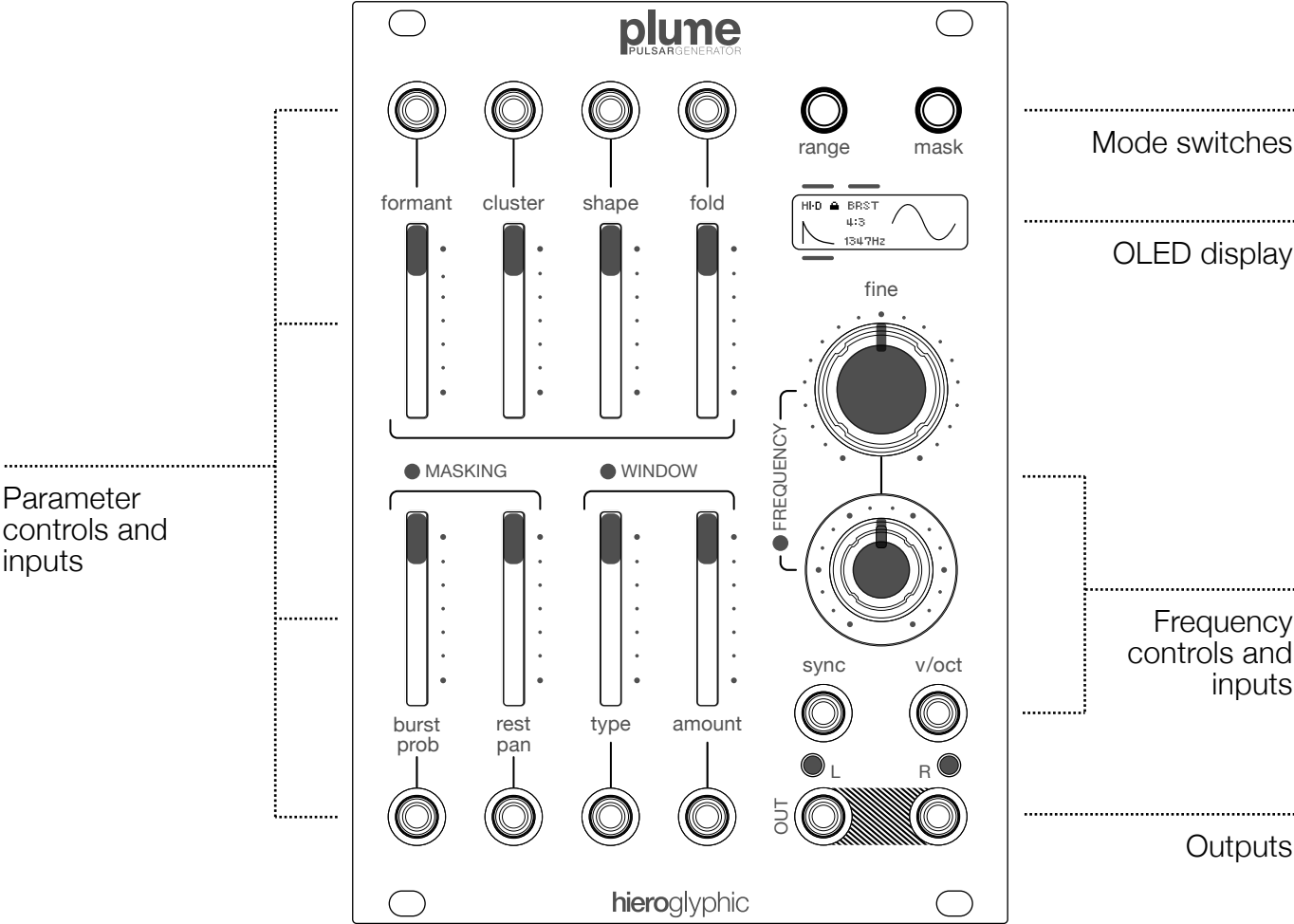
PULSARGENERATOR

User Guide

Firmware v1.1

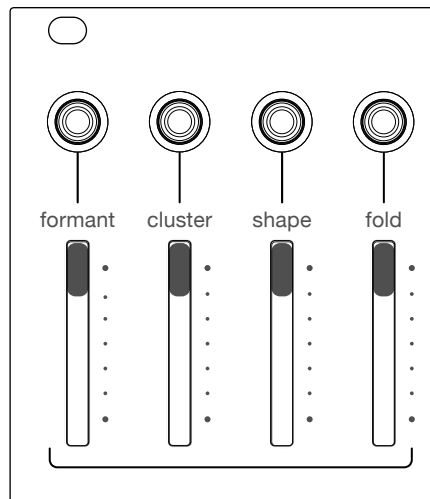
hieroglyphic

Overview & Front Panel



Parameter Controls & Inputs

The slider control values are summed with their respective CV input values to determine each parameter's total amount. Negative CV values are subtracted from the slider value. The input range is -7V to +7V.



Formant

The **formant** control has two operating modes (refer to the 'Mode Switches' section for details on how to access each mode). In 'coupled' mode, the formant value is relative to the fundamental frequency. In 'decoupled' mode, the formant value is independent from the fundamental frequency.

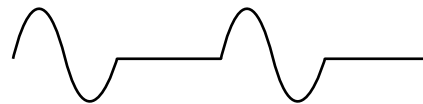


Fig. 1. A sine pulsaret with a formant frequency approximately double that of the fundamental frequency, resulting in a 50% duty-cycle.

Cluster

Cluster controls the amount of single cycle waves contained in each pulsar, but does not affect the formant frequency. The cluster amount is continuously variable from 1 to 7. Increasing the cluster value may affect the fundamental frequency when formant is at minimum value (coupled mode).



Fig. 2. Two pulsarets: one with a cluster value of 1, and the other with a cluster value of 3.

Shape

Smoothly morph between 7 wave shapes using the **shape** control.



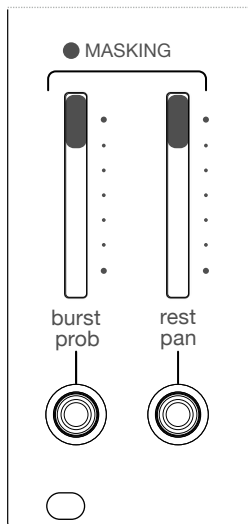
Fig. 3. Shape morphs between 7 waveforms: sine, up ramp, triangle, down ramp, square, noisy square, white noise.

Fold

Add West-Coast-style wavfolding to the pulsar waveshape using the **fold** control.

Parameter Controls & Inputs

The Masking section introduces intermittence into the pulsar train by removing -- or masking -- individual pulsars. This section has two operating modes, **Burst** and **Stochastic** (refer to the 'Mode Switches' section for details on how to access each mode). The slider labels correspond to the separate modes.



Burst mode removes pulsars according to a 'burst ratio', expressed as $b:r$. The burst ratio can be understood as a continuously variable loop consisting of bursts (pulsars present) and rests (pulsars removed).

N.B. Burst pulsars output on the left channel. Rest pulsars output on the right channel. If typical burst masking is desired, only the left output is used. If both outputs are used, the effect is known as *Channel Masking*.

Burst

Determines the amount of pulsars present in the burst ratio loop, from 1 to 7.

Rest

Determines the amount of pulsars that are removed from the burst ratio loop, from 0 to 6.

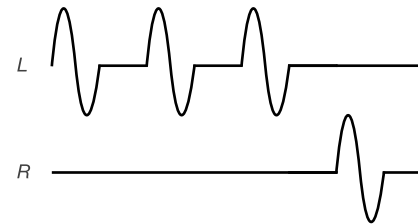


Fig. 4. Burst masking loop with a ratio of 3:1. Single channel burst masking is present at the left output. When both outputs are used, the result is channel masking.

Stochastic mode removes pulsars based on a user-defined weighted probability. Stereo panning is then applied to the output signal.

Prob

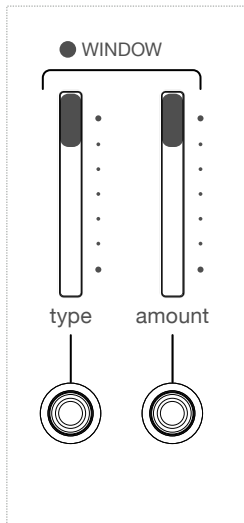
Determines the probability that a pulsar is removed from the pulsar train

Pan

Pans the pulsar train in the stereo field.

Parameter Controls & Inputs

Window modulation is an amplitude contour applied to individual pulsars, or groups of pulsars when the cluster value is above 1.



Type

Smoothly morph between 7 amplitude contour shapes.

N.B. The rectangle shape is effectively a 'reverse vca', and will completely mute the output when amount is at maximum value.

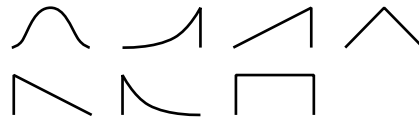


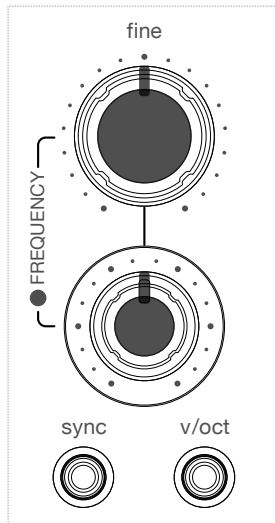
Fig. 5. Type morphs between 7 amplitude contours: gaussian, exp. attack, lin. attack, triangle, lin. decay, exp. decay, rectangle.

Amount

Set the degree to which the window modulation affects the pulsar using the **amount** control.

Frequency Controls & Inputs

Plumes's fundamental frequency is controlled via the two front panel knobs, a pitch CV input, a hard sync input, and a frequency range selector button.



Coarse Tune (small knob)

The coarse knob spans a 10 octave range (10Hz-10KHz in **HI** mode, 0,5Hz-50Hz in **LO** mode). The frequency operating range is selected by pressing the **range** button (refer to 'Mode Switches' section for details).

Fine Tune

The fine knob spans +/- 6 semitones for the centre position.

N.B. The frequency can be locked by holding the range button for 3 seconds, at which point the fine tuning is de-activated, and the coarse knob becomes a +/- 2 octave switch.

V/oct

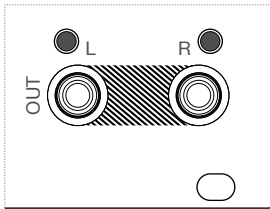
The v/oct CV input scales the fundamental frequency using a vol-per-octave scale. The -3V to +7V input range extends beyond the panel knobs' operating frequency (1,25Hz-20KHz in **HI** mode, 0,006Hz-6,5KHz in **LO** mode). The v/oct input remains active when the frequency is locked.

Sync

The sync input acts as a hard sync upon the output wave shape, resetting it with any rising-edge signal above 2,5V.

Outputs & Mode Switches

Plume's 2 outputs can function either as a stereo pair (Stochastic masking mode), or a dual-mono pair (Burst masking mode). Each output is accompanied by a bicolour LED for signal monitoring.



Outputs (L&R)

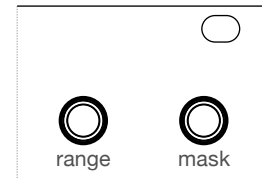
In **Stochastic** masking mode, the outputs function as an L & R stereo pair, with the signal panning determined by the pan value.

In **Burst** masking mode, the outputs function as a dual-mono pair, with bursts present at the L output, and rests present at the R output. When combined as a stereo signal, the effect achieved is channel masking.

LEDs

Each output is accompanied by a bicolour LED that indicates the signals polarity (green: positive voltage; red: negative voltage). At audio rates, the colour emitted appears orange.

The range and mask switches allow access to Plume's various operating modes.



Range

Single press: switch between **HI** and **LO** frequency ranges.

Hold for 3 seconds: Lock the frequency control.

Mask

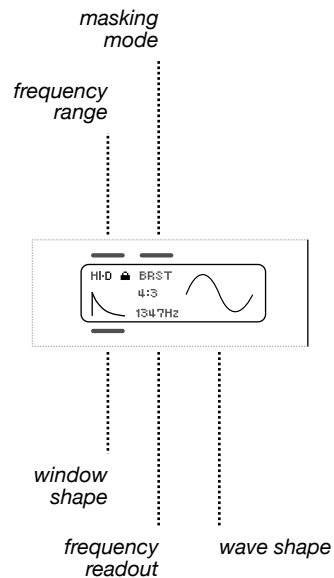
Single press: switch between **Stochastic** and **Burst** masking modes.

Hold for 3 seconds: switch between 'coupled' and de-coupled' formant modes.

To enter calibration mode, hold both buttons for 5 seconds (refer to 'Calibration' section for further details).

OLED Display


The OLED displays pertinent parameter values not easily intuited by the panel control positions. The colour-coded graphics assist in associating the displayed parameters with their respective panel controls.



Frequency Range (*yellow*)

The frequency range mode is displayed as either **HI** or **LO**. The suffix **'-D'** appears when the formant frequency is de-coupled from the fundamental frequency. The 'lock' icon (🔒) appears when the frequency lock is activated.

Masking Mode (*orange*)

The active masking mode is displayed as **BURST** or **STOCH** (for stochastic). In Burst mode, the subsequent line indicates the burst ratio (e.g. 4:3). In Stochastic mode, a signal pan graphic is displayed on the subsequent line (e.g. ).

Window Shape (*blue*)

The selected window modulation shape display is continuous even when crossfading occurs. This allows for easy selection of blended shapes.

Frequency Readout

The fundamental frequency is displayed in Hz (or KHz).

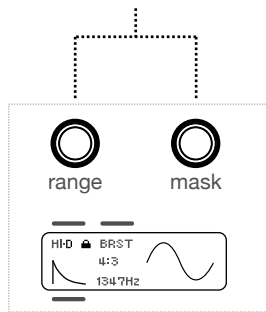
Wave Shape

Monitor the output wave shape here. Note that the effect of both the wavefolder and the window modulation appear on the display.

Calibration

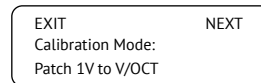
Calibration of Plume's v/oct input can be initiated at any time. There is no need to power the module off upon completion. A voltage source capable of providing stable 1V and 3V signals is needed.

*Hold **range** and **mask** switches together for 5 seconds to enter calibration mode*

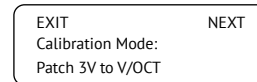


Calibration Procedure

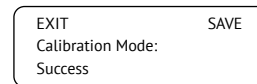
1. Disconnect all CV inputs from the module.
2. Hold the **range** and **mask** switches together for 5 seconds.
3. The OLED display will prompt you to patch a 1V signal into the **v/oct** input. Upon completion, hit 'NEXT' (**mask** switch).



4. The OLED display will then prompt you to patch a 3V signal into the v/oct input. Upon completion, hit 'NEXT' (**mask** switch).



5. '**Calibration Mode: Success**' will then appear on the OLED display. To save your new calibration settings, hit '**SAVE**' (**mask** switch).



N.B. Hit '**EXIT**' at any time to exit calibration mode and return to your previous settings.

Specifications & Firmware Updates

Technical Specifications

Input impedance: 100K ohm

Output impedance: 100 ohm

CV input range: -7V to +7V

V/oct input range: -3V to +7V

Sync input: 2,5V threshold

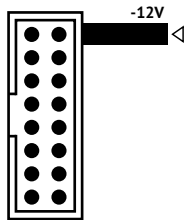
Output range: -5V to +5V,

Module width: 18HP

Power consumption: +135/-15 mA

Module depth: 25mm

Installation: Red stripe on -12V



Firmware Updates

Plume operates on the **Electrosmith Daisy** platform, which uses a web-based programmer found here:

<https://electro-smith.github.io/Programmer/>

An up to date version of the Plume firmware can be found here:

<https://www.hiero-glyphic.com/technical>