# Dizygote - User Manual

## Firmware 0.0.2


### Dictionary

- CV -  control voltage
- FM - frequency modulation
- VOCT - voltage per octave (pitch CV)
- VCA - voltage controlled ampllifier

### Hardware

- 10 HP
- 35 mm deep
- 100 mA +12V
- 40 mA -12V
- 0 mA 5V

### Usage

dizygote is an a-side/b-side digital oscillator with a built-in envelope generator/VCA. the a-side builds harmonies with a square wave and frequency modulation (FM). the b-side distorts a sine wave with phase modulation. both oscillators output in stereo. they can be heard either together or individually based on toggling the module's state.

## Inputs:

Note: CV inputs do NOT have a circle graphics around their hex nuts

- **trig** - button and gate in can be used to trigger the internal envelope. This envelope will be applied to the active oscillator VCA. **Pressing and holding the trig button can be used to switch between a looped envelope state**
- **switch** - button, gate in and two LEDs for toggling between the a and b oscillators. There are three possible states. If the left LED is on, the square wave oscillator will be output, if the right LED is on, the sine wave oscillator will be output, if both LEDs are on both oscillators will output sound. **Pressing and holding the switch button can be used to toggle between mono and stereo states. When in the mono state, oscillator a is output to the left audio output; oscillator b is output to the right audio output. left and right LEDs will flash when the device is in the mono state.**
- **length** - knob and CV in for changing the envelope length. at max length value, the oscillators will continue to play sounds regardless of whether or not the built in envelope is triggered.
- **mod** - knob and CV in for changing the FM (a/left square oscillator) and phase (b/right sine oscillator) modulation amounts
- **mfreq** - knob and CV in for changing the FM (a/left square oscillator) and phase (b/right sine oscillator) modulation frequencies
- **freq** - knob for setting the oscillator frequency
- **v/oct** - voltage per octave CV for modulating the oscillator frequency

## Outputs:

Note: CV outputs have a circle graphic around their hex nuts

- **out l and out r** - audio output
- **env** - CV envelope out based on the module's internal VCA envelope. The width of this envelope should be slightly squeezed; meaning, the peak of this envelope will match the VCA envelope but its total duration will be shorter. It can be delightful to feed this envelope into a filter further down the audio signal path.

# Calibration:

In addition to standard Dizygote firmwares, *-calibrator.bin suffixed firmwares can be used to recalibrate v/oct cv input. To recalibrate your Dizygote, you will need a device or sequencer capable of sending a trigger cv signal as well as v/oct cv signals to your device. Instructions are the following:

- Flash your Dizygote using one of the *-calibrator.bin images

- When powering on your Dizygote, turn all of the knobs to zero (roughly 7 o’clock) and press both buttons. If you have successfully entered calibration mode, all three LEDs will be flashing and no audio will be coming from the device.
- If at any time you feel you have done something incorrectly, pressing the right switch button will cause the device to abort calibration.
- Connect your sequencer’s v/oct and gate signals to the Dizygote’s v/oct and trigger cv jacks.
- Have your sequencer play C notes across different octaves to send -3V to 7V v/oct cv signals. Note, if your device does not support this full range of cv, smaller ranges such as 0V to 5V v/oct signals will suffice.
- After sending multiple trigger + v/oct cv signals to your device, press the left button to complete calibration.

## Additional Resources

https://github.com/rawyawmedia/eurorack/tree/main/firmware