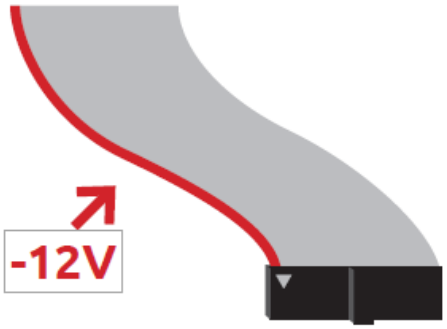
OCTAVES VCO

USER MANUAL

POWERING THE MODULE | THANKS FOR PURCHASING A MODULE FROM BEFACO! BEFORE YOU PLUG THIS MODULE IN...

1. Disconnect your cabinet from the mains.
2. Triple check the power cord polarity. The coloured line on the cable (pin number one) is the -12V rail.
3. If you plug the module backwards you might burn it out and unfortunately this is not covered by the warranty.
4. If you have any questions about this product feel free to contact us support@befaco.org



INTRODUCTION | WHAT IS OCTAVES VCO?

A harsh and funky take of an additive Oscillator. Pile up multiplications of your frequency to get six pulses on consecutive octaves, with common PWM and volume control for each.

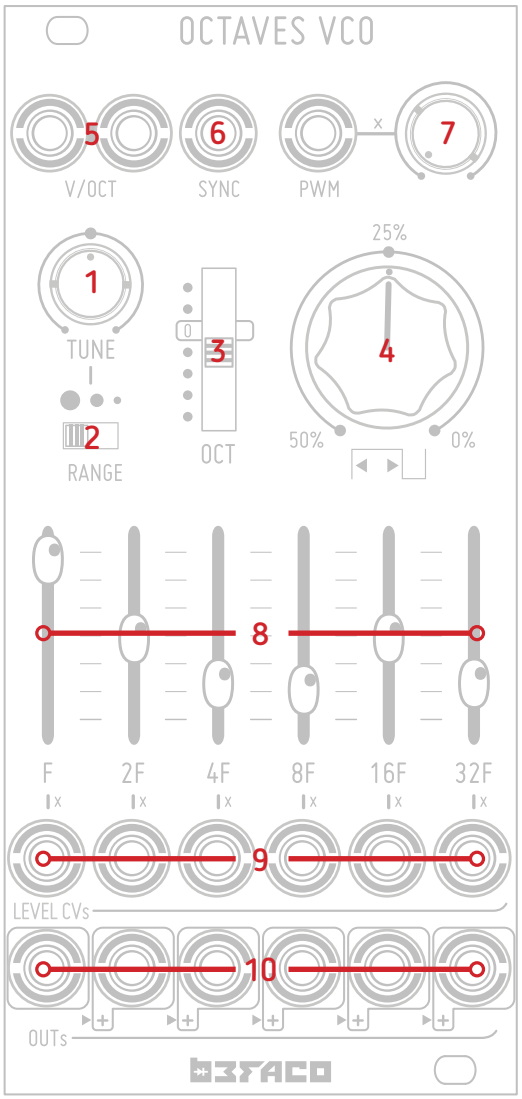
At the core is a triangle oscillator whose frequency is doubled several times to obtain 2x frequency triangles. Then these triangles are passed through comparators to convert them to pulses of variable width.

This octave generation method differs from the classic pulse divider method in two ways:

- Pulse With Modulation on all the resulting pulses. This PWM Is symmetrical, so both flanks of the pulse expand at the same time.
- All octaves are centered on each other so the sum of them always produces symmetrical “castell-like” shapes. This generates a different timbre than the classic divide-down methods where all octaves are summe at 0º phase producing a “staircase-like” wave shape.

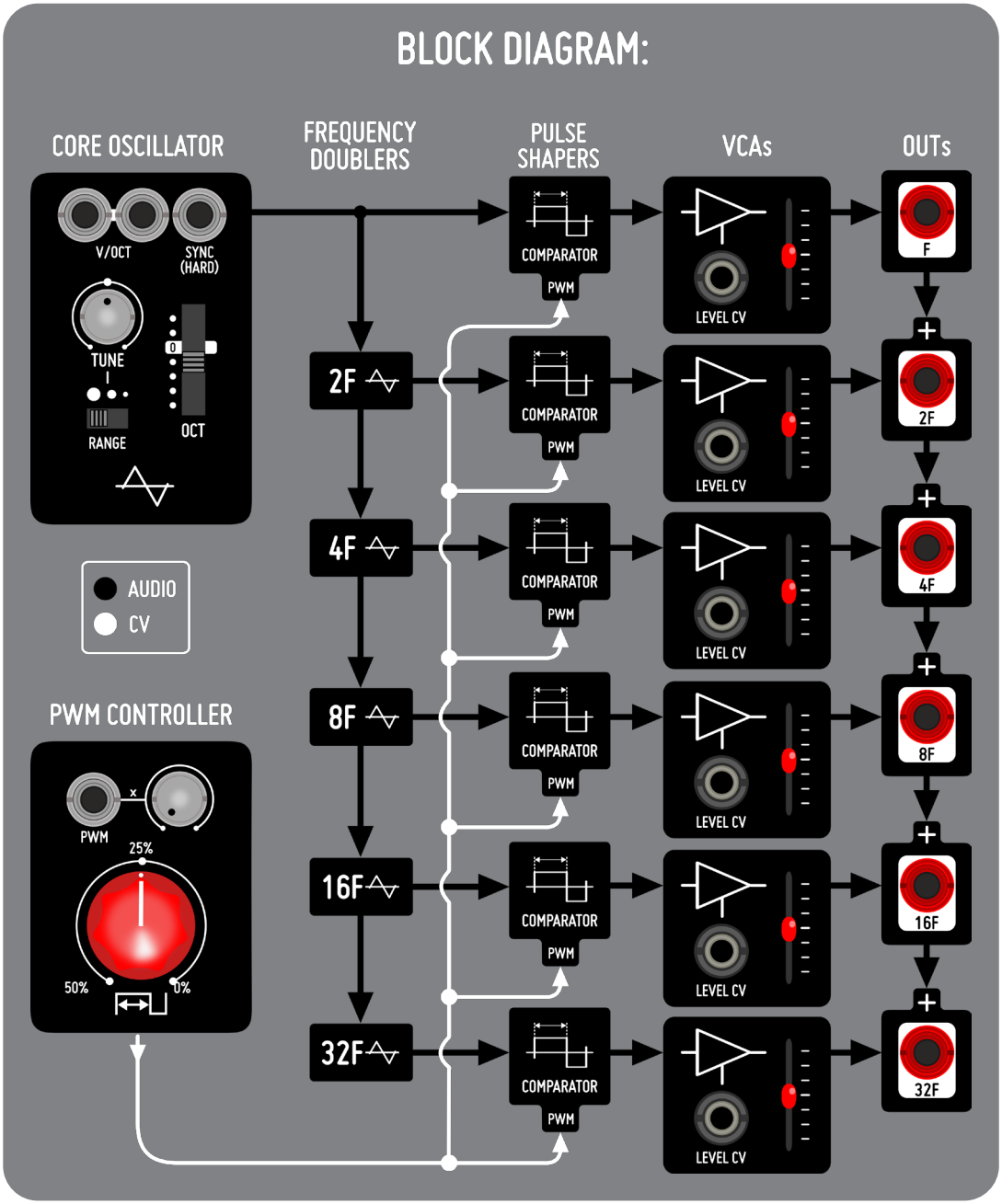
Six VCAs (one for each pulse) let you play with the volume of each octave. This can be done manually or via CV. When a CV is pach to the Volume INs the manual controls become attenuators.

On top of that, octaves VCO has a multi-mix feature. That means each octave is summed in cascade to the next one. You can either have one output with all frequencies or break the chain and get different submixes.



1. **TUNE**
   Sets the pitch of the VCO. C At the center position.
2. **TUNE RANGE**
   Select the precision of the TUNE control [1]. Full range at the left position, one octave at the center, and one semitone at the right position.
3. **OCTAVE SELECTOR**
   Select the base Octave of the core oscillator.
4. **PULSE WIDTH**
   Controls the proportion of the period in which all the pulses are UP or DOWN.
5. **PITCH CV CONTROL**
   "Volt per octave" control voltage INs. Both INs are summed together.
6. **HARD SYNC IN**
   Resets to zero the core oscillator, when a pulse is received (usually from another oscillator), generating extra harmonics.
7. **PWM CV IN & ATTENUATOR**
   CV is passed through the manual attenuator. The resulting CV is added to the PWM MANUAL CONTROL [4]
8. **MANUAL LEVEL CONTROLS**
   Adjust the volume of the OUTs. When a CV is present at the LEVEL CV INs [9] they become attenuators of the incoming voltage.
9. **LEVEL CV INS**
10. **SIGNAL OUTS**
    Output of the different octaves. Each one is summed to the one on the right. When connecting a jack, all the signals from all the jacks that are not connected further to the left come out through it. This makes it possible to have different mixes.

    For example, If only the rightmost jack is connected this jack will act as "Master out" with all the Octaves. Also, If another jack is connected on the third out, you get two mixes; one with the first three and one with the last three.


BLOCK DIAGRAM:
CORE OSCILLATOR
FREQUENCY DOUBLERS
PULSE SHAPERS
VCAs
OUTs
V/OCT
SYNC (HARD)
TUNE
RANGE
OCT
AUDIO
CV
PWM CONTROLLER
PWM
25%
50%
0%
2F
4F
8F
16F
32F
COMPARATOR
PWM
LEVEL CV
F
2F
4F
8F
16F
32F

MISCELLANEA | SPECS AND CREDITS

Size: 12HP

Deeth: 30 mm

+12v: 110 mA

-12v: 84 mA

Designed with care and love by the Befaco Team in Barcelona 2023.