

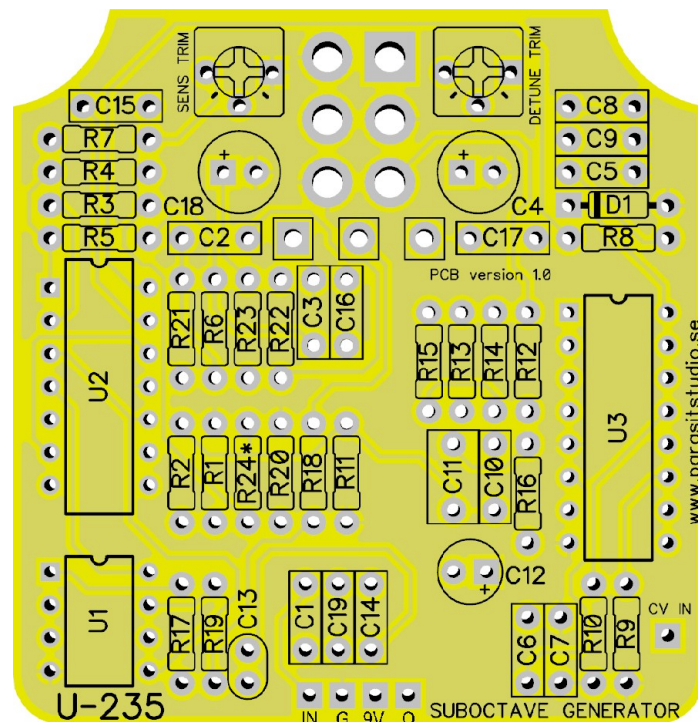
# U-235 Suboctave Generator

**Build Document last updated august 2017**

Version 1.0 2017

The U-235 Suboctave Generator is a clean analog octave down effect based around a Phase Locked Loop chip. It has a couple of features that you normally don't find in an analog octave down pedal, such as a detuned output and a voltage control input.

Happy building and playing!



## **CONTROLS**

LEVEL POTENTIOMETER – Controls how much of the lower octave that you want to blend in with the clean signal.

OCTAVE SWITCH - Toggle between

- One octave down
- Detuned output
- Two octaves down

### **General builds tips**

- Solder the low profile components first, from short to tall height. Recommended order: resistors, diodes, IC socket, film-caps, electrolytics, pots and switches
- CMOS chips are very sensitive to static charges and can be easily damaged. It's a good idea to wear a anti-static wristband or at least avoid wearing a wool jumper and petting your cat/dog while building...
- Always use sockets for IC chips and transistors to avoid heating them directly. It also makes it much easier to swap them out if needed.
- Pay special attention to the orientation of the diodes and electrolytics.
- The square pad represents pin 1 of the pot.
- This PCB's is designed for a 16mm Alpha PCB mounted angled pot. You could also use solder lug type and just tack some "legs" with short pieces of wire to the pot to mimic a PCB mount type.
- Mount the pot, switch to the back side (solder side) of the PCB and solder them from the front side (component side).

### **Wiring**

For more info on how to wire up the stompswitch, jacks ect, please visit the Parasit Studio website and download the PDF called "offboard wiring". You can find it here:

<http://www.parasitstudio.se/build-docs.html>

## U-235 Bill Of Materials (BOM)

Resistors		Capacitors		IC's	
R1	1M	C1	100nF	U1	TL072
R2	1M	C2	2.2nF	U2	TL074
R3	10K	C3	10nF	U3	CD4046BE
R4	470K	C4	100uF	<b>Potentiometer</b> LEVEL C100K  SENS TRIM 1M DETUNE TRIM 20K	
R5	22K	C5	4.7nF		
R6	330K	C6	33nF		
R7	330K	C7	100nF		
R8	10K	C8	10nF		
R9	10K	C9	22nF	<b>Switch</b> OCTAVE DPDT on/off/on	
R10	10K	C10	100nF		
R11	10K	C11	220nF		
R12	100K	C12	10uF		
R13	100K	C13	470pF		
R14	100K	C14	100nF		
R15	100K	C15	10nF		
R16	22K	C16	1nF		
R17	100K	C17	100nF		
R18	4.7K	C18	100uF		
R19	100K	C19	100nF		
R20	100K	<b>Diodes</b> D1 1N5817			
R21	330K				
R22	39K				
R23	10K				
R24	4.7K				

*Nevermind the asterix behind R24 on the PCB. It was a prototype note that I forgot to remove on the manufactured board. Ops!*

### Other things not included in the BOM but good to have:

bypass LED and Current Limiting Resistor (these have to be mounted off-board) enclosure, input and output jacks, DC jack, led bezels, 3PDT switch and knobs.

### **Building tip**

It's important to keep the input and output wires as short as possible. Don't run wires underneath or over the board. There's high amplitude square waves going on inside the circuit and it can easily bleed into the clean signalpath, making it sound less clean than it's supposed to be. So just keep that in mind.

### **Trimmers**

- SENS (sensitivity) trimmer  
Adjust this trimmer to set the touch sensitivity/sustain/gating of the octave down from very sensitive and glitchy to more gated and controlled
- DETUNE trimmer  
Set the octave switch in the middle position and adjust this trimmer for a detuned output, in between one and two octaves down.

### **CV input (optional)**

The CV input lets you hook up an external Low Frequency Square Wave Oscillator (LFO) that will modulate the output and make it alternate between different octaves (depending on the octave switch setting).

It works well with a wide range of voltages:

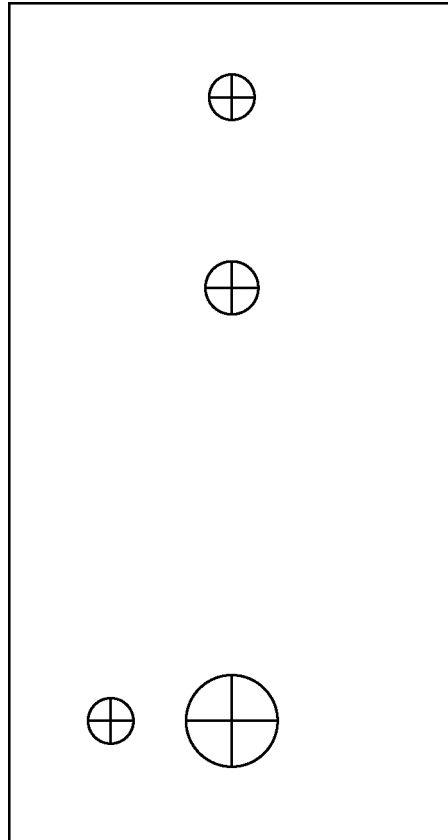
- Minimum voltage range: 1.4 volts peak to peak
- Maximum voltage range: 12 volts peak to peak

So try connecting the LFO output from a synthesizer, modular system or the Parasit Studio New Wave CV Generator.

### **CV jack Wiring**

To hook up the CV (control voltage) input jack, connect the CV pad on the PCB to the tip of a 3.5mm jack (or jack of your choice). Make sure that the sleeve of your jack is connected to ground (it usually is connected to ground via the enclosure unless you have an isolated jack type). If you use a stereo/balanced jack, just leave the ring lug unconnected.

## Drilling template (1590B)



- This template is approximate. Use at your own risk!
- Make sure your printer isn't doing any scaling / is set to 100% print size.
- Drill the DC jack and input/output jacks to your own preference.
- **Measure and confirm before drilling!**

## **Troubleshooting**

There's always a chance of running into trouble. To minimize error, follow the BOM and general building tips carefully. Take your time and don't rush. Take a break now and then. Use good solder, and it helps to have a decent soldering station insted of a cheap iron.

## **Musikding DIY kit**

If you have bought the Musikding DIY kit and have recieved a faulty faulty, incorrect or missing component, please contact musikding.

[Contact us](#)

## **Smallbear Electronics / Synthcube DIY kit**

If you have bought the Smallbear Electronics DIY kit and got a faulty, incorrect or missing component, please contact Smallbear Electronics.

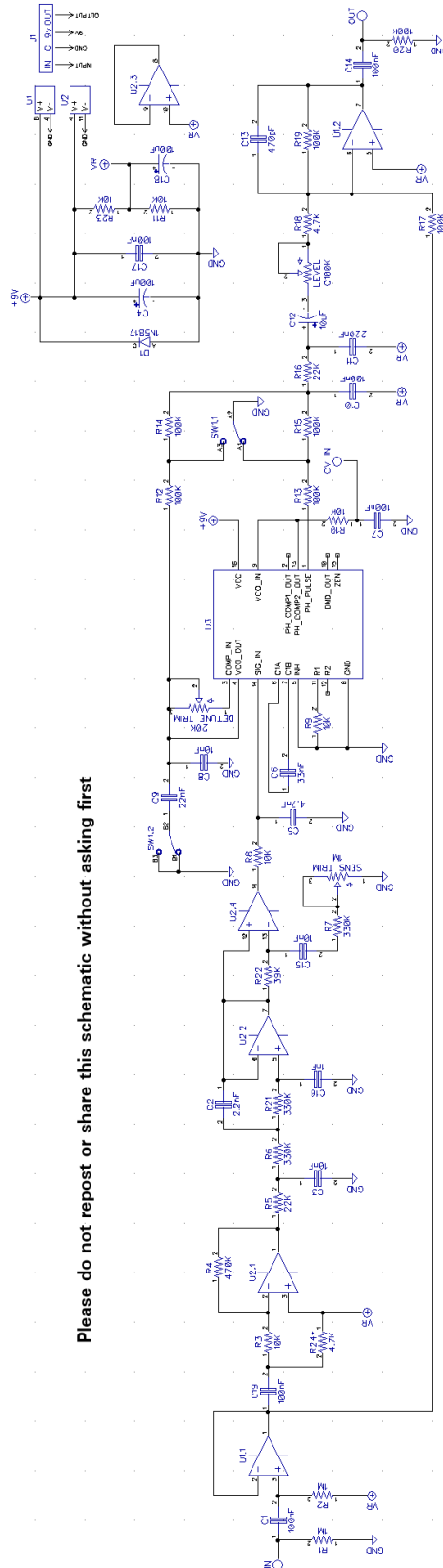
[smallbearelec@synthcube.com](mailto:smallbearelec@synthcube.com)

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# Schematic



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