

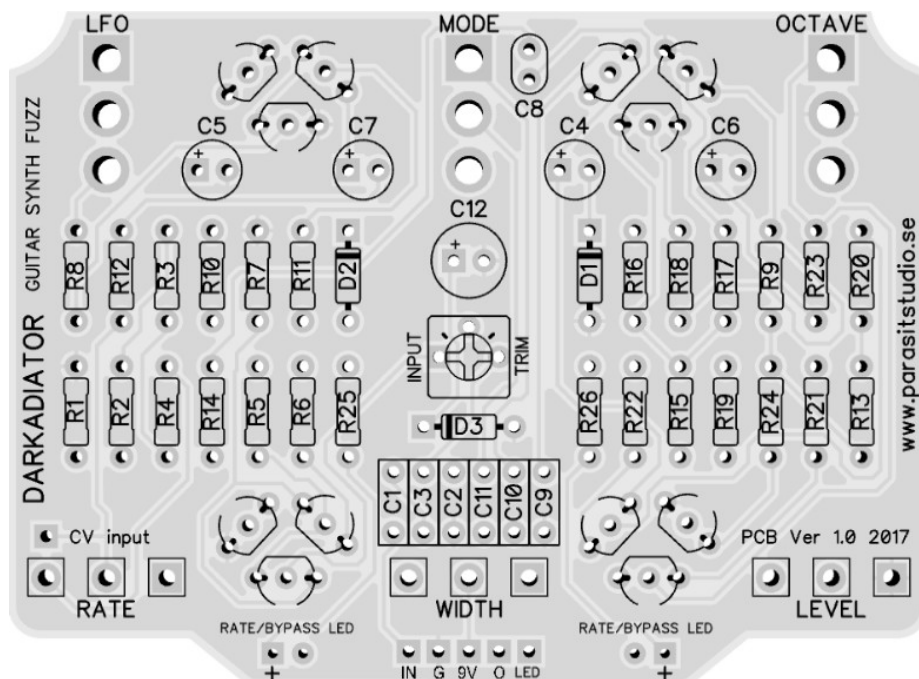
THE DARKADIATOR

Build Document last updated march 2025
for PCB version 1.0

The Darkadiator is a transistor based (discrete) synthy 8-bit sounding square wave fuzz that can do octave down, pulse width modulation and alternating octaves or stutter.

This circuit works best with high output pickups. It is a gated circuit by nature of the square wave. If you are using single coils and need more sustain, try a boost or compressor in front. To improve tracking of the octave down, use your neck pickup with the tone rolled off.

Happy playing!



Controls

SWITCHES

- LFO: Turns the LFO on or off
- MODE: Toggles between pulse width modulation or lowpass filter
- OCTAVE:
 - Up position – One octave down
 - Middle position – Fuzz and octaves down blended equally
 - Down position – Straight square wave fuzz

POTENTIOMETERS

- RATE: Controls the rate of the LFO / alternating octaves modulation
- WIDTH: Controls the pulse width or the cutoff of the lowpass filter, depending on the octave switch position
- VOLUME: Controls the overall volume

TRIMMER

The PCB mounted trimmer sets the input sensitivity. Touch the strings while adjusting the trimmer until you have the most amount of string noise.

CV INPUT (optional)

Controls the rate of the LFO. It's not very useful in this circuit IMO, but I added it since it doesn't require any extra components to the PCB in this case.

General builds tips

- Solder the low profile components first, from short to tall height. Recommended order: resistors, diodes, transistors, film-caps, electrolytics.
- Pay special attention to the orientation of the diodes and electrolytics.
- When mounting the PCB inside the enclosure, place the switches and pots in the PCB without soldering first, then place them in your drilled enclosure. Gently tighten the nuts to the enclosure, then solder last. It will make it easier to put the PCB inside the enclosure without putting too much stress on the pots and switches.
- This PCB's is designed for 16mm Alpha PCB mounted angled pots. You could also use solder lug type and just tack some "legs" with short pieces of wire to each pot to mimic a PCB mount type. The square pad represents pin 1 of each pot.
- Make sure that the backside of your pots are covered so they don't short anything on the PCB. If you not have pot covers I recommend pvc electrical tape.

I recommend that you use a socket (SIF socket cut down to 3 pins) on at least one of the transistors – see the troubleshooting page for more info about this transistor placement.

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:

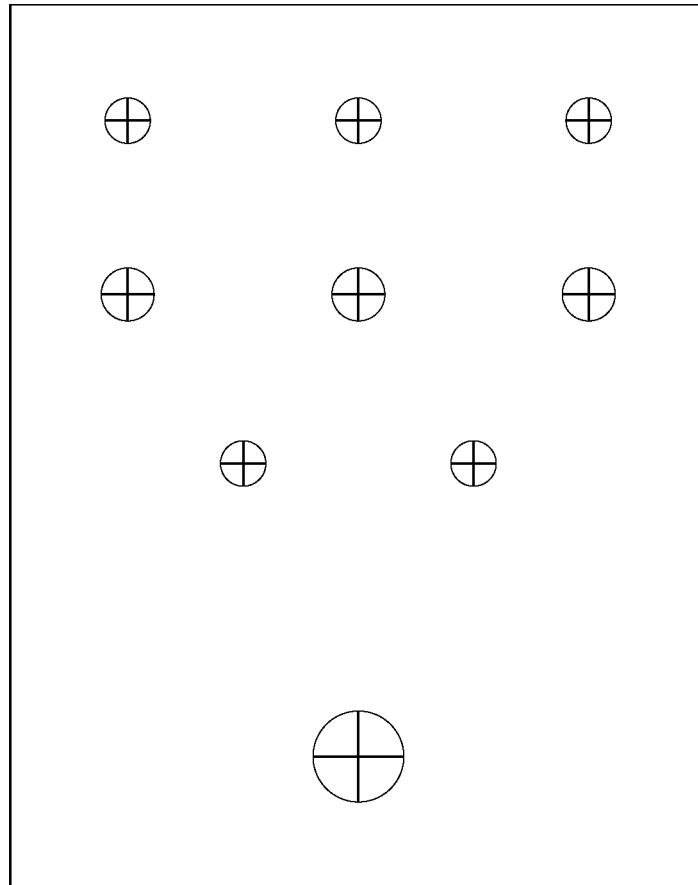
<http://www.parasitstudio.se/build-docs.html>

The Darkadiator 1.0 Bill Of Materials (BOM)

Resistors		R20	100K	Transistors			
R1	2.2M	R21	10K	Q1-Q12	2N3904 (x12)		
R2	470K	R22	10K	Diodes			
R3	470K	R23	100K				
R4	10K	R24	10K				
R5	10K	R25	15K*				
R6	10K	R26	15K*	D1	1N4148		
R7	330R	Capacitors		D2	1N4148		
R8	100K			C1	100nF	D3	1N4007
R9	1K			C2	100nF	2x LED's (rate/bypass)	
R10	1K			C3	1nF	Potentiometers	
R11	10K	C4	2.2uF	WIDTH	C250K		
R12	10K	C5	1uF	RATE	B25K		
R13	1K	C6	10uF	VOLUME	A100K		
R14	100K	C7	10uF	Trimmer	1M		
R15	100K	C8	100pF	Switches			
R16	1K	C9	10nF			OCTAVE	SPDT on/off/on
R17	10K	C10	100nF			MODE	SPDT on/on
R18	10K	C11	100nF			LFO	SPDT on/on
R19	47K	C12	100uF				

- * Current Limiting Resistors for the bypass/rate indicator LED's. Use the appropriate value for your LED type.
- The board mounted LED's works as both bypass indicators and LFO rate indicator LED's, as the LED's only blinks when playing and stays lit otherwise when the pedal is engaged, and off when disengaged.
- The "LED" hole (next to the output connection hole) should be connected to the ground for LED bypass on your stompswitch (if not using the optional 3PDT board).
- Other things that are not included in the BOM but good to have: enclosure, input and output jacks, DC jack, stomp switch, led bezel and knobs. A 3.5mm jack (or any type jack of your choice) will also be needed if you are doing the CV input mod.

Drilling template (1590BB)



- Use at your own risk! This template is approximate.
- Make sure your printer isn't doing any scaling / is set to 100% print size.
- Drill footswitch, DC jack and input/output jacks to your own preference.
- **Measure and confirm before drilling!**
- Read the build tips section highlighted in red before soldering pots and switches to the PCB.

OPTIONAL MODS

CV input

The optional CV input mod will control the rate of the LFO. To wire up the CV input jack, connect the CV in pad on the board to the tip of a jack (I prefer a 3.5mm jack, but it can be any type depending on which type of equipment that you want to interface with). Make sure the sleeve of the jack is connected to ground (it usually is through the enclosure, unless you use a isolated jack type). If you use a TRS/balanced jack, just leave the ring lug unconnected.

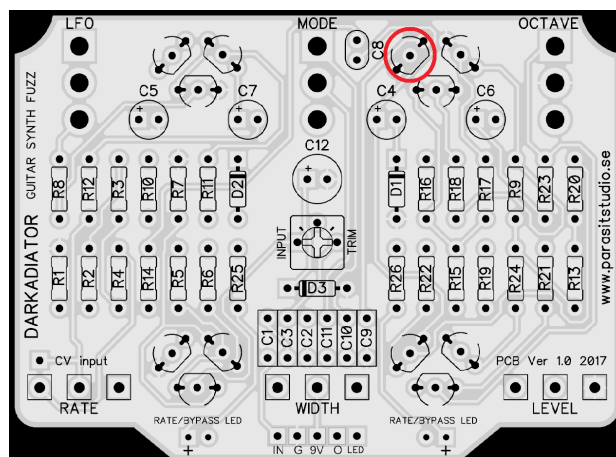
Troubleshooting

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.

No octave down?

A common issue with this build is that the octave down section isn't working. That is because of one of the transistors needs to be in a certain hfe range to work properly and there's alot of variety with the 2N3904. That's why I recommend socketing it, so you can try swapping it out with another 2N2904 if needed. You can also replace it with a 2N2222 transistor (it has the same pinout).

This is the transistor:



Musikding DIY kit

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

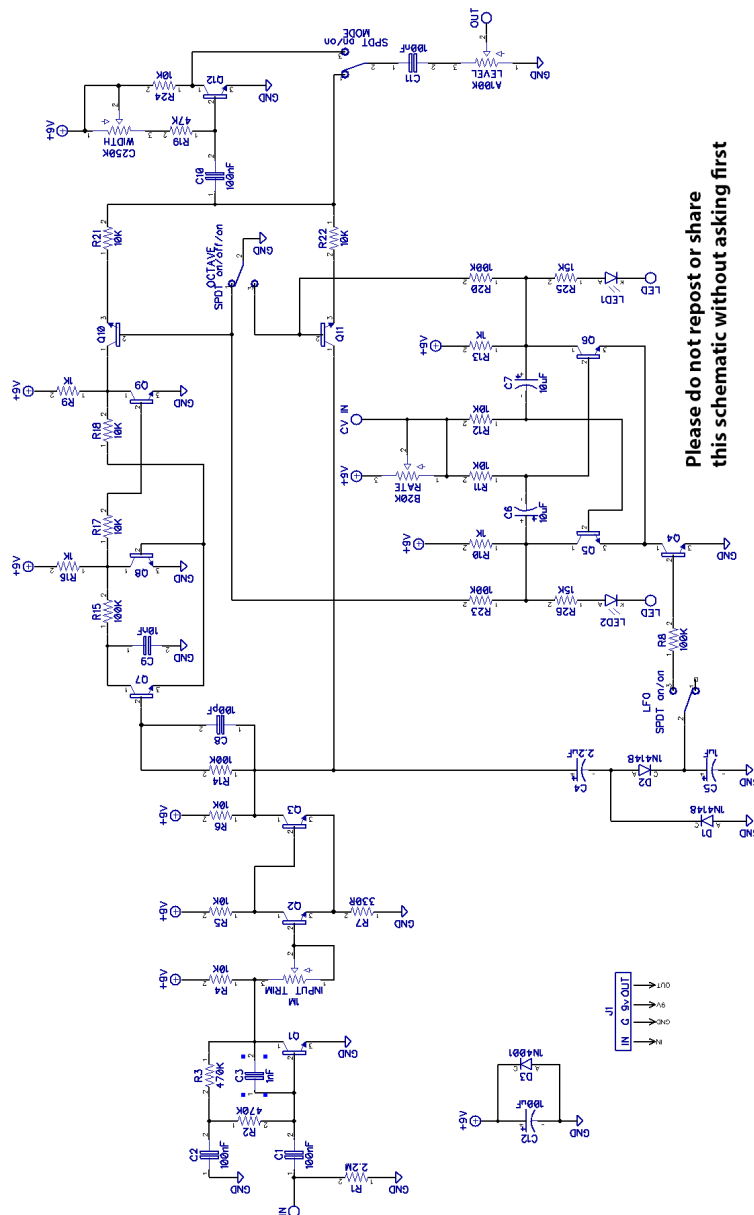
[Contact us](#)

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

Schematic



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