

INTO THE UNKNOWN

Build Document last updated january 2018

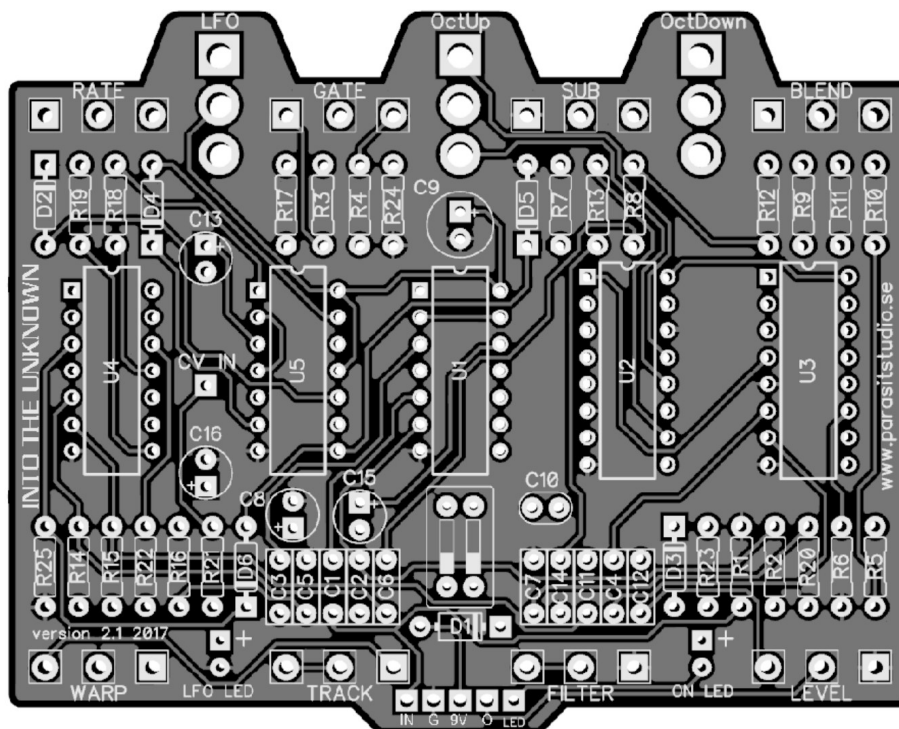
Version 2.1 2017/2018

Into the Unknown Guitar Synthesizer Deluxe is a CMOS based fuzz centered around the CD4046 PLL (phase locked loop) chip and a CD4015 shift register chip.

It can do brutal fuzz, octave down and octave up, self oscillations, theremin sounds, flanger'ish modulation and more!

This circuit works best with high output pickups. It is a gated circuit by nature of the CMOS logic. 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!



Changelog Version 2.1

- The 2.1 version has a different component placement layout on the PCB (the BOM is still the same) for allow for a faster build.
- ENV output removed

Changelog version 2.0

- The LFO now turns completely off in the middle position to avoid ticking when not using the LFO.
- LFO gate added (optional). This will make the LFO turn on or off depending on the input signal. It can be switched in/out with the board mounted DIP switches.
- Direction of the gate and filter pots are reversed, so that it will be easier to reset the pedal by turning all knobs counter-clockwise.
- CV input and ENV output added for future mod possibilites.

Note: The 2.0 PCB is compatible with the old PCB in terms of pots and switch placement, so it can be a drop in replacement for for the old board (for anyone that had trouble with ticking).

CONTROLS

KNOBS

MIX - Blends between fuzz and octave up. Goes from straight square wave fuzz to octave up or blend between both. *Only the octave up is affected by the warp, track and LFO.*

SUB - Controls the amount of octave down added to the signal.

GATE - Controls the input sensitivity. From very glitchy to gated and controlled. Turned all the way down (CCW) the circuit will oscillate by itself. Play around with the track, warp, lfo controls and your guitar knobs to change the sound and behaviour of the oscillation (*works best with the pedal directly after your guitar*).

RATE - Controls the speed of the LFO. *The modulation only affects the octave up.*

LEVEL - Controls the overall output volume.

FILTER - Controls the cutoff frequency of the resonant lowpass filter. Turn it counter-clockwise to cut out the high end or sweep it manually up and down for a cool effect.

TRACK - Controls the speed of the octave up tracking.

WARP - I don't know how to describe this control... It's interactive with the track control and has a strong effect on the character of the modulation. Turn up both Track and Warp for Theremin sounds!

SWITCHES

OctD - Toggle between one or two octaves down

OctU - Toggle between one or two octave up

LFO - Triangle wave mode (up), Off (middle) or Square wave mode (down)

[Tweak the knobs and venture Into the Unknown!](#)

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 each pot.
- **There are a LOT of switches and pots on this PCB. Be sure to place them in the PCB without soldering first, THEN place them in your drilled enclosure. Gently tighten the nuts to the enclosure, then solder LAST. Otherwise, it will be really hard to get this in your enclosure.**
- This PCB's is designed for 16mm Alpha PCB mounted angeled 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. Again, it is a very good idea to drill holes in your enclosure first, and mount the pots with the nuts BEFORE soldering the pots to the PCB. This ensures you won't put a lot of stress on the PCB.
- Mount the pots, switches and LED's 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>

Into The Unknown Bill Of Materials (BOM)

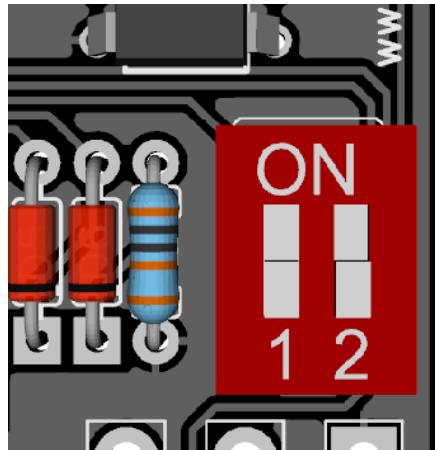
Resistors		Capacitors		IC's			
R1	1M	C1	100nF	IC1	CD4069UBE		
R2	1M	C2	4.7nF	IC2	CD4015BE		
R3	2.2M	C3	100nF	IC3	CD4046BE		
R4	1M	C4	33nF	IC4	CD4069UBE		
R5	10K	C5	4.7nF	U5	CD4066BE		
R6	10K	C6	100nF	Potentiometers			
R7	68K	C7	100nF				
R8	470K	C8	2.2uF			GATE	C250K
R9	100K	C9	100uF			MIX	B50K
R10	100K	C10	220pF			SUB	B50K
R11	47K	C11	6.8nF			RATE	C50K
R12	47K	C12	100nF			FILTER	A50K
R13	100K	C13	22uF			LEVEL	A100K
R14	220K	C14	2.2nF			TRACK	A500K
R15	220K	C15	2.2uF			WARP	C10K
R16	10K	C16	1uF	Switches			
R17	470K	Diodes					
R18	1M	D1	1N4001			OctDown	SPDT on/on
R19	2.2K	D2	1N4148			OctUp	SPDT on/on
R20*	4.7K-22K	D3	1N4148			LFO	SPDT on/off/on
R21	10K	D4	1N4148			Optional DIP SWITCH:	
R22*	4.7K-22K	D5	1N4148			2 positions	
R23	100K	D6	1N4148			(2 switches, 4 pins)	
R24	100K						
R25	47K					2x LED's	

- This PCB is designed for two board mounted LED's, one for bypass indication and one LFO rate indicator.
- * These are current limiting resistors for the LED's. Use the appropriate value for your LED type.
- The "LED" hole (next to the output connection hole) should be connected to the ground for LED bypass on your stompswitch.

Other things not included in the BOM but good to have:
enclosure, input and output jacks, DC jack, led bezels, 3PDT switch and knobs.

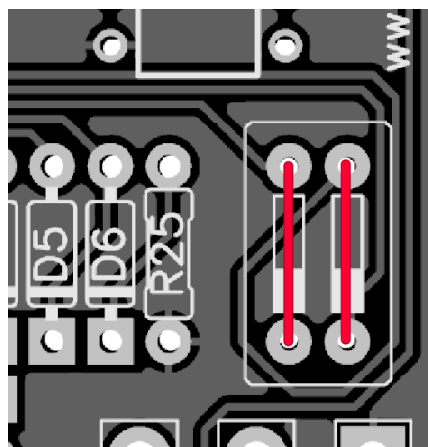
The LFO gate

The 2.0 version PCB has a LFO gate feature added (similar to the Arcadiator). It turns the LFO off completely when there is no input signal, so it stays quiet when not playing. The self oscillation from turning up the gate pot will also turn on the LFO.



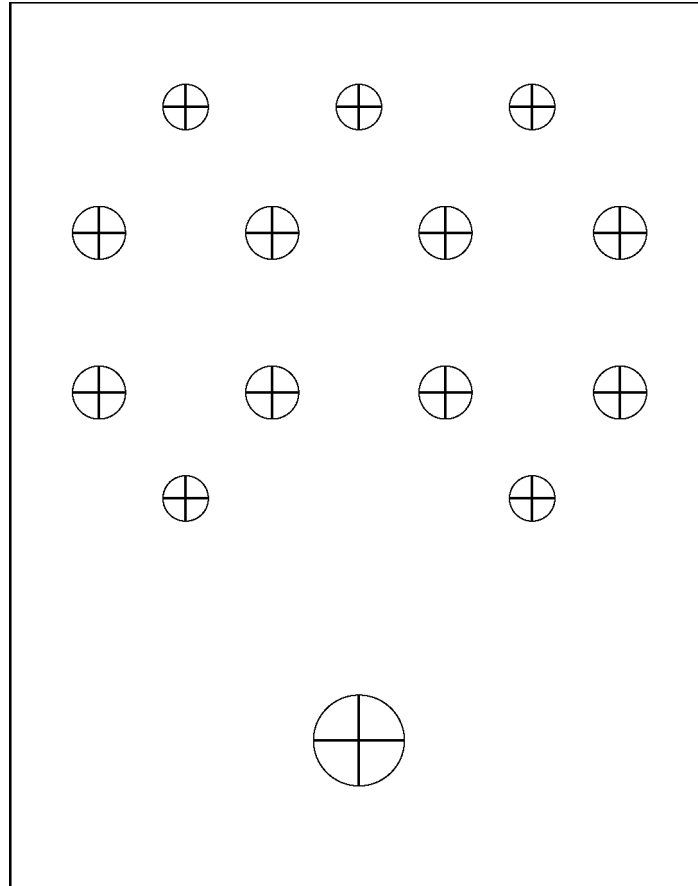
To enable or disable the gate, just turn both dip switches on or off.

If you don't have a DIP switch you can either just link the pads to have the gate on at all times, or just leave the pads unlinked for a free running LFO (just like the 1.0 version PCB). I suggest leaving the pads unlinked unless you are having an issue with ticking. Then add the links.



Link the upper and lower pads to have the LFO gate engaged at all times, or just leave it unlinked for a free running LFO.

Drilling template (1590BB)



- 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 DC jack and input/output jacks to your own preference.
- *I measured 20mm from the edge of the enclosure to the center of the input jack and 37mm from the edge of the enclosure to the center of the DC jack (on the right side, left side when you have the enclosure upside down).*
- **Measure and confirm before drilling!**
- Read the build tips section highlighted in red before soldering pots and switches to the PCB.

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 instead of a cheap iron.

If you are still having trouble, please visit the madbean forum Parasit Studio subforum section and ask for help there.

<http://www.madbeanpedals.com/forum/index.php?board=84.0>

If you have bought the Musikding kit and have received a faulty or missing component, please contact musikding directly.

<https://www.musikding.de/kontakt.php?lang=eng>

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Schematic

