

GOD CITY INSTRUMENTS – Hannibal V1.3 Build guide

The God City Instruments (GCI) Hannibal is an overdrive pedal derived from the GCI Riffchild. Experienced builders will recognize the topology as a negative feedback op amp clipper, arguably the most common type of circuit used in overdrive pedals. Despite being fairly common, it's a simple, excellent sounding, highly customizable circuit. This PCB has been designed to be an easy build with minimum components, yet still offer the builder enough flexibility to tailor the tone to their own tastes.

Regarding the "Low" knob, this pot controls how much bass is allowed into the overdrive section, but it also has an influence on gain. As more bass is allowed into the circuit, the amount of gain is reduced. If this is undesirable, jumper pins 1 and 2 of the low pot, omit the pot, and adjust R7 and C5 for desired bass and gain response. 1.2k and 0.22u is a good place to start. C5 could even be replaced with a DPDT on/on/on for 3 cap values.

If a clipping diode switch is desired, omit D2 and D3 and run wires from the D1 position to a switch for off-board clipping diode options.

This pedal is an easy build, but this guide is intended for people who have some experience building pedals. Component sourcing, component identification, assembly techniques, wiring stomp switches, etc. is not covered. The GCI Brutalist Jr. assembly guide has helpful information for less experienced builders. That guide can be found here:

<http://www.kurtballou.com/brutalistjr/>

For your convenience, complete parts kits including everything you need except the PCB can be purchased through Small Bear Electronics. Be wary that they may need to make substitutions for work-alike components which may or may not influence the tone of the pedal. Be aware that transistors may have been substituted for work-alikes with different pinouts.

<http://smallbear-electronics.mybigcommerce.com/kit-hannibal-pcb-not-included/>

Available separately is the GCI 3PDT utility PCB for PCB pin 3PDT footswitches. This PCB makes footswitch wiring quick and easy. Not compatible with solder lug style switches.

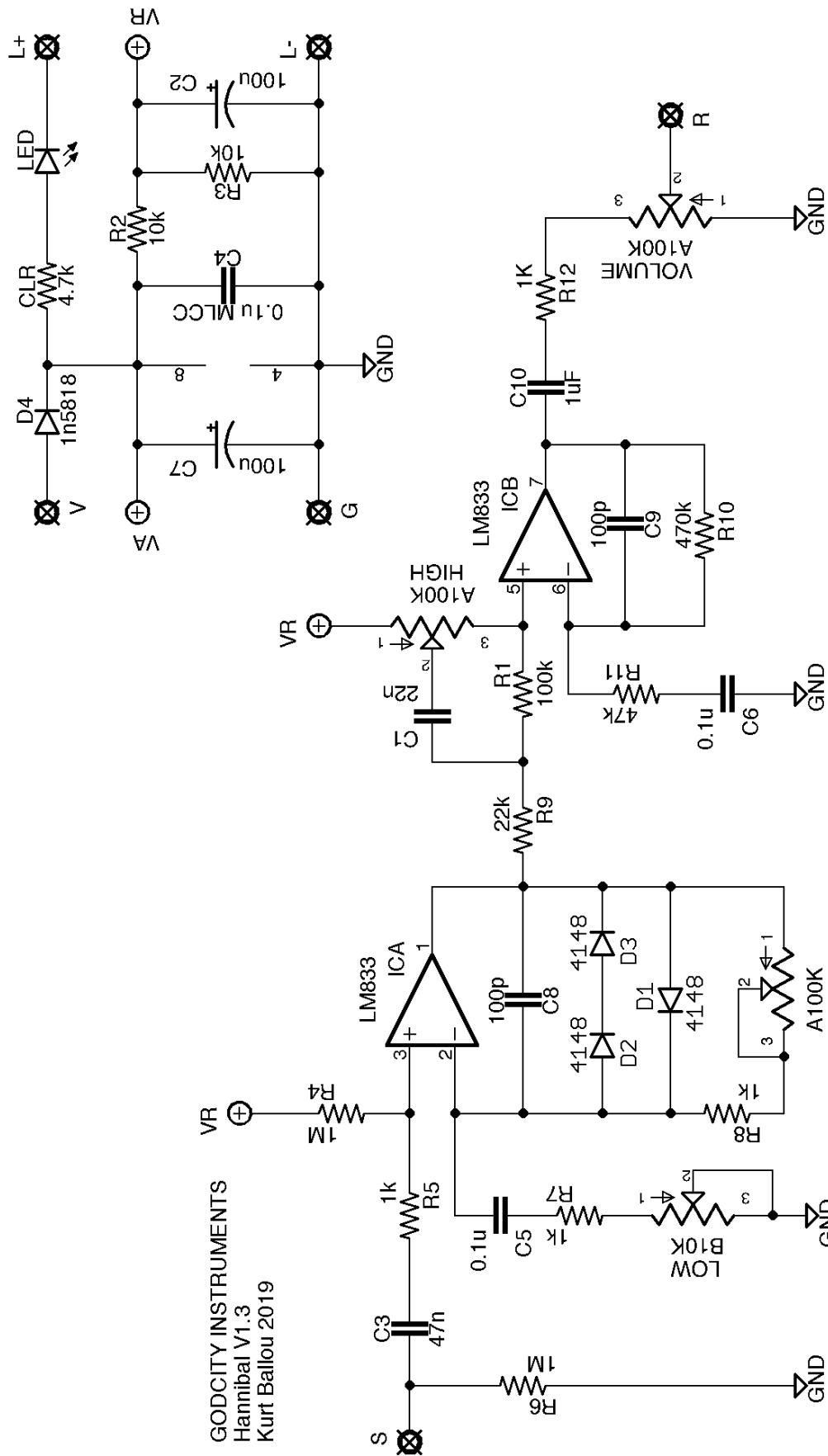
Don't forget to connect the ground pad of the PCB to the ground lug of the input, output, and DC power jacks!

Due to the scope of this project, technical support is not available. However, consider joining the GCI DIY PCB Builders group on Facebook to get advice from and share your work with other builders. We require that all group members agree to the rules before being accepted into the group.

<https://www.facebook.com/groups/2454786551255317/>

Component values for the PCB as well as some alternate values are listed below. This is a BOM for the PCB only. Resistors and diodes are 6.3mm leg spacing, film and ceramic capacitors are 5.08mm leg spacing, and electrolytic capacitors are 2.54mm leg spacing. I/O jacks, DC jack, switch, enclosure, and knobs are not listed. The schematic and a drill template for a 125B (1590N1) sized enclosure are also attached.

Part	Value	Description	Subsitute	Substitution Notes
C1	22n	film cap		
C2	100u	electrolytic cap	47u-220u	power filter cap
C3	47n	film cap	10n-100n	input cap
C4	0.1u MLCC	ceramic cap		
C5	0.1u	film cap	47n-330n	forms a HPF with R7 and Low pot
C6	0.1u	film cap	47n-330n	forms a HPF with R11
C7	100u	electrolytic cap	47u-220u	power filter cap
C8	100p	ceramic cap	47p-1n	LPF for first gain stage
C9	100p	ceramic cap	47p-1n	LPF for second gain stage
C10	1uF	film cap		
D1	1n4148	Si diode	1n456a, 1n34a, LED, zener, etc	clipping diodes
D2	1n4148	Si diode	1n456a, 1n34a, LED, zener, etc	clipping diodes
D3	1n4148	Si diode	1n456a, 1n34a, LED, zener, etc	clipping diodes
D4	1n5818	Schottky diode	1n5817, 1n4001, bat41, etc	any suitable polarity protection diode for 9v
LED	L1	LED		
IC	LM833	OP AMP	TL072, MC1458, RC4558, etc	any pin compatible op amp. Install an IC socket for easy swaps
CLR	4.7k	1/4 watt resistor	1k-10k	current limiting resistor for LED
R1	100k	1/4 watt resistor		
R2	10k	1/4 watt resistor		
R3	10k	1/4 watt resistor		
R4	1M	1/4 watt resistor	2.2M	pull down resistor
R5	1k	1/4 watt resistor		
R6	1M	1/4 watt resistor		
R7	1k	1/4 watt resistor	100R-10k	forms HPF with C5 and Low pot
R8	1k	1/4 watt resistor	1k-47k	sets minimum gain
R9	22k	1/4 watt resistor		
R10	470k	1/4 watt resistor	100k-1M	sets gain of second op amp stage
R11	47k	1/4 watt resistor	10k-100k	sets gain of second op amp stage and forms HPF with C6
R12	1K	1/4 watt resistor	1k--10k	sets maximum output volume
VOLUME	A100K	16mm pot	A50k	
GAIN	A100K	16mm pot	A50k-A250k	sets gain of first op amp stage
HIGH	A100K	16mm pot		
LOW	B10K	16mm pot		
S	PAD	send to PCB		
L+	PAD	LED+		
L-	PAD	LED-		
R	PAD	return from PCB		
V	PAD	9V input		
G	PAD	ground		



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