

# DOUBLE FLUSH



## FX TYPE: TREMOLO

Based on the Bajaman Trembulator  
PCB artwork ©2011 madbeanpedals  
Release date: 06.01.11

The **Double Flush** Tremolo is based on Bajaman's Trembulator, with additional mods suggested at [www.freestompboxes.org](http://www.freestompboxes.org). Additional enhancements have been made to add more gain to the effect, increase the usable range of the speed control, add better balance between the mixed and straight signals, as well as other minor changes. This version also allows the use of PCB-mounted pots.

## Controls

**BALANCE:** This controls the mix between effect and guitar signals.

**INTENSITY:** This controls how hard the LED is driven. Turning up the control increases the intensity of tremolo.

**PULSE:** The controls the rate of the LFO. There is a wide range of slow to fast, with the maximum range stopping just before the tremolo becomes un-useable.

**VOLUME:** The overall output. Note that changing the Balance control may require some changes in the Volume control to preserve the overall output. There is enough gain in the circuit to maintain or exceed the bypass signal.

## Build Notes

The **Double Flush** uses an LED/LDR (or Vactrol) to achieve the tremolo effect, and is driven by an LFO. While the schematic lists a VTL5C1, there is little reason to justify the expense of this component as you can easily make your own. A number of LED/LDR combinations will suffice. Suggestions are 5mm diffused red or clear, or similar. For the LDR, you can get by fine with the cheap Radio Shack ones. If you would like something more precise, try the 9203 photocell at smallbear: <http://www.smallbearelec.com/Detail.bok?no=711>

If making your own LED/LDR you can enclose it in black tape or heat shrink, but this may not be necessary. You will need to provide some light blocking when testing the effect outside an enclosure, however. In my case, I tested it in low light conditions and put a small piece of tape over the LED and LDR temporarily.

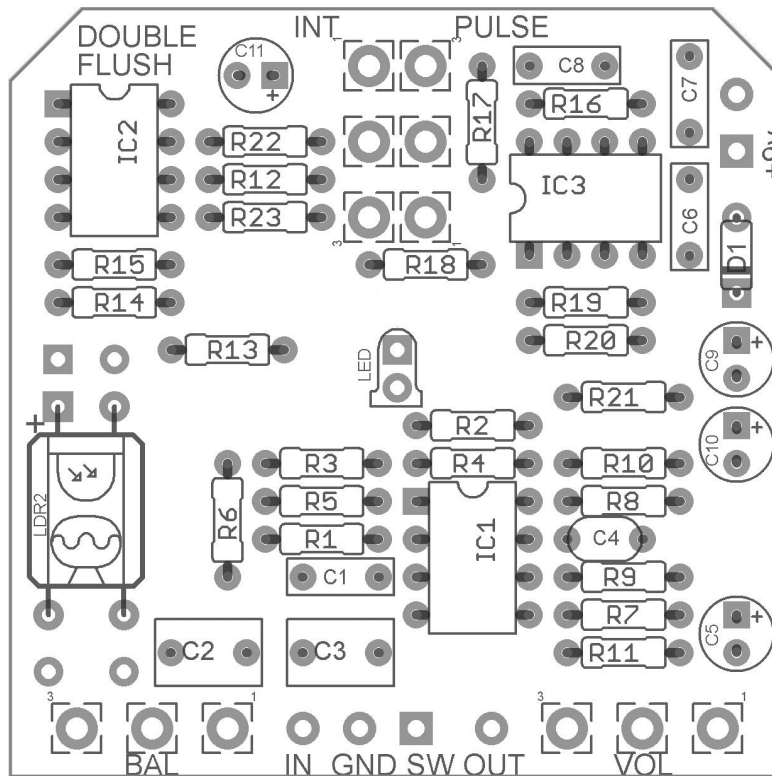
Note that your LED indicator will flash in time with the PULSE setting. This will shut off when the effect is bypassed, but the actual LED/LDR combo will not: it will flash as long as power is connected.

You may use different substitutes for the ICs. The TL062 was chosen for the LFO due to low noise and power consumption. You can also substitute a TL072 for the JRC4558 and TL071 for the LF351.

You can use 16mm short pin PCB mounted pots for the double sided version. The LED is also center mounted on the board for convenience. <http://www.smallbearelec.com/Detail.bok?no=692>

## LAYOUT DIAGRAM

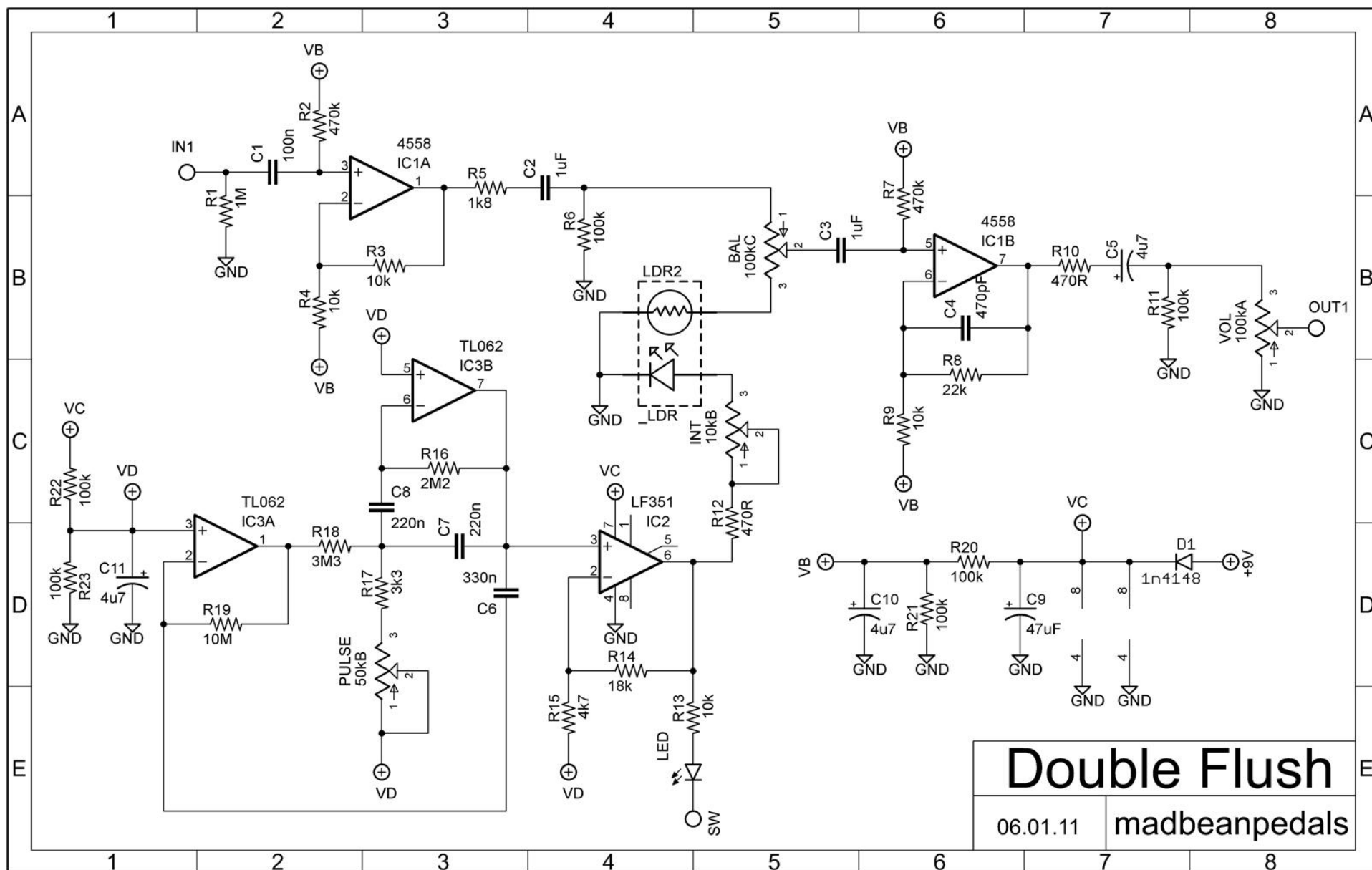
2.06" W x 2.025" H



This PCB will fit in a 1590B enclosure (battery may be difficult to fit)

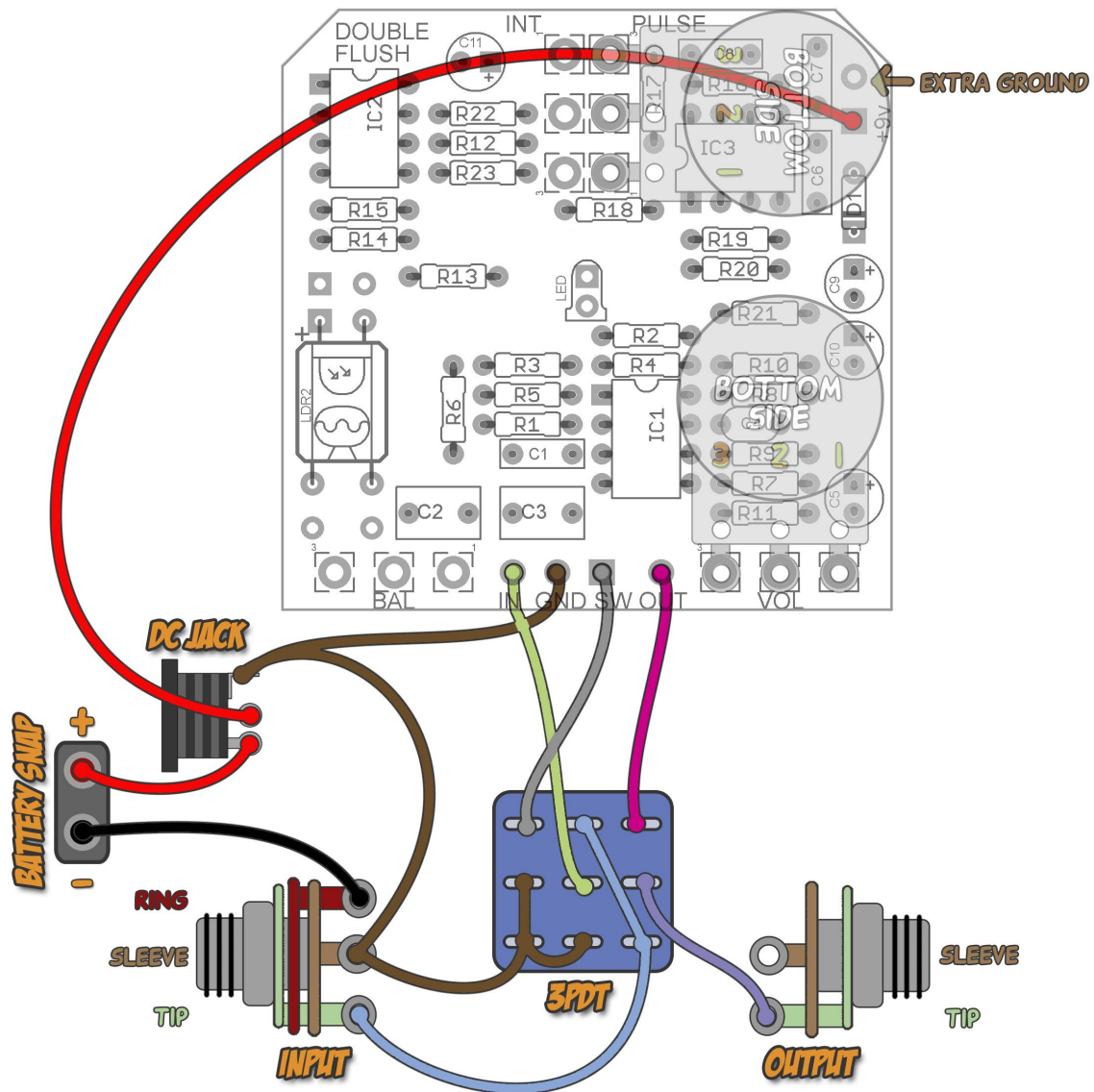
## BILL OF MATERIALS

Resistors		Resistors		Caps		Diodes	
R1	1M	R13	10k	C1	100n	D1	1n4148
R2	470k	R14	18k	C2	1uF	<b>IC</b>	
R3	10k	R15	4k7	C3	1uF	IC1	JRC4558
R4	10k	R16	2M2	C4	470pF	IC2	LF351
R5	1k8	R17	3k3	C5	4u7	IC3	TL062
R6	100k	R18	3M3	C6	330n	<b>Pots</b>	
R7	470k	R19	10M	C7	220n	INT	10kB
R8	22k	R20	100k	C8	220n	BAL	100kC
R9	10k	R21	100k	C9	47uF	PULSE	50kB
R10	470R	R22	100k	C10	4u7	VOL	100kA
R11	100k	R23	100k	C11	4u7		
R12	470R	LDR	VTL5C1				

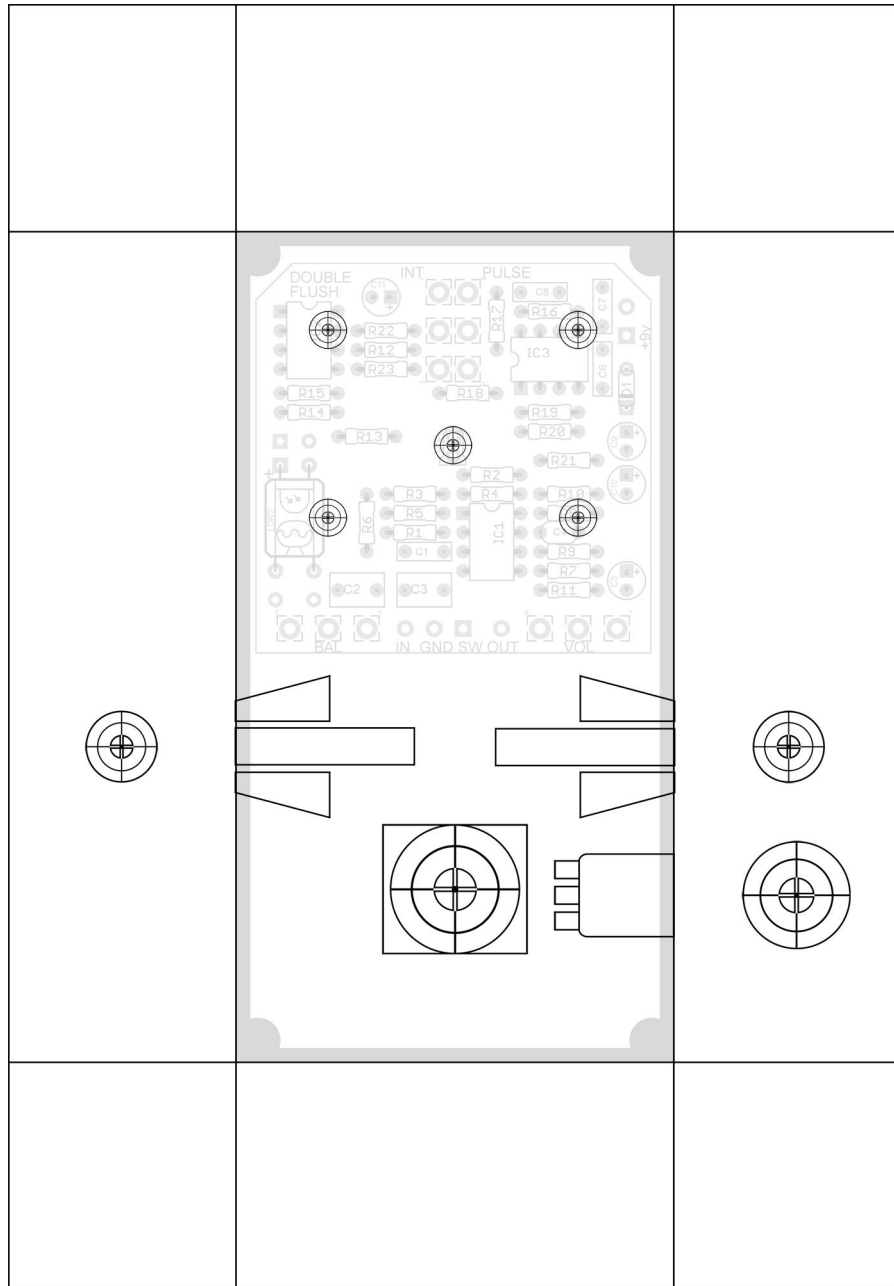


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## WIRING DIAGRAM

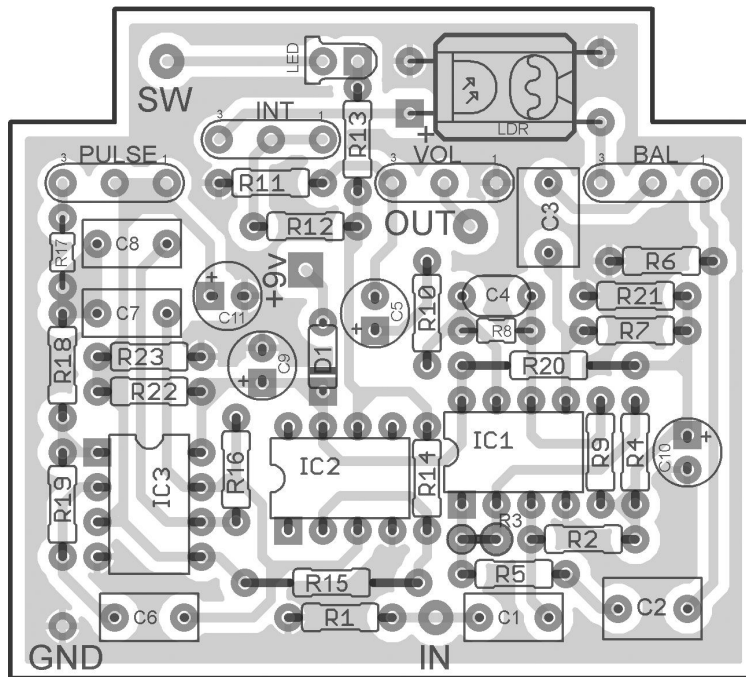


**1590B**  
**4.64"W x 6.68"H**

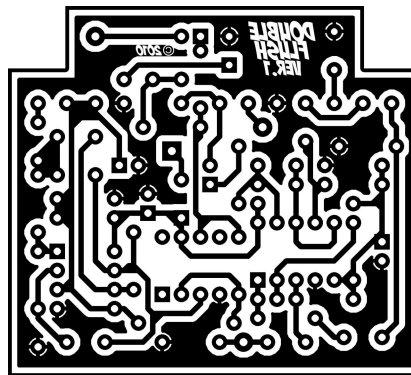


*If you wish to use a battery, the 125B enclosure is a better choice.*

## SINGLE-SIDED VERSION (PG. 6-8)



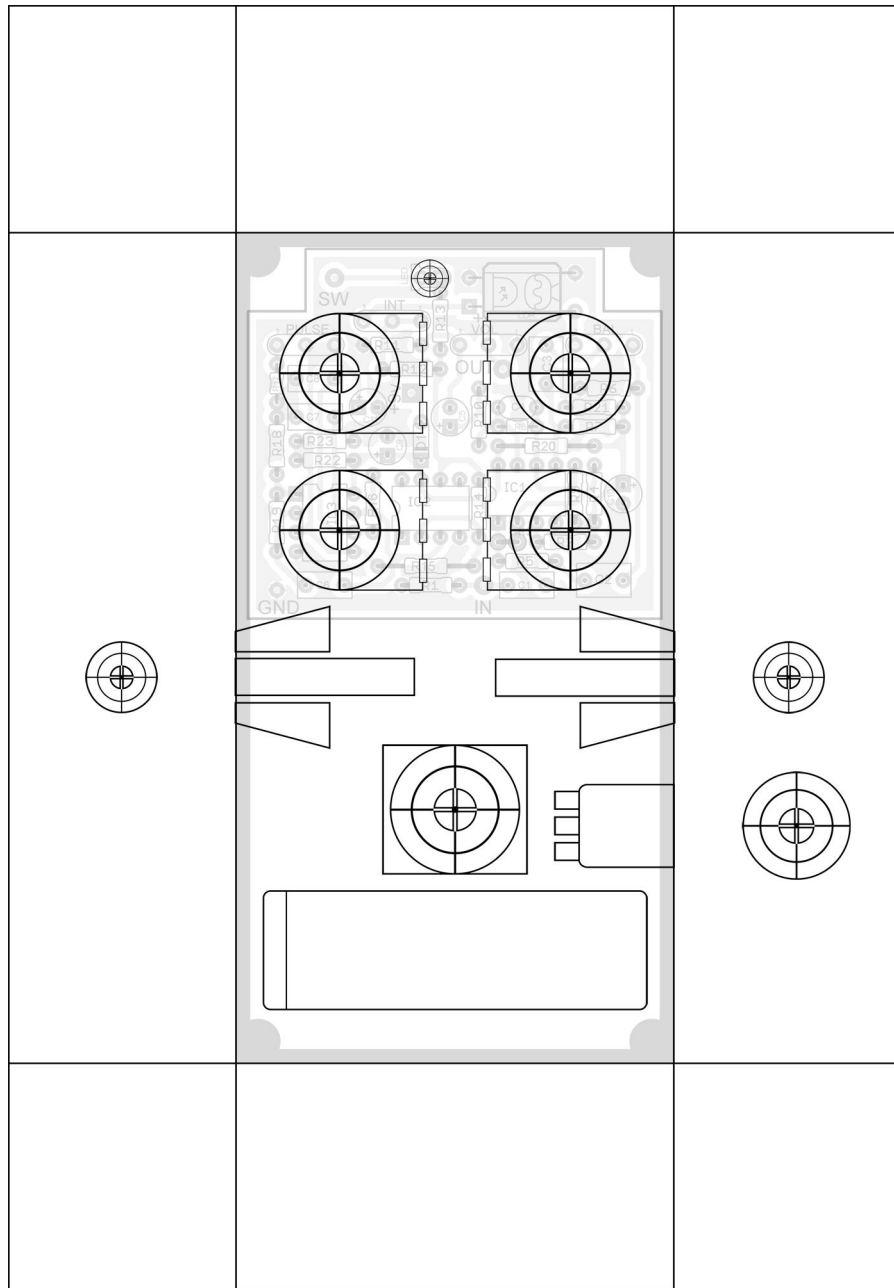
**2.167" W x 1.942" H (including borders)**







4.64"W x 6.68"H





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