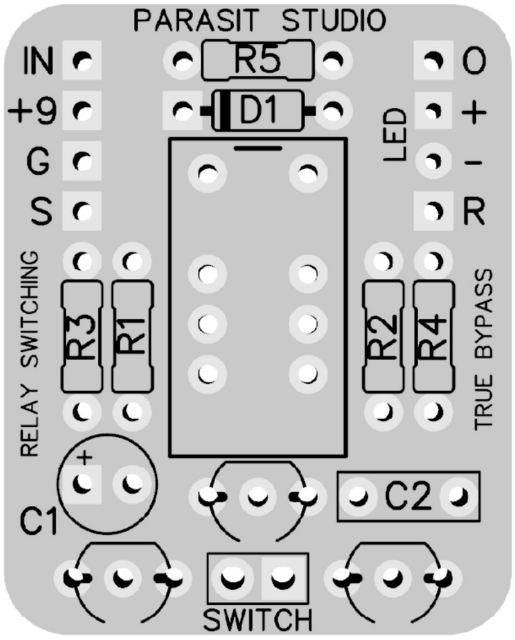
RELAY BYPASS

Build Document last updated april 2018
for PCB version 1.0

The Relay Bypass Board is used for true bypass switching, using a momentary switch. It's nice for those luxury builds when you want a smoother switching and less mechanical click than you get with a latching switch. The momentary switches also lasts longer. This board is microcontroller free and uses common 2N3904 transistors for the switch toggle and debounce functions.



Wiring

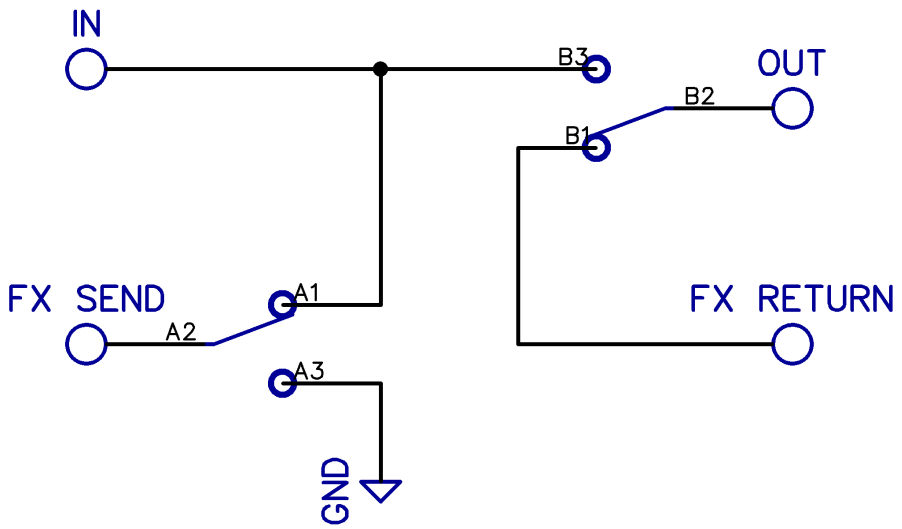
- **IN** INPUT JACK tip
- **+9** +9v
- **G** GROUND
- **S** SEND (FX input)

- **O** OUTPUT JACK tip
- **+** bypass LED anode
- **-** bypass LED cathode
- **R** RETURN (FX output)

- **SWITCH** Momentary SPST switch

Make sure all ground points are connected: DC jack negative pin, input and output jacks sleeve lugs, effects ground and the relay bypass ground.

Equivalent signal switching diagram



Note that in bypass, the FX input is grounded

Relay Bypass Bill Of Materials (BOM)

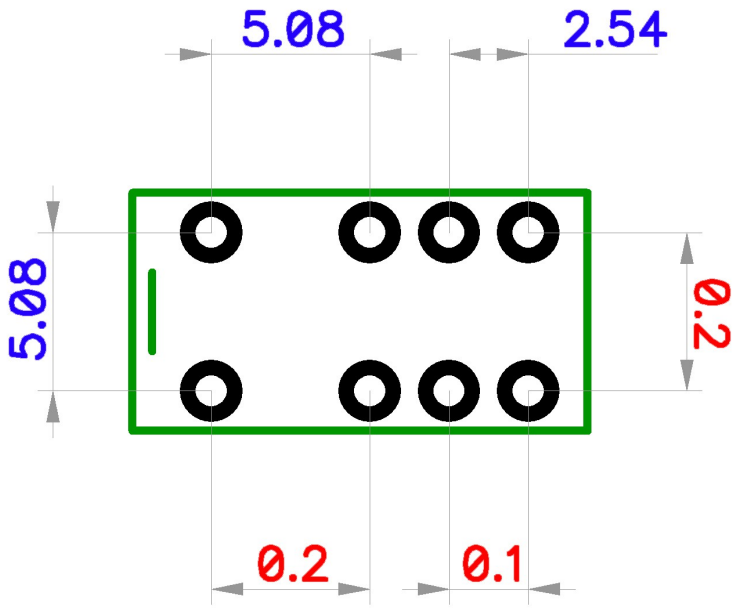
Resistors		Capacitors		Relay
R1	100K	C1	33uF	1x Fujitsu RY-12W-K *(or)*
R2	100K	C2**	220nF	1x Hongfa HFD3/12 *(or)*
R3	100K	**Diodes**		1x Kemet EC2-12NJ *(or)*
R4	10K	D1	1N4148	1x Takamisawa NA12W
R5	CLR*	1x bypass LED		**Transistors**
				3x 2N3904

- Pay special attention to the orientation of the diode and elecrolytic capacitor.

- * R5 - Current Limiting Resistor. Use the appropriate value for your LED type. I recommend a 4.7K resistor for a normal diffused LED or a 15K resistor for a superbright clear LED.

- ** C2 – Use a multilayer cheramic capacitor (to keep size down. Any type of cap will work fine).

- UPDATE 2018-04-12: Added the KEMET and the Takamisawa relays.
- UPDATE 2018-04-12: Note that there's another blue relay called ”FUJITSU-TAKAMISAWA RY-12W-K”. It will not fit! Check the datasheets and make sure that it has the dimensions shown below (red = inch, blue = mm)



NOTES

These are 12v relays, but they work just fine with 9v power supplies since the switching voltage is around 6v.

Note that when turning on your effect, it will toggle back to bypass if you keep the switch pressed down for too long. This is normal behaviour of this transistor flip flop circuit.

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.

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 recieved a faulty or missing component, please contact musikding directly.

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