



# monommonster

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## INSTRUCTION MANUAL FOR THE MONOMONSTER RELAY BYPASS MODULE REV. C

### GENERAL DESCRIPTION

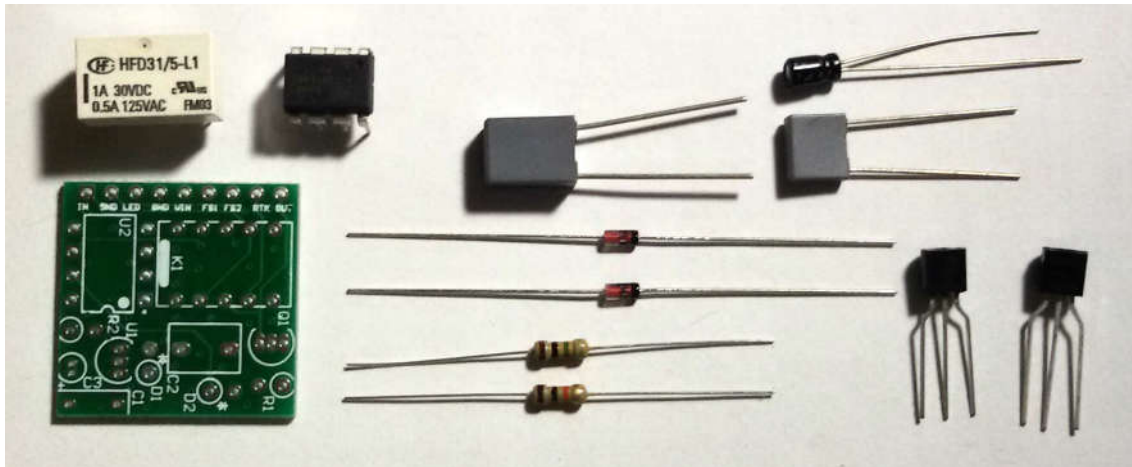
The Relay Bypass Module Kit (RBM) is a clever circuit that enables you to have true bypass switching in virtually any effect pedal! The RBM can be incorporated into new pedals or retrofitted into older pedals that might not have true bypass switching.

In addition to the normal ON / OFF switching capability, there's also a momentary mode which allows the user to insert the effect into the signal chain only while pressing down on the footswitch, upon release the effect is bypassed.

A lot of thought went into the design of this module and user feedback helped me improve the circuit and code from revision to revision. This is the 6<sup>th</sup> revision of this circuit and I feel confident saying this is the best one yet!

### KIT ASSEMBLY

In order to assemble the kit you'll need a soldering iron, some solder and small cutters. I assume you have some experience in soldering, if this is not the case it might be a good idea to let someone else do the assembly for you.



The kit contains the following components, as shown in the picture:

- Green PCB
- DPDT latching relay (top left, white case)
- Microcontroller (DIP-8 package, right of the relay)
- Film capacitor 1uF (grey box, center)
- Film capacitor 10nF (grey box, right of above capacitor)
- Miniature electrolytic capacitor 4.7uF (top right)
- Two small signal diodes (orange colored, center of picture)
- 1M resistor (brown, black, green rings)
- 10k resistor (brown, black, orange rings)
- MOSFET 2N700 (3 legs, on the right)
- Voltage regulator 78L05 (3 legs, on the right)

Please follow the table below and install the components on the PCB. Make sure you follow the suggested order and that you read the comments before installing the components to avoid mistakes.

Designator	Component	Comments
R1	1M Resistor	Brown, black, green rings
R2	10k Resistor	Brown, black, orange rings
C1	10nF Cap.	--
C2	1uF Cap.	--
C3	4.7uF Cap.	White line near one of the pins indicates negative leg
D1	Diode	Anode should be next to ring marker on PCB
D2	Diode	Anode should be next to ring marker on PCB
Q1	MOSFET	Marked as 2N7000, notice orientation
U1	Regulator	Marked as 78L05, notice orientation
U2	MCU	Notice dot on case aligns with dot marking on PCB
K1	Relay	Notice marked lines on relay and PCB are aligned

## MODULE CONNECTIONS

Module connections are straight forward, the wire pads on the top of the PCB are marked for convenience on both sides of the PCB.

Marking	Connecting to...	Comments
IN	Input jack	Input jack's tip
SND	Effect circuit's input	--
LED	LED Anode	When active output is about 5V, 20mA abs. max.
GND	Effect circuit's ground	See explanation below
VIN	Positive voltage supply	15V abs. max.
FS1	Footswitch	Either terminal of momentary SPST switch
FS2	Footswitch	Other terminal of momentary SPST switch
RTN	Effect circuit's output	--
OUT	Output jack	Output jack's tip

The way that the circuit, box (which houses the said circuit) and audio jacks are all referenced could have dramatic effect on the noise level of the pedal when active and while switching. The best practice is to use a Star grounding scheme so that the box and effect circuit as well as jacks have a single point which they are all referenced to. This will usually offer the best performance. If you are unfamiliar with the topic please use Google and you'll get up to speed in no time!

## **PROGRAMMING MODE**

The module has two operation modes: Normal & momentary. Normal mode allows a direct replacement for a mechanical switch. Momentary mode inserts the pedal into the signal chain only for as long as the footswitch is being pressed down. Programming mode can be activated by holding down the footswitch while connecting a power supply to the module. After releasing the footswitch, each press will alter between the two operation modes. The LED indicates which mode is selected. LED = OFF means Normal mode is selected and LED = ON means Momentary mode is selected (the LED should toggle with each press of the bypass switch, however the relay won't click). In order to finalize the selection, the power should be removed from the unit. When the module is powered back up the chosen mode will be initiated automatically. This setting is kept even when power is removed. The user can enter programming mode as many times as desired and change the operating mode.