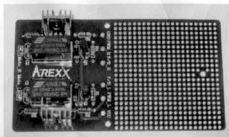


INSTRUCTIONS

Motor Controller Board



Benefits:

The motor controller on the new PCB is specifically designed to handle the current draw of Mr. Basics motors (up to 2A @ 4.8V) with minimum power loss at low voltages.

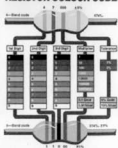
If for example you were to use a L298N or a few L293D's piggybacked to handle the current then you would still loose a couple of volts across the "H" bridge and there for need at least 6V to get good power to the motors.

Basically the relay based motor controller on the Mr. Basic PCB is more efficient. The heat sinks on the transistors are only there to handle stall current.

Part list:

2x 680 ohm resistor	R2, R5
2x 3K3 ohm resistor	R1, R4
2x 27K ohm resistor	R3, R6
2x 0.1uF monolythic capacitor	C1, C2
2x 1N4007 diode	D1, D2
2x BC547 transistor	Q1, Q3
2x BD681 darlington transistor	Q2, Q4
1x PCB	
2x HFD2-05 2A 5V DPDT relay	RELAY1, RELAY2
2x small TO-220 heat sinks	
2x M3*6 Screw (used for mounting the darlington transistor and heat sinks)	

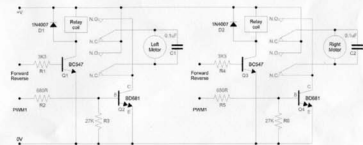
RESISTOR COLOUR CODE



Start by inserting the resistors, diodes and capacitors. Once you have soldered in these components you are ready to solder in the small transistors (Q1 and Q3).

Be careful not to apply too much heat as they can be damaged by excess heat. Beginners should mount the transistor about 10mm above the PCB so the long legs will help reduce the chance of heat damage.

Now mount the heatsinks on the power transistors (Q2 and Q4) with the mts and bolts provided. The heatsink mounts on the back of the transistors (no numbers). The relays and power transistors can now be soldered in.



As you can see each motor has two inputs that can be connected directly to the outputs of your microcontroller.

The PWM input will allow power to flow through the motor. A high signal will turn the motor on. A low signal or open circuit will turn the motor off. By changing this output from high to low with a frequency of at least 100Hz with a variable duty cycle then the speed of the motor can be precisely controlled with good torque at low RPM.

The Forward / Reverse input activates the relay to reverse polarity across the motor. To ensure long life of the relays it is best to drive the PWM input low before changing direction of the motor and to keep it low for at least 20ms to allow time for the relay to respond. This will prevent arcing across the terminals.