

Important Information

- This kit assumes moderate soldering and electronic assembly skills.
- If you do not feel that you have these skills, please do not attempt to assemble this kit.
 - Adult supervision is required.
- Always wear safety glasses when working with tools and soldering equipment.

Required Tools and Equipment

- Encoder / Divider Kit
- Low wattage soldering iron station for use on electronic assembly
- Tin-Lead or lead-free rosin core or no-clean solder (do not use water soluble or acid type fluxes)
- Lead preparation tool (i.e.: small needle nose pliers)
- Cutting tool (i.e.: small diagonal cutting pliers)
- Small Philips head screw driver

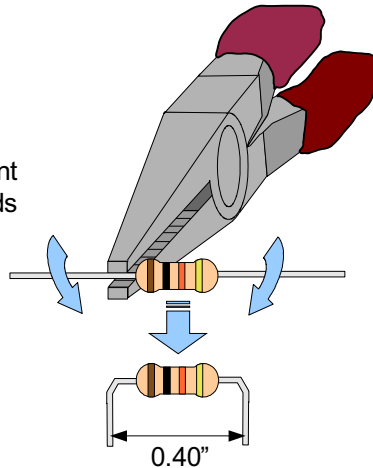
Kit Contents

ITEM	VENDOR	PART NUMBER	DESCRIPTION	QTY	LOCATIONS
1	BaneBots	ENC/DIV PCB	PCB	1	
2	Digikey	296-8319-5-ND	IC, DUAL 4-BIT BIN CNTR, 14-DIP, 74HC393	1	U1
3	Digikey	568-1405-5-ND	IC DUAL 4-TO-1 SEL/MUX 16-DIP, 74HC153	1	U2
4	Digikey	296-1602-5-ND	IC DUAL FLIP-FLOP 16-DIP, 74HC74	1	U3
5	Digikey	296-1365-ND	VOLTAGE REGULATOR, +5V, TO-92	1	U4
6	Digikey	10KQBK-ND	RESISTOR, 10K OHM, 1/4W, AXIAL	6	R1,R2,R3,R4,R5,R6
7	Digikey	220QBK-ND	RESISTOR, 220 OHM, AXIAL, 1/4W	2	R7, R8
8	Digikey	399-4151-ND	CAP, 0.1uF, CERAMIC, RADIAL, .1"	1	C2
9	Digikey	P966-ND	CAP, 10UF, ELECTROLYTIC, RADIAL, .1"	1	C1
10	Digikey	1N4001-TPMSCT-ND	DIODE, 1N4001, AXIAL	1	D3
11	Digikey	160-1142-ND	LED, GREEN, T1, RADIAL	2	D1, D2
12	Digikey	104433-3-ND	HEADER, PIN, 2x3, .1" - OR SIMILAR	2	J4-J5, J6-J7
13	Digikey	277-1667-ND	TERMINAL, SCREW, 2 POSITION, 5MM	3	J1, J2, J3

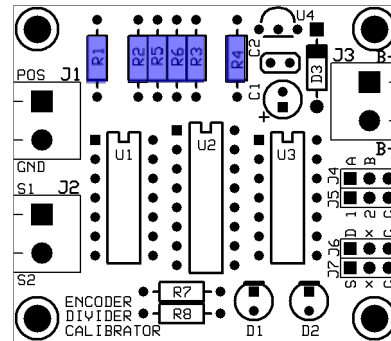
Assembly Instructions

1. Remove the kit contents and make sure that all kit items are included.
2. Locate the six (6) 10k Ohm resistors (item 6). Resistor color code: Brown, Black, Orange, Gold
3. Locate the two (2) 220 Ohm resistors (item 7). Resistor color code: Red, Red, Brown, Gold
4. Prepare the leads on the resistors as follows:

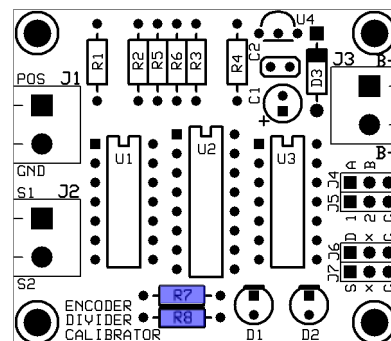
Support the resistor with a pair of needle nose pliers or similar tool as shown to prevent damage to the resistor body. Bend both leads as shown.



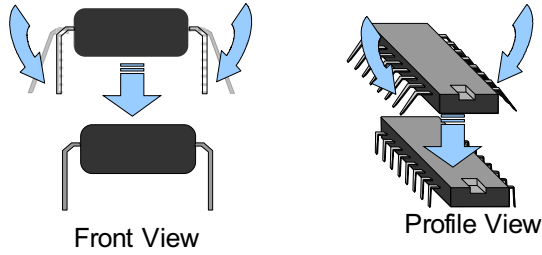
5. Insert and solder each of the six (6) 10k Ohm resistors in the following below locations: R1, R2, R3, R4, R5 and R6. Cut leads to length after soldering.



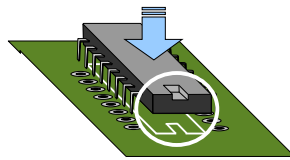
6. Insert and solder each of the two (2) 220 Ohm resistors in the following below locations: R7 and R8. Cut leads to length after soldering.



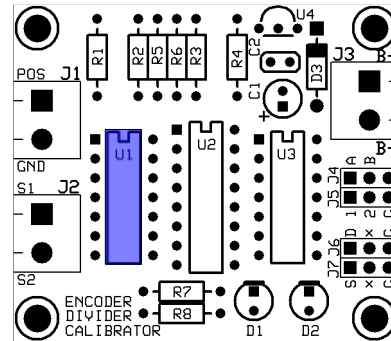
7. Prepare the leads of the ICs (items 2,3 & 4) U1, U2 and U3 as shown below.



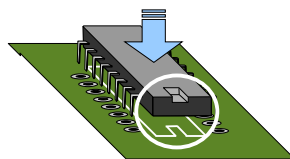
8. Insert and solder the IC (item 2, PN: 74HC393) into location U1 as shown below.



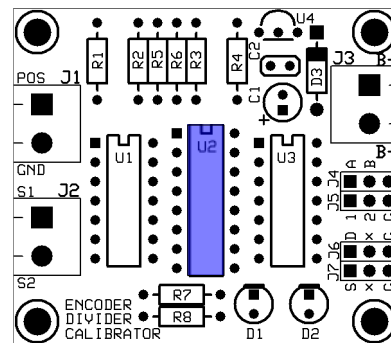
Make sure the orientation of the IC matches the orientation on the PCB silkscreen outline.



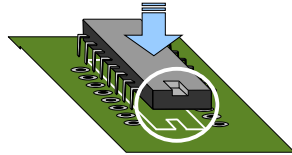
9. Insert and solder the IC (item 3, PN: 74HC153) into location U2 as shown below. Use the same precautions for orientation as in step 8.



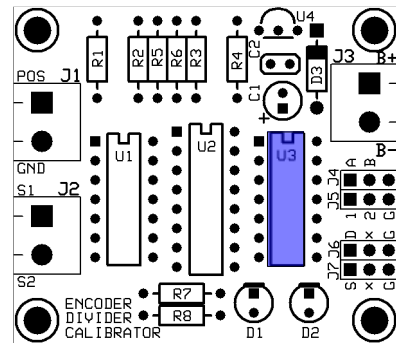
Make sure the orientation of the IC matches the orientation on the PCB silkscreen outline.



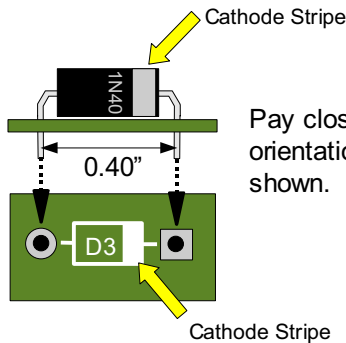
10. Insert and solder the IC (item 4, PN: 74HC74) into location U3 as shown below. Use the same precautions for orientation as in step 8.



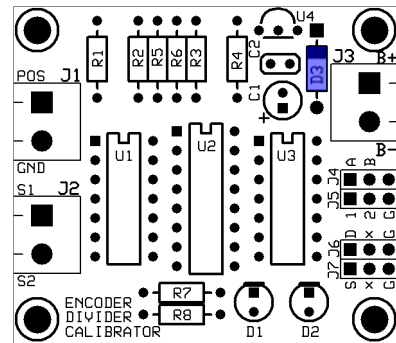
Make sure the orientation of the IC matches the orientation on the PCB silkscreen outline.



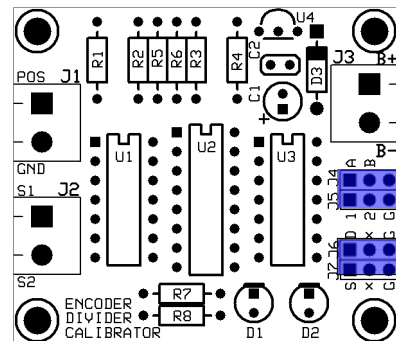
11. Prepare the leads on the diode just as the leads on the resistors in step 4. Insert and solder the diode (item 10, PN: 1N4001) into location D3 shown below. Cut leads to length after soldering.



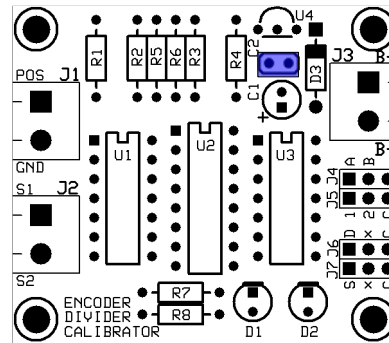
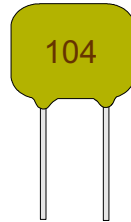
Pay close attention to the diode orientation and insert into the PCB as shown.



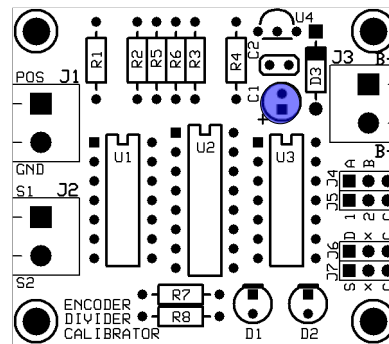
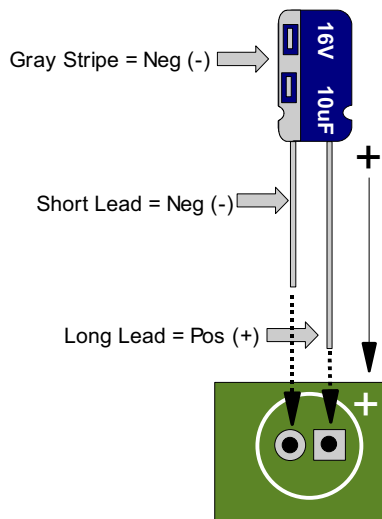
12. Insert and solder the two (2) dual row 6 pin headers (item 12) into locations J4-J5 and J6-J7 as shown below.



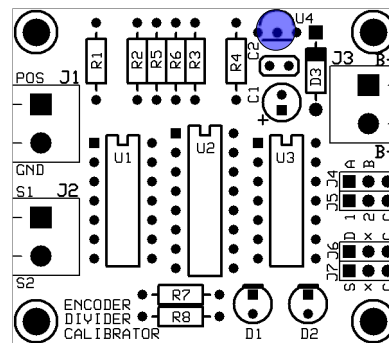
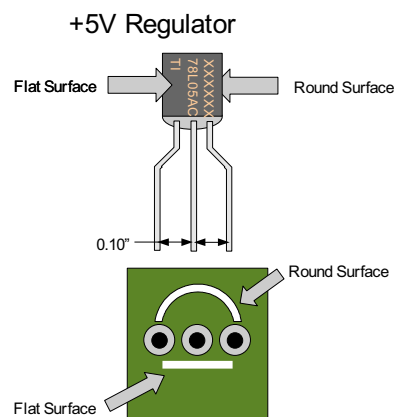
13. Insert and solder the capacitor (item 8) into location C2 as shown below. Cut leads to length after soldering.



14. Insert and solder the capacitor (item 9) into location C1 as shown below. Note the polarity of the capacitor and the polarity indication on the PCB. Cut leads to length after soldering.



15. Insert the voltage regulator (item 5) into location U4 as shown below. Note the device polarity and lead preparation. Cut leads to length after soldering.



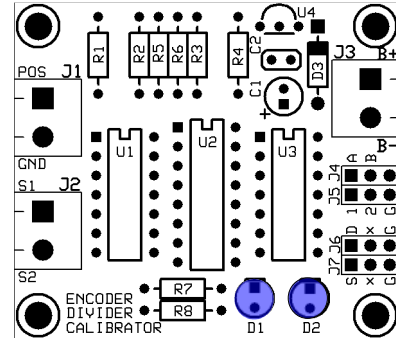
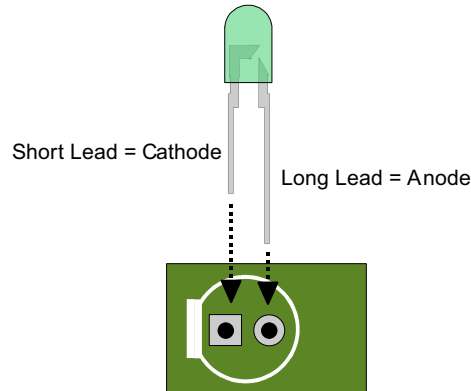
Encoder / Divider Card Assembly Instructions

Revision 1.0

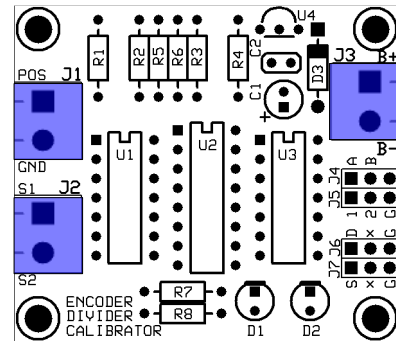
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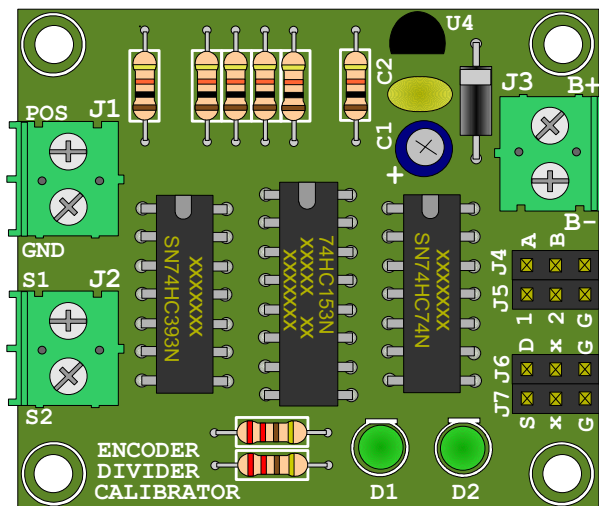
16. Install the LED indicators (item 11) into locations D1 and D2 as shown below. Pay particular attention to the orientation of the LEDs and the polarity indications on the PCB. Cut leads to length after soldering.



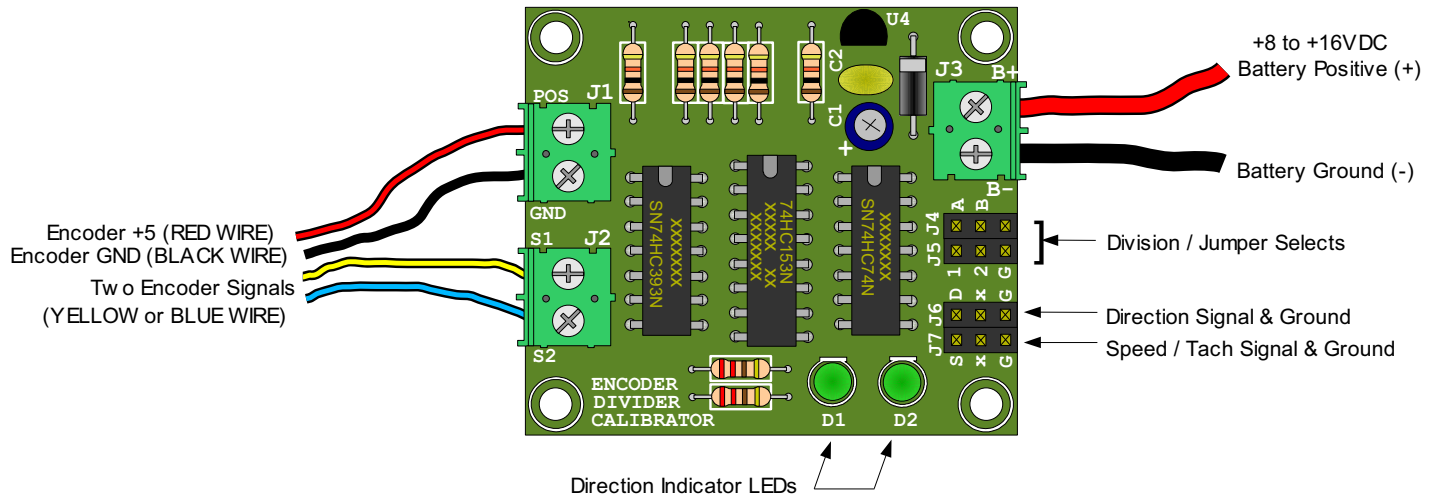
17. Install and solder the three (3) dual screw terminals (item 13) into the locations of J1, J2 and J3 as shown below. Make sure that the "wire installation entry" side of these headers is pointing outside of the PCB.



18. When completed, your assembled board should look like the picture below. Double check the polarities and orientations of the devices before you continue.



19. The encoder wires and battery power leads attach to the assembled card as follows:



20. Refer to the Encoder / Divider Card Manual for operation and configuration.