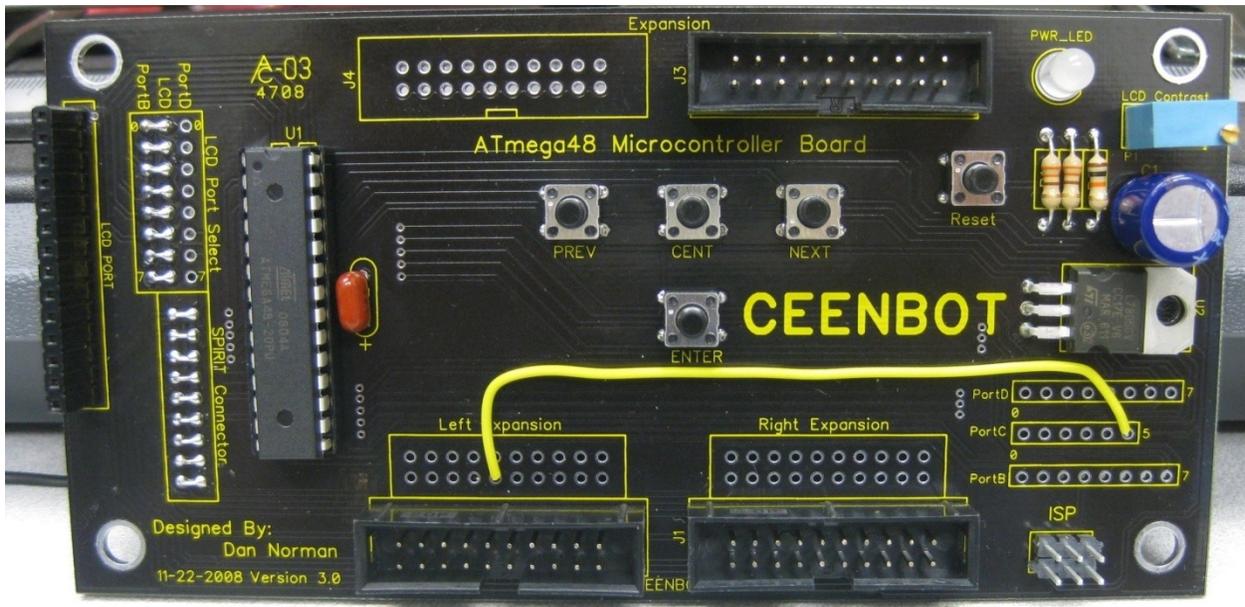


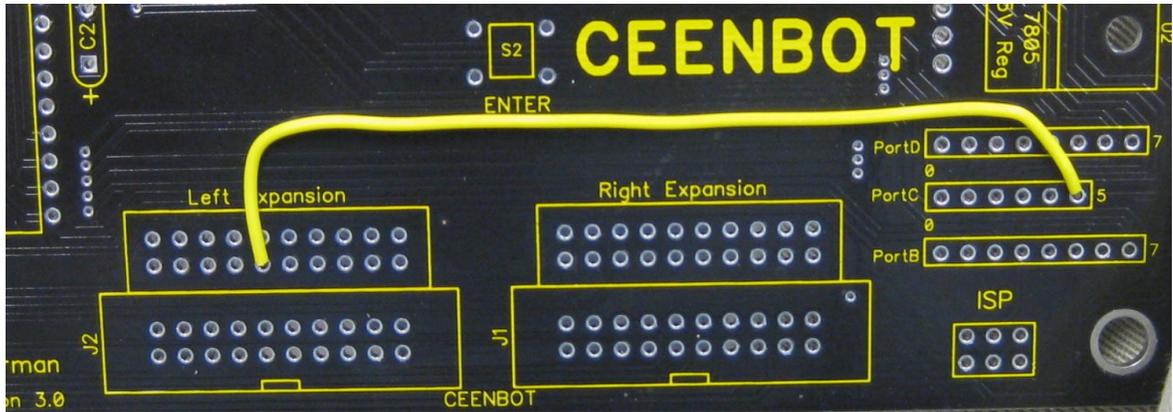
Counter Board



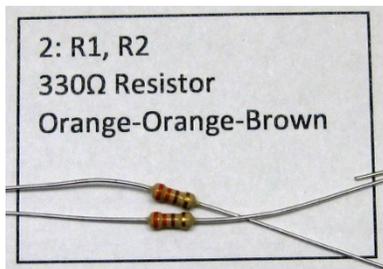
1. Solder the programming jumpers for the LCD Port Select: The jumpers go between the holes marked PortB and LCD.
2. Solder the jumpers in the holes marked "SPIRIT Connector"



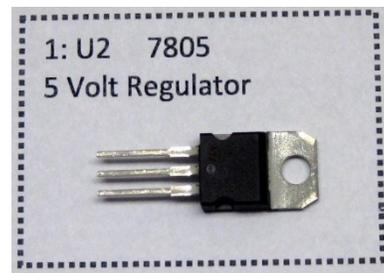
- Solder an insulated jumper wire from the 5th hole from the left on the bottom row of the Left Expansion area to hole 5 on the PortC area.



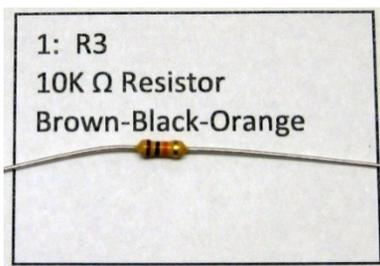
- Solder the 330 Ω resistors into the R1 and R2 positions.



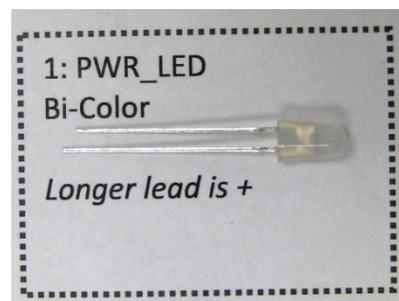
- Solder U2 – the 7805 voltage regulator.



- Solder the 10K Ω resistors into the R3 position.



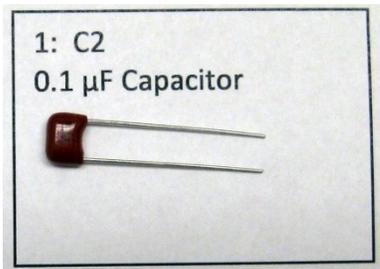
- Solder the PWR_LED. Align the flat side of the plastic case with the flat on the silk screen symbol.



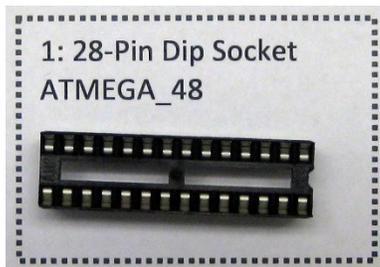
8. Solder the five pushbutton switches S1, S2, S3, S4, S5.



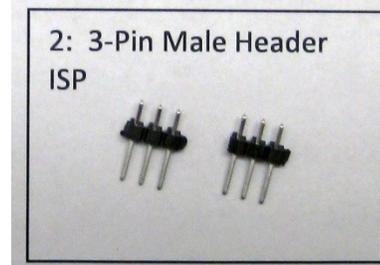
9. Solder C2, the 0.1 μ F capacitor. The orientation does not matter even though there is a + mark on the silkscreen.



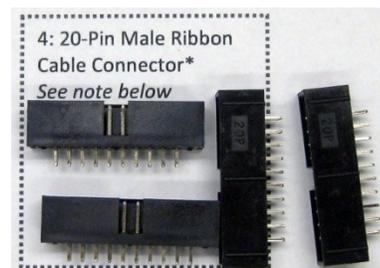
10. Solder the 28 pin socket in the area marked U1. **Do Not Solder the Integrated Circuit** – Just the socket. Make sure the U shaped notch on the socket aligns with the U shape end on the silk screen.



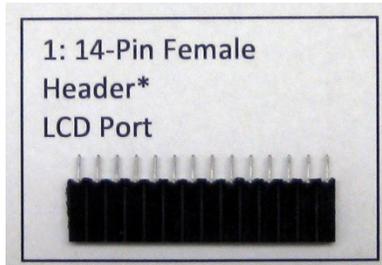
11. Solder the two 3-pin male headers into the ISP holes. The short ends go through the holes and are soldered.



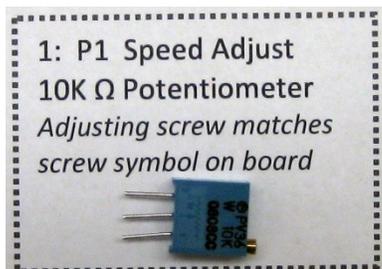
12. Solder three 20-pin male ribbon cable connectors in to J1, J2, and J3. Make sure the plastic cutout on the connector side aligns with the notch on the silkscreen. The notches will face the bottom of the board when the board is oriented so you can read the printed text.



13. Solder the 14-pin female connector in to the LCD PORT. It does **not** go and will not fit into the LCD Port Select holes.



14. Solder P1, the 10K Ω potentiometer. The adjusting screw on the top aligns with the small circle on the silk screen.



15. Solder C1, the 220 μ F capacitor. The longer lead goes into the hole with the + sign.

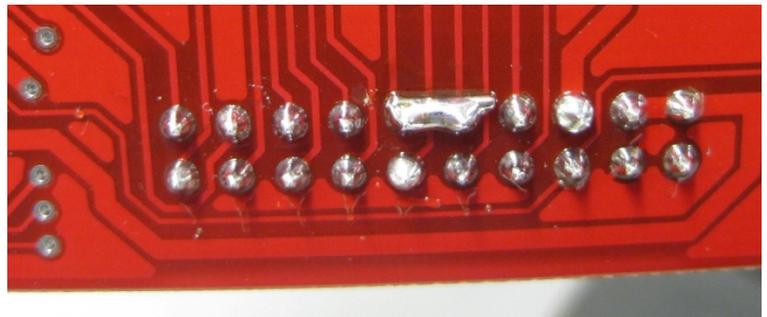
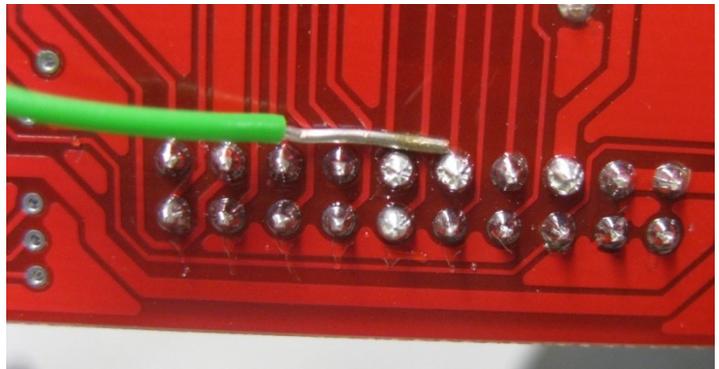


16. Insert the ATMEGA 48 into its socket. Make sure the notch at the end of the IC aligns with the notch in the end of the socket.

Interface Board Modifications

17. Disconnect the three ribbon cables from the Interface Board and remove the board from the CEENBoT.
18. Solder the 20 pin ribbon connector into the remaining position on the **Interface Board** – **not the counter board**. Make sure the plastic cutout on the connector side aligns with the notch on the silkscreen. The notch will face the center of the board.

19. Pins 15 and 16 of the ribbon cable connector that is connected to the lower Control Board needs to have a wire soldering them together. This is the 20-pin connector on the bottom edge of the Interface board when it is oriented so the silk screen text is readable. Melt some additional solder onto pins 15 and 16. Place the wire against pins 15 and 16 and reheat so that there is a solid connection. After the joint cools, use a side cutter to trim the ends of the wire so it does not contact any other pins. One of the lab assistants will help you if needed.

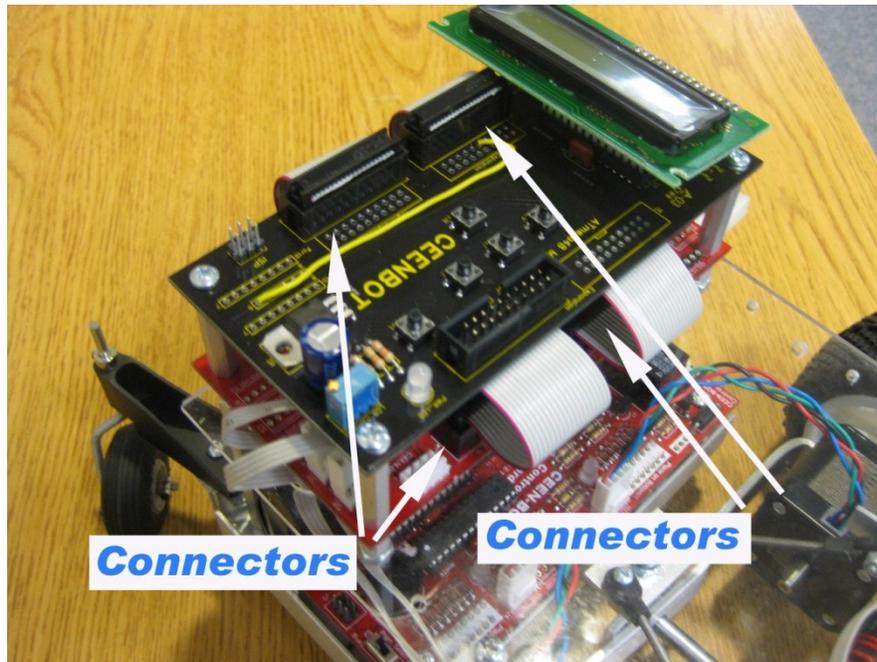


20. Construct 2 additional ribbon cables. The parts for these are not in your kits. The lab assistants will provide them. **Carefully observe the orientation of the connectors.** They both point in the same direction. The plastic key is on the outside on one connector and on the inside of the other.

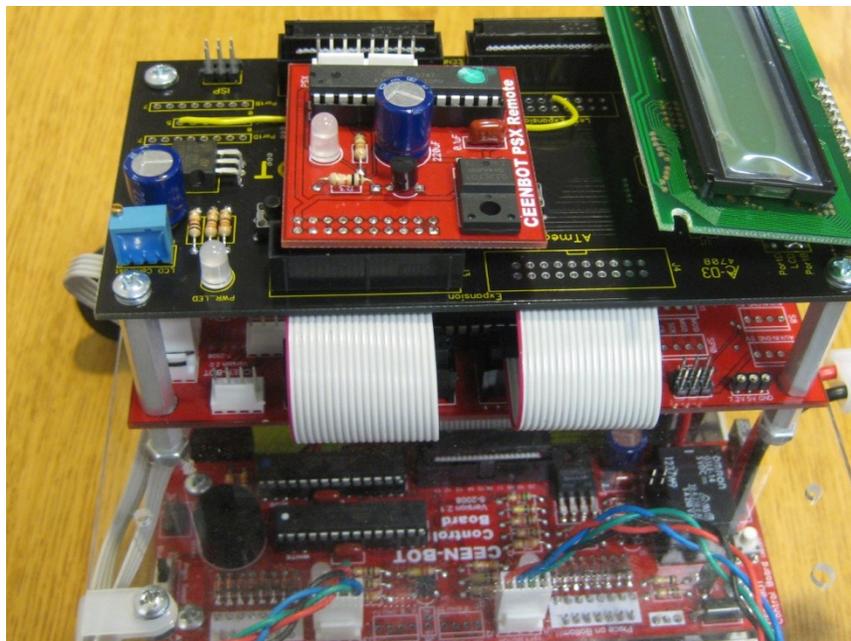


21. The Counter Board will be placed above the Interface Board using 1 ¼" MF standoffs. Place the Interface board on the existing standoffs and fasten it with the 1 ¼" standoffs.
22. Reconnect the ribbon cables on the Interface board.
23. Place the Counter board on the standoffs and attach using the 6-32 screws that were holding the Interface board in place.
24. Insert the male connector of the LCD panel into the LCD PORT connector of the Counter board. It is mounted such that the LCD panel is over the Counter board and not hanging over the edge of the CEENBoT.

25. Connect the newly constructed cables from the rear connectors on the Counter board to the front connectors on the Interface board. The ribbon cable is routed between the two boards.



26. Insert the Playstation II board into the front 20 pin male connector on the Counter Board.



The cables can be rerouted and the Playstation board moved such that the push button switches are still accessible. Remove the ribbon cable from J1 and place it into J3. The Playstation board is placed into J1. The ribbon cable does not go between the boards.

Caution: The Playstation board extends almost entirely past the Counter board and is much more susceptible to damage in this position.

