## Pre-Build Testing

First, test each pad for connectivity using a multimeter according to the device schematic in the build area. If there are any failed connections, patch this connection and continue testing. After testing every pad and correcting any errors in connectivity, confirm that all components are present before stuffing. If any components are missing, take note of the missing components so that replacements can be procured.

## Soldering

### Through-hole

For through-hole components, dip the leads of the component in flux to act as a glue as well as helping the solder to flow. Tack one lead of the component to hold it in place before soldering the other leads of the component. After soldering all other leads of the through-hole component, go back and solder the tacked lead.

### Surface Mount

For surface mount components, preheat the board to two hundred degrees and spread flux on the pad. Add a small amount of solder to the pads to help with connection using a heat gun or soldering iron. Using a set of tweezers, place the component in the desired orientation and heat both pads with the heat gun. Place the component on the heated pads and remove the heat gun and allow to cool.

### PIC Microcontroller

For the microcontroller, preheat the board to two hundred degrees and spread flux on the pads. Place the microcontroller in the desired configuration, making sure that all legs are aligned with their respective pads. After you have ensured correct alignment, apply heat using a heat gun to solder the microcontroller to the board. After 30 seconds of heat and making sure that all sides of the microcontroller are evenly heated, remove the heat gun while still holding the microcontroller in place for another 15 seconds. Check and make sure that the microcontroller is soldered by lightly nudging it with the tweezers.

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## Correcting Board Errors

There are several known errors on the board. Fortunately, these may be corrected by soldering copper wire between the points that are missing connections. Hardwire the following pads together:

* R6 (right side) to VO (on the LCD pinout)
* RD8 pin on the microcontroller to H2 pinout RD8.
* Pin number 37 on the microcontroller to SCL on H2
* Pin number 38 on the microcontroller to SDA on H2

## Correcting Board Errors

There may be disconnected pads on the board. These may be corrected by soldering copper wire between the disconnected pads. Determine errors by testing the pads against the pads they should be connected to according to the schematic.

## Post-Solder Testing

Test each pin as was done in Pre-Build Testing. Make sure to test connection by touching the pins if any are connected and not just the pads. If any components have not made sufficient contact, reapply or reheat the solder on the components to ensure a solid connection. If any pins of the microcontroller have not made a good connection, apply large amounts of flux to the area and apply extra solder to the unconnected pin, making sure to not bridge any of the pins across the microcontroller. After all pins have been checked for connectivity and connected, load the ledflash program, modified as necessary to check for the correct configuration of your board. If LED LED3 begins to flash, you have successfully soldered your board.