

# Modifying a 2.5" LCD screen for re-housing and/or lower power drain

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(This is documentation of my experience and I take no responsibility for yours!)

Here is the screen I have modified, purchased from Parallax with my propeller demo board. It's a nice screen but it runs hot, it's also surprisingly bulky considering what is in the housing. I want to make some portable equipment that will go in small boxes and run on batteries hence my quest to hack it for my purposes.



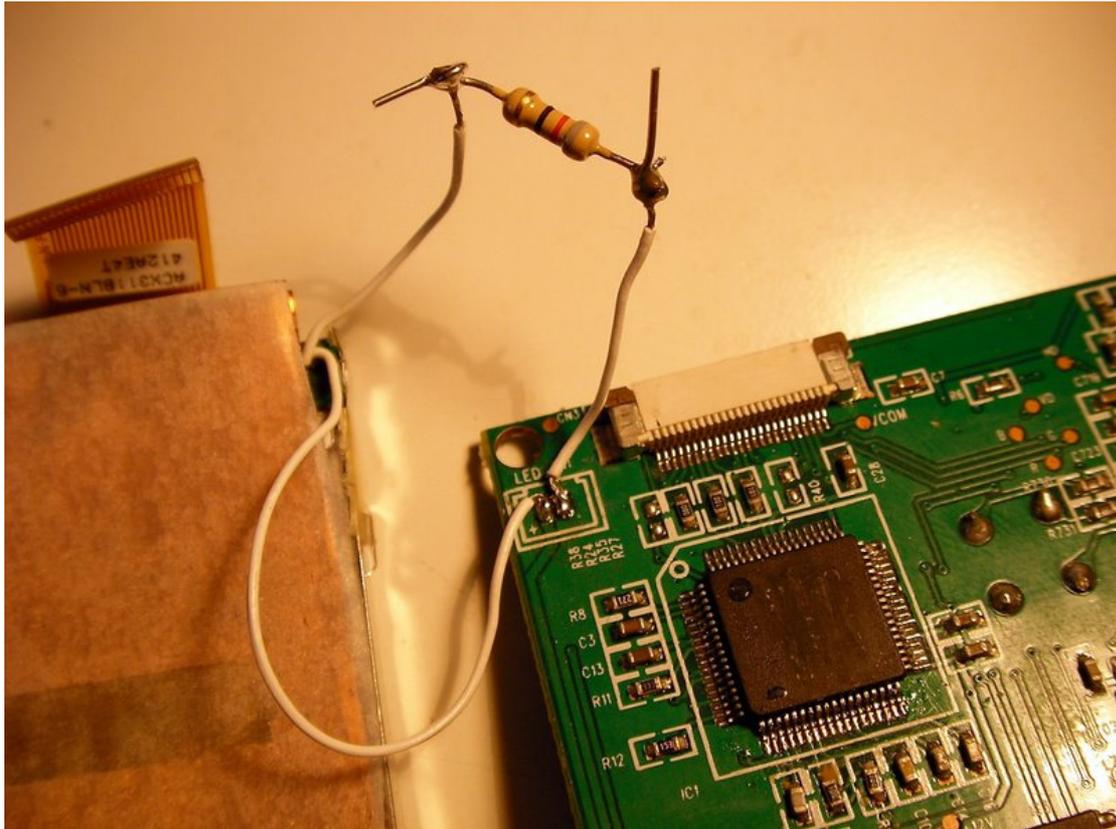
What can you do? You can do as much or as little of the following as you want:

- Add current limiting resistor to LED back light.
- Remove module from housing.
- Remove the audio board 5v regulator
- Remove the audio board all together.
- Remove 5v regulator on LCD.

You should definitely add the limiting resistor if you want to reduce the power consumption and/or the heat produced by the screen. Removing the module should only be done if you intend to re-box the screen. Removing the audio board does three things, it means you have no audio anymore (I don't mind), it automatically removes the 5v regulator on the board (and associated loss) and it makes the unit a little more compact when re-boxed. If you just want to cut power consumption then consider just removing the 5v regulator and get the 5v from an external low drop out regulator such as those on the demo board. Removing the 5v regulator on the LCD should again reduce power consumption as you can use a much better regulator externally (the same one as you might use for audio.)

### **Current limiting the back light:**

The LCD is back lit with 7 LEDs that shine into the side of some special prismatic sheet. These are the main reason for the screen being so hot; they are actually painful to touch when removed from the housing. On the LCD board there is a DC-DC converter that takes the 12v in and produces something over 20v, this is then regulated by a 7820 20v regulator (not a great choice anyway) and fed directly into the 7 LEDs and a normal diode (why I have no idea). Just add a resistor in series to reduce the current flow, I chose something around 80 ohms and it is still bright enough and has cut current consumption by about 80mA (almost 1W at 12v).



*The resistor in series with the LEDs. This should be done more neatly and insulated and you don't have to change the wires from the originals (long story).*

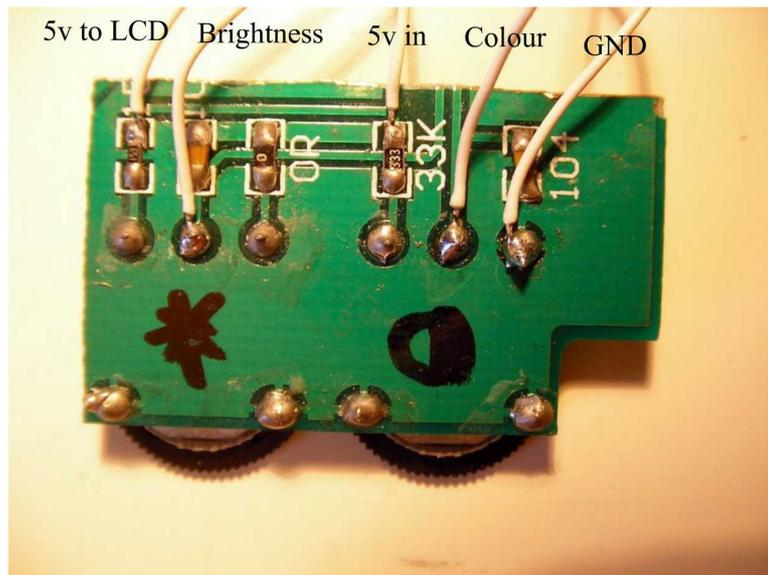
### **Remove module from housing:**

This is self explanatory but be careful, use a warm soldering iron to remove the adhesive that holds the PCBs in and a little isopropyl alcohol to loosen the double sided tape that secures the front face of the LCD module. Try to keep the module in one piece, be careful with the ribbon cable, you can unclip it by pushing the brown plastic part forwards, when replacing be sure to keep the brown part fully out until the ribbon is fully seated, then push it into position to clamp the ribbon.

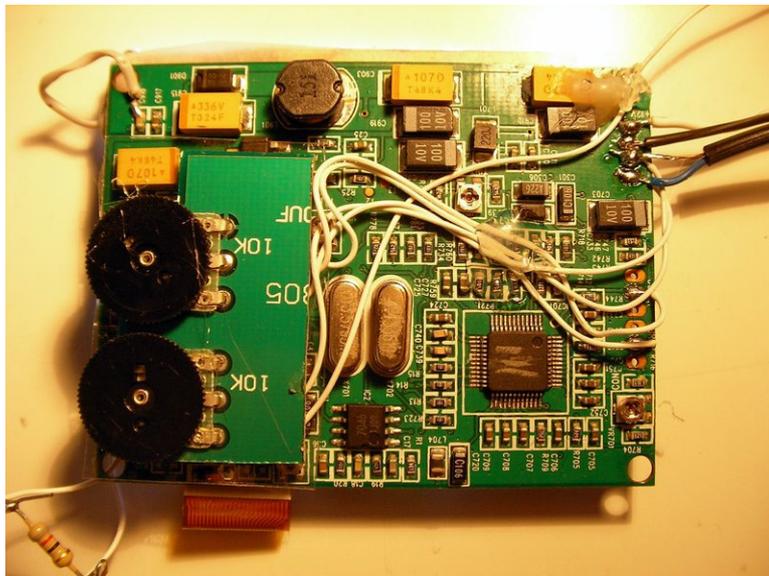
### **Remove the audio board all together:**

The audio board consists of a 5v regulator, an audio amp and the controls for the brightness and contrast. Personally I did not want to use the sound at all so I removed

the board completely and cut off the part with the brightness and colour controls for the LCD. If you want sound then keep the board. However you could remove the 5v regulator (7805) and add a wire to power the 5v audio line from an external low drop out regulator, this should reduce power consumption. The connections for my cut away board can be seen below. You will notice that there are two 5v connections; this is because I used the board to make a convenient connection between the two wires. In my case the “5v in” goes to an external 5v regulator and the “5v to LCD” goes to the pad that the LCD’s 5v regulator used to connect to. If you are keeping that regulator just have one 5v wire and pick 5v off the LCD board somewhere.



*Notice the pointless OR resistor connecting that pin to the ground plane that surrounds it anyway..*

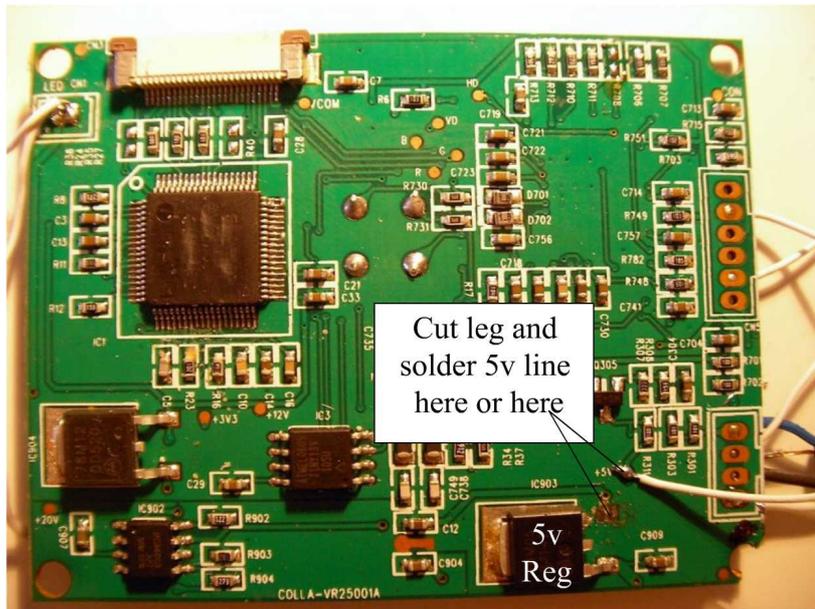


*I hot glued this board onto the back of the LCD board with a sheet of plastic between for insulation.*

## Remove 5v regulator on LCD.

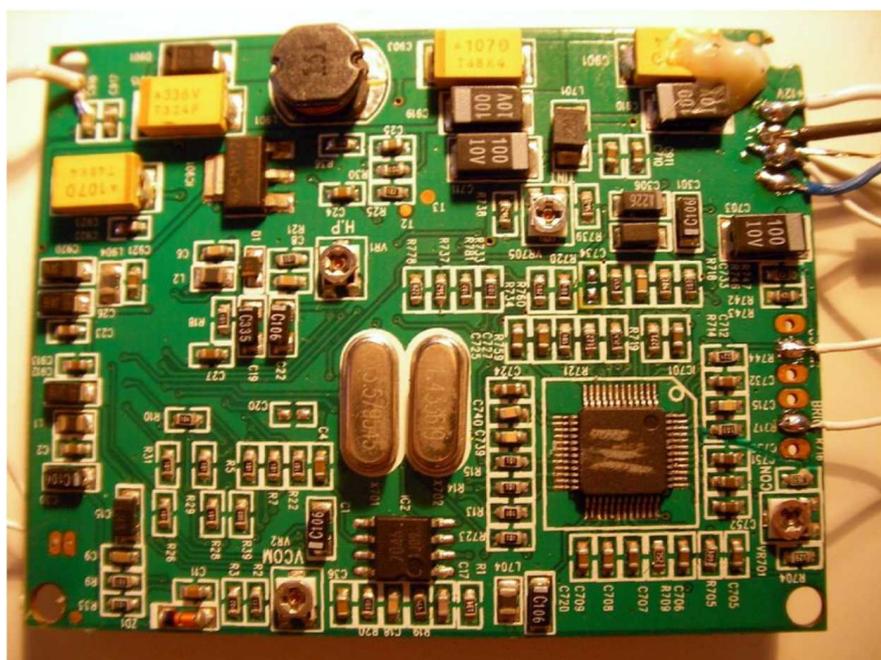
The 5v regulator mod on the LCD is optional and may be tricky if you are not removing the whole unit from the box. Again the idea is to use a better regulator such as those on the demo board to reduce power consumption.

This is the front side of the LCD board, the part that lies against the copper foil ground plane. Shown is the 5v regulator. Cut the leg and remove the bit of leg from the pad and solder a 5v line to the pad. If you damage the pad solder where I have.



## Reassembly:

Here is a reminder of the connections to the LCD board in case you forget them.



+12v  
GND  
GND  
VIDEO

Colour

Brightness

After that I hot glued the whole this into one neatish lump being careful not to create any shorts.

The screen still works perfectly, you should not get the light leakage from the top, I got that from my abuse of the screen when investigating the backlight.



*The resistor is still hanging free, yet to finalize the value.*

Hope this helps someone; don't blame me if you mess it up.

Graham