

Apeshit Mods + kitsch-bent > LEDx3

ver. 1

3/31/2011
kitsch-bent.com

before we begin...

tips

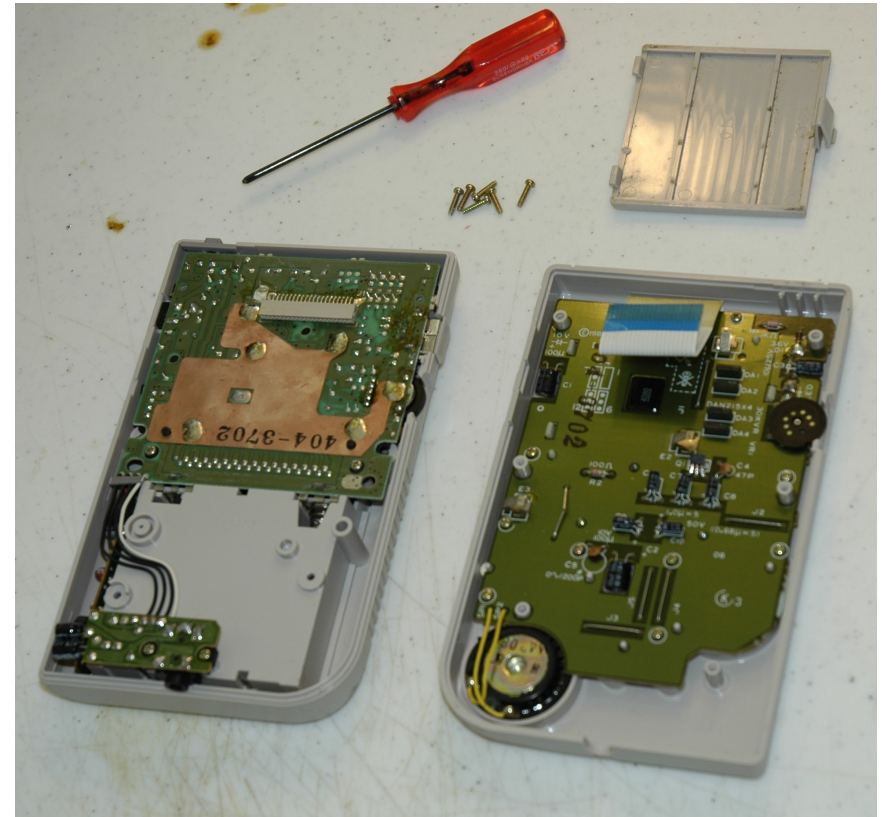
- steps 1-6 may be completed before your kit arrives in the mail. this let's you install the kit much quicker when it arrives
- be patient! rushing through this tutorial will only result in careless mistakes.
- be confident!
- be willing to ask for help! you may of course e-mail us at kitsch-bent for direct help, but also remember there are several online communities where you can generally find very supportive and wonderful people. these include: chipmusic.org and chipcoalition.com

supplies

- tri-wing and phillips screwdrivers. note: some cases are not held together with tri-wing screws. please check your case. the majority use this type of screw, however
- tweezers (optional, see step three)
- small wire cutters (these will cut plastic as well (step six))
- LEDx3 kit
 - LED panel
 - Resistor
 - Polarization film
 - Shrink wrap tubing
- soldering iron and solder
- a DMG-01 model gameboy (the 'classic')
- razor blade (see step four)
- pliers (see step six)

step one

- take all six screws out which hold the case together, and separate the two halves of the case
- the ribbon cable will come out with a gentle pull downwards
- set the screws and the bottom half of the case aside. don't lose the screws.



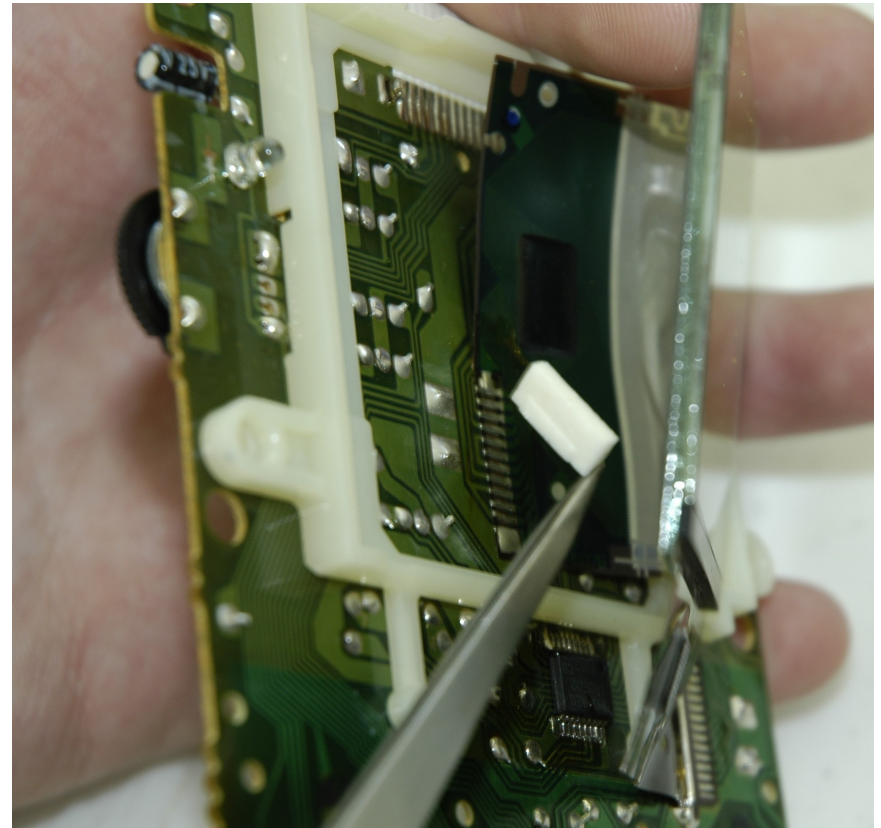
step two

- take the circuit board off the front half of the case. set these screws and the front half of the case aside and do not lose them
- you may find there is an adhesive tape holding the LCD screen to the case. if it is stuck, you can take the plastic screen protector off the case and push the LCD screen out this way



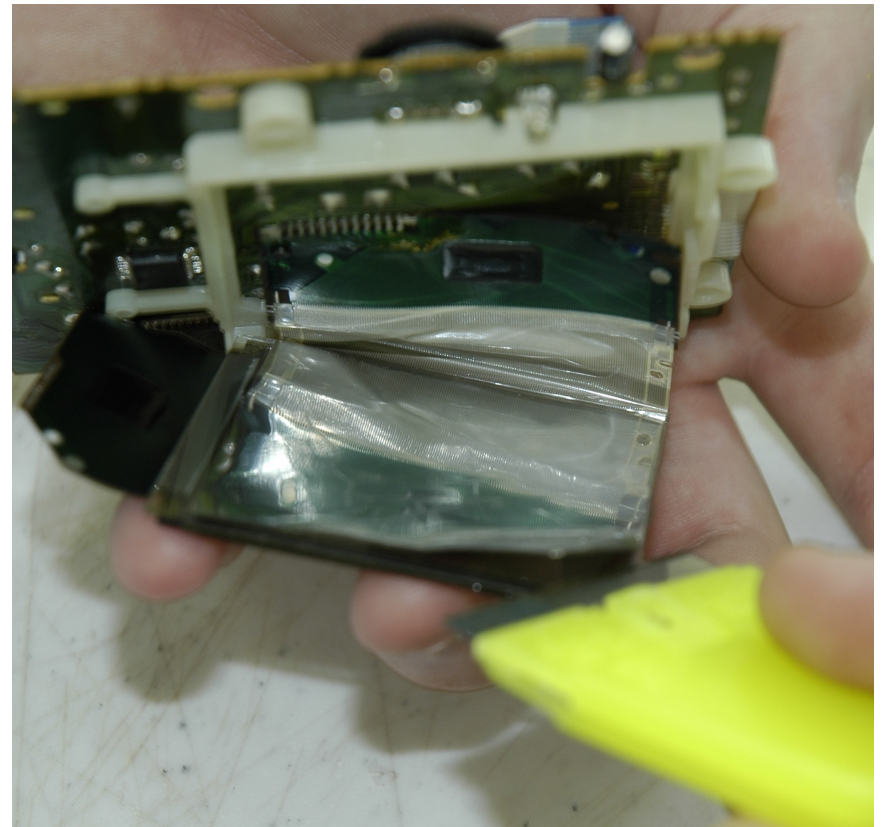
step three

- take out the two screws holding the brown LCD ribbon cable down
- lift up the LCD screen, and remove the two white foam pieces from behind the screen



step four

- using a razor blade (or other similar object) gently lift the edge of the polarization film from the back of the LCD's glass, and peel this off completely. discard this film when done, as you will replace it with the polarization film in your kit
- BE CAREFUL not to cut yourself, and please remove this film with care. this is the most difficult part of the modification, so take your time and be patient
- after you remove the film, use rubbing alcohol and a cloth to remove any remaining adhesive



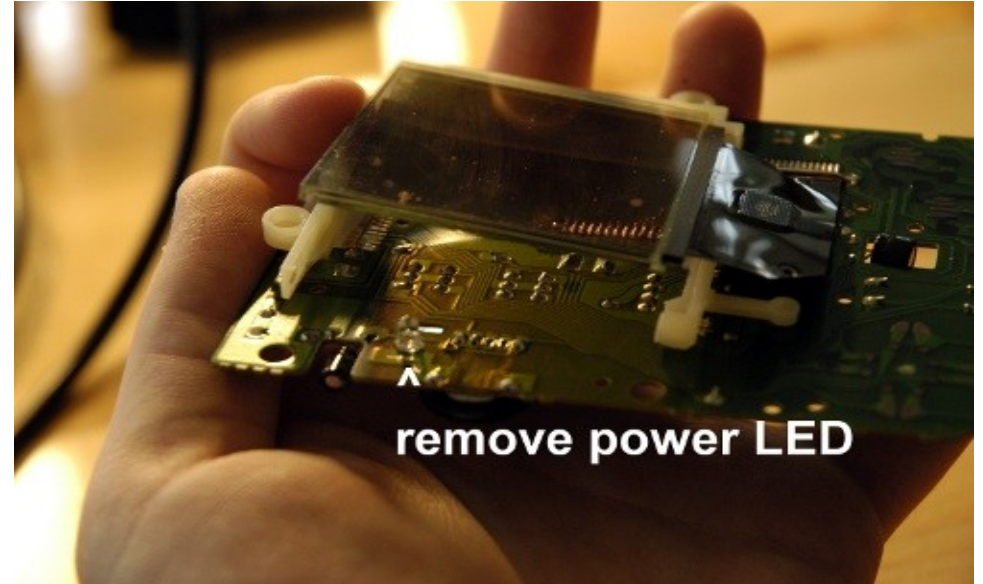
step five

- loosen the white plastic guard around the LCD screen, and lift it up from the circuit board. a section of this will be cut in the next step



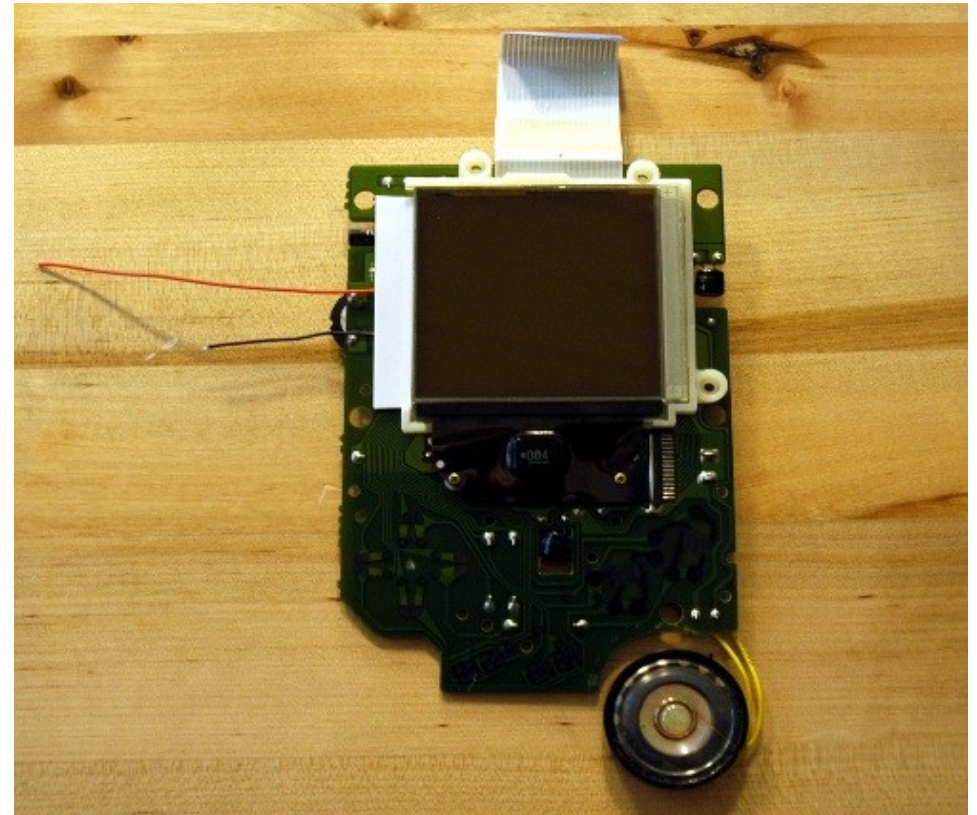
step six

- with your wire cutters, cut the section of plastic along the left side of this white plastic square
- this is illustrated in the photograph. please compare with the photograph from the previous step to understand which part of plastic is removed. also, lay the LED panel on top of the LCD if you want a precise measurement where to cut.
- this plastic is soft and easy to cut with strong wire cutters. a dremel may also be used if you wish.
- this is the only modification required to this plastic LCD frame
- after this is cut, fit the plastic frame back into place on the circuit board
- remove the power LED from the PCB. use your soldering iron to heat the solder and with pliers remove the LED from the PCB.



step seven

- open your LEDx3 kit and remove the LED panel, the polarization film, resistor and shrink-wrap tubing
- there are protective plastic films on the LED panel and polarization film which need to be removed before installation. there is one on the top (only) of the LED panel, and the polarization film has this plastic on both sides. remove all these thin, clear plastic protective films
- install the LED panel behind the LCD glass, with the wires coming out the left side. the top of the LED panel is the side from which the protective film was peeled. as seen in the picture, the red wire is on top and the black wire on bottom.
- on top of the LED panel put the polarization film (between the LED panel and the LCD glass)
- the notch on the polarization film fits the notch in the white plastic around the LCD screen
- screw back the two screws which hold the brown ribbon cable in place
- your unit should look as pictured.



step eight

- in these next few steps, we will prepare the resistor and wires and finish installation
- there is one resistor in your kit. its value depends on the color of your backlight. the resistor's main body may be either blue or tan colored, it doesn't matter
- the yellow and red backlight kits include a 68ohm resistor. the green, blue, and white kits include a 47ohm resistor.
- resistors are colored differently in part based on their tolerance, and your kit may include either a 1% or 5% resistor. only pay attention to the bands of color on the resistor. you only need to confirm we sent the correct one in this step ;)



47ohm (4 band)



47ohm (5 band)



68ohm (4 band)



68ohm (5 band)

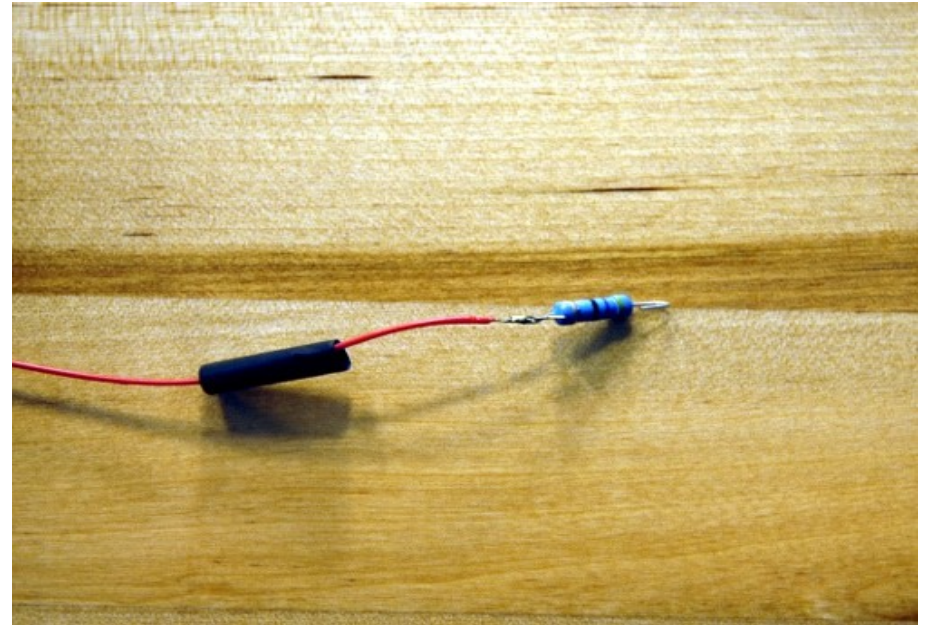
step nine

- using your wire cutters and pliers, prepare the resistor to be soldered to the gameboy's PCB
- all this involves is bending the legs into a loop, and cutting the extra length from the legs. this will make soldering to the PCB and the red wire easier



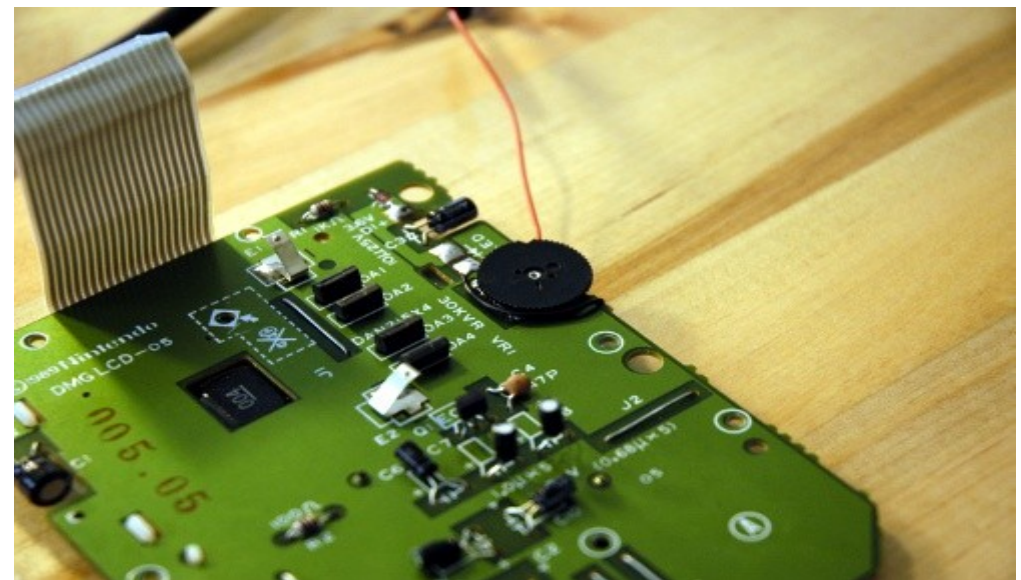
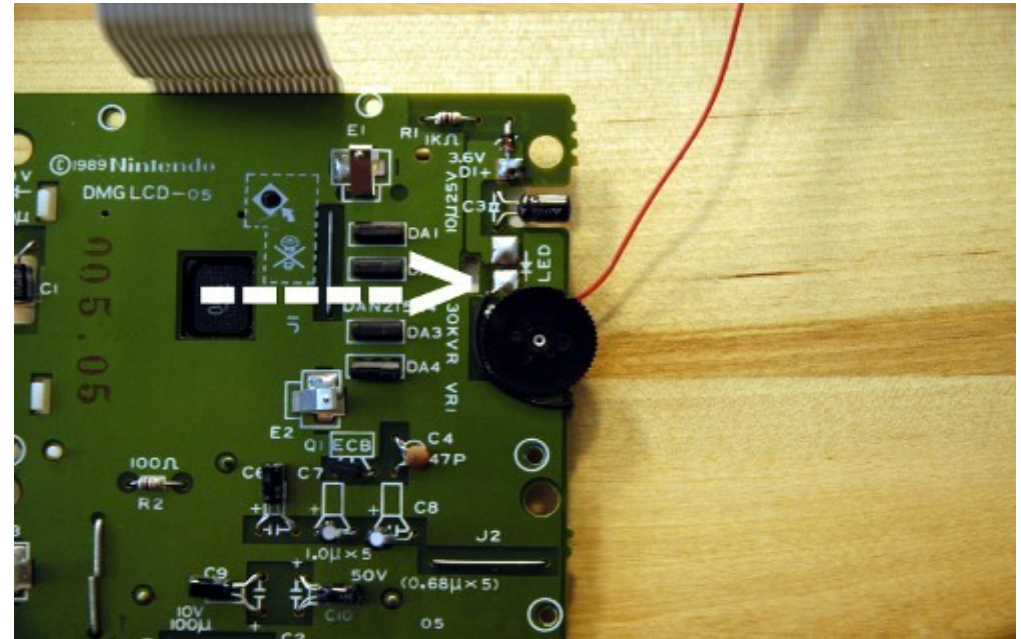
step ten

- solder the resistor to the end of the red wire
- **IMPORTANT!!!** put the shrink wrap tubing onto the red wire. if you forget to do this, you will be mad later when you have to unsolder your work and put it on the wire. so, do it now and make sure it stays on the wire!



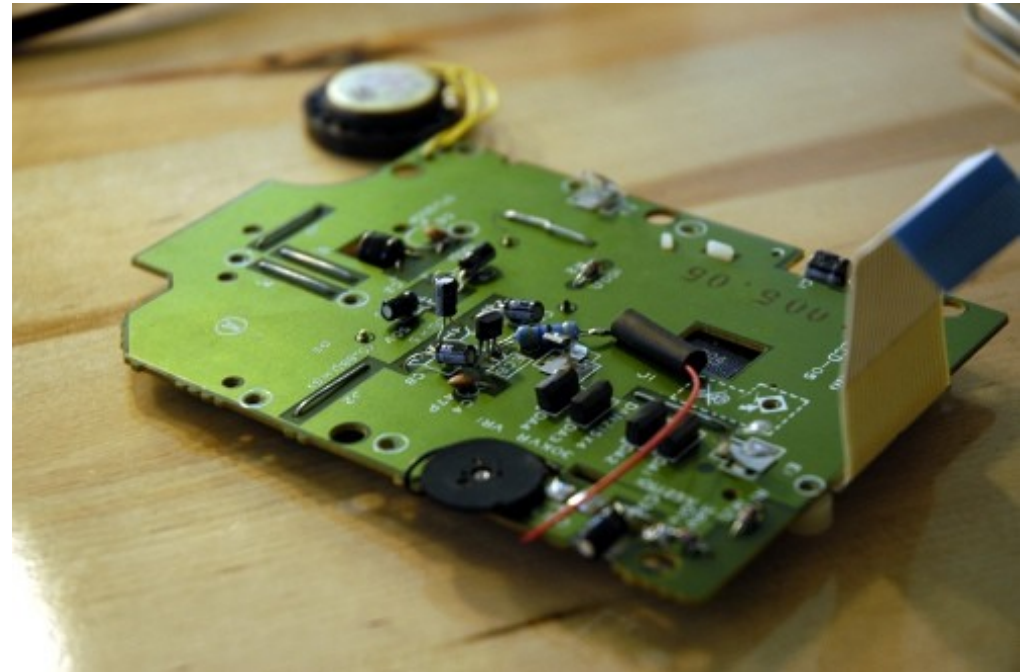
step eleven

- wrap the black wire around to the backside of the PCB. solder the end of this wire to the bottom solderpad from the removed power LED. the tip of the black wire is pre-tinned, so you only need to heat up the solder on the PCB and touch the wire to it for a moment. a pair of tweezers greatly helps
- the LED panel, when installed behind the LCD glass, doesn't need to be pushed all the way to the right side. if you find the black wire will not completely reach the solder pad, adjust the LED panel some (move it towards the left) so that the wire reaches



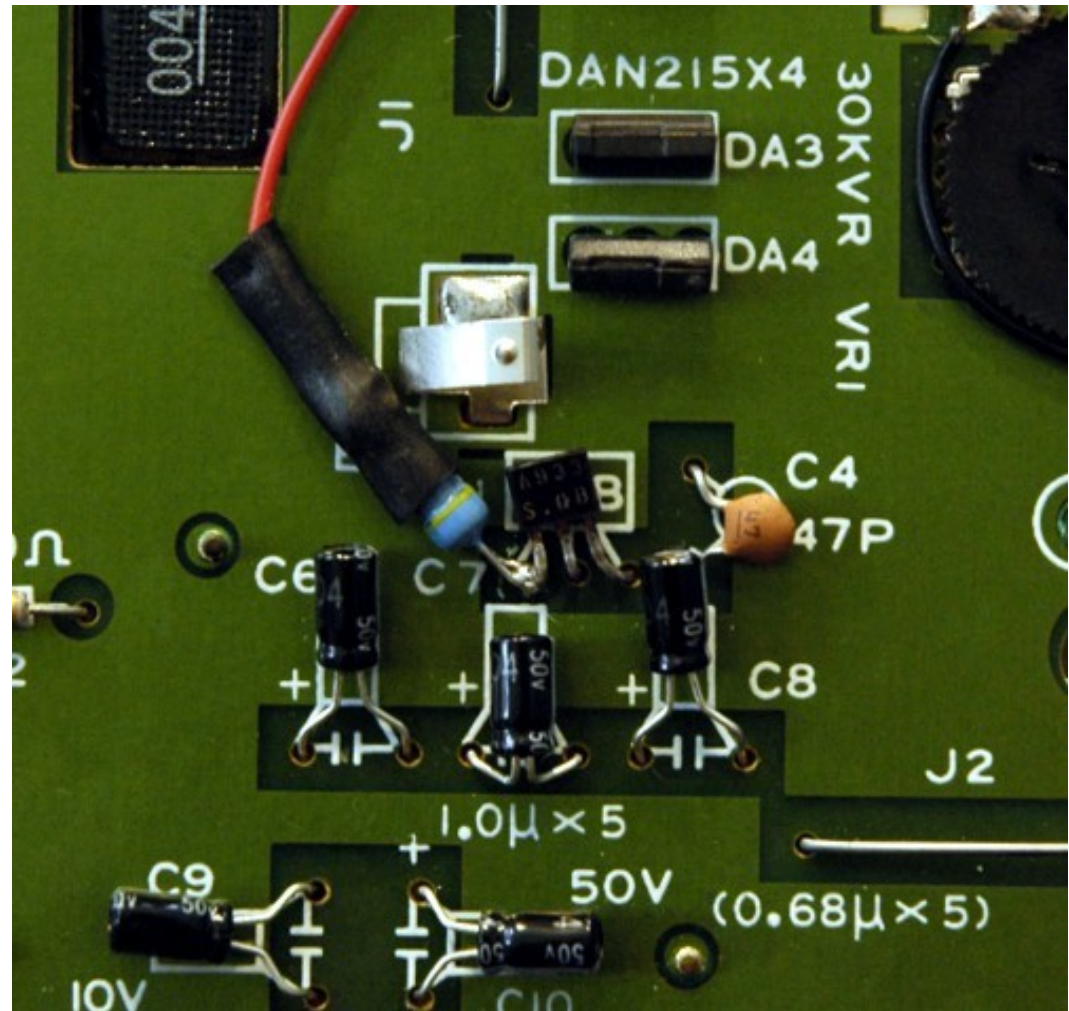
step twelve

- on the back of the PCB you will see a transistor 'Q1'. lift this transistor up so it is standing up like a building, as well as the capacitor located directly underneath. you can see these two parts standing up in the picture. this helps with soldering in this tight area
- attach the resistor to the leg of the transistor marked "E" in the picture and solder it in place. this is the leg on the left, if holding the PCB in your hand with the white ribbon cable coming out the top. please ZOOM IN to the picture, and you can see the leg marked "E". your PCB may also be marked, although some revisions (although installed the same way) do not have this marking
- make sure your soldering is connecting ONLY the resistor to this single leg. it is important you check your work after this step, because a short between the "E", "C", and "B" legs of the transistor will cause issues in your device



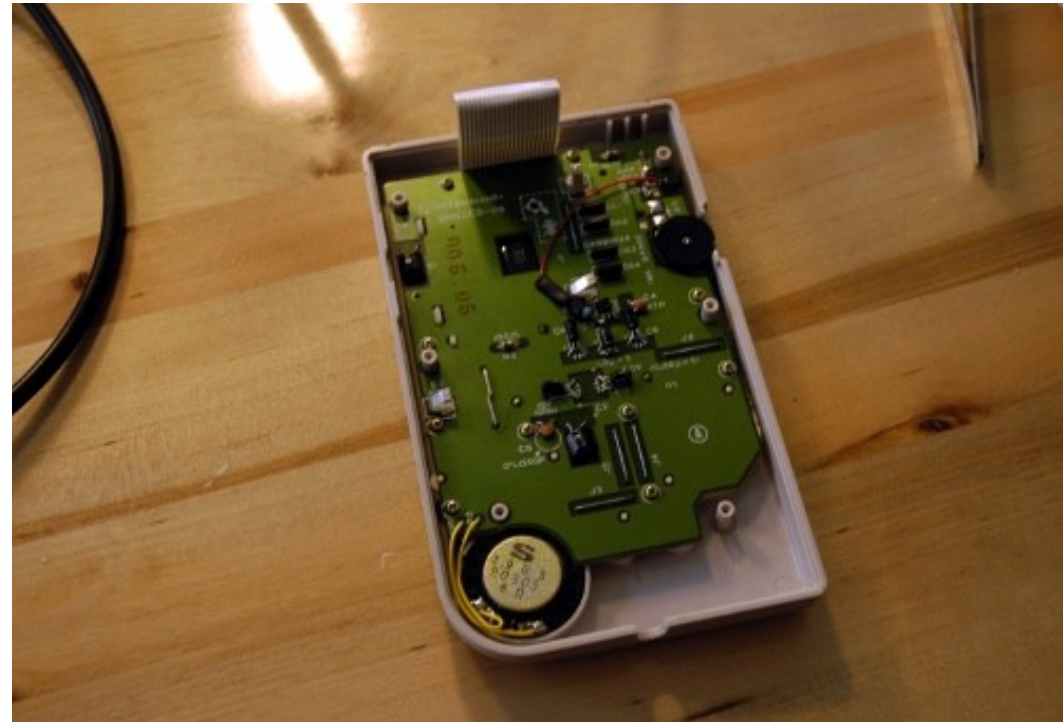
step thirteen

- this is a close-up view of step twelve's connections.
- when you bend Q1 and the capacitor back down (after soldering), make sure the top of the capacitor doesn't touch Q1 or your solder joint. you will see how I pushed this capacitor down slightly (the one marked C7)
- slide the shrink wrap tubing down so your solder joint connecting the red wire to the resistor is covered. with a heat source, shrink this tubing to protect this solder joint from touching the rest of the electronics. I suggest using the tip of your soldering iron, and gently and quickly apply heat to the tubing. moving the tip quickly up and down the length of the tube will cause it to shrink. however, too much heat will melt the plastic, so only apply the heat for short amounts of time. many people use a lighter for shrink tubing, but the flame may damage the components in this area. the tip of your soldering iron is more precise.



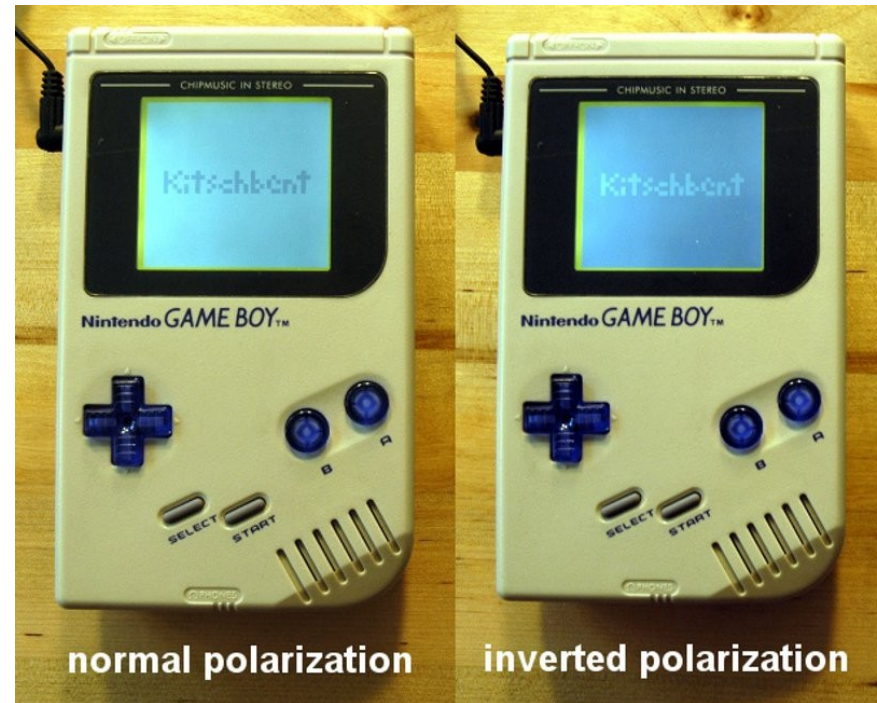
step fourteen

- screw the PCB back to the front half of the case
- don't forget to put the buttons back in!



you're done!!!

- put the two halves of your gameboy back together, and screw them together securely
- your gameboy, when put back together, should look like the images to the right. we used a white LED backlight for this tutorial, and your color may be different ;)
- you can see the difference between normal and inverted polarization



congratulations!

you are finished :)

we hope you enjoy your LEDx3

if you have any questions, please do not hesitate to contact us.

