

Sega GameGear



Backlight Replacement Kit

Hand Held Legend presents:

Custom Game Gear Backlight Installation Instruction

Hello classic gamers! Congratulations on your purchase of Hand Held Legend's custom Game Gear Backlight Modification. The following instructions are fairly straight-forward and are written to be as in-depth and easy to follow as possible, but it is assumed that you have some kind of previous knowledge of soldering and basic electronic device servicing.

Included Items:

- 1) Custom Game Gear Backlight
- 2) 100 ohm Resistor

Required Items:

- 1) Soldering Pen
- 2) Solder
- 3) Phillips head screwdriver
- 4) Security bit screwdriver (only 1 screw is required for this, the same screwdriver can be used on multiple other applications)
- 5) Straight saw to cut plastic (used for modeling, can use Dremel if you can cut straight)
- 6) Side cuts or something to cut wiring
- 7) Razorblade

Optional Items:

- 1) Shrink tube Insolation for wires
- 2) De-soldering braid/tool
- 3) Electrical tape
- 4) Needle nose pliers (to pick the screws up off the mainboard, less of a chance to lose them)
- 5) 3mm LED Light (if you wish to change the existing red LED to another color, do this step when you have the board removed from the case)

Procedure

First off, make sure you have a well prepared work area to perform this mod. It always helps to have ample room to work and a solid, clean surface to do any sort of electronics repair. To be *extra* careful, it doesn't hurt to have an anti-static strap to ensure the protection of the delicate electronic components in your

system. Also make sure to set your parts on soft, non-abrasive areas to avoid any possible scratches or dings. I've always had a clean micro-fiber cloth to set my case parts on, but a tissue or soft paper towel is fine.

Flip over the GG so the screen is facing down. Make sure to have a napkin or tissue underneath the screen to avoid any scratching of the front screen (which a GG is very susceptible to). Remove the battery covers and the 6 Phillips head screws; refer to **Figure (1)** for details. The security screw in the cartridge slot is 4.5mm and is the only security screw in the entire unit. Once you have all the screws removed, remove the rear section of the case (3 connectors will keep the case from completely separating).



Figure (1)

There were different versions of the GG board, but the principle is pretty much the same. A quick internet search can help you find specs on your unit's specific configuration. Next, carefully disconnect the 3 connectors at the top of the system. Don't pull them by the wires, since you could potentially break them. Once the connectors are disconnected, the back half of the case can now be removed and set aside.

Now, we can see all the inner workings of the GG. There are 8 screws holding the board in the case. Refer to red circles in **Figure (2)** for the locations of the screws and remove them. At this point you have probably collected a fair number of screws, so hopefully you have them in an area where you can't lose them. As you can see from the yellow circles in **Figure (2)**, the reflective cover for the lighting tube is held on by 4 screws. This cover has to be removed in order to perform this mod.

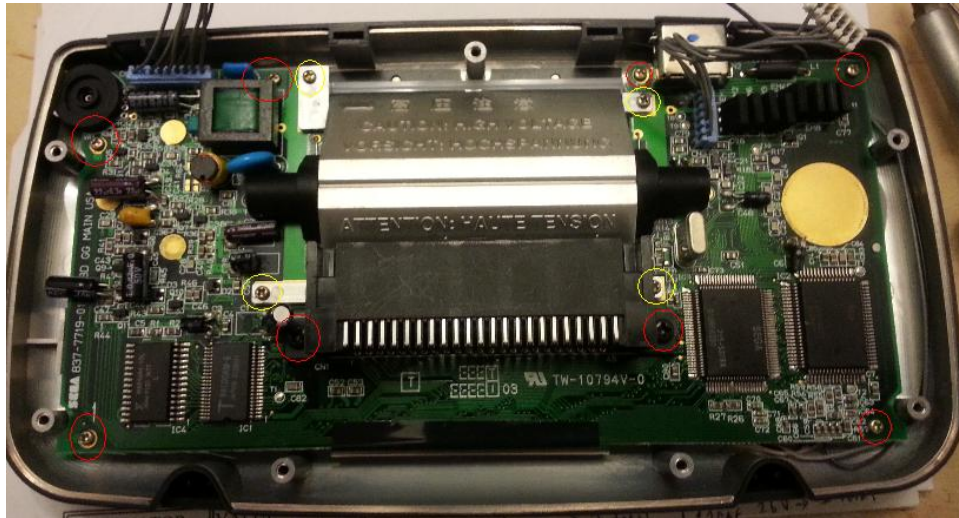


Figure (2)

Remove the reflective cover to get access to the lighting tube, refer to **Figure (3)**.

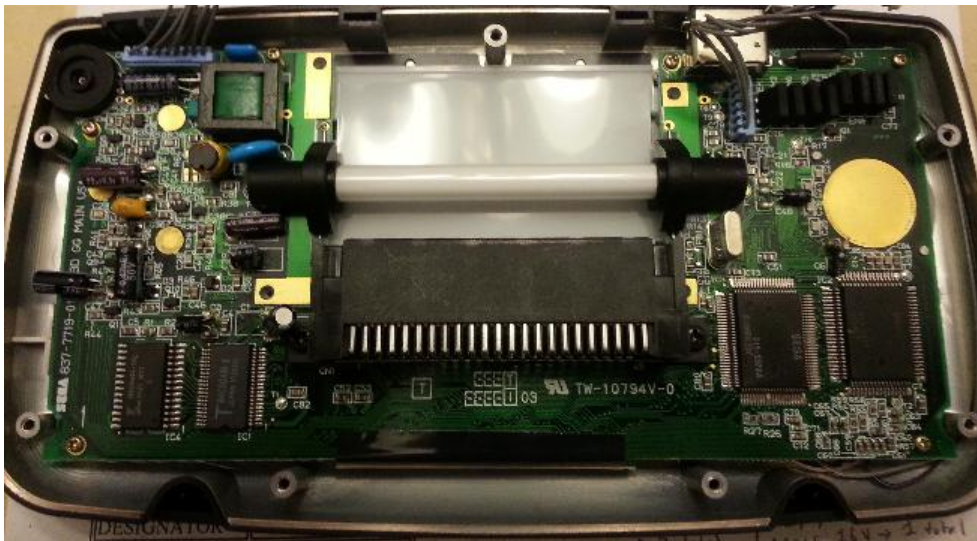


Figure (3)

It's now time to forever remove that power-hungry, battery sucking, monster of a tube. First, you will want to cut the 2 wires holding the tube to the board. There are also 2 resistors next to the ends of the tube, which are no longer needed and can be discarded. **Figure (4)** shows the location of the wires and resistors to cut. Once the tube and endcaps have been separated from the board, they can be thrown away. This is now the time to begin removing the extra components, which were part of the tube circuitry.

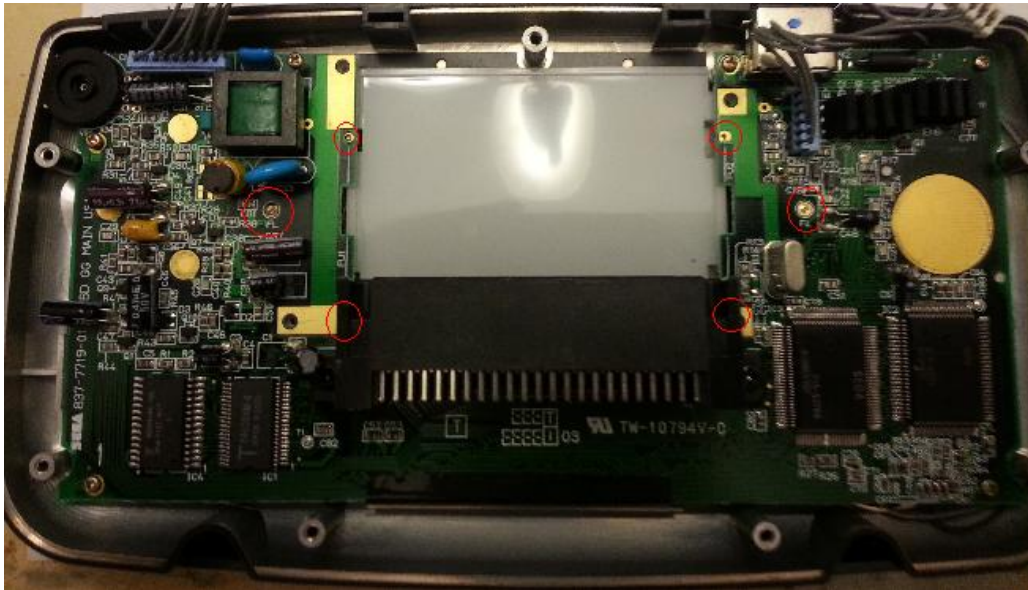


Figure (4)

Look at **Figure (5)** for the location of all the tube circuit components. The components shown in red boxes must be removed in order for this mod to work.

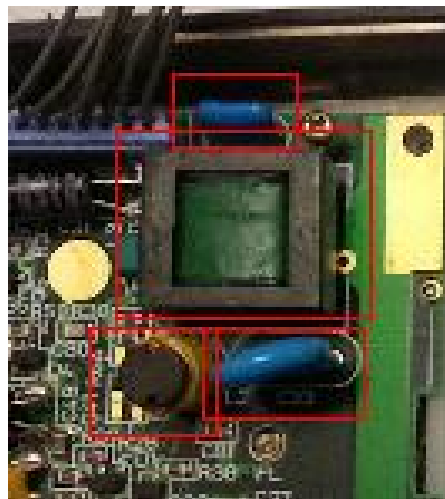


Figure (5)

There are many ways to remove these components from the board. The truly correct way would be to turn the board over and de-solder the parts from the back, but clipping them from the board is perfectly fine as long as there is no chance of a part shorting against something. Once all components are removed, it should look like **Figure (6)**. There is also an area that must be jumpered (yellow line), as shown in the red box **Figure (6)**, which can be done with either a big glob of solder or just a piece of wire. This will also allow the original brightness adjustment to still be used!

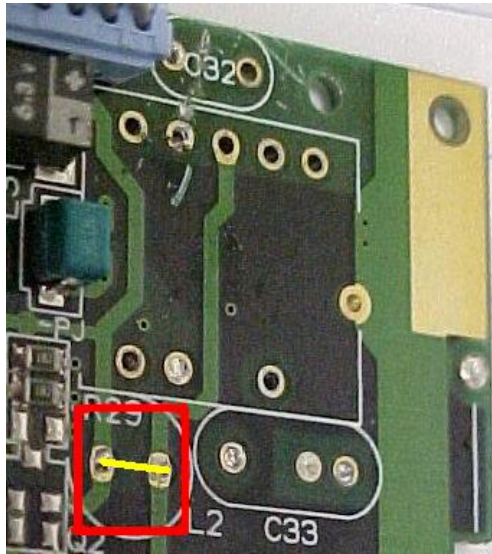


Figure (6)

Now its time to prepare the unit for the backlight install. **Figure (7)** shows the LCD and the diffuser together.

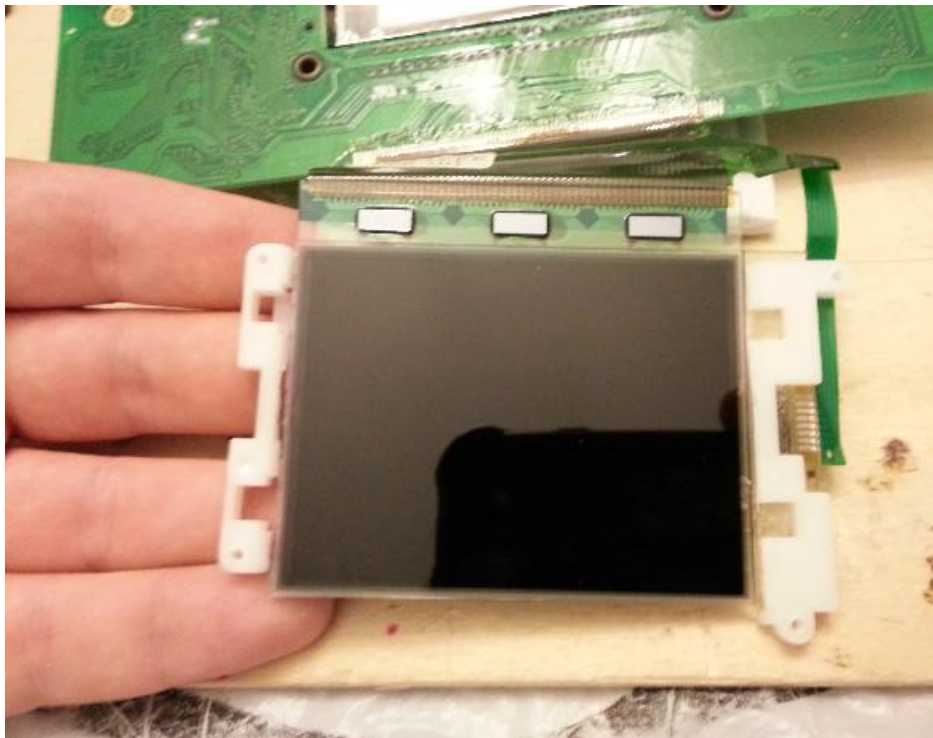


Figure (7)

You will need to remove the white light diffuser from the back of the LCD screen. This can be accomplished by using an x-acto knife or razor blade and **CAREFULLY** slide it into the middle of the 2 pieces, as shown in **Figure (8)**. Make sure you insert the razor on the same side as shown in the picture (the side with the most glue). Gently slide the razor up and down the glued area until the white diffuser separates from the LCD screen. Be very gentle with this step, the LCD screen is glass and can be easily broken.

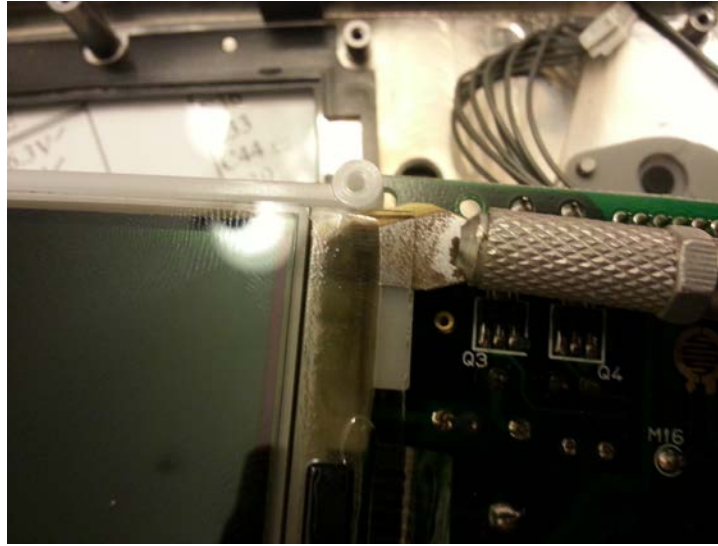


Figure (8)

This white diffuser has to be cut in order for the backlight to fit. Take your straight saw and cut along the edges of the white diffuser as it shows with red lines in **Figure (9)**. The center part of the diffuser can be tossed, but the 2 outside pieces need to be kept to be able to reattach the reflector cover.

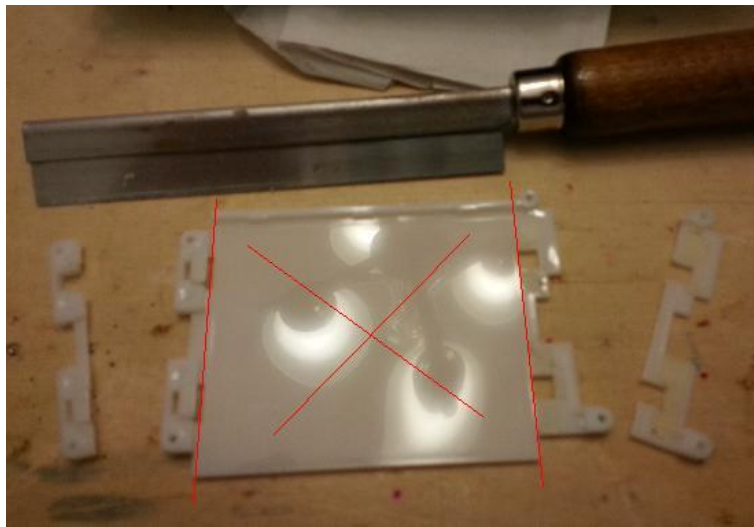


Figure (9)

Its time to begin reassembling the board and the LCD screen. Place the LCD screen back in its original position under the board. Take the 2 pieces of white diffuser cut from **Figure (9)** and place them back in their original location between the board and the LCD, as shown in **Figure (10)**. They should somewhat grab the sides of the LCD screen as they did when they were whole. Line up the holes in the board with the holes in the pieces as best as you can, again refer to **Figure (10)**. It is important to make sure the holes are lined up with the same placement as the reflective cover, since the reflective cover will be re-assembled to those holes later on.

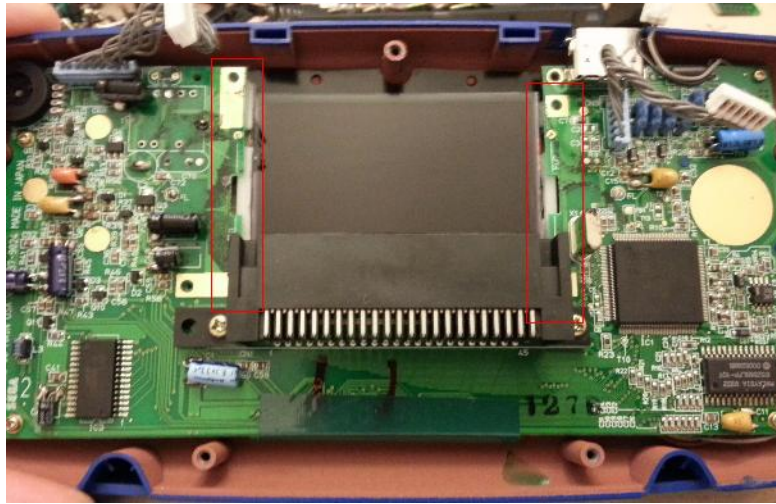


Figure (10)

Finally, its time to install the backlight! Take the backlight and place it into the space where the white diffuser used to be. Make sure you keep the wires at the top of the unit and that the backlight itself is facing the right way (the opaque part is face down towards the screen and the white part is up facing you). See **Figure (11)** for details.

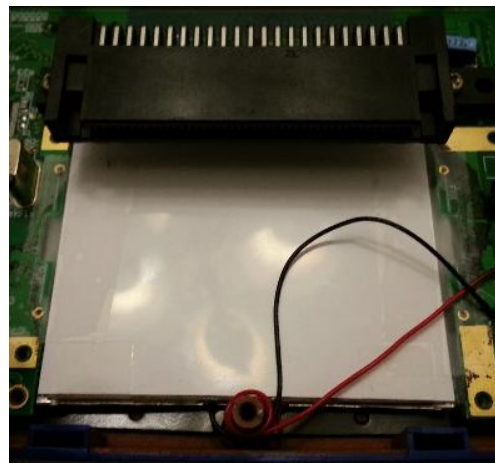


Figure (11)

The backlight will have to be powered using the original circuit for the light tube. Make sure you attach the 100 ohm resistor to the positive (**RED**) wire of the backlight. The resistor is important to decrease the 5V coming from the board to about 3V, so the backlight LEDs don't burn out. Solder the negative (**BLACK**) wire to the location shown in **Figure (12)** and solder the red wire with the attached resistor to the other location in **Figure (12)**. It might be a bit hard to see, but the positive wire is connected to the middle hole of the 5 holes at the top of the white square. I am usually a bit overprotective when it comes to protection against shorting, so after I soldered the resistor onto the backlight's positive wire I added a shrink wrap sleeve to the area before I soldered it onto the board. I recommend this step, but its not 100% necessary. I also place 2 small pieces of electrical tape on top of the exposed solder on the negative wire and the jumper, as another precaution against shorting.



Figure (12)

It's finally time to reassemble everything. It's basically the initial disassembly process, but in reverse order. Place the reflective cover back to its original location, paying attention to the 4 holes in the board and how they line-up with the modified diffuser cutoffs. **Figure (13)** shows how the reflective cover fits back into its original location.



Figure (13)

There is no need to worry about securing the backlight, since the reflective cover will hold it tight against the back of the LCD screen. Continue with reassembling the board on to the case with the rest of the 8 screws. Reattach the 3 connectors, paying close attention to their orientation, and then put the rest of the case back in its place.

and.....Presto! You can now enjoy your Game Gear with a nice, clear picture and up to quadruple the battery life! Happy Modding!

