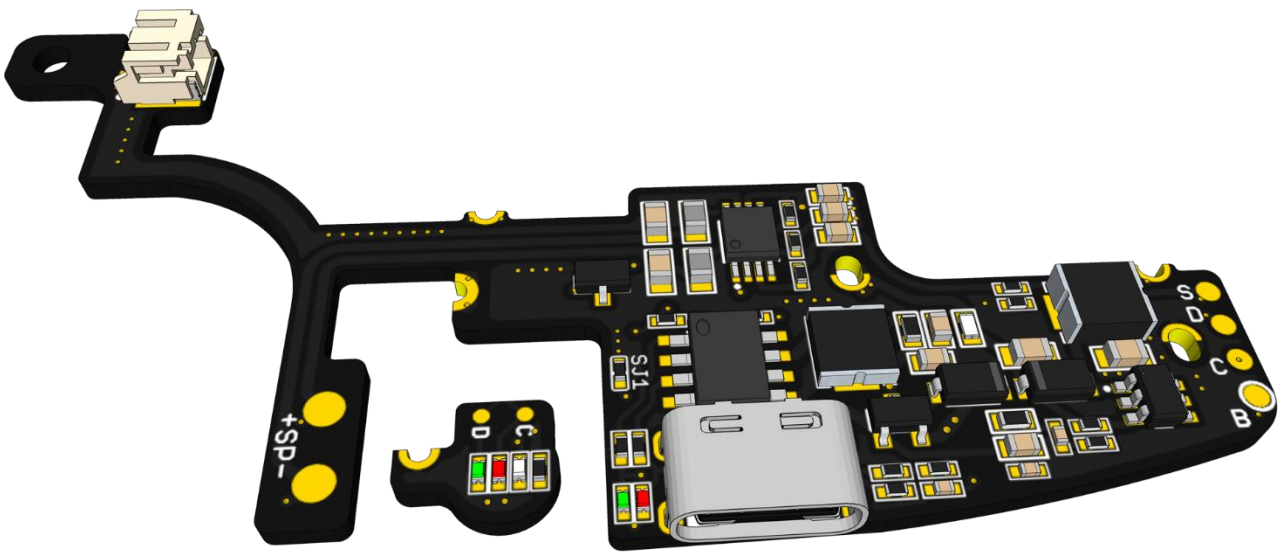


# **USB-C CHARGING KIT PRO FOR GAME BOY COLOR**



PRODUCT V3.0+

[HTTPS://SHOP.GILTESA.COM/PRODUCT/GAME-BOY-COLOR-USB-C-CHARGING-KIT-PRO](https://shop.giltesa.com/product/game-boy-color-usb-c-charging-kit-pro)

**PLEASE READ THROUGH THESE INSTRUCTIONS ENTIRELY BEFORE ATTEMPTING TO INSTALL**

**WARNING: IF YOU ARE NOT COMFORTABLE WITH SOLDERING, OR PERFORMING ANY STEP IN THIS GUIDE, DO NOT PERFORM THE INSTALL YOURSELF. FIND SOMEONE WHO IS COMFORTABLE TO DO IT FOR YOU.**

## INDEX

<b>DESCRIPTION</b> .....	<b>4</b>
<b>FEATURES</b> .....	<b>4</b>
<b>INCLUDED</b> .....	<b>5</b>
<b>RECOMMENDED / REQUIRED [NOT INCLUDED]</b> .....	<b>5</b>
<b>BOARD DETAILS</b> .....	<b>6</b>
<b>TEST THE BOARD!</b> .....	<b>7</b>
<b>INSTALLATION STEPS</b> .....	<b>8</b>
Pre installation Steps.....	8
1. Disassembly the Game Boy Color .....	8
2. Cleaning the mainboard .....	10
3. Cleaning the power switch .....	10
installation Steps .....	11
1. Protect the button pads .....	11
2. Remove unnecessary components .....	12
3. Clean the excess of tin .....	13
4. Clean the board.....	13
5. Installation of the main board .....	14
6. Installation of the light board (optional) .....	18
7. Installation of the audio cable .....	21
8. Power cable for your IPS screen .....	23
9. Cutting the plastic shell.....	24
10. Light status .....	27
11. Battery cable .....	28
12. Done!.....	31
<b>FREQUENTLY ASKED QUESTIONS - FAQ</b> .....	<b>32</b>

# DESCRIPTION

The **Game Boy Color USB-C Charging Kit PRO** is a new circuit designed specifically for the **Nintendo Game Boy Color**. This all-in-one circuit includes not only the **charging controller** but also a **boost converter** and **audio amplifier**.

The modern **IPS displays** with backlighting require more power than the original display, and **flash cards** used to load tons of games can quickly drain the battery. To truly enjoy the games, it is recommended to use a rechargeable battery instead of AA batteries.

However, simply using a rechargeable battery is not sufficient. The increased power consumption puts a strain on the original electronics, potentially causing noise in the speaker or headphones.

The typical solution is to add a charging circuit for the battery and a power converter to replace the old, inefficient one included in the GBC. Some individuals also add an audio amplifier to enhance the sound quality of the speaker. All these modifications make the GBC function optimally. However, installing them requires numerous cables and may be challenging for individuals without sufficient knowledge.

# FEATURES

- Exact **shape** for Game Boy Color.
- **Li-Ion battery charger** by USB-C with overvoltage and undervoltage protection.
- **DC to DC converter** of 5V output. *(The board doesn't support original screen, only IPS screens supported)*
- **Safe charge and play**. (From v3.1)  
*The v2.3 doesn't support "Safe charge and play" properly. Please, **DO NOT charge and play at the same time** to avoid any problems. [\(Read more about it here\)](#)*
- **Audio amplifier** for the speaker.
- **Integrated LED indicators** on the main board, next to the USB for charging battery (red) and full battery (green). It can be disabled by the jumper SJ1.
- **External LED indicators** board for playing (white), charging battery (red) and full battery (green). Optional installation.

## ***INCLUDED***

- 1 frame panel which includes the two boards:
  - Main board.
  - Light board.
- 1 Battery cable.
- 1 Cable of 2 wires for connecting the light board.
- 1 Cable of 1 wire for connecting the board to the sound pad.
- 1 Light diffuser pipe (in clear white color from v3.1)

## ***RECOMMENDED / REQUIRED [NOT INCLUDED]***

- Li-ion battery (for example [123048](#), perfect for an IPS V3 laminated screen shell)
- New speaker 8Ω 1W (optional but recommended to avoid noise, for example [this one](#))
- New [capacitors](#) (optional but recommended to avoid noise)
- [Cutting tool](#) (optional but recommended)
- [Tri-wing sand phillips screwdriver](#)
- [Cutting plier](#)
- [Cutter](#)
- Tweezers
- Tin soldering iron
- Tin
- Flux
- Isopropyl alcohol

# BOARD DETAILS

There are many pads on the charging board that need to be soldered to join it to the GBC mainboard. The following explains what each pad is for.



## Main board:

- **BATIN:** Input connector of the li-ion battery.
- **VOUT:** The energy output (from battery or USB-C) to the GBC power switch.
- **VIN:** The energy input after the GBC power switch.
- **GB+5V:** The +5V line output to power the GBC board (CPU, IPS screen, etc.)
- **GND:** The ground pad.
- **SDN:** Shutdown pad to disable the audio amplifier when the headphones are connected.
- **+SP-:** The positive and negative pads for the speaker.
- **S:** Audio input from the GBP audio wheel.
- **B:** VCC battery pad (Added in the v3.1, not used yet)
- **SJ1:** Solder jumper. If you wish, it can be removed to disable the integrated LED indicators.

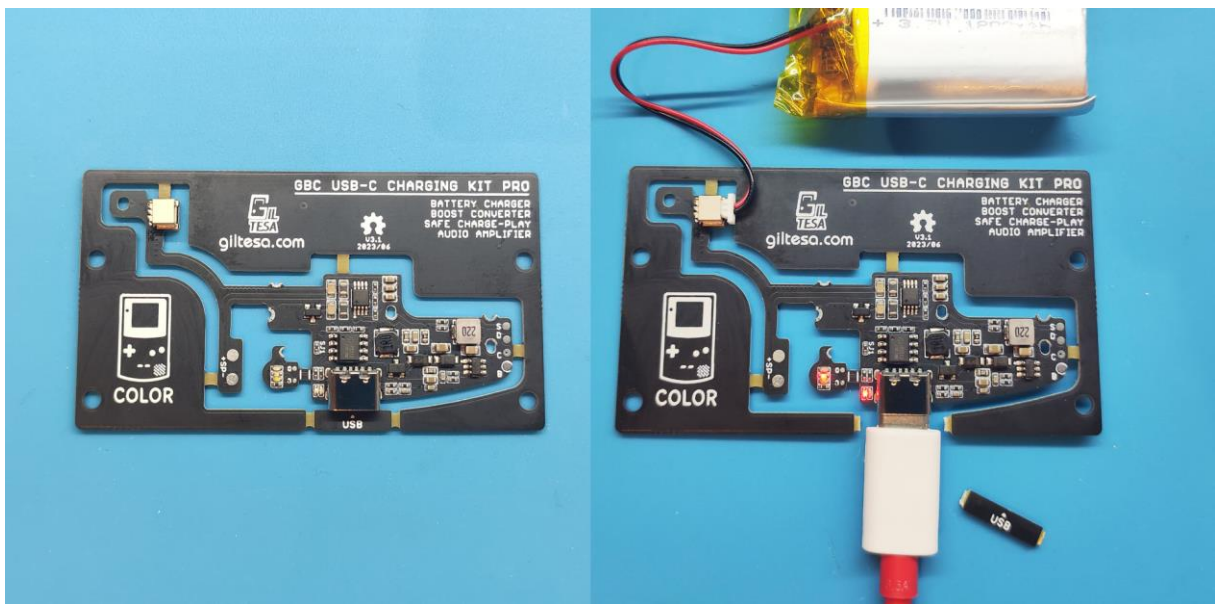
## Main board & Light board:

- **P:** Power pad for the original LED.
- **D:** Done pads for joining the light and main boards.
- **C:** Charging pads for joining the light and main boards.
- **GND:** The ground pad.

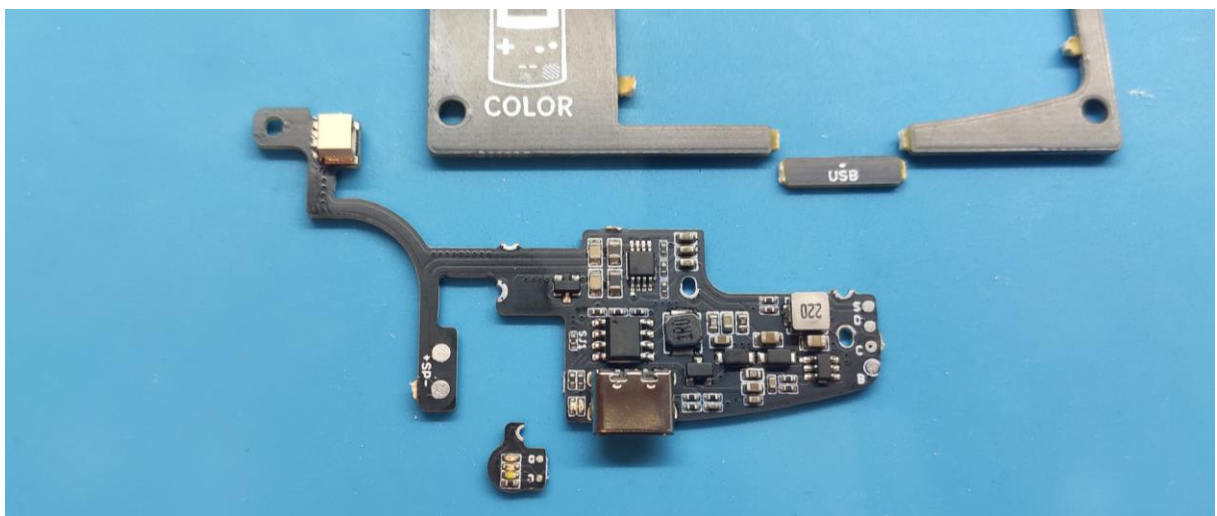
# TEST THE BOARD!

Before starting the installation, you should test the board. If it doesn't work contact me [for a replacement](#) (*all boards are fully tested, but they may damage during the shipping, we try to package them as better as possible*), if it works, go ahead with the installation.

**First** cut the notches next to the USB port, then you will be able to connect the USB-C cable and battery. **Wait until the light turns green**, indicating that the battery is fully charged.



**Second**, If the board works as expected you can cut the bridges to separate both boards from the frame and each other. You can proceed with the installation.





# INSTALLATION STEPS

Please, carefully read the following steps for a successful installation.

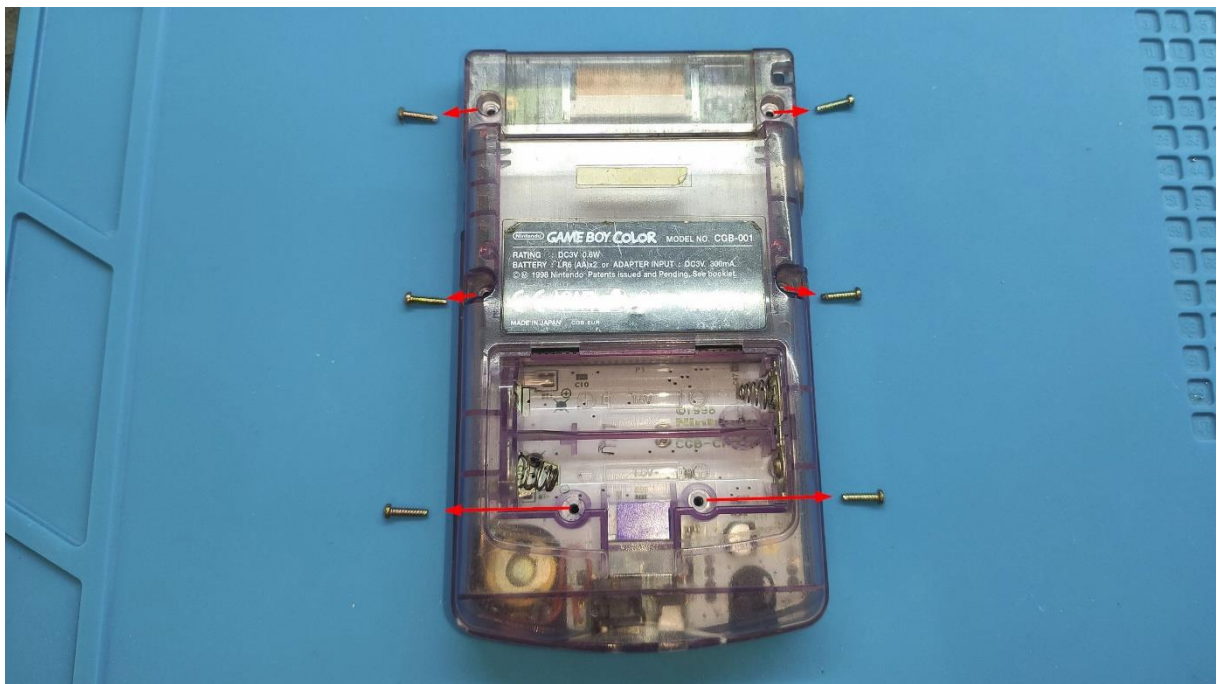
## PRE INSTALLATION STEPS

Before the installation, your GBC may need some extra steps to have it ready for the kit.

### 1. DISASSEMBLY THE GAME BOY COLOR

Nintendo products in general use two kind of screws. The first one called **tri-wing** to close the shell, and the second one called **phillips** to hold the main board to the shell.

Use the **tri-wing** screwdriver to open the shell and remove the 6 **tri-wing** screws.

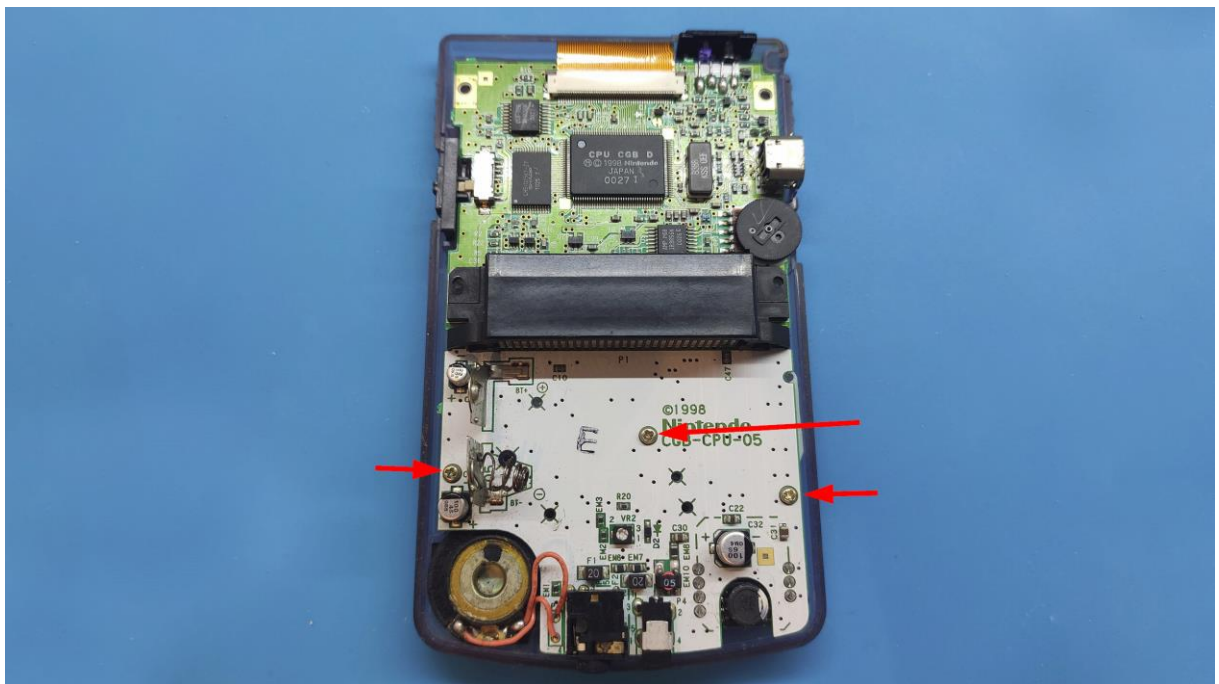




Carefully **disconnect the display cable** from the mainboard.



Then, remove the 3 **phillips** screws with a **phillips** screwdriver.



## 2. CLEANING THE MAINBOARD

Use isopropyl alcohol to clean the board. Since the board was made in 1998, the board may be full of dust or with the flux from the factory (yellow spots). All this dirt can be cleaned with alcohol.

## 3. CLEANING THE POWER SWITCH

Depending on how the GBC has been stored, the switch can be also full of dust inside and prevent a good electrical connection. **If you see when your turn on the GBC, sometimes it doesn't turn on well at the first time, this may be the cause.**

However, cleaning the power switch is a bit difficult to do. You must be extremely careful about cleaning it or you may damage it.

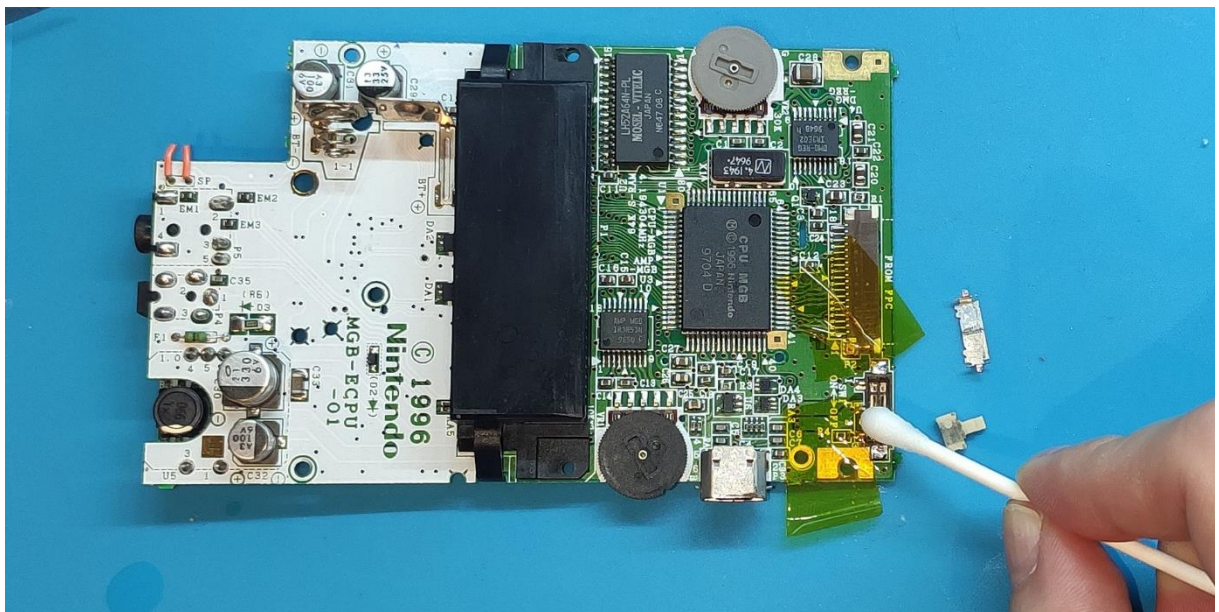
First, protect the nearby parts with kapton tape to avoid burning them with the soldering iron.

Then, heat the pads, first one and with a tweezer or flat screwdriver pry the veneer apart first on one side, then repeat this on the other side.

You can see it in the following video:

<https://youtu.be/P-4KlOvaQ2M>

Once the metallic veneer is removed. The switch can be cleaned with alcohol and close and solder it as before.



*This is a GB Pocket, but it's the same for GB Color*

# INSTALLATION STEPS

## 1. PROTECT THE BUTTON PADS

Because many pads need to be soldered and they are next to the button pads. This can cause the buttons pads get dirty with tin and interfere with proper operation. To avoid that, **protect them with kapton tape until the installation is completed.**



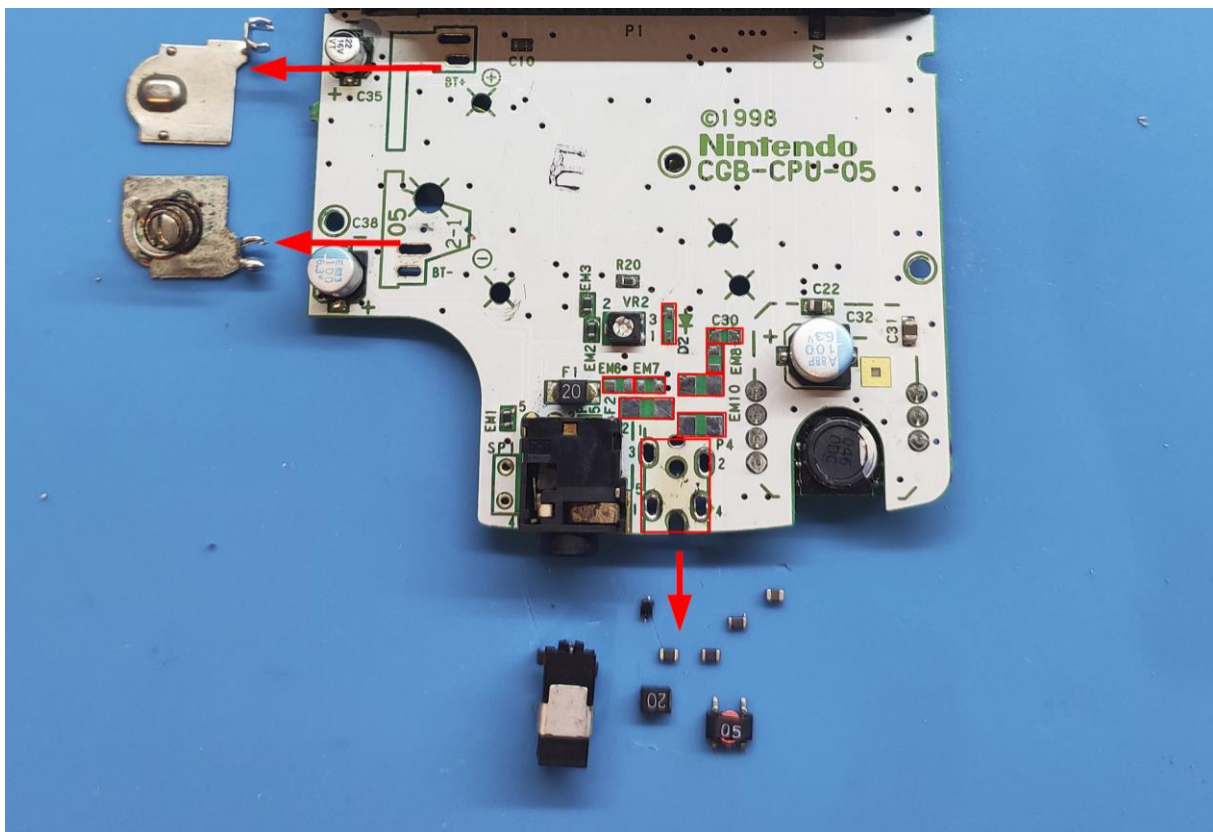


## 2. REMOVE UNNECESSARY COMPONENTS

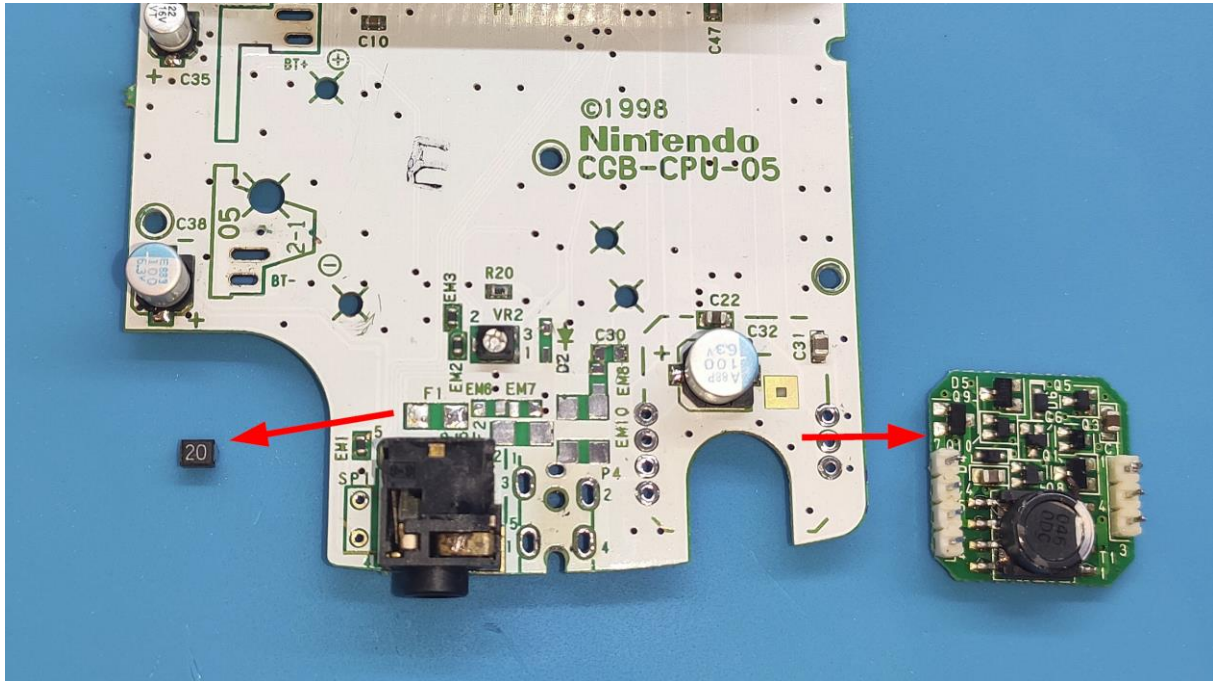
There are some components that the kit doesn't need, and they are in the middle where the kit needs to be installed.

Remove the components one by one. You can follow [this list](#) from the easier one to the harder one to remove:

- Diodes: D2
- Capacitors: C30
- Coil filter: EM8, EM7, EM6
- Fuses: F1\*, F2
- Coil filter: EM10
- **Speaker** (keep it for later if you don't have a new one)
- **Red light** (optional, only if you want to install the light board of the kit)
- Power plates BT+ and BT- for the AA batteries.
- DC Jack
- DC-DC converter\*



\* These two components are specific for the **GBC PRO** board, remove them too:



### **3. CLEAN THE EXCESS OF TIN**

All the pads where the components were before need to be clean and free of tin. Otherwise, the kit will not be flat over the GBC mainboard.

Use a desoldering pump or/and flux and desoldering mesh for removing the tin.

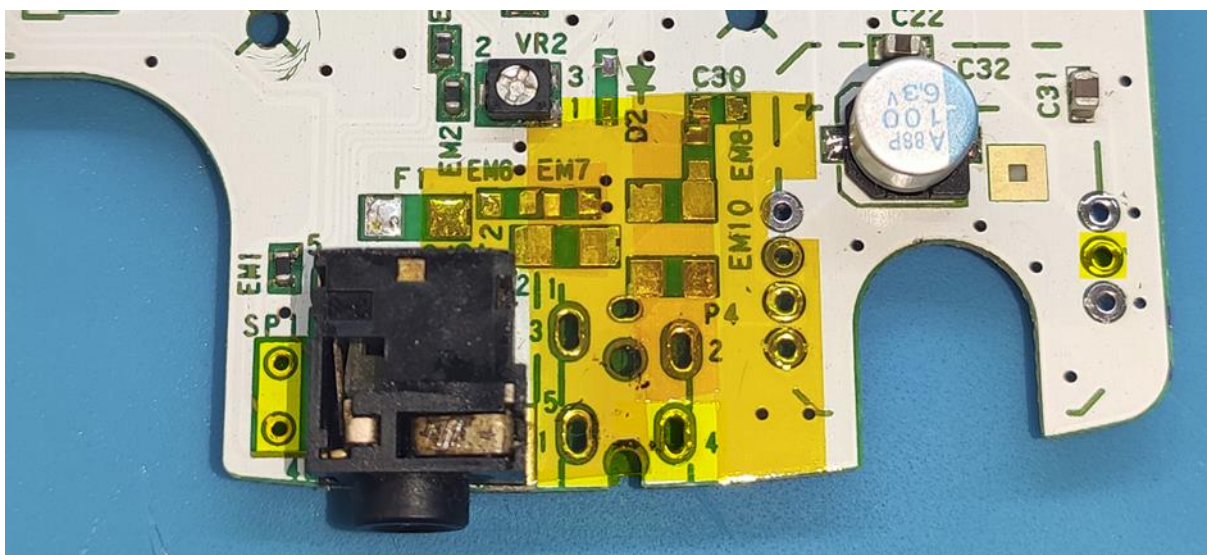
### **4. CLEAN THE BOARD**

After the components are removed, it may be dirty, clean it again with isopropyl alcohol.

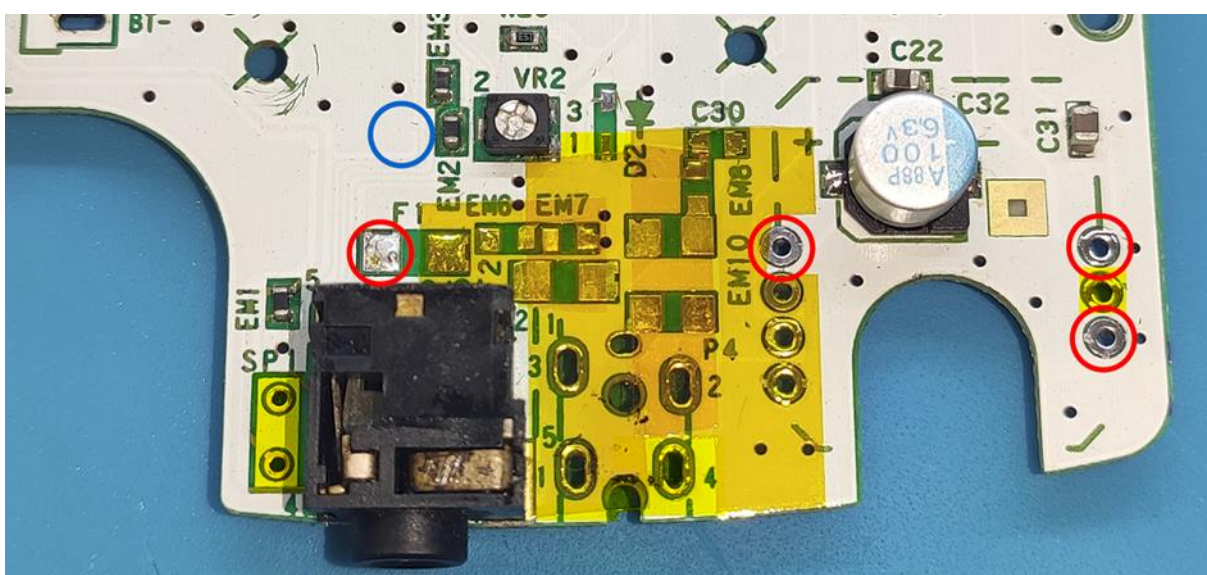
## 5. INSTALLATION OF THE MAIN BOARD

There are some pads on the board that the kit doesn't need, and they may interfere with the correct operation of it. In the worst case, they can cause short circuit and burn the kit or the GBC.

Please, protect these pads with kapton tape following the next picture:



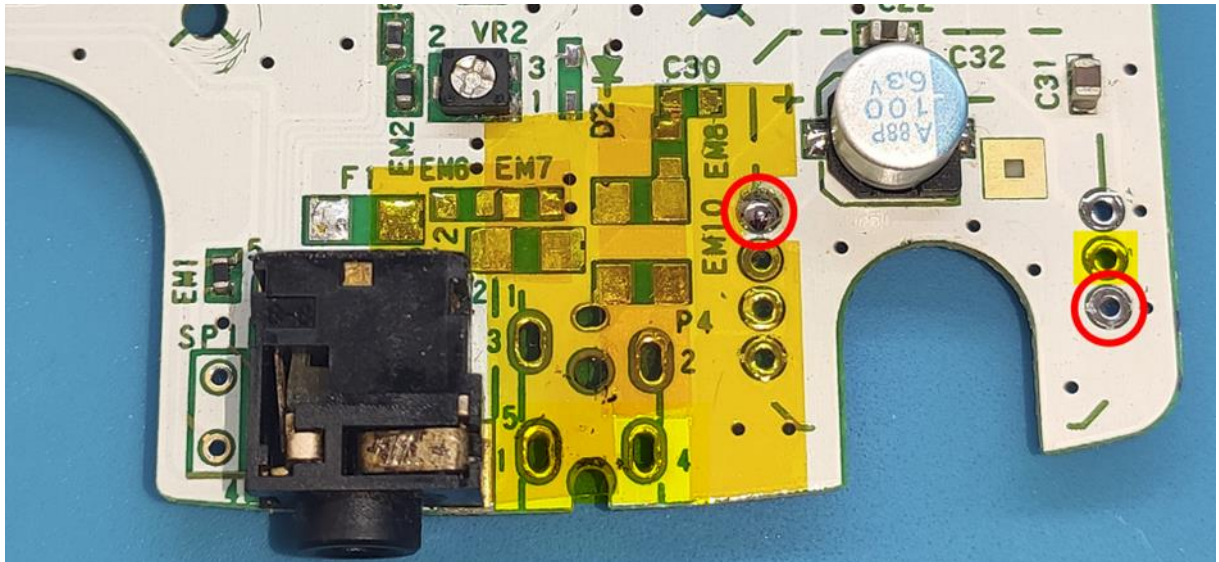
The board is going to be soldered in these pads:



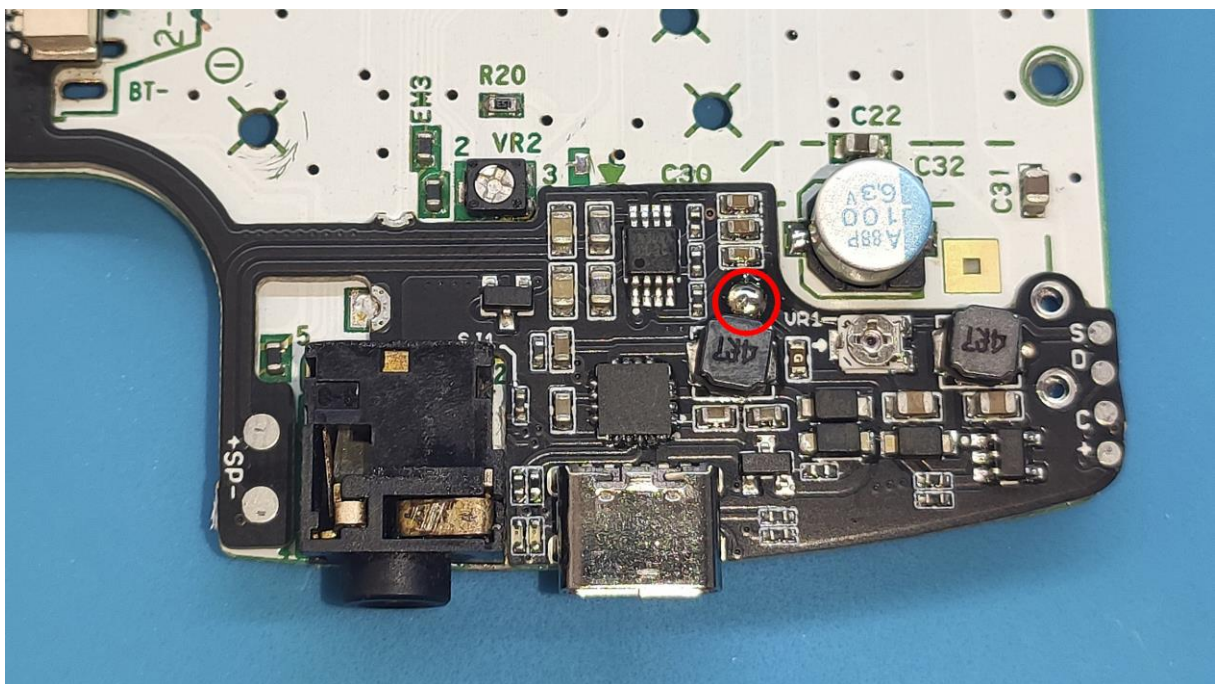
**(Blue circle)** Some versions of GBC board, like mine in the previous picture, don't have the electronic component **EM4** where the GBC PRO board need to be soldered. This can be easily fixed using a cable. You will see it later in this guide.



First, presolder these two pads with a bit of tin (not too much):



Put the GBC PRO board over the GBC mainboard and solder this pad which is going to be joined with the previous soldered pad. When you are heating the pads press with your fingers to be sure both boards are flat and there isn't any gap between the boards.

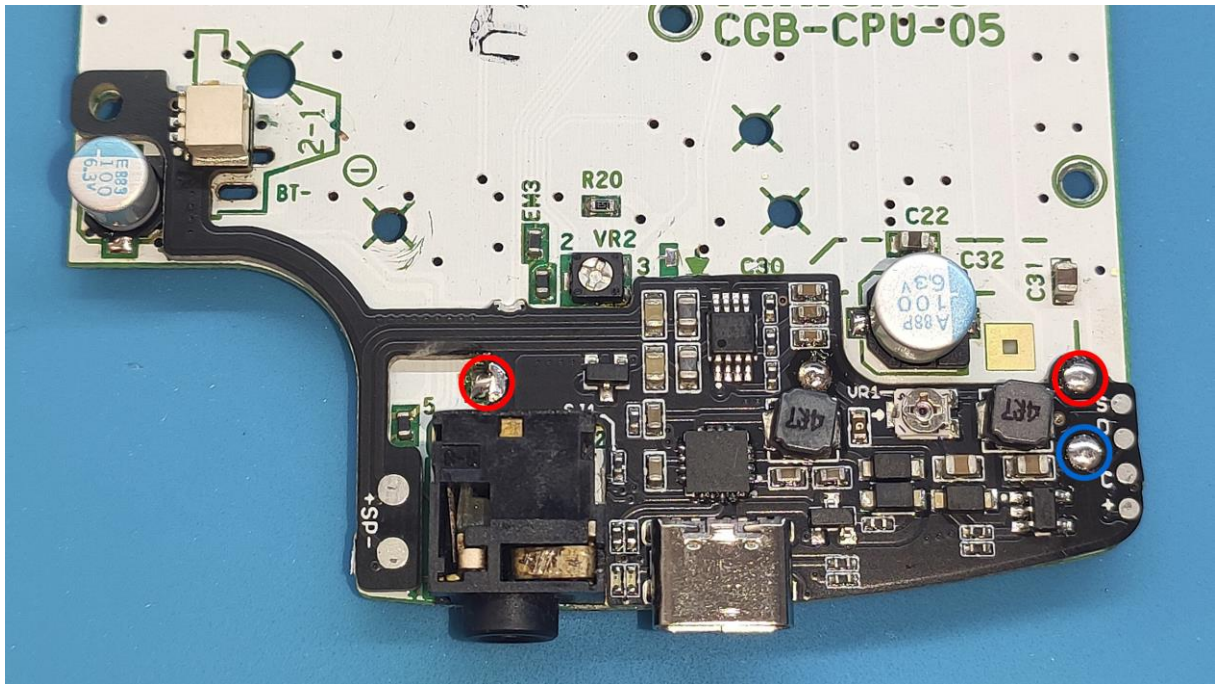


*(Photo from board v2.4)*



Then continue with these three pads. But **start with the blue one** with is far away the harder of the installation. This pad is the ground / GND pad, and it loses the heat of the solder iron very fast.

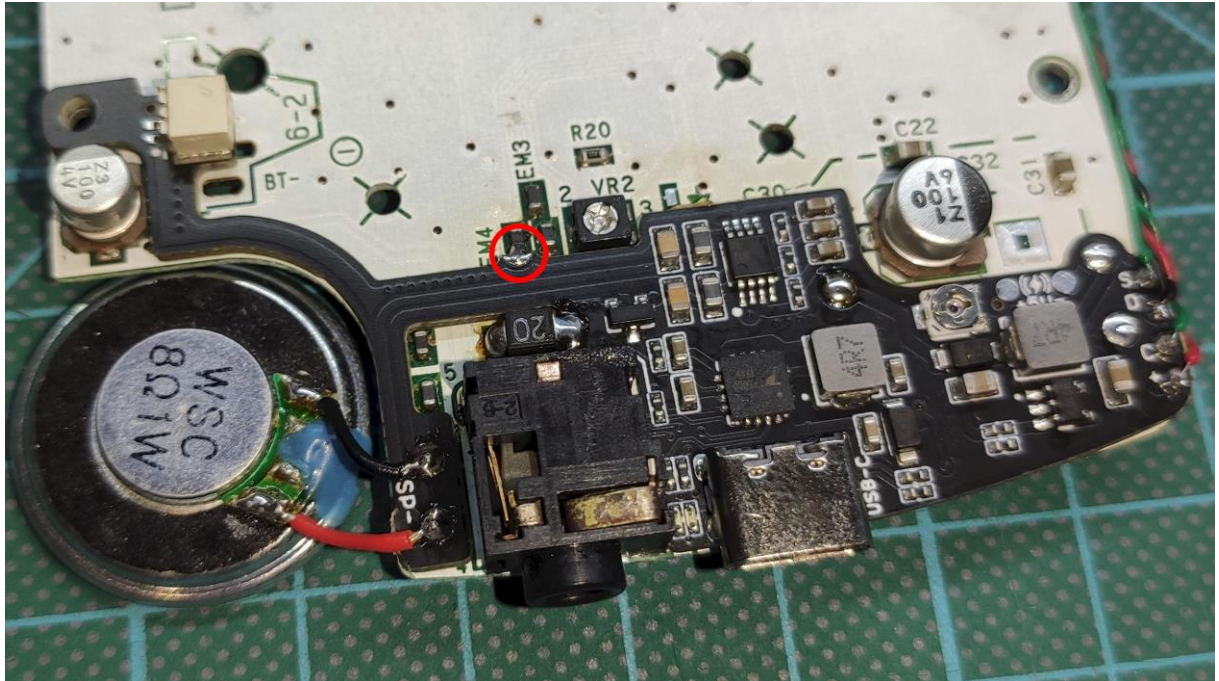
If you presoldered before these pads, shouldn't be too difficult. Add tin on the GBC PRO pad and the one down the board should melt and joint. Press the board with the fingers to keep both boards as together as possible and not gaps in the middle.



*(Photo from board v2.4)*

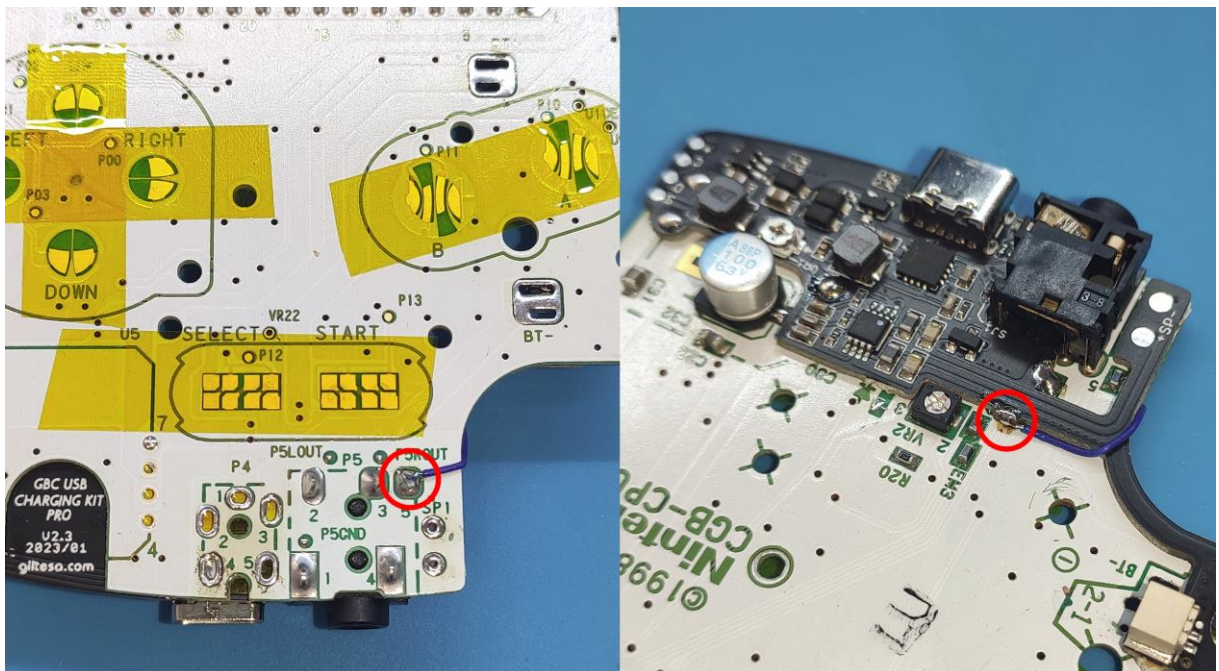
The last but not least, it's this pad which control when the speaker or headphones needs to work depending on if the headset are connected or not.

If you have the component **EM4** on your GBC mainboard, you can solder it easy:



(Photo from board v2.4)

Otherwise, you will need to solder a cable like these two photos:

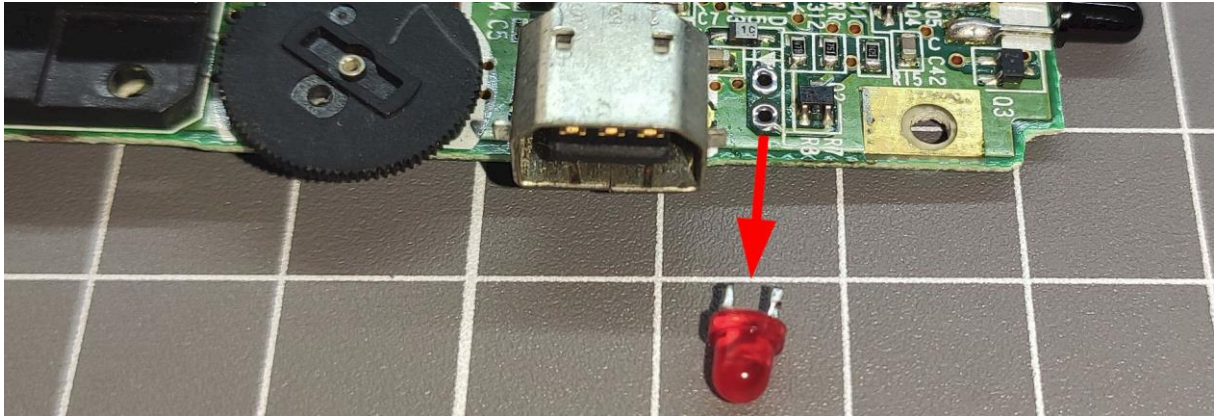


(Photo from board v2.4)

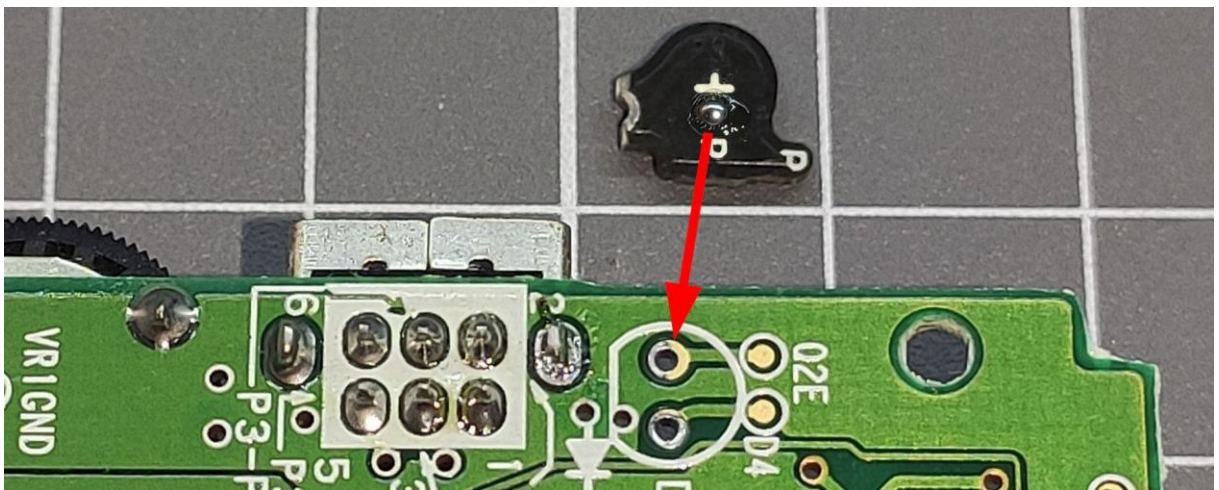


## 6. INSTALLATION OF THE LIGHT BOARD [OPTIONAL]

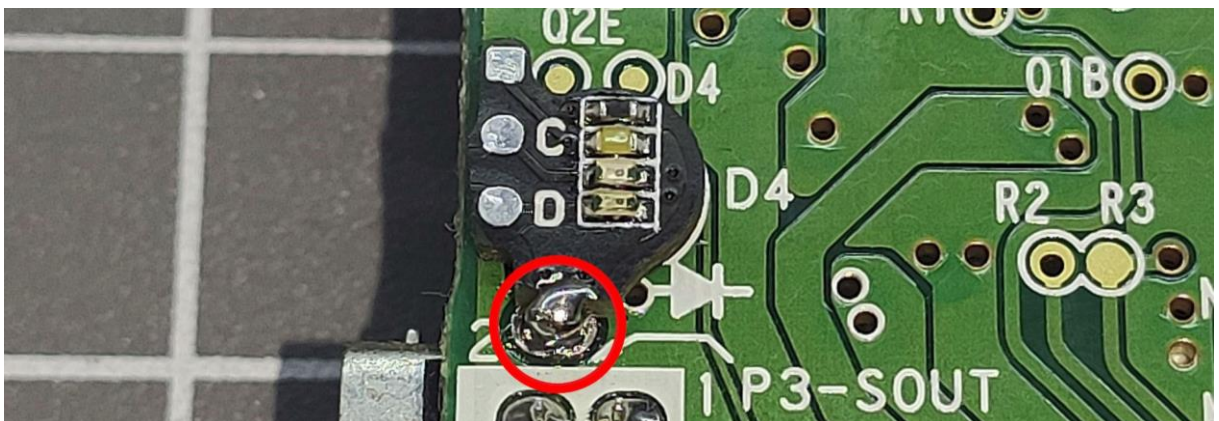
First you need to remove it. Heat both legs at the same time and then remove it from the mainboard.



The best way to solder the light board is by **pre-soldering the pad on the underside first**. Then, place the board onto the GB mainboard and heat the pad from the opposite side. The solder will melt, and the light board will be joined together.



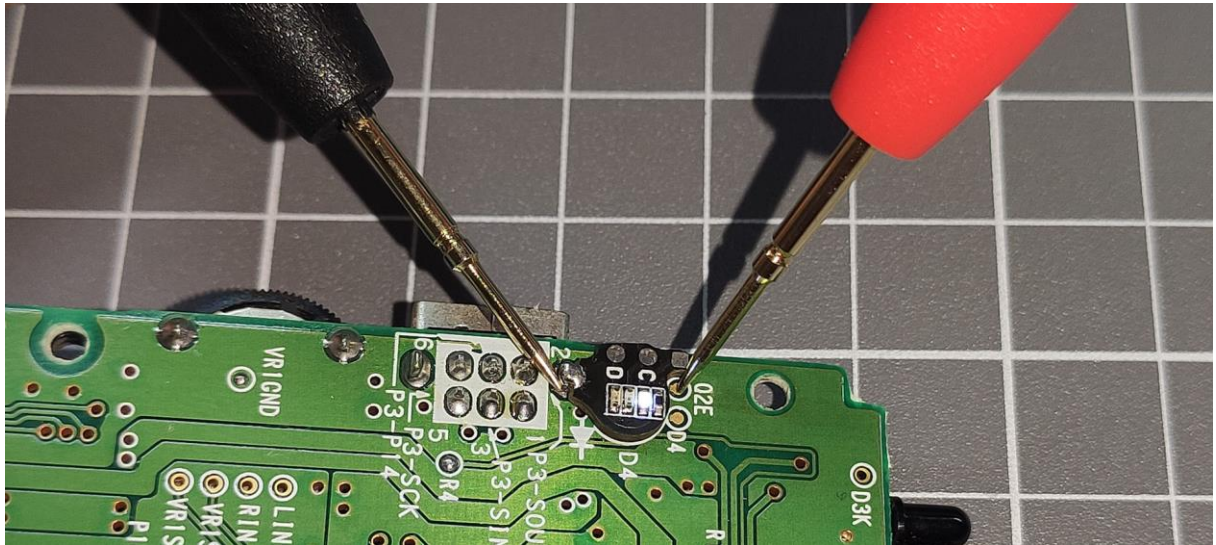
Now solder the pad on the bottom of the board. You need to connect it to one of the legs of the Link connector.





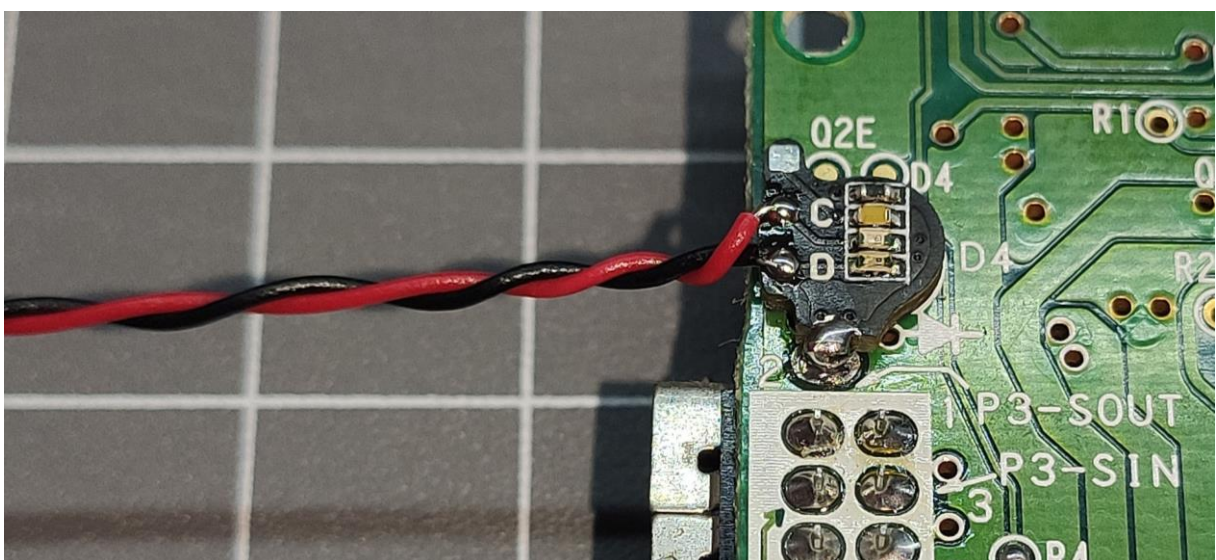
If you wish, you can now verify that the white light of the light board is functioning correctly and that both soldering joints are well done.

Select the diode measurement mode on your multimeter and place it in this position:



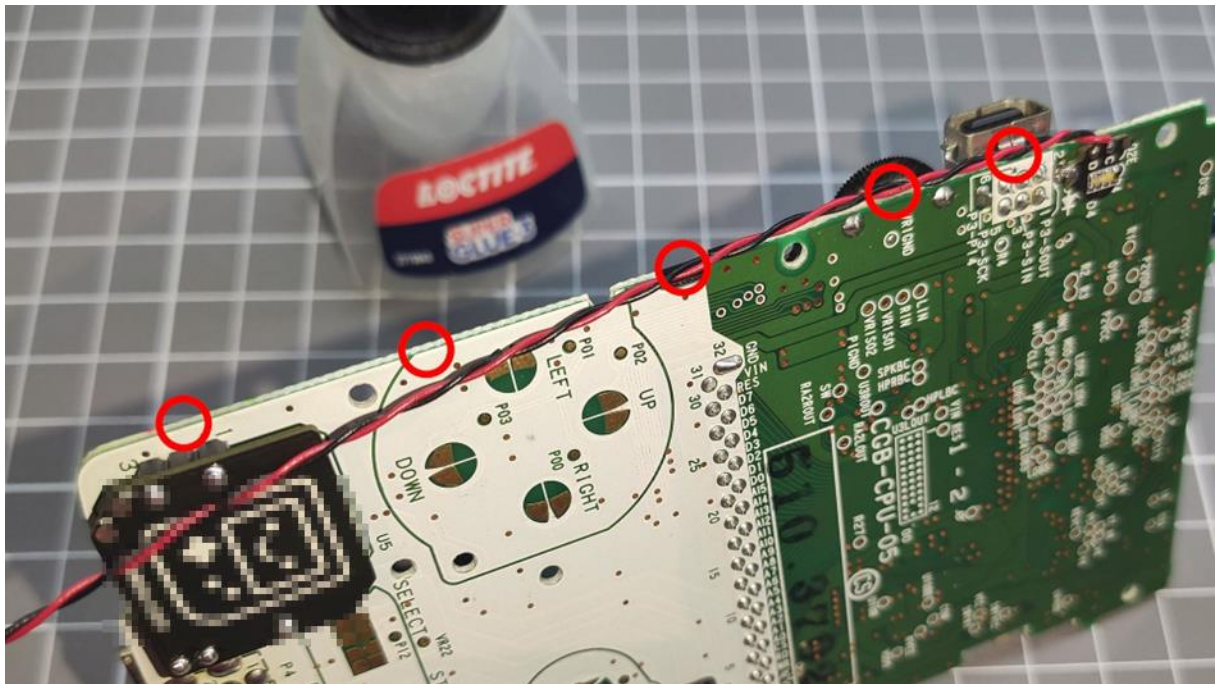
Once the light board is installed, all that remains is to solder the two-wire cable included with the kit. You should connect the **C** pads and the **D** pads respectively. The color of the cables may vary, but what's important is that the **C** pad on the light board is connected to the **C** pad on the main board, and the **D** is connected to the **D** pad.

The cable is about 3 or 4 cm longer than necessary; you can start soldering it from the light board and cut the excess later:

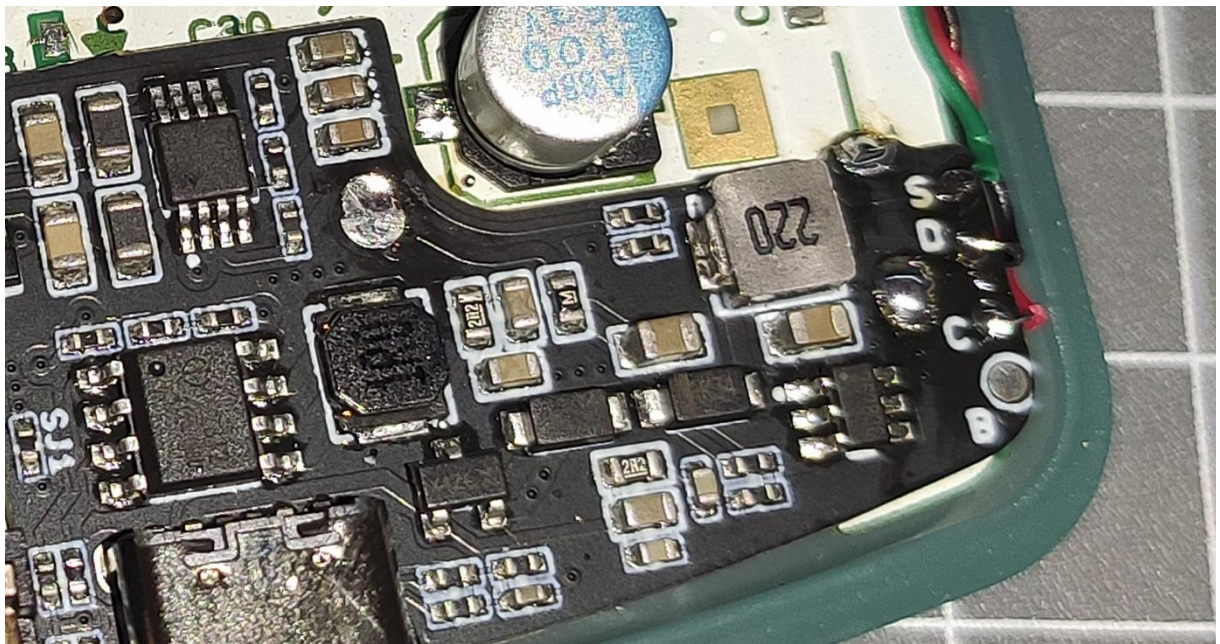


Once it's soldered to the light board, my recommendation is to attach it with **instant glue** to the side of the GB's motherboard. It will be securely fastened, although it won't prevent you from removing it if you need to in the future.





When the cable is near to the mainboard, cut the excess of cable (the cable is always longer than you need to), and solder it:



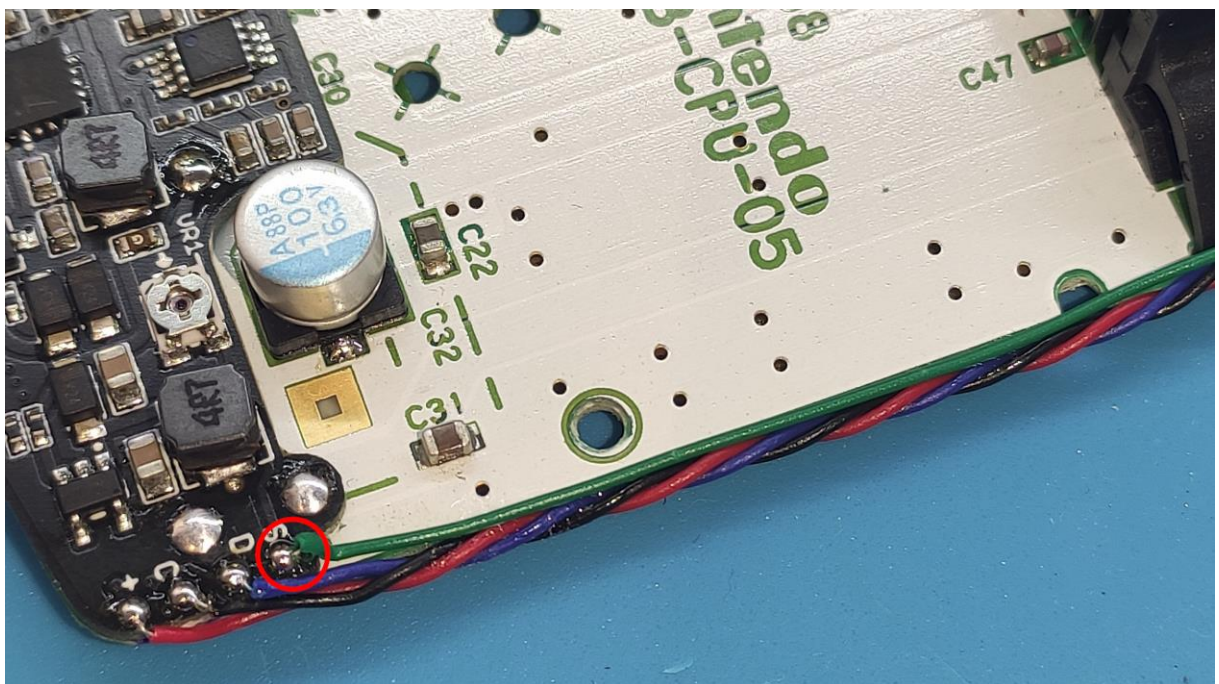
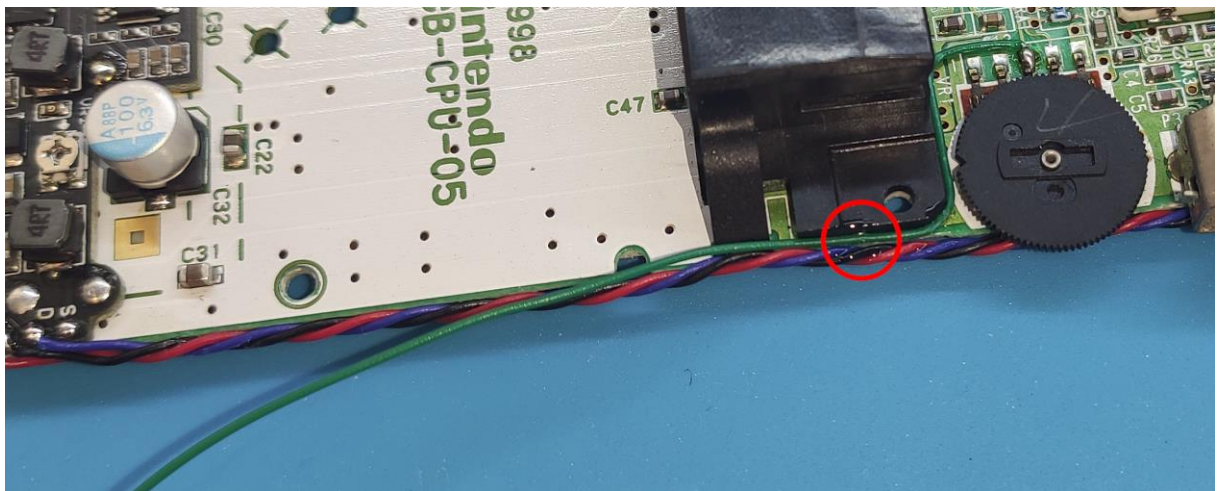


## 7. INSTALLATION OF THE AUDIO CABLE

This point is very important, otherwise your GBC won't make any sound. The provided cable needs to be soldered between these two points:



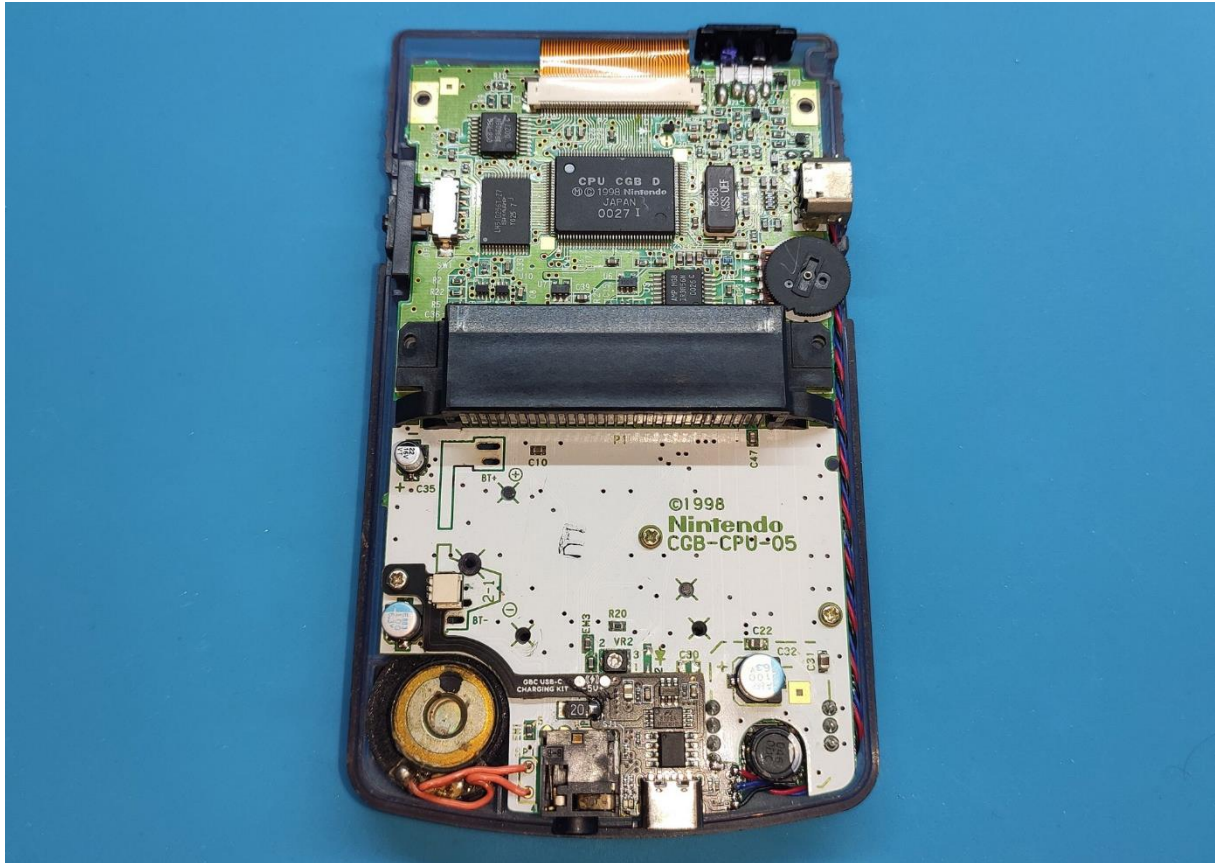
As the previous cable for the light board, you can glue this one too:



(Photo from board v2.4)

Once at this point, you can assembly everything except the bottom shell than need to be trimmed in the next step.

So, install the screen, **light diffuser** included with the kit, bottoms, and mainboard. You can also test the board with USB-C cable and the battery, check the lights works well.



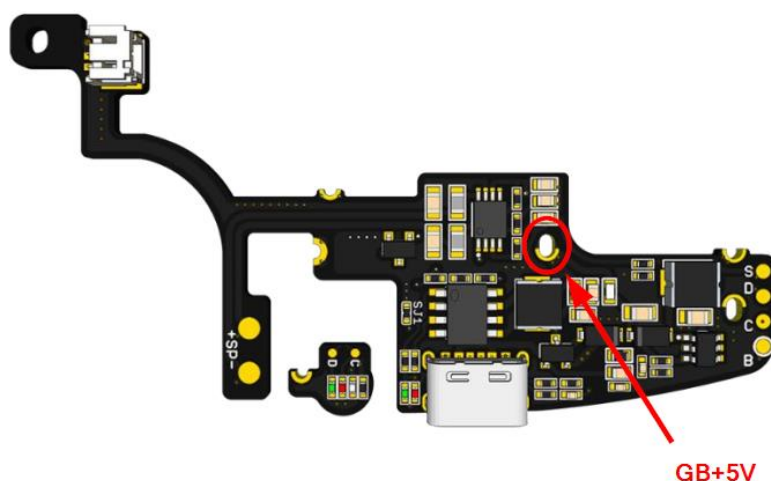
*This photo is with a GBC board, but with the GBC PRO board is the same.*



## 8. POWER CABLE FOR YOUR IPS SCREEN

If your IPS screens requires a power cable, which is usually soldered between the flex cable to the switch. **Solder it now**, and if the screen doesn't turn on or blink, you may need to solder the cable instead the switch (or any place the manufacturer says) to the **GB+5V** pad.

I don't have a picture for this, as my screen doesn't require this extra power cable. But this is where you should solder the cable if your screen requires it:



This has happened with these screens (not sure which version of each one):

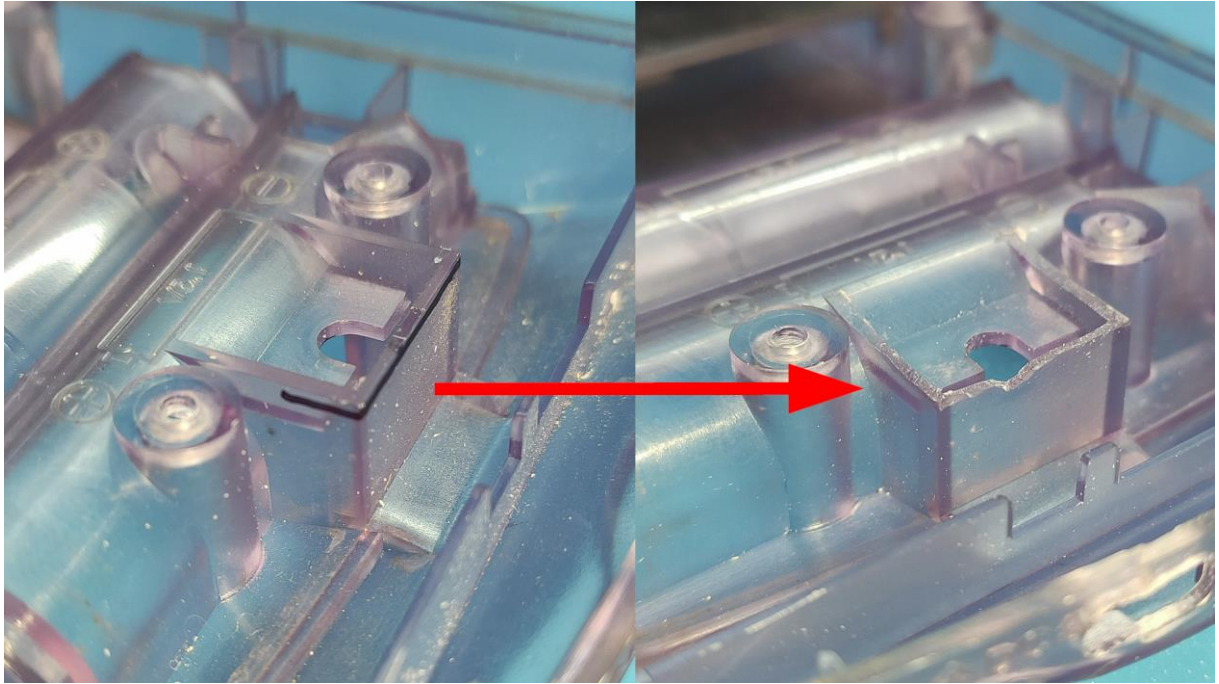
- [FunnyPlaying Game Boy Color 2.0 Q5 IPS Laminated Backlight Kit \(photo\)](#)
- [IPS Display Q5 TV Out HDMI \(photo\)](#)
- [IPS LCD GBC \(photo\)](#)

## 9. CUTTING THE PLASTIC SHELL

The GBC board has been designed to try to cut into the shell as less as possible. However, there are some parts that need to be cut/trim.

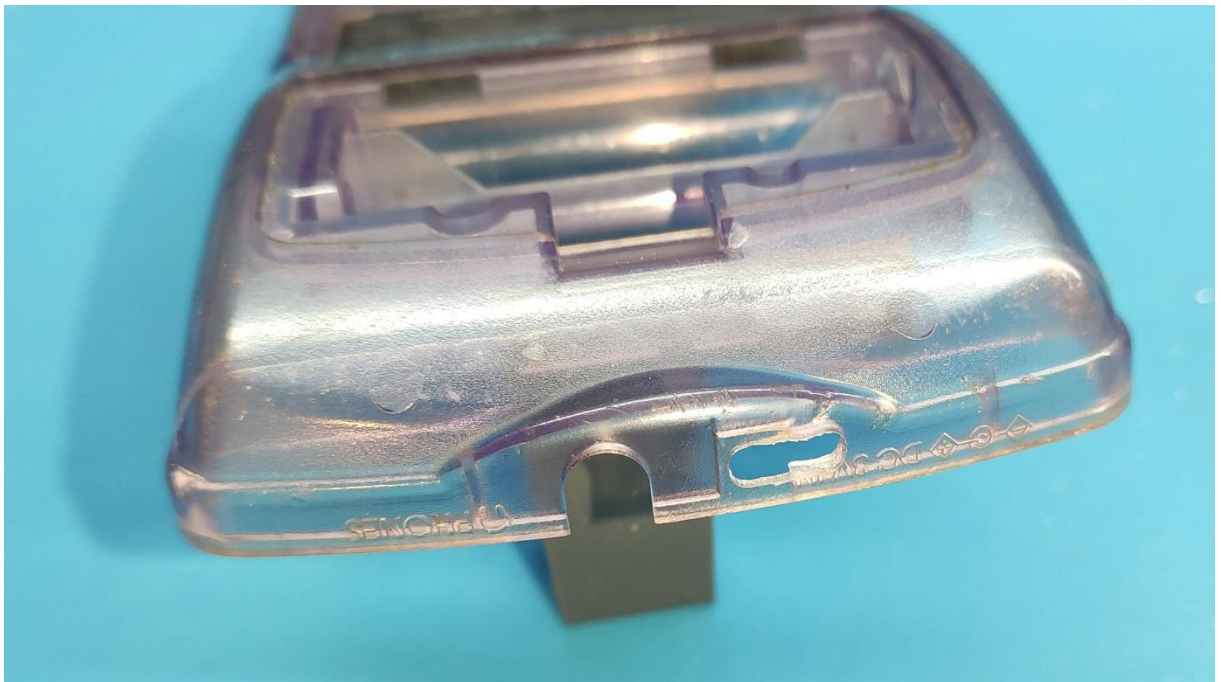
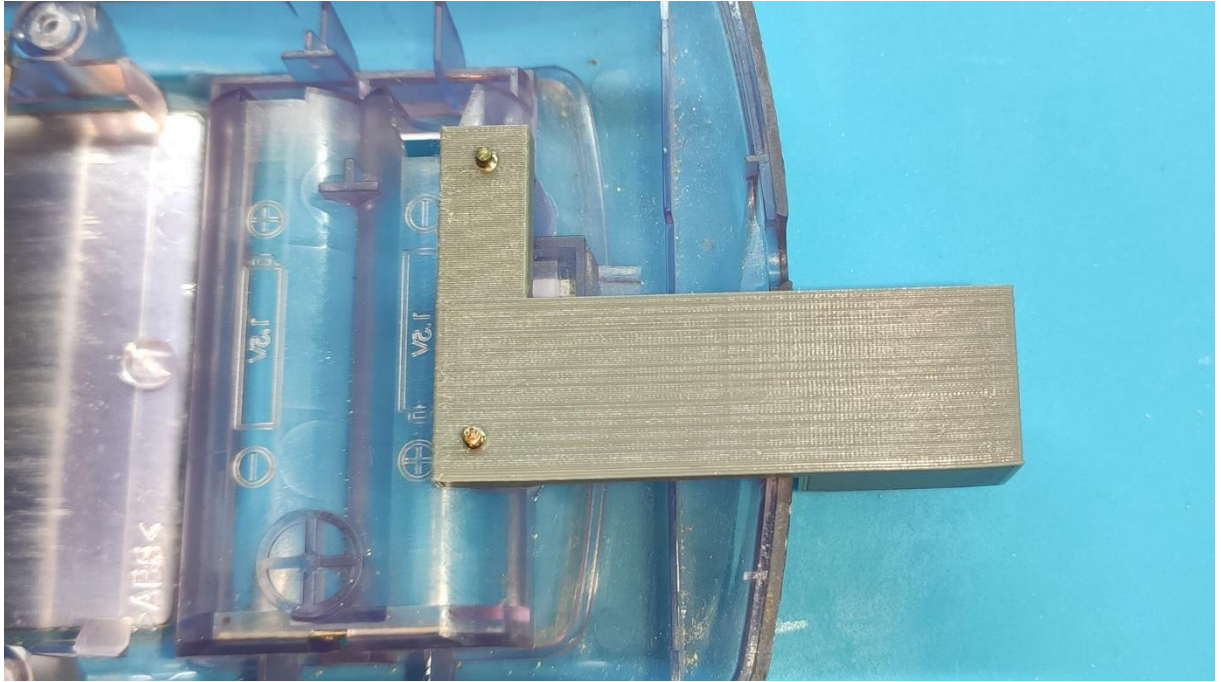
### *INSIDE THE SHELL*

This part touches the main circuit, trim it:



## THE USB-C HOLE

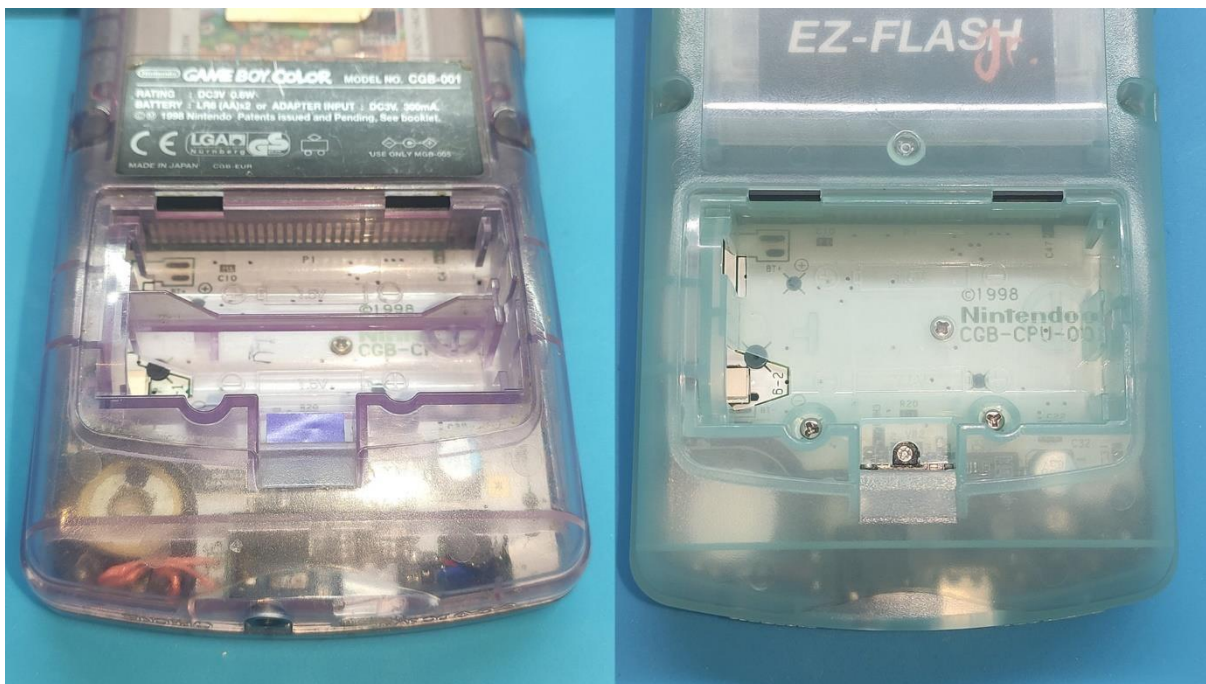
This is the part you must do as carefully as possible since this is visible from outside. Use the [GBC cutting tool](#) if you have it, or you can print it yourself.



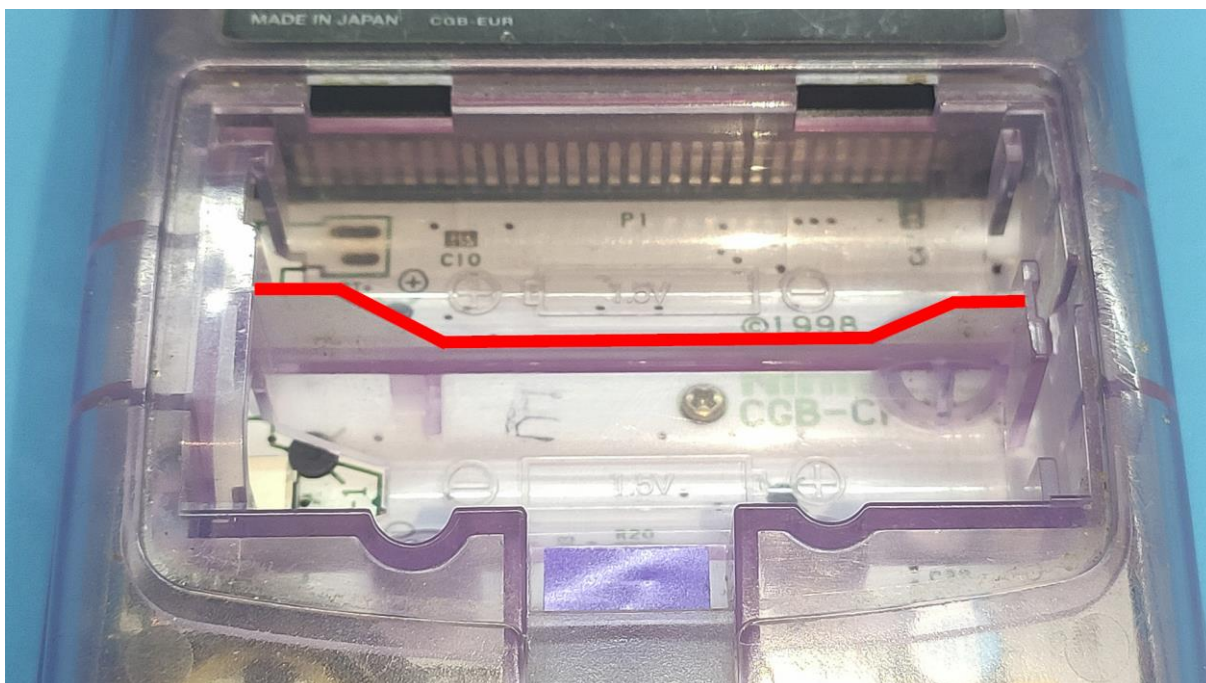


## BATTERY COMPARTMENT

Depending on the shell you have, you may need to trim or not the shell. These two pictures show you the original case and the special case with a special battery compartment from the factory.



The original requires to remove the plastic in the centre as much as possible:



The copy doesn't need any cut because it's already prepared for li-ion batteries :)

## 10. LIGHT STATUS

The board has 3 lights, **white** when the GBC is turn on (if you have installed the light board), **red** when is charging, and **green** when the battery is full.



*This is a GB Pocket, but it's the same for GB Color*

## II. BATTERY CABLE

If your battery includes the appropriate battery connector, you just need to connect it to the GBC, otherwise you will need to replace the battery cable for the provided one with the kit.

The easy way is to splice the original wires with the new ones and use kapton tape to protect the joint.



If you are comfortable soldering, you can replace the whole old cable and solder the new one directly to the battery.

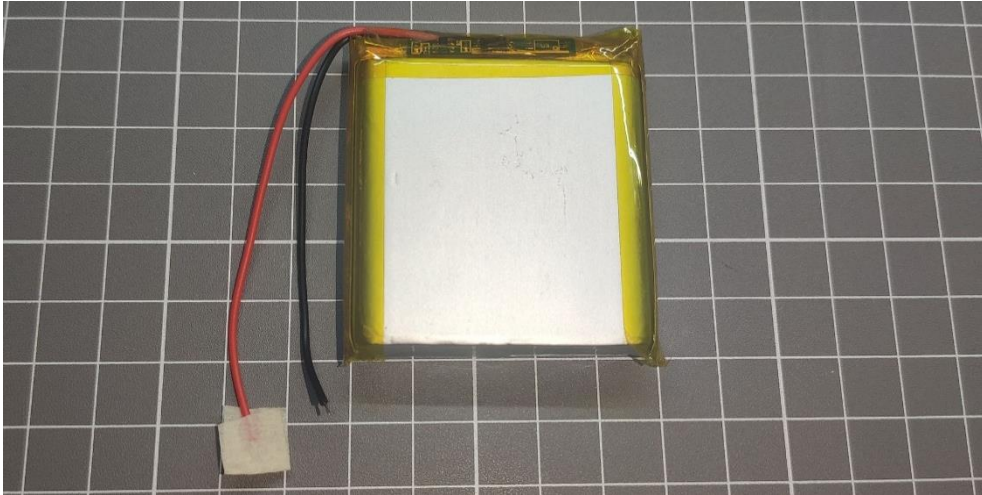
The following explains step-by-step how to do it for the Game Boy DMG battery. The steps are the same for the GBC, only the battery size changes.



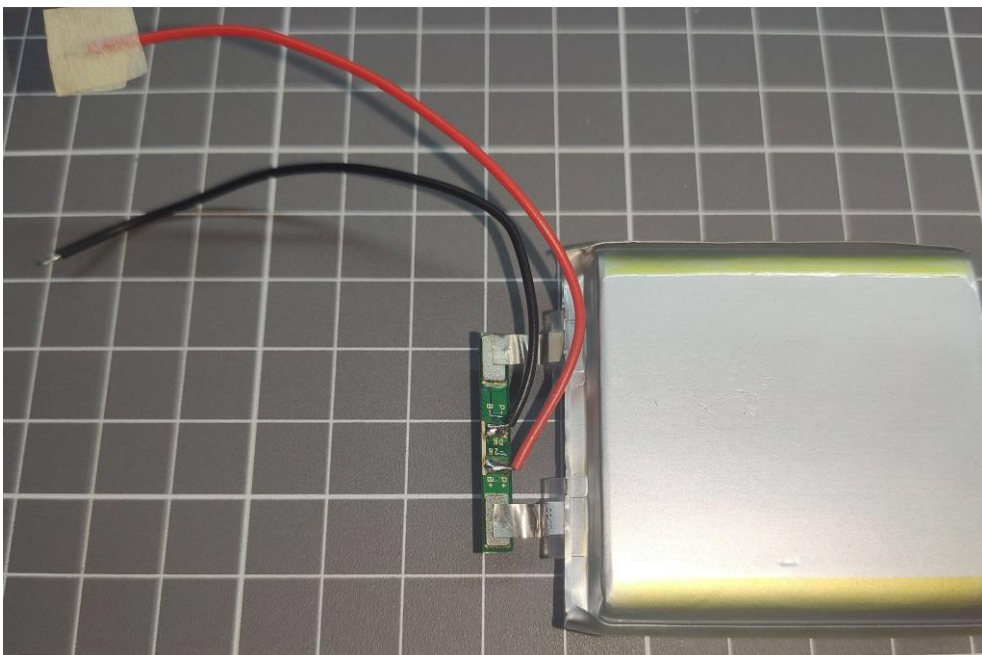
The supplied cable will allow you to use your battery in case it does not come with the correct connector by default.



The original cable of this battery will be replaced.

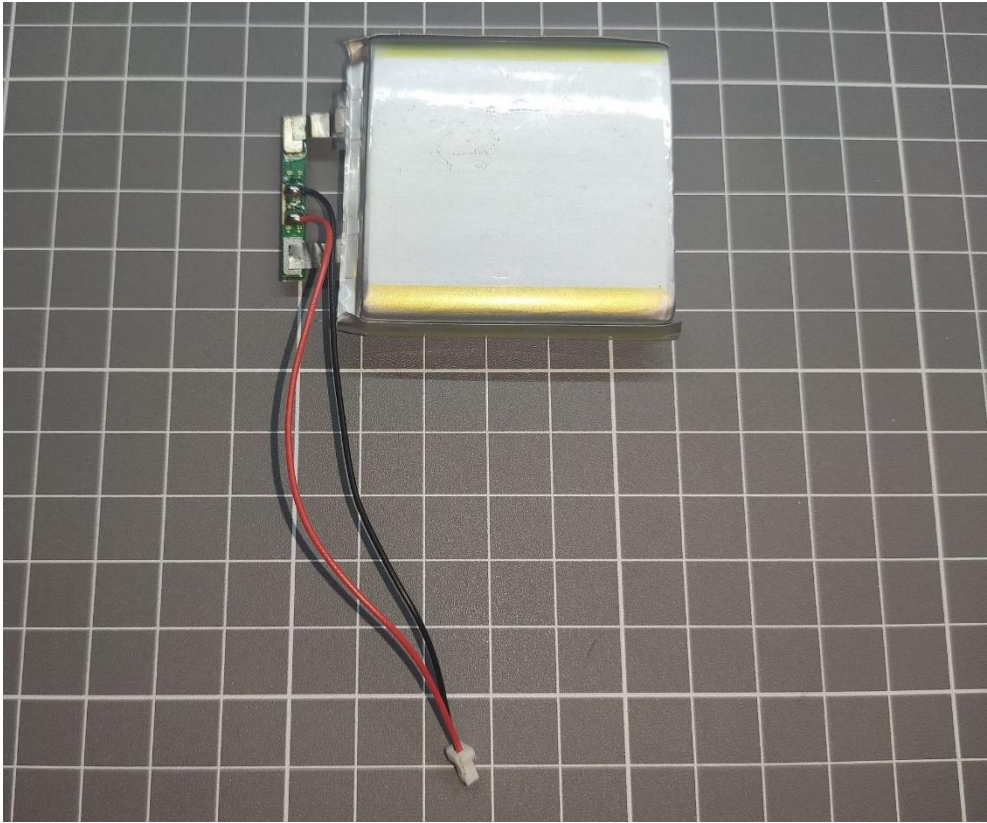


First, you need to remove the kapton tape that protects the internal battery protection circuit:





Remove the cables using a soldering iron and solder the new ones following the same polarity. In other words, where the red cable was soldered, solder the new red cable, and do the same for the black cable.



Reprotect and secure the cable again with Kapton tape as it was originally:



## 12. DONE!

Here we are, it's time to enjoy it!



# **FREQUENTLY ASKED QUESTIONS - FAQ**

## **1. THE GAME BOY REMAINS OFF WITH BATTERIES, BUT IT WORKS WITH USB-C**

If that happens, **make sure the battery is charged**. Additionally, keep in mind that **flash cartridges like EZ Flash Jr. consume more power than original games**. Your console may turn on with an original game but not with the flash cartridge. Therefore, be sure that your battery has power.

Also, ensure that **you have correctly connected the battery cable connector** to the board connector.

## **2. THE GREEN LIGHT DOES NOT TURN ON. HOW DO THE LIGHTS WORK?**

The **white light turns on and off when you turn the console on and off**, indicating the battery status. Its brightness will decrease as the battery drains. Therefore, it serves the function of the original red light.

The new **red light, along with the green light, indicates the battery's charging status. When the light is red, it means the battery is charging. Once the battery is fully charged, the light will change to green.**

If the battery is already charged and you reconnect it via USB, the circuit will check the charge, and after a few minutes, perhaps up to 10 minutes, it will indicate again with the green light that the battery is charged.

If the green light never turns on, try doing several charge and discharge cycles with the battery. This involves fully discharging the battery until the console turns off, then charging it until the light turns green (or for several hours), and repeating the process once more. Let's say that calibrates the battery.

## **3. THE AUDIO AMPLIFIER OR THE HEADPHONE JACK HAS NOISE.**

It's highly likely that simply upgrading the screen to an IPS display or adding this kit won't bring your Game Boy up to date. Other components may still have decades of use and wear. This can cause your GB not to perform at its full potential.



If you notice **strong electrical noise in the audio**, you may need to replace the **electrolytic capacitors** with new ones. There are kits available online with all the specific capacitors for each GB model; you just need to replace them while respecting each value.

You might also need to replace the volume **control wheel**, depending on whether you hear noise when adjusting it or if the volume simply varies.

Lastly, cleaning the **power switch** may also help.

#### **4. THE AUDIO AMPLIFIER IS NOT WORKING; NOTHING CAN BE HEARD.**

The audio amplifier included on the board needs to be connected to the console's audio; otherwise, it cannot amplify any audio. Make sure you have followed the guide correctly and soldered the audio cable between the console's sound adjustment wheel and the board.

Also, ensure that your speaker is properly soldered/connected and it's not damaged.

#### **5. THE IPS SCREEN DOESN'T TURN ON, OR IT FLICKERS, OR BEHAVES ODDLY.**

Some **IPS screens require an additional power cable** to function properly. The screen manufacturer recommends soldering this cable to the console's power switch output, but this recommendation is only valid if you haven't modified anything else in the console.

Since you've also added this kit, **the best place to solder this power cable is to the GB+5V pin on the board** (Refer to the 'board details' section of this guide to determine the position of this pad). From there, the screen will receive stable power.

#### **6. THE CONSOLE DOESN'T CHARGE WITH USB-C TO USB-C CABLES/CHARGERS.**

All our kits incorporate two resistors to indicate to the charger that it is a legacy device and should charge at a maximum of 5V.

The only reason one might consider for it not working is that one might be using a charger/cable from Apple or another company that doesn't follow the standard 100%. Trying other cables, for example from the Nintendo Switch, a laptop, or another mobile device, should work.

## ***7. THE GBC DOESN'T TURN ON.***

If you have replaced the capacitors in your GBC, make sure that the capacity is the same as the original capacitors. Otherwise, this may cause the console not to turn on, or only turn on when connected via USB-C.