

# GGHD™



*EXPERT*  
**Installation &**

# **Assembly Guide**

**For VA1 models or any Dual ASIC Game Gear**

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# Legal Disclaimer

Gamebox<sup>LLC</sup> can, in no way, be held liable for any damage to the user's property, or the user's health from following these instructions. While these instructions aim to give the user a comprehensive and safe guide to completing this modification, there are many potential variables that could result in the unit that the user is attempting to modify requiring more restorative measures. There is also a serious risk of, injuries, and death when working with electronics. At the time of this guide's writing these consoles are rapidly aging, and even working units should be recapped as soon as possible. Chemicals associated with some of these processes are quite toxic and should be handled with care and adult supervision. Results may vary. "GGHD", "Gamebox", "Gamebox Systems", "gamebox.systems", its associated internet domains, and the associated logos in this document are trademarks(™) of Gamebox<sup>LLC</sup>, A Limited Liability Company. This document, text and, images contained there-in are property of Gamebox<sup>LLC</sup> ©2023 Gamebox<sup>LLC</sup>, all rights reserved.

## Kit Contents:

- GGHD PCB
- Genesis controller PCB
- 9 pin FFC flex cable
- 4x 25mm M3 screws
- 4x 4mm M2 screws
- Capacitor replacement kit
- Case parts (*Top, middle spacer bracket, bottom, power button plunger*)

## Tools Required:

- Soldering iron
- Solder (Lead free or leaded)
- Phillips size 0 or 1 screwdriver
- Gamebit security screwdriver
- Wire (30AWG – 34AWG, single or multistrand)
- Needle nose pliers
- Desolder tool (*Solder pump or copper braid*)
- Tooth brush/Q-tip (*Optional / Recommended*)
- Isopropyl Alcohol, 90% (*Optional / recommended*)

## Parts Required:

- VA1 or Dual ASIC Game Gear\*

\* 2 M3X11 philips screws if your system is missing the cartridge slot screws.

## PART 1: Game Gear Recap & Functionality Test

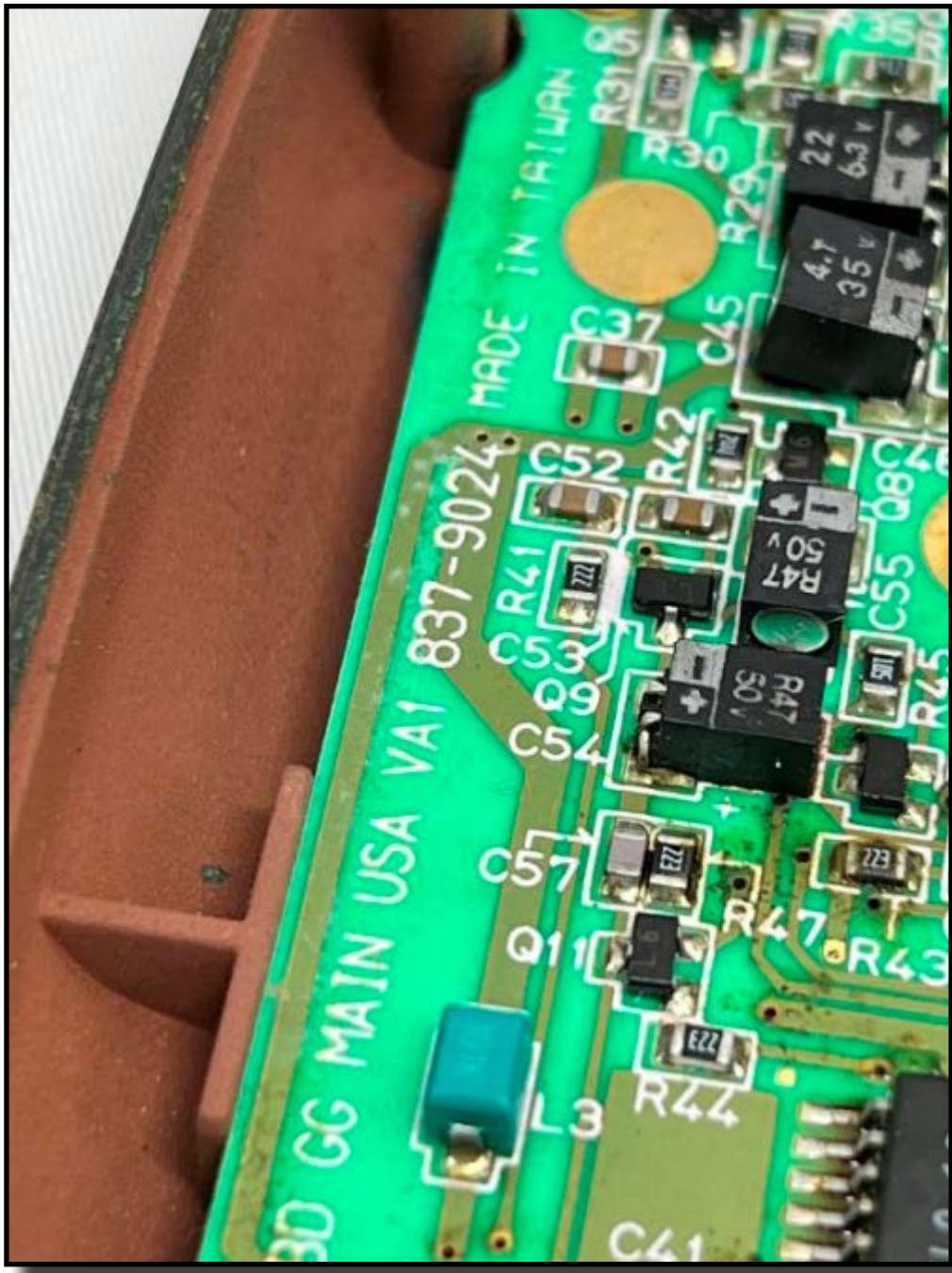
### STEP 1



Remove the 6 phillips screws and 1 gamebit screw holding the two halves of the shell together and carefully open up the Game Gear.

## PART 1: Game Gear Recap & Functionality Test

### STEP 2



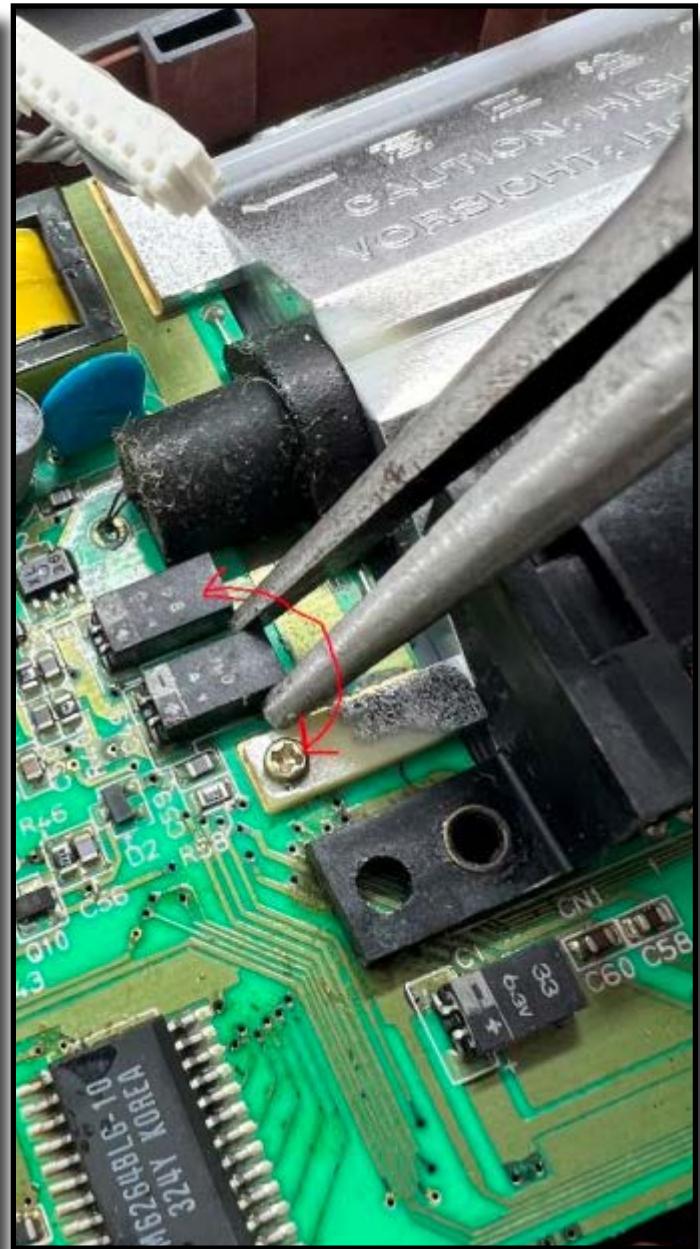
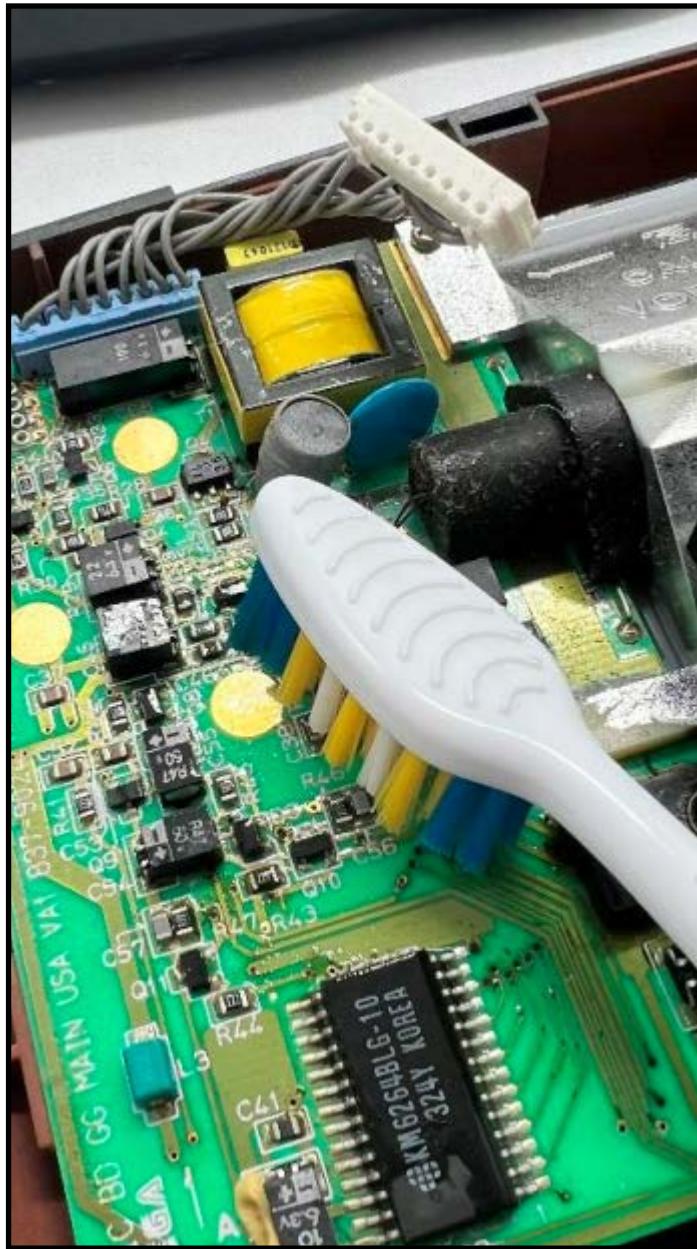
Ensure your Game Gear is compatible with this modification by finding a silkscreen that says “VA1” when you open the case. If you see “VA1”, continue to step 3. All Dual ASIC models of Game Gear are compatible with this mod.

**NOTE:** If you are not using a Dual ASIC board or **DO NOT** see “VA1” and you see “VA4”, “VA5”, or do not see “VA1” then your Game Gear is **NOT COMPATIBLE** with this version of the hardware. A further hardware revision will include support for these later models.

## PART 1: Game Gear Recap & Functionality Test

### STEP 3

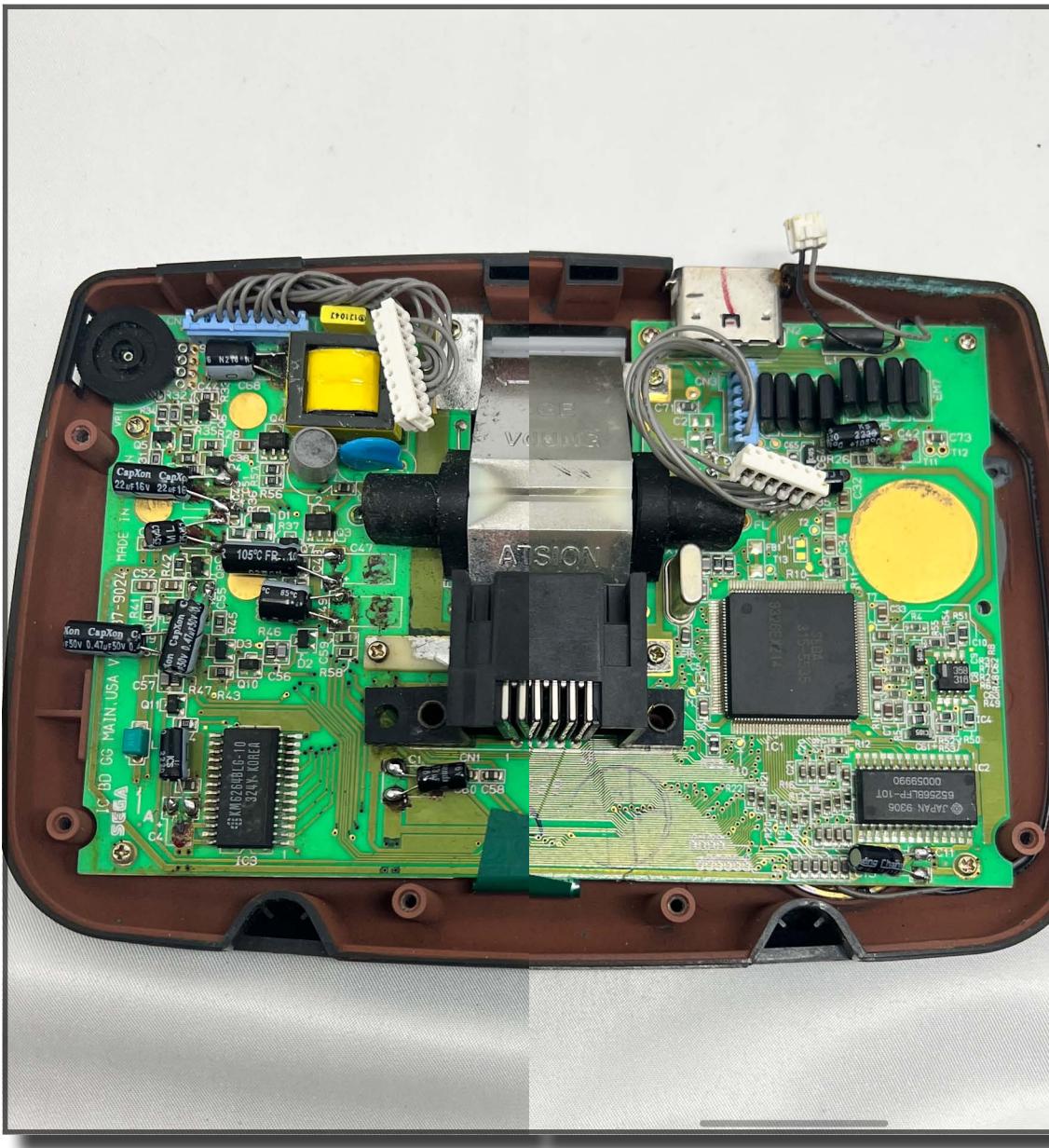
**NOTE:** If a recap has been performed and the system is verified 100% working, skip step 3 and move ahead to STEP 5 of PART 1.



Remove cables from power and audio PCBs. Use a tooth brush or Q-tip with isopropyl alcohol or deoxit to clean any corrosion off the Game Gear motherboard. Once the corrosion is cleaned, use needle nose pliers to grab and **GENTLY** move the capacitors back and forth to break the glue underneath each capacitor

## PART 1: Game Gear Recap & Functionality Test

### STEP 3(continued)



Remove all capacitors on the back of the motherboard and replace all capacitors on the motherboard and the power PCB. For a capacitor map, go to [https://wiki.console5.com/wiki/Game\\_Gear](https://wiki.console5.com/wiki/Game_Gear). Find your motherboard and power board revisions and follow the diagrams to recap your PCBs. Audio PCB does not need a recap.

## PART 1: Game Gear Recap & Functionality Test

### STEP 4



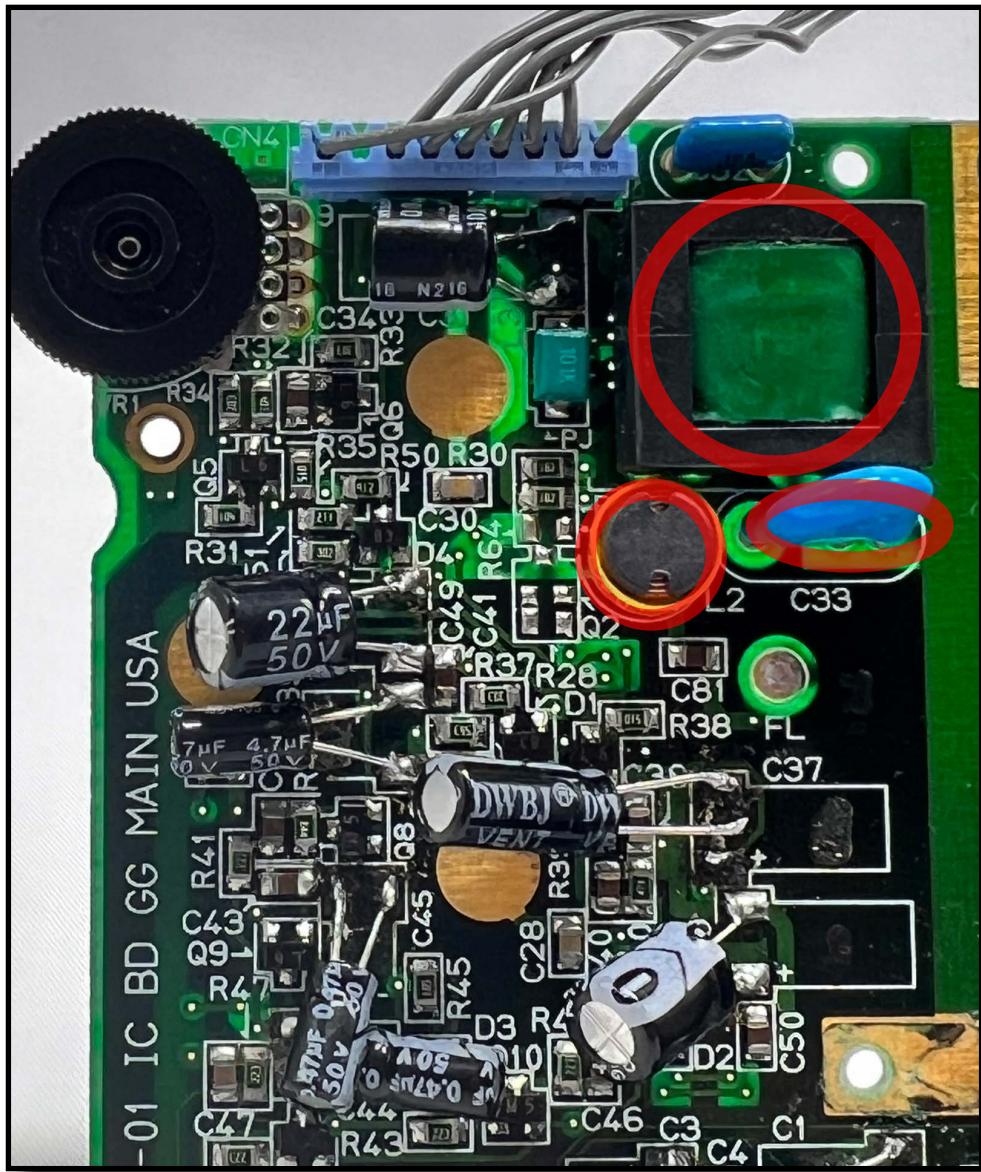
Reconnect the power PCB to the motherboard and close the Game Gear. Connect a power source (wall adapter or 6x AA batteries), plug in a game, and test the console. Ensure the console powers on and reads the game. If the recap is successful, move on to STEP 5.

**NOTE:** Save the screws from the cartridge connector shown (right). Otherwise you will have to procure 2 new M3X11mm screws. They are required for final assembly.



## PART 2: Game Gear Motherboard Preparation

### STEP 5(a) For Dual ASIC Models



Remove the circled components.



## PART 2: Game Gear Motherboard Preparation

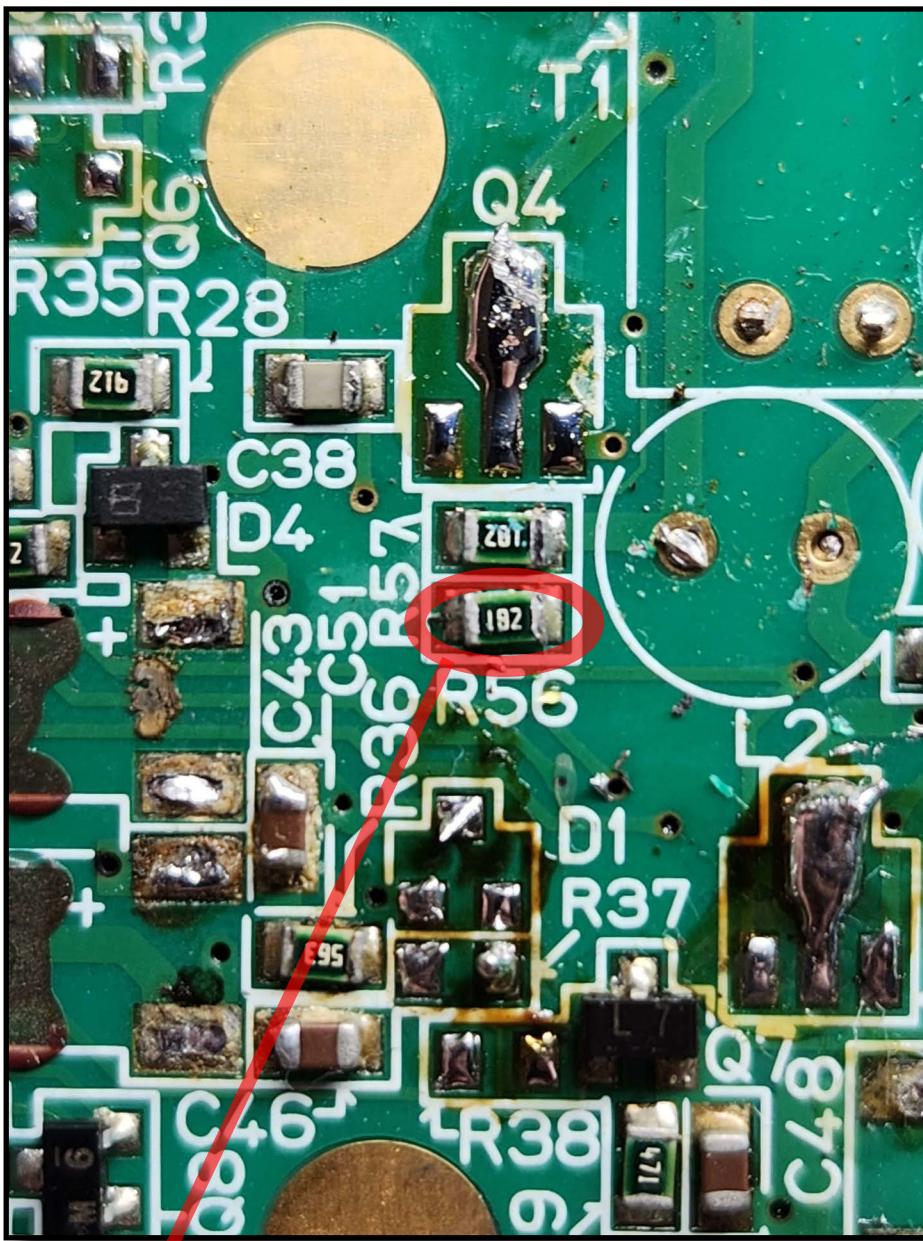
### STEP 5(b) For Single ASIC Models



Remove the circled components.

## PART 2: Game Gear Motherboard Preparation

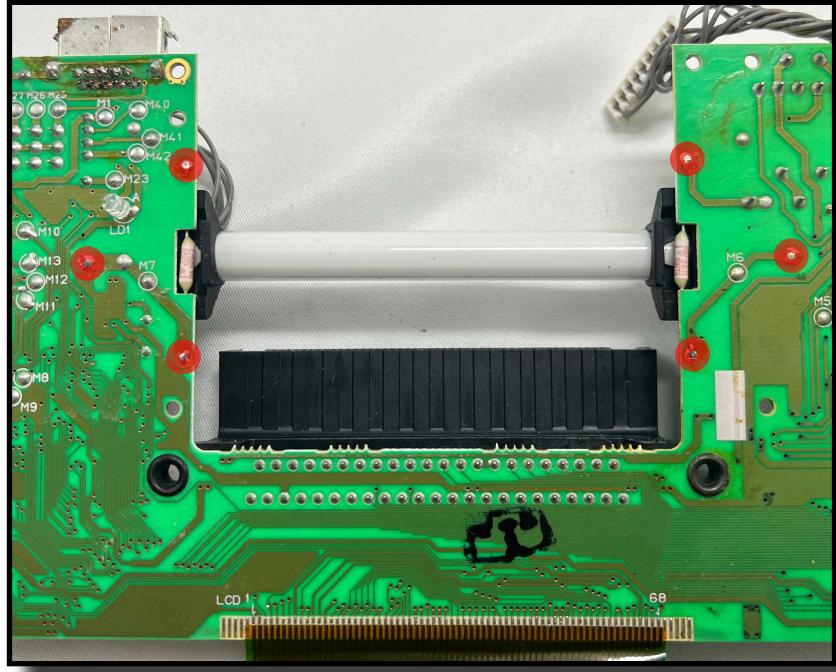
### STEP 5(c) For Single ASIC Models



Remove resistor R56

## PART 2: Game Gear Motherboard Preparation

### STEP 6

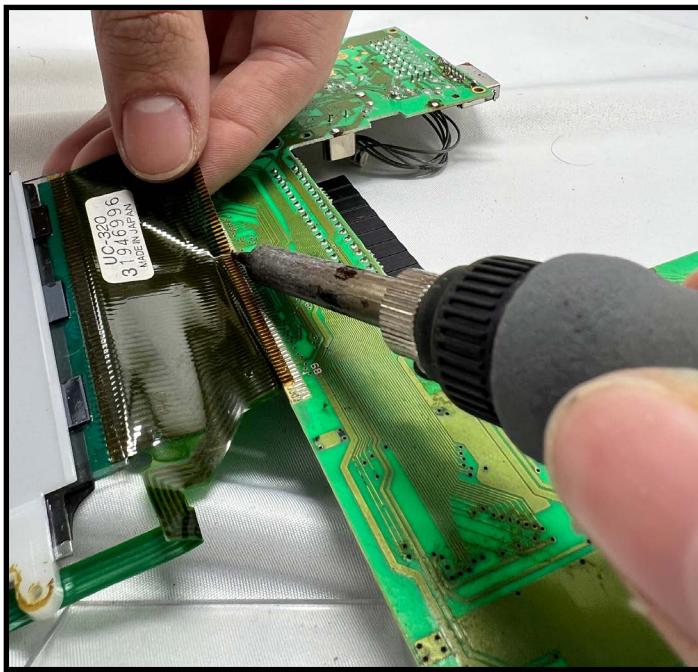
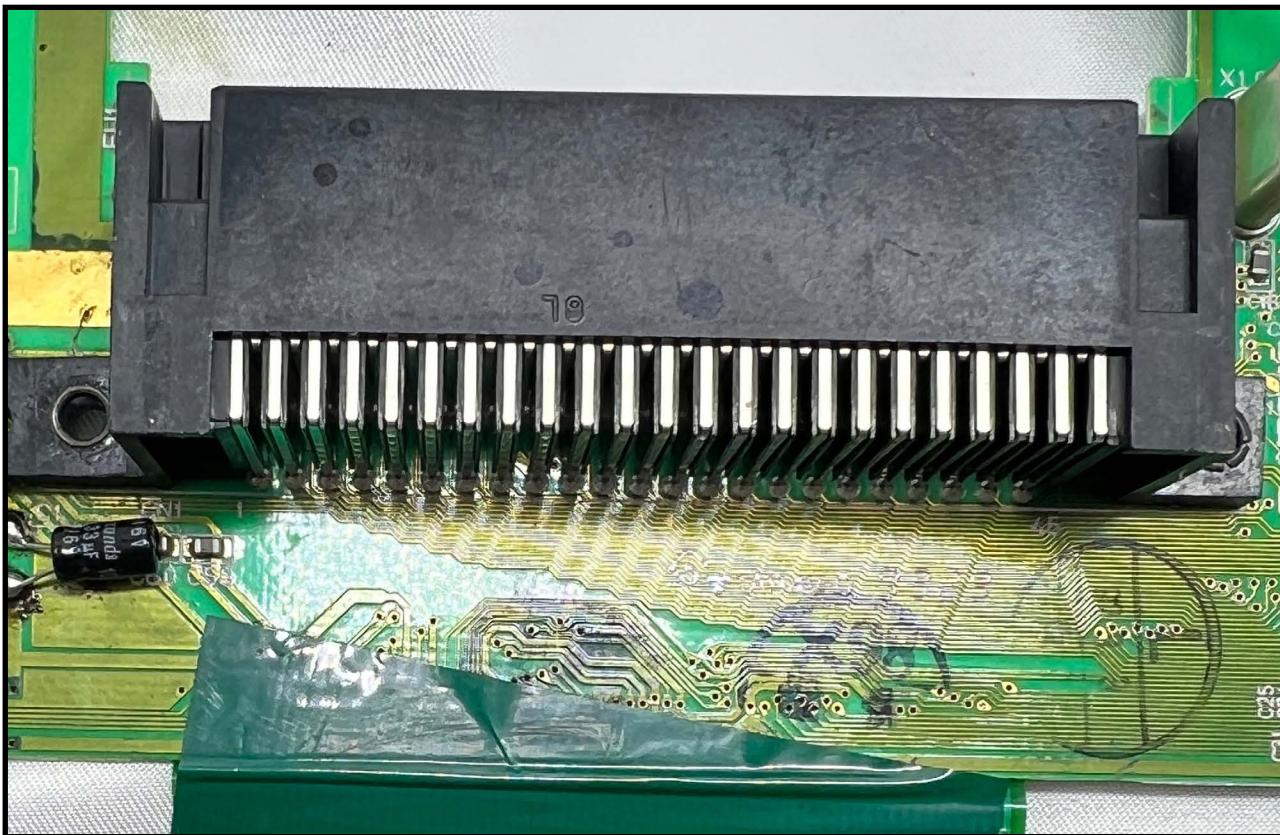


Remove the reflective shield. Desolder the points in the red circles and remove the CFL tube and the fuses.

**NOTE:** Solder must be removed for the GGHD to sit flat on the motherboard.

## PART 2: Game Gear Motherboard Preparation

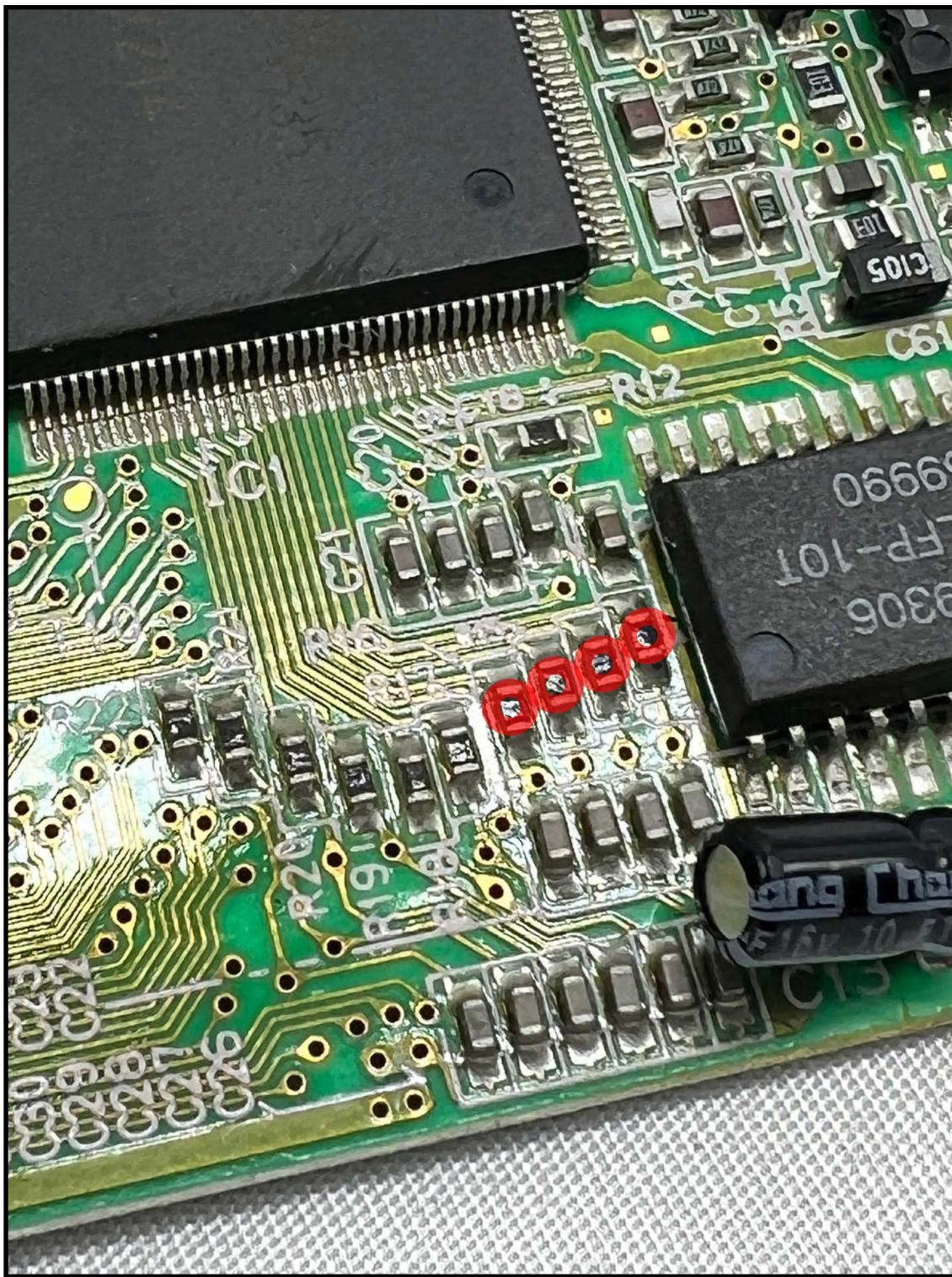
### STEP 7



Remove tape below the cartridge connector. Remove the screen from the motherboard by applying **GENTLE** but firm pressure upward and drag soldering the screen pin contacts. The screen cable will lift cleanly from the contacts one at a time when drag soldering with correct pressure applied. Remove excess solder from screen pins on the motherboard.

## PART 2: Game Gear Motherboard Preparation

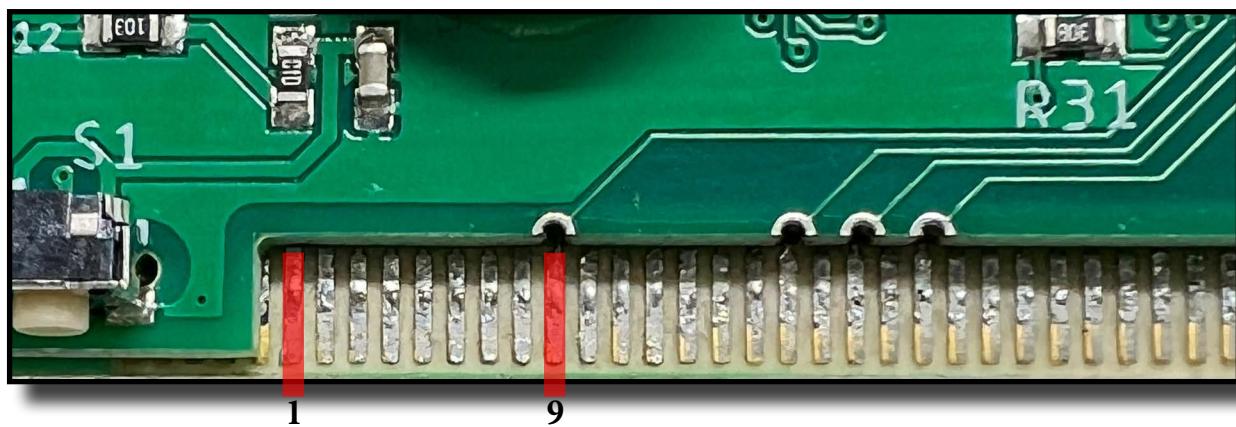
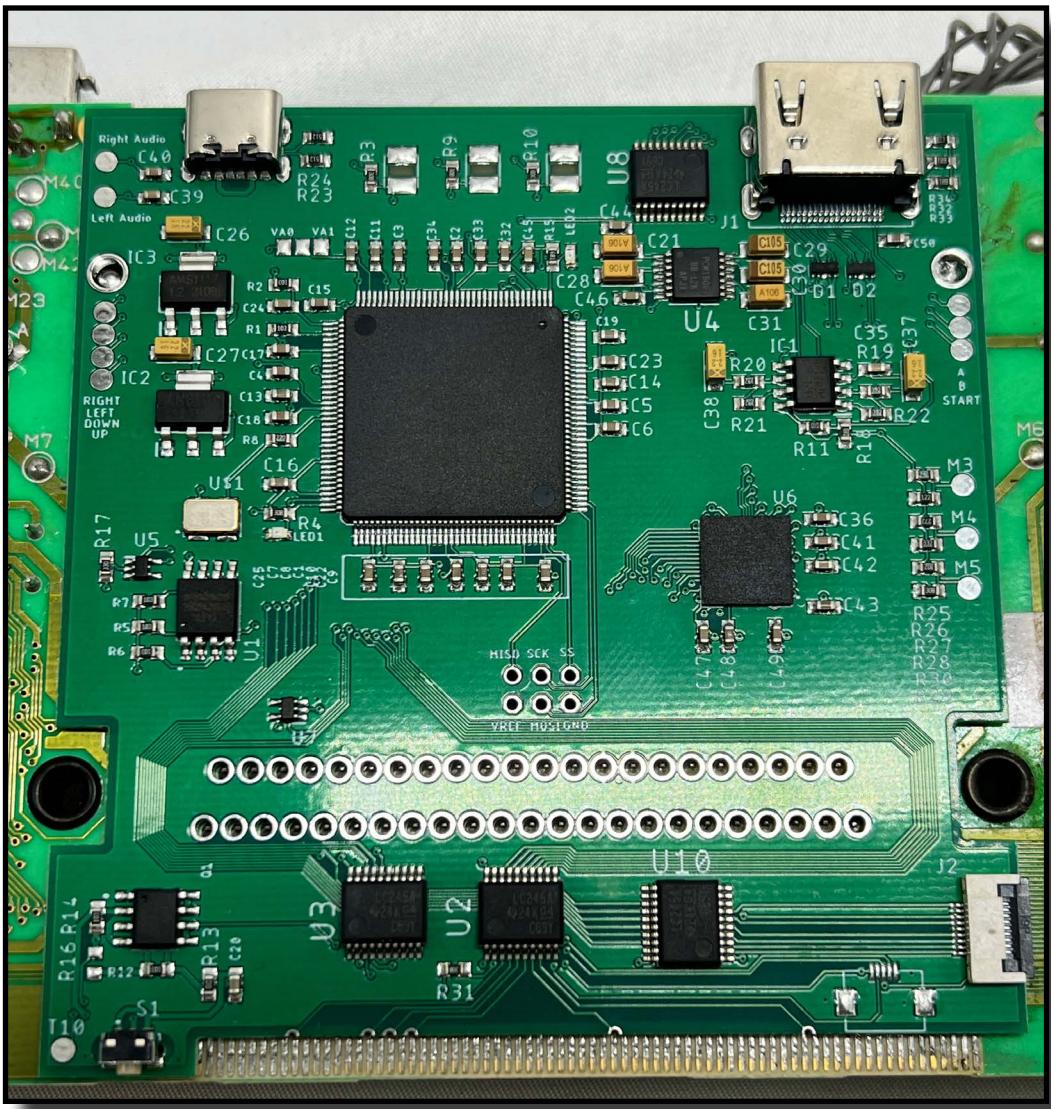
### STEP 8(For Single ASIC Install)



When doing a SINGLE ASIC installation replace each of the circled resistors with 4 solder bridges. Dual ASIC installations can ignore this step.

## PART 3: GGHD PCB Installation

### STEP 9



Place the GGHD PCB on the Game Gear motherboard aligning the cartridge 16 connector pins to the solder holes on GGHD as shown. Slide GGHD down as far as possible to make the castellated edges as close as possible to the screen pins on the Game Gear motherboard. Ensure Pin 9 aligns with the first castellated edge.

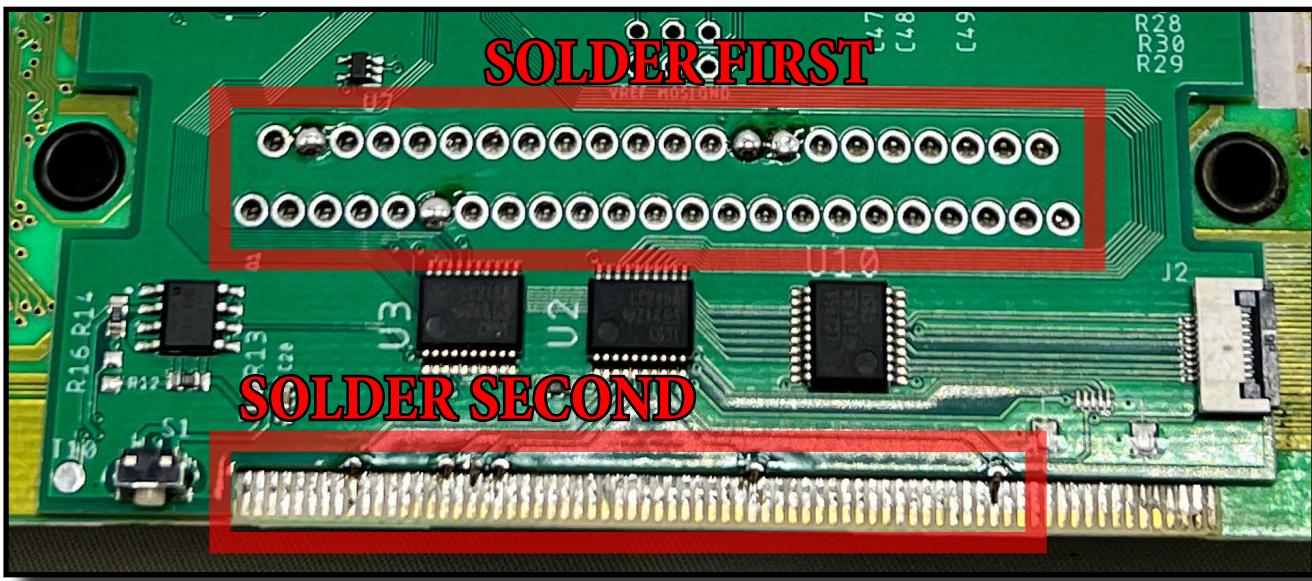
## PART 3: GGHD PCB Installation

### STEP 10

Before moving to step 11, take a moment to ensure the GGHD PCB is sitting as close as possible to the Game Gear motherboard. If there are any gaps caused by excess solder on the screen connector pins or the solder points shown in step 6, remove the solder before continuing.

**Failure to follow step 10 may result in a botched install!**

### STEP 11

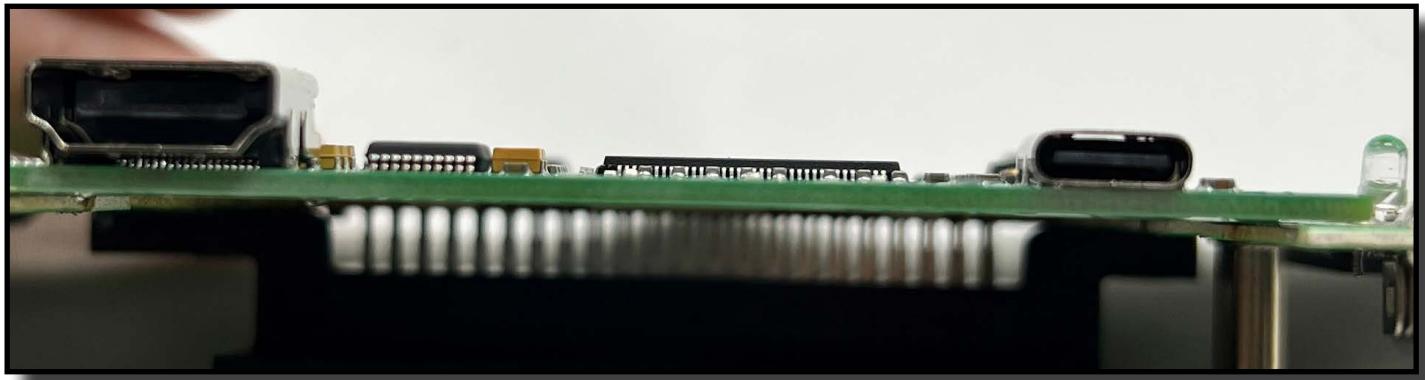
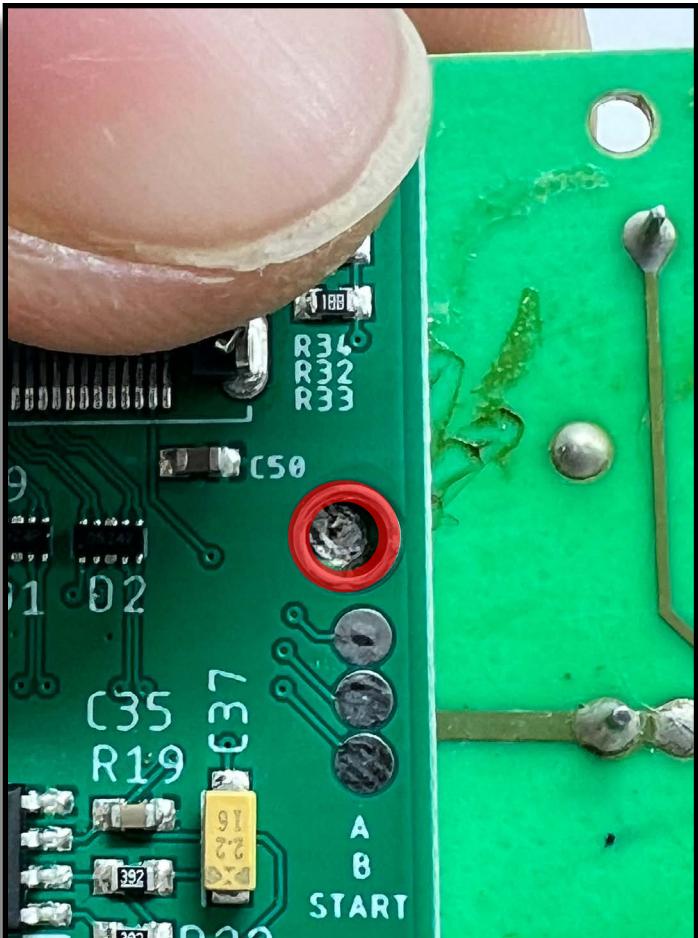
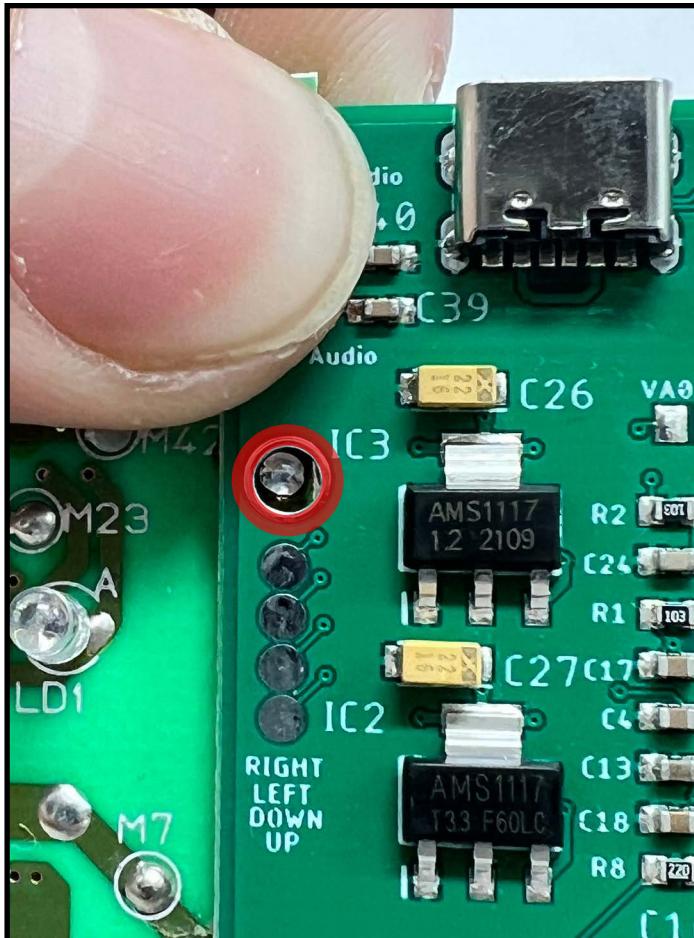


**FIRST** Solder to the cartridge pins as shown. Apply a small amount of downward pressure on the GGHD PCB to ensure it is as close as possible to the Game Gear motherboard. Only the solder pins on the cartridge connector that are soldered in the picture above are required.

**THEN** Solder the castellated edges to the screen pins on the Game Gear motherboard by soldering at the point where the two PCBs meet.

## PART 3: GGHD PCB Installation

### STEP 12

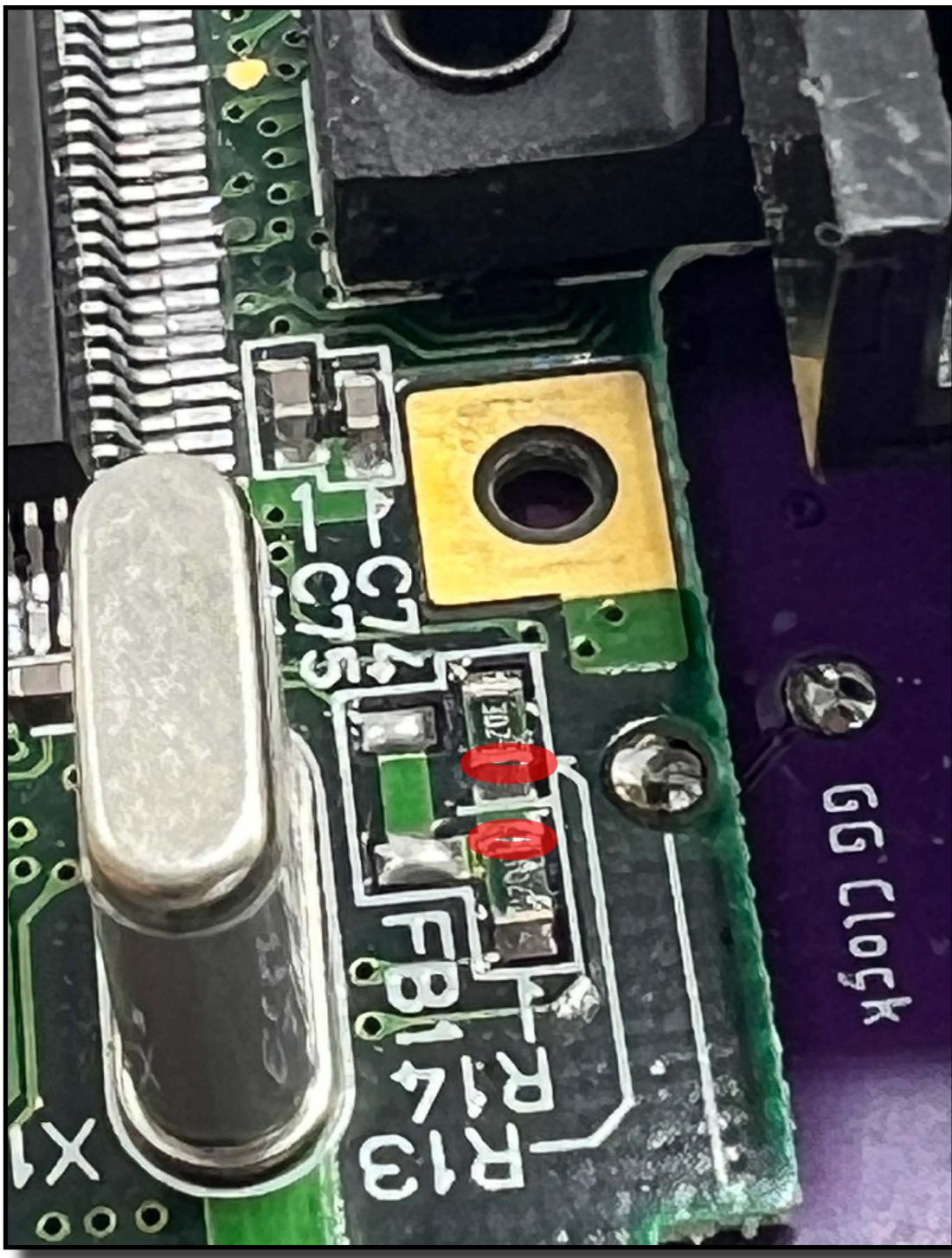


Solder to the anchor points circled. Apply a generous amount of solder first, then pinch the 2 PCBs together while applying the soldering iron to the anchor points again to ensure the PCBs are as close as possible.

## PART 4: Wiring Controls And Sense Signals To GGHD

### STEP 13(a) For Dual ASIC Models

NOTE: Unless specified, pad labels on the Game Gear motherbaord are the same on Single and Dual ASIC Motherboards. Location may vary slightly.



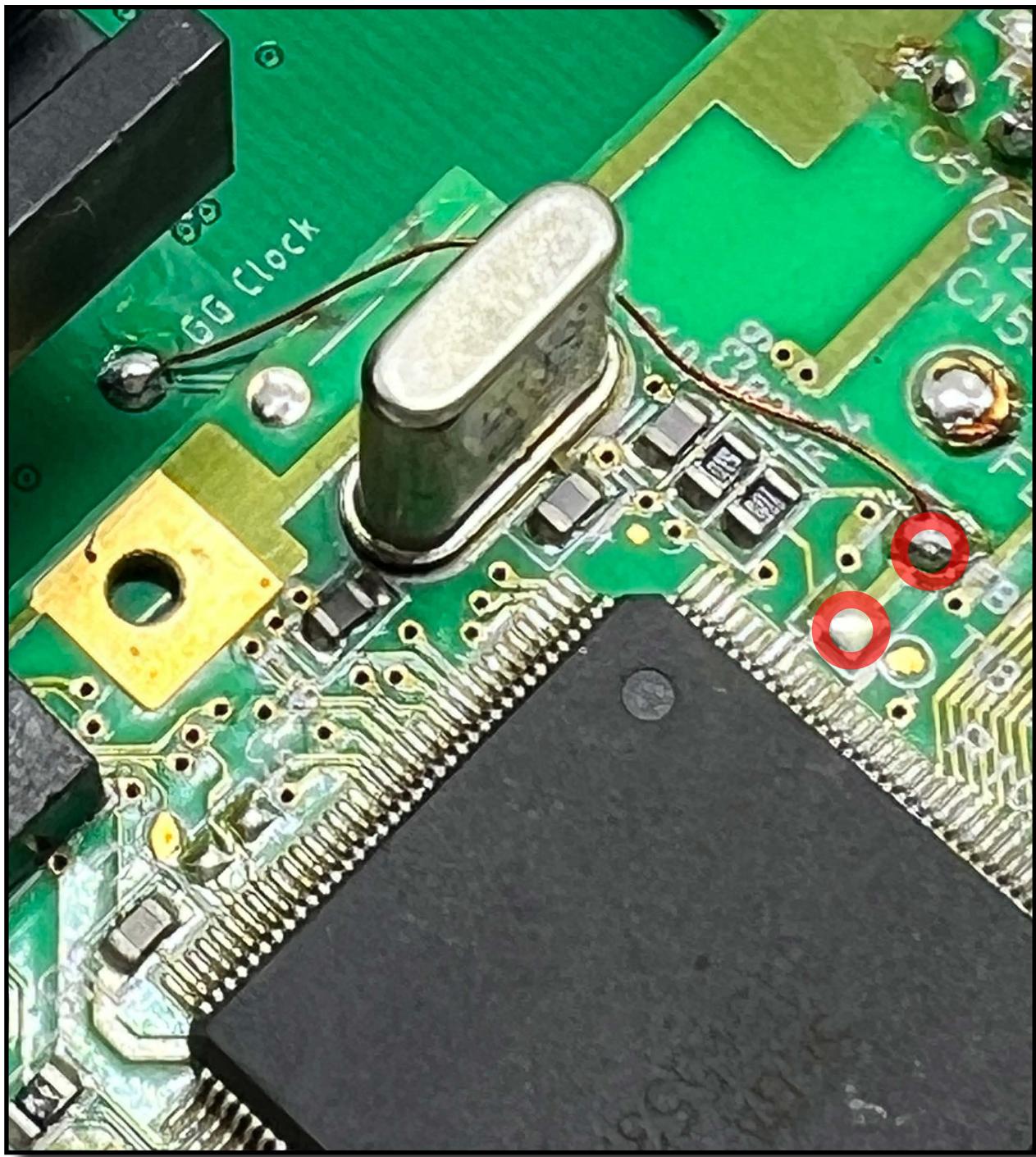
Solder GG Clock to either resistor pad circled in red.

NOTE: Keep this particular wire as short as possible! A long wire may cause graphical artifacting.

## PART 4: Wiring Controls And Sense Signals To GGHD

### STEP 13(b) For Single ASIC Models

**NOTE:** Unless specified, pad labels on the Game Gear motherbaord are the same on Single and Dual ASIC Motherboards. Location may vary slightly.

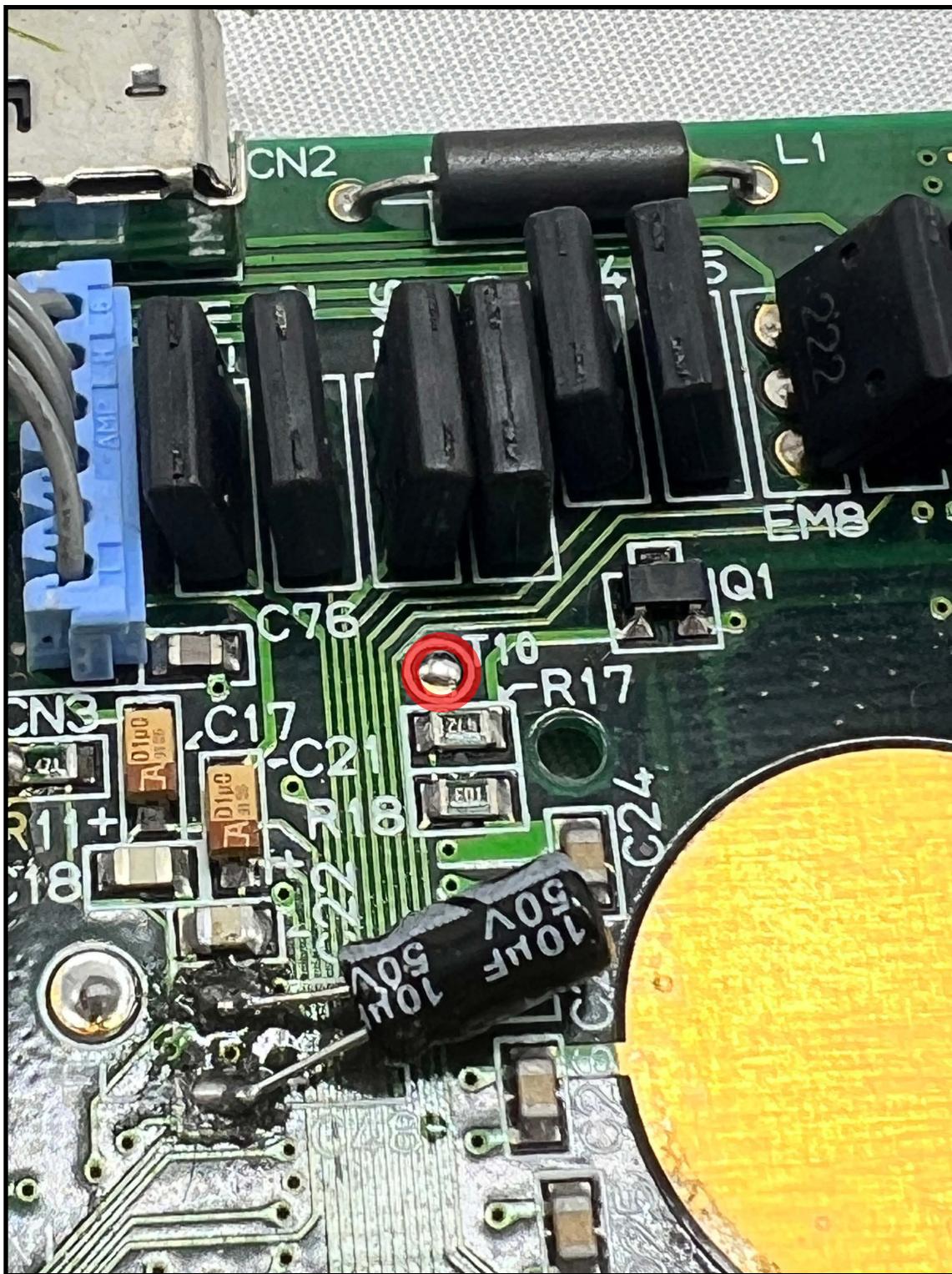


Solder "GG Clock" to either of the points circled in red.

**NOTE:** If graphical artifacting or distortions occur then refer to the troubleshooting section at the end of this document about adjusting the length of this wire.

## PART 4: Wiring Controls And Sense Signals To GGHD

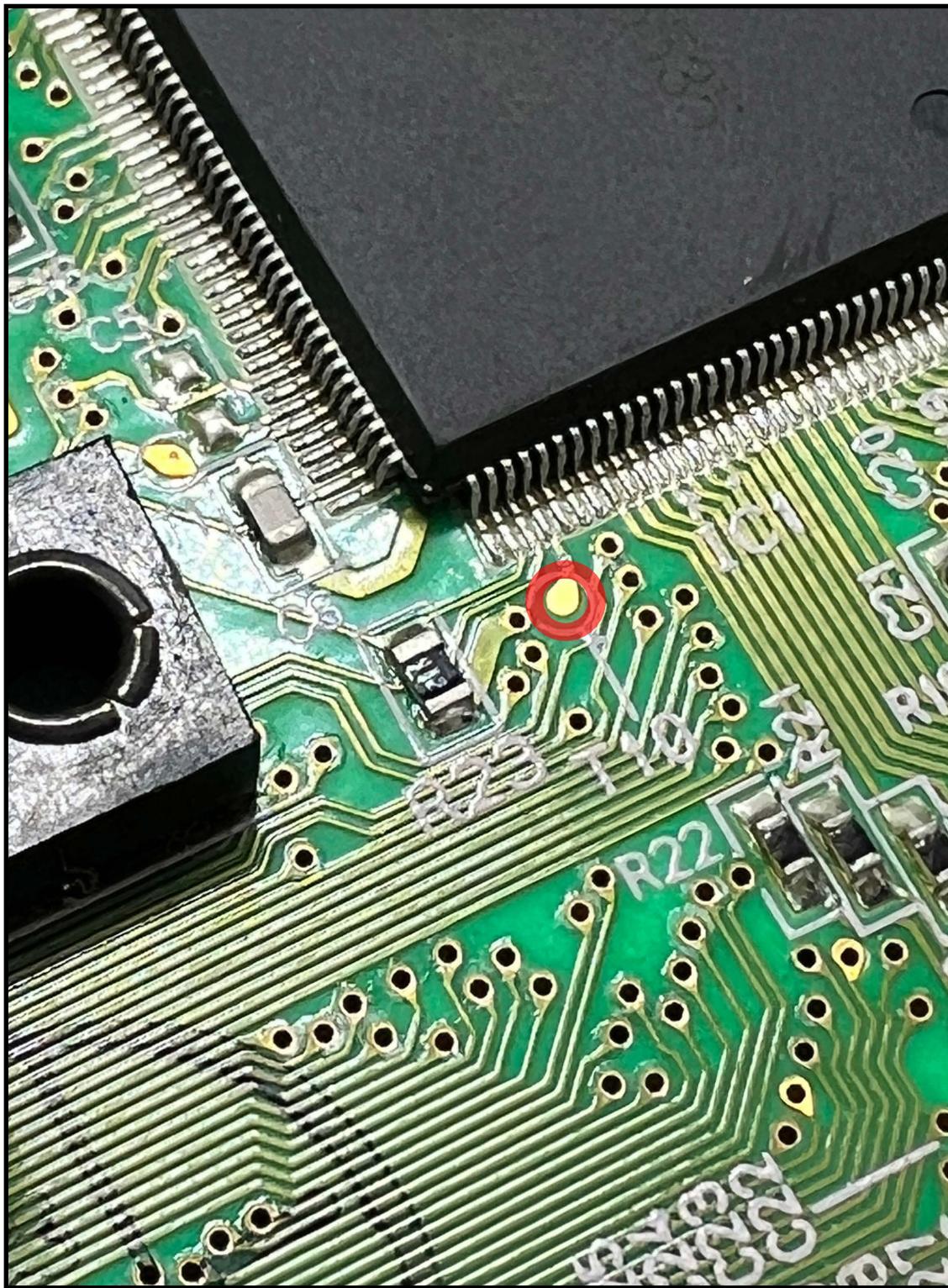
### STEP 14(a) For Dual ASIC Models



T10 Location

## **PART 4: Wiring Controls And Sense Signals To GGHD**

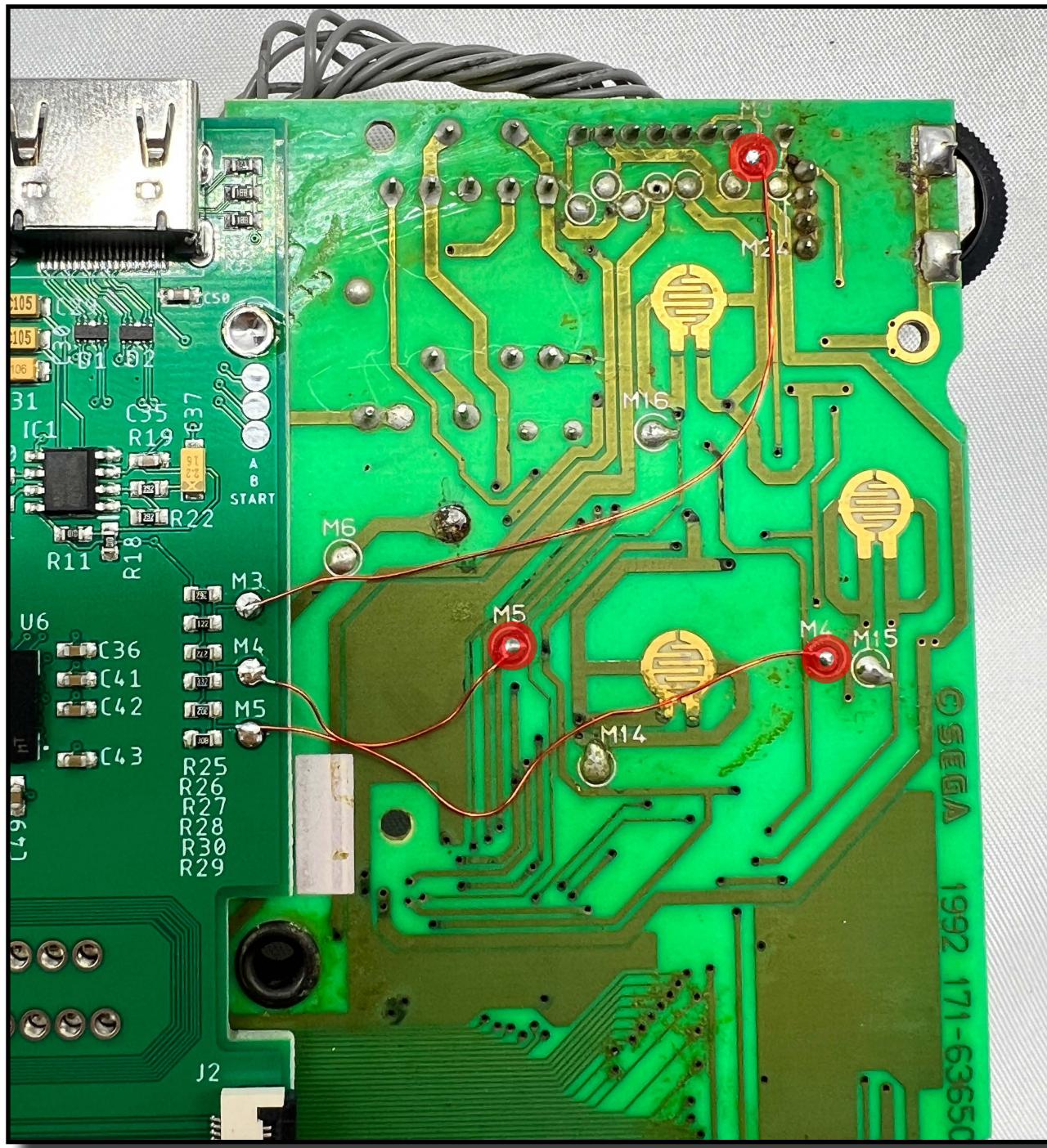
### **STEP 14(b) For Single ASIC Models**



T10 Location

## PART 4: Wiring Controls And Sense Signals To GGHD

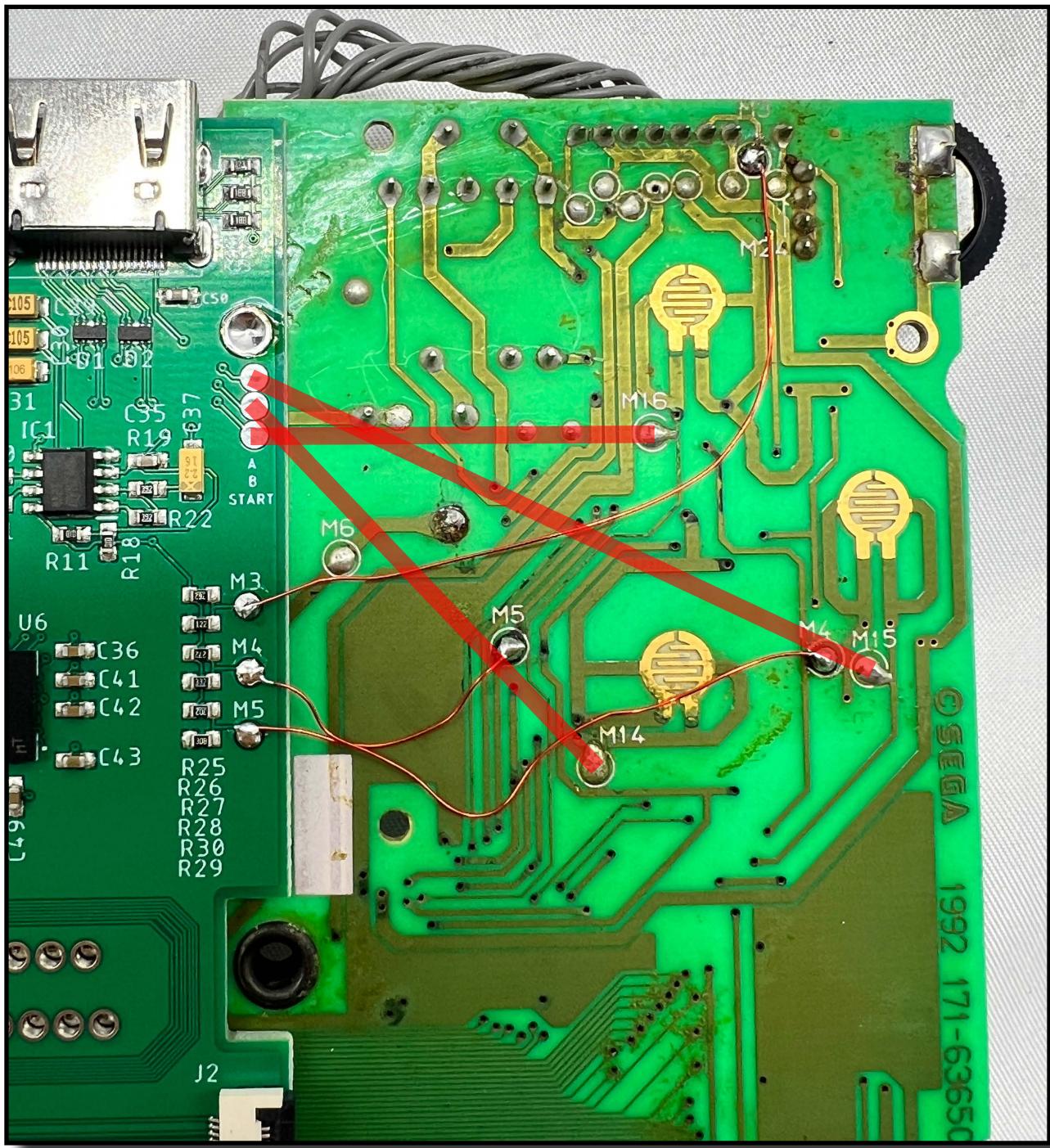
### STEP 15



Wire M3, M4, and M5 to the corresponding pads. The example(above) shows a Single ASIC motherboard.

## PART 4: Wiring Controls And Sense Signals To GGHD

### STEP 16

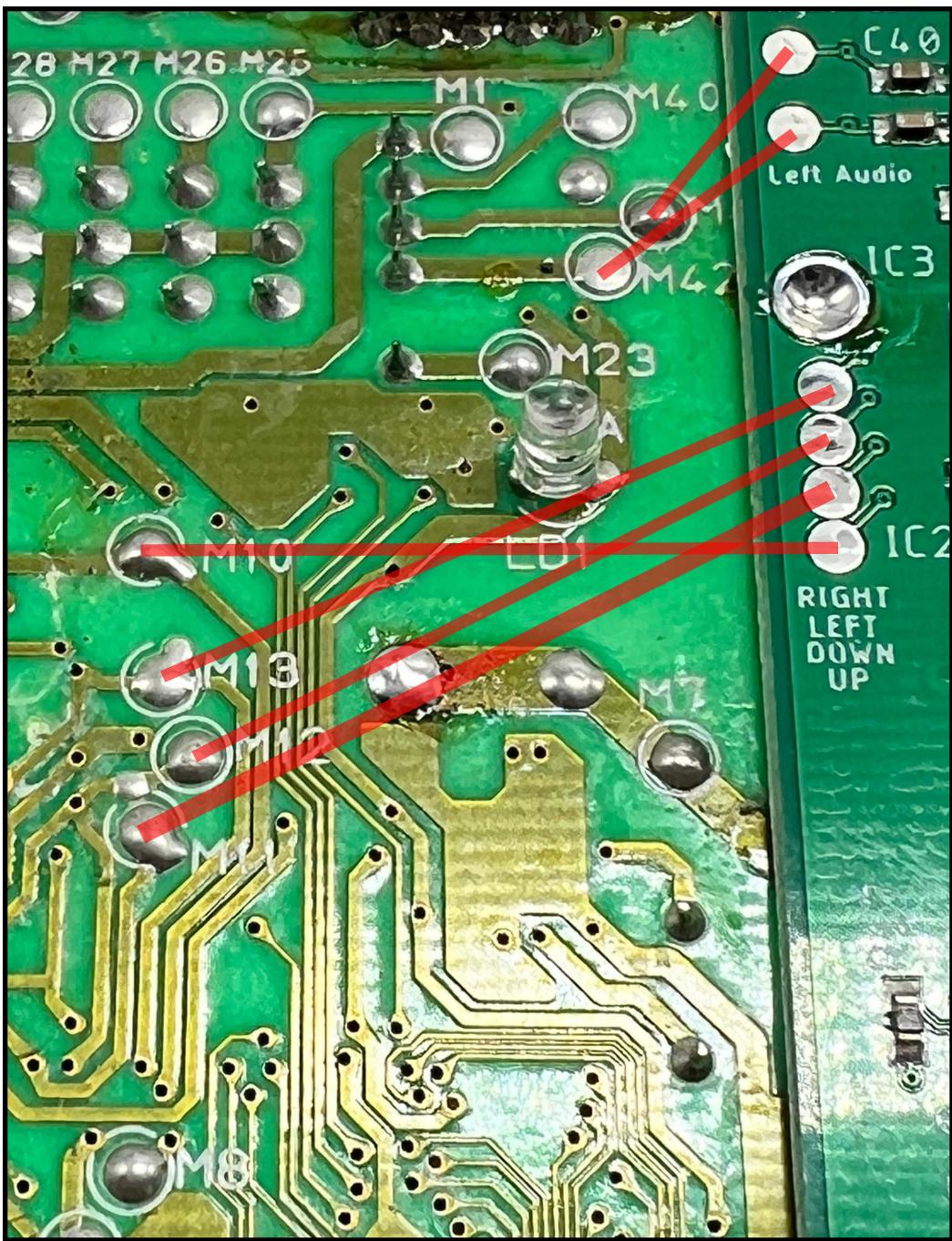


Wire the following points:

- START -> M16
- B -> M14
- A -> M15

## PART 4: Wiring Controls And Sense Signals To GGHD

### STEP 17

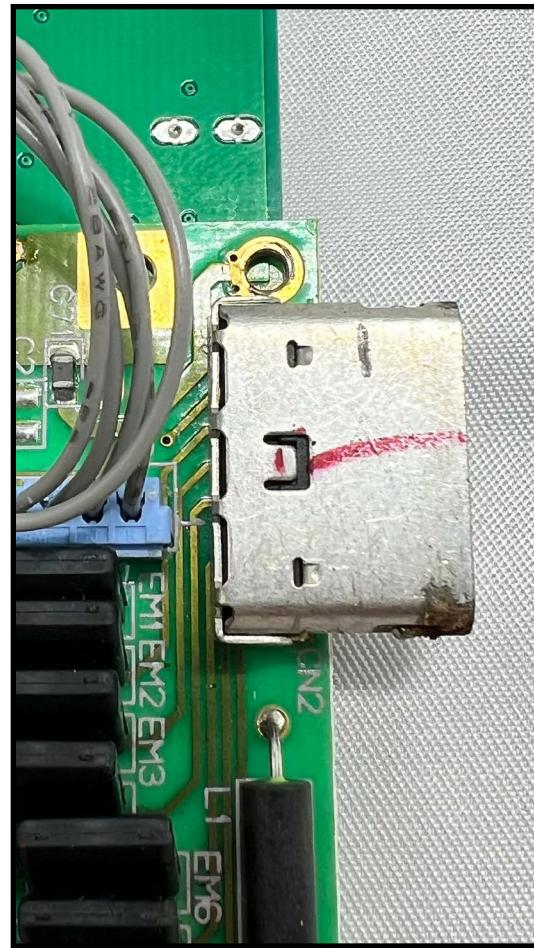
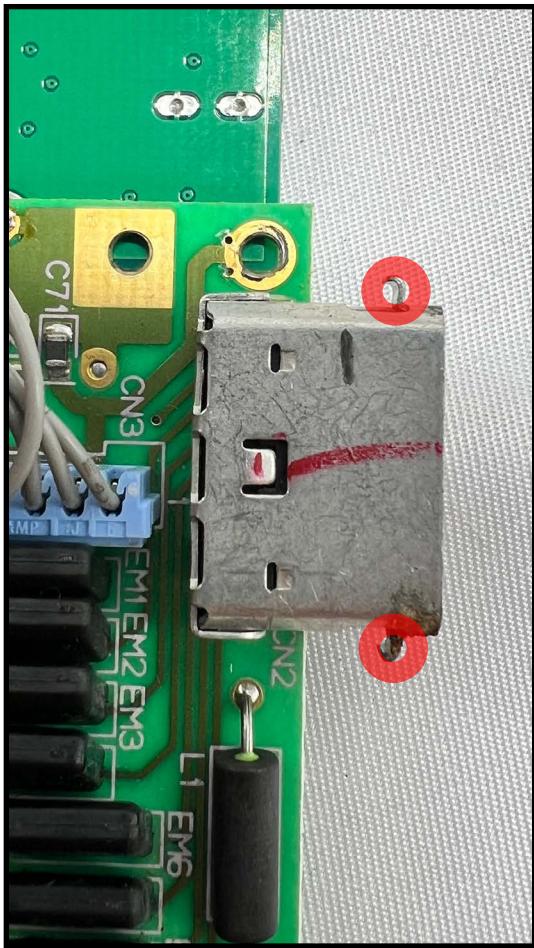


Wire the following points

- Right Audio -> M41
- Left Audio -> M42
- UP -> M10
- RIGHT-> M13
- LEFT -> M12
- DOWN -> M11

## **PART 4: Wiring Controls And Sense Signals To GGHD**

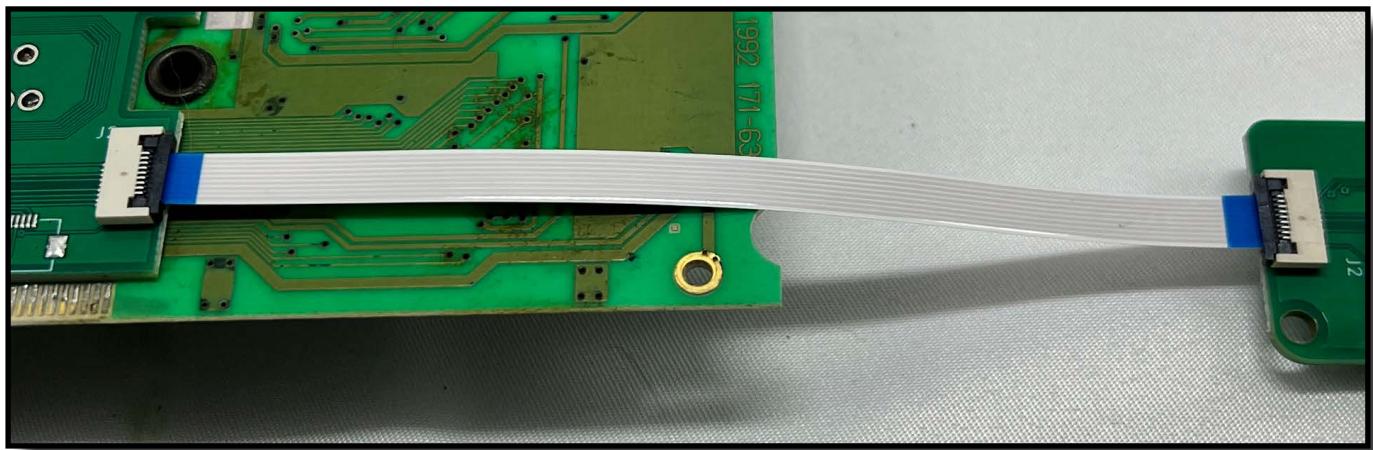
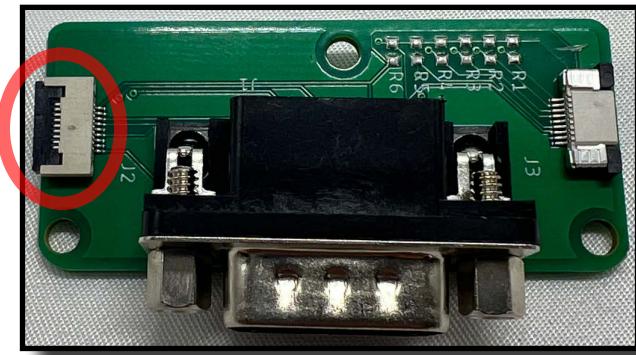
### **STEP 18**



Using a needle nose pliers, flatten the side tabs on CN2 (expansion port)

## PART 5: GGHD Final Assembly

### STEP 19

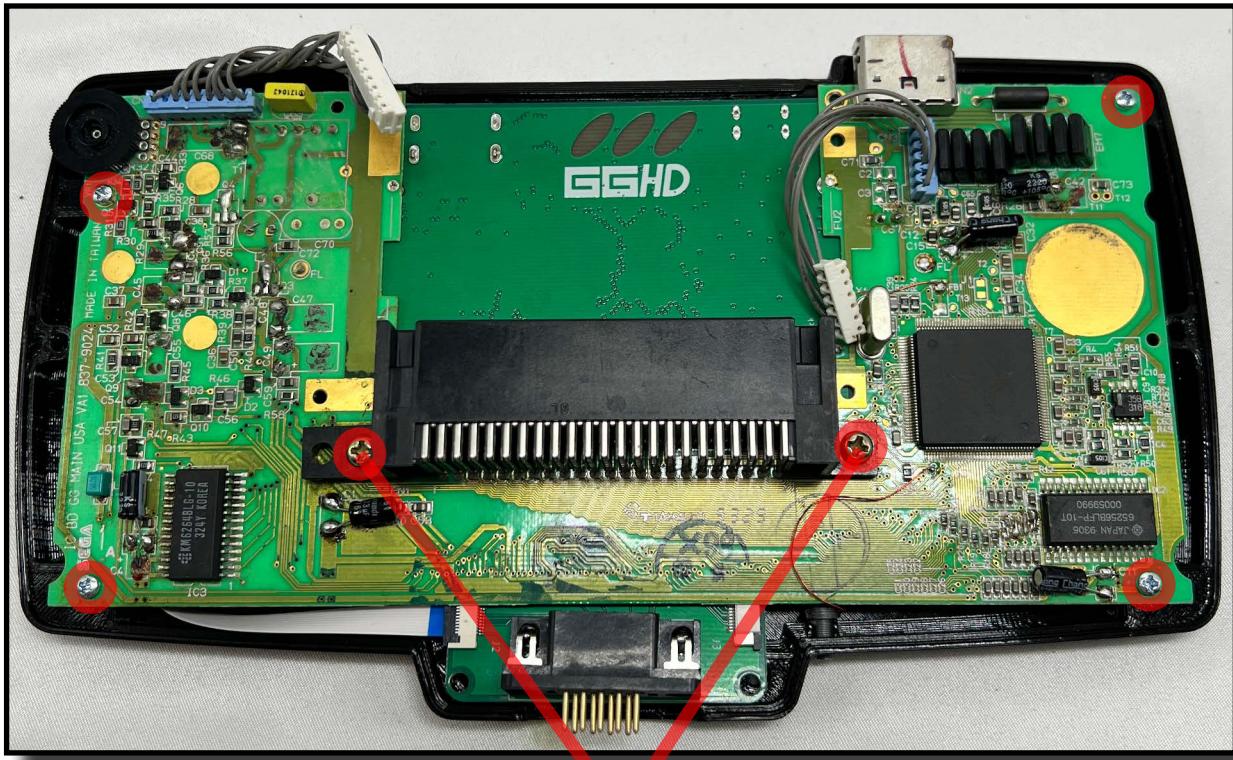
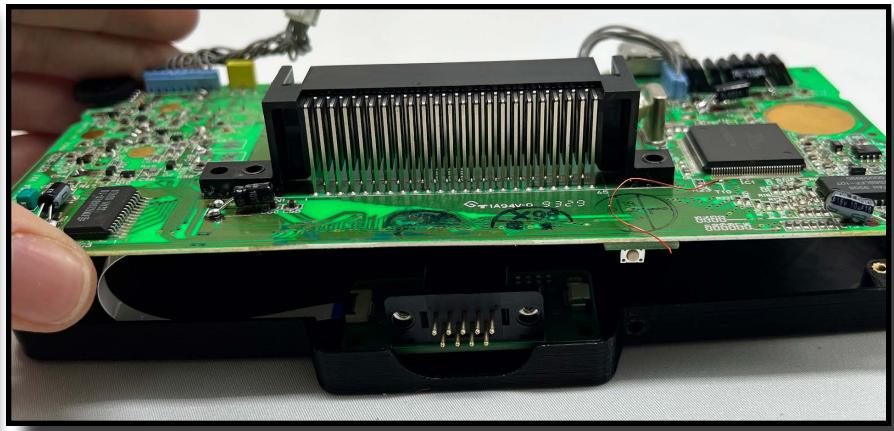
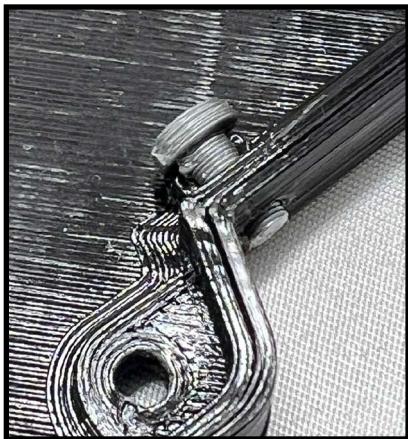


Using a needle nose pliers, remove the bolts and the metal shroud on the controller connector. Connect to GGHD as shown.

**NOTE: DO NOT use connector J3!**

## PART 5: GGHD Final Assembly

### STEP 20

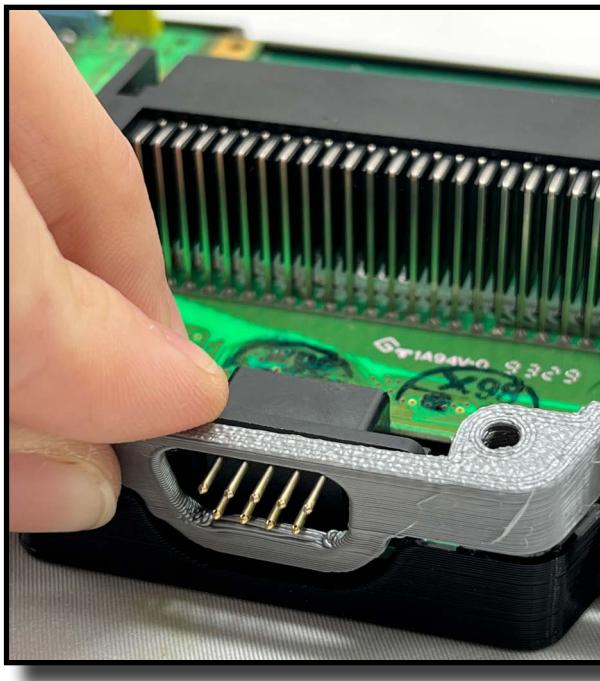


ORIGINAL CARTRIDGE CASE SCREWS

Insert power button plunger into the recess to the right of the controller PCB. Place controller PCB in the front of the bottom case followed by the Game Gear motherboard. Align screw holes and assembly will drop into place. Secure using 4 M2 screws at the four corners and the Game Gear cartridge case screws as shown above.

## **PART 5: GGHD Final Assembly**

### **STEP 21**



Place bracket as shown controller port first and align controller port mounting holes with front two holes of bracket. Place top case on top of the bracket for final step of assembly.

## **PART 5: GGHD Final Assembly**

### **STEP 22**



Flip console over to the bottom of the consolizer. Place an M3 screw into one of the two front holes. Adjust controller PCB such that the screw goes through to the threaded insert and fasten. Fasten the remaining 3 M3 screws.

**ENJOY YOUR NEW HD GAME GEAR**

## Troubleshooting

**PROBLEM:** Artifacting or general picture distortions:



ARTIFACTING



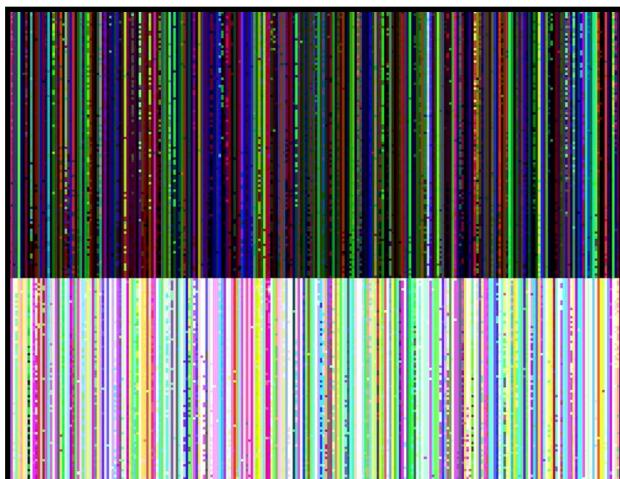
EXTREME DISTORTION

**CAUSE:** A possible difference in the original Game Gears' manufacture may result in some consoles having a different clock impedance/phase shift.

**SOLUTION:** Changing the length of the wire connecting the GGHD to the Game Gears' clock point, (As shown on Page 19) may fix this issue. Start with a 2 inch strand of wire and increase the wire's length by 1 inch increments, to a maximum of 8 inches.

# Troubleshooting

**PROBLEM:** “Rainbow Screen of Death”:

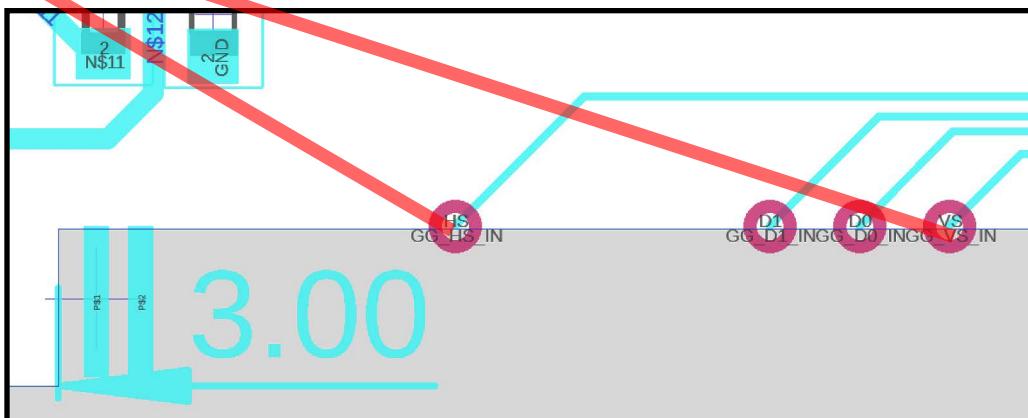


RSOD

**CAUSE:**

**Scenario A:** Incorrect/poorly connected wiring to pins M3, M4, or M5(As shown on page 22.)

**Scenario B:** H-Sync Or V-Sync may not be fully connected at the castellated edge.



**Scenario C:** Dirty or damaged pins on the game gear cartridge or the cartridge connector

**SOLUTION:**

**Scenario A:** Check your connections on these lines. Make sure there are roughly 4.8 volts going through the 5 volt line.

**Scenario B:** Check your connections along the castellated edge, check continuity if needed,

**Scenario C:** Check the pins on your cartridge/cartridge connector, clean with isopropyl alcohol or deoxit. Physical breaks may require soldering or other restorative measures.