

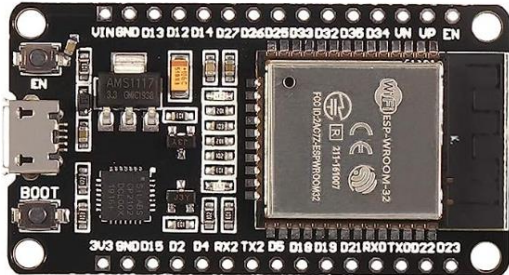
Supplies

Soldering iron and general electronic tools

30 g colored wire

ESP32 Board – recommend development board without headers

(Example - https://www.amazon.com/dp/B09QW6Y7KY?psc=1&ref=ppx_yo2ov_dt_b_product_details)



Download firmware

from <https://darthcloud.itch.io/blueretro> and unzip to folder

Current version is v1.9_hw1.zip

Flash ESP32 Board

General instructions - <https://github.com/darthcloud/BlueRetro/wiki/BlueRetro-DIY-Build-Instructions>

Windows

You will need flash download tools - <https://www.espressif.com/en/support/download/other-tools>

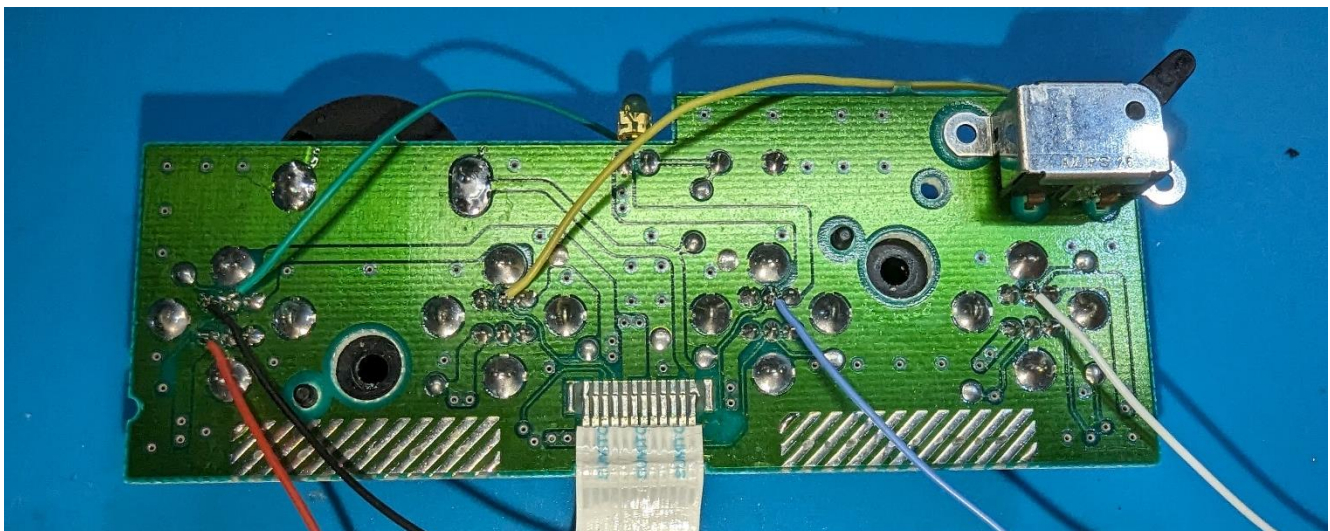
Follow instructions - <https://github.com/darthcloud/BlueRetro/wiki/Flashing-firmware-Windows-10>

Verify connection

On computer go to <https://blueretro.io/> and try to connect with BlueRetro System manager. If not successful, try flashing again.

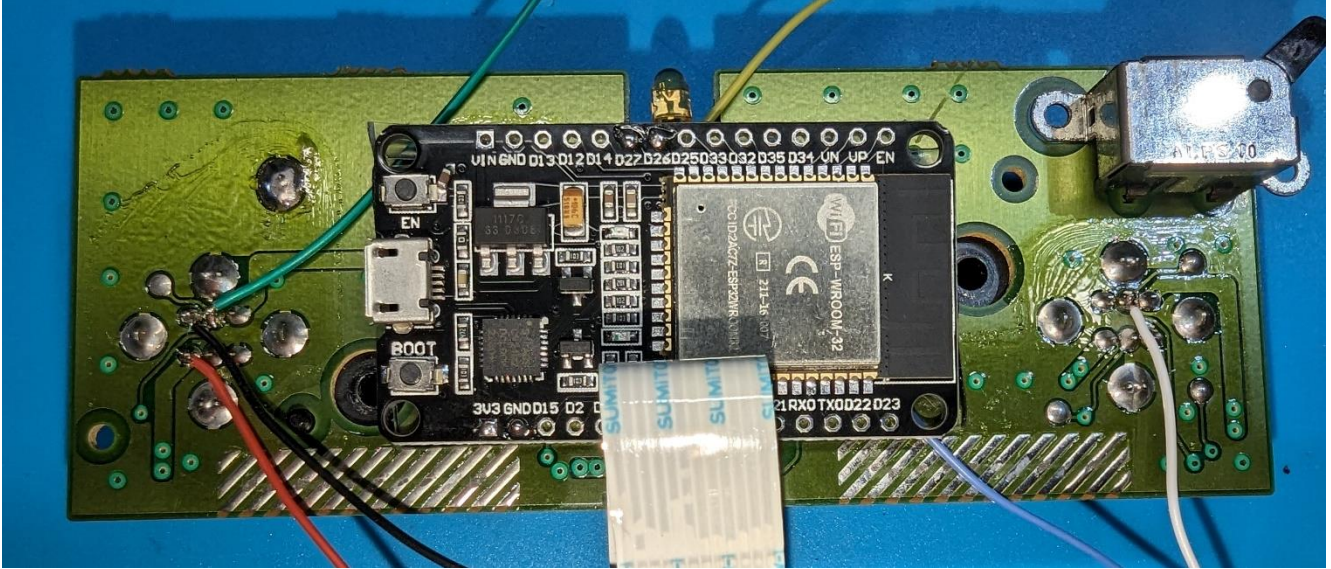
Install the board

Using different colored wires (see color coding below) solder to the data line (top middle) for each controller. Also solder black to ground and red to power on the controller board.



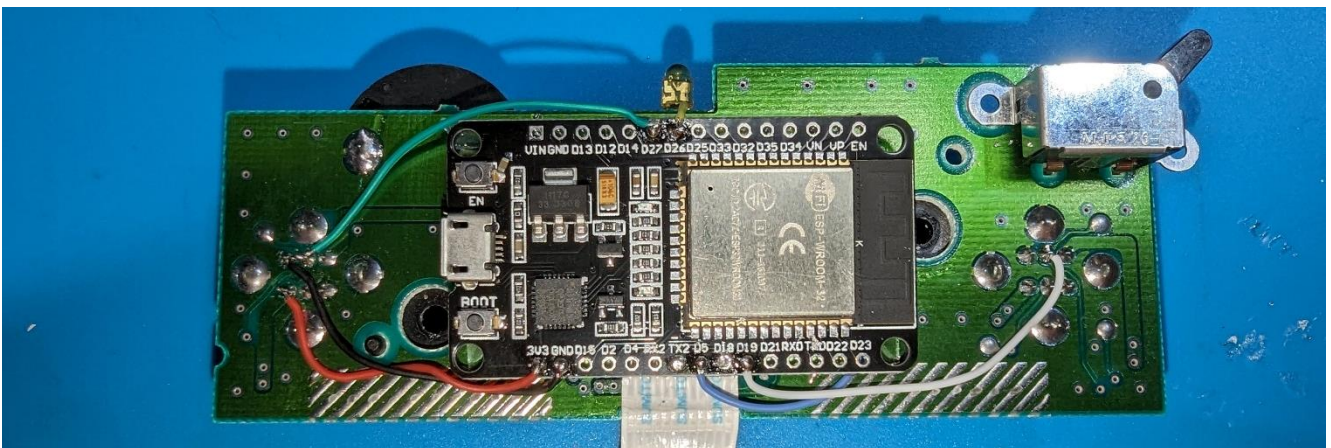
GameCube BlueRetro Assembly @colrust

Replace your battery with a socketed one (good general practice). Mount the ESP32 to the back of the controller board with double sided adhesive. Make sure you have access to both mounting holes for the faceplate – it will just fit in-between them. Make sure the tape covers the contact points on the back of the board, including the holes, to avoid any shorts. You will be covering over wires for ports 2 and 3. Route the yellow and green upward.



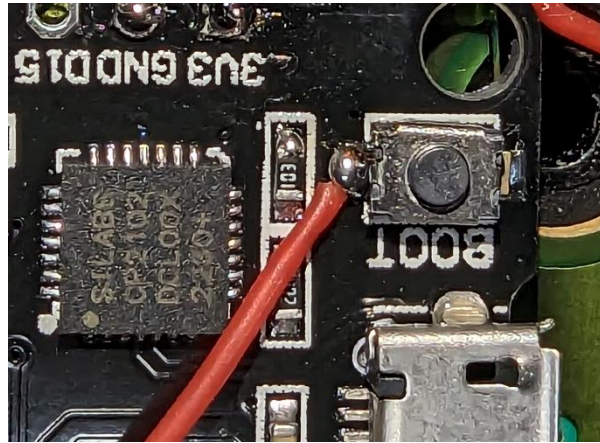
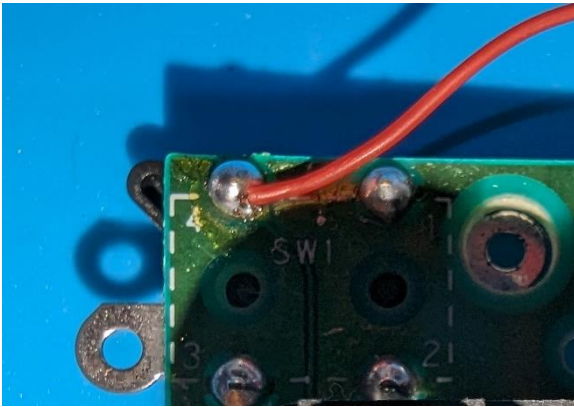
Connect to all wires ESP32 as shown.

- Port 1 – white wire – D19
- Port 2 – blue wire – D5
- Port 3 – yellow wire – D26
- Port 4 – green wire – D27
- GND and 3V3



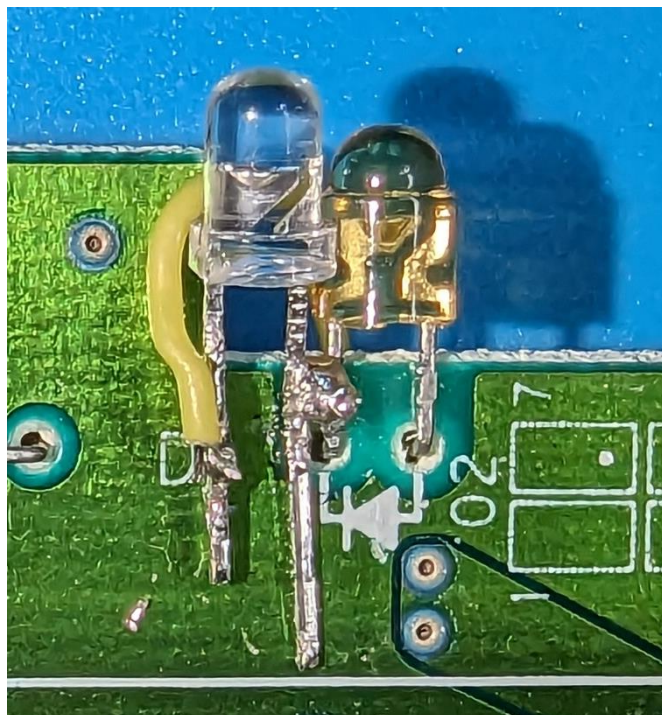
Reset switch

The reset switch is repurposed to control the ESP32. Solder a wire from the top-outside post to the inside-facing pin of the 'BOOT' switch. When the reset button is held the switch is closed and it will send power to the 'BOOT' switch. *Alternatively, can cut the pin (opposite side from pictured) holding the switch to point 4. Solder the wire to the remaining pin on the switch rather than the board. You will lose regular reset however will be able to manipulate Bluetooth connections without resetting game.*

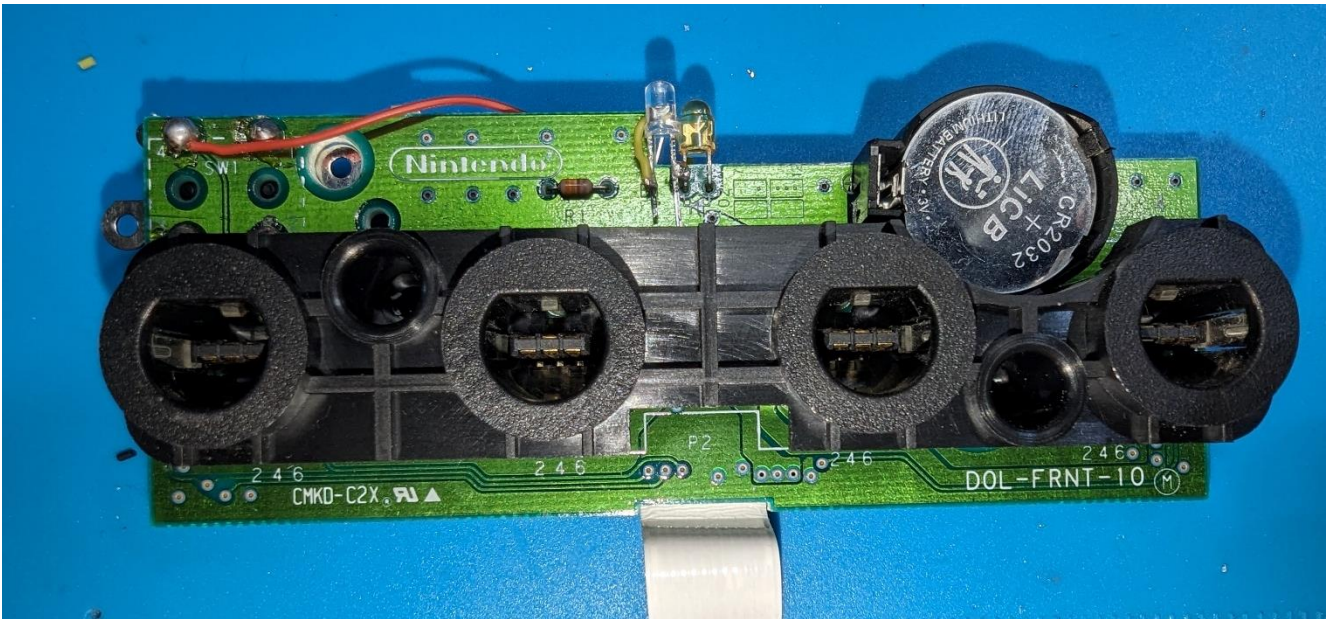
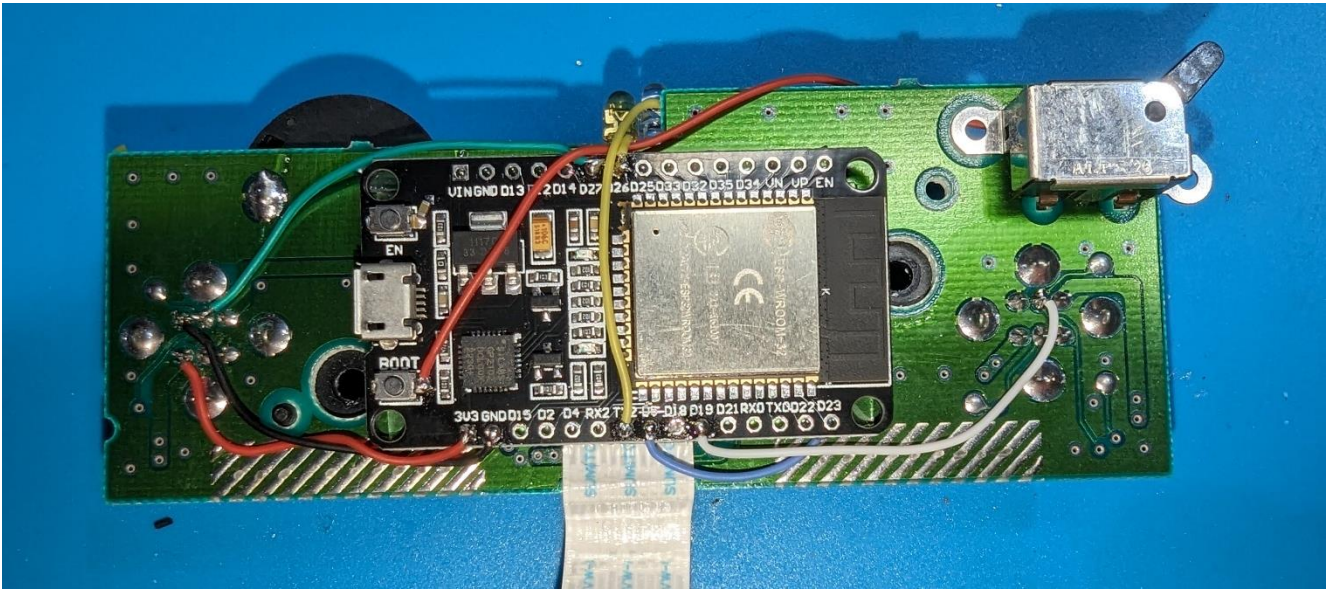


LED Indicator Light

There is a blue indicator light on the ESP32 board. An LED may be added and installed for visibility when cube is reassembled. Positive Leg is wired to IO17 (might be labeled as TX2) and negative to GND. I like to mount it next to the existing LED. Solder the long leg of the LED to the existing LED and the wire from IO17 to the short leg.



Final Result



Reset Functionality

The reset button on the console has been modified to offer new functionality based on how long you hold the button down. While it is being pressed the LED will light up to show which state you will be enabling.

1. System reset behavior while BlueRetro on and system on. Note that any active game will reset as well.
 - a. Button press under < 3 sec (All LEDs solid): If in pairing mode will stop pairing mode otherwise all BT devices are disconnected.
 - b. Button press between > 3 sec and < 6 sec (All LEDs blink slowly): Start pairing mode.
 - c. Button press between > 6 sec and < 10 sec (All LEDs blink fast): Factory reset ESP32 to original BlueRetro firmware the device shipped with & reset configuration.
2. System reset behavior while BlueRetro off & system off
 - a. Holding system reset and then powering system put the BlueRetro in boot (download) mode. It effectively disables it for the current power session.

Button combinations functions

Using generic label to describe the button combinations here. Refer to BlueRetro mapping reference for specific buttons. Also added PlayStation buttons name in () to help a bit.

- Disconnect controller (+ power off internal mod):
 - Main Left Trigger (L2) + Main Right Trigger (R2) + Middle Right (Start) + Face Down (X)
- System reset internal mod:
 - Main Left Trigger (L2) + Main Right Trigger (R2) + Middle Right (Start) + Face Left (Square)
- Toggle Pairing mode on/off:
 - Main Left Trigger (L2) + Main Right Trigger (R2) + Middle Right (Start) + Face Right (Circle)
- Factory Reset:
 - Main Left Trigger (L2) + Main Right Trigger (R2) + Middle Right (Start) + Face Up (Triangle) + D-pad Up
- Deep Sleep:
 - Main Left Trigger (L2) + Main Right Trigger (R2) + Middle Right (Start) + Face Up (Triangle) + D-pad Down

Controller Collision

There is debate about what happens if a Bluetooth and wired controller are connected to the same port. This version of BlueRetro (HW1) will not shift Bluetooth controllers to other ports when a wired controller is plugged in (as the HW2 version used in 'Laser Bear Industries' version does). It is recommended to not have a wired controller plugged into a port that has Bluetooth controller paired to it (no risk of harm however). Holding the reset button on the power up of GameCube will inactivate Bluetooth until next reboot.

Useful Links

Web configuration <https://blueretro.io/index.html>

Web configuration user manual <https://github.com/darthcloud/BlueRetro/wiki/BlueRetro-BLE-Web-Config-User-Manual>

Download firmware – select most recent HW1 version <https://darthcloud.itch.io/blueretro>

mapping video <https://www.youtube.com/watch?v=mm-pkM7eTz8>
(Controllers need to be disconnected to pair the BlueRetro to computer)

Credits

Thank you to DarthCloud, a.k.a. Jacques Gagnon, for all his hard work on this project. GitHub page is <https://github.com/darthcloud>. Also appreciate information found on various Reddit and gc-forever forums. While this seems to be the first step-by-step build guide, and the wiring of reset switch is my discovery, everything else is based on the assembly of information from multiple sources.