# GameCube Controller Modifications


A Super Smash Bros. competitor's guide to addressing GameCube Controller wear and defects

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# Introduction

## The most important tool a competitive Smash Bros. player has is their controller.

As the Super Smash Bros. metagame evolves, players must ensure their controller is able to perform difficult inputs at a moment's notice. Due to manufacturing defects and wear over the years, not all controllers are created equal. Controllers both new and old commonly have issues with their control sticks or triggers that make inputs more difficult than they need to be. Fortunately, there are ways to modify GameCube Controllers to alleviate malfunctions and increase input consistency.

In this guide you will learn how to install a resistor that eliminates snapback issues and perform cosmetic modifications. These modifications are straightforward and allow your inputs to be more consistent as well as allow you to personalize your controller. This guide will require some soldering to install a snapback resistor.

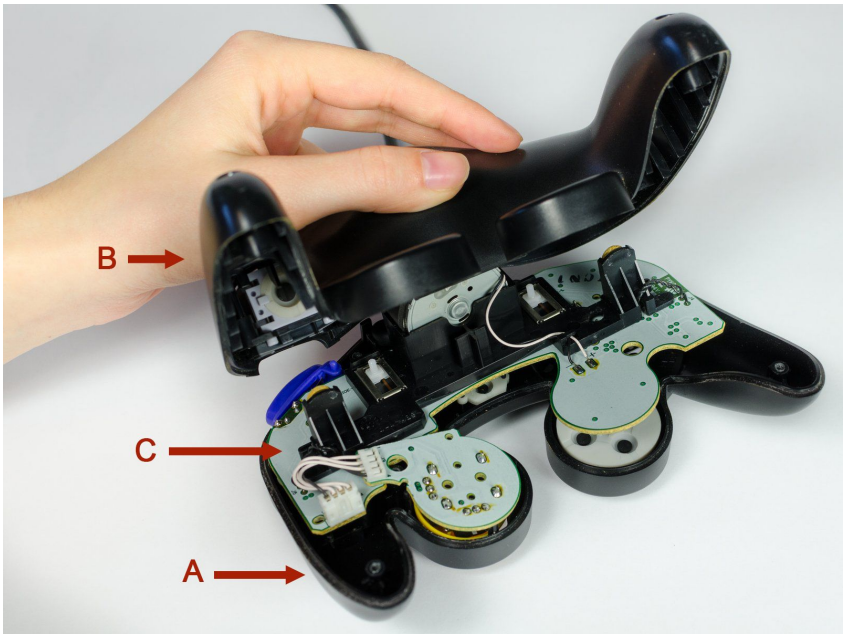
# Equipment overview

## GameCube Controller

## List of Components

| Letter | Component Name | Description of Component |
|---|---|---|
| A | Frontside Shell | The frontside of the GameCube Controller. |
| B | Backside Shell | The backside of the GameCube Controller. |
| C | Printed Circuit Board (PCB) | The PCB is board of copper that provides mechanical means to hold and connect electrical components. |
| D | Rumble Motor | This motor provides haptic feedback. |
| E | Plastic Railing | This piece holds the Left and Right Digital Input Plates responsible for full (digital) Left and Right Trigger presses. |
| F | Joystick Cap (Gray) | The left thumbstick of a GameCube Controller. Used for movement. |
| G | C-Stick Cap (Yellow) | The right thumbstick of the GameCube Controller. Used for smash attacks and aerial attacks. |
| H | ABXY Button Contact Pad | A small rubber pad with contact points that, when pressed down, bridges a connection that results in the game knowing a button is pressed. Used to attack, use special attacks, and jump respectfully. |
| I | Start Button Contact Pad | A small rubber pad with contact points that, when pressed down, bridges a connection that results in the game knowing a button is pressed. Used to pause. |
| J | D-Pad Contact Pad | A small rubber pad with contact points that, when pressed down, bridges a connection that results in the game knowing a button is pressed. Used to taunt. |
| K | Left Digital Input Plate | This small PCB plate works with a contact pad in the Left Trigger to determine is the Left Trigger is pressed all the way down. |
| L | Right Digital Input Plate | This small PCB plate works with a contact pad in the Right Trigger to determine is the Right Trigger is pressed all the way down. |
| M | Left Analog Slider | A small plastic slider that works with the Triggers to determine how far down the Trigger is pressed. Found on the PCB. |

| | | |
|---|---|---|
| N | Right Analog Slider | A small plastic slider that works with the Triggers to determine how far down the Trigger is pressed. Found on the PCB. |
| O | Left Trigger | Made of plastic. Used to shield and airdodge. (Referred to as the top of the trigger) |
| P | Right Trigger | Made of plastic Used to shield and airdodge. (Referred to as the top of the trigger) |
| Q | Left Black Back Plate | A small plastic plate that secures the Left Trigger to the Backside Shell. |
| R | Right Black Back Plate | A small plastic plate that secures the Right Trigger to the Backside Shell. |
| S | Springs | Allows the Triggers to move back to their highest position when not held down. |
| T | Trigger Foot | This plastic piece holds the contact pad for a trigger's digital press. The plastic piece also has two fangs that allow the Black Back Plates to be connected and screwed in to keep the triggers secured to the Backside Shell. |
| U | Metal Bar | This small piece of metal attaches to a trigger and the foot of the trigger. These metal bars are only included in Revision 1 Controllers. |

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Tri-Wing Screwdriver

Female Jumper Wire

Mini Phillips Screwdriver

# Snapback resistor installation

This modification removes the snapback of a GameCube Controller's control stick. Snapback occurs when you release the control stick and the control stick travels farther than its resting position. When the control stick travels past a certain threshold, it can cause unintended directional inputs that are interpreted to be in the wrong direction. This modification prevents snapback and ensures directional inputs go in the intended direction.

NOTE: After performing this modification, the controller must be calibrated by holding down the Start, Y, and X buttons for 3 seconds to recalibrate the controller each time the controller is plugged into a console.

**Items needed for this modification:**

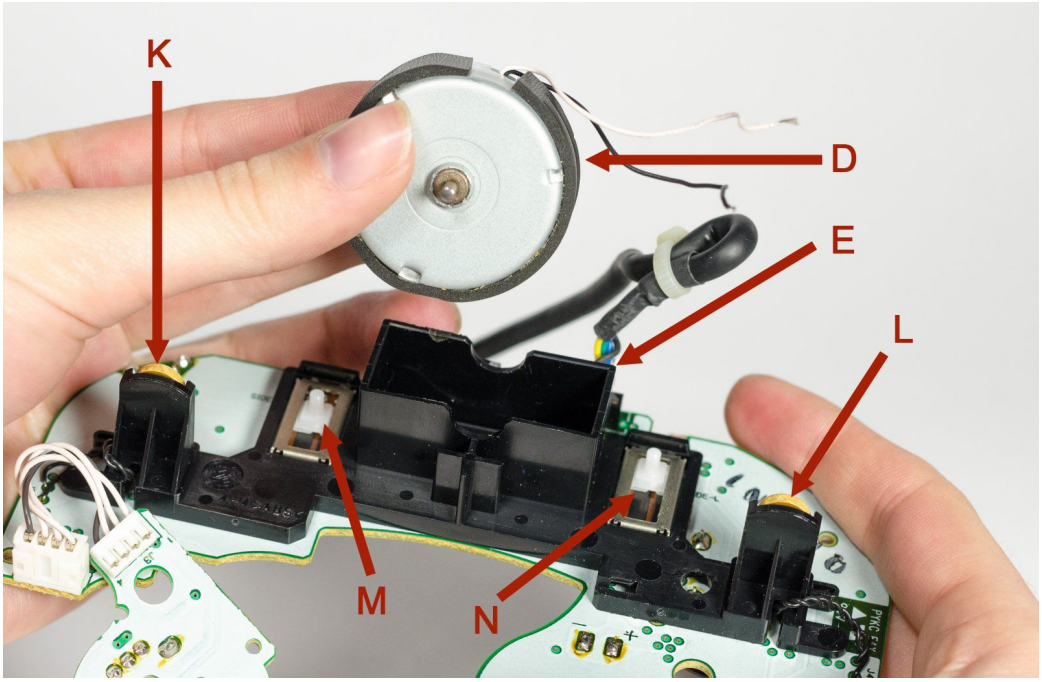
- Tri-Wing Screwdriver
- Mini Phillips Screwdriver
- Tweezers
- Soldering Iron
- Solder
- Hot Glue Gun
- Hot Glue
- Knife/Box Cutter
- Wire Cutter
- Wire Stripper
- 2x - Female Jumper Wires (2.54mm) (different colors)
- 1x - Ceramic One Microfarad (1µF) Capacitor [Labeled with 105]

**How to disassemble your GameCube Controller:**

This section will teach you how to take apart your controller properly to install the modification.

1. Use your Tri-Wing Screwdriver to remove the six (6) screws on the backside of the GameCube Controller.
2. Remove the backside shell of the GameCube Controller.
   Removal is easiest with the front side of the controller facing downwards.
3. Remove the rumble motor from the plastic railing that housed the rumble motor.
   Ensure that the wires connecting the rumble motor are no longer connected to the plastic railing.
4. Remove the L and R digital input plates from the plastic railing.
5. Remove the plastic railing from the PCB.

To remove the plastic railing, press inwards on the two clips of the plastic railing found on the frontside of the GameCube Controller motherboard. You should now be able to remove the rail.




**How to prepare the snapback capacitor:**

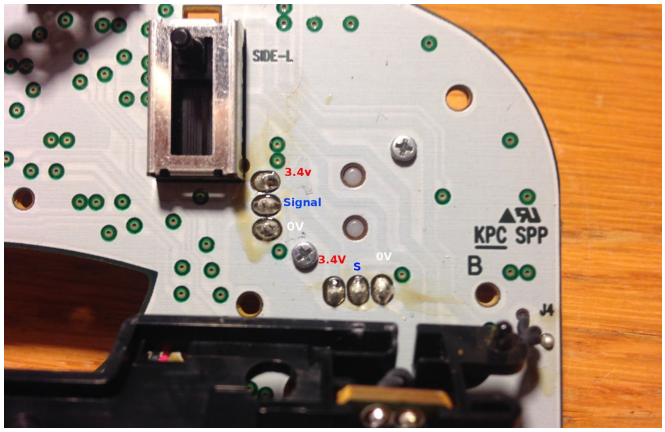
This section will teach you how to prepare the internal components of your controller for installation of the snapback capacitor.

1. Use your knife to shave 3mm of plastic off of the underside of where the L digital input plate sat.
   Shaving off this plastic will provide room for the female jumper wires.
2. Cut the two female jumper wires in half.
   You should now have four wires. You will only need two of the aforementioned two wires, so you may discard the two other halves.
3. Use your wire strippers to strip 3mm of the plastic sleeve from one female jumper wire.
   Copper threads of the wire should now be visible on one end of the wire.
4. Twist the copper threads of the female jumper wire together individually.
5. Twisting the copper threads ensures the individual threads of the wire don't make contact with other pins on the PCB.
6. Use your soldering iron to coat the twisted copper threads of the female jumper wire with 1-2mm of solder.
   Coating the twisted copper threads with solder ensures the individual threads stay together.
7. Repeat steps 3 through 6 for the second female jumper wire.

**How to install the snapback capacitor:**

This section will walk through the installation of the snapback capacitor which reduces unintended directional inputs.

1. Locate the three pins of the horizontal potentiometer.
   They can be found on the backside of the GameCube Controller's PCB. The leftmost pin is the supply pin that carries 3.4V, the middle pin is the signal pin, and the final rightmost pin is the 0V ground pin.
2. Use your soldering iron to solder the darker modified female jumper cable to the rightmost 0V ground pin.
   Ensure the contact between the wire and the PCB is solid.
3. Use your soldering iron to solder the lighter modified female jumper cable to the middle signal pin.
4. Use your hot glue gun to apply 0.5-1 CC of hot glue over the three pins of the potentiometer.
   Ensure that the hot glue covers both the soldered pins and the 3mm of exposed wires. Let cool. This procedure protects the connections of the modified female jumper cables to that they can withstand stress from use.
5. Insert your Ceramic One Microfarad (1µF) Capacitor into the modified female jumper cables.
   Slide the shorter leg into the modified female jumper cable you soldered into the ground (rightmost) pin. Slide the longer leg into the modified female jumper cable you soldered into the signal (middle) pin. If the legs are the same length, it does not matter which leg you insert into each of the modified female jumper wires.




**How to reassemble your GameCube Controller:**

This section will teach you how to put you GameCube Controller back together for use.

1. Insert the L and R digital input plates back into the plastic railing.
   Reinserting the L and R digital input plates can be done by sliding them in and place the rail back onto the Controller's PCB. Press in the two slips of the plastic railing so that the plastic railing is firmly are connected to the Controller's PCB.
2. Insert the rumble motor back into the plastic railing.
   Ensure that the metal bar on the top of the motor is pointed towards the top of the Controller.
3. Carefully put the backside shell of the GameCube Controller back onto the controller.
   Ensure that the analog sliders on the PCB of the GameCube Controller are raised to their highest position.
4. Use your Tri-Wing Screwdriver to reinsert the six (6) screws into the backside of the GameCube Controller.

# Cosmetic modifications

## These modifications allow you to personalize your GameCube Controllers and make them stand out.

**Items needed for this modification:**

- Tri-Wing Screwdriver
- Mini Phillips Screwdriver
- Tweezers

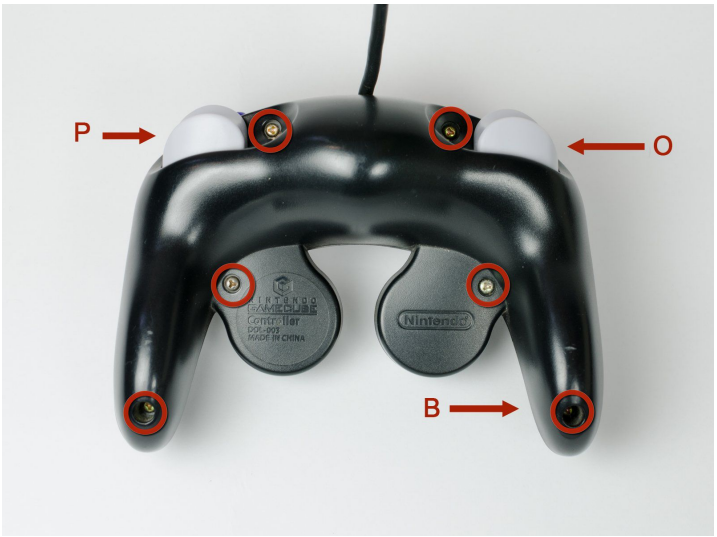
**Optional items needed for this modification:**

- GameCube Controller Shells (Frontside and/or Backside)
- Custom Buttons
- Custom Triggers
- JoyStick Caps

**How to open your controller to replace buttons, triggers, and joystick caps:**

This section will show you how to take apart your controller swap in and out buttons, triggers, and joystick caps.

1. Use your Tri-Wing Screwdriver to remove the six (6) screws on the backside of the GameCube Controller.
2. With the front side of the controller facing downwards, carefully lift the backside shell of the GameCube Controller.




**How to replace buttons:**

1. Set aside the backside shell of the GameCube Controller.
2. Lift the GameCube Controller's PCB out of the frontside shell of the GameCube Controller.
   You should now see buttons resting in the frontside shell covered by contact pads. If the contact pads are stuck to the Controller's PCB, simply take them off of the PCB.
3. Remove the three contact pads for the A B X Y buttons, Start button, and DPad.
4. Remove the A B X Y buttons, Start button, and DPad. Set aside.
5. Replace the A B X Y buttons, Start button, and DPad with your new buttons.

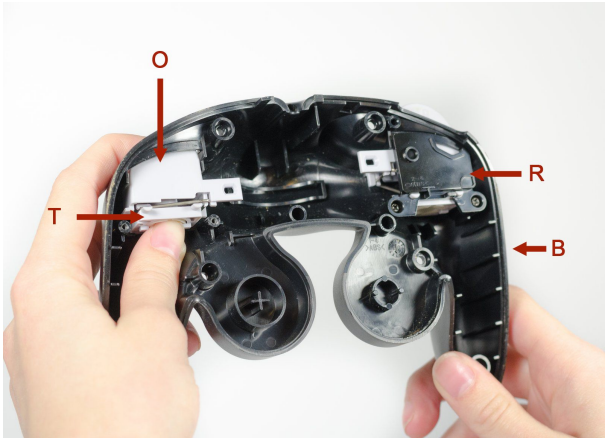
The frontside shell of the GameCube Controller is moulded to only fit buttons in their designated slots. Follow the guides on each button to ensure that the buttons are put in their correct location.

6. Insert the contact pads back on top of the A B X Y buttons, Start button, and DPad.
   Fit the small holes of the contact pad onto the small plastic poles of the frontside shell of the GameCube Controller. Each contact pad has small holes in them that correspond to small plastic poles.
7. Place the GameCube Controller's PCB back into the frontside shell of the GameCube Controller.
8. Carefully put the backside shell of the GameCube Controller back onto the controller.
   Ensure that the analog sliders on the PCB of the GameCube Controller are raised to their highest position.
9. Use your Tri-Wing Screwdriver to reinsert the six (6) screws into the backside of the GameCube Controller.

**How to replace triggers:**

This section will show you how to take apart each component of your L and R triggers and how to replace the triggers themselves.

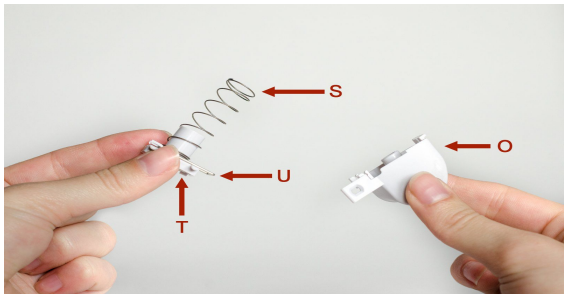
1. Set aside entire frontside shell of the GameCube Controller. You will only need the backside shell.
2. Using a Mini Phillips Screwdriver, unscrew in the four (4) screws that hold the two (2) black back plates from the GameCube Controller's backside shell that cover the triggers.
3. Remove the two black back plates.
4. Remove the triggers from the backside shell, one at a time.
   Removing triggers can be done by squeezing the top of the tripper and the foot of the trigger. Other than the black back plate, the trigger is comprised of three (3) parts: the plastic trigger cap, the spring, and the foot with the contact pad.
   NOTE: Early GameCube Controller Models (Revision 1) have a fourth (4) part, a metal bar. This bar helps the trigger go down smoothly. To remove this piece, unlatch it from the plastic trigger cap and that foot of the contact pad.




5. Replace the plastic trigger cap with your new trigger cap.
   NOTE: If you would like to install trigger plugs, do so now. Insert each trigger plug into the hole in the underside of the plastic trigger cap. Trigger plugs enable players to transition from light-shield inputs to hard-shield inputs without any analog discrepancies.
6. Insert the triggers back into the backside shell, one at a time.

Reinserting the triggers can be done by squeezing the top of the tripper and the foot of the trigger. Ensure that the 'fangs' of the foot of the trigger are sticking outward.
NOTE: If you would like to remove the springs of your triggers, do so now. Removing the trigger spring enables players to only use hard-shield inputs and no light-shield inputs.

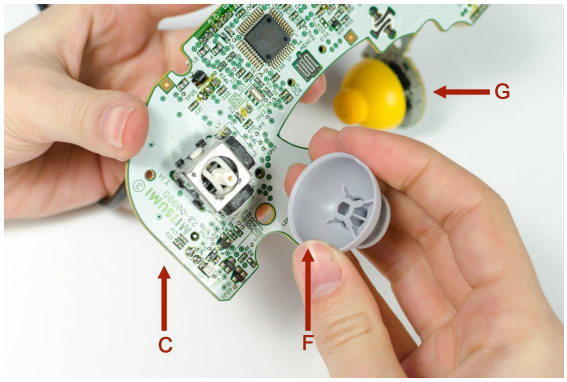
7. Insert the two black back plates onto the triggers.
   The two black back plates have holes that line up with the 'fangs' of the foot of the trigger.
8. Using a Mini Phillips Screwdriver, screw in the four (4) screws of the two (2) black back plates.
9. Carefully put the backside shell of the GameCube Controller back onto the controller.
   Verify that the analog sliders on the PCB of the GameCube Controller are raised to their highest position.
10. Use your Tri-Wing Screwdriver to reinsert the six (6) screws into the backside of the GameCube Controller.




**How to replace joystick caps:**

This section will show you how to replace your joystick cap for your main JoyStick (gray) and C-Stick (yellow) in case they become worn down.

1. Set aside the backside shell of the GameCube Controller.
2. Lift the GameCube Controller's PCB out of the frontside shell of the GameCube Controller.
   On the Controller's PCB, you will see your Control Stick and C-Stick attached.
3. Remove your Control Stick and/or C-Stick.
   To remove the either stick, pull up on either stick from the base of the stick. The stick should easily be come off of it's stickbox.
4. Replace your Control Stick and/or C-Stick.
   The controller's stickbox has a small notch and both sticks have has a small groove that indicates how they needs to be inserted. Simply line up the groove with the notch and press the stick down back onto the controller's PCB.




5. Place the GameCube Controller's PCB back into the frontside shell of the GameCube Controller.
6. Carefully put the backside shell of the GameCube Controller back onto the controller.
   Ensure that the analog sliders on the PCB of the GameCube Controller are raised to their highest position.
7. Use your Tri-Wing Screwdriver to reinsert the six (6) screws into the backside of the GameCube Controller.

# Tips

## Helpful advice to keep in mind about GameCube Controllers.

**Tips:**

- The best way to clean a GameCube controller is by using isopropyl alcohol and water. Q-Tips, Toothpicks, and a Toothbrush do a great job at removing grime from controllers.
- One of the best ways to take care of your controller is by keeping it in a case. Cases can be purchased or created with various materials, such as a Sterilite Micro FlipTop container. A good controller case will protect the controller from drops and rain while providing an easy way to transport a controller.
- If your Z-Button falls out of your controller, it can be sometimes be difficult to put back. To put it back, simply line up the peg with the corresponding hole on the frontside shell of your controller. Next, ensure that the metal piece is secured in the plastic slot. If you are using a custom Z-Button, ensure that you have a metal piece in your custom button.
- Depending on which revision of controller you have, you can have short buttons and a tall ABXY Button Contact Pad or tall buttons and a short ABXY Button Contact Pad. You can identify which type of ABXY Button Contact Pad you have based on if there are ridges around each of the raised contact points. If your button pad lacks ridges, it is a tall ABXY Button Contact Pad. Make sure you pair the right ABXY Contact Pad with the right buttons!