PS4

Ragnarok

Flex Modchip

Installation Instructions

Revised 2/7/2017

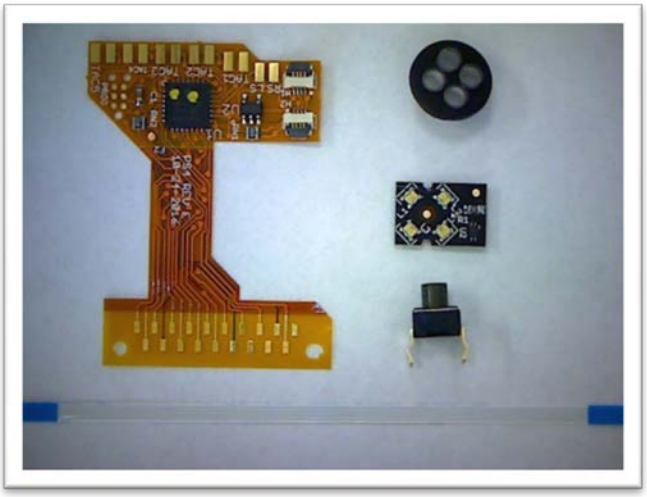
For Sony PS4 Circuit Board Revision “JDM-040”

Tools needed

- PS4 Controller (Circuit board revision JDM-040)
- Viking PS4 Ragnarok Flex modchip “Revision E” kit: modchip, 4-position ribbon cable, tactile switch, LED board, and LED lens
- Soldering iron and solder
- 30 AWG wire (American wire gauge) or similar
- Wire strippers (capable of stripping above wire)
- Electrical tape
- Fine phillips screwdriver
- Power drill
- 9mm and 9/64 inch drill bit
- Hot glue and glue gun
- Safety glasses
- Additional useful items: flux, tweezers, scissors, wire snippers, etc.

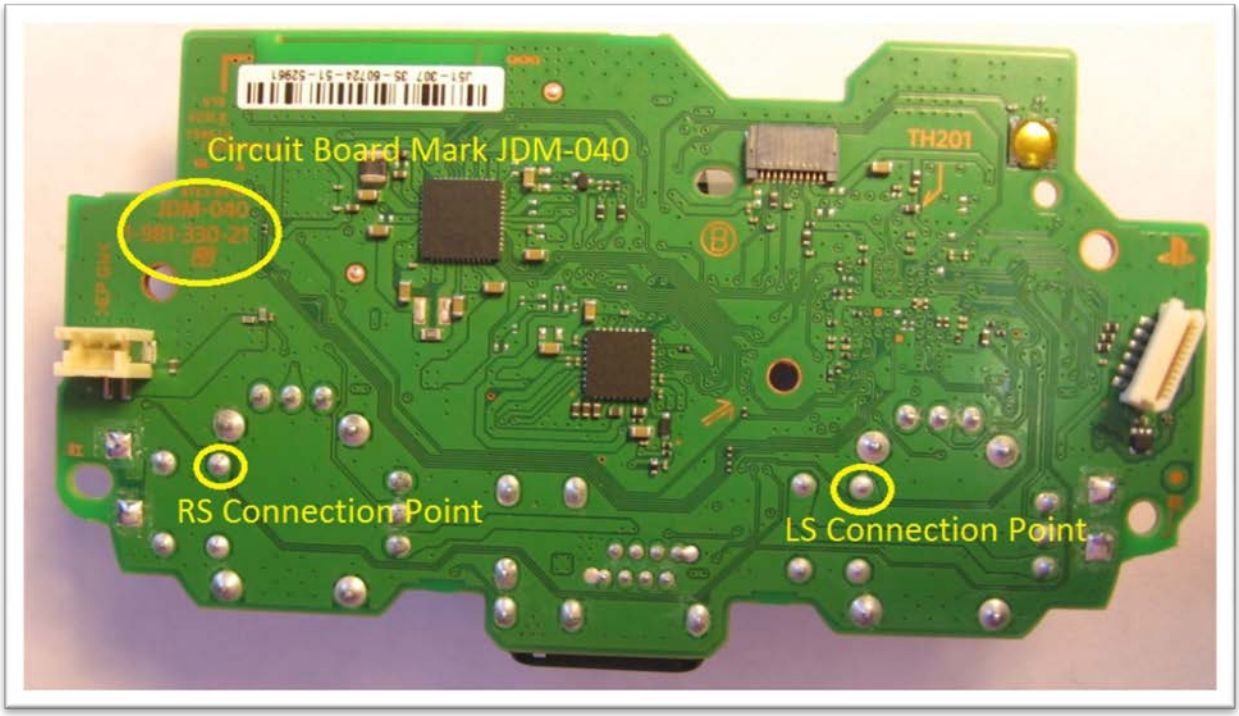
Please note that throughout the physical portion of installation guide, such as removing battery packs and disassembling the controller, has not changed much from one Sony circuit board to another. In the interest of saving time, throughout this guide we may “recycle” photos from previous installation guides.

Determine modchip and board revision



Please note that these instructions are for Sony PlayStation 4 controller revision “JDM-040”. You will need the PS4 Ragnarok Revision “E” modchip kit (pictured above) in order to modify this board.

To identify the “JDM-040” circuit board, look for the “JDM-040” marking. Please note the locations of the “RS” and “LS” solder points on the circuit board. Later, these points will be connected to the “LS” and “RS” pads on the Rev E modchip during modchip installation.



Remove the screws and cover

Once the 4 screws are removed, start separating the cover near the microphone port at the bottom. It may take some force to separate the shell. Cracking noise may be heard and some small tabs may be broken in the process, practice will make this process go more smoothly:

It is possible to remove the shell without removing either the triggers or the bumpers. The rear part near the round end of the handles should be lifted up and over the pegs that lie underneath:

Once the rear handles have cleared the pegs, it is possible to push the back half of the shell "forward" to clear the bumper and triggers, without causing the triggers to pop off. Practice will make this process go more smoothly. If the triggers pop off, **LOOK AROUND CAREFULLY FOR THE SMALL TRIGGER SPRING.** The small trigger spring is required otherwise the trigger will not return fully to the non-pressed position.

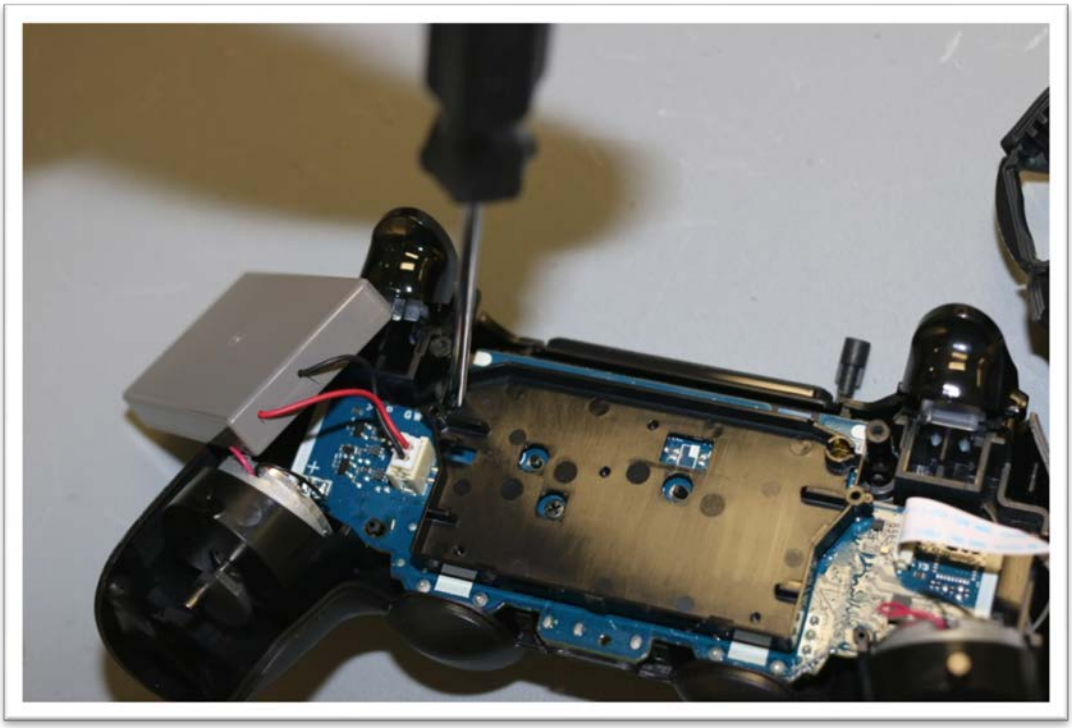
Disassemble the circuit board

NOTE: Some of the following pictures show an earlier circuit board design, but the techniques shown also apply to the JDM-040 board.

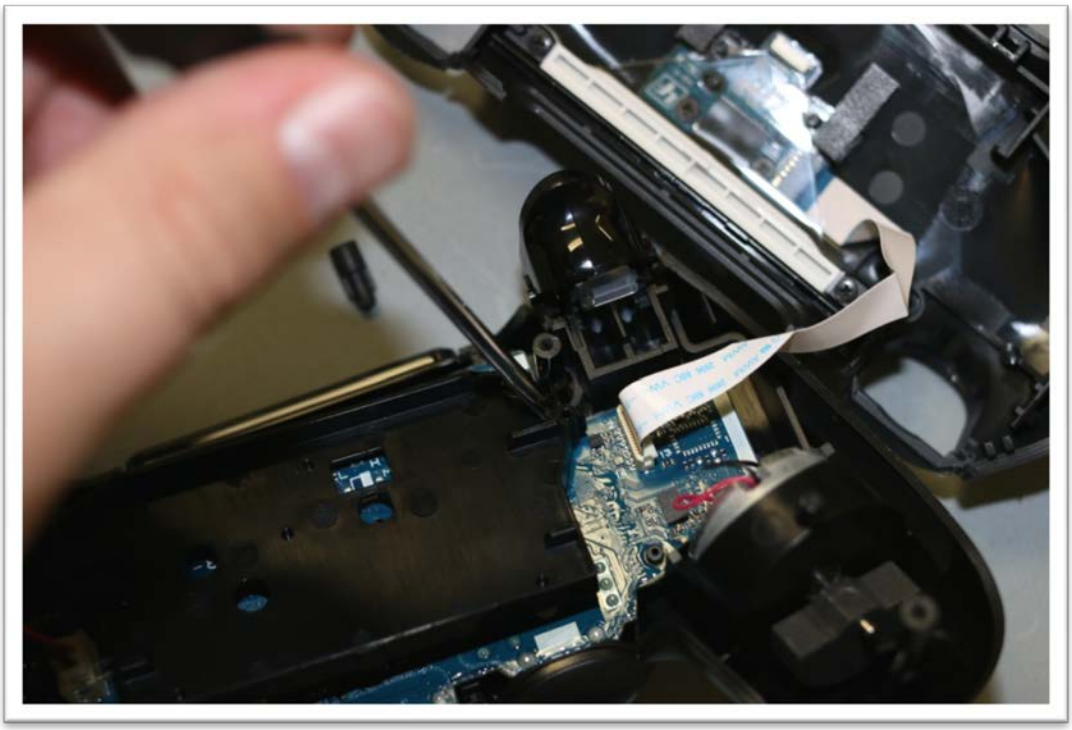
Once the top shell is separated from the bottom shell, flip it open like a clam shell:

Unhook the battery wires from the battery wires hook and remove the battery by pulling up on white battery connector on the circuit board.

The black battery tray is held in place by two plastic tabs that “hook” around the circuit board. The tabs can be loosened by inserting a flat-tip screwdriver in the locations shown:



Be gentle and do not break the tray tabs. Move them only enough to release the battery tray.



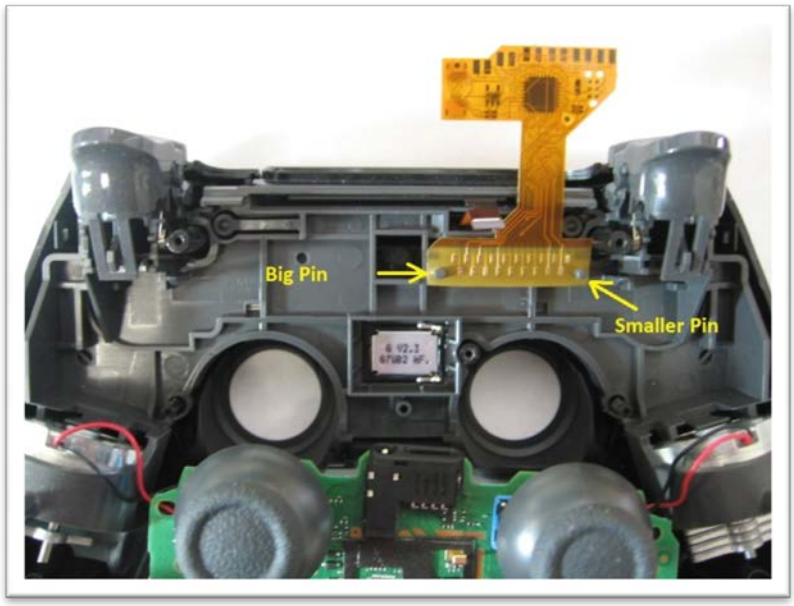
Remove the black plastic battery tray, and you will see the exposed circuit board.

You now need to separate the circuit board from its frame underneath:

1. Pull straight up on the wide ribbon cable at location “A” to separate it from its connector. Note the orientation of the silver pins on the cable, so that you can re-insert it later in the correct orientation. Set aside the bottom shell – it will be drilled and fitted with a tactile switch and LED board later in the installation process.
2. Separate the ribbon cable from its connector at location “B” by pulling the stiff tab straight forward, or toward the front of the controller.
3. Remove the screw at location “C” and set it aside and do not lose it.
4. There are two securing tabs at locations “D” which keep the circuit board flat in the underlying frame. While pulling gently up on the front edge of the circuit board, push these tabs gently forward just until they release the board.

Install the modchip

Pull the circuit board up and flip it over clam-style again toward the rear until the underlying controller frame is exposed. Install the modchip in the exact orientation as shown in the following photo:



Note that there are two pins (one larger and one smaller) which will locate the modchip "wing" precisely where it needs to be installed. On the modchip wing, the wide pin mates to the larger hole, and the smaller pin corresponds to the smaller hole. Notice that the modchip wing contact pattern mimics the controllers existing clear, flexible contact wing. Press the modchip wing down gently until it is flush with the controller's existing clear contact wing and is seated fully down on the locating pins.

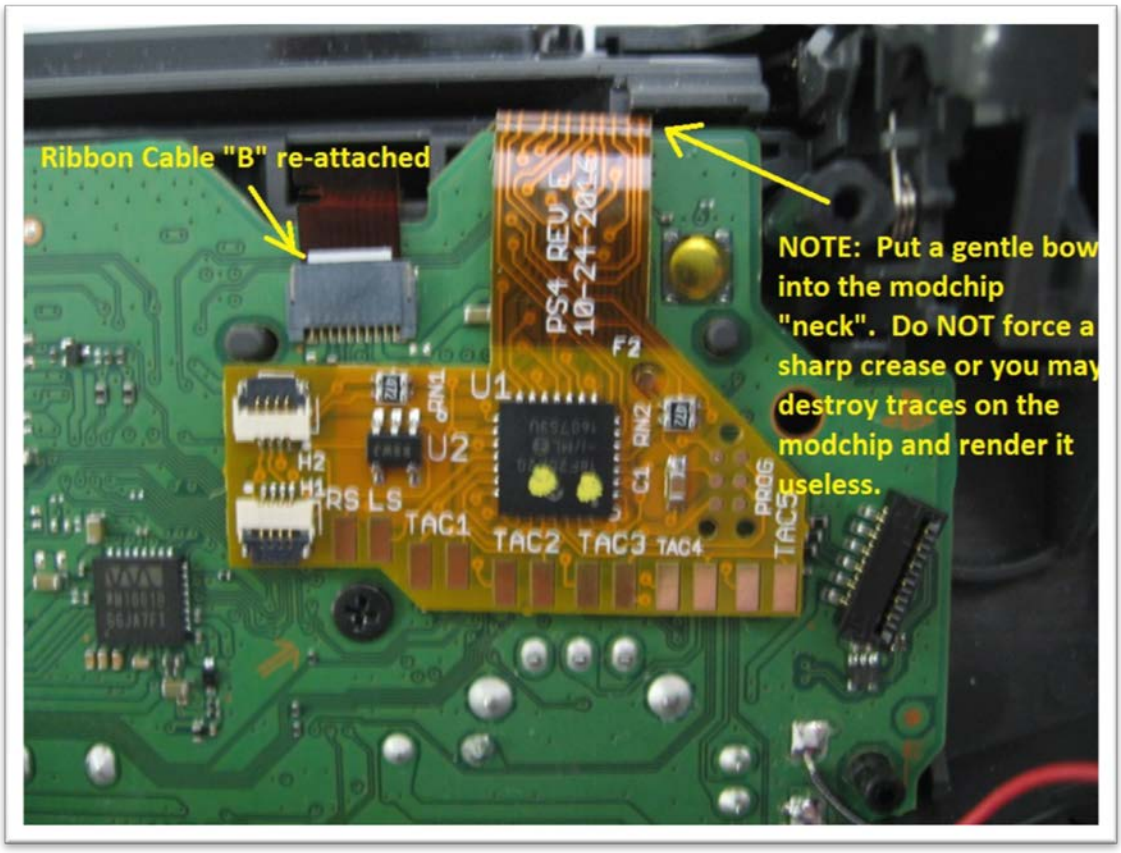
NOTE: Make sure that all wing contact points are kept clean during installation.

Now, flip the circuit board back to its original orientation, and gently place it back down into its original position in the frame. Note that the circuit board has holes that correspond to the wing locating holes, as well as other locating posts on the frame.

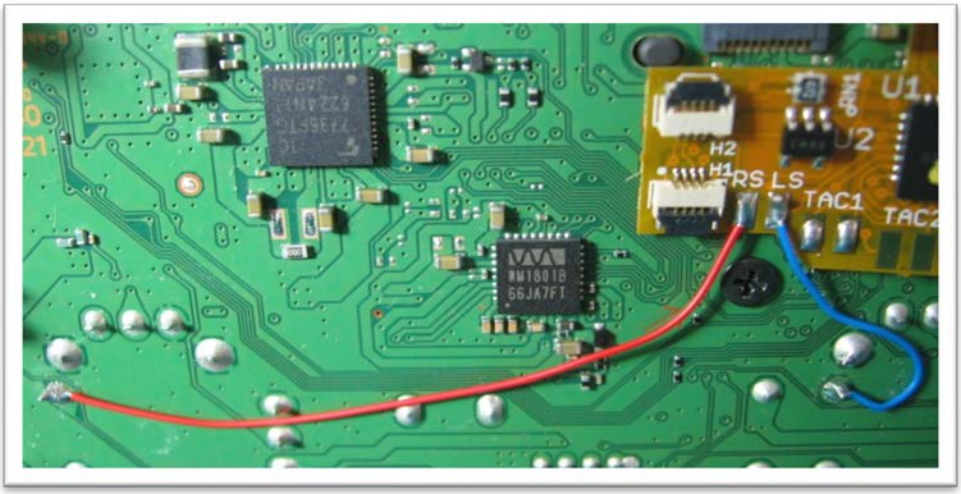
Proper installation will ensure that the modchip wing is flat and securely sandwiched between the circuit board and the clear flexible wing.

Make sure the two securing tabs, "D" from a previous photo, snap into place to secure the board. Once the circuit board is back into place and flat in the frame, re-install the single screw "C" which holds the circuit board into place. Leave the modchip hanging out of the front of the controller for now.

Next, re-insert the ribbon cable “B” into its connector. Put a loop of electrical tape on the back side of the modchip “head” and secure it to the top side of the circuit board, as shown:



With an appropriate length of 30 AWG wire, make a connection between the “RS” point on the circuit board and the “RS” pad on the modchip. Do the same for the “LS” connection points. See following photo for reference and note that the wire routing may vary – just make sure that the wires are not pinched when re-installing the battery tray.

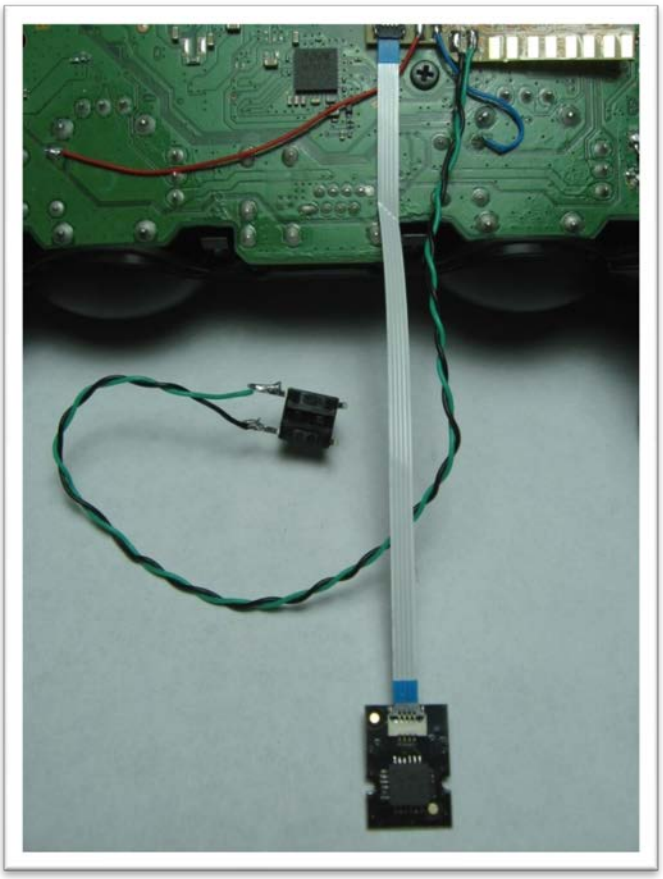


NOTE: It is very important that no bare parts of the wire touch any exposed components on the circuit board.

Connect two wires from “TAC1” to the mod switch. Connect the 4-position ribbon cable from “H1” or “H2” (you can use either) to the LED driver board.

The photo below shows the complete electrical connections of the modchip installation, except that the tactile switch and the LED board have not been installed ye

Notice the blue color of the ribbon cable. This blue indicates how the ribbon cable is to be oriented when connecting the LED board to the modchip.

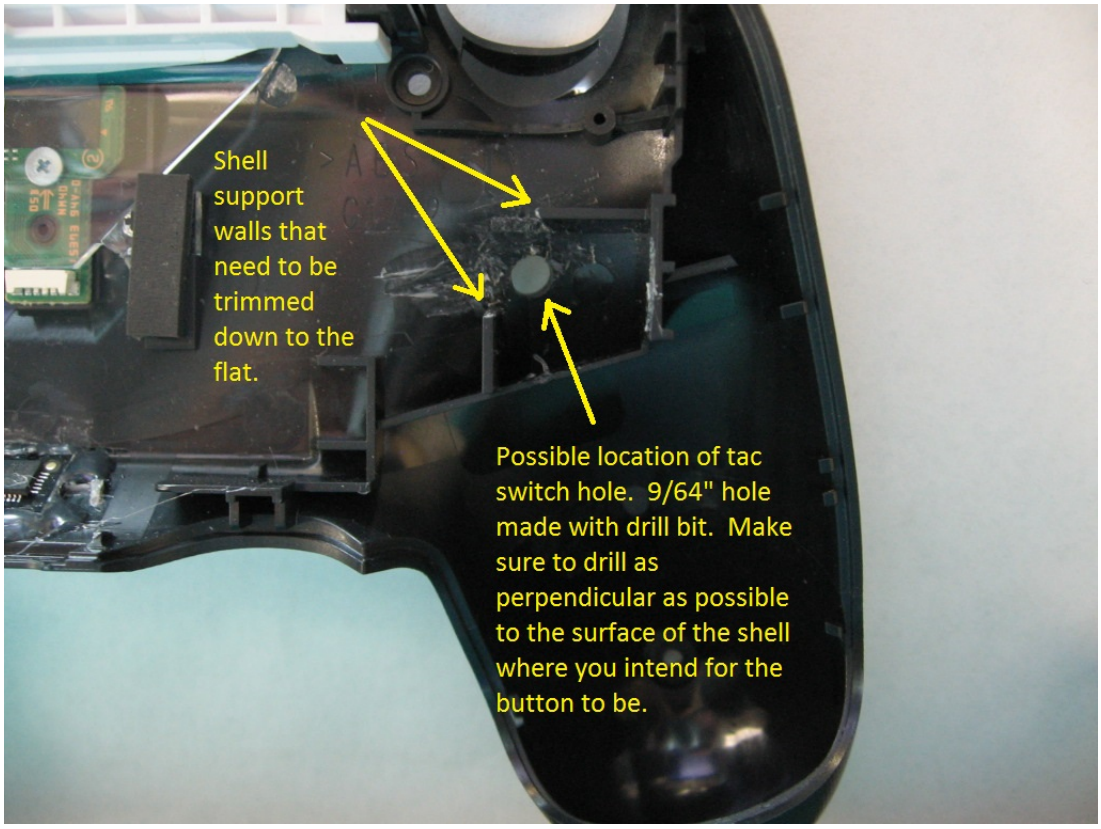


Proceed with the installation of the tactile switch and the LED board as follows.

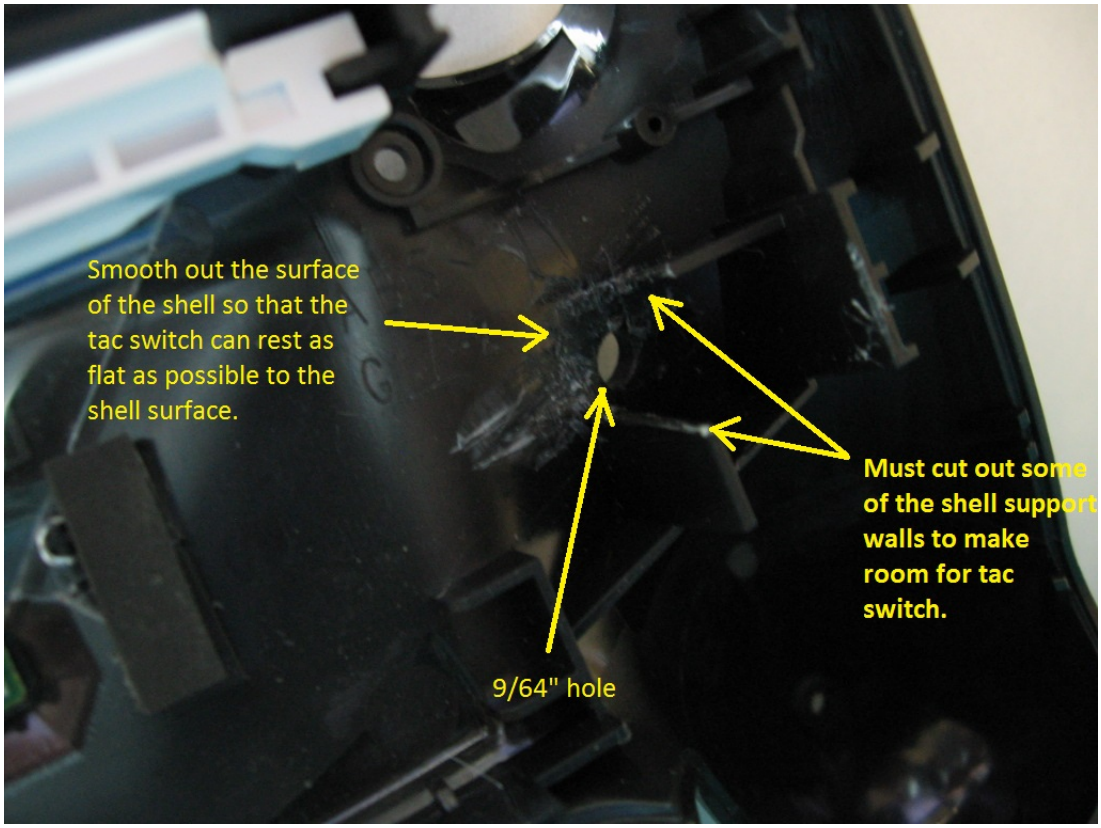
Install Mod (Tactile) Switch

There are a number of spots on the bottom shell where a mod switch can be located. Any spot chosen must have enough clearance to be able to close the shell and be away from possible spots where the tactile switch legs might touch the board and short.

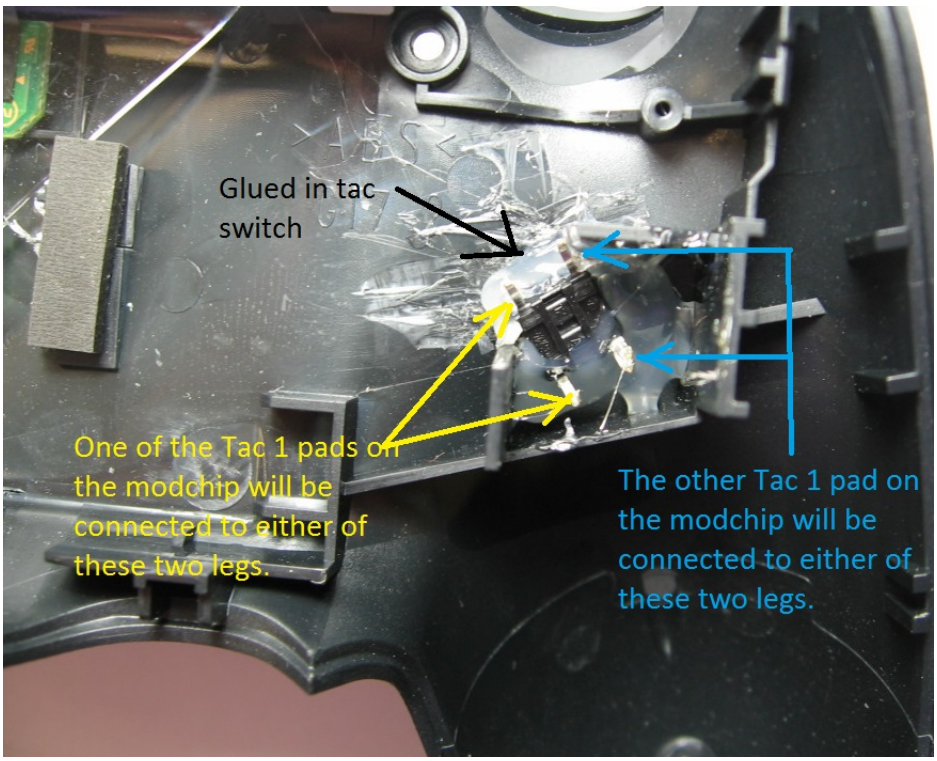
The following spot is standard for Viking builds. Any other spot you may choose is at your own discretion and risk.



The next photo shows what material removal may be required to make room for the tactile switch in this location.

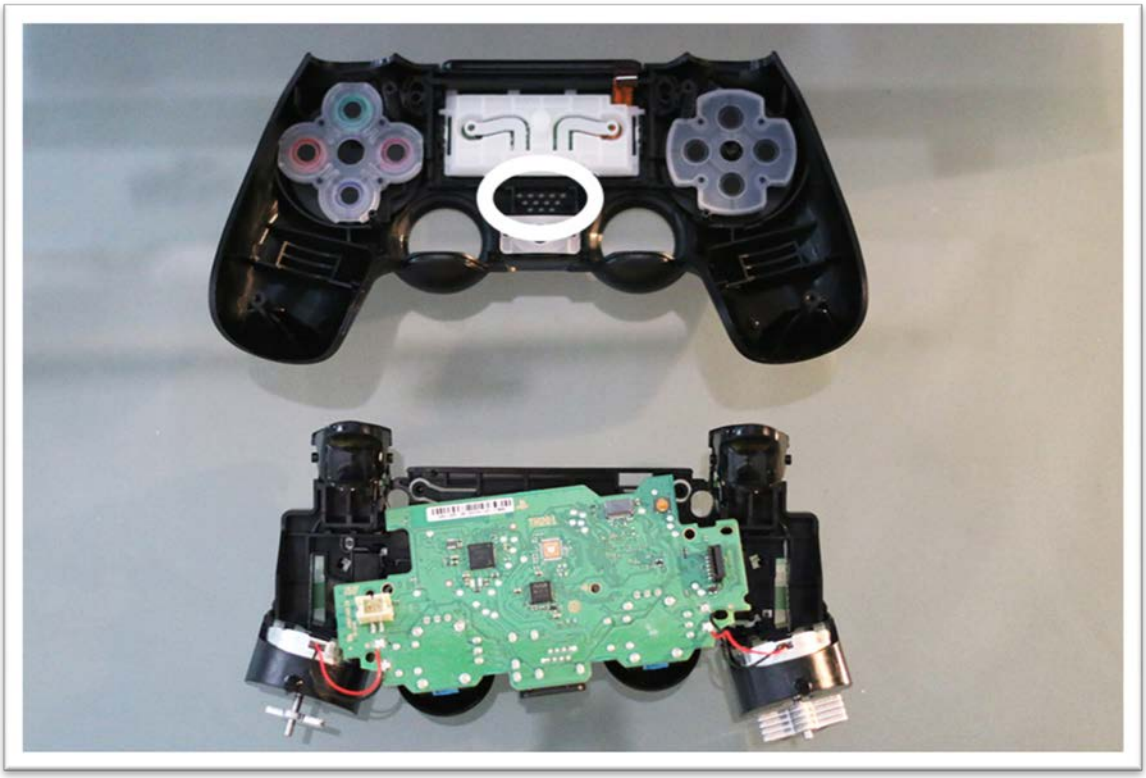


Make sure that the tactile switch is laying flat. Lay in enough hot glue on all four sides of the tactile switch in order for it to be as stable and permanently attached as possible. Tactile switch legs can be bent (before or after soldering the tactile switch wires) to fit them in the available space. Just make sure that they do not touch and create a short.

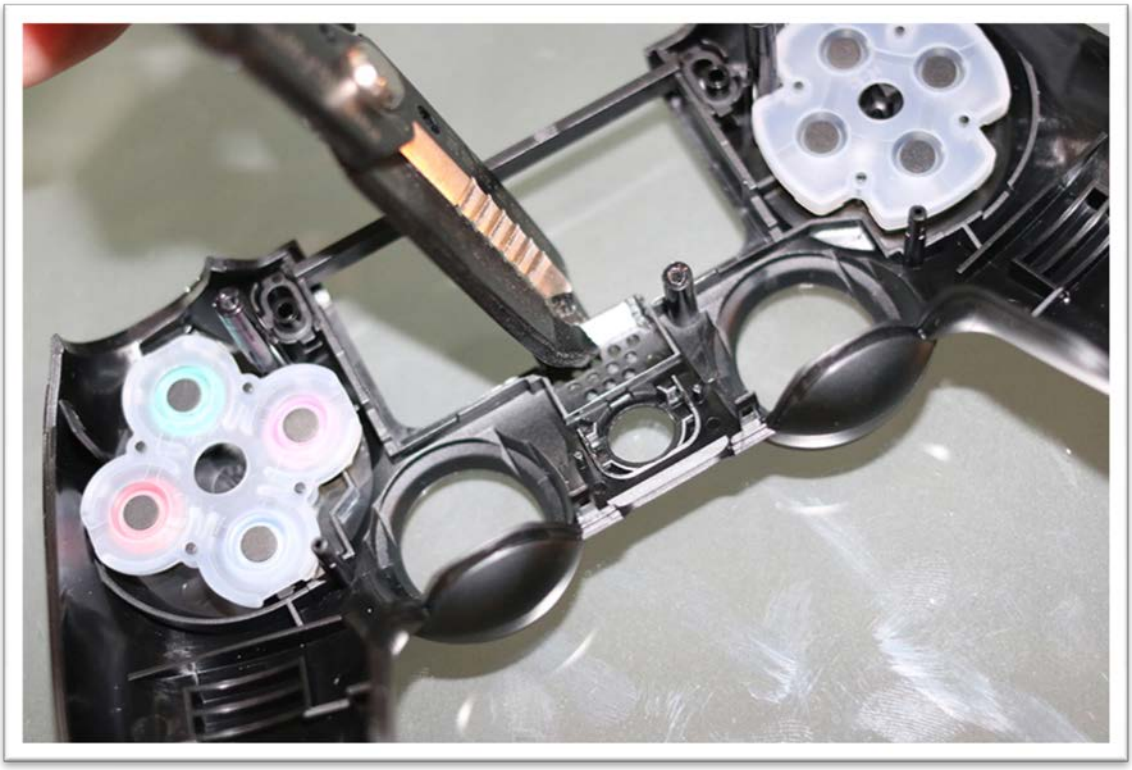


Install Indicator (Option 1)

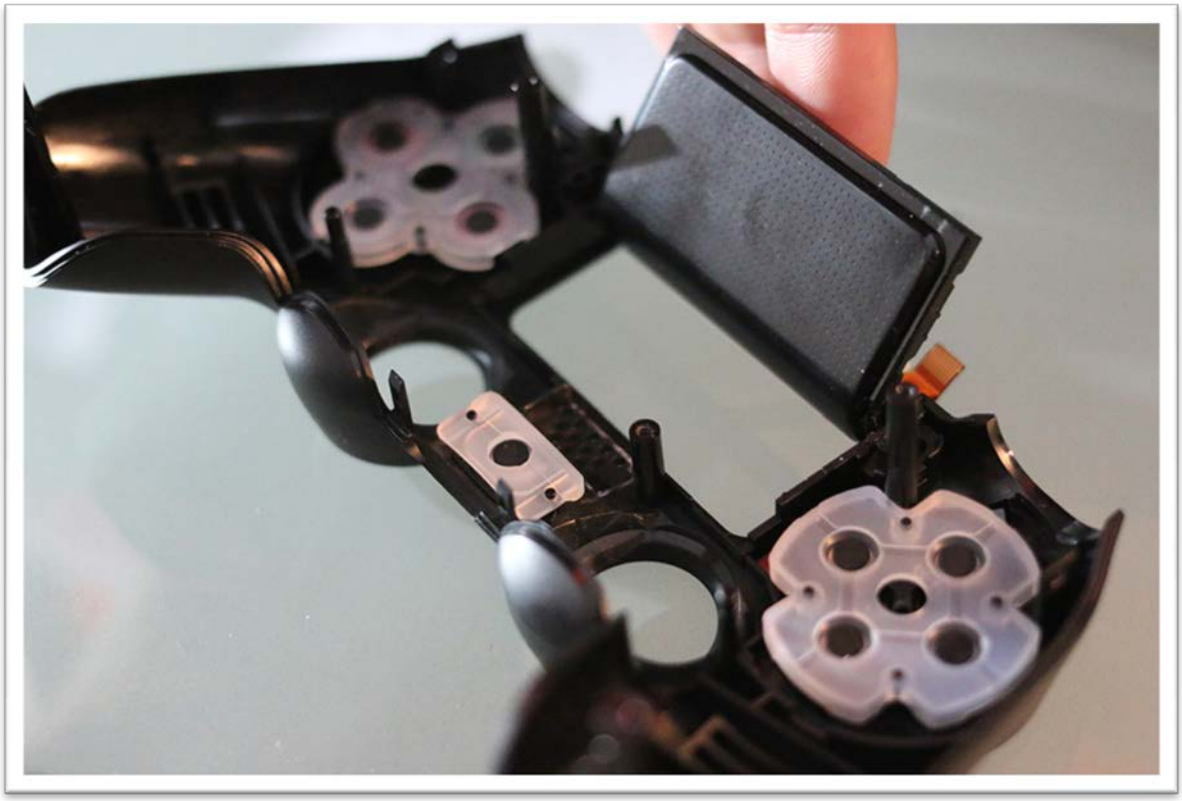
Access the speaker grille.



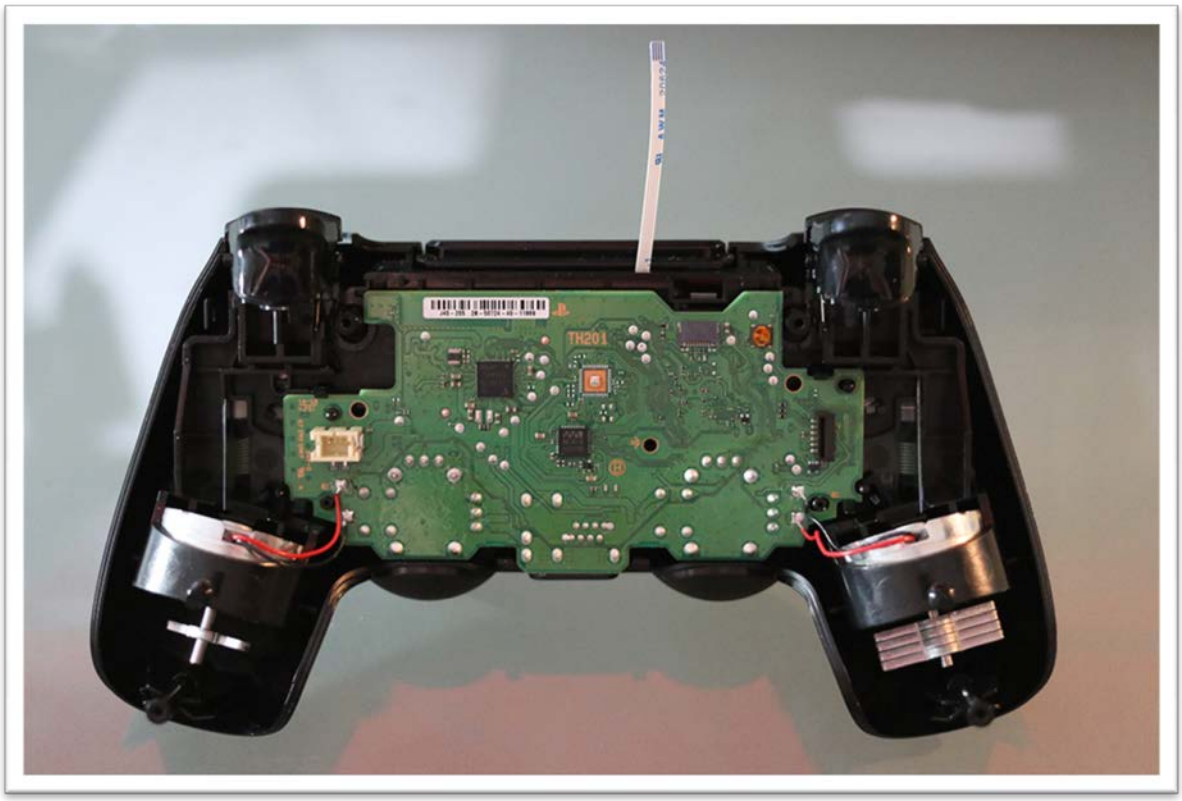
Trim away the speaker grill plastic on all four sides.



Install the LED driver board and connector cable as shown.



Make the connector cable look like this. “Blue side up” when connecting to modchip H1 or H2 connector.

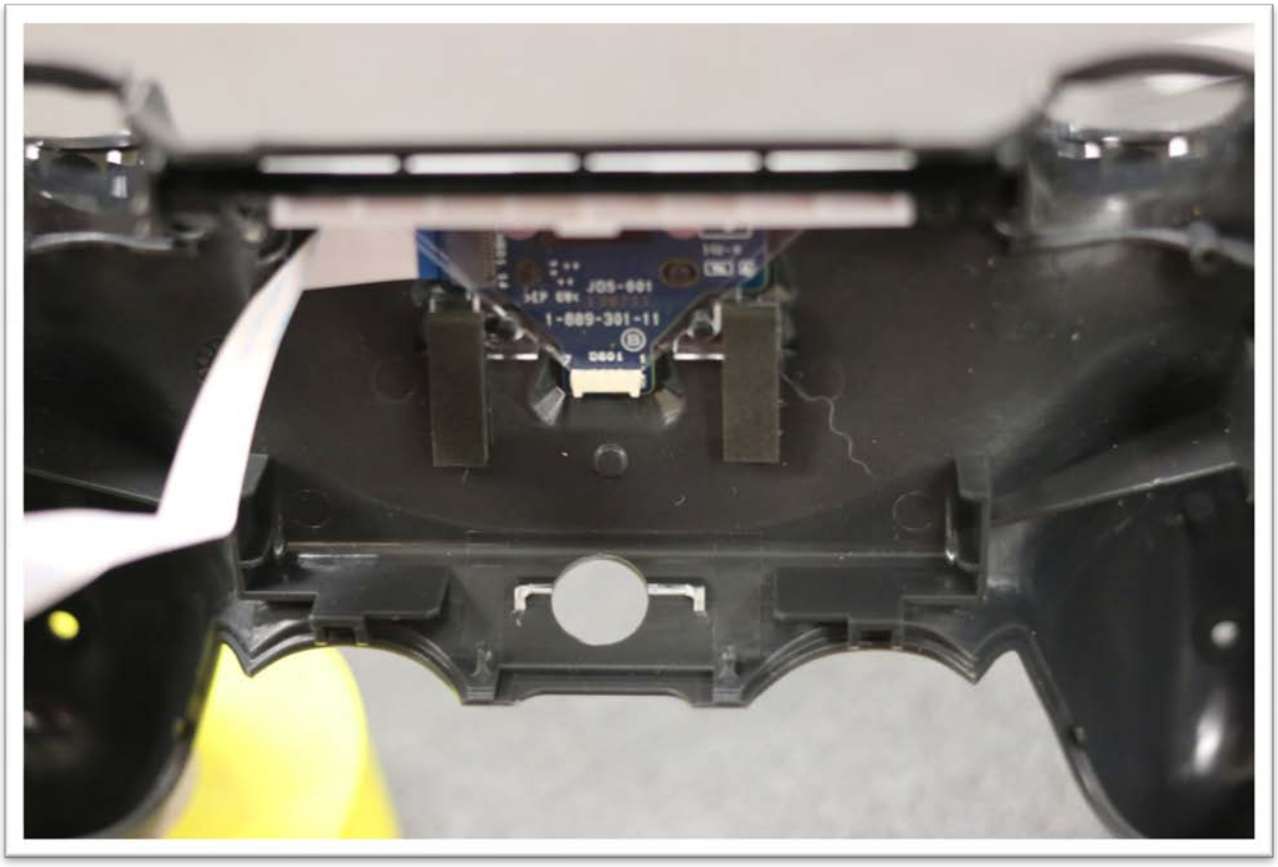


Drill Shell and Install Indicator (Option 2)

Drill a 9mm hole in the shell. Practice will be required to find the best location for the hole. Also drill a smaller hole as desired for the mod switch. We recommend using a smaller drill bit to drill a guide hole, then use a larger drill bit to make the hole a little larger, and then very last use the 9mm drill bit to make the hole the correct size.

The LED indicator is 9mm in diameter, and by using a 9mm drill bit, the indicator makes a nice press-fit into the hole. If you attempt to drill the shell without drilling a guide hole, you will most likely end up damaging the shell as the plastic is very soft.

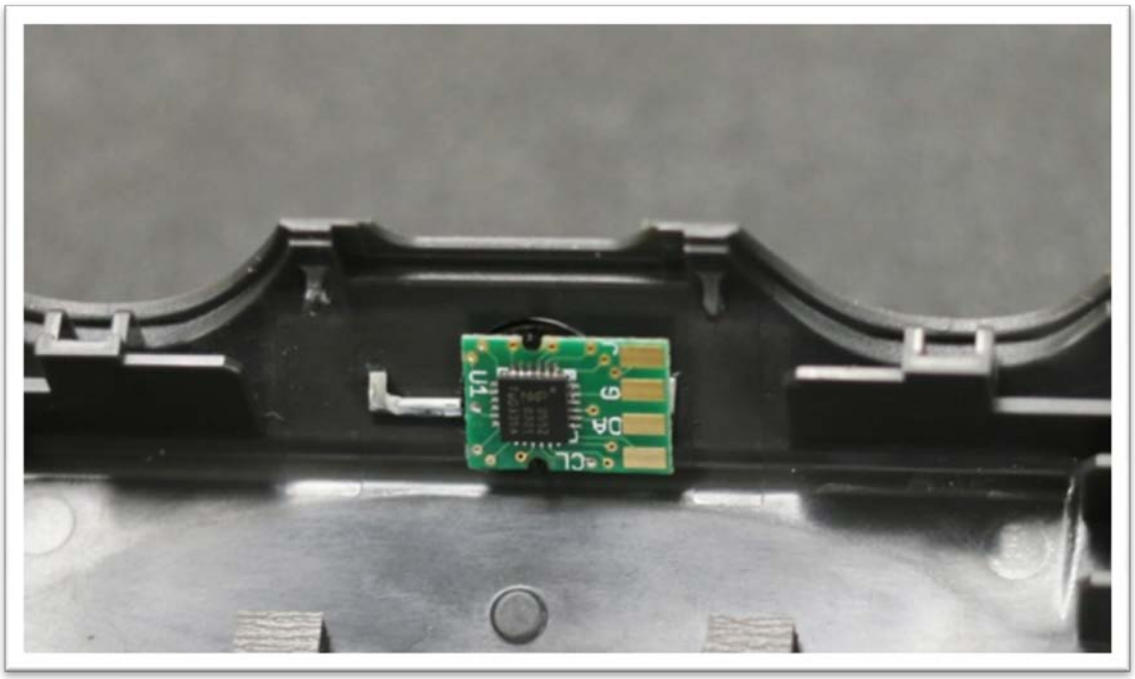
Remove the tab of plastic before drilling:



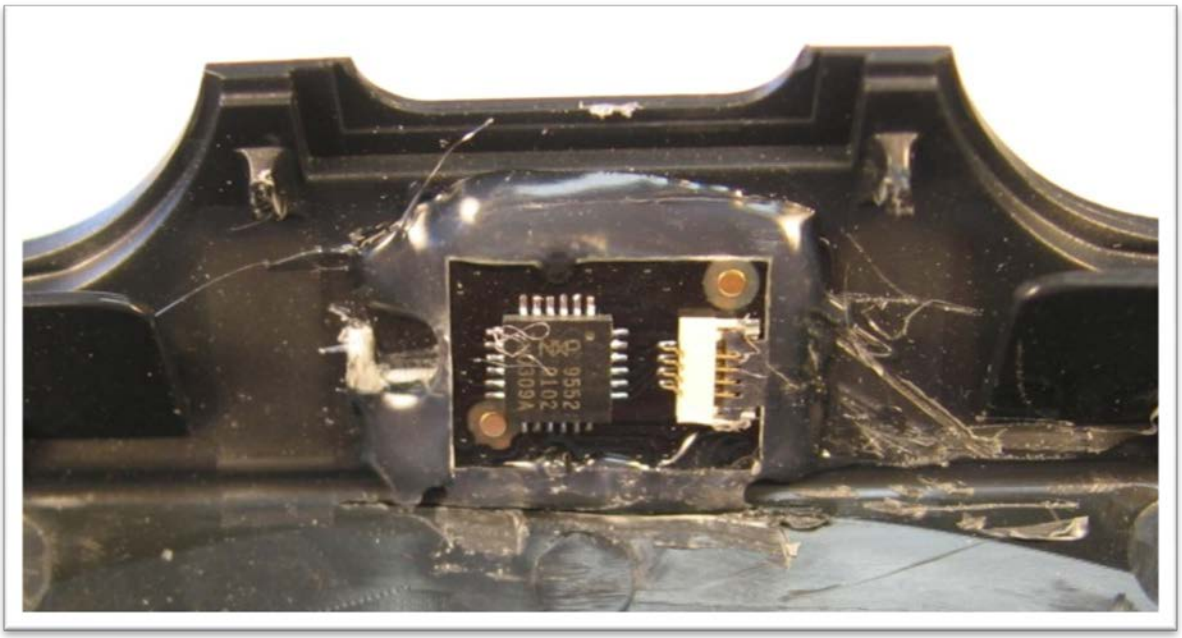

SONY
MODEL CUH-ZCT1U WIRELESS CONTROLLER 5V 800mA
Sony Computer Entertainment Inc.
NOM


NOM

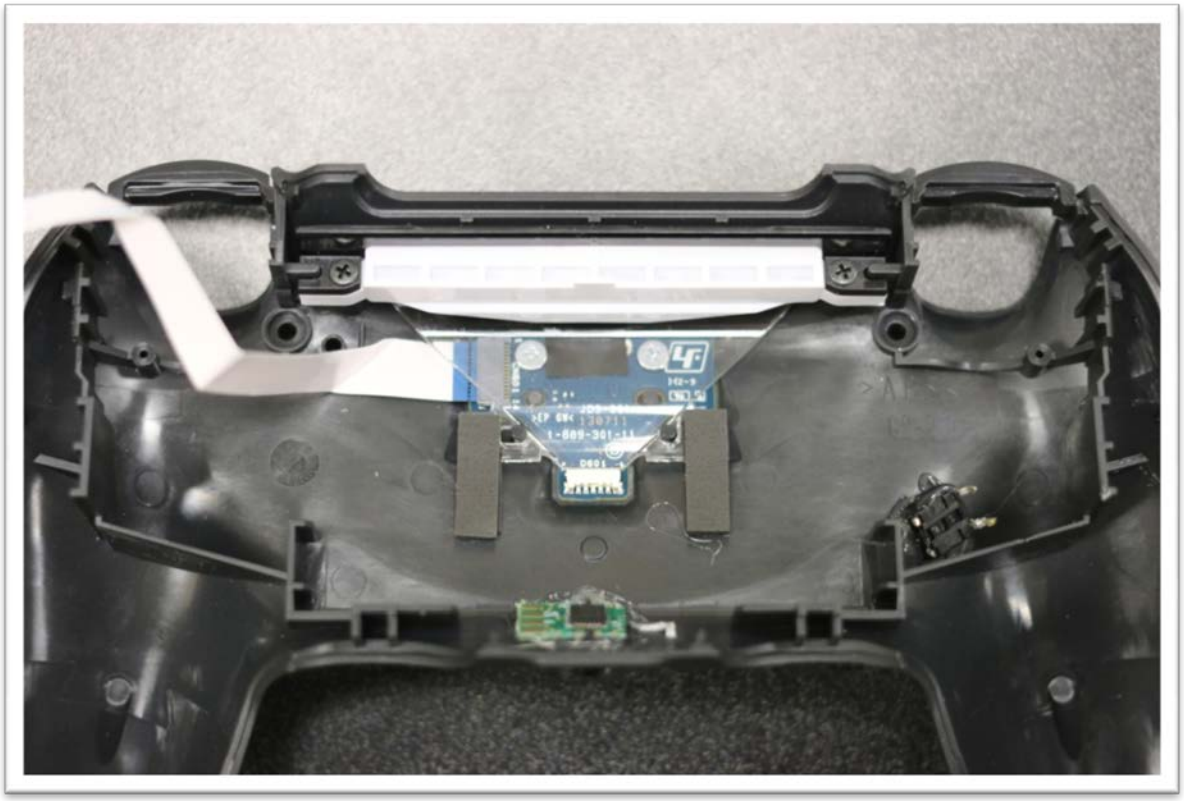
Press the LED lense all the way into the hole, noting the orientation of the two small nipples. The nipples will line up with the notches on the LED board. The LED board should be pressed firmly into the LED lense such that the little LED's on the board are sitting inside the LED lense. This will ensure best light performance.



Be sure to keep the LED board tight and firm against the LED lense and aligned in the alignment nipples, then use a few dabs of hot glue to secure everything in place.

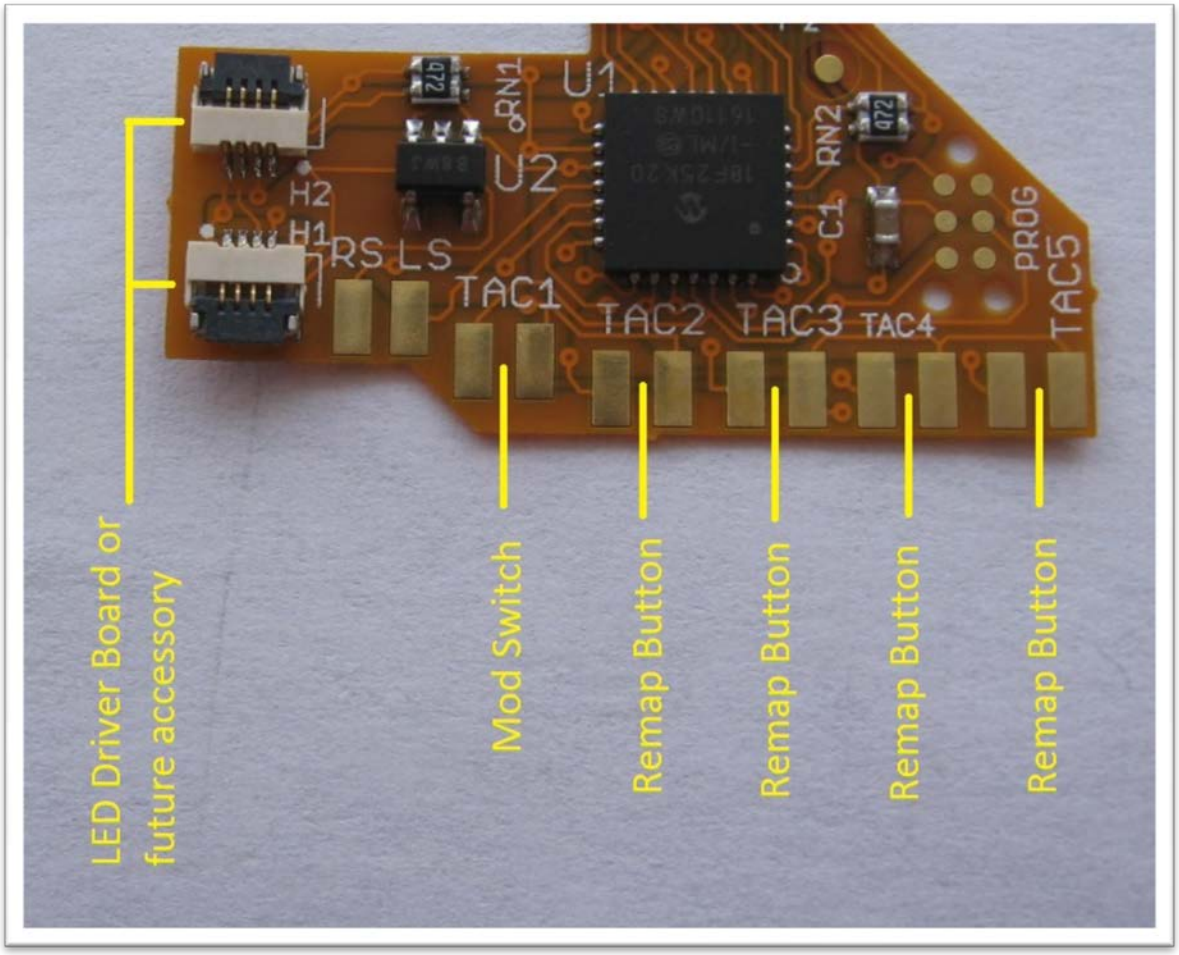


One possible location for the mod switch is shown in the photo below:



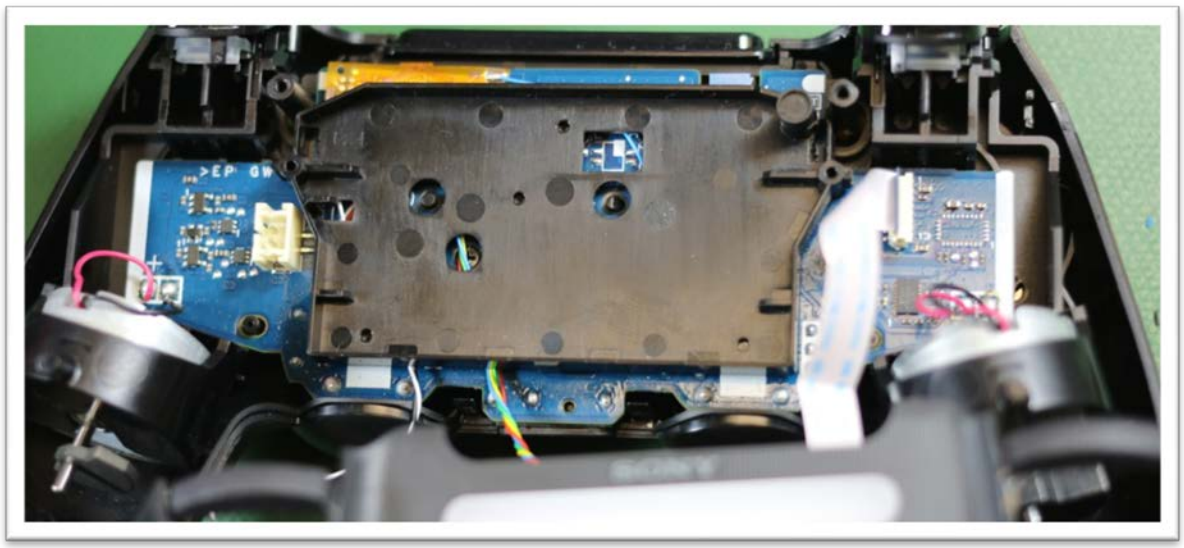
Connecting Re-mappable Tactile Buttons

You may connect many up to four additional tactile buttons to the modchip, and these tactile buttons may then be used as programmable remapping buttons. The photo below shows “TAC2”, “TAC3”, “TAC4” and “TAC5”.

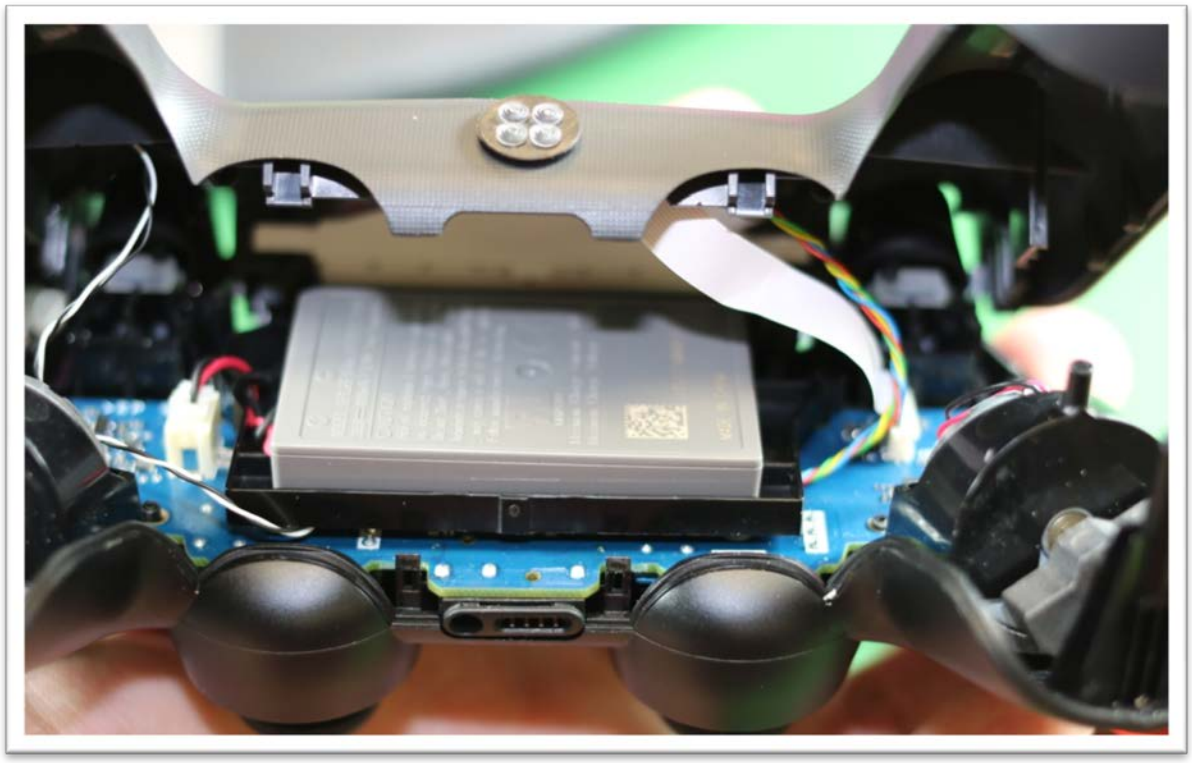


Put the controller together

Once the modchip is installed and the tactile switch and LED Board are connected, re-install the plastic battery cover and the controller's factory ribbon cable.



Route any ribbon cables or wiring harnesses carefully to avoid pinching off any ribbon cables or wiring harnesses when the shell is closed up:



Boot Into Special Test Mode

You should be able to boot the controller into a special LED and button test mode to verify that all the buttons are working properly. To do so, begin with the controller powered off, then hold L1 (Left Bumper) + R1 (Right Bumper)+ Mod Switch while powering up the controller. (Be sure to continue holding that three button combination for several seconds after the controller powers up).

The controller will play back all the available colors on the LED indicator and then start a button test. During the button test, the LED's will blink a certain number of times to correspond with each button press according to the following table:

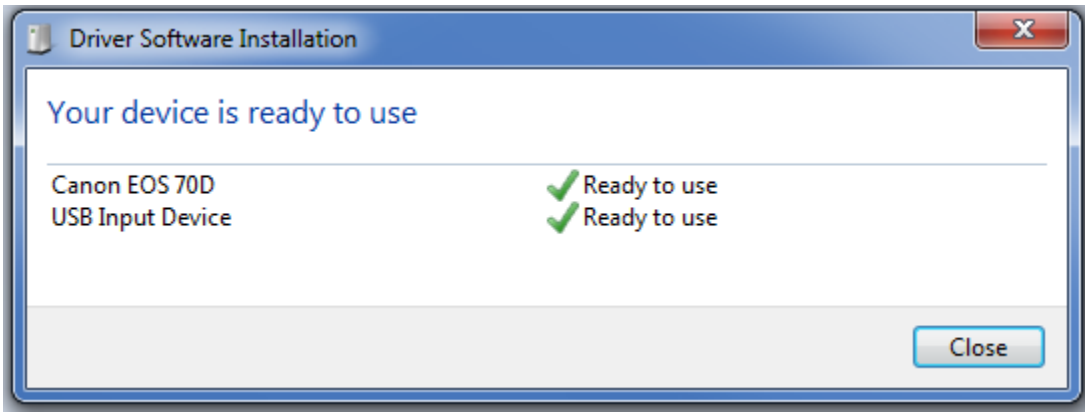
Button	**Number of LED Blinks when pressed**
D-Pad Up	1 quick blink
Right Stick Center	1 regular blink
D-Pad Left	2
Left Stick Center	3
D-Pad Down	4
Triangle Button	5
Left Bumper	6
D-Pad Right	7
Right Bumper	8
Square Button	9
PS Home	10
X Button	12
Circle Button	13
Right Trigger	14
Left Trigger	15
Mod switch on TAC1	16
Tac switch on TAC2	17
Tac switch on TAC3	18
Tac switch on TAC4	19
Tac switch on TAC4	20

Test the Controller Using Windows

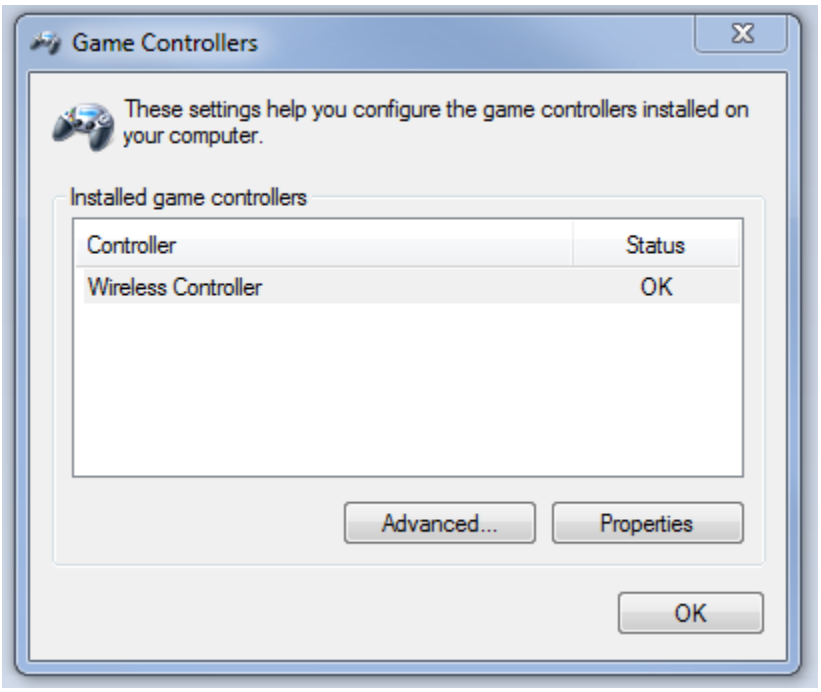
There are two ways to test the controller.

The first method involves connecting the controller to a Windows PC to verify that all the button presses are working correctly.

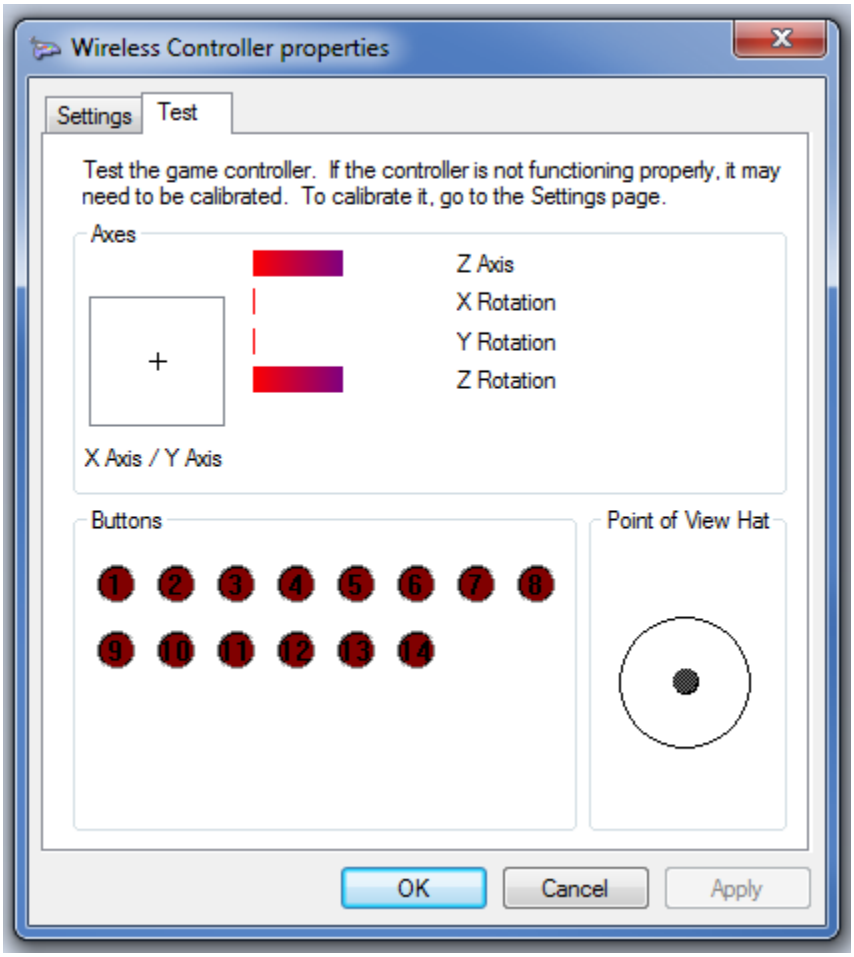
The PS4 controller can be connected to a Windows PC.



On Windows 7 for example, connect your controller by USB to your computer, and then type “Set up USB game controllers” into the search bar to launch the Windows native game controller tool.



The tool can be used to check that all button presses are functioning properly. Mods such as rapidfire can be tested without the need for a console by monitoring the flashing lights in the tool:



The second test method involves booting the controller into a special “test mode”. Start with the controller powered off. Hold L1 (left bumper), R1 (right bumper) and the Mod Switch. While holding these three buttons, power up the controller. The modchip will enter a special test mode. You will see an LED test where all LED’s flash through 10 different colors, an

First Power-up (Lock/Unlock)

Note: It is extremely important to follow this section. Failure to initialize your modchip properly will result in permanently disabling some or all of your mods.

These modchips are designed for re-sale by mod shops. When you first power up the controller, all four LED's will show red. The mod is waiting for you to start a "lock/unlock" sequence. By default you will want to UNLOCK ALL MODS.

Tap the mod switch one time to begin the lock/unlock sequence. The Player 2 LED will turn red. Now hold down the triangle button. You should see a series of LED blinks, with green LED blinks in between. This is the modchip unlocking all mods. When the sequence is complete all LED's will go out.

If you don't follow these instructions, some or all mods will become locked and this is irreversible.

Once you've tested all the buttons and unlocked all the mods, you're ready to play!