XBOX360

Ragnarok

CG2 Flex Modchip

Installation Instructions

Tools needed

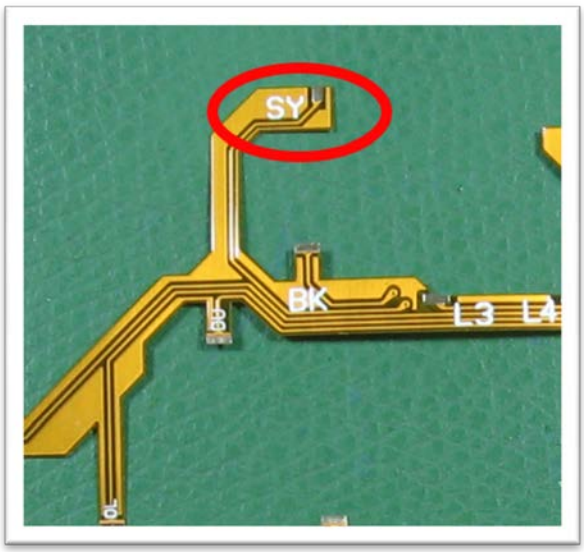
- XBOX360 controller with CG2 circuit board
- Viking360 Ragnarok CG2 Flex modchip DIY Kit (includes tac switch, USB jack)
- Soldering iron and solder
- 30 AWG wire (American wire gauge) or similar
- Wire strippers (capable of stripping above wire)
- Electrical tape
- Torx T-8 security screwdriver (included)
- Hobby knife
- Solder flux
- Cotton swabs
- Power drill
- 1/4 inch and 9/64 inch drill bits
- Hot glue and glue gun
- Safety glasses
- Scissors

Remove the screws and cover

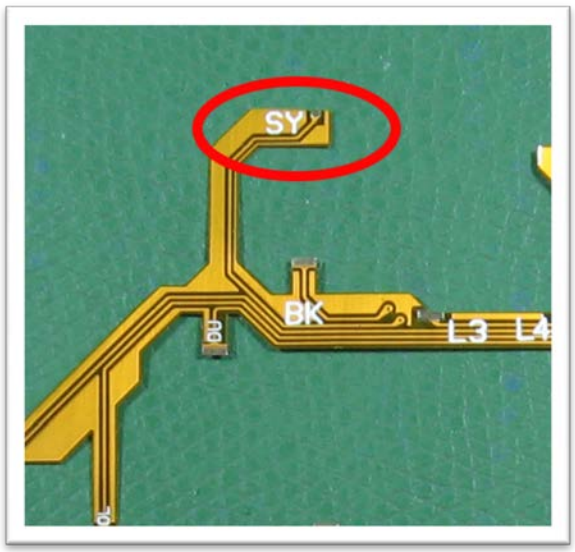
Once the 7 screws are removed, remove the back cover from the controller. Set the screws and screwdriver aside for later.

Prepare the modchip

Begin prepping the modchip by trimming the SY pad. With scissors trim the top of the SY pad off so the top of the pad is directly above the letters “SY” as shown below:

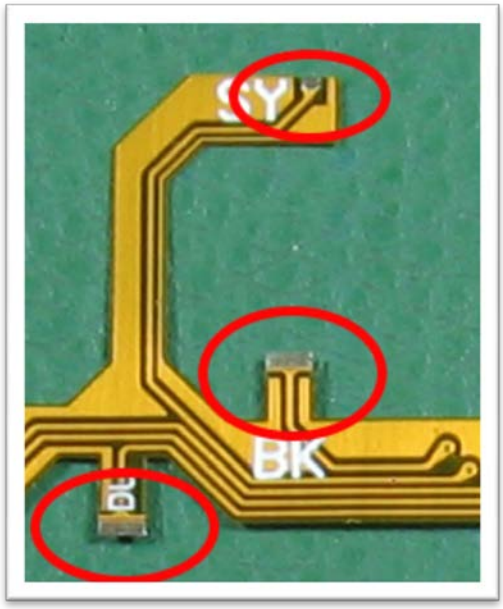


SY before trimming

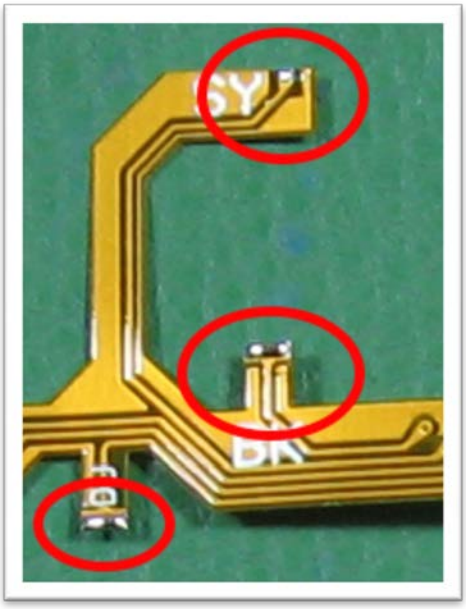


SY after trimming

Next “tin” the solder pads we will use. You can “tin” a pad by applying a little solder. We will tin these pads: DL, DD, DR, DU, BK, SY, L3, L4, RB, A, B, Y, X, PD+, PD-, PGND, PVB, RS, LB, LS, and both LTAC pads. See the diagrams below for an example.



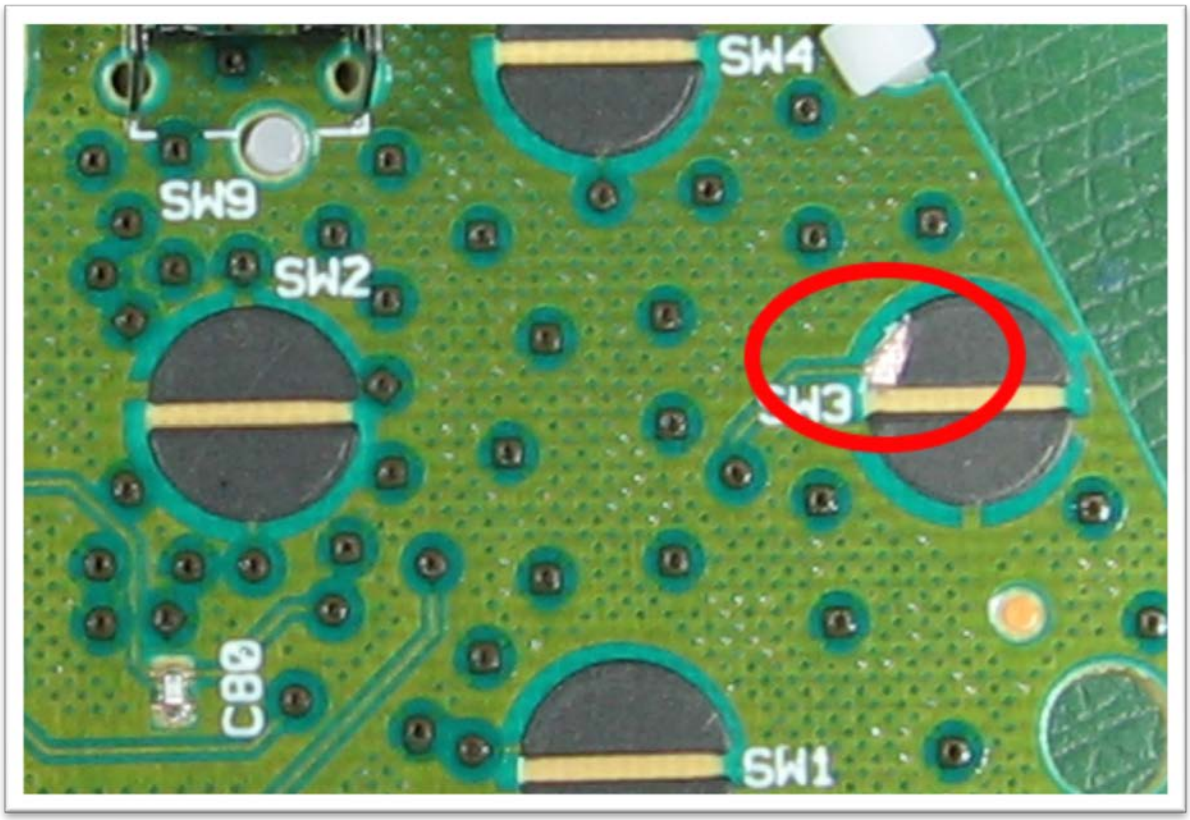
Un-tinned pads



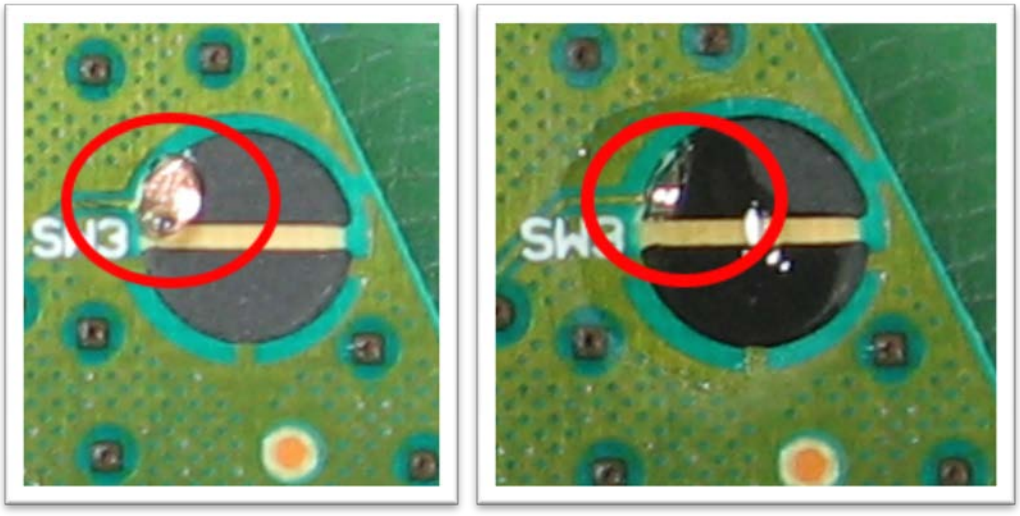
Tinned pads

Prepare the circuit board

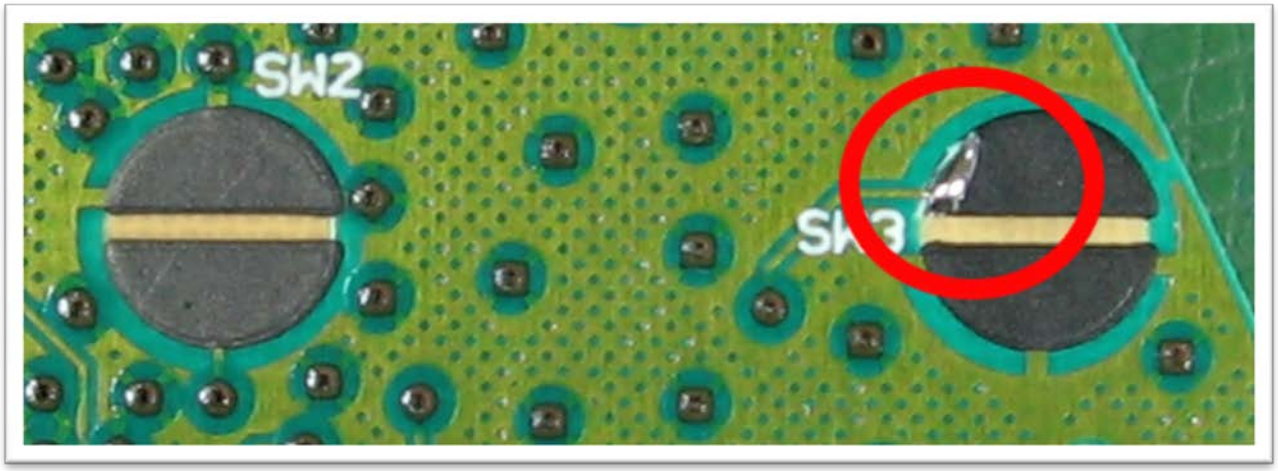
Using the hobby knife expose some of the copper below the black pad for the B button as shown below:



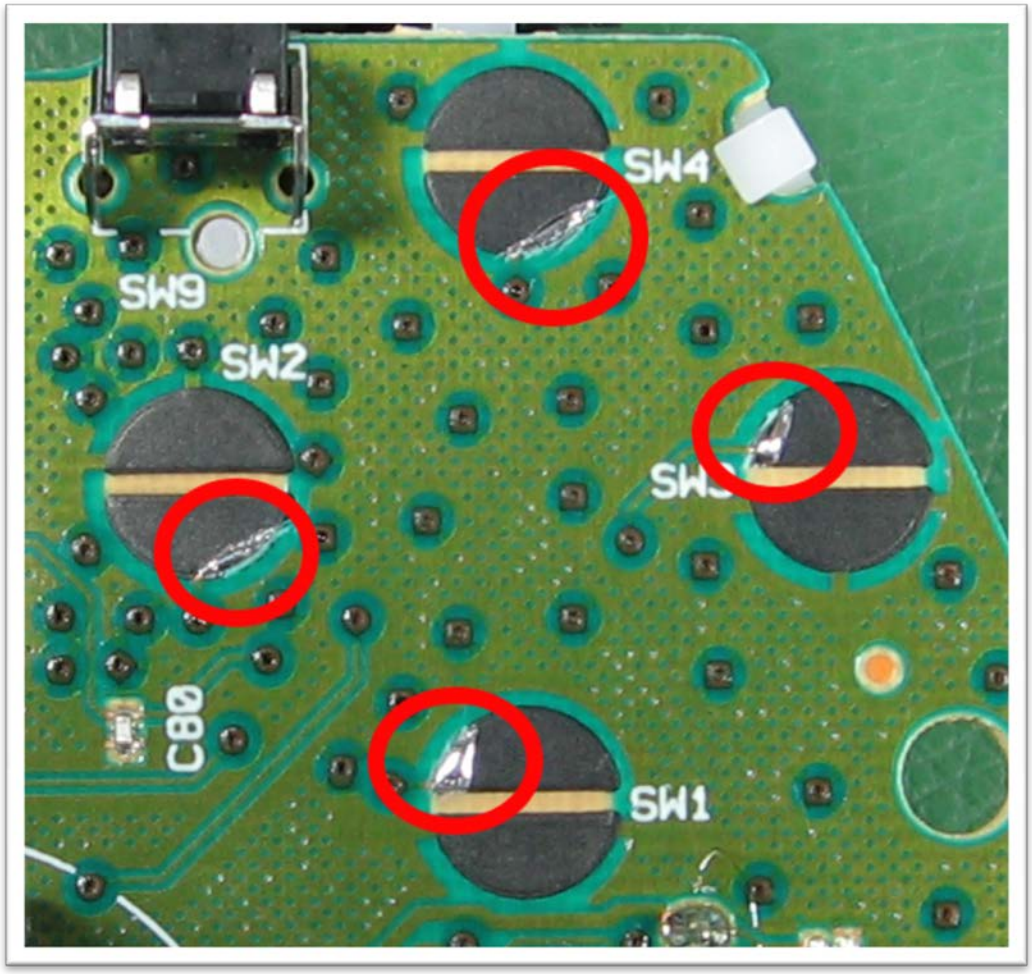
Apply some flux to the exposed copper and tin the copper. The flux will clean any oxidation off of the copper allowing the solder to stick. You can tin this copper by putting solder on your iron, and running over the surface of the copper while it is covered in flux. See below for example:



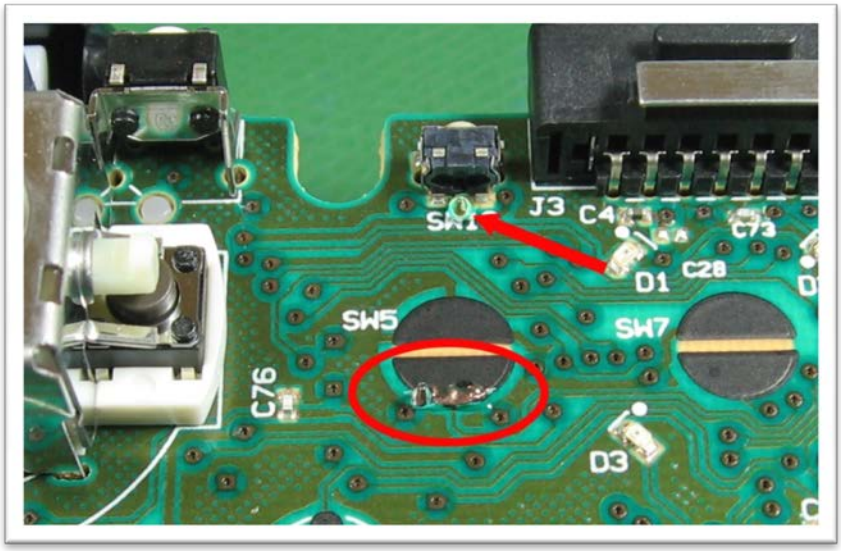
The flux can be cleaned by wiping it up with a dry cotton swab; any remaining residue can then be cleaned with a small amount of isopropyl alcohol and then wiped with a clean cotton swab. The tinned and cleaned pad is shown below:

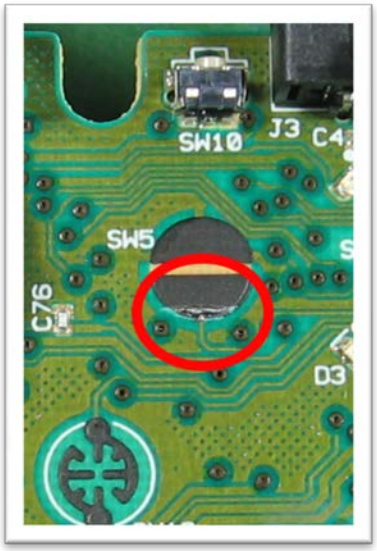


Expose the copper and tin the pads for the remaining 3 pads as shown below:



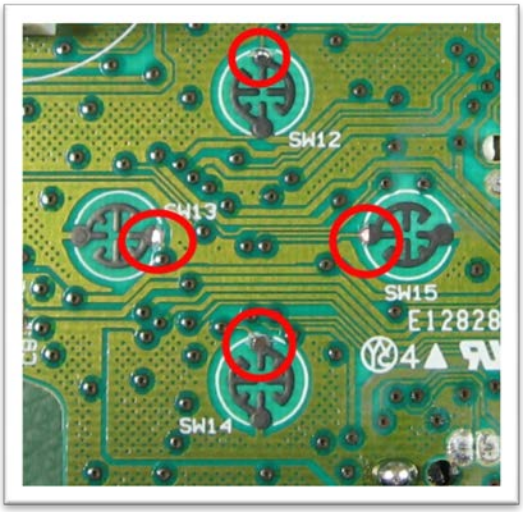
Continue the same process with the Back button as shown below:

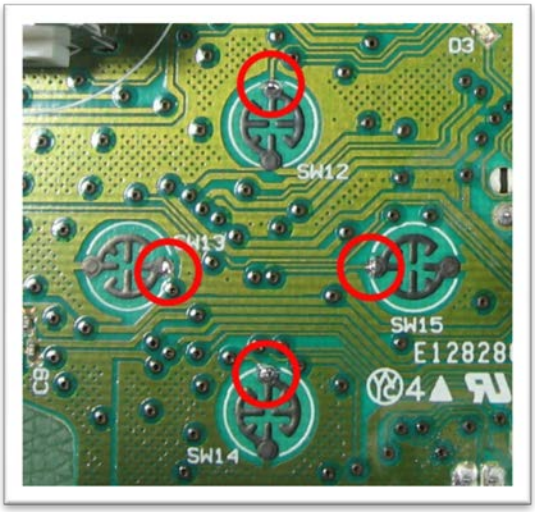




To make soldering the SY pad to the center pin of the sync button easier, you can pre-tin the sync button's center pin. If you bridge the center pin to one of the outside pins, flux can be used to un-bridge the connection.

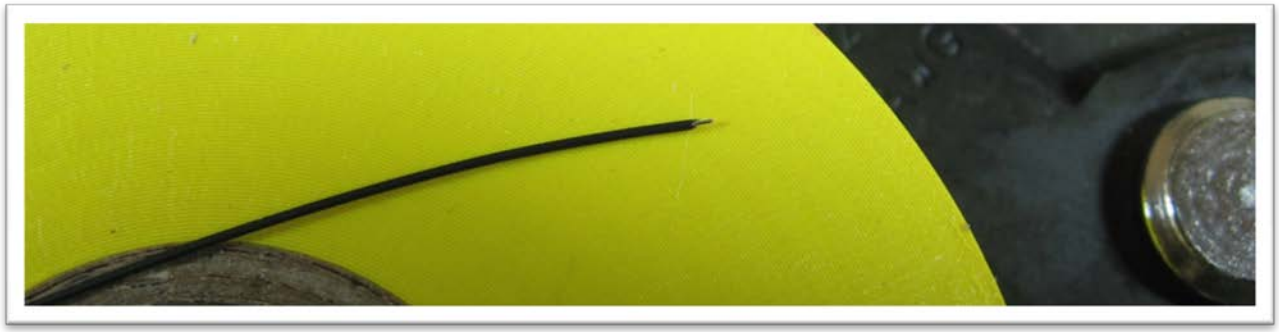
Continue the fluxing process with the D-Pad pads as shown below. Be careful not to expose too much of the copper on the D-Pad connections; only a small circle of copper is actually under the black conductive material. If you expose the entire small copper circle, the D-Pad will no longer be connected to the conductive material and will not work when you press the D-Pad buttons.





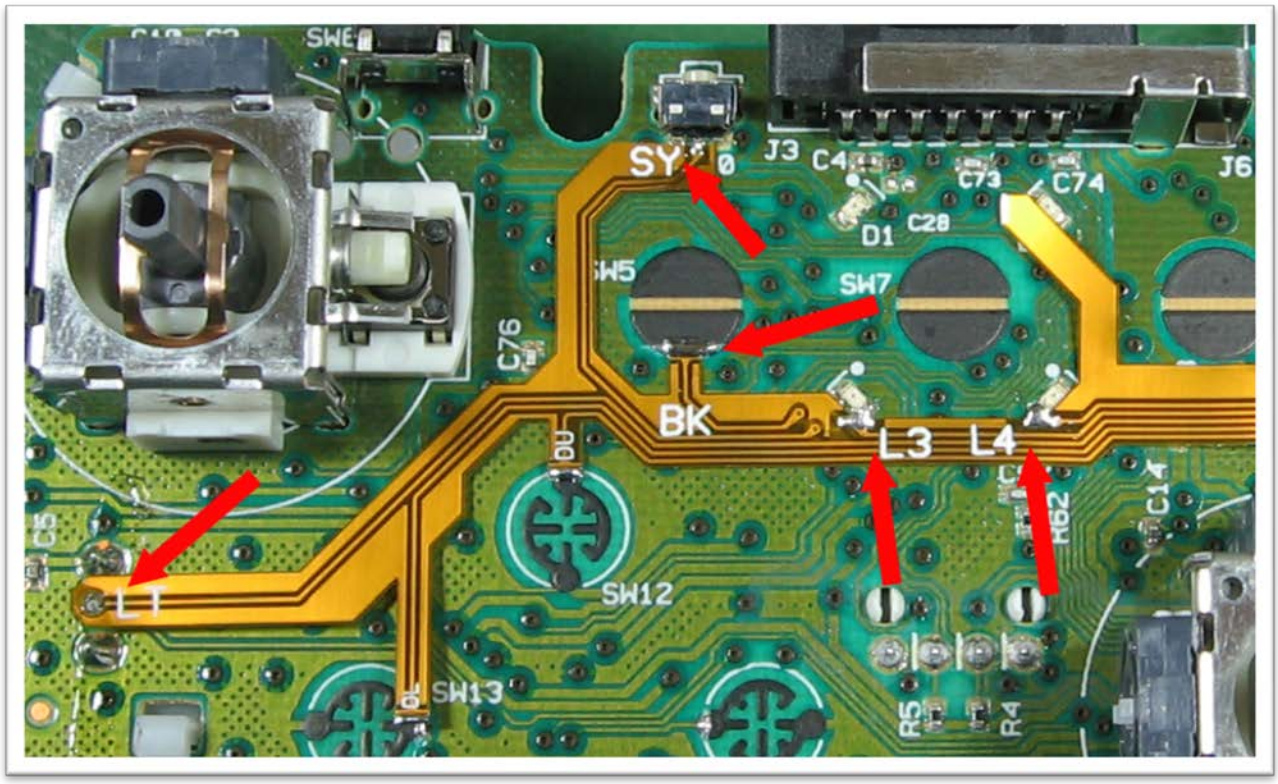
Strip the wires

We are ready to begin installing wires. Use the wire strippers to cut and strip the wires. You will need wires for the RB, LB, RS, LS, LTAC and USB connections. Only a very small amount of wire needs to be stripped to get the job done; see diagram below for an example.

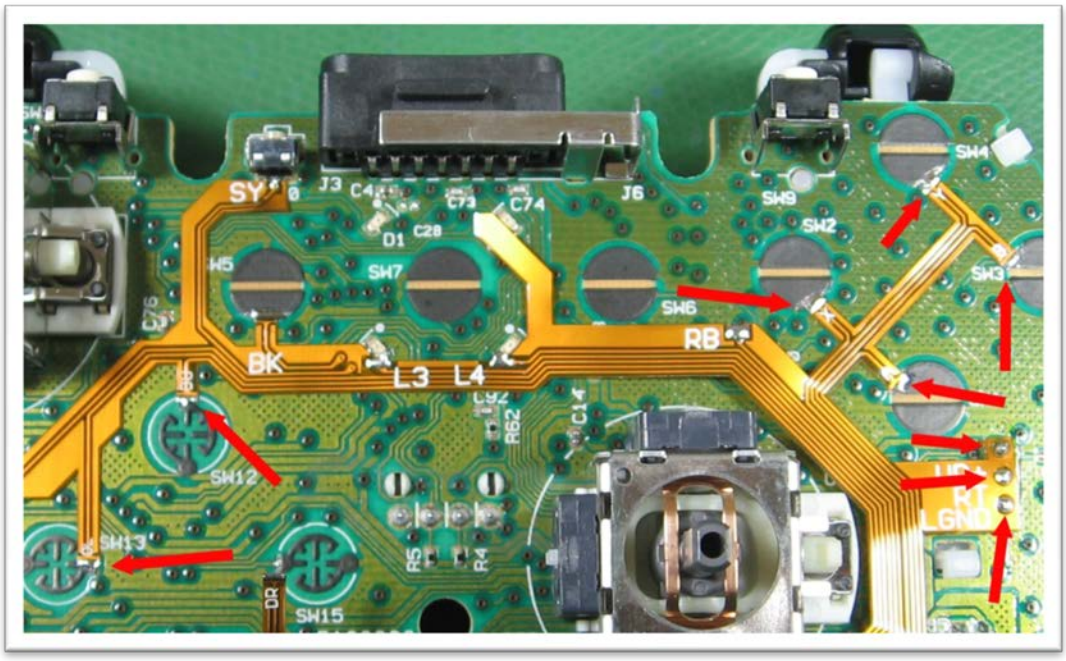


Begin soldering the modchip

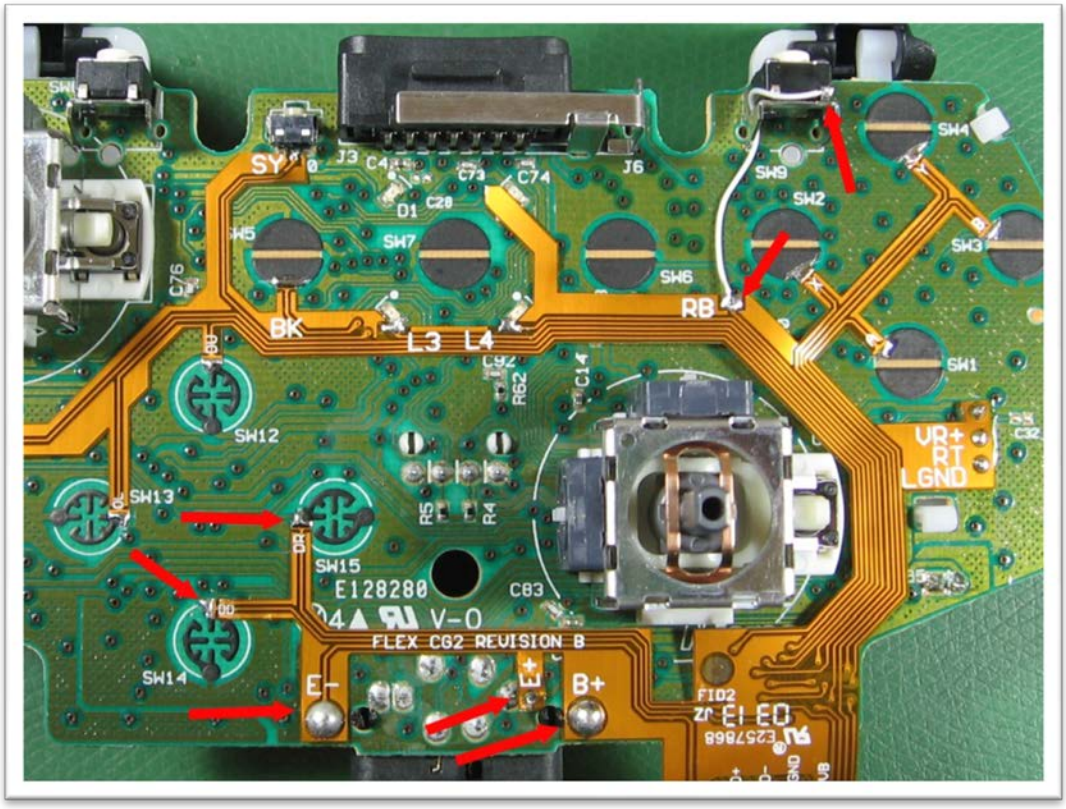
Start by placing the modchip approximately where it needs to be and soldering these connections in the following order: LT, SY, L4, L3 and BK as shown in the diagram below:



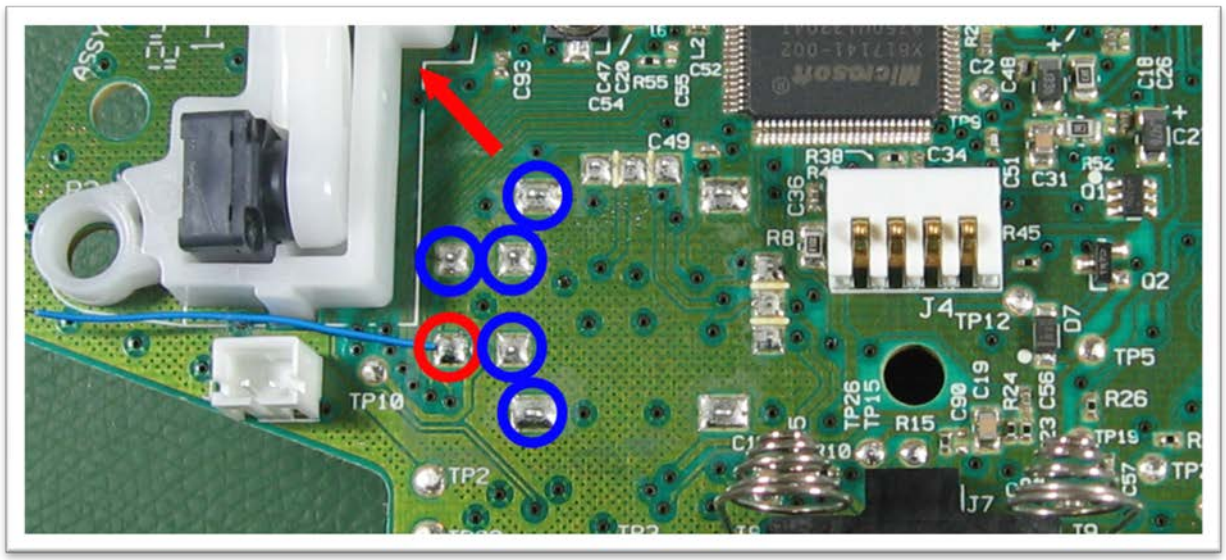
Continue soldering the modchip to the circuit board by soldering the following connections: DU, DL, VR, RT, LGND, B, Y, X and A as shown in the diagram below:



Finish soldering the modchip on this side of the circuit board by soldering the DR, DD, E-, B+ and E+ connections. Also connect a wire from the right tab on the Right Bumper to the RB pad as shown below:



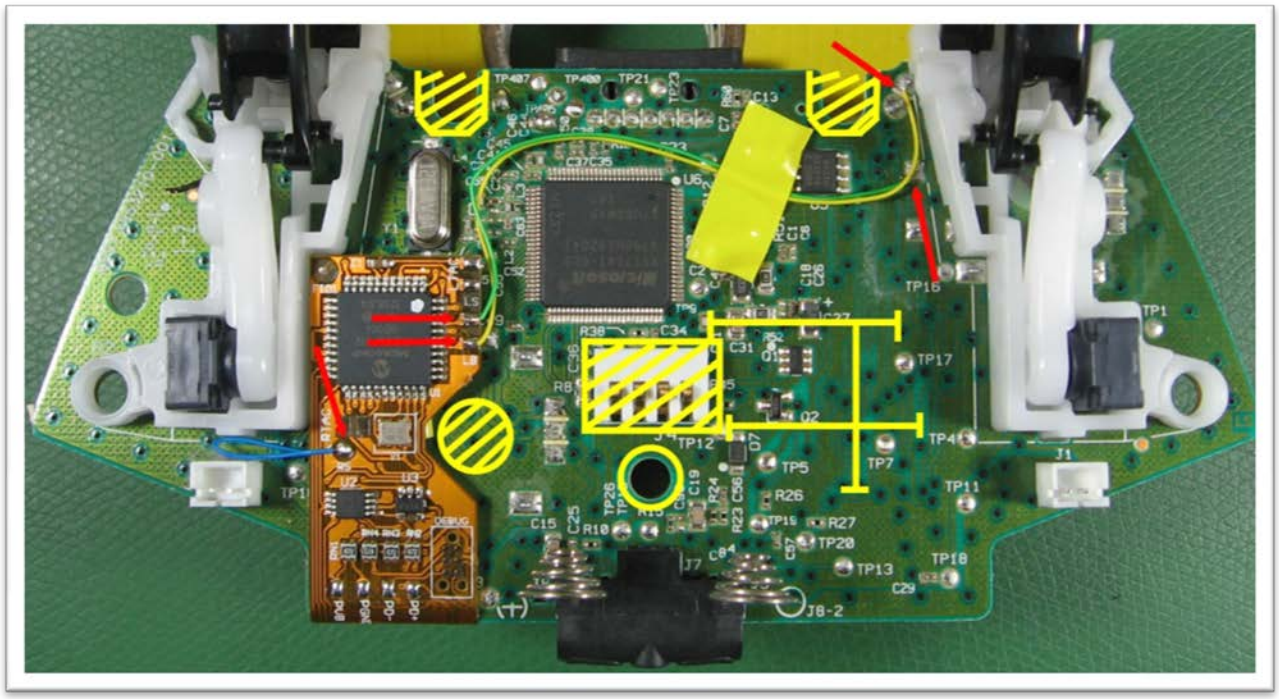
Next flip the circuit board over and solder the RS wire as shown below with the red circle:



The RS pin and the additional pins circled in blue can be trimmed with wire cutters if the modchip does not sit in the corner identified by the red arrow above.

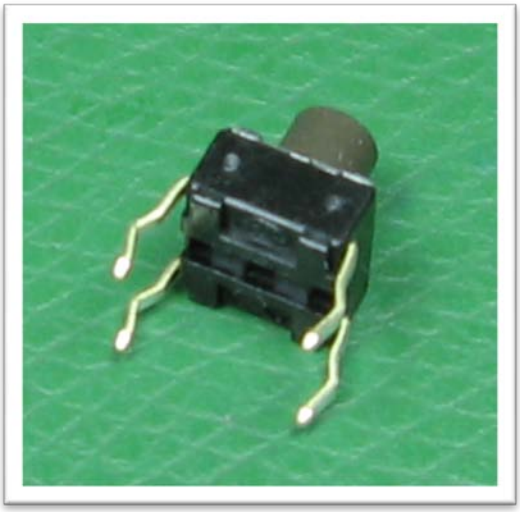
Fold the modchip around the bottom edge of the circuit board so it sits as shown below. A small piece of tape rolled into a loop can be used to hold the modchip in place.

Now you can wire the RS, LS, and LB buttons as shown below. Be careful to keep the wires out of the yellow keep out zone.

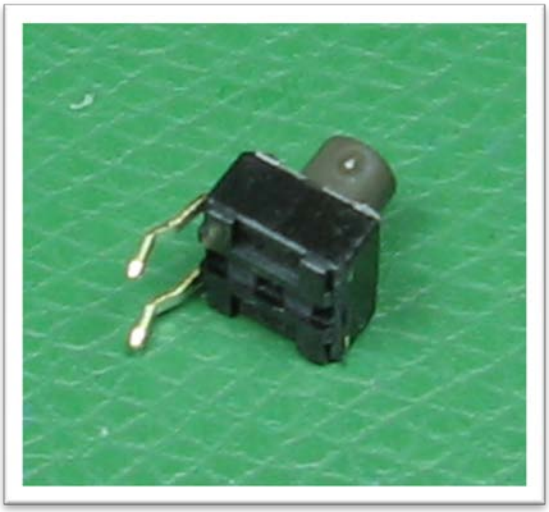


Tac switch and USB jack

It is now time to install the 6mm tac switch into the shell. Cut any two legs that are on the SAME SIDE of the switch. Only two legs are needed. See the example below

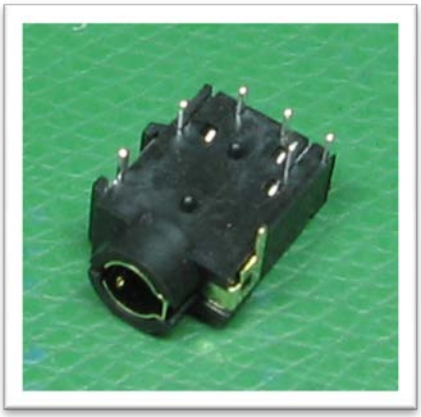


Untrimmed tac switch

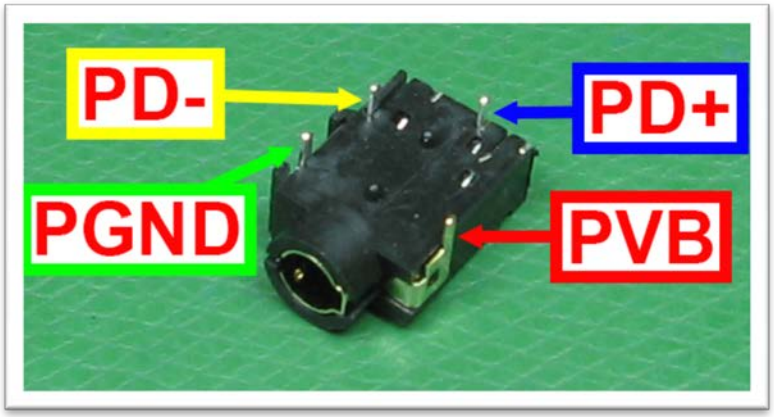


Trimmed tac switch

Next, trim the unneeded pegs off the USB jack and attach the wires. See the examples below:

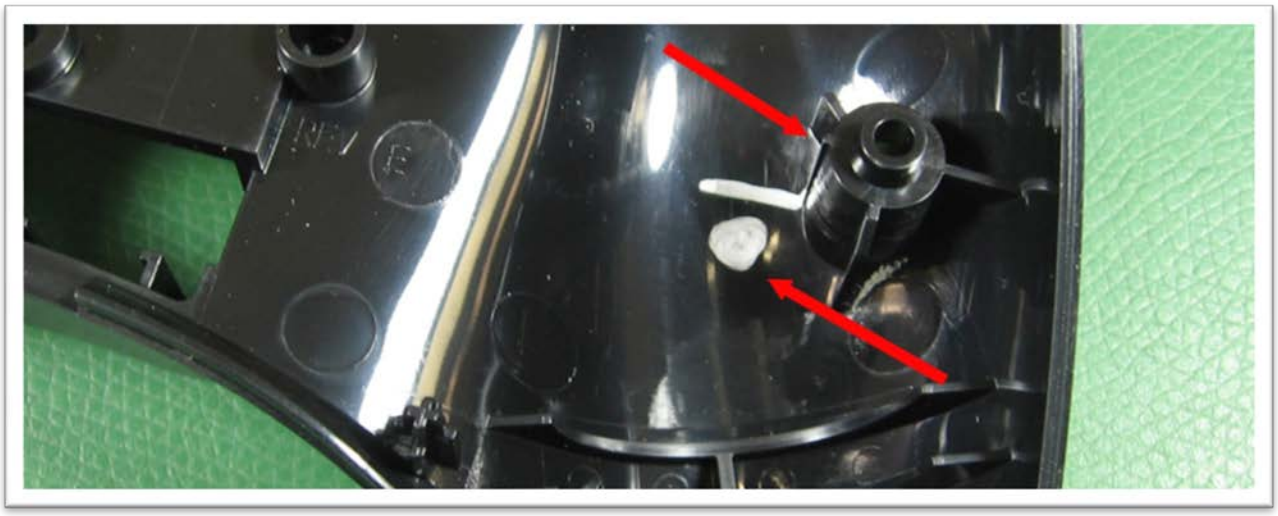


USB jack as shipped



USB jack wire placement

Once the tac switch and USB jack are ready, it is time to mark where the holes will be drilled in the back plastic shell. Mark the bottom shell as shown in the diagram below:



Using the small tab next to the screw hole as a guide draw a straight horizontal line, this line is a reference. Below that line draw a circle. This is where the USB jack hole needs drilled.

Mark the location for the tac switch and drill the holes as shown below:

Tac switch location

Tac switch and USB holes drilled

Make sure there is no unnecessary plastic around the holes. Plastic can mound or create a ridge around the hoes during the drilling process. This can cause the tac switches or the USB jack to not sit properly and come loose over time. See the diagrams below for examples:

Holes with excess plastic

De-burred holes

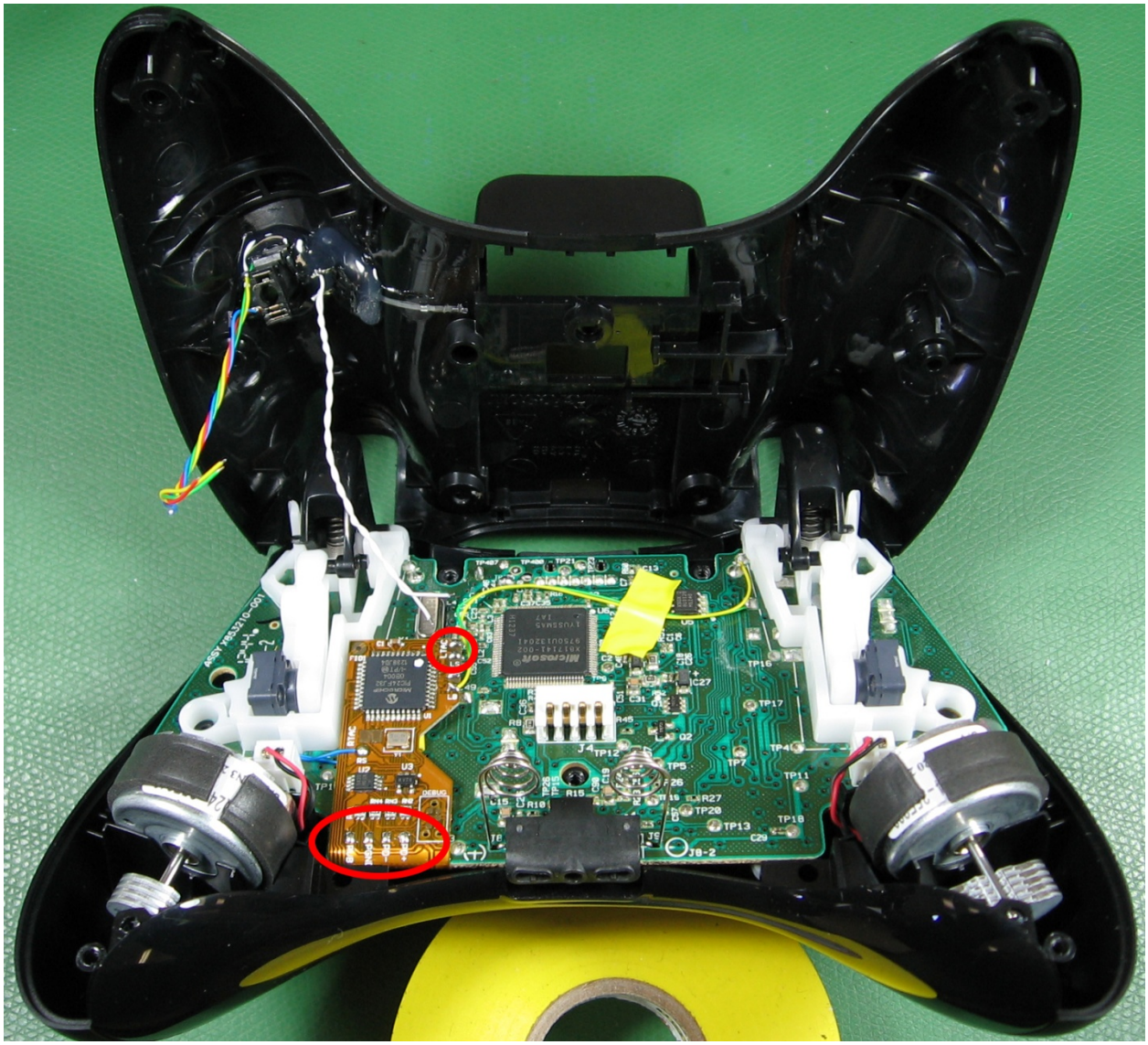
Now it is time to glue the tac switch and USB jack into the shell. Start by placing a ring of hot glue around the USB jack hole. This will allow the shoulders of the USB jack to sit on the ring of glue so the opening of the USB jack is flush with the outside of the shell.

Next glue the tac switch and the USB jack into the shell as shown below:

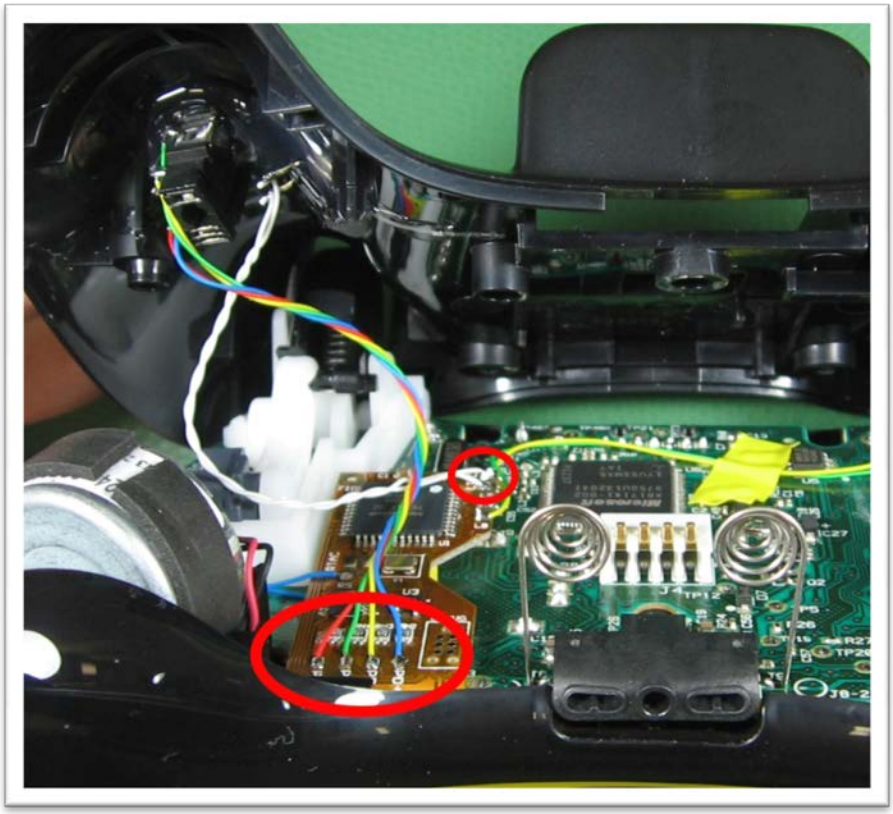
While the hot glue is drying make sure the USB jack is placed so the opening is flush with the outside of the shell. This can be done by moving the USB jack up and down inside the shell. Also while the hot glue is drying place the circuit board inside the shell and make sure that neither the hot glue nor the USB jack interfere with the normal operation of the trigger.

Put the controller together

After you place the controller circuit board back into the top of the shell and install the rumble pads it is time to wire in the USB jack and the tac switch.

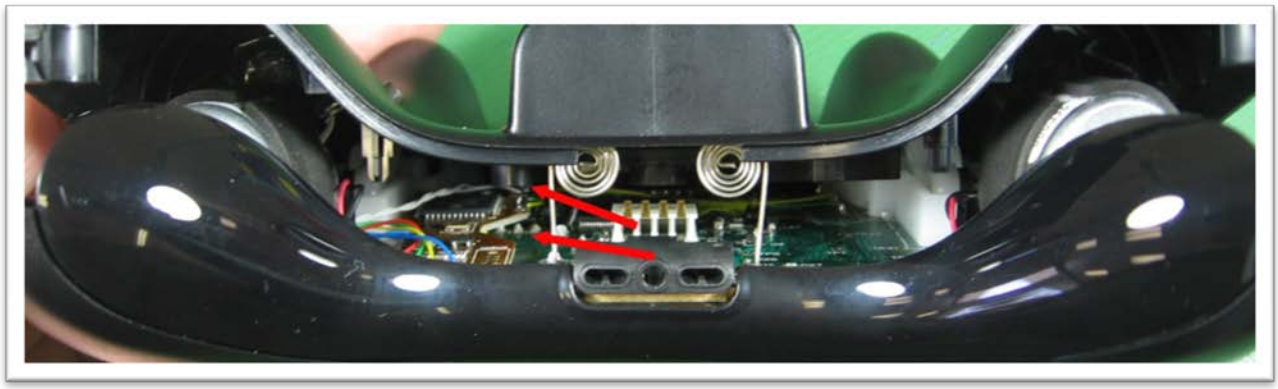


The tac switch gets wired to the LTAC pads on the modchip. The USB wires connect to the PVB, PGND, PD+ and PD- pads as shown below.



Now you can begin to close the shell. Make sure the tac switch wires are tucked in between the rumble pad plug and the white plastic of the trigger mechanism.

Also make sure the large post on the bottom shell fits in the groove of the modchip and does not squish or smash the modchip.



Finish closing the controller and put the screws back in.

Test the Controller

To test your new Ragnarok controller visit: http://www.viking360.com to download the latest software for your controller. You will need the following files:

- Ragnarok USB Customization Software:
  - If you have Windows Vista, 7 or 8 download this file:
  - http://www.viking360.com/downloads/xbox-ragnarok/xbox-ragnarok-usb-customization-software.msi
  - If you have Windows XP download this file:
  - http://www.viking360.com/downloads/xbox-ragnarok/xbox-ragnarok-usb-customization-software.zip
- Ragnarok Firmware Update tool
  - http://www.viking360.com/downloads/xbox-ragnarok/xbox-ragnarok-firmware-update-tool.zip
- Ragnarok Test Code tool with test code
  - http://www.viking360.com/downloads/xbox-ragnarok/xbox-ragnarok-test-code-and-tool.zip

For information on how to program your Ragnarok controller see the instructions on the Ragnarok Firmware Update and Ragnarok Test Code Tools.

When the test code is programmed onto your controller you can use the following table to determine if your controller is wired correctly.

Long name	Short name	LED	Photo	Number of Flashes	Solder Joint
Left Thumbstick Press	LSC	3		1	LS
Left Bumper	LB	3		2	LB
Right Bumper	RB	3		3	RB
Right Thumbstick Press	RSC	3		4	RS
Sync Button	SY	4		5	SY
X Button	X	4		1	X
Y Button	Y	4		2	Y
B Button	B	4		3	B
A Button	A	4		4	A
D-Pad Left	DL	3 and 4		1	DL
D-Pad Up	DU	3 and 4		2	DU
D-Pad Right	DR	3 and 4		3	DR
D-Pad Down	DD	3 and 4		4	DD
Left Trigger	LT	3 THEN 4		1	LT
Right Trigger	RT	3 THEN 4		2	RT