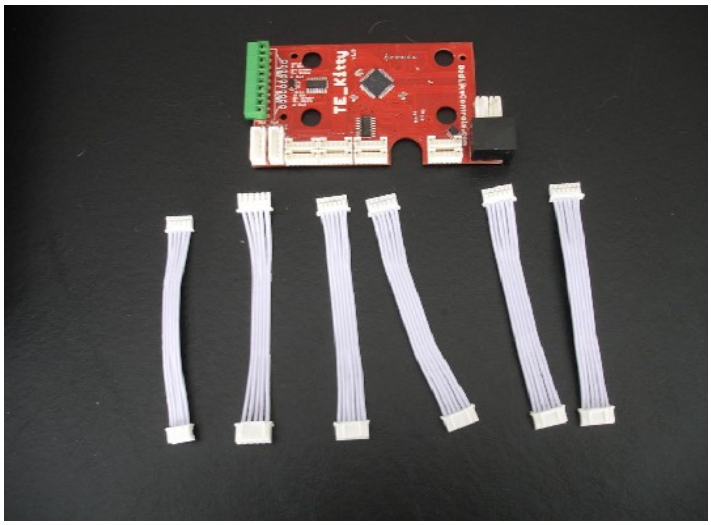
TE Kitty Install Guide v1.0

This guide will walk you through the process of installing a TE Kitty mod into your Xbox360 version MadCatz FightStick.

Please make sure you have the proper parts and tools ready:

- Xbox360 version MadCatz TE FightStick
- TE Kitty board
- Six (6) ribbon cables included in the TE Kitty kit
- Wire cutters
- Phillips screwdriver (#0 or #1 in size)
- #3 (3mm) metric Allen wrench
- Electrical tape
- X-acto or similar hobby knife
- Sharpie or similar permanent marker
- Small flat blade precision screwdriver
- Needle nose pliers

Any model of MadCatz TE FightStick will work. This guide uses the Marvel vs Capcom 2 edition stick, but newer TE-S based models won't work yet. To verify if yours will work, plug it into a console and move the lock switch to the 'locked' position. If the 'locked' position disables Start and Back, then that stick isn't supported yet. If Start and Back still work with the switch set to 'locked', then your stick is able to be modded with a TE Kitty kit.

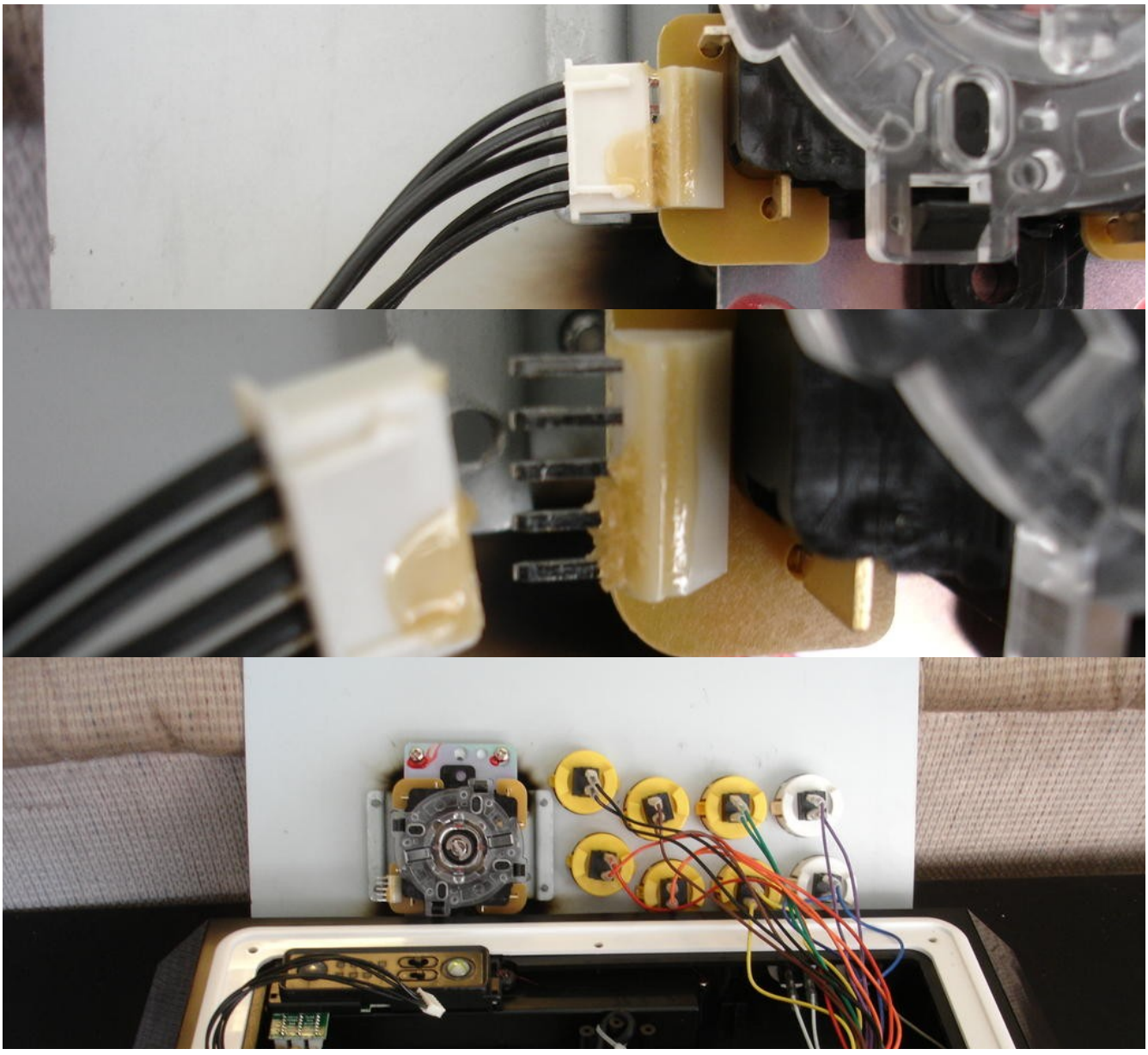
MadCatz TE FightStick (MvC2 model shown)	TE Kitty board & included ribbon cables
	

Step 1: Remove top carriage bolts

The top control panel section of the FightStick is held down by six black carriage bolts. Use the 3mm metric Allen wrench to remove all six carriage bolts so the top panel may be lifted up.
Note: The nuts that the bolts are attached to inside the FightStick are held in place by some red glue that can be knocked loose far too easily. Make sure that when you are unscrewing the carriage bolts, do NOT put any downward pressure on the bolt. Turn, but never press down. If you do, the pressure could cause the nut to separate from the plastic and make replacing the bolt very difficult.

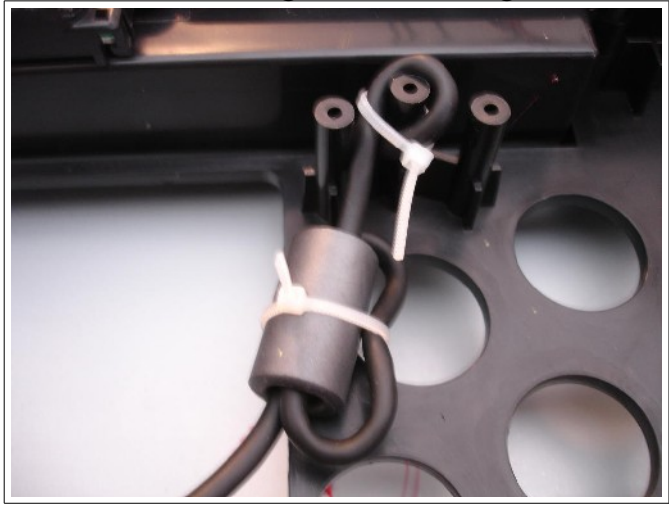
Step 2: Disconnect the Joystick

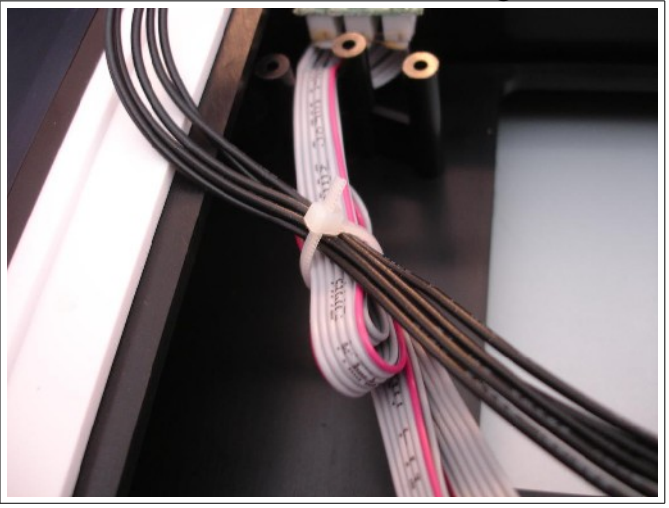
We can lift up the top, but we can't easily work on the insides yet. If we disconnect the joystick, we can set the top panel on the back of the stick and give us free access to the inside of the stick.
This is our first run-in with the evil yellow glue that covers almost every connector in the stick. Luckily, this is also the easiest one to deal with. If you want, you can use the hobby knife to cut the glue, or just pull the connector off of the joystick and tearing the glue. Either way, disconnect the joystick, and set the top panel on its edge behind the stick so the real work can begin.



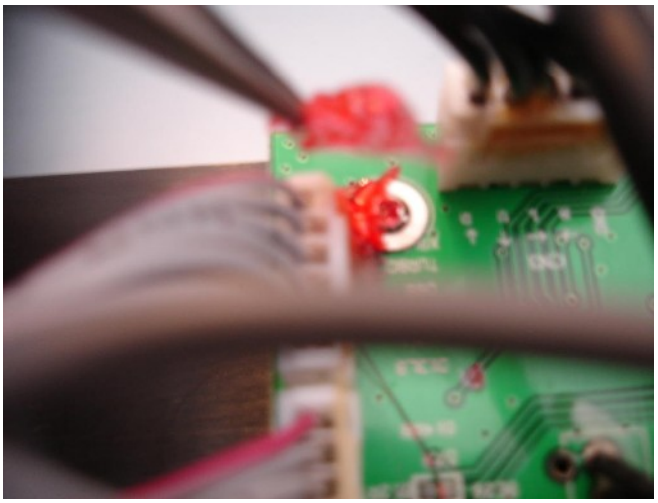
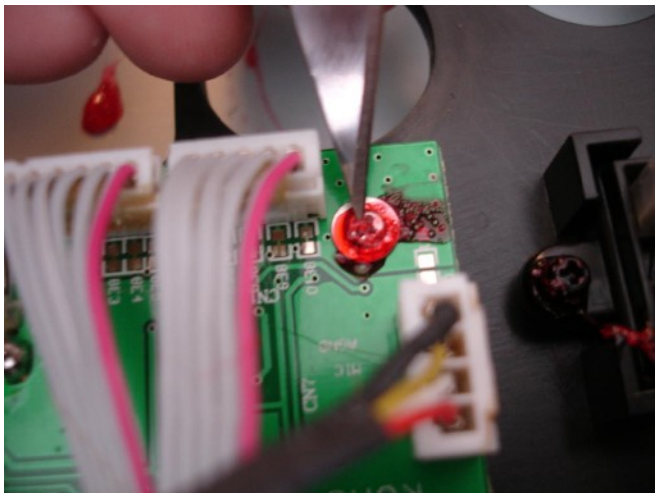
Step 3: Free up cables, unscrew main board

The USB cable has two zip ties on it, and the wire bundles on the left have one. All three of these zip ties need to be snipped and removed. Make sure to cut the zip ties but leave the cables undamaged! This will give us as bunch more freedom to move things around.





Next you will see the main FightStick pcb in the middle. There are four screws mounting it to the FightStick case, each one topped with a red gooey substance. We need to remove the screws, but we need to remove some of the red goo first. If the goo is a large enough dollop, you might be able to pull it off with a pair of needle nose pliers. If not, the easiest way to get the job done in my opinion is to use the hobby knife to remove goo from the center of the screw, exposing the '+' area the screwdriver goes. Once your screwdriver tip can get in, just unscrew the screw and the red goo will lift off of the main board.

Using pliers	Using hobby knife
	

Remove all four screws and set them aside for later.

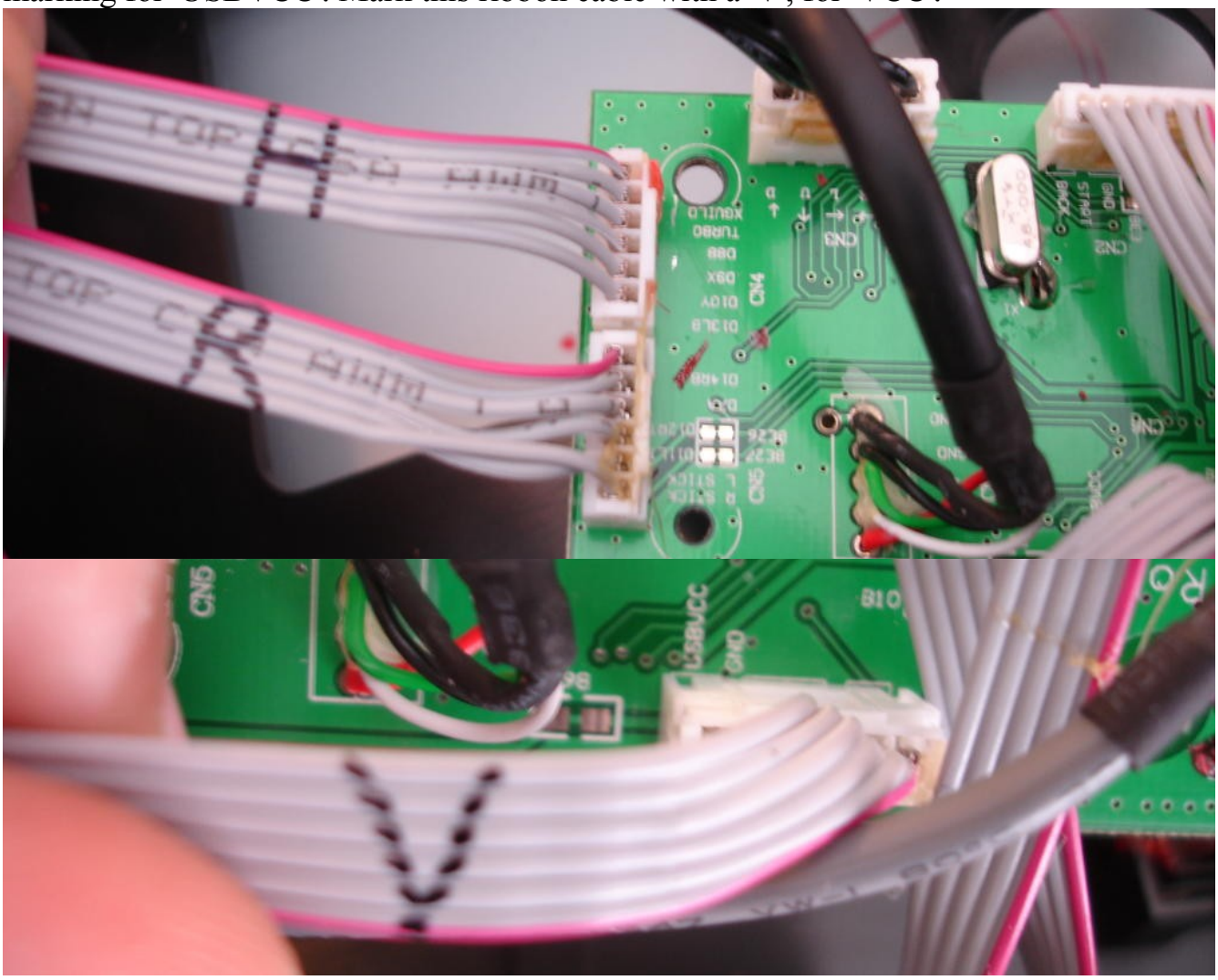
Step 4: Label H, R, and V cables

This may sound silly, but taking a moment to write on three of the ribbon cables will save you a ton of confusion and time down the road.

There are three ribbon cables going from the main TE board to the LED/Guide/Turbo section in the upper left. These are easy to get mixed up, so while they are still connected, we're going to take a moment to mark them so things will be easier down the road. Grab your permanent marker and follow along.

You will see that two of these ribbons connect on the left hand side. The markings on the main board show that the top one has the 'XGUILD' line, aka the Guide button. Mark this one with an H, for 'Home Button'. The bottom one is connected to the header with the label 'RSTICK'. Label this ribbon with an R.

The third ribbon cable connects to a header on the bottom edge, and this header has a marking for 'USBVCC'. Mark this ribbon cable with a 'V', for 'VCC'.



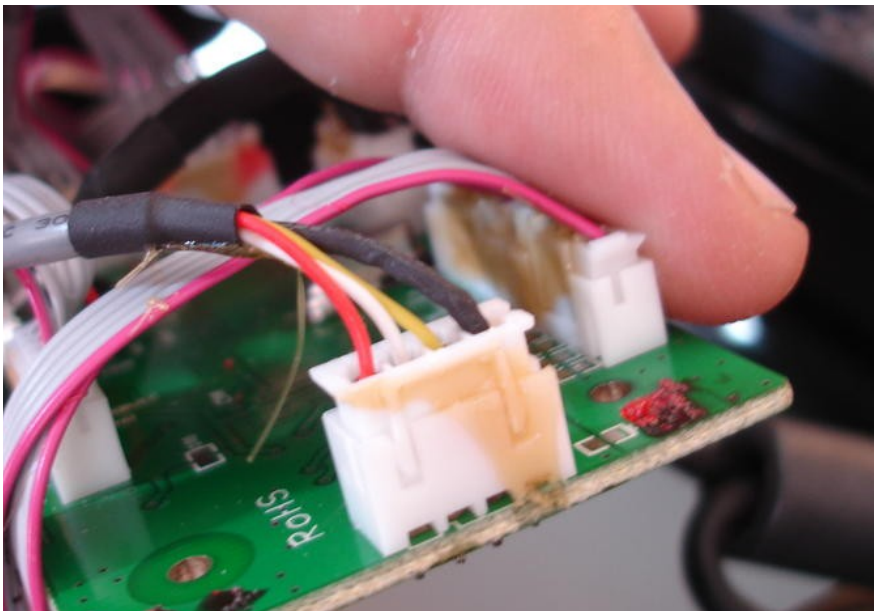
Step 5: Unplugging cables from main PCB

You MUST take your time and use a lot of care on this step. This is the only step in the mod process that can actually damage things and make the mod go sour, so please read this section thoroughly, go slow, take your time, and do this one right the first time.

Everything coming from the main FightStick PCB except for the USB connector is going to a connector on the outside edges of the board. We need to remove all of them, leaving the USB cable in the middle untouched. The connectors are made to be removable, but MadCatz has used a ton of that yellow glue to secure each connector to its header. This glue is unbelievably strong. If you just yank on the ribbon cables to try and pull the connector out, you WILL pull the ribbon cable out of the connector, and repairing that is neither fun nor easy.

Rule 1: NEVER pull on the ribbon cable. When removing the connector, the force should only be on the white plastic connector, never the wire.
Rule 2: NEVER try to remove the connector until all of the yellow glue has been cut between the connector and header.

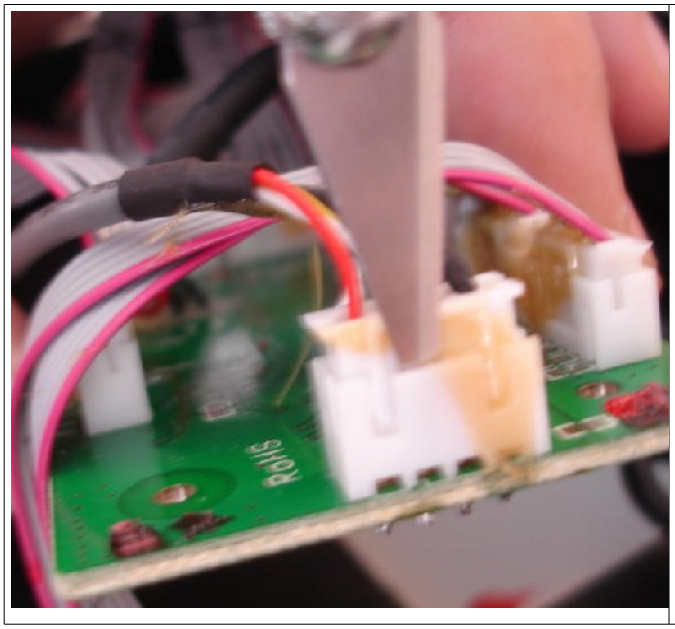
The easiest one to start with also happens to be the least important. One the far right edge of the board is a four pin header going to a gray insulated cable that goes to the headset jack on the stick.

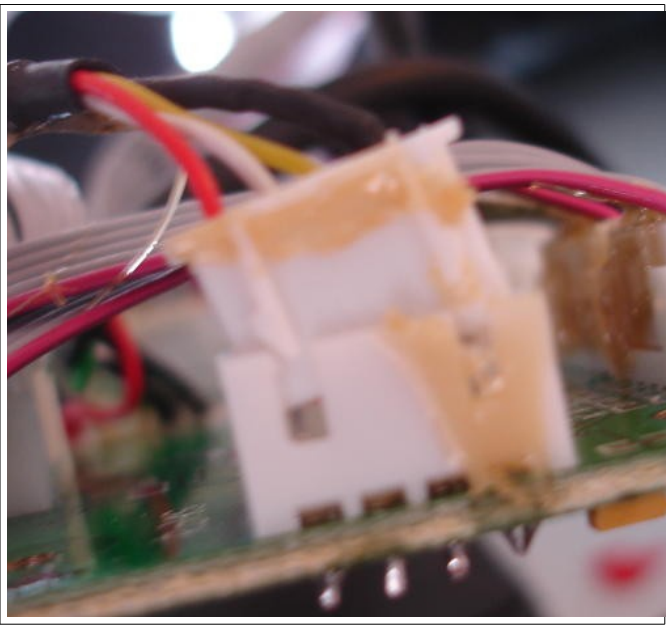


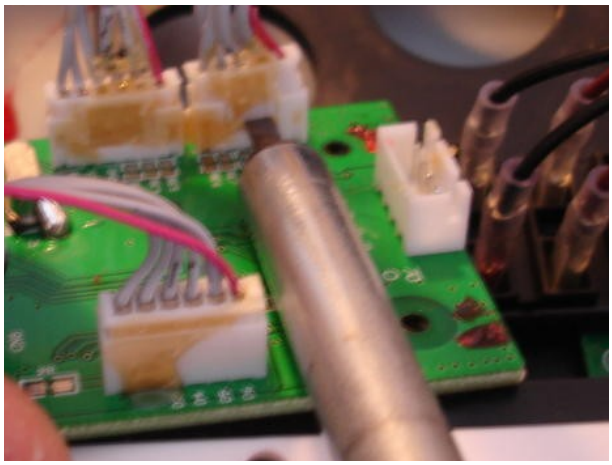
In the picture above, you can see the yellow glue where it connects to both the connector on the top and the header shroud on the bottom. Trying to remove all of that glue would take forever, so instead we're going to cut the glue that connects the top connector to the bottom shroud.

Step 5: Continued

Slip your hobby knife in between the connector and shroud and run it slowly across to cut the glue in between the connector and shroud. In the picture below, you can see that there is glue connecting the two pieces in the little notch on the right. Make sure to cut the glue in this area as well. The goal here is to cut the glue in the spots between the connector and shroud, without damaging anything; cut the glue, not the white plastic. Once you are sure the glue has been cut in a way that separates the glue on the connector from the glue on the shroud, use your fingertips on the tabs of the top white connector to slowly lift it up and away from the board. NEVER pull on the cable.







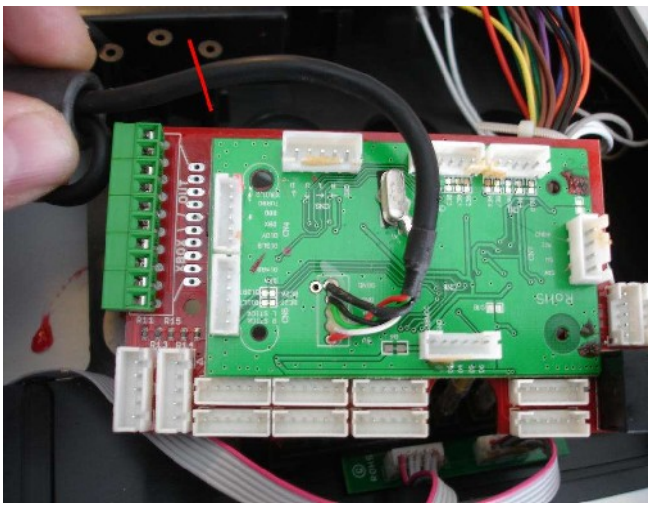
All of the ribbon cables except for the headset jack and the joystick have a trick that makes safely removing the connector much easier. After you've cut the glue to the best of your ability, wedge the flat blade of a small screw driver between the connector and shroud from underneath the connector in the front cut away window. The blade won't go all of the way in because of the metal header posts, but the blade can be twisted, separating the connector from the shroud without putting ANY force on the ribbon cable. Any glue still connecting the two pieces will be easily seen, and usually tear clean from the force.

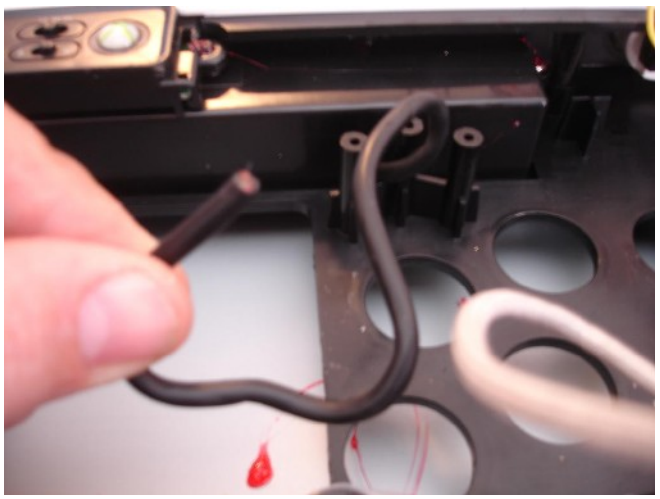
Repeat until all of the ribbon cables plugged into the TE board are removed, and only the black USB cable in the middle remains.

Step 6: Cut and prepare the USB cable

Measure twice, cut once.

Grab the TE Kitty board and place it underneath the main TE board so that the four mounting holes lines up. By the time we finish, the section of cable soldered to the main TE board needs to have each wire screwed into the four bottom screw terminals on the left. Using your wire cutters, cut the USB cable about 1inch from ferrite ring the cord is wrapped around. Once you make the cut, unloop the cord so the ferrite ring can be slid off and discarded.



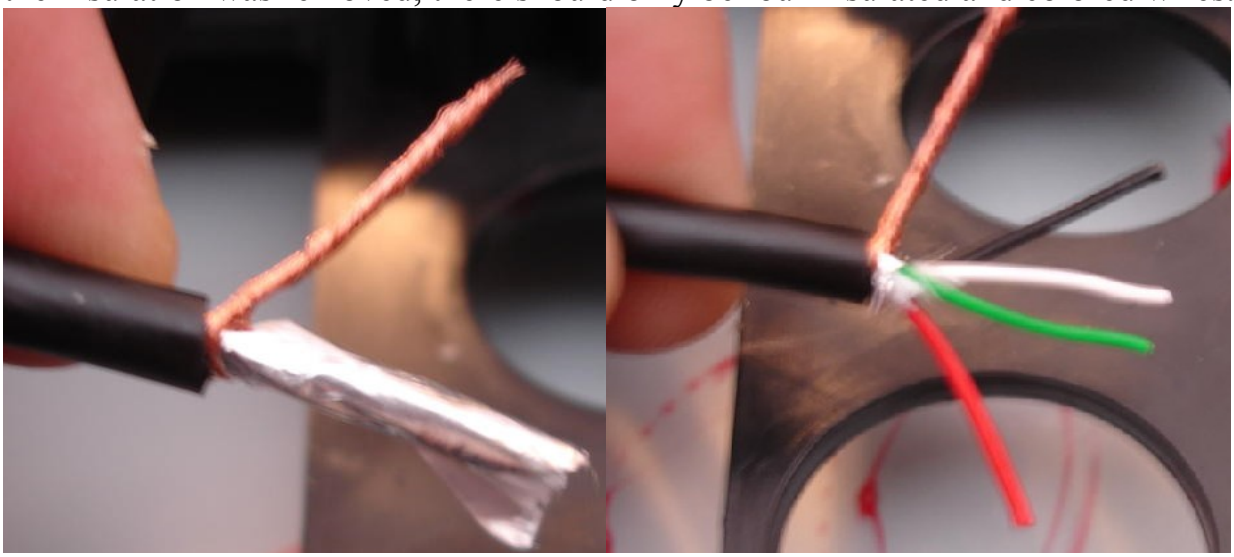


Now we need to prepare the ends of the cables on both sides of the cut you just made. Follow these steps for both the section still connected to the main TE board and the section of USB cable heading out to the cord compartment.

Using your hobby knife, gently cut a ring around the cord in the outer black insulation 1 inch (25mm) from the end you just cut. The goal is to cut the outer black insulation without damaging any of the wires inside. Slide the insulation off once free.

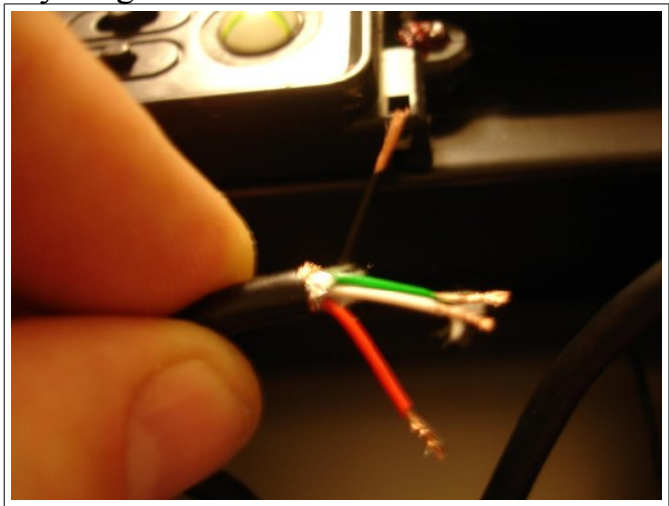
Step 6: Continued

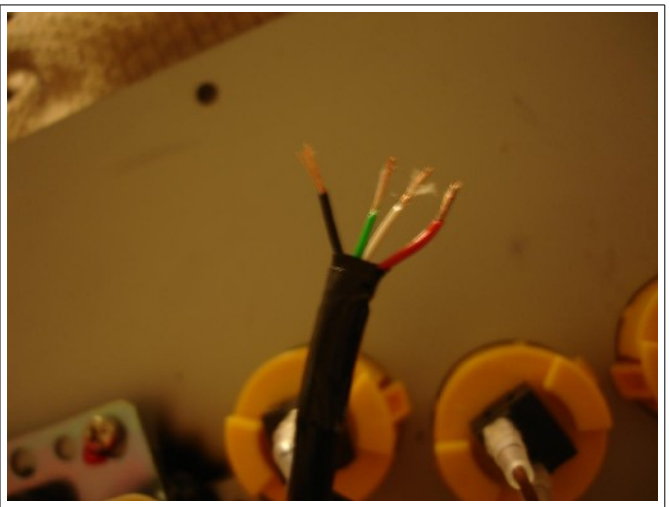
With the insulation off, you will see some thin copper wires, and a silver tin foil-like covering the innermost colored wires. Cut the uninsulated copper wires close to where the insulation was trimmed, and unwrap the foil and cut it at the same spot. From where the insulation was removed, there should only be four insulated and colored wires.



(The twisted copper in the pictures above is the thin uninsulated copper that should be trimmed at the insulation.)

Now we need to remove about 1/8 of an inch (4mm) of insulation from the end of each of these four wires. Using proper tools is best, but a hobby knife or even teeth can be used in a pinch. After this small length of each wire is exposed, twist the strands together so they will be easier to work with. Once all four wires have exposed ends, use a small piece of electrical tape around where the black insulation was cut. We want to safely wrap the little ends of uninsulated copper and tin foil so they cannot make contact with anything else.

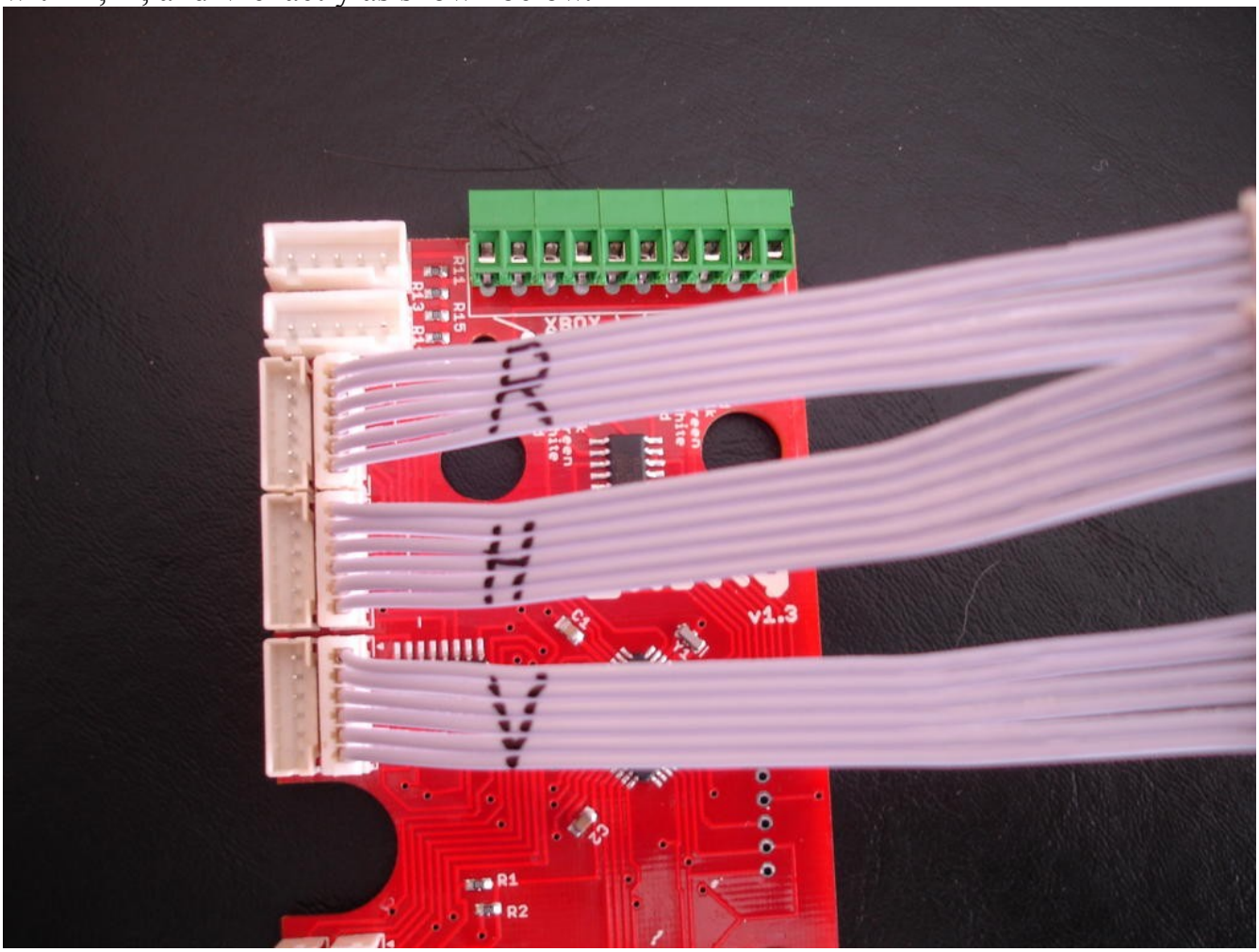




Make sure to repeat for the end section of USB cable.

Step 7: Mark H, R, and V ribbon cables

The TE Kitty board has a section on the bottom with six identical six pin headers. Grab three of the six pin ribbon cables that came with the TE Kitty kit, and place in the three headers NOT on the edge of the board. Using the picture below, label these three cables with R, H, and V exactly as shown below.

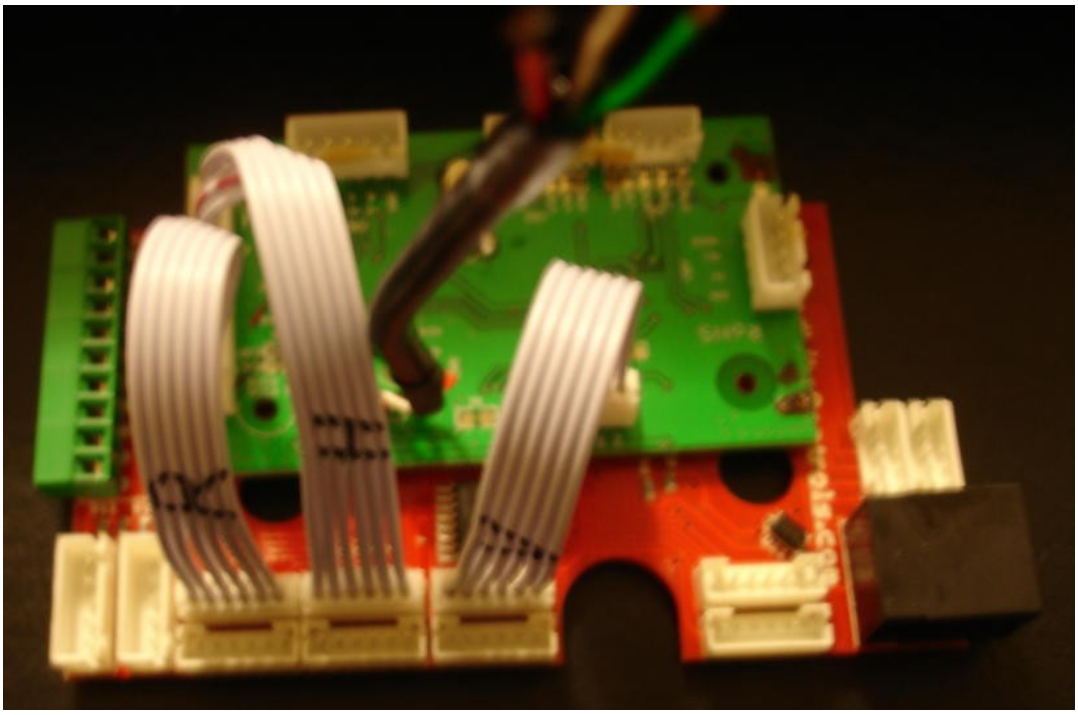


Step 8: Ribbon Cables Galore

All TE Kitty headers on the edge of the board are where the original ribbon cables go to. All TE Kitty headers on the inside of the board are where the TE Kitty ribbon cables go; the other ends of these plug into the original TE board.

Place the original TE board on top of the TE Kitty board so that the four mounting holes line up. Make sure the end of the original TE board with the single four pin headset connector is on the same end as the TE Kitty RJ-45 jack.

Plug the ribbon cable on the TE Kitty marked with a 'V' into the TE board header marked USBVCC.
Plug the ribbon cable on the TE Kitty marked with an 'R' into the TE board header marked RSTICK.
Plug the ribbon cable on the TE Kitty marked with an 'H' into the TE board header marked XGUILD.



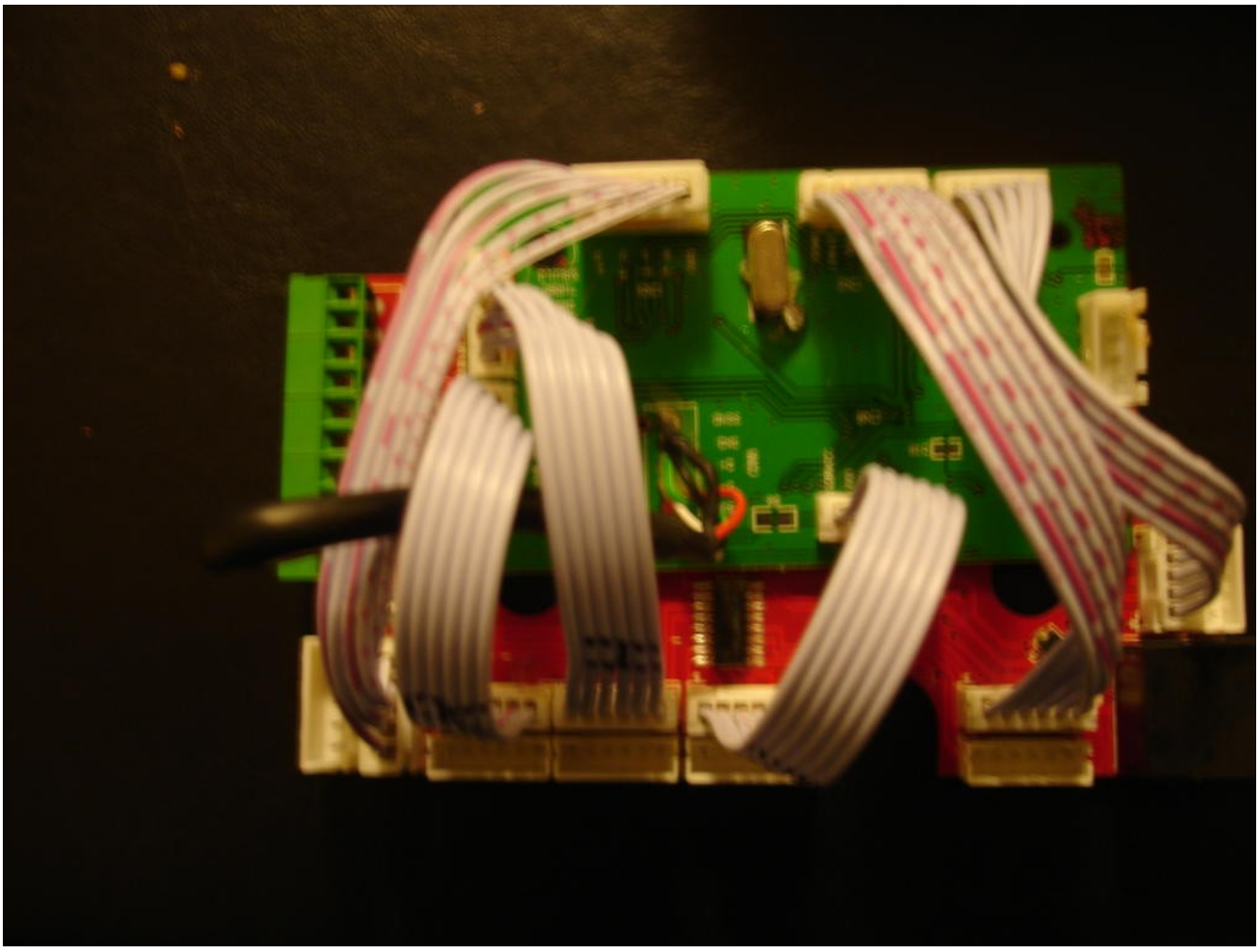
Step 8 Continued:

There are three remaining small ribbon cables that came with the TE Kitty kit: a small 5 pin cable, a larger ended 5 pin cable, and a 6 pin cable. Of the headers that are left, they can only go into the one they are meant to go into, so this is a very safe step.

Plug the larger five pin ribbon cable in the second header from the left on the TE Kitty board (the one immediately to the left of the 'R' ribbon). Plug the other end into the header on the original TE board where the directions are labeled as arrows.

Plug the six pin ribbon cable into the TE Kitty board in the open header just to the left of the RJ-45 jack. Plug it into the one away from the edge of the board, not the one on the edge. Plug the other end of the ribbon cable into the header on the original TE board labeled with 'BACK' and 'START'.

Plug the smaller five pin ribbon cable into the TE Kitty board in the open header above the RJ-45 jack. Use the one on the left, away from the edge of the board. Plug the other end of the ribbon cable into the smaller five pin header on the original TE board maked with 'BE6' and 'BE7'.

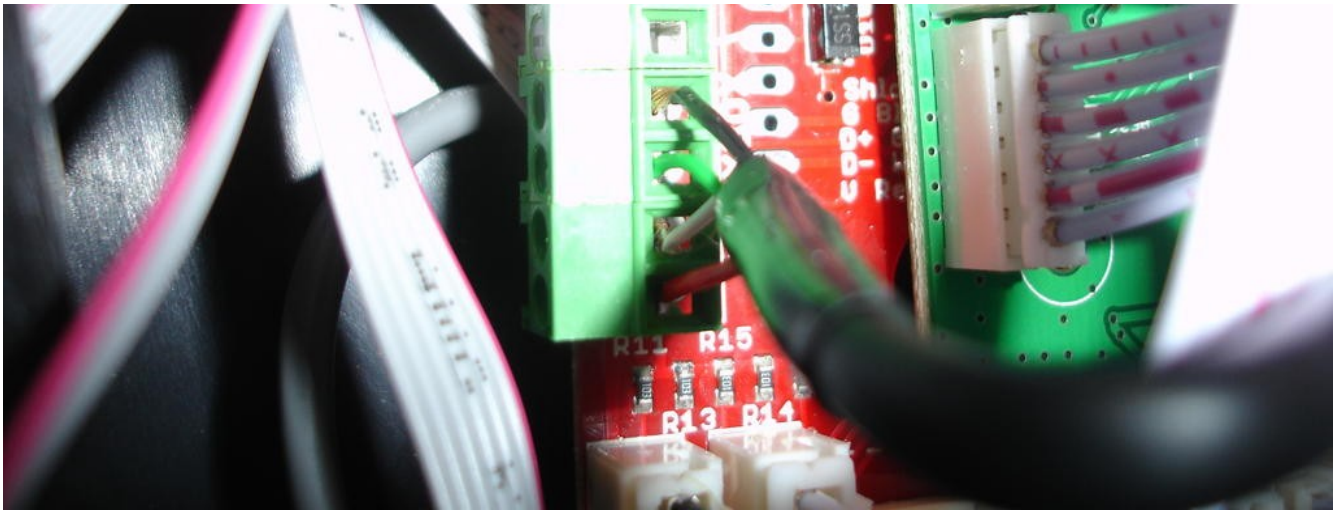


Step 9: Connect first USB wires

The length of USB cable coming from the original TE board needs to be screwed down in the bottom four spots of the screw terminals. There is writing on the TE Kitty board to show you what should go into each screw terminal, but it may be hard to see with the original TE board in the way.

The red wire goes into the bottom-most screw terminal.
The white wire goes into the second to last screw terminal, above the red wire.
The green wire goes into the third to last screw terminal, above the white wire.
The black wire goes into the fourth to last screw termina, above the green wire.

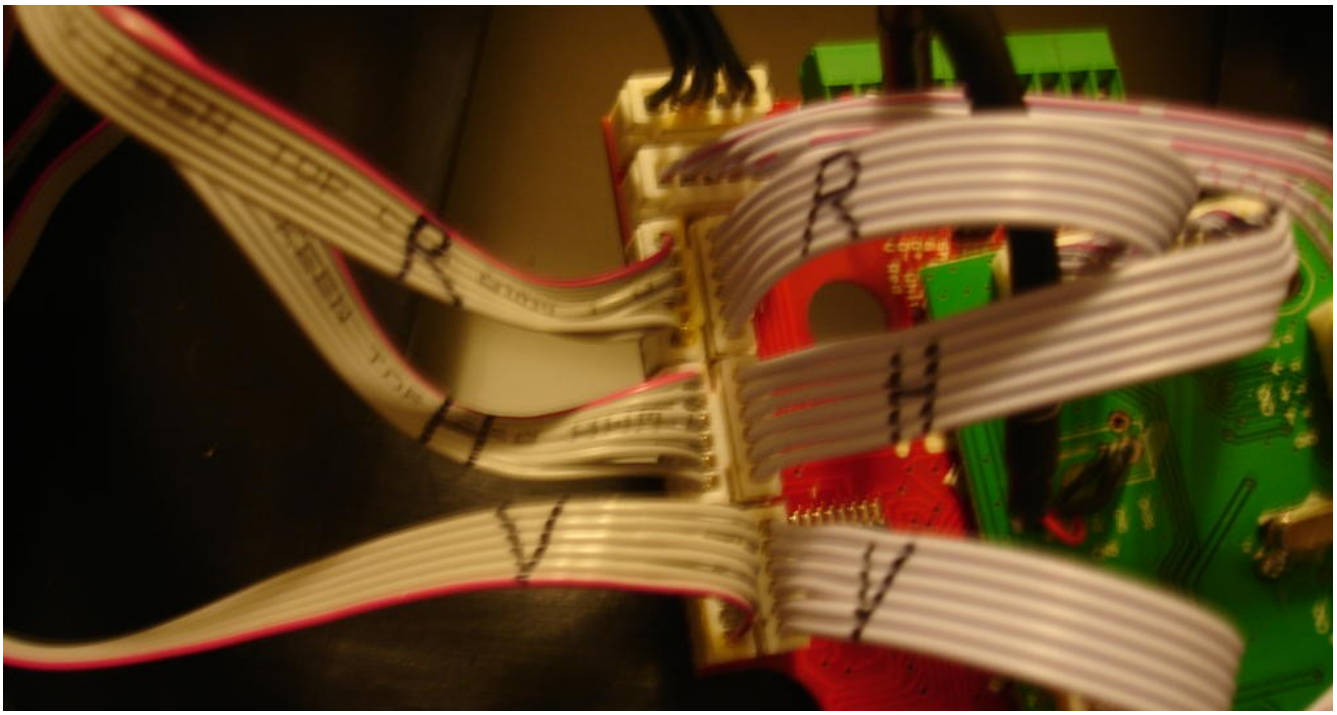
Twist the exposed copper wires at the end of each colored wire together so they will go into the screw terminal easily, then tighten the screw terminal down using your precision flat blade screwdriver.



Step 10: Connect original ribbon cables to TE Kitty

Now we will connect all of the original ribbon cables that went to the original TE board to the TE Kitty connectors. This does NOT include the four pin connector for the headset.

Start with the original three ribbon cables that we marked with the H, R, and V labels. These are the three cables coming from the LED/Guide/Turbo board in the upper left of the stick. For each one of these three, plug it into the connector next to the new ribbon cables we marked with the same letter.



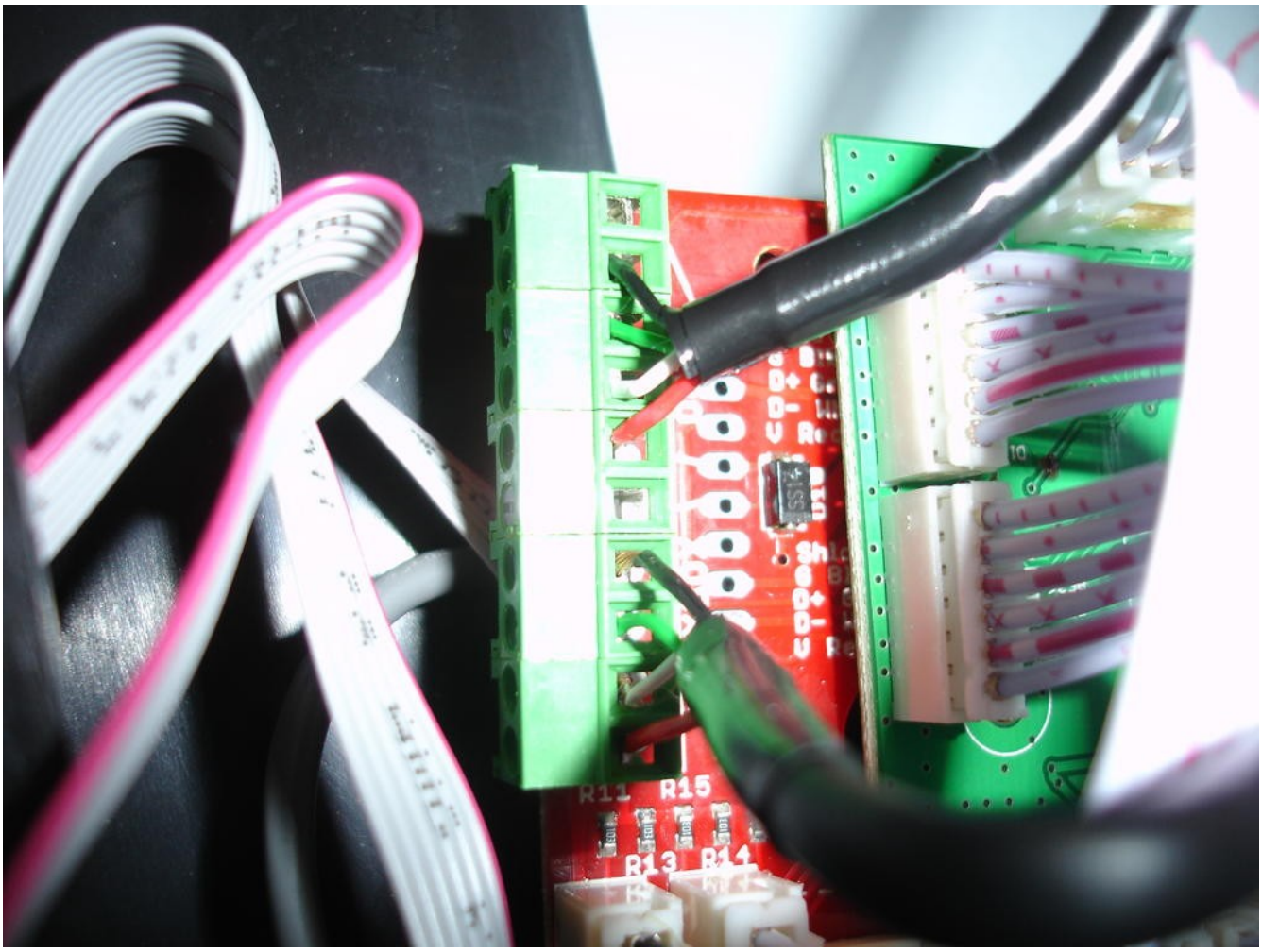
Plug the black wire that went to the joystick into the larger five pin connector on the lower left of the TE Kitty board. Make sure the end you plug into the TE Kitty is the same end that plugged into the original TE board, and NOT the end that plugged onto the joystick itself.
Plug the two ribbon cables from the button distribution board into the only two connectors left open on the TE Kitty. One has five pins, the other has 6, so it isn't possible to plug them in wrong.

Step 11: Screw down outgoing USB cable.

The section of USB cable that goes to the cord compartment should have already been prepared in step 6. If not, go back and get it ready.

The red wire goes into the fifth screw terminal from the top.
The white wire goes into the fourth screw terminal from the top, above the red wire.
The green wire goes into the third screw terminal from the top, above the white wire.
The black wire goes into the second screw terminal from the top, above the green wire.

Twist the exposed copper wires at the end of each colored wire together so they will go into the screw terminal easily, then tighten the screw terminal down using your precision flat blade screwdriver.



Step 12: Testing

Everything except for the joystick on the control panel top should now be wired up. Now is a good time to take a moment to test the stick out.

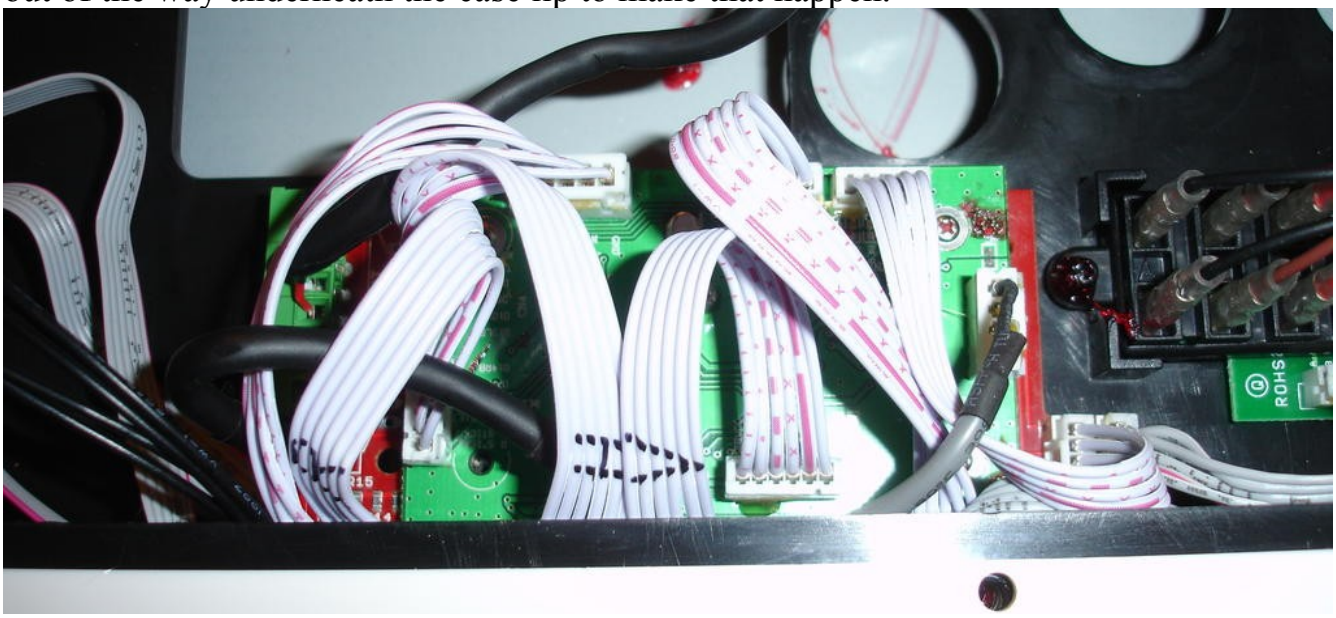
Make sure the lock switch is set to 'unlock'. Plug the USB cable into a computer with the Guide button held down. You should see the upper left and lower right player LEDs light up. If you press buttons on the control panel, you should see the matching turbo LED light up as well. If all eight button light up as expected and the player LEDs light as expected, then you've verified that the outgoing USB cable is screwed down properly, the three of the ribbon cables between the TE Kitty and LED/Guide/Turbo daughterboard, and the two ribbon cables between the TE Kitty and button distribution board are all connected properly.

Unplug the USB cable and plug it back in, without anything held down. Check to see if the 'Kitty TE Edition' shows up in the Game Controllers applet of the control panel (Start->Run-> 'control joy.cpl'). If the controller is listed, then we know that the firmware has been flashed on the main board. If not, download the most recent firmware from here:
http://www.godlikecontrols.com/download/kitty/tekitty.zip
Follow the directions to enter bootloader mode and flash the firmware.

Next, unplug the USB cable from the computer, make sure the lock switch is set to 'unlock', move the LS/DP/RS slider to 'RS', hold the Turbo or Back button down, and plug the stick in. The entry in the Game Controllers applet should show an entry for the original TE pcb, something like 'Arcade Stick (MadCatz FightStick TE)' or 'Street Fighter IV FightStick TE (Arcade Stick)'. Setting the slider to RS and holdind Turbo or Back forces the stick to switch over to Xbox360 mode and let the original Xbox360 board talk to the computer or console. Select the game controller in the window and click 'Properties'. Push any of the play buttons and you should see the matching button in the Test tab light up. Hold down the Turbo button and press each of the eight play buttons, then let go of Turbo. You should see all of the Turbo LEDs on, and when the button is pressed, it will flash a bit brighter. You should also see the upper left player LED lit. If all buttons light up as they should when pressed, flash brighter when turbo in on and the button is pressed, and the upper left Player LED is lit, that verifies that the USB wires from the original TE board are connected properly, the H, R, and V ribbon cables connecting the TE Kitty to the original TE board, and the two ribbon cables for the button lines between the TE kitty and original TE board, are all present and working properly.
The only thing left is the joystick itself which we need to save for last to make things easier.

Step 13: Mount and connect joystick

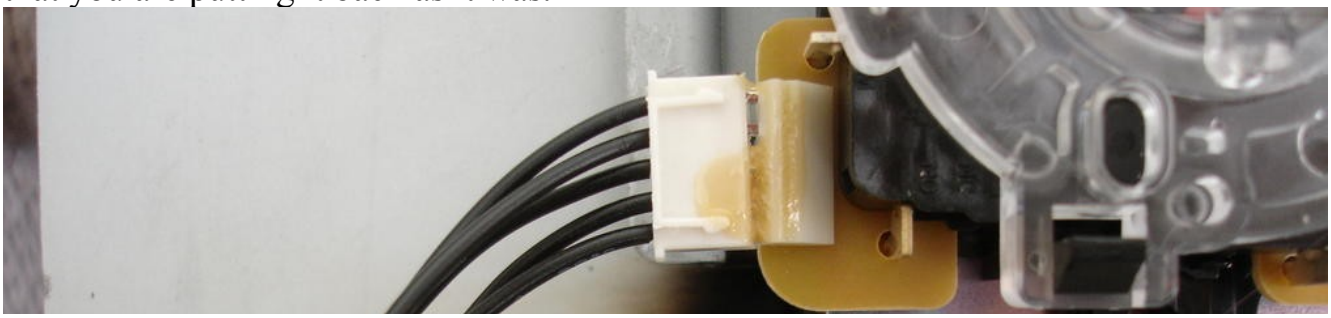
The original TE board was mounted on four posts coming from the bottom of the case. The TE Kitty board has four large holes meant to go over these posts. Move the TE Kitty so each of the four small posts are sticking through the holes with the TE Kitty resting against the very bottom of the case. You will have to orient and nudge the ribbon cables out of the way underneath the case lip to make that happen.



Once the four posts are sticking up through the holes in the TE Kitty, line up the original TE board so the the mounting holes are over the holes in the mounting posts. Grab the screws that originally held the board to the posts and screw them down. The screws closest to the wall of the case can be very hard to get to, just please make sure that AT LEAST two of the screws are replaced. All four is better, but it can be difficult to get to them.

Once the original TE board is screwed down, grab the gray insulated cable that goes to the headset jack and plug it into the TE board in the only unused header spot.

Take the metal control panel top and move it closer to the stick so you can plug the free end of the joystick cable back into the joystick. Take a look at the end and make sure that you are putting it back as it was.



Rest the control panel on the stick but do not screw down.

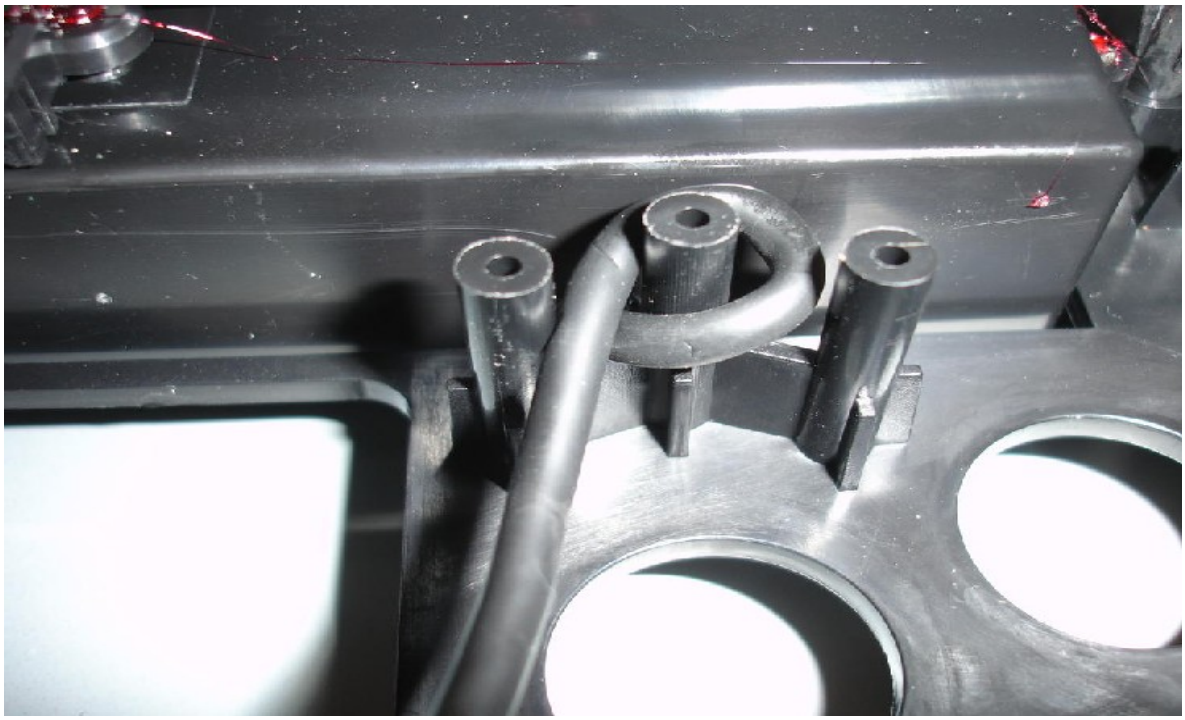
Step 14: Test joystick

This step is especially easy. Plug the joystick into a computer, wait for the player LEDs to turn off, and then move the joystick. The player LEDs should change to show what direction the joystick is in. If only a single cardinal direction is working, you have the cable plugged into the joystick backwards, and you need to flip it around. This verifies that the cable connecting the joystick to the TE Kitty is on correctly.

Unplug the joystick, move slider to RS, and plug the stick in with Turbo held down to force the Xbox360 mode. Go into the Properties page for the joystick, and verify that movement of the stick shows up properly. This verifies that the large five pin ribbon connecting the TE Kitty to the original TE board is on correctly.

Step 15: Close up

Take the USB cable just inside from the cord compartment and loop it neatly over the middle post next to where it comes out. Properly looping it here will help catch any pulling on the cord and protect the cord from damage.



This next part may take a little finesse. Rest the control panel on top of the stick where it should go and try to get it all of the way down against the stick case. There's a lot of wires running all over the stick, and any of them can get between the case and the control panel keeping it from staying flush against the case. Move and adjust any wires as neatly out of the way as you can, preferably under the outer case lips. The wires going to the buttons will try to get between the case and control panel on the left, and the wires going to the joystick will try to do the same on the left, and all of the cables and wires will try to get underneath the pushbuttons and joystick. Arrange and route the cables as best you can so the control panel will lay flat on the case.

Place the carriage bolts through the holes in the top of the control panel and use your hex wrench to rotate them clockwise so they screw the control panel down. Remember, do NOT put any downward force on the carriage bolts. Turn it, but do not press on it or you could knock the nut loose underneath.

Once all six carriage bolts are replaced and turned tight, your mod is complete. Play and enjoy!

Optional Step: RJ-45 jack installation

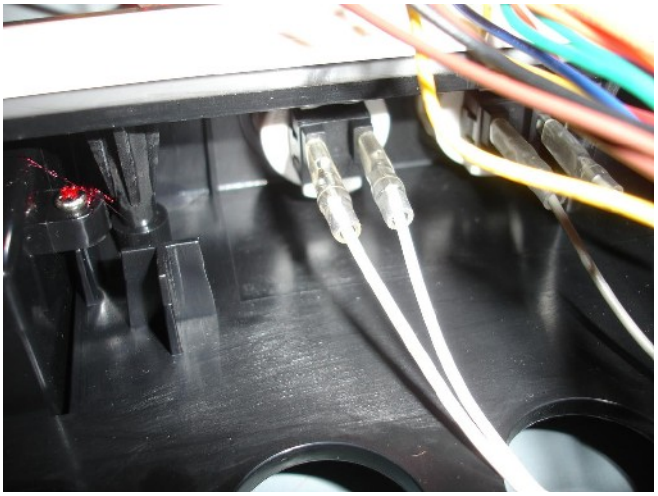
Using just the USB cable, your Kitty modded TE stick will work properly on Playstation 3, PC, and Xbox360 consoles. Adding an RJ-45 jack to your stick opens up your stick to work easily on many more systems, including Gamecube, Playstation, Playstation 2, Dreamcast, Sega Saturn, Original Xbox, SNES, NES, and many other game consoles. This optional step will guide you through the installation of a Neutrik RJ-45 pass-through jack into your arcade stick so you can play your arcade stick on these older consoles.

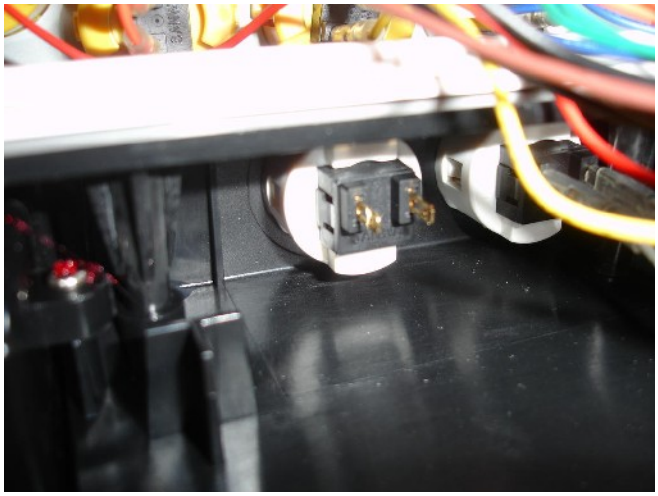
Gather up the parts and tools you are going to need for this step:

- Neutrik RJ-45 pass through jack
- Short Ethernet cable
- Phillips screwdriver
- Rotary tool or drill with small drill bit
- zip tie or twisty tie (optional)
- #3 (3mm) hex wrench
- Needle-nose pliers

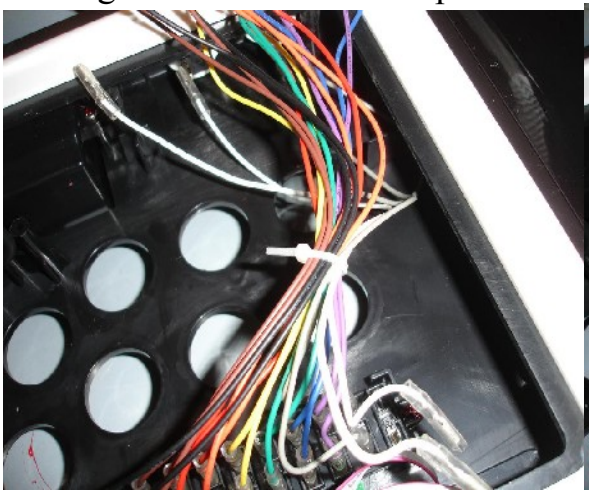
Optional Step 1: Remove Back signal wires

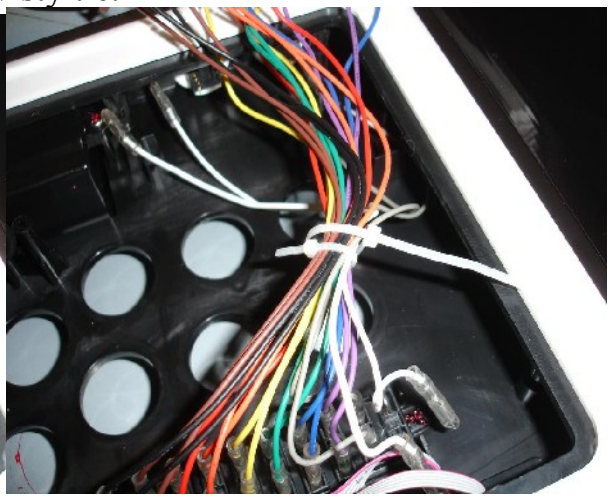
The RJ-45 jack is going to go into the spot the Back button currently is. Using the hex wrench, remove the six carriage bolts holding the top control panel down. Lift up the control panel so you can access the inside of the stick. The Back button will be the one closest to the center of the stick, so peek at it and verify what color the wires are. Then, unplug those two wires from the button.





Take a look to where those same wires are also connected to the distribution board and unplug the wires from there as well. Loosely place another zip tie or twisty tie near where the original is. Cut and remove the original zip tie along with the unneeded wires, then tighten down the new zip tie or twisty tie.





Optional Step 2: Remove Back push button

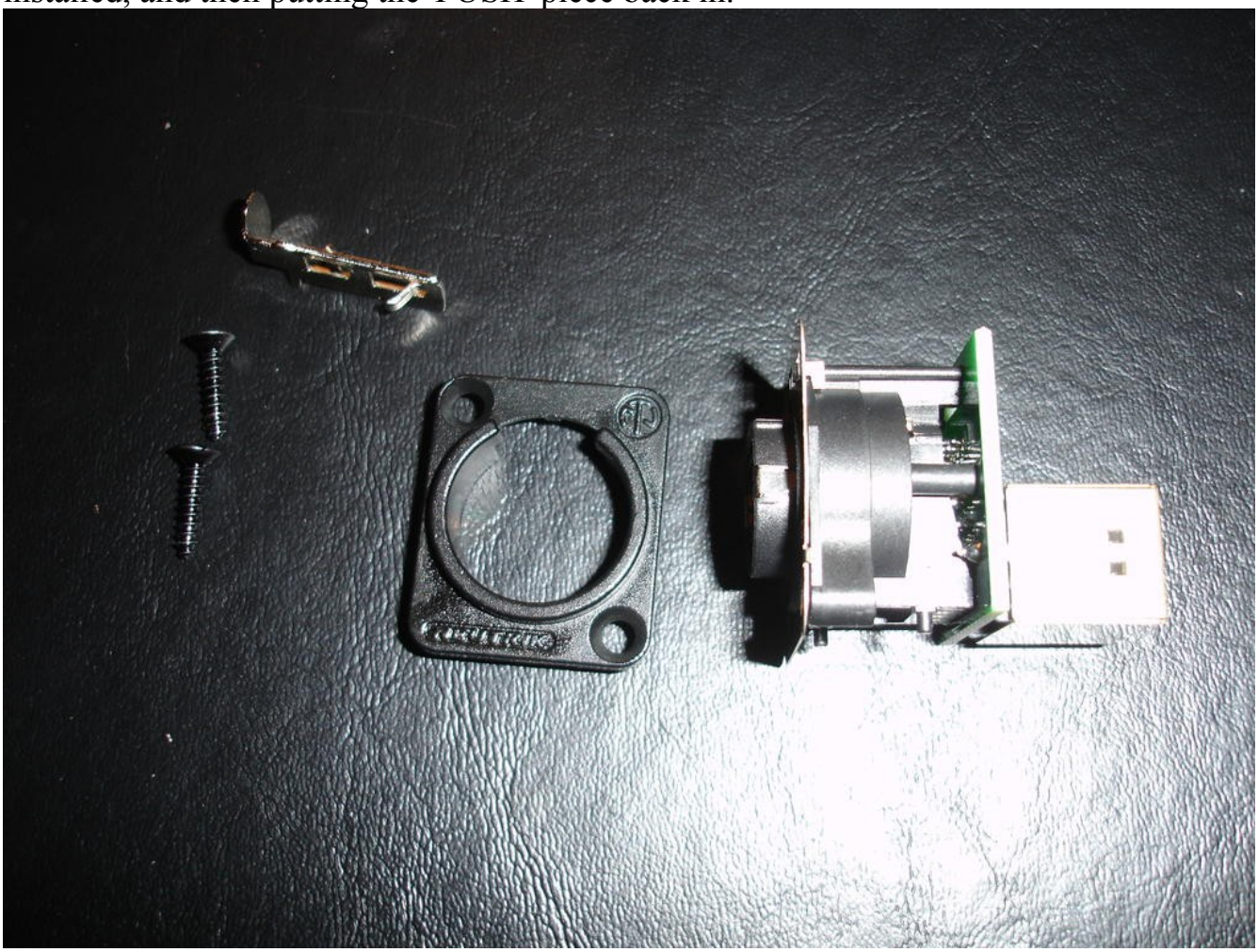
The placement of the Back push button can make it a bit tricky to remove properly. There is a good chance that the button may be broken while trying to remove it. This is a waste, but it happens. Since we won't need it any more, it's not that big of a loss.

The push button is held in place by two prongs on the side of the button. On all of the sticks I have worked on, these prongs are invariably on the top and bottom, making them hard to get to because the bottom of the case and the top lip of the case restrict access there. If you can, try to use a flat blade screw driver to push these prongs into the push button, while applying pressure on the bottom of the button to push it out. This is the best and most proper way to remove the button. It is also the hardest.

Another option is a bit hackish and may break the button, but it is the easiest method I know of. From the inside of the case, push outwards directly on the black microswitch piece of the pushbutton. This should cause the microswitch and plunger portion of the button to come out, leaving the out white shell of the pushbutton in place. From there, you can use a pair of needle nose pliers on the outside of the case to grab and pull in the prongs holding the pushbutton shell in place. The shell should then easy come out.

Optional Step 3: Disassemble Neutrik jack

Remove the two screws from the Neutrik assembly and the metal cover plate should come off freely. The 'PUSH' piece can also be pulled out if desired, but doesn't have to be removed, it just makes things easier. The 'PUSH' piece itself isn't required at all unless you want to use the matching Neutrik protective boots on the ends of your cables, but there is no harm in keeping it so I recommend pulling it out until the jack is fully installed, and then putting the 'PUSH' piece back in.



Optional Step 4: Put Neutrik pieces in place for drilling

We will need to end up drilling two small holes for the Neutrik mounting screws to go through, but first we need to put the Neutrik jack in place so we can know for certain where we will need to drill.

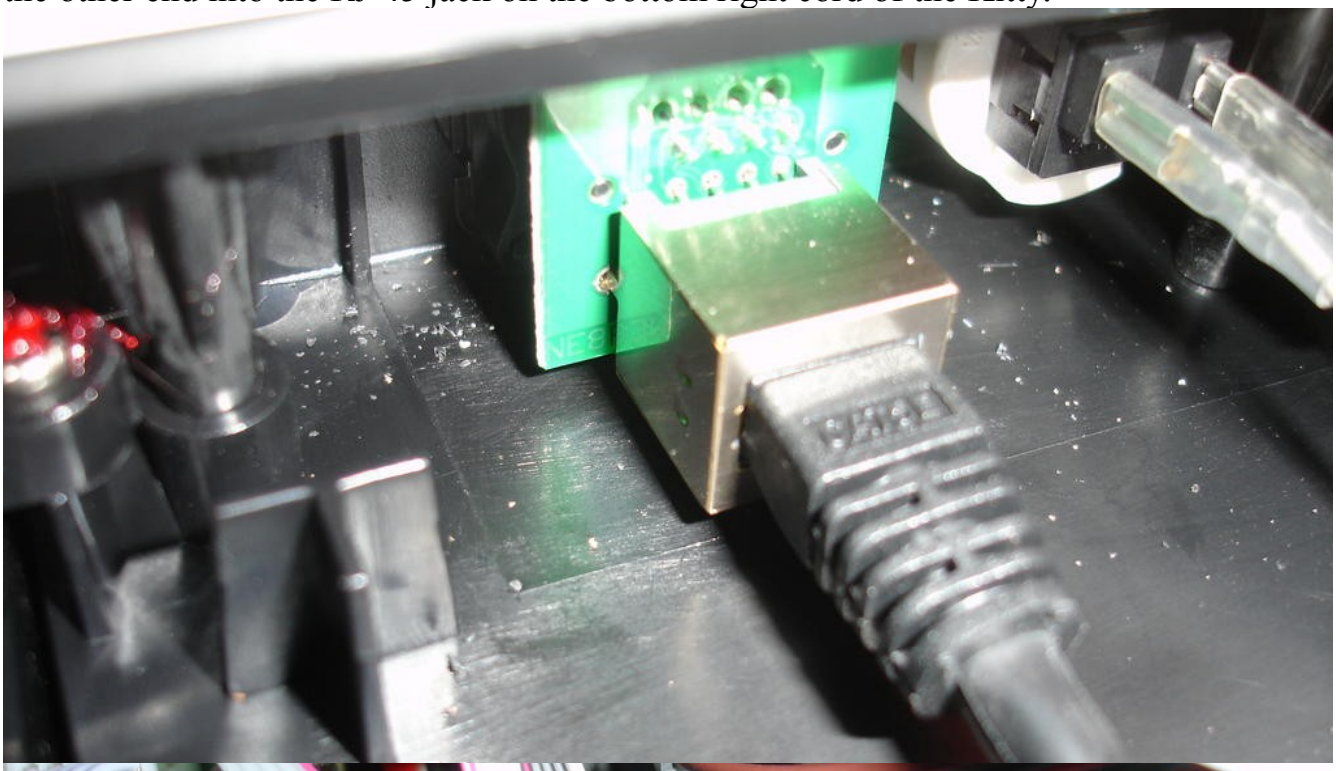
Place the main Neutrik body on the inside of the case with the outgoing RJ-45 jack facing out through the vacant Back hole. Place the metal plate piece on the outside of the case and into the Back hole. The two pieces mate together in a specific way, so make sure the RJ-45 notch is on the bottom, and the notch in the circle of the metal plate is on the top as shown here:

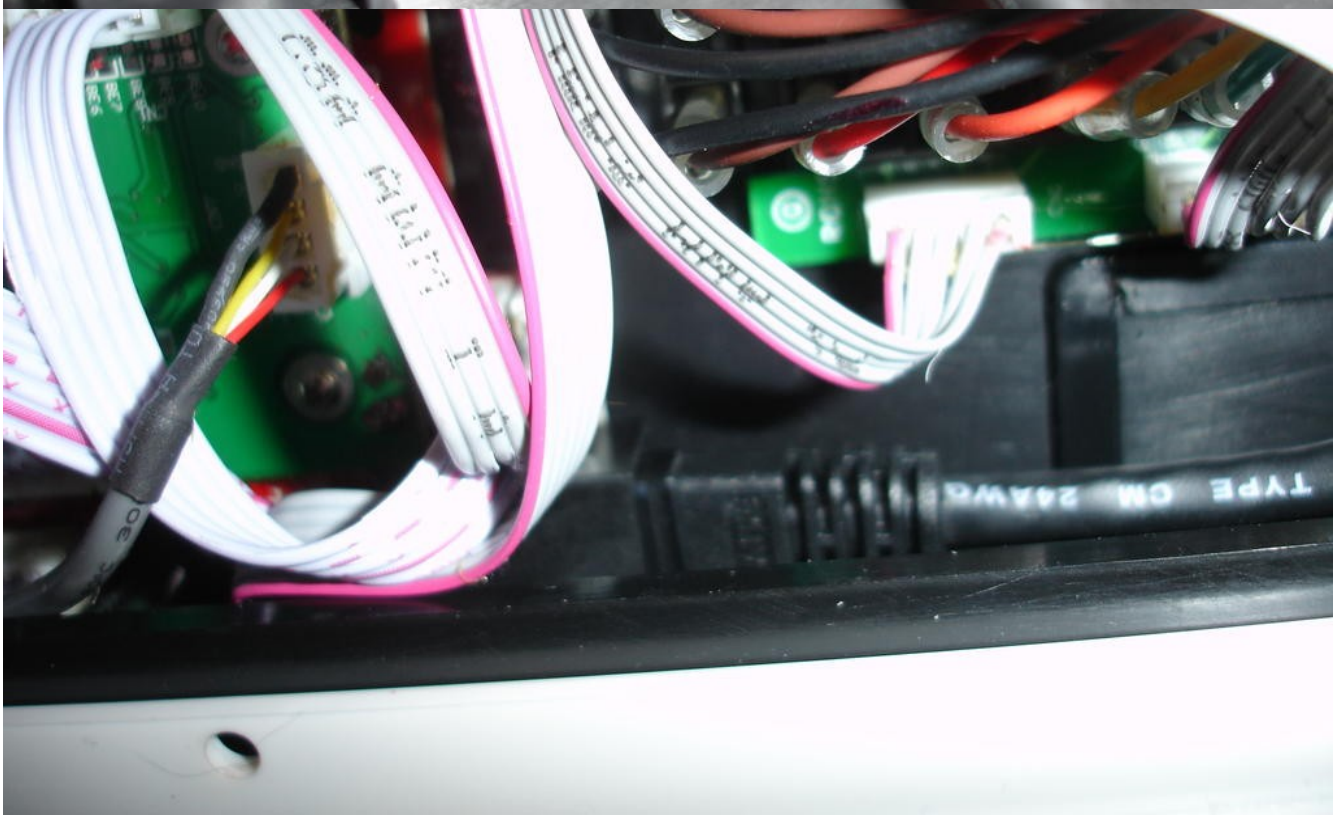
Make sure the two pieces are mated properly, hold them in place with one hand, and use your rotary tool or drill to drill two small holes through the mounting holes in the metal piece. Do not drill far! You just want the holes in the plastic case of the arcade stick. If you drill too far, you could damage where the screws go in the main body. It is best if you just start the drilling so it marks the spot in the plastic, then remove the inside main piece of the Neutrik jack, and then finish drilling through the plastic.

Replace the main body of the jack on the inside of the case, and screw the two screws through the new holes the main body of the jack. Reinsert PUSH piece.

Optional Step 5: Connect Jack to Kitty

Use the short Ethernet cable and plug one end into the inside of the Neutrik jack. Plug the other end into the RJ-45 jack on the bottom right cord of the Kitty.





Replace the top control panel and six top carriage bolts. Play and enjoy!

Version notes:
3/18/11 – v1.0 initial release.
3/19/11 – v1.1 Added screwdriver tip for connector removal in step 5.