

# Installation of the 5-11under YpbPr/Component Video Modification Board for the ColecoVision

Version 0.02 - May 21, 2010

Select a suitable ColecoVision console to modify. Before doing any work, test the unit, to make sure it's working properly. Find a clean area to work.



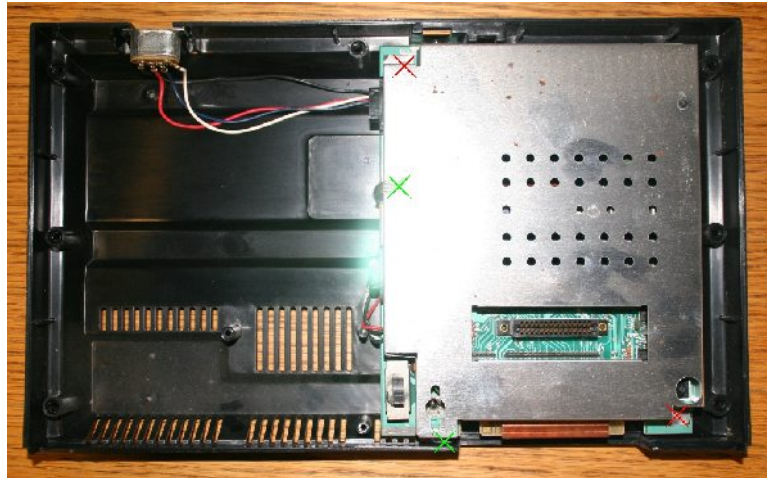
Remove the eight screws from the bottom of the console. A magnetic screwdriver comes in handy for this procedure. Do not remove the front panel sticker or the front panel.



Pry apart the bottom from the rest of the console. This can be a tricky step, and might take a few minutes. With the console upside down, grasp the front panel with your left hand. Pull the front panel away from the bottom of the console, until the lip of the bottom part of the console can be seen. Then, with your right hand, pry up the end of the bottom of the console. The picture shows the lip of the bottom of the console out its normal position. Repeat with the other end of the console, then carefully pull the bottom off. Don't use tools to pry the console open.



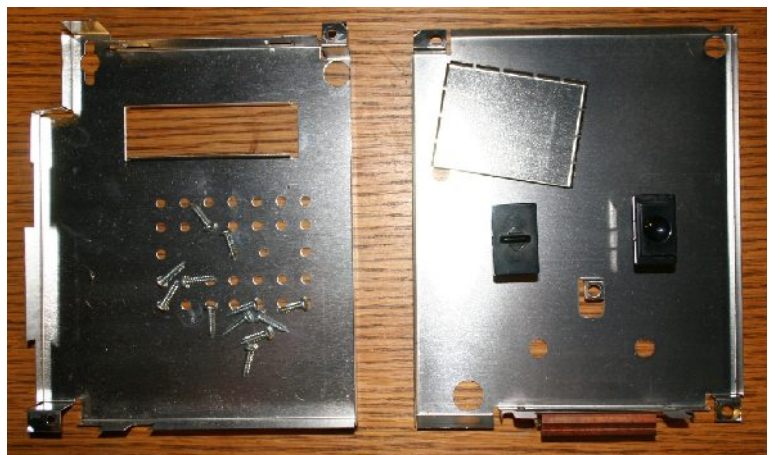
Remove the two visible screws. You may also need to desolder or pry apart the two soldered points, one on the left, and one at the bottom, near the left (shown as green “X”s in the picture).



Remove the two remaining screws. Note that all of the twelve screws are the same. Also remove the lid to the modulator.

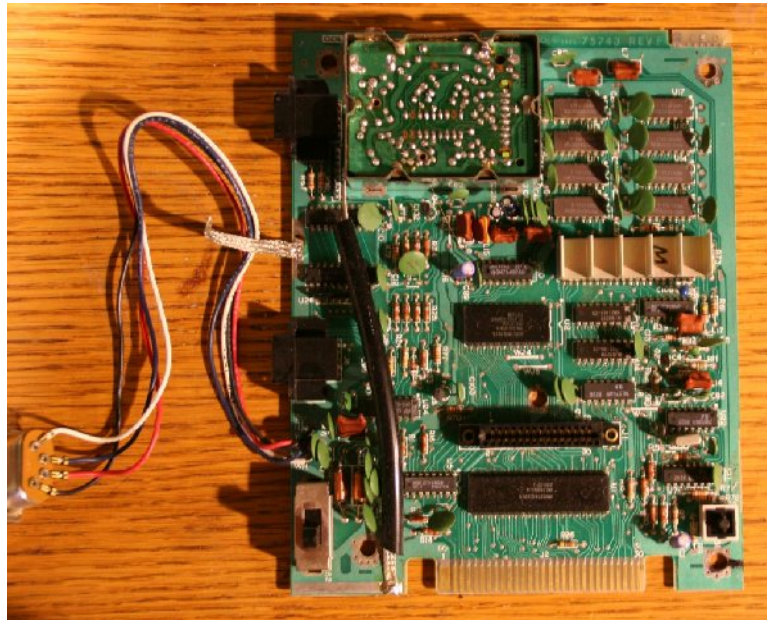


Remove the PCB. These are the parts you'll need to keep. Not shown are the top (with front panel and front expansion door) and bottom of the console.

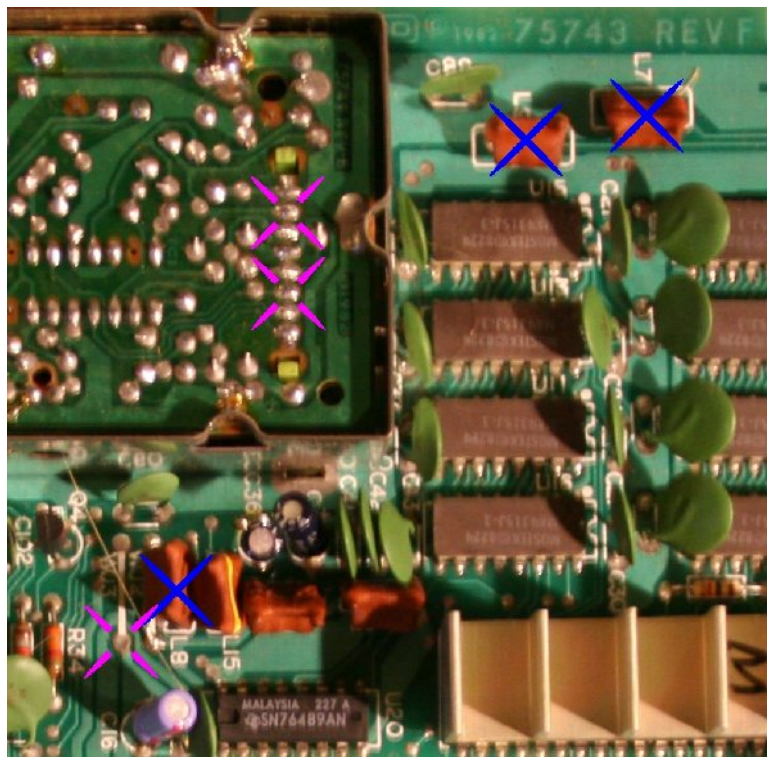




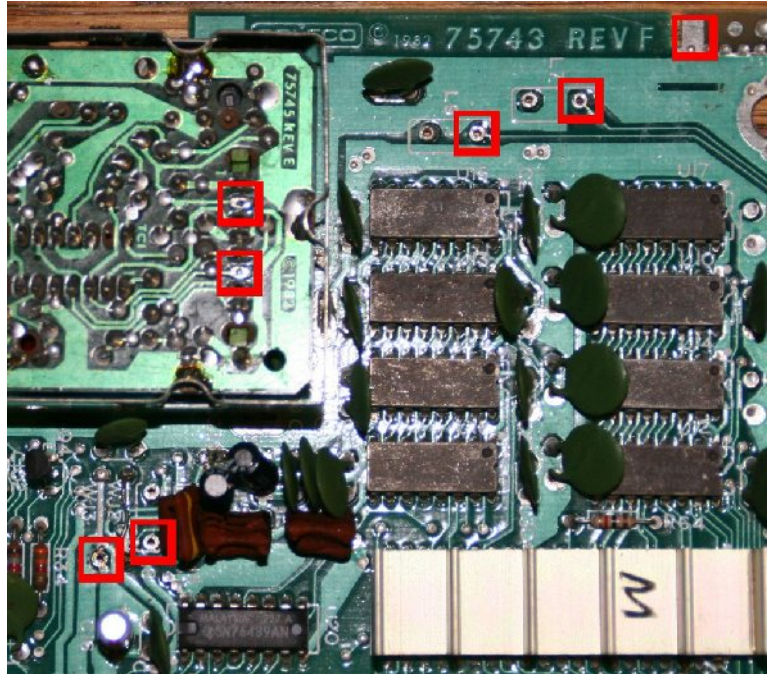
Here is the ColecoVision PCB. There are several revisions of this board, which may look slightly different than the one shown here.



Here's a close-up of part of the PCB. The inductors labeled L7, L8, and L9 (labeled with a blue “X”) need to be removed. Some revisions of the board are missing one or more of the inductors. If any inductors are missing, you should see a metal trace between the two points where the inductor would normally be. With a sharp knife, carefully cut the trace, leaving the rest of the circuitry in place. After removing the inductors, the pad holes should be desoldered, so that wires may be installed. Several other pads need to be desoldered to accept wires. These are shown with a purple “X”. They include the bottom of WJ3, and pins 2 and 6 of the single inline set of pads within the modulator (there are 8 pins total, with pin 1 labeled at the top). Don't cut off any of the pins; just remove the solder around the pin, to make it easier to connect wires to.

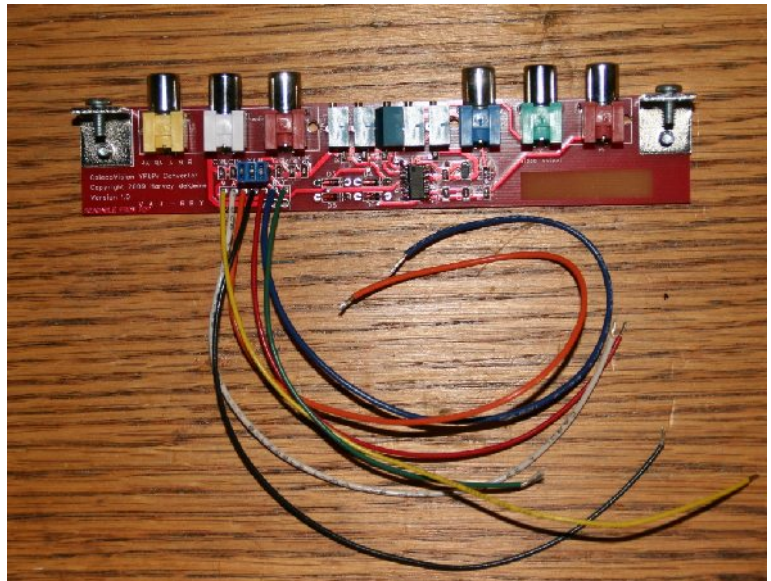


Here's a close-up of the board, showing all seven connection points that will be used, including the six pads that have been desoldered, and are ready to accept wires.



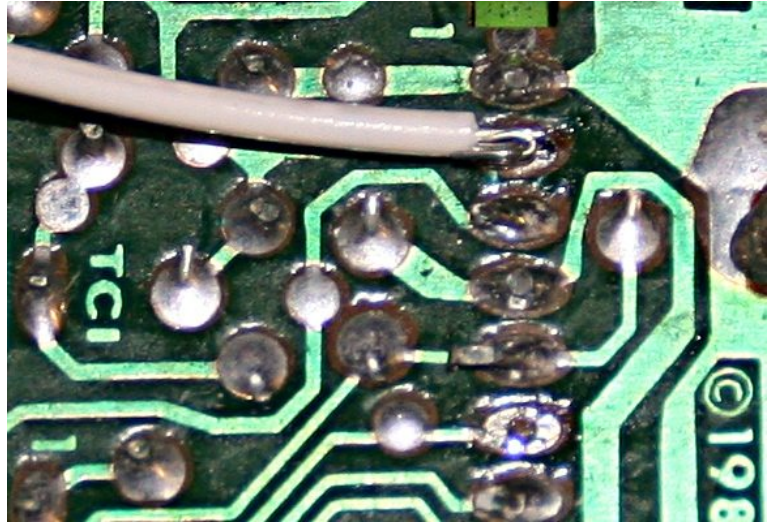
Here's what you'll be installing. If you don't have this part, you can buy one from me. :) You'll see seven wires that need to be connected to the ColecoVision:

- Yellow: Video from expansion module
- White: Audio
- Orange: +5V power
- Black: Ground for power and all signals
- Red: Red (difference) signal
- Blue: Blue (difference) signal
- Green: Luma signal

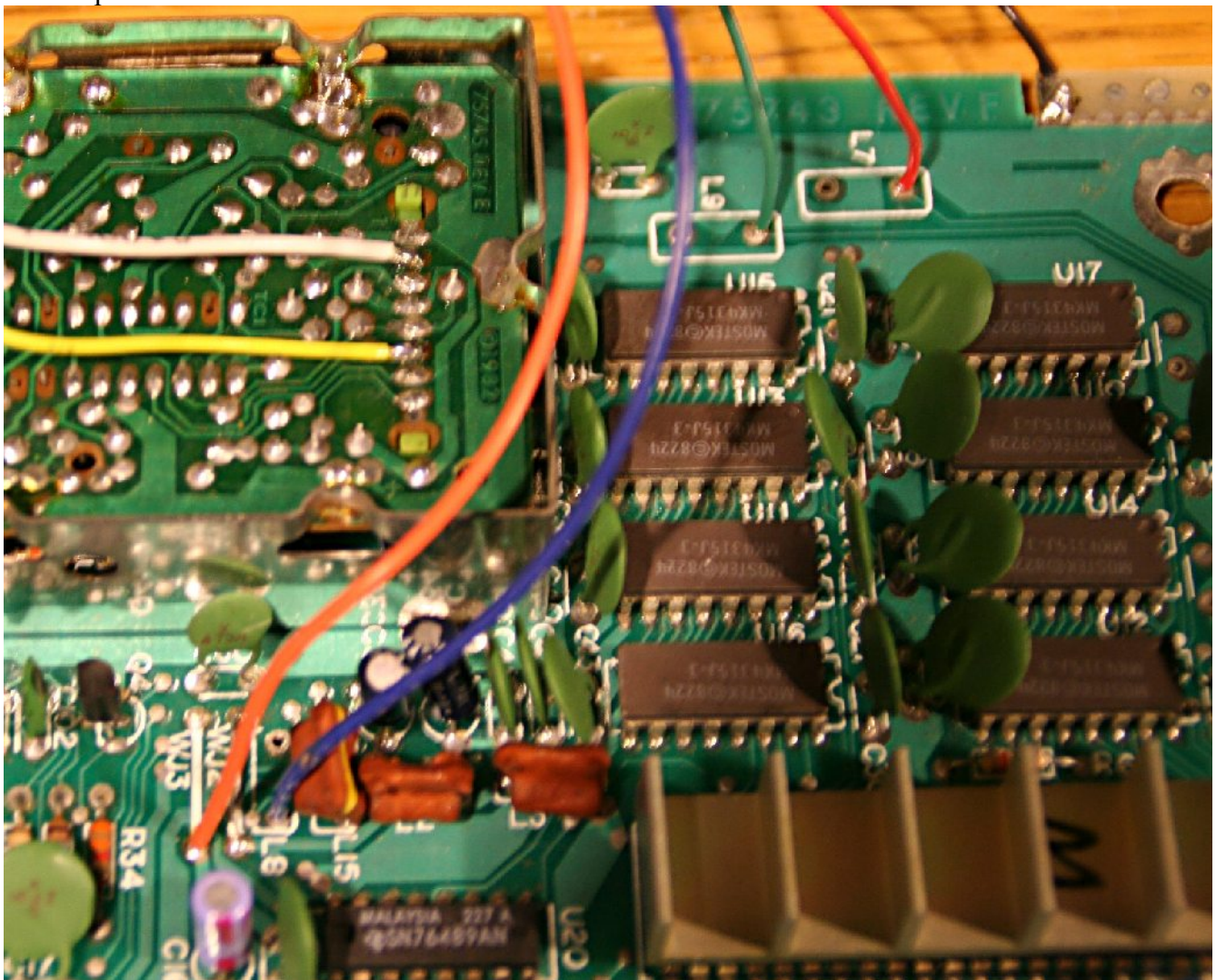




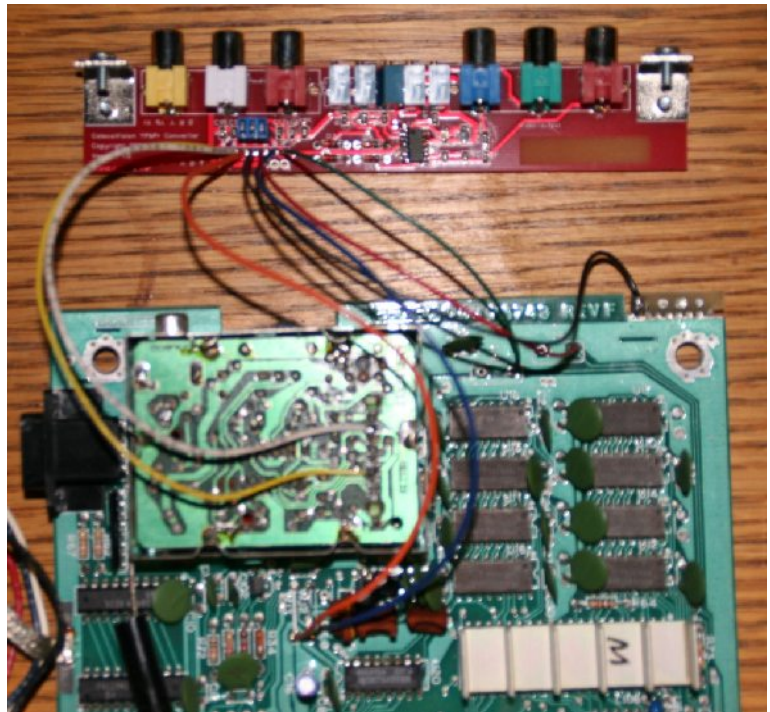
Place and solder one wire at a time. Ensure good solder flow and good connection. This picture shows the white wire with the strands crimped around the pin with pliers, and ready to be soldered. Ideally the connection should be solid prior to soldering. Make sure no strands are touching other connection points. You can also see the desoldered pad where the yellow wire goes. The red, green, blue, and orange wires need to be placed in the holes, and soldered from the bottom. The black wire is “spot” soldered on the top with a good amount of solder.



Close-up of the seven connections:



A wider view showing the modification board.



Make sure the power switch is in the off position. Connect a power supply, controller, and connections to a television via the YpbPr/component RCA connectors. You should see a picture something like this. If nothing shows up, ensure all connections are in the proper location. Some televisions may show slightly different colors, and the potentiometers may have to be tweaked to obtain the best image possible. If only minor tweaking is required, follow the descriptions of the potentiometers below. If major tweaking is required, you may want to start from scratch, as described starting on the next page. Once the picture looks good, don't touch the potentiometers.

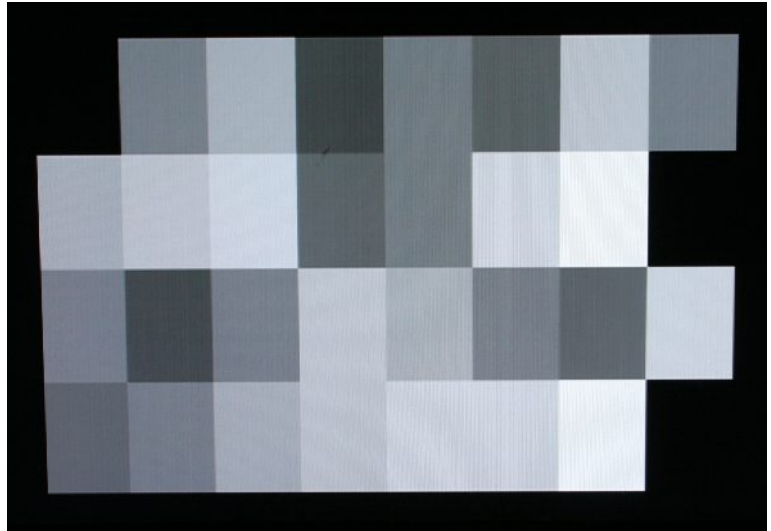


Viewed from the back, here's the order of the potentiometers, from left to right:

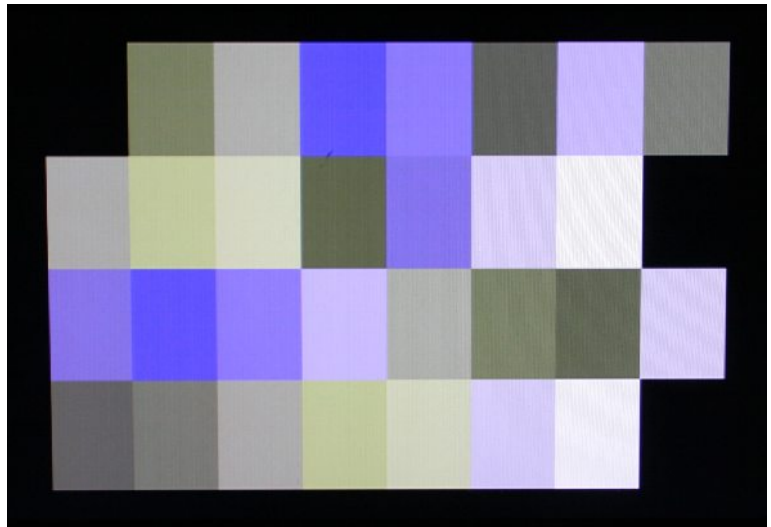
1. Blue - Counterclockwise (CCW) increases the blue level (sorry it's backwards).
2. Red - CCW increases the red level(backwards again).
3. Brightness - Clockwise (CW) increases the brightness.
4. Blue difference - CW increases the effect (brighter yellows).
5. Red difference - CW increases the effect (some other colors slightly brighter).



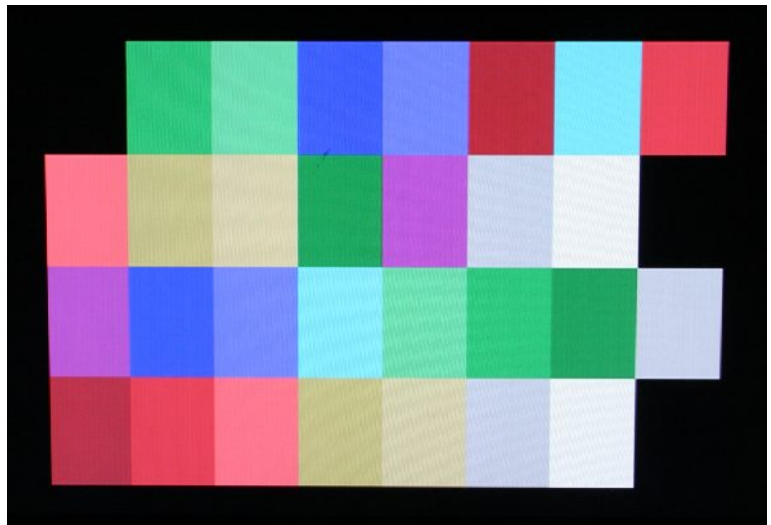
If you need to start from scratch, set the five pots (left to right) CW, CW, don't touch, CCW, CCW. You should see something like this picture, if you've got the video test cartridge installed and running. Adjust the brightness potentiometer to some mid level that shows varying shades of gray, as well as black and white, of course. Because the sync signal is on the luma (brightness) line, turning the brightness potentiometer too far CCW will make the picture flicker and/or disappear. Other affects can occur if turned too far CW.



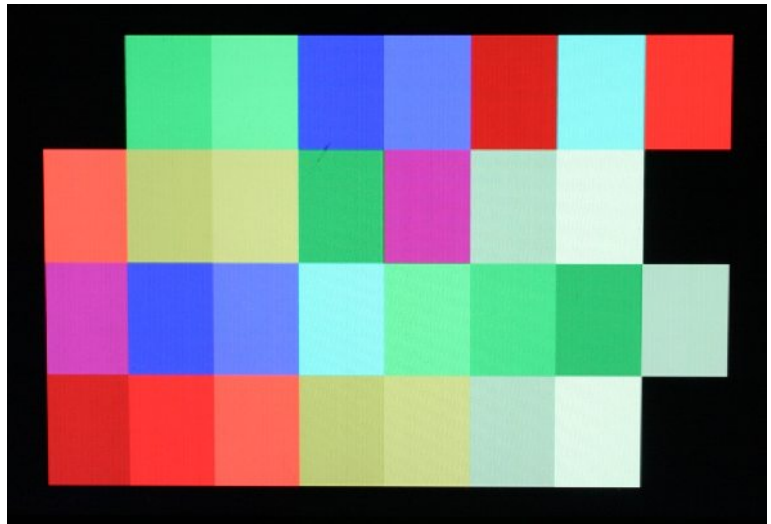
Turn up (CCW) the blue potentiometer until the fourth rectangle (the brightest blue one) is a fairly bright blue color.



Turn up (CCW) the red potentiometer until the picture looks something like this. Feel free to re-adjust the brightness, blue, and red potentiometers to suit. Notice that the two yellow colors are still quite dull.



Turn up (CW) the blue difference potentiometer. This is a key part of this modification. The yellows should brighten up, the deeper one to a fairly saturated level, as shown in the picture. Crank it up until the white square turns yellow, then turn back a bit until it appears white again. Tweak the brightness, blue, and possibly red to tweak, to get good color definition. Turn up (CW) the red difference potentiometer in the same way as the blue difference. This control is much more subtle than the blue difference signal, but will affect some of the colors to at least some degree.

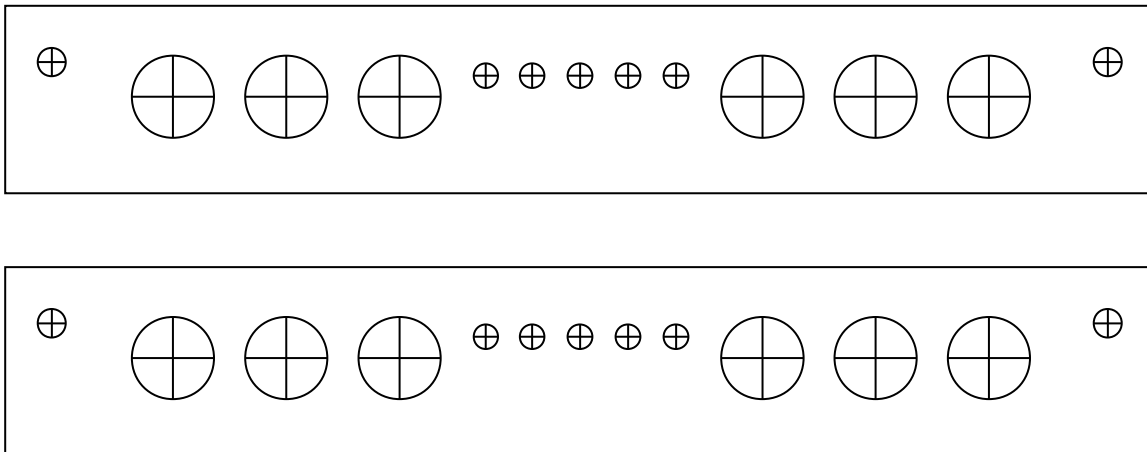


Hopefully the colors are now properly set, so you can enjoy playing some games. Unfortunately, I only have an early demo of this particular game.





Drilling template for ColecoVision YPbPr/Component video modification:



Print and cut out the template above. There's two, in case you need a spare. Make sure it's the correct width, to match the holes for the RCA connectors. The width of the rectangular template above needs to be 6.00". If it's not, print it again, verifying the scaling of the printout.

Tape the template to the back of the top piece of the ColecoVision case. The template should fit the case vertically fairly well, ignoring the small ledge at the bottom.



Detail of the taped template. Notice how the bottom edge of the template is flush to the main surface, with no overhang over the lipped edge.



Carefully drill the holes to the following dimensions:

Bolt holes:  $\sim 1/8$ " diameter

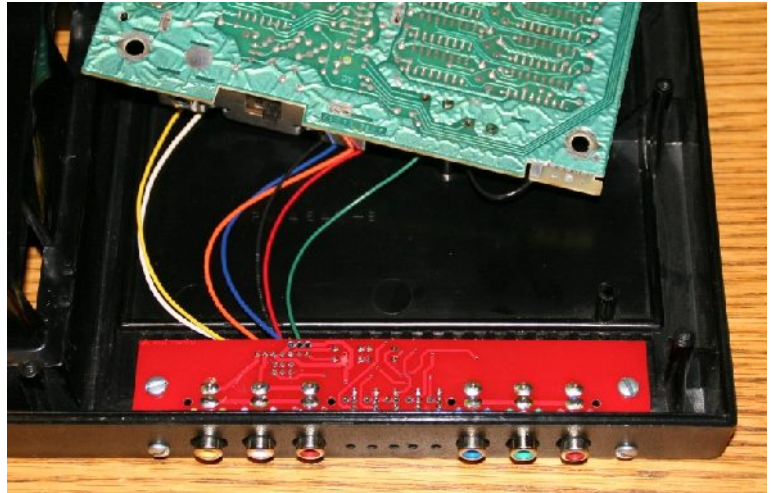
RCA holes:  $\sim 3/8$ " to  $\sim 13/32$ " diameter

Trimmer holes (optional):  $\sim 1/8$ " diameter

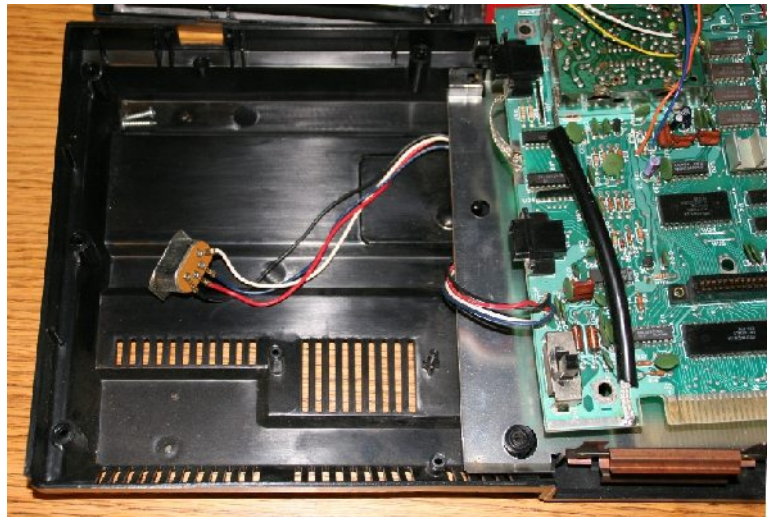
If using standard drill bits, it is wise to start with a small bit, then use progressively larger bits until the proper diameter is achieved.

Slightly larger hole sizes should be acceptable. Note that the RCA holes need to be able to accommodate the ground "ring" on the RCA cable you are using, because of the thickness of the ColecoVision walls.

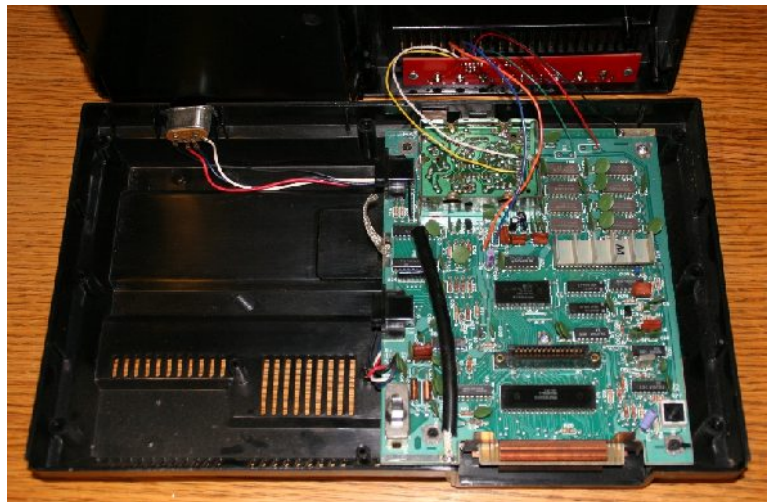
After the drill holes are cleaned up, bolt the modification board onto the case. If the “L” brackets don't fit, because the holes are too high, carefully file them down a bit and try again.



Install the bottom shield, and route the power cable underneath the centre post.

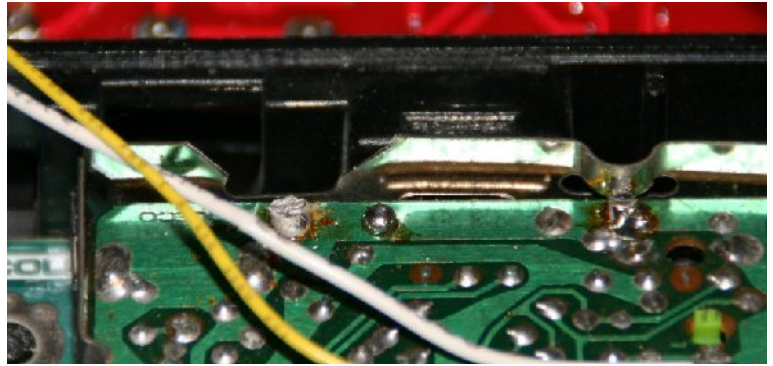


Set the main board in place, as well as the power input plug. Put the screws back in the centre and top-right locations.

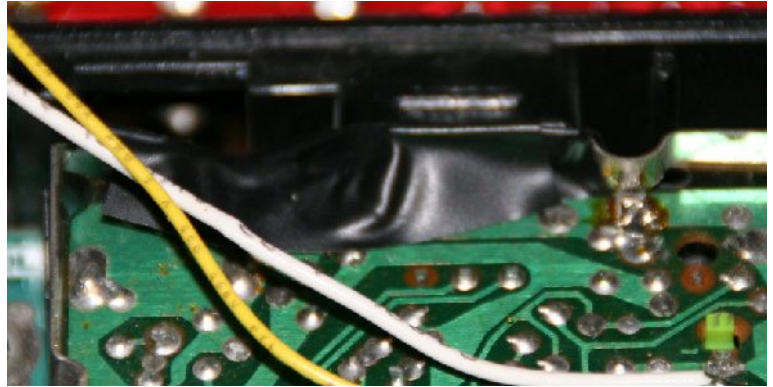




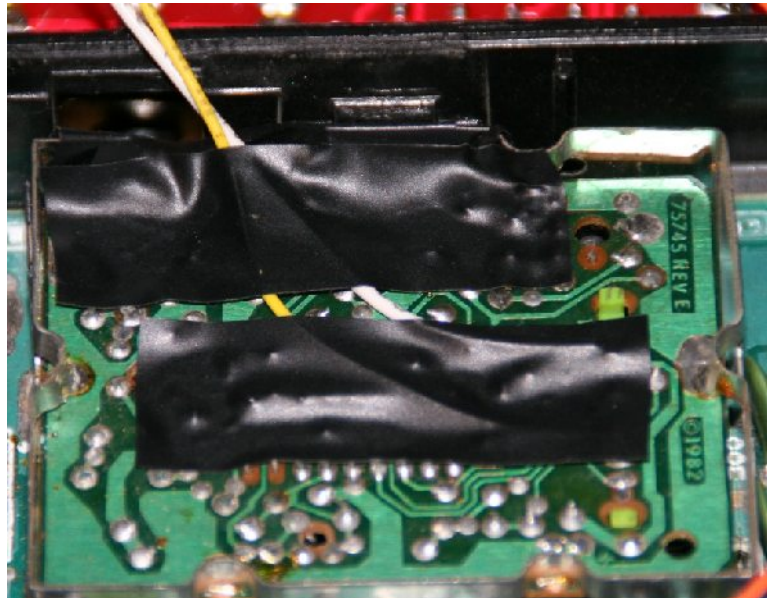
Using a pair of cutters, carefully remove part of the wall of the RF modulator, as shown in the picture. Wear safety glasses when performing this task, and carefully dispose of the extra metal material.



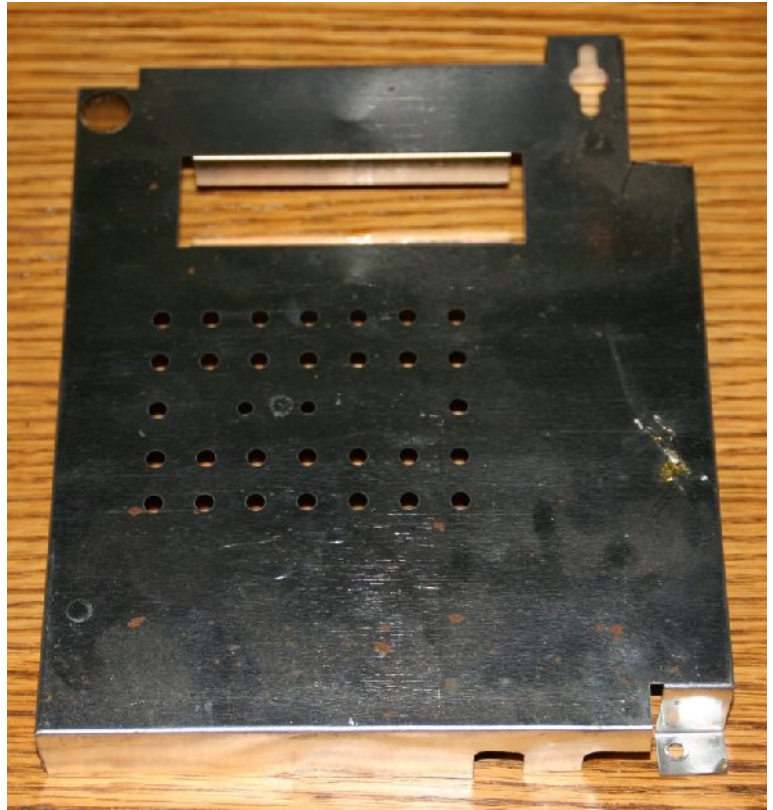
Place a piece of tape over the edge, so neither you nor the wires will get cut.



Add a couple more pieces of tape, to make sure the wires are guided properly through the opening that has been created.



Some work needs to be performed on the top shielding, to allow the wires to be routed properly, and to make sure the modification board doesn't get shorted out on the top shield. You can selectively cut an opening, but I've found it simplest to remove the whole back portion as described in the following steps.



Remove the back part of the shield: with a pair of pliers, gently rock the back flap back and forth until the creased corner breaks free. Be careful not to get cut from the sharp edges. Carefully dispose of the back piece that was removed.



Place a piece of tape around the edge that was “cut”, so you or someone else doesn't get cut.

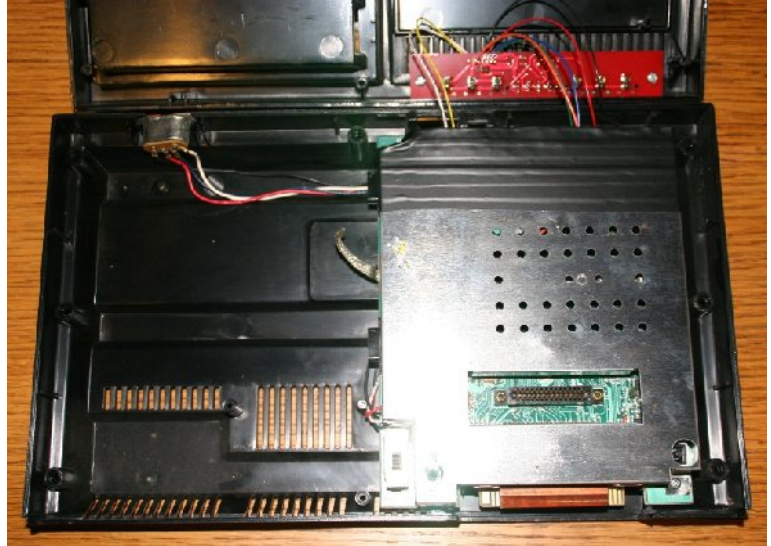




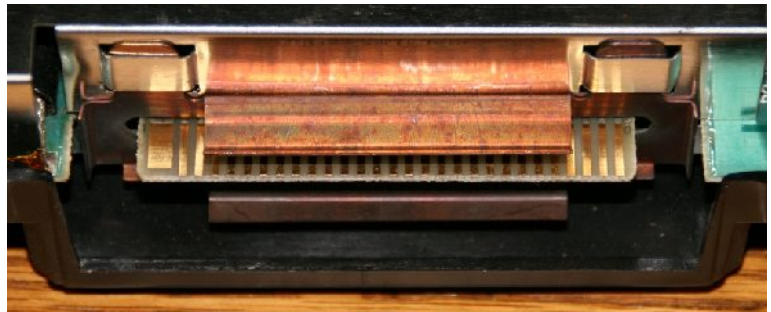
Place strips of tape on the top of the shield, at the back. Approximately nine pieces of tape should be sufficient. Place three pieces of tape beside each other, overlapping somewhat to ensure coverage. Add two more layers, so there's enough thickness built up. You may want to put an additional piece of tape over the edge, too.



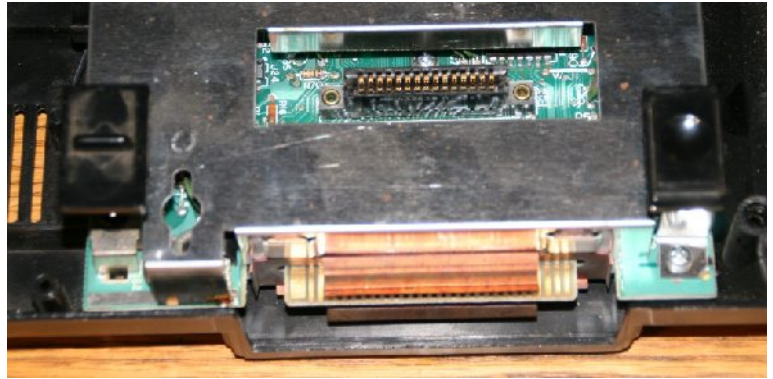
Place the top shield onto the main board.



Make sure the top shield interlocks properly with the bottom shield, as shown. Put the screws back in the to-left and bottom-right locations.



Place the switch covers in their proper locations.



Put together both parts of the console, making sure they fit together properly.



Make sure the switch covers are still in their proper locations.



Put the 8 screws back in the bottom of the case.



The modification is complete. Check everything over, and enjoy.

