

Moome Contrast Adjustment Process

Background

Most Moome cards have a multi-turn potentiometer where the contrast value can be adjusted. Although it isn't recommended to ever touch this pot, sometimes it happens by accident or because it's just tempting. What most people don't know, is that this setting controls the voltage of the analog video outputs and has a big influence on the overall picture quality.

For almost all video standards and for the inputs of a CRT Projector, the voltage for analog HD video should be 0.7 volts peak to peak (pp). If you use a higher voltage than 0.7 volts pp you will hurt the gamma response and eventually start clipping detail off the top end because the video chain inside the projector can only accept voltages below 0.7 volts pp. If you go above the correct voltages all details will start to get lost at progressively lower IRE levels as you increase the voltage. First details will be lost at 90 IRE and above, then 80 IRE and above and so forth. If you go too low on the contrast, the light output from the projector will suffer, you will experience crushed blacks and your gamma response will be wrong.

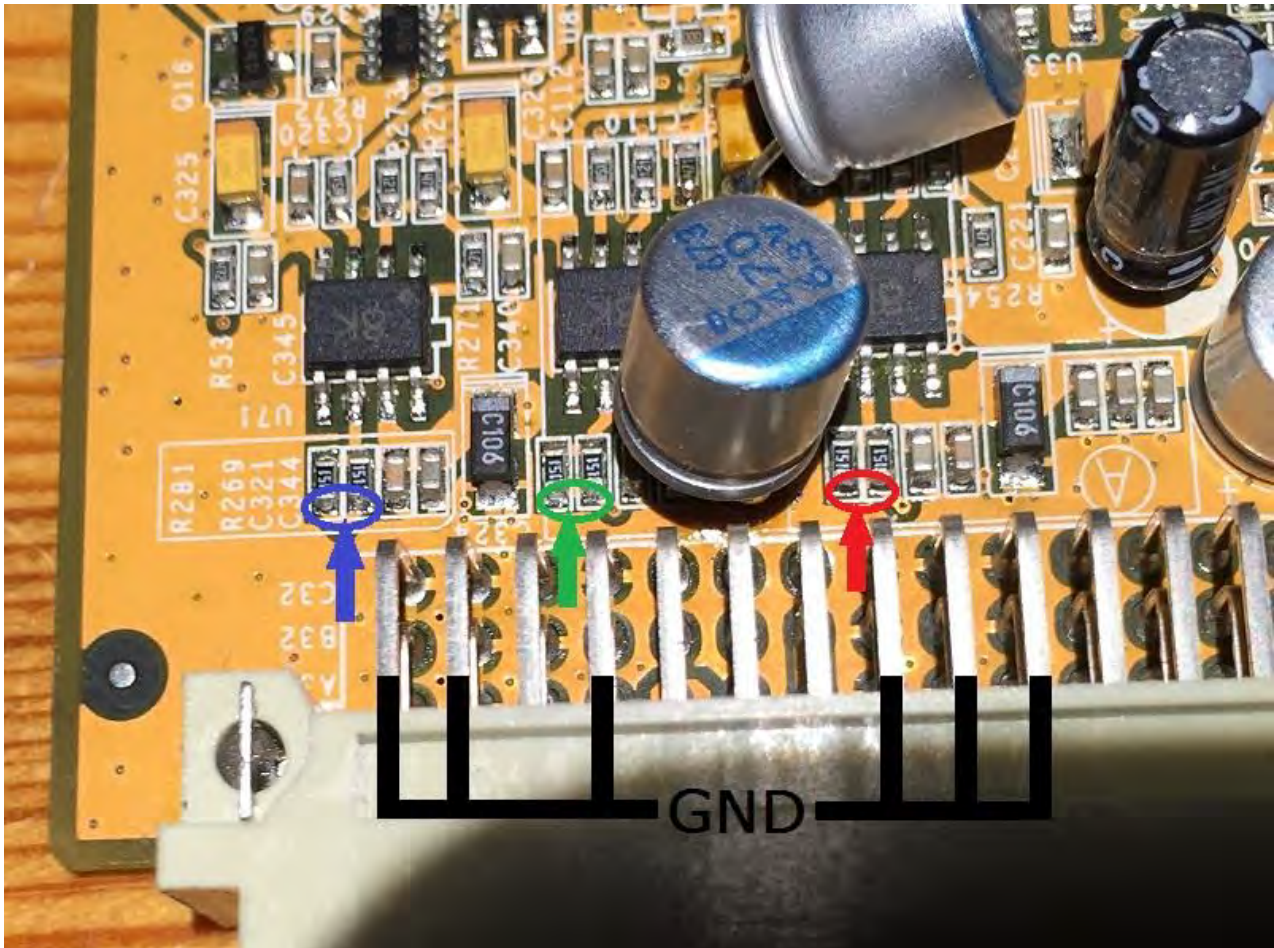
Even voltage variations from 0.7 by as little as 0.1 volts are quite deleterious to the final image.

What do you need

You will need an oscilloscope, a piece of coax wire, soldering equipment (fine tip!) and a controllable HDMI video source (e.g. Test Pattern generator, a computer or a BD player with a video test disc).

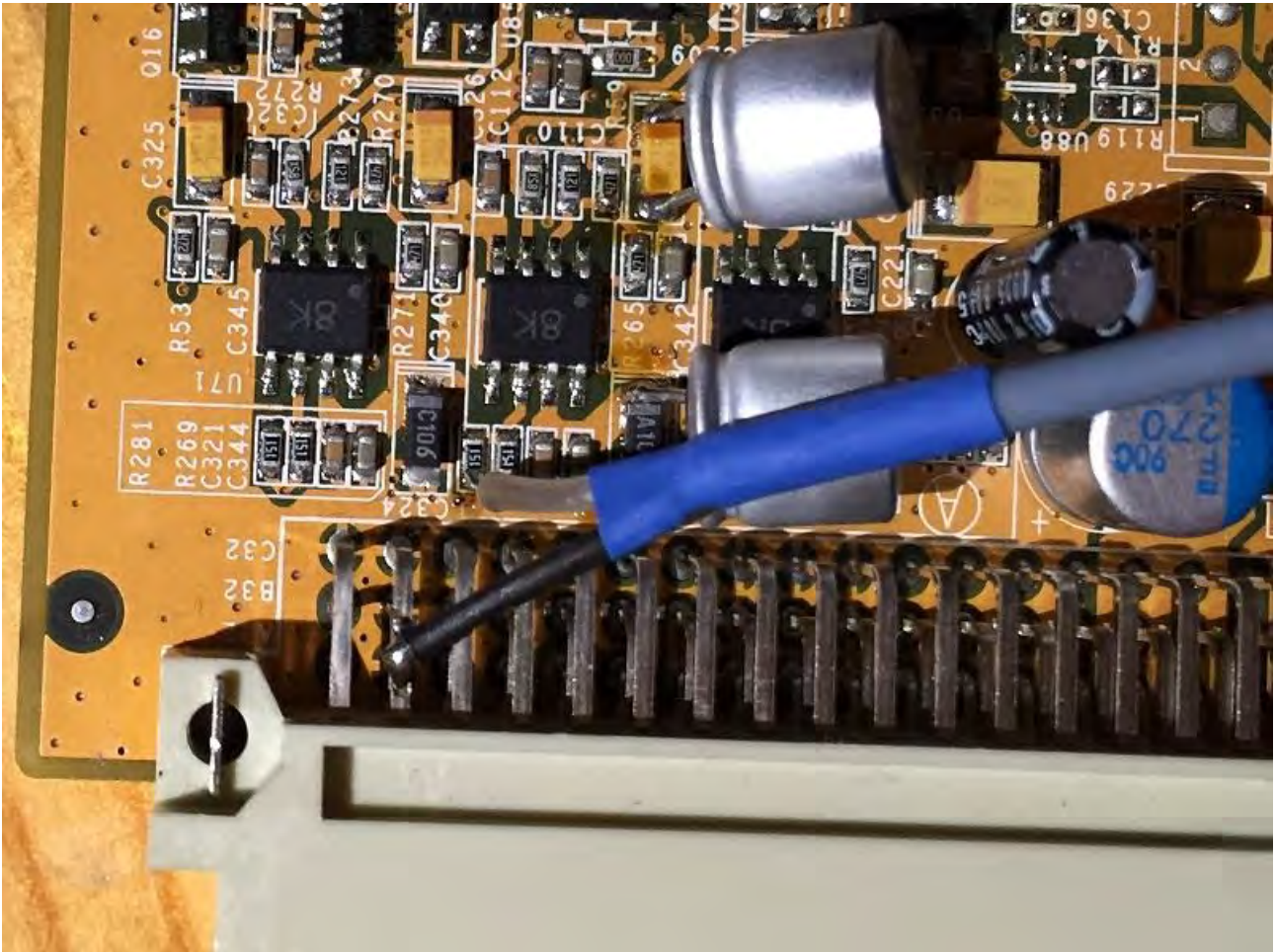
Preparation

Remove the Moome card from Your Projector and identify the Red, Green and Blue outputs:



As the output pins at the connector are completely surrounded by ground pins, it makes sense taking the signal from the circuit directly. Each amplifier has two 150 ohm resistors (connected in parallel and resulting in 75 ohm output impedance) at its output. The circles in the picture show the location where the signal can be tapped. We will use the green signal only.

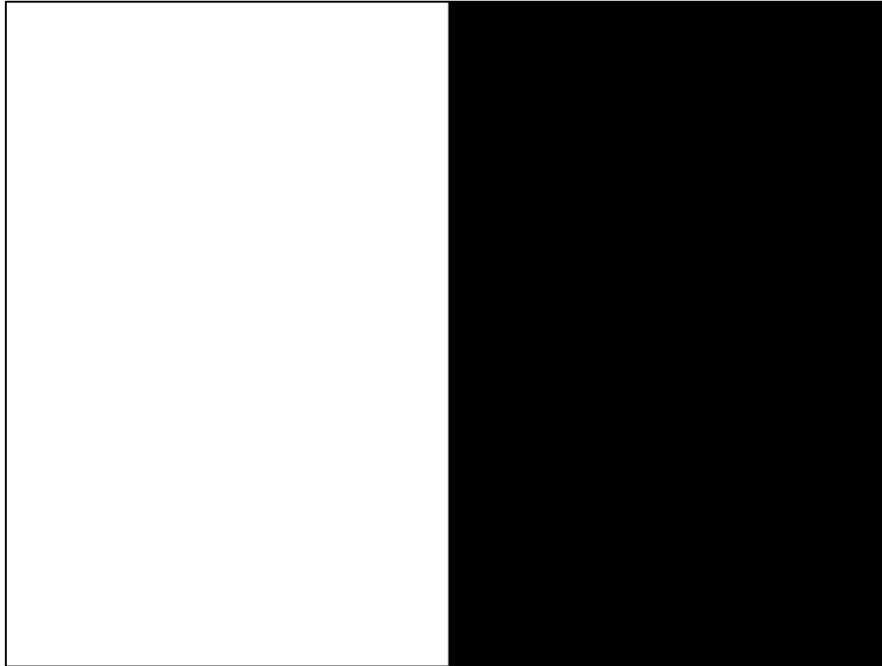
Solder the coax wire to one of the green output resistors and a nearby ground pin. Run it out the back when you plug the card into the projector. This works best when the slot above (where the Decoder Board would sit) is empty:



Connect the oscilloscope to the coax wire from the card (ground to ground and signal to input). Set the oscilloscope input to 200-500 mV/div (depends on manufacturer and model) and DC coupling. The sensitivity setting should allow for a 0.7V signal to be seen entirely on the screen at enough vertical resolution (e.g. using most of the oscilloscope's screen height). The timebase and trigger settings depend on the resolution of the HDMI signal that you will feed into the Moome card. Choose them accordingly, so that the signal display will be stable. For most HD-Signals 1-2 μ s/div will be OK.

Adjustment using the oscilloscope

Switch on the PJ and feed the card an HDMI signal with a picture that has at least one bigger area with 100 IRE white and an adjacent full black part. I used an image which is half white on the left and half black on its right side. Then I let a computer show it in full screen (Picture viewer -> Slideshow):



Now adjust the contrast potentiometer so that the white window is 0.7 volts above the black background as seen on your oscilloscope:



After this, switch off everything, remove the Moome card, remove the coax wire (make sure not to leave any solder blobs) and put everything back together. Done!