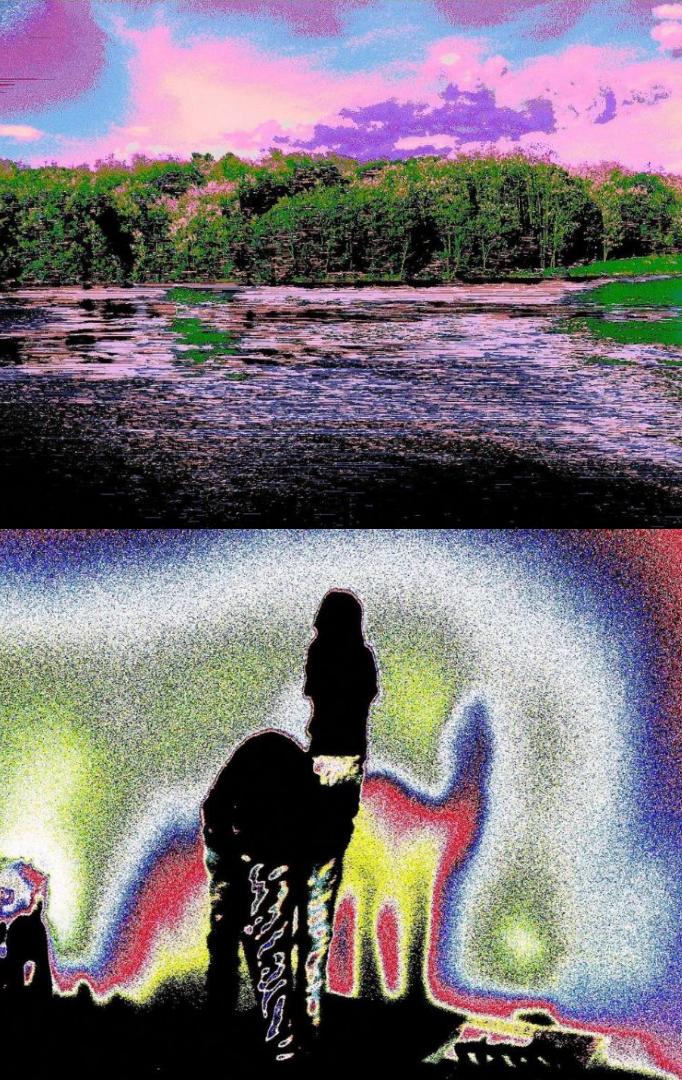


Camera Bending Tips & Tricks

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Parts

- Camera: We'll use the canon A540 as an example, but any late 90s early 2000's camera should work; you just have to experiment!
- Switches: Enameled On-Off-On Switches (2 effects per switch)
- Buttons: 8-10mm On-Off momentary or latching switches (momentary for interrupt functions)

Amazon List of Tools and Parts <https://a.co/aEclwWY>

Tools & Materials

- Soldering Iron Hakko FX-880D
 - Tip: Hakko T18-C1/05 (1mm or .5mm)
- Helping Hands
- Solder: Lead-Free Silver, Flux Core Sn99, Ag0.3, Cu0.7
- Wire: 34 AWG Magnet Wire
- Jeweler's Glasses, Microscope, Magnifying Glass
- Wire Snips
- Screwdriver (Electric Screwdrivers are awesome)
- Power Drill/Drill Press
- Glue Gun
- Super Glue

Amazon List of Tools and Parts <https://a.co/aEclwWY>



Getting Started

- Take out all of the body screws (Be sure to look in the battery compartment, and to look around after the back has been removed)
- Remove the Front and Back Plastic Covers
- Take out the screw holding the screen in place, and lift the tab holding the ribbon before removing the screen.

Link to Disassembly Guide:

<https://www.ifixit.com/Guide/Canon+PowerShot+A540+Back+Cover+Replacement/39960>



Trimming the Viewfinder

Take out every screw connected to the black plastic viewfinder.

*Be careful of the board connected to the flash. If you touch it, it will shock you and it will hurt. If a piece of metal touches it, you can fry the camera.

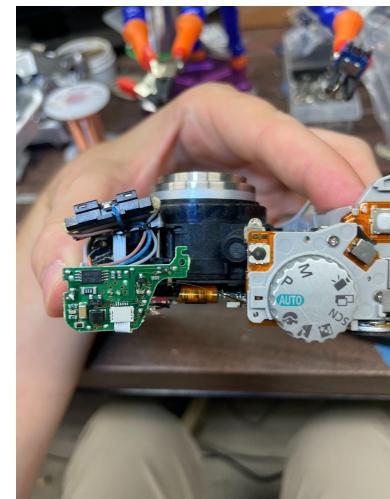
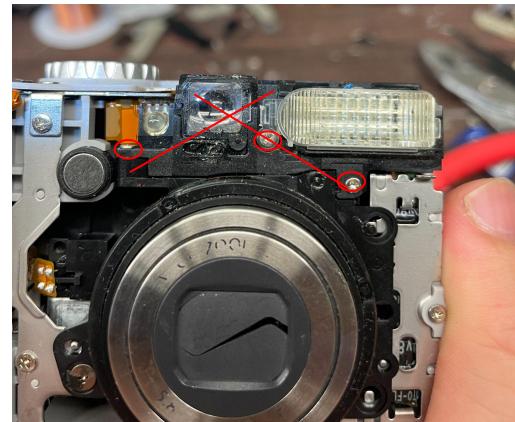
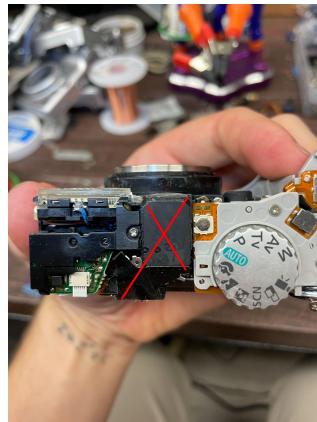


Trimming the Viewfinder

After the screws have been removed, trim/break as much of the plastic as you can (we want to remove it entirely).

There is a metal pin that holds the flash bulb onto the plastic, and it's stuck just under where the flash lens is screwed in. Once removed it will come apart easily, but you have to dig for it.

Cut away at the plastic until you can get at the pin and pull it free.



Important Notes on Case Prep

Once the viewfinder is removed, be sure to:

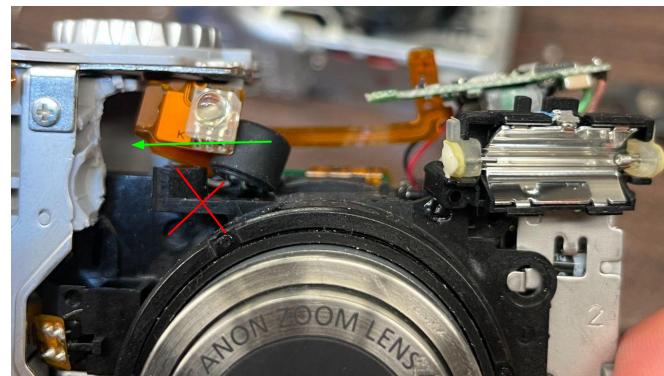
1. Superglue the Lens onto the case (only do this after you've painted! It's way easier)
2. Drill a hole the size of your desired switch just a bit below where the LED normally would be
3. Trim all of the plastic in the LED area including the microphone, and push the LED/microphone into the cavity to make room for a switch.



From this:



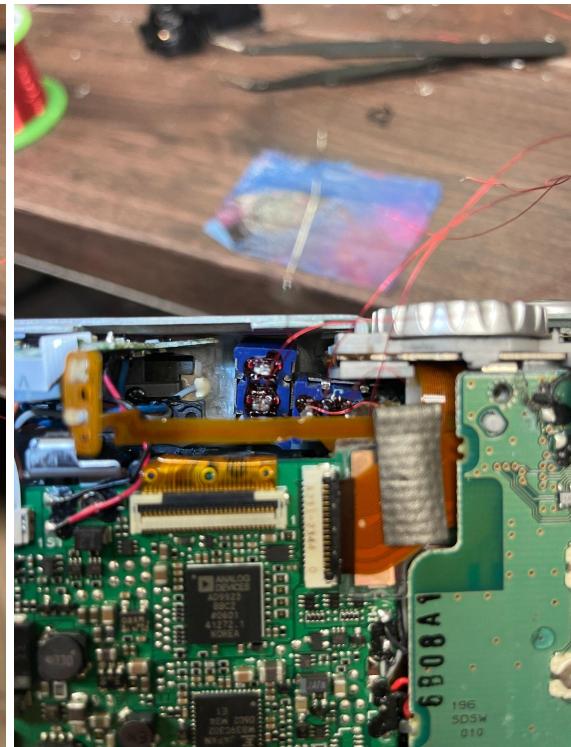
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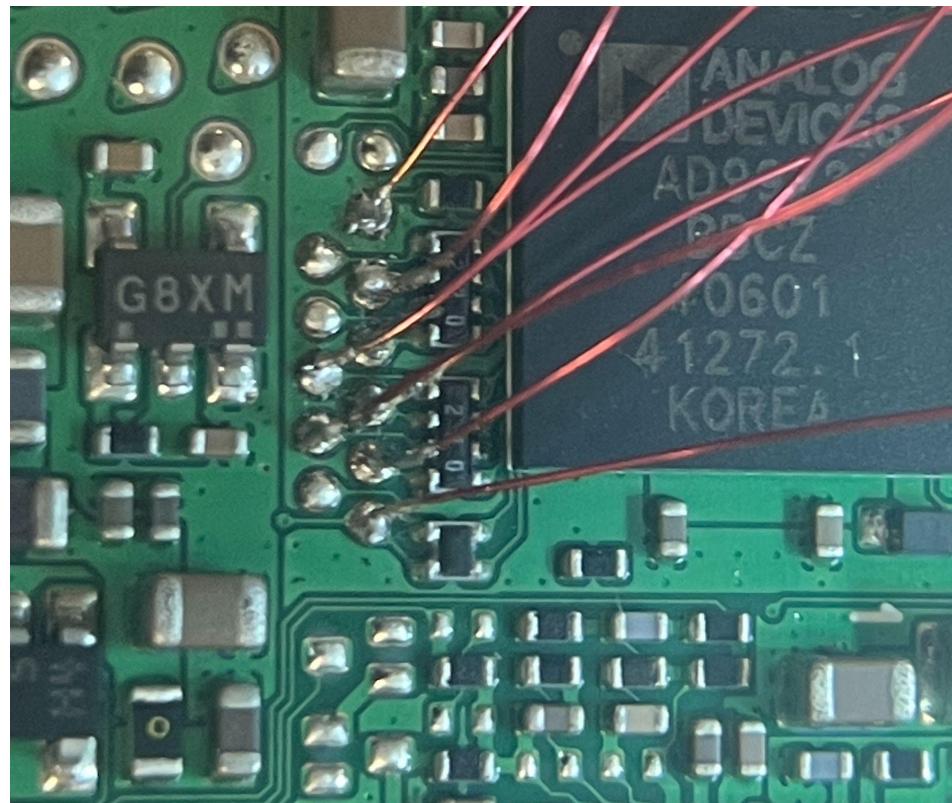
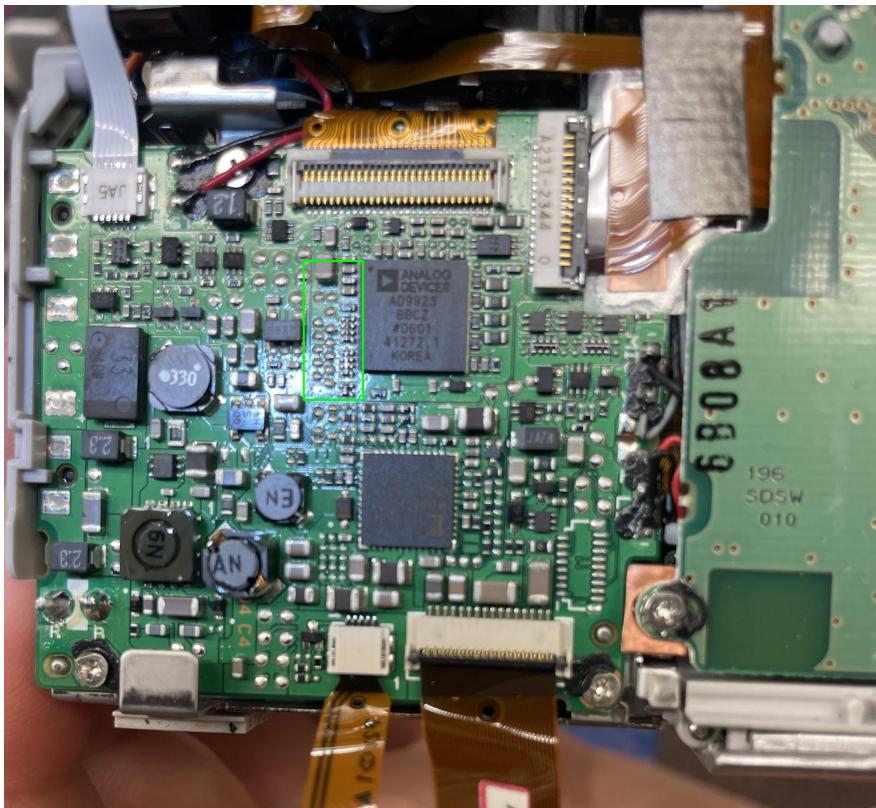
Test Fit Your Switches

If you've done everything correct, you should be able to fit two switches through the viewfinder and the hole you drilled with a vertical and horizontal orientation side by side.

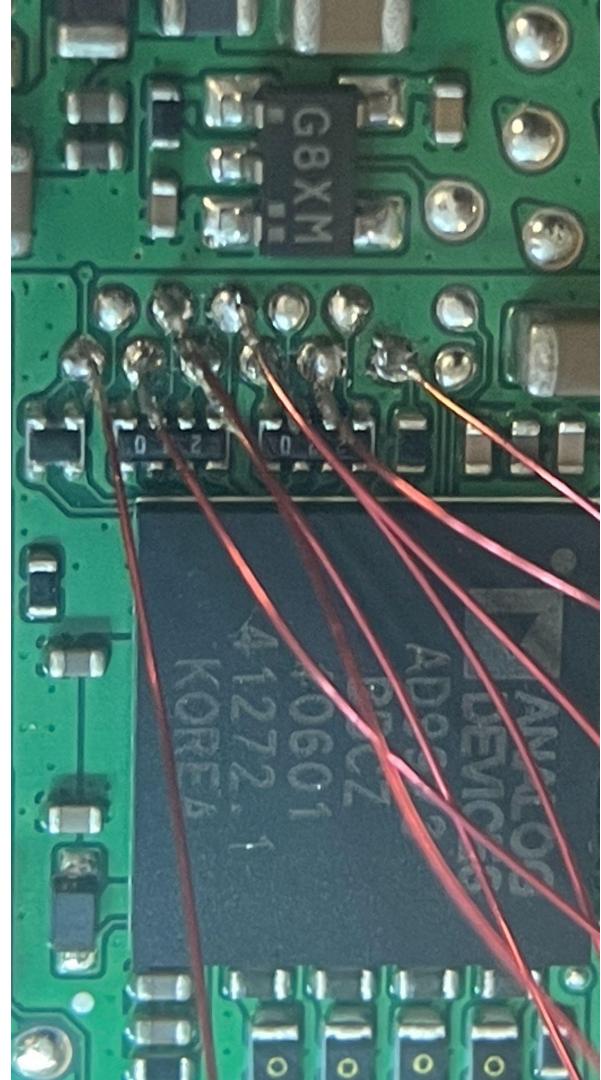
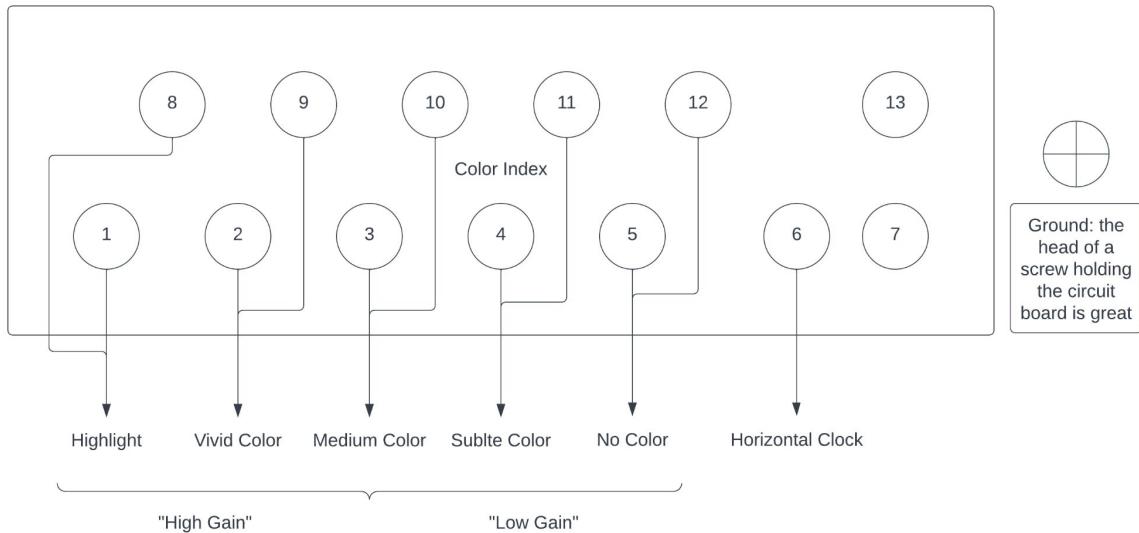
At this point I usually work with the front case on, and install the wired switches as I go along.



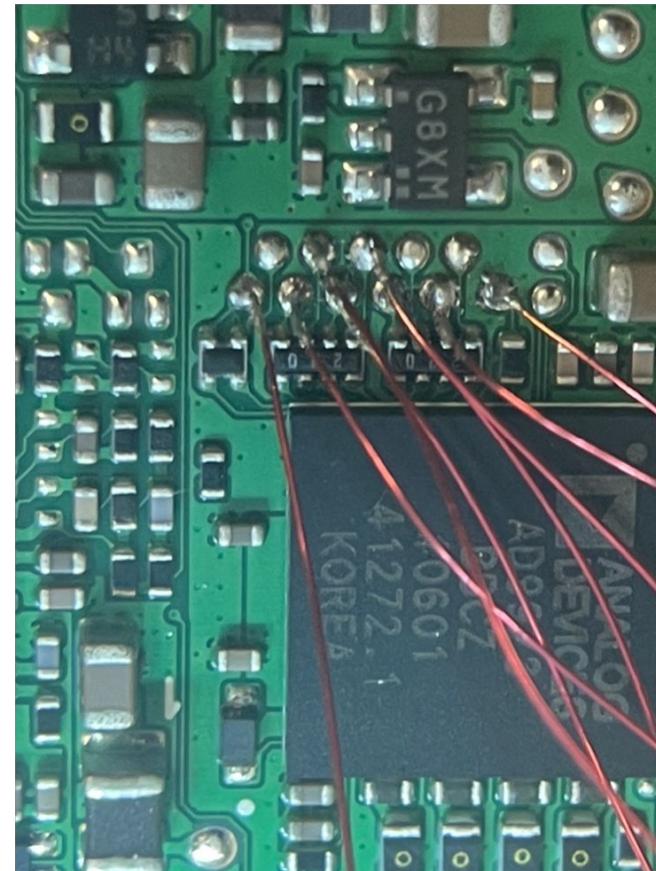
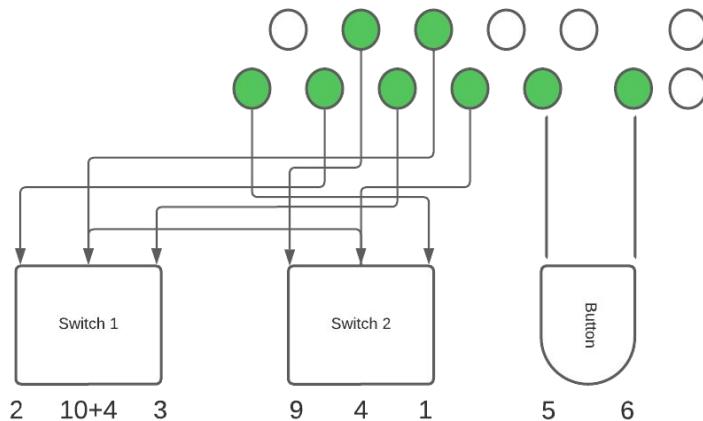
Wiring: CCD Test Points - What to look for



Wiring it up: Colorizers, Clocks, and Interrupts



Canon A540 / Glitchwerks Lightbender



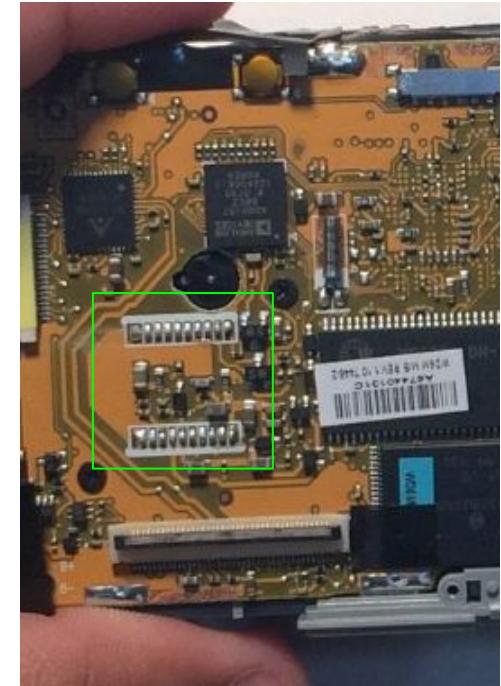


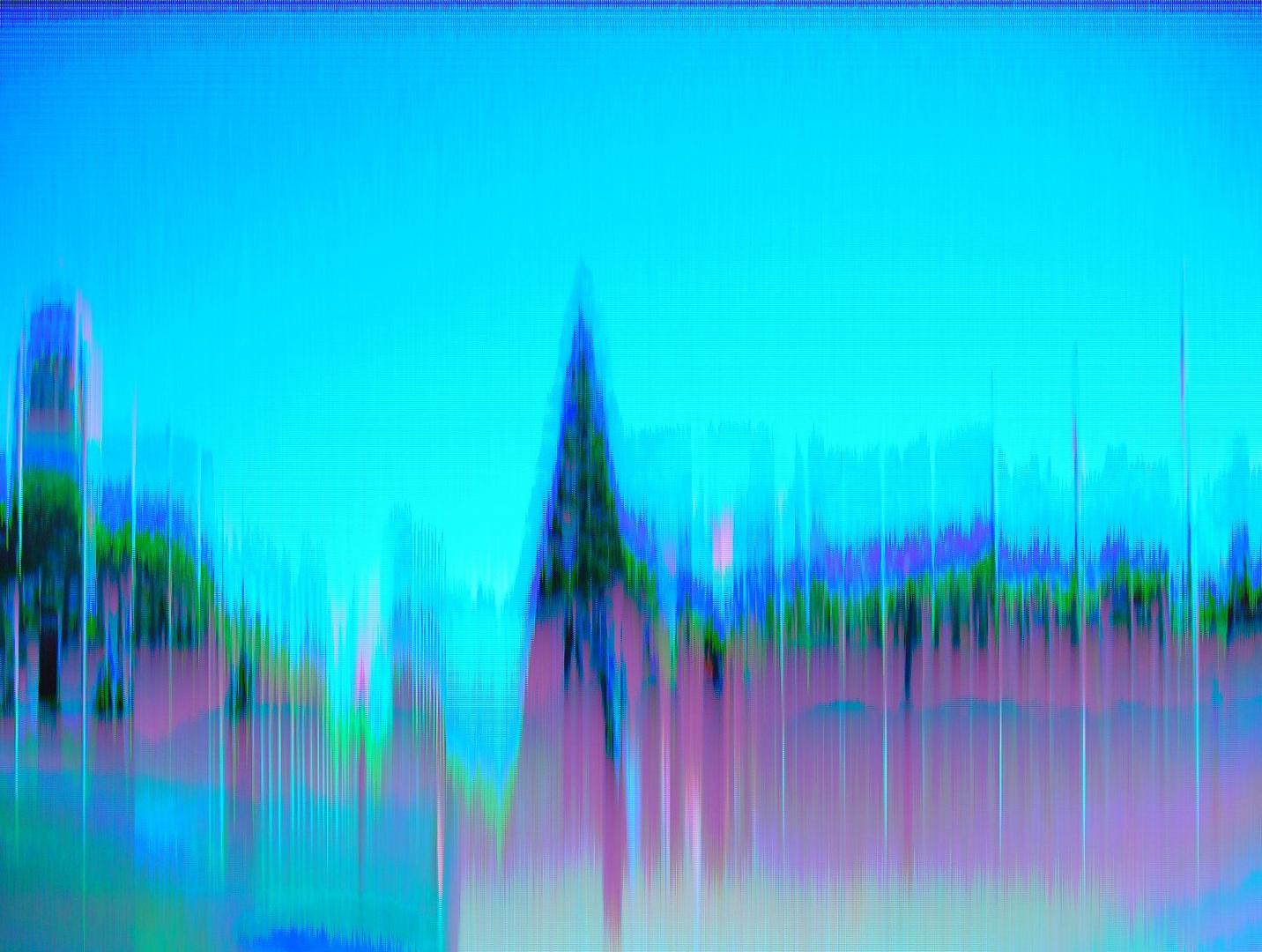


Side-note: Sensor Points & Melt Effects

You can bridge points on the sensor! It usually creates an effect similar to the horizontal clock effect, but vertical, i.e. a “Melt” effect. Pictured on the right is an example of how these points look on a canon A520 and an HP Photosmart.

You'll see these A LOT on cameras where the sensor is soldered straight to the board. **Be careful**, because there are pins that run power, and bridging them can fry your unit.



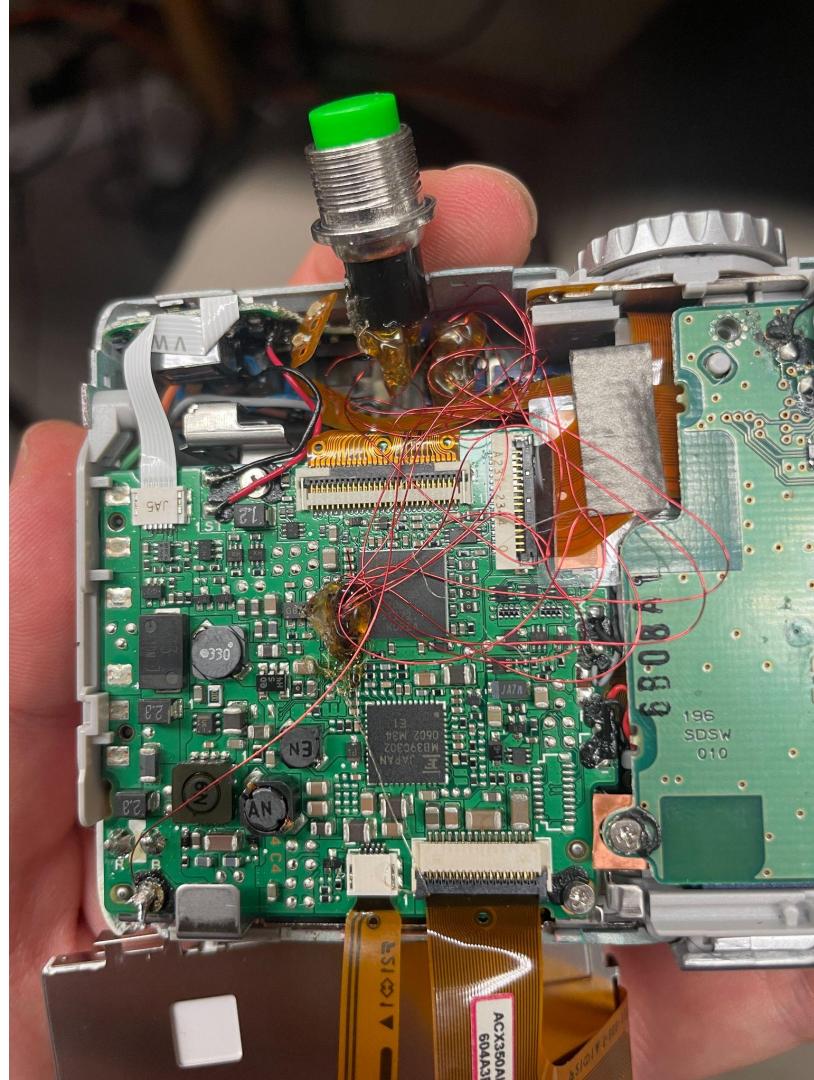


Secure your bends

Once you've soldered all of your points and you are confident that they are secure (super important), use your glue gun to coat the points on the board as well as on your switches.

This will prevent the bends from coming off in case your camera takes a tumble, and it will prevent possible short circuits from the screen or other metal points in the case.

It looks a mess, but it does the job. Once the glue has cooled, do your best to tidy up the wire and either in the cavity with the switches or get it to lay flat against the circuit board. The enameled wire shouldn't short anything out.



Close it up

- Install the front switches if you haven't already. You can use your finger to put pressure on the back while you secure them with a washer and nut. Use pliers to make sure that they are tight
- Put the screen back on and secure it to the board using the screw from earlier.
- **Important:** Test your camera after installing the screen to check for shorts. If there's a problem with the switches or buttons, look for areas of exposed wire and touch it up with a dab of hot glue.
- Clean the screen and the inside of the plastic window, and secure the momentary switch via the viewfinder on the back before reinstalling the back case.
- **TEST IT AGAIN** before putting all of the screws back in, and you're done!

*Depending on the size of the momentary switch you used, you may need to drill a wider hole for it to install on the back of the case.



Troubleshooting Common Problems

- Button Malfunction - Sometimes a short can cause the buttons to stop working. Check for shorts or damage to ribbons. I've had to replace the button board a few times.
- Bad Soldering - If your points aren't secure, switches might stop working after a little while. Practice your sequence, and do your best to avoid having to re-solder points. It's the worst feeling when this happens!
- Permanent Bends - Sometimes you'll bridge a point with your iron and it just gets stuck. It doesn't matter how much flux you use, the camera is permanently in a bent state. Accept it for what it is!
- You killed the camera - If your sensor is showing a black screen or it won't power up at all, chances are your camera is dead. Sometimes this can be due to corrosion and can be cleaned up/fixed, but if it happens out of nowhere just keep it for spare parts and try again.

Big Lesson: Don't Get Greedy When Looking for Bends

It's SO easy to get excited about circuit-bending and jump all over the board looking for combos that might make some new effect, but the truth is that there are only a couple good places to look for bends on a camera. If you get greedy and you don't know what you're poking at, chances are you will kill your camera.

I've killed so many cameras, it pains me to look at the boxes I keep them in, but it's ultimately a part of the process! You live and learn, but if you get comfortable doing what I showed you today, you'll have no problem looking at other cameras and finding new ways to glitch!

Thank you!



For more info, hit me up
@Glitchwerks on Instagram!

