CaT troubleshooting

**Generally - if there is anything wrong, try these troubleshooting steps in order:**

- Make sure Raspberry Pi turns on when plugged in (if not check "Pi not turning on" section below)
- Make sure all cables are plugged in:
    - USB-C to Raspberry Pi
    - 12V barrel power to PCB
    - 4-pin stepper motor connector to PCB
- Restart application and/or pi.
- Make sure emergency stop button is released. To do so, turn it clockwise until it springs upwards.
- Make sure the screen is connected, set up properly, and not damaged (check "troubleshooting screen" section below).
- Replace the Arduino Uno. Remember to reconnect the USB cable to the new board.
- Replace the PCB.

Pi not turning on

Useful link: https://www.makeuseof.com/tag/raspberry-pi-wont-boot-fix/#:~:text=Check%20the%20Red%20and%20Green,Ethernet%20status%2C%20if%20connected

- Check that the USB-C power cable is plugged in.
- Try unplugging and plugging the USB-C cable back in.
- Try a different power supply.
- Remove SD card, wipe the metal contacts, and then re-insert the SD card.
- Check the LEDs on the Pi – they may give info on what is wrong.
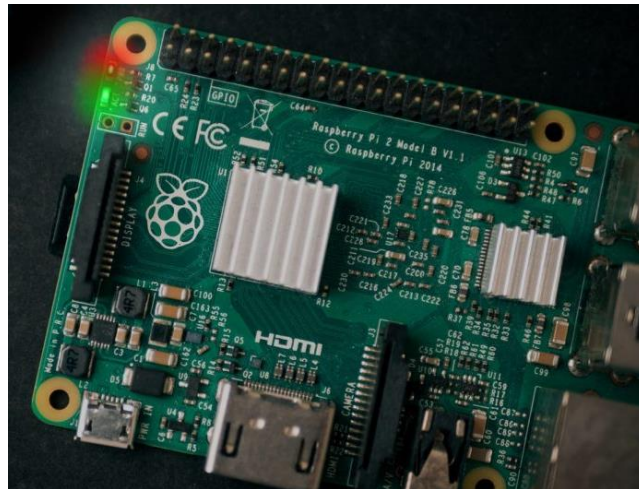
"When a Raspberry Pi boots, one or more LEDs will activate. One is red, indicating power (PWR); the other is green, and indicates activity (ACT). (There is also a trio of green Raspberry Pi LED lights indicating the Ethernet status, if connected.)

So, what do these LEDs indicate? Well, there's the normal status, which is both PWR and ACT LEDs activated. ACT flashes during SD card activity. Therefore, if there's no green light on your Raspberry Pi, there's a problem with the SD card.

Meanwhile, PWR blinks when power drops below 4.65V. As such, if the Raspberry Pi's red light doesn't light up, there's no power.

If only the red PWR LED is active, and there is no flashing, then the Pi is receiving power, but there is no readable boot instruction on the SD card (if present). On a Raspberry Pi 2, ACT and PWR LEDs lit up means the same.

When booting from an SD card, the Raspberry Pi's green ACT light should have an irregular blink. However, it can blink in a more regulated manner to indicate a problem:

3 flashes: start.elf not found
4 flashes: start.elf cannot launch, so it's probably corrupted. Alternatively, the card is not correctly inserted, or card slot is not working.
7 flashes: kernel.img not found
8 flashes: SDRAM not recognized. In this case, your SDRAM is probably damaged, or the bootcode.bin or start.elf is unreadable."

If any of these indicators occur, try a fresh SD card with a newly installed Raspberry Pi operating system.

Troubleshooting screen

- On newer CaT machines which have Raspberry Pi official 7 inch touch screen:
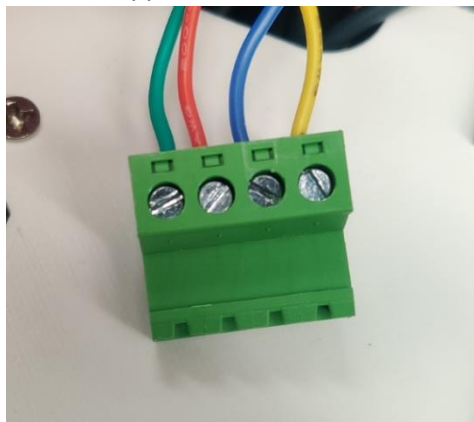 https://www.instructables.com/Raspberry-Pi-Touchscreen-Setup/

- On older CaT machines: double check that the HDMI cable (red circles) is connected to the Pi; check that the microUSB cable (blue circle) is connected to the Pi for power.
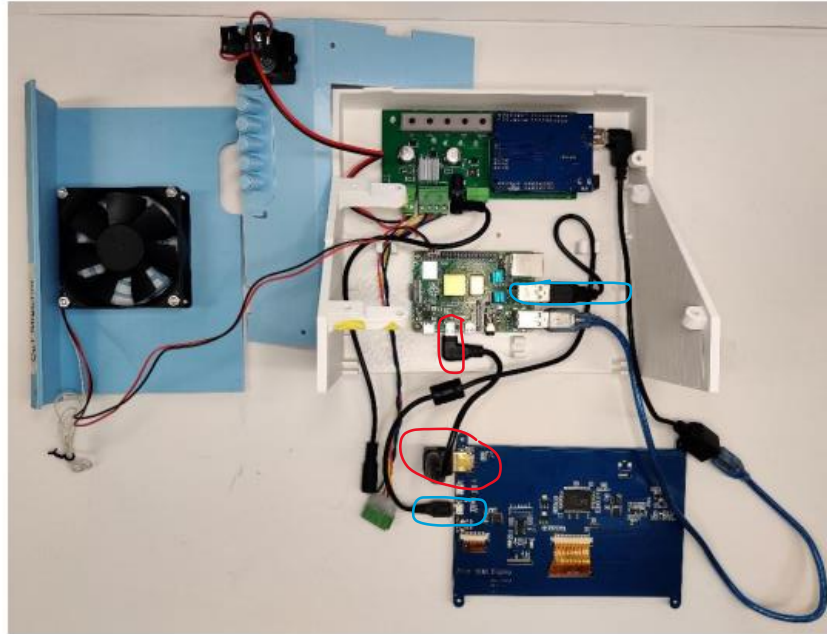
CaT running in the wrong direction.

- Locate the 4 wires coming from the stepper motor connected to the green terminal block.

- **Yellow** and **blue** are paired. **Red** and **green** are paired. Swap the positions of **ANY ONE OF TWO PAIRS** (e.g. yellow and blue **OR** red and green). If both pairs are swapped, the machine will continue running in the wrong direction. If you swap outside of each pair, the motor will make a scary noise and not run 😫.

CaT software running slow

- Make sure all other programs on the Pi are closed.
- Restart Pi and application

Excessive jittering when running

- Make sure all other programs on the Pi are closed.
- Restart Pi and application
- Try a different motor unit
- Try a different PCB
- Try a different Arduino