Additional Troubleshooting

Connor Borneman, Viren Tated

August 2025

1 Introduction

This document outlines all the troubleshooting steps taken in 2025 to test and resolve issues with the agents (robots). Before proceeding, please read the documents in the SWEP 2023 folder, as they provide important background and context.

Once you've reviewed those, return to this document. It contains additional details of some minor but potentially crucial issues that may help identify and resolve current issues. Think of this as a "mistakes log" and use it as a source of ideas for troubleshooting.

2 Loose wiring

There were multiple times where all the parts were connected and working based on the layout of the design; however, the lights would not turn on, or the wheels would not move. This could be due to something as simple as loose wiring. Tug on all the wires and double-check your connections. Another thing to note is that the layout of Agent 1 is slightly different from the other agents, but following the layout schema works perfectly fine.

3 Gear motors

If the agent's wheels are moving at a good speed but it is moving in circles or going in the opposite direction from what is expected, try looking at the four wires that connect the wheel motor to the Arduino shield. Try switching them, as this can help solve the issue.

4 Solder jumpers and traces

If there is no movement at all, the Arduino shield requires jumpers to be added, and certain traces to be cut. This is not mentioned on the layout, but you can check the other agents to see what this looks like. Below is a picture provided

to show you the same. Take a close look at the direction and PWMA pins on the right side of the picture.

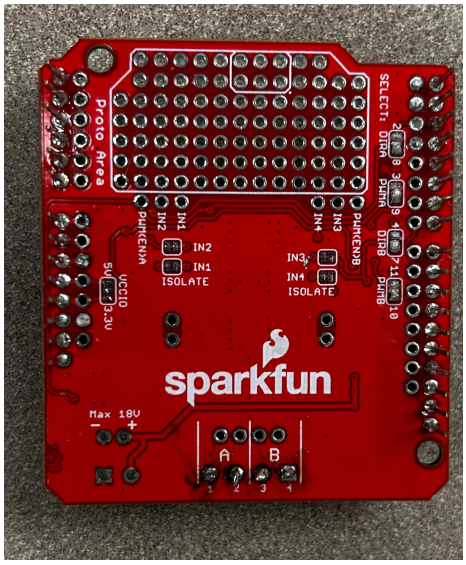

Figure 1: Example of soldered jumpers and cut traces on the Arduino shield.

For reference, below is what not soldered jumpers and uncut traces will look like.

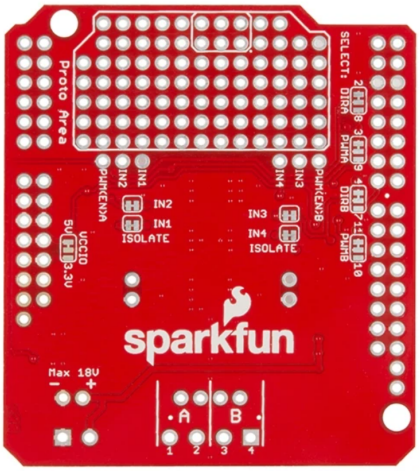

Figure 2: Example of not soldered jumpers and uncut traces on the Arduino shield.

Click here to see what it means to cut traces. **Note**: If the agent begins its movement and gets stuck while turning, or if one wheel keeps spinning while the other does not, it may be an issue with the Arduino shield being faulty.

5 Software vs Hardware

There is a possibility that all hardware components on the robot are functioning correctly, and the issue lies within the new code written for the agent. There are a few ways to verify this. First, replace the ArUco marker on the new agent with Agent 1's marker, and upload Agent 1's code to it. If the agent moves as expected, this indicates that the hardware is functioning correctly and the issue is likely with the new code. Next, do the reverse: assign Agent 1 the marker of the new agent and upload the new agent's code to it. If Agent 1 still moves correctly, then the code is fine and the issue is with the hardware of the new agent. Important: After testing, make sure to restore Agent 1's original marker and code.

6 Voltage Regulator

Please take special note of this component. Ensure that the voltage regulator being used is the exact one mentioned in the parts list and the same as every other agent. Check its connections and the pins on the piece itself.

7 Conclusion

These checks address the most common issues faced in 2025.