Part 1 and 2 Explanation

I know that my implementation is correct because the drone path is showing that it follows a straight line when I want it to follow a straight line, and a circular path when I want it to follow a circular path. I understand that the drone does not immediately go onto the path because the program I implemented shows that the drone is adjusting to follow the path desired. This is logical because it shows that the drone is moving through space and time while following the laws of physics. We understand that the drone must make the proper corrections to adjust its course and not all movements happen immediately. This is demonstrated in the figures below.

Graphical user interface

Description automatically generated

Diagram

Description automatically generated

When implementing the line-following portion of the program, I am able to redirect the drone onto a path I choose (including any angle I choose). This works by updating the state machine and telling the drone where to go after an ‘x’ amount of time has passed. The same thing goes for the circle-following algorithm because when implementing its functions into the state machine, I see that the drone redirects itself into the path I desire. The altitude, speed, and location of the circle are determined. The number of rotations can be determined by the time passed, which is logged by the mySim.start\_loop\_time timer. I can control the length of each maneuver and where it happens with the state machine.

I demonstrate this control of the drone and the manipulation of the state machine by creating a custom design that is not already included in the template code. In my design, I created a design that resembles closely to a stick-figure. The figure shown below is a result of the manipulations I made in the state machine template code given. After implementing my custom parameters, I was successfully able to use the circle-following and line-following algorithms to create the design.

Chart, radar chart

Description automatically generated

Graphical user interface, diagram

Description automatically generated

Chart, diagram

Description automatically generated