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| To: | Dr. Berry |
| From: | Christopher Collinsworth, Jordan Patterson |
| Date: | 12/3/2015 |
| Re: | Lab 1 – Teleoperation & Remote Control |

The purpose of this lab was to program 6 keys on a remote control that allow a robot to move forward, backward, turn left, turn right, spin left, and spin right. These keys were then used to move the robot in a circular path, a square path, and navigate it through an obstacle course consisting of cones.

Programming the 6 keys to move the robot was accomplished by first determining the values of the IR remote control keys that we decided to use. These values were obtained by running the R08\_Remote\_Control program that was built in and pressing the intended keys to display the values on the LCD screen. The 6 keys that we decided to use and the robot movements associated with each key are listed below:

Up arrow – move forward

Down arrow – move backward

Left arrow – turn left

Right arrow – turn right

1 – spin left

3 – spin right

Below is a figure of the remote control:

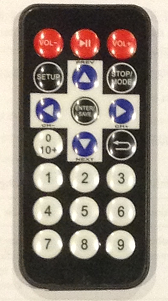


Figure 1. Robot remote control.

We then implemented the key values into our program by associating them with their corresponding movements via switch statements. So depending on which button was pressed, our program would read the key value, go to the specific switch case, and run the code under that case to initiate the desired movement of the robot.

Moving the robot in a circular path was successfully accomplished by repeatedly pressing the right arrow key, causing the robot to turn to the right until completing a full circle. Moving the robot in a square path was not as successful, though. We attempted to move the robot forward via the up arrow key and spin right via the 3 key. This method, however, did not result in a perfect square path because the robot would not spin at an exact angle of 90 degrees. This was due to friction between the floor and wheels and the alignment of the wheels not being perfectly calibrated. Navigating the robot through the obstacle course was successfully accomplished by using the up arrow, left arrow, right arrow, 1 and 3 keys to maneuver the robot through the cones in a zigzagging manner.

In conclusion, the robot performed well and was able to complete all of the specified tasks. The only exception was moving it in a square path. This problem can be resolved by correcting the speed of the robot’s wheels and the time delay to account for the error that resulted from friction between the wheels and floor and the misalignment of the wheels.