Checkpoint #4 Full Function Demonstration

[ICN5406] Mobile Robot 2021

Due: November 26, 2021

- ## Purpose:

The purpose of this checkpoint has two goals. First, making sure that your robot can detect a beacon signal and move towards it. Second, combine all the function together for robot hockey contest.

For this assignment, two infrared diodes will be set up at opposite ends of an arena. Each diode will be emitting light modulated at 38 KHz, but their pulse width are different when received by IR receiver module.

You will need to demonstrate your robot's capabilities under relaxed conditions with no other robots in the arena. The arena will be the actual contest arena.

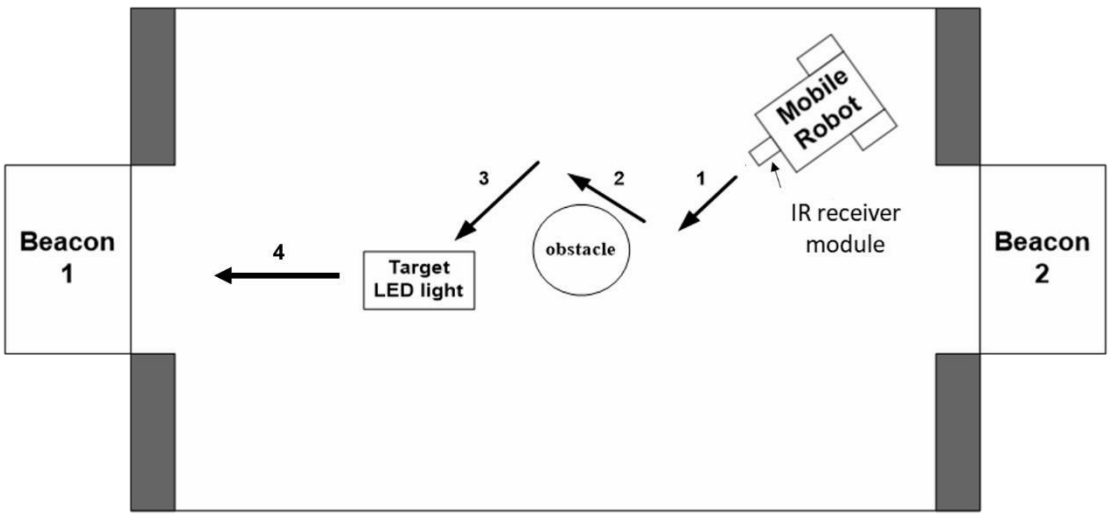
- ## Tasks:

Demonstrate your robot performing the following actions:

1. Have the ability to avoid all the obstacle in the arena. (10%)
2. Capture the hockey. (10%)
3. Your robot should be able to find **<u>two different beacons (Beacon-1 600 and Beacon-2 1500)</u>** and move to the specified beacon in the arena. Robot brings the puck into the goal , respectively, of Beacon1 and Beacon2. (50%) (For any one Beacon : 40%; the second one 10%)

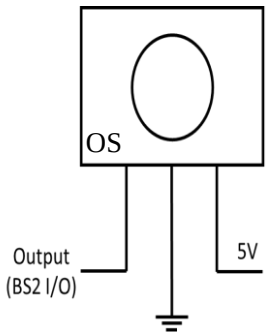
Hint: You can determine two different signals by calculating the pulse proportion in a cycle.

4. The time to complete the goal of **Beacon1_ 600** or the goal of **Beacon2_1500** (30%) (The fastest) . Should complete the mission for any one goal in 60sec.



- **Materials list:**

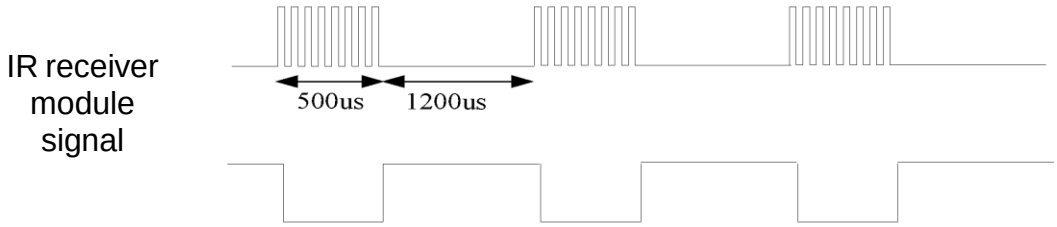
	Material	Number
1	PIC-428LM IR receiver	1



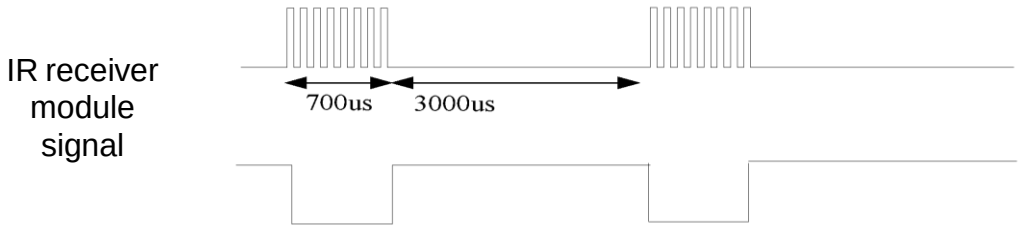
P.S. The distance between Beacon and ground around 10.5cm

- **Search Beacon** :

1. Beacon-1 600(50%)



2. Beacon-2 1500(50%)



Receive ir data for a period of time and calculate the pulse proportion.

$$\textbf{Ratio} = \frac{\boldsymbol{number\ of\ 0}}{\boldsymbol{total\ data(include\ 0\ and\ 1)}}$$

If your goal door is 1500, the ratio is between 0.17 and 0.22.

If your goal door is 600, the ratio is between 0.27 and 0.32.