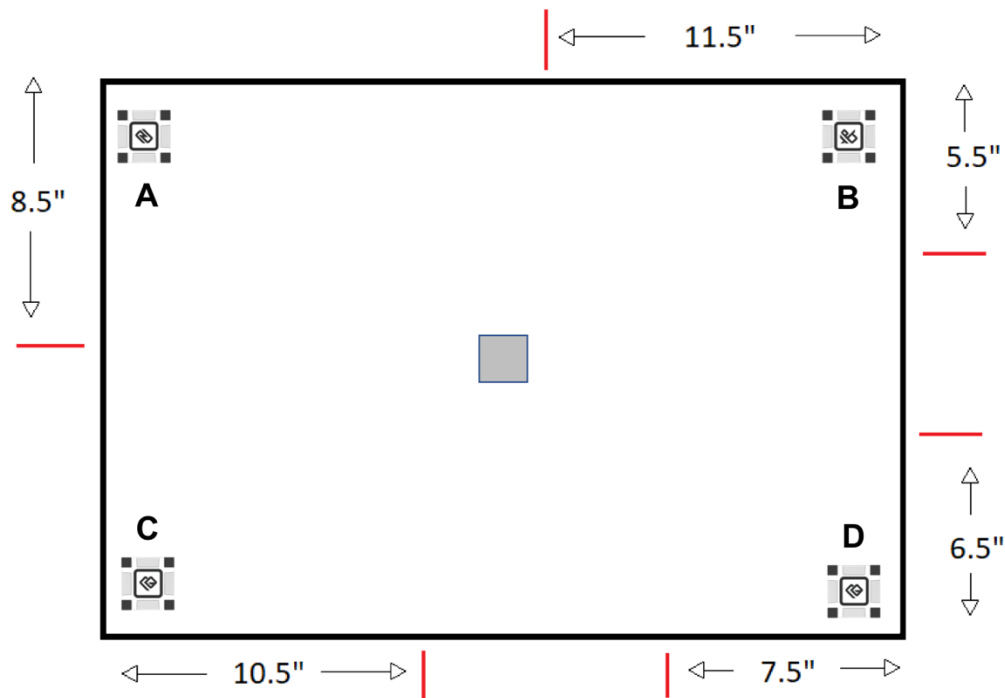


LAB 6: DELIVERY ROBOT

Due: Tuesday, April 24th 5:00pm

In the final lab, your goal is to transform Cozmo into a warehouse package delivery robot, enabling it to deliver packages (cubes) to the right destinations.

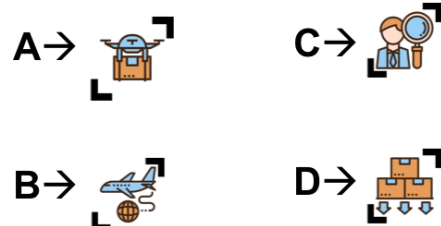
Arena Setup: The arena should be set up as follows:



Red lines show the center placement of localization symbols. This is the same layout as we used in Lab 4. Just as Lab 4, the specific location of each symbol marker will not be known a priori.

The **gray square** in the middle of the arena is off limits to the robot. The area is exactly the size of a cube, and you can use a cube to help draw a square on the arena to help designate the area. The robot should avoid entering this area and will be penalized if it does so. (Imagine that the warehouse manager stands in this area. The robot should not run the manager over.)

The **corner areas marked A, B, C, and D** are cube pickup areas. Three of the four areas will have one cube each, and one area will be empty. The robot's job is to deliver each cube to its intended destination, as shown on the right. The ID of the cube does not matter, the cubes will be arranged randomly on the starting locations (e.g., cube from A goes to *Drone*).



Your robot will be turned on somewhere in the arena, not too close to the off-limits area in the center. The robot must localize, then move the cubes in any order to their destination.

Notes:

- We are not providing any starter code for this lab. We encourage you to reuse code from previous labs. You should also generate your own map if needed.
- The initial position of the cubes will not be touching the wall.
- The final position of the cubes should be within 3 inches of the intended marker. Directly in front of the marker is fine, but might affect localization.
- Once the robot has localized, it is possible to “memorize” the location of all of the symbol markers and from then on use this information to localize more easily. This is not required but might be a useful strategy. There are other possible strategies as well.
- 5 minute limit per demo
- You may use any built-in Cozmo functions

Grading Rubric:

Cube 1	34 pts
Cube 2	33 pts
Cube 3	33 pts
Entering center square	-5 pts
Request for pickup/kidnap of robot for reset	-5 pts

For each cube:

Drive to cube – 8 pts

Pick up cube – 8 pts

Drive to destination – 8pts

Place cube – 9 pts (or 10 pts)

Submission: Submit all your code for this lab in a single zip file named Last1First1_Last2First2.zip (the first and last names of partner 1 and 2, respectively). Only one partner should upload the file to T-Square. If you relied significantly on any external resources to complete the lab, please reference these in the submission comments.

Please bring all Cozmo accessories, as well as localization symbol cards, with you to the demo and return the robot to the course staff after the demo. Make sure we check off that you have returned the robot.