# Double Boom Deployment Test

Amber Dubill - RIT MSD P20101

MULTIDISCIPLINARY SENIOR DESIGN
Kate Gleason College of Engineering

## 1 Test Objectives

The objective of this test is to determine the advantage of using double sided booms in our sail deployment mechanism. The current booms have issues with strength, and it is predicted that using the booms manufactured in this fashion will minimize that risk. There will be incremental testing until the final test of full sail and boom deployment. The first test will be without the sails, then with one sail, then with all four sails attached. If it is needed a two sail test can also be performed. Success is defined as full deployment on each part of the test with minimal assistance from the team.

## 2 Requirements/Equipment

- enough tables to have the booms deploy level
- 4x sail quadrants
- deployment testing stand
- sail spindle
- deployment mechanism sub assembly
- electronics to run the deployment motor
- 4x manufactured double booms (Fig. 1)
- sail hand tools

## 3 Summary of Procedure

Once the booms have been manufactured and attached, place the deployment mechanism on the stand, and ensure the boom paths will be supported by tables (similar to Fig. 2).

Start deployment and start a timer. Visually watch the booms for any issues. Record pictures and videos throughout the process. About every five inches, the time and increment should be recorded. Continue this process until the booms are fully deployed and end the timer.

After the first test with no sails, fold one, two, or all four sails onto the sail spindle as outlined in the "Sail Folding Procedure". Repeat the test with the desired number of sail quadrants until a full sail, full deployment test is completed.