Boeing V/TOL Team 2

Overview
The team was given an ArduCopter model-C quadcopter in order to perform a mission of payload retrieval of weighted tennis balls. There was only a 15 minute time period for the mission to take place. Each team was given the same base materials and had to use the same battery and receiver.

Objectives
The team’s main objectives were to design a pickup mechanism that had potential for multiple balls and the lift capacity to transport them. The aluminium beams were swapped for carbon fiber beams, the motors were changed and propellers increased from 10 inch diameter to 15 inch.

Approach
- Customer needs gathered from the mission rules and from Boeing sponsors
- Must be a V/TOL vehicle and can only use Turnigy 4000mAh battery
- Concept generation led to upwards of 15 designs, concept selection limited those to 4
- CAD models were created for every part in the kit in order to recreate them if necessary
- Initial prototype was created directly from CAD models
- Testing was done in the Multi Sport Complex

Outcomes
- The QuadCopter’s final, ready to fly, weight was 5.15 pounds
- The total lift capacity was 6.20 pounds with a mission capable of producing 5.30 pounds
- The total flight time for one battery set was 7.3 minutes
- The team picked up a total of 2 300 gram tennis balls in the first 15 minutes of competition
- In the fly off, the team picked up another 2 300 gram tennis balls in 5 minutes time