

Spring Validation Experiment: Team B

Objective	Demonstrate the UAV is capable of autonomous navigation, including trajectory planning and obstacle detection and avoidance.
Elements to be Tested	<ul style="list-style-type: none"> ● Localization ● Planning algorithm ● Object detection/avoidance
Equipment	<ul style="list-style-type: none"> ● UAV ● Base Station (Laptop, and Comms) ● Camera and tripod ● Waypoint Pad and Wooden Beacon
Location	Lafarge Duquesne Quarry
Procedure	<ol style="list-style-type: none"> 1. Follow preflight checklist (found in Test Plan Appendix) 2. Set up UAV on landing pad 3. Set up the ground control station 4. Populate navigation map with 50cm x 50cm virtual pillars 5. Command UAV to specified distant waypoint location using the map formed in a previous flight test 6. Command vehicle to return back to base 7. Visualize voxel grid map on base station
Verification Criteria	<p>SPR7: Vehicle is localized with less than 3 m of error from actual position, verified via RTK GPS</p> <p>SPR8: Vehicle detects obstacles of minimum map resolution size (50cm x 50cm x 50cm)</p> <p>SPR9: Vehicle flight path avoids obstacles by 3m</p>