Peregrine 2020
Jet UAV

A Continuation of Peregrine 2

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Team
Project Objectives

- Complete the design and construction of a jet UAV capable of performing flight test experiments.
- Perform flight tests to provide a proof of concept
## Level 1 Requirements

<table>
<thead>
<tr>
<th>Number</th>
<th>Description</th>
<th>Verification Method</th>
<th>Requirements Rationale / Other Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>SYS-03</td>
<td>The UAV shall have a max flight mission time of no less than 7 minutes.</td>
<td>Test</td>
<td>Ensures that the UAV can perform meaningful experiments.</td>
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<tr>
<td>SYS-04</td>
<td>The UAV shall have manual and autonomous flight control ability.</td>
<td>Test</td>
<td>Safety and Flexibility</td>
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<td>SYS-08</td>
<td>The UAV shall weigh no more than 55 lbs.</td>
<td>Inspection</td>
<td>FAR weight restriction</td>
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<td>SYS-10</td>
<td>The team shall provide a Ground Control Station (GCS).</td>
<td>Inspection</td>
<td>Complete package for operation</td>
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Challenges

• Integrate and simulate autonomous capability
  • Integration of sensors and controls to perform auto and manual flights.
  • Only for loss of signal
    • Finds a place to safely land
    • Circles around until signal reconnects
• Practice on GCS before test flights
CS Components

- Pass FAA standards for autopilot, control, and safety.
  - Development of failsafe and collision avoidance protocols
- ECU (Engine Control Unit) Integration
  - Thrust & velocity needs mapped
- Increase channel communication on the Pixhawk
- Connect Mission Planner to Xplane11 for simulation
FAA Requirements

• You must perform a preflight inspection that includes checking the communications link between the GCS and the UAV.

• You must ensure that the UAV will pose no undue hazard to other people, other aircraft, or other property in the event of a loss of control.
Working with Avionics Subsystem

• Long Range Communication Development
  • Test latency between UAV and GCS at greater distances

• Skin-to-Aircraft Signal Testing
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