RED Delivery System

Software Subsystem Requirements

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1. Requirements

1.1 Subsystem

1.1.1 Mission Phases:

- Initialization
- SynchronizedTargetPursuit
- DeployedTargetPursuit
- LoadDelivery
- DeployedDockingPursuit
- ApproximateDocking
- PreciseDocking
- Docked
- DockingErrorHandling
- SynchronizedHoming

1.1.2 Killswitch: The mission planner monitoring stations shall have the capability of controlling the drone and mothership individually for emergency halt and control systems override.

1.1.3 Version Control: RED custom processing and flight commands will be controlled over in a Github Repository for collaboration, revision tracking, and feature implementation.

2.2 Flight Commands

2.2.1 Synchronized Pursuit: The system shall have the ability to direct the mothership to carry the drone over an approximate area of the target location and start the drone in order for it to be deployed in a state of descent to target.

2.2.2 Drone Deployment: The system shall have the ability to direct the deployed drone to the target location of delivery and direct the mothership to circle above the drone until precise docking phase is initiated.

2.2.3 Load Delivery: The system shall have the ability to tell the drone to release the payload at the target location.

2.2.4 Approximate Docking: The system shall have the ability to direct the drone back to the location it was deployed from at a lower altitude.

2.2.5 Precise Docking: The system shall have the ability to tell the mothership to begin flying in a straight direction toward the location that the system was originally deployed from. The drone shall have

the ability to use camera imaging of LEDs to recognize the precise location that it must move upward into for mechanical docking.

2.2.5 Docking Success: The system shall have the ability to let both aerial vehicles that the drone has successfully docked and turn off the drone rotors.

2.2.6 Docking Error: The system shall have the ability to recognize an error state and circle back to an appropriate position to reattempt docking in the mechanical docking mechanism.

2.2.7 Homing: The system shall have the ability to direct the mothership back to the original takeoff location for safe landing of both aerial vehicles.

3.3 Communications

------TBD------

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