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Project: Griffin-1 Drone Inspection System

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\*\*1.0 General System Requirements\*\*

SYS-001 The system shall be comprised of an Unmanned Aerial Vehicle (UAV) and a Ground Control Station (GCS).

SYS-002 The system should operate effectively in various weather conditions.

SYS-003 The entire system must be transportable by a two-person crew.

SYS-004 The system shall comply with all relevant FAA regulations for commercial drone operation.

SYS-005 All flight data shall be recorded by the system for post-mission analysis.

SYS-006 The system shall have a robust communication link.

SYS-007 System setup must be completed in approximately 15 minutes.

SYS-008 The system will support future payload integrations.

\*\*2.0 Unmanned Aerial Vehicle (UAV) Subsystem\*\*

FLT-001 The UAV shall have a minimum flight endurance of 25 minutes.

FLT-002 The UAV must be able to withstand wind speeds up to 30 knots.

FLT-003 The UAV's GPS accuracy should be high.

FLT-004 The UAV shall return to its launch point automatically upon loss of communication with the GCS.

FLT-005 The UAV's propulsion system shall provide sufficient thrust for all flight envelopes.

FLT-006 The UAV may include an obstacle avoidance system.

FLT-007 The UAV's frame shall be constructed from carbon fiber composite material.

FLT-008 The UAV battery system shall provide status telemetry to the GCS.

\*\*3.0 Payload Subsystem\*\*

PAY-001 The payload shall consist of a high-resolution electro-optical (EO) camera.

PAY-002 The camera must provide clear images.

PAY-003 The camera gimbal shall provide 3-axis stabilization.

PAY-004 Real-time video feed.

PAY-005 The video stream's latency shall be less than 200 milliseconds.

PAY-006 The camera settings will be controlled from the GCS.

PAY-007 The payload should support night-time operations.

PAY-008 All imagery captured shall be tagged with GPS coordinates and timestamps.

\*\*4.0 Ground Control Station (GCS) Subsystem\*\*

GCS-001 The GCS shall be a ruggedized tablet computer.

GCS-002 The GCS software must be user-friendly.

GCS-003 The GCS display shall be readable in direct sunlight.

GCS-004 The GCS shall display real-time UAV telemetry, including battery level, altitude, and speed.

GCS-005 Mission planning features.

GCS-006 The GCS should allow the operator to define survey routes using waypoints.

GCS-007 All communication between the GCS and UAV must be encrypted.

GCS-008 The GCS shall store a minimum of 100 hours of mission data.

\*\*5.0 Safety Requirements\*\*

SAF-001 The system shall include a manual emergency motor cut-off switch on the GCS.

SAF-002 The system's flight termination procedure should be reliable.

SAF-003 The propeller blades must have protective guards for ground operations.

SAF-004 Geo-fencing capabilities.

SAF-005 The system shall prevent the UAV from flying into restricted airspace.

SAF-006 The battery health is to be monitored continuously.

SAF-007 A low-battery warning shall be issued to the operator.

SAF-008 The system shall perform a pre-flight self-test to ensure all subsystems are operational.

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