Peregrine Jet UAV

Software Test Documentation Document

Sponsor:

Dr. Siddhartha Bhattacharyya

Prepared by:

Nabil Osorio, Christian Cambron, Anthony Messina

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1. Introduction (Nabil)

1.1 Purpose

The purpose of the software test document is to test and examine the functionality of the different software components that will be used in the overall UAV system. This will include the GUI, controller system, Pixhawk software, and FPV camera software.

1.2 Scope

The test tasks will put forth a standard while implementing different testing methods to ensure safety and correctness of our final system. This document will display what features will be tested with expected and unexpected inputs and their corresponding outcomes.

1.3 References

The information viewed in this document will refer to the requirements and design documents.

2. Details (once per test case) (Anthony)

2.1.1 Test case identifier

GUI

2.1.2 Objective

The objective of the GUI testing is to identify the most efficient and effective languages and methods for displaying the information gathered from the aircraft's sensor data.

2.1.3 Inputs

Data will be fed directly into the GUI software from various sources to judge the effectiveness of the language and libraries used.

2.1.4 Outcome(s)

Data should be displayed quickly and in relatively real-time.

2.1.5 Environmental needs

For preliminary testing, the GUI will be tested locally with a set of sample data.

2.1.6 Special procedural requirements

No special requirements are needed for testing.

2.1.7 Intercase dependencies

The GUI's function is inherently dependent on the Pixhawk and FPV camera software.

2.2.1 Test case identifier

Pixhawk Software

2.2.2 Objective

The objective of testing the Pixhawk software is to achieve readability of the data being sent from the UAV to the ground station.

2.2.3 Inputs

Raw data collected on the Pixhawk itself.

2.2.4 Outcome(s)

The software should be able to output human-readable data.

2.2.5 Environmental needs

Different sensory information to run through the Pixhawk and known expected outcomes.

2.2.6 Special procedural requirements

No special requirements are needed for testing.

2.2.7 Intercase dependencies

The Pixhawk software does not have any dependencies.

2.3.1 Test case identifier

Controller System

2.3.2 Objective

The objective of testing the Controller System is to show full controllability of the aircraft with optimal latency.

2.3.3 Inputs

The controls will be mapped and used to send control data to the target aircraft.

2.3.4 Outcome(s)

The aircraft should complete the correct commands in the correct order.

2.3.5 Environmental needs

Either a simulation or an RC aircraft is needed in order to test the Control System.

2.3.6 Special procedural requirements

If an RC aircraft is used, access to a large open area will be needed.

2.3.7 Intercase dependencies

The Ardupilot software needs to be working correctly to process the data coming in from the ground station.

2.4.1 Test case identifier

FPV Camera

2.4.2 Objective

The objective of the FPV Camera testing is to achieve a low latency video feed from the aircraft.

2.4.3 Inputs

A camera will be used to send a video feed to a remote ground station.

2.4.4 Outcome(s)

The software should receive the video feed and display it with optimal efficiency.

2.4.5 Environmental needs

A camera and transmitter are needed.

2.4.6 Special procedural requirements

No special requirements are needed for testing.

2.4.7 Intercase dependencies

The GUI software needs to be semi-functional in order to be able to quickly and safely connect the two.

3. Global (Christian)

3.1 Glossary

1. UAV - Unmanned Aerial Vehicle
   a. an aircraft piloted by remote control or onboard computers
2. RC - Remote Controlled
   a. control of a machine or apparatus from a distance by means of signals transmitted from a radio or electronic device.

3. FPV - First Person View
4. GUI - Graphical user Interface
    a. a type of user interface that allows users to interact with electronic devices through graphical icons and visual indicators such as secondary notation, instead of text-based user interfaces, typed command labels or text navigation
5. Pixhawk
    a. An independent open-hardware project that aims to provide the standard for readily-available, hiqh-quality and low-cost autopilot hardware
6. Raw Data
    a. Data that is being Transmitted from the Jet motor. Usually in RS-232
7. Transmitter
    a. a set of equipment used to generate and transmit electromagnetic waves carrying messages or signals, especially those of radio or television.
8. Receiver
    a. The part of the Equipment that Receives the signal.