**Content Summary of Final Design Package**

The contents of our Final Design Package include the following:

* **Assembly Instructions/Software User Guides**
  + **Rpi5 Integration with PixracerPro and Ros 2 “Jazzy” (GD-001)** – Instructions for initially integrating the Raspberry Pi 5 with PixracerPro and Ros 2 Jazzy.
  + **QGroundControl Quick Start Guide (GD-002)** – Instructions for using QGroundControl with a PixracerPro for both the high- and low-altitude drones.
  + **System Layout (ART-002)** – Illustrates the arrangement and physical positioning of all electric components on a single wooden board within the high-altitude drone.
  + **Demo Flight Plan (ART-007)** – Demonstration of an example flight plan in QGroundControl.
* **Bill of Materials (REQ-002)** – An itemized list of the materials and components required for the system and their pricing
* **Software Bill of Materials (REQ-004)** – A detailed inventory of all software components, libraries, and dependencies.
* **System Block Diagrams**
  + **Drone Communications Strategy Block Diagram (ART-003)** – Illustrates the general drone communications setup.
  + **System Progress Overview (ART-008)** – Outlines the high-level overview of the system operation, including functionality working and functionality in progress.
  + **XPRIZE System Overview (Professional) (ART-011)** – Maps out the high-level overview of the full system operation, including the full circuit and communication integration.
* **Circuit Diagrams**
  + **High-Altitude Drone Wiring Diagram (ART-001)** – Illustrates wiring connections between the components of the high-altitude drone.
  + **Low-Altitude Drone Wiring Diagram (ART-009**) – Illustrates wiring connections between the components of the low-altitude drone.
* **Coding Documentation**
  + **High and Low Altitude UAV Code Outline (ART-006)** – Explains the code flow for fire detection, camera integration, and suppressant deployment in the High-Altitude and Low-Altitude Drones
  + See also **Rpi5 Integration with PixracerPro and Ros 2 “Jazzy” (GD-001)** in **Software User Guides**
* **Test Procedures** 
  + The following procedures, unless otherwise specified, are included in the **Central Test Plan Document (TP-002)**:
  + **Scanner Flight Tests** – Verifies the functionality and accuracy of the fire detection system during flight
  + **Suppressant Deployment Flight Tests** – Ensures the fire suppressant system activates and deploys correctly
  + **Flight Path Tests** – Confirms that the aircrafts follow the intended flight paths accurately (lawn-mower path for the high-altitude drone, direct path to the fire for the low-altitude drone)
  + **Code Debugging Tests** – Identifies and resolves software errors to ensure system reliability
  + **Other Individual Component Test Procedures** – Details on any other testing methodologies we used to verify the performance of additional system components
  + **Thermal vs. Low-Light Camera Comparison for UAS Fire Detection (TP-001)** – Procedure compares the performance of a thermal camera and a low-light camera for fire detection in various lighting conditions.
  + **Test Procedure, Thermal Camera Validation on Drone with Raspberry Pi 5 Running ROS 2 (TP-003)** – Procedure to validate the functionality of a thermal camera connected to a Raspberry Pi 5 running ROS 2, ensuring compatibility, power adequacy, and proper video feed visualization.
  + **Long-Term Safety Plan (ART-015)** – The year-long safety plan that we used for all of our test flights to mitigate risk.
* **Custom Part Drawings and/or Files** 
  + **High Altitude Camera Mount Render (ART-012)** – Render and CAD file for custom camera mount of the high-altitude drone.
  + **Low Altitude Camera Mount Render (ART-013)** – Exploded assembly render and CAD file for custom camera mount of the low-altitude drone.
  + **Drop Mechanism Render (ART-014**) – Assembly render and CAD file for the pin servo mount and pin used to deploy suppressant from the low-altitude drone.
  + **Raspberry Pi Mount (ART-016)** – Render and CAD file of the Raspberry Pi mount inside the low-altitude drone.