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| XISP-Inc Alpha Cube Sat (ACS) |
| Rideshare Payload Questionnaire |
| Version 1-1 June 7, 2021 |

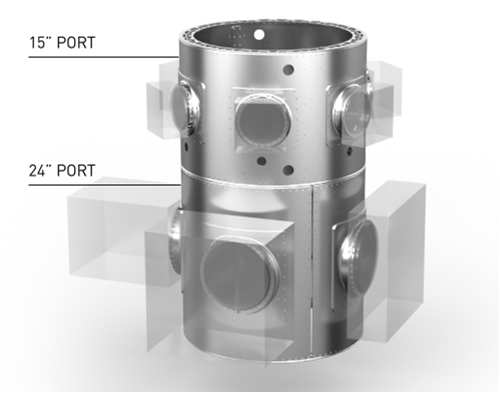
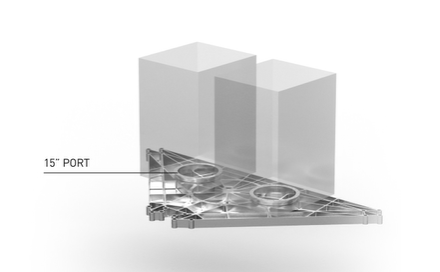
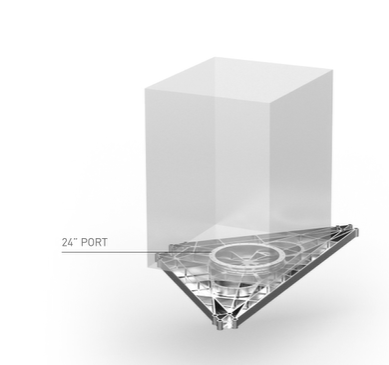


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The following set of questions establishes baseline information that SpaceX will use to conduct analysis in support of program deliverables. Please answer the questions to the best of your knowledge for the currently payload configuration.

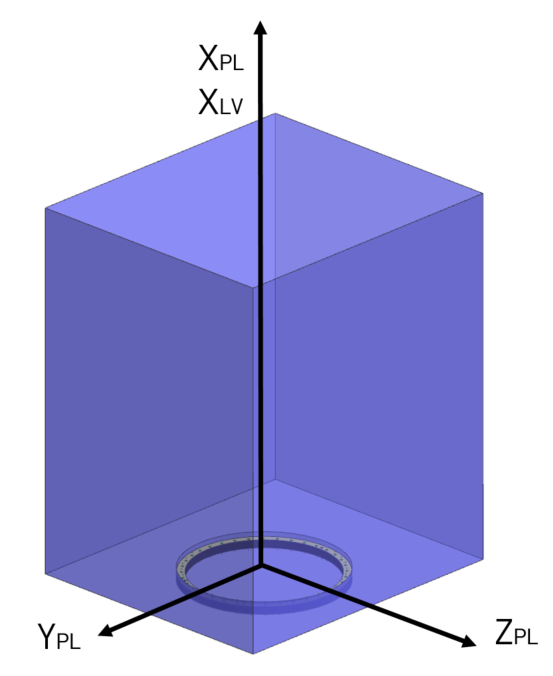
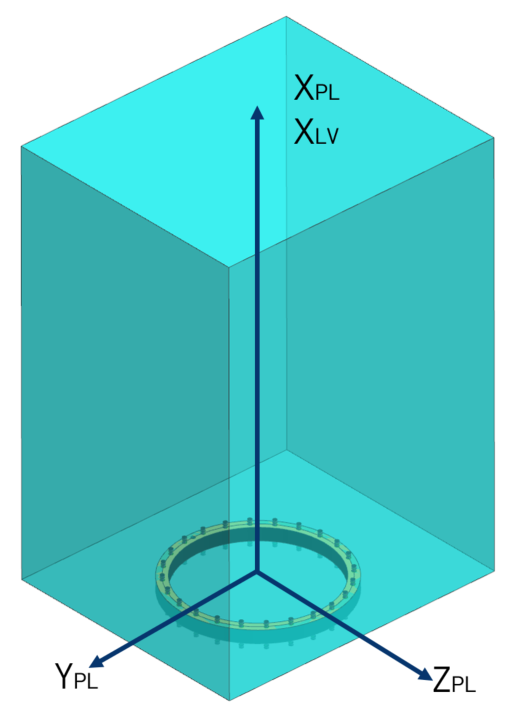
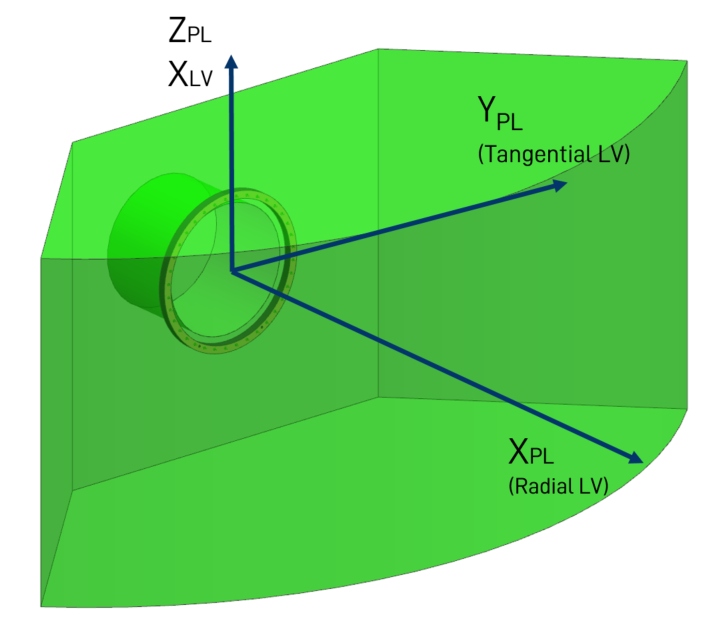
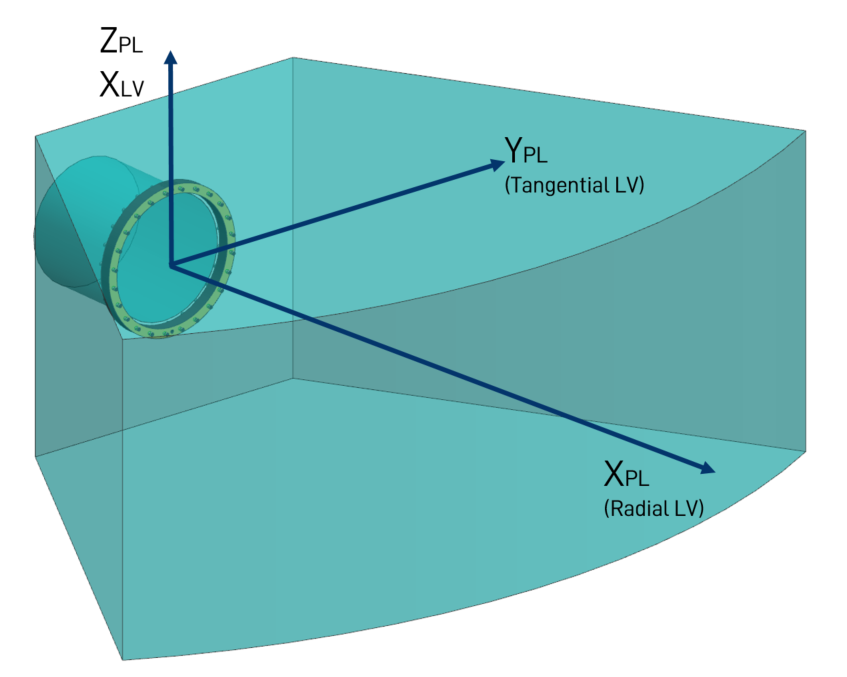
# Payload Information

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| ***Mission Information*** |
| **General Payload/Mission Description (including image):**  Alpha Cube Sat (ACS), a 6U cubesat participating in NASA’s CubeQuest Challenge Deep Space Derby fielded by Xtraordinary Innovative Space Partnerships, Inc. (XISP-Inc). ACS is manifested on the Geometric-I Falcon 9 Rideshare mission scheduled for no earlier than June of 2022. In addition to competing in the CubeQuest challenge ACS is intended to incorporate multiple advanced communication and propulsion technology development payload elements, science payload elements, and one or more commercial elements depending on available volume. |
| **Payload Type:**  SmallSat  Side-Mounted  15” Port  (check all that apply)  🗹 CubeSat+Dispenser  Forward-Mounted  24” Port |



**Forward-Mounted (Starlink)**

**Side-Mounted**



**15” Port**

**24” Port**

**24” Port**

**15” Port**

# Mission Design

|  |  |  |  |
| --- | --- | --- | --- |
| ***Payload Separation Design Parameters*** | | |  |
|  | | **Value + Tolerance** | **SI Units** |
| **Target Separation Velocity** | | ± | m/s |
| **Target Separation Tip off Rate** | XSC | ± | deg/s |
| YSC | ± | deg/s |
| ZSC | ± | deg/s |

# Mechanical Interface

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| ***Payload Mass Properties*** | | | | |
|  | | | **Value** | **SI Units** |
| **Maximum Payload Mass** | | | 15 | kg |
|  | | **Stowed Configuration** | | **Tolerance** |
| **Center of Gravity**  **(mm)** | XPL | | TBD – Mercury 6 Payload Canister | ± TBD |
| YPL | | TBD – Mercury 6 Payload Canister | ± TBD |
| ZPL | | TBD – Mercury 6 Payload Canister | ± TBD |

|  |  |  |  |
| --- | --- | --- | --- |
| ***Payload Mechanical Interface*** | | |  |
|  | | **Value** | **SI Units** |
| **Maximum Payload Length** | XPL | TBD – Mercury 6 Payload Canister | mm |
| YPL | TBD – Mercury 6 Payload Canister | mm |
| ZPL | TBD – Mercury 6 Payload Canister | mm |
| **Mechanical Interface:**  24”  15”  Other (please specify) | | | |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| ***Payload Dynamics*** | | |  | |
|  | | **Value** | **SI Units** | |
| **Fundamental Frequency – PL Lateral** | | TBD – Mercury 6 Payload Canister | Hz | |
| **Fundamental Frequency – PL Axial** | | TBD – Mercury 6 Payload Canister | Hz | |
| ***Payload*** ***Separation System*** | | | |  |
| **Type** | Lightband  Clampband 🗹 CubeSat Dispenser  Other\* | | | |
| **Company** | Maverick Space | | | |
| **Model** | Mercury 6 | | | |
| **Dimensions** | TBD – Mercury 6 Payload Canister | | | |
| **\* If Other (Please Explain)** |  | | | |

**Please provide a dimensional drawing and/or a CAD model of the Payload.**

# Electrical Interface

|  |  |  |
| --- | --- | --- |
| ***Payload Umbilical*** | |  |
| **Standard Rideshare channel allocations (and quantity) are defined below, please indicate if the Payload will require each:** | | |
| **Umbilical: Battery Charge (2)** | No 🗹 Yes | |
| **Umbilical: Battery Sense (2)** | No 🗹 Yes | |
| **Umbilical: Communication (2)** | 🗹 No  Yes | |
| **Deployment (2)** | Yes | |
| **Umbilical Breakwire (PL-side loopback) (1)** | Yes | |

# Launch Site Operations

|  |  |  |
| --- | --- | --- |
| ***Payload Batteries*** | |  |
| **How long do Payload batteries last in a flight-ready state before requiring a charge?** | TBD | |
| **Will you be charging Payload batteries at the Launch Site?** | Yes | |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| ***Required Stand Alone Testing at Launch Site*** | | | |  |
|  | Type | Duration | Safety Considerations | |
| 1 | Battery Okay | TBD | Battery would be in no-load heart beat mode | |
| 2 |  |  |  | |
| … |  |  |  | |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| ***Propulsion System*** | | | |  |
| Does the Payload have a propulsion system? 🗹 Yes  No | | | | |
| If “Yes” | | | | |
|  | Fuel Type | Estimated Volume | Fueling at Launch Site? | |
| 1 | H20 and/or H2O2 | TBD | 🗹 Yes  No | |
| 2 | Cold Gas | Optional -- TBD | 🗹 Yes  No | |
| … |  |  |  | |

**Additional Information:**

1. **Please describe any safety issues associated with the Payload.**

Spacecraft bus and payloads will be within already established and accepted risk parameters.

H20 and/or H2O2 **--** H20may be processed toH2O2 after deployment

1. **Please describe any security concerns or requirements for the Payload.**

Spacecraft bus and payloads will be inert except for battery heartbeat until payload cannister deployment + established and accepted delay parameters.

1. **Please describe any additional Payload requirements for which SpaceX should be made aware (such as sensitivity to Helium).**

Spacecraft (bus + payloads) may need to use a Delta-V as a service or other form of deployment optimization to minimize Delta-V required to reach alternate minimum energy trajectory insertion point. Calculations of Delta-V required are currently being recalculated based on the revised launch parameters and the available service options from Space-X and others. No sensitivity options have been identified to date.