# Requirements and Specifications Document

## 1. Mechanical

The satellite will contain all relevant components in a container that satisfies the size and weight requirements. The container should be able to facilitate a non-abrasive tether through the center mass of the container. The payload should be able to withstand the shocks, vibrations and temperatures incurred during the flight and landing.

| Requirement | Specification |
|---|---|
| Size of the container | 1 cubic foot (1ftx1ftx1ft) |
| Weight of the container | 2-3 pounds |
| The temperature range that the container should withstand | -80° to 90° F |

**Table 1:** Mechanical Specifications

## 2. Electrical

The electrical system will consists of a digital imager, temperature sensors, pressure sensor, and tracking device. Each data device must be able to record data for the entire flight. The images and atmospheric data must be correlated with altitude and geographic location as well as time. All electrical devices should be easily interfaced with a personal computer to retrieve logged data after the satellite's recovery.

| Requirement | Specification |
|---|---|
| Power | Minimum Battery life of 3 hours |
| Devices operation specs | Temperature range between -80° and 90° F |
| | Pressure range between 0 and 1 bar |
| Digital imager | Obtain a resolution of 3-5 Mega-pixels |
| | Capture an image each one minute |
| | A storage capacity of at least 1 GB (>180 images) |
| Temperature Sensor range | -80° to 90° F |
| Pressure Sensor range | 0 to 1 bar |
| Tracking device altitude range | 0 to 100,000 ft |
| Accuracy | Data correlation error between devices of < 10 minutes |

**Table 2:** Electrical Specifications

## 3. Documentation

The documentation requirements consist of biweekly reports and a final document. The specifications of each report are illustrated in Table 3.

| Requirement | Specification |
|---|---|
| Biweekly reports | What happened since last report |
| | Major Milestones for the next two week |
| | Critical problems |
| Final documentation | Design & detail descriptions of each sub-system |
| | Well recorded to facilitate repairs |

**Table 3:** Documentation Specifications

## 4. Testing

The satellite test will occur during the second one-third of the spring semester. The satellite will undergo a payload operation test, a battery life test, a durability test, a camera functionality test, and a data logging test for each of the sensors. The specification of each test is described in Table 4.

| Requirement | Specification |
|---|---|
| Testing period | Completed during the second one-third of the spring semester |
| Payload operation test | Simulate operation under high and low temperature |
| Battery test | Battery operation for at least 3 hours |
| Durability test | Simulate payload under vibration and shock |
| Camera functionality test | Appropriate correlation between timing and image capturing ( i.e. 1 image per 1 minute) |
| | Enough memory space to capture > 180 images |
| Data loggers | Test storage of sensors data outputs |

**Table 4:** Test specifications

## 5. General

General requirements and specifications such as project budget, payload launch location as well as payload launch and recovery date are illustrated in Table 5.

| Requirement | Specification |
|---|---|
| Project budget | Payload should cost < $2000 |
| Payload launch location | Maricopa City, AZ |
| Payload launch and recovery Date | Late April ( 28-29 April) |

**Table 5:** General specifications