

# SRP4 Design Document Preface

This document is largely the product of the EE656 Space Systems Design class, which was held at the University of Alaska Fairbanks in the Fall 2000 semester, and is intended to provide a basis for the development of the SRP4 vehicle. Much of the higher level design outlined in this document is valid, as are many of the details. However, several issues have already been identified with the content of this document, and the SRP4 design team is currently finalizing the design of each component with these issues in mind. In early March 2001, issues currently under review by the design team include:

## **Mechanical Systems**

1. Center of gravity and mass budget constantly being updated.
2. None cone materials and construction techniques.
3. Number of screws connecting the nose cone to the payload tube.
4. Material for payload tube will be 6061 T-6 Aluminum.
5. Number of screws to attach radix joint to payload tube.
6. Attachment and deployment of drag plate.
7. Some deck plates may be 1/8" thick for weight savings.
8. Inside of the nosecone below the antenna must be wrapped in mu metal.
9. Separation system design.
10. Structural integrity of components needs to be proven, either mathematically or through testing.

## **GPS**

1. GPS software evaluation.

## **EED Board**

1. Change of pressure sensor for high altitude trigger of separation system.
2. Selection of EED firing battery.
3. Validation of EED software algorithm.

## **Ground Support**

1. Packet Format (parity check versus more complex EDC or ECC).
2. GUI format.
3. Loss of power recovery.
4. Data rate over umbilical cable.

## **Flight Computer**

1. Packet format (see ground support).
2. Need for new hardware.
3. Can hardware complete algorithm loop in under 10ms.

4. Writing to/Reading from flash memory.
5. Loss of power (re-sync of clock signals).
6. Data rate over umbilical cable.
7. Removal of future enhancement section from document.

### **Power System**

4. Battery system testing.
  1. Verify power budget.
  2. Update power system naming convention.
  3. Add switching controller to block diagram.
  4. Update power input controller electrical specifications
  5. Update figure numbers and tables
  6. Provide explanatory text for table 3.1.2.2
  7. Add detail to figure 3.1.2.2 showing J1-J4 locations (theoretical)
  8. Update figure 3.1.2.3 for more detail and accuracy.
  9. Add overview of LM2524
  10. Update figure 3.1.2.7
  11. Integrate tables of tests into to a single unified electrical and mechanical table.

### **Flight Instruments**

1. Remove bill of materials and reference sections from flight instruments (not necessary).
2. Revise figure 3.2.3.1
3. Revise section 3.2.4 as necessary