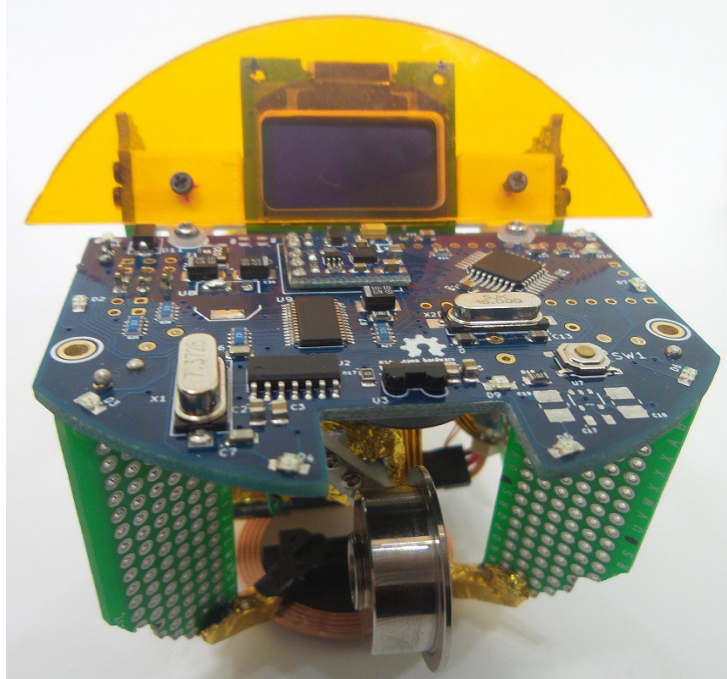


COSMOneer

Specifications



- Overview

The Cosmoneer project was started based on an idea that Cubesats needed a cheap way to simulate space, including autonomy from all power and data sources. Where Cubesats are designed for space, Cosmoneers are designed for anywhere. In a meeting with Dr. Norman Fitz-Coy of University of Florida and Prof. Bob Twiggs of Morehead State University, the Cosmoneer was born. Thanks go to Dr. Fitz-Coy who simply asked, "Please don't make it square", and whose own Cubesat project's attitude control system inspired the Cosmoneer's Control Moment Gyro.

- Purpose

This specification is to facilitate quick construction of a terrestrial satellite simulator for hobbyist and student experimentation and instruction. It is the hope of this specification that students and hobbyists alike can experience the rigors of spaceflight, without the risk and costs associated with it.

While it may appear that constraints will prevent the user from constructing a simple simulator, their purpose is actually to limit the environment to one more similar to space, where the imposed limitations of space itself have triggered exotic solutions that have advanced modern technology. Dimensional constraints are also imposed to facilitate possible adaptation to the cubesat form factor and possible deployment to LEO, were the user so inclined.

Zero-G Simulator Specification



Interface

- 1 DOF Yaw axis is accomplished via a nylon suspension tether, minimum length 5cm.
- 3 DOF in Yaw, Pitch and Roll is accomplished via tetherless spherical encapsulation.



Power Supply

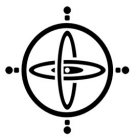
- A wireless power source will provide no more than 600mA @5v continuously.

Cosmoneer Specification



General

- Nothing shall protrude beyond a virtual sphere measuring 100mm OD when stowed.
- Structural materials and fasteners may consist of PCBs, plastics, acrylics and/or metals.
- 1DOF tether may attach inside the stowage area and up to 10mm vertically.
- CoG located 10(30mm) from geometric center in the X & Y (& Z) axis for 1 (3) DOF.



Attitude Control

- Pointing accuracy must be repeatable +/-10 degrees where target is 3M from center.
- Attitude control via Control Moment Gyro or Reaction Wheel only.



Power

- Power reception via wireless source only (IE – solar, thermal, induction, etc.)
- Power plant via on-board storage media or receiver system.
- Recharging of on-board storage media via power receiver system only.
- Total storage energy capacity not to exceed 1500mAh total.

Cosmoneer Specification (cont.)



Communications

- Primary two-way communications shall occur via directional Serial IrDA transceiver only.
- Secondary RF two-way communications are permissible when RD focusing techniques are applied that result in directional comms.
- One-way omni-directional broadcasting is permitted (telemetry, system status, etc.) via any permissible RF frequency.