

# University of North Dakota CubeSat Project



## ZAMBONI

### *Zippy Aerospace Module Broadcasting Observed Not-so-bad Images*

#### **d** **Background:**

During the past several years, the University of North Dakota (UND) School of Engineering & Mines has been focusing on spacecraft design, particularly in the areas of sensor data acquisition and telecommunications. The school has been collaborating with the Upper Midwest Aerospace Consortium (UMAC), also headquartered at UND, in taking an incremental approach towards reaching their goal of launching an orbiting, Earth-observing, remote sensing satellite by the end of the decade.

#### **Concept:**

Before UND tackles the much more complex task of designing, building, testing, and launching its own fully-operational remote sensing satellite, it needs to start with a relatively risk-free and inexpensive orbiting spacecraft. ZAMBONI, the Zippy Aerospace Module Broadcasting Observed Not-so-bad Images, will contain many of the same components as a commercial satellite, but it will be developed at a much lower cost (under \$10,000) and with a significantly lower risk than its larger counterparts. The ZAMBONI project represents a significant step in the growth of satellite systems engineering expertise at the University of North Dakota.

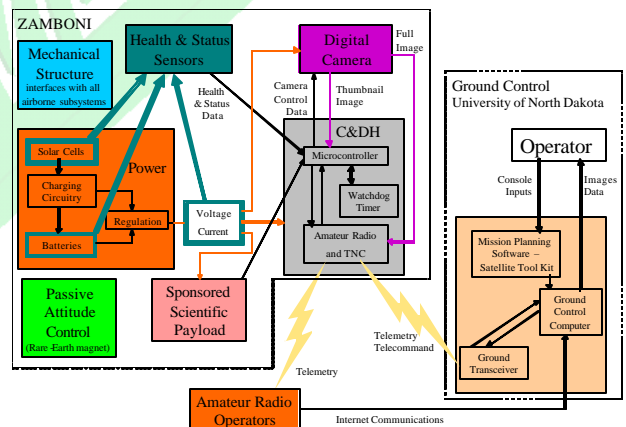
#### **Mission:**

Although size and weight must be carefully conserved on a CubeSat mission, important experiments are possible with this picosatellite spacecraft bus. The ZAMBONI package will be double the size and mass of a standard CubeSat, with a mass of 2 kg and a size of 10 cm x 10 cm x 20 cm. The UND CubeSat will contain two payloads:

- (1) Two commercial-off-the-shelf digital cameras (two cameras, mounted on opposite faces, greatly increase the probability of obtaining a useful image).
  - (2) Reserved space (approximately 30%) for a DoD, NASA, or industry-sponsored scientific payload.
- For more information on this opportunity, please contact the Project Manager.

#### **Launch and Future Directions:**

A launch for ZAMBONI will be coordinated along with other university-built CubeSats from around the world; the team expects that launch costs will be approximately \$80,000. In order to gain sufficient design, build, integration, test, launch, and mission operations expertise, UND Engineering foresees several builds of ZAMBONI prior to embarking on the development of a microsatellite. The future iterations of ZAMBONI will provide the designers with a relatively low-risk, low-cost means of testing various systems in space, such as a miniature attitude control system which cannot be tested properly on the ground. When UND eventually kicks off its full-scale remote sensing development mission, the effort will commence with confidence that it can be successful from both scientific and engineering perspectives. The ZAMBONI team is actively seeking alumni donations and corporate sponsorships to help with build and launch expenses.



For more information, contact Chris J. Schmidt, Project Manager  
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