

ARKSAT-1 Cube Satellite Project

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Acknowledgements

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Introduction

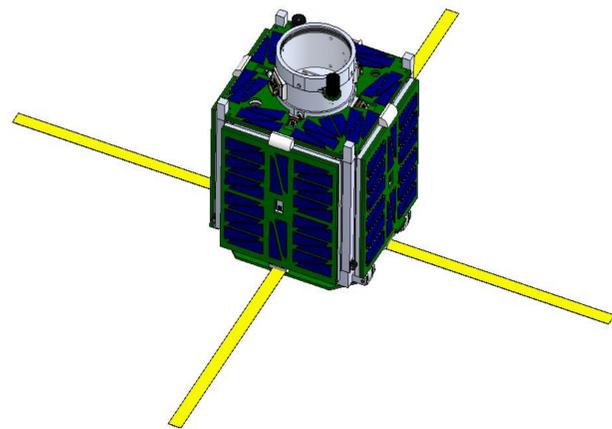
The ARKSAT-1 cube satellite is a project sponsored by NASA and the University with the goal to launch the first cube satellite mission in Arkansas.

Cube satellites are a type of miniature satellite whose main purpose is for space research. There are thousands to them orbiting the Earth at this given time and their functions range from gathering data to sampling data from space.

Purpose

The main purpose of our mission is to provide a starting point and test run the research and development cycle of launching a cube satellite. This is a first for all the team members involved and there were many things to learn about.

The secondary purpose of our mission was to have our satellite orbit the earth successfully and be able to return to the surface after a period of time. While in orbit, the satellite would attempt to point a high powered LED towards the university which we will then attempt to locate.



Methods

Mechanical Engineering:

Utilize CAD software and the department's CNC machines to create the frame and other components

Collaborate with Nanoracks to ensure design meets safety regulations

Computer Science:

Develop software for Arduino and PIC microcontrollers to communicate with various sensors

Utilizing the sensors, create the software needed to allow the satellite to orient towards Earth

Develop software to utilize onboard radio to communicate with a ground station

Results

Camera Functionality: Full functionality of thermal and optical cameras allow for the satellite to take pictures of the Earth

Motion Detection: Satellite must be able to rotate using its magnetic motors in order to orient the cameras/LED towards Earth

Radio Coms: Radio communication with our ground station will send and receive data from the satellite

Launch Compliance: Hardware and Software must meet all NASA launch and safety requirements by the delivery date



Conclusion

The work we have accomplished so far will be documented and will be shared with next semester's ARKSAT group. Currently on the software side we have developed the necessary communication software needed for both the PIC and Arduino to communicate with the various sensors. We also developed a way to store information recorded from the sensors onto a SD card within the Arduino. The machining and electronics design were also close to being finalized. An all aluminum model of the satellite was milled to almost to correct specifications given by NASA and components were ready to be soldered and tested on the motherboard.