

REQUEST FOR PROPOSAL

REQUEST FOR PROPOSAL (RFP) NUMBER: 28504850_01
FOR
DESIGN CONCEPT
OF THE

*CU Balloon Experimental Satellite
(CUBESAT)*

PROJECT: SPANISH FLY



DATE:
March 12, 2001

TIME:
3:04 PM MST

LOCATION:
Integrated Teaching & Learning Laboratory
Room 1B50

ATTENTION:

CHRIS KOEHLER
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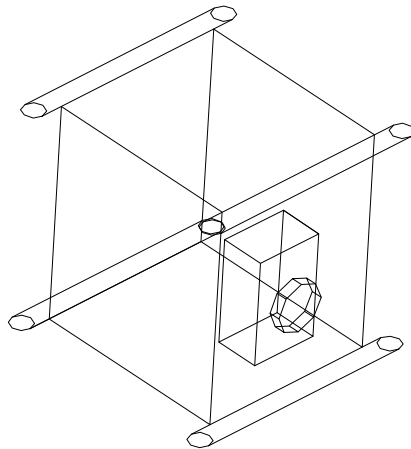
Overview

Mission Statement: Team Spanish Fly will successfully launch and retrieve a high altitude satellite to gain a better understanding of the layers of the atmosphere.

Our team hopes to show how thin the atmosphere is. The pictures that will be taken will show the thinness of the atmosphere as the balloon goes up. The camera will also show the curvature of the earth and the layers of the atmosphere. We also hope to learn how to work in a group of diverse people while trying to accomplish a common goal.

Technical

The Spanish Fly cubesat will be launched on a high altitude balloon by Edge of Space Science. The least complicated design poses a less problematic construction process and launch, so the Spanish Fly cubesat will be a simple cube. The sides will be thin aluminum plates, with an opening in one of the side walls for the camera. The dimensions of the cubesat will be 8 cm by 10 cm by 10 cm. An illustration of the cubesat is shown below.



The camera will be hooked up to a timing circuit to regulate the time increment between photos. The temperature of the camera must also be regulated to ensure that it functions properly in extreme cold. This will be accomplished through the use of chemical hand warmers, often used by skiers. Most commercial hand warmers produce heat at an average temperature of 124 degrees Fahrenheit and will heat continuously for 20 hours or more, more than adequate time for the cubesat to be launched and retrieved. Insulation will also be used on the interior of the cube to trap heat

and as a method of shock absorbance. Two types of insulation will be tested, Supafil insulation and Styrofoam. The final cubesat will make use of the insulation that is most successful during the testing process.

Testing

Testing is done to ensure the safety of the group members as well as the public.

HURT (High Impact Retrieval Test)

Because the cubesat must be intact upon landing, an impact test is necessary. Both the take-off and landing portions of the mission are extremely rough on the cubesat. We intend to simulate both impact and jostling by heaving the cubesat down a flight of cement stairs, as Edge of Space Sciences suggested. Further tests will be carried out by dropping the cubesat from a two story height into grass.

151 UFO (151° Under Fire Operations)

The two insulation types to be considered, Supafil and Styrofoam, must each be tested to determine their heat resistance abilities. A personal hand warmer with a maximum temperature of 151 degrees Fahrenheit will be wrapped in the insulation being tested, and its reactions will be observed. The insulation suffering the least damage, and not catching on fire or melting, will be used in the final design of the cubesat.

Construction

The construction effort will be undertaken by the team as a whole. Melinda Dutton, Danica Reno, and Tom Freestone will oversee the internal construction of the cubesat. This will include testing of the internal components, acquisition of the camera, and construction/acquisition of the timing circuit needed to regulate the time increment between photos.

Erika Civils, Christina Croy, Trevor Harris, and Aimee Schmelter will oversee the external construction process. This will include acquisition of the aluminum to be used in the external assembly and the machining and fitting of the assembly to the hardware provided by Edge of Space Science.

Management & Cost

Spanish Fly Schedule of Events:

<i>Date</i>	<i>Event</i>
March 12, 2001	Proposals Due at 3:04PM MST Team Presentations
March 14, 2001	Authority to Proceed with CUBSAT will be given
March 15, 2001	Finalize Design of <i>Spanish Fly</i>
March 21, 2001	Obtain Required Materials Camera, Thermocouple, Aluminum
March 26, 2001	Circuit, Structure & Overall Payload Construction
April 2, 2001	Team Presentations: Progress Reports Circuit, Structure & Overall Payload Construction Completed
April 4, 2001	Initial Testing of Complete <i>Spanish Fly</i>
April 9, 2001	Final Testing of Complete <i>Spanish Fly</i>
April 11, 2001	Team Presentations: Progress Reports
April 16, 2001	Team Readiness Review (practice) Integration of Payload and Structure
April 18, 2001	Team Readiness Review
April 21, 2001	Primary Launch Date
April 22, 2001	Secondary Launch Date
April 25, 2001	Post Flight Reports

Members of team *Spanish Fly*

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The estimated costs are as follows:

Aluminum Cube Framing/Screws	\$15.00
Hand Warmers	\$5.00 x 4
Professional Light-weight Camera	\$115.00
Timing Circuit (components)	\$25.00
Insulation	Already obtained \$0.00
Film 36 exposure	\$5.00
Film Development	\$6.50
Miscellaneous(backup funds in case)	\$25.00
Total	\$211.50

The costs are estimates for the materials up until the actual products are purchased. Most of the estimates are overestimates and we have also provided a miscellaneous fund to ensure that we have enough money in case we mess up and need to buy extra parts.