Micro-Project 1
Orbital Debris Mitigation
Due 9/13/06 at End of Class

Background:
About 20,000 tons of natural material consisting of interplanetary dust, meteoroids and asteroid/comet fragments filters down to the Earth's surface every year, adding to the terrestrial makeup of our planet, with several hundred kilograms in LEO at any one time. This natural hazard has posed dangers to space travel for years yet now operations of man in space have created a hazard of greater concern. Millions of kilograms of man-made debris orbit the Earth and present a roadblock to continued safe access to space. The growth of orbital debris poses a series of difficulties for space mission designers. To control the growth of debris and its associated hazards, a number of steps should be taken during the design process. Most new space systems consider orbital debris avoidance, and avoid creating new debris.

Problem:
Develop a concept that could be used to protect spacecraft from orbital debris.

Assignment:
Working in teams of 5-8, apply the 7-step Systems Engineering process to this problem. Write up a report of 5-10 pages describing your application of the process. Include a one-page appendix briefly describing the contributions of each of the team members.

References: Current and back issues of Orbital Debris Quarterly can be found at

http://sn-callisto.jsc.nasa.gov/newsletter/newsletter.html
(These should not be your only references.)

Purpose: This assignment is intended to give you an opportunity to work together in small groups and develop an understanding of the Systems Engineering process. This process will be applied throughout the senior design course, so you need to be familiar with it. The project itself is less important than the process. I do not intend that you come up with a detailed design, but rather that you apply the process to characterize the important elements of the problem, decide what makes a good solution, generate some alternative solutions that might work, analyze those alternatives, pick the "best" one according to your criteria, and plan for the next phase of the project. Another important aspect of this project is to get started on learning to write together. Senior design is a "writing intensive" course and you'll be doing lots of writing with others, starting here.

Teams are:

Team 1	Team 2	Team 3	Team 4	Team 5
Grimm	Candler	Paschalides	Doraiswamy	Fairchild
Horvath	Oyerly	Jimenez	Swanson	Patel
O' Connell	Cosentino	Hsia	Kenworthy	Filion
Selnick	Billheimer	Findle	Dick	Kohler
Beck	Smith	Fassett	Wasilewski	Nelson
McLane	Mogensen	Downey	Gerhardt	Buckner
Hoover	Scott			