Unmanned Aerial Vehicle Recovery

**Sponsor:** Lockheed Martin

**Sponsor’s General Mission or Business Statement:** Lockheed Martin employs about 140,000 people worldwide and is principally engaged in the research, design, development, manufacture and integration of advanced technology systems, products and services. Lockheed Martin is involved with aeronautics, electronic systems, information systems, global services, and space systems.

**Sponsor’s Advisor, Title, and Phone Number:** Dr. Robert J. Monson, Senior Manager of EDDS and IRAD Organizations Tactical Systems

**Sponsor’s Address:** P.O. Box 64525 MS U2E25, St. Paul, MN, 55164

**University of St. Thomas School of Engineering Academic Advisor:** Dr. John P. Abraham

**Team Members:** Joe Crimando (ME), Joel Farley (ME), Matt Linder (ME), Joel Seipel (ME)

**Senior Design Clinic I-II (ENGR 480-1) 2006-7 Project Mission Statement:** Our objective is to provide Lockheed Martin with a reusable, fully functioning UAV retrieval device at the beginning of May 2007. This UAV retrieval device will be nondestructive to the UAV and all the equipment it may carry.

**Major Design Requirements:**
1. Non-destructive UAV catching system
2. Able to stop a 4 lb. to 10 lb. plane
3. Two person portable
4. Cost of the unit must be under $10,000
5. 10' X 10' minimum target size
6. Wind proof to 15 mph
7. Full deployment in less than 5 minutes
8. Self-supportive under operations
9. Reusable

**Senior Design Project Summary:**
This report describes the process of designing and testing an inflatable recovery device for assisting the landing of unmanned aerial vehicles. The primary goal of the device is to provide a safe and repeatable means of recovering unmanned aerial vehicles (UAV) without damaging the vehicle or the on-board sensitive instrumentation. A set of customer requirements was obtained from Lockheed Martin, maker of the UAV system and sponsor of this project. Design specifications were generated based on the aforementioned requirements. These design specifications were relied upon during the concept generation and selection phase. Currently, three prototypes are being pursued. Fabrication on scaled versions is nearly completed and a testing phase is being prepared. Based on the testing results, full scale models will be built and evaluated with a full size UAV. Final designs and prototypes will be supplied to the customer.