

## Team Energy -iPod Charger

**Sponsor:** Lockheed Martin

**Sponsor's General Mission or Business Statement:** As a lead systems integrator and information technology company, the majority of Lockheed Martin's business is with the U.S. Department of Defense and the U.S. federal government agencies. In fact, Lockheed Martin is the largest provider of IT services, systems integration, and training to the U.S. Government. The remaining portion of Lockheed Martin's business is comprised of international government and some commercial sales of our products, services and platforms.

**Sponsor's Advisor, Title, and Phone Number:** Dr. Robert J. Monson

**Sponsor's Address:** Pilot Knob Road and Yankee Doodle Road in Eagan, MN

**University of St. Thomas School of Engineering Academic Advisor:** Dr. Jeffrey A. Jalkio

**Team Member Names:** Britton Adamson (EE), Brian Falk (ME), Jared Sandstrom (ME), Kevin Krautbauer (ME), Patrick Costello (ME), and Nate Griener (ME)

**Senior Design Clinic I-II (ENGR 480-1) 2005-6 Project Mission Statement:** Design and manufacture a durable, portable and lightweight Ipod charger that provides readily available and renewable input power for the common business person.

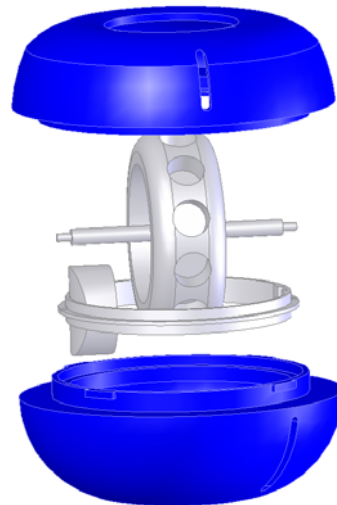
**Major Design Requirements:**

1. Output 5V, 100 mA $\leq$ 500mA for 2 hours
2. Less than one cubic foot
3. Weigh less than 15 lbs
4. Dropped from 4ft with no internal damage
5. Remote location charge

**Senior Design Project Summary:** In the world of mobile electronics and communications it has become increasingly important to provide power that is as mobile as these electronics. The Lockheed Martin Energy Generation project will provide a new innovative way of transforming mechanical motion into usable, sustainable power. Inspired by a Department of Defense competition to provide renewable energy to soldiers, the customer required a means of generating energy that could be available to a consumer market. With the widespread use of iPods, losing charge has become a common concern for customers. Thus a trouble-free charging method could spike interest in many consumers. A design focused multidisciplinary engineering team with an understanding of motor theory and electromechanical design was necessary for the project. After conceptually designing a system to perform the necessary operations, a significant amount of mechanical and electrical design was performed. After obtaining the essential components through vendors, machine shops, and fabrication, the components went through assembly and unit testing. Leadership from all group members, creativity in design, a focused schedule with the ability to adapt, good documentation, and skill with external resources was necessary for project success.



Prototype charger for Ipod



Exploded view of SolidWorks Prototype