

**Assistive Technology Design Fair (ATDF) 2006**  
**Project Highlights**

**“Open Sesame” Automatic Door Opener**

An amazing team from Dracut High School managed to design a remote control automatic door opener for a young wheel chair bound boy, who was a cousin of one of the designers. This boy simply wanted to be able to enter his house without help, when he gets home from school. This was an amazing challenge for high school students to accomplish, and at the outset we thought it might be too difficult. Their solution involved using 2 garage door openers and a cable system to open both the screen door and the steel door on the front of the house. Each opener was operated using a remote to open and close it. This cable system, which was not their first design idea, is completely safe because it still allows for the manual operation of the doors. Their system was installed in this family’s house, and seeing the video of the first time the boy opened the front door on his own was a wonderful moment to witness!

**Specialized Reading Magnification and Light System**

A team of 5 outstanding AP chemistry and physics students from Fitchburg High School took on this ATDF project as an extracurricular activity to help a woman who had a loss of vision resulting from a brain tumor, and thus had difficulty reading – sadly their client is the mother of one of the students. They designed and built a book magnifier with built-in lighting, along with a marker to help the woman keep her place in the text. Although they originally conceived of a wooden lap-top frame with a magnifier and light attached, they ended up creating a much more portable solution. They used a plastic half-rod bar magnifier, embedded high-brightness LEDs in each end, and machined a sturdy, durable frame from plastic extruded door molding that they found at Home Depot.



**Many Thanks Again To Our Major Corporate Sponsors**

*Tyco Electronics Foundation & M/A-COM, Lowell, MA*  
*3M Touch Systems, Lowell, MA*  
*Philips Medical Systems, Andover, MA*

### **“Mobility Rocker” Leg Exercise Device**

This team of students from Swampscott High School worked with a fellow student who had a congenital disease resulting in very weak leg strength. This boy could not walk on his own for long distances, and he used a wheelchair most of the time. He went to physical therapy 4 times a week in order to stretch and encourage the use of his legs. It was determined that he would really benefit from a device that would allow him to exercise his legs often, by himself, while sitting in his wheelchair. Their invention was custom-designed for a teenage boy in a wheelchair. They mounted a cool-looking skateboard onto a wooden frame that attached to his wheelchair. The skateboard was mounted using a pivot joint at its center so it rocked back and forth. It was an ingenious design because although the boy could push with his legs, he could not pull his legs back toward him – but the pivoting skateboard design did that for him.



### **“Modified Locker Remote for Molly”**

Whittier Regional Technical High School entered our ATDF this year for the first time, using this project as a capstone design project for an electronics course. They worked with Molly, a high school classmate who had cerebral palsy. Molly has no problem getting around school on her own, but her CP did impair the use of her hands, so she had difficulty opening her locker; she could do it, but it took some time, and often made her late for classes. So, this team of 17 technical students, our largest team ever, designed and built a remote control solenoid lock that they installed on her locker. Their solution was to use an infrared transmitter and receiver, although the students built and experimented with several different remote control circuits to determine which was the best for this application. Their lock also had a key in case the remote failed, and the team molded a special the key holder to precisely fit Molly’s hand. Other team members who were taking machining and CAD courses did the drawings and machined the custom parts needed to retrofit Molly’s locker with the new lock.



### **“Drive Ease” Carpal Tunnel Shifting Assistance**

One team from Greater Lawrence Technical High School worked with a woman who had Carpal Tunnel Syndrome in her wrists, as a result of sewing for more than 14 years. Her car has a manual transmission, and she found that it was very painful and difficult to shift as a result of her condition. This team designed an adjustable support cradle that fits behind the shift handle, in order to immobilize their client’s wrist while driving. The woman’s wrist brace gets attached to the cradle using Velcro, and it provides the right amount of support and stability while driving, and it allows her to move her hand to shift more comfortably.

