

February/March 2006

MAINE'S SOURCE FOR ENGINEERING AND PROGRAMMING EVENTS

UPCOMING EVENTS

April 17th-21st, 2006

Vacation Engineering/Robotics camp for 9-14 year olds

April 29th, 2006

Spring Robot Track Meet, USM

May 6th, 2006

Spring Robot Track Meet, MMA

May -September, 2006

Registration for FIRST LEGO League

July-August, 2006

Summer camp programs:

Beginner and Advanced sessions
Orono, Bangor, Portland, Augusta

September-December, 2006

FIRST™ LEGO® League Season

September-November, 2006

Teacher workshops, TBD

December 2nd & December 9th

Southern FLL Tournament

Northern FLL Tournament

Maine's Spring LEGO® Track Meet

April 29th, 2006 USM-Gorham
May 6th, Maine Maritime Academy

Registration is now open and teams should contact Maine Robotics no later than March 31st.

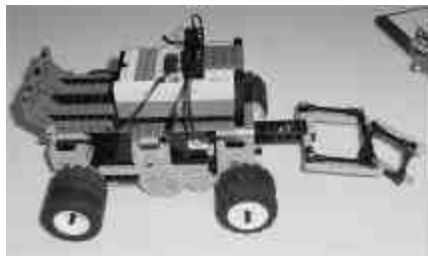
The 2005 program was met by teams from around Maine who came and competed in our 6 track events!

There were 31 robots and bridges entered into the competition and the competition was fun and fierce!

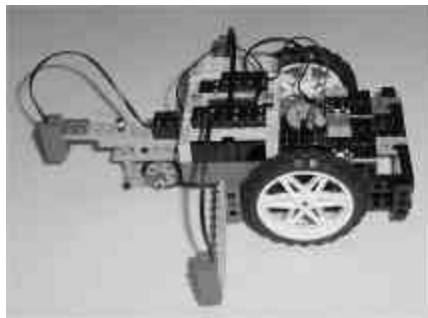
The **fastest robot** (next column) went to Lego Motion from Trenton with their 453 gram wheeled robot (2.7 seconds for 15 feet)



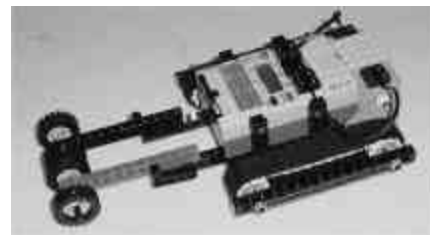
The **strongest robot** (below) went to Bacon Cheddar Ranch from Surry with their 1052 gram, 6-motor wheeled robot. The robot pulled 40 pounds the required two feet in just 16 seconds.



The best **table navigating** robot AND the fastest **line follower** went to the Trenton Lego Lions with their 508 gram robot. All four sides of the table where navigated in just 65 seconds! and the line course was run in just 9.5 seconds!



Perhaps one of the most impressive this year was the **slope climbing event**. One of the teams from the Troy Howard Middle School finished first with their 459 gram treaded robot (okay it also had some wheels) by being the only robot that could climb a 70 degree slope. Their robot finished the climb in just 16 seconds!



The last event was the **bridge building competition**. Teams had to span approximately 22 inches and hold up to 60 pounds! This year it went to a young team from Jay Maine. The Jay Mind Builders fielded a bridge that carried all 60 pounds (maximum tested) and won by being the lightest bridge in the event. Their bridge came in at 1747 grams and bested out the #2 bridge by being 1100 grams lighter!



The track meet is geared toward using straightforward principles of physics and programming in order to compete in a track meet event.

There is something for everyone and we look forward to the spring 2006 season. We will work with any interested teacher or group in educating our youth on the basic principles of physics, engineering and programming needed to successfully compete.

For the 2006 year we have added the **Ping Pong Shot Put!** Check out the web site to learn more about this new event. But simply put (no pun intended) you have to get as many ping pong balls into a box 4 feet away in just 30 seconds!

NEW Learning Modules available from Maine Robotics

For the past several years we've been working on having easy to use (for the kids AND the adults) learning modules. These are double-side,



single page, laminated, self-taught modules that teach and demonstrate the basics of building robots and programming them.

Each module covers a topic that we know from experience is important to building good robots. Most include the programming tips or example programs for use with the projects listed.

Our first bundle of 10 is now available for sale and can be found on our website. The 10 topics are:

1. Building a Robot
2. Building a Pivot Wheel
3. Using Gears, Part I
4. Using Gears, Part II
5. RoboLab Basics
6. Turning your robot
7. Using a Touch Sensor
8. Using a Light Sensor
9. Line Following
10. Using a Rotational Sensor

They will be available as a pack of ten (one each). With each purchase we include free, the teachers guide for that unit(s) to help even a novice engineer start working with the children and the robots.

Our Vacation and Summer Camps Programs

Each year since 2002 Maine Robotics Director Tom Bickford has been working with children as part of a summer camp program. In 2005 there were a total of 141 camper weeks, with each week being a 5 day, 6½-7 hour program.

Camps were operated in Orono, Bangor, and Readfield. In 2006 we



expect to have camps in Portland as well.

This program gives children the opportunity to work with adults who specialize in engineering, computer sciences and are also educators skilled at mentoring the inquisitiveness of the youth.

Visit www.mainerobotics.org/camps.html for more information.

The FIRST™ LEGO® League Tournament

The 2005 FLL Tournaments were a great success. We had about 350 people in Castine on November 19th and around 700 people on December 3rd in Gorham.

The Castine tournament served as a regional tournament and the Gorham tournament served as the state-final. The **THMS LEGO Lions from Belfast** came away with the **Director's Award** and are heading for Atlanta Georgia this April for the World Festival competition, Good luck Belfast!



Other high rankers were **When LEGOs Attack from St. George**, **Team Havoc from Trenton**, and **Nuclearly Unstable Chimp Monkz from Orono**. For a full listing visit the Maine-FLL website at www.mainerobotics.org/oceans.html.

Great thanks to Maine Maritime Academy in Castine and the University of Southern Maine in Gorham for their wonderful support

for these two tournaments. Without their generous support of facilities, time, and food our tournaments would not have been possible.

The **2006 Challenge** has been named and hinted about. It will be **Nano Quest** and have to do with the microscopic world. This is a huge field of study and is important in everything from medicine to manufacturing. I'm sure we all look forward to the full details in the fall.

Registration for 2006 starts in May. Check out our website at www.mainerobotics.org/nanoquest.html and the international page www.firstlegoleague.org.

Each fall teams with children from 9 to 14 build, test, and program robots to perform a series of thematic missions on the year's playing field. The teams also research a related topic, prepare, and then present their hypothesis, findings, and recommendations for using robotics to improve a condition they have identified.

New in LEGO Mindstorms

If you haven't heard, you might want to check it out... The long time RCX is soon to be replaced by the all new NXT MindStorms kit! While we haven't had the opportunity to play with the kit or try the software, it has been a long time in coming.



There are some definite new features that should be good, like more memory, motors with built in rotation sensors, refined touch and light sensors, new ultrasonic and sound sensors, a new programming language (supposed to be easier than RoboLab), and wires that connect like phone cords.

The system is listed on the LEGO website at \$249.99 but we have noticed that the referenced June due date has been replaced with an "available soon" timeframe, and elsewhere it says available this August, and elsewhere this fall... so you can guess as well as we can. If you are needing kits you can still get the MindStorm RCX kits through the www.legoeducation.com store at the same old prices.

If you want to do data logging, you will have to use the RCX as the new NXT software is not expected to have that capability until 2007.

For more information check out the official website at <http://mindstorms.lego.com>.

Website & Newsletter for Robotics

Since February 2005 we have had over **125,000 hits** and **15,000 visitors**. The site provides on-line information about our programs and helpful background information and links to other useful sites.

Our newsletter goes out to over 900 schools and people in the State of Maine interested in these programs. Our newsletter is also available on-line.

Belfast LEGO Lions off to Atlanta for the World Festival

by Jacquie Kahn & Joel Knight

Life for the Belfast Lego Lions has been consumed with the preparations of going to Atlanta to compete at the FIRST LEGO League Tournament. We have redesigned and reprogrammed our robot. We are designing and building a working robotic oil skimmer model for the oral presentation project. The team and parents have been working hard fundraising. Along with bottle drives and raffles, we've planned a spaghetti dinner and are conducting ongoing public presentations for various organizations in town. In addition, the Lego Lions teammates formed an instrumental jazz band called "Going to Atlanta" and made our first public debut at a recent fundraiser.

Our goal is to win at Atlanta! This goal keeps us focused and motivated to do our best. We want to return home proud of our performance in Atlanta and we want the people in our community and state to be proud of our team.

On March 4, from 9:00am – 2:00 pm, we will have a demonstration booth at the Maine Engineering Exposition in the UMO Fieldhouse. Please come join us at the exciting engineering event!

The RCX as a Data Logger

By Tom Bickford

I've been using the LEGO RCX and RoboLab for about 6 years now, so I'm starting to become an expert. I've been programming computers since 1979 (not full time, but still I remember punch cards).

One of the most unique features for the RoboLab/RCX combination that make them excellent tools in the classroom is their ability to collect and log data.

Don't let anyone minimize what this means. It means that students can design experiments and then perform the experiments, collecting data and then analyzing the data.

One excellent example, use a temperature and light sensor connected to an RCX, collect the values of these two sensors every 10 minutes for a 24 hour period. Then bring the RCX back to the computer for upload. Compare the results from a classroom, a car, a terrarium, or equivalent areas.

When and why does the temperature increase or decrease? What conditions can be controlled? What is the dependent variable? The list is long on what you can do with the equipment.

The sensors available through LEGO Education are not exhaustive, but LEGO does carry a secondary source. Go to www.legoeducation.com and search for "sensor" in their store for things like a humidity or pH sensor.

Partnering With Others

Maine Maritime Academy in Castine will be host to the 2006 Northern

FIRST LEGO League Tournament and to the Spring Robot Track Meet.

University of Southern Maine, School for Applied Science, Engineering and Technology will be host to the 2006 Southern Spring Robot Track Meet and hopefully to the Southern FLL Tournament.

Maine Robotics has worked for the last two years with Learners Without Borders, an afterschool program serving schools in several Maine communities. We are also available to work with your school or organization as mentors. Call us if you have questions.



About Maine Robotics:

Maine Robotics believes that only by working with Maine's youth from an early age and continuing through their entire educational experience can we expect our youth to successfully grow into the fields of science, engineering, computers, and technology.

Our youth want the experiences, they are ready for the tasks and lives that lay ahead of them, but we as a state and a people must help them realize this potential for their sakes as well as the sake of our state's well being.

Maine Robotics' Director, Tom Bickford, is an educator and an engineer with decades of experience in both the education and science fields. Tom holds degrees in both biology and biomedical engineering and has a background working on state-of-the-art telemedicine systems while at UNC and the UTHSC in San Antonio. Tom has taught at the middle school, high school, and college levels.

Maine Robotics was founded in 2004 and is a Maine non-profit corporation.

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Place
Stamp
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Dear Teacher, Coach, Technology Coordinator, Principal or Parent,

The programs offered by Maine Robotics are designed to foster interest and skills in computer science, engineering, physics, and technology in general. You and your students can gain so much by joining in! Please share this information with others at your school.

Our goal is to excite and teach the students, campers, and participants and keep them coming back for more; more from the programs, more from school, and more from life.

The PowerBot has 4 motors, 12 all-wheel drive tires, and can hold a gallon container on top for ballast. It is driven by a 250:1 gear reduction drive train that can easily pull 60 pounds across the floor (on a cart) but does it very, very, very slowly. (Send us a picture and description and maybe we can include your robot in a future newsletter!)

