Robots and a Whole Lot More

Hammond's Beatty/Bemcor Beating the Big Boys

For many, David and Goliath is simply a story from long ago about the little guy overcoming adversity. For Hammond's Beatty Machine & Manufacturing and its sister company, Bemcor, taking on – and defeating – the big boys is a reality.

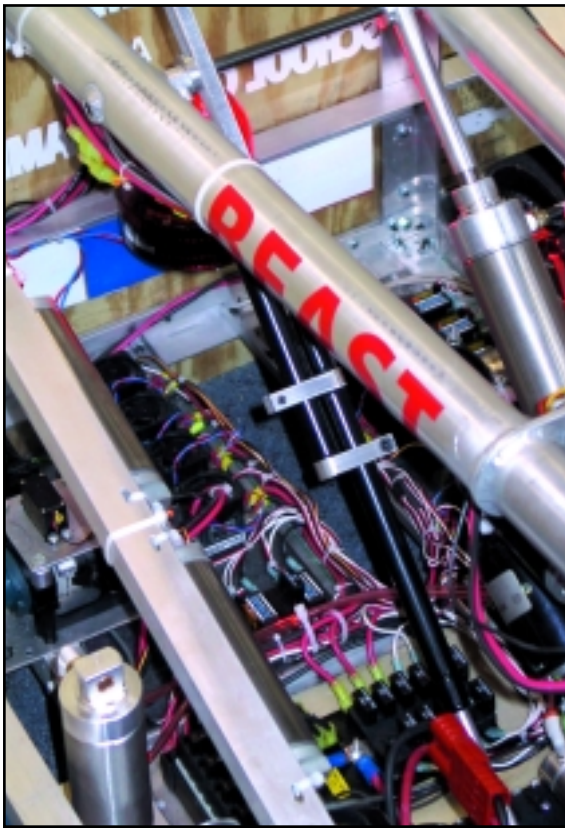
Beatty and Bemcor have sponsored Team Hammond in the nationally renowned U.S. FIRST Robotics Competition for the last eight years. Although competing against teams sponsored by Rolls Royce, Delphi, DaimlerChrysler and other corporate giants, the Hammond squads have brought home an unprecedented three national championships. No other school/team has won more than one.

When inventor Dean Kamen founded FIRST (For Inspiration and Recognition of Science and Technology) in 1989, the goal of the program was to inspire an appreciation of science and technology in young people, their schools and their communities. The nonprofit organization hosts the annual FIRST Robotics Competition for high school students and the FIRST LEGO League for elementary and middle schoolers.

Eleven years ago, the initial FIRST Robotics Competition took place with 28 teams in a high school gym in New Hampshire. The 2003 championships included more than 800 teams from nearly every state in the U.S., as well as Brazil, Canada and the United Kingdom. More than 20,000 people were in attendance at Reliant Stadium, home of the NFL's Houston Texans.

Beatty Machine is a third-generation company, started in 1917, that focuses on areas including machining, welding, rebuilding and machine maintenance. Employment peaked at approximately 160, but now numbers less than 100.

The inner workings of Team Hammond's 2003 Beast – Beatty Enhanced and Student Tweaked.



Getting started

The company's initial involvement in the robotics program was more of a trial run, according to company president Bill Beatty. When approached by school officials seeking sponsors for the program, he agreed to attend an initial meeting. It turned out Beatty Machine was the only company represented. Nevertheless, he decided to give it a try.

"I figured, how hard can it be to build a toy robot?" Beatty asks. When the team fared well in its initial year, "We had to keep going back, to keep a name for ourselves."

Team Hammond did more than that, winning the first of its three national titles in 1997. Another return was necessary, to prove that the success wasn't a fluke. Strong finishes followed, with two more national titles in 2001 and 2002.

Accomplishments for Team Hammond involve a lot of time and commitment, from both the high school students on the team and the mentoring engineers from Beatty and Bemcor. Darrell Noble, a sales manager for Beatty and one of the mentors, says the team works

By Rachel Copley

Team members at the controls and preparing for the national championship in Houston's Reliant Stadium.

seven days a week, 14 hours a day for six weeks to design, build and test the robot for that year's competition. That's a lot of time for students and adults to work together.

"I was afraid of everyone at first," says Matt Schade, a 2002-2003 freshman at Hammond Gavit High School. He says he was surprised at how many tools he was allowed to use, and how much he learned from the mentoring engineers. "I learned to work together with them in discussion boards and through differences of opinions," he says.

Beatty and Noble say the preparation for the competition is no easy task. Each year the challenge is different – stacking bins, knocking over bins, picking up pillows are a few of the examples – with competition rounds always lasting two minutes.

Each team is given a standard "kit of parts" – described by Bemcor President Dan Lazar as three boxes of materials that you would never think could be turned into a robot – and a common set of rules. The kit consists of items such as a piece of carpet, screws, a seat adjuster, motor and more.

The first step, according to Noble, is a brainstorming session with the engineers and students. All ideas are welcome. Some may be put aside at first, but often are utilized later as the process evolves. From there, a plan is decided upon, and each student is given an assignment – a special part – in building and programming the robot. Six weeks later the final product is shipped out to await the day of competition.

Building bonds

According to both the engineers and students, much more than a robot is built during those six weeks. Noble observes that the students learn respect for one another in the brainstorming stage. They gain self-confidence as they learn how to manufacture the robot. And they develop valuable public speaking skills when they practice presenting the robots for the competition.

"The change we see in the students is what keeps us going," Noble says. "We can sit and preach to them, but we would rather lead by example with them at our elbow."

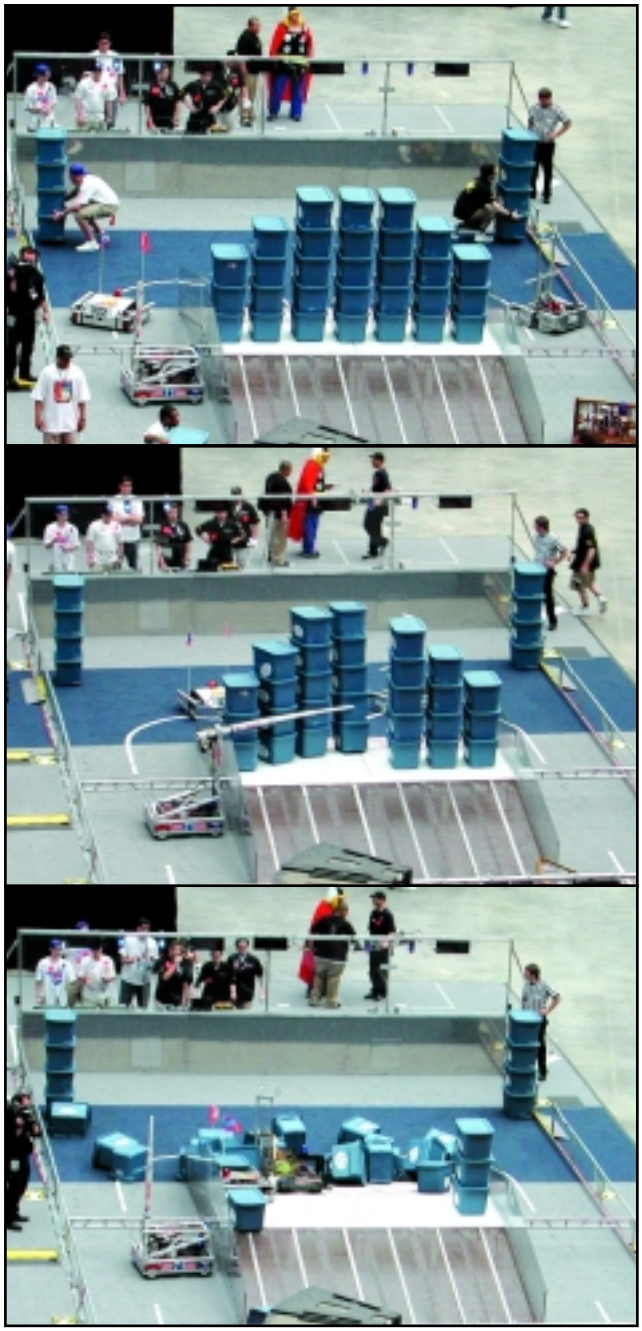
One girl joined the team at the prompting of her mother. She was rather reclusive and shy, according to the mentors. "We gradually saw her open up, start to make friends," Noble says. The girl, who decided to stay an extra semester in school just to be part of the next robotics team, told Beatty "you changed my life."

Beatty, affectionately known as Mr. Bill among the students (although he has had to explain the *Saturday Night Live* character reference to nearly all) sees former team members come back to assist in any way they can. Others have gone on to help establish college-level teams or encourage their universities to work with high school students in the FIRST competition.

Students care deeply about the program and the mentors who help them, with the Beatty/Bemcor engineers sharing the same feelings. The young participants see the program as a challenge and a reward.

Elyse Holguin, a junior last year at Gavit, says she was

Bill Beatty, right, and Darrell Noble treasure the special bonds that are formed as part of the robotics program.



Action from the 2003 championships included the Beast moving into position and knocking down plastic bins with its robotic arm.

drawn to the program because she plans to pursue a career in business and engineering. The FIRST competition gives her a feel for how people work together to produce a product in a business atmosphere.

"I learned the technical language and was even able to sit down and do it myself," claims 2002-2003 freshman Greg Ullstam, the "student engineer" of the group. "That gave me a lot of confidence, knowing I could do it."

Future rewards

Potential future business contacts can be made at these competitions. Representatives from major companies attend, with a successful team like Hammond sure to draw attention. The competition also shows students that the technological fields hold many opportunities, and that the concepts of science, math, engineering and innovation can be interesting and exciting.

"The whole idea of these competitions is to expose these kids to technical ideas, important people," Noble says.

Although the students pay the expenses for travel to the regional and national competitions, local sponsors help with the funding. Nationally, colleges, universities, corporations, businesses and individuals provide scholarships to participants. In Hammond, the parent booster club, Bot Boosters, was formed to not only assist with finances but also gain support within the community. The organization sells products and conducts demonstrations throughout northwest Indiana.

Gavit Principal Charles Hall sees the program as a valuable way to strengthen students' academic progress and build a bridge to future success.

"The kids have learned to overcome a lot of obstacles – from the beginning challenge of building a robot to fixing the problems that arise. And how many kids are given an opportunity like this?" asks Hall.

Team Hammond, second to Kokomo in longevity among Indiana programs, averages around 24 students a year, drawing from the four Hammond high schools. In 2003, there were 16 FIRST teams in Indiana, totaling more than 600 participants.

Although Beatty says the economics don't add up, the desire to work with the students and fare well in the competitions is still there. Much of the work has been shifted from the company shop to available space in the area career center.

"We have a home now," Beatty claims, adding that he maintains the original thought process that led to his involvement with the program. "I decided that if I was going to do it, I would do it to the best of my ability."

And, with an 18th-place finish in the 2003 nationals after the two successive championships, the incentive to reach the top again is stronger than ever. Can Hammond bring home a fourth championship?

Schade, looking forward to three more years on the team, smiles and says, "It's possible."

INFORMATION LINK

Resource: Beatty Machine at (219) 931-3000

Team Hammond at http://hammond.k12.in.us/TeamHammond/team.html

U.S. First Robotics at www.usfirst.org