Panther Trax

AT&T Bell Laboratories A&T Global Information Solutions
NCR Microelectronic Products Division Harrison High School
Colorado Springs, Colorado

"I often tend to dismiss ideas before actually giving any real thought to them. On the other hand, I believed all of my ideas were perfect and wondered why anyone would disagree with them. As can be expected, I was brought quickly to a harsh reality."
Umar Yousufi, Student

"I have learned to listen to people. That was a big problem for me, but now I listen to my teachers more than I did before."
Mark LaFave, Student

My ambition?

..."play professional baseball and become an engineer - all at the same time!"
Jeremy Hahn, Student

"It is not often that students and teachers work alongside each other, learning together. It was a fantastic experience to have a student teach me how to use a milling machine."
Sandy Smith, Teacher

"It was a wonderful experience when the engineer would assign different tasks and believe enough in us to do them."
Daniel Fortune, Student

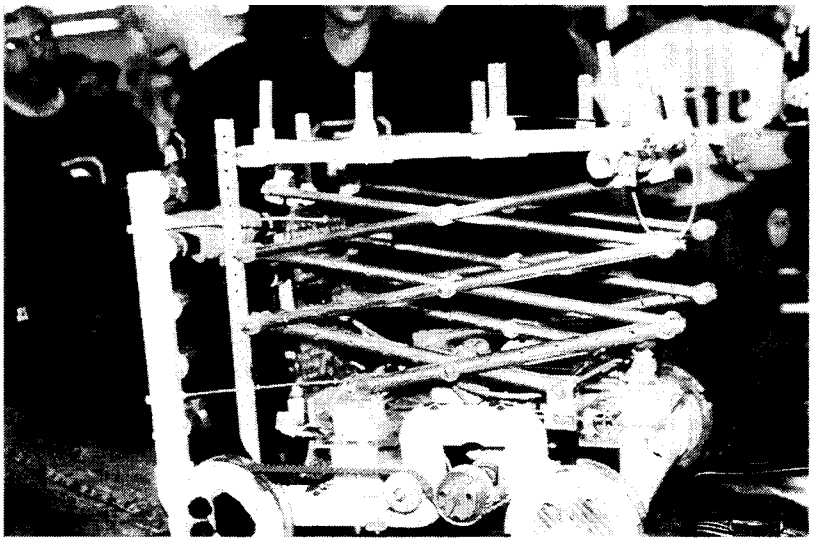
"I think that the students have had a chance through this project, to understand how engineering, and problem solving in general, doesn't always come out right the first time. The U.S. FIRST project also gave the students a chance to take ownership in the project. Taking ownership is difficult, it requires that the individual not be afraid to make mistakes and fail. Taking ownership also requires that those students who make mistakes recover and continue."
John Kaufman, Principle Design Engineer

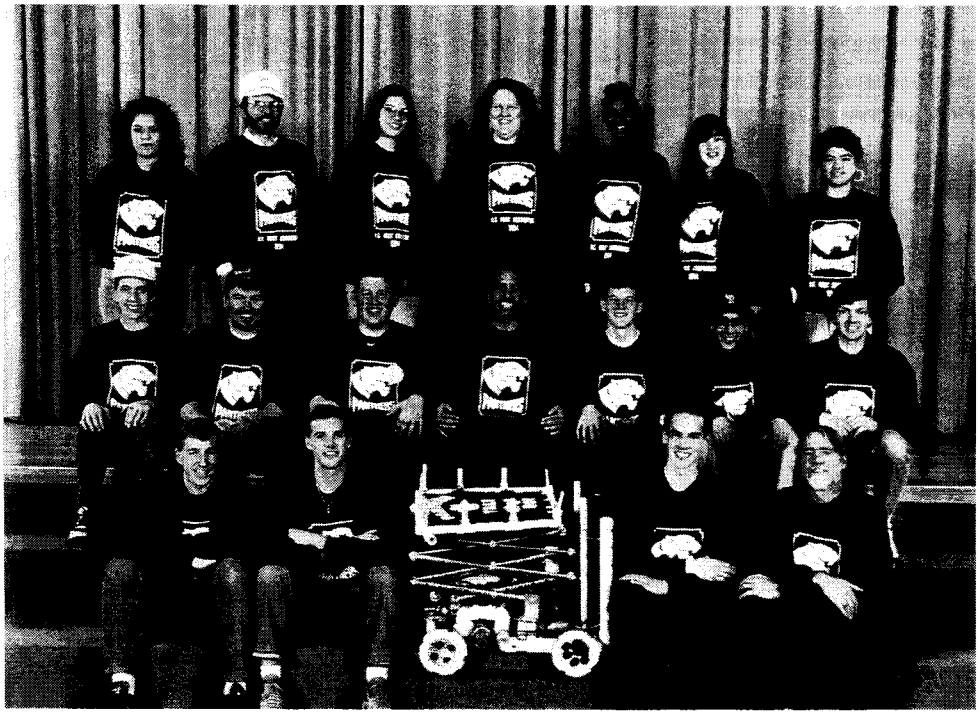
"I was really surprised that students and teachers from all over the school seemed to be interested in what was going on."
Patricia Stines, Student

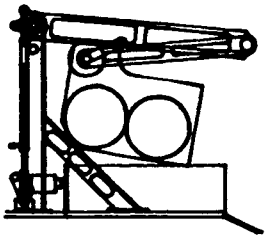
"I've learned not to wait until the last moment to do something, no matter how little it is."
Josh Mathewson, Student

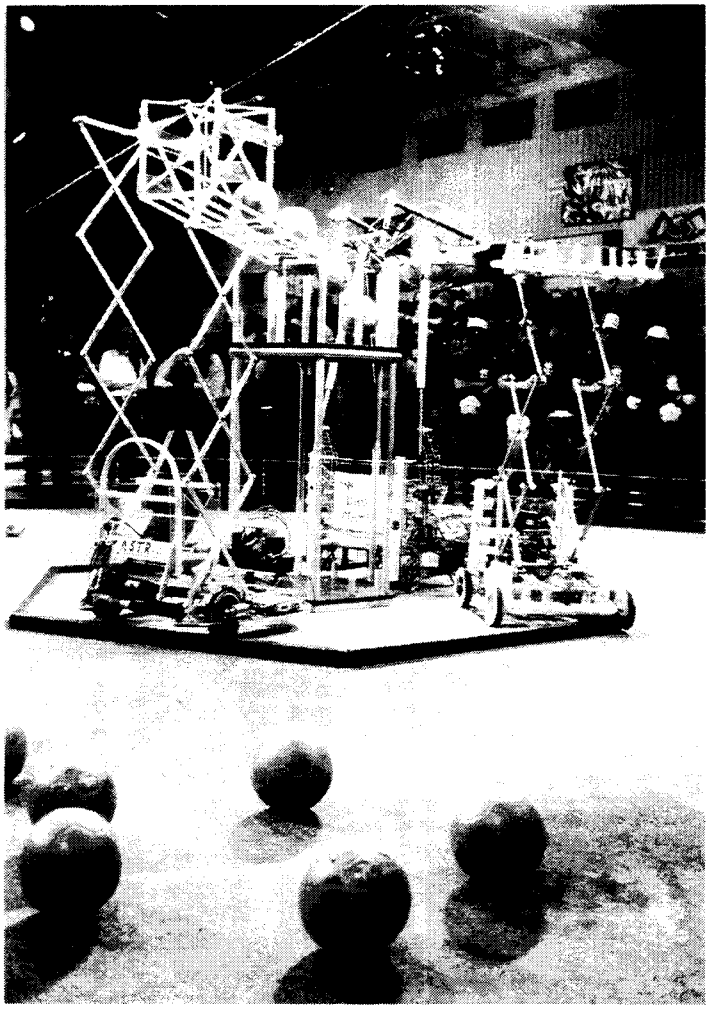
"In the U.S. FIRST Competition we had to create our own ideas, and there was no real right or wrong answer.
Moe Stenberg, Student

"I've learned that everyone plays an important part on the team. Whether it be drilling, gluing, or being the brains of the operation. What you do for the team saves the team and saves time and stress on others."
Karen Zoebisch, Student



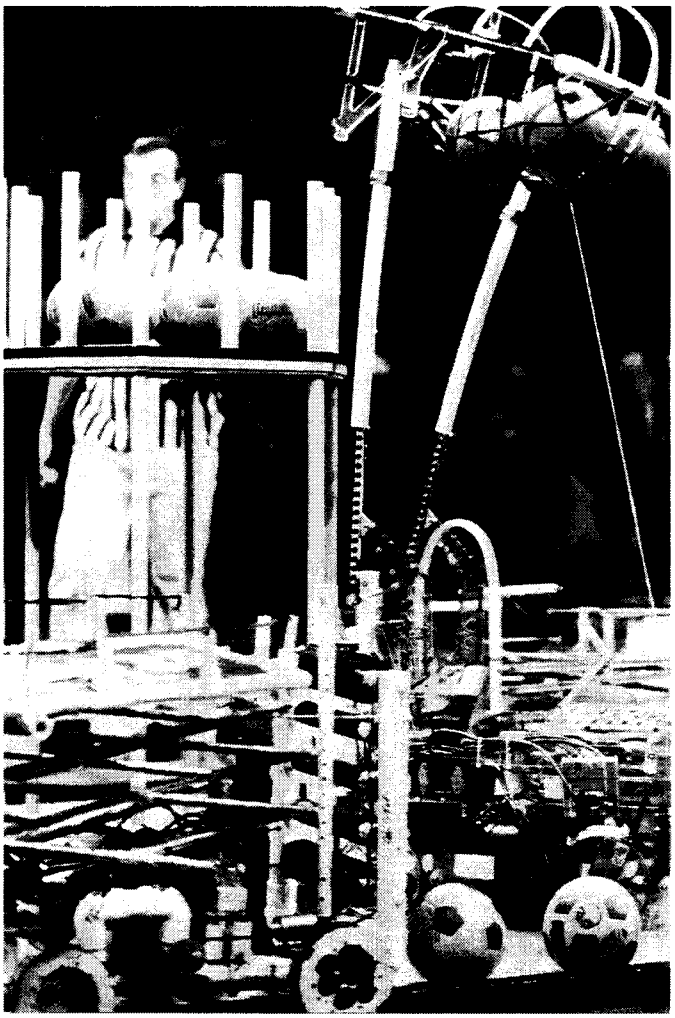






"...the arena of working in groups composed of people other than your peers was totally different than what the students had experienced in class. There was a higher level of anxiety involved in proposing an idea; 'After all, these people are professionals'. There was an intimidation factor of working with new equipment; 'I've seen this done, but can I do it?' There was a learning to deal with disappointments; 'Yours is a good idea, BUT, we're going to use this one.' Finally, there was ecstatic joy of achieving success; 'It works! I can't believe it really works!'
...So while I will continue to require team projects in class, I'm much less naive that I am actually modeling real-life team work."
Teri Smith, Teacher

"Traditional education involves a teacher, a textbook, and a lot of lectures. The questions you are asked already have answers and can be used to help understand things that relate to these problems. This project was a whole new type of learning. The problems that came up didn't always have answers, and some of the problems still haven't been solved!"
Joseph Harris, Student



A.S.T.R.O. (Applied Science and Technology Research Operation)

NASA Lewis Research Center Cuyahoga County Schools
East Technical HS, Holy Name HS, Lakewood HS, Magnificat HS, North Olmsted HS, North Royalton HS, Parma Senior HS, Strongsville HS.
Cleveland, Ohio

Outstanding Defense Award

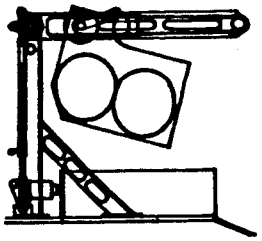
"The talents, technical skills, and patient guidance provided by the many NASA Lewis technicians, engineers and other professionals enabled us to design and build a successful entry which was recognized for 'Outstanding Defense' at the competition. We extend our gratitude for having had the opportunity to be involved in such an exciting project and to have worked with such dedicated advisors and friends."

Student members of Team A.S.T.R.O.

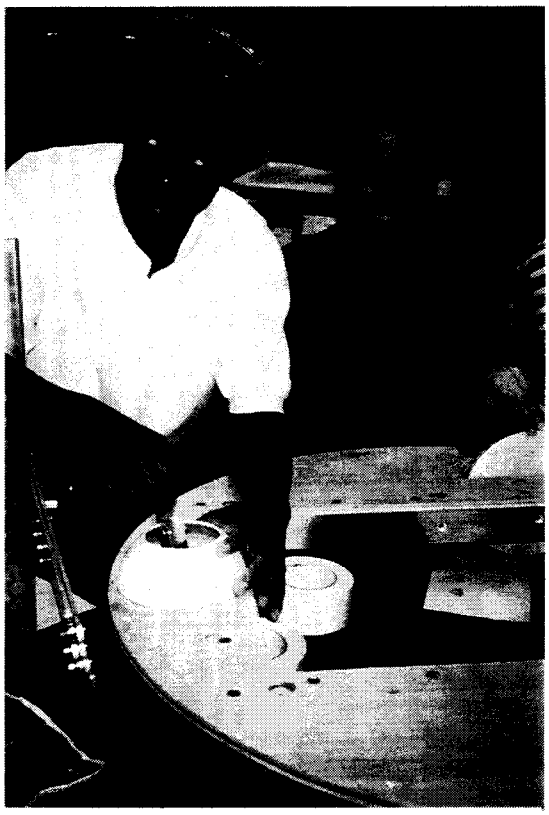
Students have limited opportunities to participate as a member of a team with an intellectual versus physical focus, the very experience most needed by business today.

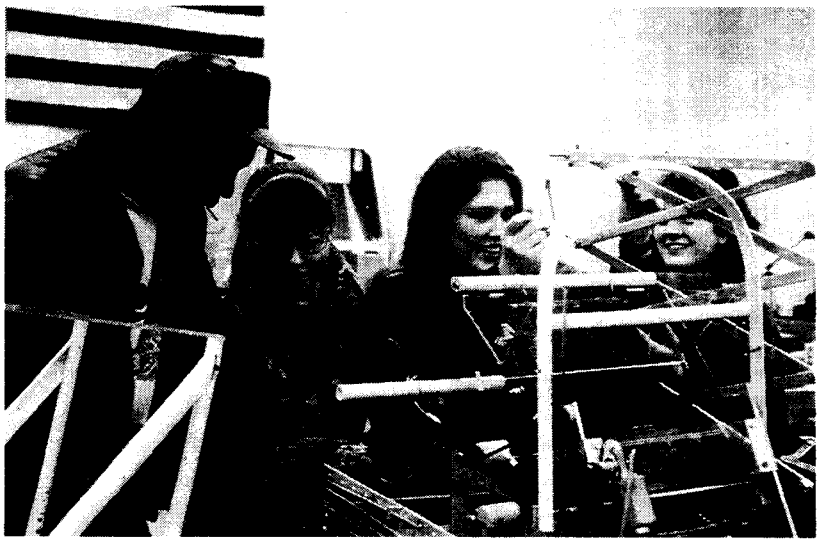
"U.S. FIRST forced us to adopt new ways of working between engineering, designing, and manufacturing. This is an example of concurrent engineering at its best."

Peter J. Murray, Model Development Manager
NASA Lewis Research Center

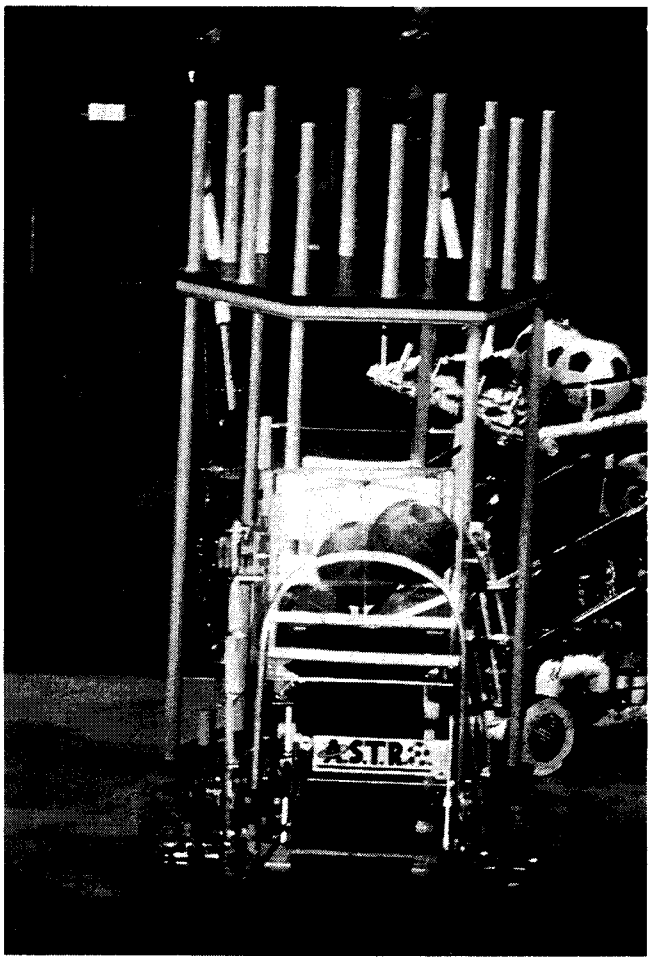


Fifteen engineers, designers, technicians, and professionals from NASA Lewis Research Center teamed with 30 students from eight high schools in the Cleveland, Ohio area to form Team A.S.T.R.O. The combination of students from urban and suburban, public and parochial schools strengthened the team by allowing a variety of viewpoints and concepts to be expressed and explored in constructing the machine. In addition, U.S. FIRST had greater exposure in the Cleveland area and will allow a number of teams to 'hit the ground running' in 1995.



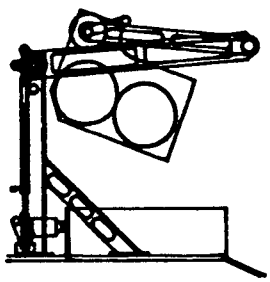


The U.S. FIRST Competition is a great way to energize and revitalize both the school system and the business organization. It allows students with a variety of backgrounds and interests and professionals from different functional areas to share their strengths and learn to appreciate others' ideas in a fast-paced environment with a focused objective.



"It was a real team effort. We learned a lot and I'm really looking forward to next year."
David Boyce, Sophomore
Parma Senior High School

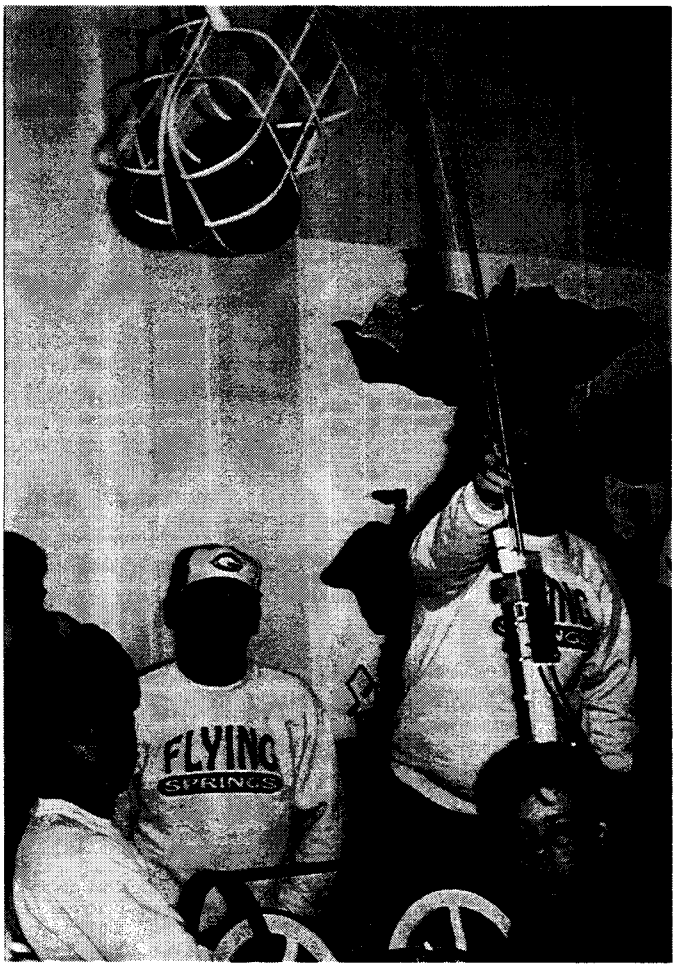
"Involvement in U.S. FIRST proved to be an outstanding experience for our students. Our sincere compliments to all of you for a job very well done."
Theodore G. Barto
Principal, Strongsville High School

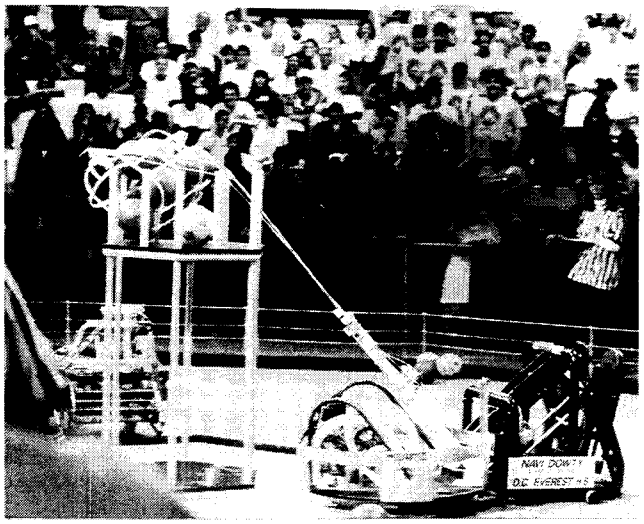


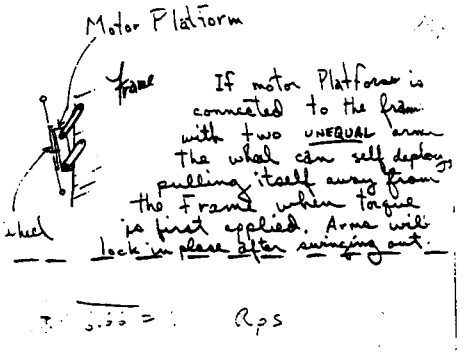
The Flying Springs

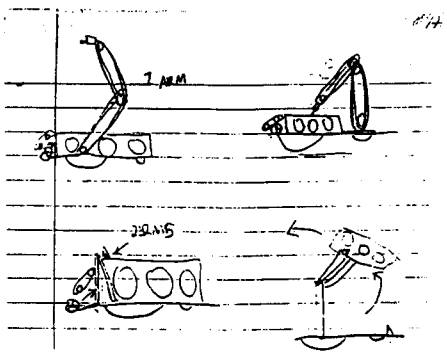
Symbiosis Corporation Miami Springs High School
Miami Springs, Florida

Procter & Gamble Creativity Award



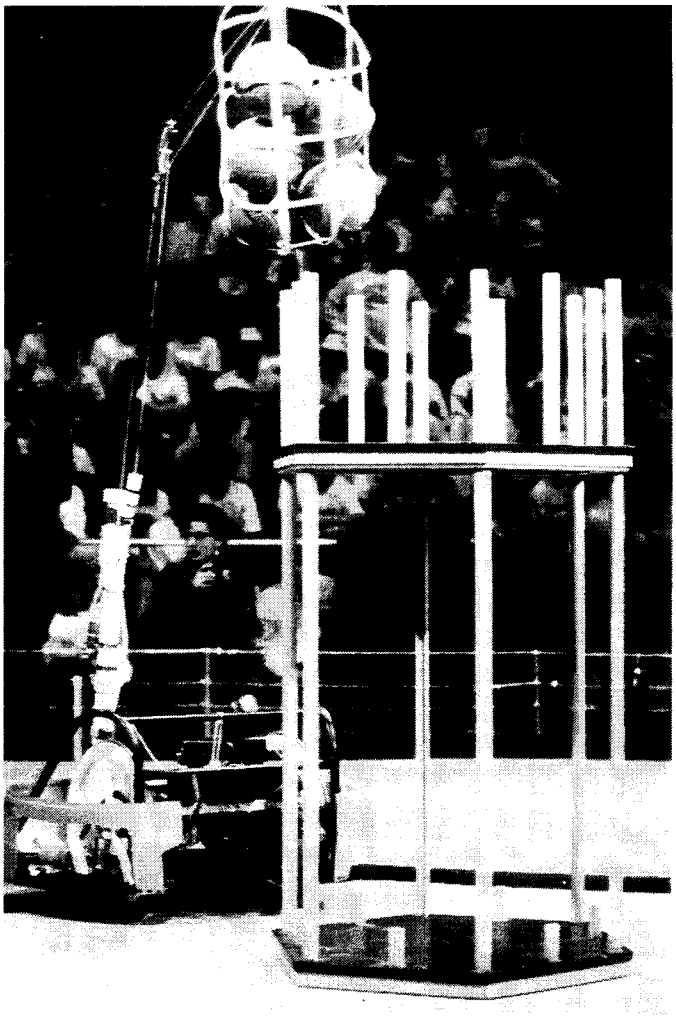


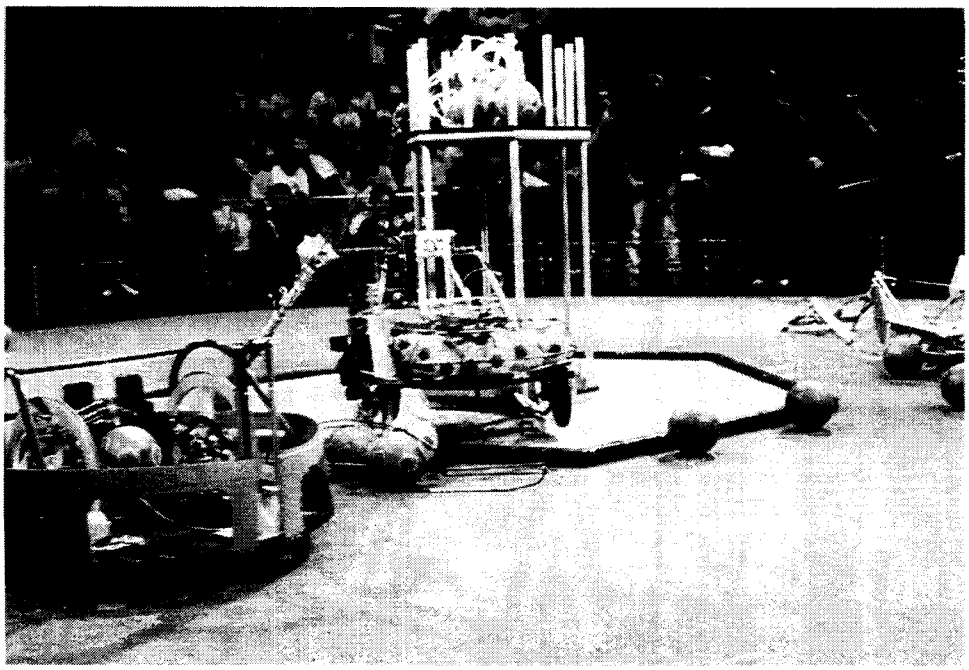


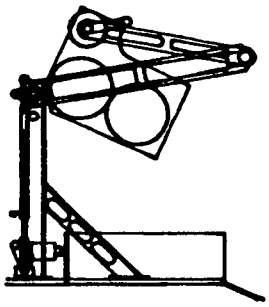


We began by introducing the high school students to basic engineering in October of 1993. We had two teams of 15 students come twice a week while different staff members discussed likely strategies and past competitions such as course #270 at MIT. We built a go cart frame and played with remote control systems.

The students from Miami Springs High School can be described as academically superior and inexperienced in basic mechanics. None of these students could relate to stories about our high school days when we would buy and fix our own 'beater cars.' On the other hand, the students were impressed with our machine shop and went through considerable effort to be present during critical stages of manufacturing. They also assisted in the CAD design of robot parts and graphic design of the logo as well as spreadsheet budget analysis.





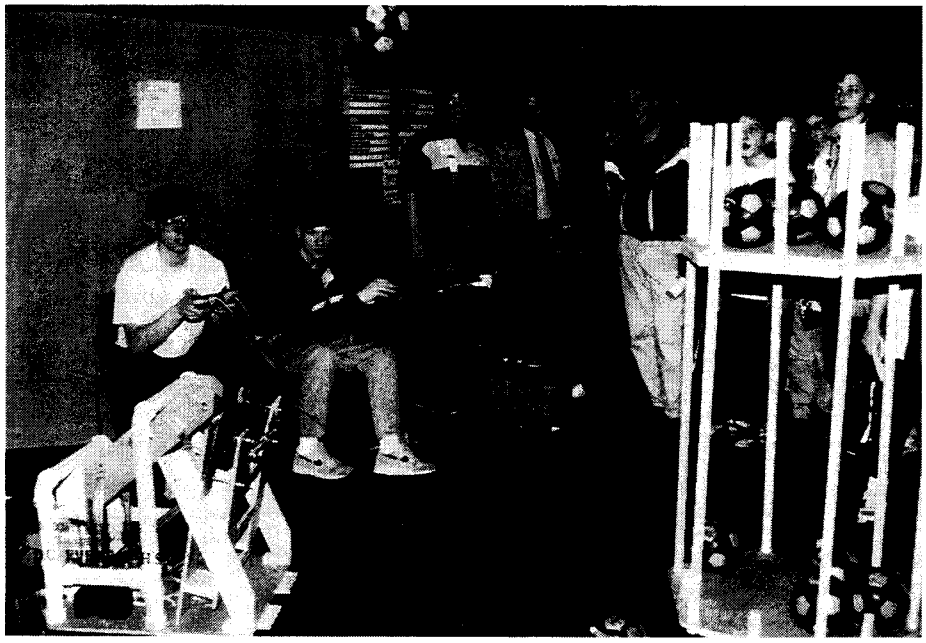


The I Omegas

Navi Dowty & Associates, Inc. D.C. Everest High School
Wausau, Wisconsin

Chairman's Award Finalist
Motorola Quality Award:

Robot required no repairs during competition.



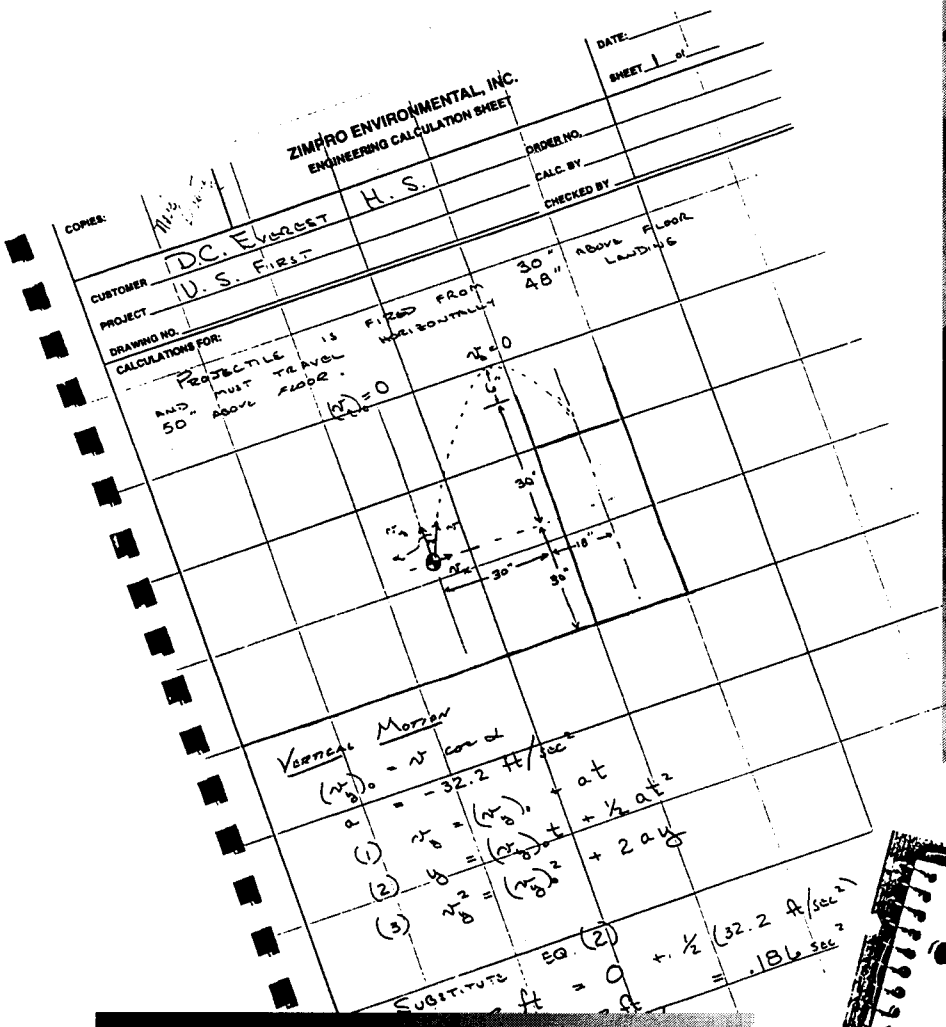
"I think they can see what can be done. I hope they get the excitement (of engineering), particularly when they see something running."

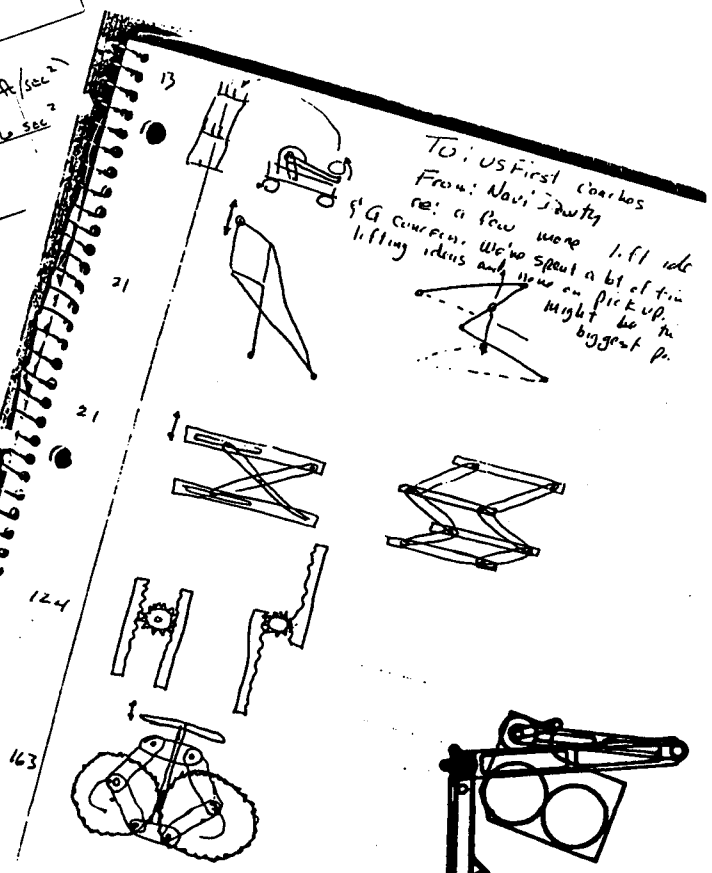
Rudy Horsch, Engineer, retired

The I Omegas Team is made up of 12 students from D. C. Everest High School and six advisors/engineers/scientists from the local area. We have made this a community coalition project with advisors from local companies, the high school, and our local university campus. Primary funding was provided by Navi Dowty and Associates, Inc., with additional help from the Wausau Area Community Foundation and the Wisconsin Public Service Foundation. Engineers and scientists from Zimpro, Wisconsin Public Service, the University of Wisconsin - Marathon Campus, and a retired engineer, Rudy Horsch, from the now closed J.I. Case area plant lent their expertise.
Our machine was built at the D. C. Everst School Technical Education Shop.

"It's neat because it really forces the kids to think like little 'MacGuyvers.' They have to try and try again and it gives them a little more appreciation when they hop into a car."

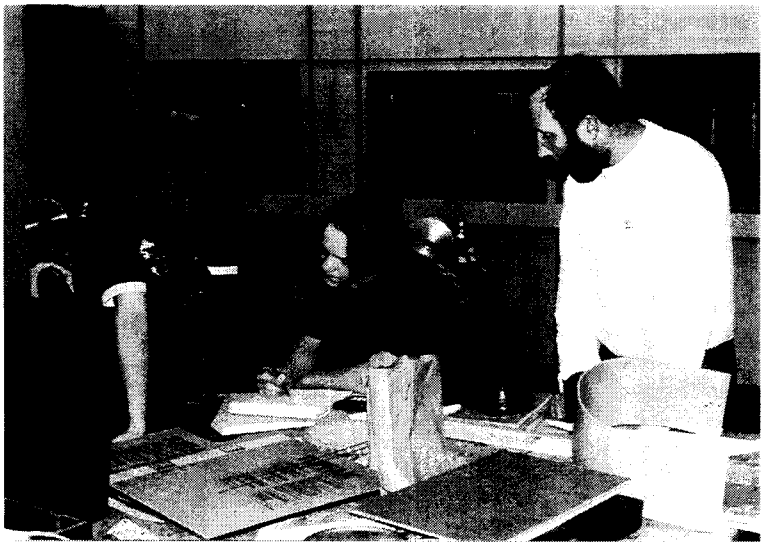
Mark Brehmer, Teacher, Technology


ZIMPRO ENVIRONMENTAL, INC.
ENGINEERING CALCULATION SHEET
DATE:
SHEET 1 of
COMES:
CUSTOMER D.C. Everest H.S.
PROJECT U.S. First
ORDER NO.
CALC BY
CHECKED BY
DRAWING NO.
CALCULATIONS FOR:
Projectile is fired from 30" above floor horizontally and must travel 48" and 50" above floor.
Vertical Motion
Substitute Eq. (2)

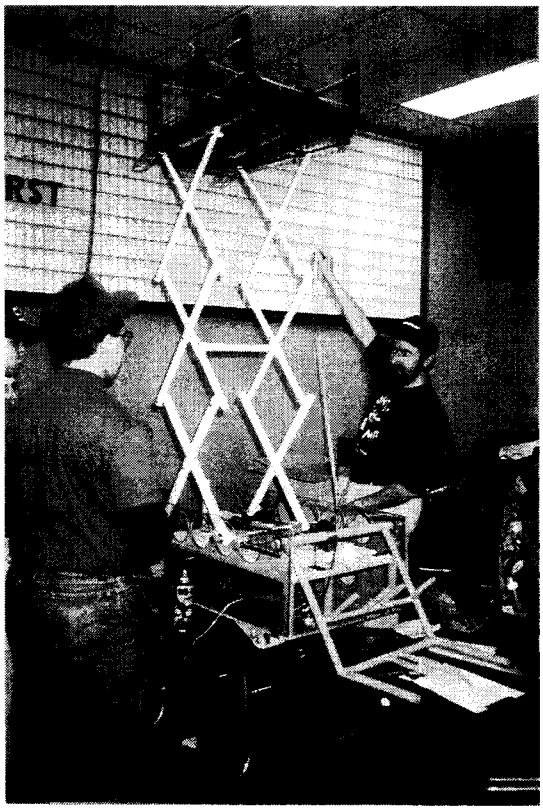

To: US First Coaches
From: Navi Jawtry
re: a few more lift ideas
g'G Coaches, We've spent a bit of time lifting ideas and here on pick up. Might be the biggest p.

The Sonic Boom

The Boeing Company Bellevue High School
Bellevue, Washington

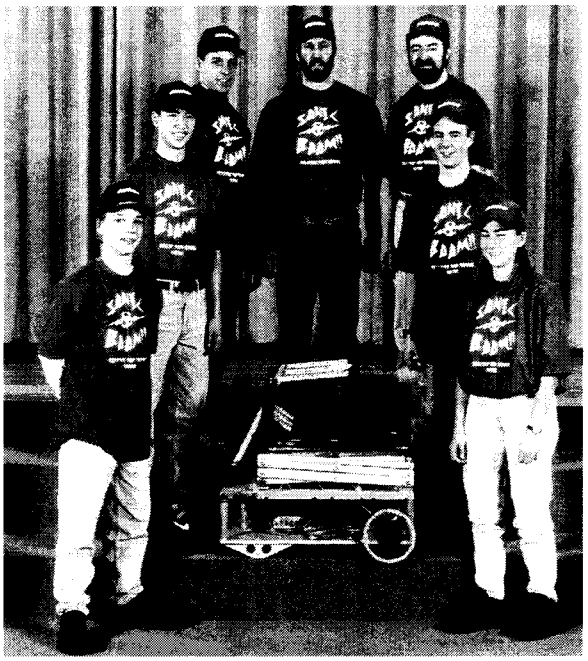


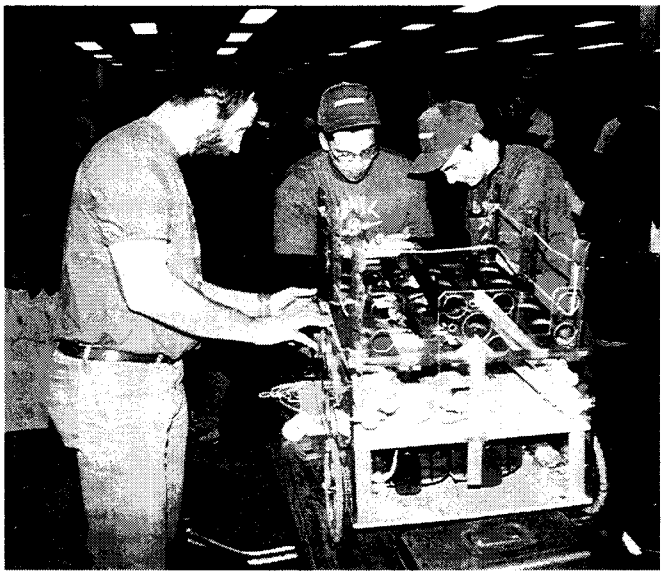
We (the students and engineers) started with "hair brained" ideas of how to score in the upper goal and turned them into a practical, robust and efficient machine. A machine equal to all at the competition.

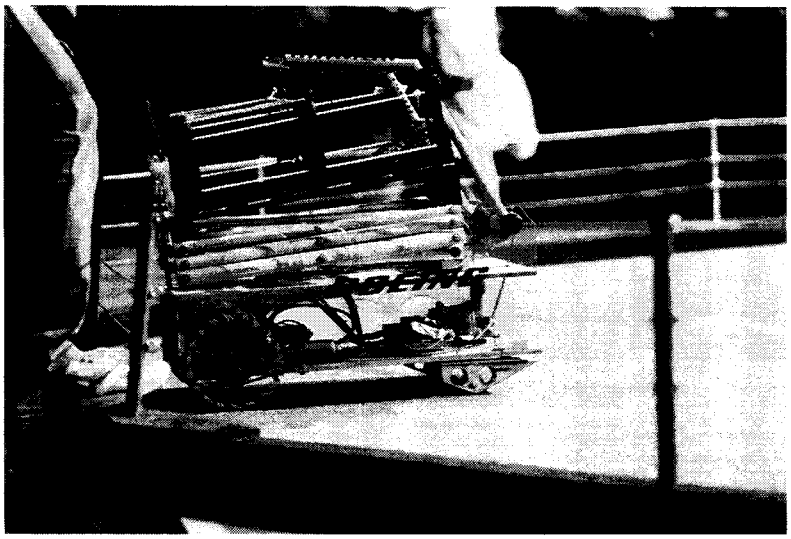


There were many machines that raised a platform of balls up to the top goal and dumped them in. Others took the approach of shooting or tossing the balls into the goal. There were also machines there that utilized a conveyor belt system.

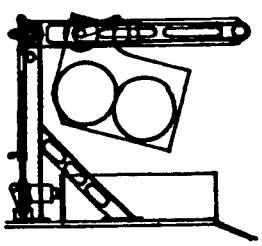
Even though many of the approaches were the same, I did not see any two machines that were exactly alike. The most interesting thing that I found was that everybody focused solely on the upper goal.







The Boeing/Bellevue High School team did not win the competition itself, but we won in terms of what the competition is supposed to achieve. The students got a real taste of what science and technology is like outside the classroom. They were also exposed to "real world" situations of time management and decision making.



Hot Shots

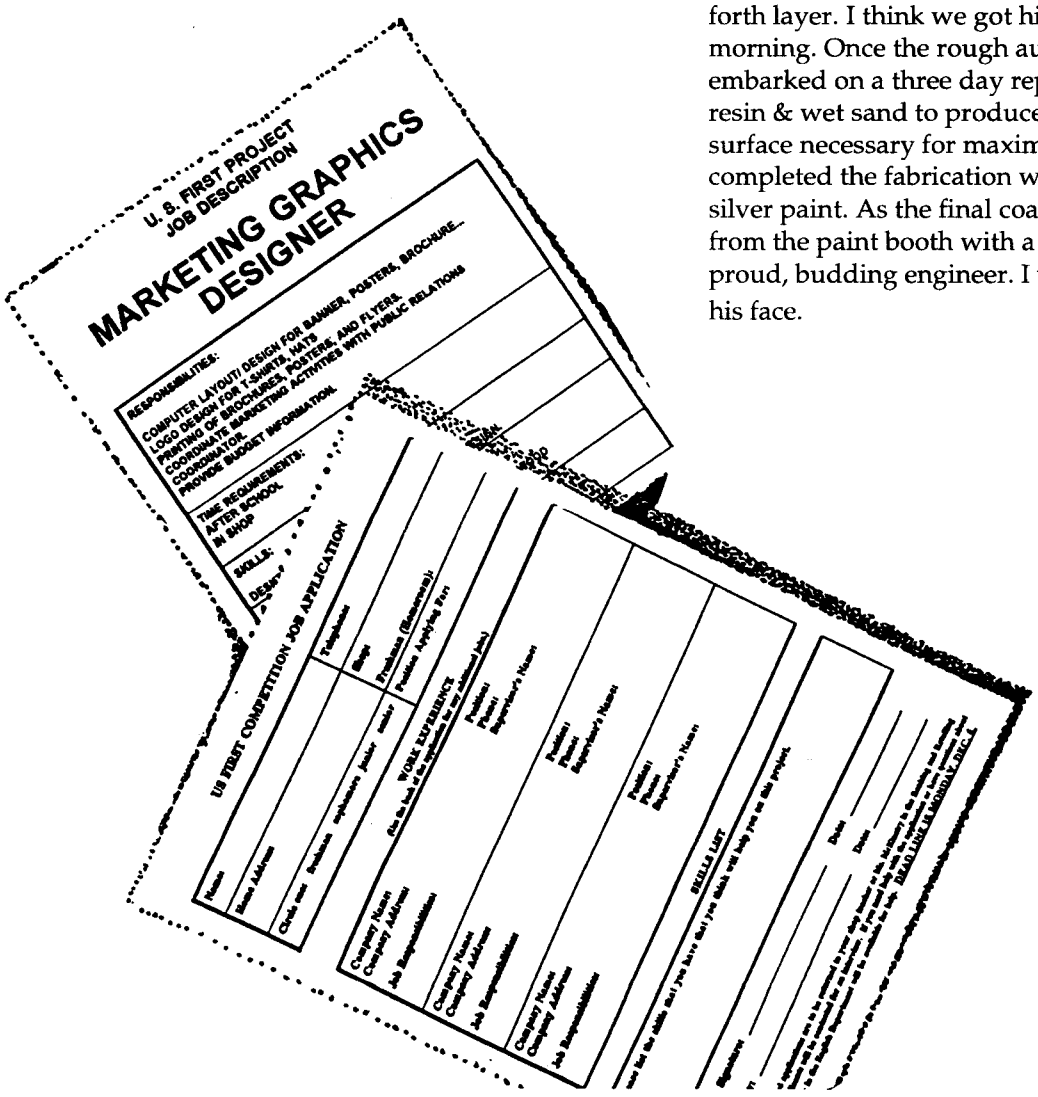
Bose Corporation Assabet Vocational Technical High School Framingham High School
Framingham, Massachusetts

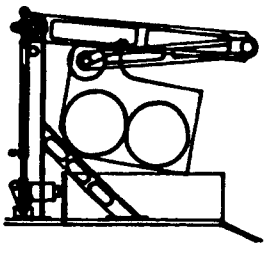
Most Creative Design Award

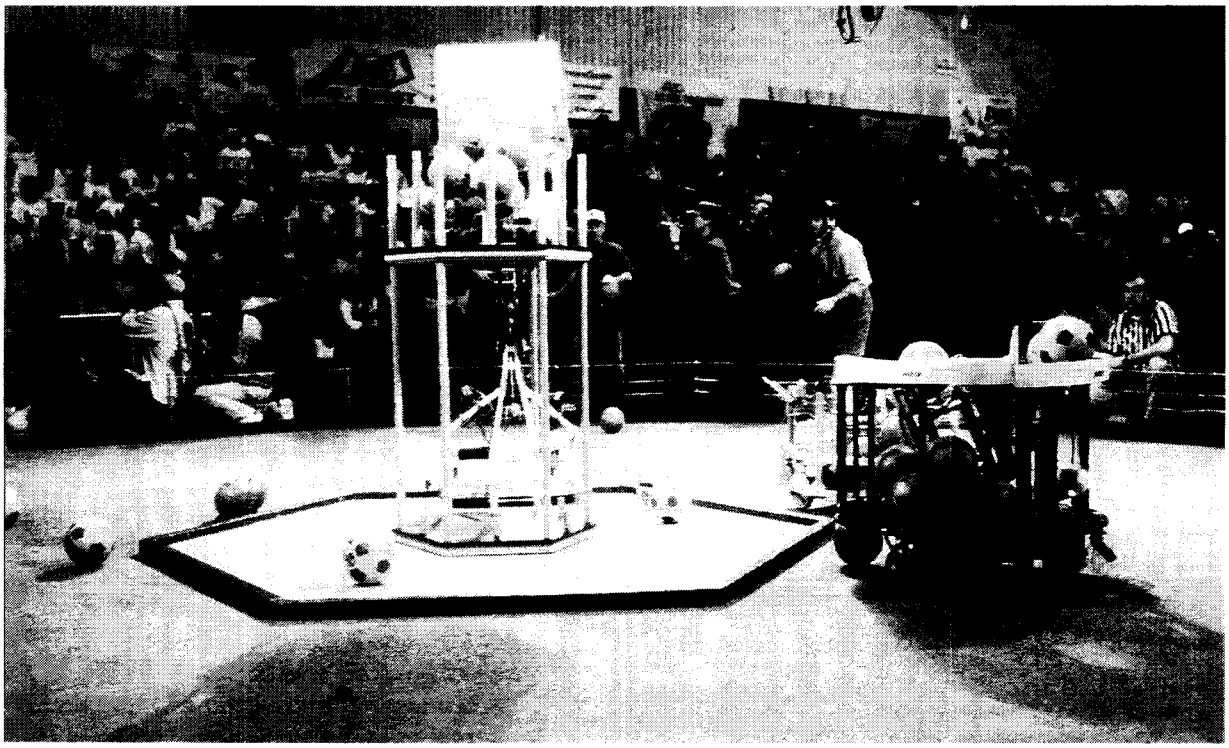
The Auger:
One of the more striking features of this year's machine was the 'Auger' ball delivery system. Once the concept was developed, the lead student engineer on the Auger Team, Chris Gumee, extruded the 3-D helical profile to scale. He then down loaded the profile to the CNC machining center and with the assistance of our lead machinist, observed hard foam blocks being machined to this profile. Chris then assembled the blocks in the proper orientation so they became the form on which the fiberglass was to be laid.

To maximize the 'engineering-is-fun' factor on this year's machine, a cannon to shoot the balls was decided on as our point scoring concept. The lead Student 'Cannon Engineer,' Nick Maddix developed the trajectory profiles, cannon angles, and energy requirements for a system that could score short shots (5 ft) as well as long shots (17 ft). After several prototypes, Nick settled in on a design, which he then fabricated on his own. Nick really caught the design-build bug. We were regularly chasing him out of the machine shop at 3 a.m. For a student at any level Nick generated first rate design work. He impressed us all so much that he now has a full-time summer job in our OEM development group.

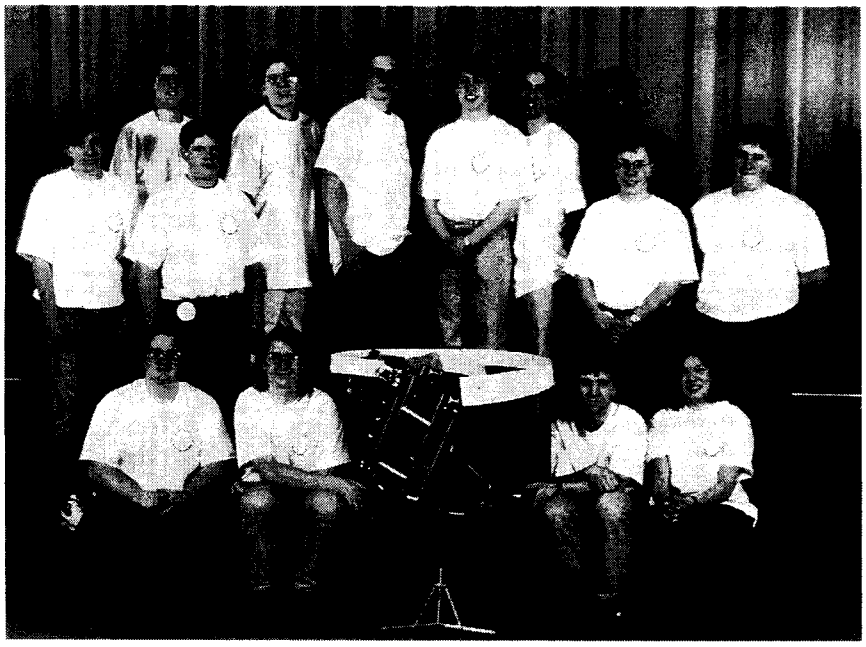
It's important to note that up until now, the most Chris knew about fiberglass was that it was really tough plastic stuff you could mold into things like boat hulls. By 11 p.m. that evening, Chris had completed 'laying up' three layers of fiberglass and resin on the form. At that point, his fiberglass instructor, a Bose engineer, informed him that three layers was probably good enough, but if he wanted to add a forth layer it would have to be done before the resin on the current layers was to cure...that night. Without missing a beat, Chris began applying the forth layer. I think we got him home before 3 a.m. that morning. Once the rough auger was cured, Chris embarked on a three day repetitive process of applying resin & wet sand to produce the smooth, low friction surface necessary for maximum screw efficiency. He completed the fabrication with several coats of a gloss silver paint. As the final coat had dried, Chris emerged from the paint booth with a glistening Auger in hand, a proud, budding engineer. I will never forget the look on his face.







What made this year's effort so rewarding was that over 50% of our machine was designed, detailed, fabricated, assembled, and debugged by our students! Many of them had little or no practical experience in such areas as design, drafting, machining, welding, painting, etc. The students' abilities to overcome these deficiencies made their contributions to the machine all the more impressive.



"No matter what you do, you can't lose."

Dave Baker, Equipment Design Manager

ARES (Astounding Redcoats Equipped by Stanley)

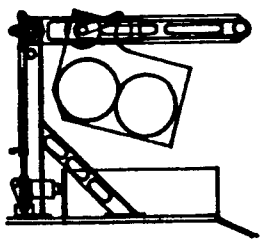
Stanley Works Berlin High School
Berlin, Connecticut

"I got a lot of experience in problem-solving. I can make just about anything now."
Mark Gajewski, Student

"It's given me a different perspective of kids and their capabilities. Some of these kids are really, really, outstanding."
Tom Giove, Stanley, Electronic Design Engineer

"No one could have built this by themselves. Everybody has to work to make the team work."
Huai Chen, Student

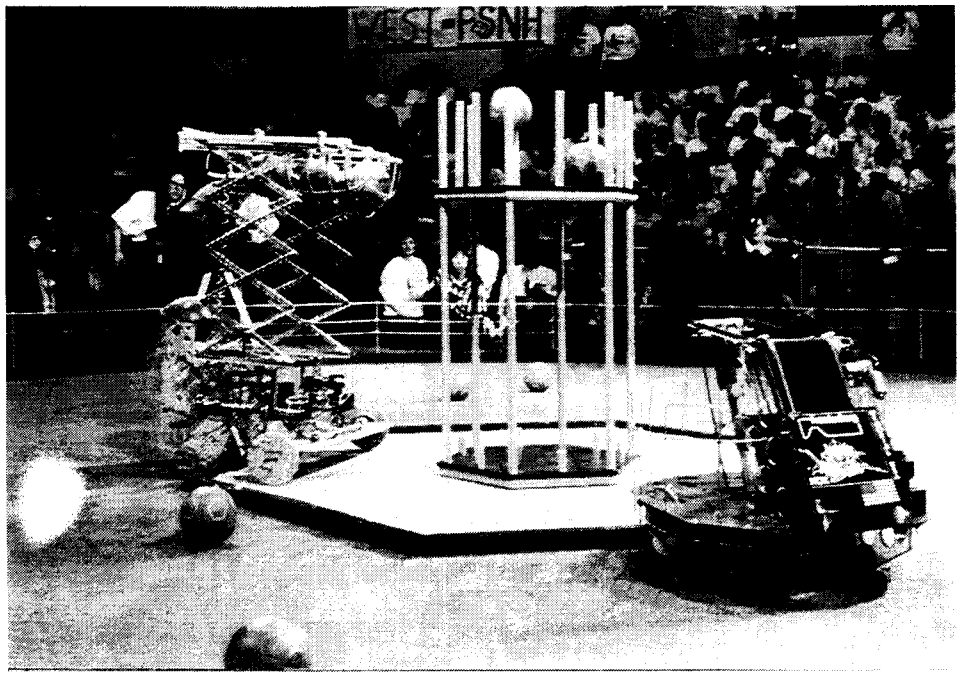
"I learned stress management."
Brian Spendolini, Student, robot operator



Freudenberg-NOK

Memorial High School Manchester, New Hampshire

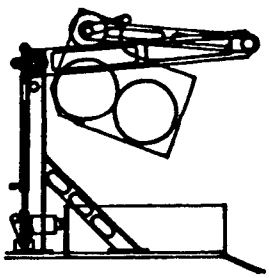
The quality program embraced by Freudenberg-NOK, GROWTTH (Get Rid of Waste Through Team Harmony) has been incorporated into our U.S. FIRST team program. Similar to its purpose in our plants, we adopted it to further intensify the focus on lean, efficient development and to further promote a team atmosphere. Each member of the team was given a GROWTTH polo shirt to be worn when working on the program. Time was allotted to inform students as to the purpose of GROWTTH and how it has helped increase productivity and profitability at Freudenberg-NOK over the past years.



After practicing for several days in our facility at home, our team was fairly confident that our machine was robust and that it would prove to be a competitive threat. However, after we unpacked our machine and began formal practice rounds, our machine developed a significant problem: it could not properly launch balls the required height into the three point goal. After spending the entire practice day trying to debug the problem, two engineers resolved the problem and devised a simple solution during a brief conversation on their drive home that evening. The next morning the fix was implemented a few minutes before the seeding competition was to begin.

U.S. FIRST was one of the most rewarding events we had ever seen and/or participated in.

It was the energy that was present in the Nashua High School gym that made us all proud of our accomplishments and that gave us a true appreciation and respect for all of the teams who had worked to be there.



Little Green Gems

General Electric Aircraft Engines Macy Industries Central High School
Manchester, New Hampshire


Manchester High School Central

Certificate of Recognition

for participation in the

U.S. FIRST 1994 Competition - "Tower Power"

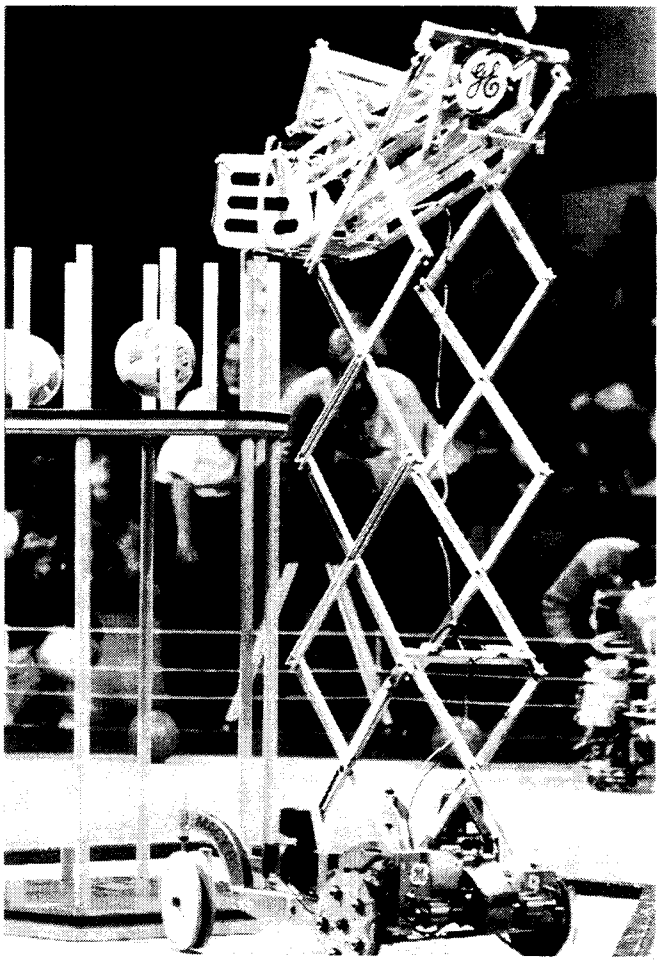
Brian A. Desfosses

February 24-26, 1994

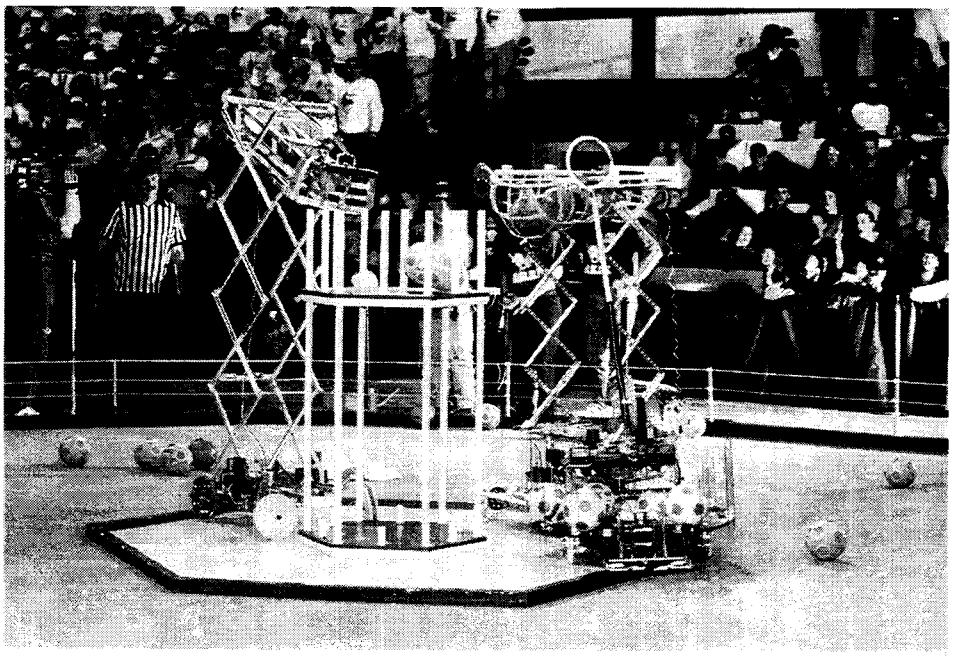
The above named individual is recognized for his/her participation in this engineering competition. This competition has the expressed goals of making students aware of the vast opportunities available in the field of engineering design and production. To that end the participants have been exposed to all the aspects of problem solving techniques in the sciences, to include: brainstorming, collaboration, modeling, prototype production, manufacturing machinery and procedures, incorporation of strategies, system testing and redesign.

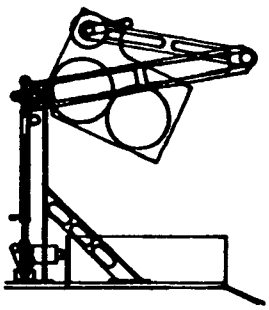
...nded for their individual efforts to further the progress of science education for themselves a... ...Their dedication to the accomplishment of program objectives and outcomes r... ...credit upon themselves, their families, and their community.

Roland C. Blanchard
Principal



Two General Electric Aircraft Engines engineers, Macy Industries, three Central High teachers and their team of more than 30 students make up the "Little Green GEMS" team. The GEMS divided into eight groups to attack the challenge of "The Tower." Male and female students from freshman through senior levels worked on the Vehicle System, Capture System, Lift System, Electrical Power System, Art Design & Ad, Project Coordination, Safety, and/or Rules and Regulations groups. Multiple brainstorming sessions produced five prototype models before the 'polished GEM' was begun the first of February.



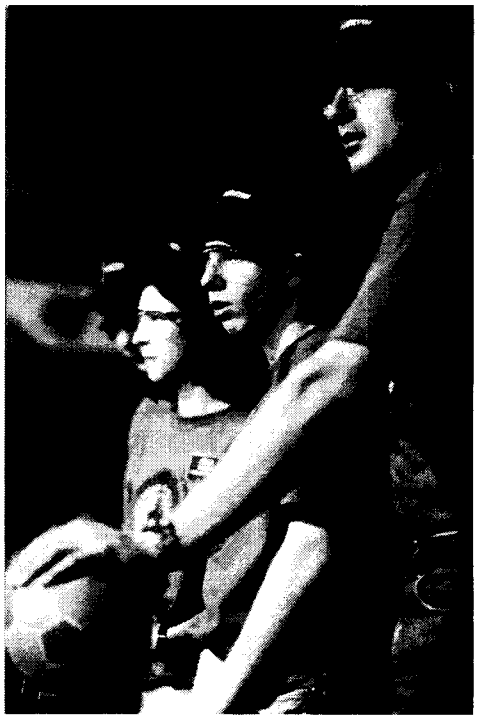


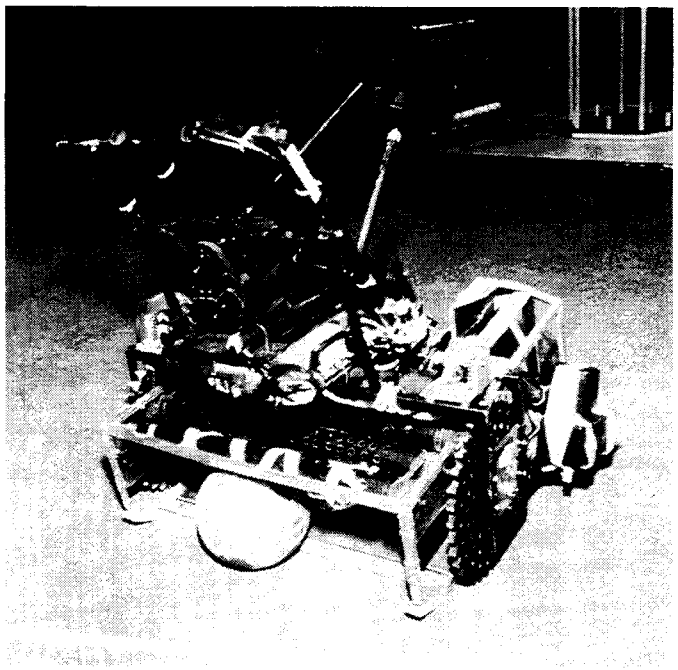
The Cardinals

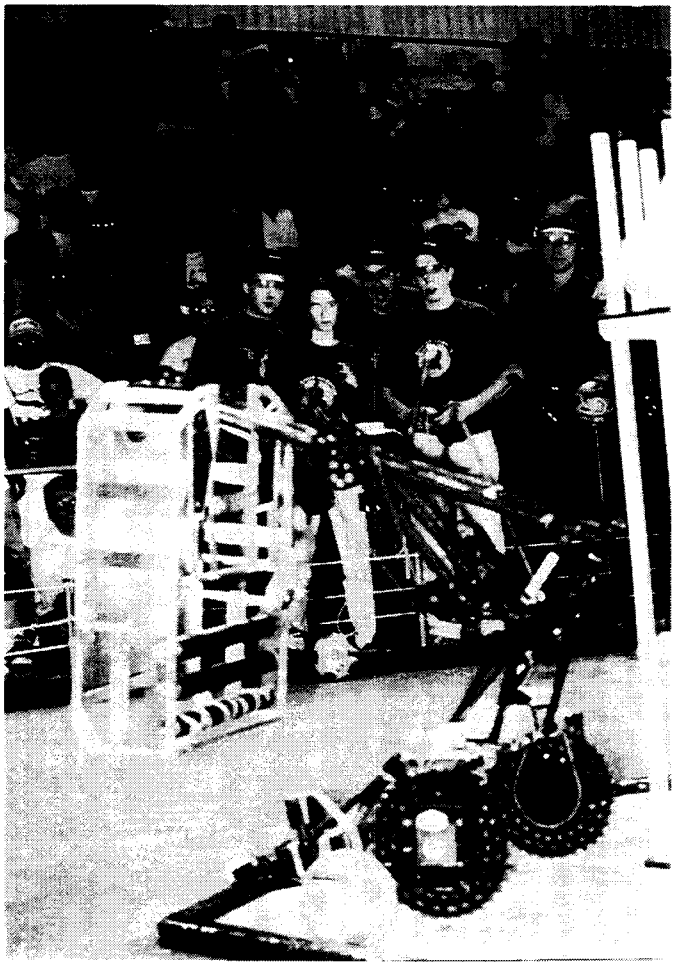
Ingersoll-Rand Company Bishop Guertin High School
Nashua, New Hampshire

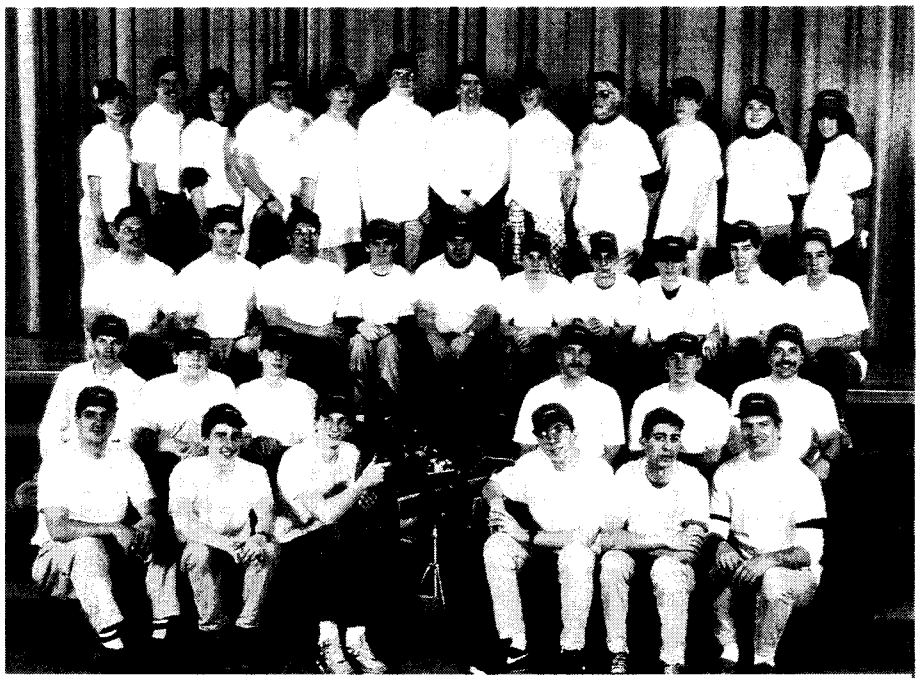
National Semifinalist

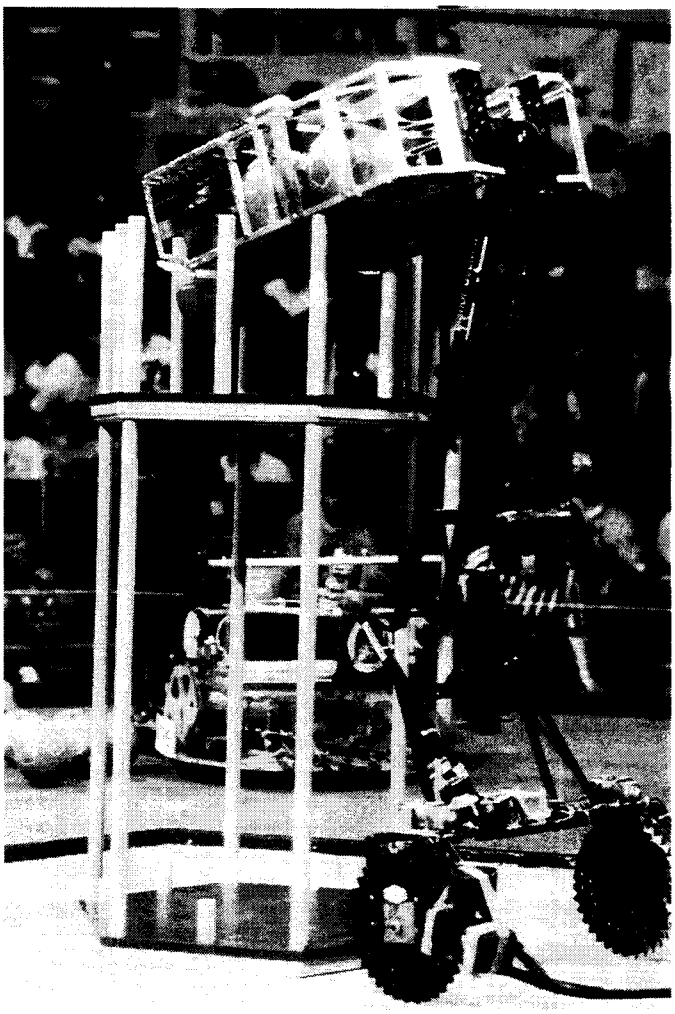
Recipient of $2,500
First NH Bank Scholarship





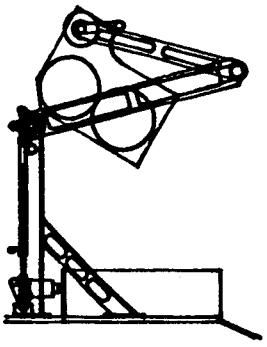






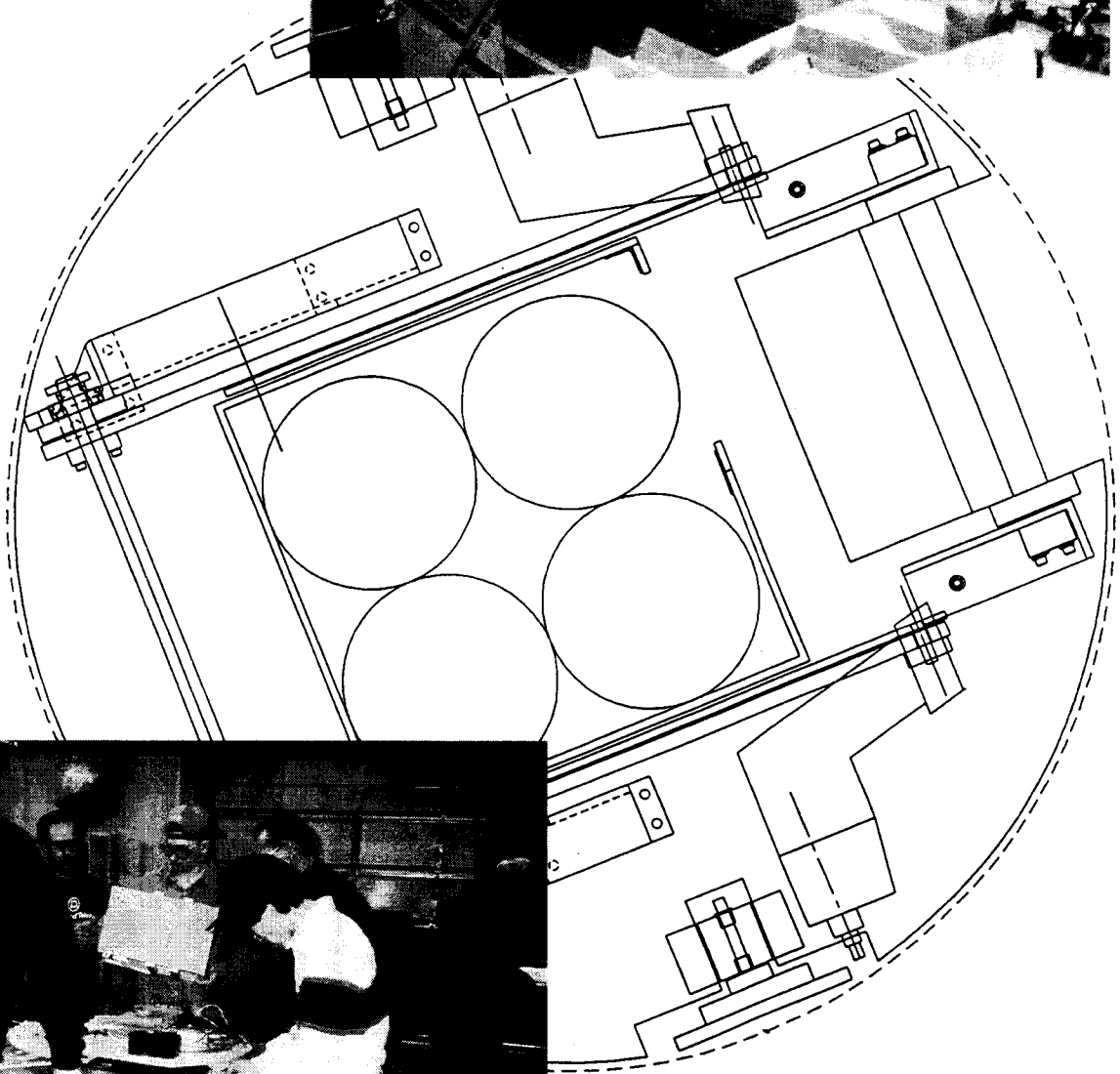
This team was originally organized to maximize effort and student/staff interaction; to minimize working extra hours at the last minute; to provide student team members with real 'day-to-day' situations and to get the drafting, manufacturing, and engineering departments to interact by working together to achieve a common goal.

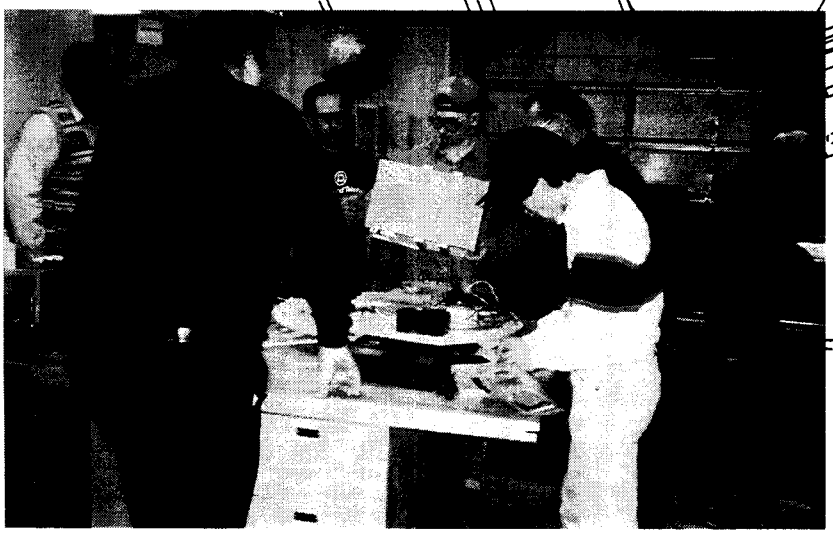
We have fun! Our team spirit is profound and we work together as a complete unit!

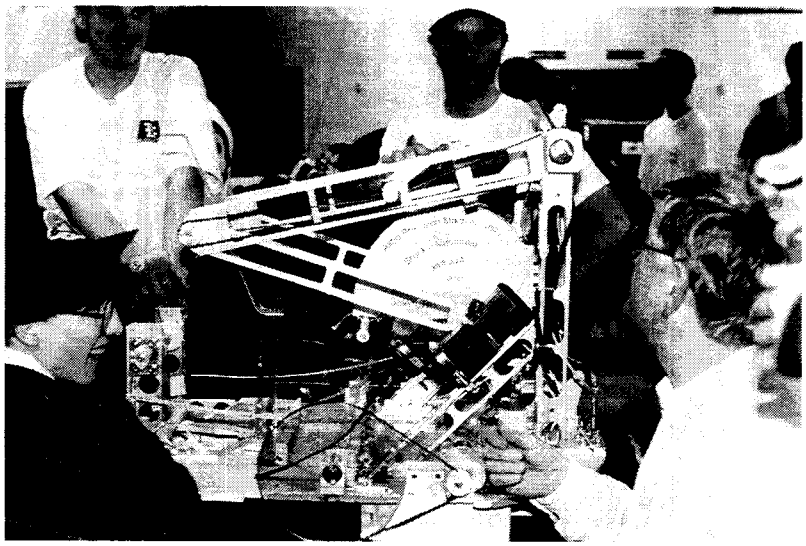


IT

Johnson & Johnston Associates, Inc. Astro Precision Machine, Inc. Brooks Automation
Salem High School Vocational Department
Salem, New Hampshire







The Salem High School U.S. FIRST team is a joint effort of three company sponsors and the students of Salem High School. Preparation was begun in July of 1993 with a meeting of school and company representatives. It was decided to engage in an activity to build the team. Salem High School students and their sponsoring company partners spent six weeks together building a winning design float for the local Christmas parade. Even Rudolph and Santa are members of this team!
The Salem High School Vocational department provided a get acquainted dinner for students, parents, teachers and sponsors. All team members went on to visit the facilities of all three sponsoring companies. A proud Johnson & Johnston 'Santa' showed up with team jackets for students during their visit there. It's also been reported that Brooks Automation and Astro Precision 'elves' kept this team well fed during the building process.

Our team motto: "Yes We Can!"