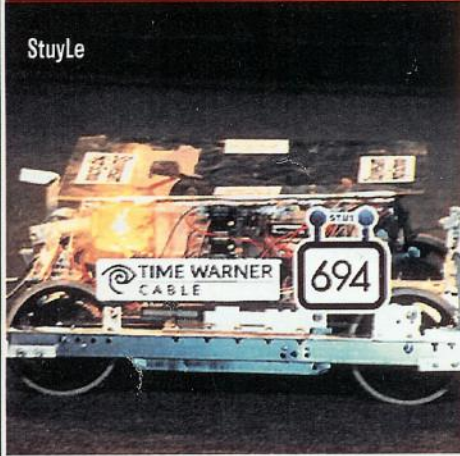


STUY



Robots... Start Your Engines!



LARRY, THE WELL BUILT BOY, WHAT MAKES HIM TICK?

Building The Robot **PART IV**



As we enter our fourth year of FIRST competition, we are faced with many new obstacles. Almost half of our team graduated last year, taking with them a wealth of knowledge and expertise. Along with training and recruiting new members, we need to incorporate an entirely new control system and programming language. In the midst of all of this change, how can we build a robot? With three years of experience under our belts, we have created a systemized approach to making the best robot we can in only six weeks. Its name is Larry.

1 | DESIGNING | WEEK 1

After much anticipation, this year's challenge is announced; FIRST Frenzy: Raising the Bar. We begin game analysis and design discussion immediately. Sketches, computer software, and a scale cardboard model of our chassis aid in the process. The model helps us work out the size and positioning of all necessary components.

2 | FIELD CONSTRUCTION | WEEKS 1-3

We build Larry's practice field from official blueprints. This project helps train our many new members in tool use, and lets us test drive Larry.

3 | STRATEGY | WEEK 1-COMPETITION

We brainstorm the best ways to score points and win matches, scout out teams, and forge alliances for optimum game play. We even make a scale model of the field to help us visualize these plans.

4 | PROTOTYPING | WEEKS 2-3

We use three rolling chassis made by the Senior Robotics Class as a base for prototypes. We attach an arm with a motor and joint to one test robot, "Leobot," named for Leo, a team member. Now we can test our ball-grippers and our program that controls the arm.

5 | PROGRAMMING | WEEKS 3-6

We face two new challenges: our head programmer graduated, and control system was upgraded. This year's programmers work on an autonomous line-tracking code enabling the robot to run without a driver for the first 15 seconds of each match. They also work on feedback loops, switches, and analog inputs to keep Larry going.

6 | BUILDING | WEEKS 4-6

We divide into teams to build each of Larry's components. Thanks to our planning, Larry is almost done by the end of the fifth week. Lucky for us, week six coincides with our winter break, so we can meet in our robotics lab every day, working to finish Larry on time. We look forward to showing off our hard work at the NY Regional Competition and the National Competition in Atlanta, Georgia.

A LEAGUE OF THEIR OWN...

Stuyvesant Robotics Club Mentors FIRST Lego League Team



For the third year in a row, Leo Li and his teammates from Stuyvesant's Team 694 went every Thursday to mentor IS 89's Lego League team. We helped them prepare for FIRST's junior robotics competition. This year's game, the "Mission Mars Challenge," began in September of

2003, giving the kids 8 weeks from mid-October to December to build their Lego bot. The game, based on the actual Mars Mission, took place on a 4' by 8' playing field, with points awarded for completing each of an array of objectives. We encouraged the children to brainstorm and think like engineers and scientists. After working with us, the kids asked questions they had never asked before and found new ways to explore the world around them. Simple Lego pieces blossomed into a robot capable of overcoming sophisticated Mars-like obstacles. Whatever the members of this Lego community become, they will carry this experience of teamwork and creativity with them, and spread the love of robots.



Team 694: In High Gear

A Year in the Life



• The club had an action-packed robotics expo "Robotic Marvels" at the Winter Garden in the World Financial Center on March 11, 2004. Our robots delighted crowds all day and were honored by a Proclamation from the City Council.



• Our marketers brainstorm, interview, write and edit, putting together the team's Chairman's Award submission and our magazine. Some even handle both marketing and engineering, making full use of their talents.



• Our parents and mentors joined us during our rookie year, and they keep coming back to help. They offer us inspiration, support and down-to-earth advice. Their help makes building our robots possible.



• Lola and Jack stole the show at the Stuyvesant Centennial Celebration, drawing the attention of WCBS TV news and the *New York Post*. School Chancellor Joel Klein was impressed, and Council Member Alan Gerson invited us to City Hall to demonstrate our talented bots.



• We recruited many new members last year at Stuy's Club/Pub fair, held interest meetings and posted signs around the school. We created interest through announcements on the P.A. system and Stuyvesant's Video Homeroom.



• Ann Moore, Chairman of Time Inc., & Ed Jackson, Senior Designer of *PEOPLE*, have been with us from the beginning. The club attends meetings and works with *Teen People* putting together magazines that showcase our abilities and achievements.



• Our seniors, Galia, Gordon, Daniele, Leo, John and Brad have been with the team for what feels like forever. Soon they'll be waving their last goodbyes to the Robotics lab—until they come back to mentor, that is! They will attend schools including Princeton, Cooper Union and MIT.



• Stuyvesant's display cases show off the school community's major clubs. In spring of 2003, Team 694 was given the honor of having two beautiful (and very visible) display cases on the main floor. Now people really notice us!



• The robotics club has drawn much attention. We've been featured on ABC TV and 1010 WINS. We also participated with other teams in FIRST's Liberty Science Center fundraising event, displaying our robots.



• Jack Welch, our main sponsor in 2002 and former Chairman of General Electric, meets his robotic counterpart, Jack, and our faculty advisor, Mr. Colon, during the graduation of the class of 2003. Both Jacks are met with a warm welcome.



• These alums, Joe, Andy and Justin, thought they had escaped, only to find out you just can't shake robot love. They keep coming back for more. They've been with us through thick and thin. They even showed up to help during blizzards.



• Our work didn't end in June. During the summer we sought new sponsors, explored using belts instead of chains to lighten the robot and designed a transmission and our own wheels.

“Half my job is doing the actual construction and half my job is teaching the newbies how not to cut their hands off.”

JOSH CASNER, *Director of Field Construction, Junior*

“I like the stuff that we're doing... we're working on a goal... it's hectic, but it's fun... it's crazy, but there's energy.”

BETH GOLDSTEIN, *Engineering, Junior*

“I've learned about machines, electrical, pneumatic, drive trains... There's probably a thousand more things...”

VICTOR LIU, *Primary Machinist, Sophomore*

“I want to learn more of the milling machine, but I already know most of it, 'cause Victor is a good teacher.”

SAMI YABROUDI, *Engineering, Freshman*

“I enjoy the concept of bringing something to life.”

PAUL DESIDERIO, *Director of Engineering/Sophomore*

“My only regret is that I didn't join the club as a freshman.”

SONIA GOLLANCE, *Treasurer, Junior*

“It's the most frustrating activity I've ever taken part in, but for some reason I'm totally addicted.”

TOM FERGUSON, *Parent/Mentor*

“I've boosted my programming skills, I've learned that learning from people is easier than learning alone... everyone's knowledge has brushed stuff onto me and I've picked up quite a bit.”

JASON RASSI, *Programmer, Freshman*

“It's more than building a robot, it's building friendships.”

JOE RICCI, *Alumnus/Mentor*



Letter from the Co-Presidents

As we near the end of our fourth year, we feel prouder than ever to be a part of the Stuyvesant robotics experience. Our club has come a long way since rookie year, and we have been with it since the very beginning. We learned many skills, from building robots to marketing. This magazine celebrates the hard work of Stuyvesant High School's Robotics Club. Consider this a little glimpse into team 694's life. We hope you've enjoyed it!

Joshua
Gordon

Daniele
Daniele

STUY

FACULTY

Principal: Stanley Teitel
Coordinator Technology Education: James Lonardo
Research Coordinator: Anne de Sostoa Manwell
Robotics Club Adviser: Rafael Colón
Assistant Robotics Room Advisor: Fred Gordon

STUYVESANT ROBOTICS CLUB

Co-Presidents: Gordon Franken, Daniele Hauptman
Vice President: Ian Ferguson
Treasurer: Sonia Gollance
Director of Engineering: Paul Desiderio
Director of Strategy and Design: Leo Li
Director of Programming: Brad Stronger
Director of Field Construction: Joshua Casner
Director of Publicity: Nelli Zaltsman

ENGINEERING TEAM

Tal Akabas, Michael Borohovski, Joshua Budofsky, Stephen Cheung, Terrence Copney, David Ferguson, Geoffrey Guray, Beth Goldstein, Alex Grintsvayg, Andrew Kayserian, Cristian Kim, Daniel Ko, Arkady Kukarkin, Kent Lee, Yi Li, Victor Liu, John Mai, Daniel Markowitz, Garvin Ming, Jack Nguy, Aviv Ovadya, Hansam Park, David Portnoy, Jason Rassi, Diana Sandy, Galia Sandy, Bill Silversmith, Un Soi Chio, Samuel Subbarao, Zuoyu Tao, David Wu, Sami Yabroudi, Yon Zloof

MARKETING TEAM

Helena Chan, Xiang Gao, Eugene Epshteyn, Inna Guzenfeld, Theresa Langschultz, Daniela Sorokko

MENTORS

Benita Berkowitz, James Carpino ('89), Leah Casner, Tom Ferguson, Tom Franken, Shelley Grant, Mel Hauptman, Ethan Heller ('03), James Heller, Steve Hilton, Ed Jackson, Elton Kwok ('02), Abby Laufer, Justin Lee ('02), Wei Li, Celi McCarthy, Ann Moore, Donovan Moore, Ou Quan, Joe Ricci ('03), Andy Woo ('96), Ji-Feng Zhu ('03)

PARENTS

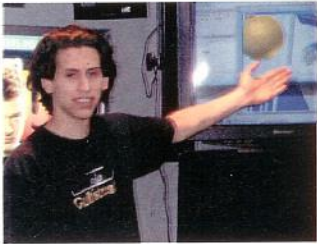
Meg Akakbas, Seth Akakbas, Jeff Borohovski, Lena Borohovski, Daniel Budofsky, Mark Casner, Beth Caunitz, Tai Lim Chan, Simon Cheung, Tong Heng Chio, Mary Christopher, Carol Franken, Judy Goldstein, Steven Goldstein, Carolyn Gollance, Phil Gollance, Ayala Jonas, Edwin Ko, Deborah Ko, Huazhen Li, Jian Hua Li, Wei Li, Arnold Markowitz, Dawn Markowitz, Nu Nguy, Yacov Ovadya, Jim Park, Myung Park, Howard Portnoy, Joan Portnoy, Michele Rayvid, Mery Sandy, Diane Silversmith, Robert Silversmith, Roz Stronger, Liging Tao, Jamil Yabroudi, Nancy Yabroudi, Jia Xin Ye, Helen Zaltsman, Anat Zloof, Avi Zloof, Li Zuo

SPONSORS

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I Think, Therefore I CAD

Inventor, a program comes to Team 694's rescue!



CAD (Computer Aided Design) is on the forefront of engineering planning. It's completely changed the design process allowing engineers to create working computer models without touching any raw materials. A computer model can test and simulate all conditions and problems that a real model would encounter.

FIRST Robotics teams are given the chance to learn how to use these professional level CAD programs. Every team is given *AutoDesk Inventor*, a cutting-edge

design application. Ian Ferguson attended a FIRST-sponsored CAD workshop and brought back his know-how to help design Larry.

Inventor works by constructing the robot on screen, component by component. Each piece is individually designed with real-life dimensions. Then the parts are assembled as if they were physical parts.

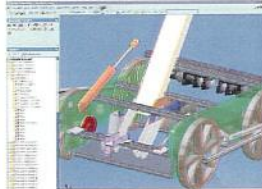
As always, we needed to visualize those designs quickly. *Inventor* allows us to save time and money by using computer drawings instead of prototyping with large pieces of wood and metal. *Inventor* also helped as we progressed from prototyping to detailed design work. All of the robot's components are accurately measured.

When using a CAD set-up, the

last stage of building a robot is getting parts fabricated. This task has been greatly simplified.

Downloading a drawing of a part into a milling machine allows for the creation of that part. Thanks to our relationship with our sponsor Cox & Company, we were given access to a machine which works smoothly with *Inventor*. Accurate and professionally produced parts were manufactured quickly.

Lastly, our designs are easily recycled from year to year. The arm on Larry, this year's robot, is very similar to that of Lola's (last year's robot) because the design is derived from last year's *Inventor* model. In years to come, the StuyPulse team will grow a library of designs for future FIRST challenges.



TEAM 694 MILESTONES

