Robo-Lions

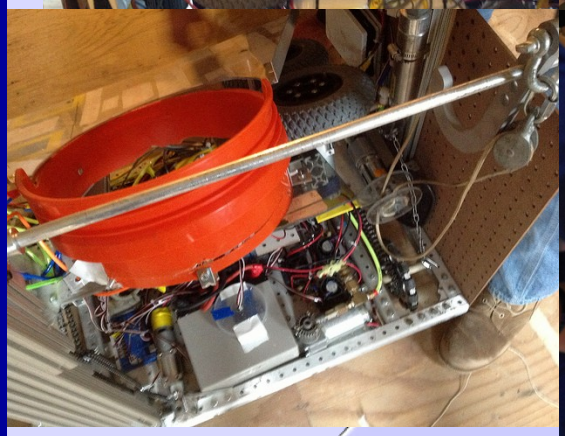
Build Season
March 2013

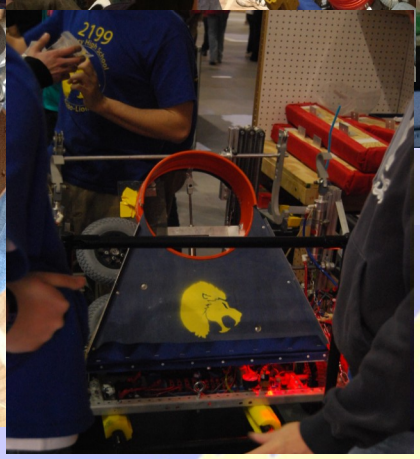
ISSUE 17

FRC Team 2199

FIRST Robotics Competitions (FRC) combine the excitement of sport with the rigors of science and technology to provide students a "real-world engineering" ezperience.

~ *www.usfirst.org*





Top, L to R:
Prototype shooter, consultations after testing, writing the awards

Bottom, L to R:
Close-up of the shooter and second stage hanger, the robot that competed in Virginia

Build Season Saga

By: Coralie M.

As all FIRST Robotics Competition (FRC) Teams know, "Build Season" begins on the same day that the new game is revealed, which was January 5th the year. It lasts for six weeks, then all of the teams entering into the new competition have to "bag and tag" their robots. They can't work on these robots until the first competitions start. Tommy M. puts it this way, "build season is when all of the team members work together to plan, design, and build a robot that fits the requirements of the new game".

This year the game is "Ultimate Ascent" which involves shooting Frisbees into goals of varying height and size, followed by an attempted ascent of a pyramidal "Jungle Gym" apparatus. Tommy's favorite part? "For me it's being able to work within a team and have fun with friends." Mikey W. adds that the best part of build season is "seeing the finished robot". Is there a downside? Some members pointed to the lack of sleep, and long meetings, but others contend that there is no worst part. In summary, build season is a pivotal time for robotics teams to create strategies, build a robot, and get extra practice in before the competitions start.

Competitions begin about a week after the end of the build, and this year the first event for the Robo-Lions was the Virginia Regional on March14-16. Their robot was performing as designed, and the team was in good form, though some unexpected communications problems limited the scoring ability, and the team was not able to make the elimination rounds.

The Robo-Lions were honored with the **Entrepreneurship Award** for the second time in two years, as well as a recognition for our Safety Captain as the "**Safety Star of the Day**" on Friday. This is our fifth Star Safety Captain in seven years—it is a tradition! It was a great start to the season, and the team is determined to make their final Regional in Baltimore an even more successful event. It begins on April 11th with inspections and practice rounds, followed by two exciting days of competition. We hope to see many of our sponsors, friends and classmates there.

Contact us:
www.robo-lions.org

The Freshman Experience

By: Coralie M.

Five new freshmen joined the Robo-Lions this year, and shared some of what they experienced during the season. For most, it was a new exciting, experience, with many new things to learn at every meeting. Matt O. worked on the build team and he commented, "It has definitely been fun, we meet almost every day for build season, and robotics takes a lot of dedication and time - but robotics is also a great opportunity".

John S., builder and designer as well as Safety Captain on the team, values "being able to work on a team, and the camaraderie." Andrew R. was on call for prototype testing and all the small jobs that had to get done. He was often assisted by the other Andrew R. (a bit confusing, but we worked it out!). Whether working hard and staying up late for those long meetings, or having fun dressing up for the Freedom Fright Night, these new members became key to our success for the season.

As the newest member of the Public Relations subteam, I have been hard at work on all the marketing, outreach, fundraising and other activities. The best part about being on the team, for me, is being able to incorporate artwork into robotics, enhancing our image along with our robot.

Clockwise from top left: Coralie gets in the spirit of Fright Night, Matt hard at work on the robot, John in the shop and as Safety Star and Andrew meeting Army robots at the Duel on the Delaware.

Senior Reflections

I'll never forget how much fun it was to catch Frisbees that were thrown by something I helped create. In previous years, the robot … wasn't too fun to play with. This year, though, the Frisbees were flying so far by the end of build season that I couldn't resist running around in the yard trying to catch them. —- Patrick D. (going to WPI to study Computer Science and ??)

This season went better than I expected. Our robot was and still is a competitor. Our wiring was organized and neat for the first time in all my years on the team. No rats nest this year! – Scott T. (going to UMBC for Computer Science)

Look for our fairwell to all our seniors in the next edition, and Alumni info, too!

After the Flood and Thoughts on Leadership

By: Abi F.

This build season was quite an adventure. Not only was our robot, John Schopman Jr., built at my house, but he was built in my basement. It wasn't much of a basement at the time, of course, it was more of a shell where a basement used to be, due to the massive house flood my family had at the end of the summer.

Rebuilding the house while the team worked was interesting- we'd have to cover up all our valuable electronics at the end of every meeting lest they be covered in drywall dust when we came back the next day. Also, it seemed like every time we sneezed, insulation would fall from the ceiling and get in the electronics, which took forever to vacuum clean.

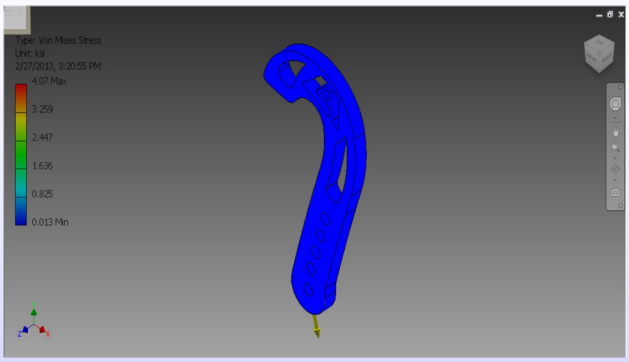
In the end, though, the basement was probably one of the best places we could have wished for to build the robot. Not only was it (relatively) spacious, but it also had heating and we were never worried about marring up the walls or the floor, because we had neither.

As Junior Captain, it was the first time anyone had really looked up to me. This was flattering, of course, but it was also a big responsibility because it meant it was becoming my job to help train the future of the team. I had to learn when to show someone what to do, when to show them how to do it, and when to do it myself. I felt like I should be the one doing all the work, until I realized that I wasn't going to be on the team for more than another year, and my new freshman needed this hands-on study so he had a clue what to do when I wasn't there to tell him.

My personal favorite part of the robot is our ability to hang for ten, then shoot four disks into the top goal before the clock runs out. It's actually something we built into the robot by total accident, but we don't have to tell anyone else that. It's mostly a psychological thing, an awe factor, because we're the only team I know of that can do that.

All About Hooks

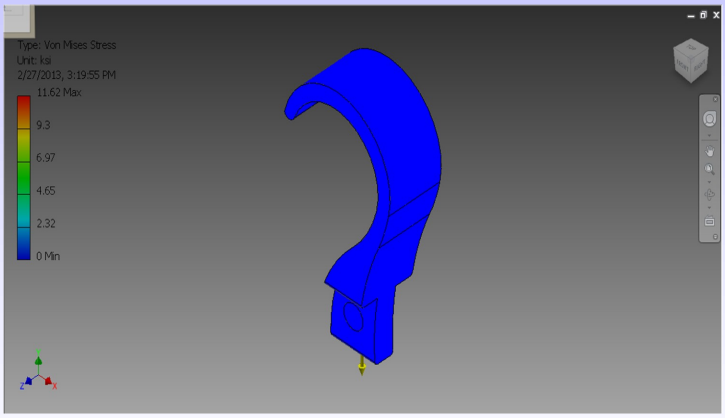
By: Mikey W..



One of the challenges this year was the the pyramid bar, which the robot had to grab and lift the up. We decided to implement a system of hooks, pistons, and winches, which required custom-made hooks. I was tasked with designing, testing, and having these hooks made.

The first step in having was to put the general dimensions onto a sketch. The bar is 1 1/2 inches in diameter, so our hook had to be at least that big. We also wanted it to be able to screw into a piston, so I had to design a base with a 7/16 inch threaded hole in order to attach it to our system.

The main concern was that the hooks support the robot safety, so I used Autodesk Inventor to run several types of stress tests and, at first, had to keep thickening and strengthening the hooks because the test results made the hooks appear too weak. I communicated with our sponsor, LAI International, as they prepared to make the hooks. In the end, our original design worked well. It turned out there were some differences in units in the stress comparisons. Our hooks were made by LAI, and have worked as designed. And I learned about what a difference units can make.



Top: Second stage hook, meant to be raised up and dropped over the higher bar—lightened as much as possible.
Bottoom: The design for the first stage was highly successful, elegant and functional.

Good Luck FRC Team 4593!

By: Abi F.

This year, the Robo-Lions had an exciting oppurtunity- to mentor a rookie team. The team they mentored, Team 4593, Rapid Acceleration from Rapid City is the only FRC team in the state of South Dakota. The Robo-Lions Team Captain for 2012, Preston Fuller, is a freshman studying mechanical engineering at the South Dakota School of Mines and Technology (SDSMT) in Rapid City, and SDSMT is the location Rapid Acceleration built their robot for the 2013 season.

As the only mentor on the team who had any prior experience with FIRST, he was valuable in getting this rookie team off to a good start, advising them on game strategy, build schedules, and team management. Via the internet videochat Skype, the Robo-Lions gave the rookie team more help in solving design problems, choosing materials, working out programming issues, and more

The Public Relations team prepared a presentation on such essentials as making buttons, writing awards and fundraising. The team sent sample documents and a package of ideas for team image, marketing and spirit. Rapid Acceleration has built a robot that can shoot for the highest goal and hand on the lower bar for 10 points. Preston and his father, one of the team mentors, will join Team 4593 at their first competition this April 4th, at DU Ritchie Center for the Colorado Regional. The Robo-Lions wish them best of luck and will be watching the webcast eagerly!

Team 4593 Rapid Acceleration at Mt. Rushmore, ready for action!

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