

#4499

www.highlandersfrc.com

# The Highlanders

## Robotics Team



“It’s not about the game, it’s about the journey”

### The Hub City Tournament Lubbock, Texas



After having a great tournament, we were surprised at being called down to the field to receive the Rookie All-Star award. Designed to recognize a well-rounded, well-run first year team, this award is based on a variety of aspects of the team—community involvement, partnerships with companies and other organizations, team structure and effectiveness, robot performance, and team cohesiveness. One of the things that especially impressed the judges was that we created a non-profit to start the team, and that we intend to add other levels of FIRST teams to join our journey. Receiving this award is a big honor, and it grants us a spot at the world championships in St. Louis, Missouri!

The tournament in Lubbock was a new experience for all of us, with challenges, victories, and lots of learning!

Who are we?

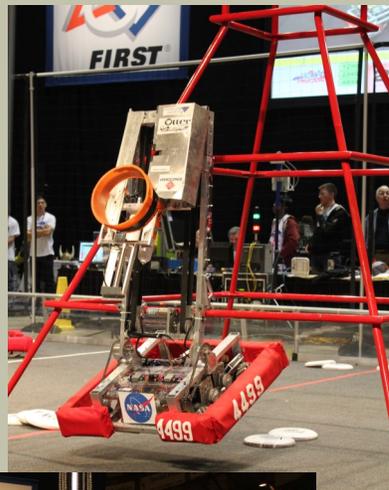
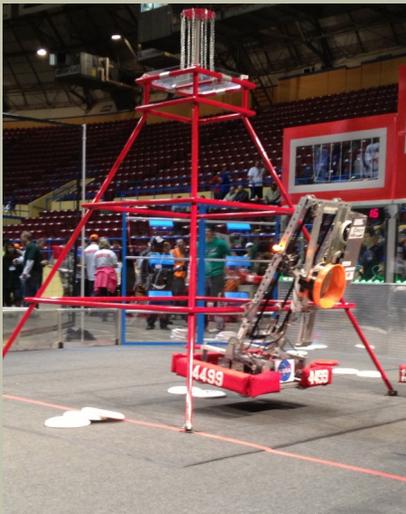
The Highlanders FRC Team 4499 out of Fort Collins, CO is a rookie (first year) team in the FIRST Robotics Challenge. We formed from two separate FTC teams and currently have members from four different schools. We are having a great season! The Hub City Regional was just our first tournament of the season—we'll go to the Denver Regional April 4-6, and then to the World Championships in St Louis, MO, April 24-27. For more information on the team, FIRST, or this year's challenge, please see our website, [www.highlandersfrc.com](http://www.highlandersfrc.com)

**Victory:** The robot passed inspection on the first day.

**Learning Lesson:** The robot passed inspection with 4 minutes left in the day! We had created a lighter-weight arm in order to be able to add on the compressor needed to launch the discs. Swapping these out took more time than we had thought it would—we're adapting our Denver strategy to prevent cutting it this close.



**Victory:** We climbed to the first level on virtually every match, right from the beginning.



**Victory:** We ended the tournament with the highest climbing points of the day.

**Learning Lesson:** even 10 points per round makes a huge impact!

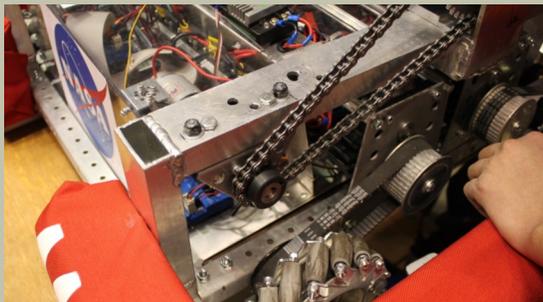


**Challenge:** While attempting a 20-point climb on the practice field, the robot fell off the pyramid. The swing as it came over the bottom bar was just too much, and it hit the ground hard. The bucket/disc feeder cracked, and the fall sheered off the axles on both 'shoulder' motors.



**Victory:** The team was able to repair the robot within 1 hour, regaining full functionality and not even missing a round.

The sheared off axle meant we needed to swap out motors and chain sprockets. The repaired version is shown here, as well.

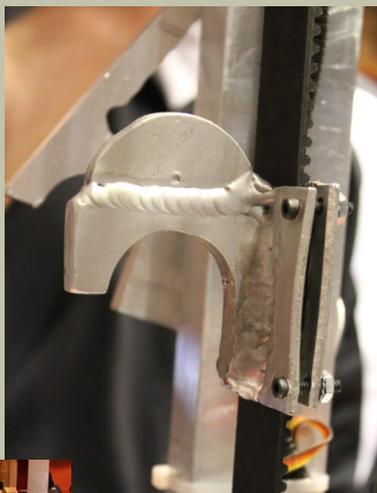


**Learning Lesson:** Mark of AndyMark, our main supplier, was on-site, and showed us how to disassemble and repair the broken motors, since the damage was only to the shaft.

**Challenge:** Other robots bumped into us while hanging, and we bent one climbing hook and broke another.

**Victory:** NASA engineers, in a mobile machine shop, welded us up some new ones.

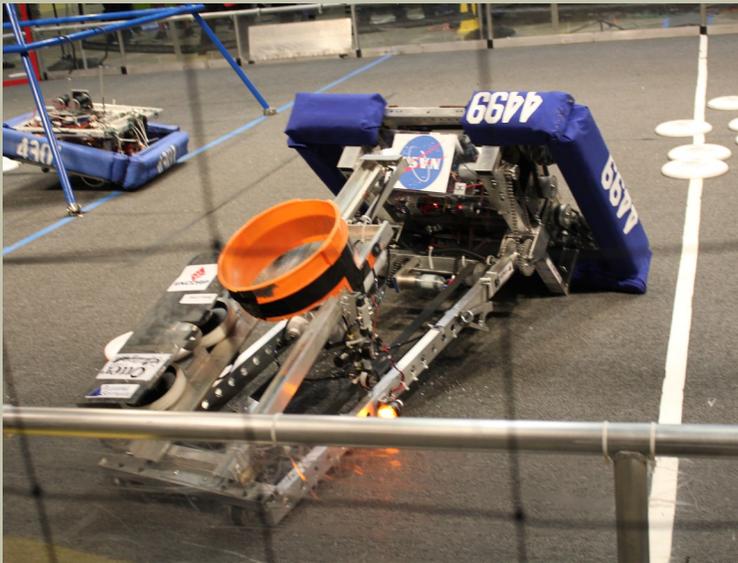
**Victory:** Being able to say "that part was made by NASA."



**Victory:** Our pit design was great, allowing us to stay organized and have everything at hand.



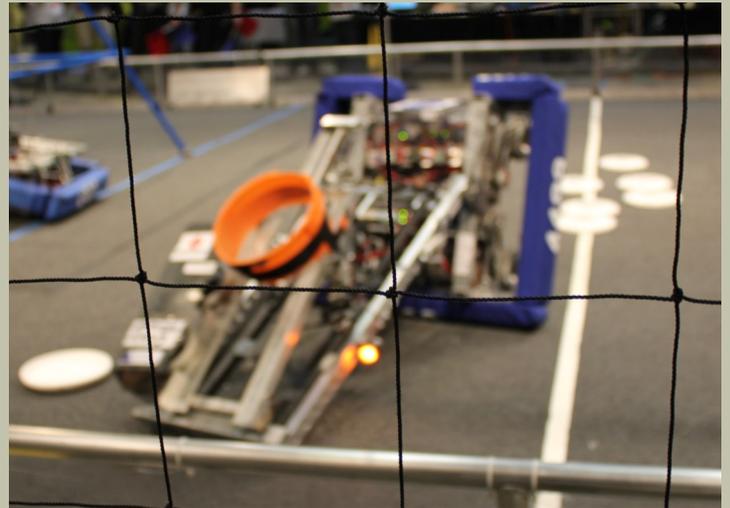
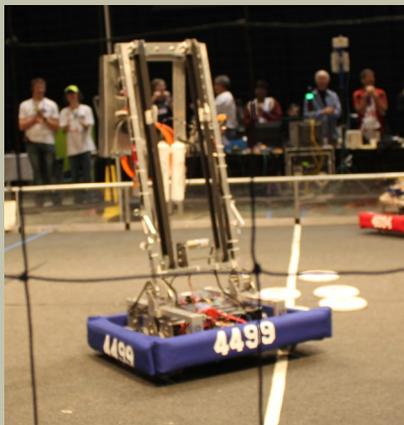
**Victory:** Parents made us dinner at the hotel each day. We saved money and had time for team discussions and decompression. Thanks Parents!!



**Challenge:** Something went wrong with the robot's gyro sensor during one of the matches. The robot fell over, which we had always believed would be the end of the match.

**Victory:** The drivers were able to use the shoulder motors and the climbing arm to lever the robot back up again.

**Victory:** The robot was able to continue the match, barely missing a beat.

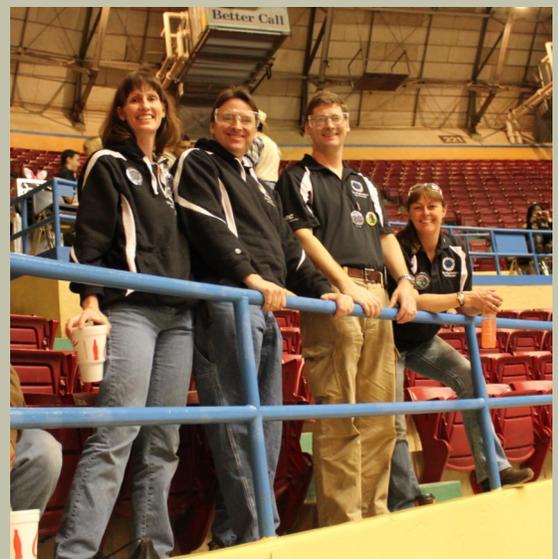


**Victory:** We caught the crazy match on video! Check it out at <https://www.youtube.com/watch?v=oR9VSBtc6sw>

**Victory:** We were able to score points with the disc shooter during the autonomous period! The first 15 seconds of each match requires the robots to run strictly on pre-loaded programs. Points for disc goals are also doubled, to make any successful shots more enticing. We shot discs on most of our matches, although our accuracy wasn't what we'd like it to be.



**Victory:** Our coaches were so proud!



**Victory:** Being invited to an alliance for the elimination rounds. It was great fun working with Project Y (team 4153) from Los Alamos, NM, and the Dark Nights, team 4378, from El Paso, TX.



**Victory:** The Emcee LOVED our huge Highlanders flag, and ran it across the field every time we had a match, and possibly the robot.

**Victory:** Talking to Woodie Flowers! One of the two founders of FIRST, Woodie spoke on Saturday morning, reminding all of us of the principles of FIRST, the value of STEM education, and the importance of always working hard to solve problems. He had some great comments about our robot, and came over to congratulate us on winning the Rookie All Star award. We had him sign our photo book as well as one of the bumpers on our robot—that bumper will be retired at the end of the season to a place of honor in the shop!





**Victory:** Passing around the trophy!



**What's Next?** We are busy improving the robot for the Denver tournament. Even though it is once again bagged & tagged, we are working on our extra robot, trying to improve the accuracy of the shooter as well as the functionality of the climber—we want 20 points, but preferably without the fall! Check out the website for updates, and think good thoughts for us April 4-6—or better yet, come and see us at DU's Magnus Arena!

## A Very Big 'Thank You' to our Sponsors!



Other Sponsors:

THE ENGLISH FAMILY AT DENHAM, VA.

THE WEIBLER FAMILY

BO JOHNSTON MUD CONSULTANTS, INC.

We couldn't do this without our mentors, including engineers from

**FleetwoodGoldcoWyard**

A BARRY-WEHMILLER COMPANY