



THE WILDHATTER

Team 100 Seasonal Newsletter



Kickoff Event

Every year, Team 100 invites a number of Bay Area Peninsula FRC teams to the Woodside High School Performing Arts Center for our annual FRC Kickoff event. This year we had a record attendance with 9 teams total, including 3 rookie teams from Burlingame HS, Nueva School, and Capuchino HS. Our day started at 9:30 with a continental breakfast in the lobby then we all filed into the theatre to watch broadcast at a delayed time. After the game was revealed, attendees broke off into 8 student-led groups with each one dedicated to analyzing different parts of the game and rules. Then the leaders

rotated groups so that each group of students would have a chance to discuss all the topics we decided. In addition to discussing the game, teams got the unique experience of making personal connections with other teams from around the area before the build season. This is a fantastic way to increase the gracious professionalism of part and idea sharing that goes on before the competition begins. Making these connections early in the season sets teams up for a heavier emphasis on using the resources around you and helping other teams in any way possible. This year's game is a fun new concept that requires a lot of teamwork and cooperation.

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Aerial Assist playing field from FRC Game Manual



Kickoff breakfast with guest teams



Student-led brainstorming groups

Robot Process

Brainstorming/Design

We have the largest number of brains together in one room during the first few days of build season, so we take advantage of this by focusing on group brainstorming and rule-reading. Our challenge this year was a bit different than most of us were expecting. We only had two options: control the ball, play offense, and assist other robots, or play defense on the goalie zone. We decided that it was better to design a robot that could pick up balls from the ground, and shoot them into the ten-point goal and over the truss. We soon began prototyping different mechanisms such as intakes, punchers, catapults, etc. This led us to a more informed decision on our robot's manipulator mechanisms. Then, the designers set out to CAD (Computer Aided Design) the robot based on the knowledge we gained from our prototypes.

Fabrication/Specifications

Once the CAD of the robot was complete, students began machining parts for the robot. Since we decided to have two robots, one for competition and one for practice, we made duplicates of each robot part. Working in our state-of-the-art machine shop, we were able to cut, mill, drill, sand, and grind just about everything we needed. This year's robot is simpler than some previous robots, but is still relatively complex. The drivetrain has 4 Versa wheels in the back and 2 omni-wheels in the front, all belt-driven by VexPro shifters with 2 CIMs and 1 mini-CIM on each side. This allows Ballrus to drive at speeds of up to 18 ft/sec. It has a two-wheel top roller intake that pulls the 24" ball into a forklift style cradle. This intake and cradle arm can be rotated to different angles for starting, intake, and shooting positions. Our shooter consists of a punching mechanism powered by 4 springs, reaching almost 200 pounds of force. Its astounding efficiency is due to a quick release trigger for archery encased in a 3D printed housing. Pulled back as a single unit by a worm gearbox and steel cable, the shooter launches the ball up to 50 feet when a small pneumatic piston pulls the trigger. Once we finished assembling the robot, we named it Ballrus for its tusk-like features.

Performance/Decoration

Ballrus's practice double is currently undergoing some mechanical upgrades and calibration. The competition robot is in the bag. We intend to optimize the angle, power, and distance from the goal to maximize our shooting efficacy. Programming features in the works include automatic targeting using a camera, feedback-based control, and automatic distance sensing.



Brainstorming on Day 1 for game strategy



Soldering encoders for the competition robot



Testing Ballrus on Bag and Tag Day



TEAM 100 WILDHATS

Upcoming Events

Team 100 will soon be attending 2 regional competitions for the 2014 game. Our first regional is the Sacramento Regional at UC Davis on March 13th-15th. The next regional is the Silicon Valley Regional at San Jose State University on April 3rd-5th. The team is greatly looking forward to seeing old teams, new teams, and all the people that make competitions so much fun. If Team 100 is on the winning alliance at either of these regionals, we have the opportunity to go to the World Championships in St. Louis.

Thank You Sponsors!



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