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Sussex County FRC Teams turn gears for competitions

By LIAM OAKES
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For six weeks, *FIRST* Robotics teams have been working arduously to prepare a robot to compete in competitions.

They compete in the *FIRST* Robotics Competition—a worldwide S.T.E.M. robotics program for high school students in grades 9-12. At the beginning of each year, a new challenge is released and all teams are only allotted six weeks to conceptualize game strategies and construct a robot.

January 7 marked the beginning of this year's "build season" with a new challenge called "Steamworks," in conjunction with a Victorian Industrial Revolution theme. A trio of three teams on both a red and a blue alliance must work together to operate a mock airship on the field. Robots assembled by each team can deliver gears to the human players in the airship, while the human players assemble the gears to engage the rotors. "Fuel" must also be delivered to the airship by shooting whiffle balls into the boiler. As time runs out, robots can tag along onto the airship by climbing its ropes and hanging off of them. The resulting scores are based off of how many tasks were completed in each match.

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In Sussex County, there are only two teams that participate in the *FIRST* Robotics Competition—Vernon High School's Team #1989 "The Vikings" and Newton High School's Team #3142 "Aperture." Both teams were able to produce a functional robot that correlates with this year's challenge.

The Vikings' team captain, Brian Hill, was "proud of the results."

"I am very hopeful that our robot will succeed in our competitions this year, and that it will advance us to the championships," said Hill. Hill is a senior at Vernon High School, and is the captain and build leader of the team.

"Our robot this year will be able to complete three tasks: deliver gears to the human players in the airship, deliver fuel to the airship's boiler, and climb onto the rope of the airship."

According to Hill, the team's build group also developed their own strategy of obtaining and launching whiffle balls, or "fuel," using an input and output system with a conveyor

belt-like mechanism on the robot. Gears are placed into the box on the robot, while the robot's drivers control the delivering of the gears to the human player.

"This year's robot, in my opinion, was one of the most difficult to design and build," said Anthony Ciaburri, the team's adviser and mentor. Ciaburri has been teaching at Vernon for twenty years and coaching the robotics team for eleven.

"The games in recent years are requiring more and more of teams with respect to solutions to the game requirements. Essentially, each year has become more difficult to fund and design given the time frame of 6 weeks."

Newton High School's team "Aperture" was also able to overcome the intense six weeks of build.

"This year we really wanted to focus on assisting the human players and gaining the extra points at the end of the matches," said John Bugay, build leader of Aperture.

Aperture's robot, similar in objectives to the Vikings', delivers gears and climbs the airship's rope. The gears are placed into the robot's box and are delivered to the peg on the airship's lift for the human player to retrieve.

Bugay also stated that their primary focus for this year's challenge is team collaboration, in where the team works together with the human players and other teams to accomplish the mission.

This is also the first year that Newton's team had to adapt to a new build group, after several students on the team recently graduated. However, Jake Kolzow describes, "I could not really see a difference between this year's group and last year's. They took the skills that we have taught them and used them to produce a working robot, with the help of mentors, like myself."

Kolzow became involved with Aperture in eighth grade, was the build leader for three years, and graduated from Newton High School in 2016. He now mentors students on the team and is pursuing a career path.

Vernon will be competing in their first district competition at Westtown School in Pennsylvania on March 11 and 12, while Newton competes at Mount Olive High School the same weekend. Both teams will compete in their second district competition at Bridgewater-Raritan High School on March 18 and 19. Competitions are open to the public, and are free of admission.

The average score of the two competitions will determine the teams' eligibility to compete in the Regional Championship at Lehigh University in April, and then to the World Championship in St. Louis, Missouri and Houston, Texas.

"*FIRST* has really motivated me to pursue a career in something that I am passionate about," Hill expressed.

"I have learned many skills, especially leadership and problem-solving. It has motivated me to pursue the career that I am headed for, and I am really excited."