# The Valor Observer

Game Summary

Renewable sources of energy are everywhere, all the time. Working together in the 2020 season of FIRST Robotics Competition, INFINITE RECHARGE, we can support boundless innovation and create a society that's empowered, inspired, and hopeful. In INFINITE RECHARGE, two alliances race to collect and score Power Cells in order to energize their Shield Generator for maximum protection. To activate stages of the Shield Generator, robots manipulate their Control Panels after scoring a specific number of Power Cells. Near the end of the match, robots race to their Rendezvous Point and rise to the challenge.

Robot Report

This week, we had a design review on Friday night where each subsystem team presented their CAD. After an open discussion and Q&A we collectively decided on the final robot design. Each subteam is in the early phase of completing their design and working on system integration so they can add their CAD to the full robot render. During testing we discovered our chassis was veering to the left. After spending time analyzing the motor data, we isolated the issue and started implementing the solution on both robots.
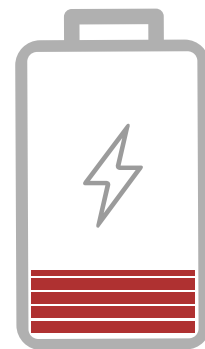
Robot status:
20% complete

Student Spotlight

Cole
⚒ Design
🎓 Senior

I started robotics in 7th grade on FTC and joined Valor in 10th grade when it was founded. I joined because I wanted practical experience in engineering. I've always been interested in STEM, and problem solving through robotics allows me to explore this curiosity. In college, I will be studying Mechanical Engineering at Purdue University. During build season I work on design work in CAD and hardware/fabrication. In competition season I am the human player on the drive team. This week I worked on CADing our robot's hopper and analyzed how to fit all the power cells (balls).

Geneva
>_ Software
🎓 Junior

I started robotics in 8th grade on an FTC team because I was interested in coding and wanted to expand my knowledge of STEM. I want to study biomedical engineering in college at either the University of Texas at Austin or University of Washington. On Valor I am the controls subteam lead and operator. This week I wrote commands for our subsystems, tested the code with prototypes, troubleshooted why the drivetrain was drifting, and began working on auto.

Julian
⚙ Manufacturing
🎓 Sophomore

I started FIRST robotics in 4th grade after I saw my older brother's FLL team and I wanted to try it for myself. I continued into FTC from FLL, and now this is my first year doing FRC. I want to major in either electrical or mechanical engineering at Purdue University. During build season I am part of the manufacturing team, and during competition season I am part of the scout team. This week I worked on designing the shooter hood with the design team as well as CNCing new front chassis bars for our intake design.

Sub-team Updates

Manufacturing

Our goal for this week was to finish and refine all of our prototypes to get finalized measurements for the CAD team and test with our newly manufactured wheel treads. We were able to complete all of our goals for this week. We completed all prototypes and finished our drivetrain to stay on track. It was challenging integrating all of the different prototypes because we did not CAD them to perfectly fit together. Next week we will support the CAD team and refine any design flaws that we discovered after testing was completed. We will start to manufacture all the finalized CAD designs.

Design

This week the design team divided into 5 groups for each subsystem: utility arm, shooter, intake, hopper, and muncher. During the design review on Friday night each subsystem team received feedback, and then everyone's goal was to complete the CAD for their design. Each subsystem team worked through difficulties in configurations. The utility arm and muncher subteams worked together on spacing. Intake also worked with both utility arm and hopper for system integration. Next week, all CAD needs to be complete by Wednesday because of our parts order.

Software and Electrical

This week our goal was to finish all subsystems and command code in the command based framework, get our shoot command functional, and start coding motion profiles. We had trouble once we realized the chassis curved. We tried using software correction to match both sides of the chassis' encoders. However, this was difficult because there were many variables involved in the process and one of them could have been causing the issue (hardware, software, or electrical). Also we worked on the shoot command's functionality. Next week, we will continue to work on motion profiling and hopefully get splines that our robot can follow.

Business

Our goal for this week was to finalize everything for our Chairman's submission, edit the business plan, and write the essay for the Woodie Flowers award. This week we got the 10k essay under the character count and finished our Chairman's documentation for outreach. This is a new requirement for all activities, so we had to reach out to contacts for all previous and current events to secure documentation. Also, we refreshed our website by updating the home page and adding this year's newsletters. Next week, we are going to submit the Woodie Flowers award and secure a date for our open house event.

Meet the Mentor

Ben Helgeson
Hardware Mentor

I work at Applied Research Laboratories as a satellite attitude determination specialist for ICESat-2. I've been in FIRST since high school when I was on an FRC team with Michael Ray and my brother Jan, and I've been a part of Valor since the beginning in 2017. In total I've been involved in FIRST for about 8 years. I'm the hardware mentor, responsible for overseeing the shop and manufacturing the robot. As a mentor it's very rewarding seeing the students develop as critical thinkers.
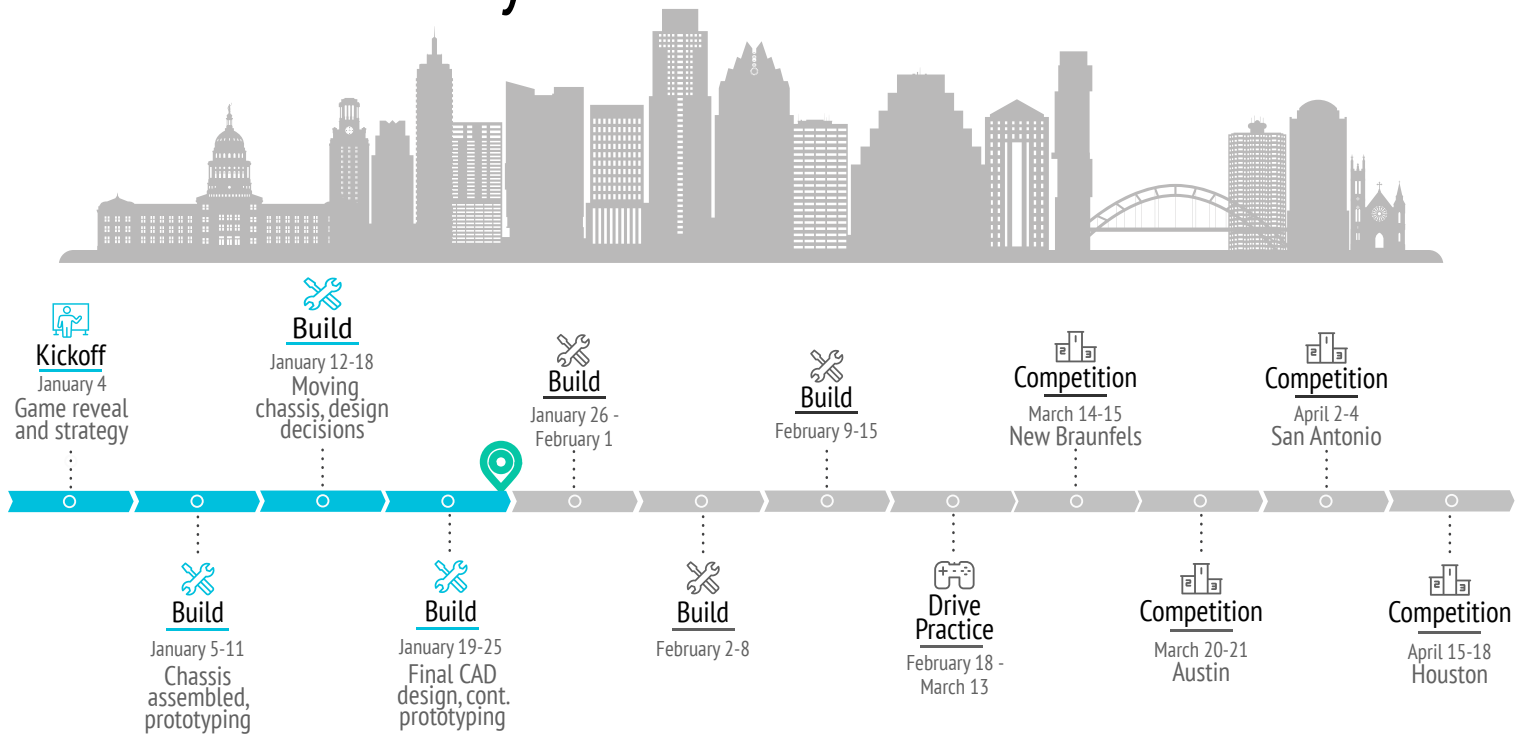

Sponsor Showcase
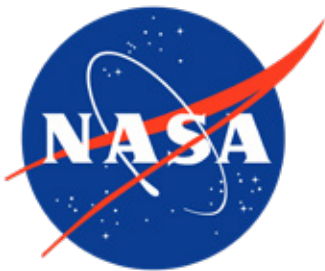
Thank you to our sponsors for all their support! These partnerships help us pursue our mission and make a larger impact within the STEM community.

Follow the Journey

Kickoff
January 4
Game reveal and strategy

Build
January 5-11
Chassis assembled, prototyping

Build
January 12-18
Moving chassis, design decisions

Build
January 19-25
Final CAD design, cont. prototyping

Build
January 26 - February 1

Build
February 2-8

Build
February 9-15

Drive Practice
February 18 - March 13

Competition
March 14-15
New Braunfels

Competition
March 20-21
Austin

Competition
April 2-4
San Antonio

Competition
April 15-18
Houston

Quote of the Week

"Obstacles don't have to stop you. If you run into a wall, don't turn around and give up. Figure out how to climb it, go through it, or work around it." - Michael Jordan

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Vandegrift High School FIRST Robotics Competition team