



Technical Design Poster Rubric

CS450HO-ROBOTIC DESIGN
AND FABRICATION

FALL TERM 2021

Elements to Include

- Graphic(s) of your assembled design
 - CAD renders and/or images of the physical assembly
- Technical Specifications
 - Motors used, ratios used and how you achieved your reductions (gearboxes, belt and pulley, etc.), calculated intake speed from JVN spreadsheet
 - General description of how the design works
 - Testing setup and how results were analyzed
 - Ideas for iteration that could improve design
- Include “FRC7407 Wired Boars” somewhere on poster & Logo
 - The idea is to show these off at competitions!
- Feel free to be creative with your designs!

Example Posters

Bear Metal Presents

Shoulder - Pivots the ballista between ejecting and storing positions in less than a second with a mini CIM and a 1:24 gear ratio. It utilizes torsion springs to apply up to 123 in-lbs of counterbalance and an analog encoder for less than one degree accuracy.

Ballista - Ejects boulders into the tower's high goal. A 775 Pro motor and 19:40 gear ratio rotates the wheels at up to 7000 rpm and can launch a boulder 10 feet vertically. A camera and a custom designed LED PCB is utilized for targeting and autonomous navigation.

Chassis - Maneuvers the robot quickly and agilely. Two speeds and four CIM motors allows for speedy runs at 13 feet per second or defensive pushing at over 150 pounds of force. 8" pneumatic wheels conquer all terrain defences with ease.

Defence Defeater - Allows traversing of all defences and collection of boulders. A three position cylinder moves it between collecting, defeating, and storing positions. A 775 Pro motor rotates the wheel with a tangential velocity of about 26 mph, which sucks boulders in a blink of an eye.

Xcalibear

Climber

- Single stage elevator
- 3D Printed Bearing Blocks
- Custom Gearbox
- 2 REV NEO motors
- 28:1 Reduction
- Custom Pneumatic Latch
- Hooks
- Easy Alignment
- Non-slip Grip
- Latches inspired by FRC#6328

Shooter

- Shooter Wheels
- 6" Wheels
- 2x Falcon Motors
- 3500-4500 Wheel RPM
- Accelerator Wheels
- 4" Wheels
- 1x Falcon Motor
- Same RPM, lower Surface Speed
- Shooter Hood
- 3D printed Angle
- Foam for adaptable compression
- PTFE Sheet to reduce friction

Ball Path

- FRC#6135 inspired V Funnel Design
- NEO 550 Motors
- Side belts prevent ball jams
- PTFE coated floor
- Automated Ball Tower
- IR Line Break Sensors
- Pneumatic system for ball storage
- Falcon Motor with 30:8 gear ratio

Intake

- Our intake design has influenced many teams this season
- Full Width Over Bumper Intake
- Rollers
- Dead axle design
- 3D printed Pulleys
- 2.5" Polycarbonate Tube
- NEO Motor
- 36:18 3mm Belt Reduction
- Polycarbonate Compliant Design
- Absorbs impacts

Drivetrain

- 6-Wheel Drive
- 4x 6" Trampa Pneumatic Tires
- 2x 6" Omni Wheels
- 2 Speed Shifting Gearbox
- 4 Falcons
- 1.5 Stage Design
- Theoretical Speeds
- High Gear: 19.5 fps
- Low Gear: 10.5 fps