TEAM 1114 PRESENTS:
SIMBOT JORDAN

Designed using the principles found in the Textbook For Success
Available at simbotics.org/workshops and on SimPhone

Turreted Shooter

- Wheels drive balls against fixed polycarbonate hood to launch them toward the basket
- Dual wheeled with 8" FIRST wheels coated with paint-on urethane
- Shooter wheels powered by one BaneBots RS-550 motor; power transmission via Fisher-Price gears
- Shooter assembly turreted for fine rotation adjustment
- Turret powered by one BaneBots RS-550 motor; power transmission via Fisher-Price gears mating to laser cut sheet metal turret gear

Elevator

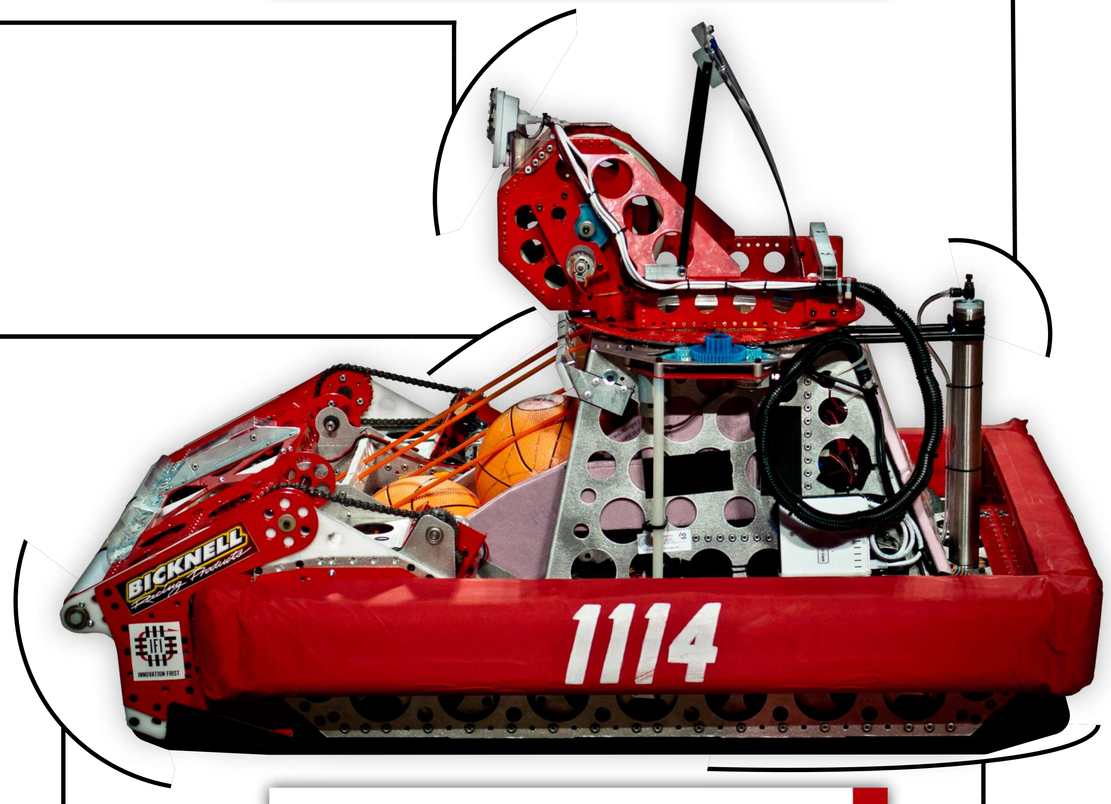
- 3 ball capacity
- Polycord belts to convey balls from intake to shooter
- Powered by one Fisher-Price motor (00968-9015)
- Power transmission via Fisher-Price gears
- Balls loaded from top of elevator into shooter with pneumatic cylinders, "pokey-pokey", for consistent feeding

Collector Arm

- Arm Rotation Powered by two AndyMark 9015 motors; power transmission via PG71 gearbox, custom spur gears and roller chain
- Manipulates bridge for balancing and collecting balls
- Roller located on arm for a greater intake width
- Ability to collect from any location on the the court (i.e., under the bridges, along the wall, in corners)
- Powered by one Fisher-Price motor (00968-9015); power transmission via Fisher-Price gears and timing belts
- Arm can also hook onto other robots' bumpers for aid in balancing

Dingus

- Used to assist the balancing of robots on the bridge
- Helps the bridge reach its equilibrium as robots move to position on the bridge
- Pneumatic piston with a ball knob mounted at the end of its rod



Drivetrain

- Six wheeled drive utilizing 8" pneumatic wheels
- Angled edges with Teflon sliders to traverse the barrier
- Powered by four CIM motors; power transmission via custom two speed transmission, utilizing AndyMark gears, and roller chain
- Approximate top speeds of 4 fps (in low gear) and 14 fps (in high gear)

Controls

- The Smart Dashboard is used to notify the drivers when carrying three balls, when the camera has finished targeting, and when a ball has been loaded into the firing seat
- Camera is used to automatically turn the turret towards the target
- A laser is pointed at the backboard to provide an alignment reference to the operator
- A baselock function is used to hold the robot in position and allow fine positional movements while balancing the bridge
- The shooter wheel is controlled by presets that set the desired speed in RPM for different shooting positions around the key
- A firing sequence that reverses the elevator for 100ms allows the robot to free any balls stuck in the elevator, fire, and then reload for as long as the button is held
- The collector arm can be moved on a button press to various positions: ball pickup, bridge manipulation, bridge pickup, retracted within the bumper perimeter, and to hold onto other robots
- Autonomous modes can fire from anywhere in the key and pick-up balls from the middle and alliance bridges

Materials Summary

- Riveted aluminum sheet metal is the main method of construction
- Reinforced with Delrin in needed areas
- Paint-on urethane rubber used to control ball flow in the roller system
- Adhesive Teflon used to reduce friction against balls where necessary, as well as on drive train for barrier crossing
- Ball rollers made of PVC with wooden plugs, driven by nylon hex shafts
- Custom transmissions using plastic gears from the Fisher-Price Power Wheels transmissions
- Pink polystyrene insulation foam for padding ball paths