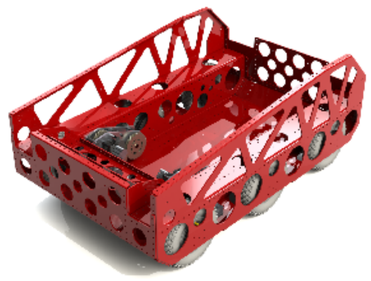
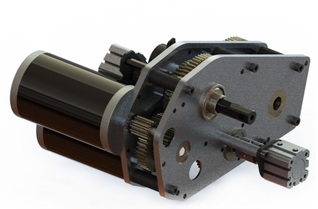
TEAM 1114 PRESENTS: SIMBOT

SENTINEL



Drive

- Riveted 1/8″ aluminum sheet metal chassis with steel base plate
- 15.25″ height for low bar clearance
- Drive profile shaped like a wedge to raise the portcullis passively
- Six wheeled utilizing 8″ Andymark pneumatic tires
- Powered by four CIMs with an approximate top speeds of 7 ft/s (low gear) and 14 ft/s (high gear)



Gearbox/PTO

- Comprised of two CNC milled 1/4″ aluminum plates that are spaced apart with standoffs
- Pneumatically actuated dog gear is used to transmit the power of the CIMs to a 1″ diameter pulley used to winch the hanging arms
- Utilizes an encoder to get position feedback used in auto routines

Hanger

- Comprised of two double jointed arms with extendable hooks that engage hanging bar
- PTO winch rotates the robot and lower hanger arms ending with the robot perpendicular to the ground and spaced out from the tower to give room for partner robots to hang
- Constructed from VEXpro Versatube and sheet metal gussets
- Overcenter linkage locks the lower arm in place
- Linkage mechanically locks the lower arm of the hanger to the drive base which is required for hanging
- Two pneumatic cylinders drive the overcenter linkage that deploys the hanging arm into position
- Constructed from VEXpro versa tubes and sheet metal gussets

Intake

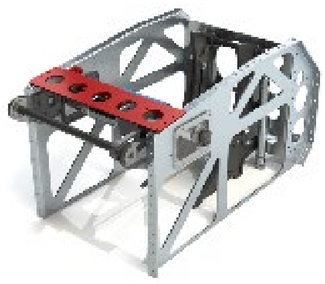
- Manufactured from VEXpro versatube and sheet metal gussets
- Intake captures balls with a roller then rotates inwards transferring the ball to the feeder
- Intake arm rotation is driven by two bag motors through VEXpro planetary gearbox and is used to manipulate the cheval de frise and to wedge the portcullis upwards
- Roller utillizes four 2″ mechanum wheels on a nylon 0.5″ hex shaft
- Light sensors detect when a ball has entered the intake causing the rollers to hold position pinching the ball
- Roller is driven by a bag motor through a 10:1 VEXpro versaplanetary gearbox

Feeder

- Feeder roller passes the ball to the shooter and retains ball while traversing the field
- Feeder powered by a VEXpro bag motor through a 3:1 VersaPlanetary gearbox
- 10.5″ thunder hex roller with high traction tape

Controls

- Implementing heading lock and base lock to avoid a change in position or heading while targeting the goals
- Uses Microsoft LifeCam to calculate the angular offset of the robot to the goal and feeds that information into an encoder PID controller to center robot
- Intake arm uses a PID controller to be able to hold position for wedging under portcullis and intaking boulders



Shooter

- Single 4″ urethane flywheel shooter with a three position hood
- Powered by a single VEXpro 775Pro Motor
- RPM feedback sensory provided by SRX Mag Encoder
- Pneumatically actuated three position hood for outerworks shooting, closup shooting and retracted position for lowbar clearence
- Comprised of four CNC milled 0.25″ aluminum parts located by an rotary slot

FOLLOW US AT SIMBOTICS.ORG /frc1114 @frc1114 /simbotics