2020 Infinite Recharge Robot Specifications
Team #5275

Drive Train:

- KOP chassis Long configuration
- Standard 6" wheels.`
- 4 CIMs
- CTRE Magnetic Encoders on drive gear boxes

Intake:

- 8 x 2” vectored intake wheels WCP (Mecanum)
- 2" 35A durometer omni wheels in middle.
- Pneumatically actuated to pull in and out of frame perimeter.
- Full width of the bumper.
- Pulls over the bumper in the middle (no cut out).
- Made out of polycarb to allow compliance.

Hopper:

- Holds 4.5 balls
- ¼" Below top of bumper
- ¼” polycord rollers on top and bottom of ball
- Made out of 2" angle.
- ⅛" polycarbonate sides
- 8" outside, inside 7.5"
- Bottom poly cord 53 1/4”

Spitter:

- Pneumatic trap door at end with poly cord rollers on bottom.

Telescope/Hook:

- PVC Pipe: 1”, 2”, 3”, 4”
- Used just to hang the hook NOT to lift the robot
- 3D printed bushings inside to align the PVC and ensure smooth operation
- 1 775Pro with VersaPlanetary to lift the telescope.
- Magnetic Encoders to automate lifting height.
- Limit switches to prevent destruction
- Hook is attached to the last stage with a mechanism to let it fall off onto the bar.
- All 4 winch ropes are attached to the hook.
- Hook wrapped in some sort of grippy material to prevent sliding
- Uses 7/64” Amsteel for rigging inside the pipe.
- Hook wrapped in poly cord or other grippy material

Winch:

- Located in the bottom of the robot to accept pull in Amsteel from all four corners of robot
- Uses 2 775Pro's with a 106.6:1 reduction in VersaDM
- Magnetic encoders to prevent winch from destroying itself.
- 2 Identical runs of #25 chain from gearbox output to hex shaft.
- Pneumatically actuated ratchet to prevent the robot from falling.
- All 4 identical length amsteel
- Pulleys mounted to chassis
- Amsteel Fid Length for Splices = 2.5"
- Black tape on ropes indicates where the rope leaves the winch.

Bumpers:

- Bumpers 1.5 inches off the ground to allow easy traversing of the Rendezvous Zone but low enough to hopefully prevent balls from getting stuck.
- 5 inch tall bumpers
- Full wrap around
- Uses Mcmaster slide latches to facilitate easy bumper removal and attachment.

Programming:

- FRC WPI Raspberry Pi Image for video streaming.
- Pathfinder Auto

What still needs to be determined:

Motors:

PDP Slot	Sub system	Motor type	Gearbox reduction	Motor Controller	Sensors	PDP connection
1	Drive Train L 1 Right_Talon_1	CIM	ToughBox KOP	Talon SRX	Mag Encoder	40 amp
2	Drive Train L 2 Right_Victor_2	CIM	ToughBox KOP	Victor SPX		40 amp
3	Drive Train R 1 Left_Talon_3	CIM	ToughBox KOP	Talon SRX	Mag Encoder	40 amp
4	Drive Train R 2 Left_Victor_4	CIM	ToughBox KOP	Victor SPX		40 amp
5	winch 1	775pro	VersaDM 106.6 :1	Talon SRX	Mag Encoder + Limit switches	40 amp

6	winch 2	775pro	VersaDM 106.6 :1	Victor SPX		40 amp
7	Telescope	775pro	VP 100:1	Talon SRX	Mag Encoder + Limit Switches	40 Amp
8	Hopper Top	BAG	VP 10:1	Victor SPX		30 amp
9	Hopper Bottom	BAG	VP 10:1	Victor SPX		30 amp
10	Intake	775pro	VP??	Victor SPX		30 amp
11	Outtake	BAG	VP 6:1	Talon SRX	Plug in pigeon to this controller	30 amp
12	Network Switch	12v to 5v Converter (Custom circuit)	https://team900.org/blog/ZebraSwitch/	https://www.pololu.com/product/2574		20 amp
13	Raspberry Pi 4	12v to USB C power (Custom circuit)	https://www.amazon.com/HOMREE-Converter-Voltage-Regulator-Standard/dp/B07ZQB6S3L/ref=sr_1_3?crid=1055S821Q5UQ&keywords=12v%2Bto%2B5v%2Busb%2Bconverter&qid=1578802485&sprefix=12v%2Bto%2B5v%2Busb%2Bcon%2Caps%2C154&sr=8-3&th=1		Camera(s)	20 amp
	Pigeon IMU	Plugged into out take Talon				

Robot Commands:

Intake:
Intake out
Intake on
Hopper on
Outtake off
outtake down
reverse(for if we have one too many balls)

Outtake:
Outtake up
Outake on
Hopper on

Unjam:
Hopper reverse and intake reverse until button is no longer being pressed.

Climb:

Can ID's

Name	CAN ID
rightTalon1	1
rightVictor2	2
leftTalon3	3
leftVictor4	4
intakeVictor5	5
hopperVictor6	6
hopperVictor7	7
spitterVictor8	8
telescopeTalon9	9
winchTalon10	10
winchVictor11	11
winchEncoder3	~~(11,12)~~
rightEncoder1	~~(1,2)~~
leftEncoder2	~~(3,4)~~

PNEUMATIC BOYS
Ratchet out - PCM channel 7
Ratchet in - PCM channel 0
Spitter out - 6
Spitter in - 1
Intake out - 2
Intake in - 5

Button Layout
Drive Stick - logi ex3dpro

1. Spitter out
2. Intake in
3. Intake retract
4. Spitter retract
5. Intake deploy
6. Spitter deploy
7. Climb retract to 0
8. Climb retract halfway
9. Climb retract ¼
10. Climb extend high
11. Climb extend “low/medium”