INVERSE PARADOX

1325

WHO AM I?

ME

- FORMER TECHNICAL DIRECTOR OF 1325
- FORMER DRIVE COACH OF 4 YEARS FOR 1325
- TRAINED EVERY 1325 DRIVE TEAM SINCE 2015
- PROFESSIONAL TIME WASTER

BAG DAY IS GONE, WHAT NOW?

TOPICS FOR TODAY

- Why did bag day exist in the first place?
- How will no bag day change FRC?
- Setting yourself up for success
- Practice bots – a thing of the past?
- A guide to R&D in FRC
- Questions

What Bag Day was supposed to do

- FIRST's attempt equalizing the playing field by constraining all teams to the same amount of hours spent on a machine

What Bag Day Did

- Created a further performance gap between highly funded and lowly funded teams
- Teams such as 1325 bought time (Off the shelf components, practice robots)
- 148 in 2018 and 2019 would build 3 full robots and 1 half robot

How will FRC Change without Bag Day?

- Not a lot
- FRC development race will get more intense (marginally)
- Quality and quantity of autonomous modes will increase
- FRC drivers performance will increase

THE END?

Set yourself up for success!

- How does your team define success?
- What events are you competing at?
- What is your strategy for the game?
- Does your robot design lend it self to modifications?

Set Season Goals

- Should be more specific then “win”
- These goals **WON’T** change throughout the season!
- Gives you direction when developing/creating your robot


WIN
EVERYTHING
FIRST
CANADA
Eddy G 2017

FRC 1325 Season Goals

2017

- Win 1 district event
- Qualify for Championship

2018

– Win 2 District Events
– Contend for a DCMP Win
– Win DCMP Chairman's

2019

- Win 2 District Events
- Win DCMP Chairman's
- Championship Chairman's Finalist
- Win a Championship

Choosing an Event

$$Week\ Number\ \propto Difficulty\ of\ the\ game$$

Should we go to a 3rd event?

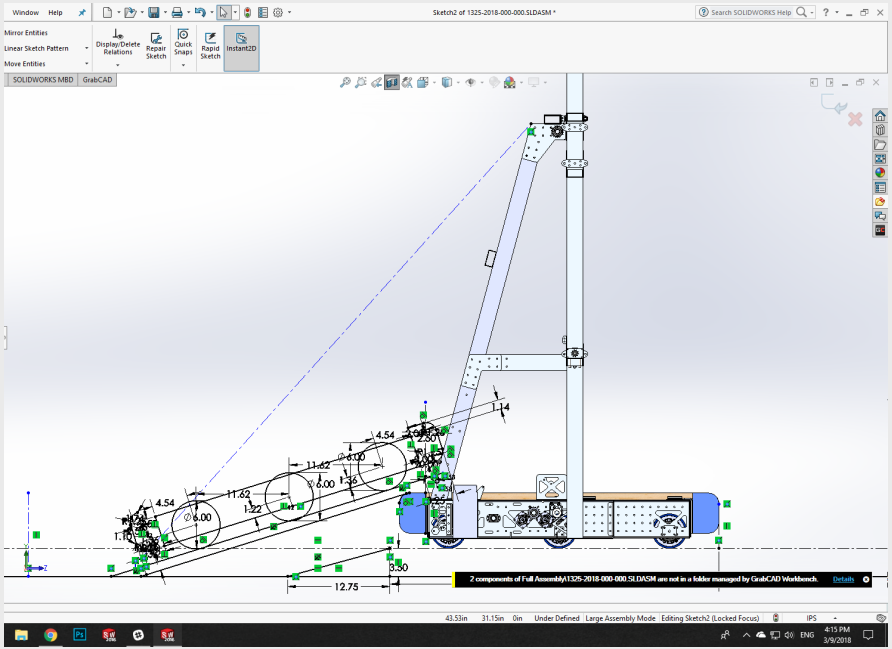
IF ABLE, ABSOLUETLY! YOU CAN TRY “WILD” THINGS

Kickoff- Choosing a Strategy

STAY WITHIN YOUR ABILITIES

Kickoff – Choosing a Strategy

- Don’t box yourself in!
- What do you do when you hit your upper limit?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SOLIDWORKS MBD
GrabCAD
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Move Entities
Display/Delete Relations
Repair Sketch
Quick Snaps
Rapid Sketch
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6.00
1.22
1.14
12.75
8.00
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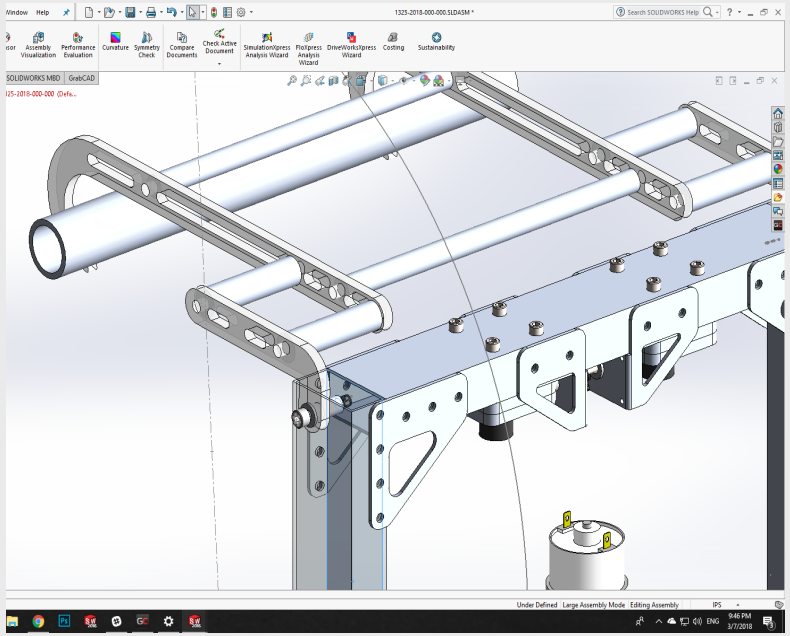
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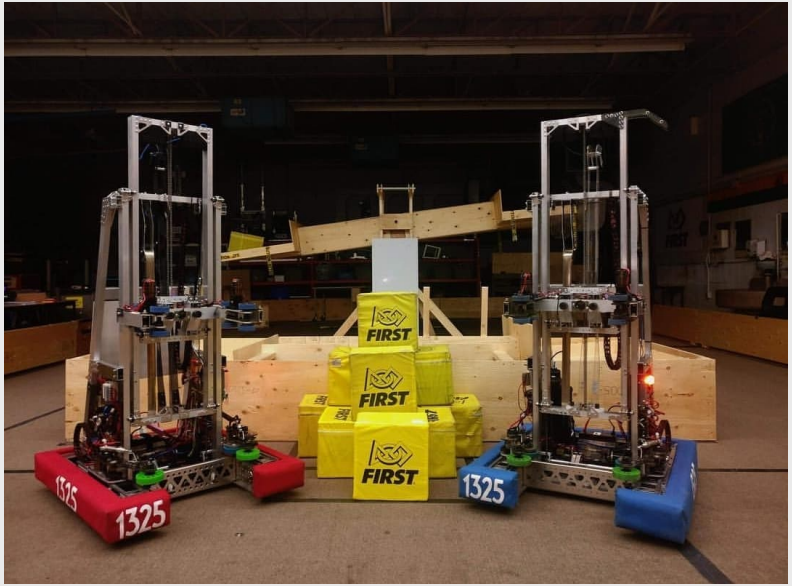
MANAGE YOUR TIME

What is/was a Practice Robot?



OFFSET TAKEOFF

Practice Robots

- Identical copy of the bagged robot
- Used to continue work on autonomous modes
- Use to test new mechanism's (R&D testbed)
- **DRIVER PRACTICE**

Practice Bots a thing of the past?

- Not quite
- FRC Robots have an ”expiry date” built into them due to the methods and materials used to make them
- Also….

"YO BILAL, TAKEOFF IS ----ING DECEASED" – A 1325 STUDENT TO ME THE DAY BEFORE CHAMPIONSHIP

"I HATE LIL BOTY WITH A PASSION" – 1325'S 2017 DRIVER

1325's Practice Robot Strategy for 2020

- We will still build one
- Practice machine will be fabricated and tested before work on the competition machine has begun
- Practice machine will be used for driver training/R&D
- Unbagged competition machine will be used by software team

QUICK START GUIDE ON R&D IN FRC!

Note on Robot Design

- Set clear goals for every subsystem
- When creating these goals, think back to your season goals. What does each system on the robot need to do in order for you to achieve those goals?
- These goals **CAN** change throughout the season

Note on Robot Design

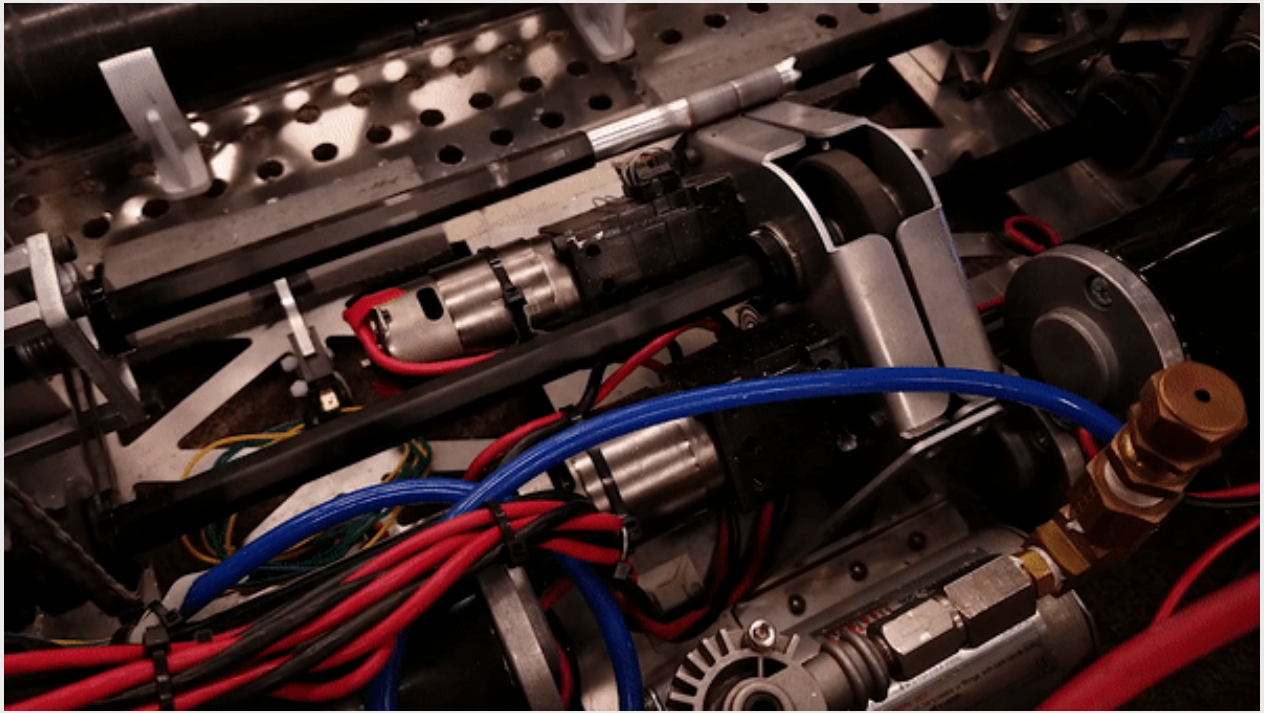
- **Need:** What does this system need to do in order to achieve your season goals
- **Want:** What would you like this system to do, not #1 priority but very close to it.
- **Wish:** What in a perfect world would you like this system to do? Usually more of a fantasy

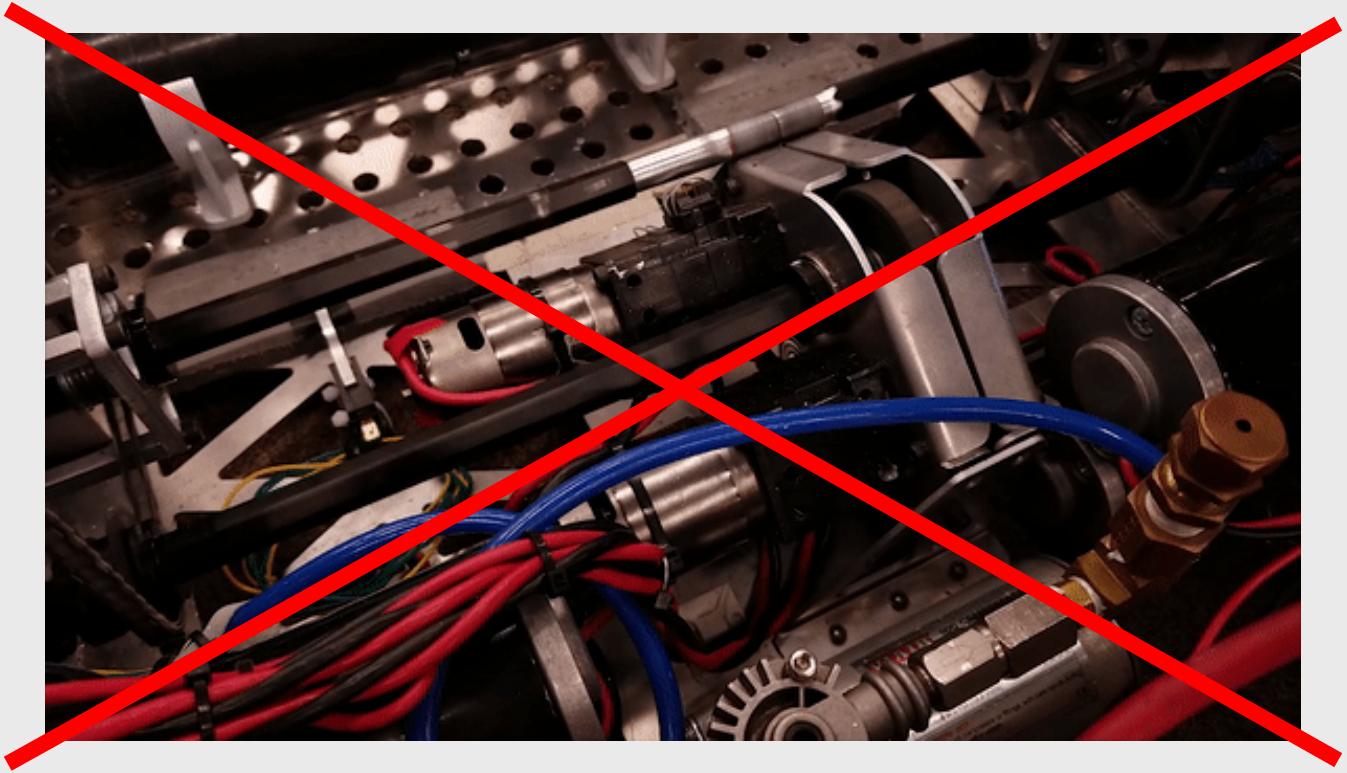
Offset's Intake Goals

- **Need:** Have the cube enter the robot in a predictable way every single time.
- **Want:** Intake the cube sub 1 sec from the time any spinning component comes into contact with the cube. Also have the ability to reverse the intake to spit the cube back out.
- **Wish:** Intake sideways (11") cubes

DESIGN A ROBOT THAT WANTS TO BE ITTERATED

Modularity is the degree to which a system's components may be separated and recombined, often with the benefit of flexibility and variety in use.

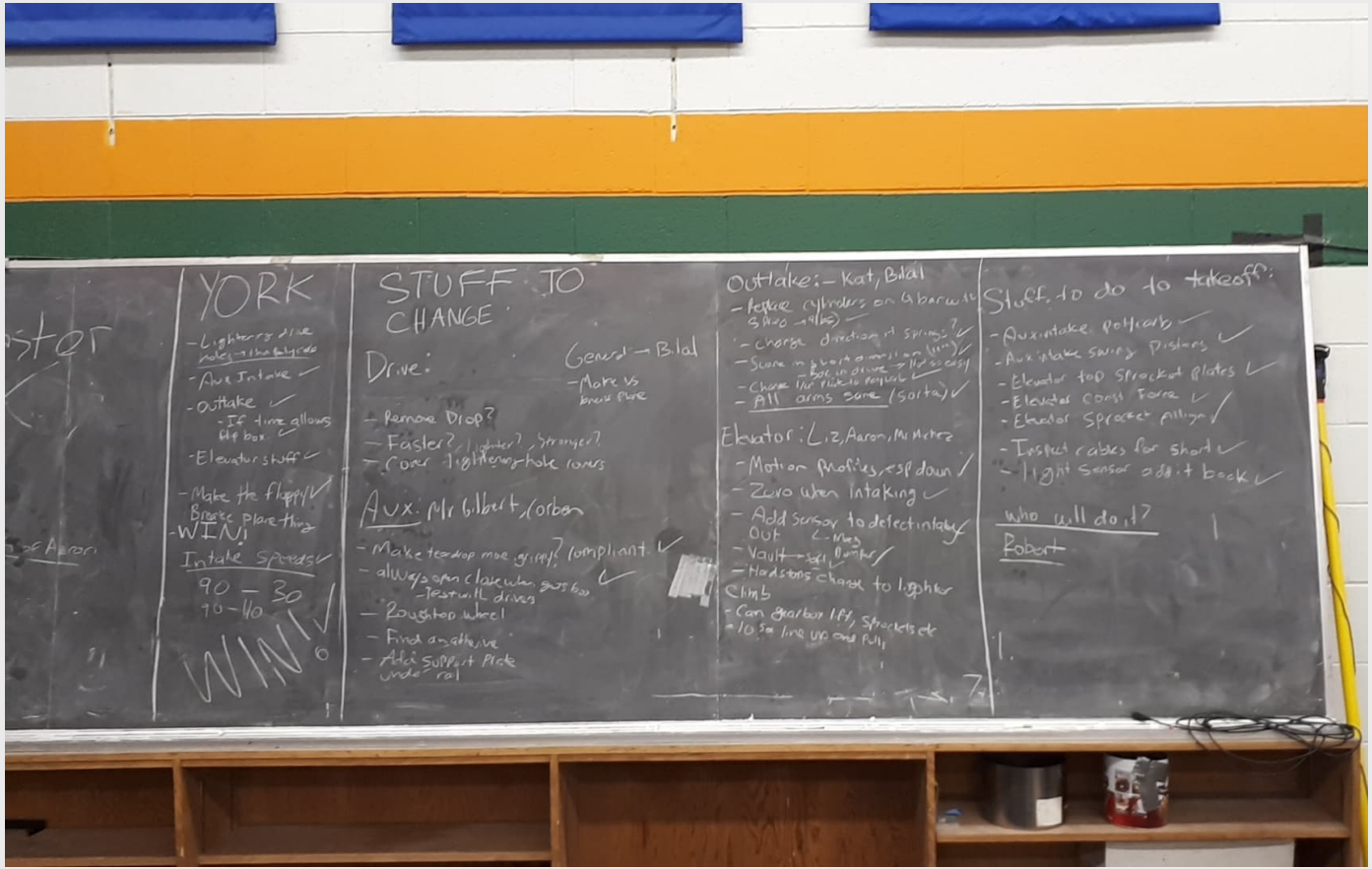




ALWAYS PUT A PNUEMATIC SYSTEM ON THE ROBOT

Robot Development Meeting

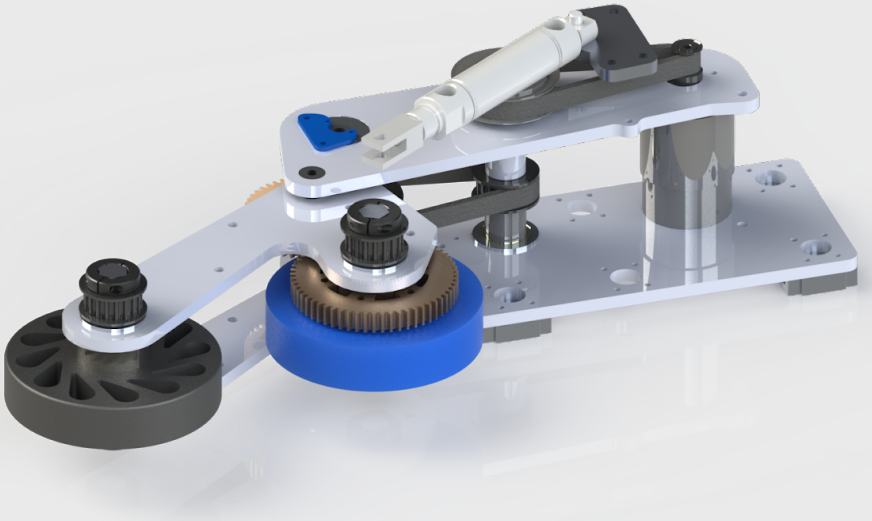
- Revisit Need's, Wants, Wish's
- Evaluate how well each mechanism achieves its needs, wants and wishes
- List any problem's that occurred at the event
- Fix it all!

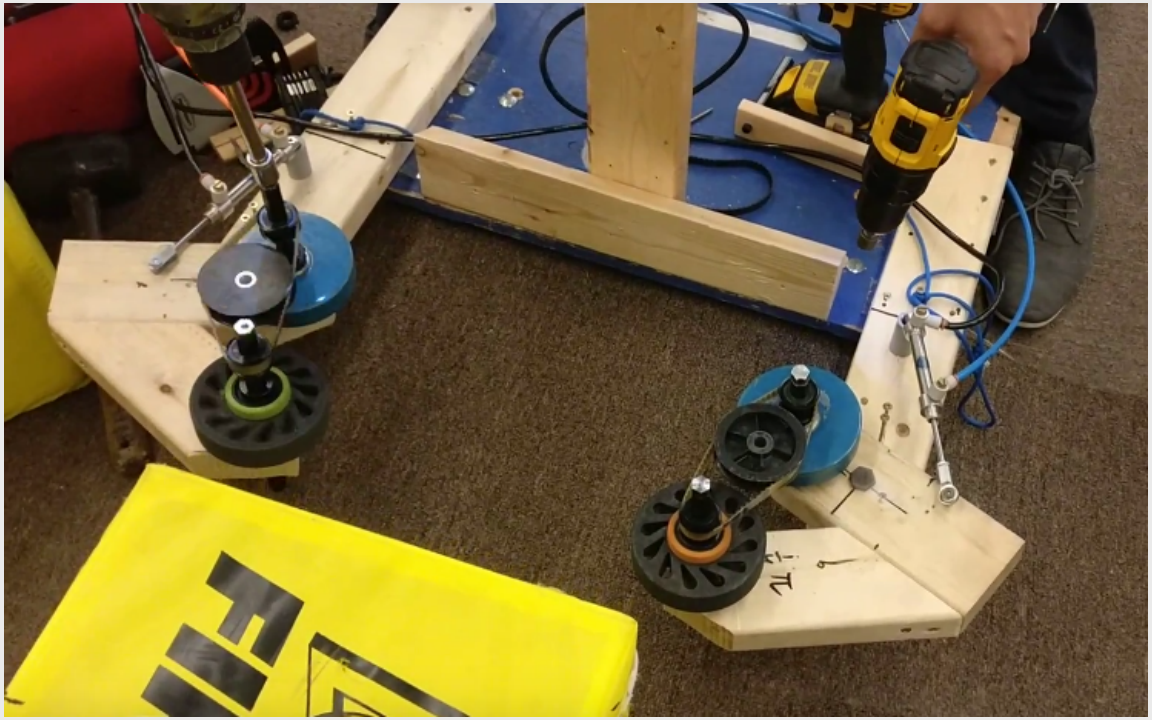

YORK
- Lighter arm drive motor → the beefy one
- Aux Intake
- Outtake
- If time allows Hit box
- Elevator stuff
- Make the floppy Brake plate thing
-WIN!
Intake Speeds
90 - 30
90 - 40
WIN!
STUFF TO CHANGE
Drive:
- Remove Drop?
- Faster? Lighter? Stronger?
- Cover lightening hole covers
Aux: Mr Gilbert, Corban
- Make teardrop more grippy? Compliant
- always open claw when goes back - Test with drivers
- Roughted wheel
- Find an adhesive
- Add support Plate under rail
General → Bilal
-Make us brave plate
Outtake: - Kat, Bilal
- Replace cylinders on 4 bar with spring rollers
- change direction of springs?
- Score in auto and maintain (wire) back in driver → Try to easy
- Change Tin Flute to regular
- All arms same (sorta)
Elevator: Liz, Aaron, Mr Mertz
- Motion Profiles, esp down
- Zero when intaking
- Add sensor to detect intake Out
- Vault - soft bumper
- Hardstops closer to lighter
Climb
- Can gearbox lift, sprockets ok
- 10 so line up and pull
Stuff to do to takeoff:
- Aux intake pot/arb
- Aux intake swing Pistons
- Elevator top Sprocket Plates
- Elevator cross bars
- Elevator Sprocket alignment
- Inspect cables for short
- Light sensor add it back
Who will do it?
Robert

Should I start over?

- Is the issue fundamental?
- Have you seen or thought of a cool idea for a mechanism?

ALWAYS TEST AN IDEA, JUST BECAUSE 1114 DID IT DOESN'T MEAN IT WILL WORK FOR YOU





Testing

- This is what makes or breaks your robot!
- Evaluate issues with your system
- Develop a solution
- Implement the solution
- TEST
- **REPEAT**

A bias is prejudice in favor of or against one thing, person, or group compared with another, usually in a way considered to be unfair.

Combating Bias

- Test a system with multiple people present
- If you ”hate” a system maybe sit testing it out
- Take quantitative data
- Largest data set possible

So, your intake achieves the need. You make a change hoping to achieve a want. Is it important to test the need again?

ABSOLUETLY!

2018 Intake Tests

- Timing how long it takes to intake a cube from the moment it is touching a wheel.
- Using a set of 20 cubes, send them into the intake in changing the angle of orientation 10 degrees every time and see how many jam?
- Repeat above test, but with cubes on different sides ie) 11”, 13”

RAMBLINGS ABOUT OFFSET

“If our journey through the season didn’t demonstrate life has its up’s and downs I don’t know what will. We really showed as long as you always bounce back, strive for success and believe in your abilities anything is possible.”

https://bit.ly/2IpdBgc

QUESTIONS?

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