Robot Design Executive Summary (RDES) Template

The purpose of the ***Robot Design Executive Summary (RDES)*** is to give the *Robot Design Judges* a quick overview of your team's robot and all it can do. This ***RDES Template*** may be used to help collect information about your team's robot and program(s) as described in the official *FIRST*® LEGO® League Challenge Guide. Teams are welcome to add content above and beyond this template.

Team #	47493	Team Name	Justice Equality Fantoms

Robot Facts

	Number of Sensors:	4
	Number of Motors:	3
	Number of Attachments:	2
	Typical Score: 265	Maximum Score: 305

Robot Name: J.E.F.

How many times have you modified your robot throughout the season? Explain the engineering process.	One major modification to upgrade to larger wheels for speed and accuracy and add a frame for wall squaring and wheel axel stability. We later added the gyro.
What is your most innovative robot feature? Explain how it operates.	Our "RotCalc" MyBlock allows us to stop guessing how many rotations it takes to move to a location on the game mat and just use a ruler and measure it. It uses a multiplication equation with Pi and a division equation to calculate rotations for distances.
How many robot programs did your team create? How many of those programs do they use? How have they changed over the duration of the season?	We wrote 8 or more programs. We are using 6. MyBlocks for calculating distance and turning angles have made programming much faster than trial and error and aiming the robot.
Which mission did your team complete most consistently?	The crane

Robot Design Executive Summary (RDES) Handout

Design Details	
Fun: Describe the most fun or interesting part of robot design as well as the most challenging parts. If your team has a fun story about your robot please feel free to share.	Getting latter programs to basically work on the first time. Programming and running programs is fun! It says "Thank You" when it gets home.
Strategy: Explain your team's strategy and reasoning for choosing and accomplishing missions. Talk a little bit about how successful the robot was in completing the missions that were chosen.	We wear to our practice event with no points, wrote a design and build program there and scored 140 points! Now we are almost maxing our Design and build for 250 points. We also did Innovative Architecture since it was the same basic approach and the basic crane. We are successful 4 out of 5 times on most runs.
Design Process: Describe how your team designed their robot and what process they used to make improvements to the design over time. Briefly share how different team members contributed to the design.	We started with a basic robot and upgraded the wheels, added a frame and gyro.
Mechanical Design: Explain the robot's basic structure, how the robot moves (drivetrain), what attachments and mechanisms it uses to operate or complete missions, and how your team makes sure it is easy to add/ remove attachments.	Basic robot with upgraded wheels and frame. Two wheel tank style drive. Arm on a motor for lowering the crane. Two pushing attachments for moving blocks. They are attached using big pins so they are easier to grab.
Programming: Describe how your team programmed the robot to ensure consistent results. Explain how the team organized and documented programs. Mention if the programs use sensors to know the location of the robot on the field.	We use a MyBlock to calculate wheel rotations and two more MyBlocks to do Gyro turns. We numbered our program names so they are easily to find on the robot. We use a touch sensor to launch the program.
Innovation: Describe any features of the robot's design that the team feels are special or clever.	MyBlocks to simplify moving around the table.

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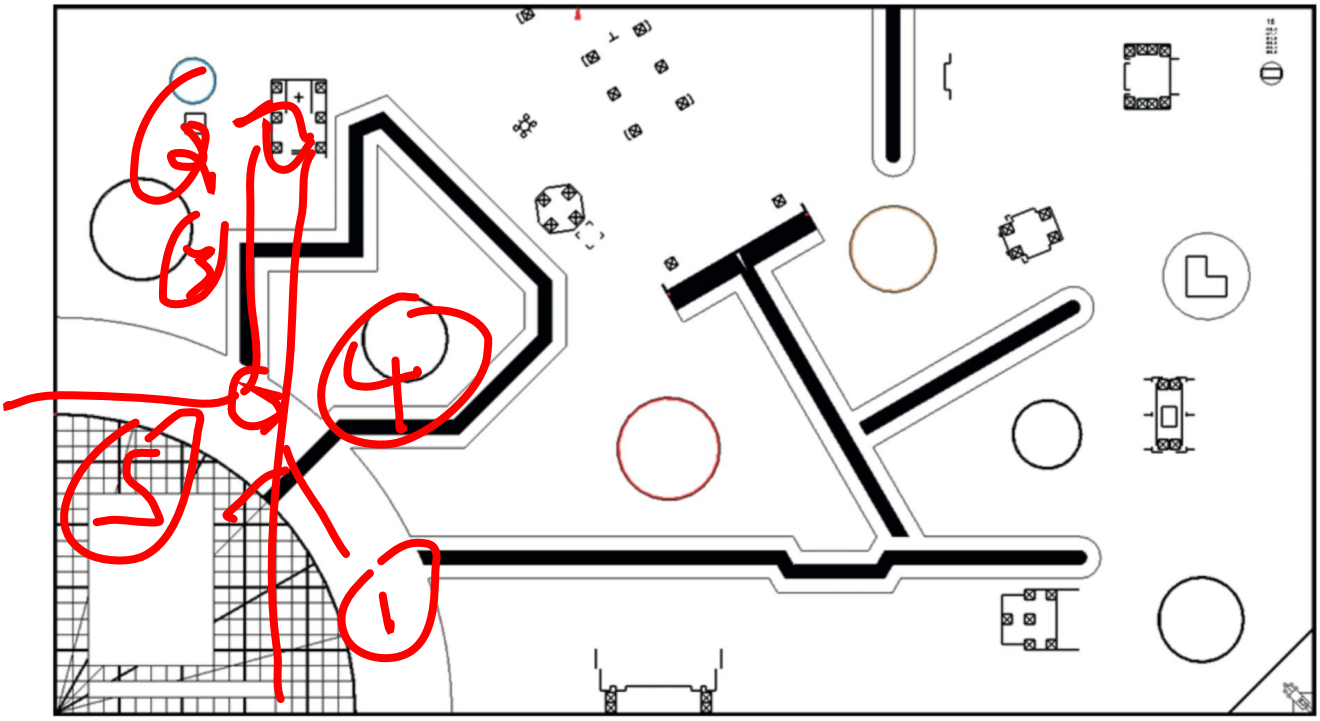
Show off your most consistent or best performing run:	
Program Name	*Describe what your robot does during this run.* 2-Crane

Robot Path Diagram

Sketch the path the robot takes as it executes the program. Each time the robot stops or takes an action, use the diagram to show what the robot is doing. *(Hint to teams: use different colors to signify individual runs or programs used.)*



Program Description

Explain your Path Diagram by showing your code, pseudocode (written outline), flow chart, or some other way. Assume the Judges have never seen the language you're using to code. How can you help them understand how your program works? (Use the back or additional pages if needed.)

1. Drive forward to the swing
2. Raise arm to lower crane
3. Back up
4. Rotate 90 degrees
5. Back up to home

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Program Summary What can your robot do? List programs you plan to use during your tournament. Duplicate and/or attach additional pages as needed.	
Program Name What is this program named in your robot?	2-Crane
Mission Accomplished *(i.e. Mission 4, Design for wildlife)*	Crane
Robot Action Forward / Turn / Lower attachment / etc. You may include a more detailed outline and/or path diagram on a separate sheet. *(i.e. Drive forward. Lower arm to release Big Water. Reverse back to base.)*	See last page
Attachments Used Do you add anything to your robot while running this program? *(i.e. Arm)*	Arm on medium motor
Program Structure (Architecture) List the types of programming commands used <actions (start motor, read sensor, etc.), loops, do until, switches (if-then), subroutines (MyBlocks), parallel programs, etc.> *(i.e. Forward in Rotations)*	Wait for touch sensor, lower arm on medium motor, "RotCalc" 23.5" w/steer drive speed 30, raise arm for .5 sec, wait .5 sec, lower arm for .5 sec, "RotCalc" -12" w/ steer drive speed 50, "TurnRight" 90deg Speed 20, "RotCalc" -18" w/ steer drive Speed 100, "Thank You"
Mechanical and/or Sensor Feedback Used Does your robot make decisions based on input from a sensor or mechanical feature? If yes, explain how the input is used.	Gyro is used to turn to needed angles. The frame is used it square the robot to the wall for launching. Wheel rotation sensors are used to figure out distances. Time is used to run the arm motor so it dose not have to complete a number of rotations and not be able to do it.