

Technical Design

Overview

Getting to see how the robots work





FLL Overview: Technical Design

The Technical Design session allows teams to show off all aspects of their robot

Teams get to choose how things run, but usually include:

- **Demonstration:** Run select missions for the judges
- **Information:** Show code, display documentation, describe the development process etc
- **Questions:** The judges will ask for more information

2 x Coaches are welcome to observe, but they cannot speak, help, or participate in **ANY** way.



FLL Overview: TD Rubric

The TD Rubric outlines what Judges expect:

Categories: Mechanical Design, Programming, Innovation

Ratings: Beginning to Exemplary (or ND)

Beginning

Developing

Accomplished

Exemplary

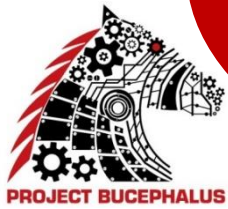
Comments: Personal responses from the judges!



FLL Overview: TD Rubric

Part 1: Mechanical Design

		Beginning	Developing	Accomplished	Exemplary
Mechanical Design	Durability	Evidence of structural integrity; ability to withstand rigors of competition			
	N	quite fragile; breaks a lot	frequent or significant faults/repairs	rare faults/repairs	sound construction; no repairs
	D				
	Mechanical Efficiency	Economic use of parts and time; easy to repair and modify			
	N	excessive parts or time to repair/modify	inefficient parts or time to repair/modify	appropriate use of parts and time to repair/modify	streamlined use of parts and time to repair/modify
	D				
	Mechanization	Ability of robot mechanisms to move or act with appropriate speed, strength and accuracy for intended tasks (propulsion and execution)			
N	imbalance of speed, strength and accuracy on most tasks	imbalance of speed, strength and accuracy on some tasks	appropriate balance of speed, strength and accuracy on most tasks	appropriate balance of speed, strength and accuracy on every task	
D					



FLL Overview: TD Rubric

Part 2: Programming

Beginning

Developing

Accomplished

Exemplary

Programming	Programming Quality		Programs are appropriate for the intended purpose and would achieve consistent results, assuming no mechanical faults	
	N	would not achieve purpose	would not achieve purpose	should achieve purpose repeatedly
	D	AND would be inconsistent	OR would be inconsistent	should achieve purpose every time
	Programming Efficiency		Programs are modular, streamlined, and understandable	
	N	excessive code and difficult to understand	inefficient code and challenge to understand	appropriate code and easy to understand
	D			streamlined code and easy for anyone to understand
Automation/Navigation		Ability of the robot to move or act as intended using mechanical and/or sensor feedback (with minimal reliance on driver intervention and/or program timing)		
N	frequent driver intervention to aim AND retrieve robot	frequent driver intervention to aim OR retrieve robot	robot moves/acts as intended repeatedly w/ occasional driver intervention	robot moves/acts as intended every time with no driver intervention
D				



FLL Overview: TD Rubric

Part 3: Strategy and Innovation

Beginning

Developing

Accomplished

Exemplary

Strategy & Innovation	Design Process		Ability to develop and explain improvement cycles where alternatives are considered and narrowed, selections tested, designs improved (applies to programming as well as mechanical design)			
	N	organization AND explanation	organization OR explanation	systematic and well-	systematic, well-explained	
	D	need improvement	need improvement	explained	and well-documented	
	Mission Strategy		Ability to clearly define and describe the team's game strategy			
	N	no clear goals AND no	no clear goals OR no clear	clear strategy to accomplish	clear strategy to accomplish	
	D	clear strategy	strategy	the team's well defined goals	most/all game missions	
	Innovation		Creation of new, unique, or unexpected feature(s) (e.g. designs, programs, strategies or applications) that are beneficial in performing the specified tasks			
	N	original feature(s) with no	original feature(s) with some	original feature(s) with the potential	original feature(s) that add	
	D	added value or potential	added value or potential	to add significant value	significant value	



PROJECT BUCEPHALUS

Technical Design

RDES

Robot Design Executive Summary

(See Challenge Guide)





FLL Overview: Technical Design

The RDES is a template to help teams explain the robot to Judges.

It is **NOT** a requirement for Australian Competition

However, the RDES is a very useful tool for getting teams through the Technical Design Session.

All teams have to do is read from a piece of paper. There is no need to memorise anything, or put on any kind of show!

Note: There is a limit of 4 minutes



FLL Overview: Technical Design

RDES Outline:

- **Robot Facts**
- **Design (Fun)**
- **Design (Strategy)**
- **Design (Process)**
- **Design (Mechanical)**
- **Design (Programming)**
- **Design (Innovation)**
- **Trial Run**

Important: There is no need to run every mission. Choose the ones that are favourite/reliable/impressive!



PROJECT BUCEPHALUS