FRC Strategy & Scouting
Hello!

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What and Why

**FRC Strategy:** How you play the game

*Starts* with game analysis right after kickoff & *ends* with your final match

**Biggest determining factor for success** (along with robot design)

Give you a clear objective for build
Always start with the Rule Book!!

- Keep the game analysis team relatively exclusive

- Figure out all the ways to score points and all the ways to prevent points

- Go through as many what-if scenarios with potential robots that could exist using the Ri3D robots for this is useful

- Think about overall strategies for the game eg. death cycles during 2014
Game-Breaking Strategies

- **What:**
  - Tasks in a game that ensure victory for the team that does them (2002, Team 71)
- **Going to be obscure and difficult to perform**
  - If a game breaking strategy exists at all
- **Use the rule book to your advantage**
  - Look for obscure rules
- **Another benefit:**
  - Gives you a very good understanding of the rules and how the game will be played
FRC Playbook

- Different plays for different scenarios
  - High Risk High Reward, Safe and low potential, etc.
- Created before the competition
  - Edited and updated after watching events and especially the powerhouse teams and their gameplay
- Show to alliance partners when discussing pre-match strategy
  - Use along with Strategy Pad to explain ideas
Cost-Benefit Analysis

You should ALWAYS include this in your game analysis.

Estimate how many points you can get for a certain task and how much time it will take.
Example:

For 2014 Aerial Assist...

3 Robot Cycles + High Goal (70% Accuracy) = 40 Points in 60 seconds

1 Robot Cycles + Truss + High Goal (70% Accuracy) = 20 points in 45 seconds

Use your CBA to determine which in-game tasks your robot will be built to do
Next Steps

- Prioritize the tasks in the game
  - Design your robot to do as many of them as is feasible
- Remember your alliance partners can also do tasks
  - However, be careful relying on them
- The amount you try to accomplish on your own depends on your team’s resources, experience, etc.
Karthik’s Golden Rules

1. Always build within your team’s limits
2. If a team has 30 units of robot, and functions have maximum of 10 units, better to have three functions at 10/10 instead of five at 6/10
- Get a clipboard
- Get dry erase markers
- Tape a laminated picture of the game field to the clipboard
  - Really useful for communicating with alliance partners before the match
1. Your strategy team should always look to discuss with alli- 
   nance partners before your match 
   a. Figure out robot roles and tactics 

2. Use scouting notes to learn about not only your opponents, 
   also your partners 
   a. An all too common situation: Team A wants to shoot in the 
      high goal, but your data says they shoot at 30%. Don’t. Let. Them. Shoot. Find 
      out a compromise that maximizes points. 

3. Have a couple backup plans for when your partners inevitably 
   fail
Drive Team Roles
Driver:
- Focus on your robot and execute the pre-match strategy
- Often controls the drivetrain as well as primary manipulators i.e. intake mechanisms
- Good qualities include...

Operator:
- Focus on your robot and execute the pre-match strategy
- Control secondary manipulators i.e. catapults, flywheels, etc.
- Good qualities include...
Human Player:

○ Get game pieces to the robot as efficiently as possible
○ Listens to Drive Coach for changes in strategy
○ Good qualities include..

Drive Coach:

○ Focuses on the whole field, maintains strategy, communicates with other drive teams
○ A good Drive Coach can lead a bad robot to be an Alliance Captain
○ Good qualities include...
Hello!
What is Scouting?

- The evaluation of the abilities of an FRC team and its robot = **BIG ADVANTAGE**
- “We don’t have a good enough robot, so we won’t need to scout” .... **False**
- Use for alliance selection AND match strategy
1. Pit Scouting
The least useful form of scouting
  ○ BUT great for new scouts and getting more people involved

Involves going to teams’ pits and asking them about their robots

Use pit scouting to learn things that you can’t see from the stands:
  ○ Drivetrain, motors & mechanisms, other unique features, autonomous plans

Don’t ask “How many points can you score?”
2. Match Scouting
- **Occurs in the stands** and involves team members watching and recording what happens during the match.
- **Use this to figure out how many points a robot contributes and the following:**
  - What role in your strategy do they fill
  - Do they play defense or offense
- **Works best when you have one scout per robot on the field**
- **Have scouts primarily focus on quantitative information** while making subjective notes about unique accomplishments during the match.
  - *Eg: a robot can shoot a ball abnormally far*
Other Forms of Scouting

- **Online Scouting**
  - If attending a late event, check in on the early events and scout them online
- **Many good systems available**
  - Team 2052 KnightKrawler = scouting app
Scouting Binder

- The center for all scouting info
- One page per robot per match
  - Each scout fills out the page during the match and hands the sheet to the lead scout to put in the binder
  - End result is a binder that documents the result for every robot for every match
- For each team:
  - Info from pit & match scouting
  - Summary page for each team

Analyze on Thursday and Friday
Scouting doesn’t mean anything if you don’t use the information

1. Figure out who to play defense on for your upcoming matches and how

2. Use what you know about the opposing alliance to determine your match strategy

3. Make pick lists based on what you know about each of the teams: Break teams down by what roles in your strategy they fill and rank them
Use of OPR

- **OPR**: Offensive Production Rating

- Gives an idea of a team’s individual contribution to a match
  - *Works better for some years (2015) than others (2012)*

- **SHOULD NOT** be used as the main determining factor for picking teams
In-match Strategies

- Completely dependent on the game
  - 2015 was not strategy-intensive, 2012-2014 had incredible and in-depth match strategy
- Defense heavy? Pure Offense? So many options!!!
- Strategies need to be flexible to work
- Leave everything on the field - go 100% for every match to win
  - Don’t play scared and try to avoid damage
Alliance Selections
If in a picking position...

- Discuss with the teams above you and try to figure out who is picking whom
- Talk to desirable teams below you about possibly teaming up
- Try to figure out who you will be with, and discuss 2nd pick robots with them
If NOT in a picking position...

- Have team members talk to all the top teams and sell your robot
- Make personal connections with some of the top teams
  - Possibly a team that you had a match with
- Serpentine order (1-8, 8-1)
- Different strategies for different picking positions
- Factor in how well you work with certain teams
  - Are they calm, cool, and collected?
  - Will they follow your strategy?
  - If they break down, will they be able to recover?
- Saying “No” is sometimes a good strategy
- Make sure your Alliance Captain has an incredible knowledge of all the teams in the Regional
  - Should never, ever call out a team number that isn’t attending the event
Resources:

Thank You!

Any questions?