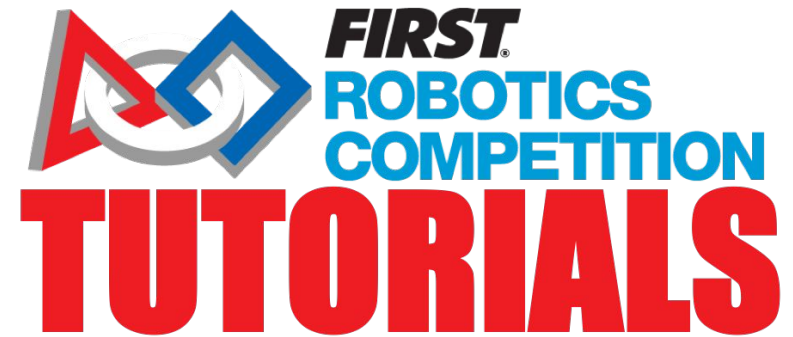# Scouting

TEAM 4150

Overview

- Why We Scout
- The Early Season
- Qualifications
- Playoffs
- After Competitions

There are more resources for Scouting than presented here; this is more an overview of the **important components** of a good scouting methodology than a comprehensive list of all the ways to accomplish those components.

Why Scout?

No one really thinks of collecting scores and so on as an essential part of FRC, BUT:

Scouting performs a few important functions:

- Provides context going into competitions and specific matches
- Builds familiarity with other teams, especially at home regionals
- Facilitates better match strategy
- Crucial for alliance selection
- Engages underclassmen/non-leadership team members in the season

Why Scout? (cont.)

To elaborate:

- Provides Context
  - "Prescouting" provides useful information going into competitions - who to look out for, probable meta-games, how the season is progressing
- Builds familiarity
  - Certain teams/bots stand out; achievements or events at a competition can be a conversation starter; good for new **members** in general to understand their region, and for a **team** that's new or attending a "foreign" regional.
- Facilitates better match strategy
  - Knowing what strategies are most effective, what the other alliance's strengths and weaknesses are, and what **your** alliance's strengths and weaknesses are are all beneficial in crafting a strategy for each match.

Why Scout? (cont.)

- Alliance Selection
  - Knowing who is "good" or highly-ranked but not *how* they're good or *why* they're highly-ranked is not useful. It's better to have a drawing than a sketch.
- Engages team members
  - Especially for large teams, it can be hard for underclassmen or team members without notable positions to feel engaged in the team's work at competitions - spectating is only so interesting and it's not advantageous - or even legal in some circumstances - to have a ton of people in the pit. Scouting allows team members who are not heavily involved in the process to be engaged and help the team.

Winning is not everything, but...

The above benefits of scouting have benefits that go beyond winning - bonding with regional teams, making connections, engaging underclassmen.

And an army marches on its stomach - performing well at competitions improves team morale, aids in fundraising, helps improve standing in the community, and can unlock doors to playoffs, invitational competitions, and even Worlds...

The Early Season

- Off-season competitions are **opportunities** to **train** new members in how to scout and get **experience** for leads.
    - Don't ignore it for the offseason just because it's not consequential.
- Scouting should begin **right from the start.**
    - Treat your scouts like part of **the drive team** - Leads/Head Scouts and members who potentially will be scouting should be involved in crafting strategy and analyzing the manual/rulebook (or should be observing this process).
    - Pay attention to community sites like **Chief Delphi** and team websites **-** there are useful discussions about strategy, as well as reveals later in the season and discussion about how the bots themselves are shaping up.
    - As the team's strategy shapes up, scouts - include your observers as well as your leads/Head Scout - need to think about what data they need for competitions.

The Early Season (cont.)

- **What** you're collecting depends on **how** you're collecting it.
  - There are a few methods to collect Scouting data.
    - Previously, our team (4150) used paper forms. Scouts write down answers/numbers in certain categories, and someone - presumably the Head Scout - enters this into a spreadsheet. Or, the forms are organized by team and are analyzed individually.
    - In the 2019 season and 2020 offseason, we changed methodologies and, inspired by and together with 2656, used a Google Form that fed into a Google Sheets.
      - This is simple: create the Form, then go to "Responses". Click the Sheets icon at the top-right corner to create a Sheet that compiles the responses.
    - Some teams use programs/apps specifically designed to collect Scouting data.
  - **The Blue Alliance** is a useful way to research teams before a competition and grab data if it cannot be collected more thoroughly.

The Early Season - *Forms*

- Each method has individual reasons for use or disuse, and can be mixed. But have a plan.
  - **Paper collection** is much more **inefficient,** and can add work to the lead scout, as well as create waste; requires more physical resource management. **It is more reliable,** though, as it can obviously be done without an Internet connection.
  - **Google Forms** is much easier to fill out, and requires no input from the Head/Lead, but requires **that students are permitted to use data** (as most venues frown on the use of Wi-Fi or hotspots, and not all parents will permit this) and that that **connection is stable.** In some cases, it simply will not be; large, cramped venues like the stands at **Worlds** or in small venues will make this approach unfeasible.
  - **Applications** may be more effective, but require personal engineering or connections to another team. (I am not familiar with this area).

The Early Season - *Forms*

The method you use should take into account **your number of scouts,** the **number of teams** and **length of competitions attended,** and **the environment.**

- Forms should generally emphasize **brevity** - it should be something that can be done **while the scouts are watching the match** to preserve accuracy, and something that the Lead can analyze relatively quickly.
- What **don't you need** and **what can you abstract?**
    - Don't focus on minutiae - you don't necessarily need the timestamp for when a point was scored, for example.
    - What can be described simply or generally? "Fast" might be all you need to say, instead of "26.7891 mph".
- How much **specificity** do you want?
    - Do you want specific numbers of observations?
        - I would generally recommend both - a notes section to allow scouts to draw their own conclusions and express their feelings, (within reason...)
- How **much ground** do your scouts have to cover?
    - Can you go one-to-a-robot, or do they have to watch more generally?
    - Use **scouting alliances** - partner with friendly teams to compile data. This allows for more collection, ensures reliability of data, and allows you to rotate scouts.
        - The raw numbers can be shared without trouble, but if this option is followed, it should go without saying that comments about your teammates and playoff lists should be kept polite and private.

The Early Season - *Who's on First?*

- Before the season begins, delineate who is doing what and make sure that everyone is qualified for that job.
  - The **lead/head scout** should have the same **rule proficiency** as a coach or other member of the Drive team. They should generally be responsible for communicating with the Drive team.
    - I would generally recommend that the Head Scout should probably not be a member of the o**n-field Drive Team**; this complicates things and puts them out of commission for **much of the time** spent in queue.
  - A second/assistant Scouting Lead/Head Scout is recommended, to aid in communicating with drivers or scouts or taking care of administrative tasks.
  - Try and pick out and **engage scouts**.
    - Don't make it a shovelware task. Try and pick underclassmen who have an interest in the job and engage them in it - they'll do better work.
    - If you can't engage everyone, have a plan to make sure the data gets collected anyway. If it comes to it, make sure you know who might be problematic in doing the job…
  - **Train everyone attending on your form** prior to a competition, and try and make sure everyone is familiar with the rules.
  - Encourage **team members not attending** to follow the competition - raises engagement, and if the form is virtual, can help in compiling.

Useful Pre-Competition Resources

- **Chief Delphi -** mentioned above. A FIRST forum.
- Team websites.
- **The Blue Alliance -** contains information on all FIRST teams, competitions, teams *attending* those competitions, etc. Highly informative.
- Other resources: some regions have a more defined FIRST culture than others, and there are some useful resources around if you look. **RoboZone Podcast** is produced out of Michigan, a FIRST hotspot, and posts frequent analyses of competitions played that week.
- **r/FRC** - more for memes than substantive discussion, but useful for keeping up with competitions.

Qualifications

As a general rule, **practice matches** take up Thursday, **qualifications** go Friday into early **Saturday,** and playoffs are the **afternoon of Saturday.** There tend to be about 90 qualification matches.

- Due to recent developments, this may change - the adapted plan for Finger Lakes Regional in 2020 involved **no practice matches,** and an **abbreviated schedule** to finish the competition by the end of Friday - depending on how the pandemic continues, something similar may be implemented for regionals in 2021.
- **Practice matches** are good opportunities to practice scouting, but there's rarely substantial gameplay during this period - mostly, it's teams feeling their way around the field and fixing technical issues.

Qualifications (cont.)

Generally, the most effective way to scout matches is **one scout per bot per match.**

- It's best to assign one scout to a slot in the Driver's station - **one person is Red One**, the next Red Two, a few people down is Blue Two, and so on.
    - This is more easily managed with additional scouts from another team.
- It is best to **rotate scouts** if possible.
    - Watching matches for ~8 hours a day is exhausting for anyone, and as time goes on your scouts may be less invested.
    - I have heard some suggest providing snacks/seat cushions/things of that nature to scouts - these things are nice touches, but make sure not to be condescending.
- Everyone should **take a turn at scouting**, regardless of seniority.
    - As mentioned previously, "dedicated scouts" are preferred, but rarely generally available. Scouting **should not** just be a duty for freshmen - it is important, and should not be wielded as punishment. Prevent team members from disparaging it to the degree that you are able.
        - Exceptions should obviously made for those who cannot scout as they have other obligations.
        - I would also recommend that the **Head Scout(s) should not actually be collecting data** - they should spend that time compiling it, analyzing it, and crafting strategy/communicating with drivers.

Playoffs

Generally, alliance selection goes as such; the specific rules are explained in the section "Playoff Matches" **here** (this should be in every game manual).

- The **top eight** ranked teams are alliance captains. Each team invites one team to join them, from team 1 down to team 8, and then a second, with 8 getting first dibs down back to 1.
  - The **eight** can pick each other; if this occurs, everyone behind the invited alliance moves up a spot.
  - If you are **invited and decline**, you are **not eligible** to be invited again. Top eight teams that decline can continue to make invites, but **cannot themselves be invited.**
- Obviously, this means that **24 teams** and **8 alliances** compete in playoffs. They play a traditional bracket until a final; in some circumstances, a **round robin** is played instead, but this isn't the norm except at **Worlds**.

Playoffs (cont.)

Prior to the day of playoffs, scouts should create a **pick list** - a numbered order of the teams at the competition to pick in the event your team is an **alliance captain.**

What this consists of is up to you. It is obviously generally good advice to pick teams that are high scorers, but not always - a team with three bots that are all good at the same thing will not get far. Scouts should have this discussion with drivers about what the team wants. Well-roundedness is important.

This list should be **created regardless of whether or not you think you'll be a captain -** if you are picked first of two alliance teammates, you should have an opinion on who the second pick will be. It should be **clearly ordered**, so in the event that 1 is picked already, you move right on to 2 and so on.

Playoffs - Strategizing

If you **don't think** you'll be in a position to **be a captain,** the scouts should inform some representatives - members of the drive team, perhaps - to visit teams that are a.) **likely to be captains** and b.) **able or at all likely to pick you.** Reaching out early is effective - the scouts should be thinking about these teams in conjunction with the drivers. The scouts should not think heavily about whether teams are "too good" to consider you - thinking as such isn't worth much.

Once you are picked, strategizing for playoffs should begin **immediately**. The Head Scout should be a part of this effort, using compiled data from qualifications.

Because of the excitement of playoffs, team members may not initially want to scout. But it is doubly important here, even if done more casually - now you aren't just scouting teams, but **alliances,** figuring out their **group dynamics**, their collective strengths, weaknesses, etc. If you win, you will face other alliances that won.

Playoffs - *Scouting*

Similar to scouting qualifications. A different form may be needed, as playoffs make ranking points (see **Game Strategy)** irrelevant, and so a form should focus more on match points. This is a minor point, however.

If this is a first competition, playoffs can tell you **much about how the game is played** - by "natural selection", you are seeing the best of the game played out before you, what strategies definitively work best. It's important, therefore, to study them.

After Competitions

Look at your data.

What types of bots worked? What didn't? What **combinations** worked? Which didn't? What **teams** are particularly fearsome or notable? Etc., etc.

It's generally a good idea to meet with any **scouting alliance** teams to discuss the competition and how effective your **methodology** was.

The same should be done at the end of the season, regarding how effective your scouting was that year. Adapt!

Credits

- This lesson was written by FRC 4150 in partnership with FRC 8027 for FRCTutorials.com

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