

Sean Light White Scouting Manifesto, 2021 Edition

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Scouting and Strategy Handbook

“Competition for the sake not of destroying one another, but for the sake of bettering and improving both competitors as a result of the competition.” ~

Woodie Flowers 1943-2019

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Chapter I : The Basics

Section I: Defining Scouting and Strategy

If you are reading this, you most likely have a question on your mind. That being “What is scouting?” or “What is strategy?”. We will be answering these questions and many more soon. This

manifesto is going to start off treating it as if you have never heard of these things, but we will go into depth on many other topics even for seasoned veterans later on. But as I said, we will start from the beginning with an analogy. Imagine your favorite major league sport, or if you don't have one, use the NFL as an example. Before a player plays on a team they need to be drafted. Even before that happens, they need to be scouted. Scouting is when you collect data on a person, or team to see if they would fit with your team/players. In FRC it is no different, at a competition you will scout another robotics team to collect data. With this data we will be able to select the right teams for us during an alliance selection (aka a draft). The strategy definition is quite simple, with this data you collect from scouting, you develop strategies for matches, playoffs or not. If you go into a match blind you may find yourself at a disadvantage, which could lose you a match.

Section II: Why Do We Scout?

Scouting and Strategy is as important to the team as any other subteam. I cannot stress this enough, people may feel as if they miss out in the pit. But scouting is in itself a whole different experience. Bad scouting or no scouting can cost teams blue banners. If you don't know your opposition, even your team, you will be put at a huge competitive disadvantage. For example, without good scouting data, 3197 would not have made it to the finals in 2019, or would not have predicted alliance selections in 2020. We can do these things because of the data we collect and upholding this standard is important. Now, that may make scouting sound quite threatening, but in reality it is quite a fun concept. Getting to benefit your team while watching robots is quite a good time, especially seeing your team on the field. You also become your

team's personal cheer squad, you may even lose your voice once or twice.

Section III: A Quick Explanation of Alliance Selections

An alliance is a team of 3 robots competing against another alliance. Fairly simple, it gets more complex once you reach the Alliance Selections. Alliance Selections occur once all qualifying matches are complete, and the top 8 teams are decided. The top 8 teams will pick 2 other teams to join their alliance. This is when scouting data becomes critical in deciding the fate of that competition. It will affect how the competition goes. Making the right picks is entirely based off of the data you collect over the course of 2 days, and if it is inaccurate it can hurt your team significantly.

Chapter II: The Basics Continued

Section I: Tools for Scouting

Without the proper tools, scouting is impossible. Now, there are several methods of collecting data, all of which have their benefits and downsides. For the sake of this handbook, we will use the methods of 3197. Depending on when you are reading this, you are either using a Google Form or the new HexScouter™ Application (if you are from another team, this doesn't apply to you but keep reading). Both of which do virtually the same thing, except the app allows us to collect data much more efficiently. You also will use either Google Sheets and Google Sheets API or Microsoft Excel.

Other teams may use other methods, using things like Tableau or even paper to collect their data. Whatever suits you best will work.

Tools TL;DR:

- A way to collect the data (Google Forms, App, Paper)
- A way to organize the data(Google Sheets, Excel, Tableau)
- A way to visualize the data(If you wish to)

3197 2020 Scouting Form:

Section 2 of 5

Autonomous

Make sure you are only filling out data for Auto here!

How many Power Cells did they shoot? *

0 1 2 3 4 5 6 7 8 9 10

How many Power Cells made it in? *

0 1 2 3 4 5 6 7 8 9 10

Did they make it off of the Initiation line? *

Yes

No

3197 2020 Organized Data Sheet:

Team Number	AVG Power Cells AUTO	AVG Bottom Port Scored	AVG Upper Port Scored	Average Climb %	Score	Can They Climb	Accuracy	Actual Average Attempted
63	2.778	5.000	0.000	0.440	16.000	yes	93.75%	5.3
83	0.000	6.000	0.000	1.000	31.000	no	66.67%	9.0
101	0.000	0.000	0.818	0.000	1.636	yes	36.00%	2.3
111	4.900	0.000	14.400	0.900	51.300	yes	77.84%	18.5
930	5.273	0.000	7.455	0.360	23.909	yes	69.49%	10.7
1625	2.600	0.400	6.200	1.000	37.800	yes	75.86%	8.7
1675	2.455	9.364	0.000	0.550	23.114	yes	90.35%	10.4
1732	2.100	0.000	6.700	0.900	35.900	no	57.26%	11.7
1739	2.273	0.364	0.000	0.000	0.364	no	80.00%	0.5
1756	4.625	0.000	16.875	0.880	55.750	yes	87.66%	19.3
1781	3.000	0.000	3.909	0.550	21.568	yes	70.49%	5.5
2022	1.900	4.500	0.200	0.300	12.400	yes	83.93%	5.6
2039	1.091	0.000	0.818	0.000	1.636	yes	45.00%	1.8
2136	1.444	0.000	0.556	0.000	1.111	no	29.41%	1.9
2151	0.300	1.900	0.000	0.000	1.900	no	32.76%	5.8
2338	3.300	0.000	14.500	1.000	54.000	no	85.29%	17.0
2358	3.500	0.600	6.400	0.700	30.900	yes	54.69%	12.8
2451	4.636	0.000	12.636	0.820	45.773	yes	84.76%	14.9
2725	0.000	0.000	0.000	0.000	0.000	yes	#DIV/0!	0.0
3061	1.800	4.000	0.100	0.700	21.700	no	0.00%	4.6
3067	2.091	2.818	0.000	0.550	16.568	yes	81.58%	3.5
3110	0.000	2.333	0.000	0.000	2.333	yes	84.00%	2.8
3197	2.727	0.909	1.091	0.380	12.591	no	55.00%	3.6
3352	1.875	1.500	0.000	0.130	4.750	yes	92.31%	1.6
3353	3.000	0.000	0.000	0.000	0.000	yes	0.00%	3.0
3410	1.273	0.000	0.273	0.000	0.545	no	37.50%	0.7
3488	2.500	0.100	5.400	0.600	25.900	no	70.51%	7.8
3522	0.000	0.000	0.000	0.000	0.000	yes	#DIV/0!	0.0
3713	0.000	0.000	0.000	0.000	0.000	no	0.00%	0.0
3734	2.111	0.000	0.444	0.110	3.639	no	11.76%	3.8
4046	0.000	0.000	2.000	0.000	4.000	no	40.00%	5.0
4096	3.000	0.000	4.444	0.670	25.639	yes	42.55%	10.4
4191	2.600	0.000	1.900	0.000	3.900	no	65.52%	2.9

Section II: Qualitative vs. Quantitative Data: What is the difference?

Before I teach you how to scout in the next chapter, I have one more basic but important concept to go over. That is the difference between Qualitative and Quantitative data. Qualitative data is, quite simply, data that involves a written response with feedback. Such as collecting data on peoples opinions on a new product. When you say that they had climbed and balanced the shield generator, you are imputing qualitative data. Quantitative data on the other hand is also quite simply, data in numbers. How many balls did they shoot? How many points did they get? What stage did they make it to? These are all questions that require Qualitative data to answer.

Chapter III: Scouting 101

Section I: The Way of the Scout

When scouting you are going to have to do a lot of multi tasking. This will include things like:

- Watching a teams robot
- Watching game pieces
- Watching the score
- Recording Data
- Writing Comments

While this may seem intimidating at first, you will eventually get into the flow of it and it will become natural to you. As long as you are positioned well in the stands and keep focused on the robot you are scouting, you will be fine.

Section II: Accurate and Consistent Data

When scouting, you are gonna make mistakes like with anything. Do not be ashamed or upset you made a mistake. Let someone know, specifically a lead so that they can go into the data and change it to what it is meant to be. This goes into making quality comments. My criteria for quality comments is:

- 2-3 sentences of detailed information
- Make the comment opinionated, but not to the extent you dismiss a team from one bad match
- Accurate description of what actually occurred that match(aka lines up with the results of others comments

As long as these criteria are met we can achieve high quality data. Match data, qualitative or quantitative, should match up with your fellow scouters. If you missed something, ask around! Someone is almost always guaranteed to have caught it. Also make sure to scout the right robot and make sure you entered the right name.

Section III: How to Use Your Form/App

This section should be fairly short as the form and questions will change every season, and be different depending on the team. Simply answer the questions based on what you observe. Here is an example of what a match that is being scouted will look like:

Autonomous

Make sure you are only filling out data for Auto here!

How many Power Cells did they shoot? *

0 1 2 3 4 5 6 7 8 9 10

How many Power Cells made it in? *

0 1 2 3 4 5 6 7 8 9 10

Did they make it off of the Initiation line? *

Yes

No

In what ports were they able to score power cells? *

Bottom Port (2 pts)

Outer Port (4 pts)

Inner Port (6 pts)

Didn't score

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Fairly simple right? Just continue this process until you have completed the form and click the submit button! Your data will be sent to a Sheet (pictured on page 5) to be organized. Make sure any future leads run over how to use the form from that season.

Section IV: Scouting Etiquette

When scouting in the stands, you are representing your team. Obviously it is absolutely ok to have fun and joke around. But also remember there is a fine line between having fun and slacking off/misbehaving. Being extremely loud, running around, and getting in the way of other teams give us a bad image. Remember why you are their first and foremost: To scout. Missing a match is only acceptable if there's someone to fill your place while you are gone. When you are anywhere in the venue please remember to act appropriately.

Section V: Scouting Robots

When it is your scouting shift (traditionally every other 10-20 matches) You will be given a button either in red/blue and with either a 1,2,3. The colors are for the different alliances. Each robot has a place on the field:

1. 1 is the farthest away from you
2. 2 is the bot in the middle of the starting area
3. 3 is the closest to you

Chapter IV: Pit Scouting 101

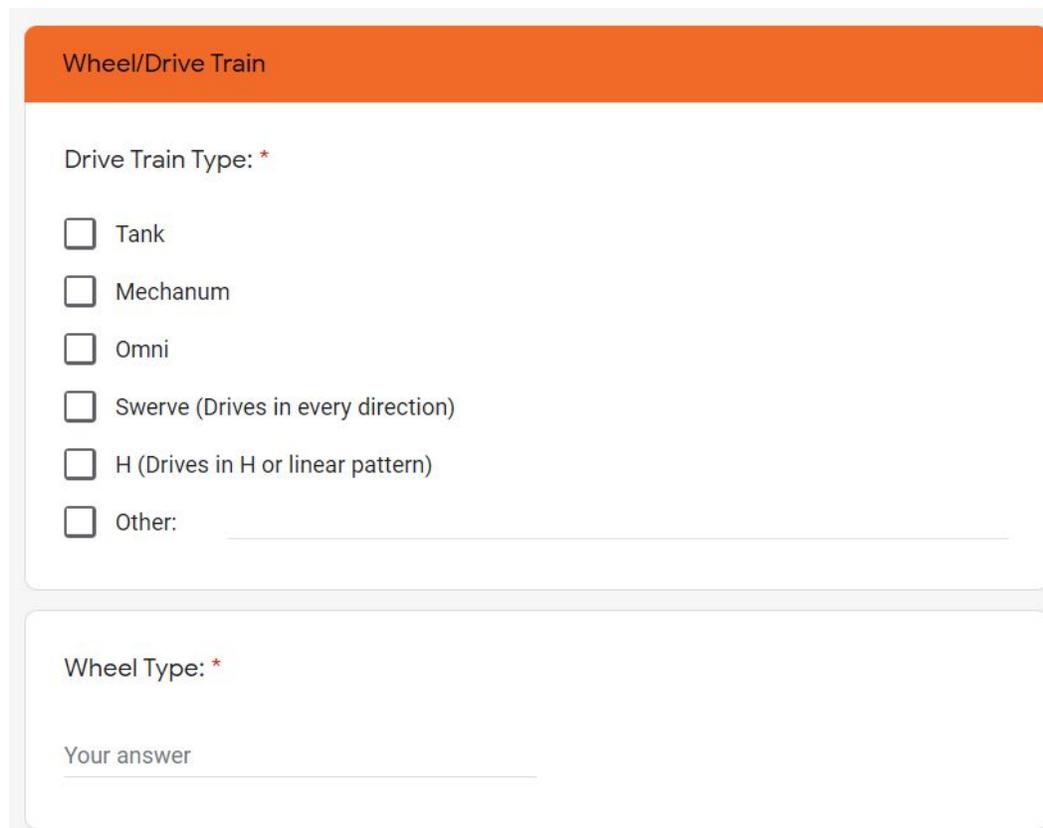
Section I: What Is Pit Scouting?

Pit scouting is something that only occurs on the practice day of a competition. Pit scouting when you go down into the pits and question all the teams at the competition about their robot. This is a good time for you to get to know teams, ask any questions you have, and make a good impression. This allows us to get an idea of a team's robot, what they are capable of, and how they think before the matches even start. This is also a time to have some fun, collect buttons/stickers that teams hand out!

Section II: How to Pit Scout

Similar to normal scouting, we have the form/app to input data then send it to a sheet.

Example of a Pit Scouting Form:



The image shows a digital form titled "Wheel/Drive Train" with an orange header. The form is divided into two sections. The first section, "Drive Train Type: *", contains a list of radio button options: Tank, Mechanum, Omni, Swerve (Drives in every direction), H (Drives in H or linear pattern), and Other: followed by a text input field. The second section, "Wheel Type: *", contains a text input field labeled "Your answer".

These questions will be mostly qualitative aka short answers. Make sure that questions are answered. Also ask the teams questions that

aren't on the form, things you may be curious about, or make a joke about something. Everyone is there in the image of Gracious Professionalism and wants to be friendly with you. Don't be a robot, be enthused and be nice. Finally, take a picture of the robot. Even if the data we collect is not used nearly as much as stand scouting, having a picture gives a good idea of the bots capabilities.

Chapter V: Friday Nights and Alliance Selections

Section I: Friday Nights and Pick Lists

Friday nights are one of the most intense nights of a competition, especially if your team is in a picking position at the time. This is when your data is going to become critical to the team's success. The team will sit together and analyze all of the collected data for a few hours over dinner. You will check TBA(The Blue Alliance) to fact check info and see rankings. After going through all the organized data you will create a pick list with all the teams at the competition, with some more arbitrary/basic lists beforehand of a team's capabilities. Here is 3197's pick list from Midwest 2020:

Team Number	AUTO AVG Power Cells Attempted	AVG Bottom Port Scored	AVG Upper Port Scored	Average Climb %	Actual Average Attempted Score with 2 pt	Accuracy	Pick #	Rank
8096	1.714	1.286	0.000	14%	3.1	6.800	60.00%	rank 38
5125	1.714	1.714	0.000	14%	2.8	12.100	80.00%	rank 22
3352	2.400	0.400	0.000	20%	1.6	4.750	100.00%	rank 28
4292	2.000	0.000	1.286	29%	2.9	7.400	45.00%	rank 54 (lowest)
3067	1.571	2.714	0.000	29%	3.5	16.568	73.08%	rank 48
3197	3.250	1.250	1.125	30%	3.6	12.591	59.38%	rank 47
4702	0.000	1.714	0.429	43%	2.9	9.600	71.43%	rank 11
2022	1.875	5.250	0.250	38%	5.6	12.400	84.62%	24 rank 33
4296	2.333	1.000	1.667	44%	3.6	17.341	92.31%	23 rank 23
63	2.750	4.250	0.000	50%	5.3	16.000	91.89%	21 rank 18
3061	1.714	2.571	0.000	57%	4.6	21.700	90.00%	20 rank 15
4241	0.000	0.286	2.000	57%	5.5	16.300	39.02%	19 rank 37
1675	2.625	9.500	0.000	38%	10.4	23.114	87.36%	22 rank 32
3488	2.714	0.143	5.000	43%	7.8	25.900	65.45%	18 rank 35
5148	3.000	0.000	5.143	43%	7.1	22.477	63.16%	17 rank 16
4096	3.000	0.000	5.000	50%	10.4	25.639	43.48%	16 rank 7
6381	2.667	3.833	1.833	67%	7.7	26.722	68.00%	15 rank 44
1781	3.100	0.000	4.125	71%	5.5	21.568	78.57%	13 rank 12
930	5.333	0.000	7.000	44%	10.7	23.909	70.00%	14 rank 27
5822	2.500	6.333	0.000	83%	6.1	22.417	97.44%	12 rank 19
4645	0.571	0.000	2.857	86%	4.8	28.100	68.97%	11 rank 10
8122	3.167	11.333	0.000	67%			94.44%	10 rank 20
2358	3.571	0.857	4.429	86%	12.8	30.900	50.00%	9 rank 9
1732	1.714	0.000	6.000	86%	11.7	35.900	51.85%	8 rank 5
5847	2.889	0.000	5.778	100%	8.3	36.167	68.42%	7 rank 1
1625	2.600	0.000	6.200	100%	8.7	37.800	69.64%	6 rank 8
7411	1.875	0.000	6.750	100%	12.7	40.091	53.47%	5 rank 17
2451	4.625	0.000	14.375	88%	14.9	45.773	85.82%	4 rank 2
111	4.714	0.000	13.429	100%	18.5	51.300	77.05%	3 rank 4
2338	3.250	0.000	14.000	100%	17.0	54.000	84.21%	2 rank 3
1756	4.833	0.000	18.333	83%	19.3	55.750	87.30%	1 rank 6

(1st Pick is at the bottom)

As you can see all the data is averaged and sorted into one list. If we were to be in a picking position this data would be even more important because it is going to be a deciding factor in who you pick.

Section II: Alliance Selections

Finally, the do or die moment in competitions. A team representative (usually the Scouting and Strategy Lead) goes to the side of the field to represent your team. If you are a picking team, you will be called to the field at the beginning of selections from 1-8. After that occurs, picking (drafting) will start. Teams will begin to select other teams from the available list. If you are an alliance captain you will use your pick list and data to make what you believe to be the correct pick. If you aren't a picking team, you can be selected as either the 1st or 2nd pick. If you are selected as a 1st pick, make sure to have your data ready to compare with your alliance captains. If you are a 2nd pick, be ready to show them your data on the alliances after the selections. If you are an alliance captain you will select which teams you and your 1st pick believe to

be the best. You may also not be picked, just remember that this is ok and you can win other awards later on for your efforts. Now sit back, pick your favorite alliance(or your own of course), and cheer them on!

This is the first revision of the Sean Light White Scouting Manifesto, Created during the 2021 IR@Home season. If there is information you believe should be added or changed. Please Contact Me seanlightwhite@gmail.com or WhoKilledCrimg3#8632 on Discord.



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