The Scouting Collaborative

Boneyard Robotics 2682 Match Scouting Sheets Manual

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Match Scouting Sheets Manual - Preface

Thank you for joining the Scouting Collaborative! In exchange for accessing our shared trove of information and data, you must first begin to scout with us. Don't know where to start? We got you. Free and open-source to all FIRST teams, Boneyard has shared links to all of their current scouting sheets.

This is a step by step user guide for how to use Boneyard's Scouting Sheets for the FIRST Robotics Competition 2020 Season: Infinite Recharge. Below are links to our resources for the season. Once you've downloaded them, you'll be set to continue this guide.

Scouting Sheets - Boneyard Robotics

Scouting isn't rocket science. Our visual, step by step approach makes our sheets easy to understand once thoroughly explained. Without further ado, let's get scouting!

A note regarding the resources used in this book:

For references and examples, we have used the *FIRST INFINITE RECHARGE 2020 Game and Season Manual* and the Audience Display diagrams officially released from FIRST's website, as well as official crop outs from our own scouting sheets. Any FIRST related material is not owned by our team but used from the open sources found on their website.

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Match Scouting Sheet Manual

We made these sheets to keep not only our students but grandmas in mind, as even they enjoy scouting. Though they may not understand the game, the process of collecting data from a single robot during the match should be simple for everyone to understand. This is why we take a simple, visual, step by step approach to scouting data, keeping in mind who all would be using it.

A Brief Overview

This scouting sheet is designed to take data from the time your competition live stream displays the next match rankings to the time the final scores are revealed after the match. From the start, you will track important information, such as the team's identifying number, their rank at the time of the match, and what match you are scouting.

From there, you'll be scouting that team's Autonomous period, taking into account where that team started on the initiation line, and if they scored any points, much less moved at all. An additional notes section is provided for teams who have an intricate autonomous.

Next, you'll move into the Tele-op period, so you can ditch the first two sections entirely from here on out. For the next two minutes and fifteen seconds, you'll be tracking everything that your robot does, from shooting to rotating the control panel. You will also track how many stages the alliance gets to or activates.

After that whistle blows, it's time to move on to Endgame. During this time, your robot may continue to shoot. This is fine, just keep marking the points in Tele-op, as this stage of the match technically, has not ended yet. This is where you'll track your robot's effectiveness in defense, or where they ended up by the end of the match.

Finally, the final score won't show up until the end of the match. Make sure to watch for the final scoreboard count before filling in this section. Take this time, if any, to review your other sections. Once the scores are posted, you may fill in these parts as necessary. If you miss anything in these sections, the **Blue Alliance** updates match information throughout the day.

Boneyard Robotics Match Scouting Sheet Infinite Recharge 2020

Here?	Team Information		Current Rank	Match #
ST	#			
2	#			**You Are Scouting:**
3	#			BLUE 2

I. Autonomous - First 15 Seconds

Initial Position on Field	Power Cells Scored (Auto)		Describe This Robot's Autonomous Period.
	Scored	Attempted	
Crossed Initiation Line? ☐			

II. Tele-op - 2 minutes 15 Seconds

Power Cells Scored (Tele-op)		Control Panel Stage 2	Control Panel Stage 3	Circle Wheel Color:
Scored	Attempted	Robot Rotated Disk ☐	Robot Matched Color ☐	Red
		Spin Accuracy:	Color Match Accuracy:	Blue
Stage 2 Started ☐	Stage 2 Complete ☐	☐ Perfect!	☐ Perfect!	Green
Stage 3 Started ☐	Stage 3 Complete ☐	☐ Slow, but correct.	☐ Slow, but correct.	Yellow
		☐ Had to restart ____ times	☐ Had to restart ____ times	

III. Endgame - Last 30 Seconds

Robot Endgame Position	Generator Switch	Any Penalties? Red/Yellow Cards? If so, why?
☐ Successful Climb ☐ Attempted Climb	Robot can slide on the bar. ☐	
☐ Buddy Climb- Describe Below: ☐ Attempted Buddy Climb		
☐ Rendezvous	Alliance successfully balanced the Generator Switch. ☐	Did robot play defense? If so, describe.
☐ Field		

IV. Final Score

New Rank:		Ranking Points:	Additional Notes:
Match Final Score:	Red: Blue:	☐ Win (2)	
		☐ Stage 3 Achieved (1)	
		☐ Endgame requirements met (1)	Scouter Name:

This is a picture of the full Match Scouting Sheet. Let's take it apart to see how it works.

Boneyard Robotics Match Scouting Sheet Infinite Recharge 2020

Here?	Team Information		Current Rank	Match #
	ST #			
	2 #			You Are Scouting:
	3 #			BLUE 2

Preliminary Data Section

The section above is used for collecting data displayed before the match begins. As you can see above the empty blocks, each area is labeled for what you are to fill in. For this example, put yourself into the shoes of a scouter and view this sheet as if you were about to scout your first match.

Here?

This section simply asks, "Is this team here to compete?" If the answer is yes, do not mark anything. I know this may be a bit confusing to understand, but trust me here and do not touch that block if the team is in attendance for this match. You'll only need to mark a large **X** in that blank if the team next to it is not here. This shows us quickly that that team was a "No Show." This is crucial in scouting, as it shows not only the reliability of other teams but how well an alliance can manage with a missing member.

Team Information

Team information simply asks for the names and numbers of teams who will be competing in this match. Watch for when the official live stream at your event displays the upcoming match information. As you can see above, this particular sheet is set up to scout the FIRST robotics team in position **BLUE 2.** This means that you will be scouting the blue alliance's second positioned team. As an example, we have used the Audience Display diagrams officially released from FIRST's website. The following page will illustrate which position is which. Your scouting sheet will have a predetermined position to scout. Fill out the team you are scouting at the top, followed by the other two teams in the alliance. The order for the other teams is not as important as putting the team you are scouting within the very top position *(This is why it is labeled ST for Scouting Team)*.

Keep in mind: You may need to relocate for better field visibility.

In this display, the team you would scout during the Qualifying Matches would be Team #2881, the Lady Cans. During this match of Quarterfinals, you would scout team #418, Purple Haze.

During Qualification Matches, the Preview will display like so:

During Playoff Matches, the Preview will display like so:

Current Rank

Keeping our eyes on the Audience Display, you'll notice that the Qualification matches show a Rank, with the current team rank underneath it. Use that data to fill in each of your alliance's ranks accordingly. At this time, we do not scout the ranks or alliance ranks of Playoff Matches.

Match

Use this block to fill in what match you are scouting. The Audience Displays above show that the upcoming match is Qualification 18. Just mark the number for this one. During Playoffs, mark what type of match you are scouting like so:

Q - Quarterfinals
S - Semifinals
F - Finals

Remember that *FIRST* has a unique system of scheduling Playoff Matches. Quarterfinal 1 is the first match between Alliance 1 and Alliance 8, but Quarterfinal 2 is between Alliance 2 and Alliance 7. Alliance 1 and Alliance 8 will not play again until Quarterfinal 5. Any tiebreakers will be played after the first 8 Quarterfinal Matches. Follow the chart below:

QF 1: Alliance 1 and Alliance 8 first match
QF 2:   Alliance 4 and Alliance 5 first match
QF 3: Alliance 2 and Alliance 7 first match
QF 4: Alliance 3 and Alliance 6 first match
QF 5: Alliance 1 and Alliance 8 second match
QF 6: Alliance 4 and Alliance 5 second match
QF 7: Alliance 2 and Alliance 7 second match
QF 8: Alliance 3 and Alliance 6 second match
QF 9: Any tie breaker match needed (additional tiebreaker matches as needed)

Keep in mind: You may need to track additional tiebreaker matches, as sometimes, even this results in a tie. Yes, this has happened. In addition, you may need to scout a match that is replayed more than one time.

Below the Match # is a block detailing which team you are to scout. For more information about that, read the Team Information section above.

I. Autonomous - First 15 Seconds

Initial Position on Field	Power Cells Scored (Auto) Scored Attempted	Describe This Robot's Autonomous Period.
Crossed Initiation Line? ☐	● ___ ___ ⬡ ___ ___ ▬ ___ ___	

I.   Autonomous - *First 15 Seconds*

The section above is used for collecting data taken during the first 15 seconds of the match, while the robot is running on pre-programmed code, or making what's called an Auto-run. Terminology aside, if the robot does so much as flinch during this period, write it down. If the robot does not have an Autonomous period or does not move during this time, especially write that down.

Initial Position on Field

All robots start on the Initiation Line at the beginning of the competition. Mark an X or O to indicate roughly where. The zones behind the line are there to help visualize the field.

When the match starts, most robots will shoot off that line almost immediately. If your robot moves across this line, check the Crossed Initiation Line box. Simple as that.

Power Cells Scored (Auto)

You are only to score your robot's points in the form of tallies. Do not worry about any other robot at this time.
Each robot would probably at least shoot the three power cells they may have pre-loaded during their Auto-run. If a power cell is shot from that robot with the intention of scoring it into one of the three ports in the Power Port, Mark a tally on the line under which outcome the shot had. If the robot scored in the Hexagonal section, make a tally over the line beside the hexagon, under the Scored section. If they missed, make a mark under the Attempted section. **If a power cell goes in and comes back out of the field element, it is counted as a missed shot.**

Keep in mind: Only keep track of the robot's shots in this section during Autonomous. There will be a section for you to score the robot's shots during the Tele-operated period.

Describe This Robot's Autonomous Period.

As the title demands, this section serves as sort of a "catch all" of any additional data you as the scouter found important to write down. Did the robot seem to have trouble moving? Did it collide with other bots during its Auto-run? Did the robot just spin around the entire fifteen seconds? Whatever the case, if you feel the need to add something a little extra, go for it. If you do not have time to write it now, remember what you saw and fill it in as necessary. You must write something, even if the robot did not move!

Keep in mind: Other than this section, you do not need to use the Autonomous or Preliminary sections beyond the first fifteen seconds of the match.

3...2…1… *Ding!* *Ding!* *Ding!*

And with that, the Autonomous period has come to an end. Once this happens, you'll watch as drivers will step beyond the line and take control of their bots. The next two minutes and fifteen seconds will be a crucial time to scout. We will now introduce our next section: Tele-op.

II. Tele-op - 2 minutes 15 Seconds

Power Cells Scored (Tele-op) Scored Attempted	Control Panel Stage 2	Control Panel Stage 3	Circle Wheel Color:
● _____ _____	Robot Rotated Disk ☐ ✶	Robot Matched Color ☐ ↗	Red
⬡ _____ _____	Spin Accuracy:	Color Match Accuracy:	Blue
▬ _____ _____	☐ Perfect!	☐ Perfect!	Green
Stage 2 Started ☐ Stage 2 Complete ☐	☐ Slow, but correct.	☐ Slow, but correct.	Yellow
Stage 3 Started ☐ Stage 3 Complete ☐	☐ Had to restart ____ times	☐ Had to restart ____ times	

II.   Tele-Op - *2 minutes and 15 seconds*

The section above is used for collecting data taken during the next two minutes and fifteen seconds of the match. During this period, drivers will take to the controls of their robots and work to get as close as they can to complete all three stages of the match.

Power Cells Scored (Tele-Op)

You are only to score your robot's points in the form of tallies. Do not worry about any other robot at this time.

If a power cell is shot from that robot with the intention of scoring it into one of the three ports in the Power Port, Mark a tally on the line under which outcome the shot had. If the robot scored in the Hexagonal section, make a tally over the line beside the hexagon, under the Scored section. If they missed, make a mark under the Attempted section. **If a power cell goes in and comes back out of the field element, it is counted as a missed shot.**

Keep in mind: Teams may continue to score points even after Endgame has started. You must keep track of each power cell the robot scores during Endgame, as it is still technically a part of the Tele-operated period.

Control Panel Stage 2

To complete Stage 2, alliances must score a total of 20 power cells to reach capacity. After this, the field will display the number of rotations on the Control Panel necessary to activate Stage 3.

This section must only be filled out if **your robot** was the one to attempt the rotation. If the robot completes the rotations necessary, then fill in the square beside "Robot Rotated Disk." Then down below, describe how well they rotated the disk as necessary, checking

the most accurate description. If the robot attempted to rotate the disk but failed, you may either write this down at the bottom in the Additional Notes section of the sheet, or simply put something to the effect of "Tried" within the white space of the Spin Accuracy section. We'll know what you mean.

Control Panel Stage 3

To complete Stage 3, alliances must score a total of 20 power cells to reach capacity. After this, the field will display the color needed to match on the Control Panel in order to complete Stage 3. Please circle the correct color under Circle Wheel Color.

This section must only be filled out if **your robot** was the one to attempt the color match. If the robot matches the color successfully, then fill in the square beside "Robot Matched Color." Then down below, describe how well they matched the color as necessary, checking the most accurate description. If the robot attempted to match the color but failed, you may either write this down at the bottom in the Additional Notes section of the sheet or simply put something to the effect of "Tried" within the white space of the Spin Accuracy section. We'll know what you mean.

Stage 2 Started

When an alliance finishes their Autonomous period and scores 9 power cells into the Power Port, the alliance completes Stage 1 and moves on to Stage 2. The field will also indicate this by lighting up certain parts of the field and showing BB-8 as the icon for the First Stage circle. When this happens, Stage 2 immediately starts. Indicate this by checking the box beside "Stage 2 Started."

Stage 2 Completed

Stage 2 is completed when the Alliance scores 20 Power Cells into the Power Port and rotates the Control Panel the indicated number of times. Once this is completed by your alliance, an image of BB-8 will appear as the icon for the Second Stage circle. Indicate this completion by checking off the corresponding box.

Stage 3 Started

With Stage 2 complete, Stage 3 immediately starts. Indicate this by checking the corresponding box.

Stage 3 Completed

Stage 3 is completed when the Alliance scores 20 Power Cells into the Power Port and rotates the Control Panel to the color provided by the field. Once this is completed by your alliance, an image of BB-8 will appear as the icon for the Third Stage circle. Indicate this completion by checking off the corresponding box.

Keep in mind: During the season, the total of Power Cells required to reach Capacity is subject to change. For example, there may be a higher total requirement of Power Cells to reach Capacity during the World Championships. Though FIRST will notify us of this change, it is always a good idea to stay informed of the changes yourself to see if this affects your match scouting.

STAGE 1 AUDIENCE DISPLAY GUIDE

STAGE 2 AUDIENCE DISPLAY GUIDE
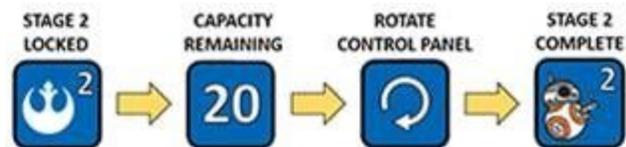
STAGE 3 AUDIENCE DISPLAY GUIDE
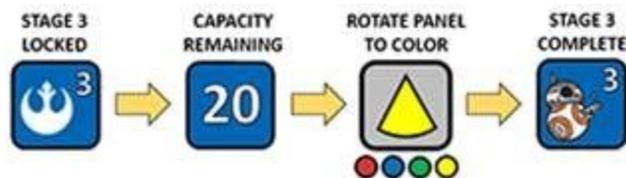
The Tele-Operated period of play does not technically stop here, we simply just tack on an extra title to the last 30 seconds of match play, called Endgame. Teams can still shoot power cells and play normally, but by this point, your robot could either be shooting its final points or lining up to climb the Generator Switch. How exciting! But how do we track that?

III. Endgame - Last 30 Seconds

Robot Endgame Position		Generator Switch	Any Penalties? Red/Yellow Cards? If so, why?
☐ Successful Climb ☐ Attempted Climb ☐ Buddy Climb- Describe Below: ☐ Attempted Buddy Climb ☐ Rendezvous ☐ Field		Robot can slide on the bar. ☐	
		Alliance successfully balanced the Generator Switch. ☐	Did robot play defense? If so, describe.

III.   Endgame - *Last 30 Seconds*

The section above is used for collecting data taken during the last 30 seconds of the Tele-Operated Period of Match Play. In the final moments of the match, things can get pretty confusing. We tried to give our scouts the opportunity to write down as little as possible by using checkboxes. However, with so many outcomes to this process, we may miss a special event. If you see anything amazing that your robot did or attempted, we encourage you to write it down in the Additional Notes section at the bottom.

Robot Endgame Position

From parking to buddy climbing, so many different things can happen as robots begin to climb. Simply track to the best of your ability what your robot ends up doing by the end of this match here. Did they park in the rendezvous point? Did they attempt to climb and fail? If the robot succeeded in buddy climbing, describe how they did it. Did they extend a bar? Did a robot pick them up? Write what you see.

Generator Switch

Balance is a key part of this field element. It is important to indicate that your robot can slide on the bar. Now, a little disclaimer: You may not see their slider in action if they even have one. Only mark this if you see the robot slide on the bar to balance during Endgame.

If the Alliance successfully balances the Generator Switch, indicate this by marking the related checkbox. If you are unsure, check the Post Match Audience Display after the match is over. For future reference, balancing the Generator Switch gives the alliance a ranking point.

Any Penalties? Red/Yellow Cards? If so, why?

If you've ever been to the initial Driver's Meeting with the referees, the Head Referee usually makes the comment that they hate to pull the cards out. Regardless of how much teams may want to follow the rules, we're human and make mistakes. Such as bumping a hanging robot. This is a big no-no. Here's a pro tip for catching penalties: Watch the Referees. When your robot does something it shouldn't, the referee watching it will point at the robot directly and simultaneously wave their alliance's corresponding flag. These penalty points count against the team that earned them during that match. Offenses can be as simple as prolonged defense to literally ripping out another robot's guts. Keep your eyes not only on the robot but the referees watching their every move.

Keep a close eye on your robot while they are playing defense. There are several offenses associated with defense. If there is a call against your robot, try to pinpoint why they may be in the wrong and write it down, as well as how often the robot was penalized for this event.

Keep in mind: Robots may not always be ramming other robots to earn penalties. Sometimes, dying in an opponent's zone can count against you if the opponent rams into you. Watch for this.

Red and Yellow Cards are so important, that the announcer will officially state the offense and the team that earned it after the match while the head referee will enter the field and display the card. A good time to watch for this is when a match has been especially aggressive, or "Match Under Review" is displayed before the final scores are revealed. If your team earned this card, write why. If you somehow missed who got a yellow or red card, it will be indicated at the end of the match.

Keep in mind: During Playoffs, if a single member of an alliance earns a yellow card, every alliance member does too. If a yellow card already exists for even one member of that alliance, it automatically changes to red, giving the entire alliance a red card and disqualifying them from the Playoff rounds entirely. As you can probably surmise, FIRST takes these offenses very seriously.

Did the Robot Play Defense? If so, Describe.

Speaking of defense, this game is great for it. And by that, I mean, greatly annoying. Track how effectively annoying your robot is to the other alliance if they so choose to defend. This is often done by entering the opposite side of the field, where the other alliance is attempting to score, and disrupting them. Because this disruption could potentially hinder the points that the alliance may earn, defense is very important.

IV. Final Score

New Rank:		Ranking Points:
Match Final Score:	Red: Blue: _____ _____	☐ Win (2) ☐ Stage 3 Achieved (1) ☐ Endgame requirements met (1)

Additional Notes:

Scouter Name:

IV.   Final Score

With the clock at 0, we've finally made it to the end of the match! After the referees are satisfied with the outcome of the data scored during Match Play, the winners are displayed and ranks are updated. Use this section to graph the results of the match. But don't delay, for soon, the next match will be put up. If you miss your chance at getting all of the data needed, the **Blue Alliance** should have it updated shortly after the match ends.

New Rank

> Simply put, a team could either rise, fall, or stay at the rank they were when they started this match. Regardless, please indicate the updated rank in the box beside "New Rank."

Match Final Score

> The Red and Blue scores will be displayed clear as day. Please write them down accordingly.

> Keep in mind: Sure, it might be tempting to go and prematurely jot down the scores before the final score is shown. No matter how confident you are in the match score, it is highly encouraged to wait until the final results are shown before writing down any information in this section.

Ranking Points

> Here, you will indicate the types of ranking points that your alliance earned, if any. This will be indicated on the Audience Display, but let's go over it quickly. If your team wins, they automatically gain two ranking points. If both teams manage to tie in score, the winning two points are split evenly between the two alliances, granting a single ranking point to each. If the alliance completes Stage 3, they earn one ranking point. If an alliance earns at least 65 Endgame points, they obtain a single ranking point.

SHIELD GENERATOR OPERATIONAL	earning at least sixty-five (65) ENDGAME points			1 Ranking Point
SHIELD GENERATOR ENERGIZED	Stage 3 ACTIVATED	-	-	1 Ranking Point
Tie	Completing a MATCH with the same number of points as your opponent	-	-	1 Ranking Point
Win	Completing a MATCH with more points than your opponent	-	-	2 Ranking Point

Additional Notes

Here, you can write down observations about the robot you scouted. This can be anything from, "Their back right wheel fell off during Endgame," to "This robot moves slowly but gets the job done." Please only state facts and not opinions, especially negative ones, on how the match went for this robot. Be as detailed as you want, just make sure that you are submitting worthwhile information. Remember, you are giving us facts, not opinions. Saying things like, "This team sucks, can't even shoot a power cell," may be factual in your eyes, but is rude and could be stated with less opinion. "Robot missed more shots than it made," or "Robot had trouble shooting" are much better phrases. Be direct and be correct. Remember, EVERY TEAM in the Scouting Collaborative will be able to see your scouting sheets.

It is worth noting if your robot suddenly dies or gets disconnected from the field. A good indication of a disconnected bot is one that, after not moving for a bit, is disabled-- when that orange light goes solid and stops blinking. Remember that a referee may disable a robot that is deemed unsafe.

Keep in mind: If your bot is disabled, there is always a chance that the robot can be re-enabled after a period of time. Pay attention to the orange light.

Scouter Name

And what better to go with an entire sheet worth of data than an autograph? That's right! Tell us who scouted this team. Who knows, if you give consistent information, your team may reward you for a job well done. That's how we do it in the Boneyard!

Well, that's all folks. Now get out there and scout some matches!