



# Lightning Robotics

## Scouting System Guide

By Aaron Cannon

### Overview

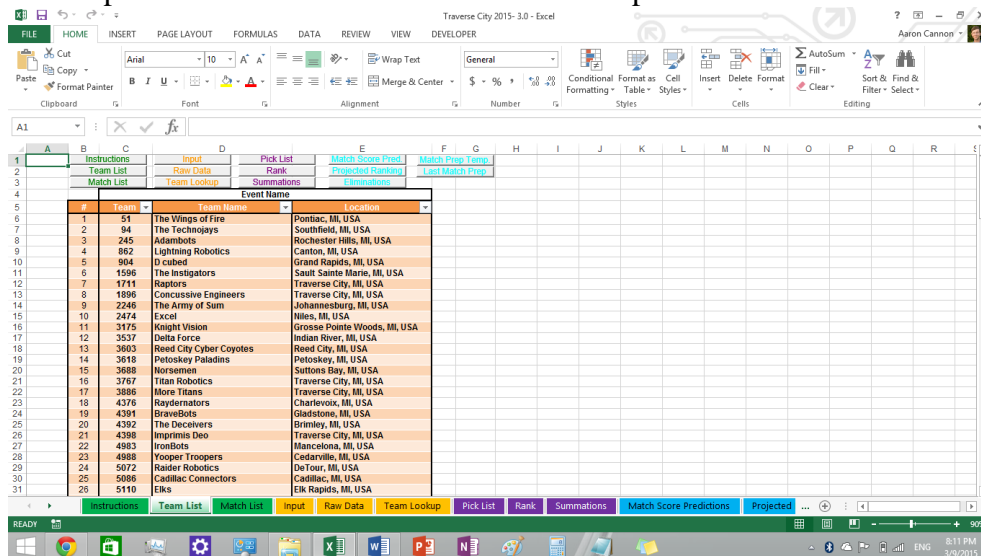
This is team 862's scouting system for the 2015 season. Our team is using tablets to input data, however the scouting spreadsheet works perfectly well with manual data input. Our team spend about \$2000 through two seasons on the electronic scouting system however using just the bare minimum should only be around \$600-\$700. The spreadsheet has been developed over many years and we wrote an android app to go with it this year. Data is transferred in an excel file to and from the tablets by usb or bluetooth (I will let you figure out how to use Bluetooth as this is separate from the actual scouting system). Feel free to use any parts of the scouting system for your own team. I have found that you get the most benefit from figuring things out on your own but I understand if you don't have the time or resources to start from scratch. Below is a guide for how to set up and use the system for an event. Specific instructions for using most of system is also contained in the spreadsheet.

### Requirements

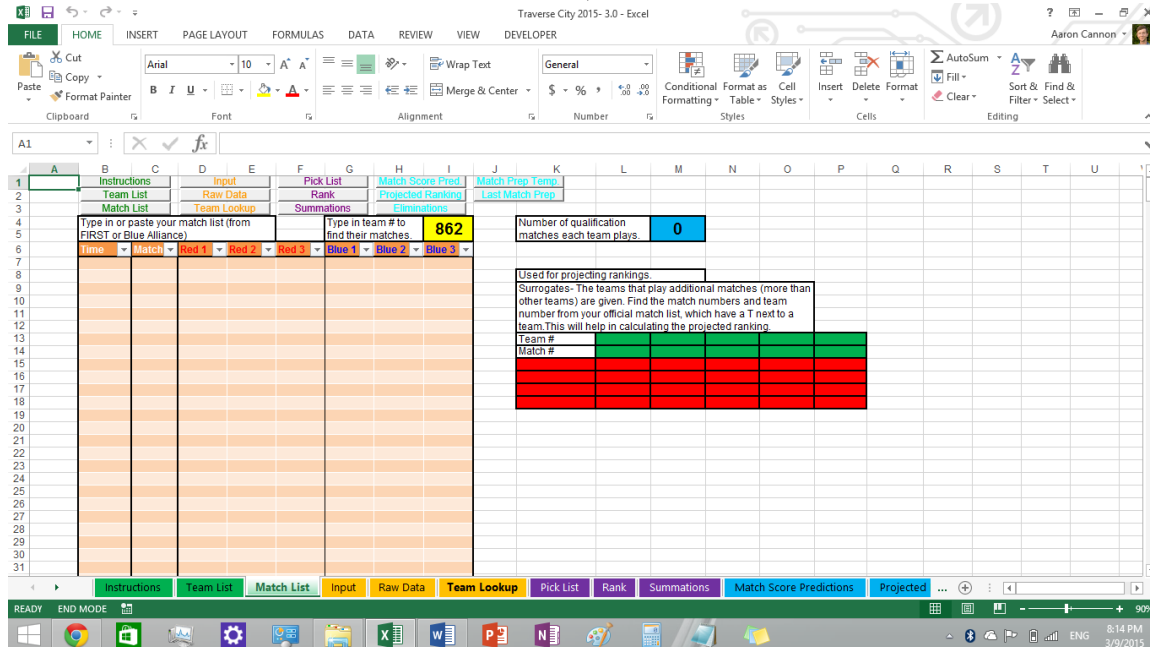
- 1 computer
- Microsoft Excel
- 6-7 Android Tablets (7in screen) optional or clipboards and paper
- USB cables, extension cords, power strips

### Pre Event Guide

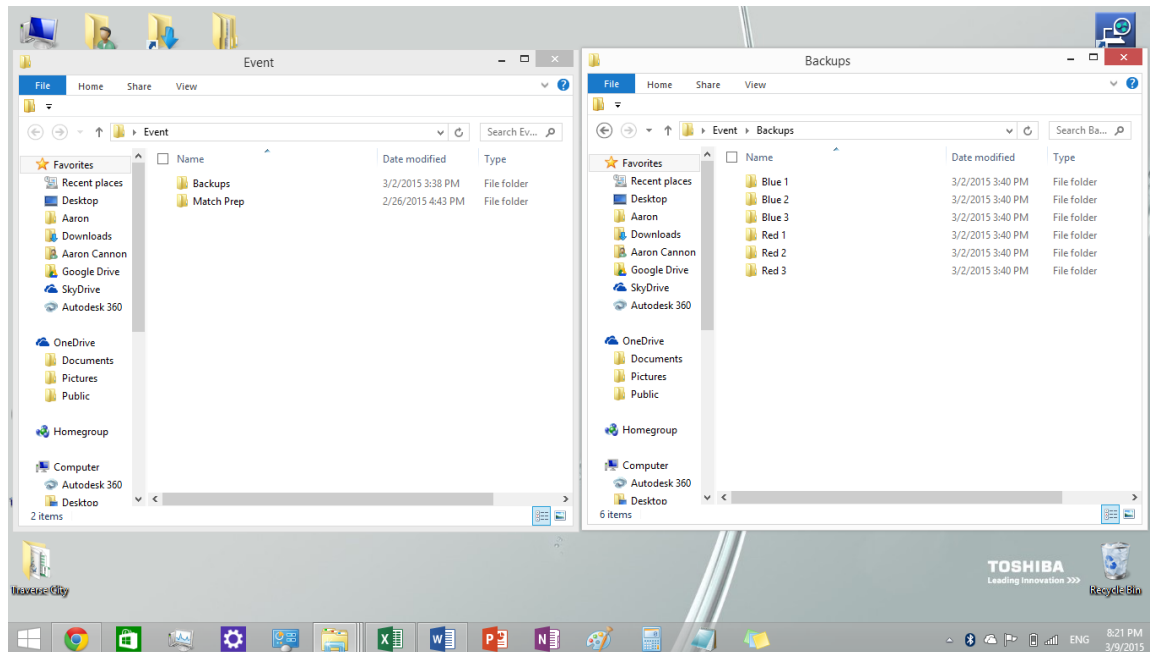
- 1 Download the most updated excel scouting spreadsheet and android scouting app APK on Chief Delphi: <http://www.chiefdelphi.com/media/papers/3101>.
- 2 Install the android scouting app APK on each of the tablets. To do so, place the APK anywhere in the tablet directory. Then, within the tablet, navigate to the APK and click install.
- 3 Next create a folder in each of the tablets and name it after your next event.
- 4 Open the spreadsheet and read through the instructions in the first tab. These should give a general overview of all the functions of the scouting system as well as definitions of most terms.
- 5 Now input the team list and event name in the Input Tab.



6 Input the match schedule in the match list tab. When you get the official match schedule at the event, look through the schedule and find all surrogates (teams playing extra matches, should have a T next to them in the match schedule).



7 Before the even you should create a file system on the computer you will be using as outlined below.



8 Next go to the input tab. This is where data is moved to and from the tablets. Data is transferred through excel files (.xls). Each file is by default named for every alliance station but can be changed. The source path is the file path for where data is stored on the tablets. You can find it by connecting the tablet to the compute, navigating to the folder, then right click and go to properties. Under Location: there should be the file path for the folder and add “/folder name” to get the full filepath (ex. E:\Traverse City). Do this for each of the tablets. Find the backup path the same way using the folders you created above in the Backups folder. This is where the excel files with the scouted data from the tablets is saved each time data is imported in case something crashes.

The image shows a screenshot of an Excel spreadsheet titled "Traverse City 2015-3.0 - Excel" and a Windows File Explorer window showing the "Traverse City" folder properties.

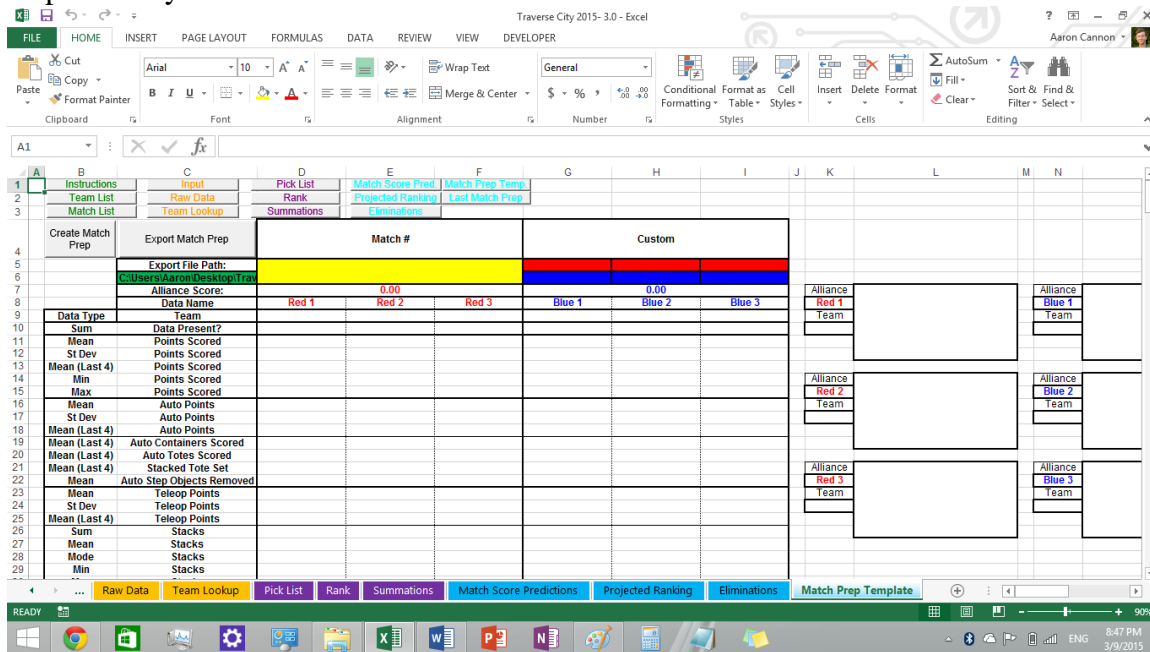
The Excel spreadsheet has a ribbon with tabs: FILE, HOME, INSERT, PAGE LAYOUT, FORMULAS, DATA, REVIEW, VIEW, and DEVELOPER. The spreadsheet contains several tabs: Instructions, Team List, Match List, Input, Raw Data, Team Lookup, Pick List, Rank, Summations, Match Score Predictions, and Projected. The "Input" tab is currently selected.

The "Input" tab contains a table with columns: Alliance Station, Red 1, Red 2, Red 3, Blue 1, Blue 2, Blue 3. The table is used to enter data for each alliance station. Below this table, there are sections for "Export Data", "Source Path", "Backup Path", and "Import Data".

The Windows File Explorer window shows the "Traverse City" folder in the "E:" drive. The folder properties are displayed, showing the location as "E:\Traverse City".



9 Now go to the match prep tab and input the file path for the match prep folder you created previously.



10 Now open up the android app on each of the tablets. Click import data button and a string of text should appear on the top. Delete everything but the very top of the directory (ex. /storage/sdcard0/). Then add the name of the folder you created in the tablet and the name of the alliance station that this tablet will be scouting like the image



- The final thing you can do to set up before an event is input any prescouted data or OPR in the projected ranking tab. In the right table, input the team list again and any prescouted data. When you get the match schedule you will be able to have a general idea of how matches will go before the matches actually start.

Traverse City 2015-3.0 - Excel

FILE HOME INSERT PAGE LAYOUT FORMULAS DATA REVIEW VIEW DEVELOPER

Clipboard Font Alignment Number Formatting Styles Cells Editing

Instructions Team List Match List Team Lookup Summations Match Score Predictions Match Prep Template Points per match needed to improve to new qual average by end of competition

Projected standings based on match score predictions

Update Rankings

Team	Qual Average	Coop Points	Auto Points	Container Points
1	51	0.00	0	0
2	94	0.00	0	0
3	245	0.00	0	0
4	862	0.00	0	0
5	904	0.00	0	0
6	1596	0.00	0	0
7	1711	0.00	0	0
8	1896	0.00	0	0
9	2246	0.00	0	0
10	2474	0.00	0	0
11	3175	0.00	0	0
12	3537	0.00	0	0
13	3603	0.00	0	0
14	3618	0.00	0	0
15	3688	0.00	0	0
16	3767	0.00	0	0
17	3886	0.00	0	0
18	4376	0.00	0	0
19	4391	0.00	0	0
20	4392	0.00	0	0
21	4398	0.00	0	0
22	4983	0.00	0	0
23	4988	0.00	0	0

Prescouting data included? 0

Input data from prescouting/past competitions to get match predictions before the competition starts. Input manually.

Team	Qual Average	Coop Points	Auto Points	Container Points
1	51			
2	94	5.0	-0.9	1.0
3	245	20.9	9.3	0.3
4	862	27.0	4.8	0.8
5	904			
6	1596			
7	1711			
8	1896	19.6	14.2	1.2
9	2246	14.4	-7.7	-0.2
10	2474			
11	3175			
12	3537			
13	3603			
14	3618			
15	3688			
16	3767			
17	3886			
18	4376			
19	4391			
20	4392			
21	4398	13.0	-1.6	0.0
22	4983	18.5	10.3	-0.2
23	4988			

Points per match needed to improve to new qual average by end of competition

Qual Avg New Qual Avg Matches Played Score

Raw Data Team Lookup Pick List Rank Summations Match Score Predictions Projected Ranking Eliminations Match Prep Template

READY 8:52 PM 3/9/2015

This is everything you can set up before the event starts. Below are the instructions for once you're at competition.

### At The Event Guide

- Once you have inputted the official match schedule, go to the input tab, connect each tablet one by one and click the export data button. This will create an excel file with the match schedule in the source path. If android app crashes or loses data, the export data button can also create an excel file with all the data in the spreadsheet (just make sure there are no blank cells, fill them all with "0").
- Now go to the app in each of the tablets and click the import data button in the app. The alliance station should change and be highlighted in the appropriate alliance color. Data is automatically saved to the excel file whenever you click last match or next match.
- Any time you want to collect the scouted data, get all the tablets, plug them in one by one and click all the import data buttons in the spreadsheet. Then click F9 to update the spreadsheet calculations.



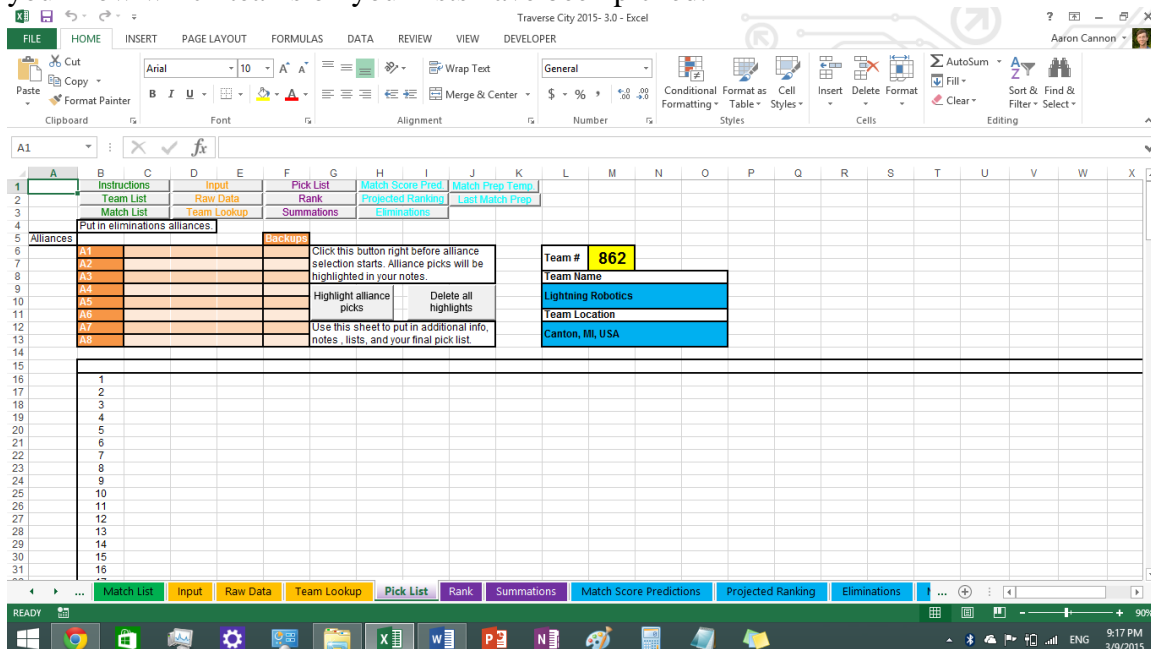
4 If the head scout wants to manually input data, try to use the raw data tab and type over the formulas. This is because importing data from the tablets overwrites all data in the input tab.

5 The raw data tab does all the major calculations for the scouting system. You can change weights if you want to prioritize certain data values. You can also filter the different data values if for example you wanted to find all the teams that can do a 3 tote auto. If you want to look at data of specific teams, use the team lookup tab.

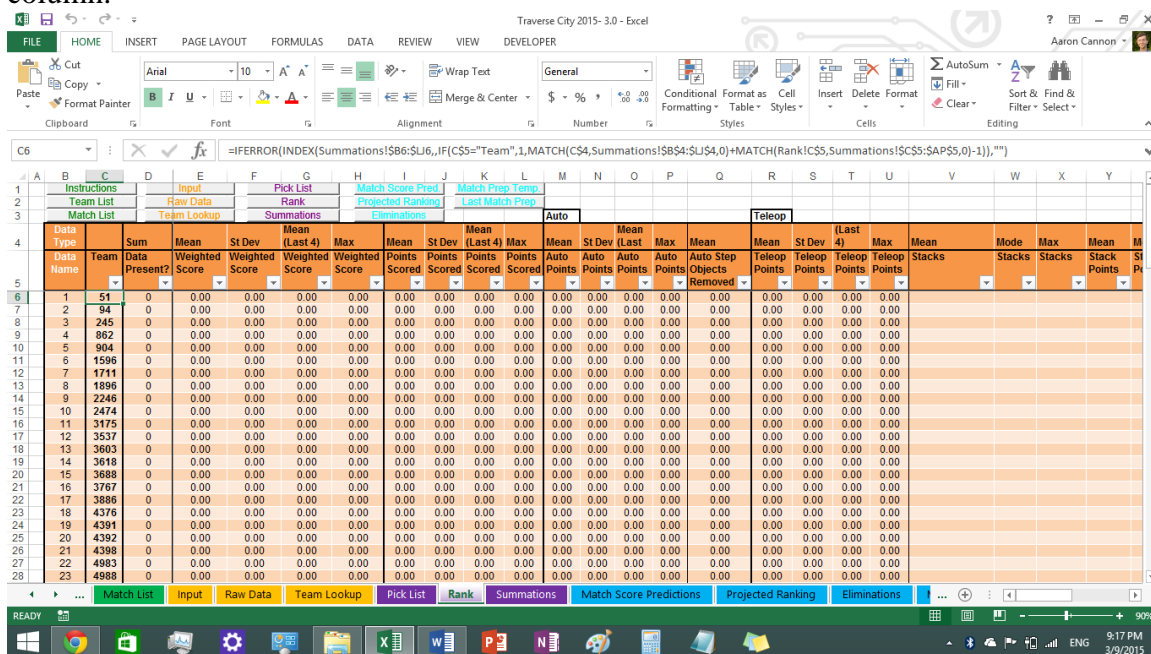




6 The pick list tab is for writing up any notes and obviously creating picklists. When you get to alliance selection, click the highlight alliance selection button. Whenever you type a team number that got picked, every instance of the team number will get highlighted in this sheet so you know which teams on your lists have been picked.



7 The rank tab is one of the most easily customizable tabs. It lets you rank all the teams at the event based on characteristics you want. To change any of the current columns, type in the data type in row 4 (ex. Sum) and type in the what you want to rank in row 5. If you need more columns, copy the formatting over and copy the formula in cell c6 into all the cells in the new column.



8 The summations tab contains all the data from the raw data tab and is accessed by the rank tab, match predictions tab, and match prep tab.

9 The match score predictions tab uses the scouted data or the prescouted data from the projected ranking tab to predict the scores for all the matches and is used to project the rankings. You can input actual match scores to keep the rankings as accurate as possible.





- 10 The projected rankings tab contains projected rankings and prescouted data. Projected rankings are updated by clicking the update rankings tab. On the top you can input your current qual average, the number of matches played, and the qual average you want to get to by the end of the event and it will calculate what you need to average for the rest of your matches.

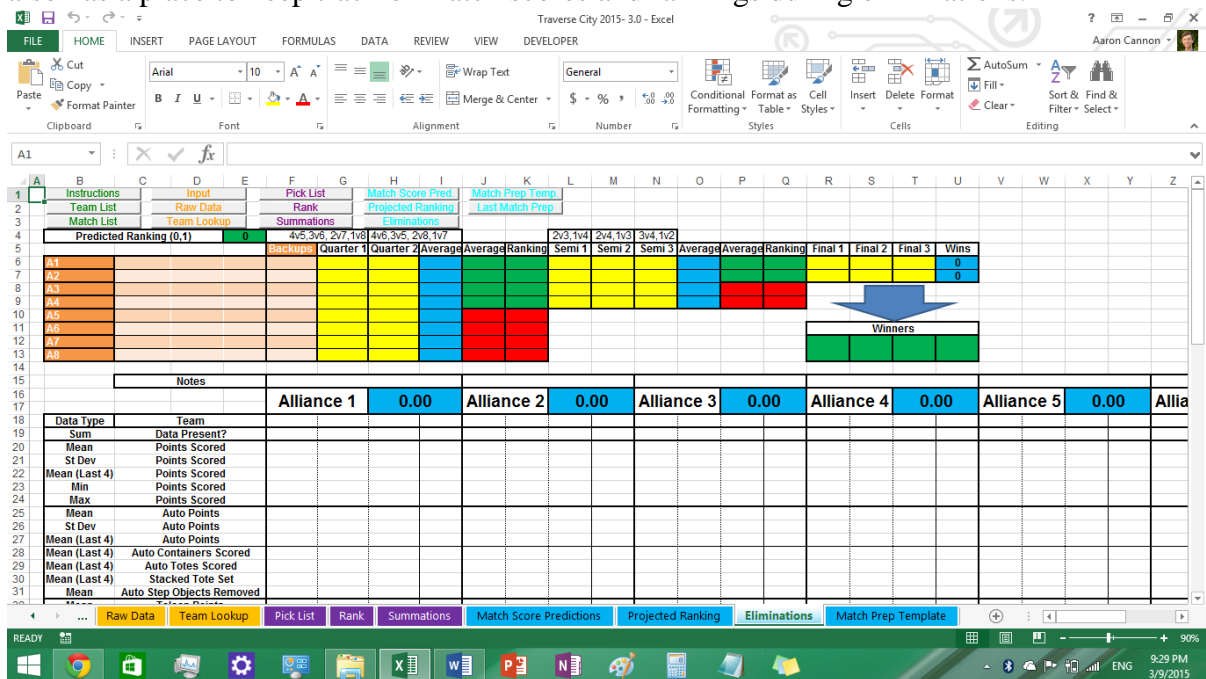
Team	Qual Average	Coop Points	Auto Points	Container Points
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20	4392	0.00	0	0
21	4398	0.00	0	0
22	4983	0.00	0	0
23	4988	0.00	0	0

- 11 The final tabs are the match prep tab and eliminations tab. The match prep tab can be customized the same way the rank tab can be. This is the data you are sending to your drive team to prepare for the next match. Make sure to discuss with them what they want to know. Type in the match number and click the create match prep for that match. Type in any additional notes you may have and then click export match prep. You can then send this newly created file to your drive team and they can open it in a tablet or computer in the pits.

Match #	Custom
1	
2	
3	
4	
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12 The eliminations tab contains the same data as the match prep tab but for all 8 alliances. It also has a place to keep track of match scores and rankings during eliminations.



You should now be all set for your event. If you have any questions feel free to email me at: [aarontcannon@gmail.com](mailto:aarontcannon@gmail.com) or contact me through chief delphi.

