



MARS 2014

# 2016 Scouting Process/Database

By:

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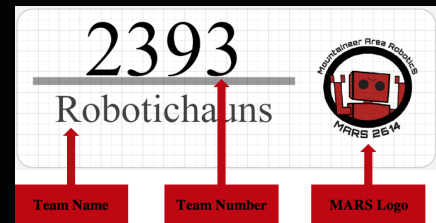
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# Introduction

MARS scouting for the 2016 FRC Season consists of a mixture of paper scouting and online analysis, as well as Slack integrations for ease of information accessibility. The Very Useful Box is a filing box holding a folder for each team at the competition and identified with a custom label. These folders contain all paper match data for that team throughout the competition. Each Paper Scouting Sheet is used for one robot in a single match. It collects a mixture of qualitative and quantitative data recorded by six paper scouts every match. This recorded data is then inputted into an Online Scouting Database for that specific competition. The Paper Scouting Sheet is then filed into the Team Folder in the Very Useful Box.

## Scouting Database

- Very Useful Box (that was the actual name of the product at Office Depot I kid you not)
  - One labeled folder with team number, name, and MARS logo for each team organized by number
  - Folders contains all paper match data for that team
- Paper Scouting Sheets
  - One per robot per match
  - Record match data to input into the Online Scouting Database
- Online Scouting Database
  - One per competition + testing/formatting
  - Input match data recorded from paper scouting sheets for further analysis
  - Picklist (overall and based on certain characteristics)



## Pre-Competition Scouting

- Analysis of teams at event
- Preparation of event-specific database
- Preparation of Very Useful Box with event-specific folders
- Preparation of plentiful paper scouting sheets
- Limited observation of notable teams in previous competitions

## Competition Scouting

- 8 scouts at once
  - 6 paper scouts, one per robot per match
  - 1 scout to transfer paper data to online database
  - 1 scout to file paper sheets into the folders within the Very Useful Box and as a backup paper scout

# Competition Schedule

## Regional Scouting Schedule

Wednesday: Load In

- Optional: additional analysis of teams of interest

Thursday: Practice Matches

- Optional: observation of practice matches for team familiarity and talent recognition

Friday: Qualification Matches

- Data collection and database input of every team at every qualification match
- Analysis of data for qualification match strategies
- Scouting Meeting
  - Strategies for remaining matches
  - Analysis of performance of self and teams of interest
  - Picklist generation

Saturday: Qualification Matches, Alliance Selections, Elimination Matches

- Qualification Matches
  - Data collection and database input of every team at every qualification match
  - Analysis of performance of self and teams of interest
  - Picklist editing as necessary
- Alliance Selections
  - Organization of team data folders by alliance (i.e. Alliance 1: Captain, 1st Pick, 2nd Pick; Alliance 2: Captain, 1st Pick, Second Pick; etc.)
- Elimination Matches
  - Analysis of data for match strategy

## Championship Scouting Schedule

Wednesday: Load In, Practice Matches

- Optional: additional analysis of teams of interest
- Optional: observation of practice matches for team familiarity and talent recognition

Thursday: Qualification Matches

- Data collection and database input of every team at every qualification match
- Analysis of data for match strategy

Friday: Qualification Matches

- Data collection and database input of every team at every qualification match
- Analysis of data for match strategy
- Scouting Meeting
  - Strategies for remaining matches
  - Analysis of performance of self and teams of interest
  - Picklist generation

Saturday: Alliance Selections, Elimination Matches

- Alliance Selections
  - Organization of team data folders by alliance (i.e. Alliance 1: Captain, 1st Pick, 2nd Pick; Alliance 2: Captain, 1st Pick, Second Pick; etc.)
- Elimination Matches
  - Analysis of data for match strategy

# Paper Scouting Sheets (Half-Sheets)

Team # _____		Match # _____		MARS 2614 Scouting Sheet: 2016 FIRST Stronghold							
<b>Auto</b>		<b>Defense</b>		<u>Easy</u>	<u>Medium</u>	<u>Hard</u>	<u>Fail</u>	<b>Shots</b>	<u>Success</u>	<u>Fail</u>	<b>Defense Description</b>
Cross/Reach _____		Portcullis						High			
<b>Shots</b>	<u>Success</u>	<u>Fail</u>	Cheval de Frise					Low			
High			Moat					<b>End</b>	<u>Success</u>	<u>Fail</u>	
Low			Ramparts					Challenge			
<b>Robot Description</b>			Drawbridge					Scale			<b>Match Description</b>
			Sally Port					<b>Penalties Description</b>			
			Rock Wall								
			Rough Terrain								
			Low Bar								
										X = Start A = Auto High a = Auto Low T = Teleop High t = Teleop Low	
										Scout: _____ Team: _____	

## Before the Match

- Write your name and team number on the bottom right corner
- Write the team number of the robot you're scouting and the match number on the indicated lines on the top
- Indicate starting position with an X

## Descriptions

- Robot Description- describe the robot, any outstanding abilities, parts, and/or performance
- Defensive Description- describe any defensive attempts (e.g. block high goals, block boulder gathering)
- Penalties Description- describe any penalties or fouls the robot committed, if intentional, and violation
- Match Description- describe the overall match (e.g. lost comms, broken, contributed to capture greatly)

## Auto

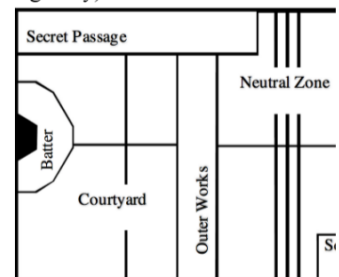
- Defenses- circle cross or reach and state defense name, if applicable
- Shooting- Place tally marks in auto shooting table for which goal and successfulness
  - Use A and a for indicating shooting positions on field
- Use field indicator letters on field drawing to show any shooting positions
- Describe auto code that didn't score in Match Description

## Teleop

- Defenses- place tally marks with defense crossed/attempted and the difficulty
  - Cross is only from neutral to opponent alliance courtyard
  - Indicate crossings that did not score too (e.g. defense is already damaged)
  - If robot leaves the Outer Works and attempts again at a failed cross, that is another tally mark
- Shots- Place tally marks in shooting table for which goal and successfulness, and use T and t for shooting positions
- End- checkmark box choosing successfulness of end game positions
  - (Successful scale requires successful challenge; a failed scale can still have a successful challenge)

## Notes

- Complete sentences are not necessary, go straight to the point without losing important information
- Legible writing
- Do not leave blanks, cross out sections not applicable
- Make sure you have a replacement with necessary scouting materials before switching out



## Quantitative Data Collected

- Team and match number for identification
- Scout name and team number for identification
- Auto
  - A reach or cross of a specified defense during autonomous
  - Number of high and low goals that succeeded and failed in autonomous
- Defense Crosses
  - The number of times a defense was crossed with a certain amount of difficulty (all crosses from neutral to opponent courtyard, even if no points scored)
- Shots
  - Number of high and low goals that succeeded and failed in teleop
- End
  - Indication of a success or failed challenge and scales (including combinations such as failed scale but successful challenge)
- The number of times defended (as specified in Defense Description)

## Location Data Collected

- Starting location
- Autonomous high and low shooting locations (both successes and failures)
- Teleop high and low shooting locations (both successes and failures)

## Description Data Collected

- Robot Description
  - Noteworthy characteristics of the robot's making or actions
  - Assumably consistent throughout matches (e.g. skilled driver with examples, unique shooter description, speed, uncommon drive train, line up speed)
- Penalty Description
  - Penalties received by the specific team and reasoning
- Defense Description
  - If and how defense was played on an opposing robot (e.g. obscured path of entire enemy alliance thus slowing their offense)
  - Quality of defense (e.g. effective defense against 254: blocked 3 shots and slowed opponents)
- Match Description
  - Noteworthy characteristics of the match as a whole (e.g. rematch)
  - Noteworthy characteristics of robot actions in match (e.g. focus on breaching, lost comms immediately after autonomous, lost power, flipped over, pushed rest of alliance onto batter)

# Online Scouting Database

The MARS Online Scouting Database Spreadsheet is an online spreadsheet created through Google Sheets. It analyzes data for all the teams throughout the competition. It includes the competition's picklist, information on each team individually, comparisons of teams, and analysis of entire alliances. Google Apps Script is used to create a Scouting Tools Menu at the top of the spreadsheet to more quickly and efficiently complete necessary tasks, such as creating a Team Sheet for every team at competition and filling in the team numbers for Match Data Input when data is being transferred to the spreadsheet from the Paper Scouting Sheets. These Scripts can be accessed in Tools>Script Editor

## Sheets and Their Functions

### Picklist

- Picklists by Shooters, Breachers, Defenders
- Shows pros, cons, and notes for each team in each position
- All manually inputted at scouting meeting with adjustments anytime following it as necessary

### Control Panel

- Team names and numbers
- Team sheets links in column C that are sent to Slack through /teaminfosheet [team number]

### Information

- Data and analysis for a team specified in C1
- Used as a template for Team Sheets

### Custom Comparison

- Put teams in D3:E8 for the Red Alliance and AM3:AN8 for the Blue Alliance
- Overall alliance analysis
- Ideal defense picks based on alliance's previous success
- Analysis on each individual team with graphs for trends throughout the competition

### Qualification Comparison

- Teams will be automatically placed into the analysis based on the specified qualification number in C2
- Overall alliance analysis
- Ideal defense picks based on alliance's previous success
- Analysis on each individual team with graphs for trends throughout the competition

### Team Comparisons

- Specific quantitative data is collected on each team from Team Sheets
- Can be organized by specified column data (lowest to greatest or vice versa)

#### Match Data Input

- Manually input match data per team per match from paper scouting
- Inputted data is transferred throughout the database

#### Schedule

- Imported qualification schedule from The Blue Alliance
- Not formatted

#### Qualification Schedule

- Formatted qualification schedule from Schedule sheet using OFFSET equations
- Adds "2614" in column J if in the match to be used for filtering in MARS Matches

#### MARS Matches

- Filters column H of Qualification Schedule for "2614" to generate a list of only MARS qualification matches

#### Alliances

- Imports alliances by pick from The Blue Alliance
- Imports elimination bracket from The Blue Alliance

#### Rankings

- Imports ranking from The Blue Alliance
- Imports OPR (Offensive Power Rating) rankings from The Blue Alliance

#### Team Sheets

- Data and analysis for a team specified in C1
- Specific data sheet per team
- Corresponding link in Control Panel
  - Sent to Slack through /teaminfosheet [team number]
- Generated and deleted through Team Sheets scripts
- Uses Information Sheet as a template

#### Scouting Tools Menu

- Created in Google Apps Script with onOpen() function for the online Scouting Database
- Located to the right of the default menus
- Initiated automatically when the spreadsheet is opened
- Fill in Schedule (updateSchedule())- places team numbers into Match Data Input based on Qualification Schedule Sheet to save time and prevent team number input errors
- Team Sheets
  - Generate Team Sheets (generateTeamSheets())- creates a Team Sheet based on Information for each team listed in Control Panel, automatically inputting the team number into C2
  - Delete Team Sheets (deleteTeamSheets())- deletes all previously created Team Sheets

# Slack Integration



MARS uses a team communication app called Slack with a team created for the Strategy Team. Slack uses Slash Commands which trigger certain features. Using custom Slash Commands certain information is sent to a specified Slack channel named “#Infobot”. As of the Newton Online Scouting Database, Infobot posts to Slack from three custom Slash Commands, /teaminfosheet, /qualmatch, and /pun.

## Slash Commands

- /teaminfosheet [team number] - links to the specified team’s Team Sheet
- /qualmatch [qualification number] - links Qualification Comparison and changes C2 to the specified qualification number
- /pun - gives a randomly picked pun from a list in the code

## Notes/Comments

- Thank you to all of our scouting partners throughout the FIRST Stronghold Season
  - Palmetto: 4265 Secret City Wildbots
  - Pittsburgh: 4547 WestyTek
  - Smoky: 4265 Secret City Wildbots
  - Newton: 3504 Girls of Steel, 2393 Robotichauns
- The Blue Alliance importations index numbers change based on current data up. Throughout competition and after competition, index numbers will change to adjust for additional data added such as alliances and elimination brackets. The current Newton Online Scouting Database available is optimized for the current formatting (post-competition formatting).
- To access the script editor of any Google Sheets spreadsheet click the Tools menu at the top and then “Script editor...”
- To organize a sheet by a specific columns data from greatest to least or vice versa, right click on the letter name of the chosen column and click “Sort Sheet A -> Z” or “Sort Sheet Z -> A” as necessary.



# Available MARS Scouting Resources

## **Newton Online Database**

<https://docs.google.com/spreadsheets/d/1MmqZKaqdiNWPYjyURGS6DUc3er48yZIs3vLPsiZXKO4/edit#gid=784846657>

## **Newton Scouting Database Google Apps Script**

[https://script.google.com/macros/d/MaHRxjVmSUzY4p6G7YFOv6FeljcchuUYc/edit?uiv=2&mid=ACjPJvELJXDo6t5Je9CeQSbub-UoAn5skjHRGTZ-Jn8ZoL2Zlv5g-6JMyzyciA3tavHElftEEU4ArfKyYOITC-\\_gi40zsufIC93\\_uLhtywFNp6HDWN5xAIh8kQ6kC8cX1fSyxVOIXeM9O40](https://script.google.com/macros/d/MaHRxjVmSUzY4p6G7YFOv6FeljcchuUYc/edit?uiv=2&mid=ACjPJvELJXDo6t5Je9CeQSbub-UoAn5skjHRGTZ-Jn8ZoL2Zlv5g-6JMyzyciA3tavHElftEEU4ArfKyYOITC-_gi40zsufIC93_uLhtywFNp6HDWN5xAIh8kQ6kC8cX1fSyxVOIXeM9O40)

## **Scouting Bot/Infobot Google Apps Script**

[https://script.google.com/d/1z0HpdgDaxsoh1d8LZhvvaGph1k6PwdeBfyYvCEo8D1K7BaYaEqrKmVyk/edit?usp=drive\\_web](https://script.google.com/d/1z0HpdgDaxsoh1d8LZhvvaGph1k6PwdeBfyYvCEo8D1K7BaYaEqrKmVyk/edit?usp=drive_web)

## **Scouting Sheet**

<https://drive.google.com/file/d/0BwGs1BOoIxO9Ti1jWHNFaDNnVTQ/view?usp=sharing>