1712 DAWGMA

WATCHDAWG REBUILT™

User Manual

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OVERVIEW

- Dawgma's scouting system provides a front end data collection application (WatchDawg) on Android Amazon Fire 7 tablets, as well as back-end Microsoft Excel driven data analysis

- WatchDawg allows teams to record quantitative robot data during competition as well as qualitative pit scouting and export that data as a csv file and/or a QR code

- The spreadsheet allows teams to store data of all teams in one location, easily view that data for match strategy insights, and compare teams across various metrics with visualization

- Teams can transfer data from the match strategy worksheet (in the excel spreadsheet) to a physical match strategy sheet, which can then be handed to drive teams

LIST OF MATERIALS

- Laptop that can run Microsoft Excel (including VBA macros)
  - x1
- 2D Barcode Scanner
  - x1
  - Description: A barcode scanner is an optical scanner that can read printed bar or QR codes, decode them, and print the resulting information. It must be connected either wirelessly or wired to your laptop and must be able to read QR codes, as opposed to just barcodes.
- Amazon Fire 7 Tablets (the Amazon Fire 7 2022 should work as well)
  - x7 (6 for use, 1 for backup)
  - Description: A tablet is a small, touchscreen computing device that is intended to be portable, yet with more processing capabilities than the average smartphone. Amazon Fire tablets were developed in 2011 as a replacement for the Kindle Series. The tablet featured a low price point that was attractive to many consumers. The series is currently in its 7th Edition, which is what our system is designed to use.
- Tablet Cases (optional)
  - x7 (6 for use, 1 for backup)
  - Description: A tablet case is a protective attachable layer designed for a tablet computer. It can provide protection against drops. The tablet case must be able to fit the Amazon Fire 7th series.
- Screen Protectors (optional)
  - x7 (6 for use, 1 for backup)
  - Description: A screen protector is a thin layer of protective material applied to the touchscreen of the tablet. It is not intended to be removed, but must occasionally be replaced after a large incident. The protector must fit the Amazon Fire 7th series screen.
- Portable charger (optional)
  - x3
  - Description: A portable charger is an energy storage device that can transfer electric power into another device. This can be used to recharge the tablets during a competition, without relying on electrical outlets. The tablet's battery life is powerful enough that this is not necessary, but a backup is always smart.

SCOUTING APP

SETTING UP YOUR TABLETS

- Follow set-up instructions given by the tablet
- Download the app "WatchDawg" from the Amazon Fire Store
    - If that is unavailable, follow github download instructions
    - To download the app from github first download Android Studio
    - Clone the github repository found on the Dawgma 1712 website
    - Enable developer options on your Amazon Fire Tablets
- Open "Device options"
- Open "About Fire Tablet"
- Tap your serial number 7 times to enter Developer Mode
- A new menu should appear in settings called "Developer Options"
- Open Developer Options, toggle it on
- Scroll down and find "USB debugging", toggle it on
- Plug in Micro-usb to laptop and tablet
- Click the "Run" button

<u>Repeat this process for all tablets</u>
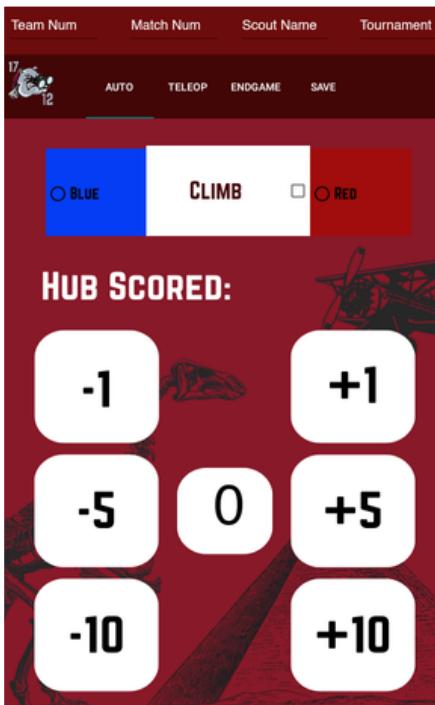
FRONT PAGE

- First page loaded when the app is opened
- Gives the option for either Match or Pit Scouting
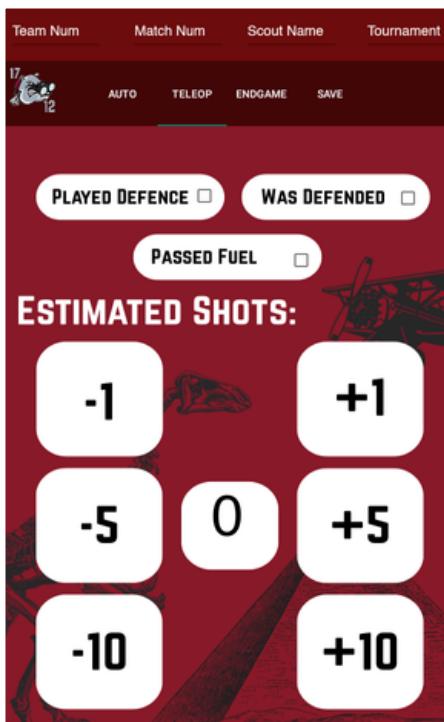
Match Scouting

- Once the match scouting layout opens, enter the team number of the robot being scouted, and the match number, and your name
- To switch between tabs simply swipe right or left, or press the tab that you wish to switch to
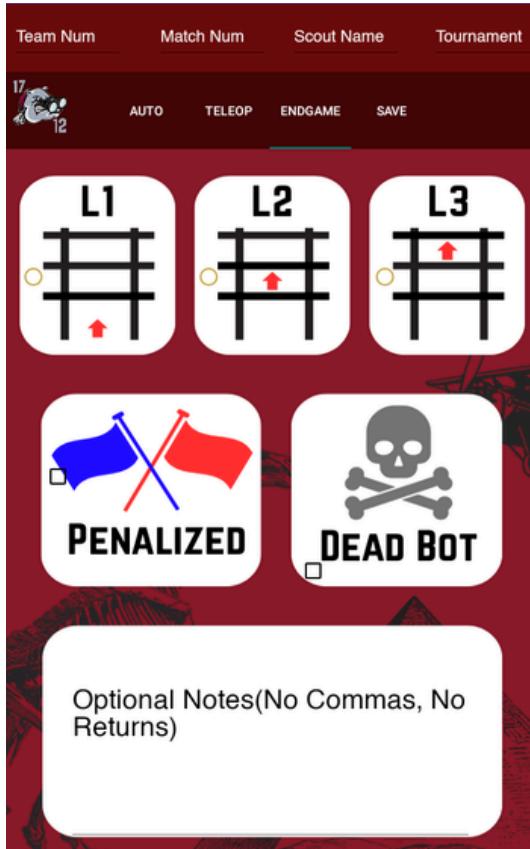
AUTO

- Note the alliance the robot is on
- Observe if the robot had climbed in auto
- Observe the number of fuel scored at the hub (+1, +5, +10)
- Press (-) to decrease and (+) to increase
- Numbers persist after switching tabs
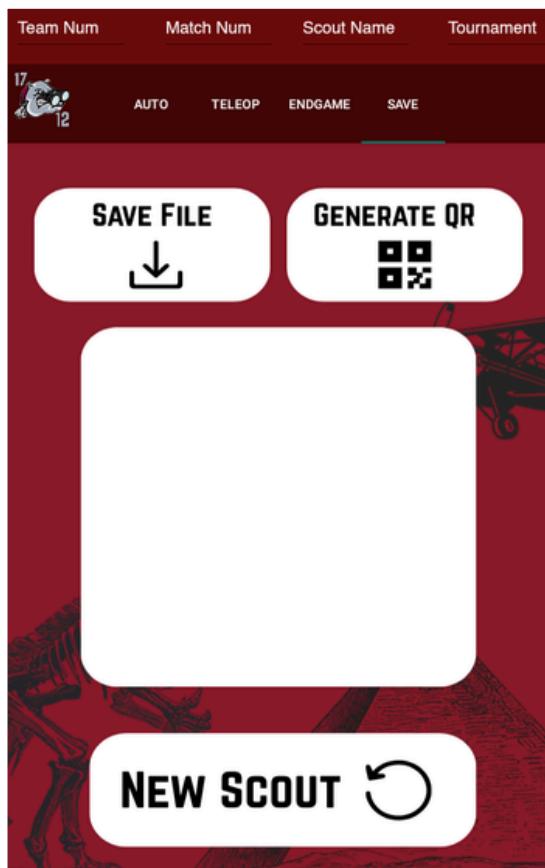
TELEOP

- Observe the same conditions as auto
- Also Check for the following conditions:
  - Played Defense
  - Was Defended
  - Passed Fuel

ENDGAME

- Check the box that represents the final state of the robot. If none are applicable: leave them blank.
- If the robot died at any point during the match, press "Dead Bot"
- If the robot committed a penalty during the match, press "Penalized"
- Write down any additional relevant information Do not include any Commas or Returns
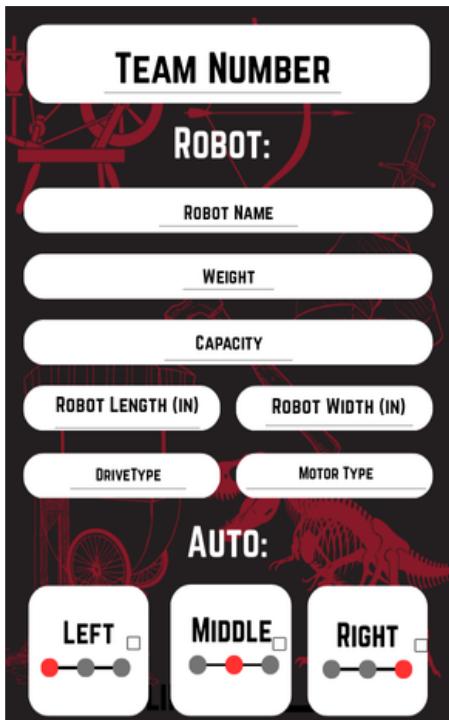
SAVE DATA

- Press "**SAVE FILE**" to download a csv file of match data (this is just for backup). To access this file, plug the tablet into your computer, open your file explorer, the tablet's hard drive should appear. Open that and the file will be in the downloads folder. The file is automatically named according to the match and team number.
- Press "**Generate QR**" to generate a QR code for data transfer. This must be created (and scanned) before starting a new match or else the data will not be saved.
- Press "**New Scout**" to return to the home screen

Pit Scouting

- In Pit Scouting, scouts go to other team's pits and ask questions about the robot. This offers the opportunity for additional information such as weight, auto routines, and drivetrain type to be entered into the system, providing additional information. Never include commas or returns in responses
- Pit Scouting should be done either before the matches start, during breaks, or with additional tablets
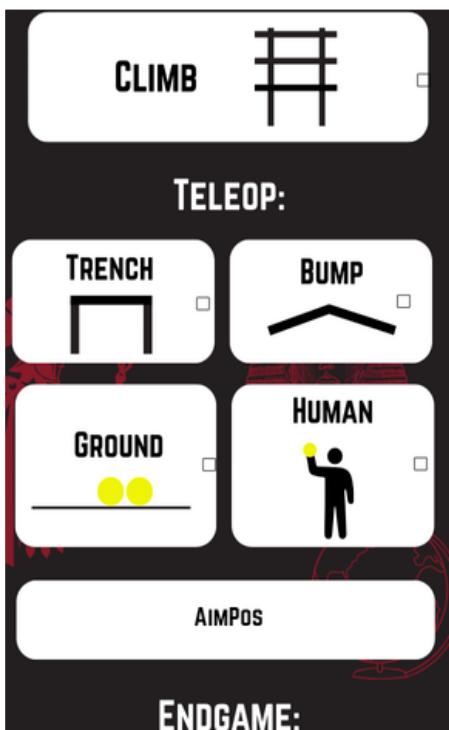
Questions to ask

- Weight with bumpers and battery?
- Drive motor type? (e.g. Falcon 500s, Neos)
- Number of drive motors?
- Drive type? (e.g. Swerve, tank)
- Robot length and width?
- Intake method?
- Ability to climb ?
  - Can climb in auto?
  - Can climb in which levels?
- Climb features?
- Auto routines?
  - (How many fuel during)
- Any additional special features?
- Robot name?

Saving Method
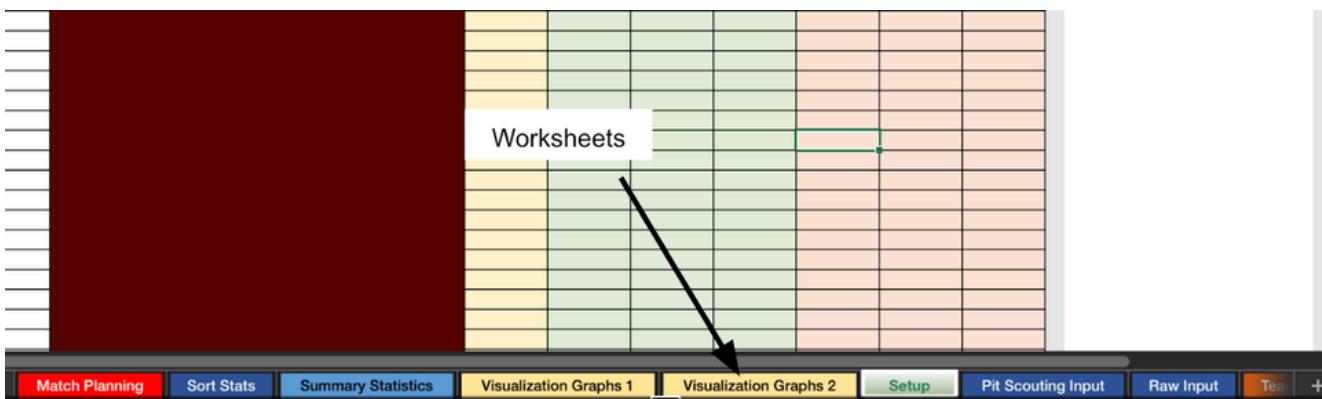
- Pressing the save button saves the QR code image file to the tablet's "Downloads" folder. This allows multiple QR codes to be saved, so you may pit-scout multiple teams' robots without scanning the QR code after each one, saving the scanning for the end.
- To access, go through the Files app and scan all the saved QR codes.

SPREADSHEET
Overview

The spreadsheet is where all collected data is compiled, stored, and analyzed. Data is scanned into the "Raw Input" sheet and is then automatically sorted into individual Team Sheets which analyze the data, and store their analysis in "Summary Statistics." "Sort Stats" and "Visualization Graphs" give options for comparing teams for picklisting. "Match Planning" gives teams data on a specific match allowing them to strategize accordingly. "Team Finder" brings up data on a specific team

For those unfamiliar with Excel, some important terms:
- Worksheets are the "pages" of the Spreadsheet
- Cells are the individual boxes in the spreadsheet
- Macros are code in Visual Basic that can be run in the spreadsheet
- Worksheets can be hidden by right clicking on the worksheet and selecting "Hide"
- Right click again to unhide any number of sheets. This can be helpful to decrease the amount of worksheets at the bottom of the page

- In column A, input all teams participating in the competition.
- Press generate team sheets to create individual sheets
- Fill out your team's match schedule
- The Scout Leaderboard keeps track of how much scouts have scouted, and also their accuracy in points off

RAW INPUT SHEET (ABOVE) AND PIT SCOUTING INPUT (BELOW)

- To input data:
- Press team cell (column A)
- Scan QR code on tablet (The information scouted will be automatically loaded into selected column)
- Press expand data while selecting the cell (can also select multiple cells at once)

- If data scanned contains commas or returns in the extra notes, undo (command z or control z depending on computer) to make sure it takes up only one row

INDIVIDUAL SHEET

- Template for the team information (The Generate Team Sheets macro copies this sheet as many times as needed and renames them appropriately)
- Hidden

SUMMARY STATISTICS SHEET

- Data for all the teams' performance in the competition

SORT STATISTICS SHEET

- Sorted version of data for all the teams' performance in the competition
- Select statistic to sort for and ascending or descending order

MATCH PLANNING SHEET

- Data for alliance robots and opponent robots of YOUR teams matches
- Make sure the match schedule is filled out in the "Setup" worksheet
- In cell B35, select from the dropdown menu the number of your next match
  - For example, you have already played 3 matches at competition and are getting ready for your 4th, select the number 4 in cell B35
- To make it easier to get this data to the drive team, we have provided a pdf of a physical Match Planning sheet that can be printed out
  - Print out enough sheets to use for all matches YOUR TEAM might participate in (including qualifications and playoffs)
  - At competition, copy down data from the "Match Planning" worksheet to the physical Match Planning sheet when you have an upcoming match
  - Hand the physical Match Planning sheet to your drive team.

VISUALIZATION DATA SHEET

- Data that's formatted for Visualization Graphs
- Hidden
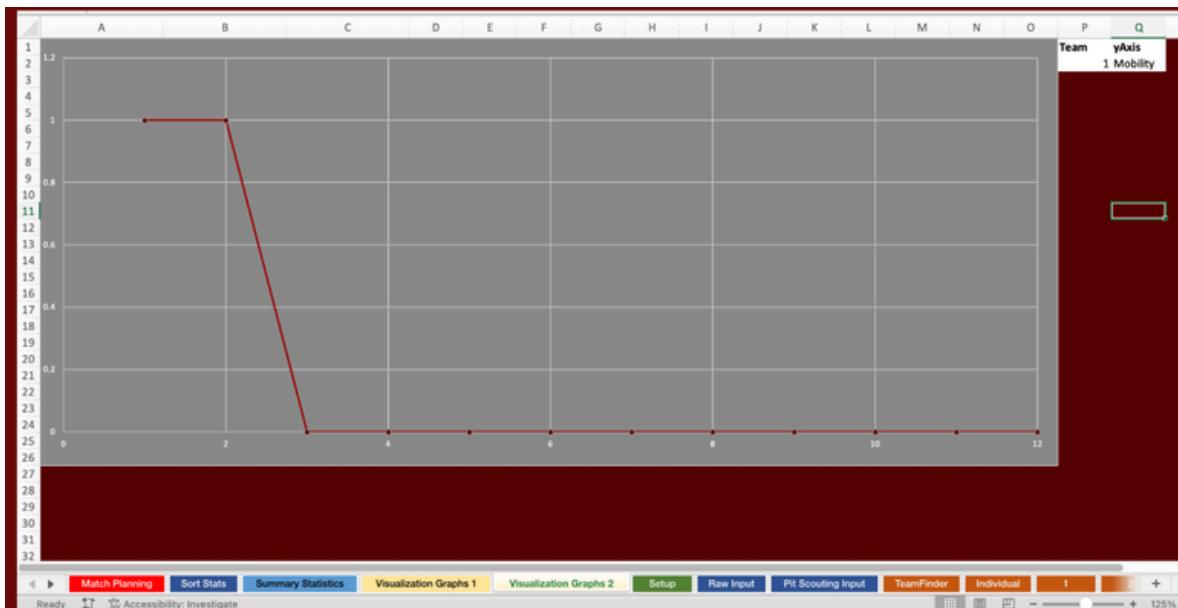
VISUALIZATION GRAPH SHEETS

- "Visualization Graphs 1" contains two graphs
  - The left graph compares all teams at the competition across 3 different metrics
  - Select metrics using the drop down menus in cells A28, B28, and C28
    - Be aware that the left graph suffers from a clutter issue, in which it's difficult to see team numbers when many data points overlap
    - The left graph needs to be adjusted! Set all of the limits to the number at the bottom of the sheet:

- The right graph compares 3 select teams at the competition across 3 different metrics
  - Metrics [a]are selected using the same dropdowns as in the left graph
  - Teams are selected using the drop down menus in cells E28, F28, G28

Visualization Graphs 2 contains one graph:

- This graph allows you to easily see a team's performance over the course of their 12 matches
  - Use drop down menu A15 to select a team
  - Use drop down menu B15 to select a metric

Notes and Acknowledgements

WATCHDAWG has been in various stages of development for several years now. The oldest versions of the spreadsheet we can find date back to 2017, and the app began development in 2020. Given how many times he has embedded his name in our macro code, we assume Gabriel would be delighted for us to acknowledge the work he did to establish the scouting spreadsheet in a form we still use today. Guanjie significantly improved the layout of the spreadsheet in 2019. The scouting app was spearheaded by Michael and Mark L, with help from their mentor, Kimee. Pit scouting digitally was finished in 2023 by Andy. In 2023 WatchDawg saw its first visual improvement worked on by Simon, Mason, and Ivan. DataDawg is a new Database hosted in Firebase which is currently in its Beta and hopefully will be fully ready in 2027, thank you to Moin and Mason for working on this. We are all excited for years of work to culminate in this public release.

WATCHDAWG 2025 was created by Officer Simon, Nate, Ethan, and Moin. The Code for the app was completed mostly by Simon. Simon also created the spreadsheet. The beautiful UI was created this year by the Media Captain Jesse. Garrett also edited this user manual you are reading right now. Last but not least, Marin edited the scouting awards created by Ivan. We would all like to thank our mentor, Yuval, for his assistance in starting working on our experimental DataDawg system to replace excel. Moin was the main contributor to this effort during build season, and I would like to give a special thanks to Moin for even contributing while spending a month in India. We would like to thank Terrance for his help with Git, Ada and Emily for UI feedback, and Conor for the logo. Finally, we would like to thank our lead mentor, Sean, for his long-time support for a publicly released scouting system. Without him, none of this would be possible.

On another note, we would like to thank George for engaging in conversation with us while we avoid working. Also would like to remember Mr. Elder who retired last year, and all of scouting and strategy wish he was still here. We would like to thank everyone for reading this and using our app.

- Simon
DAWGMA Scouting and Strategy Officer 2023-2026