2022-2023 FIRST® Tech Challenge
Field Inspection Manual
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Volunteer Thank You

Thank you for taking the time to volunteer for a FIRST® Tech Challenge event. FIRST® and FIRST® Tech Challenge rely heavily on volunteers to ensure events run smoothly and are a fun experience for teams and their families, which could not happen without people like you. With over 6,500 teams competing yearly, your dedication and commitment are essential to the success of each event and the FIRST Tech Challenge program. Thank you for your time and effort in supporting the mission of FIRST!

<table>
<thead>
<tr>
<th>Revision</th>
<th>Date</th>
<th>Description</th>
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<tbody>
<tr>
<td>1</td>
<td>7/19/2022</td>
<td>Initial Release</td>
</tr>
</tbody>
</table>

Contents

Contents .................................................................................................................................................. 3
Introduction ......................................................................................................................................... 5

What is FIRST® Tech Challenge? ........................................................................................................ 5
Gracious Professionalism® .................................................................................................................. 5
FIRST Privacy Policy ............................................................................................................................. 5
Volunteer General Information ........................................................................................................... 5
Volunteer Training and Certification ................................................................................................... 5
Volunteer Minimum Age Requirement ................................................................................................ 6
Bring a Friend! ....................................................................................................................................... 6
Helping Teams Succeed ......................................................................................................................... 6
Job Description ..................................................................................................................................... 6
Introduction .......................................................................................................................................... 6
Event Time Commitment ....................................................................................................................... 7
Overview of Responsibilities ................................................................................................................ 7
Lead Field Inspector ............................................................................................................................. 7
Prerequisite for Lead Field Inspector Role .......................................................................................... 7
Field Inspector ..................................................................................................................................... 7
Pre-Event Day Responsibilities ........................................................................................................... 8
Event Day Responsibilities .................................................................................................................. 8
Helping Teams Succeed ......................................................................................................................... 9
Field Inspection Process ....................................................................................................................... 9
Field Inspection Checklist .................................................................................................................... 9
Allowed Android Devices ..................................................................................................................... 9
Driver Station and Robot Controller Software Inspection ....................................................................... 9
Programming Language Versions .......................................................................................................... 11

Allowed Hardware System Versions .................................................................................................... 11

Gracious Professionalism® - “Doing your best work while treating others with respect and kindness - It’s what makes FIRST, first.”
Robot Operation Inspection................................................................. 12
Robot Sensor Calibration...................................................................... 13
Queueing Process .............................................................................. 13
Disabling a Robot ............................................................................. 13

Inspection Troubleshooting ............................................................... 13
Repeated Failures ........................................................................... 13

Field Inspection Tips and Tricks ...................................................... 14
Inspector Specialization .................................................................. 14
Tabletop Inspection Time Goal ....................................................... 14
Express Robot Operation Inspection at the Playing Field ............... 14

2022-2023 Season Changes and Topics for Emphasis .................. 14

Appendix A – Resources ................................................................. 16
Game Forum Q&A ............................................................................. 16
Volunteer Forum ............................................................................ 16
FIRST Tech Challenge Game Manuals ............................................. 16
FIRST Headquarters Pre-Event Support ........................................... 16
FIRST Tech Challenge Event On-Call Support ................................. 16
FIRST Websites ............................................................................... 16
FIRST Tech Challenge Social Media ............................................... 16
Feedback ......................................................................................... 16

Appendix B – Field Inspection Checklist ........................................ 17
Introduction

What is FIRST® Tech Challenge?
FIRST® Tech Challenge is a student-centered program that focuses on giving students a unique and stimulating experience. Each year, teams engage in a new game where they design, build, test, and program autonomous and driver operated robots that must perform a series of tasks. Participants and alumni of FIRST programs gain access to education and career discovery opportunities, connections to exclusive scholarships and employers, and a place in the FIRST community for life. To learn more about FIRST® Tech Challenge and other FIRST® Programs, visit www.firstinspires.org.

Gracious Professionalism®

FIRST® uses this term to describe our programs’ intent.

Gracious Professionalism® is a way of doing things that encourages high-quality work, emphasizes the value of others, and respects individuals and the community.

Watch Dr. Woodie Flowers explain Gracious Professionalism in this short video.

Learn more about the roles of volunteers on our Volunteer Resources page, “Volunteer Role Descriptions”.

FIRST Privacy Policy

FIRST takes the privacy of our community seriously. As a nonprofit and a mission-driven youth-serving organization, we are compelled to understand who we are serving, how our programs are performing, and make improvements so that we can achieve our goals of making FIRST accessible to any youth who wants to be part of the fun, exciting and life-changing experience. Thus, we need to collect certain personal data from participants and volunteers to ensure we are meeting our goals and responsibilities as a youth-serving nonprofit organization.

As a volunteer, you may be asked to handle the personal data, or personally identifiable information (PII), of coaches, team members, and even other volunteers. It is critical that you understand and follow the FIRST Privacy Policy and complete any data protection and privacy training required by your role. If you have any questions regarding data protection and privacy, please reach out to the FIRST Data Governance Team at privacy@firstinspires.org.

Volunteer General Information

Volunteer Training and Certification
To Access BlueVolt and Complete a Volunteer Role Training Course:
Once you have applied for a volunteer role that requires certification a link will appear in your FIRST dashboard that will connect you to our learning management system BlueVolt.

1. Login to your FIRST Dashboard
2. On the grey menu below “Dashboard” Click on “Volunteer Registration”
3. Click on “Roles Missing Certification”
   a. Click into the link to “Review Outstanding Tasks” which will take you to the BlueVolt site where you can complete your certifications and sign up for new training

Gracious Professionalism® - “Doing your best work while treating others with respect and kindness - It’s what makes FIRST, first.”
How to Access BlueVolt After Certifications are Complete:
Once you complete your certifications, you will no longer see a “Roles Missing Certification” link or a link to “Review outstanding Tasks” to get to BlueVolt. If that is the case, follow the steps below to access BlueVolt courses and updates.

1. Login to your FIRST Dashboard
2. At the top right of the page, click on the dropdown under your name and go to “My Profile”
3. Once there, on the left menu of the page, click on the “Certifications” link which will take you to the BlueVolt site where you can view/print your existing certifications and sign up for new training

If you have applied for a role but do not see the link to training in your dashboard, or you have other training related questions please email FTCTrainingSupport@firstinspires.org.

Volunteer Minimum Age Requirement
The minimum age requirement of a FIRST volunteer is 13 years old.

A minor must have a parent or guardian give written permission to volunteer. In addition, the FIRST Consent and Release Forms will need to be signed by a parent or guardian in the Volunteer Registration system for any volunteer under age 18.

Bring a Friend!
Volunteers are a huge part of the FIRST Tech Challenge Program and continuing to inspire students to seek out careers in science, technology, engineering, and math (STEM). FIRST Tech Challenge needs your help in recruiting new volunteers to keep our programs thriving for future generations! If you have a friend or co-worker you think would be interested in volunteering at an event, there are just a few easy steps to help get them involved!

1. Check out our full list of volunteer opportunities online!
2. Have them apply for the Event in the Volunteer Registration System. Volunteers must be screened before volunteering.
3. Have them contact Firsttechchallenge@firstinspires.org with any questions they may have.

If they are concerned about jumping in head first, no worries! Job shadowing at a FIRST Tech Challenge Event is a great way to get a taste of what a full day’s worth of competition looks like. New volunteers can discover ways they can fit their personal skills into a volunteer position!

Helping Teams Succeed
A volunteers role is about helping a team succeed so they can compete. Teams spend countless hours, weeks and sometimes months working and reworking their robot design and strategies. After all this effort, some teams will still need a friendly volunteer to help create a positive event experience for the students.

Job Description

Introduction
The field inspection process is in place to ensure that every team and their robot can successfully compete in a match. The field inspector will go through the field inspection checklist which includes verifying settings on the team’s Android devices, running a practice match, and instructing teams about a tournament’s unique match play procedures.

A field inspector needs to have the following knowledge/skills:
- Familiarity with the FIRST Tech Challenge control system;
- Experience with devices using the Android operating system; and

Additional features of the field inspector volunteer role include:

**Physical/Technical Requirements:**
- Technical – Medium
- Physical – Low
- Administrative – Low
- Communication – High

**Time commitment:**
- Pre-event training: field inspectors should expect to spend two to three hours to go through required reading/training prior to the event.
- Event day: A field inspector may only volunteer at an event for 2 hours, as the field inspections happen at the beginning of the event. Field inspectors might also serve in another role once field inspection is complete. If a field inspector has indicated on their application they are available for the full day, the tournament director may assign them another role once field inspections are completed.

**Proper Safety Attire:**
- Wear comfortable, close toed-and closed-back shoes that will not damage the competition playing field foam tile floor. Most of the volunteer’s time will be spent standing or walking around the competition area.
- ANSI Z87.1 certified safety glasses are required in the competition and pit areas.

**Event Time Commitment**
Most FIRST Tech Challenge events are whole-day events. While field inspection happens at the start of the event, many field inspectors fill other volunteer roles at an event.

**Overview of Responsibilities**

**Lead Field Inspector**
Field inspectors perform mandatory field inspections to ensure that every robot can successfully compete in a match. Lead field inspectors supervise the field inspectors and act as a resource to the field inspectors performing the inspections. The lead field inspector’s responsibilities include:

- Collaborate with the tournament director and lead robot inspector to create an inspection schedule.
- Assure that the required field inspection tools and materials are available on event day.
- Work closely with the lead robot inspector so that the entire inspection process runs smoothly, and all robots pass inspection before the opening ceremony.
- Provide periodic progress updates to the tournament director and field technical advisor.

**Prerequisite for Lead Field Inspector Role**
To serve as a lead field inspector, previous experience as a field inspector is required.

**Field Inspector**
The field inspection process is in place to ensure that every robot can successfully connect wirelessly and compete in a match. The field inspector must also go through the field inspection checklist which includes verifying settings on the team’s Android devices, to reminding the teams to arrive on time for each match.
Pre-Event Day Responsibilities

FIRST Tech Challenge tournaments squeeze a lot of activity into one day. One of the keys to running a smooth and successful event is for teams and volunteers to show up prepared. Teams spend countless hours preparing for competition day and we ask our volunteers to prepare for tournament day as well. Field inspectors are required to participate in training prior to the event. This training is provided by FIRST Headquarters.

Required reading for training:

- The Field Inspection Manual.
- Sections 7 and 8 of the Game Manual Part 1 – Traditional Events.
- The Field Inspection checklist.

It is important prior to the event that the field inspector reviews these manuals. To access the appropriate training materials to fulfill this role, make sure to apply to the position in the volunteer registration system. Upon application, an email will be sent providing access the field inspector training folder which includes a copy of this manual, call schedules for robot and field inspector monthly key role discussion calls, and recordings from past calls. The most current version of the Game Manual Part 1 – Traditional Events is located on our website.

Event Day Responsibilities

It is the responsibility of the field inspector to:

- Greet the team. Inspectors are generally the first volunteer a team will interact with.
- Verify that the team’s driver station and robot controller have the correct hardware, software, and operating system.
- Verify that the driver station and robot controller’s settings follow the rules in the Game Manual Part 1 – Traditional Events.
- Conduct practice matches to ensure the driver station connects using Wi-Fi with the robot controller, and to confirm the driver station can properly control the team’s robot.
- Help the team to be successful.
- Be fair and apply the same level of thoroughness for every team.
- Treat all teams with Gracious Professionalism®.

Field inspections generally take place at the beginning of the event. The inspections run concurrently with robot inspections (where the robot inspectors inspect the team’s robot hardware) and team judging appointments. Robots are not required to pass robot inspection before attending field inspection. Each inspection should take approximately 10-15 minutes. The following supplies (provided by the tournament director or lead field inspector) will be available:

- Field inspection checklist for each team (located in the Game Manual Part 1 – Traditional Events).
- Field Inspection Manual.
- Sections 7 and 8 of the Game Manual Part 1 – Traditional Events.
- A printout of the relevant sections of the Game Q&A Forum (forum responses are official and enforceable and sometimes supersede the game manual).
- Team list.
• Inspection stickers or other method of identifying robots that have passed field inspection that can be placed onto the robot. Field inspection stickers are not required and are used at the discretion of the lead inspector and the tournament director.
• Pens.

**Helping Teams Succeed**
A common theme you will read throughout this manual is that the field inspector’s role is not just about the inspection, it is about helping a team succeed and be able to compete. Teams spend countless hours, weeks and sometimes months working and reworking their robot design and strategies. After all this effort, some teams will still need a friendly field inspector to help them solve unexpected issues.

The recommended inspection schedule and procedures were created with the expectation that teams and volunteers will have a low stress and successful experience. If inspection runs behind schedule, keep in mind that volunteers still need to give every team the best possible experience; be kind and do not rush teams.

**Field Inspection Process**

The field inspection is independent of robot inspection. The field inspection generally takes place at the competition fields in order for the team to demonstrate that the robot functions as it should per the *Game Manual Part 1 – Traditional Events* rules. If inspection times are not scheduled, teams may do the field inspection first if they find the line too long at the robot inspection station (and vice versa).

The field inspectors core responsibilities are:

- Checking the driver station and robot controller for the correct settings.
- Make sure the driver’s station wirelessly connects with the robot controller.
- Reviews the field inspection checklist.
- Verifies robot performance by running a practice match.

The field inspection checklist is in the *Game Manual Part 1 – Traditional Events* as well as in Appendix B of this manual. This is the complete list of the items a field inspector will need to check off to pass a team through the field inspection. In addition, Appendix C and D of this document outlines the manual steps a field inspector can take to make sure the driver’s station and robot controller are configured properly and can connect to each other over Wi-Fi.

**Field Inspection Checklist**

The field inspector must check off each step in the field inspection checklist prior to passing the team for field inspection. The drive team coach and at least one driver should report to field inspection.

**Allowed Android Devices**

**Smartphones:**

a. Motorola Moto G 2\textsuperscript{nd} Generation†

b. Motorola Moto G 3\textsuperscript{rd} Generation†

c. Motorola Moto G4 Play (4\textsuperscript{th} Generation)/Motorola Moto G4 Play**

d. Motorola Moto G5

e. Motorola Moto G5 Plus

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**Gracious Professionalism**\textsuperscript® - “Doing your best work while treating others with respect and kindness - It’s what makes FIRST, first.”
f. Motorola Moto E4 (USA versions only, includes SKUs XT1765, XT1765PP, XT1766, and XT1767)
g. Motorola Moto E5 (XT1920)
h. Motorola Moto E5 Play (XT1921)

Other:

i. REV Driver Hub**

j. REV Control Hub***

No other Android Devices may be used as Robot Controllers or Driver Stations. See Rule <RS03> for the approved list of Android Operating System versions.

A smartphone Android Device Robot Controller USB interface may only connect to a REV Expansion Hub, or a USB hub.

†The use of smartphones operating on Android version 6 (Marshmallow) are allowed in the 2022-2023 season. However, in the 2023-2024 season the minimum version is Android 7 (Nougat); this will effectively end support for the moto G2, Moto G3, and non-updated Moto G4 smartphones.

*The Motorola Moto G4 Play may be sold as either Motorola Moto G Play (4th gen)”, or “Motorola Moto G4 Play”. Either phone is acceptable however FIRST Tech Challenge highly recommends that Teams purchase either model number XT1607 or XT1609, as these are the US versions and have been tested and are fully compatible with the FIRST Tech Challenge software. Teams that have purchased phones with model numbers XT1601, XT1602, XT1603, or XT1604 may continue to use these phones as legal, however there is a potential for issues with these phones not being fully compatible with the software or the approved gamepads.

**The REV Driver Hub may only be used as part of the Driver Station and not as the Robot Controller.

***The REV Control Hub may only be used as part of the Robot Controller and not as the Driver Station.

Driver Station and Robot Controller Software Inspection

The purpose of the software inspection is to make sure the Android devices and/or REV Expansion Hub have the correct settings. The field inspector will have to check to ensure:

- The driver station operating system is at least:
  - 7.0 or higher (Motorola Moto G5, Motorola Moto G5 Plus, Motorola Moto E4, Motorola Moto E5, Motorola Moto E5 Play)
  - 6.0 or higher (Motorola Moto G 2nd Generation, Motorola Moto G 3rd Generation, Motorola Moto G4 Play)
- Driver station uses the official FIRST Tech Challenge driver station app to control the robot.
- The FIRST Tech Challenge robot controller app when running on an Android phone is the default app for the USB-connected hardware modules on the robot.
- Robot controller is set to the correct Wi-Fi channel (if required by the tournament). Bluetooth is “OFF”, and Airplane Mode is “ON”
- Driver’s station is named appropriately with the team number followed by “-DS”
  - If the team is using a spare, the name should be the team number followed by a hyphen then a letter designation beginning with “A” (for example, “12345-A-DS”, “12345-B-DS”).
- Robot controller is named appropriately with the team number followed by “-RC”
  - If the team is using a spare, the name should be the team number followed by a hyphen then a letter designation beginning with “A” (for example, “12345-A-RC”, “12345-B-RC”)
• The driver station is not connected to any local networks except for the robot controller’s wireless network.
• All remembered Wi-Fi Direct groups have been removed.

One field inspector may perform the software checks with a group of up to four teams at a time. It is easy and time efficient to verify each checklist item for several teams at once. If a team has trouble at any point in the checklist, encourage them to get help from one of the other teams in your group or help them yourself if you know the solution.

The Robot Self-Inspection App has been integrated into the driver station and robot controller apps. Ask the team(s) to run the software inspection function from the dropdown menu in the driver station and robot controller apps to display the status of all the software rule checklist items on a single screen. Using the robot self-inspection app is highly recommended because it reduces the time needed for field inspection. Appendices C and D contain instructions for manually checking the Android device software settings. Use these instructions as a guide to correct deficiencies identified on the robot self-inspection status screen.

Programming Language Versions
The following tools are recommended for use in the FIRST Tech Challenge:

a. FTC Blocks Development tool – a visual, blocks-based programming tool hosted by the Robot Controller.

b. FTC OnBot Java Programming tool – a text-based integrated development environment hosted by the Robot Controller.

c. Android Studio – a text-based integrated development environment.

d. Java Native Interface (JNI) & Android Native Development Kit (NDK) – Teams can incorporate native code libraries into their apps using the JNI framework and the Android NDK.

Allowed Hardware System Versions
The following table lists the Android Devices, minimum Android versions, minimum operating system and firmware versions, and minimum FTC software versions allowed per device.

<table>
<thead>
<tr>
<th>Android Smartphones</th>
<th>Minimum Android Version</th>
<th>Minimum FTC Software Version</th>
</tr>
</thead>
<tbody>
<tr>
<td>Motorola Moto G 2nd Generation</td>
<td>6.0 (Marshmallow)</td>
<td></td>
</tr>
<tr>
<td>Motorola Moto G 3rd Generation</td>
<td>6.0 (Marshmallow)</td>
<td></td>
</tr>
<tr>
<td>Motorola Moto G4 Play (4th Generation) / Motorola Moto G4 Play (See &lt;RE06&gt; for details)</td>
<td>6.0 (Marshmallow)</td>
<td></td>
</tr>
<tr>
<td>Motorola Moto G5</td>
<td>7.0 (Nougat)</td>
<td>8.0</td>
</tr>
<tr>
<td>Motorola Moto G5 Plus</td>
<td>7.0 (Nougat)</td>
<td></td>
</tr>
<tr>
<td>Motorola Moto E4 (USA versions only, includes SKUs XT1765, XT1765PP, XT1766, and XT1767)</td>
<td>7.0 (Nougat)</td>
<td></td>
</tr>
<tr>
<td>Motorola Moto E5 (XT1920)</td>
<td>7.0 (Nougat)</td>
<td></td>
</tr>
<tr>
<td>Motorola Moto E5 Play (XT1921)</td>
<td>7.0 (Nougat)</td>
<td></td>
</tr>
</tbody>
</table>

Adapted from the “Robot Inspection for FTC” app developed by Team HazMat: 9227 and 10650.
### REV Hubs

<table>
<thead>
<tr>
<th>Device</th>
<th>Minimum Software</th>
<th>Minimum Firmware Version</th>
<th>Minimum FTC Software Version</th>
</tr>
</thead>
<tbody>
<tr>
<td>REV Control Hub</td>
<td>Control Hub OS 1.1.2</td>
<td>Firmware 1.8.2</td>
<td>Robot Controller 8.0</td>
</tr>
<tr>
<td>REV Expansion Hub</td>
<td>Firmware 1.8.2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>REV Driver Hub</td>
<td>Driver Hub OS 1.2.0</td>
<td></td>
<td>Driver Station 8.0</td>
</tr>
</tbody>
</table>

Note: The REV Hardware Client software can be used to install software onto the REV Hubs.

**IMPORTANT:** Rules <RS02> or <RS03> do not require that Teams upgrade to the latest version of the software. A mandatory upgrade (announced by FIRST) would only be required if FIRST determined there was a critical software fix that must be adopted by Teams. Teams must install the upgrade before the time of competition. Additionally, beta versions of the software are allowed at official tournaments. Mandatory upgrades will be communicated in the following ways:

- Via Team Blast – The mandatory upgrade and version number will be communicated to Teams on the Team Blast, which will also show the date the required upgrade must be made.

- Online – the minimally required software will be listed on our Technology Resources page, with the date Teams are required to make the mandatory software upgrade.

- Forum – The minimally required software will be listed in the Technology Forum page, with the date Teams are required to make the mandatory software upgrade.

Templates for all programming choices are available through the links located at [http://www.firstinspires.org/node/5181](http://www.firstinspires.org/node/5181).

Field inspectors should not fail a team for not having the latest versions of the software. A team should only fail for not having the minimally required software as indicated by FIRST.

### Robot Operation Inspection

The robot performance inspection is a vital test to ensure that a robot will operate successfully in its first qualification match and for the competition. Field inspection verifies that the driver station can wirelessly control the robot; the robot operates as expected during a practice match; and the robot is programmed to start and stop when commanded by the driver station.

Once the field inspector has confirmed that the driver station has connected with the robot controller, they should run a brief practice match. Field inspectors should gather up to 4 teams on the field at a time to run the robot operation inspection. Ideally, the inspection process should involve multiple robots on a field to simulate what would happen in a real match and reduce the time required for field inspection. Teams should run their complete 30 second autonomous period so that the field inspector can confirm that robots remain motionless at the end of the autonomous period. The field inspector should then instruct the teams to run their driver-controlled mode. The tournament director may elect to run a full two-minute driver-controlled match period during field inspection if there is sufficient time in the event schedule.

Teams that are not going to operate their robots during the autonomous period at this event are not required to demonstrate the autonomous phase of match play during field inspection. These robots should remain motionless on the playing field.

A sample robot operation inspection script is in Appendix H. Feel free to adapt this script to address the unique aspects of the tournament.
Robot Sensor Calibration
Playing field lighting has a significant effect on a robot’s vision and color sensors. Teams require a brief period on each of the competition playing fields to calibrate their robot’s sensors under competition lighting conditions. Events may specify a window of time for sensor calibration or teams may have extra time during field inspection to collect sensor calibration data. The tournament director and lead field inspector will select the time for robot sensor calibration. Since sensor calibration time may vary from event to event, the time selected should be announced to teams.

Queueing Process
The last steps in the field inspection are about educating the teams on the flow of the day, and basic rules. The teams need to be reminded that they should not make any software changes after they are queued for a match; last minute software changes could hinder a team’s performance on the field. Teams are however, allowed to continue making minor mechanical fixes to their robot.

Teams should also be reminded that the match schedule is only an estimation. As with all competitions, sometimes the matches could run early or late. Although these circumstances are usually communicated to them in the pit area, it is a best practice to remind teams early in the day that they should be diligent about when their matches are so they can be on time.

Disabling a Robot
The field inspector should be prepared to tell the teams during the field inspection what it means to disable their robot, if instructed to do so by the referee during a match. There are a few steps that a field inspector should instruct the team to do:

1. The team must first drive their robot to a neutral position on the playing field.
2. The team should press the “Stop” button on the driver station.
3. The team should then place all components of their driver station on the stands provided in the competition area or on the alliance station floor.
4. The team must not touch their driver station or robot until the match is complete and are instructed by the referee or field personnel to do so.

Inspection Troubleshooting

Repeated Failures
If a robot repeatedly fails inspection, identify the team to a control system advisor (if there is one present at the event), or the tournament director and request that they find someone to work directly with the team. Our goal is for every team to be successful, so please make every effort to assist the team.

If a team is unable to pass inspection by the time inspection is over, even with assistance, the program delivery partner or tournament director must decide how to proceed.
Field Inspection Tips and Tricks

Inspector Specialization
An individual field inspector paired with one team, progressing through the inspection checklist from beginning to end is effective, however, there is a more efficient inspection process. Experienced field inspectors have learned that inspection time and the number of volunteers are both reduced when inspection is split into two pieces, allowing volunteers to specialize in specific sections of the checklist and taking advantage of the opportunity for one or two inspectors to oversee up to four robots at a time during the practice match. For example, tabletop inspection specialists perform the static checks by completing the first three inspection sections of the checklist (drive team members present, driver station and robot controller hardware rules, and driver station and robot controller software rules). Robot operation inspector specialists perform the dynamic checks at a playing field by completing the final two sections of the inspection checklist (robot operation verified at the playing field combined with the instructional queueing process information).

Tabletop Inspection Time Goal
The tabletop checklist items are easily and quickly determined by observing the driver station and robot controller hardware and then running the self-inspection feature in the driver station app. Using the self-inspection feature built into the FIRST Tech Challenge driver station app is key to a speedy tabletop inspection. For most robots, an experienced field inspector will complete the tabletop inspection checkboxes (i.e., first three sections of the checklist) in less than three minutes.

Express Robot Operation Inspection at the Playing Field
Thorough progression through the robot operation inspection at the playing field section of the checklist and the sample script in Appendix H are the recommended inspection best practices for drive teams that are participating in their first tournament of the season. The instructional information in the script and checklist will give drive teams the knowledge and experience that will help them have a successful tournament day.

After their first tournament, drive teams are veteran competitors that no longer need detailed tournament procedure instructions at subsequent competitions. Robot operation inspection at the playing field can be significantly shortened for these veteran drive teams; an express version of field inspection is sufficient and recommended. The inspector should ask each drive team if this is their first event of the season. If the drive team is experienced, the inspector can skip most of the instructional information in the script and only describe qualification match tournament procedures that are unique the event. The robot operational aspects of the inspection should always be performed.

2022-2023 Season Changes and Topics for Emphasis

Driver Station Rules:
- Updated the driver station carrier rule (<DS07>) to clarify that only one (1) driver station carrier is allowed at the playing field and the driver station does not function as a robot cart

Software Rules:
- Updated the allowed software system versions (<RS03>)

Inspection Rules:
• Added the requirement that the driver station and robot controller software must pass field inspection before being used in a match (<I08>)
• Added the requirement that the driver station and driver station carrier must pass field inspection before being used in a match (<I09>)
• Deleted the “Qualification Matches” inspection rule from the previous season to remove rule duplication
Appendix A – Resources

**Game Forum Q&A**
https://ftc-qa.firstinspires.org/

Anyone may view questions and answers within the FIRST® Tech Challenge game Q&A forum without a password. To submit a new question, you must have a unique Q&A system user name and password for your team.

**Volunteer Forum**
Volunteers can request access to role specific volunteer forums by emailing FTCTrainingSupport@firstinspires.org. You will receive access to the forum thread specific to your role.

**FIRST Tech Challenge Game Manuals**

**FIRST Headquarters Pre-Event Support**
Phone: 603-666-3906  
Mon – Fri  
8:30am – 5:00pm  
Email: Firsttechchallenge@firstinspires.org

**FIRST Tech Challenge Event On-Call Support**
The on call event support number is available for event personnel only. Please **do not** call these numbers if you are a team looking for a ruling, a decision, or assistance. We trust that you will not misuse this resource.

- Day of event robot control system and scoring system support: 603-206-2450  
- All other day of event support: 603-206-2412

**FIRST Websites**
FIRST homepage – www.firstinspires.org  
**FIRST Tech Challenge Page** – For everything FIRST Tech Challenge.  
**FIRST Tech Challenge Volunteer Resources** – To access public volunteer manuals.  
**FIRST Tech Challenge Event Schedule** – Find FIRST Tech Challenge events in your area.

**FIRST Tech Challenge Social Media**
**FIRST Tech Challenge Twitter Feed** - If you are on Twitter, follow the FIRST Tech Challenge Twitter feed for news updates.  
**FIRST Tech Challenge Facebook page** - If you are on Facebook, follow the FIRST Tech Challenge page for news updates.  
**FIRST Tech Challenge YouTube Channel** – Contains training videos, game animations, news clips, and more.  
**FIRST Tech Challenge Blog** – Weekly articles for the FIRST Tech Challenge community, including outstanding volunteer recognition!  
**FIRST Tech Challenge Team Email Blasts** – contain the most recent FIRST Tech Challenge news for teams.

**Feedback**
We strive to create support materials that are the best they can be. If you have feedback about this manual, please email firsttechchallenge@firstinspires.org. Thank you!
## Appendix B – Field Inspection Checklist

**Team Number: __________**

**Field Inspection Status (circle):** PASS / FAIL

<table>
<thead>
<tr>
<th>✔ Drive Team Members Present</th>
<th>Rule #</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coach (required), Driver 1 (required); Driver 2 (optional)</td>
<td>&lt;C06&gt;</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>✔ Driver Station and Robot Controller Hardware Rules</th>
<th>Rule #</th>
</tr>
</thead>
<tbody>
<tr>
<td>Driver Station consists of only one Android device (Circle): Motorola Moto G 2nd Generation, Motorola Moto G 3rd Generation, Motorola Moto G4 Play, Motorola Moto G5, Motorola G5 Plus, Motorola Moto E4, Motorola Moto E5, Motorola Moto E5 Play, or REV Driver Hub.</td>
<td>&lt;RE07&gt; &lt;DS01&gt;</td>
</tr>
<tr>
<td>Smartphone Robot Controller Android device (if used) is one of the following models (Circle): Motorola Moto G 2nd Generation, Motorola Moto G 3rd Generation, Motorola Moto G4 Play, Motorola Moto G5, Motorola G5 Plus, Motorola Moto E4, Motorola Moto E5, Motorola Moto E5 Play. The Android device’s USB interface only connects to a REV Expansion Hub or a USB hub.</td>
<td>&lt;RE07&gt;</td>
</tr>
<tr>
<td>The touch display screen of the Driver Station is accessible and visible to field personnel.</td>
<td>&lt;DS02&gt;</td>
</tr>
<tr>
<td>The Driver Station consists of no more than two of the allowed gamepads (Logitech F310, Xbox 360, wired Sony DualShock 4 for PS4, Etpark Wired Controller for PS4), or Quadstick game controller in any combination.</td>
<td>&lt;DS03&gt;</td>
</tr>
<tr>
<td>No more than one (1) optional external battery powered or unpowered USB hub is present.</td>
<td>&lt;DS04&gt;</td>
</tr>
<tr>
<td>No more than one (1) optional COTS USB external battery connected to the REV Driver Hub USB-C port or a USB hub connected to the smartphone Android Device is present.</td>
<td>&lt;DS05&gt;</td>
</tr>
<tr>
<td>Driver Station smartphone Android device (if used) USB interface is only connected to either a Mini USB to OTG cable or combination of cables connected to one USB Hub, or one gamepad USB cable connected to an OTG Micro Adapter.</td>
<td>&lt;DS06&gt;</td>
</tr>
<tr>
<td>Driver Station Carrier (if present) meets requirements.</td>
<td>&lt;DS07&gt;</td>
</tr>
<tr>
<td>The Driver Station Android Device only plays allowed sounds.</td>
<td>&lt;DS08&gt;</td>
</tr>
</tbody>
</table>

### DS RC Driver Station (DS) and Robot Controller (RC) Software Rules

<table>
<thead>
<tr>
<th>Rule #</th>
</tr>
</thead>
<tbody>
<tr>
<td>Android smartphone(s), REV Driver Hub, and REV Control Hub are named with the official team number followed by –DS or –RC as appropriate.</td>
</tr>
<tr>
<td>Android operating system satisfies the requirements: Motorola Moto G 2nd Generation, Motorola Moto G 3rd Generation, Motorola Moto G4 Play – version 6.0 or higher. All other allowed Android devices – version 7.0 or higher.</td>
</tr>
<tr>
<td>DS and RC apps are version 8.0 or higher and the DS and RC apps have the same version numbers. The RC app is not installed on the DS and the DS app is not installed on the RC.</td>
</tr>
<tr>
<td>NA REV Driver Hub (if used) operating system is version 1.2.0 or higher.</td>
</tr>
<tr>
<td>NA REV Driver Hub (if used) has Bluetooth turned off and Wi-Fi turned on.</td>
</tr>
<tr>
<td>NA REV Control Hub (if used) operating system is version 1.1.2 or higher and the firmware version is 1.8.2 or higher.</td>
</tr>
<tr>
<td>NA REV Expansion Hub (if used) firmware version is 1.8.2 or higher.</td>
</tr>
<tr>
<td>NA REV Control Hub (if used) has Wi-Fi turned on, Bluetooth is turned off, and the password is different than the factory default value of “password”.</td>
</tr>
<tr>
<td>Android smartphones (if used) are set to airplane mode, Wi-Fi is turned on, and Bluetooth is turned off.</td>
</tr>
<tr>
<td>Android devices are not connected to any local networks.</td>
</tr>
<tr>
<td>All remembered Wi-Fi Direct Groups and Wi-Fi connections on Android devices have been removed.</td>
</tr>
</tbody>
</table>

*Gracious Professionalism® - “Doing your best work while treating others with respect and kindness - It’s what makes FIRST, first.”*
<table>
<thead>
<tr>
<th></th>
<th>Communication between the Robot and Driver Station is only through the RC and DS applications. Out of band communication is not allowed.</th>
<th>&lt;RS09&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>NA</td>
<td>Driver Station uses the official FTC Driver Station app to control the Robot.</td>
<td>&lt;RS06&gt;</td>
</tr>
<tr>
<td>NA</td>
<td>The FTC Robot Controller app on the smartphone Android Device (if used) is the default application, the application launches, and no other messages pop up.</td>
<td>&lt;RS05&gt;</td>
</tr>
<tr>
<td>NA</td>
<td>Robot Controller is set to the correct Wi-Fi channel (if required by the competition).</td>
<td>&lt;C14&gt;</td>
</tr>
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<table>
<thead>
<tr>
<th>✔</th>
<th>Robot Operation Verified at the Playing Field</th>
<th>Rule #</th>
</tr>
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<tbody>
<tr>
<td></td>
<td>Robot Controller connects with the Driver Station.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Robot switches between autonomous and driver-controlled operation correctly.</td>
<td>&lt;RS04&gt;</td>
</tr>
<tr>
<td></td>
<td>Robot starts and stops when commanded by the Driver Station.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>The team understands how to disable their Robot, if instructed to do so by a referee.</td>
<td></td>
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<table>
<thead>
<tr>
<th>✔</th>
<th>Queuing Process Information Provided at the Playing Field</th>
<th>Rule #</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Team understands that software changes are not allowed in the Queue Area.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Team understands that the match schedule is only an estimate. Matches may start prior to or after the scheduled time. It is the team’s responsibility to monitor schedule changes and show up when required.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Team knows that they are responsible for attaching their Team Supplied Alliance Marker on two sides of their Robot before they approach the competition playing field.</td>
<td>&lt;RG05&gt;</td>
</tr>
</tbody>
</table>

General Comments or Reason(s) for Failure (if any):

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___________________________
Field Inspector