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2020-2021 FIRST® Tech Challenge

FIRST TECH CHALLENGE

Live_Scorekeeper Manual
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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 5,500 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!

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1. Introduction

1.1. 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. To learn more about FIRST® Tech Challenge and other FIRST® Programs, visit www.firstinspires.org.

2. 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 Description”.

3. FIRST Volunteer Rights and Responsibilities

NOTICE OF NON-DISCRIMINATION
For Inspiration and Recognition of Science and Technology (FIRST®) does not discriminate based on race, color, national origin, sex, disability, age, status as a veteran who served in the military, religion, gender, gender identity, or gender expression in its programs and activities.

Keep updated at: http://www.firstinspires.org/about/legal-notices

4. Job Description

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

- **Time commitment:**
  - The Scorekeeper should expect to arrive early at the event to help set up the FTC Live scoring software and displays.
  - The Scorekeeper should expect to be at the event for the entire duration, approximately 8 hours for a full-day event. League Meet events are typically shorter.

- **Proper Dress:**
  - The Scorekeeper generally sits. Comfortable shoes and attire are encouraged.
  - ANSI Z87.1 certified safety glasses are required in the competition area.
4.1. Volunteer Training and Certification
Volunteers must apply to their role using the Volunteer Registration System. After the volunteer has applied to their role, FIRST Tech Challenge will send an email to the volunteer with access instructions to training and certifications (if applicable). Emails with access to the training and certifications will be sent within one business day from applying to the role. If you have applied for a role but have not received access to the training, please email FTCTrainingSupport@firstinspires.org.

The Scorekeeper should read this manual before the event. She/he should speak to the Tournament Director or Affiliate Partner to check for additional requirements, such as meetings before the event or run-throughs of the queuing path before the event.

The Scorekeeper is required to pass the certification test prior to the event. The estimated training time is one hour.

The Scorekeeper should familiarize him or herself with FTC Live downloadable software (traditional events) and the cloud-based FIRST Tech Challenge Scoring system prior to the event.

4.2. Volunteer Minimum Age Requirement
FIRST requires that FIRST Event volunteers be at least 13 years old, however, the Regional Planning Committee can increase the age requirement as needed. Adult volunteers cannot have children with them while volunteering nor be responsible for supervising children at the event. Children under the minimum age are welcome at FIRST Competitions with suitable supervision by someone other than a volunteer.

4.3. Key Volunteer Role Minimum Age Requirement
Volunteers MUST be at least 21 years old before they can serve in a Key Volunteer Role for the FIRST Tech Challenge. Key Volunteer positions include: Volunteer Coordinator, Head Referee, Judge Advisor, Field Manager, Field Technical Advisor, Lead Robot Inspector, Lead Field Inspector, and Lead Scorekeeper. Local Affiliate Partners can make case by case exceptions to these guidelines by contacting FIRST for approval.

4.4. 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 FTCteams@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!
5. Overview of Responsibilities

The FIRST Tech Challenge lead scorekeeper (referred to in this manual as “the scorekeeper”) is the person responsible for making sure that the scoring software is setup correctly for use at the event. The scorekeeper helps the flow of the event and provides information to the teams and to the audience. Being prepared before and diligent during the event will help to provide a positive experience for all participants. The responsibilities of a scorekeeper include:

- Participation in training prior to the event.
- Accurately entering match scores into the FIRST Tech Challenge Live (FTC Live).
- Entering team and sponsor information into the scoring software.
- Generating matches for the event.
- Setting up displays for audience to view scores.
- Communicating match schedules to key volunteers such as Referees, Judges, Tournament Directors, etc.

Make sure to speak with the Affiliate Partner or Tournament Director prior to the event to determine if there are additional responsibilities and time commitments to set up the scoring computers and displays. At some events, the scorekeeper may be responsible for setting up the computers, displays, etc. There are many components that are required to be set up to run the FTC Live and displays correctly.

A scorekeeper must be confident and comfortable with the FTC Live and FTC Scoring event configuration process to be able to reliably record results during the hectic pace of a FIRST Tech Challenge event. Learning the role and equipment ahead of time will go a long way towards keeping the event running smoothly and on time.

6. Pre-Event Day Responsibilities

Outlined below are responsibilities scorekeepers have before event day. Make sure to check with the tournament director to see if they need help setting up before the event, and when you should be there to set up the scoring equipment. Many events set up the fields and A/V equipment the night before, which may also include loading the most current version of FTC Live onto the scoring computer, configuring the event with FIRST Tech Challenge Scoring system (FTC Scoring), and setup of the display screen. Be sure to check with the tournament director or Affiliate Partner to understand what is being prepared ahead of time, and what needs to be done on the morning of the event. Reading the section Setting Up a Traditional Event will also prepare you for pre-event responsibilities for the 2020-2021 season.

- Watch the pre-recorded Scorekeeper training videos. This will help familiarize with the system and how it operates.
- Pass the scorekeeper certification test
- Familiarize yourself with the scoring software
- (Optional) Attend a Monthly Key Role Discussion Q&A call. This will provide the opportunity to ask questions, or provide feedback to other scorekeepers.
7. Event Day Responsibilities

7.1. FIRST Tech Challenge Live Setup
Setup of the FTC Live is usually completed the day before the event. The Affiliate Partner or tournament director will be able to guide you on what has been completed the day before. On the morning of the event, you will need to turn on the scoring computer and displays, and start the FTC Live.

7.2. Pre-Match Responsibilities
- Work with Affiliate Partners or tournament director to establish when teams are declared “no show”
- Work with Affiliate Partners or tournament director to determine logistics of the event, such as number of matches to be played, or the time schedule for the matches.
- Ensure that all team and sponsor information has been entered correctly.
- When all teams have checked in, update team information as necessary and generate matches.
- Communicate match schedules to key volunteers.
- Generate the inspection schedule.
- Generate the judging schedule.

See Appendix B for the Event Checklist.

7.3. Game Play
The scorekeeper and the emcee/game announcer should agree on a “ready” signal to start the match timer clock prior to the start of the matches. The match timer clock shall begin after the emcee/game announcer has verified that both alliances and the scorekeeper are ready, and a 3-2-1 countdown.

7.4. Generate Alliances
After all qualification matches have been played, the scorekeeper will enter the formed alliances and generate matches for the elimination matches.

7.5. Awards
The scorekeeper may be asked to enter the awards into the FTC Live and print the awards ceremony script for the emcee/game announcer.

Other event-day duties may be assigned, as needed.

8. Post-Event Responsibilities

Qualifying Tournaments, League Tournament, State/Region Championship Events – After all matches have been played and all scores have been recorded, the event score results must be submitted to FIRST. See the section Uploading Event Data to FIRST for more information.
9. Introduction to the FIRST Tech Challenge Scoring System and FIRST Tech Challenge Live software

What is the FIRST Tech Challenge Scoring System?
The FTC Scoring system is a cloud-based software that has multiple functions to allow you to input and track vital information during a remote or traditional event.

The system allows a program delivery partner or a team administrator to generate and track the following for a remote event:

- Team information
- Sponsor information
- Match results

For a traditional event, FTC Scoring system is used for:

- Event creation
- League creation
- Event configuration:
  - League creation and setup
  - Team lists
  - Division creation and setup
  - Adding sponsor information

What is the FIRST Tech Challenge Live software
FIRST Tech Challenge Live is a downloadable software program that has multiple functions to allow you to input and track vital information during a traditional event only. It works in coordination with the setup of events in the FTC Scoring system prior to an event.

The system allows a scorekeeper to generate and track the following for a remote event:

- Team information
- Sponsor information
- Match schedules
- Match results (including an option for real-time score tracking)
- Alliance selection for elimination and final matches.

This software will also allow you to display sponsor information and team match results to teams and spectators. This manual will go through step-by-step instructions on how to run the program correctly and efficiently.

10. System Hardware

10.1. System Requirements
The FIRST Tech Challenge Live software is available on the Windows and Mac platforms. It is a browser-based application, meaning that you interact with the system exclusively through a web browser. The system also supports real-time score tracking. Live score data can be entered into the system using a tablet.

10.1.1. Windows
- Windows 7 or 10
- Java 8 or higher (available from www.java.com, only needed for the laptop running system software)

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• Google Chrome; Firefox is not supported.
• Support for Wi-Fi if connecting to a wireless network
• Ethernet adapter if connecting to a wired network

10.1.2. Mac
• macOS Sierra or greater
• Java 8 SDK or higher (available from www.java.com, only needed for the laptop running system software)
  - Note – Unlike the Windows environment, macOS requires the Java Development Kit (JDK) to run. Windows only requires the Java Runtime Environment (JRE) to run.
  - If you install the JDK software onto your Mac, you should not need to install the JRE software. The JRE should already be included as part of the JDK
  - The JDK software can be downloaded from the following Oracle web link:

![Java SE Development Kit 8 Downloads](image)

Figure 1 - Accept the License Agreement, then select the Mac OS X x64 version to download.

• Google Chrome
• Support for Wi-Fi if connecting to a wireless network
• Ethernet adapter if connecting to a wired network

10.1.3. Android Tablet (for Real-time Score Tracking)
• Android Marshmallow (6.x) or greater
• Google Chrome
• Support for Wi-Fi

Note: Some event hosts prefer to use Amazon Kindle tablets for real-time score tracking. Kindle tablets can be configured to work well with the FTC Live. Kindle tablets, however, do not typically have Google’s Chrome Browser installed. Additional steps are required to get the Chrome software running properly on a Kindle tablet. Details on installing Chrome on a Kindle tablet are beyond the scope of this documentation.

Also note: that some Kindle tablets have an operating system that is based on an older version of Android (Lollipop). These Kindle devices can still be used with the FTC Live.

10.1.4. iOS Tablet (for Real-time Score Tracking)
• iOS 8 or greater
• Google Chrome

Support for Wi-Fi

10.2. System Layout
The FIRST Tech Challenge Live software is flexible and can be used in a variety of configurations. This section provides an example of a basic configuration and an example of a more complex configuration.

10.2.1. Basic Configuration with Paper Scoring
The most basic configuration requires a single laptop that will serve as both the scorekeeper computer and as the field display computer. This configuration also includes an external monitor (to serve as a field side display), and a printer (to print match schedules and scoresheets).

Figure 2 - A very basic layout with paper scoring.
10.2.2. Advanced Configuration with Real-Time Scoring
The system also supports real-time score tracking using a pair of wireless tablets.

This advanced configuration includes the following components:

- Scorekeeper Laptop – A laptop that has the FTC Live scorekeeping software installed. This laptop acts as a server for the whole system. It is also used for match control and scorekeeping (such as reviewing, editing, and committing scores).
- Printer – Used to print match schedules, reports, and other useful documents.
- Network Router with Wi-Fi support – Used to connect system components together.
- Field Display Laptop – A laptop that uses a web browser and a network connection (wired or wireless) to access the system server and display field-related information during an event. It is connected to a large screen monitor.
- Audience Display Laptop - A laptop that uses a web browser and a network connection (wired or wireless) to access the system server and display spectator-specific information during an event. It is connected to a large screen monitor.
- Scoring Referee Tablets (x2) – Referees use these tablets to track, in real time, the score during a match. After a match is complete, referees can review, edit and submit their scores to the system. The tablets use a wireless connection and a web browser to access the system server.

Important Tips:

- You will need to know the IP address of your computer that is running the system software (i.e., the scorekeeper laptop in this example). When another device, such as a referee tablet or a display
computer, wants to access the system, the user will have to provide the IP address of the scorekeeper laptop to the web browser in order to access the system functions. Consult with your IT administrator on what the IP address is for your server or refer to the section

- Wireless activity for the FTC Live should operate on a Wi-Fi channel that will not interfere with the control of the competition robots.
- Audio cues (such as the match start or match stop sound effects) for a public announcement (PA) system can be pulled from any of the Display computers. It is recommended that a single computer is used as the source of the PA audio (to avoid audio synchronization issues).

11. Download and Installation

11.1. Important Tips for Running the FTC Live Software

Here are some tips before you get started:

- Disable any firewall, or open appropriate ports, on the computer that will be running the server.
- Disable any ad blocking software on devices that will interface with the server. The ad blocking software occasionally misinterprets server resources as ads.
- Ensure that Google Chrome is installed and is the preferred browser.
- Important note: Firefox browser is not supported!
- If it has been more than a few days since the software was released and you have internet access, perform a data download before creating the event to ensure team info is up to date. "Event Admin" dropdown -> Manage Server -> Data Download.

11.2. Minimum Hardware Configuration

For most events, the hardware requirements to run the FTC Live scoring software are very modest.

11.2.1. Scoring Server Minimum Requirements (Windows/Mac/Linux)

- Intel Core i5 Processor
- 4 GB of RAM
- 300 MB of available disk space
- CAT 5 Ethernet adapter (USB connected would be OK if built-in not available)
- 802.11 WiFi adapter

Note: If you are running a large event, such as a dual division event, a higher performing computer might be warranted.

11.2.2. Network Requirements

The selection and configuration of the network hardware can be more critical than the selection of the server hardware to the success of your live scoring event.

- Use a dedicated (i.e., not shared with other users or applications), local network to connect your scoring devices.
- To avoid latency issues, the scoring server should be local to your event (and not run through a remote Internet/Cloud connection).
- Scoring network should be on its own secure network (i.e., not open to the public). This should minimize the risk of malicious activity from occurring towards the FTC Live.
- Use a wired connection whenever possible (with the exception of the real-time scoring referee tablets, which are typically wireless devices).
- If you need to use a wireless connection, work with your FTA and venue IT staff to make sure you select a wireless channel that does not interfere with the competition robots.

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• Check with your venue’s IT staff to see if a WiFi Blocker is present. If one is present, you will not be able to use wireless scoretracking devices unless the staff disables this function.
• Use a modern (made within the past 3 years) switch/access point that is powerful enough to accommodate the number of devices needed at your event:
  o FIRST has received credible reports of older, “underpowered” switch/access points being unable to support a large enough number of devices operating on the FTC Live network.
  o Use an appropriately sized network device that will be able to accommodate all your scoring-related devices simultaneously.

11.3. **Downloading the Software Package**
The FIRST Tech Challenge Live software is available for download from the following link:

https://github.com/FIRST-Tech-Challenge/scorekeeper/releases

The software is stored as a compressed archive file and is available in .zip or .tar format.

**Note:** that Windows and Mac users will most likely want to download the “.zip” version of the archived software.

![Figure 4 - Releases begin with the phrase "FIRST-Tech-Challenge-Live".](image)

To use the software, unzip the downloaded file into the folder of your choice. FIRST suggests that users save the file on the computer’s desktop to easily access the program. The software will run from this directory.

To extract or unzip the file, right-mouse select the archive file and select the appropriate option to extract the compressed files to your computer.

11.4. **Launching the FIRST Tech Challenge Live Server**
Once you have successfully extracted the contents of the archive file, you will need to launch the system server. This server will run in a window on your computer. You will access this server through your Chrome web browser.

11.4.1. **Launching the Server Using Windows**
Use Windows Explorer to navigate to the main program directory. Find the Windows batch file called “FIRST-Tech-Challenge-Live-Windows.bat” and double-select it to launch the server.
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Figure 8 - The batch file will launch the system server in a terminal window.

After the server is started, the batch file will launch your default web browser and display the main webpage (web address of "localhost").

Figure 9 – The software should launch your default browser and display the FTC Live system's main page.

11.4.2. Launching the Server Using macOS

Using Finder, navigate to the main directory of the program folder and locate the script file named “FIRST-Tech-Challenge-Live-UNIX”. Double select the file to run the script.

Note: macOS might warn you that the application was downloaded from the Internet. If you see this warning, select the “Open” button to allow your computer to run this application.
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Figure 10 - If prompted, select the “Open” button to allow your Mac to run the software.

For Mac computers, the user account that is running the scorekeeping software typically needs administrative access on the computer to run the software properly. When you launch the “FIRST-Tech-Challenge-Live-UNIX” script, the software will check to see if you are running the script with administrative access. If it does not think it has administrative access, the application will prompt you for your Mac’s password. A macOS terminal will appear and the system will prompt you to login using your user password. Type in the password and press return.

Figure 11 - If prompted, type in your user password for your Mac account and press RETURN.

If successful, the terminal window will show that the scorekeeping server is running. Note that while you are using the software, you should keep the server running in the background on your Mac computer. You can minimize the terminal window, but do not close the window or the system will stop working. After the server is started, the batch file should also launch your default web browser and display the main system webpage (with a web address of “localhost”, see Figure 11).

Note: On some Macs, the system will launch the main page in a Safari browser, even though you might have Chrome set as your account’s default browser. If this happens, FIRST recommends closing the Safari window and open a Chrome window instead. Specify the address of “localhost” in the Chrome window to access the scorekeeping server.
11.5. **Using an Alternate HTTP Port (Advanced Topic)**

By default, when you launch the server, the software tries to use the default HTTP port (port 80) when it launches the web server that is used by the scoring software. In some cases, the default port might not be available on the laptop that is running the system’s server.

Or, if a Mac user does not have administrative privileges on the computer (which is needed to use the default port), then he or she can still run the software if they specify an alternate HTTP port for the scorekeeper server.

For these cases, it is possible to change the port by passing the new port value as a command line argument. Note that this is an advanced topic. Most scorekeepers will not need to know how to change the port.

11.5.1. **Using an Alternate HTTP Port on a Windows Computer**

Open a Windows command line terminal ("cmd.exe") and navigate to the "bin" subdirectory of the scorekeeping software’s program folder. In the Command window, type in the following command

```
FIRST-Tech-Challenge-Live.bat -p <port number>
```

Where `<port number>` is replaced by the value of the port number you’d like to use (“8080” for example). Press RETURN and the software should invoke the webserver and use the port specified in the command line.
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Figure 13 - Include the argument "-p 8080" to launch the server on port 8080.

When the install script launches your web browser it should include the port number (in this example, ":8080") when opening the web page for the address “localhost”.

Figure 14 – If you changed the port number, then you must include the new value in the address when accessing the server.

11.5.2. Using an Alternate HTTP Port on a Mac Computer

One advantage of using an alternate HTTP port number on a Mac is that it does not require administrative access to run the software. This is useful if your user account is restricted and does not have administrative privileges.

You will need to use a terminal window to launch the software using a different HTTP port. The terminal program is in the “Utilities” subfolder of the macOS “Applications” folder.
Launch the terminal app from the Utilities folder. You will need to type commands into the terminal window to navigate to the FIRST Tech Challenge Live directory and then to launch the server software. Note that macOS is a case sensitive operating system so if you copy the commands in the example below, make sure the capitalization is correct.

For example, assume that the software is in a folder on the Desktop of the current user and has the name “FIRST-Tech-Challenge-Live-0.4.0”. You will need to type in the following command at the terminal prompt to change to the “bin” subdirectory.

```bash
cd ~/Desktop/FIRST-Tech-Challenge-Live-0.4.0/bin/
```

If you successfully changed to this “bin” subdirectory, you can invoke the software using the following command (don’t forget the “./” before the name of the file):

```bash
./FIRST-Tech-Challenge-Live -p <port number>
```

Where `<port number>` is replaced by the desired port number value (for example, “8080”). The software should invoke the system server and use the port specified in the command line. When the install script launches your web browser it should include the port number (in this example, “:8080”) when opening the web page for the address “localhost” (see Figure 16).

**11.5.3. Navigating to the Server Using an Alternate Port**

If you launched the server with an alternate HTTP port, then when you want to connect to the FTC Live server, you must specify the port number as part of the server address. For example, if the system is listening on port 8080, then you must append a “:8080” to your web address when navigating to the server. If you do not specify the port at the end of the address, the web browser might fail to connect to the scorekeeping server.

![Figure 15- The terminal application is in the “Utilities” subfolder of the “Applications” folder.](image1)

![Figure 16 – Specify the port number in the address if your scorekeeping server is using an alternate port number.](image2)
12. Setting Up a Traditional Event

12.1. 2020-2021 Season Changes - Setting Up an Event

Setting up a traditional event has a different workflow starting in 2020-2021. Some event setup MUST be done in the cloud-based FTC Scoring system before the event, and some setup can be made easier if done ahead of time.

12.1.1. Event Creation: All events are synchronized within the cloud-based FTC Scoring system (ftc-scoring.firstinspires.org) automatically within a day of entry into FIRST’s event creation portal. All official events must be created this way. Official events are automatically imported into FTC Live from FTC Scoring system at the start of an event, and are uploaded to it upon completion of the event.

12.1.2. Event Configuration: Several parts of event setup MUST be done ahead of time in FTC Scoring system.

Prior to the event, data must be imported into the FTC Live version that will be running at the event. There are three options to accomplish this, depending on who is present and the availability of internet access at the event venue.

Here is a summary table of which method is recommended for a given scenario:

<table>
<thead>
<tr>
<th>Internet access at setup time?</th>
<th>Event Admin access to FTC Scoring system at set-up time?</th>
<th>Recommended method</th>
</tr>
</thead>
<tbody>
<tr>
<td>YES</td>
<td>YES</td>
<td>Automatic Import (A)</td>
</tr>
<tr>
<td>YES</td>
<td>NO</td>
<td>Key-Based Setup (B)</td>
</tr>
<tr>
<td>NO</td>
<td>NO</td>
<td>Offline Setup (C)</td>
</tr>
</tbody>
</table>

12.2. Getting Version Number and IP Address

Start by opening FTC Live software. Due to software updates, it is useful to know the version number of the FIRST Tech Challenge Live software that you are currently running. It is also helpful to know the IP address of the scorekeeping server. This information can be obtained from the top of the browser screen when viewing the FIRST Tech Challenge Live pages (software version 0.4.3 and higher).

Figure 17 - The software version number and the system IP address
12.2. **Logging into FTC Live**
- Select “Login” at the top-right corner of the screen.
- You can log in with the username “local” and leave the password field blank.

![Login Screen](image.png)

*Figure 18 - Log in to the "local" account to gain access to the system.*

**Important Note:** The “local” user account is the primary administrative account for FTC Live download. It is only available locally on the computer that is running the server application. Users should take care to secure this computer to make sure an unauthorized user will not access the “local” account.

12.3. **Logging in with Default Accounts**

The default account has username `local` and no password.

![Login Page](image.png)

*Figure 19 - The login page allows for a default account.*

12.4. **Navigating the System’s Home Screen**

Once you have logged in to FTC Live (blue banner), the home screen should look like the following image:

![Home Screen](image.png)

*Figure 20 - Selecting the FIRST Tech Challenge logo (upper left-hand corner of window) will take you to the FTC Live’s home screen.*
In the upper right-hand corner of the screen you will find:

- Resources: Opens a directory of scorekeeper-related documents, including printable scoresheets.
- Feedback: Submit your concerns to the FIRST Tech Challenge Live software developers.
- Login: User account information, you can also select the “Hello, local” link to get information about your current user account.

![Figure 21](image)

Figure 21 – Feedback, resources, and account info links are available in the upper right-hand corner of the home screen.

There are options available in the “Event Admin” menu:

- **Setup Event**: This will allow you to create a single event using an event key found on the “Play Event Locally” page in the FIRST Tech Challenge Scoring system or to enter the .db file for an Offline Event.
- **Create User**: This gives you the option to create individual user accounts for users that may only require access to a subset of the software features.
- **Manage Users**: When you have a list of users for the events, this section will allow you to manage the users and their FTC Scoring system access.
- **Manage Server**: This allows you to manage the server for an event.
12.5. **Set Up an Event – Automatic Import**
The FTC Scoring system will automatically import the event into FTC Live. This method requires internet access and event management access to the event on FTC Scoring system, but is the easiest.

1. Run FTC Live. When the browser window pops up, login, but do nothing else. (Top banner is **DARK BLUE**)

2. Navigate to FTC Scoring system (FIRST Tech Challenge-scoring.firstinspires.org): (Top banner is **BLACK**)
   a. Log in to an account with Event Admin access to the desired event.
   b. Open the event’s home page, then select “Manage Event.”

---

**Figure 23 - Page once logged in**

**Figure 24 - The selected event appears.**
c. Select “Play Event Locally”.

![Figure 25 - On selected event dashboard, select “Play Event Locally”](image)

d. Under the “Automatic Setup” section at the top, select “Import This Event”.

![Figure 26 - Automatic Setup select “Import This Event”](image)
e. This operation will open the FTC Live (DARK BLUE banner) software and require confirmation of the event setup from FTC Scoring.

![Confirm Event Setup](image)

Figure 27 - Confirm event setup in FTC Live.

f. Once confirmed, the Event Dashboard appears to continue the process of setting up the event.

![Event Dashboard](image)

Figure 28 - Selected event dashboard in FTC Live.
12.6. **Setting up an Event – Key-Based Setup**

Using this method, someone with FTC Scoring system, event management permissions for the event gets a key from FTC Scoring, and sends that key to the scorekeeper running FTC Live. In this scenario, FTC Live must have internet access, but the scorekeeper does not require FTC Scoring system permissions.

**A. Event Manager (FTC Scoring System):**

1. Login to the FTC Scoring system ([ftc-scoring.firstinspires.org](http://ftc-scoring.firstinspires.org)), with an account with Event Management access.

2. Navigate to the event’s home page and click “Manage Event”.

3. Select “Play Event Locally”.

**Figure 29 - In FTC Scoring, select “Manage Event”.

**Figure 30 - On the selected event dashboard, select “Play Event Locally”.

---

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4. Under “Manual Setup”, copy the Event Key, and send it securely to the Scorekeeper or FTA. Do not give this key to anyone else.

![Copy the event key, under "Manual Setup".](image)

**B. Scorekeeper (FTC Live)**

1. In FTC Live (DARK BLUE banner), login as local admin.
2. From the “Event Admin” dropdown menu at the top, select “Setup Event”.

![Under "Event Admin," select "Setup Event."](image)
3. Enter the Event Key sent by the Event Manager and click “Submit”.

### 3. Set Up an Event – Key-Based Set Up

From the “Event Admin” dropdown menu at the top, select “Setup Event:

![Setup Event](image)

**Setup Event**

If you have internet access, you can setup an event by entering the Event Key found on the event’s “Play Event Locally” page on FTC Cloud. If you do not have internet access, proceed to “Offline Setup”.

**Event Key**

Submit

Note: If you are testing the system please skip this step and continue to Offline Setup. If you do not have an Event key, ask your Program Delivery Partner or Event Manager. If they are not immediately available or does not have the key, you may skip this step for now. A key will be required to upload event results to FIRST after the event. Please remember to upload results from all official events, especially League Meets.

*Figure 33 - Event Key entry.*

4. It will show the event details and ask for confirmation. Make sure this is the correct event, and then hit “Confirm”.

### 12.7. Set Up an Event – Offline Event

Using this method, an Event Manager downloads a file from the FTC Scoring system, and sends it to the Scorekeeper/FTA or brings it to the event. This method does not require internet access at the event.

**A. Event Manager (FTC Scoring System):**

1. Prior to the event, login to the FTC Scoring system (BLACK banner) with an Event Management account.
2. Navigate to the event’s home page and click “Manage Event”.

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3. Select “Play Event Locally”.

Figure 35 - On the selected event dashboard, select “Play Event Locally”.
4. Under “Offline Setup”, select “Download”. It will download a file to your computer. Send this file to the person running the FTC Live or bring it to the event on a flash drive. Do not give this key to anyone not running FTC for this event.

B. **Scorekeeper (FTC Live)**

1. In FTC Live *(DARK BLUE banner)*, login as local admin.

2. From the Event Admin, select “Setup Event”, then select Offline Setup.

3. The .db file upload page opens, select the Choose File option, then go to the location of the .db file (USB).
4. Once the file has been selected, select the “Setup Event” button to continue.

Figure 39 - Select "Setup Event".

5. Review the information for the selected event and Confirm or Cancel to begin scorekeeping. The dashboard for the event should appear once Confirm is selected.

Figure 40 - Confirm the details of the event are correct.

12.8. FTC Live Event Dashboard

Once you have created a new event, FTC Live should display the Event Dashboard. You can also jump to the Event Dashboard for the event by selecting the event’s “Dashboard” option from the “Event Admin” drop down menu.

Figure 41 – You can use the Event Admin menu to navigate to the Dashboard if you have an event currently selected.
Each step has an action and a status listed on the Event Dashboard. You can select a button to perform an action.

<table>
<thead>
<tr>
<th>Step</th>
<th>Action</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Edit Event</td>
<td>Done</td>
</tr>
<tr>
<td>2</td>
<td>Create Default Accounts</td>
<td>Not Started</td>
</tr>
<tr>
<td>3</td>
<td>Add/Edit Teams</td>
<td>0 teams added</td>
</tr>
<tr>
<td>4</td>
<td>Add/Edit Sponsors</td>
<td>0 sponsors added</td>
</tr>
<tr>
<td>5</td>
<td>Configure Judging/Inspection Tracking (Optional)</td>
<td>(Optional)</td>
</tr>
<tr>
<td>6</td>
<td>Create Judging/Inspection Schedule (Optional)</td>
<td>Not Started</td>
</tr>
<tr>
<td>7</td>
<td>Create Match Schedule</td>
<td>Not Started</td>
</tr>
<tr>
<td>8</td>
<td>Manage Awards</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Advancement Report</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Send Results to FIRST</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Download Archive File</td>
<td></td>
</tr>
</tbody>
</table>

*Figure 42 - Event Dashboard.*

**Note:** Be sure to select “Send Results to FIRST.”

Also, in the upper left-hand corner there is a “Back to Event Home” link. Selecting this link will take you to the home page for the currently selected event.
12.9. Creating Default User Accounts

You will need to create a set of user accounts that your volunteers can use during the event. Select the “Create Default Accounts” button on the Event Dashboard to display the Default Accounts screen.

Press the “Generate New Random Accounts” to create a set of accounts for the currently selected event.

Press the printer icon in the upper right-hand portion of the screen if you want to print a hard copy of the list.

The password and access permissions for a user account can be changed by an event administrator by selecting the “Manage Users” item from the “Event Admin” menu and then using the resulting screen to review and modify information for the selected account.
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• If the FTC Live already has the team’s data prepopulated, the newly added team number will appear along with its team information. If the system does not have any data for the team, the remaining columns for the newly added team will be blank.
• You can remove a team by pushing the delete button towards the right side of a team listing.
• You can switch to “Find by State/Province” mode by selecting the “Find by State/Province” tab.
• If you are done adding and editing teams, press the “Done” button.

12.10.2. Adding Teams by State or Province
Another option is to select “Find by State/Province” tab to add teams:

• FTC Live should display a list of available pre-populated teams by selected region.
• Use the Country and State/Province controls to select the country and state/province to display.

• Check boxes to add teams to the event (turns purple).
• Select single teams with the “Add Individually” tab.
• If you are done adding and editing teams, press the “Done” button.
12.10.3. Importing a List of Teams
You can use the Add/Edit Team page to add teams by selecting and uploading a team list file.

- FTC Live can read team list files from past FIRST Tech Challenge seasons (prior to 2018-2019).
- An event administrator can also create a simple text file with a team number on each line of the file and use that as a team list.
- Press “Choose File” and use the pop-up file browser to find and select your team list file.
- After you have selected the team list file, press the “Upload Team List” button to upload the list data.

The uploaded teams should now be included in the team list for the currently selected event.

12.10.4. Editing Existing Teams
Select the “Add/Edit Team” button on the Event Dashboard, and then use the “Add Individually” tab to edit the team. When you are finished editing teams, press the “Done” button to leave the Add/Edit Team screen.

12.11. Adding/Editing Sponsors for an Event
The software comes populated with the following sponsors:

- FIRST Tech Challenge Presenting Sponsor: Qualcomm
- FIRST Tech Challenge Official Program Sponsor: Collins Aerospace

These sponsors cannot be modified and need to be displayed at every event. In addition to the above sponsors, you may add regional or event sponsors.

Select the Add/Edit Sponsors to create or edit a sponsor list for your event.

- Press the “Add” button to add a new sponsor for an event.

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Enter the name of the sponsor.
Select the type of sponsor (Global, Regional, or Event).
Select the “Create Sponsor” button to create the new sponsor.
Use the “Choose File” and “Import Sponsor Data” buttons to import a sponsor data file.

Sponsor information can be displayed on Audience Displays by using the “Video Switch” tab of the Match Control Page (for details, see the section “How to Display Sponsor Information”).

12.12. Creating the Match Schedule
If you have a list of at least four teams for your event, you can generate the match schedule. On the Event Dashboard, select the Create Match Schedule.

- You can edit the “Matches per Team” field (within the limitations set by the system) to adjust how many matches per team will be scheduled.
- You can edit the “Cycle Time” field to adjust the desired target cycle time for a match.
• You can press the “Default” button to use the default parameters to generate a simple match list (no match blocks or breaks included).

• You also have the option to create a more complex match schedule, with blocks of matches and breaks inserted in between.
  - Press the “Add Match Block” button to add a block of matches to the schedule.
  - Press the “Add Break” button to add a break in between matches to the schedule.
  - Adjust the start and end times for the blocks and breaks and provide labels (such as “lunch”, “morning”) for the breaks.

Figure 54 - You can create a more complex match list by adding breaks and blocks to the schedule.

• Once you configured your match blocks and breaks, you can push the “Run Matchmaker” button to run Idle Loop’s Matchmaker software. A progress bar should appear with an estimate on how much time to generate the schedule.

Figure 55 - Push the Run Matchmaker button to generate the match list for your event.

• Once the match list has been generated, it will appear towards the bottom of the screen. There is an option to display or hide the suggested match times for the schedule. By default, the match times are hidden.

• After you have reviewed the match schedule, you can use the “<< Back to Dashboard” link to return to the Event Dashboard.
Figure 56 - The generated match schedule will appear towards the bottom of the screen.
12.13. **Uploading Event Data to FIRST**

On the Event Dashboard, select the “Send Results to FIRST” button:

![Figure 57 - Dashboard with Send Results button.](image-url)
Opens the Send Results to FIRST page, select “Submit Results”.

Successful submit will give a Submission ID. If you need to report any issues or bugs to Github, please include this number.

**Note:** Once you submit, an event cannot be resubmitted. So make sure the event is complete and all data is saved and correct.

If you skipped the Setup Event step, it will prompt you for a key now. It is required for this step.
13. **Match Control and Scoring**

If you successfully created a match schedule for your event, then you are ready to begin controlling (initializing, running, and scoring) the matches.

**13.1. Example Scoring Workflows**

Before examining the details of the Match Control features that are available in FTC Live, it is helpful to look at the workflow for scoring an event.

**13.1.1. Scoring Using Paper Scoresheets**

FTC Live can be used with [paper scoresheets](#) to control and score an event. For this scenario, the typical workflow is:

- Load Match
- Show Match Preview
- Randomize Field
- Run Match
- Manually Enter Scores (using a “Forced Edit” of the results)
- Commit Results
- Display Results

**13.1.2. Scoring Using Wireless Tablets**

Wireless tablets can be used for [real-time score tracking](#):

- Load Match
- Show Match Preview
- Referees Submit Pre-Match Info
- Randomize Field
- Run Match
  - Referees track, then submit Autonomous
  - Referees track, then submit Driver-Controlled
  - Referees review, then finalize their scores
- Commit Results
- Display Results

**13.2. Event Home Page**

You can navigate to the Event Home Page from the Event Dashboard by selecting the “<< Back to Event Home” link that is in the upper left-hand corner of the screen. Depending on your user account permissions, the home page will display categorized lists of features that are available from the server:

- Event Info – These links display important event-related information. A scorekeeper can review and print out information such as the match schedule, team rankings, and match results using these links. Also, a pit display can be launched from a link in this category.
- Score Tracking – A referee would use these links to score for the red or blue alliance.
- Event Administration – These links take the user to the Event Dashboard, the Match Control page, and to the various public display screens.
13.3. **Match Control Page**
Select the “Match Control Page” link to display the Match Control Page.

The Match Control Page is where the scorekeeper will spend most of their time. It is where the match timer is controlled, as well as, where scores are edited. It is recommended that the Match Control Page be used in full screen mode, and that the user not navigate away from the Match Control Page’s browser tab. If the user would like to have two or more active browser screens on their laptop (for example, if the user wanted to display the match control page and the field display page), it is recommended that user have two separate browser windows launched on their computer.

**Important Note:** Only one Match Control Page should be open per scoring server per event. More than one Match Control Page can result in confusion, and inaccurate and unpredictable match results.
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At the very top of the Match Control Page, lists information about the current “Loaded Match” and the current “Active Match”.

- Loaded Match is the next match to be played. The alliance lists turn green once the referee has submitted initialization data for that alliance. When both are green, the match start button turns green to allow for the match to start.
- Active Match shows the match currently in progress and the time left. The buttons progress through the match flow, generally from left to right. Green buttons indicate the next steps, yellow buttons indicate repeated actions (that are allowed), and red buttons indicate non-standard match flow operations, but are still allowed. Grey buttons cannot be used at the time.

13.3.1. Match Control Buttons
The buttons on the Match Control Page below Loaded and Active Match, allow for the control of the match flow.

- Load Next Match - This button will load the next match in the schedule for play, allowing referees to input initialization data and allowing randomization of the field. To load a different match, use the Play / Replay button on the schedule tab. If no matches exist, button does nothing.
- Show Preview - Audience Displays will show the list of teams competing in the next match, and their current rank.
- Randomize Field - This will generate a random number to use to configure the field before the match. If external randomization is enabled in settings, a tooltip will appear below the button to allow selection of a value. Clicking again will prompt for confirmation, but will allow re-randomization.
- Show Randomization - This will show the randomization value and corresponding field state on Audience Displays.
• Show Match - This prepares the displays for match start by showing the screen used during a match.
• Start Match - Starts the match. This button is not available until after the field has been randomized. It is red until both referees have submitted initialization, but can still be clicked when red. After match start, it turns into an “Abort Match” button, which is used to reset the match timer. After an abort, the match returns to the waiting for init stage, and referees must refresh their pages and re-submit initialization before the start button turns green again.
• Commit & Post Last Match - This is a convenient button that is available once the previous match’s scores have been submitted by referees, and the next match has not yet started. It will both save the results of the previous match, and show them on screen. This button should only be used after confirmation signal from the head referee that all data as entered by the referees is correct and no cards need to be given. Otherwise, matches can be edited, committed, and posted from the schedule tab /edit scores tab.

13.3.2. Match Control Tabs
The Match Control Page has several tabs that can be used to switch the information displayed on the screen:

• Schedule - Shows list of matches, their status, teams, and scores. From this tab, which match to play can be selected, and matches can be selected to edit or show results.
• Incomplete Matches - Shows the matches that have been started but not completed (committed to the database).
• Score Edit - Used to edit scores or enter CARDS. Click Edit on a match in the Schedule tab to load this tab.
• Active Match - Shows the live scoring state of the match currently being played, or the last one played. Looks like score edit tab but cannot be edited. After a match is complete, it provides a button to edit scores.
• Settings - Allows for configuration and loading of test matches.
• Video Switch - Used to show sponsors, bracket, audience key, wifi reminder, ranks, and blank screen.

13.3.3. How to Display Sponsor Information
You can display the list of sponsors on an Audience Display using the tabs that are available on the Match Control screen.

1. Select the Video Switch tab, then the “Show Sponsors” button.

![Figure 66 - Select the "Show Sponsors" button to display the sponsor information on Audience Displays.](image)

2. Select “Show Sponsors” button to display the sponsor information on the Audience Displays at your event.

3. The Audience Displays should automatically begin displaying the sponsors for your event.

![Figure 67 - The Audience Displays with sponsor information.](image)

13.4. Scoring/Timing Displays
A laptop or computer that is connected to the same network as the system server can be used to display scoring and timing information:

• Field Display – The Field Display provides basic match and timing information for the teams and volunteers on an active competition field. If live scoring is enable, it also provides live score information.
• Audience Display – The Audience Display provides match and timing information, formatted for spectators. If live scoring is enabled, it also provides score information including a graphical representation of the state of the field during a match. When the results of a match have been committed and posted, the results information should display on the audience displays.

• Overlay Display – The blank portion of the screen is where a video feed (typically live camera footage of the match) can be overlaid onto the screen using chroma key technology.
You can have multiple devices acting as Field or Audience Displays on your network. It is strongly recommended that these devices are connected to the server through a wired (Ethernet) network to avoid interfering with the wireless control systems of the robots. Or, if a wired connection is not convenient, a wireless connection can be used, but it should be configured so that it operates on a Wi-Fi channel that will not conflict with the wireless control systems of the robots.

### 13.4.1. Setting up a Display

By default, the Scoring/Timing Displays are private and not accessible without an authorized user account. Currently a user account requires Display privilege to be able to display the Scoring/Timing information.

Before you can set up a Field or Audience Display, you will need:

- Verify that you have the IP address of the FTC Live server.
- Verify that you have a valid user id and password that can access the Scoring/Timing feature.
- Launch the Google Chrome browser on your display computer.
- Type in the IP address to navigate to the system server.

**Figure 71 - Type in the IP address to navigate to your system server.**

- “Login” link in the upper right-hand corner.

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• In the Event Home page for your selected event, select the “Scoring/Timing Displays” link.
• On first load, the Display Page will appear with a settings dialog open. The settings dialog allows you to choose a display type (Audience, Field, Overlay), as well as binding the display to a field. Note that after you close the settings dialog, you can re-open it by clicking anywhere on the page while holding down the CTRL key.

![Figure 72 - Display Settings Dialog.](image)

• The “Audio Testing” buttons at the top can be used to play the game audio cues to test the PA system.
• Select which Display Mode for the computer you are configuring.
• If you bind the display to a field, then it will only show events for the specified field.
• If you are not using real-time score tracking, disable the “Show Live Scores” option.
• Displays must be shown in full screen. After changing to full screen, refresh the page to ensure it is properly displayed.
• Google Chrome is recommended. Firefox is NOT supported and will not work with the display screens.

**Note:** Test that Scoring/Timing Displays update automatically as the scorekeeper changes the state of the active event.

### 13.5. Scoring Using Paper Scoresheets

FTC Live supports scorekeeping using paper scoresheets and a very basic system configuration (see Figure 3 on page 13). This configuration has a single laptop that functions as the FTC Live server, the Match Control laptop, and as the Audience Display. Referees use paper sheets to score the matches. These are found in the Resources folder or Scoresheets. After a match is complete, the scorekeeper manually enters the values through the Match Control page.

#### 13.5.1. Configuring the Audience Display

On the laptop, the scorekeeper should have two browser windows opened. One window should display the Match Control screen. The other window should be configured as an Audience Display with the “Show Live Scores” option disabled (see image below). Both browser windows should be logged in as the “local” user.
If the “Show Live Scores” option is disabled, then the Audience Display will only display match and timing information. No real-time scores will be displayed.

**Note:** The Audience Display browser window should be maximized in the externally connected HDMI monitor so that the teams and audience can see the timing and match information clearly.

### 13.5.2. Step-by-Step Example: Scoring with Paper sheets

1. Scorekeeper selects the match that he/she wants to score and pushes the “Play” button that appears next to its listing on the Match Control Page (or the Scorekeeper pushes “Load Next Match” if the next match in the schedule is to be played). The match should be listed as the “Loaded Match” near the top of the Match Control screen.

   ![Figure 74 - Press "Load Next Match" or "Play" button to load a match. It will be listed as the "Loaded Match" near the top.](image)

2. The scorekeeper presses the “Show Preview” button on the Match Control Page. This should force the Audience Displays to display information about the upcoming match.

   **Note:** On the Match Control Page the “Show Preview” button should change from green to yellow after the button has been pressed.
3. Select the Randomize Field button on the Match Control page or the referees can roll a physical die and use the result to determine how to place the game elements for the autonomous phase.

4. The scorekeeper can push the “Show Match” button to show the match information, which for this scenario will include the alliance team numbers and the match clock.
5. The scorekeeper pushes the “Start Match” to run the match.

**Note:** The “Start Match” button might be colored red. Please disregard, because it is “waiting” for pre-match information from a score tracking tablet for live scoring.

6. After the match begins, the Audience Display should play the audio cue indicating that the match has begun and the countdown timer on the display should be active.

**Note:** that the scorekeeper has the option to abort the match by pushing the “Abort Match” button while the match is active.
Figure 79 - The audio cue should play and the timer should start counting down at the start of the match.

7. After the match is complete, the scorekeeper collects the paper scoresheets from the referees and then pushes the “Active Match” tab on the Match Control screen. This will bring up the electronic version of the scoresheets on the Match Control screen.

Figure 80 - Press the "Active Match" tab to display the electronic version of the scoresheets.
8. Under the “Active Match” tab, the scorekeeper should push the green button with the label “here” to edit the scoresheets manually.

![Select the "here" button to edit the scores.](image)

Figure 81 - Select the "here" button of the phrase "To edit click here" to edit the scores.

9. When prompted, select the “Force Edit” to force the edit to occur.

![Click "Force Edit" button to force an edit of the scores.](image)

Figure 82 - Click "Force Edit" button to force an edit of the scores.

10. If prompted, click “Yes” to override the referees. It is OK to click “Yes” since real-time scores were not tracked for this match.

![Override Referees?](image)

Figure 83 - Hit "Yes" to override the referees and enter the scores manually.

11. The scorekeeper should manually enter in the score values through the Match Control Page. The scorekeeper should then press “Save Edits” and then “Commit” (or just “Commit”) and the scores will be committed to the FTC Live system.
Figure 84 - The scorekeeper should edit the scores, then push the "Commit" button to commit them to the system.

12. The scorekeeper should then press the “Schedule” tab to return to the match schedule, and then press the “Post” button next to the match to display the match results on the audience display.

Figure 85 - Press the "Post" button next to the match to display the Match results to the Audience Display.

Figure 86 - The Audience Display should show the match results.

13. The scorekeeper can repeat the process for subsequent matches.
13.6. **Live Score Tracking Using a Tablet**

13.6.1. **Connecting a Tablet to the Server**
A tablet running Google Chrome can be used to manually track scores during a match. Before you can begin live score tracking, you will need to know the IP address of the computer that is running the FTC Live server. You also will need a user id and password that has referee (i.e., score tracking) permission for the event.

**Note:** that if you implement live score tracking using a pair of wireless tablets, make sure the operating Wi-Fi channel for the score tracking tablets will not conflict with the wireless control system of the robots.

To connect to the server, use the following steps:

- Verify that the tablet is connected to the same network as the FTC Live server.
- Launch the Google Chrome browser on the tablet and type in the IP address into the Chrome address/navigation bar to navigate to the FTC Live server.

![Figure 87 - Type in the IP address (which you can get from your IT admin) of the server in the browser's address bar.](image)

- If you successfully connect to the FTC Live server, you will see its home page. Select the upper right-hand menu icon to display the menu options for the home page. The "Resources" "Feedback" and "Login" links should appear towards the top of the screen.

![Figure 88 - Select upper right-hand menu icon to display the "Feedback" and "Login" menu options.](image)

- Select the "Login" link and follow the onscreen instructions to login to the appropriate user account.
- If you have successfully logged in, you should see the Home page with a listing of Event Info and Referee Score Tracking.

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On the Event Home page, select the appropriate Referee Score Tracking link (Red Alliance or Blue Alliance).

If prompted, select a field if you want to bind the tablet to a specific field or select “All Matches” if you would like to use this tablet to score all matches for this event.
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**13.6.2. Step-by-Step Example: Scoring an Event with Wireless Tablets**

In this section, we will go step-by-step through the process of scoring an event using wireless tablets for real-time score tracking. Scorekeeper is logged into FTC Live with Event Admin privileges and has a browser window displaying the Match Control page for the selected event. The referees who are score tracking for the event have connected their respective tablets to the server and are logged in with score tracking access. We also assume that there is a Field Display computer and an Audience Display computer and these devices are properly configured and connected to the server.

1. Scorekeeper selects the match that he/she wants to score and pushes the “Play” button that appears next to its listing on the Match Control Page (or the Scorekeeper pushes “Load Next Match” if the next match in the schedule is to be played). The match should be listed as the “Loaded Match” near the top of the Match Control screen.

2. The scorekeeper tablets should display the match (or matches) that are available for scoring. Both referees (Red Alliance and Blue Alliance score referees) should select match that they will be scoring.

- If there are no active matches yet, the tablet will display the following message. You will have to wait for the scorekeeper to prepare a match to play before the screen will change.

![Figure 92 - If there are no active matches, then this message will appear.](image)

**Figure 91 - Select a field if you want to bind tablet to a specific field, or select "All Matches" to score all matches with this tablet.**

![Figure 91 - Select a field if you want to bind tablet to a specific field, or select "All Matches" to score all matches with this tablet.](image)
3. The scorekeeper presses the “Show Preview” button on the Match Control Page. This should force the Audience Displays to display information about the upcoming match.

Note: On the Match Control Page, the “Show Preview” button should change from green to yellow after the button has been pressed.

4. The score tracking referees should see a screen that displays the Pre-Match Setup state for their alliance. Each referee (red and blue) should use their tablet to update the Pre-Match Setup state to match the state on the field.
   a. FTC Live needs to know if each team is present.
   b. The referees should press the respective “Alliance Ready” buttons at the bottom of their screen after they have entered in the current state of their Pre-Match field.
   c. In Figure 81 (see below) Team 7135 is present. Team 8089 is present.
5. Once the Pre-Match information has been entered, the referee tablets will display a message that indicates that the FTC Live is waiting for the match to start.

6. The scorekeeper should press the “Randomize Field” button to “roll” the virtual die to determine how to configure the minerals for the Autonomous portion of the match.
   a. After the field has been randomized, the score tracking tablets will display the randomization results.
   b. The Audience Display, however will not show the randomization results until “Show Random” is selected. Instead, the Match Preview information should still be visible.
7. The scorekeeper should press the “Show Random” button to display the randomized information on the Audience Displays.

8. The scorekeeper should press the “Show Match” button to show the match information on the Audience Displays and the Field Displays.
9. When everyone is ready to begin, the scorekeeper pushes the “Start Match” button to start the match.

10. During the autonomous phase, the referees should enter the score tracking data using their respective tablets.
   a. While the scores are being entered, the score values on the Audience and Field displays should be updated with the current score tracking values.
   b. The scorekeeper can press the “Active Match” tab on the Match Control Page to monitor the score tracking data.
   c. The match information (including the time remaining on the countdown timer and the state of the match) are listed for the “Active Match” at the top of the Match Control Page.
Figure 101 - The scorekeeper can press the “Active Match” tab to display the active match information.

11. Once the Autonomous phase is complete, the referees should verify their autonomous scores and push the “Submit Autonomous” button to submit the autonomous scores to FTC Live.

Figure 102 – Referees should push the “Submit Autonomous” button to submit their autonomous scores.

12. During the Driver-Controlled period, referees should enter the scoring data using their tablets.
13. Once the Driver-Controlled period is complete, referees should verify their scoring data and then push the “Submit Driver-Controlled” button to submit the scoring data.

**Figure 103 - Referees should push "Submit Driver-Controlled" to submit their Driver-Controlled scores.**
14. After the referees submit the Driver-Controlled data, they have an opportunity to review and edit all the scoring data for the match that was just played.
   a. The referees can adjust their scores if needed.
   b. The referees should each press the “Submit Final Scores” when they are ready to submit their final scores for a match.

Figure 104 - Referees can review the scores and then push the "Submit Final Scores" button.
15. After the referees have submitted their final scores, under Schedule, the scorekeeper has the option to edit the scores even further. To commit the scores push the “Commit & Post Last Match” or the “Commit” button listed next to the match.

Figure 105 - Scorekeeper can press the "Commit" button to commit the finalized scores.

16. Once the scores have been committed, the Scorekeeper can push the “Post” button to post the results to the Audience Displays.
   a. The scorekeeper also has the option to Replay the match if the referees determine that a replay is warranted.
   b. The scorekeeper also has the option to Edit the scores for the match.

Figure 106 - Once the scores have been committed, the scorekeeper can post the results.

Figure 107 - When the scorekeeper posts the results, the final match info is displayed on the Audience Displays.

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Note: If the match is complete and the referees have not yet submitted their final scores, the scorekeeper has the option to force an edit of the match score data.

c. If this is done before the referees submit their final scores, the referees will not be able to submit finals scores for the match (the scorekeeper is overriding their scores).

d. This option allows a scorekeeper to enter score data from a paper scoresheet, if, for example, live scoring is not available during a match.

e. In general, however, scores should be submitted by the referees using their score tracking tablets.

**Figure 108 – Scorekeepers can edit/override the score data by selecting the Force Edit button.**

Note: The scorekeeper can abort the match by pushing the “Abort Match” button during the match.

f. FTC Live will prompt the scorekeeper to verify that he/she really wants to abort the match.

g. If a match is aborted, referees will need to manually refresh their tablet browsers to display the current state information for the match.

h. After a match has been aborted, it can be replayed. Note the field might need to be re-randomized before replaying a match.

17. Once this process has been completed, the scorekeeper can press the “Load Next Match” button to start the process again for the next match in the schedule.
14. Managing Elimination Matches

1. Once the qualifying matches have been completed and committed, the scorekeeper can press the “Alliance Selection” tab on the Match Control Page to begin the Alliance Selection process.

![Figure 109 - Press the Alliance Selection tab to begin the selection process.](image)

2. Press the “Start Alliance Selection” button will display a ranked list of teams on the Match Control screen.

![Figure 110 – Pressing the Start Alliance Selection button will display a ranked list of teams.](image)

3. The scorekeeper should push the “Set Audience Display” to toggle the Audience Displays to Alliance Selection mode.

![Figure 111 – Pressing the “Set Audience Display” button puts the Audience Displays into Alliance Selection Mode.](image)
4. Press the “Captain” button next to a team to designate the team as an Alliance captain. If an eligible team is unable to be an alliance captain (for example, if the team must leave the event early) press the “Remove” button in their listing to remove them from the selection process. Once an alliance captain is selected, their team number should appear as the Alliance Captain, and the list of available teams will be updated.

![Figure 112 - Press "Captain" to designate a team as an alliance captain or press “Remove” if they are unable to be a captain.](image)

5. As the Captain makes his/her Alliance’s first invitation, the scorekeeper can press the “Accept” or “Decline” button for the invited team to indicate whether the team accepted or declined the Captain’s invitation. The Alliance Selection Displays should update automatically as the button is pressed.

![Figure 113 – The scorekeeper should press the “Accept” or “Decline” button listed next to a team to accept or decline an invitation.](image)
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7. When the alliances are finalized, the scorekeeper should press the “Generate Matches” button to generate the elimination match list. Once the elimination matches have been generated, the scorekeeper can select the “Schedule” tab to view the elimination schedule.

![Figure 116 - Press the "Schedule" tab after the matches have been generated to view the elimination schedule.](image)

8. Once the elimination schedule is available, the scorekeeper and referees can run the matches in a manner similar to how the qualification matches are run. However, if there are more than 20 teams participating at your event, the elimination matches will list three teams per alliance. For an event with 3 teams per alliance, during the Pre-Match Setup of an Elimination match, the referees will need to designate which two of the teams are competing in each match.

![Figure 117 - Referees will need to designate which two teams are participating (i.e., are present) for an Elimination Match.](image)

9. In figure above the referee has indicated that Teams 11780 and 8089 will be playing in the match while team 13507 is sitting out the match for the Red Alliance.

After the first elimination match of a semifinal round has been played, when the referees view the Pre-Match Setup screen for the next match in that semifinal round, a message should appear at the top of the screen indicating which of the three teams did not play in the previous match. This warning appears so that the referee can verify that all three teams for each alliance participated in the elimination matches per the official Game Manual, part 1 (if an alliance has three teams, then “the team that sits out the first match must play in the second match, with no exceptions”).

FTC Live lets the scorekeeper run the matches until each semifinal round has a winning alliance. The scorekeeper can edit, commit, and then post the results for each elimination match. If the alliances in a
When the semifinal matches are complete, FTC Live will automatically generate final elimination matches for the two winning alliances. The final elimination matches are scored in a manner similar to the semifinal matches. The scorekeeper can edit, commit and post each final-round match. If the alliances tie, the system will automatically add a new match to the schedule.

Once the final matches are complete, the scorekeeper can post the final match results to the Audience Displays and display the winning alliance.
15. Managing League Events

**Overview of Leagues**

**League** - A group/association of teams in a specific geographic location. This group of teams competes in meets, and then a league tournament. Each league tournament is associated with exactly one league. All teams that compete at a league tournament must be members of one (parent) league.

**Child League** - An optional subset of a league (the “parent” league) that compete together before joining the rest of the parent league’s teams at the league tournament. All teams in a child league are also members of the parent league. This structure exists for regions that run large league tournaments and wish to divide teams up to help organize meets.

**League Meet** - Meet is a one-field competition that uses the same field and game elements as other FIRST Tech Challenge tournaments. However, for a league meet, the event is abbreviated, and only includes qualification matches (but no judging sessions, awards or elimination matches). Results carry forward to future meets and the league tournament.

**League Tournament** - The final event in league play. Each league tournament is associated with exactly one (parent) league. Team rankings incorporate performance in matches from league meets. League tournaments include judging and awards. Teams advance from a league tournament to a super qualifier or regional championship.

**League Configurations**

In previous seasons, leagues have been managed in different regions using different terminologies. Data has been centralized into FTC Scoring system so the terminology has been standardized. Below are examples of how to transition from prior systems into the FTC Scoring system league set up. In all cases, the outcome is functionally equivalent to the prior season experience.

**Standalone League Model**

Regions that run single-league events and league tournaments with no inter-league play. Follow the steps in the section: [Creating Leagues for Your Region](#).
Inter-League Model

Regions that ran leagues where multiple leagues may have been present at a single event, for example, inter-league tournaments (ILT) or other inter-league play.

This model follows the standalone league model until the league tournament, where multiple leagues play in the same league tournament. In this model, the leagues are usually isolated until the ILT, but some variants may exist where teams play in meets with teams from other leagues.

To enter this format into the system, first create a league (parent) that includes all teams that will play at a single ILT. Then, you can create a child-league to split the teams into the same groupings as you would have previously.

Example Scenario:

In the SKYSTONE season, league A and league B each had 20 teams. The two leagues played separate meets, but played together at a 40 team ILT.

Scoring System: Create one league with all 40 teams. Then, create a Child League A and a Child League B. Add the appropriate teams to each child league. All of the child league meets can be associated with their respective child league, but the ILT must be associated with the parent league.

Metro League Model

In this model, league inter-play is very common. Teams may play in any meet, and data is aggregated from the various meets at the League Tournament. Teams or events may be grouped into multiple leagues, but can play in any meets.

To enter this format, create one league and add all teams participating and all the meets. You may create child-leagues if desired. Ensure that no team plays in a meet associated with a different league. It is OK if they play with a different child league, but not a different parent league.

15.1. Creating Leagues for Your Region

Important Note: League creation and setup MUST be done in the cloud-based FTC Scoring system. It CANNOT be done in FTC Live. Similarly, the association of an event to a league MUST be done in the FTC Scoring system.

1. Log in to the FTC Scoring system with your FIRST dashboard login.
2. Select your region. This takes you to the main Region page with a list of options: Events, Teams, Leagues, Sponsors and Users. To set up a league go to Leagues, then Create League.
3. Specify a unique League Code, following the same rules as event codes (all lowercase letters and numbers and underscores, no whitespace, preferably one word).

4. Specify the League Name and the Location (region)

5. Select "Create League."

![Image of League Code, Name, and Location input fields]

*Figure 122 – Specify League Code, Name and Location and press “Create League”.*

6. For your newly created league, you will need to return to the main region page (go back or select the FTC logo), then select “Events” to access the individual league events to add/edit teams.

![Image of Event List]

*Figure 123 - Select "Events" on main region page.*

7. Select the event to edit.

![Image of Event Details]

*Figure 124 - Select the event.*
8. Then select “Manage Event” to add or edit teams for the league event.

![Image](https://example.com/image125.png)

**Figure 125 - Select the "Manage Event" to add/edit teams.**

9. Select the "Add/Edit Teams" button.

![Image](https://example.com/image126.png)

**Figure 126 - Choose from four options to add teams.**

a. You can add/edit teams with four different options: Find by State/Province, From Region, League Members, Add Individually.
10. Selected teams will appear in purple, when finished, click "Done".
   a. Select "Back" in the top-left corner to return to the selected league event dashboard.
   b. Repeat steps for each additional league for your region.

**Create a Child League**

1. To create child leagues, you will first need to create the parent league. Then select the “Leagues” tab and the “Create Child League” appears.

2. Enter the “League Code”, “League Name” and the “Location” and save the edits.

**Add Teams to the Child League**

3. Go to “Teams”, select “Edit Team List” to choose teams for the child league.

4. Just like parent league set up, choose from 4 options to add/edit teams then select “Done”.
5. Once you’re done creating child leagues, go back to the parent league, then select “Leagues” to view the child league(s).

**Rankings for Parent/Child Leagues**
League Rankings will appear on the “Rankings” tab.

Note: As an administrator, you will see the league rankings from unpublished events, so they may differ from other sources until an event’s results are published. A child league’s home page will also show league Rankings, however those rankings are for fun. They have no competitive meaning at the League Tournament, and may not accurately reflect the full rankings, which are shown in the parent league’s ranking list.

**15.2. Running a League Event**
Select “Play Locally” for the specific league event.

**Important Note:** Scorekeepers at meets should not edit the league team list unless instructed to do so. If they believe the list is wrong, they should leave it and notify the League Manager after the event. An incorrect league team list will not affect match data, as long as the event’s team list is correct.

**16. Managing Awards**
If you are running an event that is not a League Meet, then your Event Dashboard should include a step that allows you to manage awards for your event. Press the “Manage Awards” button to begin the awards management process. This can also be found in Judging, by selecting the FIRST Tech Challenge logo.
When you first launch the Awards Manager, FTC Live will default to the “Give Awards” screen (see figure below).

The “Give Awards” screen lists all of the awards that are defined for the current event in the order that they are to be given. Awards that are highlighted in red must be given per Judging Manual rule on equitable distribution of awards. Awards that are highlighted in green have already been “given” (i.e., winners have been assigned).

### 16.1. Giving an Award

When you are ready to give an award to a team, select it on the “Give Awards” screen. After you have selected the desired award, enter the required information for each team or individual. You can also enter text to describe why the winner was selected in the “Judge’s Comments”.
Press “Save” to save your changes.

**16.2. Managing the List of Awards**

You can select the “Manage Awards” button to modify award. You can also modify the order of the awards by selecting an award listing, and then using the mouse to drag it to its new location in the presentation order.

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**Note:** The mandatory awards are supposed to be presented in the original order as listed by the FTC Live. Also note that the system will not let you edit or delete a mandatory award, you can only edit optional awards.

Once you have finished managing your awards, you can return to the “Give Awards” screen to continue giving the awards (i.e., assigning winners for the awards)

**16.3. Viewing / Printing the Awards Script**

Once you have given out all the awards (i.e., once you have assigned winners to each award) the list on the “Give Awards” screen should be green.
### Give Awards

<table>
<thead>
<tr>
<th>Award</th>
<th>Winner/Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Judges' Award</td>
<td>6382 Kaiserlautern HS - Raider Robotics</td>
</tr>
<tr>
<td>Compass Award</td>
<td>10942 Viteck HS (RoboRaptors)</td>
</tr>
<tr>
<td>Promote Award</td>
<td>10941 SHAPE HS</td>
</tr>
<tr>
<td>Arm, Inc. Control Award</td>
<td>10958 Baumholder MHS</td>
</tr>
<tr>
<td>Motivate Award</td>
<td>11405 Hohenfeld MHS Tigers</td>
</tr>
<tr>
<td>Design Award</td>
<td>11407 Viteck HS (Falcons)</td>
</tr>
<tr>
<td>Collins Aerospace Innovate Award</td>
<td>13152 Netzberg MS (FTC)</td>
</tr>
<tr>
<td>Connect Award</td>
<td>11456 Stuttgart HS Panthers</td>
</tr>
<tr>
<td>Think Award</td>
<td>10940 Ramstein HS - #1 - METAL GEAR</td>
</tr>
<tr>
<td>Dean's List Semi-Finalists</td>
<td>Winner:</td>
</tr>
</tbody>
</table>

**Figure 132** - Once you have assigned winners for each award, the list should turn all green.

Press the “View/Print Script” button to view the award script. Press the “Print” button to print the script.

### Awards Manager

#### View Script

Welcome to the IH Championship 2019 Awards and Closing Ceremony! As many of you know, FIRST is a non-profit and a global movement transforming lives and inspiring future innovators, and problem solvers. FIRST engages young people, kindergarten through 12th grade in our four STEM programs including FIRST LEGO League Jr., FIRST LEGO League, FIRST Robotics Competition, and of course, FIRST Tech Challenge. Our STEM programs are a fantastic opportunity to have the hardest fun you’ll ever have! Speaking of the hardest fun you’ll ever have, what an outstanding day we’ve had. Before we hand out our awards, let’s thank the awesome people who made this event happen. Today could not have been possible without our volunteers! Please give a big round of applause for all the volunteers who have given their time, effort, dedication, and so much more to make this program a success. Also, a big round of applause for our generous sponsors, especially our Presenting Sponsor Qualcomm and our Official Program Sponsor Collins Aerospace! Thank you! Before we hand out the awards, I would like to introduce our special guest.

[Introduce Speaker]

Let’s give a round of applause to our Judges, Referees and Field Tech Advisors for all their expertise, dedication and hard work today as they make their way up to the front for the presentation of awards.

[Volunteers file onto the stage]

Thank You! And now, the Awards.

**Judges’ Award**

The Judges Award is given at the discretion of the Judges to a team they have encountered whose unique efforts, performance or dynamics merit recognition, yet the Team does not fit into any of the existing Award categories.

**Figure 133** – Press the “View/Print Script” button to view the awards script.

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16.4. **Presenting the Awards**
Press the “Present Awards” button to begin the presentation process.

![Present Awards interface](image)

To reveal an award, simply select the Award name and the Audience Display should display the Award name (but not the users). Selecting the 3rd place winner, will reveal the third-place winner on the Audience Display. Selecting the 2nd Place winner will reveal the second-place winner on the Audience Display. Selecting the 1st Place winner will reveal the first-place winner on the Audience Display. If you’d like to reveal all of the winners at once, simply select the 1st Place winner.

![Award results](image)

Figure 134 – Press “Present Awards” button to begin presenting the awards.

Figure 135 - As each winner is revealed, their team number and name are displayed on the Audience Display.
17. Reviewing Match Results

If you navigate to the event home page, you can select the “Match Results” link under the “Event Info” category to view the Match Results for the currently selected event.

The Match Results page displays the available match results for the currently selected event. You can press the “Print” button to print these results.

You can also review the virtual scoresheets for a match by selecting the corresponding “Scoresheet”, “Red” or “Blue” link for the match under the “Score breakdown” column. “Scoresheet” shows the combined scoresheet (Red and Blue), while the “Red” and “Blue” links show the individual scoresheets.
You can review the combined or individual scoresheets for a match.

You can also select the “View Match History” link to view how many times the scores for a match were modified and re-committed.

**Figure 138** - You can review the combined or individual scoresheets for a match.

**Figure 139** - You can view how many times a match’s scores were revised and re-committed.
18. Troubleshooting the FTC Live

18.1. Accessing the FTC Live Logs

It can be helpful to access the FTC Live logs and review messages from the FIRST Tech Challenge Live scorekeeping server. The output from the scorekeeping server is redirected to a text file in a subdirectory within the software directory. To access the log files, in the main program directory the FIRST Tech Challenge Live software look for a subdirectory named “bin”. Double select the “bin” subdirectory to view its contents.

![Figure 140 - Open the bin subdirectory.](image)

You should now see a directory called “logs”. Double-click on the logs folder to view its contents.

![Figure 141 - Double select the “logs” subdirectory.](image)

If you have run the software at least one time, then you should see at least one log file in the “logs” subdirectory. Double-click a log file to view its contents.
Figure 142 - You should see a listing of log files within the "logs" directory.

Figure 143 - Log files contain useful information for troubleshooting.
19. Appendix A – Resources

**Game Forum Q&A**
https://FIRST Tech Challengeforum.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.

Volunteers that apply for a specific volunteer role will receive an email from FTCTrainingSupport@firstinspires.org with their username and password to the forum. 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**
These numbers are 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 FTC Live support: 603-206-2450
All other day of event support: 603-206-2412

**FIRST Websites**
FIRST homepage – [www.firstinspires.org](http://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!

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*Gracious Professionalism®* - “Doing your best work while treating others with respect and kindness - It’s what makes FIRST, first.”