2018-2019 FIRST® Tech Challenge
Scorekeeper User Manual

Presented By Qualcomm

www.firstinspires.org
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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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<tr>
<th>Revision</th>
<th>Date</th>
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</thead>
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<tr>
<td></td>
<td></td>
<td>• Appendix A – Update to on call event support line to include scoring system support.</td>
</tr>
</tbody>
</table>

Contents

Contents .......................................................................................................................... 3

Introduction....................................................................................................................... 6

What is FIRST® Tech Challenge?......................................................................................... 6

FIRST Core Values ............................................................................................................. 6

Gracious Professionalism® .............................................................................................. 6

Gracious Professionalism for Volunteers.......................................................................... 7

FIRST Volunteer Rights and Responsibilities ................................................................ 7

NOTICE OF NON-DISCRIMINATION .................................................................................. 7

Volunteer Rights and Responsibilities ............................................................................. 7

Tournament Organization Structure ................................................................................ 8

Job Description.................................................................................................................. 9

Volunteer Training and Certification .............................................................................. 9

Volunteer Minimum Age Requirement ............................................................................. 10

Key Volunteer Role Minimum Age Requirement ............................................................... 10

Bring a Friend! .................................................................................................................... 10

Overview of Responsibilities ............................................................................................ 10

Pre-Event Day Responsibilities ........................................................................................ 11

Event Day Responsibilities ............................................................................................... 11

Scoring System Setup...................................................................................................... 11

Gracious Professionalism® - “Doing your best work while treating others with respect and kindness - It’s what makes FIRST, first.”
<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-Match Responsibilities</td>
<td>11</td>
</tr>
<tr>
<td>Game Play</td>
<td>12</td>
</tr>
<tr>
<td>Generate Alliances</td>
<td>12</td>
</tr>
<tr>
<td>Awards</td>
<td>12</td>
</tr>
<tr>
<td>Post-Event Responsibilities</td>
<td>12</td>
</tr>
<tr>
<td>Introduction to the Scoring System</td>
<td>12</td>
</tr>
<tr>
<td>What is the FIRST Tech Challenge Scoring System?</td>
<td>12</td>
</tr>
<tr>
<td>System Hardware</td>
<td>13</td>
</tr>
<tr>
<td>System Layout</td>
<td>13</td>
</tr>
<tr>
<td>Basic Configuration with Paper Scoring</td>
<td>13</td>
</tr>
<tr>
<td>Advanced Configuration with Real-time Scoring</td>
<td>13</td>
</tr>
<tr>
<td>System Requirements</td>
<td>14</td>
</tr>
<tr>
<td>Windows</td>
<td>14</td>
</tr>
<tr>
<td>Mac</td>
<td>14</td>
</tr>
<tr>
<td>Android Tablet (for Real-time Score Tracking)</td>
<td>15</td>
</tr>
<tr>
<td>iOS Tablet (for Real-time Score Tracking)</td>
<td>16</td>
</tr>
<tr>
<td>Download and Installation</td>
<td>16</td>
</tr>
<tr>
<td>Important Tips for Running the System Software</td>
<td>16</td>
</tr>
<tr>
<td>Downloading the Software Package</td>
<td>16</td>
</tr>
<tr>
<td>Launching the FIRST Tech Challenge Live Server</td>
<td>17</td>
</tr>
<tr>
<td>Launching the Server Using Windows</td>
<td>17</td>
</tr>
<tr>
<td>Launching the Server Using macOS</td>
<td>18</td>
</tr>
<tr>
<td>Using an Alternate HTTP Port (Advanced Topic)</td>
<td>20</td>
</tr>
<tr>
<td>Using an Alternate HTTP Port on a Windows Computer</td>
<td>20</td>
</tr>
<tr>
<td>Using an Alternate HTTP Port on a Mac Computer</td>
<td>21</td>
</tr>
<tr>
<td>Navigating to the Server Using an Alternate Port</td>
<td>22</td>
</tr>
<tr>
<td>Setting Up an Event</td>
<td>22</td>
</tr>
<tr>
<td>Getting Version Number and IP Address</td>
<td>22</td>
</tr>
<tr>
<td>Logging in to the System</td>
<td>23</td>
</tr>
<tr>
<td>Navigating the System’s Home Screen</td>
<td>23</td>
</tr>
<tr>
<td>Creating an Event</td>
<td>25</td>
</tr>
<tr>
<td>The Event Dashboard</td>
<td>26</td>
</tr>
<tr>
<td>Creating Default User Accounts</td>
<td>27</td>
</tr>
<tr>
<td>Adding/Editing Teams for an Event</td>
<td>28</td>
</tr>
<tr>
<td>Adding a Team Individually</td>
<td>29</td>
</tr>
<tr>
<td>Adding Teams by State or Province</td>
<td>29</td>
</tr>
</tbody>
</table>
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. To learn more about FIRST® Tech Challenge and other FIRST® Programs, visit www.firstinspires.org.

FIRST Core Values
We express the FIRST® philosophies of Gracious Professionalism® and Coopertition® through our Core Values:

- **Discovery**: We explore new skills and ideas.
- **Innovation**: We use creativity and persistence to solve problems.
- **Impact**: We apply what we learn to improve our world.
- **Inclusion**: We respect each other and embrace our differences.
- **Teamwork**: We are stronger when we work together.
- **Fun**: We enjoy and celebrate what we do!

Gracious Professionalism®

FIRST® uses this term to describe our programs’ intent and Gracious Professionalism® is not clearly defined for a reason. It has different meanings to everyone. Some possible meanings of Gracious Professionalism include:

- Gracious attitudes and behaviors are win-win.
- Gracious folks respect others and let that respect show in their actions.
- Gracious Professionals make valued contributions in a way that is pleasing to others and to themselves.
In the end, Gracious Professionalism® is part of everyday life. When professionals use their knowledge graciously and individuals act with integrity and sensitivity, everyone wins, and society benefits.

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

**Gracious Professionalism for Volunteers**
It is a good idea to spend time going over this concept with volunteers. Provide volunteers with real-life examples of Gracious Professionalism in practice before, during, and after the event and recognize great Gracious Professionalism when you see it in action!

**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](http://www.firstinspires.org/about/legal-notices)

**Volunteer Rights and Responsibilities**
Volunteers are the most valuable asset to FIRST®. Your selfless contribution of time and resources are instrumental in accomplishing our mission of inspiring the next generation of science, technology, engineering, and mathematics leaders and innovators. The foundation of the relationship between FIRST and our volunteers is respect.

It is your right to:

- Be treated with Gracious Professionalism®. Gracious Professionalism is a way of doing things that encourages high-quality work, emphasizes the value of others, and respects individuals and the community.
- Feel valued. FIRST recognizes the significant efforts that volunteers contribute. The time that you donate not only helps FIRST succeed but also builds the FIRST community.
- Understand your role. FIRST will inform you about what’s expected of you, your schedule, any meals you will be provided, any changes to program or policy, and who to contact should you need assistance.
- Expect a safe environment. FIRST strives to create and maintain a safe environment for all volunteers and participants and will always factor safety into program planning.
- Receive fair treatment and inclusion. All volunteers will be treated with respect and dignity in inclusive environments. FIRST does not discriminate on the basis of race, color, national origin, sex, disability, age, status as a veteran who served in the military, religion, sexuality, gender, gender identity, or gender expression in its programs and activities.
- Reevaluate your time commitment. FIRST appreciates all of our volunteers and understands that volunteers experience life situations that may affect their commitment.
- Communicate with your Volunteer Coordinator or your local FIRST leadership about:
  - Concerns or limitations that are affecting your volunteer role.
  - Any mistreatment towards you or others. You may be required to fill out a [non-medical incident form](#).

Gracious Professionalism® - “Doing your best work while treating others with respect and kindness - It’s what makes FIRST, first.”
Contact FIRST Headquarters directly if you feel that you are being treated improperly and attempts to resolve issues and conflicts at the local level are not successful. Volunteers can call (800) 871-8326 or email volunteer@firstinspires.org.

It is your responsibility to:

- Treat others with Gracious Professionalism®.
- Follow the schedule and the role description provided for your position. Contact your local FIRST leadership if there are any issues.
- Respect others, treat them fairly and kindly. Be inclusive and follow the non-discrimination policy of FIRST.
- Follow safety rules and ensure safety of others. Adhere to all FIRST Youth Protection Program (YPP) policies. Report any injuries or safety concerns within 48 hours.
- Adhere to the FIRST Code of Conduct.
- Have FUN!

**Tournament Organization Structure**

*Figure 1 - League Championship, Qualifying Tournament, Championship Tournament Organization*

- Field Manager*
  - Lead Queueer
  - Scorekeeper
  - Referee
  - Game Announcer
- Head Referee
  - Referee
- Pit Manager
  - Pit Admin Crew
- Judge Advisor
  - Judge
  - Judge Advisor Assistant
  - Judge Mentor Observer
- Volunteer Coordinator
  - Disc Jockey
  - Load-In/Load-Out Crew
  - Crowd Control Volunteer
- Dean’s List Interviewer**
- Dean’s List Reviewer**

*For events without a Field Manager, all volunteers that report to the Field Manager will report to the Field Technical Advisor, except for the Emcee and Game Announcer who report to the Volunteer Coordinator.

**Dean’s List interviewers and reviewers operate outside the realm of judging. Dean’s List Volunteers do not participate in Event day deliberations for the Dean’s List Award.

***Wi-Fi Technical Advisors are only recommended for Championship Tournaments and World Championship.

FIRST® Tech Challenge SCOREKEEPER Manual

Revision 3: 0.5.1
Learn more about the roles of volunteers on our Volunteer Resources page, “Volunteer Role Description”.

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 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 at the scoring system. Comfortable shoes and attire are encouraged.
  - ANSI Z87.1 certified safety glasses are required in the competition area.

**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 the FIRST Tech Challenge Scoring Software prior to the event.

**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.

**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.

**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!

**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 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 scoring system.
- 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 scoring system and displays correctly.

A Scorekeeper must be confident and comfortable with the system to be able to reliably record results during the hectic pace of an FIRST Tech Challenge event. Learning ahead of time will go a long way towards keeping the event running smoothly and on time.

**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.

- Watch the pre-recorded Scorekeeper training video. 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.

Many events set up the fields and A/V equipment the night before, which may also include loading the scoring system onto the scoring computer and setup of the display screen. Be sure to check with the Tournament Direct or Affiliate Partner to understand what is being prepared ahead of time, and what needs to be done on the morning of the event.

**Event Day Responsibilities**

**Scoring System Setup**

Setup of the Scoring System is oftentimes 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 scoring system.

**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.

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

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

**Awards**  
The Scorekeeper may be asked to enter the awards into the Scoring System and print the awards ceremony script for the Emcee/Game Announcer.

Other event-day duties may be assigned as needed.

**Post-Event Responsibilities**

**For League Meet Events** - the Scorekeeper must save and provide the results to the Tournament Director or Affiliate Partner. These results contain important team information that needs to be loaded into the Scoring System at the next League Meet or League Tournament.

**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.

**Introduction to the Scoring System**

**What is the FIRST Tech Challenge Scoring System?**  
The FIRST Tech Challenge Scoring System (also known as FIRST Tech Challenge Live) is a software program that has multiple functions to allow you to input and track vital information at an event.

The System allows a Scorekeeper to generate and track the following:

- 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.
System Hardware

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.

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).

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 *FIRST Tech Challenge 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 scoring system 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).

**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.

**Windows**

- Windows 7 or 10
- Java 8 or higher (available from [www.java.com](http://www.java.com), only needed for the laptop running system software)
- Google Chrome
- Support for Wi-Fi if connecting to a wireless network
- Ethernet adapter if connecting to a wired network

**Mac**

- macOS Sierra or greater
- Java 8 SDK or higher (available from [www.java.com](http://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:
  - You should select Java SE 8 (Java SE 8u191 at the time this document was written) or higher.
  - Accept the license agreement, then download the Mac OS X x64 JDK package (see Figure 5 below).

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

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

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Note that some event hosts have a preference to use Amazon Kindle tablets for real-time score tracking. Kindle tablets can be configured to work well with the scoring system. 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 scoring system.

**iOS Tablet (for Real-time Score Tracking)**
- iOS 8 or greater
- Google Chrome
- Support for Wi-Fi

### Download and Installation

**Important Tips for Running the System 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!

**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](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. Browse the Releases page and download the .zip or .tar file for the software version that you would like to use. Note that the archive file begins with the phrase “FIRST-Tech-Challenge-Live”. Also note that Windows and Mac users will most likely want to download the “.zip” version of the archived software.

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, you can right mouse click on the archive file and select the appropriate option to extract the compressed files to your computer.

**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.

**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 click on it to launch the server.

![Double click on the FIRST-Tech-Challenge-Live-Windows.bat batch file to launch server.](image)

Windows might warn you that you are attempting to run software from an unknown source. It is safe to ignore the warning and click on “Run” to run the software.

![Windows 7 users might see a warning message similar to this one.](image)

Note that if you are a Windows 10 user you might need to click on the “More info” link on the warning message and then the “Run anyway” button to run the software.

Gracious Professionalism® - “Doing your best work while treating others with respect and kindness - It’s what makes FIRST, first.”
Figure 9 - Click on "More info" then "Run anyway" to run the software.

A black terminal window will pop open and will need to remain open while you are using the software. You can minimize the window so that it will continue to run in the background. This is the window in which the system server is running.

![Terminal window](image1.png)

Figure 10 - The batch file will launch the system server in a terminal window.

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”).

![System main page](image2.png)

Figure 11 – The software should launch your default browser and display the system’s main page.

**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 click on the file to run the script. Note that macOS might warn you that the application was downloaded from the Internet. If you see this warning, click on the “Open” button to allow your computer to run this application.
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.

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 that for 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.
**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.

**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:

```bash
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.

---

**Figure 14 - If successful, the terminal will show that the server software is running.**

**Figure 15 - 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 16 – If you changed the port number, then you must include the new value in the address when accessing the server.](image)

**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.

![Figure 17- The terminal application is in the “Utilities” subfolder of the “Applications” folder.](image)

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.

```
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):

```
./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).

**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 scoring system 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.

![Specify the port number in the address if your scorekeeping server is using an alternate port number.](image)

**Setting Up an Event**

**Getting Version Number and IP Address**

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 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).

![The software version number and the system IP address](image)
**Logging in to the System**
When you launch the software, a browser window that lists active and all events should appear on your desktop. If this your first time running the software, these lists will be empty. Before you can begin, you must first login to the system.

- Click on “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)

*Figure 20 - Log in to the "local" account to gain access to the system.*

**Important Note:** the “local” user account is the primary administrative account for the system. 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 get access the “local” account.

**Navigating the System’s Home Screen**
Once you have logged in to the system, the home screen should look like the following image:

![Home Screen](image)

*Figure 21 - Clicking on the FIRST Tech Challenge logo (upper left-hand corner of window) will take you to the system’s home screen.*

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Note that if you do not have any events defined for your system, these lists will be empty. You can return to this home screen from many screens within the system by simply clicking on the FIRST Tech Challenge logo in the upper left-hand corner of the screen.

![Feedback and account info links are available in the upper right hand corner of the home screen.](image)

In the upper right-hand corner of the screen you can submit feedback to the FIRST Tech Challenge Live software developers and you can also click on the “Hello, local” link to get information about your current user account.

![An “Event Admin” menu should appear after logging in to the system.](image)

Towards the upper left-hand corner of the screen there is an “Event Admin” menu. If you are on the system’s home screen, there are options available in the “Event Admin” menu:

- Create Event: This will allow you to create a single 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 system access.

Clicking on the event code or name for an event listed in the screen will take you to the home screen for that selected event.
Creating an Event
From the “Event Admin” menu, select the “Create Event” item to create a new event.

When you want to create a new event, you are required to fill in the following fields:

- **Event Code**: The event code must be unique, all lowercase, and must not contain spaces or special characters. For example, an event code can be “leaguemeet01” or “nhqualifier1”. Important note for League organizers: the event codes for league meets should be unique within a league.

- **Event Name**: The event name is used for the scoring software and will appear on displays.

- **Event Type**: It is important to select the correct event type. League meets must select the “League Meet” event type for the rankings and score rollover to work correctly.

- **Event Start Date**: Select the start date of the event from the calendar.

- **Event End Date**: Select the end date from the calendar.

- **Number of Fields**: League Meets will be pre-populated with 1 field. Other event types will allow you to enter the number of competition fields at the event. Most events have 1 or 2 competition events.

Once you have entered in valid values for these fields, press the “Create Event” button to create the event.
Figure 26 - Specify the event information then press “Create Event” to create a new event.

The Event Dashboard
Once you have created a new event, the system should display an Event Dashboard, which lists the typical steps a user will follow to run a FIRST Tech Challenge event. You can also jump to the Event Dashboard for the currently selected event by selecting the event’s “Dashboard” option from the “Event Admin” drop down menu.

Each step has an action and a status listed on the Event Dashboard. The action items are also buttons. You can click on a button to perform an action.
Also, in the upper left-hand corner there is a “Back to Event Home” link. Clicking on this link will take you to the home page for the currently selected event.

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

Press the “Generate New Random Accounts” to generate a set of user accounts that can be used to provide limited access to the system for your volunteers for the 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 clicking on the “Manage Users” item from the “Event Admin” menu and then using the resulting screen to review and modify information for the selected account.

New users can be added by an event administrator by clicking on the “Create User” item from “Event Admin” menu.

When they are logged in to the system, an individual user can also change his/her account password by clicking on the “Hello” link in the upper right-hand corner.

An event administrator can reset the accounts back to their originally assigned passwords by clicking on the “Reset Accounts” button.

An event administrator can generate new random passwords for all the default accounts by pressing the “Generate New Random Accounts” button.

**Adding/Editing Teams for an Event**

Click on the “Add/Edit Teams” button on the Event Dashboard to add or edit teams for the selected event. Note that the system comes with a pre-populated list of FIRST Tech Challenge teams that you can search from.
Adding a Team Individually
You can add a team individually from the “Add Individually” tab:

- In the “Team Number to Add” field, type in the number of the team you would like to add.
- Press the word “Add” to the right of the Team Number to add the team to the event.

![Figure 31 - Enter Team Number and hit "Add" to add a team.](image)

- If the system 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 edit the fields of a team by pushing the edit button towards the right side of a team listing. After you have edited the columns for the selected team, push the Save button (which replaced the Edit button).
- 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 clicking on the “Find by State/Province” tab.
- If you are done adding and editing teams, press the “Done” button.

![Figure 32 - Use the Edit or Delete buttons to modify or remove a team.](image)

Adding Teams by State or Province
You can also add teams by region by clicking on the “Find by State/Province” tab:

- The system 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.

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Find the teams that you would like to add and check their “Add?” check boxes to add them to the event.

- You can switch to “Add Individually” mode by clicking on the “Add Individually” tab.
- If you are done adding and editing teams, press the “Done” button.

**Figure 33 - Use the Country and State/Province controls to select your country and state/province.**

**Figure 34 – Select teams and then click on “Done” to add them.**

**Importing a List of Teams**

You can use the Add/Edit Team page to add teams by selecting and uploading a team list file.

- The system 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 the “Choose File” button 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. You can use the “Add Individually” tab of the Add/Edit Team screen to verify and edit the newly imported team data.

**Editing Existing Teams**
If at a later point in time you would like to edit a team’s information you can click on 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.

**Adding/Editing Sponsors for an Event**
The software comes prepopulated with the following sponsors:

- **FIRST Tech Challenge Presenting Sponsor**: Qualcomm
- **FIRST Tech Challenge Official Program Sponsor**: Rockwell Collins
- **FIRST Tech Challenge Official 3D Augmented Reality/Virtual Reality Sponsor**: PTC

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.

Click on 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.
- Enter the name of the sponsor.
- Select the type of sponsor (Global, Regional, or Event).
- Use the “Choose File” and “Import Logo” buttons to select and import a logo image.
- Click on the “Create Sponsor” button to create the new sponsor.

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• From the main Add/Edit Sponsors screen, you can also use the “Choose File” and “Import Sponsor Data” buttons to import a sponsor data file.

Figure 37 - When you add/edit a sponsor, you should specify the sponsor's name and level of support.

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” on page 40 of this document).

**Creating the Match Schedule**

If you have a list of at least four teams for your event, you can generate the match schedule. Click on the “Create Match Schedule” button on the Event Dashboard to go to the Create Match Schedule screen.

• 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.
  o Press the “Add Match Block” button to add a block of matches to the schedule.
  o Press the “Add Break” button to add a break in between matches to the schedule.
  o Adjust the start and end times for the blocks and breaks and provide labels (such as “lunch”, “morning”) for the breaks.

![Image of match schedule](image)

**Figure 39 - 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.

![Image of run matchmaker](image)

**Figure 40 - 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.
Creating an Event Archive File
The last step listed on the Event Dashboard is the "Download Archive File". Pressing this button will create a "snapshot of the event data that can be used to archive match information, to pass league meet match data on from one league event to the next, or to save for debugging and troubleshooting purposes. For Chrome users, the database file should be automatically saved to the “Download” directory of your computer.

This archive database will include league information (including league lists and prior ranking data) as well as the match data (including team lists, schedule information, match data and ranking information) from the current event. The file will use the event code as the prefix and it will have ".db" as its suffix.

For example, an event with an event code of "nhchampionship2019" translates to an archive file with the name "nhchampionship2019.db".

Once you have downloaded this .db file, if it is for a league event, then you can pass the file on to the next league meet so they can import the data to use for calculating team rankings at subsequent league meets. You can also upload this archive .db file to FIRST using Schoology.

Uploading Event Data to FIRST
If you would like to submit event scores to FIRST using Schoology, please use the following steps:
1. From the Event Dashboard, click on “Download Archive File”
2. Rename file to include a 2 letter State or Province, date of the event and name of the event (for example: AK_11072018_Meet_1)
3. Log into the Scorekeeper course in Schoology
4. Click on “Submit Event Score Results Here”

5. Click on “Submit Assignment” and upload the .db file
6. If more than one file is submitted by the same person, click on “Re-Submit Assignment”

**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.

**Example Scoring Workflows**

Before examining the details of the Match Control features that are available with the system, it is helpful to look at the workflow for scoring an event.
Scoring Using Paper Scoresheets
The system can be used with paper scoresheets to control and score an event. For this scenario, the typical workflow is as follows,

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

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

Event Home Page
You can navigate to the Event Home Page from the Event Dashboard by clicking on 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.
**Match Control Page**

Click on 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 (and not two browser tabs within the same window) launched on their computer.
At the very top of the screen (right under the words “Match Control”, see Figure 47 above) the Match Control Page lists information about the current “Loaded Match” and the current “Active Match”.

- **Loaded Match** – Loaded Match (which appears above the Active Match information) is the next match in line 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 match start.

- **Active Match** - Active Match (which appears below the Loaded Match information) 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.

**Match Control Buttons**
The buttons located at the top of the Match Control Page 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, it will appear the button is doing 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 and Field 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.

**Match Control Tabs**
The Match Control Page has several tabs that can be used to switch the information displayed on the screen (see Figure 49 below):

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Figure 49 - Click on a tab to change 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.

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. Click on the “Video Switch” tab of the Match Control screen (see Figure 49 above). The Video Switch tab should have a “Show Sponsors” button.

   
   Figure 50 - Click on the "Show Sponsors" button to display the sponsor information on Audience Displays.

2. Click on the “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 51 - The Audience Displays should start displaying the sponsor information.

**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 enabled, it also provides live score information.

  ![Field Display](image)

  *Figure 52 - Field Display*

- **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 Overlay Display mode is similar to the Audience Display but has a large blank portion of its screen. 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.

**Important Note:** Because most web browsers set a limit on how many parallel connections there are between the browser and a server, you should be careful and limit how many displays you run on a single computer. The developers recommend the following limits:

- Maximum of 2 Scoring/Timing Displays running on a single computer.
- Maximum of 1 Match Control Page and 1 Scoring/Timing Display running on a single computer.
- Maximum of 1 Scoring/Timing Display and 2 Referee (score tracking) Pages on a single computer.
- Maximum of 1 Match Control Page and 2 Referee (score tracking) Pages on a single computer.
**Setting up a Display**

Before you can set up a Field or Audience Display, you will need to know the *IP address* of the system server. You will use this address to access the Scoring/Timing Display Features from the server. Before you can begin, you will also need a user id and password for the event that you are trying to display. By default, the Scoring/Timing Displays are private and not accessible without an authorized user account. Currently a user account requires Event Admin privilege to be able to display the Scoring/Timing information.

- Verify that you have the IP address of the system 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.
- Typing in the IP address to navigate to the system server.

![IP address](image)

*Figure 55 - Type in the IP address to navigate to your system server.*

- When you first arrive at the scoring system’s Home page, click on the “Login” link in the upper right-hand corner of the screen and login to the system with the valid user id and password.

![Login](image)

*Figure 56 - Click on "Scoring/Timing Displays" to launch the Scoring/Timing Display page.*

- After you log in, you should see a listing of available events. Click on the event that you want to track in the Field or Audience Display.
- In the Event Home page for your selected event, click on the “Scoring/Timing Displays” link (currently located under the “Event Administration” category).

**Event Administration**

- Event Dashboard
- Match Control Page
- **Scoring/Timing Displays**

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

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after you close the settings dialog, can re-open it by clicking anywhere on the page while holding down the CTRL key.

Figure 57 - Display Settings Dialog.

- The “Audio Testing” buttons at the top can be used to play the game audio cues to test the PA system.
- Select the 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 do are not using real-time score tracking, disable the “Show Live Scores” option and the display will not display any real-time score information.
- 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.

Once your Scoring/Timing Displays have been configured, they should update automatically as the scorekeeper changes the state of the active event.

**Scoring Using Paper Scoresheets**
The system 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 scoring system server, the Match Control laptop, and as the Audience Display. Referees use paper sheets to score the matches. After a match is complete, the scorekeeper manually enters the values through the Match Control page.

**Configuring the Audience Display**
On the laptop, the scorekeeper should have two browser windows opened. One window should display the Match Control screen (see Figure 46). The other window (which should be a separate window and not a browser tab) 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 that 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.

**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.

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 that on the Match Control Page the “Show Preview” button should change from green to yellow after the button has been pressed.
3. The field is randomized.
   a. The referees can roll a physical die and use the result to determine how to place the game elements for the autonomous phase.
   b. Or on the Match Control Page the scorekeeper can push the “Randomize Field” button to randomize the field, and then push the “Show Random” button to display the results on the Audience Display.

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

Figure 60 - The Audience Display should display match info after the “Show Preview” button has been pressed.

Figure 61 – After the “Show Random” button has been pressed, the Audience Display will show randomization info.

Figure 62 - Pushing the “Show Match” button will display the Match information and timer on the Audience Display.
5. The scorekeeper pushes the “Start Match” to run the match. Note that the “Start Match” button might be colored red. This is because it is “waiting” for pre-match information from a score tracking tablet. Since this scenario does not involve live score tracking, you can disregard the color of the button.

![Match Control](image)

*Figure 63 - Push the “Start Match” button to start the match.*

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.

![First](image)

*Figure 64 - 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.

![First](image)

*Figure 65 - 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.

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

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.

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 system.
Figure 69 - 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 70 - Press the "Post" button next to the match to display the Match results to the Audience Display.

Figure 71 - The Audience Display should show the match results.

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

**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 system server. You also will need a user id and password that has referee (i.e., score tracking) permission for the event.

Also 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 scoring system 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 scoring system server.

![Figure 72 - 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 score keeper server, you will see the system home page. Click on the upper right hand menu icon to display the menu options for the home page. The “Feedback” and “Login” links should appear towards the top of the screen.

![Figure 73 - Click on upper right hand menu icon to display the "Feedback" and "Login" menu options.](image)

- Click on 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 all the active events in the system. Click on the event that you want to score.
On the Event Home Page, click on the appropriate 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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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.

### 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. This example assumes that the scorekeeper is logged in to the system with Event Admin privileges and has a browser window displaying the Match Control Page for the selected event. We also assume that 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.

14. 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.
15. The scorekeeper tablets should display the match (or matches) that are available for scoring. Both referees (Red Alliance and Blue Alliance score referees) should click on match that they will be scoring.

16. 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 that on the Match Control Page the “Show Preview” button should change from green to yellow after the button has been pressed.
17. 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. The system needs to know if each team is present.
   b. The system also needs to know if a robot for each present team is latched on the lander or not.
   c. 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.
   d. In Figure 81 (see below) team 11103 is present and their robot is latched onto the lander. Team 8089 is present, but their robot is not latched onto the lander.

18. Once the Pre-Match information has been entered, the referee tablets will display a message that indicates that the system is waiting for the match to start.
19. 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 yet. Instead, the Match Preview information should still be visible.

20. The scorekeeper should press the “Show Random” button to display the randomized information on the Audience Displays.
21. The scorekeeper should press the “Show Match” button to show the match information on the Audience Displays and the Field Displays.

22. When everyone is ready to begin, the scorekeeper presses the “Start Match” button to start the match.

23. 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.

![Match Control Page](image)

*Figure 87 - The scorekeeper can press the "Active Match" tab to display the active match information.*

24. 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 the system.
25. During the Driver-Controlled period, referees should enter the scoring data using their tablets.
26. 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.
27. After both referees submitted 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.
28. After the referees have submitted their final scores, the scorekeeper has the option to edit the scores even further, or he/she can commit the scores by pushing the “Commit” button listed next to the match.

29. 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 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 92 - Once the scores have been committed, the scorekeeper can post the results.

![Scorecard](image.png)

Figure 93 - When the scorekeeper posts the results, the final match info is displayed on the Audience Displays.

30. Note: If the match is complete and the referees have *not yet submitted* their final scores, the scorekeeper as the option to force an edit of the match score data.
   a. 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).
   b. This option allows a scorekeeper to enter score data from a paper scoresheet, if, for example, live scoring is not available during a match.
   c. In general, however, scores should be submitted by the referees using their score tracking tablets.
Figure 94 – Scorekeepers can edit/override the score data by clicking on the green “here” button (see image above).

31. Note: the scorekeeper can abort the match by pushing the “Abort Match” button during the match.
   a. The system will prompt the scorekeeper to verify that he/she really wants to abort the match.
   b. If a match is aborted, referees will need to manually refresh their tablet browsers to display the current state information for the match.
   c. After a match has been aborted, it can be replayed. Note the field might need to be re-randomized before replaying a match.

32. 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.

Managing Elimination Matches

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 95 - Press the Alliance Selection tab to begin the alliance selection process.

Pressing the “Start Alliance Selection” button will display a ranked list of teams on the Match Control screen.
The scorekeeper should push the “Set Audience Display” to toggle the Audience Displays to Alliance Selection mode.

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.
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.

Once the first alliance captain has made their initial selection, the process begins again for the team that is eligible to captain the second alliance. Note that the software will adhere to the Alliance Selection rules that are prescribed in the official Game Manual when determining and displaying selection eligibility for the remaining teams.

The selection process is repeated until all alliances are finalized. If the scorekeeper needs to undo the most recent alliance selection, then he/she can push the “Undo” button on the Match Control screen.
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 click on the “Schedule” tab to view the elimination schedule.

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.

In Figure 103 (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.

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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”).

The system 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 semifinal round are tied, the system will generate an additional tie breaker match and automatically add it to the elimination schedule.

The system will automatically add a match to the schedule if the alliances are tied.

When the semifinal matches are complete, the system 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 the for 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.
Managing League Events

A League 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 or elimination matches). Teams that are part of a League can compete in as few or as many League Meets as they choose. A team’s League ranking is calculated using data from prior League meets. At the end of the season, a League will have a League Championship, which will include judging and elimination matches.

The scorekeeping system supports League play throughout a season.

Creating Leagues for Your Region

Currently, the scorekeeper software requires that you define and manage your Leagues as part of an event. If you want to create and manage Leagues in advance of any scheduled League meets, you can create a dummy event at the beginning of the season and define your Leagues from within the dummy event.

Note that you can also define the Leagues from an actual scheduled League meet if you prefer (instead of using a dummy event). This section, however, uses a “dummy” event to create the Leagues.

1. Log in to the scoring software as the local admin user.
2. Use the "Create Event" menu item to create a dummy event.
   a. Specify a unique Event Code for your League Meet (all lowercase, no spaces).
      i. The event code that you specify for this “dummy” event will appear in the exported data file, so make it relevant.
      ii. A good example might be the region name, such as "granite".
   b. Make sure that “League Meet” is selected as the Event Type for the dummy event.
   c. Specify an Event Name (such as "Granite State Dummy Event")
   d. Specify a date (you can use the current day).
   e. Click "Create Event" to create your “dummy” event.
3. On the Event Dashboard for your newly created dummy event, select step 3 “Manage Leagues”.
4. Use the “Add” button on the right side of the Manage Leagues Page to open the Create League form.
5. Specify a unique League Code, following the same rules as event codes (all lowercase letters & numbers and underscores, no whitespace).
6. Specify a League Name and set the region information.
7. Click "Create League" to create the new League.

8. For your newly created League, click on the "Add/Remove Teams" button to open the Add Teams page.
a. Use the “Add Individually” tab to add teams by typing in the team number and hitting the “Add” button. Note that if there is team data associated with the team number, this information will appear in the team listing. If the team number is new the other fields will be empty in its listing.

Figure 109 - Type in team number and hit "Add" to add a team.

b. You can also click on the “Find by State/Province” tab to add teams by region.

9. When finished, click "Done".
   a. This returns you to the League form.
   b. Click "Back to League List" in the top left corner to return to the Manage Leagues page.

10. Repeat steps 4-9 for each additional League for your region.

11. When complete, click the "Export Leagues" button at the top of the page.
   a. The file will be downloaded to the user's Downloads folder, and the file's name will end with the suffix "_leagues.db".
   b. This League database file can now be sent to your first League meet.

Figure 110 - Press the "Expore Leagues" button to export the League data from this event to a downloaded file.

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Important Note: To avoid duplicate Event Codes for League Meets, it is recommended that League managers establish a naming format before their first League event and tell their scorekeepers what Event Codes to use for their respective events. One possible format would be the following,

[region]_meet[#]_[year]

For example, in the Granite State region, meet #1 for the year of 2018 might be “granite_meet1_18”.

Also note that the “Export Leagues” button will export the team data for the Leagues from the current event. It will also export match/meet data from previous league events that it may have (from a file import). The “Export Leagues” button, however, will not export the match data from the Event that is currently being scored. If you want to include the match data from the event that is currently being scored, you must use the “Download Archive File” button in the Event Dashboard (which is explained in the section below).

Running a League Event
League events are similar to a non-League event, but the scorekeeper might need to important League data from a previous League event before scoring the new event. League data files may contain League team information and meet data. Also, after a League event is complete, the scorekeeper will need to export the event data to a file to be used for calculating team ranks at subsequent League events.

1. Create the event as normal, ensuring that "League Meet" or "League Tournament" is selected as the Event Type.
   a. Make sure that you specify a unique Event ID when creating the event.
   b. Use the Event ID format that was agreed upon or recommended for your region.
2. From the Event Dashboard, select "Manage Leagues".
3. Use the "Choose File" button at the top to select the data file provided by your Event Manager/League Manager. After selecting the file, click "Import League Data" to import the data.
4. The League Data Import page shows a list of leagues and events that will be imported from the selected file.
   a. Green is a new league/meet that will be imported.
   b. Red is a duplicate league/meet that will not be imported.
   c. If a league or meet is yellow, a data mismatch has occurred, and it will present several options.
   d. Note that each import item can be expanded to show a brief explanation by clicking on the “+” symbol.

![League Data Import](image)

Figure 111 - Green items are new, red items are duplicate and yellow items have data conflicts.

5. If everything looks ok (nothing highlighted in yellow), click "Import".
6. After importing all files (you can import more than one), return to the Event Dashboard via the link at the top-left corner of the screen.
7. Click "Add/Edit Teams" to add/edit teams for your event.
a. This page defaults to "Find by League".
b. Select a league from the dropdown, and it will present a list of teams in the league to add to the event.
c. Add teams to the event’s team list by selecting the checkbox.

d. Alternatively, you can add teams individually by typing in the team number and pressing “Add” on the “Add Individually” tab.
e. You can also add teams by region using the “Find by State/Province” tab.

8. After adding teams, select "Done", and proceed with the event as normal.
9. After the event is complete, archive the data to a file by selecting the last item on the Event Dashboard, "Download Archive File".
   a. The archived event data (which includes league lists and scoring data) should be downloaded to the Downloads folder of the scorekeeper computer.
   b. Send the downloaded file to your League Manager/Affiliate Partner (so the data can be used for future League events in the season).
   c. Note that this archive data file includes the current Event’s match data and can be imported into the next League Meet to incorporate this data into the League rankings.

**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.

**Managing Parallel League Meets**

If two events are played in parallel involving the same league, the data will need to be combined after both events have occurred.

FIRST recommends that in advance of a set of parallel league meets, someone who is designated as a “League Manager” create a League data file (using the dummy event method described in the section entitled Creating Leagues for Your Region, see page 67) that will be shared with both parallel events.

The scorekeepers at each event should use import this League data file at their respective events and score their matches normally. After both events are complete, the event data from each event should be forwarded to the League Manager, who will import these two events files and generate a new, combined event file that can be used for future League events.

Use the following steps to important the dual event data and combine them into a single event data archive file.

1. Create a dummy event, in the same manner as before.
2. On the Manage Leagues page, import the data files from each event, 1 at a time. The second set of imported items will show red/duplicate league lists, and possible some duplicate meets. This is OK.

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3. If a league is yellow, it means they were edited by the scorekeeper at one of the events. The system gives several options, the one you most likely want to choose is the *merge* option. After the import is complete, edit the league to view the team list, and make any adjustments as needed.

4. If an event is yellow, it likely means two events were created with the same Event Code. The system will let you change the Event Code for the one that is being imported.

5. After all data is imported, use the "Export Leagues" button to download a file containing the merged data. This file can be imported by the scorekeeper at the next League event.

### 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.

![Manage Awards](image)

*Figure 113 - Press the "Manage Awards" process to start the awards management process.*

When you first launch the Awards Manager, the system will default to the "Give Awards" screen (see figure below).

![Awards Manager](image)

*Figure 114 – “Give Awards” screen of Awards Manager.*
The “Give Awards” Screen lists on the left-hand side 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 FIRST rules. Awards that are highlighted in green have already been “given” (i.e., that already have winners assigned).

**Giving an Award**
When you are ready to give an award to a team, select the award by clicking on it on the list of available awards on the “Give Awards” screen. After you have selected the desired award, click on the “Edit” button in the Award Description section to assign winners to the award. You can also enter text to describe why the winner was selected in the “Winner Justification section”.

![Figure 115 - Click on the "Edit" button to edit the selected award.](image)

Press “Save” to save your changes.

![Figure 116 - After assigning winners and providing justification text, press "Save" to save the award information.](image)
Managing the List of Awards
You can click on the “Manage Awards” button to add, modify or delete an award. You can also modify the order of the awards by clicking on an award listing, and then using the mouse to drag it to its new location in the presentation order. Note that the mandatory awards are supposed to be presented in the original order as listed by the system. Also note that the system will not let you edit or delete a mandatory award, you can only edit or delete optional awards.

![Awards Manager](image)

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).

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.
Figure 118 - 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 7Name 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, Rockwell Collins. 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.

- 2nd Place Blair Academy
- 2nd Place Metal Marauders
- 1st Place EC Eaglebots

Commemorative Award

Figure 119 – Press the “View/Print Script” button to view the awards script.

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

To reveal an award, simply click on the Award name and the Audience Display should display the Award name (but not the users). Clicking on the 3rd place winner, will reveal the third-place winner on the Audience Display. Clicking on the 2nd Place winner will reveal the second-place winner on the Audience Display. Clicking on 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 click on the 1st Place winner.

![Figure 120](image1)

Figure 120 – Press “Present Awards” button to begin presenting the awards.

![Figure 121](image2)

Figure 121 - As each winner is revealed, their team number and name are displayed on the Audience Display.
Reviewing Match Results

If you navigate to the event home page, you can click on 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 clicking on 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.
Figure 124 - You can review the combined or individual scoresheets for a match.

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

**History for Q1**

<table>
<thead>
<tr>
<th>Commit #</th>
<th>Time</th>
<th>Winner</th>
<th>Red Score</th>
<th>Blue Score</th>
<th>Scoresheet</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2018-11-08 08:11:22 AM</td>
<td>Blue</td>
<td>25</td>
<td>35</td>
<td>Scoresheet</td>
</tr>
<tr>
<td>2</td>
<td>2018-11-08 08:12:66 AM</td>
<td>Blue</td>
<td>25</td>
<td>65</td>
<td>Scoresheet</td>
</tr>
<tr>
<td>3</td>
<td>2018-11-08 08:13:06 AM</td>
<td>Blue</td>
<td>40</td>
<td>65</td>
<td>Scoresheet</td>
</tr>
</tbody>
</table>

Figure 125 - You can view how many times a match’s scores were revised and re-committed.
Troubleshooting the System

**Accessing the System Logs**

It can be helpful to access the system 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 click on the “bin” subdirectory to view its contents.

![Open the bin subdirectory.](image1)

**Figure 126 - Open the bin subdirectory.**

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

![Double click on the "logs" subdirectory.](image2)

**Figure 127 - Double click on the "logs" subdirectory.**

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 on a log file to view its contents.
Figure 128 - You should see a listing of log files within the "logs" directory.

Figure 129 - Log files contain useful information for troubleshooting.
Appendix A – Resources

Game Forum Q&A
http://ftcforum.usfirst.org/forum.php
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 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!

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