



PRESENTED BY **Qualcomm**

FIRST® GAME CHANGERSSM powered by Star Wars: Force for Change
2020-2021 *FIRST® Tech Challenge*

Remote Event Requirements Guide



FIRSTINSPIRES.ORG/ROBOTICS/FTC

© & ™ 2020 Lucasfilm Ltd.

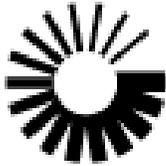
Sponsor Thank You

Thank you to our generous sponsors for your continued support of the *FIRST*® Tech Challenge!

***FIRST*® Tech Challenge
Season Presenting Sponsor**

Qualcomm

***FIRST*® Tech Challenge
Official Program Sponsor**

 **Collins
Aerospace**

***FIRST*® Tech Challenge CAD and
Remote Collaboration Sponsor**

Onshape
A PTC Business

Revision History		
Revision	Date	Description
1	9/12/2020	Initial Release
1.1	11/24/2020	<ul style="list-style-type: none"> Updated Playing Field Overview Image Changed “FTC Live Scoring” to “FTC Remote Scoring” Added Appendix B – Power Shot stability

Contents

Contents.....	3
Introduction.....	4
What is <i>FIRST</i> ® Tech Challenge?	4
<i>FIRST</i> Core Values	4
<i>Gracious Professionalism</i> ®	4
How to Use This Document	4
Field Description.....	5
Overview.....	5
Playing Field Overview.....	5
Scoring Elements.....	6
Playing Field Surface	6
Field Boundary Requirements.....	7
Scoring Zone Requirements.....	8
Boundary Dimensions:	8
Target Zones:	9
Start Lines and Starter Stack:	9
Drop Zone:	10
Field Elements	10
Navigation Images	11
FTC Remote Scoring System	12
Appendix A – Resources	13
Game Forum Q&A	13
<i>FIRST</i> Tech Challenge Game Manuals.....	13
<i>FIRST</i> Headquarters Pre-Event Support.....	13
<i>FIRST</i> Websites.....	13
<i>FIRST</i> Tech Challenge Social Media	13
Feedback.....	13
Appendix B – Remote Power Shot Stability	14
Weighted Box	14
Chair	14

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.

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

Watch Dr. Woodie Flowers explain *Gracious Professionalism* in this [short video](#).

How to Use This Document

Teams competing remotely in the ULTIMATE GOAL™ presented by Qualcomm season must follow the field requirements outlined in this manual. Teams are allowed some flexibility in how their field is set up based on the resources they have access to. This guide will outline allowable options for remote field setup.

Questions about the requirements should be referred to the Remote Game forum. Teams that need access to the forum must email firsttechchallengeteams@firstinspires.org.

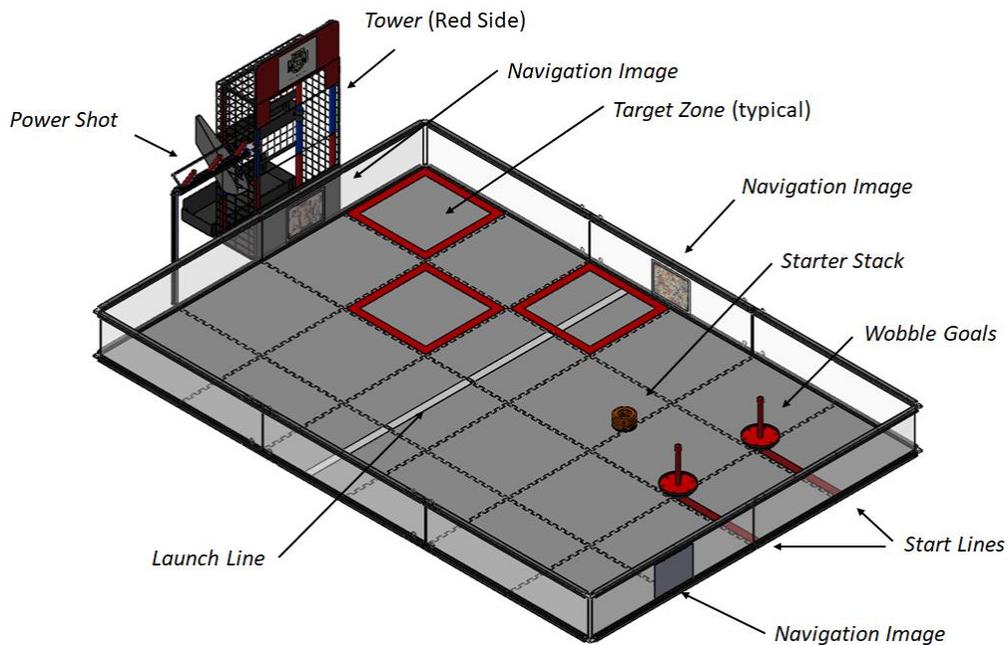
Field Description

Overview

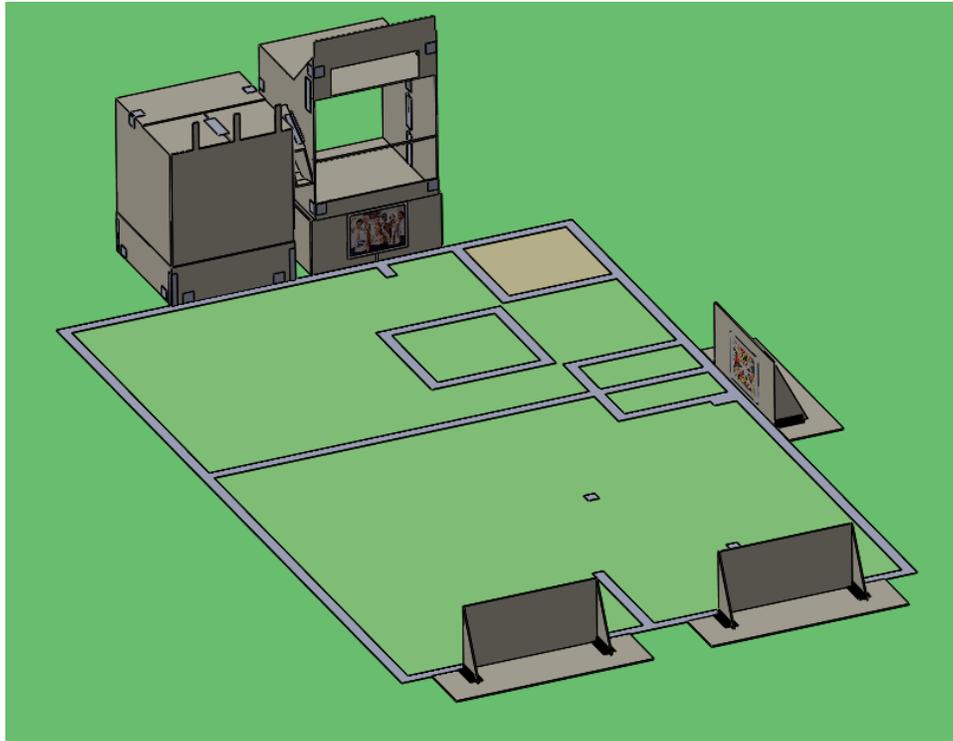
The Remote Competition field for ULTIMATE GOALSM presented by Qualcomm consists of the following elements:

1. Scoring Elements
 - a. Rings
 - b. Wobble Goals
2. Playing Field Surface
3. Field Boundary
4. Scoring Zones
 - a. Start Lines
 - b. Launch Line
 - c. Target Zones
 - d. Drop Zone
5. Field Elements
 - a. Tower Goal
 - b. Power Shot
 - c. Return Rack
 - d. Navigation Images

Playing Field Overview



Field with AndyMark goals and perimeter walls



Field with DIY Goals and taped Boundary

Scoring Elements

These are the items that a Robot interacts with to score points in ULTIMATE GOALSM.

Teams must purchase the following items from AndyMark to compete in the game challenge, there are no DIY options available.

- Wobble Goals
 - Remote teams need two wobble goals, either red or blue.
- Rings
 - A total of 10 rings are required to compete in the game challenge.

The Remote Game Kit can be purchased through AndyMark®: www.andymark.com/FTC

Playing Field Surface

The playing field surface is the area within the field boundary where the robots will be driving and competing. Teams have the option of playing on any surface type available such as carpet, cement, etc. If teams competing remotely switch to traditional events during the season, they must plan for a difference in how the robot drives/performs as soft tiles are used in the traditional event format.

Teams may opt to purchase soft tiles, which are used in traditional events. They can be purchased directly through www.softtiles.com or through AndyMark.

Field Boundary Requirements

ULTIMATE GOALSM - Remote Version is played on an approximately 12 ft x 8 ft (3.65m x 2.44m) field. The Boundary of the Field can be defined in one of three ways, official perimeter walls, DIY perimeter walls, or a simple tape outline. Any of these options are acceptable for official gameplay.

1. Option 1 – Official AndyMark or IFI Field Perimeter.

ULTIMATE GOAL – Remote uses a subset of a standard *FIRST* Tech Challenge perimeter, two panels from the standard 12 ft x 12 ft field are not used.

- AndyMark Field Perimeter: <https://www.andymark.com/products/first-tech-challenge-perimeter-kit>
- IFI Field Perimeter: https://www.vexrobotics.com/278-1501.html#attr-vex_kit_contents

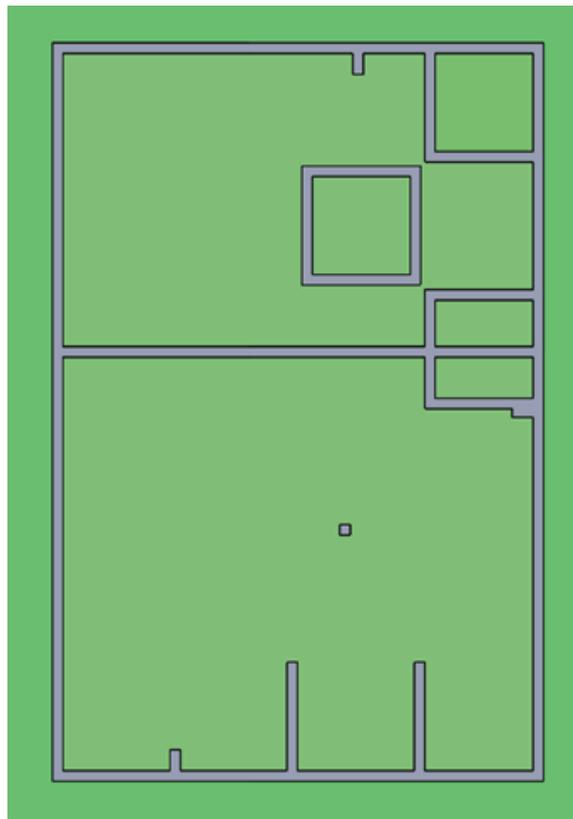
2. Option 2 – DIY Field Perimeter

This is a lower cost alternative to the commercially available perimeter walls. *FIRST* has made DIY guides available to build the perimeter walls with recommendations on where to purchase materials. Teams can use this guide or opt to build their own DIY walls.

- DIY Build Guide: <https://www.firstinspires.org/resource-library/ftc/game-and-season-info>

3. Option 3 – Taped Boundary

The minimum requirement is to have a taped boundary to define the Playing Field area. This option involves defining the field boundary by using tape to mark off the 141" x 94" (3.58 m x 2.39 m) space. The tape should be placed such that the outer edge of the tape defines the playing field area. See the Scoring Zone Requirements section for taping instructions.



2" wide Gaffers tape is recommended but any type or color of tape is acceptable. Below are examples of tape that can be used.

- Gaffers Tape: <https://www.findtape.com/gaffer-tape?tref=hp>
- Stucco Tape: <https://www.findtape.com/Shurtape-PE-444-Stucco-Masking-Film-Tape/p372/?idx=1&tid=2&info=stucco>
- Masking Tape: <https://www.findtape.com/Shurtape-CP-106-Economy-Grade-Masking-Tape/p364/?idx=2&tid=2&info=masking%2520tape>

When selecting a type of tape, pay attention to the floor it will be placed on to ensure the floor surface isn't damaged by the tape.

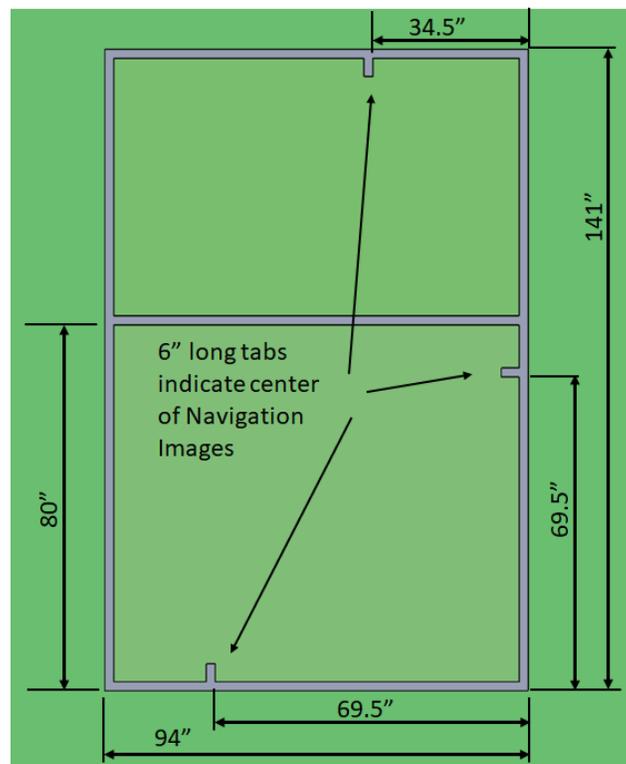
Because ULTIMATE GOALSM involves rings that are launched, and returned to the field via a ramp, there is a likelihood that rings may be launched or roll outside of the field boundary. Having a perimeter around the playing field boundary will help teams to keep the elements within the playing field boundaries. Such a perimeter can be as simple as PVC tubing or lumber laid alongside the tape boundaries.

Scoring Zone Requirements

The Target Zones, Launch Line, and Start Lines are taped off areas within the Field Boundary. 2" wide Gaffers tape is recommended but any type and color of tape is acceptable.

Boundary Dimensions:

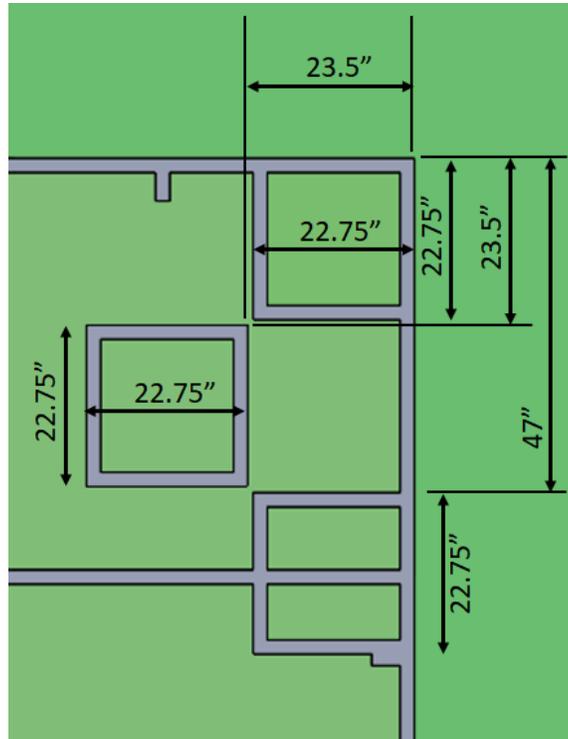
If foam rubber tiles are used, then the playing field surface is defined by the outer edge of the 24 tiles, with the perimeter tiles having their tabs cut off. If tiles are not used, then the playing field should be taped as shown:



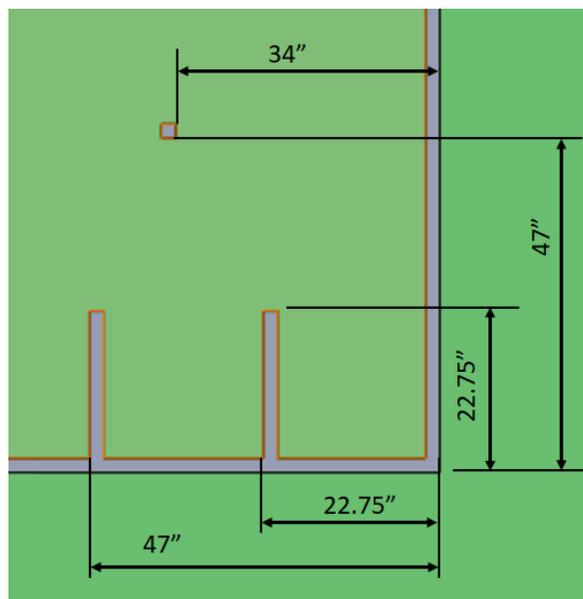
Note: the short, 6" long tabs are intended to act as guide for the positioning of the Navigation Images and Tower Goal.

Target Zones:

If foam rubber ties are used, then the taped areas should be located just inside the tabs of the appropriate tiles. See the [Field Setup Guide](#) for details. If tiles are not used, then the Target Zones should be taped as shown:

**Start Lines and Starter Stack:**

If foam rubber tiles are used, then the Start Lines should be taped just inside the left-hand tabs on the appropriate tiles. See the [Field Setup Guide](#) for details. If tiles are not used, then the Start Lines and Starter Stack locations should be taped as shown:



Drop Zone:

The Drop Zone is an unmarked area outside the Front Boundary (opposite the Tower Goal) where the Wobble Goals are placed during End Game. The Wobble Goal scoring task requires the Robot to lift the Wobble Goal over a 12" (30.5 cm) high barrier. If a perimeter wall (option 1 or 2 above) is not used, a barrier will have to be provided. This can be as simple as dropping the Wobble Goal into a 12" tall box.

Field Elements

The Field Elements for ULTIMATE GOAL – Remote include one Tower Goal, one PowerShot, and one Return Rack.

- Option 1 – Official AndyMark Field Elements

These are identical to the elements used in traditional matches and can be purchased through AndyMark: www.andymark.com/FTC

The Field Elements can be purchased as either a Red version or a Blue version. There is no difference in game play, but one is a mirror image of the other and the field and Scoring Zones must be set up accordingly. See the Field Setup guide for details.

- Option 2 – DIY Field Elements

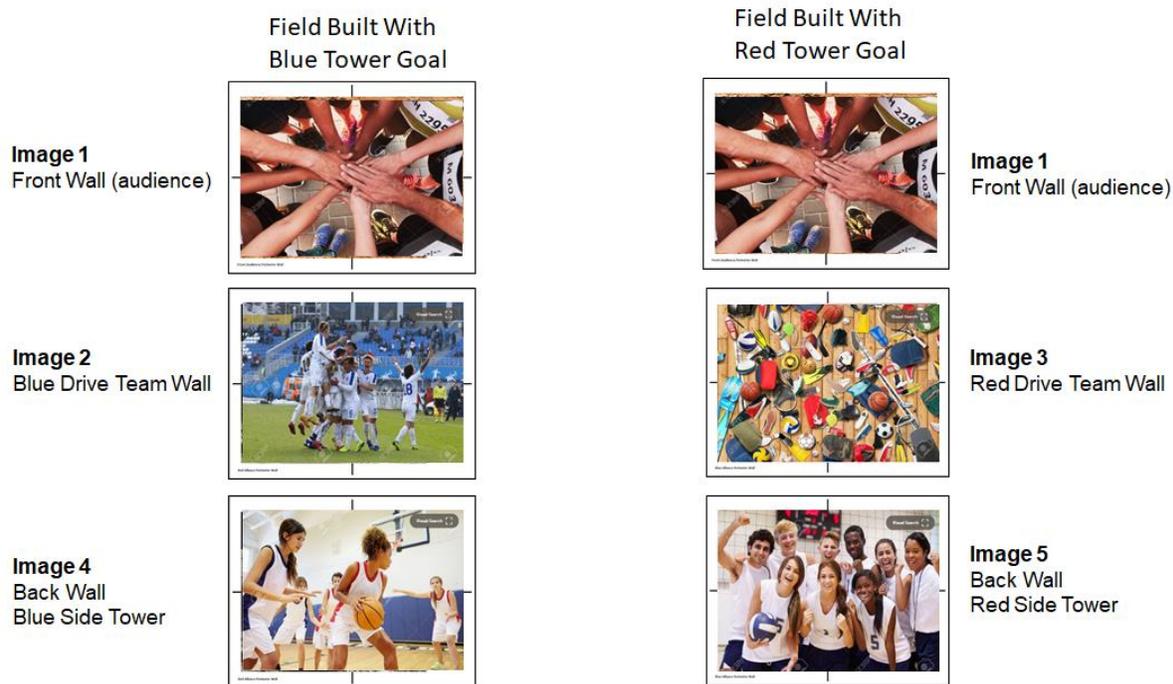
Teams may fabricate their own game elements from readily available materials. The DIY elements are designed to simulate the performance of the Official Field Elements, but teams should realize that there will be some differences in how the Ring bounces, deflects, etc. The DIY Field Element Guide can be obtained at this link: <https://www.firstinspires.org/resource-library/ftc/game-and-season-info>

Navigation Images

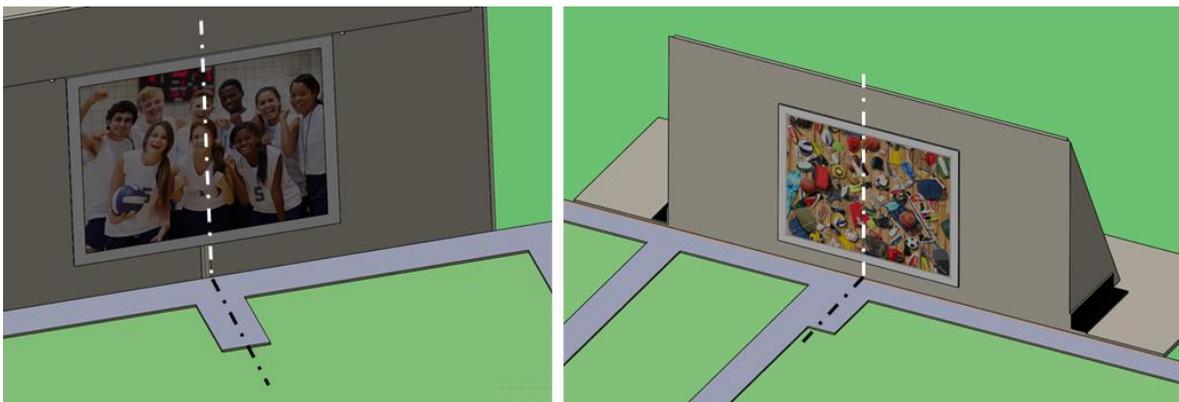
On a traditional field, there are a total of 5 navigation images placed on the outside walls of the 12 ft x 12 ft playing field perimeter. For remote gameplay, teams may use a total of 3 navigation images. Navigation images are not a requirement in remote gameplay; however, they are helpful in robot navigation during the autonomous period of the match. Images can be downloaded from the [game and season page](#).

The navigation images should be set up exactly as identified in the [Field Setup Guide](#). For example

1. If a team is using the blue side of the field, the navigation images will be mounted under the tower goal, on the wall centered and to the right of the Tower Goal, and the front wall (audience side of field).
2. If a team is using the red side of the field, the navigation images will be mounted under the tower goal, on the wall centered and to the left of the Tower Goal, and the front wall (audience side of field).



If a team is not using perimeter walls, they will need to place the navigation images on a vertical surface such as a cardboard box. The base of the tower goal can be used as one of the vertical surfaces. The center of the images should be aligned with the center of the short tape sections.



FTC Remote Scoring System

Teams will be responsible for scoring their own matches during a remote event. Teams can score their matches electronically or using paper scoring sheets:

- Option 1 – Use the FTC Live Cloud scoring system to score a team's matches
 - Requires a stable, reliable Internet connection
 - Requires a device (smartphone, tablet, Chromebook or laptop) to enter in scores during the match
 - Must be connected to Internet
 - Must have a web browser
 - Can be used to play match audio cues
 - Team can optionally have a second device to act as a field/team display during the match
 - Must be connected to Internet
 - Must have a web browser
 - Can be used to play match audio cues
- Option 2 – Use paper scoresheets to score a team's matches
 - Scoresheets can be downloaded from <https://www.firstinspires.org/resource-library/ftc/game-and-season-info>. After a match is complete, a team's score must eventually be entered into the FTC Live scoring system
 - Someone who has Internet access can be designated to enter in the score for the team
 - Scores must be entered before the close of the remote event's submission window

For detailed information, please refer to the FTC Live Cloud Scoring Guide, which is available from the [game and season page](#).

Appendix A – Resources

Game Forum Q&A

<https://ftcforum.firstinspires.org/>

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

FIRST Tech Challenge Game Manuals

Part 1 and 2 - <https://www.firstinspires.org/resource-library/ftc/game-and-season-info>

FIRST Headquarters Pre-Event Support

Phone: 603-666-3906

Mon – Fri

8:30am – 5:00pm

Email: Firsttechchallenge@firstinspires.org

FIRST Websites

FIRST homepage – www.firstinspires.org

[FIRST Tech Challenge Page](#) – For everything *FIRST* Tech Challenge.

[FIRST Tech Challenge Event Schedule](#) – Find *FIRST* Tech Challenge events in your area.

FIRST Tech Challenge Social Media

[FIRST Tech Challenge Twitter Feed](#) - If you are on Twitter, follow the *FIRST* Tech Challenge Twitter feed for news updates.

[FIRST Tech Challenge Facebook page](#) - If you are on Facebook, follow the *FIRST* Tech Challenge page for news updates.

[FIRST Tech Challenge YouTube Channel](#) – Contains training videos, game animations, news clips, and more.

[FIRST Tech Challenge Blog](#) – Weekly articles for the *FIRST* Tech Challenge community, including outstanding volunteer recognition!

[FIRST Tech Challenge Team Email Blasts](#) – contain the most recent *FIRST* Tech Challenge news for teams.

Feedback

We strive to create support materials that are the best they can be. If you have feedback about this manual, please email firsttechchallenge@firstinspires.org. Thank you!

Appendix B – Remote Power Shot Stability

When using the AndyMark half field set for remote gameplay, it's possible that the Power Shot assembly might shift front to back, making it more difficult for accuracy. In order to better secure the Power Shot, it is recommended that teams tape the base to a weighted box, or other household item to better secure the Power Shot in an upright, stable condition. It's important to note that the Power Shot should never be secured to the playing field wall, if used. Here are some examples of ways teams can secure the Power Shot:

Weighted Box



Chair

