

FIRST[®]

ENERGIZESM

PRESENTED BY

Qualcomm

NorCal FTC Rookie Coach Workshop

October 5, 2022

2022-2023 *FIRST*[®] Season

FIRST[®]
ENERGIZESM

PRESENTED BY **Qualcomm**

**SUPER
POWERED**SM

POWER  **PLAY**SM

PRESENTED BY  **Raytheon
Technologies**

CHARGED UPSM

PRESENTED BY  **HAAS**
CNC Machine Foundation

Introductions

Dianne France – FTC Program Coordinator

Mark Edelman – FTC Program Director, Game Design Committee, FIRST
World Championship Head Referee

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dianne@playingatlearning.org

Our Agenda

- Basics
- FIRST
- Playing at Learning
- NorCalFTC.org
- Portfolios/Awards
- Competitions/Advancement
- Resources

Housekeeping

- Everyone is muted.
 - Will stop periodically for questions
 - Type your questions in the question box. Please try to be clear.
- Will be recorded and posted on our website
- Plan to be done in an hour - can take longer for questions if necessary

More than Robots!

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

Coopertition®

Coopertition® produces innovation. At *FIRST*, *Coopertition* is displaying unqualified kindness and respect in the face of fierce competition. *Coopertition* is founded on the concept and a philosophy that teams can and should help and cooperate with each other even as they compete.

Be the adult in the room - literally

We are here to enable the kids to:

Be Safe

Learn Stuff

Have Fun

A Mentor...

- Requires no special skills, but should have patience, dedication, and a willingness to learn alongside the team.
- Is any person who works with the team in his or her area of expertise, for as little as one team meeting or as many as all of them.
- Helps provide valuable support and serves as a resource in his or her area of specialty.
- Directs the process the team follows to solve the yearly game challenge, without providing the solution him or herself.
- Is a coach, teacher, motivator, and facilitator.



Each team must have at least two mentors who are 18 years old or older.

In *FIRST* Tech Challenge, it is important that mentors and students are equal and that the relationship is a partnership. Each person works collaboratively towards a mutual and beneficial goal. To succeed, all the mentors and team members must commit to this.

Mentors should also be willing to acquire some basic knowledge of programming and robot building. Many teams enlist the support of a technology teacher or technical mentor for additional assistance. *FIRST* strongly encourages teams to invite people with backgrounds in engineering and programming to share their knowledge and experience.

Not your Toys!*

Advice

Advice – What you would do

Counsel / Mentor – Ask what they will do

(*Of course you can have fun too and play with all the toys – except their robot!)

Counsel



In your team's rookie year, focus on enjoying the first year of participation as a survey of the program. The objective should be to fully experience *FIRST* Tech Challenge. Once a team has a positive experience, based on realistic goals, your students will overflow with ideas next year.

FIRST

For Inspiration and Recognition of Science and Technology

- “Parent” organization
 - 7,696 FTC teams (2019-2020)
 - 77,000+ participants (Ages 12-18; Grades 7-12)
 - FIRST teams overall in 110+ countries
- FIRST manages:
 - Team Registration and \$295 registration fee
 - YPP (Youth Protection Program) Coach Screening
 - Student registration – team roster
 - Storefront – purchase control system and kit of parts
 - Annual definition of the game and rules

Playing at Learning – www.norcalftc.org

- Volunteer driven local non-profit 501(c)3
 - (Also manages FLL Challenge and FLL Explore)
- Northern California FIRST Program Delivery Partner
 - Provide local support to teams
 - Manage and support local competitions – Qualifying Tournaments (QTs) and Pilot Leagues
 - Including registering for all competitions!! – **NOT** on the FIRST site
 - Runs NorCal Championship event
 -

FIRST Dashboard

- Create a team
- Edit Team Information
- Pay for team/storefront
- Invite Coaches/Mentors
- YPP Screening for mentors
- Accept/Invite students for team
- Dean's List Nominations
- Grant information

The dashboard features a top navigation bar with links for PROGRAMS, COMMUNITY, WAYS TO HELP, and ABOUT. A user profile for 'Hello, Dianne France' is visible in the top right. Below the navigation is a 'DASHBOARD' header with four main sections: MY TEAMS, PARENT/GUARDIAN - YOUTH, VOLUNTEER REGISTRATION, and MY CLASS/SCHOOL PACK ACCOUNT. A row of action buttons includes 'CREATE NEW TEAM(S)', 'GIVE TO FIRST MISSION', 'REGISTERING YOUTH FAQ', 'RETURNING TEAMS', 'ACCESS THINKSPACE', and 'SHOPPING CART'.

The 'Teams List' section contains a table with the following data:

Team Name	Team Number	Program	Team Type	Returning Team	Outstanding Tasks
M-SET Fish	#649	FIRST® Robotics Competition	Veteran	✓	
MSET BetaFish	#7841	FIRST® Tech Challenge	Individual Team	✓	

Below the table are four management panels:

- Team Options:** Includes dropdowns for Outstanding Tasks, Team Information, Payment & Product, and Certificates & Awards.
- Team Finances:** Shows 'Team Shopping Cart' with a shopping cart icon, 'Payment/Product (Receipt)' with a minus sign, 'Funds & Grants' at \$5,000.00, and 'Credits' at \$0.00. A 'Finance Options' button is at the bottom.
- Team Contacts/Roster:** Lists 'Primary Contacts' (3), 'Youth Members' (0), 'Other Contacts' (3), and 'Invite Contacts'. A 'Contact Options' button is at the bottom.
- Team Events:** Contains a message: 'Team Registration does not guarantee that events are available in your area. If you cannot locate an event in our system, please contact your local partner at: Local Support'. An 'Event Options' button is at the bottom.

Storefront

SUPPORT



- WELCOME
- CONTROL SET
- ELECTRONICS SET
- COMPETITION SET
- CHECKOUT

Choose an Electronics Set

\$295.00 (USD) 1

The modules in the Electronics Set control the flow of information to and from the various components on the robot. Each team will be allowed to purchase one Electronics Set for the 2022-2023 FIRST® Tech Challenge season.

REV Robotics Control Hub

Includes:

- REV Robotics Control Hub
- Phillips – head screws & nylock nuts (set of 4)
- Rover Switch with bracket and XT to Tamiyu adapter cable
- Color sensor with cable
- Touch Sensor with cable



[View Larger Image](#)

Temporarily out of stock. Order now and we'll deliver when available.

ADD TO CART

Notice:

The REV Robotics Control Hub inventory is limited and may be backordered. First-year (rookie) team orders will be prioritized as they are received. All products, except the Control Hub, will be invoiced at the time of purchase. Control Hubs will be invoiced separately upon shipping.

FIRST is working closely with supply partners to address these challenges and will share more information as it becomes available. [Sign up to receive updates on Control Hub availability.](#)

Limit one (1) per team.

\$282.00 (USD)

Order History:

- Season Registration In cart
- Control Set* (Not Ordered Yet)
- Electronics Set* (Not Ordered Yet)
- Competition Set* (Not Ordered Yet)

* While these items are necessary to build a functioning robot, teams are not required to purchase them in this Storefront (with the exception of season registration). Teams may reuse equipment from previous seasons or purchase components from other vendors.

CONTINUE

Choose a Competition Set

The Competition Set provides the structure and locomotion for the robot. Each team will be allowed to purchase one Competition Set for the 2022-2023 FIRST® Tech Challenge season.

TETRIX® FIRST® Tech Challenge Competition Set

TETRIX FIRST Tech Challenge Competition Set includes:

- 824 TETRIX MAX building elements designed for competition
- Heavy-duty structural, motion, and hardware elements including a variety of wheels, and aluminum gears, channels, flats, and connectors
- Four TorqueNADO® DC motors with encoders, motor cables, aluminum mounts, and REV hub conversion cable pack
- Four 180-degree standard-scale servo motors and aluminum mounts
- Rechargeable battery pack and charger
- Assembly tools
- Sturdy storage bin, lid, and sorting tray



[View Larger Image](#)

Temporarily out of stock. Order now and we'll deliver when available.

ADD TO CART

\$580.00 (USD)

REV FIRST® Tech Challenge Competition Set

- New REV Building parts with over 1350 pieces
- Channel and Extrusion aluminum structure
- Metal and plastic gussets and brackets
- Configurable UltraPlanetary Gearboxes with HD Hex Motors
- Smart Robot Servos with multiple attachments
- Bearings and hex shafts
- Multiple wheel options (Omni, Traction, Grip, Intake)
- #25 sprockets and chain
- 7 sizes of hex gears
- Fasteners and tools including Chain Tool
- Slim Robot Battery and charger
- Plastic carrying tote



[View Larger Image](#)

In Stock

ADD TO CART

\$555.00 (USD)

\$295.00 (USD) 1

Order History:

- Season Registration In cart
- Control Set* (Not Ordered Yet)
- Electronics Set* (Not Ordered Yet)
- Competition Set* (Not Ordered Yet)

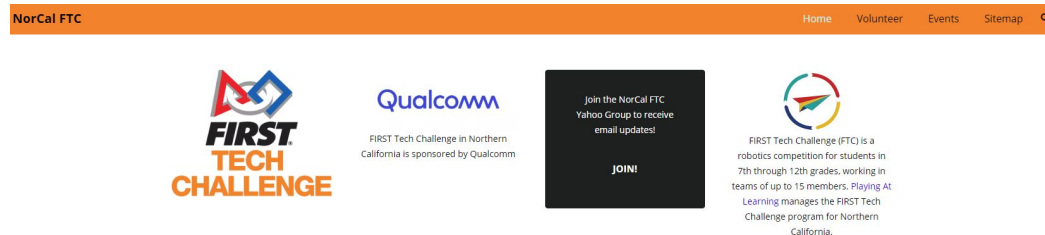
* While these items are necessary to build a functioning robot, teams are not required to purchase them in this Storefront (with the exception of season registration). Teams may reuse equipment from previous seasons or purchase components from other vendors.

CONTINUE



NorCalFTC.org

- What you need to know locally
- 1st – Sign up for Google Email Group!!



○ PLEASE READ OUR EMAILS !!

NorCalftc.org

- “Items of Interest”
- Team List
- Qualifier List and Status
- FTC QT Registration
- Advancements

Items of Interest

Thank you for your patience as we update this site with the 2022-23 game, Power Play!

[Register for the Town Hall Meeting for Qualifier Registration – Oct 10th, 7:00pm](#)

[Register for the Rookie Coach Workshop – Oct 5th – 7:00pm](#)

Team Workshops

Form to get more information about volunteering: <https://forms.gle/QbjpRXQDY7GszCSHA>

[Here's a link to older Items of Interest](#)

<p>About</p> <ul style="list-style-type: none"> WHAT IS FTC? CURRENT SEASON INFO NORCAL FTC POLICIES 	<p>Season</p> <ul style="list-style-type: none"> 2022 KICKOFF NORCAL FTC EVENT REGISTRATION 2022 ADVANCEMENT 2022-23 EVENT SCHEDULE QUALIFIER STATUS UPCOMING EVENTS TOURNAMENT CHANGE FEE PAYMENT 	<p>Teams</p> <ul style="list-style-type: none"> TEAM LIST MENTOR MANUAL RESOURCES TEAM GRANTS FTC COSTS SEASON TIMELINE PRACTICE FIELD 	<p>Volunteer</p> <ul style="list-style-type: none"> HOW TO BECOME A FIRST VOLUNTEER VOLUNTEER FOR AN FTC QUALIFIER ORGANIZE A REMOTE EVENT QUALIFYING TOURNAMENT ORGANIZE A TRADITIONAL QUALIFYING TOURNAMENT LEARN MORE
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Engineering Portfolio.....and Notebook

The Engineering Process – Good!

Good Notebook = Learning

Portfolio required to be considered for judged awards

What do you want to tell the judges?

Absolute requirements if it's to be considered

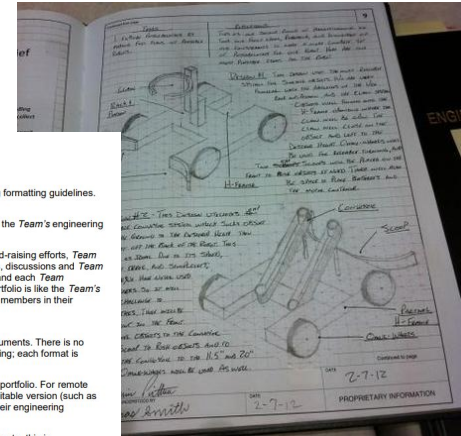
Must have team number on the front

Read the Game Manual 1 for recommendations

Start TODAY if you haven't already

Electronic platform will be easier to share – in person should be printed.

Notebook is optional although HIGHLY recommended



9.3 Engineering Portfolio

9.3.1 Overview
 This section describes the requirements for creating the engineering portfolio, including formatting guidelines.

9.3.2 What is an Engineering Portfolio?
 An engineering portfolio is a short and concise summary of the content collected within the *Team's* engineering notebook.

The engineering notebook is a complete documentation of the *Team*, outreach and fund-raising efforts, *Team* plans, and the *Robot* design. The engineering portfolio should include sample sketches, discussions and *Team* meetings, design evolution, processes, obstacles, goals and plans to learn new skills, and each *Team* member's concise thoughts throughout the journey for the season. The engineering portfolio is like the *Team's* cover letter or resume. *Teams* should be careful to include only the first name of *Team* members in their engineering portfolio.

9.3.3 Engineering Portfolio Formats
Teams may document their summary portfolio with either handwritten or electronic documents. There is no distinction made between handwritten and electronic engineering portfolios during judging; each format is equally acceptable.

- a) **Electronic:** *Teams* may use any electronic programs to create their engineering portfolio. For remote event judging, *Teams* must create a single file that is a sharable, online, non-editable version (such as a PDF) of their engineering portfolio. For traditional events, *Teams* must print their engineering portfolio.
- b) **Handwritten:** *Teams* may create a handwritten version but for remote judging events, this is discouraged due to difficulties in scanning into a readable, sharable, online version.

- 9.3.4 Engineering Portfolio Requirements**
- a) To be considered for judged awards, a *Team* must submit an engineering portfolio.
 - b) The total number of pages for an engineering portfolio must not exceed 15 pages, plus a cover sheet.

A *Team* number on the top of every page makes it easy for Judges to know who created the engineering portfolio they are reviewing. The *Team* number on the front page is

Notebooks recommended,
not required

Information about Portfolios in
Game Manual Part 1

Awards – understand the criteria

FIRST Resource Library – award descriptions

Game Manual 1 Section 9 – Judging and Awards

Dean's List Nominations - Game Manual 1, Section 10

Be sure to answer the questions in your nomination

Nominations due by Jan 15th, 2023

Dean's List Interview only event late February (date TBD)

Promote and Compass Awards

Only at Championship

All teams eligible



FIRST Tech Challenge Award Definitions and Criteria

Updated 2/8/22

Inspire Award

This judged award is given to the team that best embodies the 'challenge' of the FIRST Tech Challenge program. The team that receives this award is a strong ambassador for FIRST programs and a role model FIRST team. This team is a top contender for many other judged awards and is a gracious competitor. The Inspire Award winner is an inspiration to other teams, acting with *Gracious Professionalism*® both on and off the playing field. This team shares their experiences, enthusiasm and knowledge with other team, sponsors, their community, and the judges. Working as a unit, this team will have shown success in performing the task of designing and building a robot.

Required Criteria for the Inspire Award:

- Team must show respect and *Gracious Professionalism*® to everyone they meet at a FIRST Tech Challenge event.
- Team must be a strong contender for several other judged awards. The Inspire Award celebrates the strongest qualities of all the judged awards.
- The team must be an ambassador for FIRST programs. They demonstrate and document their work in their community.

What to expect at competitions

- Game Manual Part 1 section 3.0 & 4.0
- FTC Resource Library – “Preparing for Competition”
 - Arrive when doors open – not when you are scheduled for inspection or judging
 - Be prepared!! Bring your working robot!
 - Tournament Directors will send out information specific to their site – share this with team and parents!
 - Plan your food – don’t let your team get “hangry” – stay hydrated!
 - Set team’s expectations accordingly
 - Gracious Professionalism above ALL things – even when things go wrong
 - It may be loud, frantic, stressful, but FUN!
 - Look at other robots and talk to other teams

Advancement to Championship

Ratio for advancement = # teams in championship / total number of plays
(# teams in championship depends on # teams registered)

Event advancement = ratio * number of teams in event

Then rounding and lottery spots.

Qualifiers and League Tournaments are equal in figuring their advancements.

Advancement List in Game Manual 1, Section 6.2

6.2 Order of Advancement

If the Team listed has already advanced or there is no Team fitting that description (as in 2nd Team selected at smaller Tournaments, or 3rd place award finalists at smaller Tournaments), the advancement will continue in order.

1. Optional – Qualifier host Team (Note: Each region's program delivery partner decides if this advancement opportunity is offered. The Team MUST compete at one other Tournament within the region and must meet the criteria set forth by the program delivery partner in the agreement. This advancement applies to qualifying Tournament hosts only, and does NOT apply to host Teams of meets, league Tournaments, super qualifying Tournaments, or championship Tournaments).
2. Inspire Award Winner
3. Winning Alliance Captain
4. Inspire Award 2nd place
5. Winning Alliance, 1st Team selected
6. Inspire Award 3rd place.
7. Winning Alliance, 2nd Team selected
8. Think Award Winner

When to Compete?

- Robot is never “done” – don’t wait for it
- Consider Schedule – currently much of our availability is “early”
- Early qualifiers – “no one” has played before, winning scores typically lower; likely first try so no iteration
- Later qualifiers – more time before competing, winning scores higher, possibly some second plays; may be 2nd iteration for some teams
- Larger events will advance more teams (it’s a ratio)
- Smaller events mean you’re competing against fewer teams

You will get to list your preferences then we’ll have a lottery – you won’t necessarily get your first choice.

Oct 10th Town Hall!!

Resources

Be willing to look and read a bit

Official Manuals

Game Manual Part 1 (Robot, Tournament)

Game Manual Part 2 (Game)

FTC Forums – Official Q&A

Team Calls – Look for dates in Team Blasts (Old Team Blasts on website)

FTC Scoring System

<https://ftc-docs.firstinspires.org/>

FIRST Tech Challenge Docs

FIRST TECH CHALLENGE 0.1.0

Search docs

About the FIRST Tech Challenge
 Gracious Professionalism®
 Site Feedback Form

GETTING STARTED
 Rookie Teams
 Veteran Teams
 Coach (Administrative) Resources
 Technical Mentor Resources

GAME AND SEASON-SPECIFIC RESOURCES
 Game Manuals
 Game Q&A Forum
 Playing Field Resources

CONTROL SYSTEM RESOURCES
 Control System Introduction
 Hardware Component Overview
 Hardware and Software Configuration
 Programming Resources

CAD RESOURCES
 Computer Aided Design (CAD)

ADDITIONAL TOOLS
 FIRST Machine Learning Toolchain

FIRST Official Resources Official Game Q&A

FIRST Tech Challenge documentation [Edit on GitHub](#)

FIRST Tech Challenge documentation

FIRST Tech Challenge is a robotics program for middle and high school students. It's way more than building robots, see About the FIRST Tech Challenge to see why.

Note

This project is under active development. Anything contained herein is for informational purposes only; while this documentation is intended to support teams and in some way provide context to game rules, the game rules supercede all documentation found here. If you have feedback about this project, please use our [feedback form](#).

I AM A...

Rookie Team	Veteran Team	Coach (Admin)	Mentor (Technical)
Rookie Resources Rookie Teams may not know where to start. This is the way!	Veteran Resources Veteran Teams looking for veteran resources can look here.	Coach Resources Coaches looking for Team Administrative Resources can look here for help.	Mentor Resources Technical Mentors looking for Technical Resources should look here first!

Programming Quick Links	Control System Links	Game Manual Links
Quick Links for Programming Language Resources Blocks OnBot-Java	Let's get to know the FIRST Tech Challenge Control System! Driver Station	Be sure you're following all of the rules of the competition! Game Manuals and Q&A are essential documents.

Technical Mentoring Resources

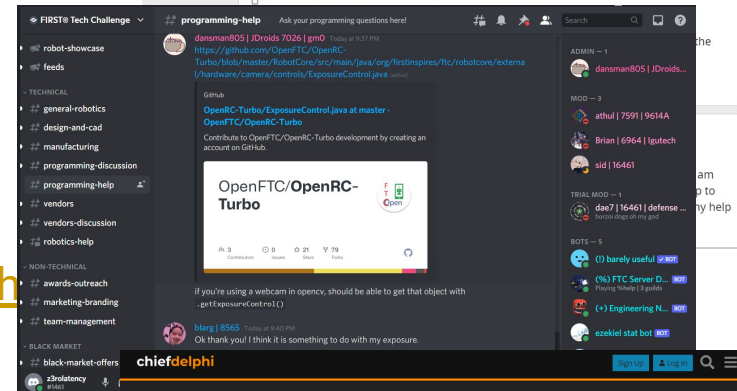
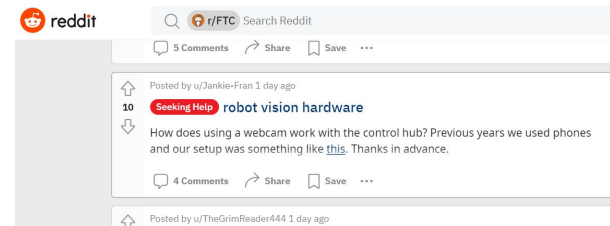
NOTE – Not all are monitored or promoted by FIRST

Component and System Documentation

- [FIRST Sites](#)
- Vendor Sites (Next Slide)
- Reddit <https://www.reddit.com/r/FTC/>
- Discord
- Chief Delphi <https://www.chiefdelphi.com/c/oth>

Training, including mechanical design

- Team documentation (Google is your friend)
- Game Manual Zero <https://gm0.org/en/latest/index>. (Caution, mainly good, but biased)



Topic	Replies	Views	Activity
📄 About the FIRST Tech Challenge category	1	358	Dec '18
📄 STC Freight Frenzy xRC Simulator Tournament - October 24 on First Updates Now	0	57	8h
📄 Trying to get TorqueNADO motor encoder to work with the REV control	0	100	5d
📄 Top R130H/Quick Build Robots for Freight Frenzy	0	147	7d
📄 Two robot reveals from the Kettering Bulldogs R130H Team + goBILDA giveaway	0	155	14d

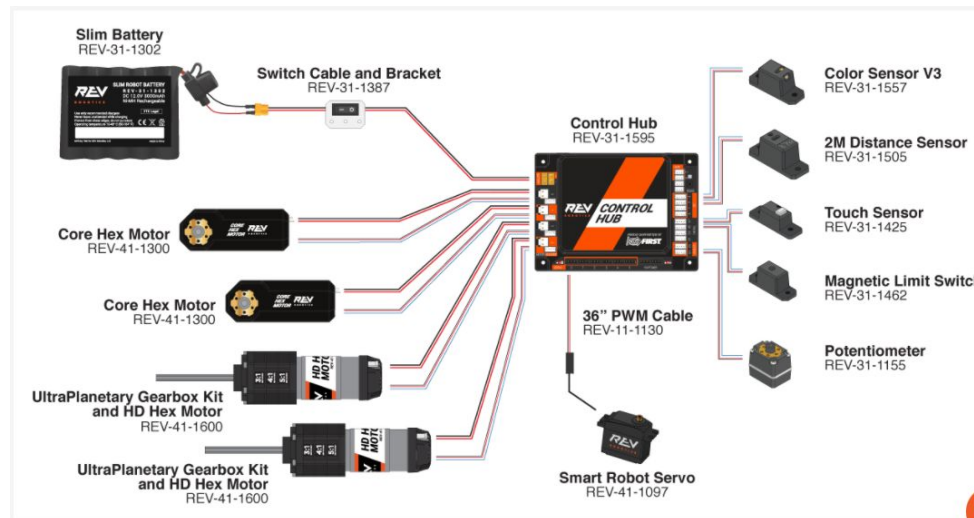
Vendor Sites

REV Systems Documentation

Start here: <https://www.revrobotics.com/ftc-guided-experience/>

Documentation

- [Control Hub User's Manual](#)
- [Getting Started with the Control Hub](#)
- [Hello Robot: Introduction to Programming](#)
- [Control Hub Troubleshooting Guide](#)
- [REV Hardware Client User's Manual](#)
- [Color Sensor V3 Datasheet](#)
 - Videos:
 - [Getting Started: Control Hub](#)
 - [Getting Started with the Control Hub and the REV Hardware Client](#)
 - [Wireless ADB on a Control Hub](#)
 - [Pairing Driver Station to a Control Hub](#)
 - [Troubleshooting: Control Hub to a Computer over WiFi](#)
 - [Troubleshooting: Connecting a Second Expansion Hub](#)



Vendor Sites

AndyMark and Pitsco also have building and programming resources including videos and CAD models

GoBuilda also gaining popularity – not currently a supplying partner for FIRST



Home / FIRST / FIRST Tech Challenge / How Do I...? - AndyMark and Your Team

How Can AndyMark help you with FIRST Tech Challenge?



Dive into FIRST Tech Challenge with AndyMark!

AndyMark has been working with FIRST to manufacture the official game pieces and sets for FIRST Tech Challenge since 2013.

We've worked to create high quality robust gearmotors, highly configurable

There are millions of possibilities to possibilities that you have available

Our goal is to deliver quality products at support@andy-mark.com or by



My Account | Support |

Shop | Our Programs | Experience Pitsco | About Us

HOME > COMPETITIONS, CLUBS, AND PROGRAMS > FIRST TECH CHALLENGE

QUICK START GUIDE

Here's a list of things you'll probably need to build a successful robot for a FIRST Tech Challenge robot:

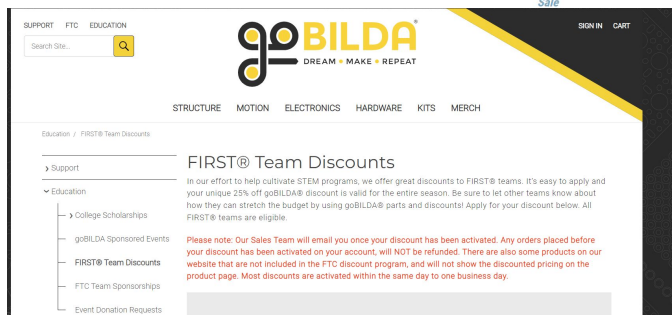
- **FTC Chassis** (aka "drive base", "drive train", "chassis", "drive system") - This is the base platform you
- **S3 Building System** - Design the mechanisms you need to play the game using these components
- **NeverRest Motors** - Performance, many ratio options, and years of proven reliability to get your m
- **PicoBox Gearboxes** - Strength, combined power of multiple motors, and an additional ratio chan
- **Nubs** - The perfect connection point for your moving pieces
- **Wheels** - Many diameters, bores and styles-our wheels aren't just for driving.
- **The FIRST Tech Challenge Perimeter Kit** - Get the official perimeter used for events, and darts fo

Narrow By:

Product Type

- Materials and Supplies (1)
- Robotics Elements (134)
- Robotics Sets (2)

Safe



FIRST® Tech Challenge



Get 25% off spare parts!

Enter a valid FTC team number and get your promo code now.

Enter your team number.

SUBMIT

Shop Competition Set



Some Tips from the Global Chief Ref

- **Read the FTC Manual!**
 - several changes to “usual” items
- Keep Up with the FTC Q&A!
- Join the monthly “Team Gameplay” webinars

Questions

- Before asking questions – look for your own answer
- Was it in an email? Something posted on our site?
- Emails work better
- Phone calls – if we don't answer, leave a detailed message and your team number and perhaps your email address
- Patience 😊

Now – what questions do you have for tonight?