

PitCrew Commander Tutorial Book — FRC Edition

A Student and Mentor Guide to the PitCrew Platform

Build. Plan. Win.

Version 1.0 — FRC Season Guide Updated July 2026 | the-pitcrew.co

A Note Before You Begin

This book is written specifically for FIRST Robotics Competition teams. Every example, every workflow, every prompt, and every timeline in this guide is built around the FRC season — from January Kickoff through your Regional, District, or Championship event.

PitCrew is not a replacement for your team. It is the most capable assistant your team has ever had. Think of it as having seventeen expert consultants available twenty-four hours a day, seven days a week, who never get tired, never get frustrated, and never miss a deadline.

Your job is to be the decision-maker. PitCrew's job is to do the heavy lifting so you can focus on learning, building, and competing.

Read this book once before Kickoff. Keep it nearby during your first team meeting. Refer to specific chapters as the season progresses. By the end of the year, you will wonder how any team ever competed without it.

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Chapter 1: Understanding the System

What PitCrew Is

PitCrew is a web-based mentor-assist command center that gives your FRC team access to seventeen specialized AI agents, each with a distinct area of expertise. Rather than requiring students to find and consult each agent individually, Commander acts as the central hub. You ask Commander a question, and Commander automatically determines which agents need to be involved, passes the task between them in the correct order, and returns a single, unified answer.

The key insight is this: **you never need to know which agent is handling your question.** You simply ask, and the system works.

The Agent Architecture

The seventeen agents are organized into six departments, each covering a distinct area of your team's operation.

Department	Agents	Primary Focus
Orchestrator	Commander	Routes all tasks, produces MoSCoW lists
Engineering	Rulebook, CAD-Bot, Ada, Optic, Volt, Scout	Robot design, code, vision, strategy
Operations	OSHA, Ledger, Stress-Test	Safety, budget, quality control
Outreach	Grants, Megaphone	Fundraising, community events — location-aware
Awards	Legacy, Spark, Aesthetics	FIRST Impact, Engineering Inspiration, Industrial Design
Documentation	Scribe	Engineering Notebook
Human Resources	Guide	Student placement and onboarding

The Golden Rule

Every student talks to Commander. Commander talks to the agents. The agents talk to each other. You never need to copy and paste between them.

This is the most important concept in the entire system. When you type a question into the Commander chat, you are not just sending a message to one AI. You are activating a pipeline. Commander reads your question, decides which agents are relevant, passes the task to the first agent, and that agent passes its output to the next agent in the chain — automatically, in the background, while you wait.

Kickoff Context: The Intelligence Layer

When your team completes the Kickoff Wizard for a project, Commander and all 17 specialist agents automatically receive a **Kickoff Context** block containing your game name, selected strategy, Minimum Competitive Robot (MCR) definition, and team constraints. This means you can open Commander on Day 2 of build season and ask *“What should we prioritize this week?”* and receive a game-specific, strategy-aware answer — without pasting any context manually.

What the System Cannot Do

The agents are brilliant advisors, but they have no hands. They cannot physically cut, drill, weld, or machine aluminum; deploy code to a roboRIO without a student connecting a laptop; drive the robot at competition; or attend a community outreach event. The agents produce the plans, the designs, the code, and the documents. **Your students execute them.** This is not a limitation — it is the design. FIRST is a student program, and the learning happens in the doing.

Chapter 2: Getting Started: First Login and Team Setup

Step 1: Open PitCrew

Navigate to the-pitcrew.co in any modern web browser. Chrome, Firefox, and Edge are all supported. Safari works but is not recommended for the best streaming experience.

You will see the PitCrew landing page, which displays all seventeen agent badges and the four main feature cards: Commander Chat, MoSCoW Board, Scribe Notebook, and the Agent Roster.

Step 2: Log In

Click **Sign In** in the sidebar or the **Open Commander** button on the landing page. You will be redirected to the Manus login portal. Log in with your school email address or the account your mentor has set up for you. After logging in, you will be returned to PitCrew automatically.

Tip: If clicking Sign In appears to do nothing, check that your browser is not blocking external navigation or pop-ups. Safari Private Browsing, Firefox Strict ETP, and Brave's aggressive shields mode may block the OAuth redirect.

Step 3: Join Your Team

After signing in for the first time, your mentor or team captain will share an **invite link** with you. Open the link in your browser and click **Join Team**. If you have not received an invite link, ask your team captain to go to **Teams** → **[Your Team]** → **Invite tab** and generate one.

Step 4: Select Your Role

On the **Profile** page, select the role that best describes your position on the team. Your role determines which specialist agents are highlighted for you by default.

Role	Best For
Executive	Team captain, lead mentor, program manager
Fabricator	Students who machine, weld, and assemble parts
Integrator	Students who wire electronics and integrate subsystems
Programmer	Students who write Java or Python code for WPILib
Strategist	Students who scout, plan autonomous, and analyze match data

Step 5: Create Your FRC Project

Go to **Teams** → **[Your Team]** → **Projects tab** and click **New Project**. Enter a project name (e.g., “FRC 2026 Season”) and select **FRC** as the program type. This sets the Build Calendar to 8 weeks by default (adjustable), uses FRC-specific event labels (Regional, District, Championship), and configures all agents with FRC context.

Chapter 3: Talking to Commander: How to Ask Good Questions

The Anatomy of a Good Prompt

Commander works best when you give it three things: **context** (who you are), **the task** (what you need), and **constraints** (what limits you). A prompt that includes all three will always produce a better result than a vague question.

Component	Weak	Strong
Context	“Help us with our robot”	“We are a 12-student FRC team in our third season”
Task	“What should we build?”	“Generate a MoSCoW priority list for the REEFSCAPE game”
Constraints	(none)	“Budget: \$6,000. Tools: CNC router, lathe, MIG welder. 8-week build season.”

Starter Prompts for FRC Teams

The following prompts are tested and effective for FRC teams at each stage of the season.

Kickoff Day:

“We are a 12-student FRC team in our third year. Our budget is \$6,000. We have a CNC router, lathe, and MIG welder. Analyze the REEFSCAPE game and generate a MoSCoW priority list for our 8-week build season.”

Week 3 of Build Season:

“We are in Week 3 of build season. Our drivetrain is complete. Our intake mechanism is 50% built. Robot Freeze is in 5 weeks. What should we prioritize this week to make sure we have a driveable robot by Week 7?”

Before the Regional:

“Our Regional is in 2 weeks. Generate a final pre-competition checklist for our pit crew, our drive coach, and our award submissions.”

What Commander Routes Automatically

When you ask Commander a question, it reads the intent and routes to the appropriate agents without you specifying which ones. Here are common FRC questions and the agents Commander activates:

Your Question	Agents Activated
“What are the autonomous scoring rules?”	Rulebook
“Design an intake for the game piece”	CAD-Bot, OSHA
“Write code for our swerve drivetrain”	Ada
“Is our robot legal for inspection?”	Rulebook, OSHA
“How do we improve our autonomous score?”	Scout, Ada, Optic
“Write a grant letter for a local business”	Grants, Megaphone
“Log today’s build session”	Scribe

Chapter 4: The Kickoff Wizard: Your Season Starting Point

The Kickoff Wizard is the most important tool in PitCrew. It is the structured process that transforms a game reveal into a documented strategy, a robot definition, and a build plan — all in a single session. Every other tool in PitCrew works better after the Kickoff Wizard is complete, because Commander and all 17 agents automatically receive your game context.

In FRC, Kickoff Day is the starting gun for an 8–10 week sprint to Robot Freeze. There is no time to iterate between competitions — the robot you ship is the robot you compete with. Every decision made on Kickoff Day echoes through the entire build season. The Kickoff Wizard ensures those decisions are documented, deliberate, and team-wide.

The 9-Step Wizard

Navigate to **Kickoff Wizard** in the sidebar. If your game is in the Game Library, select it. Otherwise, upload your FRC Game Manual PDF. The wizard walks your team through nine steps.

Step 0 — Game Library: Select the current FRC game. The system pre-loads known game parameters, scoring objects, and field layout.

Step 1 — Game Notes: Fill in the scoring objects, autonomous tasks, teleop tasks, and endgame tasks. Rulebook assists with rule citations.

Step 2 — Strategy Framing: Describe your team's strengths and constraints. Commander suggests three strategic directions.

Step 3 — Decision Matrix: Score each strategy across five criteria (scoring potential, build complexity, driver skill required, reliability, and uniqueness). Commander calculates a weighted score and recommends a direction.

Step 4 — MCR Definition: Define your Minimum Competitive Robot — the simplest version of your robot that can score enough points to qualify at your Regional. This becomes the baseline for your MoSCoW Board. In FRC, the MCR is critical: you must ship a working robot by Robot Freeze, and there is no second chance.

Step 5 — Prototype Plan: Identify the two or three mechanisms that carry the most risk and need to be prototyped in Weeks 1–2. Set prototype due dates so they appear on the Build Calendar. In FRC, prototyping must happen fast — you have at most 2 weeks before fabrication must begin.

Step 6 — Constraint Capture: Document your team's budget, tool inventory, experience level, and meeting schedule. This context flows into every agent response for the rest of the season.

Step 7 — Review: Review the complete session. Export as Markdown for the Engineering Notebook.

Step 8 — Meeting Mode: A full-screen facilitation view designed to be projected on a screen during your Kickoff Day team meeting. Shows the current step, the game name, your strategy, and your MCR in large, readable text.

Step 9 — Commander Context Banner: A persistent banner visible in Commander that shows your game, strategy, MCR, and key constraints at a glance. Once the Kickoff Wizard is complete, every Commander session automatically includes this context.

After the Wizard

Once you complete the Kickoff Wizard, navigate to **MoSCoW Board** and click **Generate with Commander**. Commander uses your game notes, strategy, MCR, and constraints to produce a fully populated priority board in seconds. This is the starting point for your entire build season.

Chapter 5: The MoSCoW Priority Board

The MoSCoW Board (/moscow) is your team’s shared priority list for the build season. Every robot feature, mechanism, and software task lives here, organized into four priority columns.

Column	Meaning for FRC Teams
Must Have	Required to meet your MCR and be competitive at your Regional
Should Have	Improves your score but is not required to compete
Could Have	Nice to have if time allows before Robot Freeze
Won’t Have	Explicitly out of scope for this season

In FRC, the MoSCoW Board is a hard constraint tool. Items in **Could Have** should be treated as “only if we finish Must Have and Should Have by Week 6.” Items in **Won’t Have** are a public commitment to the team that these features will not be built — removing the temptation to scope-creep in Week 7.

Generating the Board

After completing the Kickoff Wizard, click **Generate with Commander** on the MoSCoW Board. Commander produces 15–25 items across all four columns, each with a description, suggested assignee role, and a flag for whether it needs prototyping.

Managing Items

Each card on the board can be edited inline. Click any card to expand it and update the description, assignee, priority column, or approval status. Items flagged as needing prototyping show a purple **Proto** badge. Set a **Proto Due Date** on any prototype item to have it appear as a chip on the Build Calendar in the correct week.

The Approval Workflow

When Commander generates items, they start in **Draft** status. Your team Executive or lead mentor reviews each item and marks it **Approved** or **Rejected**. Only approved items flow into the CAD Board and Fabrication workflows. This prevents the team from building things that were never formally agreed upon.

Chapter 6: The Engineering Department Agents

Rulebook — The Rule Expert

Rulebook has read the entire FRC Game Manual. Ask it anything about scoring, field setup, robot inspection, or legal mechanisms. It always cites the specific rule number so you can verify the answer in the official manual.

“What is the maximum robot weight at the start of a match? Cite the rule.” “Can we use a custom 3D-printed intake? What are the material restrictions?” “What are the bumper requirements for FRC? Cite the specific rules.”

Important: Always verify rule citations against the official FIRST Game Manual before making design decisions. Rulebook is highly accurate but the official manual is the final authority.

CAD-Bot — The Mechanical Designer

CAD-Bot produces mechanism concepts, assembly descriptions, and part recommendations for FRC-scale robots. It is familiar with WCP, REV, AndyMark, and Thrifty Bot components and will recommend specific part numbers when relevant. It understands the constraints of a 125-pound, 28-inch-frame-perimeter robot.

“Design a ground intake for 2-inch diameter game pieces using WCP components.” “What is the best elevator configuration for a 48-inch vertical extension that fits within the 125-pound weight budget?” “Generate a bill of materials for a swerve drivetrain using SDS Mk4i modules.”

Ada — The Programmer

Ada writes Java and Python code for WPILib. It produces Command-based subsystems, autonomous routines, and operator interface bindings. It is familiar with the roboRIO, REV Spark MAX, CTRE TalonFX, and common FRC sensors.

“Write a Command-based subsystem for a flywheel shooter with velocity PID control using a Spark MAX.” “Write an autonomous routine using PathPlanner that drives from the starting zone to the scoring position and scores two game pieces.” “Write a swerve drive subsystem using WPILib’s SwerveDriveKinematics.”

Optic — The Vision Engineer

Optic configures vision pipelines for FRC. It is familiar with PhotonVision, Limelight, and WPILib’s AprilTag pose estimation.

“Configure a PhotonVision pipeline for AprilTag localization on our swerve drive.” “Write a Limelight targeting routine that aligns the robot to the scoring target.”

Volt — The Electrical Engineer

Volt produces wiring manifests, power budgets, and electrical compliance checks for FRC robots.

“Generate a wiring manifest for a robot with 4 swerve drive motors, 2 elevator motors, 1 intake motor, and 3 pneumatic solenoids.” “What is the maximum current draw we can expect from our motor configuration? Will we trip the main breaker?”

Scout — The Strategy Analyst

Scout analyzes game scoring and produces strategic recommendations, autonomous path priorities, and alliance selection guidance.

“What is the highest expected autonomous score for a top-tier FRC team this season?” “We are ranked 4th at our Regional. Generate a pick list strategy for alliance selection.”

Chapter 7: The Operations Department Agents

OSHA — The Safety Inspector

OSHA reviews robot designs and build processes for safety compliance. It checks for sharp edges, pinch points, pneumatic safety, and general workshop safety.

“Review our pneumatic system design for safety compliance.” “Generate a safety checklist for our build sessions, including CNC and welding operations.”

Ledger — The Budget Tracker

Ledger tracks your team's spending, forecasts remaining budget, and flags items that are over budget.

“We have spent 3,200 of our 6,000 budget. We still need to buy swerve modules (1,200), aroboRIO2(500), and game-specific parts (\$400). Will we stay within budget?”

Stress-Test — The Quality Engineer

Stress-Test generates test plans, pre-competition checklists, and failure mode analyses.

“Generate a test plan for our elevator mechanism before Week 5.” “Create a pre-Regional checklist for our pit crew.”

Chapter 8: The Outreach and Awards Agents

Grants — The Fundraising Agent

Grants writes sponsorship letters and grant applications tailored to your team's location and the local business community. FRC teams typically need 8,000–20,000 per season; Grants helps you reach that target.

“Write a sponsorship letter for a local aerospace company. Our team number is 1234, we are based in Orlando, Florida, and we are looking for \$2,500 in support.”

Before using Grants for the first time: Set your team's location at **Teams** → **[Your Team]** → **Settings** tab.

Megaphone — The Community Outreach Agent

Megaphone plans and promotes outreach events, demo days, and school visits.

“Plan a robot demo at a local middle school for 60 students. We have 2 hours and five team members available.”

Legacy — The FIRST Impact Award Agent

Legacy helps document your team’s community impact, writes award submissions, and tracks outreach metrics. The FIRST Impact Award is the most prestigious award in FRC.

“We have done 18 outreach events this season reaching 520 students. Help us write the FIRST Impact Award essay.”

Spark — The Engineering Inspiration Award Agent

Spark helps document your team’s engineering process and innovation for the Engineering Inspiration Award.

Aesthetics — The Industrial Design Award Agent

Aesthetics evaluates your robot’s visual design, branding consistency, and presentation quality for the Industrial Design Award.

Chapter 9: The Documentation Agent: Scribe

Scribe automatically formats every Commander session into an Engineering Notebook entry. After each build session, team meeting, or design review, navigate to the **Scribe Notebook** (/notebook) to find a formatted entry ready for review.

Each entry includes a session title, date, participants, key decisions, action items, and a summary of the work completed. You can edit any entry before exporting.

In FRC, the Engineering Notebook is evaluated at the Regional and Championship levels for multiple awards. Teams that document consistently throughout the build season — not just in the final week — score significantly better in judging.

Exporting entries: Click **Export .md** on any entry to download a Markdown file. For a print-ready version, use the full-screen expand button and click **Print** inside the modal.

“Log today’s build session. We worked on the elevator mechanism for 3 hours. The first chain run was too loose and skipped. We added a tensioner and it worked. Action item: CAD-Bot to

finalize the elevator CAD by Friday.”

Chapter 10: The Human Resources Agent: Guide

Guide helps mentors onboard new students, assign roles, and create personalized learning plans.

“We have a new student joining the team. He has no robotics experience but is interested in mechanical design. Create a 4-week onboarding plan for him.”

“Generate a role description for our new Drive Coach position.”

Chapter 11: The Build Calendar

The Build Calendar (`/build-calendar`) is your team’s shared timeline for the entire FRC season. It shows an 8-week grid by default (adjustable to 10 weeks) with three types of content in each week column.

Auto-derived chips appear automatically when you set due dates on other tools:

- **Blue CAD chips** — CAD Board requests with a `neededBy` date
- **Green Fab chips** — Fabrication tasks with a `dueDate`
- **Purple Proto chips** — MoSCoW prototype items with a `protoDueDate`

Manual tasks can be added to any week by clicking the + button in a week column. These are free-form tasks that do not come from another tool.

Season events appear as colored badges at the top of each week column, set in the Season Dates tab.

The Season Dates Tab

The Season Dates tab is where you configure your FRC season timeline. Set your **Kickoff Date** (the first Saturday of January) and your **total weeks** (default 8, adjust to 10 if your district allows). Then add your competition events.

FRC event types available:

- **Regional / District Event** — Your primary competition. Florida teams typically compete at the **Orlando Regional**, a 3-day event held in a major arena or convention center in March.
- **Championship** — The FIRST Championship in April (Houston or Detroit).

- **Scrimmage** — An informal practice event, if your region hosts one.
- **Milestone** — Any internal team deadline (e.g., “Robot Drive-Ready”, “Autonomous Working”, “Robot Freeze”).

Important: Add a **Robot Freeze / Ship Day** milestone in the Season Dates tab. The Build Calendar will display a **Robot Freeze** badge on that week column, serving as a hard visual deadline for the entire team.

The Prototype Work Row

Below the week grid, a purple **Prototype Work** section shows all MoSCoW items flagged for prototyping that do not yet have a `protoDueDate` set. In FRC, all prototypes should have due dates set by the end of Week 1 — prototype work that is not scheduled is prototype work that will not happen.

FRC Build Phase Labels

The Build Calendar uses four phase labels for FRC projects, based on the 8-week build season:

Weeks	Phase	What Should Be Happening
1–2	Design	Prototype high-risk mechanisms; finalize CAD for all Must Have items
3–5	Build	Fabricate and assemble all Must Have mechanisms; begin code
6–7	Integration & Testing	Integrate all subsystems; run full test protocols; tune autonomous
8+	Robot Freeze / Ship	Final testing; freeze the robot; prepare for Regional

Chapter 12: The Project Lifecycle Checklist

The Lifecycle Checklist (`/lifecycle`) is a real-time guide from project creation to competition day. It shows six collapsible phases, each with checklist items that auto-check based on actual project data.

Phase	What Gets Auto-Checked
1 — Kickoff & Strategy	Kickoff Wizard session exists, game notes filled, strategy selected, MCR defined
2 — Planning & Prioritization	MoSCoW Board generated, prototype targets flagged, CAD requests created
3 — Build Season	Fabrication tasks created, cut list items added, build calendar tasks exist
4 — Integration & Testing	CAD items in review or approved, fabrication tasks completed, notebook entries created
5 — Competition Prep	Regional or District event dates added to Season Dates
6 — Post-Competition Review	Notebook entries with “review”, “debrief”, or “lessons” in the title

Each item includes a **Go** → link that navigates directly to the relevant tool. An overall progress bar at the top shows the percentage of phases complete. Use this page at the start of each week to see where the team stands and what is still missing.

In FRC, the Lifecycle Checklist is most valuable in Weeks 3–5, when it is easy to lose track of whether all the foundational work (CAD approval, fabrication task creation, autonomous code) has actually been completed.

Chapter 13: The Agent Roster: Live Activity View

The Agent Roster page (`/agents`) provides a real-time view of all 17 agents during an active Commander session.

State	Visual	Meaning
Idle	Dimmed card	Agent not involved in the current session
Active	Pulsing ring + spinner	Agent is currently processing
Done	Green checkmark + output preview	Agent has completed its task
Skipped	Faded card	Agent was not needed for this query

A session progress bar at the top shows the session title, an X/N agent counter, and a **View** button that jumps directly to that Commander session. The Roster is most useful during Kickoff Day — project it on a shared screen so the whole team can watch the AI pipeline in real time.

Chapter 14: FRC Season Workflows — Week by Week

The FRC Season at a Glance

FRC runs from January Kickoff through your Regional (March) and Championship (April). The build season is 8–10 weeks — one of the most compressed engineering timelines in any student program. There is **no iteration between competitions**. The robot you ship at Robot Freeze is the robot you compete with at your Regional and Championship. Every week of the build season counts.

Month	What's Happening
September – December	Pre-season: fundraising, outreach, training
First Saturday of January	Game Kickoff — strategy, design, and prototyping begins immediately
Weeks 1–2	Design phase: prototype high-risk mechanisms
Weeks 3–5	Build phase: fabricate and assemble
Weeks 6–7	Integration & Testing: full robot testing
Week 8+	Robot Freeze / Ship Day — no further changes
March	Orlando Regional (3-day event)
April	FIRST Championship (Houston or Detroit)

Pre-Season (September – December)

During the fall, before the game is announced, your team focuses on fundraising, outreach, and preparation.

Use **Guide** to onboard new students and assign roles. Use **Grants** to draft sponsorship letters to local businesses and foundations — set your team location first at **Teams** → **Settings**. FRC teams typically need 8,000–20,000 per season; begin fundraising in September. Use **Megaphone** to plan fall outreach events at local schools and community centers. Use **Ledger** to set a build season budget before any parts are ordered. Use **Legacy** and **Spark** to begin documenting the team's outreach history for award submissions.

Recommended pre-season Commander prompt:

“We are a third-year FRC team with 12 students and three sponsors. Help us create a 3-month fundraising plan to raise \$15,000 before Kickoff.”

Kickoff Day (First Saturday of January)

Kickoff Day is the most important day of the FRC season. The game is revealed, and your team has roughly 8–10 weeks to design, build, and program a 125-pound robot before Robot Freeze / Ship Day. Unlike FTC, there is no time to iterate between competitions — the robot is frozen at the end of the build season. **Every decision made today echoes through the entire season.**

The FRC Kickoff Day workflow:

1. Watch the game reveal video as a team.
 2. Open PitCrew and navigate to **Kickoff Wizard**.
 3. Select the current FRC game from the Game Library (or upload the manual PDF).
 4. Work through Steps 1–5: game notes, strategy framing, Decision Matrix, MCR definition, and Prototype Plan.
 5. Use **Meeting Mode** to project the session on a screen for the team discussion.
 6. Lock in your strategy and MCR. This is a binding team decision — write it down.
 7. Navigate to **MoSCoW Board** and click **Generate with Commander** to produce the priority board.
 8. Review and approve the board as a team. Move anything that is not MCR-critical to **Could Have** or **Won't Have**.
 9. Navigate to **Build Calendar** → **Season Dates** and set your Kickoff Date to the first Saturday of January. Set total weeks to 8 (or 10 if your district allows).
 10. Add your Regional event (Orlando Regional, March), Championship (April), and a Robot Freeze milestone on Week 8.
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Weeks 1–2: Design Phase

The goal of this phase is to validate your highest-risk mechanisms through rapid prototyping and finalize CAD for all Must Have items. Every day of Week 1 is precious.

What to do in PitCrew:

Use **CAD-Bot** to generate mechanism concepts for your top two Must Have items on Kickoff Day evening. Build physical prototypes the next day. Test them against the game piece. If a mechanism fails, ask CAD-Bot for an alternative design. Set **Proto Due Dates** on your MoSCoW Board prototype items — all prototypes should be tested by the end of Week 2.

Use **Rulebook** to verify that your prototype designs are legal. Ask it to cite the specific inspection rules for any mechanism you are unsure about. A design that is illegal at inspection is a design that must be rebuilt during competition week.

Use **Volt** to generate a preliminary wiring manifest so the electrical team can begin ordering parts.

Recommended prompt for Week 1:

“We are in Week 1 of FRC build season. Our strategy is [X]. Our MCR is [Y]. Generate a day-by-day schedule for Weeks 1 and 2 that gets us to a working prototype of our intake and

shooter by the end of Week 2.”

Weeks 3–5: Build Phase

The goal of this phase is to fabricate and assemble all Must Have mechanisms. By the end of Week 5, you should have a driveable robot with at least one scoring mechanism functional.

What to do in PitCrew:

Use **CAD-Bot** to finalize mechanism designs based on prototype results. Use **Ada** to write subsystem classes for each mechanism and begin integrating them into a Command-based robot program. Use **Stress-Test** to generate a validation protocol for each subsystem. Set `dueDate` values on all fabrication tasks so they appear as green chips on the Build Calendar.

Use **Scribe** to log every build session. The Engineering Notebook is evaluated at the Regional and Championship levels — teams that document consistently throughout the build season score better in judging.

Recommended prompt for Week 4:

“We are in Week 4 of FRC build season. Our drivetrain is complete. Our intake is 80% built. Our shooter is 40% built. Robot Freeze is in 4 weeks. What should we prioritize this week?”

Weeks 6–7: Integration and Testing Phase

The goal of this phase is to have a fully integrated robot running autonomous routines by the end of Week 7. This is the most technically demanding phase of the FRC build season.

What to do in PitCrew:

Use **Ada** to integrate all subsystems into a unified robot program. Use **Optic** to configure your vision pipeline for AprilTag localization or game-piece detection. Use **Stress-Test** to generate a full test plan — run every test case and document results in Scribe. Use **Scout** to generate autonomous path options based on the game’s scoring structure.

Recommended prompt for Week 6:

“We are in Week 6 of FRC build season. Our robot is fully assembled. We need to tune our autonomous routine and fix a jitter issue in our shooter. Generate a testing priority list for this week.”

Week 8+: Robot Freeze / Ship Day

FRC teams freeze the robot at the end of the build season. This is a hard deadline — no further changes to the robot after this point. The Build Calendar shows a **Robot Freeze** badge on the final week column.

What to do in PitCrew:

Use **Stress-Test** to generate a final pre-freeze checklist. Verify that every Must Have item is complete and tested. Use **Scout** to generate a Regional strategy brief. Use **Legacy** and **Spark** to finalize award submissions — award essays are due before or at the Regional.

The time between Robot Freeze and the Regional is for driver practice and award preparation. Florida teams typically compete at the **Orlando Regional** — a 3-day tournament held in a major arena or convention center. The event includes practice matches (Thursday), qualification matches (Friday–Saturday), and elimination rounds (Saturday).

Recommended prompt for Robot Freeze week:

“Our robot is frozen. Our Regional is in 3 weeks. Generate a 3-week driver practice schedule and a final award preparation checklist.”

Chapter 15: Competition Day Playbook

The Pit Crew Routine

Before every match, run the Stress-Test pre-match checklist. The checklist covers:

1. Battery voltage above 12.5V.
2. All motor connections secure and responding.
3. Bumper mounting — all bolts tight, team numbers visible on all four sides.
4. Pneumatic pressure hold (if applicable) — pressure must hold for 60 seconds with compressor off.
5. Camera connection showing a live feed.
6. Controller binding test — all buttons responding correctly.
7. Robot fits within the starting configuration dimensions.

Never skip the checklist. The most common reason robots fail at competition is a loose connector or a dead battery that was not checked.

The Drive Coach Routine

Before each match, the Drive Coach should review Scout's pre-match strategy brief. The brief covers your alliance's combined strengths, your opponents' known weaknesses, the recommended autonomous path, and the recommended teleop priority.

The Pit Scouting Routine

During the practice match session on Thursday, send a student to pit-scout every team in your division. Ask three questions: *"What is your drivetrain?"*, *"What can you do in autonomous?"*, and *"What is your most reliable scoring action?"* Enter the notes into Commander to build a scouting database.

Recommended scouting prompt:

"Here are my scouting notes from 24 teams at the Orlando Regional: [paste notes]. Rank them by alliance value and suggest our top 3 picks for alliance selection."

Between Matches

"Team 4512 just beat us by using a defense strategy we didn't expect. How do we counter it in our next match?"

Alliance Selection (Friday Evening)

"Based on our scouting data, we are the 3rd alliance captain. Generate a ranked pick list of the top 8 available teams for our first and second picks, prioritizing autonomous reliability and endgame capability."

The Orlando Regional

The Orlando Regional is a 3-day event typically held in a major arena or convention center in the Orlando area. Day 1 (Thursday) includes practice matches and pit setup. Day 2 (Friday) includes qualification matches. Day 3 (Saturday) includes the final qualification matches, alliance selection, and elimination rounds. Award ceremonies are held on Saturday afternoon.

Florida teams that qualify at the Orlando Regional advance to the FIRST Championship in Houston or Detroit in April.

Chapter 16: Mentor Guide — Administration and Export

Onboarding New Students

1. Go to **Teams** → **[Your Team]** → **Invite tab**.
2. Click **Generate Invite Link**. The link is valid for 7 days.
3. Share the link with the student via group chat, email, or Discord.
4. The student opens the link, signs in, and clicks **Join Team**.
5. The student selects their role on the **Profile** page.

As a team owner or Executive, you can verify and reassign any member's role at any time from **Team Detail** → **Members tab**. Click the role badge next to any member's name to open a dropdown with all five role options.

Setting Team Location

For the Grants and Megaphone agents to provide location-specific responses, set your team's location:

1. Go to **Teams** → **[Your Team]** → **Settings tab**.
2. Enter your **City**, **State/Province**, and **Country**.
3. Click **Save Location**.

Florida teams should enter "Orlando, Florida, United States" or their specific city. Grants will then reference local businesses and foundations; Megaphone will suggest local schools and community centers.

Creating a Project

Each team can have multiple projects — one per season, or one per program if you run both FRC and FTC. To create an FRC project:

1. Go to **Teams** → **[Your Team]** → **Projects tab**.
2. Click **New Project**.
3. Enter a project name (e.g., "FRC 2026 Season").
4. Select **FRC** as the program type.
5. Click **Create**.

The FRC program type sets the Build Calendar to 8 weeks by default, uses FRC-specific event labels, and configures all agents with FRC context.

Exporting the Engineering Notebook

Any team member can export any Scribe notebook entry as a `.md` Markdown file by clicking **Export .md** on the Notebook page. For a clean print-ready version, use the **full-screen expand** button on any entry, then click **Print** inside the modal.

Exporting the MoSCoW Board

Any team member can export the current MoSCoW board by clicking **Export .md** in the board header. The export includes all items, their priority column, their description, and their approval status.

Exporting the Kickoff Wizard Session

After completing the Kickoff Wizard, click **Export .md** on the Review step to download the full session as a Markdown file — including game notes, strategy, MCR, and prototype plan — ready for the Engineering Notebook.

Chapter 17: Frequently Asked Questions

Q: Can I ask Commander questions that are not about robotics? Commander is a general-purpose AI orchestrator. However, the specialist agents are optimized for FRC contexts. For general questions, Commander will respond directly without activating the specialist agents.

Q: What if Commander gives me wrong information? Always verify critical information — especially rule citations — against the official FRC Game Manual. Rulebook always cites the rule number so you can check the source directly.

Q: Can multiple students use Commander at the same time? Yes. Each student has their own account and their own session history. Multiple students can be in Commander simultaneously without interfering with each other.

Q: Does Commander remember previous sessions? Within a single session, Commander has full context of the conversation. Across sessions, Commander does not automatically remember previous conversations. However, the Kickoff Wizard context (game, strategy, MCR, constraints) is automatically injected into every new session for the active project.

Q: What is the difference between a Team and a Project? A Team represents your FRC team (e.g., Team 1234). A Project represents a single season within that team (e.g., “FRC 2026 Season”). One team can have multiple projects — for example, if your organization runs both an FRC team and an FTC team, each gets its own project with the correct program type.

Q: Can we use PitCrew for both FRC and FTC? Yes. Create a separate project for each program and select the correct program type (FRC or FTC) when creating the project. The Build Calendar, season event labels, and agent context all adapt automatically.

Q: What happens after Robot Freeze? After Robot Freeze, your robot is locked. You cannot make changes to the robot hardware or software until the competition begins. Use the time between Robot Freeze and your Regional for driver practice, award preparation, and scouting. PitCrew's Build Calendar shows a Robot Freeze badge on the final week column as a visual reminder.

Q: How do we handle the Engineering Notebook for award judging? Scribe automatically formats every Commander session into a notebook entry. Review and edit each entry after your build sessions, then export as Markdown or print directly from the full-screen view. Judges at the Regional evaluate the notebook — consistent documentation throughout the build season is more valuable than a last-minute compilation.

Chapter 18: Quick Reference Card

Task	Where to Go	What to Ask
Start the season	Kickoff Wizard	Upload game manual, complete all 9 steps
Generate priority list	MoSCoW Board	“Generate with Commander” button
Ask a rules question	Commander	“What does rule G301 say about...”
Design a mechanism	Commander	“Design an intake for [game piece] using WCP components”
Write robot code	Commander	“Write a Command-based subsystem for a flywheel shooter”
Check robot legality	Commander	“Is our [mechanism] legal for FRC inspection?”
Log a build session	Commander → Scribe	“Log today’s build session: [summary]”
Track the budget	Commander → Ledger	“We have \$2,800 left. We need to buy [parts]. Will we stay in budget?”
Plan a fundraiser	Commander → Grants	“Write a sponsorship letter for [local business]”
Prepare for the Regional	Commander → Stress-Test	“Generate a pre-Regional checklist for our pit crew”
Scout an opponent	Commander → Scout	“Analyze Team [XXXX]’s performance data”
Write an award essay	Commander → Legacy	“Help us write the FIRST Impact Award essay”
View the season timeline	Build Calendar	Set kickoff date and add Regional + Robot Freeze in Season Dates tab

Task	Where to Go	What to Ask
Check season progress	Lifecycle Checklist	Review all 6 phases and click Go → links for incomplete items
Watch agents work	Agent Roster	Project on a shared screen during Kickoff Day
Export the notebook	Scribe Notebook	Click Export .md on any entry
Invite a new student	Teams → Invite tab	Generate Invite Link (valid 7 days)