

FRC Team 972 – Iron Claw Robotics

High-level Overview of Build Season

1) Learning and Mastering the Game.



The FRC Game Reveal typically occurs on the first Saturday in January. Learn more at: <https://www.firstinspires.org/robotics/frc/game-and-season>

Team 972 Students, Teachers and Technical Mentors complete an unbiased review & detailed analysis of the Game Manual.

Study & complete a detailed analysis of the Game Manual

A comprehensive mastery of the game is imperative before team members can start brainstorming possible Game Play Strategies.

2) Game Play Strategy.

The team brainstorms possible Game Play Strategies that will allow them to maximize point scoring and defensive play as a member of a three-team alliance during the match.



With a thorough understanding of the teams' technical abilities and available resources, the DVC decides on a final Game Play Strategy and which subsystems should be repurposed from prior year FRC robots.

The Decision Voting Council (DVC) is a predetermined group of students with prior FRC experience as well as robot hardware and software subsystem knowledge. Refer to the Team 972 Handbook to learn more about the DVC.

DVC Pre-approved Robot Subsystems CAD review/approval and Manufacturing can start on Work Day 5

3a) Functional Robot Requirements.

Game Play Strategy will influence the Functional Robot Requirements.

3b) Subsystem Ideas and Design Requirements.

The DVC approves which Subsystem Ideas move onto the prototyping phase.

DVC documents everything the robot will do and how + robot cycle times by game play operation

DVC documents everything the robot will not do and why

4) Prototyping of Approved Subsystems:

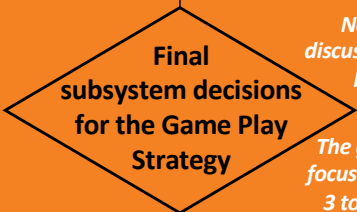
- Prototype
 - Validate Design Requirements
 - Refine prototypes as needed
- Validate Pre-Approved Subsystems.

Prototype / Validate / Refine:
1) Hardware: Robot subsystems for final Game Play Strategy
2) Software: Code samples to operate the prototyped robot subsystems

Validate Pre-Approved Subsystems:
Ensure pre-approved subsystems will support the final Game Play Strategy and design requirements

5) Final Subsystem Decisions.

The DVC leads this activity with the students by reviewing the prototypes, code samples, and how well they performed against the design requirements. The DVC will then select the final prototyped subsystems for the teams FRC robot.



Note: Ahead of build season the team discusses, and the DVC approves what should be manufactured versus purchased

The goal of this activity is to keep the team focused and to avoid scope creep over weeks 3 to 7 as they work on items listed below.

6) Robot Building Time!

Mechanical & System Hardware:
1) Final subsystem CAD & simulation
2) Subsystem manufacturing
3) Subsystem assembly
4) Final subsystems mounted with electrical and pneumatics systems with limited testing

Robot Subsystem Software:
1) Finalize subsystem code
2) Unit testing of subsystem code
3) End to end subsystem code testing / simulation if possible
4) Finalize driver station displays & desired camera view options

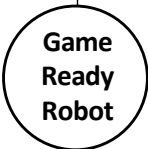
7) Game Play Strategy Validation, and Practice Practice Practice!

Final Integration Testing and Driver Operation of all subsystems to emulate Game Play Strategy, and Practice Practice Practice!

In an ideal world where everything has gone to plan (it never does) this work occurs during weeks 6 and 7.

8) Game Time!

The goal is for the team to have a FRC game ready robot for Regionals by the end of week 7. Regionals start in week 8, typically the first week in March and are run over a 6-week period.



Team 972 typically competes in 2 Regional Competitions as well as at the FIRST Houston Championships should they qualify at the Regionals.

Game Mastery and Strategy

Robot Subsystem Ideas, Design and Validation

Build the Robot and emulate Game Play Strategy

Work Days 1 - 5

Work Days 6 - 12

Work Day 13

Work Days 14 - 30

31 - 39

Work Day 40

Time Frame: Week 1 and Week 2 after FRC Game Reveal

Weeks 3 to Week 7

Work Day 40