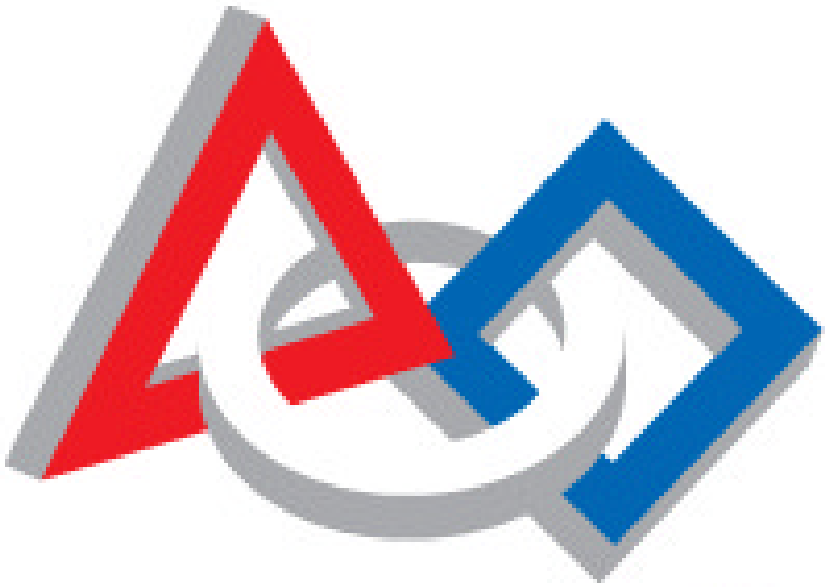


FVC

FIRST Vex Challenge

Table of Contents

Section 1 – Introduction 6

1.1 – Overview 6

1.2 – About *FIRST* 6

1.3 – What is The *FIRST* Vex Challenge? 7

1.4 – Gracious Professionalism – A *FIRST* Credo 7

1.5 The *FIRST* Vex Challenge – 2006 Season 7

Section 2 – The Game 10

2.1 – Overview 10

2.2 – Game Description 10

2.3 – Game Definitions 11

2.4 – Game Rules 13
2.4.1 – Scoring 13
2.4.2 – Scoring in Autonomous Mode 13
2.4.3 – Safety Rules 13
2.4.4 – General Game Rules 13
2.4.5 – Hangin'-A-Round Specific Game Rules 14

Section 3 – The Tournament 16

3.1 – Overview 16

3.2 – Tournament Definitions 16

3.3 – Practice Matches 16

3.4 – Qualifying Matches 16

3.4.1 – Schedule 16

3.4.2 – Rankings 17

3.5 – Elimination Matches 18
3.5.1 – Alliance Selection Process 18
3.5.2 – Match Ladder 18
3.5.3 – Elimination Scoring 18

3.6 – Tournament Rules 19

3.7 – Small Tournament Structure 19

Section 4 – The Robot 21
4.1 – Overview 21
4.2 – Robot Rules 21
4.3 – Autonomous Programming Guidelines 23
Section 5 – Engineering Notebooks 25
5.1 – Overview 25
5.2 – What is an Engineering Notebook? 25
5.3 – The Notebook 25
5.4 – Guidelines/Format 25
5.5 – Judge's Tips 26
5.6 – Virtual Help 26
5.7 – Notebook Examples 26
Section 6 – At The Event 29
6.1 – Overview 29
6.2 – Tournament Event Agendas 29
6.3 – Courtesies and rules 29
6.4 – Competition Overview 30
6.4.1 – Practice Rounds 30
6.4.2 – Judge's Interviews 30
6.4.3 – Match List 30
6.4.4 – Scouting 30
6.4.5 – Early Matches 30
6.5 -- Team Spirit 31
6.5.1 – Team Styling 31
6.5.2 – Banners and Flags 31
7.1 – Overview 33
7.2 – *FIRST* Vex Challenge Awards Eligibility 33
7.3 – *FIRST* Vex Challenge Award Categories 33
7.3.1 – *FIRST* Vex Challenge *Inspire* Award 33
7.3.2 – *FIRST* Vex Challenge *Amaze* Award 33
7.3.3 – *FIRST* Vex Challenge *Innovate* Award 34
7.3.4 – *FIRST* Vex Challenge *Connect* Award 34
7.3.5 – *FIRST* Vex Challenge *Think* Award 34
7.3.6 – *FIRST* Vex Challenge Winning Alliance Award 35
7.4 – Judging Process, Schedule, and Team Preparation 35

7.4.1 – Judging Process 35
7.4.2 – Judging Schedule 35
7.4.3 – Team Preparation 35

7.5 FIRST Vex Challenge Championship Event Eligibility 36

Section 8 – Team Resources 38

8.1 – Overview 38

8.2 – *FIRST* Contact Information 38

8.3 – Getting Answers to Your Questions 38

8.4 – Technical Support 38

8.5 – Team Development Support 38

8.6 – Using the *FIRST* and FVC Logos 39

Section 1

Introduction

Table of Contents

Section 1 – Introduction 6

1.1 – Overview 6

1.2 – About *FIRST* 6

1.3 – What is The *FIRST* Vex Challenge? 7

1.4 – Gracious Professionalism – A *FIRST* Credo 7

1.5 – The *FIRST* Vex Challenge – 2006 Season 7

Section 1 – Introduction

1.1 – Overview

This section provides an introduction to *FIRST* and the *FIRST* Vex Challenge program.

1.2 – About *FIRST*

"…to create a world where science and technology are celebrated… where young people dream of becoming science and technology heroes."
FIRST Founder, Dean Kamen

FIRST (For Inspiration and Recognition of Science and Technology) was founded by inventor Dean Kamen to inspire young people's interest and participation in science and technology. Based in Manchester, New Hampshire. *FIRST* is a 501 (c) 3 non-profit organization.

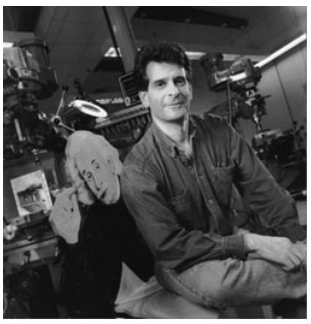
A volunteer-driven organization, *FIRST* is built on partnerships with individuals as well as businesses, educational institutions, and government. Some of the world's most respected companies provide funding, mentorship time and talent, and equipment to make *FIRST's mission* a reality. As a team coach, you join over 43,000 committed and effective volunteers who are key to introducing over 90,000 youth to the joy of problem solving through engineering.

FIRST already provides two well-known programs, the *FIRST* Robotics Competition (FRC) for high-school-aged students and *FIRST* LEGO® League (FLL) for 9 to 14 year-olds. Also located at *FIRST* headquarters is the research and development facility called *FIRST* Place. *FIRST* Place is integral to game design, new program development, evaluation and professional development of all *FIRST* robotics programs team coaches.

Since 1992, the *FIRST* Robotics Competition (FRC) has challenged high-school students – working with professional mentors – to solve an engineering design problem in an intense and competitive way. The program is a life-changing, career-molding experience – and a lot of fun. In 2006, the competition reached thousands of students on close to 1,125 teams in 32 regional competitions and one Championship event. Our teams come from Brazil, Canada, Ecuador, Israel, Mexico, the United Kingdom, and almost every U.S. state.

"We want to change the culture by celebrating the mind. We need to show kids that it's more fun to design and create a video game than it is to play one."

Dean Kamen,
Founder, *FIRST*



Dean Kamen is President of DEKA Research & Development Corporation; a dynamic company focused on the development of revolutionary new technologies that span a diverse set of applications. As an inventor, physicist, and entrepreneur, Dean has dedicated his life to developing technologies that help people lead better lives. Dean's proudest accomplishment is founding *FIRST*.

1.3 – What is The *FIRST* Vex Challenge?

FIRST is creating a new initiative – the *FIRST* Vex™ Challenge. The Vex Robotics Design System, available from Innovation First, Inc., challenges students' creative problem-solving skills by enabling them to build robots that do amazing things. The Vex System allows students to design and construct robotic devices which can be autonomously programmed or radio controlled to perform various tasks that expand the boundaries of experimental intelligence.

The *FIRST* Vex Challenge grew out of the existing *FIRST* Robotics Competition and the *FIRST* Robovation platform. *FIRST*, RadioShack, and Innovation First collaborated to develop an improved version of the *FIRST* Robovation kit. The new kit was significantly upgraded and is called the Vex Robotics Design System. *FIRST* creates the game/challenge and teams can use the Vex Robotics Design System kit to participate.

FIRST Vex Challenge teams purchase the Vex Bundle Kit and Vex accessories come directly from Innovation First, Inc. The kits provide a level starting point for all teams. The game's rules and regulations are provided by *FIRST*. Students must maintain an Engineering Notebook to track their progress, successes, and disappointments throughout their design process. When you bring dedicated, enthusiastic students and a mentor together, they will produce a wide range of amazing machines that are ready for competition.

1.4 – Gracious Professionalism – A *FIRST* Credo

Dr. Woodie Flowers, National Advisor for *FIRST*, speaks about *gracious professionalism* in this way: "The *FIRST* spirit encourages doing high-quality, well informed work in a manner that leaves everyone feeling valued. Gracious professionalism seems to be a good descriptor for part of the ethos of *FIRST*. It is part of what makes *FIRST* different and wonderful.

Gracious professionalism can and should mean different things to each of us. It is possible however, to outline some of its meanings:

- Gracious attitudes and behaviors are 'win-win.'
- Gracious folks respect others and let that respect show in their actions.
- Gracious professionals make a valued contribution in a manner pleasing to others and to themselves as they possess special knowledge and are trusted by society to use that knowledge responsibly.

In the long run, gracious professionalism is part of pursuing a meaningful life. One can add to society and enjoy the satisfaction of knowing that you have acted with integrity and sensitivity. That's good stuff!"

The *FIRST* Vex Challenge is a student-centered activity and is about giving students a unique and stimulating experience. We want students to learn the value of teamwork and to respect everyone's ideas and contributions to the team. *FIRST* values are about appreciating our differences and learning what those differences add to our lives. *FIRST* programs succeed most fully when team members bring the *FIRST* values they learn back to their communities.

1.5 – The *FIRST* Vex Challenge – 2006 Season

FIRST Vex Challenge teams will participate in the *Hangin'-A-Round* challenge for the 2006 season. Each game match is made up of two distinct types of play – operator-controlled and autonomous. Each tournament features alliances of two teams playing from opposite ends of the playing field. Teams will compete to score the most points by completing various tasks including, lifting softballs and placing them in goals, maneuvering an atlas ball over 4 times the size of the robot and hanging from a pipe structure.

During an exciting build period, teams work as a group to overcome obstacles and meet challenges while learning from and interacting with their peers and adult mentors. Teams work together to build a Vex robot to compete in one of many Championship Tournaments across the country, and perhaps the *FIRST* Championship Event in Atlanta, GA, where they celebrate their accomplishments with other *FIRST* Vex

Challenge teams, family, and friends. After the hard work and a lot of fun, students come away with a greater appreciation of science and technology and how they might use it to positively impact the world around them. In addition, they cultivate life skills such as planning, brainstorming, collaboration, teamwork, leadership as well as research and technical skills.

Section 2

The Game

Table of Contents

Section 2 – The Game 10

2.1 – Overview 10

2.2 – Game Description 10

2.3 – Game Definitions 11

2.4 – Game Rules 13
2.4.1 – Scoring 13
2.4.2 – Scoring in Autonomous Mode 13
2.4.3 – Safety Rules 13
2.4.4 – General Game Rules 13
2.4.5 – Hangin'-A-Round Specific Game Rules 14

Section 2 – The Game

2.1 – Overview

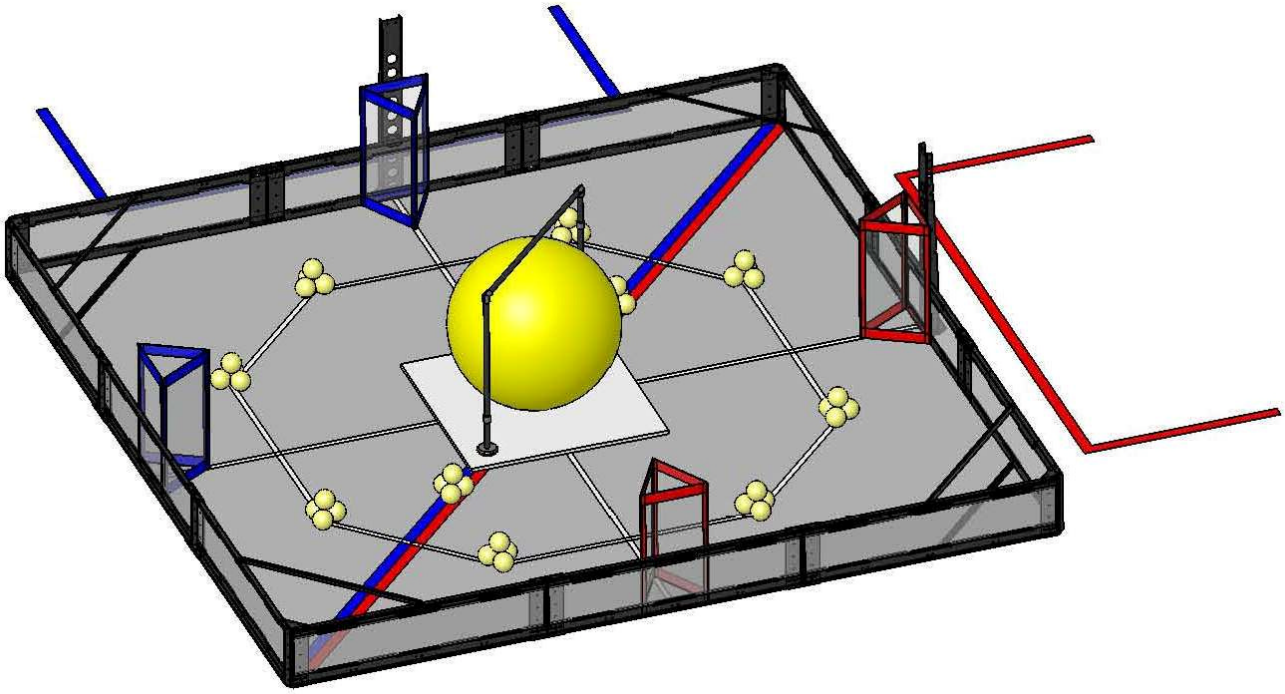
This section describes the *FIRST* Vex Challenge game for the 2006 season, called Hangin'-A-Round. It also lists the game definitions and game rules.

2.2 – Game Description

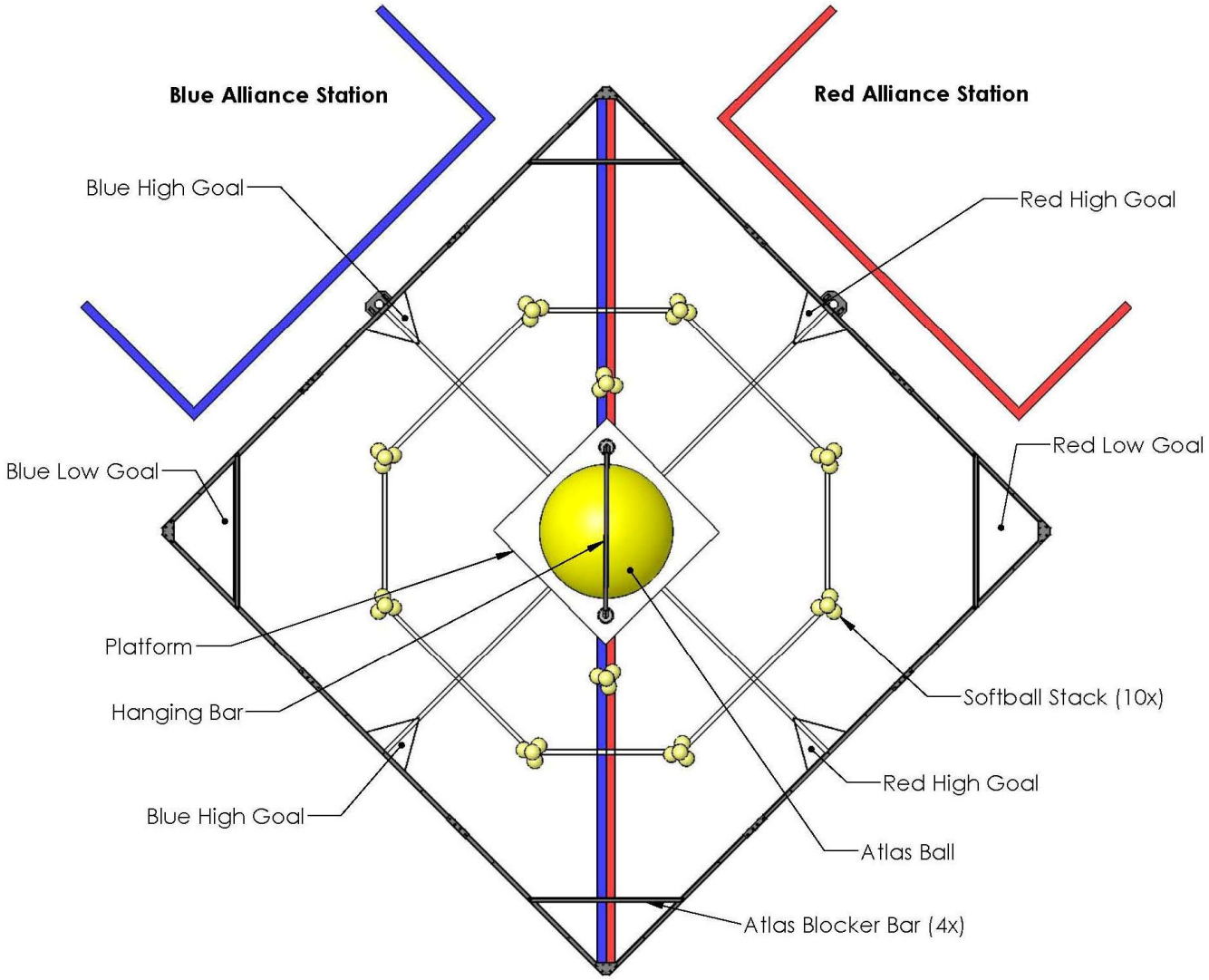
Matches are played on a field initially set up as illustrated in the figures below. Two *alliances* – one "red" and one "blue" – composed of two teams each, compete in each *match*. The object of the game is to attain a higher score than your opponent *alliance* by placing *softballs* into your colored *goals*, *possessing* the *atlas ball* on your side of the field, and by being *parked* on the *platform* or *hanging*.

A bonus is awarded to the *alliance* that has the most total *ball* points at the end of the *Autonomous Period*.

There is a total of 46 *softballs* available as scoring objects in the game. Forty of these *softballs* will be found on the field, while three will be available to each *alliance* prior to the *match*.



Note: *The illustrations in this section of the manual are only provided to give a general visual understanding of the game. Teams should refer to the official field drawings available in appendix 5 for exact field dimensions, a full field BOM and exact details of field construction. Lower cost field options are also provided in appendix 6.*



2.3 – Game Definitions

Alliance – A pre-assigned grouping of two teams that work together for a given *match*.

Alliance Station – The designated region where the *drivers* and *coach* stand during any *match*.

Atlas Ball – A 30” diameter inflated ball that is located on the center of the *platform* at the beginning of each *match.*

Autonomous Period – A 20-second time period in which the *robots* operate and react only to sensor inputs and to commands pre-programmed by the team into the onboard *robot* control system. Human control of the *robot* is not permitted during this time.

Ball – Either an *Atlas ball* or a *softball*.

Bar – The 33” tall, 36” wide, iron pipe structure (including hardware and fasteners) mounted to the *platform*.

Coach **-** A student or adult mentor designated as the team advisor during the match and identified as the person wearing a “*coach*” badge.

Driver **-** A student team member responsible for operating and controlling the *Robot* and wearing a “*Driver*” badge.

Driver Controlled Period – The 2:00 (two minute) time period in which the *robots* are operated by the *drivers.*

Goal – Either a *high goal* or a *low goal.*

Hanging – A *robot* is considered to be *hanging* when it is in contact with the *bar*, and no part of the *robot* is in contact with the *platform* or foam playing surface.

High Goal – One of the four 24” tall, triangular shaped field structures (two designated red, two designated blue) into which teams can score *softballs*.

Low Goal - One of two regions (one designated red, one designated blue,) located in corners of the playing field into which teams can score *softballs*. The outer edge is defined by a 3/8” high, elevated lip.

Match - A *match* consists of an *autonomous period* followed by a *driver controlled period* for a total time of 2:20 (two minutes, twenty seconds).

Parked – A robot is considered to be *parked* when it is in contact with the platform, and no part of the *robot* is in contact with the foam playing surface.

Platform – The 36” rotating square (including the *Atlas ball* positioning ring) located in the center of the playing field.

Possessing – An *alliance* is considered to be *possessing* the *Atlas Ball* when the majority of the *ball* is positioned in the alliance’s *zone*.

Robot – Anything (which has passed inspection) a team places on the field prior to the start of a *match*.

Scored – A *softball* is *scored* in a *goal* if some part of the *ball* is within the two-dimensional space defined by the edges of the *goal*, and not touching a *robot* of the same *alliance*.
Note: A *goal* extends infinitely perpendicular to the playing field surface within the *goal* boundaries.

Softball – A standard regulation softball 11” circumference (3.5” diameter) that is located in stacks of four at specified locations around the field.

Stack – A group of four softballs positioned in specified locations in random orientation around the playing field. Three softballs are set in a circle with one softball placed on top of the other three.

Zone – A half of the playing field designated for each alliance (blue or red). The division is marked by red and blue adjacent tape lines along the diagonal of the field which travels from the *alliance station* to the audience.
Note: The zone extends infinitely perpendicular to the playing field surface within the field boundaries.

2.4 – Game Rules

2.4.1 – Scoring

- A *softball* that is *scored* in a *low goal* is worth one (1) point for the *alliance* that the *low goal* is designated for.
- A *softball* that is *scored* in a *high goal* is worth three (3) points for the *alliance* that the *high goal* is designated for.
- A *robot* that is *parked* at the end of the *match* is worth five (5) points for the corresponding *alliance*.
- A *robot* that is *hanging* at the end of the *match* is worth fifteen (15) points for the corresponding *alliance*.
- *Possessing* the *Atlas ball* doubles the value of all *softballs scored* in an *alliance*'s designated *goals*.

2.4.2 – Scoring in Autonomous Mode

- At the end of the *autonomous period,* the *alliance* that has more total *ball* points receives a ten (10) point bonus.
- *Ball* points include any *scored softballs* and can be doubled by *possession* of the *Atlas ball.*

2.4.3 – Safety Rules

<S1> If at any time the *robot* operation is deemed unsafe or has damaged the playing field, surface, or barriers, by the determination of the referees, the offending team may be disqualified. The *robot* will require re-inspection before it may again take the field.

<S2> If a *robot* goes completely out-of-bounds (outside the playing field), it will be disabled for the remainder of the match.

> **Note:** The intent is NOT to penalize *robots* for having mechanisms that inadvertently cross the field border during normal game play.

2.4.4 – General Game Rules

<G1> At the beginning of a *match*, each *robot* must not exceed a volume of 18 inches wide by 18 inches long by 18 inches tall. An offending *robot* will be removed from the match at the Head Referee's discretion.

a. Alignment devices (templates, tape measures, lasers, etc.) that are not part of the *robot* may NOT be used to assist with the positioning of the *robot*.

<G2> Each team shall include up to two *drivers* and one *coach*.

<G3> During a *match*, the *drivers* and *coach* must remain in their *alliance station*.

<G4> *Balls* that leave the playing field are considered out of play. These *balls* will not be returned to the field.

<G5> *Drivers* and *coaches* are prohibited from making intentional contact with any game or field object. The first instance of intentional contact will result in a warning, with any following instances resulting in a disqualification.

<G6> During a *match*, *robots* may be remotely operated only by the *drivers* and/or by software running in the on-board control system. If a *coach* touches his/her team's controls anytime during a *match*, the *robot* will be disabled and the team disqualified.

<G7> Scores will be calculated for all *matches* either immediately after the *match* or when all objects on the field come to rest.

<G8> *Robots* may not intentionally detach parts during any *match*, or leave mechanisms on the field. If a detached component or mechanism is attached to a *goal* and prevents additional scoring of *balls*, the team will be disqualified. Multiple infractions may result in disqualification for the entire competition.

<G9> Strategies aimed solely at the destruction, damage, tipping over, or entanglement of *robots* are not in the spirit of the *FIRST* Vex Challenge and are not allowed. However, *Hangin'-A-Round* is a highly interactive contact game. Some tipping, entanglement, and damage may occur as a part of normal game play. If the tipping, entanglement, or damage is ruled to be intentional, the offending team may be disqualified from that *match*. Repeated offenses could result in a team being disqualified from the remainder of the competition.

<G10> *Robots* must be designed to permit easy removal of *balls* from any grasping mechanism without requiring that the *robot* have power after the *match*.

<G11> Field tolerances may vary by as much as +/-1", so teams must design their *robots* accordingly.

2.4.5 – Hangin'-A-Round Specific Game Rules

<SG1> At the beginning of each *match*, the two *alliance robots* must be placed completely within their *alliance zone,* touching a wall and not touching any *softball stack*.

<SG2> Prior to the start of each *match*, each *alliance* will have three (3) *softballs* available to preload into their robots.

a. A *softball* is considered to be legally preloaded if it is touching the *robot* and not touching any part of the playing field or game objects.
b. No *robot* may preload more than two (2) *softballs*.

<SG3> A *softball* is not considered *scored* if it is being touched by a *robot* on an *alliance* of the same color at the conclusion of either period.

<SG4> A *robot* cannot pin (inhibit the movement of an opposing *robot* while in contact with one or more field elements) an opposing *robot* for more than five seconds, if the opposing *robot* is not *parked*. If a referee determines this rule to be violated, the offending *robot* will be disabled for the match.

Section 3

The Tournament

Table of Contents

Section 3 – The Tournament 16

3.1 – Overview 16

3.2 – Tournament Definitions 16

3.3 – Practice Matches 16

3.4 – Qualifying Matches 16
3.4.1 – Schedule 16
3.4.2 – Rankings 17

3.5 – Elimination Matches 18
3.5.1 – Alliance Selection Process 18
3.5.2 – Match Ladder 18
3.5.3 – Elimination Scoring 18

3.6 – Tournament Rules 19

3.7 – Small Tournament Structure 19

Section 3 – The Tournament

3.1 – Overview

The *FIRST* Vex Challenge will be played in a tournament format. Each tournament will include *practice*, *qualifying*, and *elimination matches*. After the *qualifying matches*, teams will be ranked based on their performance. The top teams will then participate in the *elimination matches* to determine the event champions.

3.2 – Tournament Definitions

Alliance Captain – A student chosen to represent their team during *Alliance Selection* for the final *Elimination Matches*.

Alliance Selection – The process of choosing the permanent alliances for the *Elimination Matches.*

Crystal Assignment – The designated radio frequency crystal that a team will use for a given match. These crystals will be provided to teams before each match.

Elimination Match – A match used to determine the championship alliance. Alliances of three face off in a best two of three series, with two teams playing in each match. The first alliance to win two matches will proceed to the next round.

Practice Match – An un-scored match used to provide time for teams to get acquainted to the official playing field.

Qualifying Match – A match used to determine the rankings for the *Alliance Selection*. Alliances compete to earn *Qualifying Points* and *Ranking Points*.

Qualifying Points (QPs) – The first basis of ranking teams. *Qualifying Points* are awarded for winning (two points) and tying (one point) a *Qualifying Match*.

Ranking Points (RPs) – The second basis of ranking teams. *Ranking points* are awarded in the amount of the score of the losing alliance in a *Qualifying Match.*

3.3 – Practice Matches

At the event *Practice matches* will be played in the morning during the team registration time until the Drivers Meeting begins. Every effort will be made to equalize practice time for all teams, but will be conducted on a first-come, first-served basis. These matches are not scored, and will not affect team ranking.

3.4 – Qualifying Matches

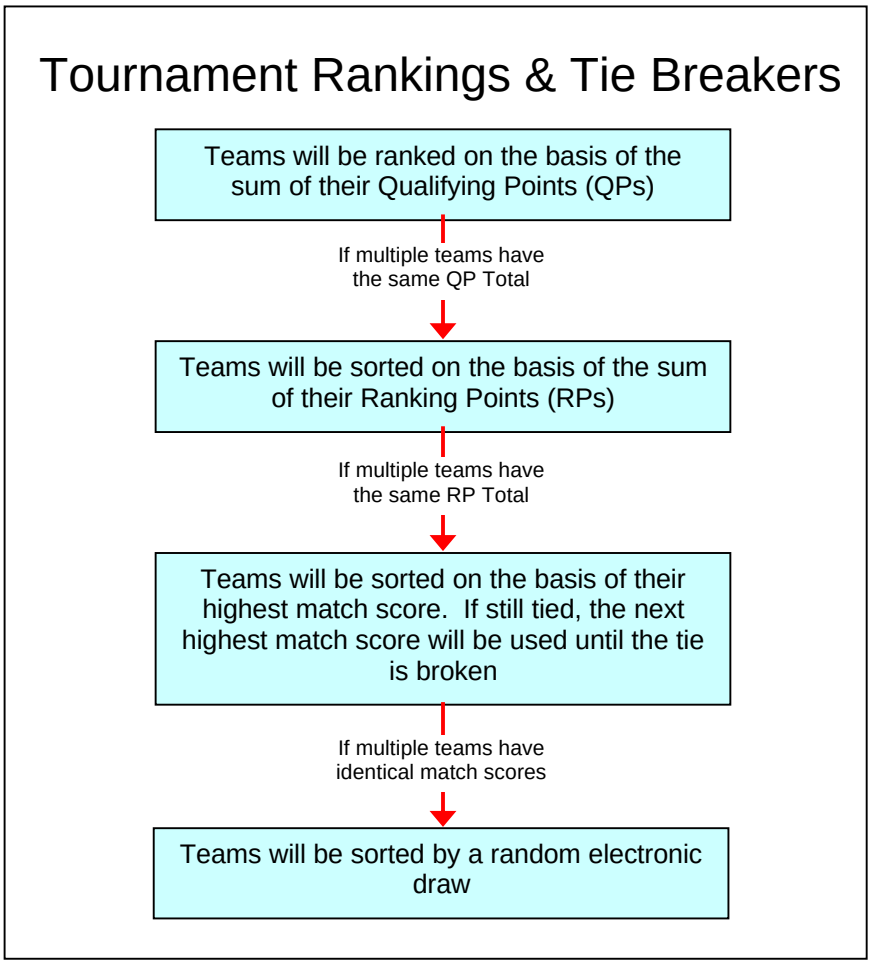
3.4.1 – Schedule

- The *qualifying match* schedule will be available prior to opening ceremonies on the day of competition. This schedule will indicate alliance partners and match pairings. It will also indicate the alliance's color – red or blue – and your team's starting position for each match. This starting position is used to determine the placement of each team within the alliance station, as well as your *crystal assignment*.

- The *qualifying matches* will start immediately after opening ceremonies in accordance with the qualifying match schedule.
- Teams will be randomly assigned an alliance partner to compete against two randomly assigned opponents in each *qualifying match*.
- All teams will be **scored** on the same number of *qualifying matches*.
- In some cases, a team will be asked to play in an additional *qualifying match*, but will not receive credit for playing this extra match.

3.4.2 – Rankings

- At the conclusion of each match, *Qualifying Points (QP)* will be issued:
  - Winning teams of a *qualifying match* receive two (2) *QP*
  - Losing teams of a *qualifying match* receive zero (0) *QP*
  - If a *qualifying match* ends in a tie, all four teams receive one (1) *QP*
  - If a team is disqualified they receive zero (0) *QP*
- All teams in each *Qualifying Match* will also receive *Ranking Points (RP)*.
  - The number of ranking points assigned for each match, is that of the losing alliance's score.
  - In the event of a tie, both alliances will receive the same *RP* (equal to the tie score).
  - If a team is disqualified they receive zero (0) *RP*
  - If both teams on an alliance are disqualified, the teams on the winning Alliance will be awarded their own score as their *RP* for that match.
- For a *qualifying match*, if **no** member of a team is present in the driver station at the start of a match, that team is declared a "no show" and will receive zero (0) *QP* and zero (0) *RP*.



3.5 – Elimination Matches

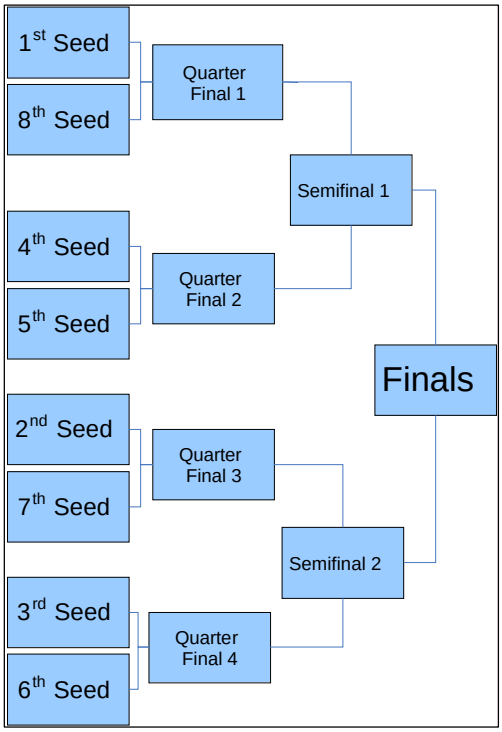
- The *alliance selection* process will consist of two rounds of selection, such that eight alliance captains will form elimination alliances consisting of three teams.
- These eight alliances will participate in a tournament to determine the event champions.
- If a team is disqualified during an *elimination match*, then their entire alliance is disqualified, and the match will be recorded as a loss.

3.5.1 – Alliance Selection Process

- Every team will choose a student to act as a team representative.
  - These student representatives will proceed to the playing field at the designated time to represent their teams in the *alliance selection*.
- There will be eight alliances formed in the *alliance selection*.
- In order of tournament ranking, the student representative of the highest ranked team not already in an alliance will be asked to step forward as an *alliance captain* to invite another available team to join their alliance.
- A team is available if they are not already part of an alliance, or have not already declined an alliance invitation.
  - If the team accepts, it is moved into that alliance.
  - If a team declines an invitation, they CANNOT be invited into another alliance, but are still available to select their own alliance if the opportunity arises.
  - If a team declines, the *alliance captain* from the inviting team must then extend another invitation.
- This process will continue until all eight *alliance captains* have been designated and chosen one alliance partner.
- The same method is used for each *alliance captain*'s second choice. Any teams remaining after alliance eight makes their second choice will not compete in the *Elimination Matches*.
- During matches, two teams from an alliance will play on the field. **Any team which sits out the first match in an elimination series, must play in the second match, with no exceptions.** Teams should consider the robustness of the robots when picking alliance partners.
- Prior to each *elimination match*, the *alliance captain* must let the referee know which two teams will playing in the upcoming match

3.5.2 – Match Ladder

The *elimination matches* will play in a ladder format as shown on the right.



3.5.3 – Elimination Scoring

In the elimination rounds, teams do not get *qualifying points*; they get a win, loss or tie. Within each bracket of the Elimination Match Ladder, matches will be played to determine which alliance advances, as follows:

- The first alliance to win two matches advances.
- Any tied matches will be replayed until one alliance has two wins, and advances.

3.6 – Tournament Rules

<T01> Referees have ultimate authority during the competition. **Their rulings are final.**

a. The referees will not review any recorded replays.
b. Any questions for the referees must be brought forward by a student drive team member within the time period of two (2) matches.

<T02> The only people permitted by the playing field are the three drive team members who are identified by the drive team badges. These badges are interchangeable.

<T03> There are no time outs in the qualifying rounds; in the elimination rounds, each alliance will be allotted ONE time out of no more than three minutes. The matches must progress according to schedule.

a. If a robot cannot report for a match, at least one member of the team should report to the field for the match.

<T04> All team members, including coaches, must wear safety glasses or glasses with side shields while in the pit or alliance stations during matches.

3.7 – Small Tournament Structure

In the case that a tournament has less than 24 teams (the requisite amount to have eight full alliances), the tournaments will be played with one of the following structures.

- If there are less than 24 teams, but more than 16 teams
  - Alliances will still consist of three teams
  - The number of picking teams in the alliance selection will be equal to the amount of teams divided by three, less any remainder. (e.g. If there are 19 teams, 19/3 = 6.33 à 6 picking teams)
  - The match ladder follows the same format as a full tournament, with byes being awarded when there is no applicable alliance. (e.g. If there are seven alliances, there would be no 8th alliance, thereby awarding a bye to the 1st alliance in the quarter-finals.)
- If there are less than 17 teams
  - Alliances will consist of two teams
  - The number of picking teams in the alliance selection will be equal to the amount of teams divided by two, less any remainder. (e.g. If there are 13 teams, 13/2 = 6.5 à 6 picking teams)
  - The match ladder follows the same format as a full tournament, with byes being awarded when there is no applicable alliance. (e.g. If there are seven alliances, there would be no 8th alliance, thereby awarding a bye to the 1st alliance in the quarter-finals.)

Section 4

The Robot

Table of Contents

Section 4 – The Robot 21

4.1 – Overview 21

4.2 – Robot Rules 21

4.3 – Autonomous Programming Guidelines 23

Section 4 – The Robot

4.1 – Overview

This chapter provides rules and requirements for the design and construction of your robot. A *FIRST* Vex Challenge robot is a remotely operated vehicle designed and built by a registered *FIRST* Vex Challenge student team to perform specific tasks when competing in Hangin'-A-Round. Prior to competing at each event, all robots will have to pass an inspection. Refer to Appendix 1 for the Robot Inspection Guidelines and Appendix 4 for the Inspection Checklist.

4.2 – Robot Rules

There are specific rules and limitations that apply to the design and construction of your robot. Please ensure that you are familiar with each of these robot rules before proceeding with robot design.

<R1> Only ONE robot will be allowed to compete per team in the *FIRST* Vex Challenge. Though it is expected that teams will make changes to their *robot* at the competition, a team is limited to only ONE robot.

a. It is against the intent of this rule to compete with one robot, while a second is being modified or assembled.
b. It is against the intent of this rule to switch back and forth between multiple robots during a competition.

<R2> Every robot will be required to pass a full inspection before being cleared to compete. This inspection will ensure that all FVC robot rules and regulations are met. Initial inspections will take place during team registration/practice time.

a. If significant changes are made to a robot, it must be re-inspected before it will be allowed to compete.
b. All robot configurations must be inspected before being used in competition.
c. Teams may be requested to submit to random spot-inspections by event personnel. Refusal to submit will result in disqualification.
d. Referees or inspectors may decide that a robot is in violation of the rules. In this event, the team in violation will be disqualified and the robot will be barred from the playing field until it passes re- inspection.

For further information on the inspection process please refer to Appendix 1, Robot Inspection Guidelines

<R3> The following types of mechanisms and components are NOT allowed:

a. Those that could potentially damage playing field components.
b. Those that could potentially damage other competing robots.
c. Those that pose an unnecessary risk of entanglement.

<R4> At the beginning of any match, the maximum allowed size of a robot is 18" x 18" x 18".

a. During inspections, robots will be placed into a "sizing box" which has interior dimensions matching the above size constraints. To pass inspection, a robot must fit within the box without exerting ANY force on the box walls or ceiling (i.e., if the robot cannot be held inside the constraints by the box itself).
b. Robots may expand beyond their starting size constraints after the start of a match.
c. Any restraints used to maintain starting size (i.e. zip ties, rubber bands, string, etc.) MUST remain attached to the robot for the duration of the match.

<R5> Robot construction is constrained to the following:

a. Any Official Vex Component may be used (except as limited below).

- Only one (1) Vex Microcontroller
- Up to two (2) Vex Y-Cables
- Up to ten (10) Motors or Servos (Any combination, up to ten)
- Only one (1) Battery Pack from the Vex Power Pack (Vex P/N: 230-0036)
- Up to two (2) RF receivers
- The packaging, manual binders, Styrofoam, cardboard, plastic bags, etc. from the Vex kits are NOT included and CANNOT be used for robot construction. Only the Vex parts themselves are allowed.

Note: Official Vex products are ONLY available from Vex or *FIRST. Products on the VexLABS.com web site will denote what is available for use in this competition, not all products may apply. Products identical to those listed as competition legal on the www.vexrobotics.com site are also considered "official Vex products".*

b. The following additional components may also be used:
   - Ten (10) elastic bands, #32 size only
   - 40" of 1/8" Nylon Rope
   - 6" of 3/4" Wide Velcro
   - 12" x 15" of Non-Slip Pad
   - Any material strictly used as a color filter for a Vex Light Sensor
c. Any parts which are identical to legal Vex parts may be used.
d. Teams may add non-functional decorations from parts not on the above list, provided that these parts do not affect the outcome of the match, and must be in the spirit of "Gracious Professionalism".
e. No additional components may be used.

<R6> All parts that are used must be tracked through a Bill of Materials (BOM). This list can be included in your Engineering Notebook.

<R7> During inspections if there is a question about whether something is an official Vex component, a team will be required to provide documentation to an inspector, which proves the component's source. Such types of documentation include receipts, part numbers, or other printed documentation.

<R8> No more than two transmitters may control a single robot during the tournament. No modification of the Vex transmitter is allowed of ANY kind.

<R9> Parts may NOT be modified as follows:

a. Motors, extension cords, sensors, controllers, battery packs, and any other electrical component of the Vex Robotics Design System may NOT be altered from their original state in ANY way.
b. Welding, soldering, brazing, gluing, or attaching in any way that is not provided within the Vex System will NOT be allowed.
    i. Mechanical fasteners may be secured using Loctite or a similar thread-locking product.
        1. This may be used for securing hardware ONLY.

<R10> Robots must display their team number (numerals only, i.e. "1114").

a. The judges, referees, and announcers must be able to easily identify robots by team number.
b. Team number must be visible from two sides of the robot (180 degrees apart).
c. The numerals must each be at least three inches high, at least in 3/4-inch stroke width and in a contrasting color from their background.

<R11> Robot receiver must be accessible by competition personnel.

a. The radio crystal must be easily removed from the robot without any robot disassembly.
b. The radio crystals will be provided to each team for each match.

<R12> Robots must include a mounting device to securely hold one FVC Robot Identification Flag throughout an entire match.

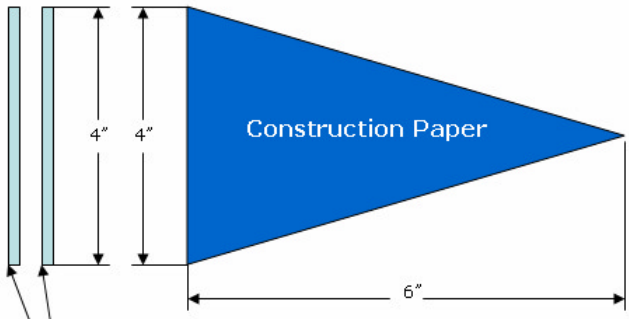
a. The flags will be provided at the event
b. The flag tube dimensions are .250" OD x .200" ID x 8.250" length with a triangular flag 4.000" high x 6.000" wide.
c. For full details please refer to the following diagram

FVC Hangin'-A-Round Robot Identification Flag

Quantity required per Vex Robot: 2 each (1 red flag, 1 blue flag)

A. Straw

Manufacturer Name: Solo Cups
Product ID: SLO1480
Manufacturer Part Number: 14800 0222
Material: plastic
Brand Name: solo
Vendor Description: Scoop Straw
(or equivalent)
Product Notes: SPOON STRAW WRPD 8-1/4in



B. Construction Paper

Item 403016
Model 03624
(or equivalent)

Construction Paper Blue

All-purpose classroom art paper with soft eggshell finish.
Contains 25% sulphite to provide clean cutting and better folding.
Heavy weight 76 lb., acid free

Item 403719
Model 03443
(or equivalent)

Construction Paper Holiday Red

All-purpose classroom art paper with soft eggshell finish.
Contains 25% sulphite to provide clean cutting and better folding.
Heavy weight 76 lb., acid free

Source: STAPLES that was easy.®
http://www.staples.com

C. Fastening System

Scotch® Magic™ Tape Scotch® Magic™ Tape

(or equivalent) permanent transparent tape. Non-yellowing tape disappears when applied, and stays invisible over time. Can be written on. Additional Information No 810: 1 inch core comes in 36 yd. rolls in 1/2 inch and 3/4 inch widths; 3 inch core comes in 72 yd rolls in 1/2 inch, 3/4 inch and 1 inch widths. No. 104 1/2 inch x 450 inch; No. 105: 3/4 inch x 300 inch

Notes:

1. **Durability of construction paper may be increased by lamination**
2. **Flags may include graphics, e.g. *FIRST* logo, sponsor logo, event**

GBC Self-Adhesive Lamination, Letter Size Sheets, 50 Sheets per Pack
•No heat, no machine-just peel and seal
•Clear

4.3 – Autonomous Programming Guidelines

Please go to http://www.vexrobotics.com/programming/ for requirements concerning programming an FVC competition robot, or refer to the Programming Guide in Appendix 2.

Section 5

Engineering Notebooks

Table of Contents

Section 5 – Engineering Notebooks 25

5.1 – Overview 25

5.2 – What is an Engineering Notebook? 25

5.3 – The Notebook 25

5.4 – Guidelines/Format 25

5.5 – Judge's Tips 26

5.6 – Virtual Help 26

5.7 – Notebook Examples 26

Section 5 – Engineering Notebooks

5.1 – Overview

This section describes the requirements for creating the Engineering Notebook, including formatting guidelines, Judge's tips, and the use of various forms of engineering support. It also provides sample pages from an award winning *FIRST* Vex™ Challenge Engineering Notebook.

5.2 – What is an Engineering Notebook?

One of the goals of *FIRST* and the *FIRST* Vex Challenge is to recognize the engineering design process and "the journey" that a team makes during the phases of the problem definition, concept design, system-level design, detailed design, test and verification, and production.

Throughout the building of your robot you will come across some obstacles, lessons learned, and the need to draw things out on paper. This is where you and your team will use an engineering notebook. These notebooks will follow your team from kickoff throughout the competitions. Judges will review your Engineering Notebook to better understand your journey, design, and team.

Note: *Refer to the judging criteria section of Section 7: Awards & Judging Criteria and the guidelines in Appendix 3 for more details on how your Engineering Notebook will be judged.*

5.3 – The Notebook

Laboratory or documentation notebooks are available through your school or local stationary supply store. There are many different types to choose from, using the following criteria:

- Use a notebook with a stitched binding.
- **Do not** use a loose leaf or spiral bound notebook.
- Numbered pages are recommended (but not necessary) so that pages cannot be substituted or deleted.
- Only **one** Engineering Notebook will be required per team.

5.4 – Guidelines/Format

The *FIRST* Vex Challenge Engineering Notebook is a complete documentation of your team's robot design. This documentation should include sketches, discussions and team meetings, design evolution, processes, the "Aha's!", obstacles and each team member's thoughts throughout the journey. So here are the guidelines:

- Write EVERYTHING down!!
- Engineering Notebooks should be organized enough to have an outsider understand your team and your journey.
- Entries should be in **Permanent Ink** – Not Pencil.
- Start your notebook by introducing each team member and mentor with a brief biography of their name, age (or school year), interests, and reasons for joining your *FIRST* Vex Challenge team.
  Tip: *Pictures along with the bios would serve as a great visual for the judges to get to know each member of your team.*
- At the start of each day the team meets, start a fresh page. Your team number, date, and start/stop times should be recorded when starting a new page. Each day should start with two columns:
- Task Column – What your team is doing and discovering?
- Reflection Columns – Where your team records thoughts on what is happening and any questions that need to be answered.
- Entries should be made by every team member, initialed, and dated.

- All designs and changes to your robot should be recorded directly into your notebook. The inclusion of all elaborate details and sketches are preferable. Notes and calculations should be done in your notebook, NOT on loose paper.
  Tip: *A judging panel is always interested to see a unique design or playing strategy. On the other hand, a design without the substance to support its reasoning will not be viewed as highly.*
- In the case of an error, draw a single line through the incorrect data. Do NOT erase or use correction fluid. All corrections should be initialed and dated.
- Use both sides of a page. Never leave any white space: "X" out or Crosshatch all unused space, and don't forget to initial and date.
- To insert pictures or outside information into your notebook, tape the picture into your notebook and outline with permanent ink, to note that it was there in case it falls out.
  Tip: Pictures or sketches of your robot designs are recommended as part of a thorough documentation.

5.5 – Judge's Tips

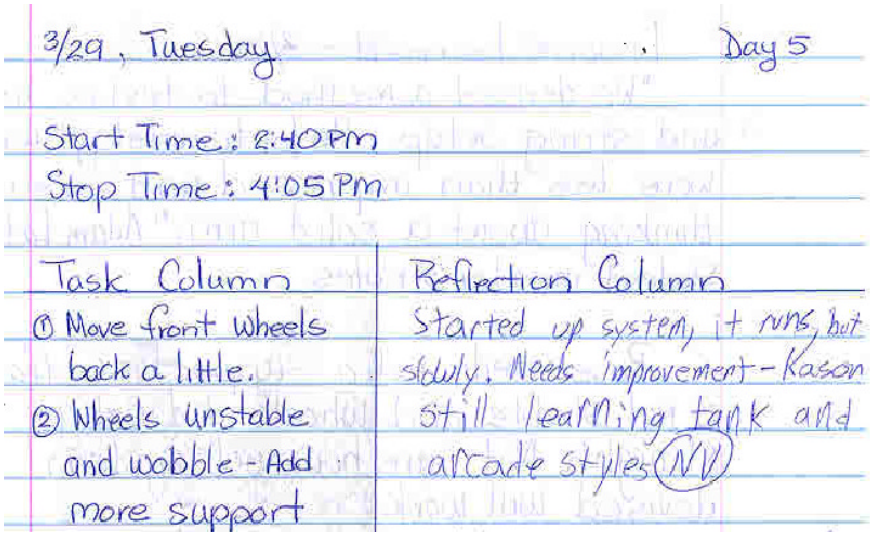
- Every notebook is a work in progress, forever changing and developing. Judges do **not** want to see a "final" copy notebook; they want the **real thing** complete with misspellings, stains, worn edges and wrinkled pages. Just remember to keep it real!
- When turning notebooks into the judges at your event, place sticky tabs at the top of the page on your top 6-12 best moments as a team. Judges will use these pages as their preliminary review of your notebook.
- Don't be afraid to customize your Engineering Notebook to reflect your team's personality! At the end of the season, this notebook will be a great piece of memorabilia for your team.

5.6 – Virtual Help

It is in the spirit of *FIRST* to bring the technical knowledge of an engineer to high school students to broaden their awareness and knowledge of the engineering world. For more information or any technical help with your Engineering Notebook, please visit the official Vex product forums at: www.vexforum.com

5.7 – Notebook Examples

The following examples were taken from FVC Team 2 C.H.A.O.S. from Manchester High School Central in Manchester, New Hampshire. They were the 2005 Winners of the *FIRST* Vex Challenge Think Award for their outstanding Engineering Notebook.



3/29, Tuesday Day 5

Start Time: 2:40PM
Stop Time: 4:05 PM

Task Column	Reflection Column
① Move front wheels back a little.	Started up system, it runs, but slowly. Needs improvement - Kasan
② Wheels unstable and wobble - Add more support	still learning tank and arcade styles (NV)

Lessons learned - 4/11 11

Had to learn about leverage so arm will work and robot won't tip over.

Tried out "arm" ideas using mat and center goal.

Claw?

Section 6

At The Event

Table of Contents

Section 6 – At The Event 29

6.1 – Overview 29

6.2 – Tournament Event Agendas 29

6.3 – Courtesies and Rules 29

6.4 – Competition Overview 30
6.4.1 – Practice Rounds 30
6.4.2 – Judge's Interviews 30
6.4.3 – Match List 30
6.4.4 – Scouting 30
6.4.5 – Early Matches 30

6.5 -- Team Spirit 31
6.5.1 – Team Styling 31
6.5.2 – Banners and Flags 31

Section 6 – At The Event

6.1 – Overview

This section provides a general summary regarding a *FIRST* credo, mascots/uniforms, recommended items and equipment for teams to bring, pit rules, event schedules, registration, practice rules/time slots, and robot inspections. Please read the following to get a "feel" for competition schedules, registration procedures, practice times, and matches.

6.2 – Tournament Event Agendas

Schedules will be available through your local FVC Affiliate Partner prior to your tournament.

6.3 – Courtesies and Rules

You will hear the expression *Gracious Professionalism* often throughout your involvement in the *FIRST* Vex™ Challenge. One of our main goals is to encourage all team members to conduct themselves with kindness, consideration, and sharing.

We hear heartwarming stories of teams sharing parts, helping to build and/or repair competing robots, and helping rookie teams avoid preventable pitfalls. These are examples of some side benefits of being involved with this organization.

The pit is where the behind-the-scenes action is. The *FIRST* staff and volunteers want you to enjoy the competition. Please read the rules below so everyone can work and compete in a safe, sportsmanlike, friendly, and orderly manner. Please follow courtesy rules while in the pit as well as in the audience. We are trying to encourage support from our audiences at the regional events and the championship. We need continued and growing support from outside sources. Please help to make them comfortable.

Bands:	No live bands in the audience or pit.
Battery Safety:	Charge in an open, well-ventilated area.
Fire Extinguishers:	Located at the pit administration station and on the playing field.
Food:	You cannot bring food on site… at all. Not even as a promotion. Do not provide teams with candy, water, fruit, soft drinks, etc. This is to promote good will and the spirit of partnership with venues.
Music/Noise:	No loud music, audio systems, whistles, banging sticks, blow horns, etc. They interfere with announcements. They prevent teams from hearing important announcements, can be annoying, and can cause hearing loss. Power may be shut off and/or radio/cd player, noise makers confiscated.
Phone lines:	No free phone lines for internet access… at all.
Robot Operation:	Robots in the practice area of the pit must be tethered to ensure that there not be any interference with the competition.
Team Safety Captain: **Safety Glasses:**	Each team appoints a safety captain who will help maintain safety at events, especially in the pit. He or she will remind attendees about: All team members and onlookers must wear safety glasses in the pit and on the playing field. If you wear glasses, you must wear safety goggles over them or wear attach safety side shields to them. Teams are required to bring enough safety glasses/goggles to supply its team members and its guests.

Running:	There is to be no running in the pit or in the competition arena.
Painting:	There will be no painting in the pit.
Sales:	Because of site regulations/contracts, FIRST cannot allow teams or individuals to sell items, such as T-shirts, pins, etc., at any events.
Seat Saving:	Not allowed, we need seats to get the public comfortable and interested.
Two-way radios:	These are not allowed in the pit or near the playing field since they may interfere with robot operation and cause accidents.

6.4 – Competition Overview

FIRST requires all teams to bring and supply safety glasses for its members and guests for each competition. Students and adult team members and guests must wear them to protect their eyes while working on the robot, when observing robot building/repair work, and while competing.

Operators, players, and coaches will not be allowed on the competition field without them. Regular glasses and sunglasses do not qualify as safety glasses. **You must wear safety goggles over them.**

Goggles are not required to be worn over regular glasses **if** the regular glasses are made of polycarbonate / plastic material similar to that in safety glasses **and** safety side shields are attached.

6.4.1 – Practice Rounds

The competition fields will be open to anyone who would like to practice before the opening ceremonies. Teams will only be allowed on the fields for practice during this time.

6.4.2 – Judge's Interviews

There will be a ten to fifteen-minute interview scheduled for every team to meet with the judge's throughout the event. Please have at least two student team representatives available; the entire team/robot are not required to attend, but are encouraged.

6.4.3 – Match List

The match list will be distributed to teams by competition personnel on the day of the tournament.

6.4.4 – Scouting

Teams often use the list for scouting other teams and their strategies. This is especially helpful when choosing alliances for the final rounds.

6.4.5 – Early Matches

If your team is in any of the first four matches on day of your event, volunteers will ask you to line up *before the opening ceremonies*. Matches begin right after its conclusion. Please, make sure your team is on time in case you have an early match.

6.4.6 – Maintaining Schedule

The queue team will work together throughout the days to line up teams for competition matches and maintain the schedules. It's important to pay attention to the match schedule and listen for announcements

throughout the day. You will need to know when you will compete, find out the number of the ending match before lunch, and which match designates the end of the tournament day.

6.5 – Team Spirit

Competing as a team is fun as well as rewarding. Part of the pleasure and reward of being a team member is the way the team stylizes itself with team T-shirts, trading buttons, hats, cheers, cheerleaders, and costumes.

6.5.1 – Team Styling

When deciding on a team name or acronym, consider how you can work a theme around it to make your team more fun and recognizable. Refer to Section 8: Team Resources for information.

6.5.2 – Banners and Flags

Sponsors provide *FIRST* with banners so we can display them in specified areas as a way of thanking them for their generosity. We encourage teams to bring team flags and/or sponsor banners, but we ask that you adhere to the following:

- Do not use them to section off seating. Saving group seats is not permitted.
- Hang banners *in your pit station only*, not on the pit walls.
- You may bring banners to the competition area, but please do not hang them there. This area is designated for official *FIRST* sponsors' banners.

Section 7

Judging & Awards Criteria

Table of Contents

7.1 – Overview 33

7.2 – *FIRST* Vex Challenge Awards Eligibility 33

7.3 – *FIRST* Vex Challenge Award Categories 33
- 7.3.1 – *FIRST* Vex Challenge *Inspire* Award 33
- 7.3.2 – *FIRST* Vex Challenge *Amaze* Award 33
- 7.3.3 – *FIRST* Vex Challenge *Innovate* Award 34
- 7.3.4 – *FIRST* Vex Challenge *Connect* Award 34
- 7.3.5 – *FIRST* Vex Challenge *Think* Award 34
- 7.3.6 – *FIRST* Vex Challenge Winning Alliance Award 35

7.4 – Judging Process, Schedule, and Team Preparation 35
- 7.4.1 – Judging Process 35
- 7.4.2 – Judging Schedule 35
- 7.4.3 – Team Preparation 35

7.5 FIRST Vex Challenge Championship Event Eligibility 36

Section 7 – Judging & Awards Criteria

7.1 – Overview

This chapter provides a complete description of all of the *FIRST* Vex™ Challenge Awards; the judging process, criteria and philosophy that teams will need to be aware of in preparation for participating at a *FIRST* Vex Challenge Tournament.

In addition to winning points during the regional competition, the awards represent another positive way for mentors to instill important values like teamwork, creativity, innovation, and the value of the engineering design processes**. As you read the criteria for each award please make sure to use the Judges' Guidelines located in Appendix 3**. These judging guidelines are a part of the road map to success.

7.2 – *FIRST* Vex Challenge Awards Eligibility

To ensure fairness to all teams and to provide equal opportunity for all teams to win an award at a *FIRST* Vex Challenge Championship Tournament, teams are only eligible to win an award at the first two Championship Tournaments that they attend. Those teams who compete in more then two Championship Tournaments do so for the purpose of being involved in the fun and excitement of the tournament and not with the intention of winning multiple awards.

7.3 – *FIRST* Vex Challenge Award Categories

7.3.1 – *FIRST* Vex Challenge *Inspire* Award

This formally judged award is given to the team that performs well in all categories, that impresses all other teams and who they would always want as an alliance partner and finally, the team the judges' view that best exemplifies all components of the *FIRST* Vex Challenge philosophy. This team should serve as an inspiration to other teams. This team excels at the game challenge, acts with gracious professionalism and also understands how to communicate their experiences and knowledge to other teams, and the judges.

Teams at the event will be given ballots that can be used to vote for the competitor that they feel should win the award. These votes, along with the criteria below, will be used by the judges to determine the ultimate winner.

The team will be reviewed to have the following qualities:

- A team who is recognized by both peers and judges to demonstrate respect, gracious professionalism both for team members and fellow teams.
- A team who demonstrates good communications and teamwork skills within the team as well as with their alliances.
- A team that can communicate clearly about their robot design; its design impresses other FVC teams and the judges; and the robot consistently performs well during matches

7.3.2 – *FIRST* Vex Challenge *Amaze* Award

During the course of the competition, the judging panel may encounter a team whose uniqure efforts, performance, or dynamics merit recognition. This judged award is given to the team that defies any other award category.

7.3.3 – *FIRST* Vex Challenge *Innovate* Award

The *FIRST* Vex Challenge Innovate Award celebrates a team that not only thinks outside the box, but also has the ingenuity and inventiveness to make their designs come to life. Inspired by longtime *FIRST* corporate sponsor Innovation First, Inc., this judged award is given to the team that has the most innovative and creative robot design solution to any and/or all specific field elements or components in this year's *FIRST* Vex Challenge.

- Teams should mark the six Engineering Notebook entries that describe succinctly how the team arrived at their solution. An Engineering Notebook is not required to be judged for this award. However, the judges may want to see the thought process that went into your design.)
- Their design may be judged on the basis of design elegance, robustness, and the degree of "out of the box" thinking it reflects.
- Their design may be judged on the basis of either the whole robot or some sub-assembly or component of the robot.
- The design does not necessarily have to work all of the time during matches to be considered for this award. However, teams should be able to demonstrate their solution for the judges.

7.3.4 – *FIRST* Vex Challenge *Connect* Award

This judged award is given to the team who has been able to reach beyond their team and connect with engineers, their school, or their community. Things that may be considered when judges determine this award include:

- How did the team attract engineering mentors? This could be live or virtually.
- How does the team recruit students to study engineering?
- Has the team held any unique, creative, or extensive fundraising activities?
- How has the team spread the word of *FIRST* and FVC to their community?
- Has the team given back to their community?

7.3.5 – *FIRST* Vex Challenge *Think* Award

This judged award is awarded to the team whose Engineering Notebook best reflects the "journey" the team took as they experienced the engineering design process during the build season. Teams will need to keep Engineering Notebooks describing the steps, brainstorms, designs, re-designs, successes, and "those interesting moments" when things were not going as planned.

- All teams MUST submit an Engineering Notebook to be considered for this award. Only one notebook will be accepted per team.
- The Engineering Notebook may be maintained by a single team member but MUST contain entries by all team members. However, entries will need to highlight the thoughts of various team members and mentors on the team.
- The notebooks should be organized, and the team's processes, brainstorms, and strategies well documented. **Teams should mark six entries** as good examples of the different types of experiences the team encountered including:
  - What the team experienced during the engineering design process,
  - The experience of the team work and communication during the building of the robot,
  - Identify some of the defining and/or interesting moment(s), obstacles and Aha(s),
  - What are some of the lessons learned from the entire experience,
  - Drawings and descriptions of the robot during the different stages of design.
- The Engineering Notebooks are not production documents. They are intended to capture the engineering process as it happens and they should reflect the team's personality and spirit.

Note: Teams should review Chapter 5: Engineering Notebooks for a complete description and format specifications.

At registration, teams will be given a FVC Engineering Notebook Envelope to fill out as well as to place their engineering notebooks in when submitting it to the FVC Pit Administration desk at the beginning of the tournament. Engineering Notebooks will be returned to the teams after the judges have finished selecting the award.

7.3.6 – *FIRST* Vex Challenge Winning Alliance Award

This award will be given to the winning alliance represented in the final match.

7.4 – Judging Process, Schedule, and Team Preparation

The schedules at the *FIRST* Vex Challenge tournaments may vary from site to site, therefore, exact times for both the matches and meeting with judges cannot be given within this manual. All teams will either receive this schedule prior to or during check-in at the competition. Team preparation, the judging process, and schedule are outlined in this section.

7.4.1 – Judging Process

At the *FIRST* Vex Challenge Championship Tournament events, there will be two parts to the judging process: 1) interview with judges and 2) evaluation performances. Each team will have a "fact finding" discussion/interview with a panel of two or three judges. No awards will be determined on the basis of this interview alone. Judges will use a set of guidelines (see Appendix 3) to assess each team.

After the completion of the initial interviews and evaluations on team and robot performances during matches, all of the judges will convene to review their assessments and create a list of top candidates for the various judged awards. Judges may require additional impromptu discussions with teams if necessary. Deliberations will be completed during the elimination matches.

Teams are asked to bring their robot to the judge interview. This is the best chance for teams to explain and demonstrate their robot design to the judges in a quiet and relaxed environment.

7.4.2 – Judging Schedule

The judging generally will take place in a separate area(s) away from the competition and pit. This location is intended to facilitate a conversation where judges and participants can hear and understand each other well. Teams will follow the schedule that outlines team interview times and locations. If possible these interview schedules may be posted on a web site prior to the actual day of the competition. Teams will be instructed where to find this information if it is available. Championship Tournaments that do not pre-schedule teams will issue schedules to teams when they check-in the morning of the tournament.

Upon arrival please familiarize yourself with where the judging will occur and budget enough time to get there. To keep this process on target throughout the event, we require that all teams arrive at an adjacent queuing area five minutes before their scheduled interview.

7.4.3 – Team Preparation

Teams are encouraged to use the award guidelines to self assess where they are within an award category and help them establish higher goals. Pay close attention to the Good and Excellent categories in order to understand the desired result. These guidelines will be the same ones used by the judges during each event and *FIRST* Vex Challenge event that will be held at the *FIRST* Championship.

It is important to remember that this is the team's opportunity to highlight how they rallied as a team around the robot, the technical information that was learned along the way and how this experience has affected

the members and mentors individually and as a team. Judges will want to hear from team member representatives and mentors. Since there are several awards with different criteria, teams may want to consider appointing different team members to speak with judges on the specific topics.

The mentors' contribution during the judging process will be kept to a minimum, however, the judges will like to know the highlights about the team; its history and make up; what the team achieved during the competition season; and the experiences that were gained. Team representatives' abilities to answer the questions or elaborate on robot design functions or attributes with minimum direct assistance from the mentors will be evaluated during the team interview.

7.5 FIRST Vex Challenge Championship Event Eligibility

The culmination of the *FIRST* event season is the *FIRST* Championship Event held at the Georgia Dome in Atlanta, GA. This event represents the conclusion of the season for *FIRST* LEGO League (FLL), the *FIRST* Vex Challenge (FVC), and the *FIRST* Robotics Competition (FRC). There will be over 80 FLL teams, over 75 FVC teams, and close to 340 FRC teams. This is a fun an exciting experience for teams in all programs to participate.

For the 2006 Season, *FIRST* Vex Challenge teams will need to earn their way to the Championship Event. Eligibility is earned by your performance on and off the field. The following award winners are eligible to attend the Championship Event:

- FIRST Vex Challenge Winning Alliance Award Winners
- FIRST Vex Challenge Inspire Award Winner

Teams will still be responsible for their own entry fees, lodging, and travel costs to the Championship event. If there are not enough eligible teams, as described above, to fill the event, FIRST will allow teams to participate in a lottery for the remaining slots.

Section 8

Team Resources

Table of Contents

Section 8 – Team Resources 38

8.1 – Overview 38

8.2 – *FIRST* Contact Information 38

8.3 – Getting Answers to Your Questions 38

8.4 – Technical Support 38

8.5 – Team Development Support 38

8.6 – Using the *FIRST* and FVC Logos 39

Section 8 – Team Resources

8.1 – Overview

This chapter provides teams with necessary information for contacting *FIRST* Vex™ Challenge staff, accessing technical support, and using the *FIRST* and *FIRST* Vex Challenge logos.

8.2 – *FIRST* Contact Information

You can reach the *FIRST* Vex staff by phone at (800) 871-8326 or e-mail at fvcteams@usfirst.org. The office is open Monday through Friday from 8:30 a.m. to 5:00 p.m., EST. Be sure to provide your team number in your message. Refer to the information below for the appropriate resource.

8.3 – Getting Answers to Your Questions

For general information and questions regarding the *FIRST* Vex Challenge, please send an e-mail request to fvcteams@usfirst.org.

For questions regarding the *FIRST* Vex Challenge *Hangin'-A-Round* game, please have your team leader (or a single team representative) register for a free account at forums.usfirst.org. Please use the "register" link in the upper left and follow on-screen directions. The free forum account needs to be registered and activated in order to ask official game questions. The FVC Interactive Manual and Game Q&A is accessed directly at http://forums.usfirst.org/forumdisplay.php?f=35 or by browsing to forums.usfirst.org and following the "*FIRST* Vex Challenge" link found under the "*FIRST* Programs" heading. Please do **not** use the FRC Game Q&A for FVC Questions.

For detailed information on the *FIRST* Vex Challenge pilot, robot kit and accessories, playing field, etc., visit the following websites:

Website	Description
www.usfirst.org/vex/	*FIRST* Vex Challenge information, FAQs, and team resources
forums.usfirst.org	*FIRST* Vex Challenge Game Q&A and Interactive Manual
www.innovationfirst.com	Innovation First, sponsor of the *FIRST* Vex Challenge
www.vexrobotics.com	Vex Robotics Design System parts and accessories
www.vexforum.com	Vex forum and technical support
www.intelitek.com	Vex programming software upgrades and technical support

8.4 – Technical Support

It is in the spirit of *FIRST* to bring the technical knowledge of an engineer to high school students to broaden their awareness and knowledge of the engineering world. A valuable resource is the Vex Forums, which enable you to post questions that will be answered by real engineers with professional Vex product experience. Visit http://www.vexforum.com.

8.5 – Team Development Support

In addition to the staff at *FIRST* headquarters, an additional regional level of support is available through the *FIRST* Regional Directors, *FIRST* Senior Mentors, and VISTA Volunteers. Regional Directors assist with team-related needs such as finding a team sponsor. To find out the name of the Regional Director in your area, send an e-mail request to fvcteams@usfirst.org. *FIRST* Senior Mentors and the VISTA Volunteers, a corps of

experienced *FIRST* volunteers, assist teams with team development, team mentor guidance and other needs. Send an email to fvcteams@usfirst.org to inquire if a Senior Mentor is available in your area.

8.6 – Using the *FIRST* and FVC Logos

We encourage teams to develop and promote team identity. It is a great way to help *FIRST* judges, announcers, and audiences recognize your team at the competition, and it is also a way to help you create a "buzz" about your team in your community.

You have incredibly creative opportunities in terms of designing your own identity. Examples of how teams "brand" their efforts with websites, incredible team logos on robots, t-shirts, hats, banners, fliers, and giveaways.

You can download the *FIRST* and FVC logos and Logo Standards information from the *FIRST* Vex Challenge web site at www.usfirst.org/vex/. Keep in mind the following when working with the *FIRST* and FVC logos:

Positive Promotion: Use the *FIRST* and FVC logos in a manner that is positive and promotes *FIRST*.

Unmodified: Use the *FIRST* and FVC logos without modification. This means that you will use our name and the circle, square, and triangle as you see it on our website or letterhead. You can use it in red, blue, and white, or in black and white.

Modification Permission: If you have an interest in modifying the *FIRST* and FVC logos, do that only when you receive our permission. *FIRST* is happy to talk with you about modifications after you submit a written request letting us know why you want to modify the logo, how you plan to do it, and where you plan to apply it. Send an e-mail request to Marian Murphy, mmurphy@usfirst.org, Marketing and Promotion.

Advertising Use Approval: All teams and sponsors must obtain approval from *FIRST* prior to incorporating our logo in any advertising. Send an e-mail request for advertising approval to Marian Murphy at mmurphy@usfirst.org.