



ROBOTICS COMPETITION RULE BOOK

2017





SECTION 1

CLEAN SWEEP - INTRODUCTION

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SECTION 1 - INTRODUCTION

1.1 Overview

This section provides an introduction to VEX, and the origins of the *CLEAN SWEEP* Challenge. The majority of this document is taken directly from information provided by VEX. Certain sections have been edited to meet the requirements of the *CLEAN SWEEP* game developed by CareerSource Chipola (CSC). The contest will be held March 30, 2017, in Marianna, Florida. Any changes or additions to the rules contained in this document will be sent to all schools as soon as possible. Any changes or additions to the rules will be made only to clarify items in the contest with intent to remain as close to the original rules as possible.

This year the contest has some different obstacles from previous years and teams are strongly encouraged to read the rule book and understand the requirements of the game. In addition, teams should pay special attention to allowable parts as that will be an emphasis of judges this year.

Questions related to the contest should be emailed to robotics@careersourcechipola.com.

NOTE: THIS YEAR ALL TEAMS WISHING TO COMPETE IN THE CONTEST MUST ELECTRONICALLY SUBMIT THEIR LOG BOOKS NO LATER THAN 3 PM CENTRAL TIME MARCH 17, 2017. ALSO NOTE THAT LOG BOOKS WILL BE GRADED AND TEAMS WILL RECEIVE POINT BONUSES TO BE USED IN THE ELIMINATION TOURNAMENT. TEAMS THAT DO NOT SUBMIT A LOG BOOK BY THE REQUIRED DATE WILL NOT BE ALLOWED TO ADVANCE PAST THE FIRST ROUND OF THE ELIMINATION TOURNAMENT. THIS WILL BE STRICTLY ENFORCED.

1.2 Prizes

The team that wins the elimination tournament will receive both a trophy they may keep as well as have their names added to the traveling trophy to be kept by their school until the next contest is held.

In addition, trophies and/or plaques as well as prize money will be awarded for the following:

Log Book Contest

1st \$150.00
2nd \$100.00
3rd \$ 50.00

Tournament Winner

1st \$200.00
2nd \$150.00

3rd \$100.00
4th \$50.00

Fastest Single Time: \$25.00

Sportsmanship: \$100.00

Most Unique Design: \$50.00

1.3 CLEAN SWEEP – A Primer

CLEAN SWEEP is an exciting and dynamic challenge which will provide teams with a high paced challenge for the duration of each match. Each team will have to decide on a strategy that best fits their robots ability to complete the tasks necessary in the competition. Teams will compete to contribute the most towards cleaning the arena in order to win the competition.

While participating in *CLEAN SWEEP* teams will develop new skills in response to the challenges and obstacles which stand before them. Some problems will be solved by individuals, while others will be handled through interaction with their student teammates and adult mentors. Teams will work together to build a VEX Robot to compete in the CSC tournament where they celebrate their accomplishments with other teams, family and friends. After the contest, students come away not only with the accomplishment of building their own competition robot, but with an 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.

Teams will have ten (10) minutes of practice time prior to the first competitive event. A team's highest combined score in two preliminary rounds will determine their seeding for a single elimination tournament. Teams will have time in their pit area between rounds to repair and recharge. A good driver is a must, but a solid pit crew able to make quick changes and repairs on the fly can often be the difference between victory and defeat.

1.4 The Playing Field

Each team is tasked with determining how to best use their robot, their knowledge, and the resources available to complete the assigned task and score the most points. The contest will consist of four (4) robots operating within the twelve foot by twelve foot VEX competition arena.

Inside the arena will be at least thirty (30) ping pong balls, thirty (30) tennis balls, two (2) balls each with a circumference of 12.5 inches, two (2) balls each with a circumference of 19 inches, and one (1) section of PVC pipe not to exceed 8 inches in length and 3 inches in diameter, and four (4) five gallon buckets. Each team will be assigned one (1)

five gallon bucket in which to score points. Points will be awarded for each item located in the scoring bucket based upon points assigned to each item.

In addition, each team can score points by having their robot use the side wall of the arena to lift their robot completely off the ground.



SECTION 2

CLEAN SWEEP – THE GAME

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SECTION 2 – THE GAME

2.1 Overview

This section describes the Robotics competition game called *CLEAN SWEEP*. It also lists the game definitions and game rules.

2.2 Game Description

Matches are played on a field initially set up as revealed on game day. The object of the game is to clean up the arena floor and move the objects on the floor to your scoring bucket. Teams may only drop objects in their own bucket and will be disqualified for attempting to score points for another team or for intentional interference with another team in a team's scoring area.

Each ping pong ball placed in a scoring bucket shall be worth five (5) points. Each tennis ball placed in the bucket shall be worth ten (10) points. Each 12.5 inch ball shall be worth fifteen (15) points. Each 19 inch ball shall be worth twenty (20) points and the PVC pipe shall be worth twenty-five (25) points.

Prior to the first match of the competition each team will be given an opportunity to score points using the autonomous mode. During this portion of the competition teams will be given thirty (30) seconds of autonomous operation to score up to fifty (50) points by filling the scoring bucket with balls. (Note: The PVC pipe will not be used in this portion of the contest.) The number of balls available will be limited to the number of balls in the arena. Robots will start this portion of the competition on one side of the arena and may place as many balls as they would like on their robot. The robot will then be tasked with operating without driver input across the playing field and placing the balls in the scoring bucket. Any points scored, up to a maximum of fifty (50), within the thirty second autonomous period will be added to the final score of each match the team plays thereafter. Example: Team Alpha scores five (5) points during the autonomous scoring period. At the start of each subsequent match Team Alpha will start the game with five (5) points.

Teams will only have one opportunity to score points using the autonomous period and no penalty will be given for failure to score or to teams that do not make an attempt to score using autonomous operation.

Robots may also score thirty (30) points each match by lifting their robots off the floor using the side wall of the arena. If no part of a robot is touching the competition floor at the end of a match when scored by the judge then that robot shall be awarded thirty (30) points.

Each match will last three (3) minutes.

2.3 Game Definitions

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

Competition Team – A group consisting of at least two (2) students and one (1) coach, but no more than five (5) students and one (1) coach. During an actual match one (1) student will be designated as a driver, one (1) as the driver’s assistant, and the remainder will be identified as pit crew.

Design/Build Team – A group of individuals working together to design and build a robot for competition. Must contain one (1) coach, but may contain as many students as desired by the team sponsor.

Driver – A student team member responsible for operating and controlling the robot and wearing a “*Driver*” badge. A driver for each team shall be allowed to enter the actual playing field.

Driver’s Assistant – A person on the team that shall be allowed to enter the playing field for the purpose of helping a driver complete necessary repairs or remove a robot stuck on a barrier.

Field of Play – An area inside the boundaries of the arena measuring approximately twelve foot by twelve foot.

Match – A match consists of one timed competition event.

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

2.4 Game Rules

The 2017 CSC Robotics Contest is a contest in which robots are tasked with removing objects from the arena floor and placing them in a storage bucket.

2.4.1 Robots may measure up to 18” in height. The total width and length of the robot must not exceed a total of 36” to be measured in 1” increments.

Example: A robot may be 16” wide and 20” long (16+20=36). A robot could also measure 1” wide and up to 35” long (1+35=36). Length and width will be measured to the next highest inch count. Example: A robot that measures 16.1” in length shall count as 17” in length. If a robot is not square the most extreme distance of height, length and width will be used to determine the measurement. A robot that measures 10” wide at one point but 12” wide at another point will be counted as being 12” wide. Judges will

be firm in their measurements and teams are strongly encouraged to avoid situations where robots are over the limit. Robots that are deemed over the limit may be allowed to compete in the round robin matches but shall not be allowed to advance in the tournament.

Measurements will be made using structural points on the robot and using the distance between items such as ties or cables that may extend out but do not provide structural support as long as those items are not rigid in nature.

2.4.2 CLEAN SWEEP Rules:

1. Once the contest has started no team member may touch any robot until the match is completed.
2. Except game officials no one is allowed to enter the field of play once a match has started and while the match is being played. Team members may only enter the field of play after the match is over and the official has given permission.
3. A robot that intentionally interferes with the progress of another robot will be disqualified. Judges may stop the clock and remove the offending robot from the field of play.
4. Robots may not block another robot from reaching their own start area. Robots deemed to be intentionally interfering with the work of another robot are subject to disqualification from the match and/or the tournament.
5. The course will allow for four (4) robots to operate at one time. In elimination rounds the top two teams shall advance. In the final round placement shall be determined by the score of the final match.
6. Teams shall be allowed three minutes to complete the task. Officials reserve the right to adjust the time allowed in advance of the elimination rounds.
7. Teams may not score points for another team, block a team from scoring in an appropriate scoring bucket or remove balls from another teams scoring bucket.
8. Teams may not move, tilt, turn over or otherwise manipulate a scoring bucket not belonging to their team.
9. Decisions of the judges are final and not subject to protest.
10. Buckets that are turned over will result in only those items fully contained in the bucket being scored while buckets that are upright will have all items within the imaginary extended cylinder going up from the edges of the bucket scored.

2.4.3 Team Rankings

Round robin play as determined the day of the contest will be used to seed a single elimination tournament to determine the overall champion.

2.4.4 – 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 by a contest judge. **Note:** The intent is NOT to penalize robots for having mechanisms or only a part of the robot that cross the outside field border during normal game play.

<S3> If a robot is deemed to be intentionally working against the spirit of the rules the judge may disable the offending robot.

<S4> If a robot is deemed to intentionally move or otherwise work to disable or cause damage to another robot a judge may disable the offending robot for the remainder of the match. Repeated violations of this rule may result in the removal of the offending robot and team from the competition.

2.4.5 – General Game Rules

<G1> At the beginning of a match, each robot must not exceed a volume of 18” high and total of 36” when adding width and length. Any expansion beyond these measurements must occur after the match has begun and must be powered without direct human contact. An offending robot will be removed from the match at the Head Referee’s discretion.

<G2> Alignment devices (templates, tape measures, lasers, etc.) that are not part of the robot may not be used to assist with the position of the robot.

<G3> Each team shall include at least one (1) driver, one (1) driver’s assistant and one (1) coach. This rule may be waived at the discretion of the lead contest official.

<G4> During a match, only the driver and a driver’s assistant may be within the designated participant area next to the field of play. Each individual will be required to stay in their assigned area or their robot may be disabled by a judge.

<G5> Robots must be operated by only one (1) controller device.

<G6> No team member may make intentional contact with any game or field object once the match has begun. An instance of intentional contact will result in the team making contact having their robot disabled for the remainder of the match.

<G7> During a match, robots may be remotely operated only by the drivers and/or by software running in the on-board control system. If anyone other than the driver touches his/her team’s controls while the robot is in the field of play anytime during a match, the robot will be disabled and the team disqualified.

<G8> Scoring time will be calculated for all matches either immediately after the match or when all objects on the field come to rest.

<G9> Robots may not intentionally detach parts during any match or leave mechanisms on the field. If a detached component or mechanism prevents scoring, the team will be disqualified. Multiple infractions may result in disqualification for the entire competition.

<G10> Strategies aimed solely at the destruction, damage, tipping over, or entanglement of robots are not in the spirit of this competition and are not allowed. Repeated offenses could result in a team being disqualified from the remainder of the competition.

<G11> Robots must be designed to permit easy removal of game objects from any grasping mechanism without requiring that the robot have power after the match.

<G12> Field tolerances may vary by as much as +/- 1", so teams must design their robots accordingly.

<G13> Intentionally left blank

<G14> Robots may display a team name. All team names must be approved by CSC. Robots may not display logos for products or from companies deemed inappropriate by CSC for a high school based competition. CSC and the contest judges reserve the right to reject team names at their sole discretion.

2.4.6 – CLEAN SWEEP Specific Game Rules

<SG1> Prior to the beginning of the match teams shall place their robots in their designated starting area.

<SG2> In the round robin portion of the contest, teams will be placed in the arena based upon information provided to the judge by a contest official. In the tournament portion of the contest teams will select starting positions based upon their rankings as determined by contest officials.

<SG3> Each team will be given a card or cards they earned based upon the score assigned to their log book. Each card may be used one time during the single elimination tournament and may not be used during the final round.

<SG4> Teams may not move, or caused to be moved, any object on the field prior to the start of the match.

<SG5> There is a three (3) minute time limit on a match; however, contest officials may change the time limit at any time prior to the start of the first elimination round.

2.4.7 – CLEAN SWEEP Scoring

<S1> Each ping pong ball placed in the scoring bucket shall be worth five (5) points.

<S2> Each tennis ball placed in the scoring bucket shall be worth ten (10) points.

<S2.1> Each 12.5" circumference ball placed in the scoring bucket shall be worth fifteen (15) points.

<S3> Each 19" inch circumference ball placed in the scoring bucket shall be worth twenty (20) points.

<S4> The PVC pipe placed in the scoring bucket shall be worth twenty-five (25) points.

<S5> A robot hanging from the side of the arena with none of the robot touching the arena floor shall be awarded thirty (30) points. The robot must not be supported by wall and not lifted off the ground by balls, the PVC pipe, the bucket or another robot.



SECTION 3

CLEAN SWEEP – THE TOURNAMENT

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SECTION 3 – THE TOURNAMENT

3.1 Overview

The *CLEAN SWEEP* competition will be played in a tournament format. The tournament will include a short practice session prior to the start of matches. Each team participating in *CLEAN SWEEP* will be guaranteed at least two (2) matches. **Please note that cell phones are not allowed within the area designated for the playing arena.**

3.2 Tournament Definitions

Team Captain – A student chosen to represent their team in the event a team decision is needed by tournament officials.

Practice Time – An unscored period of time used to provide time for teams to get acquainted with the official playing field.

Seeding – All seeding for initial tournament brackets and/or pool assignments will be randomly selected.

3.3 Practice Time

At the event practice time will be available for all teams on both a scheduled and a first come-first served basis. Prior to the event date all teams will be provided with an initial time period for team practice on the event field. Teams will be allotted ten (10) minutes of field time to use in any manner they see fit. Teams will need to ensure they arrive far enough in advance to install the crystal assigned to their team for practice time. Additional practice time will be made available on a first come/first served basis if the event schedule allows for additional practice time.

Practice time shall start at exactly 8:15 A.M. on the day of the contest and shall end at a time to be decided by contest officials. Teams shall be assigned practice times on a first-come first-serve basis. No team shall be given more than one (1) ten (10) minute block of time so each team is strongly encouraged to ensure their robot is ready to practice and compete upon arrival at the contest site.

3.4 Pool Play/Match Ladder

Event organizers may elect to hold pool play in order to determine teams that move forward to a single elimination bracket. Pool play may only be used if each pool will contain a minimum of three (3) teams so that each team has at least two (2) matches. If pool play is used event organizers will post at the event a defined set of rules as to how pool play will be used to seed the following elimination tournament. The rules must establish for all participants how the ladder will be seeded and must give higher seeding

to teams based first upon rank within their respective pool and second upon their average score per match played.

Event organizers may also elect to have a random pull of teams for preliminary rounds. In the event a random pull for preliminary rounds is used the best single time from each team shall be used to determine seeding for the elimination bracket.

Event organizers may elect to forgo pool play and randomly seed all teams in a match ladder. In the event a match ladder will be used without pool play the match ladder must allow for double elimination so that all teams are guaranteed at least two (2) matches. Event organizers must post at the event a representation of the match ladder that clearly shows how the matches will proceed. If a double elimination ladder is used event organizers are allowed to change the ladder as necessary due to changes that may be made necessary due to a double elimination event.

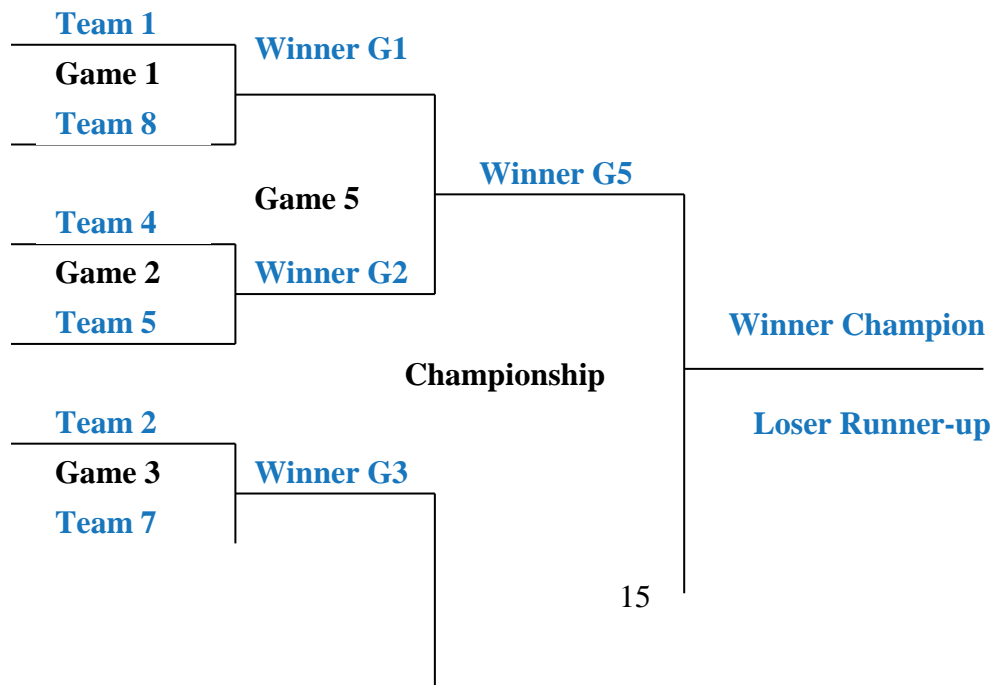
Example of Pool Play

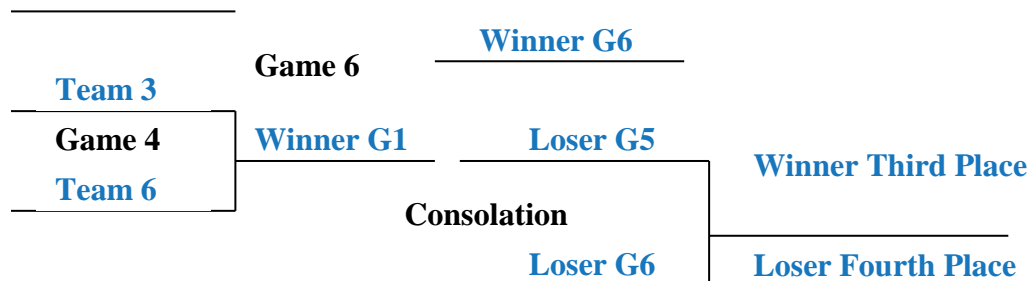
| Pool A | Pool B | Pool C | Pool D |
|--------------|--------------|------------|------------|
| Team Alpha | Team Beta | Team Gamma | Team Delta |
| Team Epsilon | Team Zeta | Team Eta | Team Theta |
| Team Iota | Team Kappa | Team Mu | Team Nu |
| Team Xi | Team Omicron | Team Pi | Team Rho |

Using Pool A/Pool B the Pool Schedule and Robots in the arena would be:

- Team Alpha vs. Team Epsilon
- Team Iota vs. Team Xi
- Team Alpha vs. Team Iota
- Team Epsilon vs. Team Xi
- Team Alpha vs. Team Xi
- Team Epsilon vs. Team Iota

Single Elimination Ladder Example:





3.5 Tournament Rules

<TR1> Referees have ultimate authority during the competition. **Their rulings are final.**

<TR2> The referees will not review any recorded replays.

<TR3> Any questions for the referees must be brought forward by the Team Captain prior to the start of the next match on the same field. In the event no further matches are to be played on the field in question the Team Captain will have ten (10) minutes in which to bring forward any questions.

<TR4> The only people permitted on the playing field are the driver and the driver's assistant. They will be identified by badges. These badges are interchangeable.

<TR5> **All team members, including coaches, must wear safety glasses or glasses with side shields while in the pit or while in the team area during matches. Coaches are responsible for enforcement of this rule.**



SECTION 4

CLEAN SWEEP – THE ROBOT

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SECTION 4 – THE ROBOT

4.1 Overview

This chapter provides rules and requirements for the design and construction of your robot. A robot is a remotely operated vehicle designed and built by a team to perform specific tasks when competing in *CLEAN SWEEP*. Prior to competing at the event, all robots will have to pass an inspection. Refer to Section 4.3 for the Robot Inspection Guidelines.

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 (1) robot will be allowed to compete per team in the *CLEAN SWEEP* event. Though it is expected that teams will make changes to their robot at the competition, a team is limited to only ONE (1) 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.
- c. It is against the intent of this rule for a team to allow their robot to be used by another team.

<R2> Every robot will be required to pass a full inspection before being cleared to compete. This inspection will ensure that all 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.

<R3> The follow 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.

- d. Those that carry signs, messages, symbols, or words that are deemed unacceptable by the event staff.

<R4> At the beginning of any match, each robot must meet the sizing requirements as described previously in this document.

- a. During inspections, robots may be placed into a “sizing box” which has interior dimensions matching the above size constraints. CSC reserves the right to use other measuring devices. 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 by the box itself).
- b. Robots may extend beyond their starting size constraints after the start of the 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.

4.3 Robot Construction

<RC1> Robot construction is limited to non-pneumatic components from VEX (<http://www.vexrobotics.com/vex>) plus additional items listed below.

- a. 40” of 1/8 Nylon Rope
- b. 6” of 1” wide (or less) Velcro
- c. 6 rubber bands (size #32 only)
- d. 6 square inches of non-slip padding.

Note: 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 the competition. These parts must not be used to improve the structural integrity of the robot.

<RC2> All parts used must be tracked and reported on the Design Log to be graded. All Teams are required to submit a log book no later than 3 P.M. Central Time, March 17, 2017. Log books must be submitted in electronic format as described in the log book contest rules.

<RC3> During inspections if there is a question about whether something is an approved component, the lead event official will be required to make a decision.

<RC4> No more than one (1) transmitter may control a single robot during the tournament. No modification of the VEX transmitter is allowed of ANY kind.

<RC5> Robot receiver must be accessible by the competition personnel.

<RC6> Robots may only be controlled by one (1) VEX Transmitter.

<RC7> Parts may not be attached in any way not provided as part of the VEX Robotics Design System

- a. Example: It is illegal to glue, weld, solder, or to stick parts together with chewing gum.

<RC8> VEX Electronics may not be modified in any way.

<RC9> The older 75MHZ controller will not be supported by contest officials. Any team that chooses to use the older controller runs the risk of radio interference. All teams are strongly encouraged to use the Vexnet joystick controller.



SECTION 5

CLEAN SWEEP – THE LOG BOOK

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5.1 Description

Using Microsoft Word, PowerPoint or an equivalent program that can be easily opened using common software programs, teams shall develop an electronic log book. This log book must outline the progress of the team as they advance through the build process. Each team may determine the outline and layout of the log book; however, the preference is chronological while addressing the design process, challenges and changes as well as materials used. Judges reading the log book should be able to clearly see steps the team took to design, build and improve the robot to meet the challenges of the contest.

Log books are limited to fifty (50) 8½” by 11” pages or slides.

Photographs, charts or other visual representations may be used; however, these items should only be used to enhance the written portion of the book and not as a replacement for written descriptions or details.

Links to items outside the fifty (50) page limit are not allowed and will not be viewed if included.

5.2 Deadline

This book shall be delivered to CSC by either email or by way of CD, DVD or thumb drive no later than 3:00 P.M. Central Time March 17, 2017. Teams are responsible for ensuring the log books arrive on time. Since some files may be too large to email teams should ensure they allow sufficient time for delivery in case files are unable to be delivered by email. Log books that are emailed should be sent to logbook@careersourcechipola.com. Teams are encouraged to request a read receipt to ensure the email has been received.

NOTE: THIS DEADLINE SHALL BE STRICTLY ADHERED TO AND TEAMS NOT MEETING THE DEADLINE WILL NOT BE ALLOWED TO MOVE PAST THE FIRST ROUND OF THE ELIMINATION TOURNAMENT.

5.3 Judging

Log books will be judged by five (5) individuals awarding points according to a scoring chart. The highest and lowest total score for each log book will be eliminated. The remaining three (3) scores will be averaged to determine the final judging score to the nearest tenth of a point. Teams will be awarded bonus points based upon the final judging score. The top five (5) teams will receive an additional bonus card and will be interviewed the day of the contest. Interview scores will be added to the final judging score to determine the winners of the log book portion of the contest.

Teams will not be notified until the day of the contest which teams will be interviewed.

5.4 Log Book Scoring

Points shall be awarded using the following criteria:

20 points: Overall Impression

- 1) Overall impression of log book, how the book flows, and ability of judges to understand progression from design to final build.
- 2) Documentation of team member responsibilities and evidence of team member participation.
- 3) Proper grammar and punctuation is used within the log book.
- 4) Does the log book clearly identify the name of the team/robot?

15 points: Documentation of the Design Process

- 1) Does the log book show various designs that were considered?
- 2) Does the log book show advantages and disadvantages of certain designs?
- 3) Does the log book show team participation in the design process?
- 4) Does the log book show how the build process impacted changes to the design?

15 points: Documentation of the Build Process

- 1) Does the log book allow the judge to clearly follow the build process?
- 2) Does the log book show how non-design issues during the build were overcome?
- 3) Does the log book show the team participating in the build process?
- 4) Does the log book clearly show how design flaws, if any, were overcome in the build process.
- 5) Does the log book show how close or how different the final product is when compared to the design?

30 points: Documentation of Challenges and Changes

- 1) Does the log book clearly show challenges faced by the team and how those challenges impacted the final design and/or build of the robot?
- 2) Does the log book allow judges to understand if the challenges and or changes were a result of things under the control of the team or outside forces?
- 3) Does the log book allow judges to understand how team dynamics impacted the final product?

20 points: Documentation of Materials

- 1) Ability of the judges to clearly understand all materials used to construct the robot.

Up to 100 points in total shall be awarded as the final judging score.

5.5 Card Bonus

Teams shall be given a card based upon their final judging score. Cards shall be awarded as follows:

| Final Judging Score | Bonus Amount |
|------------------------|----------------|
| 91.0-100.0 points | Twenty Points |
| 81.0-90.0 points | Fifteen Points |
| 71.0-80.0 points | Ten Points |
| 60.0-70.0 points | Five Points |
| Less than sixty points | Zero (0) |

In addition the top five (5) scoring teams shall be awarded a second card bonus of five points. Teams may use one or both cards prior to the start of any match. Cards may only be used once and may not be used during the final round of the tournament.

5.6 Interviews

The top five (5) teams will be interviewed the day of the contest by a panel of three to five judges. The top three (3) interview scores from the judges will be averaged and added to the final judging score to determine the log book winners.

Judges may ask questions of the entire team or of a single individual. The interview will not last longer than ten (10) minutes and questions will not be provided in advance. At least three (3) individuals must be made available to interview and the driver and assistant must be included as part of the interview process.

Judging will award up to fifty (50) points on the following criteria:

Ten points: Does the team show a solid knowledge of the design and build process used to finish the robot?

Ten points: Are individuals able to answer questions in a manner that demonstrates they have a solid knowledge of the design and build process?

Ten points: Does each member of the team participate in answering the questions posed by the judges? Note: Not all team members are expected to answer each question, but each team member should be a participant in the overall interview.

Ten points: Are the answers provided given with a high degree of certainty and while demonstrating poise and presence?

Ten points: Do team members use examples of events that occurred during the design or build process to demonstrate lessons learned either as an individual or by the entire team?