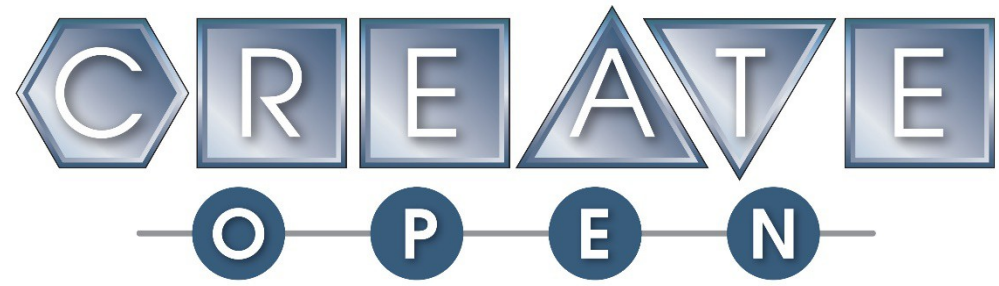

CREATE
OPEN

Table of Contents

Section1:Introduction

1.1 - Overview

This section provides background for the ***CREATE Open Program.*** This competition is for students primarily in grades 7-12. Younger students are welcome as well if they are ready for this level of engineering challenge.

1.2 - Introduction

The CREATE Open Program was designed to be an advanced engineering challenge. It incorporates technical skills, with communication, social, and leaderships skills, while having a heavy emphasis on innovation.

Robots of all types are welcome. Metal, wood, plastic or many other materials are legal in this program. We encourage teams to think outside the kit (er, box) and push themselves to explore a wide range of design options.

The future of our country, the future of our world is directly tied to our collective ability to innovate. It is, and will be, the source of solving mankind's most pressing issues.

So we invite you to join CREATE and teams from all over the world in designing, testing and succeeding into the future.

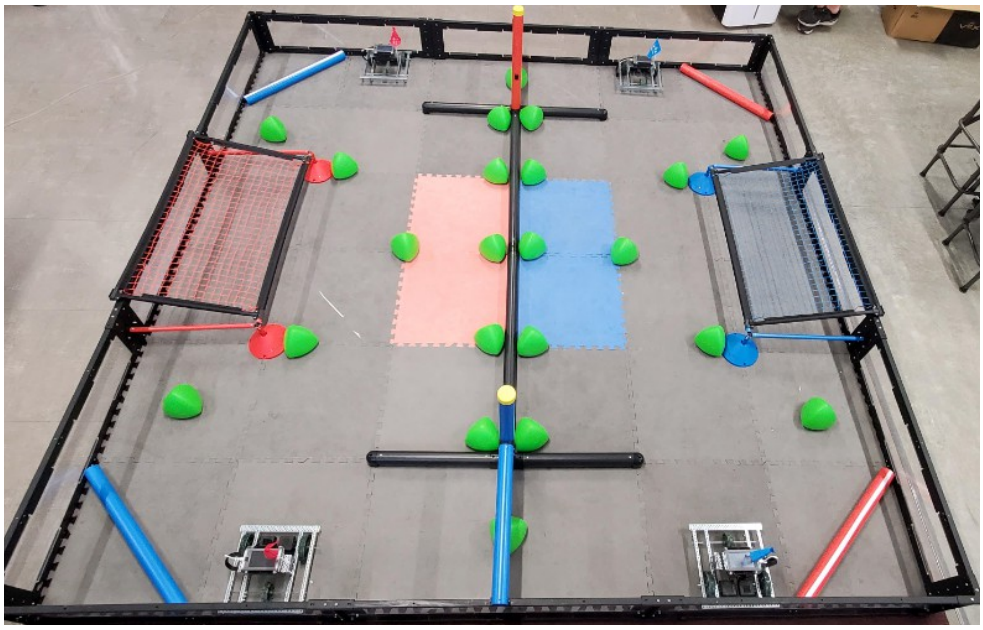
Section 2: The Game

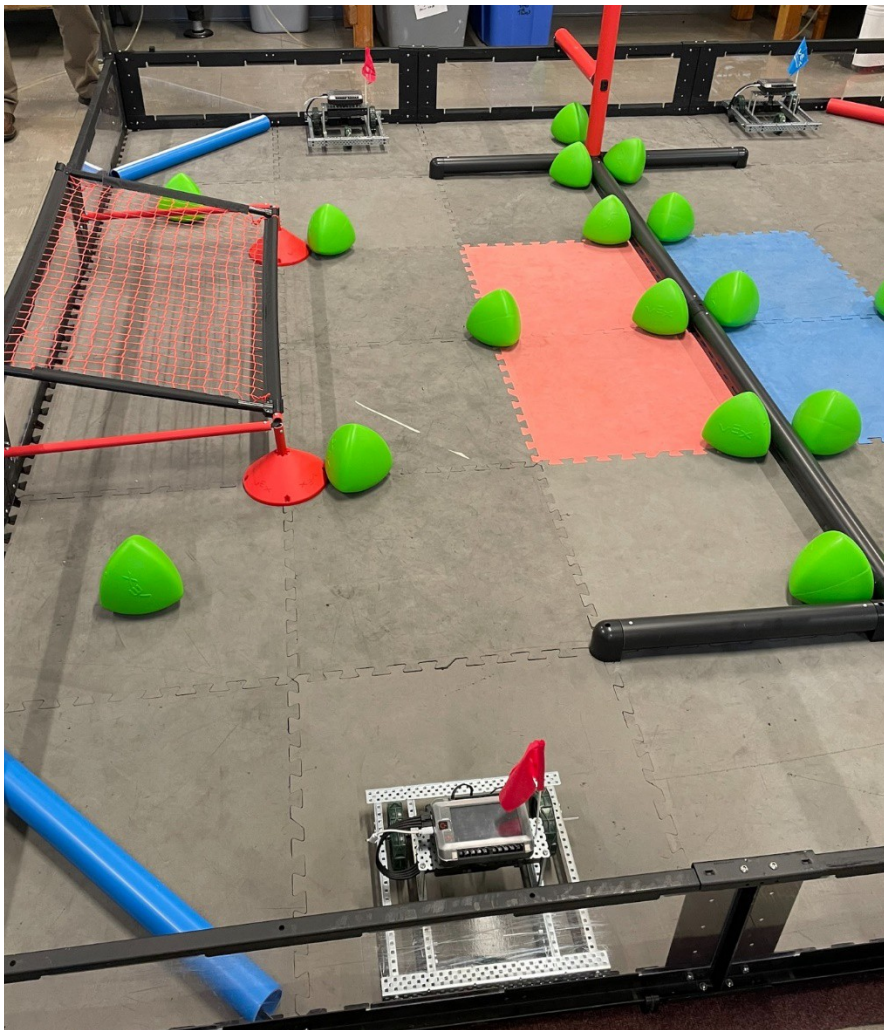
2.1 - Overview

This section describes the CREATE Open Program game for 2023-2024. (Note: This game uses the game set designed for the 2023-2024 VRC game Spin Up). It also lists the game ***definitions, scoring,*** and game ***rules.***

2.2 – Game Description / Field Drawings

Matches are played on a field initially set-up similar to the VRC game Spin up as seen below. There are a few changes.





Changes to VRC set up to get the field ready for the OPEN program:

Field is set up the same as for the game VEX Spin Up with the following CHANGES:

Extra Game Objects start on the field, for a total of 22 Objects on the field. All the rest are Match Loads. see setup photo above.

One of each of the Colored PVC pipes in the corners is designated as a scoring Goal by the use of white tape. Two white stripes are placed on the PVC. The Corner Goal is the alliance corner on the left as seen from the Driver's Box.

Two teams form an alliance and go head-to-head with two other teams in an opposing alliance. The object of the competition is to attain a higher combined score than all the other teams. Points are scored by performing mandatory and optional tasks. This will include:

AUTONOMOUS TASK (10 or 30 pts) is achieved by:

- Robot picks up an Acorn and places it on top of the Net Goal, then returns to starting spot.
- 10 points for one Robot success, 30 points for two Robots success.
- ALL tasks must be completed within the 20 seconds of the Autonomous period.

SCORING TASKS

-Each Acorn in the Net Goal) – 5 pts.
-Each Acorn in the Corner Goal – 3 pts.
-Each Acorn in the Floor Goal – 1 pt. Note- Some Acorns start in a scoring position
- An Even number of Acorns in the Corner Goal, Net Goal, and on top of the Net Goal – 20 pts.

TIME BONUS TASKS (must be accomplished to receive Time Bonus)

- At Least 3 Acorns in the Net Goal
- At Least 3 Acorns on Top of the Net Goal
- At Least 3 Acorns in the Corner Goal
- BOTH Robots 'Parked'

DOUBLER TASKS

- One Colored Acorn in the Corner Goal (but not touching the foam tile)
  DOUBLES points in the Corner Goal
- Two Colored Acorns in the Corner Goal (but not touching the foam tile)
  DOUBLES entire Score

***Note** Only one Doubler Task will score. If both Doublers are scored, the Corner Goal points are not Doubled.

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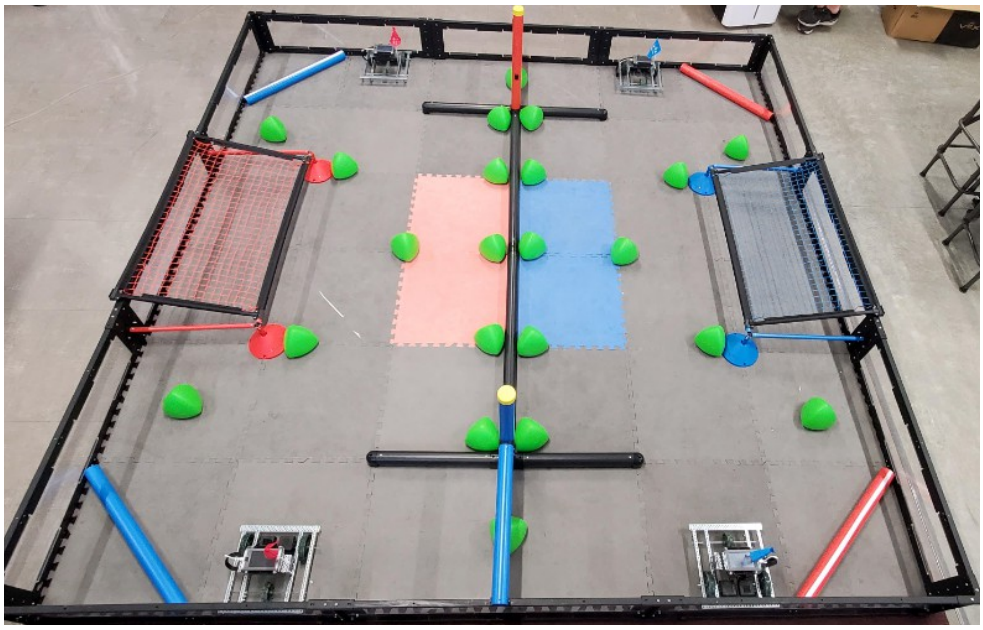
The following is a photo on how to setup the field elements.



2.3 – Game Definitions

Alliance – Two randomly paired teams that work together during a match.

Autonomous Period – The first twenty seconds of each match during which time the robot may operate only autonomously using onboard sensors and pre-programmed commands. The autonomous period may only be initiated by either pressing a button on the robot or activating a sensor (i.e. placing your hand above a distance sensor close enough to activate the autonomous code) or pushing a button on the remote.

Coach - A student or adult designated as the team adviser during the tournament.

Disablement – A penalty applied to a team for a rule violation. A team that is disabled is not allowed to operate their robot for the remainder of the match, and drivers are to place their remote(s) on the ground.

Disqualification – A penalty applied to a team after a match for a rule violation. A team that is disqualified in a qualification match receives a zero for a score. When a team is disqualified in a Finals match, the entire alliance is disqualified and receives a zero for their score. At the head referee's discretion, repeated violations and disqualifications for a single team may lead to its disqualification for the entire event.

Drivers - Team members responsible for operating and controlling the Robot. Only the two drivers from a team are allowed to be in the Driver's Station during a match.

Driver's Station – The designated region where the drivers stand during the match.

Entanglement – A robot status. A robot is entangled if it has grabbed, hooked, or attached to an opposing robot or field element.

False Start – A robot moving before the match begins will be considered to have false started. A five-point penalty will be assessed for each robot that false starts. If the false start is severe, at the discretion of the referee, the team may be disqualified.

Field Element – The foam tiles, field perimeter, white or other colored tape, all supporting structures, accessories of game objects.

Match - A two-minute period made up of a twenty second autonomous period followed immediately by a one hundred second driver-controlled period.

Pre-placement of Robots – Each team is allowed to place their robot in the designated area of the field as specified by the current year's game rules.

Removed from the field – Any game object that leaves the field. All objects that leave the field of play stay out for the duration of the match.

Remaining time bonus – The number of seconds remaining on the clock when all mandatory tasks have been complemented and remotes are returned to the floor.

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

Team Member – Any of the participants that make up the team. Team members may assist the drivers with the pre-placement or pre-loading of the robot. Only the two drivers (per team) are allowed in the Driver's Station for the match. Not all games will have pre-placement and/or pre-loads.

Trapping – A robot is considered trapped if an opposing robot has restricted it into a small, confined area of the field, approximately the size of on foam tile or less, and has not provided an avenue for escape. Trapping can be direct (e.g. pinning an opponent to a field wall) or indirect (e.g. preventing a robot from escaping a corner of the field).

2.4 – Scoring

Please Note: Referees have the option to re-instate bonus points for a team depending on circumstance. Score is not final until referee certifies results.

SCORING

AUTONOMOUS BONUS

Robot picks up an Acorn and places it on top of the Net Goal, then returns to starting spot.	10 points for one Robot success, 30 points for two Robots success.

TIME BONUS

At least three (3) Acorns in the Corner Goal	Seconds are points. 45 Max in Quals, 90 Max in Finals.
At Leats three (3) Acorns in the NET Goal	
At least three (3) Acrons on top of the Net Goal	
Both Robots 'Parked'	

TASK BONUS

Each Acorn in the Net Goal	5 pts
Each Acorn in the Corner Goal	3 pts.
Each Acorn in the Floor Goal	1 pt.
An Even number of Acorns in each of the Corner Goal, Net Goal, on top of the Net Goal	20 pts.

DOUBLER

One Colored Acorn in the Corner Goal (but not touching the foam tile)	X2 Corner Goal points.
Two Colored Acorns in the Corner Goal (but not touching the foam tile)	X2 Entire Score

PENALTIES

Starting Early	Minus 10
Driving Late	Minus 20
Skip ONE Time Task	Minus 15

2.5 – Game Rules

2.5.1 – Safety Rules

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

2. If a robot goes completely out-of-bounds (outside the playing field) it will be disabled for the remainder of the match.

2.5.2 – General Game Rules

1. 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.
   NOTE: Alignment devices (templates, tape measures, lasers, etc.) that are not part of the robot may be used to assist with the positioning of the robot. However, positioning a robot must be done quickly. Referees may limit positioning time to start a match on time.
2. For each match, teams shall include two drivers. The drivers may change from match to match.
3. During a match, the drivers are the only people allowed in the driver's station.
4. Any team member may assist in Pre-placement of the robot or the pre-load of the scoring object. (For games that have pre-placement and/or pre-loads.)
5. Scoring objects that leave the playing field are considered out of play. They will not be returned to the field for that match.
6. Drivers are prohibited from making intentional contact with any game (other than match load) or field object. The first instance of intentional contact may result in a disqualification.
7. During a match, robots may be remotely operated only by the drivers.
8. Robots may not intentionally detach parts during any match or leave mechanisms on the field. Multiple infractions may result in disqualification for the entire competition.
9. Robots must be designed to permit easy removal of scoring objects from any grasping mechanism without requiring the robot to have power after the match.
10. Field tolerances may vary by as much as +/-1". Teams must design their robots accordingly.

2.5.3 – Specific Rules

1. At the beginning of each match, the robots must be placed fully on the tile along the side wall (not on the wall that has the Driver's Box) that is adjacent to the corner tile. Both alliance robots start in the alliance scoring zone (the zone with the net of the alliance color). NOTE that this is the half of the field FARTHEST from the Driver's Box.
2. Before the match can begin, all remotes must be placed on the floor.
3. In order to get a Time Bonus, both remotes from an alliance must be placed on the floor. Maximum Time Bonus is 45 seconds in qualification matches and 90 seconds in Finals matches..
4. Qualification Matches have a 20 second autonomous period followed by 100 seconds of driver control. There is a pause between autonomous and driver control. Finals Matches have 20 seconds of autonomous and 120 seconds of Driver Control.
5. Penalties incurred can move your score to below zero. If a negative final score is achieved, it will be changed to zero (0).
6. There are 4 areas to score Acorns:
   1.1.1.1. CORNER GOAL. The Corner Goal is the area inside the 2 walls that meet in the corner and the PVC pipe touching both of those walls. The goal is

designated by white tape on the PVC pipe. It is the left hand corner as seen from the drivers box. If two points of an Acorn are in the 3D volume of the Corner Goal, it is considered Scored.

1.1.1.2. NET GOAL. The Net Goal is defined as the area UNDER the Net. If two points of the Acorn are in the 3D volume under the Net, the Acorn is considered to be scored.

1.1.1.3. TOP of the NET. An Acorn is considered to be Scored on the Top of the Net if it is supported by the Net and nothing else (for example, no robot is touching it)

1.1.1.4. FLOOR GOAL. The Floor Goal is half of the field (divided by the Black PVC and colored PVC extensions) except for the Corner Goal and the Match Load Zone. The Red Floor Goal is on the half of the field with the Red Net. The Blue Floor Goal is on the half of the field with the Blue Net.

7. Corner Goals are off limits to robots from the opposing alliance. If the opposing robot enters the Corner Goal or causes any Acorns to be de-scored from the Corner Goal, it is DQ'd.

8. The Net Goals are off limits to robots from the opposing alliance. If the opposing robot enters the Net Goal or causes any Acorns to be de-scored from the Net Goal, it is DQ'd.

9. The Top of Net Goals are off limits to robots from the opposing alliance. If the opposing robot causes any Acorns to be de-scored from the Top of Net Goal, it is DQ'd.

10. DOUBLER ACORNS. Doubler Acorns are the Red and Blue Acorns (2 each) that may be introduced as match loads in the last 30 seconds of a Qualification match and at any time in a Finals match. They are considered scored if they are in a Corner Goal of the corresponding color and are not touching a foam tile. Doubler Acorns only are used to Double Scores, they do not count as any points themselves.

1.1.1.1. If a single Doubler Acorn is Scored, the points in the Corner Goal are Doubled.

1.1.1.2. If both Doubler Acorns are Scored, The Corner Goal points do not double, the ENTIRE Score of that alliance is Doubled.

11. A Robot is considered PARKED if it is not touching any foam tiles.

12. Match Loads are introduced in the MATCH LOAD ZONE. The Match Load Zone is defined as the area inside the 2 walls that meet in the corner and the PVC pipe touching both of those walls. The Zone does NOT have white tape on the PVC pipe. It is the left hand corner as seen from the drivers box. Match Loads are introduced one at a time in the Match Load Zone. Once an Acorn vacates the Match Load Zone, another Acorn can be introduced. Match Loads can be placed on the foam tile in the Match Load Zone or on part of a robot that is in the 3D volume of the match Load Zone. NO inertial energy may be given to the Acorn. It must be gently placed.

13. Robots start within an 18x18x18 volume.

14. Any one robot can control no more than 1 (one) Acorn at any time. Teams in violation of this rule will be warned. If steps are not taken to attempt to immediately rectify this, the team will be DQed.

15.

Section 3: The Tournament

3.1 - Overview

The ***CREATE Open Program*** will be played in a tournament format. Students in 7th - 12th grade are allowed to participate as well as younger students who are ready for this level of engineering challenge. Each tournament will include ***qualification matches*** and ***finals matches*** with ***practice matches*** available at the event partner's discretion. The top ranked teams after qualification races are over will invite other teams to join them in a permanent alliance in the finals portion of the tournament. The number of teams that advance to the finals matches will be determined by the event organizers. In addition to the competition portion of the event there are judged awards as well. These awards will range from technical knowledge, design, build quality, sportsmanship, and understanding of the engineering process.

3.2 - Tournament Definitions

Team Captain – A person chosen to represent their team.

Event Partner – The organizers of the event/tournament, also known as the host school/program.

Finals Matches – The final matches of the event which determines the tournament champions and finalists.

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

Qualification Match – A match used to determine the rankings for each team.

3.3 - Registration

When your team arrives at the tournament, the first stop is the registration table. Here, your team will be checked in, drop off their Engineering Notebook (optional), get information on the schedule, and find out where the pit is located.

3.3.1 - Inspection

The next step after registration is inspection. Your team cannot compete until your robot has passed inspection. The robot is checked for size, safety, and so on. If there is a problem, the team must return to your pit, correct the problem and be re-inspected. See the appendix A of this document for more information on Inspection Guidelines.

3.3.2 - Pit Area

The Pit area is usually in a large room such as a cafeteria or gym. The team may be instructed to find a table to use or may be assigned a specific table for their use. Power outlets will be nearby. This is your team's 'home base' for the day. This is where your team works on the robot, charges the batteries, and so on. The pit area is a great place to talk with other teams as well.

3.3.3 - Practice Matches

At the event, practice matches may be played during the team registration time until the Drivers Meeting begins. Check the event schedule.

3.4 - Judging

Judging takes place in a formal manner once the team is registered and inspected. You might be given a schedule of where and when to go for your team's judges interview or you might be asked to go to your team's interview after a match. Some events allow teams to be interviewed on a first come, first interviewed basis. The format chosen is at the discretion of the Event Partner. During the interview, your team explains their creative process, shows off their robot, answers questions, and generally gets the opportunity to shine. Informal judging takes place during the entire tournament. Judges and other tournament officials observe teams all day. Both the formal and informal judging is the basis for several awards at the end of the day. Always do your best, even when no one is watching. Please see appendix B: Awards for more information.

3.5 - Drivers / Coaches Meeting

The Drivers / Coaches meeting is a short presentation about the competition and the venue. This is followed by a question-and-answer session. This is your opportunity to get all your questions answered. Do not hold back because you think the question may be a dumb question. Chances are that many other teams are wondering the same thing. This meeting is mandatory for all drivers and coaches.

3.6 - Opening Ceremony

There will often be a short opening ceremony, a welcome is extended to all teams, the schedule is reviewed, logistics are explained, and qualification match schedules will be passed out if not already available.

3.7 - Qualification Matches

- Find your team on the schedule and note which matches you will compete in. There are four robots on the field in each match.
- You will note that your team will be partnered randomly throughout the qualification rounds. Be sure to have your team talk with their partners sometime prior to the match to determine strategy, strengths, weaknesses, etc. Teams work together to score as many points as possible. The final score of the match is given to each team on an alliance.
- Each team will be scored in the same number of qualification matches.
- At the end of the Qualification Rounds each team will have a point total from all of their qualifications matches combined. A team ranking is published based on these scores. After each match, rankings of all teams will be posted. If there is a tie in the total score of all qualification matches it will be broken by comparing the highest individual score attained in a qualification match. If there is still a tie then the next highest individual qualification score will be used, and so on. In the very unlikely event that ALL qualification scores between the tied teams is the same, the computer will select the order of teams.

3.8 – Finals

After all qualification matches are over the top teams invite other teams to join them in a permanent alliance of four teams to compete in the Finals. A team may decline, and if they do they will be taken off the board and no other teams may select them. They may still act as an alliance captain and invite other teams to join them if they are ranked high enough. Teams should consider carefully before they decline because if they are not able to act as alliance captains they will be eliminated from further play.

The number of alliances taken into the Finals matches will be left up to the event partner with the following minimums:

- For tournaments with 16 or fewer teams, all teams should be allowed to participate in the finals matches.
- For tournaments with 16-30 teams, at least 4 alliances (16 teams) should be allowed to participate in the finals matches.
- For tournaments with 31-50+ teams, at least 6 alliances (24 teams) should be allowed to participate in the finals matches.

Finals matches start with the lowest ranked alliance and proceed until the top ranked alliance has played a match. The second round of finals starts with lowest ranked alliance based on first round scores and proceeds to highest scoring/ranked alliance. Additional finals rounds may be held at the discretion of the Event partner. The team with the highest match score of all Finals matches is the Tournament Champion. In the case of a tie, the higher seeded alliance is the Tournament Champion. Finals matches run 3 minutes and the 'time remaining' bonus has a maximum value of 90.

NOTE:
During the finals ALL FOUR robots collaborate to attain a high score. This changes the dynamic and can lead to interesting strategies. For instance, is it legal for the red teams to set down their remotes, call for time, and then have the blue teams continue to do Bonus tasks for them? YES! Would it be legal for those blue teams to even score the doubler on behalf of the red teams? YES - But only if it is the red doubler. They could not use the blue doubler to double the red score. What about time tasks? Could blue complete time tasks for red? YES! If you have any questions about how this works in the finals, be sure to ask them in the drivers meeting.

3.9 - Awards Ceremony

Awards are given to the tournament champions (four teams) and sometimes the tournament finalists (four teams). The Honor Award will also be given at all tournaments. For a complete list of possible awards please see appendix B: Awards.

3.10 - Tournament Rules

1. Referees have ultimate authority during the competition. ***Their rulings are final.***
   1.A. The referees will not review any recorded replays.
   1.B. Any questions for the referees must be brought forward by a driver within the time period of two matches.
2. The only people permitted by the playing field are the two drivers.
3. Each alliance will be allotted ONE time out of no more than three minutes. The time out can only be called directly preceding a team's match and **cannot** be taken during a match. Time outs can only be taken during the finals of a tournament. The matches must progress according to schedule.

NOTE: If a robot cannot report for a match, at least one member of the team should report to the field for the match. If no team member is present during a qualification match, then the team will be disqualified and receive a score of zero. If a team member is present, event without a robot, that team will receive the score earned by the alliance.

Section 4: The Robot

4.1 – Overview

This section provides rules and requirements for the design and construction of your robot. A CREATE Open robot is a remotely operated vehicle designed and built by a registered CREATE Open team to perform specific tasks when competing in a CREATE Open challenge. Prior to competing at each event, all robots will have to pass an inspection. Refer to Appendix A for the 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.

1. One robot is allowed to compete per team. Though it is expected that teams will make changes to their robot at the competition, a team is limited to ONE robot.

NOTE: It is against the intent of this rule to compete with one robot, while a second robot is being modified or assembled.

2. 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.A. If significant changes are made to a robot, it must be re-inspected before it will be allowed to compete.
    - A.B. All robot configurations must be inspected before being used in competition.
    - A.C. Teams may be requested to submit to random spot-inspections by event personnel. Refusal to submit will result in disqualification.
    - A.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.
    - A.E. For more information on the inspection process please refer to Appendix A: Inspection Guidelines.
3. The following types of mechanisms and components are NOT allowed:
    - A.A. Those that could potentially damage playing field components.
    - A.B. Those that pose an unnecessary risk of entanglement.
4. At the beginning of any match, the maximum size of a robot is 18" x 18" x 18".
    - A.A. During inspections, robots will be required to pass within the perimeter of a sizing tool. To pass inspection, a robot must fit within the sizing tool without exerting ANY force on the tool. The orientation of the robot when sized must be the same as its orientation when placed on the field.
    - A.B. Robots may expand beyond starting size constraints after start of a match.
    - A.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.
5. Robot Build Rules
    - A. Any control system or material may be used to build the robot. This includes all VEX parts, electronics, motors, etc., but also allows Arduino based control system (or any other) as well as 3D printed/laser cut parts, hand made parts, etc.
    - B. A maximum of 2 pneumatic tanks per robot may be used. (Again, a desire to keep the playing field level.) Also, for this year only VEX pneumatics (pistons and tanks) are allowed.

C. A maximum of 10 non-VEX motors, or 12 if pneumatics are not used, are allowed. A maximum of 88 W worth of motors if VEX motors are used, is allowed. This applies to ALL robots regardless of what control system or motors used.

D. Up to 2 of the batteries that meet the criteria below may be used to power your robot. These 2 batteries may be used for any purpose. Examples are: They can be used to protect wireless communication, or to power lights, or power your motors/sensors/sound. Electronics such as Go Pros that have their own internal batteries that are in no way connected to the robot's electrical system are legal and do not count toward the two-battery limit. There are two types of batteries that can be used, those on the Specified list and those that meet the criteria for power tool batteries. Please note that no modifications may be made to any battery on either list. Here is the Specifics:

D.A. Batteries may not exceed 13 Volts

D.B. In addition to the specified batteries above, power tool batteries can be used that meet the following criteria: either

E. They are commercially available.

F. Unmodified. No modifications may be made to these batteries.

G. Only hard case batteries will be allowed.

H. Batteries must be either NiMH, or Lithium chemistry.

I. They either have the rated voltage on them or spec sheets accompany the batteries at all times, and they are limited to 13V rated voltage.

J. Teams understand how to use a voltage meter and can use it to show tournament officials the current voltage of the battery when requested.

K. Teams have the battery specifications and voltage meter with them whenever they are getting inspected or are participating in a match or skills.

L. At no time can any battery used exceed 15V when tested. Should any battery exhibit this behavior it will be taken by tournament officials and then returned at the end of the event. Should a robot come to a match or skills with a battery that tests over 15V it will result in immediate disqualification from a match or a zero on their skills attempt.

M. Here is an example of a legal power tool battery and charger:

M.A. Battery https://www.amazon.com/Lasica-Lithium-48-11-2402-Milwaukee-Cordless/dp/B0756BRJ6Z/ref=sr_1_11?keywords=power+tool+battery+12V&qid=1561866443&s=gateway&sr=8-11

M.B. Charger:https://www.amazon.com/Milwaukee-Genuine-48-59-2401-Lithium-Indicating/dp/B0086AJFAM/ref=pd_bxgy_469_2/130-8308049-9166344?_encoding=UTF8&pd_rd_i=B0086AJFAM&pd_rd_r=c9e97b12-9ae9-11e9-99da-dd5cbc43a5ca&pd_rd_w=FJDaz&pd_rd_wg=wKcYS&pf_rd_p=a2006322-0bc0-4db9-a08e-d168c18ce6f0&pf_rd_r=1DWZMA4JX1JBF7HD0466&psc=1&refRID=1DWZMA4JX1JBF7HD0466

N. All parts, EXCEPT pneumatics may be modified from their original factory condition. This includes all motors and electronics. Please keep in mind however that safety is a primary concern. Any robot deemed unsafe by the inspectors/referees will not be allowed to compete until the safety issue is resolved or may be disqualified from the tournament.

O. No rare earth magnets or electromagnets, other than those used in shielded motors, may be used as these pose an interference hazard with both electronics and metal.

P. No control system, part or set of parts can act in a fashion that inhibits the normal operation and/or communication of other robots is allowed.
Q. No power sources other than pneumatics, batteries or compression (rubber bands, springs, etc.) are allowed.
R. CREATE officials reserve the right to restrict any material or part that interferes with the normal operation of the field or another robot. If you are unsure, ask first.
S. Voltage may not be combined. (i.e., you cannot double your voltage and halve your current.)
T. A team license plate must be:
   T.A. Displayed on two opposite horizontal sides of their robot.
   T.B. White background with black lettering. (Some small decorations/color may be added to the edge of the license plate.)
   T.C. Must be easily identified by judges, referees and announcers.
   T.D. Must have numerals/letters that are at least 1.5" high, at least 1/2" stroke width.
   T.E. Must be strong enough to survive match play. I.E., if you use the CREATE license plate template and print your license plate, the paper must be protected by a clear plastic protective sleeve or placed behind plexiglass.
   T.F. VEX Robotics License plates are acceptable if desired.
U. All parts that are used must be tracked through a Bill of Materials (BOM).

6. ***The robots are to be built by the students.*** Adults, coaches, parents, mentors are to be facilitators, offer suggestions, teach and guide. We understand that each student is unique, and their learning facilitated by different styles which may benefit from varying levels of assistance. For instance, if a child cannot remove a stripped bolt, it is perfectly acceptable for an adult to do that for the student. If a student has never seen a particular mechanism, it is a great learning experience for the student to build it with an adult. However, any mechanism that is in ANY significant way built by an adult should be dis-assembled and re-assembled by the student(s). It is very important that the students understand their robot and are able to fix it during the tournament as adults are not to assist in any capacity, except to help remove stripped bolts or where safety is involved. Teams with adults acting in discord with this rule will be removed from consideration for judged awards. Repeated and/or egregious infractions may result in a team being disqualified from the tournament.

The CREATE Open program is open to students of all ages, including College/University teams. However, there are a number of restrictions for College/University teams:

1. University teams are welcome and encouraged to participate in regular season Open Tournaments/Events.
2. In regular season events College/University teams may not alliance with another College/University team.
3. A University teams is defined as a team that has 1 or more members that have graduated high school and attends a college or university. Please note that this a) allows for mixed teams of university and hs/ms students, and b) is meant to disqualify professional engineers.

4. University teams may participate in regular season tournaments.
5. University teams may not participate at the Open Program State Championship. This is a state championship level event and will be restricted to ms/hs teams only.
6. We welcome university teams to participate at the U.S. Open. They will not be able to participate in the regular Open Division, but if we get enough teams a smaller division will be created for them. There will be NO registration fee for university teams at the 2021 CREATE World Championship, instead they will be asked to a) run their division and b) volunteer during the tournament.

Awards - CEATE Open awards share many similarities to awards at events you are accustomed to with one significant exception. Great focus will be given to innovation. i.e. Using new methods of construction (3D printing, etc.) and different types of motors, controllers, etc. We really want to spur creativity.

This document is considered a draft document until October 1st, 2023. Changes may be made up to that date. Additional changes may be made during the season if warranted AND it will not be uncommon for CREATE to make U.S. Open specific changes to these rules. Any U.S. Open specific rules changes will be made at least 4 weeks prior to the U.S. Open.

Translations – Any translation of any of the CREATE Open Program documents are to be considered and used as a courtesy. The English version of any/all documents will be considered the final authority on rules, guidelines and recommendations for the CREATE Open Program.

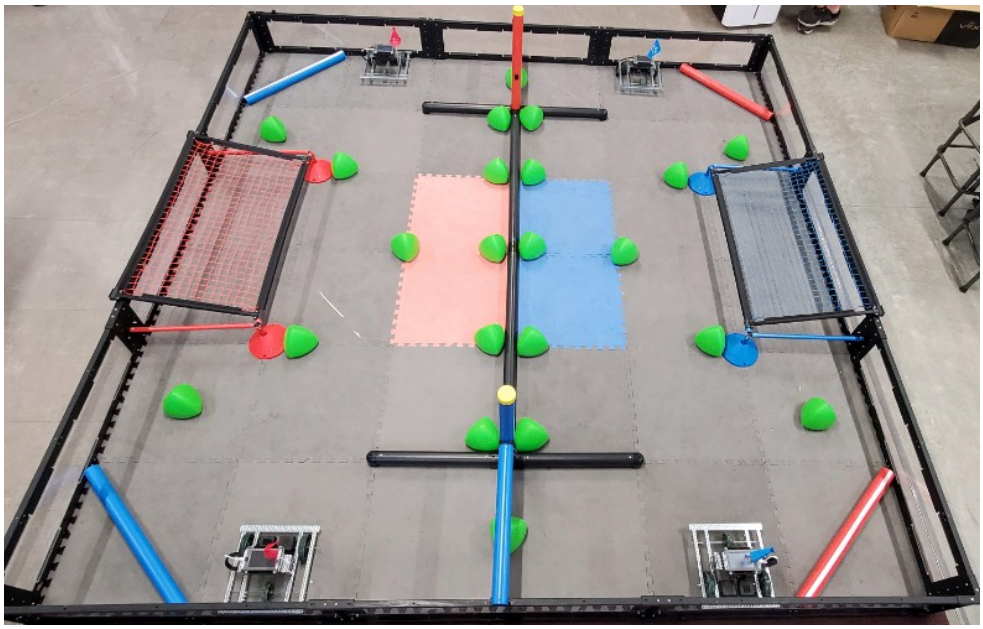
Section 5: Skills

5.1 – Skills Overview

CREATE OPEN Skills is the opportunity for a team to take the field alone and to score as many points as possible in 60 seconds. Skills test a team's robot and driving ability in a lone challenge.

5.2 - Rules

1. All skills matches will be 60 seconds in length.
2. The field will be set up as seen below.



3. Drivers must declare as either red or blue, starting on that side. Drivers start with their remotes on the floor and do not reach down to pick them up until the screen counts down 3, 2, 1!
4. Driver may select any legal starting position.
5. Drivers stop as soon as the referee says stop, or when the team places their remote back on the floor.
6. Skills match scoring, bonus and time remaining scores are as follows:
    1. Drivers must complete all required tasks before a driver MAY set the remote down and stop the clock.
    2. Autonomous must complete two of the three required tasks before a team member can signal to the referee and stop the clock.
    3. Autonomous and driver skills score similarly, as shown below.
7. Skills rankings will be determined by the highest single score a team has achieved. If two or more teams have the same highest score, their next highest score will be used to break the tie, and so on. If teams are still tied after comparing all their scores it will be up to the Event Partner to either have the teams continue to do skills, alternating turns, until the tie is broken, or award

multiple skills champions. NOTE: If team A has done skills twice and team B has done skills only once, and they have the same high score, team A will win the tie breaker as team B's second score will be zero.

8. SCORING:

DRIVER SKILLS

Robot declares to be RED or BLUE and only scores for the declared color

TIME BONUS

One Acorn in the Corner Goal	Seconds are points.
One Acorn in the NET Goal	
One Acorn on Top of the Net Goal	

TASK BONUS

Each Acorn in the Net Goal	5 pts
Each Acorn in the Corner Goal	3 pts.
An Even number of Acorns in each of the Corner Goal, Net Goal, on top of the Net Goal	20 pts.

DOU-BLER

Two Colored Acorns in the Corner Goal	X2 Entire Score

PENALTIES

Starting Early or Driving Late	DQ

Programming

SKILLS

Robot declares to be RED or BLUE and only scores for the declared color

TIME BONUS

Any TWO of these THREE tasks	One Acorn in the Corner Goal	Seconds are points.
	One Acorn in the NET Goal	
	One Acorn on Top of the Net Goal	

TASK BONUS

	Each Acorn in the Net Goal	5 pts
	Each Acorn in the Corner Goal	3 pts.
	An Even number of Acorns in each of the Corner Goal, Net Goal, on top of the Net Goal	20 pts.

DOU-BLER

	Two Colored Acorns in the Corner Goal	X2 Entire Score

PENALTIES

	Starting Early or Driving Late	DQ

5.3 - Event Rules

1. Skills are an ***optional*** portion of the OPEN Program and may not be offered at all events.
2. If Skills are offered, the number of tries will be up to the Event Partner but CREATE recommends no less than two tries per team.
3. Skills are optional. Teams are not required to participate, nor required to take all their allotted turns.
4. Scheduling of Skills will be up to the Event Partner. Some may offer fields set up specifically for Skills and might be scheduled while matches are going on. Some may do all Skills prior to matches starting. Be sure to review the schedule early in the day.
5. It is up to each team to ensure they get all their turns in. Don't wait until the last minute that Skills is scheduled. You may miss your chance.
6. Trophies are optional for this challenge. However, CREATE recommends that any tournament with more than 15 teams awards a Skills Champion Trophy.

Appendix A: Inspection Guidelines

A.1 - Overview

This section describes Robot Inspection for the OPEN Program competition. It also lists the inspection ***definitions*** and inspection ***rules***.

A.2 - Description

The ***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. The official ***"Competition Inspection Checklist"*** is another important document which can be used by teams as a guide to pre-inspect their robot. The "Competition Inspection Checklist" can be found on the OPEN Program game page of the CREATE website: www.CREATE-Found.org.

A.3 - Definitions

- ***Robot*** – An operator-controlled vehicle designed and built by an OPEN Program. team to perform specific tasks while competing. The robot can be constructed using only approved components. No other parts will be allowed on the robot. Prior to participating in the competition, each robot will be required to pass an inspection.
- ***Robot Sizing Tool*** – A tool used during robot inspections which has interior dimensions 18 inches wide. The robot's height, width and length must fit within this tool without exerting ANY force on the edge of the tool.

A.4 - Inspection Rules

1. The team's robot must pass inspection before being allowed to compete. Noncompliance with any robot design or construction rule may result in disqualification of the robot at an event.
2. The Official Team Number must be displayed on the robot prior to inspection as defined in the Robot section of the manual.
3. Robot construction is constrained by the components a team may use as defined in the Robot section of the manual.
4. The maximum size of the robot for starting a Qualifying or Elimination Match is 18x18x18. The robot must fit within a Robot Sizing Tool. The robot must be self-supporting while the Sizing Tool is passed over it.
5. The starting configuration of the robot at the beginning of a match must be the same as a robot configuration inspected for compliance, and within the maximum allowed size.
6. If Robot designs have more than one possible starting configuration, the largest possible configuration must be used during size inspection.
7. When a team makes a modification to improve performance or reliability of their robot, the team may request a re-inspection of their robot by an Inspector.
8. Inspectors evaluate robots to ensure each robot has been designed to operate and function safely. The robot must be designed for safe operation and handling. Specific safety rules and limitations apply to the design and construction of a robot.
9. A robot is deemed successfully inspected when all items listed on the "Competition Inspection Checklist" have been recorded as passed by an Inspector.

Appendix B: Awards

B.1 - Overview

This section describes the awards for the OPEN Program competition. It also describes the format of ***judging*** and offers helpful hints for teams to be used in preparation.

B.2 – Types of Awards

There are three types of awards given to teams competing in the OPEN Program game:

On-Field Awards - Based solely on the scores obtained on the field.

Judged Awards - Based solely upon the scores received in the judged portion of the competition.

Hybrid Awards - Based on the combination of on-field performance, the judged portion of the competition, and social interaction throughout the tournament. Teams must do well in both the On-Field and Judged Award categories.

B.3 – Judging

Judging is done throughout the day. It is done informally by judges and event officials as they watch your team's interaction with event officials, referees, judges, other teams and fans, and how you relate to members within your team. There are two type of judging/judges interviews that occur at an OPEN Program tournament:

B.3.1 – Team Judging for Awards

Team judging is offered to every team attending an OPEN Program tournament. It has a formal structure as follows:

- ***Team Presentation*** – During the first three minutes your team will have an opportunity to present to the judges. Your focus can be your robot, how it works, and/or your engineering journey. You will be judged on presentation skills and technical knowledge.
- ***Scripted Questions*** – During the middle five minutes each team will be asked the same set of questions. A list of questions will not be available before the competition and each team promises not to discuss the interview until all interviews are completed. Some questions will be technical in nature, some will focus on your engineering journey, and others will focus on team interaction.
- ***Judges Questions*** – During the last two minutes the panel of judges may ask any question they would like.

B.4 – Helpful Hints

Awards are based upon each team's performance throughout the entire day. Please keep in mind that everything you do says something about you and your team. Judges and event officials will be with you in the pit area, playing field and all the common areas. The following are characteristics of winning teams:

- Respectful - Respectful of each other, other teams, officials and everyone at the tournament.
- Enthusiastic - Enthusiasm is contagious. Great teams have plenty of it and spread it around!
- Focused – Everyone on your team should have a role to play and should take their role seriously.

- Knowledgeable – Each member of your team should have a good understanding of your drone, drone add-on equipment and team-built game mechanism. They should know how team-built components were constructed and what decisions were made in the final design of these mechanisms.
- Each team member contributes to the presentation and to answering questions. It is perfectly acceptable to have one team member (student) lead the presentation. However, the best teams are careful to make sure that every member of their team has a part in the presentation.
- Engineering notebooks are VERY helpful for the judges in team judging. Teams are strongly encouraged spend the time to write a first-class engineering notebook. A well-written engineering notebook, which details not only your designs, both rejected and accepted, but also your journey as a team, will be looked on very favorably by the judges. The notebook is also an excellent way to prepare for your 8-minute interview as it helps you remember things that happened throughout the year and organizes your thoughts. Please keep in mind that all elements of the notebook are to be done by the students.
- Well run teams have coaches and mentors that understand that their role is to be a facilitator. During the interview all questions should be answered by the students only, unless specifically directed to a coach/mentor.

B.5 – Awards List / Descriptions

Not every award is offered at every competition. Awards are up to the Event Partner.

Honor Award - This is the highest award presented in a CREATE Open tournament. The recipient of this award

is a team that excels in all aspects of competitive robotics. On field performance, technical knowledge, interviews and interaction with all teams, fans and tournament officials will be taken into consideration in determining the winner of this award. The Honor Award is heavily weighted toward technical innovation, fair play and collaboration.

Amaze Award - The "Amaze" award will be presented to a team that has built a competition robot that clearly demonstrates overall quality. Solid mechanical design along with demonstrated robot strength, programming, robustness, performance and consistency are key attributes assessed for this award.

Build Award - The "Build" award will be given to a team that has built an impressive machine, with attention to features and safety. Judges will look for beautifully crafted and constructed robots that also show a clear dedication to

safety and attention to detail. These robots will have a professional feel and quality look to them, with clear attention to quality in construction.

Design Award - The "Design" award is presented to a team that demonstrates an organized and professional approach to the design process, project management, time management and team organization. The winning team will be able to describe how they created and implemented an efficient and productive design process to effectively manage their time and resources to accomplish their project goals.

Key Criteria:

1) Engineering Notebook is a clear, complete document of the team's design and build process

2) Team is able to explain their design and strategy throughout the season

3) Team demonstrates personnel, time and resource management throughout the season

4) Teamwork and interview quality

Energy Award - The "Energy" award will be decided based on team enthusiasm at the event. The winning team will demonstrate enthusiasm throughout the competition – in the pit area, on the field, in the audience, when their robot is playing and when it's not. This award will be judged and decided by the volunteers and staff at the event.

Innovate Award - This award is given to the team with the most innovative solution to the current year's challenge. Innovation is judged at multiple levels: 1) Highest level - Building non-kit or predominantly non-kit based robots which address the challenge in an effective and innovative way, 2) Intermediate level - Introducing additional components, (structural parts, motors, controllers, sensors) to predominantly kit based robots in an effective and innovative way, and 3) Base level - Using kit based parts/equipment in an effective and innovative way. Custom built parts, effective performance and innovative design are key attributes assessed for this award.

Robot Skills Champion - Presented to the # 1 ranked team in the Open Robotics Competition. Combing both the Driver and Programming scores.

Robot Skills Finalist - Presented to the #2 ranked team in the Open Robotics Competition. Combing both the Driver and Programming scores.

Sportsmanship Award - The "Sportsmanship" award will be presented to a team that has earned the respect and admiration of the volunteers and other teams at the event. This team is a model for all to follow and interacts with everyone in a positive, respectful and polite manner. This award is judged during the event by teams, referees and volunteers.

Think Award - The "Think" award will be presented to a team that has successfully utilized autonomous programming modes during competition. Quality, consistency and success of autonomous programs as well as the ability of the students to explain the programming process will help to determine a winner of this award. This award may be judged by the referees, programming inspectors and/or members of the judge panel.

Tournament Champion - Presented to the winning alliance of the Open Robotics Competition tournament.

Tournament Finalists - Presented to the runner-up alliance of the Open Robotics Competition tournament.

B.6 – "Honor by Design"

Honest – Follow the spirit of the rules of the competition. Do "what's right" when no one is looking.

Competitive – Always give your best. Be humble in victory and gracious in defeat. Be respectful of your teammates, coaches and mentors, competitors, judges and spectators.

Collaborative – Act in the best interest of the team's goals and be supportive of your fellow teammates. Share knowledge, tools, and parts with other teams.

Leader – Encourage, praise, involve and constructively challenge your teammates.

Professional – Works hard and is determined. Overcomes obstacles. Is well trained and acts in a professional manner.

Appendix C : Duals / Triangulars / Ad Hoc Tournaments

While most tournaments will follow the format described in Section 3, Event Partners have the option of other formats. Duals, Triangulars, and Ad Hoc Tournaments (which may follow similar formats to athletic events such as wrestling or tennis). If an Event Partner chooses to hold a tournament other than the type described in Section 3, the only teams to qualify for a State Tournament must come from skills scores only. Skills cannot be altered in a Dual, Triangular, or Ad Hoc Tournament.