



2004

Rules

READ THIS FIRST: To maximize performance and eliminate surprises, the team must take the time to read and understand FOUR documents: The Field Setup Instructions, the Missions & Scoring, the Tournament Terms & Rules, and the current Questions & Answers page on the web.

PRECEDENCE: When there is conflict between the wording of a Mission and a Rule, the Mission takes precedence. The current Questions & Answers page on the web takes precedence over all other Challenge documents.

CHALLENGE QUESTIONS: For official answers to questions about any aspect of the robot game part of the Challenge, including advance rulings on special strategies or situations, e-mail flitech@usfirst.org (most efficient) or call 1-800-871-8326, x118 (less efficient). When e-mailing, be sure to put "Challenge" in the subject line, and please state your role on the team (member, coach, parent, mentor). NOTE: flitech does not answer questions about building or programming the robot. NOTE: The FLL International Forum is great for sharing ideas, opinions, and tips, but it is not a reliable source of correct answers about the Challenge.

MATERIALS: The robot, its attachments, accessories, and all other Strategic Objects brought to a Match must be made entirely of LEGO elements in original factory condition. Electrical parts are limited in type and quantity to 1 RCX, 1 Rotation Sensor, 2 Touch Sensors, 2 Light Sensors, 3 Motors, 1 Lamp, and 6 AA batteries. Stickers, paint, tape, glue, oil, etc. are not allowed, except marker can be used for owner identification in hidden areas only.

SOFTWARE: The robot must be programmed using LEGO MindStorms Robotics Invention System or RoboLab software (any version).

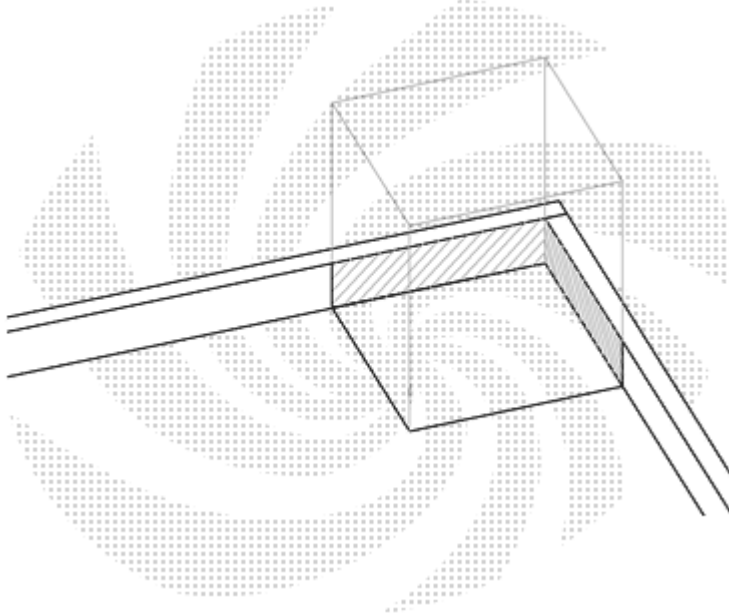
DOWNLOADING: One team's download can erase another team's programs and ruin their performance. Therefore, downloading is only allowed in the pit area, download settings must be kept on short range, the process must be shielded from surrounding teams, and the RCX should be kept OFF when not in use.

PARTICIPATION: Only two team members at a time are allowed at the field except during repair emergencies. To share in participation, members can switch out with each other between Mission Attempts.

MATCH: At a tournament, two Challenge fields are joined back to back, and each team is paired opposite another to compete in a Match. For 2-1/2 minutes, the robot tries to earn the best score it can by completing Missions. The timer never pauses during a Match. Each Match is a fresh chance for a team to earn its best score, and no Match has anything to do with another.

ROUND: The process of cycling all the teams through one Match each is called a Round. Most tournaments run at least 3 Rounds, and teams have plenty of time between their Matches to go to the pit area and work on the robot and its programs as needed.

BASE: Base is an imaginary box formed by vertical planes that rise from the perimeter of the Base area, including the inside surfaces of the border walls, and by an invisible ceiling 16in (40cm) high.



USE OF HANDS IN BASE: Before the start, and only when the robot is completely in Base during the Match, the team is allowed to make repairs, add or remove parts, load Strategic Objects or Deliverables, unload Retrievalables, set mechanisms, select programs, aim the robot, interact with sensors, and press buttons.

MISSION: A Mission is a job the robot can complete for points. Missions can be attempted in any order, alone or in groups, re-attempted when possible, or skipped. Points are earned if the required results on the field are still visible at the end of the Match.

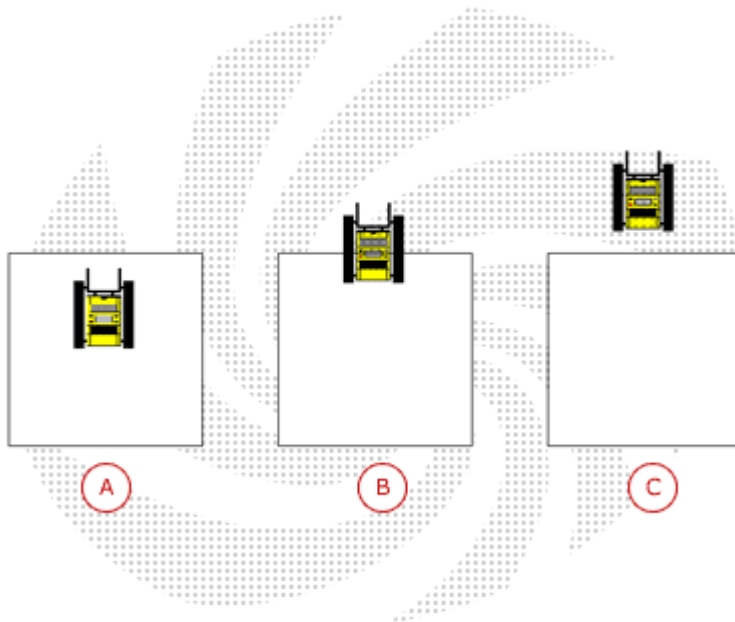
STARTING POSITION: At the beginning of the Match, and for all Restarts, all portions of the robot and its currently used attachments, Strategic Objects, and Deliverables must start from completely in Base as shown in the diagram labeled Robot Position.

Robot Position

A: Completely in Base

B: Crossing IN or OUT

C: Completely OUT of Base



STARTING TECHNIQUE: The team can start the robot by pressing a button, signaling a sensor, or simply letting go of it while it's running, but the team must no longer be touching the robot as it starts crossing out of Base.

HAND FORCE: The team is not allowed to push, roll, slide, or throw the robot or anything else out of Base.

AIMING: Alignment devices can be used to help aim the robot in Starting Position, but they must be made from the allowable Materials, and they must stay completely in Base.

ROBOT MUST LEAVE BASE: The robot must leave Base at least partially before it is allowed to do anything except travel and transport. Any changes made to the field before the robot starts crossing out of Base will be undone by the referee.

FORCED RESTARTS: Every time the robot is touched, it must immediately be returned to Starting Position unless it is already there.

RETURNING TO BASE: Except for Forced Restarts, the robot does not have to return to Base unless the team wants to handle it or unless a Mission requires it.

BONUS LOSS: If the robot is touched while completely out of Base, the referee removes one Bonus Object from the field if there are any available at that time. If the robot is touched while crossing in or out of Base, there is no Bonus Loss.

DELIVERABLES/RETRIEVABLES: Deliverables are objects which are worth points when moved to a place outside of Base. Retrievable objects are objects which are worth points when moved to Base.

DELIVERABLES, ROBOT TOUCHED: If the robot is touched while in contact with a Deliverable, the team gets the Deliverable back in Base for another try.

DELIVERABLES, POINTS: Points for a Deliverable are given as long as some portion of that Deliverable is at its destination, whether or not it is packaged or joined with others.

RETRIEVABLES, ROBOT TOUCHED: If the robot is touched while in contact with a Retrievable which has not reached Base and the object stays with the robot when carried to Base, the referee keeps that object off the field and it is not worth points. If the object stays on the field, it is covered under the Loss Of Contact and Stray Objects rules.

RETRIEVABLES, POINTS: Points for a Retrievable are given only if the robot gets some portion of that object to reach Base.

LOSS OF CONTACT: When the robot loses contact with a Deliverable, Retrievable, or Strategic Object, the team can not get that object back by hand.

STRATEGIC OBJECTS: Strategic Objects are team-supplied objects which the robot leaves on the field by design.

STRAY OBJECTS: Any object caused by the robot to be in the way of future Missions can be removed from the field by the referee upon team request unless doing so would have a direct effect on scoring.

ROBOT DAMAGE: At any time during the Match, the team can recover robot parts that come off as an obvious result of unintentional damage or disintegration. The team can do this by hand or request help from the referee.

FIELD DAMAGE: Changes in the field are never restored by hand for the sake of giving the team "more tries". However, if a Mission model breaks, malfunctions, or is moved or activated by anything other than allowable robot action, the referee reverses the problem as soon as possible and gives the team the benefit of the doubt if points are in question. If it is obvious to the referee that intentional field damage is part of team strategy, no points are awarded for related Missions.

SCORE DETERMINATION: To minimize controversy about what happened during a Match, THE SCORE IS DETERMINED AT THE END OF THE MATCH, BY THE CONDITION OF THE FIELD AT THAT TIME ONLY. This means that points are not awarded for accomplishments that the robot accidentally trashes before the Match ends.

BENEFIT OF THE DOUBT: In situations that too close to call, such as when a split-second or the thickness of a line is a factor, and in situations where a result can be soundly argued to two opposite conclusions, the team is given the benefit of the doubt.

AFTER THE MATCH: The referee and the team look at the field together and come to agreement about what points were earned or missed and why, and to be sure that the team is not walking away with any Mission Models.