

U.S. FIRST

The COMPETITION
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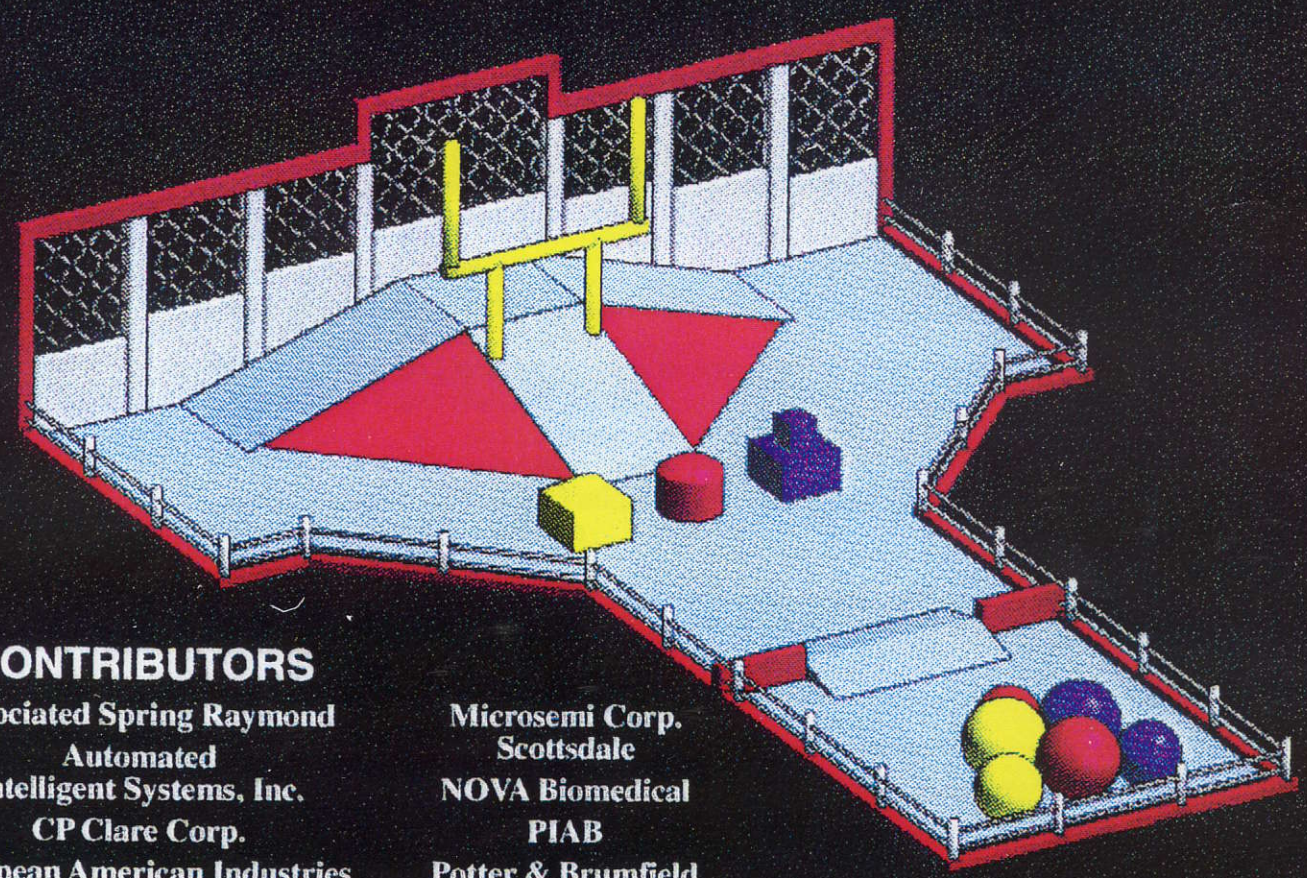
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The RULES

THE 1995 U.S. FIRST ROBOTIC COMPETITION RULES

TABLE OF CONTENTS

Section 1	Overview	2
Section 2	Safety Rules.....	3
Section 3	Machine Design & Operation.....	3
Section 4	The Kit of Parts.....	4
	Explanation of additional components in the Official Kit of Parts	
	Use of materials	
	Limitations on materials	
	List of components	
Section 5	Tournament & Play.....	15
	Tournament general guidelines	
	Specifics of game play	
	Regional results and seeding at the National Championship	
Section 6	Field.....	17
	Field diagrams	
Section 7	Control System.....	21
	Rules, manual, specifications, hook up instructions	
Section 8	Schedule of Events.....	44
	Regional tournament structure	
	National Championship structure	
	Registration & Practice	
	Seeding matches & Double elimination tournament	
	Timing between Regional Tournaments and National Championship	
	Shipping & transportation of machines	
Section 9	Administrative Details	47
	Before you come to the Competition..	
	Pit Station	
	Submission Deadlines: team profiles, guest lists, Chairman's Award	
	Before you leave the Competition..	
	Returning unused kit parts and container	
	Taking your machine back with you	
	Event locations, dates and addresses, & hotel information	
	U.S. FIRST staff & numbers	
Section 10	Awards	51
	Chairman's Award	
	Founder's Award	
	Judges' Awards	
Appendix	Team Directory	52
	Supplier Directory.....	60
	Small Parts Inc. ordering procedure & supplement.....	63
	Autodesk Animation Celebration.....	69
	Manufacturers Specifications	71

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OVERVIEW

COMPETITION OBJECTIVE *(Also see Section 5)*

To design and build a remotely-controlled robot that can collect, transport and lift one 24" and/or one 30" diameter ball over a horizontal bar. The playing field is a carpeted modified T-shaped area. The goal area is made up of three ramps and two slopes leading to a square platform. In each match, three teams compete to put their own balls over a field goal. Two points are scored with the smaller ball and three points with the large ball. The winner of each match is the team with the highest score. In the case of a tie, the higher large ball in the goal area breaks the tie. If no balls are within the goal area, the large ball closest to the center of the top of the platform wins.

EVALUATION & AWARDS *(Also see Section 10)*

The winner of each match will be the team with the highest score at the end of two minutes. The overall winner will be determined in a double elimination tournament. The recipients of the various Judges' Awards and the prestigious Chairman's Award will be determined by an independent panel of judges.

CONSTRAINTS

Materials *(Also see Section 4)*

Each machine must be constructed exclusively from materials provided in the Kit of Parts ("The Kit") supplied by U.S. FIRST, with the following additions and exceptions:

- 2' x 4' x 1.1" Rohacell™ structural foam shipped directly to each team from the manufacturer
- up to \$425 worth of materials purchased from the Small Parts Catalog
- *Additional Hardware* available from outside sources. A specific list of materials and quantities is provided with the *List of Components*.
- fasteners, washers and adhesives from outside The Kit may be used for joining and fastening purposes only
- adhesive tape may be used only as an electrical insulator
- lubricants may be used only to reduce friction within your own device
- The Kit container may not be used to build the device.

Control System *(Also see Section 7)*

You *may not* tamper with the Control System even though it is part of The Kit.

Energy Sources *(Also see Section 3)*

The energy used by the machines in the Competition must come solely from:

- electrical energy derived from the onboard battery packs
- storage achieved by deformation of springs or the latex tubing provided in The Kit
- a change in the altitude of the device's center of gravity.

Size & Weight *(Also see Section 3)*

Machines must fit, unconstrained, inside a cylinder 36 inches in diameter and 30 inches in height. The weight of the machine including batteries may not exceed 70.0 pounds.

Shipping *(Also see Section 8)*

Shipping rules and deadlines vary by events in which your team is participating. See *Administrative Details* for specifics. UPS is sponsoring complimentary shipping; however, you may use the shipper of your choice.

SAFETY RULES

- S1. Safety first. Due to the nature of the event in which electrical equipment, springs and tools are used, safety will not be compromised.
- S2. Any machine which is determined to be a safety hazard by the referees at any time during the Competition must be sufficiently modified to the referees' satisfaction or it may be disqualified and not allowed to compete.
- S3. No energy stored in a rubber band may be used to launch any projectile. This does not apply to the latex tubing provided in The Kit.
- S4. Projectiles must have a frontal area greater than or equal to 10 square inches and be shaped to avoid eye injury. Competition balls are considered safe projectiles and are the only projectiles the latex tubing may launch.
- S5. Do not tamper with power supplies, batteries, chargers, battery boxes, or any control system component. In addition, do not apply labels or otherwise mark these components. We will re-use them and your identification may cause confusion.
- S6. Safety glasses must be worn by all team members in the team boxes during matches, and in the pit area when working on machines. They are also highly recommended if your neighbor(s) in the pit are working on their machine.
- S7. Remove batteries from the holders while making adjustments to your machine. Due to the strength of the motors in The Kit, it is important to keep fingers away from the gears while your machine is connected to a power supply.
- S8. The batteries may deliver more than 100 Amperes. Do not let the wires come into contact with any metal surfaces. Route wires carefully to avoid damage and short circuits, which may cause serious burns and/or fire.

MACHINE DESIGN & OPERATION

Size \leq 36" \varnothing x 30"; Weight \leq 70.0 pounds

- M1. Your vehicle may not exceed the above size and weight requirements before the seeding rounds begin. There are no restrictions on the orientation of the cylinder when measuring a machine.
- M2. All machines will be weighed and measured during the practice day at each Competition event and may be reinspected anytime during an event. If modifications to your machine are necessary to meet the above requirements, they must be completed before seeding matches begin.
- M3. Teams are expected to design and build machines to withstand vigorous amounts of interaction with other machines. (Also see Rule T7.)
- M4. Until the controls are enabled at the beginning of each match, machines and any appendages, extensions or projectiles must remain unconstrained within the 36" \varnothing x 30" starting size. Once a match begins, machines may extend beyond that limit under their own power.