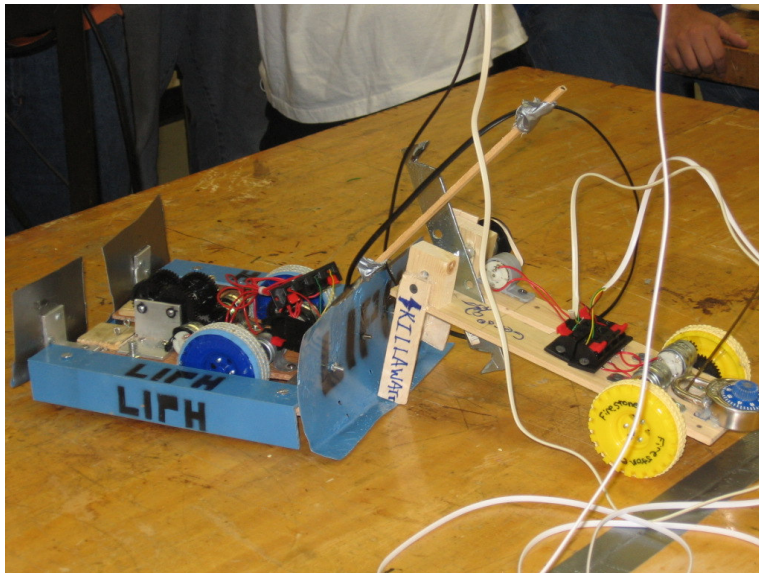


3rd Annual



Lightning Robotics



Sumo Bot Competition
June 2^{ed}, 2007

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Italicized parts are new additions to the rules
~~Lined Out~~ parts are no longer a part of the rules

Sumo Arena Description

Arena Floor. The Sumo Arena Floor measures 8 feet by 7 feet 11 inches and is made of two 4 foot x 8 foot sheets of 23/32 inch thick particle board. The divide between the two field halves will be covered with a single strip of black duct tape. The two sheets are framed underneath along all four sides by 2x4s. The two floor halves are held together by five 4 inch long .5 inch thick bolts. The Sumo Arena Floor sits on the floor of the competition venue.

Wire Tower. The Sumo Arena Tower is made of 1 inch PVC pipe. Four vertical poles stand in the corners; these poles mount to the Sumo Area Floor through 4 end caps which are bolted to the floor 2 inches square from the corners by 1/4 inch thick bolts. The vertical poles end in 90 degree elbows. 4 horizontal poles run from the elbows to a central 4-way connector above the center of the field. The Wire Tower structure stands 4.5 feet above the Sumo Arena Floor.

Playing Field. The Sumo Arena Playing Field sits on the Sumo Arena Floor; the main features of the 2007 Playing Field are two Platform & Ramp sets. The Platforms are constructed of a 1 foot by 2 foot sheet of 5.2mm thick Luan mounted on two 2 foot long sections of 2x4 which run along the two long sides of the Luan sheet. The 2x4's are mounted so their "4 inch" sides mount against the Luan & Arena Floor. The platforms are located so their centerline of the 1 foot side runs along centerline of the field and so the inner 1 foot side is offset 6 inches out from the center of the Floor. The top of the platforms will sit 1.707 inches above the Arena Floor. Four main ramps provide access onto the platforms these ramps are 2 feet wide and start 1 foot from the long sides of both platforms. The main ramps are each supported from underneath by three angled 2x4 struts. Two side ramps will also provide access to the platforms from the two short sides on the outer edge of the arena; these ramps are 1 foot wide and start 9 inches from the outer side of each platform. They are each supported by two angled 2x4 struts. The placement of the two platforms & 4 ramps creates a three foot long 1 foot wide alley in the center of the field. The center of the alley (between the two platforms) will have a 1 foot square piece of shelf liner, aprox. 1/8 inch thick mounted to the Arena Floor. The areas of the ally between the two sets of ramps will each have a 1 foot square sheet of clear Acrylic 1/8 inch thick sheet mounted to the Arena Floor, these two sheets will have a logo sheet under them. The outermost three inches of the arena floor will also be covered with shelf liner. Starting boxes are located along the 8 foot length of the field (one on

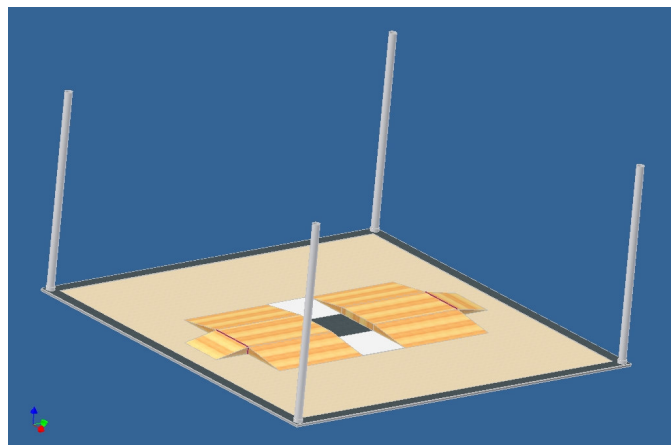
each side), the starting boxes are 15 inches square & are define by the outer edge of the ¼ inch wide black crepe tape on three sides & the edge of the Arena Floor along the fourth. Starting boxes are centered along the edge & marked with either an **I** or **II** to identify the box.

Wires. The Sumo Arena Wires are 12 feet long straight phone cords with 4 stranded wires per cord. Cords have both ends cut off and the inner wires split and the ends striped. There are a total of 4 cords on the Sumo Arena 2 per robot.

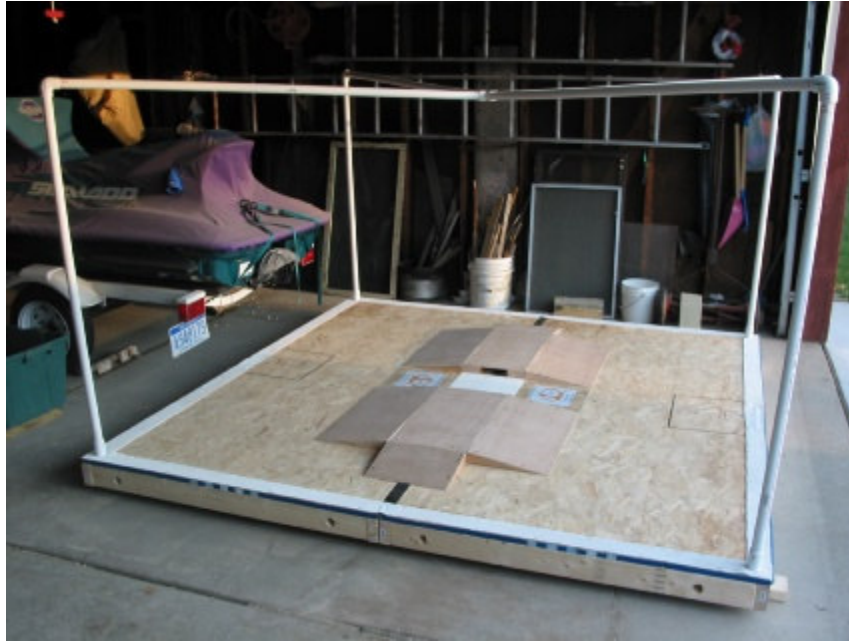
Driver Stations: Each of the two Sumo Arena Driver Stations is 2 feet long by 1.5 feet wide three level carts, with the top level 3.4 feet above the room floor. Driver Station's will be positioned opposite each other so that their 2 foot long side is parallel to & about 2 feet away from the 8 foot long sides of the table. Each Sumo Arena Driver Station has one Controller Box and one Controller Pad.

Controller Boxes. The Sumo Arena Controller Boxes are KELVIN Wired SUMO® Wrestler Controller, Deluxe. They have the ability to control 4 motors each; they have a high or low power selector switch; drivers may choose to use either high or low power. High Power: 17.6 volts, 1/16 amp // Low Power: 17.6 volts, 1/32 amp

Controller Pads. The Sumo Arena Controller Pads are KELVIN Apache Controllers. They have two plugs that connect to two ports on the Sumo Arena Controller Boxes. Each has two sets of four buttons. Depending on how you wire your robot in one set of four buttons, one will drive both motors forward, one will drive one forward and the other backward, one will do the reverse on previous one, and one will drive both motors backward.



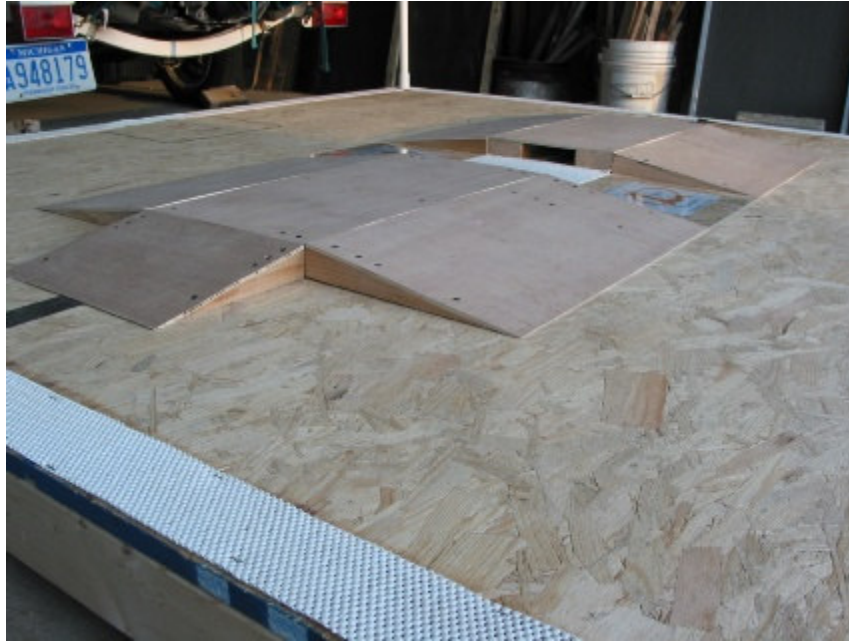
CAD Representation of the Field



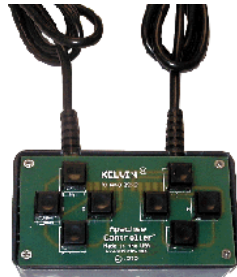
2007 LRSBC Field & Wire Tower



2007 LRSBC Field



Platforms & Ramps close-up



Controller Pad



Controller Boxes

Kit of Parts

Kits are KELVIN Wired SUMO® Wrestler Kit, Deluxe

1 wood blank
1 piano wire
8 eight inch wires
2 three inch diameter wheels (yellow or blue)
1 castor
4 pulley packets
4 gear packets
2 motor brackets (metal)
2 Large Motors
2 Small Motors
1 terminal block
4 rubber bands
6 bolts
2 axle rods
8 small screws
2 large screws
4 eye screws
2 spacers
2 adapters (2mm to 3mm)
1 two inch piece of tubing
1 Instruction Packet

Small Motor



Voltage Range: 3.0- 6.0
Nominal Voltage: 6
Current (amps): 0.26
RPM (max.): 17,000
Torque (g/cm): 20.72
Terminal Type: Solder
Shaft Diameter (mm): 2
Shaft Length (mm): 6.5
Size (D x L mm): 23.5 x 27

Large Motor



Voltage Range: 6.0 – 12.0
Nominal Voltage: 12
Current (amps): 0.14
RPM (max.): 12,500
Torque (g/cm): 44.2
Terminal Type: Solder
Shaft Diameter (mm): 2
Shaft Length (mm): 10
Size (D x L mm): 24 x 32

Pictures not to scale

Robot Rules

- R1.** At the beginning of every match, the MAXIMUM allowed size of your robot is 12 inches by 10 inches by 15 inches tall.
- R2.** Your robots MAY NOT weigh more than 4 pounds. This rule excludes the allowed onboard batteries. **Please be advised the KOP Drivetrain may not be powerful enough to move a robot that weighs more than about 2 lbs!**
- R3.** You may spend a total of \$50 on materials not in the kit to use on your robot.
- R4.** In addition to the eight wires coming from the Controllers Boxes, you may utilize two nine volt alkaline batteries to power your robot and you may control them however you wish. Any custom controller system counts towards your spending limit outlined in rule **R3**.
- R5.** The only motors you may use are those found in the KOP or their identical replacements, in any combination up to a grand total of 4 motors.
- R6.** You may only use one robot through out the entire competition.
- R7.** You MAY NOT use a previously built robot.
- R8.** You may NOT use any fabricated parts from previously built robots.
- R9.** You may not have any device that interferes with the electronic workings of your opponent's robot; mechanical, electrical, or otherwise.
- R10.** These items don't count towards your \$50 limit: paint, glues/ epoxies, solder, and any non-functional decorations.
- R11.** Only materials ON your robot count towards your \$50 limit. (i.e. spare or replacement parts don't count). With the exception of a custom controller as outlined in **R4**.
- R12.** You may not use any device that causes severe damage to your opponent's robot. Severe damage is defined as completely destroying your opponent's robot in one hit. Remember the goal is to PUSH your opponent off the Field, devices should be used to help get it off the Field.
- R13.** Devices may not be designed to leave your robot.

R14. Devices may not have sharp blades. (Must be able to run finger along edge without cutting skin.)

R15. No flames or explosives are allowed to be used on your robot.

R16. No compressed gasses besides air may be used on your robot.

R17. (More of a guideline than actual rule) Be creative decorate and name your robot.

Competition Rules

C1. Participants will be equally placed into the Competition Bracket positions by random selection the morning after Kickoff, Competition Bracket positions will be announced the day of competition.

C2. Any open slots in the brackets will be filled with automatic bye in rounds, the slots will be chosen at random before the participants are placed into their slots, only one bye will be allowed per match, unless there is a no show for a match.

C3. Matches will be played in numerical order.

C4. The following awards will be given out to those who fit the criteria listed with them:

*LRSBC Coolest Robot – Voted Coolest Robot

*LRSBC Finalist– Lost LRSBC Final Match

*LRSBC Champion – Won LRSBC Final Match

C5. Safety Glasses MUST be worn when: A) Driving in a match, B) Using a power tool, C) around someone using a power tool.

It is recommended that Safety Glasses be worn while watching matches (IF a match seems like it may require it everybody will be asked to wear safety glasses.)

C6. When viewing a match PLEASE sit or stand back from the edge of the Sumo Arena (i.e. Please do not sit on or lean on or against the Sumo Arena.

C7. Spectators may not interfere with any robot or its wires while it is on the field during a match. (Also stated in rule **M7.**) If this occurs the match will be restarted.

C8. The maximum capacity of participants in the 2007 LRSBC is 32.

C9. Spare parts for most of the larger items in the KOP will be available. (Please keep in mind that the Spare Parts will be off of old Sumo Bots, i.e. used parts)

C10. Music will be allowed to be played during matches ONLY if BOTH drivers agree to allow it. All music must be appropriate for the school setting.

C11. Competition is single elimination except the final match which will be best 2 of 3.

Match Rules

- M1.** To win a match your opponent's robot must fall off the field. Exceptions made in rules M2, M3, M4, & M5.
- M2.** If your robot is crippled to the point it can no longer move it is considered a loss.
- M3.** You may, if you see fit surrender a match to your opponent and it will count as a loss.
- M4.** If your robot is pinned and can not move it will count as a loss.
- M5.** If a stale mate occurs a vote of all contestants who were watching, on who was more aggressive, will be taken to decide the winner. Referee has final word.
- M6.** You get one minute after your match is called to get your robot to the Sumo Arena and ready to compete. Failure to do this will result in forfeiting the match.
- M7.** No one may touch either robot or their wires at any point during a match.
- M8.** Robots MUST start each match in the 15" square Starting Box directly in front of their owner's Driver Station, and in its starting position outlined in rule R1.
- M9.** Intentional damaging of the sumo arena may be grounds for a disqualification. (A driver is in full control of his robot and using devices to damage field instead of engaging opponent)

Extra Information

Full Kelvin Sumo Bot catalogues can be found at:

www.Kelvin.com

Click on the Sumo Cars link

Then click on the wired Sumo Cars link

You may ask questions at:

www.lightningrobotics.com

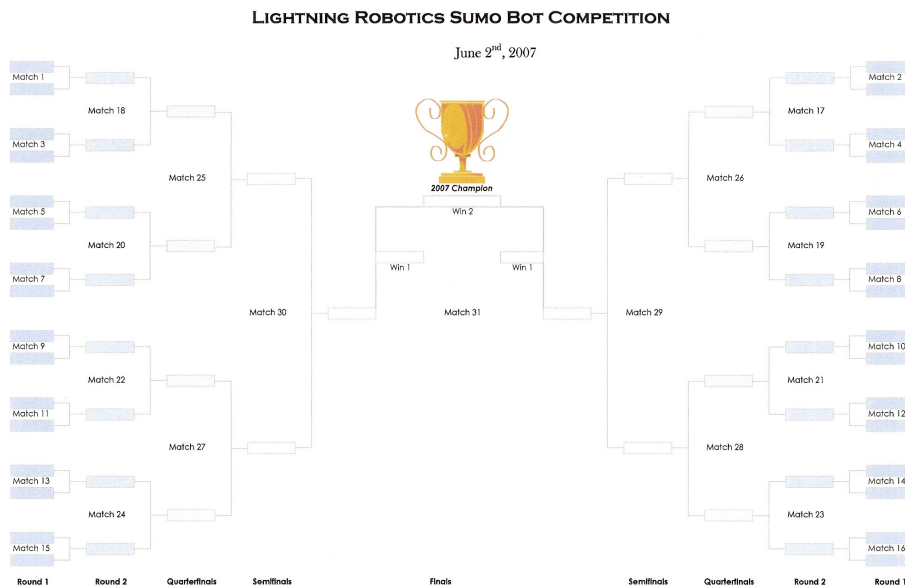
Click on: Forums

Click on forum: Lightning Robotics Sumo Bot Competition

Click on Sub-forum: LRSBC Q&A

Read: Asking a Question, thread first

Post your question in a new thread.



2007 Competition Bracket

Credits

LRSBC Committee

Joe Jagadics, Founder & Committee Chairman

Brian Graham, Competition Design Advisor

Matt Korzeniowski, Competition Design Advisor

Jay Obsniuk, General Advisor & Referee

Lightning Robotics Sumo Bot Competition

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