

Spring 2003 Simple Machines Robotics Competition

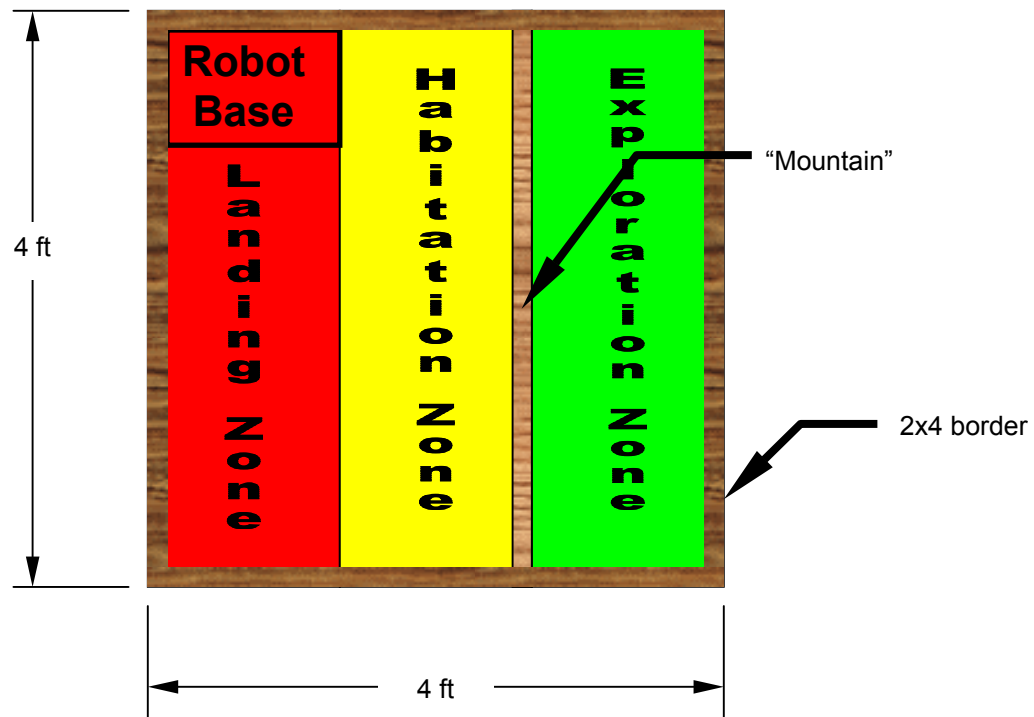
Hogg Middle School

March 8, 2003

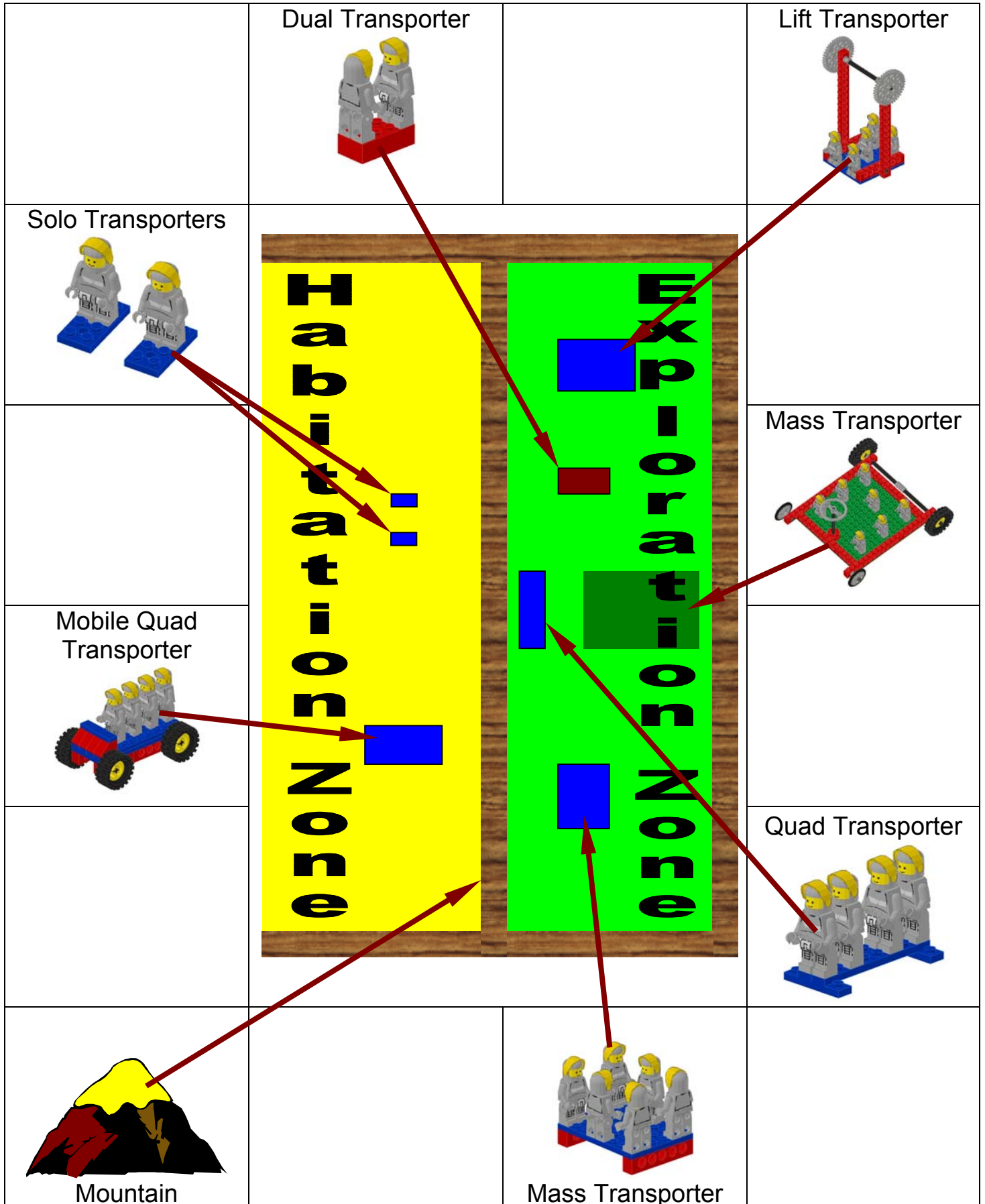
Roboticists, the LEGOnauts have explored LEGO Centauri and it's time for them to return to Earth. Wow, you did an incredible job of helping the LEGOnauts explore. If you accept, it is your mission to return the exploration team to the LANDING ZONE. Since the transporters were damaged during the landing, we need you to develop a robot that will help transport 30 LEGOnauts from the EXPLORATION and HABITATION ZONES to the LANDING ZONE. Are you ready to step up to the challenge?

Below is everything that we know about the mission.

- The team must be ready to execute the mission on March 8, 2003 at Hogg Middle School.
- The equipment available for a team to build a robot or robots is 3 LEGO Motorized Simple Machines Kits.
- The following diagram presents the environment that will be encountered.



- The following diagram presents where the LEGOnauts will be in the HABITATION and EXPLORATION ZONES.



- The team has 2 minutes to complete the mission.
- The team scores 5 points for each LEGOnaut in the LANDING ZONE.
- The team scores 2 points for each LEGOnaut in the HABITATION ZONE.
- The team's score is determined at the end of the 2-minute mission.
- A LEGOnaut counts if any part of the LEGOnaut is breaking the plane of the zone.
- If a LEGOnaut becomes disassemble (e.g. helmet comes off), the position of the LEGOnaut's torso is what will determine the score.
- The mountain is considered part of the HABITATION ZONE.
- The ROBOT ZONE is part of the LANDING ZONE.
- A LEGOnaut in both the HABITATION ZONE and LANDING ZONE counts 5 points.
- The team's robot/robots and all parts must start inside of the ROBOT BASE at the beginning of the 2-minute mission.
- The ROBOT BASE is the 12" x 16" boundary extended vertically (i.e. the robot can not hang over the line at the beginning of the mission).
- The line indicating the ROBOT BASE is NOT part of the ROBOT BASE.
- The team can touch their robot without penalty when the robot is partially inside the ROBOT BASE but after touching, the robot must be completely inside the ROBOT BASE to continue the mission.
- The team's robot/robots must start inside of the ROBOT BASE every time it is returned to the ROBOT BASE during the mission (i.e. no part of the robot can be breaking the plane of the ROBOT ZONE line after being touched by a team member).
- A penalty of 5 points will be assessed if a team touches their robot, including parts that have become separated from the robot, which is outside of the ROBOT BASE.
- If a robot is touched, the robot must be returned to the ROBOT BASE to continue the mission.
- The controller and wire are NOT considered part of the robot.
- The robot shall not have any elastic stored energy (i.e. stretched rubber band) when the mission begins or when the robot is returned to base but elastic stored energy can be generated from activating a motor.
- The controller and wire can ONLY be used to provide electrical power to robot motors (i.e. it can not be used to drag the robot, corral LEGOnauts, etc.).
- If a controller or wire are used illegally (judges call), the team will be required to immediately place the robot back in the ROBOT BASE to continue the mission.
- A team may touch any playing piece (Lift Transporter, Mass Transporter, LEGOnaut, etc.) COMPLETELY inside the ROBOT BASE without penalty.
- If a playing piece is illegally touched, the playing piece along with all attached pieces will be removed from play for the remainder of the mission.
- A playing piece is NEVER considered part of the robot.
- A penalty of 10 points will be assessed for each LEGOnaut that leaves LEGO Centauri (i.e. the playing field).

Frequently Asked Questions

Do we need to bring the transporters (game pieces with LEGOnauts) to the tournament?

- No, you only need to bring your robot. There will be 2 playing fields (transporters, wooden table, & mountain) set up for the competition when you get to Hogg on March 8th.

How many rounds will we compete in?

- Each team will have a minimum of 3 rounds (morning) in which they compete.

Does the LEGOnaut count as "in a zone" if the transporter which it resides is "in the zone"?

- The LEGOnaut is "in a zone" if any part of the LEGOnaut crosses the plane of the line. The transporter location does not matter.

Can the team modify a robot while it is in the base?

- Yes, they can add or subtract without penalty as long as the "stuff" they bring to the table is not from more than 3 Simple Machine kits. They can also load (transporters and LEGOnauts that are in base) without penalty. Remember, all of the "stuff" must fit in the ROBOT BASE at the beginning of the mission.

If the transporters or LEGOnauts fall apart, is there a penalty?

- No, it is not a penalty but intentional destruction is not allowed. If destruction (intentional or unintentional) is occurring AND the team does not heed a warning given by the referee (ex. "Hey guys, please quit running the transporter into the wall like that", the judge will instruct the team to retrieve the robot (with penalty) and start a new mission. Finally, some of the transporters will be "glued" together but none of the LEGOnauts will be glued to the transporters.

May we glue our robot together?

- NO! There should be no other materials other than that of the 3 Simple Machines Kits used. Please remember that these kits have to be used for future competitions.

May we modify the LEGO?

- No, LEGO bricks and parts cannot be modified in any way. Even the strings can not be cut to make shorter strings. Please remember that these kits have to be used for future competitions.

Should our robots be built when we arrive for the competition at Hogg on March 8?

- Yes, please be ready to compete when you arrive at the competition. Learn the game ... build a 'bot ... practice ... make your 'bot better ... practice ... make your 'bot even better ... practice, practice, practice.

Please contact Lucien at Lucien.Junkin@jsc.nasa.gov with any questions or comments.

Thank you for maintaining the spirit of the game!