Engineering And Robotics Learned Young

◈ EARLY ◈

Spring 2006 Robotics Competition

Roboticists, your creativity and hard work helped the Global Association of Space Agencies (GASA) extract all the raw materials needed to begin colonizing the Moon! Since you did such a great job, GASA is requesting your help again to return all of the Processed Moon Rocks from the Lunar Regolith Processing Facilities to the Construction Zones. Thank you again for helping colonize the Moon so future generations can be picnicking, biking, hiking, and camping on Mars and beyond!

Below is everything that we know about the mission.

- The team must be ready to execute the mission for your EARLY Tournament.
- 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.

Field
48" x 48" x 3/8" plywood

Field Perimeter
2" x 4" boards

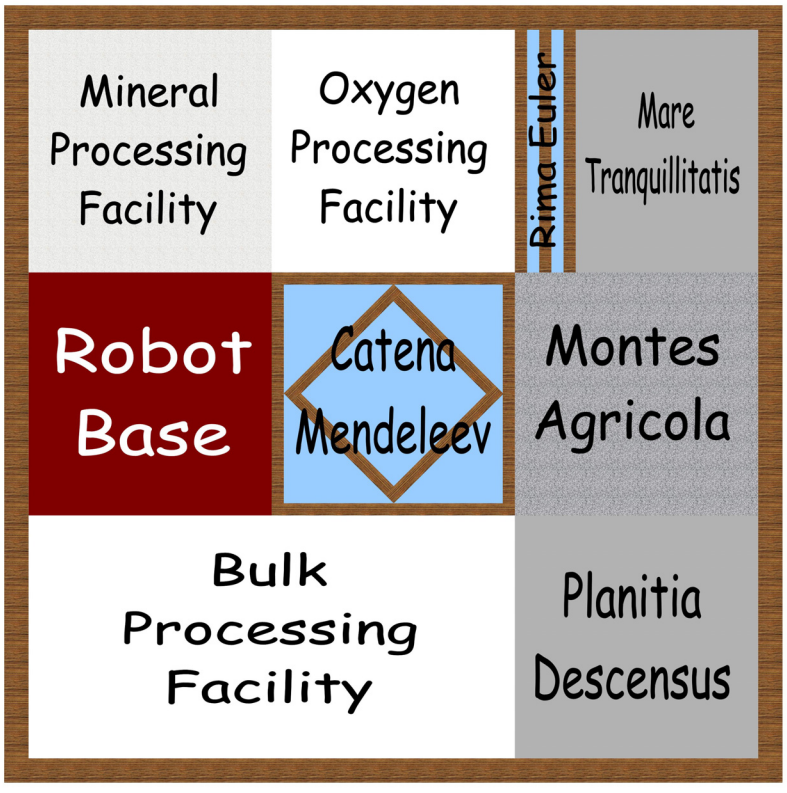
Mineral Processing Facility
15" x 15"
$\frac{3}{4}$" plywood

Oxygen Processing Facility
15" x 15"

Robot Base
15" x 15"

Catena Mendeleev
15" x 15"
$\frac{3}{4}$" x $\frac{1}{4}$" molding perimeter & inscribed square rotated 45 degrees

Bulk Processing Facility
30" x 15"



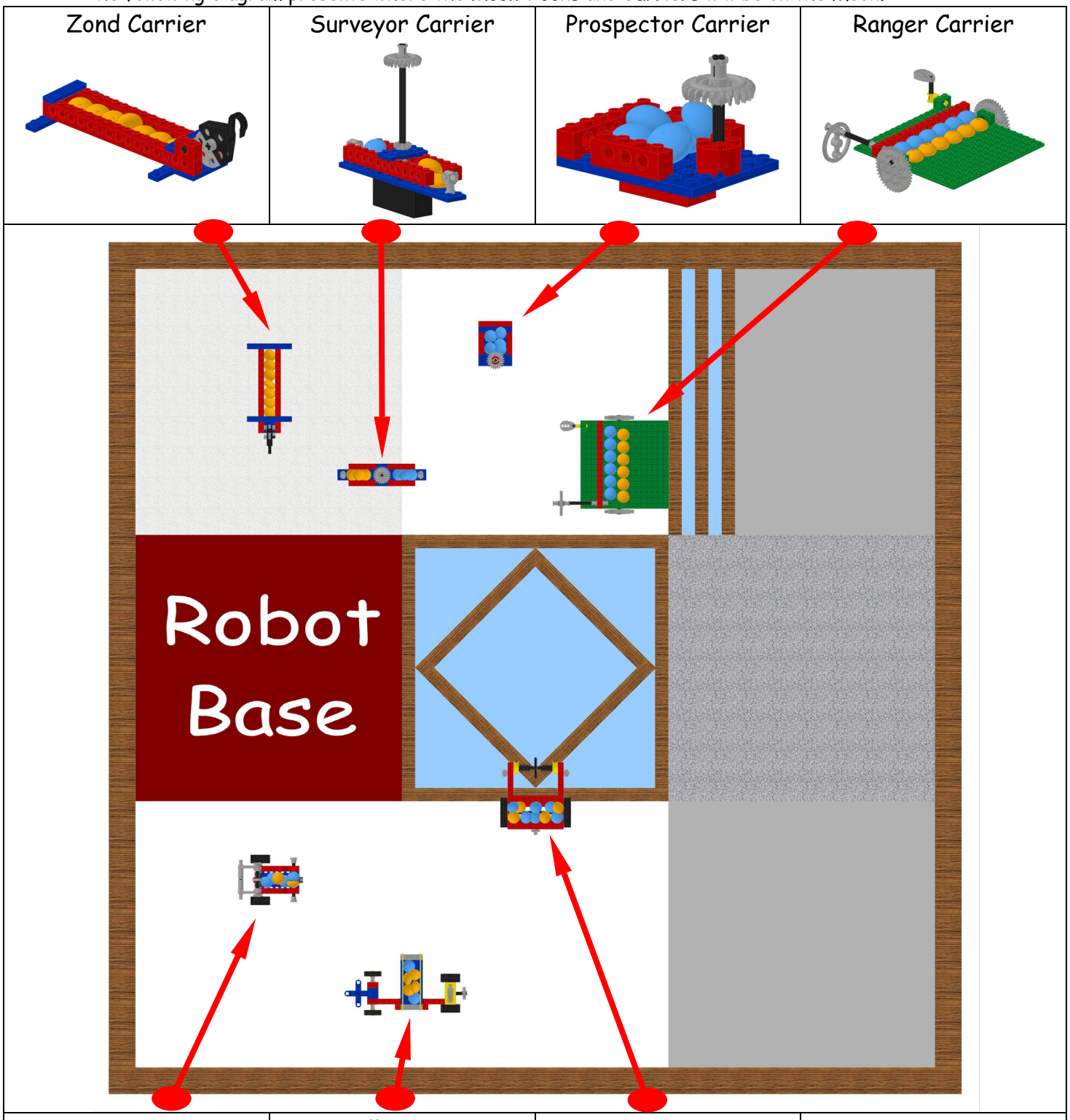
Rima Euler
$3\frac{3}{4}$" x 15"
$\frac{3}{4}$" x $\frac{1}{4}$" molding equally spaced

Mare Tranquillitatis Construction Zone
$11\frac{1}{4}$" x 15"

Montes Agricola Construction Zone
15" x 15"
$\frac{3}{4}$" plywood

Planitia Descensus Construction Zone
15" x 15"

- The following diagram presents where the ***Moon Rocks*** and ***Carriers*** will be on the Moon.



Mission Rules

1. The team has 2 minutes to complete the mission.
2. There are 52 ***Processed Moon Rocks*** on the playing field at the beginning of each mission, represented by blue and amber flat marbles. The 26 blue flat marbles and 26 amber flat marbles are all ***Moon Rocks***.
3. The team's score is determined at the end of the 2-minute mission.
4. If a ***Moon Rock*** is moving when time expires, the referee will wait until the ***Moon Rock*** has stopped moving before determining it's scoring position.
5. The team scores **1** point for each ***Moon Rock*** in the **PLANITIA DESCENSUS CONSTRUCTION ZONE**.
6. The team scores **3** points for each ***Moon Rock*** in the **MARE TRANQUILLITATIS CONSTRUCTION ZONE**.
7. The team scores **5** points for each ***Moon Rock*** in the **MONTES AGRICOLA CONSTRUCTION ZONE**.
8. A ***Moon Rock*** counts as in a **CONSTRUCTION ZONE** if it is breaking the plane of one of the **CONSTRUCTION ZONE**.
9. A ***Moon Rock*** that is breaking the plane of both the **PLANITIA DESCENSUS CONSTRUCTION ZONE** and the **MONTES AGRICOLA CONSTRUCTION ZONE** counts as in the **MONTES AGRICOLA CONSTRUCTION ZONE**.
10. A ***Moon Rock*** that is breaking the plane of both the **MARE TRANQUILLITATIS CONSTRUCTION ZONE** and the **MONTES AGRICOLA CONSTRUCTION ZONE** counts as in the **MONTES AGRICOLA CONSTRUCTION ZONE**.
11. A ***Moon Rock*** may never go into the **ROBOT BASE**. Any ***Moon Rock*** that breaks the plane of the **ROBOT BASE** shall be removed from field. In addition, if a ***Moon Rock*** breaks the plane of the **ROBOT BASE** AND is on a ***Carrier***, the ***Carrier*** along with all ***Moon Rocks*** on the carrier shall be removed from the field. Therefore, teams may not return ***Moon Rocks*** to the **ROBOT BASE** and then transport them to a **CONSTRUCTION ZONE**. *Please note that **Moon Rocks** were allowed in the **ROBOT BASE** in the **EARLY Fall Challenge**; this rule is to make the Spring Challenge more challenging than the Fall Challenge.*
12. Only the parts that are contained in three Motorized Simple Machine kits may be used to construct the robot (i.e. no other materials such as glue may be used on the robot). The kit parts may not be altered.
13. The team's robot/robots and all parts must start inside of the **ROBOT BASE** at the beginning of the 2-minute mission (i.e. no part of the robot may be off the playing field when the mission starts). However, the parts do NOT have to be assembled together. Parts can be removed and returned to the field during the 2-minute mission.
14. The **ROBOT BASE** is the 15" x 15" boundary extended vertically (i.e. the robot can not hang over the line at the beginning of the mission).
15. 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.
16. Any ***Moon Rock*** or ***Carrier*** that remains with the robot when the robot is retrieved shall be removed from the field.

17. 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 BASE** boundary after being touched by a team member).

18. A penalty of 10 points will be assessed if a team touches their robot, including parts that have become separated from the robot, that is outside of the **ROBOT BASE**.

19. If a robot is touched, the robot must be returned to the **ROBOT BASE** to continue the mission.

20. If a ***Moon Rock*** is touched, the ***Moon Rock*** shall be removed from the field for the remainder of the mission.

21. If a ***Carrier*** is touched, the ***Carrier*** along with any ***Moon Rocks*** it contains shall be removed from the field for the remainder of the mission.

22. A ***Carrier*** is NEVER considered part of the robot.

23. The controllers and wires are NOT considered part of the robot.

24. 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.

25. 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 ***Moon Rocks*** or ***Carriers***, etc.).

26. If a controller or wire is used illegally (referee's judgment), the team shall be required to immediately place the robot back in the **ROBOT BASE** to continue the mission.

27. ***Moon Rocks*** are very valuable. A penalty of 10 points will be assessed for each ***Moon Rock*** that leaves the field during the mission.

28. All referee rulings are final and may not be appealed.

Please visit the EARLY Neighborhood Forums at www.EARLYrobotics.org or contact Mission.Control@EARLYrobotics.org with any questions or comments.

Thank you for maintaining the spirit of the game!