

Engineering And Robotics Learned Young

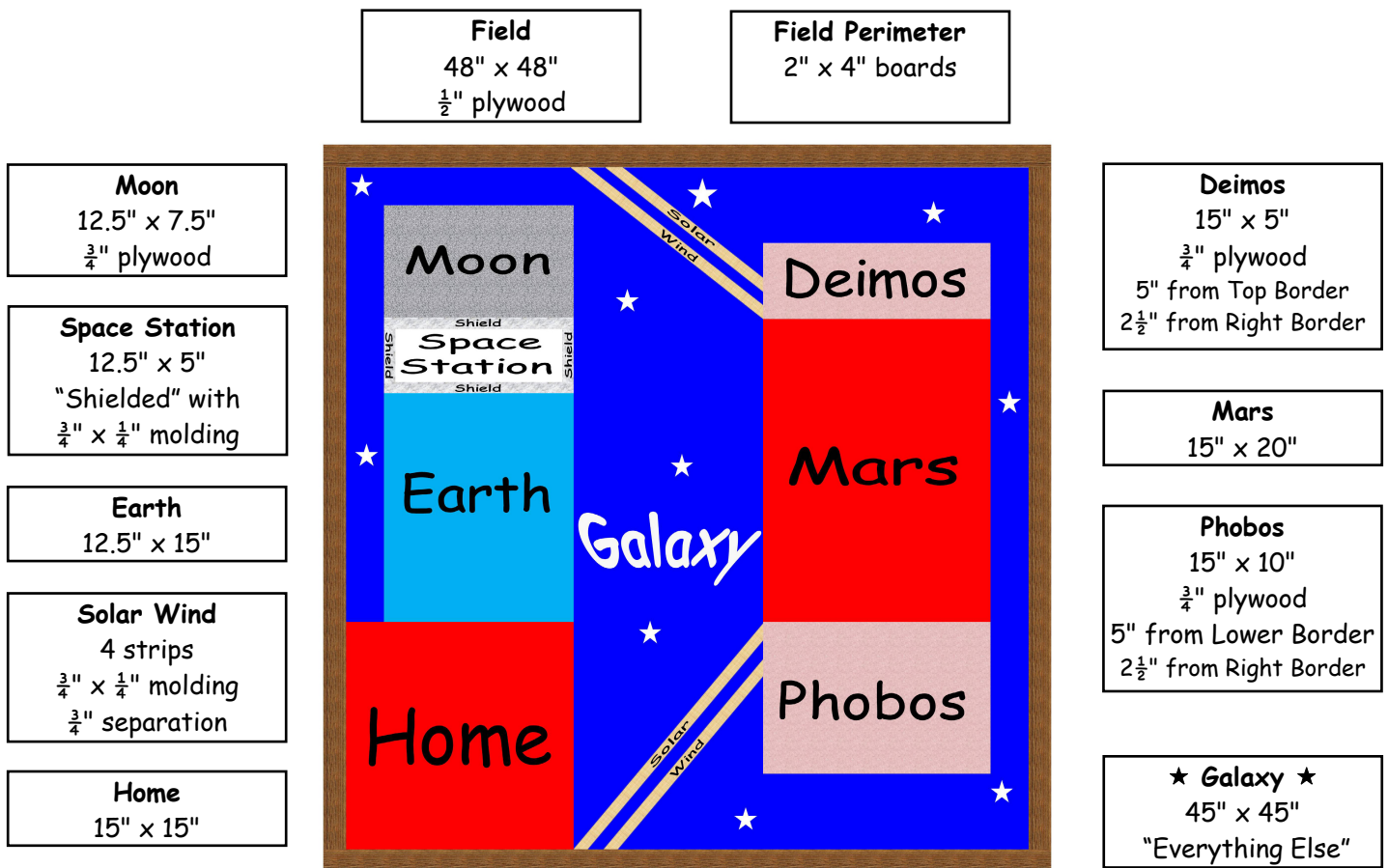
◆ EARLY ◆

Spring 2012 Robotics Competition

Roboticists, the Global Association of Space Agencies (GASA) thanks you for helping future generations picnic, bike, hike, and camp on Mars! GASA now needs you to build a robot to help replenish the Mars Atmosphere Construction Kits (MACKs) by returning the MACKs to the Earth, Moon, and Space Station. Please help GASA continue to colonize Mars!

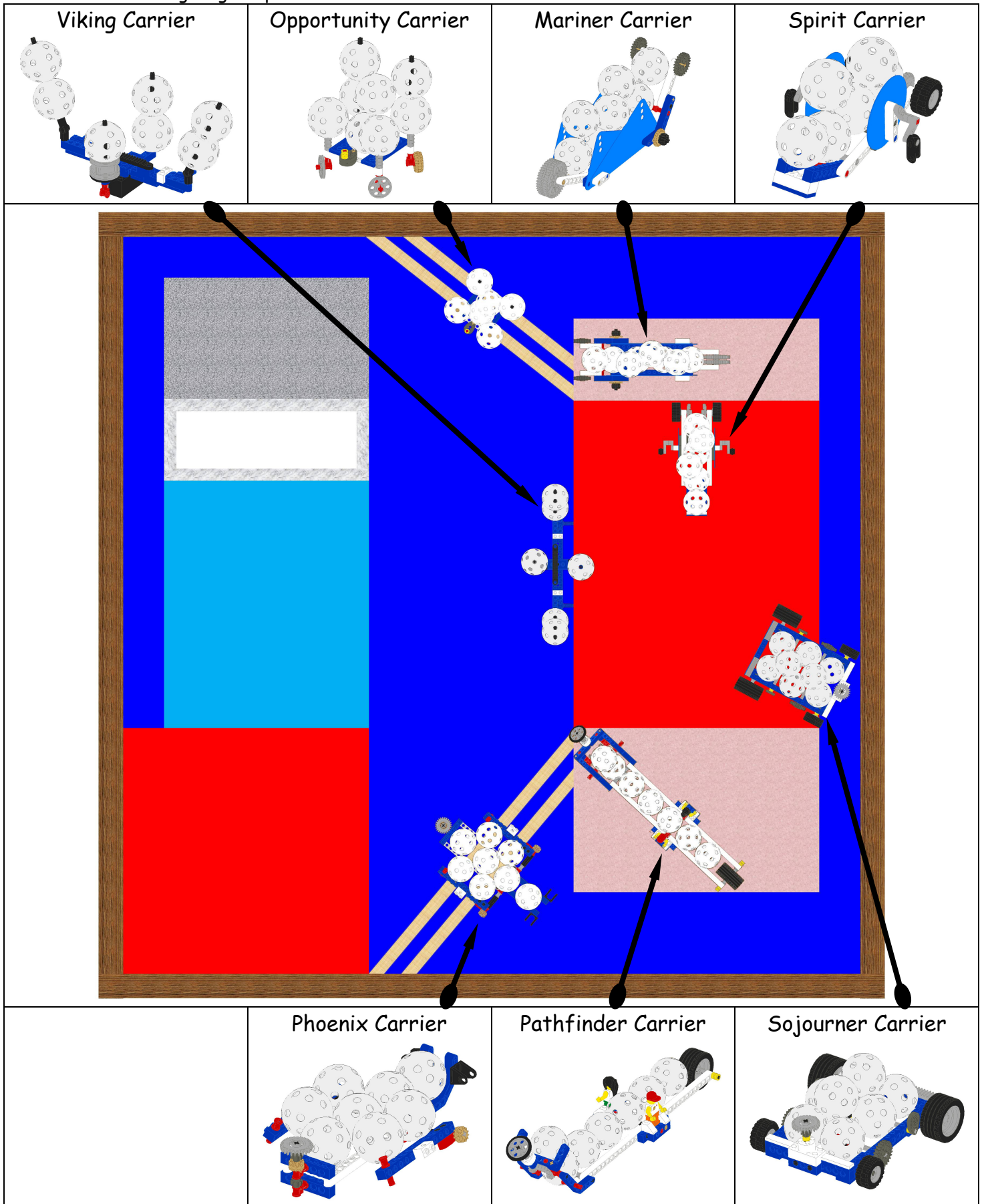
Below is everything that we know about the mission.

- The team must be ready to execute the mission for your EARLY Tournament.
- The equipment available for a team to build a robot is 3 LEGO® Simple & Motorized Mechanisms Kits.
- The following diagram presents the environment that will be encountered.



Galacticville

- The following diagram presents where the *MACKs* and *Carriers* will be in Galacticville.



Mission Rules

1. The team has 2 minutes to complete the mission.
2. There are 52 *Mars Atmosphere Construction Kits (MACKs)* on the playing field at the beginning of each mission, represented by practice golf balls.
3. There are 7 *MACK Carriers* on the playing field at the beginning of the mission constructed from one LEGO® Simple & Motorized Mechanisms kit.
4. The team's score is determined at the end of the 2-minute mission.
5. If a *MACK* is moving when time expires, the *MACK's* scoring position is determined when the *MACK* has come to rest.
6. There are three scoring zones: the **EARTH**, **SPACE STATION**, and **MOON**.
7. The goal of the mission is to place the *MACKs* on the **EARTH**, **SPACE STATION**, and **MOON**.
8. The team scores 2 points for each *MACK* in the **EARTH** scoring zone.
9. The team scores 3 points for each *MACK* in the **SPACE STATION** scoring zone.
10. The team scores 4 points for each *MACK* in the **MOON** scoring zone.
11. A *MACK* breaking the plane of a scoring zone is considered in the scoring zone.
12. A *MACK* in multiple zones simultaneously (scoring zone & non-scoring zone, scoring zone & penalty zone, penalty zone & non-scoring zone, etc.) is considered in the zone that results in the greatest points.
13. The *MACK* and *Carriers* may not be touched. If a *MACK* is touched, it shall be removed from play. If a *Carrier* is touched, the *Carrier*, along with any *MACKs* on the *Carrier*, shall be removed from play. This is the *EARLY Game Changing Rule* intended to make the Spring Mission more challenging than the Fall Mission.
14. Only the parts that are contained in three LEGO® Simple & Motorized Mechanisms kits along with nine 20" controller extension wires may be used to construct the robot and attachments (i.e. no other materials such as glue may be used on the robot). The kit parts may not be altered.
15. **HOME** is the 15" x 15" boundary extended vertically.
16. The robot and all attachments must begin completely inside **HOME** at the beginning of the 2-minute mission (i.e. no LEGO parts may be off the playing field when the mission begins). The parts do not have to be assembled together and the parts may be removed from and returned to the field during the 2-minute mission.
17. The team may retrieve their robot without penalty when the robot is partially inside **HOME** by lifting the robot vertically. After retrieving, the robot must be returned **HOME**. If a *MACK* or *Carrier* remains with the robot when the robot is retrieved, the *MACK* or *Carrier* shall be removed from play.
18. If a team touches their robot, including parts that have become separated from the robot, that is completely outside **HOME**, a penalty of 10 points shall be assessed.

19. If a robot is touched, the robot must be returned **HOME** to continue the mission.
20. The robot must start completely inside **HOME** every time the robot is returned **HOME** (i.e. after retrieving the robot, no part of the robot may be breaking the **HOME** plane when continuing the mission).
21. The controllers and wires are NOT considered part of the robot.
22. The controller wires may only be used to provide electrical power to robot motors (i.e. the controller wires may not be used to drag or corral a robot, **MACKs** or **Carriers**). If a controller wire is used illegally (referee's judgment), the robot must immediately be returned **HOME** to continue the mission.
23. The robot shall not have any elastic stored energy when the mission begins or when the robot is returned **HOME**, but elastic stored energy may be created with a motor during the mission (i.e. the robot may not be manually "wound up").
24. A **Carrier** is never considered part of the robot.
25. Because **MACKs** are very valuable, if a **MACK** is ejected from the playing field, a penalty of 10 points shall be assessed. No penalty shall be assessed for **MACKs** that are removed by a referee.
26. A score of zero shall be awarded if penalties result in a negative score.
27. All referees' rulings are final.

Please contact Mission.Control@EARLYrobotics.org with any questions or comments.
Thank you for maintaining the spirit of the game!