

Engineering And Robotics Learned Young

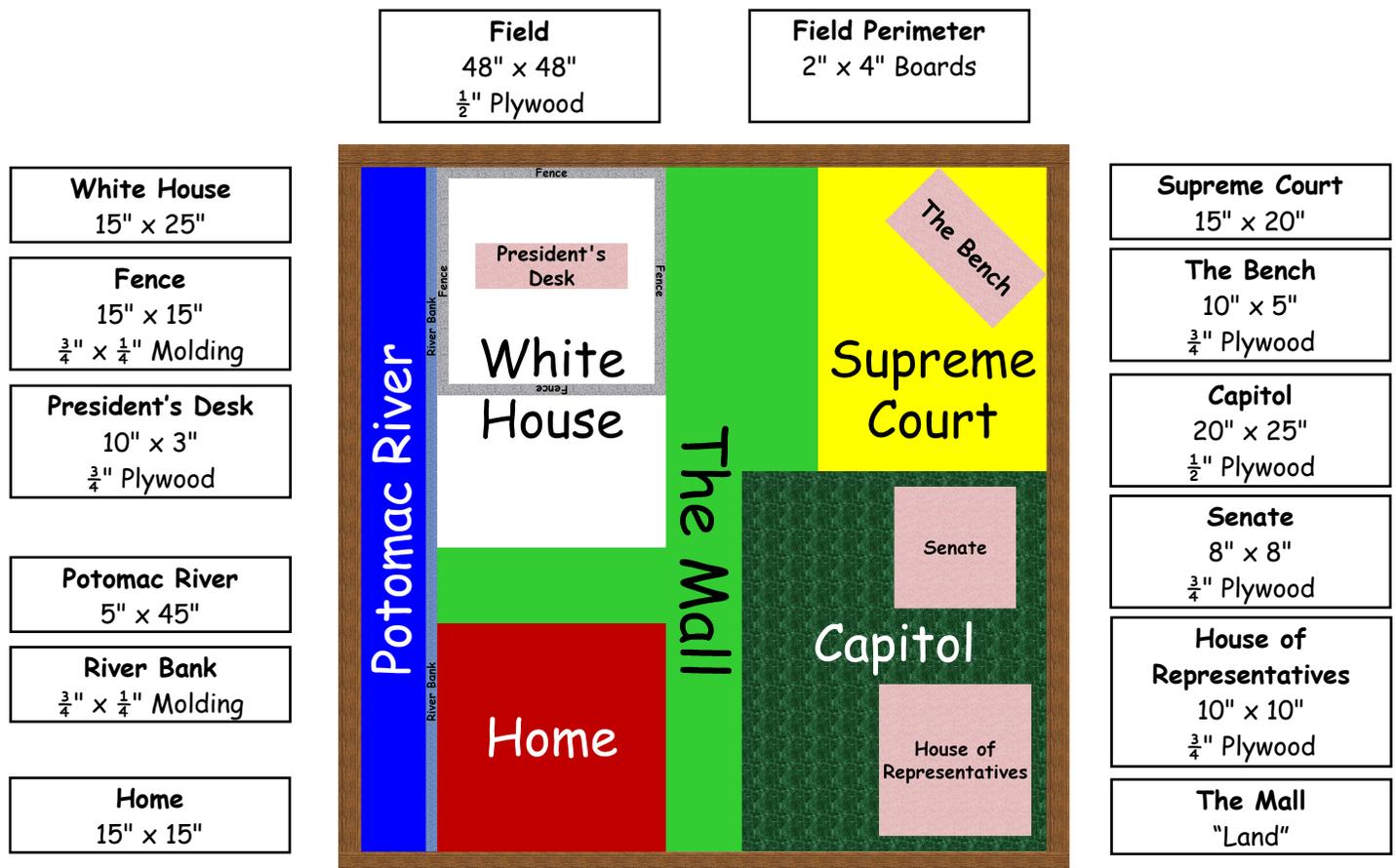
◆ EARLY ◆

Fall 2017 Robotics Competition

Roboticists, The United States needs your help transporting Bills and Laws throughout the Capital in Washington D.C. among the Three Branches of Government — the Executive Branch, the Legislative Branch, and the Judicial Branch. The United States needs you to build a robot to take the Bills to Congress and to the President, and the Laws to the President and to the Supreme Court. Please help The United States of America!

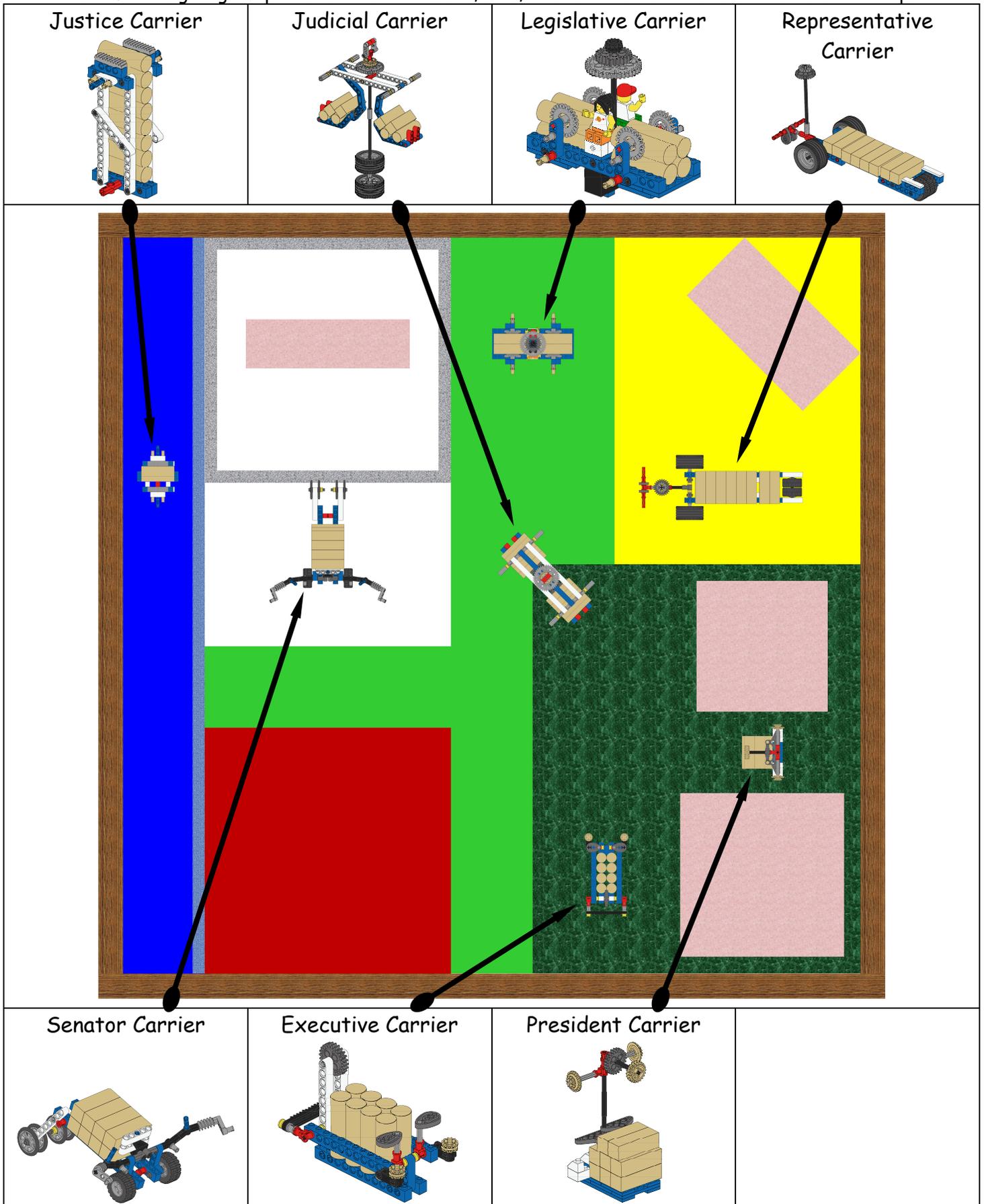
Below is everything that we know about the mission.

- 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. Construction details are found in the *Mission Field Details* document.



United States of America Capital

- The following diagram presents where the *Laws*, *Bills*, and *Carriers* will be in The United States Capitol.



Mission Rules

1. The team has 2 minutes to complete the mission.
2. There are 28 **Laws** and 28 **Bills** on the mission field at the beginning of each mission. The **Laws** are represented by $\frac{5}{8}$ " round wood dowels that are 2" long and the **Bills** are represented by $\frac{5}{8}$ " square wood dowels that are 2" long. The round and square wood dowel details are found in the **Mission Object Details** document.
3. There are 7 **Carriers**, each carrying 8 **Laws** or **Bills** or a combination of 8 **Laws** and **Bills**, on the mission field at the beginning of the mission constructed from one LEGO® Simple & Motorized Mechanisms kit. Carrier details are in each **Carrier Instruction** document.
4. The team's score is determined at the end of the 2-minute mission.
5. If a **Law** or **Bill** is moving when time expires, the **Law** or **Bill's** scoring position is determined when the **Law** or **Bill** has come to rest.
6. There are seven scoring zones: the **WHITE HOUSE**, the **PRESIDENT'S DESK**, the **CAPITOL**, the **SENATE**, the **HOUSE OF REPRESENTATIVES**, the **SUPREME COURT**, and **THE BENCH**. The **FENCE** is part of the **WHITE HOUSE**.
7. The goal of the mission is to *deploy* **Laws** and **Bills** in the scoring zones.
8. A **Law** or **Bill** is *deployed* when the **Law** or **Bill** is directly supported by the mission field; expressly, a **Law** or **Bill** must be touching the mission field to be *deployed*. Please recognize that a **Law** or **Bill** resting on another **Law** or **Bill**, a **Carrier**, or a robot and not touching the mission field is *NOT deployed*.
9. The team scores 1 point for each **Bill** that is *deployed* in the **CAPITOL** or the **WHITE HOUSE**.
10. The team scores 2 points for each **Bill** that is *deployed* in the **SENATE**, the **HOUSE OF REPRESENTATIVES**, or on the **OVAL OFFICE DESK**.
11. The team scores 1 point for each **Law** that is *deployed* in the **WHITE HOUSE** or the **SUPREME COURT**.
12. The team scores 2 point for each **Law** that is *deployed* on the **PRESIDENT'S DESK**.
13. The team scores 3 points for each **Law** that is *deployed* on **THE BENCH**.
14. There is one penalty zone: the **POTOMAC RIVER**. The **RIVER BANK** is part of the **POTOMAC RIVER**.
15. The team is penalized 1 point for each **Law** or **Bill** *deployed* in the penalty zone.
16. A perfect score is achieved by having all of the 28 **Bills** *deployed* in the **SENATE**, the **HOUSE OF REPRESENTATIVES**, or on the **OVAL OFFICE DESK** and having all of the 28 **Laws** *deployed* on the **BENCH**. Thereby, all 28 **Bills** are worth 2 points each and all 28 **Laws** are worth 3 points each, resulting in a score of 28×2 plus 28×3 , or 140 points.
17. A **Law** or **Bill** *deployed* and breaking the plane of a scoring zone is considered *deployed* in the scoring zone.
18. A **Law** or **Bill** *deployed* in multiple zones simultaneously (scoring zone & non-scoring zone, scoring zone & penalty zone, penalty zone & non-scoring zone, two scoring zones, etc.) is considered *deployed* in the zone that results in the greatest points.
19. In summary, a **Law** or **Bill** must be "*deployed in a scoring zone*" for a **Law** or **Bill** to count for points. A **Law** or **Bill** is *deployed* in a scoring zone when the **Law** or **Bill** is touching the field and is breaking the plane of a scoring zone.

20. 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.
21. **HOME** is the 15" x 15" boundary extended vertically.
22. 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.
23. 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 to **HOME**. If a *Law*, *Bill*, or *Carrier* remains with the robot when the robot is retrieved without penalty, the *Law*, *Bill*, or *Carrier* that is now in **HOME** remains in play.
24. If a team touches their robot, including parts that have become separated from the robot, that is completely outside **HOME**, the team is penalized 10 points. The robot must be returned **HOME** to continue the mission and if a *Law*, *Bill*, or *Carrier* remains with the robot when the robot is returned **HOME**, the *Law*, *Bill*, or *Carrier* must be removed from the field.
25. 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).
26. The controllers and wires are NOT considered part of the robot.
27. 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, *Law*, *Bill*, or *Carrier*). If a controller wire is used improperly, the robot must be immediately returned **HOME** to continue the mission and the *Law*, *Bill*, or *Carrier* involved must be removed from the field.
28. 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 "wound up" manually).
29. The team may touch a *Law*, *Bill*, or *Carrier* without penalty if the *Law*, *Bill*, or *Carrier* is COMPLETELY inside **HOME**.
30. If a team touches a *Law*, *Bill*, or *Carrier* that is not completely inside **HOME**, the team is penalized 10 points and the *Law*, *Bill*, or *Carrier* must be removed from the field. If a *Carrier* is touched, the *Carrier*, along with any *Laws* or *Bills* on the *Carrier*, must be removed from the field.
31. A *Carrier* is never considered part of the robot.
32. *Laws* and *Bills* may only leave **HOME** by using the robot or by "letting go" of a *Law* or *Bill* or something carrying a *Law* or *Bill*. For example, a team member may not roll, push, or throw a *Law* or *Bill* but a team member may put a *Law* or *Bill* on a properly deployed 'LEGO slide' and "let go" of the *Law* or *Bill*.
33. Because *Laws* and *Bills* are very valuable, the team is penalized 10 points for each *Law* or *Bill* ejected from the field. No penalty shall be assessed for a *Law* or *Bill* that is removed by rule (e.g. for illegal touching, dragging, etc.).
34. A score of zero is awarded if penalties result in a negative score.

Please contact Mission.Control@EARLYrobotics.org with any questions or comments.

Thank you for maintaining the spirit of the game!