Match Start Items in base: 1 - Lady
1 - Grain
1 - Water
2 - Gray Building Segments

SUPPLY TRUCK

Start: The start position for the supply truck is facing east, aligned with the marks on the mat, and with the following four models loaded in the truck bed: bread, medicine, the loose fuel, and a loose water.

Match: There are no restrictions on the method used to get the truck to the yellow region.

Score: Scoring is based on whether or not the truck is touching the mat in the yellow region at the end of the match. The light blue region within the yellow region is also considered a part of the yellow region.

EVACUATION SIGN

Start: At the start of the match the evacuation sign is in the down position with the push plate in the forward position.

Match: There are no restrictions on how the sign is moved to the up position.

Score: Scoring is based on whether or not the sign is obviously in the up position at the end of the match. It does not need to be vertical but it can only be held in place by the slider’s friction with the mat or other model parts. The robot or a strategic object cannot be in contact with any part of the sign model and other mission models cannot be used to hold the sign in place.

CARGO PLANE

Start: The cargo plane starts the match latched to the departure tower with the string centered on the plane’s trolley.

Match: There are no restrictions on how the plane is released from the latch as long as the model is not damaged. After the plane has been released and is on the mat, the robot can push it to another position.
**Score:** Scoring is based on the position of the plane at the end of the match. To score the plane must be at least partially in either the yellow or light blue regions. Due to the inconsistent operation of this model, the following rule leniencies will apply:

1) If the plane departs and hits nothing, it will automatically score as reaching the light blue region. Should it stop short of this region, the referee will push it into the light blue region as soon as possible.

2) If the plane departs and hits only minor obstacles on the runway, it will automatically score as reaching the yellow region. Should it stop short of this region, the referee will push it into the yellow region as soon as possible.

3) If the plane departs and hits one or more obstacles that would definitely have stopped even a fast rolling plane, it remains where it stopped unless moved by the robot.

**TREE BRANCH**

**Start:** The start position for this mission is with the removable branch all the way into its holder and pointing directly east with no north or south tilt. The electric line model should be upright and aligned with the marks on the mat.

**Match:** There are no restrictions on the method used to remove the branch from the tree.

**Score:** Scoring is based on whether or not, at the end of the match, the tree branch is closer to the mat than the electric lines and the tree and electric line models are upright and touching the mat. All parts of the tree branch must be lower than the electric lines and the electric line model must be in or very near its start position.

**TSUNAMI**

**Start:** The start position for the tsunami model is with the red handle down and the blue wave cylinders mostly centered on the ramp. The stud direction on the waves does not matter.

**Match:** There are no restrictions on the method used to release the waves.

**Score:** Scoring is based on whether or not all three waves are touching the mat at the end of the match.

**AMBULANCE**

**Start:** At the start of the match the ambulance should be facing east and aligned with the marks on the mat.
**Match:** There are no restrictions on the method used to move the ambulance to the yellow region.

**Score:** Scoring is based on whether or not the ambulance is in the yellow region and all of the ambulance’s wheels are touching the mat at the end of the match. The light blue region within the yellow region is also considered a part of the yellow region.

**RUNWAY**

**Start:** At the beginning of the match the runway is clear.

**Match:** There are no restrictions on the method used to clear objects from the runway.

**Score:** Scoring is based on whether or not at the end of the match the runway is cleared of all objects except the plane or the tsunami waves. Only the portion of the runway outside of the yellow and light blue regions needs to be clear.

**CONSTRUCTION RELOCATION**

**Start:** At the start of the match three of the gray building segments are stacked on top of each other and aligned with the marks on the mat in the light green region.

**Match:** There are no restrictions on how the building segments are removed from the light green region.

**Score:** Scoring is based on whether or not there are any gray building segments anywhere in the light green region at the end of the match.

**BASE ISOLATION TEST**

**Start:** At match start four tan building segments are stacked and aligned on top of each other on each of the two frames in the Base Isolation model. Window direction does not matter. The west building is pushed north to the back of the tray.

**Match:** The “damage” to the east building can only be caused by movement of the rolling frame. During a mission attempt, nothing but the frames or a fallen segment are permitted to touch either building. After a successful Base Isolation test has been completed, the building segments from the damaged building may be used in the Code Construction mission without loss of the Base Isolation score provided the end of match conditions are still met.

**Score:** Scoring is based on whether or not the method restrictions were violated and, at the end of the match, the west building is undamaged and the east building is obviously damaged. Undamaged means that there are still four “perfectly” aligned segments in the building and the building is 90° to the mat.
CODE CONSTRUCTION

**Start:** At the start of the match there are three stacked gray building segments aligned with the marks on the mat in the light green region and two additional gray building segments in base.

**Match:** There are no restrictions on the color of the building segments or the method used to build or place the building.

**Score:** The score is dependent on whether or not at the end of the match there is a multi-story building located in the pink region that is constructed only of building segments. Perfect nesting and alignment are not required but the building cannot rely on strategic objects or the robot in any way. Scoring is based on the height in segments of the tallest building that satisfies these conditions.

OBSTACLES

**Start:** At the beginning of the match all of the obstacles should be undamaged and securely in place with the tan wall on the house debris obstacle tilted toward base. The direction of the studs on the rollers in the tree debris obstacle does not matter.

**Match:** The robot must cross an obstacle from the west only and may not touch the mat north of the northern boundary of any colored region. Robot parts may extend over the northern line as long as no contact is made with the mat north of the line. An obstacle is considered successfully crossed when the robot is completely in the colored region to the east of the obstacle with no parts extending over the western boundary of that region. The obstacle models are fragile so any breakage will not be considered model damage. Using the mat south of the obstacles or even the top of the south wall for navigating around the obstacles is legal.

There are two exceptions to the rules related to this mission:

1) The robot may be rescued at anytime from this mission without receiving a touch penalty as long as the robot has not exited one of the colored regions northward while under control.

2) If the water model in the dark blue region is picked up by the robot during an obstacle mission attempt and the robot is subsequently rescued, the water will not be seized by the referee.

**Scoring:** The score for this mission is based on the east most colored region successfully reached anytime during the match or, in other words, the highest number of obstacles successfully crossed on any attempt.
HOUSE LIFT

Start: The match begins with the house in the lowered position and the red arm vertical.

Match: There are no restrictions on the method used to raise the house to the high position.

Score: Scoring is based on whether or not the house is locked in its high position at the end of the match.

PROGRESS

Start: At the beginning of the match the pointer arm on the progress model is located against the stop on the red peg side. The pointer moves clockwise when viewed from above.

Match: The pointer can only be moved using the red lever on your field. It is legal to move the lever multiple times without returning to base.

Score: Scoring is based on the pointer position at the end of the match. The score is the colored peg count from the start position moving clockwise up to and including the last peg that the pointer reached. The benefit of the doubt rule applies if any part of the white pointer piece appears to have reached the peg. The score applies to the teams at both tables regardless of who operated the model.

FAMILY

Start: The match begins with the man aligned with the marks in the orange region, the child aligned with the marks in the red region, and the lady in base.

Match: There are no restrictions on how the family members are moved.

Score: Scoring is based on the number of family members that are together in any colored region at the end of the match.

WATER

Start: At the start of the match the water bottle with the loop is aligned with the marks in the dark blue region and there is a loose water bottle both in the supply truck and in base.

Match: There are no restrictions on the method used to move water to a region where people are located.

Score: Scoring is determined at the end of the match and is based on the number of people located in a colored region that also contains at least one water model. For this mission the tsunami waves do not count as water.
SAFETY

Start: The match begins with the man aligned with the marks in the orange region, the child aligned with the marks in the red region, and the lady in base.

Match: There are no restrictions on how the family members are moved.

Score: Scoring is based on the number of people in either the yellow or red regions at the end of the match.

PETS

Start: At the start of the match the cat and dog are aligned with their respective marks in the northwest corner of the mat.

Match: There are no restrictions on how the pets are moved.

Score: Scoring is determined at the end of the match by the number of pets that are located in a colored region that also contains at least one person.

SUPPLIES and EQUIPMENT

Start: There are a total of 12 supply and equipment models. A list of the models and their locations at the beginning of the match follows:

<table>
<thead>
<tr>
<th>Model</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grain</td>
<td>In base</td>
</tr>
<tr>
<td>Bread</td>
<td>In supply truck</td>
</tr>
<tr>
<td>Medicine</td>
<td>In supply truck</td>
</tr>
<tr>
<td>Fuel</td>
<td>In supply truck</td>
</tr>
<tr>
<td>Dirt Bike</td>
<td>On marks in Orange region</td>
</tr>
<tr>
<td>Helmet</td>
<td>On dirt bike peg</td>
</tr>
<tr>
<td>Generator</td>
<td>On marks near Red region</td>
</tr>
<tr>
<td>Flashlight w/loop</td>
<td>On marks near Tree</td>
</tr>
<tr>
<td>Fuel w/loop</td>
<td>On marks near Base Isolation</td>
</tr>
<tr>
<td>Battery w/loop</td>
<td>On marks in Pink region</td>
</tr>
<tr>
<td>Radio w/loop</td>
<td>On marks near Purple region</td>
</tr>
<tr>
<td>Boom Box w/loop</td>
<td>On marks near Dark Green region</td>
</tr>
</tbody>
</table>

Match: There are no restrictions on the method(s) used to move supplies to the scoring regions. A supply can be in a container or on the robot and still score as long as the supply itself is at least partially in the scoring region.

Score: Scoring is based on the number of supplies in either the yellow or red region at the end of the match. As long as the breakage was not obviously intentional, broken models can still score. If parts from the same mode are in two scoring regions, only the region of lesser value receives scoring credit.
SAFE PLACE

Score: Scoring is based on whether or not the robot is in the red region at the end of the match. If the only part of the robot in the red region is a feature obviously added solely as an extension, the robot is not considered "in".

GAME PENALTY

Start: At the start of the match the four roof debris models used as game penalties are in the possession of the referee. If stored on the mat, they should be located against the wall in the southeast corner as shown in the map on page 1.

Match: As touch or sprawl penalties occur during the match, the roof debris models should be placed by the referee in the following sequence:

1) For penalties 1 thru 4, the referee should place one of the roof models in his/her possession on the west-most runway roof mark that is completely empty. Placement should be closely aligned with the marks.

2) For penalties 5 thru 8 where all of the models are already on the mat, the west-most roof model should be moved as far as possible into the northeast corner of the light blue region.

A sprawl penalty is defined as a robot that is obviously twice the width of Base whenever it is touched or at the end of the match. A touch penalty occurs whenever a team member touches the autonomous robot or anything it is touching while the robot is completely outside base. There are three exceptions to the touch penalty rule:

1) If the only part of the robot in Base at the time of the touch is a robot feature obviously used solely for reaching Base from a distance to avoid a touch penalty, the touch penalty is awarded anyway.

2) If the robot is outside Base, straining its motors, and no longer traveling, it may non-strategically be shut off and left in place with no penalty.

3) A robot rescue from the Obstacles mission is not penalized. See the Obstacles mission for additional details.

The robot is not allowed to move roof debris models into or out of the light blue region. Any such move should be undone by the referee. For a move into the region, the model should be relocated to the position it was in just prior to entering the region.

Score: Penalty scoring is determined at the end of the match and is based on the count of roof debris models that are inside the light blue region and the count of models that are outside of the light blue region. Models that are still in the possession of the referee are excluded from both counts.
JUNK PENALTY

**Score:** The junk penalty applies to strategic objects that are outside of base at the end of the match. A Small object penalty applies to each such object that is smaller and/or lighter than the robot. A Large object penalty applies to each such object that does not meet the definition of a small object.