Field Setup Instructions

Overview

The Challenge Field is an obstacle course on a mat. The obstacles are called Mission Models, and the mat is called the Field Mat. Some of the models are secured to the mat using 3M Dual Lock fastening material. The mat must be on a smooth flat surface, and it must be surrounded by border walls to contain all the action.

Requirements

This step first requires that you…

- have read and followed the instructions under "Surface & Borders" so you now have an official framework on which to stage your field.
- have read and followed the instructions on the CD that came with your Field Setup Kit so you now have the LEGO Mission Models.
- have the Field Mat and Dual Lock fastening material that came in your Field Setup Kit.

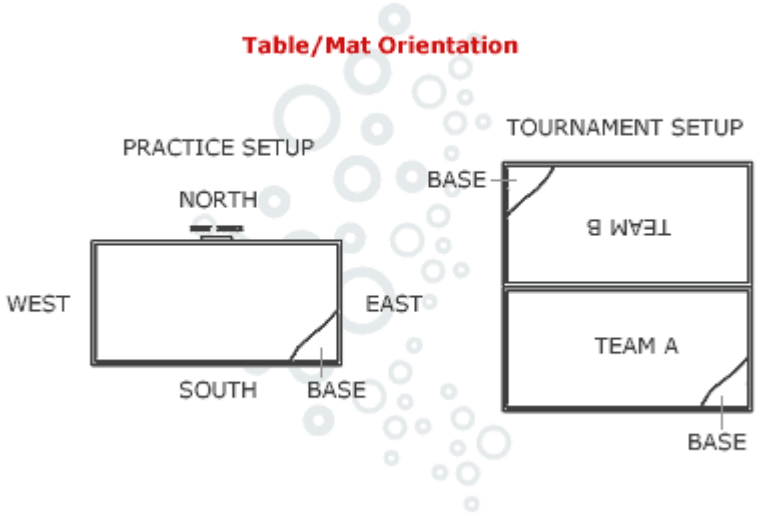
Field mat placement

Step 1:
Clear any and all debris off the surface you intend to put the mat on. Even the tiniest particle under the mat can give the robot trouble. So vacuum the surface if you can, and run your hand over the surface afterward. Get rid of any protruding imperfections you find.

Step 2:
Unroll the mat and position it so the image is up and the green logo area is at your lower right, at the Southeast corner of your surface. See the sketch labeled Table/Mat Orientation. If the mat won't fit between the border walls, take the time to move the walls as needed. If there's interference in just one or two areas due to imperfection in the border, then it's okay to trim the mat in those areas.

Step 3:
Slide and align the mat so that there is no gap between the "Base" corner's edges of the mat and the corresponding southeast borders. Gaps are acceptable at the north and west edges unless they exceed 1/2 inch (13mm), in which case you should move the borders.

Step 4:
With help from another person, pull the mat at opposite ends, then massage out any waviness from East to West and re-check the requirements of Step 3. It is expected that some waviness will persist, but that should relax over time.

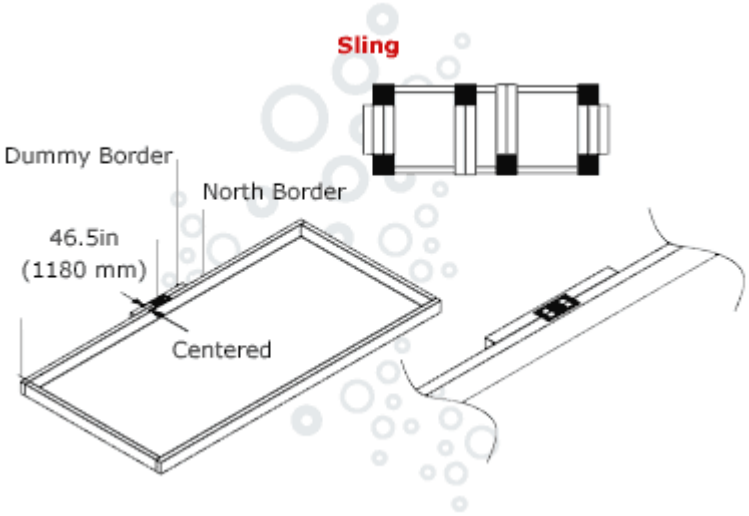


Using Dual Lock

The Mission Models can be taken off the Field Mat for transport and storage. Some are loose, but others are secured using a re-usable fastening material from 3M called Dual Lock, which comes with the LEGO bricks in your Mission Model Set. Dual Lock is designed to stick or “lock” to itself when two faces of it are pressed together, but you can un-lock it too. Wherever Dual Lock is called for in the instructions that follow, stick one square on the mat, adhesive side down, and then press another square onto the first one, adhesive side up (pulling fingers away will take practice!). These two squares locked face to face are a “pair”. Finally, line the model up over its location, lower it, and press it down onto the Dual Lock. Using this technique ensures accurate pattern alignment. This application process for the Dual Lock is only needed once---Later, the models can simply be locked onto the mat or pulled off.

Mission model placement

Sling :
Use 6 Dual Lock pairs to secure this model; half on the Back Border, and half on the Dummy Border. See the sketch labeled Sling, and note that in all sketches, each solid black square represents a Dual Lock pair on the footprint of the model. Measure along the North border wall (don’t rely on the mat) to find the midpoint between the East and West border walls. This point should be very close to 46.5 inches (1181mm) from the inside of either wall. Center the base of this model here for left/right positioning. For front/back centering, position it equally over the North and Dummy borders.



Pipeline:

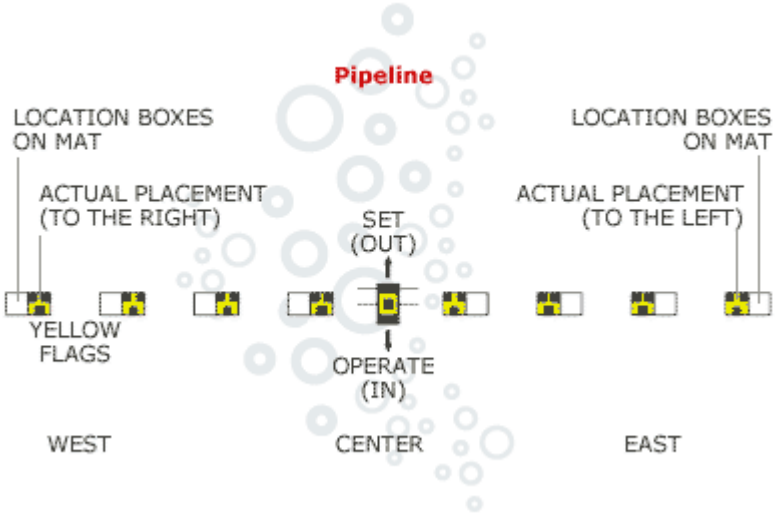
READ THESE INSTRUCTIONS FULLY BEFORE STARTING.

This model consists of three subparts---The West, the East, and the Center, and all will be precisely secured to the mat. The West part is the long one with the yellow flags. The Center part is the short one, and the East part is the long one with no flags.

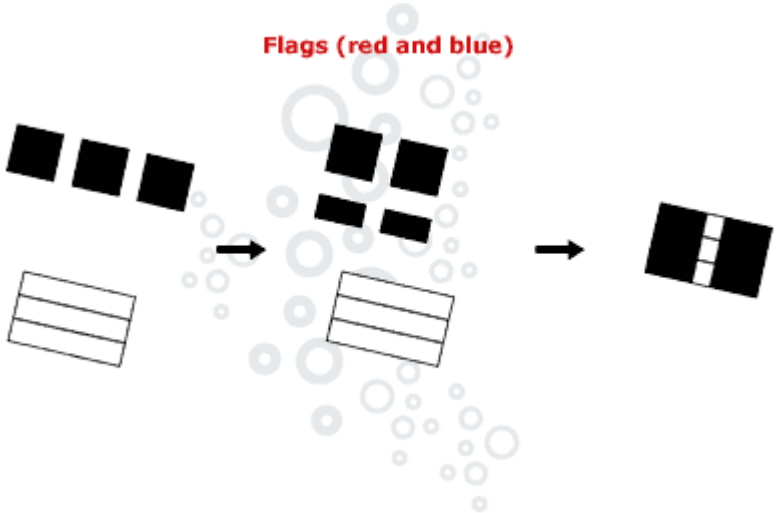
West: Orientation is with the yellow flags on the west end. See the sketch labeled Pipeline, and notice that each base for this side goes to the RIGHT of its location box on the mat. Use 3 Dual Lock pairs on each base, putting 1 pair at each north corner and 1 pair centered on the south side (12 pairs, total).

East: Orientation doesn't matter, but notice that each base for this side goes to the LEFT of its location box on the mat. The Dual Lock pattern is the same as for the West part.

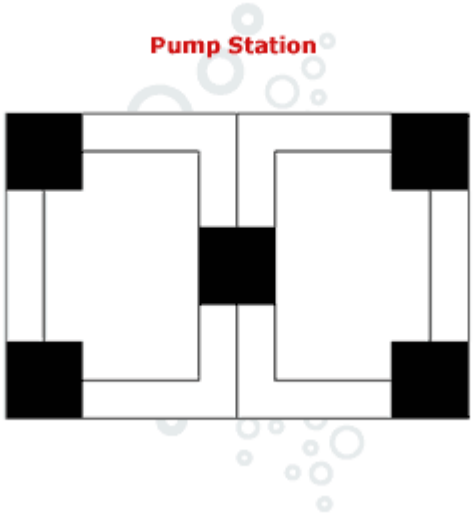
Center: Notice that the location box for this model is wider than the model's base--this is for fine-tuning. Make the initial application of Dual Lock to the model's base instead of the mat, and when you press the model onto the mat, center it initially. The Dual Lock pattern is 1 pair at each corner and 1 in the middle. Be sure to orient the model's in/out direction as indicated on the mat.
Final setup for this model is with the Center section's black pipe pushed north (out), and with all three sections of pipe pushed east. To check the function of the Pipeline, make sure the Center part's pipe aligns with the other pipes when pushed south, and after that, a push of the East's pipe toward the west causes all three sections to flip to the west. If the West or East pipes interfere with the Center's pipe when the Center's pipe is pushed south, relocate the Center model as needed.



Flags (6 red, 6 blue):
Each grey base will be precisely secured in one of the corresponding rectangles on the mat. Arrange 3 pairs of Dual Lock for each base as shown in the sketch labeled Flags (red and blue). To make this arrangement, one Dual Lock pair for each base needs to be cut in half. Be sure the final orientation has the flag pivot at the south side. Each model is in its setup position when the flag is down toward the east.



Pump station:
This model is secured precisely over its spot on the mat, using 5 pairs of Dual Lock as shown in the sketch labeled Pump Station.



Research vessel:
READ THESE INSTRUCTIONS FULLY BEFORE STARTING.
The swivel base of this model is secured precisely on the mat, using 4 pairs of Dual Lock; one pair at each corner (of the swivel base--not the ship's deck). Make the initial application of Dual Lock to the model's base instead of the mat. While keeping its base off the mat, fit the back of the Research Vessel into its location mark on the mat. When it's perfect, lower the rest of the model down, and press just forward of its center to lock it in place. To gain access to the swivel base, you can temporarily pop off white decking as needed.

Fish (Green and Grey):
There is no Dual Lock on any of the Fish models. Place each Fish precisely over its spot as labeled on the mat, with the grey Fish over the spot labeled "shark" and its TAIL perfectly over its location box.

Submarine:
There is no Dual Lock on the Submarine. Locate this model on the bow of the Research Vessel model, aligning it by nesting its base into the bow's raised black square. Face the Submarine toward the Fish models.

Dolphin:
There is no Dual Lock on this model. Place the Dolphin in the Sling, facing east or west, but with belly down, and make sure the sling is level. Also, since the Dolphin must fall freely from the Sling when the Sling is tipped, be very sure that neither the Dolphin's nose nor tail is tucked under the red side beams of the Sling.

Artifacts:
There is no Dual Lock on this model. Place it precisely on its spot on the mat.

Artificial reef:
There is no Dual Lock on this model. Place it precisely on its spot pattern on the mat.

Protective structure:
There is no Dual Lock on this model. Place it precisely on its spot pattern on the mat.

Shipping container:
There is no Dual Lock on this model. Place it precisely on its spot on the mat, noting the indicated setup position for the doors.

Crates:
There is no Dual Lock on these models. Place each one precisely on one of the rectangles east of the Shipping Container.

Field maintenace

Keep the models in original condition by straightening and tightening them often. Avoid cleaning the mat with anything that will leave a residue. Any residue, sticky or slippery, will affect the robot's performance compared to a new mat, which should be expected at some tournaments. Use a vacuum and/or a damp cloth for dust and debris (above and below the mat), and try a pencil eraser for tough marks. When moving the mat for transport and storage, be sure not to let the material bend into a sharp kink point. Such kinks are permanent and can affect the robot's movement. Kinks can also cause bubbling.