



2016/2017 Robot Game  
Field Setup



# 2016/2017 Robot Game Field Setup

The Field is where the Robot Game takes place.

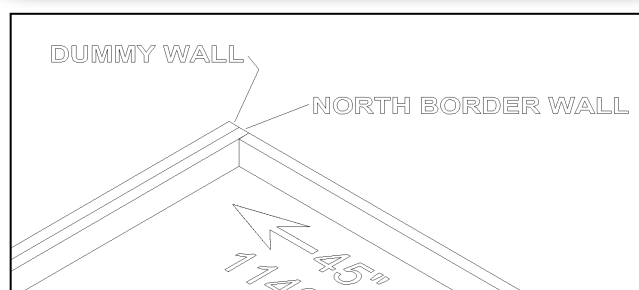
- It consists of a Field Mat on a Table with Border Walls, with Mission Models arranged on top.
- The Field Mat and the LEGO® elements for building the Mission Models are part of your Challenge Set.
- The instructions for building the Mission Models can be found at: <http://firstlegoleague.org/challenge#animal-allies>
- The instructions for how to build the Table and how to arrange everything on it are below...

## TABLE CONSTRUCTION

The Robot Game takes place on a Table with specific features, so you'll need to build one to practice on if you don't already have access to one. With weight, height, simplicity and cost in mind, a simple design is offered here, but as long as as your surface is smooth, and your Border Walls are sized and located properly, how you build the understructure is up to you. The construction is simple, but does require some wood-working skill.

At a tournament, two Tables are placed back to back, but you only operate on one Table, so you only need to build one Table to practice on.

Dummy Wall: All Robot Games have a "shared" Mission, whose Mission Model(s) rest partly on your Table, and partly on the other team's Table, which is connected to your Table's north side. You don't need to build a second table, but you do need to build the necessary part of the other team's Table, so the shared Mission Model(s) can be positioned correctly. Here are the instructions for building one Practice Table, including its Dummy Wall:



## MATERIALS

Material	Quantity
Challenge Set (Mission Model LEGO elements, Mat, Dual Lock™)	1
Sanded plywood (or other very smooth board) 96" X 48" X at least 3/8" (2438mm X 1219mm X 10mm)	1
*two-by-three, 8" (2438mm) [actual cross-section = 1-1/2" X 2-1/2" (38mm X 64mm)]	6
Flat black paint	1 pt. (1/2 L)
Coarse drywall screws, 2-1/2" (64mm)	1/2 lb. (1/4 kg)
Saw horses, about 24" (610mm high and 36" (914mm) wide	2

\*NOTE: Tables with "two-by-four" walls are legal and common, but we're slowly phasing them out at tournaments. You may make your Practice Tables with two-by-four walls, but **you must be prepared to play on tables whose walls could range in height anywhere between 2-1/2" (64mm) and 3-1/2" (90mm), as shown in the diagram below.**

## PARTS

Part	Make From	Dimensions	Paint	Quantity
Table surface (A)	plywood	96" X 48" (2438mm X 1219mm)	no	1
long Border Wall (B)	two-by-three	96" (2438mm)	yes	3
Short Border Wall (C)	two-by-three	45" (1143mm)	yes	2
*stiffener (D)	two-by-three	48" (1219mm)	no	4
saw horse	purchase	H ≈ 24" (610mm) W ≈ 36" (914mm)	no	2

\* If you are using a table surface thicker than 1/2" (13mm) check for warpage/distortion – you may not need stiffeners.

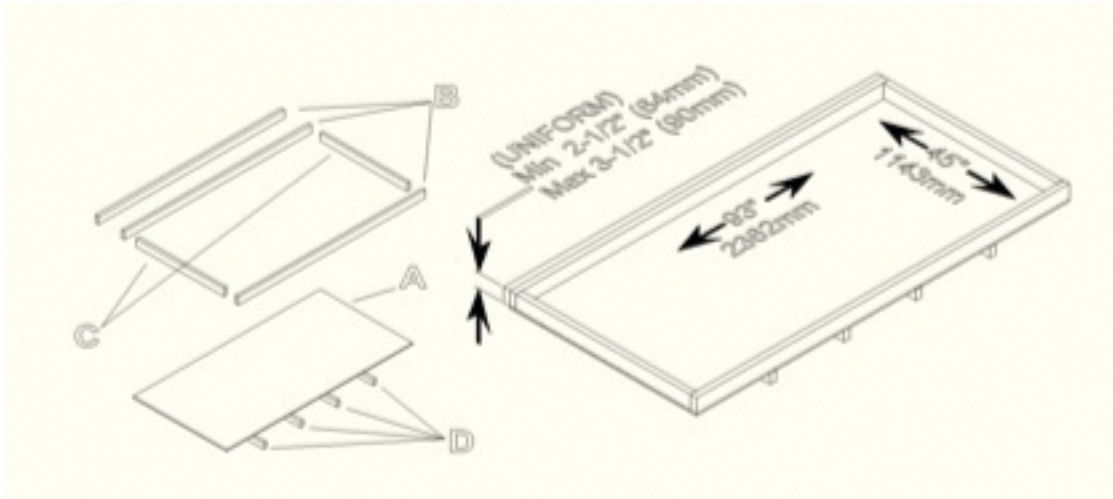
## ASSEMBLY

**STEP 1:** See which face of the plywood (A) is least smooth, and consider that the bottom face. On the bottom face, clamp, then screw on the stiffeners (D) about every 18" (457mm). Be sure screw heads and splinters don't protrude.

**STEP 2:** On the top face of the plywood, locate, clamp, and screw on the Border Walls (B,C) around the top perimeter.

- The inside wall-to-wall dimensions must measure 93±1/8" by 45±1/8" (2362±3mm by 1143±3mm).
- The height of B and C must measure between 2-1/2" (64mm) and 3-1/2" (90mm).
- Border Walls must be the same height as each other on all Tables at a tournament. Border heights at a tournament may be different than those on your practice Table.

**STEP 3:** Place this table top on short saw horses (or milk crates, or anything else short and solid.)



### FIELD MAT PLACEMENT

**STEP 1:** Vacuum the table top. Even the tiniest particle under the Mat can give the Robot trouble. After vacuuming, carefully run your hand over the surface and sand or file down any protruding imperfections you find. Then vacuum again.

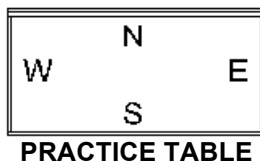
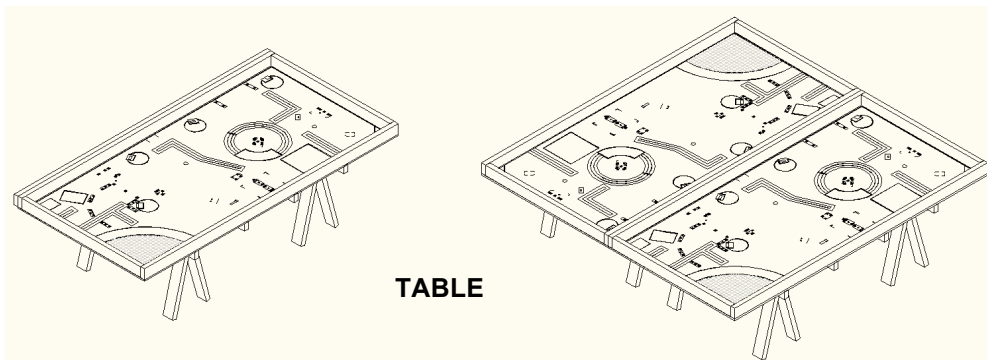
**STEP 2:** On the vacuumed surface (never unroll the Mat in an area where it could pick up particles), unroll the Mat so the image is up and its north edge is near the north/double Border Wall (note the location of the double wall in each Table sketch below.) **Be very careful to not let the Mat kink from bending in two directions at once.**

**STEP 3:** The Mat is smaller than the playing surface by design. Slide and align it so that there is no gap between the south edge of the Mat and the south Border Wall, then **center the mat east-west**, with equal gaps at left and right.

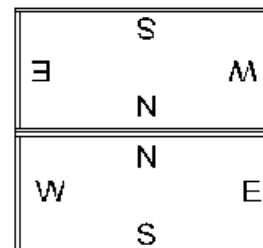
**STEP 4:** With help from others, pull the Mat at opposite ends and massage out any waviness away from the center and re-check the requirement of Step 3. It is expected that some waviness will persist, but that should relax over time. Some teams use a hair dryer to speed the relaxation of the waviness.

**STEP 5:** [OPTIONAL] To hold the Mat in place, you may use a thin strip of black tape at the east and west ends. Where the tape sticks to the Mat, it may cover the Mat's black border only. Where the tape sticks to the Table, it may stick to the horizontal surface only, and not the Border Walls.

**STEP 6:** For a competition setup, Dummy Walls are not needed. Secure two Tables north-to-north. **The total span of Border between two Tables must measure between 3" (76mm) and 4" (100mm)**



TOURNAMENT



## MISSION MODEL CONSTRUCTION

**BUILD THE MISSION MODELS:** Use the LEGO elements from your Challenge Set, and instructions from <http://firstlegoleague.org/challenge#animal-allies>. It will take a single person four to five hours to do this, so it's best done in a team construction party. For any team members with little or no experience building with LEGO elements, Mission Model construction is a great way to learn. This step is also a nice time for new team members to get to know each other.

**QUALITY:** The models must be built PERFECTLY. "Almost perfect" is **not** good enough. Many teams make several building errors and practice all season with incorrect Models... When these teams later compete on Fields with correct Models, the Robot fails. The team incorrectly blames the Robot, the tournament organizers, or bad luck for the failure. Best practice is to have several people check for correctness. **Please!**

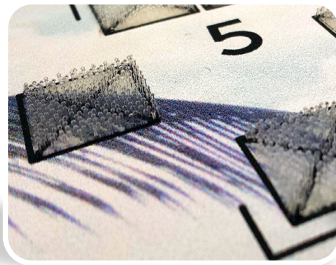
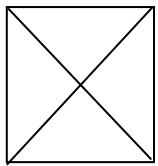
## MISSION MODEL ARRANGEMENT AND SETUP

**DUAL LOCK:** Some Models are "secured" to the Mat, while others are simply "placed" on the Mat. Each place on the Mat where a Model needs to be secured has a box with an "X" in it. The connection is made using the re-usable fastening material from 3M called "Dual Lock," which comes with the LEGO elements in your Challenge Set. Dual Lock is designed to "lock" to itself when two faces of it are pressed together, but you can unlock it too. The application process for the Dual Lock is only needed once. Afterward, the Models can simply be locked onto the Mat or unlocked. To apply Dual Lock, proceed one Model at a time...

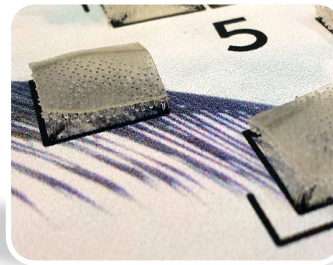
**STEP 1:** Stick one square, adhesive side down, on each box you see on the Mat with an "X" in it.

**STEP 2:** Press a second square on top of each of those, "locking" them on, adhesive side up. TIP: Instead of using your finger, use a bit of the wax paper the squares came on.

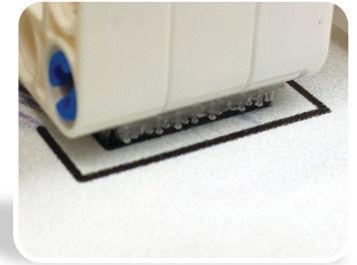
**STEP 3:** Align the Model exactly over its mark, and lower/press it onto the squares.



STEP 1



STEP 2



STEP 3

## CAUTION:

1. Pay attention... Some Models which seem symmetrical in fact have a directional feature somewhere.
2. Be sure to place each square precisely on its box, and each Model precisely over its marks.
3. When pressing a Model down, press down on its lowest solid structure instead of crushing the whole Model. Pull on that same structure if later you need to separate the Model from the Mat.

**TIP:** For large and/or flexible Models, apply only one or two pairs at a time. There's no need to do it all at once.

## MISSION MODELS (Any details not shown or mentioned are left to chance and officially don't matter.)

*These Mission Models are secured on their marks with Dual Lock as shown...*



Service Dog and Man



Service Dog Cane

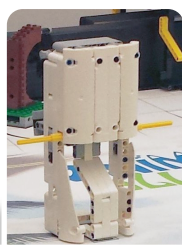
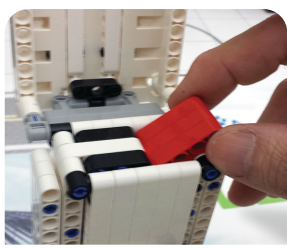


Warning Fence



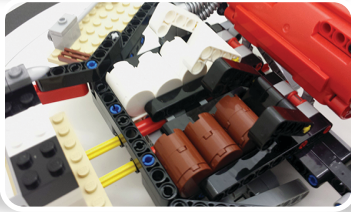
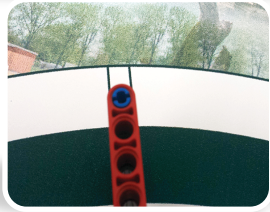
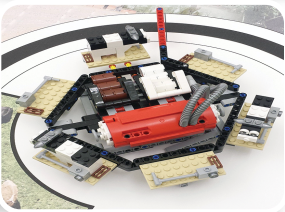
Barriers

*Note: End of cane is on black dot. Man's arm is down. Dog's head is down. Warning Fence is up.*



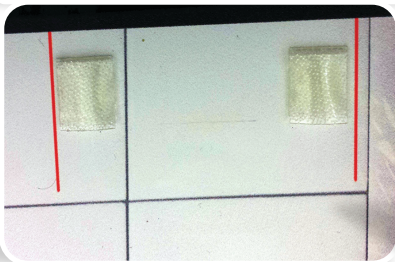
**REFRIGERATOR AND FOOD:** Refrigerator is loaded with all 8 Food inside, in random order. Door is closed.

**BEEHIVE:** Honey is loaded.

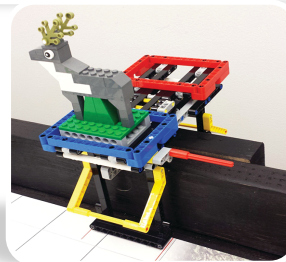


**MILKING AUTOMATION:** Red lever is aligned over its mark. Release-cow is pulled all the way out. Dispenser ramps are loaded with Milk and Manure (a type of feces) as shown.

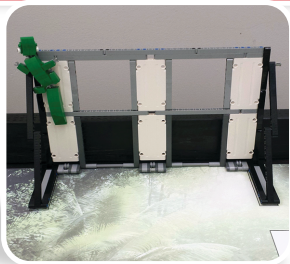
**RAMP:** Tilt is all the way down at west side.



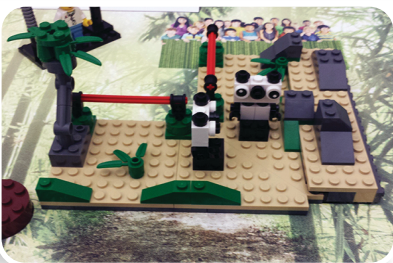
\*(Reindeer shown. You might load a different animal. See MISSIONS for full details.)



**ANIMAL CONSERVATION:** This Model is secured with Dual Lock, but not on "X" marks. Instead, **you** find the correct north-south location. Place the model between its red marks on the mat. Then center it over your Table's north border wall **and** a selection of "Dummy" wall. Next, make small pencil marks to show exactly where the model's feet are. After these location steps, apply Dual Lock – two pair under each foot. When loading an animal in your tray, push the animal north, and center it east/west. Finally, rest the red axle on its stopper.



**BIOMIMICRY WALL AND GREEN GECKO:** The Biomimicry Wall's feet are spaced slightly wide. Center them as close to their marks as possible, and keep them parallel. Press the Green Gecko onto its holder at the center of its belly as shown.

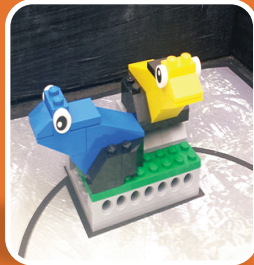


**PANDA OBSERVATION AND RETURN:** Starts with sliding section closed (counter-clockwise).

*These models are placed LOOSE on their marks as shown...(continued on next page)*



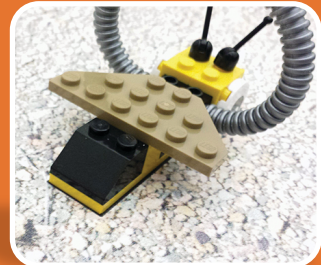
Pet (Our Little Friend)



Frogs



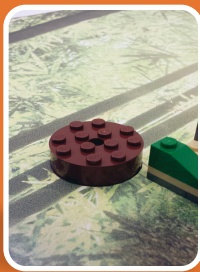
Zoologist



Bee



West  
Manure  
Sample



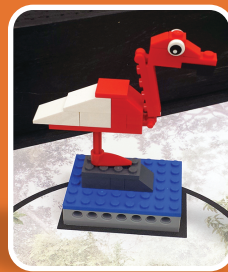
East  
Manure  
Sample



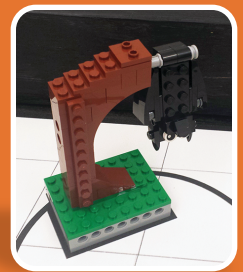
Seal  
& Camera



Gorilla

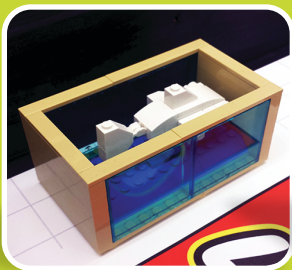


Flamingo



Bat

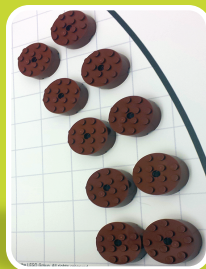
*These models are placed loose completely in BASE as you please (the pictures are just for show)*



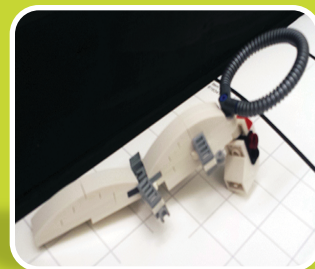
Shark & Tank



Prosthesis



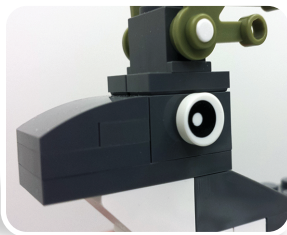
Ten More  
Manure Samples



White Gecko



Dog & Trainer



REINDEER: The Reindeer may be placed completely in BASE, OR it may be placed by hand into the south tray of the Animal Conservation Mission Model, OR it may take the place of another animal...See the **MISSIONS** for full details!

## FIELD MAINTENANCE

- **Border Walls:** Remove any obvious splinters, and cover obvious holes.
- **Field Mat:** Make sure the Mat touches the south Border Wall, and is centered east to west. 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 (many tournaments use new Mats). Use a vacuum and/or damp cloth for dust and debris above and below the Mat. To get marks off, try a white-plastic pencil eraser. When moving the Mat for transport and storage, be sure not to let it bend into a sharp kink point, which could affect the Robot's movement. Tournaments using new Mats should unroll the Mats as far in advance of the tournament day as possible. For control of extreme curl at the east or west edges of the Mat, black tape is allowed, with a maximum of 1/4" (6 mm) overlap. Foam tape is not allowed. Do **not** put Dual Lock under the Mat, or use it for anything other than securing Mission Models as described.
- **Mission Models:** Keep the Mission Models in original condition by straightening and tightening solid connections often. Ensure that spinning axles spin freely by checking for end-to-end play and replacing any that are bent.



Game board – West



Game board – Center



Game board – East



Game board – Full view

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