



Board Building 101

This document should be used with the General Rules and Annual Challenge Rules and Missions documents. Review all three documents to prepare for the RCX, Robo Challenge Xtreme Competition. Follow these step-by-step instructions to build your Board. It is easy to assemble and should take about 2 hours to complete.

Tools:

| | |
|---------------|-----------------------|
| Tape Measure | Screw driver or drill |
| Pencil/marker | Paint brush |
| Saw | Saw horses (optional) |

Materials:

| Supplies | For 1 Board | For The Quad |
|--|-------------|--------------|
| Plywood, 4'x8', ¾ inch thick, smooth on one side | 1 | 4 |
| 2x4 stud, 8 ft. long | 3 | 12 |
| 2x2 stud, 8 ft. long | 2 | 8 |
| Wood screws, 1-5/8 in. long | 1 lb. | 2 lbs. |
| Wood screws, 2-1/2 in. long | 1 lb. | 2 lbs. |
| Black paint, flat | ½ gal. | 1 gal. |
| Plywood, 2 ft. x 2 ft., ¾ inch thick, smooth on one side** | 1 | 1 |
| Your local home improvement store should be able to cut to size. | | |

** RCX competitions are expected to use the entire 2 ft. x 2 ft. piece of plywood. Usage may change from year to year. Suggestion, cut a second piece of plywood 2ft. by 2 ft., then cut that down to a triangular section, ¼ the size of the original piece. Place this piece as explained later in the instructions.

Find a large open area to work while you construct the Board. The garage, driveway or workroom do well.

Step 1, The Bed of the Board

Place the 4'x8', $\frac{3}{4}$ inch sheet of plywood on the floor in the middle of your work area. Double check to make sure the smooth side is up.

Step 2



Using a tape measure, mark the top edge of the plywood with a line at 6 inches, 34 inches, 62 inches, and 90 inches. Place an "X" to the left side of the 6 inch line as pictured. Place an "X" to the right side of the rest of the lines as pictured.



Step 3



Repeat Step 2, only at the bottom edge of the sheet of plywood.

Step 4, The Spine of the Board

Now take the two 2 inch x 2 inch studs. They are 8 feet, or 96 inches long. Cut them in half, or to 48 inch lengths.

Step 5



Raise the sheet of plywood off the ground. Place the four 2x2 studs from Step 4 under the sheet of plywood. Place one 2x2 at each of the marks for 6 inch, 34 inch, 62 inch and 90 inch. Adjust the 2x2s so that they are under the "X" and even with the line above. It is OK if the 2x2s DO NOT extend perfectly to the edge of the plywood. Better the 2x2 is a little short than long.

Step 6



Now, draw a straight line between the top and bottom marks. This line will help you screw the plywood and 2x2s together.

Step 7

Using the 1-5/8 inch screws, roughly a half inch from the line, evenly screw at least 5 screws through the plywood into the 2x2s. **Make sure the screw head is even with the top of the plywood.** Too high or too low, you will tear the mat and affect the motion of the robot.

Step 8, Building the Walls

Cut your 2x4s to the following lengths.



2 at 45 inches
2 at 96 inches

Step 9

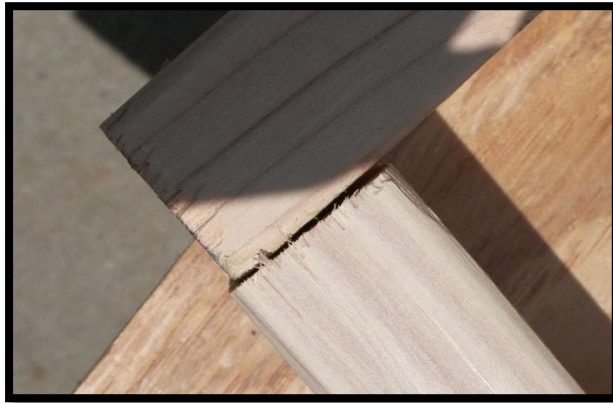


Take one 96 inch 2x4, and one 45 inch 2x4. Place them together as pictured. Make sure the tops of the 2x4s are level. Using at least two of the 2-1/2 inch screws, screw them together.



They will look like this when finished.

Step 10



Take another 45 inch 2x4. Place this at the opposite end of the 96 inch 2x4, as pictured. Make sure they are level and screw together with 2-1/2 inch screws.



It will look like this when finished.

Step 11



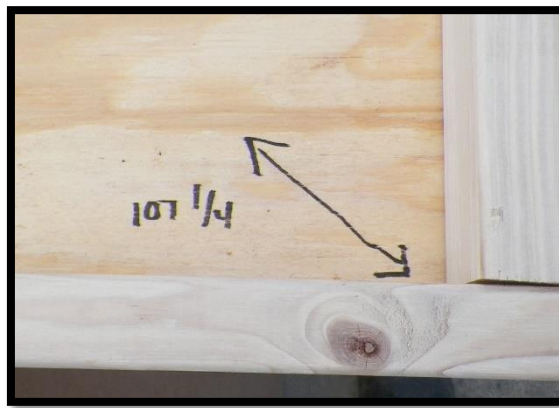
Add the other 96 inch 2x4. Place this board at the ends of the 45 inch 2x4s. Screw together using the 2-1/2 inch screws.

Step 12

At this point, place the plywood on top of saw horses, desks or other object to raise it off the ground so that you can work from underneath.

Line up the 2x4 walls to the edge of the plywood. They should line up almost perfectly.

Make sure one of the 96 inch 2x4s is lined up perfectly to the edge of the plywood. Take one 1-5/8 inch screw through the plywood into the 2x4.

Step 13

Square up the walls. Take your tape measure. From corner to corner, diagonally across the plywood, measure the outside edge of the 2x4s, it should measure roughly 107-1/4 inches. Measure the opposite two corners, it should also measure roughly 107-1/4 inches.

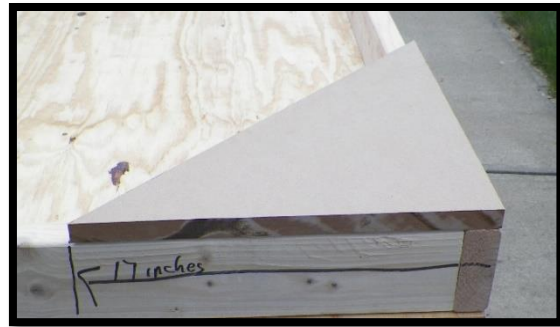
Adjust the 2x4s until both diagonal measurements are roughly the same.

Step 14

Once the diagonal measurements are the same, using 1-5/8 inch screws, screw through the plywood at each corner. Then go back and screw all the way around the plywood. Placing a screw roughly every 8 to 10 inches.

Now the walls 2x4s secure to the plywood.

Step 15 Adding The Quad Platform



The Quad Platform is the entire 2 ft. by 2 ft. piece of plywood. Measure from the top 2x4, down the side 17 inches, place a line. Measure along the top 2x4 and place a line at 17 inches also. The plywood for The Quad will diagonally connect the two lines. Make sure the points of the corners of the piece of plywood are even with the outside edge of the walls.

Using 1-5/8 inches, at least 4 screws, screw The Quad plywood into the 2x4 walls.

Top View



Side View



Step 16

Time to paint. Using the flat Black paint, paint all sides of the 2x4x. Paint all visible surfaces of the Quad. Paint at least a 2 inch border on the plywood along the 2x4 walls. Paint any other exposed surface you wish.



Your finished Board with The Quad Platform

Optional

The RCX Annual challenges will change from year to year. There may be a mission on top of The Quad Platform close by, or on the other side of the platform. Construct another piece of plywood, which is only $\frac{1}{4}$ the size of The Quad Platform to use if necessary.



Your finished Board with a $\frac{1}{4}$ Quad Platform