

# Support Box Instructions

For the Dempster Boats 10 Ft. 6 In. Lake Explorer Paddleboard

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## Overview

THESE ARE MINIMAL INSTRUCTIONS ARE FOR THE BUILDER MAKING THEIR OWN BOX.  
THESE INSTRUCTIONS CANNOT BE USED FOR THE PRE-CUT BOX FROM DEMPSTER BOATS.

**NO TECHNICAL SUPPORT WILL BE PROVIDED.**



*Photo 1. Support Box with Cradle Blocks*

Dimensions (outside): 11 ft. long x 11 ½ in. wide x 4 ½ in. high. Approximate weight 45 lbs.

The support box serves as the platform on which the paddleboard is built.

The box is braced internally and screwed together. Glue is not required.

Precise work is needed as the finished box must be flat and straight.

Diagrams are NOT TO SCALE.

## Approach

It is not possible to get all pieces for the box out of one plywood sheet. Two internal braces and the cradle blocks (external uprights in picture) must be made from extra wood.

All parts must be cut to precise dimension, and have their edges and faces at right angles (90 deg.)

## List of Materials

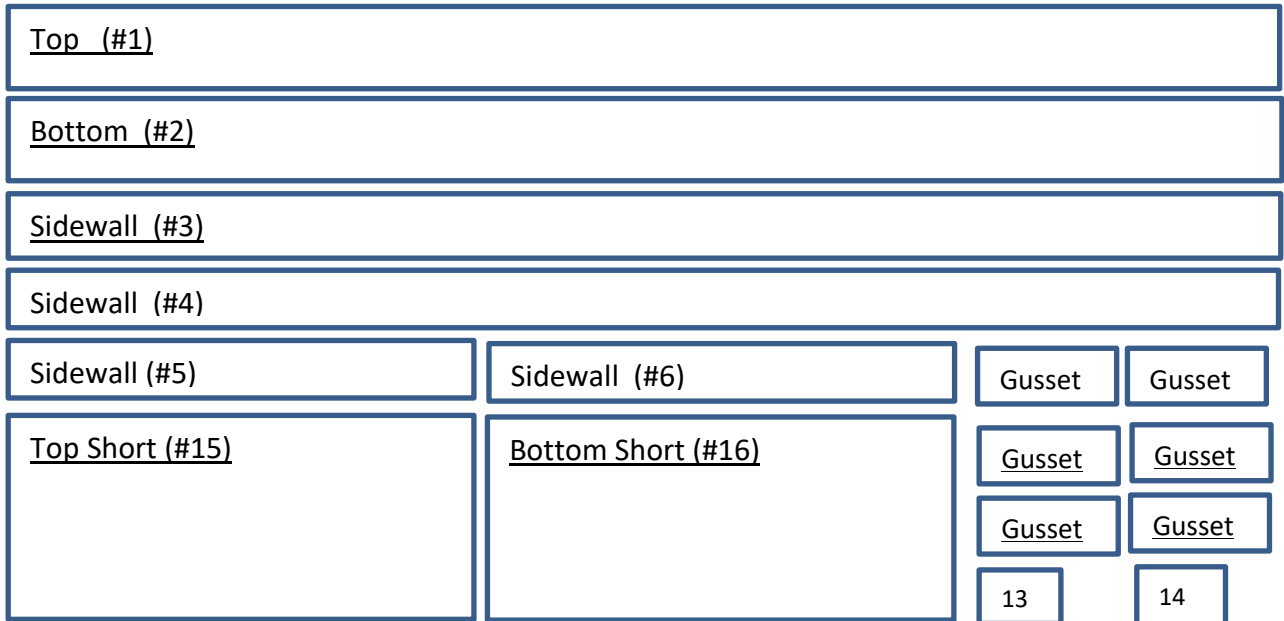
- (1) 4 ft. x 8 ft. sheet, ½ in. thick plywood. Flat stock, G1S or S2S or similar designation recommended.
  - Calculate gusset length before cutting plywood. See Step 2.
  - Curved sheets and rough surface plywood should be avoided.
- (1) 12 ft. length of 1 x 4 in. (nominal) wood.
  - Width however must match width of plywood sidewall exactly. Thickness may be undersized.
- (176) 1 ¼ in. coarse thread screws. Screws must be countersunk or counterbored to be flush with wood surface.

# Preparation of Materials

## 1. Plywood

(1) 4 ft. x 8 ft. sheet ½ in. thick plywood.

Cutting Layout is approximate.



Part Dimensions		Dimensions are Exterior Finished Size	
Part #	Description	Length	Width
1	Top Long	8 ft	11.5 in.
2	Bottom Long	8 ft	11.5 in.
3	Sidewall Long	8 ft.	3.5 in.
4	Sidewall Long	8 ft.	3.5 in.
5	Sidewall Short	3 ft.	3.5 in.
6	Sidewall Short	3 ft.	3.5 in.
5	Top Short	3 ft.	11.5 in.
7	Gusset	10.5 in	3.5 In.
8	Gusset	10.5 in	3.5 In.
9	Gusset	10.5 in	3.5 In.
10	Gusset	10.5 in	3.5 In.
11	Gusset	10.5 in	3.5 In.
12	Gusset	10.5 in	3.5 In.
13	Join Plate	4 in.	3.5 in.
14	Join Plate	4 in.	3.5 in.
15	Top Short	3 ft.	11.5 in.
16	Bottom Short	3 ft.	11.5 in.

## 2. Gussets

Determine length of gusset before cutting individual parts.

Plywood is often undersize in thickness. This will affect the length of the gussets.

Measure thickness of wood to within 1/32 in.

Calculate Length of Gusset = Box Width 11 ½ in. – (2 x thickness of plywood).

e.g. For ½ in. actual thickness, gusset will be 11 ½ - (2\*1/2) = 10 1/2

## 3. Join Plates

Use the 4 x 3.5 in plywood piece to join the short and long sidewall pieces together. There are two plates, one for each sidewall.

## 4. Cradle Blocks

Use (1) 12 ft. long 1 x 4 in. board.

- A kerf of 1/8 in. kerf was assumed for this procedure.
- Trim the board to 6 ft. 3 in. Save the cut off for internal braces (see Step 4).
- Rip the 6 ft. 3 in. piece into two 1 ½ in. widths.
- Crosscut the lengths into 6 in. lengths.
- Make 24 blocks in total.



## 5. Middle Braces

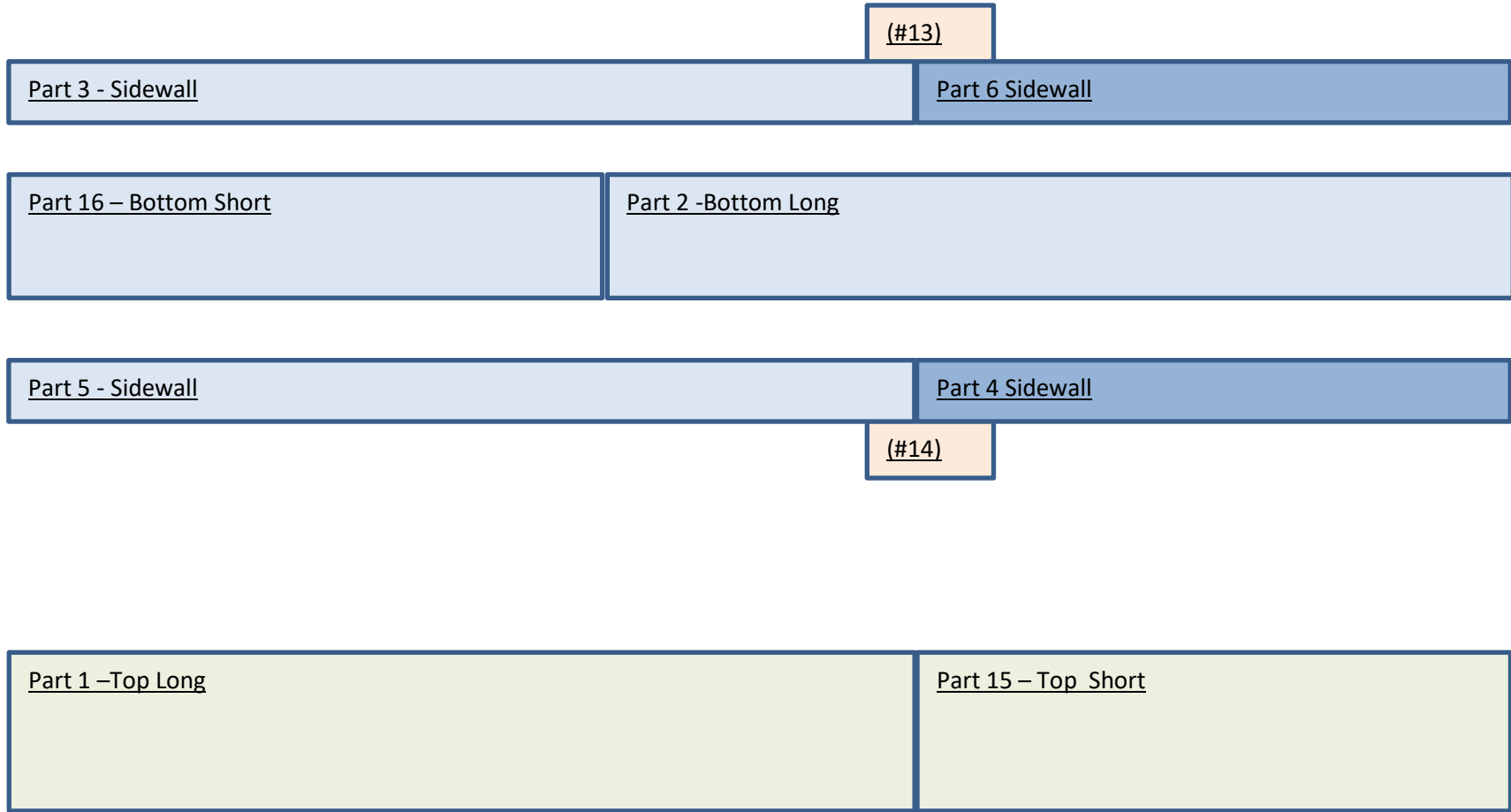
(1) 4 ft. length of 1 x 4 in. board.

1. Cut (2) braces of 2 ft. length
2. Dimension can be slightly under 2ft. due to kerf.
  - Length not a critical dimension for these parts.
  - Height is critical. It must match height of sidewalls.



# Assembly of Support Box

Layout for Assembly



## Assembly of Support Box

Note: Countersink or counterbore all screws so they are set flush to outer surface of box.

### 1. Sidewalls and Bottom

1. Set BOTTOM LONG on two sawhorses.
2. Clamp sidewall to BOTTOM LONG and ensure sidewall is perpendicular.
3. Drill and screw bottom to sidewall.
4. Set screws back from the edge of the plywood by  $\frac{1}{2}$  thickness of the sidewall.
5. Set screws back about 1 inch in from corners.
6. Set screws at about 1 foot intervals along side of box.
7. Join short and long sidewall pieces with JOIN PLATE.
8. Drill and screw the sidewall to the bottom until you reach the end of the sidewall.
9. If you have a third sawhorse, so BOTTOM SHORT butts up against BOTTOM LONG bridges across the second and third sawhorses. Continue screwing the sidewall to the bottom.
10. If you only have two sawhorses, INSTALL THE SECOND SIDEWALL rather than continuing this side. Install BOTTOM SHORT after you have installed both sidewalls on BOTTOM LONG.



## 2. Gussets

1. With one sidewall in place, Install gussets at location in table below.
2. Attach one end of gusset to the sidewall. Pre-drill before driving screw into edge of plywood gusset.
3. End gussets should have two screws equally spaced in the height of the sidewall.
4. Interior gussets can have just one screw.
5. Make sure each gusset is fully seated in the box.
6. Make sure all gussets are flush with the top edge of the sidewalls.
7. Make sure all gussets are set perpendicular to the floor and at right angles to the sidewalls.
8. Once all gussets are in position, install SECOND SIDEWALL to bottom.
9. Once second sidewall is installed, secure gussets to second sidewall.
  - a. DO NOT overdrive the screws or you will pull the sidewall off vertical.

Gusset	Position
Stern	0
1	2 ½
2	26 ½
3	51
4	84
5	106
6	129 1/2



*Photo 3. Install Gussets Inside Box*

### 3. Braces

*The braces for this step are made from 1 x 4 solid wood. These braces are not from the plywood sheet.*

1. Center the brace at the middle of the box.
2. Clamp the brace against the sidewall.
3. Drive 6 screws through sidewall into long braces using diagonal or V pattern spread over 24 inches centered at the middle of the box
4. Note:
  - a. Brace in photo is white. It is shorter than normal and not centered correctly.
  - b. Only one brace is shown.
  - c. A second brace on the opposite side is required.



*Photo 4. Installation of Internal Brace*

### 4. Top

*The box can now be closed by installing the top (not illustrated).*

1. Set TOP SHORT over the short sidewalls. Check that the joint between TOP SHORT and TOP LONG aligns with the joint in the sidewalls and is NOT positioned above the joint in the bottom panels.
2. Drill and set screws as you have been doing to secure top panels to the box.

## 5. Reference Lines

### A. Center Line

1. Sand and paint the top of the box white or a light colour. Use a matt or flat finish.
2. Label one end of the box "STERN"
3. Draw a reference line down the middle of the box.
  - It is essential that the middle line be straight.
  - Be accurate in drawing it (tolerance 1/16 in. over 11 ft.).
  - DO NOT attempt to draw the line using the side of the box as reference.

### B. Cradle Lines

1. On the center line you just drew, make marks at the distances specified in the builder's manual.
  - This table varies with each model so values are not given here.
2. Measure from the end of the box labelled "STERN".
3. Draw a line perpendicular to the center line at each of these marks.
  - Use a half-circle protractor to set the angle.
4. Extend the perpendicular line the full width of the box.
5. Label the lines from #11 to #0 as indicated.



Photo 5. Centre and Cradle Lines on Box.

## 5. Installation of Cradle Blocks

Ensure that your box is level side to side and end to end. If your box is not level, the cradle blocks will not install correctly.

### Cradle Blocks

1. Draw a line all the way around the middle of each cradle block.
2. Set the cradle block in the vertical position, with half the block above the top surface of the box.
3. Make sure the cradle block is on the BOW side of the cradle line.
4. Screw the cradle block in place. Ensure it is vertical.
5. Repeat for all stations.



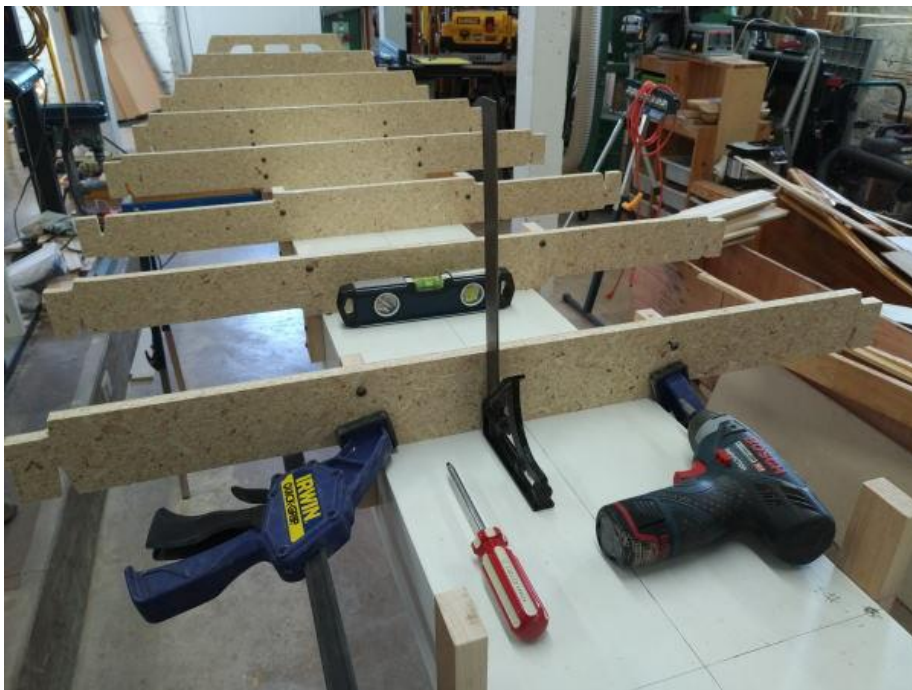
Photo 6. Ensure Station Blocks are Vertical.



## 7. Installation of Cradles

**DANGER:** The box with cradles installed is heavy, bulky and difficult to move.

1. Mark each cradle with a line at the middle all the way around the cradle.
2. Orient each cradle so the inscribed number is on the same side as the others.
3. Hold the cradle against the station blocks. Set the cradle so the midline notch lines up with the center line of the support box.
4. Clamp the cradle to the cradle block on either side.
5. Drill two holes through the cradle into the station block.
  - The lower hole should be at 1 ¼ inch from the bottom edge of the cradle.
  - The upper hole should be at 2 ½ inch from the bottom edge.
  - Ensure the holes are drilled straight through the cradle, not at an angle.
6. Set screws on each side but do not fully tighten yet.
7. Use a combination square to check that the cradle is perpendicular to the deck of the box.
8. Drive in screws.
9. Repeat for all cradles.
10. End of Construction. You are now ready to start building your paddleboard!



*Photo 9. Installation of Cradles on Support Box.*