



# THE BALANCE BOARD

*Building and Use*

## ABSTRACT

This Document is intended as an aid to those wanting to build and use balance boards. It will help answer questions about building a balance board and using it to improve your paddling and general fitness.

By:

Christopher Crowhurst and William Nash

## Contents

Why Build a balance board? .....	3
Getting started with your project .....	3
Designing your balance board .....	3
Necessary materials .....	4
Necessary tools and work space .....	4
Optional tools.....	4
Building plans .....	5
Building instructions .....	8
Exercising on your balance board .....	13
Cautions .....	13
Paddling exercises on your balance board .....	13
General exercises on your balance board.....	13

### Note from the Authors:

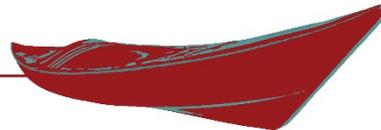
This document is intended to aid you in building a balance board, to help improve your kayaking. Wood working and kayaking pose specific risks. It is beyond the scope of this document to inform you of the proper and safe use of your kayak, tools, or the dangers associated with dusts from specific woods or coatings and treatments that may be present on or in your woods. We hope you enjoy building and using your balance board, please do so safely. Happy paddling

*Christopher Crowhurst*

*William Nash*



**NASH**  
BOATWORKS



The 3D models used to make the drawings found in  
this document can be downloaded for free:

<https://grabcad.com/library/balance-board-3>

## Why Build a balance board?

It is a fun and easy project that can be done and enjoyed with your family. It is a connection to the history of kayaking as shown in books dating back to at least 1900. And, it is a great way to increase strength and flexibility for kayaking.

## Getting started with your project

### Designing your balance board

There are several factors one should consider when designing a balance board: their physical ability, the intended use of the board and the ability to store the board are among the chief considerations. For instance if you have limited storage space and need to store it inside the cockpit of your kayak when not in use don't make it too tall to fit; if you are intending to use the board for yoga you may want a slightly less tippy board especially if you plan to do standing poses on it; and finally, if you are an inexperienced paddler and just want to begin to get practice, making a board that you cannot stay on will likely lead to giving up and using your board for firewood rather than its intended purpose.

We have chosen a middle ground and placed the center of balance 7" above the seat. This is near the naval of the average paddler and like that of many modern kayaks. This results in a board that is 3" tall and easy to store, is easy for beginners to use while providing enough challenge to keep even experienced paddlers and yogis coming back for more.

Should you desire a tipper board it is possible to increase the height of the rockers to push the center of balance lower. The effect of this is that it increases the moment of tipping or decreases the moment of righting. The same effect can be had by decreasing the radius of the rocker however it will have the unintended consequence of allowing you to pinch your fingers under the board. It should be noted that our building instructions call for no glue, only pegs, so save your scrap and if in a year you choose to change out the rockers you can easily do so.

## Necessary materials

Like most things in life this project can be done as simply or as extravagantly as one can imagine. We have again chosen a middle ground that uses simple materials and processes but leaves room for artistic flare in choice of woods, and final shape of the board.

1, 1 X 12" X 6' long board

1, 1 X 2" X 4' long board

1, 1/4" X 4' long hardwood dowel.

## Necessary tools and work space

At a minimum, you will need:

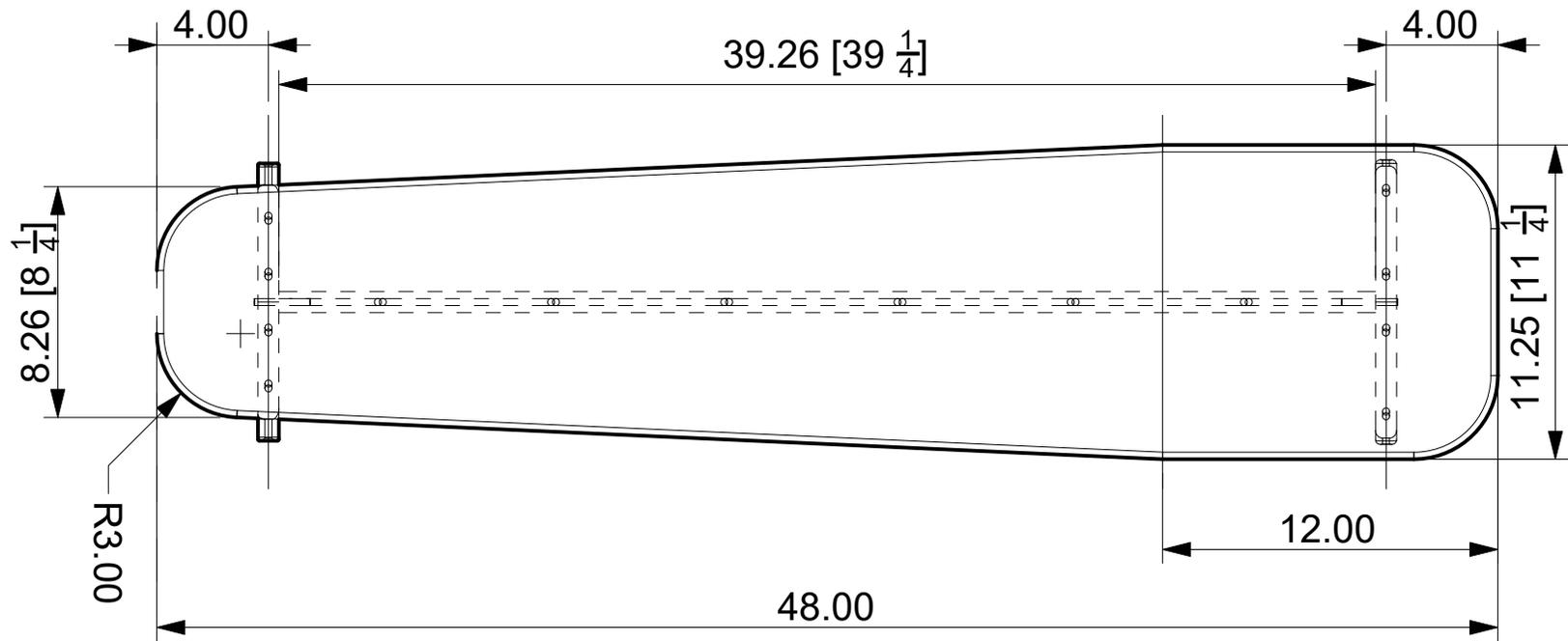
1. Pencil or other marking tool.
2. Ruler or tape measure 4' in length.
3. Square at least 6" long.
4. Saw, capable of rip and cross cutting.
5. Drill.
6. 1/4" Drill bit.
7. Hammer.
8. One nail
9. Sandpaper.
  - a. 80 grit.
  - b. 120 grit.
10. String 22" long or longer.
11. A well-lighted workspace with a stable work surface such as a set of saw horses or work table.
12. 1" wide masking tape, about 6'.
13. Small salad plate approximately 6" in diameter.
14. Sharp knife.

## Optional tools

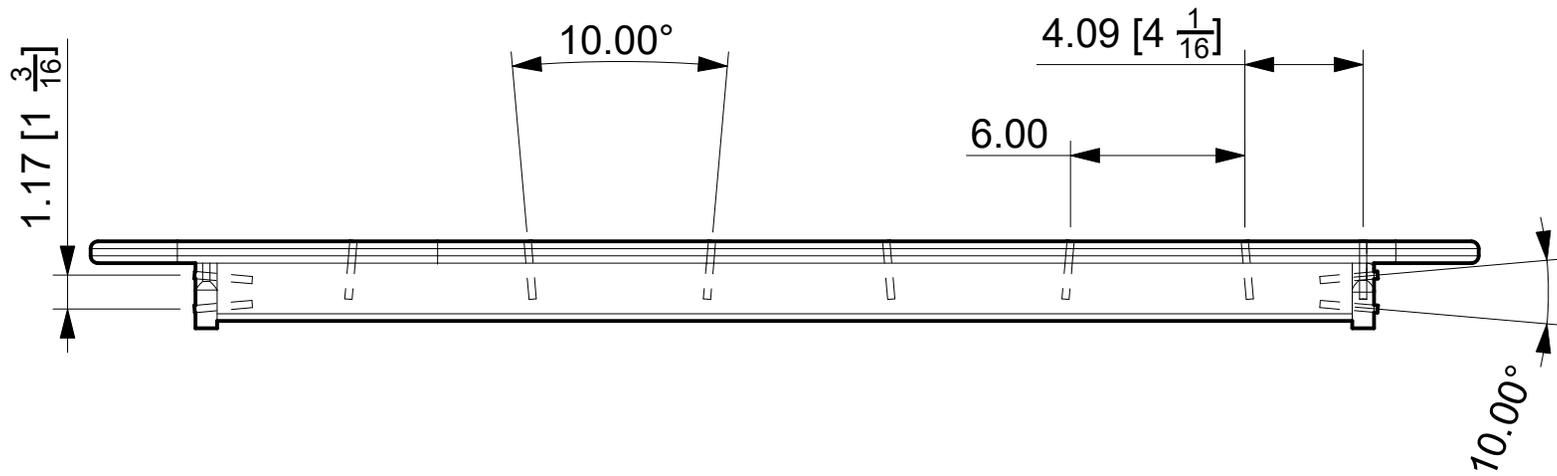
Should you have a full shop at your disposal, or simply wish to embellish the look of your board here is a list of other tools that could come in handy:

1. Jig saw or band saw.
2. Dual action sander with the grits mentioned above plus 180 and 220 grit.
3. Router with 3/8" round over bit.
4. Table mounted belt or disk sander.
5. Small, 6" ruler.
6. Compass or dividers.
7. Finish of your choice.
8. Block plane.

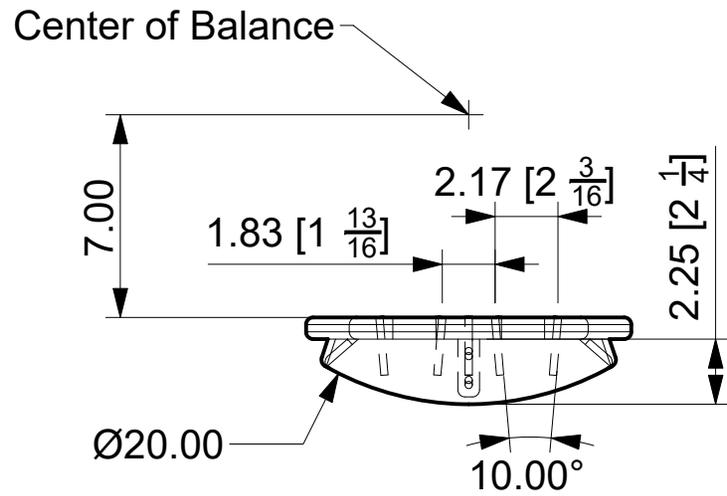
# Top View



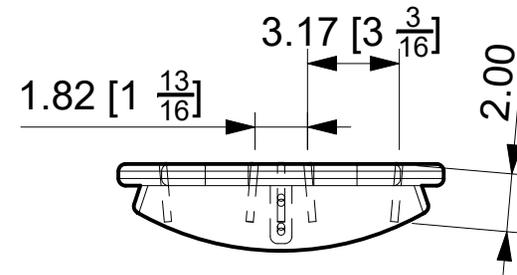
# Side View



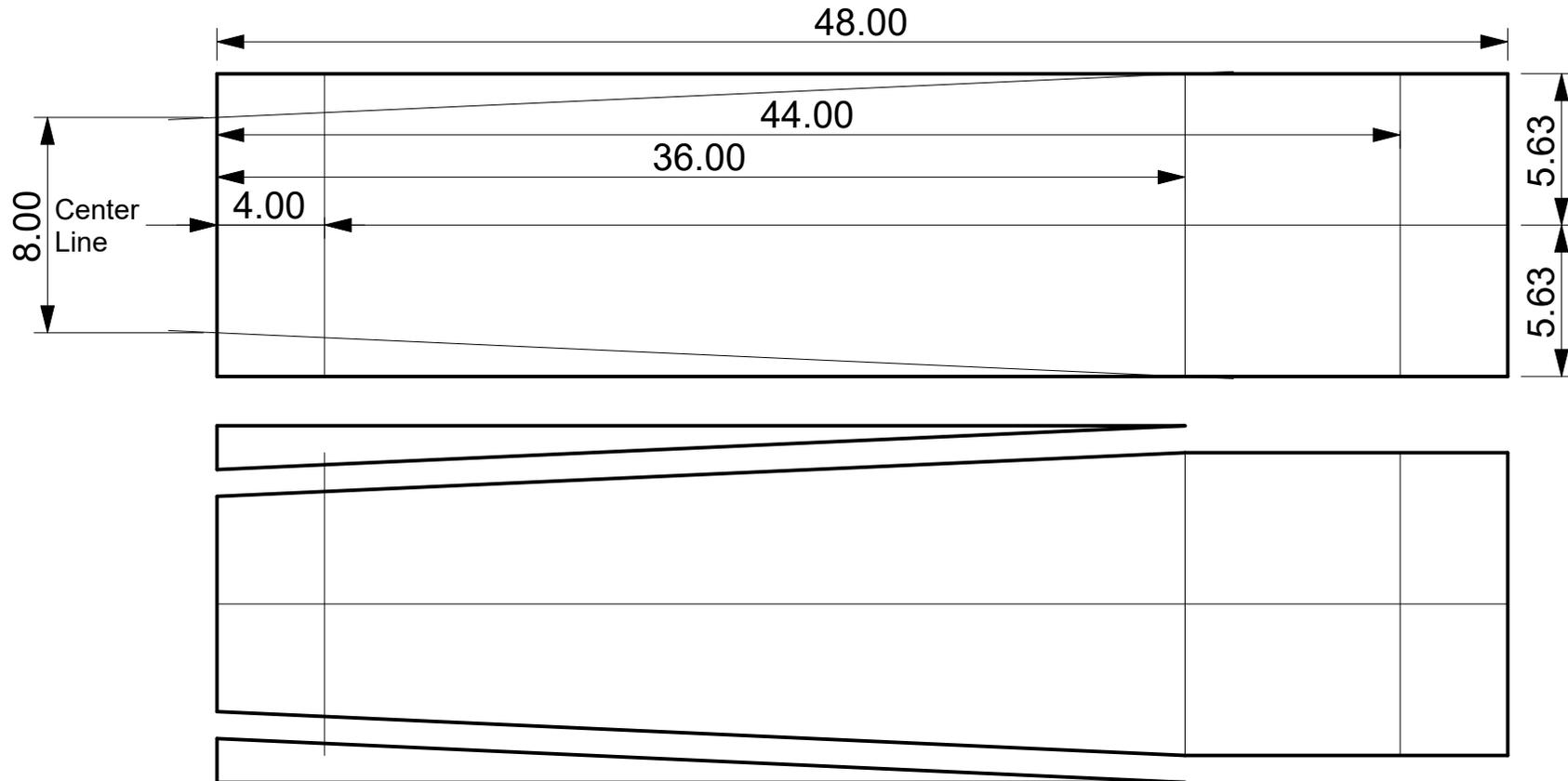
# Front View



# Back View

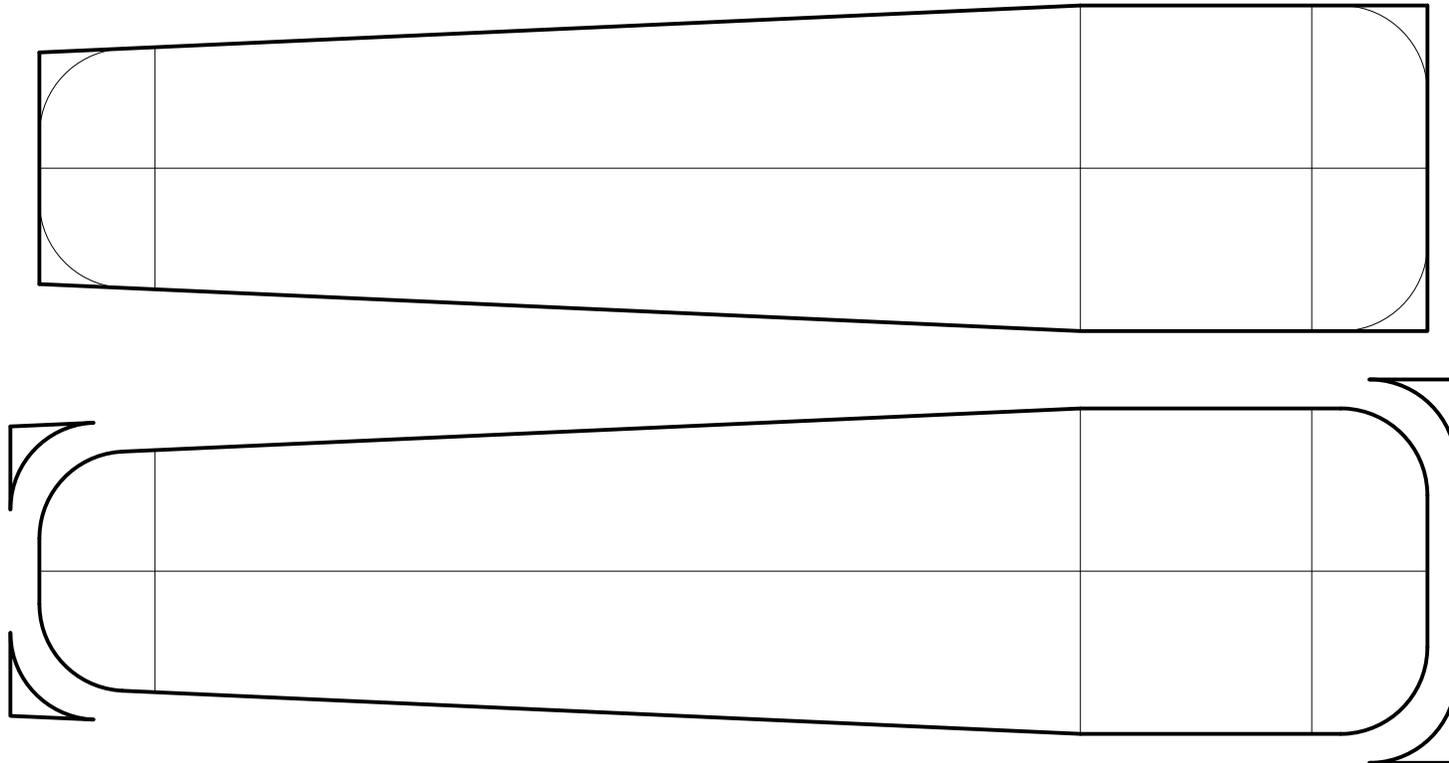


# Cutting Layout 1



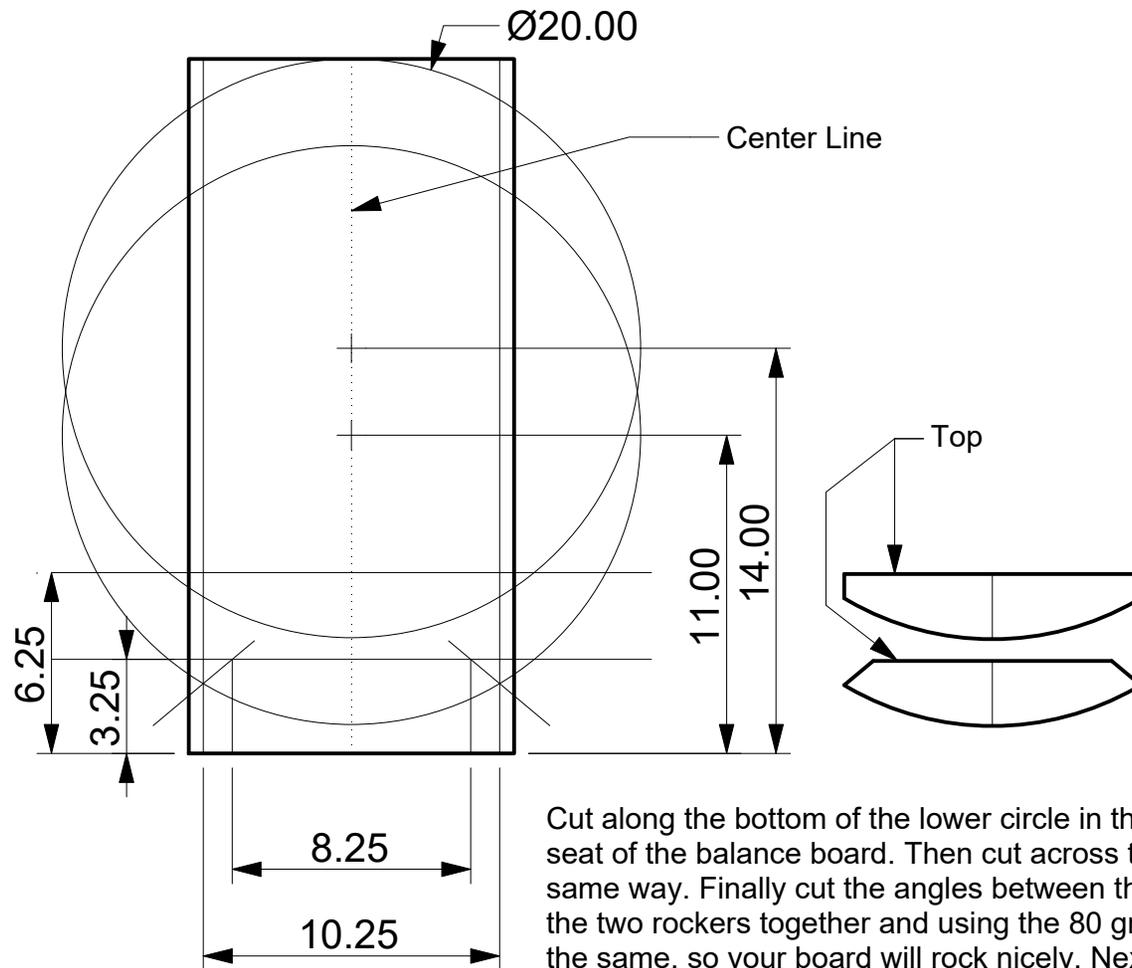
Begin by cutting your 6' long 1 X 12 down to 4'. Use your tape measure. mark 4' from one end then use your square to transfer that mark across the 12" wide face of the board. Cut just outside of the line so that your board will be 4' long when finished. At both ends of the board measure to find the center. working from left to right, at the end of the board, measure 4" from your center in both directions. Measure 4", 36", and 44" from the end of the board and mark all the locations. Use your square to transfer these marks plus your center line across and down the sides of the board to the bottom. Use your 1 X 2 as a straight edge to mark in your center line and your square to transfer your intersecting lines across the bottom. Place your 1 X 2 on a diagonal connecting the 4" mark on the end with the edge of the board at your 36" line, pencil this line in, then do the same for the other side. Cut these lines staying just outside, you can sand or plane to the line later, it is harder to add wood back on.

## Cutting Layout 2



Using your salad plate as a template, draw the radius onto the corners of the board tangent to each side the radius touches. If you are using a handsaw, cut a series of flats or facets just outside of the radius. The smaller you make the facets, the less sanding work you will have later. Once you have cut the excess material from around the board use the 80 grit sanding paper to touch up your radii and long straight cuts. Break all sharp corners now with the 80 grit paper, do not sand off your layout lines.

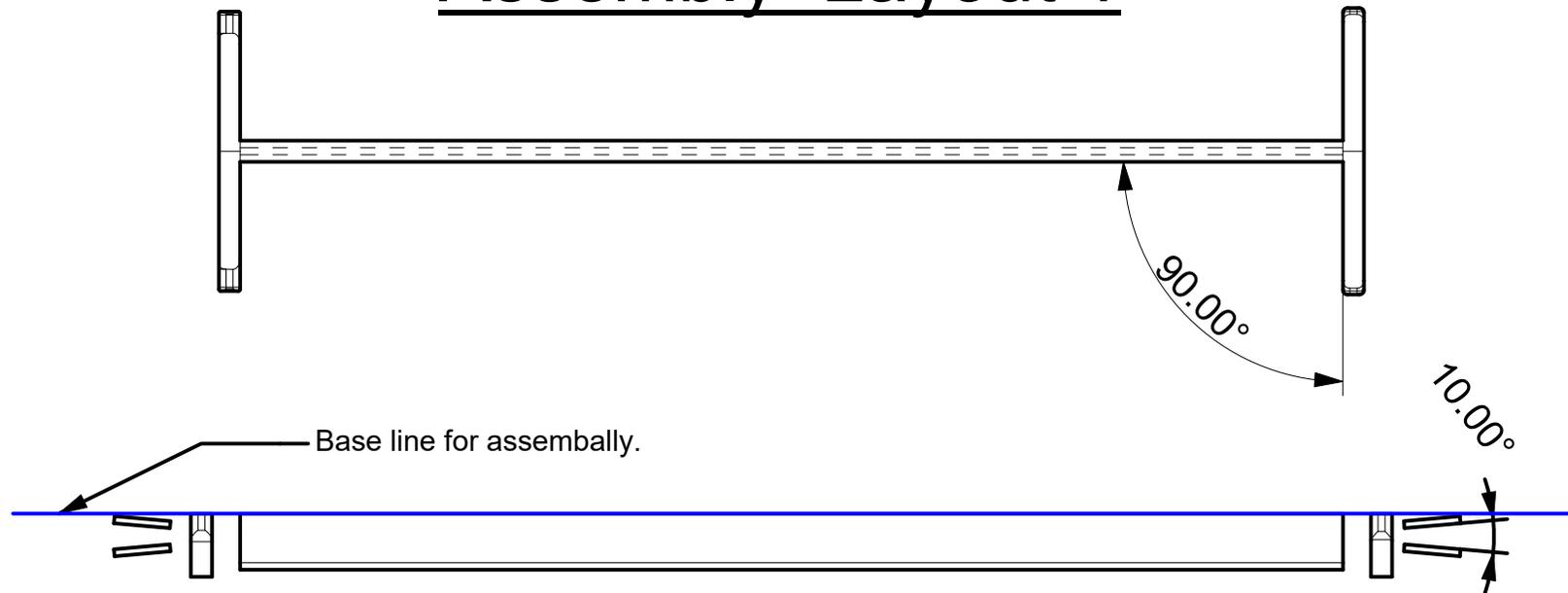
# Cutting Layout 3



On your left over piece of 1 X 12, begin by marking a center line along its length. From the bottom of the board, measure up 3 1/4", 6 1/4", 11" and 14". Use your square to transfer these lines across the material. Along the bottom of the board, measure 4 1/8" and 5 1/8" each side of the center line. Use your square to transfer these marks as high as you can or at least 3.25" and 6.25" inches as shown in the picture. If you have a compass that will make a 10" radii you can use it now to draw your arcs, alternatively, double your string over and from the point where is folded, measure up 10" pinch this point tightly and tie a knot up to your fingers. Drive your nail into the point where your center line and your 11"-mark meet. Place the string over the nail and use your pencil to pull the string tight, keep the string near to the lead of the pencil to avoid wobbling. Draw the first arc. Move the nail up to the point the centerline and the 14" mark intersect and repeat this process. Using a straight edge, connect the point where the 3.25" and the 8.25" lines intersect to the point where the lower circle intersects the 10.25" line.

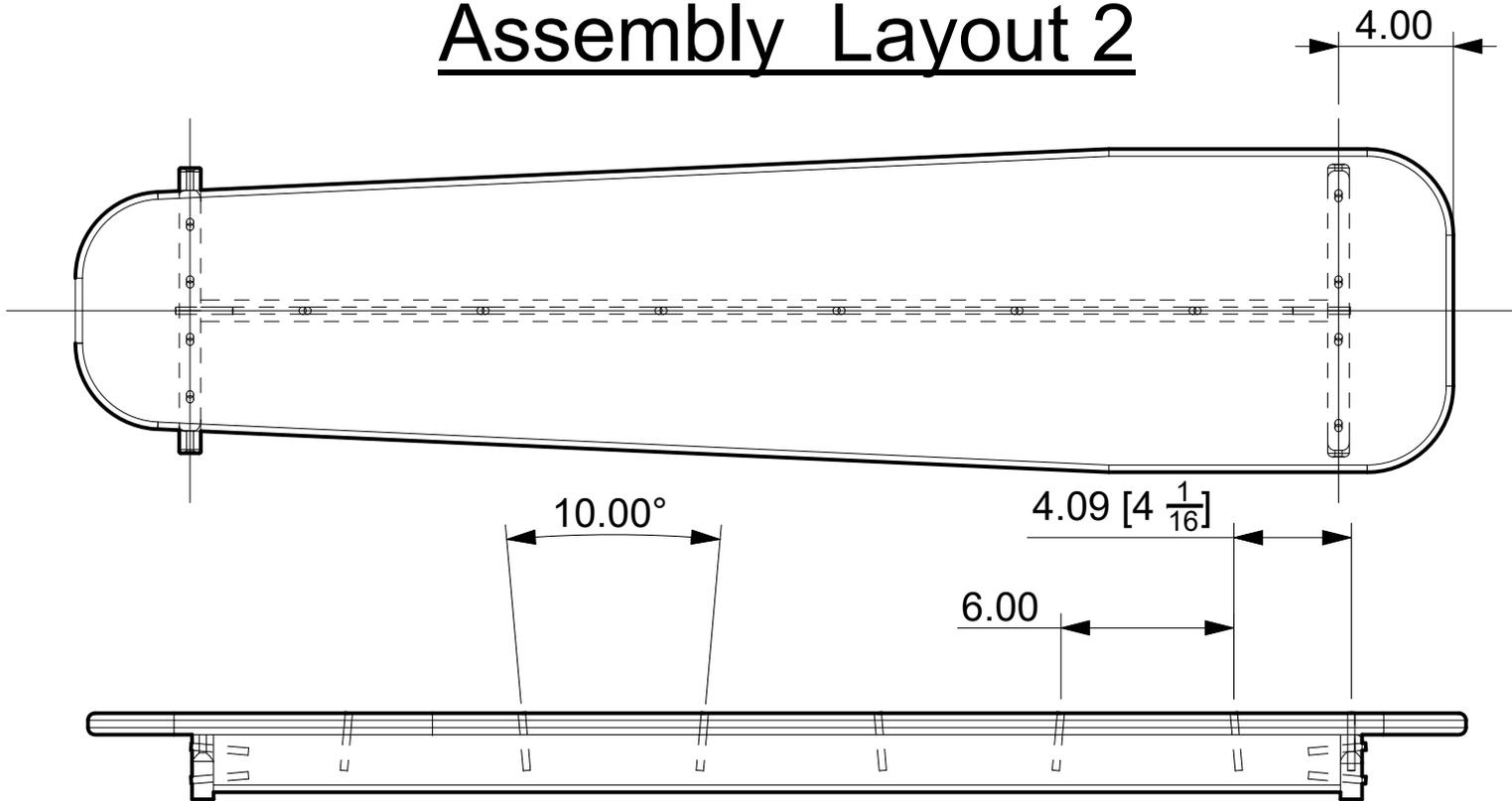
Cut along the bottom of the lower circle in the same manner as you did for cutting the radii on the seat of the balance board. Then cut across the board at the 3.25" line. Cut the upper radii in the same way. Finally cut the angles between the rounded and straight edges of the first rocker. Hold the two rockers together and using the 80 grit sandpaper try to make the radii as much as possible, the same, so your board will rock nicely. Next using the 80-grit paper with the rockers separated now, smooth or slightly round over all the sharp corners except for the ones along the long flat edges at the top of the rockers.

# Assembly Layout 1



To assemble the rockers for your balance board, you will need 4, 2" long dowels, the rockers you cut in the previous step and your 1X2 cut down to 39 & 1/4". Start by placing your rockers upside down on your work surface. Then place your 1X2 in between them, get one end of the 1X2 centered on one of the rockers and tape or clamp it in place then center the other side and secure it in place. Use your square to create a 90-degree angle between the rocker and the 1X2. hold both firmly down to the table and use your 1/4" drill bit to make a hole through the to the rocker into the 1X2 parallel to the 1X2 and at 5 degrees to the work surface. Pound a peg into this hole. Recheck for square, then drill another hole parallel to the 1X2 and at 10 degrees to the first peg. Pound a peg into this hole. Drill and peg the other rocker to the 1X2 in the same manor.

# Assembly Layout 2



To complete the final assembly of your balance board you will need the rocker unit from layout 1, the top of the board, 14, 2 long 1/4" dowels and the same tools you used to assemble the rocker. Begin by choosing what side of the board you want for the top. Place it top side down on your work surface. Using the layout lines on the board position the rocker assembly and tape or clamp it in place. Make sure the rear rocker is square to the edge of the board then measure in an X to make sure the front rocker is parallel to the rear. Turn the board right side up and drill and peg the rear rocker at opposing angles. Next drill and peg along the center support. Finally drill and peg the front rocker. Remove the tape and or clamps and sand and finish your board with your desired product.

## Exercising on your balance board

The balance board has two main purposes, the first is the exercise and development of the body and mind's ability to understand how it is moving and what position it is in. In medical jargon this is called kinesthesia. It works, by developing the mechanosensory neurons in the muscles (aka nerves) that provide the brain feedback and control the muscles. The second benefit is the strengthening of the muscles in the hips, legs and abdomen that are used extensively in kayaking.

### Cautions

As with all exercise talk to your physician before starting to use the balance board. Build up slowly starting with just a minute or so and only train longer as your body strengthens and develops its balance. When you are starting out, or if you are trying harder exercises, consider placing foam pillows on either side of the board to cushion your inevitable fall. The floor surface you practice on affects the stability of the board. Start out on a plush carpet or rug, then build up to practicing on a hard surface.

### Paddling exercises on your balance board

Simply sitting on the wide end of the board. Start with your legs bent, knees raised and splayed slightly to the sides. Initially extend your arms out to the sides, like a tightrope walker, for balance. Both the knees and the arms help provide mechanisms to move weight to help balance, to make the exercise progressively more challenging bring the arms in, and eventually cross them so they cannot move, then straighten the legs and lower the knees so the legs are resting on the board in front of you. By removing the arms and legs the abdominals become the only mechanism to help maintain balance. Also, this position will cause the lower abdominals to work harder to keep the spine in an upright posture, much like paddling without a seat rest or back band, try not to slump forward with a curved spine.

Additional ways to create greater challenge while performing seated balance board exercises: Try closing your eyes. Removing the visual cues for balance causes the mind to work harder to develop the nerves that sense movement, this simulates paddling in the dark which can be disorientating for many.

Once you are confident at the standard seated exercise, try introducing a paddling action. Either just using an "invisible" paddle or a short length of wood between the hands practice the action of taking paddle strokes while balancing on the board. The mind will become distracted by the need to focus on the paddling and cause the balance to become more instinctual and performed in the background. To make this paddling exercise progressively harder replace the "paddle" with a weight, anything from a bag of potatoes to a dumbbell will work, build up the weight over time.

Beyond paddling exercises try introducing other activities, reading a book, watching TV, juggling, whatever you can do to occupy your mind and allow the balancing action to fade into the background. Remember the more hours on the board the easier the hours in your kayak.

### General exercises on your balance board

Cross legged sitting: This changes the way your hip flexors get involved in balancing the board. Try experimenting with moving your legs into various positions, look at stacked log posture and cow face pose, both from yoga.

Standing (sideways and lengthways): As the center of gravity rises so too does the difficulty, and the distance when you fall out of the pose. Try facing the ends and the side. And then really challenge yourself by turning around while on the board.

One legged standing is the next challenge. Try a tree pose, on the board. Decreasing the contact to just one foot, enhances the development of the muscles in the ankle and calf as they fire hard to maintain balance.

Another fun “standing” pose is Surfers Pose, which involves balancing in a half squat with the non-engaged leg extended to the side. Like Tree pose this one really tests the supporting ankle.

High Plank Pose introduces using the arms for support. With feet on one end, hands grasping the sides at the other end, keep your gaze just beyond the board at a still point. If High Plank is too hard, try a kneeling plank. If High Plank is a piece of cake, try Low Plank.

Arm balances are for the brave. Crow Pose, is a favorite party game, as is Peacock Pose. Head stands and handstands can be done by the bravest of us. But all these poses tend to end in tears as the fall can really hurt when the board gets in the way of your rapid descent, you have been warned. Only try these poses when you are fully competent on the ground first.