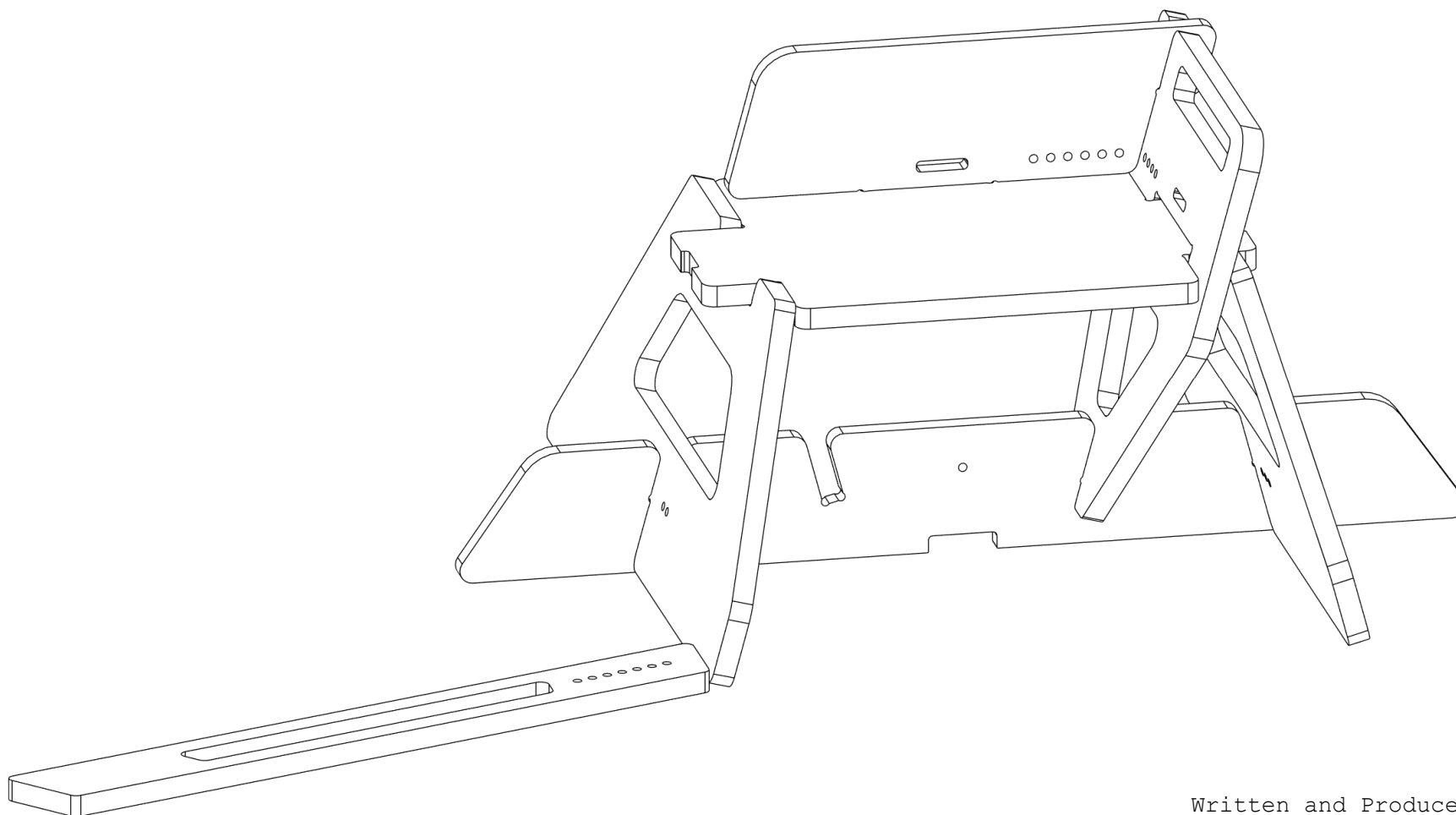




Cutting Instructions and Fabrication
Advice for the DIY Maker.



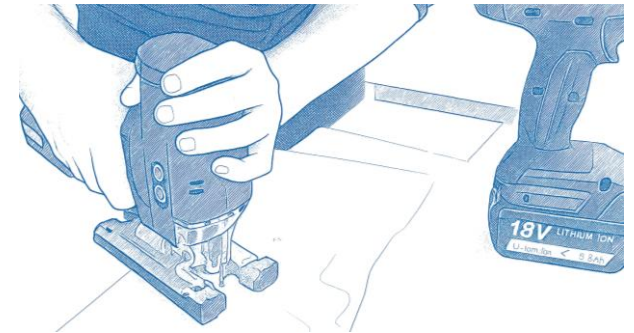
Version 2.0

Written and Produced by Dr Ed Elias
and edited by Rick Rodgers
on behalf of British Fencing

General Tips

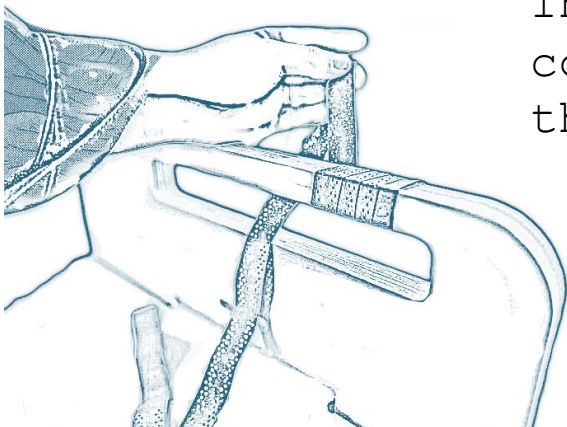
Before you get started, there are a few important things to note:

1. When making more than one of any part, for instance making parts 2+3 which are duplicates, take your time on the first of each part, because if you get that one right, then you can trace it for the other.
2. There is room for play in a lot of the pieces because if a cut is slightly off the ratchet straps will remove any wobble when tightened. If a cut's measurement is vital, it will be pointed out in the instructions.
3. Often the ratchet holes in the design are there to reduce the final weight of each piece. You can often cut them smaller if weight isn't as much of an issue for you but don't cut bigger as the minimum thickness of the supporting materials is important. If you do cut the holes smaller be sure to line them up so the ratchet strap can still go through without excess rubbing.



Useful Links

- [SwordSeat Website page](#)
- [SwordSeat online Training link](#)



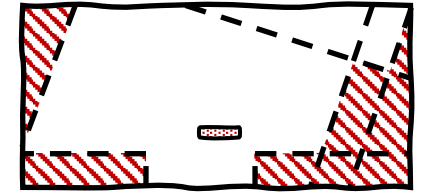
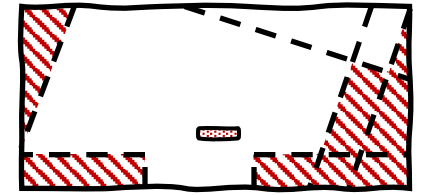
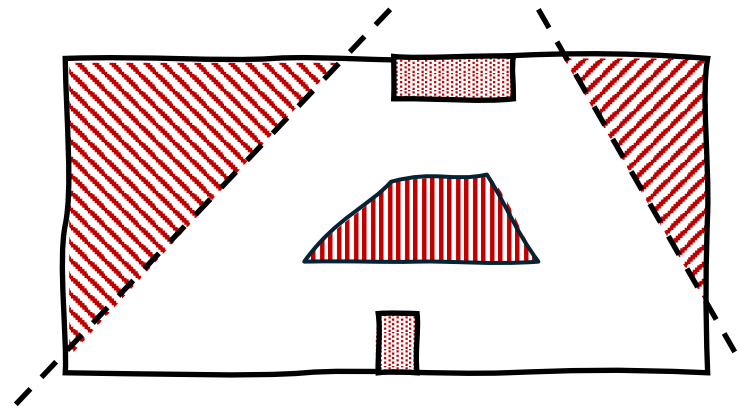
In addition to these plans, to complete your SwordSeat™ you'll need the following items:

1. 4 heavy duty ratchet straps
2. 2 reasonably firm Wheelchair cushions (16 by 18 by 3 inches)
3. Neoprene tape for the floor contact points
4. Double sided Velcro for the cushion attachments
5. Tennis tape for the handle
6. A little sandpaper to keep splinters at bay

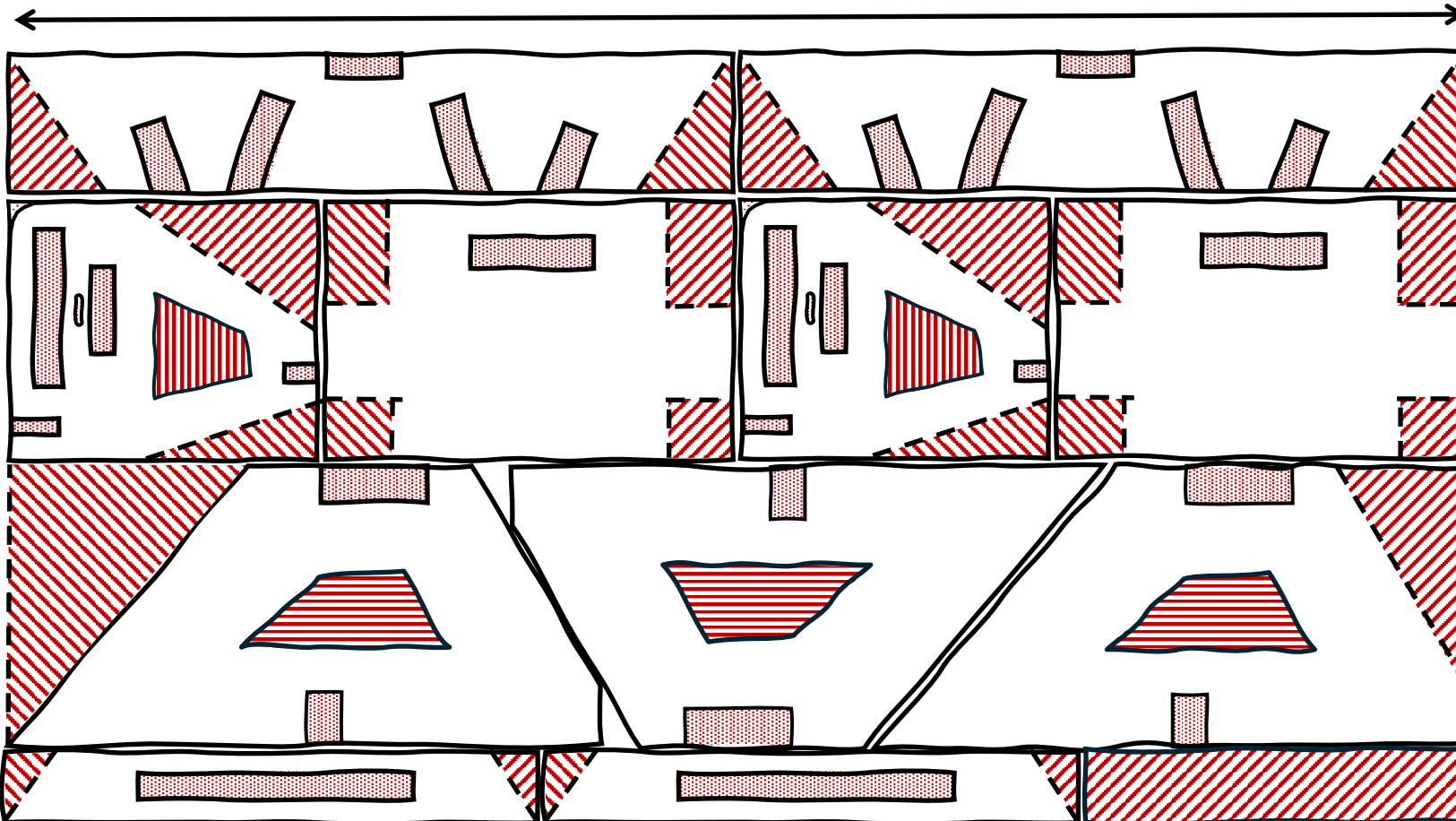
Cutting Overview

You will need,

- 25mm thick plywood sheets
- A drill
- A jigsaw
- A measuring tape
- A pencil



2440mm



1220mm

The most common size of plywood is 2440x1220 (8 foot by 4 foot) but we just couldn't squeeze it all in.

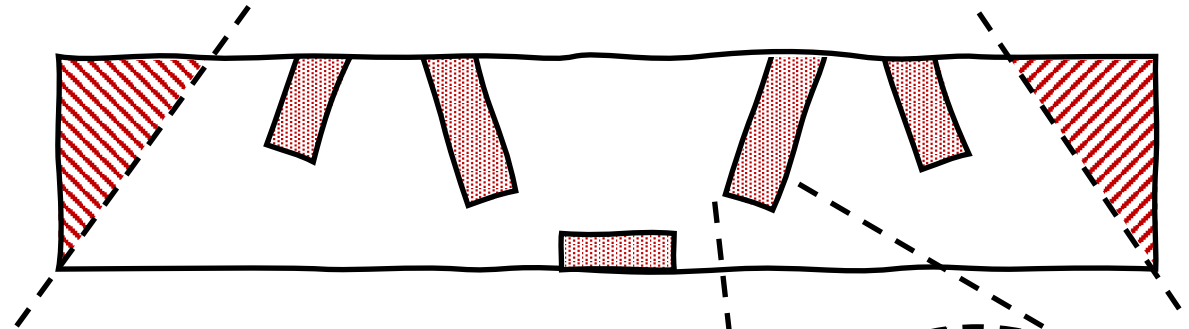
So, for two seats, you'll need one and a bit sheets.

Layout suggestion on a standard plywood sheet

Part 1 - The Base

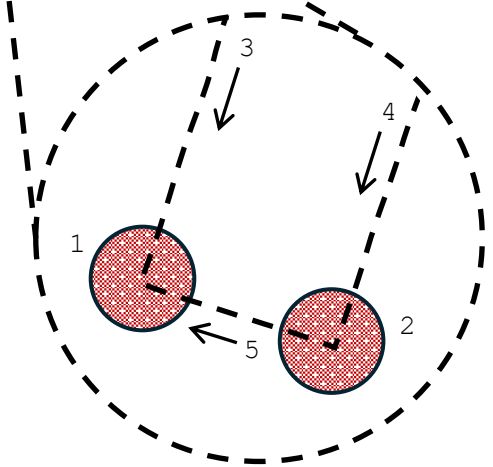
1. You need a 1200mm by 150mm rectangular piece
2. Mark out the position of the slots. It is symmetrical. The depths of the slots are not critical, a little larger than specified is not a problem, but try to get the angles right. To help, we've given you the angles and the lengths of both sides of the slot. The width of the slots should be 26 or 27mm. Cut the slots and then cut off the two corners so that the piece angles inwards like a pyramid. All 4 slots are 27mm wide.

All the plywood used in this design is 25mm thick.

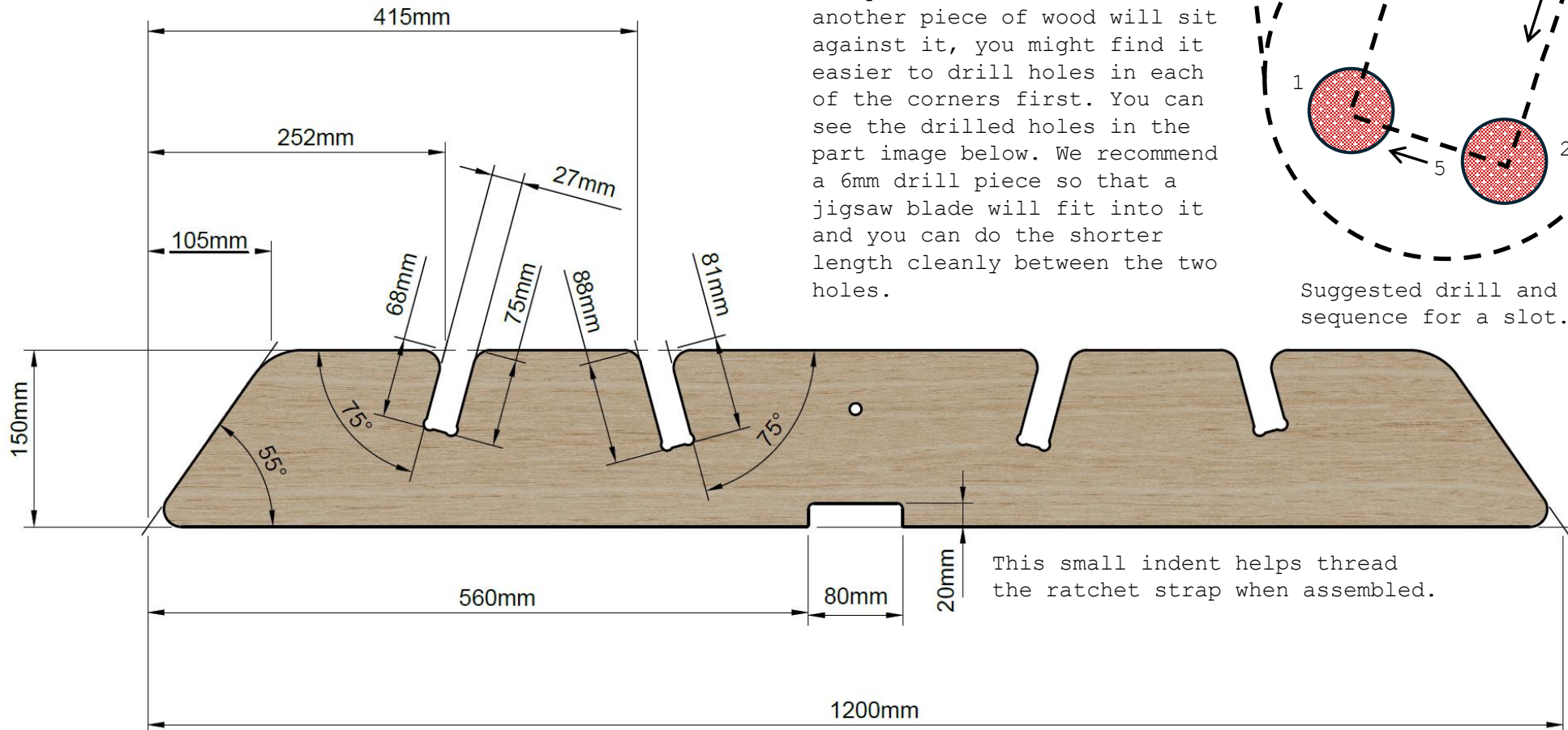


Drilling Corners...


For all internal slots where a sharp corner is needed because another piece of wood will sit against it, you might find it easier to drill holes in each of the corners first. You can see the drilled holes in the part image below. We recommend a 6mm drill piece so that a jigsaw blade will fit into it and you can do the shorter length cleanly between the two holes.

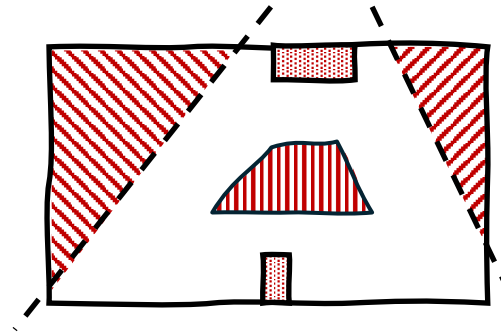


Suggested drill and cut sequence for a slot.

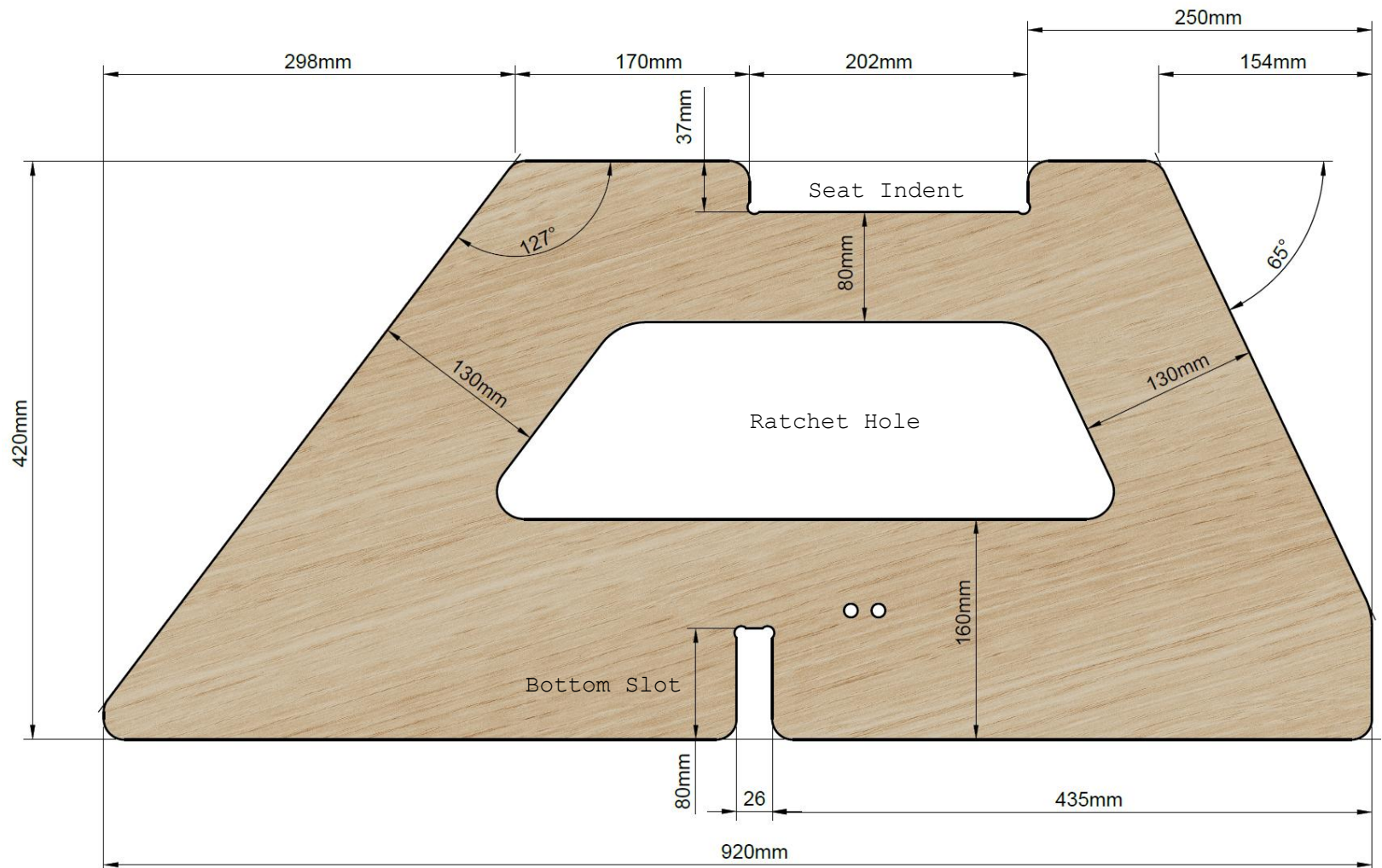


Parts 2 & 3 - The Sides

- Two identical pieces, except for the drill hole part numbering, 2 holes for part 2, 3 holes for part 3.
 - You need two large rectangles, 420mm by 920mm.
 - In the same way as part 1, the angled sides are not critical to the function of the seat but serve to reduce the weight and remove unnecessary material from getting in the way of the fencer.
 - The left and right position of the bottom slot is important; it can be more than 80mm but not less. Since all the plywood is 25mm thick we suggest making these slots around 26mm, so the wood slides in easily, but is not really loose.
 - The indent at the top is for the seat (part 5). The depth of 37mm is important so that it sits flat.
- 
- The diagram shows a technical drawing of a wooden seat component. It is a rectangle with a height of 420mm and a width of 298mm. The right side of the rectangle is cut at an angle of 73 degrees. A horizontal line is drawn across the top of the rectangle, and a vertical line is drawn on the left side, intersecting the horizontal line. The angle of 73 degrees is indicated by an arc between the vertical line and the angled side.



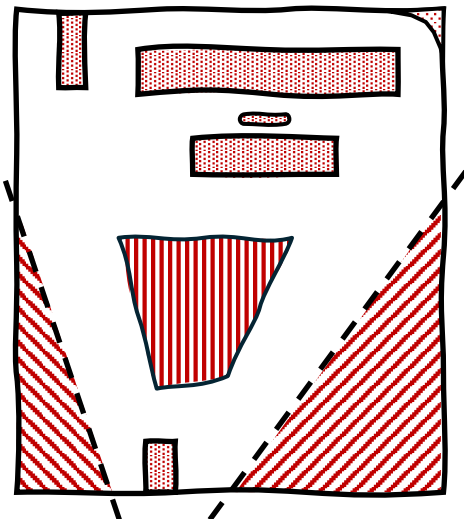
6. The size of ratchet hole can be smaller. It's there to reduce weight and allow the ratchet strap to pass through. Any hole (but no larger than this) will be fine, we want to keep the sides around it strong.



Part 4 - The Handle

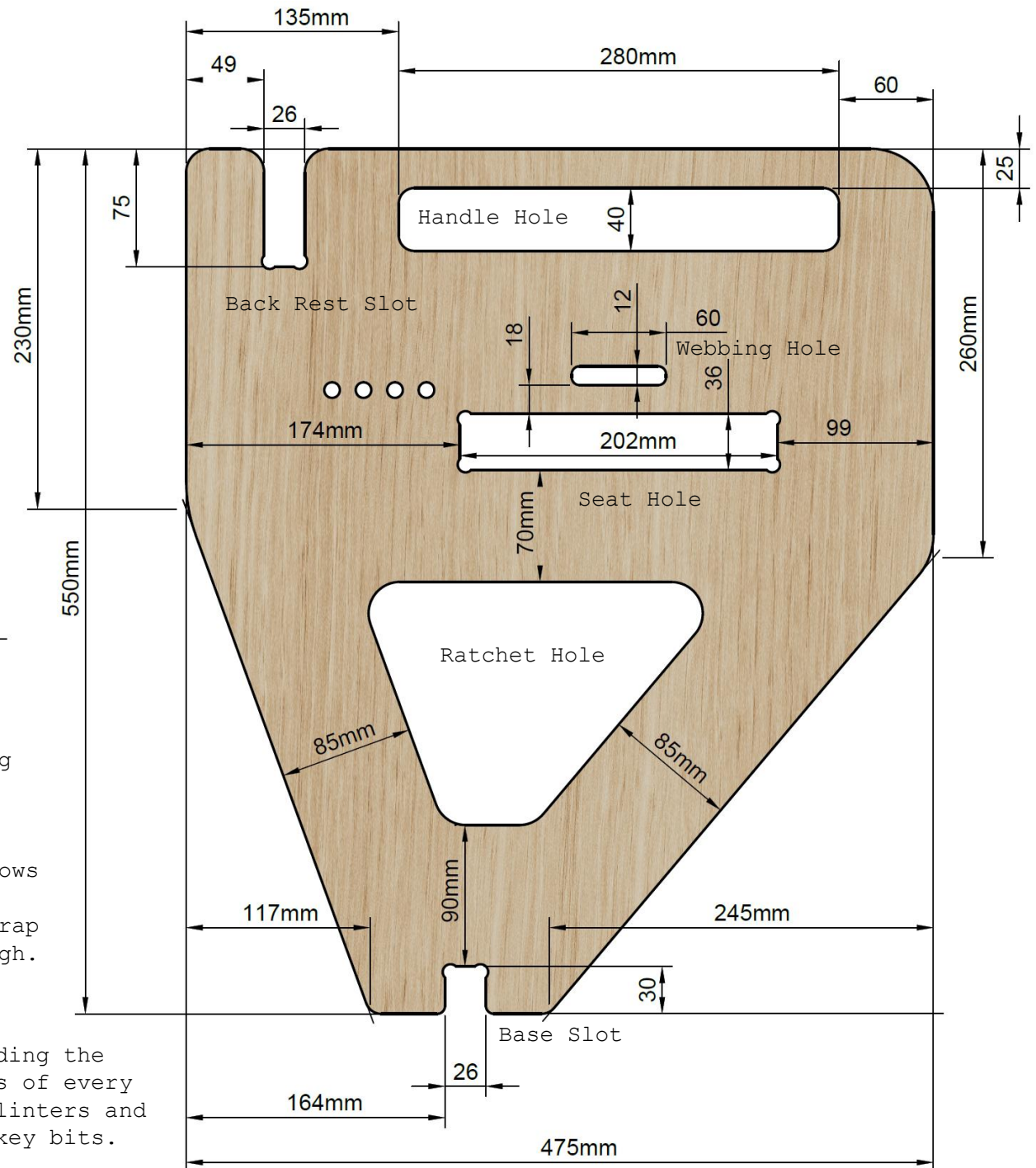
This is the most complicated part by far! It's not technically hard, but you do need to take care marking it all out before you start. Start with a 550mm by 475mm piece of plywood.

1. Mark out and drill the corners of the slots and holes. The position and size of these is important. The handle hole is less important from an accuracy point of view, but we've found a 25mm thickness at the top to be comfortable and sturdy. We highly recommend sanding the corners and then wrapping it with something cushioned like tennis racket grip tape.
2. Cut the slots and holes and then remove the bottom two corners to save weight and remove excess material from getting in the way.
3. The accuracy of the ratchet hole, like in parts 2 and 3 is not as important, but don't make the edges thinner than this.



4. A small webbing hole should be drilled just above the seat hole. This allows the webbing of the ratchet strap to reach through.

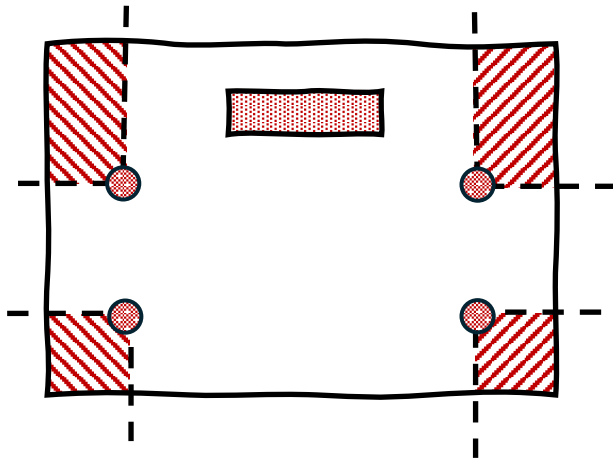
We recommend sanding the corners and edges of every part to avoid splinters and uncomfortable pokey bits.



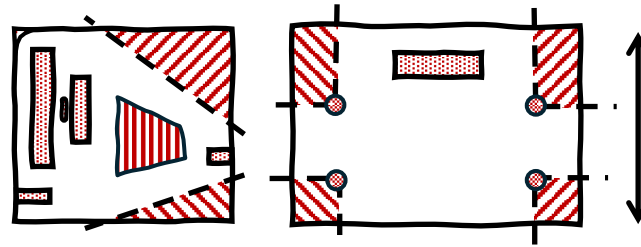
Part 5 - The Seat

Compared to part 4, this one is easy. A symmetrical rectangle with the four corners missing and a hole.

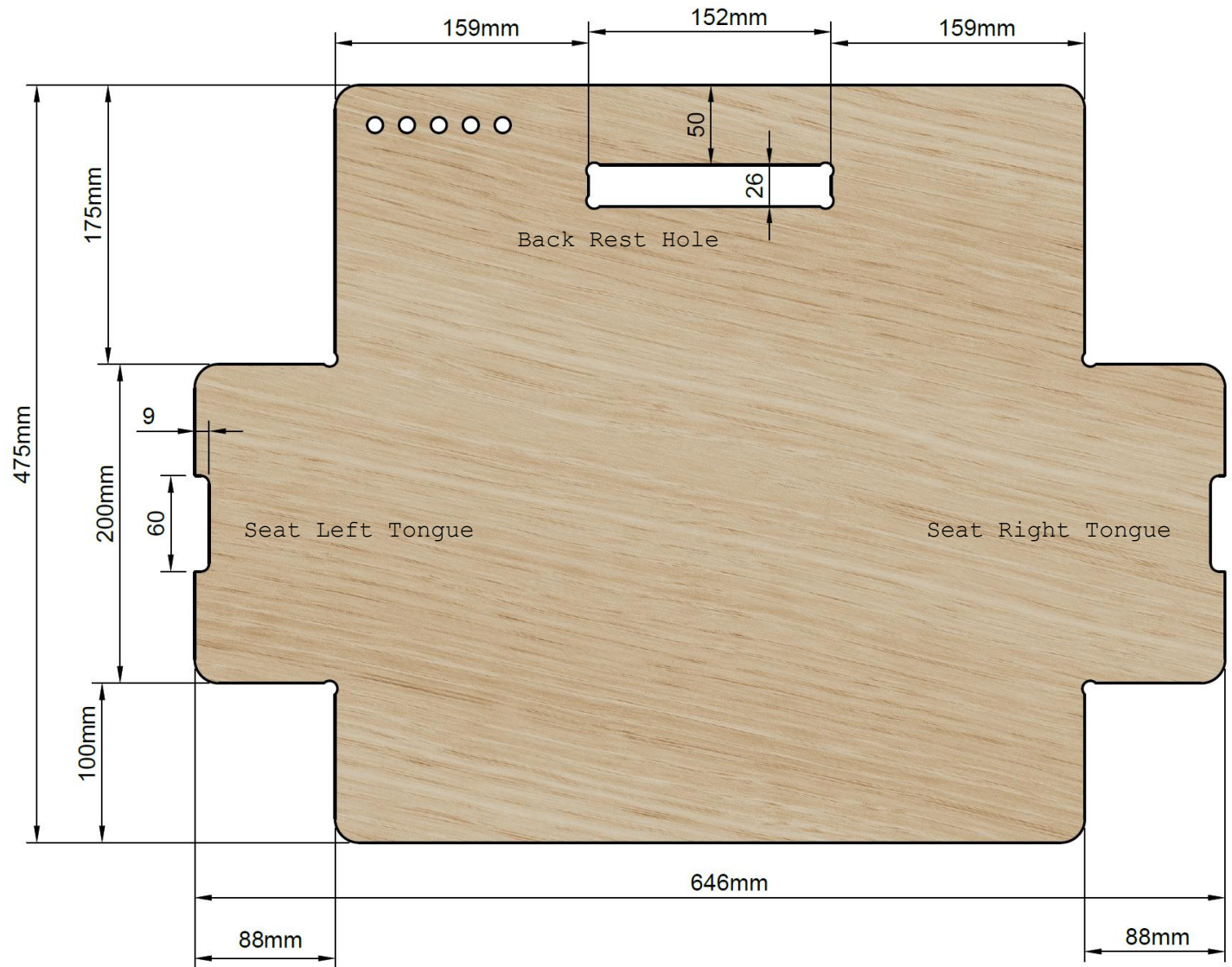
1. Start with a rectangle, 475mm by 646mm.
2. Drill the corners of the four corners and then cut to the drilled holes. This creates the two tongues, one on each side, that sit on top of the seat indents in parts 2 & 3 and through the seat hole in part 4.



3. The final significant step, is drilling and cutting the back rest hole. As long as part 6, the back rest, fits, the quality of this hole is not critical as the ratchet straps will secure it in place.
4. Lastly, two 60mm indentations can be cut into the tongues to act as guides for the ratchet straps, but they are not essential.



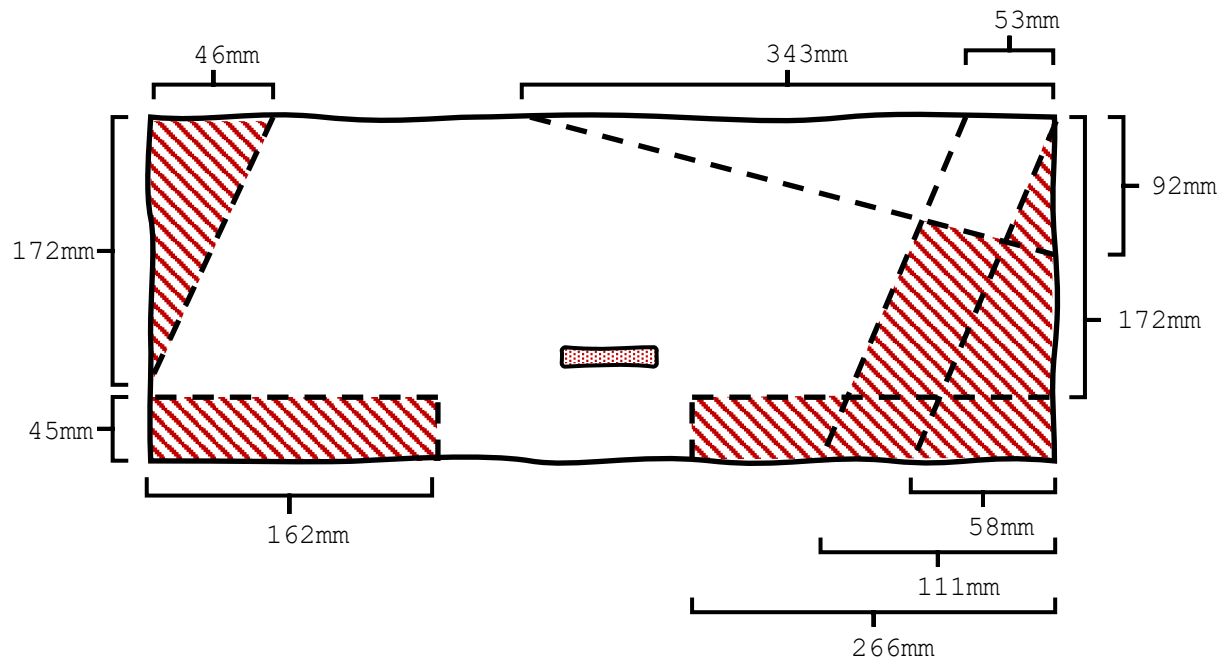
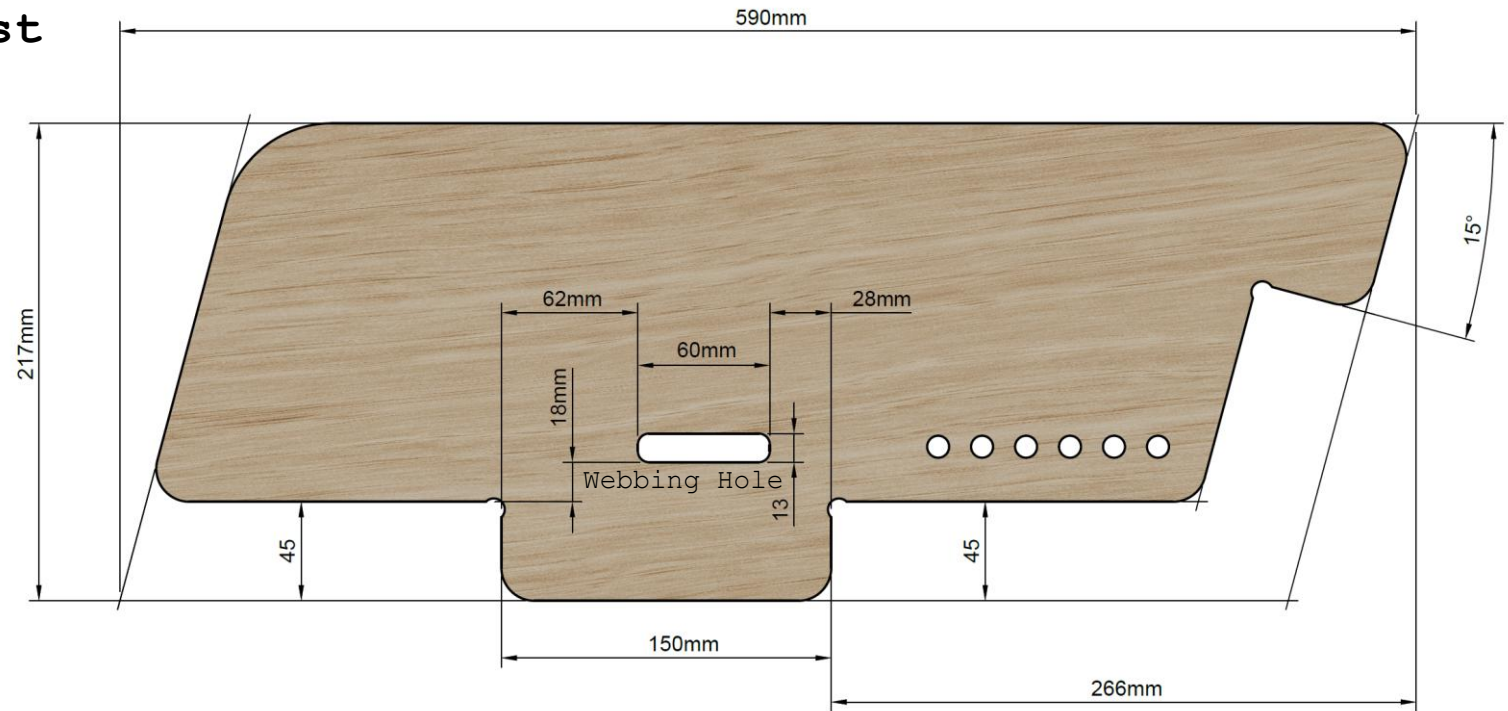
Parts 4 and 5 are the same 475mm width. So could be cut from the same strip of plywood. 1200mm(1.2m) long. The same length as part 1



Part 6 – The Backrest

A slightly more awkward piece and one that can be adjusted in height depending on impairment.

1. Start with a rectangular piece of plywood 217mm x 590mm
2. Then, using the coordinates shown below, mark out the ends of each line around the edge of the wood. Join the dots as per the image below and you'll be left with a series of lines to cut. Due to the angles the numbers are all a bit odd.
3. Drill and cut the webbing hole. You'll notice that it is not centred to the protrusion below it. This is deliberate.



A note on back rest height and cushions:

It has been designed for an 18" x 16" (roughly 450mm by 400mm) sized cushion. These are readily available but for fencing, the stiffer the cushion the better as it gives you improved reach and response agility. (The cushions used by Paralympians are not designed for comfort!)

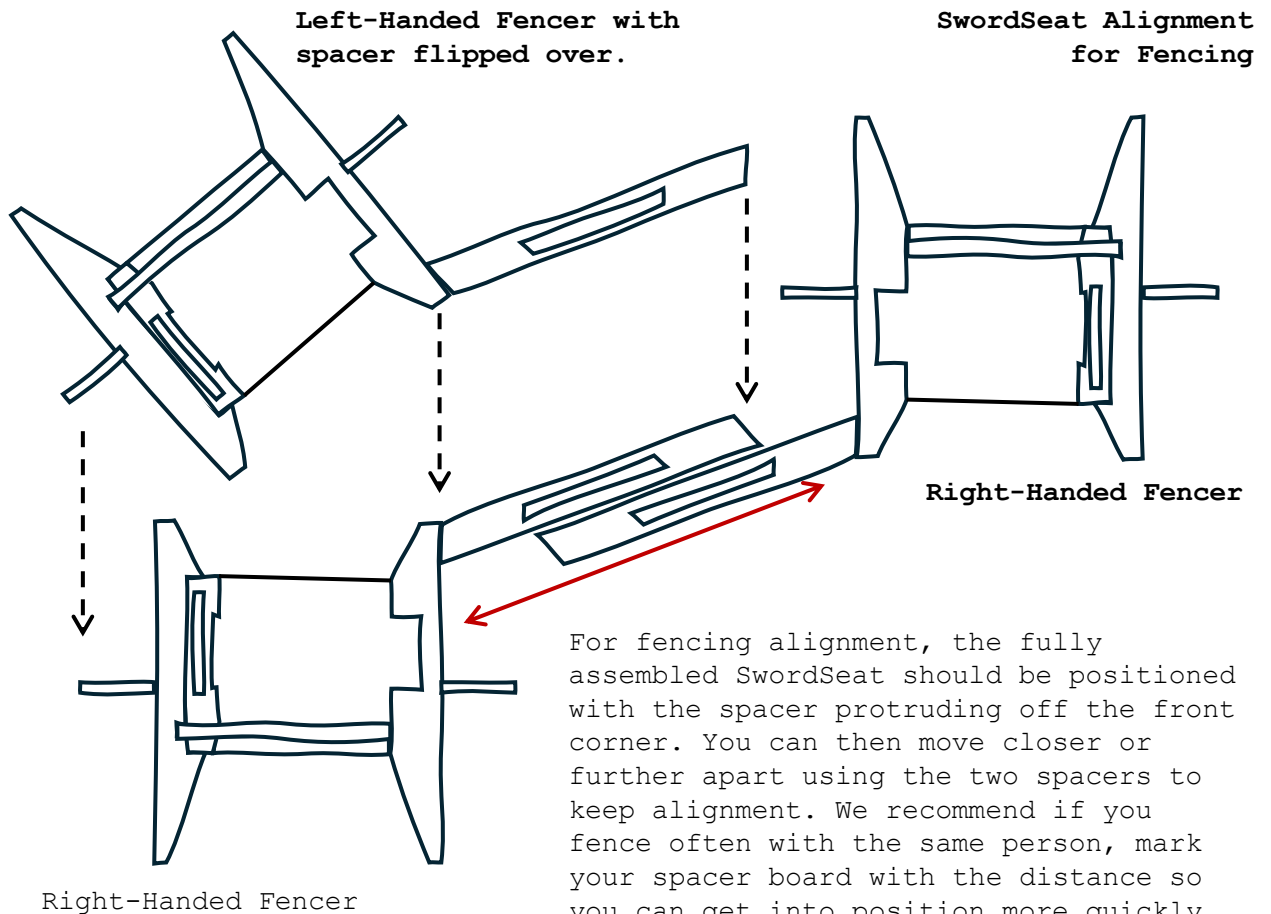
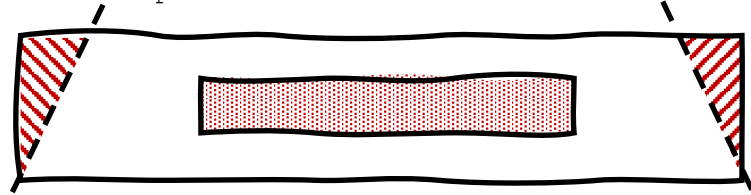
The seat back height, when used with a thick cushion, is a little lower than the required 150mm minimum height (above the cushion) regulation. This is deliberate as being made of stiff plywood rather than a more forgiving and comfortable fabric, as a wheelchair seat back rest would normally be, we wanted to keep it low and out of the way to make it more comfortable for the fencer.

Part 7 - The Spacer

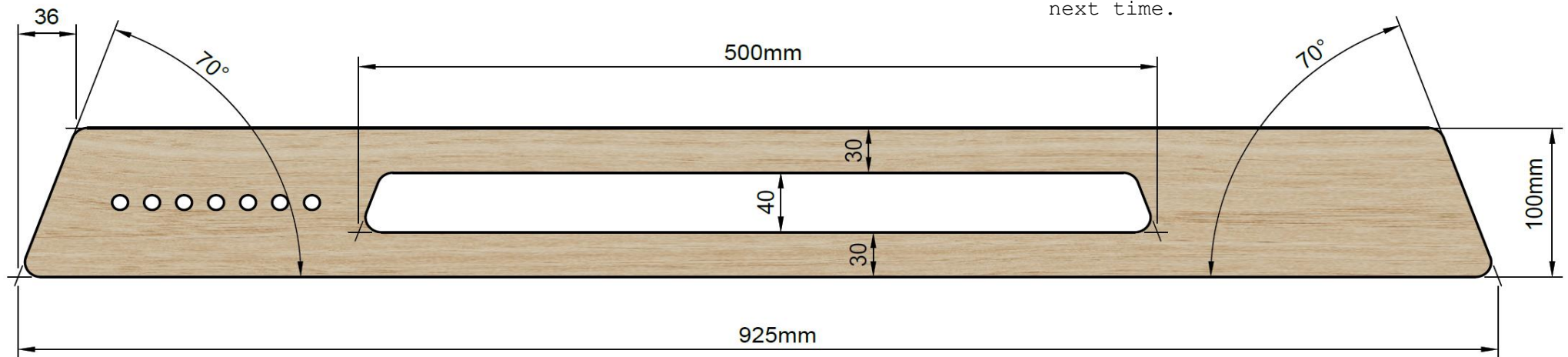
The two most important features of this part are:

- A. Having two straight and parallel long edges. This part is used for aligning the two fencing chairs. The part 7 of one chair will press against the part 7 of the other chair. So, they need to be straight for this to work well.
- B. The angle cut at the end needs to be 70° off the horizontal (or 20° off the vertical). If your part 7 is 100mm wide like the one shown here, that would be 36mm along one edge, as shown below.

The long narrow hole in the middle is just to make the piece lighter and easier to carry, but it's not important for the function.



For fencing alignment, the fully assembled SwordSeat should be positioned with the spacer protruding off the front corner. You can then move closer or further apart using the two spacers to keep alignment. We recommend if you fence often with the same person, mark your spacer board with the distance so you can get into position more quickly next time.



Disclaimer

The SwordSeat™ is a chair for community use as part of the development of a seated fencer. The chair is designed and intended for use only as specified below:

1. Use must be restricted to club or recreational fencing
2. The chair must be manufactured and assembled to the BF SwordSeat specification without any deviation.
3. Use of the chair must be risk assessed individually for each participant by a coach who is BF registered and has a valid [BF SwordSeat™ certification](#) and who is satisfied that the chair is safe for the participant to use and who supervises use of the chair.
4. Participants have declared to the supervising coach all relevant injuries and disabilities prior to use.

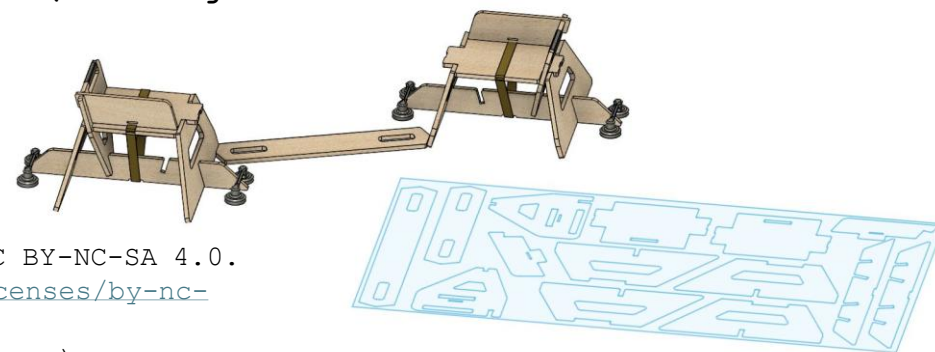
The chair is safe to use only if the above requirements are met.

Manufacturing of SwordSeat™ - Manufacturing of the chair must be undertaken by professionals in strict accordance with the published design.

Assembly- Please ensure that you follow all safety precautions and use appropriate tools during assembly. If you are unsure of your ability to assemble this furniture safely, we recommend professional assistance.

The chair may be used only if the above requirements are met.

By assembling this furniture, you agree that you are solely responsible for its assembly and use. British Fencing provide assembly instructions as a guide, and do not accept any liability for errors in assembly or any resulting injury or damage. BF excludes (so far as is it is able) any liability (including liability for negligence) arising from the manufacture or use of the chair (including where the chair is not manufactured or used as required above).



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(including where the chair is not manufactured or used as required above).

With huge thanks to the BF Charity for funding the
development of this equipment

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