

Douglas's boarding step kit

For use on

GRP* Drascombe Luggers, Longboats, Longboat Cruisers and Coasters.

Instructions for assembly and use (Ver 2.1)

General approach

This kit is very simple. It has three main parts, a few little blocks and some hinges and screws. It can be assembled with limited skill and a few simple tools. It is not a lot different from hanging a door but it does require **care and patience** in placing the blocks and in drilling the pilot holes for the screws. Remember that it will have to take your full body weight so it needs to be strong. Packing misplaced screw holes with matchsticks might work when re-hanging the lounge door in the house but it is not a good idea for a project like this. The Step will also be on display on your boat for all to see so it needs to be tidy. The process is not complicated but there are a number of screws to be driven and each one must be placed with care. To avoid getting tired and losing patience do allow plenty of time and do not plan to do the job all in one go. It may help to think of this as a short series of simple 'wood engineering' tasks.



For those of you with a high level of joinery skills there is a challenge in one optional procedure. Otherwise I make no apologies for "teaching grandmother to suck eggs" whilst passing on to others the experience I have gained from many years of dramatically fouling up the simplest of woodworking jobs.

If the instructions look long it is because they reflect a painstaking approach. For this I do apologise. It is because I suffer from the habit of trying to explain every detail without ambiguity. There are other ways of achieving the same end quickly if you have skill and confidence but it is my intention that anyone who follows these instructions to the letter should at least stand a good chance of getting to the end successfully. If you are the kind of person who never follows instructions I sympathise but do please ensure that you know exactly where each Hinge Block and hinge goes otherwise the step will not fold and may lose strength. It will in any case do no harm for you to read through the instructions once before you start.

Summary

Here is a list of the subjects detailed in these instructions. It also serves as a summary of the sequence of work.

Check List Make sure that you have everything you need

Selection Ensure that the best side shows

Trial fit to boat (Can be rescheduled to later)

If you have a second rubbing strake – cut notches

Initial Sanding "Deburring" where necessary

Prepare the Step Blocks A little cosmetic shaping

Assembling the Step Blocks to Step Panel

1. Marking the screw holes
2. Drilling the screw holes, gluing then driving the screws

Assembling the Hinge Blocks and first three hinges

1. Marking the screw holes in the Hinge Blocks.
2. Preparing the drill bit
3. Locating the first Hinge Block.
4. Drilling, Gluing and Screwing the first Hinge Block.
5. Locating and fixing the second Hinge Block and hinge 2.
6. Locating and fixing the third Hinge Block and hinge 3.

Assembling second three Hinges to the Step Panel.

1. Marking the screw holes in the Step Panel.
2. Drilling the screw holes and fixing the hinges

Assembling the Hinges to the Side Panels

Finishing

Securing the Step to the boat.

1. Stop it sliding out at the bottom of the bulwark.
2. Secure it to the gunwale at the top.

Check List.

These are the items that you need to have to hand to finish the kit.

Tools.

You will need a No 2 pozidrive **screwdriver**. Avoid the temptation to pick up any old Phillips or crosshead screwdriver you happen to have to hand or you may end up with ruined screw heads and screws half driven that you can't get in or out again. If you use a battery-operated screwdriver then you will need a No 2 pozi bit for that too but do religiously ensure that you finish driving the screws by hand. You will be taking some of the screws out and putting them back again so you must not over tighten them or they will end up loose.

For drilling the pilot holes for the screws a bench drill would be nice but for most of us a carefully used portable **drill** will have to do and even a hand drill will be fine. If you use a power drill, a battery operated one gives more control than a mains one. If you can fit the portable drill to a bench stand so much the better as that will guarantee vertical holes and you should be able to set the drilling depth.

Some of the drilling depths are critical to a millimetre or two. If you have no other means of setting drilling depth, you will need some **masking tape** or similar to wrap around the drill bit to see when you have gone far enough. I do not advise using Sellotape as it does not grip the drill bit so well and is not so easy to see.

Drill bits ("bits" to distinguish the *twist drill bits* that make the holes from the *drill* – the machine that drives them) The bits required are either 5/64" or 2mm diameter for the No 6 gauge screws and either 7/64" or 2.5mm diameter for the No 8 gauge screws.

There is one stage at which a **try-square** would be handy but anything with a right angle such as a sheet of paper will serve. If you are not confident of drilling reasonably vertical holes then you can also use (or have a helper use) a square to check that you are holding the drill upright - both fore and aft as well as side to side.

You will also need one small **clamp**, some pads of softwood to protect the plywood from the clamp jaws, a **felt pen** that will write on polished metal, a spike or **bradawl** and a **sanding block**. A second and third clamp make things simpler but are not essential.

If your boat has a **second rubbing strake** you will need to cut a couple of notches. A tenon or dovetail saw will do for the sides of the notch but a jig saw or much better still a **coping saw** is needed for the back of the notch. Coping saws are quite inexpensive.

Note: The advanced method “Option B” for preparing the Step Blocks (see below) requires additional tools that are explained in the text. Some improvisation or additional tools may also be needed to drill the holes for the lacing hook.

Materials

To make up the step you need only **glue**, **varnish** and **abrasive paper** in addition to the items in the kit. Water resistant or weatherproof wood glue from your local DIY or hardware store will be quite adequate as the step will not be stored below the waterline and will be well varnished (it will, wont it!). If you have a boatbuilding adhesive or some West epoxy or similar available and know how to use it that’s fine. Hardware shop Araldite may not penetrate the wood very well (try thinning it 5% with methylated spirit) and in any case Epoxy should not be clamped too tight as there is a danger of a dry joint.

For finishing you will want some medium and fine abrasive paper. I generally use 150 grade for medium and 320 grade for fine.

Use your favourite varnish but if you decide to give it a couple of coats of epoxy first, then allow an extra millimetre or so clearance between the Step Panel and the Side Panels. See ‘Assembly – Hinge Blocks and hinges 1 to 3’ on page 6.

Components

You should have all the following items in the kit. So that we can talk about the wooden components we have to give them names.

Step Panel – the panel with three big step apertures in it. The top is the end with no step aperture. I use the word “aperture” for the big holes you will stick your feet into and the word “holes” for the little pilot holes for the screws.

Side Panels – the two panels with big hooks at the ends. Each side is identical and interchangeable. The top is the end with the hook.

Hinge Blocks – the little flat trapezium shaped blocks. When I refer to the long side I mean the side opposite the short side. I do not mean either of the two equal length tapering sides. There should be 3 Hinge Blocks plus 1 spare.

Step Blocks – the little, long narrow rectangular blocks. There should be 3 plus 1 spare of these too.

The other components are :

Hinges – 3 pairs of 3 inch backflap hinges in 316 stainless steel.

Lacing hook – One of these is included as it is the most popular method of attaching the Step to the boat and it is not easy to find ones small enough to fit.

Shock cord (bungee) – A length of stout 6mm elastic for fixing the step to the boat

Screws – there are five types. Make sure that you know which is which.

Countersunk screws: $\frac{3}{4}$ " long No 8's of which there should be 9 and 1 spare.

These are for screwing the hinges through the Hinge Blocks.

I call these "Long No 8 countersunk screws"

Countersunk screws: $\frac{1}{2}$ " long No 8's of which there should be 27 and 3 spare

These are for screwing hinges directly to the panels.

I call these "Short No 8 countersunk screws"

Countersunk screws: $\frac{3}{4}$ " long No 6's of which there should be 7 and 1 spare.

These are for the Step Blocks.

I call these "Raised head No 6 screws"

Countersunk screws: $\frac{3}{4}$ " long No 6's of which there should be 2 and 1 spare.

These are also for the Step Blocks but are flat topped for the locations where they will have Hinge Blocks on top of them.

I call these "Flat head No 6 screws"

Pan head screws $\frac{1}{2}$ " long No 6's of which there should be 2 and 1 spare

These are for the lacing hook. (Unlike the countersunk screws, the length of these is measured from under the head)

I call these "Pan head No 6 screws"

Selection

Although very high quality plywood is used, some small knots or blemishes may still exist. Inspection at the start will ensure that if there are any, they will not be prominent. Wood is in any case a natural material so there will be variations in appearance.

Look at the Step Panel. Choose the better side and lay the panel down with the better side underneath. Lay the Side Panels on edge (straight edge down) at each side of the Step Panel to form a channel. If their best sides are not on the outside, swap them over. Lightly write "Inside" on the Step Panel and "Left (or Right) Inside" in pencil (so you can sand it off again later) on the inside faces of the Side Panels. We will be doing all assembly work for the panels and hinges on the inside or worst side (if there is one) of the panels. All the small blocks are sawn so if you look at the edges some may have a ragged edge to the top veneer on one side. Pencil "down" on the worst side of those. The "down" side of the blocks will not show at all, so for these there is no need to be gentle with the pencil.

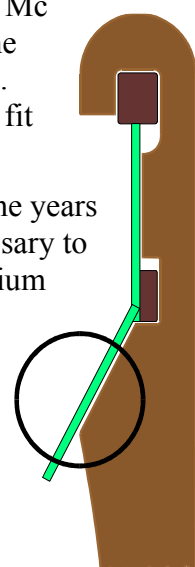
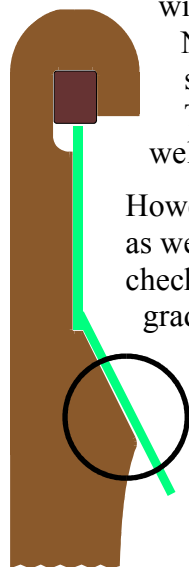
Trial fit to boat

The fit has been found to be equally satisfactory without modification on boats as widely different as a 1970's Honnor Marine Lugger and a 1999 Mc

Nulty Coaster so before removing any material, try moving the step further forward or aft to find the best location on the hull.

The Step is designed to fit nearly amidships and if it does not fit well it is most likely that you have it in the wrong place.

However, there have been variations in Drascombe moulds over the years as well as variations in the thickness of the gunwales so it is necessary to check. Any easing that needs to be done should be done with medium grade abrasive paper around a sanding block,



If you have access to your boat at this time you should do the trial fit now. If you do not, it can be done after assembly but before varnishing. As the Step is intended to fit amidships, if the boat is on its trailer, you may find that your trailer wheels get in the way. In this case, support the back of the trailer and “back winch” the boat a foot or two on the trailer. If you can’t move the boat on its trailer, you can do the trial fit afloat. If you have to do it afloat, do it after assembly and after the first priming coat of finish but before completing the varnishing. The instructions which follow about checking the fit to the boat make sense only in the correct position.

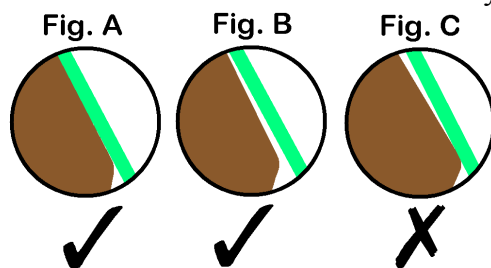
If your boat has a second rubbing strake (see right hand picture above) it will be much easier to do the fitting before assembly as you will need to cut notches for the rubbing strake before you can fit the Side Panels to the boat.

If you are doing the trial fit before assembly or final varnishing, note that it is only the Side Panels that need to match the hull. Place them approximately the same distance apart as they would be (120mm or 4¾”) if they were separated by the Step Panel.

For second rubbing strake boats jump to the rubbing strake appendix now then return to here and continue from the next paragraph.

Hook the Side Panels or the assembled step over the gunwale near the widest part of the boat where your weight will help to bring the gunwale closer to the water. You will have to hold the step out at an angle in order to hook it onto the gunwale but then the step should slip easily on. If the ‘hooks’ are a tight fit or don’t fit the gunwales then a millimetre or two of easing is permissible. Ideally they should be an easy fit but without excessive clearance.

When the Side Panels are hooked on you will discover that they are a close fit to the top and second strakes or “planks” of the hull. The concern is the fit to the second strake. At its lowest point of contact on the hull the edge of the side panel has a shallow corner which should not press into the hull until most of the Side Panel edge is already in contact with the boat. Fig. A shows a touching fit all the way down which is fine. Fig. B shows a fit where



the Side Panel is touching at the top of the second “plank” but is a few millimetres away at the bottom. That is fine too. Fig. C however, shows the corner of the Side Panel already pressing into the hull before any weight is applied, yet at the top of the second “plank” the panel is still a couple of millimetres clear. This fit should be corrected.

If no place can be found on your boat where the fit is satisfactory, then using a straight edge parallel to the boat, pencil a line on the slope of the side panel which will bring the Side Panel corner no more than about 2 or 3 millimetres away from the boat. Sand down to this mark trying not to round the edge as the flatter the edge the greater the bearing surface. It should not be necessary to take off more than a couple of millimetres. Do not use a power tool and do not remove too much material because if there is a big gap between the corner of the Side Panel and the boat, (like an exaggerated version of Fig. B) then strain will be put on the panel as it will try to bend too much.

Don’t lose sleep about all of this though as it is not likely that the corner will damage the hull since most of your weight will be borne by the gunwale but it is in the

interests of your valuable Drascombe and the longevity of your boarding step to avoid undue stresses.

Initial Sanding

The purpose of this first sanding is not to remove material. With (say) grade 150 or finer abrasive paper around a sanding block, lightly sand the edges of the panels where necessary just to remove any rough or “hairy edges” left by the routing cutters so that they don’t interfere with assembly. Don’t try to sand away the tiny indentations in the end grain plies along the edges of the panels. The mating edges in particular must remain square.

The only rounding of corners that is permissible at this stage is to the curved part of the step apertures, the corners at the narrow end of the Hinge Blocks (to match the hinge shape if you want) and the outside edge of the curve of the hooks at the top of the Side Panels. As a rule when sanding, use the block for all straight edges and the outside of curves (and the faces – but not now). Last of all, use the paper folded in hand for concave curves and inside corners before discarding the paper.

A light sanding of the faces and edges with a fine grade paper is not a bad idea at this point but note that a final sanding will need to be done just before varnishing.

Dust the wooden components off after sanding.

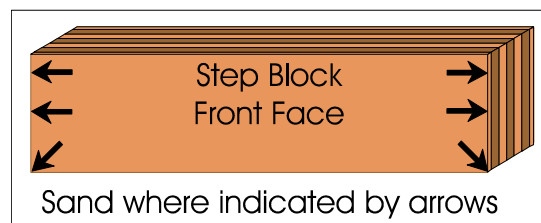
Prepare the Step Blocks.

The purpose of the Step Blocks is to double the depth of the treads. Without the Step Blocks the treads would be very uncomfortable for bare feet. (They are not all that comfortable *with* the blocks). Even if your feet are on the large side – mine are size 10.5 wide fitting – then with bare feet you should be able to get the ball of your foot fully onto the step. With shoes or boots you should be able to get a good toehold. This is aided by the stiffness of the footwear and the protrusion of the Step Blocks.

Each Step Block has two long faces, two long edges and two ends. The faces are smooth veneer and the edges display the plies. The blocks are placed with one face (which we will call the back face) against the outside of the Step Panel and one edge (the top edge) adjacent to the flat lower edge of a step aperture to effectively double its thickness.

The Step Blocks are fixed to the outside of the Step Panel but screwed from the inside and for a pleasing appearance the Step Blocks should be shaped. There are two main shaping options each with a different cosmetic result.

OPTION A. This is the standard option and is certainly the way to proceed if you are not a confident woodworker and/or do not own a recently sharpened plane or don’t want to spend too much time on this job.



It will still produce a perfectly acceptable and workmanlike result.

Simply round off the corners where shown by the arrows on the diagram using abrasive paper on a sanding

block. When you are done, you can also slightly round off where the front face and the bottom edge meet. Do not



round the long top edge or any of the corners of the back face. The photograph on the right illustrates the effect that you are aiming to achieve. When you have prepared them put the Step Blocks aside ready for assembly.

OPTION B. If you are a confident woodworker, then for a slightly more attractive finish you can plane down the long corner between the back face and the bottom edge to make a triangular section (viewed from the ends). Take off no more material than is absolutely necessary or else the fixing screws will break through. Then take a little off the rear of the top edge to restore it to ninety degrees to the mating surface so that the tread will be flat. One spare Step Block is supplied in case



of mishaps. You will need a means of holding the Step Block secure without its resting on any of its long faces or edges (e.g. clamped end to end in a wood working vice or in an improvised V block with an end stop). The result should have a top edge that is still full thickness and an outer face that tapers down towards the step panel. The angle of the planed surface has to be such that when it is offered up to the Step Panel the top edge of the Step Block is level with the bottom of the step aperture. The outside top corners of the top edge can also be sanded round. A fabricated clamp pad will facilitate clamping the Step Blocks. This can be made by putting a saw cut in a scrap of softwood then chiselling alongside it to create a “one sided V” that will engage the outside of the Step Block.

When you have prepared your Step Blocks you now have a complete set of parts for assembly.

Assembling the Step Blocks to the Step Panel

1. Mark the screw holes

Remember that the Step Blocks are going to be glued to the outside of the Step Panel (that’s the side with no hinges) and screwed from the inside (where the hinges are). So, on the inside face of the Step Panel, below the straight bottom edge of each step aperture, mark for three equally spaced screws, one in the centre and one 25mm to either side of the centre. If you are using Option A, place the marks 10 mm below the step apertures (To coincide with the middle of the Step Block). If you are using Option B then place the marks only 5 mm below the step apertures (So the screws go into the greatest depth but the screw heads will be only a tiny distance below the edge of the aperture).

2. Drill the screw holes, glue the blocks then drive the screws

The screws will be the No 6 screws which are 19mm long overall (not counting the dome of the ones with raised heads). For Option A you will be drilling into 24mm (two thicknesses of ply) which gives a reasonable safety margin. For Option B you will be drilling into an uncertain depth but that depth will be critical.



Prepare the smaller drill bit - either 5/64” or 2mm - for a depth of 18mm.

Note that the screws of the top Step Block have no hinge to interfere with them so all three screws can be raised head ones. However, one screw of each of the two lower Step Blocks will have a hinge block fitted on top of them. So for each of the two lower steps, on the

side of the Step Panel where you plan to put the Hinge Blocks use one flat head No 6 screw.

Have ready your glue and whatever the glue manufacturer says you will need to remove excess glue e.g. a damp cloth or solvent.

Apply glue to the first block and place it in position at the lowest step aperture. Clamp the Step Block in position then drill the holes and drive the screws. For Option “B” I suggest that you measure the combined thickness of the Step Panel and your shaped block now clamped to it and angle your drilling upward by just a little (say) five degrees or so toward the Step Block’s greatest thickness. For either option I also suggest that you may not need to countersink the screw holes. These screws need not be removed again so they can be fully (but not over) tightened but the flat head screws must not be proud of the surface. See how far the head of the first screw countersinks itself. If you decide that you do need to countersink the screw holes then take great care not to overdo it especially if you use Option B. In the case of the raised head screws, the raised or domed part of the screw head should remain above the panel face and the screw points should not break through.

Wipe away any excess glue and proceed to fix the second and third Step Blocks in the same way.

Assembling the Hinge Blocks and hinges 1 to 3

The purpose of the HingeBlocks is to raise one Side Panel when it is folded so that it will fold over the top of the other Side Panel and the whole folded assembly will then fold flat and lie against the bulwarks of your Drascombe.



1. Marking the screw holes in the Hinge Blocks.

Note that all three blocks go against one long side of the Step Panel. The side where you have put the flat head No 6 screws will determine which side the Hinge Blocks will go since they should not go on top of the raised head screws. Lay the Step Panel down with the (marked) inside face uppermost and put one of the Side Panels on edge by the side and up against it. (The Step Panel should be **between** not behind the Side Panels.) Place a Hinge Block down along the Step Panel’s edge with the Hinge Block’s long side against the Side Panel. The exact position of the blocks along the length of the Step panel is not important at this stage. Temporarily place a strip of thin card to separate the combined edge of the Step Panel and the Hinge Block from the face of the Side Panel. This is to simulate the thickness of the 5 or more coats of varnish that will later be applied to the Step panel and the Hinge Block. (note: we are not simulating the varnish that will be on the Side Panel as that will be behind the hinge so will ‘self adjust’). If the gap is overly large it will merely be unsightly. If the gap is too small the Step will not unfold fully. The gap should of course be consistent for all three hinge mountings. The card should not show above the block or interfere with the hinge. Now lay a hinge, shiny side up, on top of the Hinge Block with one flap on the block and one flap flat against the Side Panel.

Carefully holding all in place, mark the position for the 3 screws in the Hinge Block (not the ones in the side panel at this stage). Take care with this and make sure that

your mark will enable you to place a screw hole exactly in the centre of the holes on the hinge. Write a "1" on the top of the Hinge Block and using a felt pen mark a "1" on the underside of the corresponding hinge flap.

Repeat for two more Hinge Blocks, of course numbering them "2" and "3", then put the Side Panel to one side for the moment.

2. Prepare the drill and get the glue ready

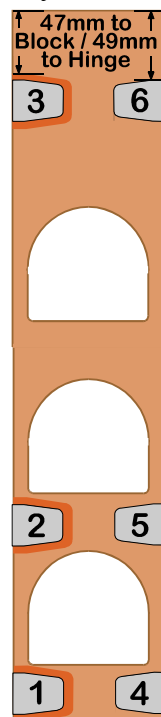
The screw hole will be going through the Hinge Block and into the Step Panel. Prepare either a 3/32" or 2.5mm drill bit for drilling (say) 20mm deep. The thicknesses of the hinge plus the two thickness of ply add to 26mm. The screws are 19mm long, so there is a good 7mm safety margin.

Locating the first Hinge Block.

Hinge Block 1 goes between the bottom of the Step Panel and the first step aperture. Place the block at the very bottom of the Step Panel with its long side against the side edge of the panel.

3. Drilling, Gluing and Screwing the first Hinge Block.

If you have three clamps (or are prepared to wait for the glue to dry on one block before fixing the next) you can glue all the hinge blocks in position before drilling.

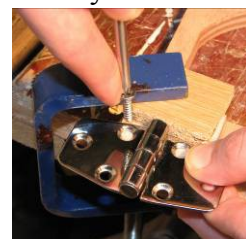


Here however is a technique that requires only one clamp and uses the screws to hold the blocks in position.

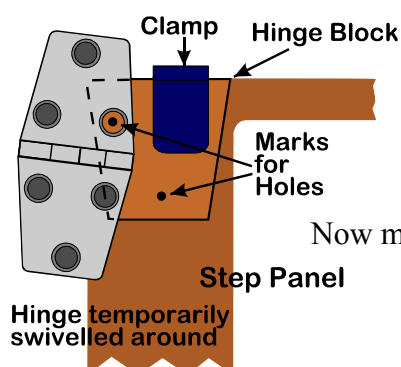
Apply glue to the underside of the Hinge Block, then using scraps of softwood as pads to prevent the clamp marking the work, lightly clamp the block in place. Do this in such a way that you still have access both to drill one of the screw holes **and**, with the hinge swivelled around through 180°, room to place the corresponding hole in the hinge over the hole in the block (see the diagram). This is so that you don't have to clamp over a slippery metal hinge. Hold a straight edge against the assembly to ensure that the long side of the block is perfectly flush with the long edge of the Step Panel. Then tighten the clamp.



I don't know about you but my holes always end up a little away from where I start them so I use a spike or a bradawl to start a pilot hole where I am going to drill.



Drill the first hole and drive one of the **long** countersunk No 8 screws through the hole in the hinge flap that has the number on. Take care that you have the correct



hinge hole as with the hinge turned around it is not obvious which is the right one. Nip up but **do not fully tighten** this or any other hinge screws as they will be removed and replaced up to twice more before the varnishing is complete. Remove the clamp and swivel the hinge around into its normal orientation.

Now make sure the block and the hinge are still aligned with the panel edge. If they are not, loosen the screw and



move the block and or hinge into alignment and re-clamp before drilling any more holes. When all is well, spike and drill the second hole, drive the second screw, check alignment again then drill the third hole and drive the third screw.

4. Locating and fixing the second Hinge Block and Hinge 2.

The second Hinge Block from the bottom of the Step Panel goes midway between the top of the bottom step aperture and the bottom of the next aperture up. “Midway” in this case is what you judge to be pleasing to the eye. Once located, using block 2 with hinge number 2, glue, clamp, drill, and screw the block in the same manner as the first block.

5. Locating and fixing the third Hinge Block and Hinge 3.



It is important that the third Hinge Block is placed so that the top of its long side is 47mm ($1\frac{7}{8}$ ”) from the top of the Step Panel. It is essential that it is no less than 45mm ($1\frac{3}{4}$ ”) and no more than 50mm (2”) from the top. Once located, clamp, drill, glue and screw the block in the same manner as before, this time using block 3 and hinge 3.

You should now have three blocks with hinges on them screwed along one side of the Step Panel which we will call “side one”.

Assembling hinges 4 to 6 to the Step Panel.

1. Marking the screw holes in the Step Panel.

We now need to fit three more hinges to the Step Panel along side two - directly opposite the first three hinges but this time without any blocks underneath. This is where the try square comes in handy but you will discover that the tops of the hinges fall 2mm below the tops of the hinge blocks. The position of the topmost hinge (No 6) should therefore be 49mm down from the top of the Step Panel.

When you have marked the top of the location for hinge 6, you can mark the position for the top of each of hinges 4 and 5 using the try square to line them up with their opposite numbers.

Stand a Side Panel on edge with its side against edge two of the Step Panel. Separate the two panels with card strips as before. As there is no block, the card strips do not need to be at a hinge location. In fact it is better if they are not. Now take a hinge and place it in the position you have just marked opposite hinge one at the bottom of the panel. With one hinge flap flat against the Side Panel and one flap flat down on the Step Panel, mark the position for the screw holes in the Step Panel only. Mark the hinge number “4” on the underside of the same flap that you used to mark the hole positions. Now mark the screw hole positions for hinges 5 and 6 in the same way.

2. Drilling the screw holes and fixing the hinges

Here we are effectively going to be putting $\frac{1}{2}$ ” screws into $\frac{1}{2}$ ” wood!! More precisely, the screws are going through the hinges straight into the Step Panel and the ply is 12mm thick. Fortunately, together with the 2mm for the hinges, this makes a total thickness of 14mm. The screws are 12.5mm long which leaves just 1.5mm difference which is nearly no safety margin at all. As the point of the screw can look after itself we will manage with a hole only 11mm deep. The thickness of the hinge accounts for 2mm of that so a hole in the wood just 9mm deep should do the trick. That will give us a small but manageable safety margin of 3mm. So prepare either a $\frac{3}{32}$ ” or 2.5mm drill bit for making 9mm deep holes.

Spike and drill the first hole for hinge 4 then mount the hinge with its numbered flap down and drive a **short** countersunk No 8 screw. Nip it up but do not tighten. Offer up the Side Panel and check the alignment of the other screw hole marks. If all is well, spike and drill the second hole. Drive the second screw, check it, then deal with the third hole and screw. After each couple of holes **check** that the depth stop on the drill is **still** 9mm from the sharp end.

Repeat for hinges 5 and 6.

You should now have a Step Panel with six hinges screwed to it by the numbered flaps of the hinges. None of the hinges are attached to the Side Panels.

Assembly – hinges to Side Panels

Start with the Side Panel where the secured flaps of the hinges are not mounted on blocks (This will give you better drilling and screwdriver clearance). Lay the Side



Panel down on the bench (inside face up) and put the matching edge of the Step Panel on edge on top of it so that the outside face of the Step Panel is exactly flush with the straight edge of the Side Panel and that the bottom of both panels coincide. If you allowed extra clearance for an epoxy finish then you can put a spacer between the panels. If not, it is not essential to put the card strips back in for this operation. Now, carefully holding all in place, mark

the position for the hinge screws in the Side Panel. Check that the depth stop on the drill is still set at 9mm and drill the screw holes. Drive a short countersunk No 8 screw and check alignment after each hole is drilled. Depending on the size of your chuck, you may have to unscrew the Step Panel to gain access to drill the holes in the Side Panel. When you have secured the three hinges on the first Side Panel and are happy with their fit, unscrew them again and put them to one side until after varnishing. Put the first side panel out of the way as well whilst you deal with the second side panel.

Now put the second Side Panel down inside up. Put the other mating edge of the Step Panel on top of the straight edge of the second Side Panel. Now again taking care that the two panels are flush at the side and the bottom, mark the screw hole positions for the hinges on the second Side Panel. Check the depth stop, drill the holes and drive the short No 8 countersunk screws checking alignment as each hole is drilled. Now take the hinges off again (assuming that the glue has set on the Hinge Blocks).

You should now have drilled all the hinge screw holes and driven all of the hinge screws once. The hinges should be put out of the way now whilst we apply a finish.

Finishing

You should now have three panels with all the blocks attached. When the glue is dry and with all the hinges removed, sand the upper surfaces of the step apertures (which are now double thickness treads), starting with 150 and finishing with 320 grit or similar fine abrasive paper on a block. The purpose is to make the join between the Step Panel and the Step Blocks seamless and flat. Then, working with the grain, **lightly** sand the faces and edges of the panels leaving the concave edges and inside corners until last as these will be done with folded abrasive paper without the block. The marks which identify the inside of the left and right Side Panels should be sanded

off and re-written where they will be covered by a hinge. The aim of this sanding is not to remove material but this time to prepare the surfaces for varnishing. Sharp corners can be rounded to improve varnish adhesion but **DO NOT ROUND BEARING SURFACES**. Bearing surfaces means where the step contacts the boat and where the Step Panel meets the inside faces of the Side Panels.

Finally apply 5 or more coats of your favourite marine varnish in a dust free environment with a light de-nibbing with fine paper between coats. International UCP is a good primer but it is probably not worth buying some just for a small item like this, so thin the first coat(s) in accordance with the manufacturer's instructions. Varnish over the exposed heads of the raised head screws which are securing the Step Blocks. The hinges should be secured after varnishing, but if you put some varnish into the screw holes it will help to prevent blackening around the holes from water seepage. Remove the backing from the supplied instruction label which should be applied (where it will be visible) under the last two or three coats of varnish.

After finishing, screw the hinges back on and this time tighten them but don't overdo it. Stand back and admire your work.

Securing to the boat.

When the step is folded and propped up against the bulwarks on the aft deck there are three issues for Securing the folded step.

1. Stop it sliding out at the bottom of the bulwark.
2. Secure it to the gunwale at the top.
3. Ensure that any fixing can be released from outside the boat.

On the starboard side of the aft deck on the Coaster there is a convenient deck eye for the end of the main sheet. This addresses all issues.

It stops the step sliding out at the bottom and it provides a fixing for the end of a piece of shock cord which loops over the gunwale to a lacing hook under the outside of the gunwale where it can be accessed by a person in the water. Currently I am using some unobtrusive dark green shock cord.



If your boat does not have this deck eye, alternative suggestions would be to fit such an eye and lacing hook or to screw or glue (possibly with Sikaflex) a small hardwood block on the deck to locate the lower edge and a turnbuckle catch (for the benefit of my American readers that is a furniture latch not a rigging screw) on the gunwale to locate the top. All who purchased kits in the first batch seemed to

use the shock cord and lacing hook method so a lacing hook, screws and shock cord are enclosed with the kit.

To fit the lacing hook, mark a position under the outside of the gunwale in line with the eye on the deck. Offer up the hook against the underside of the gunwale. The hook should be hard up against the hull so that it won't be vulnerable when docking. Now mark the positions for the screws. Drilling 5/64" or 2mm pilot holes for these 1/2" Pan head No 6 screws will require some improvisation as the holes are very close to the hull and the chuck of a power drill will be too big to allow you to get close enough. Suggestions are to try a hand drill, raid the children's modelling tools for an

achimedean drill, make a gimlet by flattening and sharpening a narrow spoke, borrow a Dremel with flexible extension, or just look around your garage/shed to see what inspiration you can find. If you drive the screws without a pilot hole there is a danger of splitting the gunwale – in fact if the screws are very difficult to drive because of the hardness of the teak or iroko, you may find that you have to go up to a 2.5mm drill.

You need a loop in each end of the shock cord. I suggest that you tie or whip a loop in the outboard end first and slip it over the hook, then feed the inboard end through the deck eye, adjust the length and securely tie or whip it off. The tension needs to be a compromise between tight enough to securely hold the step in place and slack enough for the outboard loop to be unhooked with cold, wet, and possibly weak fingers.

Using the step

To use the step, reach up and release whatever is securing it to the boat. Lift it out and open it up then hook it over the gunwale amidships. You should have worked out where the ideal position is but in an emergency anywhere close to midships will serve.

Put your foot in the highest step that you can effectively use. When you have your centre of gravity over the gunwale you can roll onto the side deck. In practice you will find that the process is simply what comes naturally.

Promptly recover the step in case it floats away.

To hook the step on and off requires that it be held out at an angle and rotated over the gunwale. This deliberately restricts by just a little the ease with which the step will float off if you let go of it, but it does not prevent it. The step could be weighted at the bottom if you wanted to regularly leave it in position when you go swimming but this would mean that it would sink if you let go whilst mounting it. I prefer it to float. When swimming it can be just laid on the aft deck where you can reach it with the hooks over the gunwale or transom to stop it slide inboard with the boat's movement. A Lanyard fixed to the gunwale restraining the step is in any case a good idea. Don't just leave it loose on the side deck as it could slide onto the cockpit floor where you can't reach it from the water. This applies even if there is someone else on board - in case they decide to go swimming too.

Do test the finished step

Whilst care has been taken in designing and testing the prototype (with a user up to 17 Stone in weight), the step has not been tested with all shapes and sizes of person. Care has been taken in writing this guidance but the assembly of the kit and fitting to the boat is outside of my control and no guarantee is given as to fitness for purpose. The user is most strongly urged to test his assembled step at the first opportunity in conditions where there is an alternative means of boarding or getting ashore. This is absolutely essential not only to ensure that the kit has been assembled strongly but also to ensure that there is no impediment which will prevent the user from accessing and using the step to board the craft in a real emergency.

Long term and maintenance.

The manufacturer's guarantee for Robbins Elite plywood is 15 years. Unless you damage the step, for instance by twisting it or applying a lot of force in a direction that it is not designed for, it should last a long time. Nonetheless you should still maintain the varnish finish. In common with wooden ladders you are advised not to

use an opaque finish such as paint because that may hide any defects that might occur. Check the hinges for freedom of movement from time to time (an occasional drop of oil would not be a bad plan). You should also check your securing arrangements. My piece of shock cord for example needed replacing after 3 years due to chafe against pontoons.

If you keep the boat in the open or on a mooring, more frequent checks will be required and the finish will of course last longer if the step is stowed out of the sun.

Finally

Please give me any feedback about these instructions or the design, construction and use of the step that might help others in the future.

I hope that you enjoy assembling your kit, that you get long service from the step and that you never have the kind of incident where you actually need to use it in an emergency.



**Appendix - For
rubbing strake.**

boats with a second

If your boat has one of these you will have to cut notches in the side panels. Stewart tells me that the second rubbing strakes are presently 40mm high and protrude 20mm from the hull. Unfortunately, we cannot just make our notches to that size because he also told me that they have varied over time. As they are fitted by hand there will also be a variation in the vertical position on the hull. Fortunately it is a fairly simple job to cut the notches and a method is described below - but first a couple of comments.

You can make the height (vertical) of the notches greater than the height of the strake. This will give a little freedom of positioning for the Step fore and aft. The depth (away from the hull) however, should be no more than is necessary to give a fit as snug as you can make it. This is so as not to reduce the width of the Side Panels any more than necessary. The Side Panels are 55mm wide at this point and so when you cut a notch 20mm deep you have reduced the panel width to 35mm. That is the same width as there is at the side of the “hook” over the gunwale - which was previously the narrowest point. You may have to make the notch a couple of mm deeper but the point is not to make it any deeper than you have to.

Secondly, one common way to cut a notch in solid wood is to cut the sides with a tenon saw, then use a chisel to cut the back of the notch between the saw cuts. In this plywood, there is a danger of crushing the soft inner laminations if you use a chisel. This is why, in the method below, I suggest using a coping saw or jig saw. If you don't know what I mean by a coping saw, when you use a web search engine like Google you will not only find an illustration but you will also find that they can be bought for as little as £3.50.

Measuring up

Take a piece of cardboard (cornflake packet variety – not corrugated), a pencil and a pair of scissors to the boat along with one or both side panels.

Hook the Side Panel over the gunwale amidships and mark the Panel where it bears against the top edge of the rubbing strake. Now hold the cardboard against the strake and mark where the top and bottom of the strake bears. Cut a notch in the cardboard to fit snugly around the strake. When you are happy with the fit of the cardboard, lay the cardboard on the Side Panel so that the top of your notch aligns with the mark you made on the Side Panel. Transfer the shape of the notch to the Side Panel by drawing around the cardboard notch. Now slide the Panel aft a couple of feet and decide how much taller you want to make the notch to allow the Step to fit further aft in an emergency. Mark the new top of the notch and extend the marked height of the notch on the panel.

Cutting the Notches

Always remember the three basic rules of cutting:

1. Measure twice and cut once. 2. You can always remove more material but if you remove too much you can't put it back. 3. Blood stains the wood.

To cut the sides of the notch just use a tenon saw to cut to the waste (inside) side of your line. To cut along the line at the back of the notch, either use a coping saw or drill a hole big enough to insert the blade of a jig saw, wholly inside one end of the line.

Fine adjustments can be made with abrasive paper wrapped around a block.

When you have made one notch, offer it up to the boat and when you are satisfied, duplicate the notch on the other Side Panel.