

Building and Using the Selway Fisher 12' Highlander

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Fraoch, a 12'x5' double chine plywood Chinese lug sailing dinghy.

Around 1982 Paul Fisher designed the Highlander dinghies. They range in size from 7'6" to 18' and are based on an attractive double chine concept with a semi-flat bottom panel. I first saw one on a beach on the Morvern Peninsula as we drove to our holiday farm on Loch Corrie. I decided to build a 12-footer as a rowing boat to get to our farm at high water when the usual approach across the saltings was flooded. Selway Fisher (SF) have a large catalogue of designs and are constantly updating them and now use CAD to generate accurate panel dimensions. Consequently the Highlander designs have been superseded by these new designs but I have counted nine members of the DCA with SF boats of this vintage. The designs have been built commercially as well as by amateurs.

Fraoch was the fourth boat I had built. The first was a flat-bottomed 11' dinghy to my own design using the stitch-and-glue technique made popular by the Mirror, then I bought a fibreglass 16' Shetland Skiff hull and fitted it out as a gunter-rigged sloop. When the family became too big for this I bought an 18' Express Pirate kit which we completed one summer holiday on the front drive. These boats were all used extensively for family cruising in the West Country, the Lakes and the west coast of Scotland. Later, after a few heart attacks and having handed the farm over to my cousin, I decided to convert *Fraoch* to a sailing dinghy. Also I had lost my crew as my children got married and I needed a smaller boat that I could handle ashore by myself. So reluctantly I sold the Pirate and started work on *Fraoch*. I was a little concerned about my ability to sail a dinghy again as I had been in keel boats for so long. If you read on you will see it was a quite unnecessary worry and the Highlander has proved an ideal boat for my type of sailing.

To illustrate the building process I have made nine sketches and in the following sections I discuss each sketch and the performance of the finished boat.

1. *The starting point*

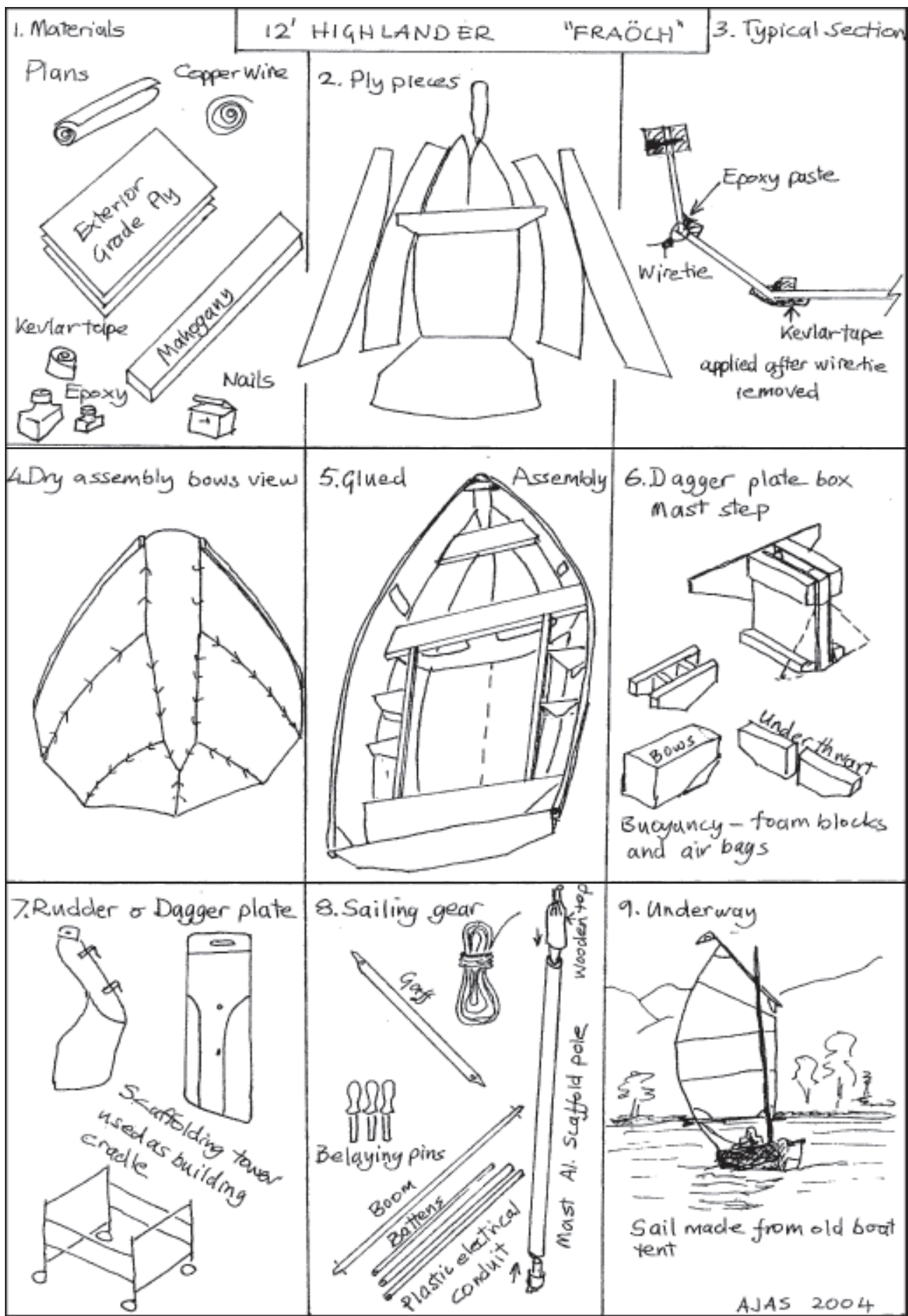
The plans were clear, easy to follow and well-dimensioned. I had planned to follow them closely and not get involved in designing any modifications, but as the build proceeded I could not resist making changes for both aesthetic and practical reasons. Assembling the raw materials in South Manchester is not particularly easy and I tried to use building materials suppliers rather than yacht chandlers. Using external grade ply was a bit of a false economy. The ply I bought had very thin outside veneers which split easily if stressed with the consequence noted in section 6. Epoxy saturation helps to penetrate to the inner layers and increases the strength. When I disposed of the first boat I built I cut through the hull and inspected the stitched and glued chines and they were all in good condition, although some of the panels had rotted in other places. The rot was due to gaps in the inner core so this time I carefully inspected the panels and made sure any gaps were filled with epoxy and sawdust.

The large mahogany plank was a bit of a mistake but was an impulse buy when I was getting the plywood. It was going quite cheaply but it was hard work splitting it into the required sections. I did have a 12" portable power saw and a thicknesser on the planer attached to my woodworking lathe which worked well, after I learnt how to use it. Each lath was tested to see if it could be bent to the required curve. Some split but enough long ones were made for the hull and the broken bits were used elsewhere.

I had to get the bronze barbed nails, epoxy glue and fillers from yacht chandlers. These are expensive but well worth the price. Many members will have discovered how unpleasant epoxy is to deal with but it enables a good strong job to be done. For some of the later modifications I used Balcotan glue, which is far easier to use.

2. *The ply parts*

I marked out the panels on the ply sheets on the sitting room floor one day when my wife was away. Where more than one sheet was needed I held them together with masking tape. To get a smooth line I used one of the laths I had made out of the mahogany, putting nails in the waste wood and weights where needed on the panel side, to get the curves. After cutting the part panels out roughly



with a jig saw I planed them to size in pairs so that both sides of the hull would be the same. After this I glued on the butt blocks which did not cover the full width of the panels because the laths had to be added to one of the edges. Then the edges of the panels were bevelled approximately and the laths glued and nailed on. At this stage I should have marked more guide lines on the panels in order to make positioning the thwarts and bulkhead easier. I only marked the centre line of the bottom panel and the position of the bulkhead. Once the bottom panel was sprung together in the bows there was then no centre line, which had consequences later.

3. Typical section

Using laths on the edge of the panels makes for a very rigid hull and also saves on epoxy but it does make the panels stiffer when wiring up. The wire stripped from old 15 amp power cables from the house was used in most places, but I had to use thicker copper wire (30 amp) to hold the bottom panels to the bow transom. Also the holes for the wires had to be drilled at an angle through the laths.

4. Dry assembly

It is satisfactory how quickly the hull shape emerges as you pull the panels together. I did all this on an old door on top of a box trailer so I could wheel the assembly around and look at it from various angles to make sure it was square. Extra temporary bracing was added whilst the gunwales were bent round but no steaming was necessary.

5. Epoxy glueing

This was my first go at epoxy fillets and I had a number of problems scraping off goo which would not set because I got the amount of hardener wrong – but eventually the hull started to go rigid. I could then move it around on the door to tape the outside joints after removing the wire ties.

6. Dagger box, mast step and buoyancy

The design was originally for a rowing boat so adding a dagger box was the modification SF proposed for sailing. I do not like dagger boards in principle and should really have installed a pivoted centre-board at this stage. Getting the box on the centre line was difficult and despite my best efforts it finished up slightly out of true. The result is that on starboard tack the board provides positive lift if the boat is moving well. People seeing *Fraoch* on starboard tack have commented that the boat seems to go to windward well despite the rig but of course on port tack we slide to leeward by the same amount. This is partly offset by the rig being more efficient depending on whether the sail is pressed against the mast or not.

Inevitably I have run aground on a number of occasions and finally the support to the after edge of the box broke away from the centre thwart at a glued joint which failed due to the outer veneer splitting off. This was easily repaired by glueing and screwing again but the joint at the hull had been strained and a small leak developed. To cure this I designed a bracket to hold the bottom after edge of the box to a new keel which spread the load to a larger area of the bottom panel.

Despite the present-day obsession with safety the design did not include any provision for buoyancy. I added solid foam under the main thwart and the bow thwart, supplemented by two long bags either side of the dagger plate held down by side benches bolted to the thwarts, and four fenders secured aft to the supports for the stem side benches. The port long bag is now held down by a board which forms a bunk when placed between the thwarts.

7. Rudder and dagger plate

The first rudder I used was from my Shetland skiff which had the same rake on the stern post as the Highlander's transom. The rudder was a rigid one and had to be taken off as you came ashore. Subsequently I adapted a lifting rudder from a Lark which has been excellent and has improved the sailing performance as well as making handling the boat on to the beach easier. The boat is very light on the helm and I have never worried about the strength of the rudder and tiller. I also use a tiller impeder which has made single-handed sailing much easier.

The dagger board is made from two sheets of 9mm ply glued together. It appears to be strong enough. The boat has little grip on the water unless the plate is down. To hold the plate down I have a pin on elastic which goes thorough the hole in the handle in the fully down position and through a hole in the board in the half raised position for running downwind. In theory the board should not fall out if the boat is inverted.

As the boat neared completion I made a second building trolley from a section of a scaffolding tower on castors so that I could move it around easily in the garage.

8. Mast and spars

The SF design was for a spritsail and I was very tempted to use one, having read John Leather's book on gaff rig. I built a sprit and a mast with shrouds for this rig but the strains on the canvas of a sprit rig would have been quite high and being retired I felt I could not spend money on buying the appropriate fabric. Many different types of rig have been used on the Highlanders so I decided to experiment. I had an old boat tent in Lancashire twill from the Shetland Skiff which consisted of a triangular panel which had covered the foredeck and a rectangular panel which had covered the after part of the boat. The Chinese junk rig relies on the battens and the leach and luff lines to take the strain so, after chats with Stewart Calcutt, this is what I went for. The mast had to be unstayed so I used a length of aluminium scaffold pole which would take the bending moment as it passed through the 2" hole in the sailing thwart. I made a tapering wooden topmast and a wooden foot to engage with the mast step. The sprit became a boom. Batten pockets were sewn onto the tent after the two parts were sewn together and plastic electrical conduit used as battens. To my surprise all this has worked. I did compare the centre of resistance of the hull with the centre of area of the sail and there was the appropriate difference to produce weather helm. I wanted all controls within easy reach of the helm so all lines are brought aft to belaying pins on the main thwart.

9. Under way

The Highlander hull has a very buoyant shape with good beam and a full bow. Because of the way the bottom panel is formed into a vee at the bows there is a fine entry despite the transom bow. As a rowing boat it is excellent, holding its way between strokes. The strips of ply on the bottom panel provide enough grip for the feet so that she is a pleasure to row. There is a slight concave curve to the keel aft of the dagger box which prevents the hull planing (a bit like the cobbles of the NE coast). In later designs, the Lynx for example, SF have overcome this by rounding the bottom panel aft and getting a smooth flow to the keel line.

The ends are nicely balanced. In a seaway the hull has a buoyant, rocking motion and has been easy to control in a quartering sea so far. When going to windward in any wind quite a bit of spray is thrown up, but one of the modifications I have made is a foredeck and wash boards and this has been effective in keeping the spray out. The forward rowing position has been lost, but as I have mainly used the boat singlehanded this has not been a problem.

Originally the choice of the junk rig was purely financial but I was also curious to see what it was like. Over time I have been pleasantly surprised as unexpected advantages have emerged. The battens prevent the sail from flapping which makes it seem very controlled. In a good sailing breeze the battens curve satisfactorily but in light winds they are a bit too stiff. The solution to this are the wishbone battens which Stewart has used but as I was trying to keep the weight of my rig as low as possible I rejected these. Also initially I laced the sail to the boom as this is what the Chinese used to do with their matting sails. The effect was that in light winds the battens did not bend at all and the sail was terribly inefficient. I almost despaired of sailing to windward. However one day I was sailing in a good breeze with one reef in and the boat was powering to windward and I realised that the sail should be loose-footed. Having unlaced the boom, the boat will actually sail upwind in light airs and also goes about more easily.

Reefing is not as easy as with the modern Chinese junk rig as I have not used the modern sheeting system. I have to secure reefing lines at the tack and the clew to reef the sail. When the sail is reefed the centre of effort does not move forward as much as it does with a bermudian sail so the boat does not carry as much lee helm as many boats do when reefed. In strong winds I am worried about getting too much curvature in the sail. By chance there is a hole in the sail left over from its tent days through which I can thread a reefing line and control the bend when I have two reefs in.

All in all, the buoyant hull combined with a satisfactory reefing system means I can sail in all the weather conditions I want to and without any athletic sitting out. Also the hull has sufficient buoyancy in the bow section to take the weight of mast and sail. So far I have not been worried that the bows might bury when running down wind. I always try and get the dagger plate half raised before bearing away so that we do not trip up over it. I feel most out of control running down wind, and in strong winds I often drop the sail so that we are running under bare poles and the resistance of the bundled-up sail.

One disadvantage of the junk rig is the amount of string but, I am getting used to the appearance of the sail when particular bits of string are tangled. A purpose-made sail would reduce this problem. Compared to a bermudian sail my rig is very inefficient but most of my sailing is done on lakes less than ten miles long, so taking four hours to get down the lake is not a problem.

My perfect day on Coniston is to beat down from Coniston Old Hall to the steamer pier at the foot of the lake for lunch. Then run back for tea before setting off for a walk through Torver to the Walna Scar road and then down to the pub at Bowmanstead for a meal with a final walk across the fields to the camp site in the dark. They talk about the Lake District being crowded but I have done this and hardly seen another person except in the pub.

As more bits are added the boat gets heavier. Initially I could handle the boat easily onto the trailer but now I have to use a block and tackle to pull the trolley the last bit. The tent is the next project and then I am looking forward to making more use of *Fraoch* (Gaelic for heather). **AJAS**

Reference: SF publish a 'Manual of small plywood boat construction techniques' and a copy is held in the DCA Library - well worth a read.