Learning to Love Lofting...
or, The Joy of Boatbuilding from Scratch

by Bill Haylock

THE OGA DINGHY (DC237 and 238) is a laudable project, although the concept seems to be a racing one-design approach rather than creating an ideal cruising dinghy.

I'd like to encourage aspirant boatbuilders (particularly those, like me, on a limited budget) to consider the option of building a boat from plans, rather than from a kit. It is considerably cheaper and opens up a huge choice of designs to choose from. And, as I have found, it can make the build a much more rewarding and enjoyable activity in itself.

I'm in the process of building a 16ft Apple lug yawl off plans I bought from the designer, Tom Dunderdale (of Campion Sail and Design – **http://www.campionboats.co.uk/details.html**) – for £73. Although involving more thought, head-scratching and hours of work than building from a kit of parts cut by a computer, I discovered that lofting the traditional way, by hand and by brain, is a very rewarding activity.

Lofting is the process of drawing, at full scale onto sheets of plywood, the crucial curves for the planks, or strakes, that will create the 3D shape of your chosen boat. Early on in my pre-build research I discovered a documentary film of the Tyneside shipyards, where skilled workers plotted chalk lines onto huge sheets of steel, to be cut by oxy-acetylene torches and riveted into ocean-going liners. The process is the same in principle for building a dinghy. At first sight, it's a daunting job – but anyone who has drawn a graph in school maths lessons can loft a curve.

Before you start you need a flat, level area to work on. My shed floor was uneven, so I built a platform of OSB board on 2 x 4 timbers, mounted on large castors, so it could be moved around. The first stage of the build was joining two 8x4 sheets of marine ply, using the same glass-and-epoxy-reinforced butt joint as described in the OGA dinghy-build article. Tom's excellent building notes that came with the Apple plans give a table of offsets – think of them as the x and y co-ordinates for points on the curve of a graph. Two points are measured vertically from the base line, and horizontally from the left hand end of the plywood, to define both edges of the strake. Having plotted and marked all the points with pencil crosses, I then re-measured them several times to convince myself they were all correct. It's then just a matter of drawing pencil lines through the crosses, using a thin, flexible wooden lath temporarily held in place with panel pins... just like drawing a graph.

I chose Tom's Apple design for a number of reasons. I liked its traditional looks, with vertical stem, multi-chine hull and sloping, tumblehomed transom. I liked the sail plan because I'm keen on balance lug sails and mizzens. I liked the option of building in water ballast. And I liked the fact that the underwater shape makes it a fast, planing hull. The final selling point was that through clever nesting of the strakes, Tom had created a 16ft hull out of only 4 sheets of marine plywood. The downside of the clever nesting was that it demanded different base lines, at different angles, for plotting the curves of each strake – hence extra headscratching and careful remeasuring of every point before making the first cut with the jig saw.

Erring on the side of caution, I kept the jig saw well away from the lines marking the edges of the strakes. This meant two or three solid days of planing down to the line with a block plane. There was a hiatus when I realised that the cheap block plane I had bought wasn't up to the job and kept going blunt. I had to wait for the delivery of a Record block plane. This proved to be one of the two most important tools for the project. So far, so boring – but the next stage of the build was where all that tedious and careful measuring, marking, cutting and planing seemed worthwhile.

Like the OGA dinghy, the Apple uses the stitch-and-tape building technique. This was originally developed by woodwork teacher Ken Littledyke who designed self-build kits for plywood kayaks under the 'Kayel' brand name, which were manufactured by Granta Boats in Cambridgeshire. It was popularised, however, by the original television DIY guru, Barry Bucknell, with Jack Holt, in the Mirror dinghy design of the early 1960s. The Mirror concept was all about making sailing accessible to the masses. The stitch-and-tape tecnique made it possible to build your own boat without specialist tools or skills and for much less money than a ready-made boat. This ethos was important for me. As a pensioner on a modest income my budget is tight and I don't have a fancy workshop with sophisticated tools.

Tom Dunderdale's design follows the original concept of stitch-and-tape because, unlike the OGA design, the Apple doesn't require the use of a building jig. Starting with the garboard strakes, stitched together with copper wire and opened out like a book, the subsequent strakes are then stitched on with cable ties, and the midships and bow bulkheads stitched in after the third strake. The strakes just need to be supported with wooden chocks at strategic points to ensure the hull is straight and true.

In just a couple of days those funny-shaped and unwieldy plywood planks took on the recognisable shape of a boat as you can see in the sequence of photographs. It seemed almost magical! What's more, the strakes all fitted together neatly – no yawning gaps anywhere. Tom's construction notes had stressed the importance of measuring and cutting the strakes to millimetre-perfect precision. I felt very proud of my new-found lofting skills and my workmanship!

The internal seams have been double-taped and epoxied, the centreboard case is in, and the entire outside of the hull has been sheathed in light glass cloth and epoxy, rather than just taped, as I wanted a smooth finish so I can varnish the topsides rather than paint the whole hull. I've still to build in the water ballast tanks in the floor, the buoyancy chambers and the thwarts, and the fore and aft decks. I've got centreboard and rudder, masts and spars to make. Plenty to keep me busy over the winter if I want to achieve my target of launching her next spring.

Her name is already chosen. *Soirbheas* (pronounced 'sirruvus') is a Scottish Gaelic word meaning 'a fair breeze' and also 'prosperity' or 'success' – a wish or blessing for someone going on a journey, which in the Gaeltacht would almost always have been by boat.

Building from scratch has saved me a lot of money, as well as being fun. So far it has cost me just over £1500 and that includes the sails and all the hardware I need. I've saved money on 'yacht tax' by avoiding the usual chandlery sources where possible – buying 2-part Jotun epoxy paint from an industrial supplier at £42 for 5 litres, for example, and sourcing literally dirt-cheap iroko for the gunwales from a pile of miscellaneous filthy, rough-sawn hardwood at a scuzzy plant nursery in an unlovely part of County Durham via an ebay advert. The marine ply, which has BS1008 and FSC certification, came from a general timber merchants in South Shields, where they let me go into the warehouse and select my own sheets. It's far-Eastern meranti and proved to be sound while working it and is much cheaper than that from specialist suppliers.

You don't need to be a highly skilled woodworker. I failed my GCE O-level woodwork exam! I have had quite a bit of practice since then on DIY building projects, however.

With stitch-and-tape you can get by with surprisingly few sophisticated tools, as long as you are prepared to spend time on lots of planing to size. The two items I would say are absolute essentials are a decent block plane and a beefy random orbital sander. I got a hefty Sealey sander/polisher for just under £90 and it's worth every penny because you spend a lot of time sanding. And you'll need as many cramps as you can afford or get your hands on.

The build has gone on for a year now because I keep getting taken away from it by other commitments. I'm beginning to resent the other commitments that keep me away from the boat! Before I started the build, my motivation was mostly the anticipation of sailing the finished boat. But I have come to realise that much of the enjoyment and fulfilment is in the actual building. It has been much more fun and more engrossing than I ever imagined. I think I will be sad when it's done and all I have to do is sail! *WH*

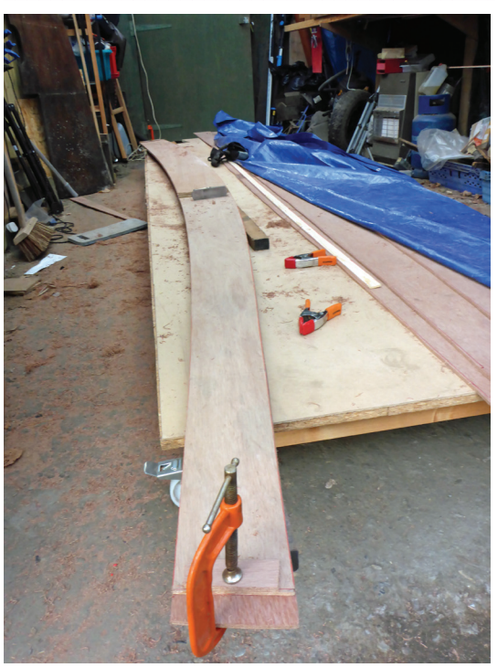


Photo 1: Planing the strakes to the line. The port and starboard strakes are clamped together to ensure they are perfect mirror images of each other

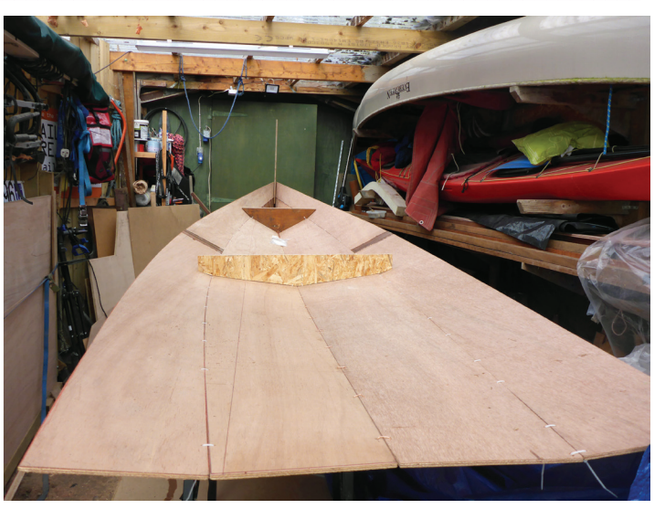


Photo 2: The first two strakes on each side are stitched together, with two simple formers to keep them open. The garboard strakes are the hardest to close at the bow as they have to twist through almost 90 degrees. I poured boiling water over the forward end of the garboard strakes to soften the plywood and pulled them together at the bow with a bolt and penny washers through both strakes.

Photo 3: *(below)* The third strake is on, ready for the transom and the bow and midships bulkheads to be stitched in.

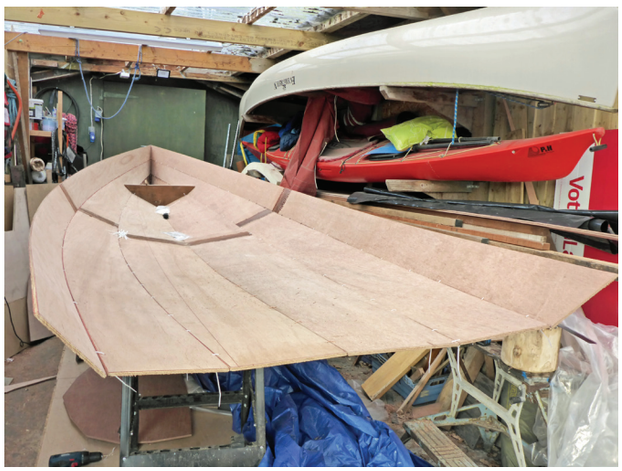
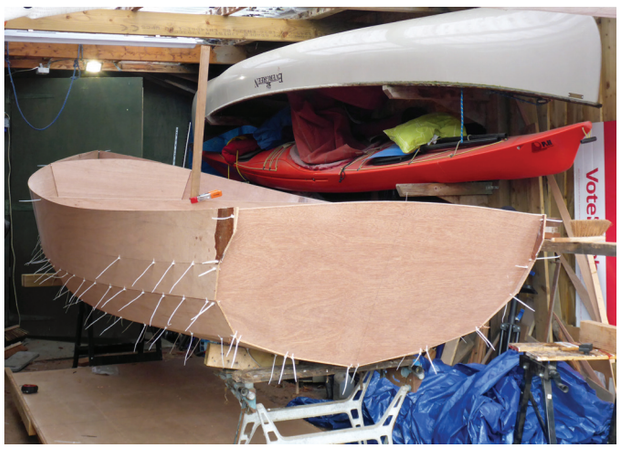


Photo 4: *(below)* And now the fourth (and widest) strake is on. It is split for about the first metre, to create tumblehome in the quarters. Suddenly, she has become a graceful boat!



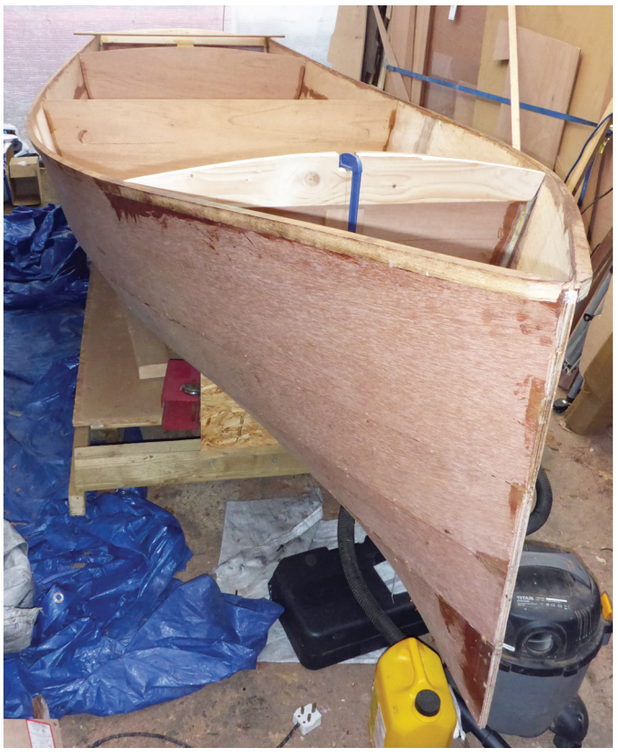


Photo 5: *(above)* The first outwale is on and the boat now feels much more rigid.

Photograph bottom left *(© Tom Dunderdale)*: A completed Apple 16 with the rig as designed. Builders have introduced a variety of sailplans, and Peter Lord's Apple 16 *Vips* (sailed by the Editor with Peter in the Baltic) has carbon fibre masts and more complex lugsails – it's a versatile design.

Photo 6: *(below)* The second outwale going on. The bow section has been epoxied, but the scarph still has to be cut in the aft end before the final section is pieced in. Once the inwales were in place the boat felt very robust.