

# International Canoe restoration

## Just like starting over...

When Jim Champ jumped onto his International Canoe last August and his heel went through the ply deck it was the start of something of a voyage of discovery: what he discovered was not uncharted waters, but uncharted wet rot! Here, Jim shares his tale...

As I'm pretty new to the International Canoe class, having spent many years sailing Cherubs, and boat number 257 was my 'bought-cheap-first-boat-because-I'll-build-a-good-one-later' boat - which is often a good introduction to any box rule class. I wasn't yet ready to build a new boat, so despite what I was about to discover, 257 was going to have to go back together.

The hole created by my unfortunate footing revealed that the uncharted depths under 257's false floor had long been breeding wet rot spores, and much of the centreline framing on top of the carbon/foam was just a spongy pulp with no discernable structural properties at all.

Well, first the deck had to come off... And then the rotten ply/cedar centre stringer had to come out... And the daggerboard case didn't look that clever... And this was rotten, and that looked heavy... And so before long I had just the carbon shell, with only inner gunwales and external paint to distinguish it from how it had left Razorback Boats for home completion some 15 years ago - "Just like starting over", as John Lennon once sang.

With an impending major weight reduction on the cards for the IC class,

257 clearly wasn't going to go back together the way she was built, but equally there was no point in putting the boat back to top specification. So before I began, I asked Bloodaxe Boats to make me some flat carbon fibre panels; this saved me loads of work and gave a better result than making them with the facilities I had and wasn't that much more expensive. I also bought some deck ply and stripwood from Robins in Bristol, and started reassembly.

### First things first

The first thing to do was to work out the internal structure. An IC is quite an idiosyncratic boat as it is narrow and has generally fairly vertical and parallel topsides, so the longitudinal stiffness isn't bad. On the other hand the sliding seat leads to fearsome torsional loads on the hull, and the narrow shroud base means that the shrouds are very heavily loaded for a non-trapeze boat. In addition, because there is no cockpit as such, the deck needs quite a lot of support. It is, after all, possible to jump on and put your heel through the deck!

I also wanted to set up a stump rig. This is where the gooseneck is on a pole extending above the front bulkhead, and the mast is stepped

on top of that. The arrangement is good for keeping kicker loads out of the mast, and makes lower shrouds unnecessary. On the other hand it can be a bit heavy. It's also decidedly unconventional, but I'm not known for letting that bother me! It's been done I think once before, on Andy Patterson's (Bloodaxe Boats) lightweight International Canoe prototype, which has a very tall stump supported by solid struts which goes up high enough to take the load from a push kicker [also known as a gnav].

The stump dictated the front bulkhead arrangement. The bulkhead must come from exactly on the shroud anchor point to the stump. With plenty of strength from the topsides I opted to have a smallish spine in front of the stump, a couple of feet long, plus a carbon reinforced cedar beam under the centre of the foredeck. Aft of that a central spine supports the floor and a bulkhead crosses this at each end of the sliding seat rails. This should brace things up nicely coupled with the effect of the deck itself. These bulkheads were never going to be enough to support my ply floor though. The spine also contains the daggerboard case and a similar case for the typical IC drop-in rudder stock.

### Beginning construction

Stage one of construction was to make up my various bulkheads and glue them in. Firstly of course one has to locate them. This is always a tricky exercise, because I've never discovered a boat that's perfectly symmetrical when new, let alone when dealing with a much used and abused 15 year old shell!

You need to get out battens, string, tape measure and luck, go round your boat thoroughly, and decide the best ground point to work everything from. In this case the master points turned out to be the gunwales at the shroud position, relative to the tip of bow and stern (both being pointed). I then made up the daggerboard and rudder cases from a carbon panel, wrapped round the various components, and assembled my mast stump, which was a left over piece of Cherub mast, sleeved from about 6 inches below the deck to the gooseneck. These three items were located in the boat with battens, string and sticky tape; the last adjustments and compromises were made to the positions of all of

them, and then cardboard patterns were made and fitted up. Once I was completely confident, more carbon panels were cut.

Here I must let you into a secret. This high tech boat building isn't more difficult than using good old fashioned wood: it's easier! You can always use some extra carbon and filler to hide an error. So I mixed up some good strong filler - double cream texture and very heavy on the microfibres - coated all the surfaces, put the panels in, taped and strung them in the correct (measured, measured, and measured again) positions, and made up fillets - basically rounding off the corners with filler - over the joins. The higher load joins then had carbon cloth put over the them for extra strength. Then I fired up the fan heater for a bit of warmth to help the epoxy go off and that was the bulkheads in place.

### Bulkheads and buoyancy

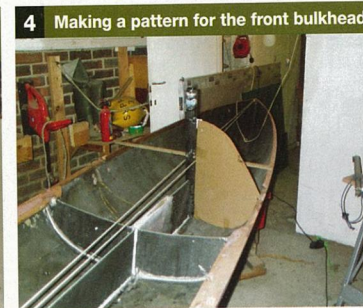
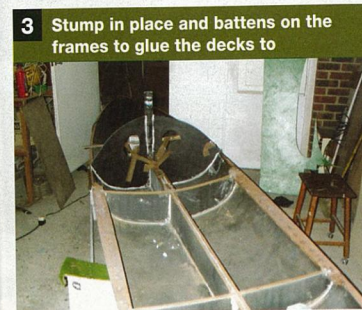
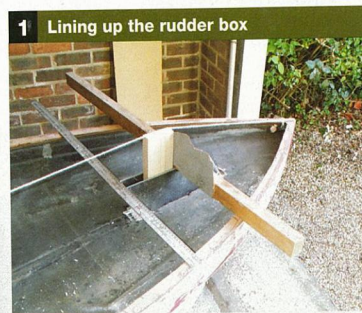
IC rules mandate a much larger quantity of separate buoyancy than most class rules, but as they don't require separate buoyancy tanks,

this can be either in loose bags of some sort or as foam. I decided to purchase some high strength flooring insulation foam and use this both as deck supports and to provide the mandatory buoyancy. The shroud anchorages also went in at this stage. I am not happy with bolting steel plates onto foam sandwich hulls, and so I wrapped unidirectional carbon fibres round a stainless steel D ring and onto the hull. This provides a fitting that is really strongly located, but can also line itself up with the load.

The next stage was to shape up my foam to act as buoyancy and supports. This was really not that much of a different task from the bulkheads, except that there's a lot more shaping to do with the far thicker foam, and you get blue dust everywhere! Again it was all glued in with a filler/microfibre/epoxy paste, but using more glass bubbles and fewer microfibres as the gluing area is greater and the load less.

Next I glued triangular cedar battens to the top of all the bulkheads to glue and staple the decks down ▶

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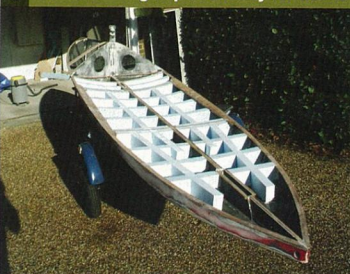




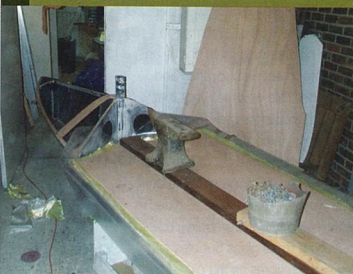
5 Bulkhead, topside and shroud detail



6 Foam framing in place ready for decks



7 Weighing the deck down



8 Decks on and ready for painting



to. Finally (for this stage) I spent a lot of time with string, sandpaper, steel rules and a laser level ensuring that my bulkheads all lined up the way I wanted too, and my deck wasn't going to finish up with ripples or, worse still, be impossible to glue down. This took me quite a few months worth of weekends to do, and it never feels as if you make much progress.

#### Fitting the decks

The next stage gives instant gratification though: gluing on the decks!

As mentioned, I chose to use ply decks, mainly for cheapness. The crew deck needed a joint, which is something I have never essayed before. I did consider just making a butt joint, but I thought I'd have a go at a proper scarf joint, like real boat builders use! A professional can better explain the technique, but basically it involves cutting off the end of both pieces of plywood at a very shallow angle, about 10cm for the 4mm ply, and matching the two up together. It didn't go too badly on the whole, but not well enough that there was any temptation to leave the deck varnished!

Putting the decks on is quick to describe and quick to do. Having

put my foot through decks before, I decided that just 4mm ply wasn't going to do for the crew deck. So firstly I glued on a layer of Kevlar cloth with epoxy. I put some old fibreboard down on top of the bulkheads, then a layer of polythene sheet. I then glued the Kevlar onto the underside of the ply, put on a piece of peel ply to soak up excess resin and laid the assembly down on top of the polythene the right way up and added lots of weight. The point of this was to have the Kevlar well consolidated onto the ply and to take on the right shape when it came to glue it on. When the glue had come off I took off fibreboard and polythene and peeled off the peel ply, which takes off all the excess resin and leaves an ideal surface for gluing onto.

I then put a layer of whipped cream filler/microfibre/epoxy paste over all the battens, on with the deck, checking it for position several times, and weighed it down with a few handy objects. Finally, using a staple gun I stapled the ply firmly down to all the battens. Once it had cured I simply had to pull out the staples and add filler.

The foredeck was much the same, except that it didn't have any Kevlar reinforcement and was 3mm ply, but double thickness under the jib tracks for reinforcement.

When cured, I sanded all the edges flush, added a thin strip of mahogany as a gunwale against the crew deck; this serves to protect the edge when bumping against jetties at my home club, and also hides inevitable Kevlar fuzz on the join. Then it was finally time to paint, varnish, fit out, and do all the other odd bits and pieces that take about three times as long as you can possibly imagine! **DSM**



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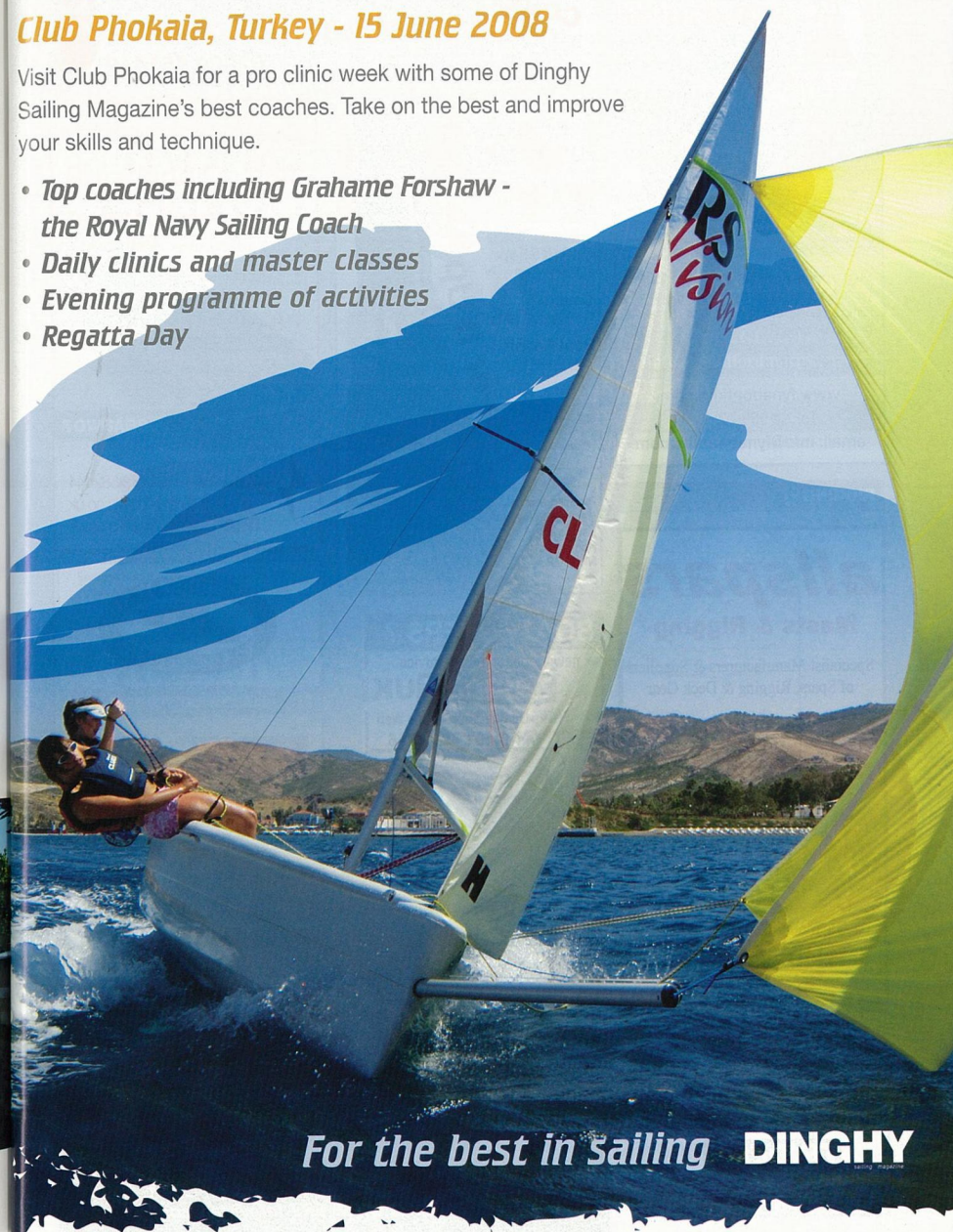
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