

# Building Bob's 8.4m DORY P-4

*Words by Bob Davis, Photography by Han Jie Davis*

Introducing the FOURTH leg of perhaps the most unusual DIY series we've ever published in F&B. Written (and built!) by husband & wife team of Bob and Han Jie Davis, it describes how they set about building a comfortable, practical cruising fishing rig they can use in the Whitsundays, around their home state's Far South Coast - powered by a 60hp outboard - and towed by a normal 4WD. Bob is determined to prove it can be done - all up - for less than \$50K - and he wants to share his methodology and thinking to inspire other readers to similar projects. His theme?



'There has to be another way' - and we all agree that's a concept worth pursuing!

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Hull painted and ready for turning



**In Part 3 we had progressed to a painted hull, almost ready to be turned over. Building a turnover frame was next, designed to create a straight-line pivot point and protect the gunwales during a rollover.**

Based on materials weighed as they went into the structure, the estimated weight of the hull was between 470-480 kg. Even taking into account the added weight of the rollover frame, a pivoted rollover would only require a lift of around 250kg – so, we figured the expense of hiring a crane could be avoided.

I dismantled the temporary carports that had served as my



Temporary carport removed

initial building shelter. Bared to the open sky for the first time, resplendent in its multiple coats of epoxy, primer undercoat and paint, the hull looked very different. I admit I paused and admired it awhile. Not too bad. The challenge would be to make the superstructure at least as well – assuming I could turn the hull over without damaging it!

## Turning the Hull Upright

First step was to go through my shed to ascertain what was on hand that might be useful for the turnover task. From past days messing about with machines and motors, there was a block and tackle, and a hydraulic ram-style engine crane, each capable of lifting 1000kg. They seemed handy for the job at hand. The question was how to utilise them effectively.

I just happened to have a heavy duty steel shed frame, bought at a clearance sale and trailed down to the coast when I moved – one of those ‘just in case another double shed is ever needed’ decisions, you know? Good decision, in the event. It meant I had a heap of steel poles, to use as lifting legs and props. Throw in the old set of 4WD tyres I’d kept in anticipation, a towing chain, some strong double pulley blocks for half inch ropes, a lifting strap, assorted shackles and short bits of chain, various anchor ropes, and some star pickets, and a potential solution emerged.

I realised that, to protect the gunwale on the rollover pivot side, a frame would need to be built under the structure, connected to the hull frames, to create a strong pivot point one side, as well as creating lifting points on the other side. I installed eight 100x50mm beams under the hull, attached to frames with short planks and bolts, and with a couple of diagonal braces inside the hull.

The photos of the trial setup show the idea. A bipod of steel shed posts was created, with bases held in position by star pickets and with a cross chain to stop them spreading.

The block and tackle was connected to the top of the bipod with its lifting chain running back to a doubled rope/pulley setup connected to a pair of star pickets. That gave us two means of lifting/pulling. A ladder served as a temporary safety prop. From the top of the bipod, ropes/straps ran over the hull to the far gunwale. The bipod enabled lifting and rolling, but with reliance for initial lifting of the far side gunwale using the engine crane. The idea seemed workable in theory –

so worth a try.

For a ‘soft’ landing, the old 4WD tyres were spread, with packing cartons laid over them, hoping to minimise blackening of the white-painted topsides. In anticipation, I had held back applying the final coat of paint on the topsides, with that inevitability in mind. For a ‘brake’ I



Trial setup of the engine crane, and bipod with block & tackle



Ingenuity is a wonderful thing . . . armed with bits and pieces left over from umpteen previous projects, a lot of determination (and a strapping, big, strong son Chris!) as Han Jie's video stills confirm, Bob and Chris turned the rig over very efficiently - and safely. It then had to be turned around, and put back in the 'trailer' position. *Well done, team!*



First rollover step successful.



Setting up for rollover stage 2.



Details of the rollover frame and the brake system.

the double pulleys and rope very effective as a brake once I'd pulled the hull past its balance point, able to control the let-down with his own weight, not really needing my assistance. It actually seemed quite easy.

We removed the bipod, using just the block and tackle connected to star pickets, for the second stage of the rollover. Chris worked the double pulley brake rope again, while I worked the block and tackle to haul the boat past its balance point, and Chris was able to ease the hull softly down onto the waiting tyres. So good!

deployed more star pickets, double pulleys and ropes on the engine crane side – a strategy that assumed I'd have a strong brake man available. That's what six-foot-plus sons are for, and Chris accepted the challenge.

In the event, the lifting power of the engine crane to get the hull moving was pivotal. Once up to the safe limit of reach of the crane arm, we propped the hull with garden sleepers, and removed the crane, then I hauled the hull to its balance point using the block and tackle. Son Chris found



Rollover successful!

Once rolled over, we removed the rollover frame. Then we had to move the hull sideways, back to its build site position – because that’s about the only spot in the yard to which I was likely to be able to reverse the big trailer, to load the hull. With some assistance from planks as skid rails under the keel, and some grunt, we were able to shift the hull to where I wanted it. I could not have managed it without my son Chris. *Thanks mate!*



Chris removing the rollover framing.



Bowsprit and trial layout of some hardware.



Han Jie testing upright cabin space.



Bowsprit support.



Cabin face timber cut down and notched for framing.

## Jobs at the Ends

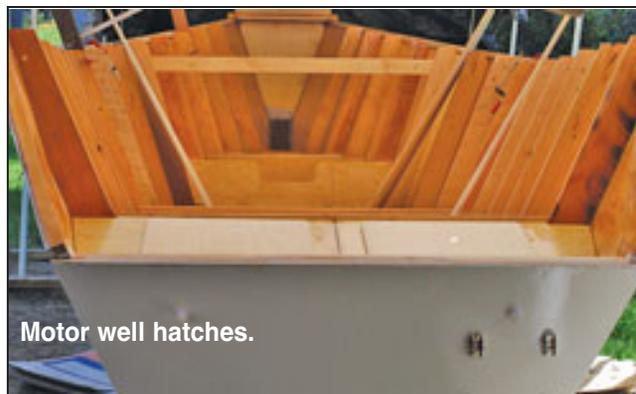
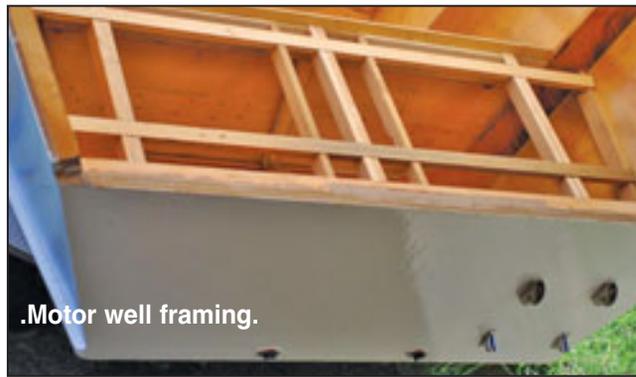
I put together a small do-list of things to do while the hull was at ground level, before attempting to load it aboard the trailer. I figured that doing things at the respective ends would be most difficult once the thing was loaded, so decided to tackle the anchor well and bow sprit, plus front timbers for the cabin structure near the sharp end, and the transom knee and motor well at the stern, while access was easy.



Front timbers and the anchor well before fairing.

Moving from stem to stern, next job on the agenda was installing a big knee on the transom, to take the engine thrust and transfer it into the body of the hull. I like knees to have base retainers, to prevent any lateral movement. The transom frame structure is all 100x40 Celery Top. The primary knee is 210x40 Celery Top and it butts tight to the face framing and under the cross beam, with its base to the keelson, butting to frame #1. A secondary knee sits ahead of frame #1 with a hardwood shoe retaining it and butting to frame #2. For timbers that are to be unseen, there’s no point in taking big timber down with plane and sander to get rid of the final mill saw burns – it just wastes the meat of a plank, reducing its strength, so I only ever take it down enough to smooth it. This ain’t an Edwardian dining table!

With the knees in place, and before doing the motor well framing, I installed the connector brackets for the stern ladder. So much easier to do with nothing in the way! Thence to the support framing, and measuring and cutting out the ply panels – with cut-outs for access hatches – for the base of the motor well. A single full-width ply piece might have seemed better, but I had two ideally sized ply off-cuts, and used them, with epoxy filler in the seam. Waste not, want not, eh? Keeping an eye on the off-cuts stack as you



progress is part of the process for economical building.

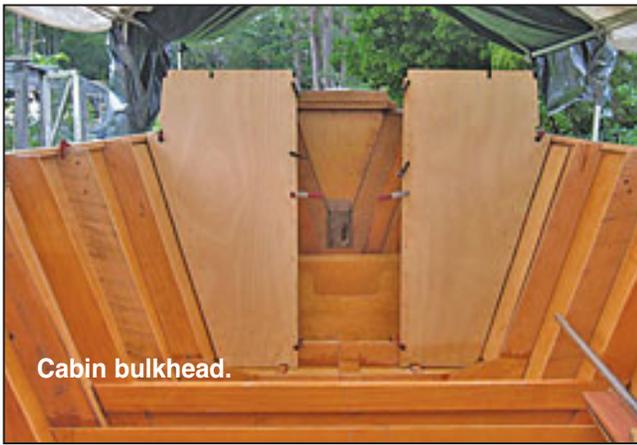
## Cabin

I had a couple of clear objectives with superstructure design. The fore-cabin must provide a berth longer than 2000mm (6'6"), with at least 1400mm (roughly 4'6") sitting headspace, and preferably 1500mm in the companionway and loo area. At the fore-cabin bulkhead, for the cabin top area adjacent to the companionway and under the front windscreens, I wanted a flat (rather than curved) shelf, for utility of available space in the pilothouse. The pilothouse had to provide at least 2150mm (7ft) standing clearance above its sole.

As well, and importantly, I wanted relative ease of access for a decent sized crewman moving through the fore-cabin to a hatch set well forward, to enable safe anchor handling while standing in the hatchway. Sure, that means access across the berth, but that simply requires a working mat to be laid across the bedding, and I made that access decision as a safety issue. Going forward around narrow side decks adjacent to the pilothouse will always be an absolutely last resort on this boat. These things obviously influenced physical design.

In layout terms, because of potential tenderness of dory hulls when lightly loaded, to keep top structural weight as low as possible I decided that there will be a step-down from the self-draining cockpit deck to the pilothouse sole. Think about it. That requires a combination step-over/step-down arrangement, or else water coming into the cockpit could flow into the pilothouse! Yes, it's a compromise, but one that's been used in many boats before. I think the early Bertram 25 had a partial bulkhead at the step-down line, with a drop-in gate/weatherboard for rough weather days. This boat will have a step-over at the pilothouse bulkhead line and a gate/door, and will have a big auto-switch bilge pump cunningly positioned under built-in furniture within the pilothouse.

It's interesting how easy it is to change a design, when you're not stuck with 50 pages of beautifully architected formal drawings. I love the organic approach, going with feel and instinct! I simply concluded one morning that the original cabin and pilothouse design I'd envisaged (and physically modelled) simply didn't suit the hull I'd actually built. That's the beauty of seeing something in the proverbial flesh, seeing its lines, its spaces, and its real volume. Dories are flat across their chines. No depth to play with down



Cabin bulkhead.



Bulkheads installed.



Pilothouse partial bulkhead.



Cabin top longitudinal stringers.



Side Risers and rails for the foc'sle.



**Straight-line cabin rails.**

there. And they're narrow in the bottoms up front – but the flare of their topsides gives a lot of volume at the sheer. That's the nature of the type, and those characteristics are proven. Having side decks at the sheerline on the front half of this hull would have left me with a coach house far too narrow to be useful. I'm ever conscious of the need to keep weight low in a Dory.

Remember the old time mackerel boats with the raised foc'sle berths cabin, and a step-up from the side decks of the cockpit onto narrow side decks adjacent to a pilothouse? I always liked that old design. Seems a lot of professional fishermen favoured it too, a good few years back. You still see them about, typically Carvel built, occasionally Clinker planked, and lovingly restored by people who value real working boats.

With my hull, extending the topsides in the front half of the boat for a raised foc'sle (like the old timers) wasn't possible because that would have pushed my widest beam past 2.5M, the maximum legal towing width. However, using risers from the station frames, with a slight inwards slope, was certainly possible, and that's what I opted to do, with no sheerline side decks as such forward of the cockpit.

I opted for 1500mm (nearly 5ft) height from sole to roof at the foc'sle companionway. With topsides made from 1200mm wide sheets, that's not a lot of height required above the sheerline, but with no side decks as such intruding, the foc'sle approach creates a lot of volume. In spite of the narrowing bottoms up front, by the time I'd done the framing it was obvious that the resulting cabin would have a comfortably spacious and airy feel about it – and that's important for the First Mate.

With that thinking done, I set about doing the cabin framing, starting with the pilothouse bulkhead panels, followed by the fore-cabin bulkhead panels. I installed a mid-area set of risers from the topside frames, with height determined by a straight plane between the bulkhead panels, and the front face plank. Then on each side I bent a long rail around the risers to establish the curve I wanted, and installed the rest of the risers, to meet and support that shape.

For the cabin top, I elected to use what is in effect an I-beam structure for the cross beams, with the cladding ply forming the top of the 'I'. Each cross beam has a flat cross piece running full width between the side rails, screwed to the underside of each of the longitudinal rails. Tight-fitting infill pieces are then installed and screwed on edge to the flat cross beam, between each of the rails. It's very strong. The cladding for the top is 9mm ply, screwed and glued to



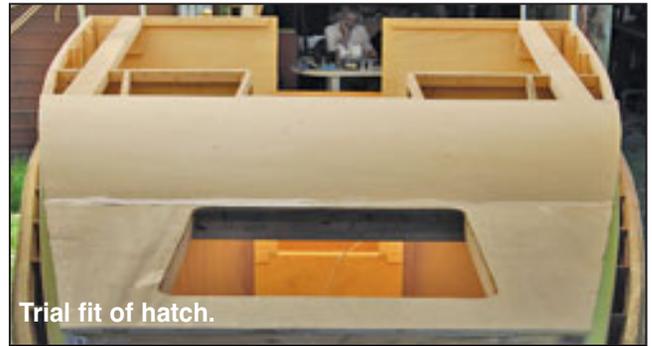
**Cabin top framing in progress.**

both the longitudinal rails and the cross beams.

Once the top framing was well progressed, and while waiting for delivery of some more timber, I began to clad the fore-cabin sides. I had a bunch of third and half sheet off-cuts from prior work, and decided to use them, effectively in 1200mm long sections, to do the side cladding. I've installed a timber slat behind each butt seam. Apart from allowing me to use up the part ply sheets, the beauty of using short sections is that it avoids the fiddly work of trying to cut and fit the base of a single long ply section to the shape of the sheer line. Sure, you get a few more butt joints, but they're so simple to do in situ and application of thickened epoxy into the seam makes the surface appear seamless, after sanding and painting.



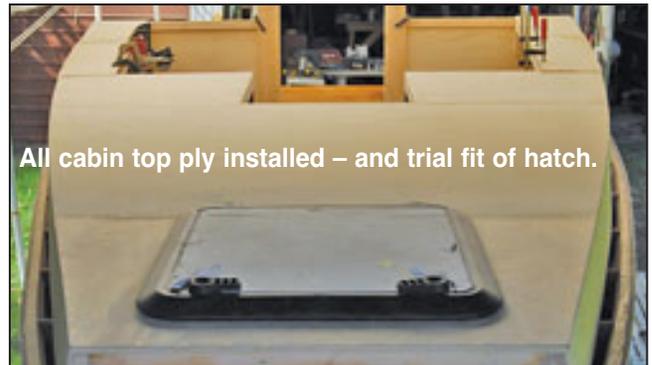
Pilothouse side panels.



Trial fit of hatch.



Front panel with frame support for hatch.



All cabin top ply installed – and trial fit of hatch.

With the fore-cabin sides done, the raised sides of the pilothouse came next. These were a bit fiddly to do because I opted to install fixed windows on each side, because really short folk might have no side view without them.

At this stage, the superstructure looks a bit boxy, but never fear - the abrupt 'cliff face' on the aft end of the pilothouse will be softened in its view abeam by the coamings for the cockpit.

It was time to finish the top framing for the cabin. This meant adding filler pieces, to complete the I-beam structure for the cross beams, to add extra infill pieces to support the butt

joints where I planned seams between top ply panels, and to add strong-point planking through which coach screws will connect the base-V of the front screen. Lots of little bits of wood!

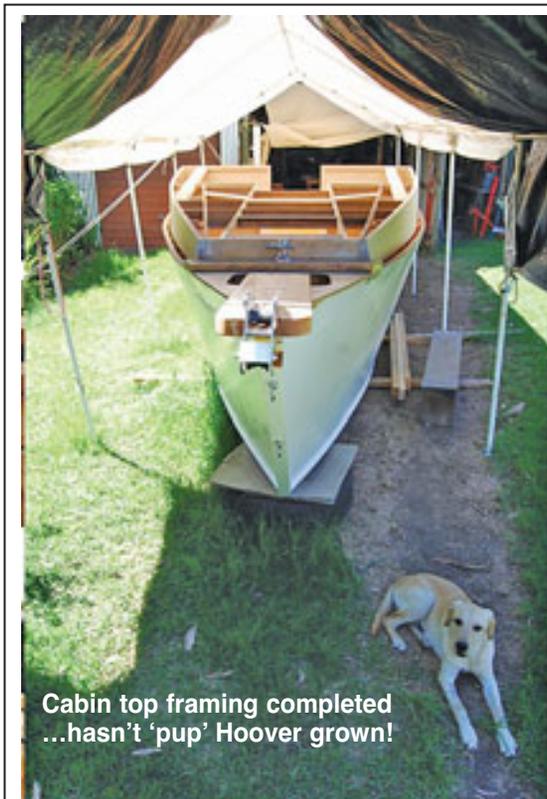
With the framing completed, it was then a relatively simple task to lay near-to-size sections of ply panel onto the cabin top, mark them out, cut them to shape with the jigsaw, and then install them with lots of epoxy and nails.

With the fore-cabin top done, it was left to install the ply panels at the sides of the pilothouse structure. While waiting for the epoxy to cure, I tidied up the hatchway framing, and did a trial fit of the hatch. Deliberately close to the face beam of the cabin, it allows easy and comfortable access to the anchor rope and chain.

### Next Month

I had hoped to finish the pilothouse framing before PW's submission deadline for this month, but alas that looked unlikely without rushing it. This framing will be bare to the world, not covered by ply, hence it does require some delicate and careful carpentry, so I opted to give it the time it deserves. So next month – we'll start with the pilothouse. It changes the look of the boat dramatically. Then we put the boat on its trailer, and we start the detailed fitting out work. My shed is full of stuff waiting to be installed – and I hope I know where most of it will go!

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Cabin top framing completed  
...hasn't 'pup' Hoover grown!

