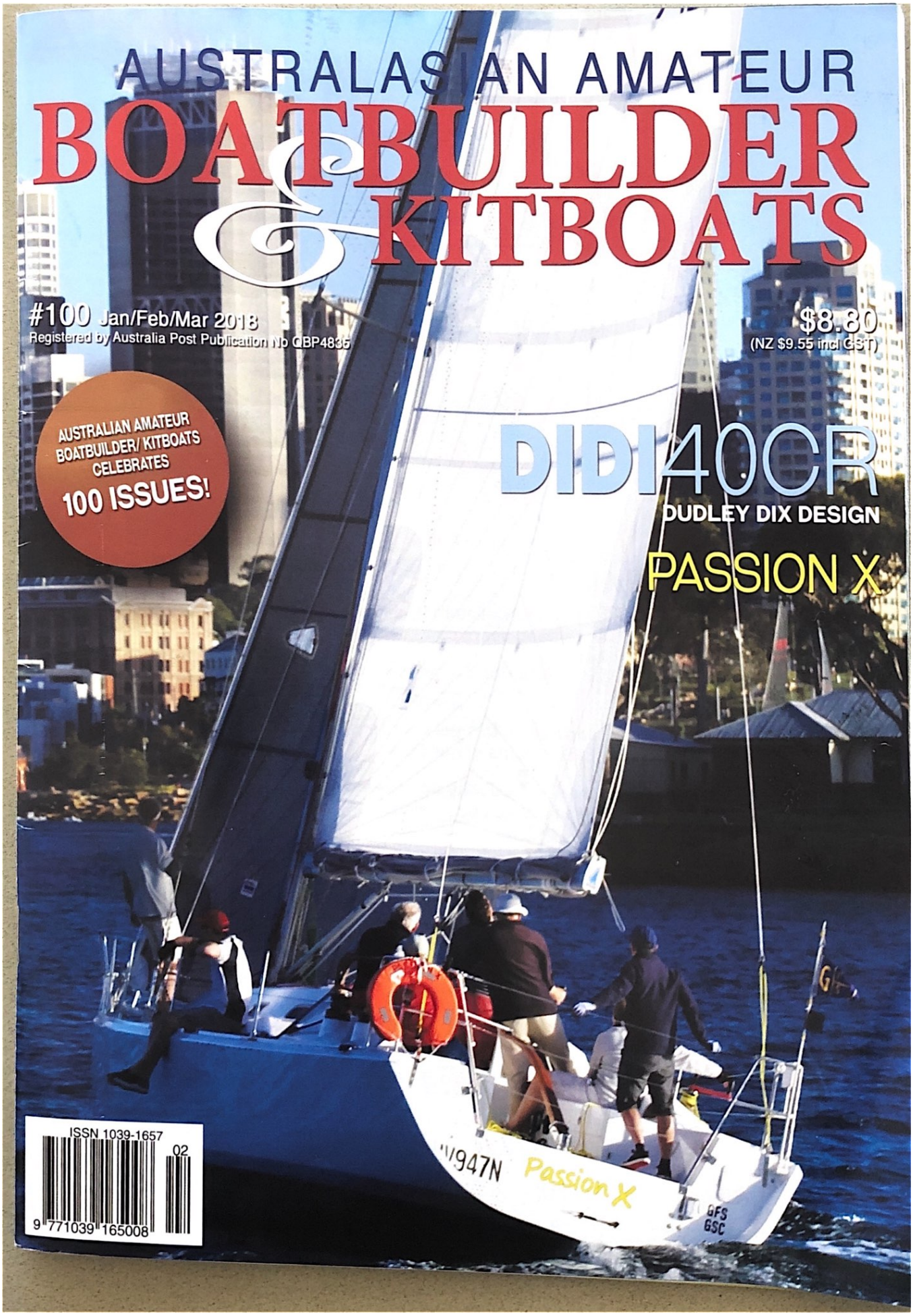
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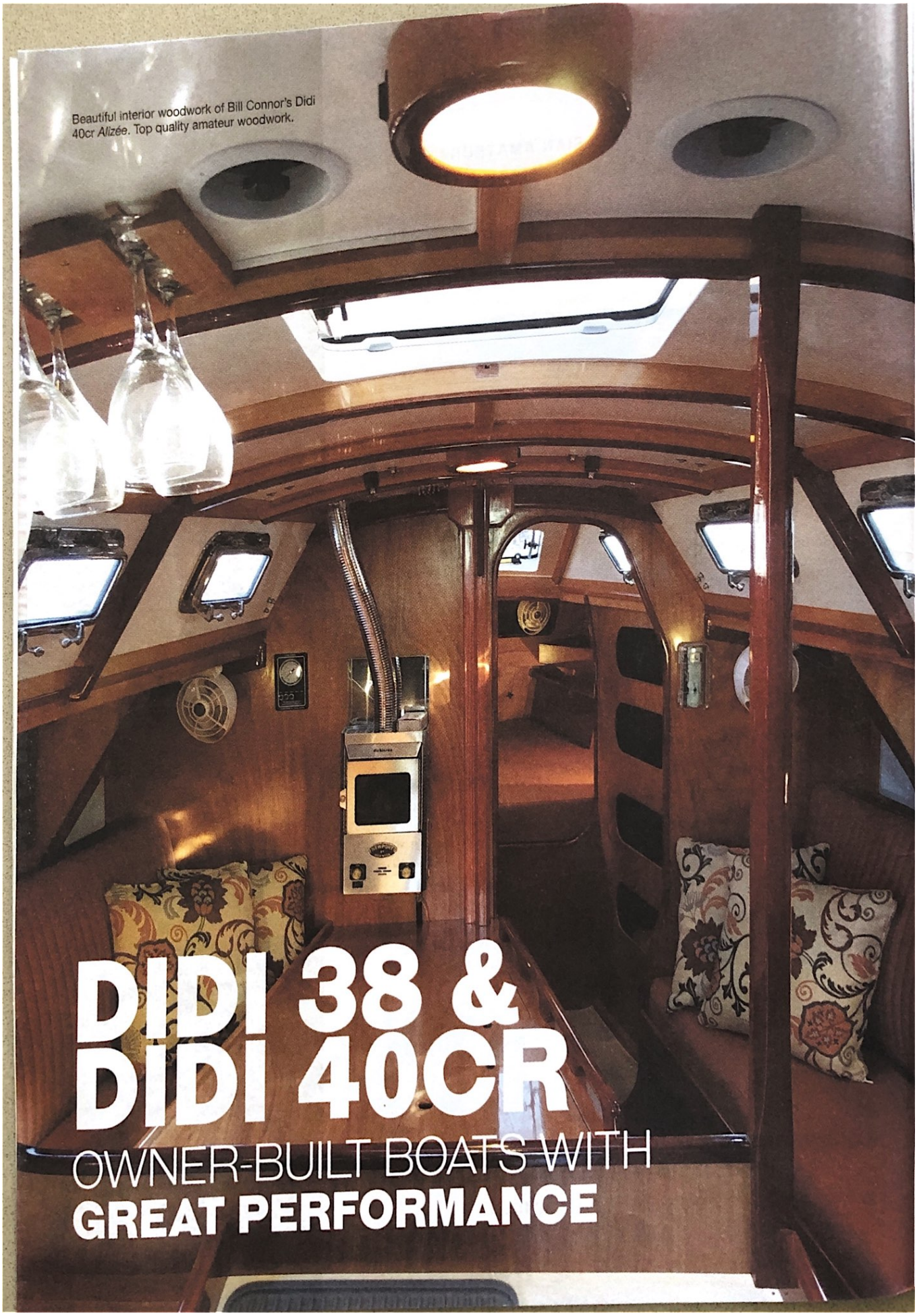


Beautiful interior woodwork of Bill Connor's Didi 40cr *Alizée*. Top quality amateur woodwork.

DIDI 38 & DIDI 40CR

OWNER-BUILT BOATS WITH **GREAT PERFORMANCE**

by **DUDLEY DIX**

Radius chine plywood, as a boatbuilding method, started as an experiment and developed over the next decade to where it became a major part of my design business. About half of my new commissions in the past 20 years have been for this method in one form or another, from small day-sailers through to large cruising catamarans.

Didi 38 *Bekhohr*, built by Stas Rechenkin, on Lake Baikal in Siberia, Russia.

I was the guinea pig in this experiment and I tested the construction concept and the boat thoroughly before we started to sell plans to others. I had sailed the Cape to Rio Race across the South Atlantic Ocean in 1993 aboard a GRP classic cruiser of my design, the Shearwater 39 *Ukelele Lady*, sailing as navigator and sailing master. At the time my own boat was *Concept Won*, a 34ft multi-chine plywood design that I drew in 1979 and built a few years later. During that Cape to Rio voyage I concluded that I needed (wanted) a new high-performance boat for the next race, to sail as skipper.

Intending to build it myself during the intervening three years, I started drawing the design for strip cedar construction. But the funds to finance the boat eluded me until commissions came in for two big designs that freed enough money for my build to start. By then nearly a year had passed and I doubted that I could complete a strip boat in the remaining two years, working mostly solo as an amateur in my garden.

Prior to this, I had drawn a series of radius chine steel cruisers for local boatbuilder clients and decided to try something similar with plywood, to speed up the build. A big difference was that for an equivalent length of plywood racer/cruiser, the displacement is less than 50% of the steel cruiser. That meant a much shallower hull that needed a different approach to hull form and the radius. The change of material also required development of new details to ensure strength sufficient to take on trans-ocean voyages in a very light boat, with everything that nature can throw at a small vessel on big waters.

TOP: The launch of Dior 36 #1, *Black Cat*, after two years of building.

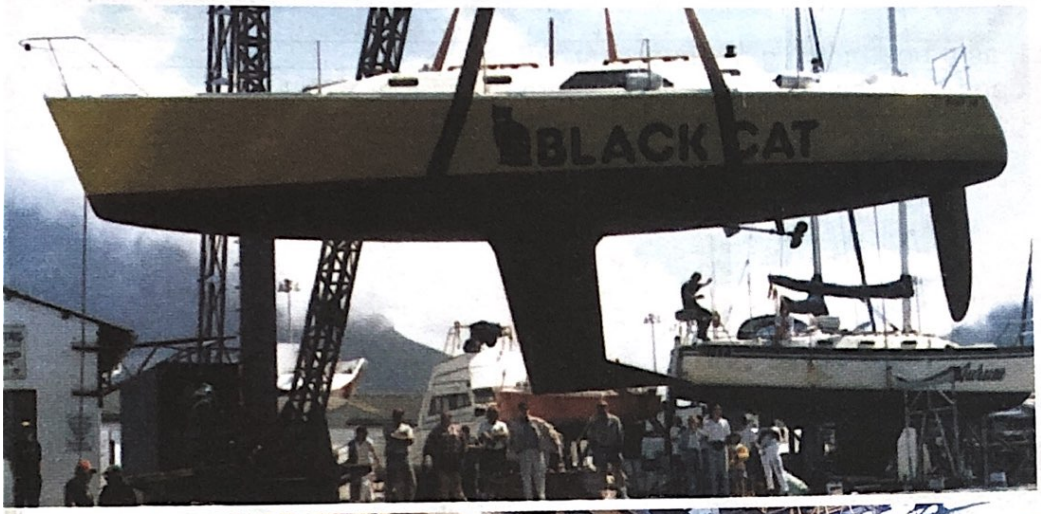
ABOVE: *Passion X* preparing for launch in the workshops of Woolwich Dock in Sydney. The owner and a professional boatbuilder friend installed the keel, with the yard doing the heavy-lifting. The yard sprayed the bottom paint.

downhill tradewind sailing, counter-clockwise around the South Atlantic High. The fleet generally gets caught by one big storm from a cold front within the first few days of the start, with occasional tropical thunderstorms further into the race. The sailing typically ranges from almost drifting through to 20+kt surfing, as well as being flattened sometimes when nature feels that we need to be taught a lesson in respect.

Contrary to forecasts by professionals in the South African boating industry, I completed the boat in time to be on the start line in January 1996. It was tight but we made it, thanks to labour input from crew. Total build time was approximately 3000 hours.

Testing the structural details and the overall toughness of the boat is what I did by racing her with a full crew the 3500 miles from Cape Town, South Africa, to Rio de Janeiro, Brazil. This race is typical downhill tradewind sailing, counter-clockwise around the South Atlantic High. The fleet generally gets caught by one big storm from a cold front within the first few days of the start, with occasional tropical thunderstorms further into the race. The sailing typically ranges from almost drifting through to 20+kt surfing, as well as being flattened sometimes when nature feels that we need to be taught a lesson in respect.

Our return voyage was a lot further south, still counter-clockwise around the South Atlantic High, skirting the edge of the Southern Ocean. I did this with one crew and a tiller-pilot to back us up at the helm. Unfortunately, the tiller-pilot died a few days out of Rio, leaving the two of us to hand-steer more than 3000 miles to get home. This voyage takes boats into the clutches of the endless procession of cold fronts that go west-east around the bottom part of the globe, so we found ourselves in numerous filthy storms en route. They helped us to hone our heavy-weather skills, from sailing around big holes in the surface of the ocean, to heaving to when I felt that to be the best tactic. They taught me how a light boat needs to be sailed in tough weather and big seas and also just how well a modern boat can look after itself and its crew in storm conditions.

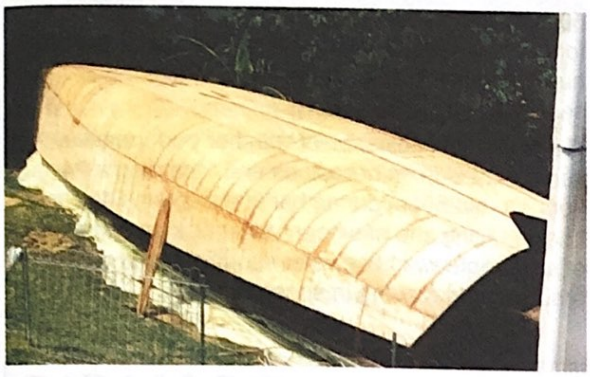


TOP: The launch of Didi 38 #1, *Black Cat*, after two years of building.

ABOVE: *Passion X* preparing for launch in the workshops of Woolwich Dock in Sydney. The owner and a professional boatbuilder friend installed the keel, with the yard doing the heavy-lifting. The yard sprayed the bottom paint.

The boat that did all of this for me is the 38ft *Black Cat*. Named and liveried for South Africa's favourite peanut butter brand, it has proven to be a wonderful name for a yellow monohull. I skippered her across the South Atlantic three times. She is now 22 years old and has crossed the Atlantic six times in total, as well as thousands of miles in coastal racing and cruising around the Cape of Good Hope and three voyages between Cape Town and St Helena Island.

The hull form is a basic V-bottom hard chine, with the chine rounded off to a variable radius that is sized to suit what I need from that particular part of the hull. The resulting shape is not much different from a modern light-displacement composite hull. It has about 2/3 of the hull area as flat sheets to side and bottom panels, which are skinned very quickly and are self-fairing due to the nature of the material. The remaining 1/3 of the hull is skinned in two



of plywood, applied in strips 250-300mm wide. The junction between the flat and radiused panels is made over a stringer, with a plywood doubler to add bonding surface area.

The hull is built over permanent bulkheads, with the stringers slotted into the bulkheads and the skin bonded to the bulkheads with epoxy fillets both sides. The bulkheads are set up on the building stocks as permanent structure, with minimal wasted timber in temporary framing, keeping costs down. The backbone is a hardwood I-beam with transverse laminated floors to spread the ballast loads into the hull.

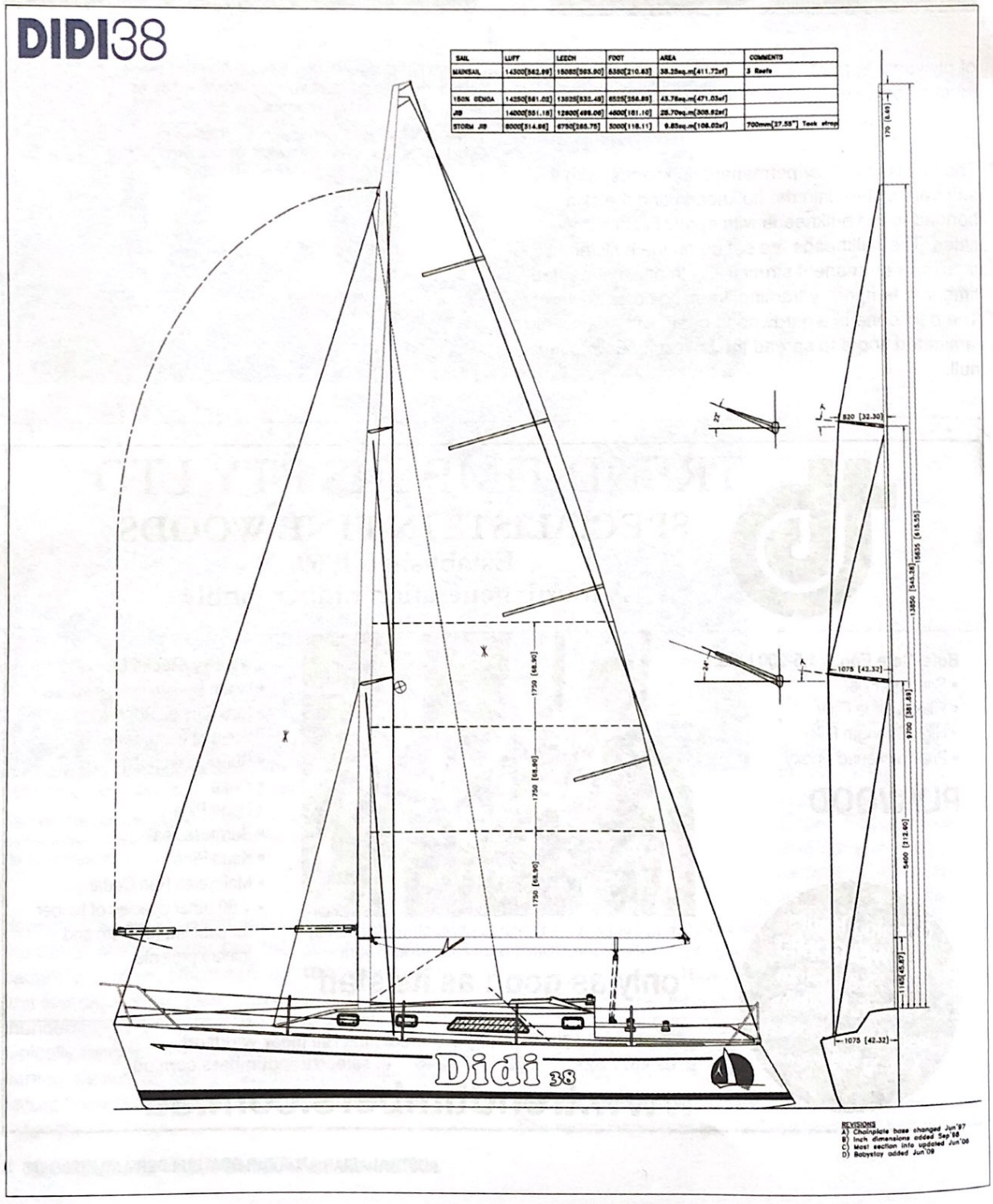
ABOVE LEFT: *Black Cat* hull skinned. The flat sheets to side and bottom are 2/3 of the hull surfce, linked by the radiused areas done in two layers.

ABOVE RIGHT: *Black Cat* hull with the sides skinned. Much of the interior was built before the skin was started.

The deck and cockpit are all 12mm plywood sheet, also over longitudinal stringers that are slotted into the bulkheads. This is a much faster and easier way to build a deck than traditional transverse deck framing. The cabin roof is laminated from two layers of 6mm plywood, over transverse laminated beams.

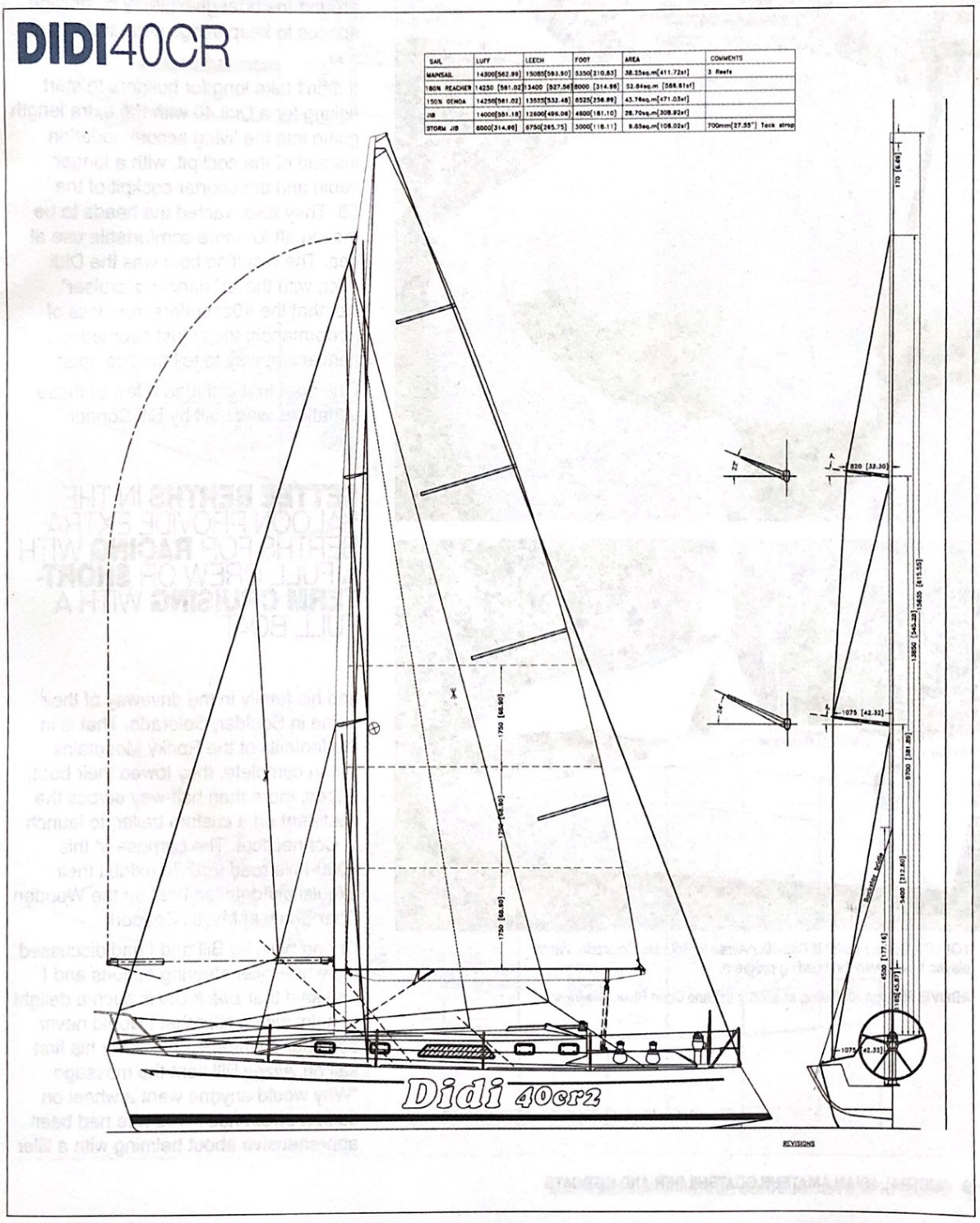
The rig that I chose for my boat was deck-stepped fractional Marconi with two sets of swept spreaders. Underwater she has a fabricated steel keel with delta bulb, 2.25m draft, and poured-in lead ballast, with a 50% ballast ratio in lightship trim. For steering I went for my favourite arrangement, a balanced transom-hung rudder and tiller – simple, light, direct and easily serviced.

Black Cat didn't disappoint with her performance, surfing at 22kts on occasions and recording a 24-hour run of 250nm during her first Cape to Rio Race. In club racing she has been very quick on all points of sail in light wind flat water conditions and excels reaching and running in strong breezes.



I named the design the Didi 38. I drew it to the 11.5m length limit that was permitted on my marina at Royal Cape Yacht Club, with short overhangs and a relatively long waterline. That combination suited my needs but I knew that other builders may want a longer stern overhang, to better optimise their boats for rating under IMS, the rating system at the time. For those builders I included the option of an extended stern on the lines drawing, to take overall length up to 12.07m. The extra length also gave a longer cockpit more suited to crewed racing. That version is the Didi 40, built from the same drawings as the Didi 38.

Along the way various builders wanted rig variations and shallower keels of varying depths, or a cast lead torpedo bulb instead of the fabricated delta bulb on *Black Cat*. Not everyone wanted to race across oceans, preferring to cruise islands with shallow waters. An inboard spade rudder with tiller was added to the options, then wheel steering.



TOP: Bill Connor built his Didi 40cr *Alizée* in Boulder, Colorado. Winter played havoc with the building program.

ABOVE: *Passion X* relaxing at anchor in Lane Cove River, Greenwich.

The interior layout of the Didi 38/40 has three double berths, one in the forecabin and two in the quarters under the cockpit. These work well as singles at sea, each with a centreline lee-cloth separating a sleeping crew from tog bags and other gear on the other half of the berth. Settee berths in the saloon provide extra berths for racing with a full crew or short-term cruising with a full boat. Cave lockers in various places around the boat give plenty of storage spaces to keep things neat and tidy at sea.

It didn't take long for builders to start asking for a Didi 40 with the extra length going into the living accommodation instead of the cockpit, with a longer cabin and the shorter cockpit of the 38. They also wanted the heads to be moved aft for more comfortable use at sea. The resulting boat was the Didi 40cr, with the 'cr' denoting 'cruiser'. Not that the 40cr suffers from loss of performance, the cr just seemed a convenient way to tell the two apart.

One boat that included a few of these variations was built by Bill Connor

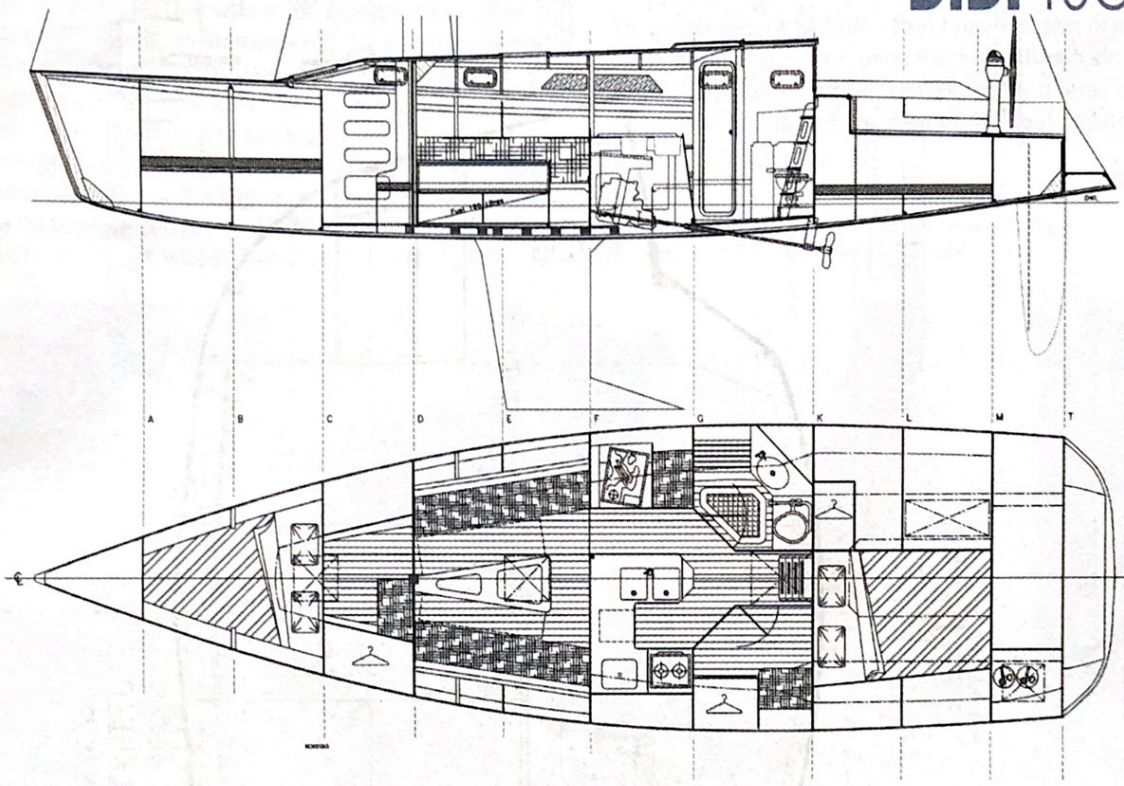
SETTEE BERTHS IN THE SALOON PROVIDE EXTRA BERTHS FOR **RACING** WITH A FULL CREW OR **SHORT-TERM CRUISING** WITH A FULL BOAT

and his family in the driveway of their home in Boulder, Colorado. That is in the foothills of the Rocky Mountains. When complete, they towed their boat, *Alizée*, more than half-way across the continent on a custom trailer, to launch in Connecticut. The purpose of this 2000-mile road trip? To exhibit their exquisitely-detailed boat on the Wooden Boat Show at Mystic Seaport.

During building Bill and I had discussed the wheel/tiller steering options and I had said that *Black Cat* is such a delight to helm with a tiller that I would never consider a wheel for her. After his first sail on *Alizée* Bill sent the message "Why would anyone want a wheel on such a sweet ride?" His wife had been apprehensive about helming with a tiller

ACCOMMODATION

DIDI40CR



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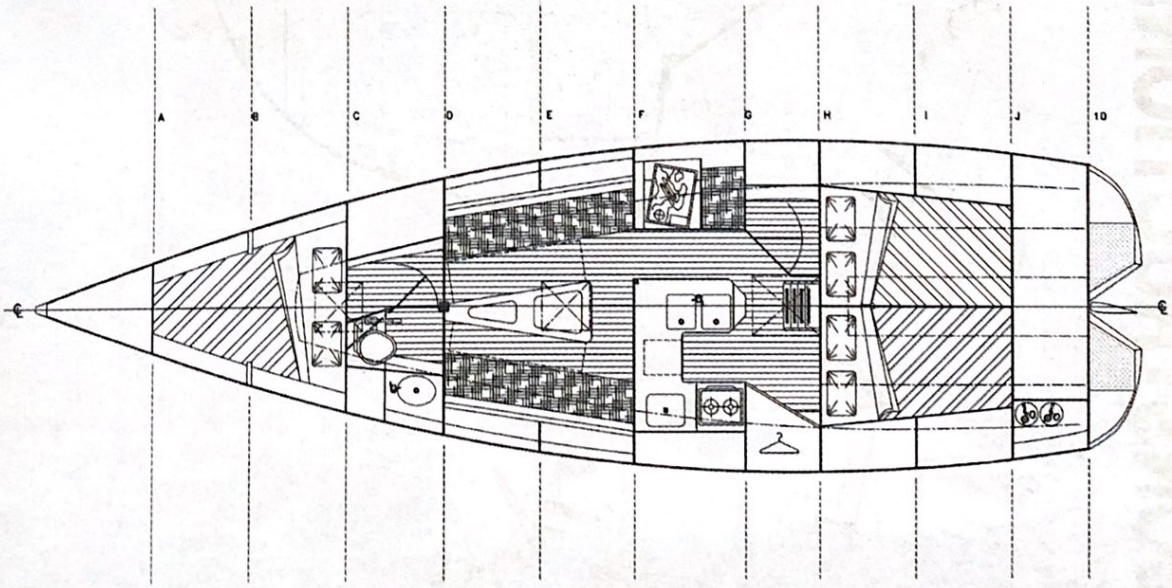
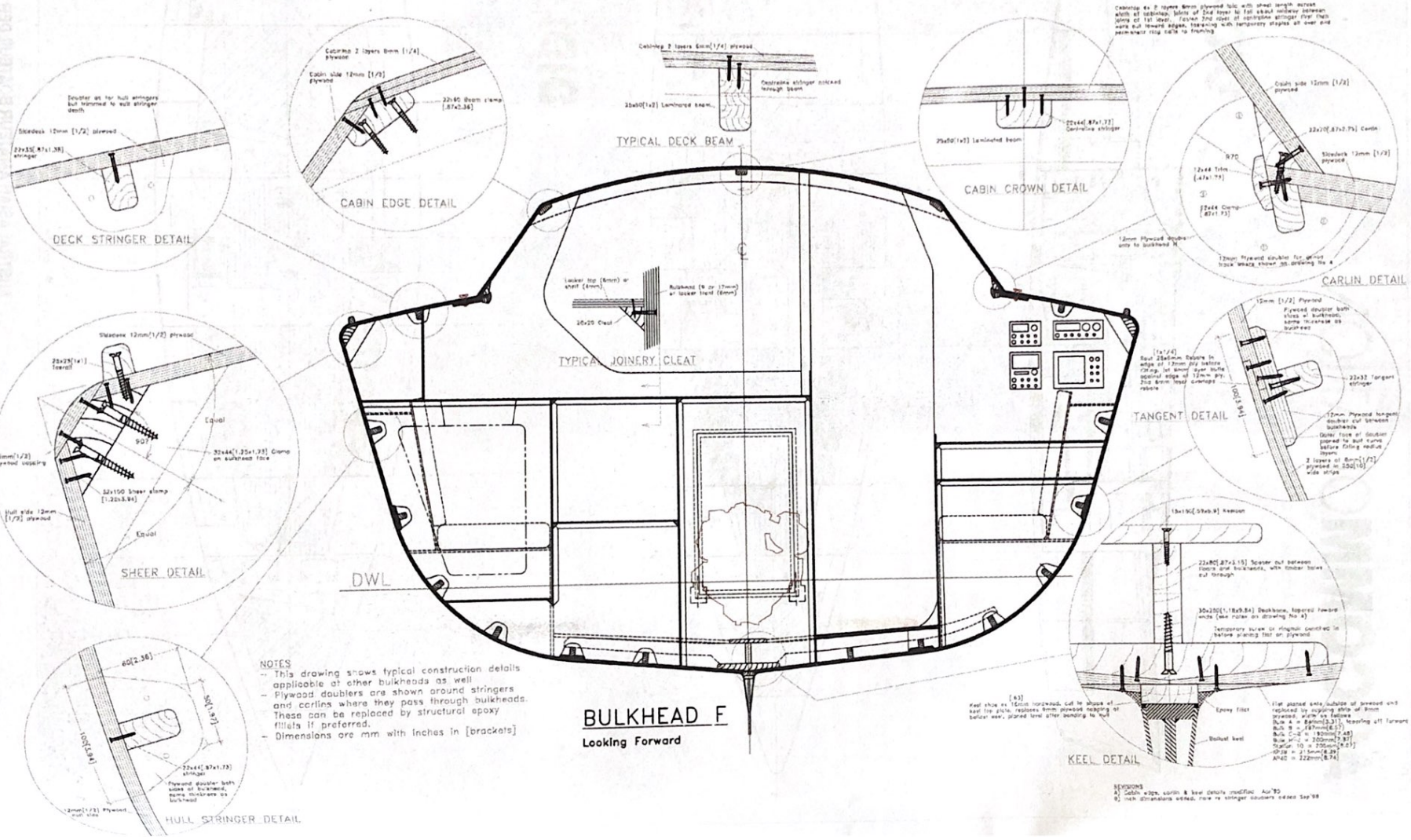


CONSTRUCTIONDETAILS



NOTES
- This drawing shows typical construction details applicable at other bulkheads as well
- Plywood doublers are shown around stringers and carlins where they pass through bulkheads. These can be replaced by structural epoxy fillets if preferred.
- Dimensions are mm with inches in [brackets]

but that first day of sailing he hadn't been able to get her to give him time at the tiller.

More recently I was contacted by David Edmiston of Sydney, who had seen the design series and wanted to build a Didi 40cr for himself, for club and ocean racing. But he wanted some modifications, to modernise the 20-year old design. He was the first builder to ask me to increase the keel depth, rather than reducing it. This was to go along with another first-time request, to increase the rig with masthead spinnakers and bigger mainsail. The deeper keel translates into larger loads, so the structure was beefed up. The hull and deck also went through changes, adding flare to the hull aft, increasing deck beam aft of Bmax through to the transom. This gave the space needed for a wider T-shape cockpit that can take a large wheel. David chose an inboard rudder with tiller for his boat, named *Passion X*. The modified boat became the Didi 40cr2.

David built her in his garden, alongside his Sydney home, over three years. She was lifted over his house by a large crane, from her sheltered build location. From there she was transported by flat-bed trailer to a professional yard by the water for fitting keel and rudder, as well as bottom painting before launch.

The most recent variation that I have drawn is for a lifting keel. This option uses the same basic structure as the fixed keels, further reinforced by a laminated ring frame to support the front of the keel casing and

BELOW: *Black Cat* at the start of the 3500 mile 1996 Cape to Rio Race, sailing out of Table Bay at 10kts.

considerably more timber to the backbone structure to compensate for the big hole through the bottom of the boat. It uses a steel casing that transfers the keel loads into the timber structure. Lifting/lowering is by a Spectra rope that runs through sheaves bracketed off the top plate of the keel and the underside of the cabin roof. The line is led to an electric halliard winch on the roof, replacing the manual winch of the fixed keel boats.

Black Cat and her voyages attracted the attention of people wanting to build racers or fast cruisers for themselves. Plan sales to date are approaching 100 boats, most of them by amateur builders. A wide range of commissions came over the years, all inspired in one way or another by *Black Cat*. We now have 15 designs and variations that are built from plywood with radius chine methods, as well as one on the board right now and another two waiting in line. I have had requests this year for big sisters to *Black Cat* of 45,50,55 and 65ft but have had to turn them down until I can clear the backlog. There is so much interest in this construction method that I could draw nothing else and not run out of concepts.

TOP: Friends help with turning the hull of *Black Cat*. Much of the interior joinery was built before the hull was skinned, reducing fit-out time.

ABOVE: *Passion X* gets her first taste of salt water, in Woolwich Dock.

SOUTH AFRICAN BORN YACHT DESIGNER DUDLEY DIX IS A GRADUATE OF WESTLAWN SCHOOL OF YACHT DESIGN. HE HAS A WIDE RANGE OF DESIGNS, BUILT BY PROFESSIONAL AND AMATEUR BUILDERS IN 90 COUNTRIES. THE DUDLEY DIX YACHT DESIGN OFFICE IS IN VIRGINIA BEACH, USA, WITH WEBSITE AT **HTTP://DIXDESIGN.COM**