

DASHEW FPB64



We've known from the beginning of sea trials that something special had occurred with Wind Horse, the FPB Series prototype. She is so much more comfortable than any design on which we've been to sea, as well more efficient offshore than expected, that we wanted to have a firm grasp of design elements which led to this happy outcome, before pursuing the next step. Which is why for the past four years we've been hard at work testing Wind Horse.

Given the thousands of hours of design work, which went into Wind Horse, along with substantial efforts in the towing tank and with CFD analysis, you would think we had all the answers. However, we can tell you from long experience that there is nothing like using a boat full time to get a feel for what works, and what can be improved upon. Now, with more than 45,000 miles under the keel of Wind Horse since sea trials were completed, we have a handle on how (and why) this design works as well as it does. We've purposely



the NEXT STEP

EVERY NOW AND THEN IN YACHT DESIGN, THE THOUSANDS OF DETAILS INVOLVED TO PRODUCE A BOAT COMBINE IN A UNIQUE WAY, CREATING A VESSEL WHICH PERFORMS SUBSTANTIALLY BETTER THAN PROJECTED.

WORDS BY STEVE DASHEW
DESIGNER OF THE FPB SERIES

searched out a variety of sea states to put the vessel and onboard instrumentation through its paces. The Horse is fitted out with six accelerometers (two for pitch rate and angle sensors). The data is collected and analyzed in real time, allowing the designers to see the shapes and periods of the waves and the resulting gale force winds, and surfing a wave. The vessel was put to sea for thousands of miles, and the designers teach us. Of course our design team (mostly people who have been with us for years) are always with us when we're testing. We've been constantly needing new ideas for the FPB, but only one goal, to produce the best vessel possible in a

more compact package. In the beginning we were not sure it was possible. We have looked at more than a thousand hull shapes, dozens of interior layouts, and more propulsion options than you can imagine. And after two years of work, the pieces started to fall into place.

New Boat
The first of four FPB64's being built by Circa Marine in Whangarei was launched earlier this year and after sea trials off the coast of New Zealand is now with its owners enjoying cruising in comfort around the Pacific Islands. In July the second FPB64 was launched, with the next two scheduled for later this year. In profile, this new design is very close aesthetically to the FPB

WAVE PIERCING
IN ACTION!



TOP: LOOKING FORWARD FROM THE ENTRYWAY.

BELOW: FORWARD END OF GREAT ROOM SHOWING INSIDE HELM.

83. The FPB 64 and 83 share the same freeboard, and house proportions are similar. The large engine room is all the way aft, with excellent access to systems. The forepeak forward offers plenty of storage for ground tackle, awnings, drogues, dock lines, fenders, dock carts, life jackets, and the quantities of other gear cruising boats need.

The great room has a large galley, space for the full-sized washer-dryer opposite, 560 litres) of fridge and freezer (with another 225 litre dual-purpose fridge/freezer in the basement). The saloon area will seat a crowd, and the bridge desk forward has plenty of space for a complete array of modern electronics.

There is a sumptuous owner's suite forward with an excellent guest cabin and separate sea-berth area aft plus a large office area.

Single Engine

After exhaustive analysis we have given the FPB 64 a single engine configuration (compared to the FPB 83's twins). The reason for this is simple - efficiency. The FPB 64 has a slightly different combination of hydrostatic properties, which allow this approach (the FPB 83's characteristics dictated the use of two engines).

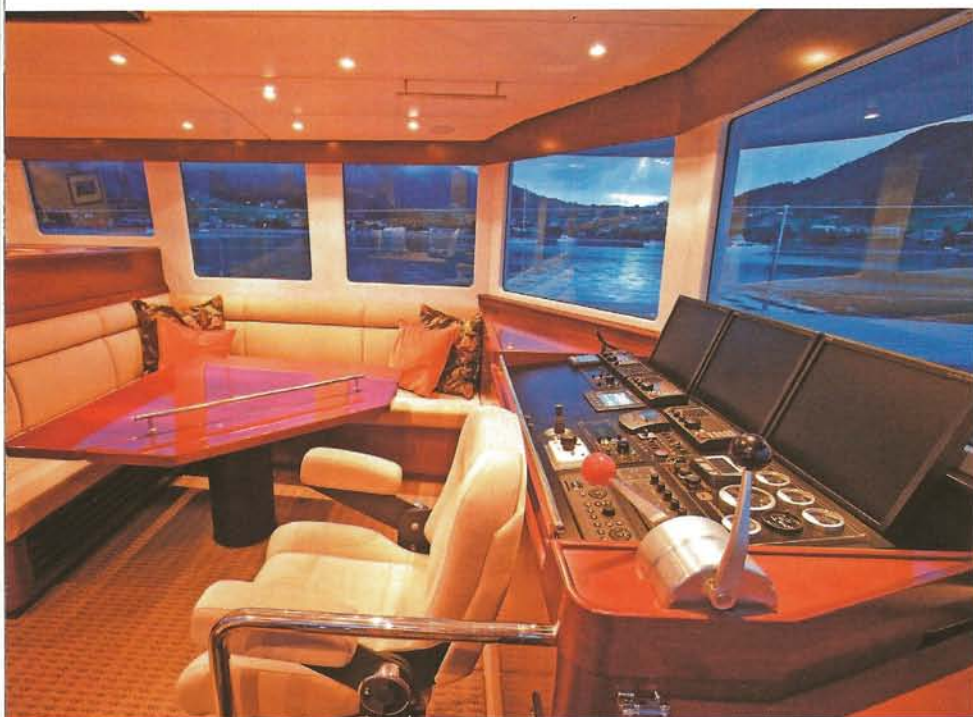
By going to a single engine installation we maintain close to the FPB 83's interior noise levels, have comparable range at a cruising speed of 9.5 to 10 knots (compared to the FPB 83 at 10.5 to 11 knots), and what has proven to be comparable or better manoeuvrability (and this is without using the standard bow thruster of the FPB 64).

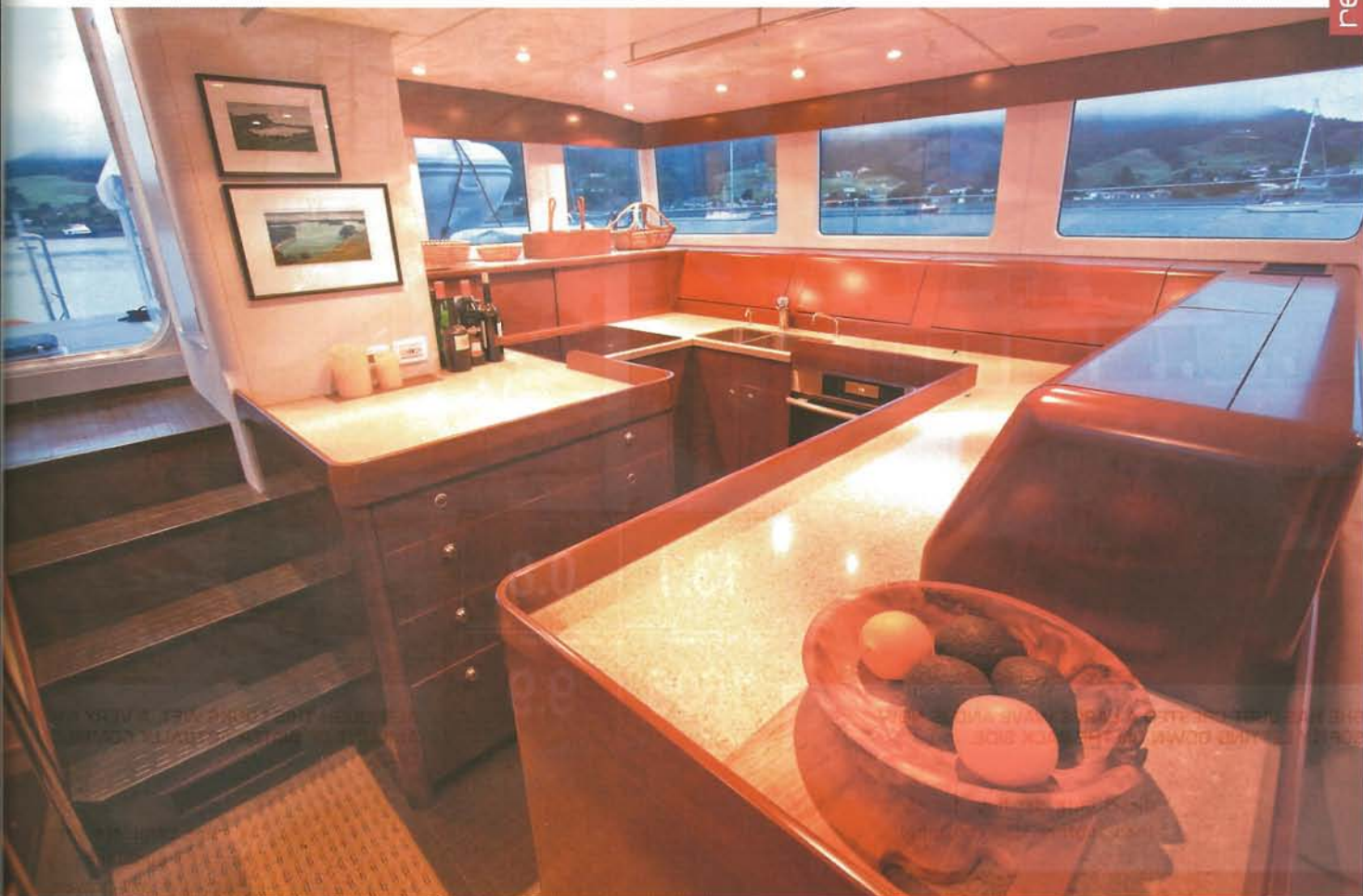
Avatar is equipped with a John Deere 6068ZFT, delivering 236HP at 2400 RPM under their M3 rating. It is available with power settings between 182 and 300 HP, by changing the computer coding. This diesel is smooth running and robust. Torque maxes out at 1600 RPM, perfectly matching our needs at 9.0 knots and allowing a substantial additional power capacity when fighting head seas at cruising RPM.

This 236 HP engine has enough "grunt" to push the FPB 64 eleven knots at 90,000 pound/40,800 kg displacement (full load), which was demonstrated during initial sea trials. Sound levels in the saloon were measured at 57 dB at 1600 RPM and 61 dB at 1800 RPM. Sea trials have shown is that even without a bow thruster - and there is one in the forepeak - the space required to rotate the smaller FPB 64 with single engine is no more than the longer FPB 83 with twins (that 5.8m difference in length is a big advantage). The combination of the huge rudder, 42-degree rudder deflection and hull shape gives the 64 an amazing turning radius.

The aluminium hull, deck, and house structure for the FPB 64 are engineered to our normal high standards, with exceptional factors of safety to the same structural standards as Wind Horse, including 5,200 gallons (19,600 litres) of fuel and water carried in integral hull tanks, with two full and two partial watertight bulkheads, and our usual high factors of safety for structure.

The stem of the boat, for example, is over 56mm thick when the topsides are welded to the stem bar. We don't need anything nearly this strong for ocean loadings, but if you are going to be





bumping into logs, docks, or other hard items, that thick, deep stem bar is really nice to have.

The conservative SSC rule calls for 5/16" (8mm) plate for the bottom, based on the framing system we are using. We have upped this to 7/16" (12mm), which is over three times as stiff (stiffness is a cube function of thickness). This is not because we need the thickness for pounding upwind, or for anything else to do with the ocean loads. That 12mm plate is being used because it gives us a warm, pleasant feeling when we're offshore knowing we have huge factors of safety in the bottom plating for things which go bump in the night. This extra thickness extends 150 to 175 mm above the datum waterline.

Probably the hardest part of engineering a structure like the FPB are the house windows. The various rule-making societies, like Lloyds and ABS, do not contemplate the loads we might see in a severe knock down. We've been through this exercise in detail on the FPB 83 and come up with 19mm (3/4") toughened safety glass for house windows. This is hugely over

engineered by ABS and Lloyds rules, but like that thick bottom plate, we prefer the emotional security, which comes with those massively strong windows.

Efficient Hull Form

Sea trials have confirmed a smooth water range, including an allowance for hydraulics and electric generation, to be around 7,600 nautical miles at nine knots. Cruising speed is between 9 and 10 knots, depending on sea state.

During trials, Avatar recorded 2366 rpm at wide-open throttle, so was a little over pitched on the prop. Speed through the water was 11.0 knots (deducting half a knot current from the GPS derived speed over ground). This is a speed length ratio of 1.38. Very efficient for a 20m 90,000/41 tonne motor yacht with just 236 horsepower at work.

While this smooth water, no wind, no auxiliary fuel burn data needs to be degraded for real world additional loads, we are presenting it this way since this is the marine industry norm for how range is calculated. Normally we'd add 2.65 litres of

TOP: THE GALLEY HAS ENORMOUS QUANTITIES OF WORK SURFACE AND STORAGE ABOVE AND BELOW THE COUNTERS.

BOTTOM LEFT: THE ENGINE WORK SPACE IS HUGE WITH EASE OF ACCESS TO ALL SYSTEMS.

BOTTOM RIGHT: THE OWNER'S SUITE IS LARGER THAN YOU MIGHT THINK.





SHE HAS JUST CRESTED A LARGE WAVE AND IS NOW SOFTLY LETTING DOWN ON THE BACK SIDE.



ALTHOUGH THIS LOOKS WET, A VERY SMALL AMOUNT OF WATER ACTUALLY COMES ON DECK.

| | |
|----------------------|--------------------|
| Total Fuel Rate | Total Fuel Economy |
| 13.1 | 0.8 |
| Liters/Hour | nm/Liters |
| Engine #0 Tachometer | Speed Over Ground |
| 1606 | 9.9 |
| RPM | Knots |

diesel burn per hour for electricity and hydraulic loads, and then another 15% consumption margin for adverse weather.



TENDERS ARE STOWED AFT WITH THE BOOMS FOR LAUNCHING AND RETRIEVAL.

Ready To Go

These boats are being built to the same complete specifications, with systems designed around the approach that has worked so well for us over the years, and has proven itself yet again on Wind Horse. There are no options except for dinghies and some personal gear. The boats are complete right down to life raft, full spare parts inventory, awnings, spinnakers, anchors, drogues and warps, and two sets of dock lines. After our hands-on, onboard personalised training, just add crew and provisions, and you are ready to explore distant horizons. There is no waiting around for months while you spend hundreds of thousands of dollars on "options" that should have been part of the original contract.

The production line approach to building these yachts produces a very high quality product at moderate cost - saving up to half of what a custom yacht of the same specification would run. There are significant sums invested in design and engineering, plus jigs and fixtures for production, and learning curve during the initial build cycles. Rather than amortising this over a single custom yacht, these costs are being spread over a production run.

TECHNICAL SPECIFICATIONS

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|--------------------|--------------------|--------------------|----------------------|------------------------|----------------------------|
| Design Name: | FPB64 | Gearboxes: | ZF 280FB | Paint (Antifouling): | Amron |
| Year Launched: | 2010 | Propellers: | ZF 32 x 21 3 blade | Hatches & Ports: | Bomar |
| Designer: | Steve Dashew | Generators: | Onan 50kW & 50kW | Heads: | Vacuflush |
| Interior Designer: | Steve Dashew | Inverters: | Victron 2500watt x 4 | Helm Chair: | Stidd |
| Builder: | Circa Marine | Watermakers: | Sea Recovery 60gph | Veneer/Plywood: | Cherrywood |
| LOA: | 19.85 m | Air Conditioning: | Climma Iveco | Upholstery: | Ultra Suede/leather |
| DWL: | 19.40 m | Interior Lighting: | Cantalupi | ELECTRONICS | |
| Beam: | 5.22 m | Anchor Winch: | Maxwell V4000 | Autopilot: | WH Autopilots |
| Draft: | 1.0 m | Anchor: | Rocna | GPS/Plotter/Sounder: | Furuno Navnet 3D |
| Displacement: | 41 tonnes | Steering: | WH Autopilot | VHF: | Icom |
| Max Speed: | 11.1 knots | Engine Controls: | Hynautic | SSB: | Icom |
| Cruise Speed: | 9.5 knots | Bow Thruster: | Lewmar | Radar: | Furuno Navnet 3D |
| Construction: | Aluminium | Stabilisers: | Naiaid | Entertainment Systems: | Samsung / Sony |
| Fuel Cap: | 13000 litres | Davit Crane: | Dashew | Switch Panel: | Circa Marine |
| Water Cap: | 6800 litres | Tender: | AB | Base Price of Boat: | \$US2.5 million (Estimate) |
| Engine: | John Deere 6068ZFT | Liferaft: | Switlik | | |

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