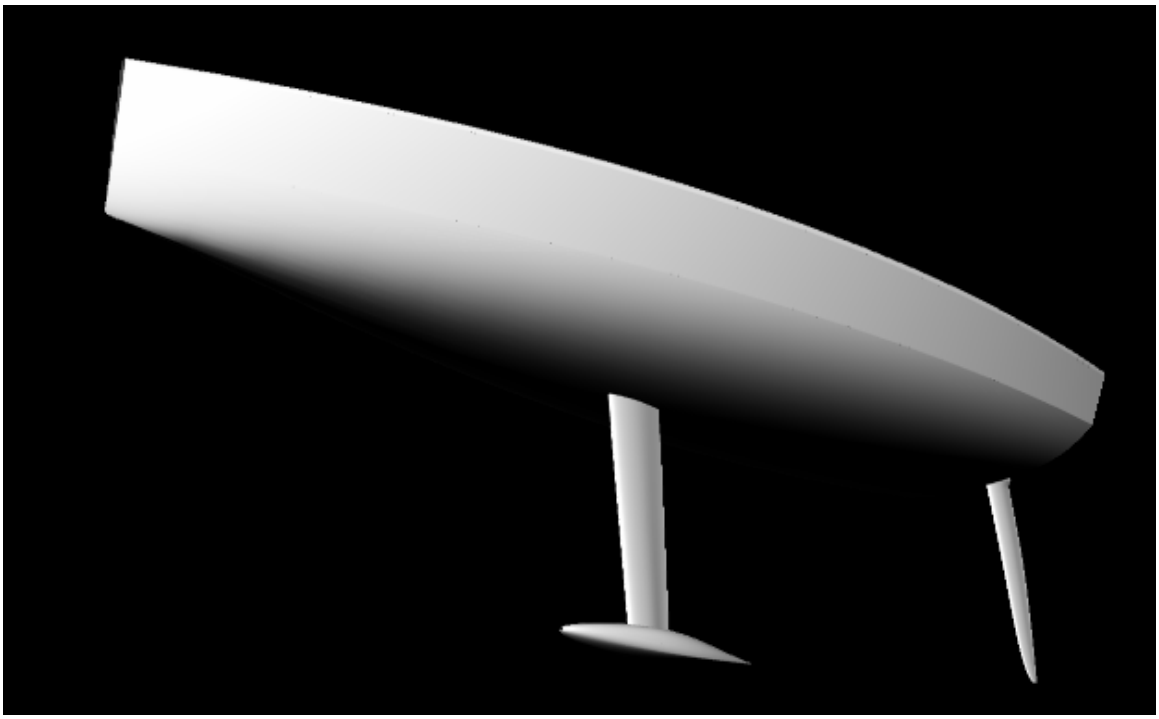


jp donovan DESIGN – 6m Racing Yacht

The Donovan 6m is a sophisticated high performance racing yacht in a sexy package, designed and engineered to provide exciting performance in all conditions. The high stability hull form, and deep keel will deliver excellent upwind performance. Off wind the ultra light displacement and tall rig will let the boat fly.

Over the past 4 years I've been developing this design for my family to sail here in Hawaii. The design process looked at a broad range of yacht sizes, and was influenced by many decades of designing and racing high performance yachts. There is a very real threshold in yachts that occurs at about 22 feet LOA that changes the whole nature of the boat. Below 22 feet the boats are user-friendly for most people to sail effectively. Above this size you need at least one or two large/strong crew members to pull on the sheets in windy conditions, so some of your friends or family will get left on the dock.

In the spring of 2009 I arrived at the solution; it combined the proper blend of high performance, high tech construction, and affordability. The sail handling loads are within the abilities of the majority of our friends and the boat will be able to be sail efficiently with a crew of 3. The solution is 21 feet (6.4 m) long and I started construction of the first hull in July 2009.

Kit packages in development for 2010 delivery

HULL FORM

The hull shape is derived from my GP26 design. While working with Victory Challenge during the last America's Cup, and during the time I was engineering and building high speed powerboats here in Hawaii, I experimented with sailing yacht hull forms in various software programs. The goal was to design extremely fair hull forms and my GP26 is the first design using this new method. The GP26 hull shape looks great and the Donovan 6m is scaled version of the GP26 hull. The form is sharp forward with smooth contours finishing at a powerful transom The shape maximizes righting moment when heeled and is carefully balanced to avoid bow down trim change as the hull heels. When the gust hits, the boat will heel without digging the bow in; the heeled shape is symmetric and the rudder stays immersed for control through the gust. In light winds simply heeling the hull significantly reduces wetted surface and presents a much narrower waterline beam. In big breeze high powered sportboats need all the available reserve buoyancy forward when driving hard downwind. The 6m hull form has the hull LCB (longitudinal center of buoyancy) located aft to allow the rig and keel to be positioned aft on the hull; the distance from the stem to the mast is the same as on most 24 footers.

RIG

Sportboats need large rigs to be "sporty". The tall rig is configured for efficiency with high aspect main and jib, and includes control mechanisms that allow the sailplan to depower as the breeze increases. There is a 24:1 forestay adjuster lead aft to the cockpit, allowing instant adjustment of the forestay/shroud tension to suit changing wind conditions (forget getting the wrenches out and counting turns on the shroud turnbuckles). The jib is self-tacking to simplify the crew tasks during the tack, with a 4:1 jib sheet purchase lead to a control box on the cockpit floor for precise control. The jib traveler control is lead under-deck and aft to the skipper for immediate jib sheeting angle adjustment during the race. The mainsail is a high aspect fat-head design which is far more efficient in light winds, and easier to depower in higher wind strengths. The boat has a fixed bowsprit – this is lighter than a retractable sprit, eliminates one more task at every mark rounding, and looks good. For moderate to low wind strengths there is a very large spinnaker, but I have a smaller spinnaker with narrower girths ordered for higher wind speeds. This smaller spinnaker will depower quicker when the sheet is eased, making the spinnaker sheet trimming much easier and allows the driver to keep the "hammer down" in big breeze. Sound like fun?

APPENDAGES

Have a look at the drawings for this design and you will see sensibly sized appendages to deliver performance and control. I have sailed on a few, but never understood why you would want a yacht with bad foils. Bad foils come out of tacks making a ton of leeway. Bad foils cause boats to spin out when driving hard downwind. Bad foils won't even let you sail in and out of harbors without sliding around like there's nothing down there. Just make the foils a reasonable size and shape and eliminate all the negatives – it's really quite simple. The deep rudder is an essential element in a rig/appendage solution that reduces leeway for superior upwind performance. The deep rudder stays immersed longer as the boat heels so you still have control of the boat exactly when you need it. The lead ballast bulb weighs in at 600 lbs. This is half the weight of the boat and will pay dividends in control and recovery during any "adventures" when the keel bulb on the deep fin delivers a sizable righting moment gain. Nothing's better than having the boat quickly back on its feet and racing

CONSTRUCTION

Interior hull and deck laminates are carbon fiber for light weight and panel stiffness, finished clear with no additional fairing compound. Additional carbon uni-directional reinforcements run the length of the hull bottom and across the hull shell at the transverse frames. Exterior hull and deck laminates are made from more durable uni-directional e-glass. All laminates use epoxy resin, with toughened epoxy adhesive for major structural bonding.

There is no part of the internal structure that doesn't have a purpose – most of the structures take on several tasks:

- The primary frame in the middle of the boat takes the broaching and grounding loads from the keel, mast compression, and shroud loads. It is built from carbon fiber for strength and light weight. In the middle of this frame the keel fits into a tapered box and is secured with a few high strength fasteners. Keel fin retracts up through deck hatch
- Forward in the hull is a bow tank structure that reinforces the bow panels in the high slamming area. It provides emergency flotation, and a safe & dry place to keep the wallet, car keys and cell phone. By design it offers quite a spacious forward berth at over 7 feet long.
- The only bulkhead in the boat is all carbon and is positioned to support the majority of the crew weight in the cockpit. It also transfers the grounding loads from the keel frame into the hull and deck.

The process for building the hull, deck and structures produced extremely fair surfaces that required minimal fairing material. The entire hull and deck structure weighs approx 325 lbs.

DECK LAYOUT

I have focused on designing an absolutely clean deck, with most control lines lead under-deck and positioned for the convenience of the driver and crew. The cockpit is large and the deck is flat: without a deck house, so getting around the boat will never be a problem. Carbon sheave boxes aft lead the spinnaker sheet under-deck to auto-ratchet blocks amidships. I've included a pair of the Harken B6 winches to hold the highly loaded spinnaker sheets in windy conditions, and be available to help add an extra 6:1 power advantage to any line on the boat.

Hull Dimensions

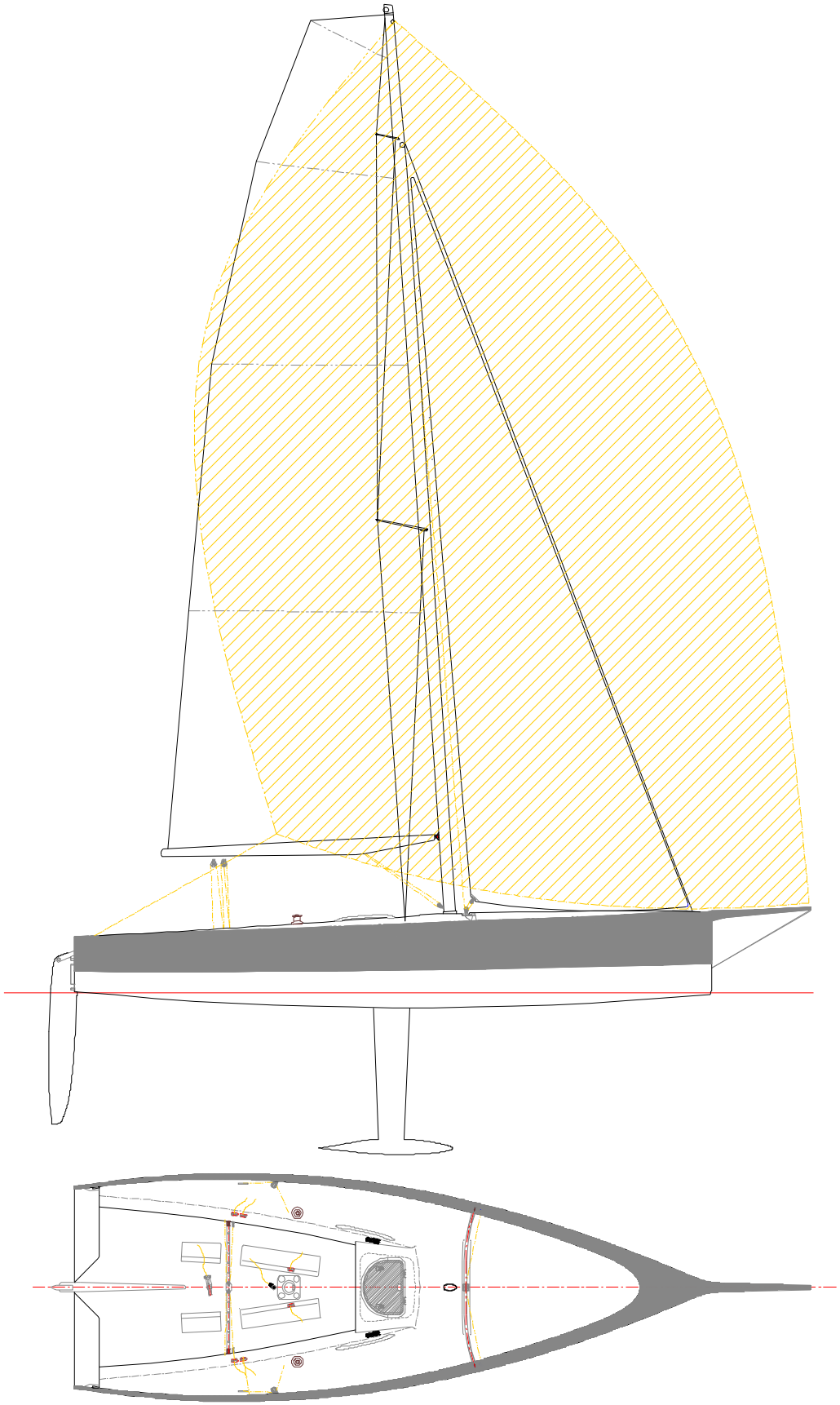
LOA 6.45m
Beam 2.30 m
Draft 1.63 m
Displacement 560 kg
Keel Wt: 300kg

Rig

Mainsail Hoist 8.30m
Mainsail Foot 2.75m
Jib Hoist 7.90m
Jib Foot (self-tacking) 2.30m
Spinnaker Hoist 9.15m

Construction

UD Carbon Inner Hull & Deck Laminates
UD E-glass Outer Hull & Deck Laminates
Epoxy Resin
Divinycell Core
UD Carbon Reinforced Internal Framing
Carbon Mast, Boom & Sprit



Carbon fiber interior laminates for strength and stiffness, finished clear

Donovan 6m under Construction in Kaneohe, Hawaii