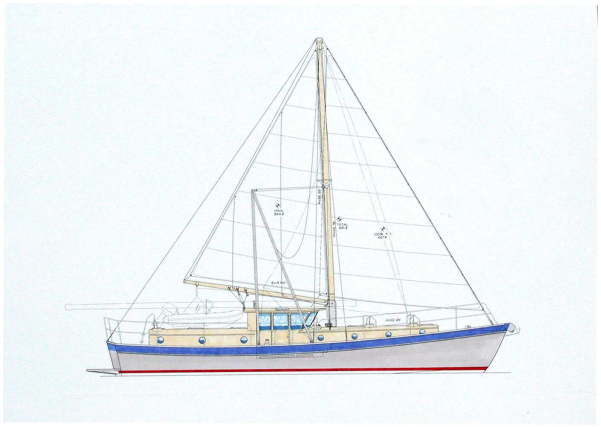
MOTORYACHTS

58 FT. PAINE STEADYSAILER
RANGER

DIMENSIONS

LOA:	**57' 10"**	**FUEL:**	**1050 gal**
LWL:	**52' 1"**	**WATER:**	**340 gal**
HULL BEAM:	**14' 2"**	**DISPLACEMENT: (half load)**	**48,900 lbs**
CHINE BEAM:	**12' 2"**	**LBS/HP RATIO:**	**575**
BEAM/LENGTH RATIO:	**25%**	**MAIN ENGINE**	**Deere 4045DFM 105hp**
MAXIMUM DRAFT:	**4' 6"**	**REDUCTION:**	**3.74:1**
HEIGHT ABOVE DWL:	**10' 6"**	**SPEED:**	**10 Kt**
STABILITY LIMIT:	**120 Degrees**	**SAIL AREA:**	**831 sq. ft.**
MIN. CABIN HEADROOM:	**6' 4"**		



What if a yacht could be had that would travel reliably at 10 knots in any wind strength from zero to thirty knots, and any wind direction including straight up and down? What if the cost of fuel to do so were no greater than that of maintaining and replacing the sails on a similar sized sailboat? What if you chose the doldrums route, for comfort, and even without any wind you could travel 7000 miles without refueling? What if in the unlikely event of an engine failure you could, slowly but reliably, sail to a safe port? What if the yacht were unusually cheap to fuel, and easy to crew and maintain?

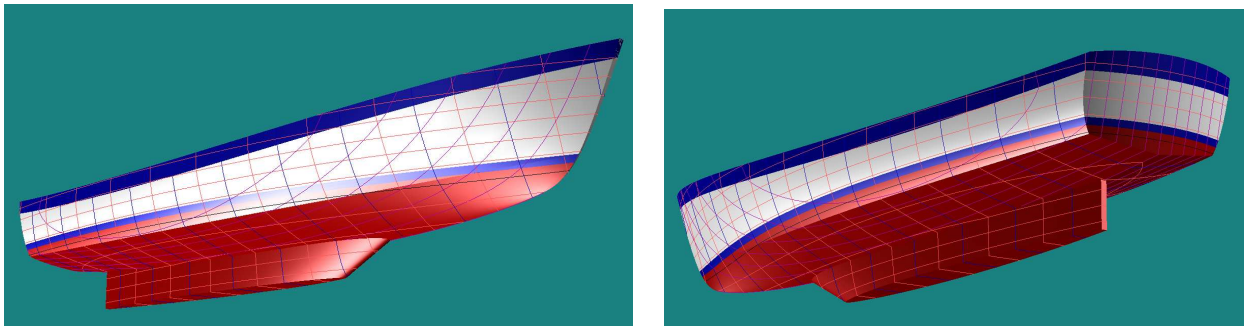
Craig Stephens, a one time member of the John Alden design staff, asked "why not?", and lacking sufficient time to draft it himself, commissioned the Paine office to perfect his vision of the ideal ocean voyager. We think he has made manifest a concept of wonderful potential for others beyond himself, and we invite your interest. *RANGER* was built at Lyman Morse Boatbuilding in Thomaston Maine, and Craig is delighted with her.

Sea trials have proven Craig right in every respect. The yacht travels efficiently at 10 knots with the engine turning at 2300 rpm as planned. While a speed of 11.1 knots was achieved at Wide Open Throttle, the engine speed was subsequently governed to prevent its use at over 2300 rpm so as to maximize the life of the engine.

The STEADYSAILER is a name we coined for this new type of yacht. With that name, you'd expect her to be a motoryacht with a steadying sail, and she is certainly that. But she's also the embodiment of the term Motorsailor. She was designed and optimized for motorsailing, which is what the majority of pure cruising sailboats do much of the time anyway. All experience sailors know what a difference in speed is made just by having the engine ticking over slowly when under

sail, or the sails up and drawing when under power. The STEADYSAILER is intended to always have the engine running, so that the yacht travels at a given speed (say 10 knots) at ALL TIMES, no matter the state of the wind. Thus she will make good 240 nautical miles per day, or over 1000 statute miles every four days, no matter what. STEADY speed, rather than the presence of a steadying sail, is what gives this design its name.

The construction was welded 5083 aluminum with a hard chine. The plates are not flat in any section, making the shape much stronger than would be the case with a drapable (the so called "developed") form. Various boatyards contacted during the design process insured us that the increased cost of the very slight plate hammering required is trivial in comparison to the strength (and superior aesthetics) gained. Craig's *RANGER* was finished almost entirely in raw aluminum, sandblasted to look as commercial as possible so as not to upset the natives in the far flung destinations he had in mind.



These computer renderings should give a good idea of the low resistance hull shape.

In order to sail, the design required a keel. Since the draft must be severely limited in order to cruise the Bahamas and the French canals, the keel had of necessity to be very long and shallow. Given a reasonable thickness ratio, this made a true NACA airfoil keel wide enough to fit into it something quite large, something like the *engine*. With the engine low, it served as ballast, the prop shaft ended up just about horizontal, and the engine room ended up with full standing headroom forward of the engine. Much of the fuel tankage was also fitted into the keel, forward and aft of the engine space, as was a modest amount of lead ballast.

Perhaps the most problematic reason why ocean voyaging has traditionally been done under sail rather than power, is motion. The presence of sails and a keel, working as motion dampers in their respective fluids, makes a sailboat less prone to rolling than a powerboat. The downside is that sailboats spend their lives heeling to a 20 degree angle or more much of the time, and are slow in light winds and make no progress in none.

Designer Ed Joy during sea trials.

The fin stabilizers are very effective at reducing rolling.

The solutions for the oceangoing powerboat are either active fin stabilizers, or hydrodynamic stabilizers ("fish") trailed from poles into the water. One needs one or the other to be comfortable on a small power craft in the open ocean.

Since one compelling aspect of the STEADYSAILOR was economy, we chose the far less expensive solution. The A-frame type poles used to trail the "fish" also are used as sheeting points for the jib or jibs, making a virtue of their necessity. Many offshore voyages follow the traditional tradewind routes, which puts the prevailing wind on the stern. In this situation the two-ply outer jib is separated port and starboard, doubling the area of sail exposed to the wind-- and these jibs are very effectively sheeted to the ends of the steadying poles so as to project as large an area of sail as possible.

In fixing the sail versus power aspects of the design, the stability of the yacht had to be dealt with. If too stable it would roll uncomfortably quickly, and if less stable it would heel excessively when motorsailing on anything shy of a beam reach. Extensive study yielded a final stability figure which insures a comfortable roll period in those few instances when the roll stabilizers might be ineffective (when stopped in a seaway for instance) yet sufficient to keep the yacht from heeling more than ten degrees in most all wind strengths where the sails would be used. The intact stability is such that the yacht will recover from a 120 degree knockdown-- a very impressive figure which is comparable to that for pure sailing craft and far in excess of the 70 to 90 degree recovery angle common among conventional motor craft.

The interior fit-out was relatively simple, and optimized for two couple cruising. The forward and aft cabins are separated by the midship pilothouse. Forward raking windows mimic those of offshore fishermen and the effect upon forward visibility is noticeable.

Ed and Craig try the steering.

Excellent forward visibility from the helm.

The boat deck houses a sailing dinghy and a rib.

The aft cockpit is large and protected from the sun.

Two large anchors and 7/16 inch chain at the ready.

One meter high pipe rails mean you'll stay aboard.

The concept of the STEADYSAILOR, in combination with the recent spike in fuel prices make larger and smaller sisterships an attractive prospect. Ed Joy was the lead designer on this project and is intimately familiar with the requirements for a successful similar design, or can sell you the rights to build a sistership.

For plans or further information contact Ed Joy:
ed@edjoydesign.com

ED JOY DESIGN JD

A Joy is a Thing of Beauty Forever