What is a Cruising Yacht?

"It's easy to design a fast boat, it's easy to design an attractive boat, and it's easy to design a roomy boat . . . but to design a fast, attractive, roomy boat is another matter altogether and that to me is what good cruising boat design is all about."

By Peter A. Schmitt

Designer of CSY Yachts.

It's easy to design a fast boat, it's easy to design an attractive boat, and it's easy to design a roomy boat . . . but to design a fast, attractive, roomy boat is another matter altogether and that to me is what good cruising boat design is all about.

There is no excuse whatsoever for a cruising sailboat that is not performance oriented and therefore, having boat speed on all points of sail, stability and maneuverability which are all of the primary importance. These components of performance will only result from a well designed underbody consisting of the canoe body and the keel and rudder appendages. The canoe body must have the necessary volume to provide the best accommodations possible and support at a predetermined flotation line the entire weight of the vessel, yet . . . at the same time, the lines of the canoe body must be as sweet and fair as possible to give the minimum amount of resistance to the water flowing past the hull.

The keel and rudder are the appendages that contribute the most to windward performance. The keel must have enough internal volume to contain the necessary ballast for self-righting stability at all angles of the keel for the chosen draft. Its fore and aft location is extremely important to the steering qualities of the vessel and its shape must provide a highly efficient, aerodynamic lifting surface to resist the side forces of the sails.

In addition to its function of being able to provide complete steering control in any type of sea condition, the rudder should also act as a hydrofoil providing side force lift. It is my own belief, that an unbalanced rudder, attached to a full span skeg of adequate size, located as far aft on the underbody as possible, provides the optimum steering control for a cruising boat. It is a known fact that a rudder with a skeg will be more efficient at higher degrees of rudder angle than a rudder without a skeg. Positioning the skeg well aft contributes to a more efficient lateral plane, thus making a better tracking vessel. In addition, the use of a skeg allows the placement of a heavy, cast bronze gudgeon at the lower end of the skeg to support the rudder stock. This places the stress on the rudder stock in the form of torsion only, and not torsion *and* bending as it is when a rudder without a skeg is used.

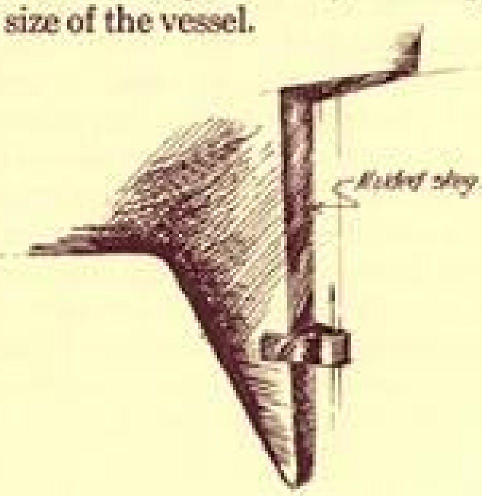
Another appendage on the underbody that is not found on many cruising boats but is used on all of CSY's boats is what I call the propeller skeg. This skeg is molded intergral with the hull shell and contains the stern tube and propeller shaft bearing. Its primary function is to act as a shroud to protect the lower propeller blade tips from debris. An additional function is that it is a much stronger method of captivating the propeller shaft and stern bearing whereas, the normally used bronze strut can loosen in time from shaft vibration and is subject to damage, the solid rigid structure of the molded skeg can never fail.

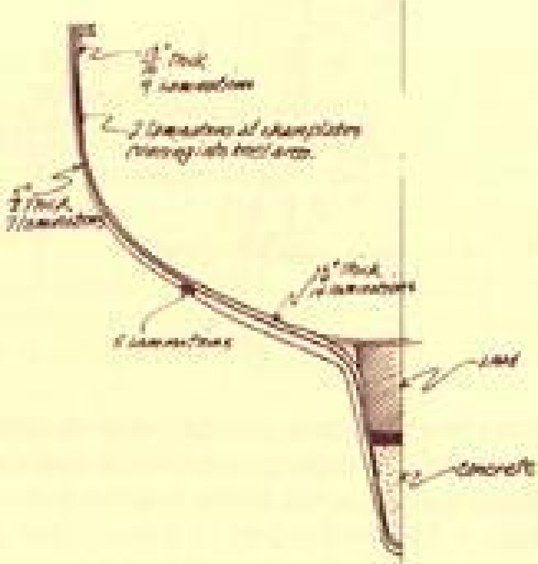
Perhaps the word heard most often during the design of a boat is the word compromise! And compromise we must! There are so many compromises made to a boat when it is on the drawing board that it is impossible to keep track of them. There are, however, three specific areas of a vessel that can never be compromised, as far as I'm concerned. These are the hull structure; the rig and rigging; and the steering system.

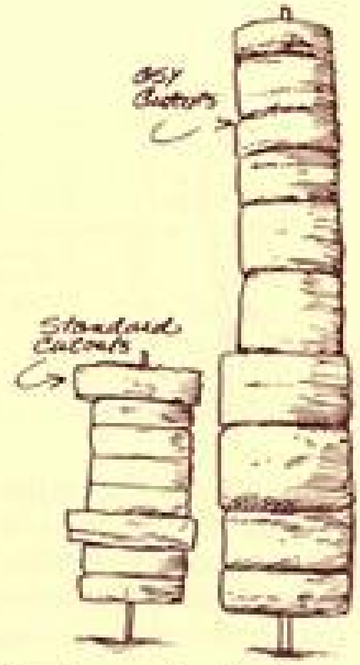
A failure of the auxiliary engine or the electrical system is an inconvenience to be sure, but the vessel is still intact and seaworthy. But . . . to have a failure of the hull structure, the rig, or the steering system—an occurance which will most likely take place in heavy weather conditions—will place the vessel in immediate jeopardy.

Fiberglass construction is a wonderful material for building a boat. The basic fibers which make up the glass fabric are among the strongest structural elements known to man. No other boat construction material gives us the freedom of design, the added interior volume due to the lack of frames, or the rot free, worm proof, easily maintained hull shell.

I suspect that when most people buy a fiberglass sailboat, they take it for granted that the hull laminate is carefully and painstakingly laid up and that the hull laminate is of adequate thickness to provide water-tight integrity under the most adverse conditions. Unfortunately this is not always the case. Each builder buys his resin and glass by the pound and it is one of the few areas in fiberglass boat construction where he can skimp on materials and labor, save money, and hide it from a buyer. No matter how it is constructed in actual sailing conditions, each boat must endure the same repetitive cycles of heavy stresses, the magnitude of which increases exponentially with the size of the vessel.



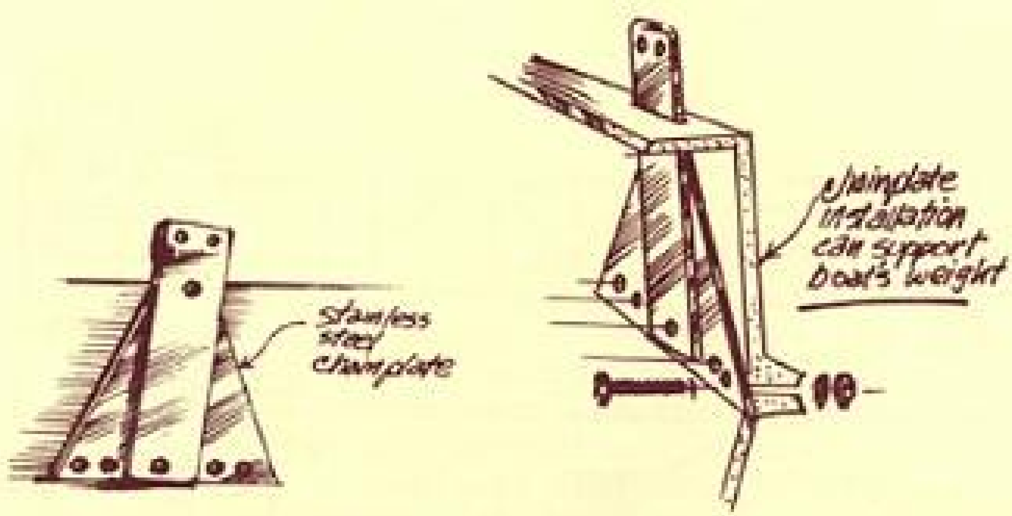




When we analyze the forces applied to a sailboat sailing, to weather in heavy sea conditions, we find that the stresses involved are truly awesome. Let's look at a few of these. The wind pressure on the sails places the masts in compression, a loading stress which in effect is trying to drive the spar out through the bottom of the vessel. The weather shrouds are applying a direct tension loading to the topsides of the vessel. The net result of this is a high bending and tensile stress to the hull laminate in the immediate vicinity of the chainplates. We then have the headstay and backstay in tension producing a bending stress along the longitudinal centerline of the vessel. Everytime the boat falls off a wave or slams into a sea there is terrific, localized impact on the forebody of the hull shell. When sailing at high angles of heel the heavy ballast keel is producing a tremendous stress at the point were it is joined to the underbody.

There is only one way to adequately resist these forces and that is with a heavy, hand laid up fiberglass hull laminate with added layers of reinforcement at points of particularly high stress combined with an internal framing system of bulkheads and partitions that are securely bonded to the inside of the hull shell. The fiberglass laminate schedules that I have specified for each of CSY's line of boats is indeed a heavy one and I know .... that when compared to what the majority of the boat building industry is doing at the present time, CSY's hulls would definitely be considered overbuilt, but their laminates have been carefully specified to adequately meet the stresses that can reasonably be expected at sea.

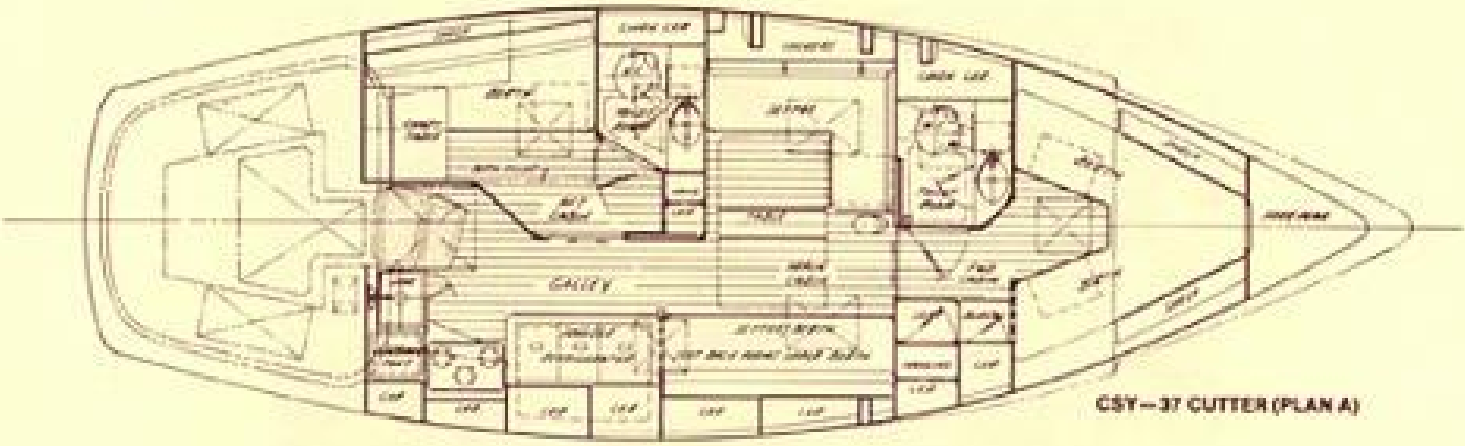
Mast design and construction is the second area where a failure will totally incapacitate a vessel. Mast design should be based on a careful analysis of the stability of a boat and not guessed at as is too often the case. My design procedure for selecting a mast section for a design is based on the stability of the boat at 30 degrees of heel. A factor of safety of 4 is applied to this compression loading thus found, to be absolutely certain that the mast section chosen will be able to withstand every stress applied to it.



The standing rigging diameters and chainplates are also calculated based on the stability of the boat. The standing rigging sizes are determined from a percentage of the stability that they are known to be loaded with, based on tests carried out on 12-meter yachts. A factor of safety of 3 is applied and the wire diameter picked accordingly. A wire diameter would not be used if its breaking strength were below the design strength required.

Chainplate lugs, which are that portion of the chainplates that accepts the turnbuckle, are designed to withstand a loading of twice the breaking strength of the wire shroud that attaches to them. Wherever chainplates are attached to the hull with bolts, the bolts are sized to withstand a loading of 3 times the breaking strength of the wire shroud. The area of the hull in the way of the chainplates is reinforced with extra laminates of fiberglass so that the hull shell in the immediate vicinity of the chainplate bolts will be able to withstand the designed load without permanently deforming the fiberglass hull. It is interesting to note that with the chainplate design as we have outlined it here, any CSY boat can be lifted from its cradle and put in the water with an attachment made to just any one pair of chainplates.

The pedestal wheel steering system in a boat is the most heavily used and most heavily stressed movable mechanical linkage on board any boat and as a result, it is the one system that is most prone to failure. The rudder and steering systems of CSY's boats are designed for a condition that allows for a boat to fall off a wave backwards with the rudder in the hardover position, a condition that places the most severe stress possible on the rudder and rudder stock. A safety factor of 4 is applied to the torsional loading derived from this calculation in order to select the diameter of the rudder stock which is solid bronze round bar and not pipe as so often is used. The wire rope portion of the steering system takes the most abuse. Even the slightest amount of misalignment between the wire and the quadrant, and fairlead and idler sheaves will cause chafe and the resultant breakage of the wire strands. It is imperative that the steering system fairlead sheaves be securely fastened to the hull of the vessel and that the wire be of adequate diameter to take the loads involved. All of the sheaves in the steering system must be of a diameter to comfortably support the wire.



CSY—37 CUTTER (PLAN A)

The interior accommodations of a production cruising boat are often the most difficult challenge of the design. Difficult because it is impossible to do an interior arrangement that will suit everyone's individual tastes and requirements. People use their boats in different ways and the accommodations should reflect this type of use to the greatest extent possible. Unfortunately, when buying a production fiberglass boat such as those at CSY it is impossible for the company to offer a customized interior for each individual buyer and maintain any semblance of productivity and profitablity. Thus, the one or possibly two accommodation plans offered by a builder for a given boat must then meet the widest needs possible.

A good rule of thumb to follow when looking at a boat and judging the merits of the interior accommodations is this:

"A boat interior that is designed for use at sea can be made to work when living aboard at dockside, but an interior that is designed for use at dockside can never be made to work at sea."

If a boat is to be used for any type of offshore cruising where a passage of a few days time is required, the most important part of the accommodations are good berths and an efficient galley. The berths used at sea should be located as close as possible to the fore and aft middle of the boat where the pitching movement is at a minimum and there must be enough berths to sleep the entire off-watch crew.

The galley should be as compact as possible with everything within easy reach. There must be a method of securing the cook in the galley, either by a belt or by galley counter design, so that one's hands can be used to work rather than just hanging on. Adequate dish and dry food locker space is required as well as adequate and efficient refrigeration capacity. The icebox or refrigerator must be heavily insulated to reduce heat loss. The boats at CSY, have as a minimum, 4" of foam insulation on all sides of the refrigerated space including the top. The galley stove should be gimballed and the stove fuel efficient. When properly installed, propane gas is, without a doubt, the preferred stove fuel. Its flame is much hotter than that of alcohol without the mal de mer causing odor and the danger of flareups.

Perhaps the most important single facet of boat design that determines whether a cruising boat will be a comfortable platform for the interior accommodations both at the dock or offshore is the weight or displacement of the vessel.

If we compare two moderate size cruising boats of equal waterline length, sail area, and ballast, yet drastically different in displacement, the following conclusions can be immediately drawn: The heavier boat will provide more interior volume consistent with a more pleasing low profile than the light boat. This is to say that both boats could have the same amount of interior volume for accommodations but the light boat will have to raise the sheer line in order to achieve it because she does not have the volume or displacement below the waterline as does her heavier sister.

There is no doubt that the heavier the boat the more comfortable it is at sea. The heavier boat is less affected by wave action, thus its mass will push through the water with the least amount of adverse motion. The vertical center of gravity of the heavier boat, will be higher than that of the light boat resulting in longer and slower periods of roll and pitch which reduces violent motions in a seaway—in a word—a much more comfortable boat.

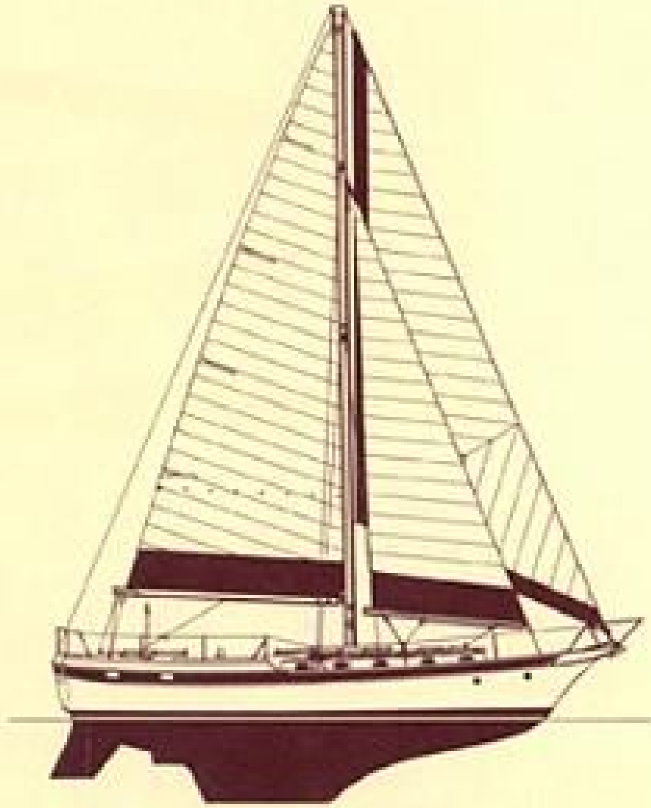
Displacement equals weight and weight equals the amount of construction materials that go into the boat. The heavier boat will reflect a thicker hull and deck laminate which means a safer and a quieter hull. The interior will have heavier components and the tankage for fuel and fresh water will be greater than that of the light displacement boat.

When comparing the light and heavy boats in actual sailing conditions, the lighter boat, in light air conditions, will have a distinct advantage on every point of sail. Sail area is horsepower and weight is resistance. The more a boat weighs the more the frictional and wave making resistance will be to the water flow around the hull. In moderate air conditions, the heavier boat will improve greatly in performance although the light displacement boat will still have a speed advantage going to weather and running. Reaching, both boats will be very close in performance. In heavy air, the heavy displacement boat comes into her own. She will most likely be faster upwind and reaching than her lighter sister ship, and only downwind in surfing conditions will the lighter boat be faster.

The disadvantage of the heavy displacement boat in light air can be overcome to great extent by the careful selection of adequate sails designed for use in such conditions.

44′ Pilot House Ketch

LOA	44′0″	Ballast (lead)	13,000
LWL	36′4″	Sail area	937 sq. ft.
Beam	13′4″	Mast height above w/l	58′3″
Draft	(4′11″) 6′6″	Water	400 gals.
Displacement	38,000	Fuel	125 gals.



44′ Midcockpit Cutter

LOA	44′0″	Ballast (lead)	12,000
LWL	36′4″	Sail area	905 sq. ft.
Beam	13′4″	Mast height above w/l	56′0″
Draft	(4′11″) 6′6″	Water	400 gal.
Displacement	37,000	Fuel	125 gal. (800 mile range)

37′ Cutter

LOA	37′3″	Displacement	19,680
LWL	29′2″	Ballast (lead)	8,000
Beam	12′0″	Sail area	810 sq. ft.
Draft	(4′8″) 6′0″	Mast height above w/l	50′4″

33′ Cutter

		Draft	4′11″
LOA	33′4″	Displacement	13,500
LWL	25′0″	Ballast (lead)	5,000
Beam	10′6″	Sail area	480 sq. ft.

What is the best rig for a cruising boat? This question again is a matter of personal preference for each individual owner, but the basic decision is whether to have one mast or two. Each rig has its advantages and disadvantages. The sloop is the simplest rig to handle in terms of number of sheets, halyards and sails to work. It is also the best rig in terms of aerodynamic efficiency in light to moderate wind velocities when a large jib can be used in conjunction with the mainsail.

The cutter is next in terms of ease of handling and efficiency. While the forestay-sail adds clutter to the deck and is totally inefficient in light air conditions, it proves its worth in heavy air. In light air, a larger jib topsail or genoa can be used to equal the performance of the sloop with similar sized sails. In heavy air, the jib can be furled and one can carry on under forestaysail and reefed main. With the sloop, a headsail change would be required to reduce the sail area of the fore triangle.

The ketch is next when it comes to ease of handling and aerodynamic efficiency. The mizzen is ineffective until the boat is close reaching and a mizzen staysail can be used under only a very limited wind angle. The ketch's greatest advantage is that of being able to break total sail area up into smaller, easier handling sails thus making sail handling much easier. The ketch rig is also advantageous in heavy air sailing when the mizzen can be used in conjunction with a small jib, entirely eliminating the mainsail and the main sail reef process.

It was over 2200 years ago when Archimedes discovered the principles governing the laws of flotation of a vessel which are as true now as they were then. "Eureka! I have found it!", he was said to have cried when he made the discovery. It is a very rare and happy moment indeed when a designer of any type of boat can say these same words himself.

CSY YACHT'S BASE PRICES

ABOUT OUR PRICING POLICY

With the ever advancing cost of everything, we have abandoned the annual or spot price rises since these rises usually have to be so large to catch up with inflation that they border on being mind-boggling.

We have elected to apply an inflation factor quarterly which experience and our cost accountants tell us we can live with. Thus we can write a contract for a firm price and save you from the surprises that an escalator clause in your contract might bring, particularly if delivery is very far in advance.

We believe that this schedule will show you more graphically than anything how the value put into a fine yacht is anything but a depreciating asset.

You will never be able to acquire a yacht at a cheaper price than you can right now.

Let us hear from you.

John R. Van Ost
President
CSY YACHT CORPORATION

CSY Yacht Corporation

CSY YACHT C
BASE P
DELIVERED T
AT TAMPA

Approximate Delivery	37 "B" Cutter	44 Mid Co
1980 March - April	SOLD	SO
May - June	SOLD OUT $9[illegible],670	SO $115
July - August	$94,420	$118
September - October	$97,252	$122

Payment Schedule:

Deposit . . . . $ 3,500 . . . . $ 5,
Pre-molding . . . . $25,000 . . . . $30,
(Due 30 days prior to molding)
Decking . . . . $45,000 . . . . $50
(Due 9 weeks after pre-molding payment)
Balance - Due when boat is launched: about 4 weeks after decking payment.

This supersedes all previous lit
Issued by CSY Yacht Corporation, Tar
Prices and Specifications are su

Southprint 12770

ORPORATION
RICES
O CUSTOMER
, FLORIDA

kpit Cutter	44 Walk-Through Cutter or Ketch (Add $6,000 for Ketch)	44 Pilot House Ketch
LD	SOLD	SOLD
,360 OUT	SOLD OUT $121,500	SOLD
,820	$125,145	$147,222
,385	$128,800	$152,525

000 . . . . $ 5,000 . . . . $ 6,000
000 . . . . $30,000 . . . . $40,000

000 . . . . $50,000 . . . . $60,000

erature and price information.
npa, Florida, No. 4, January 1, 1980.
bject to change without notice.

CSY – STANDARD OPTIONS

HULL	CSY-33	CSY-37A	CSY-37B	CSY-44C	CSY-44WT	Ketch CSY-44
Deep Draft	$ 800	$ 1,350	$ 1,350	$ 1,580	$ 1,580	$ 1,580
Shoal Draft	STD	STD	STD	STD	STD	STD
Sheer/Boot Colors (Burgandy STD)	610	675	675	720	720	720
DECK HARDWARE						
12 Volt Anchor Windlass	380	380	380	380	380	380
Cockpit Table	240	240	240	240	N/D	N/D
Bimini Top	650	675	675	720	N/D	650
Transom Name Board	180	180	180	180	180	180
Cockpit Cushions	400	440	440	400	N/D	N/D
Stern Mount Swim Ladder	300	300	300	300	300	300
Side Mount Swim Ladder	450	450	450	450	450	450
Docking Package	175	175	175	175	175	175
Anchoring Package	425	425	425	525	525	525
Safety Package	300	300	300	340	340	340
Cockpit Awning	320	360	360	N/D	N/D	N/D
Galley Pass Thru (Plastic)	177	177	177	STD	N/D	N/A
Galley Pass Thru (Bronze)	498	498	498	325	N/A	N/A
Hinged Door (Aft Cabin)	N/A	N/A	N/A	175	N/A	STD
Full Enclosure	N/D	N/D	N/D	1,950	N/D	N/D
Aft Cabin Filler & Cushion	N/A	N/A	N/A	250	N/D	N/A
Modesty Curtain	N/A	N/A	135	N/A	N/A	N/A
S/L Seawolf	1,170	1,170	1,170	1,170	1,170	1,170
S/L 555 Windless	990	990	990	990	990	990
ELECTRICAL/PLUMBING/MECHANICAL						
12 Volt DC Refrigeration	2,428	N/A	2,428	N/A	N/A	N/A
Engine Driven System	N/A	2,497	2,750	2,671	2,871	2,944
110 Volt System	N/A	2,497	2,750	2,671	2,775	2,856
Combine Engine Driven & 110 System	N/A	3,360	3,613	3,534	3,534	3,678
Install VHF Antenna	125	125	125	125	125	125
Mast Head Strobe Light & Panel	300	300	300	300	300	300
Extra Wiring in Mast	50	50	50	60	60	60
Salt Water Galley Pump	250	250	250	250	250	250
Radio Ground Plate (Large)	170	170	170	170	170	170
Air Conditioning - Full Air	2,290	3,890	3,825	5,242	5,250	5,985
Air Conditioning - Night Air	N/A	N/A	N/A	3,500	3,550	4,780
110 Shore Power	875	1,060	985	1,200	1,300	1,200
Additional Batteries - per 12V Bank	N/A	260	260	260	260	260
INTERIOR						
Domestic Package	470	535	488	535	535	535
Navigation Package	215	215	215	215	215	215

CSY – STANDARD OPTIONS

SAILS & RIGGING	CSY-33	CSY-37A	CSY-37B	CSY-44C	CSY-44WT	Ketch CSY-44
Hyde Streamstay	$ 966	$ 1,050	$ 1,050	$ 1,295	$ 1,295	$ 1,250
Ulmer Sails	SEE CURRENT ULMER PRICE SHEET					
Deep Reef Hardware - Main Boom	135	135	135	150	150	150
Insulated Backstay	210	210	210	225	225	225
Rod Rigging	535	715	715	915	N/D	N/D
Tall Rig	N/A	1,150	1,150	1,425	1,425	N/A
Windex 15	35	35	35	35	35	35
Roller Furling Headstay (Tall Rig)	N/A	1,125	1,125	1,387	1,387	N/A
COMMISSIONING						
Commissioning at CSY	1,100	1,400	1,400	1,750	1,750	2,100
Paint Name & Hailing Port on Transom	125	125	125	125	125	125
Teak O/B Bracket	35	35	35	35	35	35
Engine Spares - Perkins - Minor	N/A	135	135	135	N/A	135
Engine Spares - Perkins - Major	N/A	220	220	245	N/A	260
U.S.C.G. Documentation	300	300	300	300	300	300
Micron 25 Anti-Fouling Paint	510	600	600	640	640	640
Folding Prop (Martec)	TBA	646	646	760	760	760

(PRICES SUBJECT TO CHANGE WITHOUT NOTICE)

N/D – Not Designed
N/A – Not Available
TBA – To Be Advised
STD – Standard