Specification

for

New Morning 54

Version 7.1

Table of Contents

Notes on this document

The purpose of this document, as of revision 2.0, is to document decisions made by the Owner to either change, further refine, or specify details of the yacht..

The various sections are generally divided as follows:

General: Items that apply to all aspects of the section.

Required: Items that for purposes of Builder selection are considered required by the Owner, though many will change prior to the final specification.

Construction: Construction details specified by the designer which must be implemented by the Builder.

The following sections are not part of the specification, but provide insight into possible future changes in the specification.

Under discussion: Items that may or may not become required. By the completion of the design process all items in this section will either be deleted or migrate in some form to requirements.

Wish list: Items that we would like to see incorporated, but we recognize may not be feasible due to some other design or budgetary constraint. All of these items will eventually either be deleted or migrate to Required.

Details and Vendors: Items which we think do not affect major design decisions, but may warrant some consideration and browsing. This section is also a "catch all" for notes about specific products and vendors to enable everything to be included in a single document. Eventually these will be deleted or moved to a design brief for the next boat!

Highlighting: Items in yellow require decisions by the Owner, items in blue require further discussion with the Builder or Supplier.

I. Design Summary

A. General

1. A 54’ cruising sailboat capable of circumnavigation. She'll be sailed primarily in temperate waters with an emphasis on warmer climates, but with basic provisions for wintering in latitudes not more than 40 degrees N/S of the equator.
2. She'll be crewed by two people most of the time, with relatively brief periods during which there will be four people on board. Sail and boat handling systems will be designed under the assumption that the boat is being singlehanded.
3. We're assuming that on average we live on the boat most of the time, probably all but 6-8 weeks per year. Of the time on the boat, 85% of the nights are spent at anchor, on a mooring or tied up. In a typical year this translates into 267 days at anchor and 47 at sea. The interior design will emphasize living for two people, with an ability to accommodate 4-6 guests for entertainment and two overnight guests on occasion. Interior and deck design, both functional and esthetic, are thus equally important with sailing characteristics. That said, the goal is not to lower the quality of the sailing and “life aboard while at sea” characteristics, but to ensure an excellent interior design. Aesthetically pleasing simple elegance is the interior design goal.
4. The deck is to have a twin wheel configured aft cockpit with a large deck sheltered by a hard dodger. It is to have a bulbed lead keel and a carbon fiber balanced spade rudder. It must be reliable, comfortable, self-sufficient, well balanced and fast and will therefore carry the most reliable and efficient equipment available. The yacht is to be built for ocean cruising beyond the possibility of assistance or rescue in occasional unusually severe weather. It shall comply with ORC Category 0, “…where yachts must be completely self-sufficient for very extended periods of time, capable of withstanding heavy storms and prepared to meet serious emergencies without the expectation of outside assistance”. The interior is to be beautifully finished in a modern, “European” style. It shall be the responsibility of the Builder to review the strength of the components and to identify any items in the plans or specifications that in his opinion require strengthening. The Builder is expected to constantly strive to keep the weight of the yacht as light as possible, without using exotic materials.

B. Required

1. Launch spring of 2008.
2. The design process should continue until all regularly used components and systems, whether used under sail or at rest, have been fully anticipated and incorporated into the design. If the builder feels something has been overlooked they are specifically asked to bring such items to the attention of the Owner prior to commencement of construction of that area.
3. Safe and secure at sea, comfortable and pleasant at anchor.
4. Modern, esthetically pleasing and functional interior.
5. Considerations for outdoor living is of utmost importance while emphasizing protection from the sun as well as the need to feel secure and protected while underway.
6. It is assumed that all systems will require regular maintenance and occasional repair. Systems will be located and installed with access and serviceability in mind considering

Russ' 6'1" height. Stowage will be provided for spares, and a work space for repair work will be included in the layout.

7. She shall be designed and built to facilitate ease of maintenance and service. All components and systems should be designed and installed for accessibility and maintainability. It should be assumed that during the first seven years after launching, one third of the mechanical systems, and virtually all electronic components, will be replaced.
8. The overall priorities are safety, maintainability, comfort and aesthetics.

C. Wish List

1. Minimize number of suppliers / vendors and unique parts. Use the same component or same vendor whenever possible to minimize the number of spares and vendor support relationships.

II. Construction

A. Conditions of Construction:

1. To fulfill the design requirements all weights must be kept at a minimum without sacrificing strength or comfort. This requires careful design plus attention and care on the part of the Builder. Close and timely cooperation and communication between the Owner, Builder and Designer is a necessity, and to this end all critical correspondence shall be via email.
2. The Builder shall construct, equip, and furnish a yacht complete and ready for service as detailed in these specifications and the amendments to them which result from Owner's changes. Omission from the plans and/or specifications of any items which are necessary for the proper operation of the yacht, shall not release the Builder from supplying same. The Builder is expected to furnish all ancillary items that are appropriate or necessary for the construction and operation of all items covered within these specifications.
3. The Builder shall guarantee skilled workmanship, in keeping with the best yacht building practice, and in conformity with the plans and specifications. The workmanship in functionality, detail and finish shall be first class in all respects, and suitable for the intended purpose.

B. Tolerances:

1. Hull alignment, dimensions, and fairness shall be monitored and maintained during construction. The following tolerances must be maintained:
   a) Length + or - 1"
   b) Breadth + or - 1/2"
   c) Depth + or - 1/2"
   d) Bulkheads + or - 1/4"
   e) Shell Deflection + or - 1/16" over one square yard (1/8" total)

   If any of these tolerances are not possible to achieve given the designed scantlings and construction methods the Builder should so inform the Designer.

C. Safety Requirements

1. The Builder shall follow the standards and recommended practices of the following:
   a) The construction plans of the yacht have been engineered to approximately comply with "ABS (American Bureau of Shipping) Guide for Building and Classing Offshore Racing Yachts", dated 1994, to the "plan approval" level. ABS (American Bureau of Shipping)

no longer supports the applicability of its aforementioned Guide to vessels less than 65 feet (20 meters) in length. However, Builder is expected to have on hand a copy of this guide, and to the best of the Builder's abilities to comply with its requirements.

b) The latest issue of ABYC standards for all aspects covered by that code.

D. Designer's Drawings and Specifications

1. The Designer will supply the following drawings:

Drawing #	DESCRIPTION
01	Sail Plan
02	Deck Plan and Outboard Profile
03	Interior Arrangement
03-1	Interior Profiles
04	Hull Lines Plan
04-1	KEEL LINES PLAN
04-2	KEEL CONSTRUCTION PLAN
04-4	HULL LINES COMPUTER LOFTING on mylar, reduced as necessary for construction of building mold.
-or-	
05	Rudder and Steering Details
05-1	RUDDER FOILS, and full size computer loftings on mylar
-or-	
05-2	RUDDER LINES IGES FILE FOR MULTI-AXIS MILLING
06	Hull Construction Plan
06-4	Structural Bulkheads
06-6,7,8	Construction Sections
08-1	PRIMARY BULKHEADS full size loftings as needed
09	DECK LINES PLAN
09 -1	DECK LINES FULL SIZE LOFTING, IF NEEDED
10	DECK CONSTRUCTION PLAN
11	SPAR & RIGGING PLAN
12	CHAINPLATE DETAILS
13	STEMHEAD WELDMENT DETAIL

14 HARD DODGER DETAIL

15 ENGINE INSTALLATION AND SHAFT-LINE PLAN

Plus, any and all additional drawings, sketches, or support requested by Owner or builder.

2. Drawings By Builder: Any additional detail drawings which are deemed necessary by the Builder for the proper construction of the yacht, when prepared by the Builder shall be made available to the Designer, before the work they depict has begun. Absent review by the Designer, responsibility for such drawings is entirely that of the Builder.
3. Testing: All work shall be tested by the Builder for water-tightness, where such is required. All equipment, plumbing, steering gear, wiring, etc., shall first be tested to the full satisfaction of the Builder, and subsequently to satisfaction of the Owners or their representative.
4. Inspections: The Builder should allow adequate time for frequent inspections by the Owner or Owner's Representative. Builder is informed that it is the intention of the Owner to spend a great deal of time at the boatyard during the final six months of construction, and that the necessary communication time and personnel must be built into his pricing and schedule.
5. Replacement: During construction any workmanship or materials found to be not in conformity to the plans and specifications shall be replaced, at the Builder's cost, regardless of the stage of construction.
6. Damage: The Builder will take appropriate measures where necessary to keep wear and damage minimal during construction, and prevention of corrosion or other deterioration especially to unpainted, polished or moving parts. Piping, machinery, tanks and equipment subject to freezing shall be kept drained until filling is required preparatory to delivery. Builder is responsible to inspect components delivered by vendors prior to installation to insure satisfactory operation.
7. Cleaning: The Builder shall keep the yacht reasonably clean at all times. Particular care shall be taken to ensure that all foreign matter is removed, and all parts thoroughly cleaned before closing up a compartment, or tank. Prior to launching all foreign matter will be removed from the bilges.
8. Access To Compartments: Arrangements for access, cleaning, and painting, shall be provided to all compartments. Soles throughout the vessel shall be fitted with suitable hatches along the centerline or tank margins to permit cleaning of the entire course along which bilge water is conducted to the bilge sump. Any access hatches, etc. must be capable of being fastened in place to prevent dislodging even in the event of a 360 degree rollover.
9. Access to the engine, steering gear, and all other equipment that may require service shall be provided by constructing joiner work which can be relatively easily, and safely removed or disassembled when access is required is at sea.
10. Care shall be taken in locating equipment, piping, wireways, etc. to avoid restricting access to compartments.

E. Revisions, alternations and changes

1. Discrepancies: In case of inconsistencies between the requirements of the Building Contract, these specifications, and the documents referenced in these specifications, the following order of precedence applies:

a) The Building Contract requirements
b) These specifications
c) Construction drawings
d) Industry standards and similar reference documents

F. Materials

1. All materials, manufactured articles of construction, and equipment supplied by the Builder shall be new, of high quality, and suitable for their intended purposes. It shall be the responsibility of the Builder to check all materials delivered to ensure conformity with the details of the specifications and with all normal working requirements, including suitability for installation within the available space. Substitutions of materials or equipment shall be permitted only after consultation with Owner and/or Designer as appropriate.

   Aluminum: Extrusions to be type 6061-T6 unless otherwise noted.

   Stainless Steel: All stainless steel shall be type 304, 316 or 316L. Stainless steel welding, exposed parts, and fittings shall be finished with a high polish to minimize corrosion. Polished stainless may be hand or electro-polished as convenient.

2. Mechanical Fastenings: Type 18-8 stainless steel, unless other material is suitable for a particular application. Care shall be taken to avoid fastening using dissimilar materials. Any metal item fastened to or through aluminum must be effectively isolated from direct contact unless that item is also of aluminum. In particular, all stainless steel pieces are to be isolated from aluminum to the best of the Builder's ability.

G. Wood and Panel Product

1. Lumber: Hardwood species will be as chosen by Owners or their representative. Presume highest quality select maple, birch or cherry as of this writing. Hardwood shall be well seasoned and free of all checks, knots, cupping, sap pockets, stains, or other defects. A mixture of straight grain and figured wood will be used, and it is likely that light and dark species will be contrasted against each other as directed by Designer, Owners or Interior Designer.
2. Panels: Three large panels of the interior shall be constructed of composite or foam cored construction per the construction plan (see Section III – Hull). The forepeak bulkhead, main mast bulkhead and lazarette bulkhead will be built of this construction. All other major bulkheads and panels shall be highest quality 3/4” or 5/8” thickness marine plywood. Many of these will have final veneers of select hardwoods applied, beginning with highest quality 1/2” or 5/8” marine plywood and in these instances the total thickness may exceed the nominal thickness by a small amount.
3. Plywood: All plywood shall be first quality marine plywood. Plywood under 10mm (3/8") thickness shall be 5- ply or 7- ply; 10mm thickness and over shall be 7-ply or greater. In some instances it will be necessary for Builder or his subcontractor to laminate architectural quality veneers to the plywood to suit the interior design scheme (see above) .
4. Material Samples: May be requested by Owner or Designer, in which case the Builder shall provide same in a timely manner.

H. Sound Levels: It is the intent that this yacht be comfortable under both power and sail. All rotating machinery, pumps, and motors are to be mounted on vibration absorbing mounts. As a

target, the sound levels with machinery running should not exceed 65 decibels in the cockpit, and 70 decibels in the accommodations immediately adjacent to the engine space.

III. Hull

A. Required

1. Grounding materials as necessary to address lightning strikes.

B. Construction

1. Hull Laminate: Per the laminate schedule on drawing 178-06-5: Inner Skin Lamination and the Construction Details drawings.
2. Laminating Resins
   a) The hull shall be constructed using SCRIMP with Derakane 8084 vinyl ester resin.
   b) The deck and other areas which are laid up by hand shall use Derakane 411-800 vinyl ester resin.
3. Adhesive Resins
   a) All resins which will be mixed as glue for the joining of interior panels and similar casework will be SP System Spabond 120, PLEXUS, or WEST System epoxy resin. Proper filler powders will be added as necessary to provide good bonding and working properties.
4. Watertight Bulkheads: One required at aft end of the forepeak, and a second forward of the rudder. A foam filled "crash box" shall be fashioned at the forefoot area per the construction plan.
5. Hull and topsides laminates per drawings #178-06-04 Outer Skin Lamination and #178-06-5 Inner Skin Lamination.
6. Construction details per drawings #178-06-2, #178-06-3 and #178-06-3 Rev A.
7. Deck laminate per drawing #10 – Deck Construction.
8. Cabin Sole Perimeter
   a) The cabin sole perimeter is to be made structural per drawing 178-06 Rev C - Construction Plan and related Construction Details. Triangular stringers are to be created over Corecell or other foam formers, with their tops level and accurately located as shown in the Construction Sections. The faces of these longitudinals will have unidirectional E-glass applied. The outer portions of the cabin sole are to be PLEXUS glued to the tops of the finished stringers, and then their top faces bonded to the hull with 8" wide tapes, 3 layers of 1708 E- glass.
9. Floors
   a) There will be a total of five bottom floors. Four bottom floors will be fitted in way of the keel and one abaft the keel as illustrated on the Construction Plan and Construction Details. Suitable limbers shall be arranged to conduct water to the bilge.
10. Ring Frame
    a) There will be a large ring frame located approximately at the aft end of the keel, constructed per the Structural Bulkheads drawing.
11. Deck Beams
    a) There will be athwartship deck beams on approximately 24" centers beneath the "trunk cabin" deck. These will be of fiberglass over nonstructural closed cell foam core. These

are lightweight spacers which form a “dropped down ceiling”, of minimal structural contribution.

12. Mast Step per drawing #178-06-3 Rev A – Construction Details.
13. Cored Bulkheads per drawing #178-06-4 Structural Bulkheads.
14. Large area of copper foil bonded into hull to create a ground plane for the SSB.

C. Hull and Deck Fairing, Painting and Coating

1. Undercoating And Fairing
   a) All exterior surfaces to be faired with Awlfair and primed with Awlgrip 545.
   b) Longboard sanding, both longitudinal and vertical, is required.
   c) Below the waterline should be coated with Interlux 2000/2001 epoxy primer.
2. Finish (Top) Coatings: the deck and hull should be finished in Awlgrip Matterhorn White. The waterline stripes should be Royal Blue.
3. Non-Skid Areas: The non-skid areas will be achieved by adding a non-skid grit and specified color to the topcoat paint. This grit will be as recommended by U.S. Paint Company- probably Griptex coarse. The color of the non-skid areas will be a 50/50 mix of Whisper Gray and Matterhorn White.
4. The entire interior of the hull is to be painted with a white epoxy paint.
5. Bottom Anti-Fouling Coating: Pettit Vivid – white.

IV. Keel

A. Construction

1. Fixed ballast to be a casting approximately 17,000 lb. of antimony hardened lead to be attached to the hull using 11 in number, 1” diameter 316 stainless steel bolts. It has a bulb at the bottom, requiring a split as opposed to a single piece mold.
2. Trim ballast (internal) may be fitted as necessary after sea trials.

V. Rudder / Steering

A. General

1. A manual, two wheel, quadrant type system with wire/chain combination running over sheaves to cockpit mounted pedestals.
2. Steering to have approximately 2.25 turns lock to lock.
3. Bow thruster to provide additional directional control.

B. Required

1. Autopilot
   a) Furuno NavPilot 511 (includes processor, PG500R heading sensor, FAP6112 rudder sensor and FAP5011 control unit)
   b) Navpilot 520 (FAP5021) control unit for watch station
   c) Two Accusteer model XXXX rams (with pumps), one active, one as backup with connecting rod disconnected and on standby to be connected to rudder by Owner if/when necessary.
   d) Autopilot hydraulic pump(s) to be installed such that they are not audible from the cockpit, aft cabin, galley or salon.

2. Cockpit Wheels: 900mm Jefa tandem spoke wheels model WHT0900L, each with the DISENG unit
3. Max Power R200/8 RT201063 thruster.
4. Emergency tiller: The top of the rudder stock is to be slotted, squared or otherwise modified so that an appropriate custom welded aluminum emergency tiller extension tube may be inserted through a deck plate. Emergency tiller to be supplied by the Builder. Polished Stainless Steel Deck plate to be fitted to hole in cockpit sole to cover upper end of rudder stock.

C. Construction

1. Rudder
   a) A epoxy/carbon fiber blade with carbon fiber post and PVC foam core. The entire blade, stock, and bearing assembly to be supplied by Composite Solutions, Inc., 41 Sharp St., Hingham, MA, 02043
2. Rudder Stock
   a) 5” x 3” (approximate) trapezoidal section epoxy pre-preg carbon fiber shaft approximately 31” long (above rudder blade) and extending into blade approximately 48” for a total length of approximately 79 inches.
   b) Engineering to meet or exceed ABS requirements, to be the responsibility of the rudder builder.
   c) The portion of the rudder blade below the bottom of the shaft is to be thinned down or otherwise engineered to “break away” in the event of a hard impact thereby saving the shaft and upper portion of the blade.
3. Steerers: Jefa BS25-x13 bulkhead steerers with support bearing. Sprockets to accommodate 5/8” roller chain and 1/4" 7 x 19 stainless steel wire. Sprocket size to result in approximately 2.25 turns lock to lock for a 70 degree rudder travel.
4. Steering Quadrant
   a) Jefa – model QU5080 80 degree quadrant R=500, maximum bore size = 125 mm. Note the quadrant must be effectively isolated from the carbon shaft using a fiberglass sleeve or other method.
5. Steering Sheaves: Jefa 140mm.
6. Chain/wire rope assembly
   a) 5/8" pitch non-magnetic stainless roller chain with 1/4” wire rope. All connections to have breaking strengths equal to or greater than the wire rope or chain.
7. Rudder Stops
   a) A structure of adequate strength to stop pins on quadrant once the rudder trailing edge has reached 35 degrees off centerline, to be fabricated by Builder.
8. Rudder bearings
   a) Bearing at the hull to be Jefa 6GB000 type aligning hull bearing with fiberglass tube http://www.jefa.com/rudder.htm
   b) Upper bearing to be a Jefa 4SF000H self aligning bearing with thrust bearing: http://www.jefa.com/rudder.htm
9. Rudder gland: Jefa gaiter type seal to be fitted http://www.jefa.com/rudder.htm
10. Rudder tube: Included with Jefa 6GB000 bearing: http://www.jefa.com/rudder.htm

VI. Exterior / Deck Plan

A. General

1. A clean, uncluttered deck that after the attachment of all necessary sailing and cruising gear, does not present an obstacle course when the deck must be traversed at night in poor conditions and encourages rather than inhibits casual usage when at anchor.
2. Anticipate and integrate the design of all items normally required while at sea or at rest. Avoid a deck which has numerous necessary items "tacked on" after the design is completed and inevitably results in clutter and some items being in conflict with others.
3. The primary design goal of the cockpit area is to create an efficient and comfortable area for controlling sails and operating the boat. The primary design goal of the area under the hard dodger is to provide a comfortable watch standing, living and entertaining space that is protected from the elements.
4. The cockpit's seat bench and sole will flow uninterrupted (i.e., at the same level) from the steering stations, through the cockpit and hard dodger to the companionway, and be deep enough for use as a sleeping berth.

B. Required

1. Swim platform on transom with access to cockpit
2. Secure, accessible and enclosed storage on deck for everything that is used on deck including:
   a) Sails (assume two large nylon sails, one headsail and one staysail)
   b) Three anchors and rodes forward (one on bow, two in bow locker)
   c) Stern anchor and rode
   d) Fenders and dock lines
   e) 15hp outboard engine, stowed in a locker, not stowed on pushpit (Yamaha 15hp 2-cycle dimensions: 34.4"L x 13.1"W x 40.9"H 79lbs).
   f) Provision for mounting a 3hp outboard engine on the pushpit.
   g) Dinghy storage while on passage.
   h) Dive tanks (2 x 25" x 8"), connection to compressor, dive gear (mask, fins, snorkel, weights, regulators, buoyancy compensator vest, etc.)
   i) Fishing gear: poles, reels, nets, etc.
   j) We would like to avoid large vertical storage lockers which result in vertical piles of gear.
3. Vented and drained locker for minimum two, preferably three, five gallon propane tanks (approximately 18"h x 12"diameter).
4. Vented and drained locker for a minimum of three five gallon jerry jugs (diesel, gas and water - approximately 11"w x 11"d x 22"h) and a six gallon dinghy fuel tank (approximately 20" x 16" x 11")
5. On deck storage of life raft for easy launching; preferably at aft end of boat adjacent, or on the swim platform. May be in hard case, or a soft pack valise stored in a dedicated locker.
6. Integral jack lines on deck, designed in from the start, not added later. Some system that enables us to go from the companionway, to the cockpit, then forward or aft along the deck while being connected to the boat. Jack lines to be spectra webbing.
7. Perforated aluminum toe rail.
8. Excellent non-skid surface.

9. Lifelines on 30" stanchions with three lines.
10. Anchor sprit capable of taking severe side loads on anchor chain.
11. Radar post for 48” open array radar, GPS antenna, sat comm. antenna, etc. that incorporates hoist for the outboard motor.
12. Solar panels will cover an area approximately 40” in front of the base of the hard dodger and 50” to both sides of the centerline.
13. Bimini that will attach to aft edge of the boom and span to backstay without vertical support arms. Use one horizontal support arm hung on split backstay with ties to the lifelines port and starboard.
14. Deck flood lights: a) under hard dodger, b) at aft end of hard dodger to illuminate cockpit, and c) on radar post to illuminate steering stations and swim platform.
15. Mooring cleats forward, aft, and amidships.
16. Safety tether anchor point on swim platform to enable usage of that area while underway without risk of falling overboard (e.g., clean fish).
17. Cushions for the backs of the cockpit seats that provide excellent lumbar support.
18. Swim ladder hung from transom.
19. Pushpit mounted propane grill, removable to be stored in deck locker.
20. Headroom of 64” (5’ 4”) under the hard dodger.
21. At least one forward glass panel in the hard dodger will open for ventilation. Provision must be made to channel water that leaks around this hatch, or through it’s opening when open, away from the companionway and over the side.
22. Navigation/radar display and VHF microphone at port forward end of cockpit bench.

C. Construction

1. Windlass Foundation: The area beneath the windlass will be of solid glass and will be significantly additionally reinforced.
2. At the mast partners, the Builder is to arrange a suitable glass lined opening with the deck skins brought together vertically, of sufficient strength to permit chocking of the mast using Spartite.
3. Deck hatches - manufactured - Lewmar Low and Medium profile hatches are to be used.
   a) All manufactured hatches are to be fitted with Oceanair Recessed Skyscreens with the beige (RAL9001) trim rings and screens.
   b) Foredeck over forward berth: Lewmar Medium 70.
   c) Trunk cabin on centerline forward of mast: Lewmar Medium 70.
   d) Trunk cabin forward of mast, over shower: Lewmar Low 10 (OD 12” square).
   e) Trunk cabin aft of mast, over salon: Lewmar Medium 70.
   f) Trunk cabin port side over galley: two (2) Lewmar Low 10.
   g) Trunk cabin starboard side over aft cabin: two (2) Lewmar Low 10.
   h) Trunk Cabin under forward end of Hard Dodger: two (2) Lewmar Low 10.
4. Deck hatches - fabricated
   a) Large, two piece hatch for foredeck locker. This hatch affects the watertight integrity of the vessel, and therefore the surrounding frames are to be constructed with large channels and to house a large easily compressible gasket so as to make this openings reasonably watertight even if the boat were to be rolled over inverted. It should have

scuppered gutters that drain into plumbed drains overboard, and heavy duty flush dogs which operate with a winch handle. (Alternative handle/dogs will be considered).

b) Large hatch through cockpit sole at the forward end of the cockpit, directly aft the companionway
c) Hatch for the seat locker at aft end of starboard cockpit bench
d) Large hatch through the cockpit sole between the two helm seats
e) Hatches on seat lockers in the area beneath each helm seat. Note that the port hatch must accommodate the 15hp outboard.
f) Port and starboard transom doors into the stern lazarettes.
g) Side deck locker above the aft cabin.
h) Hatches will be dogged with Rondal dogs as follows:
   (1) 069010 - aluminum dog lock size 90 (goes through the hatch)
   (2) 068900 - s.s. dog lock securing device
   (3) 069290 - aluminum outside handle
   (4) 069220 - aluminum dog size 70 (the latch that holds the hatch shut)

5. Portlights
   a) Two custom fixed portlights, styled to match Goiot Cristal #23.10R, one in the forward head, and on the starboard side of the forward cabin.
   b) Four opening portlights, Goiot Cristal #23.10R, two each to port and starboard in the main salon.
   c) Three opening portlights, Goiot Cristal #33.13R in the galley.
   d) One opening portlight, Goiot Cristal #33.13R in the aft head.
   e) Two opening portlights, Goiot Cristal #33.13R in the aft cabin.
6. Main Companionway
   a) One watertight Builder fabricated companionway is required at the aft end of the trunk cabin. The horizontal part of the companionway will be a 12mm thick medium gray acrylic sheet which slides under the house top within Delrin channels.
   b) The vertical part will be two pieces of 12mm medium gray acrylic sheet. The lower piece will lower into sole with intermediate latching points between fully raised and flush with the threshold. The upper piece will be one piece and be inserted from the top. Storage for the upper piece will be provided immediately adjacent to the companionway. The design is to be virtually watertight even with the yacht upside down.
   c) A lock will be installed to secure the companionway.
   d) The above description not withstanding, the companionway closure should be consistent with ORC regulations.
7. Hard Dodger Laminate And Structure
   a) Per Drawing 14 and 14-1, Pilothouse and Pilothouse Details..
8. Hard Dodger Finish
   a) Interior and exterior to be painted with Awlgrip, color to match the deck and finish to be satin.
9. Hard Dodger Windows
   a) To be 3/8” tempered glass with 3M Prestige film applied to the inside of the glass to provide UV/sun protection.
   b) Opening Window: There is to be a single opening window in the central forward facing facet of the hard dodger. It will be a custom made window approximately 29” square

from Pacific Coast Marine, hinged at its top, opening out with two dogs on the lower edge with 3/8" tempered glass.

c) The mullions of the windows will be flush and radiused.

10. Watch station: A custom instrument console is to be built at the forward end on the port side of the cockpit. Adequate thought is to be given to convenient access to the backs of instruments and to concealment or protection when the Owner is absent.
11. Running lights: Lopolight as follows
    a) Starboard bow: 300-001
    b) Port bow: 300-002
    c) Stern: 300-005
12. Toerails: Antal model 700.100. Fairleads for lines to the stern, midship, and forward deck cleats are to be provided.
13. Mooring cleats: Total of six (6), Nomen 300A.SI (300mm - 11.7").
14. Handrails: There will be nine handrails in total, two being about ten feet long on the midship cabin top, two being about five feet long on the forward cabin top, two being about five feet long on the hard dodger top, two vertical rails along the aft support verticals of the hard dodger, and one across the trailing edge of the hard dodger top. All handrails should be made from a suitable composite material and painted to match the deck.
15. Cockpit table: A cockpit table should be made as long as possible such that it can be stored in a compartment on the starboard side of the cockpit. The table should be secured and removable from the cockpit sole.
16. Locker Hinges: Larger locker doors must have highest quality almost flush fitting stainless steel hinges with invisible fastenings.
17. Pulpits and Lifelines
    a) Triple bow pulpit, 1-1/4" type 316 stainless steel tubing top rail, 1" middle rail. The uprights will be of 1 ¼" tubing. Approximately 30" high.
    b) Triple stern corner pulpits. 1-1/4" type 316 stainless steel tubing top rails, 1" middle rails. The uprights will be of 1 ¼" tubing. Both will be fitted with corner seats if feasible.
    c) A triple lifeline layout made from 6mm wire with turnbuckles at one end. There are to be gates to port and starboard with pelican hooks on each of the three lines.
    d) Stanchions
        (1) 30" high tapered stainless steel tube stanchions 1 ¼" at base (12 required). Two combined stanchions with braces, for the gates on port and starboard are required.
        (2) Furling lines will be attached to the outside of the stanchions both port and starboard (see Running Rigging).
18. Bow locker
    a) A lightweight ladder for access into the bow locker from the deck.
19. Scuppers and Drains
    a) The main deck is to have appropriately located scuppers port and starboard.
    b) The cockpit is to have two, 2" drains consistent with ORC regulations.
    c) The cockpit benches are to have drains in the aft outboard corners.
20. All on deck hinges, deck fillers, deck discharge and emergency tiller cover fittings are to be sourced from Niro Petersen.

21. Flags and Flag Poles: 36” x 48”” yacht ensign fitted to an approximately 5’ staff painted to match the hull.
22. Radar mast: A mast is to be fitted, constructed from a 3.5” carbon tube.
23. Wind generator mast: A mast is to be fitted, constructed from a 3.5” carbon tube.
24. Canvas Work
    a) Cockpit cushions: The cockpit seat and backs are to have “Bottomsider” cushions of the highest quality for their seats. The seatbacks are to have custom fitted 3" thick cell foam cushions with weather resistant upholstery (Sunbrella or equal) with colors per Owners' choice.
    b) A canvas enclosure with windows which closes off the cockpit area from aft end of the hard dodger to the forward end of the utility winch peninsulas. This cover would not be used while the yacht is underway. Example in the picture below:

    c) A canvas bimini which is supported by a rod across the split backstay, a connection to the aft end of the boom and suitable tie downs to the lifelines.
    d) Mainsail cover with double fabric or equivalent for UV protection on the top half. Note that the main will use the Dutchman mainsail flaking system and the cover will need to have the appropriate slits for the vertical lines.
    e) White Sunbrella winch covers.
    f) Awnings for forward cabin and salon hatches that enable air flow but keep rain out. Suspended from the lifelines or ?? Large enough so that rain bouncing off the deck doesn’t come below and high enough to allow the hatches to be open for airflow. On Wind Horse these look like:

25. A drop board which will close off the aft end of the cockpit. This drop board should leave at least 3" of space between the sole and the bottom of the board to allow the cockpit to drain. Provision for storing the drop board to be provided in one of the adjacent cockpit lockers.
26. Both pedestals are to include a Suunto F-135K compass.

D. Under discussion

1. Foot Stops: Two removable wedge shaped foot stops, preferably of StarBoard or other non wood material, to be fitted to cockpit sole at inboard side of steering stations to brace against when heeled.
2. Swim ladder deployable from the water?
3. Cup / bottle holders at helm and under hard dodger.
4. A means to for dinghy tie up mounted on swim platform that is accessible from the dinghy when in the water. Could be a dead eye that could be used temporarily to tie off the dinghy (with a stopper knot), later taking the lead to a stern cleat. Could be a padeye to which we shackle the dinghy painter. Something other than trying to jump out of the dinghy while holding the painter.
5. Passarelle from http://www.exitengineering.com/. Socket for a removable passarelle that is stowed below deck.

VII. Interior

A. General Information

1. Except where specified otherwise in the sections describing each interior space, the general specifications below will apply to all areas of the interior.
2. The interior will be designed and built to be safe at sea, as well as be stylish and comfortable at anchor. With an emphasis on tropical cruising, the interior will be light in color and hatches, portals and dorades must be well positioned to let the breeze come in and heat and humidity escape. Hatch and window treatments need to work in conjunction with any exterior solutions such as tents or awnings, to ensure proper air low while ensuring protection from elements such as sun, insects, wind and rain.

   The interior will be aesthetically pleasing with an emphasis on openness, and a look and feel that presents clean lines, sophistication and modern yet warm characteristics. Easy-to-use

hand holds will be in thoughtful locations throughout the boat to provide ease of moving about at sea with the ability to brace oneself in the event of a roll or significant seas.

All contents of the boat shall be capable of being fastened securely in place. All lockers, drawers, cabinets, floorboards, refrigerator/freezer doors, stove burners, desktops, books, batteries and anything else that could cause harm when airborne shall be able to be securely fastened so as to remain closed and/or immovable in extreme conditions including upside-down. Storage must be easy to use with easy access for every day needs. Bulk storage must be sufficient and easily accessed.

3. Materials
   a) Cabinetry/Furniture
      (1) Cabinet doors will be flat sawn panels veneered with maple and finished with a clear satin varnish.
      (2) Edges and where different building materials meet will be carefully considered to minimize use of molding. As needed, moldings are to be clear satin varnished flat sawn maple. Owner to be included in decision making process.
   b) Counters/Fiddles:
      (1) Galley: CaesarStone, #2200 – Desert Limestone – polished finish - for counters and backsplash
      (2) Corian by Du Pont, Sonora (flat finished) with Glacier White sink for aft head and forward head.
      (3) Fiddles throughout boat should be fabricated from . Exceptions include forward and aft heads where fiddles will be fabricated with Corian.
   c) Fabrics
      (1) UltraLeather Papyrus #1256 will be used for the salon settee, purchased chairs, forward cabin headboard and forward bunk “bumper”.
      (2) UltraLeather Ivory #3700 will be used for the inside of the house, deck overhead , hull ceiling, headliner and ring frame.
      (3) Perennials Kapa Strips Style 120-196 Pele will be used for the aft cabin cushions and pillow shams
      (4) Perennial Fabrics – Canvas weave / linen - #600-27 to be used for cockpit cushions.
   d) Hardware
      (1) All locker and cabinet latches/pulls will be satin nickel finished.
      (2) Locker hinges to be stainless steel concealed hinge type 18-8, or similar with anti-rattle feature.
      (3) Passage door latches and locks to be Mobella brand with a brushed/satin stainless steel finish.
      (4) All exposed cabinet hardware will be satin finished (e.g., hand holds (including companionway), passage door handles, refrigerator latches / hinges, etc.)
      (5) All plumbing fixtures (faucets, mixers, etc.) shall be chrome finished.
   e) Electrical switches, outlets and cover plates
      (1) Cover plates: Vimar Idea Placca Rondo 16753.34 Metallic Nickel
      (2) Switches: Vimar Idea Grey (Luminous indicators in locations TBD)
      (3) AC Outlets: Vimar Idea Grey
4. Styling

a) Cabinetry and other hard furnishings will have flat panels, slab doors with European style hinges.
b) All furnishings will have radius corners. The lower corners will have a 1 ½" radius and upper corners will have a 1" radius

5. Access
   a) Arrangements for access, cleaning, and painting of all compartments shall be provided wherever practical.
   b) Access to the engine, steering gear, shaft tube, and all other equipment that will require servicing of any kind shall be provided by developing joiner work, etc., which can be removed for access. The Builder shall use his best efforts to locate piping, wiring and equipment to avoid blockage of any access. If blocking is unavoidable, removable sections shall be utilized.
6. Passage doors and frames
   a) The doors will be modern panel doors of varnished maple with a flat center. All passage doors are to have square corners and be fitted with three hinges per door. All doors will be fitted with hardware to hold them in the open position. Door frames to be veneered maple.
7. Cabin Sole
   a) The cabin sole will be quarter sawn teak installed on plascore, styled in the spirit of the photo below with long, 4" wide planks.

   b) All removable floorboards will include hardware to keep them securely in place in the event of a knockdown or roll.
   c) Access panels to have "Rabbit" [name or race boat on which they were first installed at LM] style twist lock flush style locks and pulls of a design that does not capture dust and dirt.
   d) All openings to be teak banded so no plascore is visible on either the opening or the lift-out panel.
   e) Clear satin finish completely sealing the wood and achieving a totally smooth, nonporous surface finish.
   f) Upper surface to be overlaid with a clear non-skid material like coarse GripTex covered with Awl grip clear, laid down in 2" strips located on 4" centers.
   g) The cabin soles will be supported by fiberglass beams.
8. The headliner will be built of 4mm Okume plywood and finished with foam backed White Symphony faux leather.

a) The panels are to run fore and aft, dividing the salon overhead in a manner that ensures the panels are manageable when removed for maintenance. The edges of the panels will simply butt together. The overhead areas are to be battened off the inside surface of the underside of the fiberglass deck so that all fasteners, wiring, etc, are covered over by the liners yet easily accessible by taking down individual headliner panels.
b) The design of overhead light fixtures and hatch or dorade vent spigots shall be such that these panels are removable without removing any trim rings or battens. Dorade or vent spigots should match the color of the headliner.
c) The ring frame divides the salon overhead into a forward and after part. This ring is to be nicely upholstered in foam backed UltraLeather color Ivory #3700.

9. Deck overhang, interior side of house, and interior of hull
   a) These panels are to be made removable using tabs of high strength Velcro.
   b) The panels should be covered with foam backed Ultaleather in Ivory #3700.
10. Misc
   a) Two “secret” storage compartments for valuables, one of which should be metal lined and large enough to protect electronics in the event of a lightning strike.
   b) Minimum 6’6” headroom in salon, 6’ 4” in galley and aft cabin.
   c) All hanging lockers to be provided with a stainless steel bar for hangers.

B. Cockpit
1. Required
   a) The cockpit benches will also be used as sea berths and as such are to have mattress cushions consisting of two densities of foam with the upper layer to be soft and the lower layer to be of a harder density or as recommended by upholsterer for sleeping comfort. They shall have a thickness of 3”. Back cushions will be ergonomically designed with lumbar support. Cushion fabric and pattern to be chosen by Owner
   b) Soft attachments for lee cloths will be built into the overhead of the hard dodger.
   c) Hard Dodger Console: A custom instrument console is to be built at the forward end on the port side of the cockpit. Adequate thought is to be given to convenient access to the backs of instruments and to concealment or protection when the Owner is absent.
   d) A removable table will be designed and built to fit between the cockpit benches and attach to a central point in the cockpit. Storage for these this table will be in a narrow cabinet at the inboard edge of the starboard side of the bench.
   e) Lighting: See Fay 54 Lighting, Outlets and Switches list.

C. Companionway
1. General – The companionway will be styled, designed and crafted similar to the picture below with deep, wide, companionway steps.

2. Details: At the companionway steps a port and starboard side "knee wall" of varnished maple will be built. A curved handrail will be installed upon this, extending to the overhead. This railing shall be finished in brushed stainless steel. The steps will be teak and the faces will be maple, as in the above photo. The same non-slip treatment used on the sole will be used on the steps.
3. The companionway steps will lift and be held open by gas strut and a strap hooked into a soft hook in the overhead.
4. Bug screens: A bug screen will be fabricated with an appropriate means for attachment to keep out insects but allow air flow.
5. Storage: If possible, it would be a plus if any of the step treads could flip up with a locking hinge to expose storage within.

D. Engine Box

1. Sound Insulation: The machinery space will be insulated with Soundown Barrier Composite Insulation. Rubber gaskets or seals are to be fitted around all openings and access ways to machinery space. All rotating machinery is to be mounted on rubber mounts and isolated from the foundations or structure. Sound levels when the engine is at cruising speed should not exceed 70 decibels in the interior areas adjacent the engine.
2. An automatically triggered, properly sized, Fireboy FE-241 based fire suppression system will be installed in the engine box. The engine box shall be designed such that a fire would be contained and this extinguisher would be capable of extinguishing the fire.
3. Access by lifting companionway steps, as well as through doors or removable panels on the port and starboard sides.
4. See the HVAC section for additional specifications.
5. Lighting: See Fay 54 Lighting, Outlets and Switches list.

E. Galley and Workshop

1. General - Arranged and styled in the spirit of the Trintella photo below using flat panel doors and drawers with hidden hinges, flat cut natural maple and brushed nickel pull knobs. Lower corners shall have a 1 ½" radius and upper corners will have a 1" radius. Bulk storage must be sufficient and easily accessed.

   All contents of galley shall be capable of being fastened securely in place. The wet locker, drawers, cabinets, floorboards, refrigerator/freezer doors, stove burners, and anything else that could cause harm when airborne shall be able to be securely fastened so as to remain

closed and immovable in extreme conditions including upside-down. Storage must be easy to use for every day needs.

The workshop will be located at the aftermost 24" of galley. A second sink will be used for the workshop area. There will be a transition from the CaesarStone to a stainless steel countertop. A folding bench surface running athwartship will hinge on the outboard side, rest on two short cleats on the wet locker door when in use, and be stored folded up against the outboard side with suitable restraints.

2. Cabinetry / Furniture
   a) Cabinet doors and drawers will be flat panels of satin varnished flat sawn maple.
   b) Drawers will have full extension slides to be used as space allows.
   c) All base cabinets in the galley are to have 3" high toe kick spaces. Toe kick spaces to be teak.
   d) There will be a dish storage / drying cabinet which will drain into the bilge. See photo below for example of a dish locker currently in use on the Swan 44.

e) The lower cabinet forward of the refrigerator will slide forward for engine access. This cabinet should have 3-10” drawers (to be used for dry goods storage).
f) The space under the galley sink should be drawers suitably ventilated to for drying pots/pans or for produce storage.
g) The drawer front under the forward sink will have two push button catches and a tilt out “rev-a – shelf”.
h) Flush louvers will be installed at the top and bottom of the following doors for ventilation:
   (1) Dish locker
   (2) Wet locker
   (3) Upper galley cabinets (above the doors, running the length of the cabinet)
   (4) Aft cabin hanging locker
   (5) Forward cabin hanging locker
i) The three lower locker doors under the workbench will hinge aft.
j) The wider drawers may have partitions.
k) The space area under the stove and the lowest space aft of the stove may be accessed with drop down doors.
l) Drawer height measurements as follows:
   (1) Top drawer in outboard cabinets - 5 ½”
   (2) Inboard sliding cabinet on the forward end - five drawers, each 6 5/16" high
   (3) Inboard sliding cabinet outboard side - top drawer 9 15/16".
m) Drawer designed to hold knives.

3. Counters
   a) Outboard countertop
      (1) CaesarStone #2200 Desert Limestone (polished).
      (2) The surface of the counter will be 36” from the sole
      (3) CaesarStone #2200 Desert Limestone (polished) - backsplash to run full height between countertop and bottom of upper cabinets on outboard side of galley
      (4) A CaesarStone 4” backsplash will be installed on right side of sink between counter edge and dish locker.
      (5) A trash “chute” will be located just aft of forward sink, between the sink and stove and will be a hole through the counter over a pull out trash container, space permitting.
      (6) The workbench counter area will be stainless, the backsplash will be stainless and the workbench will be stainless on both sides.
      (7) The workbench vice will be installed with machine screws.
   b) Inboard countertop

(1) Caesar Stone #2200 Desert Limestone (polished).
(2) 36” from sole
(3) No backsplash.

4. Appliances / Equipment
   a) Refrigerator/Freezer Units
      (1) There will be three (3) boxes on the inboard bulkhead at roughly station 7.5. Of the 3 boxes, the forward most box will serve as a dedicated refrigerator, the bottom aft box will serve as a dedicated freezer and the top aft box will serve as either a freezer or refrigerator.
      (2) Interior volumes:
         (a) forward box to be 7.4 ft3
         (b) aft upper to be 2.9 ft3
         (c) aft lower to be 3.9 ft3.
      (3) The interior of the boxes will be painted with Awlgrip Snow White.
      (4) A Frigoboat system with keel cooler, evaporator plates and Danfoss compressor will be used for cooling and freezing the boxes.
         (a) The compressors will be positioned to enable easy access for service and repair.
         (b) The evaporators will be positioned to minimize condensation dripping onto the contents.
      (5) The units will be insulated using vacuum panels provided by Ocean Options.
      (6) The boxes shall each have a Resolux 551 cool white LED strip in which illuminates when the door is opened.
      (7) The boxes shall have a thermometer which measures the temperature at the middle height in the box away from the door, that is read from outside without opening the door. The lead to the temperature probe shall be well insulated against extraneous heat transfer.
      (8) Each box shall have a drain in the bottom for defrosting and cleaning. The drain will be designed to endure freezing. The bottom of each box is to be graded so that it shall drain completely dry during defrosting and cleaning. The drain lines for the refrigerator boxes shall be tied together and fed to the bilge.
      (9) All doors shall have large gaskets in recessed grooves. The door hardware will be brushed stainless steel. Doors will have hold open and stop mechanism.
   b) Stove
      (1) Techimpex Mariner 2 gimbaled, propane, 2 burner stove.
      (2) Stove Safety Bar: brushed stainless steel bar installed across the front of the stove just below counter height.
   c) Microwave: GE Monogram model ZEM200SF (stainless steel finish) 11 3/16”h x 12 9/32”d x 23 25/32”w. The stove should be surrounded with removable joinery for a “built-in” look that will also facilitate removal and replacement.

5. Sinks and faucets
   a) The forward sink is an under mounted Scandvik #101021-12, order #10230 8” deep, mirror finished stainless steel double sink. This sink will use a KWC DOMO #10.061.033.127 Splendure stainless steel, single hole, single lever, kitchen mixer with swivel spout, pull-out sprayer and 9” reach.
      (1) KWC Primo # Z.504.938.127 - 'Splendure' solid stainless steel soap pump to be mounted behind the sink.

(2) A Whale Flush mount Mark IV Tip Toe foot pump will be the manual backup pump for fresh water.
(3) A Whale V pump model GP0650 will be mounted at the forward outboard corner of the galley sink to be provide salt water at the galley sink.

b) The aft sink is an under mounted satin finished stainless steel Blanco #510879. This sink will use a KWC DOMO #10.061.032.127 Splendure Stainless Steel, single hole, single lever, kitchen mixer with swivel spout, pull-out sprayer and 7 1/8" reach.
(1) KWC Primo # Z.504.938.127 - 'Splendure' solid stainless steel soap pump to be mounted behind the sink.

6. Lighting: See Fay 54 Lighting, Outlets and Switches list.

F. Aft Cabin

1. General - The aft stateroom is a multi-use cabin: at sea it provides secure sea berths and at anchor it will be used as a guest cabin and laundry room.
2. Cabinetry / Furniture
a) Details
(1) The aft berths consist of a fixed berth against the hull, and a Pullman style berth against the inboard bulkhead. These berths will be used individually as single sea berths through the use of lee cloths or as double berth. The Pullman berth will hinge directly off the bulkhead and rest on an extended rail installed on the bottom of the fiddle of the fixed berth. The fiddles of both berths will be constructed to contain their respective mattresses while also providing a close fit to each other in such a manner that it does not interfere with usage of the two berths as a double berth.
(2) Mattress cushions to consist of two densities of foam with the upper layer to be soft and the lower layer to be of a harder density or as recommended by upholsterer for sleeping comfort. They shall have a thickness of 5". Owner and LM shall work together on additional details prior to being created.
(3) Three soft attachments for a lee cloth for the outboard bunk will be provided.
(4) Unfettered access to starboard side of engine.

b) Storage: The hanging locker will be split into two sections with shelves in the forward half. The hull side should be lined with cedar plywood.
c) Counters. The counters on the cabinetry are to be maple with maple fiddle.

3. Appliances: A Splendide 2100 (WD2100) combination washer/dryer is to be recessed into the aft end bulkhead and concealed by a bi-fold door that will be secured outboard when open.
4. Soft Surfaces: Both the hull ceiling and the inboard bulkhead should be covered in Ultraleather Ivory #3700 with extra foam padding to provide a comfortable surface to sleep against when the boat is heeled..
5. Door: The passage door will be a pocket door veneered with maple.
6. Lighting: See Fay 54 Lighting, Outlets and Switches list.
7. Other: A Scandvik stainless steel spool clothesline will be mounted to the aft bulkhead and clip to the forward bulkhead.

G. Aft Head

1. General: A multipurpose, day use toilet, with sink and vanity. The entire head can be used as shower when required (i.e., sump in floor, no exposed electrical, etc.)

2. Cabinetry / Furniture
   a) Details:
      (1) To be in keeping with style of galley cabinetry. Vanity cabinet will have 2 doors. Pivoting shelf features such as those in the photo below will be added as plumbing permits.
   b) Hardware:
      (1) All doors/drawers will have polished chrome pushbutton latches to prevent inadvertent opening.
   c) Storage:
      (1) Dropdown panel for waste will be installed adjacent the toilet as in the picture below.

3. Counter with integrated Sink
   a) The counter will be Sonora (flat finish) colored Corian with an integrated Glacier White colored sink and 6" backsplash.
   b) The fiddles should also be Sonora colored Corian.
4. Faucets, toilets, accessories
   a) The toilet will be a Groco model K-H
   b) Scandvik 10492 heavy duty cast basin faucet/mix with pop up drain assembly – Chrome plated.
   c) KWC Primo # Z.504.938.000 All chrome soap pump to be mounted behind the sink.
   d) Scandvik 10466 Counter mounted shower mixer – Chrome plated
   e) Scandvik 14042 Chrome straight shaft handle Euro trigger sprayer and 6' chrome flex hoses
   f) The location of the faucet, hand shower, and soap pump to be mounted on the counter top should optimize base cabinet storage with a strong preference to locate spray on left side of sink, closest to toilet.
   g) Towel hooks and accessories to be polished Chrome (to be chosen by Owner)
5. A recessed toilet paper holder will be installed in the panel aft of the toilet.
6. Lighting: See Fay 54 Lighting, Outlets and Switches list.
7. Other
   a) Sole to be 4" shower pan of fiberglass with lightly applied griptex fine non-slip surface
   b) The toilet pedestal should be fiberglass continuous with the sole. Behind the toilet the pedestal will angle up without a 90 degree angle for ease of cleaning.
   c) A half height mirror (upper half), framed in artistically carved maple, should be placed on the wall between the aft head and salon.

H. Navigation Station

1. General - Designed to provide access to equipment and facilitate change. The electronics are the systems most subject to improvement and replacement over time. All electronics should be mounted to provide easy access to installations, facilitate change and provide excellent ventilation.
2. Cabinetry / Furniture
   a) Details:
      (1) Toe kick will extend through the trash holder.
      (2) Desk height will be 30 3/8”
      (3) Desktop will hinge up like traditional chart table
      (4) Angled console will wrap around to the settee.
      (5) The bottom face of the angled console will be slotted to provide air to flow up into the console.
      (6) Chair to be provided by owner.
   b) Storage:
      (1) There will be sufficient space for mounting a large collection of communication, navigation and computing equipment as well as at least one 15” flat panel display and a printer.
      (2) Equipment should be mounted into a Formica 909-58 black matte finished panel that does not require special fabrication or tooling so that it can be easily replaced. The Formica panel will fit into a metal frame with hinging to enable the entire panel to be open forward and rested on the table top for access to electronic components.
      (3) Work surface and seat height appropriate for typing, but large enough to use paper charts.
      (4) Storage space for office supplies, books and miscellaneous materials.
      (5) There should be a holder for pencils and navigation instrument holders (dividers, parallel rules, etc.).
      (6) Thermostatically controlled ventilation fan and ducting to remove heat from nav station electronics and pump it outside the salon.
      (7) Printer/copier mounting space, may be located away from nav station elsewhere in the salon.
      (8) At the forward outboard end of the station their will be three drawers sized as follows from the top down: 5 1/8”, 10 5/8” and 10 5/8”.
3. Counters: Counters and desk surface to be maple with maple fiddles. Fiddles per drawings.
4. Lighting: See Fay 54 Lighting, Outlets and Switches list.

I. Salon

1. General - The layout and furnishings of the salon will be aesthetically pleasing with an emphasis on openness. It will have a look and feel that presents clean lines, sophistication and, modern yet warm characteristics and in the spirit of the photo below. Hand holds will be in thoughtful locations throughout the salon to assist moving about at sea with the ability to brace oneself in the event of a roll or significant seas.
2. Cabinetry / Furniture
   a) No toe kicks.
   b) Two A. Rudin #R 564 chairs will be installed on the starboard side.
   c) The settee will be designed to compliment the A. Rudin chairs and upholstered in UltraLeather color Papyrus.

(1) The settee will have a 27” seat dimension.
(2) The height of the seat backs will be 35”.

d) The upper cabinets will “float” 6” above a counter behind the settee. The interior of the upper cabinets to be finished in maple.
e) Settee table: One piece table with folding “ears”. Brushed stainless fiddles will be built to be removable. The table will be supported on a stainless steel base which raises and lowers, and slides in and out.
f) The space under the settee will be finished so that it can be used for storage.

3. Counters will be maple.
4. Doors. The passage doors to the forward cabin and the aft head will include hardware to hold the door in an open position. The door frames will be solid maple.
5. Hand rails: Brushed stainless steel handrails, exact location and style TBD.
6. Lighting: See Fay 54 Lighting, Outlets and Switches list.
7. Other
   a) Flat panel display for movies.
   b) Speakers will be mounted to the main bulkhead, or into the cabinetry. See Entertainment section for specifications.

J. Forward Cabin

1. General – look and feel in keeping with modern lines of salon and in the spirit of the photo below:

2. Cabinetry / Furniture
   a) Cabinetry
      (1) Upper cabinets from the hanging locker to the forward bulkhead.
      (2) Hanging lockers will be lined with cedar wood
   b) Bed
      (1) Mattresses to be selected by Owner and ordered by Builder.
      (2) Bed platform to be cantilevered which will create a toe kick space
      (3) The bumper / mattress fiddle will be covered in UltraLeather color Papyrus with extra padding.
      (4) 1 - 38” wide chart drawer will be installed at the foot of the bed with four drawers above for clothing storage.
      (5) Headboard: UltraLeather Papyrus will be installed from the bunk top to the air conditioning soffit (see below). The panels will butt the upper cabinets and soffit,

and then continue down to the mattress top. This panel will be divided into multiple sections to create a design element.

(6) Three soft attachments for three lee cloths will be provided (port, center, starboard). A means of securing the lee cloths under the mattress will also be provided.

c) The outboard shelf will rest upon the fore/aft structural hull beam and receive the mattress retainer. The shelf will have a fiddle. The hull ceiling will be maple veneered below the shelf to the sole.

3. Storage: Hanging locker, but mostly shelf and drawer storage for clothing. Hanging lockers will be lined with cedar.
4. Counters: Maple with maple fiddle
5. Door: A full-length mirror will be installed on the forward side of the passage door.
6. Lighting: See Fay 54 Lighting, Outlets and Switches list.
7. Other
   a) Small B&W speakers will be built into the forward side of the cabinets on P/S. The speakers are specified under Entertainment.
   b) The air conditioning supply will be ducted through the forward bulkhead, up the inside of the bow locker, and then back into a soffit above the head of the bed.
   c) Removable "face cradle" at foot of bed, as is provided on massage tables. Located at the aft starboard corner.

K. Forward Head

1. General – A private use toilet, with sink, vanity and separate shower.
2. Cabinetry / Furniture to be consistent with the other cabinetry.
3. Storage:
   a) The face behind the toilet will have one drop down for waste.
   b) The cabinet under the sink will have storage for bathroom supplies (TP, soap, shampoo, garbage etc.).
   c) A "medicine" cabinet will be built into the bulkhead at the inboard side of the counter against the mast, with a mirror on its door.
4. Counter and Sink: The counter will be Sonora (flat finish) colored Corian with a Glacier White colored integrated sink. The counter will be 36 ½" above the sole with a 3" backsplash.
5. Faucets, toilets, shower
   a) The shower will be custom molded fiberglass with griptex applied to the shower pan to provide a non-slip surface.
   b) The shower overhead will be integral with the unit and be a removable panel.
   c) The mixer and soap shelves will be recessed into the aft wall of the shower, with the following heights, and in this order from the top down:
      (1) Soap shelf 3"
      (2) Shower mixer 9"
      (3) Space 2"
      (4) Shampoo shelf space 11"
      (5) Space 2"
      (6) Misc shelf space 4"
      (7) 4" to bottom of shower

d) Shower mixer: Scandvik 70204 with silver trim, polished chrome, bulkhead mount shower mixer with oversized trim ring and recessed into aft wall.
e) Shower union: Scandvik 70352 polished wall union
f) Shower head and chrome flex hose: Grohe Movario Trio Hand Shower #28 441 000 Grohe StarLight Chrome.
g) The shower door will be frameless glass and open out. A method for securing the door will be provided.
h) The shower should have a window measuring 18" in diameter, 56" from the sole on the forward side facing the bed. The glass for this window will be provided by the Owner and will be 19 1/8" in diameter to facilitate installation.
i) Sink faucet: Jado model 831/001.
j) KWC Primo # Z.504.938.000 All chrome soap pump to be mounted behind the sink.
k) Toilet : Tecma Silence color white with the bidet mixer / nozzle option. The toilet pedestal will be fiberglass.

6. Doors
   a) The door will include a fitting to hold it in the open position. The door frame will be solid maple.
7. Lighting: See Fay 54 Lighting, Outlets and Switches list
8. Other
   a) Towel racks, toilet paper holder TBD.

VIII. Sail Plan

A. Sail Plan per Drawing 178-01.

B. Builder to supply sails subject to agreement between Owner and sailmaker with regard to specifications.

IX. Spars, deck hardware, ground tackle and running rigging

A. General
   1. Simplify sail handling and reduce the opportunity for error.
   2. Anticipate and design in all items that are routinely needed to maintain well trimmed and controlled sails and spars while keeping the decks as uncluttered as possible.

B. Required
   1. Carbon fiber mast, boom and spinnaker pole.
   2. Dutchman mainsail flaking system.
   3. Boom control / preventer
   4. Spinnaker pole stored on mast.
   5. Stainless steel rod rigging

C. Construction
   1. Chainplates: Stemhead, inner forestay, upper (v1), lower (d1) and backstay chainplates are to be highly polished 316L stainless steel weldments by Nautilus Marine or similar as detailed on the plans with welded cover plates and hole reinforcement washers. Standing

rigging angles should be verified by Builder in the lofting. Chainplates must align perfectly with their rigging in order to prevent fatigue failures in the rigging.

D. Spars

1. General
   a) This specification is in addition to the Sail Plan and Spar and Rigging Plan as drawn by CW Paine Yacht Design. Where these documents are in conflict, this specification will take precedence.
   b) All standing rigging and will be supplied by the Spar Builder.
   c) All spars are to be supplied complete with masthead, tangs, lighting, wiring, exits for internal halyards, spreader bars, vang, gooseneck, cleats, and spinnaker car track, fittings and adjustment gear.
   d) Lyman-Morse will supply electronics such as wind direction transducer, wind speed transducer, and antennas.
   e) The mast, boom, spinnaker pole, standing rigging, all associated components supplied by the Spar Builder, and all electronics supplied by the Builder (Lyman-Morse) will be commissioned by the Spar Builder, in April 2008 at Lyman-Morse's yard in Thomaston, ME.
2. Mast
   a) Carbon fiber, as manufactured by the Spar Builder. The mast will be painted to match the color of the deck.
   b) Harken sheaves.
   c) Masthead to be carbon with four internal halyards at the masthead: two spinnaker, one mainsail, one topping lift (to be used for Dutchman flaking system but should be sized to enable usage as a backup mainsail halyard).
   d) Spinnaker halyards should exit through mast mounted sheaves with side load rollers, not through masthead tower hung blocks as shown on the Spar and Rigging Plan.
   e) Halyard exits should be faired slots with 1/2 oval stainless steel chafe bars above (inside) and below (outside) to prevent halyard wear, or per Spar Builder's normal practice subject to Owner's approval.
   f) Mainsail track: Antal HS mast slider system size 50.
   g) Spinnaker track: Harken #3154 track mounted with stainless steel internal backup strips. 100mm fastener spacing except in the high load areas where 50mm fastener spacing is to be provided. Custom spinnaker pole car per Spar Builder with self-centering bayonet fitting for storing the spinnaker pole on the mast. An Antal line driver will enable adjustment of the pole on the track. A mast mounted chock will secure the outboard end of the pole, and ensure there is no rattle, when not in use.
   h) Jib halyard: Rope halyard terminating at an Antal 622.402 halyard slider mounted on a section of Antal 602.312 automatic track.
   i) Spinlock ZS alloy jammer for Dutchman / spare main halyard.
   j) Staysail halyard should exit through a mast mounted sheave with side load rollers to enable it to be used as the spinnaker pole lift.
   k) Inner forestay to be 9T Kevlar with Wichard ratchet adjuster #558X (per recommended pin size). To be stored at on D1.
   l) One part running backstays as recommended by the Spar Builder.
   m) Vang Attachment: Carbon vang lug sized for a Navtec -30 cylinder.
   n) Three padeyes for reef tacks to be mounted on mast.

o) Wiring (lighting and electronics) to be run inside a PVC pipe securely attached to the inside of the mast with appropriate water sealed exits at the top and bottom.
p) Lightning grounding shall be provided.
q) Windex (with light) to be supplied and installed.
r) Three sets of folding nylon mast steps to enable access to the mainsail head, www.keysaver.nl or better.
s) Lighting: All mast lighting will be switched from the companionway.
    (1) Masthead: A tricolor, Lopolight 200-005, stacked with a combination anchor/strobe light, Lopolight 200-12S by using Lopolight stacking kit 400-013.
    (2) Mast mounted
        (a) Steaming light: Lopolight 200-011 mounted on the mast below the intermediate spreaders or per Spar Builder's recommendation.
        (b) Foredeck floodlight – Aqua Signal 24v 50w 3144005 (white) or better (LED preferred).
    (3) Spreaders
        (a) Deck floodlights mounted on port and starboard lower spreaders. LED floodlights are preferred or as recommended by spar builder.
t) Electronics / Antennas
    (1) Backstay SSB antenna: Install insulators in the backstay to create a 49 foot long antenna beginning at 8 feet above the cockpit sole and extending up one lower backstay leg and into the upper backstay as necessary to create a 49 foot antenna. This antenna should be insulated from the other lower backstay leg, and the portion of the backstay above and below the antenna.
    (2) Masthead mounted VHF antenna: Gam SS-2 with 35" whip.
    (3) Masthead wind wand. Wind direction / speed wand XXX
    (4) Three pads for standard marine antenna mounts will be provided on each lower spreader. The pads will be positioned at one third, one half and two thirds the distance between the mast and the shroud.

3. Main Boom: Carbon construction with conventional slab reefing. The boom is to be supplied complete with bails, end fittings, vang lug, gooseneck, and all necessary fittings. It is to be painted to match the mast and deck.
    a) Outhaul to be tensioned by a hydraulic ram. Clew to be retained by a strop, no outhaul track or car.
    b) Outboard end to have three sheaves for reef lines.
    c) Two preventer lines terminated at the aft end of the boom. A Schaefer #78-05 will be mounted to each side of the boom 15" aft of the gooseneck. A Wichard #2473 snap shackle will be welded to the pad eye to retain the preventer.
4. Jib Furler: The Spar Builder will supply a Harken Mk IV Unit 3 furler for the jib on the forestay.
5. Spinnaker Pole:
    a) Built of carbon fiber with a length of 21' per Spar Plan revision A2 dated 04/17/07.
    b) Spinnaker pole end fittings to be from Hall Spars and Rigging. Inboard end to be attached with a stainless steel pin retained with ring pins on either side to prevent unintentional removal.
6. Hydraulic System
    a) Navtec four function System 50 will be supplied by the Builder (not Spar Builder) to operate:

(1) Vang: Navtec A850-VC-030
(2) Backstay: Two (2) Navtec A250-LE-017
(3) Outhaul: Navtec XXX

b) All hydraulic plumbing within the boat will be stainless steel. Transitions to/from rubber/stainless will be made as close to the control panel as possible. Transitions from/to rubber/stainless for the mast/boom cylinders will be below the sole in the cabinet directly aft the mast and inboard of the settee.

c) System 50 panel to be located at the port side helm station below the sheet bin.

E. Deck Hardware

1. Winches: All winches will be Harken two speed with anodized aluminum drums and electric drives.
   a) Mast base: Harken 48 with horizontal drive
   b) Cockpit utility: Two (2) Harken 53 with vertical electric drive
   c) Primary cockpit: Two (2) Harken 70 with vertical electric drive
   d) Secondary cockpit: Two (2) Harken 48 with vertical electric drive.
   e) Winch handles: one (1) Lewmar 10" OneTouch, one (1) Lewmar 10" OneTouch double grip.
2. Blocks, tracks, cars:
   a) Mainsheet blocks: Harken TBD
   b) Jib track: 8' section of Antal automatic track positioned with forward end even with mast. The track is terminated at the forward end with an Antal 691.251 track end fitting with a single block with becket to be used for adjusting the jib car.
   c) Jib cars: Antal 622.492 with 949.552 block attached at the forward end
   d) Mast base fair lead blocks: Harken C7977
   e) Jib foot blocks: TBD
   f) Spinnaker sheet turning blocks: TBD
   g) Running backstay turning blocks: TBD
   h) Jib furling line blocks: Harken 7401, 7402 and 7403
   i) Spinnaker furling line blocks: Harken 7401, 7402 and 7403
3. Rope clutches / jammers
   a) Port cockpit: Six (6) Spinlock XX0812
   b) Starboard cockpit: Four (4) Spinlock XX0812, one (1) Spinlock ZS alloy jammer (main halyard)
   c) Mast base clutches / jammers
      (1) Spinnaker halyard: Spinlock XX0812.
      (2) Staysail halyard / pole lift: Spinlock ZS alloy jammer.
   d) Jib furling line: Spinlock XCS0814 black.
   e) Spinnaker furling line: Spinlock XCS0814 black.
4. Miscellaneous
   a) Wichard #6506 folding pad eyes placed at the forward outboard corners of the forward deck hatch – outboard and just aft of the inner forestay tack.
   b) Wichard #6506 folding pad eye to be used for attachment of inner forestay tack.
   c) Spinnaker Furler: RollGen 20-23 by Bamar (www.rollgen.com) to be revised when model with removable furling line available.
   d) Eight (8) Wichard toerail padeyes #16613.
   e) Six (6) Harken #1600 snatch blocks.

F. Running Rigging:
   1. Sheets:
      a) Main
      b) Jib: normal and reaching sheet
      c) Staysail
      d) Spinnaker
      e)
   2. Halyards:
      a) Jib
      b) Main
      c) Staysail
      d) Spinnakers (2)
      e) Dutchman / backup main halyard
   3. Running Backstays: Kevlar one part.
   4. Mainsail reefing: The mainsail will have three slab reefs. There will be both tack and clew lines for each reef.
   5. Multipurpose lines (MPL) port and starboard sufficiently long to be used as foreguy
   6. Preventer lines on boom (2)
   7. Jib car adjustment lines

G. Ground Tackle
   1. Bow fittings and hardware
      a) Custom fabricated stainless steel bow fitting with two anchor rollers and an attachment point for the tack of a code 0 or asymmetrical spinnaker.
         (1) Large delrin rollers will be grooved to take chain and rope rode.
         (2) This fitting will provide a proper lead for the primary chain rode to the windlass drum.
         (3) This fitting must provide for the secure storage of the primary anchor and ensure that the primary anchor cannot shift position in any sea condition.
         (4) This fitting, and it's "ears" must be sufficiently strong so as to support the loads from the anchor rode without deformation in the worst of conditions and angles.
         (5) This fitting must be strong enough to support the tack loads of a code 0 or asymmetrical spinnaker.
      b) A stainless steel chain stopper, or equivalent, to be installed on deck between the windlass and the bow roller capable holding the chain rode when under load.
      c) Anchor Windlass: Lewmar V4 (Lewmar 2007 catalog pg. 19) with gypsy no. 203 to fit 3/8" G40 ISO chain (1.22"L x .59"W) and drum (aka capstan). The windlass should be controlled by #69000346 "closed lid" switches mounted on the deck to starboard of the windlass.
   2. Primary anchor and rode
      a) Rocna 55kg.
      b) The rode will consist of 250' of G40 3/8" ISO galvanized steel chain with an oversized link on the end connected to the anchor, fabricated and attached by Acco. Spliced to the chain will be 100' of 3/4" Yale Brait.
      c) The bitter end of the rode shall be affixed to a secure mounting point in the primary chain locker with a nylon webbing strop.

3. Second anchor
   a) CQR: 60lb
   b) The second anchor will be stowed in a permanent mounting bracket, at the bottom of the aft cockpit, that ensures that it will not shift position in any sea conditions.
   c) The rode will consist of 150' of Acco G40 3/8" ISO galvanized steel chain. Spliced to the chain will be 100' of 3/4" Yale Brait. This rode will be stored in the aft cockpit locker.
4. Third anchor
   a) Fortress FX37
   b) The rode will consist of 50' of Acco G40 3/8" ISO galvanized steel chain. Shackled to the chain will be 150' of 1/2" Yale Brait.

X. Electrical System

A. General
   1. See the Electrical System diagram for an overview of the electrical system.
   2. The is no genset.
   3. The general electrical service will be a 24 volt DC 2-wire system.
   4. 12V consumers will be supplied by a dedicated navigation / communication 12V battery.
   5. 220v/230v shorepower will be power the battery charger and hot water heater.
   6. All AC consumers, except the water heater, will be supplied from the inverter.
   7. The service batteries will be charged from the solar panels, wind generator, main engine alternators or shorepower.
   8. See Electrical Budget spreadsheet for consumption details, Electrical Plan block diagram for major components and Electrical Switching Plan for switching and circuit protection plan.

B. Required
   1. Unless otherwise specified, all electrical system components should be sourced from Mastervolt per Mastervolt's recommendations on the size and configuration of the system.
   2. All wiring in the yacht is to be tagged at each end so as to be easily identified for maintenance. Every wire is to be labeled with its function, documented in Builder supplied drawings and cross referenced to locations and functions.
   3. Proper installation of the electrical system shall be the responsibility of the Builder according to best marine practice, the requirements of ABYC, IEEE Recommended Practice for Electrical Installations on Shipboard, Std. 45-1983 and NAFTA standard 302.
   4. Lightning grounding
   5. All power supplied to electronics to have excellent isolation from equipment and shore power electrical noise.
   6. Wiring
      a) General
         (1) A 24 volt system has been fitted so that smaller wiring may be used - workers are to be instructed to take advantage of this fact and to not use the same size wiring as would have been fitted with a 12 volt system.
         (2) Wiring is to be located high in the hull and as much as possible in plastic raceways or conduits. No wiring is permitted to be directly above or below the main engine.

(3) Circuits shall be arranged so that each circuit is conservatively loaded.
(4) Some lighting circuits will be ganged to provide “mood lighting schemes” operable by a single dimmer switch.
(5) Spare breakers shall be provided at each panel to accommodate expansion at a later date.
(6) Easy access shall be provided to the back of all panels for servicing and the cable shall be so installed and connected that normal servicing will involve a minimum of flexing of cables or wires.
(7) The yacht is to be electrically bonded. The bonding straps are to be Builder’s standard copper strap bonding system. It is the intention that the bonding will provide some measure of protection against lightning strikes, conducting such a strike to the keel.
(8) There is to be a ground plane applied to the inside of the hull and glassed over, to serve as a ground plane for the SSB radio and sized according to its requirements.

b) AC: Appropriately sized as specified by the IEEE for "shipboard installations", and the National Electric Code (NEC). All wire to be tinned stranded copper of minimum 14 AWG gauge with PVC Insulation. Wiring should be properly supported and isolated from structure to avoid chafing.
c) DC: Appropriately sized as specified by the IEEE for "shipboard installations." All wire to be tinned stranded copper with PVC insulation. Wire should be properly supported and isolated from structure to avoid chafing.
d) Wire Terminals: To be suitable for the marine environment. Crimped connectors to be tin plated, adhesive lined, with clear heat shrink tubing as manufactured by FTZ Industries, Inc., Simpsonville, South Carolina, or equal.

C. Shorepower

1. There will be two shorepower inlets, one for European style 230v power with one hot wire and a second for US style 220v power with two hot wires. Both inlets shall be protected with circuit breakers. The shorepower connectors shall be 50a connectors located adjacent the aft transom locker. The connectors should be Hubbell metal receptacle with all weather sealing and connectors sized to accept 50a.
2. Shorepower will be wired directly feed the battery charger and the hot water heater. All other AC consumers will be supplied by the inverter.
3. The builder shall supply two high quality power cables, 75’ in length, stranded wire capable of handling 50a. Preferably Helukabel H05BQ-F / H07BQ-F or a cable with equivalent flexibility.

D. Batteries

1. House Service Bank
   a) Twelve (12) Mastervolt MVSV 2/1000 2V gel cells (weight 150lbs each) wired in series to produce a 1,000ahr @ 24V battery bank
   b) This bank will be located beneath the salon sole above the keel floors. The Builder is to provide appropriately sized fiberglass battery boxes. The batteries shall be secured to the box structure to prevent shifting in any position, including a complete roll over and shall isolate the batteries from bilge water.
   c) The battery box will be ventilated as described in the HVAC specifications.
2. Engine start battery
   a) Optima D31M battery (900 CCA, 75ahr @ 12v).

b) This battery, and the navigation / communication battery, should be enclosed in a builder supplied battery box in the engine room that is secured from any movement including a complete rollover.

3. A navigation / communication battery identical in size to the start battery shall be located adjacent the start battery.
4. Paralleling switch: A momentary contact switch located in the engine control panel on the starboard side of the cockpit will trigger a relay which will parallel the engine battery and the navigation / communication battery. A second momentary contact switch with the same functionality shall be located in the engine box adjacent the engine start switch. The paralleling switches will be used in the event the starting battery is discharged.

E. Battery Charging
1. House Service battery bank: This battery bank will be charged by any and all of the following suppliers:
   a) Two Electrodyne 150a / 24v alternators controlled by Balmar MC-624H regulators fitted with Balmar temperature sensors (MC-TS-B).
   b) Solar
      (1) Six (6) Sunware 3265 (24v) panels on the hard dodger.
      (2) Four (4) Sunware 3266 (24v) panels on the mid-deck in front of the hard dodger.
      (3) The panels will be divided into two banks, one port, one starboard, to mitigate the shadow effects.
      (4) A separate Blue Sky Energy 3024Di charge controller will control each bank of panels.
      (5) Both charge controllers will be monitored by a single Blue Sky Energy IPN Remote display mounted where its blinking lights will not be a distraction (e.g., second layer of electrical panel, in mechanical closet, etc.).
   c) Wind
      (1) A Superwind 350 24V wind generator will be mounted to a post on the starboard side of the transom scoop.
      (2) The generator will be controlled by a Superwind CRM 24V charge regulator and a Stop switch. The Stop switch should be installed at the companionway panel.
   d) A Shorepower: A Mastervolt Charger Mass 24/100-C will charge the house service bank when connected to shorepower. An AC supply monitor will be installed in the panel.
2. Start battery: The start battery will be charged by a dedicated Yanmar supplied 80a / 12v alternator with an integral voltage regulator.
3. Navigation / Communication battery: This battery will be charged by a Mastervolt Mac 24/12-20 DC-DC converter supplied by the house service bank.

F. Inverter: An Inverter Mass 24/4000 (120v/60Hz) will supply 110v / 60Hz AC from the house battery bank for all AC consumers except the hot water heater.
1. AC outlets
   a) Standard US, double, 15a 3 pin type with GFI, positioned to enable usage by “power brick”.

G. DC Switchboard and Breakers
1. DC power will be switched and circuit protected as documented in the NM 54 Electrical Switching worksheet.

2. All panels should be constructed to provide excellent access for maintenance and expansion.
3. The panel shall have suitable facilities for monitoring the generation and consumption of 12v/24v/110v power as well as the charge status of all battery banks.
4. All panels shall have small LED's indicating "circuit on" or “fault”.

H. Interior DC lighting: See Fay 54 Lighting, Outlets and Switching list..
1. All DC lighting will be 24v, unless a specific fixture is specified that is not available in 24v.
2. Lights on inside of (or behind) cabinets where equipment is located to facilitate maintenance TBD.

I. 12V consumers
1. All 12v consumers and outlets will be powered from the communication / navigation battery.
2. DC Outlets: See Fay 54 Lighting, Outlets and Switching list.

XI. Plumbing

A. General
1. The PEX system shall be used for all domestic water and wherever else that it can be reasonably utilized (e.g., deck wash).
2. All plumbing systems to be carefully installed and the pressure water plumbing tested to 60 psi.
3. Every pipe will be labeled with its function, documented in drawings and cross referenced to function and location.
4. Plumbing systems to be laid out for ease of draining for winter storage. Drain plugs at low points shall be located to be easily accessible.
5. Special care shall be taken in routing all piping so that it is neat and orderly with all valves and drains readily accessible.
6. Protective collars to be fitted at all points where piping could otherwise chafe against ship's structure, other piping, etc.
7. Double stainless steel hose clamps are to be fitted wherever hose clamps are used.
8. Any piping through the forepeak watertight bulkhead shall be so arranged as not to interfere with watertight integrity.
9. All vented loops are to be quickly accessible and located as high as possible.

B. Required
1. Freshwater System
a) Spectra Newport 400 MK II watermaker (16gph / 24v) with MPC-5000 controller. The filters should be positioned for easy access and changing (i.e., room to swing elbows, etc.). Sound and vibration isolation should be used to ensure the system is undetectable when in operation.
b) The MPC-5000 controller should be mounted at nav station.
c) Location of water maker intake should consider location(s) of head waste seacocks (i.e., don’t suck sewage into the water maker)
d) A valve shall be located next to each fixture to allow isolating that fixture from the pressure water system (as on a domestic water system).

e) Freshwater tank, fill and supply system to be configured per the Freshwater System drawing.
f) The system shall have a positive (constant) pressure circuit to all fixtures The primary pressure pump shall be a to be a Flojet R4525-743 24v 4.5 gpm, located where it can be easily accessed for service.
g) An Espar Hydronic 10 coolant heater will be plumbed to the Isotemp hot water heater to provide domestic hot water when not connected to shorepower.
h) An Isotemp water heater, model Basic 40DS with dual coils will heat water from shorepower, engine coolant, or the Espar hydronic heater.
i) A Scandvik model # 101517-MRS (order # 14126 - 6 ¾"W x 12 ¼"H) transom shower, with hot and cold water is to be located outboard the starboard transom locker for use on the swim platform.
j) A cold freshwater outlet should be located on deck roughly amidships and terminate in a Jabsco 31910-1200 flush hose connector.
k) Interior plumbing fixtures: See the Interior section for the specification of plumbing fixtures for each living space.

2. Both showers will pump directly overboard from the shower pan via a Jabsco 31610-0094 pump controlled by an switch located adjacent to the shower.
3. Saltwater outlets
   a) A manual seawater pump for the galley sink to use the Whale Tiptoe Mk4 GP1309, which is operated by foot and is recessed into the floor. This will supply a separate spigot.
   b) Deck wash outlets, driven by a Flojet R4525-743 24v 4.5 gpm pump, to be located at the forward and aft ends of the yacht. The lines should terminate in a Jabsco 31910-1200 quick release snap on/off connector.
4. Bilge Pumping System
   a) The main bilge in the salon will be pumped out by two (2) Johnson L4000 (32-4000-02) electric bilge pumps with Ultra Safety Systems model SR float switches. One will be placed in each of the two most aft bilge compartments at roughly station 5 and 5.5 (i.e., the two deepest compartments above the keel). The integral check valves shall be removed; external check valves, easily accessed for cleaning, should be located in the exhaust hose.
   b) The water tight area around the rudder post and steering quadrant will be pumped out by a manual bilge pump.
   c) The bow locker will be pumped out with a Johnson L2200 (32-2200-02) electric bilge pump with Ultra Safety Systems model SR float switch. The integral check valves shall be removed; external check valves, easily accessed for cleaning, should be located in the exhaust hose.
   d) The chain locker will be pumped out with a Johnson L2200 24v electric bilge pump with Ultra Safety Systems model SR float switch. The integral check valves shall be removed; external check valves, easily accessed for cleaning, should be located in the exhaust hose.
   e) An Edson model 638AL-200 manual bilge pump will be mounted in the galley with its intake in the aft keel bilge compartment and it's 32" handle mounted conveniently close by (wet locker?).
   f) An Edson model 638AL-200 manual bilge pump will be mounted in the cockpit to pump the aft watertight compartment and the port lazarette (via a Y valve).

g) The electric pumps are to be wired for manual and float switch operation. Care shall be taken to insure that bilge pumps, including suction the and float switch, may be easily accessed by hand.

5. Sewage system
   a) Both toilets will be plumbed with a Y-valve to enable discharge to either holding tanks or directly overboard. See Tankage for details on the tanks.
   b) Sewage plumbing from the toilets to the holdings tanks will be PVC white pipe or "Saniflex" tubing.
6. The following pumps should be wired through a Celectron Bilge Pump Activity Monitor BW8 (http://www.celectron.co.uk/html/home.html) mounted at the nav station monitor panel and wired to an external alarm (probably the same one we'll use for other alarm functions like radar, AIS etc.).
   a) Primary and secondary main bilge pumps (2)
   b) Bow locker bilge pump
   c) Chain locker bilge pump
   d) Cockpit locker / rudder post bilge pump
   e) Freshwater pressure pump
   f) Saltwater washdown pump
   g) Forward black water pump
7. Thru-hull Fittings
   a) Thru-hull fittings and penetrations will be as documented in the NM 54 Systems Schematic.
   b) All seacocks, except the main engine raw water seacock, will be glass reinforced "Marelon" ball valves such as the Forespar MF 850 or equivalent.

XII. Main Engine / Propulsion

A. Required

1. Yanmar 4JH4HTE turbocharged diesel engine 110HP @ 3200 RPM with KM4A2 2.63 marine gear and "C Type" instrument panel, to be installed per manufacturer's instructions.
2. The engine is to be electrically started by a 12VDC battery (see Electrical – Batteries).
3. The engine should be fitted with two Electrodyne 150a @ 24v alternators.
4. Exhaust System
   a) 3" from engine to waterlift and from waterlift to stern above the waterline.
   b) Centek Industries "Vernalift" fiberglass inline marine muffler.
   c) Hose to be as approved for wet exhaust systems with wire reinforcement. Fiberglass tubing where fitted to be as manufactured by Centek Incorporated or equivalent tubing made with fire-retardant resins. All connections to have double stainless steel hose clamps. The exhaust run is to be properly supported on sound absorbing mounts and is to have a high loop at the aft end extending up to the underside of the main deck. A swing check valve shall be fitted to prevent the intrusion of sea water into the engine exhaust in heavy weather.
5. Propeller System Drive Train
   a) Propeller: 3 blade Gori folding propeller 22" x 17 RH.
   b) Propeller Shaft: Shaft will be 2" diameter Aquamet 22 stainless steel with one zinc anode.

c) A “Spurs” cutter will be mounted on the propeller shaft.
d) Strut: Custom cast Bronze.
e) Cutless bearing: Rubber bearing with a non-metallic (epoxy fiberglass) shell: 2 5/8” O.D. x 1-3/4” I.D. x 7” L as manufactured by B.F. Goodrich part no. 4173 or equivalent.
f) Stuffing Box (stern seal): A PYI PSS Shaft Seal. Builder is to plumb raw water injection from the main engine raw water system.
g) Stern Tube: Fiberglass tube approx. 2.625” I.D. X 3” O.D.

6. Max Power R200/8 RT201063 thruster.
7. Drip Pan: Areas of the bilge beneath the engine are to be dammed off to contain any drips or leaks from the engine.
8. Engine instruments to be mounted at the starboard forward end of the cockpit
9. Engine controls: A Spinlock ATCU/1 flush mount throttle control adapter will be mounted on the starboard side of the cockpit above the jib sheet bin, and mated to a Teleflex B700 SOL #172118 throttle/transmission control.
10. Engine(s) start/stop. In addition to start/stop from the instrument panel, an additional start/stop switch is to be located in the engine space to facilitate engine maintenance.
11. Easily accessed for all regular maintenance and repairs (oil changes, fuel filters, transmission, coolant, raw water pump, etc.
12. Locate primary fuel filters such that there is a clear view of the water collection bowls
13. Thermostatically controlled inlet/exhaust fans to ventilate engine room (also see HVAC).
14. Oil change system: Reverso GP-3012.
15. Speedseal cover on water pump impeller.
16. Vetus strainer inline after raw water pump to catch the bits and pieces of a failed impeller so they are not sucked into the heat exchanger.

XIII. Heating / Ventilation / Air Conditioning

A. Required

1. Dorades: Total of six boxes, two in the main salon, two in the galley, one in the aft head and one in the aft cabin.
   a) Constructed of fiberglass. Interior openings in all cases are to have insect and air shutoff screens. Exterior openings are to have storm covers which can quickly replace each cowl. The dorade boxes are to be of a streamlined design to integrate nicely with the aesthetic of the surrounding deck.
   b) Plastimo # 16925 (white with blue interior) cowls will be used on the dorades over the salon.
   c) Plastimo # 16923 (white with blue interior) cowls will be used on the dorades over the galley, aft head and aft cabin.
2. Heat
   a) Hot water from the Espar Hydronic 10 coolant heater will be routed through heat exchangers with thermostatically controlled fans in each cabin.
   b) Alternatively, the heat exchangers may be heated by the engine coolant. A 3 way valve will control the feed to the heat exchangers (Espar, engine coolant, or OFF/isolated).
3. Air conditioning: A Marine Air Vector Turbo VTD6K air conditioner will cool the forward cabin (calculated volume of 252 cu. ft.). No other area of the boat will be air conditioned.

4. Eight Hella Turbo or Caframo Bora (#748) fans at locations to be specified. http://www.caframo.com/12volt.htm#748).
5. Engine and battery boxes
   a) The battery boxes will take in air from below the cabin sole and exhaust air through the engine box exhaust fan.
   b) The engine box will have an inlet fan to push air into the box and an exhaust fan to extract air from the box. The air inlet and exhaust will be in the cockpit coaming aft of the helm positions. One thermostatic sensor for the fans will be located in the engine box and a second one in one of the battery boxes; both will be adjustable with regard to their switching temperature. Both fans will be switched on in any of the following conditions:
      (1) engine is switched on irrespective of temperature, or
      (2) the temperature in the engine box rises above the setting of its thermostat, or
      (3) the temperature in the battery box rises above the setting of its thermostat.

XIV. Electronics

A. General
   1. Electronics will be the components with the shortest life cycle on the boat and should be installed in a manner which anticipates and facilitates regular change and reconfiguration.
   2. All power supplied to electronics to have excellent isolation from equipment and shore power electrical noise.

B. Required
   1. Ground plane: The ground plane will consist of 120’ of 3” wide copper foil, .021” thick, glassed into the hull.
   2. Communications and navigation
      a) Icom 802 SSB with
         (1) AT-140 antenna tuner (backstay antenna)
         (2) SCS PTC-IIusb modem
         (3) DSC watch antenna (Gam SS-2)
         (4) Backstay antenna as detailed in the Spars section
      b) Icom 604 VHF with
         (1) Two (2) Command Mic III remote microphones (one each installed at the watch station and at the starboard helm).
         (2) Gam SS-2 antenna mounted at the masthead as specified in the Spars section. Antenna to be connected with LMR-400 coaxial cable.
         (3) Standard Horizon 220SW hailer speaker.
      c) Syrens ECAP-X WiFi bridge and access point.
         (1) Antenna mounted on the first spreader and connected with LMR-400 coaxial cable.
      d) Iridium satellite phone
         (1) Handset model 9505a
         (2) Fixed mast antenna
         (3) Data adapter
      e) ACR GloabalFix 406 Cat II EPIRB – mounted??
   3. Navigation
      a) Furuno MFD8 (2)

(1) One mounted at the starboard helm
(2) One mounted at the watch standing station

b) Furuno DRS4A radar sensor
c) Furuno HUB101 NavNet hub
d) Furuno N2K GPS model GP320BXXXX
e) Furuno FA50 AIS Class B transponder
(1) Antenna mounted on first spreader

4. Boat Instruments – Furuno FI-50
5. Computer:
   a) iMac 20" (16"h x 19.25"w x 2"d)
   b) HP C6180 wireless printer/scanner/copier
6. Miscellaneous
   a) Maretron DSM250 mounted at nav station
   b) Meteograf Baroscope mounted at nav station
7. Entertainment
   a) Apple 30" Cinema display (27.25"w x 18"h x 1.75"d) for connection to entertainment components to be mounted in salon.
   b) Alpine 9886 audio receiver.
   c) Speakers
      (1) Two B&W CWM 500 speakers are to be provided and installed in the salon
      (2) Two B&W CWM 500 speakers to be provided and installed in the forward cabin.
      (3) Two PolyPlanar MA5104 speakers mounted in the cockpit coaming behind the helm positions.
   d) Speaker switching and volume controls TBD.

XV. Tankage

A. Required
   1. All tanks are to be tested using air pressure to a hydrostatic head equal to 24 inches above the fill cap or vent.
   2. All tanks are to be secured to the hull to ensure that they will not shift in severe conditions including a 360 degree roll.
   3. All tanks are to be effectively baffled.
   4. All tanks shall have a sufficient number of well located access ports to ensure that the entire tank may be accessed for inspection and cleaning.
   5. Tank Venting: All vents are to be located as high as possible and as nearly above their respective tank as possible, and well above their respective filler plate.

B. Fuel
   1. This system is to be a day tank type system which allows the main engine to have fuel supplied and fuel returned to/from the day tank, and the day tank to be supplied by any of the four storage tanks.
   2. The fuels tanks will be welded 5086 aluminum alloy.
   3. The fuel tanks should not have screens on the pickup tubes.

4. These tanks will be securely attached to the hull structure to prevent movement. They will be located well outboard under the raised sole in the salon.
5. Port: One tank of 70 gallons and one tank of 45 gallons.
6. Starboard: One tank of 70 gallons and one tank of 52 gallons.
7. Fuel tank fillers: Four Niro-Petersen 50mm stainless steel, flush mounted deck fills, with locks, one each for the port and starboard pair of tanks; gasketed to prevent leaks, stamped "DIESEL" will fill the four bunker tanks.
8. A 50 gallon day tank will be located just aft of the keel.
9. All fuel lines between the tanks and between the day tank and the engine shall be stainless steel.
10. The supply manifold to the day tank is to be neatly arranged with all the valves easily actuated and labeled. Properly sized stainless steel ball valves will be used.
11. Fuel will be transferred from the fuel supply manifold to the day tank by a Jabsco 18680-0940 pump through a Racor 75/500 fuel filter. The transfer pump will be controlled by an Offshore Systems Transfer Pump Controller.
12. A bypass valve will allow the engine to draw directly from any storage tank.
13. The primary fuel filters will be a Racor 75/500 placed between the day tank and the engine. A remote pressure gauge for this filter assembly will be mounted in the cockpit adjacent the Yanmar panel.
14. A Walbro FRB16-2 electric auxiliary fuel lift pump will be installed between the supply bypass valve and the primary fuel filters. It may be switched on by either 1) a momentary contact switch mounted adjacent the primary fuel filters, or 2) a switch (not momentary contact) in the engine room adjacent the engine cranking switch.
15. All filters should be positioned to facilitate inspection of the water collection bowels and changing of the filters.

C. Fresh water
   1. Two tanks built of welded polypropylene.
   2. One tank of 100 gallons and one of 45 gallons.
   3. A Niro-Petersen 50mm stainless steel, flush mounted deck fill, with lock, stamped "WATER", will service both tanks.

D. Black water
   1. Each holding tank should be fitted with a Jabsco model 59090-0024 pump with a 1-1/2" suction pipe for discharge overboard (see Through Hulls).
   2. Each tank shall also be plumbed to enable pump out from a deck fitting when necessary. The pump out fittings should be Niro-Petersen 50mm stainless steel flush mounted deck pump out fitting, with a lock and stamped "WASTE".
   3. Forward head: One 26 gallon polyethylene tank to serve the toilet.
   4. Aft head: One 15 gallon polyethylene tank to serve the toilet

E. Propane
   1. Three (3) Trident #1420-0020 composite propane tanks should be fitted in a vented storage box, accessed via the port transom door.

2. The propane supply system is to include a Trident 1230-1411 regulator, a low pressure solenoid and an on/off switch near the stove.
3. The propane should be plumbed from the propane locker to the stove using Aeroquip hose FC 321-06-UL 7mm 350 psi max. or an equivalent.

F. Tank Level Monitoring:

1. All tanks will be fitted with Offshore Systems NMEA2000 (N2K) level senders. The senders should be connected via N2K "micro" cabling. The sender specifics are as follows:
   a) Five fuel tanks, part #3271-500 (500mm sender)
   b) Forward water tank, part #3281W-500 (500mm sender)
   c) Aft water tank, part # 3281W-1000 (1000mm sender)
   d) Two holding tanks, part #3281B-500 (500mm sender)
2. An Offshore Systems MultiTank display, part #3330 will be used to display the tank levels. Allow mounting room for the upgraded color sensor they will supply in the fall of 2008, approximately 7"w x 7"h.

XVI. Safety

A. Required

1. A Winslow 6 person raft installed in the aft end of the cockpit.
2. A MOM8 and Lifesling to be installed on the stern pulpit
3. Builder to work with Owner to devise a system for anchoring Jacklines to port and starboard in such as manner as to enable them to be easily removed when not needed. Jacklines will be made of spectra or dynema webbing and terminate 6'- 8' from the transom.
   a) Builder will work with Owner to provide attachment points in the cockpit to enable a crewmember to move from the companionway to the helm or jacklines without disconnecting the safety tether.
4. Builder to provide one properly sized softwood plug for each underwater thru-hull. These are to be attached to each thru-hull by a nylon cord.
5. Floor boards and cabinets will have a positive latching mechanism that we are confident will keep them secure in a knockdown or rollover.

B. Under discussion

1. External audible alarm, like car alarm to use to scare off boarders?
2. Hard, water tight covers for cockpit speakers, or locate them behind watertight bulkhead.
3. MOB system
   a) Raymarine LifeTag (200 hr battery life on CR2)
   b) Mermaid-id from First Light Solutions
   c) http://www.wavefinder.ch/en/
   d) MOB i-lert http://www.mobilert.com/default.asp?id=home

C. Details and Vendors

1. MOB button at helm and maybe also under hard dodger
2. Jack lines
   a) Run from bow to roughly 7' from transom (avoid getting dragged behind the boat)
   b) maybe Schlauchband for jack lines from Mammut Tec www.mammuttec.com

c) Per PS V31 #15, webbing, not nylon, possibly polyester or spectra (used by Brad Van Liew).
d) See Kate Laird's email of 1/26/06 regarding jack lines on Seal.

XVII. Miscellaneous

A. General
   1. Other than spare parts included with installed systems, the Builder will not be responsible for providing any spare parts.
   2. Except for specialty wrenches for filler caps, deck plates, etc., and tools provided with purchased systems (e.g., filter wrench with watermaker) the Builder will not be responsible for providing any tools.

B. Required
   1. If a panel has to be removed to access something, then the fasteners for that panel should be of a type that facilitate repeated attachment and removal, ideally with a captive fastener that doesn't end up on the floor, in the bilge or over the side. Wood screws are not an appropriate fastener for anything that we expect to remove and refit more than once.

XVIII. Commissioning

A. Diesel fuel: The builder will fill all fuel tanks half full of diesel fuel for dock and sea trials.

B. Main engine crankcase oil: Builder to fill with appropriate lube oil before dock and sea trials.

C. Main engine gear oil: Builder to fill the gearcase.

D. Dock Lines: Four - 60 foot long 1/2" dia. braided nylon dock lines with eye splices on one end, to be provided by Builder.

E. Fenders: Four ribbed fenders 10" x 26", to be provided by Builder. Each fender to have 10 feet of nylon rope attached.

F. <u>All</u> construction debris must be removed from throughout the entire boat (both normally accessed and normally not accessed compartments), including but not limited to tools, screws, nuts, sawdust, fabric scraps, scrap wood, fiberglass pieces, etc. The bilges should be thoroughly flushed, all limber holes tested and working correctly and no debris should be in the bilge sump.

G. IMS measurement certificate to compare the finished boat to the design numbers

XIX. Dock and Sea Trials

A. Dock Trials
   1. All machinery and equipment shall be installed and be in operating condition before arrival of the Owners and/or their representative for dock trials.
   2. All machinery is to be operated to the satisfaction of the Owners, or their representative, at the dock, running continuously for one hour or as recommended by the manufacturer. After satisfactory dock trials and when the yacht is proven to be in a seaworthy condition sea trials can begin.

B. Sea Trials

1. Sea trials will be made during which the yacht will be required to make runs at various speeds under both sail and power, including full power. Steering and reversing tests are also to be run. It shall be possible to steer the yacht manually without undue exertion and indeed with pleasure.
2. The yacht shall be anchored with all anchors and the anchors recovered and properly stowed. All auxiliary equipment, such as pumps, autopilots, comm./nav equipment, watermaker, etc., are to be thoroughly tried to the satisfaction of the Owners and/or their representative.
3. Should any defects arise, they shall be corrected by the Builder immediately, in a satisfactory manner. Builder should make allowance for such unavoidable adjustments both in his delivery schedule.
4. Trials shall include a full day under sail with a representative from the Designer aboard in true winds not less than 10 knots. Builder shall have aboard sufficient personnel and tools to retune the rig underway at the discretion of the Designer. In the event that the Designer deems necessary more extensive retuning of the rig than is possible underway (alteration of the D2 tension or alteration of headstay length, for example) he shall make known his recommendations to the Builder, who shall make such alterations before delivery of the vessel to its Owners. Once the rig is tuned to the Designer's satisfaction; notes, measurements and photos shall be taken to insure that subsequent rig "set ups" will duplicate the initial one.

C. Acceptance And Delivery: After completion of all the requirements of these specifications and plans, and after satisfactory tests and trials have been made, a thorough cleaning, and finish work touch-up to the satisfaction of the Owners, the yacht shall be formally delivered to the Owners; afloat and in proper operating condition. The Builder shall deliver to the Owners all the required documents showing clear title to the yacht.

D. Manuals And Warranties: An Owners' manual will be compiled by the Builder and shall include all manufacturers' literature. While the Owners will assist in compiling this manual, Builder is expected to facilitate this work by carefully setting aside all related documents when gear is unpacked for installation aboard the yacht. All equipment warranties shall begin on the day of official delivery to the Owners.

E. Service Warranty: Any service work on subcontractor supplied equipment that is found to be required after sea trials will be the Builder's responsibility to resolve before the Owners take delivery and shall be the Builder’s responsibility throughout the warranty period.