

Design Brief

Cruising Yacht

for

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## I. Design Summary

### A. General

1. A 50' – 60' 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 50 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 there will be a crew of two with only one person normally on watch, thus designed to be essentially single handed once at sea.
3. For a given displacement, longer and narrower is preferred over shorter and beamier.
4. 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, 15% at sea; or roughly 50 nights at sea each year. The interior design will emphasize living for two people, with an ability to accommodate two guests on occasion. Interior 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 characteristics, but to ensure an excellent interior design.
5. 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. Stowage will be provided for spares, and a work space for repair work will be included in the layout (though this space need not necessarily be dedicated solely to repair work).
6. 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.

### B. Required

1. Launch second half of 2007
2. Safe and secure at sea, comfortable and pleasant at anchor.
3. Hard dodger
4. Designed to be maintained and serviced. All components and systems should be designed for accessibility and maintainability. It should be assumed that half of the mechanical systems will be replaced and all electronic components will be entirely replaced at least once during the first seven years.
5. Owner is 6'1" (1.86m) and does not like to duck or bump his head!
6. Modern, light, esthetically pleasing and functional interior.

### C. Under Discussion

1. Total cost of ownership not to exceed \$140,000 / year for seven years.

## **II. Hull**

### A. Required

1. Minimize transom slap and slamming when at rest.

### B. Under discussion

1. Minimum beam of 14.5'.
2. Aluminum or composite? Low maintenance of unpainted aluminum, and “low rent” look are both appealing. Lower weight of composite (or so I’m told) is a vote for composite. Which is most resilient to impact, not just surviving impact, but maintenance after impact? In any case, we would like an exterior finish that is more functional than beautiful.
3. Bow thruster mounted in tunnel?

### C. Wish List

1. Lots of waterline.

## **III. Keel**

### A. Under discussion

1. Bulbed and moderate draft (6' – 7')
2. No moving parts.

### B. Wish list

1. No excessive “sailing” when at anchor.

## **IV. Rudder / Steering**

### A. General

1. Biased towards balanced spade rudder based on good experience with New Morning.

### B. Required

1. Hydraulic autopilot

### C. Under discussion

1. Dual rudders? Less load on rudder bearings?
2. Wind vane? Or how to silence the autopilot?

### D. Wish list

1. Reliable rudder bearing with no leaks.

## **V. Interior**

### A. General

1. Forward “owner’s suite”, main saloon with adjacent navigation station and galley, aft “multi-purpose” cabin.

2. Design style similar to Trintella designs (ignoring fabric selections)



B. Required

1. Interior spaces will be “modern” in design with light wood panels (e.g., maple), large radius curves and excellent lighting creating a light, comfortable and airy living space.
2. Minimize opportunities to bump head of 6’1” (185.5cm) owner.
3. Latching floorboards to be secure in the event of knockdown or roll.
4. Use of LED lighting wherever possible to minimize power consumption.

C. Under discussion

1. Minimum 6’6” (2m) headroom in all living spaces.

D. Wish list

1. Interior designed by designer with name recognition to increase resale value. In the style of Andrew Winch or Ken Freivokh.

E. Master suite

1. General
  - a) Excellent ventilation
2. Required
  - a) Centerline “queen” bed ( $\approx 60'' \times 78''$ , 1.5m x 2m)
  - b) Toilet and vanity; entire head can be used as shower when required (i.e., sump in floor).
  - c) Hanging locker for clothing.
  - d) Hull “windows” and at least one hatch to provide natural light and ventilation.
3. Wish list
  - a) King size bed

F. Saloon

1. General: Patterned after La Rossa saloon (ignoring fabric selection)



2. Required
  - a) Deep, wide, angled companionway steps (like New Morning)
  - b) Dining table with “booth” style seating.
  - c) Two fixed chairs with retracting foot rests
3. Under discussion
  - a) Saloon table folds open to serve two fixed chairs.

#### G. Nav Station

1. General
  - a) Designed to provide access and facilitate change. The electronics are the systems most subject to improvement over time. Marine electronics have about a 3-4 year life cycle, so I anticipate at last one major upgrade during seven years and probably several minor upgrades. Everything should be mounted to provide easy access to installations and facilitate change.



2. Required
  - a) Sufficient space for mounting a large collection of communication and navigation equipment as well as at least one large flat panel display.
  - b) Full foot/leg room available (i.e., sufficiently inside curve of the hull).
  - c) Ventilation and air circulation to electronic equipment cabinets.
  - d) Sufficient space to use paper charts.

3. Under discussion
  - a) Usage of wireless instruments and systems were possible.
4. Wish list
  - a) Seating that would facilitate viewing by two people for short periods of time.

## H. Galley

1. General
  - a) Long, narrow galley with lots of counter space and overhead cabinets. Not “U” shaped.



2. Required
  - a) Large, deep single sink
  - b) Two burner gas cook top
  - c) Large oven (28"?)
  - d) Cabinets above and below; lower cabinets have large drawers, not shelves.
  - e) Counters that are a good working height and don't require any bending over to work at them; higher than standard heights and definitely higher than New Morning.
  - f) Rounded peninsula as in La Rossa
  - g) Refrigerator
  - h) Freezer
  - i) Washer dryer (located at aft end)
  - j) Trash compactor
3. Under discussion
  - a) Separate beverage refrigerator
  - b) Microwave integrated into oven (i.e., single unit)
4. Wish list
  - a) Separate oven from cook top.

## I. Guest cabin

1. General
  - a) Multi use cabin, sea berths at sea, general use when at anchor, occasionally guest cabin.
2. Required
  - a) Two berths suitable for use as sea berths.

- b) Desk and “office” space.
  - 3. Under discussion
    - a) Pullman style bunks that fold away when not in use.
    - b) Fold away desk.
  - 4. Wish list
    - 5. Aerobic exercise equipment.
- J. Second head
  - 1. Required
    - a) Toilet, vanity
    - b) Separate shower tall enough and wide enough for owner
  - 2. Wish list
    - a) Accessible from guest cabin and saloon/galley
- K. Engine / Equipment room
  - 1. General
    - a) A dedicated space for the main engine, water maker, genset, hydraulic pumps, electric bilge pumps, water pumps, hot water heater, air heater, tool storage, charging rack (for rechargeable tools and toys), and work bench with vise.
  - 2. Required
    - a) Excellent ventilation
  - 3. Under discussion
  - 4. Wish list
    - a) Standing headroom.
    - b) Water tight to improve the chances of having reliable systems in an emergency.

## **VI. Sail Plan**

- A. General
  - 1. Should be manageable for a female solo sailor (not Ellen MacArthur!).
  - 2. We assume 70% of the time the wind is aft the beam so the sail plan should reflect that bias and facilitate performance and handling off the wind without nylon sails.
- B. Required
- C. Under discussion
  - 1. Cutter rig
  - 2. Roller furling headsails which are not reefed, furl and move aft with smaller and smaller headsails as on solo racing boats.
  - 3. Sprit to get the tack of the reacher or gennaker further forward of the fore stay.
  - 4. What is normal downwind sail configuration?
- D. Wish list
  - 1. Roller furling for a nylon sail for light air or running.



## **VII. Sail Handling**

### A. General

### B. Required

1. Powered winches that can also be manually operated. Our experience is that not all winches advertised to offer this actually work in practice.

### C. Under discussion

1. Hydraulic roller furling and winches?
2. LeisureFurl boom for furling main?
3. All control lines lead to cockpit?

### D. Wish list

### E. Reckmann furlers

## **VIII. Deck Plan**

### A. General

1. A clean, uncluttered deck that does not present an obstacle course when the deck must be traversed at night in poor conditions and encourages rather than inhibits casual usage.
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” and inevitably some in conflict with each other.

### B. Required

1. Hard dodger, possibly with extended top for sun shade. Optionally closed aft with canvas; canvas stows securely when not in use in a manner that will survive waves washing the dodger. Forward panels open for ventilation. Visibility above to see rig when under dodger. This space provide a casual living space as well as a space to stand watch in poor conditions. Once again ignore the fabric selection!



2. Post aft for radome, GPS antenna, sat comm antenna, etc.
  3. Secure and accessible storage for everything that is used on deck including sails, fenders, dock lines, life raft, deflated dinghy, outboard, outboard fuel (working tank and additional fuel), snorkeling and fishing equipment, etc.
  4. Davits or some form of night time dinghy storage.
  5. Bow anchor rollers, secure mounts and chain locker(s) for two forward anchors.
  6. Stern anchor roller, secure mount, storage for rode and a method for retrieval of the anchor (windlass? Primary winch?).
  7. Swim ladder.
  8. No teak decking or cap rails, no exterior wood.
  9. Canvas bimini that stows securely at deck level.
- C. Under discussion
1. What to use to surface the deck? Paint? Treadmaster?
  2. Anchor sprit?
  3. Solar panels mounted on top of dodger?
  4. Canvas bimini.
  5. Center cockpit?
- D. Wish list
1. Chain locker positioned further aft to move the weight off the bow.
  2. Flush hatches (Rondal or Nirvana).

3. Passerelle integrated and out of the way when not needed.
4. Integrated jack lines.
5. Perforated toe rail for attachment of snatch blocks, lines, whatever.
6. Companionway hatch: one piece lexan, lowers into slot, raises (manually) to latch at half or full open (a la Swan 46).
7. Cockpit seats (or possibly removable cushions) should provide good back support (i.e., higher than just mid-back)
8. Storage space for trash bags

## **IX. Standing Rigging and Spars**

### A. General

1. Simplify sail handling and reduce the opportunity for error. Design in all items that are routinely needed to maintain well trimmed and controlled sails and spars.

### B. Required

1. Vang
2. Boom control / preventer

### C. Under discussion

1. Swept spreaders?
2. Store spinnaker poles vertically on mast?
3. Cat rig?
4. Van de Stadt swing rig?

### D. Wish list

1. Carbon fiber mast.
2. Simplicity.

## **X. Running Rigging**

### A. Required

1. Most lines led to the cockpit, excluding only those which are more conveniently handled on the foredeck.
2. Ability to reef from the cockpit.

### B. Under discussion

1. Secondary method of securing reefed main (e.g., tack or clew hooks).

## **XI. Ground Tackle**

### A. Required

1. Permanent mounting for two bow anchors and one stern anchor and associated rodes.
2. One windlass forward

3. Mechanical assistance to recover stern anchor
- B. Under discussion
1. Hydraulic windlass

## **XII. Electrical System**

- A. General: A primarily DC boat with 24V system
- B. Required
1. 24V DC system
  2. Inverter
  3. Lightning grounding
- C. Under discussion
1. 110v or 240v AC
- D. Electricity Generation
1. Required
    - a) As much solar generation capability as can be safely and reliably installed on deck (e.g., Solara panels, not winged panels).
  2. Under discussion
    - a) Small DC genset depending on how much power can be generated from solar.
  3. Wish list
    - a) Solar plus batteries could provide 3-4 days of power.
- E. Batteries
1. General
    - a) Batteries sufficient for minimum of X days of usage when at sea or rest (whichever is greater).
  2. Required
    - a) Separate battery banks for starting and house.

## **XIII. Plumbing**

- A. Required
1. High capacity water maker – 40GPH, filter membrane(s) probably not mounted in engine compartment.
  2. Water maker filters easily accessed for maintenance.
  3. Fresh water flushing for heads (manual, not electric)

## **XIV. Heating / Ventilation**

- A. Required
1. Excellent air flow through the cabin(s)
  2. Forced air heater (e.g., Espar)

- B. Under discussion
  - 1. Air conditioning?
  - 2. Hydronic heating instead of forced air?
- C. Wish list
  - 1. Less deck clutter than traditional array of Dorade vents.
  - 2. Dome shaped deck vents as on Swan 46?

## **XV. Main Engine / Propulsion**

- A. Required
  - 1. Easily accessed for all regular maintenance and repairs (oil changes, fuel filters, transmission, coolant, raw water pump, etc.
  - 2. Not like this!



- B. Wish list
  - 1. Saildrive
  - 2. Minimal vibration and noise
  - 3. Minimize turbulence and force on rudder when under power

## **XVI. Electronics**

- A. General
  - 1. Electronics will be the items with the shortest life cycle on the boat and should be installed in a manner which anticipates regular change and reconfiguration.

2. Although the list of electronics is extensive, the owner is fully trained in the use of their respective on/off switches to minimize power consumption.
- B. Required
1. SSB, VHF, Satellite phone
  2. Boat instruments (wind speed/direction, boat speed, depth fore/aft)
  3. Radar, GPS/Plotter
  4. Computer
  5. Baroscope
  6. Display repeater under hard dodger (will require some sort of security cover) and at helm.
  7. Flat panel for TV and/or video
  8. Audio speakers (Saloon, forward cabin, cockpit)
- C. Under discussion
1. Wireless boat instruments (e.g., TackTick) and/or wireless viewing / controller (e.g., B&G, Raymarine)
  2. Sounder
  3. OCENS weather
- D. Wish list
1. Radome should be gimballed (if a Radome and not an open array)

## **XVII. Tankage**

- A. Required
1. Fuel to provide motoring range of 1,500 miles
  2. 200 gallons water in two-three tanks.
  3. 50 gallons black water in two tanks
  4. Dinghy fuel storage (5 gallons?)
- B. Under discussion
1. Asymmetrical water tanks? 150 gallon main tank and 50 gallon reserve tank?
  2. How much water necessary for 5-7 days of usage in anchorage where not desirable to make water?
  3. Water as ballast?

## **XVIII. Safety**

- A. Required
1. The below decks injuries seem much more common than the on deck injuries. Floor boards and cabinets will have some positive latching mechanism that we are confident will keep them secure in a knockdown or rollover. The mechanism may not always be active for convenience, but there has to be some system to enable them to be secured.

2. Cockpit anchor points for harnesses that keep sailor in/on the boat, not dragged alongside. They should enable a safe passage from the companionway to the helm and jack lines.
- B. Under discussion
1. Integral jack lines on deck, designed in from the start, not added later. Some system that enables us to go forward or aft from the cockpit while being connected to the boat.
  2. 30" stanchions and lifelines.

## **XIX. Reference**

- A. La Rossa
1. A Trintella 51A, see [www.larossa.de](http://www.larossa.de)
- B. New Morning
1. Current boat, Swan 44 MK II