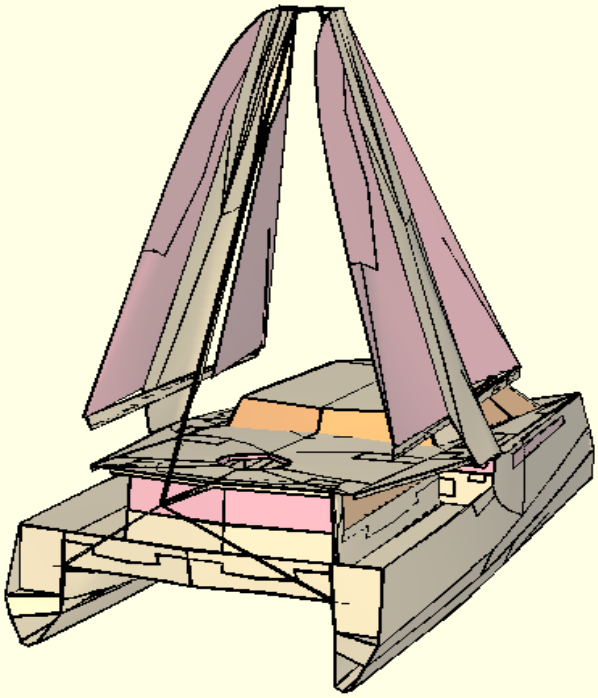
A design study

ladybird concept

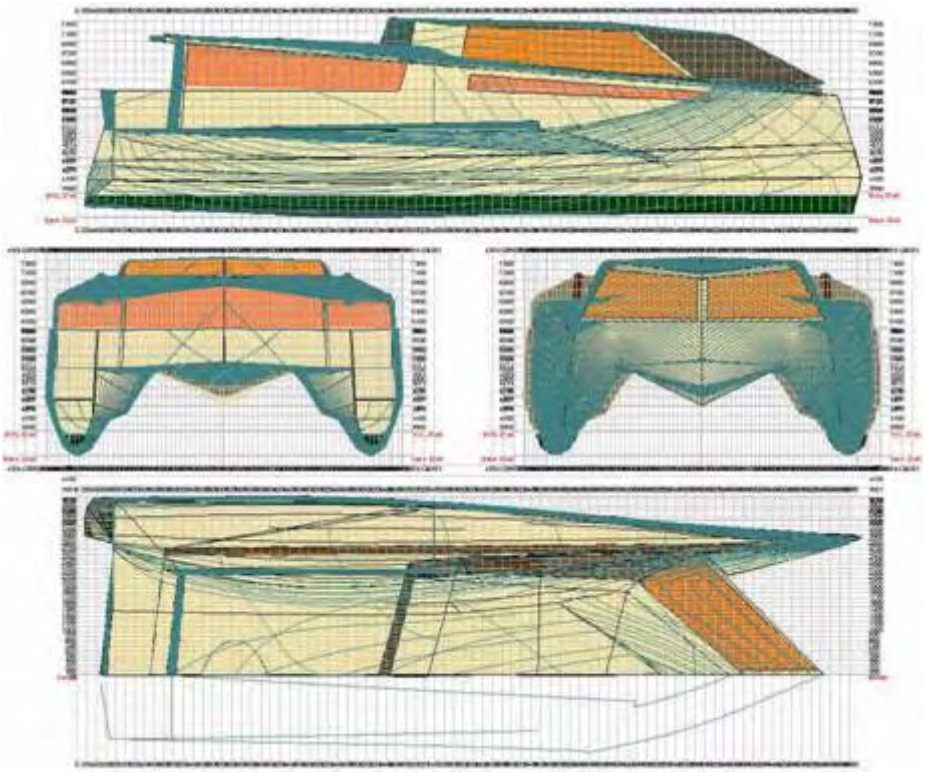


preliminary hull sketch

design concept.

I've been thinking bout my ultimate boat. The bigger the better Burnell and Froud already noticed but I want to be able to push and pull my boat around a bit. Yet it has to be a live aboard with comfortable home like dimensions. Have economic engines and can sail around the world. At 16m a deckhouse cat has its proportions about right. A clean and comfortable boat, light weight and simple to build. Modern fly by wire gear should enable even single handed sailing but boat be best for one or two couples and if wanted should sleep a dozen

hull design



first line plan setup

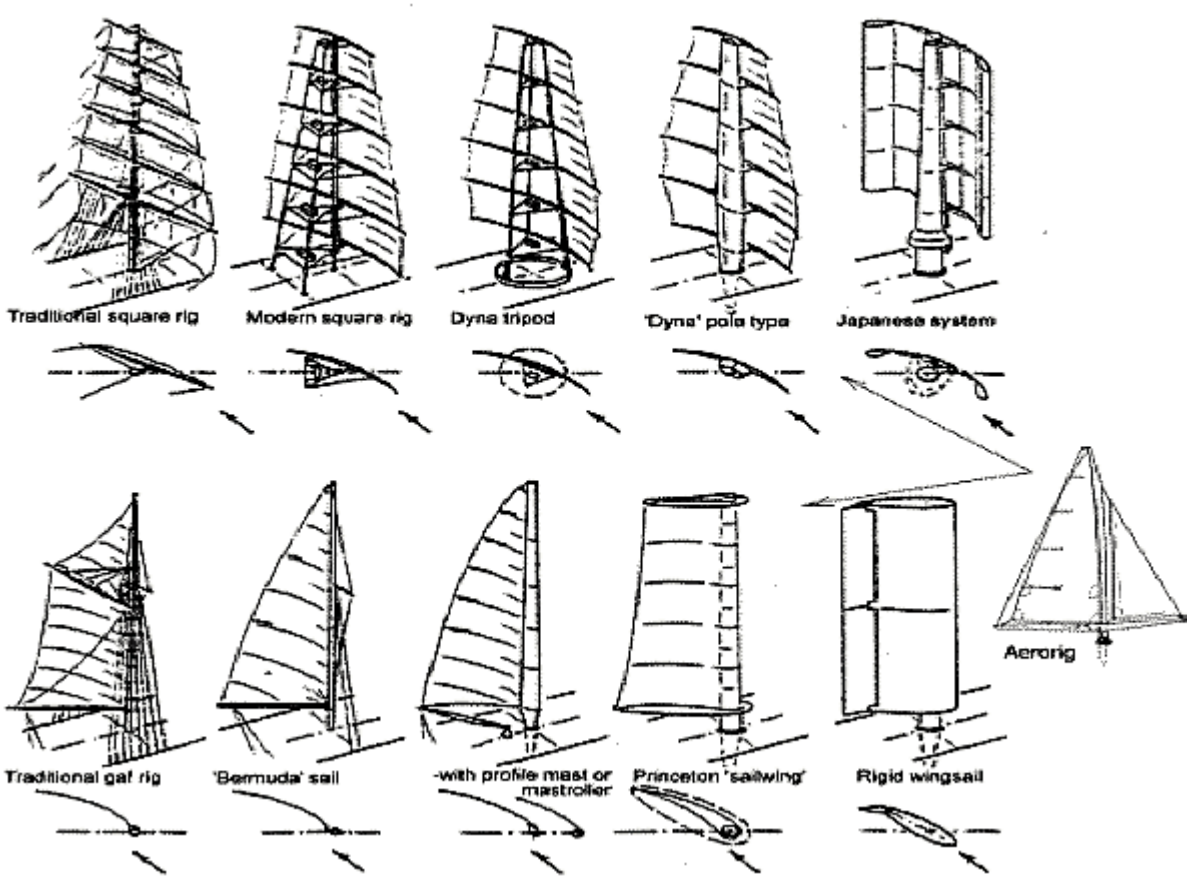
Standing out wave piercing hulls have greater stability and give better hull access Between the hulls improve water flow out laterally and -like a hobby cat- don't need skegs and beaches easy. At the waterline sharp 20 :1 L/B hull's keep in displacement mode wave drag below vicious at 20 knts The hulls carry a Incat style deep V stepped flying centre hull that breaks and ventilates rougher waves beneath the bridge preventing excessive stamping or nose diving in rougher water. Wave piercing nose cones can be sacrificial bumpers against driftwood and be replaceable, better for sharp bow construction too.

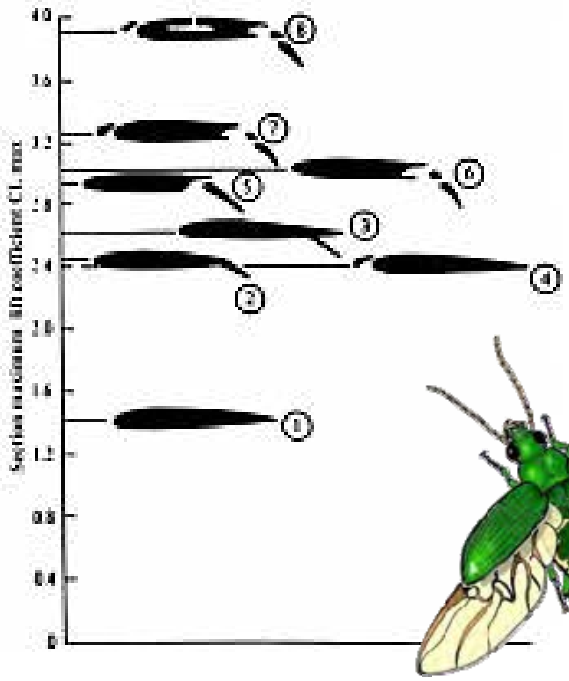
Above the chine the hulls flare inward, and carry -for example- a small 600 kg car and at the other side a tender. Good to have own transport and gives low CG ballast for stability. These toy's can be hoisted out their pockets. Air flow on the hull profiles don't stall but is directed upward to the sails and with a little rounded edges on the deck house reducing lateral air drag.

joy of sailing

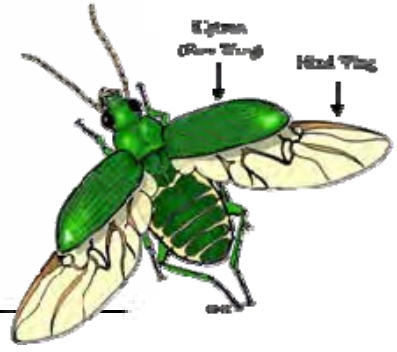
Once on open water its fun to hoist sails, makes sense on longer legs too so I started a sail plan. Got inspired by a ladybird opening solid wings and pumping up soft membrane wings. A variation on the Princeton sail wing below. I'm trying to find a seamless transition from power to sail, performing and looking good in both modes.

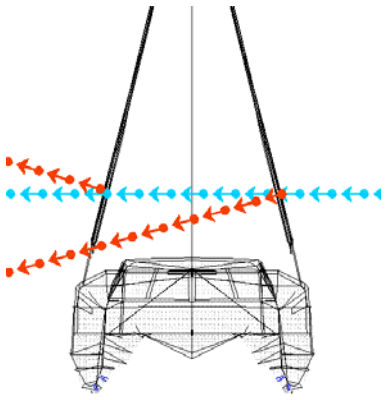
Like to see the rig hoisted from a flush deck position witch reduces drag and CG, howling and rattles when in power boat or marina condo mode and think its possible to design a motor sailor with a difference.



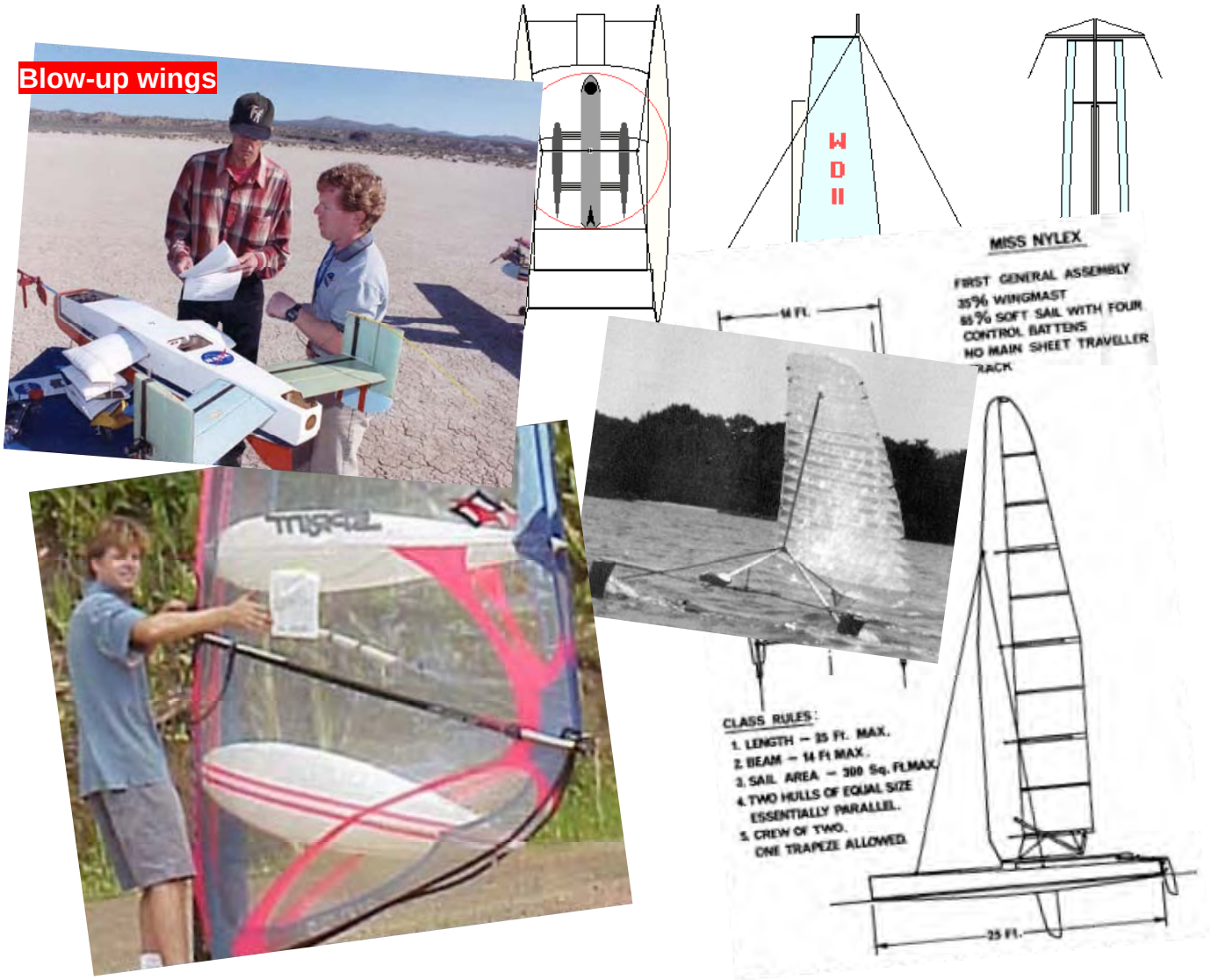


Bipod wing masts store needly sideways and reduce rigging loads on a cat, the shorter mast height lowers the CE and moment of pitching and give stability as force is down on the windward sail and up on leeside. Wings can be self pointing and simple to fly, ideal cruising power.





Maybe on a motor sailer I should think down and trade wind sailing but a wing seems more exiting. Free rotating masts are needed and deck stepping the tabernacles enables easy striking and tuning. 360 degree rotating 70m2 wings can turn within the fore and aft stays on 2x150kg lateral carbon bipods. Downwind butterfly wings that open their trailing edges?

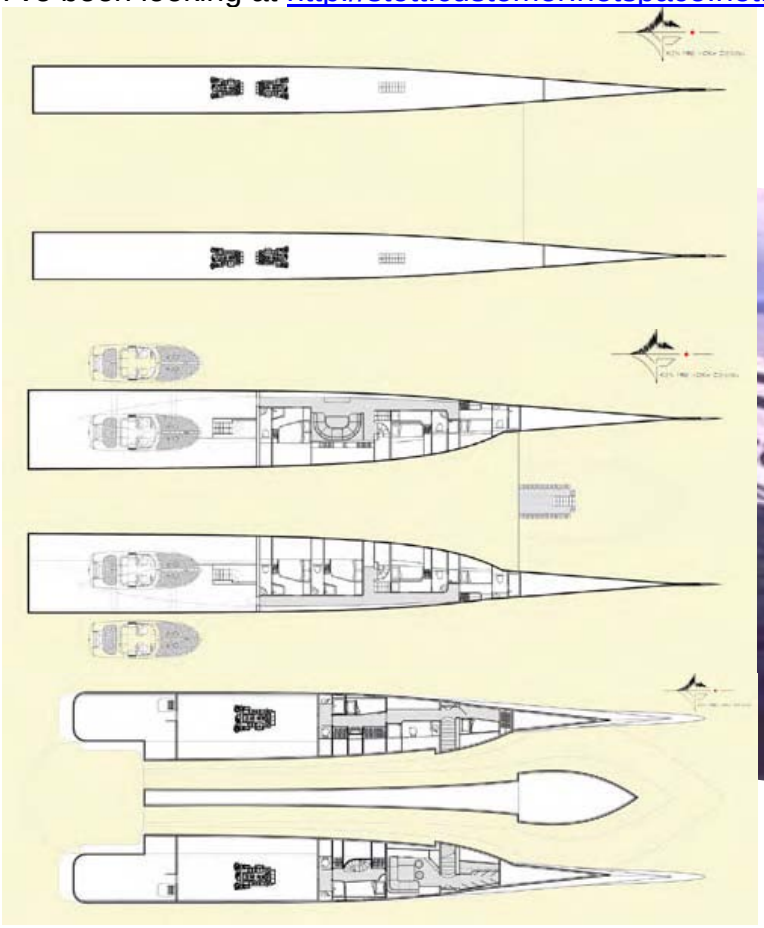


Started with hull and aft bipod with socking genoas. Than inflatable wingsails, don't know where it leads but here some other wingsail links:

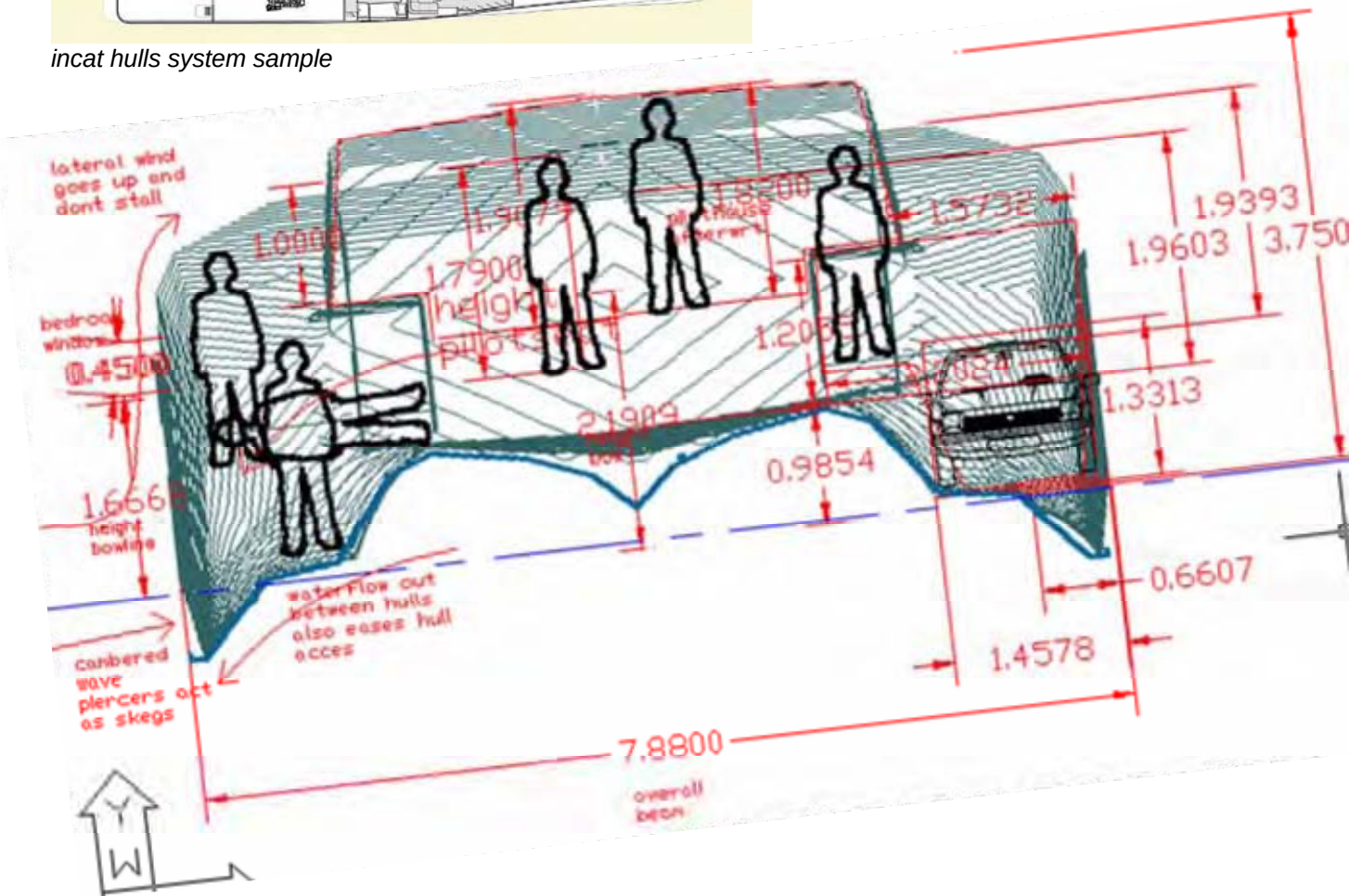
http://www.dfrc.nasa.gov/Newsroom/X-.../new_wing.html
http://pdf.aiaa.org/jaPreview/JA/1980/PVJAPRE44659.pdf
http://www.tspeer.com/Wingmasts/teardropPaper.htm
http://www.olypen.com/dkaseler/inflatable.htm
http://www.solarnavigator.net/wing_sails.htm
http://www.shadotec.com/Technology.html
http://www.wingsails.com/cetiri.html
http://www.omerwingsail.com/
http://www.drtomorrow.com/lessons/lessons6/40.html
http://www.geocities.com/aerohydro/Imhoff.htm
http://www.geocities.com/aerohydro/Seafliertext.htm
http://www.cookeassociates.com/science.html
http://www.dahlberg-sa.com/kd/Wing.htm
http://www.globalinventure.com/
http://www.lusas.com/case/composite/wingsail.html

construction

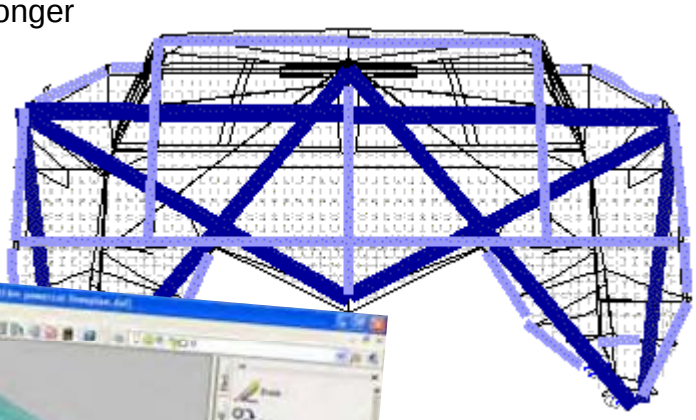
Maybe a carbon reinforced epoxy glued aluminium space frame is a good idea here?
Developable slab sided surfaces make the boat modern, lightweight cost effective.
I've been looking at http://stott.customer.netspace.net.au/devilcat.htm#_top

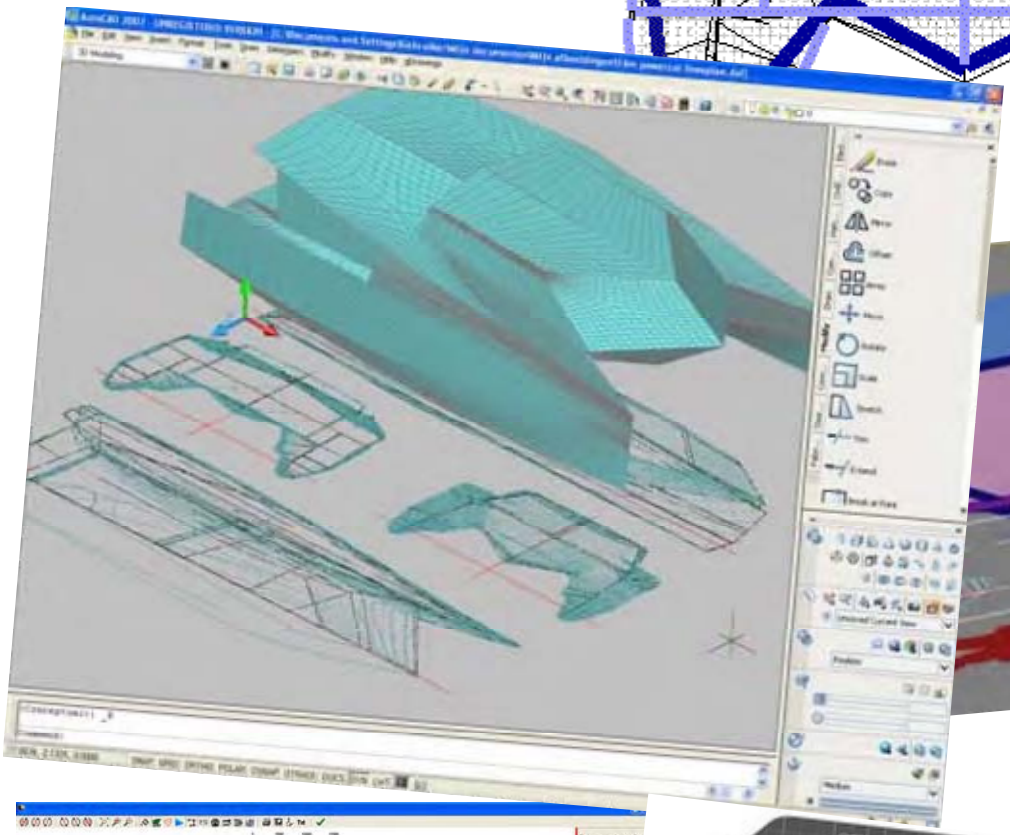


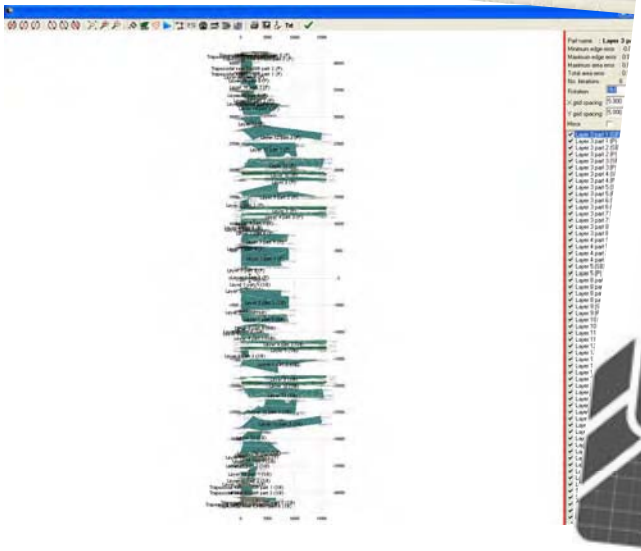
incat hulls system sample

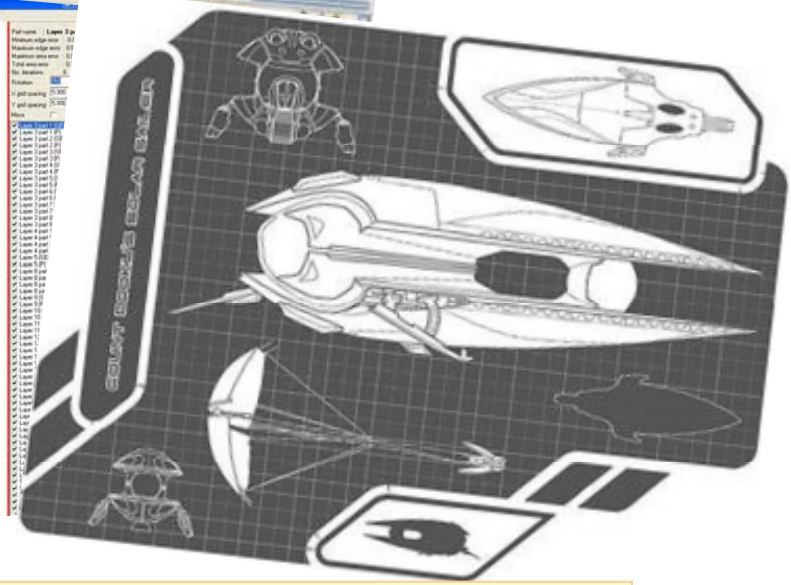


A flying middle hull enables longer and stronger cantilever trusses in the space frame
Reinforced stations support tabernacles, bridge section, deckhouse and davits, pilothouse is integrated in middle hull forward bow section trusses.









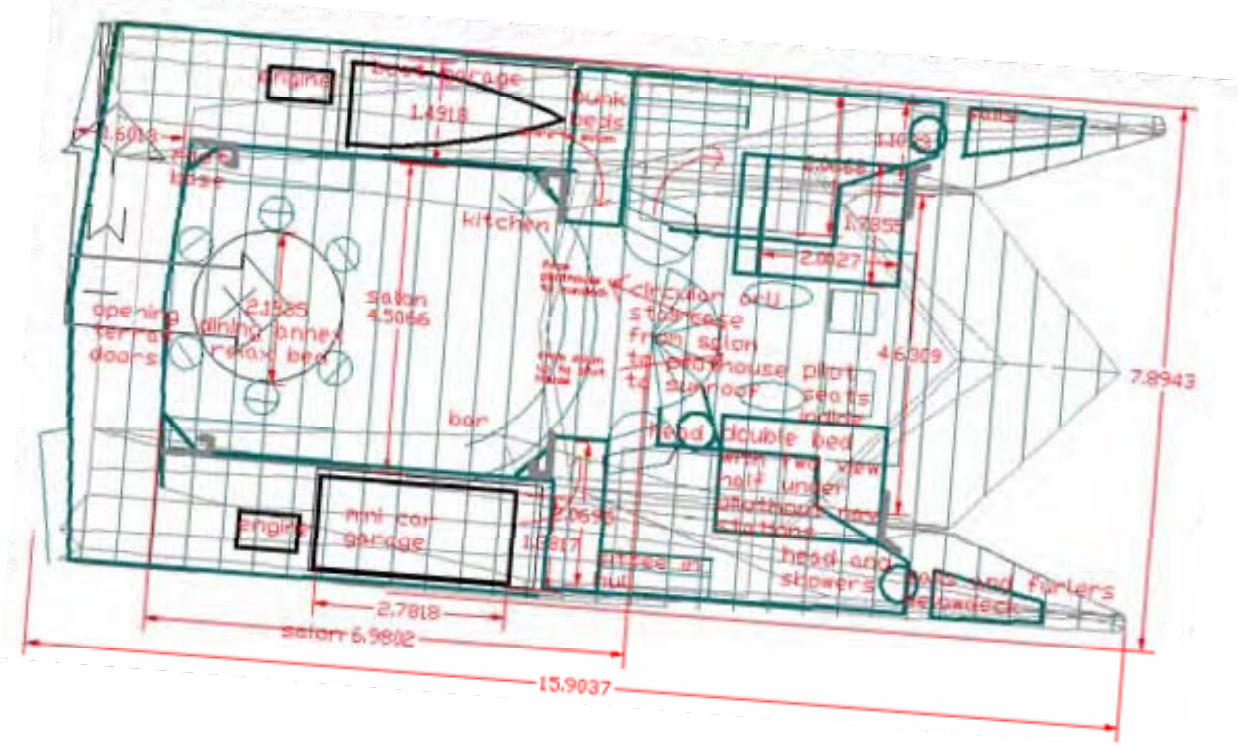
Did panel patterns and weight calculations but start liking count doeku's black and white solar sailor styling here more so back to style, construction and patterns later

Interior lay-out

In the hulls from the front back a small settee with head and double bed with fwd looking escape hatches going under the pilothouse side nav stations and sittees, 1m up stairs, looking aft 2 or 4 aft bunk beds, bulkhead, garages, bulkhead, engines and at the stern fold down swim platforms with stairs and storage

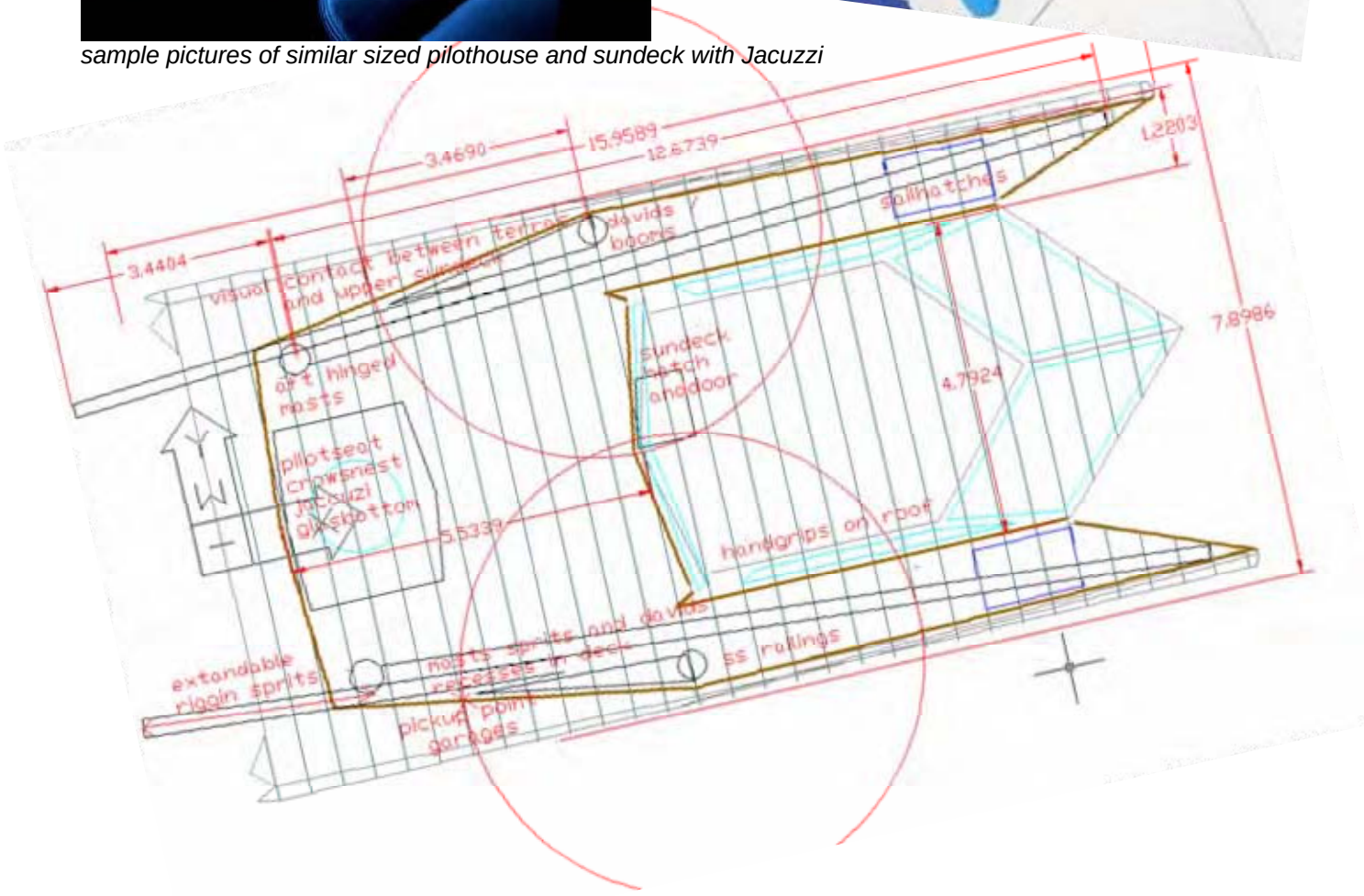
Salon about 5x7m is spacious and well lit, has fwd bathroom, kitchen, bar and aft opening terrace doors and under the skylight a dining.

salon sample with skylight



Terrace and salon are level with the 1.50m wide freeboard walk around terrace. In these side decks inward hinging garage hatches. Gangway bulwark doors fold out for hoisting car, tender or freight. These doors may also be used as wide sideway boarding plank at 90 degree. Pilothouse includes settees, fwd pilot seats with sail and power controls and aside under the navigation desks the fwd double beds. Pilothouse is again a meter up from the salon with open kitchen and possibly via an open spiral staircase.

sample pictures of similar sized pilothouse and sundeck with Jacuzzi



Top and fourth floor is the sundeck with on the sides the hinged masts, the aft extendable rigging sprits, fair weather pilot box sit, on the sides the davits / booms and fwd the sail hatches with socks and furlers. Tubed, preferable stainless railings

Between masts the detachable small sailing sit can perhaps be hoisted up and function as crows nest while down on the sun deck it can be used as Jacuzzi with a transparent bottom shining light into the salon's glass ceiling, o yes, there is plenty of functional luxury to imagine on this size of a boat.

2x70 hp engines sit on a upward swept aft bottom with 2x1300 litre fuel tanks under garages at about CG prop shaft with pop-up winged rudders or better the water jets, stern drives perhaps? What do you think?

Maybe this boat should be a bit bigger, my fantasy smaller, build from other materials. These illustrated ideas give some insight in my motor sailor fantasy.

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