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SURVEY FOR THE OFFSHORE RACING COUNCIL

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THE DEPARTMENT OF NAVAL ARCHITECTURE AND MARINE ENGINEERING

THE UNIVERSITY OF MICHIGAN
COLLEGE OF ENGINEERING

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INTRODUCTION

The Department of Naval Architecture and Marine Engineering at the University of Michigan has been assisting the Offshore Racing Council in gathering data to help improve the handicapping rules it administers. The results to a questionnaire that was sent out May 1993 are enclosed in this report. Approximately 200 questionnaires were sent sailing's leading yacht designers and builders around the world. Thirty-three of the questionnaires were returned completed and eleven were returned unanswered because of incorrect addresses or for other reasons.

The survey consisted of a series of questions regarding sailing yacht design preferences that were to be placed in ranked order. The number of first and second place responses for each question are shown as pairs of numbers on the following copy of the questionnaire. The number of first place responses is shown in bold print followed by the number of second place responses in italics. The reason only first and second place responses are listed is that many respondents only gave first and second place preferences or only used check marks. If only check marks were used, they were counted as first place votes. Individual written responses to specific questions are also listed. The written responses are listed verbatim; however, the handwriting was not always legible and interpretations were made as necessary.

Survey for Offshore Racing Council

Part A: Sails, Sailhandling Systems, and Spars and Rigging

1. What rig configuration(s) do you prefer for an all-purpose offshore racing yacht without regard for specific races?

18.7 Masthead Sloop
16.7 Fractional Sloop
1.3 Yawl/Ketch
0.0 Cat
0.1 Other: Cutter

2. What rig(s) for general cruising without regard to particular areas?

18.5 Masthead Sloop
7.3 Fractional Sloop
2.7 Yawl/Ketch
1.1 Schooner
0.1 Cat
5.2 Other: Cutter

3. What governs your preference for a specific rig for offshore racing?

5.8 Ease of sailhandling
6.3 Adaptability
1.0 Other: Average crew can handle effectively
21.2 Speed
10.8 Seaworthiness
3.7 Simplicity
1.0 Other: Cost
1.0 Other: Efficiency

4. For cruising?

25.2 Ease of sailhandling
5.3 Adaptability
1.0 Other: Durability
2.9 Speed
13.5 Seaworthiness
1.0 Other: Efficiency
13.4 Simplicity
0.1 Other: Cost

5. What attributes of spar materials are most important for an offshore racing yacht?

4.6 Cost
23.5 Strength/weight ratio
1.2 Ease of fabrication
2.5 Ease of maintenance and repair
17.8 Reliability
2.3 Availability
1.1 Other: Stiffness

6. For a cruising yacht?

10.4 Cost
7.10 Strength/weight ratio
2.3 Ease of fabrication
8.9 Ease of maintenance and repair
27.5 Reliability
4.4 Availability
0.0 Other

7. In the absence of rule restrictions, but considering serviceability and the effects of cost on marketability, what materials do you prefer to specify for the construction of offshore racing yacht spars?

20.3 Aluminum alloys (6000 series and below)
4.8 Aluminum alloys (7000 series and above)
1.2 GRP Composite
13.5 Composite of high modulus fiber reinforced plastic
1.0 Other: Bowsprits//spinnaker poles Carbon Fiber

8. For cruising yacht spars?

25.3 Aluminum alloys (6000 series and below)
4.2 Aluminum alloys (7000 series and above)
3.2 GRP Composite
1.0 Other: Bowsprits//spinnaker poles - Carbon Fiber
8.5 Composite of high modulus fiber reinforced plastic
2.0 Other: Wood

9. In the absence of rule restrictions, but considering serviceability and the effects of cost on marketability, what materials do you prefer to specify for the standing rigging of an offshore racing yacht?

1.1 1x19 Galvanized steel wire rope
3.7 1x19 SS wire rope
26.4 SS rod
7.2 Cobalt/SS alloy rod
4.4 Aramid or Spectra fiber
0.2 Carbon fiber
0.0 Other high-modulus fibers
0.0 Other

9a. What are the most important reasons for your choice(s)?

3.5 Cost
14.3 Strength/weight ratio
4.0 Ease of fabrication
4.2 Ease of maintenance and repair
1.0 Other: Reducing weight aloft
20.5 Reliability
4.2 Availability
1.0 Other: Stiffness
3.0 Other: Stretch
1.0 Other: Performance

10. For a cruising yacht?

2.1 1x19 Galvanized steel wire rope
12.10 1x19 SS wire rope
18.5 SS rod
0.0 Cobalt/SS alloy rod
2.2 Aramid or Spectra fiber
0.0 Carbon fiber
0.0 Other high-modulus fibers
1.0 Other: Mix of 1x19 & rod

10a. For what reasons?

10.6 Cost
5.6 Strength/weight ratio
2.2 Ease of fabrication
9.3 Ease of maintenance and repair
24.3 Reliability
4.3 Availability
1.0 Other: Ease of handling
1.0 Other: Lack of stretch
1.0 Other: Reducing weight aloft

11. What materials would you encourage for the running rigging of an offshore racing yacht?

	Aramid, Spectra or other high modulus fiber rope	Polyester fiber rope	7 × 19 SS wire	7 × 19 Galvanized steel wire rope	Other
Halyards	**21**, *1*	**0**, *1*	**13**, *3*	**3**, *6*	**0**, *0*
Spinnaker Halyards	**25**, *0*	**5**, *4*	**3**, *4*	**1**, *3*	**0**, *0*
Sheets	**22**, *2*	**6**, *8*	**1**, *0*	**0**, *1*	**0**, *0*
Guys	**25**, *1*	**4**, *6*	**2**, *0*	**0**, *1*	**0**, *0*

11a. What are the most important reasons for your choice(s)?

3.2 Cost
20.5 Strength/weight ratio
1.2 Ease of fabrication
3.4 Ease of maintenance and repair
1.0 Other: Owner's choice
14.7 Reliability
2.1 Availability
2.2 Other: Ease of use
1.0 Other: Low stretch
1.0 Other: Reducing weight aloft

12. Of a cruising yacht?

	Aramid, Spectra or other high modulus fiber rope	Polyester fiber rope	7 × 19 SS wire	7 × 19 Galvanized steel wire rope	Other
Halyards	**14**, *6*	**2**, *2*	**12**, *1*	**3**, *6*	**0**, *0*
Spinnaker Halyards	**15**, *4*	**12**, *6*	**3**, *3*	**2**, *1*	**0**, *0*
Sheets	**13**, *3*	**15**, *5*	**0**, *0*	**0**, *0*	**0**, *0*
Guys	**19**, *4*	**9**, *6*	**1**, *0*	**0**, *0*	**0**, *0*

12a. For what reasons?

10.2 Cost
8.4 Strength/weight ratio
3.1 Ease of fabrication
9.3 Ease of maintenance and repair
15.7 Reliability
2.0 Availability
6.1 Other: Ease of handling
1.0 Other: Owner's choice

13. In the absence of rule restrictions, considering serviceability and the effects of cost on marketability, what materials would you specify for the deck hardware of an offshore racing yacht?

	Stainless steel	Aluminum	Titanium	Bronze	Composite materials	Other
Winch drums	**5**, *4*	**23**, *4*	**2**, *1*	**0**, *1*	**5**, *0*	**0**, *0*
Winch mechanical parts	**15**,*9*	**2**, *1*	**7**, *2*	**13**, *4*	**2**, *2*	**0**, *0*
Jib Tracks	**5**, *2*	**23**, *2*	**3**, *1*	**2**, *0*	**0**, *0*	**0**, *0*
Blocks, cars	**5**, *5*	**14**, *2*	**12**, *2*	**2**, *0*	**5**, *5*	**0**, *0*
Cleats, padeyes	**14**, *4*	**11**, *4*	**6**, *1*	**2**, *0*	**3**, *2*	**0**, *0*

13a. What are the most important reasons for your choice(s)?

8, *4* Cost
21, *3* Strength/weight ratio
1, *3* Ease of fabrication
5, *4* Ease of maintenance and repair
17, *5* Reliability
3, *1* Availability
1, *0* Other: Few boats require custom hardware
0, *1* Other: Ease of handling

14. Of a cruising yacht?

	Stainless steel	Aluminum	Titanium	Bronze	Composite materials	Other
Winch drums	**18**, *3*	**11**, *5*	**0**, *1*	**6**, *1*	**2**, *0*	**0**, *0*
Winch mechanical parts	**20**, *2*	**2**, *1*	**2**, *0*	**14**, *5*	**2**, *1*	**0**, *0*
Jib Tracks	**14**, *1*	**17**, *3*	**0**, *0*	**3**, *0*	**0**, *0*	**0**, *0*
Blocks, cars	**15**, *6*	**13**, *4*	**3**, *1*	**3**, *0*	**3**, *1*	**0**, *0*
Cleats, padeyes	**21**, *4*	**7**, *4*	**2**, *2*	**3**, *1*	**2**, *0*	**0**, *0*

14a. For what reasons?

10, *5* Cost
7, *5* Strength/weight ratio
1, *2* Ease of fabrication
13, *2* Ease of maintenance and repair
22, *8* Reliability
5, *4* Availability
0, *1* Other: Ease of handling/light weight

15. Rank any sailhandling systems you would like to see in wider use on offshore racing yachts:

6, *4* Roller-furling headsails
5, *3* Boomed or self-tacking headsails
2, *0* Luff-roller furled mainsails
4, *1* Foot-roller furled mainsails
14, *3* Asymmetric spinnakers
7, *3* Retractable spinnaker booms or bowsprits
2, *3* Spinnaker snuffers
15, *5* Fully-battened mainsails
13, *5* Non-overlapping headsails
1, *3* Unstayed masts
1, *0* Boomless mainsails
1, *0* Bipod masts
1, *0* Other(s): Rotating wing masts, foil shaped jibstays

15a. What are the most important reasons for your choice(s)?

2, *2* Low initial cost
2, *2* Adjustability
3, *3* Longevity
14, *4* Simplicity
12, *4* Speed
17, *5* Ease of handling
8, *3* Seaworthiness
3, *1* Ease of repair/maintenance
11, *5* Small crewing requirement
4, *4* Safety
1, *0* Other: To bring more people into sailing
1, *0* Other: Cost

16. Rank any sail materials you would like to see in wider use on offshore racing yachts:

5.1 Soft finish woven polyester fiber
2.2 Hard finish woven polyester fabric
6.3 Polyester reinforced plastic film laminates
11.2 High modulus fiber reinforced plastic film laminates
4.1 Woven or knitted high modulus fibers
1.0 Other(s): Soft, light, longlasting

16a. What are the most important reasons for your choice(s)?

5.1 Low initial cost
2.0 Adjustability
7.4 Longevity
1.2 Simplicity
10.2 Speed
5.4 Ease of handling
2.2 Seaworthiness
1.2 Ease of repair/maintenance
14.1 Strength/weight ratio

17. List any sail materials you would like to see discouraged from use on offshore racing yachts:

6.0 High modulus fibers (boron, carbon, kevlar)
1.0 Carbon - unidirectional fibers - any material that is not durable ≈ 2 full race reasons (300 hrs)
1.0 Carbon (cost)
1.0 Carbon, brittle materials
1.0 I don't care what material, but the lower tech sails should be given a rating credit so that owners aren't made to feel they have to pay more just to compete.
2.0 Polyester reinforced plastic film laminates & high modulus fiber reinforced plastic film laminates

18. Rank attributes of rigs, sails and sailhandling systems which in your opinion deserve more encouragement by the offshore race handicapping rules or regulations.

8.0 Low initial cost
3.0 Adjustability
8.10 Longevity
11.7 Safety
5.7 Speed
11.11 Simplicity of handling
19.3 Seaworthiness
3.2 Ease of repair/maintenance
6.7 Small crewing requirement
1.0 Other: Positive marketing appeal to get more more people into sailing or return to sailing

Part B: Hull and Deck Design and Structure

19. In the absence of rule restrictions, but considering serviceability and the effects of cost on marketability, what materials would you prefer to specify for the hull skin(s) of an offshore racing yacht?

10.3 E-glass
15.6 S-glass
2.1 Polyester resin
13.7 Vinylester resin
16.2 Epoxy resin
5.8 Aramid fiber
3.0 Other high-modulus fiber
12.1 Carbon fiber
8.3 Aluminum
2.4 Wood
0.0 Other

19a. What are the most important reasons for your choice(s)?

8.3 Low initial cost
12.4 Longevity
23.1 Strength
8.6 Seaworthiness
4.6 Ease of maintenance/repair
2.0 Other: Strength
1.0 Other: Puncture resistance - preventing osmosis

20. For the hull of a cruising yacht?

19.3 E-glass
13.3 S-glass
7.5 Polyester resin
18.4 Vinylester resin
8.2 Epoxy resin
5.5 Aramid fiber
3.0 Other high-modulus fiber
4.1 Carbon fiber
8.3 Aluminum
9.5 Wood
1.0 Other: Availability, reasonable price
1.0 Other: Strength
1.0 Other: Puncture resistance - preventing osmosis

20a. What are the most important reasons for your choice(s)?

14.7 Low initial cost
16.4 Longevity
19.3 Strength
1.0 Other: Strength
10.5 Seaworthiness
7.3 Ease of maintenance/repair
1.0 Other: Availability, reasonable price
1.0 Other: Puncture resistance - preventing osmosis

21. For the deck skin(s) of an offshore racing yacht?

8.5 E-glass
12.7 S-glass
5.3 Polyester resin
9.5 Vinylester resin
18.3 Epoxy resin
6.4 Aramid fiber
4.1 Other high-modulus fiber
16.3 Carbon fiber
7.1 Aluminum
2.3 Wood
1.0 Other: With core

21a. For what reasons?

6.4 Low initial cost
8.5 Longevity
25.3 Strength
9.4 Seaworthiness
5.4 Ease of maintenance/repair
4.0 Other: Weight

22. For the deck a cruising yacht?

18.3 E-glass
13.3 S-glass
9.3 Polyester resin
15.3 Vinylester resin
10.3 Epoxy resin
5.4 Aramid fiber
2.0 Other high-modulus fiber
4.2 Carbon fiber
5.1 Aluminum
4.4 Wood
1.0 Other: With core

22a. For what reasons?

17.3 Low initial cost
10.8 Longevity
16.5 Strength
10.3 Seaworthiness
7.5 Ease of maintenance/repair
0.0 Other

23. In cored laminate hull construction, what core materials do you prefer?

24.4 Plastic foam
8.8 End-grain balsa
1.0 Other: Honeycomb
1.2 Marine plywood
1.0 Other: PVC Foam

23a. What are the most important reasons for your choice(s)?

2.3 Low initial cost
17.2 Longevity
23.1 Strength
1.0 Other: Market acceptance
0.1 Other: Closed cell non-organic
7.4 Seaworthiness
5.1 Ease of maintenance/repair
5.0 Other: Weight
1.0 Other: Construction concerns

24. In cored laminate deck construction, what core materials do you prefer?

22.5 Plastic foam
12.7 End-grain balsa
1.0 Other: PVC Foam
1.2 Marine plywood
1.0 Other: Solid laminate
1.0 Other: Honeycomb

24a. For what reasons?

1.2 Low initial cost
16.3 Longevity
22.0 Strength
1.0 Other: Consistency
8.4 Seaworthiness
5.1 Ease of maintenance/repair
3.0 Other: Weight
1.0 Other: Closed cell non-Organic

25. In the absence of rule restrictions, what materials, if any, would you prefer to specify for reinforcing (framing) in an offshore racing yacht hull?

5.5	E-glass	3.1	Other high-modulus fiber
11.4	S-glass	17.3	Carbon fiber
2.2	Polyester resin	5.3	Aluminum
8.4	Vinylester resin	4.1	Wood
16.3	Epoxy resin	0.0	Other
2.3	Aramid fiber		

25a. What are the most important reasons for your choice(s)?

3.3	Low initial cost	11.2	Seaworthiness
11.2	Longevity	3.2	Ease of maintenance/repair
27.1	Strength	2.0	Other: Construction considerations
1.0	Other: High strenght/weight ratio	0.1	Other: Aesthetics

1.0 Other: Thousands of glass boats were built in the 70's + early 80'2 before S glass and carbon fiber. Depending on boat size it should just be a case of 1,2,or 3 layers of 1808 or 1708 tape over a foam core stiffener

26. What materials would you prefer to specify for reinforcing in a cruising yacht hull?

13.4	E-glass	2.0	Other high-modulus fiber
12.4	S-glass	6.3	Carbon fiber
8.2	Polyester resin	2.1	Aluminum
10.3	Vinylester resin	5.2	Wood
9.5	Epoxy resin	0.0	Other
2.2	Aramid fiber		

26a. What are the most important reasons for your choice(s)?

12.5	Low initial cost	10.2	Seaworthiness
11.6	Longevity	5.4	Ease of maintenance/repair
19.1	Strength	1.0	Other: Construction considerations
0.1	Other: Aesthetics		

1.0 Other: Thousands of glass boats were built in the 70's + early 80'2 before S glass and carbon fiber. Depending on boat size it should just be a case of 1,2,or 3 layers of 1808 or 1708 tape over a foam core stiffener

27. Have you worked within the framework of

29 ABS
24 Lloyd's

7 Other scantling rules?
R.I.Na.
R.I.Na., D.N.V., N.K.K.
French, Spanish, German & Australian
Nevin's, Herreshoff's for older boats
Herreshoff
R.I.Na., Bureau Veritas
D.N.V.

27a. Please briefly summarize your experiences working with these rules:

1. ABS - 10R - Boats.
   Lloyd's - 12m - Cruising boats.
   R.I.Na. - Cruising boats.
2. ABS: Excessive I (moment of inertia) - requirement for stiffeners.
   LR: Excessive sandwich skin thickness requirements.
3. All in general: Main stream safety and achievement of highest industrial standards of construction.
4. ABS: Poor response /archaic composite construction scantlings /overpriced - poor + of little value in all respects.
5. ABS & Lloyd's: Both are cumbersome bureaucracies, very slow to respond to changes in technology, even slower to service customers, out of touch with current boatbuilding realities.

27a. Continued

6. Lloyd's is fairly heavy, ABS is probably 10-15% heavier in certain areas than need be.
7. Herreshoff Design/construction of traditional plank-on-frame vessels.
8. I use ABS as a standard guide. The rule is easy to use but the staff at ABS in inconsistent in applying the rules for certification.
9. Recent 55' VLDB + 40' IMS. Currently 46' cruiser/racer.
10. ABS & Lloyd's: They are similar - both helpful in designing and as a measure of insurance against malpractice lawsuits.
11. Allow boats to be too lightly constructed as evidenced by many recent failures.
12. Currently designing an aluminum BOC Class I boat to full ABS class, designed a number of 40-60' production sail cruisers to ABS & Lloyd's.
13. Lloyd - 12 M rule.
    A.B.S. - rudder & hull scantlings used as a guide.
14. Complicated plan approval process - expensive.
15. Lloyd's - difficult yields heavy structures.
    ABS - excellent but yields too light structures that break.
16. All cruising designs and most cruiser/racer designs above 35' are built to Lloyd's ABS standards - + ABS A-1 offshore certification.
17. Lloyd's impossible!
    ABS - OK.
    DNV - OK.
18. ABS & Lloyd's: Lengthy, bureaucratic, costly, but necessary.
19. ABS easiest and best.
    Lloyd's GRP Rules inexplicably based on unreliable chopped-strand glass.
    DNV's Rules frightfully expensive.
20. Lloyd's: Little technical merit (obsolete).
    ABS: Good intentions, but needs to be more open to alternative analysis methods, materials.
21. ABS: Most boats (95%) since 1980.
22. ABS: Some go years working with NARU, S.N.A.&M.E.
23. Lloyd's: Two 12-meters in aluminum alloy
24. Very good cooperation from ABS
25. Lloyd's too heavy
    ABS - too light in spots
26. ABS & Lloyd's: Derivation of scantlings
27. ABS results in a heavy (cover yourself) laminate resulting in a "somebody else's problem" situation.
28. Lloyd's seems to be a slightly better rule. ABS is very crude in comparison.

28. In the absence of rule restrictions, what material(s) would you favor for external ballast?

33.0	Lead	1.2	Cast iron
0.4	Steel	0.0	Other

28a. What are the most important reasons for your choice(s)?

8.3	Low cost	6.5	Ease of maintenance/repair
29.2	Density	1.0	Other: Energy Absorption
0.4	Strength	1.0	Other: Stability for least volume

29. In the absence of rule constraints, would you place any fixed ballast within the fairbody of a racing yacht other than for fine trim adjustment?

4 Yes 29 No

29a. If Yes, what percentage of total ballast? _____%

For what purpose(s)?

1.0 Weight concentration
1.0 If boat was built light enough that it was greatly lighter than design diplacement, even with proper sized keel. Wouldn't want to add lead onto keel thickness just to not have any on boat.
1.0 Hood type CTBD designs - require this. It should not be disallowed.

30. Would you place any fixed ballast within the fairbody of a cruising yacht other than for fine trim adjustment?

5 Yes 28 No

30a. If Yes, what percentage of total ballast?

Range: 30 - 100 % Mean: 55 % Mode: 30 %

For what purpose(s)?

2.0 Easy motion & shallow draft
1.0 Increase inherent stability
1.0 Hood type CTBD designs - require this. It should not be disallowed.

31. In the absence of rule constraints, would you use water ballast in a racing yacht?

24 Yes 9 No

31a. If yes, what percentage of total yacht displacement without water ballast?

Range: 5 - 40 % Mean: 19.1 % Mode: 15 %

32. Would you use water ballast in cruising yacht?

15 Yes 18 No

32a. If yes, what percentage of total yacht displacement without water ballast?

Range: 5 - 90 % Mean: 18.8 % Mode: 15 %

33. What appendage configuration(s) do you prefer for an offshore racing yacht, absent rule constraints?

Fixed keel:
26.3 Fin
2.3 Winged
0.0 Long chord
1.0 Scheel
0.3 Shoal draft
1.0 Other: Deep keel
19.4 Bulb

Moveable appendage:
5.4 Keel/centerboard (ballasted centerboard)
1.3 Light daggerboard
6.3 Trim tab
0.1 Other: Swing keel
5.3 Keel/centerboard (light c'board)
3.2 Ballasted daggerboard
2.1 Jibing board

Unconventional:
2.1 Multiple centerline boards
3.1 Tandem keel
4.0 Bilge boards
0.0 Other

Steering:
1.0 Keel-hung rudder
29.0 "Spade" rudder
5.6 Multiple aft rudders
0.0 Other
3.4 Skeg-hung rudder
2.1 Articulated rudder
1.0 Forward rudder and aft rudder

33a. What are the most important reasons for your choice(s)?

5.2 Low cost
26.4 Effectiveness
8.5 Strength
0.1 Other: Better maneuvering astern
2.6 Ease of maintenance/repair
3.1 Other: Speed
1.0 Other: Reliability
1.0 Other: Trick designs don't really sell more boats. Witness Amoco Procyon

34. What appendage configuration(s) do you prefer for a cruising yacht?

Fixed keel:
16.5 Fin
5.2 Winged
8.1 Long chord
3.2 Scheel
8.7 Shoal draft
1.0 Other: Pure CTBD
15.3 Bulb

Moveable appendage:
7.4 Keel/centerboard (ballasted centerboard)
2.0 Light daggerboard
1.3 Trim tab
0.1 Other: Swing keel
10.2 Keel/centerboard (light c'board)
3.1 Ballasted daggerboard
0.2 Jibing board

34. Continued

Unconventional:
- 4.0 Multiple centerline boards
- 1.1 Tandem keel
- 1.3 Bilge boards
- 0.0 Other

Steering:
- 2.0 Keel-hung rudder
- 20.5 "Spade" rudder
- 3.4 Multiple aft rudders
- 1.0 Other: Outboard
- 11.3 Skeg-hung rudder
- 0.0 Articulated rudder
- 1.0 Forward rudder and aft rudder

34a. What are the most important reasons for your choice(s)?
- 4.4 Low cost
- 24.3 Effectiveness
- 17.3 Strength
- 0.1 Other: People want a keel that holds them upright and not so deep they run aground, and a rudder that doesn't break
- 9.1 Ease of maintenance/repair
- 2.0 Other: Shallow draft
- 0.1 Other: Better maneuvering astern

35. Beam/Length ratios of contemporary IMS yachts are

1.0 too fine | 6.0 too broad | 25.0 about right. (Check one)

35a. If not about right, what are the most important reasons? (Rank answers)
- 1.0 Not fast
- 3.0 Not seaworthy
- 2.1 Poor directional stability
- 1.0 Low stability at sailing heel angles
- 5.0 Not sufficiently resistant to capsize/sticking inverted
- 0.0 Other

36. Beam/Length ratios of contemporary IOR yachts are

0 too fine | 24 too broad | 6 about right. (Check one)

36a. If not about right, what are the most important reasons? (Rank answers)
- 7.1 Not fast
- 13.3 Not seaworthy
- 8.1 Poor directional stability
- 3.1 Low stability at sailing heel angles
- 12.1 Not sufficiently resistant to capsize/sticking inverted
- 0.0 Other

37. Draft/Length ratios of contemporary IMS yachts are

12 too deep | 2 too shoal | 19 about right. (Check one)

37a. If not about right, what are the most important reasons? (Rank answers)
- 2.2 Too deep for seaworthiness in bad weather
- 4.3 Keel span too great for structural integrity
- 1.1 Inadequate keel span for windward performance
- 1.1 Inadequate ballast depth for stability
- 0.1 Other: Keel chords too short for structural integrity
- 1.0 Too shoal for seaworthy performance
- 0.1 Hull depth too shoal for structure, accommodation or ballast
- 4.1 Other: Too deep for shoals and harbors

38. Draft/Length ratios of contemporary IOR yachts are

10 too deep | 3 too shoal | 17 about right. (Check one)

38a. If not about right, what are the most important reasons? (Rank answers)
- 3.1 Too deep for seaworthiness in bad weather
- 4.2 Keel span too great for structural integrity
- 1.3 Inadequate keel span for windward performance
- 1.1 Inadequate ballast depth for stability
- 0.1 Other: Keel chords too short for structural integrity
- 2.0 Too shoal for seaworthy performance
- 2.0 Hull depth too shoal for structure, accommodation or ballast
- 0.1 Other: Too deep for shoals and harbors

39. Displacement/Length ratios of contemporary IMS yachts are

12 too light 1 too heavy 19 about right. (Check one)

39a. If not about right, what are the most important reasons? (Rank answers)

4.0 Too light for seaworthiness
6.1 Too light for structural integrity
1.2 Inadequate allowance for ballast
1.0 Other: Little Penalized
1.0 Other: Require too light construction to achieve adequate stability
1.0 Other: Not enought weight for moderate interior vs. room required
1.0 Other: They do not allow true cruiser - racer to compete on a closed course

0.0 Require too much structure
0.0 Too heavy for ease of handling
0.0 Too heavy for seaworthiness

40. Displacement/Length ratios of contemporary IOR yachts are

5 too light 14 too heavy 11 about right. (Check one)

40a. If not about right, what are the most important reasons? (Rank answers)

3.0 Too light for seaworthiness
2.1 Too light for structural integrity
0.1 Inadequate allowance for ballast
3.1 Too heavy for seaworthiness
1.0 Other: All ballast internal

2.1 Require too much structure
5.1 Too heavy for ease of handling
2.0 Other: Too slow
2.0 Other: Too heavy

41. Sail area/Displacement ratios of contemporary IMS yachts are

8 too high 2 too low 23 about right. (check one)

41a. If not about right, what are the most important reasons? (Rank answers)

3.1 Too high for ease of handling
2.0 Too low for adequate performance
1.0 Other: Because of too much wetted surface

1.2 Require too much rigging
1.0 Other: Little penalized

42. Sail area/Displacement ratios of contemporary IOR yachts are

3 too high 2 too low 23 about right. (check one)

42a. If not about right, what are the most important reasons? (Rank answers)

1.0 Too high for ease of handling
2.0 Too low for adequate performance

1.1 Require too much rigging
0.0 Other

43. What features of yacht design and construction (with respect to hulls and decks) would you like to see <u>encouraged</u> by the handicapping rules and regulations?

1. Seaworthiness - stability in rules.
2. Strong, safe, and stable yachts, proper handicap for normal scantlings.
3. Longevity of materials, design, rig/sail plan - multi-purpose ability of accommodation plan.
4. Rig & construction simplicity.
5. More impact resistance - both hull & deck // larger cabin volume.
6. Less need for large crews, more physical comfort.
7. More moderate disp, mastheat rigs, more moderate draft.
8. Stability & seaworthiness.
9. More freedom to innovate, simplificaiton of rules, rules based on sail area limitations.
10. Speed, stability, lower cost.
11. Long waterlines, good acceleration, ease of handling.
12. The IMS style hull has freed us from unnecessarily slowing boats down by lumps, bumps, tucks, creases, skeglets, etc. While a lot of talk is going on to promote different theories on IMS being actually for cruiser racers not racer cruisers, the emphasis should be to promote the 30' - 42' size range where there are potentially 877 + 534 + 200 boats = 1611 new boats; not the

42 - 45'	43
46 - 59'	61
60'+	39
	143

boats most of which are production cruisers or big (meaning mega bucks cruisers). Of the guys who do race, don't try to force boats into being slower as in the

43. Continued

12. Continued
proposed 40' x 17000 lb 620 IMS class. 8 year old J or Schock 35's will beat them around the course so the bigger boats will eventually stay home rather than go slow. Nobody ever asked me to design a slower boat than before - they always want to go faster.
13. Freedom of choice.
14. More penalty for light wt. const or - develop certain wt/sq ft rules which must be followed.
15. Innovation in structure, materials & configuration.
16. Useful interiors, affordable structure.
17. Larger cabins & houses - smaller cockpits - easier sail handling systems.
18. Lifting keels, heavier scantlings.
19. Greater inherent stability - stricter limits on crew weight.
20. None, rules should not force anything, owners should decide.
21. Stability, speed, safety, seaworthiness.
22. Scantling rules, use of (espec. ABS's).
23. Simplicity, up to date materials, speed, non-"type forming" rule ease of handling with small crews.
24. Use of carbon on inner skins & framing - the cost differential is less than the cost of a jib ($6000) for a 40 ft. design. We have identical boats in kevlar and S-glass/carbon composites. The carbon/S boats have shown little deflection (overall bending stiffness) problems over a decade of sailing. The kevlar boats tend to get mushy in just 1-3 yrs. The investment in carbon can go a long way in the life of the boat. It got out of hand ($) when it was used on floor boards to cover bilge lead, etc. While overall bending stiffness is somewhat insignificant in flat water, it is very detremental to performance in a seaway due to headstay movement.
25. Continue to simplify all handicapping et.
26. Sufficient strength & stiffness & impact resistance.
27. Stability.
28. Adequate structure in ends - especially forward.
29. Use of water ballast.
30. Light displacement.

44. What features of yacht design and construction (with respect to hulls and decks) would you like to see discouraged by the handicapping rules and regulations?

1. Very light displacements - water ballast - very high cost materials.
2. The need to use the crew as ballast on the rail.
3. Non functional galley, cabin, and accommodation plans- i.e. the "one trick pony" concept of design.
4. Expensive, non speed producing features.
5. Ultra light hull + deck skins.
6. Crew ballasting flat decks.
7. Very light disp, runner required fractional rigs, very deep draft, very short chord keels.
8. Extreme dimensions, unnatural bumps, ultra-expensive construction without justifiable gain.
9. Heavy, slow boats, complex boats.
10. Arbitrary limitations.
11. Eliminate carbon - honey comb cores.
12. Excessive weight.
13. Skinny mast w/more than 3 sets of spreaders.
14. Exotic materials - try to get back to mainstream to allow amateur construction to compete.
15. Deep draft, thin-skin cored laminates.
16. Flimsy scantlings. More skin thickness needed on custom composite yachts.
17. Stupid rules like allowing kevlar but not carbon!
18. Instability.
19. None.
20. Complexity, "type-forming," heavy boats, large crews.
21. Use of kevlar in hulls.
22. Balsa or cored decks & hulls.
23. Ballast/disp. above 55%.
24. Lack of sufficient strength & stiffness & impact resistance.
25. Slow boats that win by putting.
26. Very narrow keels at juncture of keel and hull.
27. Excessive beam; inadequate standing rigging & spars.

45. Please provide an estimate of the percentage of your designs or models which at least occasionally participate in organized handicap racing.
Range: 0 - 100 % Mean: 64.5 % Mode: 80 %

Part C: Auxiliary Propulsion Systems for Racing Yachts

46. Rank in order of preference in the absence of rules:
12.12 folding propeller 18.6 feathering propeller 2.2 fixed propeller 0.0 other systems (specify
Number of blades 19 two 10 three ___ more
2.2 Mounted in aperture
18.5 exposed shaft with a supporting strut
0.2 unsupported shaft
8.6 on a strut drive.
0.0 Other

46a. What are the most important reasons for your response?
4.2 Low cost
2.5 Strength
8.1 Seaworthiness
1.1 Ease of maintenance/repair
1.0 Other: Weed & lobster pot proofing
1.0 Other: Simplicity/cost
10.3 Speed
20.5 Low drag
2.2 Low-speed maneuvering
1.0 Other: Noise and vibration
1.0 Other: Reliability
0.1 Other: Going astern