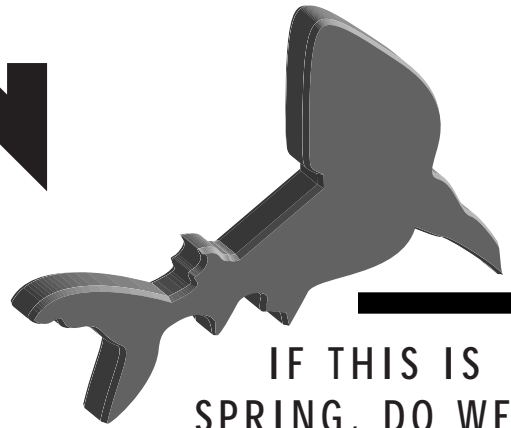


# sharkscan

THE NEWSLETTER OF THE CANADIAN SHARK CLASS  
Spring 1997



## CSCA RACING SCHEDULE 1997\*

PROVINCIALS(C)	
BHYC, Bronte	Jun 7/8
NIAGARA FRONTIER	
BCC, Buffalo	Jun 21/22
RCYC OPEN (LORC)	
RCYC, Toronto	Jun 21/22
NATIONAL CAPITAL(C)	
BYC, Ottawa	Jun 21/22
C&C OWNERS	
NYC, Toronto	Jun 28/29
CANADIANS(C)	
KYC, Kingston	July 5/6
SHARK WORLD CUP(C)	
BCC, Buffalo	July 20-24
NIAGARA CUP	
NOLSC, Niagara	July 19/20
LEVEL REGATTA	
Youngstown	Jul 26/27
GOLDEN HORSESHOE OPEN(C)	
RHYC, Hamilton	Aug 16/17
HUMBER BAY OPEN	
TS&CC, Toronto	August
GOLD CUP(C)	
Mimico CC, Toronto	Sept 6/7
GEORGIAN BAY INVITATIONAL	
Georgian Bay	Sept 20
YOUNGSTOWN SHARKS	
Youngstown	Oct 4/5
HOME COMERS(C)	
NOLSC, Niagara	Oct 11/12

(C) Counter Regatta

## THIS JUST IN TRILLIUM 1997



- 1 Crackerjack, BHYC
- 2 Eager IV, RCYC
- 3 Dartos, KYC
- 4 Duck Soup, MCC
- 5 Hedonist, TSCC
- 6 Frankly Scarlet, BHYC
- 7 Malarkey, RCYC
- 8 Silver Phantom, RCYC
- 9 Spam, SPSC
- 10 Obsession, RCYC
- 11 Haj, TSCC
- 12 Spirit, KYC
- 13 Invicta, RCYC
- 14 Impulse, TSCC
- 15 Flirtatious, RCYC
- 16 Fiction, RHYC
- 17 Gangrene, ABYC
- 18 Shoestring, TSCC
- 19 Gamache, TSCC
- 20 Beau Thai, RCYC
- 21 Enigma, RCYC
- 22 Moh, BC

## IF THIS IS SPRING, DO WE WANT TO SEE SUMMER?

Oh, why not. I'm not going to apologize for being late with this issue. So there.

What's new with you? If you can go by the submissions for this edition of Sharkscan, apparently rudders are on a few people's minds. Rules are big this year. In fact, I've got a few of my own.

Also, because I've been using up my annual quota of words on a new book, I've decided to reprint one of my favourite articles (how lazy can you get, eh?).

We had a Shark in the Boatshow again, as reported earlier, and it was not the roaring success of the previous year, despite the valiant efforts of all who contributed their time, boats, products and services. On the other hand, our web-site is getting lots of positive feedback (see Shark Sightings) and has attracted a number of new members from far afield.

The North Shore team hosted a Shark Round Table at the Boulevard Club in February and it was quite successful and very well attended.

Well let's get on with it.

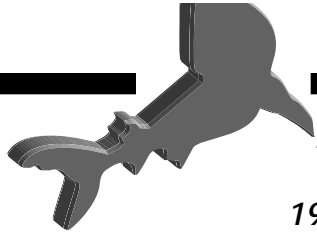
*Beaux Eaux*

## ATTENTION WEB SURFERS!

Shark Bytes has a new address

[sharkbytes.simplenet.com](http://sharkbytes.simplenet.com)

The latest Shark news, 24 hours a day. Check it out.



## NOTICE OF REGATTA

### *1997 ScotiaMcLeod Shark Canadian Championship July 5-6, 1997*

#### **Invitation**

On behalf of the Canadian Shark Class Association, the Kingston Yacht Club invites sailors from Europe and North America to enter the 1997 ScotiaMcLeodShark Canadian Championship regatta from July 5 to 6th, 1997.

#### **Venue**

The 1997 ScotiaMcLeod Shark Canadian Championship will be held on the warm, windy waters of Lake Ontario off Kingston, Ontario, Canada.

#### **Rules**

The event will be governed by the 1997-2000 Racing Rules of Sailing(RRS), the Class Rules of the Shark Class Association, this notice (except as modified by the Sailing Instructions), and the Sailing Instructions. This is a Category B event (IYRR Appendix A.3).

#### **Eligibility**

The ScotiaMcLeod Shark Canadian Championship is open to all yachts possessing a valid measurement certificate and whose helmsman or skipper is a registered member of his or her national Shark Class Association.

#### **Schedule**

Friday July 4	1500-2200	Measurement & Registration
Saturday July 5	0800	Breakfast
	0900	Measurement & Registration
	1000	Warning signal, Race #1 followed by up to three races
	ASAP	Debriefing followed by dinner and band
Sunday July 6	0800	Breakfast
	1000	Warning signal, first race of day followed by up to two races. No race will start after 1400 hrs.
	ASAP	Haulout, debriefing and prizegiving

#### **Courses**

The current Olympic (triangle and windward/leeward) courses as per the Sailing Instructions.

#### **Scoring**

The Low Point scoring system (RRS) will be used. Seven races are scheduled with four on Saturday. Four completed races shall constitute a series. If more than four races are completed, one race will be dropped.

#### **Prizes**

In addition to the Canadian Championship Trophy, there will be prizes for the skippers and crews finishing in the top five positions.

#### **Inspection and Measurement**

There will be minimal measurement but all yachts must have a valid measurement certificate endorsed with their required corrector weights. Yachtowners are reminded that they must carry all required equipment unless they have a valid Request For Weight Relief form.

#### **Launching, Hauling, and Mooring**

Boats can be launched and hauled free of charge at the Kingston Yacht Club. Yachts will be moored within the club basin during the regatta. All yachts shall be afloat by 0930 Saturday, July 5th and shall not be hauled out before the end of the regatta without prior permission of the jury. Neither careening nor the use of underwater breathing apparatus for the purpose of cleaning or inspection of the hull shall be permitted during the regatta. During the regatta, yachts may be inspected by the jury for measurement purposes.

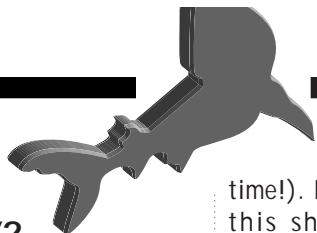
#### **Entries**

Entry fee is \$75.00 Cdn. and includes T-shirts, breakfast (Sat. and Sun.), dinner, debriefing and dancing for all crewmembers.

#### **Contact**

Requests for information should be sent to:

**1997 ScotiaMcLeod Shark Canadians**  
**c/o Kingston Yacht Club**  
**1 Maitland St.**  
**Kingston, Ontario, Canada K7L 2V3**  
**(613) 548-3052 (613) 548-8876 (FAX)**



## HAVE YOU HUGGED YOUR RUDDER LATELY?

by Terry Moss  
1765 Scorcher

Following an interesting discussion on rudders at a recent ISCA meeting I attended, it occurred to me that this might be a good time of the year to suggest that you take a good look at the condition of your rudder.

For wooden blades it is important that all nicks and dings be repaired by filling with epoxy, sanding and if needed, re-varnishing (a varnish with a U.V. blocking agent is recommended.)

Older wooden rudders, and especially the sweptback, spade type (narrow at the waterline and wide at the tip) should be inspected *very* closely. If the rudder shows signs of delaminating (most of them were made from plywood) and has been getting heavier each year, there is a good chance that moisture has entered the wood fibres. This being the case, you need to establish if repairs can be made or whether you want to run the risk of the dreaded loss of control at some critical moment (it always happens that way!) when the rudder breaks just below the lower pintle. This is not the recommended way to reduce your rudder weight!

A close inspection should also be made of the pintles, especially the lower unit. Look for fractures or cracks in the pintle straps around the bends and welds. They are due to cold working metal fatigue and will be accelerated if the pintles are continuously flexing under load (signs of the rudder blade being overloaded).

In the gudgeon area, it might be a good idea to replace the fixing bolts. These too can fatigue and may let go at the wrong time (this is never a right

time!). Replace the bolts one at a time, this should maintain the gudgeon alignment.

If you have bronze gudgeons and the pin hole is badly worn, (not a safety issue) you might want to a) have the gudgeons bushed or b) replace them with Shaefer 81-43 gudgeons. What I like about these gudgeons is that they are stainless and they use 4 bolts per gudgeon (a plus is that the 2 outer holes match the holes in the bronze version).

If you have any questions on the above, please call me. Happy steering.

(705) 534-7168

## Reminder to all Shark Owners:

If you did work to your Shark this winter or added new equipment, you may be required to get the work or equipment re-measured. If the work or equipment is a measured item, then it should be re-measured. Talk to your local Measurer if you have any doubts. The measured items should then be forwarded to me to be kept on file. It would be a shame for you to be thrown out of a regatta for a legal but unmeasured item. Remember that your boat is only legal when it has been measured and is on file with me.

To date, I have received three requests for weight relief. This means that all other boats must race with all equipment listed in the Shark rules. Boats will be checked this year at Regattas and are expected to carry all equipment. If your boat is overweight, then apply for weight relief. Please do not get caught at Regattas because of simple paper work. Talk to your local measurer and get your boat weighed and do not forget to apply for weight relief. Request for weight relief must be on file with me before your boat is legal.

Jeff Mitchell

## Shark Stuff

**SHARK WANTED:** 1986 or newer, very well-maintained, preferably never raced. Contact Carmine Forgione during the day at 905-564-7500 ext. 7218 or evenings and weekends at 416-767-8307.

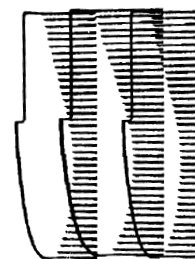
**Sails** - large inventory of used sails at reasonable prices. Call Greg Cockburn Res (416) 486-0711 Bus (416)863-7743

**Jib** - good shape \$75  
Call James T. Snodgrass at (902)826-1677

**JC Sails** - used only twice, rolled/never folded-full main, 180% Genoa-selling for \$500 less than today's purchase price! Call L. Sweet (905) 338-6236 Bus (905) 829-4197 Home

**Rudder**-white foamcore 'Ebert' design.  
Call L. Sweet (905) 338-6236 Bus (905) 829-4197 Home

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- Finished in epoxy and spar varnish.
- Minimum weight laminar flow section

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TERRY MOSS  
1-705-534-7168

## North American Weight Rule Rewrite

This is a proposed rewrite for NA Weight Rule. At this time, I am looking for comments from the membership on this proposal. Please let me know if you approve or disapprove of this rewrite or if anything should be added to this rule. If the membership gives a positive response to this proposed rule change then the membership will be asked to vote on it.

The purpose of rewriting the weight rule is to simplify the rule and to give more options to the boat owner and eliminate weighing at 2100 lbs - a step which is not necessary. At this time NA weight rule is two pages long. With a simple rewrite, it could be reduced to a page. This revision would reduce paper work and give the owner more options.

All boats will still race at the 2300 lbs minimum weight. Boats will be required to carry a minimum of common equipment. (See proposed rule change)

All other equipment is optional - mattresses, ice box, etc... This will give the owner more options. The owner can select the items which they feel are necessary to have on board. For instance, an owner may feel a boarding ladder is a necessary item, so this owner could remove a bunk cut-out to compensate for the weight.

The boats will no longer be weighed at 2100 lbs. but will weigh at 2300 lbs. all up racing weight. Boats which weigh over 2300 lbs may remove non-fixed items from the boat without apply for weight relief to the Chief Measurer. Items like mattresses, floor boards, bunk cut-outs may be removed without applying for relief. This is more flexible and reduces paper work.

Boats which are still overweight may apply to the Chief Measurer to remove fixed items such as built-in ice box, sink.

Boats which weigh less than 2300 lbs will have the option to carry more items or to carry lead, which must be fixed to the bunks.

All boats will be required to carry the minimum common equipment and also a list of all equipment on board.

Removing the weighing process at 2100 lbs and not having the owner request weigh relief for non-fixed items simplifies the weighing process for the owner and the measurer. Rewriting the North American weight rule does not change the intent of the rule but rather the administration of the rule.

### *North American Weight Rule*

a) All boats shall carry:

- 2 Paddles
- Sound Signaling Device
- PFD's for each member of the boat
- Fire Extinguisher
- Motor and Fuel Tank
- Flares
- Anchor and Rode
- Heaving Line or Cushion
- Bailing Bucket or Pump
- Any other items required by law

All other equipment is optional.

Personal clothing and consumable stores, including water and engine fuel, may not be included in the all up racing weight.

b) The equipment added to arrive at the all up racing weight is to be normal racing and cruising equipment and not ballast.

c) Owners with boats weighing over 2300 lbs may remove items which are not fixed without written application to the Chief Measurer.

Owners must apply to the Chief Measurer to remove or modify internal fixed items. If the Chief Measurer approves, he will certify and sign the application and produce a new

measurement certificate.

The Chief Measurer will have the discretion to consider other weight reduction methods.

d) Boats which weigh less than 2300 lbs have the option of carrying additional normal sailing equipment or metal corrector weights to be permanently fastened to the topsides or undersides of the bunk tops to meet the 2300 lbs. requirement.

The weight must be marked on the correctors and be shown on the list of equipment.

e) All boats shall carry on board an itemized list of equipment signed by a local measurer, which shall be available to the race authorities.

- \*1. Paddles minimum 4 ft
- \*2. Total weight to be 60 lbs
- \*3. Proposed rule change

Jeff Mitchell  
587 Wilene Drive,  
Burlington, Ont L7L 2B3  
(905) 637-2829  
E-Mail [mitchell@bigwave.ca](mailto:mitchell@bigwave.ca)



## Boat Building for the Home Handyman

So, the renovation is finished. So's your marriage. You've got time on your hands and yard full of building materials. The wife took the pickup. Friend's don't call much since your last house painting party, and they were her friends anyway.

Not much on your personal horizon, is there? When you're looking at the junkpile in the yard, don't overlook the potential in the debris of your life. Make sailing your lifestyle. Meet new friends, impress some women. Everything you need is waiting just outside your door.

Here's a project that is guaranteed to change your life – *build your own sailboat*. Yes, you read me right. It's fast, easy and affordable. Let's start right now.

Research is pretty important and fortunately for you, there are plenty of people standing around yacht brokerages just dying to do it for you. Boat dealers, builders and designers are so darned proud of their product they'll tell you anything. Be sure to tell them you're "thinking seriously" or better yet "buying this season". Give them your ex-wife's name, new address and phone numbers. Collect brochures. Size of yacht is not important right now. Think how your homebuilt beauty can benefit from the combined expertise of the yachting universe.

Go home and assess your materials. The size of your yacht will be determined by the size of your inventory. Your objective is to build the biggest boat possible using only materials on hand.

Your primary building material is drywall. If your house is still standing, chances are you have the right stuff.

Every good builder needs a plan. You must obtain drawings, plans and specifications for a number of yachts in your target size. Getting these plans is cheap and easy. Write a carefully worded plaintive letter to several

builders detailing the tragic near-loss of your beloved (insert model name here) in the catastrophic Punky Doodle Yacht Club fire of '96. Due to your reduced circumstances and lack of insurance you will need to rebuild from the ground up. Throw in some extravagant praise, mention how lucky you were to purchase this gem from her original owner and sit back to await your plans.

### THE HULL

Most boats you see nowadays are fiberglass and have nice, smooth rounded hulls. This is difficult to achieve with drywall. But not impossible. Some reconnaissance is required at this stage. Search out boat storage yards with limited security.



Select a boat of a size and shape that meets your requirements. Bring your drywall and a garden hose. With your hose, wet the drywall (this step may be omitted if your drywall has been outside for some time). Fasten the pieces of soggy drywall around the boat you have selected as your mould. Some kerosene heaters will expedite drying. You will need complete privacy for this venture. We recommend night vision goggles on a moonless night.

Having formed the hull, you will need to reinforce it. Remember – a light boat is a fast boat, so choose your reinforcing material carefully. We recommend steel studding, it's much easier to bend than wood. Gather up all those little odds and ends of lumber and glue them inside the hull around the high impact areas. Add some ceramic tile for decorative effect. A length of lead pipe cut in half will

protect the bow from impact. (The bow is the pointy part you drive up onto the dock to stop the boat).

Finish taping, then fit the transom. (That's the blunt end at the back where you sit and is sometimes mistaken for a open air privy.) You should complete the deck at this time, piecing the leftover bits of drywall together to form an interesting pattern. Reinforce using the same techniques you used for the hull.

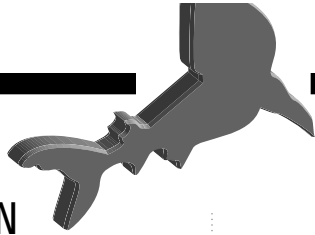
Paint is nice, but latex is definitely out. High gloss enamel is ideal. Choose a nautical colour which will not fade. Pink is not considered in the nautical range, even this year.

Our next step is called vacuum bagging. If you are unclear about the exact procedure, take a trick to your nearest boat builder. This may require air travel. In that case, check out fibreglass fabricators in your area. Make an appointment to view the facilities. Express undue interest in their vacuum pump. A small disposable camera would be an asset. Use their coffee break wisely.

Of course, we won't be stealing any trade secrets if we put the plastic on the outside. And since you haven't had any home-cooked meals in a while, the refrigerator won't be needing a compressor. You can keep your beer in the 100 litre cooler you've been using as a sofa bed.



Use lots of epoxy to ensure a good stiff hull and deck. And the hard plastic shell will rival anything on the market for shine.



## BASS FISHING IN GEORGIAN BAY THREATENED BY SHARKS!

The Midland Bay Sailing Club is pleased to invite the Shark Fleet to participate in its annual Adams Point/Flat Point distance race to take place Saturday, September 20th.

The race consists of a 19 mile, T-shaped course using navigation buoys as turning marks. It usually provides a good mix of sail angles and good winds combined with gorgeous scenery and clear water.

Our club has a hoist, so launching can be done at the club on Friday or Saturday. An evening meal is planned for Saturday evening. Accommodation is available in Midland. The entry fee has yet to be established but as with the meal, will be very attractive.

If we get enough Sharks entering we are also willing to run 2 or 3 short course triangle races on the Sunday in Midland Bay with awards going to the overall winner.

Please contact me by mail or phone if you intend entering and I will send you an entry form with directions etc. Also, let me know if the 1 race or 2 day event appeals to you.

My address and phone number are below.

*Terry Moss*  
P.O. Box 90, Site 6  
RR#1 Port McNicoll ON L0K 1R0  
(705) 534-7168



## RUDDER STRENGTH

by Richard Hinterhoeller

In 1985 I designed and built a rudder which we used on Geordie Moggridge's Shark "The Fool's Overture". From the point of view of control, the rudder exceeded all expectations. We almost never lost steerage, even on the toughest of spinnaker reaches. There was, however, a price to be paid for all of this control. During the summer of 1989 the lower gudgeon bolts fatigued. Shortly thereafter, we noticed that the lower pintle strap had a fatigue crack running three quarters of the way through. That fall, the rudder snapped.

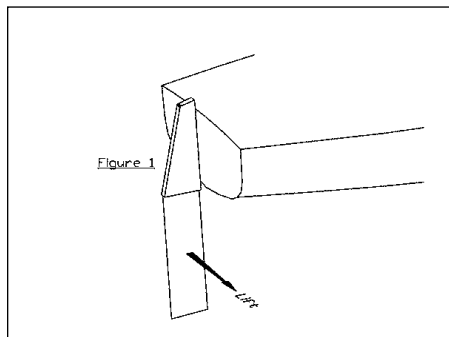
Quite frankly, when I drew up that rudder, I didn't pay a lot of attention to its strength. I just assumed that Shark rudders, built in accordance with the class specifications, had a reputation for longevity so I wouldn't have to worry about it. Obviously I was wrong.

As a result of that failure, Terry Moss' comments at the Canadian General Meeting and in light of the specifications being given a general overhaul, I have taken it upon myself to review section 6.5 (Rudder) of the class rules from a structural point of view. In the process of performing the calculations, I have concluded that although a structurally sound rudder can be made within the class rules, simply adhering to them is no guarantee of strength regardless of the materials used.

In this article I would therefore like to share my findings with the Shark fleet and propose some additional specifications to the rudder rules so as to reduce failures in the future.

**Loads:** One situation where the rudder is loaded is on a beam reach. The boat develops weather helm and the skipper compensates by pulling the tiller to windward. Consequently the rudder is moving through the water at an angle (the angle of attack) and generates a

sideways force known as lift (Figure 1). The lift balances the forces



causing weather helm and the boat sails in a straight line. As the wind speed increases, weather helm increases and a greater angle of attack is required until at some wind speed, the maximum lift is achieved and the rudder starts to stall. Any increased weather helm will cause the boat to lose control and round up. A larger rudder can generate more lift and control the boat with greater weather helm than a boat with a smaller rudder.

Although lift acts along the entire rudder blade, it can be visualized as a force acting at a certain depth, roughly midway down the rudder blade. If you multiply the lift force times the distance below some level, say the lower pintle strap, you can determine the bending moment on the rudder structure at that level. If the rudder lacks the strength at that level, it will break.

A larger rudder blade will create a larger lift force, hence requiring a greater strength than would a smaller rudder. A deeper rudder, since it applies its force at a greater distance from the pintle straps, would also create a larger bending moment hence requiring greater strength than a shallower rudder.

The strength is achieved by having enough width and thickness to withstand the bending moment caused by the rudder blade. In the case of a cored fibreglass rudder, one can also add extra layers in key areas. One can also use higher performance fabrics.

**Calculations:** The \$64,000 question when analysing anything on a boat is

"What are the actual loads?". I have exceeded 20 knots in a Shark but a rudder which could withstand a full stall at those speeds would sink the poor boat. For guidance, I therefore turned to the American Bureau of Shipping (ABS) Guide for Building and Classing Offshore Racing Yachts. Based upon the waterline length, displacement and rudder geometry for a given design, the ABS guide has calculations for determining the bending moment on the rudder. The guide also recommends safety factors and allowable strengths for various materials. For materials not covered by the ABS Guide I used values published in the "Boat Data Book".

As it turns out, on a Shark the bending moment is calculated by assuming a fully stalled rudder at 6.74 Knots. The pressure works out to be 9020 Newtons/square metre or 188 pounds per square foot. Your average rudder has to sustain a load in the neighbourhood of 2200 Newtons or 500 pounds. By the time you apply the recommended safety factor, the design load becomes 5200 N or 1200 lbs. Could you mount your rudder horizontally by the pintles and have your entire crew jump on the blade?

Following are a few suggested additions to the current specifications.

Limit the maximum allowable rudder depth: Currently a minimum rudder depth is specified, but no maximum. As mentioned above, an excessively deep rudder can overload the rudder structure. Also, a rudder which is deeper than the keel (965mm below waterline, 985 mm below the transom) is vulnerable to damage from hitting the ground. I therefore propose a maximum rudder depth of 95% of the vertical distance from the transom to the keel, specifically 935mm. Although this is considerably deeper than current design practice, it is consistent with earlier Shark rudder designs.

By limiting the depth to 935mm, I have been able to reduce the lengthy calculations from the ABS guidelines to two simple charts for screening critical

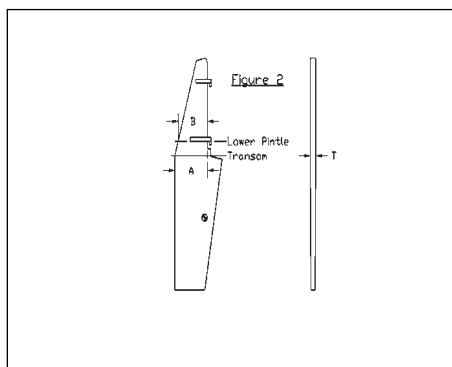
areas of the rudder.

### Screen the rudder blade using

**Chart 1:** Currently, the specifications govern the rudder blade from the transom level on down. This level sees the highest bending moment in the currently regulated part of the rudder so it should be screened for strength, particularly since many rudders are reduced in width from this point upwards. To use chart one, at the transom level:

- 1/ Measure the rudder blade width in millimetres (mm) at the transom level (Width A on Fig 2)
- 2/ Measure the rudder maximum thickness in mm at the transom level.
- 3/ Calculate the rudder area in square metres (m<sup>2</sup>).
- 4/ On chart 1 find a curve which represents the width of the rudder, for

example the third curve from the bottom represents a width A of 230mm.



- 5/ Follow that curve until it crosses the the measured rudder thickness.
- 6/ Draw a horizontal line across to the left hand axis of the graph to read the maximum allowable area. For example, a 230mm wide rudder which is 40mm thick would be allowed a maximum

blade area of 0.21 m<sup>2</sup> (2.26 sq feet).

If you designed a Mahogany Shark rudder made to the minimum allowable dimensions of 178mm wide (dimension A on Figure 1) by 35mm (T) thick at the transom level, it can not be made small enough (according to existing specifications) to survive.

Screen the rudder stock using Chart 2: The lower pintle level should be screened since it sees the highest bending moment on the entire rudder. Although it is not currently regulated, it should become so in the future. At the lower pintle, follow a similar series of steps as above:

- 1/ Measure the rudder stock width in mm at the lower pintle level (Width B on Fig 2). It is assumed that the rudder

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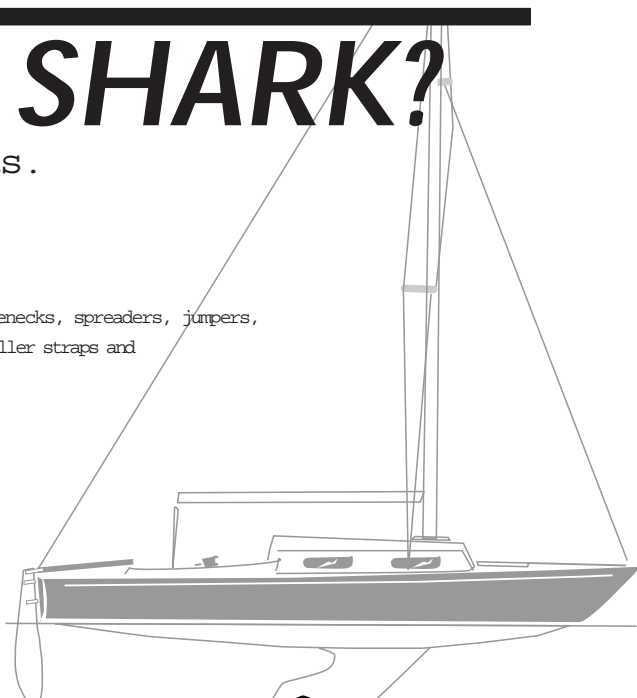
## • RUDDERS

Totally elliptical rudder, constructed in solid mahogany with a fibreglass insert around perimeter of the blade or composite fibreglass construction.

(Pssst...a slightly larger rudder, same design, is in the works)

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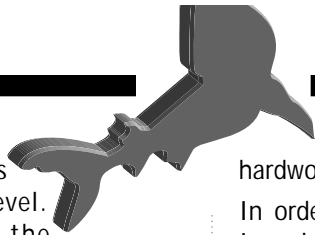
# masthead

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cross section is rectangular at this level. At the time the specifications are written, procedures for dealing with non-rectangular cross sections will have to be written.

2/ Measure the rudder thickness in mm at the lower pintle level.

3/ Calculate the rudder area in m<sup>2</sup> (same value as step 3 above).

4/ On chart 2 find a curve which represents the width of the rudder stock, for example the fourth curve from the bottom represents a width B of 180mm.

5/ Follow that curve until it crosses the the measured rudder thickness.

For example, a 180mm wide rudder which is 46mm thick would be allowed a maximum blade area of 0.24 m<sup>2</sup> (2.58 sq feet).

Provided the shape of the rudder is changed gradually and with no notches, the rest of the rudder should have adequate strength.

**Wood Construction:** The current wording of using "Hardwood" should be redefined. By definition, hardwood comes from deciduous trees and softwood comes from conifers. Balsa wood is technically a hardwood yet would be unsuitable for a rudder. This rule should be amended to specify South or Central American Mahogany.

**Fibreglass Construction:** The variety of reinforcements and construction techniques makes the writing of specifications for fibreglass construction very difficult. My first suggestion is that the same rules governing the width and thickness of wood be applied to fibreglass and that it is up to the builder to ensure that the rudder is as strong as its wooden equivalent. If you don't have the background to make this assurance or you are not prepared to destruction test a sample rudder, stick to wooden construction.

My second suggestion is that if fibreglass is being used as a protective sheathing, it is to be used only over a

hardwood core.

In order to compare various materials, I calculated the strength of a mahogany plank. For the identical width and thickness and for several fibreglass fabrics, I calculated beams of equal strength to the mahogany plank. The relative weights and deflections are as follows:

Material	Weight	Deflection
Mahogany	100%	100%
Mat	142%	162%
Woven Roving	129%	118%
Bi-Axial	60%	189%
Uni/Mat 2:1	44%	295%
Uni/Mat 4:1	42%	285%

If you use conventional Mat, Woven Roving or Cloth (similar properties to Woven), you should expect your rudder to be 30% to 40% heavier than mahogany. Your laminate will also be 30% to 40% of the rudder thickness. By feathering the skins in the low load areas, you can achieve slightly better results. If you can get your hands on higher performance Bi-Axial and Uni-directional/Mat fabrics, you can achieve weight savings over mahogany, albeit with a more flexible rudder.

The third recommendation I would make with regards to fibreglass construction is that the basic rudder in standard measurement trim but minus corrector weights shall weigh no less than 6.8 Kg. Although this doesn't guarranty a structurally sound rudder, it is much better than allowing a 5 lb cloth rudder with 12 lb of corrector weights.

**Carbon Fibres:** The conventional interpretation of skin and core in composite construction is that the skin provides the bending strength and the core acts as a lightweight spacer which transfers the shear stresses. The current wording "... fibreglass over an optional core" can be interpreted to allow carbon fibres as part of the 'core'. The use of this very high performance material as part of the

core inappropriately exploits of the current wording.

The class should address this issue and either change the wording from 'fibreglass' to 'fibre reinforced plastic', thus clearly allowing the use of exotic fibres such as carbon, or leave the wording as is and clarify that the use of exotic fibres is clearly prohibited anywhere.

In making this decision, Shark sailors should bear in mind that carbon fibres are significantly more expensive than glass and that the use of carbon fibres is an all or nothing situation. Carbon fibres are so stiff that you either have enough to take up the entire load or you have none. Anything in between and the carbon will snap. You can't just throw a few dollars worth of fibres into the structure.

**Core:** Although a lightweight material is typically used for the core, it is not just along for the ride. The core fulfills an important and complex function. It has to be stiff enough to maintain a constant distance between the rudder shells when loaded. It has to be rigid enough in shear that the shells cooperate with each other and it has to be strong enough in shear so that it doesn't fail.

Materials such as Core-cell, End-grain Balsa, Airex, Klege-cell and Divinicell are specifically made to fulfill these functions. Solid fibreglass, some polyester putties, plywood and micro-balloon putties can also be used, especially in high stress areas such as the pintles. Air, styrofoam and polyurethane foam on the other hand are not suitable except where the loads are very small.

I suggest that the wording "Except where high strength localized reinforcements are used, only core materials intended for use in fibreglass sandwich construction are permitted for use as a core." be added to section 6.5 a.

So how did the old two-piece Fool's rudder fit into these curves? At the transom level, it was 91% of the

necessary strength and at the lower pintle, it was 78%.

Will following these recommendations guarantee that your rudder won't fail? No. Through a lack of maintenance your rudder could develop rot. It is possible that the ABS guidelines underestimate the speed of a Shark. The pintle straps may be concentrating the load badly or you may have weakened the rudder by adding holes when replacing pintles. These recommendations will guide you to making a much stronger rudder than by following the current specifications.

In closing I would like to encourage a dialogue amongst Shark sailors. After some reasonable period of time I hope we can put these issues to a vote and make the appropriate amendments to the rules. At a minimum I would like to see these recommendations used as voluntary guidelines. So, measure your rudders this summer to see where you fit in. If you have made your own fibreglass rudder, remember that corrector weights don't add any strength. Also bear in mind that a couple of extra pounds in the rudder will cost your standings less than a DNF due to breakage.

**Richard Hinterhoeller**  
*ISCA Specifications Officer*

If you have any comments, I can be reached at (905) 336-7490

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Chart 1: Shark Rudder Dimensions at Transom vs Maximum Area

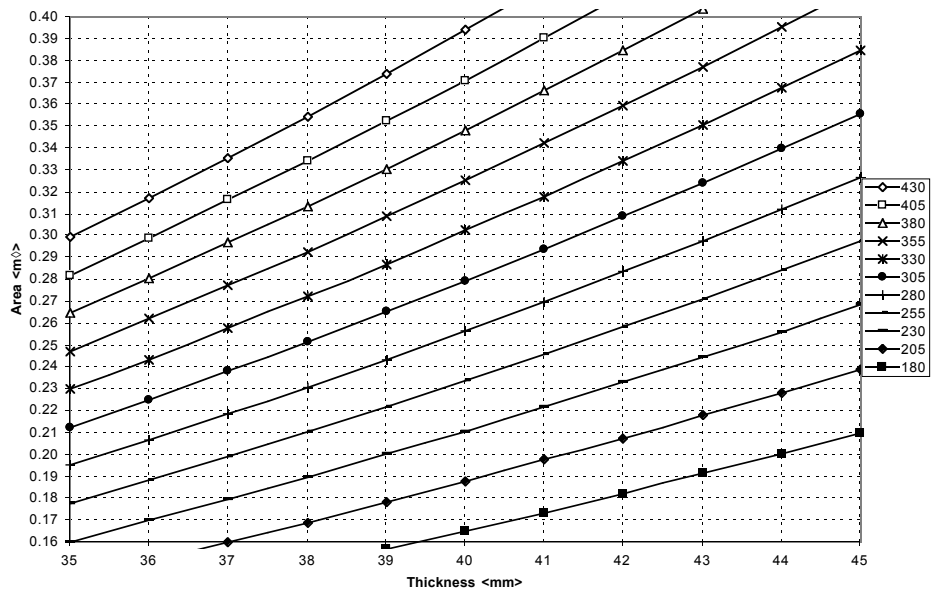
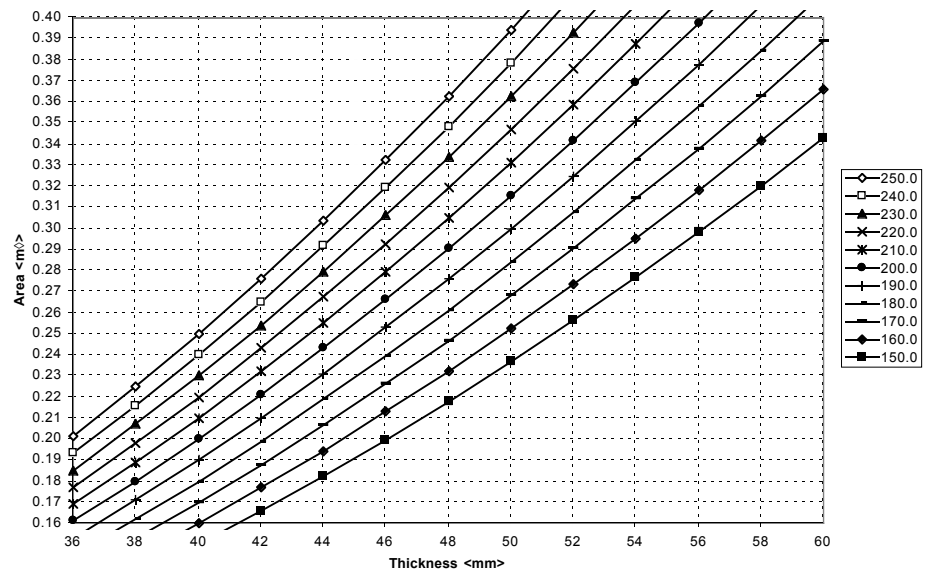
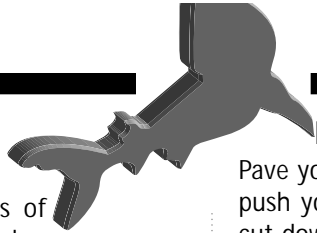


Chart 2: Shark Rudder Thickness at Pintle vs Maximum Area vs Width





## INTERIOR APPOINTMENTS

The interior comforts of your vessel will depend on the furniture you were left with. Small sofas and chairs are fine for larger vessels if properly secured. A waterbed does double duty as a bunk and ballast, provided you make adequate arrangements for draining and shipping water. Smaller boats can use leftover doors reshaped and epoxied as centreboards and rudders. A small Volkswagen or Yugo, suitably compressed, can easily be fashioned into a keel.

A word about fibreglass. This is desirable in a modern yacht. Line the inside of your hull with 4" Fibreglass pink insulation. Fashion a liner from drywall. The liner does not need to conform to the contours of the hull. In fact, fitting furniture is more difficult if surfaces are curved. Conventional wisdom is not always efficient.

The interior of your vessel should receive the benefits of your creativity. Use your expertise in home plumbing and wiring. These skills are similar for marine use. Possibly superior.

## SPARS & RIGGING

You'll need a material that's strong and hollow for your internal halyards. For shorter rigs, stovepipe is fine, but aluminum street light poles are made to order for taller rigs. New subdivisions use lots of these. Bring a flatbed truck equipped with a crane.

Four lengths of angle iron can be bolted together for the boom. Fashion fittings from common household objects like stainless steel cutlery.

## SAILS

We recommend laminating your leftover vapour barrier plastic to bedsheets. This requires a girlfriend with a sewing machine and a steam iron. You probably haven't had time to get one yet, so another moonlight stroll through the boatyard may be necessary. Bring bolt cutters (for protection).

## ENGINE

Pave your lawn and let your lawnmower push you around for a change. You can cut down the blade for a nifty propeller and you're on your way. Is it too late to save the Volkswagen engine? Serves you right for not reading the instructions all the way through before you started.

## ELECTRONICS

Getting tricky here, but from distorted minds come creative solutions. A depth sounder is nice for forays in shallow waters. Install a powerful stereo system. Fasten a stereo speaker face down, inside the hull just forward of the keel. Using elementary calculations, you will be able to determine the depth of the water from the feedback. Many yachts are equipped with a VHF radio but they are of limited use for true emergencies like locating liquor stores and boat delivery pizza chains. Better to keep a supply of charged cellphone batteries on hand. And you don't need to take a test to operate your phone.

## PUTTING IT ALL TOGETHER

Time to get it together. It's time to drop that deck on and fasten it with C-clamps. Metal eavestrophing provides excellent runoff in addition to a sturdy rub-rail. Remember that Volkswagen? You will probably want windows in your boat. And hockey socks over tire sections can't be told from real fenders. Look around you. Rather than rent a truck to take the remains to the dump, really customize your craft.

## GO SAILING

We hope you built your boat with transport in mind, because you should be ready to launch her. Again, night time is the right time. Travelifts are rarely busy after midnight. Our job is done. Good luck and goodbye.

## SHARK OF THE YEAR



FOR THE FOURTH YEAR IN A ROW IT'S...

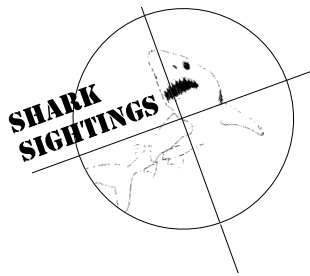
DUCK SOUP – SID DAKIN

- 2 Dartos, Don Ruddy
- 3 Frankly Scarlet, Jeff Mitchell
- 4 Haj, Graham Jones
- 5 Debu, Kalle Saarits
- 6 Crackerjack, Jack Mitchell Jr.
- 7 Eager IV, Greg Cockburn
- 8 Gangrene, Adrian Trus
- 9 Unc, Mark Wiggins
- 10 Silver Phantom, Jim Barkman
- 11 Spirit, Roger Rathbun
- 12 Obsession, Paul Currie
- 13 Flirtatious, Pierre Boulanger
- 14 Tea for Two, Keith Quigley
- 15 Invicta, Toby Barwick
- 16 Hedonist, Don Sutherland
- 17 Cariad, Dave Simpson
- 18 Grafitti, Rodney Smith
- 19 Malarkey, Graeme Young
- 20 Gamache, Jacques Michaud
- 21 Rat, Wayne Harrison



*Beaux Eaux*

## Executive



Welcome to Shark Sightings - a place to reach out to your fellow Shark sailors and share information, look for stuff or simply to say hello. Send your regards via E-mail to Bill Henderson or Christine Forsyth. Following sightings are hits from our Shark homepage.

Hi, we own a Shark in Toronto and are looking for a used RUDDER. Please contact us at (416) 364-3462.

*Johnathon Maguire*  
*jonathon.maguire@utoronto.ca*

Can anyone supply aluminum toe rail for "Four Winds?"

*Kevin Wood, Sambro NS*  
*kwood@ns.sympatico.ca*

Hello, my name is Tom Nylund. I'm from Finland and I'm a happy owner of a Swedish built (1978) Shark 24. The model has never been sold in Finland, so my boat has travelled here on the deck of a cargo ship. Amazing because I have already made a visit to the Stockholm archipelago with my Sharky

in 1994. I have met only 3 other Finnish Sharks so far.

*Tom*  
*aslak@netti.fi*

I'm the second person from the Altmuehisee in Germany to visit your site (the first being Lueder Heidemann). I looked for a long time to find something about Sharks on the internet (although I still don't own one!) and finally found your homepage accidentally in December. I've visited your pages several times and I really like it! Congratulations to you. Our Club, WSO in Ornbau is located 17 km in the south of Ansbach. The famous and romantic old city of Rothenburg is about 45 km to the northwest of Ornbau. By the way, if you try to find Altmuehlsee on an atlas, be sure it is a new one. Altmuehlsee is an artificial lake built in 1985. There is a really fast growing Shark fleet on this lake. The 10th Shark in our club will definitely be launched this spring and it's still not mine, but I hope to be number 11 or 12. There are at least 3 more Sharks on the lake so we will have at least 13 Sharks on our lake this summer.

It would be really great to exchange information between Europe and North America and elsewhere. You may publish my e-mail address. Let's keep in touch.

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Contributions are gratefully accepted.  
Photographs are eagerly anticipated.  
Contact the editor for preferred formats.