

**Safety at Sea for Shorthanded Sailing**  
**By Dan Benjamin**

1. Be well rested before leaving shore, conserve your energy
  - Mentally alert
  - Take rest breaks from the helm, use the autopilot, alternate drivers
2. Start seasickness medicine early, the night before,
  - Learn the dosage that works for you
  - Monitor yourself and crew for signs of seasickness or reaction to medicine
3. Rig the safety systems **FIRST:**
  - Jack Lines
  - Lifering/lifesling
  - MOB pole - Make certain it is deployable and securely attached to the ring
  - Boarding ladder
  - Liferaft
  - Survival suit - attach lanyard between bag and boat
  - Crash mat
  - Tiller tripline or autopilot controller
4. Dress appropriately for the anticipated conditions  
On the ocean:
  - Dress warmer than you do in the SF Bay
  - Sea boots - not dinghy boots, surf shoes, or barefoot
  - Use your hood, not a rain hat or ball cap
  - Layers of warmth
  - Foulies keep water out - Get rid of your old leaky foul weather gear
  - Foulies should be designed for the sailing area: Ocean not bay
5. Work to **STAY DRY!!!** Dry = warm
  - Dress **BEFORE** you go on deck
  - Close your pants cuffs!!!
  - Zip up, close neck/collar flaps

**If you get cold, your susceptibility to seasickness Increases**

  - Put hood on - keep it and you dry

**It is better to be a little over-warm than shivery cold**
6. Drink fluids and eat food regularly
  - "Fuel the furnace"
  - Lots of hours of sailing time - 6 - 16 hours for a Farallones Race
    - How many meals would you miss if you waited to eat until after you cross the finish line?
  - If your crew is sick, **YOU** keep eating
7. **STAY ATTACHED TO THE BOAT = Tie off!!!!!!!!!!**
  - When you leave the dock
  - Before you come on deck
  - Tie off to the high side jackline or "deep" in the cockpit when possible
    - Don't lay down on the deck, head down, to reach the low side, you could get pitched off, you will get sick - attach high and step down to low side
  - Resist temptation to "swing" around the shrouds with one hand when moving forward or aft

8. Jacklines are mandatory!
  - They must be fitted so the skipper and crew can move from the cockpit to the forward and to the aft end of the deck without unclipping the harness
  - They should be attached to through-bolted or welded deck plates or other suitable strong anchorages
  - Locate them as close to centerline as possible, preferably inside the shrouds
  - Their length should limit your travel so you cannot go over the bow, and stop short of the transom a distance equal to the length of the lanyard.
  - Avoid the "ends" - mount pad eyes where you need them
  - Avoid using cleats as anchorages
  - Fixed helmsperson anchorages
  - Install multiple anchor points
  - Do Not Use Lifelines for tie off
  
9. Lanyards keep you attached
  - Have locking hooks at each end to avoid roll-out
  - Secure the lanyard together or use elastic style lanyard to avoid tripping
  - Replace your lanyard as necessary
    - Inspect the stitching, damage from sunlight (UV), salt, chemicals, abrasion
  - Install an opening shackle at the body end
  - Double lanyards for moving from attachment to attachment point
    - Long/short/double leg
  
10. Harnesses connect you to your lanyard
  - Integral harness to foul weather gear
  - External harness
  - Inflatable with integral harness
  - The harness must be properly adjusted on your body
  - Your lanyard must be clipped to both rings ( if there are two rings) of the harness
  
11. External jacklines are located outside of the lifelines
  - Permit attachment of your extra lanyard if you are over the side and unable to reach to the gunwale
  - The idea is to slide along the hull to a lower area/stern (but not beyond) for easier access
  
12. Boarding ladders may be necessary
  - Various "ladders" are used
    - Portable ladder installed by the crew - secure the ladder so it will not float away
    - Transom ladders - need a release system
    - Rope ladders
    - Steps or handles mounted on the transom
    - Windvane, rudder cages
  - Train the crew on how to deploy each system

13. "Lurch" control - The flying skipper and crew
  - Install foot blocks for the skipper and the crew
    - Wood or plastic blocks
    - Pipes frames - could be dangerous if you step inside the pipes
    - Combination foot and deck gear box (Dan Newland approach on Pegasus XIV)
  - Tie off as short as possible
  - Skipper may need to move to inboard steering position in difficult conditions
14. Lifelines are mandatory!
  - Lifelines should be a minimum of 2 feet above the local working deck
  - A lower lifeline should be installed
  - Aluminum stanchions corrode and break (Olson 30 experience)
  - Replace the lifelines routinely when they show signs of corrosion or damage
  - Replace small diameter lifelines with larger diameter lifelines (see ORC requirements)
  - Secure stanchions to the boat (especially socket type on Olson 30)
15. Communication could save the day
  - Keep a handheld VHF in the cockpit
  - External microphone and speakers in the cockpit
  - Monitor Channel 16 for emergency assistance
  - Carry an emergency antenna - if dismasted you may lose the main antenna
  - Personal size radio in your pocket
16. Emergency Position Indicator Radio Beacon (EPIRB) a must!
  - Carry a 406 MHz EPIRB
  - Register the EPIRB as required
  - Train your crew on how to activate the EPIRB
  - Keep EPIRB immediately accessible
17. Flares are used to draw attention
  - Carry all required flares, properly dated, easily accessible
  - Train your crew on how to light or fire off flares
  - Personal size flares can be carried in your pocket
18. Personal Flotation Devices (PFD) will keep you afloat
  - You have some choices
    - A) Inflatable PFD with an integral harness
      - Manual inflation
      - Automatic inflation
    - B) Vest type PFD and external harness
  - Whistle and strobe light attached to PFD or harness
    - Replace the battery frequently, test the light
19. Plan and practice a Man Overboard Drill
  - Attach your lanyard to your jackline and drop it over the side of the boat as if you have fallen over - where will you end up? Can you reach the gunwale? Can the crew reach you?
  - You must carry a deployable life ring and pole, or
  - You must carry a deployable lifesling
  - Practice (skipper and crew) guiding the boat to an object dropped overboard
  - Practice deploying your lifering and pole /lifesling
  - Practice recovery methods for getting victim back on board
    - Lifting tackle for sling or other system

- Halyard
  - Ladders
  - Sails - scoop and hoist
  - Net
- Stop or greatly slow the boat during recovery if possible
    - Roll-up or drop the headsail
    - Drop the main if possible - probably not possible, boom hazard also
    - Turn autopilot off

20. Self-Recovery - No crew available

- **DON'T GO OVERBOARD!**
- Try to roll or pull yourself back in right away - Don't "experience" the feeling - you may only get one chance - you are at your strongest and most motivated at first
- Deploy your flotation
- Reach the external jackline and connect your second lanyard
  - Release the primary lanyard
  - Move to a lower point of access or the stern
  - Deploy ladder
  - Reboard
- Keep your head above water
- Don't drink in sea water
- Pull tiller/autopilot tripline or release to stop the boat
- Cut Free????
  - If you are certain that you will not get back on the boat
    - Will a wave lift you enough?
  - If you are certain that you will drown if the boat does not stop
  - If you see another boat standing-by to assist you
  - If you have methods to contact help (personal flares, radio, whistle, EPIRB)

21. Rescue by another vessel (also shorthanded)

- Call the Coast Guard **FIRST**
- Do not risk the safety of your crew or boat
- You will probably not be able to get very close to the other vessel in a large seaway
- You will probably have to instruct the MOB to let go or leave the other vessel and allow you to recover them
- Lower your sails, turn the motor on (if possible)
- Deploy your lifeline and pole near the MOB or,
- Deploy your lifeline and begin sailing or motoring around the MOB to recover them
- Follow your training for recovery method
- If necessary, you may also need to do a transfer of person(s) which is best done by using a liferaft - determine if it is really necessary to effect a transfer at all
- Jumping from boat to boat can get others seriously injured
- Diving in yourself or your crew could lead to additional loss of life

## Cooking at Sea

by Dale Parshall

Cooking at sea is definitely not why I go sailing. I'd far rather be steering the boat, trimming the sails, or having a beer and watching the stars. But every so often I really feel the need to eat ... so I get forced into cooking ... something.

For me, the idea is real simple: Maximize staying on deck doing the things I like to do. And minimize standing up inside a bouncing boat until sweat forms on my face and saliva runs in my mouth. Needless to say, when I'm the cook I want meals that are quick to prepare.

At the same time, crew are much nicer people if they are well fed and remember it tasting pretty good.

These two ideas, really quick to prepare and tastes pretty good, require a kind of cooking that is different from normal home cooking. After the first few days on the ocean - when the fresh stuff is gone - the problem becomes even more difficult. Like so many things, the answer lies as much in preparation as in execution.

### The easy part, the first few days:

On a passage, most people fall into a pattern. Typically everyone makes their own breakfast. Normally this is cold cereal, hot instant cereal, breakfast bars, or coffee cake and fruit (while it lasts). When someone makes sandwiches at lunch, usually they make them for the whole watch.

Dinner is normally at the change of the watch and served at two seatings (either in the main cabin, or on deck, depending on weather and sea). Often someone on watch before dinner cooks, and someone on watch after dinner cleans up. Occasionally, both are off watch responsibilities. Once, I was on a boat where the same person did all the cooking and clean up for the whole passage ... and had no other job.

The first few days out, cooking dinner can be pretty much like heating up a large pot of "leftovers".

Stews, casseroles and heavy soups (with meat, starch, and vegetables all in one pot) can be made ahead at home. Grilled steak, barbecued chicken, and grilled bockwurst are also excellent when reheated. If you are short on prep time, a large frozen lasagna or other jumbo frozen dinner is a good answer. Personally, I think heating up "leftovers" is the best way to cook on a boat.

After preparation at home, freeze all the foods solid (except, of course, for the first dinner). If you don't have a freezer on the boat, the frozen "leftovers" will slowly melt in the cooler. What ever melts first (usually what's on top) gets eaten first. By starting out frozen, they will keep an extra day or two.

If you want to keep things frozen longer, pack them in the bottom of the cooler with lots of dry ice wrapped in newspaper. But, this will probably make the box too cold for vegetables or other things that should not freeze.

For a fully crewed boat, the technique of re-heating "leftovers" is usually limited by cooler space rather than shelf life in the cooler. Take as many "leftovers" as you can fit in (along with everything else). Double handers and single handers may be able to put more than a few days "leftovers" into the cooler, and will need to be careful when using the last of them. Give everything coming out of the cooler the sniff test before putting it in your mouth.

The first few days on the way to Hawaii may be a close reach. Even if it pipes up, some people will feel fine. But some people (and possible the cook) may not be quite rock solid. Sometimes just the change from a close reach to a beam reach will unsettle a previously solid stomach. While someone is suffering, I let them be the judge of what or how much, if anything, to eat or drink. When they begin to recover, it seems that the first thing they can take is 7Up and/or saltines (with salt). For those who are just fine, but look at the horizon while talking to you, instant noodle soup seems to be exactly right ... even for successive meals. When deciding which instant soups to buy, don't forget miso soup in the Japanese section.

A few fresh fruits and vegetables will last two weeks or more: Fresh oranges and apples will probably last the whole race, assuming you can carry more than the crew can eat. A slightly green pineapple will probably ripen in time for the half way party. Plan on using fresh zucchini, asparagus, and eggplant during the first few days. Fresh corn, green beans, and broccoli will probably last half the race, but they must be kept cool. Fresh potatoes, yams, squash, and onions will probably last the race without refrigeration, but cabbage (cole slaw, or substitution for lettuce in sandwiches) and carrots (carrot and raisin salad) will only last if kept cold. Preserve the unused part of a cabbage by unwrapping leaves, rather than cutting out sections.

In the meat department, look for vacuum packed meats, not meats wrapped by the butcher. They have a longer shelf life in cooler. Lunch meats and bacon (spaghetti carbonara) are commonly vacuum packed. But look for roasts or pork tenderloin too. Canadian bacon is often vacuum packed, and leaves less grease than bacon to deal with after cooking.

#### After the fresh stuff is gone:

When the fresh stuff is gone or spoiled, it's time for Plan B. Here you are limited by the availability of products, be they canned, bottled, or freeze dried. Shelf life is no longer an issue.

For main dishes, freeze dried foods from a camping store will keep until next year. As will canned stew, hearty soup, and corned beef hash. Canned ham (baked, or fried ham steaks) is great, but look for one that does not require refrigeration. Canned chicken chow mien, beef chili, beef ravioli, spaghetti and meatballs, and tortellini would provide variation, but find out if your crew will eat any of these before you stock up. Be very careful about brands, flavors vary widely.

When you decide to cook the main dish yourself, keep it simple. By this time you may be surfing down waves under spinnaker, and even "just a little broach" sure creates havoc in the galley. Easy to use canned foods include: chicken chunks (a la king, stews, casseroles, or pasta salads), shrimp, tuna, salmon, clams, or crab meat (cakes, stews, in tomato or creamed sauce over pasta, newburg, casseroles, or pasta salads), roast beef in gravy (as is, or shepherds pie), and dried beef (SOS). Boxed macaroni and cheese or a stove top stuffing mix with a couple of cans of chunk chicken are other possibilities. Have a taste testing before you make final decisions.

A wide variety of sauces and mixes come in plastic packages and bottles. Try pasta salads with an herb mix, or pasta with bottled tomato or alfredo sauce. Velveta (macaroni and cheese) and parmesan cheese need no refrigeration, and sour cream (stroganoff) and creamed cheese (spreads) will keep for two weeks if kept cool.

There is a large selection of canned fruits and vegetables, and instant potatoes. You can plan just about whatever mixture of red, green and yellow vegetables and various starches you like. Add crunch to either vegetables or main dishes with water chestnuts, bamboo shoots, bacon bits, croutons, french fried onions, chow mein noodles, shoestring potatoes, nuts and seeds. Canned fruit, individual puddings, plum pudding and hard sauce, no-bake cheesecake, and cookies (in air tight packaging) all make excellent desserts.

Fresh bread will mold long before Hawaii pops up over the horizon. Unsliced bread will last a little longer, or at least it is easier to cut the mold off the outside. When it is no longer appetizing, switch to rice cakes, large heavy crackers, or canned brown bread. Muffins, corn bread, and biscuits are simple to make. But if you need real bread, bake Irish soda bread, substituting powdered buttermilk for fresh.

Boxed sterilized milk is just about as good as fresh, and it needs no refrigeration. Powered milks range from OK to not so OK. You can improve the flavor of these by adding a little powdered non-dairy coffee creamer. Evaporated milk has a different flavor, but can be used in cooking.

For lunches and lighter meals heavy soups and crackers are a good substitute for sandwiches. But when you get into the tropics and it's hot on deck, try canned sardines, or herring, dry sausage or salami, or vacuum packed lunch meats and cheeses served on crackers. But make sure there is enough for the winch grinders.

One of the great mysteries of the ocean is how much food disappears in the middle of the night. When it's dark out, the only thing standing between the night watch and tomorrow's lunch is a basket of goodies that anyone can dip into at any time. Keep it where the crew can grab out of it just as they go on deck. Fill it with cookies, candies, fresh fruit (while it lasts), cookies, energy bars, granola bars, cookies, peanut butter crackers, dried fruit, cookies, fruit sticks, crackers, raisins, and beef jerky. And more cookies!

Keep one cupboard for bigger heavier snacks, and tell the crew they can take what they want. Fill it with instant soups, nuts and trail mix (with a few small plastic bags nearby to carry up on deck), popcorn (packaged in a disposable aluminum popping pan), and individual fruits and puddings.

It's really nice, especially in the middle of the night, when the on watch crew puts boiling hot water in a thermos just before waking up the new watch. Once the new watch takes over on deck and settles into the watch, they'll be back down one at a time to get a cup of coffee or cocoa.

Some boats carry bottled water because they are concerned about the water in the tanks. When filling the water tanks, add a tablespoon (½ oz) of liquid chlorine bleach for every ten gallons of water. If you think something has been growing in the water, double the chlorine. You'll taste the chlorine and you may not like the flavor. But the chlorine won't hurt you, and you won't get sick from the water. Instant iced tea and fruit flavor mixes will partially cover the chlorine flavor, and help everyone keep up their liquid intake in the tropics.

If you store beer and soda cans individually on a shelf or in the bilge, store them on their tops. If they rest on the joint where the top is folded over the side, the boat movement is less likely to chafe a hole in the thin wall of the can.

Make a ten page cookbook:

One last bit of advice, and this is a tough one. For every dish you plan to cook on the boat, practice making it at home first. If you are following a recipe in a cookbook, you will probably need to change it to make it usable at sea. Substitute dried or canned for fresh. Substitute prepared sauces. Change the quantities and measures to match the number in the crew and the size of the cans you substituted. Simplify the process of constructing the dish. Then simplify again. Write down this new recipe while you actually prepare the dish at home.

You'll probably only need about ten dinner dishes after the original "leftovers" are gone. If you have good success at changing the recipes then this is not a big task. But if all does not go as planned, it's better to find out at home.

Put only those recipes that you will provision for in a three ring binder for use on the boat. Who ever has to cook will be forever indebted. Especially if he is in "looking at the horizon" mode.



## Prop Shaft Seals and Prop Shaft Locks

by Dale Parshall

The Single-handed Transpac Race Instructions call for the Race Committee to install a prop shaft seal just before the race, and to inspect it at the end of the race. The prop shaft seal is only to verify the boat has not been propelled by the engine during the race. It will not keep the propeller from turning. To stop prop shaft rotation, you may need a prop shaft lock (not seal).

Originally, according to a story told by the General on the 1998 race, SSS did not require prop shaft seals. But about 8 or 10 years ago the French (who are big in single handed racing) inquired about our Single-handed Transpac Race. Apparently they went away rather dubious when they found out we did not seal prop shafts. Thus began the policy of putting seals on prop shafts.

When you read the required equipment section of the race instructions, you may not even think about a prop shaft lock. The Race Instructions only call for a prop shaft seal, which the Race Committee will install. But if your prop shaft is likely to rotate while the transmission is out of gear, you will also need a prop shaft lock. So add "prop shaft lock" to your To Do List.

The seal itself is the long wire type that is wrapped around or through something, and then the ends are held together with a small piece of lead crushed with an identifying mark. The race committee will normally apply the seal either the prop shaft itself or to the shift lever, whichever the skipper prefers.

If the seal is attached to the prop shaft, any rotation of the shaft will break the seal. So you will need to insure that the shaft does not rotate during the race. While the boat is sailing and the engine is being run to charge the batteries (and the transmission is out of gear) the action of the water on a fixed blade prop causes considerable torque and rotation. Even a Martec III has some twist to the folded configuration that could impart some torque. Perhaps if the stuffing box and cutlass bearing were not tight some slow prop shaft creep might occur. If your boat has a "dripless" shaft seal, it will provide almost no resistance to creep. And lastly, some transmissions do not completely disengage, causing the shaft to creep continuously when ever the engine is run out of gear.

If the seal is applied to the gear shift lever, putting the boat in gear will break the seal. An advantage of applying the seal in this way is that if the lock breaks or was never installed, rotation of the prop shaft will not break the seal. But a disadvantage is that if a line in the cockpit gets wrapped around the gear shift lever, it can break the seal whether the engine is running or not. In 1998, I had the seal applied this way and tried to leave my gear shift lever in the "button in/shifter not engaged" position all the way to Hawaii time.

I personally have a safety concern related to any failure of the lock. If the locking part breaks, slips, comes off, bends, or begins to rotate with the shaft under load, is anything nearby that could be damaged? . When a wood block is "sacrificed", the broken parts might go flying in

unpredictable directions. And a nylon fishing line wrapped around the propshaft might become a weed whacker. Look for nearby water, fuel, or electrical lines, etc. If you have a dripless shaft seal, the bellows is a fairly delicate part. In my boat it would be nearly impossible to stop the inflow of water while sailing. Minimize the size of the part that is to be sacrificed, and protect any thing nearby that might become damaged. In any case, be certain that the safety of the boat is not compromised by the prop shaft lock.

Prop shaft locks should be too quick and foolproof to disengage in an emergency. Some designs can be disengaged from the cockpit by pulling on a line or control cable. Others need to be disengaged by reaching into the shaft area where the locking mechanism is located, which would take more time. And still others are disengaged by putting the transmission in gear, causing some sacrificial part such as a wood block or fishing line to break. Make yours disengage with a minimum of complexity and time.

One commercially available prop shaft lock is essentially a pin that slips into a hole in a collar bolted around the prop shaft (after manually aligning the hole). The pin is on the end of a control cable, allowing it to be disengaged from the cockpit. But be certain to not put the transmission in gear with the engine running, unless you have pulled the pin first.

Another commercially available lock is a break pad that is compressed around a round collar bolted to the prop shaft. I had one on a previous boat that was spring loaded into the locked position, and engine oil pressure activated to the unlocked position. It was strong enough to stop the rotation of a three blade fixed prop on a 45 foot boat, even at high boat speeds. But since it was oil pressure activated, the prop spun when ever the batteries were being charged.

Over the years, several "do it yourself" ideas have been tried. Here are just a few:

Two vice-grips clamped onto the prop shaft in opposite directions. Harrier uses this technique every year, and they hold his 2 blade Max prop just fine. Beserker tried it in 1996, but they failed to hold his 2 blade fixed prop.

Block of wood resting in a position that prevents the shaft from turning. This may have a trip line attached allowing you to remotely remove the lock. Or the wood may be considered sacrificial. Sensei did this (with a trip line to the cockpit) with success in 1996. And that transmission induced prop shaft creep when out of gear and charging the batteries.

Sacrificial 50 lb test fishing line tied from the stringer around the heads of the bolts in the transmission to prop shaft coupling hub. ( 4 parts = 200 lbs test, on a 2" radius ... or some such.) Used successfully by Razzberries and Giggles with folding props in 1998. (A hose clamp version of this was tested by Giggles before the race, but was discarded. To get a larger radius arm, Giggles used a hose clamp on the outside of the coupling hub, and tied the fishing line to the hose clamp. The hose clamp slipped off the hub before the fishing line broke.)

What ever you decide to do, don't wait until the Race Committee puts seal on your prop shaft before you realize you need a lock.

## What is a Chip Log?

By Dale Parshall

A Chip Log is a small piece of wood that is dropped in the water and used in measuring the speed of a boat. I've been told they date back to the days of square riggers and the British Admiralty. At that time the block of wood was attached to a long light line with knots tied in it at regular intervals. The line was wound on a spool, which would unwind when the wood was dropped into the water and the ship sailed ahead. A sailor would feel the line as it spooled out (for a measured period of time) and count the knots that passed his hand. And, of course, he would report the speed of the boat in "knots".

Neither I nor the guy that told me this story is old enough to personally remember the truth of the matter. But it does make a good story, and who knows, maybe it's true.

Since Chip Logs are not available today in stores, you have to make one. Place a screw eye in the end of a 6 inch piece of 2 by 6 (or 2 by 4), and tie on a piece of eighth inch line about 90 feet long. At 84.4 feet from the block of wood mark the string with a permanent marker.

This Chip Log is still just about as primitive as the one used by the British Admiralty. But with a stop watch or second hand watch, you can determine your boat speed. Even if you can not charge the batteries any more.

### How to Use a "Chip Log on a String"

Tie the bitter end of the string onto the stern of boat where you can reach the mark at 84.4 feet easily.

Hold the block of wood, and trail the string behind the boat in a long U.

Drop the block of wood into the water and start the watch at the same time.

Quickly, grasp the string at the 84.4 foot mark. Pull the string forward a couple of inches to take the strain on your fingers. Continue holding it as the boat moves forward pulling the string from a U shape, into a J shape, and then straight. Watch the block if you can.

When the string pulls straight and the block begins to be pulled through the water by the string, the string will seem to jerk. When the string jerks, stop the watch. At that moment, the boat will have sailed 84.4 feet from the point where the block was dropped into the water.

Since the boat traveled 84.4 feet, divide 50 by the number of seconds it took (or use the attached table). The result is the speed of the boat through the water in knots.

## 84.4 foot Chip Log

By Table:

| seconds: | knots: | seconds: | knots: | seconds: | knots: |
|----------|--------|----------|--------|----------|--------|
| 6.0      | 8.3    | 10.0     | 5.0    | 14.0     | 3.6    |
| 6.2      | 8.1    | 10.2     | 4.9    | 14.2     | 3.5    |
| 6.4      | 7.8    | 10.4     | 4.8    | 14.4     | 3.5    |
| 6.6      | 7.6    | 10.6     | 4.7    | 14.6     | 3.4    |
| 6.8      | 7.4    | 10.8     | 4.6    | 14.8     | 3.4    |
| 7.0      | 7.1    | 11.0     | 4.5    | 15.0     | 3.3    |
| 7.2      | 6.9    | 11.2     | 4.5    | 15.2     | 3.3    |
| 7.4      | 6.8    | 11.4     | 4.4    | 15.4     | 3.2    |
| 7.6      | 6.6    | 11.6     | 4.3    | 15.6     | 3.2    |
| 7.8      | 6.4    | 11.8     | 4.2    | 15.8     | 3.2    |
| 8.0      | 6.3    | 12.0     | 4.2    | 16.0     | 3.1    |
| 8.2      | 6.1    | 12.2     | 4.1    | 16.2     | 3.1    |
| 8.4      | 6.0    | 12.4     | 4.0    | 16.4     | 3.0    |
| 8.6      | 5.8    | 12.6     | 4.0    | 16.6     | 3.0    |
| 8.8      | 5.7    | 12.8     | 3.9    | 16.8     | 3.0    |
| 9.0      | 5.6    | 13.0     | 3.8    | 17.0     | 2.9    |
| 9.2      | 5.4    | 13.2     | 3.8    | 17.2     | 2.9    |
| 9.4      | 5.3    | 13.4     | 3.7    | 17.4     | 2.9    |
| 9.6      | 5.2    | 13.6     | 3.7    | 17.6     | 2.8    |
| 9.8      | 5.1    | 13.8     | 3.6    | 17.8     | 2.8    |

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By Formula:

$$\text{rate} \times \text{time} = \text{distance}$$

$$\text{rate} = \text{distance} / \text{time}$$

$$\text{knots} = \frac{84.4 \text{ feet} / 6076.1 \text{ feet per nautical mile}}{\text{seconds} / (60 \text{ sec per min} \times 60 \text{ min per hour})}$$

$$\text{knots} = 50 / \text{seconds}$$

## JURY RIG

Used by Chuck Beazell aboard JOE in the 1996 SSS Transpac Race. Chuck completed the last few miles of the race and crossed The finish line under sail.

Before you leave the dock

Have the right equipment to deal with cutting the rigging.

- Bolt Cutters for cables
- Hacksaws for Rods -- with plenty of good blades
- Pliers to pull pins.

Emergency Radio antenna

- VHF off the shelf emergency antenna.
- SSB-a section of cable - Talk to Mike Jefferson for details

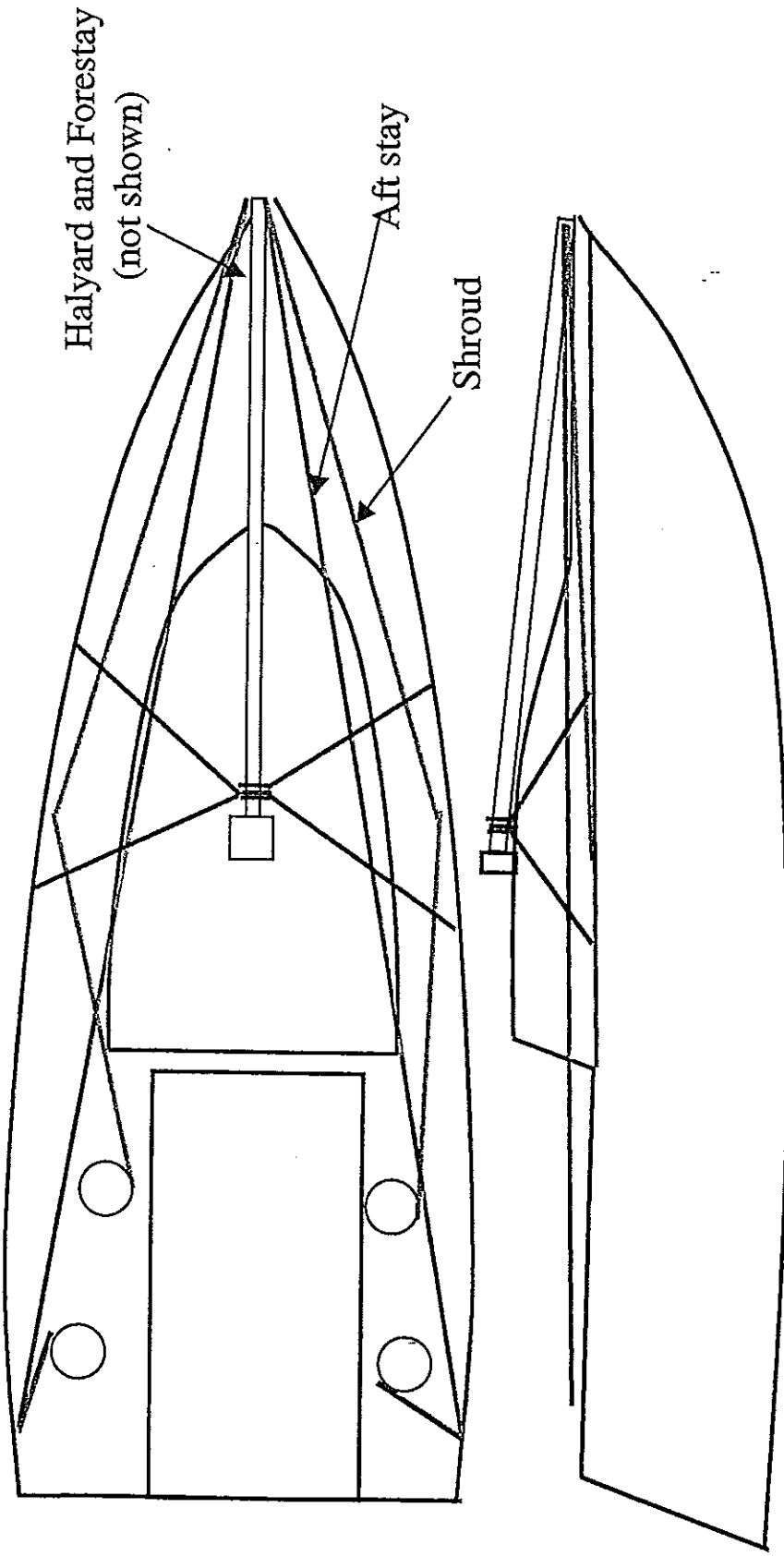
Assume all your lines will go overboard with the rig

- Take enough extra lines to complete a jury rig

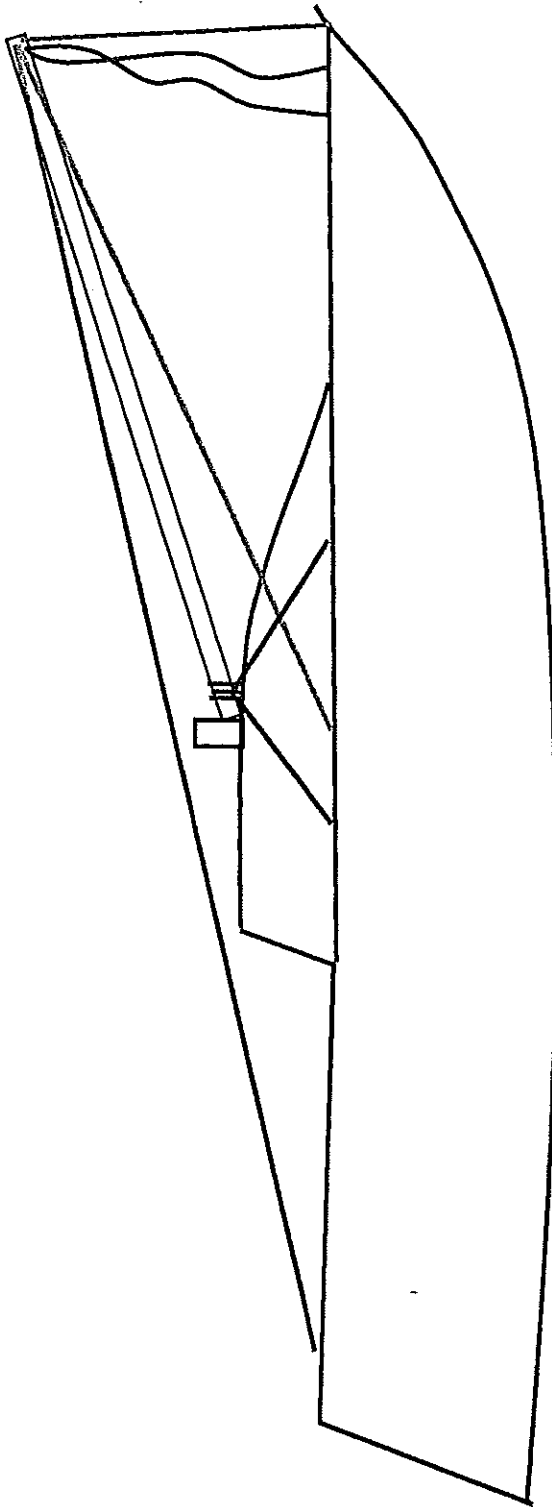
Understand your sail dim so that you know what sails can be used on a jury rig

Have a plan.

- Will you try to save the mast pieces?
- The boat is dead in the water - will I take the time to clip in.
- Do I want to get the life raft ready first or race to get rid of the mast.

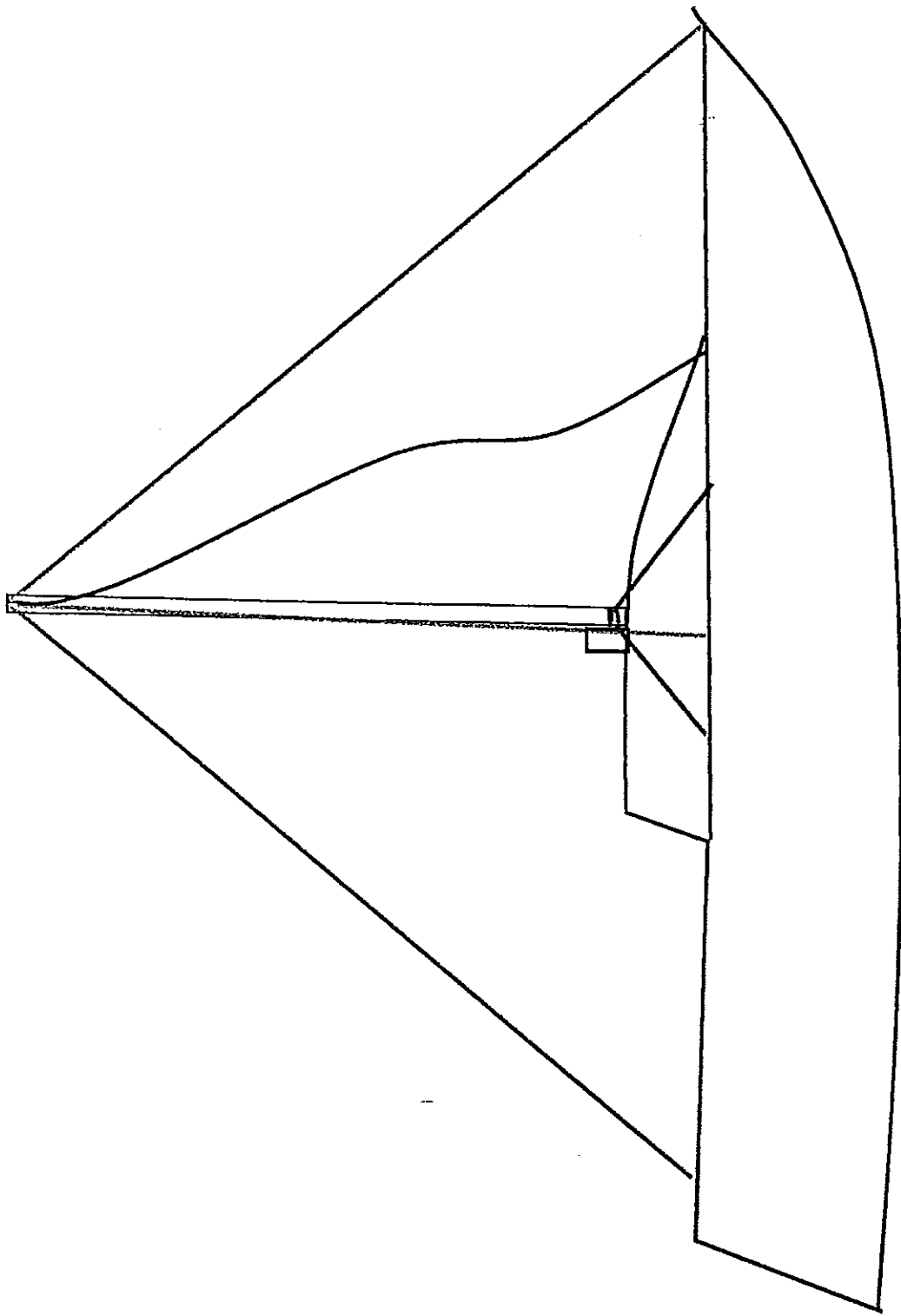


- 1) Put the pole in position as shown and tie 4 ropes to the rail to hold the base in place. Put the mast end of the pole pushing against something very solid. Jaw should be on the bow.
- 2) Tie 2 lines to the jaw and run them aft through the afterguy blocks - then to primary winches.
- 3) Tie 2 more lines to the jaw and run them through blocks on the rail or jib track near the base of the mast.
- 4) Tie 1 more line to the Jaw and secure it to the bow - something strong. Leave this line slack. (Forestay).
- 5) Tie a block to a short rope loop and put the rope in the jaw. Run a line through the block (Halyard).
- 6) Take up the slack on the 2 shrouds such that the mast is centered. Don't tighten them.
- 7) Tighten the 2 aft stays. They will need to be tight enough to hold the mast off the deck in the next step



- 8) Go forward and lift the pole such that it is past horizontal. Note that this may take several adjustments because you will have to put enough tension on the aft stay for it to stay elevated while you run back to raise it further - but you need enough slack to get it past the horizontal without breaking anything. The shrouds need to be adjusted such that they are starting to tighten when the pole just passes horizontal.
- 9) Continue tightening the aft shrouds a little at a time - note that as the pole rotates up the shrouds will need to be loosened. Be careful - you can easily break the shrouds.
- 10) When the pole gets to about a 45 degree angle take the slack out of the Forestay. You will have to walk the length of the boat several times to repeat the following sequence to finish raising the mast
  - Tighten the 2 aft stays
  - Loosen the 2 shrouds.
  - Loosen the forestay.





Hoist Sails.  
Down wind try hoisting a small jib by its clew.

Dismasting - What I did (not what I should have done):

- 1) Yelled \$^%#\*^% as the Mast rolls over me and knocked me to the deck - I'm Hoping they find my body so people know I didn't do something stupid like fall overboard.
- 2) Body check - yes I'm alive - the blood all over the place is due to a cut in my foot but its not serious.
- 3) Ran below and picked up the VHF Mic -- Issued a distress call on 16 just in case anyone was in range.
- 4) Throw the mic at the wall and yell at myself -- you stupid fool - the antenna is gone. You are on your own - so forget about getting help.
- 5) Grab the bolt cutters and run up on deck to start cutting.
- 6) Notice that the mast is slamming against the hull and realize that there is a good chance I will be holed.
- 7) Drop the bolt cutters in the cockpit floor and pull the life raft out of its storage compartment. Tie off the inflation tether so that it is ready to go. Make sure a knife is ready to cut the tether.
- 8) Run below and throw the abandon ship bag in the cockpit. ( note this is not the time to be thinking about whether everything you need is in the bag).

- 9) Pick up the bolt cutters - Cut the cable back stay - Wow that was a lot harder than I thought it would be!
- 10) Try to cut the rod shrouds with the bolt cutters - I thought I was stronger than that?? -- what the hell is going on - I just dented the jaws of the bolt cutter.
- 11) Go below and get the hack saw. Cut away the shrouds. Wow this cuts pretty fast.
- 12) Change the blade then cut away the forestay - above the roller furling drum - at least I saved something.
- 13) The rig slips down some but now I remember that several of the sheets are still holding it in place. It looks like the rig is about 6 feet down but could still hole the boat with the right wave. The hack saw is already in my hands so I just saw through the lines.
- 14) Watch the rig start to disappear under the boat. I hear 1 more snap - surprise - the burgee halyard was not strong enough to hold up the mast!
- 15) Yell @)\*^\$^#^#% again. Reality is now setting in. The blood all over the decks really adds to the Ambiance - but I have a min. to think.