



# Expedition Companion



for Sail Training with Mahina Expeditions



# EXPEDITION COMPANION

FOR SAIL TRAINING ABOARD

VARIOUS VESSELS



## *My Goal*

*"To present the best opportunity for people motivated to master ocean voyaging skills in a safe and supportive environment, while having a positive impact on places we explore"*



## *John Neal*

with over 403,000 miles and  
50 years of ocean cruising and  
teaching experience



P.O. Box 1596 • Friday Harbor • WA 8250 • 360.378.7344  
mahina.com • sailing@mahina.com

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28<sup>th</sup> Edition



# **ABOUT THE AUTHOR/EXPEDITION LEADER**

## **John Neal**

Born on the banks of Africa's Blue Nile, John's ocean sailing experience started in 1974 when at the age of 22, he set sail from Seattle on his Vega 27 sloop completing a 15,000 mile voyage through the South Pacific. His bestselling book, Log of the Mahina, chronicled those adventures. He's authored, co-authored, or contributed to an additional 17 books and more than 150 magazine articles. John has logged 403,000 offshore miles ranging from Australia, Africa, Antarctica, Svalbard, the Med, South Pacific, Patagonia, rounding Cape Horn six times under sail. John holds USCG 100-ton master's and FAA Private Pilot licenses.

## **Boat Purchase Consultation**

Since 1977, John has helped over 1,200 clients worldwide locate, evaluate and purchase the best possible boat for their proposed cruising for a flat fee.

Visit [www.mahina.com/consult](http://www.mahina.com/consult) for details.

## **Mahina Offshore Sail Training Expeditions**

Since 1976, John's passion has been sharing his knowledge of ocean cruising and he's conducted over 200 sail-training expeditions worldwide aboard his Hallberg-Rassy 42, Mahina Tiare II and his HR 46 Mahina Tiare III. Forced by Covid to sell MTIII in New Zealand, John has pivoted to teaching aboard chartered vessels worldwide in his favorite areas for training.

View [www.mahina.com](http://www.mahina.com) for details and to view past expedition log updates.

## **Mahina Offshore Cruising Seminars**

To help sailors prepare for safe, self-sufficient voyaging worldwide on their own boats, John annually presents a one-day Offshore Cruising Seminar at the October Annapolis Boat Show and two-day hands-on cruising workshop at SVC in Anacortes, WA on the second weekend in March. These seminars are also available in a virtual format.

Details on [www.mahina.com/seminars](http://www.mahina.com/seminars)







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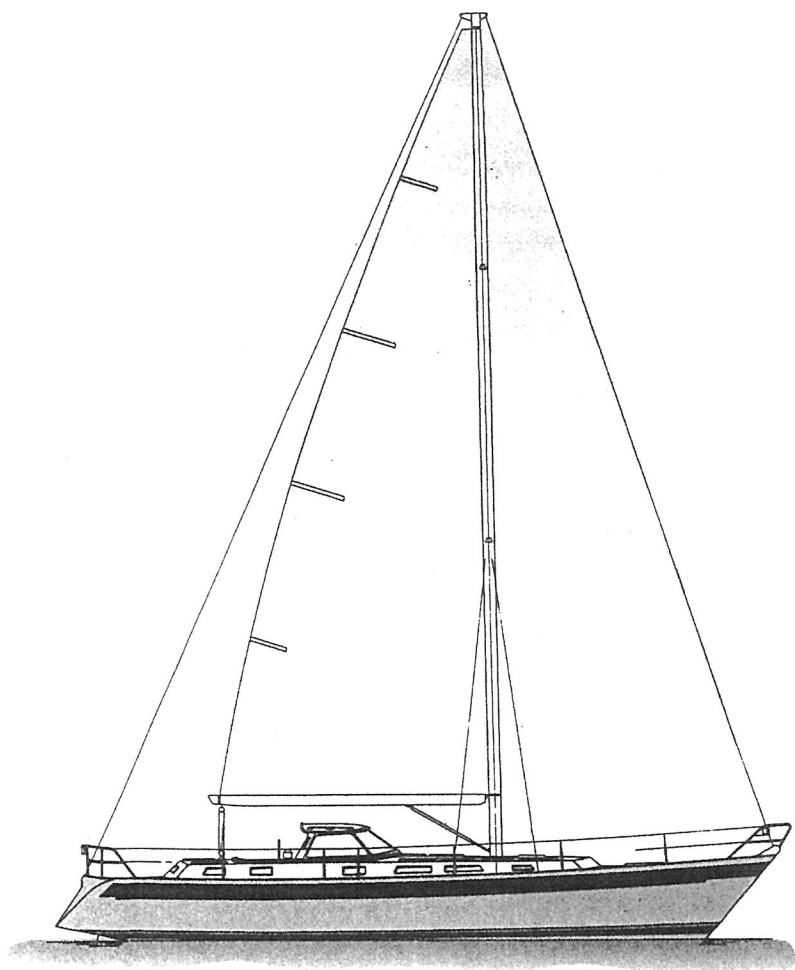
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### Our Goals

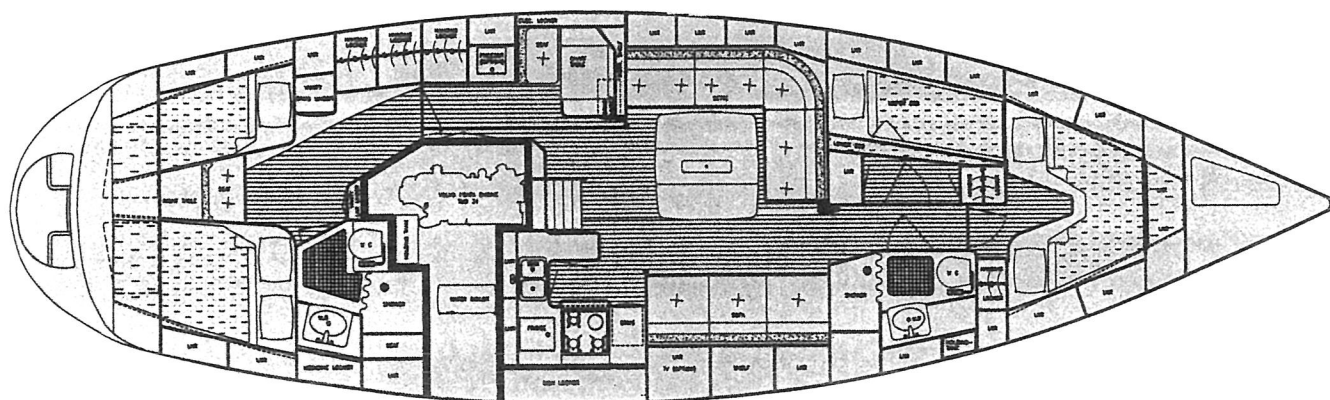
*"To present the best opportunity for people motivated to master ocean voyaging skills in a safe and supportive environment, while having a positive impact on the places we explore."*

### SPECIFICATIONS:

Length overall	14.78 m 48'6"
Length waterline	13.27 m 43'1"
Beam	4.32 m 14'0"
Draft	1.88 m 6'1"
Displacement	16 t 32,000 lbs
Ballast, lead	6.4 t 12,800 lbs
Sail area	100m <sup>2</sup> 1,018 sq. ft.
Height of mast	19.4 m 63'
Number of berths	10
Number of Exp. members	6
Motor	Volvo Penta TMD 31L, 95 hp
Speed under power	8.4 knots
Designer	German Frers
Vessel Registry:	Cook Islands

# MAHINA TIARE III

H A L L B E R G - R A S S Y 4 6



[www.mahina.com](http://www.mahina.com)



# INTRODUCTION



## *Welcome Aboard*

*You are a valued member of this expedition and we are eager to share our knowledge and experience with you. The general atmosphere onboard is dependent on all of us working efficiently and harmoniously together.*

**Hydration:** We request that you drink a minimum of 2-3 liters of water per day to prevent seasickness, lethargy, headaches, constipation, yawning, sighing and to keep you positive.

**Meals:** We ask that each expedition member be present for all onboard meals.

**Questions:** Don't be afraid to ask questions. There are no "dumb" questions. We are all learning!

**Communication:** Repeat all commands so the person giving the command knows you have heard it.

**"HEADS-UP!"** A term we use when we need everyone's attention.

**Syllabus:** We will be teaching from an established syllabus and many questions relating to a specific subject will be answered in greater depth at this time.

**Safety First! Be Careful!** Don't take any unnecessary risks. Move quietly and methodically. One hand for the ship, one hand for yourself always. Stay low and move carefully when going forward on deck.

**STOP, LOOK, THINK and ASK** if something is too hard. When an item won't come or go easily there is a problem. Don't force anything or strain yourself. If you do break something or discover something broken, do let us know.

**Respect:** Everyone learns differently - please refrain from taking over someone else's task.

**Assigned Tasks:** When given a task you are the one who must complete it.

**Be prepared** to encounter the following on an ocean passage: seasickness, fatigue, exhaustion, depression, set watch and responsibility schedule, expectations versus reality conflict, formal leadership structure. Shipboard life is not a democracy as the captain is responsible for all lives and the boat. The first 2-3 days of any passage are the most difficult, while your middle ear and sleep patterns are getting settled. You may feel like getting off the boat and that things may not get better, but they will.

**Problems:** Communicate problems at once. Don't let tension build. Little things may bug you, this is normal. Please keep your sense of humor, consideration plus perspective, and most of all a positive attitude.

**Intrusion Free Zone:** While onboard please refrain from using your electronic communication devices. Of course you are welcome to use them ashore.

**Shipboard Priorities:** As the safe operation of Mahina Tiare is a shared responsibility, safety and shipboard priorities including repair and maintenance come before personal expectations.

**Expedition Update:** We welcome your contribution of images and text for our expedition updates.

**Moaning Tiki:**

*Please share your personal goals and reasons for joining this expedition.*

*We are excited about sharing this adventure and learning together.*



# MAHINA EXPEDITIONS SAIL TRAINING OBJECTIVES

## Safety Systems Checkout

- ☐ Liferaft: make, model, capacity. Review launching.
- ☐ Survival packs: inventory and discussion of deployment.
- ☐ Lifejackets: location and donning. Safety harness: procedures and cockpit stowage.
- ☐ High lifelines vs. deck jacklines: rig and discuss options.
- ☐ Bilge pump systems and bilge high water alarm: test.
- ☐ Thru-hull fittings with attached wooden plugs. Location and discussion of maintenance.
- ☐ Emergency tiller: location and use of.
- ☐ Propane solenoid and alarm: test system, inventory spares.
- ☐ Fire Extinguishers: location, type and review.
- ☐ Adventure Medical Marine Kit: inventory. Review additional prescription drugs.
- ☐ Discussion of common medical problems, prevention and treatment, including seasickness and dehydration.
- ☐ MOB: practice procedures and retrieval utilizing Lifesling.
- ☐ Standing and Watch Orders: review.
- ☐ Emergency Station Bills: Fire, Flooding, MOB and Abandon Ship review.

## Boat Systems

- ☐ Marine diesel engine: operation, maintenance, spares and servicing.
- ☐ Electrical systems: survey of wiring, charging, monitoring and storage systems. Review alternative power options.
- ☐ Watermaker: use, maintenance and spares.
- ☐ Outboard motor and dinghy: launching, operation, retrieval and stowage.
- ☐ Marine head: operation, maintenance and spares.
- ☐ Tanks: fuel, water, holding tanks: maintenance of.

## Sails and Rigging

- ☐ Understanding the components and design of rigging and sails.
- ☐ Demonstrate points of sail and sail trim.
- ☐ Raising, reefing and stowing mainsail including use of lazy jacks, rigid vang and preventer.
- ☐ Furling and reefable sails: demonstrate use of.
- ☐ Sail repair: sewing sailcloth. Use of palm and needle and Sailrite sewing machine.
- ☐ Rig checks: pre-departure and daily at sea including chafe prevention.
- ☐ Working safely aloft. Each person may go aloft at anchor or in port with a safety line attached.
- ☐ Rigging spares and fittings: location of. Emergency rigging repair procedures.
- ☐ Winches: one and two speed. Dismantle, service and reassemble.
- ☐ Demonstrate belaying a line to a cleat, coiling short and long lines, tying bowline, slippery hitch, reef and figure eight knots.
- ☐ Splicing: three-strand nylon line and dacron yacht braid. Installing a soft eye on yacht braid line.

## Storm Sailing Techniques

- ☐ Storm management: review techniques for different vessel types and sea conditions.
- ☐ Review of storm preparation: bilge and pumps, clear decks and cockpit, charge batteries, meal preparation, sleep deprivation.
- ☐ Rig storm sails.
- ☐ Storm tactics: practice fore-reaching, heaving-to, towing warps and use of drag devices.

## Communication

- ☐ VHF: communication and distress.
- ☐ Iridium: use of IridiumGo! and Iridium satphone.
- ☐ Discussion of communication options for cruisers and while in various countries.

### **Anchoring, Docking and Mooring**

- ☐ Discussion of anchors, chain, windlass and rode for varying conditions.
- ☐ Safe use of electric windlass, manual back-up feature and chain snubber deployment.
- ☐ Second bow anchor: setting and retrieving.
- ☐ Demonstration of safe docking and mooring procedures.
- ☐ Dock lines, fenders and chafe gear: use of.

### **Navigation**

- ☐ International Rules of the Road and navigation lights recognition: overview and test.
- ☐ Chart selection and organization: selecting best nationality of chart to cover a specific area.
- ☐ INT and US Chart #1, Sailing Directions, Light List and Cruising Guides: use of.
- ☐ Coastal navigation: plotting courses and position, measuring distances, noting nav aids, depths, dangers, currents and obstructions.
- ☐ Electronic navigation: use of GPS, discussion of accuracy of charts relative to GPS positions.
- ☐ Electronic charting systems; both MFD and laptop/tablet charting platforms: use of.
- ☐ Radar for collision avoidance, coastal navigation and squall avoidance: use of.
- ☐ AIS: understanding merits and limitations and use of.
- ☐ Demonstrate steering by compass.

### **Meteorology**

- ☐ Sources of marine weather: internet, PredictWind, VHF, GRIB files, commercial weather routers, Navtex.
- ☐ Overall prevailing world weather systems and predicting and gauging surface current and drift.
- ☐ Marine weather charts: identify and explain the features of.
- ☐ El Nino and La Nina effects on marine weather.

### **Galley**

- ☐ Refrigeration, cooking appliances and equipment review.
- ☐ Meal planning, provisioning and stowage discussion.
- ☐ Fishing lures and equipment for offshore.

### **Selecting an Ideal Cruising Boat**

- ☐ Discussion of what makes and appropriate cruising boat.

## **MAHINA EXPEDITIONS OFFSHORE SAIL TRAINING ENDORSEMENT**

\_\_\_\_\_ has received detailed instruction and has competently demonstrated the above noted skills during an expedition of \_\_\_\_ days, from \_\_\_\_\_ to \_\_\_\_\_, standing \_\_\_\_\_ hours of daylight watches and \_\_\_\_\_ hours of night watches.

Total Coastal Miles \_\_\_\_\_

Total Offshore Miles \_\_\_\_\_

\_\_\_\_\_  
Instructor

\_\_\_\_\_  
Instructor

\_\_\_\_\_  
Date



# DOING YOUR PART



**Rings:** Please remove rings before joining us, for your safety.

**Tidiness:** Mahina Tiare is your home for the expedition; keep her clean, tidy and shipshape at all times. We will be visited by customs and guests and want you to be proud of the vessel.

**Duty Roster:** Complete your duty in the morning, as soon as possible.

**Cabins:** For safety please do not hang ANY items on the leecloths or on any fittings in your cabins. Do not leave any items lying on your berth, as we require access to safety items stowed below. For safety reasons, all surfaces must be kept clear of personal items while sailing.

**Cabin Fans:** To conserve electricity don't use if not needed i.e.: cold enough to sleep under a sheet.

**Hatches and Ports:** Do not leave any open hatch or port unattended.

**Bedding:** Spread your sheet before lying on your bunk. Make your bed and tidy your cabin upon rising.

**Saltwater:** Avoid getting salt below. Salt crystals attract moisture making items damp and susceptible to corrosion and bad smells.

**Foul Weather Gear:** Do not sit down below in foul weather gear. Take off wet foulies in the cockpit.

**Clothing:** If your clothes are salty, don't sit below or lay on your bunk. After encountering salt spray rinse off with the aft deck shower. Don't swim in dirty clothes; salt water bacteria makes them stinky and damp.

**Harness and Tethers:** To avoid damaging gelcoat & varnish, be considerate with your hardware. Harnesses are never to be worn below. Amanda will demonstrate our harness etiquette.

**Laundry:** There is not sufficient water onboard for doing laundry. **ALL** laundry shall be done ashore, when appropriate. Please ask first as we do not wish to jeopardize your sailing schedule waiting for laundry.

**Carpet:** Avoid getting the carpet wet as moisture damages the varnished floorboards. Keep wet shoes in your hanging locker or shower, wet items in the shower.

**Shoes:** Only white or neutral soled shoes on deck that have not been worn ashore. Use separate shoes/sandals ashore - stow them in a plastic bag. Protect your toes for the first few days on deck.

**Interior Wood:** Please be kind to the soft mahogany interior woodwork. No belt buckles or clothes with studs or protruding zips. Be gentle with all doors drawers and hatches - never let go of the catch when opening and closing them. **PLEASE DON'T SLAM THEM.** Always check that you are not jamming anything in the cupboard doors. Mahina Tiare is your home, treat her gently.

**Showers:** We generally shower at least every day or so, weather and water supply permitting. We will advise you when it is appropriate as this is an organized and structured activity. Please do not use the head sink as a shower. We request you don't bring bar soap as it leaves a slippery residue. We provide soft soap/shampoo and you are welcome to bring your own liquid soaps/shampoo.

**Sunblock:** Please use minimum sunblock lotion as it transfers and damages the cockpit cushions, interior varnish and upholstery. However, if applied to areas other than your face please cover up or wash it off before sitting anywhere.

**Injuries** Please notify us if you have any open wounds, grazes or bites as in a marine/tropical environment these may require treatment.

**Swimming:** Always swim with a partner and notify someone aboard when entering the water. Never swim away from the boat alone.

**Electricity:** To conserve electricity please turn your fan and lights off when leaving your cabin.

**Water:** To conserve water never let tap run unnecessarily. Monitor water gauge.

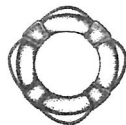
**Plastic:** Don't throw any plastic overboard.

**Shells:** Don't collect shells or marine life.



*Mahalo*

## SAFETY EQUIPMENT



### Bilge Pumps

1. Labeled BILGE PUMP, middle of electrical panel - breaker always ON. \_\_\_\_\_gpm
2. High capacity 4,000 GPH, switch is left of panel - always on AUTO. \_\_\_\_\_gpm
3. Manual pump besides companionway, blue handle under nav. seat, switch overboard valve in engine room under pump. \_\_\_\_\_gpm

**First Aid:** Basic supplies in forward head above sink. Extensive supplies in shower locker. Please carefully take care of scratches and bites.

### Fire Extinguishers

1. Above port cabin's hanging locker.
2. Under main saloon table.
4. Under companionway step.
5. Auto engine room.
6. In aft cabin hanging locker
7. \*Fire blanket – underneath nav seat.

In the event of an engine room fire:- shut off engine room fan (middle line of right side on electrical panel), and engine.

**Life Jackets:** Your life jacket is in your hanging locker. In the event of any emergency, put it on.

**Liferaft – Viking Solas 8 man:** Stowed on deck, under boom. Slip grey canvas cover, pull catch pin, ease overboard. There is \_\_\_\_\_ft of painter line.

**Man Overboard:** If you see someone fall overboard, immediately shout "MAN OVERBOARD" twice, appoint a spotter, deploy the Lifesling, execute "QUICK STOP" maneuver.

**Safety Harnesses:** Your safety harness must be worn whenever you're on deck and the vessel is underway. Take your harness on and off in the cockpit only. Do not wear it below as the hardware damages the woodwork. Stow your harness in the grey duffel located in the starboard cockpit locker.

**Survival Packs:** #1 yellow pelican case and #2 yellow dry bag, stowed in starboard cockpit locker under harness bag.

**Propane Solenoid:** Located in the galley above the refrigerator, must always be turned OFF at panel (ALARM switch) when stove is not in use.

**Thru-hull Fittings:** Locate each thru-hull fitting, note attached wooden plugs.

**Engine Lug Down:** If engine slows without anyone bumping the throttle instantly bring engine shifter/throttle to neutral.

## ONBOARD EQUIPMENT

**Charging:** Each cabin has USB chargers and 12v outlets that are always available. 110v AC power is only available when the engine is running.

**Books:** Marine reference books are located in the locker above engine room doors.

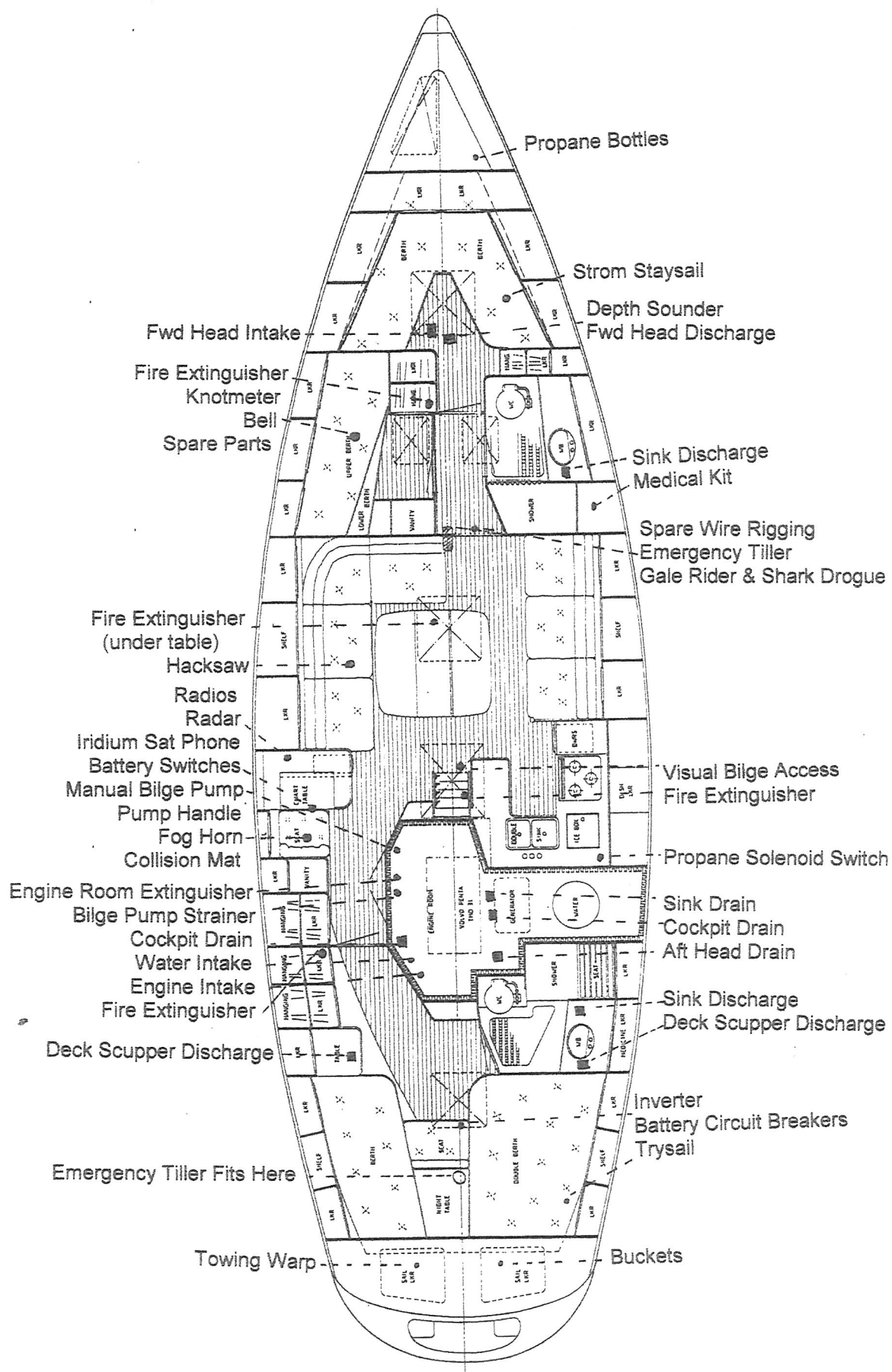
**Yoga Mat:** Located in the main salon hanging locker

**Head (Toilet):** If it hasn't been eaten, don't put it down the loo, apart from a very moderate amount of toilet paper. We insist that MEN MUST SIT DOWN at all times when using the head. Use holding tank at anchor. Extra paper and cleaning supplies are stowed under the sink.

**Paper Towels:** Please be mindful of paper towel usage. The blue planet thanks you.



# LOCATION OF SAFETY EQUIPMENT





# SEASICKNESS – AVOIDANCE AND TREATMENT



When day sailing, seasickness goes away once land is reached or the anchor is down. However, on coastal or offshore passages longer than 24 hours preventing or effectively treating seasickness becomes a health and safety matter as left untreated continual seasickness results in incapacitation.

Some level of seasickness is normal and should be expected during the first 1-4 days of an ocean passage, even if you have never been seasick while coastal sailing. Seasickness is caused by sensory conflict and/or stress, both of which result in histamine production. Nausea results when histamine reaches the brain. Some people are more susceptible than others but given the right conditions anyone can become seasick. Having dealt with over 400 seasick sailors over the past forty years, we have become very experienced at prevention and treatment. If you want to avoid seasickness or recover quickly, follow these steps.

The responsibility for the safety of the vessel doesn't go away if you're seasick. A continual watch for hazards, other vessels, navigation and weather monitoring must be maintained. It is VERY important to maintain your full watches no matter how you feel; lying in your bunk is not an option. Helping others get over seasickness as quickly as possible must be the focus and responsibility of all on board. Frequently seasick crew will ask to be left alone, saying they don't feel like drinking or eating anything. Leaving them alone is a mistake as it is important to keep them sipping fluids and regularly eating small amounts.

To avoid or lessen the severity of seasickness the following steps should be taken:

## **Prior to Sailing**

- Avoid coffee, black tea, colas and alcohol (all of which are diuretics) and fatty foods at least 4 - 5 days before the passage.
- Increase your water intake to 2 to 3 liters per day.
- Give each crew member their own 1 liter water bottle labeled with their name.
- Start appropriate seasickness medication at least 24 hours prior to departure: 2-3 grams of Vitamin C, Berocca, Stugeron tablets, Compazine suppositories or TransDerm Scopolamine.
- Prepare everything possible before departure to minimize time required below decks once underway: have meals planned and ready, bunks made up and lee cloths rigged, navigation organized and appropriate clothes laid out.

## **Once Underway**

Whether or not you feel any symptoms of seasickness, it is essential to:

- Maintain a steady fluid intake of one liter per 2-3 hour watch ensuring a total of 2-3 liters per day.
- As soon as seasick symptoms appear (mild headache, queasiness, sweating, drowsiness, depression) sensory conflict has caused histamine production to start and a more disciplined response is required.
- Add Emer'gen-C (available in health food stores), Berocca or a similar vitamin-mineral drink mix containing potassium and electrolyte replacement minerals to your drink bottle. The electrolyte replacement helps your cells absorb fluid more quickly and completely. Gatorade and similar sports drinks lack vitamin C which counteracts histamine production.

- Eat small amounts of food on a regular basis: crackers, cookies, crystallized ginger, tinned fruit or hard candies. Bananas provide potassium and are an excellent first choice if available.

### **Effective Seasick Medication**

- Stugeron (cinnarizine) 15 & 75 mg tablets are unavailable in the US, but are readily available in many countries including the UK or from [www.CanadaDrugsOnline.com](http://www.CanadaDrugsOnline.com). Stugeron, an over-the-counter antihistamine has consistently proven to be one the most effective anti-seasick medications causing less drowsiness than other antihistamines.
- Compazine (prochlorperazine) 5, 10 or 25 mg suppositories (not oral) have proven to be the most effective prescription anti-nausea and anti-anxiety medication that importantly does not cause drowsiness. As anxiety can cause nausea and since Compazine treats both it is an important drug to carry aboard. Suppositories are far more effective than tablets once vomiting has started.
- Transderm Scopolamine 1.5 mg patches may work when no other drug does, but one **MUST** first test this drug out on land as documented side effects include drowsiness, blurred vision, disorientation, anxiety, hallucinations and psychosis. Expect major personality changes and serious drowsiness if Scopolamine is used more than three days.

**CAUTION!** With any drug, prescription or OTC, there are published side effects. Do your homework; ask your physician and pharmacist and research each drug. If you have heart, blood pressure or prostate problems your physician may not be able to prescribe some of these drugs. Test each anti-seasickness drug ashore well before departure to check for side effects.

### **Feeling Queasy? If so:**

- Take the helm and steer the boat, focusing on the horizon. If the boat is overpowered, reduce sail. If you are sailing close-hauled, ease sheets and fall off.
- When going below, first take your foulies off in the cockpit rather than below decks. Minimize time working below if possible. The faster you either get back on deck or lie down the better you'll feel. Lying down prevents histamine from reaching the brain, decreasing nausea.
- Avoid lying down in your foulies for an extended period of time to lessen the chance of hyperthermia.
- Maintain medications and review whether additional or different medications are required.

### **Going to Vomit? If so:**

- Vomit into a 2 liter plastic container with tight-fitting lid that you can use on deck and below.
- To avoid a possible overboard situation don't lean over the lifelines to vomit; use a container.
- Most people feel considerably better after vomiting, but it is essential to maintain a steady fluid-electrolyte intake. Take small sips, stay hydrated, and keep your blood sugar level up. This is helpful for avoiding Sopite syndrome which will make you feel like sleeping and not wanting to eat or drink. Giving in to Sopite puts you at risk of prolonged dehydration, which can lead to shock.
- Prolonged vomiting causes dehydration surprisingly quickly, hypothermia (even in the tropics) anxiety, confusion, depression and shock. Once in shock, an enema or IV is the next step to rehydration and your survival.

After departure, coastal wave refraction and associated choppiness should be followed by more regular ocean swells, so do not be initially discouraged by seasickness. In almost all cases sailors recover from seasickness within 1-4 days if they follow the above advice.

Inherent in accepting and mastering these steps is realizing your responsibility and doing everything within your power to get over or help crew mates get over seasickness as quickly as possible. No one wants to be a liability aboard. In most cases, those that have come through appreciate that managing seasickness effectively is a key to unlocking the pleasures of blue water sailing.

V1.14

# Seasickness and the sopite syndrome

What mariners need to know regarding these  
two distinct responses to motion

by Michael Eden-Walker

Most sailors are well aware of the classic signs of seasickness. Drowsiness, nausea, pallor, increased salivation and cold sweats.

What most are not aware of is a distinct syndrome that often coexists with and is confused with classic seasickness. This syndrome was identified in 1976 by space researchers. The term sopite comes from the Latin "sopire" meaning, "to lay to rest, to put to sleep." The syndrome is characterized by yawning, drowsiness, disinclination for physical or mental work and lack of willingness to participate in group activities. Also noted are lethargy, apathy, decreased ability to concentrate, daydreaming, melancholy, sleep disturbances, performance errors, frequent daytime napping, irritability and a desire to be left alone.

Notice that drowsiness is common to both syndromes. Beyond this the syndromes differ in symptomatology and time course. Sopite often appears *before* the onset of nausea and persists *after* nausea subsides.

Sopite can exist in people who have a *very low* susceptibility to motion-induced nausea and can persist in people *fully adapted* to motion-induced nausea.

These observations carry some clear lessons for sailors. It can be seen that if one were to identify seasickness only in the classic way, it would be possible to miss some extremely important and potentially hazardous symptoms.

Cruisers often are sleep deprived and required to make important judgment calls on a repetitive basis. If sopite is interacting with decisions in only a minor way, causing uneasiness, emotional depression and loss of interest, it is easy to see how the mixture could be potentially dangerous.

Furthermore, some of the medication used to counteract "sea sickness" are sedating and could well exacerbate the symptoms of sopite. As we are all aware, it is the cognitive effect of motion that debilitates the sailor most rather than the classic symptoms of seasickness such as nausea and vomiting.

It may be therefore that treatment strategies should incorporate less sedating measures. Recommended for this would be Compazine (prochlorperazine) suppositories in doses of 10 mg to 25 mg. The 25 mg suppositories can be cut in half as some find the larger dose too strong. Dosing should be done regularly every eight to 12 hours to maintain control of symptoms.

Now that sopite syndrome has been clearly identified as a distinct entity separate from classic seasickness, it is hoped that sailors will be more aware of the extent of motion problems in yachting. It is also hoped that new treatment strategies will emerge.

My thanks to Dr. Ben Lawson of the Naval Aerospace Medical Research Laboratory in Pensacola, Fla., and John Neal on board *Mahina Tiare III* for their support and input.

## DEHYDRATION

I understand that dehydration is the most common potentially serious health issue aboard. If I do not drink 2-3 liters of water per day, I expect to experience some of the following: queasiness, seasickness, headaches, fatigue, listlessness, constipation or diarrhea, depression, anxiety and confusion.

I understand that if I remain dehydrated for several days, I may go into shock requiring hospitalization, intravenous fluids or enemas.

---

signed, expedition member



# DEHYDRATION

## SYMPTOMS AND PREVENTION

Dehydration is the most common and serious medical problem we see during our sailing expeditions. Symptoms of dehydration include: seasickness, headaches, yawning, drowsiness, excessive sleeping, lack of motivation, constipation, diarrhea, irritability, depression, anxiety, mental confusion, muscle cramping, loss of appetite, urinary tract infections and kidney stones.

It is your responsibility to avoid dehydration. Once dehydrated, you become a liability on board, not an asset.

You can't rely on thirst to tell you when you need water in the tropics as you can become seriously dehydrated to the point of going into shock without becoming thirsty.

Breathing depletes one liter per day and sweating depletes up to one liter per hour. When a breeze cools your skin you will be unaware of losing fluid, as your clothes aren't becoming damp and sweaty.

It is essential to drink three (3) liters of water per day, even if you aren't used to this. Your health and ability to be responsible and alert on watch are paramount.

Diuretics (fluids that cause your body to lose an equal amount of water include coffee, black/green tea, cola and beer) should be avoided.

## Avoiding Dehydration by CB Ocean Navigator Magazine NO.51

While on a voyage, a crewmember becomes increasingly lopy and complains of a headache. Although there could be a number of causes, one of the likely contributing factors is dehydration. Indeed, whether the problem is seasickness, the early stages of hypothermia or hyperthermia, rehydration will help. In fact, when exposed to wind and sun, the human body requires a tremendous amount of fluid to remain hydrated.

There are a number of possible causes of dehydration. In warm humid climates, the most common trigger is profuse sweating. The purpose of the sweating reflex is, of course, to keep the body core temperature normal. This end is achieved through evaporation: As sweat vaporizes off the skin, it carries away heat. While sweating works well, it can tax the body's fluid resources. An adult, for example, is capable of sweating more than a quart of fluid in an hour. However this rate of sweating cannot be maintained for long unless the supply of water is replenished.

When the skin is cooled by a breeze, the signs of dehydration are less obvious. However, even though a person may be unaware of losing fluid, the body can suffer a considerable "insensible" loss that will typically amount to quarts of water each day. Breathing, for example, can deplete up to a quart of water every 24 hours. Thus, even without the telltale signs of heavy work or sweating, it is easy to become dehydrated. It is not unusual to hear crewmembers emphatically state, "I can't be dehydrated; it's not even that hot."

More noticeable losers of fluid are ill crewmembers.

Their symptoms may include fever, diarrhea, hyperventilation, and vomiting as a result of sea sickness or illness. In fact, in most cases, the greatest danger from seasickness is dehydration. Dehydration can also occur as the result of abdominal bleeding or the inflammation of either organs or the abdominal wall. A final cause of dehydration is injuries. Most common is the dehydration caused by third-degree burns. Even if these severe burns occur over a relatively small area, fluid losses can be substantial. Burns over a wider area may cause life-threatening dehydration.

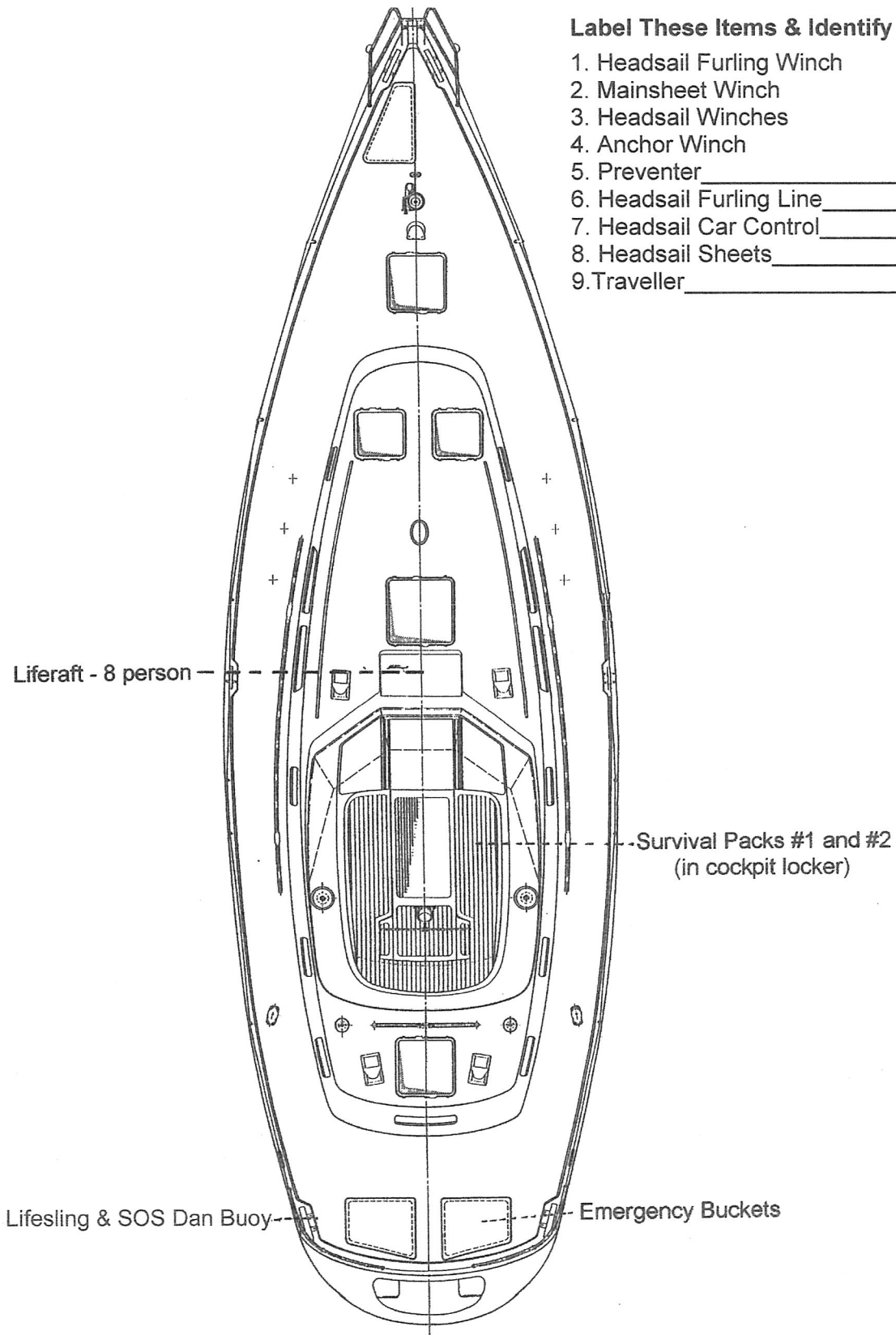
All of sickness-related dehydration problems outlined above are clearly more of a problem in hot climates, where the body's cooling requirements are much grater.

What are some of the other symptoms of dehydration? One of the most frequent is headache. A crewmember heading for a bottle of aspirin, or some other over-the-counter painkiller, could signal dehydration. Encourage that crewmember to drink several glasses of liquid instead of, or in conjunction with, the painkiller. It's amazing how quickly drinking a glass of water clears up the problem. Loss of appetite, nausea, and apathy are all traditional signs of dehydration. They are also signs of seasickness. Whether the dehydration exists as a result of seasickness, or whether the symptoms are primarily from seasickness, a competent skipper will attempt to keep fluids going to the stricken crewmember. For someone nauseous or actually vomiting, small sips of water taken repeatedly seem to be less upsetting than trying to down an entire glass of liquid in a short period of time. Even if the person subsequently vomits, it is more likely that a portion of the sipped fluid was absorbed.

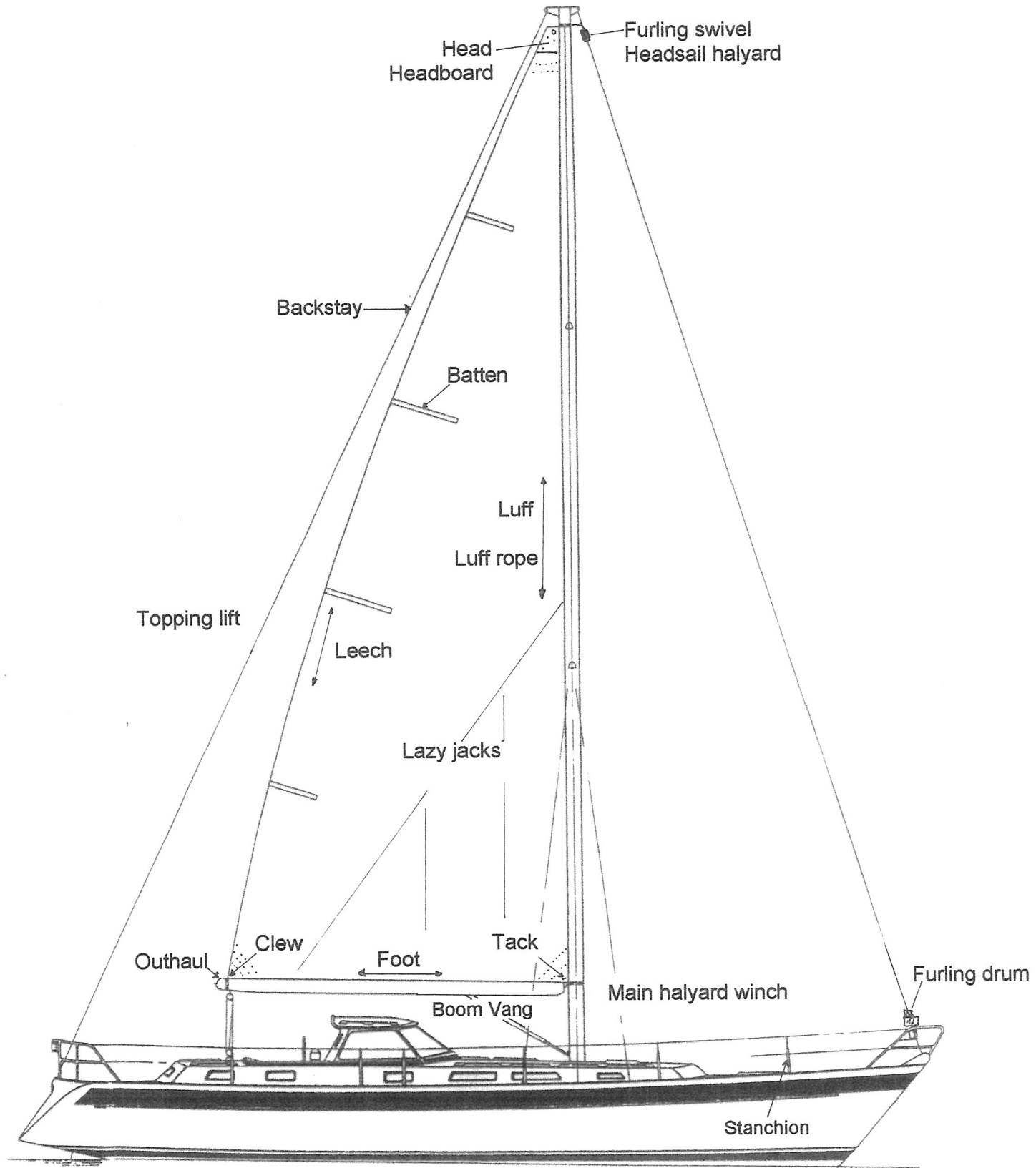
## DECK FAMILIARIZATION

**Label These Items & Identify Their Colors**

1. Headsail Furling Winch \_\_\_\_\_
2. Mainsheet Winch \_\_\_\_\_
3. Headsail Winches \_\_\_\_\_
4. Anchor Winch \_\_\_\_\_
5. Preventer \_\_\_\_\_
6. Headsail Furling Line \_\_\_\_\_
7. Headsail Car Control \_\_\_\_\_
8. Headsail Sheets \_\_\_\_\_
9. Traveller \_\_\_\_\_



# SAIL ORIENTATION





## WATCHES - SAMPLE



At sea we run a set watch schedule which changes to a new schedule at the end of the each week.

When on watch you will standing to steer switching off, with your watch partner, every 30 minutes.

OFFSHORE WATCHES	
0000	Kim & Holly
0200	Amanda & Barbara
0400	Bill & Ed
0600	Kim & Roberto
0800	Barbara & Bill
1000	Kim & Ed
1200	Holly & Roberto
1400	Ed & Bill
1600	Barbara & Holly
1800	Kim & Roberto
2000	Barbara & Bill
2200	Roberto & Ed

If coastal and inland waterway sailing, when we stop each night, we use an hourly schedule with two people on watch; you alternate, with your watch partner, helming for 30 minutes and either navigating or standing in a lookout position.

DUTY ROSTER – SAMPLE		Fri.	Sat.	Sun.	Mon.	Tue.	Wed.	Thur.
NAVIGATOR – COASTAL: Prepare charts and plotting the night before. Study cruising guides and tides. OFFSHORE - Plot 1200 position and calculate 24-hour noon run. Optionally shoot latitude by noon sextant sight.		Bob	Stv	Sue	Ptr	Bob	Bly	Mik
HEALTH & SAFETY OFFICER, HEAD MASTER – At 1000 and at 1600 clean behind and around head, under wooden grate & mirror with windex and paper towels. Empty head rubbish. Ensure crew are in good health – hydrated, cuts and scrapes covered, etc.		Mik	Bob	Stv	Sue	Mik	Ptr	Bly
CAPTAIN of the day and KEEPER of the DECK – Oversee daily running of the vessel. Wipe down cockpit and cushions with freshwater, clean windshield. Tidy deck. Check rigging.		Bly	Mik	Bob	Stv	Bly	Sue	Ptr
WEATHER PERSON & GALLEY HELPER Locate position on the weather charts. Interpret forecast positions and give a weather briefing to crew. Help with food prep and dishes.		Ptr	Bly	Mik	Bob	Ptr	Stv	Sue
SECRETARY of the INTERIOR, STORY TELLER & NAV ASSISTANT – Vacuum carpet by 1000. Ensure bunks are made and all personal gear is stowed in lockers. Present an “Item of Interest” at dinner. Assist with navigation.		Sue	Ptr	Bly	Mik	Sue	Bob	Stv
BOSUN – Officer in charge of vessels equipment – DOCKING & ANCHORING, DINGHY & HAPPY HELPER – Coordinate sail cover, wheel cover, cockpit enclosure, high life lines & preventer. Teach “Knot of the Day”.		Stv	Sue	Ptr	Bly	Stv	Mik	Bob

# GETTING UNDERWAY CHECKLIST

## Forward Cabin

- ☐ Lock hatch
- ☐ Clear bureau and bunks of gear
- ☐ Check lifevests
- ☐ Rig lee cloths

## Port Cabin

- ☐ Lock hatch and port
- ☐ Clear bureau and bunks
- ☐ Rig lee cloths

## Forward Head

- ☐ Lock port
- ☐ Close sink drain
- ☐ Check that both head handles are off (horizontal) and that head lever is on DRY BOWL

## Saloon

- ☐ Lock ports (6) and hatch
- ☐ Stow all gear

## Galley

- ☐ Secure strap over drawer fronts
- ☐ Check that Thermos is full of hot water and secure
- ☐ Put pan locks in place on stove. Lock stove in position.

## Navigation Station

- ☐ Stow computers
- ☐ Turn on "A.Pilot" breaker - located in middle of nav station instrument panel
- ☐ Weatherfax on timer with antenna switched to WFX position
- ☐ Engine room fan switch ON – nav station instrument panel
- ☐ Webbing strap over drawer fronts
- ☐ Log book and appropriate charts placed in cockpit

## Engine Room

- ☐ Check engine, transmission and coolant levels
- ☐ Check alternator belt tension

## Aft Cabin and Head

- ☐ Check that ports (3) and hatch are locked
- ☐ Stow gear & rig lee cloths

## On Deck

- ☐ Check that both anchors are secure
- ☐ Dinghy tied down with bow and both stern lines
- ☐ High lifelines ready
- ☐ Lock aft deck lazarettes
- ☐ Secure and lock outboard motor

## **ENGINE PROCEDURES**

### **Starting the Engine**

1. Have John check engine, transmission and coolant levels.
2. Press ON button. Press START button briefly. After one minute bring engine revs to 1000 RPM to warm up by pressing in red button and advancing throttle.
3. To put engine in gear, bring shift/throttle lever to neutral, wait two seconds, then push forward until it "clicks" for slow forward.
4. Check that oil pressure and water temperature needles are on blue marks.

### **When the Engine is Running**

1. Scan water and oil gauges every five minutes.
2. Visually check the engine room for steam or oil hourly and that water is coming out the exhaust.

### **Stopping the Engine**

1. Bring throttle/shift lever to slow forward for 2 minutes.
2. Press and hold START/STOP button for 2 second. Press OFF button.
3. Check that temperature gauge reads zero.

## **ANCHORING PROCEDURES**

### **Raising the Anchor**

1. Start engine and warm up for five minutes.
2. Turn on "A Pilot" switch at the chart table, activating the depth sounder.
3. Direct helmsperson to motor slowly forward, indicating direction of anchor.
4. Press black (left) windlass deck switch to raise the anchor.
5. Keep fingers and toes clear of windlass and chain. Be careful!
6. Call out 50' markers to helm – helm calls back depth of water.
7. Tell helmsperson when anchor is clear of the water.
8. Carefully and slowly bring anchor into roller with very short taps on the switch.

### **Dropping the Anchor**

1. Check chart and sailing directions for obstructions and information
2. Choose a location providing shelter from most wind directions.
3. Avoid damaging coral or anchoring in rock or kelp if possible.
4. While helmsperson drives the boat, one person calls depths, someone is on lookout from mast pulpit or bow, navigator follows the chart, and another is at the ready at the windlass.
5. Stop forward motion of boat. Ease chain out with control using red deck switch. Watch fingers.
6. Call out 50' chain markers, stop at a minimum of 4 to 1 scope.
7. Let boat settle into the wind and current before applying power in reverse.
8. Take bearing on ashore to judge if anchor has set as 1000-1200 revs in reverse are applied.
9. After two minutes of steady power and no movement, bring engine to neutral, set chain snubber and turn off engine.
10. Navigator notes time, depth, and GPS position on log. Plot anchorage on chart to check accuracy of chart.

### **Setting a Second Bow Anchor**

1. Attach chain and line to Delta anchor.
2. Helmsperson should power slowly forward so that second anchor can be dropped 30 to 60 degrees off first anchor.
3. In coral conditions, second anchor must be deployed from the tender.
4. Pay out second anchor rode until there is equal tension on both anchors.
5. Cleat rode off on port bow cleat and rig chafing gear.



# SAIL HANDLING PROCEDURES

## Raising the Mainsail

1. Turn into the wind and ease mainsheet.
2. Release boom vang (black line) and all three reef lines.
3. Attach main halyard (tan colored) - check it's not wrapped.
4. Remove and stow sail ties, 2x2 to starboard top lifeline - forward of the stanchion by genoa car.
5. Pull main up by hand until it becomes difficult, then place on winch and crank.
6. Once main is hoisted, release topping lift (white line on boom) & tighten boom vang. Advise helm, "Vang On". **\*Never release topping lift before main is fully hoisted.**
7. Set topping lift so that it dances, then set leech line.
8. Finish with "deck work" - Main halyard - place two additional tight wraps on winch, then coil and stow line so it just clears the deck when hung on the winch. Lock reef brakes and stow reef lines.
9. Final check - ask helm "How does the main look?" before leaving the mast.

## Reefing the Mainsail

1. Prepare reef lines and halyard. Ease mainsheet.
2. Release vang & tighten topper (topping lift) - block to block.
3. Ease halyard, pull down luff while pulling on all loose reef lines.
4. Hook tack ring on rabbit ear. Tighten halyard.
5. Winch in correct reef line.
6. Release topping lift then tighten vang. Advise helm, "Vang On".
7. Set topper then leech line.
8. Deck work - coil and stow halyard and reefing lines on appropriate winches.
9. Final check - "Helm, how does the main look?"

## Shaking Out a Reef

1. Prepare reef lines and halyard. Ease mainsheet.
2. Release vang and tighten topper.
3. Ease halyard 1' then release tack ring followed by reef lines.
4. Hoist main to appropriate height. You may also need to winch in appropriate reef line.
5. Release topper & tighten vang. Advise helm, "Vang On".
6. Set topper then leech line.
7. Complete deck work.
8. Final check.

## Dropping the Mainsail

1. Prepare reef lines and halyard.
2. Release vang & tighten topper.
3. Rig lazy jacks - advise helm "Main coming down".
4. Ease halyard while pulling in the reef lines.
5. Flake main - tie with 4 sail-ties, one at each lazy jacks position, using slippery hitch.
6. Stow lazy jacks
7. Remove and secure main halyard to high life line eye.

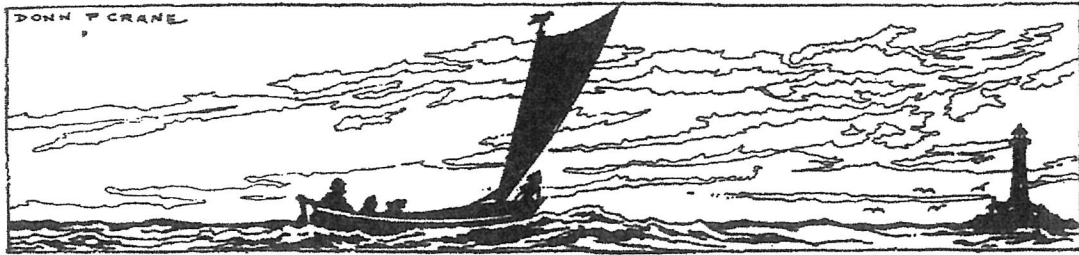
## Unfurling the Headsail

1. Loosen lazy sheet, place working sheet on winch. Set headsail car position.
2. Place furling line on winch (to prevent sail from unrolling too quickly, causing overrides) .
3. Winch or hand pull the working sheet while the furling line is carefully eased to the required sail area.
4. Trim sail & tidy lines - take two extra wraps around winch and coil tail around drum to hang inside cockpit.

## Furling the Headsail

1. Ease the sheet until the sail luffs.
2. Adjust headsail car position so that the sheet lead bisects headsail clew.
3. Pull on furling line manually or with winch until sail is desired size.
4. Trim headsail and tidy lines.

# SAIL REDUCTION GUIDE



This guide is for true wind speed. Shoaling water, current opposing the wind or crossed swells can dramatically worsen sea state and boat performance.

true wind speeds

## Wind forward of the beam

17 knots, 1<sup>st</sup> reef in mainsail, 10% of genoa furled.

23 knots, 2<sup>nd</sup> reef in mainsail, 20% of genoa furled.

28 knots, 3<sup>rd</sup> reef in mainsail, 30% of genoa furled, increase backstay tension if possible.

35 knots 3<sup>rd</sup> reef in mainsail or drop main and hoist trysail.

Storm jib or storm staysail replaces furled headsail. Set running backs.

45 to 55 knots, forereach or heave-to if your destination is upwind. Wait for directional change.

55 knots or more see below.

## Wind aft of the beam

22 knots, 1<sup>st</sup> reef in mainsail, 10% of genoa furled genoa.

28 knots, 2<sup>nd</sup> reef in mainsail, 20% of genoa furled.

34 knots, 3<sup>rd</sup> reef in mainsail, 30% of genoa furled. Rig inner forestay.

40 knots, 3<sup>rd</sup> reef in mainsail, storm staysail. Set running backs. Increase backstay tension.

45 knots, storm trysail and storm staysail, dropping staysail if boat becomes difficult to steer because of excessive boat speed.

## Tactics for Storm Conditions with Sustained Winds Above 45 Knots:

- Forereach under trysail or triple reefed main.
- Heave-to under trysail and storm sail. This may be uncomfortable above 50 knots.
- Run or broad reach downwind under minimum storm sail or under bare poles, towing warps or drogue if required. Hand steering may be required to counter rogue waves or the tendency to broach.
- Contact a professional weather router if you are in sustained winds above 45 knots or a tropical depression is forecasted within 400 miles.



## STANDING ORDERS

### WAKE OR NOTIFY JOHN OR AMANDA IF:

- Any AIS target comes within 3 miles CPA.
- You see any lights, ships or objects.
- You notice approaching weather; lightning or low, dark clouds to windward.
- There is an increase in windspeed or change in direction.
- You hear unidentifiable sounds.
- We catch a fish.
- **You are in DOUBT, ANYTIME, FOR ANY REASON**

**The captain who knows that he/she will be awakened by the crew for these or any reason ALWAYS sleeps better!**

## WATCH ORDERS

### DUTIES OF THE PERSONS ON WATCH, DAY OR NIGHT

- Be on deck with harness on ready to go ten minutes early.
- Before assuming the watch, make sure that you understand the watch orders and sail plan.
- You are the **eyes of the ship** and it is essential to maintain a vigilant 360° lookout.
- The watch person who is not steering is responsible for looking astern, checking the radar and making log entries.
- Constantly monitor sail trim, wind shifts or increases and approaching weather.
- Organize sail changes and maneuvers with \_\_\_\_\_ on deck.
- When motoring check engine gauges every 10 minutes.
- On the hour complete logbook entry and check that the head has been left on dry bowl and both wall valves are horizontal.
- On night watch keep non-essential talking to a minimum so others can sleep.
- **UNDERSTAND AND OBEY STANDING AND WATCH ORDERS.**

### END OF WATCH DUTIES:

- Pass on any pertinent information to the relieving watch. Don't leave surprises.
- Fill out log book and plot position on chart.
- Check that all lines are neatly coiled.

### END OF A SAILING PROCEDURES:

- Check that all sheets and halyard are tidy.
- Put on mainsail cover and wheel cover.
- Stow binoculars and navigation equipment.
- Plot GPS position on chart.
- Launch tender and mount outboard motor.
- Go for a swim, check the anchor, RELAX!

# EMERGENCY STATION BILL

## MAN OVERBOARD

**PREVENTION:** Wear harness at all times when above decks.

Move forward on the windward side and move cautiously.

Use the head below.

1. Shout "**MAN OVERBOARD**" twice to alert everyone.
2. One person **POINTS TO CREW OVERBOARD**, never taking eyes off them.
3. **HELMSMAN TURNS WHEEL ½ TURN TO WINDWARD**, walks carefully back to Lifesling.
4. **DEPLOY BOTH LIFESLINGS**, first throwing inflatable one, then larger attached sling.
5. **PRESS MOB & ENTER ON GPS.**
6. Boat has gone through the **Eye of the Wind**, backwinding the jib.
7. **ACTIVELY STEER BOAT** until Lifesling reaches MOB. Sails/boat gybe.
8. **WHEN LIFESLING REACHES MOB** turn helm hard over away from the wind.  
Boat gybes and is hove-to.
9. **PULL MOB TO SWIM STEP AND ASSIST ABOARD.** Be very gentle with person in cold water situations where hyperthermia may exist.

## FIRE EMERGENCY

1. Shout "**FIRE**" twice to alert everyone.
2. Helmsperson **HEAVE TO**: to minimize airflow below.
3. Crew **SECURE ALL PORTS**, hatches and bulkhead openings.
4. **LOCATE SOURCE** and attempt to **EXTINGUISH FIRE IMMEDIATELY.**  
**GALLEY:** Small HALON extinguisher in fourth drawer down.  
**ELSEWHERE:** Extinguishers located under steps, under main saloon table and in aft cabin and bunk cabin hanging lockers.  
**ENGINE ROOM:** Automatic extinguishers discharges with a BANG. Halotron.
5. **TURN OFF** engine, engine fan, gas alarm and main breakers.
6. **Liferaft:** 2 person standing by.
7. **Communications:** 1 person remove Iridium phone and place in Ziploc bag.

## FLOODING EMERGENCY

1. Shout "**FLOODING**" twice to alert everyone.
2. **TASTE** the water.
3. Everyone is responsible for **CHECKING THEIR CABIN AREA** for water ingress.
4. Bunk cabin is responsible for **HEAD** as they have no thru hulls in their cabin.

## ABANDON SHIP EMERGENCY

1. Shout "**ABANDON SHIP**" twice to alert everyone.
2. **HEAVE TO**, stopping boat.
3. **DON LIFEJACKETS** located in your hanging locker or under forward bunk.
4. **DO EVERYTHING POSSIBLE TO SAVE THE BOAT.**
5. **DECISION TO ABANDON SHIP IS MADE BY JOHN AND AMANDA.**  
AMANDA: Damage Control.  
JOHN: Issue **MAYDAY** with IRIDIUM SAT Phone, YB Tacker and VHF  
CREW: 2 to launch **LIFERAFT.**  
CREW: 2 in cockpit passing **ABANDON SHIP PELICAN CASE** and **DRY BAG.**  
CREW: 1 to collect **SUPPLIES:** flashlights, blankets, handheld VHF'S and food.



# A Man-Overboard Plan

by Bernadette Brennan

**W**hen a crewmember goes over the side, recovery time is of the essence. In an effort to come up with a recovery system that is simple and lightning quick, the U.S. Yacht Racing Union Safety At Sea Committee, the U.S. Naval Academy Sailing Squadron, the Cruising Club of America Technical Committee and the Sailing Foundation of Seattle, Washington, joined forces to conduct extensive research and sea trials. The result of their collaboration is the "Quick-Stop" method of man-overboard recovery. The hallmark of this method is the *immediate reduction of boat speed by turning in a direction to windward and thereafter maneuvering at modest speed, remaining near the victim.* In most instances this is superior to the conventional procedure of reaching off, then either jibing or tacking and returning on a reciprocal course.

## The Quick-Stop Course Of Action For Both Full And Shorthanded Crews

1. Shout "man overboard" and IMMEDIATELY bring the boat head-to-wind and beyond (Figure 1). If available, designate a crewmember to spot the victim's position in the water. The spotter should not take his eyes off the victim.
2. Provide immediate flotation. Deploy buoyed objects such as cockpit cushions, rolled up PFDs kept handy to the helmsman, life rings and so on. These objects may not only come to the aid of the victim, but will "litter the water" where he went overboard and help your spotter to keep him in view. It was determined that deployment of the standard man-overboard pole rig required too much time. The pole rig is saved to "put on top" of the victim in case the initial maneuver is unsuccessful.
3. Allow headsail to back and further slow the boat.
4. Continue the turn with headsail

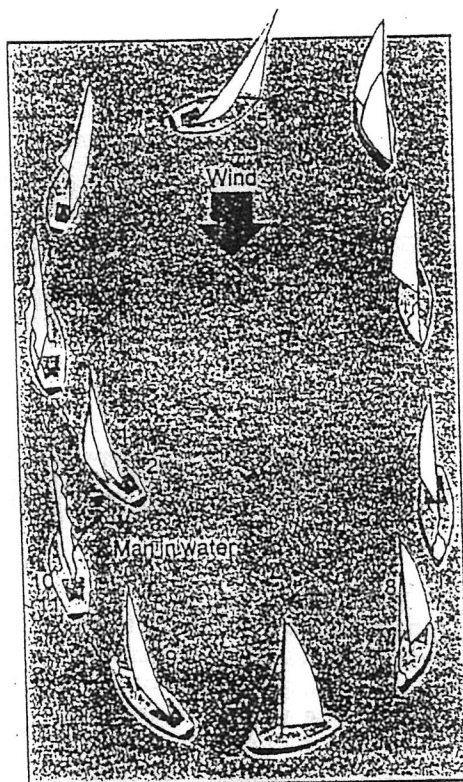


Fig 1. Quick stop. Eleven steps to a quick man-overboard recovery.

backed until wind is abait the beam.  
5. Course is stabilized on this beam-to-broad reach for two or three lengths then altered to nearly dead downwind.

6. Drop the headsails while keeping the mainsail centered (or nearly so). The jib sheets are not slacked, even during the dousing maneuver, to keep them inside the lifelines.

7. Hold the downwind course until the victim is abait the beam.

8. Jibe the boat.

9. Approach the victim on a course of approximately 45 to 60 degrees off the wind.

10. Establish contact with the victim with a heaving line or other device. The Naval Academy uses a "throwing sock" containing 75 feet of light floating line and a kapok bag that can be thrown into the wind because the line is kept inside the bag and trails out as it sails to the victim.

11. Effect recovery over the windward side.

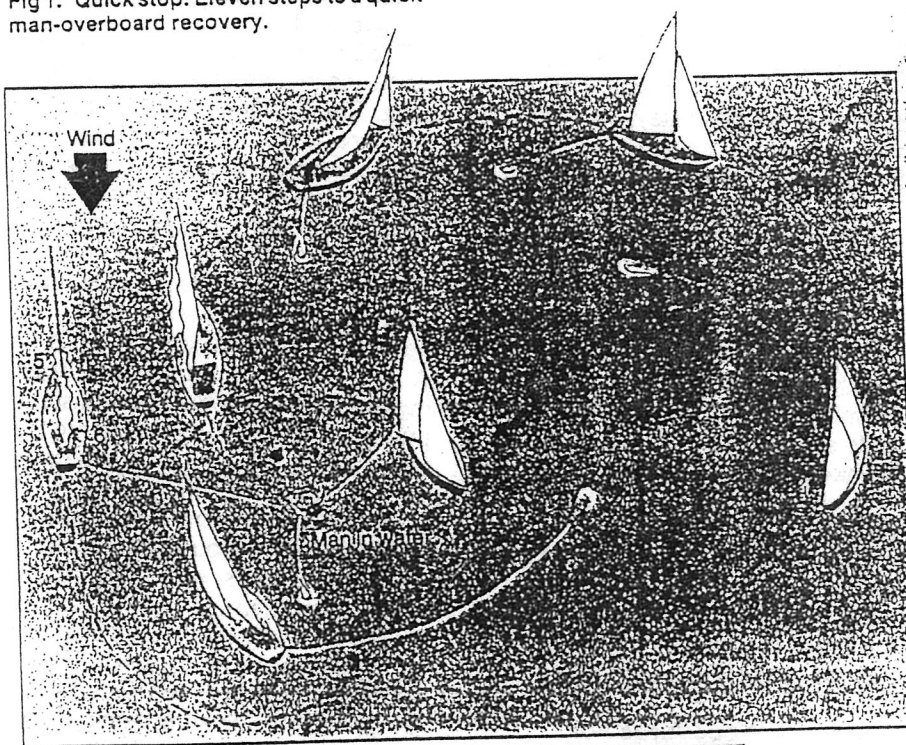
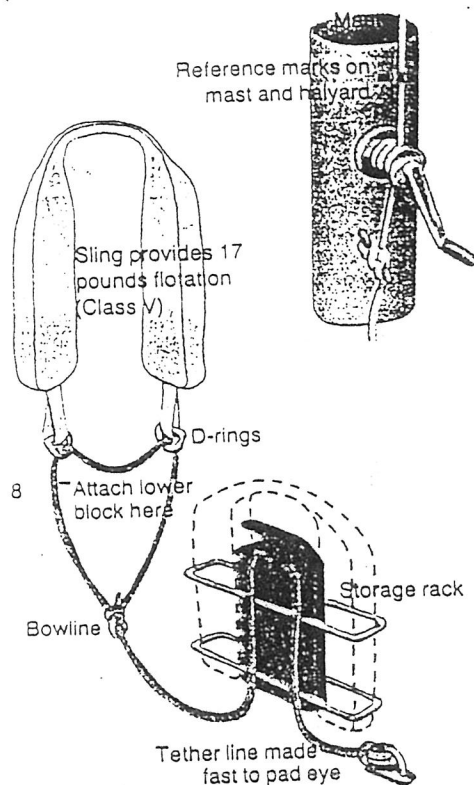


Fig. 2 When only two people sail together, and one goes over the side, the scenario should proceed as shown.



Premark the hoisting halyard at the correct height for quick attachment to the Lifesling, which combines a buoyant harness with an easily deployed floating throw line.

### Spinnakers

The same procedure is used when flying a spinnaker. Follow the preceding instructions. As the boat comes head-to-wind and the pole is eased quickly to the head stay, the spinnaker halyard is quickly lowered and the sail is gathered on the foredeck. The turn is continued through the tack and the approach phase commences.

### Yaws And Ketches

Experiment with your mizzen sail. During sea trials, it was determined that the best procedure was to drop the mizzen as soon as it is convenient to do so during the early phases of Quick-Stop.

### Use Of The Engine

The use of the engine is not required, although it is advisable to start it, but keep it in neutral during the Quick-Stop phase, unless it is needed in the final approach.

### Recovery Procedures For Shorthanded Crews

When there are only two people sailing together and one goes overboard, the remaining crewmember

may have difficulty handling the recovery alone. If the victim has sustained injuries, getting him back aboard may be almost impossible. To overcome this problem, a specialized piece of equipment called the Lifesling is added to the Quick-Stop method, which is simple to effect by a singlehander.

The Lifesling is a floating horse-collar device that doubles as a hoisting sling. The Lifesling is attached to the boat by a length of floating line three or four times the boat's length. When a crewmember falls overboard the scenario should proceed as follows:

1. A cushion or other flotation is thrown while the boat is brought IMMEDIATELY head-to-wind and beyond to slow and stop it (Figure 2).
2. The Lifesling is deployed by opening the bag that is hung on the stern pulpit and dropping the sling into the water. It will trail out astern and draw out the remaining line.
3. Once deployed, the boat is sailed in a wide circle around the victim with the line and sling trailing astern. The jib is not tended but *allowed to back from the head-to-wind position*, which increases the rate of turn.
4. Contact is established with the victim by the line and sling being drawn inward by the boat's circling motion. The victim then places the sling over his head and under his arms.
5. Upon contact, the boat is put head-

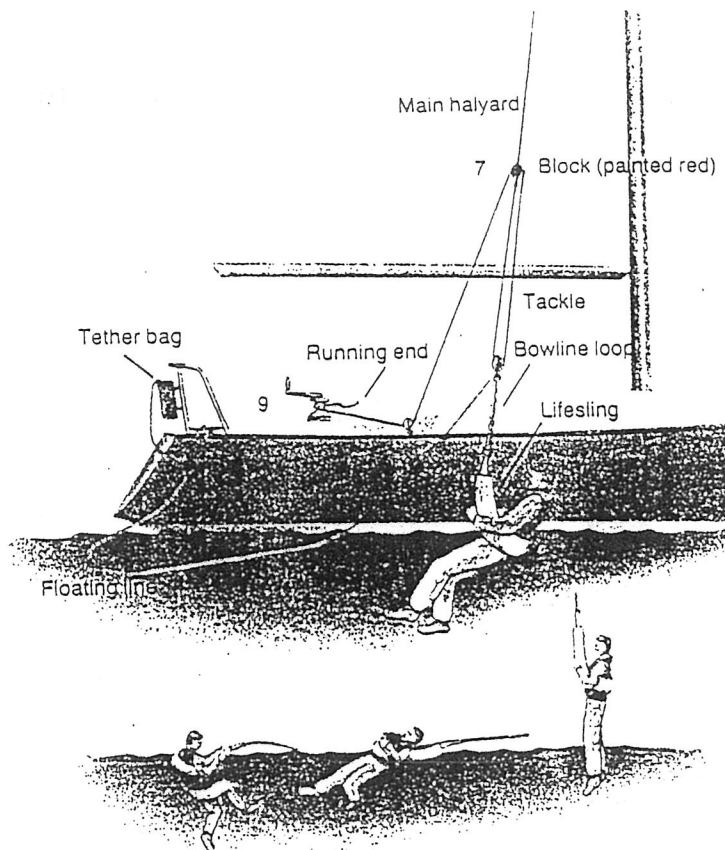


Fig. 3 Use of the Lifesling, illustrated here, may be the only way one person can get a tired victim back aboard a boat.

*to-wind again*, the headsail is dropped to the deck and the main is doused.

6. As the boat drifts slowly backward, the crew begins pulling the sling and the victim to the boat. If necessary, a cockpit winch can be used to assist in this phase, which should continue until the victim is alongside and pulled up *tightly* until he is suspended in the sling (so that he will not drop out) with his head and shoulders out of the water. Cleat the line. The victim is now safe (Figure 3).

7. Attach a three- or four-part tackle to the main halyard, haul it up to a predetermined point, about 10 feet above the deck or high enough so that the victim can be hoisted up and over the lifelines. Cleat off the halyard (Figure 3).

8. Attach the lower end of the tackle to the (previously sized) loop in the tether line that passes through the D-rings of the sling (Figures 4 and 5).

9. Reeve the running end of the tackle through a sheet block or snatch block on deck and put it on a cockpit winch. Hoist the victim aboard by winching in on the running end of the tackle

Bernadette Brennan is the Deputy Editor of *Cruising World*.


# MAN OVERBOARD



5. (Press MOB & ENTER on GPS)

4. Deploy Lifesling

3. Quickly turn wheel  $\frac{1}{2}$  turn to windward

2. Person points 

1. "MAN OVERBOARD!"

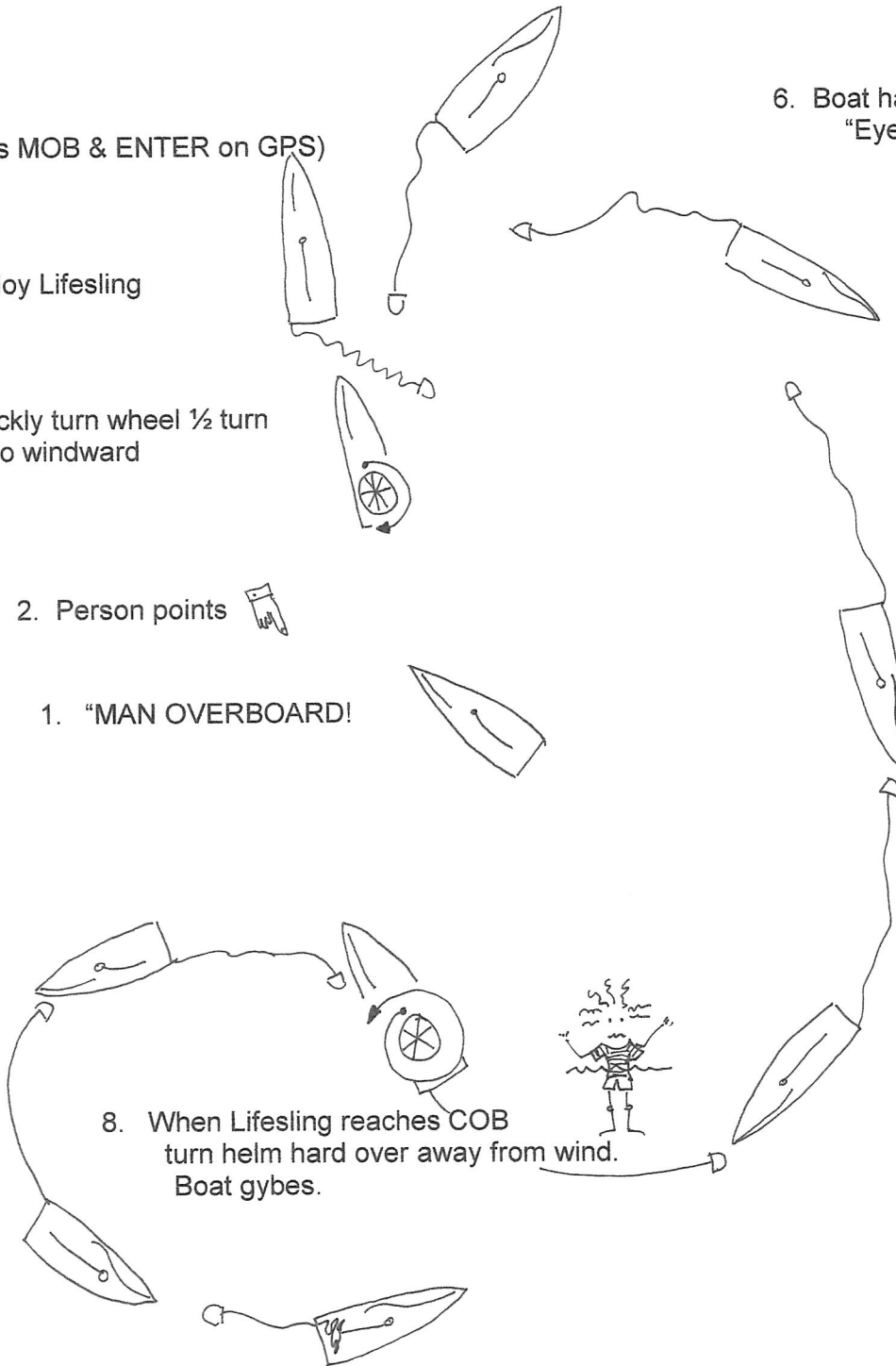
6. Boat has gone through "Eye of the Wind"

7. Boat gybes

Steer boat to pass within 6ft of COB

8. When Lifesling reaches COB turn helm hard over away from wind. Boat gybes.

9. Boat is hove- to and stable. Retrieve COB



**MARINE NOTICE**

**AFFIX THIS NOTICE NEAR YOUR RADIO**

# **DISTRESS & URGENCY INFORMATION**

## **DISTRESS**

If in imminent danger and immediate aid is required, use **MAYDAY**.

1. Switch to 2182 kHz or 156.8 MHz (Chl. 16), International Distress Frequencies (any other frequency may be used if it is known that the nearest station or ship is keeping watch on that frequency).
2. Alarm Signal (where possible), say: "MAYDAY" (3 times).
3. Say: "This is \* ..... " (3 times)
4. Say: "MAYDAY \* ....."
5. Give your position.
6. State nature of distress.
7. State nature of help required.
8. Give any other information which may assist rescue.
9. Listen on the same frequency for acknowledgement.
10. If any other ship interrupts, say: "SEELONCE MAYDAY."

## **CANCELLATION OF DISTRESS OR URGENCY CALLS AND MESSAGES**

**DISTRESS** and **URGENCY** calls and messages must be cancelled if it is subsequently found that assistance is not required.

**Example — MAYDAY:**

Say: "MAYDAY (once) All Stations (3 times), this is:

\* ..... (3 times)

Cancel my earlier MAYDAY, help no longer required — out."

**Example — URGENCY:**

Say: "All stations (or a particular station) (3 times), this is:

\* ..... (3 times)

Cancel my earlier URGENCY call, engine now repaired — out."

**UNNECESSARY TRAFFIC SHOULD BE AVOIDED AT ALL TIMES**

\* Insert your ship's name and call sign.

## **URGENCY**

If **MAYDAY** not warranted, but urgency required for safety of ship or person, use —

### **PAN PAN**

1. Switch to 2182 kHz or 156.8 MHz (Chl. 16), International Distress Frequencies (any other frequency may be used if it is known that the nearest station or ship is keeping watch on that frequency).
2. Say: "PAN PAN" (3 times).
3. Give the name of the station required (3 times).
4. Say: "This is \* ..... " (3 times)
5. Give urgency message.
6. Listen on the same frequency for acknowledgement.

If you hear **SECURITE** (SAY-CURE-E-TAY) this indicates that a navigational or meteorological warning is to follow.

## **IF YOU HEAR A DISTRESS MESSAGE**

1. **LISTEN CAREFULLY.** If possible, write down the message and time.
2. **LISTEN FOR ACKNOWLEDGEMENT** from a coast radio station.
3. If no acknowledgement heard — acknowledge, then re-send the message.
4. Say: "MAYDAY RELAY" (3 times).
5. Say: "This is \* ..... " (3 times)
6. Give distress message as sent by vessel in distress.
7. Give assistance if possible. Advise coast station of what you are doing.
8. Continue to listen in.
9. If other radio traffic interrupts, say: "SEELONCE DISTRESS  
This is \* ....."



# ABANDON SHIP SUPPLIES - MAHINA TIARE III



## **#1 Pelican Waterproof Case, Yellow** – Stowed in starboard cockpit locker under harness bag

Ocean Signal RescueME EPIRB-GPS registered with NOAA  
Ocean Signal RescueME 406 PLB-GPS, registered with NOAA  
Standard HX890NB Floating VHF-GPS with strobe, alkaline battery tray and spare batteries  
ICOM IC-A20 aircraft VHF handheld radio, battery case, and spare alkaline batteries  
Rescue laser light, 20-mile range  
4 Pains-Wessex SOLAS para-red flares  
4 SOLAS handheld flares  
Pains-Wessex SOLAS floating smoke signal  
Watermaker - Katadyn Survivor 06  
\$100 U.S cash  
1 Thermal protective suit for warming hypothermic victims  
Copy of Passports – laminated  
List of all Atlantic and Pacific MRCC's including phone numbers & email addresses  
Swiss army knife  
Orion dye marker  
Extra alkaline batteries  
Waterproof compass

## **#2 Grab Bag** - West Marine Dry Bag - Large 13 x 13 x 20 – Stowed in corner of starboard cockpit locker

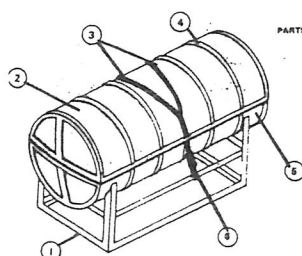
\*Items in zip-lock bags  
McMurdo Fast Find 220 406 PLB-GPS, registered with NOAA, in waterproof case  
Icom handheld VHF with alkaline battery tray  
Rescue laser waterproof light, range 20 miles  
Pains-Wessex SOLAS floating smoke signal  
3 Olin handheld flares  
\*20 alkaline AA batteries  
5 Comet SOLAS parachute red signal rocket  
\*2 Datrex multi emergency ration (18 bars)  
2 tubes of antibiotic cream  
\*1 Thermal protective suit for warming hypothermic victims  
\*4 Packets Hurricane matches in waterproof container plus disposable lighter  
12 Red handheld SOLAS flares  
2 Fish filet knives in holders  
2 Mylar highway safety blanket, 69x72" (excellent radar reflector)  
\*Assorted fishing line, hooks and sinkers  
Orange locator flag, small bottle of orange marker dye  
Deck of cards, harmonica  
Compass, whistle  
Soap, toothpaste and toothbrush  
Sunglasses, sunhat, cotton scarf  
Bottle of SPF 45 sunblock, tube of zinc oxide  
Packet of hard candy  
Locator light, flashlight, signaling mirror  
Water bottle, 20' light line  
Multi-purpose can opener  
\*Sea Survival manual by Dougal Robertson

## **Viking RescYou Pro SOLAS Liferaft**

*(stowed on deck in front of windshield)*  
Offshore "E" equipment pack  
McMurdo 220 406 PLB-GPS in crush-proof, waterproof case, reg. w/NOAA  
Additional water and survival food

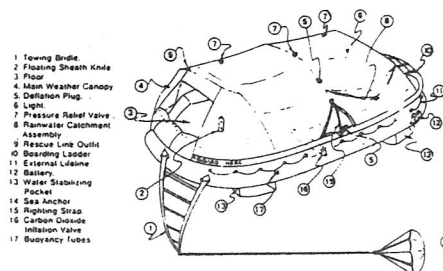
## EMERGENCY INFORMATION FOR USING INFLATABLE LIFERAFTS

1. As soon as possible after boarding, check all persons in your raft for sharp objects in their pockets and/or on shoes or boots. Lash all equipment to prevent chafing the raft. In cold weather, inflate the bottom floor with a hand pump to provide insulation from cold sea water. In hot weather, deflate the bottom to receive a cooling effect from the sea water.
2. If the fresh water supply is low, do not allow smoking. Smoking creates thirst. If you do allow smoking, check the water around your raft for possible fire hazards.
3. Explain to everyone to keep out of the sun and in the shade as much as possible. This will cut down loss of body fluids. Issue no water rations for the first 24 hours, and then only the minimum amount of 1 can per day ( $\frac{1}{3}$  in the morning,  $\frac{1}{3}$  at noon and  $\frac{1}{3}$  at night) must be used. The human body contains up to 70 pints of water. If you do not take in a minimal amount of water each day, dehydration will take place, and death will result.
4. Keep the interior of the raft well ventilated, as heavy concentrations of carbon dioxide gas are dangerous and can not be detected by smell. Also, and of greater concern, the carbon dioxide exhaled from normal breathing by raft occupants is equally dangerous.
5. The raft's capacity shall be stenciled in the immediate area of each raft. In an emergency you **can** overload an inflatable liferaft.
6. After abandoning your vessel, stay in the immediate area. Make sure the sea anchor is streamed to reduce your drift and help in your rescue.
7. If, for some reason, you do decide to leave the area and make a landfall, remember that in the daytime, the wind usually blows toward shore. (This would be the time to take in the sea anchor and use this wind to assist you toward shore). At night, the wind usually blows away from shore. Once ashore lash the raft down so it will not blow away in a sudden storm and use it as a shelter. Make a clearing a short distance from the raft where sparks from a fire will not fall on the raft. Build a large fire to attract attention.
8. Do not become alarmed if you hear air escaping from a recently inflated raft. This is normal. **Safety valves** are provided to allow excess pressure to escape so as not to cause damage by overinflation. If air continues to escape and the rafts starts to get soft, use the plugs that are provided to close the safety valves.
9. You can make the batteries in the lights on the rafts last longer by unscrewing their bulbs during daylight hours.
10. A raft will ride better in a rough sea when "soft". Remember, air expands in hot weather and contracts in cool weather. Keep a check on the raft and use the hand pump to get the desired results.
11. If your raft is in or near a fire on the water, use the raft knife located in a special pocket on the outside of the canopy near the entrance, to cut the line to the sea anchor. The sea anchor was automatically streamed when raft was launched. Propel the raft away from the fire or other danger with the paddles found in the raft. When at a safe distance, stream the second sea anchor provided with each raft.
12. All rafts are equipped with a repair kit. This kit has glue, rubber patches and a buffing stone. Allow 24 hours for the patches to dry before pumping up raft to a "hard" pressure. You will find 3 or 4 repair clamps to make emergency repairs for cuts and holes up to 6" long. Insert bottom plates into the inside of the hole so that the threaded rod sticks out. Then fasten the top plate over the bottom plate with a wingnut.
13. The leader must assign duties to everyone in his raft. This will keep everyone busy and will improve the chances of survival. Explain to everyone what these duties are.
  - The medical man should get out the first aid kit, see what he has to work with and read the instructions.
  - The lookouts should know what type of signals must be made readily available for use. The lookouts should also be instructed to wake everyone if it rains to catch and drink as much water as possible.
  - The man assigned to maintenance should check all repair equipment. He should make a complete check of the raft for damage. He should lash down all equipment bags and loose equipment to prevent them from chafing the bottom of the raft.
14. The operating cord on each raft must be shackled to the raft stowage cradle prior to sailing so that the cord and hydrostatic release will perform as intended by the manufacturer.
15. If you are unable to release the raft manually, remember that water pressure will actuate the hydrostatic release gear. The raft's buoyancy will float it to the surface inflated or not. The sinking ship will pull on the operating cord and the raft will inflate. The weak link on the operating cord will then part and the raft will float free. Because this cord is designed to part as the ship sinks, never tamper with it or attempt to replace it.
16. When you stream a sea anchor, make sure the "holding or drag line" is long enough to cause the pull on it to be more horizontal than downward.
17. "Broaching to" is the term used to describe a raft that is broadside (or at right angle) to the swells or surf. This is the most dangerous situation for a raft to be in. By streaming the sea anchor over the bow or stern, the drag caused by the sea anchor will tend to hold the raft end-on into a swell or surf.

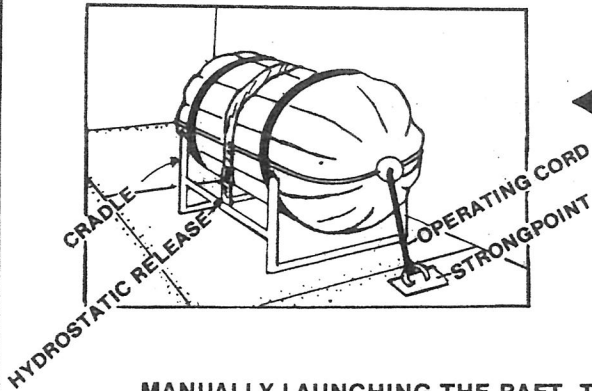


PARTS OF AN INFLATABLE LIFERAFT

1. Cradle.
2. Inflatable Liferaft.
3. Tie-down Straps.
4. Stainless Steel Packing Bands.
5. Fiberglass Container.
6. Hydrostatic Release Mechanism.



1. Towing Bridle.
2. Floating Sheath Knife.
3. Floor.
4. Man Weather Canopy.
5. Deflation Plug.
6. Light.
7. Pressure Relief Valve.
8. Rainwater Catchment Assembly.
9. Rescue Line Outlet.
10. Boarding Ladder.
11. External Lifeline.
12. Battery.
13. Water Stabilizing Pocket.
14. Sea Anchor.
15. Righting Strap.
16. Carbon Dioxide Inflation Valve.
17. Buoyancy Tubes.



The raft in a typical stowage situation showing the painter made fast to a strongpoint. To free the raft lashing to launch it by hand, operate the manual release mechanism on the hydrostatic release. If the emergency situation does not allow you to launch the raft by hand, it will be released automatically as the ship sinks. The tug caused by the sinking ship will operate the gas release valve and the sudden force of the buoyancy of the inflating raft will break the painter or "operating cord"

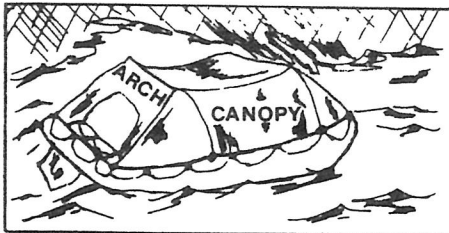
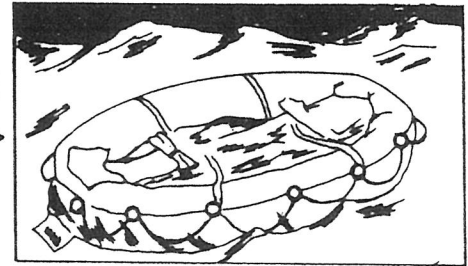
**MANUALLY LAUNCHING THE RAFT.** The painter or operating cord has been made fast to a new strongpoint before launching.

*Looks easy! Well, it weighs a couple of hundred pounds. Just try this act alone if you are Superman!*

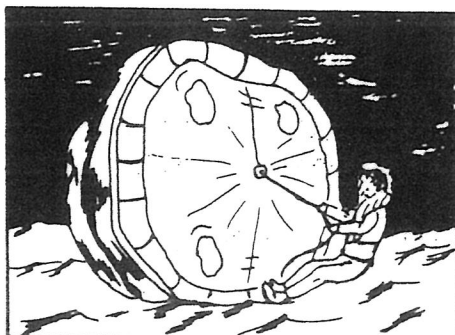


**THE RAFT STARTS TO INFLATE.** When the painter is pulled out to its full length (about 100 ft.) and then given a sharp jerk it will operate the gas release valve and start inflating (i.e. blowing up) the raft.

**THE RAFT IS PARTIALLY INFLATED AND MAY BE BOARDED** at this stage. You should crawl under the canopy (i.e. the fabric top) of the raft because sitting on top of it may delay inflation.



**HOW TO BOARD THE RAFT.** It may be possible to board the raft directly from a ship's ladder to avoid going into the water. This may offer you many favorable long-term survival benefits. When boarding a raft from the water, place one foot firmly on the rung of the ladder, grasp the hand holes provided on the top of the raft's buoyancy tube and at the sides of the entrance, heave your body up and slide head-first into the raft. If necessary, you may jump into a partially inflated raft with some degree of safety....but jump for the arches rather than onto the center of the canopy.



**RIGHTING THE INFLATABLE LIFERAFT.** In the unlikely event that a raft should inflate on its side, it can be righted by one person if the correct procedure is followed. Turn the raft with its canopy into the wind. Climb onto the cylinder of the raft and use the righting handholes as shown. Lean well back and, as the raft comes over, swim out from under. Don't let the raft float/blow away from you, however, during this process!

# EARTHQUAKE - TSUNAMI RESPONSE



As sailors we need to be aware of the ever present threat of a tsunami. By establishing emergency procedures for your crew and vessel along with knowing what to expect and do in the event of a tsunami it will be far less likely that you and your crew will become casualties and that your vessel will sustain damage. 59% of tsunamis occur in the Pacific with 80% caused by earthquakes.

In the event of an earthquake, time is of the essence as there may only be four minutes from the time of the earthquake to the arrival of a tsunami. Tsunamis travel at 300-600 mph in the deep and open ocean so waiting to see if civil defense alarms sound after an earthquake is not wise.

When we experienced the earthquake in Apia, Samoa in 2009 the alarm sounded approximately 12 minutes later. Already the water was rapidly receding from Apia Marina where we were moored. At the instant the sirens went off, the tsunami was already coming ashore on the south side of the island in a series of waves that would claim over 130 lives. The quake was centered approximately 120 miles south of Samoa and about 100 miles west of American Samoa.

The NOAA Pacific Tsunami Warning Center is located at Ewa Beach, Hawaii. They have seafloor and coastal sensors located around and across the Pacific but after an earthquake it takes them at least 12-15 minutes to analyze data to determine if there is the potential for a tsunami. It is important to note that there can be as much as 300-400 miles between tsunami crests, so after the initial series of tsunami waves hit, the next set of waves may occur up to one hour later. There may be as many as nine consecutive wave sets. This was the case in the 1960 tsunami that devastated Hilo, Hawaii, which had 35' waves and claimed 61 lives. Tsunamis can also wrap around islands.

## EARTHQUAKE - TSUNAMI AWARENESS

### **Mid Ocean**

As mid-ocean tsunami wave height is generally less than 3', tsunamis are frequently unnoticed by mariners. However, here is an earthquake account from Brian Taylor aboard Kyole. "I was approximately 100-150 miles from the September 29<sup>th</sup> earthquake center on and the effect on Kyole was a bit scary. She started shaking as if you were driving a car with all the wheels about to fall off. I assumed that I had major trouble with my transmission system so stopped the engine and stopped the prop shaft from turning.....still shaking...checked the sails to see if they were flapping madly.... No problems there. The shaking stops and then restarts for a short while longer. I was talking on my SSB radio a few minutes later and was then advised that a tsunami warning was in force."

### **When Ashore in a Coastal Location**

In any coastal location always note the tidal range and times. If you ever see the sea level rising higher or receding lower than normal realize that this is the natural warning sign of an approaching tsunami. If ashore, do not go out on the exposed reef or shore to collect fish, as locals frequently do. You must immediately run inland to high ground or get above the third floor of a sturdy building, if available. Tsunamis have traveled .7 mile or further inland if the terrain is flat, so the option of going to the highest floor of a sturdy building may be safer than attempting to run inland. In the Samoan tsunami the ground floors of many buildings were washed clean of everything and it would not have been possible to survive due to backwash of debris and swift currents, while above the third floor many buildings were relatively undamaged.



**When Aboard**

If you are docked and experience an earthquake or rapidly receding water, immediately start your engine, cut your docklines and motor at full speed to water deeper than 150'. If the event occurs at night and/or it isn't possible to safely leave the harbor, quickly leave your boat, running for the hills or to a tall, substantial building.

**At Anchor**

If you are at anchor and experience an earthquake or rapidly receding water, immediately start your engine, raise your anchor and get to deeper water. In the 2009 tsunami that hit Niuatoputapu, Tonga friends aboard a 39' sloop tried to raise anchor immediately after the earthquake but found their chain wrapped around a coral head, so they let out all of their chain. When they saw the 13' high surge come over the reef they kept the bow pointing into the wave while maintaining full forward throttle. They managed to survive the series of waves and swirling current with only stretched chain and a damaged windlass.

**When leaving the boat, here are some priorities to quickly grab:**

1. Passports, cash and credit cards
2. Iridium satellite phone
3. Cell phone
4. VHF handheld radio (this proved very helpful in Samoa)
5. Flashlights
6. Knapsack
7. Water bottle
8. Granola bars or similar
9. Necessary prescription medicines
10. Reading/prescription glasses
11. Running shoes
12. Jacket



# SEAMANSHIP



SEAMANSHIP IS CRITICALLY IMPORTANT TO YOUR SAFETY WHILE CRUISING!!!

Seamanship comes from practical experience and common sense and can't be gained by reading books. Following are specific areas where poor seamanship or judgement could result in the destruction of your vessel and possible loss of life:

## Before Departure

1. Become an accomplished **sailor**; practice sailing on all points of sail, reefing, Lifesling retrieval, heaving to, rigging a preventer and sailing at night.
2. Practice **single handling** your boat; have your partner stay below.
3. Establish **dedicated safe stowage procedures** both above and below decks. Keep your boat free of clutter.
4. **Do not overload your boat** as it then becomes more vulnerable to damage from large seas. Evaluate and eliminate weight rather than raising your waterline.
5. **Prepare your boat** for a knockdown; ensure batteries, floorboards, locker doors and drawers are positively secured.
6. Establish and review **emergency systems and procedures** for man overboard, fire, sinking, rig and steering failure, first aid, communications and abandon ship. Make sure everyone has an understanding of these. (See forms on following pages)
7. Establish **watch schedule** and watch instructions maintaining leadership, responsibility and communication.
8. Have reliable **wind speed and direction instruments** for easier determination of sail combinations.
9. Post a **Sail Reduction Guide** so everyone knows the correct sail combination for wind speed. Modern sailboats sail best at moderate angles of heel, not with their toerail in the water. A long-distance cruise is not the place to stress your boat, rig and sails by pushing the boat too hard. The best time to reef or change sails is when you first think about it as waiting to see if conditions worsen places strain on the crew and equipment. This is consistently a common occurrence for inexperienced sailors; it pays to be conservative until you understand how much speed the crew, steering system and boat can handle. Generally, after reducing sail, boat speed remains the same, leeway is reduced and the comfort level onboard increases.
10. Practice hoisting **storm sails**, and **deploying storm management devices**.
11. Become **proficient at navigation**; quickly and accurately plotting positions on paper charts.
12. Practice using **radar and AIS**. Starpath Radar Trainer is an excellent computer instructional program. **If your radar is not AIS compatible, upgrade it, adding an AIS transceiver.**
13. Provision with **meals** that are easy to prepare by the entire crew including some freeze-dried meals and healthy, high-energy snacks such as trail mix, granola bars, dried fruit and nuts. The Essential Galley Companion has easy one-pot meals.
14. Install a top plunger **thermos** for drinks and quick meals.
15. Purchase **Compazine suppositories** and an **electrolyte replacement**, like Emergenc-C or Gatorade, to help prevent and treat seasickness.

16. **Test the tricolor and navigation lights** when in port before leaving on a passage.
17. Consider taking an **experienced third crew person** on passages where you have a higher risk of rough conditions. This may be a requirement by your insurance company particularly **on your first offshore passage** or a difficult passage. An extra watch person greatly decreases your chance of sleep deprivation.(3 on 6 off instead of 3 on 3 off)

### At Sea

Many cruising couples alternate **three hour watches**, day and night. It is recommended to stand watch in a sheltered location in the cockpit rather than below decks.

1. Keep hourly **log entries** with position, course, speed, log, winds speed and direction and barometric pressure.
2. **Plot your position** on a paper chart at least every six hours, noting any charted dangers i.e., reefs/islands on your projected course.
3. Ensure that **dangers appearing on your paper charts also exist on your electronic charts**. Be aware of electronic chart range issues as hazards often do not show up unless you are zoomed in to a 6 or 12 mile range. Therefore if you are viewing your electronic charting on a 24 mile or greater range, you may miss reefs/islands that are always noted on paper charts.
4. **Inspect** rigging and sails daily for signs of wear or anything amiss.
5. Consider checking in with a **radio/weather net** with your daily position report.
6. Keep **communication open** and ensure responsibility.

### Collision Avoidance

Rule Five of the International Regulations for preventing Collisions at Sea (COLREGS) makes maintaining a watch a matter of law. This rule applies in any condition of visibility, and states; "Every vessel shall at all times maintain a proper lookout by sight and hearing as well as by all available means appropriate in the prevailing circumstances and conditions so as to make a full appraisal of the situation and the risk of collision".

**This clearly creates an obligation to maintain a continuous visual and audible watch for signs of other vessels, and to use equipment such as radar and AIS to supplement those senses when the situation requires. AIS is an excellent collision avoidance tool, but is not required for fishing vessels and is not always turned on or working aboard all ships.**

1. Modern **ships can travel up to 25 knots**; the time from first sighting a ship until potential collision may be under ten minutes.
2. **Never assume that a ship you sight has someone on watch** or that they can see you.
3. **Never assume that a ship can quickly alter course or stop**, because they can't.
4. **Never, ever assume right-of-way** and never try to cross in front of a **commercial vessel**.
5. **Never cross close astern of a fishing or towing vessel**.
6. **Be prepared to quickly take evasive action** if a ship alters course toward you.
7. **Attempt to contact any ship on Channel 16**, while on passage, if you judge your course will come within three miles of them in clear daylight weather, or within five miles at night or with reduced visibility.
8. **Keep your VHF communications short**. Speak clearly and slowly, using single digits for positions and courses when advising vessels of your intentions or course change. English is rarely the watchkeeper's first language. Example: "Motor Vessel Silver Star, Silver Star, this is the sailing vessel Windsong, four point five miles on your starboard bow. I am slowing down so that you will pass ahead of me. Please reply on Channel 16".

9. Broadcast **Securité** (see-cure-eh-tay) messages if in fog or reduced visibility.

**SECURITÉ CALL**

1. SECURITÉ., SECURITÉ., SECURITÉ.
2. This is the Sailing Yacht \_\_\_\_\_.
3. Our position is \_\_\_\_\_.
4. Our course is \_\_\_\_\_ degrees magnetic and our speed is \_\_\_\_\_ knots.
5. We are sailing in reduced visibility.
6. Any vessels in the area please respond on Channel 16.

10. Leave your **radar and AIS** on 24 hrs a day whenever you are sailing within 150 miles of land as this is a high traffic area or are experiencing reduced visibility.
11. Mid-ocean at night, turn the **radar and AIS** on for one minute every 30 minutes to check for ships, squalls and land. The power consumption to do this is negligible.
12. A **masthead tricolor** running light is essential to good seamanship when night sailing. The high position at your masthead ensures maximum visibility and cannot be blocked by headsails or heeling.

### Squall Avoidance

1. **Sail conservatively**; reefing or reducing sail as soon as you first think about it. This is particularly important to reduce anxiety level of those on board who may be less experienced or confident. Cruising isn't supposed to be scary!
2. To avoid squalls, some of which contain lightning, **be prepared to alter course** or reduce sail quickly.
3. Squalls are almost always **visible at night**, and are clearly visible on radar.
4. **If no one is maintaining a watch** your vessel may become dangerously overpowered it hit with an intense squall or microburst (page 152) in which wind speeds may reach 160 knots. The most intense tropical squall I've experienced was between New Zealand and Tahiti; the wind went from 5 knots to 100 knots and back to 5 knots in less than one hour. I saw this squall approaching, dropped all sail and steered downwind under bare poles with flat seas.

### Seamanship at Landfall

1. Ensure that you are well **rested**. When you are fatigued from a difficult passage, the strong urge to get into port often overpowers good seamanship and judgment.
2. Maintain a good 360-degree **lookout**.
3. Carry quality original paper charts and regularly **plot your position** on appropriate paper charts, not relying solely on electronics.
4. Check **current and tides tables** and study cruising and pilot guides for your landfall.
5. **Continually calculate your arrival time** to ensure a daylight arrival.
6. **Don't make landfall** in an unfamiliar port in the dark or in squally, foggy or stormy weather. More boats are lost while making landfall in these conditions than are lost mid-ocean.
7. Expect the **surface current** to increase as you approach land. Be prepared to slow down or possibly heave to. Be patient.
8. Take note of the **natural signs**: clouds, swell patterns, wave refraction and birds.
9. Monitor all **electronic equipment**: radar, depth sounder, GPS, AIS and radio.
  1. **Radar** is an excellent navigation tool. It will often show breakers on close ranges, but frequently there are no breakers in the protected waters of a pass or channel. To make the situation more difficult, water depths may go from 50 fathoms to a few inches in less than a boat length, so radar and depth sounders are useless in these situations.
  2. **GPS** does not allow you to make safe landfall at night since few of the available charts other than in Europe and North America have been corrected using available satellite imagery. Errors in charted position of up to several miles occur. To verify this, plot each

GPS anchorage position on a paper chart; it's not uncommon to find the GPS position places you ashore or out to sea.

3. **Electronic Chart** accuracy outside of Europe and North America is frequently shocking often showing our track going across small islands or land.

### Dealing with Fatigue and Sleep Deprivation

1. **More vessels are lost** from fatigue and inattention than any other cause.
2. **Causes of fatigue** include lack of sleep, dehydration, poor diet, seasickness, boredom, physical exhaustion, depression, jetlag and over stimulation.
3. **Results of fatigue:** inability to concentrate, apathy, lethargy, irritability, withdrawal, delay in response and poor judgement.
4. **To prevent fatigue aboard**, ensure all are well-rested before departure. Avoid alcohol and ideally caffeine several days before departure, keep track of hydration with a goal of 2-3 liters per day. When underway stay alert by navigating, completing hourly log entries, reviewing weather charts and forecasts, writing journal entries, making hourly radar and AIS checks plus walking circuits of the deck checking sails, rigging and equipment. Other activities include researching your landfall, exercise, reading, listening to audio books, music or podcasts.
5. If you're the skipper, set and **stick to a watch schedule** and ensuring that you get enough sleep. When you are resting, leave detailed standing orders for the on-watch. Ensure your crew are comfortable: not too cold, wet or too hot. For the watch keepers provide shelter from spray and cold or intense sun. Strongly encourage the off-watch to get proper sleep in a bunk and discourage napping on the floor or in the cockpit in foulies. When crew are sleeping below, keep cockpit noise to a minimum.
6. **Good nutrition** is important for staying alert with a steady energy flow. Ensure regular meal times with nutritious, hot meals. Resort to freeze-dried meals or cans if needed. Install a top-pump thermos in the galley so hot drinks can be easily made. Blood sugar energy crashes result in extreme fatigue so reduce sugar and focus on energy-sustaining snacks. Instead of cookies try celery or whole grain crackers with peanut butter, or fruit. Substitute protein or Cliff Bars for sugary granola bars.
7. **Singlehandlers** face a unique challenge, and must learn to sleep in 20 minute increments, frequently in the cockpit with radar and AIS alarms plus an alarm clock set.

### Proactive Decision Making

A prudent sailor uses sound judgement and is constantly apprising the conditions.

### Resources

#### Books and Programs

- **The Art of Seamanship** - Ralph Naranjo
- **The Annapolis Book of Seamanship** - John Rousmaniere
- **Ten Degrees of Reckoning** - Hester Rumberg
- **Black Wave** - John and Jean Silverwood
- **The Essential Galley Companion** - Amanda Swan Neal, *Kindle*, mahina.com
- **Radar Trainer** - computer instructional program. [www.starpath.com](http://www.starpath.com)





# WEATHER PATTERNS



Voyage planning begins with a general understanding of the world's prevailing winds. Sailing routes are dictated by the temperature differentials across the surface of the earth, its rotation and the ocean currents. Deviating from the traditional routes means bucking the general flow of winds and currents.

## Learn About the Weather

1. **RYA Weather Book:** Chris Tibbs
2. **Windy.com**
3. **PredictWind.com**
4. **Weather.gov:** National Weather Service forecasts

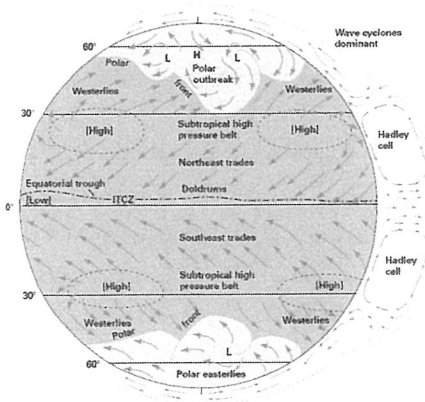
## Resources for Routes and Passage Planning

1. **World Cruising Routes** by Jimmy Cornell, [www.noonsite.com](http://www.noonsite.com)
2. **Atlantic and Pacific Crossing Guides**, RCC Pilotage Foundation
3. **Cornell's Ocean Atlas**, Pilot Charts, Visual Passage Planner

## Sun and Heat

The weather we experience draws its energy from one basic source: the sun. The sun heats the surface of the earth, which, in turn, heats the atmosphere from below. Warm air rises and because it's less dense, and therefore lighter than cold air it creates a lack of air pressure in the area, called a "low". Where the surface is cooler, it cools the overlying air, causing it to sink. This creates an excess of air pressure, called a "high".

## Global Circulation



This heat from the sun at the equatorial regions is moved polewards by global air circulation and the main ocean currents. Both these factors help regulate the world's climate. When the equatorial air rises it then cools and subsides at the poles before travelling back to the equator along the earth's surface. The earth's rotation from west to east bends the airflow along the surface creating five bands of prevailing airflows: The ITCZ, trade winds, variables, westerlies and polar winds.

**Hurricane Seasons:** Don't push the edge of hurricane seasons.

**Hurricane Seasons:** Northern Hemisphere - June, July, August, September & October.

Southern Hemisphere - November, December, January, February, March & April.

## Eight Tools for Weather Monitoring

1. **Recording Barometer:** [starpath.com](http://starpath.com), [speedtech.com](http://speedtech.com), [weems-plath.com](http://weems-plath.com).
2. **VHF Radio** for receiving local marine weather forecasts.
3. **Iridium** or **BGAN** for www access.
4. **Internet** access either through wi-fi aboard or from internet cafes ashore to view more data-intensive weather sites. Broadband USB devices are frequently the best option.
5. Either dedicated **weatherfax** receiver/printer: Furuno Fax 207 or 408 or:
6. **Software** for receiving weatherfaxes utilizing Iridium, or SSB with Sailmail and Pactor modem.
7. **GRIB Files** through [www.saildocs.com](http://www.saildocs.com).
8. **Navtex**, an excellent resource for receiving coastal forecasts, in English in Europe.

## Weather Before Departure

1. **Study weather patterns** for at least one month before departure.
2. Establish an account with a **professional weather routing** service particularly if the passage you are attempting has the potential for powerful and dynamic weather patterns: crossing the Gulf Stream, Bay of Biscay, WA-OR-NoCal coast, sailing to and from New Zealand, etc.
3. Study books on **regional marine weather** so that you will recognize and know how to deal with unusual specific weather conditions.
  - The Concise Guide to Caribbean Weather– David Jones (excellent, though OP, avail. thru Amazon)
  - Mexico Weather for Boaters – Pat Rains. This is a brilliantly simple and understandable book.
  - Mariners Met Pack – Bob Mc Davitt free download: <https://about.metservice.com/our-company/learning-centre/mariners-met-pack/>
  - Mediterranean Weather Handbook for Sailors – Roberto Ritossa
4. **Time your departure** to utilize favorable winds and the maximum weather window, without arrival time constraints such as family and friends arriving.

## Weather Underway

1. Record **barometric pressure** hourly in the ships log: awareness and trends are key!
2. **Check in daily** on a SSB or Ham Weather Net (optional).
3. Analyze and **monitor the weather daily** using weatherfax, Navtex, or satellite images.
4. Be flexible and prepared to **slow down or speed up** to let unfavorable weather systems pass.

## Weather Routing

**Commander's Weather** • [www.commandersweather.com](http://www.commandersweather.com) • [info@commandersweather.com](mailto:info@commandersweather.com). Affordable rates and leading US-based global router. This is the company we use and recommend.

**Marine Weather Center** • [www.mwxc.com](http://www.mwxc.com) • Chris Parker, located in FL is the official forecaster for several East Coast to Caribbean rallies • 863-248-2702

**Locus Weather** • [www.locusweather.com](http://www.locusweather.com) • e-mail [locuswx@midcoast.com](mailto:locuswx@midcoast.com) • Routing packages.

**MetService New Zealand** • [www.metservice.co.nz](http://www.metservice.co.nz).

**MetBob** • [www.metbob.com](http://www.metbob.com) • Bob McDavitt, recently retired from MetService NZ now provides private weather routing covering the South Pacific and beyond. We use him.

**MeteoGib** • [www.meteogib.com](http://www.meteogib.com) • Stephanie Ball specializes in the UK, Med, Atlantic & Indian Oceans

**Passage Weather** • [www.passageweather.com](http://www.passageweather.com) • Free worldwide GRIB weather files.

**Russell Radio** • [www.russellradio.org.nz](http://www.russellradio.org.nz) • [russellradio@clear.net.nz](mailto:russellradio@clear.net.nz) • Radio service yachts arriving and departing N.Z.

**Susan Genett's Real Weather Ltd.** • [www.realwx.com](http://www.realwx.com) • email [forecast@realwx.com](mailto:forecast@realwx.com). • Formerly with National Weather Service now runs her own global routing service based in Newport, Rhode Island.

**WxAdvantage**, Bill Biewenga • [www.wxadvantage.com](http://www.wxadvantage.com) • e-mail [billbiewenga@home.com](mailto:billbiewenga@home.com)

**Weather Routing Inc** • [www.wriwx.com](http://www.wriwx.com) • Provides forecasts for shipping and yachts worldwide.

**www.Weatherguy.com** • email [weatherguy@weatherguy.com](mailto:weatherguy@weatherguy.com) • 808.254.2525 • Rick Shema, a former U.S Navy meteorologist now based in Hawaii specializes in West Coast and Pacific routing.

## Weatherlinks and Resources

[www.buoyweather.com](http://www.buoyweather.com) • 2 day forecast for any location worldwide.

[www.marineweather.com](http://www.marineweather.com) • comprehensive weather site.

[www.noaa.gov](http://www.noaa.gov) – National Weather Service • Resources for weather faxes and forecasts.

[www.nws.noaa.gov/om/marine/radiofax.htm](http://www.nws.noaa.gov/om/marine/radiofax.htm) • worldwide weather fax schedules

[www.passageweather.com](http://www.passageweather.com) • source for worldwide GRIB files.

[www.predictwind.com](http://www.predictwind.com) • the future of weather prediction services

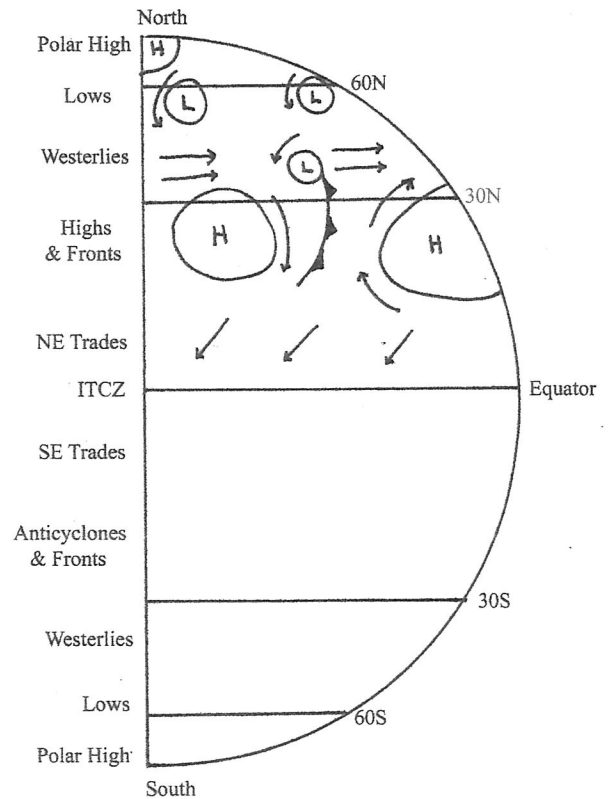
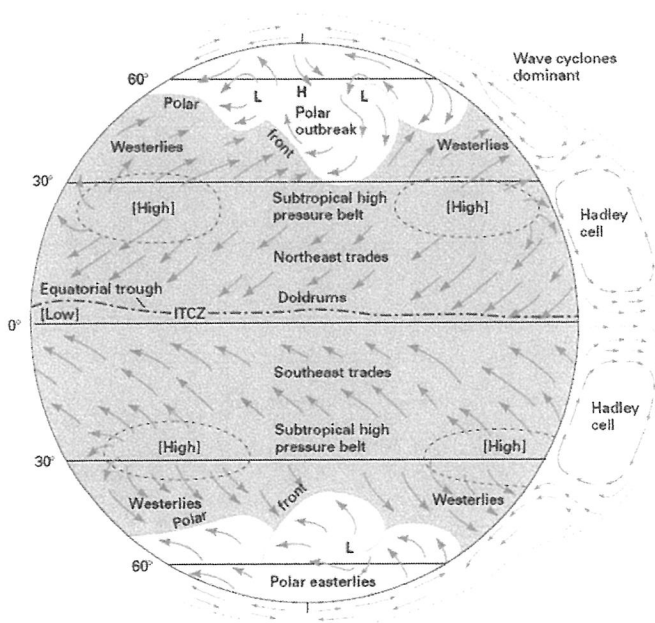
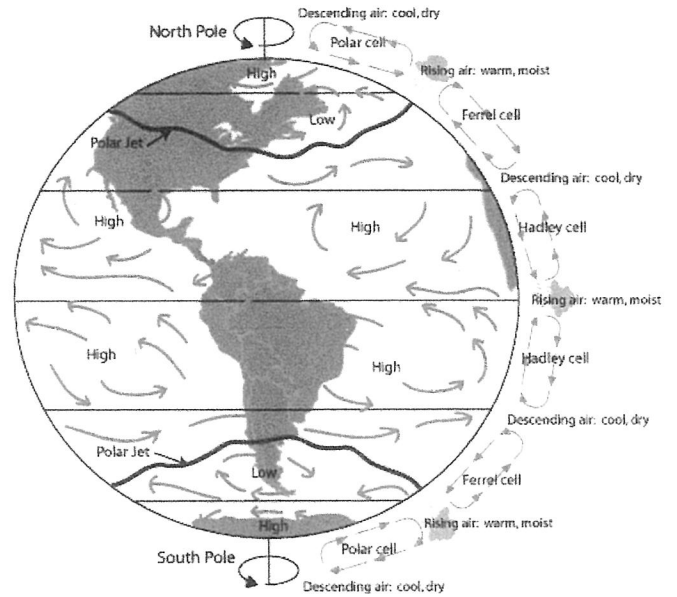
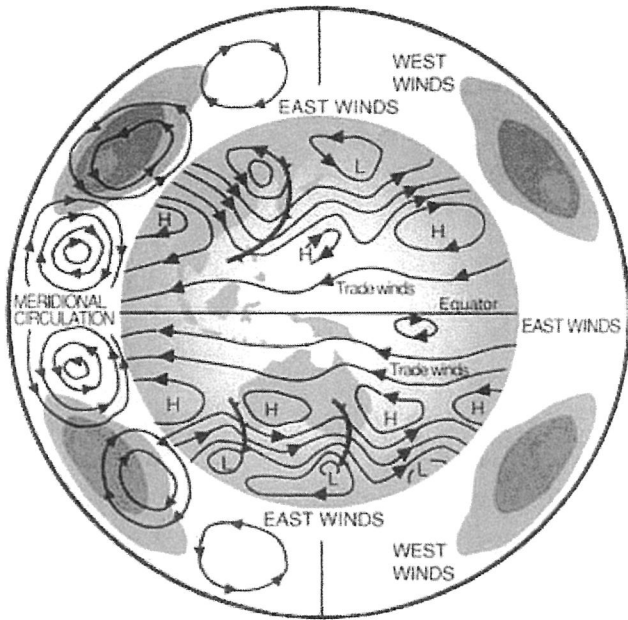
[www.saildocs.com](http://www.saildocs.com) • GRIB weather files.

[www.windy.com](http://www.windy.com) • graphic and accurate display of the world's winds and currents.

[www.worldclimate.com](http://www.worldclimate.com) • monthly rainfall and temperature records for many locations.

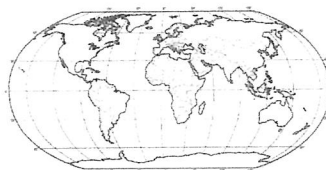
[www.xcweather.co.uk](http://www.xcweather.co.uk) • European weather forecasts

# GENERAL CIRCULATION OF THE ATMOSPHERE



Complete this diagram as a mirror image of the Northern Hemisphere.

# WEATHER SYSTEMS OF THE WORLD



## Trade Winds

Trades are steady winds blowing east to west around the world on either side of the tropical doldrums. Trade winds die off and may even reverse during hurricane season. These are the sailing winds cruisers dream about – 11-21 knots average, with mostly blue skies and puffy cumulus clouds.

## Tropical Squalls

Squalls are to be expected in the trade wind belts and are more common poleward of 18 degrees. They can be isolated, or the leading edge of a frontal system, convergence zone or tropical wave. Squalls move at approximately 18 knots westward and can generally be spotted at 15-20 miles visually and up to 30 miles on radar. If you cannot see through, around or over the squall, or notice that it has a tall anvil-shaped cloud above it, you'll want to change course to avoid it. As a squall gets closer, if the water under the squall looks like fog or smoke or if you experience a cold blast of wind and quickly-breaking wavelets emanating out from the squall, expect up a directional wind shift and a 15-25 knot wind increase. If you see lightning or hear thunder, the squall may produce a 30-70 knot wind increase. On the other hand, if the squall does not appear dark and dense and the rain under the squall is coming straight down, the wind increase may be as little as 5-10 knots. Squall activity does not show up on GRIB files and there may be no indication of squall activity on weatherfax unless the squalls are related to a larger weather system (front, convergence zone, tropical wave).

## ITCZ – Inter Tropic Convergence Zone

The ITCZ, previously referred to as “the doldrums” is the area along the equator between the NE (Northern hemisphere) and SE (Southern hemisphere) trade wind belts of light, unsettled winds. Within the ITCZ intense squally conditions frequently prevail. The ITCZ moves poleward during summer months and the strength and location of the central, semi-stationary high pressure cells of each ocean basin can narrow the ITCZ and also shift it N or S. Knowledgeable sailors will pass the ITCZ at sharp, not shallow angles whenever possible. The ITCZ is narrowest across the Pacific and substantially wider across the Indian Ocean.

## Variables

Between latitudes 25° and 35° variable and lighter winds extend poleward from the outer edge of the trade wind belts and the semi-stationary high pressure cells of each ocean. The wind direction and speed is influenced by passing fronts extending and rotating off low pressure cells further still poleward, frequently in the 35° to 45° zone.

## Depressions

In mid and high latitudes, areas of low barometric pressure moving eastward at 5-35 knots occur and generally result in unsettled and potentially bad weather. Wind is the result of compression of isobars, therefore if the pressure in the center of the depression is substantially lower than adjacent pressure, strong winds result, approximately following the direction of the isobars. Depressions are indicated by a falling barometer, changing cloud formations and generally show up on GRIB and weatherfax.

### Tropical Revolving Storms

Known as hurricanes, cyclones or typhoons, tropical revolving storms are to be avoided by being aware of their seasonal and geographic limits. They frequently form in the ITCZ and their direction of movement is not always consistent. Tropical storms are not labeled on GRIB charts, but are detailed on weatherfax.

### Westerlies- Roaring Forties

Further poleward from the variables and generally north and south of 35° we find frequently steady, gale-force westerly winds blowing unimpeded by land for thousands of miles. These winds can be very useful for gaining easting instead of tacking against the trade winds. Examples of where westerlies are helpful are sailing from NZ to Tahiti, Japan to the West Coast, and crossing the North Atlantic. One needs a substantial and seaworthy vessel if planning on venturing into the Roaring Forties!

### Polar Highs

Over the polar regions stationary high pressure cells give surprisingly clear and settled weather conditions during summer months. Equatorward of the polar highs a band of convergence with warmer, wetter weather and reduced visibility is frequently encountered between 65° and 70°.

### El Nino, La Nina

During strong El Nino episodes, trade winds across the Pacific become lighter, can die out and in some instances even reverse. Sea surface temperatures (SST's) climb as the warm water is no longer being pushed toward Indonesia and the incidences of severe tropical revolving storms, even in areas that don't normally experience them increases substantially. Conversely, there are substantially fewer and less severe hurricanes in the Atlantic and Caribbean during El Nino episodes.

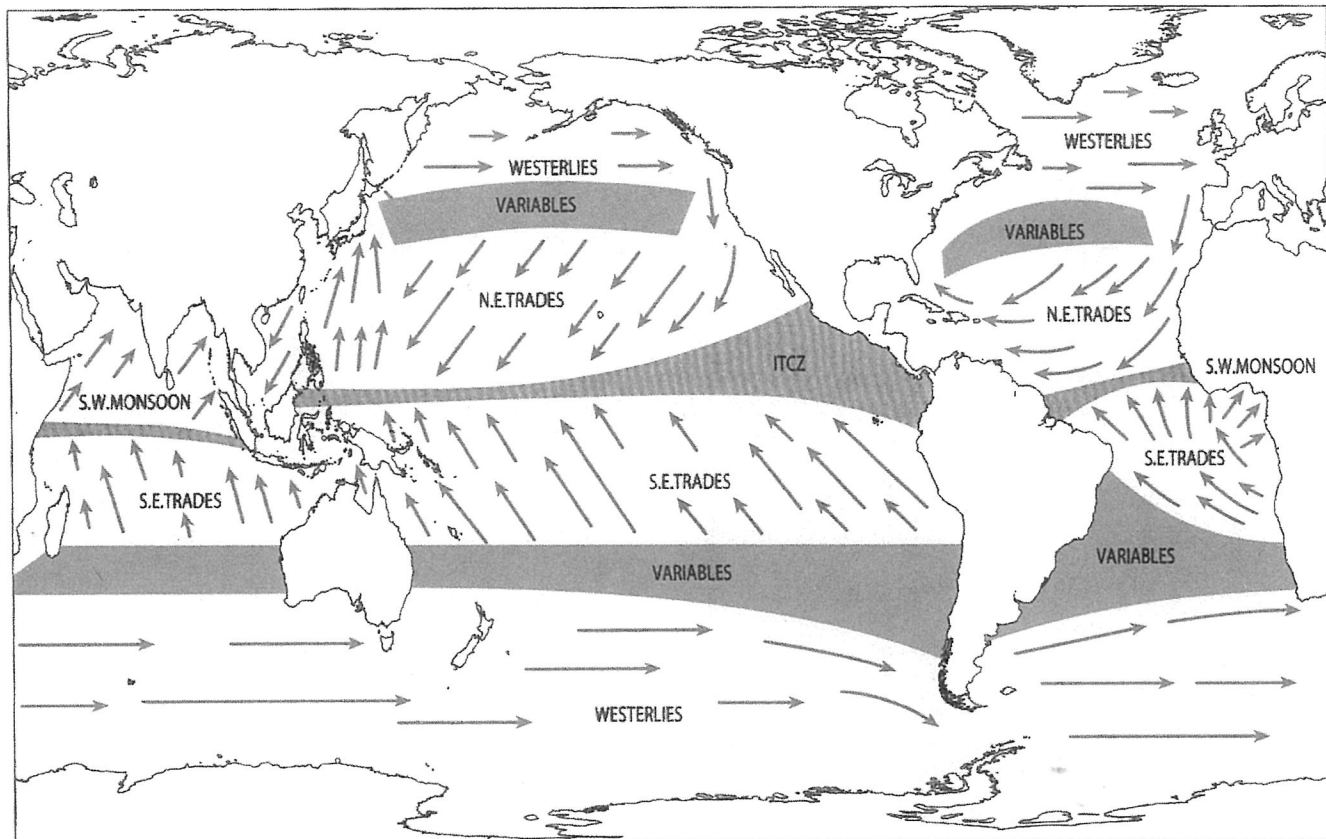
During La Nina, trade winds increase to 20-30 knots causing a drop of 3 - 5° C SST across the Central Pacific and convective activity (squalls and thunderstorm) is greatly reduced. While the incidence and severity of tropical revolving storms across the Pacific is diminished, they increase substantially in the Caribbean and Atlantic, and the hurricane season becomes longer.

### World Distribution of Tropical Storms

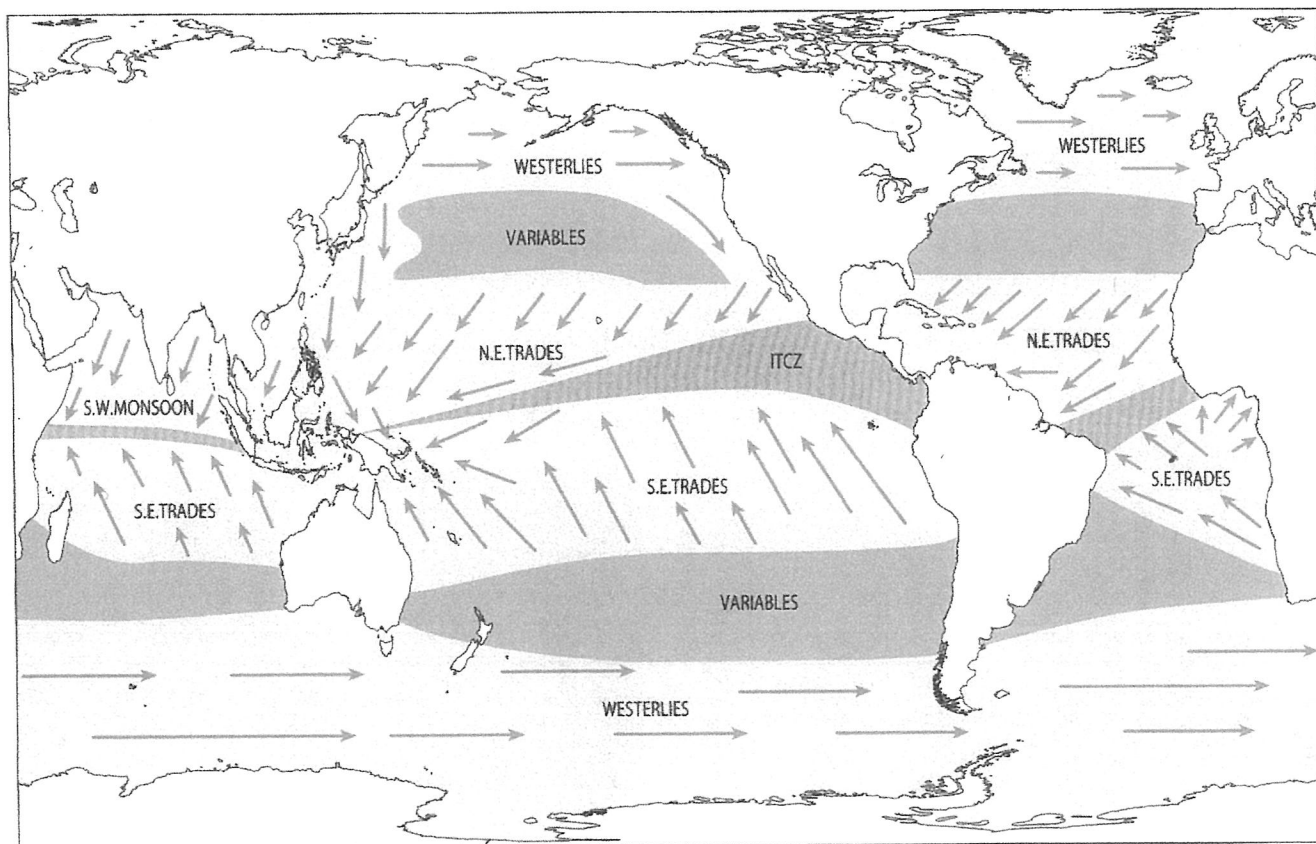
Area	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
South West Pacific												
West Coast of Mexico												
Caribbean & Southern USA												
West North Pacific												
Northern Indian Ocean												
Southern Indian Ocean												







*Prevailing wind systems / July to September*

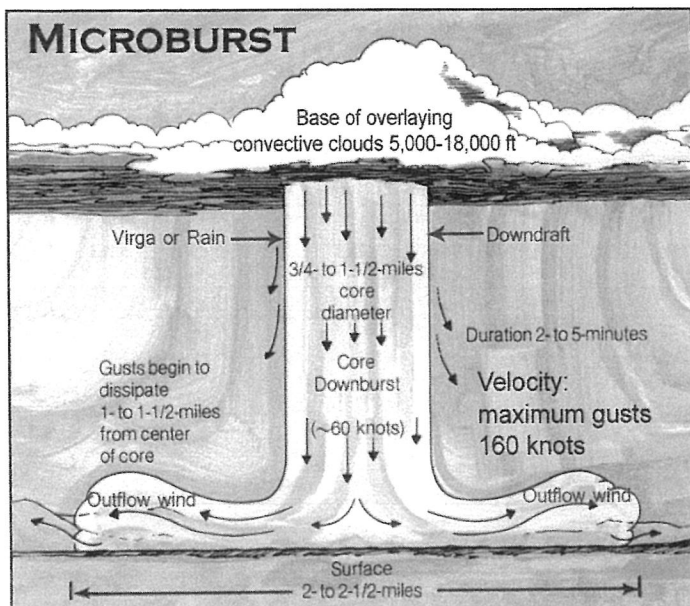


*Prevailing wind systems / October to December*

Image Credit – Cornell's Ocean Atlas, Jimmy and Ivan Cornell


# WEATHER TERMINOLOGY


1. The sun is a source of warmth, heating the surface of the earth and creating the process of **convection**. The principle of convection conveys warm, moist tropical air aloft, creating clouds, this air then descends into the "Horse Latitudes" of between 30°- 40° N. latitude and 30°- 40° S. latitude.
2. Air moves from high to low pressure. Between the two points, there is a **Standard of Measurement: 1013 millibars**. Pressure readings above 1013 are considered high pressure, and below 1013 are considered low pressure. High pressure generally means good weather, low pressure, bad weather.
3. An **Isobar** is a line joining points of similar barometric pressure. ISOBARS form shapes and patterns and when they enclose areas of pressure they are called HIGHS or LOWS. Winds follow ISOBARS and the closer the ISOBARS are spaced the stronger the wind.
4. **Lows** or depressions are labeled with an "L" or "C". Another name for a low is cyclone. Wind goes **clockwise around lows in the Southern Hemisphere** (and counterclockwise in the Northern Hemisphere) towing in 15-20 degrees. **Shallow** low: 1000 - 1012 mb, **moderate** 980 - 1000 mb, and **deep** or **intense** low is below 980 mb. A complex low has two or more centers and can mean severe weather. If the central pressure is rising the low is **filling**. If the central pressure is dropping, the low is **intensifying** or **deepening**. The deeper the low, the stronger the winds and heavier its rain. Lowering pressure is caused by air rising and being drawn off by upper winds faster then it can be replaced by the lower winds. Moist air weighs less than dry air and causes lower surface pressure.
5. **Highs** or anticyclones are labeled on a weather map by an "H" or "A". Winds go **counterclockwise around a high in the Southern Hemisphere** (and clockwise in the Northern Hemisphere), leaking outwards 15-20 degrees across the isobars. A **weak** high has a central pressure of 1014 - 1020, a **moderate** high 1020 - 1030 and a **strong** or **intense** high is above 1030 mb. If center pressure is above 1030, expect gale force winds somewhere on the high's perimeter. Intensifying means a rising central pressure, and weakening means a falling central pressure. Rising pressure is caused when light surface winds do not carry away the sinking air as it arrives. Air weighs more when it is colder and drier. The center of a high is an area of light winds.
6. When the wind **backs** it changes direction in a **counter clockwise** direction. This is an indicator of incoming bad weather associated with the passage of a low. When the wind **veers** it changes direction in a **clockwise direction**. This is also called clocking.
7. **Bomb** is the name given to a low or depression whose central pressure falls more than 14 millibars in 24 hours at 30 degrees latitude.
8. **Squash Zone** is an area of strong winds formed when isobars between a high and low become compressed and can produce the most severe weather possible outside of a tropical cyclone or hurricane.
9. **Wind waves** are waves generated by local wind and die out after wind drops.





10. **Swells** are long ocean waves created by constant trade winds or distant storms. They can have a long period or interval between crests. They add to the overall height of local wind waves and when coming from a different direction than the local wind they may cause additional steeping of the waves. At sea there are frequently swells from several directions occurring at any one time.
11. **Squalls** are common in the tropics and can have up to 80 knots of wind. They show up visually or on radar but not on GRIB files or weatherfax charts.
12. **Microbursts** are localized downdraft winds of up to 160 kts found in strong thunderstorms. They can range from a few seconds to several minutes and can be wet (with rain) or dry. Best defense is to try and avoid thunderstorms using visual clues and radar. If unavoidable immediately drop all sails and motor away from the path of the thunderstorm.

## Weatherfax Symbols

 A **Cold Front** is the leading edge of an invading colder air mass, marked by a line with triangles pointing to where it is moving. Cold fronts push in underneath the warmer air ahead of them forcing the warm air upwards and making cloud and areas of heavy rain. A frontal passage at sea will be marked with increased wind speeds, rain and a decrease and shift from SW to NW in the northern hemisphere with frontal passage. A **Weak Cold Front** is a similar symbol except there is a gap in the line between the barbs.

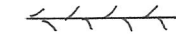
 A **Warm Front** is the leading edge of an invasion of warmer air and is marked by a line with semicircles pointing to where it is moving. The advancing warm air rises over a zone of retreating cooler air, making a cloudbank that slopes forwards from ground level upwards, usually bringing prolonged steady rain.

 An **Occluded Front** A cold-front occlusion occurs when a cold front overtakes a warm front, trapping the original warm air aloft, where it cools, making dense clouds and rain. Try and avoid these areas. When a warm front overtakes a cold front, the process is termed a warm-front occlusion. A warm front overtaking a cold front usually results in dissipation of the front. An occluded front is marked by a line with triangles and semicircles on the same side pointing to where the front is moving.

 A **Stationary Front** is one that has lost its impetus for movement so that neither air mass is making much progress. It is marked by a line with semi circles on one side protruding into the warmer air mass and triangles on the other side protruding into the cooler air mass.

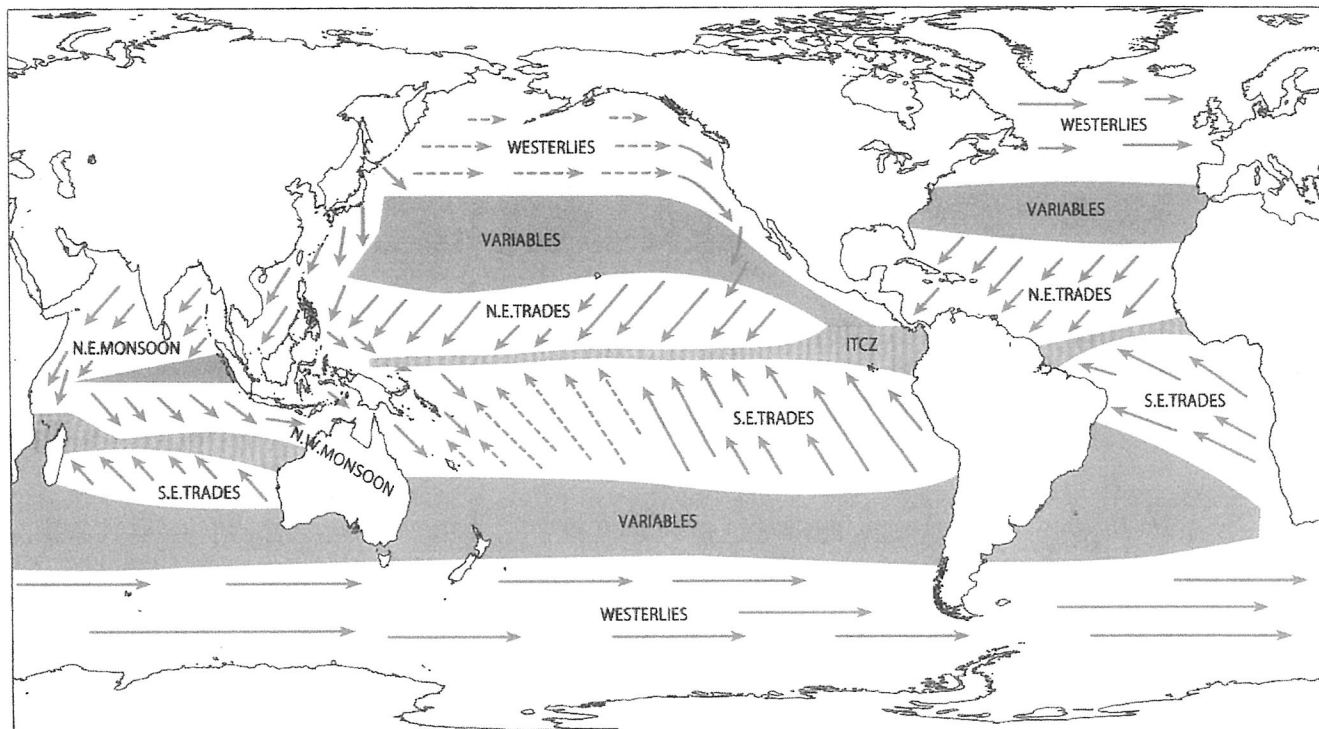
----- A **Trough** (shown as Trof on some charts) is an elongated area of relatively low pressure typically associated with a cyclonic wind shift. Troughs usually contain weather similar to lows and fronts.

~~~~~ A **Ridge** is an elongated area of relatively high pressure extending out from the center of the high in a tongue-like shape. The weather in a ridge is an extension of the weather in a high, but an unexpected feature on an approaching ridge especially near land may be a zone of strong wind.

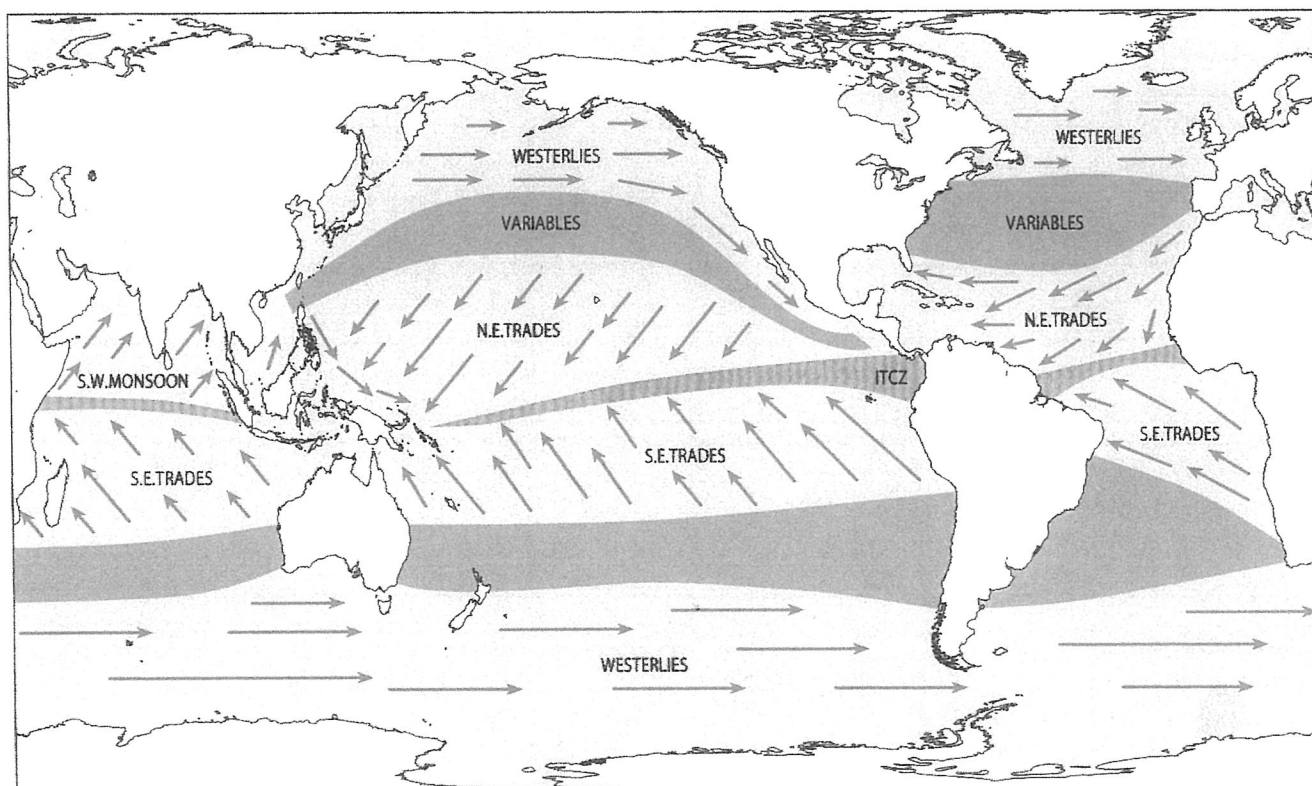
 The **Intertropical Convergence Zones (ITCZ)** snakes across the Pacific and Atlantic between 5 deg and 10 deg north of the equator, between the NE & SE trade wind belts. Convergence zones can be located between highs and lows outside of the inter-tropical area and are typified by convection (thunder and lightning) squalls which may have up to 60+ knots and intense rain. When crossing a convergence zone, the sharper the crossing angle, the shorter the exposure to this unsettled weather will be.

| BEAUFORT WEATHER SCALE |            |           |                 |                                                                                                                                                          |
|------------------------|------------|-----------|-----------------|----------------------------------------------------------------------------------------------------------------------------------------------------------|
| Beaufort Force Scale   | Wind Knots | Seas Feet | Common Name     | Description                                                                                                                                              |
| 0                      | <1         | -         | Calm            | Sea like mirror                                                                                                                                          |
| 1                      | 1-3        | 0.25      | Light air       | Ripples with appearance of scales – no foam crests                                                                                                       |
| 2                      | 4-6        | 0.5-1     | Light breeze    | Small wavelets: crests of glassy appearance, not breaking                                                                                                |
| 3                      | 7-10       | 2-3       | Gentle breeze   | Large wavelets: crests begin to break; scattered whitecaps                                                                                               |
| 4                      | 11-16      | 3½ -5     | Moderate breeze | Small waves, becoming longer, numerous whitecaps                                                                                                         |
| 5                      | 17-21      | 6-8       | Fresh breeze    | Moderate waves, taking longer to form, many whitecaps, some spray                                                                                        |
| 6                      | 22-27      | 9½-13     | Strong breeze   | Larger waves forming; whitecaps everywhere; more spray                                                                                                   |
| 7                      | 28-33      | 13½-19    | Near gale       | Sea heaps up; white foam from breaking waves begins to be blown in streaks                                                                               |
| 8                      | 34-40      | 18-25     | Gale            | Moderately high waves of greater length; edges of crests begin to break into spindrift; foam is blown in well-marked streaks                             |
| 9                      | 41-47      | 23-32     | Strong gale     | High waves; sea begins to roll; dense streaks of foam; spray may reduce visibility                                                                       |
| 10                     | 48-55      | 29-41     | Storm           | Very high waves with overhanging crests; sea takes a white appearance as foam is blown in very dense streaks; rolling is heavy and visibility is reduced |
| 11                     | 56-63      | 37-52     | Violent storm   | Exceptionally high waves; sea covered with white foam patches; visibility still more reduced                                                             |
| 12                     | 64+        | 45+       | Hurricane       | Air filled with foam; sea completely white with driving spray; visibility greatly reduced                                                                |

# PREVAILING WIND SYSTEMS OF THE WORLD



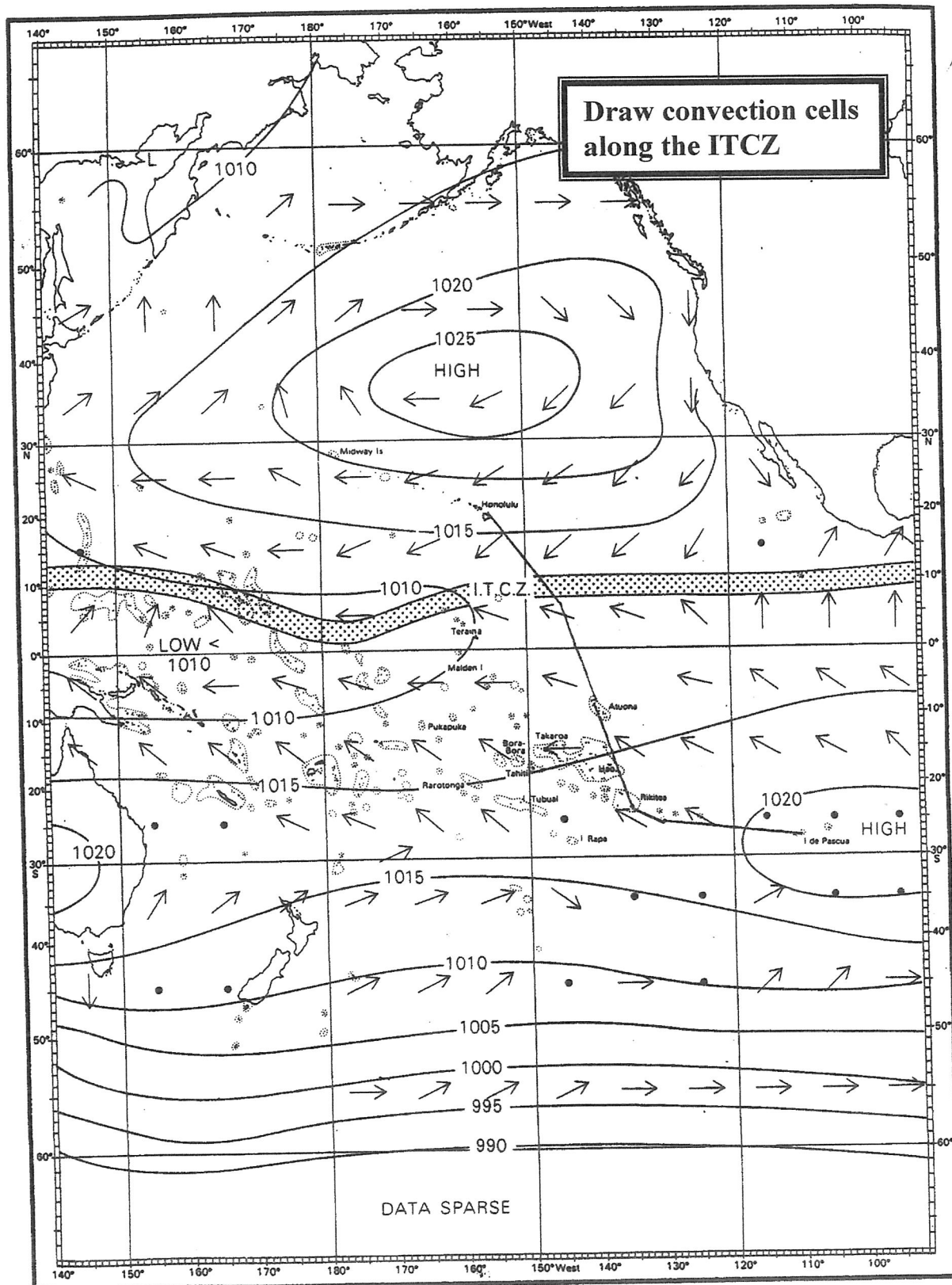
*Prevailing wind systems / January to March*



*Prevailing wind systems / April to June*



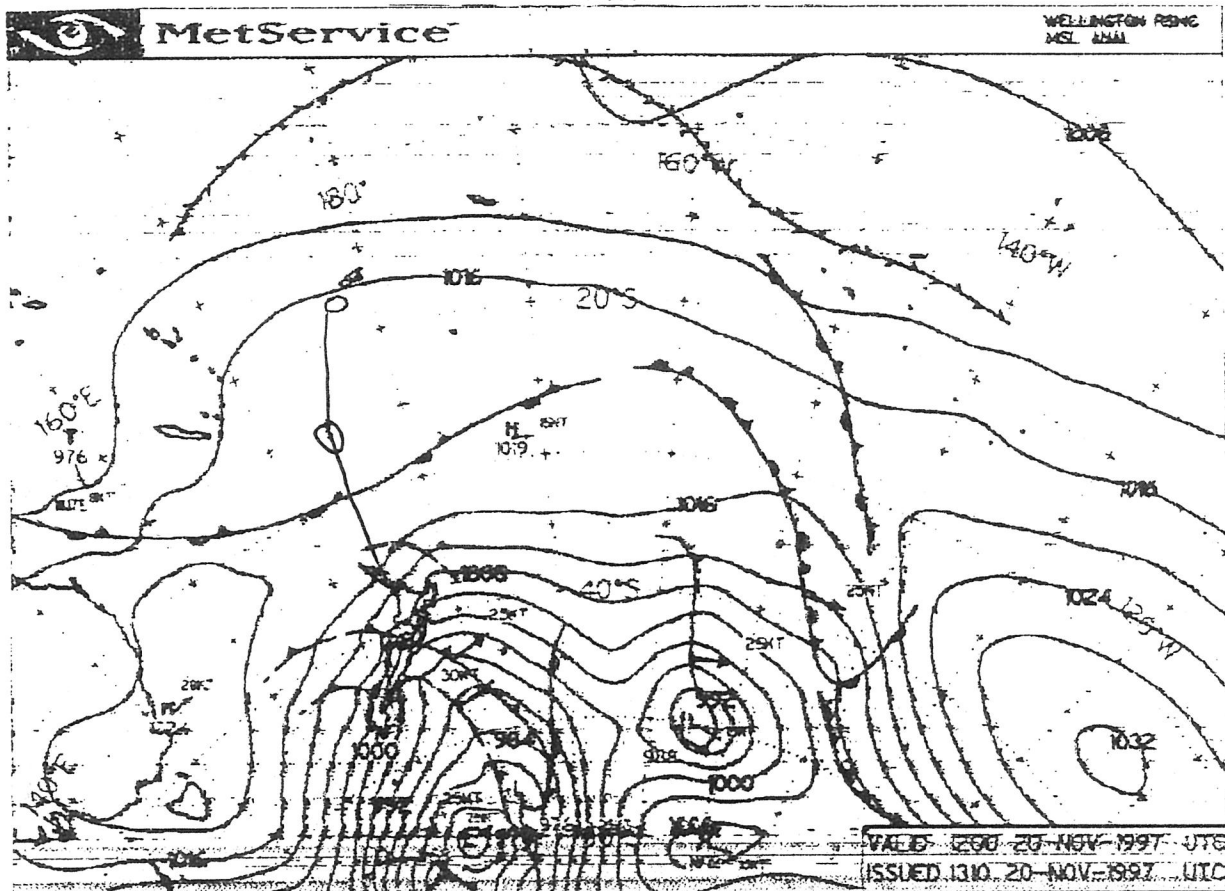
# MEAN BAROMETRIC PRESSURE & DOMINANT WINDS JULY





# WEATHERFAX

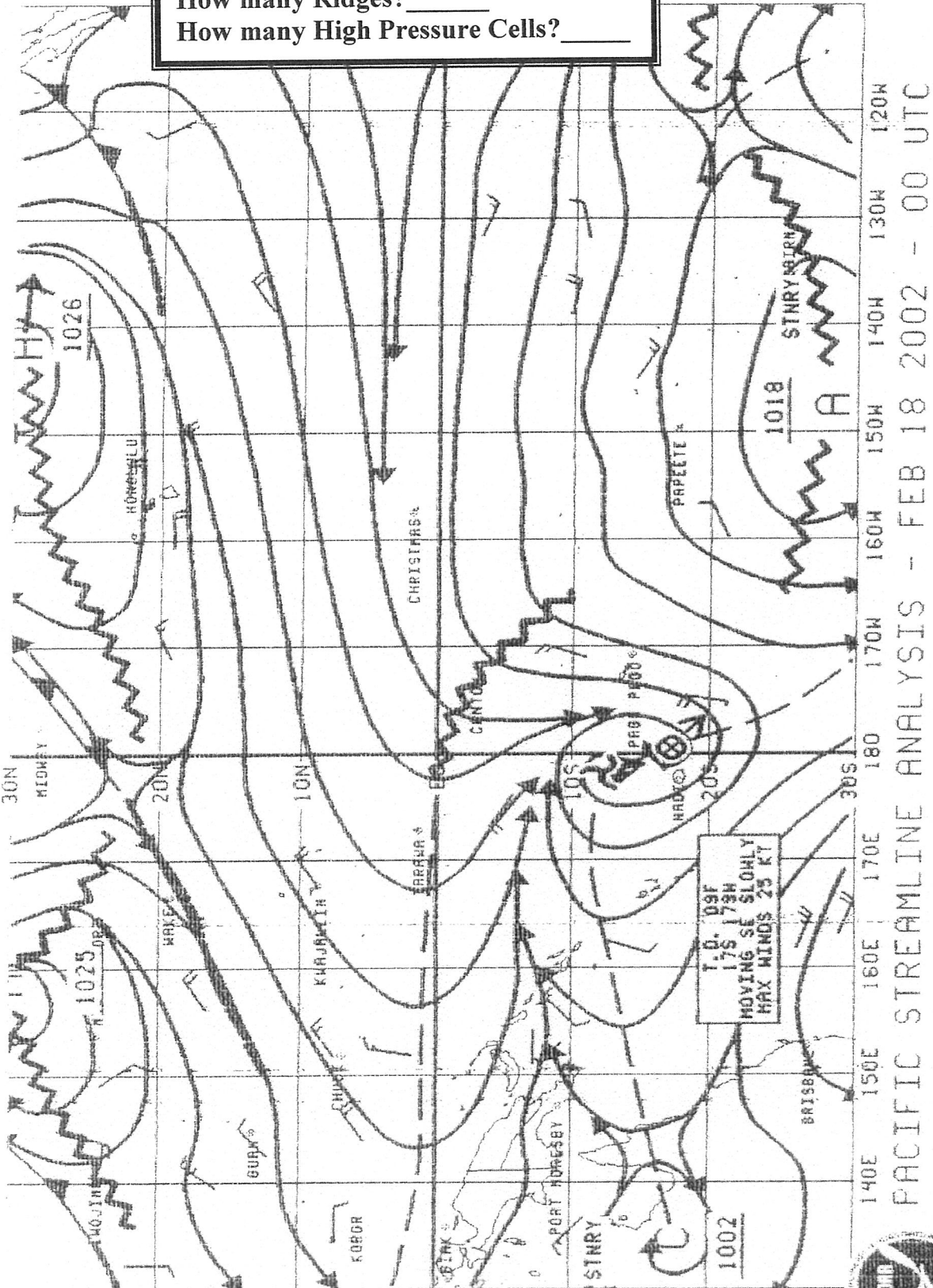
## MEAN SEA ANALYSIS FOR SW PACIFIC



Identify these on the weatherfax:

- |                          |                          |
|--------------------------|--------------------------|
| 1. Tropical Cyclone Nute | 7. Stationary front      |
| 2. High pressure         | 8. Low pressure          |
| 3. Occluded front        | 9. Convergence zone SPCZ |
| 4. Weak cold front       | 10. Cold front           |
| 5. Warm front            | 11. Ridge                |
| 6. Trough                |                          |

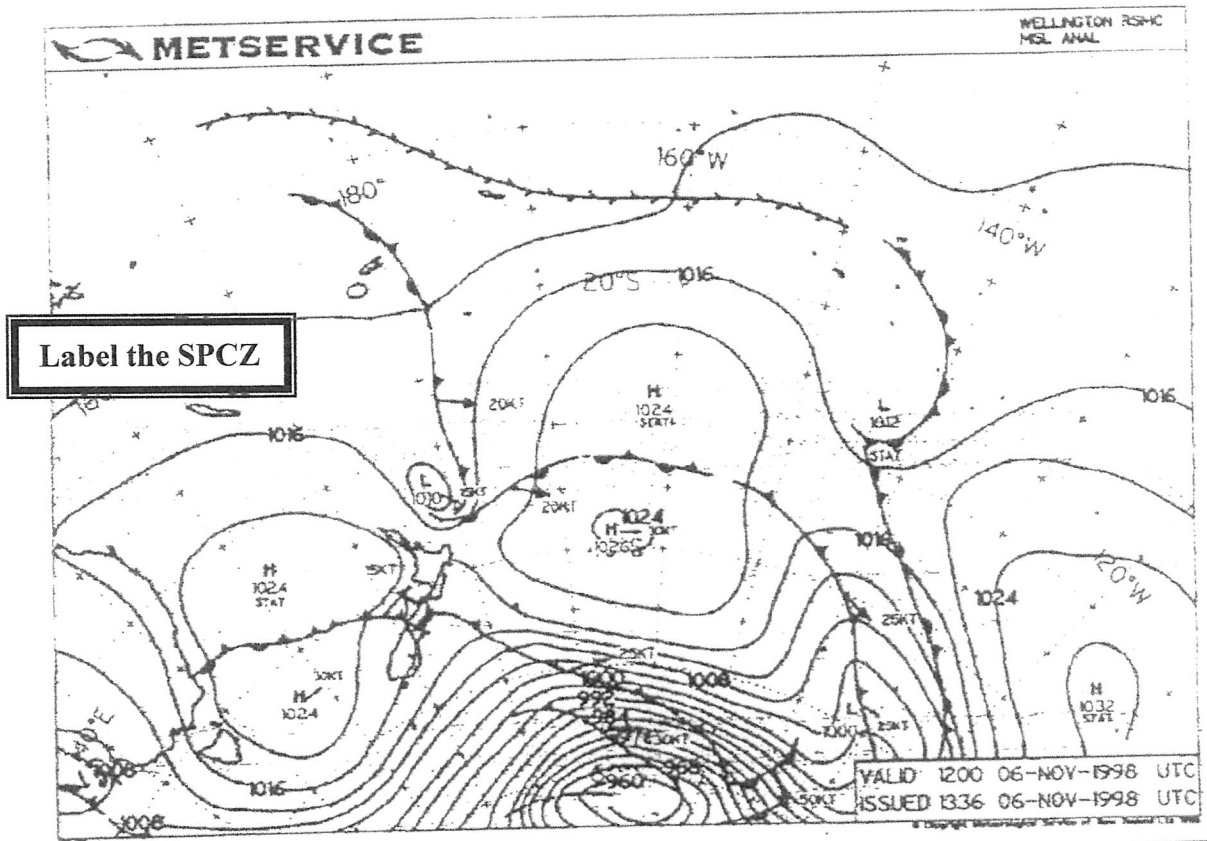
How many Ridges? \_\_\_\_\_  
 How many High Pressure Cells? \_\_\_\_\_



KVM-70 U.S. Dept. of Commerce/NOAA/National Weather Service Honolulu, Hawaii

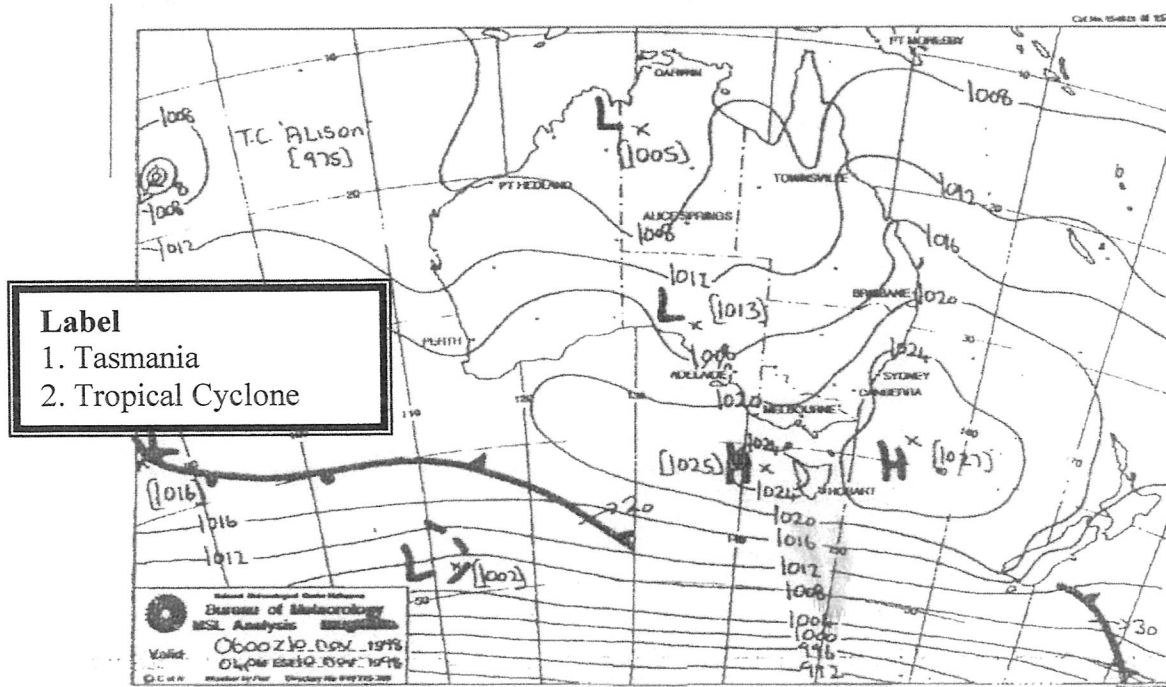


2.5LF 580.0 KHz 101.0 (TIMER)  
e-10C576 120rpm-OK Phase-OK

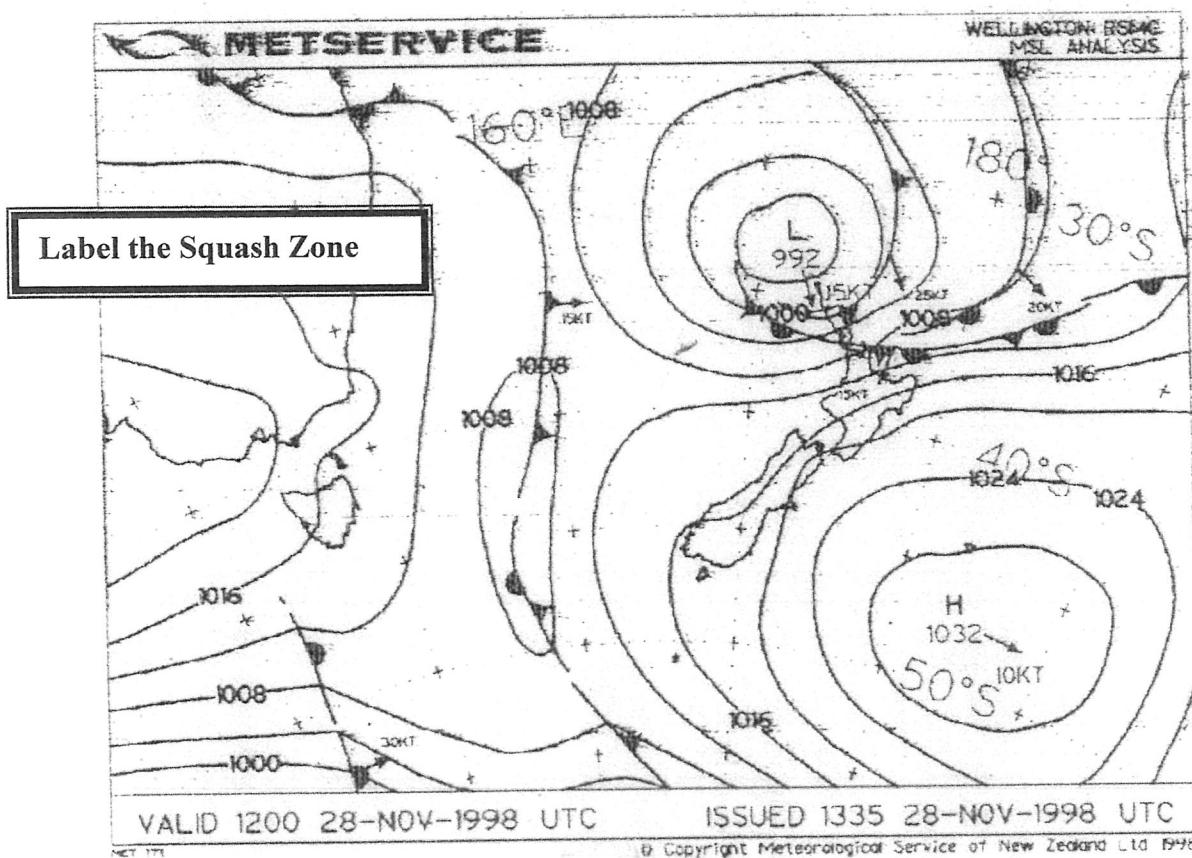
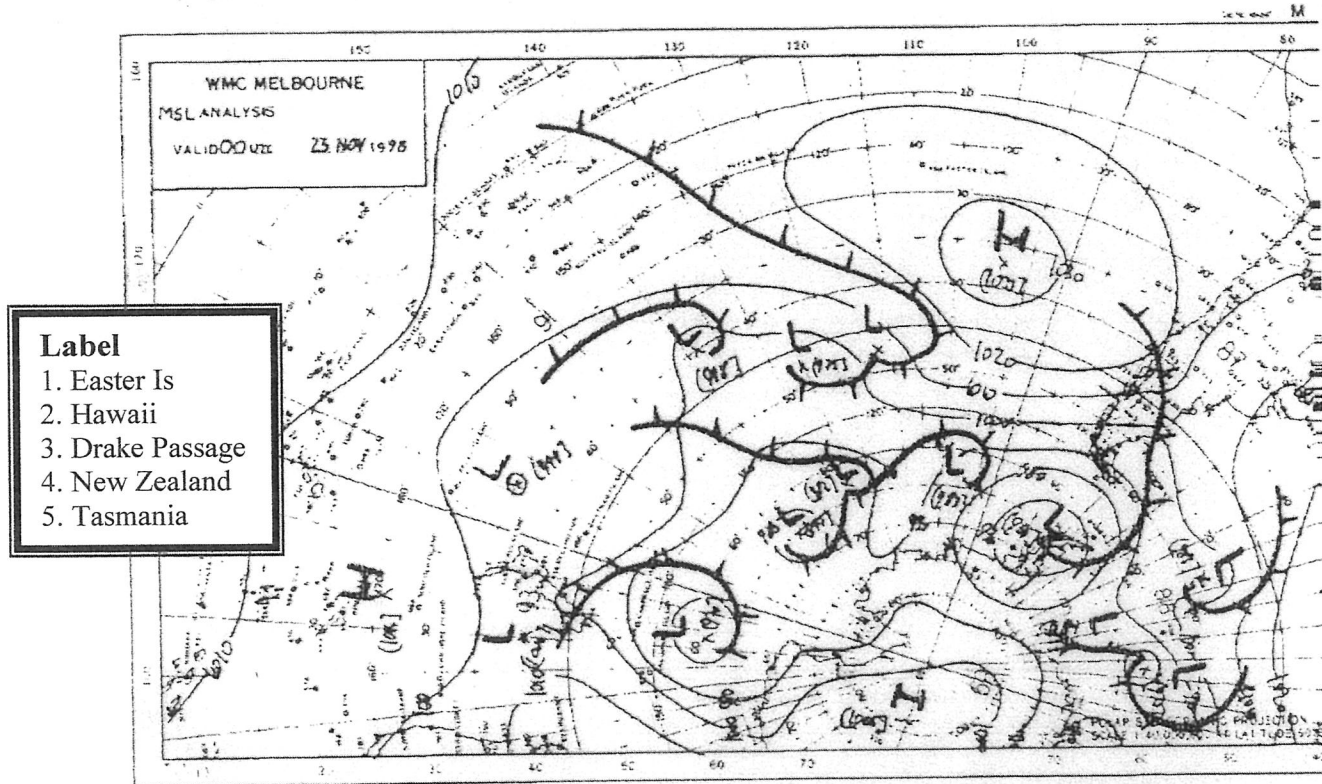


3.13N AXM 11033.0 KHz 814c (TIMER)  
Remote-10C576 120rpm-OK Phase-OK

AXM / AXI Survey. See notice 0045-0100 UTC.

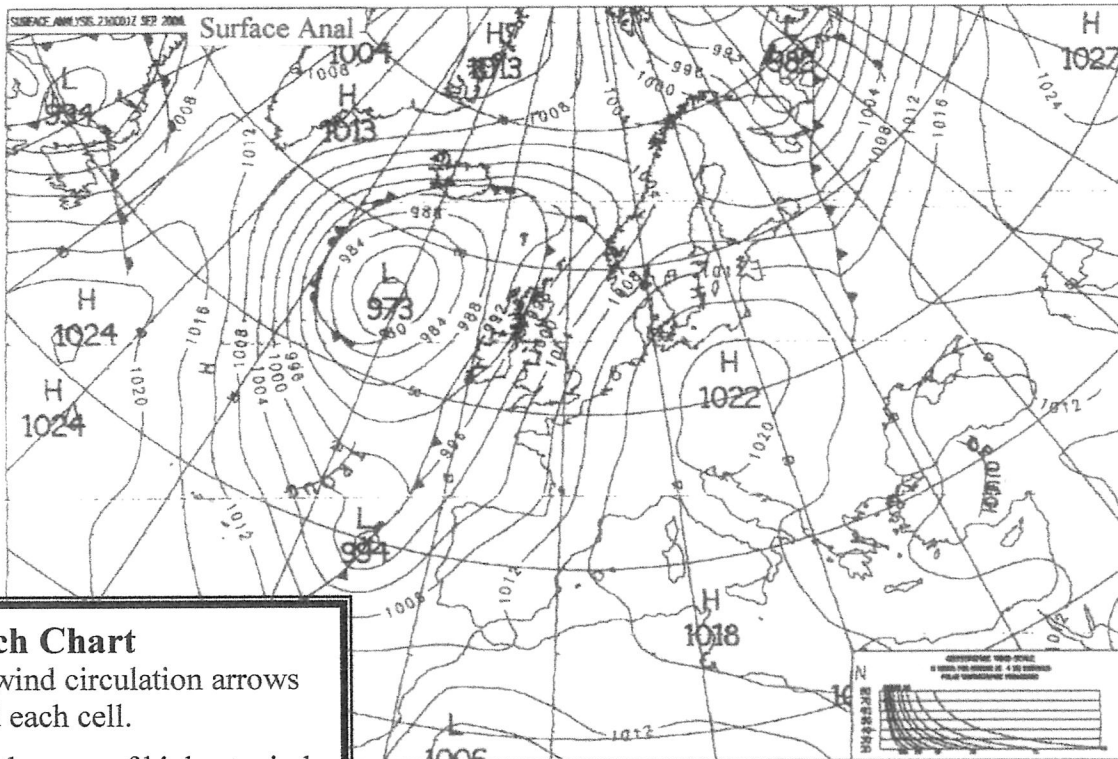


321N ZKLF 9459.0 KHz 10:32 (TIMER)  
Remote-10C576 120rpm-OK Phase-OK



Remote-10C578 120rpm-OK Phase-OK

## FLEET WEATHER AND OCEANOGRAPHIC CENTRE, NORTHWOOD, ENGLAND

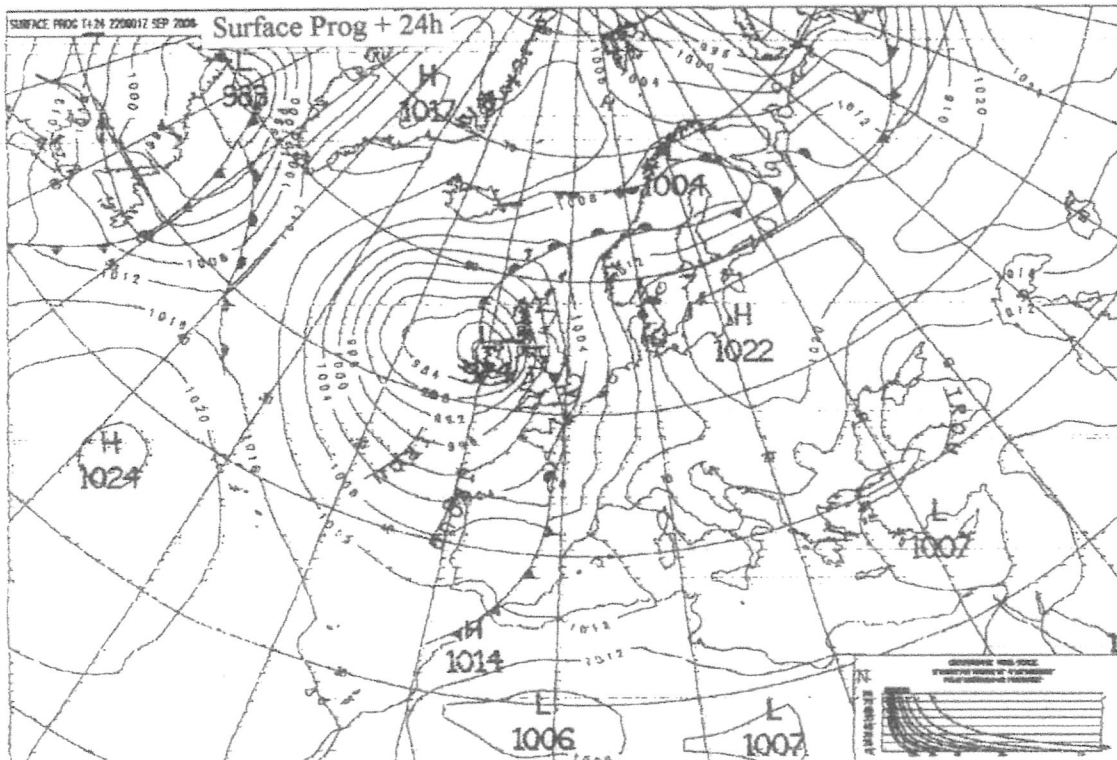


### For Each Chart

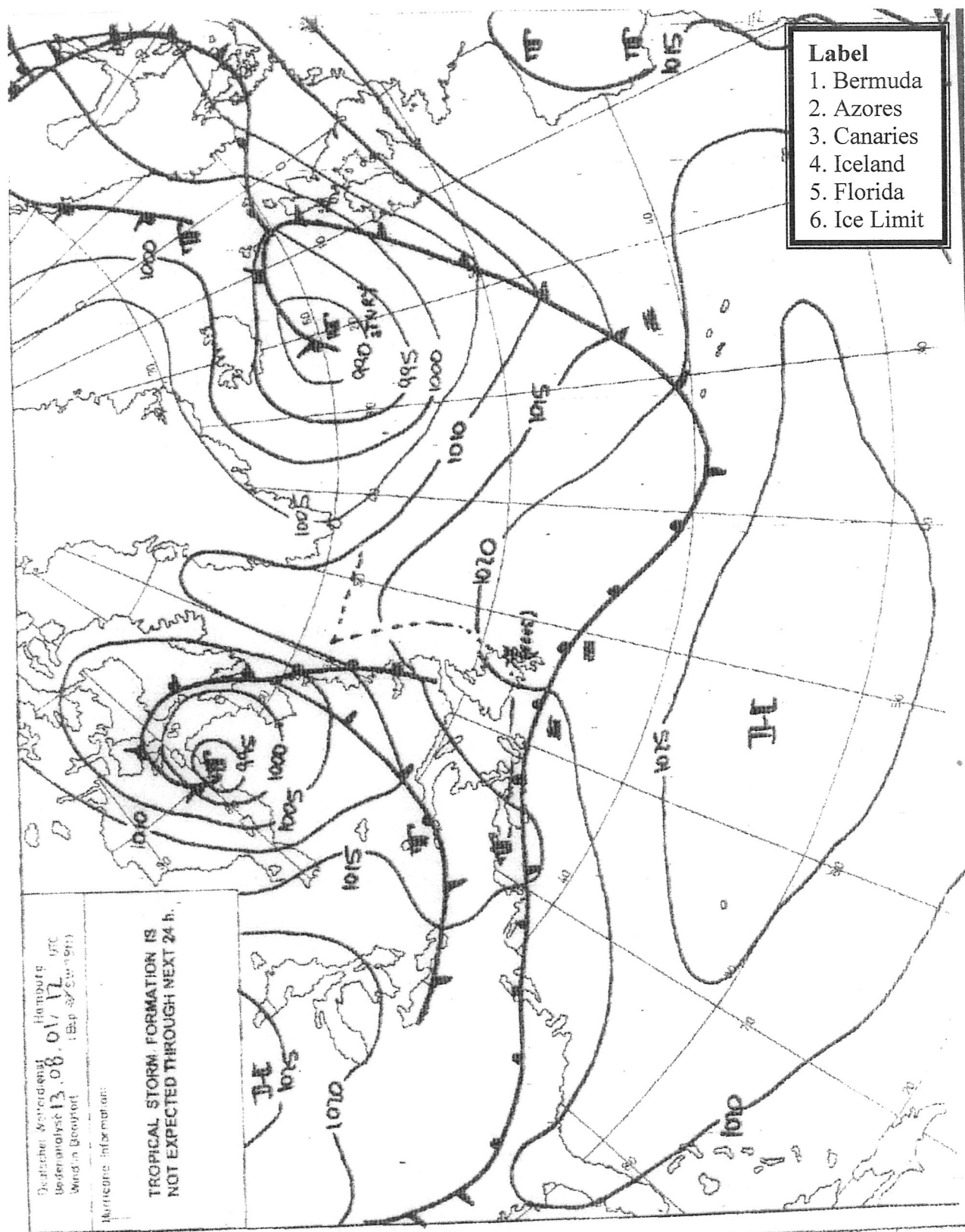
1. Draw wind circulation arrows around each cell.
2. Circle the area of highest wind.

Remote-10C576 120rpm-OK Phase-OK

## FLEET WEATHER AND OCEANOGRAPHIC CENTRE, NORTHWOOD, ENGLAND







- Label**
- 1. Bermuda
  - 2. Azores
  - 3. Canaries
  - 4. Iceland
  - 5. Florida
  - 6. Ice Limit

Deutscher Seewetterdienst Hamburg  
 Wetteranalyse 13.08.01/12 UTC  
 Wind in Geopfer (Bsp. 37/50-971)  
 Hurricane Information:  
**TROPICAL STORM FORMATION IS  
 NOT EXPECTED THROUGH NEXT 24 h.**

12.08.01 07:00 7890.0 KHz 18:00 (TIMBER)  
 Remote-100576 1204PM-OK Phase-OK

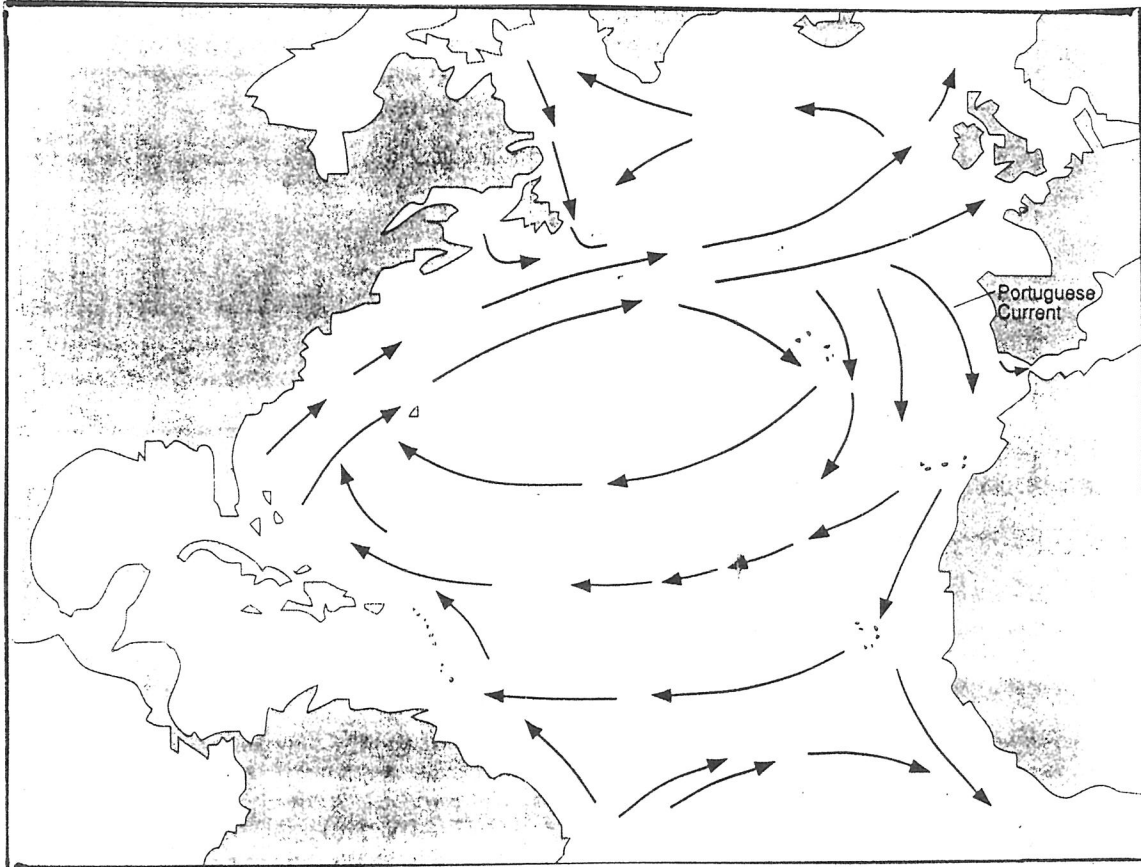
**Label the Equatorial Counter Current**

**KEY**  
 Vector-mean rate in knots is indicated in figures. The constancy of a current is indicated by the thickness of the arrow, thus:  
 — Less than 30%  
 — 30%–70%  
 — More than 70%

**CURRENTS:**  
 NORTH SUBTROPICAL CURRENT  
 NORTH EQUATORIAL CURRENT  
 SOUTH EQUATORIAL CURRENT  
 SOUTH SUBTROPICAL CURRENT  
 VARIABLE CURRENTS

**ISLANDS AND FEATURES:**  
 Hawaiian Is., Midway Is., Line Islands (Johnston Atoll, Fanning Is., Christmas Is., etc.), Phoenix Islands (Line Islands), etc.

## CURRENT FLOW NORTH ATLANTIC



### Identify the Following Island Groups

- |             |                |
|-------------|----------------|
| 1. Iceland  | 5. Greenland   |
| 2. Bermuda  | 6. Cape Verde  |
| 3. Azores   | 7. West Indies |
| 4. Canaries | 8. Ireland     |

### Complete the chart by labeling the following

- |                                  |                           |
|----------------------------------|---------------------------|
| 1. N. Equatorial Counter Current | 6. N. Atlantic Current    |
| 2. Canary Current                | 7. Antilles Current       |
| 3. Gulf Stream                   | 8. N. Subtropical Current |
| 4. Azores Current                | 9. Labrador Current       |
| 5. N. Equatorial Current         |                           |



154 Broad St, Suite 1517, Nashua, NH – Tel: 603-882-6789, fax: 603-882-6661  
email: [info@commandersweather.com](mailto:info@commandersweather.com), website: [commandersweather.com](http://commandersweather.com)  
Office Hours: 5AM to 5PM US Eastern Time, 365 days a year

### **How Commanders' Weather Corporation Delivery Service Works**

**To start:** Call or email us with your present location, destination, and projected departure date.

**Then:** We will monitor the weather for your route and help you find the optimum window to leave. You may call in at no charge to check on a projected departure date, provided you eventually purchase a written departure delivery package (\$99) or written forecast (\$73/\$83) from us.

**We will need:** 1) your boat name and type of boat, 2) average boat speed, 3) communication details-where to send the forecast and anything we need to stay in touch with you (cell, land email, boat email, SatPhone, fax), 4) billing details (Visa, Master Card, American Express, wire transfer, mailing address)

**Shortly before departure:** We will send you your forecast by email or fax, usually the day before you leave. Feel free to call us if you have any questions about the forecast or routing.

**Once you are on your way:** We will monitor your progress along the way, provided there is a way for us to contact you in case of weather problems. Depending on the length of your trip, you may want to get additional written or verbal weather forecasts. We will not update you unless you request or unless we see unexpected severe or dangerous weather headed your way.

**Finally:** We will bill you at the end of your voyage, or at the end of the month, depending on which comes first.

#### **A written forecast sent by email includes: (5-day text-\$73 or 7 to 8-day text - \$83)**

- a) a detailed written summary of the weather pattern indicating where systems are, how they are moving, how the weather pattern is changing and how it will change, how the changes will affect you, areas of squalls, big seas, etc
- b) routing suggestions to best take advantage of the upcoming weather pattern, with safety being the top consideration
- c) a breakdown of wind direction and wind speed at selected time intervals along your projected route - these are usually in 6-hourly increments thru the first 3 to 4 days, then 12-hourly increments up to day 8
- d) consultations with our staff to go over any questions you may have prior to departing.

#### **A written forecast with hand-drawn weather maps sent by email includes: (Regular delivery forecast - \$99 – Transatlantic delivery forecast- \$104)**

- a) all the above
- b) 8 days of weather maps - these will have high and low pressure areas, fronts, isobars on them -a good reference to what is discussed in the summary

#### **A verbal forecast includes: (\$39)**

- a) a discussion of current weather conditions
- b) a discussion of weather features over the next 3 to 5 days

#### **An outlook or short written forecast includes: (\$39)**

- a) a discussion of current weather conditions
- b) a discussion of weather features over the next 3 to 5 days
- c) no detailed breakdown of winds or routing

**Once enroute,** any additional forecasts are charged at \$73 (5 day)/ or \$83 (7-8 day) per written forecast and \$39 per verbal forecast or short text

Subject: Weather 9/16/06  
From: "Commanders' Weather" <CommandersWeather@compuserve.com>

To: John Neal and sy "Mahina"  
From: Commanders Weather Corporation  
Route: Kirkwall, Orkney Islands to Mandol, Norway, as soon as  
practical  
Prepared: 0600utc Saturday, September 16, 2006

Summary:

- 1) Not unusual for stormy weather in the Orkneys, but some fairly robust storm systems will be affecting the Islands over the next 7 days, so when the opportunity arises to depart, you should go and go quickly
- 2) 1st low is near 55N/23W this morning and will move N towards Iceland
  - a) S-SE winds will be over 20 kts more than under later today and tonight
  - b) unfortunately this will be upwind to Mandol, so will need to wait for the cold front to pass with a wind shift into the SW and W
  - c) it appears the front will arrive around 1400-1800UTC Sunday
- 3) Once you get the wind shift, I suggest you depart
  - a) the good news - the winds will become quite light behind this front, but
  - b) the bad news - the winds will become quite light behind this front and the seas will still be rough, so it could be uncomfortable, but
- 4) Another major low will be moving E across the North Atlantic Sun/Mon
  - a) this developing gale will be near 57-58N/34-35W Sun morning and 56-58N/20-22W Mon morning before heading ENE into central Norway late Wed
  - b) this low will bring increasing SE and possibly ESE winds in the Orkneys and you will be racing the arrival of these stronger headwinds - the further E you are, the longer it will take for the strong winds to arrive. Also, the further E you are, the strong winds will be a bit softer and the wind directions may be more S-SE instead of SE and ESE
  - c) regardless, if you don't depart Sunday afternoon/early evening, then you will have to wait for this gale to pass and then there will be larger/stronger low for late in the week, so you could be stuck in the Orkney's until next weekend
- 5) With departure Sunday afternoon, I have the next SE winds arriving for you late Mon/Mon night
  - a) could go a little S of rhumb line to set-up for a better angle for the SE winds Mon night/Tue morning, but would prefer you to be further along the track then back to the SW and playing for wind angle. Being further E will reduce the gale threat
  - b) I have the cold front arriving about the time of your arrival in Mandol Tuesday afternoon
- 6) There will be a much stronger/larger low during the 2nd half of the week
  - a) this low may have some of the energy from hurricane Gordon, so it could be quite robust
  - b) this low will be near 58-59N/25-30W Wed morning and move thru the northwest UK late Friday
  - c) your winds will increase from this low late Wed/Wed night - the further E you are, the lighter the winds
  - d) this monster low will start to spin down, weaken, and move NNE on Fri/next Sat

Bottom-line, looks like a small opportunity to depart Sunday afternoon, once you get the wind shift into the SW and W and then boogey as quickly/safely as possible for Mandol, otherwise you will be waiting for certain until next weekend

Wind forecasts

Wind directions are TRUE, wind speed in kts, and time is UTC



Sat, Sept 16

12: 160-180/16-22, gust 28

18: 150-170/17-23, gust 30

Weather: Fog/drizzle may lift to some patchy sunshine this afternoon, but clouds, fog, mist, and showers return overnight.

Sun, Sept 17

00: 150-170/17-23, gust 26-28

06: 160-180/16-22

12: 170-190/20-12

18: 220-240/16-10, departing somewhere between 1400 and 1800UTC

Weather: Showers, fog, and mist ending with the wind shift then cloudy to partly cloudy. Seas 6-10 feet, but slowly diminishing

Mon, Sept 18

00: 260-300/10-5

06: 330-010/ 4-7, tending to light/variable

12: Light/variable, becoming 100-130/ 5-10, near 58 45N/01 30E

18: 150-170/10-16, new SE winds will be increasing from W to E across the delivery route

Weather: Partly cloudy to cloudy, maybe some mist or a few showers overnight. Seas 3-5 feet, but increasing quickly overnight

Tue, Sept 19

00: 150-170/16-22

06: 150-170/15-21, much stronger further W in the North Sea

12: 200-230/18-24, squalls 30-35 with the cold front, near Mandol

18: 240-270/16-22

Weather: Mostly cloudy with showers, mist, fog being joined by squalls during the daylight hrs. Some clearing late in the day. Seas 6-9 feet from the S, but falling to 5-7 feet overnight

Wed, Sept 20 - Mandol

00: 240-270/15-21, much lighter in the Harbor

12: 210-180/16-22, departing and heading E

Weather: Partly cloudy to cloudy. Seas 3-6 feet early, but increasing in Mandol, but unlikely you will see much of an increase further E

Thu, Sept 21

00: 170-190/15-30, strongest winds SW Norway and lighter near Gotteburg

12: 180-200/16-24

Weather: Mostly cloudy, chance of showers and mist, especially around Norway. Seas up to 8-12 feet around Mandol and westward. Very stormy in the Orkneys

Fri, Sept 22

00: 170-190/12-18

12: 170-200/ 8-16

Weather: Overnight and early morning mist/fog otherwise cloudy to partly cloudy, chance of a shower or 2.

Best Regards, Ken Campbell

# STORM PROCEDURES



## Before Departure

1. **Learn about marine weather** and study the weather patterns for your passage.
2. **Hire a professional weather router** if the potential for dynamic weather conditions exist.
3. Consider taking an **experienced crew person** on passages where you have a higher risk of rough conditions. An extra watch stander should greatly reduce sleep deprivation.
4. **Start a ship's log.**
5. Install a **hot water thermos** for drinks and quick meals.
6. Provision with **easy to prepare meals**. Include freeze dried meals.
7. Keep **high-energy snacks** such as dried fruit and granola bars, readily available.
8. To help **prevent seasickness** purchase Stugeron tablets, Compazine suppositories plus Transderm Scop patches and an electrolyte replacement such as Emergen-C or Berocca.
9. Fill the bilges with water testing that all **bilge pumps** and high water alarms are working.
10. Securely **stow all items** above and below decks.

## When in a Storm - Maintain Responsibility for the Vessel

1. **Be Alert**, continue keeping a 24-hour watch. Rule Five of the International COLREGS makes maintaining a watch a matter of law stating; "Every vessel shall at all times maintain a proper lookout by sight and hearing as well as by all available means appropriate in the prevailing circumstances and conditions so as to make a full appraisal of the situation and the risk of collision".
2. **Keep the boat sailing comfortably.** A long-distance cruise is not the place to stress your crew, boat, rig and sails by trying to see how hard you can push the boat. Modern sailboats sail best at moderate angles of heel, not with their rails in the water. The best time to reef or change sails is when you first think about it, since waiting for conditions to worsen puts a strain on crew and equipment. This is a serious problem for inexperienced ocean sailors. It is always best to be conservative until you understand how much speed the crew, steering system and boat can handle. You will be surprised that often after reducing sail boat speed is the same and leeway is reduced, resulting in a better course made good.
3. **Get weather information from a professional service**, not other cruisers.
4. Keep an **hourly log** recording wind direction & speed, barometric pressure and position.
5. **Plot your position** on an appropriate paper chart at least every six hours.
6. Ensure **storm sails** are accessible and ready to go.
7. **Transfer fuel** from jerry jugs to top-up main tank if possible.
8. Check bilge and ensure **bilge pumps** are in working order.
9. Charge **batteries**.
10. **Seal all openings that could admit water** into boat: tape plastic bags over dorade vents and chain hawse pipe, secure washboards, place duct tape over water and fuel tank vents, cover engine air intake if it is on deck or in the cockpit.
11. **Consider checking in daily** with position and weather conditions an SSB net.
12. **Monitor the radar.** Leave it on continuously at night or in reduced visibility when within 150 miles of land.
13. **Inspect rigging and sails** continuously for signs of wear or anything amiss. Get out of the cockpit, go forward to check the mast and bow.
14. Broadcast **Securité** (see-cure-eh-tay) messages if in fog or reduced visibility or you have storm devices deployed.

#### SECURITÉ CALL

1. SECURITÉ., SECURITÉ., SECURITÉ.
2. This is the Sailing Yacht \_\_\_\_\_.
3. Our position is \_\_\_\_\_.
4. Our course is \_\_\_\_\_ degrees magnetic and our speed is \_\_\_\_\_ knots.
5. We are sailing in reduced visibility.
6. Any vessels in the area please respond on Channel 16.

#### When in a Storm - Maintain Responsibility for all Crew

1. **Study storm location** and track.
2. Keep **crew informed and involved** in the situation, relaying all forecasts and information.
3. **Discuss tactics** and options.
4. **Avoid seasickness.** Take Sturgeron, Compazine or apply Transderm Scope. Seasick crew are a major liability requiring special care.
5. Keep **hot water** in the thermos for drinks or instant soups. Staying hydrated and keeping regular **meal** schedules and healthy **snacks** is of highest importance but is frequently overlooked. Avoid caffeine.
6. Catch up on **sleep**. In storm conditions fatigue and sleep deprivation are your worst enemies. Shorten watches if conditions deteriorate.
7. **Don't overstress boat**, sails, rig or steering gear.

### EXCEPTIONAL "ROGUE" WAVES

Exceptional waves are twice the significant wave height and occur every 4 to 5 hours or approximately every 1,000 waves. The largest ever recorded was 123' off the NW tip of Vancouver Island.

#### Factors contributing to exceptional seas include:

1. Wind opposing current.
2. Shelving, shoaling or promontories.
3. Multiple wave patterns occasionally combining to form a single breaking sea or a set of much larger than the average breaking seas.
4. Amount of fetch.

#### Examples of places where exceptional waves occur:

- Alaska, British Columbia, Washington, Oregon and California coastline
- Areas affected by the Gulf Stream and Aghallus Currents
- Tasman Sea, Cape Horn, Bay of Biscay, North Sea, southern tip of Norway and Ireland

The problem with exceptional waves is that they are frequently from a different direction than the main wave pattern. If this results in breaking seas hitting your vessel on the beam it may cause damage to dodgers, ports and hatches, and in the worst case even roll your vessel.

In large breaking seas vigilance is important. Safety and seamanship dictate having someone on the helm, alert to alter course; taking the breaking sea on the quarter or bow. In heavy seas you cannot completely rely on an autopilot although it could possibly be used if someone is on lookout. In the event of an exceptional wave they can then turn off the autopilot and steer by hand, thus lessening an exceptional wave's impact or damage. A protected helm position is a valuable asset in these conditions.



# STORM TACTICS



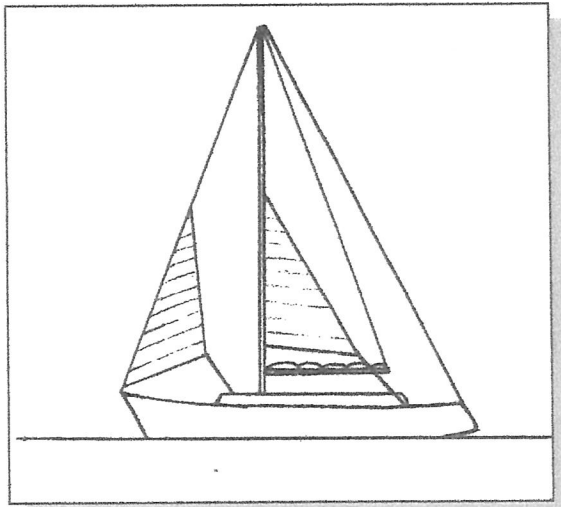
There is not one absolute best storm tactic for all types of sea conditions and boats. Larger, faster, deeper-draft boats of modest beam generally handle serious storm conditions best. Centerboarders or boats with excessive beam may tend to roll sooner and stay inverted once rolled. If you're sailing a 30' boat in storm conditions, there is a much higher chance that you will need to heave-to or employ storm tactics than if you're on a 50' boat.

During the Queen's Birthday Storm we found that with a crew of six we were able to safely run off before the storm on our Hallberg-Rassy 42 under small storm jib, hand steering at 180 miles per day. If we didn't have a full crew, we would have chosen to heave-to or tow warps or drogue to reduce speed. Jim and Sue Corenman on Heart of Gold, a Schumaker 50 racing boat, were very close to the worst area of the storm and sailed out of the way at over 200 miles per day, with just two very experienced people trading off at the wheel.

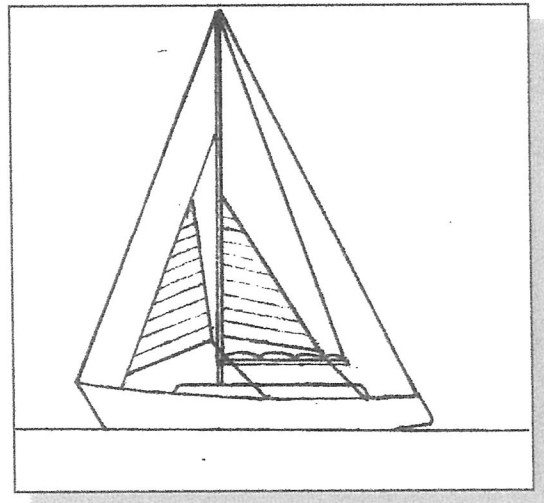
**The following tactics are listed sequentially as the winds and sea increase**

## 1. Hoist Storm Sails

**Advantages:** To reduce heeling, speed, and stress on crew, rig and sails.



***Storm Jib and Trysail – Sloop***

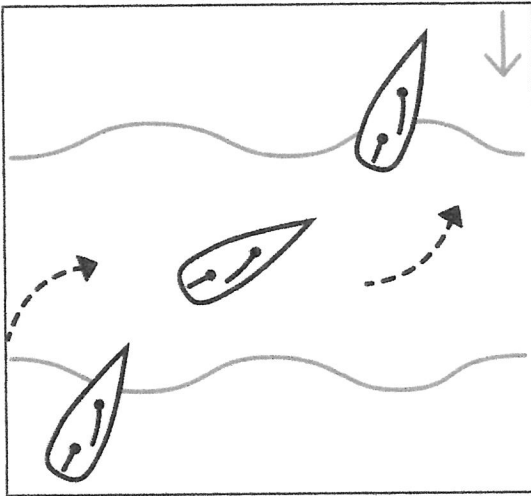


***Storm Staysail and Trysail – Cutter***

If winds over 50 knots are forecast, contact a professional weather router, prepare the storm trysail, hoist storm staysail or storm jib. Consider heaving-to to remove furling headsail. If this isn't possible wrap it securely with a spare halyard. If two spare halyards are available, "maypole" the furlled sail by wrapping halyards in opposite directions. Several boats have been dismasted because of headsails unfurling.

**Cautions:** You need to keep enough sail area up to maintain 5-6 knots, otherwise the rolling motion is difficult to live with and you increase the chance of being rolled. This is the time to look at your options; if you don't have enough sea room, start heading further offshore.

## 2. Fore-Reaching



**Method:** Triple reefed main or trysail, no headsail and helm secured.

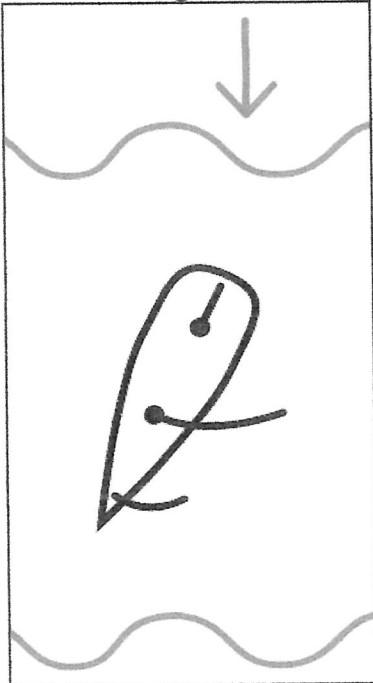
**Advantages:** The considerable advantages of this tactic include not having to hand steer, lessening exposure time since the boat is going toward, not with the storm, and a surprisingly comfortable ride. Heaving-to in sustained winds over 50 knots (with a back-winded storm headsail and triple reefed main or trysail) places considerable stress on the rig, particularly the windward spreaders. We have found dropping or furling the storm headsail (or furling the genoa), sheeting in the triple-reefed main or trysail and locking the wheel in a close-hauled heading produces a very comfortable 2-3 knots. If the bow falls off to leeward, the main (or trysail) brings it back on course.

In higher winds, this tactic proves quieter and more

comfortable than #4, Heaving-to. As occasional larger seas may push the bow off causing the vessel to lie beam on it's important to have someone maintaining a watch to occasionally adjust the helm.

**Caution:** It is essential to find out if this tactic will work on your boat as it won't work on many modern, flat-bottomed boats with a short (fore and aft measurement, not draft) keel. Try it in 30 knots with a double-reefed main. If this tactic does not work you can try #7, Close Reaching Under Storm Sails by simply hoisting the storm headsail and hand steering. Another option is #8, Motorsailing under storm trysail or deeply-reefed main.

## 3. Running or Reaching Off



**Method:** Sailing downwind on a broad reach or run.

**Advantages:** Reduces apparent wind speed, (example: Upwind – 30 kt wind + 6 kt boatspeed = 36 kts apparent wind speed, vs. Downwind – 30-6=24 kts apparent). More comfortable motion.

**Cautions:** You must have sufficient sea room to employ this tactic.

The danger is excessive boat speed which can result in broaching, rolling or pitchpoling. In sustained winds over 50 knots it is prudent to replace a reefed main with a storm trysail as it is independent from the boom. A gybing mainsail, even if secured with a preventer, can result in injury and damage in strong winds.

Modern boats handle offwind boat speed better and are generally easier to steer at higher speeds than heavy, full-keeled traditional designs.

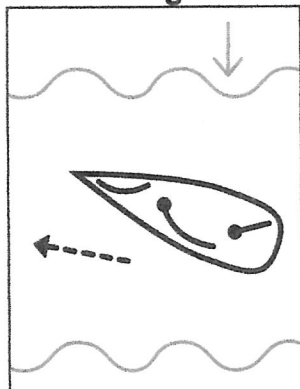
Rogue waves are a danger as conditions deteriorate; larger breaking waves coming from a different angle than the predominant direction. In these conditions hand steering and alertness is prudent, requires utmost concentration but is physically demanding. When you're hand steering and hear or see a rogue wave, you're then able to quickly square the stern, stern quarter or bow to the breaking wave. If you're on autopilot or windvane a rogue wave can result in a knock down or

roll over with dismasting.

Most cruisers have little experience or endurance hand-steering, having always relied on autopilots or windvanes. Read *The 1994 Pacific Storm Survey and Rescue in the Pacific* to learn how many sailors had to abandon their vessels as they were relying on autopilots, in severe conditions, and were rolled and dismasted.



#### 4. Heaving-To



**Method:** To heave-to, set storm sails and sail the boat on a close reach or close hauled. Tack the boat through the wind, backwinding the headsail but do not release the jib sheet. Secure the helm so that the boat does not tack through the eye of the wind or conversely, fall off onto a reach, gaining speed. This allows the boat to take breaking waves 40-60 degrees off the bow, and not on the beam. If breaking waves are present secure the helm with bungee cords so there's some "give" in the steering when the boat is hit by breaking seas. Keep the boat sailing at 2-3 knots, easing the storm trysail (or reefed mainsail) to reduce boat speed if the boat is sailing too fast.

I've demonstrated and practiced heaving-to many times but have only used this technique twice in non-teaching storm conditions but have. In a hurricane off Mexico, after I tried heaving-to, I found a more comfortable

motion by using tactic #7 Close Reaching under storm sails which also got me out of the dangerous semi-circle. In 1996 in an intense "squash zone" on the edge of the Roaring Forties we hove-to in 60 knots with 30' seas. After a brief uncomfortable time, we changed to fore-reaching under storm trysail and found it to be a more suitable tactic.

**Advantages:** Heaving-to is one of the safest storm tactics that doesn't require constant steering, as long as winds are less than 50 knots and seas under 25'-30'. By keeping the boat moving at 1-3 knots hove-to, the chance of broaching out of control or pitchpoling is eliminated. You can choose to heave-to on either tack and if one tack takes you closer to land, choose the other.

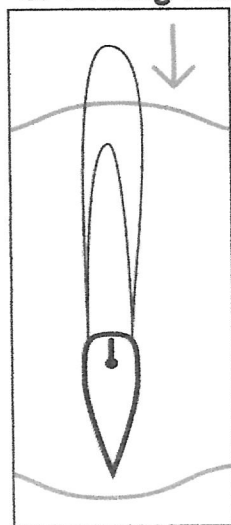
Heaving-to has several advantages over utilizing tactic #10 Deploying a Sea Anchor. These include: less chance of damaging rudder and steering system, better maneuverability to get out of the way of ships, no chance of pulling out cleats or having the sea anchor rode chafe through, smoother motion, no chance of tangling lines around rudder or prop during retrieval. It's also simpler to get underway once storm conditions ease.

**Cautions:** Many lightweight fin-keel, spade rudder boats may not heave-to, instead continually gybing around in circles. Heaving-to is not appropriate for multihulls. In both these cases consider #2 Fore-reaching or #7 Close Reaching. It is essential to practice heaving-to in progressively stronger winds to see if this tactic works for your boat.

In storm conditions heaving-to has little to no advantage over #3 Fore-reaching but it can be used to slow the boat down for daylight landfall, reefing the main, or to rest.

\*If hove-to broadcast a "Securite" message every 30 minutes on VHF Channel 16 stating your position, and lack of maneuverability

#### 5. Towing Warps off the Stern

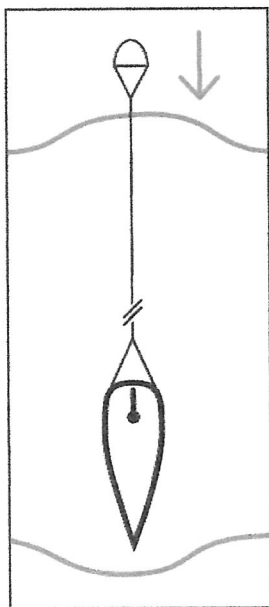


**Method:** Secure your longest nylon rode (should be 250' to 400') to stern mooring cleats on each side and ease the line out to create a loop behind the boat. Dragging this U-shaped bight reduces sea surface tension, creating a visible "slick" astern which slightly reduces the chance of breaking seas crashing aboard. Towing warps also improves steering response by reducing boat speed. This tactic is effective with multihulls and light to moderate displacement boats. It works well to tow multiple warps, each a different length. On my 27' & 31' boats I've towed as many as three sets of warps in storm conditions with good results. On our current 48' - 38,000 boat, towing warps has almost no effect. Some vessels have also towed tires or chain with anchors but a dedicated drogue (#6) is a better option.

**Advantages:** Reduces boat speed and the tendency of broaching or pitch-poling from excessive speed. Less chance of steering system damage.

**Cautions** If the warps are not effectively reducing boat speed there is the danger of pitch-poling or broaching resulting in a roll and dismasting.

## 6. Towing a Drogue off the Stern



**Method:** A dedicated drag device (drogue) is towed 300+ feet astern.

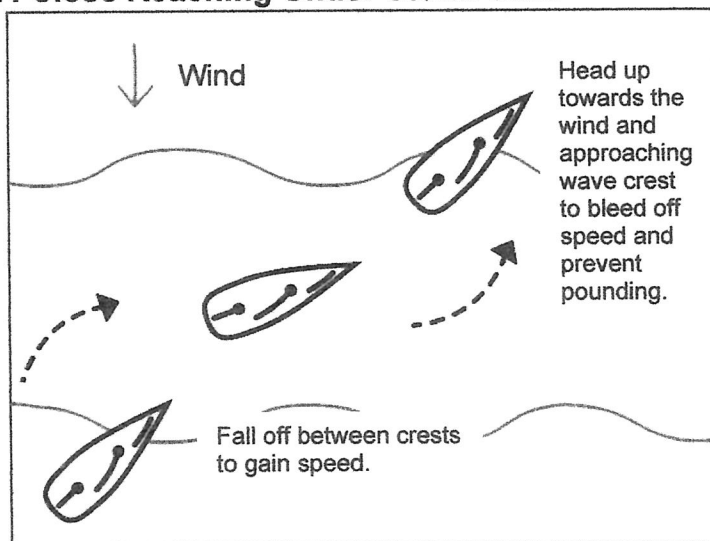
**Advantages:** A drogue provides more drag and resistance than warps, further reducing boatspeed as conditions deteriorate. Based on our experience, the most versatile and dependable drogues are the Galerider manufactured by Hathaway, Reiser & Raymond and the Fiorentino Shark Drogue. We've also tested the Para-Tech Delta Drogue.

We've found New England Ropes Multi-Plait to be an ideal line for towing a drogue; it's easy to store and does not get hockles or tangles plus we also use the line for anchoring, mooring and towing.

A Jordan Series Drogue utilizes a series of over 100-200 5-inch cones permanently attached to 300' line. Although the series drogue produces sufficient drag, it's a bulky, more expensive and less flexible option.

**Cautions:** Excess boat speed with either warps or drogue can result in loss of control in which case you will need to recover the drogue and try another tactic. When riding stern-to large breaking seas, boats with aft cockpits are more vulnerable to being pooped than center cockpit designs

## 7. Close Reaching Under Storm Sails



**Method:** Actively steer the vessel. Head up towards the wind and approaching wave crest to bleed off speed and prevent pounding, then after passing the crest, fall off to regain speed for the next wave.

**Advantages:** Eliminates the chance of pitchpoling. Sailing upwind towards the storm reduces your exposure time.

This tactic is an excellent "ultimate storm" option. It has been safely and efficiently used by a majority of race boats in multiple Sydney-Hobart Races.

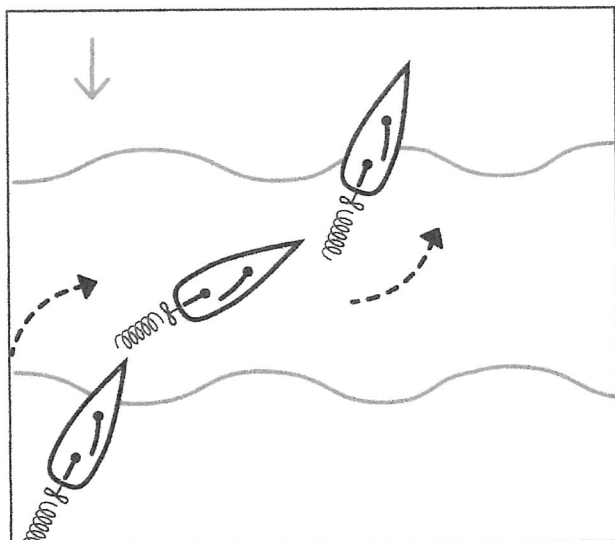
**Caution:** This tactic requires accurate

upwind steering to avoid the breaking crests. Avoid excessive speed by utilizing a trysail and staysail. Ideal speed should be fast enough for maneuverability, yet not so fast that the yacht goes flying off the top of waves and crashes down into trough. On most boats this will translate into a boat speed of 5-6 knots. A drogue can be towed astern if necessary. This is one of the least comfortable and more difficult tactics. For multihull's a better tactic is #2 Fore-reaching.

## 8. Motorsailing Slowly to Windward

**Method:** Sailing close hauled under deeply reefed mainsail or trysail (no headsail) with the motor in gear at low RPM's. Same as #2 Fore-reaching, but with engine running.

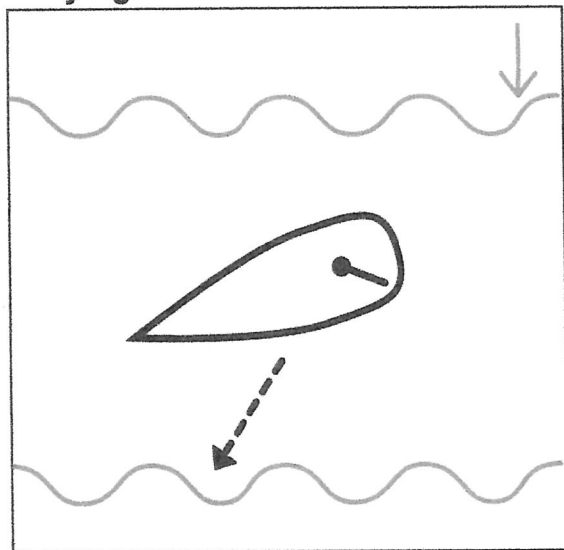
**Advantages:** Reduces motion, eliminates the chance of broaching or pitchpoling, reduces exposure time to the storm.



This tactic has proven successful for moderate and heavy-displacement sailboats, and powerboats. I've interviewed skippers of the Westsail 43, Por Vida that survived 90 knot winds and 40' seas in the Queen's Birthday Storm and the Roberts 50, Swanhaven which used this tactic in an 80 knot cyclone. Wings, a Serendipity 43 (70's IOR race boat) successfully used this tactic in the Dec '98 N.Z. storm.

**Caution:** In rough sea conditions any sediment or moisture in the bottom of the fuel tank will get stirred up, blocking fuel filters and causing your engine stop. Prevent water entering the fuel tank through fuel tank vents and avoid lines wrapping around the propeller.

## 9. Lying A Hull



**Method:** Drop/furl all sails and secure the helm.

**Advantage:** Useful only in tropical squalls of short duration where seas are flat.

**Caution:** Don't lie a hull if seas are higher than the beam of your boat. This is the fastest way to get rolled and dismantled in breaking sea conditions, as was repeatedly evidenced in the '94 Queen's Birthday and December '98 New Zealand storms. . We've successfully used this tactic in intense tropical squalls when wind speed has gone from 10 to 60 knots then back to 10 knots in 15 minutes. When lying a hull, while singlehanded my Vega 27 in 1975 near the Cook Islands on the edge of a tropical depression, I was rolled to 90 degrees, breaking the rudder. In retrospect forereaching would have been a better tactic.

There have been several recent incidences where large catamarans lying a hull have experienced severe rudder damage.

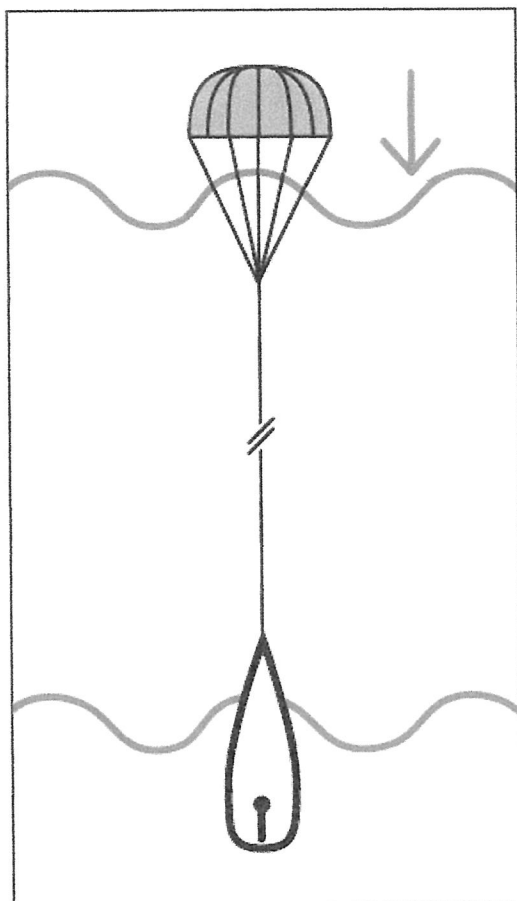
## 10. Parachute Sea Anchor

**Method:** Dedicated parachute sea anchor is deployed on a bridle at the bow, with a line 12 to 15 times the boat's overall length. For our 48' boat we'd need 580' of 1" line weighing 150 lbs and presenting considerable bulk.

**Advantages:** Slightly useful for multi-hulls, power boats or lightweight boats where #2 Fore-reaching or #4 Heaving-to are not safe options. Para-anchors are useful to stabilize the boat if you need to get into the water to effect repairs or to clear lines from the prop.

**Cautions:** It must be deployed early, as deployment becomes more difficult in strong winds. A sea anchor cannot be easily retrieved until storm conditions have abated.

In winds over 50 knots and in breaking seas over 20' there is an excellent chance of rudder or steering damage as the boat is being driven backwards. Substantial chafe protection must be installed before the sea anchor is set because of the tremendous loads generated. Four of the five skippers I've spoken with who have deployed sea anchors in true storm conditions, have lost them within hours due to chafe.



When using a parachute sea anchor remember to broadcast a Securite message every 30 minutes on VHF channel 16 stating your position and lack of maneuverability.

Jimmy Cornell, three-time circumnavigator, author of *World Cruising Routes* and founder of The ARC states, "I really believe parachute sea anchors are useless and dangerous."

However, Lin and Larry Pardey are keen proponents of this tactic in their *Storm Tactics Handbook*.

The August 1, 2000 issue of *Practical Sailor* reviews sea anchors and drogues. In the Dec. 1, 2000 issue Steve Dashew, author of *Surviving the Storm* writes, "Practical Sailor readers should be aware that some of the systems discussed have major drawbacks when being used in breaking seas, in particular parachute anchors. During research for *Surviving the Storm*, we debriefed a number of sailors who had used para anchors in severe weather. We did not find one successful story. In every case there was some type of major failure which lead to other difficulties, or to the adoption of other tactics.

Although we've used a parachute sea anchor in teaching situations, we've yet to encounter conditions where we thought it was the best tactic. We don't think

it wise or good seamanship to depend on a sea anchor in large breaking sea conditions as attractive as the concept is (just set the sea anchor, go below and wait out the storm).

Fiorentino, Para-Tech and Shewmon Sea-Anchors are the most common and are constructed of sturdier materials than military surplus cargo parachutes. Although para anchor manufacturers recommend their products for multihulls, at least one major multihull builder, Cantana tells owners not to use them because of potential damage to the steering system.

### Additional Information

- **Surviving the Storm-Coastal and Offshore Tactics**, Steve and Linda Dashew, Free download - [www.setsail.com](http://www.setsail.com). One of the most important and relevant books on storm sailing.
- **The Voyager's Handbook, second edition**, Beth Leonard.
- **The 1993 Pacific Storm Survey**, The Boats Which Survived It, and the Lessons Learned. Booklet by Kim Taylor, Quarry Publishing, Inlet Road, RD 3, Kerikeri, New Zealand.
- **Rescue in the Pacific**, Tony Farrington, International Marine. A true story of disaster and survival in the Force 12 Queen's Birthday Storm.
- **Drag Device Data Base**, book by Victor Shane, Para-Tech Engineering.
- **Pacific Rescue**, Award-winning video produced by TVNZ and National Geographic on the 1994 Queen's Birthday Storm.
- **Storm Tactics Handbook** - Modern Methods of Heaving-to for Survival in Extreme Conditions. Lin and Larry Pardey, Paradise Cay Publications

### Resources

- **Hathaway, Reiser & Raymond**, [www.hathaways.com](http://www.hathaways.com), 184 Sselect St., Stamford, CT 06902 Tel 203.324.9581, fax 203.348.3057, [www.hathaway.com](http://www.hathaway.com). Manufacturers of the Galerider drogue.

- **ATN**, [www.atninc.com](http://www.atninc.com), 1509 SW 1<sup>st</sup> Avenue, Ft. Lauderdale, FL 33315 Tel 800.874.3671, fax 954.523.2777. Manufacturer of the Gale Sail, a heavy weather sail that sets over the furling headsail.
- **Fiorentino Para-Anchors**, [www.Para-Anchor.com](http://www.Para-Anchor.com), 1048 Irvine Ave. 489, Newport Beach, CA 92660 Tel 800-777-0454, fax 949-722-0454, Manufacturers of quality sea anchors and drogues utilizing a unique stainless steel "para-ring".
- **Para-Tech Engineering Co**, [www.seaanchor.com](http://www.seaanchor.com) 2117 Horseshoe Trail, Silt, CO 81652; 970.876.0558; [www.seaanchor.com](http://www.seaanchor.com). Manufacturers of Para-Tech Sea Anchors and Delta Drogue, and publishers of *Drag Devices Data Base*.



## SUMMARY

For storm survival it is essential to develop helming skills and endurance and not constantly rely on an autopilot or windvane. Actively steering a boat requires an alert helmsperson and fatigue is a constant challenge. If survival depends on it, two in-shape sailors on a one hour on, one hour off watch schedule, for 48 or more hours, can safely steer a vessel through a storm.

In reality the chances of encountering sustained winds over 35 knots during a circumnavigation are slim if all available forecasting tools are utilized.

## Out of Control in A Storm?

If you can't steer the boat without broaching while surfing down the faces of waves, here are your options:

- **Forereach** under trysail or triple reefed main.
- **Tow warp or a drogue** astern to reduce speed. (This can be done under storm trysail or under bare poles)
- **Drop the sails** and continue steering downwind under bare poles.
- **Heave-to.**

## Ultimate Storm Tactics

If wind or seas continue to increase to the point that you feel endangered by breaking seas these are your last two options:

- **Turn upwind** and forereach or **close-reach**, steering by hand and bleeding speed off by pointing up into the largest seas. Try and keep boat speed down to 5-6 knots so that you don't pound when punching through the wave crests.
- **Motorsail** upwind under storm trysail or triple reefed main.



# DEALING WITH ANXIETY AND FEARS IN STORM CONDITIONS



Although rarely given much thought when planning a cruise, the psychological challenges of a major life change that leaving familiar surroundings for a life of cruising entails are often the most difficult adjustment that new cruisers have to deal with.

## What is Anxiety?

Anxiety refers to an overwhelming sense of apprehension or fearfulness and can produce both psychological and physical symptoms. Anxiety can be brought on by many factors and few situations can provide such a wealth of stresses as an ocean passage by sailboat.

Anxiety does serve a purpose and mild levels of anxiety may help to make a sailor more cautious and result in increased motivation to focus on the task, e.g. to get the boat safely to the next port.

Overwhelming anxiety, however, tends to cause an individual to focus inwardly and away from the task at hand. An overly anxious state can lead one's focus and attention inwardly or onto one specific task, losing sight of the "big picture", possibly endangering the safety of the boat and crew.

On the far end of the anxiety continuum, panic refers to a sudden, overwhelming anxiety of such intensity that it produces feelings of stark terror. Panic states tend to be much more debilitating; rational thought is often suspended and people may freeze or react in an unpredictable or self-endangering manner. Common examples are in storm conditions when people ask to be taken off a perfectly seaworthy boat or when they lie huddled below decks, praying for the storm to be over instead of actively sailing their boat.

## What Causes Anxiety?

- **Medical and physical conditions** including seasickness, dehydration, fatigue, low blood sugar, PMS, menopausal symptoms, recent injuries, diabetes, certain cardiac conditions, asthma, thyroid and parathyroid disorders and some systemic infections can produce feelings of anxiety.
- Several **medications** including caffeine, nicotine, some anti-seasickness medications including scopolamine, antihypertensives (medications for high blood pressure), theophylline (a bronchodilator used to treat asthma) can aggravate feelings of anxiety.
- **Psychological stresses** of a major lifestyle change, leaving family and friends, stresses in a relationship, previous negative experiences as well as negative thoughts (doubting one's own abilities or perceived limited or lack of control of a situation) can increase stress reactions. People who are non-swimmers or are uncomfortable on the water should learn to swim proficiently if they want to go cruising.
- Our experience at sea is that **chronic worriers** are more prone to anxiety reactions and have greater problems relaxing at sea than those individuals who are less prone to introspection and worry.
- We have found ocean passage making to be a great **intensifier of emotions**. If you are dealing with depression, anxiety, resentment and anger, you may find that being out of touch with familiar surroundings to be frightening and unfulfilling. Traveling by RV or sailing in coastal waters close to home might be a safer option than long distance voyaging. If you

are basically a happy, outgoing, mentally and socially well-adjusted person, you will probably find passage making exciting and fulfilling.

### Anxiety Producing Times

Everyone, no matter how experienced, experiences anxiety about cruising. If you realize this is normal and know when to expect it and how to deal with it you will be better prepared for cruising.

Some instances where anxiety should be expected are:

- When it is **time to leave the security** of your home port, just after your bon voyage party. Press onward, don't stop now. You didn't spend all of this time and energy to change your mind now!
- During your **first night offshore** at sea. Since you will have previously made an offshore shakedown passage of several days before departing on your long-term cruise, this won't be the end of the world. In a few hours the sun will rise again!
- During and after your first **rough offshore passage**. A fair number of boats end up for sale or on the back of a truck after the owner's first exposure to rough water. All of the chartering and coastal cruising in the world still won't prepare you for the adjustments required for ocean passagemaking.
- When you're at the **furthest point from land**. This is a common and serious place to experience an anxiety attack. Expect this and be ready for it! Confidence in your well-prepared boat and in your seamanship and navigation skills (gathered during your ocean shakedown trip) would help lessen this anxiety. Many cruisers find that having a radio aboard and checking into maritime nets with daily position reports helps reduce anxiety. It is scary to be in the middle of the ocean and to realize that you are totally responsible for making the boat, cruise, crew or relationship and passage work, and that in most instances there is no one that can come and assist you.

### Symptoms of Anxiety

Signs of anxiety in sailors include irritability or distractibility, being overly talkative or becoming withdrawn, stalling, e.g., putting off departure, rapid breathing or hyperventilation, "wild-eyed" look or avoiding eye contact.

### Dealing with Anxiety

- **Talk** about your anxiety with your partner. Do your homework: take sailing lessons and navigation lessons, (swimming lessons too, if needed), spend several months living aboard before departing.
- **Make sure that you stay healthy**, hydrated and watch your diet and exercise.
- Take an extra experienced **crew person** aboard for your first passage or for rough passages so that fatigue and sleep deprivation don't increase your anxiety level.
- **Make sure that you have at least 20 Compazine** suppositories. From our experience of dealing with hundreds of first-time voyagers, this is by far the best seasickness medication and it also has an anti-anxiety effect.
- Occasionally, a mild sedative may be necessary. All should be used sporadically and with close supervision. **Xanax** .25 mg is similar to Valium and may have fewer side effects. It is taken twice a day for no more than a week. Another option is **Hydroxyzine** 50mg every 6 hrs



# ANCHORING TECHNIQUES



## Anchoring Equipment

1. **Type of Anchor:** Pivoting Fluke (Danforth, Fortress), Rollbar (Rocna), Plow (CQR, Delta), Claw (Ray, Bruce).
2. **Size of Anchor:** Holding power: determined by weight, design and surface area of blades & flukes.
3. **Anchor Rode: Chain:** hot-dipped galvanized – Proof coil, BBB, high test & alloy chain.
  - a. **All Chain:** 120'-250.'
  - b. **Line:** New England Ropes Premium 3-strand 3 strand or multiplait.
  - c. **Combination:** Chain 50' and Rode 120'-350'

Chain should be marked every 50' with a nylon cable tie and should be secured to a structural part of the bow with a nylon line that could be quickly cut if conditions force you to abandon the anchor and chain temporarily
4. **Connectors:** Shackle anchor to chain. Secure shackle pin with seizing wire.
5. **Anchor Windlass:** horizontal or vertical. Stainless is far better than aluminum. Requires annual maintenance.
6. **Bow Roller(s):** Two are better than one, & **Bow Cleats:** strong enough for cleating off an anchor snubber.
7. **Anchor Snubber:** 30' of line to transfer load from chain to bow cleat, bypassing the anchor windlass.
8. **Chafe Protection:** for nylon rode or snubber: fire hose or chafe guard sleeves from Talyor Made/Davis.
9. **Anchor Marker:** brightly colored float and light line.
10. **Anchor Rode Bag:** storage bag for anchor line.
11. **Tender:** may be required to set and/or retrieve second anchor.
12. **Heavy Gloves**

## Selecting and Anchorage

1. Consult **chart** and cruising guides for depth, seabed characteristics, obstructions, and information.
2. Check **weather forecast** recording direction and strength of wind and swell height.
3. Choose a spot with sufficient **depth, flat bottom, minimum swell and wind**, and sufficient **swinging room**.
4. **Make a circuit** of the anchorage checking how other boats are anchored and their swinging radius.
5. **Avoid anchoring** in rock, kelp, coral or eelgrass if possible. Eel grass is rare in depths greater than 30'. Coral is fragile and takes a long time to grow. Do everything possible to avoid anchoring in or damaging coral. It's also very abrasive and will quickly wear the galvanizing off the chain, causing it to start rusting
6. Anchor **near boats similar to yours** and observe the unwritten code of courtesy: vessels already at anchor have priority.

## 3. How to Anchor

1. Slowly approach your anchoring spot **and make a slow 360-degree turn**, checking the depth in the radius of swinging room and if visibility permits, making sure that your chain and anchor will not touch coral then steer **into the wind** while noting depth.
2. Bring the boat to a stop and **drop the anchor** to the sea floor.

3. **Back up slowly** while paying out the desired scope (generally 4 to 1 with all chain), keeping the bow into the wind.
4. Let boat settle into the wind, **set anchor snubber** or bridle, then slowly apply power in reverse at about 2/3 throttle for two minutes. Anchor should set and rode stretch out.
5. **Check that you're not dragging** by aligning two objects, one behind the other, and feeling for vibration on the anchor rode. Anchor rode vibration indicates dragging – see #6.
6. Place engine in neutral, **rig chafe gear**, turn off engine.

### After Anchoring

1. Navigator notes time, depth and GPS position in logbook, then plots anchorage position on chart.
2. Plan and study escape route. Set waypoints for a safe nighttime exit. Set the radar's VRM's on shoreline to help determine if you're dragging.
3. If possible **dive the anchor** with a mask to visually check the set.
4. Establish **anchor watch standing procedures** in case conditions warrant it.
5. **At dusk** note all surrounding vessels, navigation lights and prominent features such as trees, structures, headlands and lights.
6. Rig night **anchor lights**. Two are better than one.

## Six Anchoring Techniques

### 1. Single Bow Anchor

Under normal cruising conditions this is the most common technique with at least the following scope (ratio of chain released to depth of water):

- Force 3 (7 to 10 knots) 3 to 1 scope: 150' of chain in 50' of depth
- Force 4 to 6 (11 to 27 knots) 5 to 1 scope: 250' of chain in 50' of depth
- Above force 6 a second bow anchor greatly reduces your chances of dragging.
- Force 7 to 9 (32 to 47 knots) 7 to 1 scope: 245' of chain in 35' of depth

The above is ideal. In some instances, obstructions including other boats, rocks, coral heads will make this much scope impossible.

### 2. Two Bow Anchors

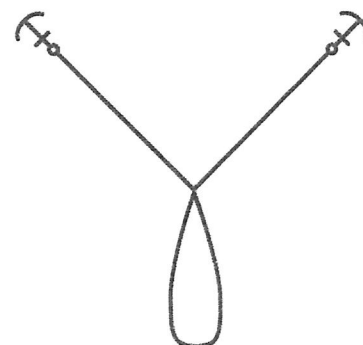
Two bow anchors are useful when:

- Strong winds cause your boat to tack back and forth.
- Holding ground is poor.
- You know winds may increase.
- You want to go ashore and not worry about your boat.

This technique is often combined with a stern line or lines ashore in anchorages where the bottom drops off steeply from shore, e.g., in Patagonia and Alaska.

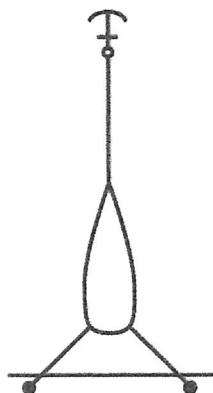
Unless the bottom is foul with coral or rocks, you may be able to set maximum scope on your primary all-chain anchor, then motor slowly forward at a 30 to 60-degree angle, drop the secondary bow anchor and then equalize the loading on the two anchors.

In coral or rocky anchorages, it will be necessary to set the second anchor by dinghy. On boats over 40', it is often easiest to position the tender under the bow roller. Carefully lower the secondary anchor and 30' to 50' of chain into it, then motor or row it out with a second person on the bow easing out the 120' to 250' of nylon anchor rode. When you have reached the limit of the nylon rode stretch



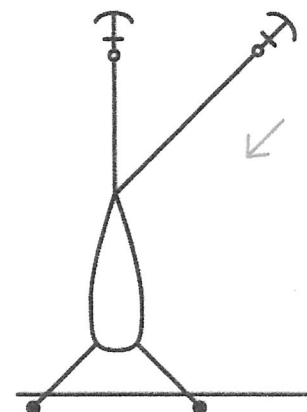
it out as far as possible away from the bow of the yacht, then ease the chain and anchor over the side and have the person on the bow take up the slack.

### 3. Mediterranean Style Mooring



Med-style mooring where you moor bow or stern to a quay is common in many parts of the world, but is a technique that requires planning and practice to carry off smoothly. Many cruisers prefer to moor stern-to, since this allows them to utilize their primary, all-chain-rode. In Scandinavia many boats have stern anchor rollers and windlasses so they can easily anchor bow to shore where depths drop sharply.

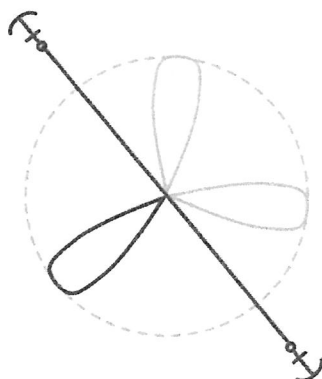
It is best to practice this on a calm day at an empty dock so you'll be ready for first time encounter with med-style mooring. If you're short handed, consider installing a remote power-down control for your windlass at the helm. This way one person can easily lower the bow anchor while backing the boat and the second person has stern lines ready to go ashore.



If you have cross winds or current or a very narrow slot to fit into, having a person in an inflatable to act as a side thruster may save the day. Bow thrusters, while certainly non-essential for ocean cruising, make this maneuver simpler.

Knowing which way your boat tends to back and using that to your advantage is helpful. If your boat is difficult to control in reverse, an option available if the slot you are heading for isn't too narrow is to drop the bow anchor while going forward slowly, pay out the necessary scope, set the brake. Allow the boat to swing around to the bow, then back the short remaining distance to the quay.

### 4. Bahamian Mooring



If you need to anchor where tidal currents might cause the yacht to pass and foul a single bow anchor, or if you're anchoring in an area with a steep drop-off where a 180-degree swing would set the yacht aground, Bahamian mooring is an option.

After dropping your main anchor, a second bow anchor on nylon and chain rode can be set 180 degrees out from the primary anchor. The yacht's swinging radius and chances of fouling the primary anchor in a wind or current shift are greatly reduced.

### 5. Bow and Stern Anchors

This technique is only used when:

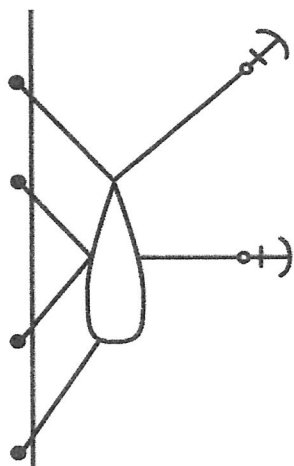
- Shallow water or numerous coral heads reduce swinging room.
- Winds and swell are not from the same direction, e.g. Azores, Hawaii or Marquesas at night when lying to one anchor means rolling in the swell.





- Other boats in an anchorage are moored this way.

## 6. Beam Anchor



Beam Anchor is useful when moored to a rough wharf surface, if wind or current is pressing your vessel against the wharf, you need some space from inquisitive children or if you don't want cockroaches and rats aboard. Once moored along a wharf set a beam anchor to your midship cleat using your dinghy. Loosen dock lines and tension anchor rode to keep your boat off the wharf. An additional option is to drop your main anchor several boat lengths off the wharf at a 45-degree angle to the wharf, reversing in alongside. This technique is frequently used by freighters and megayachts in tight or windy harbors and also aids departure.

## 6. What to Do if You're Dragging

1. **If anchor starts to drag**, it is likely the bow will blow off and the vessel will assume a beam-to-wind and swell orientation. If this happens, IMMEDIATELY start the engine, turn on the nav lights and call for "ALL HANDS ON DECK!!!"
2. **Increase scope**. If this doesn't stop the dragging retrieve and reset the anchor.

## 7. Anchor Retrieval

1. **Motor** slowly towards the anchor and stow the snubber line.
2. **Keep the boat positioned over the anchor rode** as you winch in the rode. Don't place undue stress on the windlass.
3. Once the rode is hanging vertically over the bow the **anchor should disengage** from the seafloor. Let helm know – "anchor is free"
4. Bring the anchor **up entirely** to the bow roller and pin or secure it.

## 8. What Matters: Keeping it Simple

1. **Items we've never used**: swivel connecting anchor & chain, riding sail, tandem anchors or kellet.
2. **Key points**: arrive in good daylight, select anchoring spot carefully, let out substantial amount of scope, and be prepared to move to a safer anchorage if wind increases or changes direction or if an arriving vessel anchors close directly upwind of you.

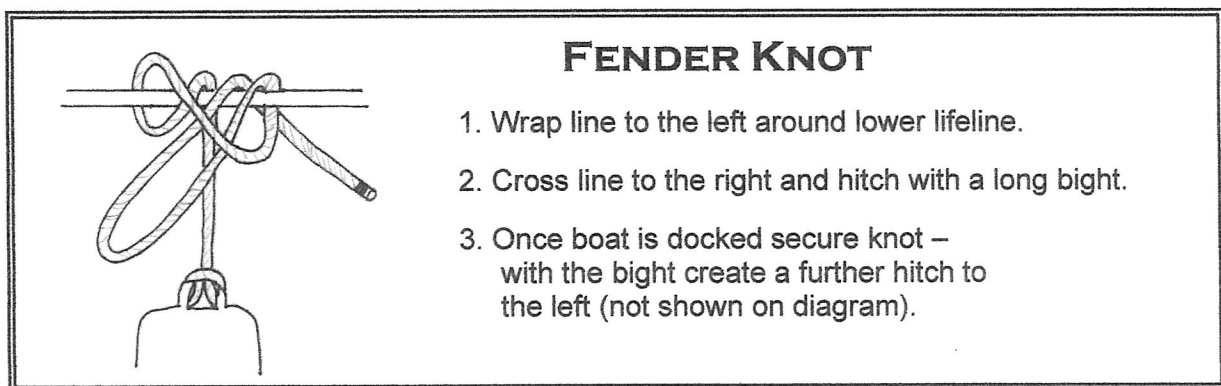
## Anchoring Seamanship, Courtesy and Responsibility.

1. **Monitor depth** regularly
2. **Monitor the position of surrounding vessels**; they may prove to be your highest risk.
3. **Monitor boats upwind**, in the event they drag down on you.
4. **If concerned** about the holding, take bearings with a hand bearing compass and set radar Variable Range Marker (VRM) and Electronic Bearing Line (EBL) on shoreline, and other vessels then shut radar off. Many times, in tropical squalls and in Chile and Antarctica we used the radar to confirm our position at anchor and that of other vessel when visibility was poor.
5. **Marking your anchor** with a brightly colored float may help prevent arriving boats from anchoring too close to you.

6. **Never endanger or block another boat** by anchoring too close to them. If you anchor upwind of a boat that was already anchored and drag down on them, you are legally liable for damages.
7. **Never expect another boat to move** because you anchored too close to them.
8. **It is common for people to anchor close upwind and on top of your anchor.** Expect this. Politely explain that you don't feel safe having your exit blocked if increasing winds force you to leave. If the skipper doesn't offer to move, don't get upset, just move to another spot. The offending skipper has probably never had another boat drag down on them during a midnight squall and must not understand responsibilities and liabilities under maritime law.
9. If there is only one boat anchored in a large bay, the arriving **yachts will inevitably anchor as close as possible** to them. Don't be guilty of this - perhaps they wish some privacy.
10. **Set the radar VRM's** variable range markers on ashore and vessels upwind to determine if you or they are dragging.
11. After dark **monitor** lights and prominent features ashore such as trees, structures, headlands and peaks as a reference against dragging.
12. If you're in an anchorage and the **wind substantially increases or changes direction**, put out to sea, move to a more protected anchorage or set additional anchors. Don't wait to see what other boats do.
13. Never trust a **mooring** unless you know who set it, what the construction is, and when it was last inspected. If possible, swim to check the mooring.
14. **Wear Polaroid sunglasses** in bright sunlight to reduce glare better allowing you to view hazards above and below the surface..

### Anchor Watch Standing Orders

1. **One person stands watch** under the dodger, dressed for going to sea, for an hour, waking the next watch ten minutes before change of watch, completing the log entry and briefing the next watch.
2. **Log Entry** includes time, depth, GPS position, barometer, wind speed & direction, bearings, average compass heading and any other pertinent information.
3. **Tools:** headlamp, spotlights (2), binoculars, horn, handheld VHF on Ch 16, laser range finder
4. **Monitor:** depth, radar, bearings, distance to upwind vessels (with laser range finder and radar) and check snubber for chafe every 20 minutes.
5. **If anchor starts to drag**, it is likely the bow will blow off so that vessel will assume a beam-to-wind and swell orientation. If this happens, **IMMEDIATELY** start the engine and yell, "ALL HANDS ON DECK!!!" Turn on nav lights.
6. **If a vessel is dragging down on you** immediately start the engine and power forward at an angle away from the dragging vessel.
7. **Notify the captain** if wind average increases more than 5 kts, depth decreases more than tidal variance or visibility deteriorate.



# DOCKING PROCEDURES ABOARD MAHINA TIARE

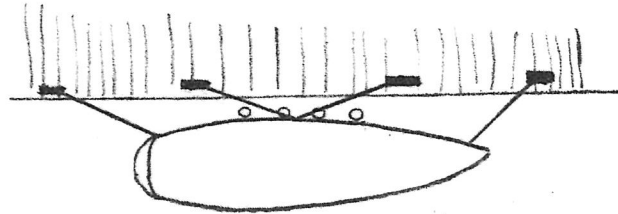
## DOCKING EQUIPMENT

**Docklines:** Stowed starboard lazarette. All 6 dock lines have a 10" eye splice. 4 at 30' with white tail whipping two at 45' with blue tail whippings.

**Fenders:** One fender is stowed in the starboard aft lazarette and three large fenders are stowed in the anchor locker.

**Boat Hook:** located port cabin top beside handrail.

**Bow Thruster:** Wireless remote is stored at nav station beside the radar. A thruster test is generally done on dock approach. Crew will be alerted of thruster use as the thruster makes considerable noise and when standing at the bow a sideways motion is experienced.



1. Establish whether we will be **docking to port or starboard**.
2. **Rig dock lines.** The inboard (bitter) end is secured to a cleat. Run the line shoreward from the cleat, then back over the pulpit or lifeline so it is ready to send ashore. Coil it. The eye generally goes ashore with a request to drop it over a cleat/bollard. Be careful NOT to allow any lines to fall in the water where they could foul and damage the propeller or thruster.
3. **Rig fenders.** Two fenders forward of mid-ship gate and two aft of gate. Tie them to the lower lifeline, to correct height - generally not quite touching the water. .
4. **Establish crew docking stations:** docking master, bow line, forward spring, aft spring, stern line, dock jumper, roving fender attendant and boat hook bearer if required.
5. **Full attention by all crew is required**, unnecessary chatter is distracting. If we're looking for a posted slip number it's helpful if those at the bow look closely, generally they sight the slip before cockpit crew.
6. The **docking master will advise all crew** of the plan - which dock lines to first send ashore, what obstructions we need to be aware of and check that everyone is ready at their stations.
7. As we approach the dock, **note wind and current direction and velocity**. Check for lines or debris in the water. Clearly advise helm of any potential obstacles or potential dangers observed.
8. Bow person **calls the distance** from the dock
9. Please **DO NOT throw dock lines to anyone ashore who isn't MT crew**, unless requested to do so by the helmsperson, as they inevitably will quickly cleat the line off or start pulling on the line, taking control away from the helm.
10. **When directed send the appropriate dock line eye ashore.** When secured ashore on cleat/bollard clear the line from the boat cleat, standing by to take up slack or to ease. Make fast when directed.
11. **NEVER LEAP/JUMP for the dock** if you consider it unsafe. Be aware docks may be slippery.
12. If we are about to hit something don't endanger your hands or feet instead **use a fender between the boat and dock**, piling or another vessel. **Push on the toerail**, not stanchions or lifelines.
13. Once vessel is secure, **note our position**. Should we can move fore or aft to allow room for future arriving vessels?
14. **Dock line tails** are generally kept aboard, not on the dock. Tidy dock lines with Flemish or regular coils.
15. **Rig chafe gear** where/if appropriate.
16. Docking master completes a **final check** of vessel and lines and **relieves crew** of station duties.
17. Always **be prepared to lend a hand** to any boat that is approaching or getting ready to depart.
18. **Collect rubbish** if disposal is possible and or necessary, organize hose to fill water tank and wash down. Rig shore power cord if power is available.

## NAVIGATION GUIDELINES

To be prepared for possible early morning departures, it is essential that your day's navigation and plotting be completed the night before.

1. **Days Run:** Plan route and calculate mileage with dividers, dividing miles by 6 knots to obtain an estimate of day's run for establishing departure time.
2. **Tide:** Calculate tide for nearest port from tide tables, and note them in the logbook.
3. **Pilot Book and Cruising Guides:** Read all relevant information, taking special note of narrow passes, tides, currents, dangers and obstructions. Note primary and alternative anchorages and locate harbor charts or drawings.
4. **Track:** Plot track on chart lightly in pencil and label with small, neat writing as follows:

Waypoint: Small circle at intersection of track

Choose a waypoint name that corresponds to the nearest geographical point.

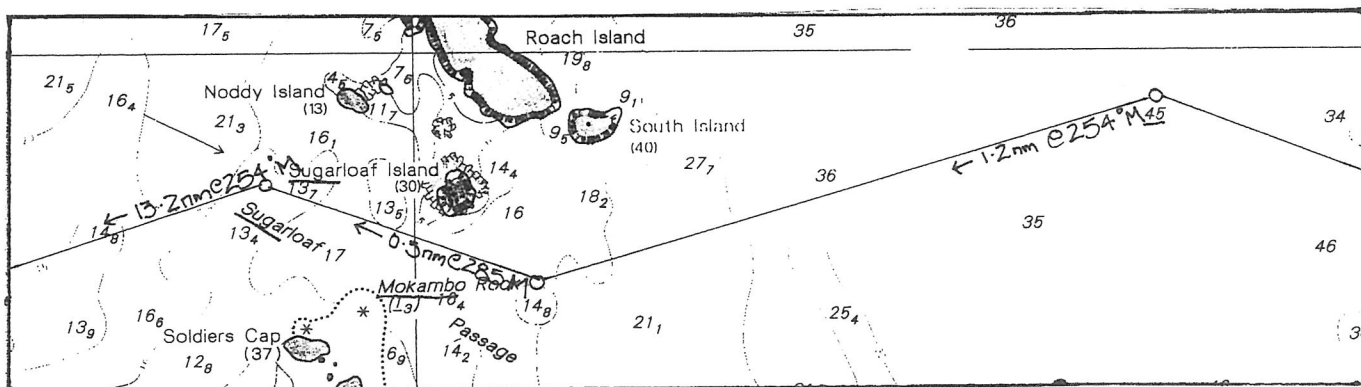
Underline the geographical point which the waypoint is named after.

If no geographical name is possible write a given name next to the waypoint

Mileage: just after the beginning of each course line write distance in miles followed by lower case nm followed by @.....then

Course: magnetic followed by upper case M.....then

Arrow: place and arrow in direction of course. e.g. 3.2 nm @ 184° M →



5. **Log Book:** Enter days plotting into table on page opposite hourly log entries. Use degrees, minutes and three decimal points for all waypoints otherwise you can't enter them into the GPS. eg. 31°30.100

| Waypoint           | Course | Miles | Latitude  | Longitude  | Chart |
|--------------------|--------|-------|-----------|------------|-------|
| MOKAMBO            | Z54    | 1.2   | 31°30.100 | 159°04.124 | 73B   |
| SUGAR              | Z85    | 0.5   | 31°30.250 | 159°05.500 | 73B   |
| Total Days Mileage |        | 1.7   |           |            |       |

6. **Global Positions Systems:** Enter waypoints into GPS and double check for errors.
7. **Dangers:** Note and familiarize yourself with hazards along your route, remembering that because of wind direction we may need to deviate from the plotted course.
8. **Navigator's Duties:** Ensure log entries are made hourly and whenever an identifiable landmark is passed. Plot position on chart every 2-3 hours. Brief each helmsperson as to where we are on the chart in relation to our course and dangers. Note time of all anchoring or mooring, depth, and GPS position in logbook. Plot position to check accuracy of chart.

## Page 16

## Passage

Date 7 OCTOBER

SPITZBERGEN

21

North Pole

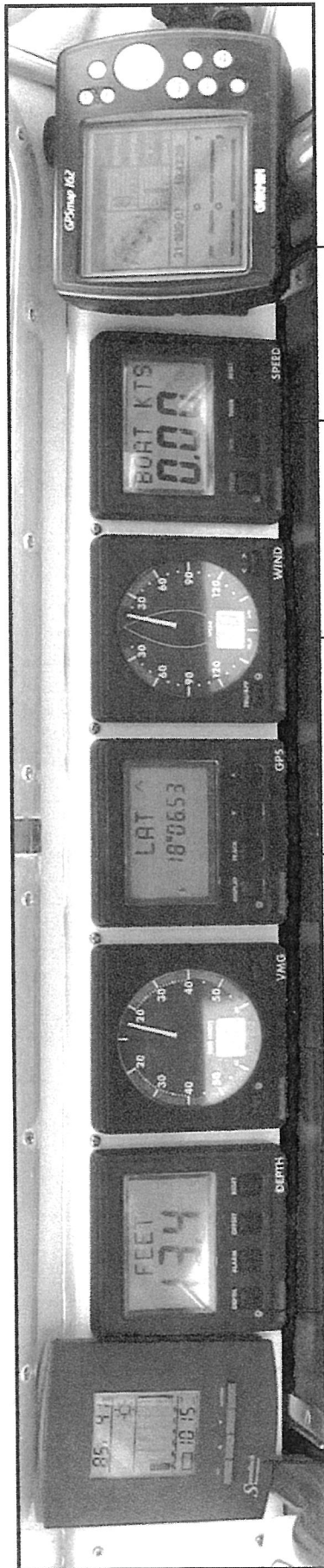
| Time | Course                        | Kts                  | Log                                           | Sky              | Wind                      | Speed                                | Baro                                | Latitude     | Longitude     | Range | Bear. | Remarks             |
|------|-------------------------------|----------------------|-----------------------------------------------|------------------|---------------------------|--------------------------------------|-------------------------------------|--------------|---------------|-------|-------|---------------------|
| 0300 | 00°                           | 10.3                 | 70641                                         | 10%              | SE                        | 16                                   | 1012                                | 03° 41' .762 | 139° 47' .134 | 142   | 003   | 2ND REEF MAIN GUSTY |
| 0400 | 003°                          | 9.1                  | 70621                                         | 70%              | SW                        | 12                                   | 1013                                | 03° 49' .621 | 140° 73' .196 | 140   | 005   | 3RD REEF MAIN RAIN  |
|      |                               |                      |                                               | % of cloud cover | Compass direction of wind | Small box readout on wind instrument | Barometer reading - left instrument | From GPS     | From GPS      |       |       | Comments            |
|      |                               |                      | Trip button- 2 <sup>nd</sup> from boats speed |                  |                           |                                      |                                     |              |               |       |       |                     |
|      | Course steered by helmsperson | Speed from knotmeter |                                               |                  |                           |                                      |                                     |              |               |       |       |                     |
|      | Time in 24-hour clock         |                      |                                               |                  |                           |                                      |                                     |              |               |       |       |                     |

**Symbols**

 anchor up      
 anchor down



# COCKPIT INSTRUMENTS



**Barometer**  
electronic

**Closehaunched Indicator**  
Valid only when the wind is  
forward 60 degrees.  
Expanded view of wind  
indicator.

**True Wind Angle**  
**True Wind Speed**

**GPS – Garmin Map 162**

**Boat Speed**

**Trip Button** – used for  
measuring miles in log entry.

**SOG – Speed Over  
Ground**  
**GPS** for SeaTalk instruments

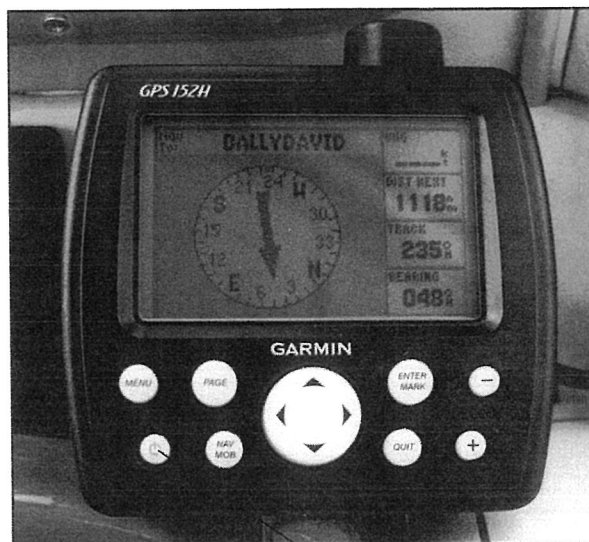
**Depth**

Measured in feet below keel.

\* Note: our navigation charts are  
in meters, feet and fathoms.

1 meter = 3 feet  
1 fathom = 6 feet

# GPS INSTRUCTIONS



## Entering a Waypoint

*MENU* x 3  
*ENTER* (new waypoint)

▲ X 2

*ENTER*

Spell waypoint  
*ENTER*

▼

*ENTER*

Modify present latitude

▶

Modify present longitude  
*ENTER*

▼

▶ X2 to OK. Double check lat and long  
*ENTER*

*QUIT*

## Turn On

Bottom left button  
Also controls lighting and contrast

## Selecting a Waypoint

*NAV*

▼ go to waypoint  
*ENTER*

▼ to desired waypoint  
*ENTER* x2

## Deleting a Waypoint

*MENU* x 2

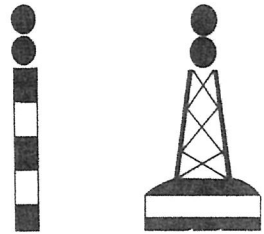
▼ to desired waypoint  
*ENTER*

◀ x2 to *DELETE*  
*ENTER* for OK  
*ENTER*  
*QUIT*

# NAVIGATION MARKS

## Isolated Danger Marks – Black with Red ban base

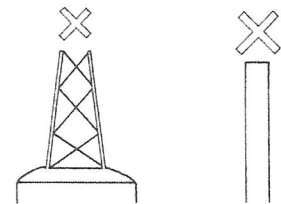
Erected or moored above an isolated danger that has navigable water all around it.  
Group Flash (2) white lights.



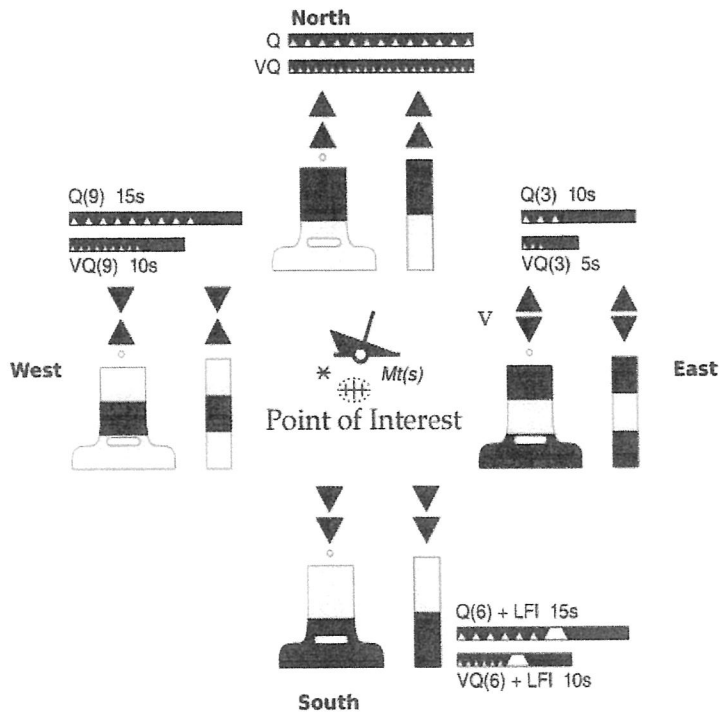
## Special Marks - Yellow

Primarily used to assist in navigation, special buoys indicate special areas or features such as military exercise zones, recreation zones, traffic separators etc. They're the same in both IALA buoyage systems.

Their lights, when they have them, are yellow and can have any rhythm apart from those used by isolated danger, cardinal, safe water, lateral and emergency wreck buoys.





## Cardinal Marks



# Usual Marks in the Leeward Islands of Tahiti

## LOCAL MARKS

In all the islands, Local Marks are to be kept:

- Red  on the island side  
Green  on the reef side  
(See Fig. 1)

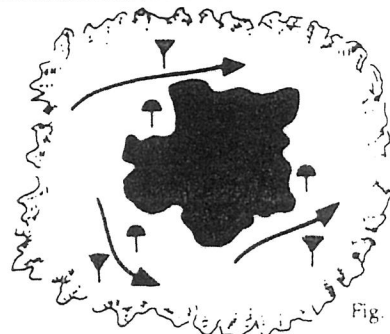




Fig. 1

## LATERAL MARKS

When coming from seaward into the lagoon and to the wharf Lateral Marks are to be kept:

- Red  on portside  
Green  on starboard side  
(See Fig. 2)

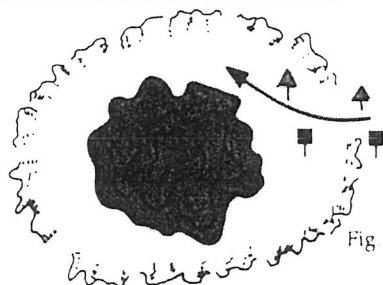


Fig. 2

**NOTE:** Inside the lagoons of Tahaa and Raiatea, as the direction of buoyage is counter-clockwise around these islands, you will always have the red marks on the island side and the green marks on the reef side.

(See Fig. 3)

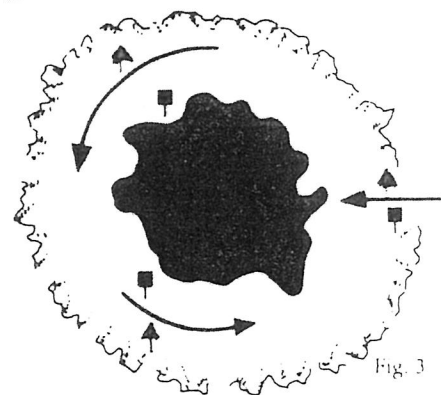






Fig. 3

## CARDINAL MARKS

- |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|  |  |  |  |
| <b>NORTH</b>                                                                        | <b>SOUTH</b>                                                                        | <b>WEST</b>                                                                         | <b>EAST</b>                                                                         |
| You must sail North of this mark.                                                   | You must sail South of this mark.                                                   | You must sail West of this mark.                                                    | You must sail East of this mark.                                                    |

## LATITUDE BY NOON SIGHT

|    |                  |     |     |   |                                  |   |   |  |
|----|------------------|-----|-----|---|----------------------------------|---|---|--|
| 1  | HS               | °   | '   |   | Declination                      | ° | ' |  |
| 2  | IC (+ or -)      |     |     |   | d corr/code                      |   |   |  |
| 3  | HS true          |     |     |   | Declination True                 | ° | ' |  |
| 4  | Dip ft           | —   |     |   |                                  |   |   |  |
| 5  | App. Alt         |     |     |   | Date                             |   |   |  |
| 6  | Alt. Corr.       | +   |     |   |                                  |   |   |  |
| 7  | HO               | °   | '   |   | DR Lat.                          |   |   |  |
| 8  | Zentith          | 89° | 60' | 0 | DR Long.                         |   |   |  |
| 9  | HO               | —   |     |   | Aprox. GMT Time<br>of Local Noon |   |   |  |
| 10 | Zentith Distance |     |     |   |                                  |   |   |  |
| 11 | Declination      |     |     |   |                                  |   |   |  |
| 12 | Latitude         | °   | '   |   |                                  |   |   |  |

## LATITUDE BY NOON SIGHT

|    |                  |     |     |   |                                  |   |   |  |
|----|------------------|-----|-----|---|----------------------------------|---|---|--|
| 1  | HS               | °   | '   |   | Declination                      | ° | ' |  |
| 2  | IC (+ or -)      |     |     |   | d corr/code                      |   |   |  |
| 3  | HS true          |     |     |   | Declination True                 | ° | ' |  |
| 4  | Dip ft           | —   |     |   |                                  |   |   |  |
| 5  | App. Alt         |     |     |   | Date                             |   |   |  |
| 6  | Alt. Corr.       | +   |     |   |                                  |   |   |  |
| 7  | HO               | °   | '   |   | DR Lat.                          |   |   |  |
| 8  | Zentith          | 89° | 60' | 0 | DR Long.                         |   |   |  |
| 9  | HO               | —   |     |   | Aprox. GMT Time<br>of Local Noon |   |   |  |
| 10 | Zentith Distance |     |     |   |                                  |   |   |  |
| 11 | Declination      |     |     |   |                                  |   |   |  |
| 12 | Latitude         | °   | '   |   |                                  |   |   |  |

## LATITUDE BY NOON SIGHT

|    |                  |     |     |   |                                  |   |   |  |
|----|------------------|-----|-----|---|----------------------------------|---|---|--|
| 1  | HS               | °   | '   |   | Declination                      | ° | ' |  |
| 2  | IC (+ or -)      |     |     |   | d corr/code                      |   |   |  |
| 3  | HS true          |     |     |   | Declination True                 | ° | ' |  |
| 4  | Dip ft           | —   |     |   |                                  |   |   |  |
| 5  | App. Alt         |     |     |   | Date                             |   |   |  |
| 6  | Alt. Corr.       | +   |     |   |                                  |   |   |  |
| 7  | HO               | °   | '   |   | DR Lat.                          |   |   |  |
| 8  | Zentith          | 89° | 60' | 0 | DR Long.                         |   |   |  |
| 9  | HO               | —   |     |   | Aprox. GMT Time<br>of Local Noon |   |   |  |
| 10 | Zentith Distance |     |     |   |                                  |   |   |  |
| 11 | Declination      |     |     |   |                                  |   |   |  |
| 12 | Latitude         | °   | '   |   |                                  |   |   |  |



# LINE OF POSITION — H. O. 229

| GREENWICH MEAN TIME    |                            |   |     | SHIP'S LOG DATA        |                          |   |   |
|------------------------|----------------------------|---|-----|------------------------|--------------------------|---|---|
| 1                      | Chronometer                | h | m   | 28                     | Date                     |   |   |
| 2                      | Stop Watch (-)             |   |     | 29                     | Body                     |   |   |
| 3                      | Chrono. time of sight      |   |     | 30                     | Hs                       |   |   |
| 4                      | Chronometer F (-) or S (+) |   |     | 31                     | DR Latitude              |   |   |
| 5                      | Chrono. corrected          |   |     | 32                     | DR Longitude             |   |   |
| 6                      | 12 hour correction (+)     |   |     | 33                     | Log                      |   |   |
| 7                      | GMT (Date )                | h | m   | 34                     | Course                   |   |   |
| GREENWICH HOUR ANGLE   |                            |   |     | DECLINATION            |                          |   |   |
| 8                      | GHA (hr.)                  | o | /   | 35                     | Dec. (hr.)               | o | / |
| 9                      | GHA (m. & s.) (+)          |   |     | 36                     | d corr./code (+) or (-)  |   |   |
| 10                     | GHA (sun, aries)           |   |     | 37                     | Declination true         |   |   |
| 11                     | GHA (moon, planets, stars) |   |     |                        |                          |   |   |
| LOCAL HOUR ANGLE       |                            |   |     | HEIGHT OBSERVED        |                          |   |   |
| 12                     | GHA (from 10 or 11)        |   |     | 38                     | Hs                       |   |   |
| 13                     | 360 (+)                    |   |     | 39                     | LC (+) or (-)            |   |   |
| 14                     | Total                      |   |     | 40                     | Hs true                  |   |   |
| 15                     | AP Longitude (-)W, (+)E    | L |     | 41                     | Dip (ft. ) (-)           |   |   |
| 16                     | Total                      |   | 000 | 42                     | Apparent Altitude        |   |   |
| 17                     | 360 (-)                    |   | 000 | 43                     | Alt. Corr. (+) or (-)    |   |   |
| 18                     | LHA                        |   | 000 | 44                     | Ho (sun, planets, stars) |   |   |
|                        |                            |   |     | 45                     | Ho (moon)                |   |   |
| H.O.229 ARGUMENTS      |                            |   |     |                        |                          |   |   |
| 19                     | LHA                        |   | 000 |                        |                          |   |   |
| 20                     | AP Latitude                |   | 000 |                        |                          |   |   |
| 21                     | Declination true           |   |     |                        |                          |   |   |
| H.O.229 — EXTRACT — Hc |                            |   |     | H.O.229 — d CORRECTION |                          |   |   |
| 22                     | Hc                         |   |     | 46                     | Tens                     |   |   |
| 23                     | d corr./ code (+) or (-)   |   |     | 47                     | Units and decimals       |   |   |
| 24                     | Hc true                    |   |     | 48                     | Total d correction       |   |   |
| H.O.229 — EXTRACT — Zn |                            |   |     | INTERCEPT              |                          |   |   |
| 25                     | 360° or 180°               |   |     | 49                     | Ho or Hc                 |   |   |
| 26                     | Z (+) or (-)               |   |     | 50                     | Ho or Hc (-)             |   |   |
| 27                     | Zn                         |   |     | 51                     | Intercept T or A         |   |   |

Zn Rule: N. Lat. [ LHA greater than 180° ..... Zn = Z  
LHA less than 180° ..... Zn = 360° - Z  
S. Lat. [ LHA greater than 180° ..... Zn = 180° - Z  
LHA less than 180° ..... Zn = 180° + Z

Intercept Rule: If Ho is greater than Hc,  
intercept is from AP toward body.  
If Hc is greater than Ho,  
intercept is from AP away from body.

## MOON, PLANETS (additional correction)

|                              |                         |  |  |
|------------------------------|-------------------------|--|--|
| 1                            | GHA (line 10)           |  |  |
| 2                            | v corr./code (+)        |  |  |
| 3                            | GHA (to line 11)        |  |  |
| MOON (additional correction) |                         |  |  |
| 1                            | Ho (line 44)            |  |  |
| 2                            | HP corr./code (+)       |  |  |
| 3                            | Total                   |  |  |
| 4                            | Upper limb corr. (-30') |  |  |
| 5                            | Ho moon (to line 45)    |  |  |

## STARS (additional computation)

|   |                       |  |  |
|---|-----------------------|--|--|
| 1 | GHA aries (line 10)   |  |  |
| 2 | SHA star (+)          |  |  |
| 3 | GHA star              |  |  |
| 4 | 360° (-)              |  |  |
| 5 | GHA star (to line 11) |  |  |

# DIESEL ENGINE ESSENTIALS



## What does a diesel engine do?

- Converts diesel fuel to energy: torque and electricity.

## 6 Components of a Diesel Engine - similarities to the body

1. **Fuel system** - food
2. **Electrical** - brain
3. **Cooling system** - hydration, sweating
4. **Lubricating system** - blood stream
5. **Air** - breathing
6. **Transmission** - movement

### 1. Fuel System

- Inspect and clean tanks.
- Install fuel tank sump pump.
- Pre-filter fuel if questionable (West Marine).
- Always add biocide/algaecide: Biobor JF or Star Brite.
- Lift pump brings the fuel from the tank to the fuel filter.
- Injection pump pressurizes the fuel and sends it to the injectors.
- Injectors spray the fuel into the cylinders at the right moment.
- BANG! The fuel/air mixture explodes due to compression.
- High pressure common rail engine vs traditional mechanical fuel injection engine.

### 2. Electrical

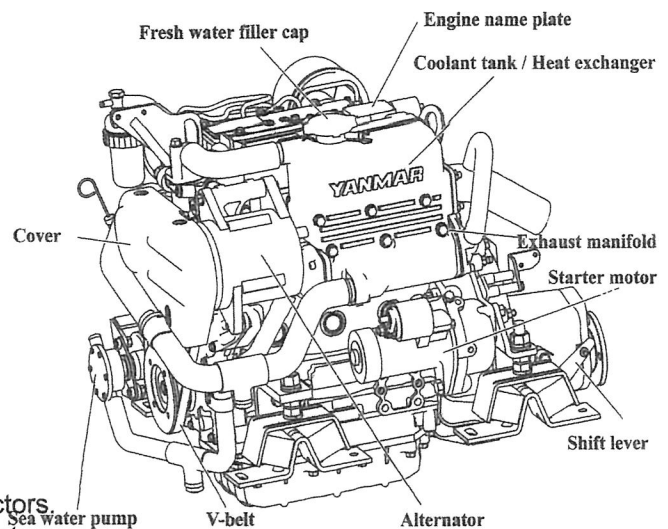
- The electrical system on your boat is very similar to the one in your car.
- An electric starter motor starts the engine and an alternator generates electricity.
- Belt tension is very important; if the belts slip, the alternator doesn't work or gets "fried".
- Check for "wiggle" in all wire connections.
- Replacing standard alternator with a high output Balmar and smart regulator speeds charging.

### 3. Cooling System

- Engine generates a lot of heat from the explosions; without efficient cooling, the engine overheats and stops.
- Engines have two separate cooling systems: sea water and fresh water.
- Marine diesel engines use seawater to cool the circulating freshwater by way of a heat exchanger.
- Sea water is sucked into the heat exchanger by a raw water pump.
- Potential causes of overheating: debris sucked into sea water intake (plastic bag, jellyfish, etc.), water pump impeller wearing out, belts slipping or broken.
- Check simplest solutions first: water flow, belt tension before checking impeller.
- Note if your engine has sacrificial zinc anodes and replace when 50% is eroded. Carry three sets of spare zincs.
- Check hose clamps and squeeze hoses checking for soft spots.

### 4. Lubricating System - Oil

- Keeps the parts moving. Without oil, the engine stops.
- Carries away waste by-products (sulfur and carbon).
- Needs to be filtered. Oil filter is like your liver, filtering out impurities.
- Change oil and filter at number of engine hours specified by manufacturer or at least annually.
- Annual oil analysis shows unusual wear patterns.

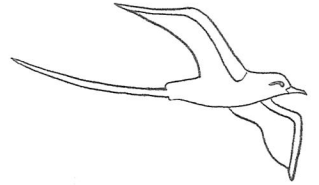


#### Oil Change Quick Tips

- Use a Zip-loc when unscrewing and removing the filter.
- Drain oil from filter and Zip-loc into waste oil container.

## 5. Air

- Diesel engines need lots of clean air.
- Air filter needs to be cleaned or replaced at least once a season or when visually dirty.



## 6. Transmission

- The transmission on a boat is similar to one in a car; it takes energy from the engine to make the boat move forward.
- The transmission fluid level needs to be checked weekly and replaced at least annually.

## Start Up and Operating Procedures

- Before start up
- After start up
- While motoring

## Engine Maintenance

- Engine log and hour meter
- Zincs: prop, hull and engine
- Winterizing
- Siphon break
- Saildrive seals

## Annual Mechanics Check

- Valves
- Alignment

## Environmental Matters

- Do the right thing!
- Clean engine and bilge.
- Oil sorb pads.

### Quick Tips

- When replacing both fuel filters, fill them to the top with clean fuel before screwing the lid down or screwing the cartridge to the engine, thus eliminating the need to bleed the fuel system (nasty job!).
- Engine should run up to within 100-200 rpms of maximum rated with wide open throttle (WOT).
- Smaller Yanmars (GM, YM & QM series) are famous for having their smaller-than-normal exhaust elbows carbon up, resulting in reduced power and in time, inability to start. These water-injection exhaust elbows are also subject to corroding through in as little as five years, resulting in seawater backfilling into the cylinders which can cause catastrophic failure. Solutions: run these engines up to within 200 rpms of max rated speed every 2-4 hours ("Italian Tune-Up") and pull the exhaust hose checking for carbon build-up and corrosion at least annually. Higher quality and much less expensive stainless after-market elbows are available from [www.exhaustelbow.com](http://www.exhaustelbow.com).

## 20-Year-Old Engine and Heading Offshore

- Compression check.
- Service injectors.
- Replace fuel lift pump.
- Rebuild starter and alternator.
- Service heat exchanger, oil & transmission coolers.
- Replace engine mounts.
- Replace exhaust water injection elbow.
- Remove & inspect shaft, replace cutlass bearing.
- Check damper drive plate.

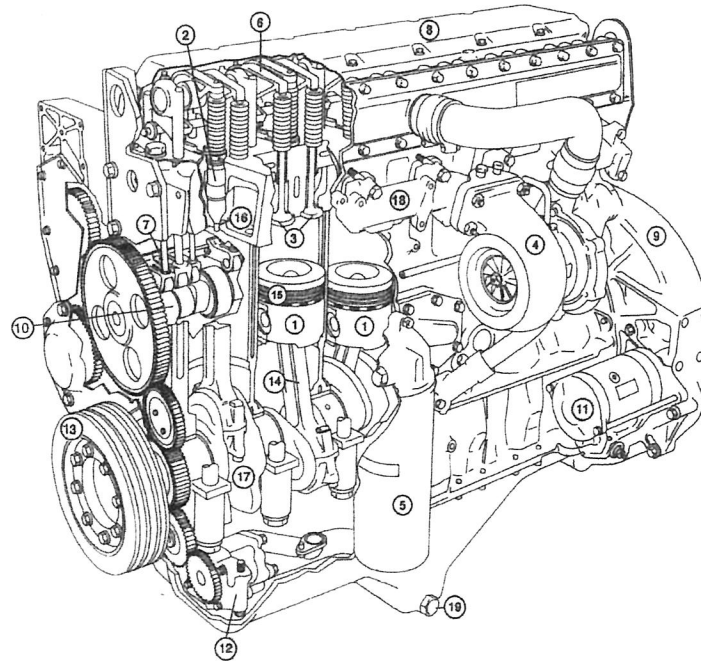
## Resources

- Diesels Afloat - Pat Manley
- Marine Diesel Engines - Nigel Calder
- Engine Manuals: operators, shop & parts
- Marine Diesel Engine Maintenance DVD - by Bennet Marine
- Marine Diesel Engine Essentials – a Learning & Coloring Book - Amanda Swan Neal & Andrea England

## [www.mahina.com/forms.html](http://www.mahina.com/forms.html)

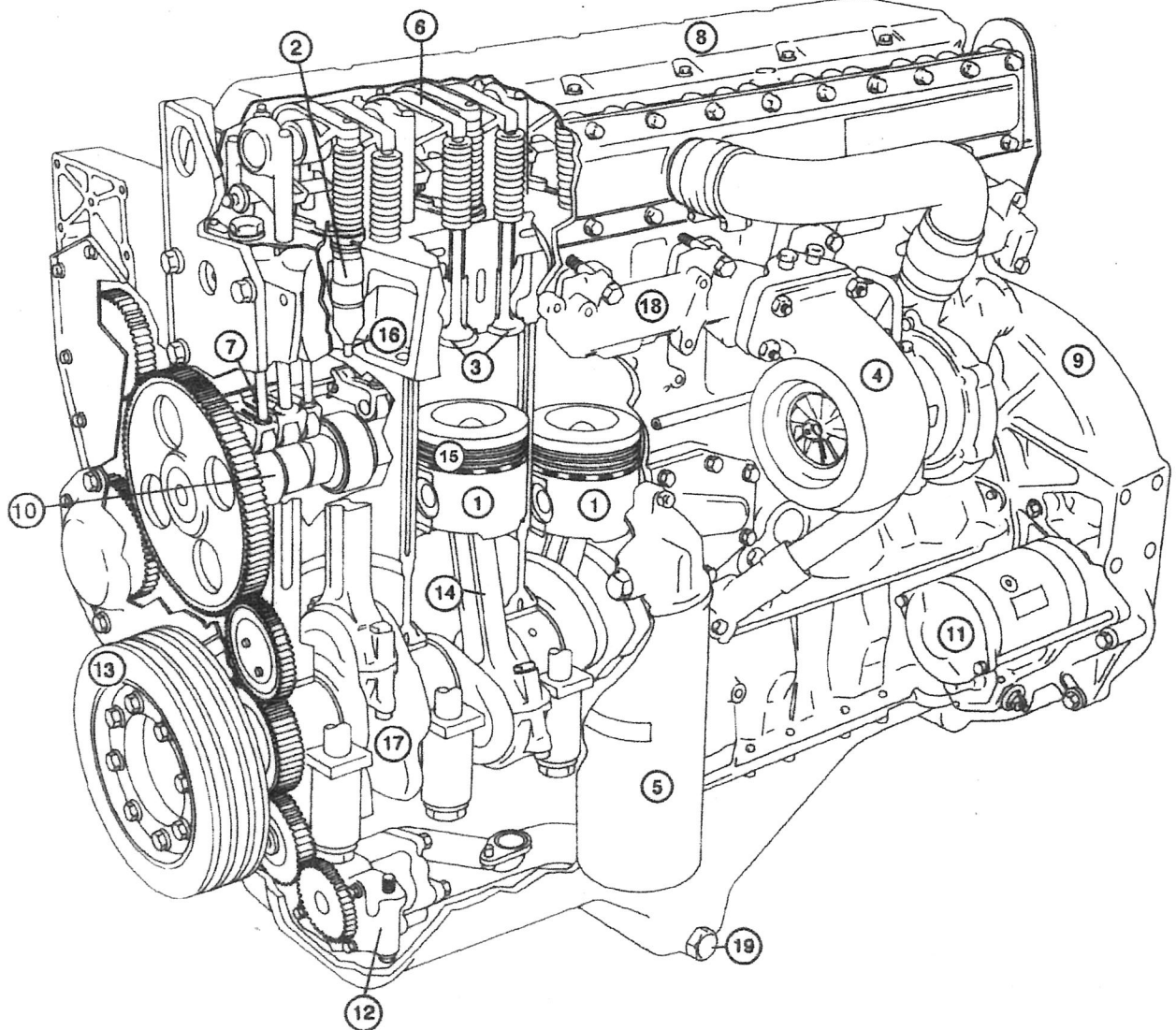
- Engine Spare Parts List
- Spare Parts on Mahina Tiare
- Mahina Expeditions Diesel Engine Test

### HOME WORK: name these 19 engine parts



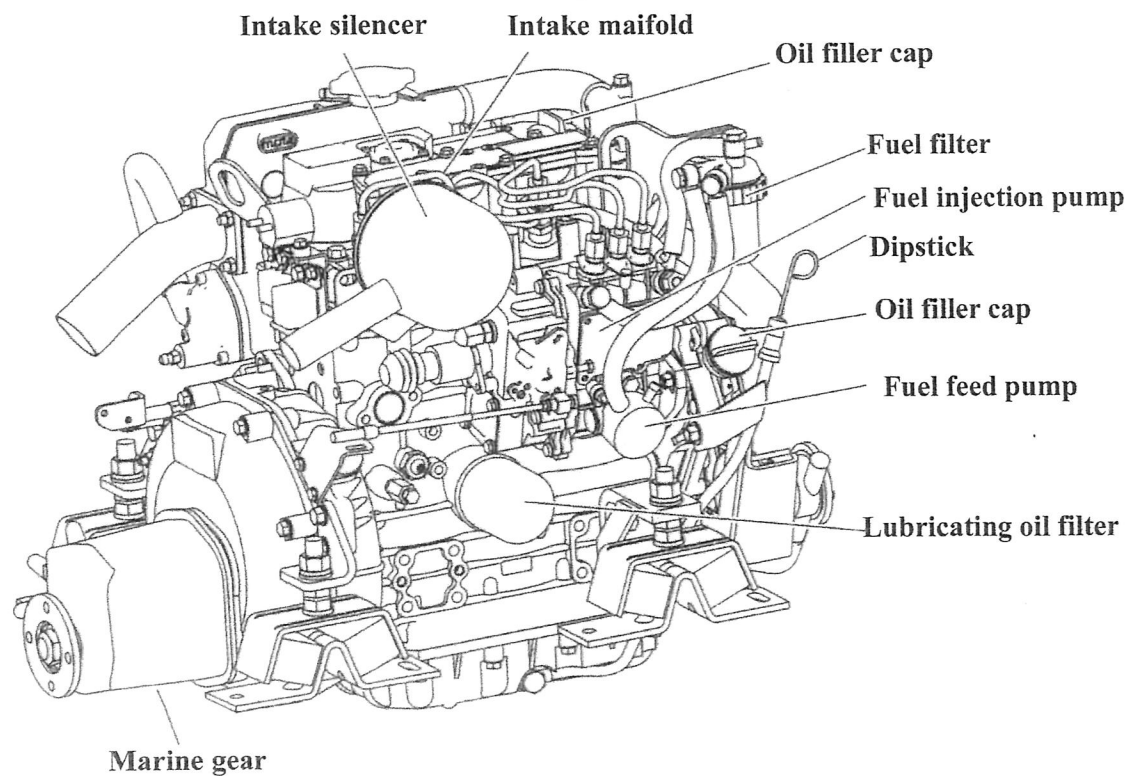
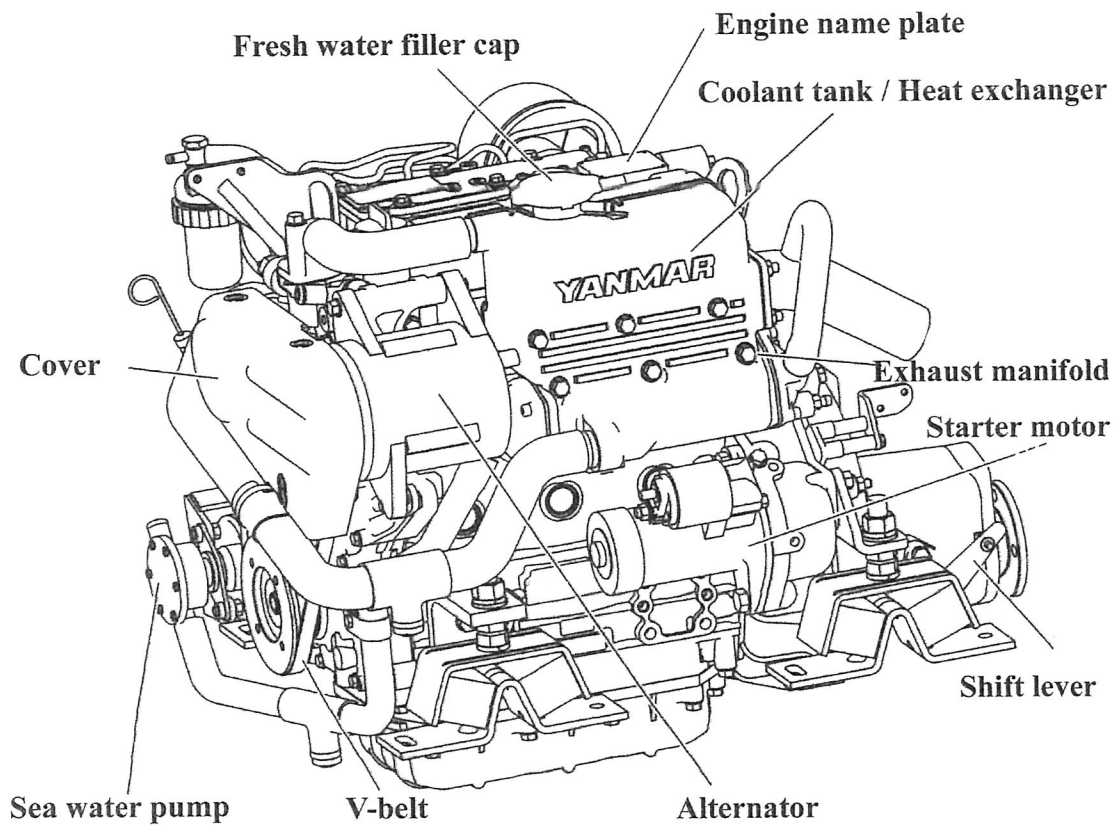
## ENGINE PARTS     SIDE VIEW FOUR-CYCLE DIESEL ENGINE

Courtesy Nigel Calder



- |                 |                      |
|-----------------|----------------------|
| 1. Piston       | 11. Starter          |
| 2. Injector     | 12. Lube oil pump    |
| 3. Valve        | 13. Fly wheel        |
| 4. Turbocharger | 14. Con rod          |
| 5. Oil filter   | 15. Piston rings     |
| 6. Rocker arm   | 16. Injector nozzle  |
| 7. Push rod     | 17. Crankshaft       |
| 8. Valve cover  | 18. Exhaust manifold |
| 9. Bell housing | 19. Oil drain        |
| 10. Cam shaft   |                      |

## TYPICAL MARINE DIESEL ENGINE





# ENGINE & SYSTEM SPARES

## ABOARD MAHINA TIARE – HR 46



### Engine- Volvo TMD 31L 95 hp diesel

(Enough consumables for one season)

#### Filters

- 8 Oil filters
- 4 Racor fuel filters
- 4 Transmission filters
- 2 Volvo fuel filters
- 1 Engine air filters

#### Engine Electrical

- 1 12 volt alternator
  - 2 sets of belts
- 1 24 volt alternator
  - 4 sets of belts
- 1 Starter motor with solenoid
- 1 Voltage regulator, 24 volt
- 1 Alternator bracket
- 1 24 volt alternator wiring harness
- (MT is a dual-voltage boat; 24 v for larger loads and 12 v for starting and small loads)

#### Engine Cooling System

- 2 Salt water pumps (complete)
- 1 rebuild kit for fresh water circulation pump
- 5 Impellers
- 2 Thermostats
- 1 Transmission oil cooler

#### Plumbing

- 1 Par Max 4 spare bilge pump
- 1 Par Max 4 fresh water house pump
- 1 Jabsco Twist'n'Lock manual head pump assembly and rebuild kit
- 1 Jabsco Quiet-Flush electric head pump & macerator plus spares kit
- (MT has one manual and one electric head)

#### Watermaker-PUR Endurance 160

- 1 Pump assembly
- 1 Offshore rebuild kit
- 6 Pre filter elements
- Spare membrane & motor (in office)

#### Propane System

- 1 complete set of spares for entire system including:

- 1 Regulator
- 1 Solenoid and sniffer
- 2 Pigtails
- 1 Xintex fume detector and control system

#### Electrical

Assorted-Light fixtures; bulbs, fuses, circuit breakers, spare wire

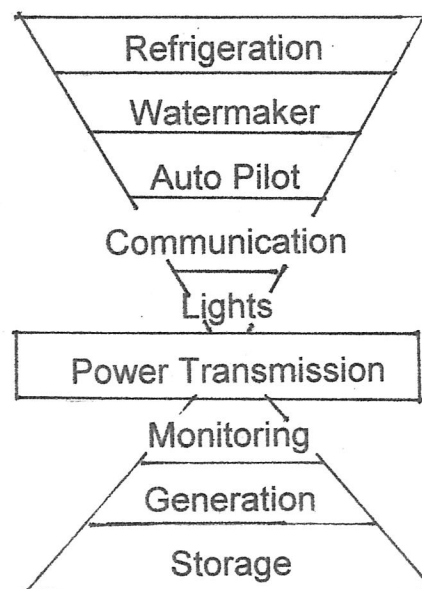
#### Boat

- 1 Emergency VHF antenna
- 1 Inflatable dinghy repair kit
- 1 Inflatable dinghy repair 2-part glue
- 2 Stanchions

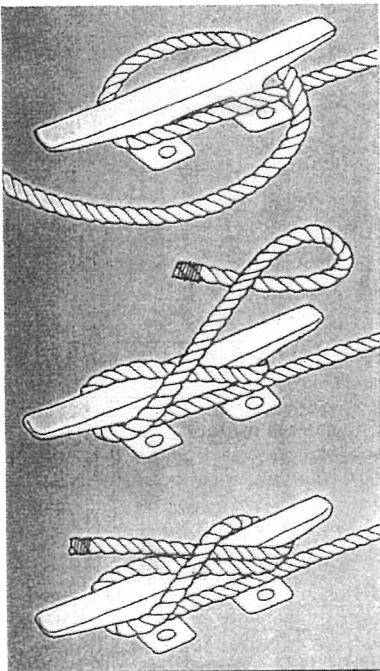
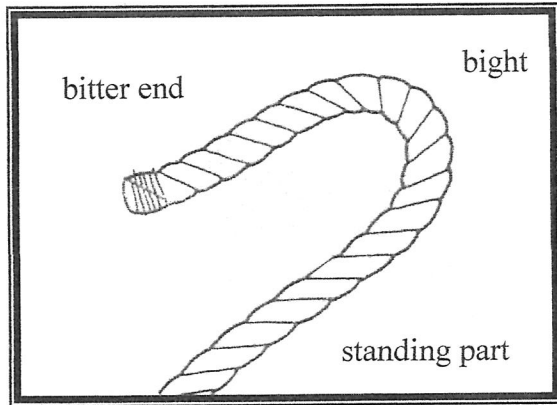
#### Miscellaneous

- 1 spare fixed prop and puller
- 30 Hose clamps
- 3 Max prop zincs
- 3 Hull zincs
- 6 Bow thruster zincs
- Autopilot CPU (in office)
- Assorted nuts, bolts, washers & screws

## ELECTRICITY ABOARD

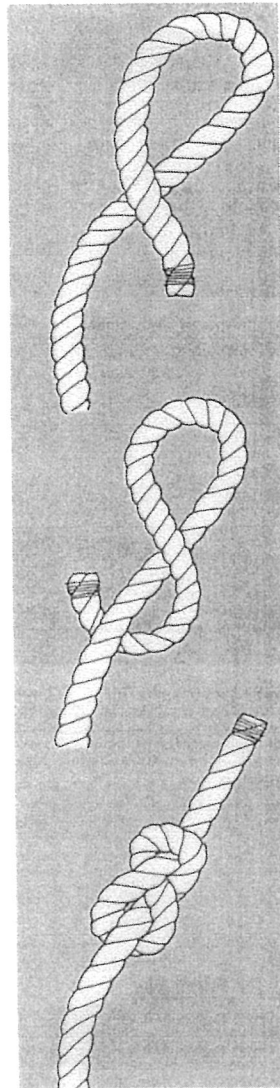


## KNOTS, BENDS, AND HITCHES



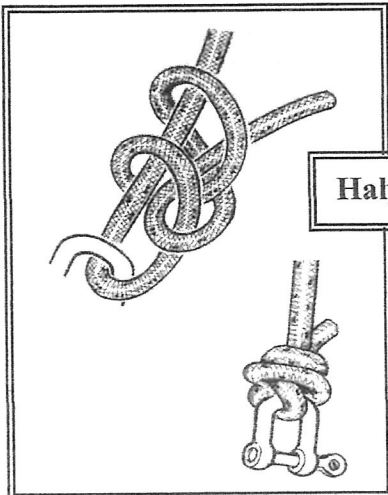
### Cleating a Line

Snub the line with a 360 followed a figure 8 finishing with a half hitch.

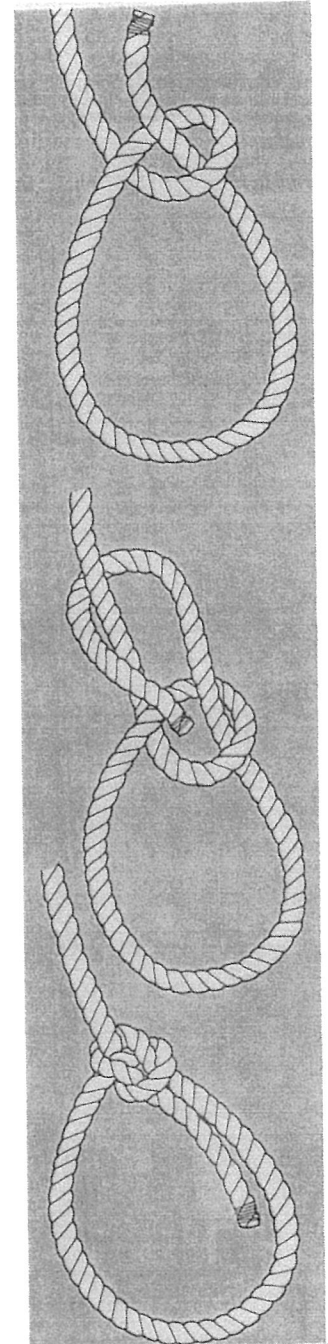


### Figure 8

Tied in end of a line to stop it running through blocks and sheaves. Leave a 6" tail.



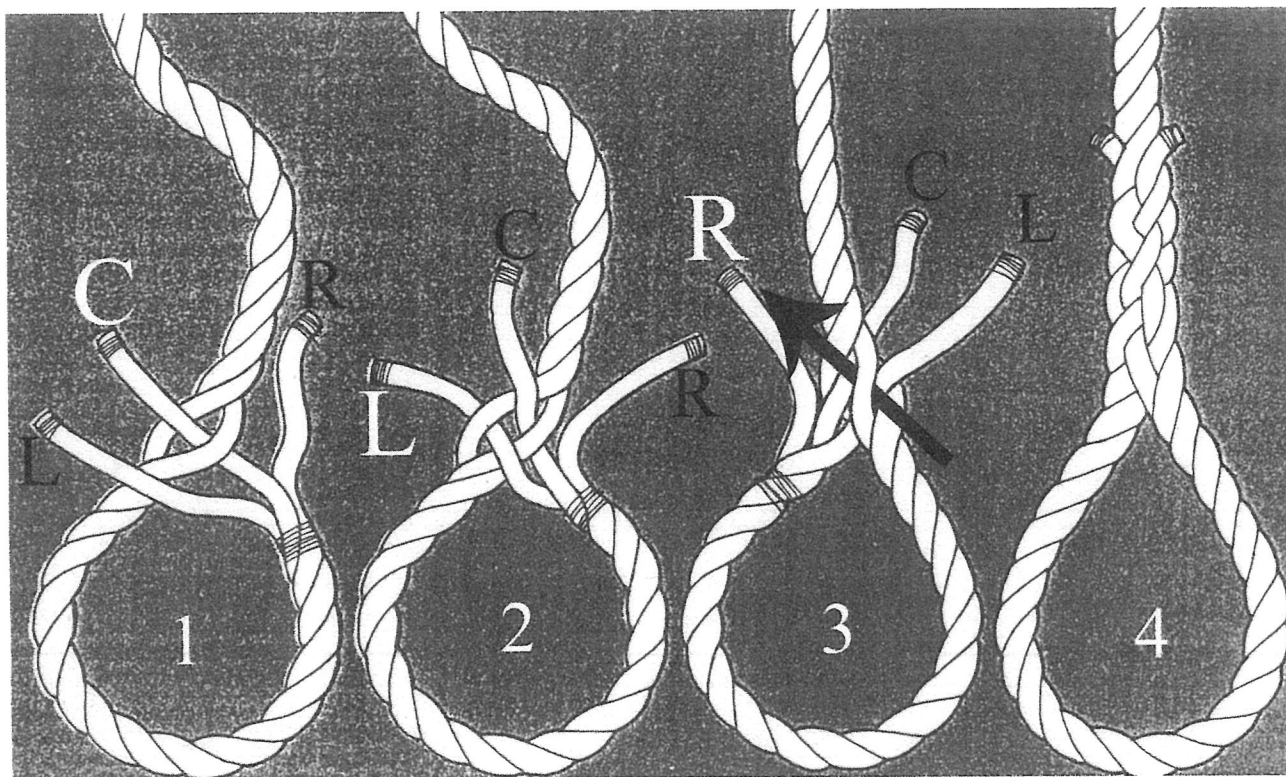
### Halyard Knot



### Bowline

The most important and frequently used knot onboard

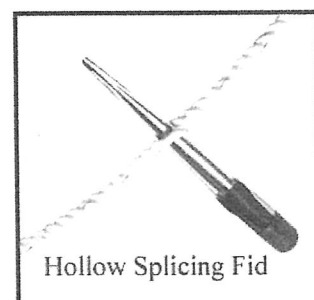
# EYE SPLICE: THREE STRAND LINE



**TOOLS:** Hollow Splicing fid and electrical tape

## INSTRUCTIONS:

1. Tape a band around the line 8" from the end of the line, unravel the three strands and tape each end with a tapered point. They are now named tail strands.
2. Form the eye in an anti-clockwise circle butting the taped band next to the main line and lay the three tail strands naturally across the line.
3. Tuck C the center tail strand under a twisted strand of the main line in a "right to left" direction. Note image 1. All tail strands will be tucked "right to left".
4. Tuck L the left of center strand over the main line strand you first tucked with C and under the next main strand. Ensure you continue to stay to the left of the original center strand and tuck in a "right to left" direction. Note image 2.
5. Turn the splice over.
6. With R the last strand, split the two main strands that are together, tucking once again in a "right to left" direction, entering where C, the second tail strand exits. Note image 3 – Black Arrow.
7. Remove tape band and snug up the eye to the main line by gently pulling on the tail strands, one at a time.
8. Now that you have formed the eye (there are numerous other ways to do this) continue with the splice. In turn tuck each of the three tail strands "over one strand, under one strand" of the main line. You may start with any strand.
9. Repeat step 8 two more times. Note image 4.
10. To create a taper in the main line that leads into the splice tuck two tail strands, leaving one strand untucked. Next leave another tail strand untucked and tuck the final tail strand. The strands should end in a row on the same side of the main line.
11. Cut and burn the ends of the tail strands.



Hollow Splicing Fid

# BRAIDED EYE SPLICE

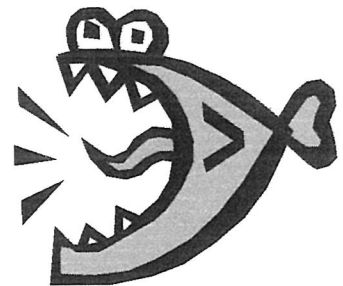
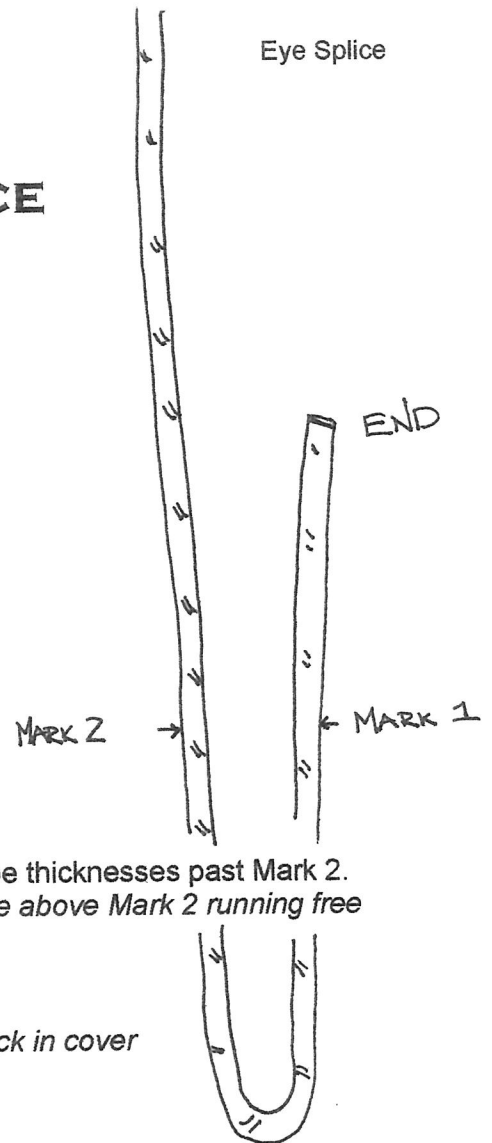
## Equipment

7/16 braided line  
sharp knife  
3M electrical tape  
marker pen

sailmakers needle  
fid (4" knitting needle)  
coconut tree and patience

## Instructions

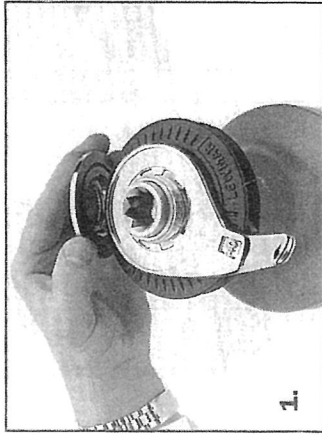
1. **Tape and cut end of rope**  
tie a slipknot 6' from end
2. Place **Mark 1** with marker pen 16" from end  
**Mark 2** at the desired termination point of your eye
3. At **Mark 2** open the line and pull **core out** from end of rope  
Tape fid to core *nice tight taping*
4. **Insert fid at Mark 1** and travel up the line till you are a two rope thicknesses past Mark 2.  
*keep core flat ie don't twist i , don't snag the cover, keep core above Mark 2 running free*  
exit on opposite side
5. Starting at slip knot 6' up **milk the rope back to shape**  
*milk the eye splice so rope and eye are formed, no slack in cover*  
tails are the same length
6. **Remove fid** from core and tape it to the cover
7. At loop, **pull out tail core 2"** and milk loop closed  
*this will allow enough slack to bury tail*
8. Hold cover and core at Mark 1 and **pull out standing core 20"**
9. **Feed fid up inside exposed core** entering at Mark 1  
exit when cover is buried the entire length
10. **Pull out the cover** and untape fid
11. **Taper the cover** line by removing 2-3 strands every 1" down the line, ending with 4 strands
12. **Marry the joint** by pulling both tails
13. **Milk the joint smooth** starting at the bury and milking away either side
14. Tie slip knot to coconut tree and whilst placing a little tension on the loop **tug till all disappears inside**



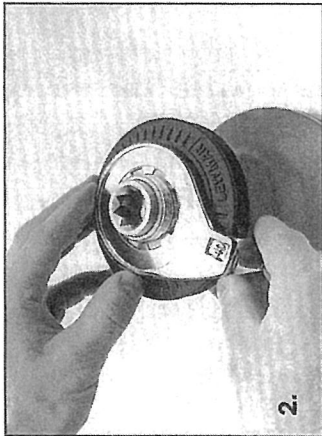
voilà!!

**SERVICING TWO SPEED 30ST, 40ST, 44ST,**

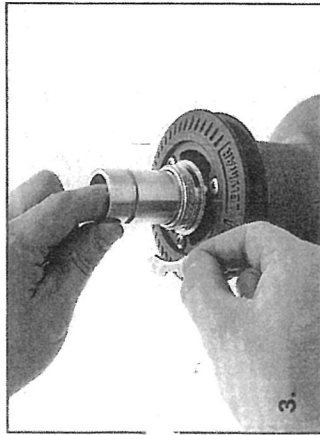
**48ST, 50ST, 54ST, 58ST, 62ST**



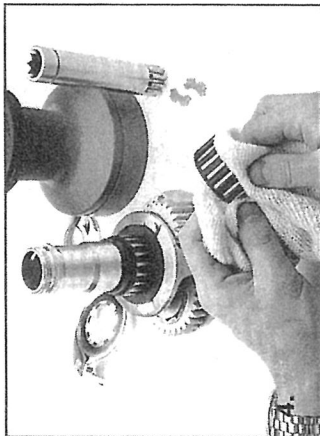
1. Unscrew top cap.



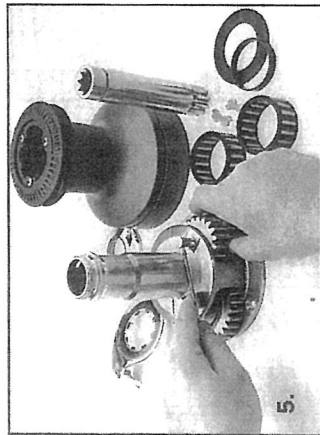
2. Lift and remove the feeder arm.



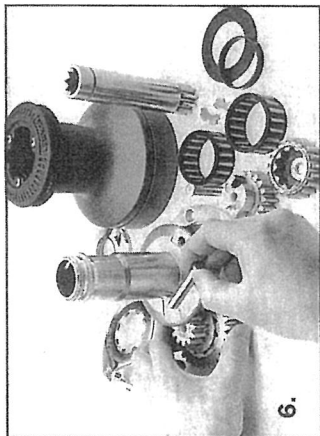
3. Remove the two retaining collets, lift out the main spindle.



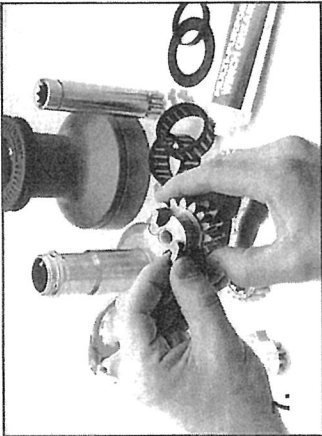
4. Remove and clean the drum bearings and washer.



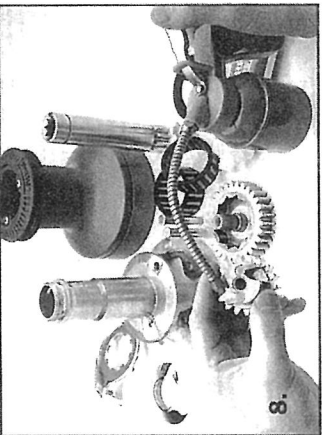
5. Using a small bladed screwdriver, raise the two gear spindles.



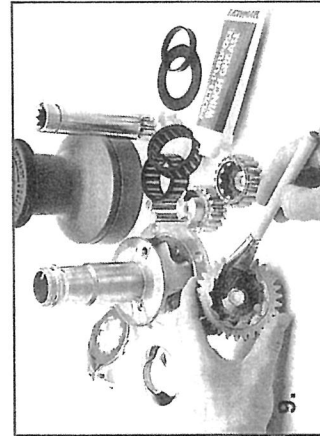
6. Lift out the gear spindles and remove the gear assemblies.



7. Remove and inspect the pawls and pawl springs, replace if necessary.



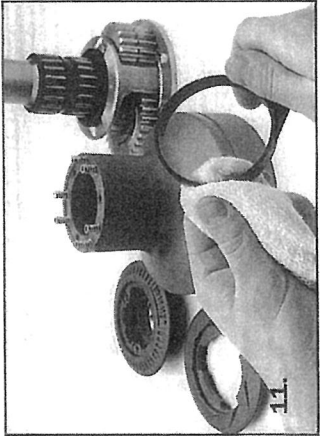
8. Assemble the pawls and springs, lightly oil the pawls, check for correct operation (no sticking).



9. Lightly grease the ratchet and bearing surfaces, re-assemble the gears.



10. Lightly grease and fit the gears, gear spindles and the main spindle.



11. Strip and clean crown assembly. See the Servicing Wavespring section in this manual.

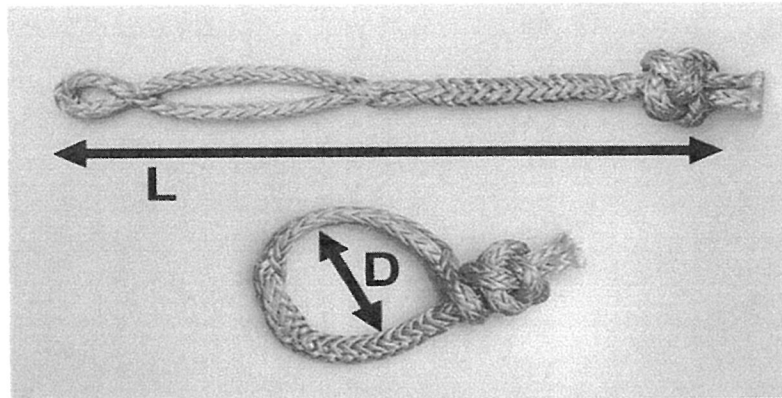


12. Re-assemble the drum, main spindle retaining collets and feeder arm. Lightly grease the 'O' ring and top cap thread before fitting.

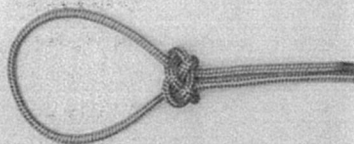


# SOFT SHACKLE

Resources: Animated Knots by Grog - app \$5.00 • Reeds Knot Handbook by Jim Whippy  
Make your own soft shackles: [http://l-36.com/soft\\_shackle\\_9.php](http://l-36.com/soft_shackle_9.php)



Lanyard Knot

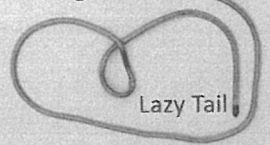


Diamond Knot

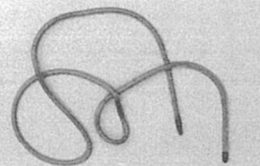
1. Make a loop

Working Tail

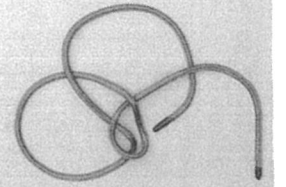
Lazy Tail



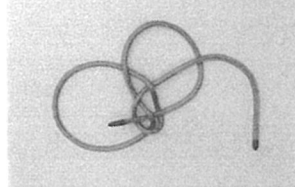
2. pass working tail over- left of loop then under- right of loop



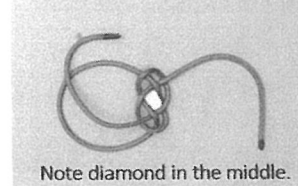
3. make a bend inside loop



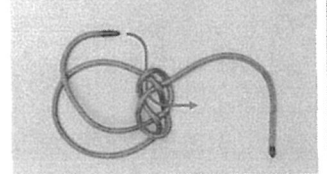
4. thread working tail through bend



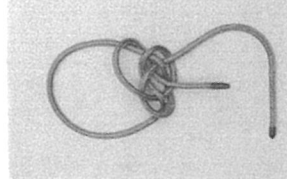
5. and tighten - working tail up



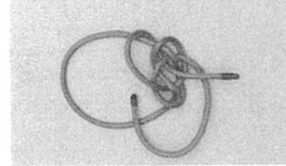
6. thread working tail through diamond



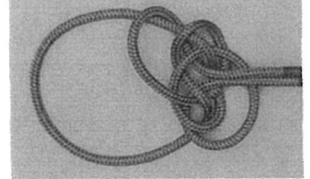
like so



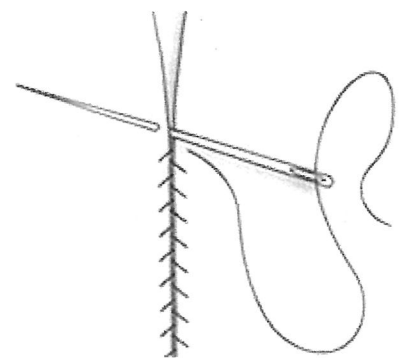
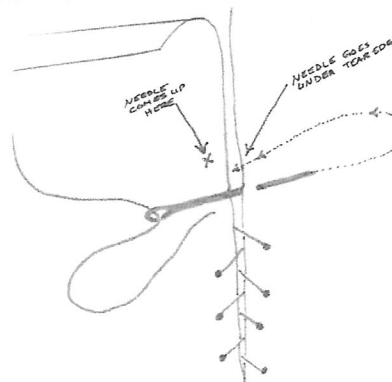
7. pass lazy tail around outside of one side of standing loop



8. then through diamond.



Baseball Stich for sail repair



#KNOTTEDSISTAS

# RIGGING SPARES



## Tools

1. Tool or tools for cutting away rigging in an emergency - hacksaw and 5 blades stowed in a quickly accessible place. Optionally hydraulic rigging cutters, Shootit-12 rig cutter from [www.euromarinetrading.com](http://www.euromarinetrading.com) or battery powered angle grinder
2. Rivet gun to match rig construction and matching rivets.
3. 2 drill bits, threaded tap and tap handle sets (different sizes) and machine screws to replace corroded rivets or to use to attach aluminum plating when doing emergency repairs.

## Bosun's Locker

1. Bosun's chair or climbing harness.
2. Anti-corrosive locking compound: Loctite 242 (removable), Loctite 271 (high strength, removable with high heat).
3. Anti-corrosive compounds: Lanacote (prevents rust, oxidation and electrolysis) and Tef-Gel (corrosion inhibitor and anti-seize lubricant).
4. Star brite PTFE trailer hitch and Teflon/silicon spray for sail slides, track and hanks.
5. 2 rolls of chafe tape: 3M vinyl electrical color-coding tape, we prefer it to branded rigging tape.
6. Monel or stainless seizing wire for shackles.
7. A reel (twice the length of the mast) of 3/32", nylon line to trace/mouse out halyards.
8. 30 feet of technical (core only) line for use in emergency rigging repairs.
9. Spare shackles, clips and rope thimbles.
10. Clevis pins and cotter/split pins.
11. Winch servicing kit containing winch grease and oil, spare pawls springs, pawls and possibly circlips, (West Marine has kits and parts for Lewmar, Harken, and Barient winches).
12. \*A mechanical system making an emergency eye or fork in the rigging wire: Hi-MOD, Norseman, Sta-Lok or Castlock fittings. *\*Optional if you have a long length of technical core*

## Splicing Bag

1. Knife, sharp and sturdy and scissors.
2. Bainbridge hollow fids: large and small for rope splicing.
3. Sailmaker's palm.
4. FSE Robline waxed whipping twine – different sizes and colors.
5. Needles: A large #18 sailmaker's needle, contained in Bainbridge premium sailmaker's needles.

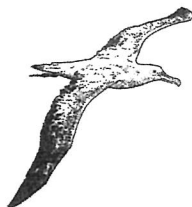
## Spares

1. Forestay or backstay, whichever is longer or technical core: dyneema, etc.
2. Halyard with 10' of extra tail.

## Amanda's Bum Bag

Thread & whipping twine, Sailmakers Spike, Needles, Fid, Palm, Knife, Tape Measure, Calipers, Leatherman, Screwdriver with Multi Head Attachments, Vice Grips, Crescent Wrench, Needle-nose Pliers, Seizing Wire, Electrical Wire Ties and Electrical Tape.

## GOING ALOFT



Going aloft is potentially one of **the most dangerous** aspects of cruising, but one that can't be neglected or avoided.

1. **Mast steps** tend to foul and chafe halyards and increase noise and windage at anchor. We recommend installing two mast steps, five feet down from the masthead, just inside the upper shrouds where they won't be a hindrance to halyards. This makes inspecting the masthead fittings and replacing tricolor navigation light bulbs easier, as being bosun chair and trying to reach overhead is difficult.
2. **Ratlines or steps to the spreaders** aren't necessary as we've found it not necessary to climb higher than the gooseneck for visibility in coral waters.
3. **Never go aloft without a safety line.** Besides the halyard and bosun chair, attach a second halyard to your safety harness. If you have two people available, the person not winching you aloft in the bosun chair takes up the slack on the second halyard. If anything fails in the bosun chair or halyard, the load will then be on your harness and second halyard so you won't fall. If you have only one helper available, every ten feet or so they'll take up the slack on the second halyard then make it fast.
4. **An electric anchor windlass** can be used to hoist a person aloft. Snatch blocks can be used to obtain a fair lead from halyard exit to windlass.
5. If you're **singlehanded** you can rig a four-part block and tackle, hoisting the top fiddle block to the masthead on a halyard and securing the bottom fiddle-cam block to your bosun chair. Another option is ATN Mastclimber. A hard seat with a backrest and one-way jammer, and leg straps with foot loops and a one-way jammer allows you to hoist yourself aloft using your leg muscles.
6. **Bosun Chair Options:** West Marine Professional, Harken Ronstan or Spinlock Mast Pro.
7. Inspect the **halyard and winch**. Ensure the halyard is a fair lead to the winch.
8. Check that the **halyard runs freely** with a load and that there's no clunking noises or binding at the top sheave.
9. **Never trust your life to halyard shackles;** it is better to tie the halyard to your fiddle block or bosun chair with a bowline knot. Your safety line will be your safety harness, the tether of which you snap around a spreader or to the masthead when stopped to inspect the mast and rigging.
10. Wear **long pants and shoes** to help you get a good grip on the mast
11. We've found that Japanese rubber-covered cloth fish-cleaning **gloves** give an excellent grip on rigging wire. The more you help by climbing, the happier the person winching will be.
12. Use **clear and concise commands**.
13. Take as much caution **letting the bosun down** as hoisting them aloft.
14. Ensure your mast has a **mouse line** for adding a new halyard in case you lose a halyard through chafe or by accident.

# SAIL REPAIR KIT

## THE VERY BASICS



**Resources:** Most items are available from [sailrite.com](http://sailrite.com)

### Tools

- ☐ Sewing machine – Sailrite Ultrafeed Zigzag LSZ-1
- ☐ Seam ripper/quick unpick.
- ☐ Scissors
- ☐ Hot knife - soldering iron with flat tip. At a push you can use a lighter.
- ☐ Sailmakers spike/awl.
- ☐ Yard stick - 36" metal straight edge (also used for chart navigation).

### For Sewing

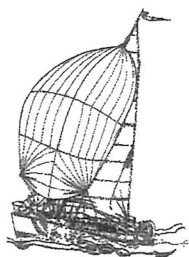
- ☐ sewing machine thread V92.
- ☐ heavy sewing machine thread V138 - used for hand stitching repair of sails original machine stitching.
- ☐ hand sewing thread for webbing - #EW352 from Aquabatten is my favorite, used for rope whipping and leatherwork. I also like FSE Robline 0.8mm whipping twine.
- ☐ needles - embroidery needles for V138 thread, & heavy duty sailmaker #18 needle for whipping twine.
- ☐ thimble
- ☐ sailmakers hand palm.

### Spares

- ☐ spare sail slides
- ☐ spare battens

### Materials

- ☐ sail cloth to match sails - 6 ft of each weight for headsail, main and spinnaker.
- ☐ 2' fabric to match roller furling UV cover.
- ☐ 2' Topgun chafe protection fabric.
- ☐ 1 yard dacron sticky-back repair fabric.
- ☐ 1 roll 3" dacron sticky-back repair fabric.
- ☐ 6' sail cloth tape.
- ☐ webbing - assorted sizes to match sails.
- ☐ seam stick - 1 roll (like double stick tape).
- ☐ Spool (30m) 2mm polyester braid - for lashing on sail slides and emergency lashings such as clew rings.



# SAIL SHAPE

Adapted from The Complete Sailor by David Seidman

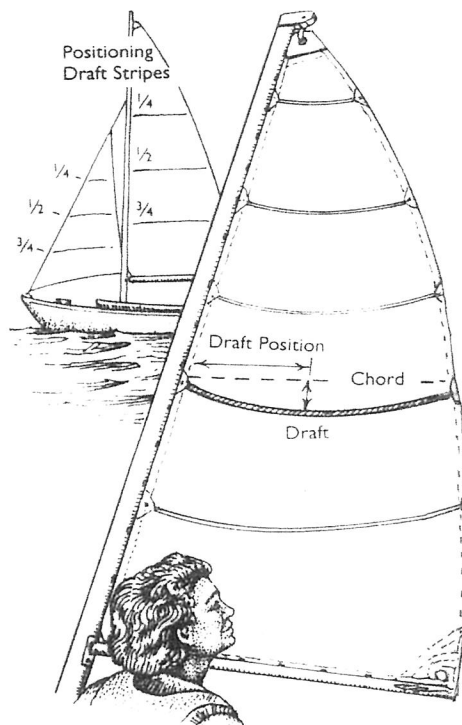
A sail's airfoil shape is described by its cross section. The imaginary reference line from luff to the leech is the *chord*. And perpendicular from the chord to the sail is the *draft*, or depth.

The location of maximum draft along the chord is the *draft position*, expressed as a percentage of the chord's length aft of the luff. The ratio of the maximum draft to the chord is the sail's *camber*, an indication of its fullness.

Since there is no universal all-purpose sail shape, sailmakers put in what they believe to be the proper camber and draft position for close-hauled sailing at a theoretical "average" wind strength of 10 to 12 knots.

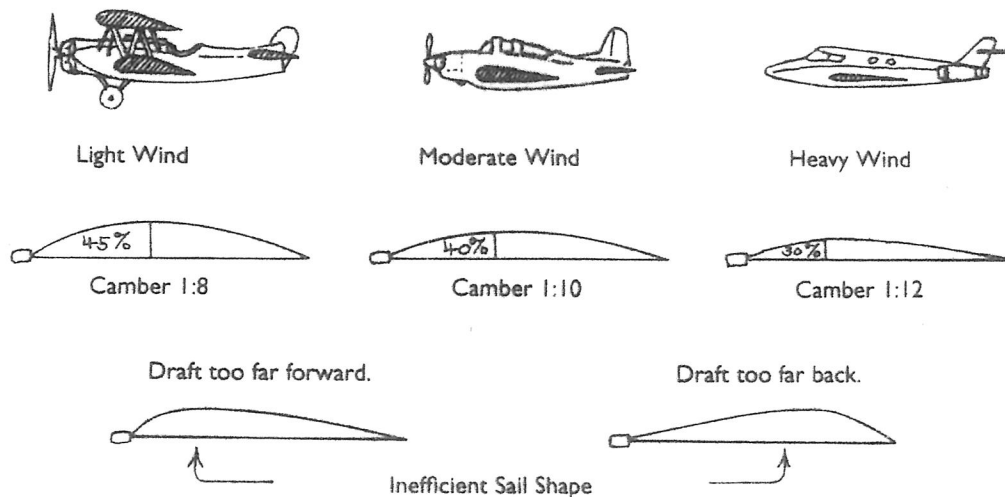
When creating a crosscut panel sail, the sailmaker cuts each panel with shape at the seams to create a curved sail with draft.

Typically the camber of a mainsail might be 1:10, and the draft position about 40 percent of the luff. In all other winds the sail's shape will need to be altered to obtain perfect setting, such as flatten the sail in heavy winds to reduce heeling.



It might help to think of a sail's shape in terms of the evolution of the airplanes and their wings.

- A relatively slow biplane's fabric covered wing is well rounded on top with considerable draft located almost midway back.
- A WWII fighter with aluminum wings has less draft and it is farther forward.
- And the composite wing of a corporate jet is almost flat, with a small amount of draft located very far forward.



This analysis is also similar to the evolution of sail design

- Viking ships and square riggers had full canvas sails that did not allow for upwind performance.
- Modern ocean cruising yachts have moderate draft cross cut dacron sails.
- Ocean racing Volvo yachts have molded composite foil sails.



# CHECKLIST FOR OFFSHORE CRUISING



- ☐ **Set your goals!** Write them down now. You are going to need all of the energy and direction available so get yourself in shape with daily exercise and proper diet.
- ☐ Consider taking an intensive **live aboard sailing course** such as Offshore Sailing School's Fast Track to Cruising. [www.offshore-sailing.com](http://www.offshore-sailing.com).
- ☐ **Volunteer as crew** in local sailing races to gain experience.
- ☐ Make an **ocean passage** preferably with instruction aboard someone else's boat and ideally with intense, hands-on instruction.
- ☐ Browse **noonsite.com** weekly for latest cruising updates.
- ☐ Join **Seven Seas Cruising Association**, [www.ssca.org](http://www.ssca.org). Their monthly bulletins are an excellent source of the latest information from cruisers currently "out there".
- ☐ Subscribe to **sailing magazines**. Blue Water Sailing, Practical Sailor, Latitude 38, Cruising World, Caribbean Compass and if you're going to Europe, Yachting World.
- ☐ **Purchase** World Cruising Routes, Lonely Planet Guides and Nigel Calder's Boat Owner's Mechanical and Electrical Manual.
- ☐ Become familiar with **yachtworld.com**.
- ☐ Locate an experienced and honest **yacht broker** and commence your search!
- ☐ Take a course and practice **coastal navigation**: log keeping, dead reckoning, taking and plotting bearings, chart reading, tides and currents.
- ☐ Take a **celestial navigation course** and practice until you're confident. This is optional.
- ☐ Take a **marine weather** course and start daily checking internet ocean weather sites for your intended cruising area.
- ☐ Take a **sail repair course**.
- ☐ Take an **offshore medical course**.
- ☐ Take a **diesel repair course** and go over every inch of your engine with a qualified mechanic. Purchase engine spare parts.
- ☐ Take **Spanish or French language course** and listen to instructional CDs while driving. This is essential and not an option.
  
- ☐ **Purchase Boat.**
- ☐ Secure offshore **insurance**.
- ☐ Consider signing up for an **offshore rally**.
- ☐ Get thorough **physical exam** including blood tests, inoculations and vaccinations. Discuss prescription drug list with your physician, and have them write prescriptions.
- ☐ Get complete **dental check-up** and cleaning 6 months before departure, then final cleaning just before leaving.
- ☐ Check your **health insurance**, and look into medical evacuation services such as offered by Diver's Alert Network (DAN).
- ☐ Get to know your boat by going **sailing frequently**.
- ☐ Install **priority and optional equipment**.
- ☐ Purchase a **new computer** with enough memory for electronic navigation. Use this computer for navigation and long-range communication but not for web surfing.
- ☐ Establish a form of **long-range email communication**, i.e.: Sailmail, Iridium, BGAN. Purchase and install an external wi-fi antenna.

- ❑ Practice **heavy weather** sailing: reefing, sail changing, storm management tactics including heaving to and man overboard. Go out when gale warnings are up.
- ❑ Install and practice using **self-steering vane**, optionally an autopilot.
- ❑ Complete a **passage** on your boat where you'll be out of sight of land at least 72 hrs.
- ❑ Arrange a **reaching/downwind pole** and stowage system.
- ❑ Remove **mast(s)**, strip off fittings and spreaders checking for cracks or wear. Replace all standing rigging if over 8 or 9 years old.
- ❑ Have your **sail wardrobe** surveyed by a sailmaker and purchase spare sailcloth, fittings, tools, and optionally a sewing machine.
- ❑ Hire a **rigger** to help tune rig and go for a test sail.
- ❑ **Haul your boat**, check and lubricate all ball valves or seacocks. Have offshore insurance survey done. Apply three coats of Micron 66 or Petit Trinidad.
- ❑ Purchase **spares** for every system on the boat: pumps, motors, electrical, repair kits.
- ❑ Purchase or **repack liferaft**. Assemble Abandon Ship Kit.
- ❑ **Move aboard** boat, ideally 6-12 months before departure.
- ❑ Sell or lease **home** or condo. Have massive garage sale. Find storage unit.
- ❑ Quit your **Job** or sell your business. (Hooray!!!!)
- ❑ Reassure **family and close friends** that you are not crazy, have not jumped off the deep end, and that you're looking forward to having them visit you in an exotic location.
- ❑ Set up **e-mail updates** with friends and family and possibly a **web site**.
- ❑ Purchase and stow **medical supplies** and books.
- ❑ Establish an account with a professional **weather routing service**.
- ❑ Complete initial dry goods and cans **provisioning** and stowing.
- ❑ Sell **vehicles** or possibly keep the oldest one in storage.
- ❑ Set up as many ongoing bills as possible for electronic payment and arrange with someone to **pay bills and forward mail**. Sign and have several copies of a limited Power of Attorney agreement for them.
- ❑ **Complete fresh (and optional frozen) foods purchases** and stowing.
- ❑ Have a **Bon Voyage party** as a way of saying goodbye to friends and thanking those who helped you in preparation.
- ❑ Sail to a nearby **quiet anchorage** where you can catch your breath and finish final stowing.

*Now the real adventure begins!*



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| WORLDWIDE COVERAGE INCLUDING U.S. AND CANADA (New Business Rates valid through 12/31/2015)<br>Rates Do Not include surplus lines taxes (if applicable)                                |                                   |                                   |                                   |                                   |                                   |                                   |                                   |                                   |                                   |                                   |                                   |                                   |
| Deductible                                                                                                                                                                            | US \$250                          |                                   | US \$500                          |                                   | US \$1,000                        |                                   | US \$2,500                        |                                   | US \$5,000                        |                                   | US \$10,000                       |                                   |
| AGE                                                                                                                                                                                   | MALE                              | FEMALE                            | MALE                              | FEMALE                            | MALE                              | FEMALE                            | MALE                              | FEMALE                            | MALE                              | FEMALE                            | MALE                              | FEMALE                            |
| 14 days to 9 years                                                                                                                                                                    | First 2 Free; thereafter \$300.00 | First 2 Free; thereafter \$300.00 | First 2 Free; thereafter \$262.00 | First 2 Free; thereafter \$262.00 | First 2 Free; thereafter \$204.00 | First 2 Free; thereafter \$204.00 | First 2 Free; thereafter \$179.00 | First 2 Free; thereafter \$179.00 | First 2 Free; thereafter \$164.00 | First 2 Free; thereafter \$164.00 | First 2 Free; thereafter \$146.00 | First 2 Free; thereafter \$146.00 |
| 10-18                                                                                                                                                                                 | \$308.00                          | \$308.00                          | \$274.00                          | \$274.00                          | \$226.00                          | \$226.00                          | \$211.00                          | \$211.00                          | \$198.00                          | \$198.00                          | \$175.00                          | \$175.00                          |
| 19-24                                                                                                                                                                                 | \$697.00                          | \$985.00                          | \$603.00                          | \$969.00                          | \$470.00                          | \$743.00                          | \$409.00                          | \$647.00                          | \$321.00                          | \$520.00                          | \$285.00                          | \$448.00                          |
| 25-29                                                                                                                                                                                 | \$735.00                          | \$1,122.00                        | \$642.00                          | \$1,090.00                        | \$500.00                          | \$840.00                          | \$436.00                          | \$729.00                          | \$341.00                          | \$606.00                          | \$304.00                          | \$476.00                          |
| 30-34                                                                                                                                                                                 | \$823.00                          | \$1,241.00                        | \$708.00                          | \$1,169.00                        | \$549.00                          | \$905.00                          | \$481.00                          | \$790.00                          | \$377.00                          | \$634.00                          | \$335.00                          | \$540.00                          |
| 35-39                                                                                                                                                                                 | \$922.00                          | \$1,466.00                        | \$747.00                          | \$1,300.00                        | \$578.00                          | \$1,010.00                        | \$506.00                          | \$872.00                          | \$396.00                          | \$727.00                          | \$353.00                          | \$568.00                          |
| 40-44                                                                                                                                                                                 | \$1,166.00                        | \$1,609.00                        | \$947.00                          | \$1,400.00                        | \$628.00                          | \$1,097.00                        | \$550.00                          | \$960.00                          | \$526.00                          | \$745.00                          | \$468.00                          | \$662.00                          |
| 45-49                                                                                                                                                                                 | \$1,299.00                        | \$1,566.00                        | \$1,065.00                        | \$1,332.00                        | \$825.00                          | \$1,030.00                        | \$719.00                          | \$897.00                          | \$587.00                          | \$708.00                          | \$522.00                          | \$631.00                          |
| 50-54                                                                                                                                                                                 | \$1,586.00                        | \$1,742.00                        | \$1,344.00                        | \$1,502.00                        | \$1,039.00                        | \$1,165.00                        | \$907.00                          | \$1,036.00                        | \$770.00                          | \$859.00                          | \$685.00                          | \$765.00                          |
| 55-59                                                                                                                                                                                 | \$1,917.00                        | \$1,917.00                        | \$1,667.00                        | \$1,667.00                        | \$1,290.00                        | \$1,288.00                        | \$1,124.00                        | \$1,124.00                        | \$947.00                          | \$955.00                          | \$842.00                          | \$850.00                          |
| 60-64                                                                                                                                                                                 | \$2,822.00                        | \$2,656.00                        | \$2,572.00                        | \$2,406.00                        | \$2,168.00                        | \$1,914.00                        | \$1,963.00                        | \$1,762.00                        | \$1,640.00                        | \$1,457.00                        | \$1,460.00                        | \$1,297.00                        |
| 65-69                                                                                                                                                                                 | \$5,893.00                        | \$5,113.00                        | \$5,640.00                        | \$4,890.00                        | \$5,276.00                        | \$4,453.00                        | \$4,056.00                        | \$3,310.00                        | \$3,546.00                        | \$3,176.00                        | \$3,156.00                        | \$2,827.00                        |
| 70-74                                                                                                                                                                                 | \$9,724.00                        | \$8,437.00                        | \$9,306.00                        | \$8,069.00                        | \$8,705.00                        | \$7,348.00                        | \$6,692.00                        | \$5,462.00                        | \$5,851.00                        | \$5,240.00                        | \$5,207.00                        | \$4,665.00                        |
| OPTIONAL RIDERS: SPORTS RIDER= \$250.00 DENTAL RIDER (ADULT)= \$425.00 (CHILD)= \$285.00 Maternity Rider= \$2,200.00<br>ALL OPTIONAL RIDERS ARE IN ADDITION TO THE BASE PREMIUM COST. |                                   |                                   |                                   |                                   |                                   |                                   |                                   |                                   |                                   |                                   |                                   |                                   |

## CHECKING INTO A FOREIGN PORT



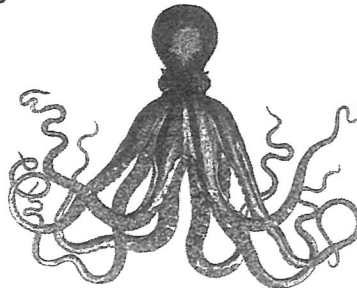
1. Determine the **Ports of Entry** for the country you'll be visiting on [www.noonsite.com](http://www.noonsite.com) or in Jimmy Cornell's World Cruising Routes and World Cruising Destinations.
2. Determine if a **visa or cruising permit** is required prior to your arrival by checking with the [www.noonsite.com](http://www.noonsite.com) or the consulate or embassy of the country. Other sources of up-to-date information are the SSCA Bulletins, [www.scca.org](http://www.scca.org), travel agents or U.S. State Department.
3. **Proof of medical and repatriation insurance** is required if visiting the EU or French territories. DANBOATER.ORG has reasonable short-term plans.
4. **Proof of available funds** is required for long stay visas in some countries. They'll want to see cash or bank statement upon arrival.
5. Consider hiring an **agent** for clearance: Panama, Galapagos, Columbia, Venezuela, Indonesia, Russia or Egypt.
6. **Entry and/or Exit Fees** - of \$30-\$250 are charged by most countries, following the example of the U.S.
7. Make or buy the **flag of each country** you plan to visit. This is called a courtesy flag and it is flown from your starboard spreader while you're in the country. Some small countries fine boats arriving without the courtesy flag flying. If you don't have a sewing machine or can't find the country's flag, an option is to use colored marking pens on a piece of sailcloth. Blue Water Books, [www.bluewaterweb.com](http://www.bluewaterweb.com) 954-763-6533 has an excellent selection of good quality foreign flags. Your vessel's flag of registry should be flown at the stern.
8. **Pre-Arrival Notification:** Complete and send required forms by email or fax before you arrive. Several countries (U.S., Australia, Fiji, Vanuatu and New Zealand, for example) require 24-72 hours notification before arrival with vessel registry number and all passport information.
9. Fly the yellow "**Quarantine**" flag upon entering a countries territorial waters and before entering the Port of Entry. This lets officials know that you're just arriving and wish to clear with health, customs, immigration etc.
10. **Prepare your paperwork:** clearance certificate from the last port, passports, ship's documents and crew lists.
11. **Call the Harbormaster/Port Captain on CH 16** you approach the Port of Entry, they'll direct you to the appropriate mooring place, and know you're not trying to hide from them.
12. Determine where and if there is a **Quarantine Anchorage Area**, and whether you should wait onboard for health officials to come out or go ashore to meet them. The procedures vary from country to country. Some countries like the U.S. may fine you if more than the captain goes ashore
13. Plan on being visited by or visit **Health, Immigration, Customs and Port Captain.**
14. Talk with (but don't board) **other yachts** to determine current procedures and details.
15. Make sure you **boat is tidy and clean** and keep chatter to minimum.
16. It is essential to get **passports stamped** for any crew departing by air.
17. **Sniffer dogs** may be brought aboard by customs in some countries.
18. Some countries require that you **check in at every island** (Azores and Canaries, for examples) while others (New Zealand) just want to see you twice: when you enter and when you depart.
19. **Fishing Permits** are required if you have fishing tackle aboard in Mexico and are required for fishing in Canada, Alaska and some other places. Enquire when clearing customs.
20. **Animals:** check [noonsite.com](http://noonsite.com)
21. When checking out ensure you receive a **Certificate of Port Clearance**. This proves you've legally cleared out and haven't left any unpaid bills or crew behind. Even when leaving a U.S. port for a foreign port it's necessary to have outbound clearance papers to surrender upon arrival at your destination country, contrary to what USCBP may claim.

# CORAL REEF AWARENESS



We hope you will take the opportunity to enjoy tropical water snorkeling. Here are some tips:

- Sunscreen and soap kill coral polyps. When swimming use a rash guard, polyester or Cool-Max type t-shirt, and swim cap for sun protection. Use modest amount of soap when showering on the swim step.
- Don't touch coral with your fins, feet, knees, elbows or hands. Coral is easily damaged and contact with some types of coral (such as fire coral) can be painful. Wounds from coral cuts can become quickly infected and you may not be able to swim for at least a week until they heal.
- When wearing fins in shallow water be very careful when treading water as fins stir up the sand which can suffocate the coral.
- If you see fishing line or net tangled in coral gently remove it, or ask us to, as turtles and marine life can get tangled in it and drown.
- Pick up any rubbish that you see underwater and place it in the dinghy.
- When beach walking, pick up six-pack can holders and plastic bags as turtles may mistake these for jellyfish and choke.
- Do not buy, accept gifts of or collect any shells or coral. It is illegal to take them into any CITES treaty country, and removing them can upset the reef balance. Those who understand the strain on marine resources will refuse gifts of shell leis.
- Do not chase sea turtles or rays.
- At restaurants, order pelagic species including tuna, mahi mahi, wahoo (Spanish mackerel) and avoid ordering reef fish including snapper, grouper or parrot fish. These species can harbor ciguatera neurotoxins and are also under great pressure from overfishing worldwide.





# LEAVING YOUR BOAT IN A FOREIGN PORT



A high percentage of cruisers we meet each year plan on leaving their boats in a safe place and flying home, often once a year. International air travel has never been more reasonable, in fact many cruisers find they can more than cover the cost of flying home by the money they save in purchasing spare and replacement parts “back home”, vs. in the country they’ve sailed to.

If you’re leaving your boat for less than three weeks, it may be most convenient to leave it in the water, providing you can find a secure marina slip or mooring. For longer periods of time, it is frequently cost effective and attractive to combine dry storage in a secure boatyard with your annual haul out.

## Research

- ☐ **Length of time** boat can stay in the country without incurring import duty.
- ☐ Check **www.noonsite.com** for recommendations and contacts.
- ☐ Check **Seven Seas Cruising Association** bulletins for letters detailing member’s experiences.
- ☐ Ask **local sailors or other cruising yachties** for their recommendations.
- ☐ If possible **visit the yards** and marinas and talk with the operators.

The following criteria are optimal. Obviously, in developing countries not all of these features or services will be available.

## What to look for in a Marina

- ☐ Well-managed **office** and maintained slips.
- ☐ **Locked gate** on the marina piers.
- ☐ **Security guard** and cameras.

## What to look for in a Yard

- ☐ **Well managed** office and yard with a **paved, fenced, and guarded** storage compound.
- ☐ Insure that the **displacement of your boat** is not close to the limits of the Travelift or cradles.
- ☐ Well maintained **Travelift** with cables and straps regularly inspected and periodically replaced.
- ☐ Determine if the boat yard’s **insurance policy** covers damage to your boat if they drop it, run into it, or if it blows over while in their yard.
- ☐ **Shelter** from prevailing and any unusual storm winds.
- ☐ A separate **spray booth** so your boat does not get covered in overspray.
- ☐ **Steel cradles** with adjustable arms, not screw jacks and 55 gallon drums with wedges.
- ☐ If **Bronwell boat stands** are used ensure correct number are used: 30’-40’ft boat 7-9 stands. 40’-55’ boat 9-11 stands.
- ☐ Nearby **yacht services** including sail, engine and rigging repair.
- ☐ Ask when the **busiest season** and **holidays** occur. Many yards and services are stretched to the max around these times. Don’t try and get anything achieved in New Zealand three weeks before Christmas until a week or two after the New Year. Kiwi’s have a party spirit that shuts down all services!
- ☐ If you are leaving the boat for a period of time it may work out well to leave a list of **jobs to be done** with the yard or associated workmen. They can then work on your boat in a down time and appreciate the business, rather than it becoming rush job upon your return. Contact the yard a month before your return to make sure the jobs are being completed.

## Before Leaving

### Cover Boat

- ☐ Protect the boat with a **cover** if possible. It will shelter your boat from sun, dirt and overspray and keep it cooler inside.

After getting a \$4,000 quote for a **full boat cover** made of Sunbrella in the U.S., we had one made of reinforced vinyl in Fiji for \$700 U.S. It wasn’t pretty or a perfect fit but it protected our boat for nine

years while we were back home working before disintegrating. We then had a much better cover made out of Top Gun, an excellent polyester duck that we currently use.

### Chain

- ☐ Clean and **inspect** anchor chain and anchors for rust.
- ☐ If chain is rusty, **regalvanize** it as soon as possible, as the chain will continue to rust and erode until it is sand blasted or acid-dipped and regalvanized.

### Clear Decks

- ☐ Clear the decks of as many **removable items** as possible: barbecue, jerry jugs, anchors, life raft, sails, outboard, etc.

### Contact

- ☐ Obtain detailed contact **information for the yard or marina**.
- ☐ Hire a **local person** to check the boat for you. We often use a business that is doing work on the boat, e.g. the electrician. Another option is to use a liveaboard cruiser who is moored nearby.
- ☐ Keep a record of all the contact information for all the **businesses** that are doing work on the boat or equipment.
- ☐ Staple all **business cards** onto sheets of paper and photocopy. Leave one copy on the boat and take a few copies home with you. It is generally necessary to contact the businesses and confirm the work being done before you return to the boat. Other cruisers also appreciate the information if they are heading the same way as you are.

### Engine

- ☐ Check **cutless bearing** for play by trying to move the prop up and down.
- ☐ Lubricate **throttle and shift** linkage and cables.
- ☐ Check **belts** for wear and tension.
- ☐ **Filters:** Change engine and transmission oil and filter.
- ☐ **Drain, flush and replace coolant.** Inspect and replace engine cooling system zinc anodes. Don't let old antifreeze end up in the ocean. Try and find a place that recycles or can properly dispose of it.
- ☐ Clean or replace the **air cleaner**.
- ☐ **Flag** anything that needs attention upon your return.
- ☐ Thoroughly **clean engine** exterior. We use Simple Green, paper towels or rags, followed by touch-up paint.
- ☐ Place new **oil zorb sheets** under the engine so that any oil or coolant leaks are easily detectable.

### Batteries

- ☐ Check battery **fluid levels** if you don't have gel or AGM batteries. Fully **charge** all batteries.
- ☐ **Disconnect** master battery switch or better yet, remove cables.
- ☐ **Remove batteries** from all devices: clocks, flashlights, binoculars etc.

### Interior

- ☐ **Curtains, Cushions and Covers:** Launder all interior fabrics as any salty or damp fabric will mildew.
- ☐ **Galley:** clean galley cupboards and lockers. Throw out or give away all food that will go stale while you are gone.
- ☐ **Stove:** clean oven and stove top. Remove stove and clean surrounding alcove.
- ☐ **Lockers:** go through all lockers and ask yourself, "Is this really necessary to have onboard?" Lighten that load instead of raising the bottom paint.
- ☐ Wipe all **interior surfaces** (excluding plexiglas) with Windex.
- ☐ Leave out **roach** and ant bait and set off a bug bomb just before leaving.

### Liferaft & Safety

- ☐ Note expiration date of liferaft and inquire on the availability of having it repacked. If needed, schedule the re-pack after your return.
- ☐ Remove **Co2 cartridges** from inflatable life vests.

### Medical

- ☐ **Check** medical kit, noting **expiry dates** of all drugs and items that need replenishing.
- ☐ Check **local prices and availability**, it may be easier to purchase supplies when returning home.

### Outboard Motor

- ☐ **Service** outboard motor, drain and replace lower unit gear oil, check water pump impeller, drain carburetor. Consider spraying fogging preservative spray down engine intake.

### Rigging

- ☐ Go up the mast to perform thorough **rig check** of all fittings, welds, spreaders, lights, halyards, cotter pins, turnbuckles, sheaves, swages, and wire.
- ☐ **Lubricate** upper furling swivel, track, and masthead sheaves.
- ☐ Clean and lubricate **winches and turnbuckles**.
- ☐ You may even consider pulling the mast if it needs repair or **rigging replacement**.
- ☐ If there are repairs that you'll need help with, hire a **rigger** and book repair work before leaving.

### Sails

- ☐ **Remove all sails, including furling sails**; wash, dry, inspect and fold them.
- ☐ If **repairs** are needed, find a sailmaker and book a time to have the repairs done before leaving your boat.
- ☐ If you are repairing the sails yourself, check that you have the necessary **equipment and supplies**.

### Systems

- ☐ Flush **bilge** with freshwater after collecting oil by suspending oil absorbent material into bilge.
- ☐ Flush **heads** with fresh water. If hauling out place a hose against the thru-hull from outside.
- ☐ Fill **propane** tanks and disconnect hoses.
- ☐ Flush the **refrigeration** cooling system with fresh water.
- ☐ Biocide **watermaker**.
- ☐ Remove and clean impeller for the **knotmeter**.
- ☐ Run diesel **heater** for 10 minutes

### Tanks

- ☐ Fill **fuel tanks** and add bactericide.
- ☐ Flush **holding tanks** with fresh water. Lubricate valves.
- ☐ Flush **water tanks** and bleach tank and hoses before draining water tank.

### Insurance

- ☐ **Photograph** everything for insurance purposes: cradle or marina slip, cover, interior, and position of boat in the yard.
- ☐ **Send** your insurance company a note and a copy of the photographs advising what your plans are.
- ☐ Ask for **Port Risk** insurance deduction if leaving your boat for more than one month.

### Valuables

- ☐ Find a **secure storage** place for electronics and valuables if necessary.

### Wish List

- ☐ As you **go through** the boat make a list of marine supplies to purchase and bring back to the boat.

### If you are Hauling Out

- ☐ Show the lift operator a photo or diagram of your boat's **underbody**, marking strap placement locations with masking tape on caprail.
- ☐ Request the most **secure location in the storage area** for your boat. The ideal location will be out of the regular traffic pattern of the Travelift and will be protected from strong winds from any direction. Several tropical boatyards have recently had boats blown over in strong winds. This is not good!
- ☐ Disconnect the **forestay or backstay**, depending on the lift operation.

- ☐ Have the boat pressure **washed**, if available, or scrape and scrub off growth.

### After Hauling Engine

- ☐ **Flush engine** for at least 20 minutes by disconnecting raw water intake hose from the thru-hull and placing it in a large bucket with a fresh water hose. It will take some adjusting to get the fresh water flow to match the engine intake requirement.
- ☐ In the last few minutes before shutting off the engine pour 2-4 quarts of **coolant** (anti freeze) into the bucket and shut off the engine before the last of the fluid is gone.
- ☐ If possible, have the **exhaust** flow into a bucket below the boat as antifreeze should be disposed of correctly.
- ☐ If your boat will be left in **freezing conditions**, refer to the engine manual. It may recommend draining the fresh water cooling system and raw water cooling circuit.
- ☐ Dismantle anti-syphon valve, removing any accumulated salt crystals.

### Thru- Hulls and Rudder

- ☐ At a minimum **turn each handle and spray lubricant where the handle meets the fitting**.
- ☐ If your boat is over 7 years old, consider **replacing** at least the head, galley and engine intake thru-hulls and valves and all related plumbing.
- ☐ Replace all **corroded** thru-hulls.
- ☐ Check **rudder bearings** for play and replace rudder seals if they have been weeping.



### Recommissioning Your Boat before Launching

- ☐ **Antifoul** the bottom.
- ☐ Wax and polish **topsides** (if applicable).
- ☐ Replace sacrificial **zinc anodes** on prop, shaft, hull and bow thruster if eroded more than 40%.
- ☐ Inspect and possibly **remove rudder**. **Grease rudder bearing and stern gland**, if applicable.
- ☐ **Check cables** and gear on the steering system and quadrant. Look for cables which are too loose or have broken strands. Cables which are too tight will make a boat difficult to steer.
- ☐ Reinstall **raw water** pump impeller.
- ☐ Polish or paint **propeller** with PropSpeed. If you have a feathering prop, service and grease it.
- ☐ Reconnect and tighten **battery cables** and connections. Cover with Lanocote or similar coating. Connect the ground wire after the positive wire, making sure all possible DC loads and battery charger are turned off.
- ☐ Test run **engine** with intake hose in a bucket.
- ☐ Check **thru-hulls** and hose clamps.
- ☐ Burp **stern gland** after launching, if you have a dripless shaft seal requiring this.

### Recommissioning your Boat after Launching

#### Cleaning

- ☐ **Scrub** decks. Clean and wax cabin sides if applicable.

#### Systems

- ☐ Check the **bilge** for leaks.
- ☐ **Fill bilge with water**, test bilge pumps and high water alarm.
- ☐ Check **anchor windlass** operation. Replace lubricating oil if necessary, remove, clean and grease clutch/brake assembly.
- ☐ Reinstall **knot log impeller**.
- ☐ **Flush and fill water tanks**.

- ☐ Run diesel **heater** for 10 minutes.

### Rigging

- ☐ Go up the mast to perform a thorough **rig check** of all fittings and welds, spreaders, lights, halyards, cotter pins, turnbuckles, sheaves, swages, and wire.
- ☐ **Lubricate** upper furling swivel, track, and masthead sheaves.
- ☐ **Tune** rigging. If you're not an expert, consider hiring a rigger to go for a quick tune-up sail with you.
- ☐ Clean and grease **winches** if you didn't do this earlier before leaving your boat.

### Sails

- ☐ Bend on **sails**.

### Safety Equipment

- ☐ Service **fire extinguishers**.
- ☐ Have **liferaft** repacked if needed.
- ☐ Replace expired **flares**.
- ☐ Check **EPIRB** operation and battery replacement.
- ☐ Check **medical kit**. Add the drugs you purchased to replace expired ones.
- ☐ Check **abandon ship bag** – recharge hand held VHF's

### Interior

- ☐ Steam clean **carpets** and cushions.
- ☐ Provision **galley**.

### Annual Engine Maintenance

- ☐ Adjust **valves**.
- ☐ Tighten **head bolts**, if required.
- ☐ **Align** engine only after boat is back in the water and mast is tuned.
- ☐ Check the tension of all **belts**, particularly on alternators as any slippage causes overheating and burnout.
- ☐ Check **turbo boost** pressure, if applicable.
- ☐ Service **fuel injectors**, based on exhaust smoke.
- ☐ Check all **charging systems**.
- ☐ Rebuild **starter motor and alternator** every seven years or 5000 hours.
- ☐ Purchase a **one year supply** of filters, impellers, belts, and engine oil.

If you're not too mechanically inclined, consider hiring a diesel engine mechanic to help you. If possible, try to find a mechanic that specializes in your make of engine.

### Sail Away

- ☐ Once the boat is in the water and ship shape, plan on spending a few days cruising to a quiet spot. This allows you time to recover from the stress, grime and noises of yard work and check that all systems are operational.





# NAUTICAL TERMINOLOGY

- Abaft** – behind the middle of the boat.  
**Active sheet** - headsail sheet taking the strain.  
**Aft** – at or towards the back of the boat.  
**Abeam** – off the side(at right angle) to the boat.  
**Awarthships** – across the vessel from side to side  
**Batten** – a thin slat that slides into a pocket on the mainsail, helping it to hold shape.  
**Bear away** – to turn away from the wind.  
**Bearing** – the direction of an object from the vessel.  
**Beating** – a course sailed upwind.  
**Bight** – a loop of line.  
**Bitter end** – the end of the line.  
**Block** – a pulley on a boat.  
**Block-to-block** – Two-blocked tackle  
**Bridle** – a Y shaped lifting or towing harness  
**Bollard** – A short vertical post on a ship or wharf used for securing mooring lines  
**Broach** – loss of directional stability  
**By the lee** – sailing downwind with the wind the same side as the boom.  
**Cleat off** – secure a line to a cleat in correct manner.  
**Close reach** – sailing with wind forward of beam. 70 degrees from bow.  
**Clear the cleat** – totally remove all lines from the cleat.  
**Course** – direction the boat is steered according to the compass.  
**Current** – horizontal movement caused by wind and/or tide.  
**Dead downwind** – sailing with the wind right behind.  
**Depower** – remove power from sails by luffing or making them flatter. Done to reduce heeling  
**Draft** – depth keel from water surface.  
**Ease** – to let out a line in a controlled manner.  
**Ebb** – out going current.  
**Fall off** – to turn away from the wind.  
**Fend off** – push off.  
**Flake or Fake** – to lay out a line using large loops to keep it from getting tangled.  
**Flashing** – Total duration of light less than dark.  
**Flood** – incoming current.  
**Fothering** – cover a leak in the hull with a sail or canvas.  
**Give-way vessel** – vessel required to give way when on collision course.  
**Gybe ho** – command given before gibing.  
**Hard over** – helm turned as far as possible in one direction.  
**Head up** – to turn towards the wind.  
**Heading** – direction according to the compass.  
**Helms a lee** – command given tacking.  
**High Lifeline** – line rigged bow to stern at waist-height to clip onto.  
**Hockle** – kink in a line.  
**Hoist** – to pull a line to lift an object.  
**Isophase** – light and dark of equal time  
**Jacklines** – line rigged bow to stern to clip onto  
**Kicker** – block and tackle system to hold boom down – vang.  
**Lash or lashing** – securing line  
**Lazarette** – aft deck locker.  
**Lazy jacks** – lines that assist mainsail lowering.  
**Lazy sheet** - headsail sheet not under load – windward side  
**Lee helm** – boats tendency to turn away from wind.  
**Leech line** – cord that prevents flutter on sails trailing edge.  
**Leech** – the after edge of a sail  
**Leeward** – side or direction away from wind.  
**Let go** – totally release a line.  
**Luffing** – the fluttering of a sail.  
**Make fast** – cleat or tie off a line.  
**Mast pulpits** - stainless guard rail at the mast.  
**Occulting** – Opposite of flashing light.  
**Painter** – line attached to the bow of the dinghy.  
**Pitchpole** – when a boat nose dives onto the water and flips stern over bow.  
**Preventer** – line attached to end of boom to prevent boom from swinging across the boat.  
**Pulpit** – stainless steel guard rail at the bow.  
**Pushpit** – stern pulpit.  
**Range** – distance or leading marks/lights.  
**Ready about** – command prior to tacking.  
**Rode** – line/chain attached to the anchor.  
**Secure a line** – cleat or tie off a line.  
**Slot** – gap between mainsail and headsail.  
**Slow astern** – move throttle aft until it clicks.  
**Slow forward** – move throttle forward until it clicks.  
**Snubber** - line secured to chain to take shock.  
**Spritzer** – A quick shower or rinse with no soap  
**Sterile cockpit/vessel** – keep non-essential talking to a minimum.  
**Stand by** – be ready, but do not take line off  
**Stand-on vessel** – vessel with right of way.  
**Strop** - sling  
**Tacking** – command given while tacking.  
**Tail** – the end section of a line.  
**Take up** – pull in or take the slack out  
**To tail** – to control a line from a winch or cleat  
**Telltails** – yarn on a sail to indicate sail trim  
**Tender** – dinghy.  
**Track** – actual course across the ground  
**Traveler** – track and car that controls the sideways movement of the boom.  
**Two-blocked** – when two blocks meet  
**Upwind** – towards the wind.  
**Vang** – block and tackle system to hold boom down – kicker.  
**VMG** – velocity made good in desired direction  
**Warp** – lengthwise direction of woven thread  
**Weather helm** – boats tendency to turn towards wind. Occurs when overpowered.  
**Windward** – towards the wind.  
**Working sheet** – sheet being used to trim the sails.

## SEA BAG LIST

### MAHINA OCEAN 2023 - 2024 EXPEDITIONS

#### SCOTTISH ISLES EXPEDITIONS, LEGS 1 – 4, 2023 & LEGS 1 & 2, 2024

Your gear must fit in one or two bags: a **soft-sided duffel** bag no larger than [REI 60L Roadtripper Duffel](#) or [Gill 60 Liter Race Team Duffel](#) (max. length 30", max. girth 60"). Optionally, you can also bring a small to **medium-sized frameless knapsack** similar to [REI Flash 18L Daypack](#). The knapsack is useful for hiking and shore trips.

**You must be able to carry your duffel and knapsack: Total maximum weight for all your gear is 30 lbs.** No suitcases, bags with wheels, metal-framed backpacks, folding luggage carts, camera bags, rigging knives, satphones, tracking devices, hair dryers, or excuses, please. **Nearly everyone brings more than is needed.** Drones and knitting are welcome! Each person has a shelf or drawer and shared hanging locker for shoes & foulies. Folding and organizing clothing in [Eagle Creek Cubes](#) or Zip-loc bags saves space.

➤ REI: 800-426-4840, [www.rei.com](http://www.rei.com), West Marine: 800-538-0775, [www.westmarine.com](http://www.westmarine.com)

#### Foul Weather Gear & PFD/HARNESS/TETHER

- ☐ Foul weather jacket. [West Marine's Third Reef](#) provides quality and value. **Jacket must have a hood.**
- ☐ [Patagonia Torrentshell rain pants](#) or similar from [REI](#) or [Marmot](#) are lighter and less bulky than foulie pants which are **bulky to pack and overkill** for these expeditions.

**Mahina Expeditions provides top quality Spinlock Lite+ PFD/Harness combinations and tether.**

#### Sleeping Bag

- ☐ Rather than packing a sleeping bag, an easier and less expensive option is to purchase one upon arrival. Each starting port has excellent prices on toasty bags, which are considerably less costly than in most other countries. I'll be happy to recommend which shop, depending on your starting port.
- ☐ Pillows and pillowcases are provided.

#### Primary and Middle Layers

- ☐ Soft-shell waterproof, breathable jacket: [Patagonia Bomber Hoodie](#) Super versatile indoors or on deck.
- ☐ 1 lightweight smart-looking short-sleeved collared shirt for men, 1 smart outfit for women for clearing customs.
- ☐ 2 **loose-fitting non cotton** short-sleeved running shirts: [REI Active Pursuit](#)
- ☐ 2 midweight long-sleeved non-cotton tops: [REI Sahara](#), [REI Women's Base Layer Crew Top](#)
- ☐ 1 nylon running shorts that are comfortable, loose-fitting & quick drying. [Nike](#) & [REI](#) have good options. Please do not bring long, cotton, baggy, belted or pocketed shorts as they are bulky and difficult to dry.
- ☐ 1 pair of [Eddie Bauer First Assent Guide Pro Lined Pants](#) These are absolutely brilliantly appropriate!
- ☐ 1 pair regular [Eddie Bauer First Assent Guide Pro Pants](#) (unlined)
- ☐ Please do not bring killer cotton jeans, sweatpants or sweatshirts which are bulky and difficult to dry.
- ☐ 1 pair running or yoga tights or long underwear bottoms: [REI Midweight Base Layer Bottoms](#), [Patagonia Women's Center Crop Tights](#).

#### Footwear

- ☐ 1 pair of newish, neutral soled boat shoes or sandals. [Grundens Deck Boss Ankle Boots](#) have been very popular. [Technical/performance deck shoes](#), [Teva Omnium 2](#) sandals.
- ☐ Comfortable, sturdy, fast-drying, non-leather running or walking shoes.
- ☐ Thongs to protect your feet from barnacles during beach landings and for marina showers.

#### Miscellaneous Gear

- ☐ Mahina Expedition Companion plus pens and notebook. It is unnecessary to bring your Offshore Cruising Companion because of space and weight requirements.
- ☐ Waterproof LED Headlamp with red & white lights plus extra batteries. Best, by far and only waterproof headlamps: [Black Diamond Spot325](#). Waterproof headlamps leave hands free for reefing, hourly logbook entries, etc. This is VERY important for your safety and not an option.
- ☐ Pillows and pillowcases are provided.
- ☐ Swimwear (running shorts dry faster than swim trunks)
- ☐ Warm [beanie/stocking cap](#) for night watches.

- ☐ Waterproof gloves: [Sealskinz](#) are the most versatile we've found. Optional if you easily get cold hands.
- ☐ Underwear (suggest 3 sports bras for women)
- ☐ Sun hat: [Tilley Airflow](#), [Columbia Sportswear Bora Bora](#) with tie down.
- ☐ 1 [Baseball cap](#) with tie-down clips for deflecting spray in heavy weather.
- ☐ 1 medium [Multi-Towel Lite](#) or small hand towels, **max. size: 16" x 24"**. **Please pay attention here!** There isn't room to dry or hang larger towels.
- ☐ 2 washcloths: [REI Co-op Multi Towel Mini | REI Co-op](#)
- ☐ Waterproof watch with light.
- ☐ Alarm clock.
- ☐ Waterproof sun and lip screen.
- ☐ Sunglasses with keeper strap. Two pair reading glasses, if used.
- ☐ Passport valid for at least one month from start of expedition. Please ensure that we have received a copy of your latest passport before the start of your expedition.
- ☐ COVID Vaccination certificate with an up-to-date COVID booster shot.

**Seasickness:** Eliminating coffee and black tea and increasing water intake to two liters daily for 2-3 weeks before the expedition **greatly** reduces your chance of seasickness and dehydration. If you think you may be prone to seasickness, read our [Seasickness: Avoidance and Treatment](#) page and consider following the drug recommendations. We provide each expedition member with a 1-liter water bottle.

**Optional:** camera, 2 books or tablet device.

USB and 12-volt power are always available for charging and I'll bring a small 110-volt power inverter.

**Travel and trip cancellation insurance,** Click [HERE](#) for [www.danboater.org](http://www.danboater.org)'s travel insurance. There is a link from [www.mahina.com](http://www.mahina.com).

**Communication Etiquette:** For the safety of the vessel and out of consideration for others aboard, we ask that you make and receive phone calls on shore only. When we're at anchor or in port, you're welcome to send and receive messages in the privacy of your cabin or bunk, but not in shared living or cockpit spaces and definitely not while you're on watch or during meals.

**Quiet Time Courtesy:** If a fellow expedition member is being taught or coached or is concentrating on navigation, please allow them an oasis of peace and quiet.

**Private Food Stashes:** You're welcome to share treats with other expedition members, but please, no private food or aboard.

**Expedition Timing:** Each leg starts promptly at 4pm and ends at 8am on the stated days. It is not possible to join the boat early or stay later.

**Please arrive in your joining port 20 hours before the start of your expedition, spending a night in a hotel.**

This extra time reduces the chance of your delaying the start of the expedition due to delayed flights or baggage. It also provides time to get over jet lag and to become acclimatized and rested before coming aboard. I will be pleased to recommend a hotel in your joining port.

Please do not schedule your return flight before 8 AM on the final day of the expedition.

**THE MOST IMPORTANT THING TO BRING WITH YOU: a positive attitude and an eagerness to learn.**



## 2023 – 2024 PACIFIC NORTHWEST SEA BAG LIST MAHINA EXPEDITIONS

Your gear must fit in one or two bags: a **soft-sided duffel** bag no larger than [Gill 60 liter Race Team Duffel](#), [REI 60 Liter Big Haul Duffel](#) (max. length 30", max. girth 60"). Optionally, you can also bring a small to **medium-sized frameless knapsack** similar to [REI Flash 18L Daypack](#). The knapsack is useful for hiking and shore trips.

**You must be able to carry your duffel and knapsack: Total maximum weight for all your gear is 35 lbs.** No suitcases, bags with wheels, metal-framed backpacks, folding luggage carts, camera bags, rigging knives, satphones, tracking devices, hair dryers, or excuses, please. **Nearly everyone brings more than needed.** Drones and knitting are welcome! Each person has a shelf or drawer and shared hanging locker for shoes & foulies. Folding and organizing clothing in [Eagle Creek Cubes](#) or Zip-loc bags saves space.

➤ REI: 800-426-4840, [www.rei.com](http://www.rei.com), West Marine: 800-538-0775, [www.westmarine.com](http://www.westmarine.com)

### Foul Weather Gear & PFD/HARNESS/TETHER

- ☐ Foul weather jacket. [West Marine's Third Reef](#) provides quality and value. **Jacket must have a hood.**
- ☐ [Patagonia Torrentshell rain pants](#) or similar from [REI](#) or [Marmot](#) are **lighter and less bulky than foulie pants.**

**Mahina Expeditions provides top quality Spinlock Lite+ PFD/Harness combinations and tether.**

### Sleeping Bag

- ☐ Pillows and pillowcases are provided
- ☐ Singles please bring medium weight sleeping bag. Couples will be provided with sheets and duvet.

### Primary and Middle Layers

- ☐ Soft-shell waterproof, breathable jacket: [REI Soft Shell Jacket](#). Super versatile indoors or on deck.
- ☐ 1 lightweight smart-looking short-sleeved collared shirt for men, 1 smart outfit for women for clearing customs.
- ☐ 2 **loose-fitting non cotton** short-sleeved running shirts: [REI Active Pursuit](#)
- ☐ 2 midweight long-sleeved non-cotton tops: [REI Sahara](#), [REI Women's Base Layer Crew Top](#)
- ☐ 1 nylon running shorts that are comfortable, loose-fitting & quick drying. [Nike](#) & [REI](#) have good options. Please do not bring long, cotton, baggy, belted or pocketed shorts as they are bulky and difficult to dry.
- ☐ 1 pair of [Eddie Bauer First Assent Guide Pro Lined Pants](#) These are absolutely brilliantly appropriate!
- ☐ 1 pair regular [Eddie Bauer First Assent Guide Pro Pants](#) (unlined). These are the only two long pants you'll need.
- ☐ Please do not bring killer cotton jeans, sweatpants or sweatshirts which are bulky and difficult to dry.
- ☐ 1 pair running or yoga tights or long underwear bottoms: [REI Midweight Base Layer Bottoms](#), [Patagonia Women's Center Crop Tights](#).

### Footwear

- ☐ 1 pair of newish, neutral soled boat shoes or sandals. [Grundens Deck Boss Ankle Boots](#) have been very popular.
- ☐ [Technical/performance deck shoes](#) or [Teva Omnium 2](#) sandals.
- ☐ Comfortable, sturdy, fast-drying, non-leather running or walking shoes.
- ☐ Thongs to protect your feet from barnacles during beach landings and for marina showers.

### Miscellaneous Gear

- ☐ Mahina Expedition Companion textbook plus 4 pens and notepad.
- ☐ Waterproof LED Headlamp with red & white lights plus extra batteries. Best, by far and only waterproof headlamps: [Black Diamond Spot325](#). Waterproof headlamps leave hands free for reefing, hourly logbook entries, etc. This is VERY important for your safety and not an option.
- ☐ Pillows and pillowcases are provided. Bedding (duvet and sheets) is provided for couples. Singles need to bring a light or mid-weight [sleeping bag](#).
- ☐ Swimwear (running shorts dry faster than swim trunks)
- ☐ Warm [beanie/stocking cap](#) for night watches.
- ☐ Waterproof gloves: [Sealskinz](#) are the most versatile we've found. Optional if you easily get cold hands.

- ☐ Underwear (suggest 3 sports bras for women)
- ☐ Sun hat: [Tilley Airflow](#), [Columbia Sportswear Bora Bora](#) with tie down.
- ☐ 1 [Baseball cap](#) with tie-down clips for deflecting spray in heavy weather.
- ☐ 1 medium [Multi-Towel Lite](#) or small hand towels, **max. size: 16" x 24"**. **There isn't room to dry or hang larger towels, so please do not bring them!**
- ☐ 2 washcloths: [Multi-Towel Lite Small](#)
- ☐ Waterproof watch with light.
- ☐ Alarm clock.
- ☐ Waterproof sun and lip screen.
- ☐ Sunglasses with keeper strap. Two pair reading glasses, if used.
- ☐ Passport valid for at least one month from start of expedition. Please ensure that we have received a copy of your latest passport before the start of your expedition.

**Seasickness:** Eliminating coffee and black tea and increasing water intake to two liters daily for 2-3 weeks before the expedition **greatly** reduces your chance of seasickness and dehydration. If you think you may be prone to seasickness, read my [Seasickness: Avoidance and Treatment](#) page and consider listed the drug recommendations. We provide each expedition member with a 1-liter Fiji Water bottle.

**Optional:** camera, 2 books or tablet device.

USB and 12-volt power are always available for charging and 110-volt power is available when the engine is on.

**Travel and trip cancellation insurance,** Click [HERE](#) for [www.danboater.org](http://www.danboater.org)'s travel insurance.

**Communication Etiquette:** For the safety of the vessel and out of consideration for others aboard, we ask that you make and receive phone calls on shore only. When we're at anchor or in port, you're welcome to send and receive messages in the privacy of your cabin or bunk, but not in shared living or cockpit spaces and definitely not while you're on watch or during meals.

**Quiet Time Courtesy:** If a fellow expedition member is being taught or coached or is concentrating on navigation, please allow them an oasis of peace and quiet.

**Private Food Stashes:** You're welcome to share treats with other expedition members, **but please, no private food aboard.**

**Expedition Timing:** Each leg starts promptly at 4pm and ends at 8am on the stated days. It is not possible to join the boat early or stay later.

**Please arrive in your departure port 20 hours before the start of your expedition, spending a night in a hotel.** This extra time reduces the chance of your delaying the start of the expedition due to delayed flights or baggage. It also provides time to get over jet lag and to become acclimatized and rested before coming aboard. I am happy to make hotel and travel recommendations – just email me: [sailing@mahina.com](mailto:sailing@mahina.com).

Please do not schedule your return flight before 10 am on the final day of your expedition.

**THE MOST IMPORTANT THING TO BRING WITH YOU: a positive attitude and an eagerness to learn.**

V3.23





## MAHINA EXPEDITIONS NAVIGATION TEST

NAVIGATION TAKES PRECEDENCE OVER EVERYTHING, AND MUST BE COMPLETED AND WAYPOINTS ENTERED THE NIGHT BEFORE DEPARTURE OR LANDFALL.

1. Draw or describe a Mercator projection chart.
2. When would you use parallel rules and dividers?
3. How many minutes in one degree of latitude?
4. How many miles in one minute of latitude?
5. What is one nautical mile?                      one fathom?                      one cable?
6. Where does one measure miles on a nautical chart?
7. What is the latitude of the north and south poles?
8. What is a meridian?
9. What and where is the prime meridian?
10. Where is the dateline? Name two countries on the dateline.
11. Where is 0 degrees longitude?
12. Explain the difference between variation and deviation.
13. Explain the difference between true and magnetic headings.
14. What is the difference between the true and magnetic north poles?
15. Why do we write course and distance for each leg in pencil on the chart?
16. Why do we enter latitude and longitude of each waypoint in the navigational computer AS WELL as in the GPS?
17. When determining a course on a nautical chart, do we use the inner or outer compass rose? What is the difference?
18. When making landfall, which chart(s) should be used?
19. What are the Sailing Directions and who publishes them?
20. Why is it still important to plot the ship's position on a paper chart several times per day in this day of electronic navigation?
21. Why should you plot your anchored position on a paper chart?

## RECOMMENDED BOOK & DVD LIST

### MAHINA SEMINARS AND EXPEDITIONS

#### Boat Selection, Outfitting & Preparation

|                                                                                          |       |
|------------------------------------------------------------------------------------------|-------|
| Advanced Bluewater Cruising, Hal Sutphen.....                                            | 24.95 |
| Annapolis Book of Seamanship, John Rousmaniere .....                                     | 49.99 |
| Best Used Boat Notebook. John Kretschmer <i>Excellent book</i> .....                     | 29.95 |
| ☺Big Book of Boat Canvas, Karen Lipe .....                                               | 19.95 |
| Bluewater Women, Gina de Vere .....                                                      | 16.99 |
| Boatowners Guide to Corrosion, Everett Collier.....                                      | 18.95 |
| ☺ Boatowner's Mechanical & Electrical Manual, 3d ed., <i>Excellent</i> Nigel Calder ...  | 49.95 |
| Canvaswork and Sail Repair, Don Casey .....                                              | 21.95 |
| Catamarans; Complete Guide for Cruising Sailors, Gregor Tarjan.....                      | 39.95 |
| ☺ Changing Course, Debra Ann Cantrell <i>Psychology of changing lifestyles</i> .....     | 12.95 |
| Complete Rigger's Apprentice, Brian Toss.....                                            | 39.95 |
| Cruising Woman's Advisor, 2d ed., Diana Jessie.....                                      | 18.95 |
| Diesels Afloat, Pat Manley <i>Simpler, better illustrated than Nigel Calder's</i> . .... | 29.95 |
| ☺ Essential Galley Companion, Amanda Swan Neal <i>Available from Mahina.com</i>          | 29.95 |
| ☺Evolutions Captain, The Tragic Fate of Robert Fitzroy, Peter Nichols                    | 12.95 |
| Inspecting the Aging Sailboat, Don Casey .....                                           | 15.95 |
| It's Your Boat, Too, Suzanne Giesemann .....                                             | 14.95 |
| ☺ Marine Diesel Engines, 3d ed. Nigel Calder <i>The Bible for Marine Diesels</i> .....   | 27.95 |
| ☺Modern Cruising Sailboat, Charles J. Doane <i>Excellent!</i> .....                      | 39.95 |
| RYA Weather Handbook, Chris Tibbs .....                                                  | 22.95 |
| ☺ Sail & Rig Tuning, Ivar Dedekam <i>Absolutely invaluable!</i> .....                    | 24.95 |
| Seaworthy Offshore Sailboat, John Vigor .....                                            | 18.95 |
| ☺ Surveying Fiberglass Sailboats, Henry Mustin <i>Easy to follow and superb</i> .....    | 17.95 |
| Surviving the Storm, Steve Dashew ... ..                                                 | 69.95 |
| Twenty Affordable Sailboats to Take you Anywhere, Greg Nestor.....                       | 19.95 |
| The Complete Ocean Skipper, Tom Cunliffe .....                                           | 50.00 |
| ☺The Queen of the North Disaster, Colin Henthorne .....                                  | 24.95 |
| ☺The Weather Experiment: Pioneers Who Sought to See the Future, Peter Moore              | 17.95 |
| ☺ Understanding Weatherfax, 2d ed., Mike Harris, <i>The most useful weather book</i> .   | 19.95 |
| ☺ Voyager's Handbook, 2d ed. Beth Leonard <i>Comprehensive and superb</i> .....          | 39.95 |
| Voyaging with Kids, Behan Gifford .....                                                  | 35.95 |

#### Navigation Books & Cruising Guides

|                                                                                       |        |
|---------------------------------------------------------------------------------------|--------|
| Illustrated Navigation, Ivar Dedekam <i>Highly recommended</i> .....                  | 24.95  |
| ☺Illustrated Seamanship, Ivar Dedekam <i>Excellent book</i>                           | 24.95  |
| ☺MEX WX For Boaters, Rains <i>Very important book for cruising Mexico safely</i> .... | 24.95  |
| ☺ Nautical Almanac ( <i>issued annually, must have shipped to you</i> ) .....         | 29.95  |
| ☺Ocean Passages and Landfalls, 2d Ed, Rod Heikell.....                                | 69.95  |
| ☺ Pacific Crossing Guide, 2d Ed Royal CC Pilotage Foundation*                         | 70.00  |
| ☺ Pacific Island Pilot, Vol. 3, Central Pacific, British Admiralty* .....             | 126.00 |
| Practical Celestial Navigation, Susan Howell ( <i>for when your GPS fails!</i> )..... | 19.95  |
| Sailing Directions for W. Coast of Mexico & Central America, DMA Pub 153*.....        | 40.00  |
| South Pacific Anchorages, Warwick Clay. <i>Hard-to-find info on anchorages</i> .....  | 55.95  |
| ☺Tide Tables, NOAA/Nat GeoSp-Intell Agcy <i>Prices vary by region</i>                 |        |
| ☺ We, the Navigators, David Lewis, a seminal work on Polynesian Navigation            | 31.95  |
| ☺World Cruising Destinations, Jimmy Cornell <i>Covers every country in the world.</i> | 49.95  |
| ☺ World Cruising Routes, Jimmy Cornell <i>Very important book</i> .....               | 59.95  |

\* Similar guides are available for most worldwide cruising grounds; consult Captains or one of the nautical book resources for advice

### Medical Books

|                                                                            |       |
|----------------------------------------------------------------------------|-------|
| ☺ Marine Medicine – A Comprehensive Guide, Eric A. Weiss <i>IMPORTANT!</i> | 15.95 |
| ☺ International Medical Guide for Ships, WHO, 3d ed.                       | 98.50 |
| ☺ Merck Manual; home edition in paperback (OOP, available from Amazon)     | 7.99  |

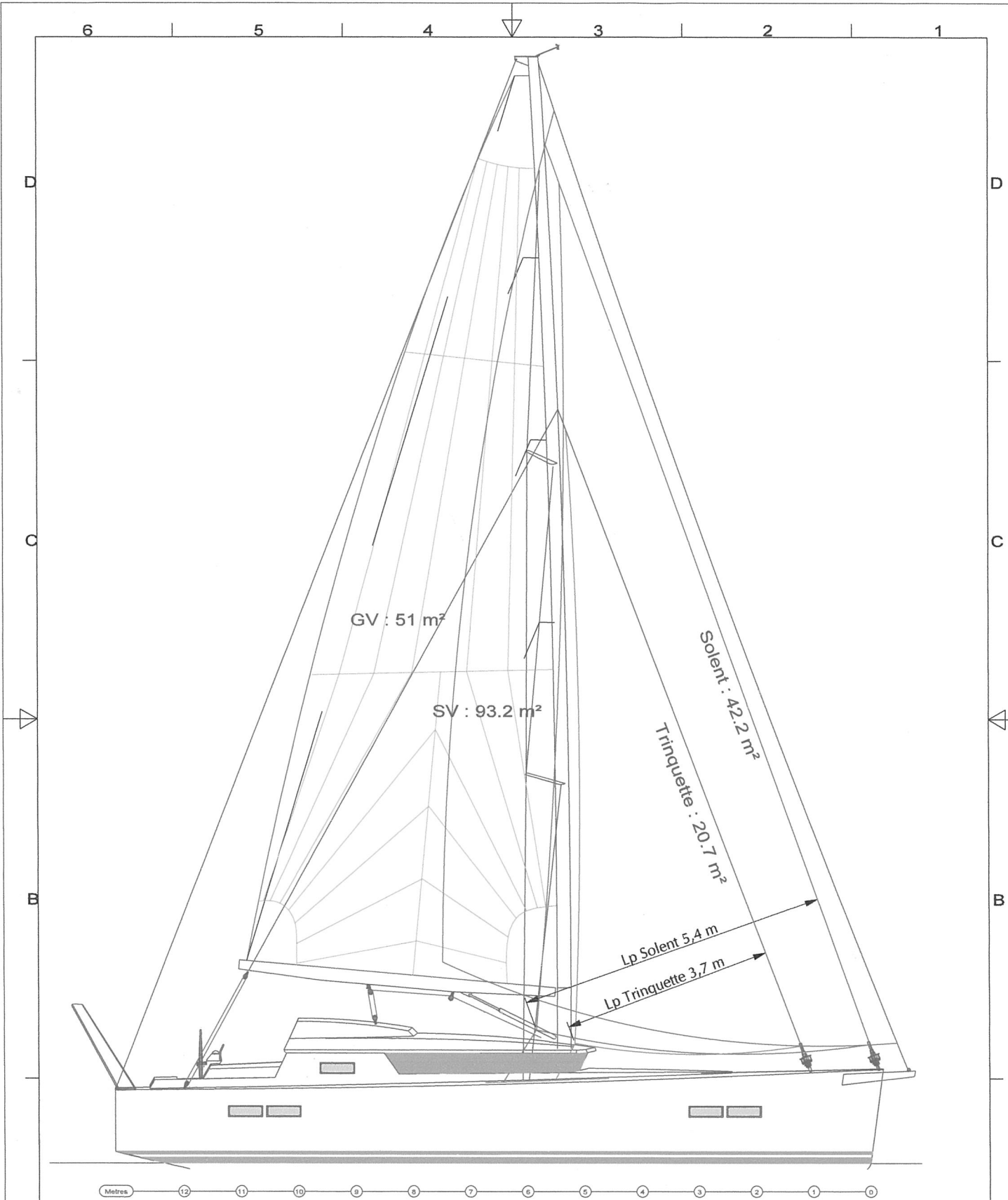
### DVDs




|                                                                      |       |
|----------------------------------------------------------------------|-------|
| Annapolis Book of Seamanship, volumes 1-5, priced individually at    | 34.95 |
| ☺ Sailing in Heavy Weather .....                                     | 44.95 |
| ☺ Inspecting Your Rig, Brion Toss .....                              | 29.00 |
| ☺ Going Aloft, Brion Toss .....                                      | 29.00 |
| ☺ Tuning Your Rig, Brion Toss.....                                   | 32.00 |
| Cruising with the Shards, Paul and Sheryl Shard .....                | 24.95 |
| Get Ready to Cruise, Lin and Larry Pardey .....                      | 29.95 |
| Get Ready to Cross Oceans, Lin and Larry Pardey .....                | 29.95 |
| Handling and Anchoring Your Boat .....                               | 34.95 |
| ☺ Pacific Rescue <i>Excellent analysis of Queen's Birthday Storm</i> | 34.95 |

☺ Highly Recommended by John and Amanda and used as reference books aboard Mahina Tiare on sail training expeditions

*This list was compiled with help from, and most of these books are available from:*  
*Captain's Nautical Supply, [www.captainsnautical.com](http://www.captainsnautical.com) (located in Seattle, WA)*  
*The Nautical Mind Bookstore, [www.nauticalmind.com](http://www.nauticalmind.com) (located in Toronto, ON)*  
*Paradise Cay Publications, [www.paracay.com](http://www.paracay.com)*

# NOTES



|                                                                                     |                                                                                     |                  |                             |
|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|------------------|-----------------------------|
|  |                                                                                     | GE45             |                             |
|                                                                                     |                                                                                     | Voilure          |                             |
|  |  | Ech. : 1/60      |                             |
| Format : A3                                                                         | Folio : 1/1                                                                         | Code Clipper : - | Fichier GY : 4-VOILURE-GE45 |
|                                                                                     |                                                                                     | Révision : 0     |                             |

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# EQUIPMENT LOCATION Garcia Exploration 45

- 1 liferaft
- 2 flares
- 3 flashlights
- 4 first aid kit
- 5 VHF
- 6 MFD
- 7 GPS
- 8 Floating light
- 9 foghorn
- 10 second anchor
- 11 life buoy
- 12 boat hook
- 13 PFD's
- 14 Life jackets
- 15 removable ladder
- 16 main anchor
- 17 lifeline
- 18 fire blanket
- X fire extinguisher
- smoke detector

