Offshore Cruising Seminar

SEMINAR OBJECTIVES

1. To present a broad information base for all aspects of offshore cruising. To enable you to have a safer, more enjoyable cruise.

2. To promote good seamanship practices, safety equipment and procedures.

3. To help organize your priorities, realizing that you must take full responsibility for your life, health and boat; placing essential equipment before luxury items.

4. To promote optimum health while cruising, and to help you become aware of the most common medical problems, their prevention and treatment.

5. To present a program which helps your cruising dreams become a reality.

John Neal
Barbara Marrett

Wonderful to have you at the Seminar - Hope to see you Cruising :)

Barbara Marrett

with a combined total of over 130,000 miles and 18 years of ocean cruising experience.

Mahina Productions
P.O. Box 1596 • Friday Harbor, WA 98250 • (206) 378-6131

Mahina Productions Offshore Cruising Seminar

Saturday

8:00 - 8:30	**Registration**
8:30 - 8:50	**Introductions:** What type of boat do you own? Cruising goals?
8:50 - 9:00	**Course Objectives:** Realistic Expectations, Reasons for Cruising
9:00 - 9:30	**A Woman's or Mate's Point of View:** Contributions, Needs, Expectations, Adjustments, Flexibility, Cruising with Kids
9:30 - 9:45	**Psychological Aspects of Cruising:** Dealing with Departure, Cruiser's Blues, Re-entry and Reality
9:45 - 10:00	**Cost of Cruising Today:** Working while Cruising, Useful Job Skills, Wages, Immigration, Work Permits
10:00 - 10:10	**BREAK:** Tea, coffee, juice, cookies. Get to know each other!
10:10 - 10:45	**Boat Selection and Purchase:** New or used? Homebuilt? National and regional price differences, how to research and shop. Surveys: hull, rig, engine. Hull materials, under-body configurations, structural checklists, rigs
10:45 - 11:55	**Sails:** Quality vs. price, domestic vs. oriental, custom vs. production, inventory, care and repair. **Rigging:** Rig maintenance, emergency spares, halyards
11:55 - 12:05	**BREAK**
12:05 - 12:15	**Boat Canvas:** Dodger, awning/raincatcher, leeboards, hatch covers, windscoops, collision mats. Sewing machines, thread, fabric, how-to books with patterns.
12:15 - 12:35	**Safety at Sea:** Hypothermia and prevention, proper gear, emergency repairs at sea, going aloft
12:35 - 1:00	**Passage Planning:** Seasonal planning, weather forecasts, storm avoidance and tactics, cyclones
1:00 - 2:00	**LUNCH BREAK:** Please be prompt, we must start at 2:00
2:00 - 2:45	**West Coast and Hawaii Cruising:** Best times, weather systems, moorage, storage, aerial slides of anchorages
2:45 - 2:55	**Clothing:** Cold weather, tropical, in port, footwear
2:55 - 4:50	**Priority Equipment:** Details of necessary equipment and costs, engines and boat spares, Cruising with Ham Radio
4:50 - 5:00	**BREAK**
5:00 - 5:40	**Optional Equipment:** Details of equipment and costs
5:40 - 6:30	**Liferaft Film:** Abandon Ship, Prepare to Survive

We will stay afterwards to answer your questions.

Mahina Productions Offshore Cruising Seminar

Sunday

8:30 - 9:00	**Seamanship and Making Landfall:** How not to lose your boat, when not to make landfall, use of all available tools and aids, low island landfall, coral atolls and passes, Polynesian navigation, aerial views, coping with shipwreck
9:00 - 10:20	**Cruising Medicine:** Common cruising and tropical medical problems - prevention, evaluation, treatment, follow-up, references, education, and sources
10:20 - 10:30	**BREAK**
10:30 - 11:50	**Cruising Medicine:** Recommended drug list: antiseptics, skin preparations, antibiotics, antifungals, antihistamines, pain relief, anti-motion sickness, gastrointestinal treatment, existing personal medical problems, references
11:50 - 12:05	**Dental Care:** Prevention and emergencies
12:05 - 12:15	**BREAK**
12:15 - 12:35	**Dangerous Marine Animals:** Slides, references, avoidance, treatment
12:35 - 12:45	**Boatkeeping Hints:** Dishes, bodies, heads, laundry
12:45 - 1:00	**Stoves:** Availability of fuels, storage capacity **Heaters:** Types of available systems, installation
1:00 - 2:00	**LUNCH BREAK:** Please be prompt so we won't run late
2:00 - 2:20	**Navigation Equipment:** Coastal, offshore, electronics
2:20 - 3:00	**Anchors:** Types, sizes, quantity, stowage **Chain:** Types, diameter, length, stowage, bridles **Line:** Types, length, care and stowage, abrasion **Windlasses:** Manual, electric, hydraulic, backing plates **Anchoring:** Normal, storm, coral, rock, multiple, fouling, bending, diagrams for various techniques
3:00 - 3:50	**Provisioning:** Bulk purchase and stowage, can preparation and stowage, freeze-dried, dehydrated, sprouts, purchasing and stowing fresh foods
3:50 - 4:50	**Managing Your Escape:** Finances, budget planning, money transferal, credit cards, taxes, real estate, telephone **Responsibilities:** Passports, ship's document, **crew**, bonds, visas, animals, insurance, local customs, language, clearing in and out procedures, courtesies, firearms
4:50 - 6:00	**South Pacific Cruising:** The Milk Run - slides, charts and passage planning of sailing from the West Coast to New Zealand

THANKS FOR COMING!

We hope to meet you again at an idyllic anchorage.

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PRE-DEPARTURE CHECKLIST *(206) 378-4359*

1. Get to know your boat. Go sailing in a wide range of conditions.
2. Take a course and practice coastal navigation: log keeping, dead reckoning, taking and plotting bearings, chart reading, tides and currents.
3. Practice heavy weather sailing: reefing, sail changing, storm management tactics. Go out when gale warnings are up.
4. Complete a passage where you'll be out of sight of land for at least two consecutive nights.
5. Take a celestial navigation course and practice until you're confidant.
6. Take a sail repair course and go over each of your sails with a sailmaker specializing in cruising sails. Purchase machine, cloth, fittings, tools.
7. Take a diesel repair course and go over every inch of your engine with a qualified mechanic. Purchase engine spare parts.
8. Purchase spares for every system on the boat: pumps, motors, repair kits.
9. Study for and pass Amateur Radio General License. Install ham radio, tuner and antenna. (optional)
10. Install and practice using self-steering vane, optionally an autopilot.
11. Arrange a reaching/downwind pole and stowage system.
12. Remove mast(s), strip of fittings and spreaders checking for cracks or wear. Replace all standing rigging if over 6 or 7 years old.
13. Hire a rigger to help tune rig and go for a test sail.
14. Purchase or repack liferaft. Assemble Abandon Ship Kit.
15. Install optional electronics: satnav, loran, GPS, radar, weatherfax, SSB.
16. Take marine refrigeration course, or as a minimum have a technician show you how to replace the drier and recharge the system. Purchase spares.
17. Move aboard boat, ideally 6-12 months before departure.
18. Sell or lease home or condo. Have massive garage sale. Find storage unit.
19. Calculate if you still have enough savings to leave on ETD or if you should work one more year. (Ugh!)
20. Quit your job or sell your business.
21. 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.
22. Get complete dental check-up and cleaning 6 months before departure, then final cleaning just before leaving.
23. Get thorough physical exam including blood tests, inoculations and vaccinations. Discuss prescription drug list with your physician, and have them write prescriptions.
24. Purchase and stow medical supplies and books.
25. Do initial dry goods and cans provisioning and stowing.
26. Sell vehicles.
27. Arrange with someone to pay bills and forward mail. Sign a limited Power of Attorney agreement for them.
28. Complete fresh foods purchases and stowing.
29. Have a Bon Voyage party as a way of saying goodbye to a lot of friends at the same time and to thank those that help you in preparation.
30. Sail to a nearby quiet anchorage where you can catch your breath and finish final stowing.
31. NOW THE REAL ADVENTURE BEGINS!

John Neal, Barbara Marrett P.O. Box 1596 • Friday Harbor, WA 98250 • U.S.A.

WOMAN OR MATES POINT OF VIEW

"And through all the tumble and activity of the Straits, I am conscious of the pleasure of the keen whip of the wind on bare calves and feet and the sting of spindrift on my cheeks, and greatest of all satisfactions, the sense of doing my part, of being needed and making good in my station at the helm."

Charmian K. London, 1915
The Log of the Snark

OBJECTIVES OF THIS SECTION:

1. To identify common concerns and fears of people new to offshore cruising.

2. To give insights on how to alleviate and understand these concerns.

3. To present some of the highlights and enrichment achieved from the cruising lifestyle.

4. To discuss cruising with children.

1. Making it the Mate's Trip Too:

   A. Responsibility of both partners to involve each other in the planning process.

   B. Find out what excites you about cruising.

      1.
      2.
      3.

   C. Share duties, that way you'll appreciate what it takes to manage the boat. & feel part of the trip

      1.
      2.
      3.
      4.
      5.

   D. Help decide and plan where you'll go, the style in which you'll cruise based on your needs also Cruising doesn't have the Macho!

      1.
      2.
      3.
      4.

2. Adapting to a Dramatic Change in Lifestyle
Live aboard before you leave on your cruise!

A. Get used to the smaller space.

B. Have your own lockers and drawers and keep them organized.

C. Designate a space on the boat where people can go to be alone.

D. Get used to each other's close company.

1.
2.
3.

E. Learn to simplify, leaving unnecessary belongings ashore. Adjust to the new lifestyle without all of the modern conveniences.

F. Meeting cooking and provisioning challenges: keeping it simple!

G. Filling free time: boredom, passage blahs, exercise, books, language tapes, crafts, celebrations, instruments.

3. Confronting Fears and Anxieties
Do a real shakedown cruise first on the ocean.

A. Get used to being out of sight of land before your big cruise.

B. Have the best safety gear and know how to use it.

C. Dealing with fear of failure -- having realistic self expectations.

1.
2.
3.
4.
5.
6.
7.

D. Loneliness and isolation

1.
2.

4. Positive Aspects of Cruising, becoming closer to your partner (and family), adventure, cultural enrichment and education, ease of making new friends--afloat and ashore, time for projects, time for evaluating your life, and seeking new direction. It is also often a time of contentment and serenity interspersed with periods of discomfort and frustration.

CRUISING WITH CHILDREN

We meet people cruising with children of all ages. It's hard to generalize, but from our observations and conversations, parents who have newborn to three year old children, seem to have a tougher time cruising than those with older children. Teens who start cruising at ages 14 or 15 often miss their friends and organized sports and want to graduate from high school with their own class.

Here are some tips:

1. Involve your kids in the planning stages of the cruise so they don't feel like they're being railroaded into your dream. Address their needs, expectations and fears.

2. Allow them private space - a separate cabin if you have the room, but at least a place they can store their toys and shell collections.

3. Bring a rowing/sailing dinghy and/or a windsurfer.

4. Give them responsibility for boat handling, maintenance, etc. View this as a learning experience for them.

5. Peers are important to kids. Talk with people who've cruised with children. You may consider buddy-boating some of the time with other boats which have kids aboard.

6. Education: courses available up to the 8th grade from: Calvert School, Tuscany Road., Baltimore, MD 21210. High school courses available from University of Nebraska. Many kids enjoy attending school in different countries, if even for a few months while waiting for cyclone season to end. Children learn new languages quickly, so don't pass up this opportunity just because the school is taught in a language other than English. When we met New Zealander Emma Tiare Russel-Green on Moorea, she had only been in kindergarten on Moorea a few months, but spoke fluent Tahitian, French with a Tahitian accent, and English. The world becomes your children's classroom -- they experience geography, language, culture, history, music, art and biology first hand, instead of just learning from books and a teacher in a classroom.

IF YOU'RE ON AN EXTENDED CRUISE EXPECT TO Experience a Let Down

A. Freak Out

Everyone experiences anxieties about cruising, no matter what their level of experience is. If you realize this is normal and know when to expect it, it shouldn't throw you for quite as big of a loop.

1. When it's time to leave the security of your home port, just after your bon voyage party is finished! Press onward! You didn't spend all of this time and energy to change your mind now!

2. During your first night at sea. Since you will have made an offshore shakedown passage before leaving on your real cruise, this won't be the end of the world. In about nine hours the sun will rise again.

3. During and after your first rough offshore passage. A fair number of northwest cruising boats end up for sale or on the back of a flat bed truck once they reach San Francisco. Bay area boats end up in San Diego for sale, and SoCal boats end up in Baja or Hawaii. Latitude 38 classified ads will confirm this.

4. When you're at the furthest point from land. This is a common and serious place to freak out -- expect it and be ready for it. Confidence in your well-prepared boat and in your navigation and seamanship skills (gathered during your shakedown ocean trip) are ways to lessen this anxiety. Many cruisers find that having a ham or SSB radio on board and checking in to maritime nets with position reports helps calm their anxieties. It is scary to be in the middle of the ocean and to realize that you are responsible for making the cruise, boat, and passage work and that there is no one that can come and assist you. Make sure than your physician includes a prescription for Valium in your first aid kit for serious anxiety attacks.

B. Miss your children, grandchildren or other family members. We've watched people cut short a good cruise and sail back home because of this. Some options:

1. Install a ham radio, get your license and phone patch home, or install a marine single sideband radio and call home using the High Seas of KMI San Francisco, WOM Ft. Lauderdale, or WOO New Jersey. This is more expensive than ham radio -- about $16 for first three minutes and $5 per additional minute.

2. Invite the people you're missing the most to come and visit you for a week or two. Grandkids often make excellent crew.

3. Plan on flying home once every 12-18 months for a visit, leaving your boat hauled out in a safe place.

4. Get into letter writing or sending audio cassette tapes. If you have older parents, as we do, their health and situation becomes more pressing. Talk with other family members about helping take care of aging parents while you're cruising. Set up a means via radio where family members can call you in an emergency ie., check in with a mainland ham station or net every couple of days.

C. Feel insecure about your job skills and employment possibilities once you return from cruising. Some hints for coping with these are: subscribe and have forwarded to you trade publications dealing with the type of work you do, visit and/or work in similar jobs in countries you're visiting. Send a newsletter every couple of months to your old clients, customers, & contacts back home. Keep them up-to-date and interested in what you're doing and where you are cruising. This makes a big difference when you're trying to get back in the groove (if you so desire) after your cruise. We recently met a super-successful Wall Street stockbroker who did this 15 years ago on his first circumnavigation and is now doing it again. At his companies expense, he threw a dinner party and showed slides to all of his accounts of his first circumnavigation, just before leaving on this trip. Now he has lots of people interested in his trip and anxious to see slides and do business with him again once he returns.

D. Miss familiar cruising grounds. I keep charts of the San Juan and Gulf Islands handy, and every so often pull them out and fantasize about cruising there again. The extreme example of this was a couple from Portland who said they thought the cruising and sailing was better back home in Portland than in Hawaii where they had just sailed to. The important point is to be happy and into wherever you are. This sounds trite, but it's true!

E Expect & feel alienates from family + friends

F Support System

G Culture Shock when you return

WHAT TO DO IF YOU GET THE "CRUISER'S BLUES"

1. **Start exercising daily**: If you're at anchor, try swimming steadily for 20 minutes, bicycling, walking, jogging or going for a hike. If you're under way, experiment with different exercises that can be done in the cockpit or on the cabin sole.

2. Watch your diet. No more Pringles or junk food, cut your sugar intake in half. Don't forget to take multi-vitamins and mineral tablets daily. Make sure that you're drinking 6-8 glasses of water per day (beer doesn't count, sorry!).

3. Go on the wagon. Try a week without alcohol.

4. Think about how incredibly lucky you are. Would you rather be living in India or Ethiopia or N.Y.C., or be stuck in a traffic jam on 101, I-5 or the Santa Monica freeway on your way to a boring 9-5 rat race job?

IF YOU ARE HOT...

1. Open the hatches!

2. Hoist windscoops over each hatch or skylight.

3. Rig your main and foredeck awnings.

4. If possible, go for a swim.

5. Turn on your 12 volt fan.

6. Drink two glasses of water with lemon or lime concentrate added.

7. Spray yourself with a plastic spray bottle (the type you'd use to mist plants or to spray clothes before ironing)

8. Soak your shirt in water, then put it on. This really works, especially in a breeze. The evaporating water will cool you for 15 minutes, then repeat!

9. Don't complain, everyone around you is hot too! Would you rather be cold and wet? If so, sail to Alaska.

IF YOU ARE COLD...

1. Cover your extremities: hat, gloves, socks and shoes or boots.
2. Start layering clothes and end with a jacket that will keep out the wind.
3. Turn your heater on, or light your kerosene lamps.
4. Have a cup of hot tea, chocolate or soup.
5. Snap on your dodger backdrop/enclosure.
6. Close the doors to your pilothouse, you lucky ones with inside steering!
7. Don't complain, everyone around you is cold too. Would you rather be hot and sweaty? If so, head for the tropics!

BOAT SELECTION

Selecting a cruising boat is one of the most critical decisions in preparing for an offshore voyage. Obviously there isn't any single design that is perfect for everyone. Our concern is that you choose a boat that will be safe, comfortable, well-built, and prove to be a good investment.

Size and Cost

Two of the most important points to remember when selecting a boat are size and cost. Few people realize that outfitting a boat for long distance cruising can easily take 30% to 60% more than the initial purchase price. On a 35' new or used boat, this can mean an additional $15,000 to $20,000 just for essential equipment including additional sails, ground tackle, liferaft and safety gear. This amount excludes any optional equipment such as refrigeration, electronics, outboard motors, scuba gear, and autopilots.

The common scenario goes like this: you overspend on the initial purchase of the boat, spend more money on optional equipment that isn't essential, then run short of funds once you've completed your initial provisioning and have actually started cruising. We speak from experience, having done this before!

A more realistic approach is to spend less on the initial purchase by either purchasing a well-built used boat or consider buying a smaller boat. Purchase the priority equipment first, provision the boat (or set aside $2,000 for it), set aside $500 to $1,500 per month for the period of time that you want to cruise, and then see if there is enough money left for the expensive non-essential but "sure would be nice to have" equipment.

The size of boat that you select really affects your cruising costs, not only in initial purchase and outfitting, but also in cruising expenses once you're under way. Over 75% of the boats cruising for a year or longer are sailed with only two persons aboard, and from experience we feel that a boat in the 30' to 40' size range works out best for most people, especially if they are fairly new to sailing. The time and cost involved in keeping up a boat over 40' goes up exponentially and many people that have been cruising full time for more than just a couple of years opt for a boat under 40'. Eric and Susan Hiscock were an example of this, Wanderer IV being a 48' ketch, and Wandrer V a 39' cutter, which they found much easier to handle. Exceptions to these observations are folks like Steve and Linda Daschew, now double-handed cruising thier new high-tech 68' ketch, Sundeer. Steve grew up sailing on his family's 70' schooner and is comfortable sailing large, fast cruising boats with small crews.

Crew

People cruising on larger boats often get stuck in the bind of having to depend on finding pick-up crew in different ports to be able to safely manage their boat on ocean passages. Crew problems are one of the most persistent and common problems on cruising boats. It's easy to find plenty of friends and family members that are excited about sailing with you when you first leave home, but as you get further away and airfare becomes more expensive, finding crew becomes difficult, and you may not be comfortable trusting your boat and life to people that you don't really know.

You must be prepared to singlehand your boat. You or your partner/wife/crew may become ill (or even severely seasick) leaving one person to handle everything. In respect to this possibility it makes sense to have a boat with manageable sized sails and a totally dependable wind-vane self-steering system and an electric autopilot as well. Fatigue is the #1 cause of short-handed or singlehanded boats being lost on the rocks or reefs while making landfall, so it is vitally important that you are able to handle your boat without help, and that your realize your limitations.

Primary Options

In the initial purchase of your cruising boat you have four options: buy a new boat, have a custom boat built, buy a good used boat, or build a boat. If financial constraints don't apply to you, the first option may be the most attractive. If your budget and time isn't quite so open-ended, a well-built used boat is the most logical option. If you can possibly find a boat that has already been outfitted and cruised, you'll save tens of thousands of dollars, as cruising equipment adds very little to the selling price of used boats. Home building, the last option makes the least sense unless you are an experienced boat builder. Very few people that we've met who have built their own boats would ever do it again. Many home builders never cruise their boats, enjoying the building process which generally takes three to ten years, more than actually cruising. Home-built boats are generally much more difficult to sell and may have a lower resale value than a comparable production boat.

Used boat prices vary geographically. Boat prices in Southern California used to be the highest in the U.S., but tough economic times have really leveled prices out. Areas with the most depressed economies (New England, Great Lakes) often have the best prices, along with Florida, where many East Coast and some European cruisers end up, out of time or money. Pacific Northwest prices are firmer than in the past, possibly due to the fairly strong economic climate. When trying to figure whether it makes sense to purchase a boat out of your area, make sure to factor in trucking costs. We paid $2600 for trucking our 42' Mahina Tiare from Long Beach to Seattle, plus another $1000 for decommissioning, insurance and recommissioning. We were quoted approximately $6,000 to truck a 42' boat from Florida, and around $2000 from the Bay area to Seattle.

The weakness of the dollar has made purchasing a boat overseas much less of a bargain than it was in 1984-85. For the first time ever, we've seen boat buyers coming from New Zealand and Australia to the West Coast, which is a 180 degree shift from past patterns. If you're interested in cruising a specific area such as Europe, and aren't that interested in the passages required to get there, purchasing a boat already there may be a good solution.

When purchasing a boat overseas, try and stick with a builder that is well-known and possibly has dealers back in the States. This will mean that it will be much easier for you to sell the boat and that you'll probably receive a better price if you sail it back home to sell it. The cost of shipping a 35' boat from Europe or New Zealand to the West Coast is $10,000 to $12,000. Any U.S. Embassy will be able to provide you with temporary documentation papers.

Boat Selection Checklist

1. Design: Was the boat designed for ocean sailing? Did the boatbuilder follow the designers construction criteria? If at all possible, contact the designer before purchasing. Some Taiwanese-built yachts advertised as being designed by Robert Perry or Doug Peterson may actually be pirated designs. The designer is not paid a royalty and the builder often tries to save money by saves money by reducing structural integrity. Stay far away from these boats!

2. Builder: Is the builder still in business? (When considering a used boat) If so, call them up and ask them about the boat that you're considering, having ready serial number and date of construction. Does it sound like the builder will still be in business in three or four years if you need replacement parts or advice?

3. How easily can the boat be sailed? Does it have a long and dangerous bowsprit? Low or excessive freeboard? A lot of weather helm? Is it very tender, will you be sailing to windward at 30 degrees of heel? Will it have a comfortable motion at sea, or will it tend to hobbyhorse to windward and roll downwind?

4. Will the boat make a comfortable home? An ex-race boat that has fantastic sailing characteristics but is cramped, damp and dark won't be a good cruising boat since you probably will be underway less than a quarter of the time.

5. How well can the boat sail to windward? Will upwind passages back home be impossible or extremely difficult? Will you be able to sail off a lee shore in an emergency?

6. How easily can the boat be made to self-steer? Is it unduly squirrelly? Is it easily balanced, and is the transom free of overhanging stern pulpits?

7. What is the stowage capacity of the boat? Will there be room for additional sails, tanks, food, bosun locker supplies, lines, spare parts, medical and safety supplies, or are the lockers under the settees and berths already filled with tankage that could have been designed into the

8. What is the weight carrying capacity of the boat, compared to your needs? Can the boat carry the additional weight of three anchors, a windlass and several hundred pounds of chain, as well as additional water (8lbs./gallon) and fuel (6lbs/gallon), a liferaft, dinghy and outboard? You'll be adding several thousand pounds of additional equipment, and if the boat you're considering is already on her waterline before you start loading cruising equipment you may end up several inches below the designed waterline, which can, on some designs be a dangerous problem. Boats that handle the weight the best are not real narrow at the waterline beam and have transom sterns without excessive overhangs.

9. Hull strength: Do the builder's boats have a history of severe osmosis problems? Two very good builders (Camper Nicholson of England and Uniflite, previous builder of Valiant Yachts) have the worst reputation for severe blister problems on certain models. Is the hull balsa-cored (problematic) or foam cored (great for insulation and impact resistance)? Is the hull thick and brittle from too high of a resin to glass ratio? This situation occurs most often with heavy displacement Taiwanese-built boats.

10. Deck construction: Are teak decks laid over plywood? If teak was laid

over plywood, was sufficient bedding compound used, or will you end up with thousands of small deck leaks where the screws are? Avoid balsa-cored decks like the plague. Unless every single screw or bolt hole in the deck has been made oversized and then filled with epoxy and re-drilled, saltwater will penetrate the balsa sooner or later, and the consequences are very expensive! If the boat has foam-cored decks, check all horizontal surfaces carefully for delamination by tapping with a small hammer. Do the decks provide adequate non-skid without being knee-grinders? If you plan on living aboard or cruising north of Santa Cruz, insulated decks will mean the difference between a damp, drippy interior and comfort.

11. Hull to deck joint: Are there screws or nuts protruding on the inside? Is this joint totally sealed to prevent leaks? If this area looks like it may be a problem, it is possible to radius the inside of the joint with epoxy and microballoons and then lay several layers of fiberglass tape over the inside of the joint, totally sealing it and strengthening the area at the same time. This is a messy job, but anything is better than deck leaks.

12. Bulkhead attachment: Are the bulkheads adequately attached to the hull? On a fiberglass boat they need to be glassed on both sides with multiple layers of tape. This is often a problem area on mass-produced boats, with Islander 36's as an example. Are there internal stiffening systems, or is the interior woodwork just lightly attached to the hull, only to break loose after a few thousand miles of ocean sailing? Is there proper access to hull and deck areas, or do fiberglass liners make leak-stopping very difficult?

13. Chain plate load transmission: Are the chain plates going to lift the deck or distort hull, or is the load evenly spread out?

14. Mast support system: Deck stepped masts are great, if proper structural members transmit the load to the keel. Otherwise deflection and possibly delamination under the mast will occur. Check the mast for trueness - even with an aluminum mast.

15. Keel: If external ballast is used keel bolts attaching the keel to the hull must be accessible, and keel loading must be spread out through the floor system. Internal ballast eliminates some potential problems with keels, but check closely during survey for any voids in keel area between the ballast and fiberglass.

16. Rudder: How well is the rudder protected from logs and flotsam? Can the rudder take impact and grounding without jamming or being damaged? How easily can it be removed with the boat in the water for repair? Unprotected spade rudders are much more likely to be a problem. I know of three Swans that have lost their rudders between Panama and Tahiti in one year alone.

17. Engine: Is the engine a common make that will be easy to find parts and service for? How good is everyday access? Can the engine be removed without having to destroy the cockpit or companionway? Is there an engine hour meter and logbook showing maintenance history? What is the fuel consumption? Range under power? 600-800 miles minimum under power for long distance cruising where fuel may not be available for months at a time is nice. Being able to maintain at least six knots under power will get you in most passes and channels at the time of least current. When I bought Mahina Tiare, I thought the 25hp Volvo

diesel engine was overkill for a boat that only displaced 9,500 lbs, but the top speed of 7.2 knots, cruising speed of 6.5 knots and maximum range under power at 5 knots of 1,200 to 1,500 miles was been great for entering passes and speeding up windless passages.

18. Steering system and position: If the boat has wheel steering, is the system built by a reputable company like Edson where you know you'll be able to get spare parts and that the castings are all first class? One of the most common and serious problems with some Taiwanese-built boats is in the steering systems; poor initial design, inferior bronze castings and rudders that aren't able to hold up to the stresses of ocean sailing. This isn't a problem on the more expensive imports like Norseman, Mason and Little Harbor.
Is the steering position located where the helmsman can be easily sheltered without having to resort to a huge dodger? What is the visibility like? I personally prefer tillers on most designs under 38', there is just less to go wrong or have to worry about, and it's much easier for self-steering with less friction involved.

Hull Construction Material

1. Fiberglass, like any material, can vary greatly from one builder to the next. The majority of fiberglass boats were never designed or built for extended ocean sailing and may eventually fall apart if pressed into this type of service. At the other extreme are some designs that are very heavily built, but are overweight and not good sailing boats. Some very good but not expensive cruising boats were the earliest fiberglass production boats, such as the Pearson Tritons, Vanguards, Alberg 35's and Countesses. After 25 years these boats are still going strong, and now worth double the initial selling prices. As with any type of boat, it is absolutely necessary to have a fiberglass boat thoroughly surveyed before purchase, including a check of the water content of the hull laminate with a moisture meter.

2. Steel is an excellent material for boatbuilding, and often the choice of sailors that have done extensive offshore cruising. The good impact resistance and total water-tightness of the hull, deck and fittings is a real advantage over other materials. With sandblasting and the new epoxy coatings steel takes less time to maintain than it used to, although it still requires more time and cost to maintain than a fiberglass boat. Two of the most attractive new cruising boats on the market today are the Amazon 37 and 44, built in Vancouver. These are powerful, fast and stiff boats whose hulls are extremely fair without the use of fairing. They are also extremely expensive. Look for the largest number of steel boats in Europe, with a few on the East Coast and in New Zealand and Australia. A poorly-built steel boat will have places on the inside of the hull that will trap water and allow the hull to rust through from the inside out. Access to every part of the interior of the hull makes checking for corrosion and painting much easier.

3. Aluminum is lighter than steel, though not quite as strong. Painted aluminum boats in the tropics seem to develop blisters in corners around welds after a couple of years, requiring an extensive and expensive repainting job. There are quite a few unpainted French aluminum cruising boats cruising around the world at any given time, and although their oxidized aluminum hulls may not be attractive, they seem quite practical. Aluminum suffers from electrolysis more severely than steel, so if cruising on an aluminum boat you'll want to be very careful about spending much time in marinas that are electrically "hot".

4. Wood boats often offer a lower purchase price, although the cost and time involved in keeping them in good shape is more than with other materials. If you have a limited budget, and don't mind the additional work, a well-built wooden boat may be a good choice.

Modern wood epoxy saturation (WEST System) technique produces boats that are lighter and stronger than traditionally built boats. The best areas to find modern cold-molded boats are in the Northwest, New England and New Zealand.

In 1977 I sailed for several months through the South Pacific on a classic 39' Sparkman and Stephens sloop, and found out how much effort was required to maintain a wooden boat in top shape in the constantly changing weather of the tropics. The teak decks were so hot during the day that we either had to wear shoes of carry a bucket of water with us to wet the decks down as we walked forward, and although the boat was in top shape, deck leaks were just a fact of life. Teak decks also act as an excellent solar heat collector. The varnished teak cockpit and cabin sides were beautiful, but difficult to maintain. There are simply many more potential sources of problems on wooden boats in the tropics, perhaps that's why we see fewer of them every year. However, there is a special warmth an appeal of wood that some people find irresistible, whether or not it takes more care and maintenance.

5. Ferrocement is the only material that has no advantages. It is the most labor intensive material to build with, is difficult to impossible to finance, insure or repair, and has the lowest impact resistance of any material.

Underbodies

1. Fin keel/Spade rudder is the cheapest and easiest type of boat to build. This type of underbody is the most maneuverable and fastest on the race course, but the unprotected rudder is vulnerable to logs, rocks and coral. An example of this type of underbody is a Cal 40, several of which have cruised thousands of miles without problems. If your cruise involves any high latitude sailing or gunkholing in remote areas, this would not be the best design for your use.

2. Skeg-protected rudder, detached from the keel is better-suited for long distance cruising. The skeg protects the rudder to some degree, and makes the boat easier to steer. Examples of this type of design: Valiant 32, 40, Crealock 34, 37. There are the most suitable, well built boats of this type of design, and they are a good choice.

3. Modern cutaway full keel, with attached rudder and moderate displacement is my personal choice for cruising in isolated areas where groundings aren't uncommon and the nearest shipyard may be thousands of miles away. The cutaway forefoot allows the boat to sail faster, keeps it from tripping or broaching as soon under storm-running conditions and makes it more maneuverable than a traditional Tahiti ketch type full keel underbody. The fact that the propeller is enclosed in an aperture and the rudder is slightly above and protected by the full length of the keel make for fewer problems. Careening or hauling out in primitive boatyards is easy with this type of design. Examples of this type of design: Cape Dory, Freya 39, Nicholson 31, 32, Morris, earlier Hallberg Rasseys.

4. Heavy displacement full-keeled double-enders used to be a nearly automatic choice for long distance voyaging. However, yacht design has made some great strides in the past 25 years, and it seems sensible to take advantage of these

improvements which make for faster, more comfortable passages, and smaller, more easily handled sail plans without resorting to bowsprits and boomkins. An example of this type of boat is the Tahiti ketch or designs based on Norwegian lifeboats.

5. Multihulls have advantages and disadvantages, like any type of boat. Their advantages include very little heeling or rolling, tremendous interior and deck space, making them great for living aboard and chartering. Another distinct advantage is that multihulls don't sink if holed, unlike ballasted monohulls. Their disadvantages for offshore cruising is that they are more weight-sensitive and overloading them can be dangerous, and than under extremely rare instances than can capsize. We are friends with two couples who are very happy after years of cruising their Jim Brown designed 31' and 38' tris, and have met an interesting Austrian couple that have cruised over 100,000 miles safely on their 60' cat.

Key points to remember:

1. Don't overspend on initial purchase price, save at least 40% of your total budget for outfitting, provisioning and cruising funds.

2. Realistically assess your needs in terms of size of boat and amount of equipment. Remember the KISS formula. More complicated systems mean more maintenance and spares to track down. Think moderate in terms of displacement and sail area - extremes, either ultralight or heavy displacement will be less comfortable or restrictive because of poorer performance.

3. Have the boat carefully and thoroughly surveyed by a marine surveyor experienced in offshore boats. Best not to choose a surveyor recommended by the seller or yacht broker. You want to find someone who has no vested interest, other than making sure that the boat you're considering is safe and a good investment for you. Marine insurance companies and banks are often able to recommend surveyors whose opinions they trust.

4. If possible, find and talk with people that own sisterships to the boats you're considering. Cruising World Magazine's "Another Opinion" Service (1-900-988-2275 or 5 John Clarke Rd., Newport, RI 02840) is an excellent resource.

BOAT SELECTION

We are not in the business of recommending or representing any specific boat builders or brokers. Here are some boats to consider for offshore cruising, listed in alphabetical order. There are some very well-built boats (for example, Swan and Baltic) which we haven't included on this list because in our opinion they don't necessarily make comfortable cruising boats. These are boats we are familiar with. There are other suitable cruising boats we are not familiar with. They are not on this list.

	USA Able	Able 32, 42, 48	Superb quality, not inexpensive.
*	USA	Alajuela 33	
*	USA Pearson	Alberg 30, 35, 37	Early f/g boats. Well proven, not expensive.
	USA	Alden 38, 44, 46, 54, 58	Classy, well built, beautiful & expensive.
	FRA	Amel 36-53	Strong, well designed.
*	CAN	Amazon 29, 37, 44	Steel boats, attractive modern designs.
	FRA Henri Waquiez	Amphitrite 43	Strong & roomy. Excellent company.
	USA Morris	Annie 28	
*	SWE Albin	Ballad	
	ENG	Bowman 36-58	Strong boats.
*	USA	Bristol 27-45	
	USA	Bristol Channel Cutter 28	Well built, not my personal choice. Good company.
*	USA	Cal 39	Comfortable, reasonably priced.
	USA	Caliber 33, 35, 38, 40	Well-built.
*	ENG	Camper Nicholson 31, 32, 35, 38, 39, 40, 43, 47, 56, 70	Out of business except for shipbuilding. Watch for blister problems on all models.
	USA	Cape Dory - all models	All models are well designed & built.
	USA	Cape George Cutters 31, 36, 38	Some owner completed. Strong & fast.
	FRA Henri Waquiez	Centurion 42, 47	Stong, fast & attractive. Excellent company.
	USA	Cherubini 44, 48, 62	Semi-custom boats. Beautiful & expensive.
	CAN	Contessa 26	Tania Aebi circumnavigated.
	HOL	Contest	
*	USA Pearson	Countess 44	Older John Alden design. Will need to be repowered & rewired.
	CAN	Corbin 39	
	USA Pacific Seacraft	Crealock 31, 34, 37, 44	Santa Ana, CA. One of the very best companies building cruising boats.
	USA Pacific Seacraft	Dana 24	Santa Ana, CA.
		Deerfoot Yachts	Fast & innovative, aluminum & fiberglass hulls.
	GER	Dehler 34, 38	Modern, well built.
	USA	Dickerson 37, 50	
	ENG, USA, CAN	Endurance 35, 38	Attractive Peter Ibold design built by various yards in ENG, USA & Canada.
*	USA	Esprit 37	Perry design. Comfortable, well proven.
*	USA	Fast Passage 39	Some built in Canada, some by Tollycraft. Excellent boat.
	ENG	Fisher 30-46	Motorsailers. Great for N.W. Alaska & N.E.
	USA Pacific Seacraft	Flicka 20	Mini-Ocean Cruiser.
	USA Morris	Francis 26	
*	USA	Freya 39	One of the best values. Many owner-completed. Built in S.F.

	FRA Henri Waquiez	Gladiateur 33	Excellent company.
	SWE	Hallberg Rassy, 31, 35, 36, 38, 41, 42, 45, 49	Well built, comfortable, & surprisingly fast. Very strong company, excellent service.
	USA	Hinkley 30-64	Well built, very expensive, hold their value well.
	FRA Henri Waquiez	Hood 38	Strong, fast, & attractive. Excellent company.
	USA	Island Packet 27, 32, 35, 38, 44	Good boats, design, strong company.
	USA	J-40; J-44	Fast, light.
*	USA Miller Marine	Jason 35	Built near Seattle, some owner-completed.
	CAN	Kanter 42, 45, 60, 65	Steel & aluminum boats, semi-custom. Highest quality.
	USA Morris	Leigh 30	
	USA Morris	Linda 28	
	TAI	Little Harbor 42 - 90	Ted Hood designed, heavy displacement. Semi-custom.
*	USA Allied	Luders 33 (DOVE), 36	Older well-built fiberglass boats.
	USA Pacific Seacraft	Mariah 31	At least one circumnavigation.
	TAI	Mason 33, 43, 44, 53, 54, 63	Some of the very best Taiwan built boats.
*	USA	Mercator 30	Inexpensive. At least one has circumnavigated.
	ENG	Moody 24 - 44	Good boats, reputable builder.
	USA & ENG	Morris 26, 28, 30, 32, 36, 44	Chuck Paine design. Superb quality, good company.
	USA Morris	Morris 36	(Earlier called Justine 36)
	FIN	Nauti-Cat Motorsailers	Very strong & comfortable. Not terribly fast. Very roomy, great liveaboard.
	CAN	Niagara 31, 35, 42	Well-built & roomy. Good company.
*	USA	Nordic 34, 40, 44, 45	Bellingham, WA. Attractive well built boats.
	USA	Nor'Sea 27, 35	27' is trailerable.
	TAI	Norseman 400, 447	Well-built, fast, expensive and attractive.
*	ENG	Ocean 60, 71	Powerful boats.
*	USA	Ocean Cruising 42	Only a few built by Hank Hinkley.
	USA Pacific Seacraft	Orion 27	Santa Ana, CA.
	ENG	Oyster	Some have inside steering.
*	USA Pearson	35, 42, 52	Good value. Un-sexy interiors.
*	USA	Pearson 35, 365, 424, 530	Well-built, not flashy.
	FRA Henri Waquiez	Pretorien 35	Strong, fast & attractive. Excellent company
	ENG	Rival 36-41	Not many on West Coast. Good boats.
	USA	Sabre 34, 38, 42	Built in Maine, excellent quality.
	ENG	Sadler 34	Unsinkable, fast, beautiful. Superb boat.
	CAN	Saturna 33	Attractive, Bill Garden designed pilothouse cutter.
*	USA Allied	Seawind II 32	Excellent boats. Good value. First f/g boat to circumnavigate the world.
	USA	Seguin 44, 51	S & S design. Excellent boats. Semi-Custom.
	USA	Shannon 28, 37, 38, 43, 50, 51	Excellent boats. Expensive & reliable.
*	USA	Southern Cross 28, 31, 35, 39	Good boats. Attractive designs.
*	CAN	Spencer 35, 42, 44, 54	Older boats, built in Vancouver, B.C.
	SWE	Sweden Yachts	Expensive & well built.

	USA	Townsend 30	Built in Pt. Townsend, WA. Attractive and strong boat.
	HOL	Trintella	Roomy and well-built.
*	USA Pearson	Triton	Superb value. Earliest f/g production boat. Very sturdy.
	USA	Valiant 32, 40, 42, 47	Tremendous blister problems with Valiants not built by the new company in Texas, once they get into warm waters.
	CAN	Vancouver 27	Also built in Taiwan & England.
	USA Pearson	Vangard	Excellent value.
	SWE Albin	Vega 27	At least six have circumnavigated.
	ENG	Victoria 30, 34	Chuck Paine designed.
	SWE	Vindo 29, 34, 38, 39	In my mind, probably the prettiest production boat.
	ENG	Westerly 26 - 36	Not flashy, but well-built boats.
*	USA	Westsail 28, 32, 39, 42, 43	Well-built boats. 39 is rare & attractive Perry design.
	CAN	Whitby 42	Sell for around $100k. Roomy & sturdy. Inexpensive but sturdy.
	USA	Windship	Expensive custom boats.
*	USA	Yankee 26, 30	S & S designed. Inexpensive.

MULTIHULLS

	USA Corsair	F-27	Many fast & safe ocean crossings. Easily trailerable.
	USA Perf. Cruising	Gemini 3200	
	FRA Jeantot	Privilege 39, 48	
	USA Various	Searunner Trimeran 31, 37	Jim Brown, excellent designs. Most were home built. Watch for soggy plywood.

	CAN	Canada
	ENG	England
	FIN	Finland
	FRA	France
	GER	Germany
	HOL	Holland
	SWE	Sweden
	TAI	Taiwan
*	Out of Business	

SAIL SELECTION

Although sails are among the most important equipment on an offshore cruising boat and the last thing you want to worry about, their selection and care are often left to last in terms of outfitting and budgetary priorities. It is essential to realize that the quality of sails you start out with will directly govern how much time and money you'll spend on repair and replacement once you're actually cruising. My experience with sails comes from a much broader base than my own 15 years and 100,000 miles of cruising. For the 10 years I have either totally or partially financed my cruising by repairing sails, so my recommendations come from a wide range of experience.

The sails that need the most repairs, last the shortest length of time, and have meant the most business for me have been imported Hong Kong or Taiwan sails. These are almost always less expensive, but when you have to start doing fairly major repairs after only one or two years of use, they are a poor value. The two most common problems are inferior quality materials and poor shape and cut, resulting in uneven stresses, shortening the life of the sail.

When I look for a sailmaker to make a new sail for Mahina Tiare, these are my criteria:

1. Have they had extensive offshore sailing experience, since there's a lot to be learned about sails at sea, which can't be learned in a loft.
2. Can they sew in reef and clew points, jib hanks and sail slides by hand?
3. Do they use rope, tape or webbing to reinforce the clews of working jibs, and rope around the head and clew, tapering and handsewn on the foot and leech?
4. Do they use extra-wide seams when joining panels together, so there's room to add two more rows of stitching later, without tear on dotted line effect?
5. Do they triple-stitch all seams on working sails?
6. Do they use large, multi-tongue patches to reinforce the corners?
7. If at all possible, can they come down to your boat to measure it?
8. Will you be paying for expensive national advertising and high overhead?

There are very few sailmakers left in the world that know how to do the handwork so essential to a long-lasting cruising sail, or who are willing to because of the increased time involved. The 1988 SSCA Equipment Survey lists Cranfield and Carter of England, Schattauer of Seattle, and Hasse and Petrich of Port Townsend Washington as the top three sailmakers in the world. Interestingly, Hood is rated dead last, even behind Lam of Hong Kong. I have over ten years and 40,000 miles on my lapper built by Schattauer (6010 Seaview Ave. N.W., Seattle, WA 98107, 206-783-2400), and over 20,000 miles on an excellent mainsail built by Hasse and Petrich (315 Jackson, Port Townsend, WA 98368, 296-385-1640) without any repairs other than partial restitching, a normal occurrence.

Once you locate a good sailmaker, take all of your existing sails to them to be checked over. Many times they will be able to re-work your sails, adding reinforcement and chafe protection. They will be able to cut the foot shorter on your larger genoas, so that you'll be able to see under them and they wou't scoop water up at sea. Sails greatly affect the performance of your boat!

Don't overbuy at first. Make sure that your working sails are in top shape, sail your boat for a while, then fill in the gaps with new sails. Expect 10 to 12 years of use out of top quality, well maintained cruising sails.

1. Mainsail: Your most heavily used and important sail, so it must be cut well and be in excellent shape when you leave. Three sets of hand-sewn reef points, and the batten pockets should not be sewn directly onto the sail, instead sewn onto a backing patch first, then stitched to the sail.
2. Working Headsails: Should be the same weight cloth as the mainsail, and heavily reinforced with rope, webbing or dacron tape.
3. Lapper: On sloops, an overlapping genoa of 120%-130% will probably be the most commonly used sail on ocean passages. The foot should be cut fairly high for visibility and to avoid scooping waves. A tack pennant will be used to keep the sail above and from chafing on the lifelines. Sewn on hanks work better and chafe the sail less on working jibs. Pre-stretched Dacron rope may be used instead of wire in the luff, making the sail easier to stow and giving you finer tension adjustment.
4. Storm Jib: A strong storm jib (about 65%) of at least 8 oz. cloth well reinforced with rope, webbing or luff tape. Before folding the storm jib, oil each of the hanks, because it can be dangerous to get the sail half hanked to the forestay, only to find a frozen hank, sending you back to the cockpit for pliers.
5. Storm Trysail: A trysail may not be necessary for a brief offshore trip, but should be included in your inventory for extended offshore sailing. The real advantages are that you're not wearing out your mainsail in storm conditions and that there is no chance of your boom flying across your cockpit if you gybe or broach.
6. Light Air Sails: Having effective, efficient light air sails may often mean having to motor or being able to move along at 3 to 4 knots. I've found the most versatile light air sail to be a lightweight dacron drifter, with hanks. This sail will outlast and is easier to use shorthanded and can be used closer to the wind than a nylon cruising spinnaker. If your budget can handle a cruising spinnaker in addition to the dacron drifter, go for it!
7. Roller Furling Jibs: Furling jibs make sail handling safer if you have a log bowsprit (Ingrid 38, Alajuela 38 for examples) or a very large foretriangle, but for most boats under 40' are not necessary. The possibility of unfurling in high winds, the difficulty of fitting a storm jib that won't come out of the slot in high winds, the likelihood of the mechanism freezing or jamming in bad conditions and the much quicker deterioration of the sails are all very real problems. However, on large, short-handed boats, or boats with long bowsprits they make sense. Brands that have a good reputation include: Pro-Furl, Reckmann, Schaffer, and Selden.
8. Roller Furling Mainsails: Only necessary on large boats with small crews. A distinct disadvantage is the howling noise made by the slot in the mast if you're tied to a dock and have the wind from astern. Hood and some other manufactureres sell a sock which can be hoisted up the slot, but they tend to jam up.
9. Roller Reefing: Though not very popular today, a well-designed roller reefing system is hard to beat for speed and ease of reefing. There must be a collar at the inboard end of the boom to keep the luff rope from bunching up around the gooseneck while reefing. I've used roller reefing on my last three boats, preferring it to jiffy reefing. Hood Sails are marketing a French-designed in-the-boom reefing system that has not received very good recommendations from the cruisers who we've talked with.

10. Tanbark-Colored Sails: Much easier on your eyes, slightly more expensive than white cloth, and may not last quite as long.
11. Full-Batten Mainsails: Useful if your main is tired and loosing its shape, or if you do a lot of motorsailing, but subject to increased chafe on ocean passages. Are full batten mainsails a sailmakers hype, or are they actually a good value? I'm not sure! If you have extensively used a fully-battened main, please drop us a postcard and let us know if you would recommend them. Thanks!

Proper care will greatly increase the lifespan of sails. The mainsail cover must be put on as soon as the anchor is down, and jibs should always be bagged when not hoisted. After each passage we take all of the jibs that we've used ashore, rinse them off if possible and then spread them out on a grassy spot to dry, walk around them checking every seam for stitching that might need to be replaced, and oil the hanks with sewing machine or 3 in 1 oil. We also fold our jibs, and find that they take about a quarter as much valuable storage space than if they are just stuffed into their bags.

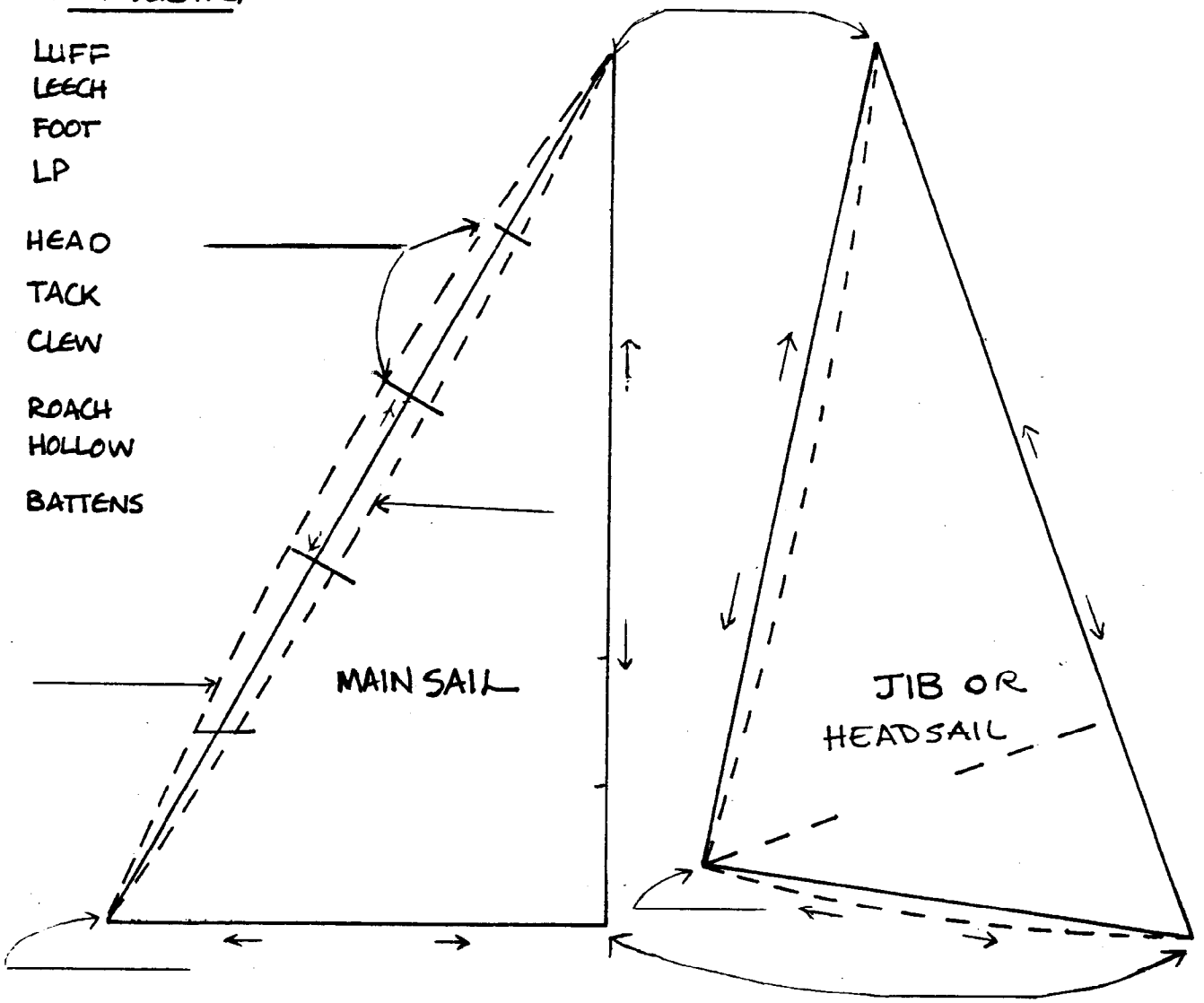
VOCABULARY

LUFF
LEECH
FOOT
LP

HEAD
TACK
CLEW

ROACH
HOLLOW

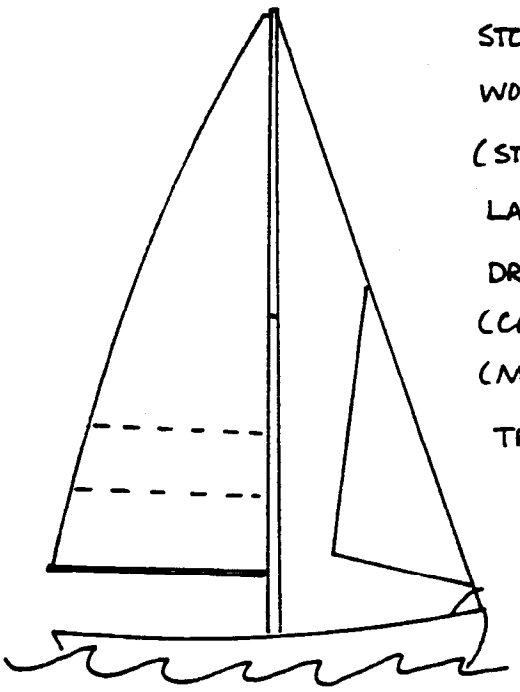
BATTENS



I.
J.
P.
E.

SQUARE FOOTAGE

ROW OF REEF POINTS



STORM JIB (STAYS'L)

WORKING JIB
(STAYS'L)

LAPPER · GENOA

DRIFTER
(CRUISING SPINNAKER)

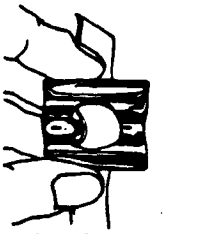
(MIZZEN STAYS'L)

TRYS'L

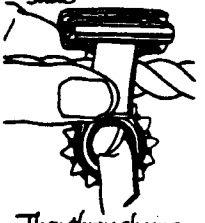
CONFESSIONS OF A SAILMAKER

By Carol Hasse

HANDSEWING A MAINSAIL SLIDE TO THE SAIL



Thread approximately 1 foot of webbing through slide

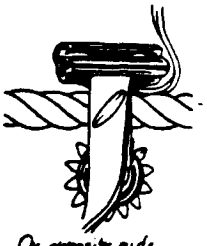


Then through ring holding down webbing with thumb

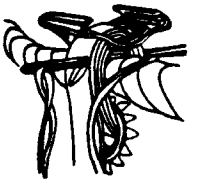
Take webbing through slide maintaining position of first wrap of webbing

Take 3 wraps through slide and ring ending on opposite side of sail Leave webbing uncut

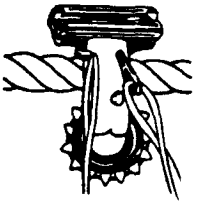
Knot or melt end of thread into a rivet Drive needle through sail & webbing between ring & bolt-rope being careful not to catch bolt-rope and catching first wrap of webbing Exit needle directly opposite entry Pliers are helpful here



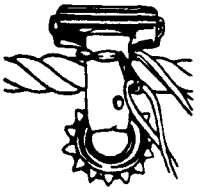
On opposite side of sail drive needle through webbing between slide and bolt-rope missing bolt-rope Exit directly opposite



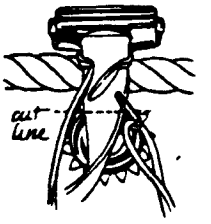
Bring thread around the outside of the webbing and drive the needle through the same hole again Pull on thread drawing up the slack in thread and webbing



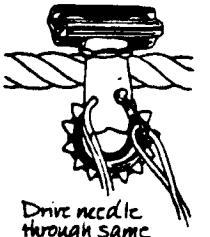
Back on beginning side of sail drive needle through webbing again missing bolt-rope Exit opposite



Bring thread around outside of webbing and drive needle through the same hole again Pull on thread drawing up slack



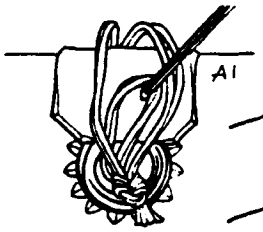
On opposite side of sail drive needle through webbing and sail between bolt-rope and ring forming an 'x' Exit directly opposite

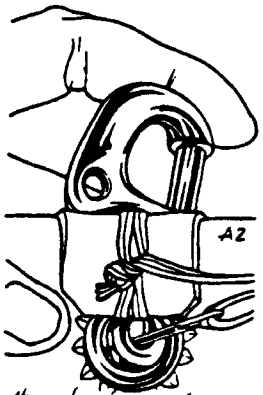


Drive needle through same hole as rivet or knot End by making rivet on opposite side Cut off excess webbing on cut-line (see above)

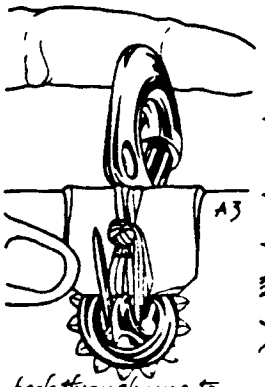
Cross section of internal track with slug secured to sail with webbing

HANDSEWING A JIB HANK

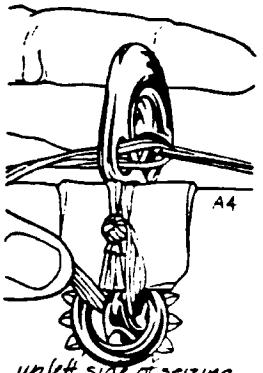




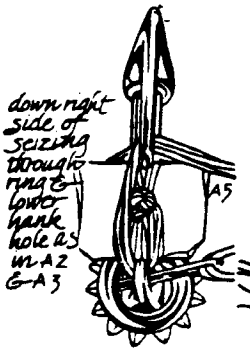
through ring to starboard side of sail & through lower hank hole right to left



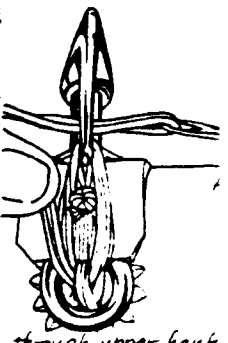
back through ring to port side of sail



up left side of seizing left to right through top hank hole

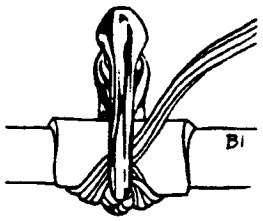


down right side of seizing through ring & lower hank hole as in A2 & A3

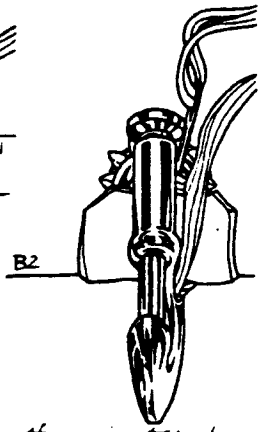


through upper hank hole left to right part A complete

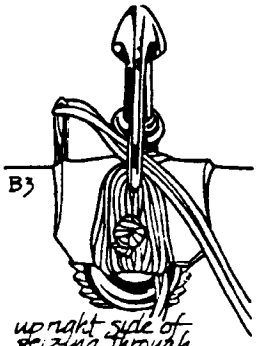
Repeat twice



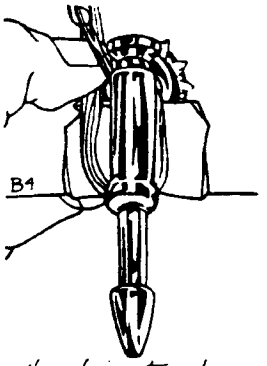
over the luff to starboard side of sail turning the sail as you go



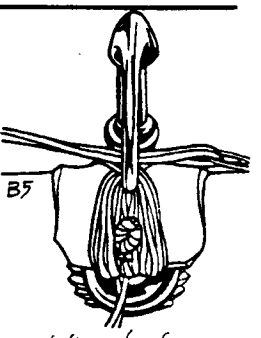
throug ring to port side of sail do not go through lower hank hole



up right side of seizing through upper hank hole right to left & over luff



through ring to port side of sail again. do not go through hank hole

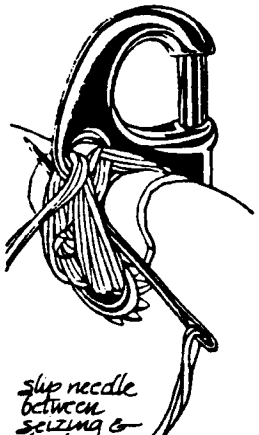


up left side of seizing. left to right through upper hank hole part B complete

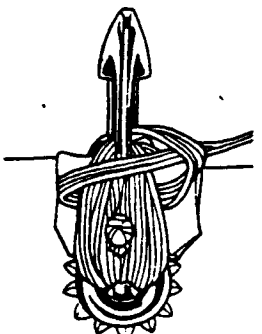
Repeat Once

return to A2 continue through to A6

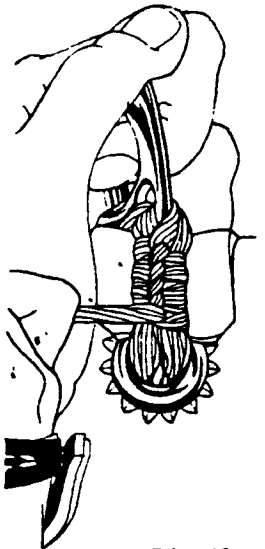
Repeat once again now on to the finishing knots



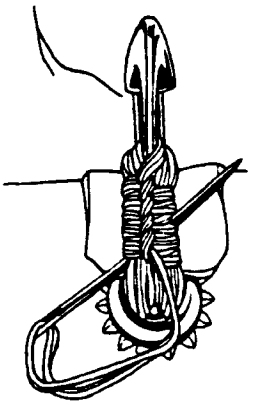
slip needle between seizing & leather right to left being careful not to catch either. it is helpful to create a channel with the blunt end of a larger needle before hand.



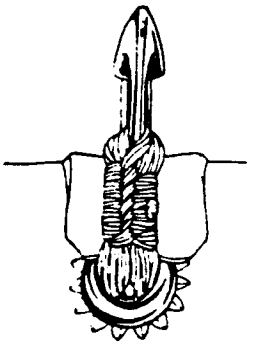
left to right catch loop created



Repeat 4 or 5 times



push needle left to right through the bulk of seizing pliers will be helpful



melt thread off into a smooth rivet

Illustrations by Gu[illegible]

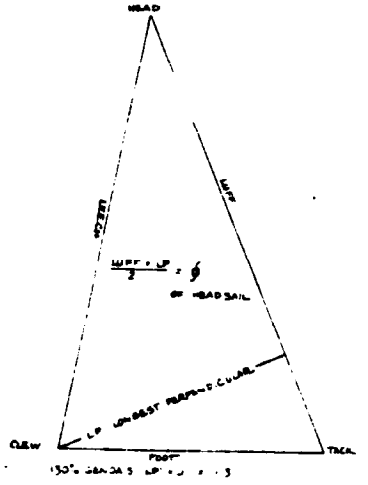
Happy Sails to You

A vessel at sea is much like a space ship. It is a moving life support system which must sustain its own and its crew's well being in an environment inhospitable (albeit irresistible) to human life.

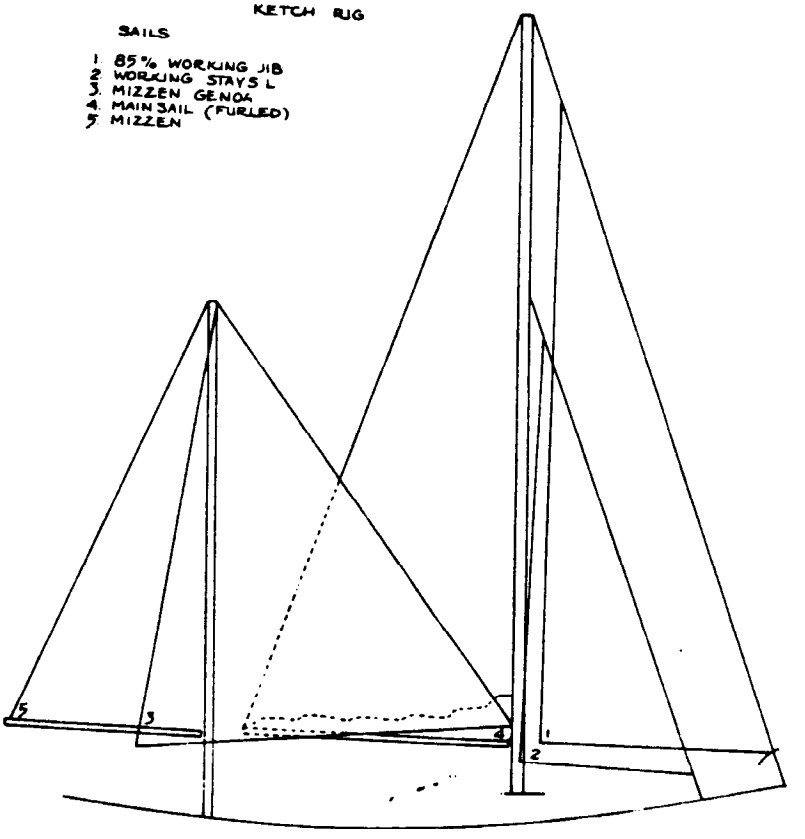
The structural integrity of a sailboat's hull and rig, and proper provisioning (of food, water, fuel, navigational instruments, tools, spares, and safety gear) are essential to this floating life support system. But the bottom line is what makes it go and what makes it stop.

I'll skip the "stop" subject — various anchors and attendant gear — and discuss the "go" part — sails!

Once away from the dock a sailor must be prepared for winds of any strength. Regardless of how carefully one has listened to weather broadcasts, scrutinized pilot charts or taken warning on red mornings, "s... happens." In Puget Sound and offshore, conditions range from calms to gales, with currents and lee shores thrown in for excitement. A complement of sails must fulfill the job requirement of preparedness, efficiency and relative ease of handling in all conditions. A smaller inventory means fewer sail changes, easier stowage and (you may have figured this out) less expense.



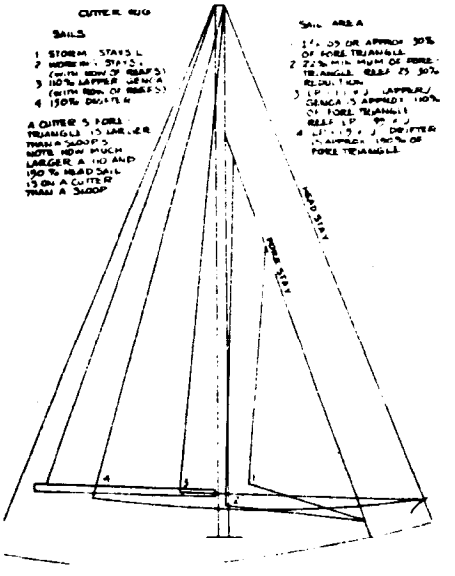
by Carol Hasse



To obtain this ideal suit of sails (or begin acquiring it) a sailor may consult one or more sailmakers. The naval architect's sail schedule, dock talk, armchair sailing, and your personal experience will also help determine an inventory for smooth sailing. Allow me to reduce your Ma Bell bill and offer this sailmaker's advice:

Different types of rigs require different sail inventories. With the exception of the catboat, the cruising sloop requires fewest sails of any rig. They are: storm jib, working jib, lapper/genoa, light air sail, mainsail with two reefs, and trysail. That's it, for cruising here or anywhere. A roller furling, or better yet reefing lapper/genoa may eliminate the need for a working jib, but not the need for a separate storm jib or light air sail.

If your vessel is a cutter, you will need only one additional sail, a working stays'l, although I am always worried sick I'll have to go out on the foredeck again in heavy weather to tuck the reef back in if my first reefing job comes undone. I am embarrassed



to admit this experience is among my nautical mishaps.

If your vessel is a ketch or yawl you will need all of the above plus a mizzen and a mizzen stays'l. A mizzen staysail, generally made of nylon, is a light air reaching sail which is set flying (without attachment to a stay). Its head is hoisted from a halyard block at the mizzen mast head, its tack set at the after lower shroud and its clew sheeted to a block at the end of the mizzen boom. Earl Hinz, a respected cruising author, makes a strong case for the mizzen genoa. It is a dacron sail, set flying from the mizzen mast head to the main mast near the gooseneck and sheeted to a stern cleat. His sail trials showed his mizzen genoa capable of pointing higher and making less leeway than his mainsail, while maintaining the same speed. This is a great advantage for a shallow draft vessel.

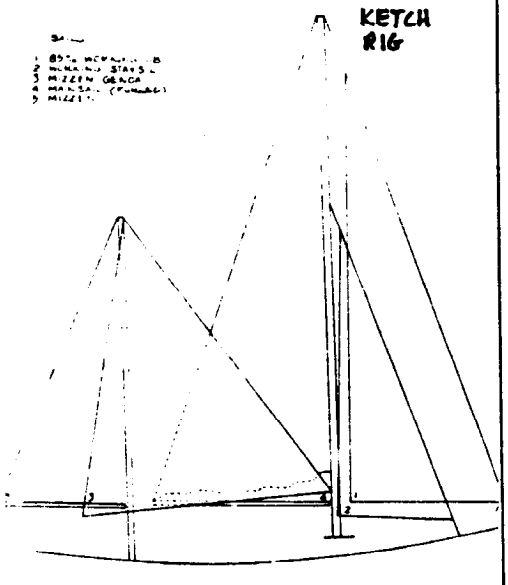
If your vessel is a schooner, brigantine or bark, you will have to phone or visit our loft after all so we can discuss raffees, courses, t'gallants, royals, gollywobblers, fishermen, t-tops'ls - not to mention how to brace the yardarm.

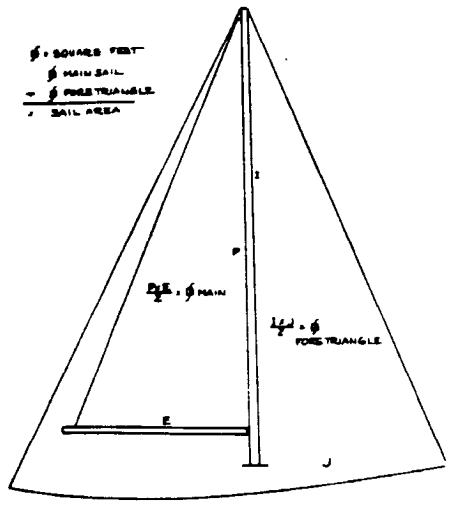
The sail inventories discussed above are minimum but comprehensive and require some further explanation. Let's start where your sailmaker does when you ask for a price quote on a new sail or sails and clear up this portion of the sailmaker's alphabet right now! "What is your I, J, P and E?"

I = distance from the jib halyard block to the deck

J = distance from the forward face of the mast to the base of the headstay

P = maximum allowable length of the mainsail's luff





E = maximum allowable length of the mainsail's foot

From these dimensions a sailmaker can determine the square footage of any sail you may wish to have made for your boat. And so can you! You will recall from 8th grade geometry (you were paying attention weren't you?) that height x base divided by two equals the square footage of a triangle. Hence, PxE/2 equals the square footage of the mainsail and IxJ/2 yields the square footage of the foretriangle.

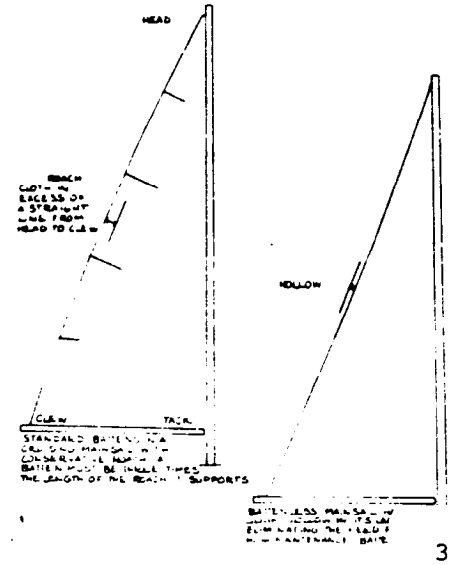
The size of every headsail (jib, genoa, drifter, etc.) is relative to the foretriangle's size. For instance, storm jibs are roughly 30-35 percent of the foretriangle, and working jibs 80-90 percent. Lappers are 105-115 percent, genoas 120-160 percent and drifters 165-180 percent. More accurately, the percentage of a headsail is directly related to the length of the LP as a function of the J dimension. LP stands for longest perpendicular — or the "height" of the triangle with the luff as its "base." It is a line drawn at a right angle from luff to clew. One determines the square footage of a headsail by multiplying the luff of the sail times the LP and dividing by two.

A 150 percent genoa has an LP which equals 1.5 x J, a 130 percent genoa has an LP which equals 1.3 x J, and so on. With this knowledge, imagine what fun you can have with scale ruler, compass, square and calculator making the Emperor's new suit of sails for your boat.

Square footage (area) and fullness (draft) of a sail are important considerations in sailmaking, and so is the sail's configuration or two-dimensional shape. All headsails on a cruising boat should be cut to clear the bow pulpit to prevent chafe, avoid scooping waves and ensure visibility. The clew should be close to the main boom's height, high enough for visibility and low enough to pole out easily. Generally the leading edge of drifters, cruising spinnakers, genoas and lappers is "full hoist." The heads of these light to medium air sails go all the way to the jib halyard block, taking advantage of the "wind fraction gradient" — stronger winds aloft. Cut for heavier winds, a working jib's luff is a few feet shorter than full-hoist with its head near the head of the mainsail when reefed. The head of a storm jib is generally in the vicinity of "half-mast," thus lowering the center of effort and reducing heeling moment in heavy winds.

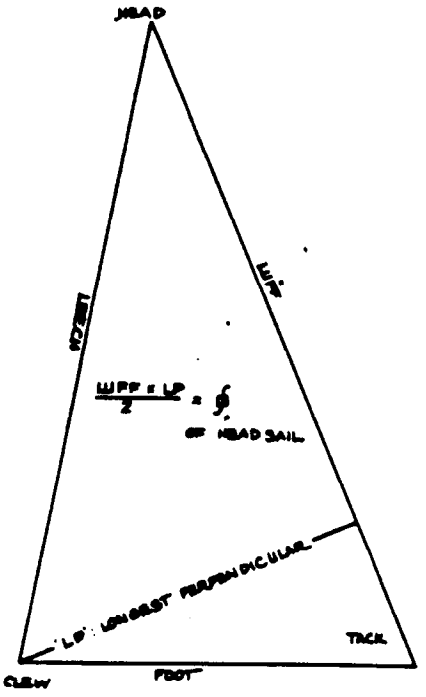
A working mainsail may be battenless, full-battened or made with standard battens. A mainsail with "standard" battens has roach in its leech: cloth in excess of a straight line drawn from head to clew. A leech with "roach" must be supported by battens to keep it from fluttering. In early yacht racing, roach was added to mainsails in order to sneak in unmeasured sail area, since PxE/2 does not include additional roach area. It was discovered that the battens used to support roach made a better setting leech and increased sail performance. Despite added efficiency, however, extra maintenance and hoisting hassles drive cruising sailors to have "roachectomies" performed, or order battenless mainsails.

A "battenless" mainsail is one cut with a hollow leech (much like a jib or genoa's leech) eliminating the need for battens to support its free standing trailing edge. Battenless mainsails are



common in the cruising world. Advantages are its ability to be hoisted easily on any point of sail and less maintenance. At least 50 percent of all sail repairs made while cruising are on batten pockets. If you sail much without an engine you will appreciate the ease of raising and lowering the battenless mainsail. Disadvantages of a battenless mainsail are smaller sail area, less efficiency and most likely an ill-setting leech. Such unsightly ailments as hooks, cups, and flutters are exacerbated as sailcloth ages and on high aspect rigs due to increased leech loading. Although there is less sail area aft in a battenless or hollow cut main, excessive weather helm may be induced over time as draft moves aft toward a tight leech. We have actually corrected an FD-12's weather helm problem by installing battens in the owner's "battenless" main at his brilliant request.

A fully battened mainsail usually sets excellently and performs better than a "standard" battened mainsail. Our loft just completed one for my 25' Nordic folkboat "Lorraine" and I am impressed with its consistently good shape; it even drives the boat when "pinching." The Marconi fully battened mainsail has such great compression loading along the luff at the battens forward ends, however, that raising, lowering and chafe problems have yet to be worked out by any loft. Despite claims, having to be head to wind to raise or lower sail is hardly my idea of ease of handling, nor is



dropping sail to adjust batten tension. Just how does one keep the battens and their pockets from wearing on the standing rigging, or handily stow spare full length battens? Fully battened mainsails are beautiful in their efficiency, however, and as batten pocket end systems and luff slides for full-batten sails evolve so will my endorsement of their offshore use.

Assessing a variation on the theme, I am quite enamored with the efficiency and ease of handling of the "Chinese junk" or fully battened "lug" rig. The junk sail's luff is free standing, making the sail a dream to hoist and drop. Reefing is as simple as lowering a venetian blind I learned while gunkholing Mexico's west coast in 1972 aboard the *Golden Apple*, a 30' Chinese junk.

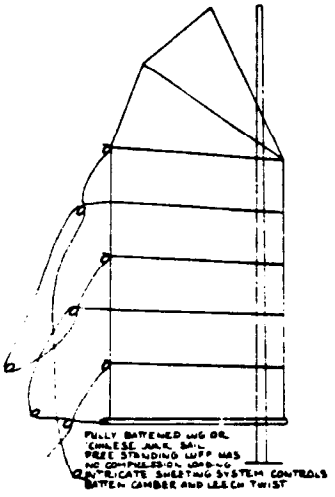
A system of "sheetlets" and "euphroes" (blocks) enables one to control the batten's camber and leech twist. Westerners are always amazed to learn that the Chinese had established trading routes with Mexico, sailing against trade winds and currents in their junks long before the Spanish made their downwind arrival.

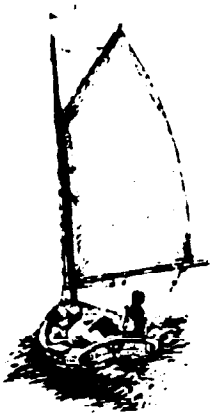
If you do decide on full or standard battens in your mainsail make sure the batten pockets are heavily constructed to endure the chafe of lying against shrouds on long passages and flogging when reefing and coming about in heavy weather. Regardless of which mainsail you choose, two rows of reefs should be installed — preferably at 25-50 percent reductions of sail area.

Reefing systems and storm sails deserve special attention as does the plethora of light air sail options and their handling. Stay tuned for subsequent articles with thorough coverage on these subjects.

In the meantime: beware the sailmaker who promises a one-headsail inventory to handle 0-40 knots. Give a wide berth to the sail loft that insists you need an arsenal of jibs, genoas, yankees, mules and spinnakers to leave the marina. Take notes underway if necessary to ascertain which of your current sails perform best in specific wind velocities and points of sail. See which sails are missing and wanted to ensure your safety, comfort and good times on the water.

Just in case you doubt that sails are the "go" part of your sailing vessel, I'm compelled to share a Marquesan refueling story. After a 28 day passage from La Paz to Taiahoe Bay aboard the 101' Baltic schooner *W. N. Ragland* we





we were ready to fill our 500 gallon tanks drained frighteningly low from impatient motoring through the doldrums. As we prepared to trade Polynesian Francs for diesel the Gendarme informed us we could buy five gallons.

Remember, the wind is free — if you can catch it! ❑

CONFESSIONS OF A SAILMAKER

By Carol Hasse Illustrations By Gae Pilon

Sail Repair: What to Do and How to Do It

Most sailors approach sail repair with the same confident enthusiasm with which they might attempt brain surgery. This sense of foreboding often benefits the sailmaker (who, as a result, gets a lot of business), but not the offshore cruiser whose self-sufficiency in every aspect of maintaining his/her vessel and its attendant gear is vitally important.

There's a mystique surrounding sails — perhaps since their operating principle (turned 90 degrees) consists of the same magic that keeps airplanes in the sky. However, fixing sails really is straightforward — trust me.

The first step in sail repair is assessment: ascertaining just what needs fixing — and in some cases if the sail is worth putting time and materials into.

The initial clue regarding a sail's condition is its age. Dacron sailcloth will last approximately 8-10 years (longer if a sail's use is seasonal or infrequent). The amount of abuse and exposure to light a sail endures determines its useful life. Dacron has two major enemies: ultraviolet deterioration and chafe. The most effective maintenance routine for dacron is to cover it when it's not in use and to protect it from wear against spreaders, spars, running and standing rigging, pulpits, cotter keys, sailtrack fittings, and hardware integral to the sail itself. A less obvious form of chafe is dirt and salt in the weave of the cloth — keeping a sail clean extends its life. Remember, flogging a sail may result in severe wear and tear, not to mention a resounding racket that assures unwanted attention on the helmsperson or sheet trimmer.

The assessment procedure is a thorough inspection which both local and coastal cruisers should do annually and offshore cruisers should conduct prior to each passage. The process begins with laying the sail out full on a clean, flat surface. Location-wise, a sail loft floor is the obvious first choice. However, I've used domestic and foreign airplane hangars, runways, gymnasiums, barns, ballrooms, tennis courts, parking lots, pool halls, tropical resort lawns and golf courses to name a few. Be creative and improvise — you'll probably have to during the rest of the repair process!

...a flogging sail may result in severe wear and tear, not to mention a resounding racket...

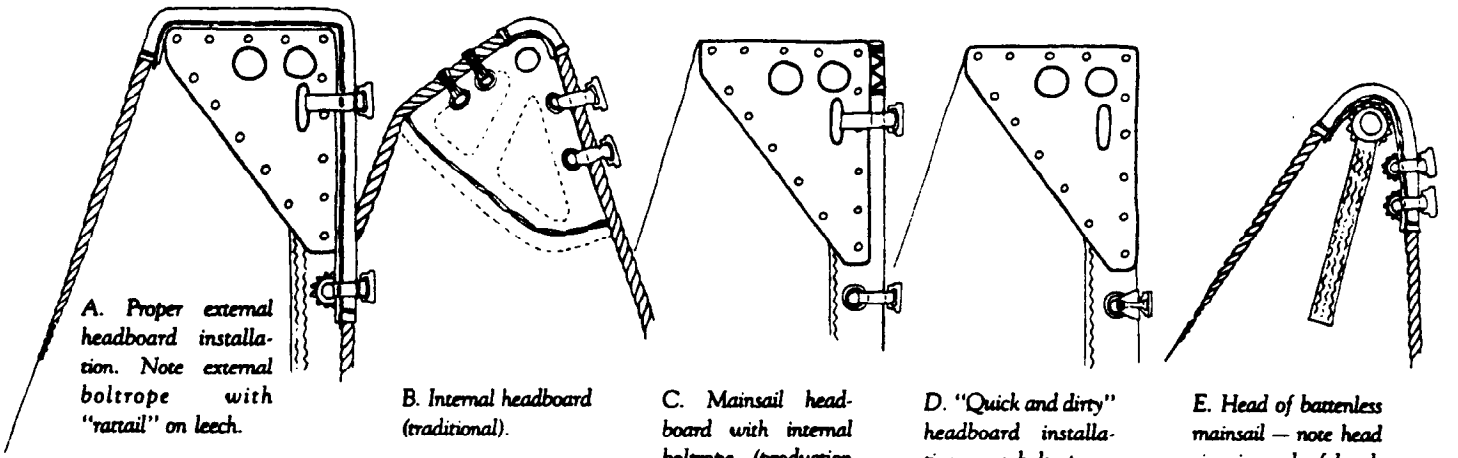
When spreading the sail, make sure reinforcing patches at head, tack and clew, batten pockets and reef points are "up" for viewing. Remove sheets, battens and shackles. The sail is now ready for inspection.

Use the following "laundry list" to assess your sail. Be sure to take careful notes and mark the sail with pencil so you can find the areas that need attention later.

1. Look for broken stitches in the head reinforcing patch.
2. Examine the headboard or head ring for elongation or deterioration.
3. Check the sailcloth, luff tape and/or boltrope around the headboard for wear.
4. Make sure slides in or around the headboard are secured well and that their method of attachment isn't chafing the headboard, sailcloth, or bail of the slide.

There was an English sailor who neglected the above item and, as a result, provided gainful sail repair employment for me while I was waylaid in Nassau. The slide at the head — where loading is the greatest — chafed through its seizing and departed from his mainsail after a trans-Atlantic passage. While cruising in the Bahamas, a gale in the "Tongue of the Ocean" blew up and the mainsail slide two feet down the luff from the headboard (not meant to take the load without a slide in the headboard above it) tore out. So did the grommet it was secured to. Almost immediately, most of the slides and grommets below it yanked out and the boltrope was liberated from the mainsail's leading edge as well. Had this mainsail been properly made with two slides at the head, handsewn rings instead of grommets along the luff for the luff slides to be secured to, and a boltrope handsewn around the head and along the leech the length of the head reinforcing patch (see illus. 1) this probably wouldn't have happened. That's a construction story, not a repair story, however. Back to our list.

5. Check for chafe and broken stitches in the luff tape and boltrope both between and under each luff slide, working your way down the luff towards the tack.
6. Make sure each slide on the luff is in good condition, is seized securely to its ring or grommet, and that the seizing is not wearing the sail or slide.



A. Proper external headboard installation. Note external boltrope with "ratrail" on leech.

B. Internal headboard (traditional).

C. Mainsail headboard with internal boltrope (production standard).

D. "Quick and dirty" headboard installation — no boltrope

E. Head of battenless mainsail — note head ring instead of headboard.

Illus: 1: Construction options for the heads of mainsails.

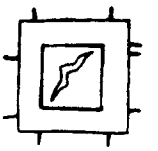
7. Check that each grommet or handsewn ring on the luff which the slide is seized to is not corroded or pulling out.
8. Examine the reef reinforcing patch for broken stitches.
9. Make sure the reef tack ring isn't corroded, elongated or coming out of the tack reinforcing patch.
10. Examine the boltrope or luff tape for chafe where the reefing tackle might abrade when it's engaged.
11. Observe the tack reinforcing patch for broken stitches.
12. Make sure the tack ring is in good condition and securely in place.
13. Note if there is chafe on the cloth, boltrope or leather around the tack ring.
14. Proceed along the foot looking for broken stitches and chafe in the dacron tape or boltrope.
15. If there are slides on the foot of the sail, make sure they are in good condition and properly fastened to the sail.
16. Make sure grommets or rings along the foot which slides are attached to aren't corroded or pulling out.
17. Monitor clew patch for broken stitches.
18. Note chafe in the sailcloth, boltrope or leathers around the clew ring.
19. Make certain clew ring is in good condition and securely in place.
20. Observe the entire leech, noting broken stitches in the leech hem.
21. See if the leech line inside the leech hem is chafing through the hem.
22. Ensure that the leech line cleat is in operable condition.
23. Check to see if the leech line works (i.e. tightens the leech when pulled).
24. Examine stitches in the reef reinforcing patches on the leech.
25. Survey the condition of the sailcloth around reinforcing patches.

The importance of the above item became all too clear to me while aboard a schooner in the Bahamas. A controlled jibe shockingly resulted in the sail splitting from leech to luff. It was blowing hard and we were reefed. The tear began in the sailcloth directly above the reef reinforcing patch and continued lightning-bolt style, 4-6" up to the seam above the reinforcing patch and shot across the entire width of the sail in seconds.

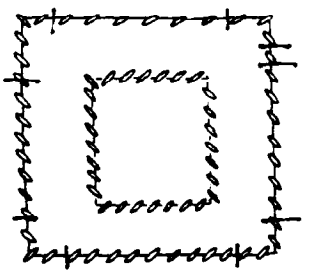
Almost immediately, most of the slides and grommets below it yanked out and the boltrope was liberated from the mainsail's leading edge as well.

Had we observed the weakened sailcloth surrounding the reef reinforcing patch and added a larger "cover patch" over the original reinforcing, this disabling circumstance could have been avoided. Repairing the sail was no minor feat and required usurping loft space, time and tools from the British America's Cup Lionhart syndicate's boatyard complex. I still consider this a diplomatic miracle. The logistics of coming and going with a 500 square foot mainsail in pieces by overloaded dinghy to avoid being in the loft when the syndicate needed it is a story in itself — but back to sail assessment ...

26. Look for chafe around the reef ring that might be caused by reefing tackle.
27. Observe condition of the reef ring.
28. Carefully monitor batten pockets for chafe or holes on both sides of the sail.
29. Having arrived back at the head, walk or crawl along each seam looking for broken stitches.
30. Check each panel for tears.
31. Make sure the stitches that hold reef point reinforcements in place are in good order.
32. Make sure reef point rings or grommets aren't corroded or pulling out.
33. Congratulate yourself! You've just completed a thorough inspection of your sail; it's not often in life that we confront things far bigger than ourselves.



A. Outer square is the sew-to line with strike-ups. Inner square is the cut line (the tear will be cut out of the sail cloth along the cut-lines)



B. The patch in place may be sewn by hand (as shown) or zig-zag machine.

Illustration 2: T.V. screen patch.

Headsail inspection is a similar process: examine corners, edges, and body of the sail for broken stitches, chafe, or tears and go over hardware (hanks, grommets or rings) for wear. In both cases, once problems are determined, repairs and/or reinforcements may be made. Now that we've covered assessing the condition of the sail, let's take a look at dealing with the weaknesses we've uncovered.

Holes in the body of the sail may be repaired using the "TV screen" patch.

Broken stitches can be repaired with dacron twine or thread either by hand or using a zigzag machine. The best, although not the fastest or most practical, method is to follow the old needle holes. The proper handsewing stitch will be discussed in another installment of "Confessions," but it's shown in the handsewn "T.V. screen" patch illustration (see illus. 2). V-69 dacron thread with a 110 needle or V-346 or 3-ply dacron waxed twine with a #16 or #18 needle are appropriate for restitching with machine or by hand respectively. Begin by sewing on top of 2-3" of the remaining "good" stitches. Continue over the broken stitches and finish 2-3" into the "good" stitches on the other side of the worn area.

Holes in the body of the sail may be repaired using the "T.V. screen" patch. Measure the size of the hole or tear and cut out a piece of dacron of the same weight as the sail. The patch should be square or rectangular in shape and 1-1 1/2" larger than the hole or tear on all four sides. The larger the hole, the more important it becomes that the weave of the patch line up with the weave of the sailcloth underneath it. In this case, you'll want to match the "grain" of the patch with the sail before cutting the patch to size. It's best to cut dacron with a "hot" gun or knife which both cuts and seals at once, preventing cloth from unraveling at its raw edges.

Once the patch is made and the sail is lying flat, hold the patch in place with pushpins and carefully draw around it. A sailmaker has two aids to sewing navigation — the "sew-to" line and "strike-ups." The sew-to line is the one that the patch will be sewn along — the one drawn around the patch while it is pushpinned in place. Strike-ups are short marks (1/4-1/2") made perpendicular to the sew-to line to ensure that the patch is sewn in evenly. By matching the strike-ups as one sews along the sew-to line it's assured that the patch will be stitched in the desired location. But, we're a little ahead of ourselves.

Once sew-to lines and strike-ups are drawn around the patch, remove the pushpins and patch from the sail. Neatly cut (preferably with a hot gun or hot knife) a rectangular or square hole 1-1 1/2" inside and parallel to the sew-to line. The patch can be sewn to the sail by machine or hand. When this is complete, the sail is sewn to the patch (see illus. 2). The result is a neat patch resembling a T.V. screen. I've often wondered what sailmakers pre-1940's called this type of repair. By the way, the rule about repairing holes is: if you can't stick a pencil through it, don't fix it.

If ultraviolet rot is the cause of holes or tears, you'd better order a new sail.

If a seam has come apart, use pushpins to align panels as closely as possible to their original position. Draw a sew-to line and strike-ups (you can use the original ones it they're still visible) and stitch the seam back together by hand or machine.

Chafe is usually the culprit in the above cases of broken stitches, tears, or opened seams — so find the cause of it. Use rigging

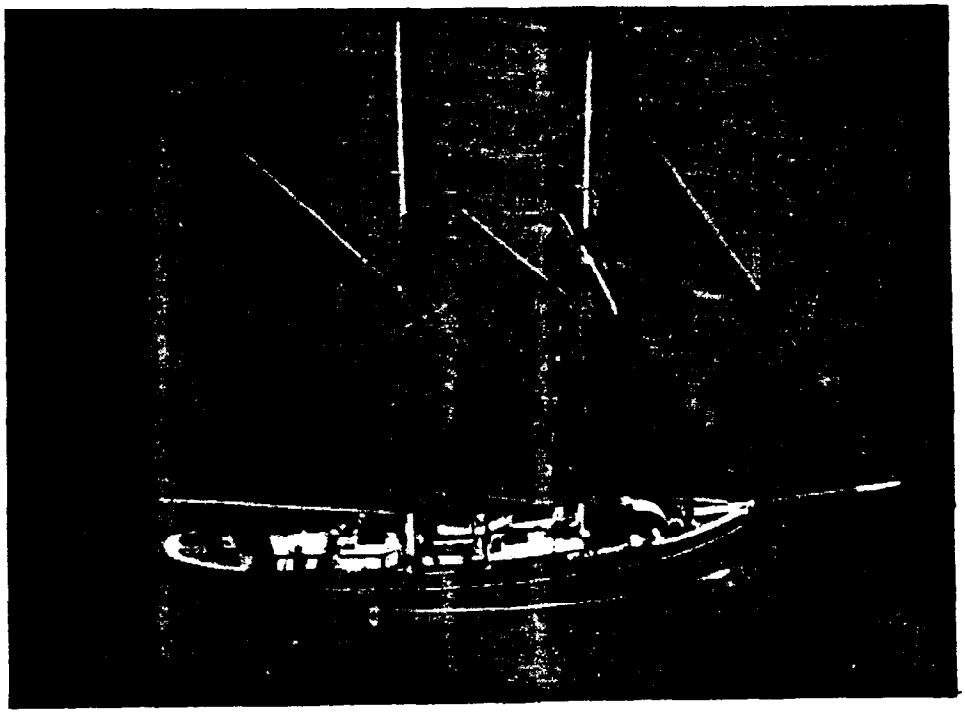
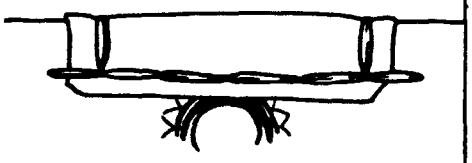


Illustration 3:



A. Slow down chafe with sacrificial leathers.

B. A last-ditch alternative, cross stitching a corner or edge of a sail where it's chafing.

tape or baggy wrinkle on rigging and/or extra layers of dacron sailcloth on the sail when it can't be kept from contact with the standing rigging or spars. If ultraviolet rot is the cause of holes or tears (or you can stick your finger through the sailcloth) you'd better order a new sail!

Chafe at the corners and reef cringles of a sail can be slowed down by sewing sacrificial leathers where fittings, sheets, halyards or reefing tackle can wear on the sailcloth or boltrope (see illus. 3-A). This requires a palm and #14-12 needle used with V-462 or 7-ply waxed dacron twine. Gae and I promise to produce a step-by-step illustrated article about sewing leathers, for now copy the style shown.

If leather isn't part of the contents of your dirty bag; webbing, vinyl or dacron can be substituted. As a last-ditch alternative, you can cross stitch around a corner or edge of a sail where it's chafing with a #14-12 needle and V-9C or 7-ply waxed dacron thread (see illus. 3-B). You'll first notice chafe as a darkening of the cloth or boltrope; handle it then and avoid dealing with serious damage.

The rings or grommets which provide a point of attachment for hanks, slides, or reef point ties (usually 3/8-5/8" in diameter) can be reinforced or replaced as described in February's *Confessions of a Sailmaker*.

Hanks that are worn or chafing the sail underneath their point of attachment (press-on jib hanks are generally guilty of the latter) may be replaced and re-seized with dacron twine as illustrated in August '87 *Confessions*.

Slides on a mainsail or mizzen that are worn or whose attachment system is wearing the sail under them (i.e. a stainless steel shackle) can be replaced or re-seized with webbing as discussed and illustrated in December '87 *Confessions*.

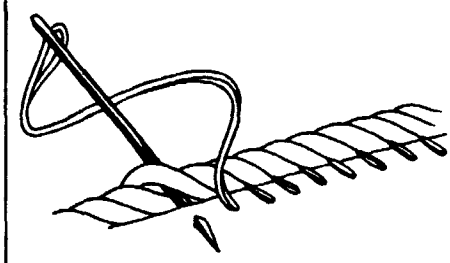
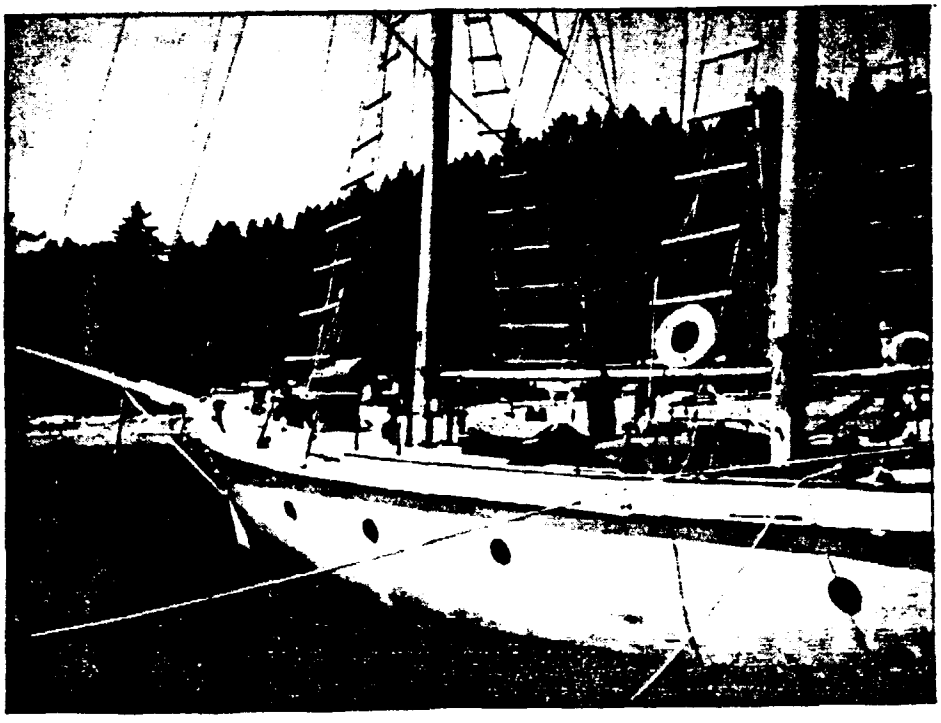


Illustration 4: Roping

Boltropes which have torn away from a mainsail's luff or foot can be restitched with palm and #14 needle using V-462 or 7-ply waxed dacron thread as illustrated (see illus. 4) — sewing rope to the sail's edge by driving the needle between the boltrope's strands and pulling stitches tight inside the "lay" of the 3-strand line.

Corners at head, tack, clew and reef points can be a major production to remove, replace or reinforce. If a ring is pulling out, elongating or deteriorating you might want to consult a sailmaker. Unfortunately, most oriental sails come with hydraulically pressed corner rings of dissimilar metals. These aluminum



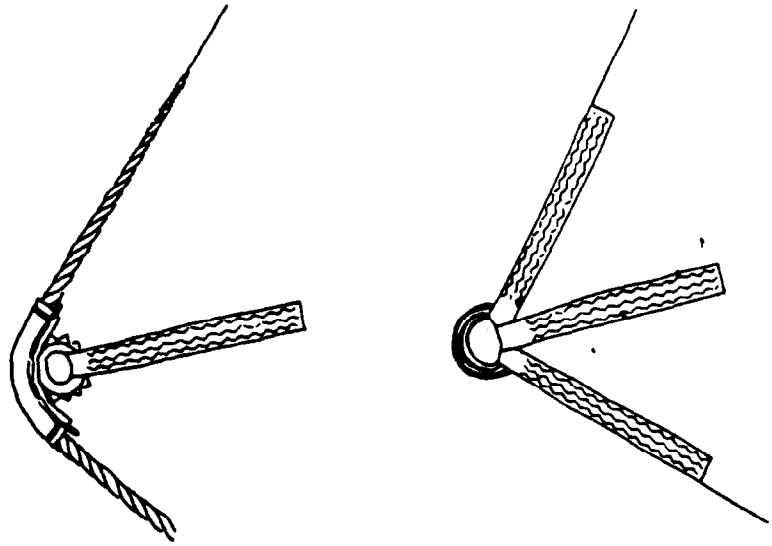


Illustration 5:
A. Corner ring reinforced with webbing.
B. Corner ring installed with webbing

rings with stainless steel liners corrode quickly (particularly in the tropics) and proceed to eat the sailcloth around them. They must be hacksawed or cold-chiseled out and replaced with a non-corroding ring, generally at great expense and greater hassle.

There are hydraulically pressed rings composed of nylon, bronze or stainless steel that don't deteriorate when pressed in place with stainless steel liners. Although the hydraulically pressed ring is the strongest type that may be installed in a sail, it's brittle and hard compared to the cloth it is put in and may break the sailcloth around it and actually pop out of the sail. Alternatively, the handsewn brass ring/brass liner of similar size may pull out under load sooner than a hydraulically pressed ring. *But*, the dacron twine stitches with which it is sewn in place provide a flexible bearing surface that prevents the ring from breaking out. Handsewn brass rings may elongate and should be removed and replaced when they do — a much easier job than removing and replacing a hydraulically pressed ring (the process of handsewing a ring is described and illustrated in February '88 *Confessions*.

These aluminum rings with stainless steel liners corrode quickly and proceed to eat the sailcloth around them.

The problems of a ring corroding, breaking out or elongating are best dealt with professionally. If, however, one is far from a sailmaker a ring can be reinforced simply by sewing a 1-1 1/2" webbing strap through the ring and into the reinforcing patch (see illustration 5-A). Should the unlikely/unfortunate tearing out of a head, tack or clew ring occur, you can replace the corner ring by re-installing it with several webbing straps (see illus. 5-B).

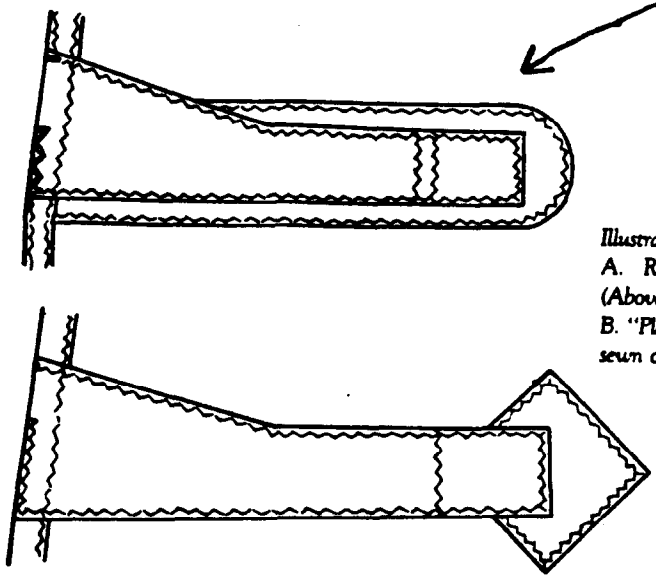


Illustration 6:
A. Reinforced batten pocket. (Above)
B. "Platform" pocket with handsewn outboard end.

Headboards rarely pull out of a sail. If the headboard's hole provided for the halyard has elongated, a sail loft can press in a headboard liner. Often, we see a slide installed in a headboard with stainless steel seizing wire or shackle. These attachment systems wear boltrope, slide and headboard. You're best bet is to remove the slide and reinstall it with webbing. If there isn't room in the headboard for a webbing seizing, put in a ring below the headboard to seize the slide to (since loading is greatest at head and clew, it's best to have two slides right next to one another at both locations) — see illus. 1

The most common repair is fixing the batten pocket. Battens just love to poke holes at their inboard ends. You can slow this process with an extra layer of cloth under the whole pocket (see platform pocket, illus. 6-A). A minimal avoidance tactic is extra reinforcing at the inboard end (see illus. 6-B). Tapered flexible battens and batten tip end protectors aid a great deal in keeping both sail and pockets intact.

It is with sail repair as it is with many things in life — an ounce of prevention is worth a pound of cure. A properly constructed sail (i.e. one which is durable and maintainable) and vigilance regarding a sail's exposure to sunlight and chafe will save you hours of sail repair at "shop rate" in a loft — not to mention time that would be better spent cruising. The preceding information should save you time and money as well as enable you to do much of your own sail repair.

Of course, I do have a motive in disclosing all this information on sail repair. If a few more of you bluewater sailors would start practicing sail repair now, I won't be so busy fixing sails when I get my chance to go offshore cruising! □

RIG MAINTENANCE

A. Before Departure

1. Replace standing rigging; forestay, backstay, and shrouds every 5 to 7 years. If you have the space and weight capability, bring the old set along for spares. Otherwise, just bring along the longest piece of rigging, often the backstay. In order to make an emergency shroud or stay shorter than your spare you'll need a way to cut the wire (vise and hacksaw with 5 blades or cable/bolt cutters) and a system for attaching the unswaged end to a turnbuckle or tang. The cheapest system is three stainless steel, or galvanized, wire rope clamps ($3-5 per clamp from West Marine Products). Other options include nicro-press sleeves and swaging tool ($40 total), or a do-it-yourself end fitting ie., Norseman, Castlok, Sta-lock.

2. Stock up on chafe tape and self-amalgamating tape. I use 1-1/2 rolls of each per year for a 31' sloop, and it's often difficult to impossible to find outside North America. Monel seizing wire and duct tape should also be in your rigging kit. If you ever need to replace a swage fitting and find that your turnbuckle doesn't have enough travel in it to reach, cut and install a short piece of anchor chain - this will serve both as a spacer and a toggle.

3. Replace wire or wire/rope halyards with pre-stretched Dacron. Practical Sailor rated New England Ropes Sta-Set the best, and I've found it wears well. Rope halyards are safer, easier on your mast and hands and give you more control of sail shape than wire halyards. Cut your halyards with 10' of extra length in the tails, this way you'll be able to turn them end-for-end and shorten them so the worn spot will be eliminated on jib halyards, or at least in a different place on main halyards, instead of having to replace the halyard the first time it is worn. Carry enough line for a spare set of halyards. We usually get two years and 10,000 miles use on the main halyard and nearly that on the jib halyard.

4. Rig a double-sided preventer/vang with at least two part block and tackle, ideally led aft to cleats in the cockpit so that you can adjust it and gybe without going forward.

5. Rig a downwind pole. We've had good success with a Forespar Line Control pole, which we store on deck. If deck storage is inconvenient, it can be stored on the front of the mast.

6. Before departing on a major cruise, pull the mast(s), lay it on sawhorses and carefully inspect every inch of it, disassembling spreaders and lubricating them with Lanacote, which prevents corrosion and wear between aluminum parts. If you don't feel comfortable about what to look for, hire a rigger for an hour or

two to explain and go over the mast and rig with you. This job will take 1/2 a day and is much easier and cheaper than being dismasted at sea! Consider also hiring a rigger to help you tune the rig once you re-step the mast.

B. Before Each Major Passage

1. Go up the mast in your bosun chair carefully checking for cracks or elongation in tangs, swage fittings, making sure that all clevis pins and cotter pins are in place and taped with chafe tape, so they cannot be snagged and pulled out by a halyard, or catch on and tear your sails. Check where rigging wire enters swage fittings - if you see a gap between the wires or a few strands that have pulled out from the swage barrel, time for repairs.

2. Lubricate your masthead sheaves...

3. Check that masthead tricolor light bulb is functional.

4. Give an especially thorough inspection to spreader bases, looking for cracks or abnormal play.

C. At Sea

1. Daily, check each stay at deck level, lifting turnbuckle boots, looking for cracks in swage barrels, broken wires or gaps where the wire enters the swage terminal, clevis pins or cotter pins missing or snagging sheets or sails. Check backstay, shroud and stemhead fittings for cracks daily. The alternative is expensive and dangerous! I've discovered five terminals with broken wires when checking aloft, and twice on Mahina found cracks in the cast aluminum spreader fittings that might have resulted in dismasting if I hadn't gotten them welded up.

2. If you are dismasted, save the mast and rigging if you can do so without damaging the boat or taking undue risks until you reach a professional rigger. He may be able to tell by looking at the mast and rigging what went wrong, and in some instances can reuse the mast by cutting it and inserting a sleeve.

SPARES LIST FOR SAILS, CANVAS AND RIGGING

Sail Repair Kit:

1. Sailor's Palm, specify right or left hand.....10.00 to 17.50
2. Beeswax, 1 cake..... 3.00
3. Hand Needles, 2 #12, 6 #14, 4 #16 ..... 11.10
4. Dacron Handsewing Waxed Thread, 11b. medium V-462..... 21.64
5. Dacron Machine Thread, ½1b H&B V-69..... 16.79
6. Scissors, 1 pair Wiss 10" shears..... 47.28
7. Fids, 1 10" wooden fid..... 10.92
8. Pushpins, 24..... 3.25
9. 100' Fiberglass Tape Measure..... 47.96
10. Bench Hook..... 2.48
11. Sailcloth, weight to match weight of each sail,1-2 yds per sail per yard
12. Dacron Luff Tape, 5"x5-10 yds of 5oz. and 8oz..... 1.50 2.04
13. Nylon "Ripair" Tape, 1.5oz nylon sticky-back x 25', specify color 4.38
15. ½" and 1½" wide Nylon Webbing, 5 - 10 yds ea., cost per yard... .35 & .75
15. Leather for reinforcing, 1 - 2 sq. ft., price per sq. foot..... 7.66
16. Spare Battens for each batten onboard.....
17. Scratch Awls, 4" l.o.a., 3 - 4..... 1.88
18. Bronze Jib Snaps, 2 -6 spares for each headsail, price each.... 3.52 7.88
19. Mast Sail Slides, 6 - 10 spares for main&mizzen, ck foot slides .72 to 12.84
20. Brass and Stainless Rings, #4, #9, #10, #11, each..... .50 to 4.18
21. #2 Spur Grommet Die and Hole Punch w/ 1 gross spur grommets.... 135.71
22. Seam Rippers, 3, each..... 1.34
23. Cordless Butane or 12 volt soldering iron w/hot knife blade....29.00 to 69.00

(Many of these items can be ordered from Port Townsend Sails, 206-385-1640)

Rigging Spares:

1. Enough spare halyard line for one complete set of new halyards, each with an extra 8' of tail. Rig spare halyards for jib and main.
2. One spare set of jib sheets.
3. Spare shackles for each halyard and spare snap shackle for jib sheets.
4. Spare forestay or backstay, whichever is longest.
5. A system for shortening and making an eye in the spare piece of rigging wire in an emergency: wire rope clips, Norseman, Sta-Lok or Castlock fittings, 6. Nicropress tool and sleeves of the proper size.
7. Pop rivet tool and rivets for track, mast or boom repairs.

(West Marine Products is a discount source for most equipment on this list.)

Canvas Spares:

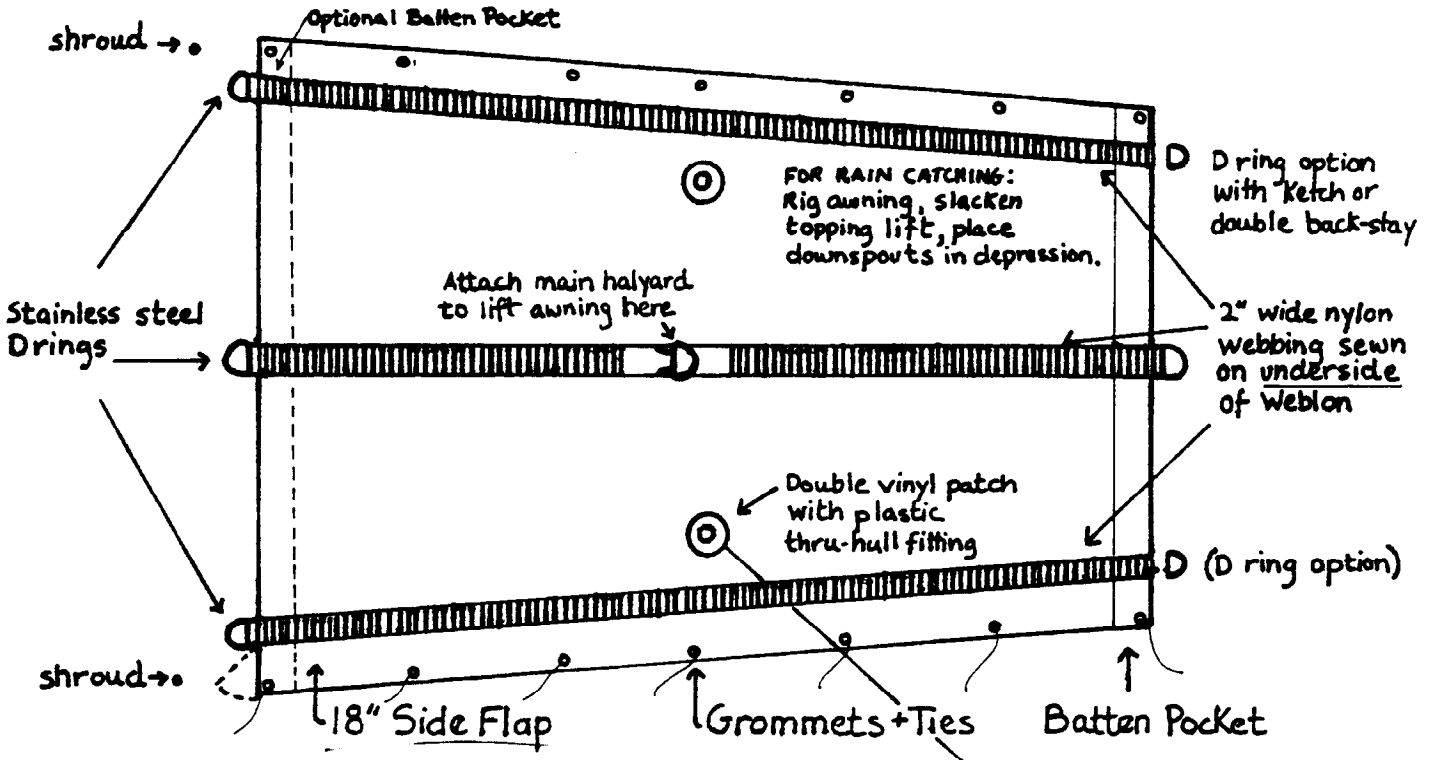
1. Acrylic fabric to patch sail cover, awning, and to make covers and bags out of.
2. Spare jib bag, same size as the largest. Great for carrying the laundry in!
3. Grommet setter and hole punch for #1 or #2 spur grommets and one gross of nickel-brass grommets. (also listed under sail spares)

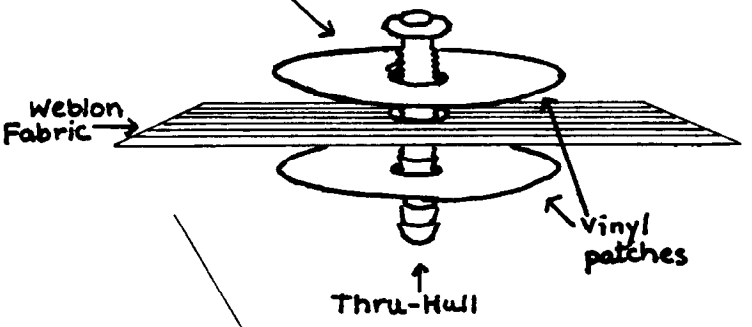
(Any marine canvas shop can either supply or order these items for you.)

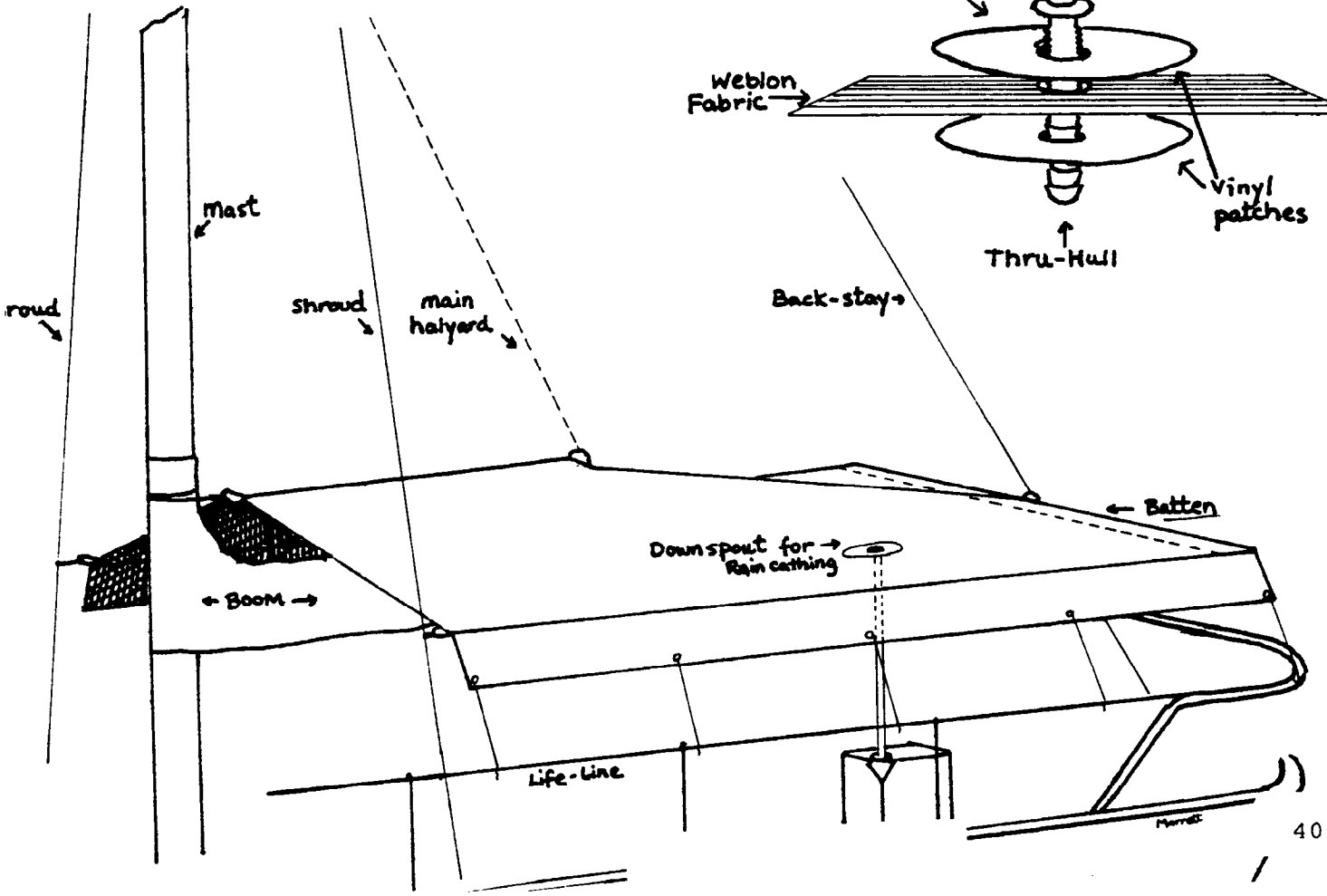
SUN AWNING / RAIN CATCHER

Recommended fabric: 12 oz. WEBLON® duplex color, vinyl / dacron laminate

Custom Awnings: The Artful Dodger (206) 385-2670

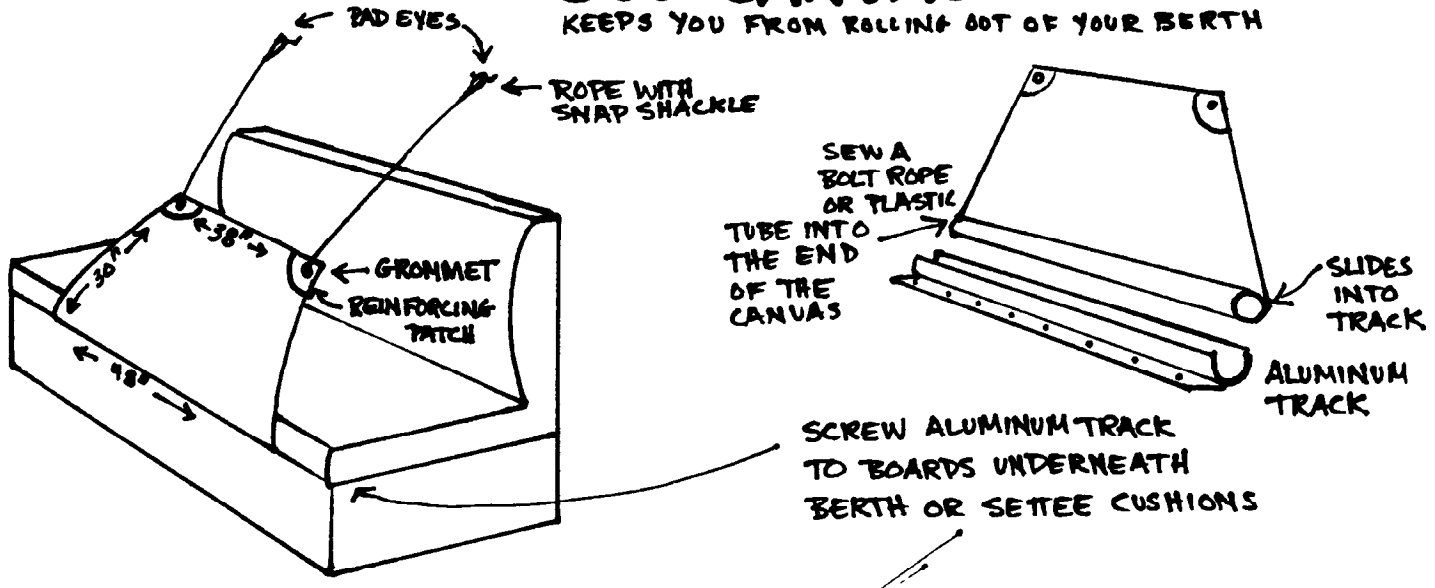






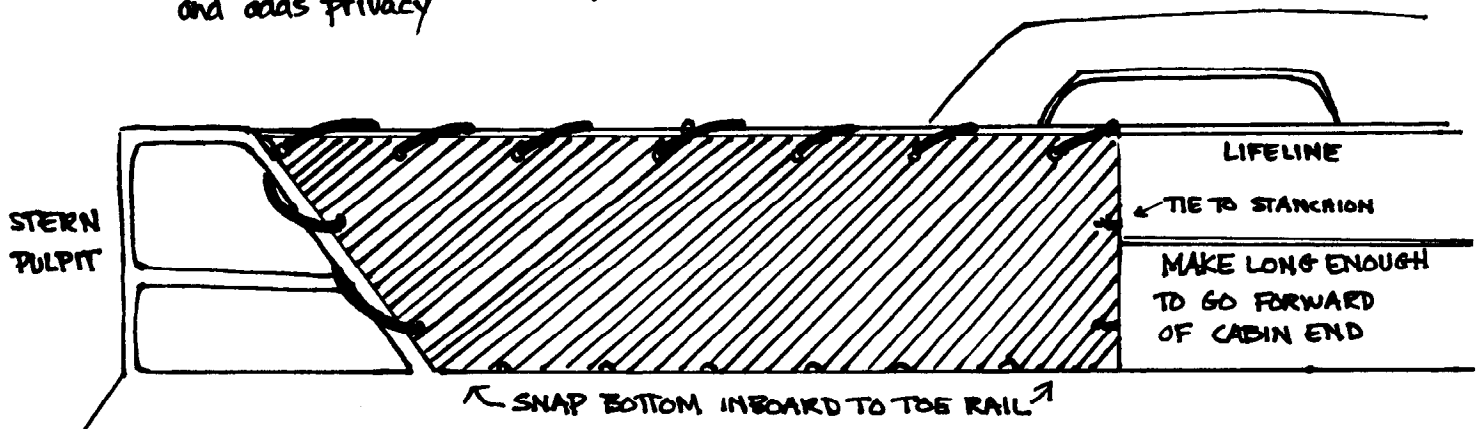
LEE CANVAS

KEEPS YOU FROM ROLLING OUT OF YOUR BERTH



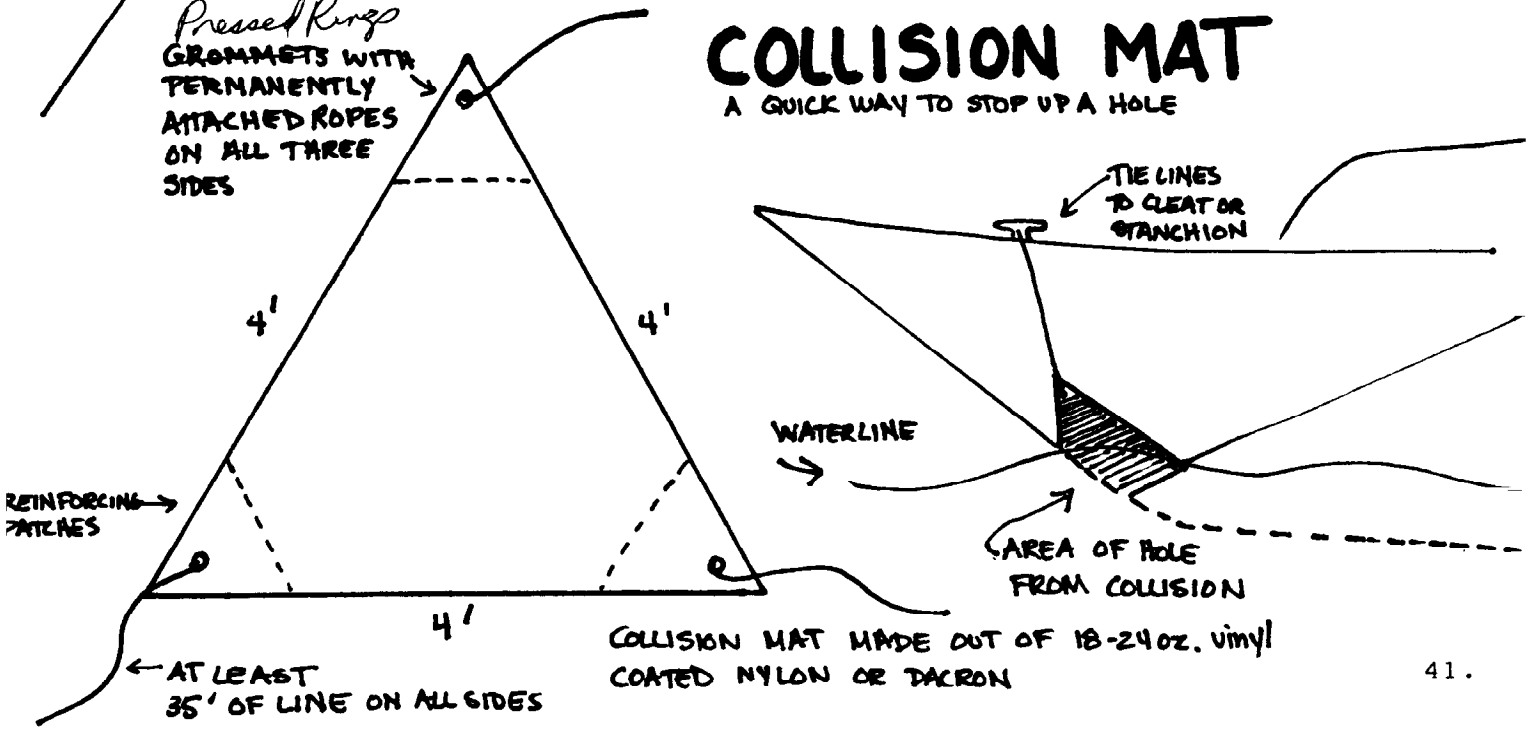
WEATHER CANVAS

Lessens spray in the cockpit and adds privacy



COLLISION MAT

A QUICK WAY TO STOP UP A HOLE



There are few emergencies so alarming to a sailboat's crew as the sight of a flooded bilge and floorboards awash. In most cases a flooded boat can be saved, but it calls for cool heads and immediate action. If collision is the cause, the damaged area must be exposed and plugged or patched, as described below. More frequently, however, flooding results from failure of a thru-hull fitting, hose or fixture, which will be difficult to identify if it is submerged. Here's how to identify the problem, stop the leak and prevent future incidents that could sink your boat.

Man The Pumps

Start pumping without delay. While one crewmember looks for the source of the leak, another should activate the electric or hand pump. A 1½-inch-diameter hole 18 inches below the waterline admits 15 gallons of water per minute, allowing about an hour before the water floods the engine. A six-inch-diameter hole allows less than 10 minutes before the engine is submerged. Need more pump power? If the engine will start, use it as a bilge pump by closing the raw water intake sea cock, disconnecting (or sawing) the intake hose at the sea cock and sticking it in the bilge. A piece of household screening can be tied around the end to prevent clogging. The engine will draw its cooling water from the bilge. Monitor bilge level and engine temperature to guard against overheating.

Collision Repair

The areas of the hull most vulnerable to damage from collision or grounding are the bow, forefoot, forward topsides when the boat is heeled, keel bolts and areas surrounding a fin keel, spade rudder and centerboard trunk. The fastest way to stem the flow of water is to plug the damaged area from the inside. Remove or cut away inside cabinetry, if necessary, to expose the damaged area, then plug the hole with rags, a life jacket, cushion or anything that will conform to the hull and brace it in place with a boathook, oar, 2 x 4s, or what have you **(Figure 1)**. Additionally, or alternatively, secure a collision mat, small tarp or storm jib to the outside of the hull **(Figure 2)**. Or, patch the damaged area with a pre-drilled plywood patch, self-tapping screws and waterproof caulking or gasket material.

If the boat has been holed by rocks, freeing it may only prompt sinking in deeper water. Instead, concentrate on controlling flooding while you fabricate a patch, or radio for outside assistance.

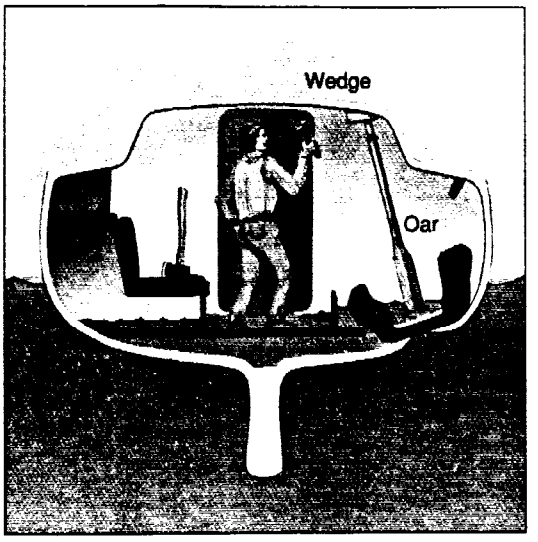


Fig. 1 Cut away cabinetry if necessary, then plug and shore the damaged area.

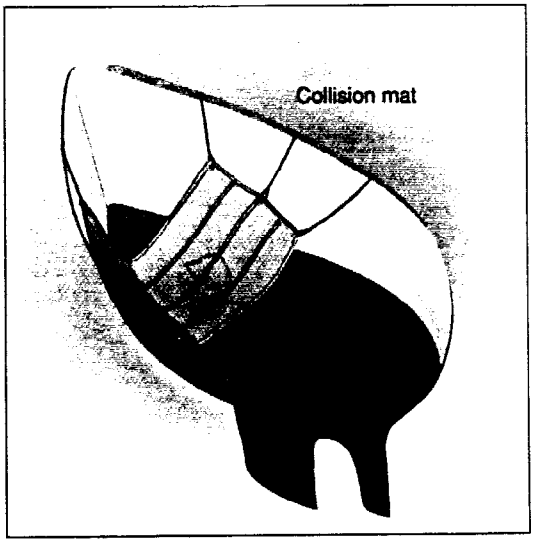


Fig. 2 Fix a collision mat or storm jib to stem the inflowing water.

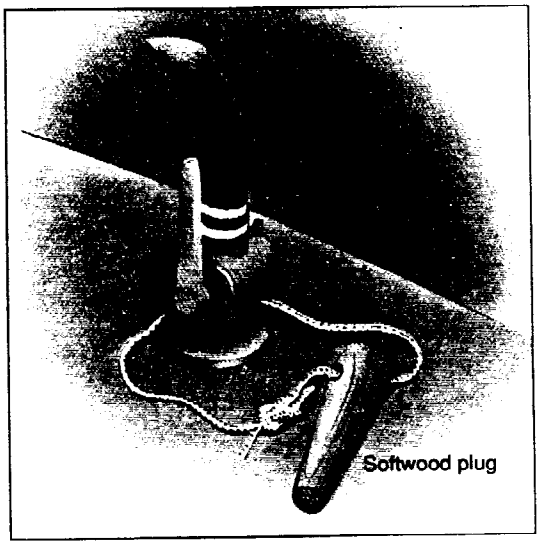


Fig. 3 A tapered softwood plug can seal off a broken sea cock.

Find And Stop The Leak

Inspect these below-waterline fittings:

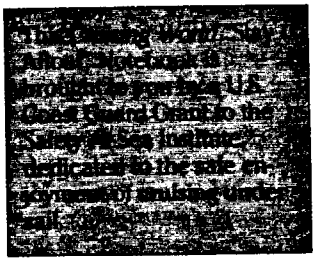
- Heads • Sinks • Sea cocks • Engine cooling system (raw water pump and muffler) • Propeller shaft, stern gland, stuffing box • Other thru-hulls (impeller, transducer, and so on) • Rudder shaft and fittings

When heeled, heads and sinks can ship enormous amounts of water. Examine each fixture, hose and clamp, and close any unused sea cocks if in doubt. A tapered, softwood plug can be driven into a broken sea cock. Ruptured hoses should be replaced or temporarily repaired with waterproof fiberglass tape.

Inspect these above-waterline sources:

- Ventilators, deck pipes • Open portholes and hatches • Poorly fastened chain plates • Hull-deck joint, particularly at chain plates • Deck fills and vents (water, fuel, waste) • Scuppers (check hoses and clamps) • Mast partners • Clogged drains in lockers or anchor well

Suspect these sources in very rough weather. Slow leaks can grow into large ones over time.



PREVENTATIVE MEASURES TO FLOOD-PROOF YOUR BOAT

SAFETY BY DESIGN

- Before you buy a boat, be sure its hull, deck and components meet or exceed standards established by The American Boat and Yacht Council (ABYC), American Bureau of Shipping (ABS) or Lloyds A-1. If in doubt, have the boat professionally surveyed before setting offshore.
- Use marine-grade sea cocks with shut-off handles on all thru-hull fittings. A tapered softwood plug should be attached to each with a lanyard **(Figure 3)**. Inspect and lubricate sea cocks annually.
- All hoses connected to thru-hull fittings should have two stainless steel clamps at each juncture. Hoses should be inspected regularly and replaced if worn.
- Toilets and sinks should be mounted as close as possible to the centerline and fitted with accessible sea cocks.
- To prevent water from siphoning back into the boat, the toilet discharge line should be fitted with a vented loop **(Figure 4)**.
- Be sure the engine is properly aligned with no excessive vibration. At haul-out time check the stern bearing for wear. Repack the stuffing box if necessary.
- Carry a minimum of three bilge pumps: one electric model, one manual pump that can be operated from the cockpit, and one portable pump with an outlet hose that reaches the cockpit **(Figure 5)**. Fit each pick-up hose with a strum box or strainer. Consider fitting electric bilge pumps with an automatic afloat switch and bilge alarm.
- Permanently rig your engine's raw water pump as an emergency bilge pump by T-ing off the intake hose with a Y-valve connected to a lift hose with strainer **(Figure 6)**.

Develop Safe Habits At Sea

- Make a plumbing diagram, highlighting in color all sea cocks, thru-hull fittings, bilge pumps and pick-ups. Seal it in plastic for emergency use.
- Before going offshore, secure the deck: dog portholes and hatches; turn ventilators aft or seal them; plug deck pipes; clear scuppers of debris.
- Reduce the likelihood of collision and grounding by keeping a running fix, monitoring the depth-sounder and keeping a lookout at all times.
- Keep bilge clean and limber holes free so bilge water can drain to the sump on either tack. Remove paper labels from any goods stowed in bilge.
- Check bilge at regular intervals (such as the change of watch) to detect problems early. Monitor leaking by counting the number of pump strokes.
- When powering for long periods, periodically inspect the cooling system and stuffing box for signs of leaks.
- Close sea cocks to head and sinks except when in use.
- Protect the impeller and transducer from damage by crewmembers and shifting stores. Stow canned goods elsewhere.

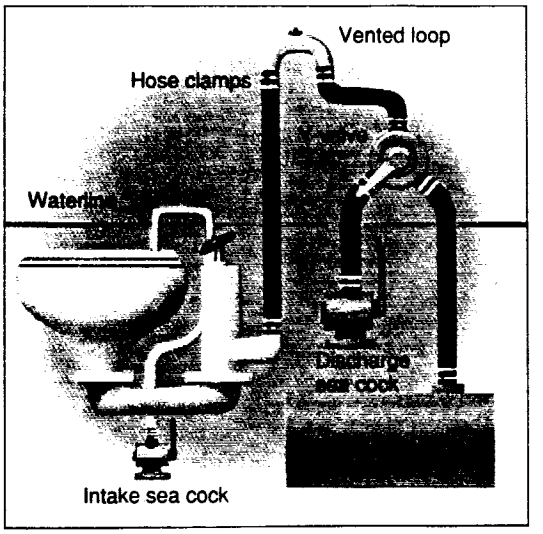


Fig. 4 Toilets should be fitted with a vented loop to avoid siphoning.

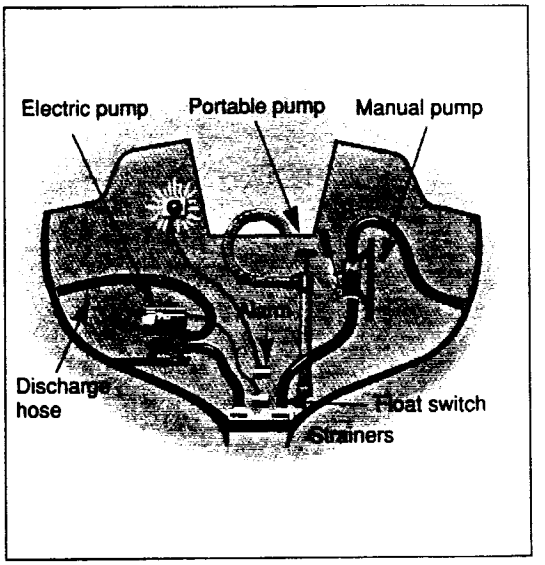


Fig. 5 Carry at least three bilge pumps and consider installing a float switch and bilge alarm.

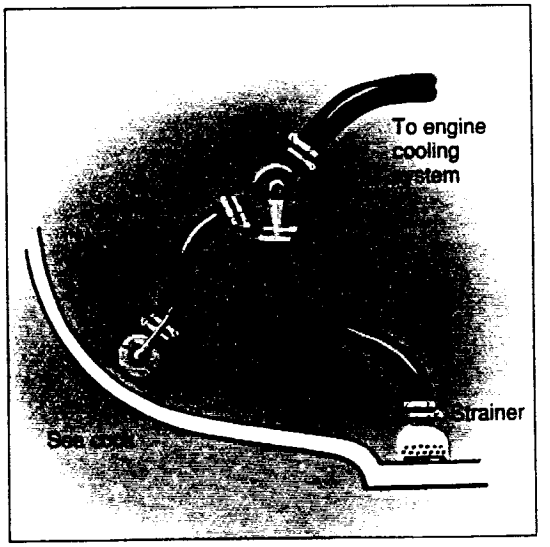


Fig. 6 The engine's raw water pump can be permanently rigged as a backup bilge pump for emergencies.

Damage Control Kit

Before going offshore, make a damage control kit and keep it accessible in an emergency:

- Spare hoses, hose clamps, tapered softwood plugs for sea cocks, packing for stuffing box
- Tools: hand drill, handsaw, ax, hammer, nails, self-tapping screws, caulking gun, hacksaw
- Gaskets and sealants: Underwater epoxy, water-activated fiberglass tape, caulking (3M 5200), inner tube rubber
- Patch: two 14" x 20" panels of 1/8-inch plywood pre-drilled for one-inch self-tapping screws
- Shoring material: wood wedges, boathook, oars, 2 x 4s, and so on
- Collision mat approximately four feet square with numerous grommets and lines long enough to encircle the boat
- Wood or plastic storm shutters for any portholes over two square feet
- Snorkel, face mask and wet suit for cold water. Additionally, a scuba tank or "pony bottle" of compressed air

SAFETY AT SEA

PREPARATION:

1. Practice man-overboard procedures IN THE WATER, using Lifesling system and wetsuit or Thermafloat coat.
2. Purchase safety gear: Lifesling, Lirakis harness, ACR personal lights, U-Vic Themafloat coat or Mustang Cruiser suit, North or Stearns vest, survival suit or wetsuit (if you'll be sailing in high latitudes), liferaft with double floor, EPIRB, solar still or watermaker
3. Prepare the boat: storm shutters for large ports, high lifelines, check stanchion bases, plan emergency hull repair techniques, build a dodger to give you a protected helm position, reducing fatigue.

MAN OVERBOARD?

1. Cold water- TORSO REFLEX, result is sudden drowning.
2. Coronary possible, influenced by alcohol.
3. Hypothermia acts quickly: body reacts by shivering, actions become intoxicated.
4. Don't swim. 8/10 of a mile maximum distance in 50^{o} water.
5. Back to the waves, stay quiet and keep the warm water in the core
6. Harness must have a quick-release clip at chest

PASSAGE PLANNING

PREPARATION:

1. Pilot Charts
2. Time of year
3. Track and plot weather systems
4. Avoid storms by knowing their location and direction
5. Departure planning

STORM PROCEDURES

PREPARATION:

1. Build confidence in yourself and your boat by practicing storm sailing before you take off.
2. Different designs handle differently in different situations
3. Sea room dictates tactics used

ILLUSTRATE ON THE BACK OF THIS PAGE THE FOLLOWING TECHNIQUES:

1. Storm sails 2. Running with 3. Towing warps 4. Heaving-to
5. Lying a-hull 6. Sea anchor

ILLUSTRATIONS AND REASONS FOR DIFFERENT STORM PROCEDURES

1. Storm sails:

   Reason:

2. Running/reaching:

   Reason:

3. Towing warps:

   Reason:

4. Heaving-to:

   Reason:

5. Lying-a-hull:

   Reason:

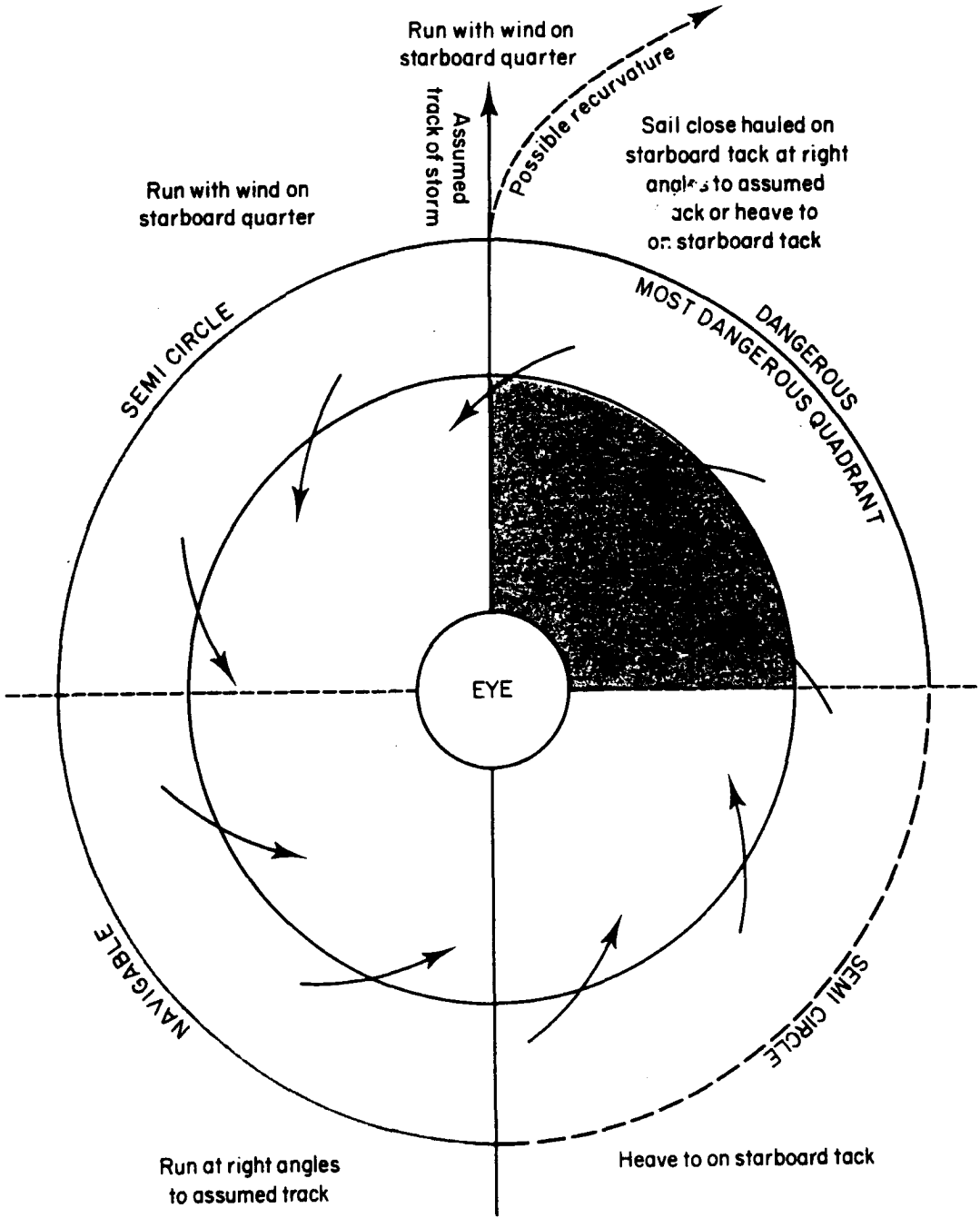
   Danger:

6. Sea anchor

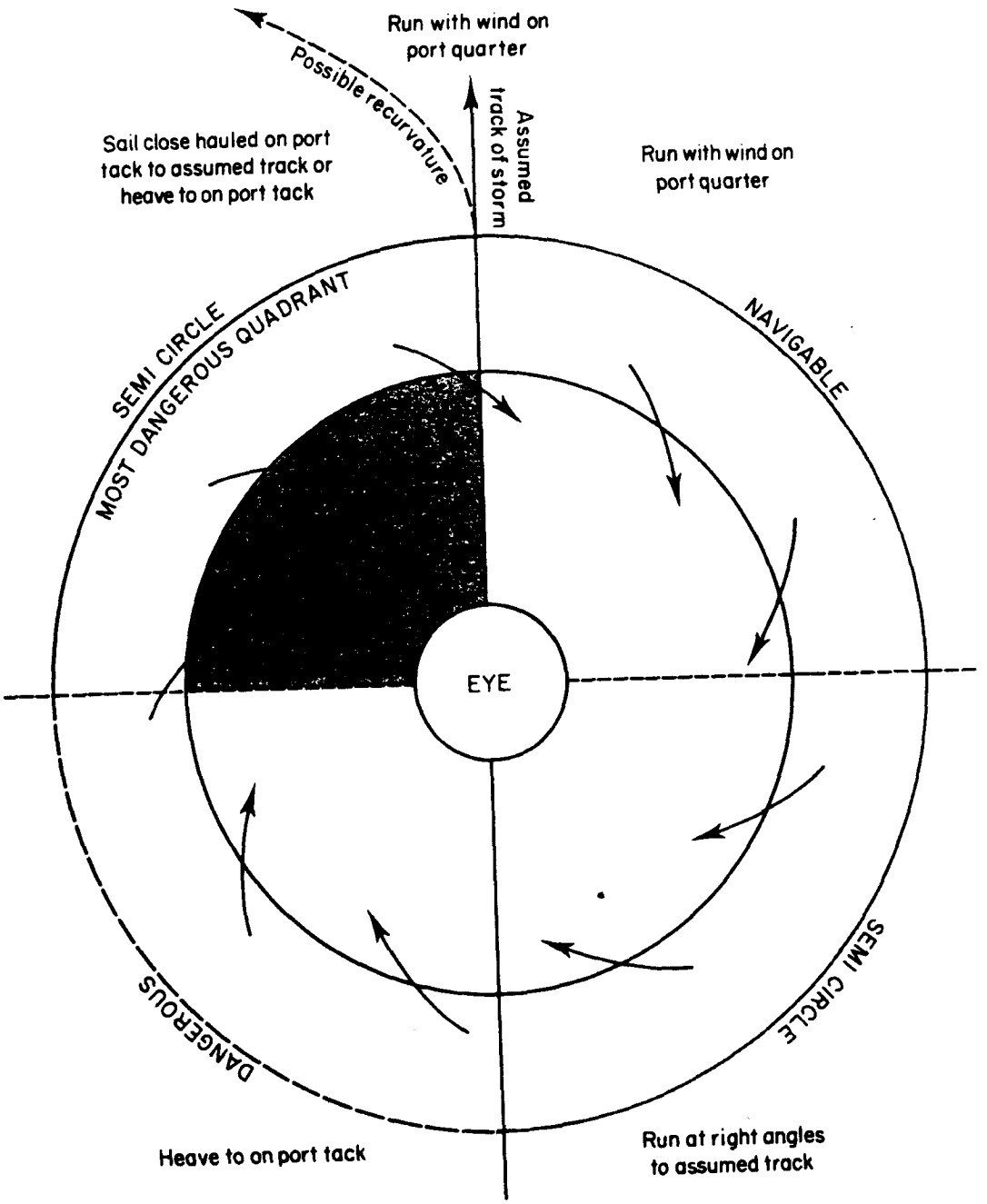
   Reason:

   Danger:

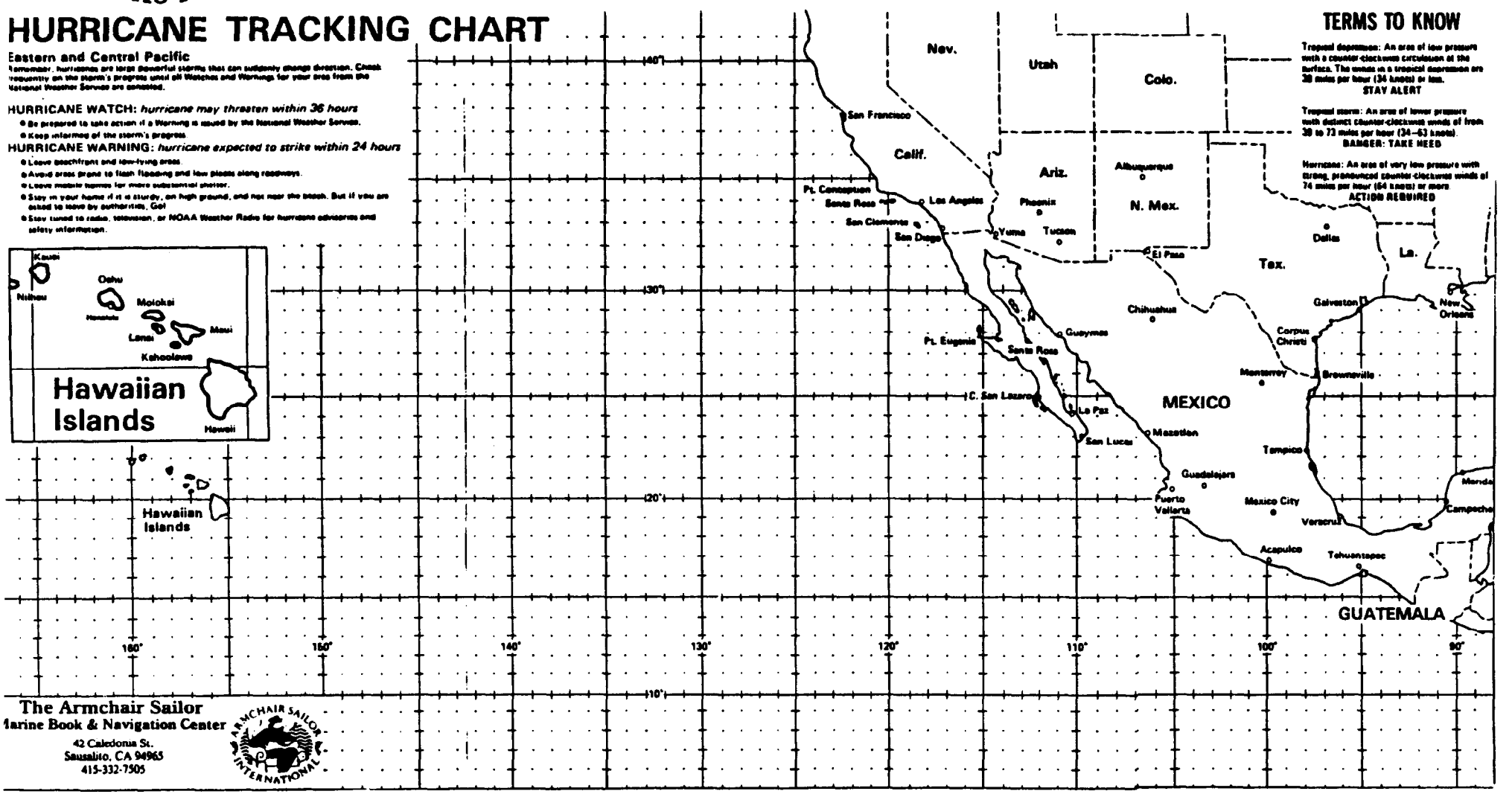
PRACTICE, PRACTICE, PRACTICE HEAVY WEATHER SAILING BEFORE YOU DEPART!!!



TROPICAL STORM TACTICS
NORTHERN HEMISPHERE



TROPICAL STORM TACTICS
SOUTHERN HEMISPHERE



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42 Caledonia St. Sausalito, CA 94965
415-332-7505

ATLANTIC OCEAN

HURRICANE TRACKING CHART

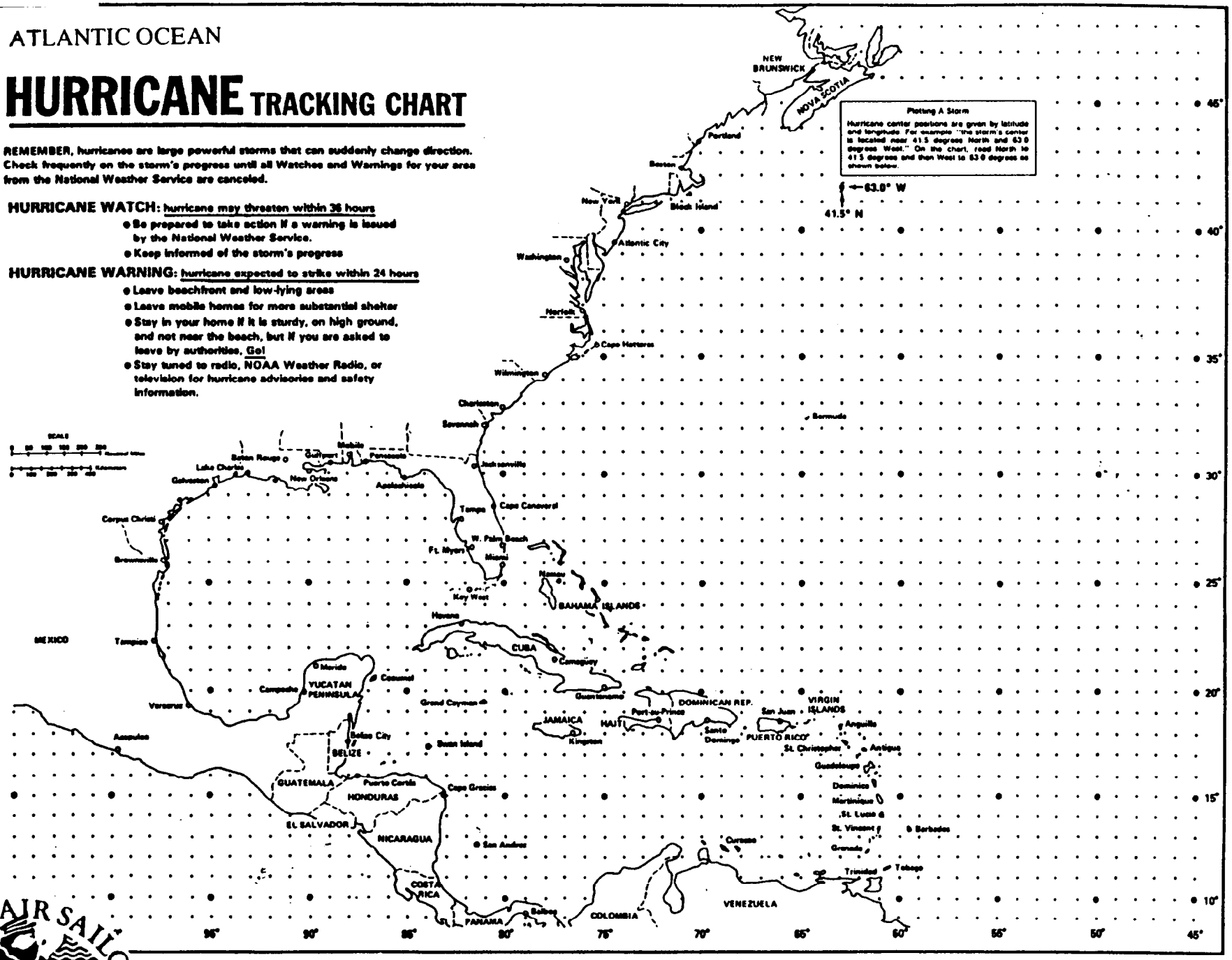
REMEMBER, hurricanes are large powerful storms that can suddenly change direction. Check frequently on the storm's progress until all Watches and Warnings for your area from the National Weather Service are canceled.

HURRICANE WATCH: hurricane may threaten within 36 hours

- Be prepared to take action if a warning is issued by the National Weather Service.
- Keep informed of the storm's progress

HURRICANE WARNING: hurricane expected to strike within 24 hours

- Leave beachfront and low-lying areas
- Leave mobile homes for more substantial shelter
- Stay in your home if it is sturdy, on high ground, and not near the beach, but if you are asked to leave by authorities, Go!
- Stay tuned to radio, NOAA Weather Radio, or television for hurricane advisories and safety information.



ATLANTIC OCEAN
HURRICANE TRACKING CHART

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Hypothermia—It Can Kill

Reproduced through the courtesy of SAFECO Insurance Company.

When the body begins to lose heat faster than it can produce it, a condition called "hypothermia" begins to develop. When a person is immersed in cold water, the skin and surrounding tissue cool very fast. When the body core reaches 90° F, unconsciousness may occur. When it drops to 85° F, (30° C) death often occurs due to heart failure. Moreover, a person in cold water may drown due to loss of the use of arms and legs.

All boaters should be aware of the danger signs of hypothermia and how to treat hypothermia victims.

When a person is immersed in cold water for any period of time, watch for these danger signs:

- uncontrollable shivering
- vague, slow, slurred speech
- memory lapse, incoherence
- immobile, fumbling hands
- frequent stumbling, lurching gait
- drowsiness
- apparent exhaustion; inability to get up after rest

Survival in cold water depends basically on two factors—body size and fat, and activity in water. By remaining still, an average sized person, wearing light clothes and a PFD, may survive 2½ to 3 hours in 50° water. Do not swim to keep warm. Extra heat is lost to the cold water due to increased circulation of the blood to the arms, legs and skin. Swimming and treading water increases the cooling rate by about 35%.

CRITICAL AREAS OF HEAT LOSS

In addition to the head, other areas of high heat loss in cold water are the sides of the chest and the groin area. Special attention should be given to these areas to reduce body heat loss.

H.E.L.P.

HUDDLE

H.E.L.P. (Heat Escape Lessening Posture)

Hold your arms tight against the sides of your chest. Also raise your thighs to close off the groin region. This simple practice results in increasing predicted survival time by almost 50%.

HUDDLE

Studies show that if a huddle is formed so that the sides of the chests are held closely together, a 50% increase in predicted survival time is obtained.

FIRST AID FOR HYPOTHERMIA

Incorrect treatment of hypothermia victims may induce a condition known as "after drop" — the improper rewarming of cold, stagnant blood from the extremities returning to the body's core. This may cause the body's core temperature to drop below the level to sustain life. Here are the recommended procedures to treat hypothermia patients:

1. Move victim to a sheltered area. Do not allow victim to walk.
2. Carefully remove all wet clothing.
3. Apply heat to the victim's trunk by using a warm bath, shower, hot water bottles or heated blankets. An effective field treatment is for one or more of the rescuers to remove their clothing, using their own bodies to warm the victim's naked body. A sleeping bag or blankets should be used to conserve the body heat. If the victim appears near death, heart massage and mouth-to-mouth resuscitation should be administered immediately.
4. In cases of mild hypothermia, a warm shelter and dry clothing may be all that is needed. If the victim is conscious and can swallow without difficulty, a warm, sugary drink may ease discomfort. Watch that liquid does not enter the victim's lungs.

DO NOT:

—Give the victim any alcohol
—Rub frozen body areas with snow or ice
—Wrap hypothermia patients in a blanket without an auxiliary heat source. This may cause after-drop.

Most of all, avoid actions which may cause you to end up in the water in the first place.

MAN OVERBOARD!

One of the leading causes of death in boating accidents is drowning. Many of these fatalities result from people falling overboard. It is your responsibility to know how to rescue such a person.

1. Throw a PFD into the water near the person.
2. Immediately make a sharp turn at a slow speed and return to the area where the victim is in the water.
3. Approach the victim slowly with the wind in your face and into the waves.
4. Get a swimming or boarding ladder over the side of the boat.
5. Stop the engine and help the person into the boat (over the back of the boat if you do not have a swimming ladder).
6. To avoid capsizing, have all other passengers shift their weight to the opposite side of the boat.
7. As a last resort or when the person in the water is unconscious or hurt, put on a PFD, tie a line to the boat, hold on to the line and go into the water after the victim.

Above all, keep your head. And take an advanced boating course where experts will show you how the procedure is done, step by step, correctly and safely.

GOING ALOFT

Going aloft is the most potentially dangerous part of cruising, but one which can't be neglected. I personally know of three cruisers killed from falls from their masts and one who ended up with a broken back. I don't think mast steps are the solution, since a good friend of mine was killed when he climbed his mast steps during a blow to try and free the top of his roller furling unit which had jammed with the sail half-furled. He lost his footing and grip and fell 45' to his death on the deck below.

The added weight of a person aloft, even in a fairly calm anchorage greatly increases a boats rolling motion. At sea this force is increased and is trying to catapult you off the mast, so it's essential to wear a safety harness connected to a halyard which someone is tailing on deck every time you climb your mast steps, even at the dock! Other problems with steps include a tendency to foul and chafe halyards and increased noise and windage at anchor. I've installed only two mast steps, 5' down from our masthead, just inside the upper shrouds where they can't chafe or foul the halyards. This makes inspecting masthead fittings and replacing tricolor bulbs much easier than trying to reach overhead from a bosun chair. I simply stand up on the steps with the bosun chair still strapped to me.

As far as mast steps or ratlines to climb aloft for visibility in coral waters, we've found that standing on the gooseneck of the boom is sufficient.

Try and avoid going aloft at sea, by preventive maintenance, I haven't had to go aloft at sea in 75,000 miles and fifteen years of sailing.

We keep a spare halyard (actually a spinnaker halyard) secured to the bow pulpit, forward of the forestay, to serve as either a spare jib or main halyard. We keep figure eight stopper knots tied at the bitter end of each halyard, and are meticulous about securing each halyard to the same pad eye on deck as soon as a sail is dropped.

When going aloft, wear long pants and shoes that can get a good grip on the mast ie., deck shoes or boots, tennis or running shoes.

The best Bosun chair I've found is built by Medof Marine and sold by West Marine. At $60 it's not cheap, but it is well designed, comfortable and has lots of good safety features including a seat belt/crotch strap to hold you firmly in place, plus a D-ring on the underside to secure a downhaul to, for really rough conditions.

If you have large two-speed halyard winches or an electric anchor winch, you can easily hoist someone aloft with just a halyard and a bosuns chair. We have small halyard winches, so I'm still using the same hoist myself 4:1 block and tackle rig I bought for Mahina, 15 years ago. It consists of a double-sheave fiddle block which I first hoist to masthead with the main halyard.

Be very careful about how you fasten a halyard to the upper fiddle block or to your bosuns chair. Shackle failure (or inadvertant opening of snap shackles after snagging on something) cause the majority of mast accidents. If possible, tie the halyard directly to the block or chair, but at least tape any snap shackle shut. Next is to shackle the lower cam-fiddle block (identical to our mainsheet block) to the stainless steel D rings on the bosuns chair. For line, I've found 1/2" nylon or dacron yacht braid, slightly longer than four times the height of the mast works well. I've found that I can hoist myself 45' in less than 5 minutes, by pulling down on the outside line of the tackle with one hand and straight out from the cam cleat with the other. When I'm stopping at the spreaders or masthead, I wrap the tail around the cam cleat three times, to act as a brake if the cam cleat fails. This system has worked well for me and is much simpler than it sounds!

NEVER go aloft without a safety line. I wear my safety harness which is secured to the jib halyard and have Barbara take up the slack on it, with the tail wrapped around the jib halyard winch. She cleats this off once I reach the spreaders or masthead.

If any part of my block and tackle or bosun chair fails, I'll be left hanging by my safety harness and Barbara can lower me slowly to deck, using a few turns on the winch for friction.

If I need more tools or chafe tape sent up, Barbara puts them in a canvas bag, which she then ties to the tail of my block and tackle, and I easily hoist it up.

PRIORITY EQUIPMENT COSTS TOTAL

These prices are only part of the cost of outfitting a 35' sailboat for cruising with two people. Discount prices from either West Marine or Boat U.S. catalogs.

1.	Shortwave Radio Receiver (Radio Shack, Sony or ICOM).....	from $200 to 1019
2.	VHF Marine Radio, Antenna, Cable (West Marine or ICOM).....	220 to 435
3.	Dinghy/Tender (West Marine CD 8 to Avon RIB 3.10.....	650 to 2625
4.	Windvane Self-Steering System (Navik or Monitor).....	1395 to 2795
5.	Dodger (w/stainless frames & hardware, acryllic or Weblon).....	1000 to 3000
6.	Depth Sounder (Autohelm St-50 to Tridata).....	550 to 599
7.	Distance Log and Knotmeter (Swoffer or Autohelm Tridata).....	320 to 599
8.	Anchors (45 & 35 lb. CQR, Danforth 22 lb).....	1053 to 1053
9.	Chain (total of 350' in 3 sections, 3/8" BBB ACCO or Teledyne).	777 to 777
10.	Anchor Windlass (Simpson Lawrence 9555 or Maxwell VWC 1100)....	1295 to 1795
11.	Bilge Pump (Whale Gusher 10, 30, plus Rule 3700 or Jabsco 4000)	580 to 580
12.	Liferaft (Viking Icelandic, Avon Offshore, Switlik Offshore)..	2905 to 5020
13.	Emergency Watermaker (Survivor 06 to Survivor 35).....	499 to 1295
14.	EPIRB (ACR RLB 21 & RLB 24).....	229 to 1075
15.	Safety Harness and Tethers (2) (Switlik or Lirakis).....	199 to 212
16.	Add'l. Safety Equipment (2 vests, throwable, flares, thermal)..	367 to 1420
17.	First Aid Kit Including Prescription Drugs.....	300 to 600
18.	Halon Automatic (engine room) and Manual (galley) Extinguishers	139 to 508
19.	Handheld 12 Volt Spotlight (300,000 to 1,000,000 candlepower)	55 to 79
20.	Radar Reflector (Firdell Blipper).....	99 to 99
21.	Masthead Tricolor Navigation Light (Aqua Signal Series 41)....	42 to 185
22.	Batteries (Prevailer Deep-Cycle Gel, 2x4D or 2x8D).....	738 to 890
23.	Battery Condition-Voltmeter (Professional Mariner, Balmar 2000)	34 to 499
24.	Foul Weather Gear (WMP Expl or Henri-Lloyd OR FLT w/pants x 2)	588 to 1860
25.	Tools.....	200 to 400
26.	Lifesling, Hoisting Tackle and Man Overboard Pole.....	282 to 282
27.	Whisker or Reaching Pole (Forespar).....	200 to 695
28.	Ventilation.....	150 to 350
29.	Additional Water Tanks (3x5 gal.jugs & 3 coll. jugs minimum)..	60 to 300
30.	Additional Fuel Tankage (3x5 gallon jugs minimum).....	34 to 300
31.	Bosun's Chair (Medoff Marine).....	75 to 75
32.	Swim Ladder (Sopac stainless steel).....	160 to 160
33.	Snorkeling Gear x 2.....	200 to 350
34.	Anchor Roller (Windline Marine URM-1).....	189 to 189
35.	Anchoready (holder for Danforth Anchor on stern pulpit).....	35 to 35
36.	Secondary Compass for Belowdecks (Ritchie or Danforth).....	59 to 294
37.	Handbearing Compass (Davis to KVH Datascope).....	25 to 369
38.	Binoculars (Swift Armored, Fujinon or Steiner).....	138 to 949
39.	Dividers, Parallel Rules, Plotting Sheets.....	30 to 30
40.	Barometer (Seth Thomas, Chelsea, Weems and Plath).....	68 to 270
41.	Chronometer (Seth Thomas, Chelsea, Weems and Plath).....	68 to 370
42.	Back-Up Chronometer (Casio, Timex, Swatch Quartz wristwatch)..	30 to 56
43.	Primary Metal Sextant (Astra IIIB to C. Plath Navistar Classic)	449 to 1750
44.	Secondary Plastic Sextant (Davis Mk3-25) Omit w/GPS or satnav..	29 to 189
45.	Charts (60 @ av. $16 ea., Sail. Dir., Nav. Tables, Cr. Guides).	1500 to 2500
46.	Engine and Boat Spare Parts.....	500 to 1000
47.	Storm Jib, Storm Trysail, Drifter.....	3500 to 3500
48.	Awning/Raincatcher, Cockpit Weather Canvas.....	800 to 1000
49.	Rigging and Canvas Spares.....	300 to 300
50.	Flags.....	100 to 300
Total	**.....**	**$23,415 $45,032**

OUTFITTING FOR COASTAL AND OFFSHORE CRUISING:

Priority Equipment

These recommendations are based on my experience, observations and interviews with hundreds of cruisers over the past eighteen years and 98,000 miles of cruising.

Obviously I haven't been able to evaluate every item of equipment available, but I do know that the following items have a good track record. New gear comes out all the time, so we have been updating this section three times per year!

I feel fortunate to have started cruising on a shoestring budget. Eighteen years ago, $12,500 bought Mahina, a Vega 27 sloop built by Albin Marine in Sweden. I sailed her 22,000 miles; as far south as Samoa, and as far north as Desolation Sound, British Columbia. I cruised without a head and cooked on a two-burner kerosene stove. Mahina had no satnav or GPS (these weren't available for yachts in 1974); no VHF radio, ham or single sideband transceiver, loran or RDF, liferaft, autopilot, or outboard motor.

The equipment I had was simple: good sails including a storm jib and trysail, a windvane self-steerer, a dodger, three anchors, an Avon Redcrest dinghy with CO2 inflation bottle (my makeshift liferaft), an EPIRB, a knotmeter, log and depth sounder, a masthead tricolor running light, and a whopping 40 gallons of water.

Mahina's 12 hp gas engine didn't work when I left. I nearly removed the engine to gain more storage, but I eventually got it to work on a fairly reliable basis. The permanent fuel tank capacity was only five gallons, and with two additional jerry jugs I could stretch the range under power to 180 miles at 4½ knots.

What the Vega 27 did offer was a lightweight, fairly fast cruiser with excellent sailing characteristics. I singlehandedly sailed in and out narrow coral passes in the Tuamotus and Societies, just for the challenge and exhilaration of it. Because she was a relatively light displacement (5,000 lbs) and was incredibly fast on ocean passages, as long as she wasn't overloaded. My best 24 hour run was an incredible 181 miles, but even singlehanding I had five straight days over 160 miles per day. The motion on such a small and light boat is active and fatiguing, particularly when the wind is forward of the beam. Mahina was a spartan vessel compared to today's comfortable cruisers. But the point is - for a relatively modest investment, Mahina was my ticket to explore the South Pacific!

Many people I meet at boat shows and through these seminars are convinced that they can't go cruising in a boat under 40', and certainly not without ham radio, a watermaker, refrigeration, roller furling, GPS, radar etc. Instead of setting their sights on a smaller, more easily affordable boat and simpler lifestyle, they slave away, half burned-out, trying to save or pay off that bigger boat with all of the goodies, instead of just doing it - getting some experience and taking off much sooner. Life goes by fast, and you only get one shot at it. It makes sense to make your dreams happen sooner, rather than later.

On the other end of the spectrum, I've sailed with Steve Dashew on his latest beauty, the 67' aluminum high-performance ketch, Sundeer. I admire Steve's inventiveness and designs - and the fact that he and Linda can successfully sail and cruise Sundeer by themselves. Sundeer is a safe, comfortable home. This style of cruising, if you can afford it, is just as valid as cruising without an engine or a head as Lin and Larry Pardey have chosen.

Our new Mahina Tiare falls in the mid to upper end of the spectrum. At 42' and equipped with many modern goodies, cruising aboard her is not roughing it. Someone asked us last weekend, "Does cruising on the 42' boat take the sense of challenge and adventure out of cruising?" I answered, "No, but it does take some of the anxiety away". I returned in Mahina to the Straits of Juan de Fuca from Hawaii in 1975 and 1981. Both years there was fog for six days before making landfall. I was unable to take any sights, unable to see the ships that I could hear and had to rely soley on dead reckoning.

It was foggy for nearly a week before we made landfall in the Queen Charlottes this year, but with GPS and 24 mile radar we knew our position, the location of ships nearby and could see the outline of the islands on the radar. The anxiety level and fatigue factor were much lower. Sure, cruising on a larger boat with more equipment is comfortable and sometimes easier. But <u>cruising</u> is what it's all about! We've seen many cruisers spend lots of time and money in foreign ports waiting for parts and trying to get their systems working while folks in smaller boats were out cruising the isolated spots and having a blast.

We'll start out by looking at the gear we recommend needed for coastal and offshore sailing. Obviously for local cruising in protected waters some of this gear is unnecessary.

1. **Shortwave Radio Receiver**
   Most Reliable: ICOM R-71A ($1019 list often discounted)
   Most Logical: ICOM 735 amateur transceiver ($1064 list, $849-$899 disc.)
   ICOM M-700 ($2325+1075) or M-800 ($3149+1075)
   Least Expensive: Radio Shack DX-440 ($199.95)
   Sony ICF-SW7600 ($250), ICF-2010 ($450)

If you're only cruising close to the coast and not going south of Florida or San Diego, VHF weather reports will suffice. But for longer-distance cruising, a shortwave receiver is necessary to receive time signals and weather warnings from stations like WWV and WWVH as well as high seas marine weather broadcasts on stations such as NMC-San Francisco and NMO-Honolulu. To be able to receive the single sideband weather broadcasts, your receiver must have either a SSB switch, or an adjustable BFO (beat frequency oscillator) knob. If you're on a tight budget, the inexpensive Sony or Radio Shack receivers will do an adequate job.

The July 1, 1991 issue of Practical Sailor (for back issues: 75 Holly Hill Lane, Greenwich, CT 06836, 203-661-6111) has an excellent review of low to medium cost shortwave receivers and list discount mail order sources.

Because of the relatively small price difference between a quality shortwave receiver and transceiver, I personally recommend installing an ICOM 735 ham radio to be used as a receiver, even if you aren't able to pass the morse code test before departure. <u>In an emergency situation</u>, you can legally transmit on

any frequency, even if you don't have a ham license, and this this could save your life. The new "no Morse code" technician license with limited voice privileges is obtainable in an intensive weekend seminar, although the frequencies then available to you don't include the 20 and 40 meter frequencies used by the ham maritime mobile nets. Gordon West Radio School (714) 549-5000 is the hot tip for getting your ham license easily. We cover ham radio in our optional equipment section.

Sony makes several very compact digital receivers with SSB capability, these are are very compact and have a lot of neat features, but according to a friend who ran the Sony repair facility in Tahiti, they don't last particularly well on boats in the tropics.

2. **VHF MARINE RADIO**
   Most Reliable: Icom M-56 (List $639, often discounted to $365)
   Good Value: West Marine Aries II ($149)

Several countries, including New Zealand and Australia, now require you to give advance notice of your arrival at a customs port of entry by radio, so at a minimum, a VHF radio is needed for international cruising. Icom and Standard Communications make up 52% of the VHFs on cruising boats, with Icom having the best repair record of any radio manufacturer, according to the Seven Seas Cruising Association Equipment Survey ($10 from SSCA, 521 South Andrews Ave., #10, Ft. Lauderdale, FL 33301 (305) 463-2431) The very compact profile and splash resistance are also reasons we chose the M-56. If your radio is going to be subjected to drips or spray, the Icom M-125 is a commercial-grade water-resistant radio which we see on many commercial boats. Both the West Marine and Icom radios have a 2 year warranty with a flat rate repair ($49 WMP, $67.50 Icom) for as long as you own the radio. Standard's warranty is even better: three years and $65 flat fee after. There are Icom dealers with access to repair facilities throughout the Pacific in places as remote as Fiji, PNG, Solomons, New Caledonia, as well as in Central and South America and Europe.

3. **Dinghy/Tender**
   Most Versatile and Reliable: Avon Rover 3.10 ($2275 list/$1949 discounted)
   Most Innovative: Avon Roll-Up 2.85 ($2375/$2049) and 3.15 ($2750/2375)
   Less Expensive: Avon Redcrest ($1325 list, often discounted to $1125)
   West Marine Offshore series $995 to $1495

After having cruised with both rigid and inflatable dinghies, I've found that for load-carrying capability, safety, and ease of stowage that inflatables with wooden or fiberglass floors are the most versatile. If you have the deck space to store a rigid sailing dinghy, by all means take one as a back-up for a good inflatable but realize that if you ever are caught in extremely rough sea conditions it may be smashed on deck by breaking waves. The traditionalists say that inflatables don't row well enough in storm conditions to allow you to take out and set additional anchors. This is true for dinghy-style inflatables without the optional floorboards, but a couple of years ago in a sustained 50 knot tropical depression in Samoa I was able to power out and set storm anchors for two boats that were dragging anchor toward a coral reef in extreme conditions using our six-year old Rover 3.10 with 7.5 Johnson outboard. In those conditions, a hard tender would have been swamped by the breaking seas. I've also been able to tow engineless boats short distances in crowded harbors where sailing wouldn't have been safe or possible. By having a planing

inflatable, we are able to leave Mahina Tiare in a protected anchorage, then take our sportboat to explore a much larger area than if we were relying on rowing only. For snorkeling and diving trips, an inflatable is much easier to get in and out of from the water than a hard dinghy, and is virtually impossible to tip over. Inflatables are also excellent in the surf, although we often remove the motor and row in if it looks like there is any chance of getting the motor wet.

Flip-up launching wheels which fasten onto the transom of sportboat-type inflatables are a must, making launching and landing much easier on your back and on the fabric on the bottom of the boat. They are available through several marine stores or directly from from R.I.C., Box 68386, Oak Grove, OR 97268.

If cost and deck space are not too limiting, my first recommendation for a tender would be an Avon R.I.B. (Rigid Inflatable Boat) 3.10 with fiberglass shallow-"V" hull and transom, with 9.9 or 15 hp outboard; the rig we have used for the past two years on our new Mahina Tiare. From our observations, Zodiac and Metzler fare the worst of all in the tropics. For an excellent review of inflatables, check out the Nov. 1, 1991 issue of Practical Sailor. It was interesting to note that the "buy again" ratings for Avon were 89% in 1988 and 98% in 1991 and average age was 7.6 years. The only drawback to Avons is their high initial purchase price. If you are only cruising for six months and have to watch your budget closely, consider an Achilles or West Marine Offshore inflatable.

4. **Dodgers** - A REAL PRIORITY!
   Most Reliable: stainless steel frames, Sunbrella acrylic or Weblon vinyl
   Cost: $351 for do-it-yourself kit, $1300-$3000 for professionally built

A steering and watch position in the cockpit that is protected from wind, spray and sun greatly reduces fatigue at sea, leading to safer and more comfortable passages. The ultimate solution is to have an inside steering position or to have a hard-top permanent dodger or fixed windshield with stainless-framed spray hood attached. A less expensive and more common solution is to have a stainless framed dodger with a heavy gauge (.040 mil thickness) clear plastic windows that is in a fixed position with substantial stainless tubing (not nylon webbing) supports. I've found that when the dodger isn't needed for cold, spray and wind it is needed for sun protection, so my favorite designs don't fold down. Instead, the center window (or in some cases, all of the windows) are removable, allowing for air circulation in fine weather or at anchor.

Aluminum tubing will save you money initially, but may collapse as my first dodger on Mahina did when hit by a wave. Snap-on sun covers of acrylic will greatly extend the life of the plastic windows, as the sun turns the plastic cloudy and brittle in less than two years of tropical cruising. If you are headed towards the tropics, try and choose a light-colored fabric for the dodger, dark colors are great solar heat collectors.

A common mistake made in the design of dodgers for offshore sailing is to make them too high. It isn't necessary to stand up under a dodger; a design that provides sitting headroom and still allows you to see over the dodger when you're standing in the aft end of the cockpit is more practical. Build your dodger too high, and a wave will carry it away, even if you use stainless tubing and fittings. If possible, have a backdrop built which will attach with

common-sense fasteners to the after edge of the dodger, angling back and down to attach to the cockpit coaming and seats. This enclosure is great for windward or downwind passages and keeps the salt and spray out of the cabin. The backdrop should have one or two vertical zippers in the middle of it to allow you quick entrance and exit of the cockpit. I designed and built this type of system on our 31' Mahina Tiare, with just enough room for two people to sit on either side when the backdrop was snapped in. It also allowed us a place to put wet clothes and boots when living aboard in the winter.

Our 42' ketch came with a hardtop fiberglass dodger with safety glass windows. In heavy or cold weather, we can sail the boat in 50 knots of wind with the cockpit completely enclosed with canvas which attaches to the hard-top dodger and mizzen shrouds. We have better visibility from the cockpit than most boats with inside steering, but in three minutes we can stow all of the canvas and open the front of the windshield up for ventilation. New Zealand is the place where many cruisers have fixed windshields and hardtops installed. We've seen many experienced cruisers opt for this arrangement - Steve Dashew's boats are a good example.

Sailrite Kits (P.O. Box 987, Columbia City, IN 46725, 800-348-2769) have custom dodger kits available for those brave enough to attempt to sew their own. The best dodgers I've seen are from The Artful Dodger Co. (206-385-2670) in Port Townsend, WA, Starbuck Canvas (415) 332-2509 and Gianola & Sons (415-332-3339) in Sausalito. Each of these companies can include flexible or hard-mount solar panels over the dodger as well as stainless steel hand-holds on along the aft top edge and on the sides, if needed.

5. **Windvane Self-Steering Systems**
   Most Reliable: Monitor ($2795)
   Least Expensive: Navik ($1395), for light to med. displ. boats to 32'

For inland and sheltered coastal cruising, an electric autopilot really makes sailing less fatiguing and more comfortable.

For extended long distance ocean cruising with less than four people aboard, a dependable windvane is not a luxury item. Unlike electrical autopilots, it doesn't draw any electricity and can't short out if it gets wet. A windvane reduces fatigue and exposure so that your passages will be safer and more comfortable, allowing you more time for navigation and sleep.

Having owned, sailed with, or repaired several types of windvanes including Aries, Fleming, RVG and Monitor over the past 98,000 miles, my personal choice is the stainless steel Monitor, which flawlessly steered our 31' boat over 47,000 miles in conditions ranging from surfing downwind under bare poles in a hurricane to to light-air drifting with 2½ knots of boat speed. The builder, Scanmar Marine, 415-332-3233, has become a virtual clearinghouse for vane gear, and now also builds the Saye's Rig and Auto-Helm and is the U.S. importer of the Navik. Between the four different types of vanes, they can find one that will fit your boat. The company's owner, Hans Bernwall circumnavigated the world in the '70s, and has a reputation for excellent service.

Aries vanes from England are the most common, but Nick Franklin, the owner and inventor has gone cruising and the vanes are no longer available. Most of the Aries are constructed of a mixture of metals including cast aluminum, and tend to corrode and become stiff in a tropical salt environment.

For an in-depth review of windvane self-steerers, check the Jan. 1, 1989, Feb. 15, 1989, and April 15, 1989 issues of Practical Sailor (203-661-6111 for back issues).

6. **Depth Sounder**

Good value: Autohelm St-50 ($739/550), ST-50 Tridata ($895/$599)
Possibilities: Apelco XCD 550 ($769 list, $399 average disc. price)
Interphase DC 500 ($719/499)

Because this is the second-most important navigational instrument on a cruising boat, I recommend that you carry two separate sounders; either permanently mount both as we've done in the past, or keep the spare tucked away for when the primary sounder breaks down.

The capability of sounding to at least 100 fathoms is necessary, and an alarm is very useful at times. If you only install one sounder, try and position it so that it can be read from the chart table and cabin as well as in the cockpit. Heat and sunlight can destroy some digital liquid crystal displays (LCD's) in less than a year, so if your digital instruments don't come with snap-on covers, sew up one out of light-colored acrylic fabric.

There is not one single sounder that stands out as the best for all types of installations. In terms of one instrument which does the most duties, the Autohelm ST-50 Tridata gets the award. In one very small waterproof display depth (600' maximum range), boat speed, log distance (to 9,999 miles), trip distance (to 999 miles) sea temperature, and timer are provided for under $600. I haven't used one yet, but the electronics wizards I've talked with said they have seen very few failures of this unit. If it is good as it looks, it will be a best buy. Our new boat came with all Brookes and Gatehouse electronics. The Hercules depthsounder is not their latest, but it has worked well for eight years. There is a repeater located in the cockpit above the main hatch. The main unit is mounted below at the chart table, and the LCD numbers are big and bright enough for me to se them in my bunk in the aft cabin. As I write this, I'm anchored off Stuart Island in the San Juans. Last night a typical wintertime gale came through with winds peaking at 50 knots. It was great to be able to see the depth and know that the anchor was holding without getting out of bed!

Few cruisers today ever consider taking a sounding lead with them, but we've found ours very helpful this summer when checking out narrow entrances with the dinghy. One person can go ahead of the yacht in the dingy, sounding and calling back the depths. In areas where shoaling occurs rapidly, this is a lot safer than using the sounder and the keel as a sounding lead. The only company that I've seen marketing sounding leads recently is Robert E. White Instruments, 34 Commercial Wharf, Boston, MA 02110 (800) 992-3045). I recommend their 4 lb. sounding lead with 60' marked line for $32.

7. **Distance Log and Knotmeter**

Most Reliable: Swoffer 5E-10 Knotmeter ($240) F-Type Distance Log $280)
Autohelm ST-50 Tridata ($899/599)

A distance log is important for dead reckoning navigation in both coastal and ocean sailing and a knotmeter is helpful for seeing changes in boat speed when trimming sails.

Few cruisers today choose to put up with the hassles of fouled rudders, props, windvanes, and hungry sharks that plague Walker type trolling logs, instead opting for a modern knot-log with thru-hull transducer. The Swoffer instruments have analog instead of digital readouts and don't have problems of the LCD displays turning black or losing their memory if the power is turned off. Swoffer (1048 Industry Drive, Seattle, 98188) is a family-owned business which has been in operation since 1959 and is famous for its quality and service. The Autohelm ST-50 provides depth, speed, and distance information at the same time.

8. **Bilge Pumps**
   Most Reliable: Whale Gusher 10 (22 GPM, $232/176), Gusher 30 ($375/305), Edson Diaphragm (30 GPM,$380)
   High Output Electrical: Rule 3700 GPH ($136/99), Jabsco 4000 GPH ($140/99)

Your boat should have at least three separate bilge pump systems; a manual pump that can be pumped while steering, a second manual pump that can be operated from the cabin, and a high-capacity (3000+gph) electric pump which can hopefully handle a broken thru-hull fitting. Each of these pumps should have its own intake strainer and separate overboard discharges above the waterline so that back siphoning can't occur. Par Jabsco sells an Ultrasonic Pump Control Switch ($58/45) that cannot be fouled by bilge debris and is completely sealed. Ours turns on in rough weather, even if the bilge is dry, so you may opt for the more dependable (and expensive) Ultimate SR switch - $69 without alarm, $124 with high water alarm. For high capacity in an emergency, Jabsco makes a bronze pump that is belt-driven off the main engine and which sells for around $300. Another option with even higher output is a small, gasoline-powered pump. It is important to stick with major brands like Whale, Edson and Jabsco, both for longevity and for ease of finding spare parts later. Keep your bilges clean and dry. By placing oil absorbent sheets under the engine and suspending a mesh Oilzorb pad in your bilge, you can prevent oil from mixing with your bilge water. When you haul out your boat, drain and thoroughly clean all debris from your bilge. A wet and dry shop vacuum is useful for this messy job.

References: Bilge Pump Switches: Practical Sailor Aug. 15, 1990 issue
Electric Bilge Pumps: Practical Sailor Mar. 15, 1989
(For back issue of Practical Sailor call (203) 661-6111

9. **Liferaft** (6 person, double floor, canister models for comparison)
   Best For Yachts: Avon Offshore Double-Floor Cannister($4675/4095)
   Switlik Offshore Search & Rescue ($5020)
   Switlik Coastal ($3395/3149)
   Viking Yachting Offshore Icelandic ($2905)
   Givens Offshore Cannister Double Floor ($5795)

There really isn't any substitute for a quality self-inflating canopy liferaft for long-distance ocean cruising. If the sustantial cost is unmanageable for you, used liferafts can often be found at substantial savings. Avon, Switlik, Viking, and Givens all build coastal (vs. offshore) models that are less expensive, not designed for long-term survival but are good rafts. If your raft is over a year old, have it repacked by an authorized service dealer. He will inflate your raft with air (not the CO2 bottle) and leave it for a couple of days to check for slow leaks. Ask if you may come back and see your raft when it's inflated. This is a good chance to familiarize yourself with the equipment

packed inside the raft and discuss with the re-packer what equipment should be added. Some items that should be included, either in the raft or in an abandon ship bag that can quickly be removed from the cockpit: EPIRB, handheld VHF with optional refillable alkaline AA battery pack, Survivor 06 Watermaker, SOLAS flares, dye marker, smoke signal, signaling mirror, flashlight, knife, water containers, hard rock candy, vitamins, sealed survival food, two can openers, fishing gear, small spear gun, dip net, sunscreen, first aid cream for saltwater sores, space blanket, 5' x 5' canvas square with grommets to be used as a sail or blanket, bailer, paddles, patch kit, pump. Either West Marine's Dry Bag ($29) or Survival Technologies Abandon Ship Bag ($88) will work well. At least two five gallon water jugs should be kept in the lazarette where they can removed quickly and tossed into the inflated liferaft. It took 17 years of looking, but last year in Annapolis I found a small, easily-stowed Hawaiian sling type spear gun sealed in plastic and designed for liferaft use; $68.95 from Coast Navigation, 800-638-0420.

Once you've left the U.S., you may find that international airlines can either repack your raft or tell you who does their repacking. In the Pacific, Rescue Equipment Fiji, Ltd. in Suva (tel.: Fiji 24199) is a factory-authorized repair and repack station for nearly all brands and charges less than $100 US for a very thorough inspection, certification and pick up and delivery. Most raft manufacturers recommend repacking every 12 months.

Stowage of your liferaft is important. Many rafts stowed in canisters on deck are destroyed (in as brief a period as 18 months) by water penetrating between the two halves of the canister or wicking up the inflation cord. The best designed canisters do not rely on a rubber or neoprene gasket for watertightness, instead the top half overlaps the bottom half and an o-ring or gasket is hidden inside. Mounting a canister liferaft on deck, forward of the cockpit exposes it to possible breaking seas, so if you must mount it on deck, make sure securing hardware if substantially bolted through the deck. On our 31' boat we used a valise-packed Avon raft stowed in the quarter berth. Our 42' boat was designed to carry a streamlined Viking canister just forward of the windshield and is secured with four quick-release straps. The optimum liferaft stowage is in some French production yachts where there is a molded-in liferaft compartment under the helmspersons seat.

Recommended reading: Cruising World Oct. 1991, Practical Sailor Sept. 1991 Survivor by Michael Greenwald, Adrift, Steve Callahan, Survive the Savage Sea, Dougal Robertson.

Recommended video: Abandon Ship, Preparing to Survive

10. **Emergency Watermaker or Solar Still**
    Best Value: Recovery Engineering (PUR) Survivor 06 (6 gpd) ($550/499)
    Highest Output: Survivor 35 (35 gall. per day) ($1425/1295)
    Least Expensive Option: Airborne Solar Stills ($166/149)

Water is essential to surviving more than 12 days in a liferaft, food is not. Because of the bulk and weight, even "full pack" liferafts come with only a very limited amount of water. Grabbing a five gallon jug stowed in the cockpit just before boarding your liferaft will greatly lengthen your survival time. Even better, budget for a manual watermaker which is also useful if your main water tank becomes damaged or contaminated. The Survivor 06 will provide enough water

for the survival (1 qt. per day ea.) of more than 12 people pumping 60 minutes each per day, and the Survivor 35 will provide water for more than 24 people per day. These pumps require just 6 lbs of pressure but are not efficient from a perspiration loss standpoint if the air temperature is over 104 degrees, so remember to do watermaking in other than the hottest time of the day if you're in a liferaft in the tropics. I am so paranoid about running out of water that we carry both an 06 and a 35. If you only carry one watermaker, don't have it packed inside your liferaft where it would be very difficult to use if you had a water shortage on your boat.

A less efficient option is the Airborne solar still which produces 1 to 3.5 pints per day, depending on available sunlight. Coast Navigation (800-638-0420) and West Marine Products (800-538-0775) sell these for $149.

11. **EPIRB** (Emergency Position Indicating Radio Beacon)
Most Reliable: ACR RLB-21 ($389/229), RLB-24 406MHz ($1835/1075)
Alden Satfind 406 ($1895/1469)
(Possibly) Litton 406 ($1515/1049)

An EPIRB on board gives you a much better chance of being located in an emergency. As of May 1986, 577 persons had been rescued as a result of EPIRBs and ELTs (aircraft version). We carry two: an ACR RLB-21 packed inside our liferaft, with a second unit packed inside our liferaft ready-bag. The RLB-21 is waterproof, small, light and has a 5 year recommended battery replacement. It comes with a velcro attachment pad which can be sewn on a float or foulweather jacket or safety harness. The RLB 21 EPIRB's transmit a continuous distress signal on 121.5 MHz and 243 MHz which can be picked up by satellites in the northern hemisphere. Unfortunately, coverage doesn't extend much south of Hawaii and is non-existent in most of the South Pacific and Atlantic, so the only chance of reception is from an aircraft monitoring one of the two frequencies and flying within 150 miles of your position. Australia has just established a ground station that provides coverage for a radius of 2000 miles, and there are several other ground stations planned for the southern hemisphere. The excellent (but expensive) solution is one of the new 406 Mhz EPIRB's which transmit simultaneously on 406 MHz and 121.5 MHz providing worldwide coverage for the first time. This system has been in use in Russia and Europe for several years, but has only recently received F.C.C. approval in the U.S.

Prices and size of 406 units are coming down. The first U.S. produced and approved 406 was the ACR RLB 23 which at $3795/$2195 and 26½" x 4¼" was too large and expensive for many yachts. Rumor has it that ACR, the industry leader in EPIRB's, is about to come out with a smaller, less expensive model suitable for yachts. The "float-free" Category 1 mountings required on commercial vessels are often unwieldy and impractical to mount on sailboats. Manually activated Category 2 models are easier to mount or store.
Another tremendous advantage of the 406 MHz system is that each unit transmits a unique serialized code, allowing for NOAA to identify the name and type of vessel, greatly reducing the amount of time in determining who you are and if your signal is a false alarm. False alarms presently make up 95% to 99% of the signals, and the fine for not immediately reporting an unintentional distress signal is $1000. The cost of operating a C-130 Search and Rescue aircraft is $1,821 per hour.
To check out your EPIRB, turn it on for 1 second or three audio sweeps during the first 5 minutes of any hour, while listening on 99.5 MHz on an ordinary FM radio.

12. **Safety Harness and Tether**
Most Reliable: Switlik ($99.50), Lirakis ($95/75), STG Pelican 2 ($106) SOSpenders ($84.90)

Each member of your crew should have their own harness, stowed separately in labeled bags. Some key points to remember when buying a harness:

1. The harness should fit fairly snugly so that you won't slip out under sudden loading. Adjustable harnesses allow a good fit over sweaters, etc.
2. Avoid harnesses that have metal "face-ripper" plates in front.
3. Tethers should be 6' or less and have quick-release buckles on each end. I especially like the Survival Tech. ORC tether w/special snap shackle.
4. Rig high dacron lifelines from stern pulpit, through an Alladin cleat 5' off the deck on the inside of the upper shroud, amd down to the bow pulpit.

This allows you to clip your tether on to the high lifeline before leaving the cockpit, and is much easier to work with than jack lines along the deck.

13. **Additional Safety Gear**

A. **Flotation:** As a minimum, at least one Type III or Inflatable Type V vest per person. Type I are safer, but extremely bulky, so rarely worn.
B. Throwable Device: Omega Rescue Throw Bag Heaving Line ($29/23) or Seaid Throwable Inflatable Horseshoe ($97) are both excellent additions to a Type IV horseshoe or foam buoyant cushion. The Survival Tech. M.O.M. 8 Overboard Module ($525/$479) is the ultimate in rapidly deployable man-overboard gear.
C. Visibility: The Pains-Wessex ORC Cat. II Flare Package ($457/285) includes enough SOLAS flares and smoke canisters in a waterproof plastic bottle, and is cheap insurance if you really want to be seen. SOLAS parachute flares are far superior to normal USCG-approved flares. A personal strobe (Forespar-$36/23 or ACR Firefly-$85/59) attached to each harness is great.
D. Thermal Protection: For high latitude cruising (above/below 40 degrees) some type of hypothermia protection is a good idea, ranging from the Mustang Thermofloat Coat with convertible wetsuit beavertail, to the Mustang one-piece Cruiser Suit or Anti-Exposure Coverall/Worksuit worn by the USCG, to a Mustang or Stearns Survival Suit. Survival suits have saved many lives but are difficult to work in, so many Alaskan and B.C. sailors wear the Cruiser or Coverall suits which allow you normal range of movement.

13. **First Aid Kit**
Cost: $300 - $600 for long distance cruising. Detailed in medical section

This is an important part of outfitting, and shouldn't be left to the last minute. It is important to meet with your own doctor to get their recommendations and discuss the use of different medicines. Everyone on board needs to take a CPR and first aid course in the last year before departure.

14. **Halon Automatic and Manual Fire Extinguishers**
Most Reliable: Fireboy and Kidde

Electrical and engine fires do occasionally occur on cruising boats with diesel engines, and can be disastrous, especially with fiberglass which burns rapidly. It's difficult to think of any logical excuse not to install an automatic halon extinguisher in the engine room near the electrical connections. Halon, unlike CO2 is not fatal to breathe, is five times more effective at fire supression and installation of an automatic system may reduce your insurance rates by $40/year.

Dry chemical extinguishers are nearly useless on burning fiberglass or fuel, so besides our automatic halon system in the engine room, we also carry a 5 lb. Halon portable extinguisher mounted in the head. I have used the ACR $19.95 palm-sized Halon extinguisher to put out a 10' x 10' gasoline fire during a safety seminar, and now keep one in the galley.

15. **Hand-held 12 Volt Spotlight**
Most Reliable: several incl. Brinkman Q-Beam ($55), Nite Tracker ($79.95)

There is no alternative to a powerful spotlight that plugs into ship's power. I've had excellent service from the Q-Beam and would also recommend the million candle power Brinkman or Nite Owl Mega Beam ($61.95) which use the identical case. I've found that mounting the plug-in below at the chart table prevents corrosion and shorts common with cockpit 12 volt plugs. The new cordless rechargeable Nite Tracker 500,000 c.p. looks great, but we haven't had a chance to test it yet.

16. **Radar Reflector**
Most Reliable, best chance of being seen: Firdell Blipper ($139/99)

The most common reflectors used are Davis, in which I have little faith after being told repeatedly by freighters they couldn't see us on their radar. The captain of one freighter even went as far as recommending the Firdell to us over the radio at sea, and that was the first time I'd heard of it. They are used by commercial and rescue boats throughout the world, including the U.S.C.G., and return a much larger signal in rough sea conditions or when your boat is heeled over. We have ours permanently mounted on our mizzen above the radar antenna.

17. **Running Lights**
Most Reliable: Aqua Signal Series 40 ($42.00 - $185)

The original equipment navigation lights on many yachts are dangerously undersized and ill-placed. Kerosene running lights look salty but are a hassle and nearly invisible at sea. The masthead tricolor is a legal running light for sailboats up to 65', and gives ships a much better chance of seeing you and determining your course, and requires only a third the electrical drain of running two bow lights and a stern light. Strobes must only be used in an emergency at sea, not as running lights. My first choice would be a combination tricolor-anchor light.

18. **Batteries**
Most Reliable: Prevailer or Dynasty Heavy-Duty Marine Gel ($179 for 82Ah)

If your batteries are over two years old or are at all questionable, replace them with new gel batteries. Battery problems resulting from low voltage or fluid levels commonly plague cruising boats. From our experience with Prevailer Gel batteries aboard Mahina Tiare, I do believe the marketing claims that gel batteries will accept a 10-15% higher charge rate so that they can can be charged at a faster rate without overheating or damaging the plates. A significantly lower self-discharge rate means that if left for several months they won't go flat. Another real advantage over traditional deep-cycle marine batteries is that they are totally sealed, and won't leak acid even if your boat takes a severe knockdown. If you seriously enjoy tinkering and playing with electricity, you may choose to go the Surrette or Rolls deep-cycle battery route

with a sophisticated charging system that will "equalize" the batteries once a month. Having gone that route on our last boat, I am more happy with the simplicity and performance of the Prevailers, coupled with a super-accurate monitor system and a high-output alternator. Two separate battery banks are a must, and the latest thinking is to alternate in using them for house and starting application, this will cause the starting battery to last longer than if it is only used for starting. It is vitally important that you keep track of battery voltage at all times as no battery can last if you keep it in a continually discharged state.

19. **Battery Condition Meter or Voltmeter**
    Least Expensive: Professional Mariner 8-16 volt range analog voltmeter ($34/31), Digital ESM-4 ($129/109)
    Most Info: Balmar DCM 2000 ($695/499), Cruising Eq. Amp Hour+ (329/299)

These meters will tell you the state of your battery and should be installed in a visible location, like at your chart table. I prefer meters that are always on and visible versus the type where you have to manually throw the switch to check the voltage. The Balmar D.C. Monitor will actually calculate how many amp hours remain in each battery bank, how many hours at present discharge rate until you reach 50% discharge (the point at which you should ideally recharge batteries), and temperature of each battery bank (important to prevent damage from overcharging). There are more sophisticated units available that control the alternator output as well as monitoring voltage and amperage, but we have seen some problems with these units.

20. **Foul Weather Gear**
    The Best: Henri-Lloyd Ocean Racer ($460 Jacket, $170 floatation, $300 Pant)
    Good Value: West Marine Explorer ($169 Jacket, $125 Pants)
    H-L Foremost One-Piece ($245), Patagonia Ocean Smock ($255)
    Best for Tropics: West Marine Pacific Cup Weathersuit ($149 top, $99 pants)

Comfortable, leak-proof foul weather makes sailing in inclement weather much more bearable. The Henri-Lloyd Ocean Racer has a built in harness and optional removeable floatation vest, making it the most versatile gear available. If you plan on sailing in areas where the water temperature is below 55 degrees, consider purchasing a Mustang Ocean Class Thermafloat coat, which has a built-in neoprene harness and beavertail, which when fastened provides you with good hypothermia protection, increasing your survival time from less than an hour to over nine hours. These coats also make good foul weather gear in cold climates and are U.S.C.G.-approved flotation devices. They can be special ordered through West Marine. More details on foul weather gear follow in our clothing section.

21. **Tools**
    Most Reliable: Craftsman, Stanley, Snap-On, Makita (expensive!)

The following is a list of the minimum tools that should be aboard for an extended cruise when you're out of the way of repair facilities:

1. Claw hammer.
2. Small hand saw for wood. (Teflon-coated saws don't rust as fast.)
3. Socket set containing both metric and SAE sockets. (Oil lightly after use.)
4. Packing nut wrench with 3" jaw. (West Marine for $11.50)
5. Pipe wrench. (For disassembling thru-hull and plumbing fittings.)
6. Crow bar and hatchet or axe. (For removing interior in case of hull damage)

7. Wire stripper/crimper tool, plenty of solderless terminals and connectors.
8. Hand drill, non-electric ($35 at WMP); optionally Makita cordless drill with 12 volt charger ($59). Set of new drill bits and taps.
9. Crescent wrenches: small; medium and large. Set of allen wrenches.
10. Open-end or box-end wrenches for working on your engine.
11. Vise grips, small and large, needlenose pliers, diagonal wire cutters.
12. Hacksaw with a dozen spare blades.
13. Screwdrivers (small, medium and large), both standard and phillips.
14. Stanley Surform shaper, wood and metal files.
15. Portable butane soldering iron ($34.95) with optional rope cut tip ($9.85).
16. 40' 14-2 Duplex wire for future projects; 3 rolls electrical tape.
17. Caulking gun with 10 oz. cart.of Boatlife Life-Caulk and silicone sealant.
18. Wire or cable cutters, optional. (Faster than a hacksaw in an emergency)
19. Pop riveting tool and assortment of aluminum and stainless rivets, optional.
20. Tape measure; minimum 10', optionally a 100' tape for rigging measurements.

22. **Lifesling, Hoisting Tackle and Man Overboard Pole**
    Cost: Lifesling ($115), lifting tackle ($77), MOB pole ($90)

The Lifesling is the best system for getting someone who has fallen in the water back aboard. It consists of three components: a storage bags which snaps on your stern pulpit, 150' of floating retrieving line, and a flotation collar with optional water-activated light. The 3 to 1 hoisting tackle may not be necessary if you have large two-speed halyard winches mounted on the mast. The directions for use of the Lifesling are printed on the bag, and it's very important to practice the system before an emergency occurs. We also carry a 12' Forespar man overboard pole on the backstay.

23. **Whisker or Reaching Poles**
    Most Reliable: Forespar Lock Button ($200-445), Line Control ($315-695)

Whisker poles are used to hold out the jib when running downwind or broad reaching. The Line Contol poles are easier to use, but the contol line chafed through in less than 2,000 miles of downwind sailing, so I think I would probably recommend the Lock Button model, even though it's more awkward.

24. **Ventilation**
    Most Reliable: Dorade boxes, Vent-O-Mate, Nicro Lo-Vent Exhaust, Water Trap

Continuous ventilation in all weather conditions is important in keeping your boat dry and free of mold, no matter what climate you're in. You should be able to have air flowing through the boat, even in a tropical downpour or while beating to windward. The following are some suggestions on placement:

1. A pair of Dorade vents on each side of the cabin top with two deck plates in each box so you can have the airflow coming directly in during fine weather or going through the water trap during rain and spray.
2. Stainless steel extractor/exhaust vents are excellent to locate in the head or galley. They are effective even in very light winds from any direction.
3. Cowl or clamshell vents can be installed in the cockpit coaming to keep the lazarette dry and mildew-free.
4. If you have an anchor well, consider mounting a removable 4" Nicro Cowl vent on the cover, cutting an 8" hole in your furtherest forward bulkhead and installing a screw-out deck plate. This in effect turns the anchor locker into a large Dorade box and ventilates the most difficult part of the

boat. If you don't have an anchor well, a Nicro Water Trap will serve a similar purpose.

The solar intake/exhaust ventilators are an excellent idea but so far have been real susceptible to shorting out when they get wet.

25. **Additional Water Tanks**
Most Reliable and Versatile: Plastic 5 gallon jerry jugs ($11.50), Vetus or Nauta flexible tanks ($148 - 14.5 gal., $233 - 37 gal.)

Even if your boat has substantial tankage, it's important to bring along at least three 5 gallon jugs, since many places you won't be able to fill your tanks with a hose at a dock but will have to bring the water out in jugs carried by dinghy. Besides three hard plastic jugs of water, we carry six collapsible clear plastic Reliant brand jugs (the best!) just for reducing the number of trips we have to make ashore for water. We always keep at least one of these in easy reach in the cockpit in case we have to abandon ship.

26. **Additional Fuel Tanks**
Most Reliable: Plastic 5 gallon jerry jugs and/or add'l permanent tanks

As with the water, once you leave North America the fuel docks become scarce, so you'll need at least three 5 gallon jugs to ferry fuel out from shore. If you run out of fuel on the main tanks, it's nice to know that you have 13½ gallons stashed to get you into port. The jugs should only be filled to 4½ gallons and should be tied in an upright position.

27. **Bosun's Chair**
Most Reliable: Medoff Marine Custom Boatswain's Chair ($103/75)

This is the best-designed and safest chair I've seen. Check "Going Aloft" section for more details.

28. **Swim Ladder**
Most Reliable: Sopac ($219/160), Perko Folding Steps ($20/17 each)

An easy way to get back onboard from swimming or the dinghy is important, and most of the folding aluminum and plastic ladders are unstable. The Manta is built in New Zealand of stainless steel. Permanent small fold-down chrome transom steps offer another simple alternative.

29. **Snorkeling Gear**

If you'll be cruising in warm waters, get a set of mask, fins and snorkel for each person aboard. I've found that the clear silicone gear lasts quite a bit longer than the older black rubber style. Full-foot fins are best, protecting your feet from coral and urchin spines without the hassle of booties. We've found 1/4" or 1/8" shorty wetsuits great, even for tropical waters, if we are going to spend more than 30 minutes in the water at a time. If possible, rinse all gear in fresh water after each swim. One-piece lycra body suits are lightweight, protect against sea nettles and sunburn, provide some thermal insulation and ave available for under $80 at dive shops.

30. **Gifts**

People you'll meet in less developed countries are often friendly and generous, so you'll want to be prepared with some useful gifts to show your appreciation. Here are some ideas: children's clothes and small toys; non-prescription medical supplies, given to village health care worker (if there is one): roller gauze, gauze compress and dressings, Betadine topical antibacterial skin de-germing solution for skin cuts and infections, bacitracin ointment (Neosporin), aspirin, vegetable seeds; rubber thongs; any type of fishing gear; a rugby or volleyball for a village; boat repair supplies including paint, sandpaper, caulk, nails, screws, hand tools; sunglasses; hats; colored t-shirts; costume jewelry; perfume; scented soap; shorts; printed fabric; reggae or rock and roll tapes; Poloroid snapshots (take several rolls of film); marbles; kites; frisbies; snorkeling gear. These are just some ideas. You certainly don't have to go out and buy all of these things or try and play Santa Claus, but you hopefully will want to be able to reciprocate if you're shown generosity by local people.

On a different note, we think that the results of giving or selling liquor to local people can result in domestic violence and, on occasion, sets a bad precedence for yachts that follow you. Better to offer customs officials lemonade, iced tea, or coffee and cookies than a drink. Also, the practice of some American cruisers of trading Penthouse magazines for lobster in Mexico gives the local people a warped idea of American women and may result in trouble later.

We need to be thoughtful guests in foreign countries, mindful of the impact we make.

CRUISING WITH HAM RADIO

Charles Hicks
Johnson Hicks Marine
Santa Cruz

Getting a Ham radio license and installing a transceiver is often one of the last items on a cruising sailor's lists of things-to-do before departing, but most sailing hams will agree, it was one of their most important accomplishments. Ham radio will keep you in touch with many of the cruising friends you meet along the way (even though you decide to head east through the Panama Canal and they head out for the Marquesas), will easily provide communications back to the States and be of tremendous help should an emergency occur.

To sail long distances without the benefit and safety of HF (long distance) communications equipment is, in my opinion, analogous to heading out across the Pacific without a sextant or a knowledge of celestial navigation. Although you may well-make it to your destination, cruising has enough difficult challenges as it is without having to resort to such do-or-die tactics.

LICENSES

To operate an amateur radio you will need to get a license. Getting a license is about as difficult as learning the important details of navigation and many of the things you learn will be invaluable during your cruise . . . not only in getting optimum performance from your communications gear, but also in maintaining your other electronics.

There are several "classes" of Ham radio licenses, but the one you will need to get for cruising is the General Class. The "General" is the license that allows you to operate on all the amateur bands using voice. You will need to be able to send and receive Morse Code at 13-words-per-minute and pass an elementary theory and procedures test. I received my General Class License when I was 13 years old, if that gives you an idea of the difficulty.

You may want to first get a Novice Class License which only requires a 5-word-per minute code and simple theory/procedure exam. You won't be able to talk on any of the important bands, but you can "get on the air" and use Morse Code. Being on the air and making actual contacts will help you to painlessly increase your code speed to the General's 13-words-per-minute.

Amateur radio classes are offered by most Ham Radio Clubs and many junior colleges. There is a Ham Radio Club in most all cities and you can find out how to get in touch with them by inquiring at your local Ham radio equipment dealer. In addition, there are many excellent study guides available. Some of the most effective study materials that I've found are offered by the Bash Educational Services in Hayward, CA. (415) 278-8275. These products can be ordered direct, or purchased at local Ham radio equipment dealers.

STUDY GUIDES FOR NOVICE CLASS LICENSES:

*The Final Code Course At 5-Words-Per-Minute**
*The Final Exam For The Novice Class**

STUDY GUIDES FOR THE GENERAL CLASS LICENSES:

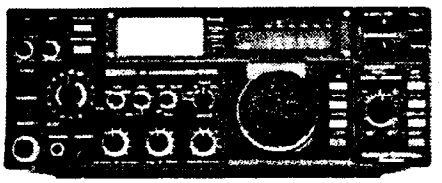
*The Final Code Course At 13-Words-Per-Minute**
*The Final Exam For The General Class**
Amateur Radio Handbook (Published by the ARRL)

Bash Educational Services Publications

TRANSCEIVERS

For a good Ham installation you'll need as a minimum a Ham transceiver and an antenna. If you want to use the same antenna for all frequencies, you'll also need an antenna tuner (antenna coupler) and a good grounding system.

Three of today's most popular Ham transceivers are the ICOM Model 735 the KENWOOD Model TS 430-S and the YAESU Model 757 GX. The "street" price for any of these units, at the time of this writing, is less than $800 and each unit is capable of approximately 200 Watts output, will operate on all of the important Ham frequencies, have memory channels, and (very important!) includes an excellent full-coverage short wave receiver, (vastly superior to the old standby, the Zenith Transoceanic).

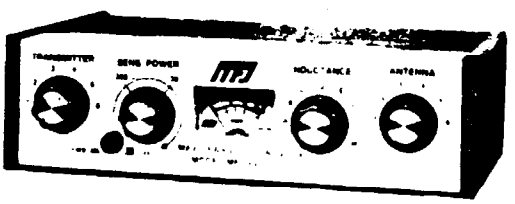


Icom 735

TUNERS

There are many antenna tuners available. In general, they can be grouped into two classifications; manual tuners and automatic tuners. A manual antenna tuner must be, as the designation implies, manually re-tuned whenever you change bands or have a large change in frequency. Because of this, manual tuners are usually located close to the transceiver and most cruising Hams develop a tuning chart (a chart of tuner settings vs. operating frequency) and post it nearby to simplify the procedure.

Automatic antenna tuners are normally mounted remote from the transceiver, usually close to the base of the antenna. Automatic tuners work well and are extremely easy to use, but are expensive. One of the most popular is a unit manufactured by Hull Electronics and has a suggested list price of $1195. Manual tuners, on the other hand, such as the MFJ 941C has a suggested retail of less than $100.

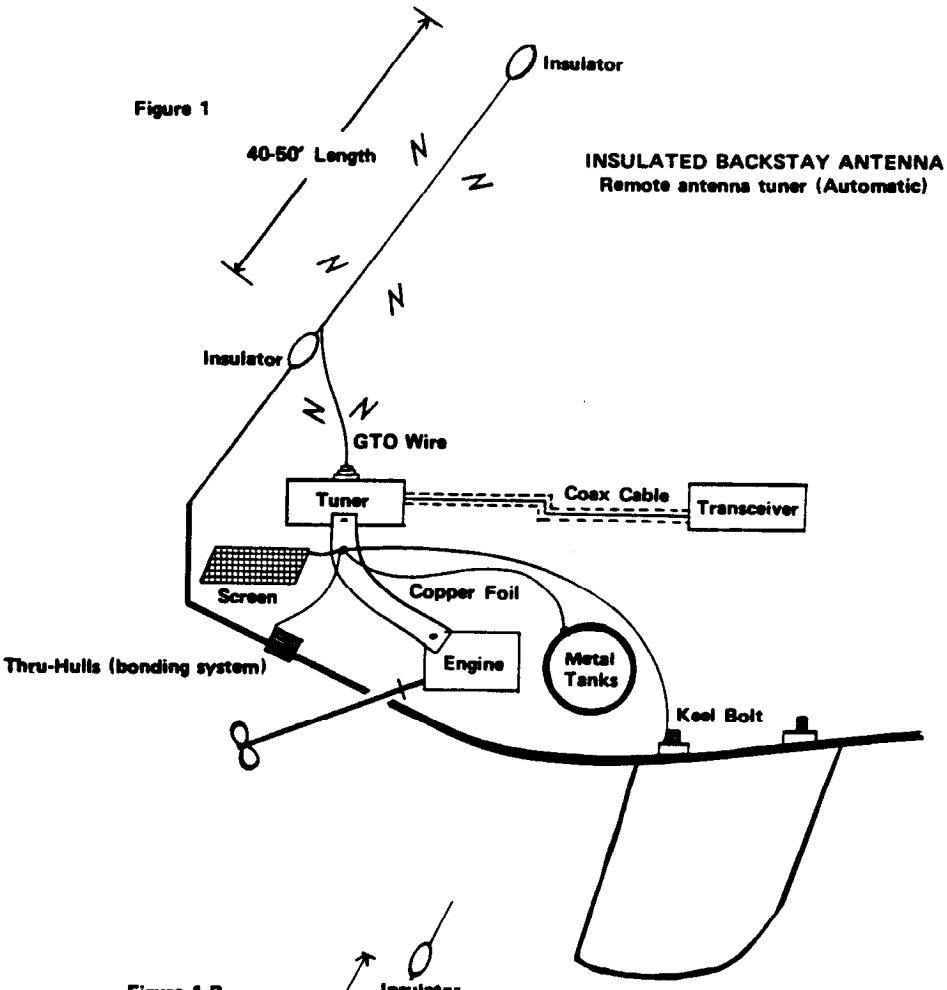


MFJ Antenna Tuner

ANTENNAS

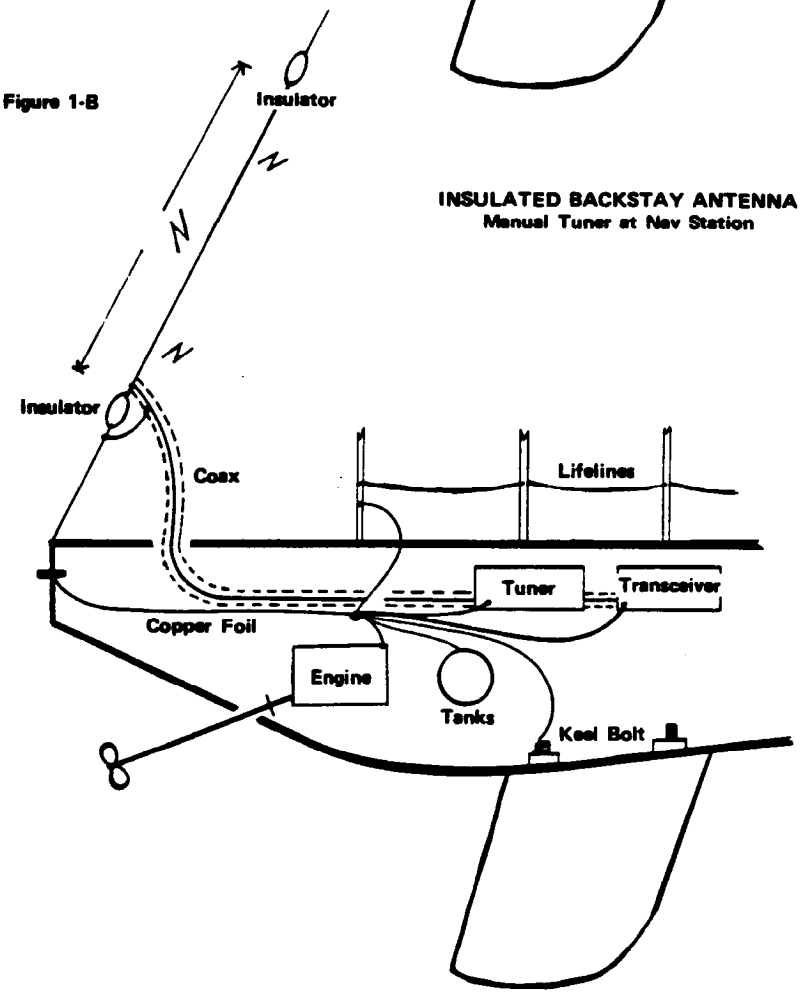
One of the best antennas available on a sailboat is your backstay! All you need to do is to insulate it at both ends so that you end up with an insulated length of approximately 40 to 50 feet. The insulated stay then should be connected to your antenna tuner (see figure 1) which is, in turn, connected with coax to your transceiver. If the tuner is located close to the base of the backstay, a single conductor wire (usually GTO or high-voltage wire) can be used to connect the antenna to the tuner. Run this wire as direct as possible to the tuner because the lead-in wire is also part of the radiating antenna! If you decide to mount the tuner at the nav-station, far away from the base of the backstay, then you should consider using shielded coax to connect the antenna to the tuner. Otherwise the antenna lead-in wire will snake through the boat causing interference with other electronics and it will be difficult to properly tune the antenna. Shielded coax should minimize this problem, but make sure the coax shield is grounded both at the tuner and at a location close to the antenna. (See figure 1-B).

Figure 1



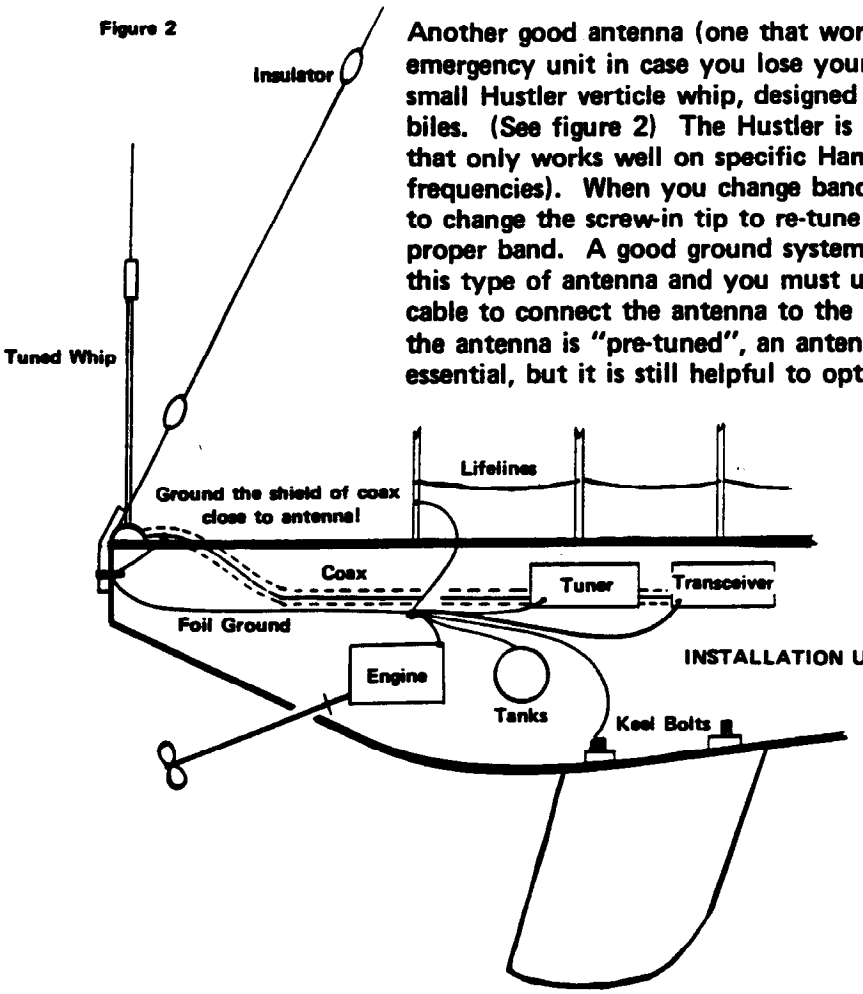
INSULATED BACKSTAY ANTENNA
Remote antenna tuner (Automatic)

Figure 1-B



INSULATED BACKSTAY ANTENNA
Manual Tuner at Nav Station

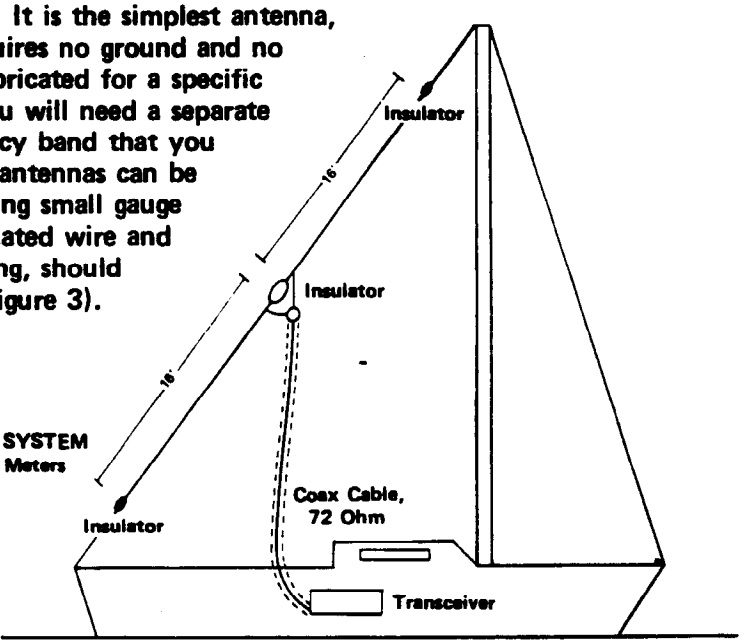
Figure 2



INSTALLATION USING HUSTLER "Tuned Antenna"

Another good antenna (one that works well as a standby emergency unit in case you lose your backstay) is the small Hustler verticle whip, designed for use on automobiles. (See figure 2) The Hustler is a "tuned" antenna that only works well on specific Ham bands (range of frequencies). When you change bands, you will need to change the screw-in tip to re-tune the antenna to the proper band. A good ground system is essential with this type of antenna and you must use shielded coax cable to connect the antenna to the tuner. Because the antenna is "pre-tuned", an antenna tuner is not essential, but it is still helpful to optimize the antenna.

One final antenna that needs to be mentioned is the half-wave dipole. It is the simplest antenna, easy-to-fabricate, requires no ground and no tuner. It must be fabricated for a specific band, however, so you will need a separate unit for each frequency band that you want to use. Dipole antennas can be quickly fabricated using small gauge insulated or non-insulated wire and hoisted into the rigging, should the need arise. (See figure 3).



DIPOLE ANTENNA SYSTEM
Dimensions for 20 Meters

GROUND SYSTEMS

Other than for a dipole, a good ground system is as import as the antenna. In fact, the total antenna system is made up equally of the radiating wire and the ground system. Each component is equally important. Getting a good radio ground on a wood or fiberglass boat can present quite a challenge. Direct electrical contact with seawater is not really as necessary as providing the maximum possible conducting *surface area* to create a ground plane for the antenna to work against. The higher the frequency, the more important the ground becomes. In practice, a reasonable good ground consists of just about everything metal in sight bonded together with copper strap (large surface area), such as the engine, rudder post, metal fuel and water tanks, copper water lines, and, if needed, lengths of copper strap run through the boat. For optimum results, the copper strap should not be "daisy-chained" to each metal item, but instead, a separate strap should run to each item from a common ground point. This common ground point should be as close to the antenna tuner as possible. (See Figure 4).

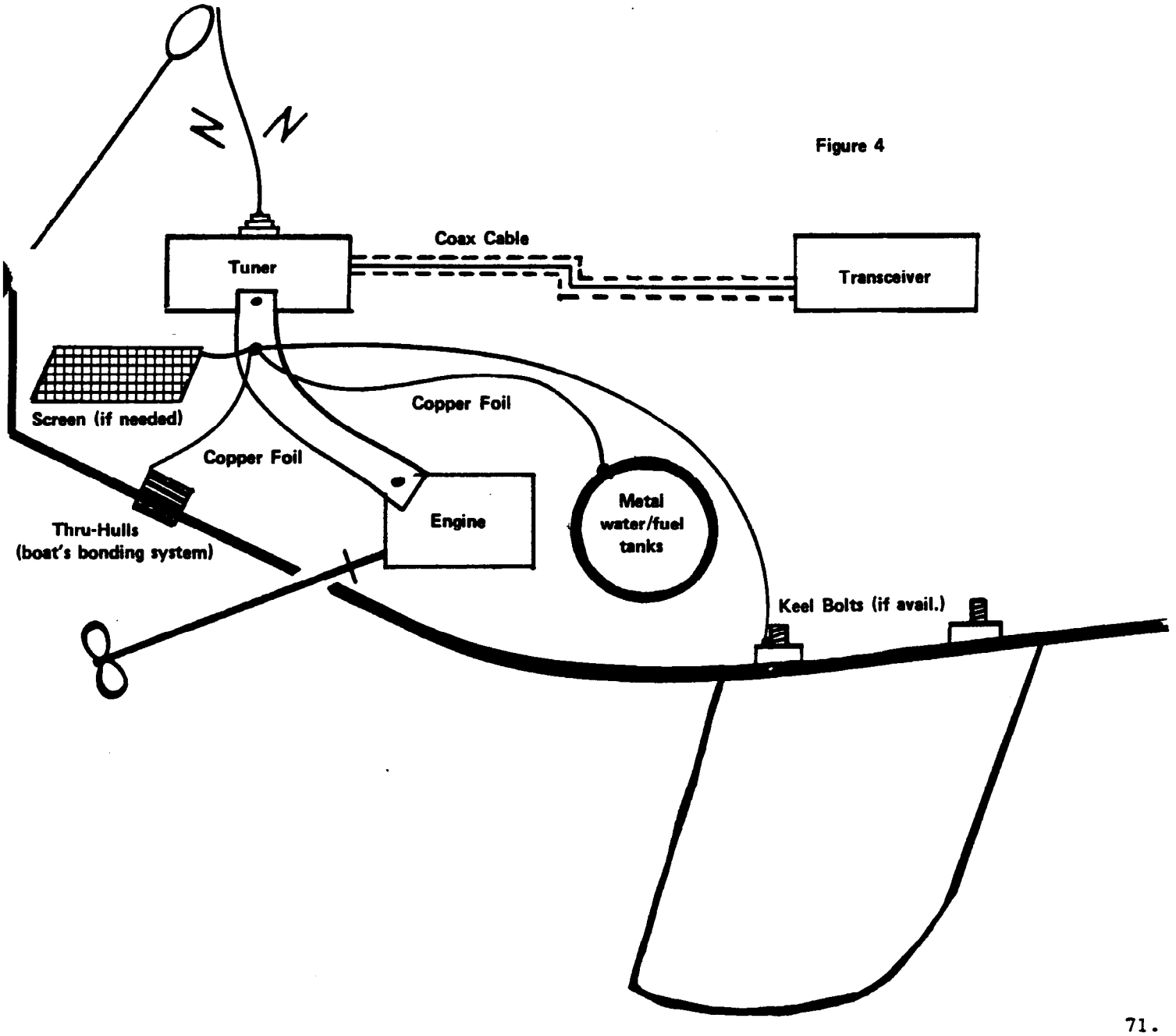


Figure 4

Photo by Gordon West

HAM NETS

In last month's Santana, Rick Booth's excellent article on ham radio afloat really hit home on how easy it is to get the ham ticket. I hope every mariner will see ham radio sets aboard as a safety device - not just a set for gabbing.

And hey, you don't need a ham license to buy the equipment. You can legally tune into the Pacific Coast ham nets and receive valuable weather information, storm warnings, and Mexican port advisories from licensed hams down south.

Included here is the 1989 ham radio high frequency monitor list for cruising down south (see box). It begins in the early morning, and will fill you with information as the day progresses.

Maritime mobile ham nets are well-run gathering spots of hams that exchange weather and cruising information. It's also a good spot to call out for help, license or not, if you're looking for someone in the vicinity that could handle a cruising emergency. (Nothing is worse than hooking up with a farmer in Iowa and trying to get him to understand that you need the Coast Guard off Turtle Bay!)

Even if you don't have a ham license, tune in for up-to-the-minute weather reports, and the latest news about every harbor south. You'll hear discussions about dinghy thefts, outrageous port fees, or hospitable town folks and secret harbors with pleasant port captains. You'll know everything about where you're planning to cruise, just by listening in. If you're a licensed ham, you can also take part in the transmissions too.

Your ham set might also tune into regular Pacific Coast weather reports found on the voice high frequencies (see box).

Tune in next month, and if you're good, I'll tell you how to receive weather facsimile charts on an IBM compatible personal computer for under eighty bucks. (You do need a ham receiver or inexpensive shortwave receiver.)

Sounds interesting, doesn't it? There are literally hundreds of frequencies and channels to tune in hams from voice weather reports for Mexico to Voice of America worldwide news reports.

If this does sound interesting to you, think about getting a ham set on board soon. Listen into the excitement on amateur radio and then get your license. It's easy. - **Gordon West**

Gordon is a noted ham and electronics writer and lecturer. He operates the Gordon West Radio School, a heck of a good place to learn ham and qualify for your license. Gordon's school is at 2414 College Drive in Costa Mesa - 714/549-5000.

SANTANA

GORDON WEST

WB6NOA
Electronics Editor

MARITIME MOBILE NET LIST

TIME(UTC)	FREQ(MHz)	NET NAME/DESIGNATOR	DAYS	AREAS	INFO:	CONTACT
0100	3.935	Gulf Coast Hurricane Net		G/C USA	Seasonal?	
0100+	21.407	Pac-Ind Ocean Net	Daily	Pac/Ind Oc		W6BYS
0100/2400+	14.313	Mar. Mobile Serv. Net		Pacific	(Also 1800)	KB5YX
0200+	3.992	Anz Traffic Net		Anz/Baja	M/M TFC OK	
0200+	14.305	CA-Hawaii (CC&H?) Net		Ca/Haw/Pac		
0200/0100+	7.290	Hawaii PM Net	M-F	Hawaii	(Inter Islands)	KH6B
0220+	14.315	John's Weather Net	Daily	So Pac/Norfolk Isl		VK3JA
0300/0200+	14.313	Seafarer's Net		Pac/W Coast	WA6ZEL or	KC7EX
0300+	14.106	Traveler's Net		Aust/Ind Oc		VK6ART
0330	14.040	E/C M/M CW Net		E/ Coast	CW Oper.	
0400+	14.115	Canadian DDD Net	Daily	Pacific	Also 1730	VE7DB
0400	14.075	Pac CW Traffic Net	MWF	Pacific	CW Oper	
0430+	14.314	Pac Mar Net-Warm up		Pacific	W/U	K7YRU
0500+	21.200	VK/NZ/African Net	Daily	Pac/Ind Oc		VK3PA
0500+	14.280	USA/Australia TFC Net		Pacific		
0530**	14.303	Swedish Maritime Net		Pacific		
0530+	14.314	Pacific Mar Net		Pacific	Roll Call	K7YRU
0630+	14.180	Pitcairn Net	Mon	So. Pac		VR6TC
0630+	14.320/105	So African Mar Net	Daily	Atl/Ind Oc	(&1130)	ZS5MU/ZS5GC?
0700+	14.313	International M/M Net		Atl/Med/Car	Also 1700	DK0SS?
0700+	14.265	Pacific Island Net		Pacific		
0700	14.310	Guam Area Net		West Pac		
0715+	3.820	Bay of Islands Net	Daily	Aus/NZ/S Pac		ZL1BKD?
0800	7.280?	Australia TFC Net		Aus/S Pac		
0800>0830+	14.315	Pac Inter-Island Net	Daily	S Pac/Sea		P29CC?/P29JM/KX6QU
0800+	14.303	UK Maritime Net		Atl/Med/Car	(Also 1800)	G8OS?
0900+	14.313	Mediterranean M/M Net	Daily	Med		5B4MM
0900	7.080	Canary Island Net		Atl		
1000**	14.330	Pac. Gunkholers Net		So Pac		
1000	14.313	German M/M Net	Daily	Atl/Med		DK0MC
1030+	3.815	Caribbean WX Net	Daily	Car	WX Also 2230Z	VP2AYL?
1030**	14.265	Barbados Cruising Net		Atl/Car	(14.263?)	
1100/1000+	3.770	Maritime WX Net	M-Sa	NE Canada	Shore WX	VE1AAC
1100+	7.082.5	Caribbean M/M Net	Daily	Car	(Listen 7.230)	J6LDZ?/KV4JC
1100+	14.313	Intercon Net	Daily	N/S/C Amer	(Also 2200)	K4PT
1100+	14.283	Carribus TFC Net	Daily	E/C-Car		KA2CPA
1130+	14.320/105	So African M/M Net	Daily	S Atl/Ind Oc	(0630)	ZS5MU/ZS5GC?
1130+	21.325	So Atl Roundtable	Daily	So Atl/Ind Oc		PY1ZAK
1200	14.040	M/M CW Net		E/C USA	CW Oper	
1200	14.332	YL Emergency Net		USA		
1200+	14.320	So East Asia Net	Daily	Sea/Indonesia/Aus		WB8JDR
1245/1145+	7.268	Waterway Net	Daily	E Coast/Car		NU4P
1300+	21.400	Trans-Atl M/M Net	Daily	N Atl/Med/Car		VE1ZL/VP5SL
1400	7.292	Florida Coast Net		Florida		
1400+	3.963	Sonnsa Net	Daily	Baja/Cal	Roll Call	WA6VZH
1500**	7.193	Alaska Net		Alaska		
1545**	14.340	Marquesas Net		So Pac		
1600/1500+	7.238.5	Baja CA Mar Net	Daily	Baja/CA	(EX KATE'S Navy)	W6CHX
1600/1700+	14.313	Coast Guard M/M Net	MDF	Atl/Car/USA		K4DZ/K4CG
1630**	7.285	Serape Net	Sun	Mex Coast		
1630+	21.350	Pitcairn Net	Fri	So Pac		VR6TC
1700+	14.340	CA-Hawaii Net	Daily	CA/Haw		K6VDV
1700+	7.240	Bayco M/M Net	M-F	C/Amer/Panama		HP3XWB
1700+	14.313	International M/M Net	Daily	Atl/Med/Car	(Also 1700)	DK0SS?
1700+	14.329	Skippers Net	Daily	Pacific		KH6OE
1730+	14.292	Alaska Net	M-F	Alaska		
1730+	14.115	Canadian DDD Net	M-F	Pac	(Summer, Also 0400)	VE7CEM
1800>1900+	14.285	Kaffee Klatch Un-Net	MWSa	Haw/Tahiti	"News"	KH6S
1800+	14.303	UK Maritime Net		Atl/Med/Car	(Also 0800)	GJTJY?
1800+	14.305	Confusion Net	Daily	S/Pac		W7GYR
1800+	14.342	Gordon on the Air		W/W		WB6NOA
1800/1700+	14.313	Mar Mobile Serv Net	Daily	Atl/Car/Pac	Also 0100	KB5YX
1800+	7.076	So Pac Cruising Net	Daily	So Pac	WX/Harbor-Informal	
1800	7.197	So Pac Sailing Net	Daily	So Pac		WA2CPX
1830+	14.342	Manana M/M Net-W/U	M-Sa	S/C-E/Pac	W/U	KA7HVA
1900+	14.342	Manana M/M Net	M-Sa	W/C-E/Pac	Weather	KA7HVA
1900	7.255	West Pacific Net		W Pac		
1900+	7.285	Shamaru Net (Friendly?)	Daily	Hawaii	(Ex Smitty's?)	KH6BF
1900	21.390	Halo Net		N/S Amer		
1900+	14.329	Bay of Isl Net	Daily	NZ	(Colin's)	ZL1BKD?
1900	3.855	Friendly Net		Hawaii		
1900	3.990	Northwest Mar Net		Pac NW		
2000**	7.060	VK Maritime Net		Aus/So Pac		
2100+	14.315	Tony's Net		NZ/So Pac	Weather	ZL1AT
2100	21.390	WAmer Traffic		N/S Amer		
2130**	14.318	Daytime Pacific Net		Pacific	Informal?	
2130	14.280	E/C Waterway Net		E/C USA		
2200+	21.350	Pitcairn Net	Tues	So Pac		VR6TC
2200+	21.404	Pac Mar Net-W/U	M-F	Pacific	W/U	KH6CO
2230+	3.815	Caribbean WX Net		Car	WX (Also 1030)	VP2AYL?
2230+	21.404	15 Mtr Pac Mar Net	M-F	Pac/CA/Haw		K7YDO/KH6CO
2300/2200+	14.313	Intercon Net	Daily	N/S/C/ Amer	(Also 1100)	K4PT
2310**	14.285	CA-So Pac Net	Mon	So Pac		
2330	21.325	So Atl Roundtable		So Atl		
2400+	14.320	S E A M/M Net	Daily	S & W Pac/Sea	(Rowdy's)	VS6BE

LEGEND:
R/C = Roll Call, Passage Maker Positions Taken; WX = Weather Info Available; W/U = Warm Up Session - Check Ins; E/C = East Coast; W/C = West Coast; C/A = Central America; G/C = Gulf Coast; CW = Morse Code Net; Atl = Atlantic; Car = Caribbean; Med = Mediterranean; "+" = Info checked from several sources as of May, 1986. "**" = No current information – possibly outdated; ">" = From/To times of net. Dual times listed "/" = Standard to daylight, winter to summer time changes.

NOTES:
1. Many Thanks: KL7RM, KB6FIC, KA7HVA, WB6NOA, W1RU, W6ORS, KB5HA, WH6J, ZL1MA, N7DX, N4JTE, W6YDO, J87CC, W4VBQ, WA6LLO, WD6EYJ, VE1ZL ET AL.
2. Some nets not primarily M/M nets but may run M/M traffic. Updates appreciated. M/M nets on 14.313 nearly worldwide – 24 hours a day.
3. Stations are cautioned to check appropriate band allocations, operator privileges and third party agreements.
4. We're looking for current information. Please provide full updates/corrections.

CRUISING YACHT ENERGY BUDGET—UNDERWAY

FOR A 24-HOUR PERIOD

LIGHTING *(Assume 10 hours of darkness)*

Running lights (3 bulbs @ .5A bulb)	*15.0 Amps*
Compass light (1 bulb @ .15 A)	*1.5*
Instrument lights (assume 4 B/G displays)	*2.5*
Misc. lighting (2 hours @ 2 amps)	*4.0*

INSTRUMENTATION

Sailing instruments (B/G Hornet w/4 displays)	*4.8*
VHF Radio (10 min.xmit/30 min.receive)	*2.5*
Sat-Nav (.8 amps average for 24 hours)	*19.2*
Ham radio (1 hr. receive and 15 min.xmit)	*6.0*

OTHER

Refrigeration (0 amps if engine driven - otherwise	*48.0*
Total for 24 hours	**103.5 Amps**

If you use only your engine to recharge the batteries with the standard 55-amp alternator and voltage regulator, it would take approximately 6 hours of engine running time each day to recharge the batteries. Listening to the drone of an engine for 6 hours each day is quite a penalty to pay for the pleasures of cruising! You can reduce the engine running time by either consuming less power (e.g., turn off the Sat-Nav between passes, etc.) or by generating more power.

A regulator by-pass can be installed to allow your alternator to deliver a constant high amount of charge current to the batteries which will reduce the engine running time considerably. In addition, you may want to invest in Solar Panels and/or Wind and Trolling Generators to assist the engine and reduce the required engine charging time. The table below gives an idea of the types of current that can be expected from these devices during a typical 24-hour period.

RECHARGE POSSIBILITIES

Run Engine with Regulator Bypass (55 Amp alternator running @ 30 amps for 3 hrs.	*90.0 Amps*
Solar Panel (2 Amp Panel for 6 hours)	*12.0*
Trolling Generator (4 Amps for 24 hours)	*96.0*
Wind Generator (6 Amps for 24 hours)	*144.0*

ENGINE SPARE PARTS LIST

1. **Oil Filters:** Change as per engine manual or every 100 hours. Average engine use while cruising full time is 300 to 600 hours per year. So, for a two year cruise take at least six filters. This is much easier and less expensive than trying to track down the filters in foreign ports. For an alternative source, check filter wholesalers in the Yellow Pages, instead of the engine dealer.

2. **Engine Fuel Filters:** Change as per engine instructions, or at least one replacement cartridge per 100 engine hours for every filter. There should be a minimum of two cartridge-type (Racor, Fram, Dahl, CAV type) filters before the injector pump. Every 5 hours visually check the glass sediment bowl for water or dirt.

3. **Diesel Fuel Conditioner-Bactericide:** Carry at least three pint bottles per year. By adding this each time you fill your main tank or jerry jugs, you'll prevent an algae scum from forming in your tanks and keep your injectors burning cleaner.

4. **Thermostats:** Plan on replacing thermostats yearly in tropical conditions, so carry one spare per each year you plan to cruise. To check that a thermostat is working, remove it from the engine, place it in a pan on the stove and heat until it opens. A candy thermometer can be used to check the opening temperature.

5. **Alternator and Water Pump Belts:** Replace before leaving; keep the old belts as spares; and buy another set if the old belts showed any signs of wear.

6. **Perkins 4-107, 4-108 Engines with Borg Warner Transmissions:** Replace the transmission oil cooler before departing and carry the old cooler as a spare. This unit rarely gives problems in temperate climates, but can corrode through in 1-2 years in tropical waters, allowing saltwater into the engine crankcase, resulting in expensive major repairs. It is very difficult to repair the oil cooler, so the best remedy is to have a spare and change it the minute you see any signs of sea water in the engine oil (grey foamy muck in the breather cap or dipstick).

7. **Injector Nozzles:** If your engine is over 8 years old, has over 1000 hours on it, smokes excessively or is hard to start, take the fuel injectors out and have them cleaned and tested. You should carry at least a set of spare injector nozzles, if not a set of spare rebuilt injectors.

8. **Alternator:** Carry a spare alternator, carefully wrapped so moisture can't get to it. We have seen dozens of boats chasing around in foreign ports trying to get alternators repaired or replaced. Marine alternators are very expensive - your spare could be a rebuilt heavy-duty automotive type. We currently use a Delco 55 amp automotive alternator that we bought as a rebuilt for $40 from a NAPA Auto Parts store. If at all possible, select an alternator that has an external voltage regulator, instead of one where the regulator is either built in or fastened on to the alternator which often results in premature failure because of the high operating temperature inside a sailboat engine room.

9. **Voltage Regulator:** If you are fortunate enough to have an external regulator instead of one mounted in or on the alternator, carry a spare. In addition, you may choose to install an alternator control device such as an Auto Mac so that you can manually adjust the rate of charging of your batteries, lessening engine time.

10. **Starter Motor:** If your boat is over 8 years old or has over 1000 engine hours, take the starter off and have it checked. Have new brushes installed, keeping the old brushes for spares. Starters are good for many years of service, but they can't stand salt water dripping on them; so make sure that your engine room is free of leaks and keep all terminals clean and coated with Lanocote or Vaseline.

11. **Shop Manual on Engine and Transmission and Numbered Parts List:** Don't plan on being able to find parts easily once you leave the U.S. Get to know the parts distributor/dealer for your engine before you leave; ask them for their advice of which spare parts you should take for extended cruising. Some manufacturers (Perkins) have separate parts lists for coastal and long-distance cruisers.

12. **Water Pump Impellers:** Replace existing impellers yourself (you'll have two if your engine is fresh-water cooled) before you leave. When the impeller fails you'll inevitably be the furthest away from a mechanic. Carry two impellers per year and replace them yearly, even if they aren't worn out. When they are worn out the blades will fall off and may clog part of your cooling system. If you have the money and the storage space, consider buying a complete spare pump assembly.

13. **Zincs:** Find out if your engine has sacrificial pencil zincs in the cooling system, and if it does, replace them if they are eroded and plan on one spare set per year. For both engine zincs and external hull and prop zincs, expect much faster disintegration in tropical waters. If you presently need to replace your zincs once a year in temperate waters, plan on twice a year in the tropics. 2 months

14. **Engine Gasket Sets:** Include head gaskets, intake and exhaust manifold gaskets and water pump gaskets.

15. **Engine Oil:** For long distance cruises, carry enough oil for at least five engine and transmission oil changes. If you ever have a problem and get salt water into the engine, you'll need to change the oil and filter at least three times, running the engine briefly in between changes to get the salt and moisture out. Don't carry oil in one quart cardboard containers with the metal ends, since these tend to chafe or rust through at sea, leaving you with a real mess in your bilge! At truck stops, auto parts stores and fuel distributors it is usually possible to buy engine oil in 1 or 5 gallon plastic jugs, the most efficient possible to carry and store oil. Before purchasing, check your engine and transmission manuals to determine the exact type of oil that is best for your engine. Don't plan on finding engine oil meeting marine diesel engine specs in every country. Use your old plastic oil containers to hold the oil until you get to a port where you can find a place that can recycle it. Don't pour it overboard or into the soil, where it will work it's way into the ground water or ocean.

16. **Stern Bearing:** When you haul your boat out before leaving, check the stern bearing for excessive play and replace if necessary. Carry a spare stern bearing. After relaunching, check for engine alignment.

17. **Stuffing Box:** If you have a traditional-style packing gland, buy an extra 18" of extra packing material of the right diameter. If your stuffing box uses neoprene seals, plan on replacing one set per year.

18. **Fuses:** Even if your house circuits have circuit breakers, your engine may have a replaceable fuse and holder mounted on or near the engine or near the wiring harness. Carry a spare.

BOAT PREPARATION AND SPARE PARTS LIST

1. **Leadline and Emergency Tiller**

2. **Ship's Log:** We use about six stenographer's notebooks per year as logbooks.

3. **Wooden Taper Plugs:** One tied to each thru-hull fitting on the inside.

4. **Caulking Material:** Clear silicone sealant for ports and hatches, in 3 oz. tube and BoatLife Life-Calk in 3 oz. tubes and one 10 oz. cartridge for deck leaks, underwater sealing and emergency hull repairs. Caulking gun for cartridge.

5. **Drinking Water Hose:** Two or three 50' non-garden drinking-water safe hoses and a Systems IV Water Filter with garden hose connectors-filters as you fill tank

3. **Manual and Electric Bilge or Water Pumps:** Allow one rebuild kit per pump.

4. **Manual Galley Foot or Hand Pumps:** Allow one rebuild kit per pump, plus one complete spare pump. Should go 2 to 3 years without rebuilding or repairs.

5. **Galley Sink Spouts:** Replace Whale brand aluminum telescoping swing spout with Fynspray chrome-brass sink spout ($17.95) which won't corrode or leak.

6. **Pressure Water System:** To greatly reduce your water consumption and reduce the chance of pumping your drinking water into the bilge (if a hose or fitting breaks), disconnect your pressure water system and install separate foot pumps in the galley for fresh and salt water. Par Jabsco are the most common and among the least reliable pressure water systems. A more reliable option for showers or deck washdown, Paragon Pumps by Groco are what commercial boats and large yachts use, and are much more dependable and efficient. A pressure storage tank (accumulator) is essential to any fresh water pressure system.

7. **Light Bulbs:** Plan on two bulbs per year for masthead tricolor light; one per year for each running light and one bulb every two years for interior lights.

8. **Kerosene Lamps:** Purchase one spare chimney and wick for each lamp. Kerosene lamps are great for taking the chill off the cabin at sea or anchor.

9. **Spare Batteries:** Alkaline batteries are often unavailable or very expensive once you're cruising in foreign countries, and locally available carbon-zinc batteries usually prove to be very short-lived. We suggest stocking up on all of the Duracell or Eveready alkaline batteries you can before departure, including D, C, AA, AAA sizes plus spares for quartz watches, calculators, clocks and cameras. You may want to try and experiment with rechargeable ni-cad batteries.

10. **Main Compass:** Carry a spare diaphragm, fluid, syringe and light bulb. When refilling, cool the liquid and compass down if possible. This will prevent a bubble from forming in the compass after filling.

11. **Head Rebuild Kit:** Allow one kit for each two years planned cruising.

12. **Kerosene Burners:** Allow one burner or rebuild kit per burner per year, with a minimum of two spare burners on board at all times. The easiest solution is just to replace the burners once a year ($25 ea.) when they start leaking.

13. **Epoxy Barrier Coating for Fiberglass Boats:** Fiberglass boats which have never had a blistering problem often end up with major osmosis problems after spending over one year in tropical waters. To avoid this costly and very messy repair job, apply an epoxy barrier coat to your hull before departure, after the hull has been stripped and had time to dry out sufficiently. The drying out process can take a minimum of two weeks to several months and should be monitored with a moisture meter. Applying epoxy to a partially dried hull only exacerbates the potential problem. West System Epoxy has a good book titled Gelcoat Blister Repair and a video tape that helps detail safe use of their coatings. An in-depth report on accelerated hull drying and blister repair is available for $15 from AISA, Box 11500, Piedmont, CA 94611. I would personally choose either West System or Interlux Interprotect 1000-2000 epoxy barrier coating systems.

14. **Anti-Fouling Paint:** Just before departing on your cruise, haul your boat and scrape, strip or grind your old paint off. Be sure to wear a respirator or at least a face mask while removing the toxic old bottom paint. Put a minimum of three coats of Petit Trinidad 1275 on the hull and an additional two coats along the waterline. This is a high-copper content hard paint that can be sponged off every couple of weeks in the tropics after the first few months, and has lasted us up to 2½ years in the tropics without repainting. Carry enough paint onboard to re-paint so that you won't have to change brands of paint if Petit products are unavailable the next time you haul out.

15. **Varnish:** Everyone has differing opinions on the treatment of exterior and interior wood. The exterior teak used on many sailboats today is kiln-dried, instead of air-dried, and tends to check and crack if left uncoated and unprotected in the tropical sun. In 17 years of cruising in both tropical and cold climates, I've seen and tried a lot of different methods of protecting wood.

Here is my advice based on that experience: Oiling wood, interior or exterior is a mistake if you're headed to the tropics. On the interior oiled wood supports mold, and on the exterior it tends to turn black with mold growing in the wood pores, and requires frequent recoating. Two-part clear LPU finishes are too hard and inflexible for exterior teak; the finish just doesn't expand and contract at the same rate as the wood and is extremely difficult to touch up.

So, the answer for interior wood is simple and relatively inexpensive: Flecto Varathane #91 Clear Satin Plastic Finish. Varathane goes on easily over wood that was previously oiled and is very durable.

The best solution we've found for exterior teak is to strip it to bare wood with sanders, scrapers, heat or chemical stripper and coat with six coats of Behr Super Spar Clear Gloss Varnish, or Interlux Jet Speed (for quick re-coating) followed by Interlux Schooner or Clipper Clear Polyurethane Varnish, or Epifanes Varnish. When we sold Mahina Tiare in Australia, it had been had been three years since we last stripped our teak (by hand at anchor in the Marquesas) and it still looks great! Every three months we do a light sanding with 280 grit sandpaper followed by one or two coats of varnish. This entire process tooks six hours on our 31' boat, and eight hours on our 42' ketch with both of us working together. We also touch up any bare spots as soon as possible, using a rubber cement jar and applicator. Cleaned the jar with rubber cement thinner and then filled it with varnish.

When choosing a boat for long distance cruising, remember that the amount of exterior teak trim dictates the amount of time you'll spend stopping leaks and sanding and varnishing.

OPTIONAL EQUIPMENT COSTS TOTAL

The equipment listed here will make a long-distance cruise more comfortable, and in some cases, safer, more convenient, and more fun. I've listed these in the priority order that I personally would choose for my own boat, if I had an unlimited budget. We don't have, and aren't able to afford all of these optional equipment items. Your personal tastes, cruising grounds and budget will dictate what optional gear you choose when outfitting. You certainly don't need any of this gear to cruise successfully. Discount prices listed here are from either West Marine or Boat US catalogs, or sources listed in the Optional Equipment section.

1.	Radar (Apelco LDR9910, Furuno 1720, Raytheon R10X, R20X).....	1295 to 2479
2.	Global Positioning System (Interphase, Magellan, Trimble).....	1399 to 2999
3.	Single Side Band Radio and Tuner (ICOM M-600, M-800 & AT-120).	3400 to 4224
4.	Ham Radio Transceiver with Tuner (ICOM 735 & AT 120).....	1524 to 1524
5.	Handheld VHF (West Marine Alpha or ICOM M-7 or M-11).....	179 to 389
6.	Autopilot (Autohelm 2000 to 7000).....	679 to 3995
7.	Fuel Filter (WMP Funnel-Filter or Downwind's Baja Filter).....	13 to 70
8.	High Output Marine Alternator (Balmar 100 or 140 amp).....	449 to 595
9.	Outboard Motor (Johnson or Evinrude 4, 8, or 15 hp).....	788 to 1693
10.	Solar Panel (Siemens M-5 to M-65).....	109 to 459
11.	Electric Cabin Fan (Hella Jet or Hella Turbo Fan).....	24 to 59
12.	12 Volt Vacuum Cleaner (Powerwinch or Bl&Dkr Dustbuster Plus)..	27 to 49
13.	Watermaker (Recovery Systems, Standard, Village).....	1669 to 7590
14.	Refrigeration (Adler Barbour Super Coldmachine to Sea Frost)...	1095 to 1776+
15.	Sewing Machine (Pfaff 130 or Sailrite's Brother Conversion)...	650 to 1645
16.	SCUBA Gear.....	400 to 1000
17.	Weather Facsimile (Alden Faxmate, TRIV, Furuno 208A, Raytheon).	795 to 3695
18.	Inverter (Statpower 250 Watt to Heart 2800 Watt).....	169 to 1495
19.	Trolling Generator (Redwing or Ferris).....	595 to 639
20.	Word Processor or Computer (Smith Corona PWP or Zenith S.S.).	595 to 3000
21.	Video Camcorder (Sony 8mm to Underwater Model).....	795 to 1695
22.	Folding Bicycle (Da Hon Painted Steel 1 speed to 6 speed).....	199 to 349
23.	Roller Furling (ProFurl, Schaffer or Reckmann).....	1680 to 4490
24.	Underwater Camera (Minolta Weathermatic to Nikonos V).....	289 to 539
25.	Television and Video Cassette Player.....	500 to 750
Totals	**.....**	**$20,142 $47,198**

Underlined items are found in Navigational Equipment List

OUTFITTING FOR OFFSHORE CRUISING:
OPTIONAL EQUIPMENT

The following gear is not necessary for offshore cruising and should only be purchased after you have priority gear installed and have set aside money for provisioning and cruising. List prices are followed by average discount prices.

1. **Single Sideband Radio**
   Most Reliable: ICOM M-600 ($1899/1599), M-700 ($2325/1649), M-800 ($3149)
   AT-120 Auto Tuner ($1075/625)

For cruisers not able to get a ham license, or needing to be able to place business calls, marine SSB is an excellent option, allowing you to place phone calls through the a high seas operator. Calls to the U.S, Canada and Mexico cost $4.98 per minute. To set up an account with the A.T.&T. High Seas Operator, call 1-800-SEA-CALL. To receive a time and frequency schedule, call the nearest A.T.&T. Coast Station collect: KMI-San Francisco: 415-669-1055; WOM-Ft. Lauderdale: 305-587-0910, WOO-New Jersey: 609-597-2201. There are now several informal nets throughout the world utilizing SSB frequencies. Unlike ham radios, marine SSB radios are built for marine use, and allow you to legally order parts, check on bills and bank balances. The new ICOM M-600 SSB has a switch on the dial that allows it to operate on amateur frequencies.

2. **Ham Radio**
   Most Reliable: ICOM 735 ($1099 list, often disc. to $899)
   ICOM AT-120 Antenna Tuner ($1075/625)
   Least Expensive: Used Atlas 310 or 315 ($400 aprox.) with Hustler Ant.($70)

Ham radio is high on the list of optional equipment, both from a safety and informational and safety standpoint. It is great for getting medical information and advice quickly and reliably (through the maritime nets) and opens up a wealth of weather and practical information about entry, customs, anchorages and provisioning. The only drawback is the licensing procedure which requires you to receive 13 words per minute Morse Code and pass a multiple choice electronics theory test. Most people spend about three months preparing to pass the general exam, which can now be given by other cruisers who are hams, even outside the U.S. Gordon West Radio School (24514 College Dr., Costa Mesa, CA 92626, 714-549-5000) offers an intensive weekend seminar where most people actually pass their novice test by Sunday night. He also has excellent cassette courses available at any amateur radio store. If you aren't able to pass the test before you leave, take the tapes with you, and you'll be able to find cruising hams who can administer the test to you. A very few people on yachts operate without a legal license, but this is severely frowned upon by serious hams and can lead to trouble; plus, you won't be able to check into any of the maritime nets since the guardians of the airwaves running the nets have computers to check out any new call signs quickly. In an emergency, however, you are allowed to transmit on any frequency. The most commonly used bands for maritime mobile cruising boats are 20, 40 and 15.
The ICOM 735 is the most common and dependable radio on cruising boats, according to the SSCA survey, and ours performed flawlessly for 3½ years. By clipping diodes 33 & 34 on the inside of the radio, it can be used to transmit on marine single side band frequencies in emergencies. The AT-120 antenna tuner is simple and easy to operate and eliminates the possibility of damaging the radio because the antenna wasn't properly tuned before transmitting. Figure 1

in the "Cruising With Ham Radio" article details installation. Figure 1-B shows a less expensive option, the manual antenna tuner, and Figure 2 gives the least expensive option, the Hustler vertical whip, from which I had good service for many years. The grounding system detailed in Figure 4 is critical to the success of any ham or single sideband installation. Many of the engineers at ICOM have ham radios installed on their own boats and have written an excellent booklet on marine installations.

3. **Handheld VHF Radio**
   Most Reliable: ICOM M-11 ($659/389), ICOM M-7 ($549/299)
   Most Economical: West Marine Alpha ($179)

Our eight-year old ICOM M-2 has been dropped, rained on and sprayed with water; but still works well. We've found it invaluable for keeping in touch with each other and the islanders in the difficult anchorages of Pitcairn and Easter Island. We often use it if one of us goes to town and the other stays on the boat. In some countries (including the U.S.) it isn't legal to transmit from shore with a marine VHF radio, so you will want to use discretion when transmitting.

Before each ocean passage, I pack the radio in a waterproof pouch inside our abandon ship bag, along with an optional battery pack filled with alkaline AA batteries (CM12-G battery pack for M-11, BP-80 for M-7 radio). ACR now builds a SOLAS waterproof survival VHF ($722/399) with 5 yr. sealed lithium battery, ideal for packing inside a liferaft, but not as versatile as the ICOMs.

Most of the sailors who have survived the sinking of their yachts report having several ships pass their liferaft before they are finally picked up. Most ships monitor VHF Channel 16 at sea, and the ability to call passing ships that you see, instead of counting on them seeing your flares, would give you a much better chance of rescue.

4. **Autopilot**
   Most Reliable: Autohelm 2000 ($949/679) 3000 ($999/699), 7000 ($5200/3995)

An autopilot isn't necessary for long-distance cruising, but it sure makes motoring or sailing in winds too light for a windvane more enjoyable. I cruised ten years without an autopilot, but after cruising the last eight years with autopilots, I'm hooked, and wouldn't chose to cruise without an autopilot again. An autopilot can also be considered a back-up, but not a replacement for a windvane on long passages. Remember that all autopilots consume more electricity than advertised and will break down sooner or later, so if you must rely solely on an autopilot for steering, carry a complete back-up system. If your cruise is limited to coastal cruising with ocean passages of less than three days, an autopilot would probably prove more useful, but for long ocean passages, the freedom from worry of breakdowns and electrical drain makes the windvane a clear choice in my mind. For different viewpoint, and a strong argument for WH autopilots, read pages 16-27 in Steve and Linda Dashew's Offshore Cruising Encyclopedia.

Our new boat came with an Autohelm 5000, (forerunner to the present and improved 6000 & 7000) which has broken down in mid-ocean twice so far. The biggest problem with the smaller Autohelms is carboning up of the electric motors, so you after talking with their factory repair technicians, you may choose to carry a spare motor and/or brushes.

5. **Fuel Filter**
   Most Thorough: Downwind Marine's Baja Filter ($54.50+$16 water separator)
   Next Best: Fuel Funnel Filter from West Marine ($14.95/13.50)

Filter out water and dirt before bad fuel contaminates your tank.

6. **High-Output Marine Alternator**
   Most Dependable: Balmar ARS 100 amp ($599/449) 150 amp ($799/595)

We have cut the amount of time we need to run the engine to charge batteries by 60% The reasons we chose the Balmar alternator are: lifetime warranty, external, adjustable multi-step voltage regulator at no extra charge, anodized and baked powder coating for corrosion resistance, and top reputation for dependability. The external regulator (vs. the standard piggybacked regulator attached to the alternator) is vitally important for any alternator installed on a boat where air circulation and cooling is not as good in a vehicle. We manually adjust the voltage down if we are doing a lot of motoring in areas like Alaska, and tweak it up for maximum fast charging on ocean passages when we are only running the engine to charge batteries. The Balmar D.C. 2000 Monitor allows us to monitor the temperature, voltage and percent of charge.

If you choose to have GPS, refrigeration, ham or SSB radio, radar, or an inverter on board, a high-output alternator is essential. Coupled with a powerful 110 volt inverter and substantial gel battery storage capacity, you will be able to eliminate the the noise, weight and expense of a separate 110 volt generator. It's essential to check the capacity of your batteries and cables before installation, since attempting to force to much electricity into too small cables or batteries results in melt down! An interesting option for generating a lot of power and running a refrigeration compressor and watermaker all at the same time is the Balmar Aqua-Pac, which utilizes a 4.2 hp Yanmar diesel engine and weighs about 100 lbs.

7. **Outboard Motors**
   Most Reliable and easiest to find parts worldwide for: Johnson, Evinrude
   Costs: 4 hp ($1051/788), 8 hp ($1640/1230), 15 hp ($2257/1693)

Depending on your budget and type of tender, you may decide to buy an outboard motor. Although they certainly aren't necessary for cruising, they greatly expand your exploring range, both for snorkeling and for landing on isolated beaches while leaving your yacht anchored in a safer location. They are essential for safety if you have a sailboard on board. We have used our Avon 3.10 Sportboat with 7.5 hp Johnson to set storm anchors for friends whose boats were dragging toward coral reefs in 50 knots of sustained wind. In six years of heavy service, our motor has been to the shop only twice for minor problems. The smallest practical motor that I'd recommend is a 4 hp Johnson/Evinrude, which will push an Avon Redcrest (must have floorboards) along at 5 knots. Japanese outboards have become very reliable, but the parts availability worldwide is their drawback. Some tips for safe and easy outboard operation:

1. Remove the motor from the tender if you're towing it more than 2 miles.
2. Disconnect the fuel line and tilt the engine so that the lower unit is clear of the water after each day's use.
3. Grease all fittings with a grease gun every six months.
4. Sew an acrylic cover and rinse inside and outside whenever possible.
5. Replace the original-equipment steel fuel tank with a plastic Tempo tank.

6. Never store gas below decks. We stow our Tempo tank on the stern pulpit and either use up or give away the last of our gas before an ocean passage.
7. Use a safety line to prevent accidental dunkings.
8. Install one of Forespar's new outboard lifting systems to save your back when trying to get motor from dinghy to stern pulpit, or use a halyard.

8. **Solar Panels**
   Most Reliable: Siemens M-65, 42 watt ($550/459), M-5 watt ($185/109)

We are completely sold on solar power and often go for over a week at anchor relying solely on one panel to run our cabin lights, radio, 12 volt fan, vacuum and sewing machine. Since we've added an inverter, word processor, camcorder and t.v., we've had to run the main engine to charge batteries some times, so it's time for us to think about adding a second panel! We have a small Arco (Siemens) M-5 panel which we leave hooked directly to our batteries when we leave our boat unattended. I prefer this to leaving a battery charger plugged in, since there's less chance of overcharging or shorting our with the 5 watt panel. For larger, multi-panel systems, the Sunselector Charge Controller ($74/64 at West Marine) will prevent overcharging.

The flexible Sovonics panels were an excellent idea, but tended to get waterlogged and short out if they got wet repeatedly. Sovonics is no longer in business. It will be interesting to see if the United Solar panels available from West Marine (11 watts - $209, 22 watts - $359) will prove more reliable. United Solar guarantees the wattage to meet stated value for three years. Flexible solar panels are great for installations on dodgers and sun awnings or laying on the deck. The biggest advantage is that they can be stowed under a settee cushion when not in use. The disadvantage is that they cost more per amp output and put out less power for the same size, compared with the Siemens.

9. **Electric Cabin Fan**
   Most Reliable: Hella Turbo ($83/59), Hella Jet Swingaway ($33/24)

You may choose to have two 12 volt fans onboard if you're headed for tropical cruising; one mounted in the galley and a second fan mounted on a 6"x9" plywood base that can be moved around with you. I use ours the latter way when sewing, working on the engine or navigating. We also have a small Hella Rotor fan above our bulkhead-mounted kerosene heater which really improves heat distribution.

10. **12 Volt Vacuum**
    Most Reliable: Several including Black and Decker Dustbuster Plus 12 Volt

We've found it much easier to keep the boat clean with a portable vacuum aboard.

11. **Watermakers**
    Best Value: **Power Survivior** 35 ($1850/1669), Survivor 80 ($2995/2795)
    Least Expensive: Recovery Engineering Survivor 06 ($550/499)

Most watermakers require 110 volt power, so can only efficiently be used while you're running a generator. The Power Power Survivor 35 uses 4 amps of 12 volt power to make 1.4 gallons of fresh water per hour. The design has been upgraded and improved and cruisers using it in Mexico and the Caribbean where water is at times contaminated and/or difficult to obtain report excellent results. Many cruisers we've spoken with are meeting all of their water needs by using two

solar panels to operate the Survivor 35 for a few hours each day. We hope to install the new Power Survivor 80 (2.8 g.p.h., 8 amp draw) before returning to the South Pacific. After 800 hours of operation the Power Survivors need to be re-built ($129 kit). The Survivior 06 is designed for liferaft survival use and converts 2 pints of sea water to fresh water in one hour.

12. **Refrigeration**

Best Compromise: Adler Barbour Super Coldmachine 10 ($1295/1095), Isotherm 5000 ($1600), Sea Frost ($1776+)

Refrigeration is generally the most expensive and least dependable piece of equipment to maintain on an extended cruise. Qualified refrigeration repair people are expensive and difficult to find, even in the U.S., and nearly impossible in many countries. If you want to be able to depend on refrigeration, it's necessary to have the gauges, tools and spare freon and drier to recharge the system yourself. Proper installation, small box size, 6" to 8" of insulation and good ventilation for the compressor will increase the efficiency and reduce the number of problems. The most efficient (and expensive, up to $6000) systems utilize a compressor that is belt-driven off the engine. The tremendous drawback to these systems is that in tropical waters you are tied to running the main engine 2 to 3 hours every day. I find the noise and engine heat objectionable, so I would instead recommend a 12 volt system like the ones listed above, with substantial battery storage capacity and a high output alternator. This gives the options of running the system off electricity generated from your high-output alternator, solar panels, trolling generator, or when in a marina, or battery charger. This eliminates the need for a separate 110 volt motor to power the system when dockside. When we are running the engine (and generating lots of amperage) we turn the refrigeration system up to the max, allowing us to run it only once every day or two. Our new boat came with an expensive Grunert separate freezer and refrigeration system which has proven fairly reliable, but very power-hungry. We find that filling any empty spaces in the freezer with ice blocks made from Tupperware containers filled with water lessens the compressor running time once the box is no longer filled to the top with food.

Sea Frost (Rt. 4, Barrington, NH 03825, 800-435-6708) has an excellent reputation for engine-driven and 12 volt systems. Scan Marine's (2144 Westlake Ave. N., Suite D, Seattle, WA 98109, 206-285-3675) 12 volt Isotherm 5000 has received rave reviews from cruisers we've met.

13. **Sewing Machine**

Most Reliable: Pfaff 130 ($650 used, rare) Sailrite Kits Brother ($1645)

I actually think that a sewing machine capable of repairing sails should be on the priority list since it can pay for itself quickly, allowing you to make repairs at sea and sew additional canvas covers for your boat as you cruise. The Pfaff 130's were last built over 20 years ago in Germany and are in high demand as a commercial machine throughout the world, so they now sell for more than six times their original price. I have used mine in a commercial canvas shop and on Mahina Tiare for over 11 years without the machine ever once going out of time or breaking down. After each use I carefully oil and clean the machine, and it is still rust-free. To locate a Pfaff 130, contact Clayton Klinger at Sewing Machine Service, Box 333, Renton WA 98057, 206-255-8673 and tell him that you'd like a machine set up like ours with a handcrank, new motor,

and plastic case. Sailrite Kits (800-348-2769) modifies a Brother industrial machine which is excellent.

14. **Scuba Gear**
Most Reliable: U.S. Divers, Dacor, others
Cost: $400 for used tank, backpack and regulator to $1000+ for new outfit

A small aluminum 50 cubic foot tank with simple single-hose regulator can be very useful for freeing anchors stuck in coral or making underwater repairs. A buoyancy compensator vest is a nice option, making untangling chain and anchors easier. A compressor is heavy, bulky, and expensive. We've always been able to get our tank filled at a hotel or on a larger yacht. We personally prefer snorkeling to scuba diving for recreation, but having the tank has meant we didn't have to cut away our main chain and anchor when it has been badly fouled in deep water. Don't attempt scuba diving unless you've completed a course.

15. **Power Inverters**
Most Reliable: Heart Freedom 1000 watt ($850/695) to 2800 watt ($2090/1495)
Lower Output: Statpower 250 watt ($199/169), Prowatt 800 ($499/399)

An inverter allows you to run 110 volt appliances, including power tools, computers, microwave ovens, TV-VCRs without having to listen to a generator. We have used the small 14 ounce Statpower to power our word processor and camcorder, and our 2700 watt Balmar/Trace to run our freezer, toaster, hair drier and even an electric heater on 750 watt setting when under power in Alaska. The latest Hearts have built-in battery chargers, an excellent feature.

16. **Trolling Generators**
Most Reliable: Redwing Trolling ($595), Wind ($595), Combination ($895)

A trolling generator means that when you're sailing at 5½ knots you'll be generating enough electricity to run lights, ham radio, sat nav and possibly refrigeration, though not all at the same time. Wind generators require more attention and can't be left unattended. Source for the Redwing: Downwind Marine, 2819 Canon, San Diego, CA 92106, 619-224-2733. Additional source: Hamilton Ferris, Box 126, Ashland, MA 01721, 508-881-4602.

17. **Word Processor or Computer**
Most Reliable: the verdict is still out on this one!
Some Options: Smith Corona PWP 7000LT or PWP 80 ($695), Zenith Super Sport

We've met several cruisers using computers to decipher morse code or facsimile weather broadcasts and maps, to entertain their children with and to make writing newsletters easier. Contact SSC, 615 S. El Camino Real, San Clemente, CA 92672, 714-498-5784 for software and suggestions on best P.C. for boat use.

After some research, we chose the Smith Corona PWP 7000 which has a built-in disk drive and comes with a separate printer. This works only as a word processor and can't print weather charts. The unit requires 110 volts to recharge or run the printer, for which we use the small Statpower inverter. We store the word processor and printer it in a large zippered plastic chart bag, and have had no corrosion problems after three years on board.

18. **Video Camcorder**

Easiest to Get Repaired Worldwide: Sony

We've met several boats that were using camcorders instead of 35mm cameras to document their cruises and send to family and friends back home. I think the 8mm or Hi-8 format camcorder works the best on boats since it is physically much smaller and lighter than VHS models, and yet still gives you 2 hours per tape. We've recorded several movies by plugging our Sony 8mm Camcorder into V.C. players on other boats. To watch the movies, we just plug our camcorder into our 12 volt television and operate both from the Statpower inverter.

19. **Folding Bicycles**
    Most Practical: Da Hon Painted 6-Speed ($399/349), Economy 1-Speed ($199)

Folding bikes mean that you can explore easier and further on land. They work well for carrying groceries, fuel, or water. In many places that we've cruised, the markets, gas stations, and sometimes even the places to fill water jugs may be miles from the anchorage, and bikes make transportation quick and easy. The easiest way we've found to carry fuel and water is to tie the handles of two 5 gallon jugs about one foot apart, drape the line over the seat, then just push the bike along. Cargo racks will further increase your carrying capacity. Each time before stowing our bikes in their bags, we spray them with WD 40 and wipe them down with a rag. Even folding bikes are bulky and heavy (32 lbs), so unless you have extra space and can handle the weight, you may skip them.

20. **Underwater Camera**
    Most Reliable: Nikonos I to V ($250 used I, $539 new Nikonos V)
    Less Expensive Options: Minolta Weathermatic 35 ($363/289)
    Sea & Sea Motormarine I ($259), MMII ($399)
    EWA Underwater Camera Bags (from $29)

Any underwater camera is great for action sailing shots when there is a lot of spray in the air. For high quality underwater shots, a flash is necessary. We recently bought a EWA Bag for a simple point-and-shoot 35mm camera. Optical Advantage (1-800-426-4221 or 301-653-3306) sells EWA Underwater Housings at discounted prices for nearly all models of 35mm and video cameras. Their prices start at $29 for simple housing. Helix (310 S. Racine, Chicago, IL 60607, 800-33-HELIX) has the world's largest underwater camera and video inventory and sells at discounted prices.

We keep our regular 35mm cameras and lenses in double zip-loc bags with silica gel. Pre-paid Kodak Processing Mailers are the most dependable route to go for developing. Least expensive source for film and mailers: 47th Street Photo, 36 East 19th St., NY, NY 10003. 800-221-7774, fax 212-982-0684.

21. **Television and Video Cassette Players**
    Most Reliable and Best Value: Audiovox 12 Volt Player ($349/249)
    10" AC/DC Color Television/Monitor
    Emerson TV-VCP combination

Obviously none of this equipment is essential to cruising, but it can be a lot of fun to invite friends over for dinner and a movie in an isolated anchorage! Multi-system televisions and video players which work outside of North America are available from 47th Street Photo (see above for address).

PRIORITY NAVIGATIONAL EQUIPMENT LIST

COASTWISE NAVIGATION

1. **Main Compass**
   Most Reliable: Ritchie, Danforth
   Cost: $139 to $482

The main compass should be swung by a compass adjuster before undertaking a major cruise. If your compass is over 8 years old, take it to an instrument shop to be overhauled and fitted with a new diaphragm. If your compass is less than 8 years old, carry a spare diaphragm since the rubber/neoprene will eventually rot in the tropics. If cruising in high latitudes, your compass may need a compensation weight on the card to keep it level. If in doubt about what brand or model to buy, talk with the people that adjust and repair compasses professionally.

2. **Hand Bearing Compass**
   Most Reliable: Silva ($99/$74)
   Least Expensive that works: Davis ($38/$29)
   Most Innovative: KVH Datascope ($445/369)

A hand bearing compass is necessary for taking bearings on identifiable points of land or lights. Check for stability in the card by holding the compass at arm's length, rotating quickly 180 and back. The card should not continue to swing back and forth when you return to the original position. The Silva comes with two excellent universal mounting brackets enabling you to use it as a secondary interior bulkhead, telltale compass, or emergency replacement for the main compass. The fluxgate KVH combines a 5 power monocular, compass, range finder in one unit.

3. **Binoculars**
   Best Buy: Swift-Focus Armored 7 x 50 ($138/$90)
   Absolute Best (according to Practical Sailor): Fujinon Polaris ($869/545)

Binoculars are a very important part of navigational equipment to be used in low-light conditions and for identifying buoys, landmarks and lights. 7 x 50 is the best power for use on sailboats. The rubber armored models are less likely to get out of alignment from bumps and drops, but still need gentle treatment.

4. **Dividers, Parallel Rules, Pencils, Plotting Sheets**

Necessary for dead reckoning and celestial navigation.

5. **Barometer**
   Most Reliable: Chelsea, Weems and Plath, Seth Thomas, WEMPE
   Cost: $68 to 269

A barometer is necessary to give warning of impending storms and weather changes. It is important to calibrate your barometer every six months after obtaining local pressure by calling or visiting an airport or port weather office.

Priority Navigation Equipment

Offshore Navigation

1. **Chronometer**
   Most Reliable: Chelsea, Weems & Plath, Seth Thomas, Casio, Timex
   Cost: $30 to $300

Several accurate timepieces are essential for celestial navigation. Wind-up type chronometers tend to be less accurate than battery-powered quartz timepieces. I keep an inexpensive quartz watch set on GMT and stowed inside my sextant case and only wear it when I'm taking a sight. All timepieces need to be checked against broadcast time signals every 3 days at sea and rate of change entered in your Ship's Log. A small luxury is to have two matching chronometers mounted on the main bulkhead, one showing local time, the other showing GMT.

2. **Primary Sextant**
   Best Buy: Astra IIIB ($449), Frieberger Yacht ($490), Frieberger Drum ($690)
   More Expensive: Tamaya ($960-1433), Cassens & Plath ($1240), C. Plath ($1750)

Your primary sextant must be metal. Plastic sextants are useable for back-ups, but are not safe for primary use. The problems are eye damage (cheap plastic instead of glass filters) and instability of the plastic in warm climates. If possible, take a spare set of mirrors. Your sextant must be kept dry and free of salt. To prevent corrosion, wipe salt spray off with a damp cloth, occasionally wipe frame with WD 40 and place a drop of oil on each adjustment nut every 2 months. There are four separate adjustment operations which should be carried out monthly when you're using the sextant, listed in Bowditch Vol. 1, pages 405-411.
A secondary sextant can be skipped if you have GPS or satnav. If you don't, the least expensive Davis Mk 3 ($25) will work in an emergency.

3. **Nautical Almanac, Navigation Tables, Light Lists, Tide and Current Tables, Sailing Directions, U.S. Chart #1, Rules of the Road**

These should be purchased before you leave the U.S. or Canada. Nautical Almanac, Tide and Current Tables must be replaced annually, so make shipping arrangements.

Optional Navigation Equipment

1. **Radar**
   Best Available: Raytheon R-20X ($2995/2479), Furuno 1730 ($2995)
   Best Buy (according to Practical Sailor): Raytheon R-10X ($2295/1879)
   Least Expensive: Apelco LDR 9910 ($2200/1295)

For both collision avoidance and navigation, radar is an excellent tool. The low-cost, low-power draw Apelco has received good recommendations from the long distance cruisers we've met using it. We have had excellent service from our Raytheon R-20X; we've spotted ships at 20 miles, land at 22 miles, and rain squalls in time to change course and let them pass to leeward of us.
Tropical climates are especially hard on radars; operating them for several hours at least weekly will dry them out and extend their life. The Oct. 1, 1991 issue of Practical Sailor (203-661-6111) has an excellent review of low-cost radar units.

2. **Global Positioning System (GPS)**
   Most Reliable: Trimble, Interphase, Magellan, Furuno, Magnavox
   Best Buy: Interphase StarPilot ($2195/1399)

Now that GPS is operational 24 hours per day, it is truly the navigation system of the future. Every month or two we are seeing new units for the marine market, and prices continue to drop! Don't wait until one month before departure to purchase a GPS, better to buy and install it at least six months before departure, and leave it on continuously, to see if any problems are going to arise. Portable GPS receivers provide much better service on sailboats if hooked up to an optional external antenna and 12 volt power supply. The June 1, 1991 issue of Practical Sailor has a limited review of GPS receivers. It is important to remember that few of the charts available are anywhere nearly as accurate as GPS, so be careful!

3. **Transit Satellite Navigation System (Satnav)**

Satnav is a less attractive electronic navigation system since GPS came down in price and reached 24 hr. coverage, but it should be operational until at least 1994. For best accuracy and dependability, satnav or GPS should be left on 24 hours per day at sea (and ideally in port, as well). Budget 10 to 24 amps draw per day. Remember that modern navigation systems are <u>far</u> more accurate than charts, and may break down.

4. **Loran**
   Most Reliable: Micrologic, Trimble, Furuno, Raytheon
   Best Buy (according to Practical Sailor): West Marine's Vector ($239)

For coastwise cruising up to 300-400 miles offshore on either the U.S. West or East coast or in Europe, Loran presents an inexpensive navigation system. Remember that land mass may effect accuracy or block signals completely at times, and that Loran is not dependable south of Ensenada, Mexico or north of Prince Rupert, Canada. The Loran station in Hawaii was permanently shut down in 1992.

5. **Weather Facsimile Receiver/Recorder (Weatherfax)**
   Most Reliable: Alden TR-IV ($3895), Furuno 208A ($1995/1795)
   Best Buy: Alden Faxmate ($995/799), and Seafax 4000 ($595/535)

Weatherfax, although by no means on our Priority Equipment list is certainly a valuable tool for storm avoidance and passage planning. The Seafax model needs to receive input from a Ham or SSB radio, and utilizes a separate small battery-operated computer printer. The Furuno 208-A is the least expensive and most widely used model weatherfax that includes a built-in radio receiver and fully automatic operation, and has an excellent reputation. Bring twice as many rolls of paper as you think you'll need!

CLOTHING

It's hard to generalize about clothing because cruising grounds, changes in climate and lifestyle will dictate the clothes you bring. Your wardrobe will have to be flexible to accommodate standing watch as well as forays into fancy cities.

Cold Weather or Foul Weather Cruising

Proper clothing reduces fatigue, which means fewer accidents and mistakes on the water, so wearing suitable boating attire becomes not just an issue of comfort but one of safety as well.

Below are four clothing categories listed according to their primary functions. Using a layering system of clothing allows for comfort in a variety of sailing conditions from warm and dry to wet and cold.

1. The underwear layer maintains a comfortable climate next to the skin. While it provides some insulation, its main purpose is to control moisture on the skin which can cause chilling. If you don't perspire much, which will most likely be the case on a cruising boat, snug fitting cotton, wool, silk or synthetic fiber will work well as an underwear layer. If you are very active and perspire a lot (raising anchor, or changing sails, rowing the dinghy or racing) a less absorbent fiber such as polypropylene or capilene will keep your skin drier by wicking moisture away.

Warmth is Provided by the Middle Layers, Clothing and Insulation

2. The clothing layer absorbs moisture and provides some insulation. Wool or cotton turtlenecks and pants will absorb moisture from the underwear layer and help it evaporate, meanwhile providing some insulation.

3. The insulation layer provides additional warmth. Remember that when sailing in cold conditions you need to cover all extremities, so be sure to insulate your head, hands, and feet, as well as the rest of your body. We've found the Patagonia Synchilla hats, gloves and poly/wool socks to be the best, and a lot less itchy than pure wool.

   Although goose down is an excellent and lightweight insulator, it is useless when wet and molds easily, so it isn't practical on boats. Synthetics retain more loft and insulation, while absorbing less water than their natural counterparts: wool, cotton or down.

   Patagonia's Synchilla and Capilene, West Marine's fleece and pile, and REI's Thinsulate and Quallofill vests, parkas and jackets are all excellent synthetic insulators for wet environments.

4. The shell layer/foulweather gear protects against wind, rain, spray, snow and sun. There are two directions you can go for your shell or foul weather layer; breathable and semi-waterproof, or non-breathable and completely waterproof. The concept with breathable fabric (Goretex, Entrant) is that it allows your sweat to pass through the fabric as water vapor, but keeps water out.

   We keep REI parka's on board (mine is Goretex, Barbara's is 60-40 cloth) which we have sprayed with Scotchguard, and use these as wind breakers. They are more comfortable than foulweather gear, but don't take the place of foulies, because they are not completely waterproof.

Henri-Lloyd, Patagonia, Line 7, West Marine and REI all make state-of-the-art foulweather gear. Totally waterproof fabrics are nylon cloth with neoprene (or PVC in the case of Line 7) callendered onto it. The most comfortable designs are lined and have vents for body heat and moisture to escape, so they don't turn into portable steam baths. Many jackets combine insulation layer with shell layer functions. Depending on the climate you can add or subtract layers under your shell or foulweather gear for versatility.

When trying on foulweather gear, try it on with different combinations of clothing underneath, ie., a light shirt which you would wear under it in the Summer or tropics and a turtle neck and heavy sweater which you would wear underneath in colder climates. Once you have the heavy clothes underneath, make sure the gear doesn't restrict your movement unduly, or bind across the shoulders.

We've personally chosen a mixture of foulweather gear, since our cruising ranges from the high latitudes of Alaska and New Zealand to the tropics. We each have Line 7 PVC smocks which are super in the tropics because they allow lots of air circulation and keep our shorts dry without resorting to foulweather pants. For colder climates, John has a Henri-Lloyd Ocean Racer II Floater coat with built in harness and matching pants and Barbara has a one-piece Henri-Lloyd Foremost jumpsuit. Henri-Lloyd is the most expensive gear, but our experience has shown that the quality and longevity justify the price. We also have Mustang U-Vic Thermafloat coats which we use only in the Northwest. If the higher cost of Henri-Lloyd puts you off, try West Marine's Explorer line - good fabric and some great design features, at nearly half the price.

Tropical Cruising

* It's hot! When passagemaking you'll probably wear as few clothes as your modesty dictates. Remember: water and white sand beaches reflect up to 60% of the ultraviolet rays that hit them, so even if you're out of the direct sunlight, ie., under a dodger or in the shade of a sail, you can get severely burned by reflected sun.

* Wear sunscreen on exposed skin and lips and baggy cover-ups and a hat. It is possible to get really burned when snorkeling in the water, so we usually wear tee-shirts if we're going to be snorkeling for any length of time.

* The best sunscreen we've found is Aloe Up. It is waterproof for up to 80 minutes in the water, non-greasy and non-staining and is available in S.P.F. levels of 4 to 25 at Long's Drugs and WMP. Aloe Up also makes a good #15 lipscreen called Lip Ice.

* Loose fitting absorbent shirts, shifts and shorts allow air to flow freely next to the skin, cooling and drying as perspiration is absorbed by the material. Cotton or silk fabrics work best.

* Consider your passage making clothes sacrificial, because they'll get faded, torn and stained. Consider using oversize cotton long-sleeved shirts and old pajama bottoms or surgical scrub pants as cover ups.

* Loose cotton underpants or running shorts with a breathable liner are preferable to synthetic underpants or bathing suit bottoms for extended periods of wear. Synthetics trap moisture against the skin causing sailor's rash or baboon bottom and vaginal infection in women.

In-Port

* What you step ashore in at Nice on the Cote D'Azur will definately differ from what you'll wear in Wrangell, Alaska. Having a couple of nice dresses, skirts or suits suited to the climate you'll be visiting will come in handy.

* For men, slacks, a blazer and tie are a requirement for visiting formal British-style yacht clubs. John doesn't carry a blazer or a tie, finding more casual clubs less stuffy and more fun. Dress shorts or slacks and a nice sports or tailored shirt are great for clearing customs and conducting business.

* In the warmer climates gauzy dresses of Mexican or Indian fabric without waistbands are cool and don't need to be ironed.

* In dusty or dirty areas such as Mexico and the Middle East tans and khakis make much more sense than white. Pastels are great other places, but no matter where you are in the tropics dark colored clothes will roast you.

* With the exception of Austrialia, Europe, a few French territories and "the bush" women throughout the world dress with much more modesty than Americans. Often only young girls wear shorts or dresses above their knees. Women in these cultures not only cover their legs, but also their arms, and it is rare to see them wearing a sleeveless blouse! Going ashore in bathing suits, halter tops or skimpy clothes, especially in remote villages embarrasses and often insults the local people, even if they are too polite to mention it. Be sensitive, take your cues from the way the locals dress.

* Skimpy or revealing clothes invite hassles from some local men - Latins are famous for this. Only prostitutes wear revealing clothes in their cultures.

Miscellaneous Clothing Hints

* Everyday clothing is generally more costly with less variety available once you leave the U.S. and sailing clothes are usually unavailable or are 2 to 3 times as expensive, so buy what clothes you'll need for your cruise before you leave.

* <u>Really</u> lightweight cotton clothing suitable for the tropics can be found in Hawaii, Southern California, and Florida. Look forward to buying a few colorful pareus if you sail to Tahiti. These are some of the most versatile tropical attire around.

* Nylon wind or sailing pants with drawstring waists and velcro instead of zippers, not only stop the wind, but are cool in the tropics, are mosquito proof, and are warm when worn with insulated underwear in cold climates. Prices range from $20 for Breezin' brand, to $35 for Cantebury NZ to $95 for Patagonia.

* Metal zippers, belt buckles and cheap jewelry will corrode in the salt environment, so store them in zip-loc bags or plastic boxes away from your clothes.

* Cotton tank tops and harem pants are other cruising favorites.

* 12 volt irons do a passable job, but I've only used mine twice in a year. Misting clothes with a sprayer then hanging them for a few minutes will cause most of the wrinkles to fall out.

* Clothes stored in drawers and lockers without louvered or ventilated doors invite mold and are subject to soakings from deck leaks. By carefully folding clean, dry clothes in zip-lock bags, then storing them flat in duffel bags, they will be kept mold free and looking pressed. Check them and air them out every 4-6 months.

* Once every month or so in the tropics, we take all of the clothes out of our hanging locker and hang them under the boom for a few hours on a hot and dry day. This prevents mildew.

* Hanging clothes in net bags in the forepeak (if you don't have any deck leaks) adds more storage space and keeps them ventilated.

* Never stow salty or wet clothes in an unventilated area. Rinse salty clothes and foulweather gear as soon as fresh water is available.

* There are several preparations found in marine stores and chandleries which remove rust stains from various boat surfaces. The milder preparations are also safe for removing rust spots from cotton & silk clothing and will say so on the label.

Shoes and Boots

* In cold and wet climates non-skid deck boots with room for two pairs of socks are essential for sail changes or going ashore looking for oysters. $30-$35.

* Leather boating shoes stored for any time in the tropics will become stiff and moldy because they absorb salt and are hard to dry out. Leather does protect your feet from stubbing and cutting when on deck, so if you have a deck strewn with hazards you may want to keep a pair in a well-ventilated place. If your deck is clear of hazards consider Nike Aqua-Sox. Their non-skid soles and mesh uppers make ultimate sense for warm weather sail changes, and they cost only $25.

* Sperry Topsider canvas deck shoes don't seem to mold, and Harken and Henri-Lloyd make modern deck shoes that have predominately polypropylene and polyester uppers; all of these shoes offer more foot protection than Aqua-Sox.

* Our favorite foot gear for going ashore are heavy duty flip-flops with nylon thong straps, arch supports and molded non-skid soles. The only places we've found them are Hawaii, Florida, & California. Island Slippers, Scott and Rainbow are the brands which incorporate these features and Scott can be ordered from West Marine. Prices range from $13 to $20. We wear ours 95% of the time on shore, even hiking!

* Plastic "reef walkers" are one-piece molded sandals from France, available for $7 a pair in Tahiti or New Zealand or $45 at Bloomingdale's in New York. They are nearly indestructible and used by Tahitian fishermen in the coral shallows looking for lobsters.

HEALTHY LIFERAFT HAS ANNUAL PHYSICAL

Investing in an emergency inflatable life raft is a prudent precaution in case of fire or foundering. BUT with several stipulations.

A self inflating rubber raft is a sophisticated device and like other sophisticates, should not be treated casually or taken for granted. Most off-shore sailors do not favor complicated devices and life rafts unhappily fall into this category because there is no simple way to achieve the following requirements:

- An auxiliary vessel that in an emergency will accommodate the whole crew of a 50 footer.
- Will be even more seaworthy than the parent vessel itself which may be partially destroyed and sinking because of mountainous seas and storm winds.
- Will protect the crew from sun and cold with an automatically erecting canopy and inflatable floor.
- Will contain a minimum amount of supplies to maintain the complement for 3-7 days and visual aids to attract the attention of rescuers.
- Will be mobilized in 25 seconds by pulling a lanyard to trigger the inflation mechanism.

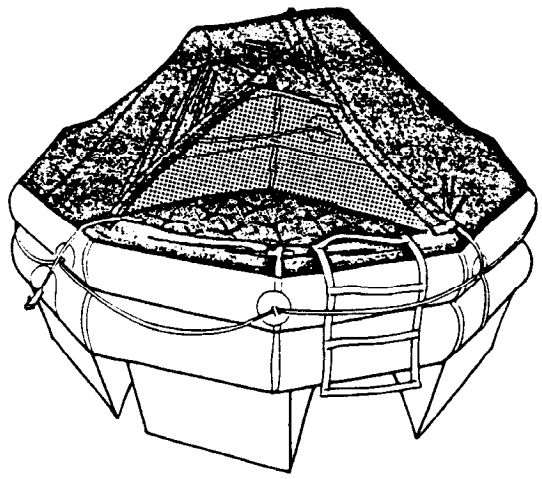
and finally

- This craft that is to safely carry 8 people for an extended time in whole gale conditions should be contained within a package the size of a suitcase and weigh no more than a person could launch by himself.

Stipulation 1

For a liferaft to perform as intended it is essential the owner follows the manufacturer's inspection and service recommendation. Emergency life rafts must be inspected and serviced every 12 months. (USCG does not allow passenger carrying vessels to put to sea if inspection interval exceeds 12 months.) The work, which must be done by an authorized service station, consists of: inflation, air tight testing, visual inspection of raft and contents, replacement of faulty or out-of-date items, and repacking in a special way (like a parachute). The repacking cost is 5%-10% of purchase price, if performed regularly. Regular servicing assures reliability and extended life of raft, and definitely will reduce costs.

The fiberglass raft canister is usually mounted on deck exposed to rain and seas, hot sun, cold nights. Even if it is water tight, and few things are in foul weather, condensation will create water and deteriorate flares, batteries, CO_2 systems. Resulting rust will weaken canopy, sea anchor, and chafe rubber. Annual liferaft servicing will prevent depreciation of your investment and provide security. Liferafts contained in a fabric valise are intended to be stored in water tight lockers and must not be stowed on deck.



Stipulation 2

A couple whose yacht was sunk by a whale spent 117 days in a 4 man raft until rescued by a passing ship. After returning to England from their miraculous survival the raft manufacturer was criticized for not including sufficient survival equipment and supplies. A list of suggested items was submitted and an exercise was undertaken by the raft makers to provision a raft according to the list. The result was a container the size of a steamer trunk, weighing 200 lbs. and the purchase price was doubled. The survivors admitted that since they had not expected to sink they would not have purchased the system.

(Their ordeal would have been considerably shortened had an Emergency Position Indication Radio Beacon (Epirb) been at hand. This is a device most heartily recommended by the U.S. Coast Guard for all voyagers.)

Transocean Voyagers should provision their raft with additional equipment. The standard supplies are intended to sustain life for 3-7 days. Since the raft container is nearly chock full, most additional supplies will have to be packed in an ancillary container that is stowed in a readily available place, safely and securely mounted but quickly unsecured.

Some items that might be included:

Additional Water, First Aid	Flares
Fishing Equipment	EPIRB
Space Blankets & Clothing	Canned Food
Signal Mirror & Whistle	Tools
Inflatable Mattress if raft without inflatable floor	Playing Cards, Books, Pencil, Paper
Solar Still	Etc., Etc., Etc.

When raft is repacked, it may be possible to slip a few of these items in the container.

A partial list of authorized Avon liferaft service stations:

BLUE WATER MARINE
1000 Broadway
Houston, Texas 77012

HEWETT MARINE
761 Channel Street
San Pedro, CA 90733

COAST MARINE & INDUSTRIAL SUPPLY
398 Jefferson Street
San Francisco, CA 94133

LIFE SUPPORT SYSTEM
104 D Lagoon Drive
Honolulu, HI 96819

NORDBY SUPPLY CO
Salmon Bay Terminal
Seattle, WA 98199

TEXAS MARINE & INDUSTRIAL SUPPLY
850 Harrisburg Blvd
Houston, TX 77012

N J RUSSO CO
736 Channel Street
San Pedro, CA 90733

WILLARD MARINE
Pier 62
San Francisco, CA 94107

PACIFIC MARINE DIST
3340 N W Yeon
Portland, OR 97217

WESTERN MARINE SUPPLY
4401 4th Ave S
Seattle, WA 98124

SEA MATE MARINE
2030 Kittner Blvd
San Diego, CA 92101

APEIRON TECHNOLOGY, INC
140 Oregon Street
El Segundo, CA 90245

HEWETT MARINE CO
555 Selby Street
San Francisco, CA 94124

MARINERS SUPPLY CO
4865 N Lagoon Avenue
Portland, OR 97217

EAGLE ENTERPRISES
700 W International Airport Rd
Anchorage, AK 99502

Check today to see if your raft is due for service.

SEAMANSHIP

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 destruction of your boat and possible loss of life:

* **At Anchor** If you've anchored in a location that becomes questionable because of an increase or change in wind direction, don't wait to see what other boats do before you either: put out to sea, move to a more protected anchorage or set additional anchors.

If you are safely anchored and an arriving boat anchors directly upwind of you or in a way that would block you from hoisting anchor and leaving, don't hesitate to row over and ask the new boat to leave. After you've had a few boats drag down on you in the middle of a midnight squall, you'll understand that this is a matter of seamanship affecting the safety of both boats. If the skipper of the recently arrived boat doesn't understand your concern just hoist your anchor and move to a safer spot. It's not worth getting excited or upset about. People on yachts are often like sheep. If there is only one boat anchored in a huge bay, the arriving yachts will inevitably anchor as close as possible to the first boat. Don't be guilty of this- perhaps that lone boat has chosen an uncrowded spot because the sailors enjoy privacy!

* **DURING LANDFALL** Far more boats are lost while making landfall in the dark or during squally weather conditions than are lost at sea. Entering unfamiliar harbors at night is asking for trouble! We've sen the wrecks of yachts that attempted this on the West Coast, on Hawaii, Maui, at Honolulu (several) in the Tuamotus (many), Tahiti, Huahine, Bora Bora, Penrhyn, Rarotonga, Aitutaki, and in Samoa. As I write this we have just left Suva, Fiji where the wreck of a nearly-new Cape Dory 33 is sitting in the shipyard next to the yacht club. This was the fifth yacht to be wrecked in recent years while attempting to enter Suva harbor in the dark. While we were anchored in Suva, two yachts followed another yacht which was using radar and sat nav through the pass in the dark. The next morning each of the skippers said that they would never try that again after several near misses with coral. Radar is an excellent navigation tool which will often show up breakers on close ranges, but frequently there are no breakers on the protected water of a pass or channel. To make the problem more extreme, the water depth may go from 50 or more fathoms to a few inches in less than a boat length, so radar and depth sounders are useless in these situations.

GPS and satellite navigators don't allow you to make safe landfall at night since few of the available charts other than in North America have been corrected using available satellite imagery. Errors in charted position of 2-9 miles are not uncommon. To verify this, leave your GPS or sat nav on for several hours at anchor and take a couple of LOP's with your sextant and plot the position. You may be surprised to find that your fixes put you on a mountainside or several miles out to sea on the latest chart of the island. So it's best to wait until morning before entering a new port! This is easy to say, but when you are fatiqued from a difficult passage, the strong urge to get into port often overpowers good seamanship and judgement.

* **AT SEA** With the advent of dependable windvane and autopilot devices, cruising couples feel that keeping a 24-hour watch is unnecessary, so they both go to sleep at night with the vane or autopilot on. It's just a matter of time and odds until they are run down by a ship or clobbered by a line squall, microburst or white squall they didn't see coming. So far, in 98,000 miles of sailing, there have been six times I would have been run down at sea if I hadn't been alert and altered course - three times in daylight and three at night. Squalls are almost always visible at night, even without radar. If you see a squall coming, you may be able to change course to avoid it, or reduce sail. If no one is awake, you may wake up with your boat overpowered and find it dangerous and difficult to reduce sail. In the tropics, I've often watched the windspeed go from 12 knots to 50 knots in a few short minutes. The most intense tropical squall I've ever experienced was between New Zealand and the Austral Islands, when the wind went from 5 knots to 100 knots and back in less than one hour. Several sail training ships have capsized and sunk with loss of life when they couldn't reduce sail quickly enough in tropical squalls.

We alternate three-hour watches day and night, though we rarely spend the whole watch on deck. As I write this, we are 200 miles north of New Zealand. Barbara is asleep, and I go on deck every 12 minutes to slowly scan the horizon for squalls or ships. Last night, we spotted the tricolor light of a 47' Dutch steel sloop directly ahead of us, also bound for New Zealand. As soon as we saw their light we called them on the VHF radio to exchange course and speed information. A tricolor running light is essential to good seamanship when night sailing. The high position at you masthead ensures maximum visibility and cannot be blocked by headsails or heeling.

* **IN HEAVY WEATHER** A long distance cruise is not the place to stress your rig or sails by trying to see how much sail you can carry and how fast you can push the boat. 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, sails and rig, and may result in blown-out sails or dismasting. This is one of the most serious problems for experienced ocean sailors. It is always best to be conservative until you really understand how much speed you, your steering system and boat can handle. We usually find we don't lose boat speed after reefing and the comfort level always increases. Modern sailboats sail best at less than 12-18° of heel, not with the rail under water.

A tip to make headsail reductions easier, whether or not you have roller furling, is to ease the mainsheet all the way out and turn and run straight downwind, with the preventer holding the boom firmly down. The mainsail will blanket the jib, reducing the pressure on it, so that it will be much easier to lower or furl. If you are on the foredeck changing sails, you'll find that the reduced motion and spray makes the job much safer and beats getting drenched with salt water! If you choose to have a roller furling jib, it is essential to have a second forestay that can carry a storm staysail or storm jib. No roller furling system can be used in 15 knots and 35 knots with the same sail, no matter what sailmakers try to tell you. I have found that changing a jib shorthanded in a headfoil in heavy weather is neither easy or safe. If you choose to have a roller furling headsail, you'll also need a backup storm sail that can either be hanked on to a removable or fixed inner stay (best) or a second smaller furling sail or an inner stay.

Here are the key points:

1. When anchoring, make sure you always have an "out" if conditions worsen.

2. Don't try to make landfall in an unfamiliar port in the dark or in squally weather. You may have to slow the boat down, heave to for a daylight arrival thereby making your passage a little longer, but be patient - it's better than losing your boat.

3. Don't rely solely on electronics; GPS, loran and radar are great tools, but no more than that. You must understand and practice basic dead reckoning navigation for the time when a voltage spark or a dead battery shuts down your electronics.

4. Keep a 24-hour lookout on the ocean and be prepared to alter course or reduce sail quickly. Never assume right-of-way over a commercial vessel at sea. Attempt contact on VHF channel 16 if your course looks at all close to a ship. Never take it for granted that a ship you sight on the ocean has anyone on watch or that its crew can see you. We give our course and speed and any course changes even if the ship we're broadcasting to doesn't respond on channel 16.

5. Sail conservatively - reef or reduce sail ad soon as you first think about it.

MAKING LANDFALL

When NOT to make landfall:

1. at night
2. bad weather
3. unsure of position

Use ALL types of navigational tools and aids available:

1. compass + log dead reckoning
2. sextant - celestial navigation
3. lights + land
4. natural signs
5. electronics, radar GPS loran, depth sounder.

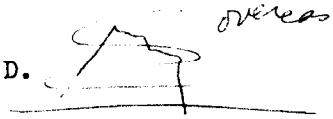
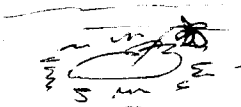
LOW ISLANDS AND CORAL PASSES

1. Low islands are visible 7 to 10 miles.
2. Not visible at night or cloudy weather.
3. Visibility greatly reduced when sun is low on horizon
4. Plan landfall between 10 am - 3 pm.
5. Coral reef passes are found in what oceans? Atlantic, Pacific, Indian.
6. When approaching an island, expect to current to increase 2 to 6 mile
7. Time arrival around slack water and daylight.
8. If attempting to enter against a moderate current, use the inside eddys

POLYNESIAN NAVIGATION TECHNIQUES

Suggested reading: We, the Navigators, The Voyaging Stars, Finding Your Way.

SPECIFIC TECHNIQUES:

1. Clouds: A. 
   B. 
   overcast
   C. Atoll lagoon
   D. 
2. Swell Patterns 
3. Wave Refractions 
4. Birds — west waves period shorten
   sunrise, sunset, bird going to island
5. Smell

Common Medical Problems: Prevention, Treatment and Medication

Table of Contents by Sue Frederickson, R.N.

OBJECTIVES

1. To provide guidelines for the prospective offshore cruiser to realistically assess medical requirements and preparations for individual cruising adventures.
2. To inform the offshore sailor (with limited medical resources) of common health problems specific to cruising in isolated marine environments, and to suggest alternative remedies using common on board items.
3. To encourage the cruiser to think about anticipating and preventing medical problems and accidents and to promote good health practices.
4. To discuss cruising medical problems, especially tropical, without duplicating information available in other references on board.
5. To present helpful medical information in easy to understand, non-medical terminology.

BEFORE LEAVING

The skipper or boat owner has more to worry about than the operation and safety of his vessel. He also has legal and moral responsibility for the health care and safety of his passengers and crew. When you let go those dock lines and cast off on your offshore cruising adventures, you are taking responsibility for their lives into your own hands.

Blue water adventurers need to be medically self-sufficient, skilled enough to deal with minor problems and able to stabilize serious ones. Offshore cruising requires extensive preparation of the boat and crew, and constantly challenges your creative problem solving abilities.

The cruising lifestyle is generally a healthy one, but there's always the potential for serious trauma - accidents you may have to deal with by yourself. Trauma injuries can largely be prevented by careful consideration of the type of gear on board, securing it safely, and by being more cautious than usual. Use the boom preventer, don't take unnecessary physical risks, and use that safety equipment!

Ocean racing, where the crew are pushing themselves and the boat, has more potential for injury than laid-back cruising. Poorly equipped and badly maintained yachts will increase risks for accidents. In rough weather larger boats may also be more dangerous, because of the greater size, weight and force of the gear and sails. Lack of experience will also tip the odds.

In life threatening situations you need to know how to deal with the emergency immediately. Be proficient in your basic first aid ABC's (Airway, Breathing, Circulation). At sea you can't depend on anyone else, and time is critical. It will take too long to reach assistance on land, or call for medical help on the radio, or to consult your medical reference books. Know the immediate steps to bring an emergency under control. This will gain the time you need to find further assistance.

After you've dealt with the initial emergency, slow down, and take time to check the manual, or get on the radio. Remember that often it's safest and best to do nothing other than make the injured or ill comfortable until you can obtain professional medical assistance or advice.

At least one person on board should be delegated ship's doctor, and have training in accident response and management. Ideally, everyone on board should know how to administer CPR (Cardio-Pulmonary Resusitation). You cannot learn CPR from a book; practical experience is vital, though a reference guide may be a helpful refresher on board.

On extended voyages of a year or more, or when there are other medical risk factors, more than one crew member should complete an advanced medical emergency management course. Many courses are oriented to stabilizing the patient for evacuation to a hospital emergency room. The long range cruiser needs information and training beyond that. Try to find a course that is oriented to medical management in a marine environment, with limited resources in isolated regions. The course should include: Evaluation and management of a patient who is unconscious or has head injuries; how to conduct a physical; treatment of open wounds, burns and fractures; care for drowning and hypothermia; some information about eye, ear and dental

problems; evaluation of chest and abdominal pains and some background physiology.

It's important to know how to assess a patient and to check vital signs such as pulse, temperature, blood pressure and pupil dilation. Know how to record and describe them. Specific medical information is essential for evaluation, whether you are searching through the manuals or relaying it to a medical adviser over the radio.

The physician supervising the course should have experience in medical emergency situations such as mountain rescue or hospital emergency room. The course should provide or recommend good reference material, because you can't possibly retain all of the information. Intensive medical courses like this aren't easy to find and may be expensive, but your life might be worth it!

Deciding just how much medical preparation and expense is appropriate for your trip needs careful consideration. If you can easily afford it, do it. If you're planning a short trip and it's a toss-up between a priority equipment item and an intensive medical course you may be safer to buy the equipment. At least take a basic Red Cross fist aid course and have medical manuals and a well-stocked medicine chest on board.

Choose priorities carefully. Creature comforts shouldn't come before taking care of your health! You're spending a lot of time, effort and money to equip your boat and develop skills to deal with nautical catastrophes. It also makes good sense to be equipped to deal with medical problems.

Visit your own doctor and try to glean as much information from him as you can. Explain your cruising situation and the type of knowledge you require, and he may be able to give you some useful instruction. This may suffice if an intensive medical course isn't available, but keep in mind that your practitioner may not have experience in areas that you need to know about, particularly tropical health problems, which seem to plague the cruiser most often. Non life-threatening, but annoying ailments are more often a problem for the cruiser than serious trauma. You need awareness and resources to deal with both. Read about common cruising

medical problems later in this chapter and familiarize yourself with them, as many are preventable. The key is to anticipate and avoid potential medical problems, and to know how to deal with them. The non-medical cruising sailor shouldn't risk playing doctor but should have sufficient first aid and health maintenance knowledge to manage most medical problems until professional advice can be obtained.

Really, the amount of preparation you do depends on how you perceive the odds for medical problems and the level of peace of mind necessary for you. Factors that may increase risks of medical problems include:

Cruisingwith children

Extended periods of cruising, i.e., more than one year

Longer periods of "sea time", i.e., more than 50 days, a year, or long ocean passages

Isolated cruising grounds

Middle aged or older crew

History of and pre-existing or chronic medical problems

More people on board

No means of radio communication with medical advisers

Financial limits on medical preparation and supplies

Before leaving have a full medical check up with your family doctor, or one that has access to your complete medical and family medical history. These may give clues on health problems to which you may be susceptible, or prone to developing. Evaluate them together and discuss how you could cope with health problems if medical assistance is not immediately available.

Medical problems you've had in the past may occur again when your body's resources are stretched. For example, if you've had cystitis, ear infections or pneumonia, these could recur. If it happens on a remote island, hundreds of miles from the nearest doctor or pharmacy, you must be prepared. By probing into your medical history you may be able to predict some of your highest risk health problems and evaluate, with your doctor, the most appropriate treatments and drugs. With

this type of assessment, and an awareness of the most common cruising medical problems, you can intelligently meet, and even prevent medical crises.

EXISTING HEALTH PROBLEMS

If you need medical treatment or medication for any chronic or recurring problem, be sure you fully understand the nature, pathology, symptoms, progression, treatment and trouble areas of the disease process so that you may intelligently take on at least some of the responsibility for maintaining your optimum health. Read up on your condition and make a list of questions. Talk at length with your physician about your condition and ask him/her to use diagrams if necessary to explain details. Repeat back what you understood to be sure you got it right. Make notes if you think you may have trouble recalling all the information. Don't be afraid to ask lots of basic "what if?" questions or to seek a second or third opinion.

If you do have a pre-existing medical condition, check with your doctor if it's stable enough for you to venture offshore out of range of medical assistance. Even medical problems that are stabilized on medications may change dramatically with the lifestyle, exercise, diet and weight changes that can occur during cruising. This may be especially relevant to high blood pressure, and could even require adjustments in medication. Explore this possibility with your physician.

Sailors suffering from high blood pressure, or on blood pressure medication or fluid pills, should know how to take their own blood pressure and have the equipment on board. Diabetics need extensive preparation to be completely self-sufficient in managing their disease. Again, at least one other person on board should know how to check blood sugar, and administer the appropriate treatment in case sufferers become completely incapacitated. A ham radio is recommended in these situations. You could prearrange with your doctor or another medical professional for verbal consultations via telephone patch. (Refer to medical assistance subtitle.)

Have your physician write a letter detailing your medical problem, its history,

course, progression, drugs and treatments. It should include your doctor's full name, address and phone number in case additional information is needed. Keep several copies in the ship's medical log.

If you require on-going drug therapy stock twice the amount you anticipate needing for the voyage. Plan to restock and replace your medication at a major port down the line, keeping in mind you will probably arrive there later than originally planned! Find out both the generic name and local brand names of your medication. This information is available from a pharmacist, the pharmaceutical manufacturers or a Poisons Index Service. Be aware that some insulins and hypertension medications may vary slightly between manufacturers in different countries. Note the expiration dates of all drugs in your ship's medical log for easy reference.

Check the storage instructions for factors like temperature and light. Add moisture-absorbing silica gel packs to the drugs and store them airtight with lids firmly secured and sealed with plastic electrical tape around the lid. Most drugs stored this way unopened will be effective for several months beyond expiration. Exceptions are tetracycline which is unstable and becomes toxic if used beyond expiration, and nitroglycerine tablets for angina which only last about six months. Some drugs deteriorate faster once opened in tropical marine environments. Any long-term illness or medications should be brought to the attention of the skipper and recorded in the ship's medical log. Tell the skipper where the drugs are kept, and your requirements. In turn, the skipper should inform somebody else on board of his/her medical needs.

Check with your doctor as to whether you should continue taking your medication while seasick, and how long the medication can be withheld. If you wear contact lenses, tell someone else where you keep them and how to take them out. Seasickness can be so incapacitating, and may make life so unappealing, you may totally neglect critical drug and other health requirements unless someone does it for you!

Maintain regular medical checkups and vaccinations, especially for children.

An identification bracelet for allergies and medical problems can be obtained from the Medic-Alert Foundation, P.O. Box 1009, Turlock, CA 95380 or telephone

(209 668-3333), for a small fee. They'll also provide a wallet card detailing more of your personal medical information, and 24 hour access to a computer bank of your health records, and how to contact your physician and family.

SHIP'S MEDICAL LOG

A ship's medical log should be kept for recording medical problems and the onboard drug inventory. Maintaining a medical record is important for your own treatment evaluation, subsequent professional evaluation and possibly for insurance or legal references.

Record all injury and illness, noting the time and date. Describe what happened, the likely cause, and actions or treatment taken. Also record the actual date and time each entry is logged. Keep a complete and accurate account of the progression of signs and symptoms on a day-by-day basis, and the details of any medications used. This will assist you in evaluating and managing your health problems and a medical practitioner should follow up. Don't try to rely on your memory! Only with log recording can effective evaluation, both on-going and retrospective, be complete. In the unlikely event of any legal or insurance proceedings, nothing will help you more than accurately recorded details from the time of the event.

List expiration dates of your drug inventory and keep track of supplies for ease in planning where and when to restock. There may be many months between locations where drugs can be obtained, and restocking opportunities can be easily overlooked. All narcotics and controlled drugs should be accounted for as they are used. Refer to The Ship's Medicine Chest for requirements for controlled drug accounting and format.

It may also be valuable to keep a page in the medical log for each person on board to record special medications, allergies, pre-existing medical problems and normal vital signs for base line reference (blood pressure and pulse).

Inquire about the health of crew members you pick up along the way. It may not

be wise to take responsibility for someone with a high risk of medical problems. A person older than 40 years, overweight, with high blood pressure and poor physical fitness is not a good choice for offshore cruising crew.

MEDICAL ASSISTANCE IN FOREIGN COUNTRIES AND AT SEA

The blue water cruiser needs to be somewhat medically self-sufficient with extensive medical supplies and drugs on board, yet on the other hand should avoid self-medicating if at all possible, instead seeking qualified medical assistance. Self treatment may be dangerous and make the problem worse. Doctors even on the smallest island usually have more experience and knowledge of medical problems than the non-medical sailor, especially about common local conditions.

While meandering among islands on the usual cruising routes, you may meet other cruisers in the medical profession.

Sparsely populated, isolated islands may have a nurse with some degree of training and radio contact with a doctor or medical center. Island colonies or protectorates of a major country often have access to good emergency medical advice and evaluations. If an island has an airstrip, a plane can sometimes be arranged to fly out extreme emergencies. If not, occasionally naval ships or passing freighters can be located for assistance in evacuation. These types of emergency evacuations are arranged on a government official level or by private worldwide emergency ambulance services (see later) and may be extremely expensive if not covered by insurance.

In foreign countries, try to find a physician who speaks your language or at least have a good translator. A correct diagnosis and treatment may hinge on an accurate history and description of symptoms.

Names of English-speaking physicians can be obtained from agencies that deal with U.S. or British travelers, large travel agencies and hotels, embassies and consulates.

There are organizations in the United States that will assure travelers of medical assistance abroad. They can provide lists of reputable physicians who are fluent in English and will consult for a reasonable pre-set fee. This service may be especially valuable for persons with pre-existing medical problems. Often the physicians listed are in major cities around the world and not the common cruising ports. See Medical Assistance Services later for details about organizations providing for medical needs while travelling outside the United States.

Seeking out the best medical resources in a foreign country will always be less expensive than returning to the U.S. Generally, medical expenses outside the United States will be much less than in the U.S. For very serious problems or major surgery, try to reach more sophisticated medical facilities in a developed country. Local medical resources should be sought first to stabilize serious problems before attempting to transport the patient.

RADIO MEDICAL ASSISTANCE

At sea and in isolated cruising areas, radio communication may be the only means of obtaining medical advice. Single Side Band (SSB) radios have communication ranges of up to several thousand miles, depending on atmospheric conditions at that time. If a coastal station can be reached, medical advice can be obtained through the Marine operator or Coast Guard.

Ham radio is the offshore cruiser's favored choice for emergency communications. With it, you can randomly contact someone at almost any time, but not specific persons immediately, unless a schedule is pre-arranged. There are several ham radio nets set up specifically for offshore cruising yachts to check in daily, and for any emergency traffic. medical assistance can be found, from a variety of sources using ham-telephone patches.

MAJOR MARITIME HAM NETS

Maritime Mobile & Seafarers Net. Operates 24 hours a day with control stations throughout the world on 14313 kc.

Manana Net out of the west coast of USA covers much of the Pacific Ocean and meets daily on 14340 kc at 1830 GMT.

Pacific Maritime Mobile Net operates on the same frequency at 0530 GMT. Its coverage reaches from the west coast of the U.S. to Australia.

MEDICAL ASSISTANCE SERVICES

Public Health Service Hospitals in the United States will accept calls from vessels at sea, and provide medical advice. This can be done by ham radio phone patch or through a Coastal Marine operator or Coast Guard on Single Side Band radio. Refer to The Ship's Medicine Chest for calling instructions for DH MEDICO. Public Health Service Hospitals are rapidly disappearing and it often takes several hours to establish communication between the vessel and a physician. Public Health Hospitals are set up to provide free medical treatment to licensed crew on U.S. or foreign documented vessels.

SSB Coastal Radio Stations and Coast Guard Stations throughout the world are linked to CIRM, an international medical advisory organization headquartered in Rome. They also have the appropriate resources to contact the nearest rescue services. Communication with a physician is not immediate.

M*A*S*H. Medical Advisory Systems, Inc. Hotline was established in the private sector to respond promptly to the emergency advice needs for vessels at sea and in foreign countries. It provides a Medical Telecommunications Response Center for the maritime industry. Physicians are available around the clock to give advice to MASH members. They can be contacted directly on SSB, VHF, or on their toll free 800 number via a ham radio phone patch or through the U.S. Coast Guard and Coastal Stations. MASH is also linked with emergency evacuation services, and has computer records of individual medical histories that can be retrieved by the doctor answering the call. It was established primarily to serve the merchant marine industry. MASH also promotes membership for private vessels.

Medical Advisory Systems, Box 193 Pennsylvania Avenue Ext., Owings MD 20736
(~~301~~ 310) 257-9505 Long Beach

UCSD San Diego
Travellers Clinic
619 543-5787

Manana ham net directs calls from offshore cruisers requiring medical advice to The Memorial Medical Center of Long Beach's Emergency Room. They accept calls via ham patch and can usually have a physician respond promptly. ~~213~~ 595-2133

310 595-2133

International SOS, P.O. Box 11568, Philadelphia, PA 19116 (800) 523-8930.
International SOS is an organization that arranges medical referrals and evacuation throughout the world. Joining International SOS works like an insurance policy and should their services be required in an emergency, medical and transportation expenses are covered. They can also give medical advice over the phone and provide a wallet-sized card with all of your medical records on it.

Near, 1900 N. MacArthur Blvd., Ste. 210, Oklahoma City, OK 73127.
1-800-654-6700
Near stands for: Nationwide/Worldwide Emergency Ambulance Return. This is an emergency travel service that can arrange evacuation of medical emergencies to the nearest sophisticated facility or back to the U.S. with appropriate medical attendants if necessary.

Medic-Alert Foundation, P.O. Box 1009, Turlock, CA 95381, (209) 668-3333.
Medic-Alert, provides an identification bracelet worn to alert medical personnel of any conditions or allergies. An individual identification number on the bracelet can yield more detailed medical information as well as how to contact family; by accessing the Foundation's computer bank.

→ IAMAT, 736 Center Street, Lewiston, NY 14092, (716) 754-4883.
IAMAT stands for: International Association for Medical Assistance to Travelers. It is a non-profit organization that provides information on immunization, risk charts for malaria and other diseases, and a list of English speaking physicians in 120 countries around the world. Gene Donalson

Assist-Card, 745 Fifth Avenue, New York, NY 10022, (212) 752-2788.
Assist-Card provides an emergency message service in 67 designated countries that can dispatch local medical help and arrange transportation.

→ MedHelp Worldwide: The International Health Plan.
Policy available through: Wallace & Company, 243 Church Street. N.W., Suite 100, Vienna, VA 22180. 1-800-237-6615.
MedHelp Worldwide provides accident and health insurance abroad, with a minimum coverage period of six months. Provides coverage for insured persons who will be living anywhere in the world except the U.S.A., Canada or Hong Kong. They will insure blue water cruisers. (approximately $1,200 annually for a couple in their mid-thirties.)

MEDICAL INSURANCE AND LIABILITY WHILE CRUISING

Most blue water cruisers elect to go cruising without medical insurance coverage. International, comprehensive insurance coverage for all medical expenses, as well as transportation cost back to the U.S., is expensive, unless you can extend your existing insurance policy to cover you offshore. Instead many cruisers are choosing to cover themselves in a limited way for

any type emergency by setting money aside in a high interest bearing, easily accessible account. These savings should just be reserved for emergencies. These may be medical, a trip home to see ill family, or a new mast. Medical expenses are generally much less expensive outside the U.S., making the need for insurance less of a priority. You may do better financially by seeking out the best medical care available in the country you're in than if you sought similar care while in the U.S., but the level of care is dependent on the country and hospital you're in.

International SOS has a program covering its members for emergency medical advice, care and transportation to an appropriate medical facility, and back to the U.S. if necessary. This is reasonably priced and may be worth investigating. See previous section for address.

The master of a vessel may be legally liable for the medical needs of his crew and passengers. This would depend entirely on the court and how they defined someone as a paying passenger or a paid crew member. Generally, this payment arrangement is not the situation with cruising yachts. Be cautious if picking up paying charter guests. Selecting healthy crew is a consideration.

VACCINATIONS

During childhood most developed countries routinely immunize against major diseases. In certain areas in the world these diseases are still a significant problem. Any immunizations that were missed or need updating should be obtained before embarking on an extended offshore cruise. These include: Diptheria, tetanus, pertussis (whooping cough), measles, mumps, rubella, and poliomyelitis. Be sure your children's immunizations are kept up to date enroute. Everybody should have a tetanus booster before leaving.

When venturing into less developed regions, other vaccines are recommended or required. Lists of these countries are available in a government publication,

including information on diseases, their prevalence and helpful preventative measures. The source for this info. is Health Information for International Travel, stock # 017-023-00184-1. For sale by the superintendent of documents, U.S. Government Printing Office, Washington, D.C. 20402. Cost:$5.00

The most common diseases requiring vaccination for the traveler are: hepatitis A, cholera, typhoid and yellow fever, rabies, meningococeal plague. Travelers on ordinary tourist routes are unlikely to acquire hepatitis and vaccination is not usually recommended. However, travelers to tropical areas and developing countries who bypass ordinary tourist routes may be at greater risk of acquiring hepatitis A, and immunization may be advisable. When venturing into regions known to have malaria, prophylactic treatment is needed.

There are benefits and risks associated with the use of all immunization products; no vaccine is completely effective or completely safe.

Health Hints for the Tropics, recommended by the U.S. National Institute of Health is available by writing: Tropical Medicine & Hygiene News, 6436 31st St. N.W. Washington, D.C. 20015-2342 (202)362-6094

Common Medical Problems Encountered While Cruising

Recognition, Prevention, Treatment & References

GASTROINTESTINAL PROBLEMS

SEASICKNESS OR MOTION SICKNESS

Rare is the sailor who never gets seasick! Fortunately, motion sickness for most of us is usually only a problem if the seas are rough, or for the first day or two of the passage until the ship sails beyond the refractory sea swells from land, and the sailor adapts to the motion of the boat. Motion sickness is a physical disorder caused by sensory conflict between the

inner ear balance center and visual perception. Staying on deck and directing vision to a stationary point on the horizon reduces the sensory conflict. Taking the self-steering vane or auto pilot off and hand steering for a while works well.

Those most prone to motion sickness are the very old, very young, and females. Female hormones make them more susceptible just before and during menstruation and during pregnancy.

Motion sickness begins with skin pallor, cold sweating, drowsiness, yawning and increased salivation. It may progress to head symptoms of dizziness, headache, drowsiness, malaise, severe depression and even reduced survival instincts, then gut symptoms of queasiness, nausea, vomiting and dry heaves.

Try to prevent seasickness by following suggestions listed later to reduce the sensory conflict. If you have a history of seasickness, take medications before casting off. Once seasickness nausea has begun, it's too late to take oral preparations. Keep a variety of preparations on board, including non-oral type (if already vomiting). Different medications work best for different people, and it may be necessary to try more than one at different times.

MEDICATIONS

Non-prescription antihistamines include:

Dramamine (chemical name Dimenhydrinate, brand names outside the U.S., Nauseatol, Andrumin)

Marezine, Antivert, Bonine (Cyclizine, Meclizine, Meclozine, Ancoloxin, Bonamine Ancolan)

Dramamine causes the most drowsiness, Bonine is the longest acting and Marezine causes the least drowsiness.

These antihistamines are for mild seasickness sensitivity and need to be taken prior to departure, before any nausea symptoms begin. They take at least 4 hours to be fully effective, and should be taken every 6 hours. Take at least 2 doses

before departing, (e.g., 8 hours and 2 hours before departure).

Some people may find it necessary to start taking Dramimine one or two days before departure to avoid seasickness. Taking Dramamine well in advance also allows adaptation to the drug and its side effects. Antihistamines do have a noticeable side effect of drowsiness, which may be hazardous if the person is also responsible for navigation, or if they are on deck and therefore vulnerable to falling overboard.

PRESCRIPTION DRUGS FOR MODERATE TO SEVERE SENSITIVITY (Non-Oral)

Transderm-Scopolamine: Small impregnated skin patches placed behind the ear. The drug is absorbed through the skin into the blood stream.

These are used mainly for prophylaxis, and should be applied the night before departure. Each patch lasts for 72 hours. Caution should be taken not to get any of the drug in the eyes, otherwise blurring or loss of short range vision may occur making it impossible to read the compass or chart. Wash hands well after applying. Transderm-Scopolamine seems to be the favorite anti-motion sickness drug for most cruising sailors. It has a few unpleasant side effects, and may cause some drowsiness and blurring of vision, hallucination in some cases, increased sweating, and possibly decreased heart rate. It shouldn't be used by divers.

Compazine and Phenergan Suppositories: A good choice for the sailor once nausea and vomiting have begun. Lasts at least 6 hours and does have some associated drowsiness.

Intramuscular, injectable prescription drugs are also used for moderate to severe motion sickness, but probably shouldn't be administered without a medically trained background. These include Phergan and Ephedrine, Scopolamine and Dextro-amphetamine.

ALTERNATE MOTION SICKNESS REMEDIES

These have the advantage of no noxious side effects, but generally have no medical proof of effectiveness, although some people swear by their effectiveness.

Ginger Powder Capsules: 2 taken every 4 - 6 hours may alleviate nausea symptoms.

Acupressure Wrist Bands: A strap with pressure nodules worn strategically around the wrist to exert pressure on specific acupressure points that prevent nausea. Conflicting reports about its effectiveness, but if it works for you, it has the strong advantage of no drugs and no side effects.

CAUTIONS AND CARE OF THE SEASICK SAILOR

Motion sickness can be seriously debilitating, causing physical safety problems on board as well as serious dehydration. Look after your seasick shipmates; they may be incapable of looking after themselves. They may be weak, dizzy and unable to concentrate. Don't allow them on deck. Instead, harness the seasick sailor in the center of the cockpit so he/she cannot fall overboard, even if leaning over the side. The sick person may be so severely depressed he/she wouldn't care if he/she did fall overboard, or if the yacht was run down by a ship. He/she may not be capable of maintaining a safe watch.

This person needs to be protected from the cold and the sun. His/her body temperature will already be low and he/she is at risk of exposure (hypothermia). He/she will lack the motivation and energy to put on more clothing, so help him/her to bundle up warmly. Conversely, he/she may be frying in the sun, unable to move and protect him/herself. Be attentive to the seasick sailor's needs.

The motion sick sailor usually does better out in the fresh air where there is some breeze, away from enging fumes and galley odors.

After prolonged vomiting the seasick person's loss of body fluids and electrolytes (salts), low blood pressure and increased blood viscosity can lead to serious

problems. Encourage the patient to take small amounts of fluids with electrolytes every 15 minutes. Glucose and electrolyte fluids (such as Gatorade or pedalyte) should be given, and they may also tolerate eating dry crackers. A mixture of one gallon of water, 1 teaspoon salt and ½ teaspoon baking soda with lemon flavoring will also replace lost electrolytes. If patient is unable to take oral fluids and i. in progressive severe shock, fluids may be administered rectally, or parenterally by needle under the skin (refer to Advanced First Adi Afloat).

OTHER HELPFUL HINTS TO AVOID AND REDUCE MOTION SICKNESS

Position yourself where there is least motion, amidship, to the stern. Preferably out in the fresh air tethered in the cockpit.

Keep away from odors, stay in a cool, shady place. Cool, wet cloth placed on the back of the neck and forehead may help.

Lie on your back, with head supported and still.

Look at a 45^{o} angle above the horizontal, and at a fixed place on the horizon. If you can't keep your eyes on a fixed object, keep them closed to reduce sensory conflict between the inner ears' balance center and visual perception.

Diversional activities may reduce symptoms, especially steering the boat (but not reading).

If sailing extremely close-hauled, it may be better to drop off a few degrees and take an extra day for a more comfortable trip. or change destination

Encourage frequent small drinks and dry crackers. Avoid fatty, spicy, aromatic foods.

POOR NUTRITION

Medical research says it is quite unnecessary to supplement the diet with vitamins and minerals; a good balanced diet supplies more than you need.

Supplementary vitamins and minerals become expensive when used everyday. For the most part, the affluent nutrition-conscious cruising sailor can procure a balanced diet.

However, in the real world of extended offshore cruising in remote areas, the so-called "balanced diet" is less easily obtained. The longer the cruise and the more remote the cruising grounds, the greater the possibility of problems developing. It does take months for vitamins and minerals to be depleted from the body, but this does happen to the cruising sailor.

On high islands, fresh food usually grows well in volcanic soil and the cruiser can obtain supplies from the inhabitants. Atolls, however, are skeletal coral remains of a sunken volcanic island and yield very little good soil. They may grow little more than coconuts and frequently support few inhabitants. Fruit and vegetables may not be obtainable in these areas. Isolated atolls are also some of the most spactacular cruising grounds, luring the sailor to linger.

Careful provisioning and food storage is the key, but we believe supplementary vitamins and minerals should also be kept on board. You don't need to take them everyday, but do use them when you cannot obtain a "balanced diet". For example, during illnesses, when the refrigeration breaks down, delayed passages due to dismasting or bad weather, or during long periods in remote areas where fresh food is unobtainable.

Poor nutrition can lead to a host of problems with varying severity and signs and symptoms that can be numerous and obscure. Malnourished cruisers may experience lethargy, listlessness, depressed motivation and mood, cramps, persistent skin infections, boils, headaches, dizziness, weakness, and tender, swollen or bleeding gums, not to methion sleep disturbances, night blindness, memory changes and even convulsions. Single handing males seem to be at greatest risk.

Assess your cruising itinerary for the remoteness of location and the length of time out to calculate for a good supply of multi-vitamins and minerals. Also

remember that until you reach sizable ports vitamins and minerals will be difficult or expensive to replenish.

Vegetarians and females of child-bearing age should supplement their diet with extra iron at times. Post-menopausal women should take supplementary calcium. Vitamins C and E may be helpful during illnesses. Vitamins E, C, A and D, and Zinc may assist wound healing. B Complex is for those taking oral contraceptives, on vegetarian diets, or who have regular alcohol habits.

Vitamins are relatively inexpensive compared to other pills. They may prevent more costly medical expenses and don't take up much storage space. It's better, though more expensive, to buy non-synthetic, 100 percent natural vitamins and chelated minerals with no additives.

SUPPLY SUGGESTIONS

Multi vitamins - Especially vitamin B. (Mega doses aren't necessary.)

Chelated Minerals - With calcium, iodine, iron, magnesium, copper, zinc, manganese, and potassium. (Chelated means in a predigested form which is easily absorbed by the body.)

Vitamin C - If taking extra during illnesses, you must drink copious amounts of water, especially when in the tropics, to prevent kidney stones and damage.

Vitamin E - Don't suddenly start taking high doses of E. This is a fat-soluble vitamin and it's possible to overdose. The fat soluble vitamins are A, D, E and K. Adequate amounts are usually obtained from your multi vitamins.

Chelated Iron Compound - Containing Vitamin C, Iron, B6, B12 and folic acid; has all the blood forming elements to prevent anemia and promote absorption of iron.

Salt Tablets - Most people have heard that the body loses more water and salt from increased perspiration in the tropics. This salt depletion can lead to severe cramping, but it is not a good idea to start taking salt tablets everyday just

because you're sailing in the tropics. A consistently high salt intake can elevate the blood pressure and result in accelerated hardening of the coronary arteries and premature heart attacks. It is appropriate to increase your salt and water intake with excessive sweating in high temperatures (greater than $90^{o}F$, $30^{o}C$) and when troubled by cramps. Increase your salt intake if performing heavy physical exertion in a hot climate.

By adding extra salt to your diet, rather than taking salt tablets, it is harder to take excessive amounts. Drinking large amounts of water in hot climates without supplementary salt may also reduce body salt, causing severe, painful cramps in the legs, arms, abdomen or jaw. Salt tablets taken on their own will cause stomach irritation. They should be mixed with water and glucose and sipped slowly, or if taken whole, drink 2 glasses of water and glucose after. For more details on heat cramps, heat stroke and heat exhaustion, refer to Dr. Cohen's Healthy Sailor.

CONTAMINATED WATER

On atolls water is often scarce. Supplies come from rain catchments or slightly brackish wells. The water on high islands comes from springs, natural rain catchments, reservoirs and rivers. Any of these may be contaminated.

Babies and children are more susceptible to serious diarrhea from contaminated water than adults. Always boil water for cruising babies and young children.

The best method is to catch your own rain water with an awning arrangement over the boat. While sailing, rain water can be caught in a bucket hanging at the gooseneck.

When obtaining water from shore ask around about the quality, especially from other yachties, as the locals build up resistance to bad water. Look to check sanitation - does the water come from a river with a village upstream?

The most effective way to treat drinking water is to bring to a vigorous boil, then allow to cool. Boiling destroys all the diarrhea producing toxins.

The best way to treat tank water is with iodine. Purifying tablets are available from pharmacies and sporting goods stores. Two percent tincture of iodine, from the first aid chest, can also be used. Five drops per litre or quart for clear water and ten drops in cloudy water. If the water is extremely cold, it needs to be heated for the chemical reaction to take place. After adding iodine, allow the water to stand at least 30 minutes. Iodine may be purchased inexpensively from chemical supply stores. Chlorine may also be used for treating water, though not quite as effective as iodine.

CHLORINATION OF WATER

Chlorine Strengths	Number of drops per gallon (divide by 4 for liters)	
	Clear Water	Cold or Cloudy Water
1%	40 drops per gallon	80 drops per gallon
4 - 6% (household bleach, e.g., Clorox)	8 drops per gallon or 1 teaspoon per 10 gallons	16 drops per gallon
7 - 10%	4 drops per gallon	8 drops per gallon

Swimming pool chlorine may be more practical for treating large tanks. 100 drops equal 1 teaspoon. Mix chlorine into water, and allow to stand for at least 30 minutes. Cold water takes longer for the purification reaction and should be either warmed or left to stand for several hours. A slight chlorine odor should be detected: if not, leave to stand longer and/or add more chlorine. In tropical climates, chlorine will gradually evaporate out and tanks may need to be rechlorinated every few weeks. Chlorine should not be added to aluminum tanks because this may cause problems with solder weld.

Algae tends to grow inside water tanks in the tropics. If you are using rain water which is not iodized, you may need to add chlorine from time to time if you can taste the algae. Every four to six months, or when you have access to a hose, scrub out your water tanks with clorox and water, rinsing well afterwards. In some

cruising grounds it may be at least six months between places where you can fill the tanks by hose. You may think the water and tanks are wonderfully clean and clear until you start sailing to windward, when the sediment and algae gets shaken up! Filtering your water as it goes into the tanks will reduce sediment. A funnel with several screens or layers of gauze acts as a good filter.

Some hearty sailors have even resorted to adding wine or vinegar to treat their water. Where there's a will, there's a way!

SOME WARNINGS ABOUT CONTAMINATED WATER

Ice and containers in contact with contaminated water should also be considered unsafe.

It's safer to drink directly from a can or bottle, but water on the outside may be contaminated and should be wiped off.

Ice cream made with contaminated water is not toxin-free.

Brushing your teeth or showering with your mouth open in contaminated water may be enough to cause diarrhea.

If invited ashore for refreshments where water is suspect, it's safest to accept hot drinks, or coconut milk straight from the nut.

An obscure complaint related to contaminated water is the development of tiny, raised white lumps under the skin surface. These are extremely itchy and at first may be mistaken for multiple mosquito bites. They start around the fingernails, can spread up the arms and occasionally all over the body. The itch may become nerve-racking. It is caused by the water, though only one person on board may be affected. Drinking only boiled water, or treating the water tanks, will cure the itching lumps.

CONSTIPATION

This frequently occurs during ocean passages as a result of decreased activity and a diet low in residue and fresh foods. not drinking enough water Constipation can easily be prevented and alleviated by adding high fiber foods to the diet and doing daily exercises. Provision so you can eat fresh fruit and vegetables daily. Sprouts can easily be grown

on board. When fresh supplies end on board, dried fruit, prunes and fruit juices help, and bran rarely fails. Include a bran muffin recipe that uses a lot of bran.

Increasing your fluid intake is also necessary for constipation, especially in the tropics. Include oral laxatives in your medicine chest. Senekot, a mild vegetable laxative and a stronger type that increases the gut motility and softens the stool, e.g., Doxidan, for more guaranteed results. Island remedy for constipation is to eat papaya seeds. Your medicine chest should also contain a reusable enema for impaction and emergency fluid administration. Persistent constipation with sudden onset should be checked out medically: it could be cancerous bowel obstruction. This is more relevant to middle aged and older persons.

DIARRHEA

When cruising in countries with sanitary conditions you are unaccustomed to, you may contract traveller's diarrhea within two to ten days after contact with contaminated food or water. Take precautions with water mentioned in the preceding section to help prevent "Montezuma's Revenge".

Symptoms are many loose stools per day, stomach cramps and occasionally nausea and vomiting. This increased intestinal motility is the body's normal cleansing mechanism at work trying to eliminate toxic agents. For this reason, initial therapy should not be aimed at stopping the diarrhea, but at replacing lost fluids and electrolytes (body salts). Most cases of traveller's diarrhea are self-limiting and typically subside spontaneously in one to five days, especially if liquids and no solids are taken.

A simple and effective formula for treatment is:

Day 1 - Eat nothing, drink large quantities of a glucose with electrolyte solution (Gatorade, Pedalyte or Infalyte, etc.). Or, if these are not available, sip alternately from two glasses, one containing fruit juice (apple, orange) with a teaspoon of honey or corn syrup and a pinch of salt; the other containing a

quarter teaspoon of baking soda (caution when taking baking soda orally; overdose can cause severe alkalosis, maximum of one teaspoon three hourly, three times a day).

Day 2 - "BRAT" diet only. Bananas, Rice, Apples, Toast. Continue taking fluids with electrolytes.

Day 3 - Start taking Kaopectate. Continue BRAT diet.

Avoid high fibre foods, dairy products, particularly milk, and spicy foods until all symptoms have disappeared.

Obtain professional advice if the diarrhea is severe and doesn't lessen after several days, if there is blood or mucus in the stool, dehydration or fever with chills and shaking. These symptoms indicate a more serious infection requiring specific diagnosis and treatment beyond the average sailor's skills. Randomly taking antibiotics, yours or others, may make matters worse and be dangerous. If there's blood or mucus in the diarrhea it could be Shigella or Salmonella infection, requiring Trimethoprim Sulfa or Ampicillin as prescribed. Refer to The Ship's Medicine Chest for good detailed description of types of diarrhea infections.

The routine prophylactic use of antibiotics to prevent traveller's diarrhea is definitely NOT recommended because of possible side effects and the likelihood of inducing resistant diarrhea-causing organisms. In some countries Iodochlorhydroxyquine (Entero-Vioform) is available over the counter for traveller's diarrhea. Avoid this - it has not been proven effective in preventing diarrhea and may be extremely dangerous. Drugs that decrease the motility of the bowel, such as diphenoxyalte (Lomotil) and lopermide (Imodium), should only be used on the advice of a physician. They are prescription drugs that may do more harm than good and should not be used randomly for self medication.

STOOL CHECKS

When cruising in areas where amoebic dysentery is known to occur, stool checks

should be carried out every year, or on return. Also, have a check with any chronic diarrhea, particularly with fever. If amoeba goes untreated, it can cause dangerous liver problems.

DIARRHEA SECONDARY TO ANTIBIOTIC THERAPY

Antibiotics can destroy the normal bowel flora which results in a reactionary diarrhea. Yoghurt or acidophilus capsules (yoghurt culture) will help to settle this variety of diarrhea. It may be necessary to discontinue the antibiotic if diarrhea cannot be controlled, evaluate commencing treatment of another type. Lincomycin antibiotic should never be used by the blue water cruiser due to possible serious problems of pseudo colitis associated with it.

DIARRHEA IN BABIES AND YOUNG CHILDREN

Babies and young children are more likely to develop diarrhea and vomiting from contaminated food and water. Be extremely conscientious about taking precautions to prevent this. Babies should only be given boiled water. Serious dehydration occurs very rapidly. Prompt treatment and medical assistance is vital and high oral intake of glucose and electrolyte solutions in the interim.

WORMS

Intestinal worms are common in some less-developed communities and easily acquired from eating inadequately cooked pork, beef and fish. They are relatively harmless and treatment can usually wait until the next port. Symptoms may be vague and go unnoticed. Refer to The Ship's Medicine Chest for details. Drug therapy for pinworm and roundworm is Pyrantel-Pamoate (Antiminth).

CHOLERA

An infectious diarrhea that occurs in epidemics, particularly in Asia and Africa.

The infection may be mild and self-limiting in two to seven days. Alternatively, it may be a massive diarrhea which can be fatal. Severe diarrhea from cholera has the appearance of rice water, and may also be associated with some vomiting, fever, and abdominal cramps. If fluids and electrolyte levels in the body cannot be maintained, severe dehydration progressing to shock and death may occur, otherwise recovery is easily achieved.

Cholera is acquired from contaminated food and water. In areas where cholera is common, special preventative measures should be taken. Some endemic regions require cholera vaccinations; refer to Government Health Department Publication Health Information for the International Traveler for a list. Otherwise, the vaccination is not recommended because it's not highly effective and only provides partial protection for four to six months. The cholera organism is easily destroyed by chlorination and heating of water. Avoid eating uncooked vegetables and contaminated water (refer to Contaminated Water section). Treatment includes replacing body fluids and electrolytes at the same rate of loss. In severe situations, intravenous fluid replacement is necessary, and medical assistance required. Refer to section on diarrhea, The Ship's Medicine Chest, and The Merck Manual.

DENGUE FEVER (Breakbone Fever)

Dengue fever is a viral disease transmitted by mosquitoes in tropical and subtropical climates. The incubation period is from 3-15 days, followed by a sudden high fever (up to 105°F, 40°C), headache, and muscle and joint pain. The initial high fever lasts 2-3 days, subsiding with profuse sweating. After feeling better for one to two days, another fever may occur, along with a red rash. The disease lasts from 3-12 days, and convalescence is often prolonged, lasting several weeks. Reduced energy levels may linger for several months.

There is no specific treatment for dengue other than bedrest and insuring adequate fluid intake. The fever is helped with ~~aspirin~~ or acetaminophen, and combination codeine preparations for the pain. Specific diagnosis requires blood tests. Where these are not available it is better to avoid aspirin in case the symptoms are actually

caused by other similar tropical viruses that may have heamorragic tendencies which aspirin could complicate.

Prevention involves protection from mosquito bites in areas where dengue fever is endemic. Insect repellent, light long-sleeved shirts and light trousers are advisable, especially at dusk. On board, mosquito coils are effective, and when sleeping ashore, sleep under mosquito netting.

Persons who contract dengue should be protected from mosquitoes for the first week to prevent transmission from them to other persons.

Other references include "The Ships Medicine Chest" and "The Merck Manual".

MALARIA

Malaria is transmitted by mosquito. Anti-malarial treatment should be taken by all travelers in areas where risks of malaria transmission occur. Countries where malaria risks exist are listed in "Health Information for the International Traveler", along with anti-malaria requirements, and features of the disease. The main risk areas include Indonesia, Malaysia, Africa, and Central and South America.

FILARIASIS (Elephantiasis)

Filariasis occurs in tropical and subtropical climates, and is transmitted by mosquito. It is easily prevented with prophalactic treatment with Diethylcarbamazine (Carbamazine) taken once every six months, while residing in tropical areas where filariasis is endemic. Carbamazine is usually easier to obtain in these tropical areas than in the U.S. Prevention of mosquito bites is advisable.

The presenting symptoms are often a cough from chest infiltrates, chills, fever, headache, and malaise may also be present. Filariasis causes obstruction of the lymphatic system, resulting in swelling. Elephantiasis, extreme swelling, is a late stage that usually only occurs in people residing in tropical areas, and only after repeated reinfection from filariasis-carrying mosquitoes.

INFECTIOUS HEPATITIS / HEPATITIS A

Hepatitis A is a viral infection of the liver acquired from contaminated food, water, and shellfish in areas of poor sanitation.

Travelers following the usual tourist routes are generally not advised to seek immune globulin protection. However, cruisers in tropical regions and in developing countries, who are bypassing the usual tourist routes, may be at greater risk for infectious hepatitis. People staying in areas with high incidences of hepatitis A should consider protection with immune globulin. This prophalactic intramuscular injection needs to be repeated every 4-6 months. In some countries immune globulin is available over the counter. It is advisable to receive this from a physician, otherwise use caution with dosages and method of administration. Trade names and dosages may vary from country to country. The U.S Government has a publication that has a table of immune globulin dosages depending on weight and your length of stay in high risk areas. See "Health Information for the International Traveler".

Prevention for infectious hepatitis requires avoiding contaminated foods, shellfish from contaminated water, and treating suspect water. Water should be considered contaminated and possibly harboring hepatitis, in areas with poor sanitation, for example, if there is a village up stream.

The illness begins with mild flu-like symptoms; anorexia, malaise, fever, nausea, vomiting and headache. It is during the initial 14 days of hepatitis that it is most contagious. The infection can be transmitted by direct contact, using the same dishes, poor hygiene and sanitation, lack of hand washing, and from kissing. Jaundice does not always occur with hepatitis. If jaundice occurs, the yellow eyes and skin appear 3-10 days after the flu-like symptoms, and may be associated with dark urine and itchy skin. Affected persons are no longer infectious once the jaundice is obvious. The jaundice peaks in 1-2 weeks, and the patient will start to feel better despite the worsening color.

Positive diagnosis of hepatitis involves blood tests. Antibiotics will not help hepatitis. Debilitating convalescence with listlessness, depression, and poor appetite may last from several weeks to four months. Care should be taken to ensure adequate

rest during this time to promote healing and prevent lasting liver damage. In severe cases, with significant fluid loss from diarrhea and with reduced fluid intake, one could become seriously ill. Encourage the patient to drink small amounts at frequent intervals, especially in hot weather. If significant dehydration should occur, medical help should be sought for intravenous fluid and electrolyte replacement. This can usually be accomplished even in poorly equipped medical facilities.

Hepatitis A virus is excreted in the urine, stool and saliva for the first two to three weeks. Appropriate isolation measures should be taken to prevent others from contact of infected matter.

The compromised liver function associated with hepatitis can be minimized by abstinence from drugs that are metabolized in the liver and from alcohol, for up to one year. A low fat diet is recommended with hepatitis because the liver is involved with its digestive process. Aspirin preparations should be avoided with hepatitis because of the possibilities of increased bleeding tendencies. Vitamin K injections are sometimes prescribed for bleeding problems. Vitamin K is a fat soluble vitamin that can be overdosed on. The principle food sources of vitamin K are leafy vegetables, pork, liver and vegetable oils.

For more information, refer to The Ship's Medical Chest.

BOTULISM - CANNED FOOD POISONING

Botulism is a highly dangerous food poisoning from improperly canned foods. Botulism can be acquired not just from ingestion of toxic food but from touch and inhalation of toxic fumes! The toxins affect the nervous system and progress to paralysis and respiratory failure. Prevention is essential:

Meticulous sterilizing technique for canning.

Careful can storage to prevent rust and punctures of cans. (Refer to Can Storage in Provisioning chapter.)

Careful inspection of cans before opening for signs of spoilage, bulging ends. Hissing or exploding contents on opening is definitive of spoilage.

Any suspect cans should not be opened and should be discarded, thrown overboard if at sea.

Cooking contents for 30 minutes will destroy botulin toxins.

Anyone who has ingested suspected food should make vigorous attempts to clear contents from their digestive system by vomiting, gastric lavages, laxatives and enemas to clear the bowel. Induce vomiting with ipecac or by tickling the back of the throat; alternative solutions if ipecac is unavailable - soapy water (handwashing liquid detergent); large volumes of salted water (1 teaspoon to 1 pint); strong mustard solution. After vomiting, activated charcoal dissolved in water to absorb any residual toxins. Caution when inducing vomiting that patient is alert enough not to inhale emesis. If poisoning signs develop, the victim must be evacuated as soon as possible to a hospital capable of managing respiratory failure by artifical ventilation.

Refer to The Ship's Medicine Chest for good details about botulism poisoning.

Honey should not be given to infants younger than one year due to a risk of developing an infantile variety of botulism.

APPENDICITIS

Odds are remote, but it is possible for somebody to have an acute appendicitis attack while offshore. It usually occurs in adolescents and young adults, especially if there is a family history of appendicitis. Prompt diagnosis and surgical intervention are vital. Only in rare cases will appendicitis subside spontaneously.

Apply ice to the abdomen, administer antibiotics (e.g., Ampicillin), and pain relief until you reach medical assistance. Don't give laxatives, enemas, or solid food to the patient. Refer to The Merck Manual.

Typically, the symptoms follow this pattern:

Cramping central abdominal pain

Loss of appetite, nausea, occasionally vomiting. If vomiting begins before

onset of pain then it's not appendicitis.

Cramps subside to a steady pain localized in the right lower abdomen.

Nausea and vomiting subsides with localization of pain.

Fever, rapid pulse, and cessation of bowel movements, or occasionally diarrhea.

Untreated appendicitis will most likely progress to diffuse abdominal infection (peritonitis) accompanied by shock. Appendectomy should never be attempted by unqualified persons. Prophylactic appendectomy is NOT necessary for the offshore cruiser.

SKIN PROBLEMS

CORAL CUTS

Small coral grazes can rapidly turn into nasty, lingering, infected lesions which leave a permanent scar if not taken care of properly. Best to try and avoid coral cuts and grazes! Should you cut yourself on coral, fine particles remain imbedded in the wound. These particles continue to grow in the tissues (because body tissue is of similar makeup to salt water) and cause inflammation and infection. Hydrogen peroxide is the most effective way of killing live coral and cleansing the wound. Scrub the cut hard with a cotton or gauze soaked in hydrogen peroxide. The solution won't sting the raw flesh but the scrubbing may hurt, and the peroxide should be allowed to bubble down deep for several minutes. Check to make sure no residual particles of coral are left in the wound. It's important that this initial cleansing is done as soon as possible to remove the coral particles and the infected slime that covers the coral. Alcohol preparations do not kill the coral and are painful to raw tissues. Antiseptics and antibiotics won't kill the living coral, either. Secondary bacteria infections, especially staphlococcus, may thrive in coral cuts. Sprinkle Tetracycline powder from capsules in the wound after cleansing with hydrogen peroxide.

Coral cuts heal best if kept dry, out of salt water, and are left exposed to the

air. They should be cleansed several times with hydrogen peroxide for the first 24 hours to kill any lingering coral particles. Scrub well again if you suspect more particles are left and apply more Tetracycline powder afterwards. Subsequent cleansing should be gentle so as not to rub off the new granulating cells.

Serious secondary infections are a common problem, especially in the tropics and in a marine environment. When venturing ashore, cover the cut if on the lower limbs or hands to prevent picking up dirt and shore bacteria or fungal organsims. Avoid plastic dressings because they don't breathe, keep the wound moist and don't stick well in the tropics.

Infectious organisms proliferate in warm moist environments and skin infections are a continual battle. Conscientious wound cleaning should prevent and clear up skin infections, without having to resort to antibiotics. Keep in mind that there are disadvantages in taking antibiotics and they should not be used randomly instead of wound cleaning. If a deep infection does develop, a full course of antibiotics may be necessary. Commonly used antibiotics for this type of infection are Tetracycline, a broad spectrum antibiotic, or Cephlosporin more specific to Staph infections. Refer to The Use of Antibiotics and Self Medicating, later in this chapter. If coral is still imbedded, the wound won't heal and will continue to fester for months despite the use of antibiotics. In this case, it may have to be opened up with a surgical blade and coral particles cleaned out thoroughly again.

PREVENTION

Always wear high top tennis shoes or boots when wading among coral and getting in and out of the boat.

Wear gloves when handling coral, anchor and chain, and when scrubbing the bottom of the boat.

Diving fins should have covered heels.

Avoid scraping yourself when diving among coral, or wear a wet suit or clothing.

CUTS, WOUNDS AND SKIN INFECTIONS

The constant warmth and moisture in the tropics makes for a luxurious growing environment for flora and fauna, as well as nasty infections. Even the smallest cuts and scratches can easily turn into huge purulent sores that take forever to heal, if not cared for properly from the beginning.

Any break in the skin should be immediately cleansed well with Hibiclens or Betadine and painted with an antiseptic such as iodine, methiolate or mercurichrome several times a day. It is very important to carry out this regimen conscientiously to prevent severe infections that may progress to blood poisoning. Dry wounds heal best if left open to the air. Cover only to keep the dirt out if going ashore, or if the wound is oozing. Avoid getting it contaminated or dirty.

The most common type of bacteria to inflitrate a wound is staphylococcus. If the wound gets dirty or there are any signs of infection, redness, pain, swelling or pus discharge apply an antibacterial ointment such as Bacitracin or sprinkle with Tetracycline powder from a capsule.

To help clean the wound and draw out infected matter apply warm compress, drawing agents, or soak in warm salty water. Compresses can be made with clean linen and hot water, taking care not to burn the skin. Apply for 15 minutes at least 3 times per day until the wound is clean and looks clear of infection. To help draw out the pus, mix a hot salt or epsom salts solution for the compress or to soak the wound in it. Magnesium Sulphate paste, or epsom salts with glycerol is a strong drawing agent for cleaning out infected wounds and boils.

Once an infection is established, with neighboring lymph node swelling and tenderness, any fever, chills, or general malaise, systemic (oral) antibiotics should be taken as advised by a physician.

Large deep wounds contaminated with dirt are at high risk of becoming infected. These may need prophylactic antibiotics in addition to extensive cleaning. A broad spectrum antibiotic that could be used such as Tetracycline or Vibramycin; or a

strong gram-positive (for Staph) Cephlosporin. Tetracycline is a potent drug and should be reserved for more serious infection; avoid giving it to children less than 13 years, as it discolors their teeth. Tetracycline can also cause severe sun sensitivity. Ideally, an infection should be cultured out before starting antibiotics to find which antibiotic it's most sensitive to. Because this often won't be possible while cruising, and it's most likely Staph, a good broad spectrum, or gram positive antibiotic should be taken for a full course of 10 to 14 days, e.g., Tetracycline, Cephlosporin, Penicillin, or Erythromycin. For more mild infections, Bactrim (a bacteriostatic, sulpha drug) will work without some of the side effects of the more toxic antibiotics, such as Tetracycline. Caution: some people are allergic to sulfa drugs. When putting together your medical kit, discuss with your doctor the types of antibiotics to carry on board. Refer to The Self Medicating and The Use of Antibiotics section in the end of this chapter. Avoid self medication when possible and research drugs first before commencing. The Merck Manual has a discussion of staphlococcus infections and antibiotics under Bacterial Diseases caused by Gram-Positive Cocci.

Other important factors in the prevention of skin infections and promotion of healing are good nutrition and personal hygiene. Try to avoid injury and always cleanse cuts thoroughly to prevent the establishment of infections.

SALT WATER SORES OR SAILORS BUMPS

These raised bumps which resemble small pimples are infected hair follicles. They are found most frequently on sailors' buttocks and are caused by salt water dampness and friction.

They can be prevented and cured easily. Don't sit around in damp salty shorts, and keep skin clean with fresh water and dry well. Wearing cotton shorts rather than nylon also helps. For more serious cases, antibacterial ointment such as Bacitracin helps. Pay attention to diet and hygiene, and sun those buns!

BOILS

These are more serious infections around hair follicles with deeper tissue involvement. Boils are not uncommon afflictions of sailors cruising in the tropics, especially when diet and hygiene are compromised or if general health is not optimal. They are localized, painful, hard red swollen areas that progress to a point.

Apply hot compresses to encourage the boil to form a head and discharge pus. Use salt, epsom salt solutions or drawing pastes described in the Cuts, Wounds and Skin Infections section. Apply Bacitracin ointment after the hot compresses.

Never squeeze the boil; that will spread the infection further into the tissues. When it comes to a head with a firm white spot in the center, the boil may be lanced with a sterile surgical blade, and compresses applied to draw out the pus. While it is draining, cover with a loose gauze dressing and Bacitracin ointment. When the drainage has stopped, leave the boil open to the air, to dry and heal. If the boil does not respond to treatment, or there are multiple boils or symptoms of blood poisoning (fever, chills and general malaise), systemic antibiotics should be taken. Consult with a physician for accurate treatment and assessment as there may be other more serious underlying conditions predisposing to recurrences of boils. Severe cases may require antibiotic injections. A 10 to 14 ay course of oral Erythromycin is often used, or other antibiotics for Staphlococcus mentioned in the Skin Infections section. Also refer to The Merck Manual and The Ship's Medicine Chest.

JUNGLE ROT

Jungle Rot (Tinea Versicolor) is a common yeast infection of skin which flourishes in the tropics, where it is often seen marking local island inhabitants.

Jungle Rot is characterized by round, blotchy areas of depigmentation. At first, it may look like a peeling suntan, but close inspection reveals loss of skin coloring in blotches.

To exterminate any yeast or fungus infection requires sustained, vigorous treatment. Immediate recurrences of Jungle Rot are common when the full treatment program is not completed. Just because the spots have disappeared doesn't mean the yeast has! But it can be cured by carrying out the following regimen religiously for two weeks. Though unattractive, the skin lesions are not debilitating, although occasionally they may itch due to heat or sweat.

If you self-diagnose Jungle Rot during a passage, or while cruising areas where fresh water is scarce, you may want to delay treatment until you reach a port with good fresh water supplies. The treatment regimen uses Selsun 2½% shampoo for the first week, and Tinver Lotion the second week. Both are available only by prescription. Selsun Blue shampoo is available over the counter, but is only one percent strength, and not sufficient.

First week: Wash in fresh water
Scrub Selsun shampoo all over body for several minutes
Leave on for 15 - 30 minutes
Rinse off with fresh water, dry well and keep skin dry
Repeat morning and night every day for one week religiously

Second week: After washing in fresh water, apply a thin film of Tinver Lotion all over the body twice a day. Do not rinse off. After swimming, rinse off in fresh water and apply the appropriate lotion.

TROPICAL SKIN FUNGUS

This may also be known as Jungle Rot in some places, but more commonly known as Ringworm or Athlete's Foot. Fungi flourish in humid tropical climates and can be persistent, with periods of exacerbation and remission. But they can be completely cured.

Tropical skin fungus frequently invades around dead tissues such as toenails and nair. It may occur on different parts of the body and look completely different in

different areas, from mild inflammation to strong reactions.

If possible, it should be specifically diagnosed by a skin specialist or physician experienced in skin fungus disorders and treated with the appropriate prescripton lotions and drugs. The medications will depend on the location of the fungus infection. Helpful non-prescription items are Tinactin or Lotrimin cream applied to location of the fungus infection, and Burrows Solution (a mineral cleanser) for daily soaks. Keep the area clean, dry and salt free.

For more details, refer to The Merck Manual and The Ship's Medicine Chest.

DEEP CUTS AND SCALP LACERATIONS

Sailors should not attempt suturing without proper instruction - may cause more serious problems than it solves. It would be better to use Steristrips to approximate the wound edges. These are thin strips of tape which are stuck to one side of the cut, pulled to close the cut and stuck down on the other side to hold the edges together. If the steristrips won't adhere easily, painting Tincture of Benzoid on the skin will assist.

Scalp lacerations bleed profusely and can usually be stopped by maintaining direct pressure. If bleeding continues, try twisting a dozen hairs together on each side of the cut, then pull the cut edges together by tying the strands.

PROFUSE BLEEDING

To control bleeding, apply direct pressure and maintain it. Don't remove the first pressure pad or it will pull away clots and aggravate bleeding. Elevate the affected area. Pressure to pressure points should only be applied in addition to direct pressure, and never at the expense of maintaining good direct pressure (pressure points are places where you can feel a pulse and compress the artery against the bone to reduce blood flow to the bleeding area).

Most people seem to know something about tourniquets, but don't realize they are potentially fatal. Tourniquets should be reserved for critical situations such as amputations. In the past it was advocated that tourniquets should be released every 20 minutes to allow some blood flow to keep the tissues alive. Today, the first aid experts, after evaluating the use and effects of tourniquets in the Vietnam War, now recommend otherwise. In practice, it was demonstrated that releasing the tourniquet allowed blood clots to circulate and cause potentially fatal pulmonary emboli (lug clots). Cases also occurred where people bled to death from the blood lettings. Latest first aid teachings recommend using all other methods to stop bleeding. Only use a tourniquet as a last resort in an extreme situation and do not release it. The reasoning being that it is preferable to lose a limb from complete stoppage of the blood supply than to lose a life from complications of releasing the tourniquet. Sustained direct pressure will usually stop bleeding, except in very rare or extreme cases. In isolated areas where no help is available, it may be a valid attempt to release a tourniquet after one hour. At this point, sufficient vaso spasm (constriction of blood vessels) and clotting may have occurred to prevent rebleeding, the tissues may not be too severely damaged from lack of blood and direct pressure may now be sufficient. If this single effort fails, make no further attempts to release the tourniquet.

Large losses of blood cause shock, necessitating fluid replacement. Refer to <u>The Ship's Medicine Chest</u>.

BRUISES AND IMPACT INJURIES

Elevate the injury above heart level and apply a cold compress immediately. The cold will constrict the blood vessels and reduce the intertissual bleeding, bruising and swelling. Apply ice or chemical cold pack wrapped in a damp cloth, but be careful not to freeze burn the skin. Ideally, keep the cool application on for the first 24 hours, then apply a warm pack to help reabsorption of the intertissual bleeding.

Use only non-aspirin preparations for pain relief of impact or bleeding injuries, because aspirin increases bleeding tendencies. This is particularly important for head injuries.

For fractures, refer to The First Aid Manual, Advanced First Aid Afloat, or The Ship's Medicine Chest.

Marquesa

NO-NO's, NOSEUMS, OR SANDFLIES

These particularly nasty creatures look and sound like mosquitos, but their bite causes the most ferocious itch which can last for weeks. When the bite is scratched, the poison inflitrates and may itch intensely for a week or more if continually scratched. These often turn into infected sores. If you can resist the over-powering desire to scratch this particularly violent itch, it will be short lived.

No-no's do not infest every tropical "paradise", their prevalence can depend on the weather. Warnings of infestation often spread by word of mouth among the cruising community and from locals. They are most prevalent at dusk.

This is our recommended course of action: Light mosquito smoke coils in the cockpit when anchored close to shore. Wear light long-sleeved shirts, trousers, and shoes to completely cover up when no-no's are known to be around; apply Cutter's insect repellent lotion.

A selection of remedies for the itch include: Calamine lotion applied frequently; ammonia or an antiperspirant deodorant that contains aluminum salts; baking soda mixed to a paste with water; or Adolph's meat tenderizer with alcohol. Other suggestions for repelling sandflies, that work for some people, are taking high doses of oral Vitamin B and applying Avon "Skin So Soft" lotion.

SUNBURN AND SKIN CANCER

Cruising usually means long periods of exposure to the sun. It's important

to think carefully about sun protection as you will be spending more time out in the blazing tropical sun than below decks. Parts of the sailor's body are always exposed to the sun, and there is a high incidence of skin cancer among sailors, particularly of the lips, face, ears, back of the hands, neck and shoulders.

Take lots of different sun screens with PABA, including number 15, some with blockout, and especially number 15 lipscreen. Keep lipscreen near the cockpit and use it frequently. Avoid suntan oils because they make decks dangerously slippery. Aloe Up

Have a couple of wide brimmed hats with ties, some light weight, long sleeved shirts with collars that can be turned up, light weight trousers and gloves. There will be times you will need to completely cover up while cruising in the tropics, both from sun while sailing and from mosquitos on shore.

Severe sunburn is best prevented, but can be helped with cold wet compresses and a local anaesthetic lotion such as Solarcaine.. Use Hydrocortisone 0.5 - 1% cream to reduce inflammation. It may also help relieve the pain. Aspirin or Tylenol may be necessary for pain relief.

People who are particularly sensitive to sun may increase their resistance by taking oral Paba. In extreme heat, wearing a wet terrycloth hat will dramatically assist cooling.

For comprehensive information on heat exhaustion, heat stroke and drugs that may precipitate heat stroke by interfering with sweating, and drugs that may cause photosensitivity, refer to Dr. Cohen's Healthy Sailor. Tetracycline antibiotic, sulfa drugs, phergan for nausea and water pills for high blood pressure can cause severe sunburning (photosensitivity).

MINOR BURNS

Prevention: In the galley, use a heavy plastic or rubber apron while sailing.

Secure pots on stove, don't fill higher than halfway and in rough weather use a pot with a lid that can be secured, for example a pressure cooker.

Treatment: Immerse burns immediately in cold water. Clean seawater or salt solution is preferable, with ice or chemical cold packs added. Soak until the heat dissipates, at least half an hour. Apply Silvadene ointment (Silver-sulfadiazine) thickly to the burned area and leave open to the air. If two burned surfaces are touching each other, between the fingers for example, place sterile gause between them. Soak burns in salt water several times a day and reapply Silvadene ointment.

Burns are very likely to become infected. Silvadene is an antibacterial agent that prevents infection of burns far more effectively than antibiotic cream. Care should be taken to prevent burn injuries from becoming contaminated.

Pain relief may be necessary, strength depends on the severity of the burn and perceived pain. Use Tylenol for moderate discomfort, or Tylenol with Codeine in worse cases. For more severe cases, a narcotic analgesic like Demerol tablets may be necessary.

Patients with extensive, severe burn have serious shock problems, which can be fatal. Fluid replacement is essential for shock. Give weak solutions of sodium bicarbonate (baking soda) and sodium chloride (table salt) slowly by mouth to the conscious patients. Refer to The Ship's Medicine Chest, Red Cross Advanced First Aid, and Advanced First Aid Afloat for information about administration of sterile fluids subcutaneously (under the skin).

GENITO-URINARY PROBLEMS

URINARY TRACT INFECTIONS AND CYSTITIS

This problem more often affects females. The symptoms include pain, frequent urge to pass water and cloudy urine that may have an abnormal odor.

The key to reducing painful symptoms is to dilute the urine by drinking several gallons of water per day, at least 2 large glassfuls per hour. This also helps to flush out the infection. Drinking cranberry juice, and taking high doses of Vitamin C 500 mg every 2 hours for 1 day will help. You must drink large amounts of water if taking high doses of Vitamin C.

If the symptoms do not start to clear after 2 days of this regimen, or if any back or loin pain develops, an antibiotic should be taken as prescribed by your doctor. A single, high dose regimen of Septra or Bactrim DS (Double Strength), 4 tablets is first choice, or Ampicillin 3.5 g, or Amoxicillin 3.0 g. These newer single dose regimens have some advantages over the 10 to 14 day antibiotic courses, but if the symptoms persist after the single dose regimen, the longer course should be completed. Septra DS 1 tablet twice daily x 10 - 14 days, or Bactrim DS.

Bactrim (Septra) are sulfur drugs and should not be given to people sensitive to sulfur. Patients should drink copious amounts of water during the course. Check with the doctor initially prescribing the antibiotics to see if you have any medical contra-indications for these drugs. If you have been successfully treated for urinary tract infections in the past, take that same medication with you, in case there are any recurrences. Refer to The Use of Antibiotics and Self Medicating section in this chapter, and The Merck Manual for drug choices and doses.

VAGINAL AND GROIN THRUSH

Thrush is a common yeast infection also known as Monilia. Its symptoms are a red, uncomfortable groin rash for men and an uncomfortable vaginal itch for women. In the tropics it is most frequently caused by wearing nylon underwear. Nylon creates an ideal, warm, moist environment for the yeast because it is non-absorbent and does not breathe.

Vaginal yeast often occurs when taking antibiotics, and some women are regularly plagued by yeast infections. Yeast colonies are normal vaginal flora, but infections can flare up with changes in acidity.

Prevention: Don't wear nylon underwear in the tropics. Wear 100% cotton, if any. Good hygiene; keep area clean and dry.

If taking antibiotics and you have history of vaginal yeast problems, lactobacillus

capsules inserted into vagina twice daily may prevent infections.

Women should avoid excessive douching and perineal washing with harsh soaps that may alter the normal pH.

Treatment: Apply Nystatin cream or powder for the skin rash; keep area clean and dry.

For vaginal yeast the best remedy is to insert lactobacillus capsules into the vagina morning and night for 4 days; or two weeks if infection recurs. (Lactobacillus is a yoghurt culture also known as acidophilus. Yoghurt can be used if capsules aren't available, though it's not always as effective because it may be difficult to apply. Lactic acid adjusts vaginal pH, making it difficult for yeast to grow.)

Other remedies that may help if your resources are stretched include: Betadine douche, 2 tablespoons per quart, twice daily. Nystatin vaginal suppositories twice daily for a week. Weak vinegar solution douche, 2 tablespoons per quart. Gyne-Lotrimin cream or vaginal suppositories. Douching with Boric Acid powder in solution.

KIDNEY STONES

While cruising in the tropics, we noticed an unusually high incidence of kidney stone problems among the cruising community, not only in people with a history of stones, but more often for the first time. The predisposing factors for kidney stones in these cases were:

The hot climate, increasing fluid loss which gives rise to more concentrated urine.

A sudden increase in highly acidic foods, particularly citrus fruits and mangoes which the sailor tends to over-indulge on after a long passage; red meats, or high doses of Vitamin C without accompanying high fluid intake.

In the tropics you need to drink more water than usual, at least 2 litres a day. The hotter it is, the more you exercise and perspire, the more you will need to drink. During voyages when water conservation was a consideration, we found we were less active and so didn't need to drink as much as when exploring ashore. Shortages, contaminated shore water, and unappealing tank taste pose problems when the cruiser needs to drink more water. Don't eat too much citrus fruit.

The features of kidney stones are:

Excruciating flank pain that radiates down abdomen to groin, caused by the spasm of the obstructed ureter.

Secondary infection.

Possible kidney damage from back pressure of urine into kidney.

Treatment includes:

Seeking medical consultation first, if available.

Pain relief, using a narcotic such as oral demerol.

High fluid intake.

Alkalization of the urine by abstaining from acidic food and fluids such as fruit juices, drinking water with baking soda added. (Use half a teaspoon of baking soda per quart, maximum of three teaspoons a day to prevent alkalosis problems.)

Strain the urine to check if stone is passed.

Treat any subsequent urinary infection.

Refer to The Ship's Medicine Chest and The Merck Manual.

Drink lots of water

EYE AND EAR PROBLEMS

PINK EYE INFECTION

As the common name suggests, the eye becomes bloodshot and irritated by this highly contagious infection. It is usually caused by a virus, which generally runs its course leaving no residual damage. Frequently it is followed by a secondary bacterial infection that can lead to permanent eye damage if left unattended.

To treat pink eye use Sulfacetamide eye drops and 0.5% Erythromycin ointment three times a day as prescribed or Cortisporin Ophthalmic Drops or ointment. Some people are sensitive to sulfa drugs. If eye condition deteriorates after a copus of days of using Sulfacetamide drops, discontinue use. Soaking the eyes with warm saline or a boric acid mixture will also assist in healing and soothing.

Be extremely careful not to spread the infection. Wash hands carefully and only use individual towels.

PTERYGIUM AND RETINAL BLEACHING

Pterygium or sunburn growth on the eye is not uncommon among cruising sailors, fishermen, lifeguards, snow skiers and atoll dwellers. On atolls you will notice that most of the old people have very poor eyesight from a lifetime of harsh glare.

Ultra-violet rays, wind and dust irritation cause a scar tissue to grow across the cornea. It may go undetected for many years until it spreads across the pupil and obstructs vision. However, it doesn't take a lifetime of tropical cruising to develop Pterygium. One year of intense exposure without good eye protection is enough time for susceptible sailors to develop Pterygium.

Prevention is easy - always wear good sunglasses. Dark glasses with reflective mirror on the lenses and soft leather side patches are best for sun glare off of the water. Ask an optician for advice on lenses good sungalsses. They are expensive but worth it if you're planning an extended offshore voyage. Take a second (less expensive) pair, too.

Another sun related eye problem sailors should be aware of is sunburn bleaching of the retina inside the eye. This may be aggravated by reading in the sun - or wearing inferior sunglasses that are dark enough to dilate the pupil but do not filter out the damaging rays. Blue eyes are the most susceptible to the retinal sunburn.

EAR INFECTIONS

EXTERNAL EAR INFECTIONS

The incidence of recurring "swimmers ear" can be reduced by prophylactic use of drying drops after swimming. You can make them by mixing one third white vinegar

with two thirds rubbing alcohol. Use a couple of drops in each ear, followed by antibiotic drops or some two percent acetic acid (vinegar).

External ear infections are usually caused by an infected hair follicle, like a pimple. Symptoms include itching and pain, especially when pressure is applied around the outside of the ear canal (this will usually help distinguish an external ear infection from a middle ear infection). Sometimes there may be a discharge.

Treatment: Look down the ear canal (pull ear up and back) to check for any redness or swelling.

Apply hot compresses to the ear taking care not to burn the skin.

Pain relievers such as aspirin or Tylenol may be needed.

For diffuse external ear infection an antibiotic with steroid optic drops should be used as prescribed. Such as Cortisporin.

MIDDLE EAR INFECTION

These most frequently develop as a complication to colds and tonsilitis. Bacteria from the nose and throat can reach the middle ear through the eustachian tube (connecting canal for equalizing pressure), especially when diving. Don't dive with a cold or sore throat.

Symptoms are deafness, intense pain and throbbing from pressure of pus build up inside the ear. The ear drum may rupture causing dramatic relief and drainage of pus.

Obtain medical advice if there is persistent pain, pus or fever. Antibiotics may be needed to prevent more serious complications. Commonly used oral antibiotics include Penicillin V, Erythromycin or Ampicillin. Refer to The Ship's Medicine Chest and The Merck Manual.

DANGEROUS MARINE ANIMALS

CIGUATERA FISH POISONING

Ciguatest - will test fish for ciguatera

Ciguatera affects reef fish sporadically and unpredictably between latitudes

35° North and South. The type and location of poisonous fish varies even in one lagoon and may change at different times.

There is no sure way to tell if a fish has ciguatera and cooking will not destroy the toxins. Some island cultures test fish for ciguatera by feeding it to a cat first.

Fish most often affected are barracuda and red snapper. Pelagic (ocean going) fish are least likely to be affected. The toxin is cumulative so larger fish, which are higher on the food chain, are more poisonous. Eating a small portion of the affected fish may not produce symptoms, but eating more at a second meal could increase the toxin levels enough to produce poisoning.

Ciguatera poisoning affects the nerves and gastrointestinal system. It is fatal in three percent of cases in the Pacific but rarely in the Caribbean. Signs and symptoms can start immediately or up to 30 hours later. Severe cases may occur earlier and milder cases may be precipitated by alcohol ingestion. Clinical features include:

General weakness; tingling and numbness, especially of face, hands and feet; respiratory failure in severe cases.

Reversal of temperature perception - hot feels cold and cold feels hot.

Red itchy rash and sometimes wheals.

Varying degrees of gastrointestinal symptoms: nausea, vomiting, diarrhea and/or abdominal cramps.

Uncomplicated episodes usually subside in 24 hours, but residual weaknesses, numbness and temperature perception reversal may last for many months. Flare ups may occur with ingestion of alcohol or more ciguatera toxic fish.

Prevention is the best course of action:

Check with knowledgeable locals on types and location of safe reef fish.

Eat only smaller reef fish, testing with a small portion first.

Avoid ingesting fish organs as these have higher levels of toxin than flesh.

Never eat tropical moray eels because they have a high incidence of ciguatera.

Test the fish on an animal or adult, as children are more susceptible to ciguatera poisoning.

Treat as follows:

Induce vomiting (see under Botulism) and use laxatives to remove any remaining unabsorbed toxins.

Bedrest and reassurance.

Resuscitation in extremely severe cases.

Medical assistance and hospitalization for observation of all but mild episodes.

Book References: The Ship's Medicine Chest under poisoning, and Dangerous Marine Animals.

PUFFER FISH POISONING -- don't eat fish without scales

Puffer fish are highly toxic if ingested. Fortunately, they are easy to identify by their ability to inflate themselves with water or air. All varieties throughout the world are poisonous, including porcupine and ocean sunfishes.

JELLYFISH STINGS

These are a problem in some places at certain times of the year, particularly in the western Pacific and Australia. Look before you jump into the water!

Jellyfish strands have capsules which adhere to the skin and release stinging toxins, especially when rubbed. Red patches, linear marks and blisters may accompany the intense stinging. Symptoms are usually short-lived, depending on size of jellyfish and the extent of stinging. Some types are quite lethal, especially Sea Wasp (Box Jellyfish), found almost exclusively around Australia and the Philippines. Sea nettles are another type of jellyfish. They are translucent strands that may be encountered mid-ocean when swimming or having a salt water bucket bath, or when snorkeling near shore. Treatment is the same as with other types of jellyfish.

Do not rub the affected area or apply fresh water; this will release more

toxins into the skin. Lycra Body Suit

Apply a drying agent before attempting to remove the jellyfish strands. These include alcohols, ammonia, baking soda, flour, and hot sand. Scrape tentacles off carefully with a knife or tweezer. Wear gloves, not bare hands.

To reduce the stinging, apply either local anesthetic ointment, ammonia, alcohol or Adolf's Meat Tenderizer (a papaya extract) mixed to a paste with alcohol or water. Occasionally susceptible people may have severe allergic reactions, requiring resusitation and steroids.

Keep a good reference book on board, such as Dangerous Marine Animals by Bruce Halstead.

ALLERGIC REACTIONS

Anybody who already suffers from allergy problems is a greater risk. Allergic reactions vary from a mild rash to lethal anaphalactic shock. Almost anything can cause a severe allergic reaction, including shellfish, jellyfish and drugs, especially penicillin.

Prevention: Record any allergies in the ship's medical log, noting location and dosage of their specific allergy medication. Take special note of any drug allergies. A rash or any other unusual side effects from a drug should warn not to use it again.

If anyone on board has a history of severe allergic reactions which have required hospitalization, you should have special instruction on how to administer Epinephrin (adrenalin) and hydrocortisone by injection. Epinephrin is a potentially lethal drug. Administration and dosages are critical. A single dose delivery system is now commercially available.

Recognize the early signs of a severe allergic reaction:

Sudden anxiety and restlessness

Pounding headache

Intense itching, especially of hands and feet

Shock

Hives

Swelling, especially around eyes and face

Nausea, cramping and abdominal pain

Difficulty breathing

Treatment: In cases of mild to moderate reactions, remove the allergen, and apply antihistamine or Calamine lotion. Giving an antihistamine drug immediately may prevent a more severe reaction. Keep Benadryl antihistamine on board; you can also use seasickness antihistamines such as Dramamine. With allergic reactions, speed is vital. You may also have to treat for shock - maintain the airway and elevate the legs.

Refer to First Aid Afloat, The Merck Manual or The Ship's Medicine Chest.

HYPOTHERMIA

Hypothermia refers to the condition when the body's temperature is below the normal range. When the body's temperature starts getting low it cools from the outside first. Blood is shunted away from the skin and periphery to the core and vital organs. If the temperature gets dramatically low and the body's vital organs become hypothermic, it becomes a serious situation that can lead to death. Body heat is lost quickly when immersed in water that is cooler than the body's temperature.

Man overboard poses the most critical problems for hypothermia to the offshore sailor. In water temperatures of 55°F (13°C) there is a 50% chance of survival after only 2 hours of immersion. Even in warm tropical waters, severe hypothermia can occur in time. All sailors should be aware of hypothermia, its prevention, how to recognize early signs of exposure, and how to correctly and most effectively rewarm somebody suffering from hypothermia. Avoid man overboard and hypothermia situations in the first place.

Key factors to reduce loss of body temperature when immersed in water are:

1. Get as much of your body out of the water as possible. Personal flotation devices are important for assisting this.

2. Move as little as possible. Treading water and swimming rapidly burn up

energy and heat.

3. Assume a huddled position to reduce water flow around the body, especially around the head, trunk and groin. A large proportion of body heat is lost from the head. A head covering of some sort can greatly reduce this heat loss.

TREATMENT OF HYPOTHERMIA

With mild hypothermia, the patient may be rewarmed externally, but in severe hypothermia this will steal blood from the vital organs, making the situation more lethal.

Rewarming for mild hypothermia:

Hypothermia may be considered mild when the affected person is alert enough to still be able to talk. Extreme shivering may be evident.

- Remove wet clothing and replace with dry clothes or blankets.

- Give hot drinks. Avoid caffeine and alcohol.

Rewarming for severe hypothermia:

With severe hypothermia the survivor should be ideally warmed internally. The person is getting beyond the shivering stage, muscles will be becoming rigid, and the victim may be amnesic, incoherent, confused, or semiconscious to unconscious. His/her breathing and heart rate will slow dramatically with profound hypothermia.

In a hospital core rewarming can be achieved by the administration of warm intravenous infusions, dialysis, warmed air to breath, and with warm gastric lavages.

On a boat, practical methods of rewarming internally cannot be achieved as effectively. Actions that can be initiated on board include:

- Handle the victim very gently, so as not to stimulate lethal cardiac disrhythmias. Clothes may need to be cut off.

- Warm the trunk and head with warm to hot wet towels. If you have the means to immerse the person in warm water, keep their arms and legs out of the water to help prevent stealing of blood from the core organs to the periphery. Otherwise,

lethal afterdrop phenomena may occur. Immersion rewarming should be done gradually using water no hotter than 105° - 110°F (40° - 43°C). Buddy warming is done by naked person to person contact restricted to the trunk. This can be achieved best in a sleeping blanket or sleeping bag. These methods are not core warming first, and in extreme hypothermia are not ideal.

- Having the victim breath warmed air will promote rewarming internally. This can be done by boiling water and fanning the steamy air for the patient to inhale. Extreme caution should be taken not to burn the victim. Don't hold the steaming water too close and test with yourself first. Exhaling your own breath into the victim's face in unison with their breathing will deliver prewarmed air to them.

- Breathing and pulse rate will be slow and difficult to detect in the severely hypothermic victim. Check for two minutes before commencing CPR (cardiopulmonary resusitation). CPR delived to these patients if a cardiac rhythm is still present may precipitate lethal cardiac disrhythmias.

Rough weather sailing can cause problems of exposure from reduced body temperature and should be anticipated and avoided. Exposure and fatigue lead to impaired judgment which could result in loss of life and the boat. In these conditions it is essential to keep dry, protected from the wind, and to keep up an intake of hot food and drinks. Dressing in layers with polypropolene underwear and/or woolen clothing and 100% water and wind proof fould weather gear is essential for the offshore sailor. Good boat equipment, preparation, continued preventative maintenance, and planning will greatly reduce the need to be out in exposure-inducing weather. Refer to Dr. Cohen's Healthy Sailor, Cold Water Sailing chapter. Also, Hypothermia: Causes, Effects, Prevention by Robert S. Pozos and David O. Born, published by New Century Publishers, Inc., 1982.

DIAGNOSING, THE USE OF ANTIBIOTICS, AND SELF MEDICATING

Avoid self treating and medicating. Always obtain professional medical advice when possible, locally or via your radio.

Good preparation with first aid classes, etc., and a well-stocked medicine chest are essential.

Follow an orderly, methodical pattern for medical problem solving and treatment planning.

1. GATHERING DATA - Find out all the information that led up to the problem, all the symptoms and any other physical changes. Examine the affected part and find out if the person has had anything like this before. Refer to The Ship's Medicine Chest chapter on Physical Examination. Check patient's drug allergies. Record all assessment findings as this will be helpful for your own evaluation and to any practitioner to have available. A complete and accurate accounting of the progression of signs and symptoms, the starting and stopping of any medications, etc., should be logged on a day-to-day basis. This is best recorded in the medical log. Only in this way can effective evaluation, both on-going and retrospective be effective.

2. ASSESSING - Spend time assessing data collected. Research thoroughly through medical books, especially the chapters relevant to the affected part. Question the patient for symptoms mentioned in the book but not suggested by patient. Significant minor symptoms may go unnoticed when another is dominating the scene. For example, back pain can easily be attributed to a muscular strain from lifting, and urinary symptoms which would suggest a kidney infection may be overlooked. Seek the advice of medical persons on land, other yachts, and via the radio. Remember to assess the whole person and not just the troublesome symptoms.

3. TREATMENT PLANNING - If properly researched, and using all the resources available, an intelligent intervention can be formulated.

4. IMPLEMENT YOUR TREATMENT PLAN - Follow the guidelines outlined in your medical references and from medical advisers. Log treatments, the stopping and starting of drugs and their effects.

5. EVALUATION - Evaluate and re-evaluate the effectiveness of your treatment and the progress of the problem.

The misuse of antibiotics leads to a multiplicity of problems. They should not be used randomly. Remember, any drug taken has some potential adverse toxic effect on another part of the body. Try other treatment measures before resorting to self medicating with antibiotics. For example, keep cuts clean to avoid infections.

Read all information about the drug. When having prescriptions made out, ask the pharmacist for the accompanying drug company flyer. Be aware of the drug's side effects, toxic effects, allergic reactions and how to deal with them, contra-indications, recommended dosages, course duration, and whether to take before or after meals. For maximum absorption, some antibiotics need to be taken one hour before meals, while others with food to reduce gastric problems. Tetracycline irritates the stomach and should be taken with meals, but not milk because the calcium binds with it, reducing

the absorption. Aspirin is a gastric irritant and should never be taken on an empty stomach.

Different doses may be required for different people, because the mechanisms by which the drug is absorbed, utilized and removed from the body can vary with age, weight and other underlying conditions. Children always require proportionally smaller doses. Check the drug literature. One fairly safe way to determine medication doses for children is to determine the adult dose and give the child a dose in proportion to his weight compared to that of the average adult (154 lbs.). For example: A child weighing 75 pound, weighs roughly half that of an average adult, so give one half the usual adult dose. Use the same time intervals and maximum number of doses as for adults.

The antibiotic must be taken for the complete course. The most common problem is that people discontinue taking the drug as soon as they start to feel better, and before the underlying infection is corrected. This leads to a relapse, often more serious than the original condition. The antibiotic should be continued for the recommended time, plus 4 days after the fever subsides.

Increased water intake is necessary while taking an antibiotic to reduce its toxic effect on the kidneys.

Time the administration of doses evenly around a 24 hour clock to maintain a constant blood level of the drug.

Don't drink alcohol while taking any drugs. It may react severely with, or inhibit the action of the drugs.

Antibiotics are noted for allergic reactions. The degree of reaction may vary from hives to severe anaphalactic shock with circulatory and respiratory collapse and death. Some people are more susceptible to having drug allergies than others. If you have received a particular type of antibiotic once before, it doesn't necessarily mean you won't have a reaction next time that you take that same drug. A slight reaction after taking a drug may be followed by a much more severe reaction after a subsequent exposure to the same or a related drug. People who already have

allergies are more susceptible to have drug allergies. Know how to recognize an allergic drug reaction and how to deal with it. Benedryl is an oral antihistamine you should have on board for such reactions.

Some drugs interact adversely with one another. If you are already taking a medication, check that it is compatible with the one you wish to commence taking. The package insert accompanying the drug lists the most significant drug and food interactions.

When reading the drug literature, don't be too alarmed by the long list of toxicity and side effect reactions. It may seem as if no one should use the drug, but all possible reactions are usually listed even though some of them are quite rare.

Tetracycline antibiotic can cause photosensitivity which means you are more highly prone to severe sunburn. While taking Tetracycline, keep covered up from the sun.

Silica gel packages absorb moisture and are good to place with drugs and medical supplies. The moisture can be removed from the silica gel packages by putting them out in the sun, then they can be reused.

Log expiration dates and plan where to restock in advance. Tetracycline is unstable and becomes toxic when expired.

PASSAGE BLAHS & EXERCISE

Passage blahs is a term indigenous to offshore cruising sailors, referring to the lassitude and depressed motivation and mood that can occur when boatbound during ocean passages.

After the intensely busy time preparing for long ocean voyaging, sitting on the boat mid-ocean, waiting for the next port to loom over the horizon can take some getting used to. The transition from a routine, and often stressful lifestyle with constant demands and interruptions, to an unscheduled, take one day at a time lifestyle, can be difficult for some bluewater adventurers. With these changes plus a general decrease in physical activity, "passage blahs" can occur. While the passage itself

can be hectic at times, it can also be boring, counting down the days to landfall. However, with an accepting attitude, it can also be a truly treasured time for oneself to reflect and contemplate; to meditate.

Suggestions to help adjust to these changes while cruising include:

1) Exercise daily while at sea. By being very creative and trying out different variations, many aerobic exercises can be adapted for safe onboard workouts. These should not be attempted on deck, but in the cockpit or cabin and always holding on to a secure fitting in anticipation of those stray lurches. Many exercises can be easily executed while sitting or lying in the leeward side of the cockpit or on your bunk. Soft weights that can be strapped to limbs are safer to use than hard free weights. Some cruisers use pedal driven generators during passages to maintain cardiopulmonary condition. It is amazing how much better you feel and sleep when you do work outs during passages.

2) Everyone onboard should be responsible for some important task and involved with the management of the boat. Children usually do better when included also. This participation will promote a sense of accomplishment for greater individual fulfillment while cruising as well as filling the time void. Some jobs that crew members can take on responsibility for are: weather plotting, navigation, ham radio operation, the checking of rigging and equipment, cooking, or log-keeping.

3) Take books and projects along with you to work on during your passage time. It's a good time to learn about the country you're sailing to and to even learn some of their local language. It may also be a time to learn macrame, knitting, crocheting, or other handcrafts, or to learn to play the guitar.

RECOMMENDED DRUGS

The extensiveness of drugs necessary to have on board will vary greatly among

different cruisers. It will depend on:

- the remoteness and degree of medical assistance available in the areas you are planning to cruise. The type of climate you're planning to cruise in, i.e., tropical conditions have different types of medical problems than cooler climates.

- your underlying health status, age, and familial medical history, i.e., if there's a strong familial history of heart disease, extra emergency cardiac drugs and supplies may be recommended by your physician if you are in the high risk age group. Extra training in the use of these would also be necessary.

- the length of time you plan on cruising.

The suggested drug list is only a guide for the blue water cruiser. Individual additions and subtractions will be necessary and should be done in collaboration with a doctor who understands the needs of your offshore cruising adventure.

Before commencing treatment with prescription drugs always seek medical advice first where possible. Avoid self treating and read the section on Diagnosing, The Use of Antibiotics, and Self Medication. Check for drug allergies before commencing. Read the drug literature and look them up in your medical references before starting treatment course. Follow the directions carefully for dosages and the frequency with which it should be taken.

Keep a copy of the prescriptions on board for proof that drugs were obtained legally. This may be checked for narcotics in some countries.

The use of drug trade names throughout this medical chapter is for identification only and does not imply endorsement by the authors.

* = prescription drug only

ANTISEPTICS AND SKIN PREPARATIONS

- Hydrogen Peroxide. For cleansing coral cuts.
- Surgical cleansing lotion (i.e., *Hibiclens. pHisoHex may cause photosensitivity).
- Povidone-Iodine (i.e., *Betadine, a skin disinfectant).

- Antiseptic paint (i.e., *Methiolate or mercurichrome).

- Tincture of Benzoid. When painted on the skin promotes adhesion of steristrips and dressings.

- Magnesium Sulfate (epsom salts). Drawing agent for compresses or soaking of infected wounds. May also be used as a laxative.

- Bacitracin topical ointment.

- *Sulfadiazine Silver Cream 1%. (Silvadene 1%.) For topical application on burns.

ANTIBIOTICS

- *Septra DS (double strength), Bactim DS.

- *Ampicillin 250 mg caps (optional).

- *Erythromycin 250 mg caps. A good substitute for persons allergic to penicillin.

- *Penicillin 250 mg caps.

- *Tetracycline 250 mg caps. Photosensitivity caution. Toxic if expired. Discolors children's teeth.

- *Cephalosporin (Cephradine) 250 mg caps. (Staph)

- *Cortisporin Opthalmic drops or ointment

- *Cortisporin Optic drops

ANTIFUNGAL

- *Selenium Sulfate 2.5% (Selsun 2.5% Shampoo).

- *Tinver Lotion

- *Tinactin Cream

- *Lotrimin Cream, Gyne-lotrimin cream and/or pessaries

- *Nystatin (Mycostatin) cream and/or pessaries

- Boric acid powder.

- Acidophilus capsules or powder (Lactobacillus, yoghurt culture).

- Burrows solution

ANTIHISTAMINES

- Calamine lotion
- *Hydrocortisone cream 1%
- *Benadryl 25 mg tabs
- *Epinephrine 1:1000 1cc amp. This is a lethal injectable drug for emergency use only, for the treatment of severe allergic reactions and cardiac arrest. It should only be administered by persons with prior medical training on its correct use and method administration. When persons on board are known to have severe allergic reactions, this type of instruction should be sort.
- *Hydrocortisone Sod. Succ. 100 inj. The same extreme use and precautions as with epinephrine apply.

PAIN RELIEF

- Aspirin. Preferably enteric coated. Caution: take with food as it is a gastric irritant. Don't give with impact injuries.
- Acetaminophen (Tylenol).
- *Acetaminophen with codeine (Tylenol ##).
- *Demerol tabs 50 mg.

ANTI-MOTION SICKNESS

- Antihistamines for mild seasickness. May also be used for allergic reactions and as a sedative for insomnia (e.g., Dimehydrinate - Dramamine, Audrumin, Nauseatol)
- *Cyclizine (Marezine, Antivert, Bonine, Meclizine, Melozine, Ancoloxin, Bonamine, Ancolan)
- *Transderm Scopolamine, skin patches
- *Prochlorperazine (Compazine) suppositories

or

- *Phenergan suppositories or tablets

Alternative options

- Ginger powder capsules
- Acupressure wrist band

GASTROINTESTINAL PREPARATIONS

- Baking soda. Galley supply.
- Glucose and Electrolyte powder (i.e., Gatorade).
- Kaopectate for diarrhea
- Antacid (i.e., Aludrox, Maalox, Mylanta)
- IPECAC to induce regurgitation of non-corrosive poisons
- Activated charcoal tabs. Abosrbs toxins, used with poisoning.
- Senekot. Mild vegetable laxative.
- *Doxidan. Laxative, stool softener and increases intestinal motility
- Enema (Fleets). Reusable.

MISCELLANEOUS

- Water purification (i.e., chlorine [Clorox], iodine tabs or tincutre).
- Insect repellent (i.e., Cutters' and smoke coils).
- Papaya extract (i.e., Adoph's meat tenerizer). For jellyfish stings.
- Ammonia (i.e., household cleaning variety). For stings.
- Sun protection. A variety of sunblocks, especially lip screen. After sunburn, pain reliever (i.e., Solarcaine).
- Vitamins (i.e., multivitamins with chelated minerals, Vitamin C 500 mg, chelated iron compound).
- Rubbing alcohol. for swimmers' ear, mix 2/3 alcohol with 1/3 white vinegar.
- *Valium 5 mg tabs.

OPTIONAL DRUGS THAT MAY BE APPROPRIATE FOR SOME CRUISERS:

- Ibuprofen 200 mg (Advil). Anti-inflammatory for tendonitis, muscular strains

with associated inflammation, arthritis, and menstrual cramps.

- Gamma Benzene HCL 1% cream, for treatment of head lice and scabies. This may be appropriate if you have children on board if they attend local schools or mix with local children.

- *Pyrantel Pamoate (Antiminth) for intestinal worms.

- Diethylcarbamazine (Carbamazine). Filariasis prophalaxis. Obtained almost exclusively in tropical areas.

- *Chloroquine phosphate (Aralen phosphate) antimalarial treatment. Refer to Health Information for the International Traveler.

RECOMMENDED MEDICAL SUPPLIES

- Alcohol prep packets
- Adhesive bandages (i.e., Band Aids)
- Surgical adhesive tape, several varieties of types and widths
- Bandages: 1" guze; 2", 3" and 4" crepe; 4" and 6" elastic (Ace)
- Sterile dressings: 2"x2"; 4"x4"; large battle dress
- Catheter, French sterile tray, including all insertion equipment (optional)
- Sterile cotton absorbent balls
- Gauze pads: 2"x2"; 4"x4"
-Splints, finger and wire mesh
- Steristrips, instead of sutures
- Syringes; 3cc, 5cc, 10cc. These should only be used by specially trained persons, otherwise more harm than good can be done. Oral demeral will work sufficiently instead of attempting to inject local anaesthetic. Syringes are better suited for boat projects (i.e., refilling compass fluid).
- Hypodermic needles, same applies as with syringes
- Thermometer
- Triangular bandage

- Surgical scrub brush
- Forceps
- Sterile scalpel blades
- Dressing scissors
- Safety pins
- Chemical cold pack
- Douche bottle, reusable

RECOMMENDED ON BOARD MEDICAL REFERENCES

Essentials:

The Ship's Medicine Chest and Medical Aid at Sea. U.S. Public Health Service. HEW Publication No. (HSA) 78-2024. United States Government Printing Office, Washington, D.C. 1978. 462 pp. Is currently being updated.

The Merck Manual of Diagnosis and Therapy. 14th edition. Merck & Co., Inc. Rahway, N.J., U.S.A.

Dr. Cohen's Healthy Sailor Book. Michael M. Cohen, M.D. International Marine Press, Camden. 1983. Out of print but available from Seabreeze Books, San Diego (address on resourse page)

Dangerous Marine Animals. Bruce W. Halstead, M.D. Cornell Maritime Press. 1980.

Advanced First Aid and Emergency Care. American Red Cross for the instruction of advanced first aid classes. 2nd edition, 1979. Doubleday & Co., Inc. Garden City, NY

Health Information for International Travel. U.S. Department of Health and Public Services. Stock # 017-023-00184-1
For sale by the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402. Cost: $ 5.00 PHONE: (202) 783-3238

ADDITIONAL REFERENCES

Merck Medical Dictionary. P.O. Box 2000, Rahway, NJ 07065.

Medicine for Mountaineering. Edited by James A. Wilerson, M.D., The Mountaineers 715 Pike Street, Seattle, WA 98101. 1975. ISBN 0-916890-06-6.

Guide to Clinical Care in Isolated Environments, GEOMET Technologies, Inc. 1801 Research Boulevard, Rochville, MD 20850. 1980. R.F. Fussel, MD, co-author.

Advanced First Aid Afloat. Peter F. Eastman, M.D. Cornell University Press, Centerville, MD 21617. 1974.

DENTAL
Preventative Maintenance, Emergency Care

Check Up - Before embarking on a long distance cruise have a full dental check-up, including full jaw x-ray and or plate x-rays, a check of old fillings and a good cleaning! Don't leave this appointment to the last week incase work needs to be done. Root canals take several weeks to complete. If a dentist doesn't have the follow up time to do such work he may have to pull a tooth that could cause problems at sea. Discuss your cruising plans with your dentist in regards to preventative maintenance and future work that may need to be done.

Preventative Maintenance - Clean your teeth after all meals, floss once a day. Avoid sugary foods and drinks. When possible have a dental check up and cleaning at least once a year.

Pago Pago, American Samoa has an excellent clinic but often has at least a month waiting list for routine dental care. If you are in pain they will take care of you immediately.

On Rarotonga Island in the Cook Islands dental work is inexpensive, but is not recommended for complicated work such as root canals.

The care given in French Polynesia may not be up to American standards.

New Zealand and Australia are good places to have dental work done.

Emergency Care - When you are at sea, or a place where there is no dentist, we recommend referring to the book: Where There Is No Dentist by Murray Dickson available from: Armchair Sailor Bookstore in Seattle. or from The Hesperian Foundation P.O. Box 1692, Palo Alto, CA 94302

Also ask your dentist to put together an emergency dental kit, and instruct you in its use, or purchase: Dentimedic's Dental Emergency Kit: $25.95 plus $2.00 shipping.
Dentimedic
102 Eighth Street
Pocomoke City, MD 21851 (301) 957-0788

Dentimedics kit provides information and medication to relieve most common dental emergencies, such as toothache, a lost filling, a lost cap or bridge, broken denture, mouth ulcers, or dislodged teeth. The kit contains medications for toothache and minor mouth irritations, and a material for temporary filling cementation.

In addition to what the kit contains, consider carrying *Tetracycline or *Penicillin antibiotics for the treatment of acute dental abscess. (See medical section of notebook re: administration and sun sensitivity to antibiotics.)

For acute dental pain resulting from broken tooth or abscess consider carrying *Demerol or *Percodan on board. For less severe pain *Codeine # 3 or Tylenol with *Codeine #3, for moderate discomfort: Aspirin or Tylenol.

*Prescription Drugs.

MISCELLANEOUS BOATKEEPING HINTS

To avoid chaos and confusion belowdecks, no matter what the size of your boat:

* Have a designated place for everything, and always return items to the same spot after use. This is critically important for gear like bilge pump handles, tools, emergency rigging spares, etc.
* Stow frequently used items in easy-to-reach places. What you can't get to easily may become forgotten and moldy. (See stowage plan in Provisioning / Cooking section of notebook)
* Do one project at a time, finish it and put it away before starting the next.
* Don't bring unnecessary clutter aboard; your rock collection could become a lethal projectile when a rogue wave strikes. Remember that you'll probably be purchasing woodcarvings, baskets, artwork, and gifts along the way, so leave room when you're outfitting for unexpected additions.

Bathing and Cleaning:

* Bathing on passages, "The Great Debate"; If fresh water is in short supply, wash with seawater and dry off immediately with a towel. If you can afford the fresh water, rinse off with a couple of cups of water before the salt has had time to dry to your skin. The option that we prefer is to put a few cups of fresh water into a bowl, scrub down with a lightly-soaped wash cloth and then rinse off with a modest amount of fresh water. By carrying two extra five-gallon flexible water jugs in the cockpit, we have enough water for a fresh water shower every day and a shampoo every other day on most passages. This keeps towels, clothes and bedding from getting salty.
* In the tropics we either air dry after a shower or use small terry hand towels for drying off. Small towels take up a lot less space and dry out much quicker than thick bath towels. Smaller towels also require considerably less water to launder.
* Showering in the cockpit or on deck in warm weather helps keep down moisture and mold in head below. Many bar soaps leave a scum in the cockpit or shower, we've found that biodegradable liquid soaps work better on boats.

Avoid getting salt water below:

* Rinse off on deck after swimming in salt water. Don't drip salty clothes below. Dried salt crystals attract moisture and grime to the inside of your boat as well as corroding metals and electronics.
* Have a professional upholstery cleaner steam clean your carpets and cushions with the foam still inside. In between cleanings taking cushions outside in the sun to bake out moisture then vacuuming or brushing helps get rid of salt crystals.
* Synthetic fabrics such as nylon or polyester with a stiff backing hold up best as cushion covers. Breathable vinyl and ultrasuede are also suitable. The drawback with some synthetic fabrics is that they are hot or scatchy feeling against bare skin. By covering them with cotton or terry cloth slip covers your cushions will feel cooler and stay cleaner underneath. The slip covers are made like a fitted sheet with elastic in the corners. Natural fibers like cotton, linen and leather may be fine on luxury climate controlled yachts but hold moisture and tend to mold and rot with heavy use in a marine environment.

* A 12 volt car vacuum, Dust-Buster, or 110 volt Hoover Brush Vac are good for keeping carpets, cushions and floors clean.
* A biodegradable cleaner sprinkled in the head then pumped through the outlet hoses and let sit for ten minutes will dissolve uric acid crystals and the brown scum that forms in the bottom of the head. Using it will reduce the frequency of having to rebuild the head and help eliminate odor. A long-handled dish scrubber works well as a toilet brush in conjunction with the cleaner. Avoid cleaners that have pine oil in them (PineSol, Lysol). Pine oil will destroy rubber.
* Bleach diluted with water to half strength then pumped through salt and fresh water hoses and allowed to sit a half hour, will kill algae and bacteria build-up in the hoses. This is frequently a problem on boats that haven't been used for a while, or when you're in a dirty harbor and not using your saltwater pump.
* Sponge off interior bulkheads and lockers with white vinegar or a weak solution of chlorine bleach to get rid of mold.
* Take a biodegradable soap such as Sea Savon, it lathers well in salt water and is great for cleaning dishes and bodies. Joy soap and other household soaps lather well in salt water but will not biodegrade easily.

Laundry:

* While passagemaking wear as few changes of clothes as possible and avoid getting them salty. Unless you have a watermaker, doing laundry underway uses too much precious fresh water, and it is difficult to dry clothes underway.
* Self service laundromats are rare once outside of the U.S. or U.S. trust territories. In major ports you can send the laundry to be done, but often it doesn't come back very clean. Ask other cruisers where they recommend having laundry done.
* At anchor use a moderate amount of soap in a large bucket(s) of warm fresh water (salt water washing will destroy your clothes) and let soak for a few hours, sloshing it around occassionally. Don't leave clothes soaking for more than a day or you'll be bowled over by the smell. Consider taking clothes ashore to rinse because rinsing takes the most water. Add a few drops of household bleach to the rinse water to help fight mold. Hang to dry on lifelines or string a line from the shrouds on the side of the boat to the forestay at the bow to create a triangular shaped clothes line above the deck.
* Consider getting a watermaker if you are planning on having a washing machine, otherwise when you are at anchor you will have to cart vast amounts of water on board to feed the washer.
* Concentrated biodegradable laundry soap in a plastic container is available from Seventh Generation Products or Real Goods Co. (see resource page).
* In the tropics leave rubber sandels and shoes in the dingy to avoid tracking dirt on deck and below.

LOW-IMPACT CRUISING: Waste Disposal, Environmental Concerns, Human Relations

There are several unique ways that cruising sailors can effect a positive influence as they travel through local or foreign ports. Our contact with the local people however brief is a chance to make a positive contribution to their culture. By following a few simple guidelines we can lessen our own impact and influence on the environment. Here are some examples of low impact cruising:

Engine Oil

When changing engine oil, make sure that the used oil makes it to a recycling source. Used engine oil contains heavy metals and acids. Some experts estimate that as much as 40% of the pollution in America's waterways is from used crankcase oil. One quart of motor oil can pollute 250,000 gallons of drinking water. Tossing your jug of used oil in the trash is the same as pouring it on the ground, since in landfills the oil will seep into the ground once the container breaks.

We've found that the best way to buy engine oil is either in one or five gallon plastic containers. We keep an empty container in the engine room, and pump the oil out into the container. Many larger marinas in North America have drums for recycling used oil. If your marina doesn't, talk with the manager about providing a collection tank. In many cases, there is no cost to the marina for this service, as a recycler picks the oil up without charge. We have saved used engine oil for months and thousands of miles when cruising this year in South Pacific, waiting until we could find a place that could recycle it. In Tahiti, Fiji, Samoa, Vanuatu and New Zealand, we found gas stations that would take used oil. Often the local people think we're a bit crazy for being concerned about where the oil ends up. At the Royal Suva Yacht Club the manager said, "Just dump it out on the base of the tree next to the launching ramp like all of our members do". Just a five minute walk away we found a BP service station that said they would gladly recycle any oil brought to them. When removing your oil filter, slip a Zip-Loc bag under the filter before removing it. This will prevent oil from dripping down the side of your engine and into your bilge. We've started using reusable oil absorbent sheets under the engine which absorb 13 to 25 times their own weight in oil, but repel water. These sheets not only catch drips that might occur when changing oil, but since they are white, any oil leaks from the engine are quickly visible and don't end up in the bilge.

Storage Batteries, Anti-Freeze, and Paint Thinners

When replacing your boat's batteries, make sure that the old batteries get recycled, instead of being left on the dock or by the dumpster in your marina's parking lot. Exide Corp. and K-Mart stores are paying $2 for each battery brought into their stores, and Exide is recycling both the plastic from the cases as well as the lead. Needless to say, the lead and acid are extremely toxic and very slow to decompose when disposed of in traditional landfill garbage sites, and the lead and acid may pollute groundwater sources.

Draining anti-freeze from the freshwater cooling system of your engine into the bilge, then pumping it overboard is toxic to sea life. Some service stations and a few marinas have collection containers to recycle old anti-freeze.

Paint thinner is toxic to marine life and groundwater. You may choose to use disposable foam brushes which don't require the use of thinner to clean them.

Paper and Plastics

Instead of using "cling wrap" which contains potentially harmful plasticizers to wrap leftover food, try using reusable "Tupperware" type containers. Paper towels are made white by bleaching with chlorine, and the by-product is dioxin, a deadly toxin that pollutes waterways near paper mills. Alternatives include using cloth rags when possible which can be washed and reused, or buying 100% recycled dioxin-free paper towels. An excellent and inexpensive source for recycled paper towels, toilet paper and facial tissue is Real Goods Trading Company (1-800-762-7325).

Another avoidable source of dioxin is in white-bleached paper coffee filters which may actually contaminate your coffee. Safer alternatives are nylon filters (Revere Ware sells a stainless thermos that comes with a reusable funnel-filter that has fine mesh nylon filter), cotton filters, or unbleached paper filters available from Rockline, Inc., P.O. Box 1007, Sheboygan, WI 53082.

Bring as little disposable plastic with you as possible. When you have an option, buy supplies packaged in glass or metal. We pull old socks over glass jars and bottles, then pack them tightly in Space Cases (similar to milk crates) filling in extra spaces with new spare sponges. When cruising in developed areas where there is a chance of finding a glass recycling depot, we wash glass bottles out with salt water and store them in a cockpit locker until we find a place to deposit them. Our marina in Friday Harbor has a large recycling trailer on the docks for glass bottle and aluminum can recycling. The port district saves thousands of dollars each year since they sell the glass and aluminum to a recycler who picks up the trailer. For rubbish that isn't recycled, the port has to pay $25 per dumpster to have the garbage taken away. You could light a 100 watt bulb for four hours with the electricity saved by recycling one glass bottle, so you're saving energy as well as reducing solid waste when you recycle.

When cruising in less-developed countries we've found that villagers are often happy to receive clean jars with lids.

MARPOL V International Treaty was designed to reduce the amount of ship-generated garbage dumped into the ocean and applies to U.S. flag vessels anywhere in the world and to foreign flag vessels within the 200 mile Exclusive Economic Zone of the U.S. As of July 31, 1990, all vessels 26' and over are now required to "prominently display a durable placard of at least 4" x 9" in size notifying passengers and crew of MARPOL V discharge restrictions and penalties. In addition, vessels 40' and over are required to have a written waste management plan describing the procedures used for collecting, processing, storing and discharging the vessel's garbage, and listing the person in charge of the vessel's waste management. For further information, contact: U.S.Coast Guard, Office of Marine Safety Council, (202) 267-0491.

Garbage

Be responsible with your garbage. When you are cruising in areas where there isn't any organized garbage disposal system, sink your cans in deep, open water and take your burnables ashore, dig a hole below the high tide line, burn the rubbish, then bury the ashes. Burning plastics does release toxins into the atmosphere, but is better than having it eventually end up in the ocean. The best solution is to really try and limit the amount of disposable plastic items

you bring aboard. Many villages that we've visited just throw their rubbish into the ocean, so giving them your rubbish just adds to the problem. When it's possible, we try to tactfully mention to the locals that throwing rubbish into the ocean may hurt their fish and shellfish.

Make a point of saving aluminum cans, compressing them and taking them to a recycling drop-off in the future. They don't take up much space, once crushed, and are very light. Recycling aluminum reduces air pollution and uses 90% less energy than making aluminum from the raw material. If you don't burn the plastic six-pack holders, snip each of the circles with scissors, so they don't end up getting tangled in, or strangling, birds, seals or turtles.

Alkaline Batteries
Use rechargeable batteries in flashlights, radios, tape decks. About 50% of the mercury and 25% of the cadium used in the U.S. goes into alkaline batteries. Some Radio Shack stores will recycle dead alkaline batteries, but an even better idea is to buy rechargeable nickel-cadium batteries and a 12 volt or solar battery charger. Source for chargers: Real Goods Trading Company, 800-762-7325.

Freon Gas
Don't vent freon into the atmosphere, either from air horns or when recharging your refrigeration system. Environmentally safe air horns are now available. Ozone depletion resulting in dramatic increases in skin cancer is most serious in New Zealand and Australia, but is a worldwide problem according to National Institute of Health and the European Health Agency. Other sources of CFC (chlorofluorocarbons) pollution include halon extinguishers, aerosol spray cans, styrofoam and foam-fitting packaging that protects electronics in shipment.

Alternative Energy Options
When outfitting your boat consider installing solar panels and wind and/or trolling generators instead of gasoline or diesel generators. These options will give you a longer cruising range, prove cost effective over the long run, and will reduce the amount of fossil fuel consumed. We've run our satnav, ham radio, interior lights and instruments off of a single solar panel for weeks at a time.

Shells/Coral
Don't kill and collect live shells. Each year, several of the most rare shells become extinct. Instead, look for semi-protected beaches where the shells that wash up naturally won't be broken and worn. Don't fill your freezer with large numbers of lobster and conch. They take several years to reproduce and have been over-fished in many areas by locals and cruisers. Conch are the only natural predator of the Crown-of-Thorns starfish, which can destroy coral reefs rapidly if the natural balance is thrown off.

Avoid anchoring in coral when at all possible. Several of the choicest anchorages in Hawaii have been declared marine parks with anchorage prohibited as a result of the damage done by anchors and chain. Some types of coral are extremely fragile and take years to grow. Many times by looking diligently, you may be able to find a sandy spot to drop anchor in. We sometimes use two anchors set 45-60 degrees off the bow or anchor bow and stern to limit the amount of swinging and grinding our chain does on the coral. Coral is very abrasive, and a month of anchoring in coral waters can rub enough of the galvanizing off your chain to cause it to rust.

Refuse offers of turtle shells or anything (jewelry, combs, etc.) made from them and diplomatically explain to the local people that sea turtles are no longer found on many beaches and island because of over-hunting. In French and U.S. territories all sea turtles are protected, as they are in Fiji during certain months of the year.

Thoughts on contacts with local people in less-developed areas of the world:

Health Care
Some of the areas where you may cruise will be lacking in basic health care. Where there are locally-trained nurses and doctors they often are very short on basic medical supplies. As a result of requests from nurses on isolated islands we've visited, we've returned with medical supplies they requested including gauze dressings and roller gauze, topical antiseptic scrubbing solutions, topical antibiotic cream and ointment, oral antibiotics, silvadene burn ointment and hydrogen peroxide. It's best to give supplies and medication to local nurses or doctors to dispense. Choose supplies that have the longest shelf life and don't require refrigeration. Bring knowledge. Take standard and advanced first aid classes before departing on your cruise. Carry copies of Where There Is No Doctor and Where There Is No Dentist with you. Consider inviting a doctor from home to come and cruise with you for a week or two when you are cruising in a "high need" area away from major ports. When you get your physical examination and prescriptions for your ship's medicine chest, ask your family doctor for any physicians samples they would like to donate.

Technical Assistance
Think about how you can help or teach the local people. Some ways that we've observed cruisers making a positive contribution include helping design and build rainwater collection and storage systems, teaching locals how to build boats and repair outboard engines, and repairing broken radios and cassette players. If you have medical or dental skills, by all means volunteer to assist or teach local nurses and doctors. Teachers (or non-teachers) may be asked to speak at schools to tell the children what life in North America or Europe is like. This is your chance to dispel some of the myths perpetrated by Rambo and Dallas. Bring pictures and picture books of where you lived "on land", and photos of your family "back home". Communication is important, the returns from learning how to very basically communicate in the local language far outweigh the amount of effort involved. If you're cruising with children, you'll find that they have few inhibitions about meeting kids of different cultures and will open many doors for you.

Long Term Projects
Think about long-term, far-reaching projects that could start during or after your cruise. Examples range from the 160' schooner "Tole Mour" and the 70' aluminum catamaran ketch "Canvasback" (both volunteer training/hospital ships started by ex-cruisers) to an educational video lending library in Tonga which was started and financed by a cruiser who was disappointed in the violent and sexist videos locally available.

Reciprocate
Chances are that you will want to reciprocate the generosity of local people that you meet while cruising. Try to give gifts that will leave positive

feelings behind. Some gifts that we've found were welcome included children's clothing, vegetable seeds, fish hooks and line, and a Polaroid print of the whole family. If someone aboard is artistic, a small sketch of their village or home is a lasting memory. Have you children cruising with you? Involve them with the project. We've left signed Yacht and Visitor Log Books at several villages, giving the locals a way of remembering visitors. Give gifts to persons or families who have been especially kind or helpful. Passing out gifts indiscriminately makes the locals think that all cruisers are like Santa Claus. They may then come to expect or demand gifts from cruisers that follow. If a family has invited you home for a meal, why not invite them out to your boat for juice and popcorn or dinner, or maybe out for a day sail? For more ideas on gifts see priority equipment section of notebook.

The benefits of making a positive contribution to the areas which you visit are many. You will discover a sense of purpose to your cruise, something which escapes many cruisers. Your experiences in the places you visit will be more intense and the local people will be much more open to you if they know that you are there to help and learn, not just to take pictures, barter for woodcarvings or shells, leave your rubbish and then sail on to the next anchorage.

Let us know your ideas of positive contributions cruisers can make.

ANCHORS, CHAIN, AND WINDLASSES

Anchors

Most Reliable, Best Primary Anchor: Genuine forged C.Q.R. (not imitations)
Cost: 25 lb-$450, 35 lb-$535, 45 lb-$595, 60 lb-$730 (usually discounted)

I have found the CQR to work the best in the widest range of conditions, ranging from the eel grass found on the West Coast which Bruce and Danforths and Fortresses don't do well in, to the coral anchorages of the tropics which bend Danforths into pretzels. I think that buying a welded Korean or Danforth imitation CQR anchor is false economy. It is essential to have a minimum of three or four anchors for long distance cruising, preferably of different designs. Following is a list of anchors and rodes which we used on our 31' sloop which displaced 10,000 pounds:

1. Primary bow anchor: 35 lb CQR, 200' 5/16" BBB chain, stowed on bow roller.
2. Secondary bow anchor: 25 lb CQR, 45' chain, stowed in cockpit locker.
3. Stern anchor: Danforth 13-S, 20' chain stowed in Anchor Ready bracket.
4. Spare anchor: Danforth-type 27 lb, 60' 1/4" chain, stowed in anchor well.

On our 42' ketch which displaces 38,000 pounds we use:

1. Primary bow anchor: 60 lb CQR, 250' 3/8" chain, stowed on bow roller.
2. Secondary anchor: 35 lb CQR, 30' 3/8" chain, 150' nylon line, in lazarette
3. Stern anchor: Danforth 22-S, stowed in lazarette

We hope to add and try out a 19 lb or 33 lb aluminum Fortress anchor this year.

A Bruce would make a good secondary or spare anchor, and the holding power of Fortress anchors in mud and sand sounds unbeatable. A roller for the stern anchor mounted so that you can lead the anchor line to a sheet winch (it may be necessary to use a snatch block to prevent scraping your toerail) is important.

Chain

Most Reliable: BBB Galvanized ACCO (American Chain Co.) or Teledyne
Cost: 5/16"-$4.15 per foot, 3/8"-$5.90 per foot (often discounted to 30%)

Chain is an extremely important item, not one to try and scrimp on. If the chain on your boat is old, of Taiwanese or indeterminate origin, replace it. There are huge price and quality differences in chain, so when purchasing it, insist on seeing the manufacturer's statement of testing, making sure also that the chain wasn't made in Korea or Japan. Of the three types of chain available, (proof coil, high test and BBB, my choice is BBB because it is less subject to tangles in the chain locker (a nightmare) and each piece is actually tested. The amount of chain you carry on your working anchor depends on your cruising area and the size, displacement and windage of your boat. The minimum amount of chain on the working anchor of a moderate displacement 30' boat sailing in coral waters is 140'. Chain connecting lengths one size larger than the chain can be used for joining two lengths of chain. It is important to have separate lengths of chain for each of the three or four anchors. The extra lengths of chain should be stored as low in the boat as possible, preferably near the ballast. If at all possible, lead the chain from the main anchor as far aft as possible once it goes over the windlass and through the deck. The ideal arrangement is to install a PVC chain pipe allowing the chain to stow under the V-berth, or even better, under the cabin sole, as far aft as possible. Chain will rarely

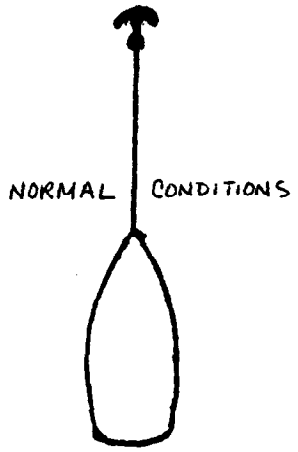
self-stow unless you have a very deep chain locker, so design your chain locker so that it is easily accessible when you need to level out the heaped-up pile of chain.

After a few months of anchoring in coral waters, chain starts to lose some of its galvanizing and begins rusting. Eventually you'll need to have the chain acid-dipped or sandblasted, then re-galvanized. When looking for a shop to handle your chain, make sure they have a chain tumbler, otherwise you may get your chain back in large lumps. About 10% of the chain strength is lost each time the chain is heated in the galvanizing process. The only places in the Pacific that I've found for galvanizing chain are Hawaii, New Zealand and Australia. Seize all shackles connecting anchor, chain and line with monel seizing wire to prevent shackle pins from working loose. This is critical!

Anchor Windlass

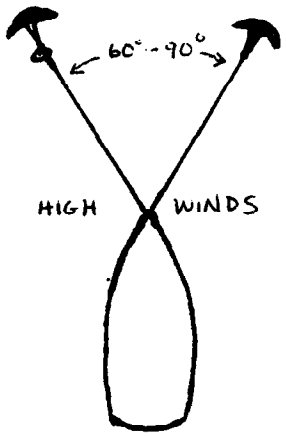
Most Reliable: Simpson-Lawrence, Maxwell-Nilsson, Muir, Lofrans
Cost: S-L 9555 manual-$1420, Muir VRC-800 electric-$1875

If you're planning on using more than 40' of chain and an anchor over 25 lbs, a windlass is a real back-saver! On boats over 32' using all-chain rode, a power windlass (electric or hydraulic) with manual back-up capability may be in order. Electric windlasses may draw up to 100 amps, so a very heavy battery cable-type lead must be used with an in-line circuit breaker installed near the battery. When anchored in rough or exposed conditions, a chain hook and nylon line which is tied off to a cleat separate from the windlass must be used to take the load off the windlass. This is also important when trying to "power out" a stuck anchor. There is an illustration of a chain hook on page 165 and a diagram of the use of a hook and bridle on page 163. Avoid Taiwanese-built windlasses, many of them have inferior quality castings which may crack under load. Cruisers that have undersized windlasses may have less inclination to re-anchor when conditions start getting rough since it becomes increasingly difficult as conditions worsen.



ANCHORING TECHNIQUES AND ILLUSTRATIONS

A SINGLE BOW ANCHOR under normal conditions, is the most commonly used anchoring technique. Most boats long-distance cruising in coral waters choose to have over 180' of chain as their main anchor rode because it is easier to stow than a combination of nylon line and chain. It also isn't subject to being abraded through quickly on coral as the line is. Over 90% of the time we anchor with one bow anchor using 4 to 1 scope of all chain. (120' of chain in 30' of water)

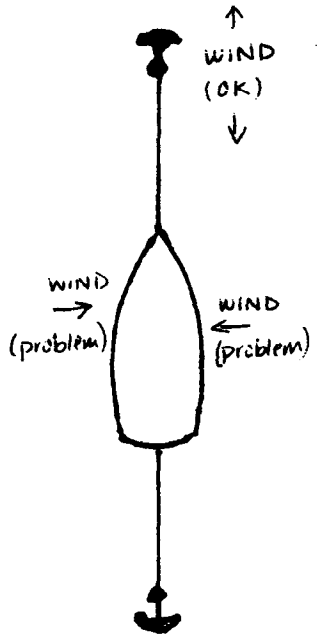


HEAVIER GROUND TACKLE (anchor and chain) IS REQUIRED WITH:

1. Poor holding ground
2. High winds or surge
3. Heavier displacement boats
4. Boats with more freeboard and windage

We use our storm anchor as our every-day anchor, as it's often impossible to set a storm anchor after the fact.

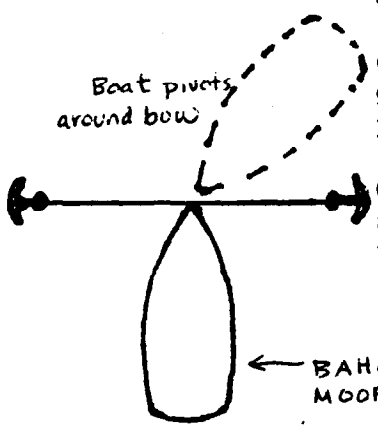
IN STRONG WIND CONDITIONS, you may find it is a good idea to set a second bow anchor, so that the loading is evenly distributed between the two anchors. This can be accomplished either by using your tender, or by driving the boat forward and off to one side from the original anchorage to drop the second anchor. If your boat "sails" back and forth at anchor, the second bow anchor will stabilize the boat in one place.



BOW AND STERN ANCHORS are generally only used: in a crowded anchorage where the other boats are using this technique, anchoring where shallow coral heads prevent you from swinging, or possibly in an area of strong current. The strain on the anchors is immense if the wind shifts and is on your beam instead of from ahead or astern.

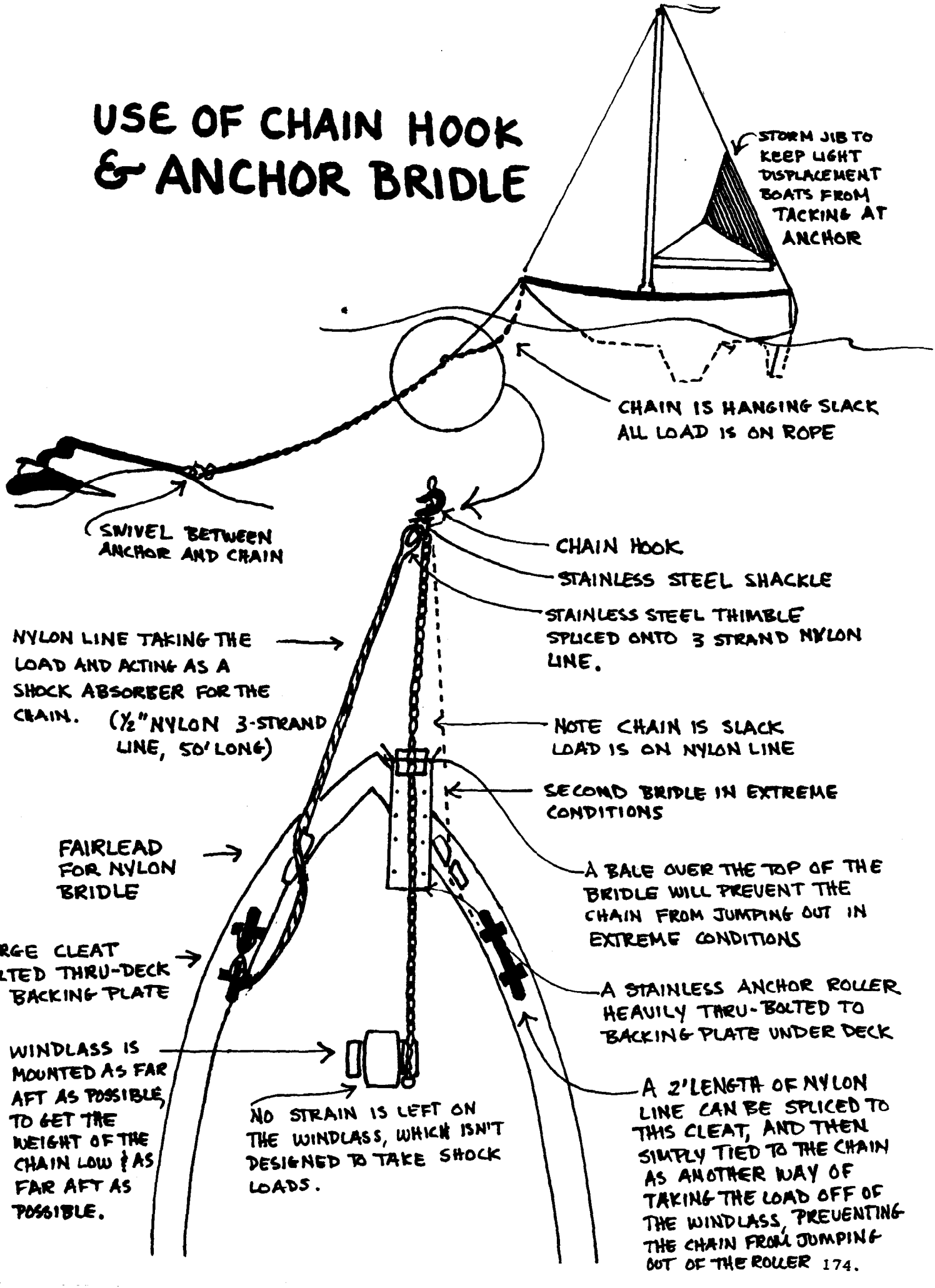
BAHAMIAN MOORING is used when you want the boat to be able to swing into the wind or current, but need to restrict the swinging radius. After dropping your main anchor, a second bow anchor (usually on a combination line-chain rode) is taken out 180 from the first, then pulled tight to the bow. This is preferable to bow and stern anchoring because the boat can swing swing with wind or current.

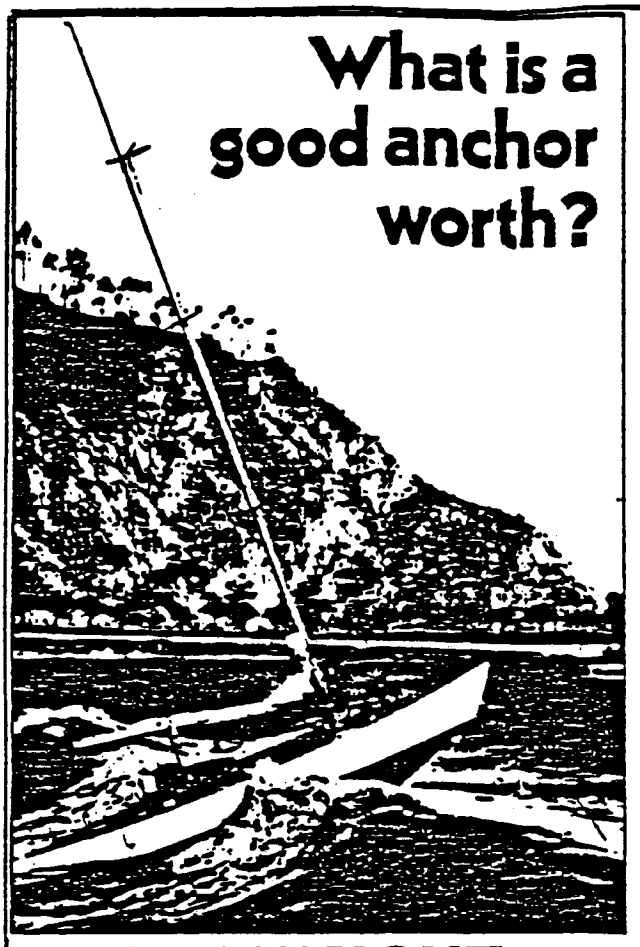
WHEN APPROACHING A NEW ANCHORAGE, come in slowly checking for obstructions as you as you steer your boat in circle around the spot where you think you'll end up. Bring the boat to a complete stop, put the engine in reverse and have the boat backing up slowly as you lower the anchor. Dumping the chain or chain/line quickly in one pile is the quickest way to foul your anchor or rode. We often let the boat sit for a few minutes to see how the boat is going to ride to the wind before gradually setting the anchor by putting the engine into reverse to really "set" the anchor.



COURTESY: If you enter a bay where there is only one boat anchored, **DON'T** go over and anchor directly upwind of the other boat. If the wind increases, you may find that you have trapped the other boat by being over their anchor. How rude!

USE OF CHAIN HOOK & ANCHOR BRIDLE





When conditions deteriorate, superior equipment proves its worth. Ground tackle can be your only link to security. When choosing rope, chain, and anchor is not the time to economize and compromise quality

The patented CQR ("Secure") digs deeper and deeper the harder the pull, and sets and holds even in difficult bottoms like grass, kelp, shingle, rock and coral. CQR is less likely to foul and by design, pivots with changing winds and tides without breaking out. That's why you see genuine CQR anchors on more cruising boats than all other makes combined.

Only CQR is drop forged by massive machines from white hot steel billets and balanced with most the weight in the flukes where it is wanted. The imitations are not forged nor balanced and are not worth the gamble. To quote Mr. Eric Hiscock *Cruising Under Sail* "For these reasons it is wise when buying an anchor to specify a genuine CQR."

The H-section shank and the one piece pin, horn, and shoe are drop forged from high tensile steel billets. The flukes are hot formed from one piece of steel plate. Made only by Simpson-Lawrence Ltd. Glasgow, Scotland.

Available from all good chandlers.

"IT PLOUGHS ITS WAY IN"

SEAGULL MARINE

For more information:
1851 McGaw Ave.,
Irvine, CA 92714
(714) 979-6161

WHAT WEIGHT CQR ANCHOR?

There are so many factors that must influence your choice when deciding the proper size CQR for your vessel:

1. Boat size, weight, windage
2. All chain, all nylon rope, combination rope and chain
3. Sea and wind condition
4. Kind of holding ground
5. Scope and special situations
6. Usual cruising locale

Many variables and maybe changing everyday, compounded by the fact that anchoring is a developed skill. Usually when we anchor conditions are reasonable, its later on that is the concern. We would all prefer the lightest anchor that will do the job but remember a CQR's holding power is in direct proportion to its weight, i.e. a 35 CQR has just about double the drag resistance of a 20 CQR.

The 35 CQR is the most popular size for experience shows that a lesser weight, which may have ample holding power, doesn't sink quickly through kelp and grass and force itself to bite in the ground.

Once an anchor is set ho.ding power is determined by the surface area of resistance rather than weight. Yet the heavier the patent anchor, greater are the areas of resistance. A 35CQR has greater holding power than a 20CQR not because it is 75% heavier but because the fluke area is 60% greater. But fluke area isn't the only consideration or Danforth would be the most popular cruising anchor, which it isn't. (See "Why Are CQRs Hinged?" next page.)

The following general suggestions are based on water-line lengths of moderate displacement sailboats and motor yachts:

LOA in ft.	Storm Condition	Product Number	Normal Condition	Product Number
18	10 lb	101	5 lb	100
20	15	110	10	101
24	20	111	15	110
28	25	112	20	111
34	35	113	25	112
40	45	114	35	113
50	60	115	35	113
60	75	116	45	114
70	105	117	60	115
–	140	118	–	–

Thoughts on choosing anchor chain

Anchor chain serves several purposes in the ground tackle system:

1. Increased weight causes horizontal pull on anchor.
2. Chain weight forms a curve in the scope (catenary). Heavy surging lifts this sag, absorbing the strain and jerk on the anchor and vessel.
3. Chain will not chafe on rock, coral, or bow chocks.
4. Chain is more suitable for anchor windlasses.

In almost all anchoring situations longer chain scope and heavier chain will hold better than less and lighter. However, an all-chain system is heavy and sometimes more awkward to set (for instance setting an anchor with the dinghy) and retrieve.

A combination chain/rope rode is a good compromise. Every sailor will offer his own formula for how much chain. One thought is, 1 or 2 times the length of the boat. Or, enough chain so that the nylon rode does not normally lay on the bottom to chafe on rocks. If rocky and coral bottoms are usual for your cruising area, then all chain is the custom or chain with polypropolene rope which floats away from the rocks and coral heads.

In a rough anchorage all-chain can snatch, once the force is sufficient to straighten the catenary. This snatch jeopardizes the set of the anchor and the well-being of the vessel. A 3/8" nylon pennant secured into the chain with a proper sized chain grab hook will stretch and absorb a great deal of the snatch load. Bear in mind that the chain is secured to the windlass or samson post. The pennant is hooked forward of the slack chain and its end secured to a bow cleat. A parted pennant means only loss of your shock absorber.

Chain self-stows better than nylon because of its weight, it is limber, it is less likely to tangle running out from chain locker through deck pipe. Chain links engage positively in the windlass wildcat pockets. Weighing anchor with an electric windlass and an all chain rode can be a very pleasant experience.

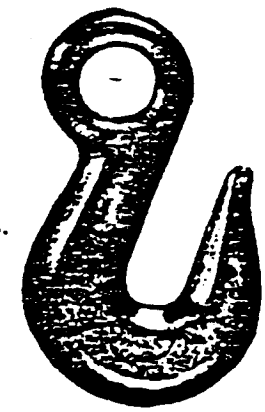
BBB chain is recommended for windlass service because it is short link, meaning more links engage in the windlass wildcat pockets. Proof coil chain has fewer links per foot which means fewer links bear on the wildcat. When the link reaches 9 o'clock on the wildcat there should be no strain on that link and it falls away to the chain locker. The more links per foot of chain the better it will peel off the wildcat.

Chain must lead to the wildcat horizontally (at 12 o'clock). This means that the lead from the bow chock or bow roller cannot be higher than the wildcat (if it is then the windlass must be raised on a block). If the chain link arrives at 11 o'clock, when it revolves to 9 o'clock it will likely still be under tension, will not peel off the wildcat, and possibly jamb.

American Made Chain, Galvanized

BBB STEEL COIL CHAIN — Recommended for Anchor Chain Using Anchor Windlasses

Trade Size	Links Per Ft.	Weight Per Ft.	Feet Per Drum	Working Load Limit	Minimum Proof Test	Minimum Break Test	Product Code
1/4"	14	.81 lb	800	1325 lb	2650 lb	5300 lb	800
5/16"	12	1.20	550	1950	3900	7800	801
3/8"	11	1.73	400	2750	5500	11000	802
7/16"	9-3/4	2.31	300	3625	7250	14500	803
1/2"	9	2.96	200	4750	9500	19000	804



PROOF COIL STEEL CHAIN — Anchor Chain. Does not work quite so well in windlasses as BBB.

Trade Size	Links Per Ft.	Weight Per Ft.	Feet Per Drum	Working Load Limit	Minimum Proof Test	Minimum Break Test	Product Code
1/4"	12	.76 lb	800	1175 lb	2350 lb	4700 lb	810
5/16"	11	1.15	550	1750	3500	7000	811
3/8"	9-3/4	1.66	400	2450	4900	9800	812
7/16"	8-3/4	2.25	300	3250	6500	13000	813
1/2"	8	2.86	200	4250	8500	17000	814

CHAIN GRAB HOOKS, plated. 5/16" . . . 815 3/8" . . . 816

PROVISIONING / COOKING
THE ULTIMATE CHALLENGE

Where to begin? Volumes have been written on this subject and I recommend several at the end of this section, but if you only read one make it Care and Feeding of the Offshore Crew by Lin Pardey. This is the best all-around volume on caring, feeding, and cruising I've found.

Food is an all important ingredient in a sucessful cruise. Because on a passage a sailor's world is so confined and repetitious, food often becomes the highlight of the day, taking on an exaggerated importance unknown on shore. Add to this the inaccessiblity of fresh foods and the importance of gauging food consumption and all of a sudden, food preparation, storage, inventory become a real challenge! I hope some of the following hints and suggestions help you meet the challenge.

Provisioning

It seems as though every cruiser has a story about running low of water or food on a passage. Careful planning, gauging expected passage time, then adding extra days for light winds, storms, rigging or engine failure will help you estimate stores and water. Allow enough stores and water for your estimated time at sea then double it for the unexpected. This does not include emergency food packed in your liferaft or liferaft ready bag.

After you have provisioned but are still moored or anchored and are taking advantage of fresh foods, it may seem as though your cans or "quick meals" will last forever. Remember: once at sea where fresh foods are limited (most fresh foods will be gone in 1-2 weeks in tropics without refrigeration), cans disappear at an alarming rate. It is easy for two people to go through 4-8 cans a day, especially when using them exclusively in rough weather. On calm passages, can consumption is lessened by using items which take a bit longer to prepare; grains, beans, pastas, cereals or eggs, for part of the meals.

What stores to bring? Remember you are not just stocking up on food, but everything you'll need to live comfortably for an extended period of time. This includes office supplies, film, batteries, medicines, and toiletries.

* Several months before you start buying provisions make a list of what items you use and the quantity you use of them.

* Test cans and prepared foods to see which are your favorite brands and which are a good value. By provisioning over several months time you can take advantage of big savings on cans at supermarkets and drug stores.

* Make sure you keep a master list of provisions before you store them on the boat otherwise, a couple of months later you won't remember what is aboard or where you put them.

* Variety is the spice of life, seek out hard-to-find items like canned; butter, cheese, bacon and special snack foods to add variety to your menu. It's amazing how an unexpected treat can brighten up a dull day or watch. Gifts, surprises and birthday treats mean a lot at sea.

* We find Costcos and Price Clubs to be fantastic sources for batteries, film, canned foods, and office supplies. What they carry from week to week changes so stock up when you see something you like! These clubs require a membership fee of approximately $30. To get your money's worth, join well in advance of departure or shop with a member.

* Have a good stock of ready-to-go meals on board. Freeze- dried foods in #10 tins, boil-in-bag meals and cans of stew are great meals for rough weather or when the cook feels lazy. Cruisers with refrigerators often cook up several meals in advance of a passage to help them get over those first queasy days at sea. If you prepare frozen meals in advance make sure to freeze them in bags which will fit the container you'll be cooking them in.

* Large or restaurant-sized cans of food will often spoil in warm weather before a crew of 4 or less can eat them and are difficult to store once opened. Except for buying a large container of cooking oil and one of vinegar, I stay away from bulk containers. I try to store thin plastic containers such as what a gallon of oil would come in, in an area where it will not shift or get punctured; or I transfer it to a sturdier container than the one it came in.

* It is easy to provision in the U.S.A. Nowhere else in the world is there such a variety of food available at low prices. Carry as much as you can of items that will be hard to find or expensive in the ports you will be visiting. The best way to find out what these items are is to ask someone who has just cruised there or read S.S.C.A. bullitens (address on resource page). Because this is often difficult we have compiled a general list, based on the areas we have cruised.

Hard to find or expensive items, once you leave the U.S.A. or Canada:

Canned boneless chicken, ham, turkey, roast beef.
(Since many of our meals are based around these items, we really stock up on them.)

Concentrated fruit juices, Ocean Spray or REI brands. These come in sturdy boxes or plastic bottles.

Nuts, seeds, raisins and other dried fruits.
(Good sources of vitamins, add zip to bland food, and are very expensive once you leave the country.)

Mayonnaise, peanut butter, Bacos, syrup, catsup, other condiments.

Whole grain cereal, whole wheat flour, corn meal, wheat germ, brown rice, honey.

Chips, pretzels, peanuts and other snack foods are becoming more available outside the U.S.A. but are very expensive!

Toilet paper and paper towels are often very expensive and of inferior quality, when available.

Generally easy to find in foreign countries:

Corned beef, canned tuna, white rice, white flour, white sugar, white bread, and oatmeal. Often dry goods come complete with weevils, cockroach eggs and other critters.

Once you leave the U.S.A. or Canada ...

* Ask other cruisers for information on up-coming ports: a ham radio or single side band radio works well for gathering this information. Ask about price and selection of food; you'll save lots by knowing countries or ports in which to do major provisioning.

* In the Pacific, buying beer and liquor in Mexico before leaving for French Polynesia will save money. Buying necessary provisions in Papeete, Tahiti when in French Polynesia but saving major reprovisioning for Pago Pago, American Samoa, if heading west will save you money. Prices and availability of all foods except fresh vegetables are excellent in Pago Pago. It makes sense to really stock your boat up here before sailing any where else in the Pacific, other than Hawaii.

* In the Atlantic, buy food in Venezuela instead of the Caribbean.

* Buy in Singapore before you get to Japan.

* Buy food in England when in northern Europe, Spain when in southern Europe.

* Get a local person to help you shop. Sample items before loading up on them to make sure they are what you think they are and to your liking.

* Over-buy. When you see something you like at the right price, buy it; you may not see it again. Keeping your boat well stocked gives you the freedom to stay places longer, change plans, and not have to make endless trips to the store.

* When shopping at public markets, arrive early for the freshest foods and best selections. Dress conservatively.

* A knowledge of the metric system is helpful in most countries because weights will be measured in kilos and liquids in liters.

* Ships chandlers are found in busy international ports. If you are buying case loads of food or want cases of duty-free liquor or cigarettes, they may be able to help you. Generally, they are used by big ships and have at least a hundred dollar minimum. All duty-free items must be loaded just before departure from the country.

Menu Planning/How much to bring

For a coastal cruise or cruise in calm waters it is possible to plan a menu for a week by figuring how much one person would consume, then multiplying by the number of people on board. Remember: appetites often increase at sea, and snack foods are always in great demand.

It is hard to plan a menu and stick to it on an offshore passage of over a week. The boat's motion, your mood, the weather, and seasickness will all affect

what you choose to prepare. Add to this fresh foods perishing, and it is anyone's guess what will end up on the table or flung all over the cabin.

For extended cruising I gauge how much food to bring by figuring main course items. For example one 7 oz. can of tuna, chicken, or ham or 4 eggs equals the main protein ingredient for one meal for two people. So on a day at sea, we would use two, 7 oz cans, one for lunch and one for dinner to this protein I add grains, pasta or vegetables. For breakfast we rely on eggs, pancakes or cereal. I multiple a day's worth of main course items by the number of days between major provisioning stops, then double it for the unexpected.

After the main course items are established, I fill the boat up with canned, freeze-dried or dehydrated fruits, vegetables, pasta, rice, flours, dried beans and peas, and - last but not least - fresh fruits and vegetables. I never count on catching fish or being given food by the locals. Although we often do receive gifts of food, one never knows where or when this will happen. I also may have several main couse items frozen in my freezer, unless these items have also been vacuum sealed (this will preserve them for several weeks thawed), I do not count them in my food inventory. Freezers and refrigerators are just too temperamental to rely on, many is the boat that has had to dump a freezer load of food over board in the middle of the ocean when their refrigeration went bad.

Fresh Food, Storage and Selection

Avoid using cardboard for storing foods; it can harbor insect eggs and is prone to absorb moisture and mold. Plastic stacking baskets or woven plastic mesh bags allow air circulation around fruits and vegetables. They can be stored easily when empty.

For flours, grains, pastas which may harbor insect eggs, seal them in several layers of plastic bags them freeze for 24 hour, thaw without opening. Or, place inside an airtight container with a quater-sized piece of dry ice, let the gas from the dry ice vent through a small opening in the lid, then seal. If you have a vacuum packer, store dry goods vacuum sealed. Bugs and their eggs cannot survive in vacuum packed foods.

Half the secret of preserving fresh foods is to buy them fresh and <u>check regularly</u> for spoilage. The list I have compiled is of fruits, vegetables, cured meats, and cheeses which last well in <u>hot climates unrefrigerated</u>. Refrigeration will generally double the life of these items and allow you to carry perishable items I haven't listed. Sailing in northern latitudes will also allow an expanded fresh food inventory and increase the lasting ability of foods.

List of Good Fresh Foods for Extended Cruising

Fruits

<u>Apples</u> - Choose good keepers like Granny Smiths or hard red New Zealand apples. Wash then wrap individually in paper towel and stow snugly where they won't get bruised or roll around. Store in a cool spot. Should last 3-4 weeks.

<u>Bananas</u> - These are a favorite gift to cruisers in tropical areas. We wash the

stalks thoroughly by immersing in fresh or salt water for a couple minutes to dislodge the hiding ants, cockroaches, and spiders. Although wetting them does speed ripening, it is a good trade-off. By cutting off a couple hands to sun-ripen and then covering the rest of the stalk with a sail bag or a black plastic bag, we can slow the ripening process of the majority of bananas. If buying bananas, buy a few hands instead of a stalk. I've yet to meet a cruising boat who could eat all 150 bananas on a stalk before they mutinied.

Citrus Fruits - We wrap oranges, grapefruits, lemons, and limes individually in aluminum foil. This seems to prolong their life, but after a month they do tend to dry out and lose flavor a bit.

Coconuts - Coconuts are plentiful in most tropical areas; they store well if left unhusked and make an excellent thirst quenching drink. For drinking nuts select ones with green husks; brown husks mean the nut is older and will contain more white meat but less liquid. Coconuts are difficult and often messy to open; carry a machete and ask a local how to husk and open the nuts. Stored out of the sun, a drinking nut will last several weeks, and a brown nut will last over a month. The nuts sold in stores in the U.S.A. are husked.

Pineapples - Pineapples bought green and stored upright and out of the sun will last over a week.

Vegetables

Cabbages - When everything else fresh and green is gone, trusty cabbages are still serving you weeks out of port. Keep them well-ventilated and dry. When storing, remove outer leaves only if mouldy. The dry outer leaves keep the inner leaves from drying out. If using only part of the head, do not slice through but peel off leaves to use in soups, cole slaw or to add crunch to a salad. Sliced cabbage heads will turn dark and rot faster than those left intact. Cabbages will last a month in the tropics if wrapped in newspaper and kept dry.

Carrots - Carrots will last several weeks if pulled fresh from the ground and not washed. Store in a cool dark place. Store-bought carrots usually start going limp and developing black spots after a couple weeks. Spots can be scraped off and carrots can be recrisped by slicing thin and soaking in a salt solution.

Ginger Root - Buy as fresh as possible; store in a dry place. After a month it starts getting woody but is still usable.

Onions and Garlic - Even when your cabbages are gone,you'll probably still have onions and garlic left. Choose very firm onions with no sign of mold. Bermuda or Spanish onions don't keep well. We buy 25 lbs. of medium yellow onions, store them in the mesh sack they come in, and place them in a dry place in our lazarette. They make great gifts if you are sailing to remote tropical anchorages and last several months.

Potatoes - Potatoes are nutritious, long-lasting cruising companions. Choose smooth-skinned baking potatoes or new potatoes. If you can get them fresh from the ground, leave them unwashed before storing in a cool, dry, dark, place where they won't roll around. Avoid potatoes with eyes or those that have been frozen. A frozen potato will appear grey beneath the skin and will not last. Remove eyes as they appear, and your potatoes should last a couple months.

Tomatoes - Tomatoes last for several weeks if bought firm, greenish pink, and unbruised. Store where they won't roll around and check regularly!

Sprouts - The best way to grow sprouts in a warm climate is a sprouting tray, as glass jars tend to create too warm an environment. Buying fresh seeds will greatly improve their sprouting ability. Sprouts provide a constant source of green vegetable when all other vegetables are gone. Rinse sprouts frequently in warm climates and save water for soups etc. Downwind Marine sells trays and sprouting guides, (address on resource page.)

Winter Squash or Pumpkins - Choose small ones, as once opened they will last only a few days. Kept cool and dry, they will last for several months.

Fresh Protein

Eggs - Eggs are a wonderful source of protein on long passage when all other fresh protein is gone. Ideally eggs purchased fresh, unwashed and unrefrigerated are best. These can often be found in foreign markets but are difficult to come by in U.S. ports so we make do with store-bought eggs. There are several methods to prolong the life of your eggs. If they are unwashed, leave them this way, then either:

1. Coat completely with Vaseline or shortening, (the simplest method).
2. Turn over every other day
3. Refrigerate, if the eggs have already been refrigerated, and turn every other day.

No matter how you preserve your eggs, the yolks will become weak after a couple weeks. At this point I break each egg into a separate container before adding it to the main dish. Eggs with cracks have usually gone bad. You should have no problem keeping eggs for a month and, if bought really fresh, several months. Outside the U.S.A., eggs are often sold without the containers, so keep a few styrofoam containers with you or purchase a plastic egg suitcase.

Country Ham - In most parts of the South, country or cured Smithfield ham can be found in supermarkets. You can tell they are preserved hams because they are wrapped in cloth and are not refrigerated. These hams have excellent keeping qualities without refrigeration. They should be soaked in several changes of fresh water to lessen strong salty taste before cooking. Sources for Country-Cured hams: Harrington's Richmond VT 05477; McArthur's Smokehouse, Millerton NY 12546; Aunt Lucy Hams, Box 126, 3 Frederick St. Walkersville MD 21793.

Store with plenty of air around them. Because they drip oil, suspending them in a double thick large paper bag is recommended. Slice several days supply at a time from the bottom of the ham then generously coat exposed flesh in salt. If mold develops it can be scraped off and the ham is still safe to eat. Hams should last up to a year.

Hard Dry Italian and Danish Salamis - These salamis have similiar keeping qualities to the ham mentioned above but do not need to be soaked or cooked before eating. The long lasting salamis are the ones not refrigerated in the store.

Cheese - Once opened fresh cheese wrapped in a vinegar soaked cheese cloth will last several weeks unrefrigerated. Canned cheese will last indefinitely if stored in a cold place but will separate it not refrigerated. Unopened, unrefrigerated, canned cheese stored in our bilge area has lasted several years. Processed cheeses like Velveeta, Laughing Cow brand, and Cheesdale last many months unrefrigerated. Grated parmesan cheese also lasts well.

Yogurt - Yogurt can be easily made by adding freeze-dried yogurt culture to reconstituted powdered milk, long-life milk, or fresh milk. If culture is unavailable a teaspoon of plain yogurt containing live cultures added to warm milk will work as well. Save a tablespoon of yogurt to start the next culture.

Fresh Meat - Uncooked fresh meat, vacuum packed and frozen can be ordered at major cruising ports such as; Papeete, Tahiti; Suva, Fiji; Auckland, New Zealand. If you have a vacuum packer on board you can do your own. Even without refrigeration, I'm told, that these meats last well over a week, several weeks refrigerated and years frozen.

Instant Bread

It is wonderful to bake bread at sea, but when it is rough and the cabin is already an inferno the last thing you'll want to do is fire up the stove for an hour to bake bread! This is where instant bread comes in. Italian or French bread sliced 3/4" thick works best. Dry the bread in the sun, several hours on each side in the cockpit or under the dodger windshield then store it in a paper bag. It will last several weeks and works well for french toast or croutons.

Storage Tips

* Ziplock bags are great, not just for food, but anything harmed by moisture-from crackers to cameras.

* The bilge area is good for storing items which need to remain cool but can stand dampness, e.g. bottles with corks, plastic containers.

* Store cans, and dry goods in dry lockers or coat cans with varnish or paint for extra protection.

* Bring along a thermos or airpot to keep hot water in. Heat the water at meal times when the stove is in use. You'll have hot water for beverages or instant soups on watches without waking anyone up by boiling a kettle.

* Wedge non-skid, thin styrofoam sheets, or sponges in between items likely to rattle or break. Socks slipped over bottles and glasses work well.

* Square-sided plastic containers with water-tight, screw on lids are an efficient way to store grains, flours, beans and pastas. Tupperware and Rubbermaid make excellent storage containers, although the lids are not as secure as screw on lids. Before you invest in storage containers make sure they make efficient use of the space on your boat.

* Use every bit of space on the boat by compartmentalizing large lockers; dividing drawers; adding hooks, shelves and nets. Dividing one long setee cushion into two or three sections will make for easy access to storage underneath..

* Most inboard engines have a tremendous amount of unused space above them, on our last boat we added a shelf above the engine and stored all of our sails there. Vinyl coated wire racks can be added to the engine access door on many boats, making a space to store engine spares and oil.

* Try to remove food items from paper or cardboard boxes and transfer to plastic containers. When this isn't possible we put two zip-lock bags around the items to help seal out moisture and discourage bugs. Cock roaches can eat through plastic, but use paper and cardboard as a food source.

* Using a Foodsaver vacuum packer is a great way to store grains, cereals, tools, medicines etc. It creates an oxygen free atmophere; so weevils, cockroaches and their eggs cannot survive; frozen meats will not get freezer burned; tools will not rust; and cheese will not mold. The Foodsaver uses its own boilable bags or can be used to vacuum seal canning jars. Unfortunately, it uses 110 electricity and is a gadget which takes up space. Cost is approximaely $225-300, it measures 5"x19"x6", available from Stewart's Marine 4600 Shilshole Ave. N.W., Seattle WA 98107 (206) 789-4600 or at some Price Club stores or boatshows.

Stowage Plan

* Keep like items together in the same location and keep one easy-to-reach locker filled with a variety of items normallystored in hard-to-reach places.

* Label and date containers with permanent magic marker. This can be changed or removed by using alcohol as a solvent.

* On boats with many berths and fitted sheets, label sheets with laundry marker or embroidery to tell you where they belong. For example: A-S = aft, starboard side; F-P = forward, port side; M-S = midships starboard.

* I used to keep a master list of stores, adding and subtracting items as we used them. This was a loose list giving me a basic idea of what we had on board. I found it too time consuming to note where every item on the boat was located, so I made lists of items in hard-to-get-at places then put these lists as near the appropriate storage space as possible; e.g. for hard-to- reach forepeak lockers I made a list and left it under the forepeak cushion; this way I didn't have to rummage through the locker to know what was inside.

* Since we just purchased a 42' boat, and there are many more lockers and drawers than on our 31' boat, and because I haven't lived aboard it for very long; I am going to do a sketch of the boat's interior and assign each storage space a number and letter code, to help find things until I am more familiar with the boat. The letter code will indicate if it is port or starboard; forward, aft or midships storage . I'll put this number/letter code after the item on my master list, (if I ever find the time.)

* On my master food list I organize foods into categories so I can glance at

the list and tell if I am running low of food in any category. For example, under Main Course Foods I list; canned meats and fish, freeze-dried meals, hearty soups and stews and frozen meats or meals. Under Vegetables I list; freeze-dried, canned, or dehydrated vegetables, etc. I also have categories for: Condiments, Sauces, Oil, Vinegar, Salad Dressings; Pasta; Grains, Cereal; Flour, Baking Supplies; Dairy Products; Nuts; Fruits; Snack Foods; Drinks; Dried Peas and Beans.

* On our general master list we'll have the following categories: Tools; Engine Spares; Canvas, Sail Spares; Paints, Solvents; Oils and Lubricants; Medical Supplies; Safety Equipment; Boat Spares; Bedding, Towels; Files, Office Supplies; Paper Products, Rags; Clothing (may come under rag category) ; Kitchen Supplies; Miscellaneous.

Water

Always carry extra water in jugs in case your main tank leaks or gets contaminated, your water maker breaks, you gauge your consumption wrong, or you have to abandon ship. The jugs are your portable back-up! Fluid intake increases in direct proportion to hotter temperatures. Allow for extra water or prepared beverages for when you reach hotter climates. Since water in jugs is often stored for long periods of time, make sure you treat it with chlorine or iodine.

When using a hose with good pressure, you can use a 5 micron charcoal prefilter. This will take out some debris but will not filter out most disease-causing organisms. It will however keep you water cleaner and extend the life of any in line drinking water filters you have inside the boat. A Seagull IV drinking water purifier installed in line will filter out all disease causing organisms as well as chemical toxins. (See resouce page for address). Filter inside purifier must be replaced at least every year.
(Approximate Cost: $50 pre-filter, $250 in-line purifier.

* On long passages (up to 30 days) we carry enough water to allow at least a gallon of fresh water per person per day. On shorter passages we allow for 3 gallons per person per day.

* Using a foot pump instead of pressure water system really saves water.

* Heated water goes a lot further for cleaning up dishes than cold water.

Pressure Cooking

Although I had never used a pressure cooker before stepping aboard Mahina Tiare, after living aboard my cooking style has changed and I find that pressure cooking is a quick, efficient way to prepare "one pot" meals, casseroles, soups and stews. Using it saves fuel and time and keeps the cabin cooler than cooking in a regular pot or using an oven. When the top is locked on, it prevents food from sloshing out the top of the pot in rough weather.

I often use our pressure cooker, with a few alterations, as a mini oven to

bake bread or make cakes. While baking the pot is dry and unpressurized. I remove the rubber sealing gasket in the lid so as not to dry it out, then put a metal trivet on the bottom of the pot (an empty tuna can with top and bottom removed will work well). This trivet acts as a spacer, and it should be at least 1/2" high. A metal pan allowing at least 1/2" between its circumference and that of the pressure cooker for even distribution of heated air is then placed inside the pressure cooker.

By removing the handles from a stainless steel sauce pan a good inner pot can be created. A pair of vice grips comes in handy for handling this inner pot when it's hot.

Be sure to bake slowly, or the bottom of your bread may burn. A flame tamer on top of the burner helps evenly distribute heat.

When baking bread grease and coat inside pot with flour. Don't remove lid until you are fairly sure bread or cake is done, otherwise all the heat escapes!

I have included an easy bread recipe, but any recipe using 4-5 cups of flour/dry ingredients will work in a 4 quart pressure cooker.

Pressure Cooker Tips

Read instruction booklet which comes with cooker carefully. NEVER remove lid before all steam and pressure has been released from cooker.

Foods cooked under pressure retain more vitamins, take less than half the time to cook, and use less water than conventional cooking. Vegetables take from one minute for cabbage to ten minutes for potatoes to cook.

By bringing leftovers to pressure inside the cooker, then leaving them sealed inside with the pressure cap still on, and bringing them back to pressure before consuming they will probably remain sterile for a couple days without refrigeration. I say probably because there is a slight chance of contamination from air getting in through the pressure release cap on the cooker. Repressuring before eating should kill most organisims. This process works well for preserving fresh fish also.

For cooking rice use a little less than 2 parts boiling water to 1 part rice, bring to 15 lbs. pressure. (The pressure regulator will rock and hiss.) Time approximately 10 minutes from this point. Brown rice takes an extra 5 minutes to cook.

Pressure Cooker Recipes - for a 4 quart cooker

RICE AND BEANS

1+1/4c brown rice	1c adzuki beans or lentils
1/2c split peas	
3 cloves garlic	5c water
1 chopped onion	dash chili pepper

Bring water to a boil then add ingredients, cover, bring to pressure, and cook under pressure 20 minutes. Beans do not have to be soaked before cooking.

Variation:
Uncover above mixture and add:
1 sm. can mushrooms
1 can cream of mushroom soup
add water to desired consistency
Season with curry, chili, parsley
Add fresh vegetables if available, simmer them until tender.

Variation :
Uncover rice and bean mixture and add:
1 med. can tomato sauce
1 sm. can mushrooms
Italian herbs and spices

Use leftover rice and bean mixture to make:

STUFFED GREEN PEPPERS

Slice green peppers about 1/4" from the top, remove seeds, stuff with left over rice and bean mixture stand them up on a metal trivet or cooking race which has been placed in a pot. Pour tomato, cheese or mushroom sauce on top. Sprinkle with grated cheese, cover pot and steam with a small amount of water for 5 mins. or until green pepper starts to soften.

RICE AND BEAN PATTIES

Use rice left-over and bean mixture. Add a beaten egg and a little flour. Sseason to taste and fry in lightly oiled pan until browned.

1 HOUR WHOLE WHEAT BREAD

1+3/4 c white flour	1+1/2 c whole wheat flour
3/4 c walnuts	1 T. brown sugar
1/2 tsp. salt	1 pkg. rapid rise yeast
3/4 c hot water	1/3 c yogurt or milk
2 T.margarine or butter	

Set aside 1 cup white flour. In large bowl mix remaining flours, nuts, sugar, salt and yeast. Heat water, yogurt and margarine to 125 - 130 degrees and stir into dry mixture. Mix in only enough reserved flour to make a soft dough. On a floured surface knead 4 minutes. Place a few inches of hot water in the bottom of a 4-quart pressure cooker. Place dough in greased cooking pot, then place pot inside the pressure cooker on top of a trivet or metal spacer. Cover with cloth, let rise 20 mins. Remove water from cooker. Place cooker lid on (with rubber gasket removed) cook slowly without bringing to pressure. If bottom of bread browns too quickly place flame tamer on burner. Cook bread approx. 30 mins.

If cooking in an oven, bake for 20 mins. in a greased bread pan until done.

Sources for Bulk Freeze-Dried and Dehydrated Foods:
West Coast

The Bee Hive 5807 Winfield Blvd., San Jose, CA 95123 (408) 225-3531
Beehive also carries dehydrated foods, bulk grains, grain mills, juicers etc.

Alpine Aire P.O. Box 1600, Nevada City, CA 95959 1-800-322-Meal
Alpine Aire's freeze-dried food is chemical and preservative free with less salt than Mountain House brand.

Storage Foods 17230 Figueroa St., Gardena CA 90248 (213) 516-1599

East Coast

Family Reserve Foods 710 S.E. 17th St. Causeway, Ft. Lauderdale FL 33316

Temple Enterprises 12007 Nebel Street, Rockville MD 20852

Stow-a-way Foods 166 Cushing Highway Route 3A, Cohasset MA 02025

Recommended Reading:

The Care and Feeding of the Offshore Crew. by Lin Pardey with Larry Pardey. W.W. Norton and Company, 1980. This is an excellent, witty book, which is much more than a collection of recipes. Contains a guide to stores shopping around the world, preserving food on long voyages, catching and storing water. But most importantly, it gives one an excellent idea of what it is like to be out there cruising!

Sailing the Farm A Survival Guide to Homesteading on the Ocean. by Ken Neumeyer, Ten Speed Press, 1981. Good book for the budget-minded do-it-yourselfer. The emphasis is on making your boat a survival retreat by harvesting the sea, canning, preserving, drying foods, growing sprouts and making yogurt on board. Tells how to combine rice, seeds, nuts, beans, grains and cereals to form complete proteins without meat. Contains recipes for an inexpensive, healthy cruising diet. Not recommended for meat and potatoes types.

The Cruising Chef Cookbook. by Michael Greenwald. Self published, available at West Marine Products, 1984. Chapters on outfitting the galley, pressure cooking, and keeping foods fresh. 330 recipes with an emphasis on using fresh fish, crustaceans, mollusks, and eggs.

Bring your favorite basic cookbook. The world is shrinking and major international ports have a surprising selection of foods, so a good cookbook will really come in handy. Good Housekeeping's cookbook or Joy of Cooking are both excellent.

Bon Appetit!

Source for Cuisinart nesting cookware and pressure cookers:
Cruising Equipment Co. 6315 Seaview Ave. N.W. Seattle WA 98107 (206) 782-8100:

COST OF CRUISING

The question we are most frequently asked is, "How much does it cost to cruise?" Our response; "It takes as much as you have!" We had $600 a month to spend our first year cruising, after outfitting. We sailed to remote anchorages, had no break downs or haul-out charges and stayed within this budget. Our second year out we had $1,000 a month to spend - guess how much we spent? Right, a little over $1,000 a month including a haul-out, replacing two deep-cycle batteries and some touring and nights in hotels.

There is a definite correlation between your lifestyle on land and what your lifestyle and spending habits will be cruising. Cruisers who tie up at fancy marinas, eat out and go on shopping sprees frequently will obviously spend more than the frugal cruiser who anchors out, catches his own food or eats with the natives. Where you choose to cruise will affect your budget as well. French Polynesia, Scandanavia, and New Zealand are far more expensive to cruise than Mexico, Venezuela or Spain. Other variables effecting the cost of cruising are: the size, age, construction material, and condition of your boat; and the number, age and condition of crew.

When figuring the cost of cruising it is important to remember that how much you spend on provisions, spare parts, navigation books and charts, and boat supplies before you leave on your trip will effect how much you spend while cruising. The monthly expenses the first year may seem deceptively low, since you are living off of what you bought before you left port. I have compliled a list of what we spent on our 31' fiberglass sloop before we left port and then a list of what we spent while cruising. Our boat was already outfitted to cruise offshore, she was twelve years old and had 20,000 miles under her keel. If she hadn't cruised before we would have added: windvane, autopilot, ham radio, liferaft, satnav, storm sails, more charts and pilot books to the list below. To get an idea of the costs of this equipment, see the Priority and Optional Equipment sections of this notebook, and remember to add these costs when figuring your budget. Keep in mind that what money you have left after outfitting plus monthly income (if any) will be your cruising kitty. Saving the money you have earmarked for some fancy cruising gadgets may mean that you can enjoy a couple more months cruising some fantastic area - and this is what it is all about!

Costs before cruising - 1986

Medical and dental supplies	$285.00
Charts and navigation books (we already had $800+ of charts on board).	125.00
One set foul weather gear, sailing clothes, deck boots	246.00
Safety harness and Lifesling	185.00
Re-rigging (includes adding an insulated backstay, an add'l $110)	694.00
Anchor lines, sheets and halyards	626.00
New anchor windlass	548.00
Sail modification	134.00
Misc. boat supplies	1,485.00
Haul-out, epoxy barrier coat bottom	1,319.00
Interior woodwork, cushion cleaning, new battery and chain boxes	800.00
Engine top-end overhaul (valves, rings, de-carboning)	1,500.00
Spare parts; engine, head, etc.	890.00
Deep cycle batteries	198.00

Snorkeling gear, wetsuit, used scuba tank	450.00
Note: Most of the above prices are discount prices.	$9,485.00

Costs during cruising June 1986 - July 1987 14,000 miles
Cruising ground French Polynesia, Cook Islands, Galapagos, Easter Island.

Postage and office supplies (business)	$285.00
Postage, cards and stationery (personal)	385.00
Gifts, clothes, souvenirs	635.00
Film and camera supplies (business and personal)	219.00
Eating out	400.00
Food, liquor, ice (includes the cost of provisioning before we left)	3,713.00
Moorage, exit fees, anchoring fees	328.00
Kerosene and engine oil	99.00
Diesel fuel and gasoline for the outboard	482.00
Laundry	28.00
Bank fees, wire transfers, etc.	66.00
Mail forwarding and bill-paying service	75.00
Phone calls (mostly business)	287.00
Boat purchases, misc	281.00
	$7,283.00

$7,283 ÷ 13 months = monthly $560.00

If we add in the predeparture costs the average comes to $1,289.00 a month for the first 13 months of cruising.

Cost during cruising April 1988 - November 1988 6,000 miles
Cruising three months in Hawaii, three in Western Pacific, one in New Zealand.

Medical and dental	30.00
Postage and office supplies (business)	254.00
Postage, cards, and stationery (personal)	250.00
Freight (excess baggage and UPS charges bringing gear back with us)	165.00
Gifts, clothes, souvenirs	323.00
Film and camera supplies (business and personal)	208.00
Eating out	140.00
Food	2,323.00
Liquor	100.00
Moorage, exit fees, anchoring fees	450.00
Kerosene and gasoline for outboard engine	22.00
Diesel fuel	123.00
Laundry	25.00
Entertainment (movies, taxi, hotel, bus trips)	191.00
Car rentals, ferry fares	246.00
Bank Fees	30.00
Bill paying and mail forwarding service	188.00
Phone calls (mostly business)	316.00
Electronic repairs (satnav and two depth sounders)	338.00
Boat purchases and haul-out (bottom paint, batteries)	2,305.00
	$8,027.00

$8,027.00 ÷ 7.5 months = monthly $1,070.00

Note: Our airfare to return to the U.S. to work; $488 round trip from Hawaii and $1,966.80 round trip to New Zealand was not figured into the above figures. Cruisers seem to return home once every couple years, so it is wise to figure in airfare when figuring your budget. If we had added in our airfare, monthly average would become $1,398.00. We carried no health or boat insurance while cruising. Although our cruising ground varied, we averaged $300 - $350 a month for food for two people. Writing articles, taking photos professionally, and conducting business as we cruise, means that our phone bills, postage, and film costs are much higher than the average cruiser. On the other hand, we spend less for liquor, souvernirs, and boat supplies than the average cruiser so our costs are similiar to people cruising on 30'- 40' boats. Most of the long distance cruisers we interviewed, (people who had sailed over 10,000 miles and been out at least a year), were spending more than $1,000 a month per couple in 1989 on boats from 30'-40.

One last thought, we try to keep a reserve in an interest-bearing account for emergencies such as a dismasting, or medical crises. If, like us, you are not retired this money comes in handy for re-entry expenses such as buying a car, mooring the boat and looking for work.

MANAGING YOUR ESCAPE - Finances

The key to cruising finances is planning your budget before you leave. Try and make a monthly budget plan, and stick to it. If you're on a limited budget, carry a small pocket notebook with you when you go shopping and record every purchase for food or boat equipment. You'll find that you spend less money this way.

1. Get to know your banker, explain your cruising plans and the service you'll be needing in money transferral.

2. Get several copies of a letter from your bank stating how long you've dealt with them, and your current balance. Do this before you spend all of your money outfitting and provisioning.

3. Open a savings account that can be drained in an emergency, with a penalty for early withdrawal. (An example would be an American Express-Shearson Lehman Money Market Account). Keep enough in this account for a major disaster, ie., illness requiring flight back to the States for treatment, engine rebuild or replacement, mast replacement, etc., if possible, $5,000 to $10,000.

4. Give a limited Power of Attorney to a friend or family member.

5. Apply for an American Express card while you're still responsible: it's good for an airline ticket home in an emergency, guarantees your personal check for buying cash or traveler's checks, and allows you to use the mail service of local American Express Offices.

6. If possible, purchase at least $2,000 in American Express traveler's checks per person, to be put aside until needed for a bond.

7. Plan on carrying American currency in small denominations for places where there are no facilities for cashing traveler's checks or changing money.

8. Remember the IRS and possible state property tax on your boat. California property taxes continue to accrue as long as your boat is registered in the state. For this reason some cruisers change their homeport to another state if they plan to be out of California for longer than 1-2 years.

FINANCES WHILE CRUISING

Methods of money transferral:

1. LETTER OF CREDIT - difficult at best, not widely accepted today.

2. CASHIER'S CHECK - may be difficult to cash without an account at bank.

3. BANK DRAFT - may take 2 - 3 weeks to be processed.

4. AMERICAN EXPRESS - will guarantee your personal check to purchase traveler's checks, up to $2,000 with regular card of $4,000 with gold card per 21 days.

5. CASH ADVANCE - on Visa, Mastercard, American Express Card. Check with your card company to see how much they will allow advanced on your card per billing cycle. The cash advance amount may differ from your credit line. A finance charge may be charged on cash advances from the date of request until you pay your bill. If you know you'll be requiring money, you can mail a check to your card company in advance to avoid interest charges. NOTE: On most cards there is also a set-up finance or transaction fee per cash advance, read the fine print on your bill for this amount. It may be a percentage of cash advance or a flat fee depending on your card company.

6. TELEX OR WIRE TRANSFER -

   A. Before you leave on your cruise, go to your bank and ask if it is necessary for you to sign a special form allowing them to wire transfer funds to you.

   B. Go to the largest bank in the area you are cruising, explain to the manager that you want to transfer money by TELEX, and ask what their corresponding bank in the States is. so your bank can send money to corresponding bank.

   C. Call either your banker, or friend with Power of Attorney, and ask that the money be sent by TELEX to the bank you are near. The small charge for the phone call and TELEX may save you weeks of waiting. Note: Some banks will only TELEX funds once they have a signed release from you, so you may have to send a release well in advance of your request for funds or make sure you have a friend with power of attorney to sign for you. Send an uneven amount, for example send $4,998.89 instead of $5,000.

   D. After 1 day has passed, start going to the local bank daily, asking if your money has arrived. In most instances the money should arrive within 2 business days.

   E. Convert only as much money as you'll need in the next 2-4 weeks into the local currency, and buy U.S. dollar traveler's checks with the rest. Keep your exchange receipts! Don't change all your money at the nearest place to your anchorage, check with other cruisers and locals to find places that give the best exchange rate. Some banks have a minimum service fee for cashing travelers checks or changing currency, others may have none.

   F. If you're going to be in a country 6 - 12 months, (perhaps New Zealand) you may want to open a local savings account. This is easier to have money sent to, and saves a little time.

   G. Spend any coins you have left over, or donate to friends. Coins cannot be exchanged once out of the home country.

REAL ESTATE

If you are only planning a short cruise (ie., 6 month trip to Hawaii) leasing or renting out your house is fine, but if you are planning to be gone for several years, this is often an invitation for problems. Consider selling the house, possibly carrying a contract to give you cruising funds, but always have a bank or attorney handle the funds. People may become

much less concerned about making payments when they know you are on the other side of the world. If you are going to leave your house leased out, expect that you are going to have some problems, and budget enough money so that you can fly back to solve them. Never have a friend or relative manage your property; instead, pay property manager 10-15% per month to manage the property.

RESPONSIBILITIES

1. PASSPORTS: Apply 4 - 6 months before departure date.

2. **PHOTOS FOR VISAS:** Remember some countries require up to 5 photos per person!

3. **DOCUMENTATION CERTIFICATE:** Send your CG Documentation Office a letter stating that you'll be out of the country, then yearly they will send to your permanent address a form to fill out, and a sticker to place on your document. Failure to do so results in a huge fine. $5,000

4. INSURANCE: Expect to pay a minimum of 3-5% of insured value in yearly premiums for offshore coverage, usually with a high deductible. Your experience and safety equipment will greatly affect your rates. Few companies will give a flat world-wide coverage, instead they insure you from one major passage to the next. The majority of cruising boats offshore are not insured. It is difficult to impossible to get insurance for a crew of less than 3 people.

   Companies which may insure boats for offshore cruising:

   * Lloyds of London
   * Pantaneus
   * BOAT US
     880 Pickett, Alexandria, VA 22304
     1-800-336-0226.
   * SSCA Insurance
     Joe Grand, The Lawrence Group
     725 AIA North Suite E206,
     Jupiter, FL 33477
     1-800-866-8906; (407) 743-8906

5. DOCUMENT AND PASSPORT STOWAGE: All passports, ship's papers and documents, wallets, and traveler's checks are best stowed in a pouch, inside of a zip-loc bag, in the chart table or somewhere near the companionway. Spare copies of passports, documents and traveler's checks should be stowed in liferaft. One person must have the responsibility of grabbing document bag on the way to the liferaft. water proof

6. CREW: The captain is totally responsible for crew. The best situation is not to need crew, as this is by far the most common problem with cruising boats. Check out crew as carefully as you can before agreeing to anything, and if you are skeptical, only agree to take them to the next port, and possibly go for a 3-4 day test sail. When signing crew on, it's important to have a written and signed agreement in the ship's log, detailing their responsibilities, wages, payment/contribution for food, and their ability to pay their own way onward, or homeward. If in doubt about this, ask them to deposit with you enough money to cover their airfare home. Be honest and careful:

you are completely responsible for them -- if drugs are found in their seabag, you can be arrested and lose your boat. If they become disgruntled, they can demand that you pay their airfare back home or to where they joined your boat.

7. BONDS: Nearly any country you travel to in the world will want to see proof of liquid funds (travelers checks or cash) when you arrive. Plan on having $2,000 per person in traveler's checks if at all possible. Some countries may require you to place a bond, equal to the amount of a one-way ticket to your home country, either when you apply for a visa, or else when you arrive. This money will be placed in a non-interest account and will be returned to you, less a service charge, just before you leave the country $30 - $50

8. VISAS:

Country	Place of Issue	Duration
Canada	Port of Entry	6 months
Mexico	San Diego, Los Angeles	6 months
French Polynesia (May require bond before entry)	On arrival or Vancouver, B.C., Seattle, San Francisco, Los Angeles, Honolulu	3-6 months
Cook Islands, Tonga, Samoa, Fiji Kiribati, FSM	Visas issued on arrival	duration 1 to 6 months
New Zealand	On arrival or Vancouver, B.C., S.F., Los Angeles	3 or 6 & 6 months
Australia	Vancouver, B.C., S.F. Los Angeles	6 months
Indonesia	Australia - (Cruising permit plus visa)	

Travel Agents, or the U.S. State Department can give you information on visa requirements.

Most places now charge $20 - $50 for Entry or Exit Fees following the example of the U.S. Customs.

9. ANIMALS: Mexico - OK
Hawaii - 120 day quarantine at $9.00 per day
Vanuatu - No entry
New Zealand - $1,000 bond per animal, 90 maximum stay
Australia and England - Check with consulates
Fiji - Animals must remain on board

For up to date detailed information on vaccinations, health certificates, permits and restrictions send $5.00 to:

ASPCA
441 East 92nd Street
New York, NY 10128

Request the booklet: "Travelling with Your Pet"

10. **LOCAL CUSTOMS:** Be sensitive and conservative in dress. Try and read and learn as much as possible about each country before you arrive. If you have children on board, carry a small encyclopedia set. Learn as much as you can from the local customs and culture. A great way to get to know the local people better is to go to church with them, and also invite them on board for dinner or a short sail. Cruising opens up areas of the world otherwise impossible to reach by regular tourism routes, so it's up to us to be sensitive and thoughtful.

11. LANGUAGE: You must make an effort to learn the local languages, BEFORE you arrive. Community colleges often have night courses, Berlitz has intensive five-day courses in most major cities. Berlitz tape courses are excellent!

12. GUNS: Not necessary for most parts of the world, often more bother than you'll believe! In Canada you are not allowed to enter with a hand gun aboard. A can of Cap-Stun is a good alternative. Cap-Stun is a powerful non-lethal incapacitating agent used by the F.B.I. which works even on people enraged due to alcohol, drugs, or emotional problems. The active ingredient, oleoresin capsicum is from red peppers. For more information contact ZARC International, 1-800-882-7011; P.O. Box 5837, Columbia, S.C. 29250. Take seminar

CRUISING COMMUNICATIONS

Mail, FAX, Telephone, Single Side Band & Ham Radio

Communication. Although we wish we could cruise without worring about phone calls, faxes, and mail, the reality is we are working as writers while we cruise. Staying in touch with home is a necessity, not just a pleasure.

Cruisers often end up playing tag across the ocean with their mail, waiting weeks for mail waylaid in their last port to catch up with them. The common scenario goes like this: Before leaving home cruisers tell their friends, "In three months I'll be in the Galapagos send mail to me c/o General Delivery after that I should be in Tahiti, send mail c/o of the Port Captain." The cruisers arrive in the Galapagos but find their cruising permit hasn't arrived; they are only allowed three days in port instead of one month. Their mail hasn't arrived but they are not sure anyone has sent mail. They try to to phone home to check but end up sitting in a hot, dusty room listening to an operator say, "Hallo, Hallo-Hallo-Hallo", as she trys all day unsucessfully to get a line through to the mainland. Frustrating? Wow-I know, I was there! Several months later the cruisers arrive in Tahiti, they phone home. Yes, mail was sent to the Galapagos. Now they have to write to the Galapagos and ask for their mail be forwarded on, but to where? After seeing the way the Tahiti Port Captain handles mail they are totally discouraged; friends have told them Poste Restante or General Delivery only holds mail for two weeks before sending it back. What's a cruiser to do?

Follow these guidelines for **mail and package** handling;

1. Designate one person in your home country to do mail forwarding. Have all of your business and personal mail sent to this person. Giving your friends your projected itineray is recipe for disaster. Weather, Customs Officials, and whim will change your itinerary. We've learned the hard way not to let our mail forwarder give out our current cruising address. Invariably a well meaning friend sends off a package which you don't know is coming, it gets held up in customs and you leave without knowing it ever arrived. Friends would much rather write to you in an exotic port than to a U.S. address but this only works if you are staying in the same place for months.

2. When you are sure of your next reliable address, have your mail forwarded altogether in a padded mailer secured with strapping tape. If more than one package of mail is being sent, have your forwarder mark the envelopes, 1 of 2, 2 of 2 etc. This way you'll know to look for more than one package, and you'll know what to expect when, instead of constantly checking for randomly-arriving letters.

3. Have your mail forwarding person mark the outside of the mail envelope. "Hold for arrival of yacht in transit". They will have to fill out a green customs declaration slip for anything that isn't obviously a single letter. Make sure this is filled out "Contents forwarded mail, no commercial value", otherwise it will be held up in customs and mired in red tape. If you are having a package sent with spare parts, have the invoice packed outside the box in a separate envelope, the box should be marked for "yacht in transit" Customs agents will generally alow spare parts into the country duty free.

Tell your friends not to send books, video tapes, christmas cookies, they cost a fortune to send and may be held up in customs.

4. Because word order varies from country to country, have your mail forwarder avoid using your middle name, or Mr, Ms, or Mrs. Have them put your surname in capitol letters. When a clerk checks the mail, have them look under both your first and last names as well as the boat's name if it has been included in the address. Be sure to check for mail in both the ordinary mail area as well as the parcel area. Be prepared to show your passport.

5. Have mail sent to a reliable place. Our choice for mail pick-up is American Express offices. You must either be a card holder or have an AM-EX travelers check to receive this service. They will hold mail at least a month or until you arrive (time varies from place to place). For a $4 fee they will forward your mail for up to one year should any arrive after you set sail for your next port. You can pick up a brochure which lists the addresses of their international offices at any branch.

In our experience Port Captains' offices don't cut it. It's not their business to play Post Office. Mail often ends up in a big pile availble for anyone to sort through and it doesn't get forwarded unless a friend finds it and sends it on for you.

We've been to several yacht clubs catering to cruisers who do a good consciensious job of sorting and holding mail.

Most general delivery mail at post offices (including the U.S.) will only be held for 2 weeks then returned to sender often by surface post! If you do miss your mail, arrange to have a fellow cruiser readdress it and send it on to you airmail.

General Delivery mail is picked up at the city's main post office. Mail sent this way should be addressed to you care of general delivery. Outside the U.S. some English-speaking countries and all French-speaking countries call General Delivery, "Post Restante". Spainish-speaking countries call General Delivery "Lista de Correos".

If you have a ham radio or single side band radio, talk to the cruisers in your next port of call to find out the most reliable way to handle mail.
6. Regardless of where you have your mail sent, it is a good idea to let the office know your expected arrival time and ask them to hold mail for you. We have seen post offices in major ports bend the rules and hold mail longer than 2 weeks for yachts that have sent them a postcard asking that their mail be held until a specified arrival date.

7. Don't have mail sent to a place you are only stopping for a few days. Depending on the port you may have to factor in several weeks for inefficient mail service. Yes, this does mean you may have to go for a month or two without mail, but its better than have it try and catch up with you.

8. Don't have mail sent until you are **sure** you are actually going to a place. Beating to weather can be a very persuasive reason for a change of itenerary. If you have a ham or single side band radio you can call your mail forwarder en route timing the mail arrival with your own. Airmail generally averages

less than 10 days in major ports worldwide. Calling or writing from your last port of call is less desirable because alot can change on a passage.

9. Postage rates are generally much higher worldwide than in the U.S. for domestic as well as foreign mail. Sending aerograms (lightweight three-fold sheets available at Post Offices worldwide) will save up to half the rate for an ordinary air-mail letter. U.S. territories such as American Samoa and Guam charge U.S. postage rates so a letter sent to the U.S. goes by domestic rates.

10. Courier services such as DHL or Federal Express and UPS are available in many major ports worldwide, assuring you of delivery with in a few days of shipment. Surface mail is not a good option for sending packages, which may take from 2-6 months to arrive, are uninsurable, and may never arrive.

FAX:
To send urgent messages, (or overdue articles) fax can be found at many main post offices or telecommunication offices in major ports or at resort hotels. Be prepared to pay an average of $10 per page.

Telephone:
Arrange for an AT&T International Telephone Credit Card before you leave by dialing 1-800-CALL-ATT. You'll save up to 1/2 the cost of a call placed in most countries by paying for it by AT&T credit card, and will usually not have to use a telephone office to place the call. We hate to sound prejudiced but as a rule Spanish speaking countries don't do well with telephones or mail. Chile however is an exception, with excellent service even on tiny Easter Island. In third world countries many cruisers rely on their ham or single side band radios to place calls.

If you have a ham radio aboard, give your telephone credit card number to a ham operator who is willing to do phone patches for you. Never give the card number over the radio! This works well for keeping in touch with family and friends, but it is illegal to use amateur radio for ordering replacement parts or conducting business.

Marine single side band opens up world-wide communication to those who have not passed a morse-code 13 word-per-minute test and received a General Class Amateur Radio license. Pre-requisites are: SSB radio and tuner ($2500-$4000), radiotelephone station and operator's licenses (contact: FCC, P.O. Box 1040, Gettysburg, PA, 17325), and a radio station log book.

A single side band radio allows you to make calls through the AT&T High Seas Radio Service. AT&T has operated three coast stations for many years:
KMI, Point Reyes, California, (415) 669-1055 collect
WOM, Ft. Lauderdale, Florida, (305) 587-0910 collect
WOO, Manahawkin, New Jersey, (609) 597-2201 collect

To register to use the AT&T service, call 1-800-752-0279. There is no charge for registering for the service and registration remains in effect for two years from the last call made. There are four billing options when placing a call from your boat with the High Seas operator:

1. Charge to a third number (office or home) that you have pre-registered by calling 1-800-SEA-CALL.

2. Charge to a third number that you have not pre-registered. Acceptance of charges at the third number is required.
3. Collect call
4. Bill to a calling card which you give to the operator over the radio. (This is asking for trouble with computer hackers, don't try it.)

The calls are automatically person-to-person and you are only charged for the amount of time that you are actually talking to your party. The three-minute minimum charge is $14.93, and $4.98 for each additional minute. Although this may seem expensive, we have found it is nearly always less (and certainly more dependable and convenient) than placing calls through the post office in many foreign countries. Last we heard it was $28 to place a three minute call from Tahiti!

Some larger yachts carry SAT-COM (satellite communications) which allows direct phone access at roughly twice the per-minute charge and a more-expensive initial purchase and installation. In the next three years satellite cellular will become available.

Receiving mail and calling home are some of the joys of cruising, following the guidelines above should help your communications go smoothly.

People who do mail forwarding professionally:

Tracy's Homebase (mail, bill paying, newsletter fulfillment, fax services, secretarial) P.O. Box 3289, Friday Harbor, WA 98250. (206) 378-4359

TME
Box 10121, Eugene OR 97440. Toll free 1-800-843-7282

Mail Call
2726 Shelter Island Drive, San Diego CA 92106. (619) 222-1186

Waterfront Postal Center
24 Sand Island Road #27, Honolulu HI 96819. (808) 842-3084

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DIAL ACCESS COUNTRIES—To reach an AT&T Operator in the U.S. call from any phone

AUSTRALIA	0014-881-011	†GUATEMALA	190
†AUSTRIA	022-903-011	†HONG KONG	008-1111
BAHAMAS[2]	1 800 872-2881	†HUNGARY	00*-36-0111
BAHRAIN	800-001	†ITALY	172-1011
†BELGIUM	11-0010	JAMAICA[2]	0 800 872-2881
BRAZIL	000-8010	†JAPAN[2]	0039-111
BR. VIRGIN IS.	1 800 872-2881	KOREA	009-11
CAYMAN ISLANDS	1872	LIBERIA	797-797
CHILE	00*-0312	†NETHERLANDS	06*-022-9111
COLOMBIA[2]	980-11-0010	NEW ZEALAND	000-911
†COSTA RICA	114	†NORWAY	050-12-011
†DENMARK	0430-0010	†PHILIPPINES[2]	105-11
DOMINICA	1 800 872-2881	†SINGAPORE	800-0011
DOM. REP.	1 800 872-2881	ST. KITTS	1 800 872-2881
†FINLAND	9800-100-10	ST. MAARTEN[2]	800-1011
†FRANCE	19*-0011	†SWEDEN	020-795-611
†GAMBIA	001-199-220-0010	†SWITZERLAND	046-05-0011
†GERMANY, FRG[1]	0130-0010	U.K.	0800-89-0011
†GREECE	00-800-1311	†URUGUAY	00-1161
GRENADA[2]	872		

*Await second tone. †Public phones require coin or card. [1]Trial basis only. [2]Limited Availability.

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ANTIGUA	ECUADOR	MALAYSIA
ARGENTINA	EGYPT	MEXICO
ARUBA	EL SALVADOR	NETH/ANTILLES
BAHAMAS	GUAM	PANAMA
BAHRAIN	GUATEMALA	PHILIPPINES
BARBADOS	HAITI	SPAIN
BELIZE	HONDURAS	ST. LUCIA
BERMUDA	HONG KONG	TAIWAN
BR. VIRGIN IS.	ISRAEL	THAILAND
CAYMAN ISLANDS	ITALY	TRINIDAD/TOBAGO
CHINA, PRC	JAMAICA	TURKS/ CAICOS
COLOMBIA	JAPAN	VENEZUELA
COSTA RICA	KOREA	
DOMINICAN REP.	LIBERIA	

1 When in the U.S. dial 1 800 874-4000 ext. 359 for more information. To report *USADirect service* problems, dial 1 800 222-3000 when in the U.S. 2 With *USADirect service*, use your regular *AT&T Card* number (the large number in the center), not the international number.

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AT&T phone home

PROCEDURES FOR CHECKING INTO A FOREIGN COUNTRY

1. Determine the Ports of Entry for the country you'll be visiting by checking the Sailing Directions, World Cruising Routes or Pilot Book.

2. Find out if a visa or cruising permit is required prior to your arrival by checking with the consulate or embassy of the country. Another source of up-to-date information are the SSCA Bulletins.

3. Make or buy the flag of each country you plan to visit. If you don't have a sewing machine or can't find the countries flag, another solution is to use colored marking pens on a piece of sailcloth with two grommets pounded in the leading edge. Flags by Lynn, 2828 Canon St., San Diego, CA 92106 has the best selection of foreign flags I've ever seen, and can sew up flags that they don't have in stock. Some small countries actually fine boats arriving without the national flag flying. This is called a courtesy flag and should be flown from your starboard spreader as long as you're in the country. The flag of the country your boat is registered in can be flown from the backstay or from a flag staff near your stern. Flag Bag #85 Arm Chair Sailor

4. Call on the VHF or SSB radio before you arrive. Some countries (New Zealand, for example) require that you contact them 24 hours before your ETA. If you've called the Harbormaster/Port Captain before you've anchored, they can direct you to the best anchorage, and they'll know that you aren't trying to hide from them.

5. Hoist the yellow "Quarantine" flag before you enter the Port of Entry. This lets officials know that you've just arrived and wish to clear with health, customs, immigration, etc.

6. Talk with other yachts already at anchor to out find latest procedures and details.

7. 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.

8. Plan on being visited by or visiting the Health Inspector, Immigration, Customs and Port Captain.

9. Send only the Captain ashore (some countries like the U.S. may fine you if more than the skipper are off the boat before it's checked in.) with the Clearance Certificate from the last port, passports, ship's documents and crew lists.

Some countries require that you check in at nearly every island (French Polynesia, for example) while others (New Zealand) just want to see you twice, when you check in for the first time and when you're ready to leave the country. Make sure that you receive a Certificate of Port Clearance when you're checking out of any country. This paper shows that you legally checked out of the last country you visited and didn't leave any unpaid bills or crew behind. Even when leaving a U.S. port for a foreign port (leaving San Diego for Mexico, Hawaii for American Samoa for examples) it is necessary to have clearance papers, contrary to what U.S. Customs officials will try and tell you. We believed the U.S. Customs people, only to have a difficult time in the Galapagos when we arrived without clearance from San Diego.

MAHINA PRODUCTIONS OFFSHORE CRUISING SEMINAR

RECOMMENDED BOOK & VIDEO LIST

OUTFITTING AND PREPARATION

The Annapolis Book of Seamanship, John Rousmaniere	$29.95
Upgrading the Cruising Sailboat, Daniel Spurr	34.95
The Complete Liveaboard Book, Katy Burke	39.95
Cruising in Comfort, Jim Skoog	35.00
Improve Your Own Boat, Ian Nicholson	24.95
Ocean Cruising on a Budget, Anne Hammick	24.95
Rigger's Apprentice, Brion Toss	29.95
Care and Feeding of the Offshore Crew, Lin Pardey (provisioning)	22.95
Two on a Big Ocean, Hal Roth (circumnavigation of the Pacific)	24.95
Managing Your Escape, Katy Burke (a very important book!)	15.95
Sailing the Farm, Ken Neumeyer (how to provision for self-sufficiency)	9.95
The Cruising Chef, Michael Greenwald	14.95
Cooking Under Pressure, Lorna Sass (pressure-cooker tips & recipes)	18.95
Boatowner's Mechanical and Electrical Manual, Nigel Calder	39.95
Marine Diesel Engines, Nigel Calder	23.95
12 Volt Doctor's Practical Handbook, Edgar Behn	24.95
12 Volt Doctor's Alternator Book, Edgar Behn	19.95
Living on 12 Volts with Ample Power, Smead and Ishihara	24.95
Refrigeration for Pleasure Boats, Nigel Calder	24.95
The Big Book of Boat Canvas, Karen Lipe	18.95
Courtesy Flags Made Easy, Mary Conger (Make your own!)	19.95
Mariner's Guide to Single Sideband, Frederick Graves	12.95
Maritime Mobile Ham, Seven Seas Cruising Association	6.95
Cruising with Children, Gwenda Cornell	27.50
Babies Aboard, Lyndsay Green	10.95
Adrift, Steve Callahan	4.95
Survive the Savage Sea, Dougal Robertson	14.95
Survivor, Michael Greenwald	26.95
How to Survive on Land & Sea, Frank Craighead	16.95
After 50,000 Miles, Hal Roth	22.50
Bluewater Handbook, Dashew	29.95
Offshore Cruising Encyclopedia, Dashew	69.50
Desirable & Undesirable Characteristics of Offshore Yachts, Rousmaniere.	29.95
World Cruising Survey, Jimmy Cornell	29.95
SSCA Equipment Survey, Seven Seas Cruising Association	10.00

NAVIGATION BOOKS

There are British Admiralty Pilot Books and Defense Mapping Agency (DMA) Sailing Directions for the entire world. We have listed some of those most frequently used. Consult *World Cruising Routes or your nautical bookstore to see which Pilot Books or Sailing Directions are needed for the area you wish to cruise.

Atlantic Coast Pilots No. 1&2, U.S. NOAA	16.50
The Atlantic Crossing Guide, R.C.C. Pilotage Foundation	32.95
Street's Transatlantic Crossing Guide, Donald Street	39.95
Atlantic Pilot Atlas, James Clarke (Pilot Charts, Sailing Dir. Routes)	75.00
Pacific Island Pilot(s) (i.e. Vol. 3, Central Pacific) British Admiralty	56.00
Sailing Directions for South Pacific Ocean, U.S. Defense Mapping Agency.	17.75

Sailing Directions for W. Coast of Mexico & Central America, DMA 17.75
Pacific Coast Pilot No. 7, U.S. NOAA..... 16.50
*World Cruising Routes, Jimmy Cornell (the most important book of all!) 37.50
World Cruising Handbook, Jimmy Cornell (essential port information)..... 69.95
Nautical Almanac for celestial navigation (issued annually, must have shipped; it is unavailable in many cruising grounds)..... 14.95
We, the Navigators, David Lewis (natural-signs navigation)..... 10.95
Tide Tables, NOAA (for appropriate areas)..... 10.00
Light lists for Atlantic and Pacific Coasts, D.O.T. U.S. Coast Guard ea. 14.95
Pilot Charts, (N.Pac., S.Pac., N.Atl., S.Atl., Indian Ocean).... .price varies

WEATHER BOOKS

Weather for the Mariner, William J. Kotsch 19.95
Mariner's Guide to Radiofacsimile Weather Charts, Joseph Bishop..... 12.95
Marine Weather of Western Washington, Cdr. Lily (N.W cruisers)..... 12.95
Marine Weather of Northern California, Cdr. Lily 12.95
U.S. Chart No. 1, Nautical Chart Symbols, Abbreviations, Terms (Required) 2.50

CRUISING GUIDES

There are hundreds of cruising guides. We have only listed the ones we know are good from personal experience. * Similar guides are available for most worldwide cruising grounds; consult one of the nautical bookstores listed under "Other Resources" page, for advice.

Cruising in Tropical Waters & Coral, Alan Lucas (very good)..... 18.95
Charlie's Charts of U.S. Pacific Coast, Charles & Margo Wood..... 22.50
Charlie's Charts of Mexico, Charles Wood 26.50
Charlie's Charts of Hawaii, Charles Wood 15.50
Charlie's Charts of Polynesia, Charles Wood 26.50
Cruising Guide to Tahiti & the Society Islands, Marcia Davock..... 29.95
A Cruising Guide to the Caribbean and Bahamas, Stone & Hart 30.00
Pacific Boating Alamanac (3 NW, N.Ca. So.Ca)..... 15.95
*South Pacific Handbook, David Stanley (absolutely invaluable)..... 15.95

MEDICAL BOOKS

Advanced First Aid Afloat, Peter Eastman 11.95
Dangerous Marine Animals, Bruce Halstead 15.00
Where There is No Doctor, David Werner 12.95
Where There is No Dentist, Murray Dickson 8.95
The Merck Manual, Merck and Co..... 21.50

VIDEO TAPES

Annapolis Book of Seamanship, Volumes 1 to 4, John Rousmaniere, ... 49.95
Navigation and Coastal Piloting, Basic and Advanced,..... ..... 69.95
Baja Passage (preparation & cruising from San Diego to Baja)..... 39.95
Atlantic Circle, Cornell (1 yr cruise to Azores, UK, Caribbean)..... 24.95
Celestial Navigation Simplified, William F. Buckley 39.95
Cold Water Survival..... 39.95
Radar Navigation & Collision Avoidance..... 59.95
Sailing in Heavy Weather 49.95

ADDITIONAL RESOURCES

Nautical bookstores, suppliers of charts, guides and navigation instuments:

Armchair Sailor Bookstore, 1500 Westlake Ave.N, Seattle, WA 98109. 800-875-0852 in WA 206-283-0858.
Armchair Sailor Bookstore, 42 Caledonia St., Sausalito, CA 94965. 415-332-7505
Armchair Sailor Bookstore, 3 Lockwood St.#202, Charleston,SC 29401.803-577-0254
Armchair Sailor Bookstore, #4 Cypress Square, 13451 McGregor Blvd. S., Fort Meyers, FL 33919. 813-489-2555
Armchair Sailor Bookstore, 546 Highway 98E Destin, Fl 32541. 904-837-1577
Armchair Sailor Bookstore, Lee's Wharf Newport, RI 02840 401-847-4252
Bluewater Books & Charts, 1481 S.E. 17th St., Ft. Lauderdale, FL 33316. 305-763-6533
Captain's Nautical Supply, 1914 4th Ave., Seattle, WA 98101. 206-448-2278
(The only U.S. agent for the excellent new French Charts, also British Ad.)
Celestaire, 416 S. Pershing, Witchita, KS 67218. 800-727-9785
(largest mail-order selection of sextants, nav. tools, books and tapes)
Dana Book and Navigation, 24402 Del Prado #B, Dana Pt., CA 92629. 714-661-3926
Kleid Technologies, Inc., 443 Ruane St., Fairfield, CT 06430. 203-259-7161
(celestial navigation audio tapes and classroom seminars, sextants, books)
Landfall Navigation, 354 W. Putnam Ave., Greenwich, CT 06830. 203-661-3176
The Navigation Center, 254 NE 4th St., Miami, FL 33132. 800-827-1414
NY Nautical, 140 West Broadway New York, NY 10013. 212-962-4522 Charts etc.
Seabreeze Books, 1254 Scott St., San Diego, CA 92106. 619-223-8989

General Marine Stores:

Boat U.S., 880 So. Pickett St., Alexandria, VA 22304. 800-937-2628
(mail order equipment, retail stores, boat insurance)
Coast Navigation, 116 Legion Ave. Annapolis, MD 21401. 800-638-0420.
Downwind Marine, 2819 Canon St., San Diego, CA 92106. 619-224-2733
Pacific Marine Supply, 2804 Canon St., San Diego, CA 92106. 619-223-7194
(PMS sells canned butter and bacon and some freeze-dried foods)
West Marine Products, 500 Westbridge Rd. Watsonville, CA 95076. 800-538-0775
(West Marine has 21 discount marine stores from Anacortes to San Diego on the West Coast, and from Long Island to Miami on the East Coast, and ships equipment worldwide to cruisers utilizing UPS, airmail and air freight

Safety Equipment Suppliers:

Floatpac, P.O. Box 567, Kings Cross, NSW 2011 Austalia, 61-2-519-5190
(floatation bladders)
Hathaway, Reiser & Raymond, 184 Selleck St., Stamford, CT 06902. 203-324-9581
(manufacture the Galerider drogue system)
Survival Technologies Group, 6418 US Hwy. 41 N., Suite 226, Apollo Bch, FL 33572 800-525-2747, fax 813-641-1110 (abandon ship equip., flotation, liferafts)
West Marine, 500 Westridge, Watsonville, CA 95076. 800-538-0775.
(disc. source for a wide range of safety equipment)
World Status Map, WSM Publ., Box 466, Merrifield, VA 22116. 703-255-3093.
(bi-monthly pub. with latest travel warnings and advisories. $6 each issue)
Yachtsaver, Moxie Cove Rd., Round Pond, ME 04564-0295. 207-529-5575.
(deployable or automatic inflation bladders to keep holed vessel afloat)
ZARC Int'l, Box 5837, Columbia, SC 29250. 800-882-7011.
Cap-Stun Weapon Systems utilizing non-lethal red-pepper spray, used by FBI

Sail, Canvas and Rigging Suppliers

The Artful Dodger, 315 Jackson, Port Townsend, WA 98368. 206-385-2670 (dodgers and awnings, excellent designs)
Gianola & Sons, 400 Harbor Dr., Sausalito, CA 94965. 415-332-3339 (dodgers)
Glen Houseley Sailmaker, 1810 Virginia Ave., Annapolis, MD. 21401, 301-263-4913
Hasse & Petrich Sails, 315 Jackson, Port Townsend, WA 98368, 206-385-1640.
The Rigging Company, 1 Maritime Dr., Portsmouth, RI 02871 1-800-322-1525 (source for mail-order rigging and rigging supplies)
Sewing Machine Service, Clayton Klinger, 206-255-8673. (source for Pfaff 130 sewing machines with hand-crank and 110v motor)
Sailrite Kits, Rt. 9, Business 30 East, Columbia City, IN 46725. 800-348-2769.
Schattauer, 6010 Seaview Ave. NW, Seattle, WA 98107. 206-783-2400.
Weblon, P.O. Box 190, Port Chester, NY 10573. Polyester reinforced vinyl fabric, excellent for sun awnings.

Miscellaneous Suppliers:

Balmar Marine, 1537 NW Ballard Ave. Seattle, WA 98107. 206-789-4970. Marine alternators, generators and power systems.
47th St. Photo, 36 E. 19th St., NY, NY 10003. 800-221-7774, Fax 212-982-0684. (Best prices Kodak film & processing mailers, large selection of discount video camcorders, 35 mm cameras, multi-sustem t.v.-v.c.r.'s
Helix 310 S. Racine, Chicago, IL 60607. 800-33-HELIX, fax 312-421-1586 (world's largest underwater camera, video, book inventory, disc. prices)
Hamilton Ferris, P.O. Box 126, Ashland MA 01721, 508-881-4602. Wind, trolling, solar generators.
Patagonia Mail Order, P.O. Box 8900 Bozeman, MT 59771. 800-638-6464. State of the art clothing for sailing and other outdoor activties.
Recreational Equipment Inc.,(REI) Box 88125, Seattle, WA 800-426-4840. Outdoor clothing and camping equipment, stores nationwide.
Real Goods Company, 966 Mazzoni St. Ukiah, CA 95482. 800-762-7325 in CA 707-468-9214. Source for solar panels, biodegradable soaps, cordless butane irons and other alternative life style products. Free catalog.
Scanmar Marine, 298 Harbor Dr., Sausalito, CA 94965 415-332-3233. Windvanes.
Software Systems Consulting, 615 S. El Camino Real, San Clemente, CA 92672 714-498-5784 (source for software to convert your P.C. into a weatherfax)
Seventh Generation Company, Colchester, VT 05446-1672. 800-456-1177 Biodegradable soaps, detergents, cleansers etc. Free catalog.
Washington State University Creamery, Troy Hall 101, Pullman, WA 99164-4410 509-335-4014. (30 oz. tins of natural cheddar cheese approx. $10)
General Ecology, H20 Purification, Box 412, Tiburon, CA 94920, 800-336-3461 (source for Seagull IV Water Purification System)
Tracy's Homebase, P.O.Box 3289, Friday Harbor, WA 98250 206-378-4359 (mail forwarding, secretarial, bill paying, newsletter fulfillment, fax services for travelers

Schools, Associations, Consumer Education:

Seven Seas Cruising Assoc. Bulletin, $25 for 12 months, $10 for Equip. Survey. SSCA, 521 S. Andrews Ave., Suite 10, Ft. Lauderdale, FL 33301. 305-463-2431
Practical Sailor, Box 359135, Palm Coast, FL, 32035. $57 per yr, bi-monthly
Ocean Navigator Magazine, P.O. Box 569, Portland, ME 04112 $20 yr, bi-monthly

Gordon West's Radio School, Inc., 2414 College Dr., Costa Mesa, CA.714-549-5000.
For Blister Problems: Gelcoat Blisters: Diagnosis, Repair, Prevention
Gougeon Bros., 100 Patterson Ave, Bay City, Mich, 48706. 517-684-7286.
A Manual for the Repair of Fiberglass Boats Suffering from Osmotic Blisters
Richard McLean, Box 11500, Piedmont, CA 94611.

Insurance:

SSCA Group Insurance, c/o The Lawrence Group, Attn: Joe Grund, 725 A1A North, Suite E-206, Jupiter, FL 33477. 800-866-8906, 407-743-8906, fax 407-743-8751
Pantaenius, UK: 11 Lynher Queen Anne's Battery, Plymouth, PL4 OLP, ENGLAND
tel.: 0752-22-36-56 fax: 0752-22-36-37
Germany: Pantaenius, 2000 Hamburg 11, Cremon 32. tel.: 040-370-910
fax: 040-37-09-11-09

SELECTED SHORT WAVE RADIO TIME SIGNALS

Call sign	Frequency MHz	Power kW	s-pulse (ms)	m-pulse (ms)	Transmission times (GMT) and remarks
ATA New Delhi India	5 10 15	8 8 8	5 5 5	100 100 100	1230 - 0330 24 hours 0330 - 1230
CHU Ottawa Canada	3.330 7.335 14.670	3 10 3	300	500	24 hours, 29s pulse omitted and 51s to 59s voice time (GMT - 5h). Hour pulse is 1s.
JJY Sanwa Japan	2.5,5,8 10,15	2	8	8	24 hours. Silence 35m to 39m past each hour. Minute warning marker of 655ms during 59s each minute.
LOL Buenos Aires, Argentina	5,10,15	2	5	5	11h-12h, 14h-15h, 17h-18h, 20h-21h, 23h-24h. 59s silent.
MSF Rugby, England	2.5,5,10	5	5	100	24 hours, 5 mins on, 5 mins silence, alternating from 0h.
RWM Moscow	5, 10 15	5 8	100	500	24 hours, each hour from 10m to 20m and 40m to 50m.
WWV Ft Collins USA	2.5 5,10,15 20	2.5 10 2.5	5	800	24 hours. 29s and 59s silent. Male voice every minute. Atlantic storm info during 8m and 9m. Pacific info in 10m.
WWVH Hawaii USA	2.5 5,10,15	5 10	5	800	24 hours. 29s and 59s silent. Female voice every minute. Pacific storm info during 48m, 49m, 50m, 51m.
Y3S Nauen, Germany	4.525	5	100	500	24 hours except 0815 to 0945
YVTO Caracas, Venezuela	6.1	10	100	500	24 hours. 30s silent. Time & identity each min in Spanish.
ZUO S. Africa	2.5 5	4 4	5 5	500 500	18h to 04h. 24 hours.

s-pulse, m-pulse = marker pulse, minute marker pulse. ms = millisecond

Silences during parts of a minute occur with some signals at times. Long range reception is most likely at 7 to 15 MHz. Power is of secondary importance. The "pips" from the BBC, Radio Australia, Voice of America, etc, may also be used.

SAMPLE

MAYDAY PROCEDURES

We may only have 60 seconds!

1. JOHN: Hoist liferaft to cockpit, tie lanyard off securely.
   Work on saving the boat; stopping fire or leak
   If impossible, throw liferaft overboard, pulling on lanyard to inflate.
   TRANSMIT MAYDAY: Ch. 16 VHF if inshore, 2182 within 300 mi. (memo 3)
   14,313 offshore (memo 1 on ham radio)
   Red knapsack, survival box, water jugs to cockpit, ready to hand down to liferaft

2. Barbara: Take sail or laundry bag, start in forepeak and work aft, collecting: wetsuits, long clothes, medical boxes, canned food, chart, flashlight, camera

3. Barbara: Get into liferaft while John hands gear over from cockpit. Keep liferaft clear of boat. Pick up floating gear.

4. John: Cut dinghy free of handrails if possible. Transmit final MAYDAY. Toss everything possible clear of cockpit. Abandon ship.

(We keep a copy of this posted at our companionway. Why not type up your own version and post it on your boat?)

DISTRESS COMMUNICATIONS FORM

Instructions: Complete this form now (except for items 6 through 9) and post near your radiotelephone.

Speak SLOWLY — CLEARLY — CALMLY

1. Make sure your radiotelephone is on.
2. Select *2182* kHz.
3. Press microphone button and say: **"MAYDAY — MAYDAY — MAYDAY."**
4. Say: "THIS IS _____ (your boat name), _____ (your boat name), _____ (your boat name), _____ (your call letters)."
5. Say: **"MAYDAY:** _____ (your boat name)."
6. TELL WHERE YOU ARE (What navigational aids or landmarks are near?).
7. STATE THE NATURE OF YOUR DISTRESS.
8. GIVE NUMBER OF ADULTS AND CHILDREN ABOARD, AND CONDITIONS OF ANY INJURED.
9. ESTIMATE PRESENT SEAWORTHINESS OF YOUR BOAT.
10. BRIEFLY DESCRIBE YOUR BOAT: _____ (State Registration No.); _____ (Length) FEET; _____ (Draft) FEET;
    _____ (Type); _____ (Color) HULL; _____ (Color) TRIM; _____ (Number) MASTS; _____ (Type; Horsepower) POWER; _____ (Construction Material).
    _____
    (Anything else you think will help rescuers to find you)
11. Say: "I WILL BE LISTENING ON *CHANNEL 16 / 2182.*"
    (Cross out channel no. or frequency that does not apply)
12. End Message by saying: "THIS IS _____ (your boat name and call sign). OVER."
13. Release Microphone button and listen: Someone should answer. IF THEY DO NOT, REPEAT CALL, BEGINNING AT ITEM 3. If there is still no answer, switch to another channel and begin again.

Mahina Productions

OFFSHORE CRUISING SEMINAR (206) 378-4359

COURSE EVALUATION FORM

We are continually improving and updating our Seminars, and would value your feedback. We would be grateful if you would take a few minutes to answer the following questions.

1. Which of the topics covered were the most important to you?

   A. _____

   B. _____

   C. _____

   D. _____

2. Which topics would you have liked covered in greater depth?

   A. _____

   B. _____

   C. _____

   D. _____

3. How could we improve the Seminar Notebooks?

   _____

4. How could we improve future Seminars?

   _____

5. How did you hear about the Seminar?

   _____

6. Are you interested in making a passage with us on board Mahina Tiare?

7. Your name (optional) _____

Thank you very much for sharing your ideas and comments with us. Our enthusiasm lies in helping people fulfill their plans and dreams of cruising, so please drop us a postcard once you're actually out there cruising, or better yet, if you see us at anchor, come on over for a visit! John & Barbara

John Neal, Barbara Marrett P.O. Box 1596 • Friday Harbor, WA 98250 • U.S.A.