PREPARATIONS

Thoroughly preparing the boat and crew are the most important parts of long distance sailing, whether with a rally or independently.

The most effective preparations start years before the planned departure date, but even with just months to go, any time (and money) spent on ensuring that the boat and crew are in good shape, fit and ready for anything will be a good investment in your safety and happiness.

Whether you are the boat owner or a crew member, please take time to read through this section of the handbook. Take onboard the advice of the experienced sailors and marine specialist companies and make positive changes to your skills, equipment, and how you sail the boat.

Preparations Section Contents

To help you navigate, each chapter has a detailed table of contents on the first page.

A SAFETY ONBOARD

The Safety Onboard chapter is designed to help you to select safety equipment that meets both your needs and the rally mandatory Safety Equipment Requirements.

Use the handy checklist on the first few pages to help you work through the equipment you should have onboard. The rest of the chapter considers the equipment in more detail - what to look for, and how to use it.

Equipment is only one part of the safety equation. The skipper's responsibilities and crew training are covered in section 3 - People Preparations.

A. Safety Onboard Contents

Safety Equipment Requirements

The following safety equipment requirements have been drawn up to ensure the minimum acceptable level of safety equipment for yachts participating in World Cruising Club Events. The World Sailing Offshore Special Regulations have been used as a guideline to compile these regulations.

Division II (Racing) is run under World Sailing Offshore Special Regulations for Category 1 and these Safety Equipment Requirements.

These safety equipment requirements do not override any greater safety requirement demanded by the yacht's national or flag country, maritime authorities or appropriate regulatory bodies.

Yacht owners considering taking fare paying guests or crew should consider the implication in relation to their national or flag regulations as required by the appropriate proper authorities.

The regulations are in two sections:

Section One: Mandatory Safety Equipment Requirements

This equipment must be carried and all items will be sighted during the safety equipment inspection prior to the start. Failure to comply may lead to disqualification from the Rally.

Section Two: Recommended Safety Equipment

Whilst equipment in this section is not mandatory the organisers strongly suggest that all the recommendations in this section are complied with. The Safety Equipment Inspector will be available to discuss points made in this section during the inspection.

For ARC Racing Division only

ARC Division II (Racing) is run under World Sailing Offshore Special Regulations for Category 1 and these Safety Equipment Requirements.

All Racing Division Skippers must ensure they comply with all these requirements and utilise the check lists available on the World Sailing Website when preparing the boat.

For World ARC only

Equipment or service dates should not expire within the first six months of the start of the Rally.

The safety equipment inspector will be able to advise you about where to renew these items subsequently.

General Requirements

Whilst everyone on board plays a part in the safe operation of the yacht, it is the sole and inescapable responsibility of each skipper to ensure that all necessary safety precautions are taken in respect of themselves, the crew and the yacht.

All safety equipment that requires regular servicing must be in date, at the start of the Rally, and remain in date for the duration of the Rally. (The Test Certificate for the liferaft shall be submitted in advance and will be inspected during the Safety Equipment Inspection).

All safety equipment carried must:

a. Be of type, size and capacity commensurate with the size of yacht and crew
b. Function correctly
c. Be easily accessible

Each crew member must be fully conversant with the stowage location and operation of all safety equipment on board.

Section One: Mandatory Safety Equipment

It is important to use this checklist alongside the Safety Equipment Requirements document and the Conditions of Entry for the Rally.

Liferaft

- [ ] a. One or more purpose made, self-inflating, liferafts of sufficient capacity for at least all the crew on board. Shall be either:
  - [ ] i. ISO Standard 9650 Type 1 Group A with service Pack 1 (>24 hours), or equivalent made up of service Pack 2 (<24 hours) and a grab bag, or
  - [ ] ii. ISAF liferafts manufactured before 2016 until replacement is due at end of service life plus food and water equivalent to (i) above, or
  - [ ] iii. SOLAS LSA Code 1997 Chapter IV or later containing a SOLAS A pack
- [ ] d. Each raft shall be mounted externally or capable of being at the lifelines ready to launch within 15 seconds. Additionally for multihulls the raft should be deployable whether inverted or not.
- [ ] e. If a liferaft is stowed in a locker that locker will be dedicated to the stowage of the liferaft and will not have stowed in it anything else that is likely to hinder access to the liferaft or cause damage to it.
- [ ] f. The end of each liferaft painter line shall be permanently made fast to a strong point on board the yacht.
- [ ] g. Each liferaft shall have a valid inspection certificate from the manufacturer or approved servicing agent, valid for the period of the rally.

Liferaft Servicing

a. Liferafts based on type are to be serviced at a service station approved by the manufacturer at the following maximum intervals:

- [ ] i. SOLAS liferafts annually.
- [ ] ii. ISO 9650 canister packed liferafts no less frequently than every 3 years.
- [ ] iii. ISO 9650 valise packed liferafts no less frequently than 3 years except that hired valise liferafts shall be serviced annually.
- [ ] iv. ISAF liferafts annually

- [ ] b. The servicing certificate, or a copy, shall be carried on the yacht.

EPIRB

- [ ] A floating, water and manually activated EPIRB transmitting on 406MHz, and 121.5MHz or AIS, fitted with an internal GPS.
- [ ] Correctly registered with the appropriate home authority.

Important: Personal locator beacons (PLBs) carried do not replace the requirement for a yacht's EPIRB.

Long Range Communications Equipment

- [ ] **ARC, ARC+. ARC Europe, World ARC:** A satellite communications system (or an SSB radio with pactor modem) capable of sending and receiving e-mail messages whilst at sea.
- [ ] **World ARC only:** Yachts must be fitted with a DSC capable marine SSB HF radio transceiver covering the 2–22 MHz bands, with an independent aerial for DSC operation, OR a suitable alternative satcoms-based system capable of transmitting and continual monitoring an instant messaging app.

VHF Radio

- [ ] A VHF DSC capable radio transceiver having a rated output power of 25W and capable of working on all standard international channels must be fitted. With:
  - [ ] An external cockpit extension speaker.
  - [ ] A masthead antenna.
  - [ ] An emergency antenna shall also be carried.
- [ ] Handheld VHF Transceiver with minimum 5W output power. Watertight or with waterproof covers.

Recommended: the handheld receiver should have Digital Selective Calling (DSC) and be equipped with GPS.

Passive Radar Reflector

- [ ] Permanently mounted in, or capable of being hoisted to, a position at least 5m (15') above deck. Type:
  - [ ] Octahedral circular sector plates of minimum diameter 300mm (12"), or octahedral rectangular plates of minimum diagonal dimension 400mm (16"), or
  - [ ] Non octahedral radar reflectors must have a documented minimum RCS (radar cross-section) of not less than $10m^2$. Smaller cylindrical reflectors do not meet this RCS requirement.

Important: Where fitted a radar target enhancer does not replace the requirement for a passive radar reflector.

AIS (Automatic Identification System)

- [ ] AIS transponder with the following antenna:
  - [ ] Share the masthead VHF antenna via a low loss AIS antenna splitter, or
  - [ ] A dedicated AIS antenna that is a minimum of 38cm long, mounted with its base at least 3 meters above the water, and fed with coax cable that has a maximum 40% power loss.
- [ ] An AIS locator beacon for each crew member appropriately fitted to lifejackets for activation method of each device.

Distress Flares

- [ ] Shall be pyrotechnic LSA Chapter III SOLAS compliant, and not older than the stamped expiry date, or four years from date of manufacture, for the end date of the event.
- [ ] Pyrotechnic flares to be stowed in a watertight container, with protective gloves and goggles.

Minimum required:

- [ ] 4 red hand held flares - 2 of which may be eVDS (electronic flares)
- [ ] 2 buoyant orange smoke

These flare requirements are in addition to any flares carried in liferafts and their supplementary service packs or grab bags.

Crew Overboard Recovery

Within reach of the steering position for instant use:

- [ ] 1. A lifebuoy equipped with a whistle, drogue, a self-igniting light. AND attached to it:
- [ ] 2. A danbuoy (pole and flag) OR an inflatable danbuoy
- [ ] OR a MOB recovery module incorporating items 1 and 2

AND, in addition to 1 and 2 above

- [ ] 3. One lifebuoy with a drogue, a self-igniting light and whistle attached, and a method to recover the person from the water
- [ ] OR a recovery sling capable of hoisting a crew member onboard, which includes a buoyant line, buoyancy section (horseshoe) with no less than 90N (20lb) buoyancy, with a self-igniting light and marine grade retro-reflective material.
- [ ] 4. AND a throwing/Heaving line (floating) 15–25m (50–75ft) length, readily accessible to cockpit.
- [ ] At least one lifebuoy or recovery sling shall depend entirely on permanent (eg. foam) buoyancy.
- [ ] Each inflatable or automatic device shall be tested and serviced at intervals in accordance with manufacturer's instructions.
- [ ] Every lifebuoy/recovery sling shall have the yacht's name on it and must be fitted with marine grade retro-reflective material and a self-igniting light.

Pumps

- [ ] Securely fitted manual bilge pump operable from on deck, and
- [ ] Securely fitted or portable manual bilge pump operable below deck (electrical/mechanical pumps may be considered a suitable alternative for second pump), and
- [ ] Emergency pump: High capacity electric or engine driven pump, or combination of pumps, (with a total minimum capacity of 200l/min) with sufficient hose(s) to discharge from any compartment directly overboard or into the cockpit.
- [ ] Multihulls shall have provision to pump out each hull, and all watertight compartments (except those filled with impermeable buoyancy).
- [ ] All required permanently installed bilge pumps shall be operable with all cockpit seats, companionways and hatches shut.
- [ ] All removable bilge pump handles shall be retained by a lanyard, to prevent accidental loss.

Navigation Lights

- [ ] Navigation lights must be fitted so that the yacht shall, at all times, comply with the International Regulations for Preventing Collision at Sea.
- [ ] Two independently wired sets of navigation lights are required. For example,
- [ ] The primary set (bow and stern lights), and
- [ ] The secondary set (masthead tricolour – for vessels up to 20m).

Important: Battery operated navigation lights are not acceptable as the secondary set.

- [ ] Spare lamps of correct wattage shall also be carried for non-LED navigation lights.

High Powered Search Light(s)

- [ ] A watertight high-intensity heavy duty searchlight powered by the ships' batteries, instantly available in the cockpit for use on deck.
- [ ] The search light shall be capable of continuous use.
  - [ ] If rechargeable, the search light shall be capable of operating whilst being charged, or
  - [ ] A combination of two rechargeable searchlights will be acceptable, if prolonged use can be demonstrated.

Lifejacket/Combined Harness

- [ ] There shall be a lifejacket/combined harness provided for each member of the crew, or a permanent buoyancy jacket for children weighing under 40kg (88lbs). The lifejacket with harness shall have:
  - [ ] Whistle
  - [ ] Light
  - [ ] Yacht name (or lifejacket owner's name)
  - [ ] Retro-reflective tape
  - [ ] Crotch strap
  - [ ] Spray hood
  - [ ] AIS locator beacon appropriately fitted
  - [ ] Safety line not to exceed 2m (6'6") length overall with self-closing hooks at each end, and an intermediate self-closing hook. *The intermediate self-closing hook may be a loop if the lifejacket is fitted with a harness release system (HRS)*
- [ ] Spare re-arming kits and gas bottles appropriate for each make of lifejacket onboard shall also be carried.

Important: For USA flagged yachts where Type 1 inherently buoyant PFDs are carried, an offshore inflatable lifejacket/harness (preferably USCG Type II approved) shall also be carried.

Jackstays and Clipping Points

- [ ] **Jackstays/jacklines:** Independent along port and starboard side decks and elsewhere as necessary to enable a crew member to move readily between the working areas on deck and the cockpit(s) with the minimum of clipping and unclipping operations.
- [ ] **Clipping Points:** Attached to through bolted or welded deck plates, or similar, in positions close to the helm, and to enable crew to clip on before coming on deck, and unclip after going below. Consideration should be given to entering/leaving a saloon on a multihull and reaching the helm.

Heavy Equipment

- [ ] All heavy equipment (i.e. anchor, batteries, gas bottles and stoves) shall be firmly secured to prevent damage from possible knockdown or capsize.

The following equipment shall also be fitted/carried:

- [ ] A safety equipment location chart in durable waterproof material displayed in the main accommodation where it can best be seen, clearly marked with the location of principal items of safety equipment.
- [ ] Emergency grab bag (see Appendix 1)
- [ ] Navigational charts (not solely electronic), and pilots for the route of the event.
- [ ] A recognised secondary or alternative method of navigation. *For example: a handheld GPS with spare batteries*
- [ ] Securely fitted taut double lifelines/guardrails around the entire deck of stainless steel or high modulus polyethylene (Spectra®/Dyneema® or equivalent) rope (braid on braid is recommended). When HMPE (Dyneema®/Spectra®) is used, it shall be protected from chafe and shall be spliced in accordance with the manufacturer's recommended procedures.
- [ ] Safety knife in the cockpit/on deck.
- [ ] Anchor of sufficient weight plus a suitable combination of chain and rope.
- [ ] Fire extinguishers (minimum 2). *Important: A fire stick is a useful fire fighting device but does not replace this requirement.*
- [ ] Fire blanket (secured near the galley).
- [ ] Companionway hatches/washboards to be capable of being secured shut independently and with lanyards or similar device to prevent accidental loss. Saloon door on a multihull shall be capable of being secured in the open and closed position.
- [ ] Bungs or softwood plugs – securely attached/stowed adjacent to each fitting to enable any through hull fitting (below and above waterline) to be closed off.
- [ ] A watertight torch/flashlight of minimum 400 lumen with spare batteries and bulbs.
- [ ] Emergency tiller capable of being fitted to the rudder stock except when there are two methods (for example tiller or wheel) of controlling a rudder, neither of which shares components with the other except for the rudder stock.
- [ ] A proven method of emergency steering with the rudder disabled. *For example, a Hydrovane system, drogue or similar bespoke system*
- [ ] Hacksaw and spare blades, bolt croppers, or suitable method for cutting away rigging fitted. Soft rigging may only require a serrated ceramic knife.
- [ ] Medical kit and instruction handbook suitable for undertaking an ocean passage with the number of people onboard.
- [ ] Foghorn.
- [ ] Buckets (at least two) of stout construction and fitted with lanyards; capacity to be at least 9 litres (2 gallons).
- [ ] Echo sounder and boat speed/distance log.

Section Two: Recommended Safety Equipment

It is important to use this checklist alongside the Safety Equipment Requirements document and the Conditions of Entry for the rally.

- [ ] It is recommended that the following equipment be carried:
- [ ] One complete spare lifejacket.
- [ ] Dinghy and oars.
- [ ] Second anchor, plus a suitable combination of chain and rope.
- [ ] Sextant and nautical almanac or tables for astro navigation.
- [ ] Storm jib.
- [ ] Storm trysail or 3rd reef in mainsail (to reduce luff by at least 50%).
- [ ] A 1m^2 area of highly-visible pink, orange or yellow capable of being displayed on the coach roof and/or deck.
- [ ] Mast-step. The heel of a keel-stepped mast should be securely fastened to the mast-step or adjoining structure.
- [ ] Drogue or sea anchor. A drogue (for deployment over the stern), or alternatively a sea anchor, or parachute anchor (for deployment over the bow), is strongly recommended as a means to reduce the risk of capsize in heavy breaking seas.
- [ ] Personal 406MHz Locator Beacon (PLB) for individual adult crew members.
- [ ] GPS capable of recording a crew overboard position, within 10 seconds, and monitoring that position without having to go below deck.

It is highly recommended that each person onboard carries a knife at all times whilst at sea.

Appendix 1: Recommended Grab Bag Contents

A yacht is to have a grab bag for each liferaft with the following recommended contents, which need not be additional to the items required by the Safety Equipment Requirements. The grab bag offers a suitable place to stow items where they will be quickly found and readily carried to the liferaft. A grab bag should have inherent flotation, be marked with the name of the yacht, and have a lanyard and clip.

- [ ] Waterproof hand-held VHF transceiver.
- [ ] Watertight flashlight with spare batteries (and bulb if not LED).
- [ ] Second EPIRB.
- [ ] First aid kit, including sunscreen and medical supplies for pre-existing medical conditions.
- [ ] Portable satellite phone with preprogrammed numbers or aide memoire.
- [ ] Handheld GPS unit.
- [ ] Power bank for charging electronics.
- [ ] Two 'Cyalume' sticks or two watertight floating lamps.
- [ ] One daylight signalling mirror and one signalling whistle.
- [ ] Two red eVDS (electronic flares).
- [ ] Additional high energy food.
- [ ] Additional drinking water in a dedicated and sealed container, or a hand operated desalinator, plus containers for water.
- [ ] Graduated plastic drinking cup for rationing water.
- [ ] String, polythene bags, seasickness tablets.

Important

If the liferaft contents require upgrading with extra rations or equipment to meet the ISO 9650 service pack 1 (>24 hours) or SOLAS A content lists, then you will need a grab bag for this equipment too.

Appendix 2: Recommended Crew Training

The skipper and at least one crew member should have undertaken training within the five years before the start of the Rally in both theoretical and practical sessions in the following training topics. World Sailing recommends that all crew members do likewise.

- [ ] Giving assistance to other craft.
- [ ] Personal safety gear, theory and practice.
- [ ] Care and maintenance of safety gear.
- [ ] Fire precautions and fire fighting, theory and practical.
- [ ] Crew overboard identification and recovery.
- [ ] Hypothermia, cold shock and drowning.
- [ ] Crew health.
- [ ] Marine weather.
- [ ] Heavy weather - crew routines, boat handling, drogues.
- [ ] Storm sails.
- [ ] Damage control.
- [ ] Search and rescue organization.
- [ ] Pyrotechnics and signalling gear, theory and practical.
- [ ] Emergency communications, theory and practical.
- [ ] Liferafts and abandon ship, theory and practical.

The Safety Equipment Inspection

Before the rally starts, every boat will have an in-person safety equipment inspection, checking that all of the mandatory equipment listed in the safety equipment requirements for the rally is onboard and suitable for use.

The checklist on pages 5-11 will help you to work through what you need to have so you are ready for the inspection.

For some rallies, an online virtual safety equipment inspection will be offered in the months before the rally starts. A virtual safety inspection is a good way to check your preparations are going to plan, and to talk to one of the inspectors about your equipment, its stowage and use.

Extra Paperwork

In addition to the safety equipment, the inspectors will also want to see:

- Proof that your liferaft complies with one of the approved types - ISO 9650, ISAF or SOLAS A.
- The liferaft servicing certificate.
- The service history or certificate for inflatable lifesaving devices.
- And, for the ARC Racing Division only:
  - IRC certificate.
  - Keel inspection certificate.
  - Crew training certificates.

The Inspection

Our inspectors are all experienced sailors, with many thousands of sea miles. They are always happy to share their expertise - they are there to help you, not to test you.

The inspector will check every item on the list to ensure it complies with the requirements and is ready to be used.

The skipper will book an inspection date and time at rally check-in. It is a good idea to book an early inspection, so any problems can be sorted out in good time.

On the day of the inspection:

- Put all small equipment like the first aid kit, lifejackets, flares and the grab bag on the cockpit or saloon table.
- Be prepared to demonstrate the emergency steering system.
- Fit the jackstays/deck lines.
- Have a list of the liferaft pack contents.
- Get all paperwork and certificates ready.

The inspection will take around 45 minutes.

Can I 'Fail' the Inspection?

You will not pass the inspection if you do not have suitable equipment correctly installed to meet the safety equipment requirements.

The inspector will make suggestions for improving your safety set-up, and will explain any issues or 'failures', and talk through solutions.

This usually means making some simple improvements, like putting the boat's name on the lifebuoys, or buying a lifejacket spray hood.

The inspector will come back to re-check until they are satisfied. Ultimately, the inspector can stop the boat from participating in the rally.

Remember that it is usually cheaper and easier to buy equipment before leaving your home port, rather than trying to purchase things at the rally start port. Plus you have the benefit of the cruise to the start to sort out stowage and trial the equipment.

Liferafts

A liferaft is designed to be used as the last resort; when you need to escape from your boat because of fire or sinking. The liferaft is designed to help shipwrecked sailors to survive while waiting for rescue. Using a liferaft won't be an enjoyable experience, but it may save your life.

Even with EPIRBs, AIS beacons, SARTs and modern voice communications, it may take some time before your distress call results in a rescue. The contents of your liferaft will help to keep you alive, and to attract the attention of your rescuers. We require all liferafts to be packed with enough food, water and equipment for more than 24 hours. You may need to supplement the standard pack of your raft with extra equipment and water.

Features of an ISO 9650 Liferaft

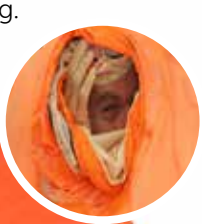
ISO 9650 Type 1 Group A is a minimum design standard and the quality and contents of rafts will vary.

Look for the following features when buying a raft:

Canopy opening: large enough to allow access wearing lifejackets, but easy to close with cold hands.

Self-inflating canopy: brightly coloured, with internal and external lights and retro-reflective tape.

Look-out port: for ventilation and watch keeping.



Tubes: brightly coloured for better visibility.

Grab lines: around the inside and outside of the raft.

Insulated floor: for comfort.

Clear instructions: printed on the raft, rather than on paper.

Step: rigid or inflatable to make boarding easier.

Inside ladder: across the raft floor to pull-in the crew.

Ladder under raft: to help righting in case of capsize.

CO2 bottle: secured out of the way.

Ballast pockets: Multiple, oversized and strongly secured ballast pockets for better stability.

Drogue: good size and securely fixed.

Emergency pack: The pack and contents should be easy to use with cold,wet hands.

Types of Liferaft

There are a range of liferafts available for cruising and racing, but whatever raft you choose, it must comply with one of these three standards:

1. ISO Standard 9650 Type 1 Group A with service pack 1 (>24 hours) or equivalent contents; or
2. ISAF liferaft manufactured before 2016 until replacement is due at end of service life, plus food and water equivalent to 1 above, or
3. SOLAS LSA Code 1997 Chapter IV or later containing a SOLAS A pack.

Of these three options, the most readily available for a recreational sailor is the **ISO 9650 Type 1 Group A.**

ISO 9650 Type 1 is an offshore liferaft.

ISO 9650 Type 2 is an inshore liferaft. Type 2 is not acceptable.

Group A means the raft will inflate in air temperatures between -15 and +65°C.

If you can only buy or rent a raft with a less than 24 hour pack, you can use a grab bag for the extra equipment and rations to make up to over 24 hour pack equivalent.

SOLAS rafts are mainly used by commercial boats and charter yachts.

ISAF rafts were superseded by the ISO 9650 design, and are now coming to the end of their design life.

Inshore and coastal liferafts are not acceptable as they are not designed for use offshore.

If you are unsure about your liferaft, please contact us. If you have an out-of-date raft or an inshore raft, you will need to buy a suitable replacement - this will generally be cheaper and easier in your home port.

Extra Features

Standards like **ISO 9650 Type 1 Group A** are a design minimum, and some manufacturers will provide additional features or equipment.

These might be simple features like stowage pockets inside the raft, or something more fundamental, such as being self-righting.

A self-righting liferaft uses an inflatable canopy arch to create righting moment when the raft is capsized, useful for a weaker crew.

Valise or Canister?

Liferafts are available in either a hard case (known as a canister) or a soft bag (known as a valise).

Valise rafts are usually slightly smaller and lighter than canister rafts, but they need more protection. A valise should be protected from water, chafe and weight, so is best stowed in a dedicated locker or somewhere accessible and protected. Never use a valise raft as a step or a seat.

Canister rafts are packed into a two-part white hard case. Canisters need to be stowed in a cradle on deck or on the rails. Never use a canister raft as a step or seat as this will break the seal, allowing water ingress.

Get to Know Your Liferaft

Before buying, compare different brands of raft by feature and price, and try to view rafts inflated at a boat show or demonstration.

Understanding how big (or small) it is for the number of crew and the quality and range of equipment packed in the raft can be instructive.

If possible, take part in a demonstration so you can see how long it takes the raft to inflate (the World Sailing standard is 3 minutes at 20°C) and what it is like to board a liferaft wearing a lifejacket.

An informal swimming pool session is good, but a formal course that includes sea safety and survival theory with a pool session is better. See page 66.

Liferaft demo in a swimming pool

Liferaft Pack Contents

The equipment and supplies packed in with a liferaft will vary by raft type and manufacturer.

We require all liferafts to have the equivalent to an ISO 9650 >24 hour pack as a minimum (or SOLAS A pack for SOLAS liferafts).

The table below shows the minimum equipment required for ISO 9650 >24 hour pack, and the additional equipment needed to bring a <24 hour pack up to the same standard.

Always check your pack contents with the manufacturer so you know what is inside your raft. You can always add extra safety and comfort items to a grab bag - you can take more than the minimum requirement.

Thermal Protective Aids (TPAs)

A TPA is a simple bag or suit made from a waterproof material like aluminized polythene, designed to keep the casualty warm and to prevent wind chill. You must have two TPAs in the raft or grab bag, but having one per crew member is a good idea. You can carry immersion suits instead of simple TPAs.

Water Rations

The more water you have in the raft, the more comfortable you will be. A hand-operated watermaker is a good addition to the grab bag. Raft water usually comes in small bags.

A graduated drinking cup will help you ration water, and a child's sip-cup will stop water spilling - both items can be packed with the raft or in a grab bag.

The recommendation is for no water for the first 24 hours, then 0.5 litres per person, per day split into three drinks at sunrise, noon and sunset. Children and the injured and sick will need water during the first day.

Food Rations

Liferaft food is usually a block of hard biscuits that provides 10,000kJ. You can add to this supply with easy to eat non-thirst making foods from the boat.

ISO 9650 Packs - Over and Under 24 Hours

Item	ISO 9650 Pack >24 hours	ISO 9650 Pack <24 hours
Bailer	1	1
Sponge	2	2
Pair of paddles	1	1
First aid kit	1	0 - add 1 to grab bag
Whistle	1	1
Waterproof torch (flashlight) with spare batteries and bulb	2	1 - add 1 extra to grab bag
Signalling mirror	1	1
Anti-seasickness pills, per person	6	6
Seasick bag, per person	1	1
Red hand flares	6	3 - add 3 extra to grab bag
Red parachute flares	2	2
Thermal protective aids	2	0 - add 2 (min) to grab bag
Leak repair kit	1	1
Air pump	1	1
Drinking water, per person	1.5 litres	0 - add 1.5 litres pp to grab bag
Food rations, per person	10,000 kJ	0 - add 10,000 kJ pp to grab bag

Note: SOLAS liferafts must have a SOLAS A pack, or a SOLAS B pack with extra items in a grab bag to make up to an A pack equivalent. Owners of ISAF rafts must have extra equipment in a grab bag to make up to an ISO 9650 Type 1 Group A over 24 hour pack. Please refer to the manufacturer's list of contents to understand what you need to add.

Liferaft Stowage

- Preferably, rafts should be mounted externally.
- If mounted elsewhere, the raft must be ready to launch within 15 seconds.
  - If stowed in a locker, it must be dedicated to the liferaft.
- Multihulls: the raft should be deployable if the boat is inverted.
- The end of the liferaft painter must be attached to a strong point on the boat.

If you have to abandon ship because of sinking or fire, it may not be a controlled situation. You want the raft to be available quickly, and to be able to board it safely with the grab bags and any other personal gear you need. You may only have a few minutes.

Where and how you stow the raft is a critical decision.

The best place to stow a canister raft is in a cradle mounted on the deck or on the aft rails.

Some multihulls have dedicated stowage in the transom so the raft can be launched even if the boat capsizes. If this feature isn't available, externally mounted on the aft rails is an option.

Valise rafts can't be stowed outside, and should be kept in a dedicated locker or in a dry location. In this case, it must be possible to get the raft to the rails and ready to launch in 15 seconds.

Hydrostatic Release Unit

Boats with externally-mounted canister rafts can fit a hydrostatic release unit (HRU) to the cradle lashing, so that in the event of a sudden catastrophic sinking the liferaft is launched automatically.

The release mechanism works on water pressure. When the mechanism is submerged to 1.5-4m depth, an integral knife cuts the lashing and the liferaft floats free of the cradle, still attached to the boat. As the boat sinks, the painter line stretches and the liferaft will inflate. A weak point in the line breaks to ensure the liferaft isn't pulled down with the boat.

Most recreational hydrostatic release units are disposable and must be replaced every two years.

Canister liferaft with a hydrostatic release unit

Dedicated liferaft stowage on a catamaran

Safety knife stored with the liferaft to cut the painter

Grab Bags

Every yacht must have at least one grab bag (or abandon ship bag) for each liferaft onboard. The grab bag contains items to aid rescue, to make your time in the liferaft more comfortable, and to help once you are rescued.

If your liferaft doesn't have an over 24 hour pack, you will need an additional grab bag with these extra items. See the list on page 15.

A grab bag should be:

- Brightly coloured, waterproof and buoyant
- Marked with the boat's name
- Fitted with a lanyard to attach to the raft

Stow the grab bag where it is easily accessible in case of a sudden abandon ship, and ensure all crew know the location and contents.

Keep another empty bag near by for last minute grabs like food, clothes or mobile phones.

It is a good idea to keep laminated copies of the ship's papers, insurance documents and crew passports permanently in the grab bag.

Grab Bag Contents

1. Location

Prioritise grab bag contents based on:

1. Location
2. Protection
3. Food and water
4. Medical

These items will help improve your rescue, and include: EPIRB, SART, waterproof handheld VHF, handheld GPS, strobe light, cyalume sticks, electronic flares, fog horn.

2. Protection

These items will help improve your time in the raft, and include: sun cream, heat or cooling packs, inflatable cushion, fold-down bucket, moist hygiene wipes, diving mask, gaffer tape.

3. Food and Water

Extra water (bottles filled to 80% only), extra food rations (non thirst-provoking), graduated water cups for rationing water, no-spill sip cup, fishing kit, collapsible container for collecting water.

4. Medical

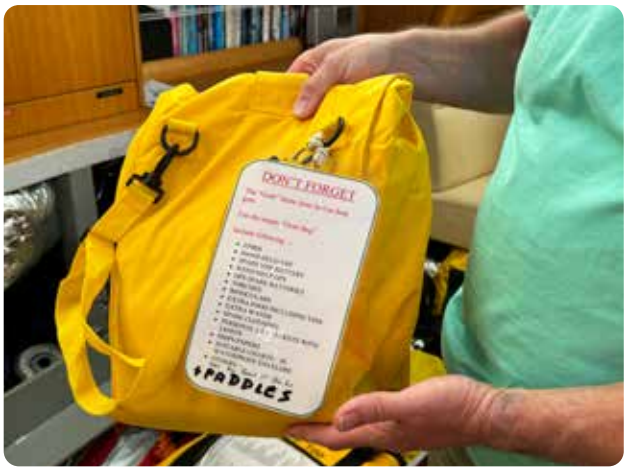
Prescription medicine, anti-emetics, extra anti seasickness pills and sick bags, inflatable splint, sunburn cream, enema kit.

Last Minute Grabs

These are items that you will probably need onboard the boat, so aren't convenient to permanently store in a grab bag. They can be 'last minute' items that you collect as you abandon the boat. Keep a spare waterproof grab bag empty for this purpose.

Crew passports, ship's papers, credit cards and money, sat phone, mobile phones, solar charger or power bank, sunglasses, spare lifejackets, spare clothes (including wet weather gear), immersion suits, danbuoy or MOB module, navigation charts, compass, sextant and tables, multi purpose tool, lighter, towels, waterproof notebook and pencils, playing cards.

Grab bag with a list of contents



Reminder list for last minute grabs

Liferaft Servicing

All liferafts and other inflatable lifesaving equipment need to be serviced by a manufacturer-approved service agent or service centre.

- The liferaft must be within service period for the duration of the rally.
  - ISO 9650 rafts - every 3 years
  - ISO valise rented rafts - every year
  - ARC Racing Division valise - every year
  - SOLAS rafts - every year
  - ISAF rafts - every year
- Upload a copy of the service certificate to the Members Area of the website.

If you are planning long distance cruising or taking part in World ARC, you will need to plan your servicing. This may mean getting the raft serviced earlier so it is in date for the whole of your cruise, or finding a service agent on the route.

Check the manufacturer's service network is convenient for your travel plans, and factor-in time for servicing to your cruising plans.

During a service, the raft will be inflated and the fabric and construction checked for corrosion and damage. The gas bottle will be refilled or replaced, and the contents checked and replaced if they are out-of-date. Liferafts that no longer meet the standard will be condemned and will need to be replaced.

If possible, be present when your raft is inspected so you can see what it looks like inflated. You may be able to ask to have some small items added to the pack, such as spectacles, copies of the boat's papers, medication, an EPIRB or electronic flares.

Ocean Safety liferaft being serviced

My Notes

Man Overboard

A crew member overboard is a serious emergency. You can try to prevent it happening by having clear rules around when and how to clip on.

Preventing a Man Overboard

The most important way to keep crew safe is to keep them onboard the boat.

This means having agreed procedures as to when crew members must wear a lifejacket/harness and when and how to clip on.

But what if someone forgets to clip on and they go over the side? What if it is the skipper who is in the water? What if you are sailing at maximum speed with the spinnaker up, or at night?

What will you do?

1. Process

The order in which you take the standard steps for a man overboard will depend on the layout of your boat, the composition of the crew and your sail plan:

- Raise the alarm with the whole crew.
- Deploy the danbuoy or lifebuoys to be a visual aid for the casualty and yacht.
- Mark the position - man overboard button on the chartplotter/GPS.
- Deploy crew members to be 'spotters' to maintain visual contact with the casualty.
- Issue a MAYDAY alert.
- Get the boat under control and return to the casualty.
- Prepare and deploy the recovery equipment.

Think about what would work on your boat, and what you could improve. For example, can you mark the position of a man overboard from the helm station?

2. Plan

Talk through the process for man overboard recovery (and other emergencies) with the crew.

Discuss different scenarios.

Record your decisions and agree the process.

3. Practise

Test your plan by practising in harbour and again in open water.

Learn from the practise. Update your plan and your boat rules. Make any changes to the type of equipment you have, how it is stowed or even your choice of sail plan. Record your decisions.

Having the right safety equipment, training and procedures will help to keep your crew safe at sea.

Our safety equipment requirements (see pages 5-11) are the minimum we expect. Create a safe sailing environment with the procedures, equipment and training that suit your boat and crew.

Before starting the Rally, every skipper must sign a safety declaration confirming they have given the crew a comprehensive safety briefing and conducted training drills for man overboard, abandon ship, dismasting, fire, flood, loss of rudder/steering and use of storm sails.

My Notes

Lifejackets

For each crew member

- A lifejacket combined harness with:
  - Whistle
  - Light
  - Yacht name (or owner's name)
  - Retro-reflective tape
  - Crotch strap
  - Spray hood
  - Personal AIS beacon
- 3-point safety line/tether
- Spare re-arming kit and gas bottle

The rule when buying a lifejacket is to 'choose one you could sleep in' - if it isn't comfortable, it won't be worn.

There are many different designs and styles of lifejackets, so try lots on until you find one you like. It is preferable if each crew member chooses the design that suits their physique, rather than having matching lifejackets.

The international standard is ISO 12402 and adult lifejackets should be 150N or 275N. Child lifejackets are 100N.

Lifejackets are inflated with CO2, either manually or automatically. Automatic inflation is more common, and this will work if the casualty is unconscious.

Comfortable lifejackets get worn. Credit: Ronald Kuijper

Children

All children need a personal flotation device. Young children weighing up to 20-30kg should have a permanent buoyancy 100N lifejacket which will turn them over so they float face-up. These usually already have retro-reflective tape and a lifting handle, and can be fitted with a water-activated light and a safety line/tether.

Junior inflatable lifejackets for children weighing 20-50kg are available in a wide range of styles, and either come equipped with the same required accessories as an adult lifejacket, or these can be easily retrofitted.

Children with an inflatable lifejacket should have a personal AIS beacon, just like other members of the crew.

Permanent buoyancy lifejacket for a child

Lifejacket Inflation

1. Auto Inflate - water activated

- Uses a water-soluble tablet
- Operates within 5 seconds of immersion
- Modern designs are less commonly activated by accident or in damp environments
- Has a manual pull back-up

2. Auto Inflate - water pressure activated

- Operates when submerged in 10cm of water
- Has a manual pull back-up if 10cm depth isn't reached
- Ideal for extremely wet environments

3. Manual Pull Inflate

- Operates by pulling a cord
- Full buoyancy in around 5 seconds
- Only works if the casualty can pull the cord

Lifejacket Accessories

All lifejackets, including children's inflatable lifejackets, must be fitted with the accessories listed on page 20.

Most quality modern lifejackets come with a crotch strap, whistle and retro-reflective tape. Some are available fully equipped with all the accessories, but these are easily bought and fitted as extras.

Crotch straps

The crotch straps pass between the wearer's legs, attaching to the lifejacket harness at the front and back. When adjusted correctly, the straps improve lifejacket performance and stop the inflated lifejacket from sliding over the casualty's face.

Spray hood

A man overboard's legs act as a drogue, orientating the casualty face into wind and waves. The spray hood (or face shield) is designed to protect the casualty from inhaling spray and water.

Ocean Signal MOB1 AIS beacon fitted inside a lifejacket

Personal AIS beacon

A personal AIS beacon allows near-by vessels to locate a casualty using the AIS.

The beacon is fitted inside the lifejacket so that it automatically activates when the lifejacket is inflated; either water activated or by a lanyard connecting the beacon and lifejacket.

There are personal locator beacons that combine AIS and EPIRB technology, making the casualty locatable via AIS by nearby vessels, and to international search and rescue services using the Cospas-Sarsat 406MHz distress frequency and 121.5MHz homing signals.

If you want the additional features of a satellite link to search and rescue services but can't fit a combined AIS-EPIRB to your lifejacket, we suggest that an additional compact 406MHz personal locator beacon be carried.

Video explaining beacons: https://bit.ly/422p0xg

Safety Line and Clipping-On

The safety line or tether will keep the wearer attached to the boat, reducing the chances of going overboard.

A three-point tether has a self-closing hook at each end and one in the middle, or a loop in the middle if the lifejacket has a 'harness release system' or HRS.

The maximum length of the line should not exceed 2m to reduce the potential distance to fall.

With the centre hook (or loop) attached to the lifejacket, the wearer has two self-closing hooks to attach themselves to the boat, making it easier to move around the deck while always being connected to the boat.

Think about how crew can move safely in rough weather from the cabin to the steering positions, winches or sail handling positions on deck.

Crew should be able to clip on before leaving the cabin, then have accessible jackstays or clipping points to get them around the boat while remaining attached at all times.

Clipped on aboard Sisi. Credit: Michael Kremtz

Lifejacket Maintenance

Look after your lifejacket - your life may depend on it.

After use, hang up the lifejacket in a dry locker and tidy the harness, crotch strap and safety line so it is ready to wear again.

Wash off salt with fresh water as this can corrode and degrade fabric and metal parts.

Lifejackets should be serviced annually. Before every passage follow the manufacturer's instructions for a visual check:

- Check outer cover and stitching for damage.
- Check the harness and crotch strap webbing for damage.
- Check buckles and fasteners for damage.
- Clean off salt.
- Clean zippers and lubricate.
- Manually inflate and leave overnight to check for leaks. If you find an air leak, discard the lifejacket as they can't be repaired.
- Check the bladder for abrasion, especially around the bottle, in folds and at the join to the outer cover.
- Check the firing mechanism expiry date and that retainer clips are in place.
- Check the gas bottle and replace if rusty or used. Weigh the bottle and replace if it is lighter than the stamped weight. Ensure the bottle is the right size for the lifejacket and is screwed-in fully.
- Test the light and check the expiry date.
- Check the spray hood for wear. Ensure it is attached to the lifejacket.
- Check the AIS beacon is connected to the lifejacket and run a test according to the manufacturer's instructions.
- Deflate and carefully pack the bladder and accessories back into the outer cover.
- Don't forget to check your safety lines for wear and that the clips are operating correctly.

Lifejacket Spares

Buy several re-arming kits (gas bottle and firing mechanism) for each design of inflatable lifejacket you have onboard.

These can be difficult to obtain in some cruising destinations, leaving an accidentally activated lifejacket useless.

Crew Overboard Recovery Equipment

Each yacht must have two independent systems of lifebuoys, with a danbuoy and a method of recovering a casualty from the water. Plus a 15-25m floating throwing line accessible in the cockpit.

At least one lifebuoy or recovery sling must have permanent buoyancy. The others, including the danbuoy, can be inflatable.

Using the images below, choose one option from System 1 and one option from System 2.

Please read the Safety Equipment Requirements and the checklist on page 5 for full details. If you are unsure, contact us for advice.

System 1 - Choose Option A or Option B

Option A

A lifebuoy (inflatable or permanent buoyancy) with a whistle, light, retro-reflective tape, drogue and boat name, with a danbuoy (pole or inflatable) attached.

Option B

An inflatable MOB recovery module (mini liferaft) incorporating the elements in Option A.

Lifebuoy & danbuoy - L: inflatable, R: permanent buoyancy

A Jon Buoy MOB module mounted on the aft rail

System 2 - Choose Option C or Option D

Option C

A lifebuoy (inflatable or permanent buoyancy) with a whistle, light, retro-reflective tape, drogue and boat name. Plus a method to recover someone from the water - ladder, block and tackle, parbuckle etc.

Option D

A recovery sling for hoisting a casualty onboard, with min 90N buoyancy, floating line, light and retro-reflective tape.

Permanent buoyancy lifebuoy

A recovery sling mounted on the aft rail

Indicating a Casualty

It is important to know where the casualty is, and to provide them with equipment to help them float. Brightly coloured equipment, flashing lights, retro-reflective tape and a tall danbuoy will help the crew to return to the casualty's location.

Rescue module. Credit: Yachting Monthly/Richard Langdon

Danbuoy

The danbuoy is a pole and flag marker. A light that is activated as the unit is thrown should be installed or retro-fitted. The danbuoy can be inflatable or a traditional pole, but it must be attached to a lifebuoy.

An inflatable danbuoy with an integrated lifering or straps must still be attached to a separate lifebuoy.

Lifebuoy

The lifebuoy is a personal floatation device thrown to the casualty. It can be a horseshoe or ring, and either inflatable or permanent buoyancy.

It must be marked with the boat name, and fitted with retro-reflective tape, whistle, drogue and a self-igniting light.

At least one of the lifebuoys (or recovery sling) must have permanent buoyancy - eg foam.

MOB Module

An inflatable MOB module is like a 'mini liferaft' for one person, with a built-in danbuoy, light, ballast pockets, straps and handholds plus a lifting point to hoist the module onboard.

These are usually mounted in a hard case on the stern or aft rail, and activated by pulling a lever. The module inflates and floats free of the boat, and the casualty swims to it and climbs aboard.

MOB modules must be professionally serviced in accordance with the manufacturer's instructions, and in-date for the duration of the rally.

Recovering a Casualty

Many crews practise returning to a casualty in the water, but far fewer consider the practicalities of getting the casualty back onboard.

Once you are back in contact with your casualty, it is important to securely attach them to the yacht while you prepare the recovery.

Practise getting a casualty back onboard, even if you do it at the dock. What if your heaviest crew member is the casualty?

The method and equipment used will depend on many factors, including:

- The mobility of the casualty and ability to help themselves.
- The height of the deck above water.
- The size and strength of the crew onboard.
- Weather conditions and sea state.

Physically dragging an adult from the water and up onto deck is hard work, and probably almost impossible on a boat with high topsides or with a weak crew.

You will need to use equipment to get them back onboard.

Throwing line

The 15-25m floating throwing line can be used to make contact with the casualty, to secure them to the yacht and to pull them closer.

Block and tackle

Simply attaching a casualty to a halyard and winching them up is hard work. A block and tackle system (also called a handy billy) will provide the mechanical advantage to make the task easier.

Attach the top block to a halyard or to the end of the boom (if using the boom, raise it up and brace it to stop it swinging) and the other end to the casualty, either connecting to a lifting strop or by making loops.

The rope tail (or fall) can be pulled by hand as you would the mainsheet, or led to a winch for additional power.

MOB module

As well as being a 'mini liferaft' for a conscious casualty, the module has a lifting strop so the entire unit can be hoisted onboard, providing additional protection to the casualty.

Recovery sling

A rescue or recovery sling is basically an inflatable or buoyant loop attached to a long floating line that is attached to the boat.

The boat circles the casualty trailing the sling until it comes within reach. Once the casualty is in the sling, they can be pulled close to the boat and a halyard or block and tackle system attached to the lifting strop.

Lifting a casualty on a recovery sling

Rescue ladder

Beware using the swim ladder on the transom in anything but a flat calm. Rescue ladders can be stored on the side rails and deployed by the casualty in the water, or from on deck. A ladder with rigid rungs is easier to use then a rope ladder.

Parbuckle

A parbuckle is a triangular sheet or grid designed to roll a casualty up the side of the boat. The two ends of the short side are attached to the side deck and the third end to a halyard plus block and tackle.

The casualty lies in the loop of fabric, and as the halyard is raised, they are rolled up.

Commercially available parbuckles are strengthened and have grab handles and mesh sections so the product sinks below the casualty, making boarding easier. In an emergency it might be possible to use a storm jib.

Parbuckle. Credit: Yachting Monthly/Richard Langdon

Dinghy

An unconscious casualty will not be able to help themselves, and you may need to consider launching the dinghy or even the liferaft with a rescuer onboard to reach and recover the casualty.

My Notes

Safety Equipment

The full list of mandatory and recommended safety equipment is listed on the checklist on pages 5-11. These are the minimum levels of equipment expected of a well-prepared boat and crew.

We do not require you to use any specific manufacturer or brand of equipment. Choose what will best protect you, your boat and crew.

Don't treat rally preparation as a 'tick box exercise', but take the opportunity to learn about the safety equipment, how to use it, store it and maintain it.

EPIRB

EPIRB on an ARC yacht

At least one ship's EPIRB operating on 406MHz and 121.5MHz or406MHz and AIS must be carried. You may also choose to have a second EPIRB in the grab bag.

Personal locator beacons carried by the crew do not replace the requirement for a boat EPIRB.

The EPIRB must be correctly registered with your home authority - contact your local coastguard or the EPIRB manufacturer for advice. More details: https://bit.ly/4gWrKRD

Upload the EPIRB details and unique hex ID (a 15 digital alphanumeric code) to the Members Area of the website.

When activated, either automatically or manually, the 406MHz signal is picked up by the Cospas-Sarsat satellite system and forwarded to the search and rescue authorities.

The 121.5MHz signal is used by the rescue authorities to pinpoint the distress location. The AIS displays an alert to all nearby vessels with AIS.

Pumps

Boats must have three pump systems. In addition, multihulls must be able to pump water from each hull. See page 7 for details.

Pump 1: Manual pump on deck

Pump fitted to a spare washboard on a Hallberg-Rassy

If a pump isn't permanently installed, then an option is to install on a spare washboard. The pump can discharge into the cockpit or over the side.

Removable handles must be secured with a lanyard.

Pump 2. Below deck

Manual or electrical pump operable from below.

Pump 3: Emergency pump

High capacity electric or engine-driven pump (or combination of pumps) with a minimum capacity of 200 litres per minute with sufficient hose to discharge from any compartment over the side or into the cockpit.

Emergency electrical pump with 233 litre/minute capacity

High Powered Search Light

Used for search and rescue and collision warning, powered by the ship's batteries.

A combination of two rechargeable searchlights will be considered if they can operate through a 12 hour tropical night.

Distress Flares

In addition to flares packed in the liferaft or in >24 hour packs, the minimum requirement is:

- 4 red hand flares (2 can be eVDs)
- 2 buoyant orange smoke flares

Most yachts will choose to carry a range of flares including parachute flares. Modern electronic flares (eVDs) can be a safer alternative to pyrotechnics.

Flares must be in date for the duration of the rally, and not older than four years from the date of manufacture.

Flares must be stored in a waterproof container with googles and gloves. DIY goggles and tough leather gardening gloves are ideal.

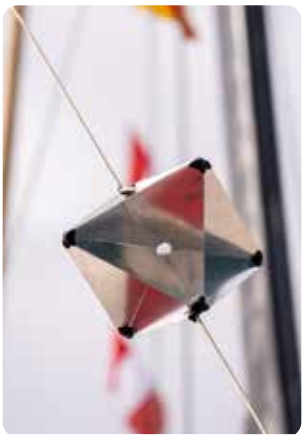
Passive Radar Reflector

All boats must be visible to shipping, even if there is a power failure onboard. A passive radar reflector requires no power and can be permanently mounted on the mast, or hoisted 5m into the rigging when needed.

Fold-flat octahedral reflectors are cheap and easy to stow. If circular, the minimum diameter should be 300mm, and if square, the minimum diagonal dimension should be 400mm.

Inflatable reflectors are also easy to stow, and should have a documented minimum radar cross section of 10m².

Tube-type reflectors are not acceptable.



Radar reflectors - L: inflatable & R: octahedral

Emergency Tiller

Emergency tiller on a Beneteau Oceanis 46

If the wheel steering system breaks and can't be fixed, then the boat will need an emergency tiller that fits to the rudder stock.

It is important to test the emergency tiller system on your boat. Some will fit at deck level, others in the aft cabin or in a locker. The emergency tiller will usually require lines to be taken to the winches for greater purchase.

If a boat has twin rudders and twin wheels and the two steering systems can be disconnected, then one could provide steerage if the other rudder or wheel was disabled.

Emergency Steering

Steering problems caused by worn steering systems combined with large ocean waves and long passages are not uncommon. Often these are easily fixed, but there must be a proven method of emergency steering if the rudder is disabled.

A windvane steering system that has an independent rudder (like a Hydrovane) is ideal.

An alternative is to tow a drogue on a bridle with control lines taken to the two primary winches. By winding the winches to move the drogue, the boat can be steered in a basic way.

Trying to rig a rudder using floorboards and the spinnaker pole will be difficult, but not impossible with the right fixings.

Whatever system you choose, this should be tested so you can deploy it in an emergency.

Medical

The skipper has a legal duty of care for the crew, and is ultimately accountable for their health and welfare.

Even if you have a trained doctor or nurse onboard, it is important that all crew members have at least basic at-sea first aid training and are familiar with the location and contents of the first aid equipment and medicine onboard. Details of training courses are covered in section 3 - People Preparations.

A good book, such as:

- Ship Captain's Medical Guide
  ISBN 9780115541490
- Skipper's Medical Emergency Handbook
  ISBN 9781399413091

will help to support training with step-by-step diagnostics and treatment with clear photographs and diagrams.

Medical Support at Sea

All sailors can access free advice from a doctor via the global maritime telemedical advice service (TMAS), provided by each country's MRCC coastguard service. The first call is made to the MRCC, who will ask for more details before connecting you to a TMAS doctor.

Contact the MRCC by SSB or VHF Ch 16 or DSC, or by telephone using a sat phone. Some MRCCs also have WhatsApp.

There are private companies who provide at-sea support services for superyachts and recreational sailors. You will pay a subscription fee for this service. As part of the service, some companies provide a comprehensive medical kit and training as well as advice by phone or video.

Medical Kits

First aid kit bag on Seren Wen.

Colour-coded medical supplies on Blue Pearl. Credit: PBO

You can buy modular medical kits for ocean sailing, containing enough equipment and medicine to be self-sufficient. These kits are available from companies like msos.org.uk and sailpartner.de and others. Alternatively, you can start with a standard medical kit, and add the equipment and medicine you need.

Buying or creating a modular kit, grouping medicines by function in clearly marked colour-coded containers will help a crew member to located the right items in an emergency.

In addition to the main medical kit, there should be a small 'day bag' for use on deck and taking ashore. That way the main kit always has the full contents available for an emergency.

If you are planning remote cruising, it is worth compiling a shore-based emergency kit for local medics to use in case you are unsure of local hygiene. This should include a sterile syringes, intravenous cannula and suture set.

Buying Medicines

The skipper has authority to purchase drugs for the boat. You will need to have the boat registration certificate and your passport. You may be able to do this at your local pharmacy or via your personal doctor, but is also possible via an online supplier like anppharma.co.uk.

Pharmacies in sea ports like Las Palmas de Gran Canaria are used to supplying medicines to ships and yachts - Farmacia Valido Sanroman is a good example. Discuss your needs with the pharmacist and give them a day or two to collate your requirements.

They can dispense almost all medicines to yacht skippers except opiate painkillers.

Suggested Medical Kit Contents

First Aid (day bag suggestion)

- Simple wound treatment - plasters etc
- Trauma dressings
- Analgesics
- Anti-seasickness
- Burns treatment
- Emergency splints

Analgesics

- Strong analgesics
- Ant-seasickness injections
- Local anaesthetic gel

Skin Repair

- Sutures
- Staples
- Wound adhesive
- Cleaning fluid
- Forceps etc

Eyes/Mouth/Skin

- Eye and ear meds
- Dental kit
- Skin creams
- Anti-fungals
- Allergy/Emergency
- Adrenaline
- Steroids
- Antihistamines
- Sedatives

Antibiotics

- Broad spectrum penicillin antibiotics
- Broad spectrum non-penicillin antibiotics
- Injectable and oral versions

Gut/Seasickness

- Anti-seasickness
- Anti-diarrhoeal
- Anti-constipation
- Oral rehydration meds
- Indigestion meds

Dressings/Splints

- Compression dressings
- Wound dressings
- Casting tape
- Splints
- Neck splints
- Adhesive strapping
- Ant-septic dressings

Equipment

- Alcohol-free moist wipes
- Sterile swabs
- Resuscitation face shield
- Oral airway adjuncts
- Eye wash 0.9% sterile saline solution
- Non latex gloves
- Scissors, tweezers, safety pins, forceps
- Surgical tape
- Cooling/warming packs
- Blood pressure monitor
- Thermometer
- Urine testing kit
- Blood glucose testing kit
- Catheters
- Medical handbook

Resources

Useful books, manufacturers and online resources.

Books

Ship Captain's Medical Guide
by Maritime Coastguard Agency
ISBN 9780115541490

Skipper's Medical Emergency Handbook
by Dr Spike Briggs
ISBN 9781399413091

Doctor On Board
by Jurgen Hauert
ISBN 9781408112724

RYA Sea Survival Handbook G43
ISBN 9781906435967

The Liferaft Survival Guide
by Frances & Michael Howorth
ISBN 9781399401500

Video

World Cruising Club Videos

Safety Collection: https://bit.ly/3PpLEZ6
Includes medical, liferaft and safety inspection videos

Ocean Safety Videos

PLBs explained: https://bit.ly/422p0xg
How to register an EPIRB: https://bit.ly/4gWrKRD
Lifejackets explained: https://bit.ly/3DDq54o
Ocean ISO liferaft: https://bit.ly/3BXHswj

Ikaros Pyrotechnic Videos

Buoyant smoke: https://bit.ly/3W5yCDH
Red Handheld: https://bit.ly/3W73zaA

Articles

Yachting Monthly: man overboard lifting
https://www.yachtingmonthly.com/gear/best-man-overboard-lifting-device-84397

Manufacturers

Liferafts & Safety Equipment

Ocean Safety	oceansafety.com
Plastimo	plastimo-pro.com
Seago	seagogroup.com
Crewsaver	crewsaver.com
Lalizas	lalizas.com
Viking	viking-life.com
Revere	reveresurvival.com
Winslow	winslowliferaft.com

EPIRBs, PLBs & Pyrotechnics

Ocean Signal	oceansignal.com
ACR	acrartex.com
McMurdo & Kannad	seasofsolutions.com
Ikaros	ikarossignals.com

My Notes

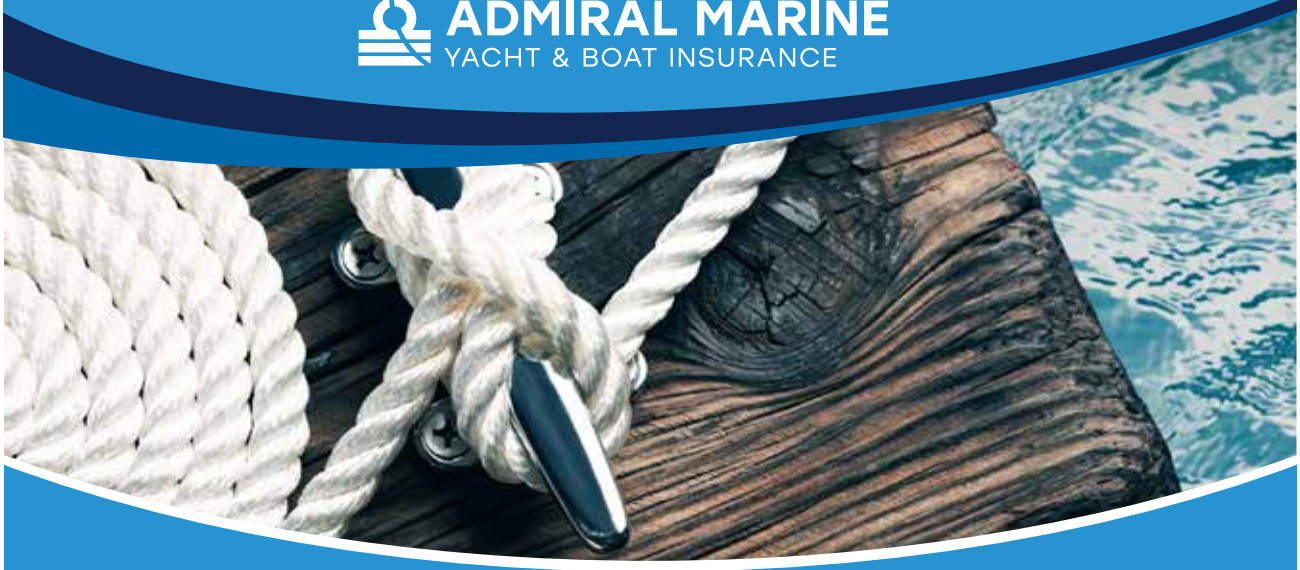
B BOAT PREPARATIONS

This chapter covers the improvements and changes that you might want to make to your boat in advance of ocean sailing, such as investing in new sails for tradewind sailing, or becoming self sufficient in electricity. Safety equipment is covered in chapter 1, Safety Onboard.

More immediate pre-departure preparations are covered in chapter 4 - Ocean Sailing.

Boat Preparations Contents

ADMIRAL MARINE
YACHT & BOAT INSURANCE



Key Benefits of Admiral Marine's Yacht Insurance

- Cover for piracy, acts of terrorism & associated risks
- No excess for third party claims
- No excess if you are struck by another vessel underway when moored
- Free cover for YB tracking devices
- World Cruising Club discount
- A contribution towards accommodation costs if the yacht is rendered uninhabitable
- One free aloft rig inspection in Las Palmas for ARC & ARC Plus participants*

Additional World ARC benefits:

- 15 month policy if required
- Search and rescue cover
- Automatic increase in third party liability limit to AUD$10,000,000 whilst in Australian waters
- One free aloft rig inspection in Las Palmas, Rodney Bay or South Africa*

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*Free aloft rig inspection available to clients insured directly with Admiral Marine only.

Planning for Blue Water

Most people start planning several years ahead of departure. Take a critical look at your boat. Is this the boat you want to live onboard and sail long term, or do you need to start looking for something different?

It is easy to spend money on improvements and equipment, but consider your long-term plans. Your needs will be different if you are taking one year out for an Atlantic Circuit or planning a five year circumnavigation.

Rigging: Your insurance company may require replacement of spars or standing rigging older than 10 years. Whatever the age of the rig, get it checked professionally.

Communications: Set-up and test Starlink, satcoms, VHF and SSB systems.

Sails: Are they up to a long passage, or are they well-worn and need replacement?

Do you have downwind sails for tradewind sailing?

Strong wind or storm sails and a good reefing system?

Back-ups: Consider the worst-case scenario.

Manual overrides for electronic/hydraulic systems in case of power failure.

Duplicate filters and pumps.

Comprehensive spare parts and tools.

Steering system: Check the rudder bearings and steering cables/chain for wear.

Hand steering, autopilot and/or windvane?

Test the emergency tiller and plan an emergency steering system.

Safety: Do you need extra safety equipment to meet rally requirements?

Create an equipment stowing plan.

Propeller: Check the stern gland or saildrive gaiter.

Consider fitting a rope cutter.

Seacocks: Check seacocks and through hull fittings for corrosion.

Fit a bung to each.

Power: Do a power audit - is your battery capacity adequate?

How will you generate power on passage and at anchor?

Water: Is your tank capacity adequate?

Do you want a water maker?

Consider manual pumps in the galley and head to save electricity and water.

Consider a salt water pump in the galley.

Anchor: Do you have suitable anchors, chain length and warp for your planning cruising?

Is your windlass serviced?

Boat Checks

Don't forget to check aloft

Based on the experience of many hundreds of yacht deliveries worldwide, professional skippers adhere to a simple, systematic checking system that can easily be applied by cruising sailors.

Use this list from PYD to 'sense check' your boat and equipment.

On Deck

Start at the bow and work aft, checking the following items thoroughly:

Anchoring System

- **Bow rollers** rotate freely, rubber not damaged or split. Stem plate is fitted securely to bow, with no cracks or signs of movement. Anchor lock pin is not bent and locks correctly in place, preventing forward motion of anchor on bow roller. Pin must be secured to the stem plate by a captive chain or lanyard.
- **Anchor** is of correct size for the boat and serviceable – not bent or cracked. Anti-kink rotating shackle at head fitted securely to chain and properly seized with wire. Anchor rode (chain/nylon) is depth marked and properly secured to hard fitting in the chain locker – pull it out and check! Ensure that the drains in chain locker are free of rubbish, so you're not carrying an extra ton of water at the bow in a seaway (it happens all too often). Check the chain locker bulkhead is watertight and not cracked at hull joints.
- Check function of **anchor windlass** in both directions – does the chain actually fit the windlass? Are the deck switches or hand-held control box serviceable and water tight? Remember to turn the circuit breaker off when not in use – the windlass can remove fingers in a moment if carelessly left active.

Hardware

- **Pulpit rails** are securely fitted to the bow and not bent or weakened.
- All **deck cleats** and **fairleads** in good order.
- Check that the bases of all **stanchions** are securely pinned and stanchions themselves are not bent and weakened. Ensure that all **guardrails/safety lines** are properly secured at both ends, bearing in mind that the aft end usually terminates in a lashing. Any access points should be closed with the correct folding clips at all levels.
- All **deck hatches** and **port lights** must close tightly against their seals and be lockable from within. Carry out water integrity test with a direct hose – are you prepared to put up with wet upholstery and bedding on a long ocean passage? If not, sort out that faulty seal now!
- Check that deck **dorade vents** are screwed onto their mounts properly and you have blanking caps available onboard to seal them, if necessary.
- Check all **water** and **fuel tank filler caps** are fitted with a captive chain and achieve a tight seal when screwed down.
- Clear out unnecessary items from the deck **lockers** to make more space – do you really need 3 deck brushes?

Foresails

- Examine the **roller furling drum** for salt corrosion and check it operates correctly in unfurling and furling the foresail. Check the furling line is attached securely to the drum and not chafed at any point in its run.
- Check the **foresail** tack is fitted securely to the furler drum and any webbing straps are sound and not worn or likely to fail. Unfurl the sail and check condition of luff, leach and foot, followed by tack, head and clew, then the leach tension line and clamp. Are the tell-tales all there and visible from the cockpit? Is the UV sacrificial strip in good order – be honest, does it need to be replaced?
- Are the **foresail sheets** properly attached, free of chafe and long enough for downwind work? If stiffened by age and salt, do they need to be washed, or should they be replaced?

Mast and Winches

- At the **mast**, check function and security of all fittings, winches, boom gooseneck and reefing controls. All rollers within the boom should spin freely and all reefing lines must run correctly. Check the mast gaiter is watertight and not damaged and all electrical cables have watertight grommets where they go through the deck.
- Check all **halyards** and the topping lift are correctly routed to minimise friction and chafe. Are the lines in good condition and attached securely to their sails or the boom, as appropriate? Where led aft to the cockpit, are the lines arranged logically on their brakes and labelled clearly?
- Examine the **boom vang/kicker** tackle for function and security. If the vang is hydraulic, check there is no fluid leakage from the seal – does it need to be replaced? Check the boom condition over its whole length and security of the topping lift. Check all lazy jacks and mainsail stack pack are correctly set up and all lines are free of chafe.
- Hoist or unfurl the **mainsail** – check condition of luff, leach and foot, followed by tack, head and clew, then the leach tension line and clamp. Check all battens are fitted, not cracked or broken and correctly secured in their pockets. Are there any spare battens aboard? Check reefing system functions as it should, without undue effort in operation. If it's stiff in operation, track down the source of friction and try to adjust the lead by moving the turning blocks, if possible. Remember: friction = chafe = gear failure!
- Check the **backstay** adjustment system.
- Check the function of all **winches** and ensure their caps are secure. Check power winches work under power and manually. Consider the wisdom of turning the winch power supply off at night, to avoid inadvertent winding on the wrong winch and ripping a sail to shreds as a result. Again, it happens all too often, so please be warned.
- Bring all other **sails** on deck, take out of their bags and check them for condition, cleanliness, correct fittings (blocks, sheets etc) then re-stow ready for use. This applies to all sails from cruising chutes and spinnakers down to the smallest trysail.

Instruments & Equipment

- Switch on all **cockpit instruments** and confirm they function correctly in all modes, particularly the log, depth and wind speed/direction readouts. Do all the instrument lights work and dim as they should?
- Check the main **steering compass** carefully for working condition: is the glass clear and free of scratches and no air bubble within? Does the light work? Check for any gross error with a hand bearing compass. Has the compass been swung, and is there such a thing as a deviation card?
- Run the **engine** up to working temperature – it should start easily and not belch black smoke, other than a blue wisp on start up. Is coolant water egressing steadily from the exhaust (unless a dry exhaust system is fitted)? Does the gearbox engage smoothly into forward and reverse without a jarring clunk? Do the temperature gauge and rev counter both function correctly? Does the decompression toggle (or other engine kill switch) stop the engine without over-run?
- Is the **steering wheel** secure on its spindle, without excessive play? Do you know the number of turns lock-to-lock and is the central position marked by a lashing on the wheel? Does the wheel lock or clamp work when required and does the autopilot engage and disengage instantly?
- Check all GPS sensors, **antennas** and other communication equipment are secure.
- Check that bow and stern **navigation lights** function correctly and are secure and not obscured by a dinghy or other equipment. Check the masthead light and steaming lights and replace any bulbs while still moored up. Check there are no obviously corroded wires or terminals – worth a quick spray with WD40. Lenses should be clear and free of cracks.

Safety inspection in Las Palmas

Safety Equipment

- Use the safety equipment checklist on pages 5-11 to ensure the boat has the right equipment.
- Check the **liferaft** is secure in the cradle or mount and that the painter is secure to a strong point on deck. If fitted, check the expiry date of hydrostatic release units (HRU).
- Check all **man overboard recovery systems** are correctly fitted and serviceable.
- Ensure for safety of the crew that port and starboard **jackstays/jacklines** are fitted that run to the extremities of the yacht, fore and aft. Replace any jackstay that looks perished or UV degraded and replace their terminal fittings if in any doubt at all – it's your life and others that rely on them.

Below Decks

Again, start at the bow and work aft, checking the following items thoroughly:

- No obvious **leaks** from the chain locker bulkhead or deck hatches / port lights.
- All **seacocks** are identified and operate freely. A tapered softwood bung/plug should be attached close to each seacock for use in sealing the hole in an emergency
- Lift the **speed log** and check the impeller is clean, and ensure it spins freely. Re-fit the log and check that the blank is secured nearby.
- Check the **depth gauge** transponder is fitted securely and all cables are secure and free from corrosion.
- Lift the **floorboards** and check condition of all bilges – are the limber holes clear, preferably with a through chain fitted for clearing debris (the inevitable match sticks and sweet wrappers)?
- Does the **toilet** pump operate correctly and flush the bowl without back flow? Do the crew know how to use it?
- Check that all **fire extinguishers** are in-date and of the correct type for their application. A fire blanket should also be mounted close to the cooker in the galley area.
- Check the integrity of the **gas** supply piping from cylinder to cooker and that all solenoids and cut-offs function correctly. Ensure the crew know the correct sequence for switching the stove on and off, so gas is burnt off and not left in the pipes to leak into the bilges to possibly explode.
- Check all **navigation instruments** at the chart table are operating correctly and the main chart plotter has the correct cartridge and the passage waypoints are entered in advance and checked. While alongside, check that the chart plotter shows the exact position on the berth as a confidence measure. Do you have all the necessary electronic charts, paper charts and pilot books for the whole passage? If radar is fitted, does it display correctly on the plotter and overlay as necessary? Check the AIS settings are appropriate.
- Do one **VHF radio** check and then accept that it works. Check that the MOB function works on the radio. Is your VHF callsign clearly displayed on a label for all users to see? Is there a script for the MAYDAY message readily available, if required?
- Check the **engine** and its systems thoroughly. Are all oil and fluid levels correct and clean? Is there sufficient spare oil, hydraulic fluid, grease etc? Are the spare water pump impellers, belts, fuses, fuel and oil filters correct for the engine type?
- Check the engine and domestic **batteries** are stowed securely and terminals are greased and not corroded. If required, ensure you have a supply of distilled water for topping up the batteries. Do they hold a healthy charge or are they tired and need replacing (see page 52).

No check list can be exhaustive - all boats are different but the above should provide a good basis to build upon.

A professional delivery skipper will take a full day to work through this sequence of checks, so it will probably take a full weekend for a private owner and helpers.

Prepared with assistance from Professional Yacht Deliveries pydww.co.uk

Checking electronics

Rigging Record

Survey your rig and record all elements. Repair or replace in collaboration with your insurer.

		Comments - diameter, length, type, make/brand, age etc		
1	Mast Section	Mast Make:		
2	Head Box			
3	Heel			
4	Mainsail Track			
5	Mainsail Gate			
6	Winches/Pads	Number of:-	On Deck:	On Mast:
7	Cleats/Clutches			
8	Halyard Exits			
9	Spreader Brackets			
10	Spreader Tips			
11	Kicker/Vang Brackets			
12	Gooseneck			
13	Backing Plates			
14	Terminals			
15	Sheaves			
16	Spinnaker Blocks			
17	Spinnaker Pole	Make:		
18	Masthead and Anchor Light			
19	Steaming Light			
20	Deck Light			
21	Antennas - VHF, AIS, GPS, satcoms etc			
22	Radar			
23	Radar Reflector			
24	Anemometer			
25	Foresail Furling System	Rope Size:		
26	Main Reefing/Furling System	Rope Size:	Make:	
27	Main Boom	Make:		
28	Stemhead Fitting			
29	Forestay			
30	Inner Forestay/Baby Stay			
31	Cap Shrouds			
32	Intermediate Shrouds			
33	Forward Lower			
34	Aft Lower			
35	Backstay System			
36	Main Halyard			
37	Foresail Halyard(s)			
38	Topping Lift			
39	Spinnaker Halyard(s)			
40	Pole Uphaul			
41	Pole Downhaul			
42	Vang/Kicker System			
43	Reefing Lines	Number:		
44	Main Outhaul			
45	Guard Wire/Lifelines			
46	Mainsheet System			
47	Foresail Sheets			
48	Spinnaker Sheets/Guys			

Small Improvements

The extra equipment and improvements needed to make long distance cruising comfortable, safe and practical need not be expensive. Before you consider the big ticket items, think about the small changes you could make.

These are some suggestions from ARC sailors:

In the Cabins

- Add more handholds in open areas for safety.
- Fit red night vision lights in the main cabins.
- Store a torch, white flare and a knife just inside the companionway for emergencies.
- Fit locking latches on all cupboard doors.
- Strong, deep lee cloths on all bunks.
- Non-slip matting for tables and in cupboards.

In the Galley

- Make a chopping board that fits the sink.
- Hanging nets are good for keeping hard fruits.
- Fit a crash bar across the front of the stove.
- Fit pot holders to the gas hob burners.
- Gadgets like a pressure cooker, bread maker, coffee machine, air fryer or Remoska make life easier for the cook!
- Portable induction hobs are an option for gas-free galleys.
- A washer-drier is a popular option for larger boats, but small manual washers are available.

On Deck

- Radar is useful for picking up squalls at night.
- Pole for poling-out the foresail.
- Bottle holders in the cockpit.

Cruising Essentials

- Ventilation is vital - windscoops, 12V fans or air conditioning.
- 100m + anchor chain will give you more options.
- A deck shower is perfect after swimming.
- The dinghy needs to be tough with a decent size outboard. Hard-bottomed or inflatable keel dinghies are best.
- Bimini or sun awnings that provide shade under sail or at anchor.
- Selection of hose connectors and a long hose.
- Selection of shore power adapters.
- Bean bag seats for the cockpit or deck.
- Walkie-talkie radios or headsets for ship-to-shore comms or less shouting when anchoring.
- Snorkelling gear for checking the anchor or mooring buoy.

Exploring

- Paddleboards and kayaks for fun exploring.
- Folding bicycles or scooters.
- Small folding cart for shopping trips.

Security

- Padlock the outboard to the dinghy.
- Padlock on a long chain or wire for securing the dinghy to the dock when ashore.
- Motion detectors connected to noisy alarm monitored via a mobile app is a good deterrent.
- Hide money in secure locations onboard.
- Use a decoy wallet with expired cards and a small amount of cash.

Galley gadgets on Sturdee. Credit Drofn Ragnarsdottir

Dinghies locked to the dock in Rodney Bay Marina

Spare Parts

Most boat systems have components with a 'life' or that are designed to wear down, corrode or break. Smaller parts may self-sacrifice in the name of saving the whole. These are generally the 'serviceable' parts.

There are three main categories of spare parts:

1. Safety: items that allow the boat to float and go in the direction you require - parts for the maintenance and repair of sails, engines and bilge pumps.
2. Comfort: spares for the maintenance of cooking equipment, fresh water pumps and toilets.
3. Luxury: parts of non-essential items that make for a more pleasant cruise, such as fishing tackle spares.

What Spares to Carry

The choice and quantity of spares carried can make the difference between a good trip and a bad one.

Many spares will fall into more than one of the three categories above. You will need to decide necessity over cost - a spare autopilot or just a spare drive unit?

At sea, it is easier (and more pleasant) to replace an entire toilet pump for example than to try to strip the system down and make repairs. Put the broken unit in a sealed bag and wait until you are ashore to tackle the unpleasant and fiddly task.

Some boats will carry thousands of dollars of spares. If you have the budget and space for this investment, then you will be more or less self-sufficient. It's worth remembering that in more remote areas an engineer may not have the spares or services kits in stock, and you'll need to draw on your supplies to get work done.

Essential Spares

Personal Safety Equipment

- Spare gas cylinders and rearming kits for inflatable lifejackets and inflatable lifebuoys/ danbuoys.
- One complete spare lifejacket.

Pumps

- Bilge: diaphragms, complete pump.
- Fresh water: complete pump, plus service kit.
- Toilet: complete pump, plus service kit.

Sails and Rig

- Sail battens and batten ends.
- Two large snatch blocks and two large snap shackles. Spare shackles for the mainsheet and vang tackle. Assorted soft shackles.
- Spare ropes of various length and type for use as sheets, halyards, mooring lines.
- Sail repair: sticky polyester sheet, three rolls spinnaker and sail tape, needles with waxed thread, whipping twine and a sailmaker's palm.
- Sta-lok emergency rigging kit.
- Bulldog (cable) grips.
- Lengths of rigging wire for rig and steering cables.
- Split pins, cotter pins.

Engine

- Consumables: impellers, fan belts, anodes, filters (air, oil and fuel). Service kits.
- Oil enough for two full oil changes for all engines and generators.
- Gearbox oil.
- Hydraulic fluid.
- Diesel biocide.

Deck Equipment

- Winch servicing kits for sheet/halyard winches and anchor windlass with extra pawls and springs.
- Winch grease, WD40, dry lubricants (PTFE).
- Spare handles for winches and windlass.
- Spare handles for fuels and water tank caps.

Electrical and Electronic Equipment

- Watermaker: service kit, chemicals and oil.
- Autopilot: drive, motors.
- Bulbs/lamps for incandescent and LED lights.
- Fuses.
- Lengths of electrical wire, plus connectors.
- Batteries for handheld equipment.
- Charging leads.

General

- Gas: spare regulator and 1m gas hose.
- Hose clips, nuts/bolts, washers, screws, contact and epoxy glue, gasket glue, tubes of sealants, gaffer tape, PTFE tape, self amalgamating tape, zip ties.
- Fibreglass repair kit with fibre matting, resin, hardener and mixing pots.

Tools

A comprehensive tool kit is an essential component of your safety equipment. You will need to repair a wide range of things at sea, and that means having a selection of tools available.

Recommended Tools

- Spanners - ring and open. Various sizes in metric and imperial sets.
- Spanners - adjustable. Preferably large and small.
- Socket set.
- Screwdrivers - flat, cross and star heads in various sizes.
- Mole grips.
- Pliers - short and long nose.
- Allen keys (hex wrenches) - various sizes.
- Hammer.
- Pop rivet gun with rivets.
- Drill and a selection of wood and metal bits.
- Insulated electrical screwdriver.
- Electrical multimeter or continuity tester.
- Electrical connector crimp tool.
- Cable snips (side cutter).
- Soldering iron.
- Battery powered angle grinder.
- Hacksaw and blades.
- Scissors.
- Craft knife with spare blades.
- Knife for cutting dyneema ropes.
- Impeller puller tool or angled pliers.
- Hot knife for cutting rope.
- Sail repair needles and sailmaker's palm.
- Splicing tools - needles, fids, whipping twine, sheath or heat shrink.

Battery operated electrical tools are more useful - buy extra batteries and charging docks.

Winch Servicing

Steering Systems

Ocean sailing can put huge strain on the steering system. Day after day of strong winds, squalls and big waves can be more than a production boat is designed for.

Damage to steering systems is relatively common, whether a problem with the rudder bearings, steering cable snapping or an autopilot malfunction. This might lead to the boat being unable to manoeuvre properly, having to hand steer or even flooding if the rudder drops or damages the aperture.

It is very important to carefully check the entire steering system - the rudder itself, the bearings, steering quadrant, cables/chains (or hydraulics) and helm, plus the autopilot (if fitted). Use a marine surveyor if necessary.

Most boats will use some form of self-steering system at least some of the time when sailing.

Electronic Autopilots

Autopilot at work onboard Edenj

Autopilot technology has improved a lot in the last ten years, so it might be worth considering upgrading to a newer model which will operate more efficiently.

Most boats will have a hydraulic or linear drive attached to the rudder quadrant. Drive units are the most common cause of problems on an ocean crossing, often because the loads are too high. Some skippers choose to install a larger drive or pump, or even duplicate the drives, (one as a push, the other as a pull).

Talk to an autopilot specialist for advice, ensure you read the manuals and understand how to adjust and maintain the pilot and take time to set-up both the system and the sails.

Windvane Steering

Hydrovane on Oyster 37 Sestina. Credit Tim Wright

Requiring no electrical input, windvane systems are an attractive option for long-term cruisers.

The mechanical vane acts on a rudder (either the boat's rudder, or an independent rudder) to steer the boat to the wind, rather than to a compass course.

A system like Hydrovane with an independent rudder provides an alternative if the boat's rudder is damaged - this fits the mandatory requirement for a proven method of emergency steering - see page 27.

A Hydrovane can be connected to a tiller pilot in light winds or when motoring to provide autopilot self steering with less power consumption.

Self-Steering Tips

- Trim the sails to help the boat sail efficiently.
- Reduce sail at night.
- Hand steer through squalls.
- Upgrade systems for ocean conditions.
- Service autopilots before departure.
- Carry spare units, manuals and suitable tools.
- Hand steering is a great skill to have, and can be great fun!

Sails for Ocean Sailing

Do not start a long distance cruise with old sails. It is a false economy - you will end up buying new sails and getting them expensively shipped overseas.

When you make an ocean passage, your sails will be in use day and night for several days or weeks. That's a huge amount of wear and tear and UV degradation.

A 15 day passage is equivalent to 60 days of 6-hour day sailing, or 2-3 years of weekend cruising.

Are your sails and systems ready for that?

Fabric

For mainsails and foresails (white sails), the most important factor will be the choice of fabric.

The ideal sail fabric would be long-lasting, tough, UV resistant, low stretch and low cost. Sadly this doesn't exist, so all sail fabric choices will be a compromise.

Woven polyester (brand name Dacron) is probably the most common sail fabric. It is strong, durable and pretty UV resistant. Dacron cloth is easier to handle than laminated sails.

Cruising laminate sails are made from a sandwich of films of different materials, or a combination of films and woven materials, bonded with fibres like polyester, Dyneema, Mylar or Kevlar.

Spinnakers, gennakers, cruising chutes and Parasailors are made from lightweight ripstop nylon.

Talk to your sailmaker about your cruising plans so they can help you with the most suitable choice of cloth and cut.

UV Degredation

UV light can degrade sail cloth and threads used for stitching the panels together. This applies to sails, biminis and covers.

Check all sails thoroughly as part of your rally preparation, as UV damage can cause panels to split and stitching to unravel.

Downwind Sails

Most ocean sailing follows the tradewind routes, so the majority of the time the wind is behind. An effective and efficient downwind sail plan is vital for both comfort and passage duration.

Whichever sail plans you choose, it is important to practice so you discover any extra blocks and ropes required, understand the best methods of flying, launch and retrieval and know what suits you boat best.

If commissioning new sails, ask the sailmaker to help with set-up.

Poled-out Foresail and Mainsail

Sailing 'wing-on-wing' is a common sail plan for cruising boats. It requires no special equipment, other than a mast-mounted pole with suitable secure guy ropes.

It is common on multihulls to use the midship cleat to rig a block to run the foresail sheet, rather than using a pole.

Wing-on-wing onboard Cupid. Credit James van Alstine

The furling foresail is poled-out to windward and the main eased to leeward and secured with a strong boom-end preventer.

It is often necessary to reef the mainsail to balance the forces more evenly, but this is still likely to be a roll-inducing sail plan.

Twin Foresails

Boats with two forestays can rig a foresail on each, both poled out with the pole secured with guy lines. The mainsail is not usually used.

This plan will work best if the foresails are of similar sizes, and you will need to be able to have two poles in use at once.

The sails can be hoist on separate forestays and handled independently, or on a single forestay with twin luff grooves where they can be furled together.

Variations on this rig are available from sailmakers with a two clew foresail on a single luff that is set independently from the existing furling foresail.

Twistle or Twizzle Rig

A two foresail rig with the sails poled-out using special long poles connected to each other with a universal joint, rather than to the mast.

Tradewind headsails on Pinnacle. Credit Stephanie Stevens

For some boats this rig can reduce rolling, as the sails and poles move with the motion of the boat. However, special long poles are required which can be hard to stow, and the rig can be difficult to set up in a rolling sea.

Twin headsails on Aqua Luna. Credit Claire Wallace

A-Sails

An asymmetric, cruising chute or gennaker are all lightweight sails made from nylon (spinnaker fabric) that fly ahead of the foresail with the tack attached to a line down to the deck that can be eased to help the sail fly. The tack is sometimes run from a bowsprit, increasing the distance from the forestay.

Use an amidships barber hauler to control the sheet angle to open or close the leech of the sail.

These sails work best between around 90-140° off the wind, whereas a spinnaker or Parasailor can sail deeper. This means 'sailing the angles' downwind.

The sail can be used with a snuffer or sock for ease of hoisting and retrieval.

Spinnaker

The spinnaker is a lightweight nylon sail with two clews, the windward clew flown from a pole attached to the mast.

It is normal to have two sets of sheets on each clew, enabling the unloaded or 'lazy' sheets to be set up for a gybe. Some boats will have single sheets with a 'tweaker' to control the guy line.

Asymmetric on catamaran Nuvem Magica. Credit David Dias

Although the spinnaker will sail deeper than an asymmetric or cruising chute, it is not effective dead downwind. The sail will be blanketed behind the mainsail.

The spinnaker can cause rolling as the air tries to escape the sail, causing eddies that can unsettle the sail, resulting in rolling. This can make the sail collapse, or even induce a broach as the boat spins to windward.

Broaching can also be caused by wind gusts, such as in squalls. Broaching should be avoided as the sail can be ripped and huge pressure put on the rig, pole and preventer, potentially leading to the loss of the rig.

The sail can be used with a snuffer or sock for ease of hoisting and retrieval. Using the mainsail to blanket the wind is useful during hoisting and lowering.

Parasailor

The Parasailor combines characteristics of both a spinnaker and a gennaker in a single, more stable system. A distinctive feature of the sail is the opening with an integrated wing in the centre section. This wing functions as an airfoil and generates not only forward drive but also upward lift. As a result, the load that presses the bow down when sailing with a conventional spinnaker is reduced.

The wing also contributes to the sail's stability. The sail can fill and generate drive in relatively light wind conditions, but can also handle stronger winds as gusts are vented through the opening. As wind speed increases, the wing helps the sail maintain a stable shape. In addition, the aerodynamic forces generated by the wing can reduce rolling motions of the vessel, contributing to a more stable motion when sailing downwind.

The Parasailor can typically be used at apparent wind angles between 80° and 180°, making it suitable for a wide range of downwind courses. Handling differs from that of a traditional spinnaker, as the sail does not require a spinnaker pole and tends to remain more stable in operation. This simplified handling can be beneficial for smaller crews. The Parasailor can also be used effectively when sailing under autopilot.

For cruising sailors undertaking longer passages, the Parasailor offers a downwind option that combines a broad wind-angle range with stable sail behaviour.

Prepared with assistance from Bojan Michiels van Kessenich, Manager Developing Markets, Parasailor.

Parasailor onboard Vivace

My Notes

www.hydrovane.com

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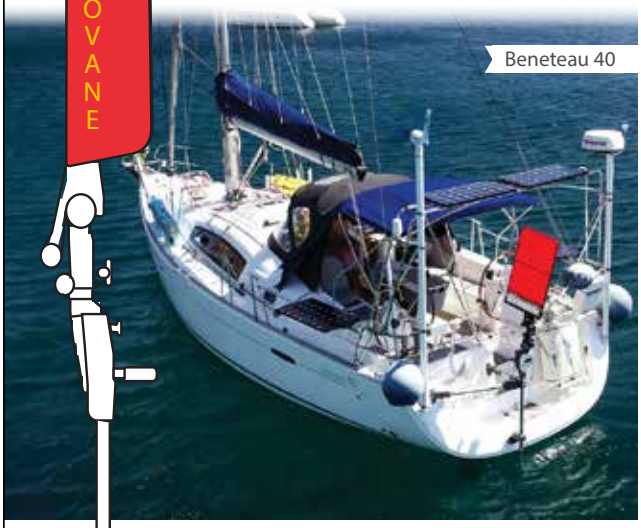
Beneteau 40


Kaia II of Vancouver, Leopard 46


Najad 460


Hanse 458

watt&sea Hydrogenerator

ECH$_2$O Tec Watermakers

★ HYDROVANE ★

STEERING THE DREAM

At-Sea Communications

Boats in transocean rallies must have:

A satellite communications system (or an SSB radio with pactor modem) capable of sending and receiving email messages whilst at sea.

World ARC boats must be fitted with:

A DSC capable marine SSB HF radio transceiver covering the 2–22 MHz bands, with an independent aerial for DSC operation

or

A suitable satcoms-based system capable of transmitting and continual monitoring an instant messaging app.

On the ocean crossing rallies, the daily weather forecast, boat positions and important fleet messages are sent by an auto email system.

In addition, there are daily SSB nets and instant messaging (WhatsApp) groups.

World ARC boats need to have a higher level of communication due to the more remote cruising areas.

You choose the products and models to achieve this capability.

Satcom Systems

In a survey of 500 ARC, ARC+ and World ARC boats from 2023-2025, it is easy to see the growth in popularity of Starlink, from around 50% of the ARC and ARC+ fleet in 2023 to 80% in 2024. 99% of the World ARC 2025 fleet have Starlink.

Common rally satcom systems:

- Starlink 80-99%
- Iridium GO! and GO!exec 28%
- Iridium Certus 200 12%
- Iridium Handheld 10%
- Inmarsat Fleet Broadband 8%
- Lars Thrane LT-3100 3%
- Inmarsat IsatPhone 2%
- Skylink 1%

Many boats have more than one satcom system onboard. For example, a fixed device like Starlink and a traditional handheld satphone for voice in emergency and when ashore.

Starlink

Working-from-boat or streaming movies are all possible with Starlink, many cruisers commenting that speeds are better than at home.

Starlink isn't a satphone, it is a wireless access device. Voice calls are only possible using WiFi calling, a VoIP system or a call on WhatsApp or FaceTime.

Airtime costs are starting to creep up, but this is still the most cost-effective at-sea internet option.

Starlink, radar, AIS and satcoms antennas

Fixed Data Systems

Starlink

Iridium Certus 200 and 700

Inmarsat Fleet Broadband

Mobile Data Systems

Iridium Certus 100

Iridium GO! and GO!exec

Skylink

Mobile Satphone Systems

Iridium Extreme, 9555

Inmarsat IsatPhone 2, IsatPhone Pro

Fixed Satphone Systems

Lars Thrane LT-3100

Iridium 9522-P

Non-Compliant Satcom Systems

These systems do **not** meet the requirements for World Cruising Club rally communication and can only be used as a back-up:

- Garmin In-Reach (Iridium): This is a two-way messaging service via an app. Does not work with the rally auto email system.
- YB Connect (Iridium): This is a two-way messaging service via an app. Does not work with the rally auto email system.

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- Thuraya (any model): Coverage area insufficient - Europe and Mediterranean only.
- GlobalStar (any model): Coverage area insufficient. Does not cover Atlantic or Pacific.

If you have one of these systems onboard, you must have an alternative that meets the requirements listed on page 47.

Making Voice Calls via Data

The ability to make a voice call is important, especially in an emergency. A basic satphone is a useful addition to the grab bag or for exploring ashore in remote areas.

If you have a data-only satcoms system, we recommend keeping an unlocked (no passcode) mobile fully charged and available to all crew for any emergency.

Any apps (for example Iridium GO!) should be downloaded to the mobile and tested before the rally starts.

Ensure all crew know how to make a voice call.

Voice Calls with Iridium GO!

To make a voice call on Iridium GO!, you will need to download the Iridium GO! app from the app store. The app allows you to make phone calls, send text messages and has SOS functions.

In case of an emergency, ensure that more than one crew member has the app on their phone and knows how to make a call.

Voice Calls with Iridium GO! exec

The GO! exec has a keyboard and speaker/microphone so you can make calls direct from the unit.

In addition, if you download the Iridium GO! exec app from the app store, you can make calls via your mobile phone or tablet.

Voice Calls with Starlink

You can use the WiFi calling function on your mobile phone to make or receive calls as usual. Alternatively, you can use a VoIP system.

Starlink is great for WhatsApp and Facetime video or voice calls, but remember that not all organisations, including coastguard MRCC, will have a WhatsApp number.

YB Connect via a YB3 Tracker

All boats in the rally are provided with a YB tracker. This is an Iridium satellite tracking device that provides the position, speed and heading of the boat - information that is displayed on the YB Races app and on the rally Fleet Viewer online.

The YB trackers are given out before the start of the Rally and collected at the finish, but you can also buy your own tracker from YB Tracking - ideal if you are continuing on a longer adventure.

As well as tracking the boat's position, the YB enables anyone onboard to send and receive text messages on their mobile or tablet.

Download the YB Connect app from the app store, create an account, then connect to the onboard tracker using Bluetooth.

Fitting a YB3 tracker on Norah

A single YB tracker can support multiple users with separate accounts, allowing crew and guests to pay their own communication costs and stay in touch via text with friends and family when they wish.

YB Connect doesn't provide the ability to send and receive emails at sea, and so doesn't meet the requirements for ARC, ARC+, ARC Europe or World ARC, but it is a useful low-cost addition to the onboard communication options.

SSB Marine HF Radio

Although less common on cruising boats now than ten years ago, SSB (or single side band) radio is still a useful tool for long-term cruisers.

SSB is a 'one-to-many' voice system (like VHF radio), unlike the 'one-to-one' voice call on a mobile phone or satphone. It is part of the GMDSS distress and safety system.

SSB operates on short wave frequencies, meaning the signal travels further - potentially thousands of miles, as compared to around 20NM for VHF radio. Short wave is also known as HF or high frequency.

Unlike satcoms there are no airtime costs, and the daily cruisers 'radio nets' are a popular way to stay in touch. The radio nets allow cruisers to chat as a group, as well as being a valuable safety feature.

It is possible to send and receive email (slowly) using SSB via a pactor modem and subscription to a service like sailmail.com. You can also receive weatherfax information by fitting a sound card.

Marine SSB and amateur radio SSB (or ham radio) are not the same thing, although they operate on the same principal. Only marine SSB has DSC (digital selective calling).

The disadvantage of SSB is that it is expensive, it requires professional installation, and it takes time to learn how to use. If you buy a boat with SSB, or want to install SSB for long-distance cruising, we recommend speaking to a professional installer or radio trainer and getting support from fellow cruisers.

SSB onboard Oyster 56 Asante

VHF Radio

Boats must have:

A VHF DSC-capable radio transceiver having a rated output power of 25W and capable of working on all standard international channels. With:

- An external cockpit extension speaker.
- A masthead antenna.
- An emergency antenna shall also be carried.

and

A handheld VHF transceiver with minimum 5W output power. Watertight or with waterproof covers.

The VHF radio is for boat-to-boat or boat-to-shore voice communication, with a range of up to 20NM, depending on the height of the antenna. A masthead antenna will deliver the best range.

An emergency antenna can be plugged into the back of the control unit then set-up on deck or hoist into the rigging if the main antenna fails or if the boat is dismasted.

Emergency antenna on Arietta

An external speaker will allow the on-deck crew to follow instructions from the marina, or to be alerted to distress calls.

A waterproof handheld VHF which is preferably also DSC-capable and equipped with GPS is an important addition to marine communications, and can be taken into the liferaft to help with rescue.

Power Audit

By having a clear idea of your boat's energy needs, you can ensure that you have an adequate size battery bank onboard and sufficient power generation sources.

Start with a power audit - calculating your output (consumption) and input (production).

Calculating Power Consumption

Listing out all the items (the consumers) on your boat with their power consumption and the time for which they are likely to be used in each 24-hour window will give you your daily demand.

Power for a consumer is often published in an items user manual specification table or printed on the back of the device. This will be given in Watts or Amps. List your audit in Watts.

Watts can simply be calculated by multiplying the current (Amps) by the relevant operating voltage equalling the power.

W=AxV For example, a 12V light operating at 1Amp is 12 Watts.

Consumer Amp hours:

- Battery capacity is measured in Amp hours (Ah)
- Calculate what each DC consumer uses when operating (this is Amps. A=W÷V)
- Multiply this by the number of hours it operates in a typical 24 hour period (this is Amp hours, Ah)
- Add up the Amp hours
- This tells you how many Amp hours you will take out of your energy store (the batteries) during a fixed period of time.

Example consumption for 24 hours for a 12V system:

Fridge & freezer.....60Ah
Watermaker 39Ah
Autopilot 5Ah
Chartplotter & GPS 12Ah
Charging phones & tablets 7Ah
Lights - nav & interior 22Ah
Starlink RV/standard active & standby 62Ah
Pumps 5Ah
Radar standby/active.....32Ah
VHF 2Ah
Total depletion in 24 hours: 246Ah

Calculating Power Generation

Next you should look at your sources for recharging the batteries (the producers). The producers should be divided into continuous - hydro, solar, wind - which produce power all the time, and top-up - generator, engine alternator - which can be turned on at intervals to top up the batteries.

Be aware that sources have varying efficiencies - alternators and solar often only give about 60% of their stated capabilities and only the continuous rated outputs of generators should be considered. Battery chargers can also give lower outputs in warmer environments.

Be aware that the continuous producers may only work for some of the time, for example while the boat is moving, the sun is shining, or the wind is blowing.

Continuous producer Amp hours:

- Calculate what each continuous DC producer (hydro, solar, wind) produces when operating (Watts)
- Multiply this by the number of hours it produces in a typical 24-hour period (this is Watt-hours, Wh) and calculate the Amp hours (divide Wh by charging voltage, e.g. 13.8V)
- Add up the Amp hours

Example production for 24 hours:

Solar panels.....50Ah

Consumer Ah minus continuous producer Ah = top-up producer requirement: 246-50=196Ah

With your daily consumption and charging capabilities calculated, you will now be able to work out how long your batteries will last and take to recharge using the engine or generator.

For example, a 200Ah depletion would take a generator with an 80Amp battery charger 2.5hours to fully recharge the battery bank.

Ideally, you would not want to be charging the battery bank more than twice daily.

So to achieve the example 200Ah, you could either increase the size of your battery bank or improve the continuous production with a hydrogenerator or adding more solar.

Prepared with assistance from Advance Yacht Systems advanceyacht.co.uk

Batteries

Boats have multiple battery banks, but your domestic house bank will be the largest and the one in constant drain.

Battery sizes are given in Amp hours. This means that a 100Ah battery with a 1Amp load would last 100 hours from 100% state of charge (SOC) to 0% (flat), although discharging by that much will destroy a battery. In practice we never discharge lead acid or AGM batteries below around 50%. Lithium batteries can be discharged down to 20%

Battery Bank Capacity

A rough guide to calculate the required battery bank capacity for AGM/lead acid batteries is:

Battery capacity = daily consumption x 3

Example: 200Ah x 3 = 600Ah capacity required

This is because they should not be depleted below 50% and charging above 85% is inefficient and slow, hence only one third of the capacity is usable.

For lithium batteries the equivalent is:

Battery capacity = daily consumption x 2

Example: 200Ah x 2 = 400Ah capacity required.

Battery Life

Batteries have a lifetime, which is defined as the number of full cycles they can be used for. This varies between types of battery technology.

A full cycle of a battery is theoretically from 100% SOC to flat, so discharging to 50% of the capacity will mean that the battery can be used for twice the number of cycles.

Different battery technologies have different discharge capacities: a rule of thumb for Lead Acid/ AGM is a minimum 50% SOC, and it is only practical to charge to 85% using an engine alternator or generator, so assume you only have 35% of your battery capacity as daily usable power

For LiFePO4 batteries, the discharge minimum is 20% SOC, so 65% is available.

A good battery monitor will give you an accurate battery SOC so can be used as your 'fuel gauge' for your battery bank.

Battery Charger

Install a charger that can charge your battery bank from 50% to 80% (for AGM/ lead acid) or from 20% to 90% (for lithium) in a short time period, so that you only need to run your generator or be plugged in ashore for as short a time as possible.

Lithium Batteries

A rule of thumb for lithium batteries is to have a charger whose current output is one third of the capacity of the battery bank.

If you have a 200Ah bank, you should install a charger with capacity of over 66A (eg 200÷3=66).

AGM/Lead Acid Batteries

For AGM/lead acid batteries, the rule of thumb is one fifth of the capacity.

So a 40A charger would be right for the 200Ah bank (eg 200÷5=40).

As a minimum, the battery charger fitted should be one that can accept multiple voltages (110/120 or 220/240) and 50Hz or 60Hz; this will at least allow the batteries to be charged, and for DC (12/24v) appliances to be run while connected to shore power.

Onboard Batteries

Charging With the Main Engine

The engine should have a 14V 115Amp alternator, which means the alternator will deliver 115A max at 6,000 rpm. However, the engine is usually regulated to generate electricity around 1,000-1,500rpm. The charging current will then be 40-80% of the rated value, so 45-90A.

Lead acid batteries only draw the full current when depleted 50-60%. Lithium batteries will draw more current from 20-85%. You will need to limit the current draw to prevent overheating the alternator.

For 200Ah top-up requirement, that would be around four hours per day of running the engine. Not an attractive prospect!

Battery Monitoring

Install a battery monitor. This will give you valuable data such as:

- State of Charge (% of capacity)
- Discharge rate (Amps)
- Remaining time before charge required (when discharging)
- Remaining time to max charge (when charging)
- Voltage
- Alarms (below safe charge level etc)
- History

A good battery monitor will be able to monitor multiple battery banks and multiple power sources (such as the engine alternator, solar power or hydro generator).

Battery and Charging Tips

Always start your voyage with a full (100% SOC) battery.

Charge using the engine in the evening to support night time requirement.

Charge laptops and mobile devices, make and heat water when the engine is running.

Balance the boat to reduce strain on the autopilot, or hand steer.

Fill the fridge or freezer to its maximum, even if that means packing with bottles of water.

Prepared with assistance from Advance Yacht Systems advanceyacht.co.uk

My Notes

Electricity Generation

There is no need to rely on the engine alternator to charge batteries. Modern solar, hydro and wind generators are efficient and unobtrusive. A combination of generation methods can deliver greater independence and freedom.

Diesel Generators

For larger yachts, a diesel generator is the most efficient way to generate electricity and to charge batteries through a charger. They use less fuel to generate the same power than the main engine, can be set to automatically start when needed and, installed in a sound-proof case, are very quiet.

Generators also give you the ability to use AC–powered equipment for example water heaters, air conditioning, microwaves, kettles.

While reliable, generators require regular servicing and spares. If possible, combine a diesel generator with another generation source.

Petrol and gas generators are not suitable for installation on boats. Although cheap and portable, these units are noisy and the fuels combustible if not stored correctly.

Wind Generators

Wind generators are most useful at anchor, when they can produce 40-80Ah in 24 hours. These are usually permanently mounted on a pole on the transom clear of the sails, or mobile units can be hoist into the rigging at anchor.

Lower apparent wind speed when sailing downwind reduces the power output, making wind generators less useful during classic tradewind sailing.

Solar Panels

Improvements in cell technology makes solar power useful in most cruising areas, although they are most efficient in stronger sunlight. Panels are best mounted on a flat surface, such as on the cabin top, on a bimini or over the dinghy to face the sun.

A 50W panel can produce up to 20Ah in Mediterranean summer sun.

They will operate under way or at anchor, and have the advantage over wind generators of being silent and unobtrusive. Recent ARC sailors with solar all say they would install more, given the opportunity.

Solar Panels

Hydrogenerators

A transom-hung hydrogenerator will generate electricity at hull speeds of 3-12 knots, and will operates most efficiently at speeds of over 5 knots, well within the range of the 'average' cruising yacht. Sportier multihulls cruising at speeds over 10knots will need to consider race models. At a steady 6 knots, up to 300Ah per day isn't unrealistic.

It is possible to use the main propeller to generate electricity when it isn't propelling the boat by connecting it to a small electric motor. The systems that are available for diesel engines require a new propeller, but can deliver up to 200W at 5 knots boat speed.

Towed hydrogenerators are less popular due to the problems handing the long tow line and drag from the generator.

Remoran hydrogenerator

Prepared with assistance from Advance Yacht Systems advanceyacht.co.uk

Shore Power

Remember, high voltage can kill!Being able to live independently with a generator, solar, wind or hydro power will give you more flexibility, but sometimes you just need to connect to shore power.

Where shore power is available, you can expect voltage to vary and a multitude of connector types to be required.

International supply:

- **USA, Canada, Caribbean:** 110/120 V at 60Hz or twin-phase: 220-240 V 60Hz
- **Japan:** 110/120 V at 50Hz or 60Hz
- **Rest of the world:** 220/240 V at 50 Hz or 3-phase: 380-400 V 50Hz

The ampage supplied to yacht docks is usually 16A, 32A or 63A.

Shore Power Frequency (Hz)

The operating frequency of appliances is important, as some (like microwaves, washing machines, dive compressors and some air conditioning) will not operate at the wrong frequency. If possible, select those that will operate on both 50Hz and 60Hz.

Battery Charger

The battery charger should be capable of accepting multiple voltages (V) and frequencies (Hz) to suit worldwide supplies so the batteries to be charged when attached to shore power.

Step-up/Step-down Transformer

A step-up transformer will step-up the shore power to your normal voltage; similarly, a step-down transformer will step-down the shore power. This may allow you to run some appliances (kettles, water heaters) that don't require the correct frequency to operate.

Isolation Transformer

An isolation transformer separates the boat's electrical system from the shore power system to prevent galvanic corrosion. It won't step up or step down the voltage.

Frequency Converter

A frequency converter converts from one frequency to another, allowing 220-240V inputs at 50Hz to be converted to 60Hz and vice versa.

Inverter

An inverter converts DC to AC, enabling appliances like microwaves or washing machines to be run from the boat's batteries. It can be set at whatever voltage and frequency your appliances use.

If your battery charger, battery bank and inverter are powerful enough, and wired up appropriately, they will allow you to run your appliances at a different voltage and frequency from the shore power, avoiding the need for step up/down transformers and frequency converters.

Connectors

There is no single global standard for shore power connection plugs and sockets.

The best way to manage this is to buy every type of connector you come across in chandleries so you are prepared.

You could make a short 1m connector lead with a female socket at one end to fit your shore power cable, and the required shore power sockets for the marina infrastructure at the other. A number of these short leads would be ideal for an Atlantic circuit, although a wider selection would be required for more distant cruising.

Shore Power Tips

- European 220/240V AC is not the same as US 220/240V AC. The frequency (Hz) is different.
- European is 50Hz, US is 60Hz
- Never attempt to plug a US-wired boat directly into a European-style dock outlet or vice versa. Always check the supply first.
- Some US boats experience problems with electrolysis because the neutral and ground wired are bonded together. Check your system.
- The shore power cable should be at least as long as the boat plus 5m.
- Carry a 15m+ extension lead with waterproof connectors.
- Useful adapters:
- European boats: 16A to 32A, or 32A to 16A and 32A to 63A.
- North American boats: standard female socket to European 32A and 63A, plus US sockets

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Water Onboard

The minimum requirement for drinking water is 2 litres per person per day, increasing to 3.5 litres per person per day in warm climates.

The drinking water requirement is comprised of fresh water, tea/coffee and soft drinks.

Water for washing, cooking and cleaning is in addition to drinking water requirements.

In a survey of round the world yachts, the average consumption was 14 litres per person per day. On boats without a watermaker, this dropped to 7 litres per person per day.

Water Tanks

Large capacity water tanks will increase your cruising range and independence, whether you're topping-up ashore or producing your own water with a watermaker.

Adding a filter between the tank and the tap can improve the taste and purity of tank water.

Most boats carry additional bottled water for emergencies.

Pressurised Fresh Water

Most boats have a pressurised fresh water system - turn on the tap and the water flows. This can lead to wastage, for example running the tap while cleaning teeth or having a high-power shower.

For boats undertaking long-distance cruising, fitting a foot pump for fresh water in the galley and toilet compartments may be a simple way to help manage consumption.

A manual foot pump is a useful back-up in case of electrical failure.

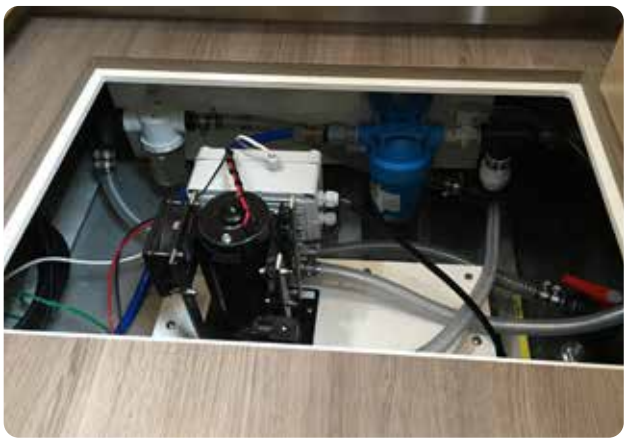
Installing a salt water foot pump in the galley is another good way to reduce fresh water consumption. Salt water is good for pre-washing crockery, cutlery and pans before a soap and rinse in fresh water.

Washing Machines

Small domestic washing machines are now common on larger cruising boats. While the power and water consumption might be high, they do free the crew from constantly seeking laundries ashore.

It is possible to buy 12V and mechanical 'washing machines' that can be stored in a locker and brought out when needed.

Washing machine onboard Oyster 56 Asante



Watermakers installed in various positions on the boat

Watermakers

Watermakers turn salt water into fresh water by pushing salt water though a membrane at high pressure. Technically, a watermaker is a desalination unit.

The water produced is safe to drink, being free of salt and most bacteria and viruses (assuming the manufacturer's cleaning and maintenance regime is followed). It is sensible to fit a filter between the tank fed by the watermaker and the tap.

Larger boat watermakers operate on 240/120V AC. A CAT-pump can run continuously, producing over 200 litres of water per hour, but uses a lot of power.

A good solution for smaller cruisers is a 12V DC watermaker utilising an energy recovery device (ERD). The ERD uses a fast-running pump operating at a lower pressure, which requires less energy.

ERD watermakers can be used as DC installations up to 150 litres an hour. Above this, AC powered from a generator is more effective.

Typical power consumption figures for ERD watermakers using DC or AC:

30 litres an hour	110W (9A 12V)
50 litres an hour	240W (20A 12V or 10A 24V)
100 litres an hour	400W (34A 12V 17A 24V)
150 litres an hour	600W (25A 24V or AC power)

Avoid using watermakers in marinas or anchorages where there may be sewage in the water. Although the membrane will filter out the bacteria, the filter itself will become contaminated.

Watermakers are an investment, and should be installed by a professional. Regular maintenance is important, and spares and service kits should always be carried.

Using the watermaker every day is better for the unit than sporadic use. Follow the manufacturer's instructions.

Schenker Zen 30 installed under a bunk

Waste Water

Holding tanks for sewage (or black water) are fitted as standard to modern yachts, and should be seriously considered as a retrofit for older boats. Grey water tanks for sink and shower water are also available.

The boat's toilets empty into the tanks, which are then either discharged overboard more than 5NM offshore (or 12NM in some countries) or pumped out at a facility ashore. This avoids polluting beautiful anchorages and damaging the environment.

Good-sized holding tanks will increase your cruising range. Use facilities ashore for toilets and showers where possible.

Put used toilet paper in a bag and dispose with the garbage instead of flushing to avoid compaction in the toilet pump or tank.

Never discharge black or grey water into the sea in sheltered waters, non-tidal areas or within protected or restricted zones. For details on country regulations, see noonsite.com.

Cooking Gas

Propane or butane are the most common options for cooking onboard boats, although electric induction plates and devices like air fryers are gaining in popularity, especially with multihull owners.

Propane (usually red bottles) is more common for most North American appliances, and butane (usually blue bottles) is more common in Europe.

Butane and propane have different burn characteristics and not all cookers can burn both gasses. Check with the manufacturer - a conversion kit may be available. Being able to burn both fuels will give you more options.

Refills

If you can burn both propane and butane, leave home with new bottles of both types, as refills are more common than exchanges.

Refilling overseas can be confusing and difficult. Carry a good selection of regulators and fittings - multi adapter kits are available from whayward.com or svb24.com or speak to your local gas engineer or marine supply store.

A scale to weigh full and empty bottles is useful.

Generally, bottles older than 10 years or in poor condition will not be accepted for refill.

Freedom Cruising

The cruising dream is an idyllic anchorage, taking the dinghy ashore for a barbecue or a drink in the local bar.

With the right combination of power generation options, good-capacity water and fuel tanks and a watermaker, you can minimise the time spent in harbours and marinas.

If you want freedom, plan ahead!

- Undertake a thorough power audit.
- Ensure you have suitable batteries, chargers/ monitors
- Choose power generation that doesn't require fuel - wind, solar and hydro.
- Install simple water-saving devices or routines.
- Upgrade water and fuel tank capacity.
- Invest in a watermaker.
- Have a cooker able to burn butane and propane.
- Carry a comprehensive selection of spares and tools.

Cocos Keeling, Indian Ocean.

My Notes

Resources.

Books

The Boat Data Book
by Ian Nicholson
ISBN 9781399412933

The Boatyard Book
by Simon Jollands
ISBN 9781472977106

Boat Owner's Mechanical & Electrical Manual
by Nigel Calder
ISBN 9781472946676

Marine Electrical and Electronics Bible
by John C Payne
ISBN 9781399414180

Diesels Afloat
by Callum Smedley, Pat Manley
ISBN 9780470061763

Diesel Troubleshooting
by Don Sneddon
ISBN 9781898660811

GMDSS - A Users Handbook
by Denise Brehaut
ISBN 9781472945686

Electronic Navigation Systems
by Jane Russell
ISBN 9781838236007

Online Resources

Cooking onboard https://bit.ly/3WVqzd6
Practical Boat Owner interviews with ARC sailors.

How sails are made https://bit.ly/4gzQEW2
Practical Boat Owner interview with sailcloth maker Bainbridge.

Companies

Advance Yacht Systems advanceyacht.co.uk
Generators, hydrogenterators, air conditioning, chargers and inverters.

Hydrovane hydrovane.com
Windvane self steering systems

Macrtra Marine mactramarine.co.uk
Watermakers and other useful equipment

Parasailor parasailor.com
Downwind sails

White Dot Sailing whitedotsailing.com
Project management, boat and crew preparation

My Notes

C PEOPLE PREPARATIONS

This section covers personal preparations that all crew should consider, as well as the skipper's responsibility to their crew.

People Preparations Contents

Skipper's Responsibility

The skipper is ultimately responsible for the well being and safety of the crew, and the safe management and operation of the boat.

Before the start, every skipper will be asked to sign a declaration that he or she has conducted a briefing with all crew members.

Pre-departure briefing must include:

- Training drills for man overboard, abandon ship, dismasting, fire, flood, loss of rudder/steering and storm sails.
- The use of safety equipment - lifejackets, flares, EPIRB, fire extinguishers, liferaft, danbuoy, first aid kit, grab bag.
- The procedure for making a Mayday call and giving the yacht's position.
- The passage and pilotage plan.

In addition, it is recommended that the skipper should:

- Talk through the World Cruising Club Safety Equipment requirements with the crew.
- Review the medical status of crew members taking medications, including seasickness and remedies.
- Assign a ship's medic.
- Review the procedures for using lifejackets and safety lines, including when and where to clip on, and issue each crew member with their own lifejacket and safety line, ensuring it is fitted correctly and the individual knows how it operates.
- Review cooking stove and other fire and explosion hazards.
- Review flooding control procedures.
- Review man aloft procedures.
- Urge each crew member to constantly think about safety and the consequences of every action.

It is important that crew joining the boat have a thorough understanding of the boat's sail handling and propulsion systems, communications, navigation and safety equipment. Not only will this help crew to take a more active role in a successful passage, but also to play their part in an emergency, especially if the skipper is incapacitated.

Storm sails briefing on Hummingbird.

Emergency Contacts

All crew must nominate a person ashore to be their contact in case of emergency.

If a crew member experiences a serious medical incident, or the boat is abandoned, or in other emergency circumstances, it must be possible for someone onboard the boat or the rally organisers to alert the casualty's friends and family at home.

The emergency person may be the crew member's legal next of kin, such as a parent or spouse, or they may be a friend.

The emergency contact must not be sailing on the boat with the crew member. If you are sailing with your spouse, choose another relative or friend to be your emergency contact.

Complete the emergency contact section of your profile in the Members Area of worldcruising.com and ensure that all crew emergency contact details are in a safe place onboard, accessible to any crew in an emergency.

Choosing Crew

Inviting new crew onto your boat can lead to long-term friendships. But if things aren't managed carefully, there is also the possibility of misunderstandings and arguments.

Some boat owners choose not to invite their best friends to sail an ocean because of the potential strain it can put on a friendship. Instead, they select people in their wider friendship circle, from recommendations or by advertising. It's your choice.

Define Your Crew Needs

Some people are happy to sail across oceans with just two onboard, while others prefer to have a larger crew.

Before you take on extra crew, check that your boat insurance covers the number of people onboard.

How many people?

Find a balance between having extra people to spread the load of watch keeping with the need to fill the boat with extra provisions and water.

Boats can feel quite small at sea, especially in the hot and sweaty conditions of the tropics.

Each crew member must have their own bunk and place to stow their belongings. 'Hot bunking' is not allowed.

Does your liferaft have capacity for the new crew numbers? If not, you'll need an additional raft.

What skills?

Be honest about your own sailing skills - do you want an 'expert' to help you or are you able to train a willing novice?

Someone with a great personality, or who is happy to cook in a gale, or plays an instrument could be just as valuable an addition to your crew as someone who has all their sailing certificates.

What don't you want?

Be honest if you don't want smokers or vegans or meat eaters onboard. State this clearly up-front to avoid later misunderstandings. The boat is your home, and you need to be happy about the people you invite into your home.

Responsibilities

Will everyone be expected to cook, clean and stand watches? If you're sailing with children or pets, how will that affect responsibilities?

If you have invited more experienced crew, are they clear that you are the skipper? How will you seek or reject advice and input?

As skipper you need to define the 'boat rules' around things like when to wear a lifejacket and when to clip on, whether it will be a no-alcohol boat etc. These need to be applied fairly to all crew members.

Flexibility

Ocean sailing rarely goes exactly to plan. If a crew member has a deadline for a flight, that will put a lot of strain on the entire crew during a light winds crossing or delayed arrival.

Paperwork

As well as checking with your own insurance company, ensure that crew joining the boat have the correct visas and onward flight tickets (see Immigration Issues on page 68).

All crew should have travel insurance.

Timings

Ensure that your crew has committed to the voyage at least 6-8 weeks before the planned departure.

If possible, have some back-up crew who could be available if someone gets ill or can't come.

Circulate an itinerary and keep the crew updated on any changes.

Get Together

Getting along together is vital for a happy crew. The best way to sail together before the rally starts, either as part of the journey to the start port or before you leave home waters.

If this isn't possible, meet up ashore or online and get to know each other - have lots of conversations and ask lots of questions.

Money

Agree the financial arrangements in writing before setting sail.

Money is the single biggest cause of conflict and misunderstanding, even between friends.

Most crews agree to share living costs such as food, fuel and mooring fees, with individuals paying their own travel and onshore costs, and the owner paying for maintenance and repairs.

Sometimes the owner pays for everything, and sometimes the crew pay a passage or daily fee.

The financial agreement may affect how the crew works together - if the crew pays a passage fee or a daily rate, are they part of the crew or on holiday? If the owner pays for everything, are the crew effectively employees?

Owners charging a daily or passage fee rather than a share of the costs could legally be considered to be chartering. This can have implications for boat insurance, and in some flag countries it can also have serious implications for the qualifications expected of the skipper and the safety equipment to be carried. Check with your insurance company.

Joining a boat as crew

If you are joining a boat as a crew member, be honest with yourself about the sort of experience you want, and the skills you bring. Ask previous skippers for a reference.

Don't hesitate to ask the skipper or owner about themselves, their experience, and how they like to run their boat.

Be prepared to be flexible and adaptable.

Where to Find Crew

If you don't have anyone in your wider circle of friends who can join your crew, try asking in the local yacht club or use a crew matching website like oceancrewlink.com.

OceanCrewLink allows you to filter registered crew by skills, and you can post your voyage, listing your requirements.

Be wary of picking up an 'ocean hitch-hiker' at short notice. Go through the usual due diligence - get references and go for a test sail.

As skipper you are responsible - see Immigration on page 68.

My Notes

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Training

Proper training is good preparation for any sailing journey. No matter how much equipment you have onboard the boat, it is the experience of the skipper and crew that makes for a safe and happy voyage.

A skipper and crew who understand how the boat works, how to stay safe, and the actions to take in an emergency will be able to contribute more to life onboard and the success of the voyage.

The skipper and at least one crew member should have undertaken both theoretical and practical training on a range of sailing topics within the five years before the start of the rally.

World Sailing recommends that all crew members do likewise.

Formal Training

Formal qualifications and specific training courses are not required to participate in our rallies. (The ARC Racing Division is different).

However, we require the skipper and at least one crew member, preferably all crew, to have undertaken theoretical and practical training in the five years before the rally in subjects including:

- Giving assistance to other craft.
- Personal safety gear.
- Care and maintenance of safety gear.
- Fire precautions and fire fighting.
- Crew overboard identification and recovery.
- Hypothermia, cold shock and drowning.
- Crew health.
- Marine weather.
- Heavy weather - crew routines, boat handling, drogues.
- Storm sails.
- Damage control.
- Search and rescue organization.
- Pyrotechnics and signalling gear.
- Emergency communications.
- Liferafts and abandon ship.

Sea Survival Training

Formal sea survival training is about considering the worst-case scenario, learning damage limitation skills and emergency management.

The World Sailing Offshore Personal Survival course is a one- or two-day course that covers many of our required training topics.

The two-day course usually includes a practical session in a swimming pool, using lifejackets and a liferaft. Practical experience of a liferaft in a controlled environment like a swimming pool is strongly recommended, and an instructive experience for any sailor.

World Sailing approved courses are available worldwide - see https://bit.ly/4j832im

If you can't find a Offshore Personal Survival course available at a suitable location, try to join a similar sea safety course, preferably one with a practical liferaft demonstration.

First Aid and Medical Training

Basic first aid training is usually based on keeping a casualty safe until an ambulance arrives. At sea we need to be more self-sufficient - medical expertise may be available online or by sat phone, but hands-on help is usually hours or days away.

Training will provide you with the confidence and skills to treat common ailments and life-threatening emergencies, know how to stabilise a crew member with traumatic injuries, to care for the patient, and to use the medicines and equipment in your medical kit. You will then be able to provide safe and effective treatment under instruction from a telemedical advice service, whether the free service via MRCC or a subscription service.

Basic one-day first aid for sailors courses are available in most countries. If possible, join a four or five-day course aimed at superyacht crew. These courses cover injuries and ailments and patient care in more detail.

Medical and first aid training is important for all the crew - what if it is the only trained medic who is badly hurt or sick?

Always carry a good book, like the Ship Captain's Medical Guide (ISBN 9780115541490) or the Skipper's Medical Emergency Handbook (ISBN 9781399413091).

See pages 28-29 for details of medical kits and medical support at sea.

Training Centres

There are hundreds of sea schools worldwide offering theory and practical training.

Personal survival technique training in a pool

Training in the UK

Hamble School of Yachting is our UK-based training partner. They offer a wide range of formal RYA or MCA training and specialist courses.

Hamble School of Yachting hamble.co.uk
Royal Yachting Association rya.org.uk

The RYA website has a complete list of approved and affiliated training centres in the UK, Europe, Australia, South Africa and North America.

Training in North America

US Sailing ussailing.org
Canadian Yachting sailing.ca

Training in Europe

Deutscher Segler Verband dsv.org
Fédéracion Française de Voile ffvoile.org
Federazione Italiana Vela federvela.it
Norges Seilforbund seiling.no
Real Federación Española de Vela rfev.es
Svenska Seglarförbundet svensksegling.se
Polski Związek Żeglarski pya.org.pl
Koninklijk Nederlands Watersport Verbond watersportverbond.nl

World Cruising Club Events

World Cruising Club runs a range of seminars and activities throughout the year, in-person and online. These aren't formal training courses, but they are a good way to expand your knowledge.

See https://worldcruising.com/shoreside-events for the calendar.

Ocean Sailing Weekend

World Cruising Club's two-day seminars provide an in-depth look at the issues around planning and preparing for an ocean passage.

World Cruising Club team, experienced sailors and marine industry professionals deliver presentations and workshops on topics including weather, managing emergencies, preventing and recovering man overboard, liferafts and abandon ship, offshore communications, power management, sails and life onboard.

Bluewater Days

One day events that combine informal seminars with an opportunity to visit onboard ARC-ready boats and talk to the owners, to network with marine industry specialists and meet fellow sailors.

If you can't get to a boat show, the Bluewater Days are a good way to see safety and cruising equipment and to get the feel for bluewater cruising boats.

Qualifying Passage

Every boat with the skipper and at least one crew must make a qualifying passage on the rally boat before arriving for the start. The length of the passage depends on the rally - check the Conditions of Entry for full details.

The qualifying passage is an opportunity to test the boat and systems in good time to make improvements or changes. It is also a good test of the crew and can highlight training needs, so take as many of the rally crew as possible.

The skipper and at least one crew must complete a non-stop coastal or offshore passage of 100, 250 or 500NM (rally specific) in the 12 months before the start.

Paperwork

Immigration Issues

Crew arriving by boat at a destination are the responsibility of the skipper. This means that if crew are leaving the boat, they need to have a valid onwards air ticket or funds available, otherwise the skipper will be responsible for the cost of repatriation.

This is particularly important if you decide to pick up last minute casual crew or 'ocean hitch-hikers'.

Signing-Off Crew

If crew are leaving the boat, they should be 'signed-off' the crew list so they are no longer the skipper's responsibility.

You can do this by visiting the immigration authorities with the crew member and his papers, including passport and onwards ticket.

Crew Joining Letter

All crew who fly in to a country on a one-way ticket to join a yacht should have a signed letter from the skipper to help with the immigration authorities.

The joining letter should look smart and official, with the yacht's name or logo, registration number, port of registry and be signed and dated by the skipper.

Suggested wording:

I, the undersigned, s*kipper of the sailing yacht [insert yacht name], registered in [insert port of registry], certify that Mr/Mrs/Miss/Ms [delete as appropriate] [insert crew name] passport number [insert passport number], is a crew member on the above mentioned vessel and will be joining the vessel in [insert port where joining yacht]. The above mentioned person will be arriving with only a one way ticket as he/she will leave [insert name of country] on board the above mentioned yacht.*

Copies of this letter in English, French and Spanish are available from World Cruising Club.

Passports

It is essential to have a valid passport. Some countries require that the passport is valid for a minimum of six months from the date of arrival - check in advance, or you may be denied entry.

If you are planning extended cruising, consider requesting a passport with extra pages for all the immigration stamps you'll collect.

Make a copy of the key pages of your passport - a laminated photocopy and/or scan. Invaluable if your passport is lost or stolen.

Visas

It is generally easiest to obtain visas in your home country before you leave, but check the period of validity if you are long term cruising.

Details about entry requirements are available in the Local Information section of this handbook, but also check the immigration website of the destination country as changes may be made at short notice. noonsite.com is a good source of information on immigration and entry formalities for cruisers.

Travel Insurance

We recommend that everyone onboard has travel insurance that provides at least a basic level of medical cover for emergency treatment.

Pay careful attention to the conditions to ensure that you are covered for ocean sailing in the countries on your route, and especially conditions for medical treatment and repatriation. Some travel insurance excludes sailing as a 'dangerous sport' or limits the time onboard.

Some specialist insurers:

UK: Hayes Parsons	hayesparsons.co.uk
UK: Topsail Insurance	topsailinsurance.co.uk
EU: Yacht Pool	yacht-pool.com
USA/CAN: DAN Boater	danboater.org

EHIC and GHIC Cards

EHIC card (EU citizens) or GHIC card (UK citizens) allow reciprocal access to healthcare in some EU overseas territories.

Checking passports prior to the ARC start

Health and Wellbeing

For some people, being at sea can be stressful, while for others it is a relaxing experience. Stress can affect general wellbeing, behaviours and underlying medical conditions.

It isn't always serious conditions that can cause distress. Even something as simple as a spare pare of spectacles can make the difference between an active, happy crew member and someone who is effectively incapacitated.

It should be possible to discuss health conditions, allergies and medications with the whole crew, but some people may feel more comfortable talking about their situation with the skipper alone.

Do not hide any medical condition or allergy from the skipper. They have a duty of care for the crew and may need to provide the care to save your life.

Record all pre-existing conditions, allergies and treatments on a form or register that can be easily accessed in an emergency, but is protected from general browsing.

Pre-Existing Conditions

If you have a pre-existing medical condition, discuss your sailing and travel plans with your doctor first.

Knowing how to help a fellow crew member suffering a severe allergic reaction, angina attack, epileptic seizure, diabetic hypo/hyper or similar life threatening episode is vital. Share with the crew the potential symptoms or warning signs, where your medication is stored, how to administer the medication and next steps, such as after care, calling for telemedical support or issuing a Mayday emergency.

Being open with your fellow crew about your condition and how you need to be treated if you are experiencing an episode can dispel anxieties and embarrassment.

Allergies

To avoid an emergency situation at sea, be honest about your allergies and their severity so the crew as a whole can ensure that these triggers, like eggs, fish, seeds or nuts, are either not onboard, or are suitably restricted.

Prescribed Medication

Ensure you have enough supplies to be in-date for the duration of the voyage, plus a suitable contingency.

Any medication may affect the choice of drugs or treatment in an emergency. If you are carrying prescribed medication, bring a copy of the prescription or a letter from your doctor describing the medicine and dose.

Some medicines are restricted in some countries, and proving that you have legal right to the product may be necessary. Make a copy of the prescription or letter for the skipper.

Vaccinations

Discuss your cruising plans with your doctor or infectious diseases specialist and ask about vaccinations for tetanus, typhoid, polio, hepatitis A and similar.

The requirement will depend on your cruising area and can change at short notice.

Malaria

The best way to avoid malaria and other mosquito-borne diseases like zika, chikungunya and dengue is to avoid being bitten. Discuss prophylaxis with your doctor before leaving home, and always check the situation and advice in the next port.

Yellow Fever

Some countries like Panama, Ecuador, Colombia and Brazil require yellow fever vaccination certifications for all or part of their territory. A vaccination lasts for 10 years, but there are age restrictions.

Example Crew Heath Form

Name	Condition	Treatment/Medicine	Notes

Staying Healthy

'Prevention is better than a cure' is a good maxim for onboard health.

Be careful to avoid injury on deck and below - use lee cloths and handholds and wear gloves and shoes when appropriate.

Simple prevention steps include:

Diarrhoea and Vomiting

- Avoid stomach upsets by following good food hygiene - ensure the fridge is cool enough, don't mix cooked and raw, take care with food preparation
- Always wash your hands.
- Check whether water from the dock is potable before filling the tanks.
- Stick to bottled water if you are unsure of the quality from the water system ashore or onboard.
- Fit filters to your water tank taps.

Burns

- Prevent burns from overspilling pans by wearing waterproof trousers and shoes when cooking in rough weather.
- Avoid sunburn by wearing a hat, sunglasses and technical clothing with sleeves. Use sun cream.
- Wear gloves when handling ropes under load - for example when easing a sheet on a winch or when trimming a sail.

Cuts

- Take extra care when using sharp knives in the galley in rough weather.
- Stop cuts and bites from being infected by disinfecting then keeping the area dry.

Mosquitoes

- Prevent mosquito bites by fitting screens over hatches, burn coils at night and use insect repellent sprays.
- Wear long trousers in the evening.
- Check current mosquito advice with local cruisers.

Managing Sea Sickness

Sea sickness is no joke; some people suffer really badly, unable to stand a watch or rise from their bunks. These people are at risk of dehydration and should be helped with sips of water or rehydration fluids.

Seasickness can leave your crew depleted, so encourage everyone to take precautions - find out which remedies suit you before departing on a long passage.

It takes most people around three days to acclimatise to life onboard, so take it easy for the first few days. You're on holiday!

- Avoid alcohol and fatty foods before departure.
- Start anti-seasick medicines 24 hours before departure, and continue as prescribed until you have acclimatised.
- Plan plain meals for the first few days at sea.
- Dehydration can be a real problem. Treat with plain water or rehydration fluids.
- Sugar and salt are important – boiled sweets, some salty crisps (potato chips), or add sugar to warm water.
- Fresh ginger in hot sugar water, or ginger cookies are also good for settling the stomach and cleansing the palate.

Managing Life at Sea

There's no escape from life and personal admin when you're at sea! Some suggestions:

Staying in Touch

- Laptop with USB and USB C ports.
- Memory sticks for sharing files without internet.
- Mini printer (with inks) for printing forms.
- Personal 'business cards' with your boat name, email, WhatsApp and social media.
- Cloud storage, Dropbox, iCloud, Google Docs.
- WiFi booster or boat hotspot.
- YB Connect for sending cheap text messages from your phone via the YB tracker.
- eSIM service - Airalo etc for data overseas.
- Local SIM for cheaper calls than your own mobile provider.
- Use WiFi to call and video home using WhatsApp, FaceTime, Teams etc.

Money

- Move to internet banking.
- Have a direct number to call your bank in an emergency.
- Have more than one type of credit card.
- Local currency is often the only option in more remote locations or smaller shops and restaurants.
- Get small denomination notes for remote areas where change may not be available.
- US dollars (or Euro) are useful if you arrive and can't get cash for the fuel dock.
- A decoy wallet containing out of date cards and few dollars cash could be a good idea to foil theft.

Mail

A mailing address for each rally port is included in the Local Information chapters. Ensure the boat name is included.

PO Boxes aren't always acceptable as a delivery address.

Specialist mail forwarding services for cruisers include:

UK: Ship to Shore shiptoshore.co.uk

USA: St Brendan's Isle sbimailservice.com

Clothing

You will probably experience all kinds of weather when sailing long distances. Squalls and frontal systems bring rain, winds and big seas, and tropical sailing has potential for sunburn and sunstroke.

Even on a tropical passage it is important to have a variety of clothing available.

Clothing for Temperate Sailing

A three-layer system is ideal when you need to keep warm and dry.

Long sleeve UV protection on Whim Sea in Saint Lucia

- Base layer - moves moisture from the skin. Many base layers also offer UV protection, and are ideal for sunny climates as a long sleeve t-shirt.
- Mid layer - is a breathable thermal layer for warmth. Think fleeces and soft shell jackets.
- Waterproof outer layer - keeps you dry even in wind-driven spray. Breathability helps moist air to escape, keeping you drier inside.

Clothing for Tropical Sailing

Sailing in the tropics isn't just about a t-shirt and shorts. You'll be exposed to fierce sunlight and UV for prolonged periods, reflection from the sea amplifying the brightness.

- Sunglasses - preferably polarised are vital to save your eyes.
- Hat - a peaked or wide brim hat to protect your face - some hats have a neck guard too.
- UV protective fabric - incorporated into trousers and technical tops. In the tropics you see local sailors covered from head to toe in technical fabric to avoid the sunlight.
- Fleece - a warm layer like a fleece or softshell for night and rainy days.
- Waterproofs - it rains, often very hard, in the tropics, so you'll need waterproofs. Most manufacturers offer lightweight waterproofs for the tropics.

Gloves and Shoes

Proper sailing gloves are vital to protect your hands from rope burns when hoisting, dropping and trimming sails.

A rope burn can easily become infected at sea. The easiest way to stop this happening is to wear gloves and treat ropes and winches with care.

Sailing barefoot feels idyllic, but it is easy to slip on a wet deck and twist an ankle, or to break a toe by stubbing it against deck hardware. Consider suitable lightweight footwear that provides support, grip and toe protection.

In temperate conditions a good pair of breathable sea boots are a must.

Going Ashore

Pack clothes for going to a nice restaurant - you'll want a break from boat clothes.

It is always polite and respectful to dress properly when visiting local officials like customs or immigration. A clean t-shirt or polo shirt and shorts and a pair of sandals will get you better treatment than wearing salt-stained shorts with a bare chest and bare feet.

Team Clothing

Rally branded clothing including polo shirts, technical shirts, shorts and skorts are available from the World Cruising Club online shop.

Team Keep Sailing V

Sailing with Children

There are always children taking part in rallies, from babies through to teenagers.

With young children who need constant attention and watching, it might be worth considering taking more adult crew to help sail the boat on long passages.

It is natural to be apprehensive about the safety of children at sea, but as long as you set (and follow) firm rules around wearing lifejackets and clipping on, it should be an enriching experience for both children and parents.

As one parent said: "To be honest, once I was happy that the boat was secure and the kids understood the importance of safety, it was probably a safer environment than on land - at least I knew where they were the whole time!"

Children are Adaptable

A concern in our always-on world is whether children will get bored with the limited space and opportunity onboard.

Many parents comment that the kids adapted to the small space quicker than the adults (don't forget the fun of making a den!) and often found them better behaved at sea than in port.

Cheaper at-sea internet access means parents can choose whether or not to disconnect, or to have daily FaceTime with friends, download movies or write a daily blog.

Involving children in the work of sailing will depend on their age and size, but it is always possible to talk about maps and distances, to create video blogs about the boat systems or to learn how to steer. There are many boats out there where the resident expert on the communications systems or navigation software is a young teenager!

Tips from Parents

- Meet other rally parents in-person or on WhatsApp before the rally starts.
- Make the kids feel part of the crew, even if they can't contribute much. Add their names to the watch system to keep a good daily structure.
- Make sure everyone eats together at least for the evening meal.
- Involve them in cooking and cleaning, steering and sail changes if possible.
- Don't overestimate the amount of schooling you can achieve at sea. Keep formal stuff for in port, and make at-sea learning more practical.
- Kids might not enjoy writing or drawing when the boat is rolling, but recording a reel or video could be more attractive.
- There are learning opportunities in the weather, the stars, sea birds and sea life, even the physics of how a sail works.
- If you don't fancy the cost of streaming video on Starlink, download films to a laptop or get a DVD player and plenty of DVDs.
- Old fashioned games and puzzles like lego are a good option, anything that can be played in the hands or can cope with the motion of a boat.

Schools

You may need to get permission to remove the child from school, so involve the school or education authority at an early stage.

Children during ARC+ 2025

There are many options for 'boat school' with reputable distance learning programmes for all ages, whether scheduled live-stream lessons or self-paced learning.

Providers used by rally sailors include:

Self Design	selfdesign.org
Cned	cned.fr
The Good & The Beautiful	goodandbeautiful.com
Shurley Instructional	shurley.com
HMH	hmhco.com/classroom-solutions/homeschool

If you are able, select a programme based on your child's age and learning style, and which have the flexibility to allow learning through real world experiences.

Sailing with Pets

It is possible to cruise with cats and dogs, but it will require significant forward planning, compromises on destinations and restrictions to your movements.

Some countries do not allow pets at all, while others require lengthy quarantine or import by air which is impossible for cruisers.

Requirements for Europe and the Caribbean are fairly straightforward, but cruisers heading across the Pacific will face greater restrictions. No pets are currently allowed into the Galapagos, Australia or Fiji.

You will usually need a health certificate and an import licence issued by the country's veterinary or biosecurity agency in advance of arrival. To obtain the health certificate, you will need to prove the animal has received certain vaccinations and is certified free of specific conditions.

This requires visits to vets in the departure port for blood tests and treatments. You'll need to factor time to get the tests done and for the results to return. The costs can add up quite quickly.

Requirements may change without notice, and we strongly recommend that you contact all countries on your planned route. Visit noonsite.com and pettravel.com for details. Details for the rally route are included in the Local Information chapters.

Dogs and cats can adapt well to life onboard, and as part of the family it can be hard to leave them behind. Allow your pet to settle in onboard, and ensure they have a safe space they can retreat to when the weather is rough.

Many ARC sailors either always walk the pet on a leash on deck, or fully net the guardrails, or both.

Dog's love being part of the crew

Resources

Useful Books

Ship Captain's Medical Guide
by Maritime & Coastguard Agency
ISBN 9780115541490

Skipper's Medical Emergency Handbook
by Dr Spike Briggs
ISBN 9781399413091

Doctor On Board
by Dr Juergen Hauert
ISBN 9781408112724

Lesson Plans Ahoy
by Nadine Slavinski
ISBN 9781733667616

Where the Magic Happens
by Caspar Craven
ISBN 9871472949912

My Notes

D OCEAN SAILING

In this chapter we share advice and experiences from sailors, covering useful pre-departure planning actions, daily rig checks and handling rigging emergencies.

Ocean Sailing Contents

Voyage Duration

While the rhumb line distance of any passage can be calculated by a quick look at the chart, it is likely that you will sail far further. With wind shifts, sailing the angles downwind or manoeuvring around squalls, you will sail 15% or 20% more.

Adding 20% to the calculated passage distance will give you a cushion when planning. This should ensure that you have enough water and food for the passage, and that you can motor when needed to charge the batteries, make way through a calm or motor into the harbour.

Boat Speed

Be realistic when determining the miles your boat will cover in 24 hours. It is unlikely that you will be sailing at theoretical hull speed.

You may not want to push your boat on a transatlantic as you would a weekend passage (it is tough on the crew and boat equipment), or you may experience conditions that slow you down, like difficult wave patterns.

Slower boat speed means more time on passage.

Days on Passage

You may find this number is far larger than first anticipated, but the cushion or buffer you have built in to the calculation will reduce stress if you know you have enough food or fuel and will help crew to plan shoreside travel.

Passage time =
Distance + 20% ÷ realistic boat speed

For example:
1000NM + 20% ÷ 5knots = 240 hours
So 10 days water, food & fuel needed

My Notes

Water Planning

Water is the most critical element of passage planning. If you run out of fuel you may face a frustrating wait in calm weather, but running out of water is life threatening.

The minimum requirement for drinking water is 2 litres per person per day, increasing to 3.5 litres per person per day in warm climates.

Water for washing, cooking and cleaning is in addition to drinking water requirements.

In a survey of round the world yachts, the average consumption was 14 litres per person per day. On boats without a watermaker, this dropped to 7 litres per person per day.

Bottled Water

You may choose to carry a large number of water bottles and soft drinks to make up a majority of the drinking water requirements. This provides a buffer if you are unable to use your watermaker, or if the water in the tanks is tainted. Most cruising boats can accommodate large numbers of bottles under bunks or under the floorboards.

Having a proportion of your water requirement in bottled form makes auditing usage easier, whether you are trying to encourage your crew to drink more, or keeping tabs on a dwindling supply. Use large bottles with a hand pump.

Water Management Tips

- Educate your crew in water saving techniques like using a mug of water to brush teeth and a wash cloth to clean your face.
- Fit foot pumps in the heads/bathroom and galley and switch off the pressure water system. This stops water going down the drain.
- Wash the dishes in salt water, finishing with a fresh water rinse.
- If you have more than one water tank, set up the system so you can isolate the tanks.
- Fit a charcoal filter before the galley tap for fresh tasting tank water.
- Limit the number of showers taken – ration people to one shower every X days (you decide!)
- Shower in salt water with special soaps and shampoos, and finish with a quick fresh water rinse.
- Talk to your watermaker manufacturer about the most efficient way to build water capacity.
- Remember that if you rely on a watermaker, it may break down. You also need fuel to run the watermaker.
- Start the passage with full tanks. Carry extra water even if you have a watermaker - its a buffer in case the main tank leaks or is contaminated.
- Give each crew member a named water bottle so you can monitor consumption.

Example Water Management Plan

Item	Calculation	Total
Drinking water: 2 litres per person per day	Number of people x 2 (minimum) x days	
Fresh water shower: 8 litres per shower	Number of scheduled showes x 8 litres	
Fresh water washing: 5 litres per person	Number of people x 5 x days	
Total estimated water consumption	Sum above	
Add safety factor of 10%		
Total water requirement		
Water tank capacity (litres)		
Watermaker output (litres)		
Extra water in bottles (litres)		
Extra water in jerry cans (litres)		
Total water capacity	Sum above	

If total water capacity minus total water requirement is negative, you have a problem!

Fuel Planning

To develop a fuel management strategy, you must quantify the 'usable' fuel capacity of the boat, and understand the rate at which fuel is consumed by the engine in cruising conditions.

Usable Fuel

Your boat specification will include the capacity of the fuel tanks, but depending upon where the exit hose is located, the usable capacity may be 15% less.

To calculate the usable capacity of the tanks, run each tank down until it is close to empty (or until the engine shuts down, if you are happy to bleed the fuel system). When you refill the tank, note the exact amount of fuel that can be added – this may be the same or less than the manufacturer's capacity. This is your 'usable' fuel. Have a spare fuel filter ready after this!

Efficient Engine Operation

To determine the most efficient speed to run your engine when the boat is equipped and loaded for extended cruising, calculate your boat speed at various RPMs.

1. With a correctly calibrated speed log on a calm day with flat seas, motor at the lowest recommended operating RPM for your engine. Note your boat speed once the boat has stabilised. Increase your RPM by 250 RPM and note the speed again. Repeat until you reach the maximum recommended RPM.
2. Next, add fuel consumption to the matrix, using the information provided in the engine manual. Using the speed and fuel consumption information, you will be able to calculate the engine speed/RPM at which you can motor the greatest distance on a quantity (litre/gallon) of fuel, and the amount of fuel that will be consumed for any given RPM and boat speed.
3. Verify your assumptions by starting with a full tank and running the engine at cruising RPM for several hours. At the end of the run, refill the tank and note the quantity of fuel used. Divide the quantity of fuel used by motoring time to give usage per hour, and compare with the earlier calculations. Repeat, using different RPMs.
4. You will be able to create a table showing the RPM with boat speed, estimated fuel used, actual fuel used and miles per litre/gallon for each 250RPM increment.

Motoring Range

Using the data you have collected, you can calculate the motoring range at the most efficient speed for the quantity of fuel carried. Many cruisers extend their range by carrying extra fuel in containers.

Fuel Management on Passage

Review fuel usage and motoring time every day. Some hints for adjusting your strategy:

- Have you motored for more than your calculated allowable daily motoring distance in the past 24 hours?
- Based on the forecast conditions, do you anticipate motoring more than your daily motoring distance in the next 24 hours?
- Are you powering into waves, using more fuel than motoring in flat seas?
- Are you running the generator more or less than you planned?
- Have you saved fuel in the past 24 hours by not using the motor as much as planned?

Based on your answers, you can recalculate your fuel requirements to meet your actual situation. For example, you can answer questions such as:

- Can I afford to motor at 6 knots at a higher RPM for 4 hours to get into port before dark?
- Should I use less fuel and slow down, waiting to enter port in the morning?
- If I lower my engine speed by 500 RPM and have to motor for 24 hours, what will be the impact on my fuel consumption, and how far will I travel?

If you are concerned about your fuel level, transfer the fuel needed for the generator to a separate tank.

Practice restarting the engine if it runs dry – manually priming an engine offshore can be difficult.

If you run your tank right down, have a spare fuel filter ready, as the old one will get very dirty.

Prepared with assistance from Rick and Julie Palm, circumnavigators and experienced cruisers.

Example Fuel Management Plan

Item	Example	Total
Usable tank capacity	600	
Extra fuel in containers	100	
Total fuel onboard		700 litres
Reserve for emergencies	10%	70 litres
Calculated length of passage	10 days	
Generator required	2 hours per day	
Total generator hours	Length of passage x generator requirement	20 hours
Generator fuel use	2 litres per hour	
Generator fuel requirement estimate	generator hours x fuel per hour	40 litres
Fuel for propulsion	total - reserve - generator	590 litres
Fuel use at efficient RPM	5 litres per hour	
Total motoring hours possible at efficient RPM	fuel for propulsion ÷ fuel use	118 hours
Estimated range at efficient RPM	speed x motoring hours possible	590 NM
Average allowable motoring hours per day	estimated range ÷ length of passage	59 NM

In this example, if you motor for less than 59NM per day on a 10 day passage you should have 10% left in your tank.

My Notes

Yacht Transport

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Food Planning

Food at sea

Make a menu plan for three meals a day for the estimated passage duration (use the calculation on page 76). Don't rely on catching fish - assume fresh fish is a bonus!

For each meal, calculate the quantities of ingredients needed per person, then multiply by the number of crew.

Factor-in dietary requirements and food preferences. If you don't like a food at home, its unlikely that you'll want to eat it at sea.

Don't forget snacks like crisps, nuts, sweets and biscuits, and tea, coffee, sugar and milk for drinks.

If you are used to cooking for a family, this should be straightforward, otherwise take your time. It is easy to under provision and either run out of food, or to end up eating the same meal day after day.

Be prepared for fridge or freezer breakdown or loss of electricity, and include some canned and dried foods or even freeze-dried bagged meals for emergencies.

If you are cooking on gas, watch the level and adjust your cooking style or menu. If you need to boil water, use a pressure cooker or kettle instead of a pan.

Provisioning Overseas

Shopping for food for the boat should be fun - exploring new stores, markets, brands and foods part of the cruising life.

The start and finish ports of all World Cruising Rallies are well provided with markets and supermarkets, making food shopping easy.

While every inhabited place you visit during your sailing will have some form of food to sell, it may not be in the quantities, prices or form you are used to. See what is available and plan accordingly - take advice from the locals.

As you relax into the cruising life you'll think about meal planning and provisioning less and less. You'll learn how to 'get by and make do' with what is available.

Before every long passage, or when new crew join the boat, always site down and talk about menus and likes and dislikes. A well-fed crew is a happy crew!

Provisioning Tips

- There are shops everywhere - don't stock-up for a year!
- Try before you buy in bulk.
- Some market traders will take orders in advance and deliver to the boat, flash freeze or vacuum pack meats - check their lead times.
- Avoid buying chilled fruit and vegetables as they will last longer stored outside of the fridge.
- Invest in a folding cart to make shopping trips light work.
- Couscous takes less water to cook than rice or pasta.
- Don't forget treats and celebration foods.
- Vacuum pack fresh meat to increase its keeping time.

Fresh Produce Guide

Will last three weeks:

Squash, potatoes, onions, garlic, cabbage, beets.

Apples, oranges, lemons, limes.

Will last two weeks:

Carrots, cucumber, zucchini.

Pineapple, pears, grapefruit.

Will last one week:

Avocado, hard lettuce (iceberg, romaine), eggplant/ aubergine, tomatoes, cauliflower, broccoli.

Bananas, melon

No cardboard onboard - it may contain cockroach eggs

Storing Food

- Most places on a boat may get wet at some time.
- Don't put cardboard boxes on deck (they can carry cockroach eggs) and get rid of any cartons and excess cardboard packaging ashore.
- Use water-tight containers whenever possible - ziplock bags and plastic containers in place of store packaging. Stick labels on all re-packaged foods and drinks. Tough ziplock bags can be washed and reused.
- Allocate specific lockers and under-floor areas for particular items (label the doors if it helps) and draw a plan, so everyone onboard knows where to find things.
- Prevent movement, abrasion and noise by using pieces of foam, plastic bags, paper towel, cloths or plastic bottles to jam between packages, cans and glass jars. Pack paper towel between cooking pans to prevent rattling on passage and damage to non-stick.
- Carefully wash and dry fruit and vegetables before stowing to remove bugs.
- Overhead nets (soft mesh) are great for hard fruit and vegetables - apples, oranges etc.
- Folding plastic storage crates in dark well-aired lockers work well for soft fruit and vegetables. Stop bruising by packing tightly, and put paper towel between layers.
- Check fruit and vegetables daily, remove and use mouldy or overripe stock.
- Wash and dry eggs and stow in plastic egg crates. No need to refrigerate or varnish; normally last 3 to 4 weeks. Test eggs by sniffing the shell and turn regularly. Avoid cardboard egg boxes.

Fridges and freezers

- Assume your fridge or freezer will break down!
- Help it to work efficiently by keeping the door open for as short a time as possible.
- Don't overwork it by adding lots of warm items at once. For example, try to eat immediately most of any fresh fish caught, rather than chilling or freezing it.
- A fridge, freezer or coolbox will work more efficiently if it is full. Pack with bottles of water or even empty cartons if necessary.
- Organise the fridge with plastic baskets for each meal: a breakfast basket containing milk, yogurt, bacon; a sandwich basket containing bread, butter, cold meat, cheese; a condiments basket and so on. This saves time and mess as crew can simply take out the basket they need.
- Organize frozen meat or meals in colour coded bags: yellow = chicken, red = beef, green = vegetarian etc, and clearly label.
- Lots of items we refrigerate at home don't really need chilling - ketchup, mustard, jam, peanut butter, hard cheese, eggs, dried meats will be OK if stored in a locker and checked before use.

Carefully wash and dry fresh produce before stowing

Cooking Onboard

- If you have a menu plan, print it out and post it in the galley so volunteer cooks don't use all the rations.
- Put the daily ration of snacks in a separate basket so the crew aren't tempted to raid the fridge.
- Keep an eye on gas supplies, and save fuel - don't boil large pans of water.
- Electrical devices like air fryers, microwaves, induction hobs, bread makers, multi-cookers and remoskas cook more quickly than gas.
- Pressure cookers are an efficient way to use gas and water supplies. You can even make bread in a pressure cooker.

- Ensure that all cooking devices are secured in case the boat rolls unexpectedly.
- Cup measures are easier than scales when following recipes onboard.

In rough weather

- Take care with hot pans. Wear shoes and waterproof trousers to avoid burns from spills.
- Use pan clamps to keep pans secure.
- Feed the crew in batches to avoid handling large pans.

Freshly baked bread onboard

Pre-Departure Food Preparations

Make time in the week before departure to get your food organised. If possible, rent an apartment and use the kitchen space to cook and freeze meals and sauces. Even cooked pasta can be frozen, just add a tablespoon of olive oil before freezing.

You'll have more space in an apartment than on the boat, you won't be heating-up the boat or using your gas supplies, and you can bring food to the boat ready frozen, helping your freezer work more efficiently.

4-5 days before departure:

- Plan the menus.
- Buy and stow all non-perishables.
- Cook and freeze meals.
- Ensure you have enough propane/butane (and a spare regulator!)
- Order fresh produce for delivery.

1-2 days before departure:

- Get fresh fruit and vegetables delivered with time to wash, dry and carefully stow.
- Print and post the menu plan.
- Check the stowage of all foods, and write a stowage plan.

Departure day:

- Make sandwiches or soup in advance for an easy first day at sea, in case anyone is feeling a bit seasick.
- Make up a daily basket of snacks - fruit, crisps, sweets.

My Notes

Disposal of Garbage

Cooking will probably create more waste on a cruise than any other activity. Dealing with packaging and food waste is an issue on long passages, especially in hot weather.

Remove as much packaging as possible before bringing food onboard. Lots of foodstuffs have extra packaging that has no function and can be removed and left ashore. Cardboard can also hide cockroach eggs.

Modern packaging materials can take years to break down in seawater and create both visual pollution and a serious danger to sea life. Turtles, dolphins, fish and sea birds die when they mistake our rubbish for a meal, or become entangled in discarded plastic bags.

Drinks cans take 100 years to breakdown, plastic bottles and bags take 450 years, fishing line and zip ties take over 500 years and even orange peel takes 2 years.

Wash and Crush

Wash dirty food packaging in seawater, crush it as small as possible and store in plastic crates in a deck locker. Small plastic items can be folded or crushed and put into a plastic water bottle to make a 'plastic brick'.

Make a can-crusher from two pieces of wood.

Well-rinsed rubbish will not smell!

Many marinas have recycling facilities. Ask about the local recycling arrangements and use these whenever possible. Don't forget that very small communities may have limited resources to handle volumes of rubbish, so it may be better to carry it a bit further until you reach somewhere with better facilities.

If your rubbish is going to be buried or burned on a beach, maybe you could live with it a bit longer?

Most cruising destinations take great pride in the quality of their local environment and may have laws restricting garbage disposal at sea. If in doubt – don't do it!

For information on general advice see thegreenblue.org.uk and on local restrictions visit noonsite.com

Overboard Disposal

US Federal law covers disposal of waste in US territorial waters. This is a good guide for boats operating where no specific regulations exist.

Never dispose of plastics into the sea.

- Less than 3NM offshore: Only fresh fish/parts, grey water. No black or sewage water.
- 3-12NM offshore: No plastics or packaging. Only organic trash ground to less than 1 inch
- 12-25NM offshore: No plastics or packaging
- More than 25NM offshore: No plastics

All of Karibu's garbage for 8 people, 20 days

Waste disposal after arrival can be a big task

People Planning

If this is your first long offshore passage, it can be difficult to know where to start with devising a watch keeping schedule that will work for everyone for such a long time.

Following are some initial questions that when answered, will help shape the watch schedule:

- Will everyone stand equal watches or will one person have other responsibilities and stand a limited schedule, such as a cook or captain?
- Is there a regular weather pattern, such as pre-dawn squalls, that suggests when to schedule experienced crew?
- Do weather conditions and experience suggest single person watches or pairing up?
- Will the crew use an autopilot or windvane, or will they hand steer, which makes it difficult to stand a watch longer than two hours?
- Does the route come close to major shipping lanes?

Though some watch schedules are more relaxed than others, taking care of the ship and crew is always the primary responsibility.

On watch, this means checking the gear for chafe, wear and damage, monitoring the course, looking for other craft, navigating to avoid hazards, adjusting sails for changing conditions or anticipated shifts, knowing when to ask for help and staying alert.

Off watch is about sleeping and resting - fatigue is a dangerous affliction and can be blamed for many human errors. It's important that the off-watch crew sleep, to be well rested for their watch.

If conditions deteriorate or there is a problem that needs fixing, there may shortened watches and less sleep for everyone, so stay well rested.

It is not uncommon to have a new crew member on a passage, and since each boat has its own modus operandi, it is wise to have a written passage protocol as even regular crew will benefit from seeing their routine in writing.

In addition to watch responsibilities, the passage protocol should address when harnesses should be worn, whether to wake an additional person for sail changes, under what conditions to take in sail, under what conditions to stay in the cockpit if alone on deck and when to call the off watch crew on deck. It should also state how frequently log entries should be recorded and positions plotted.

With moderate conditions and a crew of three or more it is easy to create a schedule that keeps an alert watch on deck at all times while allotting adequate off watch time to stay well rested. Many seasoned passage makers agree that four hours is the maximum time that someone can stay alert during a night watch, and many find three hours much more manageable. It is important to also assign a standby so that the person on watch knows whom to wake if they need help.

Fixed Watch Schedule

In a fixed schedule, A would be on standby for the first two hours of B's watch and C would be on standby for the last two hours, and so forth. Usually, dinner is the only shared meal of the day as many choose to catch up on sleep through the morning.

Rotating Watch Schedule

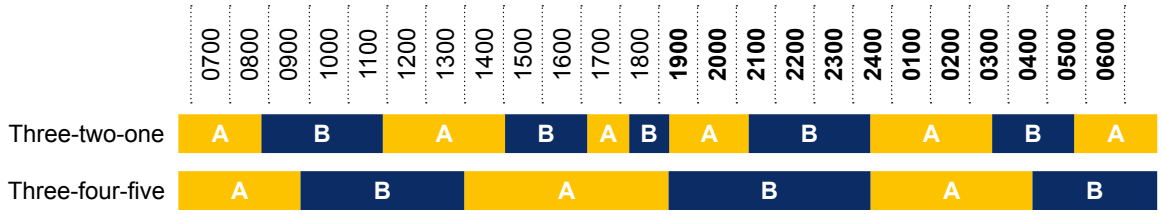
In the rotating schedule the short watches from 1500 to 1900 alter the schedule, turning a fixed schedule into a rotating one. These short watches can also serve as a social time.

The basic rotating schedule can be adjusted to incorporate different watch lengths. One variation has four-hour watches from 0600 to 2200 and two-hour watches during the darkest part of the night.

Crewed Watch System Suggestions

	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	2400	0100	0200	0300	0400	0500	0600	Cook	Dishes
Fixed schedule	A									B								C							A/B	B/C
Rotating schedule	A							B						C			A								A	C
	B					C					A							B							B	A
	C			A					B			C			A										C	B
Shifting schedule for four	A						B				C				D										D	
	B					C				D				B				A			D				A	
	A				D				C				A				B				C			D	B	
	B			A				D				B				A				D			C		C	

Double Handed Watch System Suggestions



A variation with longer watches has six-hour day watches and three or four hour night watches.

An informal watch can also be introduced to correspond with dinner, ensuring that the whole crew get together every day, which can be a surprising rarity at sea.

Shifting Watch Schedule

Though complex at first glance, the shifting schedule is a favourite of crews that include those who like fixed watches as well as those who prefer to rotate. Each person shifts between two watches, but remains in the same half of the night and has a minimum of six hours off between watches.

If a cook is on board, they can be relieved of all day watches and prepare lunch as well as dinner.

Watches for Double Handers

Although three or four crew would be nice, many cruisers prefer to head offshore as a couple.

With a double handed crew, it can become difficult to maintain a proper watch while avoiding fatigue and sleep deprivation. More than other crews, double handers need to take advantage of each other's natural cycles as some night owls have no problem staying alert in the early hours, while others naturally rise before the sun.

While one person might be able to function on just five hours of sleep, but need to get it all at once, the other might need much more, but be able to get it in catnaps through the day.

Above are two examples of double-handed watch schedules. Those who like short watches and have mastered the art of catnapping swear by the three-two-one system.

Longer night watches get easier with experience and some boats adopt a three-four-five schedule that they like.

Many double handers, and some larger crews, keep an informal watch during the day, which works well if the burden does not always fall on the same diligent person.

Staying Alert

In the middle of the ocean there are often days when there is little to do. However a cargo ship steaming at top speed can travel from beyond the horizon to your position in less than 20 minutes. As a result, every boat must find a balance between staying alert and relaxing.

Because of the tendency to lose track of time, many sailors regularly stand watches with egg timers, stop watches or alarms to remind them to check the horizon every 10 minutes or so.

Every boat and crew will have different watch keeping procedures, and flexibility is a key to all successful systems.

In developing watch keeping procedures it is important to make sure everyone knows the system, feels comfortable carrying out their watch responsibilities and can sleep well knowing their crew mates can do the same.

Night sailing in full moon

Ocean Sailing Tips

Ocean sailing puts a lot of strain on the rig, sails, halyards and sheets.

Chafe is the number one problem, followed by the effects of strong winds on worn sails and stitching.

Having the tools and equipment to make repairs is important. The furling mainsail clew of Grand Soleil 46LC *Glemm* blew out, and the crew managed to reattach the block using thin line

The mend didn't last, so the crew furled the main and hoisted the trysail for the remainder of the voyage to Saint Lucia.

Glemm's torn-out main clew. Credit Guido Rivolta

Chafe

When sailing downwind the apparent wind drops, so you need to increase your sail area to compensate. However, with more sail area and waves from astern, sudden forces can be exerted on the whole rig.

Chafe protection on spinnaker sheets

Chafe will occur everywhere that two items can rub together. There are potential chafe points all over the boat, but especially at the end of the spinnaker pole and at the top of the mast where halyards roll over sheaves into the mast.

Chafe is not just restricted to ropes - it can also occur where sailcloth rubs against any standing rigging and where sails touch other sails - a spinnaker rubbing against the furled foresail.

Spinnaker

To prevent the spinnaker or poled-out foresail sheets from chafing in the end of the pole, ensure that the sheets are covered with a cloth, leather or suede. Sheets should also be checked every day and if the sacrificial band is worn then replace it. It is cheaper to replace the cover than the actual line.

Bear in mind if you attach your sheets to the tack rings of the spinnaker (or cruising chute) with shackles, they may wear-away the tack ring over a long passage. Tying the sheets allows worn line ends to be cut and shortened (assuming you began with long-enough sheets!)

Halyards

To keep halyard chafe at the masthead to a minimum, ensure that the halyard is aligned correctly with the sheave. If they are out of alignment then the halyard will run to the side causing a chafe point.

Deck Blocks

As with the masthead, the lead of the line into the block is very important. If the line is not fed correctly then the block cannot follow the direction of the pull and will not only chafe the line, but it will also not do its job properly.

Chafe Prevention Tips

- Stabilize the rig and prevent movement as much as possible.
- Put the mainsheet traveller to leeward.
- Tighten the boom vang.
- Add chafe patches to the main sail wherever it touches the rig. This should also be done for the first reef position.
- Protect any ropes at risk of chafe with a sacrificial cover, such as hose pipe.
- Check the boat every day for signs of chafe at the masthead, pole end and on deck.
- Repair sails as soon as you spot frayed stitching or a small hole.

Parasailor on a catamaran

Boom Preventer

When reaching or running in ocean seas, you should rig a boom-end preventer (not mid-boom) in case of accidental gybe. Lead the preventer as far forward as possible and ensure that the control line and the vang can be easily released from the cockpit if the boom end hits the water.

Do not fit the preventer mid-way on the boom as this can cause the boom to break if dipping during a roll.

Using a Pole

A pole is essential for downwind sailing, either set off the mast, or via a bowsprit for an asymmetric sail.

Using a pole stowed on a mast track makes handling the pole easier, but does add weight higher up the mast. Another option is a telescopic pole which is easier to stow. Carbon poles offer very light weights making them easy to lift, but are expensive relative to metal poles.

Always secure the pole with a fore-guy, an aft-guy and an uphaul. This means a foresail can be furled quickly when needed, whilst the pole remains securely in place.

Ensure that the sheets are pulled tight against the pole jaws to reduce chafe.

Asymmetric sails used downwind tend to be flown with the tack loose, therefore a tacker may be needed to pull the sail back towards the forestay.

If you have a pole rigged and the boat is rolling. Ease the downhaul (foreguy) and tighten the pole topping lift (uphaul) to prevent the pole from touching the water. Alternatively use higher cut foresails if you have them.

Reefing

As part of your crew training program, be sure every person on board can reef and un-reef the main, preferably by themselves. Reef early and often to achieve a more comfortable (and usually faster) ride and reduce strain on your autopilot.

When the mainsail is reefed, there will be a stress line between the tack and the clew, which will put pressure on the sail fabric.

Bear in mind that your sails are not designed to withstand the constant and prolonged stress of being reefed - they will stretch, so test out reefing positions to ensure the best possible sail shape and best rope leads.

Test the reefing lines to deal with potential chafing points on sails and line, as they can wear through very quickly. You may want to upgrade the reefing lines.

Trysail

In very strong winds, you may choose to set a trysail in place of a triple-reefed main. It is best if the trysail can be set on its own mast track. You may be able to set your trysail using the boom, or flying from deck blocks with the boom lashed down securely. Test it out at the dock first.

Glemm under trysail. Credit Tim Wright

Roller Furling Foresails

Furling headsails don't work efficiently when well-reefed, and changing a roller jib at sea can be difficult and even unsafe.

Having a cutter rig, or a removable inner forestay onto which a staysail can be set will help overcome the inherent problems of a single forestay and roller foresail.

Main and poled-out foresail. Cred Steph Stevens.

Hanked-On Foresails

Having traditional foresails in strong winds can be an advantage as they are easier to hoist and lower, however a crew member does need to be on the foredeck.

If fitted, ensure that the piston hanks are well lubricated and working. Mark the lead positions for each sail on the deck.

Storm Jibs

A storm jib needs to have sufficient shape to drive the boat forward – it's not just a piece of triangular canvas. It is a good idea to test storm sails with other combinations of sail to see how the autopilot copes. Storm jibs usually need a different sheet lead and to be set on a tack strop - check how it sets before you really need it!

There are several ways to hoist the storm jib. If you have traditional foresails, you can simply hank the sail onto the stay above the lowered foresail or hank it onto a separate cutter forestay.

If you have furling gear then setting a storm jib is a little trickier. You can take the foresail down if the wind speed is not too strong, or you can use one of the sail systems that fit over the furled foresail. This not only acts as an easy way to attach a storm jib but it also stops the furled foresail from unfurling.

Leave the sheets attached to storm sails when stored, so they're ready to go.

Heaving-to

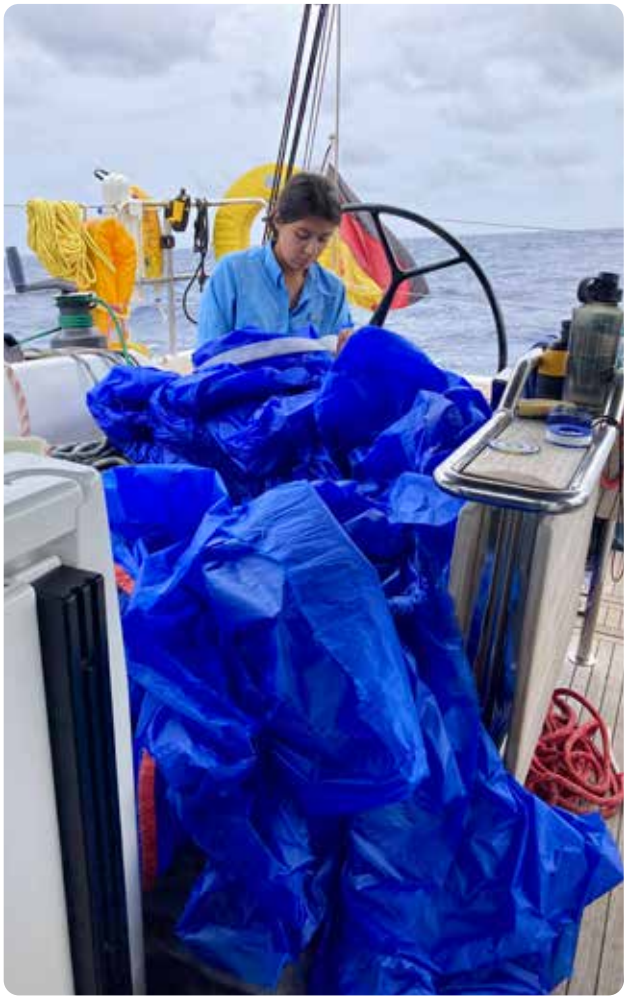
Heave-to when you need to settle the boat down to get some rest or undertake repairs.

The boat will slow down, usually moving forward at about 1 to 2kn, but with a significant amount of drift.

When hove-to the boat's motion is quieter and more comfortable. This is an effective technique in rough weather, but also is helpful if the crew needs more rest or if it is difficult to cook in the galley or undertake repairs.

Heaving-to is a simple procedure. Practice it on a calm day first.

1. Sheet in the mainsail tightly
2. Tack the boat without releasing the jib
3. When you finish the tack, the main is set as usual, but the jib is set against the wind with its clew to windward - 'backed'
4. Lastly, turn your steering wheel all the way to windward and lock or lash it in position.



Sail repairs onboard Somnium.

Common Problems

An ocean crossing will exert demands on a boat, stressing parts not tested during coastal cruising and day sailing.

A 15 day passage is equivalent to 60 days of 6-hour day sailing, or 2-3 years of weekend cruising.

Are your sails and systems ready for that?

Multiply the expected passage time by 24 to get the total hours, then divide by 6 to calculate the number of 'normal' days of sailing. Then consider the rest of your cruising plans.

Take a critical look at your boat and consider the worst case scenario - what could go wrong, and what can you do to minimise the risks?

What Goes Wrong

Every year, boats experience problems ranging from the frustrating to the life-endangering.

Many of these problems can be prevented with careful preparation, use of the right equipment, crew training and vigilance at sea.

Even with the best preparations, sometimes equipment breaks. That's when you need access to a comprehensive selection of spares and tools (see pages 39-40) and a can-do attitude.

Rigging

Total loss of the mast is very rare, but chainplate and rigging terminal failure is more common and can result in dismasting if not managed promptly.

Boom and gooseneck breakages can happen in accidental gybes, with poorly-placed preventers or if the boom dips in the water when rolling.

The forces of a continually poled-out foresail or spinnaker can damage the mast track and pole.

Chafe damage to running rigging like halyards and sheets is very common.

See pages 93-96 for tips on checking and repairing the rig at sea.

Sails

If your sails are several seasons old, get a sailmaker to check the stitching and cloth. Sailcloth is weakened by UV light as well as general use, and weakened cloth can easily tear.

Be prepared for squalls when sailing in the tradewinds. These can bring a big increase in wind speed and direction, often leading to ripped sails.

Steering

Damage to the steering cables or failure of the autopilot are relatively common. This is often caused by poor boat handling, under-specified equipment or general wear on older parts.

Less common is the loss of the rudder due to weakened bearings or collision. Consider what would happen if the rudder was broken or dropped out - this would leave a large hole in the bottom of the boat!

Electricity

Another common problem is failure in the charging system causing loss of power.

Have an electrician check the wiring cables and connections - damaged wire can cause a fire - and test the battery capacity and charging systems.

Ensure your engine is available to generate electricity by checking fuel filters and impellers and having a spare alternator available.

What are your back-up systems for no power - cooking, navigating and lighting?

Preventing Problems at Sea

One of the best ways of stopping a problem is to systematically check every part of the boat before departure and when sailing. The next few pages provide guides and suggestions for a check regime.

Winch servicing can be a messy job

Troubleshooting

When systems fail offshore, look for the simplest fix first.

Don't forget to take with you:

- Manuals and wiring diagrams - electronic versions downloaded from the internet.
- A good set of tools
- Spare parts (see page 39)
- Extra oil and engine fluids
- A good sail repair kit

Sails and Rigging

Pre-Departure

- Perform a rig inspection or have it inspected by a professional rigger (see page 33)
- Replace old standing rigging if necessary
- Service mast sheaves
- Check for areas where running rigging and sails will chafe
- Set up and test staysail stay and running back stays (if fitted)
- Set up and try whisker/spinnaker pole
- Tape cotter pins; wire-tie shackles
- Service all blocks and winches
- Replace sheets and halyards as necessary
- Set-up and try all reef lines

At Sea

- Look for chafe every day
- Do a daily rig check (see page 96)
- Worry about anything that ends up on deck, like bits of screw or broken pins
- Watch out for winch over-rides

Steering System

Pre-Departure

- Inspect the steering system
- Test the rudder bearings and check the seals
- Check and lubricate cables and pulley system
- Check autopilot electrical and mechanical connections
- Order spare parts
- Test the emergency steering system

At Sea

- Listen to your autopilot. If it is straining, balance the boat to relieve the stress on the system.

Refrigeration System

Pre-Departure

- Check raw water system and pumps
- If you can't keep the freezer frozen at the dock, it will never stay frozen at sea
- Check refrigerant level or have a refrigeration specialist check it for you.
- Learn how to bleed the water lines

At Sea

- If the raw water pump is not running, substitute another pump
- Bleed the system if you suspect an air lock
- Check the site gauge for loss of refrigerant
- If you can't fix it, keep the fridge closed as much as possible to retain the cold. Then have a huge feast!

Engine/Generator/Fuel Systems

Pre-Departure

- Learn how to bleed the system and change the impeller
- Clean the fuel tanks and heat exchanger
- Check and replace O rings on filler caps

At Sea

- In rough weather run the engine twice a day.
- If no fuel is getting to the engine, change the fuel filters and bleed the engine.
- If the engine is overheating, check the raw water pump and change the impeller.
- Check fuel filter and filter bowl - if the filter is dirty, change it. If there is water in the filter bowl, drain it. Refill filter assembly with clean fuel
- Check for cracks in the fuel line

Rigging Checks

Rigging tends to be the forgotten part of a yacht. It's made of stainless steel and aluminium, always looks the same, you have to climb it to see it all, and it just gets on with it and does its job - until the mast falls down!

After the hull, the rig - mast, standing rigging (stays) and running rigging (halyards and lines) - is the most important part of a sailing boat. Whether you are crossing an ocean or sailing in the harbour, you need to take as much care of the rig as any other part of the boat.

Three Minute Rig Check

The three minute rig check is a great way to familiarise yourself with your rig.

Do the three minute check before you leave the dock, and at every change of watch while you are sailing. Everyone onboard should have a go – spread the knowledge! You need three things for the check:

1. **Eyes:** Does everything look right? Look for missing split pins, cracks, rust, chafe and wear.
2. **Fingers:** Feel for broken strands and distortion on every swage or wire-to-terminal join. Check the tension of stays.
3. **Binoculars:** Look up the mast at spreaders, mast head, furling gear – does everything look right?

Start at the stern and walk slowly around the deck checking all rigging screws, chain plates, clevis pins and swaged terminals – anything attached to the mast or rigging.

What are you looking for?

Check your standing rigging wire where it enters the swage. Is it nice and smooth? The most common place for standing rigging to break is just inside the swage. As it is inside you cannot always see it, but you can feel it.

Feel the wire and swage - is it smooth or lumpy?

Run your hand over the wire for about 100mm to 150mm above the swage. If you shut your eyes you remove the visual sense and increase your sense of touch.

A lumpy wire at this point could indicate a broken strand. Push each strand in turn, if it moves it is broken.

If you are in port have the wire and the opposite wire replaced - replace in pairs to keep the rig balance correct. If you are at sea follow the guidance in the Managing Rigging Failures section (page 97-101).

Check that the 'legs' of split pins are opened at least 20 degrees each, otherwise they're not working!

Check that key rings are taped so they can't be accidentally pulled open

Check that shackles are seized with monel wire or plastic zip ties to stop them opening.

Remember, it only takes a few moments to walk from the cockpit to the shrouds so that you can feel them. These few moments could be the difference between finding a small problem that is repairable and losing the rig over the side.

Check shackles are seized with wire or a zip tie

Don't forget to check deck gear like sail sheet tracks, blocks, boom ends and rope lines. Once you are back to your starting point, check along the centreline. Then, using the binoculars, inspect the spreaders and mast head from every angle.

This quick check can really pay dividends:

"We have instituted a formal twice daily rigging check. This afternoon a gimlet-eyed crew member spotted that the split pin holding the clevis pin at the lower end of the forestay, although present and correct and properly splayed, was actually well on the way to wearing through (it was new with the rig 12 months ago). We changed it at sea (heart in mouth), and once extracted were able to see that it clearly would have failed at some time in the future with probably catastrophic results." Log from *Vulcan Spirit* Hallberg-Rassy 53

Use the check sheet on page 96, or make up your own version to suit your boat.

Going Aloft

It is a good idea to climb your mast for an up-close inspection on a regular basis. Before you consider climbing the mast, check it with binoculars first.

Get used to climbing the mast when tied up to the dock before trying it at sea, and try different methods until you find one that suits.

It doesn't always make sense to send the lightest person up the mast, as they may not have the strength or skill to fix a problem.

Up the mast on Nuvem Magica. Credit David Dias

Climbing the rig at sea is obviously potentially dangerous, and it is a good idea to wear sailing boots for leg protection, and a climbing helmet for head protection at sea. Wear a climbing harness or a special mast seat/harness (bosun's chair) and tie on the halyard, rather than replying on the clip, plus a spare halyard in case of failure.

Start at the bottom and work upwards, using your eyes and fingers. Check the halyard sheaves, look for chafe, split pins, cracks, rust, wear and signs of broken strands in wire rigging.

Check that mast stay fittings and spreaders are correctly aligned.

Rigging Top Tips

- Consult the service schedule for your rig and speak to a professional rigging company for checks
- Check your rigging regularly – problems can occur suddenly or develop slowly.
- Even with regular inspections, it is easy to miss hidden rigging problems in swages or chain plates.
- Don't risk leaving port if you suspect a rigging issue; problems are easier to solve in port.
- Take advice from riggers and boatbuilders, but don't be afraid to get a second opinion.

Rigging Maintenance

Lubrication

All of the moving parts should be able to move. If they don't – start with hot water. It may be just seized up by salt and general dirt. If this does not work, move onto penetrating fluids. Lastly, dismantle the item.

Service all the sheaves in the mast. If they don't turn, work out why and fix the problem. If they have developed an oval shaped center hole, renew them.

Spray the bearing surfaces with a dry Teflon or Silicon spray. They should move easily when pushed by a finger.

Undo one rigging screw at a time, counting the number of turns as you go, remember to keep the top still whilst you turn the body, this will enable you to tension the rigging back to its original state.

Clean the threads with a brass wire brush.

Lubricate the male and female parts of the threads with 'Selden Rigging Screw Oil' before reassembly.

Winches

Winches require looking after. They take an enormous amount of strain and allow us to handle sails with ease. All the major manufacturers have service guides online.

Dismantle the winch. Lay the parts out on a clean cloth in the order of removal.

Thoroughly clean each piece. Check its condition, look for cracks and chips.

Replace any part that is damaged, paying particular attention to the pawls.

Smear a thin coating of 'winch or gear grease' onto all the surfaces regardless of whether they come into contact with another part.

Re-assemble and then test.

When carrying out the winch service always replace the springs with new ones. Each spring is very small and costs almost nothing. Change them; it is all that makes your winch work...

Boom

The part most often found at fault on a boom is the wear washer. This is a nylon washer that goes between the boom gooseneck toggle and the mast bracket.

You may not have one, it will have worn away!

Check all of the fittings that are attached to the boom.

Spinnaker Pole

Make sure that the piston ends are freely moving. Check the trip lines for chafe.

If you have a telescopic pole make certain that the telescopic section slides freely and that the locking parts are in good condition.

Shackles

Extract from an ARC yacht's log: *"Over the last few days a number of shackles holding various pulleys, ropes and wires have mysteriously worked themselves loose."*

Prevention is better than cure. If you seize all of your shackles, they will not come undone. Buy yourself a couple of rolls of monel seizing wire.

My Notes

Rigging Check

Use this list to develop a twice daily at sea rigging check suitable for your boat.

Standing Rigging Check

- [ ] Chain plates.
- [ ] Rigging screws.
- [ ] Swaged terminals.
- [ ] Clevis Pins.
- [ ] Split pins and key rings.
- [ ] General condition of rigging wire.
- [ ] Guard wires/lifelines.
- [ ] Jackstay condition and attachment.
- [ ] Forestay.
- [ ] Shrouds.
- [ ] Backstay and tensioner.

Mast Check

- [ ] Condition of the mast.
- [ ] Tangs, shroud fittings and toggles.
- [ ] Spreader roots and ends.
- [ ] Condition of rigging wire.
- [ ] Mast mounted antennas, lights and wind arrow.
- [ ] Gooseneck.
- [ ] Vang attachment and system.
- [ ] Condition of the boom.
- [ ] Preventer system
- [ ] Spinnaker pole track and ring.
- [ ] Condition of the pole.
- [ ] Main furling system.
- [ ] Foresail furling system.

Running Rigging Check

- [ ] Main halyard - alignment, chafe, tension.
- [ ] Foresail halyard - alignment, chafe, tension.
- [ ] Spinnaker halyard -alignment, chafe, tension.
- [ ] Mainsheet system - shackles, blocks and sheet.
- [ ] Foresail sheets attachment and chafe.
- [ ] Foresail sheet track and cars.
- [ ] Spinnaker sheets attachment and chafe.
- [ ] Spinnaker tweakers.
- [ ] Pole uphaul and downhaul systems.

Sails Check

- [ ] Main head, tack and clew fittings.
- [ ] Main sail general condition.
- [ ] Foresail head, tack and clew fittings.
- [ ] Foresail general condition.
- [ ] Spinnaker head and clew fittings.
- [ ] Spinnaker general condition.

Hardware Check

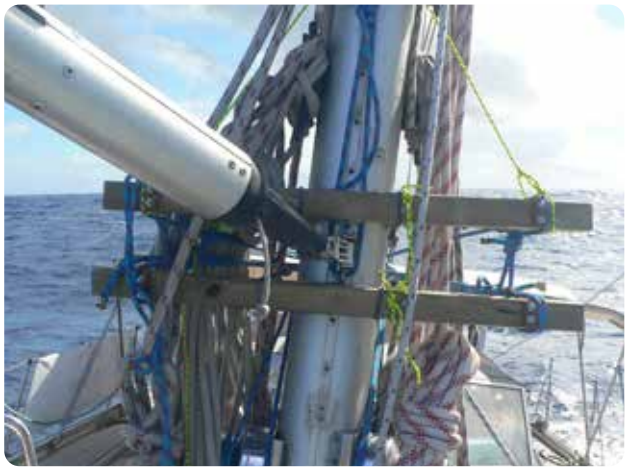
- [ ] Halyard jammers and cleats.
- [ ] Mast winches.
- [ ] Cockpit winches.
- [ ] Turning blocks and organisers.

Managing Rigging Failure

Have you planned in case the worst happens?

Cruising yachts often experience strong winds. Minor damage to your rigging during a passage is not uncommon; extensive damage is unusual. To understand common rigging failures, we thought it might be helpful to give you some examples from our rallies. These failures can occur during normal sailing conditions, and are not necessarily the result of a sudden squall or mistake by the crew:

Spinnaker Pole Track



Spinnaker pole track fix on Fenix II. Credit Elizabeth Rakoczy

Spinnaker pole track failure is relatively common when downwind sails are being used day after day. There are huge forces at work where the pole joins the mast, and these can cause the track to shear away.

Hallberg-Rassy 42E *Fenix II* was enjoying close-reaching conditions in strong winds under Parasailor – possibly the wind was too strong for the angle, but the fun of sailing was too much temptation. "Suddenly there was a mighty bang and the spinnaker collapsed. The 32mm pole T track had peeled-off the front of the mast and was bent in a knot, with the pole pushed aft. We had to mend the track, so we carefully thought through the forces - most is simply pushing the track against the mast, but the key was stopping the track from twisting. We cut off a short piece of track and fitted it with two 1m 'wings' made of cut-off bits of the track and pieces of timber. The track was attached to the mast in the right position for poling the foresail. Finally we braced the 'wing ends' with Dyneema rope to the boom gooseneck on both sides to stop the track turning sideways." This temporary lash-up lasted for the remaining six days to Saint Lucia.

Beneteau 50.5 *Ariane* was forced to continue under reduced sail when the mast track for the whisker pole failed. Overnight, the pole had sheared four bolts off of the track, pushing the track 2cm out of alignment.

The crew devised a solution by lashing the car to the track both fore and aft and athwartships, and were able to continue with one-third of the foresail sheeted to the now-repaired pole.

Spreaders

3 Drifters, a Beneteau Oceanis 50 suffered damage to the port upper spreader. A crewman had gone aloft to repair a spinnaker halyard, and while inspecting the rig, noticed a sizable crack at the spreader base. To support the compromised rig, a second backstay was fitted from the masthead using a spare halyard and a line led from the spreader tip to the port bow cleat.

Forestay

World ARC Moody 422 *Thor VI* was fitted with a removable inner forestay before the start of long-term cruising. The inner stay was intended to provide a dedicated stay for a storm jib or in case of problem with the furling genoa.

In the south Atlantic the main forestay broke at the top terminal, possibly due to an incorrect terminal fitting being used. When the forestay broke, the inner forestay was rigged and a spare halyard taken forward to the bow roller to support the mast. Eventually the forestay and foresail were removed, and halyards used to act as temporary forestays. The boat continued for around 1800NM under this improvised rig.

Lashed forestay on Thor VI before removal. Credit Rui Soares

Chainplates

Chainplate failure can be sudden and catastrophic. Often unseen corrosion caused by water ingress weakens the stainless steel, and the plate fails where the bolts pass through.

Sometimes substandard stainless steel is an issue. The only remedy is to replace the chainplates and bolts when the standing rigging is renewed.

Screwdriver lashing the furler on Liberty

Jeanneau Sun Odyssey 45 ***Liberty*** suffered a roller furling failure that prevented the foresail from furling. This was immediately followed by a chain-plate failure of a forward lower shroud.

The broken furling drum was lashed in place with light line, duct tape and a screwdriver, thereafter forcing the crew to roll the sail by hand. A running repair was made for the shroud by lashing a spare halyard between the bow and midships cleat, creating a temporary chain-plate. The shroud was then tied down to the jury chain-plate, tensioning it with a block and tackle.

10mm braid chainplate replacement on Quasar IV

Westerly Oceanlord ***Quasar IV*** was mid Atlantic when the crew noticed a creaking sound from the lower aft shroud, but could see no problems. Four days later, at night, the chain plate bolts sheered with a bang, leaving the mast wobbling around. A quick solution was needed so a short length of 10mm braid was pushed up through the hole in the deck, around the bottom of the shroud, pushed back down below with both ends then knotted. A second piece of line was attached to the shroud with 4 hose clamps run through a spare deck block and back to a winch. The aim here was to reduce the tension on the deck loop by pulling down on the shroud. After about 6 hours the 'chainplate' rope had stretched, so it was shorted, then replaced after about 500NM. The boat managed 1200NM with the shroud held in place with rope.

When there are no suitable alternative anchor-points on the deck to which jury shrouds could be attached, one idea is to bypass the chainplates.

On a fin keel boat flake all the anchor chain on deck, cut it into two lengths and drape one length over the stern working it back to the end of the keel and one over the bow working it back to the front of the keel. With the ends brought up either side and shackled to spare wire or cord which could then be attached with respectively bulldog clips or rolling hitches.

Sheared chainplate on Stevens 47 Aurora

Boom

Boom breakages are relatively common in a downwind ocean passage, sometimes caused by badly placed preventers, the boom dipping in the sea as the boat rolls, stress cracks on old sections or damage to the gooseneck fitting.

A gradual crack appeared on Gib'Sea 51 *Adrienne's* boom, which worsened until the boom 'snapped'. The crew rigged the mainsail to fly loose-footed, by attaching a sheet system to the clew, with lines lead to each quarter, in the same way that a trysail would be rigged.

Another Brick sailing into Saint Lucia with no boom

An unplanned gybe following a broken preventer in a squall caused the boom on Beneteau First 44.7 *Another Brick* to break in half. The crew removed the damaged boom and sail and continued for eight days to Saint Lucia under foresail alone.

Don't Have Nightmares

Very few yachts that have entered a World Cruising Club event have ever lost their rig, in large part due to pre-rally rig inspections and daily, routine rigging checks during the passage.

Be prepared for the worst - think through how you could solve a problem with your rig, and have useful spares and tools onboard.

Remember the rigger's motto: Look after your rig!

Repairs At Sea

As soon as you notice a problem with the standing rigging, make the problem side the lee side of the rig.

Brace the mast with spare halyards and then drop your sails. Do not let your sail flog.

There are a few methods of repair:

- Carry a spare set of rigging.
- Carry some lengths of wire, ratchet straps and a supply of Bulldog/cable grips. Use these to bridge the damaged area.
- Carry a set of 'Sta-lok' rigging repair terminals. See www.stalok.com
- Specialist rope rigging repair kit

Damaged section of wire is piggybacked with an additional length of wire and held in place with appropriate sized bulldog grips

Broken strand is pushed back into place and taped or whipped to maintain its correct position relative to the other strands

Note extra length of Sta-lok rigging repair stud. This extra length allows you to cut away the damaged section.

Sta-lok fittings are assembled with two spanners.

Dismasting

Saving the Rig

If it is possible to save some of the rig, or the break is high enough to make a 'stump' mast, then it may be possible to make a jury rig from the remaining sections of spar, halyards and cut-down sails.

The crew of C&N 83 *Mustang* managed to create an effective rig when their mast broke above the first spreaders, luckily leaving a good 'stump' mast and the boom intact. This rig was stayed using halyards, and a sail cut down to fit, and the boat was able to continue to Saint Lucia.

Stevens 47 *Aurora* was dismasted on the first night out from land, and the crew was able to get the entire rig back onboard and then motored back to Tortola, where everything could be safely sorted out.

The Wennberg family on Grand Soleil 54 *Take Off* lost their carbon mast, but were able to fashion a jury rig using the carbon spinnaker pole and a storm jib.

If possible, save some spars, sails and rope.

Stevens 47 Aurora motoring into Tortola

Cutting Away the Rig

It isn't always either practical or safe to save the rig.

A mast can quickly knock a hole through the side of a yacht. Either get the mast back on deck quickly so that you can make a jury rig, or get rid of it.

Wauquiez 47PS *Hilma* was dismasted 540NM west of Cape Verde when the 'flopping' in light winds and rolly conditions vibrated loose unsecured rigging screws.

Hilma's skipper Henrik Linder cut away the rig with a battery powered angle grinder. "A hacksaw would take you 20 minutes or longer to saw through the 12mm metal. With an angle grinder it took 20 seconds".

Grand Soleil 54 Take Off under jury rig. Credit L Wennberg

Cutting the forestay proved particularly tricky. First they had to deal with the tough sailcloth of the furled genoa, then the luff groove profile underneath and then the wire forestay itself.

"You need a really big blade on the angle grinder," says Henrik. "To be able to cut through you have to take off the cover, which is risky, and attach a huge disc so that the radius goes through the forestay."

For parts of the rigging that were too high to reach – such as cables and halyards – Henrik used a hacksaw attached to a boat hook.

Tools for Cutting Rigging

Whatever tools you choose, always attach them to the boat or yourself with a lanyard so they're not lost overboard.

Without a rig, the boat is likely to have an unpredictable motion, so always ensure that all crew are clipped on and safe from moving wires or spar sections.

Talk to your rigger about tools for emergency rig clearance. If possible, test the cutters the rigger has - then imagine using the tool on the deck of a rolling boat.

Useful rig cutting tools:

- Battery powered angle grinder with a selection of discs and spare batteries. Beware - these can be very dangerous on a rolling boat.
- Hydraulic cutters (Holmatro type) are easy to use, don't require excessive strength and cut both wire and rod rigging quickly, but are expensive.
- Ratchet cutters (Baudat type) require less force than cable or wire cutters and can be used one-handed.
- Cable cutters (Felco type) work well if rested on the deck. Select the size for your largest rigging. May not cut rod rigging.

C&N 83 Mustang made an effective jury rig

- Hacksaw with plenty of blades. Cheap, but not easy to use and they can blunt quickly.
- Explosive cutters (Shoot-it type) operate with a cartridge that fires a captive piston into the wire. Very effective on rod rigging. Not readily available.
- Bolt croppers require great force to cut wire and are not effective for rod rigging.

My Notes

Fishing

Fishing is a fun way of supplementing your diet. Buy a good how-to book that includes fish identification charts for your sailing area. Some good cookbooks may also be useful!

As well as your chosen method, you will need some strong gardening gloves for handling the line, a gaff (stick with a hook on the end), sharp filleting knives, a squeezy bottle filled with cheap rum or other alcohol, and a fish tray to keep the deck clean.

Trolling a Line

A simple system is to troll a hand line from the transom and run a piece of bungee cord from the line to the boat. When a fish strikes, the cord takes the strain.

The fish fights until it is sufficiently tired for you to pull it into the boat. Bring in the line so that you finish up with a huge loop trailing behind you in the water. Bringing the line onto deck risks you becoming entangled. You then gaff the fish aboard, release the lure back into the water and continue to fish.

Rod and Reel

For a bit of sport, you will need a quality rod with a reel which holds at least 600m of 50lb line, a rod holder and a selection of lures.

Remember, you have no way of easily slowing down quickly to fight the fish, so if you do find a monster, don't try to fight it - give it your best and then cut the line. A large marlin and a yacht are not a good mix. You may have the gear to land the fish, but anything over 200lb will have too much meat to store and take too long to eat.

The biggest mistake made by sailors is to use 100m of very heavy line - length of line is important, not the weight.

A fish can do 40 knots from a standing start; couple this with a yacht doing 6 knots in the other direction and you will quickly come to the end of 100m.

The speed and power of even a 50lb fish will easily snap a 100lb line. The art is to use a much longer line with the reel set to slip at 30% of the line weight (using a 50lb line the drag should be set for no more than 16lb).

The fish should be allowed to run against the drag setting - only when the fish stops taking line should the fight begin.

Getting the Fish Onboard

Once you have the fish within your sights, use the gaff to hook the fish in the gills and bring it onboard. If using a rod, keep the lure and fish in the water until the fish is gaffed, or you can risk the fish getting away at the last minute.

With any luck the fish will be pretty tired by the time you are ready to haul it aboard, however don't let this fool you. The priority is to kill the fish as quickly as possible. Land the fish in a confined space like the cockpit and wet the decks first to help with cleaning up.

Render it instantly docile by squirting cheap alcohol into its gills, then cut directly through the spine. Limit mess by using a plastic fish tray, or hang it overboard by its tail to drip.

Fish will freeze well, although a large catch straight into your freezer may overload the system. Instead, try ceviche, sashimi, drying, marinating and of course, eating it every night for dinner. Take a variety of recipes!

Fishing Top Tips

- Don't fish at full moon. Sea patterns change and it is unlikely you will catch anything three days either side of full moon.
- Two hours after sunrise and two hours before sundown is best.
- Look for signs of birds feeding or floating objects; both tend to mean smaller fish which in turn attract bigger fish.
- Try a pink lure for dull days and a green lure on brighter days, and bait the hook with a flying fish.
- Don't troll the line too close to the boat as fish don't like to go into the boat's wake.
- Vary the length of the line according to your speed; 5 knots = 55m line out, 7 knots = 75m

Nice tuna caught on Adelante. Credit Henrik Lind-Isaksen

Continuing Cruising

Each country has its own entry requirements, and it is important to get up-to-date advice. Countries visited on the rally are covered in the Local Information section, otherwise noonsite.com is continually updated with the latest requirements.

Port of Entry

When visiting a country for the first time, you will have to clear-in at a port of entry before going to any other locations. Flying the yellow Q flag is a request for clearance.

Customs

The Customs official will clear the boat in or out of the country, and check for duty-payable goods. They may have additional tasks such as checking for prohibited or restricted items (firearms, drugs or fruit for example). They usually have the power to confiscate any prohibited or restricted items permanently or until departure, and they may require duty-payable items (such as liquor or tobacco) to be sealed in a locker with official tape.

Customs officers will need to see your official clearance papers from your last port, plus your original boat papers and a crew list.

Immigration

Immigration officers are chiefly concerned with the clearance into and out of the country of the people onboard your boat. In some countries officials may want to meet each crew member, or to ask them to complete an arrivals card. Other countries may just require the skipper to represent all of the crew.

In countries where visas are required in advance of travel, Immigration officials will want to see each passport and visa. In countries where visas are issued on arrival, the Immigration officials will issue these. Usually each passport is stamped.

If you have crew departing the boat and travelling on by other means, take them to the Immigration official to be 'signed-off' the boat.

Quarantine

The Quarantine department protects the bio-security of the country by ensuring that inbound vessels do not import prohibited materials, which can include pets/animals, foods, plants, souvenirs or items made from natural materials. Prohibited materials will be confiscated and usually destroyed.

Health Officer

The role of the Health Officer is to ensure that the crew is free from notifiable diseases. Where it exists, this role is often combined with that of Quarantine. A limited number of countries require the crew to be checked before being allowed ashore.

Port Officials/Harbour Master

These are concerned with clearing your boat into the port, and ensuring that the correct mooring fees, light dues and buoyage fees are paid. You may have to visit the port officials first to show that you have paid the harbour dues before Customs will clear the boat into the country.

Departure Clearance

You will usually have to revisit Customs and Immigration before departure to obtain your clearance for your next destination.

Tips for Dealing with Officials

- Almost all officials are extremely hospitable and are proud to welcome you to their country.
- Be polite; they're only doing their jobs and you are on holiday.
- Corruption is rare; assume the person you are dealing with is as honest as you are.
- Dress appropriately. It is more polite to wear a clean shirt than dirty shorts and a bare chest.
- If officials visit the boat, make them comfortable and offer them a soft drink.
- Be patient. If you are clearing in ashore you may have to visit multiple offices.
- Clearance is often a lengthy process that involves large amounts of paperwork and lots of repetition.
- Carbon paper can make completing multiple forms a lot easier, and photocopies of passports and boat papers, and extra passport photographs can smooth the process.
- A boat ink-stamp or visiting card makes a nice touch, often appreciated by officials.
- Research in advance so you know what to expect. Check noonsite.com, read the pilot book and ask other cruisers.

Resources

Useful Books

The Boat Cookbook
by Fiona Simms
ISBN 9781472965684

The Tradewind Foodie
by Rod & Lou Heikell
ISBN 9781846235023

Ocean Sailing
by Paul Heiney
ISBN 9781472955395

The Complete Ocean Skipper
by Tom Cunliffe
ISBN 9781399400527

Heavy Weather Sailing
by Martin Thomas & Peter Bruce
ISBN 9781472992604

Sea Fishing
by Jim Whippy
9781408187951

Fast Fixes for Your Boat
Sandy Lindsay
ISBN 9781408190197

Skipper's Mast & Rigging Guide
by Rene Westerhuis
ISBN 9781472901484

Online Resources

Small Vegan Kitchen smallvegankitchen.com
Fishing tips sailboat-cruising.com/handline-fishing
Yachting World review of preventers bit.ly/4hBta3M
PBO Hilma dismasting https://bit.ly/410r0VV
Yachting World dismasting article https://bit.ly/4gqIOhj

Companies

Admiral Marine Insurance admiralyacht.com
Specialist yacht insurance

Advance Yacht Systems advanceyacht.co.uk
Power management & generation

Berthon International berthoninternational.com
Bluewater yacht brokerage and new sales

Hamble School of Yachting hamble.co.uk
RYA and other training courses

Hydrovane hydrovane.com
Windvane steering systems

IsTec Parasailor parasailor.com
Parasailor spinnaker

Mactra mactramarine.co.uk
Schenker watermakers

Noonsite noonsite.com
Online resource for cruising sailors

Peters & May petersandmay.com
Yacht shipping and transport

Professional Yacht Deliveries pydww.co.uk
Deliveries and yacht management

White Dot Sailing whitedotsailing.com
Coaching, preparation & yacht management

My Notes