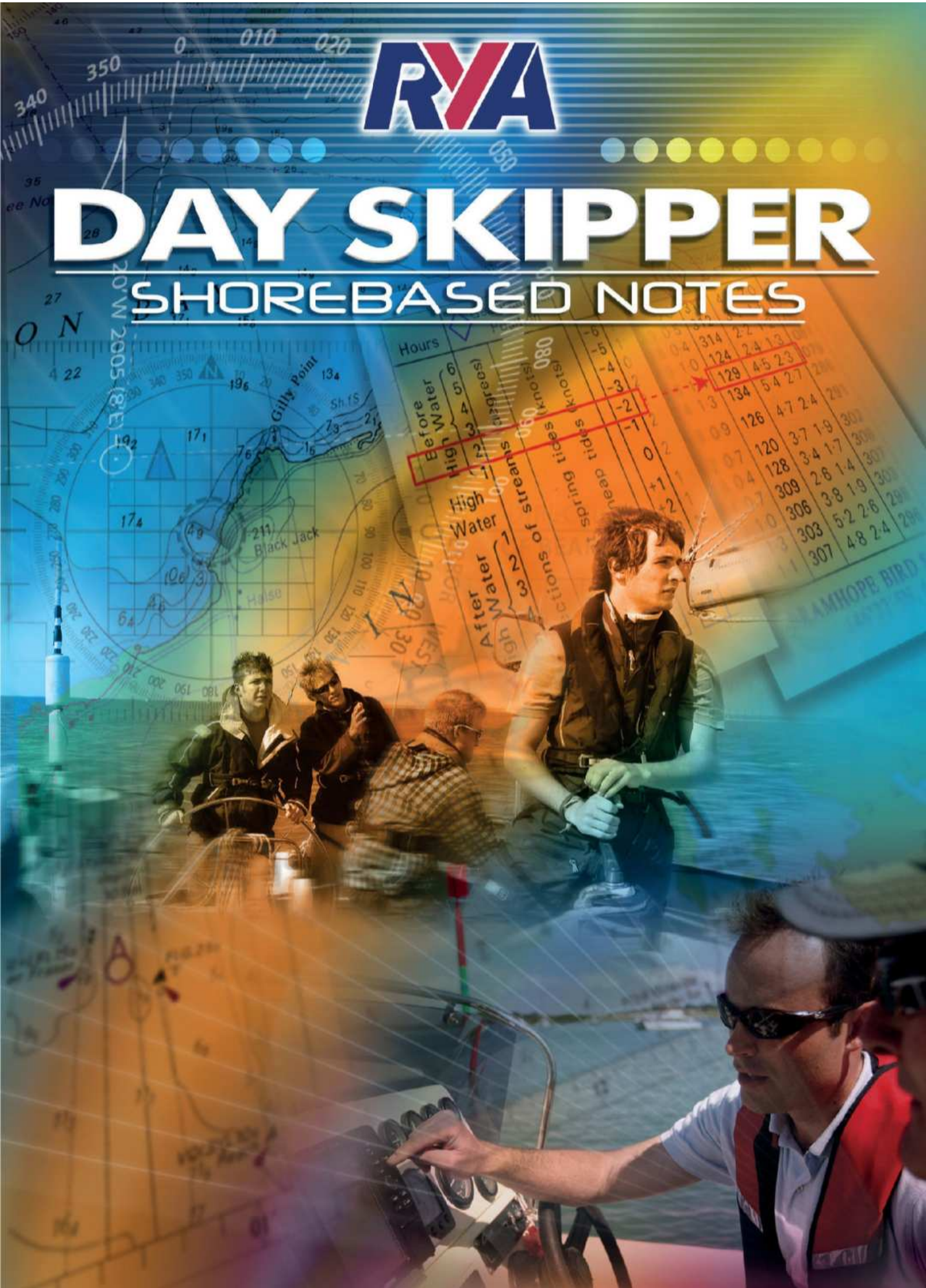
RYA
DAY SKIPPER
SHOREBASED NOTES

RYA Day Skipper Shorebased Notes

Illustrations by Steve Lucas

www.rya.org.uk

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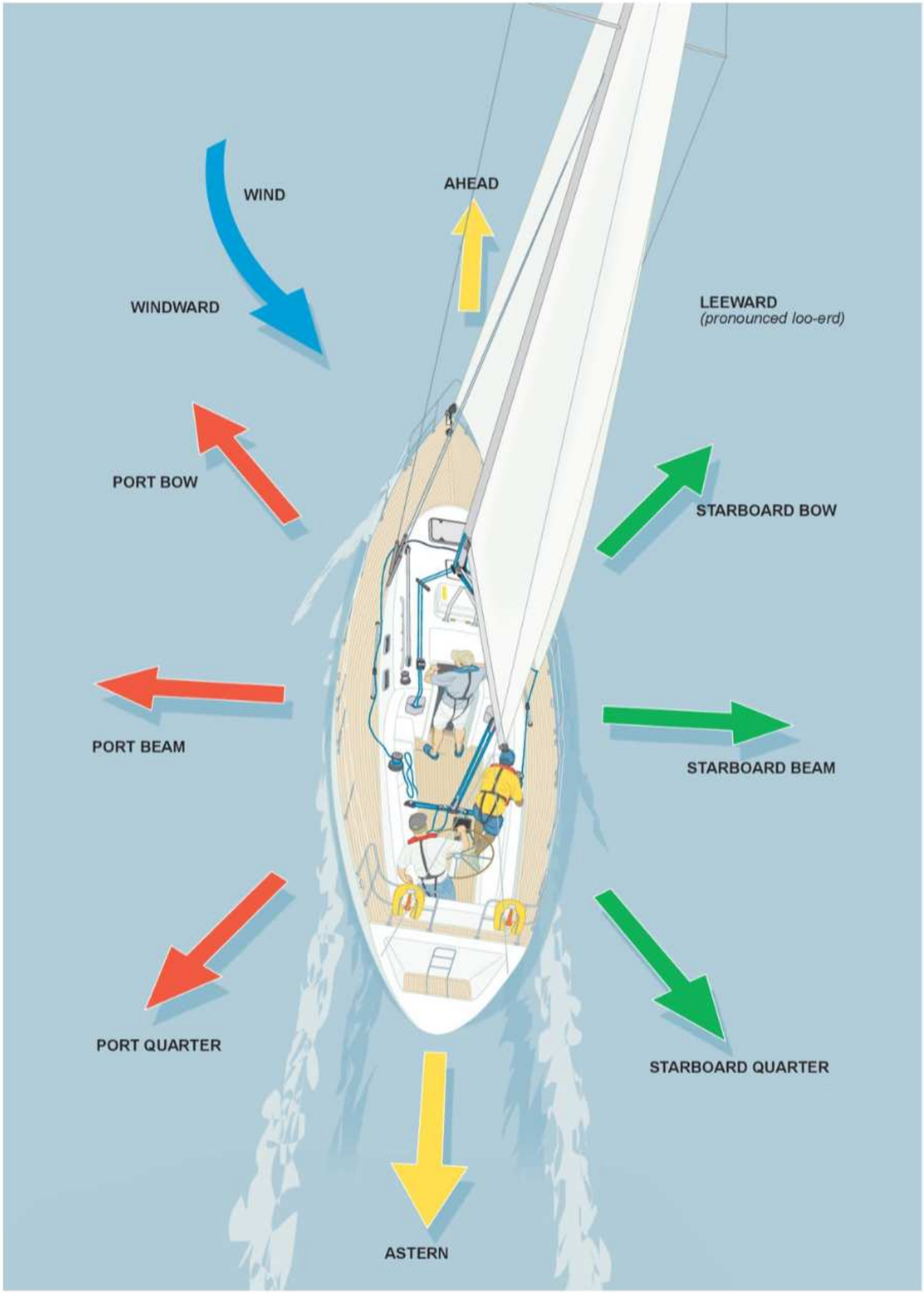
Contents

The skills required to skipper a boat safely, navigate from port to port and moor up at the end of the day are the same the world over. However, there are two notable differences that can catch out the unwary when sailing in different parts of the world; the circulation of weather patterns in the Northern and Southern Hemispheres and the layout of buoyage in the Eastern and Western Hemispheres. Both of these differences are covered in the book, but ensure you use the correct system for your sailing area.

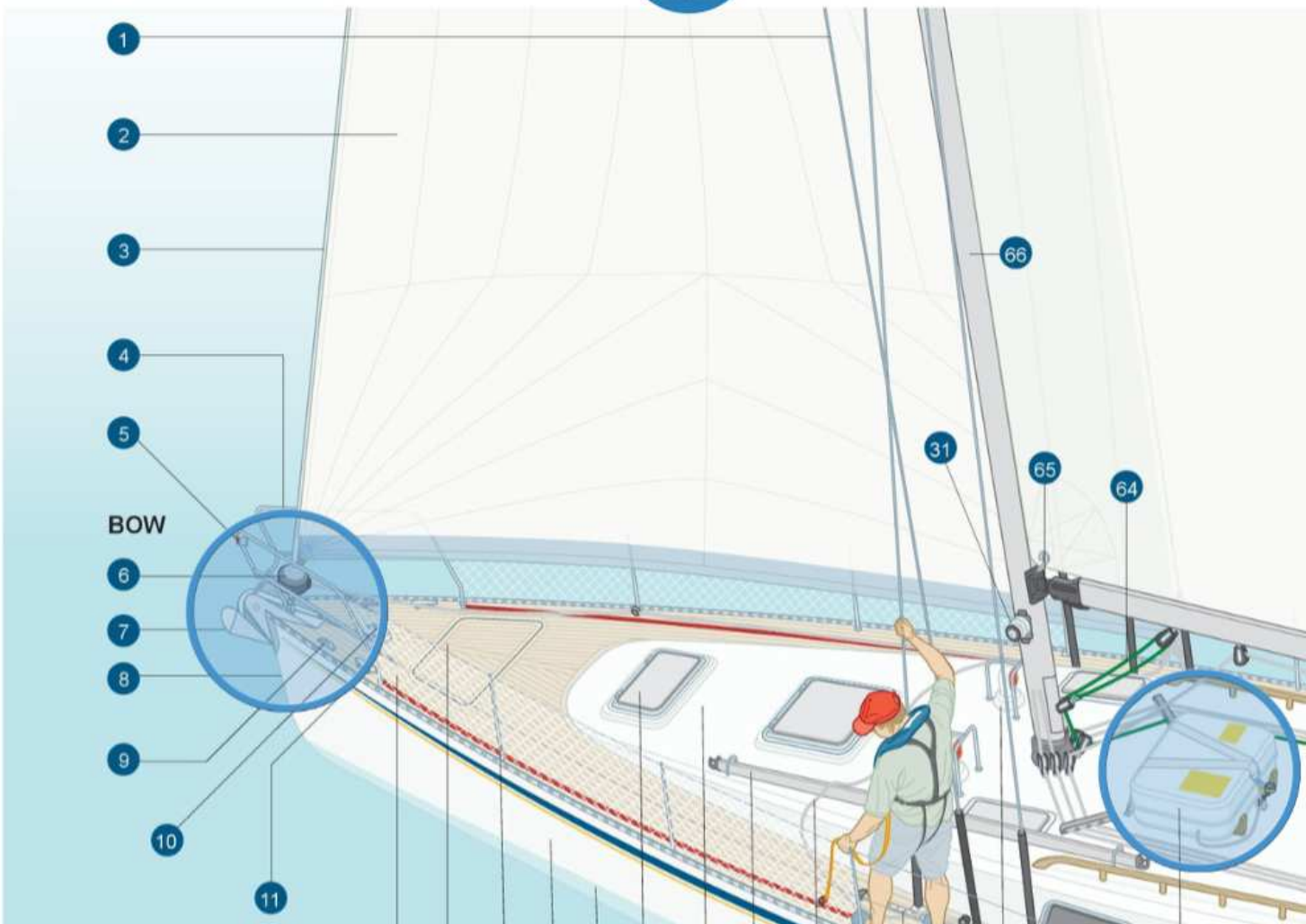
Charts reproduced throughout this book are for training purposes only. On no account should they be used for navigation.

Nautical Terms

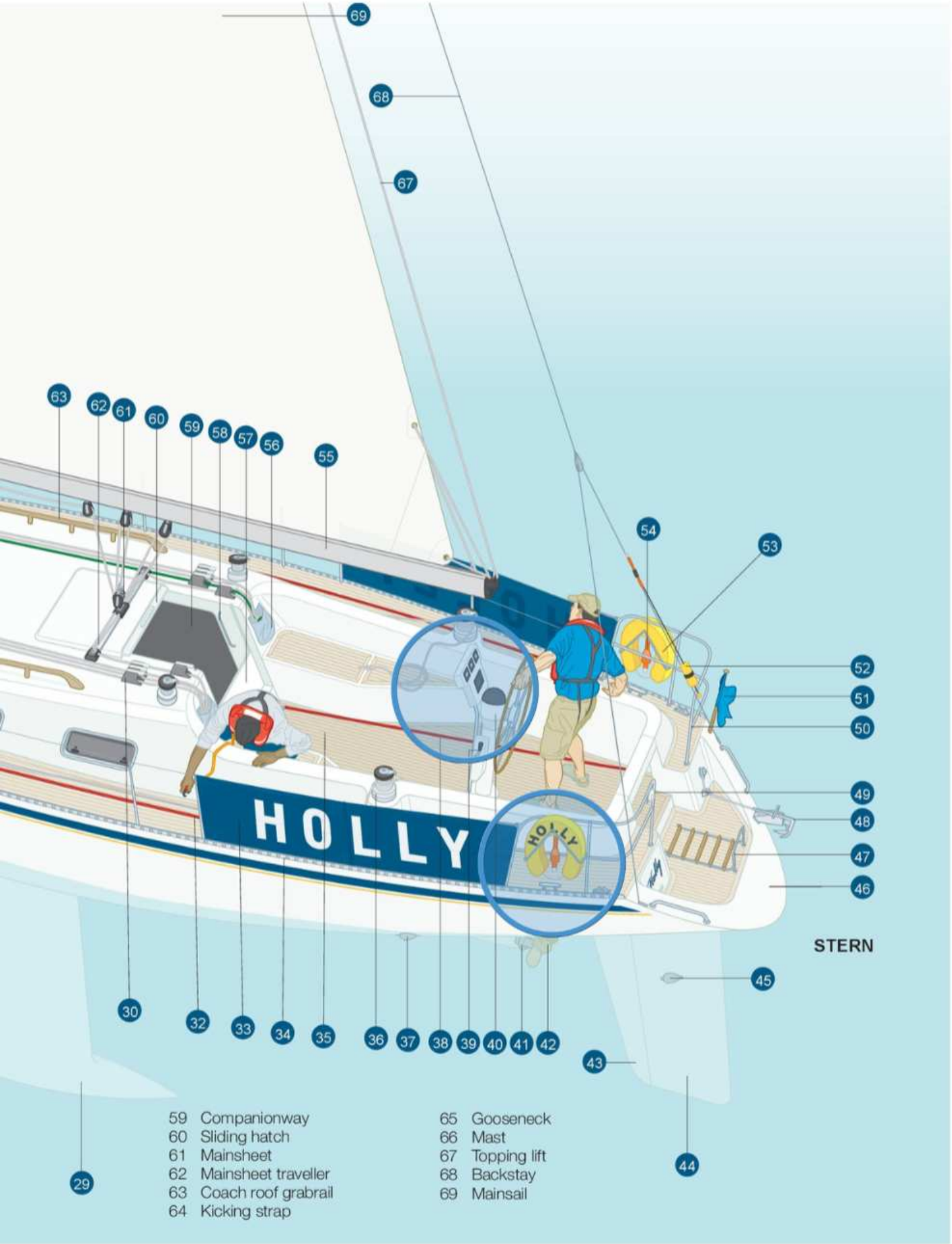


Typical Sailing Yacht

TOUCH DIAGRAM

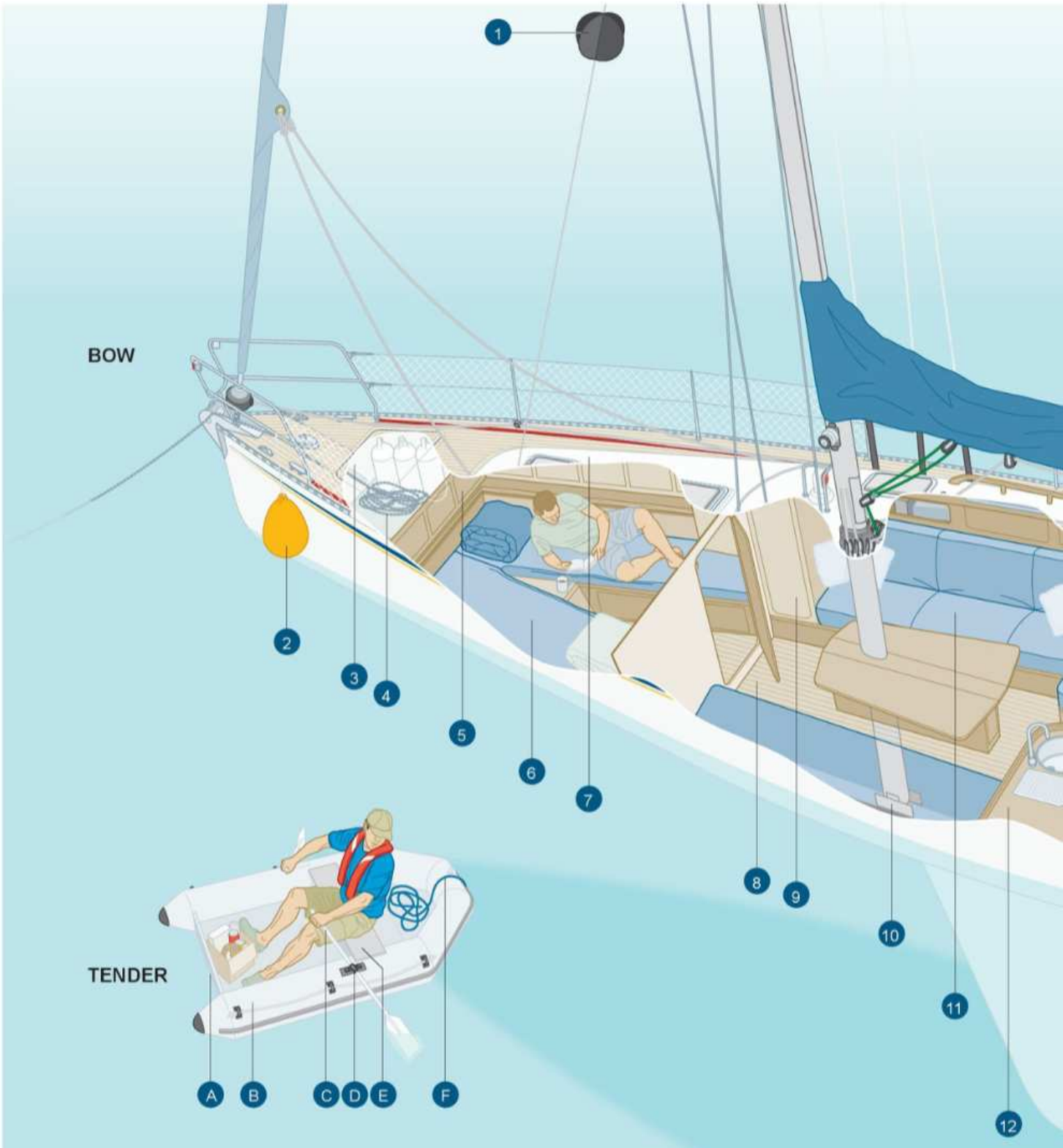


1 Shroud or stay
2 Headsail, jib or genoa
3 Forestay
4 Pulpit
5 Navigation lights
6 Furling drum
7 Bower anchor
8 Stem
9 Fairlead
10 Windlass
11 Cleat
12 Guardrail netting
13 Forehatch
14 Stanchion
15 Topsides
16 Waterline
17 Hatch
18 Coach roof
19 Spinnaker pole
20 Jib sheet
21 Jib/genoa track
22 Jib/genoa car
23 Vent
24 Bottle screw
25 Portlight
26 Guard rail
27 Liferaft *connected to Hydrostatic Release Unit (HRU)*
28 Keel
29 Bulb
30 Jammers
31 Halyard winch
32 Jackstay
33 Spray dodger
34 Toerail
35 Cockpit sole
36 Jib sheet winch
37 Hull sacrificial anode
38 Cockpit jackstay
39 Throttle/gear control
40 Binnacle
41 Propeller shaft anode
42 Propeller
43 Skeg
44 Rudder
45 Rudder anode
46 Transom
47 Boarding ladder
48 Kedge anchor
49 Rear navigation light
50 Pushpit
51 National flag
52 Danbuoy
53 Horseshoe lifebuoy
54 Floating lifebuoy light
55 Boom
56 Rope tidy bag
57 Washboard
58 Companionway grabrail

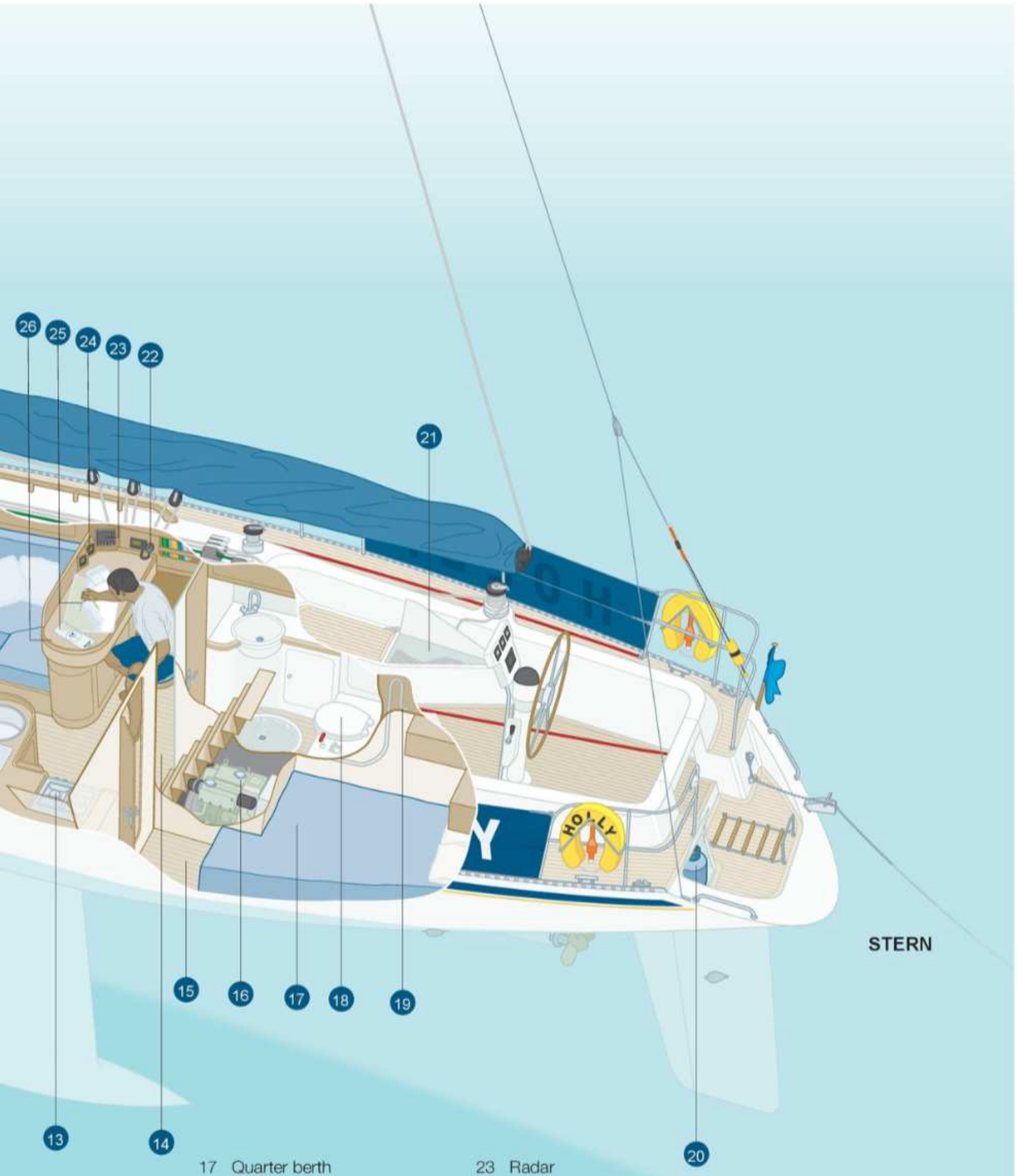


59 Companionway
60 Sliding hatch
61 Mainsheet
62 Mainsheet traveller
63 Coach roof grabrail
64 Kicking strap
65 Gooseneck
66 Mast
67 Topping lift
68 Backstay
69 Mainsail

BELOW DECK



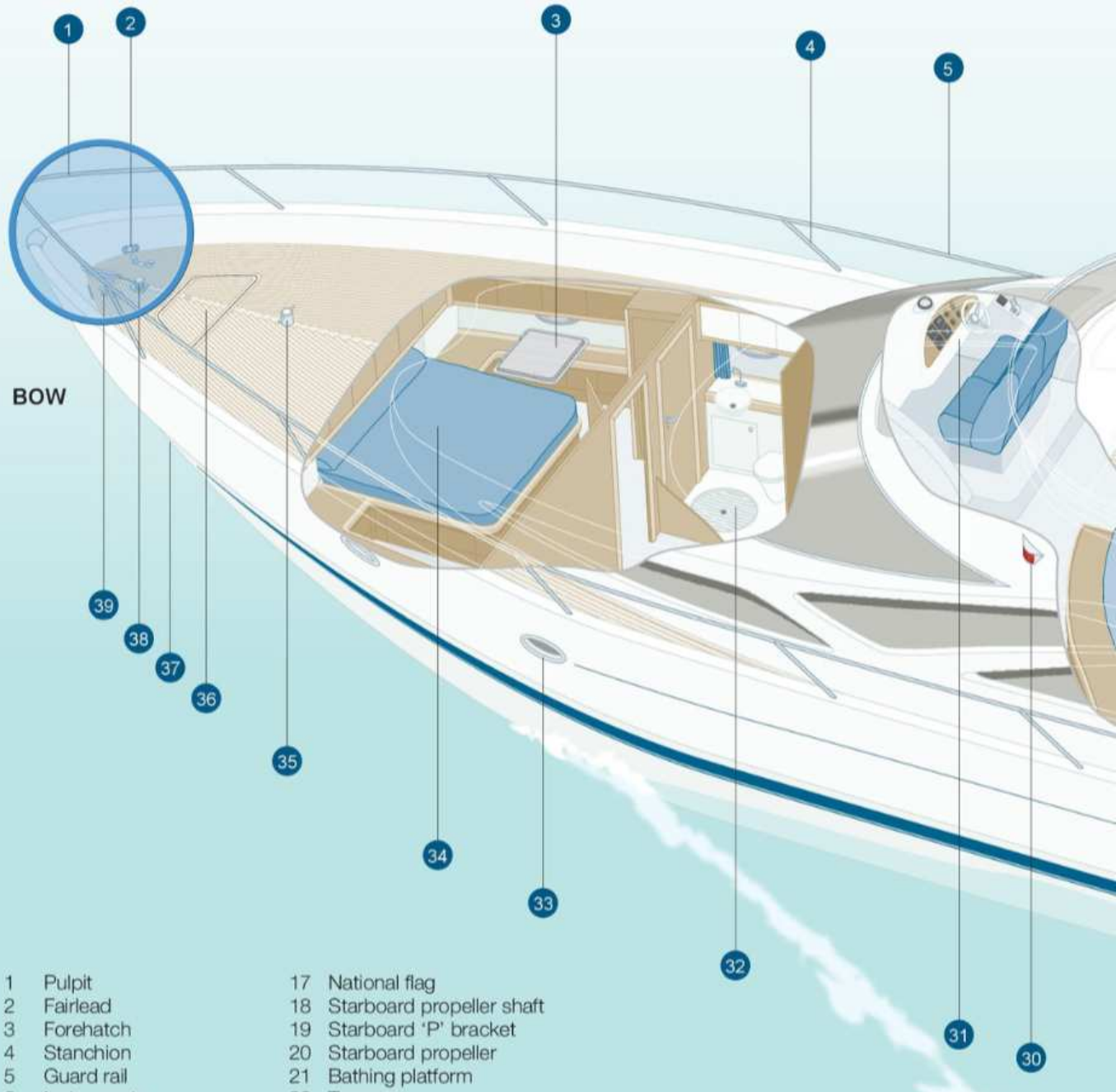
A	Transom	1	Daylight anchor shape	9	Hanging locker
B	Sponson	2	Fender	10	Mast step
C	Oar	3	Chain locker	11	Settee berth
D	Rowlock	4	Chain rode	12	Galley
E	Thwart	5	Forecabin	13	Cooker
F	Dinghy painter	6	Vee berth	14	Bilge space under sole
		7	Deckhead	15	Aft cabin
		8	Cabin sole	16	Engine



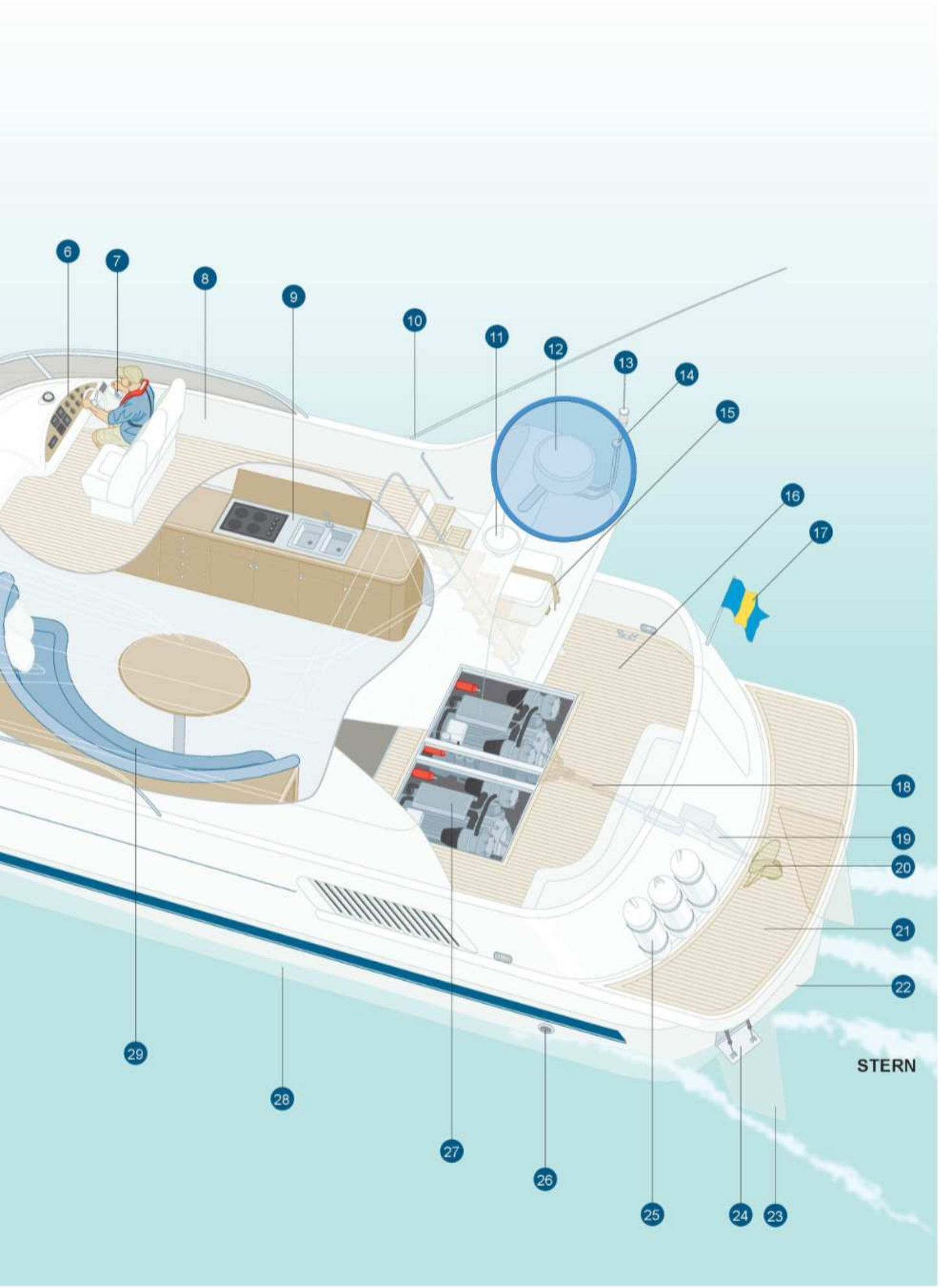
17 Quarter berth
18 Head (toilet compartment)
19 Vented loop and skin fitting
20 Gas bottle locker
21 Coaming locker
22 VHF radio
23 Radar
24 Instruments GPS, depth sounder etc.
25 Plotting instruments
26 Plotting table

Typical Motor Cruiser

TOUCH DIAGRAM



1 Pulpit
2 Fairlead
3 Forehatch
4 Stanchion
5 Guard rail
6 Instruments
7 Engine controls
8 Flybridge
9 Galley
10 VHF aerial
11 TV aerial
12 Radar scanner
13 Steaming light
14 GPS antenna
15 Liferaft
16 Aft decking
17 National flag
18 Starboard propeller shaft
19 Starboard 'P' bracket
20 Starboard propeller
21 Bathing platform
22 Transom
23 Port rudder
24 Port trim tab
25 Fenders
26 Engine exhaust
27 Port engine
28 Waterline
29 Saloon
30 Port navigation light
31 Internal controls
32 Head and shower compartment
33 Portlight
34 Forecabin
35 Bollard
36 Forehatch
37 Stem
38 Windlass and anchor
39 Cleat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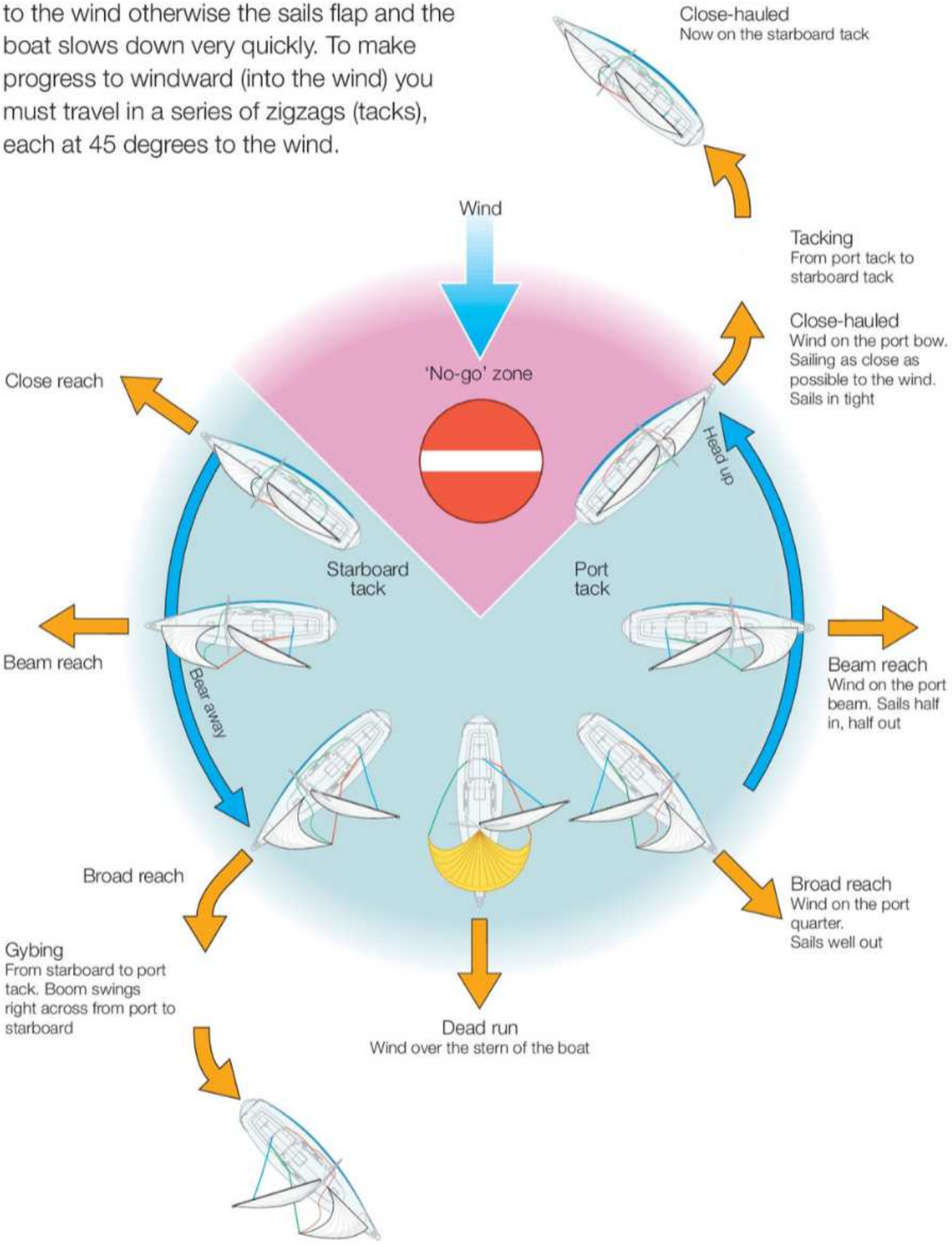
STERN

Sailing Theory

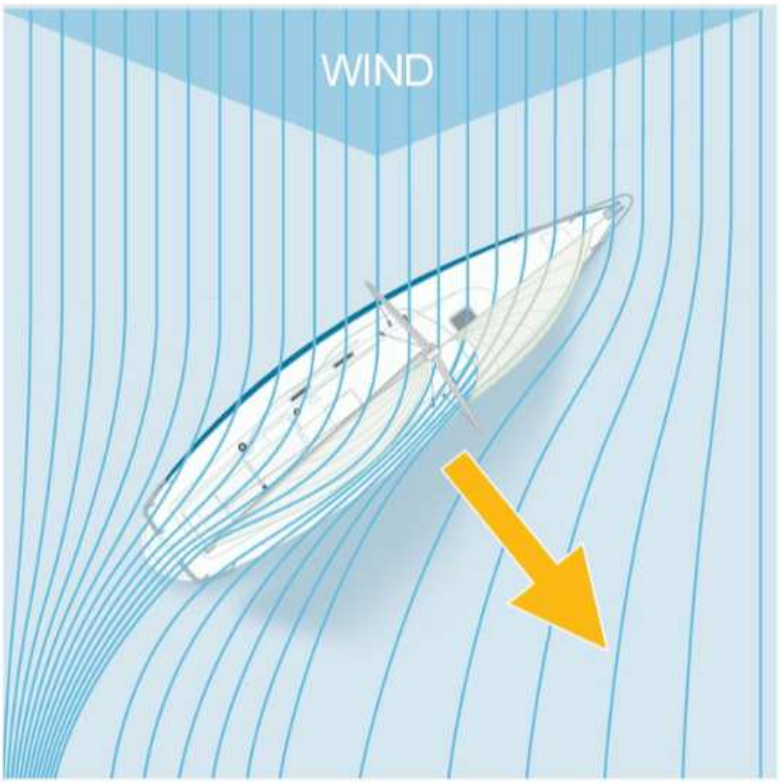
Points of Sailing

You can't sail closer than about 45 degrees to the wind otherwise the sails flap and the boat slows down very quickly. To make progress to windward (into the wind) you must travel in a series of zigzags (tacks), each at 45 degrees to the wind.



SIMPLE SAILING THEORY

When you put a spoon into running water it is sucked into the flow.



Similarly, when air flows over a sail it creates a sideways force.

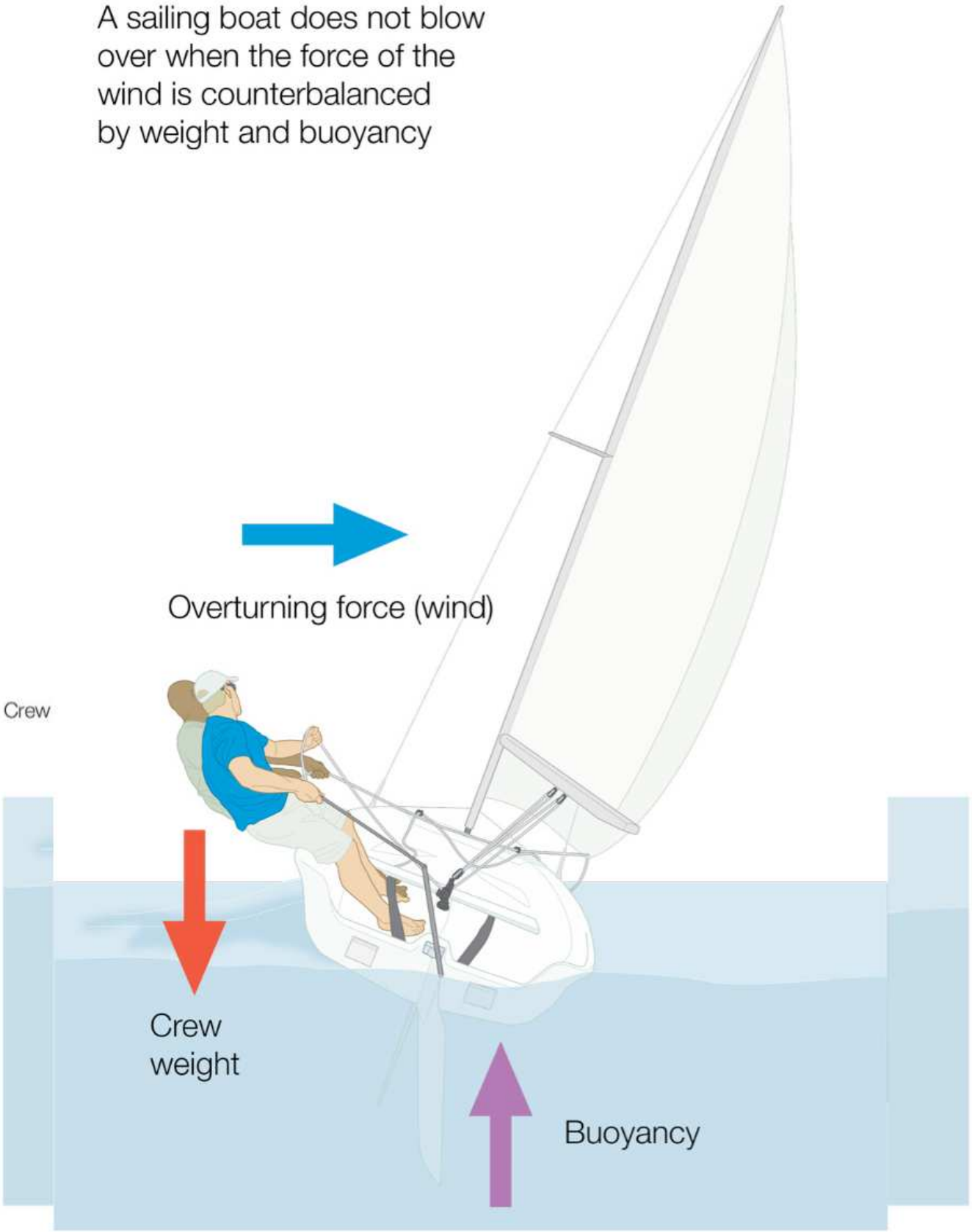
A combination of sideways force from the sail and opposite resistance from the water pushes the boat forward, like squeezing a bar of wet soap.

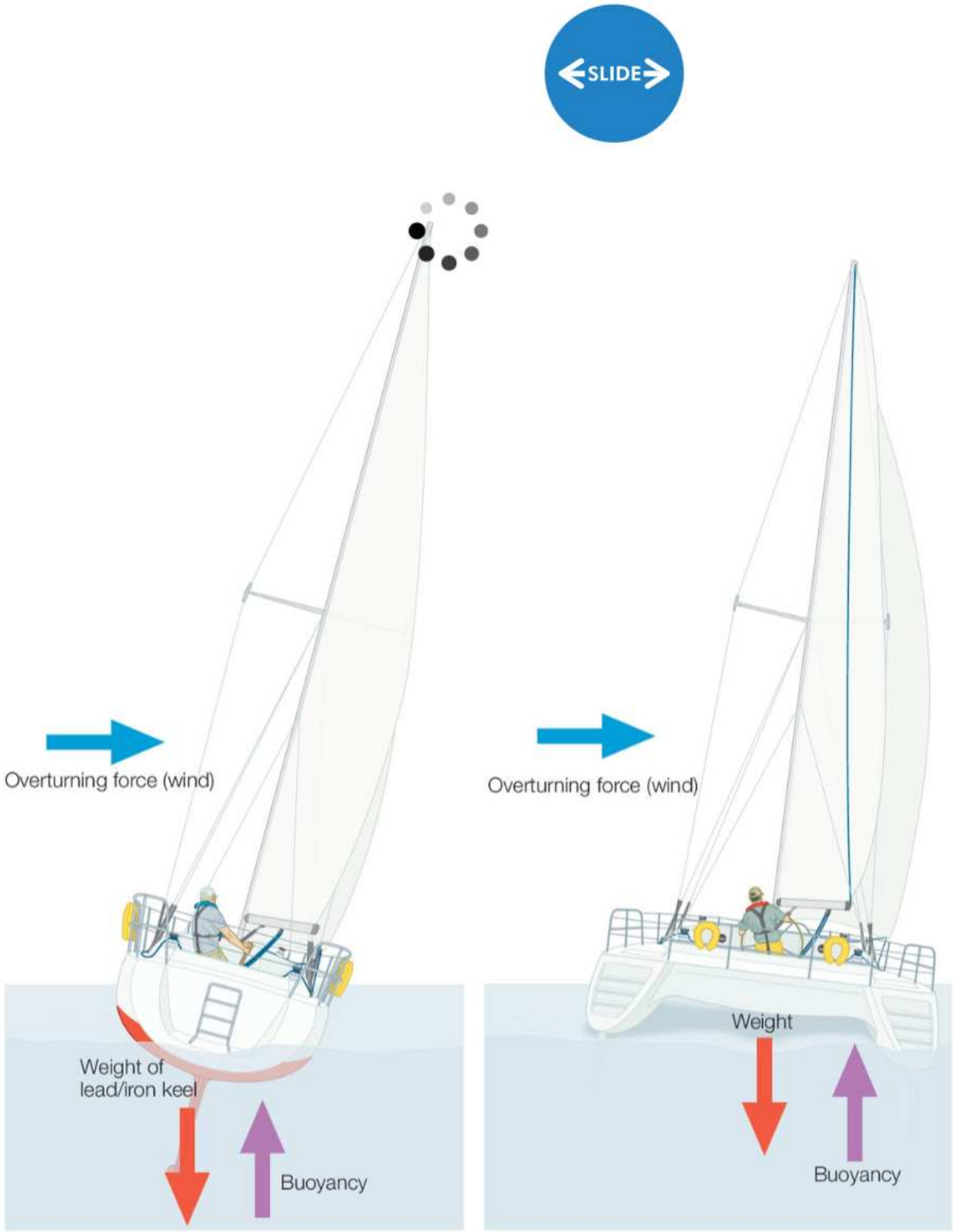
Stability

A sai
of th
buoy

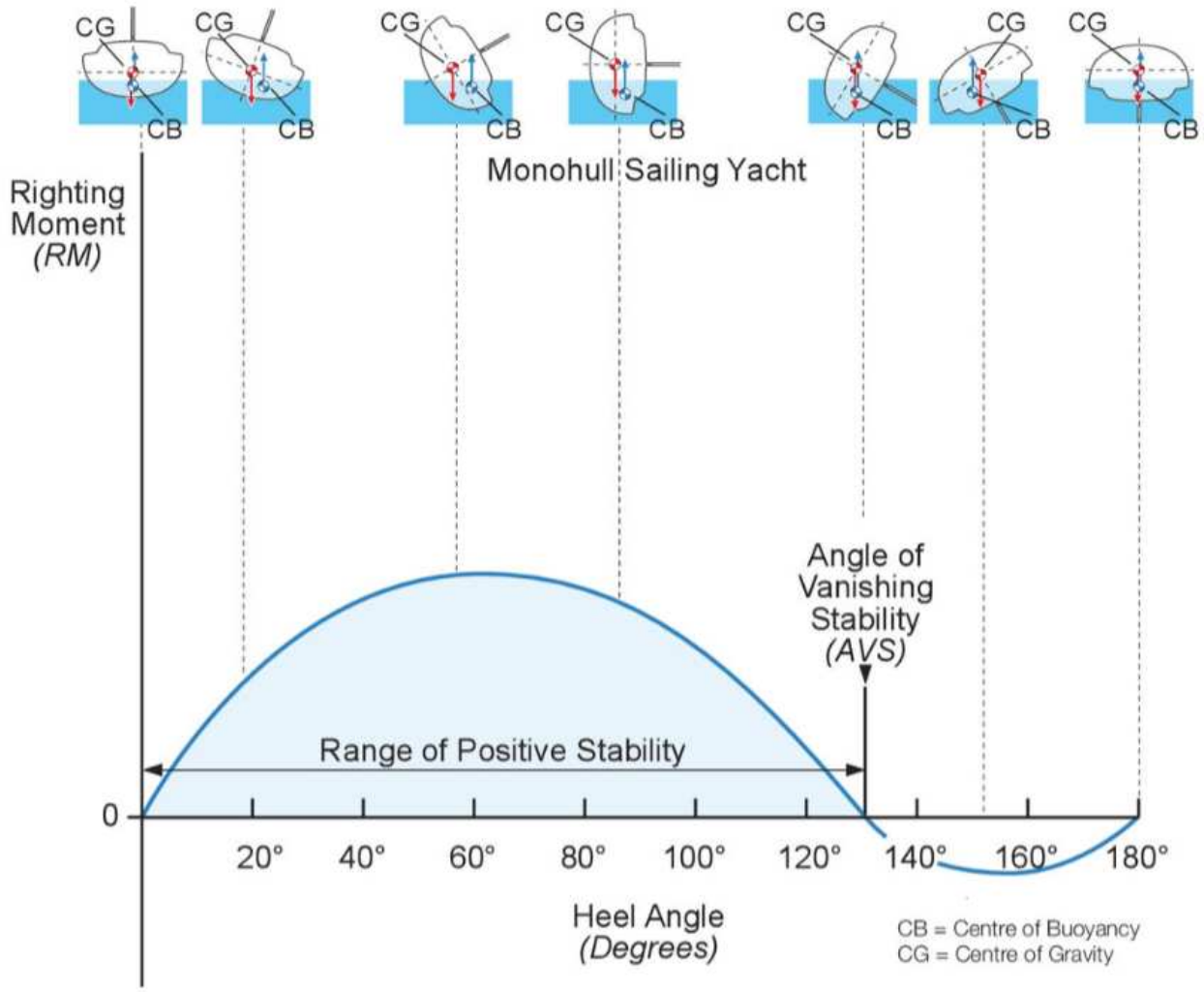
TOUCH
DIAGRAM

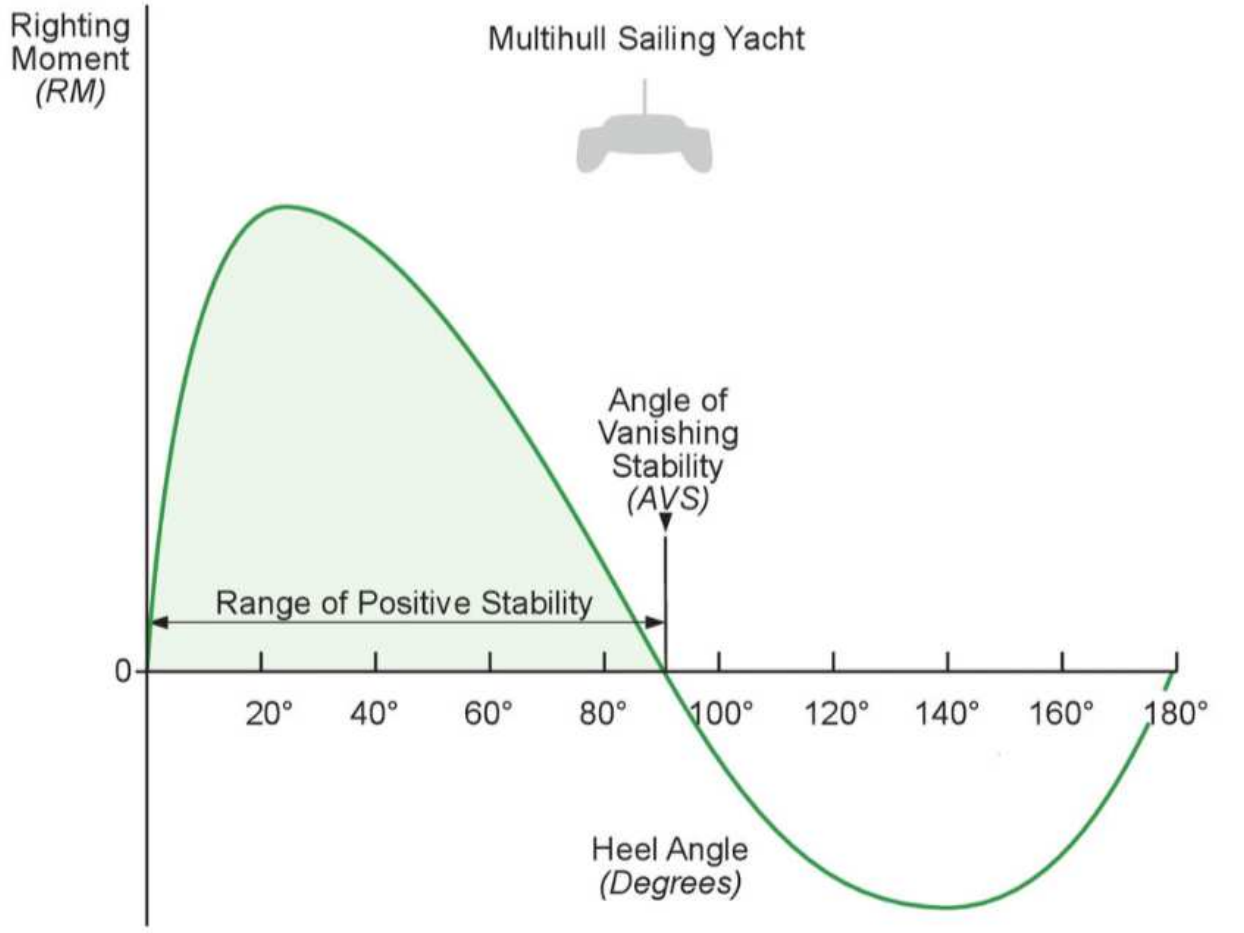
A sailing boat does not blow over when the force of the wind is counterbalanced by weight and buoyancy

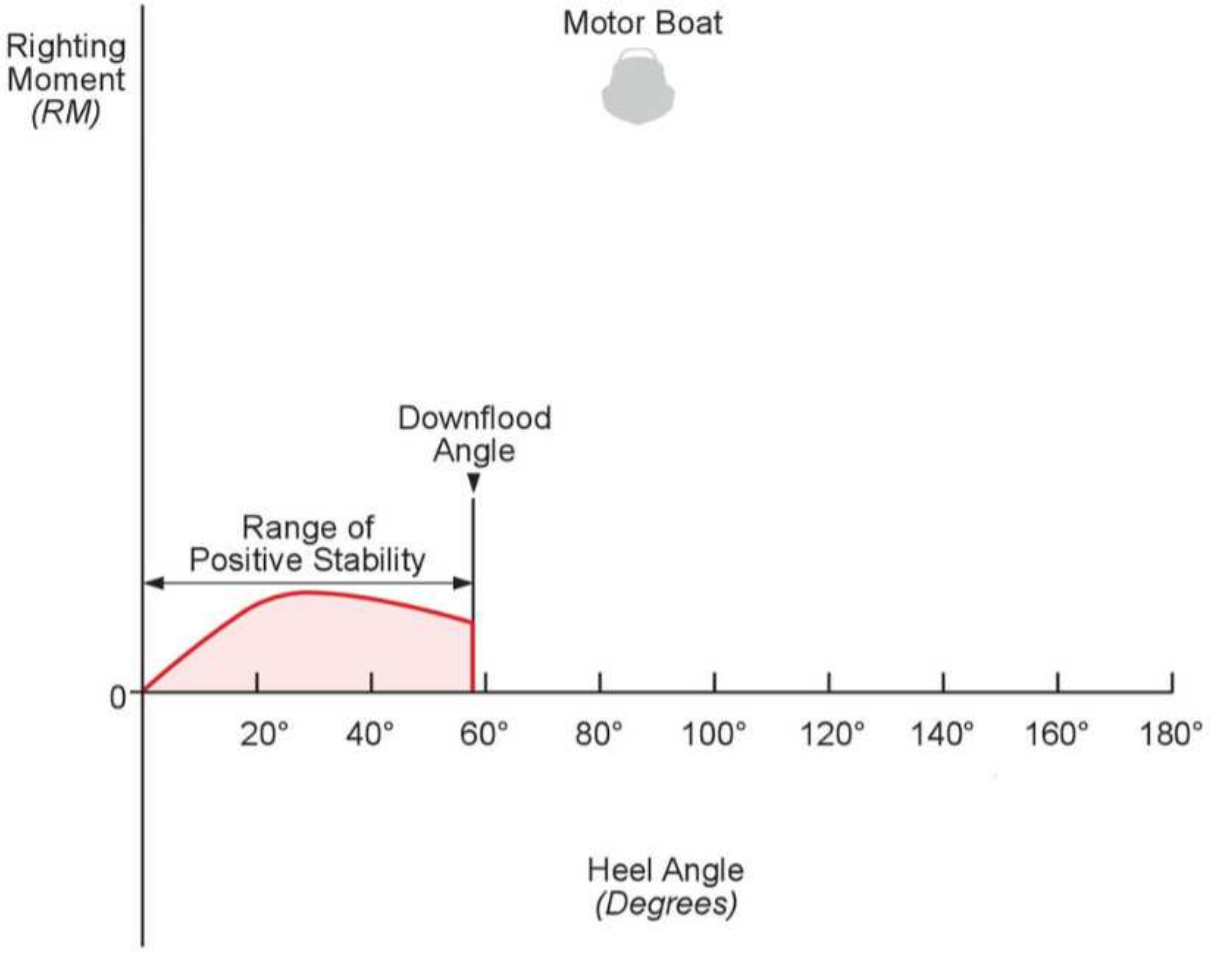


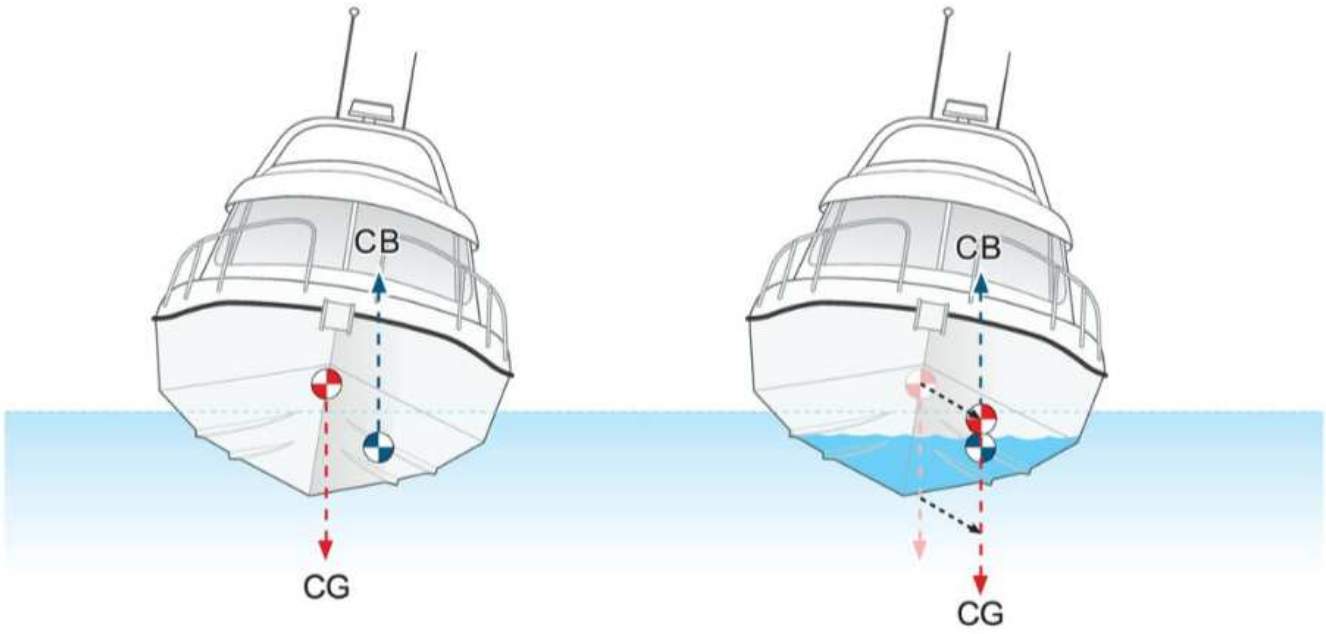

SLIDE
Overturning force (wind)
Weight of
lead/iron keel
Buoyancy
Overturning force (wind)
Weight
Buoyancy

These three stability curves are drawn to scale, assuming vessels of similar size and mass.



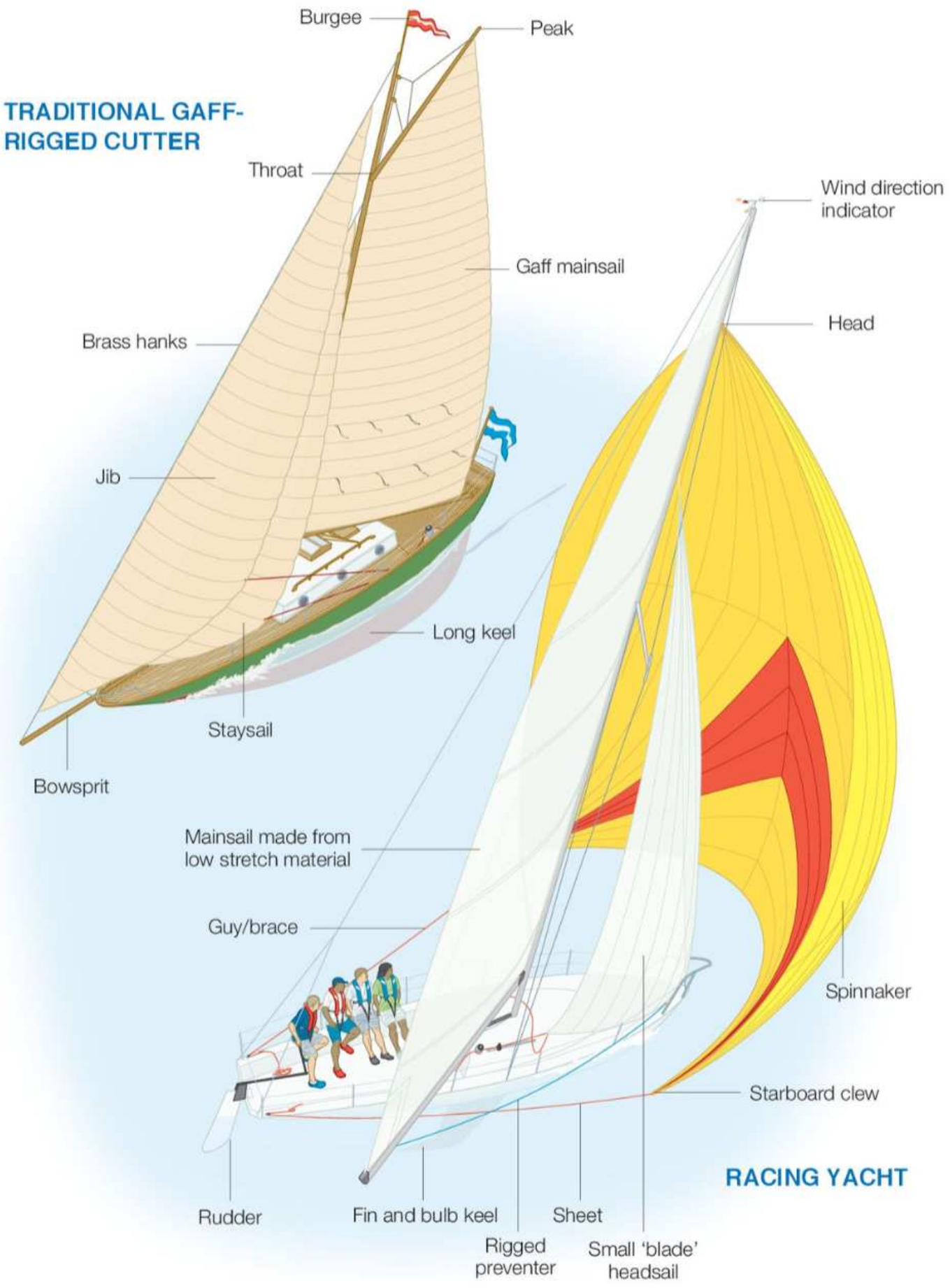






Free-surface effect allows the mass of water in a boat to move its centre of gravity. In this example, the AVS is reduced to 15° by the mass of water in the bilges.

Types of Sailing Yacht



Navigation lights
VHF aerial

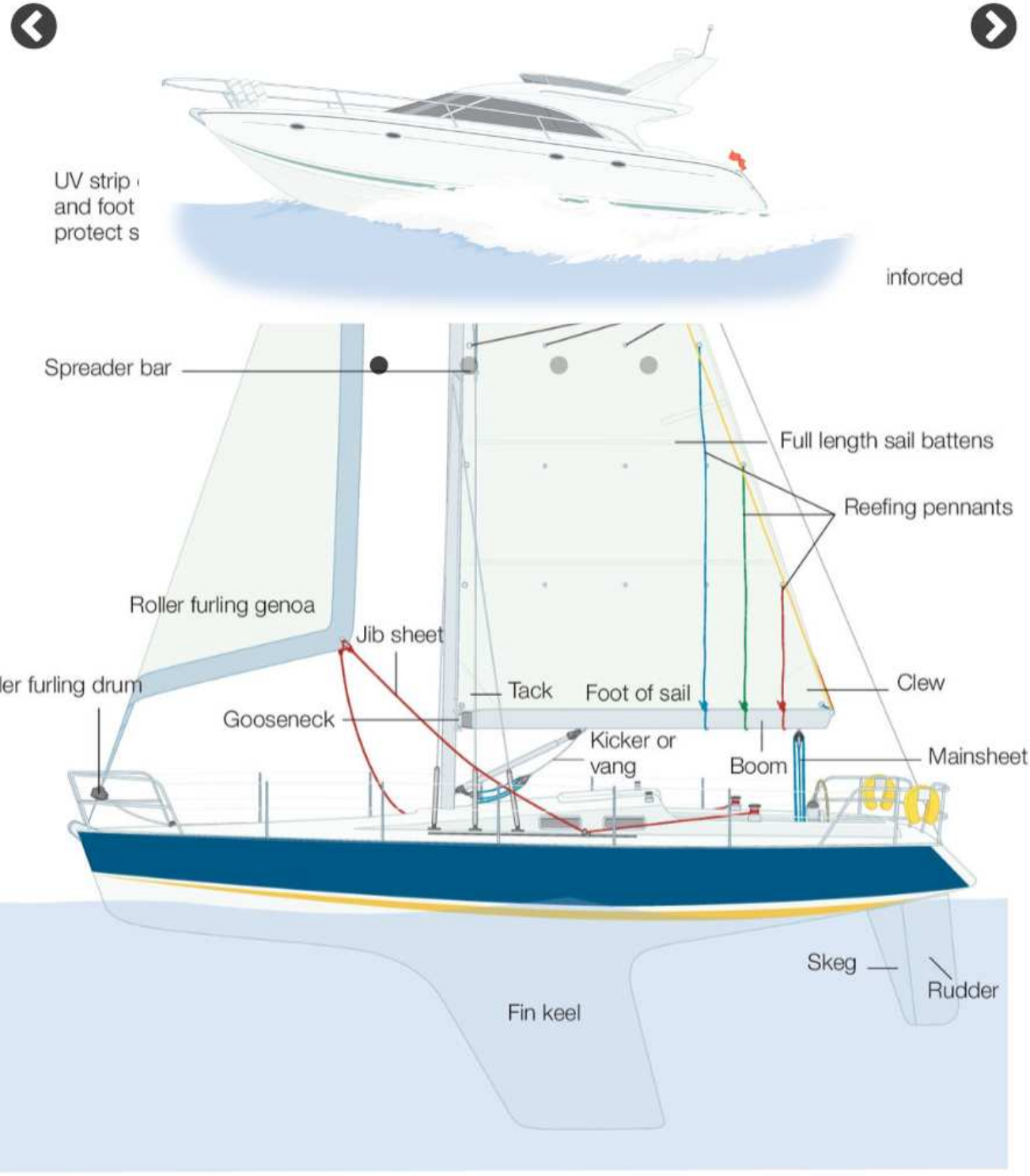
SLIDE

Flybridge Motor Cruiser

High-performance planing craft powered by twin inboard engines or twin outdrives. Many are capable of speeds exceeding 30 knots in smooth or moderate conditions.

Widely used in leisure cruising and can also be commonly chartered.

IG YACHT



Types of Motor Vessel

Flybridge Motor Cruiser

High-performance planing craft powered by twin inboard engines or twin outdrives. Many are capable of speeds exceeding 30 knots in smooth or moderate conditions.

Widely used in leisure cruising and can also be commonly chartered.

Semi-displacement Craft

Hull partially rises onto the plane. Fine entry means a comfortable ride when going into a head sea.

RIB (Rigid Inflatable Boat)

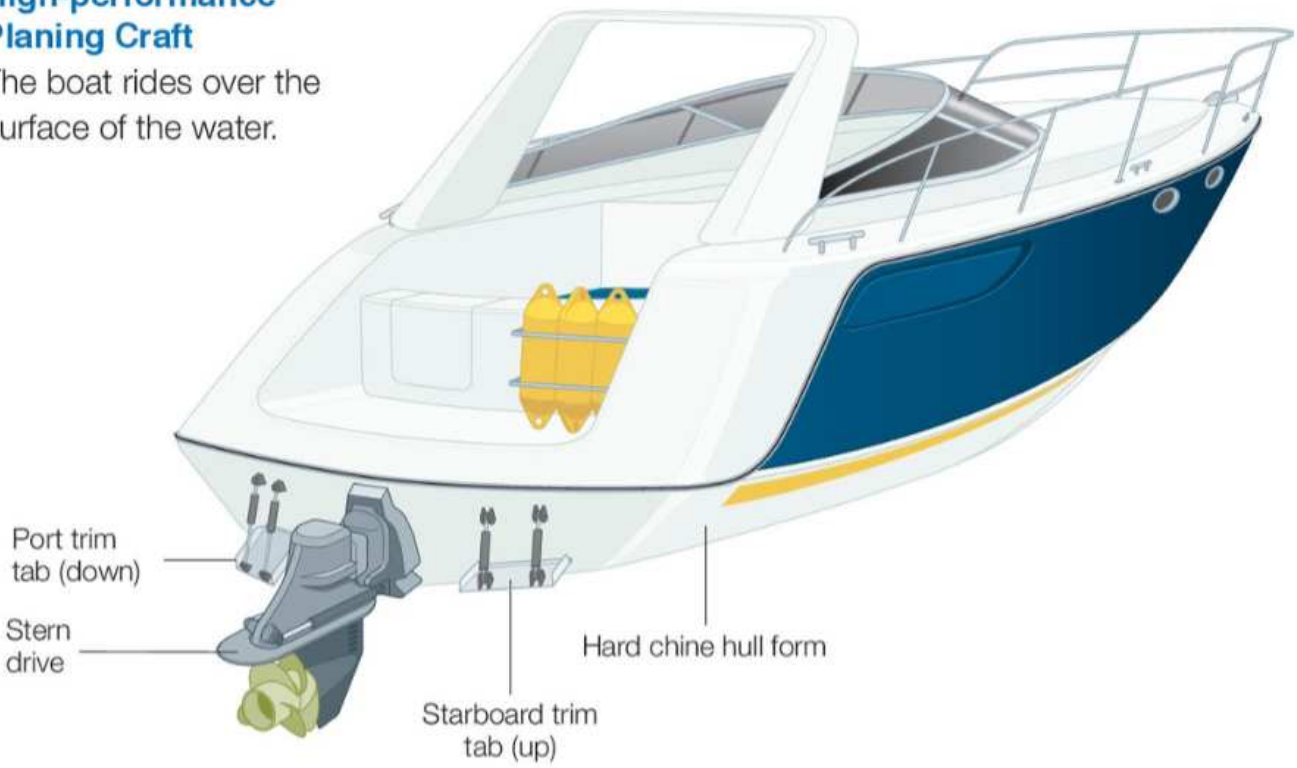
Fast open boat – separate inflatable compartments make it almost unsinkable.

Displacement Craft

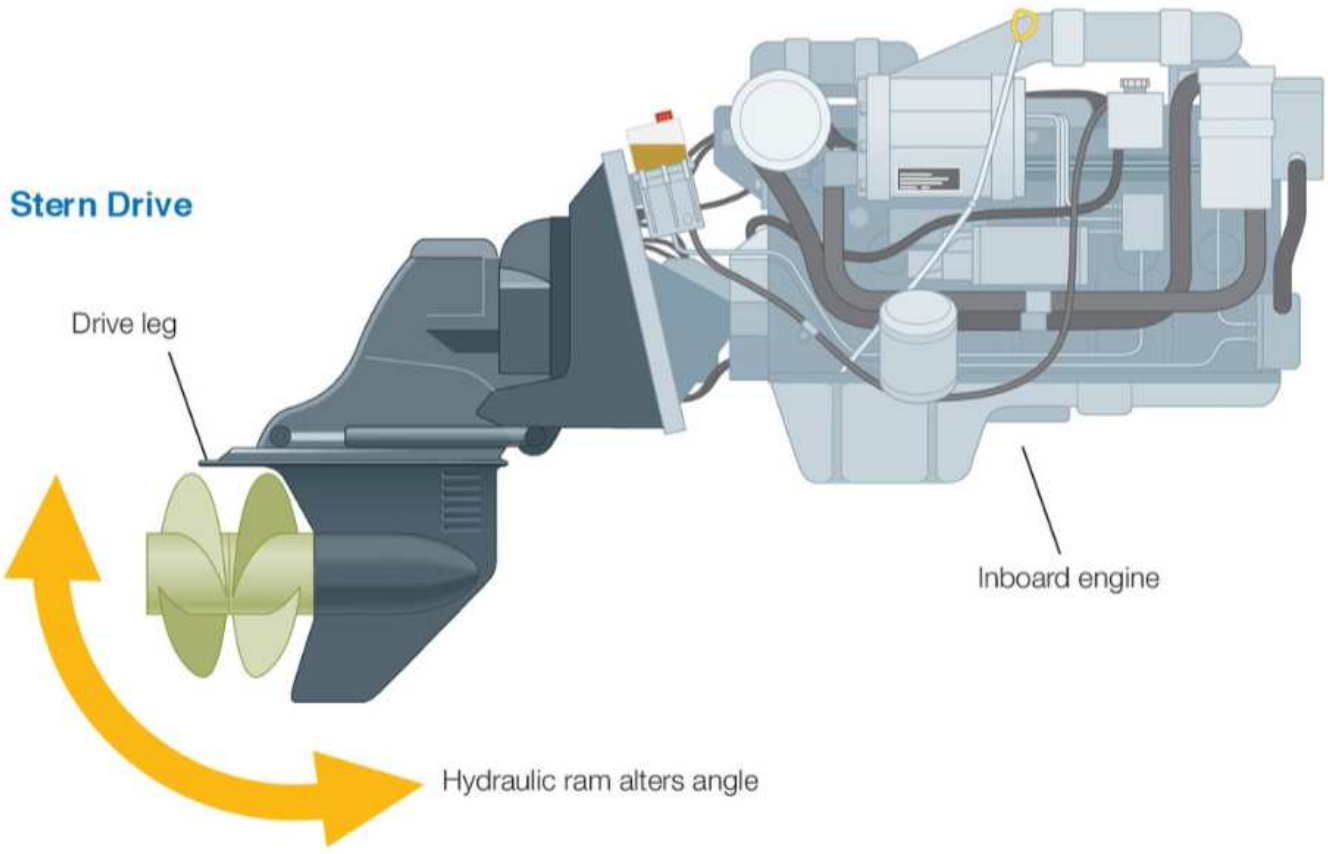
Travels through rather than over the water. This conventional hull type is slower than planing craft but has good sea-keeping properties.

High-performance Planing Craft

The boat rides over the surface of the water.



Stern Drive



TRIM

Changing the trim will affect the way a boat behaves in different conditions. Experiment to find out how your boat reacts.

Power trim (head sea)

Outdrive leg in – drops the bow for going into a head sea and reduces slamming.

Power trim (following sea)

Outdrive leg out – lifts the bow in a following sea.

Trim Tabs in Operation

Trim tabs (head sea)

Both tabs down = Bow down.

Trim tabs (following sea)

Both tabs up = Bow up.

Port tab = Port up.

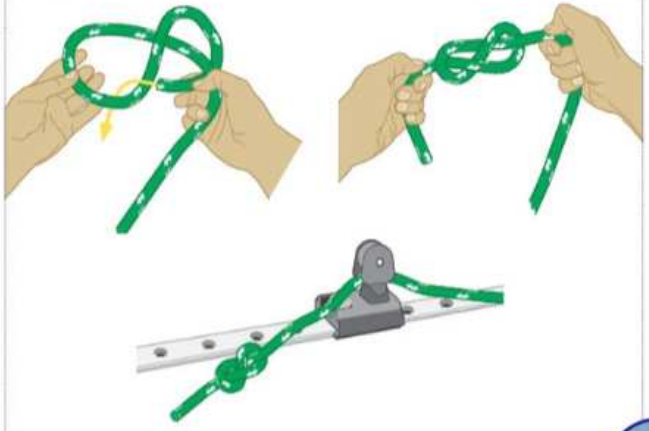
Starboard tab = Starboard up.

Knots

Just a few knots will get you sailing. They are easy to tie with a bit of practice and you will find them very useful.

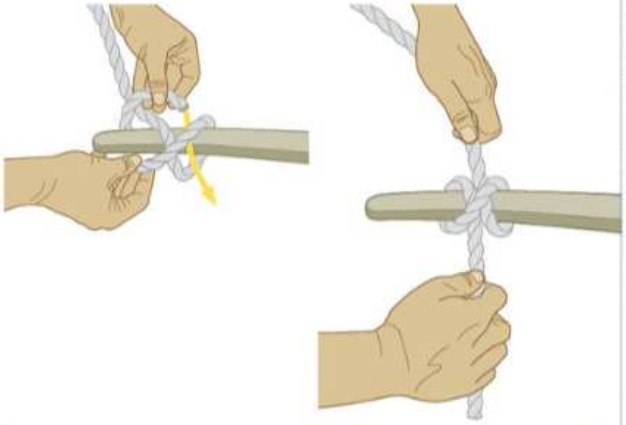
Figure-of-eight

Used as a stopper knot to prevent a rope running through a car or jammer.



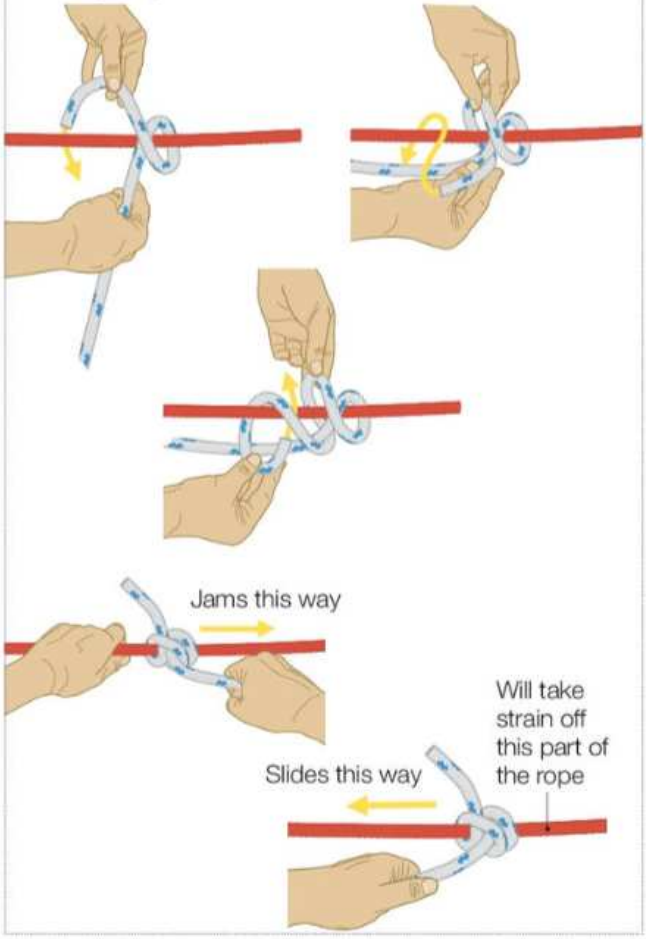
Clove hitch

For tying on fenders or other uses such as lashing the tiller amidships.



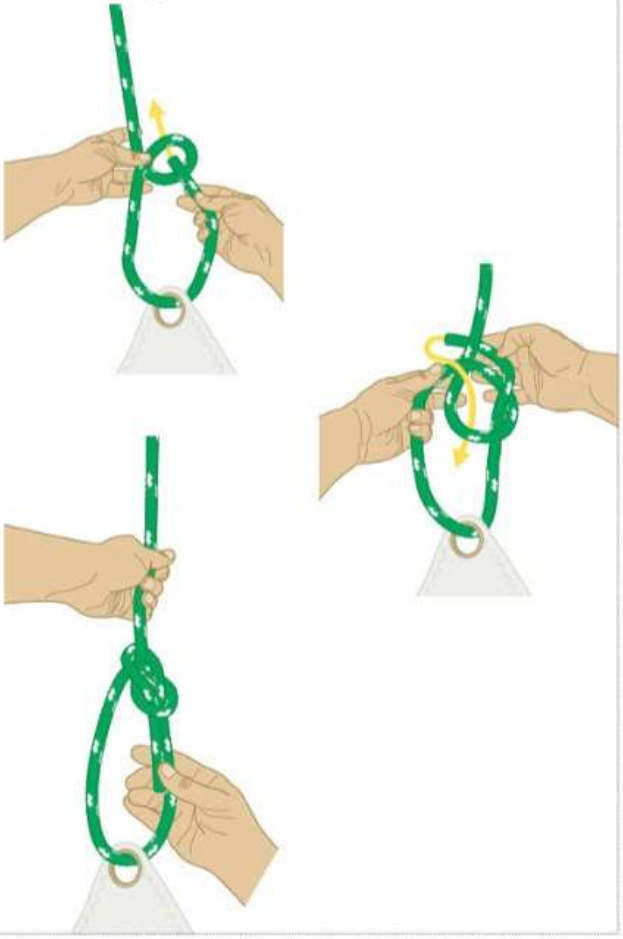
Rolling hitch

Used for temporarily relieving the strain on a working rope, e.g. if you have a riding turn (jam) on a winch.



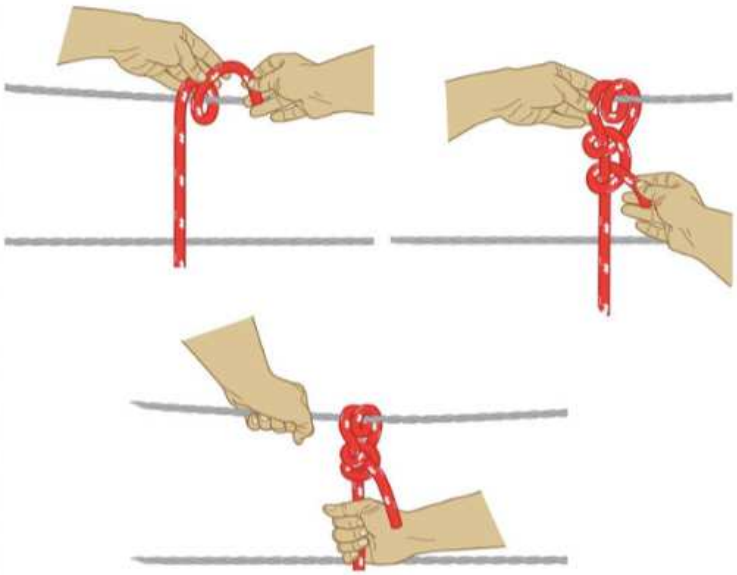
Bowline

Makes a loop in the end of a rope. Used to attach the jib sheets or to make a loop for mooring.



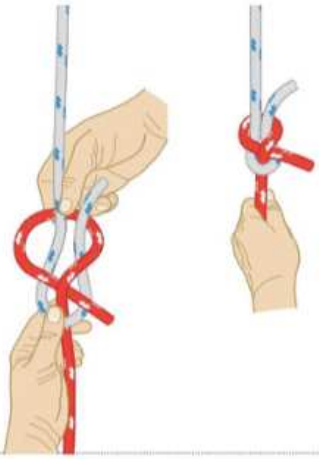
Round turn and two half-hitches

A versatile knot with many uses, such as securing a mooring line to a ring or hanging a fender.



Single sheet bend

Used to join two ropes – useful to lengthen a mooring line.

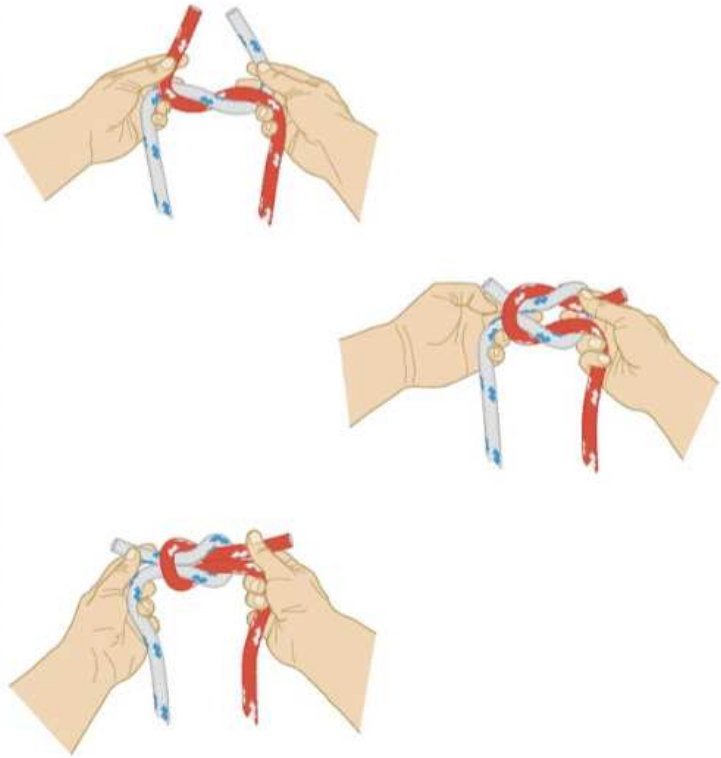


Double sheet bend

More secure and is also used to tie a smaller line to a larger one.

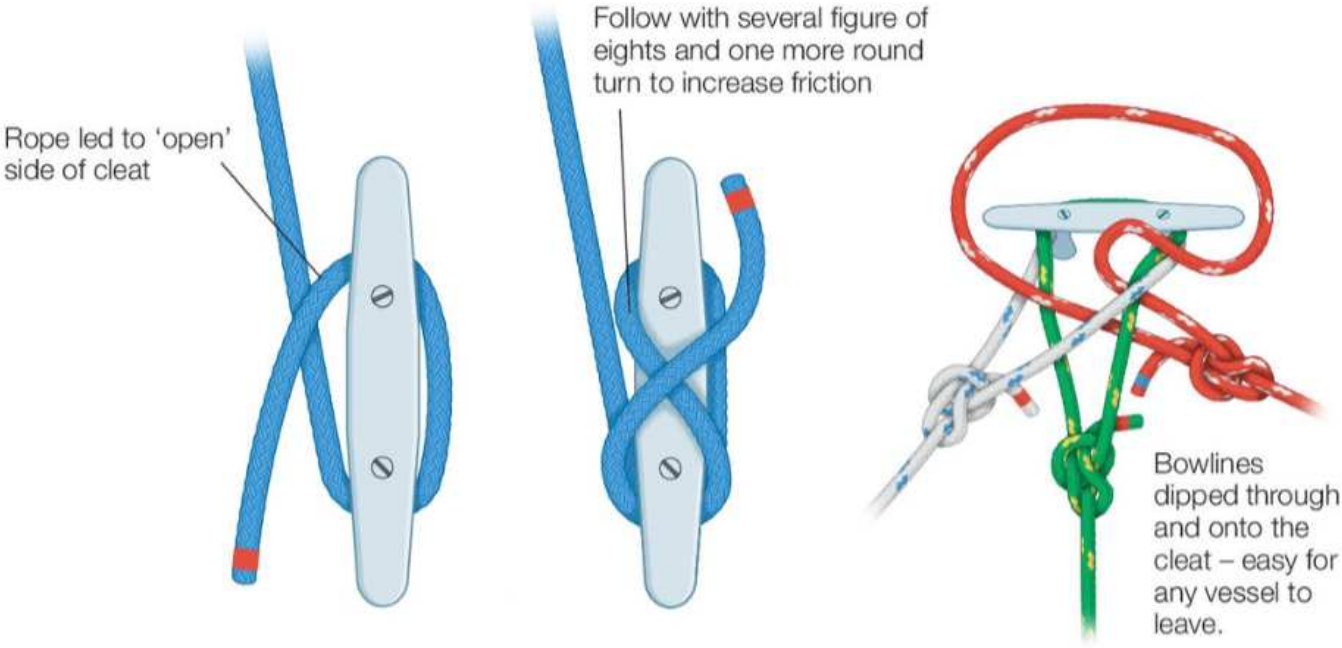
Reef knot

Useful to tie in reefs to tidy the sail – but not secure enough for mooring lines.



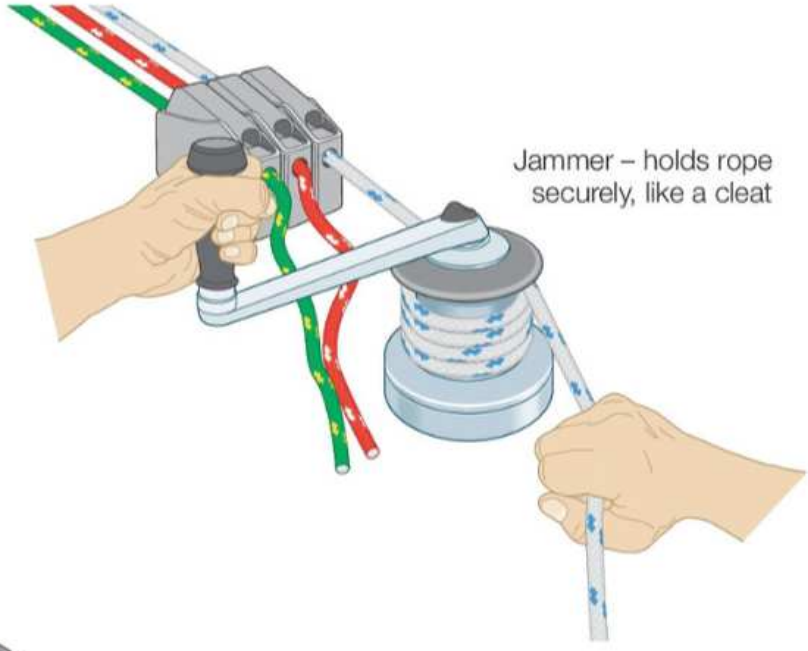
Ropework

Making Fast to a Cleat



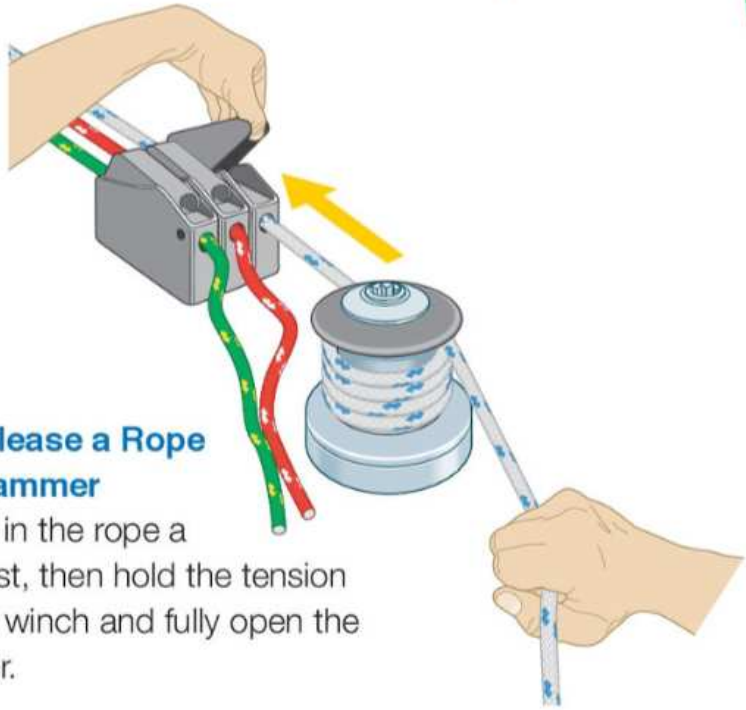
Using Rope Jammers

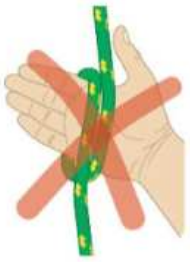
A rope can be tightened by pulling or winching through a closed jamming cleat.



To Release a Rope in a Jammer

Winch in the rope a little first, then hold the tension on the winch and fully open the jammer.





Never wrap rope round your hand when holding it, pulling on it, or using a winch. Keep hands and fingers away from winches and jammers.

Winching Techniques

Using a winch gives more power for pulling in ropes.

Always have your thumbs uppermost. Take care not to trap fingers or thumbs between the rope and the winch.

Use a flat hand to ease the rope out.

Rope Properties

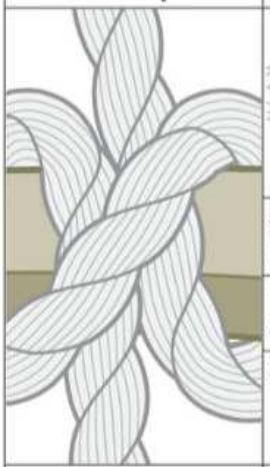
You need to choose the right type of rope for the job you want it to do. For example, you would not use a floating rope for an anchor line, or a stretchy rope for a halyard. Ropes will have a published safe working load (SWL) which should be followed, rather than the breaking strain.

	Relative Strength	Relative Elasticity	Elongation at break (%)	Floats?	Creep Performance*	UV Resistance	D/d Ratio**
Polyamide (Nylon)	1.66	1.33	24	No	Good	Good	8:1
Polypropolene	1.00	1.00	20	Yes	Fair	Fair	8:1
Polyester	1.95	2.50	12.5	No	Good	Very Good	8:1
HMPE (Dynema)	5.86	18.33	3.5	Yes	Good	Very Good	8:1
LCP (Vectran)	5.30	12.50	3.8	No	Excellent	Good	8:1
PBO (Zylon)	9.60	37.50	3	No	Very Good	Poor	8:1
Para-Aramid (Twaron, Technora)	5.00	12.67	4	No	Very Good	Fair	20:1

*Permanent elongation that occurs over extended time. Different to stretch, as it is permanent.

**Using a lower D/d ratio will produce a weak point in the rope.

Rope Constructions

Twisted Rope	Single Braids	Cover Constructions
		8-plait: Normally a thick, knobbly cover, but small core
		16-plait over two under two: Smoother cover, more space for core
	8-strand multiplait: Simplest braiding machine configuration	24-plait: Thick, durable cover, space for core
	12-strand: Rounder and smoother than 8-strand	16-plait: Similar to 24-plait, thinner cover if required
	8-plait: A thick, knobbly braid	32-plait: Thinner cover than 24-plait, allowing bigger/ stronger core
3-strand: Traditional standard rope construction	16-plait: Like 12-strand, but has a larger internal void	48-plait: Thinner cover than either 24 or 32-plait, allowing bigger/stronger core

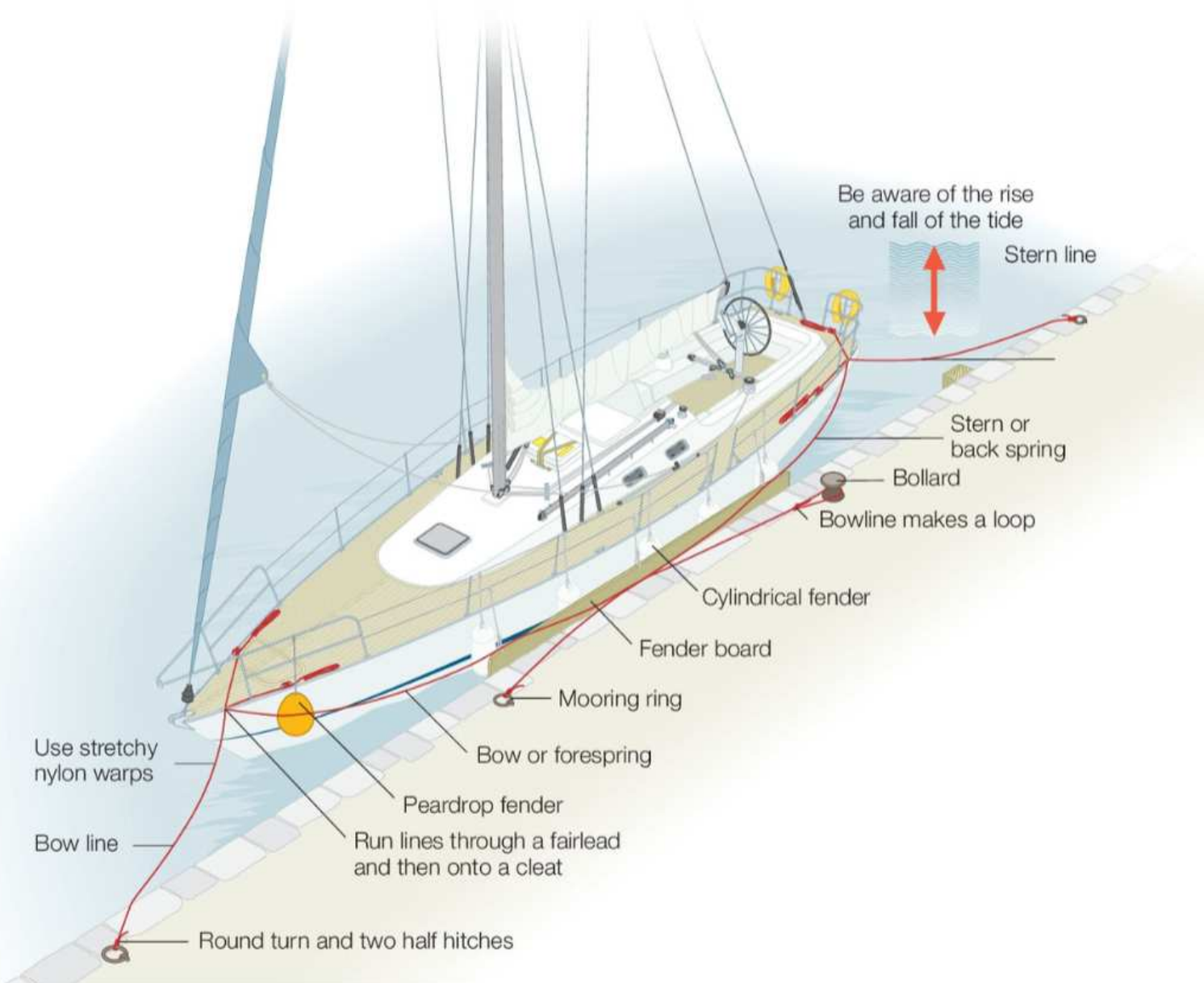
Any knot in a rope will reduce its strength. Depending on the knot and rope, it could reduce it by more than 60 per cent.

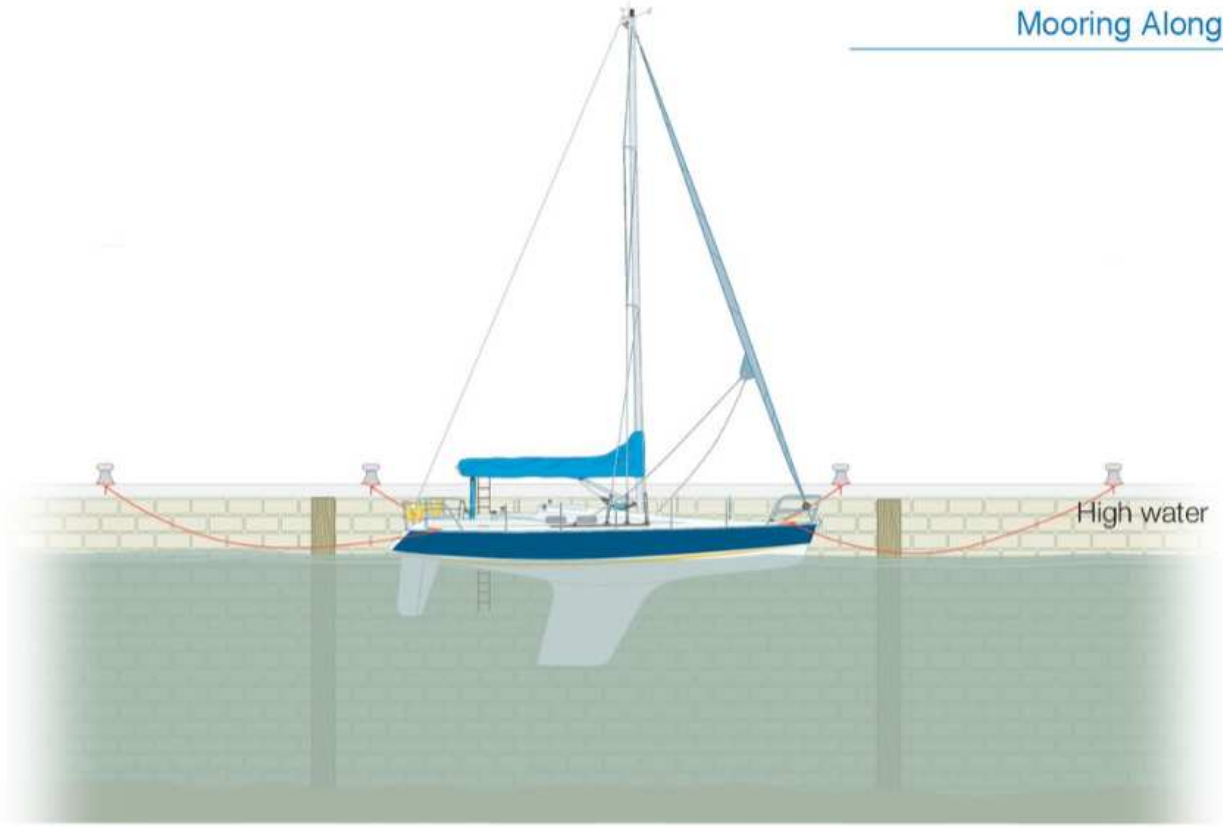
Mooring Alongside

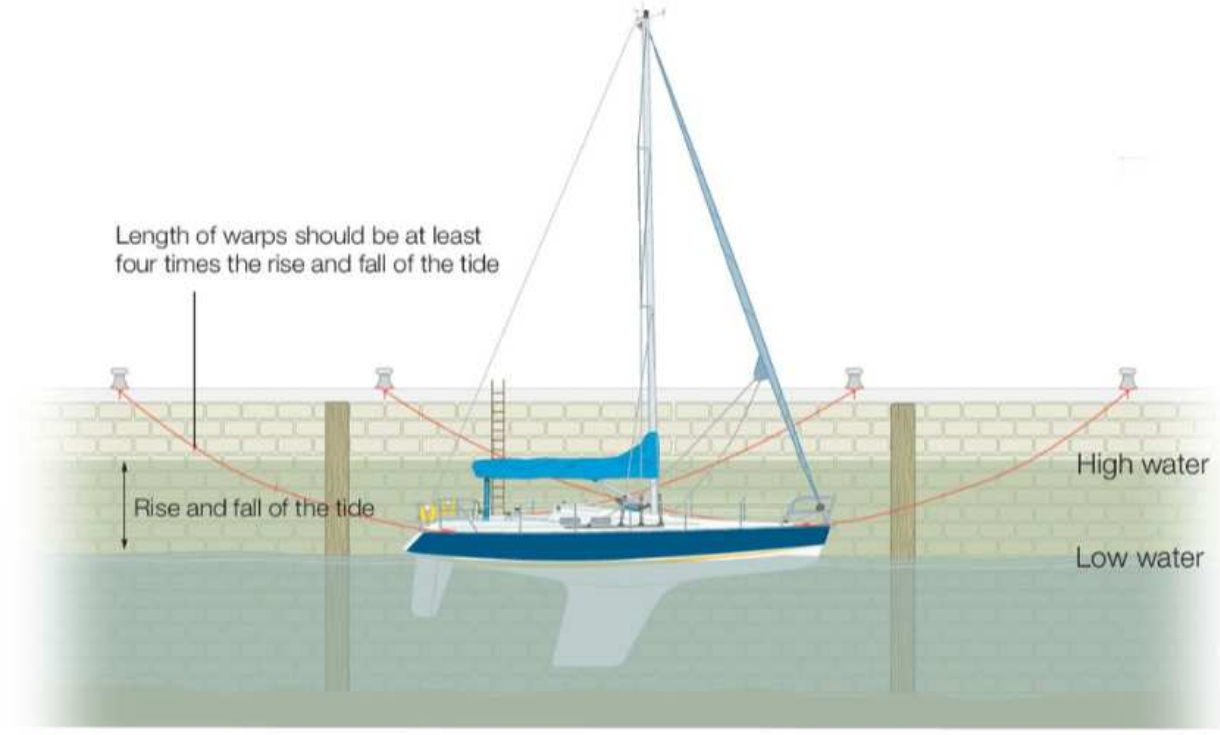
ALONGSIDE A WALL

Use a separate line for each task.

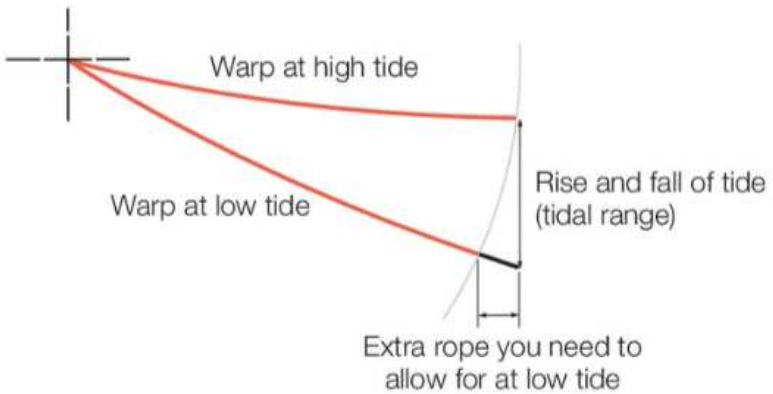
When you have attached a warp to a bollard/ring etc., bring the rest of the line back on board and attach it to a cleat. Each warp can then be independently adjusted from on board as the tide rises and falls.



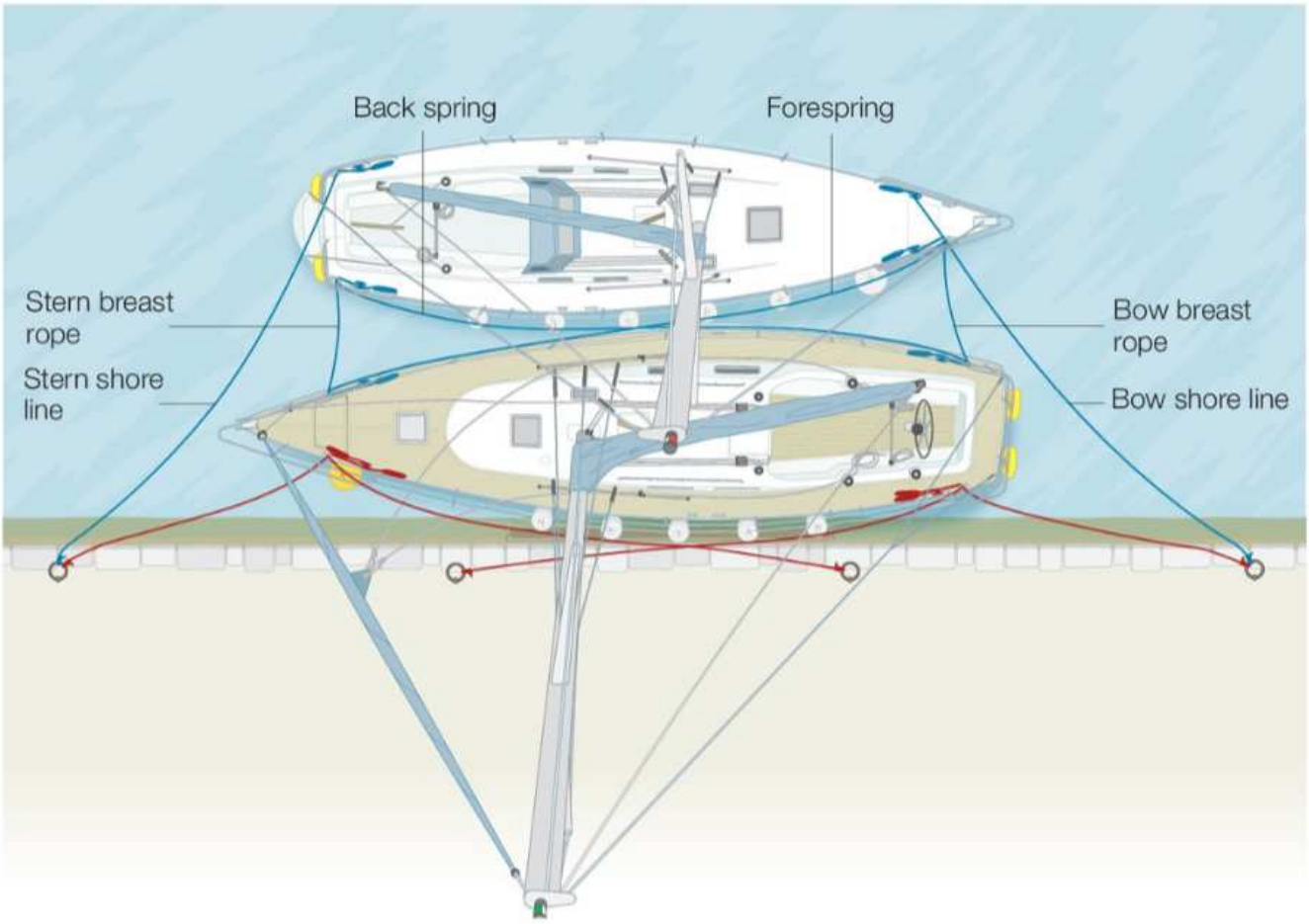




The length of the warps should be at least four times the rise and fall of tide.



IN A RAFT

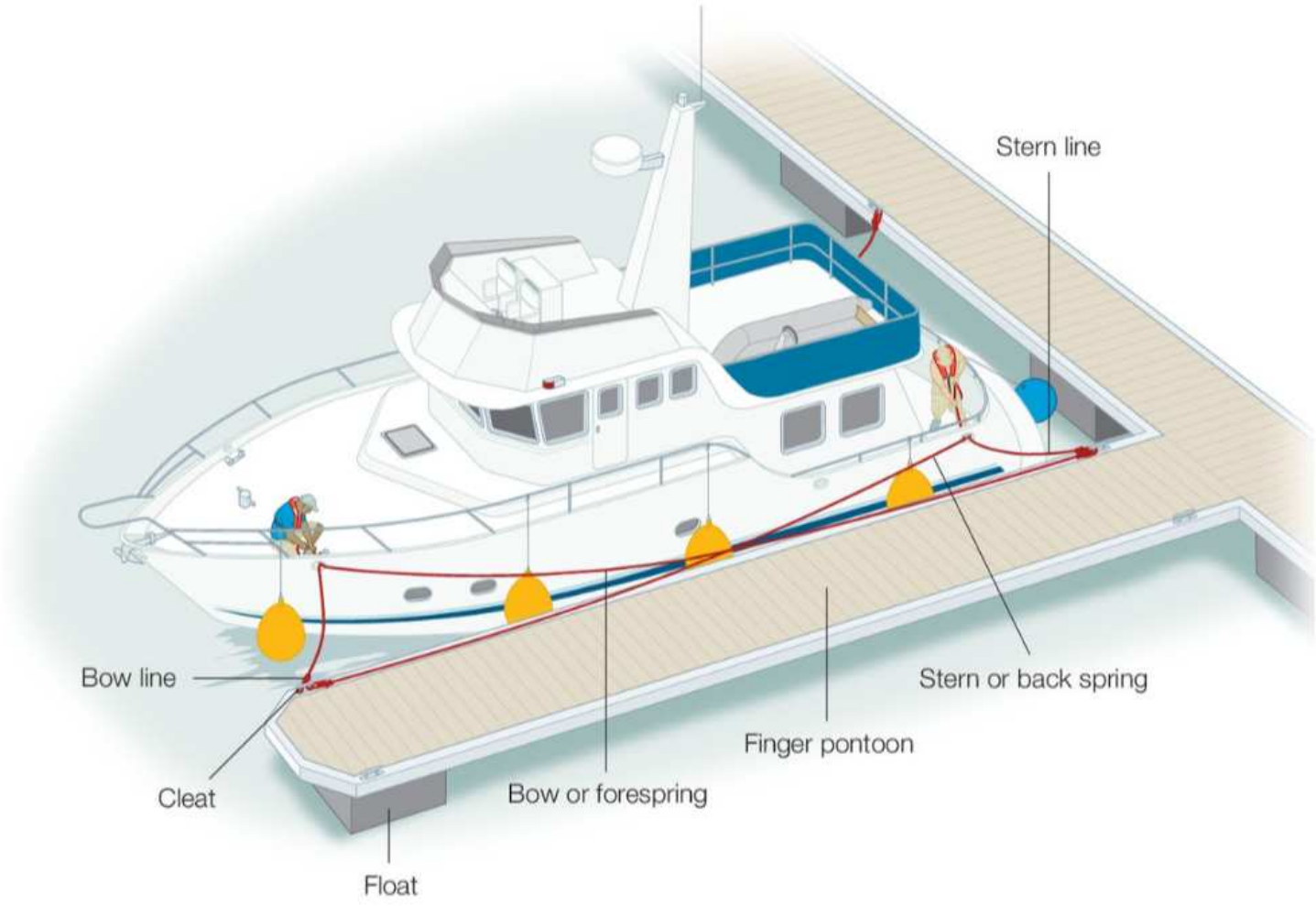


The outside boat should always take bow and stern lines ashore to minimise strain on the other boat's shore lines and cleats.

Any subsequent boats should also run shore, breast and spring lines to the adjacent boat and the mooring. A good skipper does not rely on the other boats' fittings or the competence of the other crew.

In a raft it would be best for the second boat to be in the opposite direction to the first. This will ensure that both boats have a bit of privacy from each other as the cockpits will be further apart. It will also be easier to use the foredeck of the other boat to get ashore. The masts should be staggered so the rigging will not get tangled when the boats roll.

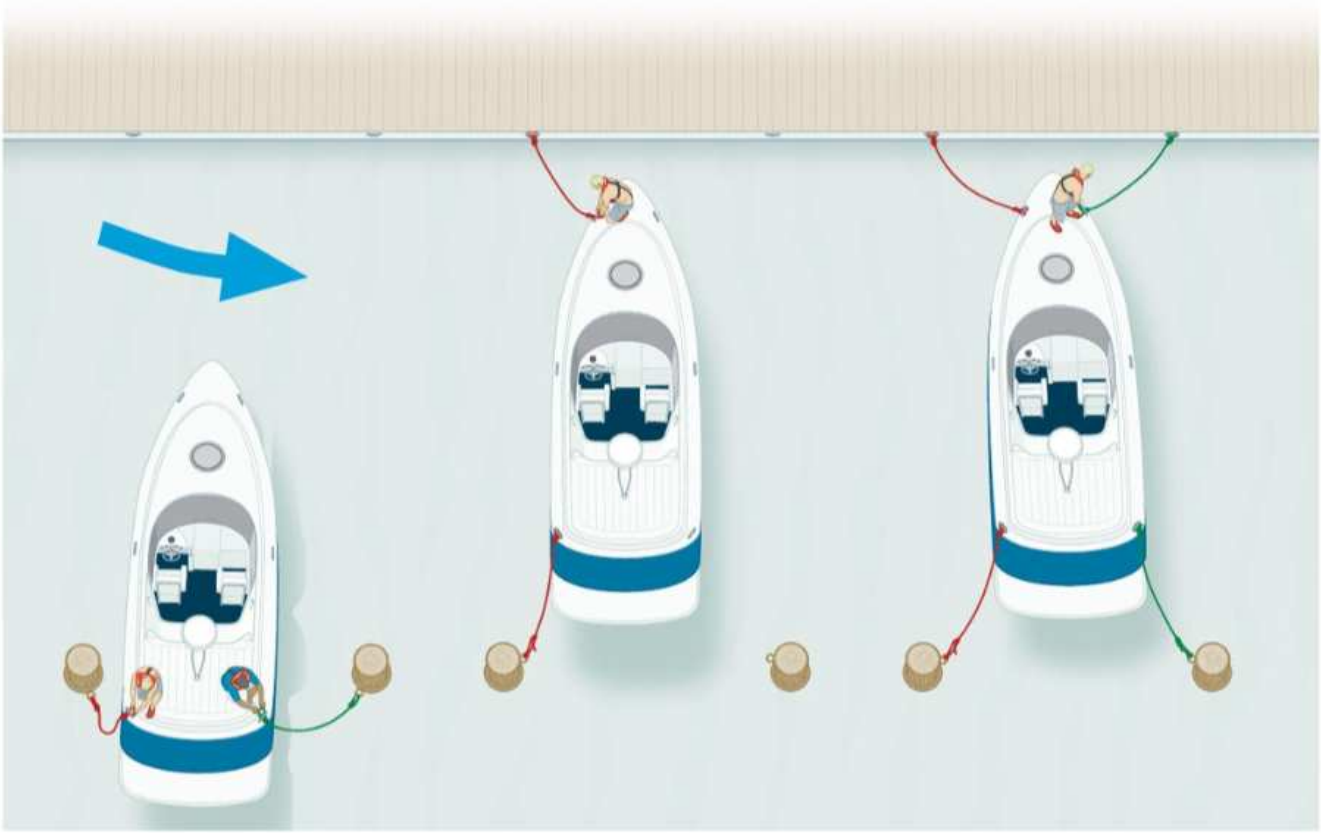
ON A FLOATING PONTOON



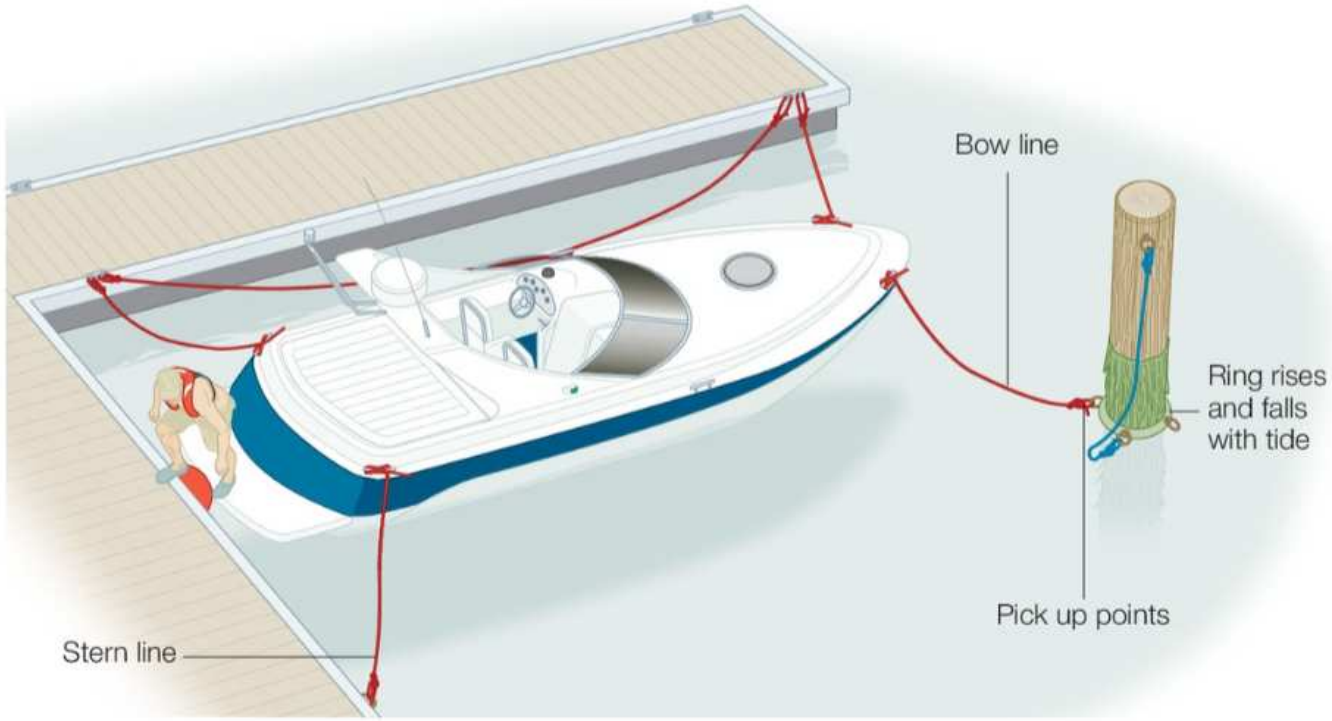
You should not have to adjust lines as the tide rises and falls.

IN A PEN

Stern lines are attached to piles and the bow lines are attached to a wall or pontoon. Usually the windward lines are attached first.



In some countries one of the piles is replaced by a pontoon for ease of access to the shore. The lines are adjusted to allow access from the steps or amidships. Pick-up lines are usually supplied on the piles to aid retrieval.



Anchoring

Will you be sheltered? Look for maximum protection from wind, swell and tide. Check forecast for possible changes of wind direction.

What is the sea bed like? Look at the chart symbols – mud and sand give better holding than rock or shingle.

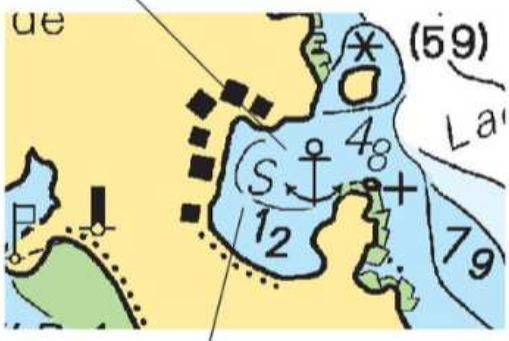
What will the tide do during your stay? Calculate the times and heights. Make sure that you don't pick a spot where you will go aground as the tide falls.

Will you have enough swinging room? Allow for other boats, isolated rocks, etc.

Prepare the amount of anchor chain or warp that you need before dropping the anchor.

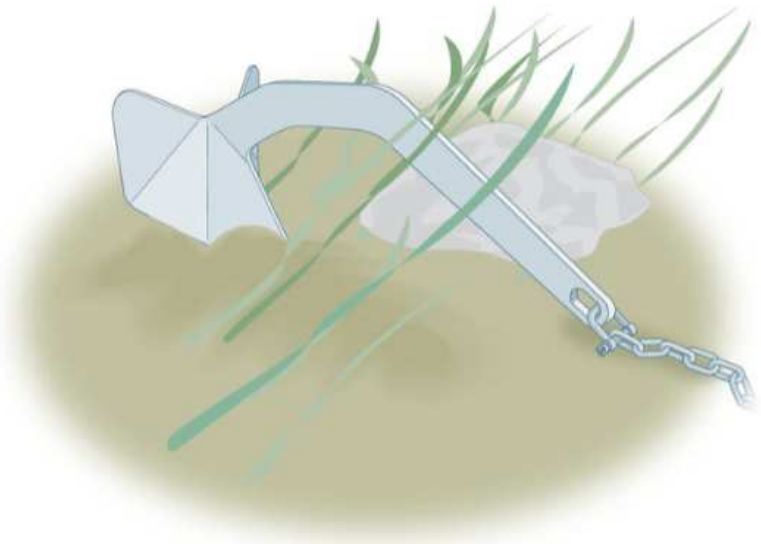
You don't necessarily need to anchor at the position of the anchor symbol. This is just a recommendation.

Avoid anchoring on or near the leading line – other boats may be coming in.



There will be much less tidal flow in the bay than outside.

TYPES OF ANCHOR

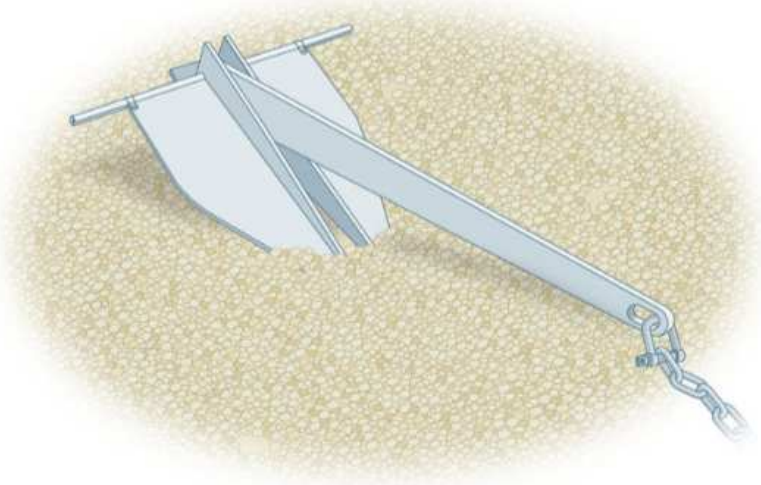


Delta

Good holding-to-weight ratio. Designed to stay on bow roller for self-launching.

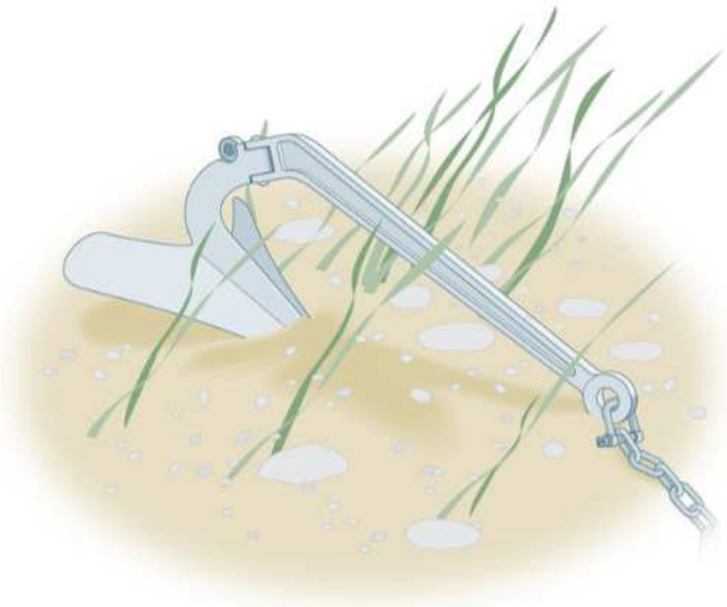
Bruce

Good holding-to-weight ratio. Awkward to store in a small anchor locker.



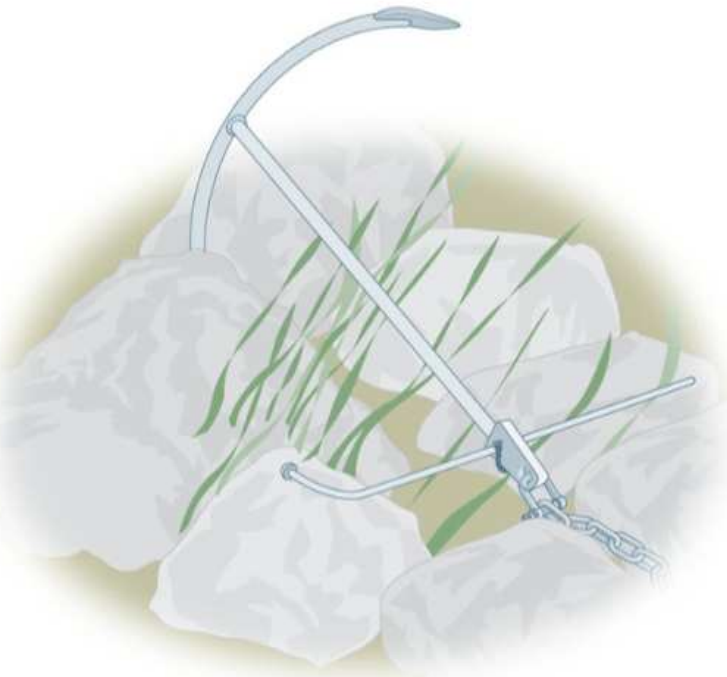
Danforth

Good holding-to-weight ratio. Stows flat. Can be hard to break out of mud.



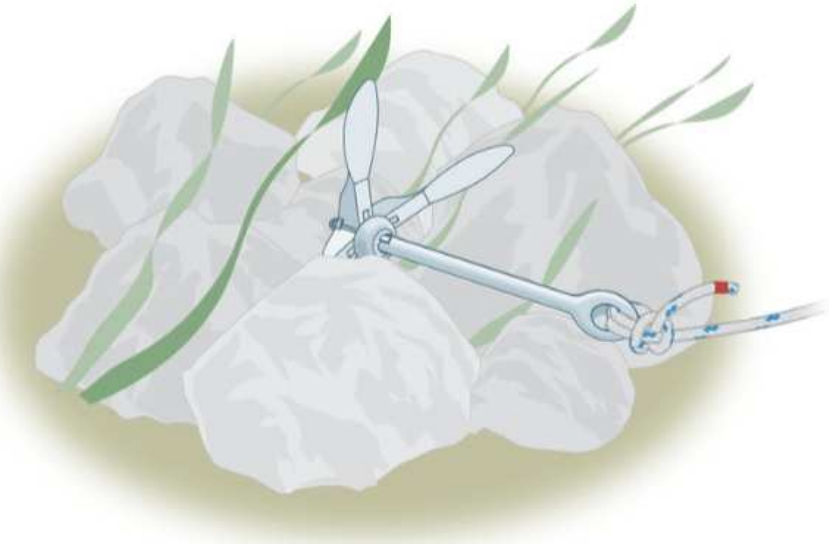
CQR or Plough

Good holding-to-weight ratio. Hard to stow and moving parts can capsize.



Fisherman's

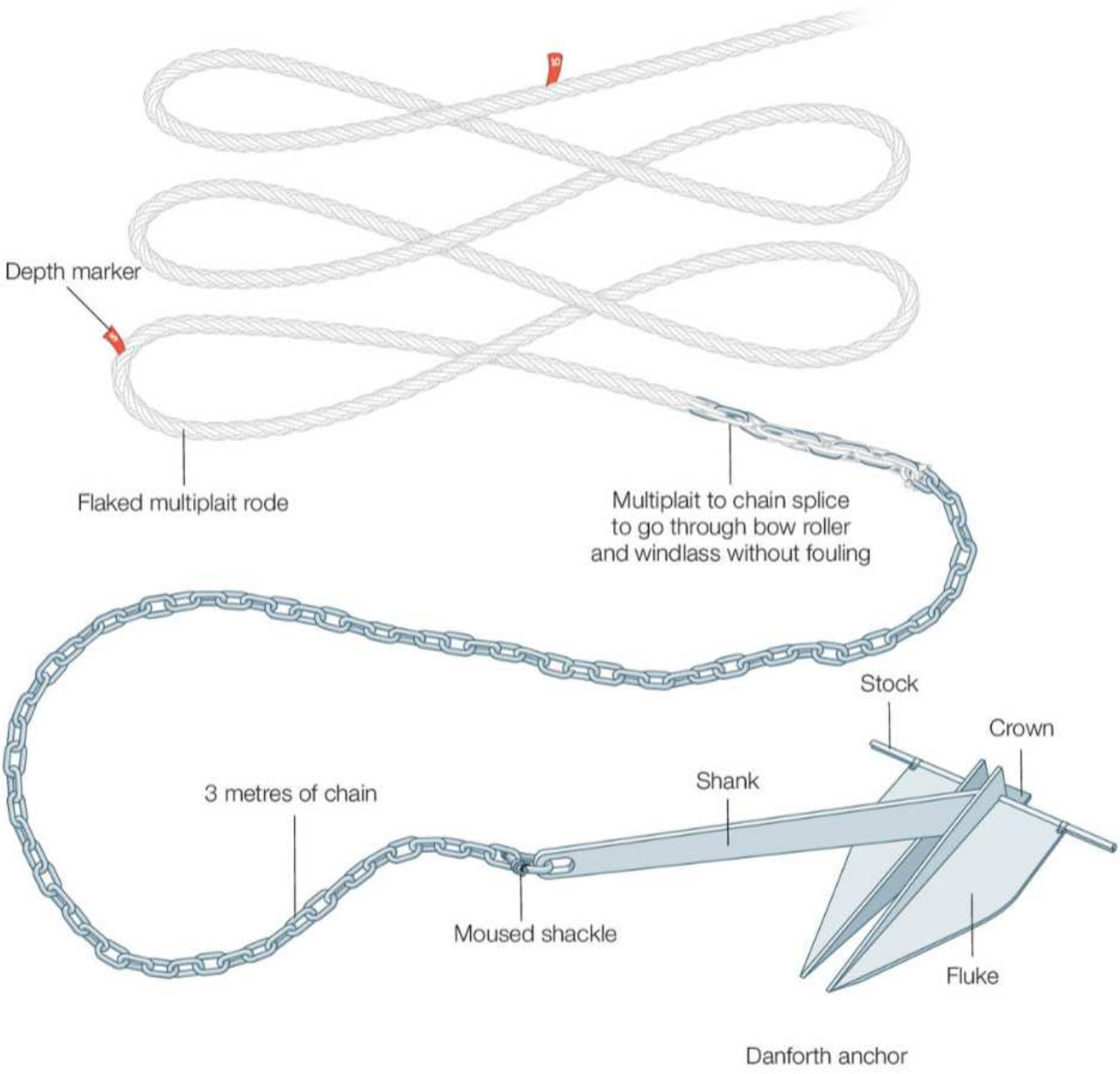
Traditional type. Good for rocky and weedy bottoms. Awkward to stow and poor holding power in sand and mud.



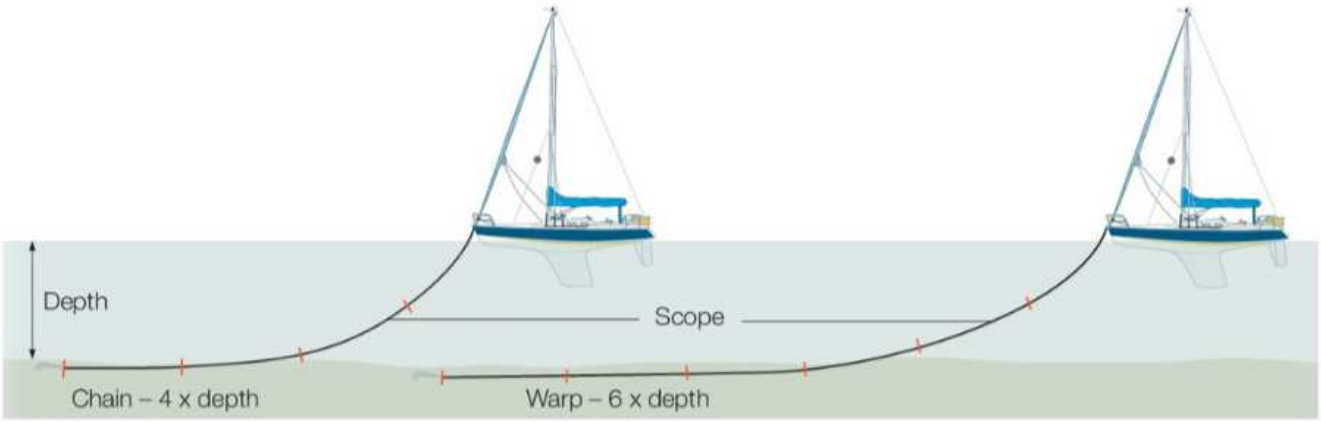
Grapnel

Normally quite light. Awkward to stow unless it's a collapsing model. Good in coral or rock. Poor in mud, clay or sand. Better suited to a tender than as a vessel's main anchor.

Anchoring Terminology

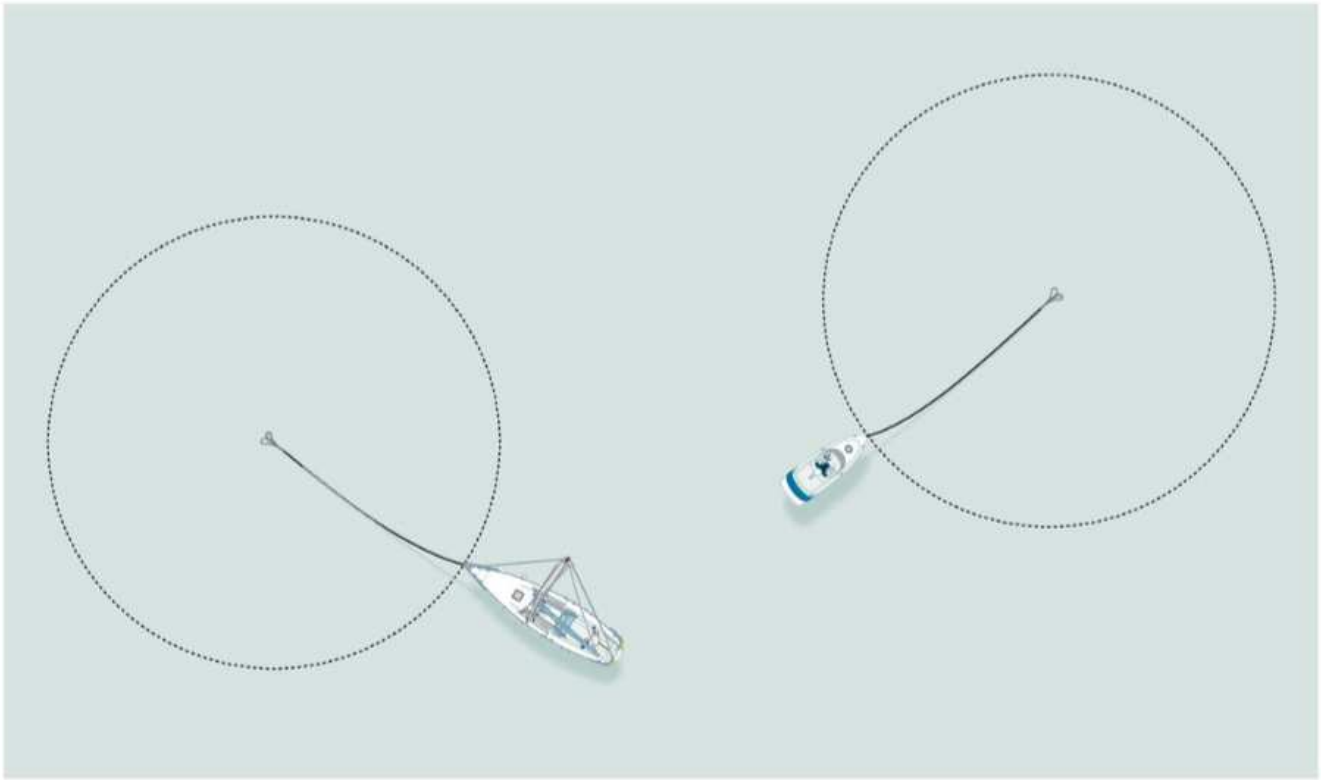


Danforth anchor



Scope

The scope of chain or warp you need depends on the maximum depth of water you expect during your stay.



Always allow enough swinging room to account for wind and tide. Bear in mind that light/flat-bottomed boats will lie differently to deeper draught/low windage boats.

Safety Equipment

As skipper you are responsible for the safety of your crew, the condition of your vessel and all equipment on board!

It is advisable to take training courses in first aid, navigation and how to fire flares. You should also have a basic knowledge of how to make running repairs to your vessel while at sea.

Working navigation lights conforming to correct specifications

Fire blanket in the galley – do not stow directly above the cooker

Soft wood bungs for plugging broken skin fittings and holes, and a wooden mallet. These should always be kept together

Extra warps can be very useful

Bucket with sponge, bailer and hand bilge pump (useful for confined spaces)

High-visibility sheet with the boat's name, for identification from the air

Spare water and fuel with funnel

Red hand flares, red parachute flares, orange pinpoint flares and orange buoyant smoke.
All should be contained within a waterproof polybottle with the lid on at all times.
This will keep flares dry and protect them from accidental ignition

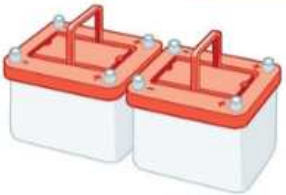
Comprehensive toolkit and sufficient knowledge, for safe use when making running repairs

Powerful searchlight

Various engine spares – impeller, fuel filters, belts etc

A lifejacket for each person on board

Harnesses for bad weather when you are on deck at night. Most modern lifejackets have built-in harnesses



Separate batteries to power domestics and engine on a split charging system

Bilge pump

A smoke alarm in each accommodation space

Fire extinguisher at the entrance of each accommodation space

Horseshoe lifebelt, drogue, floating light and danbuoy

Radar reflector

Floating rescue line at hand to be thrown quickly to anyone who has fallen into the water

Thermal protection aids

Comprehensive first aid kit and sufficient training for correct use in an emergency

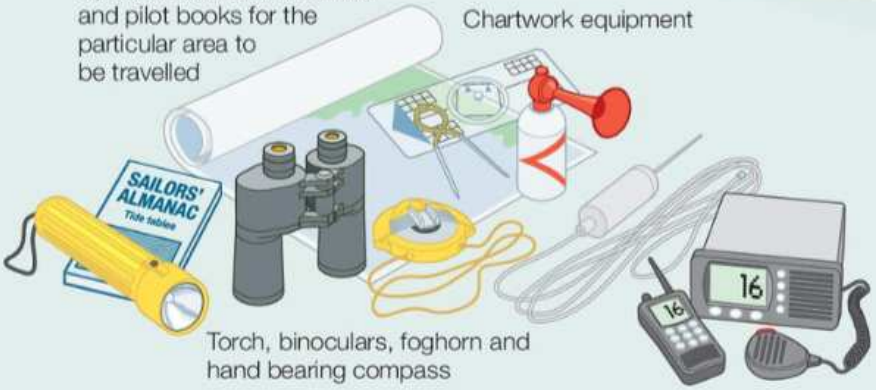
Liferaft

Tender and outboard with kill cord

Automatic fire extinguisher of sufficient capacity for the engine bay

Up-to-date charts, almanac and pilot books for the particular area to be travelled

Chartwork equipment



Torch, binoculars, foghorn and hand bearing compass

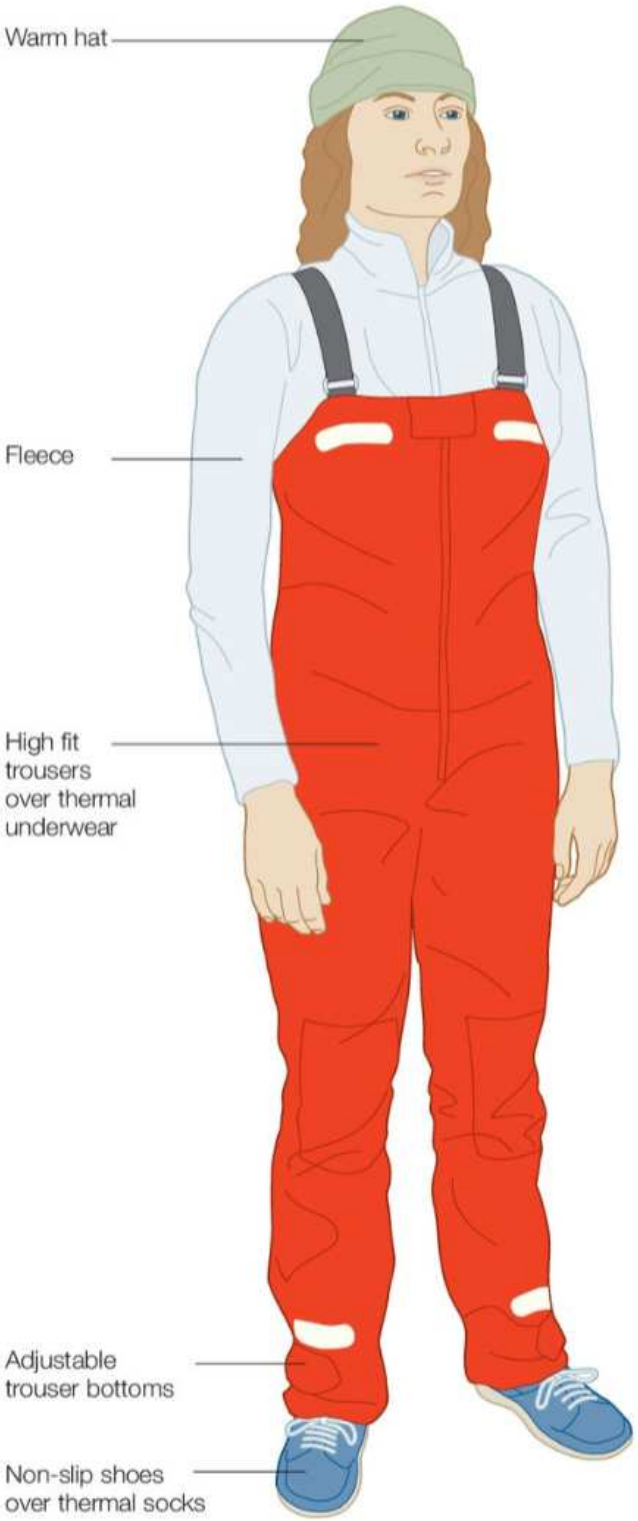
Fit a carbon monoxide detector

Fixed and handheld VHF sets with a licence and adequate training to use it properly. An emergency VHF aerial would also be a very wise precaution

Personal Safety and Comfort

Clothing

Man-made fibres layered to trap air for warmth. Avoid wearing cotton clothing underneath waterproofs.



Seasickness & Hypothermia

Stay warm and dry.

Eat and drink regularly.

Take or use seasickness remedies.

Symptoms of Seasickness

Lethargic/disinterested. Pale colour.

Symptoms of Hypothermia

Shivering, pale colour, irrational behaviour, disorientated.

Sun Protection

Ultraviolet rays are harmful, may cause skin cancer and impair vision.

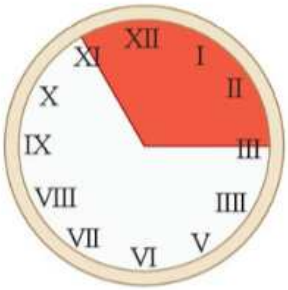
Reflection from the water increases the effect of the sun.

Wear a wide-brimmed hat and/or one with neck protection. Use sunglasses with 100 per cent UV protection.

Regularly apply sunblock of SPF 30–40.

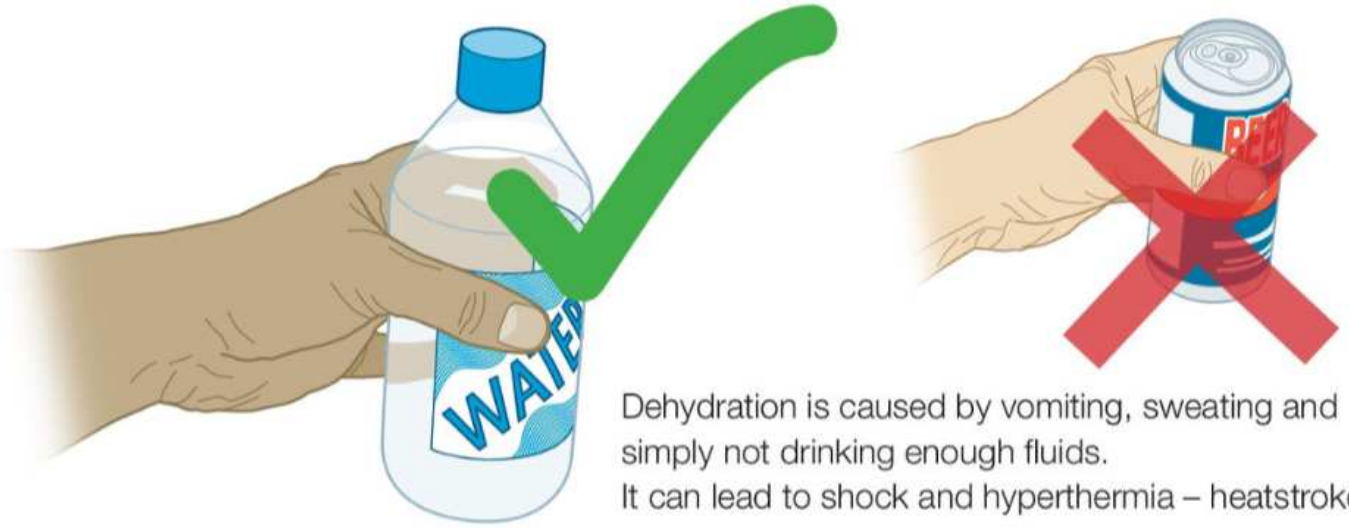
Wear loose, long-sleeved shirts and trousers.

Try to avoid exposure between 11 a.m. and 3 p.m. Take a long lunch and seek shade. Biminis and cockpit tents are ideal shelters.



Babies and toddlers are especially susceptible to UV damage. Keep them out of the sun or well protected.

Wear shoes to protect feet from hot decks and stubbing toes.



Dehydration is caused by vomiting, sweating and simply not drinking enough fluids.
It can lead to shock and hyperthermia – heatstroke.

Dehydration Symptoms

Mild: Thirst, dry lips, dark urine colour. Remedy: Rehydrate using water and/or with an oral rehydrating solution.

Moderate: Partial heatstroke. Very dry mouth, sunken eyes, skin loses elasticity. Remedy: Rehydrate casualty under close supervision and seek medical guidance.

Severe: Heatstroke. All of above plus rapid, weak pulse, rapid breathing, confusion, lethargy. Remedy: Get medical help quickly and rehydrate.

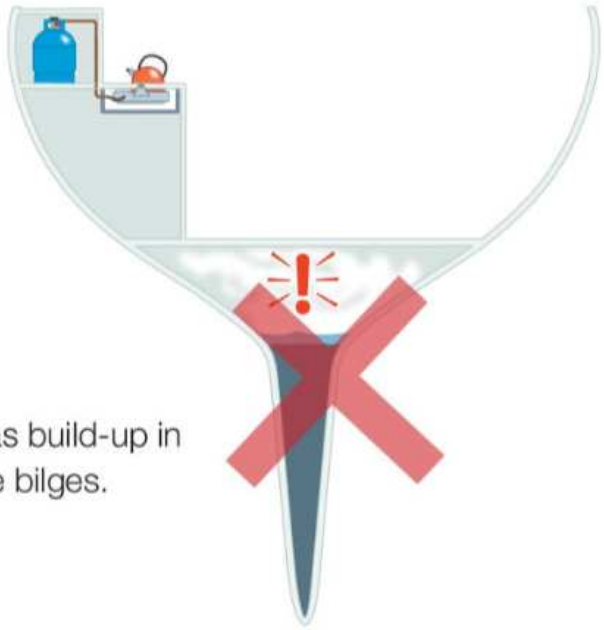
DON'T EXCEED THE ALCOHOL LIMIT.

Fire Safety

Common Causes of Fire

Smoking below decks.

Solvents/paints stored below.



Gas build-up in the bilges.

Faulty wiring.

Cooking fats.

Extinguishers

	Class A Fires (Paper, wood etc.)	Class B Fires (Flammable Liquids)	Class C Fires (Flammable Gas Fires)	Class D Fires (Metal Fires)	Class E Fires (Electrical Fires)
Foam (Cream)	✓	✓			✗
CO_2 (Black)		✓ (Secondary)			✓ (Primary)
Powder (Blue)	✓	✓	✓	✓	✓

Blanket – good for smothering flames and if clothing is on fire.

Petrol/Gasoline Vapour

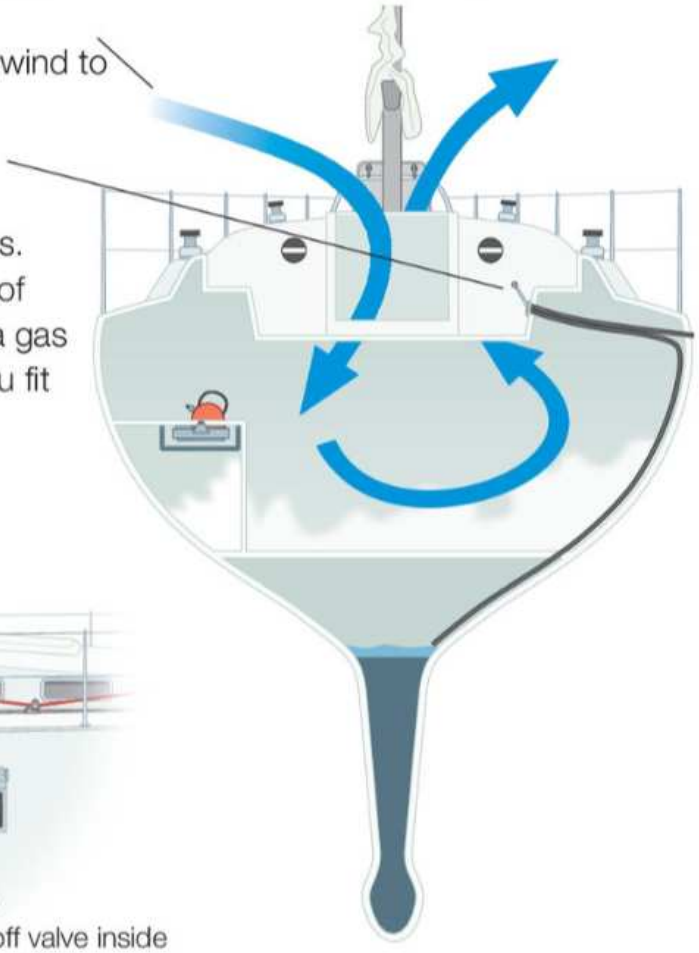
Always vent engine space before starting an inboard petrol engine.

Keep outboards on deck to avoid the build-up of petrol vapour below.

Gas Safety

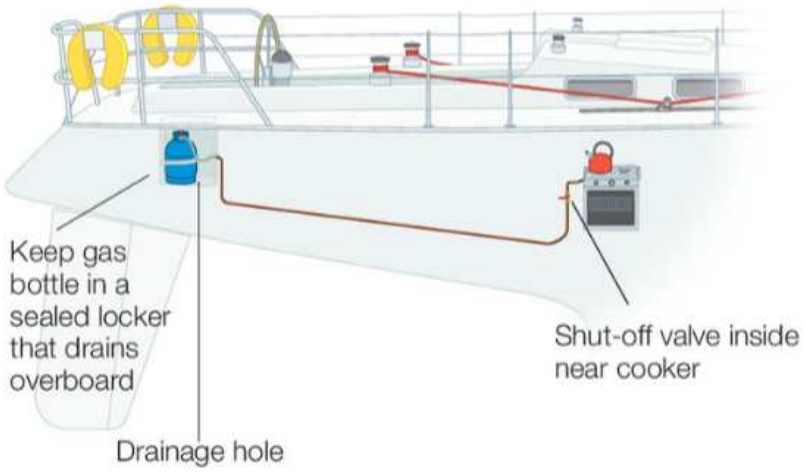
Butane and propane can be highly dangerous.

To clear gas, open hatches and turn downwind to vent fresh air through the boat.



Bilge pumps are designed to pump water, but may be effective for low volumes of gas. Many won't clear gas very effectively. Use of electric bilge pumps should be avoided if a gas leak is suspected. We recommend that you fit a gas sensor and test it regularly.

Don't attempt DIY repairs to your system. Always call in a qualified fitter.



Carbon Monoxide

All cooking and heating appliances can produce carbon monoxide if not properly ventilated.

Carbon monoxide poisoning can be deadly. The first signs are headaches, tiredness, sickness, and dizziness. It is recommended that you fit a carbon monoxide detector and test it regularly.

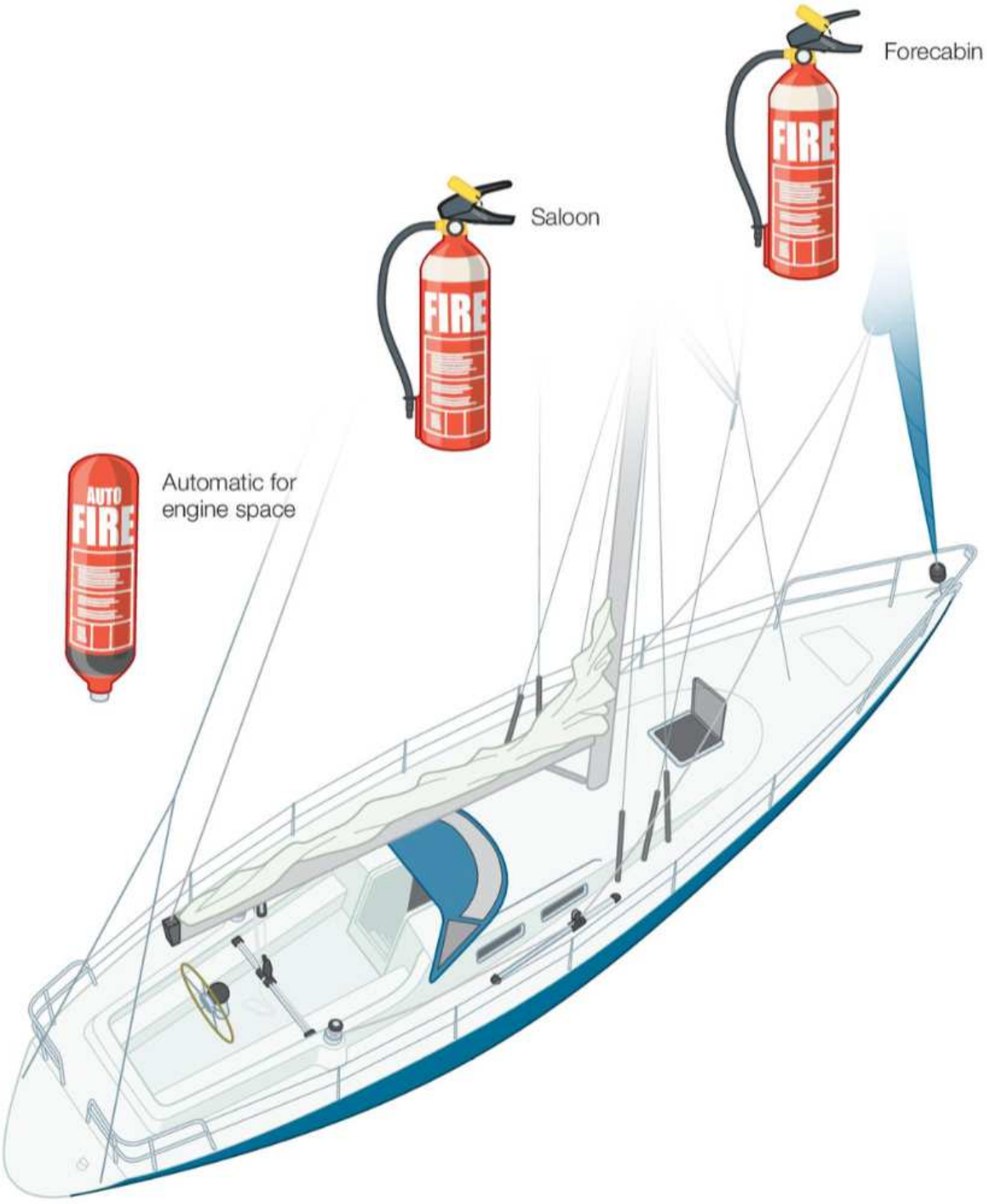
To ensure adequate ventilation throughout the cabin, make sure that any ventilators are clear of obstructions.

Fire Fighting

Location of Extinguishers

Extinguishers should be to hand near the exit to each accommodation space.

The engine space should have its own dedicated extinguisher which is automatic or can be activated remotely without having to open the engine compartment and let in oxygen.



Fighting the Fire

Aim the extinguisher at the base of the flames.

Splashing water from a bucket can be more effective than throwing its entire contents at once.

Fire blankets can be used to smother a galley fire. Protect your hands when using a fire blanket.

They are also essential for clothing fires.

If you cannot fight the fire, be prepared to abandon ship.

Remember: The boat will fill up with smoke very quickly. Get everyone on deck with a lifejacket. You may have to send a Mayday/fire distress flares etc.

Emergency Procedures

Boating is generally a safe pastime but, should the worst happen, make sure you and your crew know what to do.

If you are not already wearing one, put on a lifejacket.

Alert the coastguard.

Use a pinpoint flare (night) or an orange smoke (day).

ABANDONING TO THE LIFERAFT

Throw to leeward and tug painter to inflate. Make sure the painter is tied on.

Board raft from the yacht. Stay dry. Put heaviest, strongest crew in first to stabilise the raft and assist others in boarding.

Once aboard:

- Cut painter
- Paddle away
- Stream drogue
- Close door
- Take seasickness tablets
- Keep as warm and dry as possible
- Ventilate interior every hour.

Cold Shock

1 You will most likely gasp for air, then breathe rapidly. You can only hold your breath for a few seconds – protect your airway from waves and spray.

2 Your heart will be working harder, so don't try to swim – just relax!

3 The effects will be at their worst in the first 30 seconds but will have gone within three minutes.

4 Being prepared for this to happen so that you don't panic will greatly reduce the risk.

Emergency Services

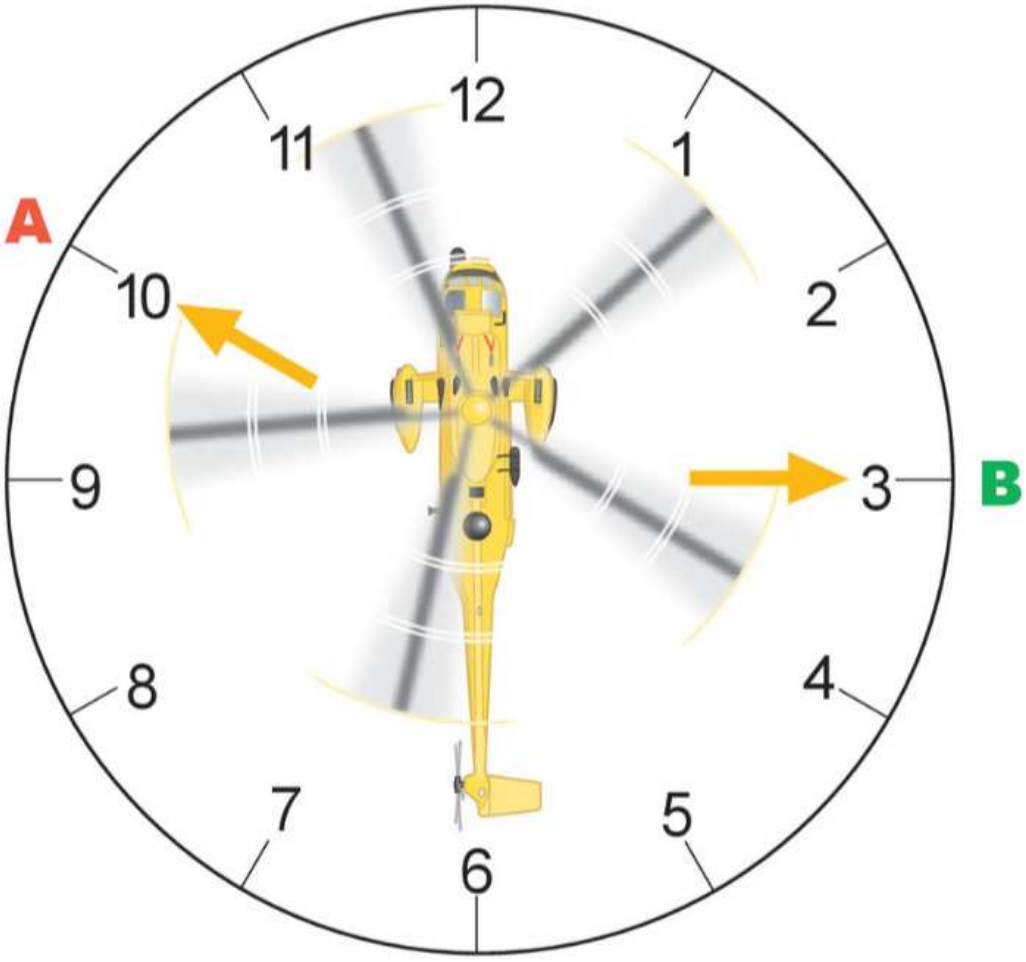
RESCUE

The lifeboat coxswain will need to talk to you to assess the situation.

Make sure there are no lines in the water which could foul the lifeboat's propeller.

Any casualties will be taken off.

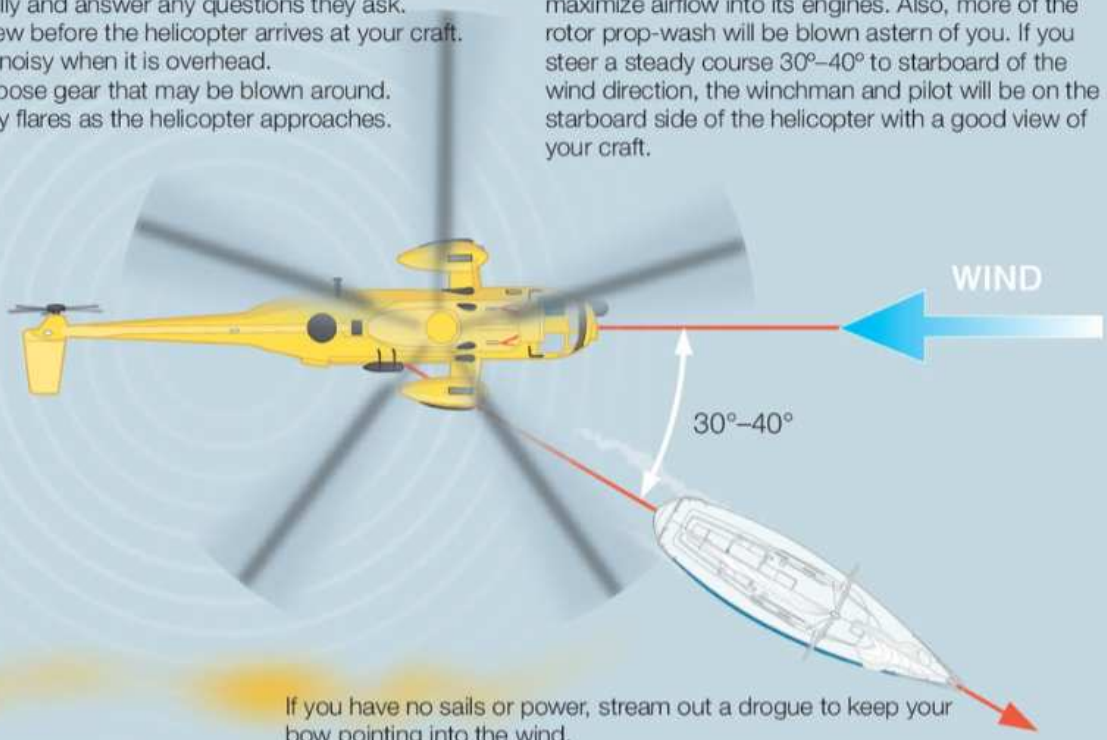
You may be taken in tow but the lifeboat's priority is to save lives, not salvage boats. Attach tow line to strong points via a bridle.



You will probably see or hear the helicopter before they see you. Call them on *VHF Channel 16* and give them your position and distance, *in relation to the helicopter*, using the clock notation above (for example, if you were 'A', "I am at your 10 o'clock" or 'B' "I am at your 3 o'clock"), even if you have triggered an EPIRB for them to home in on. Use a pinpoint flare (at night) or orange smoke (daytime) for them to locate your position from a distance once they know which direction to look.

The helicopter crew will contact you back on the VHF radio.
Listen carefully and answer any questions they ask.
Brief your crew before the helicopter arrives at your craft.
It will be too noisy when it is overhead.
Secure any loose gear that may be blown around.
Never fire any flares as the helicopter approaches.

By facing into the wind the helicopter will be able to maximize airflow into its engines. Also, more of the rotor prop-wash will be blown astern of you. If you steer a steady course 30°–40° to starboard of the wind direction, the winchman and pilot will be on the starboard side of the helicopter with a good view of your craft.



If you have no sails or power, stream out a drogue to keep your bow pointing into the wind.
If you are running before the wind in high winds with big waves and cannot turn round, it is possible for the helicopter to fly backwards and execute a fore-deck pick up. Keep the helicopter informed of all changes in your situation. They have done this hundreds of times in training exercises and for real. They are the experts so listen to them and don't panic.

Methods may vary depending on the country and organisation. Some lower rescue cages and some recommend reefing rather than lowering the mainsail.

Raising the Alarm

VHF VOICE CALL

Use VHF to alert the coastguard and other vessels in your area. You must tell them:

- Your boat's name
- Your position
- How many people are on board
- What assistance you require.

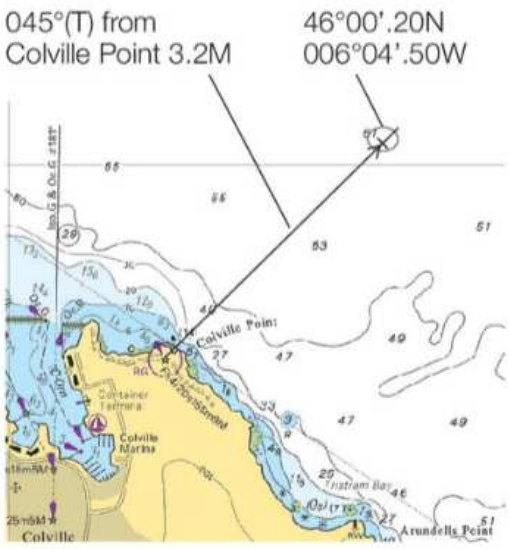
VHF is better than a mobile phone for distress calling. Other vessels in your area will hear your call and the coastguard can use VHF transmissions to fix your position.

A mobile phone will only tell one person that you are in trouble. The network coverage is patchy away from land and you won't be able to talk directly to a helicopter or lifeboat.

DIGITAL VHF (DSC) CALL

You may not have time to send a voice call but some modern VHF sets can:

- Send a distress alert or urgency call at the press of a button
- Be linked to a GNSS to give your position.



MAYDAY

When life or vessel are in grave and imminent danger.

Mayday x 3

This is... (yacht name spoken three times)

(Call sign and MMSI number (if you have DSC))

Mayday

(Yacht name, call sign and MMSI number)

Position is... (Give position in either latitude and longitude or distance and bearing from a charted object)

Nature of distress (Describe briefly what the problem is, for example sinking, MOB, boat on fire, stranded)

I require immediate assistance

Further information (Anything that may help rescuers, such as number of people on board (including yourself), abandoning to liferaft, triggered EPIRB, etc.)

Over (the invitation to reply)

PAN PAN

Urgency message – if crew or vessel needs assistance.

Pan Pan (Three times)

All stations (Three times)

This is... (name of boat x 3 (call sign + MMSI if fitted with DSC))

Position is... (Give position in latitude and longitude or distance and bearing from a charted object)

Nature of problem (e.g. broken down and in need of a tow)

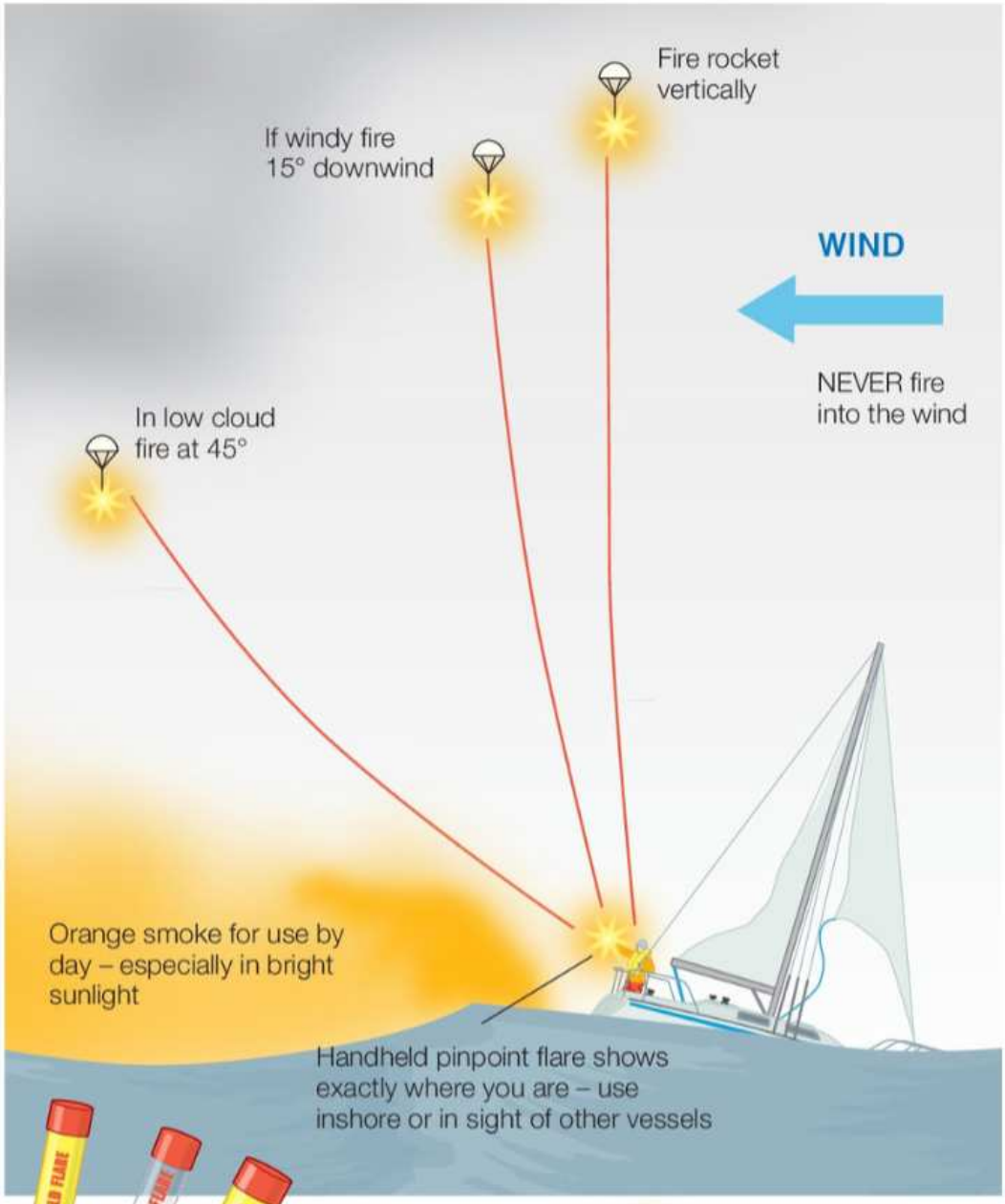
Number of persons on board (including yourself)

Over

You may use a VHF radio under the supervision of a qualified person or to make a distress call – otherwise you need an operator's certificate, such as the RYA Marine Radio Short Range Certificate (SRC). Visit the RYA website or contact your national maritime authority for details of courses.

FLARES

Never fire a parachute rocket if a helicopter is approaching.

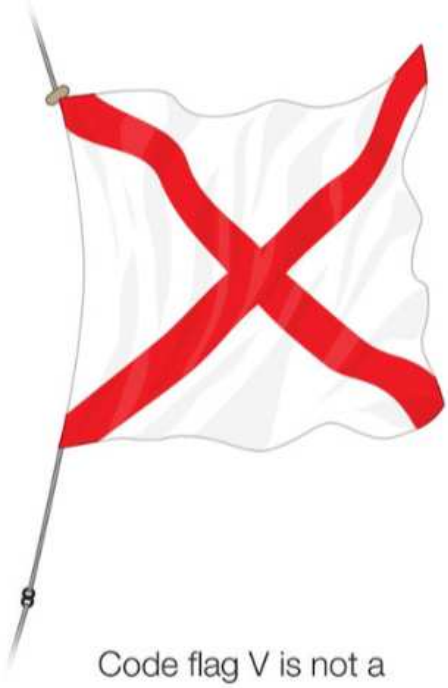


Hold at arm's length downwind.
Don't look directly at the flare.

Other Distress Signals

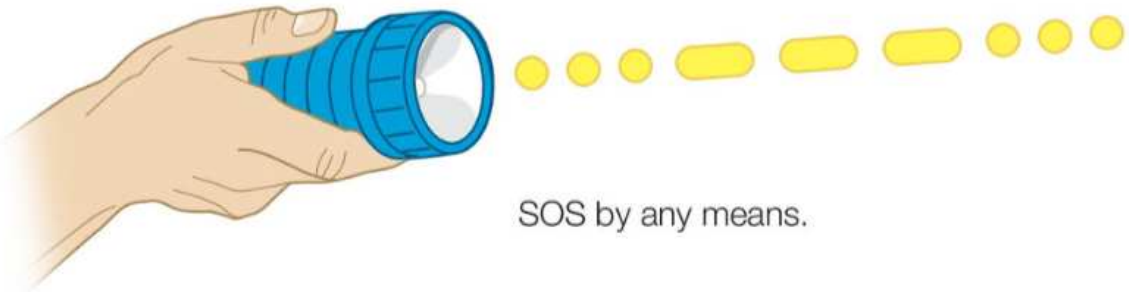
Raising and lowering arms.

Fly a ball over a square.



Code flag V is not a distress signal but means 'I require assistance.'

Continuous sounding of the fog horn.



SOS by any means.

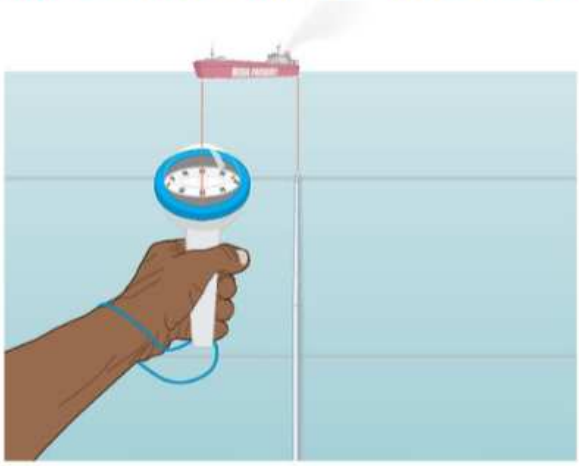
Rules of the Road

A proper lookout by sight and sound should be kept at all times.

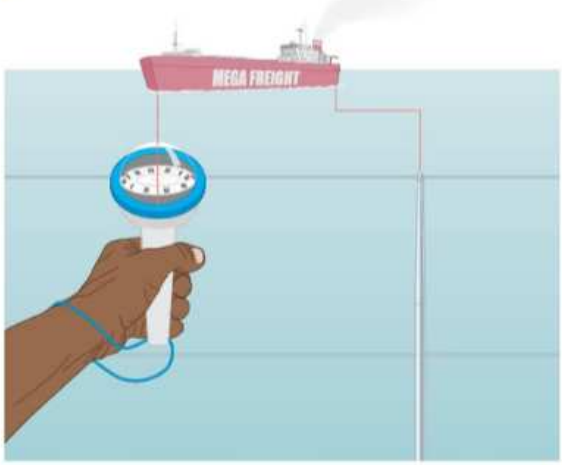
Beware of blind spots caused by sails/ sprayhoods/dodgers etc.

Proceed at a safe speed and beware of faster vessels overtaking.

How can we tell if a risk of Collision Exists?



While on a steady course, take a bearing of the ship or line it up with a part of your boat/vessel such as a stanchion or stay.

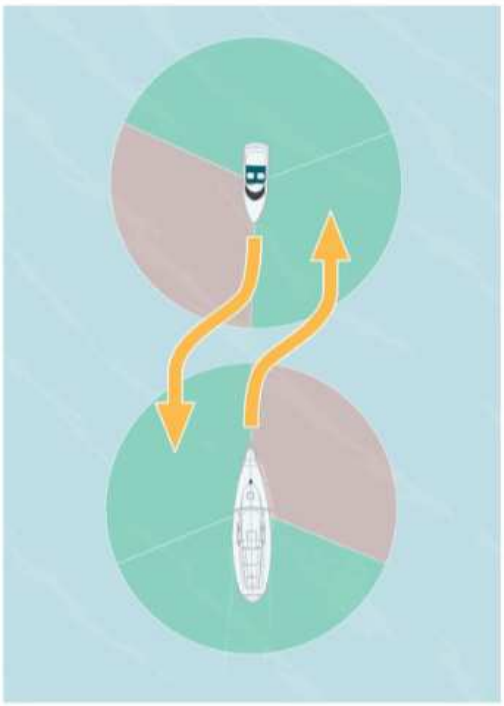


If the bearing of the ship changes or moves in relation to your stanchion there will not be a collision.

If the bearing stays steady or the ship remains lined up with your stanchion, a risk of collision exists.

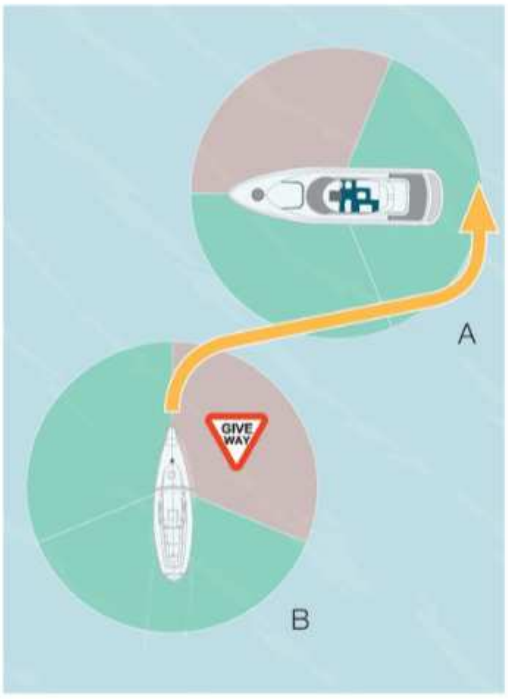
WHO GIVES WAY?

Head-on Situation



Both vessels turn to starboard.

Crossing Situation

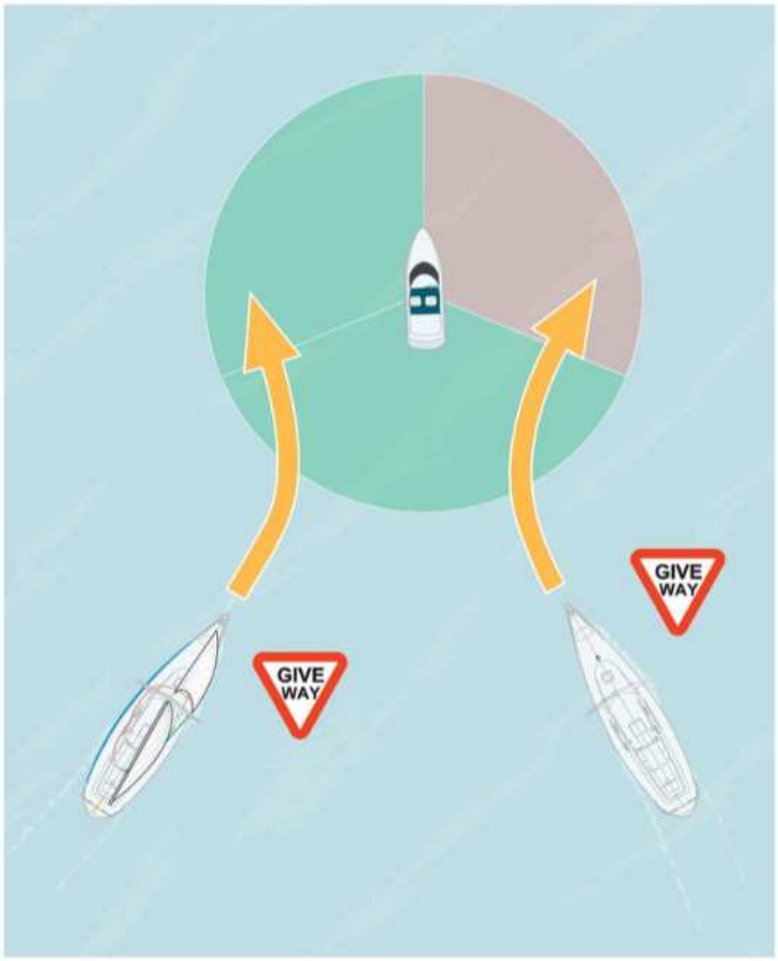


A is on the starboard side of B. B gives way to A.

Overtaking Situation

Stand-on vessels must keep a steady course and speed.

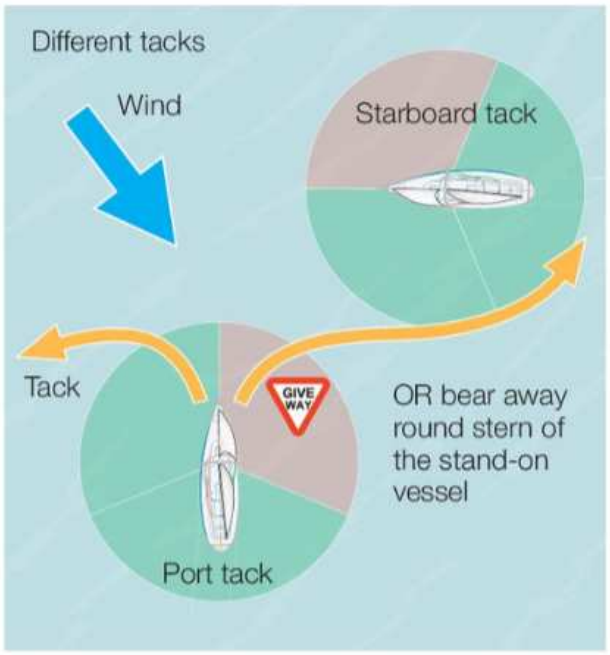
Any vessel (power or sail) in this sector must give way to the vessel being overtaken.



Give-way vessels must make their intentions clear by making an early, bold alteration of course.

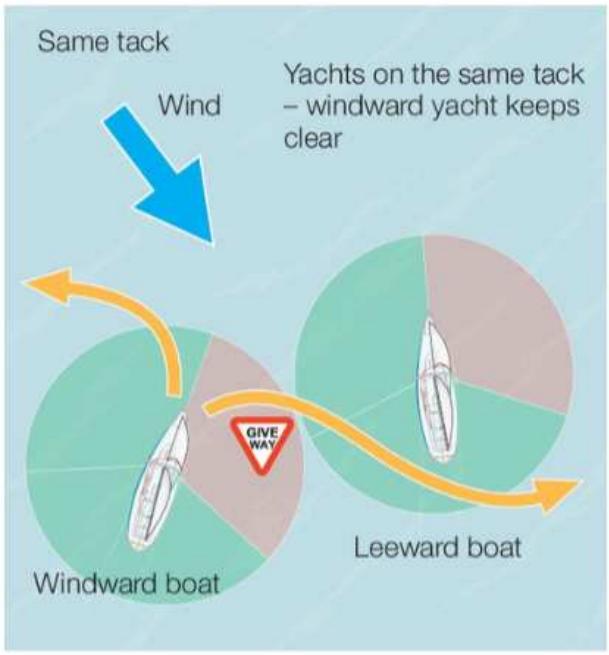
SAILING VESSELS

Port/Starboard Situation



Port tack always keeps clear whatever the point of sailing, or must bear away round stern of stand-on vessel.

Yachts on Same Tack



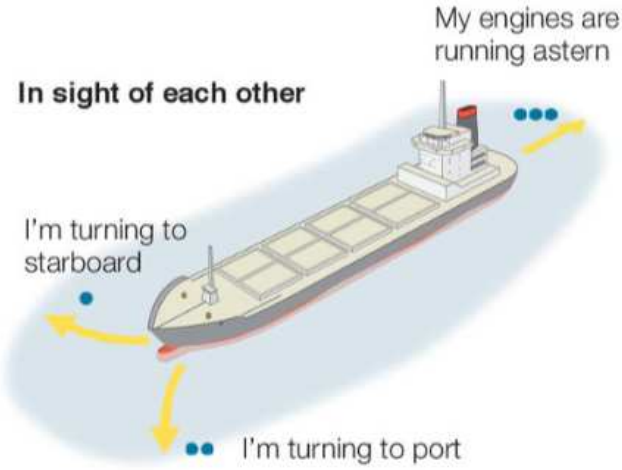
SOUND SIGNALS

In fog

Vessel under sail, making way

Power-driven vessel, making way

In sight of each other

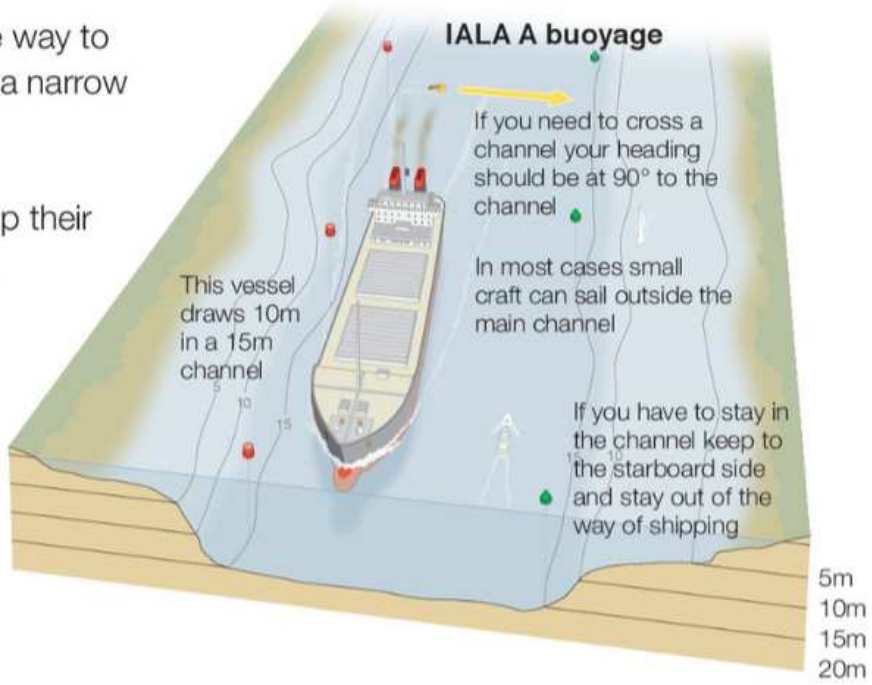


NARROW CHANNELS

Power does not necessarily give way to sail when both are navigating in a narrow channel.

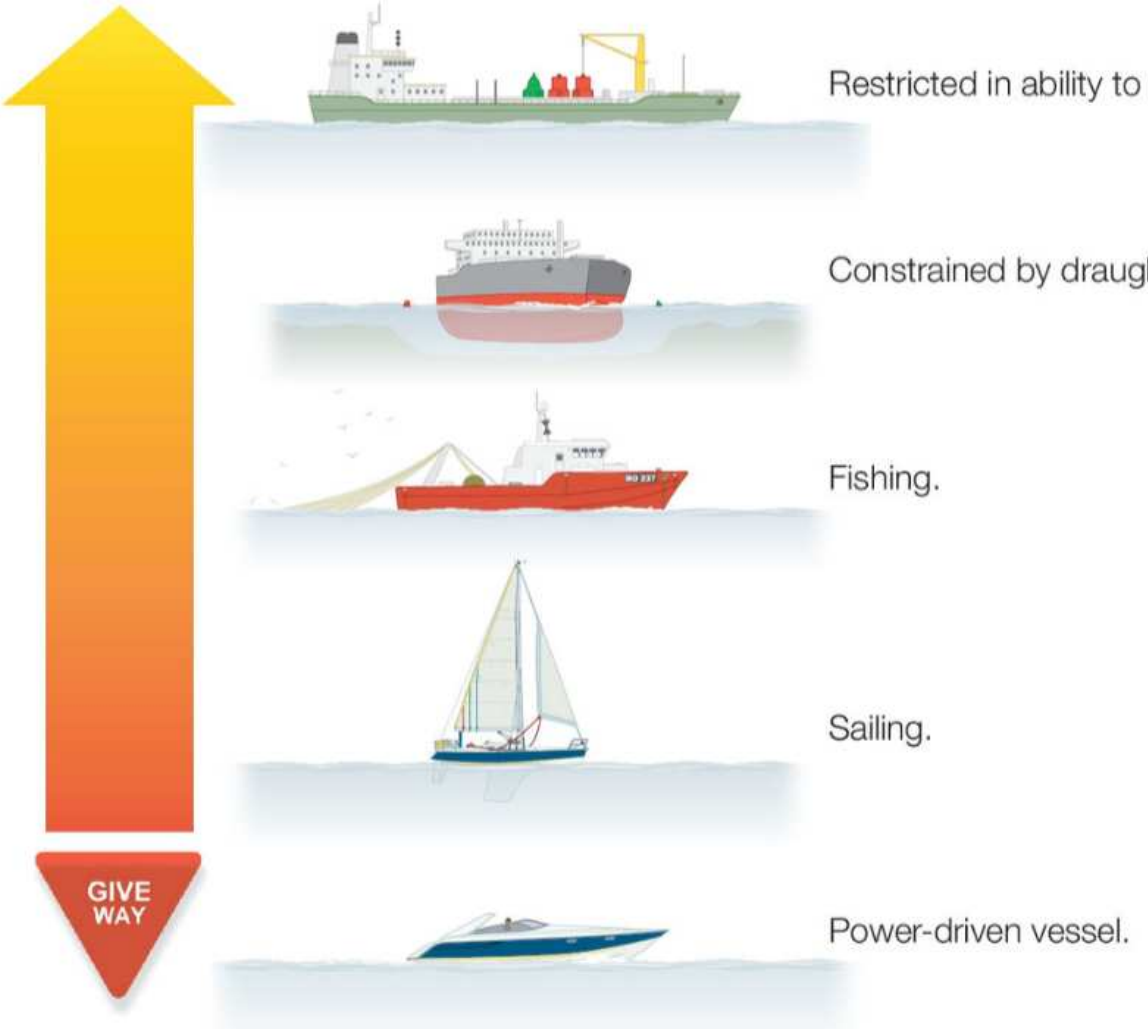
Larger vessels rely on keeping up their speed to be able to manoeuvre. Don't impede them.

Avoid anchoring in a channel.



IN ORDER OF PRIORITY

The International Regulations for the Prevention of Collisions at Sea (IRPCS) is mostly common sense – a more manoeuvrable vessel must not impede a less manoeuvrable one.

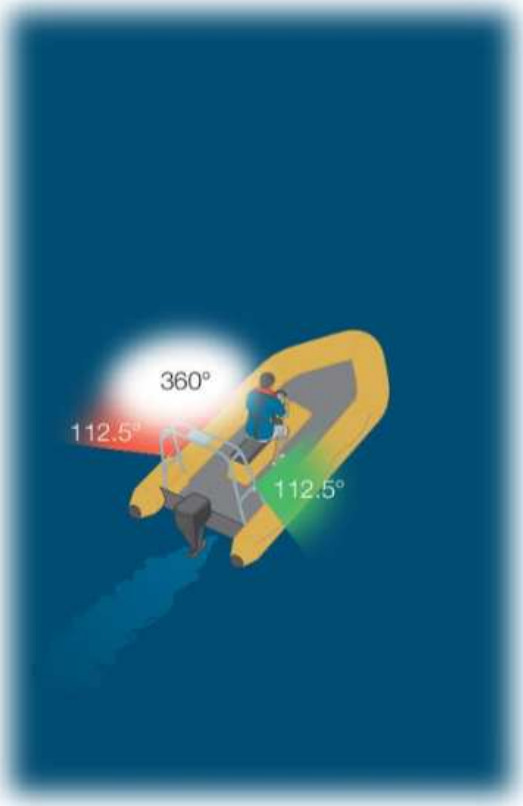


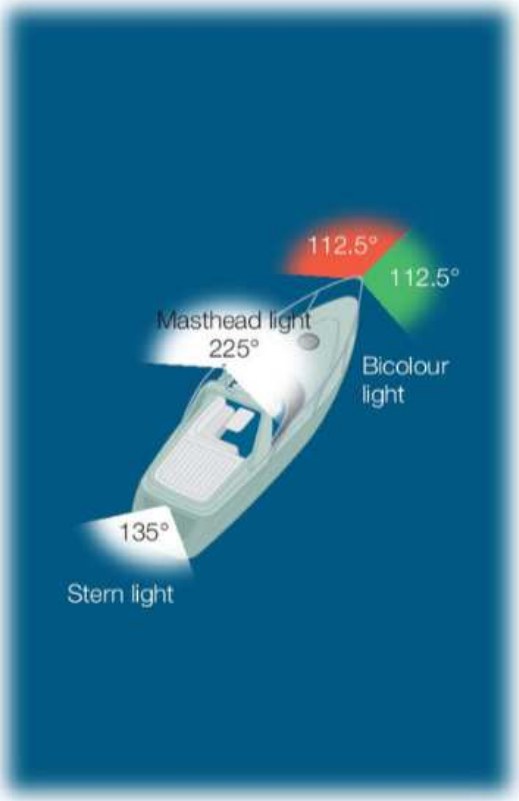
Lights and Shapes

UNDER SAIL

Less than 20m

POWER-DRIVEN VESSELS

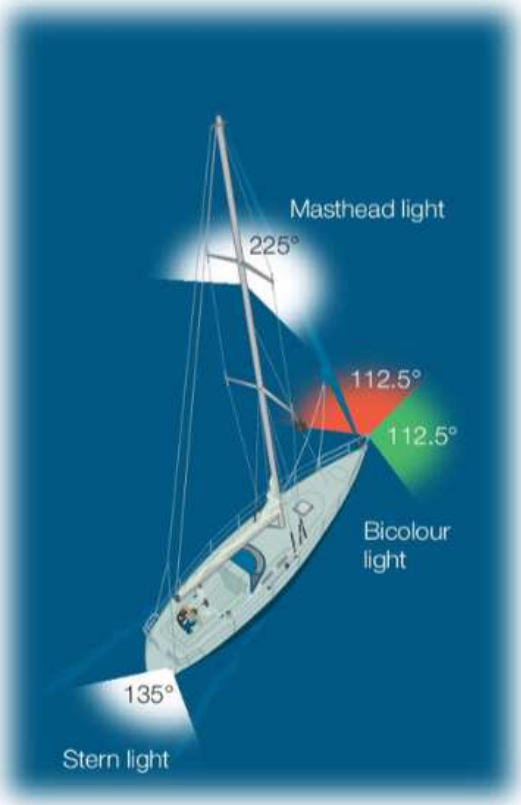


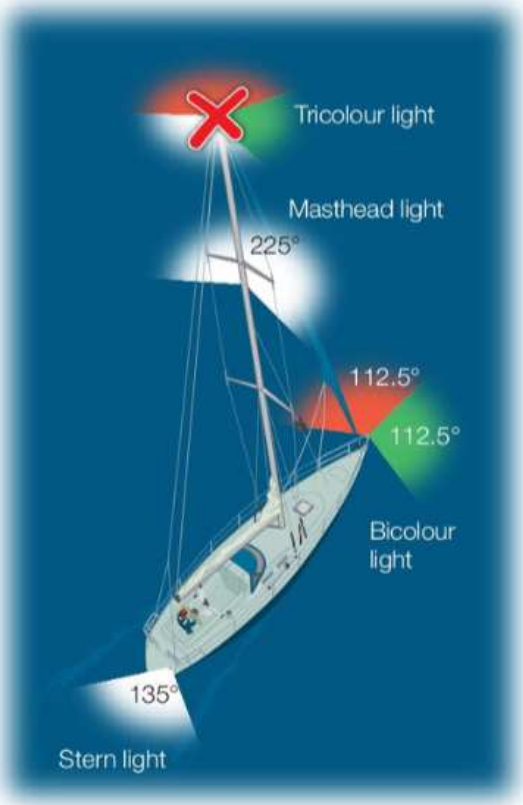


SAILING VESSEL UNDER POWER

By Day

At Night



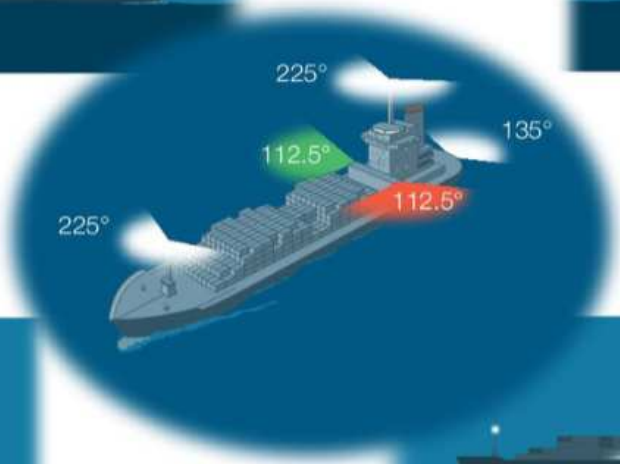


Larger ships (over 50m) must have two masthead lights.

TOUCH DIAGRAM

Starboard view.

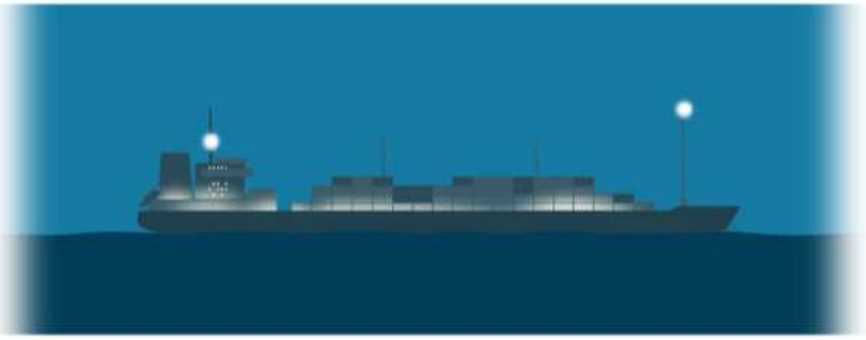
From ahead.



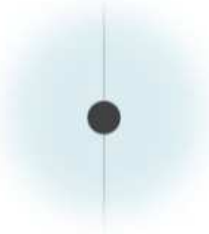
From astern.

Port view.

For a full explanation of collision regulations see the book G2 RYA International Regulations for Preventing Collisions at Sea.

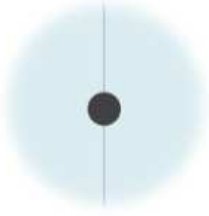


At Anchor.

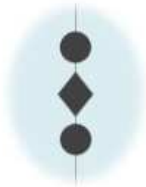


By day.

At Anchor.



By day.



By day.

Restricted in ability to manoeuvre.

By day.

Carrying out underwater work.

By day.

Constrained by draught.

By day.

Fishing by trawling.

By day.

Other types of fishing.

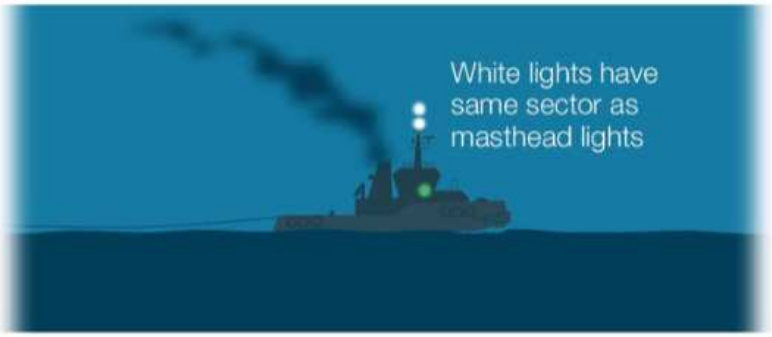
TOUCH DIAGRAM

By day.

Towing – over 200m.

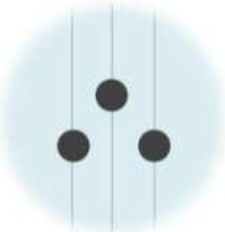
By day.

Towing – from astern.



Towing – under 200m.

Minesweeping.

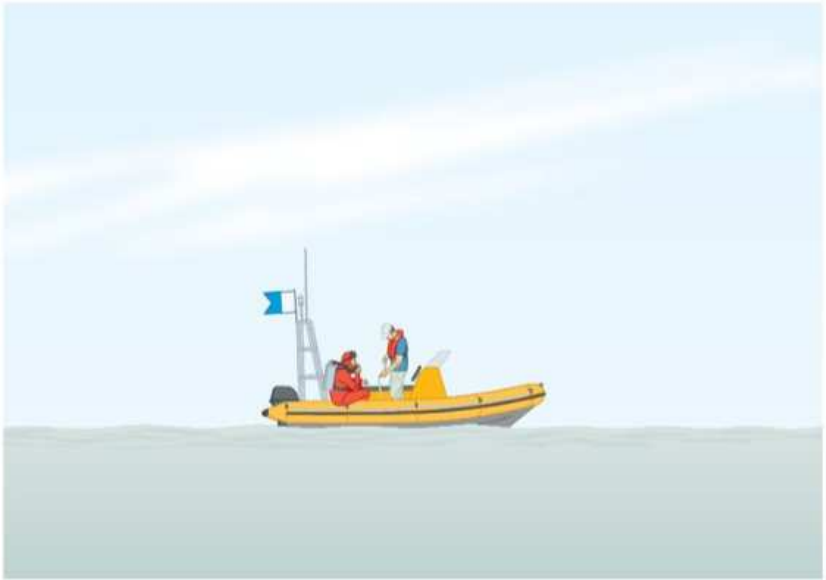


By day.

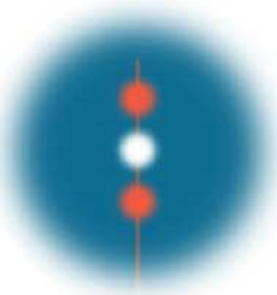
Air cushion vessel.

On pilot duty.

By day.

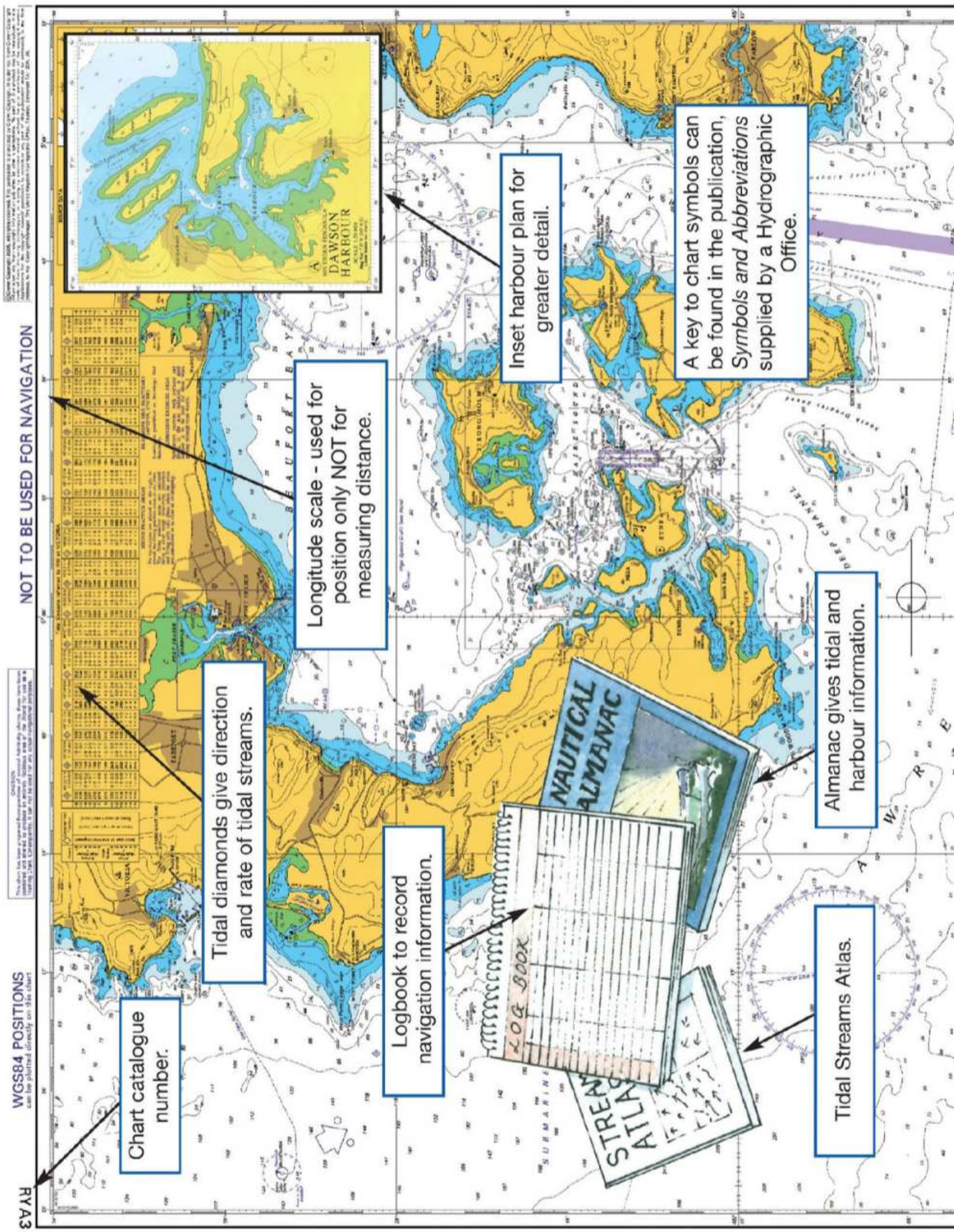


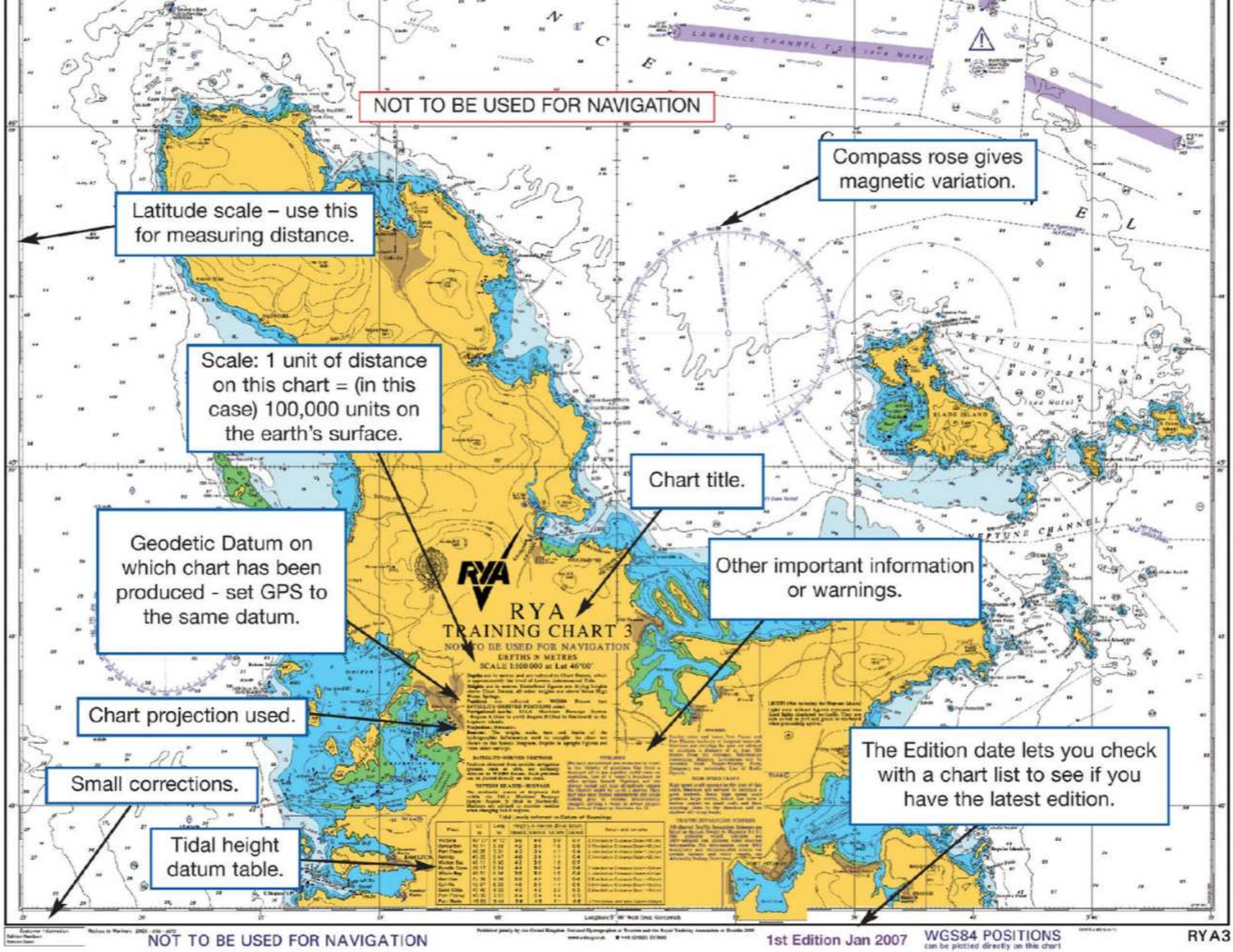
Diving.



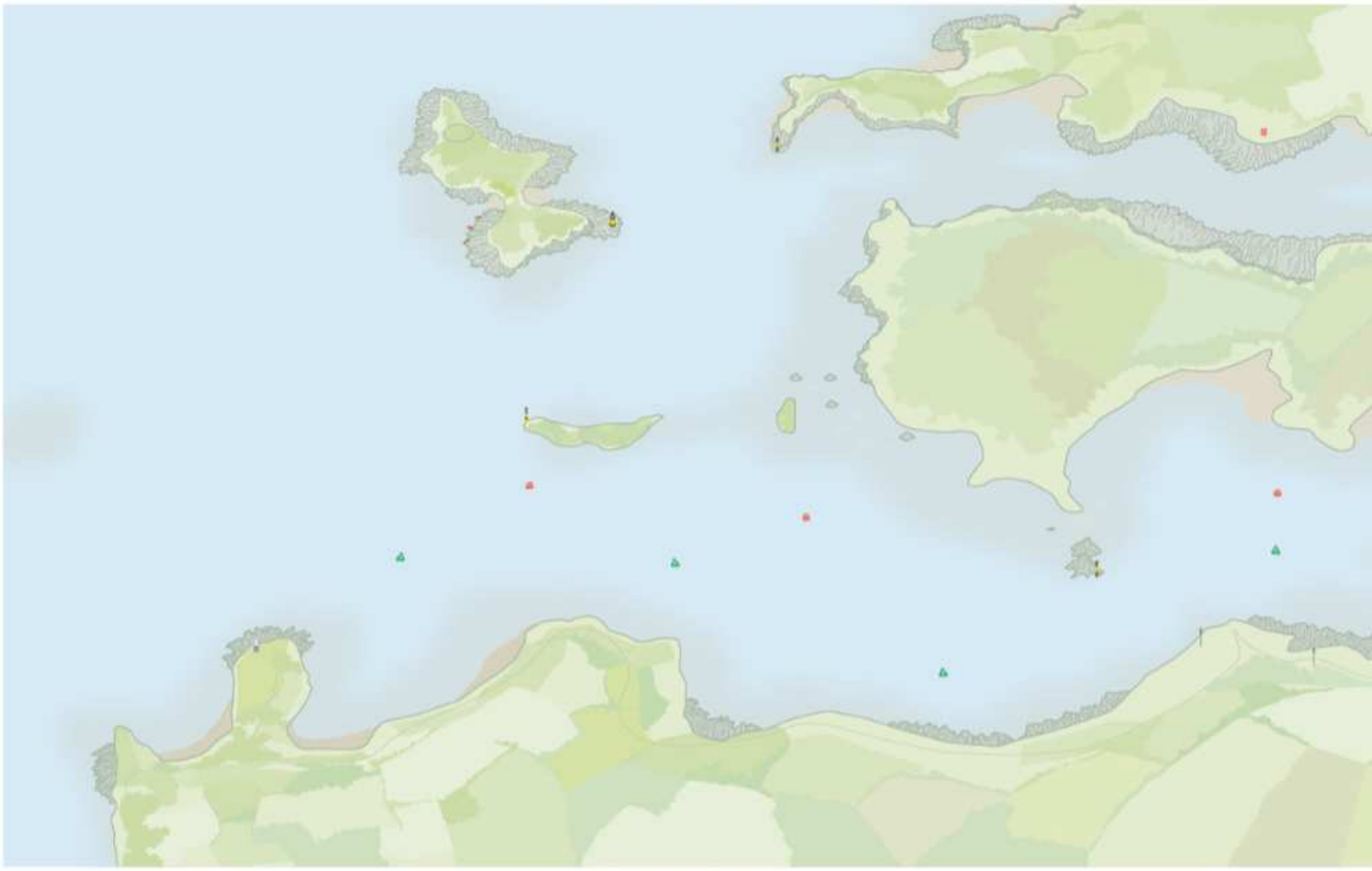
By day.

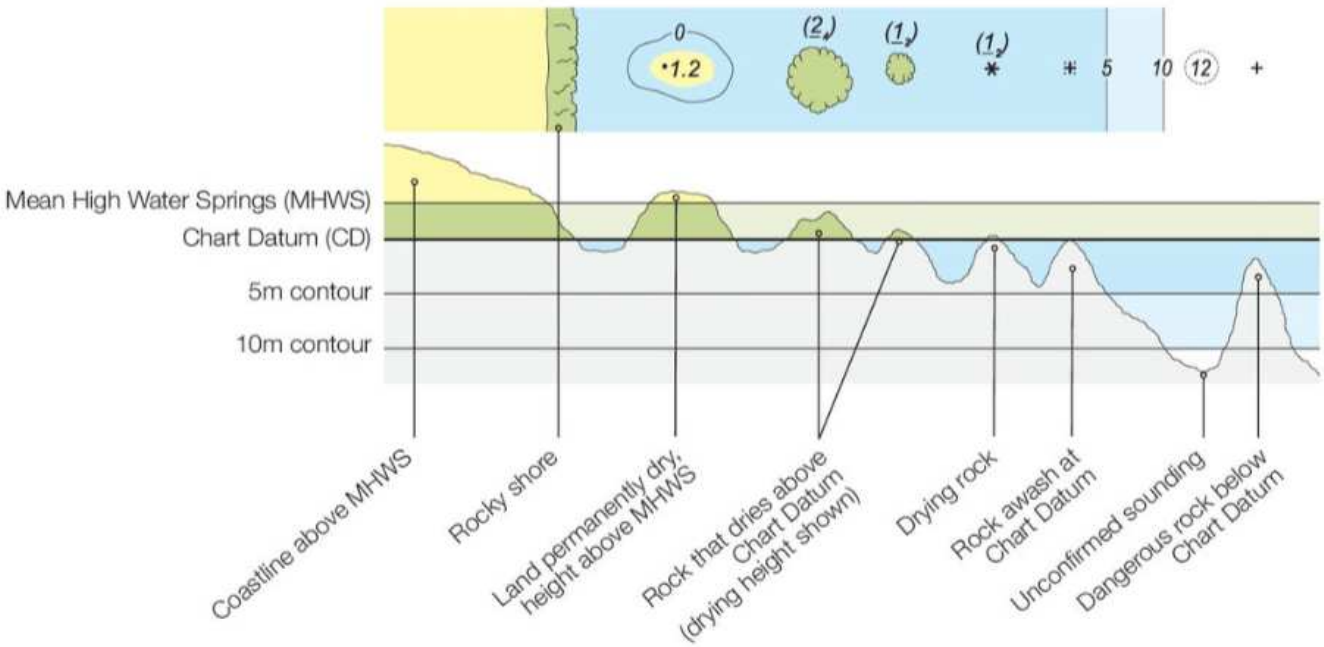
Chart Features




NOT TO BE USED FOR NAVIGATION
Compass rose gives magnetic variation.
Latitude scale – use this for measuring distance.
Scale: 1 unit of distance on this chart = (in this case) 100,000 units on the earth's surface.
Chart title.
Geodetic Datum on which chart has been produced - set GPS to the same datum.
Other important information or warnings.
Chart projection used.
Small corrections.
Tidal height datum table.
The Edition date lets you check with a chart list to see if you have the latest edition.
RYA
TRAINING CHART 3
NOT TO BE USED FOR NAVIGATION
DEPTHS IN METRES
SCALE 1:100 000 at Lat 46°00'
NEPTUNE CHANNEL
NEPTUNE ISLANDS
BLADE ISLAND
NOT TO BE USED FOR NAVIGATION
1st Edition Jan 2007
WGS84 POSITIONS
can be plotted directly on this chart
RYA3

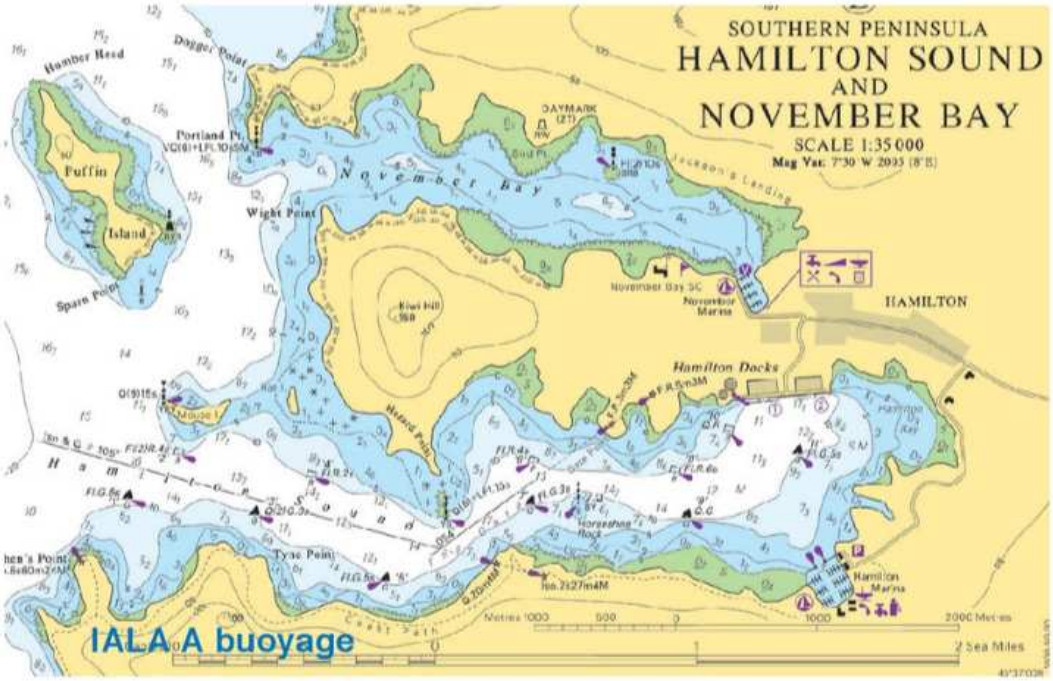
Interpreting Charts





Like land maps, charts use symbols to show useful and important features. Information is chosen carefully to show hazards clearly and to help identify features that are visible from a boat at sea.

Symbols and abbreviations published by a hydrographic office can be used to identify features and symbols on the chart (IALA A Buoyage).



IALA A buoyage

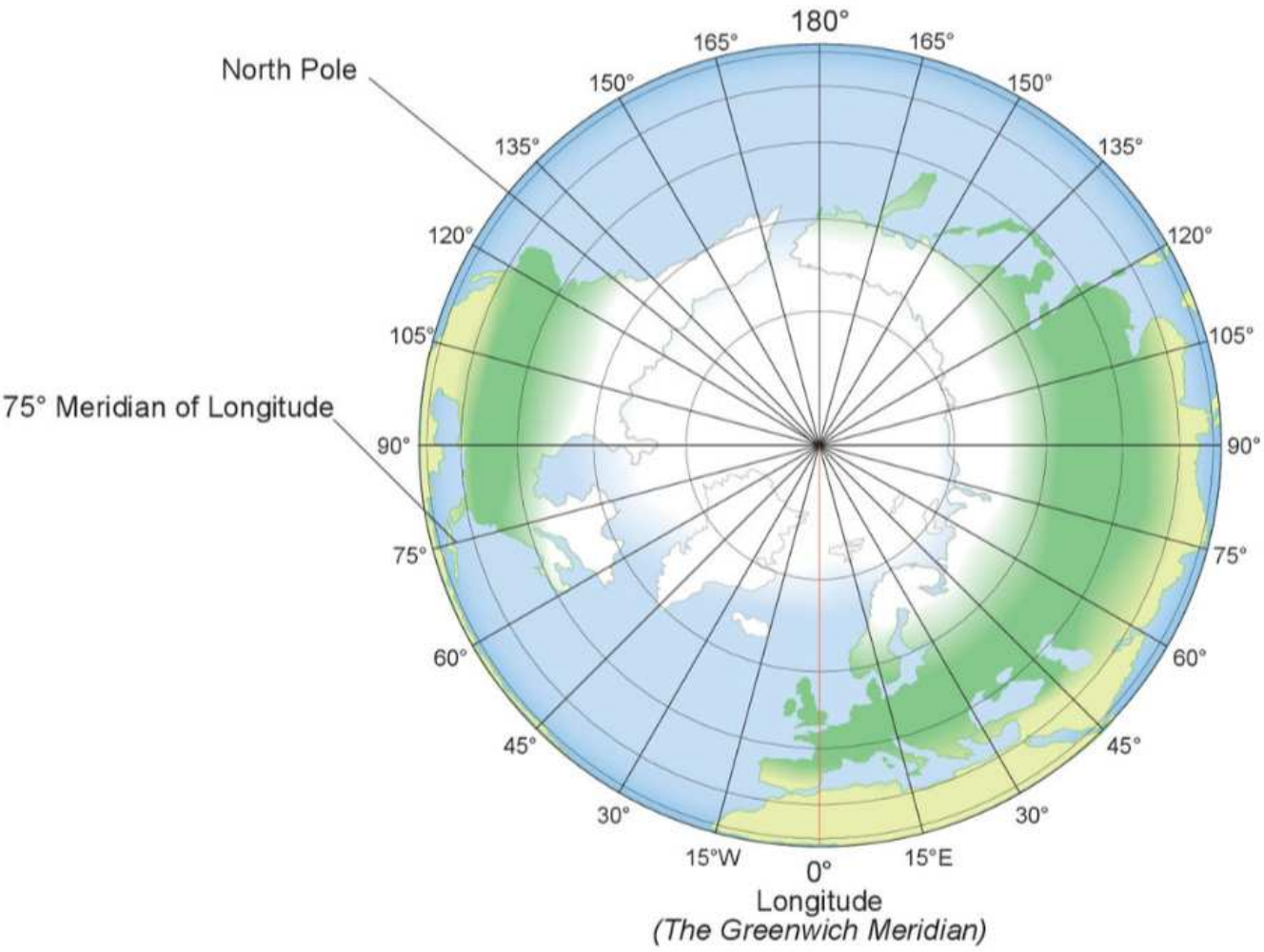
- Beacon
- Yacht harbour/marina
- Can buoy
- Wreck, depth unknown, not considered dangerous to surface navigation
- Battery, small fort
- Chimney
- Steep coast, cliffs
- Building

Plotting your Position

BY LATITUDE AND LONGITUDE

Lines of longitude run from pole to pole dividing the earth into segments, rather like an orange.

Lines of latitude are obtained by projecting angles made from the centre of the earth to points on its surface.



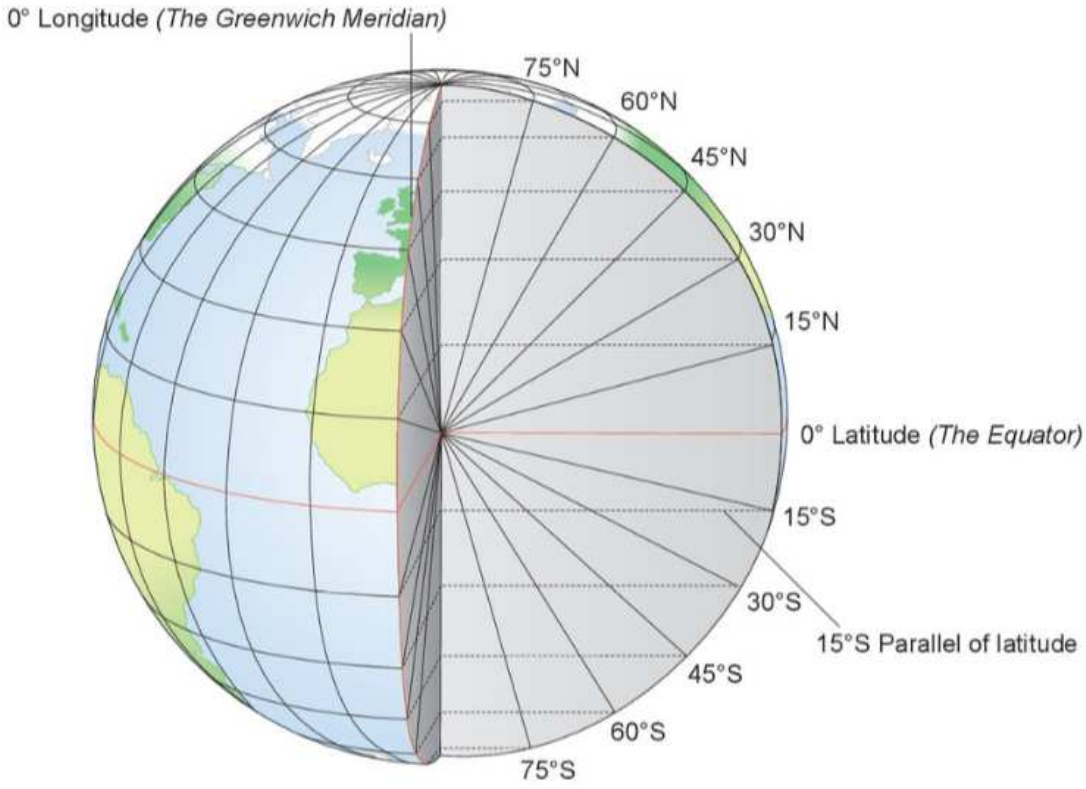
Distance and Speed

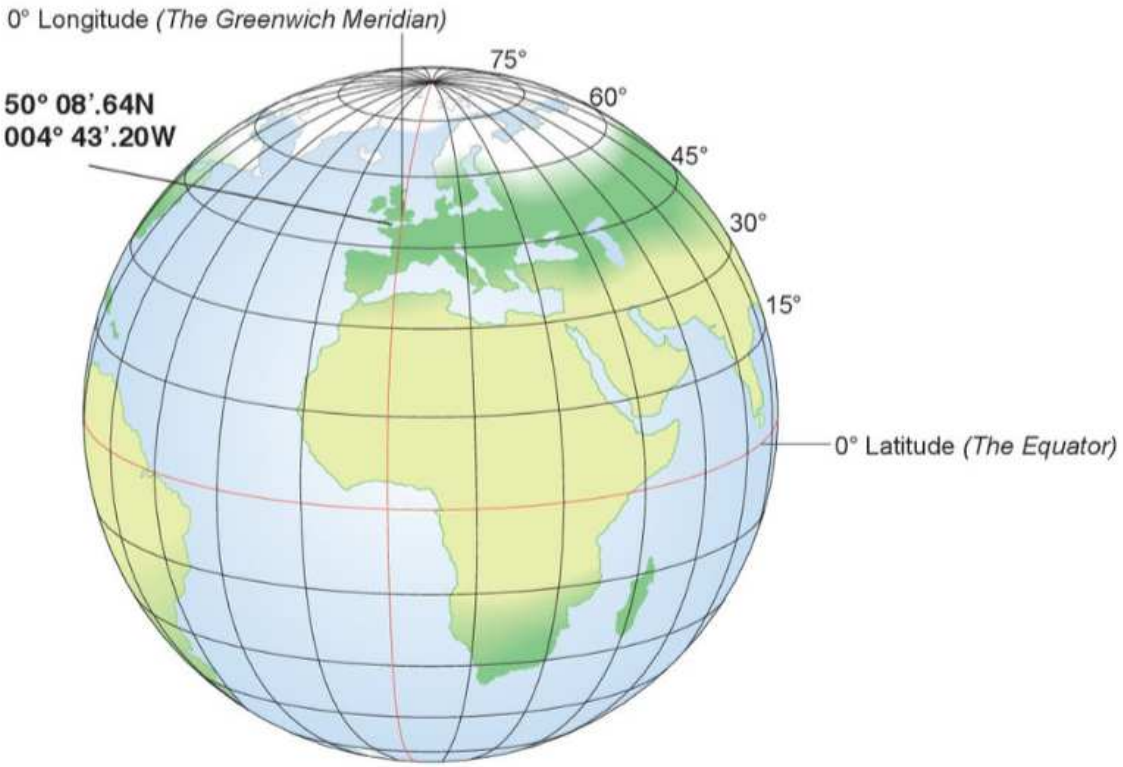
For all practical purposes a mile at sea is 1852 metres.

1° (degree) = 60' (minutes) of latitude

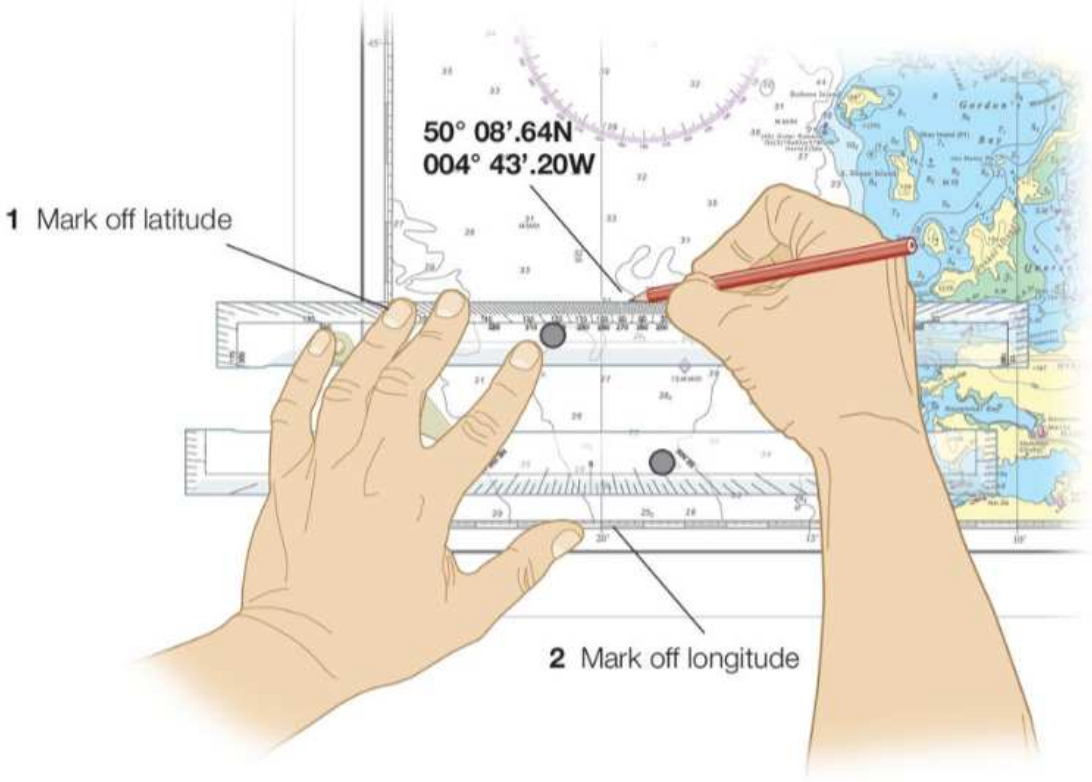
1' (minute) = 1 nautical mile

Speed is measured in knots. A knot is one nautical mile per hour.



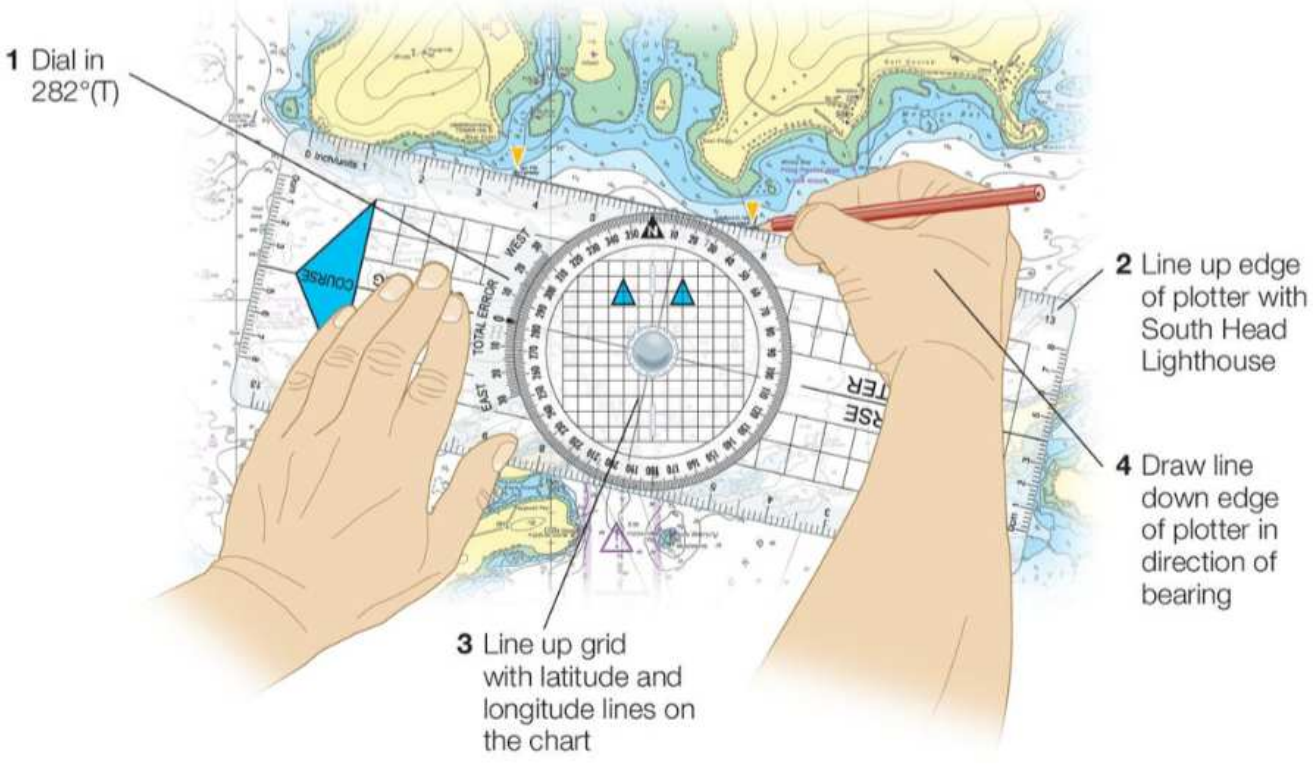


Plotting Position



WITH A PLOTTER

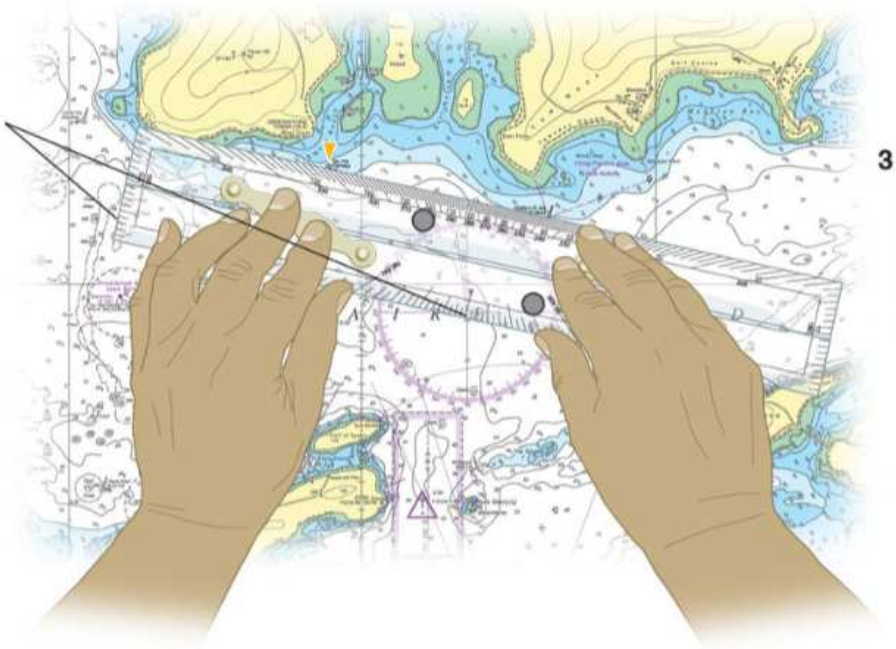
By Range and Bearing



With Parallel Rules

1 Line up edge of parallel rule with centre of compass rose and 282°(T)

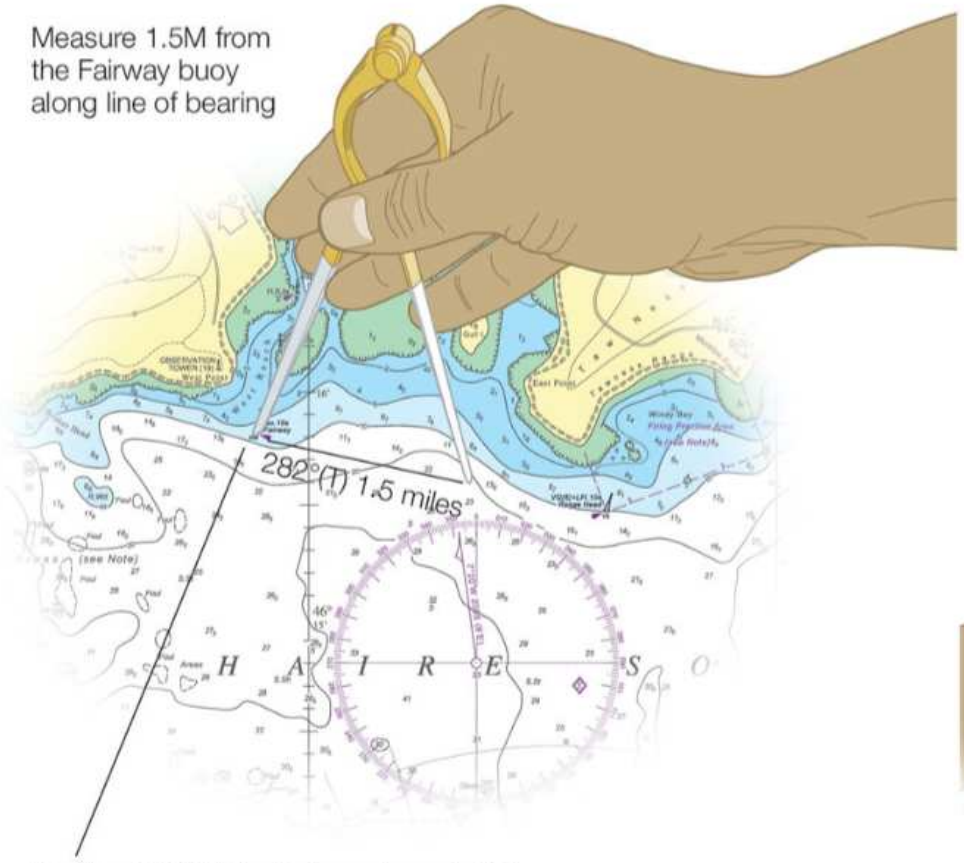
2 Keeping rules steady, walk them to line up with the Fairway buoy



3 When aligned with the Fairway buoy, draw line down edge of rules in direction of bearing

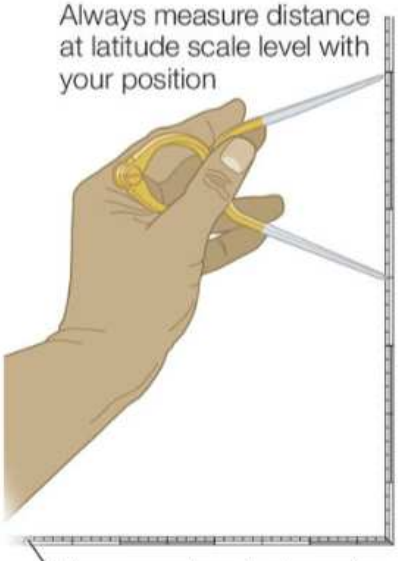
Measuring Distance

Measure 1.5M from the Fairway buoy along line of bearing



Position 282°(T) the Fairway buoy 1.5M

Always measure distance at latitude scale level with your position

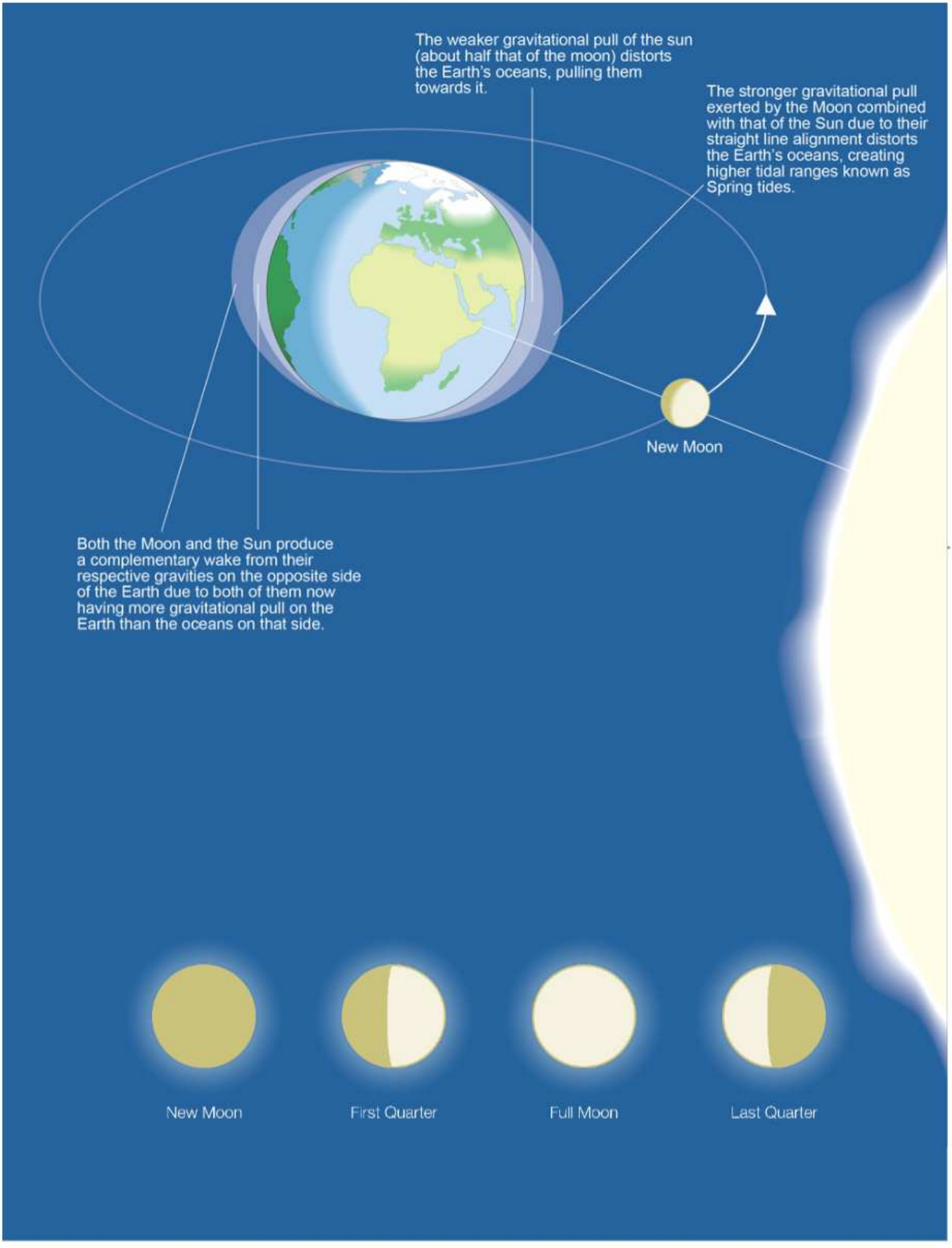


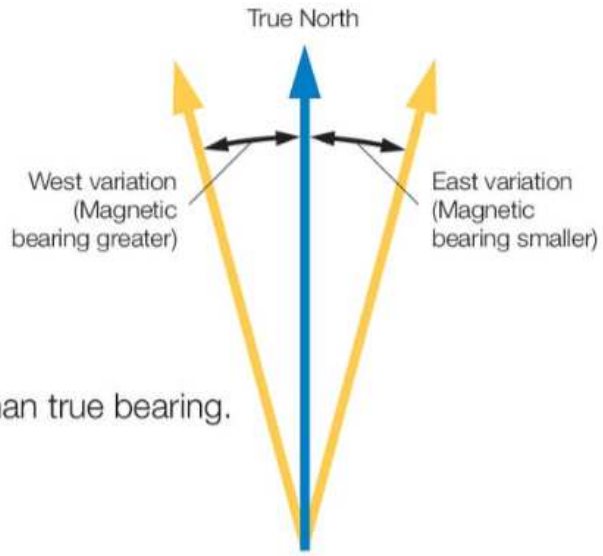
Never use longitude scale to measure distance

Variation

Charts show North as True (geographic) North. A compass can only point to Magnetic North, which changes with time and according to your position.

The difference between True and Magnetic North is called variation.

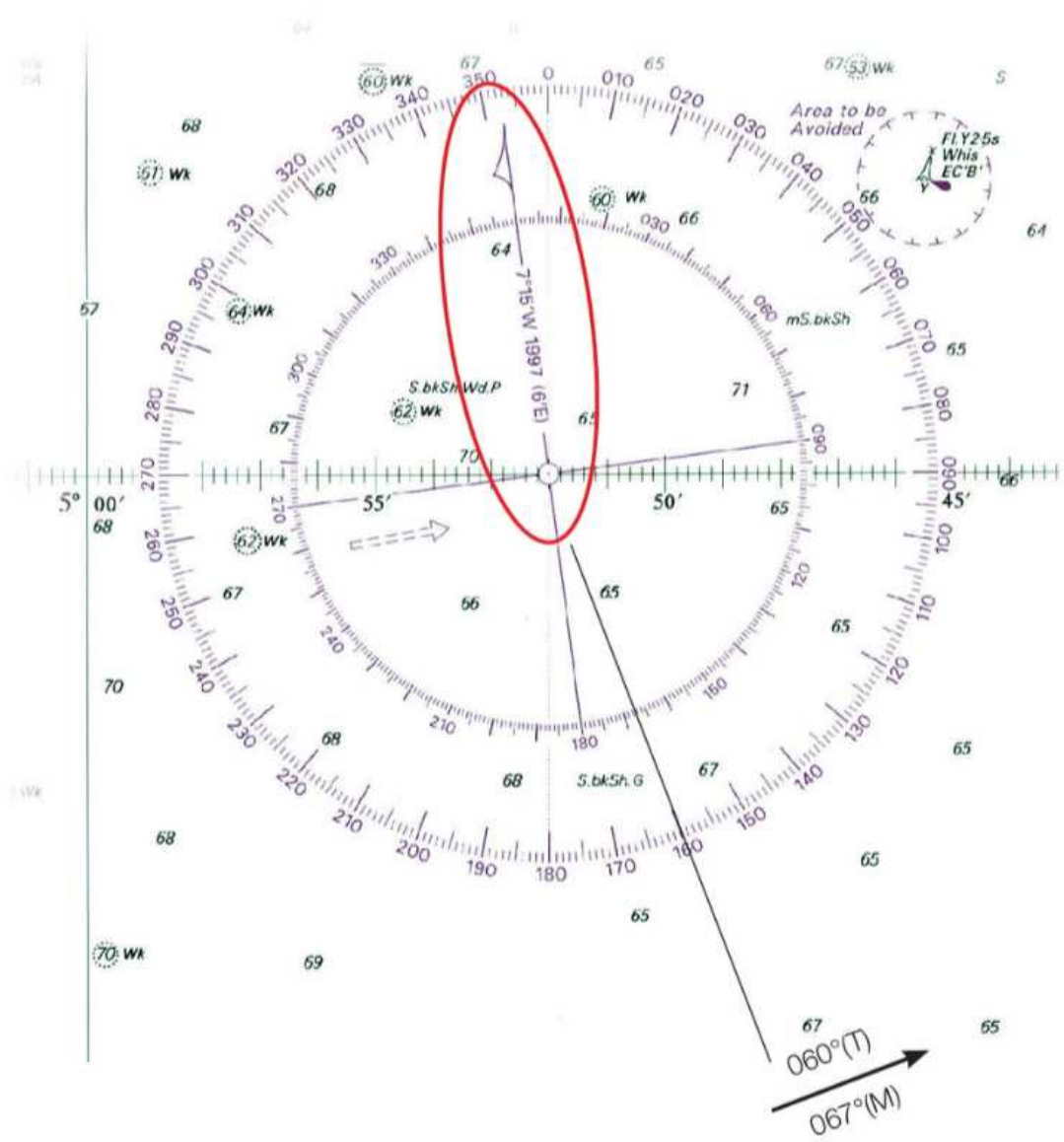




If variation is West, magnetic bearing is greater than true bearing.

If variation is East, magnetic bearing is smaller.

For example:
With five degrees West variation: 070 degrees (T) = 075 degrees (M)
With five degrees East variation: 070 degrees (T) = 065 degrees (M)

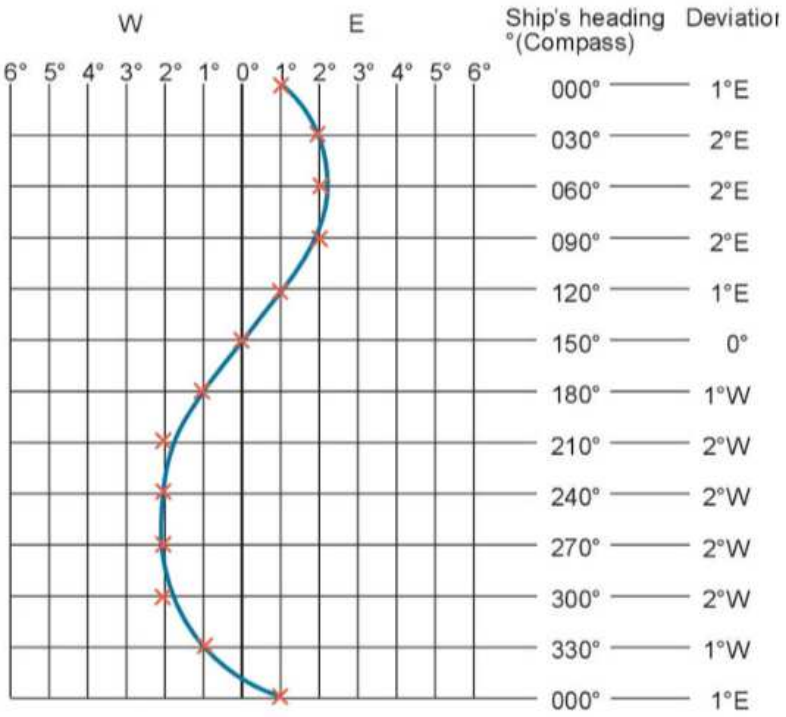


Variation for your position is found on the nearest compass rose.

Deviation

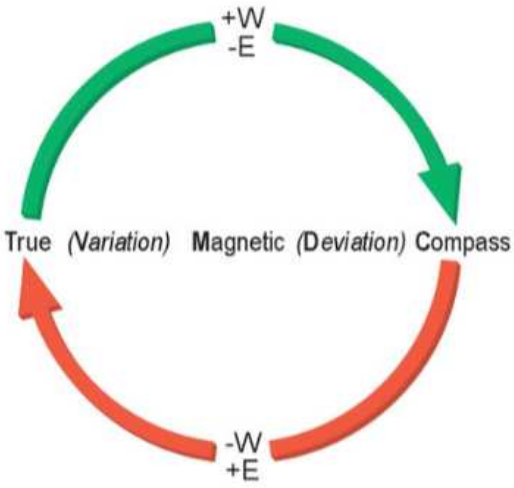
Deviation is caused by ferrous metals and electromagnetic fields on board which will affect the accuracy of the compass.

The ship's compass is swung to check the effect of magnetic influences on board. This will vary as the boat's heading changes. A card can be produced for your steering compass showing the deviation for each heading.



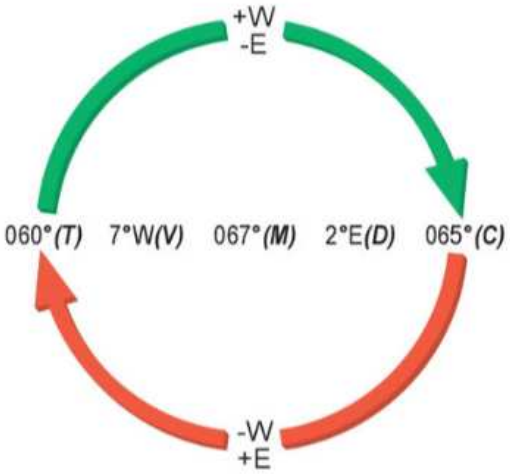
How to Apply Variation and Deviation

Chartwork is in degrees True.
Compass courses must be in degrees Compass.



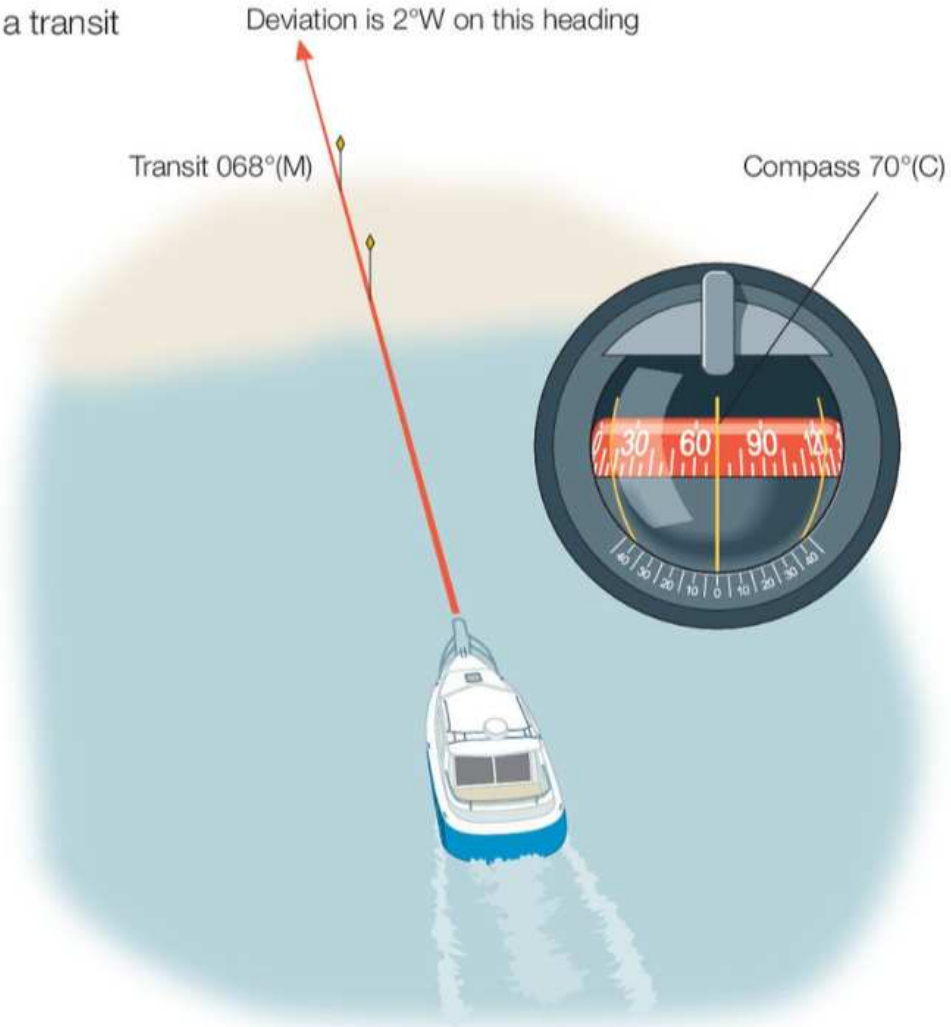
Finding a Compass Course

True bearing from chart 060°(T)
Variation +7°W
Magnetic bearing = 067°(M)
Apply deviation from card -2°E
Compass course = 065°(C)



Checking for Deviation

Point the boat straight at a transit and compare results.

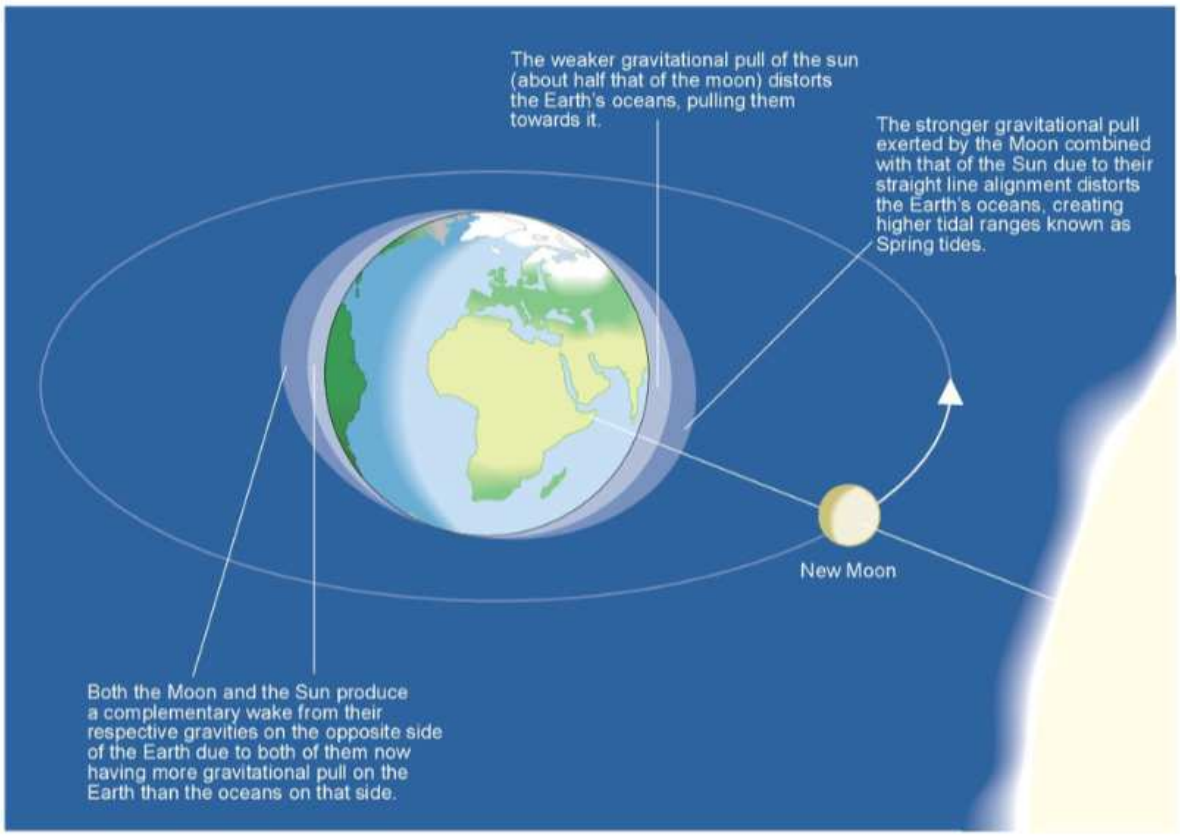


Tidal Theory

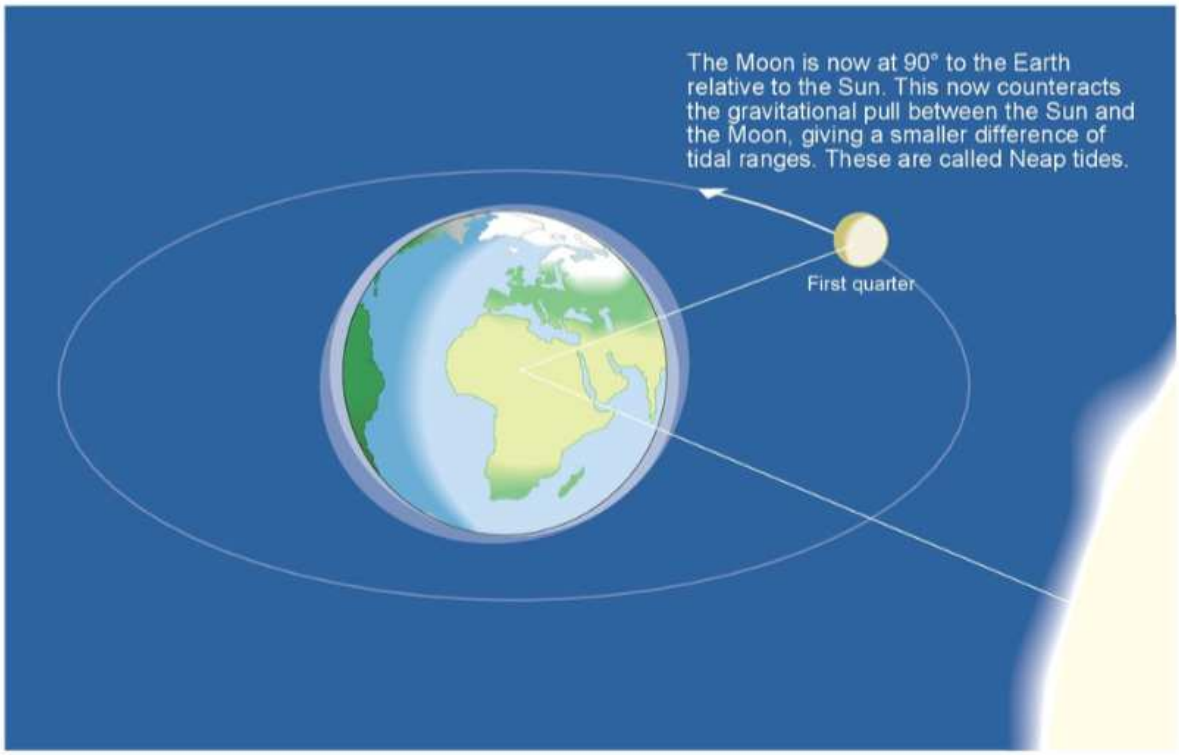
TIDES

The gravitational pull of the moon and sun is the main cause of tides.

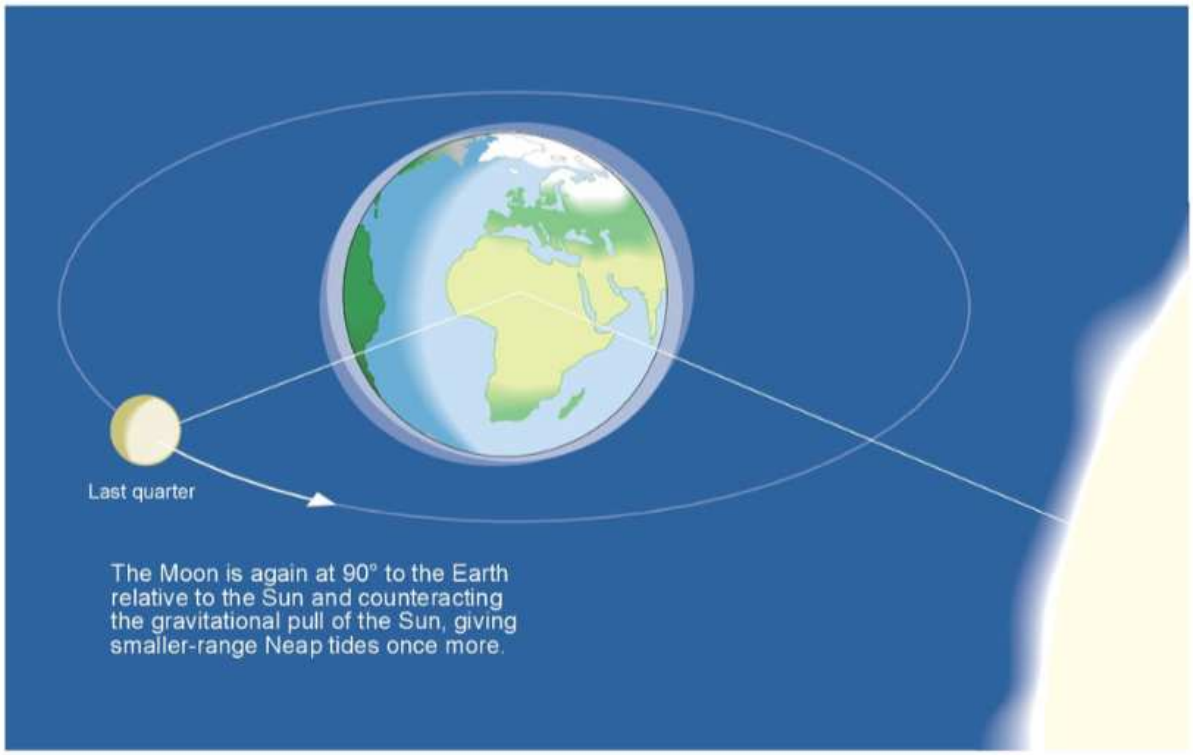
Moon and sun in line – spring tides.



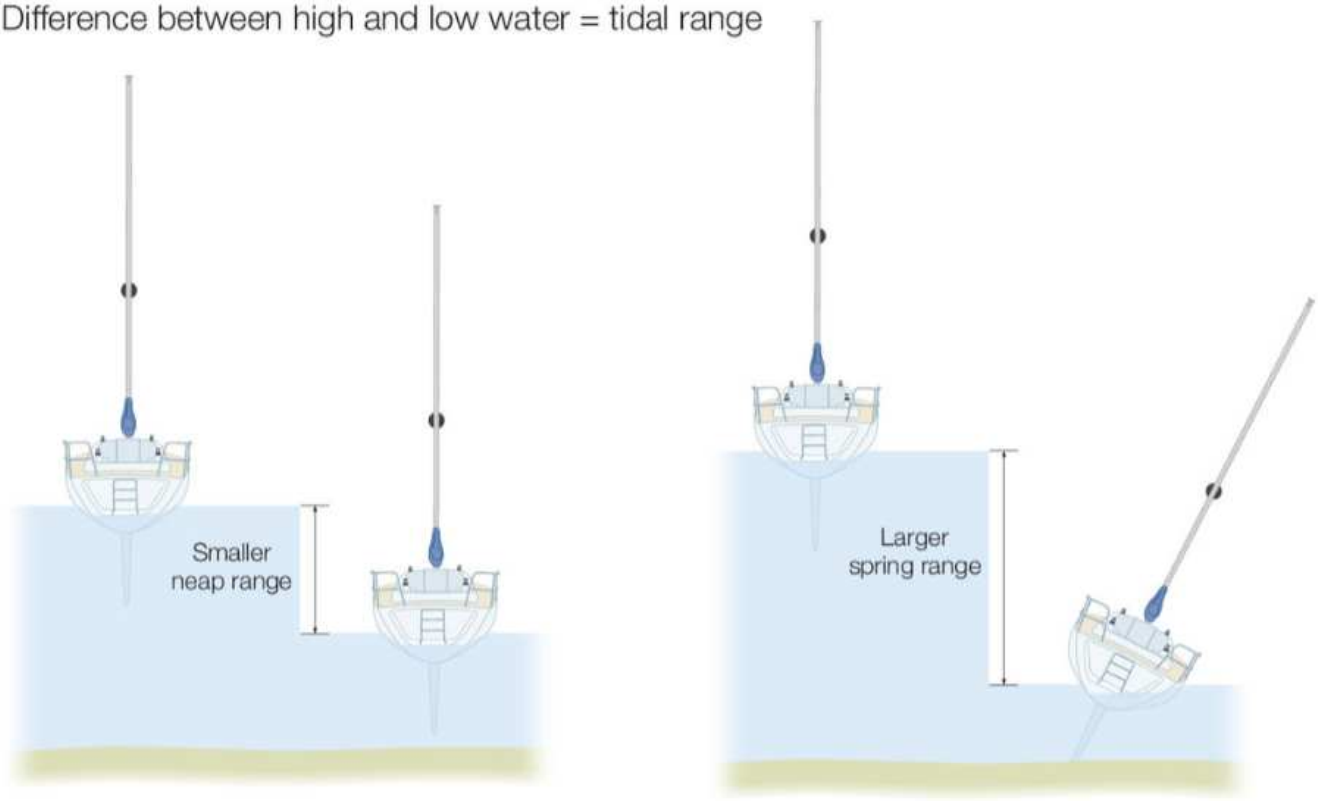
Moon and sun opposing – neap tides.




The Moon and Sun are now back in alignment and there is another combined gravitational pull on the oceans, creating Spring tides again.
Full Moon

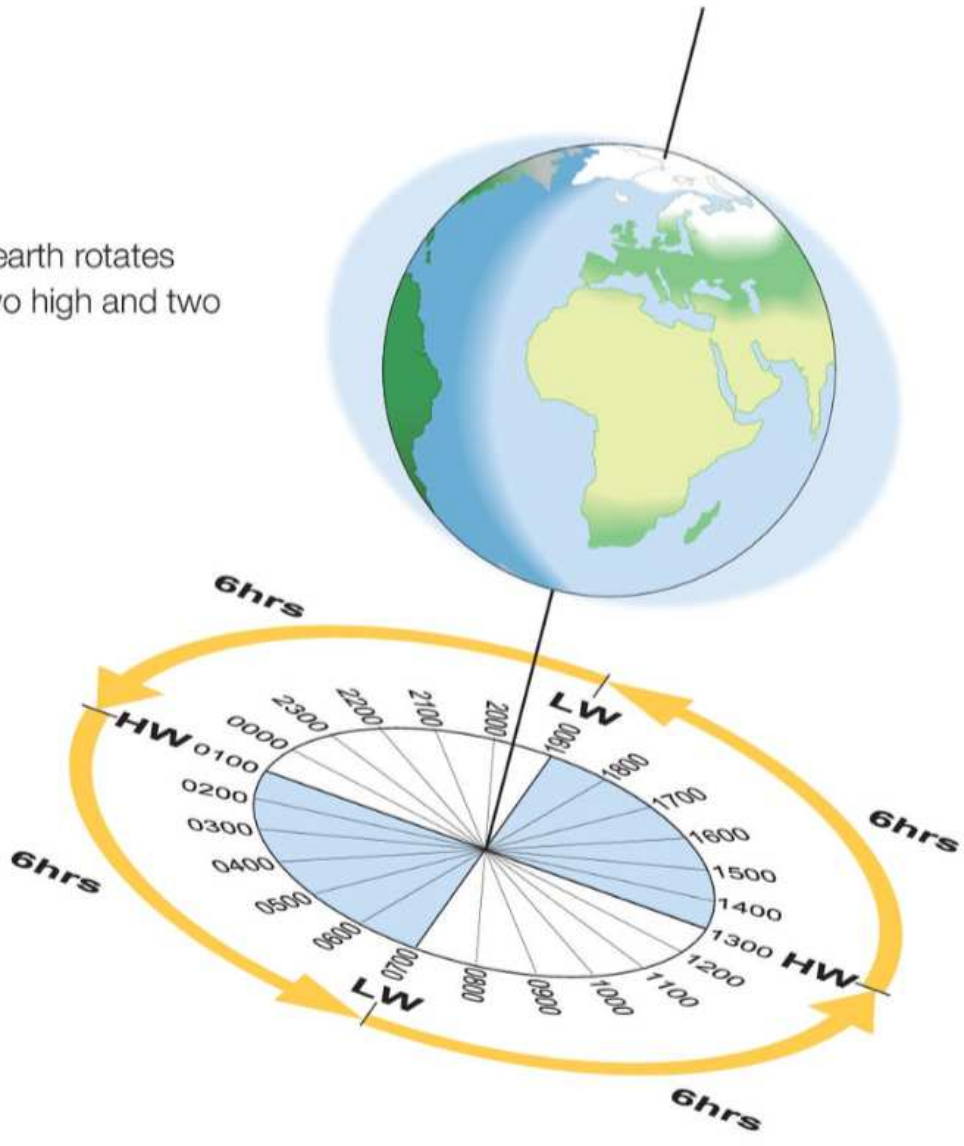

Last quarter
The Moon is again at 90° to the Earth relative to the Sun and counteracting the gravitational pull of the Sun, giving smaller-range Neap tides once more.

Difference between high and low water = tidal range

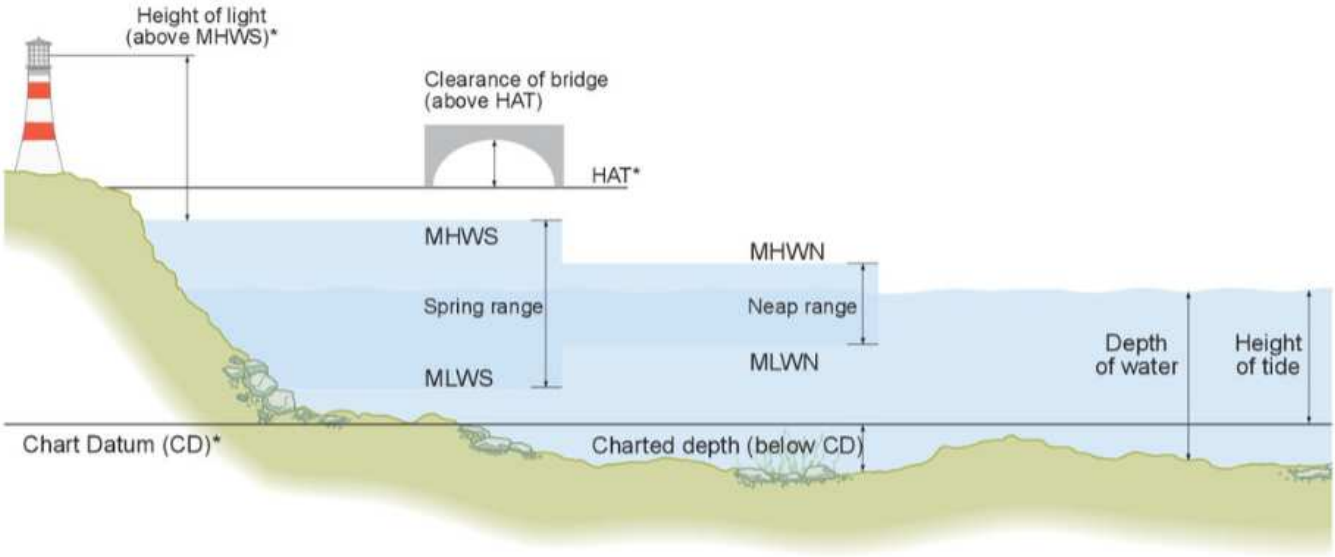


Daily Tides

Each day as the earth rotates we experience two high and two low waters.



Tidal Terms



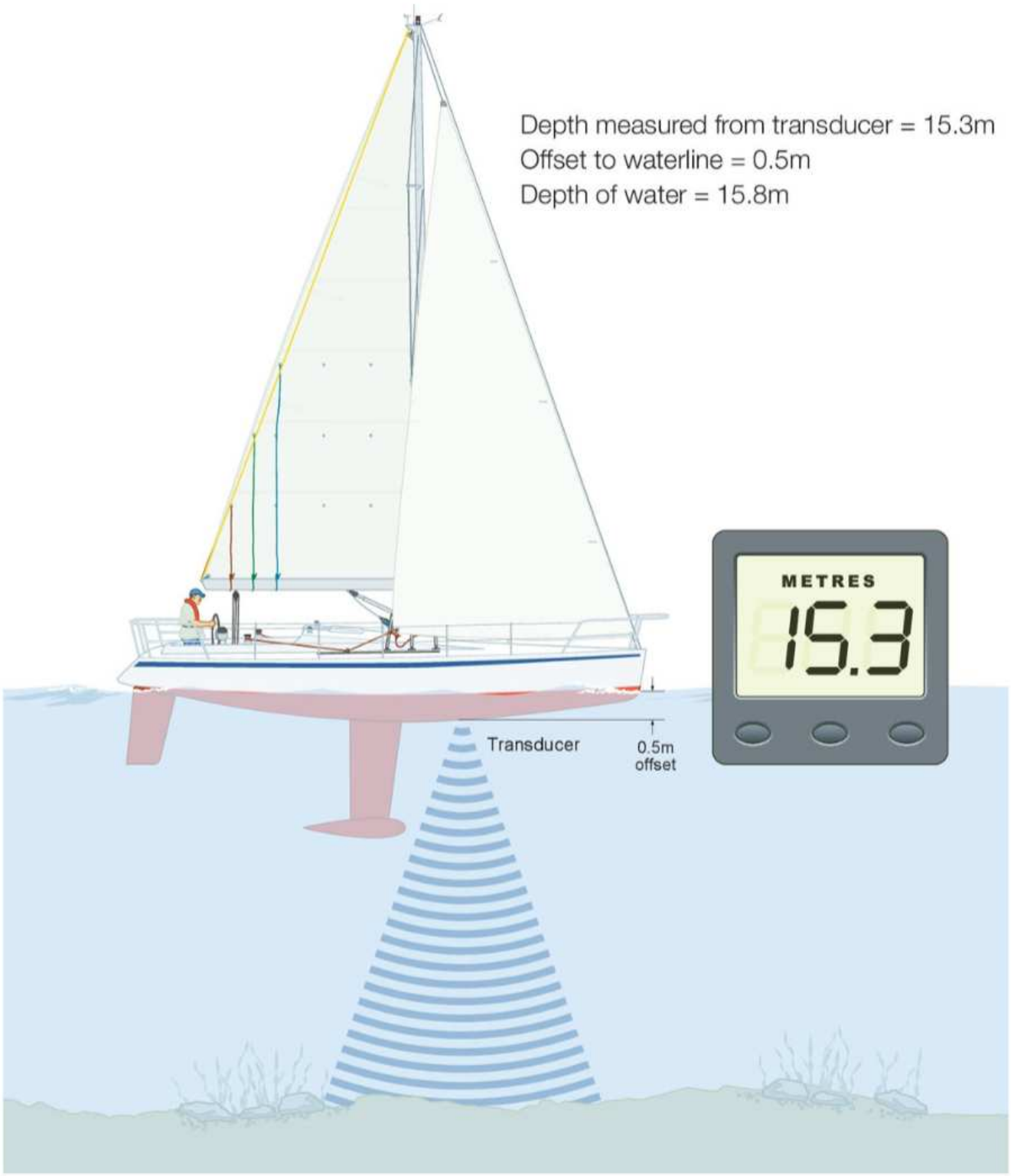
MHWS – Mean High Water Springs
MHWN – Mean High Water Neaps
MLWS – Mean Low Water Springs
MLWN – Mean Low Water Neaps
HAT – Highest Astronomical Tide
CD – Chart Datum

*Specific datums used for heights, clearances and charted depth may vary in different countries. For example, the UK uses lowest astronomical tide for chart datum, whereas the USA uses mean low low water.

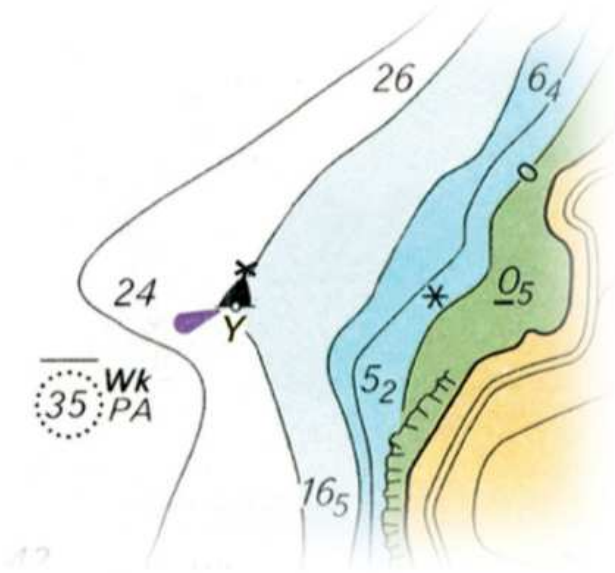
HOW MUCH WATER?

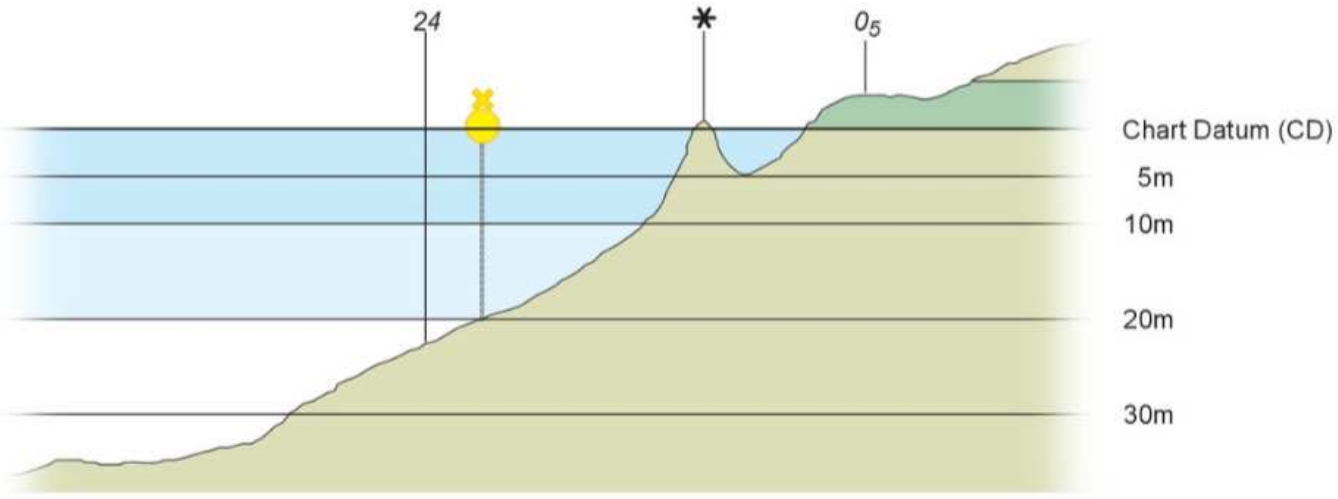
The depth of water under your boat is measured with an echo sounder. Ultrasonic signals are transmitted to and reflected from the seabed to give the depth of water on a digital or analogue display.

The transducer is situated below the waterline. Allow for this when reading the display. You can also calibrate for the display to read from waterline or bottom of keel.



A chart shows depths you are likely to meet at the chart datum (CD).

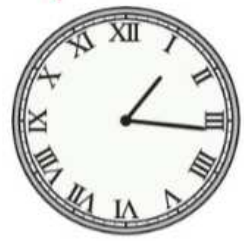


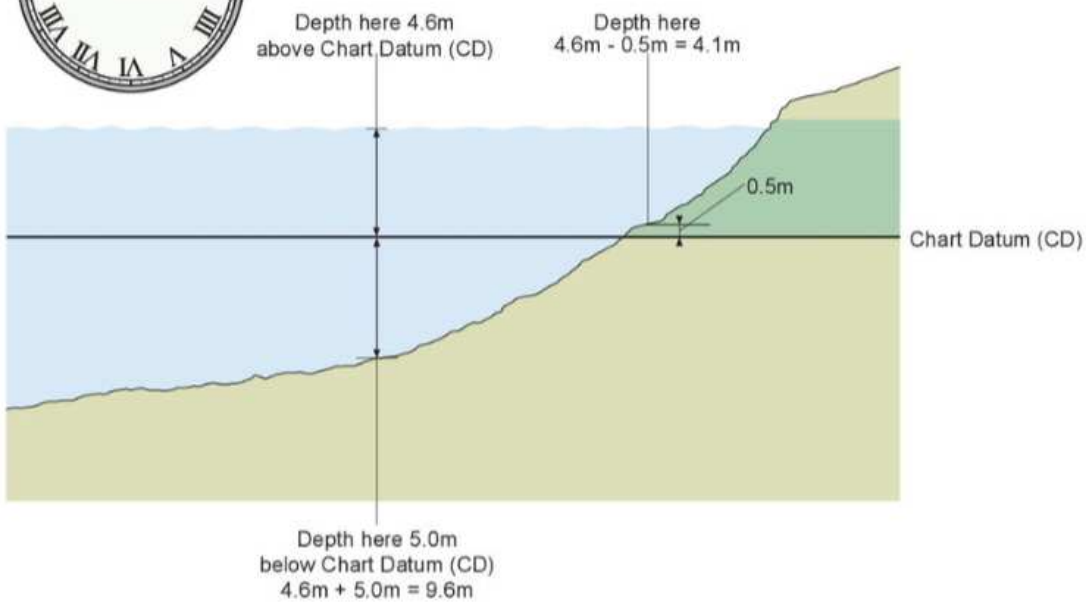


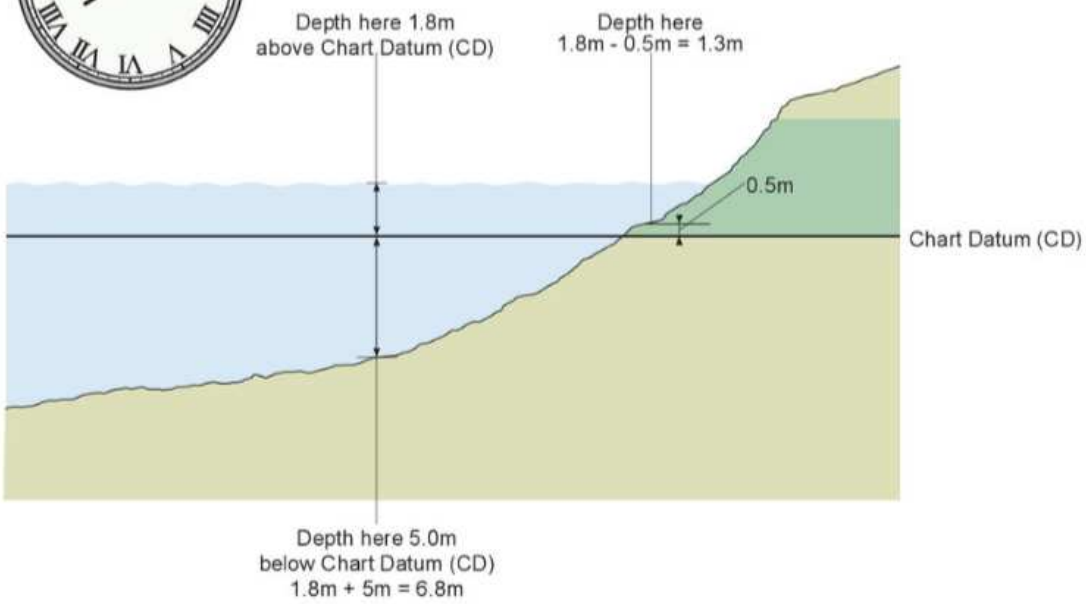
Height of tide is measured above CD.

	Time	m
16	0043	4.5
	0715	2.0
TU	1316	4.6
	1957	1.8
17	0206	4.7
	0835	1.7
W	1440	4.8

Tide tables give the times and heights of high and low water for different ports.





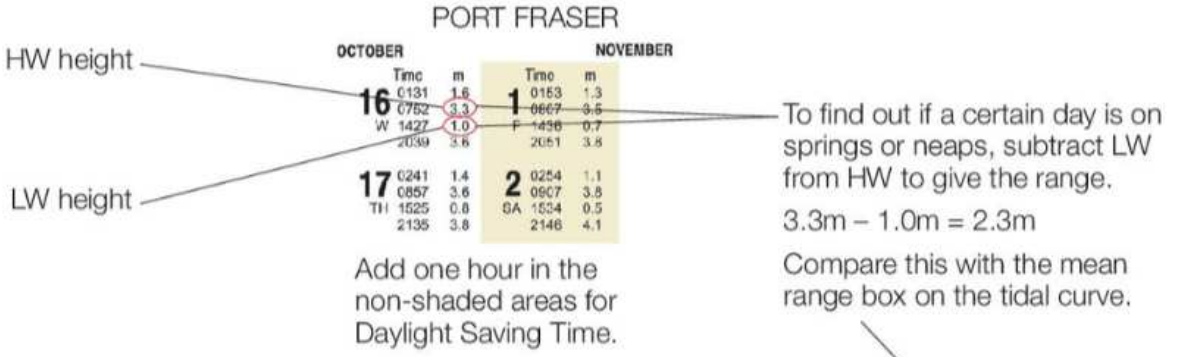


Add depths below CD to the height of tide.

Subtract drying heights from the height of tide.

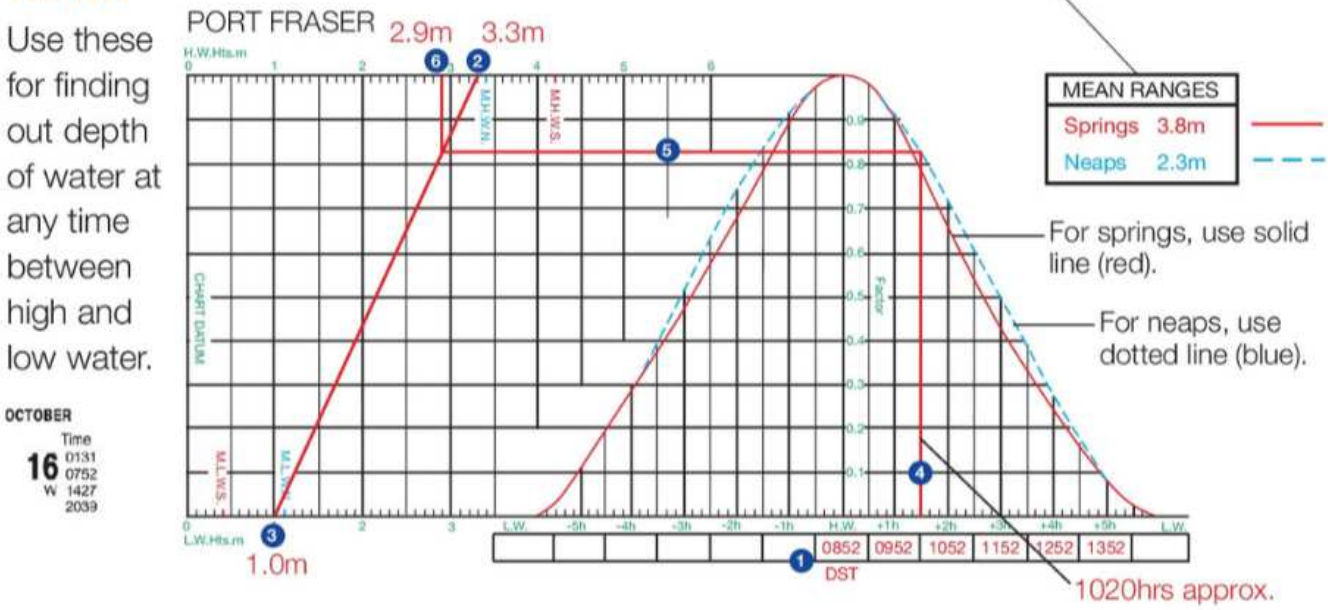
Standard Ports

Tide tables are produced for larger ports and give the times and heights of high and low water for every day of the year. Tide times may need correcting for local changes, such as differences in time zone from Universal Time (UT) and in countries operating Daylight Saving Time (DST) in the summer (BST in the U.K.).



Tidal Curves

Use these for finding out depth of water at any time between high and low water.



What will be the height of tide at Port Fraser at 1020hrs on Wednesday 16 October?

1. Enter HW (local time and fill in the boxes for each hour after HW).
2. & 3. Mark in the heights of HW and LW and draw a line between them.
4. Find 1020hrs on the bottom scale.
5. Draw a line upwards to hit the curve, then across to meet the HW/LW line, and then up to the HW scale (use the neaps curve, as HW minus LW equals 2.3m (neaps)).
6. There will be 2.9m at 1020hrs.

You can also find out when there will be a specific depth, e.g. at what time after HW will there be 2.0m of tide?
Go down to the HW/LW line from the HW scale, across to the curve and down to the time scale to find the answer – 1210hrs.

Secondary Ports

Tide tables are not produced for minor ports. To find the height and times of HW and LW at these secondary ports you will need to apply corrections, which are usually found in an almanac, to the times and heights of a standard port nearby.

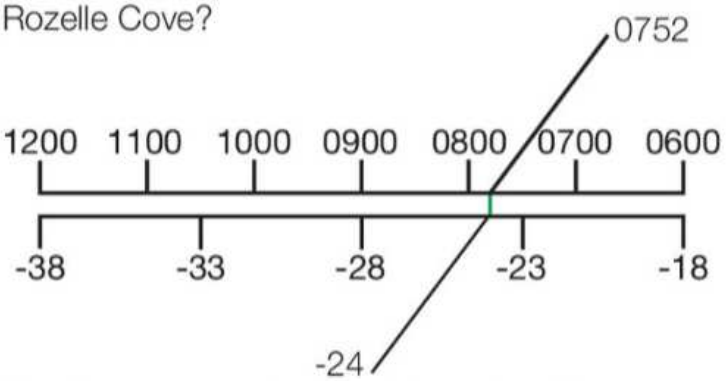
Standard Port PORT FRASER (←)

Times		Height (metres)					
High Water		Low Water		MHWS	MHWN	MLWN	MLWS
0000	0600	0500	1100	4.2	3.4	1.1	0.4
1200	1800	1700	2300				
Differences ROZELLE COVE							
-0038	-0018	-0036	-0014	+0.2	-0.2	+0.5	+0.2

Height difference: When HW at Port Fraser is 4.2m it is 0.2m more at Rozelle Cove. When HW is 3.4m, it is 0.2m less at Rozelle Cove.

Time difference: If HW for Port Fraser is at 0000hrs or 1200hrs, HW for Rozelle Cove is 38 minutes earlier, but when HW for Port Fraser is at 0600hrs or 1800hrs HW for Rozelle Cove is 18 minutes earlier.

However, if HW and LW times fall between these set times, you will need to interpolate between the corrections, e.g. if HW at Port Fraser is 0752hrs UT, what time is HW at Rozelle Cove?



HW Port Fraser	0752hrs	UT
Correction	-24	minutes
	0728hrs	UT
	+ 01.00	hour
HW Rozelle Cove	0828hrs	DST

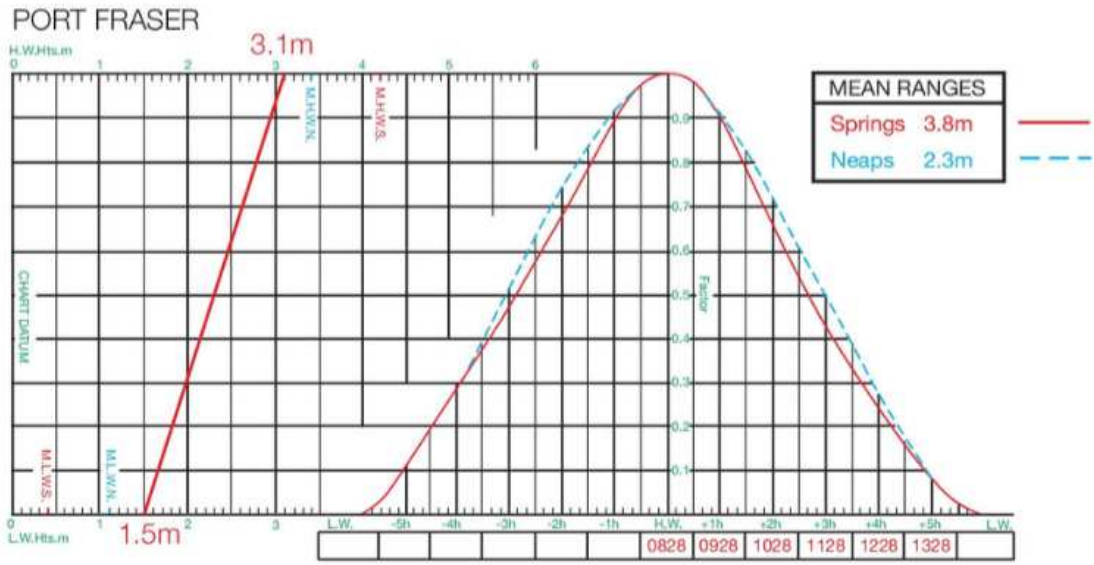
Use the same method to interpolate tide differences.

Add one hour for DST after calculating correction.

To find the height of tide between HW and LW at a secondary port, use the tidal curve for the standard port and the secondary port data.

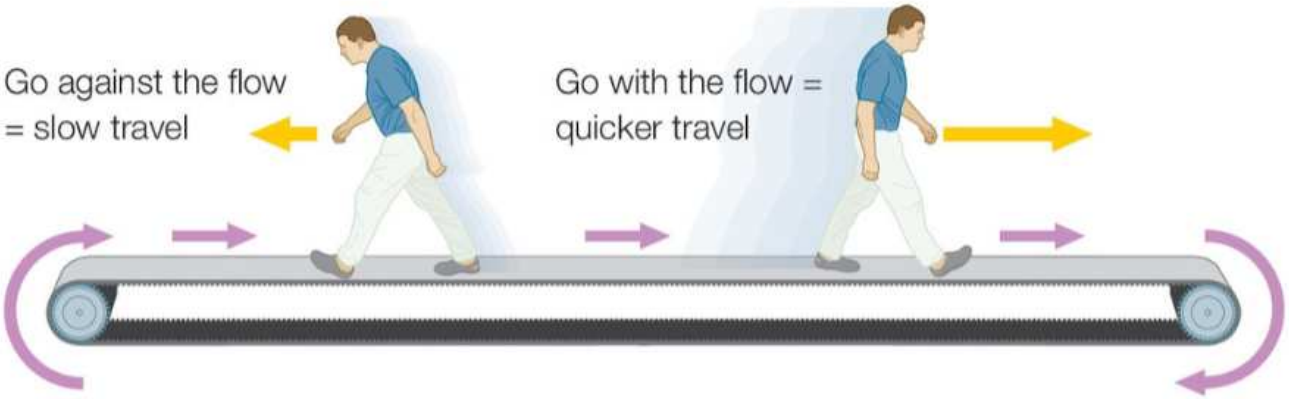
Use the related standard port.

For example, for Rozelle Cove you should use the curve for Port Fraser.



Tidal Streams

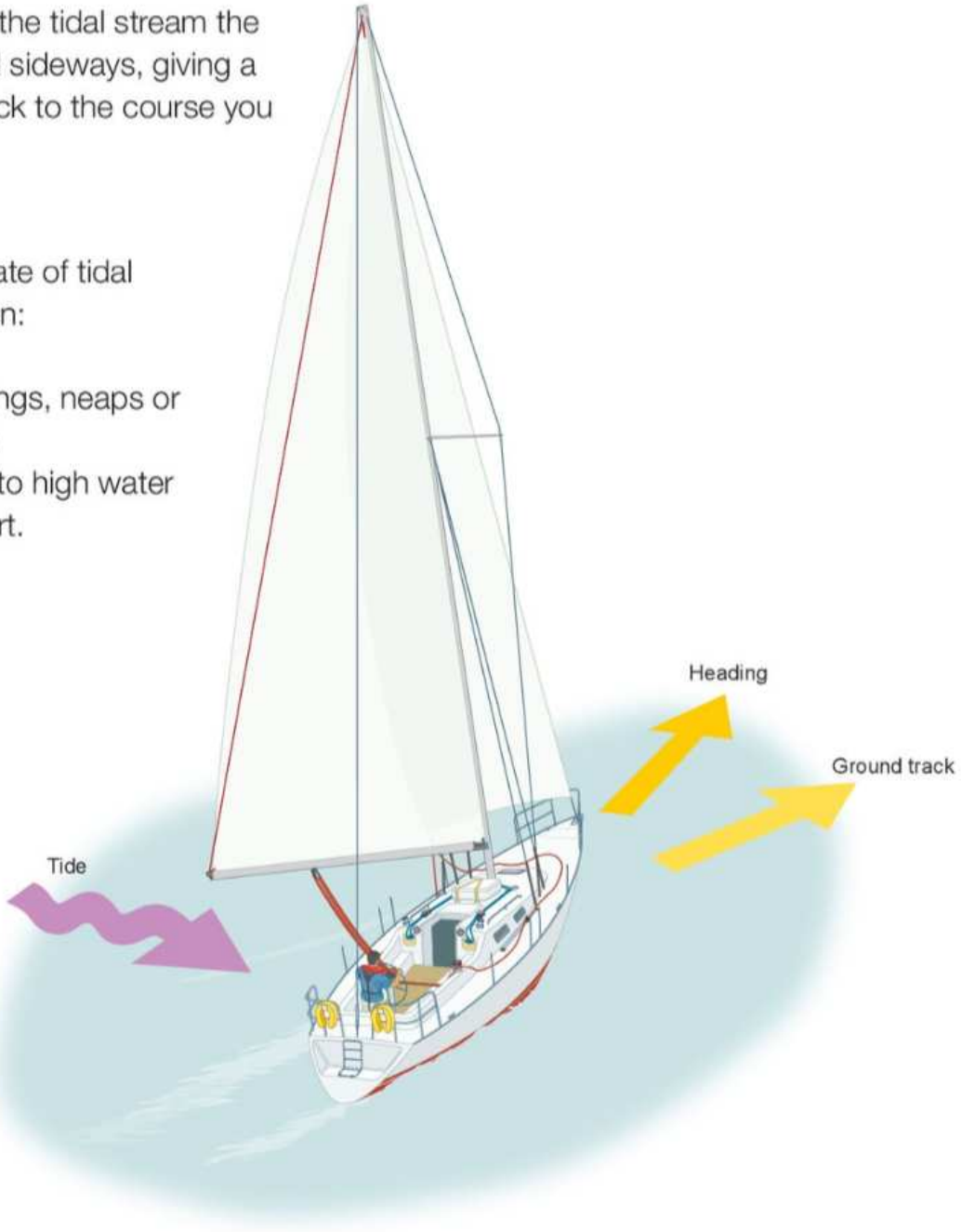
Consider the Tide as a Travelator



If you travel across the tidal stream the boat will be pushed sideways, giving a different ground track to the course you are steering.

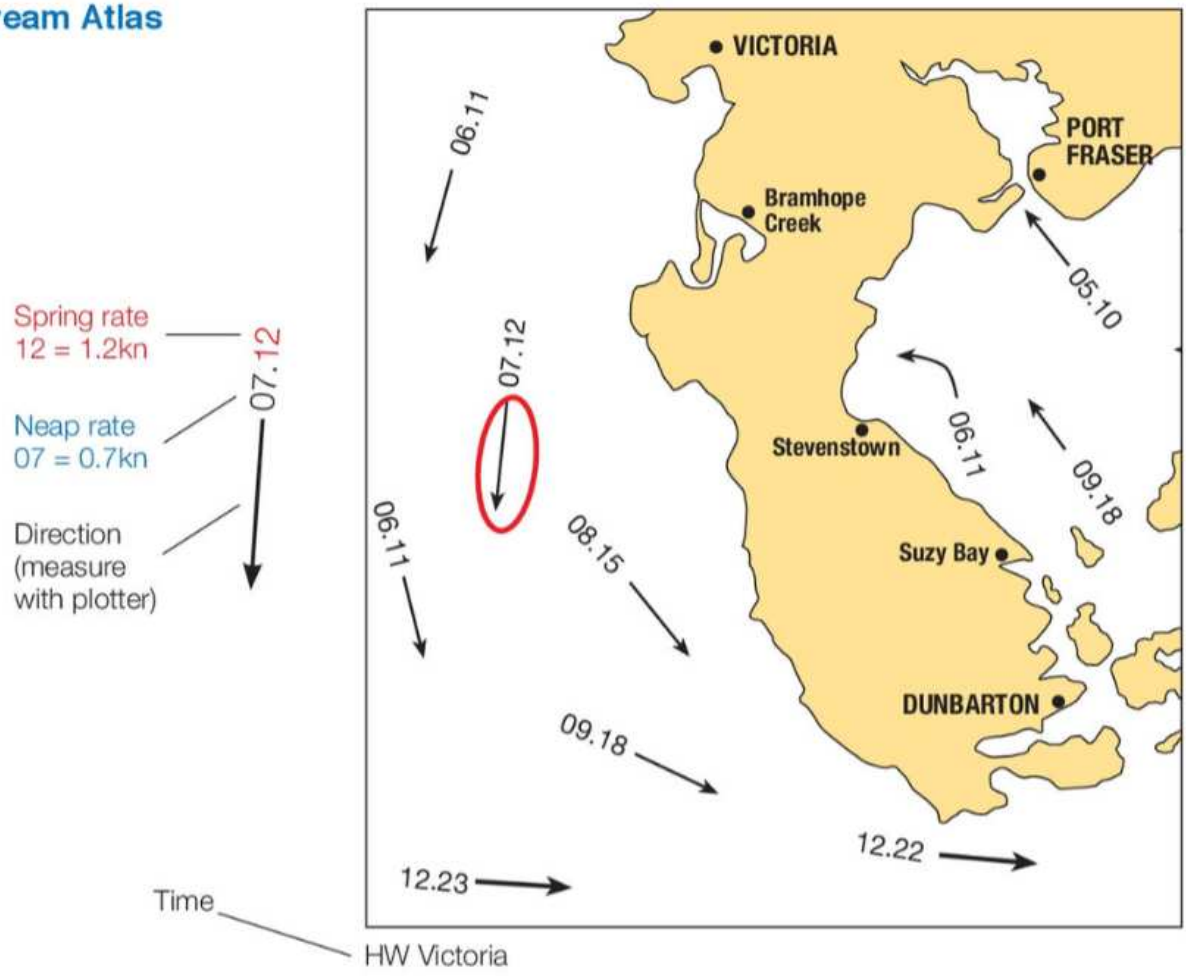
The direction and rate of tidal streams depends on:

- Your location
- Whether it is springs, neaps or between the two
- The time relative to high water at a reference port.



FINDING THE DIRECTION AND RATE OF THE TIDE

Tidal Stream Atlas



Tidal Diamond from Chart

Victoria (B)

Hours		(B) 46°20·6 N 6 18·4W		
Before High Water 6	−6	158	1·0	0·6
Before High Water 5	−5	153	1·7	0·8
Before High Water 4	−4	159	2·8	1·5
Before High Water 3	−3	154	3·9	2·0
Before High Water 2	−2	165	3·2	1·7
Before High Water 1	−1	173	2·4	1·3
High Water	0	186	1·2	0·7
After High Water 1	+1	349	1·1	0·6
After High Water 2	+2	341	3·0	1·6
After High Water 3	+3	338	3·7	1·8
After High Water 4	+4	342	3·9	2·0
After High Water 5	+5	341	2·8	1·5
After High Water 6	+6	355	2·3	1·2

Spring rate (kn)

Neap rate (kn)

Direction (°T)

Time

Example

What is the direction and rate of the tidal stream five miles south of Namley Harbour on Friday 24th May from 1045 to 1145?

1 Find the time of HW and the heights of HW & LW at Victoria on Friday 24th May.

	Time	m
24	0203	1.1
	0816	5.5
F	1434	0.6
	2049	5.4

0816 UT

0916 DST is the nearest HW (say 0915)

2 Is it springs, neaps or in between?

5.5
- 0.6

Range 4.9m = Springs

MEAN RANGES	
Springs	4.9m
Neaps	2.4m

3 How many hours before or after HW is 1045 to 1145?

HW Victoria 0915 DST

HW is taken as the midpoint of the hour

HW 0915 → 0845, 0945

+1 1015 → 0945, 1045

+2 1115 → 1045, 1145

Answer +2 hours

4 Find the nearest ◇ to your position = Ⓐ

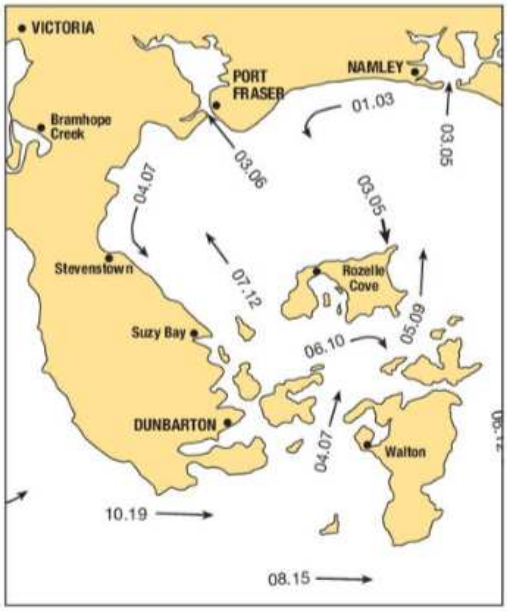
Spring rate = 1.6kn

Direction of tidal stream = 111°(T)

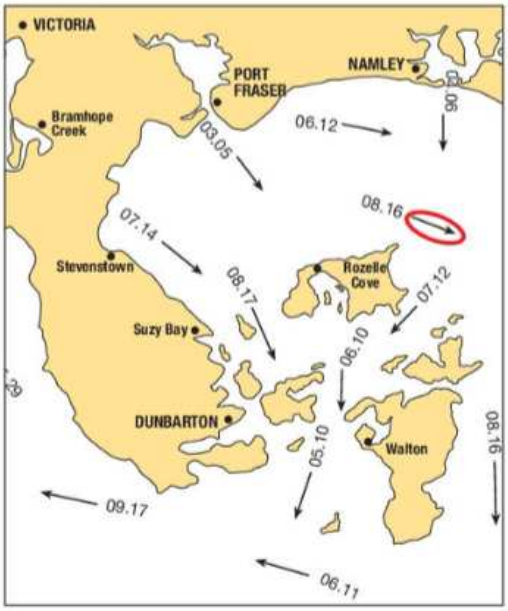
	Ⓐ 46°20·5 N 5 50·0W	
−6	110	1·8 0·8
−5	108	1·0 0·5
−4	026	0·4 0·2
−3	297	1·4 0·7
−2	278	2·0 1·1
−1	274	1·7 0·8
HW → 0	271	1·1 0·5
+1	170	0·5 0·3
+2hrs → +2	111	1·6 0·8
+3	114	1·8 0·9
+4	113	2·2 1·2

5 Or using a tidal stream atlas, which is the nearest arrow?

Measure direction of arrow 111°(T)
Spring rate 1.6kn



HW Victoria +1 1015 (0945–1045)

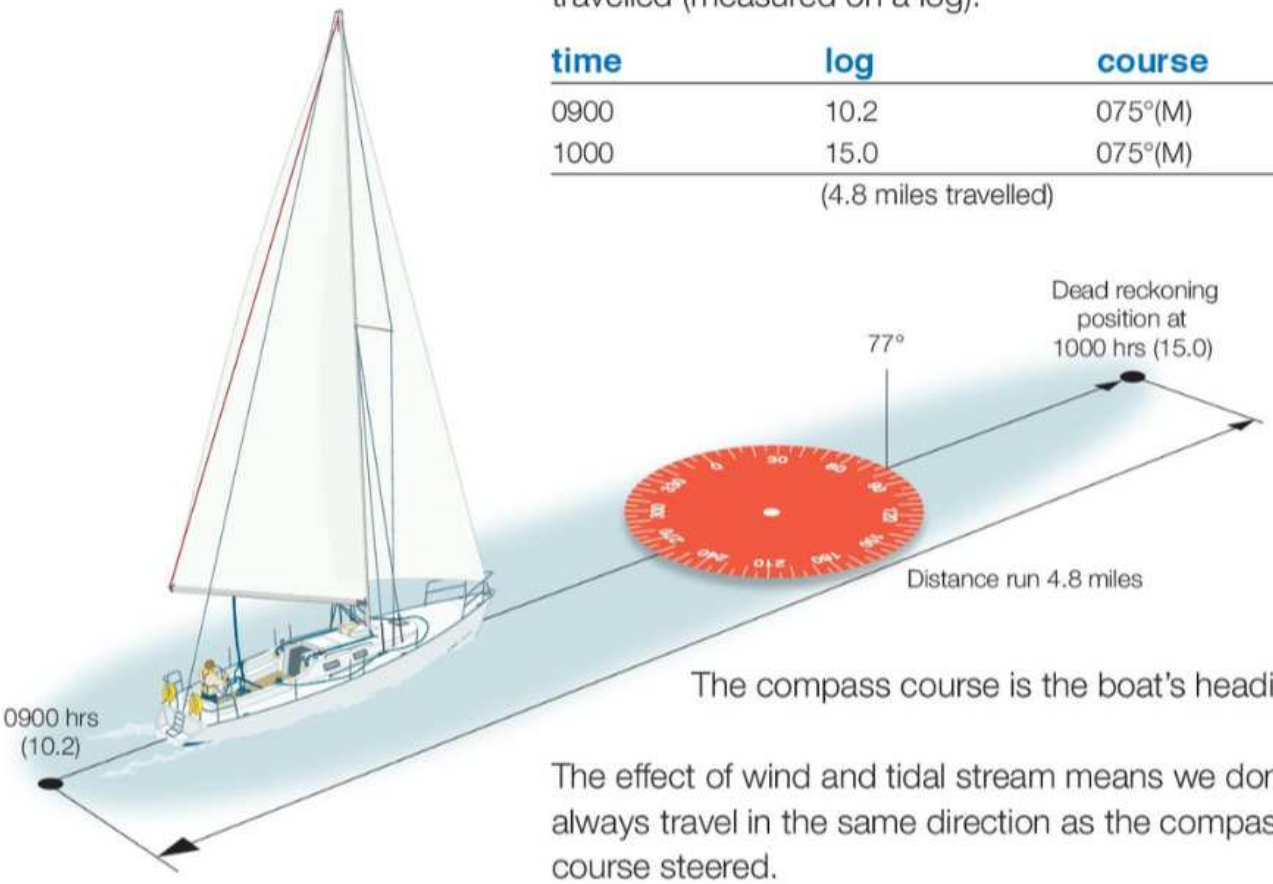


HW Victoria +2 1115 (1045–1145)

Dead Reckoning Position

It's possible to reckon your approximate position if you know a) the course steered, and b) the distance travelled (measured on a log).

time	log	course
0900	10.2	075°(M)
1000	15.0	075°(M)
	(4.8 miles travelled)	



The compass course is the boat's heading.

The effect of wind and tidal stream means we don't always travel in the same direction as the compass course steered.

Effect of Leeway

Effect of Tidal Stream

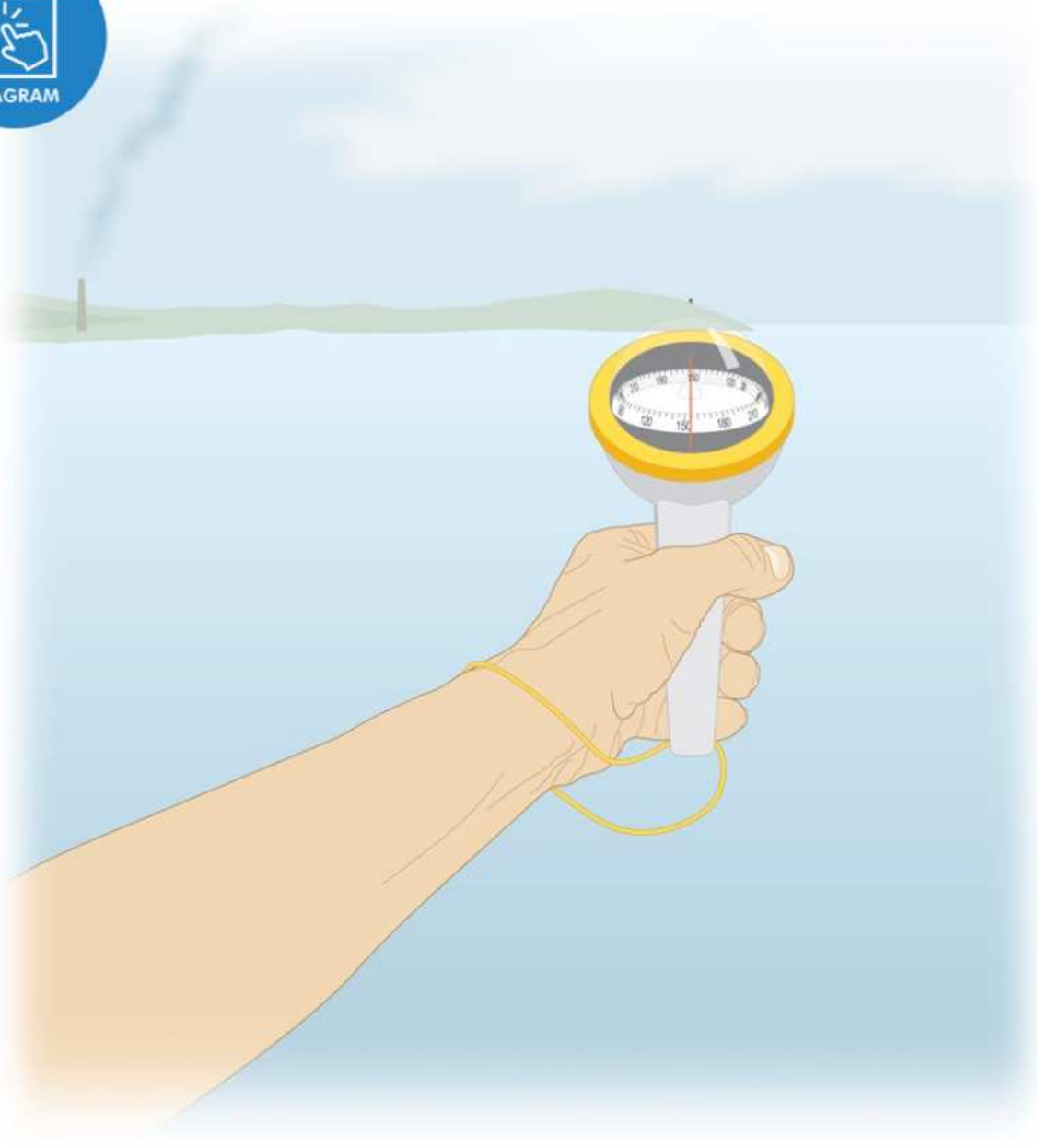
The boat is taken by the direction and rate of the tidal stream.

Estimated Position

To Plot an EP

time	log	course	leeway	wind	tidal stream
0900	10.2	075°(M)	5°	S5	

TOUCH DIAGRAM



Take bearings on charted objects to fix your position.

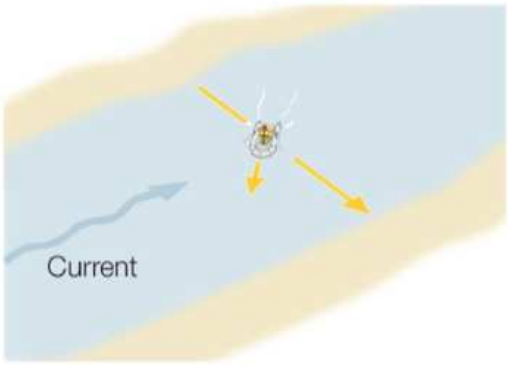
Tide set and drift

Waypoint

Dead Reckoning (DR) position

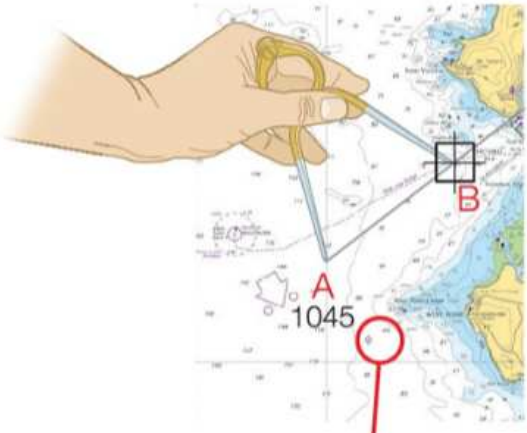
Course to Steer

A person rowing across a river instinctively angles the boat upstream to counter the effect of the current.



At sea we often can't see our destination so we need to calculate how much to angle into the tidal stream to make the most direct passage.

For example:
What is the course to steer from position A to waypoint B at 1045 DST on Friday 24 May?



1 How far is it from A to B?
Answer: 8.5 miles.

2 Approximately how long will it take to travel 8.5 miles if my speed is nine knots?
Answer: Roughly an hour.

3 Leaving position A at 1045, how will the tidal stream affect my passage for the next hour?

- Using RYA Training Chart 3, find the tidal stream reference port (Victoria).
- Find the time of HW and establish springs or neaps. Friday 24 May HW Victoria = 0916 DST range 4.9 (springs).
- Use the closest tidal diamond (B) to establish rate and direction. You could also use a tidal atlas.

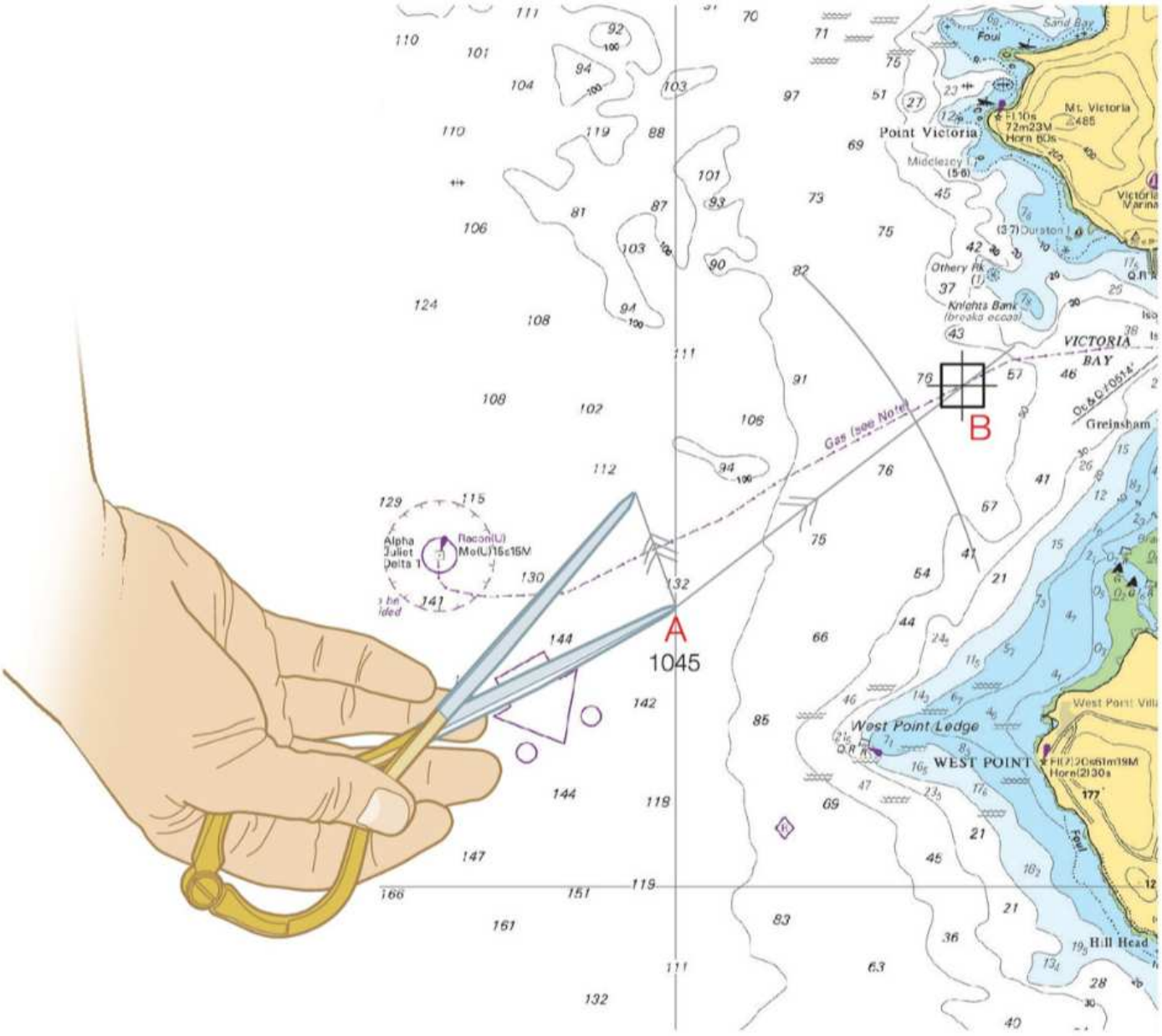
Victoria (B)

HW 0916 — 0946
+1 1016 — 1046
+2 1116 — 1146 ← 1045–1145 = HW +2
+3 1213 — 1246

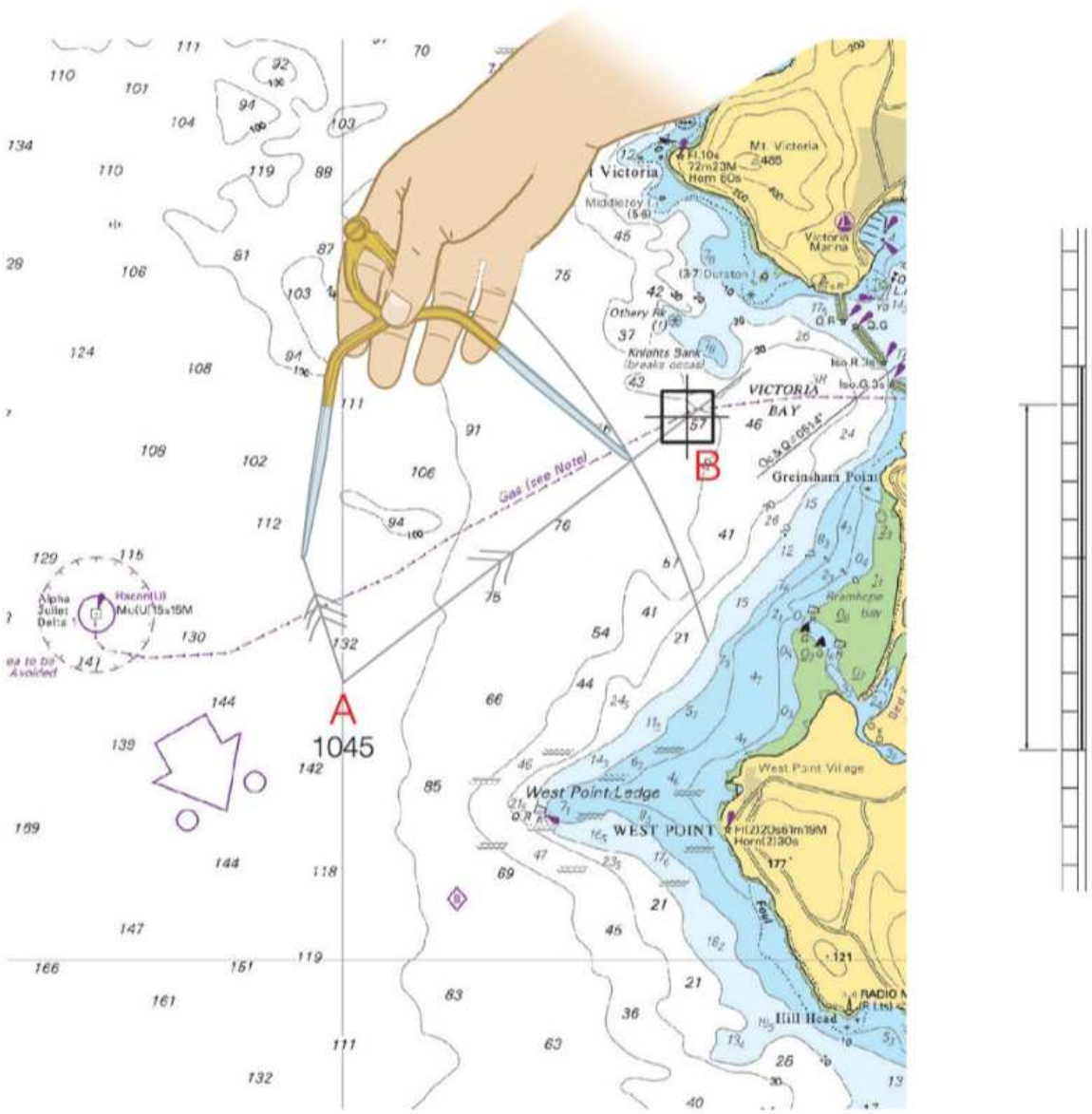
Answer 341°(T) 3.0kn

Hours		(B) 46°20'6 N 6 18·4W	
Before High Water	6	158	1·0 0·6
	5	153	1·7 0·8
	4	159	2·8 1·5
	3	154	3·9 2·0
	2	165	3·2 1·7
	1	173	2·4 1·3
High Water		186	1·2 0·7
After High Water	1	349	1·1 0·6
	2	341	3·0 1·6
	3	338	3·7 1·8
	4	342	3·9 2·0
	5	341	2·8 1·5
	6	355	2·3 1·2

4 Plot the tidal stream at the start of the ground track.

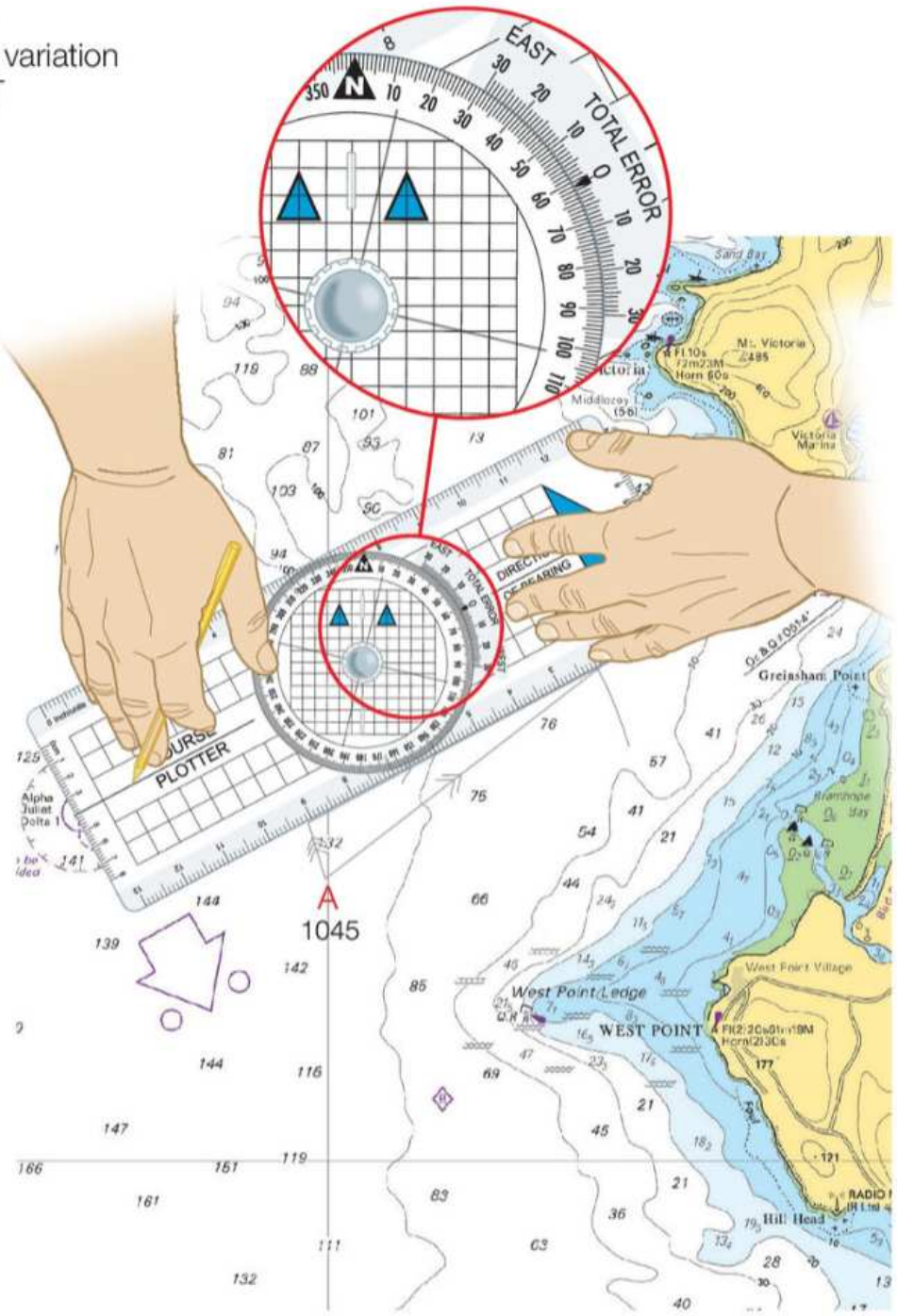


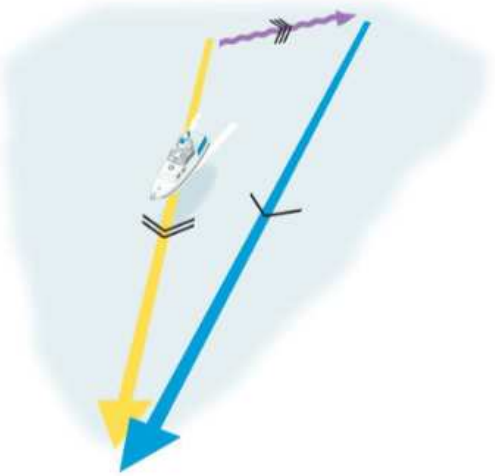
5 Measure the expected boat speed for one hour (9kn) and arc dividers from end of tidal stream to cross the ground track. This usually goes beyond or falls short of B.



6 Measure direction of water track. This will be your course to steer.

= 061°(T)
+ 7°(W) variation
068°(M)





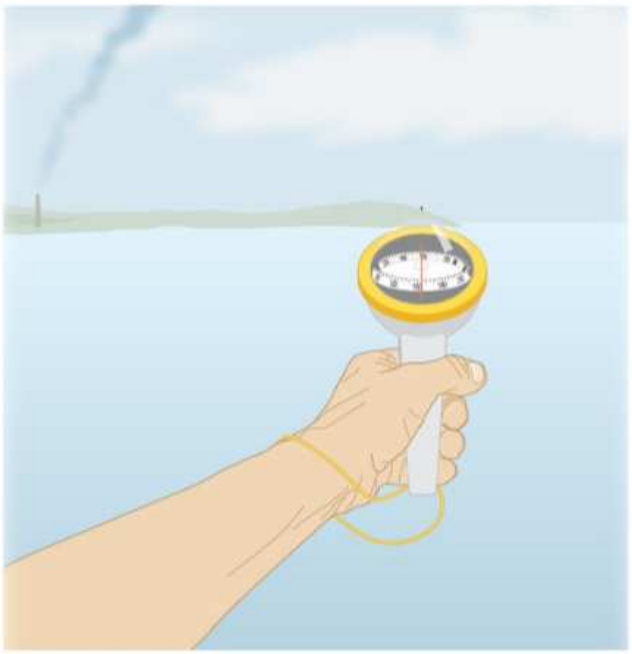
Although you are steering 068 degrees (M), you are maintaining your shortest COG or ground track.

7. Consider leeway. Head up five degrees or 10 degrees into the wind if necessary.

Fixing your Position

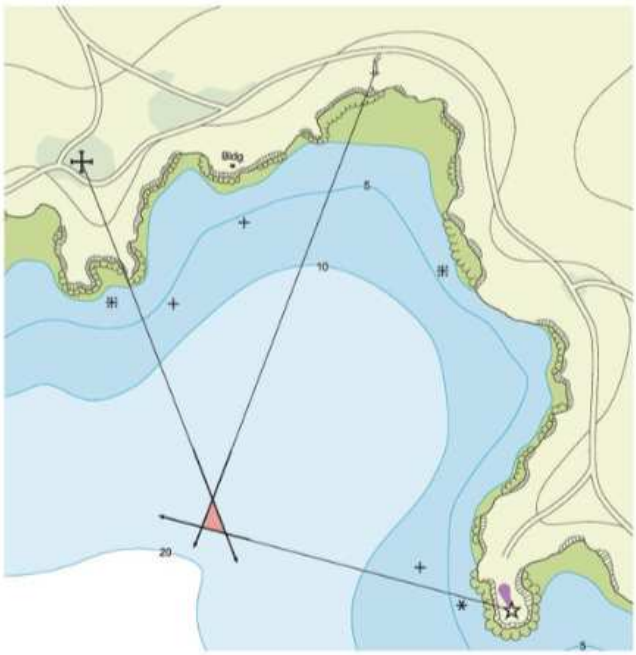
A VISUAL FIX

Three-Point Fix



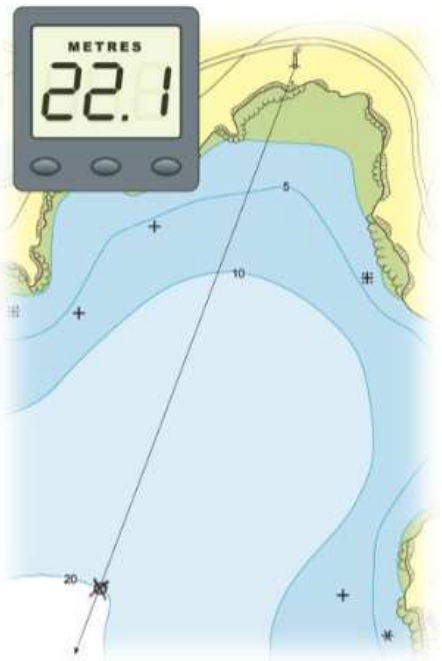
Take bearings on charted objects to fix your position.

Draw the bearings on the chart. Your position will be where the lines intersect. Use closer objects for greater accuracy.



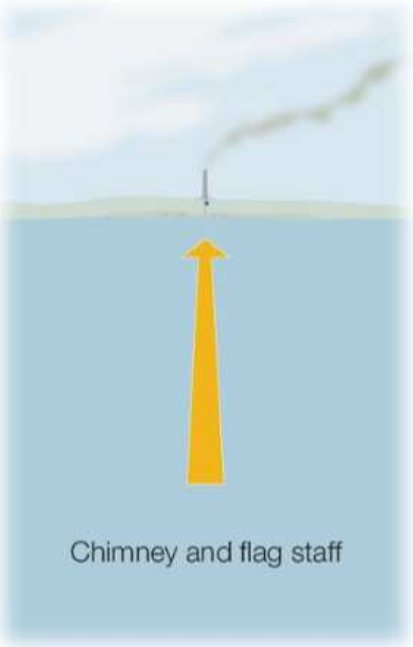
Bearings rarely line up as a perfect fix. Error produces a cocked hat.

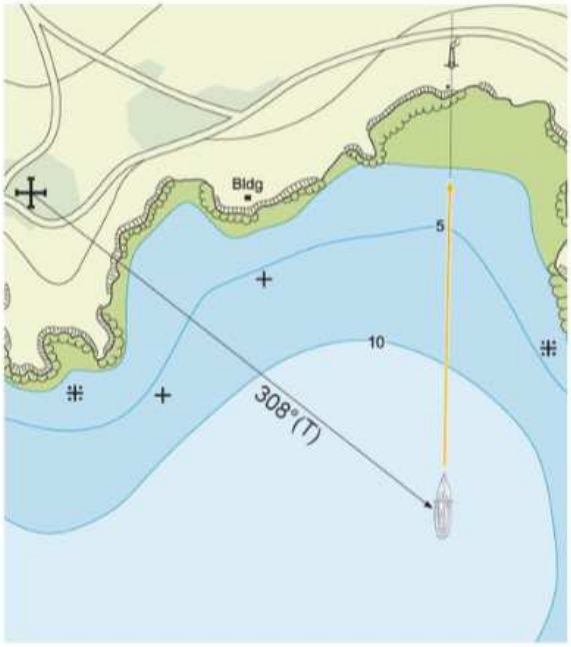
If bearings are too close together the error is greater. Don't use objects that will give a poor angle of cut.



Bearing and Contour

Fix your position by taking a bearing on a charted object. Don't forget to allow for the height of tide.





Transit and Bearing

Line up two charted objects to make a transit. This gives you a very accurate position line.

The Simplest Fix

Plot your position as you pass a charted object.

A GPS FIX

A GPS receiver obtains a fix from signals transmitted by orbiting satellites. This gives a position which is accurate to about 15 metres.

GPS is generally reliable and accurate but, as with all electronics, it can go wrong. The main things that can affect it are power or aerial failure; transmissions from mobile phones; interruptions or changes to the satellite system.

The simplest way to use GPS is to plot your position from the longitude and latitude given on the display.

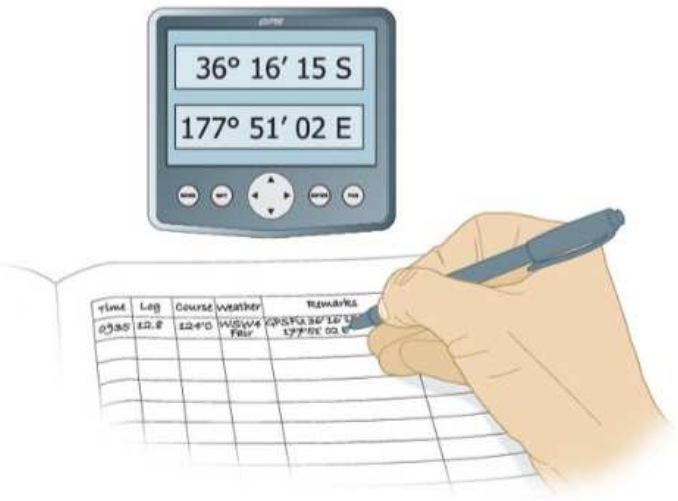
It can also give your current course and speed over the ground, and information about your position in relation to waypoints.

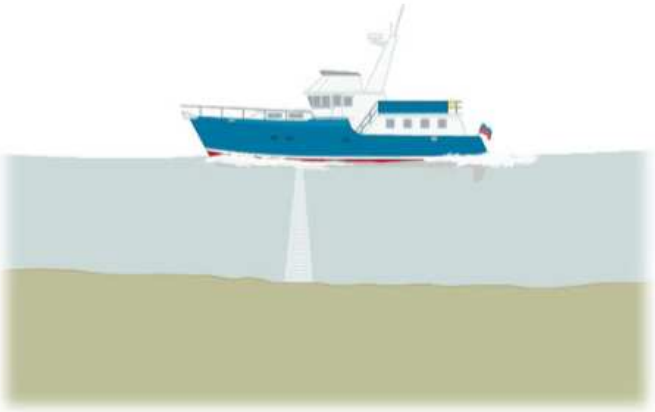
Always back-up your GPS position with information from another source such as:

Bearing.

A charted object (IALA B buoyage).

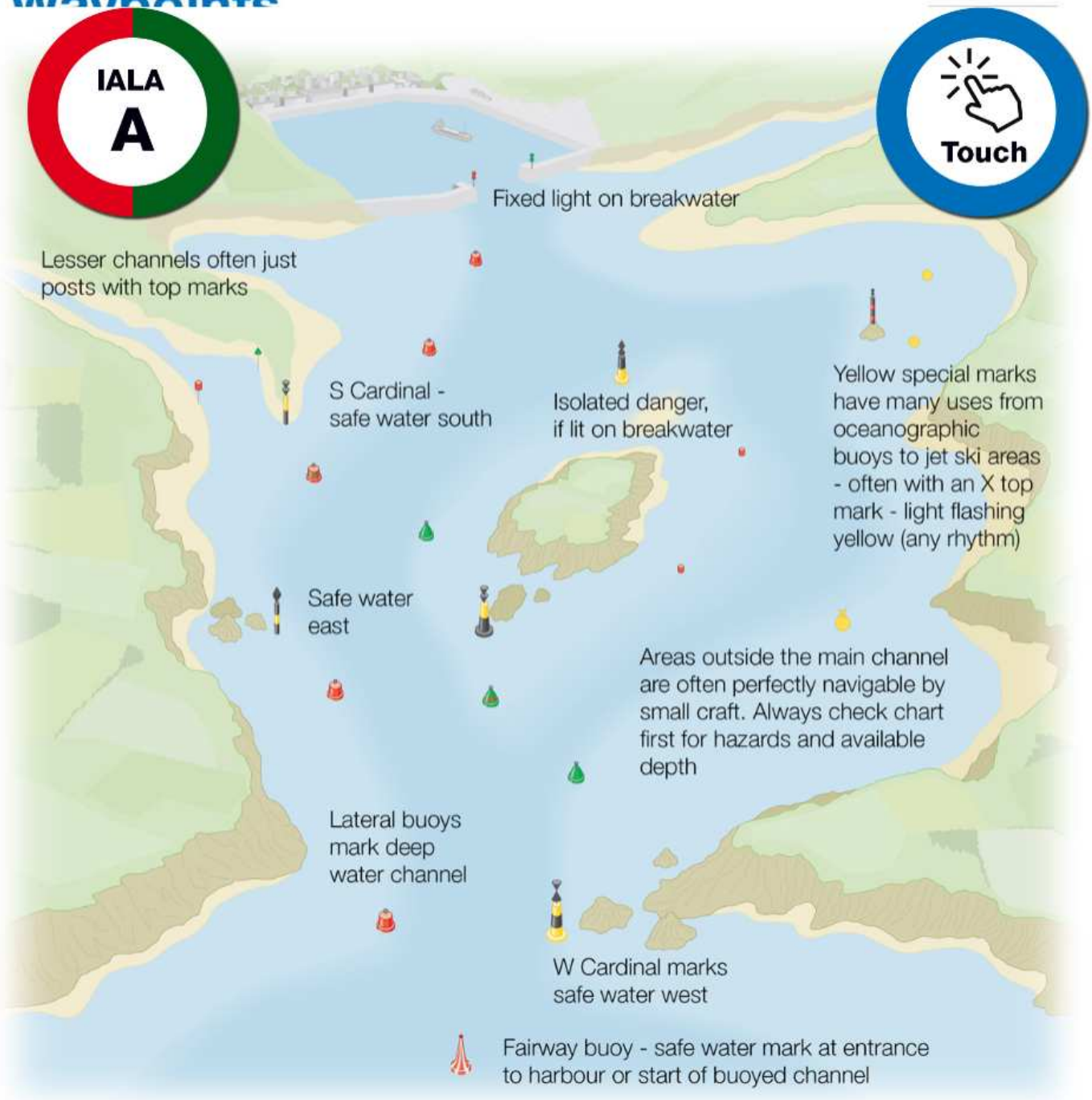
Keep a record of your position at regular intervals on the chart and in the ship's log.





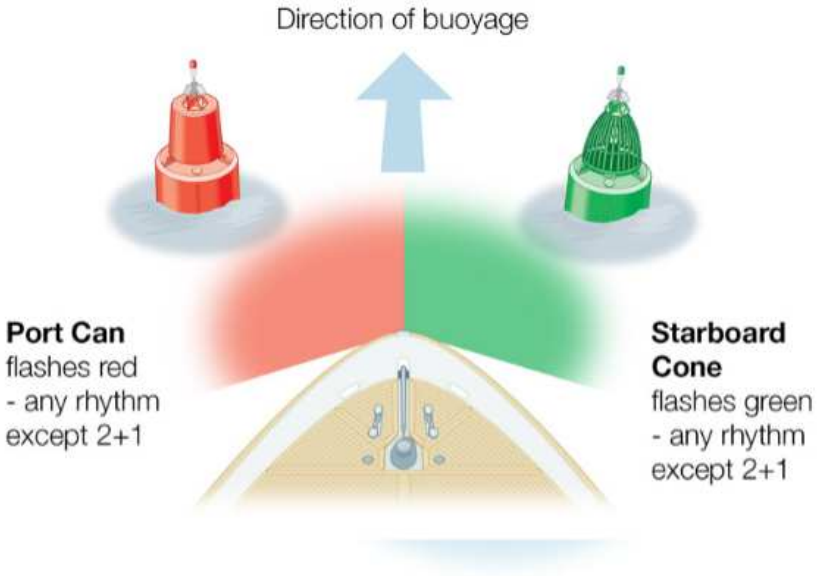
Depth allowing for tide.

Waypoints



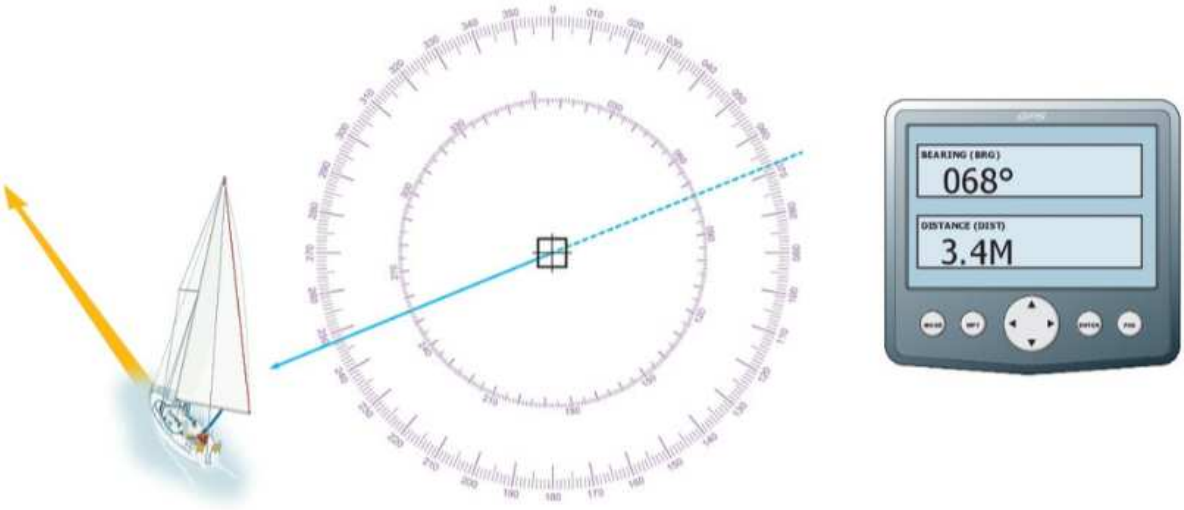
Lateral Marks

Used to mark channels. Leave starboard cone to your starboard side when going into harbour.

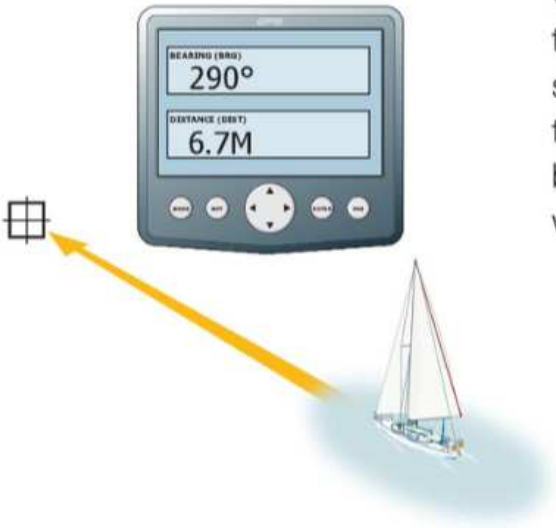


OTHER WAYS OF USING WAYPOINTS

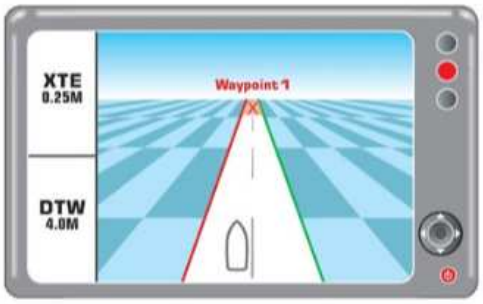
You can plot your position quickly and simply by entering easily found positions as waypoints. The GPS will give you a direction and distance to the waypoint and you can plot these to give a fix. This is easier, quicker and less prone to error than plotting latitude and longitude, but double check that you have entered the waypoint correctly.



You can also use the waypoint that you are travelling to.



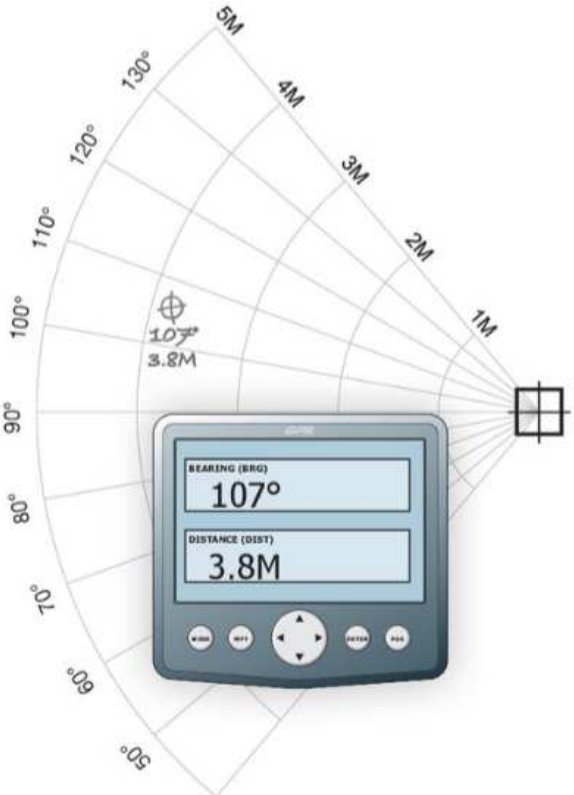
XTE (cross-track error) is the vessel's distance, to port or to starboard, from the direct line between two waypoints.



Plotting at Speed

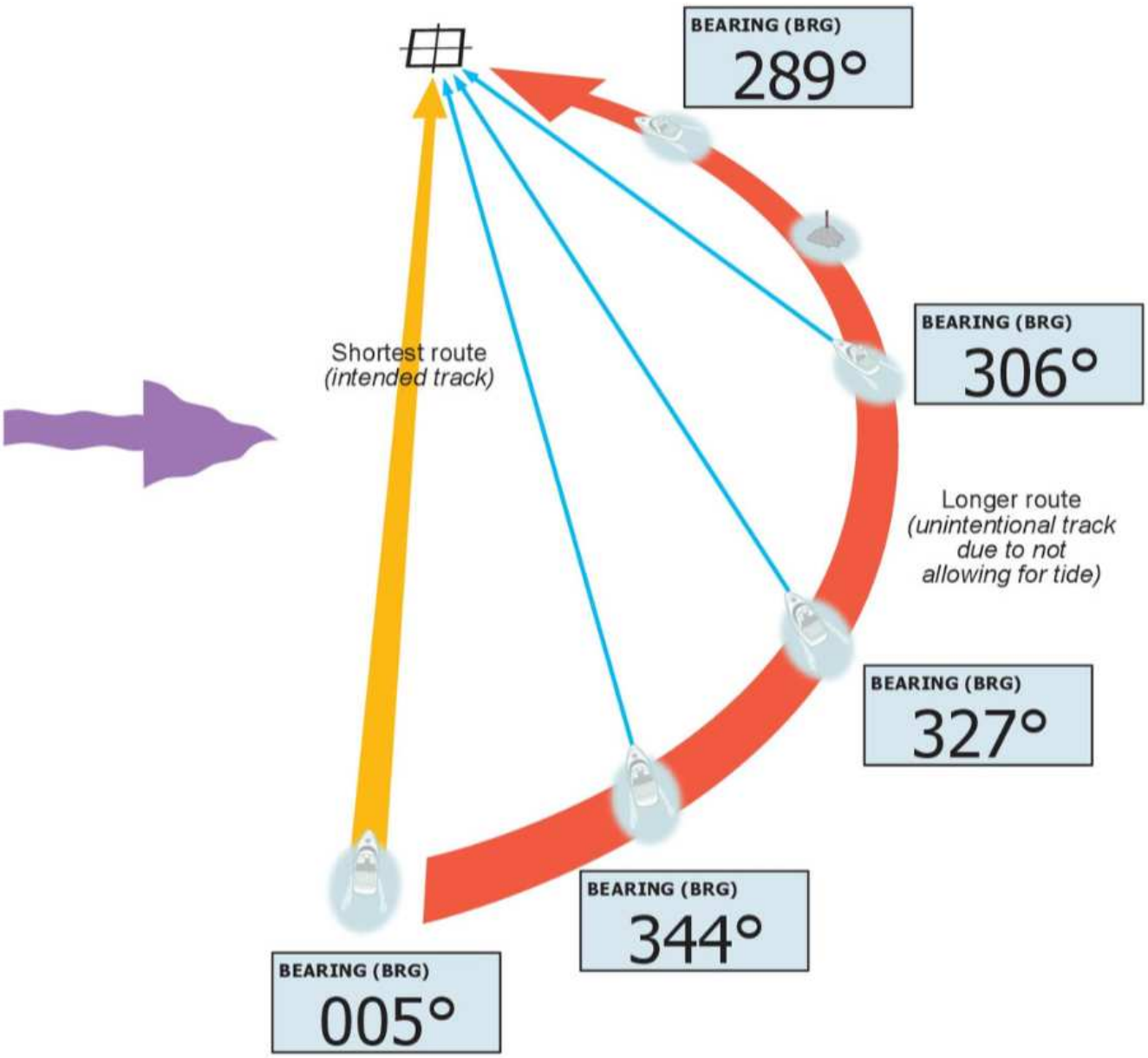
Conventional plotting can be difficult on a fast boat at speed. Navigation must be pre-planned.

Draw a web of directions and distances to your waypoint. The position can very quickly be plotted on the web.



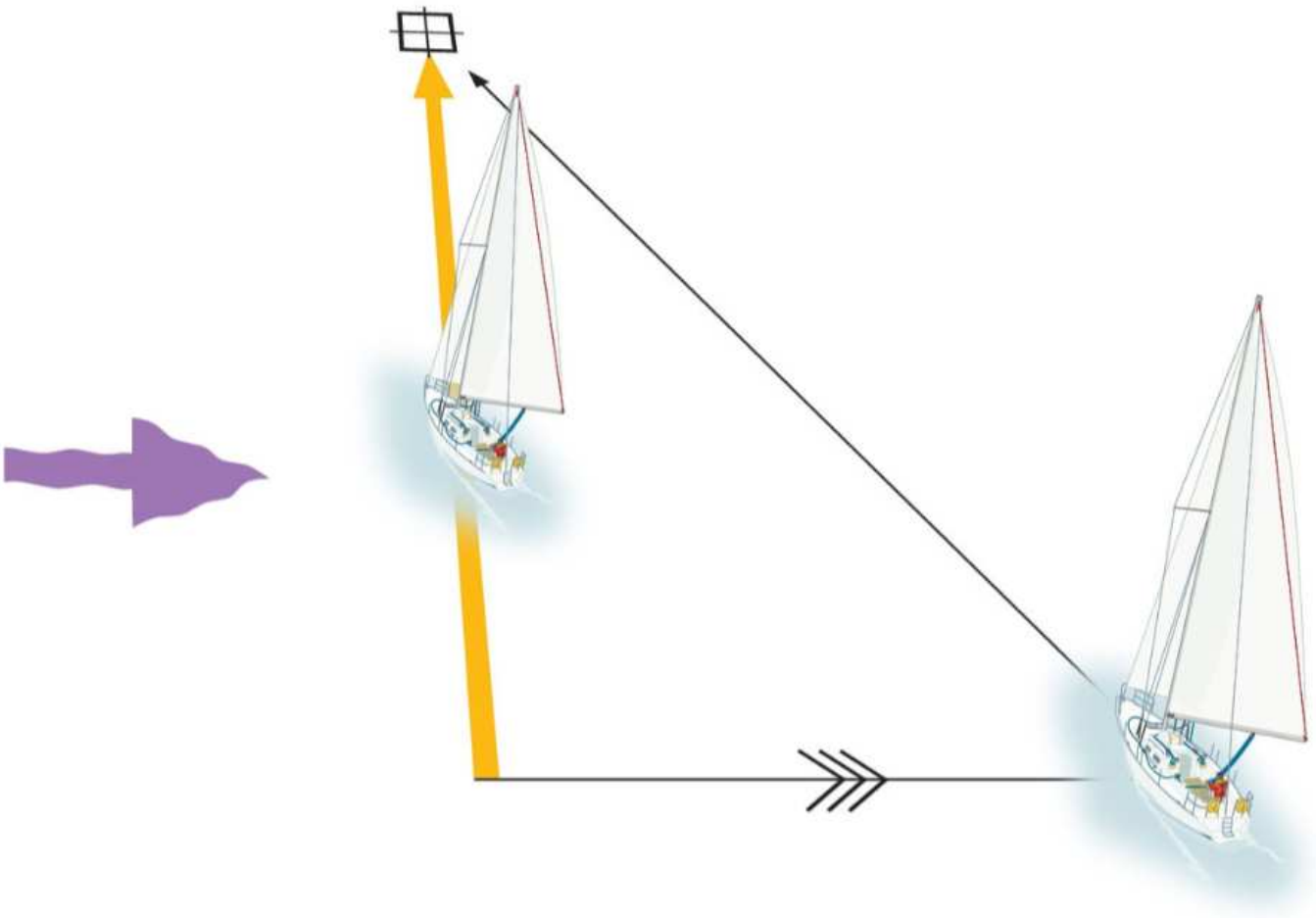
Be Careful

Remember that GPS doesn't allow for tidal stream.



It seems easy just to steer the direction to a waypoint that the GPS gives, but if there is significant crosstide you will sail a longer route and could put the boat in danger.

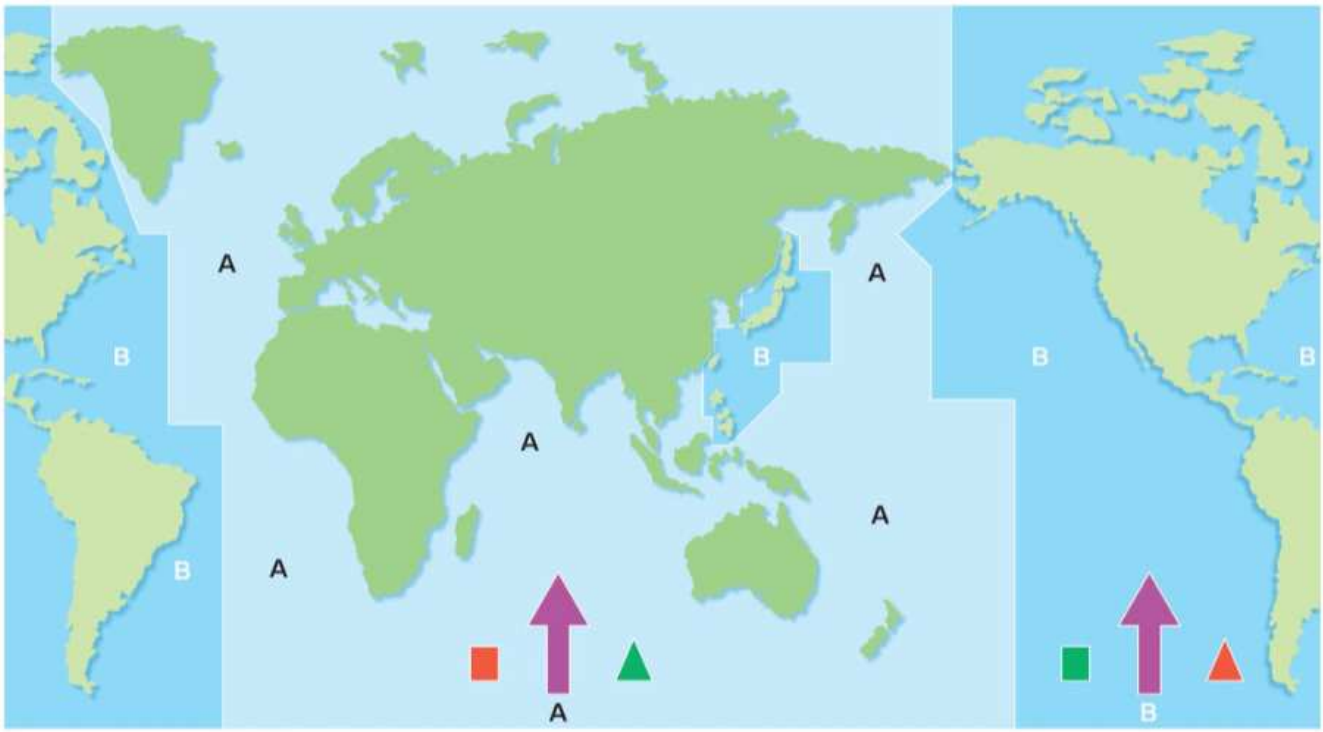
Always pre-plan a course to steer to allow for tidal stream. It's more efficient.



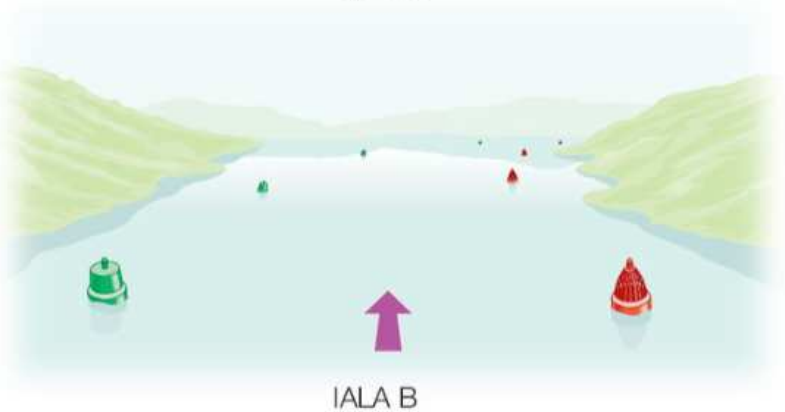
Buoyage

IALA – MARITIME BUOYAGE SYSTEM

Two buoyage systems, IALA A and IALA B, exist in the world. The difference affects the colour and light characteristics of lateral marks. IALA A is used in Europe, Africa, Russia, India, Australia and New Zealand. IALA B is used in the USA, South America, parts of the Caribbean, South-East Asia and Canada.

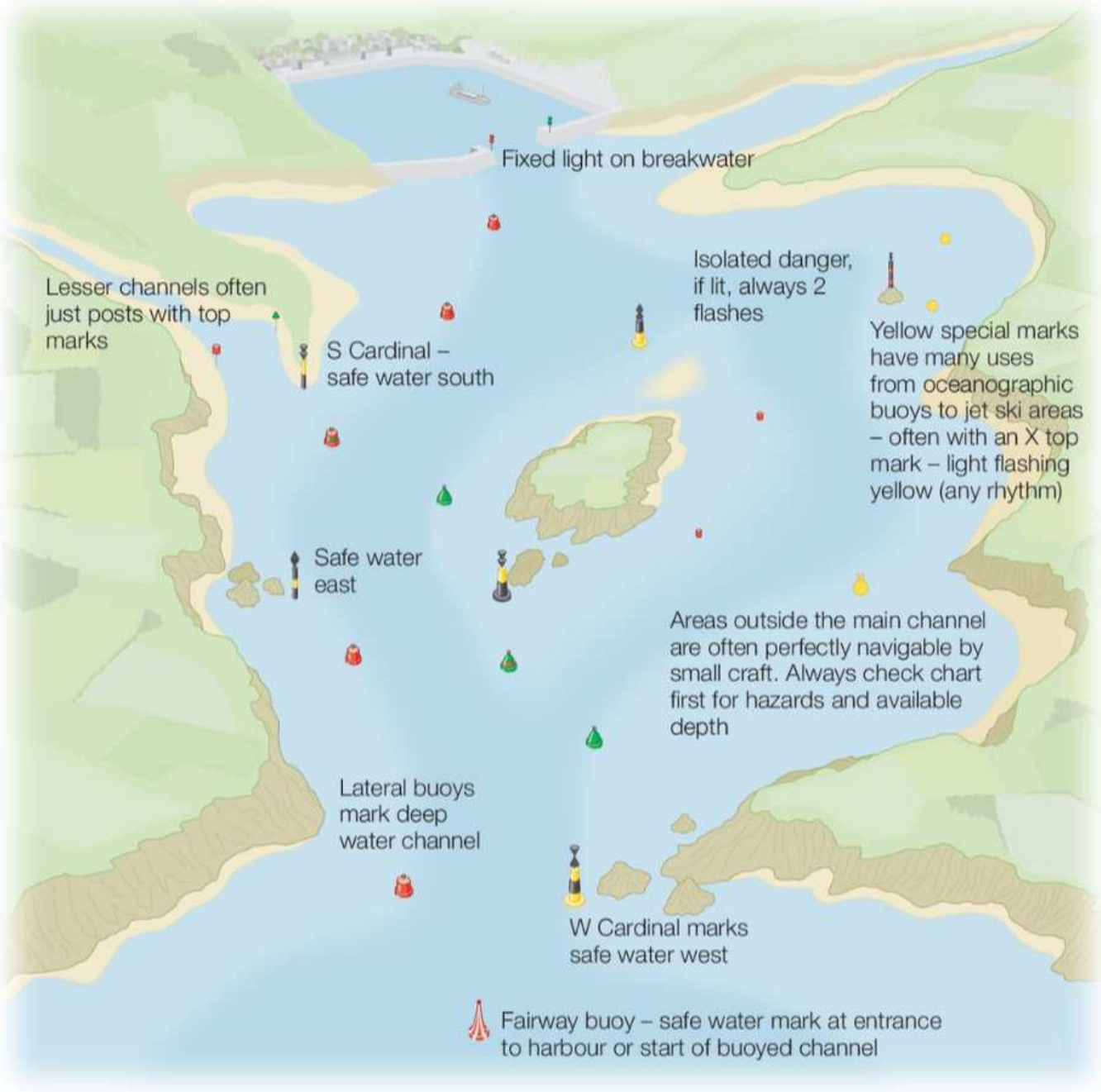


IALA A



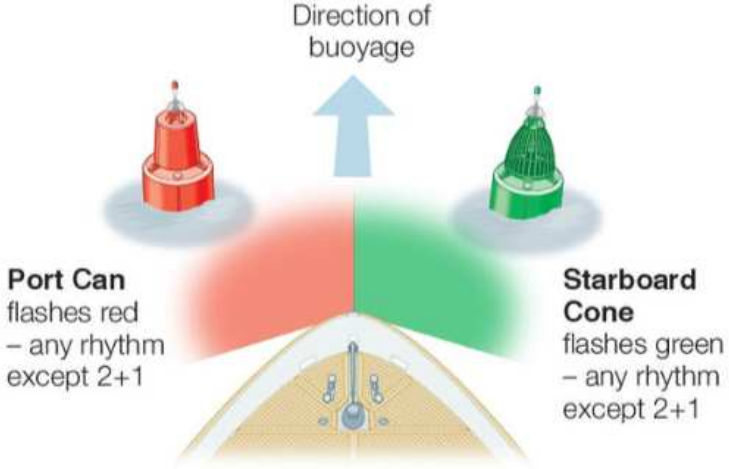
IALA B

IALA A BUOYAGE



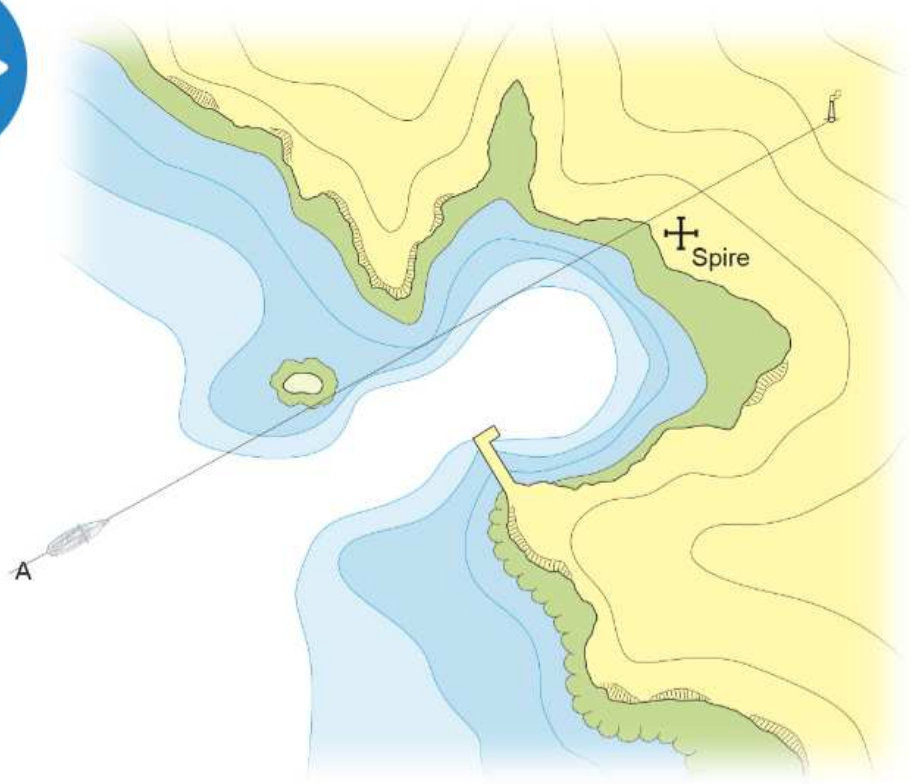
Lateral Marks

Used to mark channels.
Leave starboard cone to your starboard side when going into harbour.

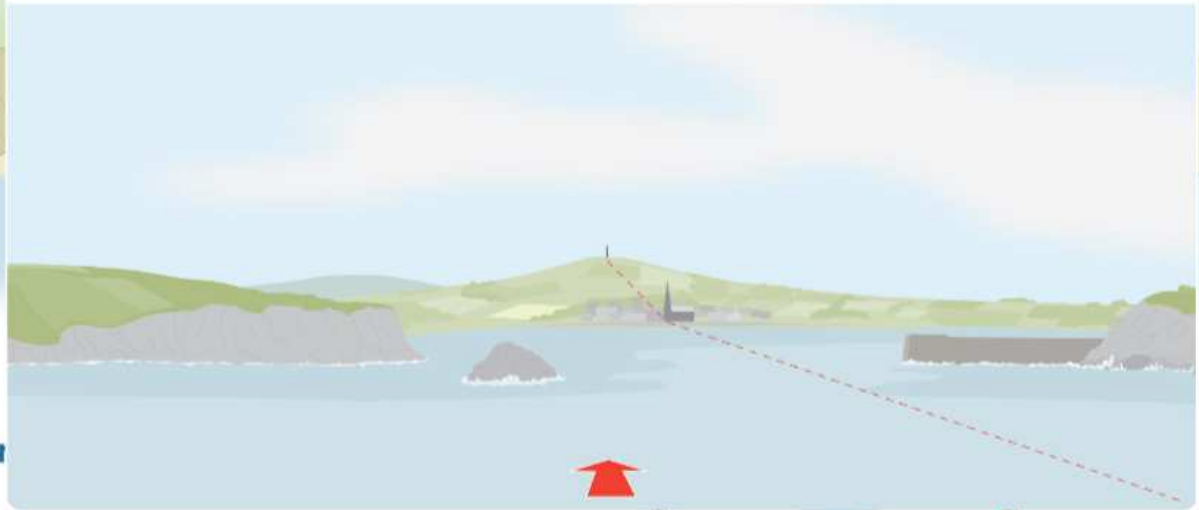


IALA B BUOYAGE

SLIDE



A = Too far to port

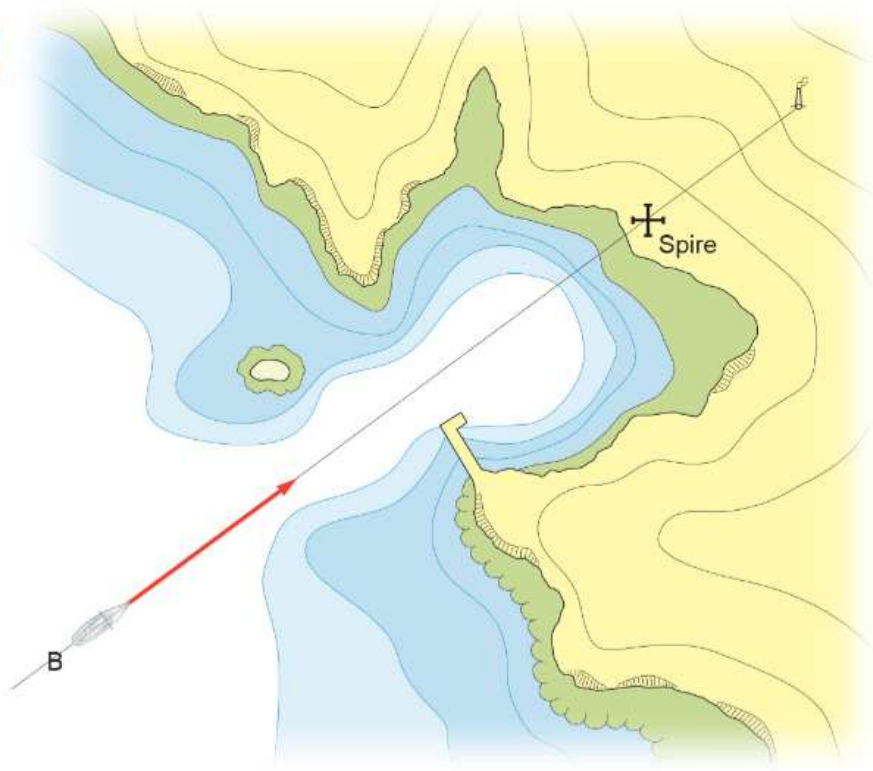


Later

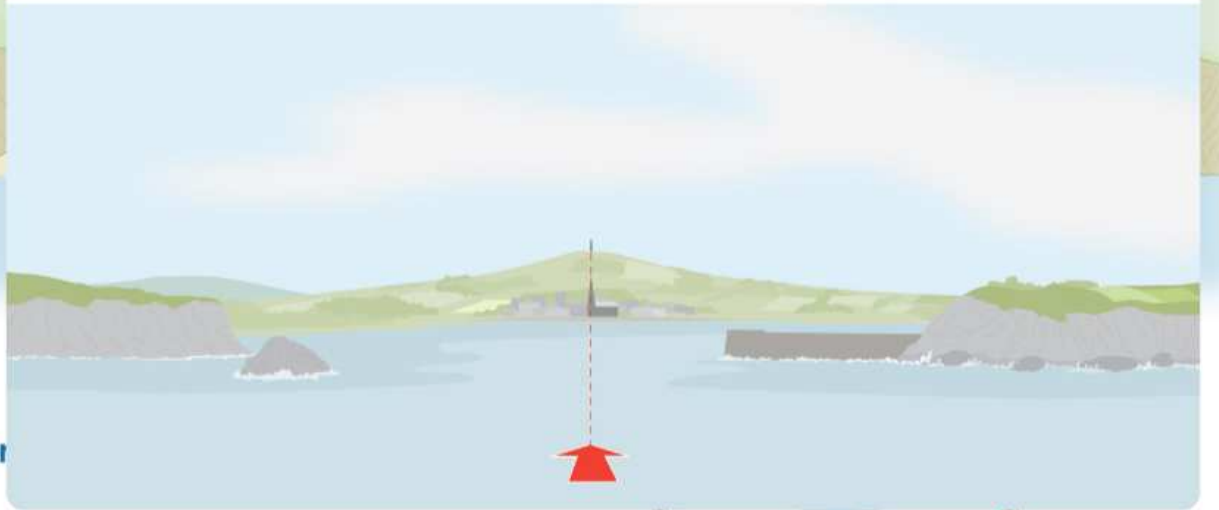
Used to mark channels.
Leave starboard cone to your starboard side when going into harbour.

IALA B BUOYAGE

SLIDE



B = On track



Later

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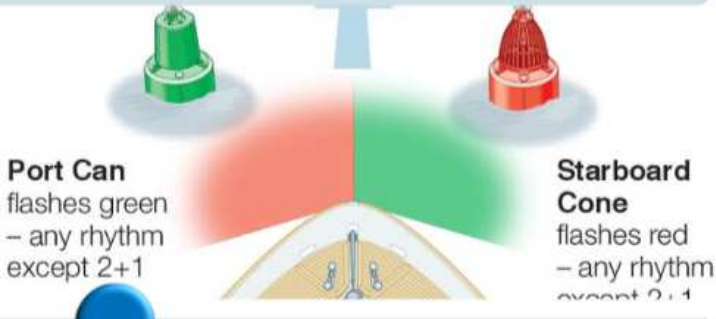

IALA B BUOYAGE

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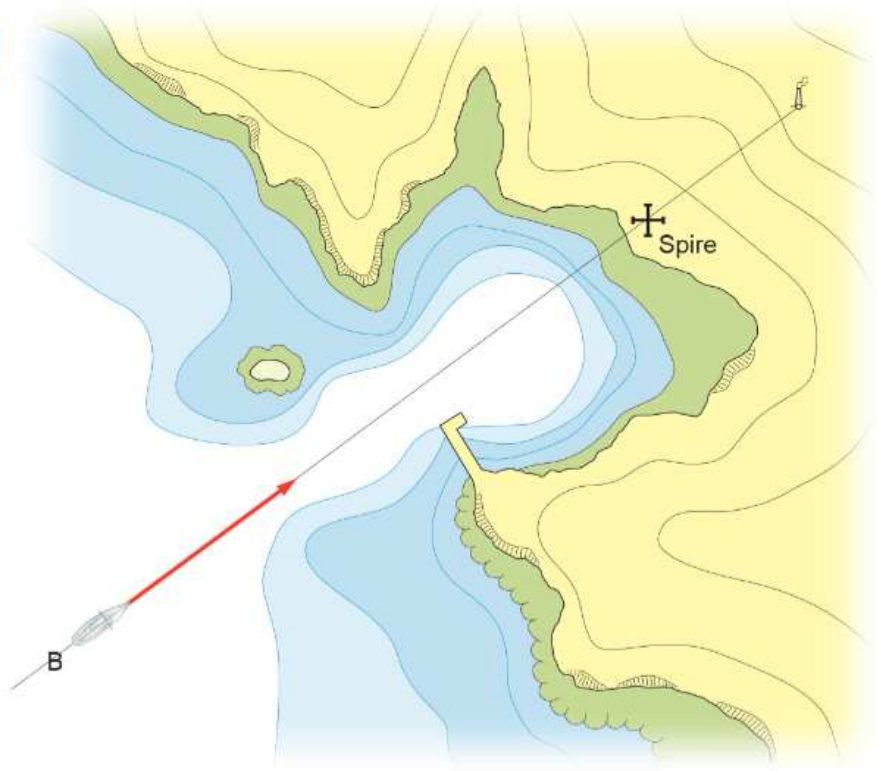
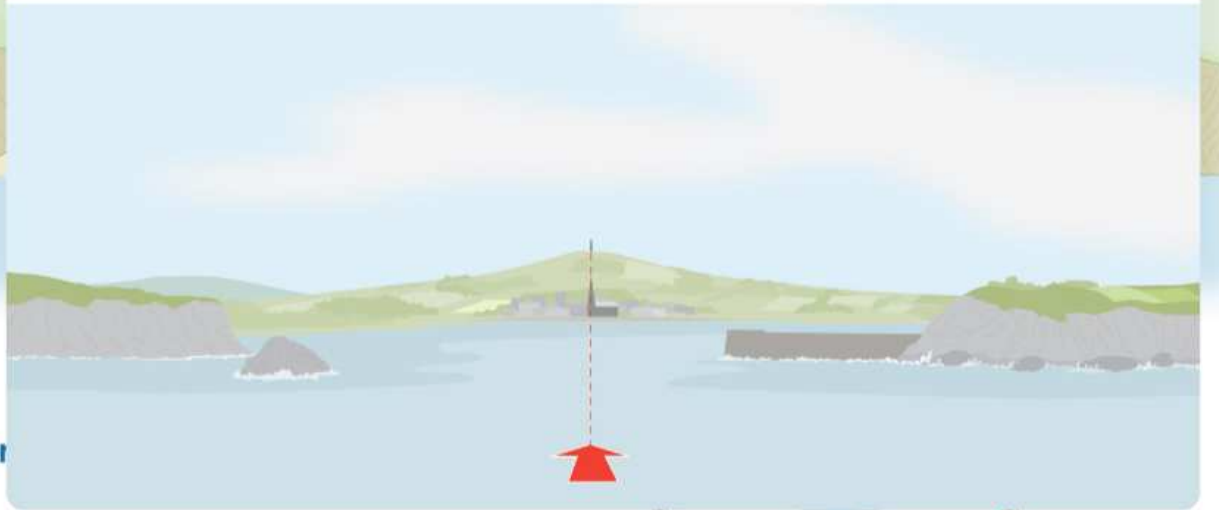


B = On track



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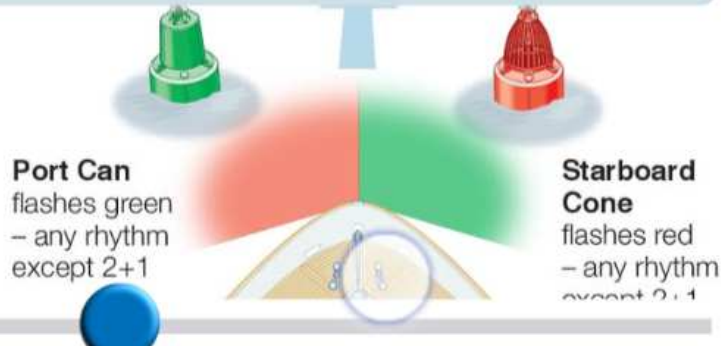
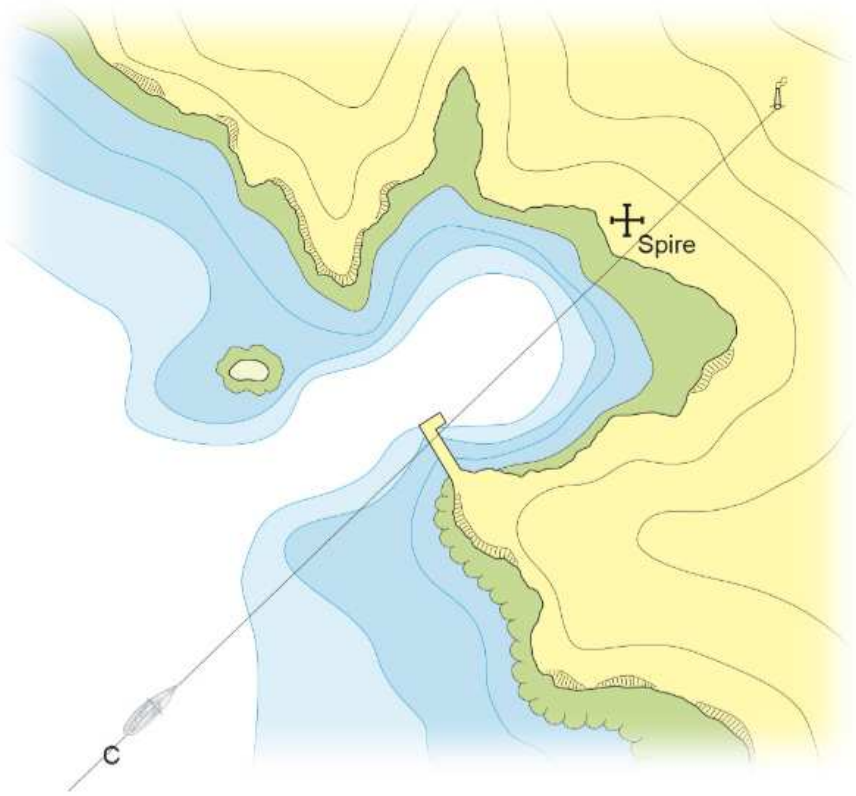
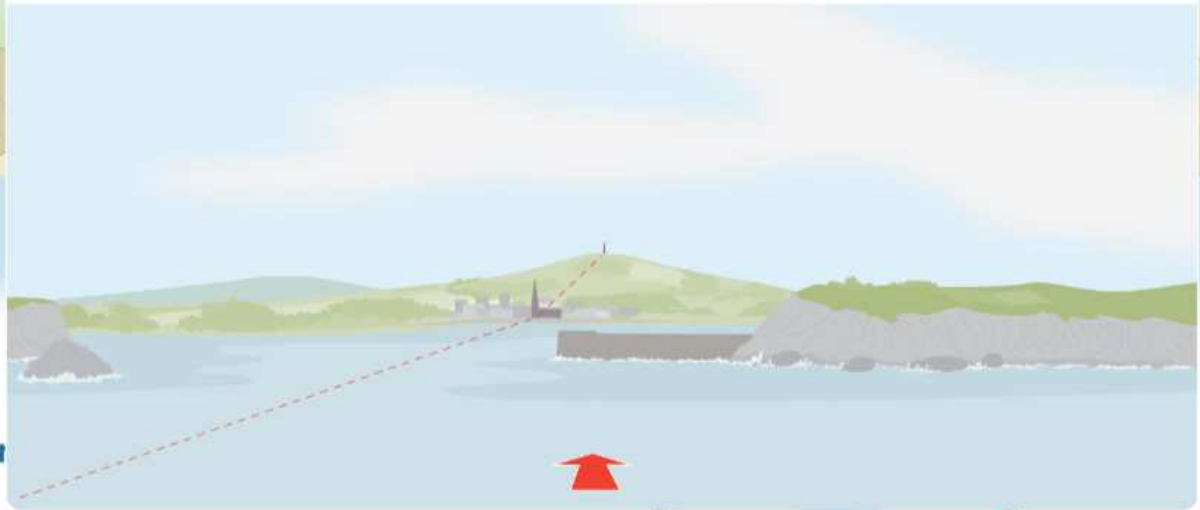


IALA B BUOYAGE

SLIDE



C = Too far to starboard



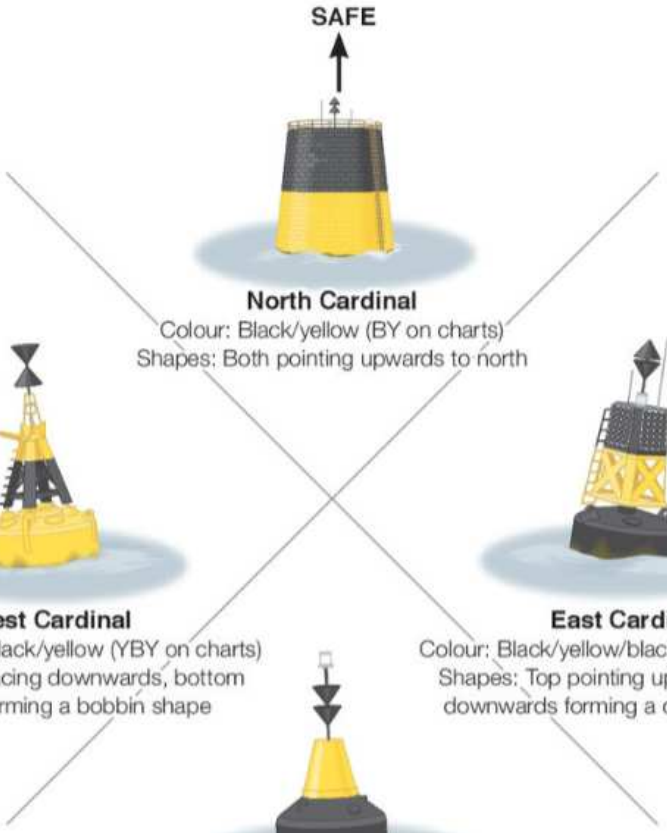
Later

Used to mark channels.
Leave starboard cone to your starboard side when going into harbour.

CARDINAL MARKS

Cardinals

Cardinal marks indicate which side of the mark is safe water and remain constant throughout the IALA system. Cones point to black bands. Buoys are found in many shapes and sizes. Solar panels and lights can make top marks difficult to distinguish.
Weeds and guano can alter the appearance and colour.

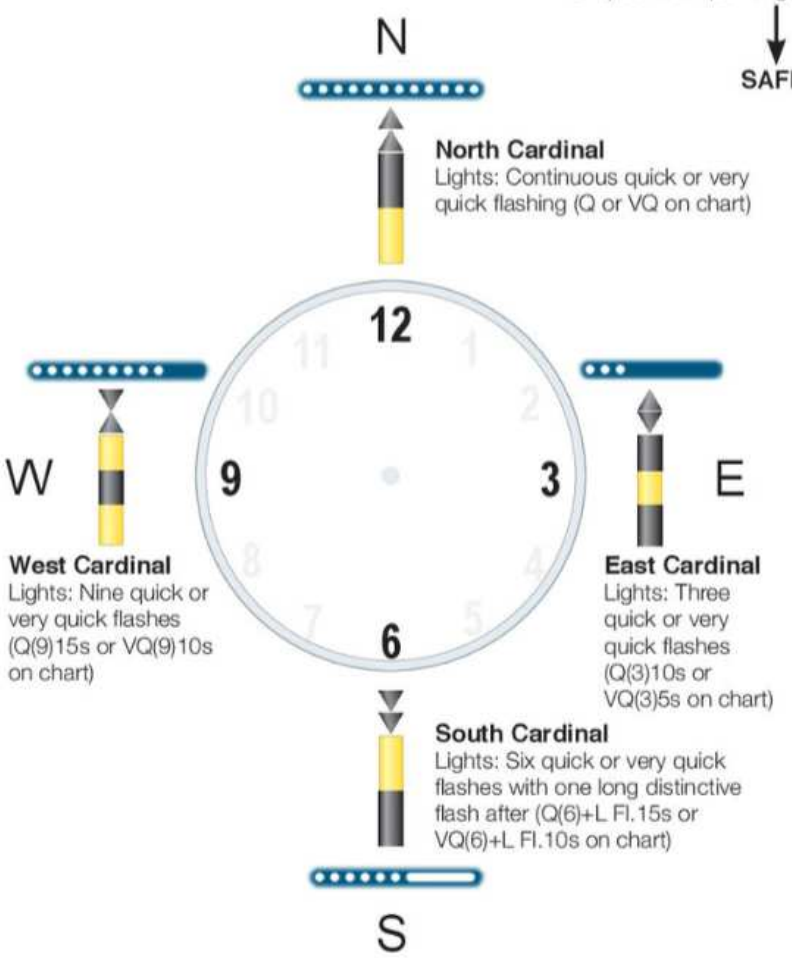


North Cardinal
Colour: Black/yellow (BY on charts)
Shapes: Both pointing upwards to north

West Cardinal
Colour: Yellow/black/yellow (YBY on charts)
Shapes: Top facing downwards, bottom upwards forming a bobbin shape

East Cardinal
Colour: Black/yellow/black (BYB on charts)
Shapes: Top pointing upwards, bottom downwards forming a diamond shape

South Cardinal
Colour: Yellow/black (YB on charts)
Shapes: Both pointing downwards to south



North Cardinal
Lights: Continuous quick or very quick flashing (Q or VQ on chart)

West Cardinal
Lights: Nine quick or very quick flashes (Q(9)15s or VQ(9)10s on chart)

East Cardinal
Lights: Three quick or very quick flashes (Q(3)10s or VQ(3)5s on chart)

South Cardinal
Lights: Six quick or very quick flashes with one long distinctive flash after (Q(6)+L Fl.15s or VQ(6)+L Fl.10s on chart)

Touch the cardinal marks on the opposite diagram to view their light characteristics at night

Emergency Wreck-marking Buoy

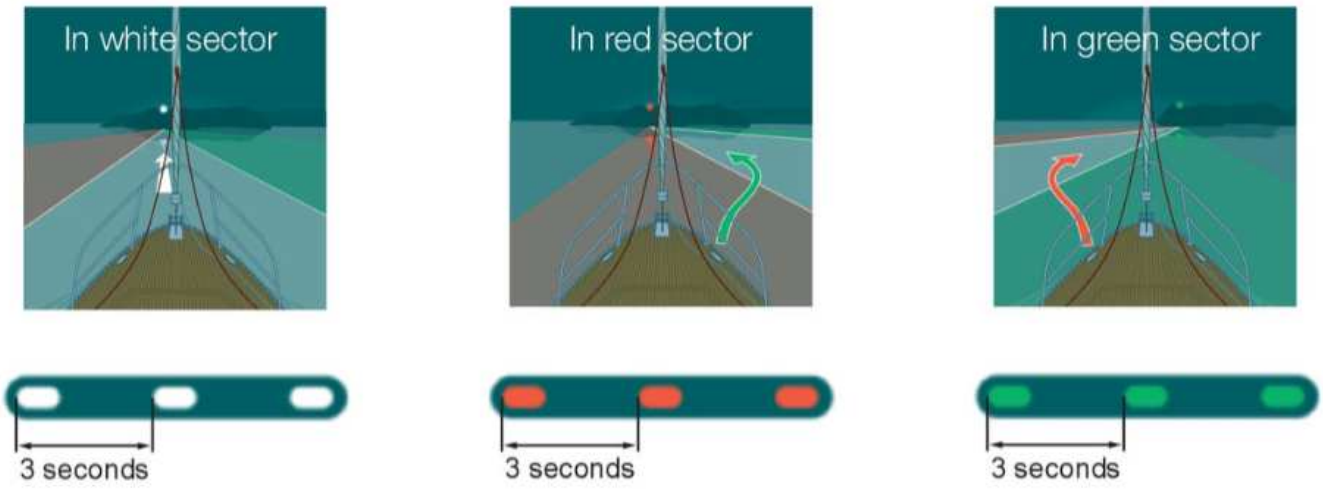
Emergency wreck-marking buoy, placed at the site of a new wreck. Remains in place until the wreck has been dealt with.

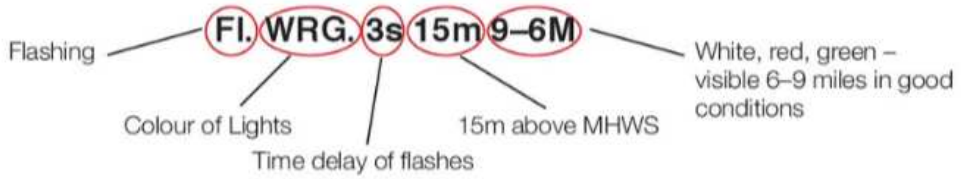
Preferred Channel Marks IALA A

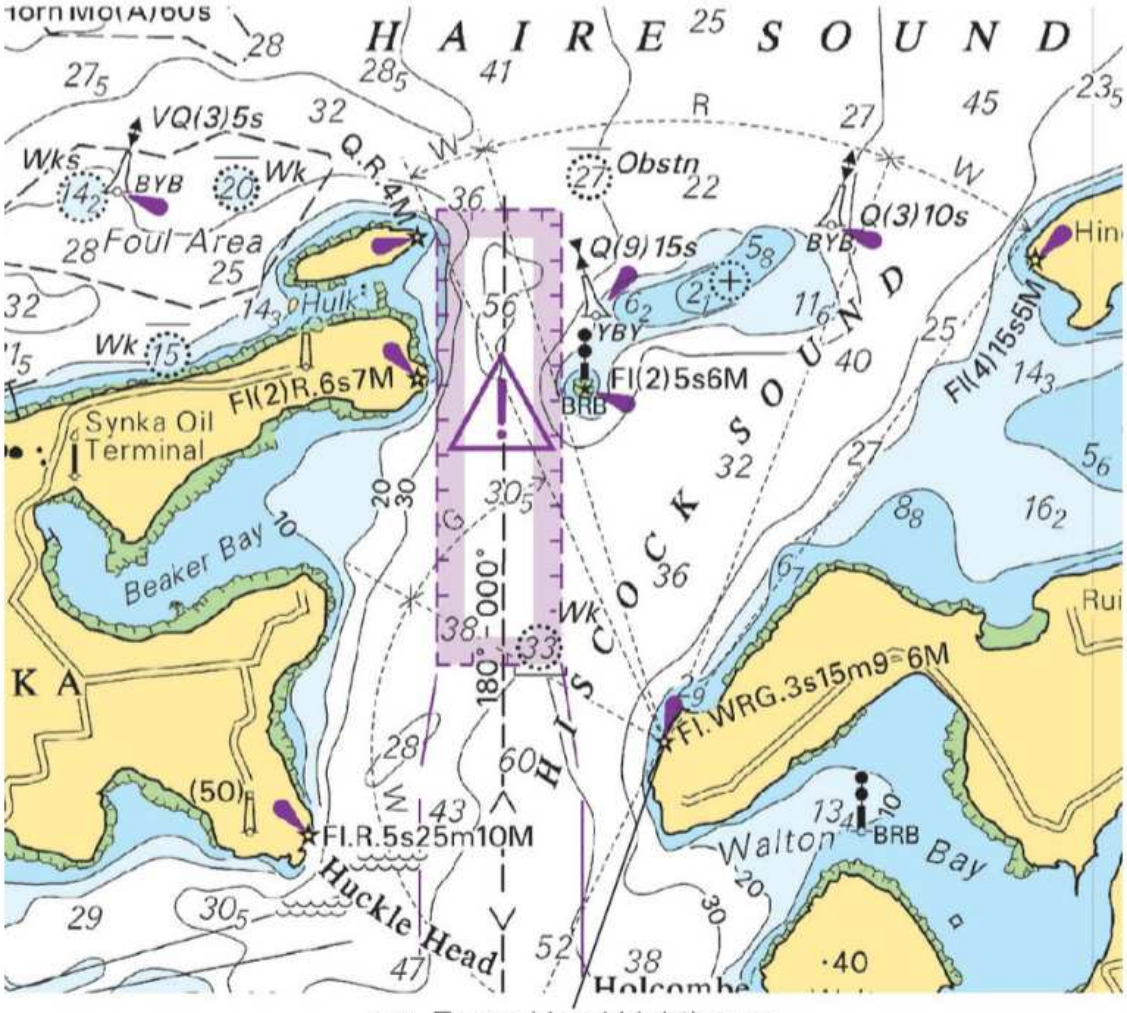
Preferred channel mark, may be placed where a channel splits in two, indicating the preferred channel.

Lights

SECTOR LIGHTS



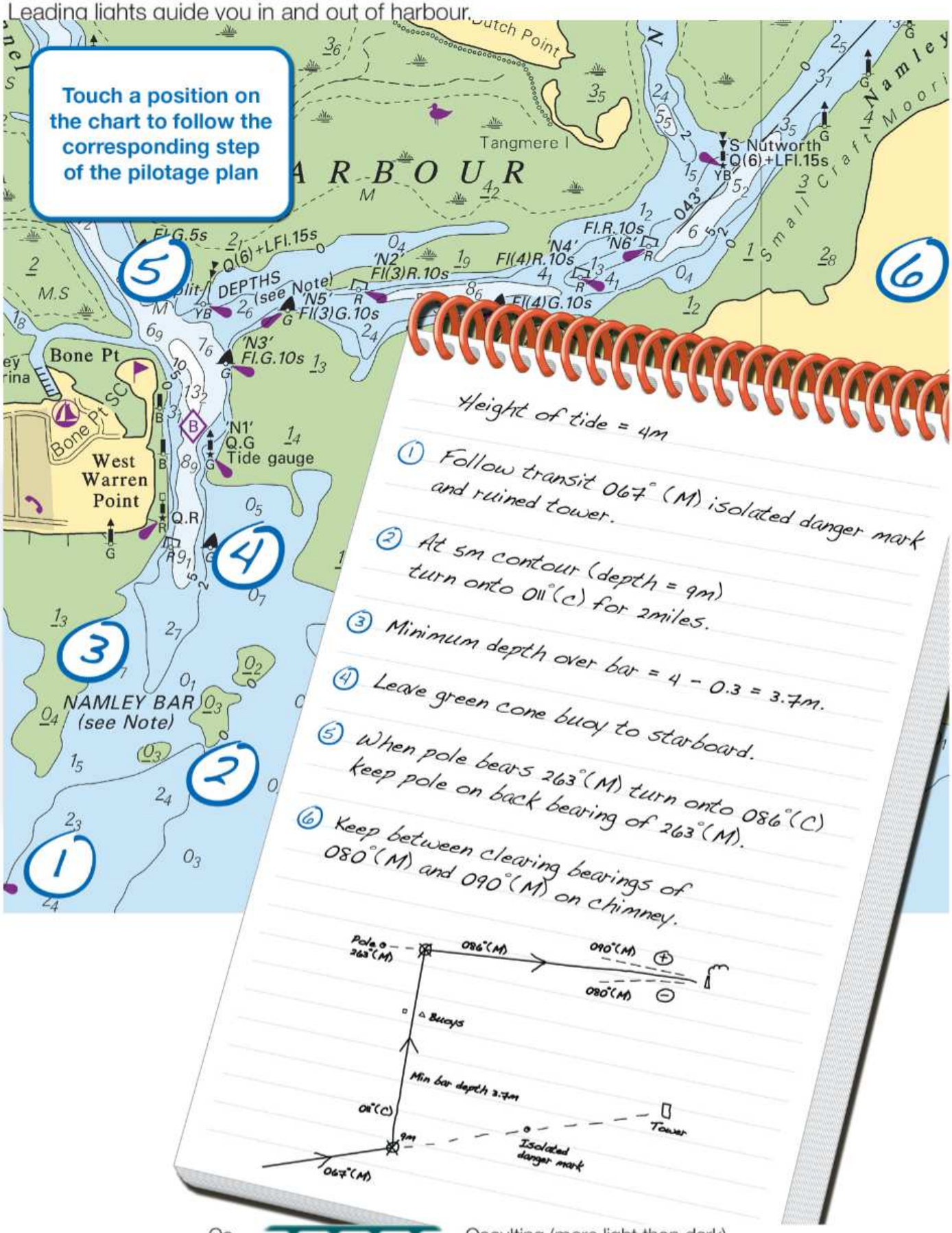




e.g. Evans Head Lighthouse

LEADING LIGHTS

Leading lights guide you in and out of harbour.



Height of tide = 4m

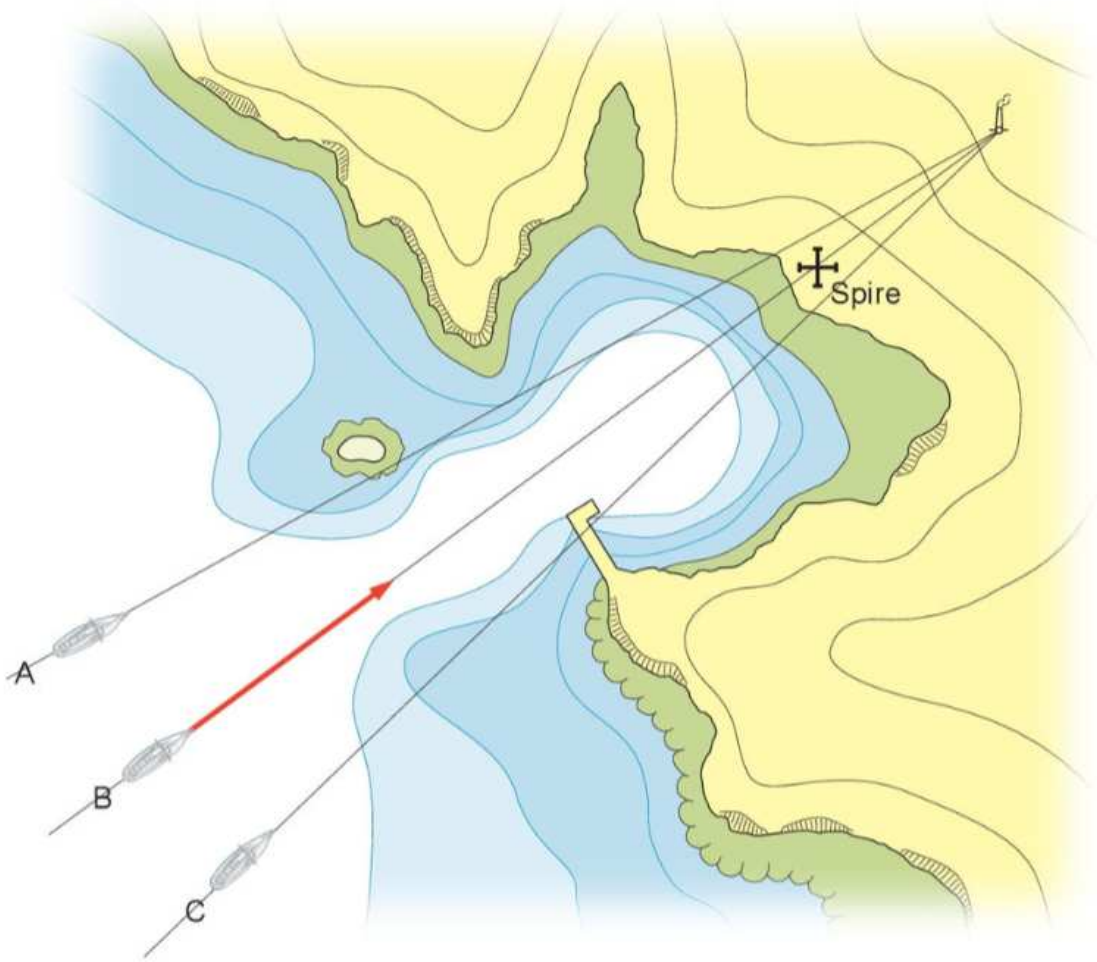
1. Follow transit 067° (M) isolated danger mark and ruined tower.
2. At 5m contour (depth = 9m) turn onto 011°(C) for 2miles.
3. Minimum depth over bar = 4 - 0.3 = 3.7m.
4. Leave green cone buoy to starboard.
5. When pole bears 263°(M) turn onto 086°(C) keep pole on back bearing of 263°(M).
6. Keep between clearing bearings of 080°(M) and 090°(M) on chimney.

Oc — Occulting (more light than dark)

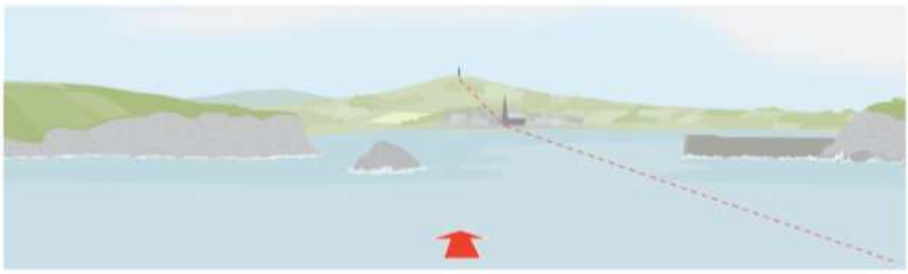
Iso — Isophase (equal periods of light and dark)

TECHNIQUES

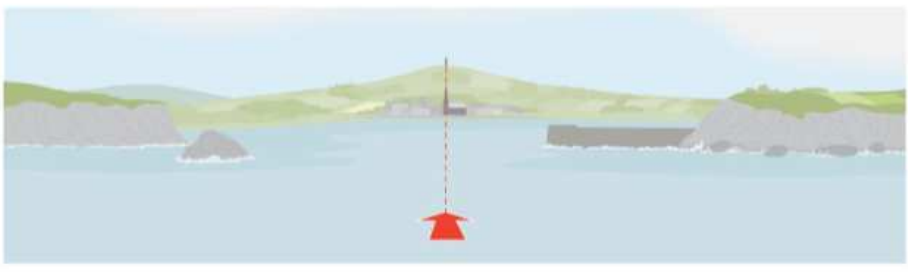
Transits



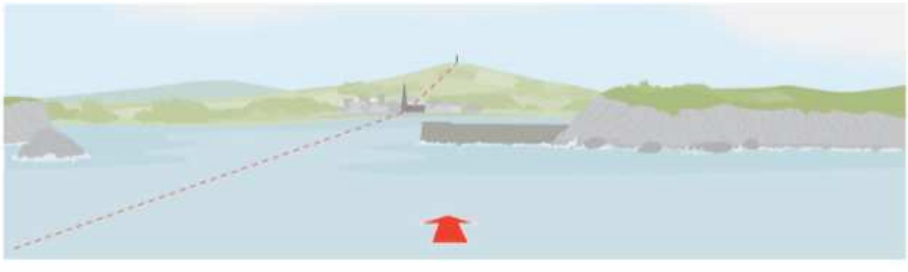
A = Too far to port



B = On track

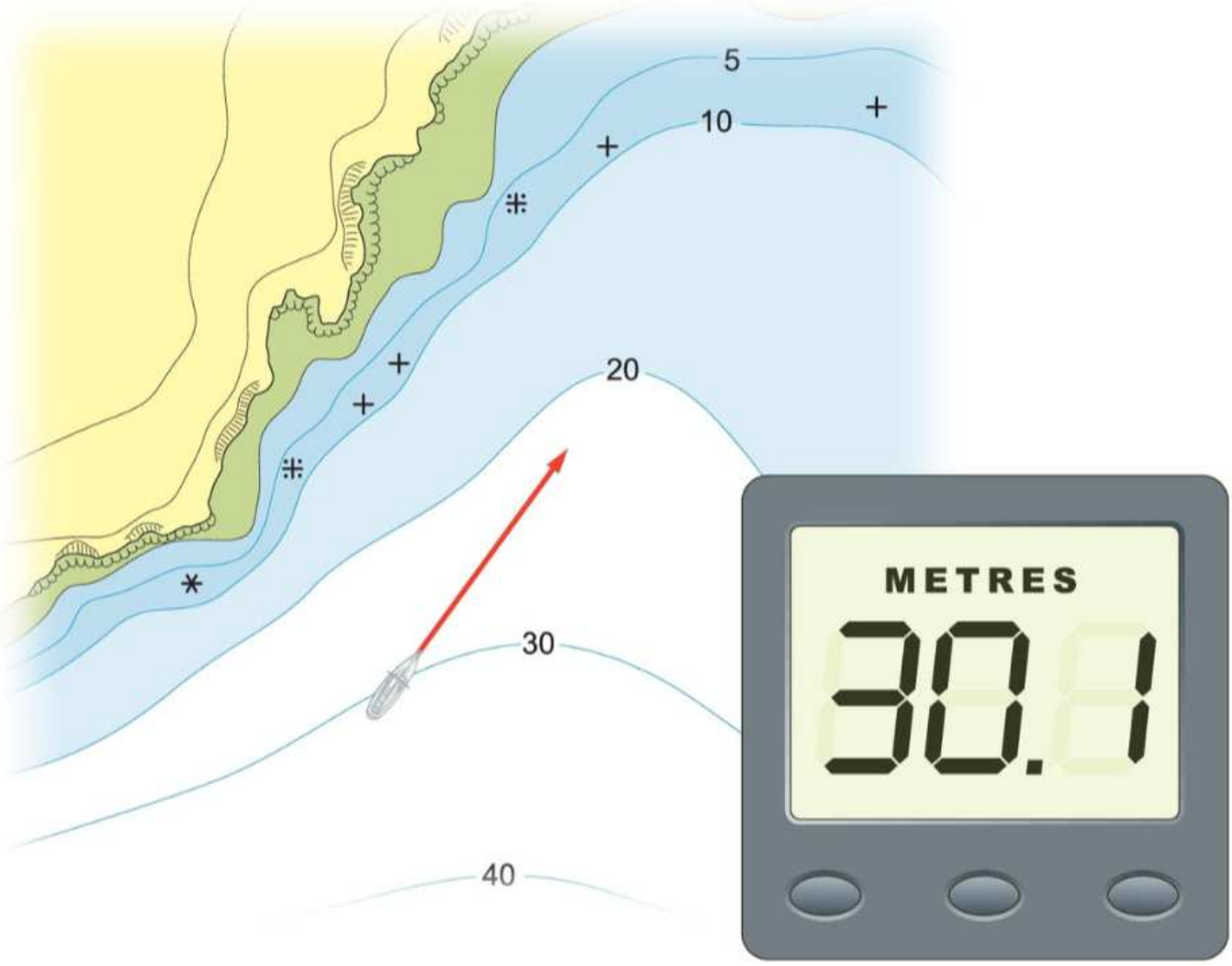


C = Too far to starboard



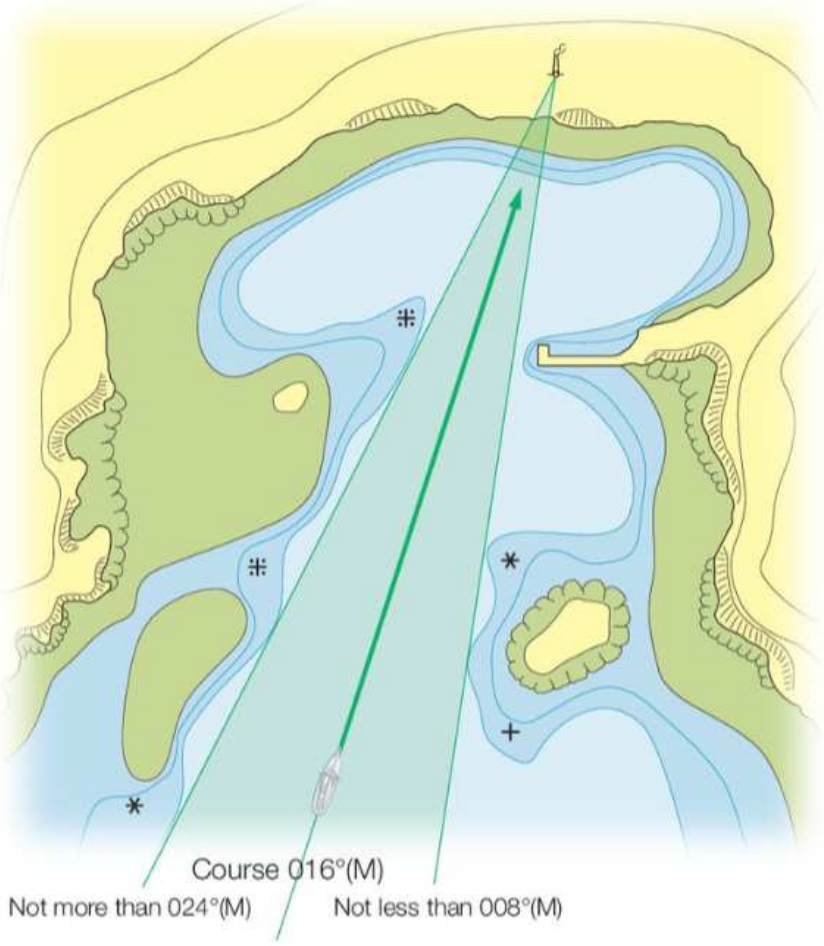
Contours

You can work out where you are when you cross a contour. They can be followed in poor visibility. Remember to allow for rise and fall of tide.

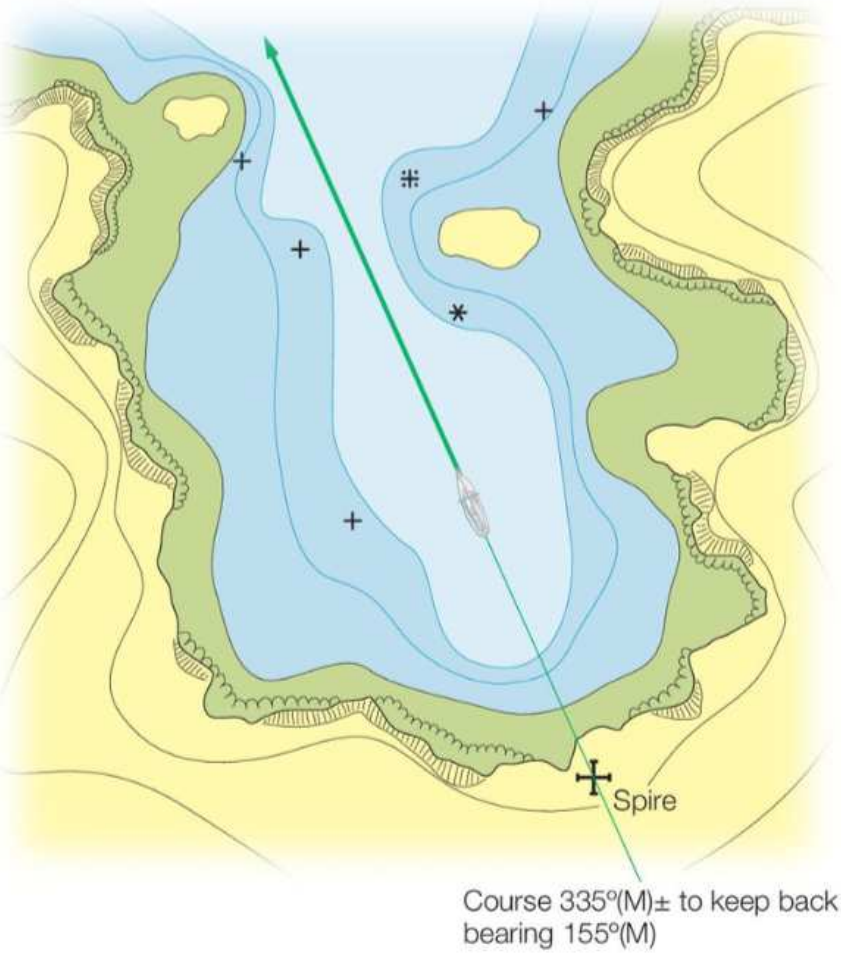


Clearing Bearing

You can go anywhere between the two bearings.

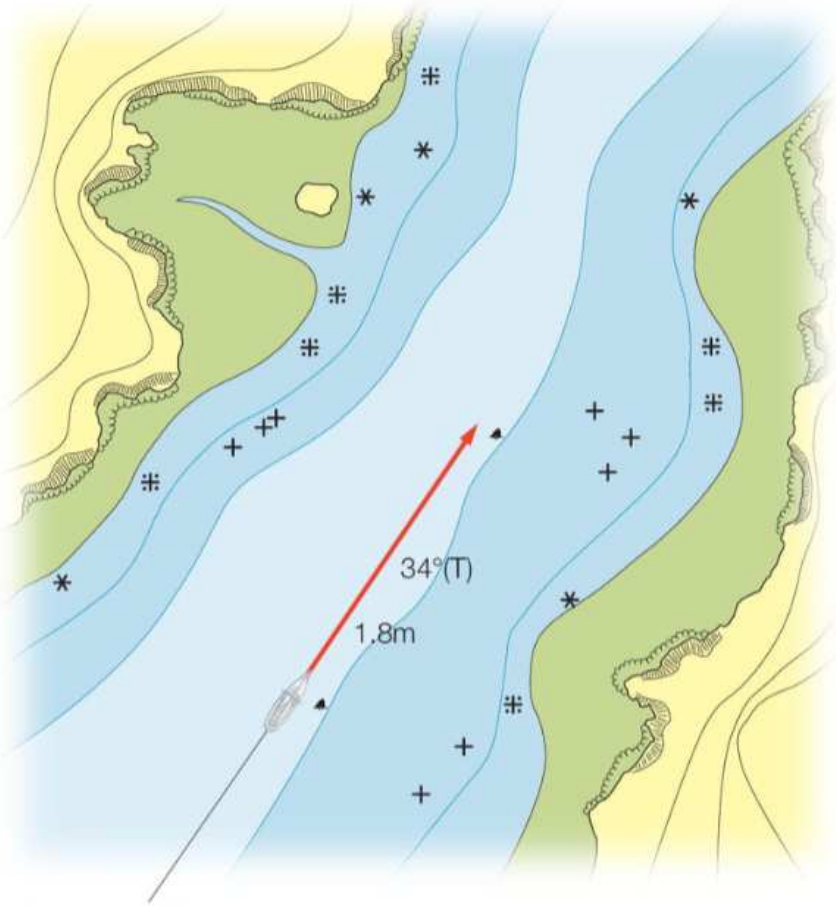


Back Bearing



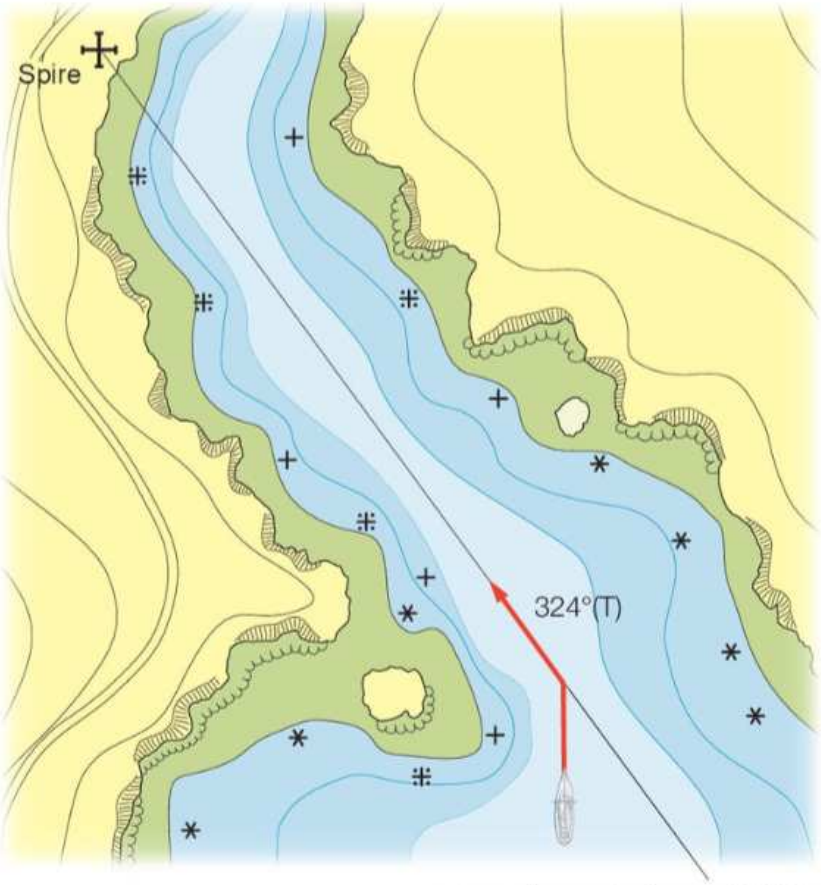
Bearing & Distance

Work this out in advance so you know where to expect the next buoy.



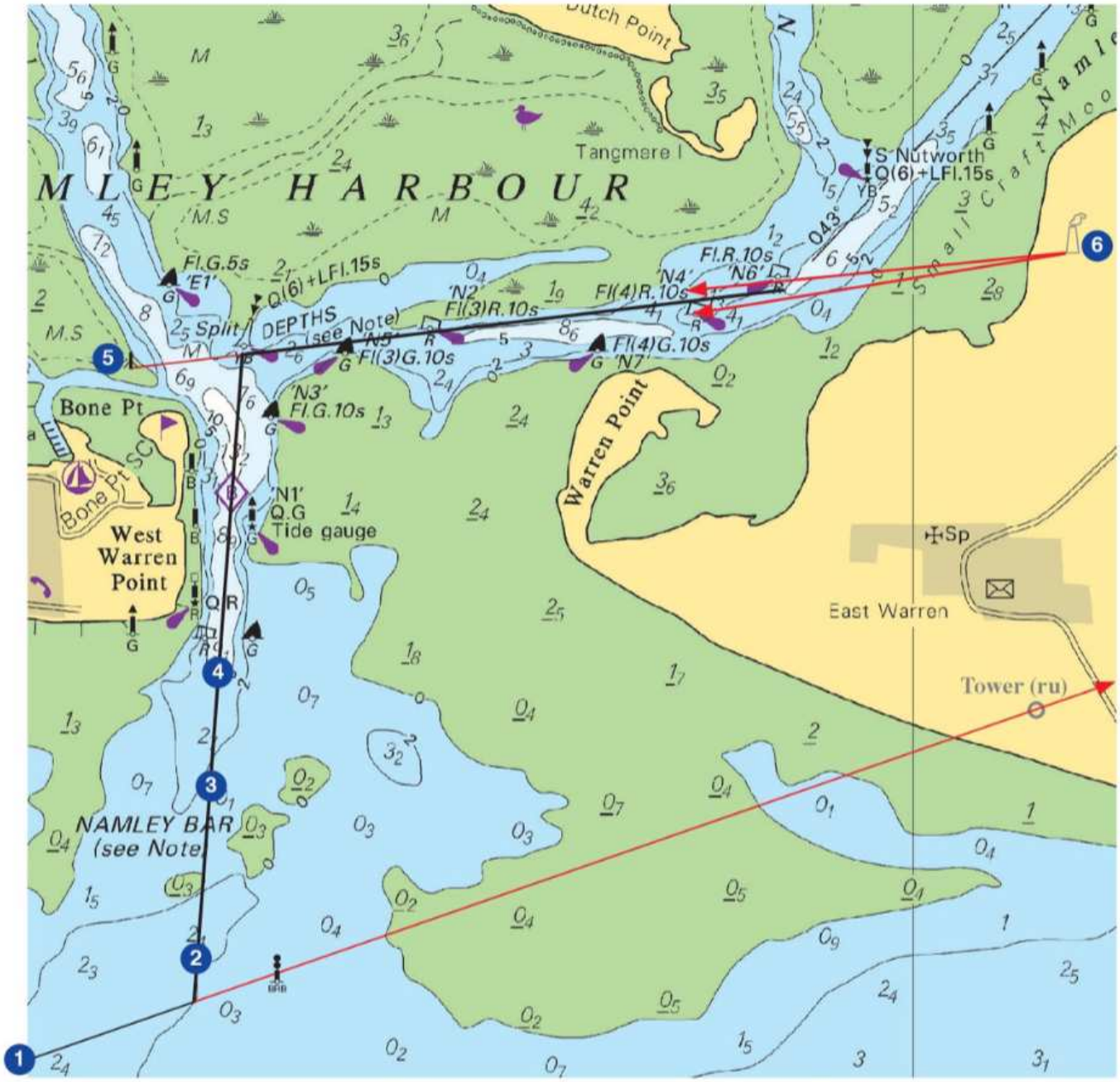
Course 34°(T). Distance between buoys 1.8 miles

Turning Points



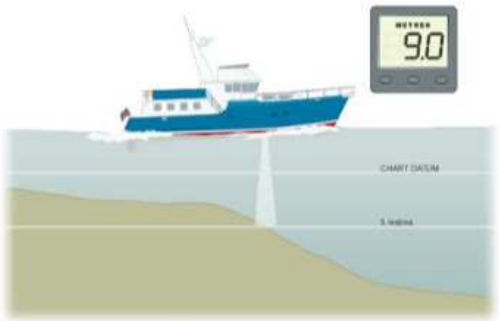
Turn when spire bears 324°(T)

Making and Following a Pilotage Plan



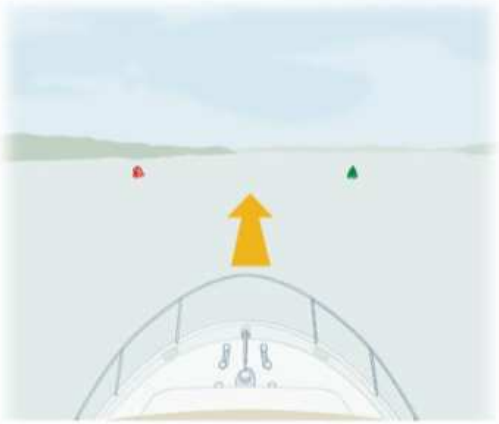
Following your Plan

1 Transit

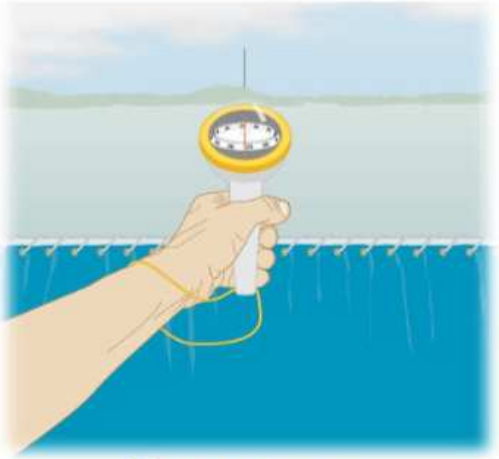


2 Contour

3 Clearance over Bar



4 Positive Identification of Marks
(IALA A Buoyage)



5 Back Bearing

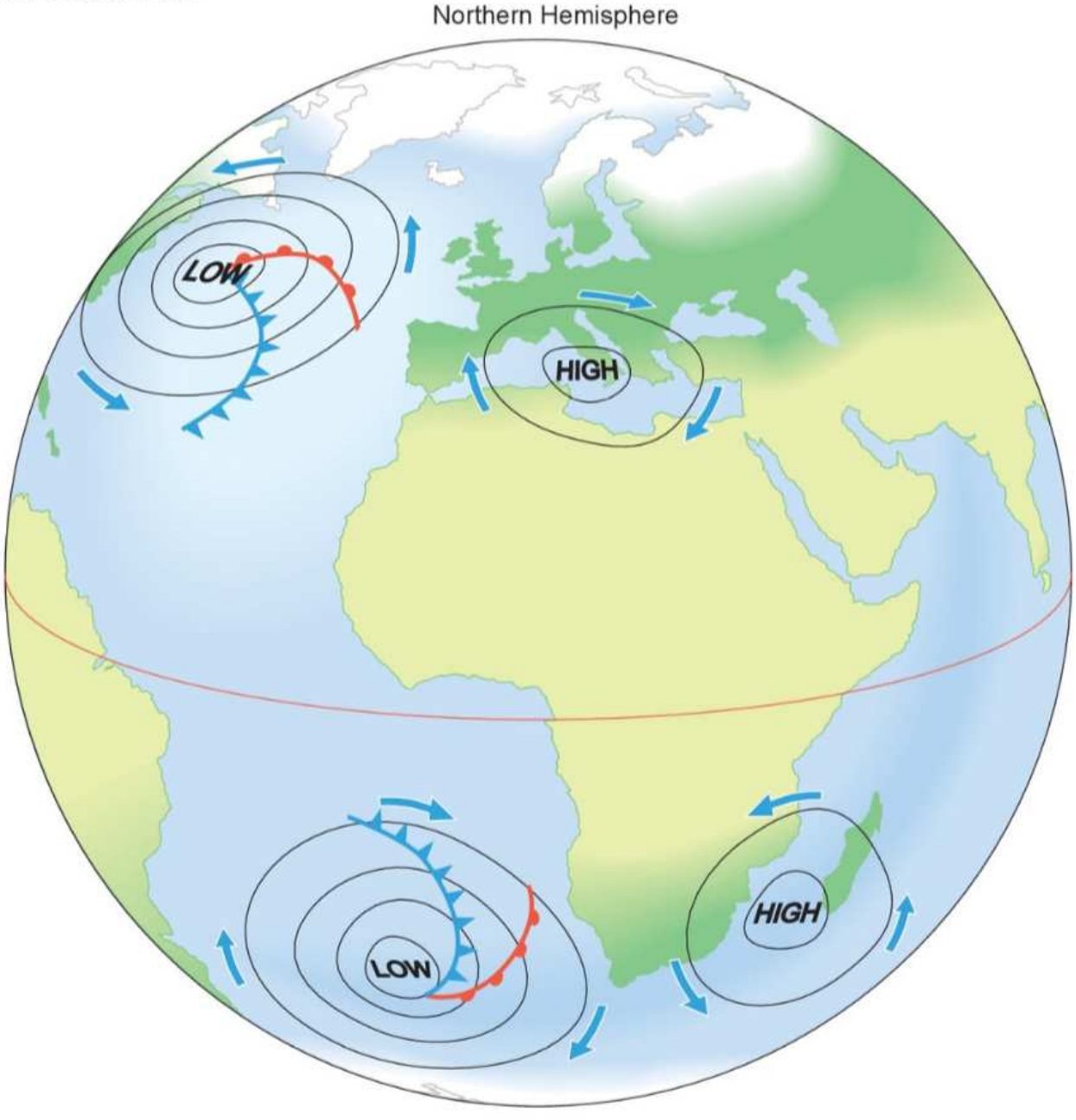
6 Clearing Lines

Weather Systems

General Overview

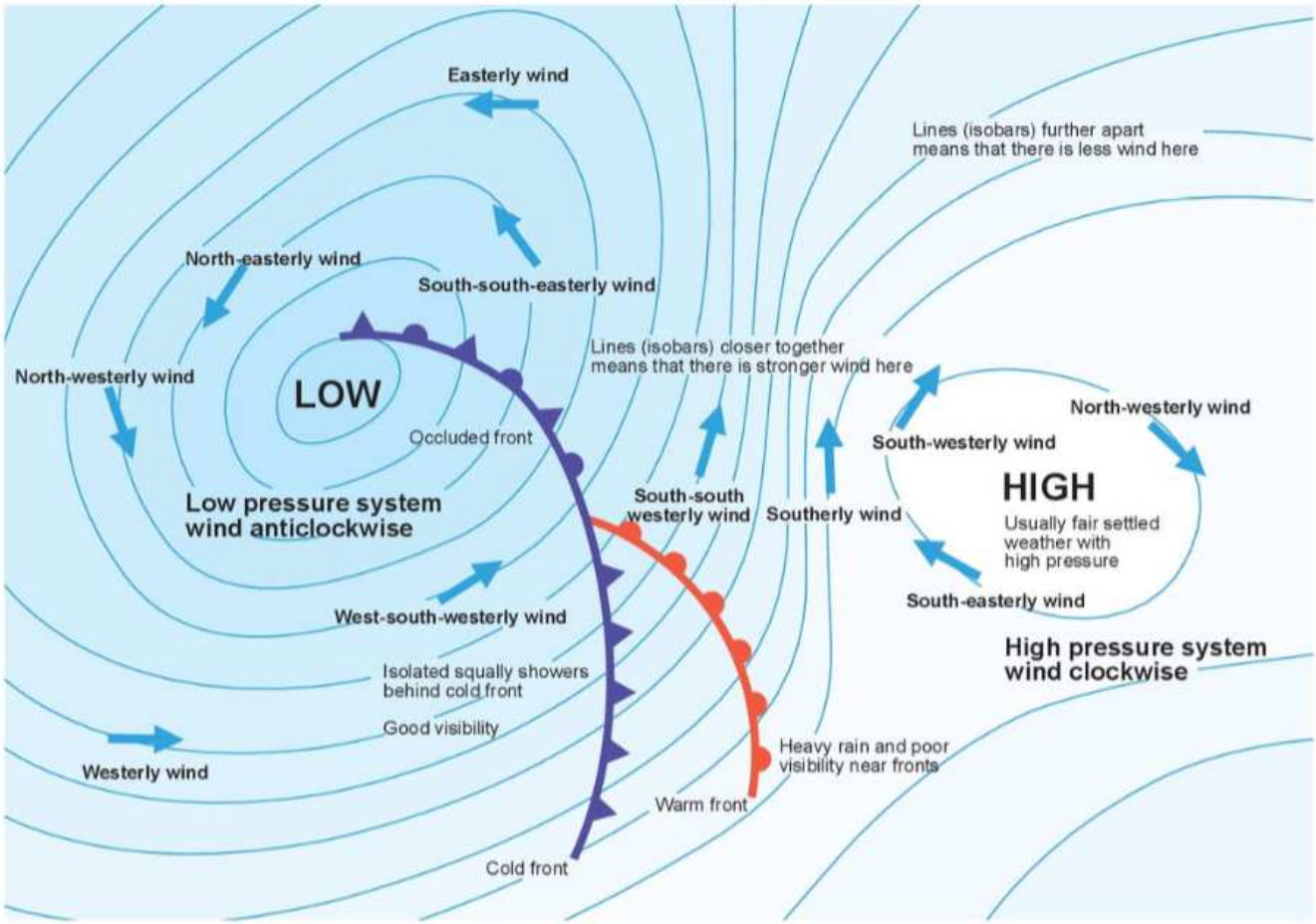
Low- and high-pressure systems dictate our weather. They revolve in different directions, depending on which hemisphere they inhabit. Where you are cruising on the earth's surface will dictate whether lows, highs or a mixture of both dictate your weather. In the UK, low-pressure systems dictate our weather. In many places in the Southern Hemisphere, cold fronts dictate the weather scene.

In the Northern Hemisphere, low-pressure systems revolve anti-clockwise and highs revolve clockwise.

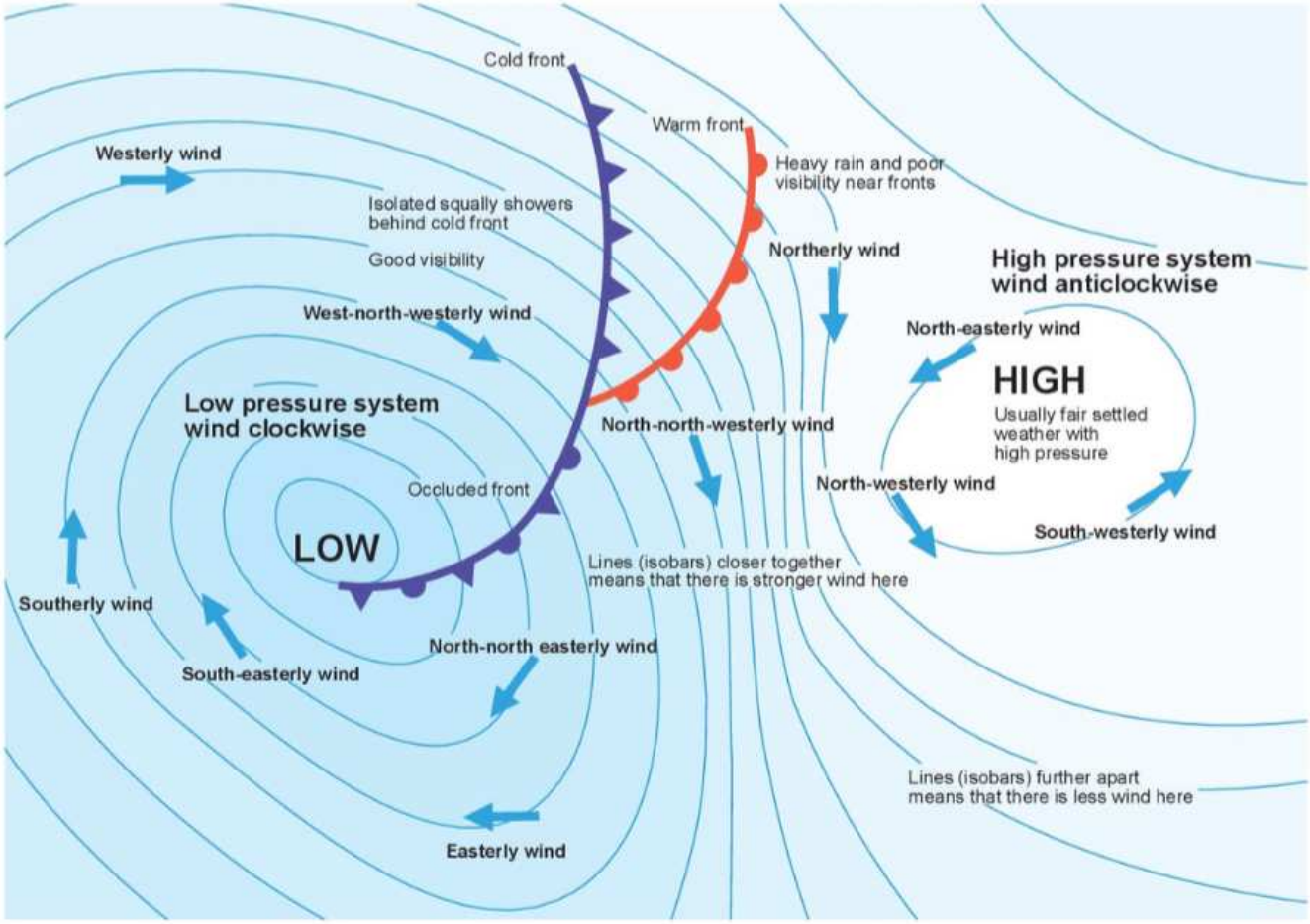


In the Southern Hemisphere, low-pressure systems revolve clockwise and highs revolve anticlockwise.

NORTHERN HEMISPHERE



SOUTHERN HEMISPHERE



Weather Forecasts

Shipping Forecast Areas

Get to know your local forecast area.

There are many different ways to obtain a forecast.

Marine safety information broadcasts on VHF by the Coastguard.

The internet – perhaps for many the easiest answer.

Many harbour and marina offices post a forecast.

Smartphone apps.

Recorded forecasts by phone.

National and local radio stations.

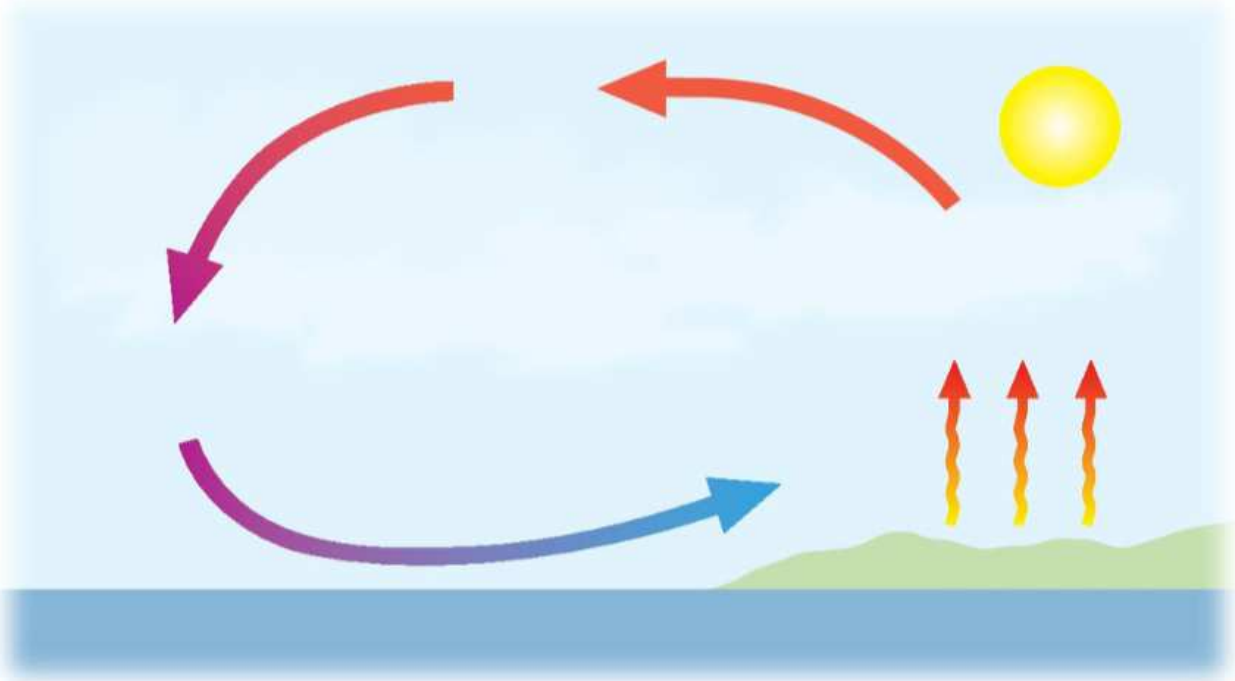
TERMS USED IN FORECASTS

Gale warnings	If average wind is expected to be F8 or more (34–40 knots), or gusts 43–51 knots. Severe gale: Winds of force 9 (41–47 knots) or gusts reaching 52–60 knots. Storm: Winds of force 10 (48–55 knots) or gusts reaching 61–68 knots. Violent storm: Winds of force 11 (56–63 knots) or gusts of 69 knots or more. Hurricane force: Winds of force 12 (64 knots or more).
Strong wind warnings	If average wind is expected to be F6 or F7. F6 is often called a 'yachtsman's gale'.
Imminent	Within six hours of time of issue of warning.
Soon	Within 6–12 hours of time of issue of warning.
Later	More than 12 hours from time of issue of warning.
Visibility	Good = greater than five miles. Moderate = between 2–5 miles. Poor = 1,000m to 2 miles. Very Poor = less than 1,000m.
Fair	No significant precipitation.
Backing	Wind changing in an anti-clockwise direction e.g. NW to SW.
Veering	Wind changing in a clockwise direction e.g. NE to SE.
General synopsis	How and where the weather systems are moving.
Sea states	Smooth = wave height 0.2–0.5m. Slight = wave height 0.5–1.25m. Moderate = wave height 1.25m–2.5m. Rough = wave height 2.5m–4m. Very rough = wave height 4m–6m. High = wave height 6m–9m. Very high = wave height 9m–14m. Phenomenal = wave height more than 14m.
Movement of pressure systems	Slowly = moving at less than 15 knots. Steadily = moving at 15–25 knots. Rather quickly = moving at 25–35 knots. Rapidly = moving at 35–45 knots. Very rapidly = moving at more than 45 knots.
Pressure tendency in station reports	Rising (or falling) more slowly = pressure rising (or falling) at a progressively slower rate through the preceding three hours. Rising (or falling) slowly = pressure change of 0.1 to 1.5 hPa in the preceding three hours. Rising (or falling) = pressure change of 1.6 to 3.5 hPa in the preceding three hours. Rising (or falling) quickly = pressure change of 3.6 to 6.0 hPa in the preceding three hours. Rising (or falling) very rapidly = Pressure change of more than 6.0 hPa in the preceding three hours Now rising (or falling) = Pressure has been falling (rising) or steady in the preceding three hours, but at the time of observation was definitely rising (or falling). Note: For those more familiar with the millibar, 1 hPa = 1 mbar

Land and Sea Breezes

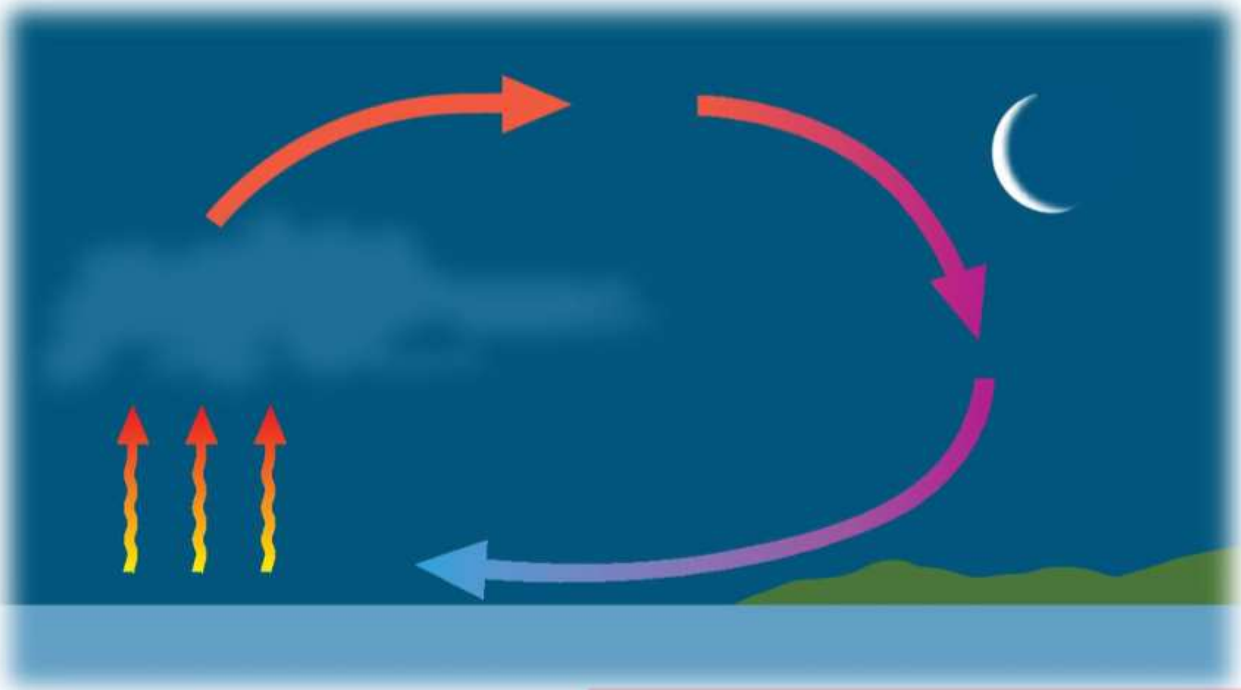
Sea Breeze

In fair weather and light to moderate offshore wind, a sea breeze is likely to develop. Warm air rises over land. It then cools, descends and blows onshore. The wind is up to force 4 in strength.



Land Breeze

This occurs on a clear night when the air cools over land and flows downhill and out to sea, particularly from river estuaries. The wind is usually no more than force 2–3, except near mountains.



Weather and Passage Making

1 Obtain a forecast.

2 Look ahead. How will future weather affect you?

3 How does the wind affect your plan? Be prepared to change your plans. Consider:

- Wind speed and direction
- Sea state
- Visibility due to rain or fog.

Outward passage downwind.

Return passage into wind – very uncomfortable.

Make sure you and your crew are prepared for what the weather will bring.

4 Wind over tide gives short steep waves.

5 Calmer conditions can be found in the lee of the land.

6 Learn to read the water for indications of wind.

7 Sailing upwind always seems windier and is more demanding than sailing downwind.

Beaufort Wind Scale

TOUCH DIAGRAM

1 Light airs. 1–3 knots. Ripples. Sail = drifting conditions. Power = fast planing conditions.

2 Light breeze. 4–6 knots. Small wavelets. Sail = full mainsail and large genoa. Power = fast planing conditions.

3 Gentle breeze. 7–10 knots. Occasional crests. Sail = full sail. Power = fast planing conditions.

4 Moderate. 11–16 knots. Frequent white horses. Sail = reduce headsail size. Power = may have to slow down if wind against tide.

5 Fresh breeze. 17–21 knots. Moderate waves, many white crests. Sail = reef mainsail. Power = reduce speed to prevent slamming when going upwind.

6 Strong breeze. 22–27 knots. Large waves, white foam crests. Sail = reef main and reduce headsail. Power = displacement speed.

7 Near gale. 28–33 knots. Sea heaps up, spray, breaking waves, foam blows in streaks. Sail = deep reefed main, small jib. Power = displacement speed.

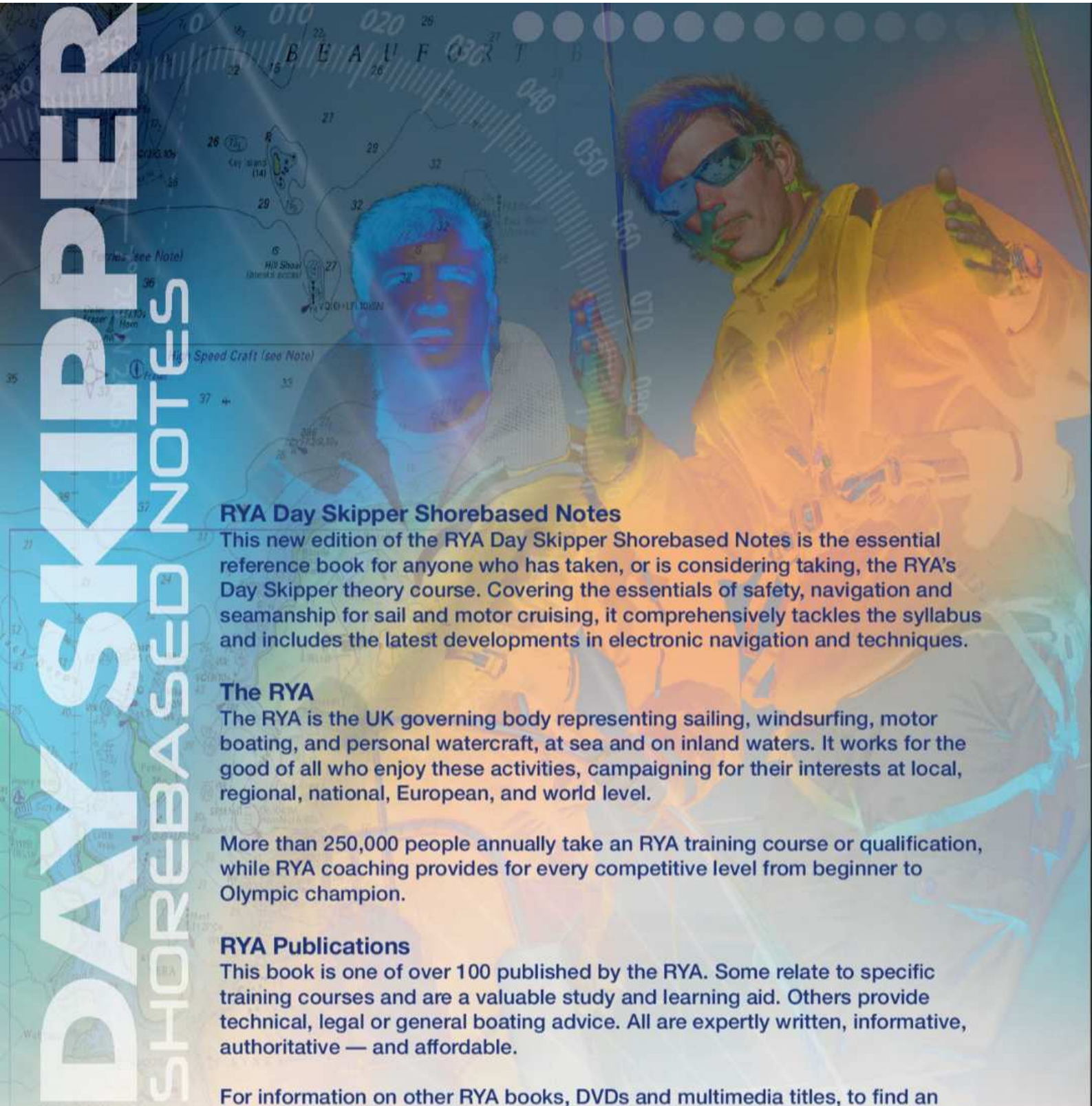
8 Gale. 34–40 knots. Moderately high waves, breaking crests. Sail = deep reefed main, storm jib. Power = displacement speed, stem waves.

9 Severe gale. 41–47 knots. High waves, spray affects visibility. Sail = trysail and storm jib. Power = displacement speed, stern waves.

10 Storm. 48–55 knots. Very high waves, long breaking crests. Survival conditions.

11 Violent storm. 56–63 knots. Exceptionally high seas with continuously breaking waves seriously affecting visibility. Survival tactics.

12 Hurricane. 64 knots and above. Exceptionally high seas with continuously breaking waves seriously affecting visibility. Survival tactics.



DAY SKIPPER
SHOREBASED NOTES

RYA Day Skipper Shorebased Notes

This new edition of the RYA Day Skipper Shorebased Notes is the essential reference book for anyone who has taken, or is considering taking, the RYA's Day Skipper theory course. Covering the essentials of safety, navigation and seamanship for sail and motor cruising, it comprehensively tackles the syllabus and includes the latest developments in electronic navigation and techniques.

The RYA

The RYA is the UK governing body representing sailing, windsurfing, motor boating, and personal watercraft, at sea and on inland waters. It works for the good of all who enjoy these activities, campaigning for their interests at local, regional, national, European, and world level.

More than 250,000 people annually take an RYA training course or qualification, while RYA coaching provides for every competitive level from beginner to Olympic champion.

RYA Publications

This book is one of over 100 published by the RYA. Some relate to specific training courses and are a valuable study and learning aid. Others provide technical, legal or general boating advice. All are expertly written, informative, authoritative — and affordable.

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