

# SAIL IN ASIA



# INTERNATIONAL CREW

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## Student Handbook

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Updated: June 2018



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# COURSE OVERVIEW

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The INTERNATIONAL CREW course is a 4/5days introduction to sailing designed for beginners. The aim is to build the students' nautical knowledge to competently take on the duties of a sailing crew on board a keelboat, in daylight hours, within sight of land.

## Theoretical Topics

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**Safety on a yacht:** Personal Safety is a vital component of sailing a yacht. Personal clothing, footwear, sunscreens and of course sunglasses. Yacht safety equipment and how to employ it in emergencies. Simple First aid, using a cooker, gas and of course handling sails and heavily loaded ropes and warps.

**Parts of the Boat and vocabulary:** Bow, stern, hull, rig and ancillary equipment. (Basic knowledge of terms).

**How a Sail Works:** Simple sail theory. Wind flow, tell-tales and trim.

**Duties and responsibilities of a crew member:** Crewing duties. Chain of command. Clear communication. Think team!

**Chartwork:** Understanding the basics

**Buoyage:** Pilotage, IALA areas A&B, Lateral and Cardinal buoyage systems.

**Collision Regulations:** The Basics of the Rules of the Road

**Meteorology:** Sources of information, personal observation, weather patterns, sea and land breezes, cloud types and formations, precipitation and fog. Modern Apps for better forecasting.

**Tides and Currents Theory:** Causes, tidal heights, Springs and Neaps, ebb and flood, almanacs, tide tables, tidal atlas, tidal diamonds, primary/secondary ports.

**Passage Plan/Short Passage:** Prepare a short passage plan for a final day trip.

**Engines:** How to start and stop outboard engines safely and in control.

# COURSE OVERVIEW

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## Practical Topics

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**Safety Brief:** Charts and publications, meteorology information sources, MOB techniques.

**Rigging a Boat:** Preparing a boat to sail, rigging and hoisting jib and mainsail. Understanding of halyards and sheets.

**Knots and Ropework:** Basic knots and ropework (Reef knot, bowline, sheet bend, clove hitch, figure of eight, round a turn and two half hitches).

**Taking over a vessel:** Crewing duties above and below deck, machinery and systems checks, instrument checks, safety equipment checks

**Mooring:** A safe and controlled approach and attachment to a mooring or buoy.

**Safety:** Understanding the risks and dangers involved in the sport. MOB under sail and engine. Personal Safety, Yacht Safety and Sailing Safely at sea. IRPCS knowledge.

**Engines:** How to start and stop outboard engines safely and in control.

**Boat handling skills:** Tacking and gybing, picking up a mooring buoy under power or sail, reefing the sails. Anchoring skills and considerations.

**Responsibilities of Captain/Skipper:** Communication with crew, delegation of crew

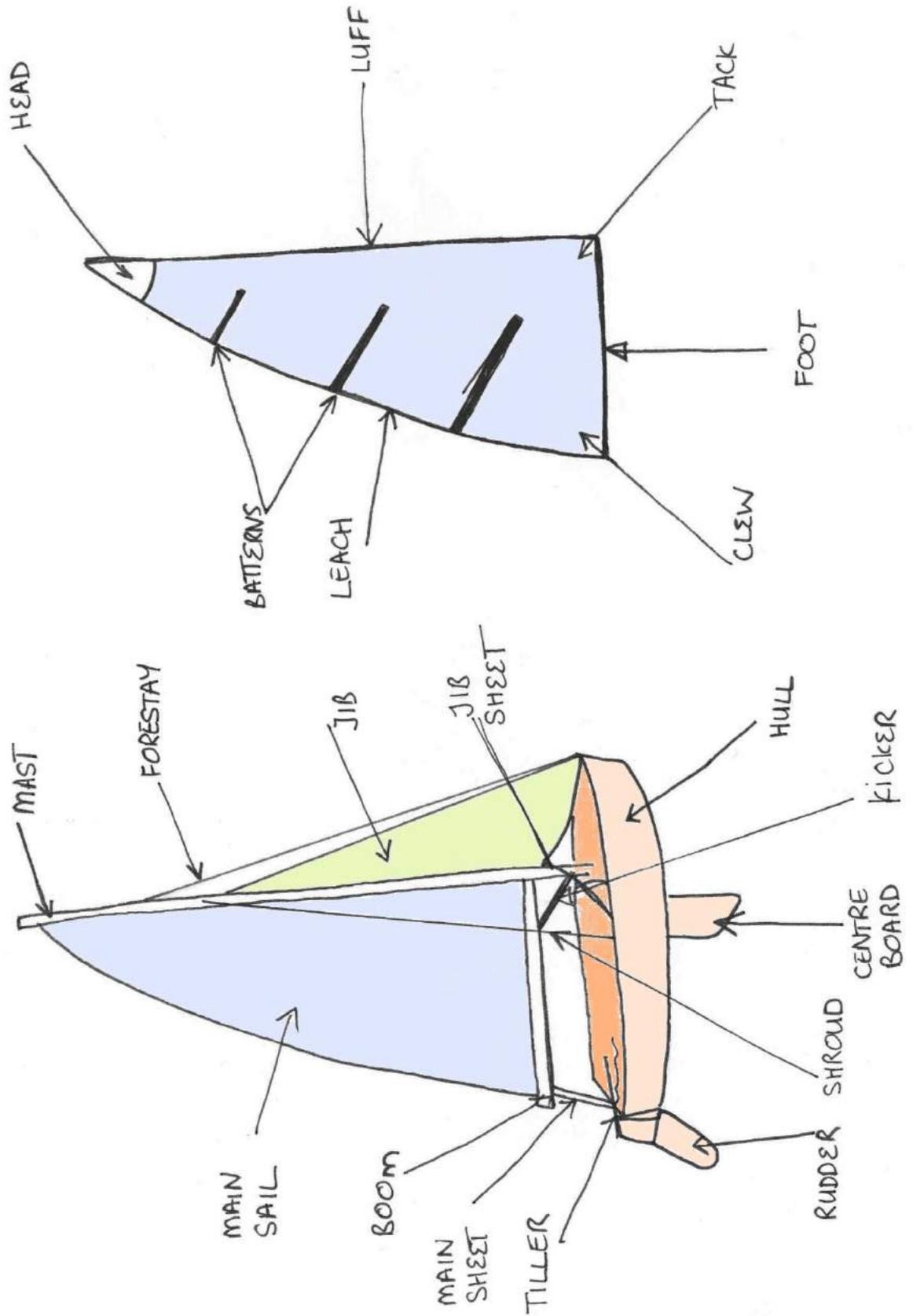
**Seamanship:** General deck work, ropes, knots and splices, care and use of lines

**Basic Sailing Skills:** Sailing on all points of sail, tacking, gybing and stopping the boat.

**Sail Handling:** Understanding parts of sail, how to hoist and lower the sail, flake sails, use roller furling and of course set and trim sails and read tell-tales.

**Boat Handling under Power:** How to deploy and start/stop an engine, how to stop a boat and come ashore/alongside in a marina or at a mooring. Anchoring, MOB, Berthing and leaving a berth, handling in confined areas with and against cross currents.

# PARTS OF A BOAT



# SAFETY

## Start out Safe

A well-prepared skipper should have an **Operational Safety Checklist** to check and plan their passage:

- Pre-departure check list
- Engine Checks - Oil, water, electrical, mechanical checks
- Safety equipment – Full safety equipment on board?
- What to do in the event of **Man Overboard** – MOB procedure?
- Fire procedure – Fire Equipment
- Emergency drills – Crew capability?
- Sea Cocks and pumps – Effective?
- Heads (toilet) – Working and briefing
- Weather and Tides – Pre-planned and up to date.
- **Plan, Plan, Plan** – it's the law!

## Personal Safety

A crew must be briefed about personal equipment that gives them safety cover. Clothing appropriate to weather conditions and footwear that ensures no broken toes or bad lacerations. A life jacket should be fitted to each crewperson before bad weather or night sailing. A good skipper ensures all the following is covered in this briefing.

- Dress Appropriately
- Dry Bag
- Fit your lifejacket
- Wear sailing gloves
- Protect your skin
- Drink water
- Rehydration salts
- Polarized Sunglasses
- Good Knife
- Waterproof Torch
- Multitool (Leatherman)
- Footwear



# SAFETY

## Boat Safety Equipment

On board your boat you should have a plan of the location of all safety equipment.



## Weather

Before Embarking on a passage a well-prepared Skipper will check:

- Weather Forecast
- Weather Warnings
- Storm Fronts
- Pressure systems
- During a passage the skipper must monitor weather conditions and cloud cover/colour
- Being caught out in a storm is not a good place to be. Be close to shelter if possible.
- Using Apps on a tablet is vital in this day and age. We recommend you use a large area forecast for distance sailing and a local area App for coastal sailing Windy covers this function, as does Wind Guru

Being caught in a storm is normally about bad planning, risk taking or going racing. Being risk-averse is the sign of a good skipper. Planning is essential!

# SAFETY

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## What to do in the event of a fire?

A well-prepared skipper should check the Emergency Muster Plan. The fire extinguishers must be appropriately selected for the type of fire.

In the event of fire:

- Raise the alarm!! Shout FIRE!!
- Try to extinguish if safe to do so **with correct extinguisher**
- Isolate if you can't (shut doors, starve the fire of oxygen)
- Get the crew on deck in lifejackets



If you cannot extinguish the fire send a **Mayday** message and prepare to abandon ship.



# SAFETY IN A MARINA

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## How to prepare for a marina arrival?

A well-prepared skipper should check the VHF radio channel and contact the marina prior to entering the marina. Listen to their instructions and make a note if necessary.

- The yacht should have fenders and lines on bow and stern and approach under power.
- The yacht must approach on starboard in the channel and at a sensible safe speed.
- Brief the Crew
- Sails must already be down and flaked on the boom
- Come alongside at a very slow speed and only allow crew to step ashore when the boat is by the pontoon and stopped. Tie lines fore and aft. Secure Springs.

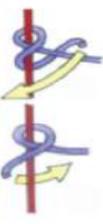
# ROPEWORK

## Useful Knots on a Yacht



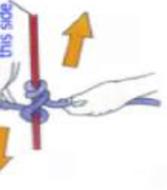
### Rolling Hitch

Used for towing small boats in or taking the strain off a line - you have a riding turn on a winch



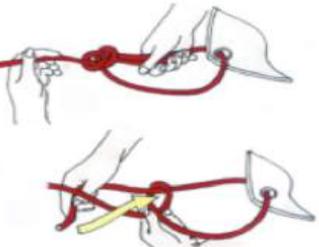
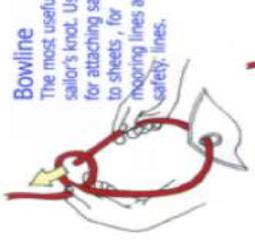
Undoes easily this side

Secured this side



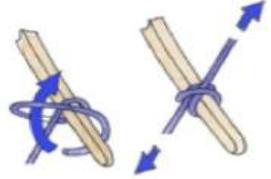
### Bowline

The most useful sailor's knot. Used for attaching sails to sheets, for mooring lines and safety lines.



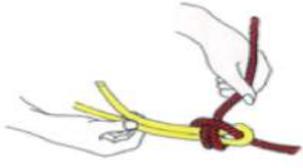
### The Clove hitch

Used for attaching fenders to guardlines and for lashing the tiller securely.

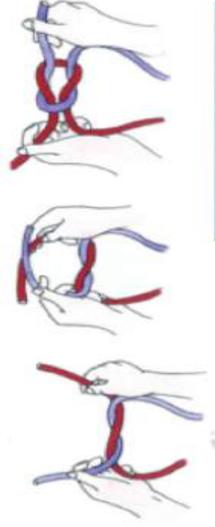


### The Double sheet bend.

Double bight on the rope ensures firm grip. Same use as for single sheet bend.

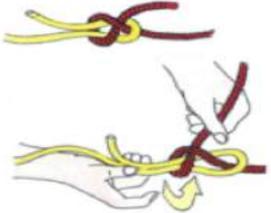


### The Reef Knot - Used for shortening sail on a 'reefed yacht'.



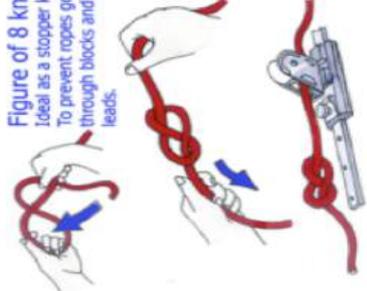
### Single sheet bend

A knot used to join two ropes of different thickness



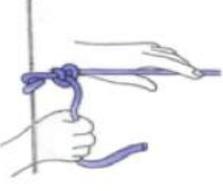
### Figure of 8 knot

Ideal as a stopper knot. To prevent ropes going through blocks and fairleads.



### Round turn and two half hitches.

Used to tie a dinghy up to a ring, an eye, or a line. Useful for many applications but be aware it can be difficult to undo when under tension.



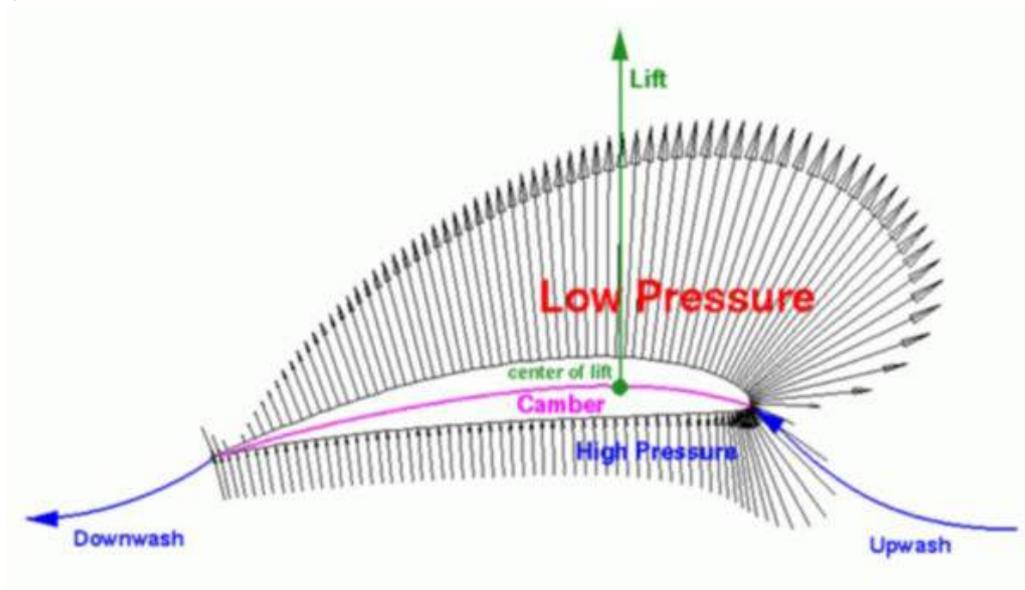
Good sailors know the knots.

# HOW A SAIL WORKS

When properly trimmed for sailing upwind a sail's leading-edge points into the wind. The wind flow over the sail creates **lower pressure** on the convex side of the sail and **higher pressure** on the concave or (windward) other side (boats get sucked along not pushed along by the wind!)

Like an airplane wing, the sail "lifts", or moves, toward the lower-pressure zone, pulling the boat along with it. This works because the sail isn't a flat sheet of cloth, instead it is curved much like an airplane wing. The curvature is built-in by the sailmaker, through careful cutting and sewing of the panels that make up the sail.

Not all of the lift developed by a sail moves the boat ahead. In fact since the direction of lift is roughly at right angles to the sail, much of it tries to pull the boat sideways. This creates leeway. The shape of the hull and keel creates a high resistance to the sideways force, therefore the boat moves ahead and only slightly to the side (typically 5°-10°).



How much of the total lift acts to pull the boat forward and how much sideways depends on the "point of sail," the angle between the boat and the wind: closer to the wind leads to more sideways movement, because the sail is trimmed in closer to the centreline of the boat.

This effect is much stronger when the wind flow smoothly over the sail. When sails flap, or the tell-tales move, this is an indication that the wind is not flowing smoothly over the sail. This is why keeping the sails filled with wind and the tell-tales flowing smoothly is so important when we are sailing.

# POINTS OF SAIL

“Point of sail” refers to **the angle of the sailboat relative to the direction of the wind**. Different terms are used for the different points of sail, and the sails must be trimmed (pulled in or let out) to different positions for different points of sail.

The diagram below shows the basic points of sail for different boat directions relative to the wind. Here, the wind is blowing from the top of the diagram (think of it as due north or 12 o’clock). A yacht cannot sail directly into the wind. We call this the ‘**no-go zone**’.

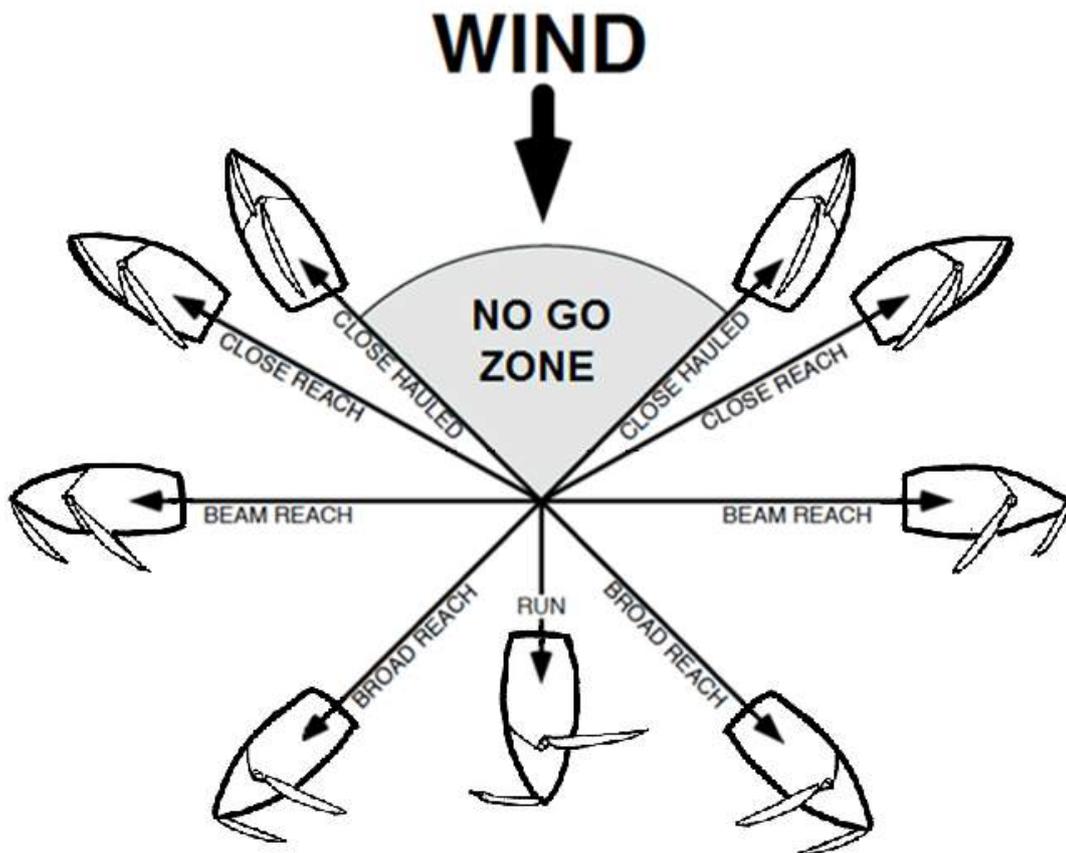
A sailboat sailing on the closest possible angle to the wind on either side (toward the northwest or northeast, 11 o’clock or 1 o’clock) is known as **close hauled**, as the sails are pulled in as tight as they can be.

Sailing directly across the wind (due west or due east, 3 o’clock and 9 o’clock) is called a **beam reach**, with the wind at 90 degrees to the boat’s direction.

Anywhere between close hauled and a beam reach is known as a **close reach**.

Sailing off the wind (either to the southwest or southeast, 4 to 5 o’clock or 7 to 8 o’clock) is called a **broad reach**.

Directly downwind (due south or 6 o’clock) is called a **run**.

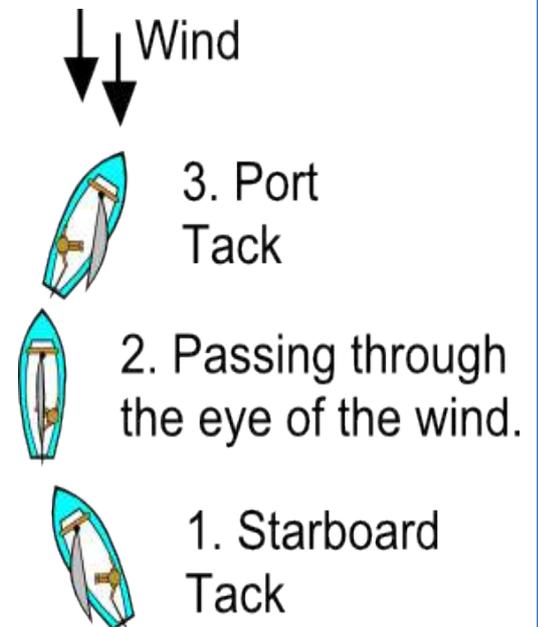


# TACKING AND GYBING

**Tacking** or **coming about** is a sailing manoeuvre by which a sailing vessel (which is sailing approximately into the wind) turns its bow through the wind so that the direction from which the wind blows changes from one side to the other.

## Tacking Procedure:

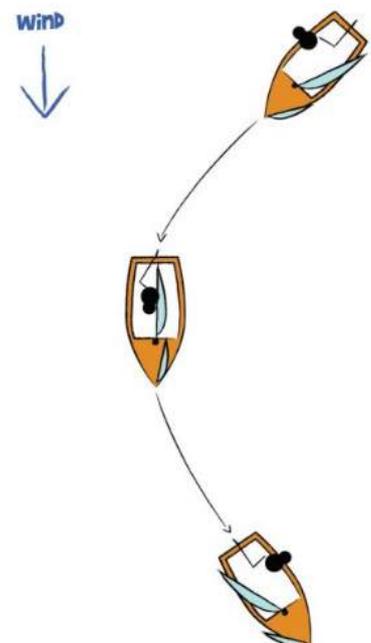
1. Make sure the area is clear
2. Find a target
3. Move body back, move tiller behind body
4. "Ready to tack?" "Ready!"
5. Push away on tiller (slowly and with small movements), "Tacking."
6. Watch boom, step across, keeping centre of gravity low, eyes focused in front and on the turn's progress
7. Find your new sitting position
8. Find target and straighten up



A **jibe** or **gybe** is a sailing manoeuvre whereby a sailing vessel reaching downwind turns its stern through the wind, such that the wind direction changes from one side of the boat to the other.

## Gybing Procedure:

1. Make sure the area is clear
2. While on a Broad Reach, find a Training Run by watching when the jib collapses on itself
3. Find a target
4. Move across the boat and find new sitting position
5. "Ready to Gybe?" "Ready."
6. Push the tiller away from you (slowly and with small movements), "Gybing."
7. Watch the boom come across, as it does, pull the tiller into the middle of the boat and find the target.



# MOORING



## Before Mooring:

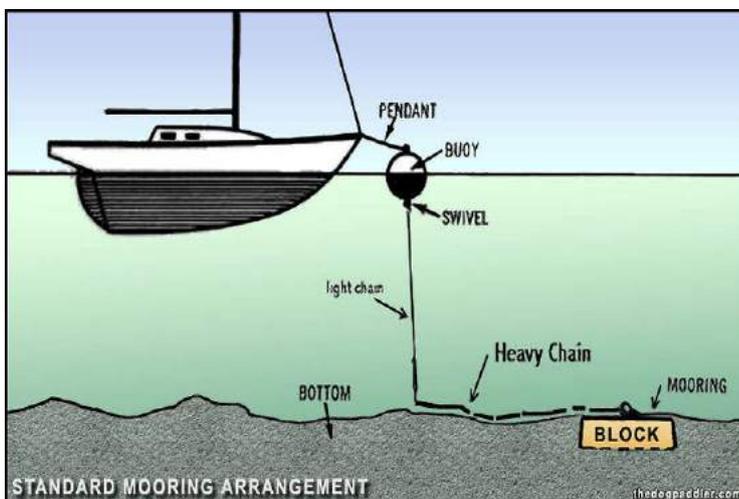
- Planning: know wind, tide, location, what mooring is anchored to, traffic, weather, possible dangers
- Communication: designate roles to crew, relay network (if noisy), hand signals understood, tools they will use
- Sufficient personnel and competent personnel

## Coming onto the Mooring:

- Plan route and communicate with crew their roles
- Come onto mooring pointing into the strongest element (wind, current), slow speed, apply throttle when necessary
- Once within safe distance go to neutral (defined by crew on foredeck giving information, direction and how far away the mooring buoy is), crew hooks mooring lines, tie off safely
- Turn off engine



## Leaving the Mooring:



- Plan route and communicate to crew their roles
- Check engine is working and goes into gear, communicate with crew when last line comes off
- Let wind take you away, reverse away, or pull mooring lines to the beam and release (whichever method is safest)
- Once clear begin motoring

# HEAVING TO

When heaving-to, the forward motion of the boat is slowed, the bow of the boat is turned through the wind but the jib is not released on the windward side (the jib is backed). The mainsail is then eased out and the boat is now turned towards the wind. Two opposing forces now exist. The jib pushes the boat away from the wind but the rudder pushes the boat into the wind. Thus, the boat comes to a near standstill, drifting slowly to leeward.)

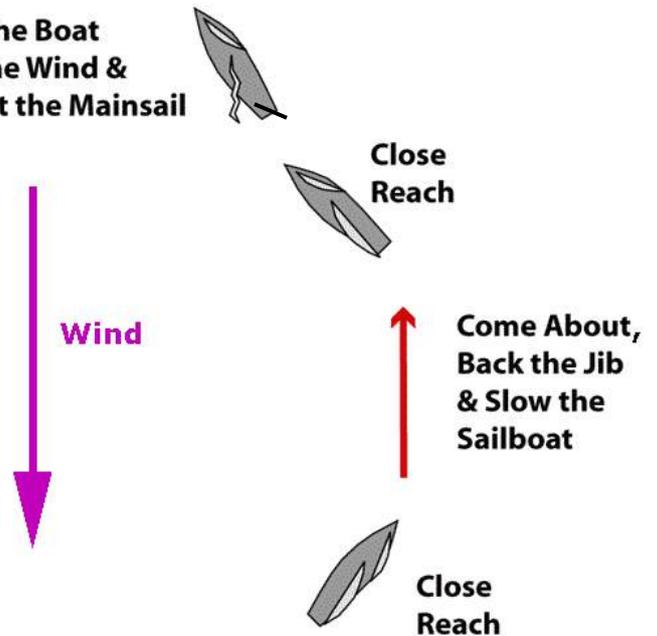
## Hove To



Slow your boat by releasing sails. Sit the boat at 90 degrees to the wind. Release jib sheet and main sheet completely. Straighten rudder.

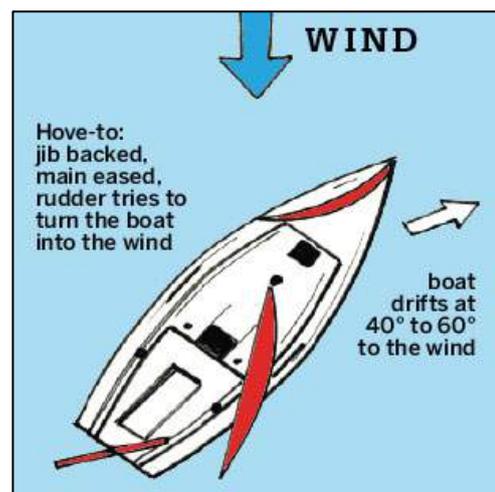
## Hove To (Jib Aback)

Turn the Boat Into the Wind & Let out the Mainsail



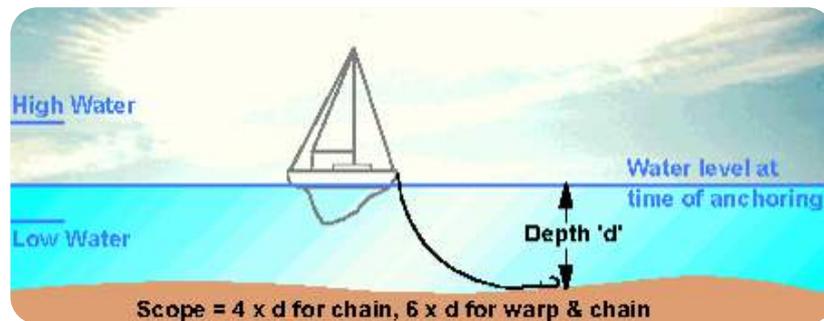
## Steps of Heaving To (jib aback):

1. Move to close reach,
2. Tack into the wind, do not release the jib,
3. Let out the main sheet,
4. Push the tiller to the leeward side,
5. Wait for the boat to slow and begin feathering.
6. Let the vang (kicker off) too!
7. Enjoy a drink/snack, fix whatever needs fixing, pick up MOB or do some navigation and chart work.



# ANCHORING

1. **Look:** Depth, how much scope (4x depth if you have only chain, 6x depth if you have rope and chain), tide (height and direction),
2. **Check Wind**
3. **Location** (holding, natural obstructions and dangers, boats, your boats radius of movement)
4. **Boat into Wind**
5. **Drop Anchor**
6. Start to **Reverse**
7. When chain stops, reverse with more power to dig it in.
8. Engine to **neutral** and **turn off**.
9. Check position by taking a **transit**



## Crew Responsibilities when dropping anchor:

1. Prepare anchor (check chain/rope, make sure it is well attached, make sure knots are tight and winch is working),
2. Set on deck the correct amount of scope for anchoring, making sure the line is not fouled,
3. Drop anchor, making sure you are clear of the anchor line,
4. Once anchor is set, feel for vibrations/dragging.

## Crew Responsibilities when picking up anchor:

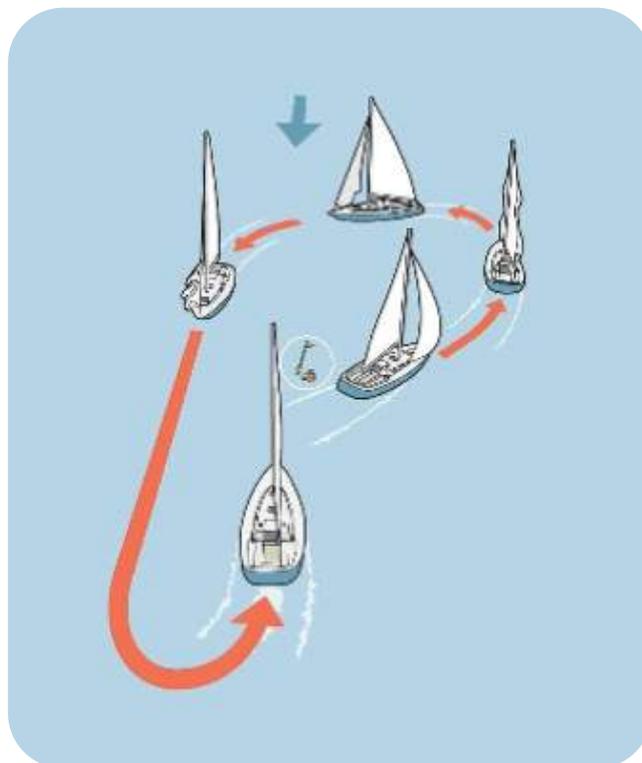
1. While the helmsman slowly motors forward toward the chain, use the winch to bring in line, or pull in the line by hand.
2. If there is too much strain, tie off on cleat, so that the line isn't pulled back into the water.
3. Good communication with helmsman as to the direction of the chain, and where it is sitting in relation to the boat (forward, over, behind).
4. Once anchor is in sight, communicate that to helmsman. Once on deck, stow the anchor and line.



# MOB UNDER ENGINE

In the unfortunate incidence that you have a Man Overboard situation you should always act quickly and calmly to rescue the person.

- Shout, “Man Overboard!!” to alert crew and passengers
- Skipper appoints person to watch and point at MOB at all times
- If near, throw dan buoy/life ring to MOB
- Press MOB on GPS
- If sailing, turn on engine, and pull main into the middle of the boat, roll head sail or drop
- Circle back, so that you are downwind of the MOB, staying at least 10 meters away from MOB at all times
- Once sufficiently downwind, turn into wind, and begin motoring towards MOB
- Upon approach, slow speed until you are almost stopped near MOB, skipper will designate pick up side, stop engine!!!
- Pick up MOB on leeward side by the stays. Use main halyard to retrieve MOB
- Treat MOB for shock, and, or wounds



# DINGHY CHECKS & OPERATION

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## Dinghy Checks:

1. Inflatable tubes full and no punctures
2. Bung in
3. 2 Paddles
4. Anchor
5. Fuel
6. Fuel line is connected on either end and primed
7. Pump
8. Bailer
9. Kill cord
10. Engine on and secured
11. Engine Intake and outtake are not obstructed
12. Prop is secured and clear



## Start Procedure:

1. Perform checks
2. Survey water/surf conditions (if big, launch using paddles), people
3. Once safely away from shore, lower engine and start
  - 3a. Make sure fuel is connected
  - 3b. In neutral, choke is open, small amount of throttle
  - 3c. Kill cord is not yet on wrist
  - 3d. Check you are clear to pull start cord, use left hand to pull start (sitting so the engine is on your left),
4. Once started or begins to turn over, TURN OFF CHOKE.
5. Put on kill cord
6. Make sure painter is secured
7. Keep a sharp lookout for swimmers, obstructions (lines, plastic bags, buoys)

## Trouble Shooting:

1. No Fuel
2. Fuel Line not connected
3. Oil
4. Water in engine
5. No kill cord
6. Carburettor flooded
7. Not in neutral when trying to start



# OUTBOARD ENGINES

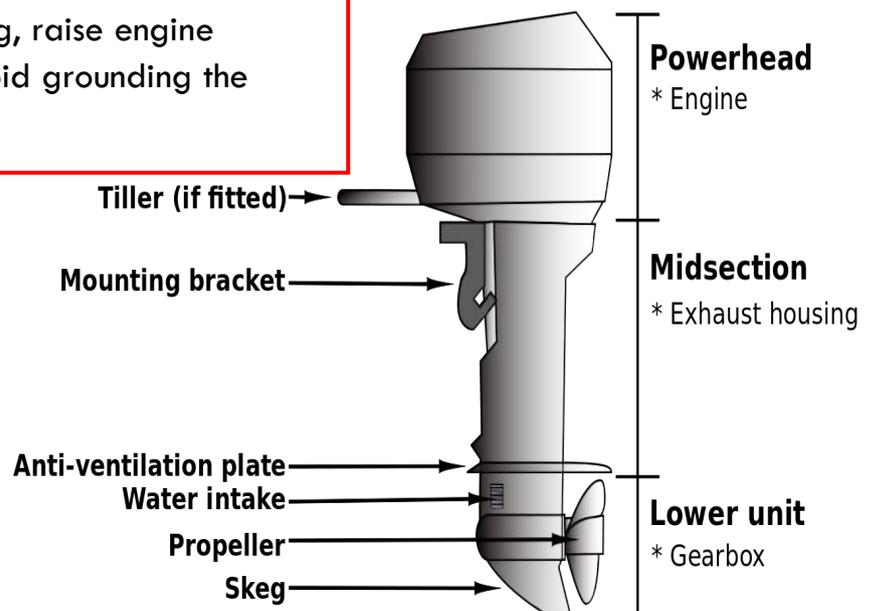
## START PROCEDURE:

- Check fuel is connected, in neutral gear, choke is open, small amount of throttle
- Kill cord is not yet on wrist
- Check you are clear to pull start cord, use left hand to pull start
- Pull starter cord once, TURN OFF CHOKE, and pull starter cord again at the same time as giving throttle.
- Put KILL CORD on wrist
- Put in gear and motor forward when ready



## STOP PROCEDURE:

- Make sure you are safely moored, or you have steering capabilities under sail.
- Check engine is in neutral, and throttle idling
- Push red button until engine stops
- In the case of a beach landing, raise engine before hitting the beach to avoid grounding the prop.



# TOWING

## Towing a dinghy

Firstly, when taking a dinghy with you for a trip it is important to remember it is always better to place the dinghy on the foredeck of your yacht if possible. If the boat is fitted with davits this means you can hoist the dinghy out of the water.

If you do have to tow the dinghy behind you, remember:

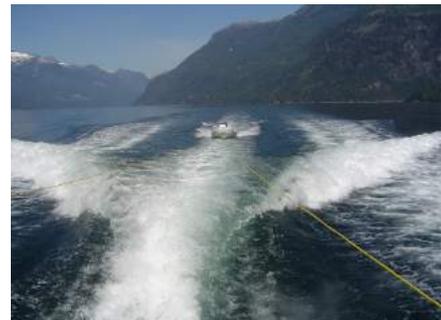
- Always use a fairly long rope
- Multiple ropes are better for extra security
- Always leave the outboard engine up when underway
- Ensure engine is securely fastened to the back of the dinghy and is tied on
- Never leave anything loose in the dinghy as there is a good chance you may lose it
- Ensure fuel tank is not leaking and the breather valve is closed.

When tying the dinghy to the back of the boat there are several different ways you can do it.

Use double lines one from either side of the yacht.



Or lift the dinghy slightly onto the back of the yacht and tie securely



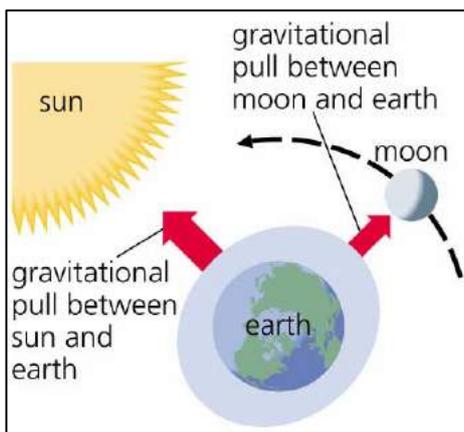
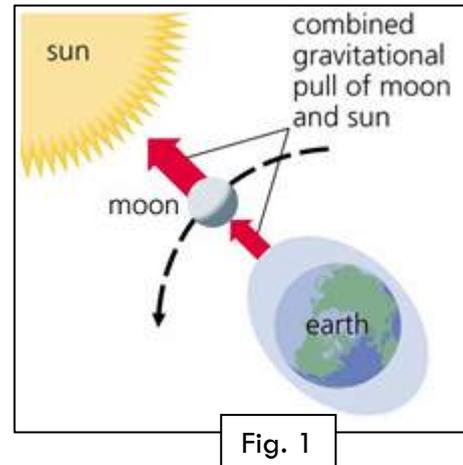
Use a bridle to help spread the weight and ensure dinghy travels straight when underway



# TIDES

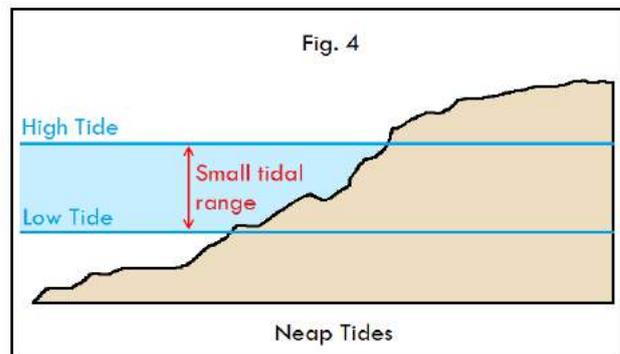
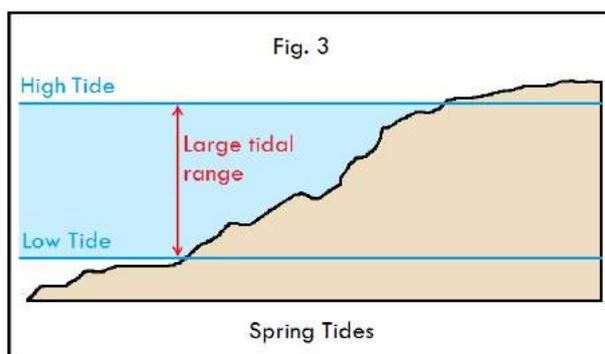
Tides are the movement of water around the coast caused by the gravitational effect of the Moon, and to a lesser extent the Sun.

**Spring tides** are especially strong tides (they do not have anything to do with the season Spring). They occur when the Earth, the Sun, and the Moon are in a line and therefore the gravitational forces of the Moon and the Sun both contribute to the tides [Fig. 1]. Spring tides occur during the full moon and the new moon. They result in a very high tide and a very low tide and therefore have a large tidal range [Fig. 3].

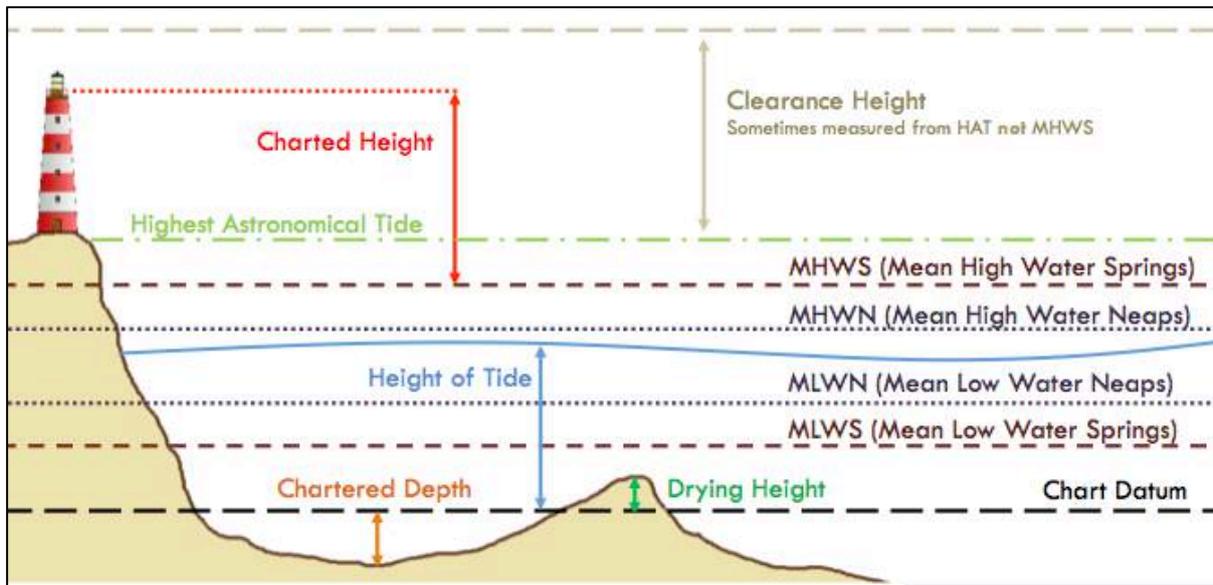


**Neap tides** are especially weak tides. They occur when the gravitational forces of the Moon and the Sun are perpendicular to one another (with respect to the Earth), and are working in different directions [Fig. 2]. Neap tides occur during quarter moons. They result in low high tides and high low tides and therefore a small tidal range [Fig. 4].

Figures 3 and 4 give an indication of the difference between the tidal range of a spring tide and the tidal range of a neap tide.



# TIDAL HEIGHTS



## The Tide Table

Tide Tables are produced by the maritime authority in each country. They give us information on the following:

The **Standard Port** to which the information refers.

Date

Time in hours (24Hr)

Tidal Height in metres

Moon Phase

เกาะตะพานน้อย (ภูเก็ต)

299

Ko Thaphao Noi (Phuket)

ละติจูด (Lat) 07° 49' 54" น.(N)

ลองจิจูด (Long) 98° 25' 30" อ.(E)

พฤศจิกายน ๒๕๕๗

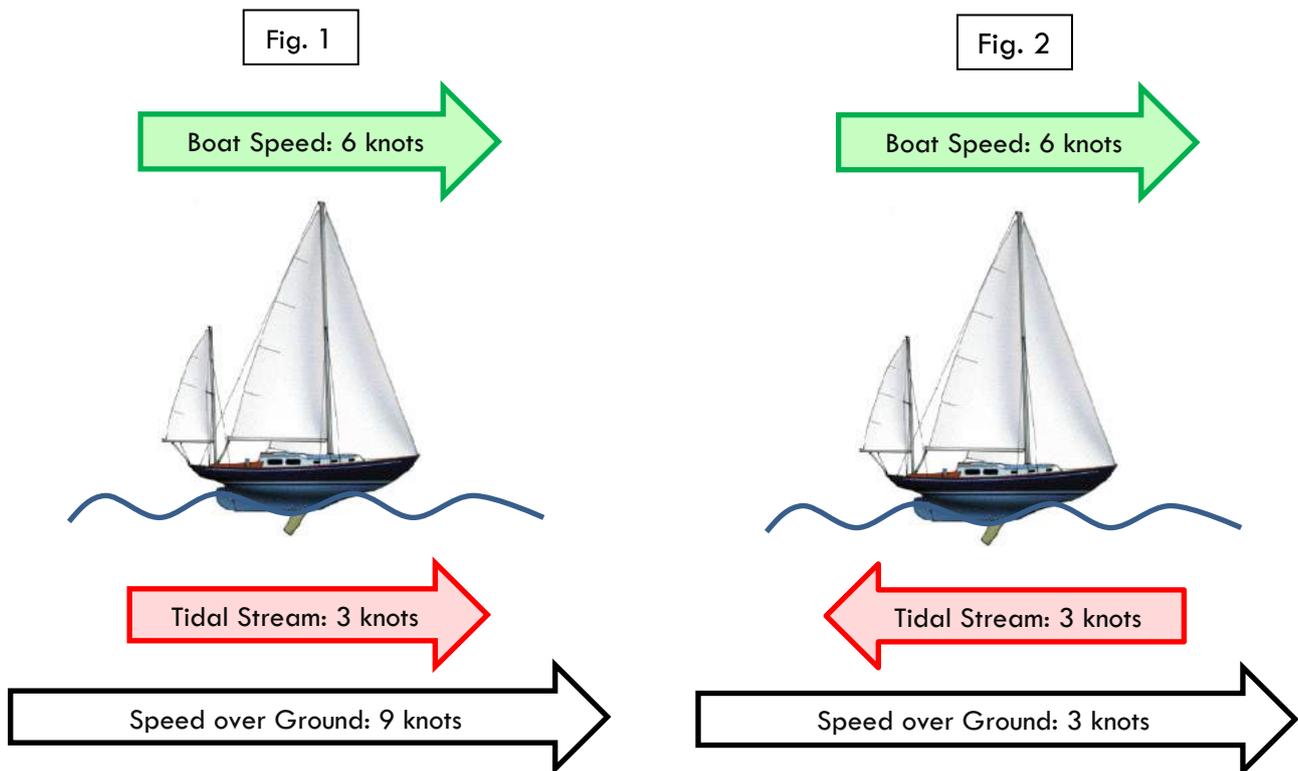
November 2014

วันที่ DATE	HOURS																							
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
	สูงของน้ำเป็นเมตร												HEIGHTS OF WATER IN METERS											
1	2.0	2.2	2.4	2.6	2.7	2.7	2.6	2.3	2.1	1.8	1.6	1.5	1.6	1.7	1.9	2.2	2.4	2.5	2.6	2.5	2.4	2.1	1.9	1.8
2	1.7	1.8	1.9	2.2	2.4	2.6	2.7	2.7	2.5	2.2	1.9	1.6	1.4	1.4	1.5	1.8	2.1	2.4	2.7	2.8	2.8	2.6	2.3	2.0
3	1.7	1.5	1.5	1.7	2.0	2.4	2.7	2.8	2.8	2.7	2.3	1.9	1.5	1.2	1.2	1.4	1.7	2.1	2.5	2.9	3.0	3.0	2.7	2.3
4	1.8	1.4	1.2	1.3	1.6	2.0	2.4	2.8	3.0	3.0	2.7	2.3	1.8	1.3	1.0	1.0	1.3	1.7	2.3	2.8	3.1	3.2	3.1	2.7
5	2.2	1.6	1.2	1.0	1.1	1.5	2.0	2.5	3.0	3.1	3.1	2.7	2.2	1.7	1.1	0.9	0.9	1.3	1.8	2.5	3.0	3.3	3.4	3.1
6	2.6	2.0	1.4	1.0	0.8	1.1	1.5	2.1	2.7	3.1	3.2	3.0	2.6	2.1	1.4	1.0	0.8	1.0	1.4	2.1	2.7	3.2	3.5	3.4
7	3.0	2.4	1.7	1.1	0.8	0.8	1.1	1.7	2.3	2.9	3.2	3.2	2.9	2.4	1.8	1.3	0.9	0.8	1.1	1.7	2.3	2.9	3.4	3.5
8	3.3	2.8	2.2	1.5	1.0	0.7	0.9	1.3	1.9	2.5	3.0	3.2	3.1	2.7	2.2	1.6	1.1	0.9	1.0	1.4	1.9	2.6	3.1	3.4
9	3.4	3.1	2.5	1.9	1.3	0.9	0.8	1.1	1.6	2.1	2.7	3.0	3.1	2.9	2.5	2.0	1.4	1.1	1.0	1.2	1.7	2.2	2.8	3.2
10	3.4	3.2	2.8	2.2	1.6	1.1	0.9	1.0	1.3	1.8	2.3	2.7	3.0	2.9	2.7	2.2	1.7	1.3	1.1	1.2	1.5	2.0	2.5	2.9
11	3.2	3.2	3.0	2.5	2.0	1.5	1.1	1.0	1.2	1.6	2.1	2.5	2.8	2.8	2.7	2.4	2.0	1.6	1.3	1.3	1.4	1.8	2.2	2.6
12	2.9	3.1	3.0	2.7	2.2	1.8	1.4	1.2	1.3	1.5	1.9	2.2	2.5	2.7	2.7	2.5	2.2	1.9	1.6	1.4	1.5	1.7	2.0	2.4
13	2.7	2.9	2.9	2.7	2.4	2.1	1.7	1.5	1.4	1.5	1.7	2.0	2.3	2.5	2.6	2.5	2.4	2.1	1.9	1.7	1.6	1.7	1.9	2.2
14	2.4	2.6	2.7	2.7	2.5	2.3	2.0	1.7	1.6	1.6	1.7	1.9	2.1	2.3	2.4	2.4	2.4	2.3	2.1	2.0	1.8	1.8	1.9	2.0
15	2.2	2.3	2.5	2.5	2.5	2.4	2.2	2.0	1.8	1.7	1.7	1.7	1.9	2.0	2.2	2.3	2.4	2.4	2.3	2.2	2.1	2.0	1.9	1.9
16	2.0	2.1	2.2	2.3	2.4	2.4	2.4	2.3	2.1	1.9	1.8	1.7	1.7	1.8	1.9	2.1	2.2	2.4	2.5	2.5	2.4	2.2	2.1	2.0
17	1.9	1.9	1.9	2.0	2.2	2.4	2.4	2.5	2.4	2.2	2.0	1.8	1.7	1.6	1.7	1.8	2.1	2.3	2.5	2.6	2.6	2.5	2.3	2.1
18	1.8	1.7	1.7	1.8	2.0	2.2	2.4	2.6	2.6	2.5	2.2	2.0	1.7	1.5	1.5	1.6	1.8	2.1	2.4	2.7	2.8	2.8	2.6	2.3
19	1.9	1.6	1.5	1.5	1.6	2.0	2.3	2.6	2.7	2.7	2.5	2.2	1.8	1.5	1.3	1.3	1.5	1.9	2.3	2.7	2.9	3.0	2.9	2.6
20	2.2	1.7	1.4	1.2	1.3	1.6	2.1	2.4	2.7	2.9	2.8	2.5	2.1	1.6	1.3	1.2	1.3	1.6	2.0	2.5	2.9	3.1	3.1	2.9
21	2.5	1.9	1.4	1.1	1.1	1.3	1.7	2.2	2.6	2.9	3.0	2.8	2.4	1.9	1.4	1.1	1.0	1.3	1.7	2.3	2.8	3.2	3.3	3.2
22	2.8	2.2	1.6	1.1	0.9	1.0	1.4	1.9	2.4	2.8	3.0	3.0	2.7	2.2	1.7	1.2	1.0	1.0	1.4	1.9	2.5	3.0	3.4	3.4
23	3.1	2.6	2.0	1.3	0.9	0.8	1.1	1.5	2.1	2.6	3.0	3.1	2.9	2.5	2.0	1.5	1.1	0.9	1.1	1.5	2.2	2.8	3.3	3.5
24	3.3	3.0	2.4	1.7	1.1	0.8	0.8	1.2	1.7	2.3	2.8	3.1	3.1	2.8	2.4	1.8	1.3	1.0	1.0	1.2	1.8	2.4	3.0	3.4
25	3.5	3.2	2.7	2.1	1.5	1.0	0.8	1.0	1.4	1.9	2.5	2.9	3.1	3.0	2.7	2.2	1.7	1.2	1.0	1.1	1.4	2.0	2.6	3.1
26	3.4	3.3	3.0	2.5	1.9	1.3	1.0	0.9	1.1	1.5	2.1	2.5	2.9	3.0	2.8	2.5	2.1	1.6	1.2	1.1	1.3	1.7	2.2	2.7
27	3.1	3.3	3.2	2.8	2.3	1.8	1.3	1.0	1.0	1.3	1.7	2.2	2.6	2.8	2.9	2.7	2.4	2.0	1.6	1.3	1.3	1.5	1.9	2.3
28	2.7	3.0	3.1	3.0	2.6	2.2	1.7	1.3	1.2	1.2	1.5	1.8	2.2	2.5	2.7	2.7	2.6	2.3	2.0	1.7	1.5	1.5	1.7	2.0
29	2.3	2.6	2.8	2.9	2.8	2.5	2.1	1.7	1.4	1.3	1.3	1.5	1.9	2.2	2.4	2.6	2.6	2.6	2.4	2.1	1.8	1.7	1.6	1.7
30	2.0	2.2	2.5	2.7	2.7	2.6	2.5	2.2	1.8	1.6	1.4	1.4	1.5	1.8	2.1	2.3	2.5	2.6	2.6	2.5	2.2	2.0	1.8	1.7

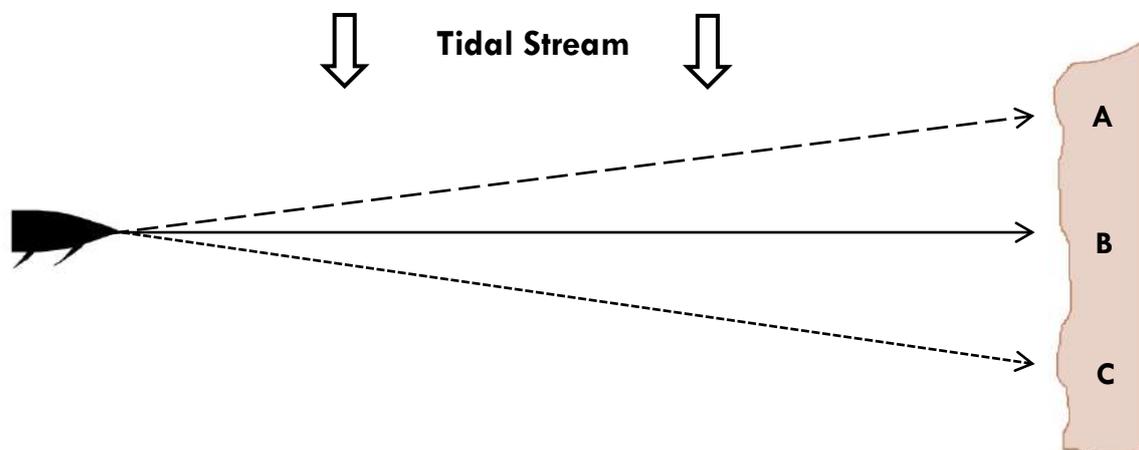
สูงของน้ำทำนายเป็นเมตรเหนือระดับน้ำลงต่ำที่สุด HEIGHTS OF WATER PREDICTED IN METERS ABOVE THE LOWEST LOW WATER  
คำนวณโดย กรมอุทกศาสตร์ กองทัพเรือ

# TIDAL STREAM

As the tide flows in (**flood**) or flows out (**ebb**), it can affect the position, direction and speed of a sailing boat. Understanding tide also means understanding this tidal stream. The tidal stream can help you forward [Fig.1], slow you down [Fig. 2] or cause you to deviate from your set course. If you are fighting the tide you may appear to be sailing forward, but actually you may not be moving or may even be moving backwards!



When sailing across the tide the helmsman needs to compensate for the effect it will have on the boat. In the example below, if the boat wishes to arrive at Point B, it must sail for Point A. If it does not, it will end up at Point C.



# IALA BUOYAGE

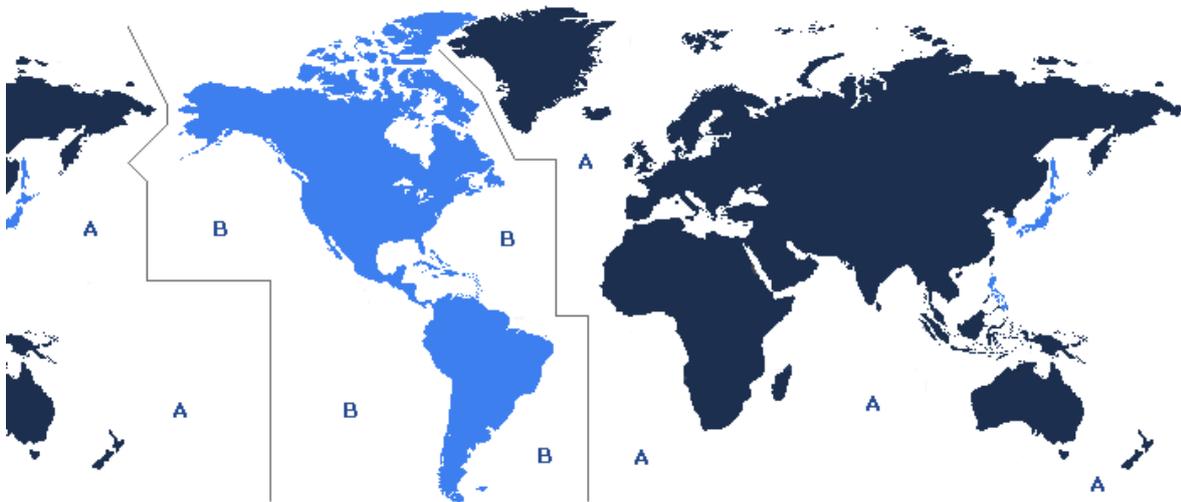
Established in 1957, IALA (International Association of Marine Aids and Lighthouse Authorities) is a non-profit international technical association. IALA provides nautical expertise and advice. There are two IALA systems based on geographical location. Sail in Asia teaches IALA System A which applies to Region A.

## Region A

Europe, Australia, New Zealand, Africa, the Gulf and the Asian countries.

## Region B

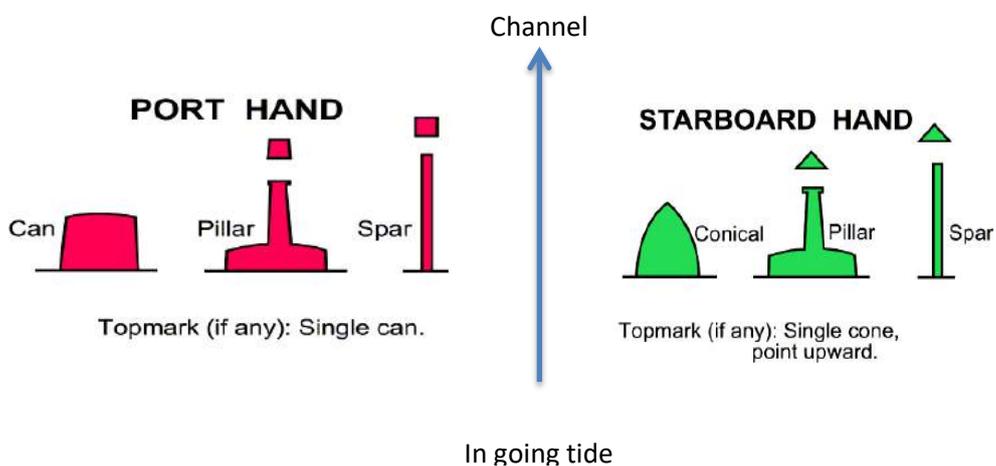
The whole of the Americas, Japan, South Korea and the Philippines.



## Lateral Marks

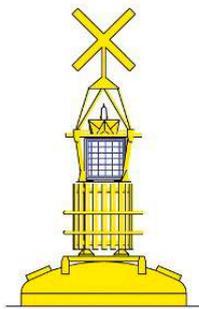
When entering a port or harbour, the LATERAL MARKS ensure you stay in the required channel. The System A Lateral Buoyage system is set in relation to the ingoing tide as seen below

### System A

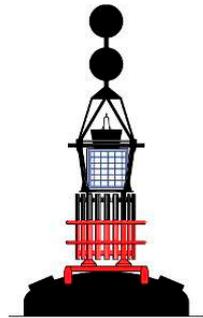


# IALA BUOYAGE

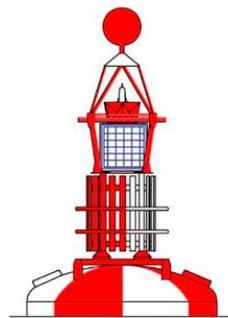
## Lateral Marks Continued



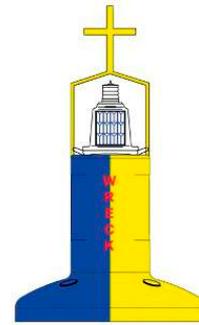
Special Mark



Isolated Danger



Safe Water Mark

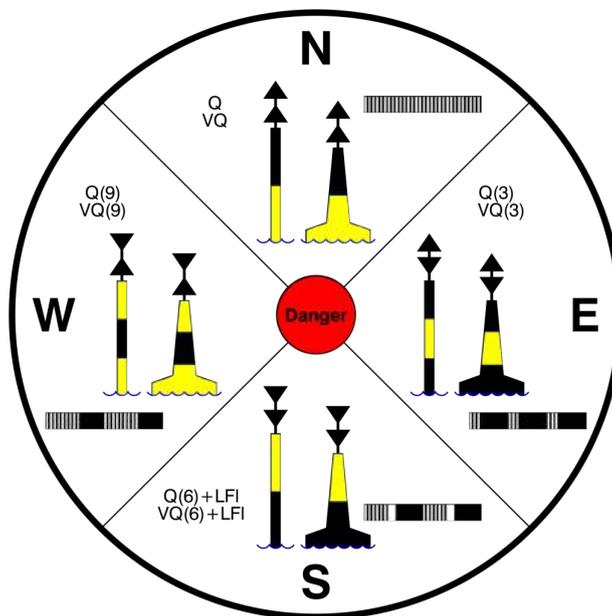


Emergency Wreck

## Cardinal Marks

Indicate the direction in which a particular danger lies, and the side on which it is safe to pass.

For Example: A North cardinal lies to the north of the danger, and the clear water is to the north of the buoy.

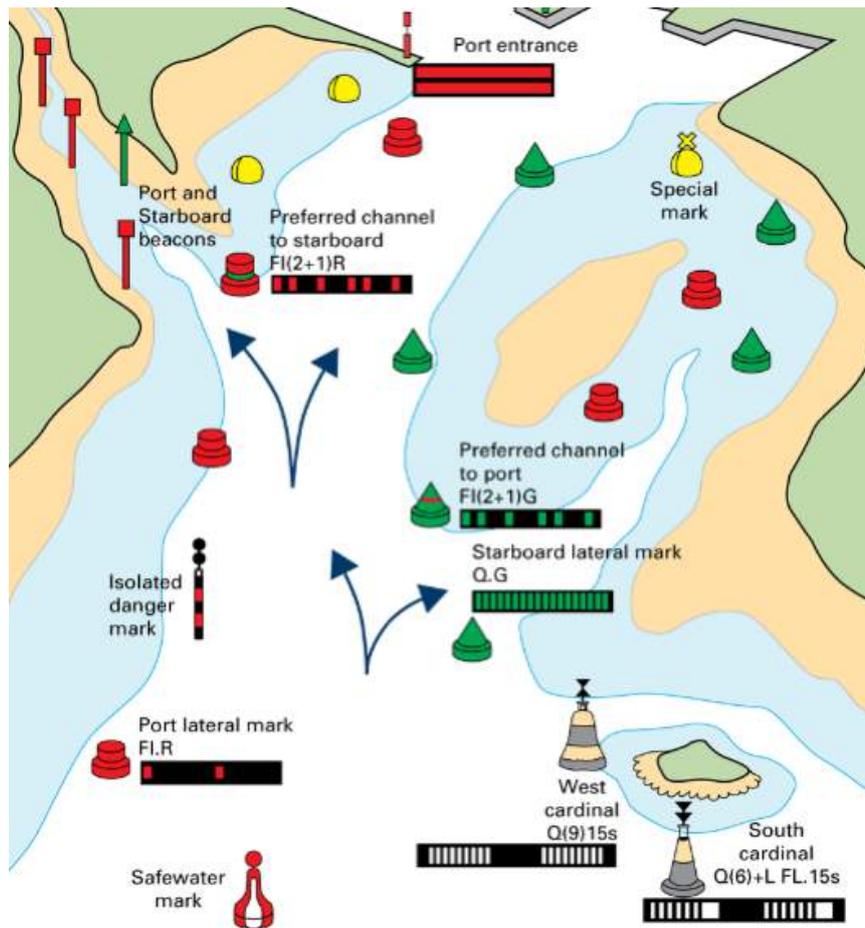


# IALA BUOYAGE

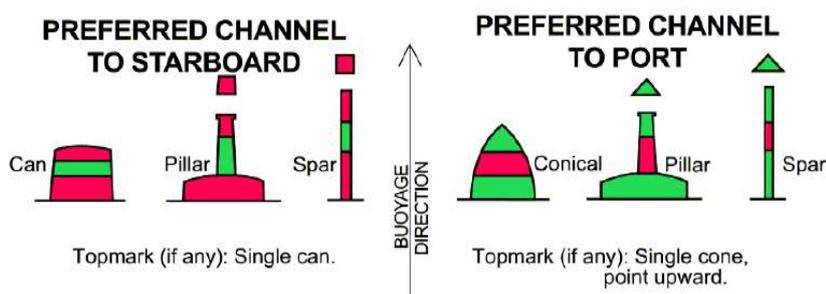
## Harbour Approach

You will be expected to identify, understand and respond to buoyage that you see.

- What marks can you identify in the image?
- Is your route safe?
- What decisions must you make?



**Preferred Channel Marks:** On entering an anchorage, port, harbour or bay there may be more than one route the watchkeeper or skipper can take. IALA have developed Preferred Channel Markers to indicate the preferred route into the anchorage.



# WEATHER INFORMATION

Small boat crew should principally have meteorological information about their local sailing area (coastal sailing). This is mainly the daily forecast, but can also be extended to a week-long, regional, or global forecast.

In general, the skipper and crew would want information on the following:

- Wind Strength
- Wind Direction
- Precipitation
- Sea State
- Air Pressure
- Temperature
- Cloud Cover
- Seasonal Changes

Thailand - Phuket (wave: NWW3 50 km 23.1. 2015 00 UTC)		Map		Webcams		Wind reports		Accommodation		Schools/Rentals		Shops		Other...	
Forecast	2D	Fr	Fr	Fr	Fr	Fr	Sa	Sa	Sa	Sa	Sa	Sa	Su	Su	Su
Gf S 27 km		23	23	23	23	23	24	24	24	24	24	24	25	25	25
23.01.2015		07h	10h	13h	16h	19h	22h	04h	07h	10h	13h	16h	19h	22h	04h
00 UTC															
Wind speed (knots)		13	13	8	2	3	12	13	15	14	9	2	1	17	14
Wind gusts (knots)		14	14	10	3	3	13	14	16	16	12	3	3	19	15
Wind direction		←	←	←	←	←	←	←	←	←	←	←	←	←	←
Wave (m)		0.7	0.6	0.5	0.3	0.3	0.6	0.6	0.7	0.5	0.4	0.3	0.5	0.6	0.6
Wave period (s)		4	4	4	10	9	4	4	4	4	4	4	5	4	4
Wave direction		←	←	←	←	←	←	←	←	←	←	←	←	←	←
*Temperature (°C)		26	26	27	28	28	26	26	26	27	28	28	28	26	26
Cloud cover (%)		-	17	11	9	29	37	39	44	41	26	19	7	14	12
high / mid / low		-	-	-	-	-	-	-	-	-	-	-	-	-	-
*Precip. (mm/3h)		-	-	-	-	-	-	-	-	-	-	-	-	-	-

## Weather Forecasts

Weather forecasts are essential in planning a safe passage. They are available from a variety of sources.

- Internet (Wind Guru, Weather 4D, GRIB Files, and Windy)
- Navionics™
- Local Radio
- National Radio (Shipping forecast)
- Marina Office
- National Meteorological Office
- INMARSAT
- NAVTEXT

GRIB FILES are the standard data format of the World Meteorological Organization. They are available to download and contain raw data based on the World's collected meteorological information.

The direction of the arrows corresponds to the direction of the wind.

½ feather = 5kts

1 feather = 10kts

1 ½ feathers = 15kts

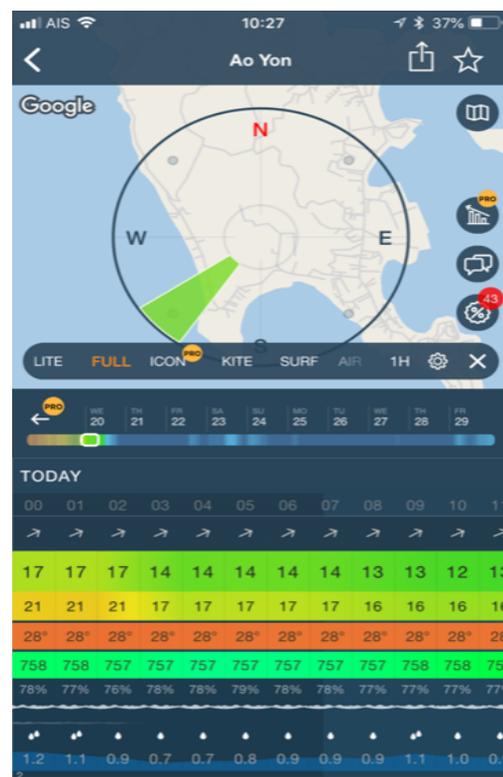
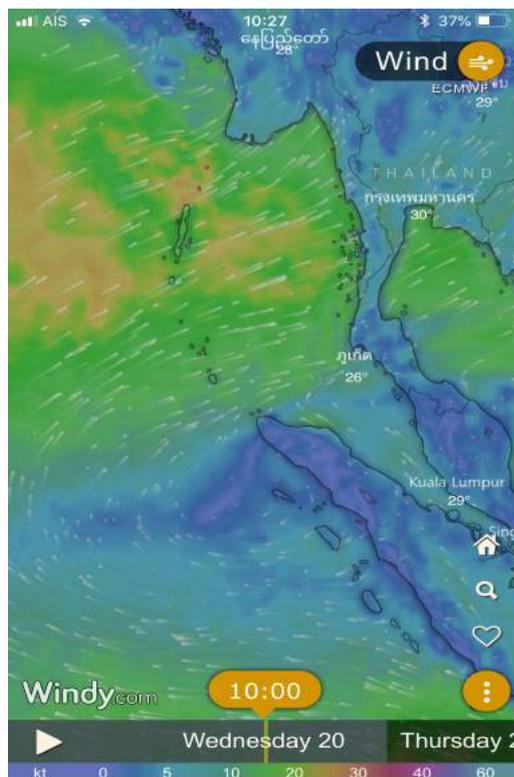
2 feathers = 20kts



# WEATHER AT SEA

## Weather Apps we recommend

We suggest you review the weather Apps Windy (Blue) and Windy (brown). This gives you the facility to look over a wide area or a local area, for sailing weather info.



## Conduct in Restricted Visibility

In the wet monsoon season, we get many squalls that cause **whiteouts**. These are conditions of very low visibility caused by heavy rain. In these conditions, as well as in fog, it is important to follow several safety precautions:

1. ready engine
2. use fog signals (-..)
3. maintain silence
4. fix position and find a safe bearing
5. post a look-out
6. slow speed
7. put on life jackets
8. use AIS, radar, etc....
9. turn on navigation lights
10. ready white collision flare



# BEAUFORT SCALE

Scale Number	Wind Speed mph	Wind Name	Noticeable Effects of Wind on Land	Noticeable Effects of Wind on Sea
0	<1	CALM	Smoke rises vertically.	Sea is mirror smooth.
1	1-3	LIGHT AIR	Direction shown by smoke drift, but not by vanes.	Small wavelets like scales, but no foam crests.
2	4-7	LIGHT BREEZE	Wind felt on face. Leaves rustle. Wind vane moves.	Waves are short and more pronounced.
3	8-12	GENTLE BREEZE	Leaves and twigs in motion. Wind extends a light flag.	Crests begin to break. Foam has glassy look.
4	13-18	MODERATE BREEZE	Raises dust and loose papers. Moves small branches.	Wave caps are longer. Many whitecaps.
5	19-24	FRESH BREEZE	Small trees in leaf begin to sway.	Waves more pronounced. Foam crests all over.
6	25-31	STRONG BREEZE	Large branches move. Phone wires whistle.	Larger waves form. Foaming crests more extensive.
7	32-38	MODERATE GALE	Whole trees in motion.	Sea heaps up. Foam begins to flow in streaks.
8	39-46	FRESH GALE	Twigs break off. Progress generally impeded.	Waves increase visibly. Foam in dense streaks.
9	47-54	STRONG GALE	Slight structural damage. Chimney pots removed.	Waves increase visibly. Foam blown in dense streaks.
10	55-63	WHOLE GALE	Trees uprooted. Considerable structural damage.	High waves with overhanging crests. Great foam patches.
11	64-75	STORM	Damage widespread around hurricane edges.	Waves so high that ships hidden in troughs. Air full of spray.
12	>75	HURRICANE	Devastation.	Devastation.

# IRPCS

The **International Regulations for Preventing Collisions at Sea 1972 (Collision Regulations or Colregs)** are published by the International Maritime Organisation (the IMO) and set out, among other things, the "rules of the road" or navigation rules to be followed by ships and other vessels at sea to prevent collisions between two or more vessels.

This Imray Rules and Signals App is a great source of information and is supplemented with a further App, Lights and Shapes that gives a student, learning material and short questions with answers.

## Fundamental Rules

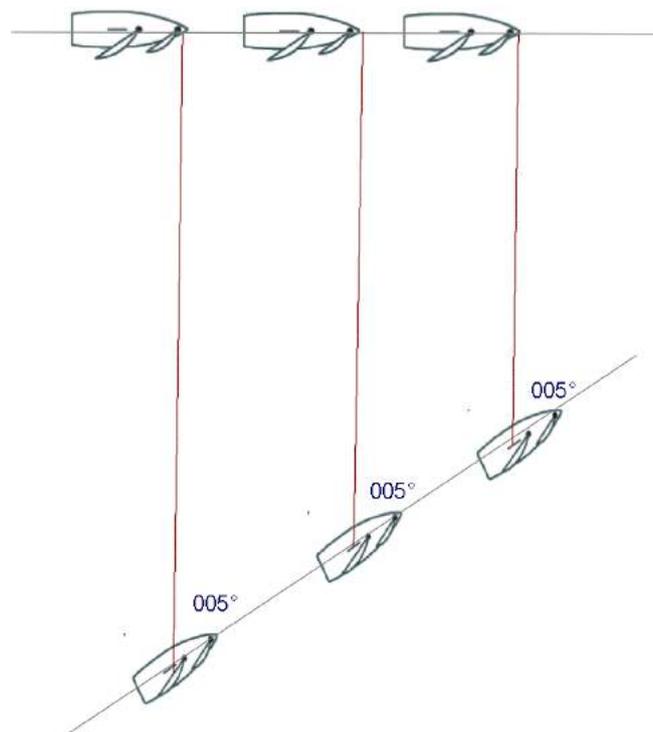
- **Keep a watch** – by all appropriate means (look, listen, radar, AIS)
- No-one has '**right of way**'
- One vessel is the **give way**, the other is the **stand on** vessel. Both remain responsible to avoid a collision
- **Travel at a safe speed** for the conditions
- In a narrow channel **keep to starboard** (right)
- **GIVE WAY** vessel must take **early and substantial action**
- **STAND ON** vessel must **maintain course and speed** until it is clear the other vessel is not taking action and only then take avoiding action

## Risk of Collision

When there is deemed to be a risk of collision

- One vessel is the **give way** vessel.
- The other is the **stand on** vessel

If there is a **CONSTANT BEARING** between the two vessels which are approaching each other there is a **risk of collision**. (Rule 7)



# IRPCS

## Sailing Rules

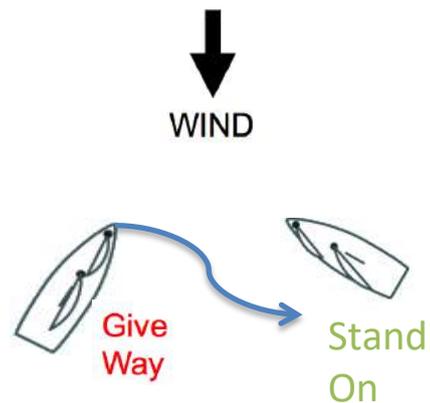
Under Sail – Rule 12

### Starboard Tack Rule

Wind on the Starboard side of the vessel -

Starboard tack boat is the stand on vessel.

Port tack boat is the give way vessel.



Under Sail – Rule 12

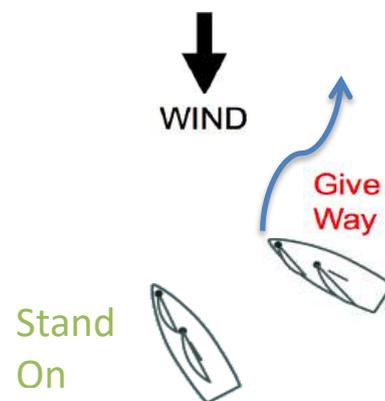
### Windward Rule

The boat nearest the wind is the Windward boat.

The boat furthest from the wind is the Leeward boat.

Leeward boat is the stand on vessel.

Windward boat is the give way vessel.



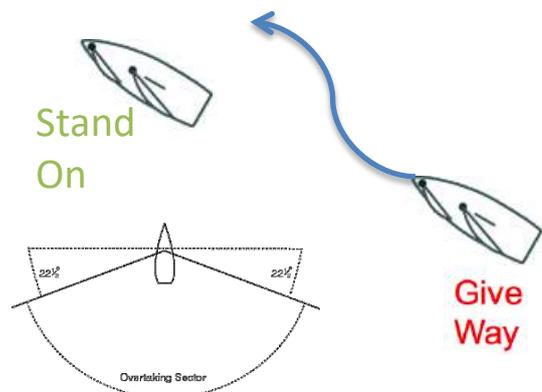
### Under Sail or Power

Applies to power or sailing vessels.

The vessel being overtaken is the stand on vessel.

**The overtaking vessel is the give way vessel. (Rule 13)**

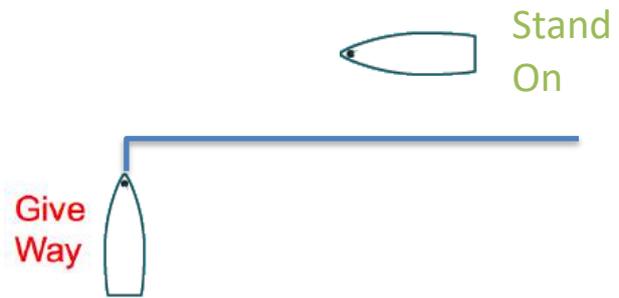
Overtaking is defined as coming from more than  $22.5^\circ$  abaft the beam (the angle a stern light becomes visible).



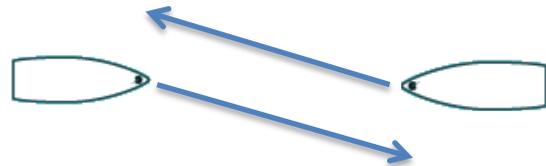
# IRPCS

## Under Power

Vessels meeting at an angle but not when one is overtaking the other: give way to vessels on your **Starboard** bow. (Rule 15)



Vessels meeting head on – both turn significantly to **Starboard** and pass Port to Port. (Rule 14)

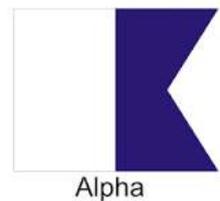


## Shapes and Sounds

Rule 27e - Vessel engaged in diving operation

Fog Signal

Efficient sound signal at intervals not exceeding 2 mins



Rule 25e - Vessel motor sailing

Fog Signal

At Intervals not exceeding 2 mins

- If making way  (long)
- If not making way  



# GLOSSARY

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- **Apparent Wind** - The wind felt on a boat (the result of true wind and wind produced by the boat's own motion).
- **Bear Away** – To move the direction of the sailboat away from the wind.
- **Bearing** - A compass direction to a point (such as a waypoint ahead).
- **Beat** - To sail close to the wind (as noun: point of sail close to the wind).
- **Beam Reach** - The point of sail with the wind coming straight across the beam (from 90°).
- **Broad Reach** – The downwind point of sail between a beam reach and a run.
- **Chart** - A nautical map showing depths, buoys and underwater characteristics.
- **Course** - The compass direction in which the boat is being steered.
- **Close Hauled** - The point of sail as close to the wind as possible.
- **Dead Reckoning** - Navigation and determination of the boat's position based on its direction, speed, and time.
- **Ease** - To let out a mainsheet or jib sheet (when adjusting a sail).
- **Ebb Tide** - The outgoing or falling tide (opposite of Flood tide)
- **Fix** - The boat's position on a chart determined by taking bearings on two or more fixed objects (or as determined by a GPS unit).
- **Flood Tide** - The incoming or rising tide (opposite of Ebb tide)
- **Gybe (or Jibe)** - To turn the boat downwind across the wind, with the sails moving from one side to the other.
- **Head Up** - To turn closer to the wind (see Luff Up).
- **Heading** - The compass course being steered.
- **Heel** - The sideways tipping of the boat due to the wind's effect.
- **Kill Cord** – The safety tether between the stop switch on an engine and the helm's wrist or foot.

# GLOSSARY

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- **Knot** - A unit of speed (for the boat or the wind) equal to one nautical mile per hour; a nautical mile is 1.15 miles.
- **Lee (or Leeward)** - A directional term referring to downwind, such as the lee/leeward side of the boat.
- **Leg** - A (usually straight) section of a boat's overall course (in a race or when sailing to a particular destination).
- **Luffing** - A shaking or flapping of the front edge of a sail (the luff) when the sail is let out too far for the course being steered or point of sail.
- **Luff Up** – To move the direction of the sailboat towards the wind (see Head Up).
- **Make Fast** - To secure (such as tying off a line).
- **Nautical Mile** - See Knot.
- **Offshore** - Direction of wind from land towards the water.
- **Onshore** - Direction of wind from the water toward the land.
- **Painter** – A rope tied to a dinghy or speedboat to secure it to other boats, moorings or pontoons.
- **Pinching** - Sailing too close to the wind when close-hauled.
- **Plane** - The boat lifts and sails fast over the surface of the water.
- **Plot** - On a nautical (paper or electronic) chart, to draw in the boat's position and course.
- **Point of Sail** - The direction the boat is pointing relative to wind direction.
- **Reach** - A course sailed across the wind, such as a beam reach.
- **Route** - A term used in chart plotters designating a planned course through a series of waypoints.
- **Rules of the Road** - Navigation laws specifying which boat must give way to another to prevent collision or accident.

# GLOSSARY

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- **Run** - The point of sail directly downwind with the wind astern.
- **Tack** - To turn the boat upwind and across the wind, with the sails moving from one side to the other.
- **Tender** - A dinghy used with a larger boat.
- **Training Run** – This is a Point of Sail between a Broad Reach and a Dead Run. This is when a gybe takes place!
- **Trim** - In general, to adjust the angle of a sail for greatest efficiency; more specifically, to pull in on the sheet (trim in vs. let out).
- **True** - With directions, true north is straight up on the chart, as opposed to magnetic north.
- **True wind** - The direction and strength of the wind not relative to the boat's motion, as opposed to Apparent Wind.
- **Waypoint** - A point marked on a nautical chart (paper or electronic) to assist with navigation (such as when plotting a route through a channel).
- **Windward** – As opposed to the lee/leeward side, windward refers to the side closest to the wind.

# TOPICS CHECKLIST

## Theoretical Topics

Safety	
How a Sail Works, Wind Awareness, Parts of a sail, Points of Sail, Trim, Tell-tales	
Parts of a Boat	
Weather	
Tides	
Rules of the Road	
Planning a journey / simple chartwork	
IALA Buoyage	

## Practical Topics

Ropework & Knots	
Leaving and returning to a Mooring or Marina, Picking Up a Mooring/ Anchoring	
Manoeuvring Under Engine	
Sail Handling Afloat and Ashore, trimming sails and reading tell-tales	
Sailing on all Points of Sail	
Tacking	
Gybing	
Heaving To	
Reefing / De-reefing Underway	
Man Overboard Under Engine	
Basic Chartwork	
Anchoring	
Dinghy Checks and Preparation	



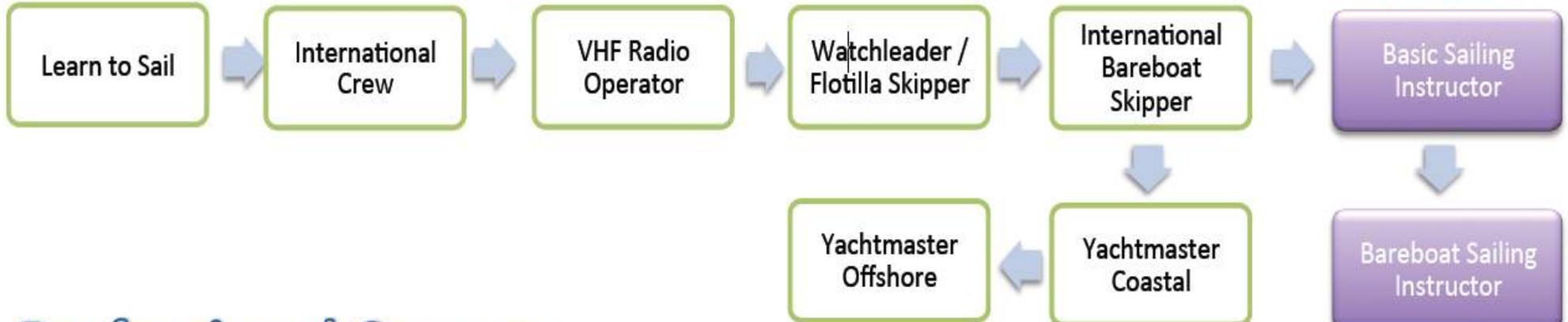
This is to certify that \_\_\_\_\_  
has an understanding of the above topics and has achieved the level  
of International Crew.

\_\_\_\_\_ Instructor

\_\_\_\_\_ Date

# IYT COURSE FRAMEWORK

## Recreational Sailing Courses



## Professional Courses



## Superyacht Courses

