DAY SKIPPER
FOR SAIL & POWER

The essential manual for the RYA Day Skipper theory and practical certificate

'Thoroughly recommended' *Hamble School of Yachting*

ALISON NOICE

3rd Edition

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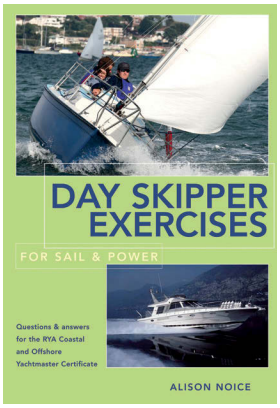

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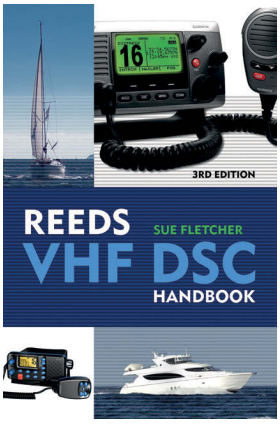

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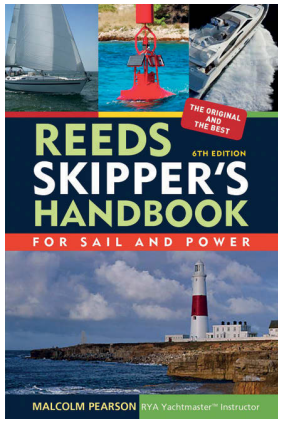

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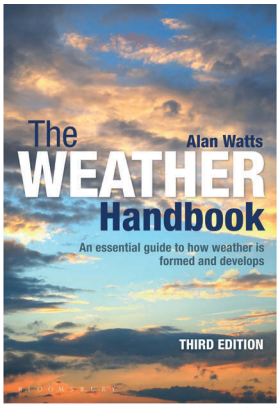

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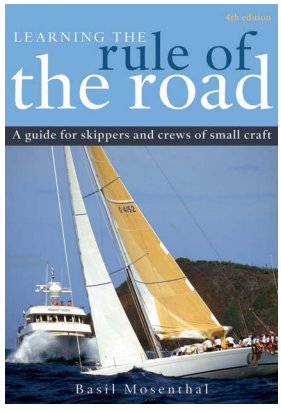

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Introduction

You are about to embark on a great adventure, following in the steps of great and famous seafarers – Horatio Nelson, Robin Knox-Johnson and Ellen MacArthur, to name but a few. I suspect they all started where you are about to begin – learning seamanship, pilotage and navigation from a book before putting it all into practice on the water and taking charge of a boat for the first time.

Their first 'voyage' in a small boat would have been a short passage in sheltered water in daylight – exactly what is expected of a student participating in a Royal Yachting Association Day Skipper course at a practical teaching centre.

RYA theory courses are for both powerboaters and yachtsmen and form part of the Yachtmaster™ training scheme, which is internationally respected and the envy of the world.

This book covers all the subjects in the Day Skipper theory course syllabus and a lot more besides. Questions have been included at the end of each chapter so that you can practise your new skills, and I hope that I have achieved a balance between traditional methods and the use of electronic equipment that was not available to many of us when we skippered for the first time. Good luck and happy learning.

Alison Noice

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Peter Noice for his encouragement, the majority of the photographs, and his sound advice.

RYA National Cruising Scheme – sail training courses

Course (and duration)	Suggested minimum pre-course experience	Assumed knowledge	Course content	Ability after course
Start Yachting Practical (2 days)	None	None	Introduction to sailing and seamanship	Basic sailing experience
Essential Navigation & Seamanship* (15 hours)	None	None	Introduces navigation and safety	Basic knowledge of navigation & safety
Competent Crew Practical (5 days)	None	None	Basic seamanship, helmsmanship, navigation & meteorology	Useful crew member
Day Skipper Shorebased* (40 hours plus exams)	Some practical experience desirable	None	Basic seamanship & introduction to seamanship & navigation	Knowledge to skipper a small yacht in familiar waters by day
Day Skipper Practical (5 days)	5 days sea time 100 miles 4 night hours	Navigation to Day Skipper Shorebased & basic sailing ability	Basic pilotage, boat handling & watch organisation	Skipper a small yacht in familiar waters by day
Watch Leader Practical (Sail training) (5 days)	5 days sea time 100 miles 4 night hours	Navigation to Day Skipper Shorebased & basic sailing ability	Navigation, seamanship and meteorology	Take charge of a watch on a sail training vessel
Coastal Skipper & Yachtmaster Offshore Shorebased* (40 hours plus exams)	Day Skipper Shorebased course	Navigation to Day Skipper Shorebased standard	Offshore & coastal navigation, pilotage, coastal & offshore passages	Background knowledge to skipper a yacht on coastal passages by day & night
Coastal Skipper Practical (5 days)	15 days sea time (2 days as skipper) 300 miles at sea. 8 night hours	Navigation to Coastal Skipper Shorebased level. Sailing to Day Skipper Practical standard	Skippering techniques & planning	Ability to skipper a yacht on coastal passages by day & night
Yachtmaster Ocean Theory course* (43 hours and one exam paper)	Coastal & offshore sailing	Navigation to Coastal Skipper & Yachtmaster Offshore standard	Astro-navigation & ocean meteorology	Background knowledge to skipper a yacht on ocean passages

RYA National Cruising Scheme – motor training courses

Course (and duration)	Suggested minimum pre-course experience	Assumed knowledge	Course content	Ability after course
Essential Navigation & Seamanship* (16 hours)	None	None	Introduces navigation and safety	Basic knowledge of navigation & safety
Helmsman (2 days)	None No minimum age	None	Boating safety, helmsmanship & boat handling. Intro to engine maintenance	Competent to handle motor cruiser of specific types in sheltered waters
Day Skipper Shorebased course* (40 hours plus exams)	Some practical experience desirable	None	Basic seamanship & introduction to seamanship & meteorology	Knowledge to skipper a motor cruiser in familiar waters by day
Day Skipper Practical course (4 days)	2 days	Basic navigation & helmsmanship	Pilotage, boat handling, seamanship & navigation	Skipper a motor cruiser in familiar waters by day
Coastal Skipper & Yachtmaster Offshore Shorebased* (40 hours plus exams)	Day Skipper Shorebased course	Navigation to Day Skipper Shorebased standard	Offshore & coastal navigation, pilotage and meteorology	Background knowledge to skipper a motor cruiser on coastal passages by day & night
Advanced pilotage	2 days	Navigation to Coastal Skipper Theory level	Passage planning & passage making. Night experience Radar & AIS	Increased confidence with pilotage skills
Coastal Skipper Practical (5 days)	15 days (2 days as skipper) 300 miles at sea 8 night hours	Navigation to Coastal Skipper Shorebased standard. Boat handling to Day Skipper Practical standard	Skippering techniques & passage planning	Skipper a motor cruiser on coastal passages by day & night
Yachtmaster Ocean Theory Course* (43 hours and one exam paper)	Coastal & offshore passages	Navigation to Coastal Skipper & Yachtmaster Offshore standard	Astro navigation & ocean meteorology	Background knowledge to skipper a yacht on ocean passages

*Syllabus is the same for sailing and motor cruising

RYA Day Skipper Shorebased course syllabus

This theory course provides a comprehensive introduction to Navigation, Pilotage, Chartwork, Meteorology and the International Regulations for Preventing Collisions at Sea. It provides the necessary background knowledge for students prior to commencing the Day Skipper Practical course and enables them to get full benefit from that course. The RYA Day Skipper Shorebased course is also an ideal refresher for those about to start a Coastal Skipper and Yachtmaster™ Shorebased course, which contains many of the subjects taught on the Day Skipper Shorebased course, but to a greater depth of knowledge.

1. **Nautical terms** • Parts of a boat and hull • General nautical terminology.
2. **Ropework** • Knowledge of the properties of synthetic ropes in common use.
3. **Anchorwork** • Characteristics of different types of anchor • Considerations to be taken into account when anchoring.
4. **Safety** • Knowledge of the safety equipment to be carried, its stowage and use • Fire precautions and fire fighting • Use of personal safety equipment, harnesses and lifejackets • Ability to send a distress signal by VHF radio • Basic knowledge of rescue procedures including helicopter rescue • Stability.
5. **International Regulations for Preventing Collisions at Sea** • Steering and Sailing Rules 5, 7, 8, 9, 10 and 12–19 (full knowledge) • All other rules (outline knowledge).
6. **Definition of position, course and speed** • Latitude and longitude • Knowledge of standard navigational terms • True bearings and courses • The knot.
7. **Navigational charts and publications** • Information shown on charts, chart symbols, representation of direction and distance • Navigational publications in common use • Chart correction.
8. **Navigational drawing instruments** • Use of parallel rulers, dividers and proprietary plotting instruments.
9. **Compass** • Application of variation • Awareness of deviation and its causes • Use of hand-bearing compass.
10. **Chartwork** • Dead reckoning and estimated position including an awareness of leeway • Techniques of visual fixing • Use of GNSS and chart plotters for position fixing • Use of waypoints to fix position (full knowledge) • Course to steer.
11. **Tides and tidal streams** • Tide definitions, levels and datum • Tide tables • Use of Admiralty method of determining tidal height at standard port and awareness of corrections for secondary ports • Use of tidal diamonds and tidal stream atlases for chartwork.
12. **Visual aids to navigation** • Lighthouses and beacons, light characteristics.
13. **Meteorology** • Sources of broadcast meteorological information • Knowledge of the terms used in shipping forecasts, including the Beaufort scale, and their significance to small craft • Basic knowledge of highs, lows and fronts.
14. **Passage planning** • Preparation of navigational plan for short coastal passages • Meteorological considerations in planning short coastal passages • Use of waypoints on passage • Importance of confirmation of position by an independent source (full knowledge) • Keeping a navigational record (full knowledge).
15. **Navigation in restricted visibility** • Precautions to be taken in, and limitations imposed by, fog.
16. **Pilotage** • Use of transits, leading lines and clearing lines • IALA system of buoyage for Region A & B • Use of sailing directions • Pilotage plans and harbour entry.
17. **Marine environment** • Responsibility for avoiding pollution and protecting the marine environment.

1 About Boats – Sail and Power

Enthusiasts who decide to take to the water will probably have first visited a boat show and enjoyed its gloss and hype or wandered down to the harbour when on holiday and chatted to the owners of boats secured to the quay. Either way they quickly realise that boats come in all shapes and sizes and are powered by different means, and that the sea has a language of its own!

This chapter doesn't aim to replace the nautical dictionary – this quick introduction will give the basics while the rest of the book, and some time on the water, will fill in the gaps. To begin with, you need enough knowledge to know what to look for at the yacht broker, or when you embark on your first cruising course.

Nautical Terms

Directions

All boats, whether powered by engine or sail, are affected by the wind. Motor cruisers often have high superstructure supporting the upper steering position and are liable to be affected by the wind, particularly when manoeuvring at slow speed. Sailing yachts use the wind to drive them forward but are also pushed sideways – making leeway – when heeled over by the wind.

The upwind side of the boat is called the windward side and the sheltered side is the leeward side (pronounced 'loo-erd').

The widest part of the boat is called the beam, so an object sighted at right angles to the boat on the right-hand side would be described as being on the starboard beam.

When looking ahead, the left-hand side of the boat is the port side, and Figure 1.1 shows that side shaded red – the colour of the port navigation light. A quick memory jogger is to remember that port wine is red.

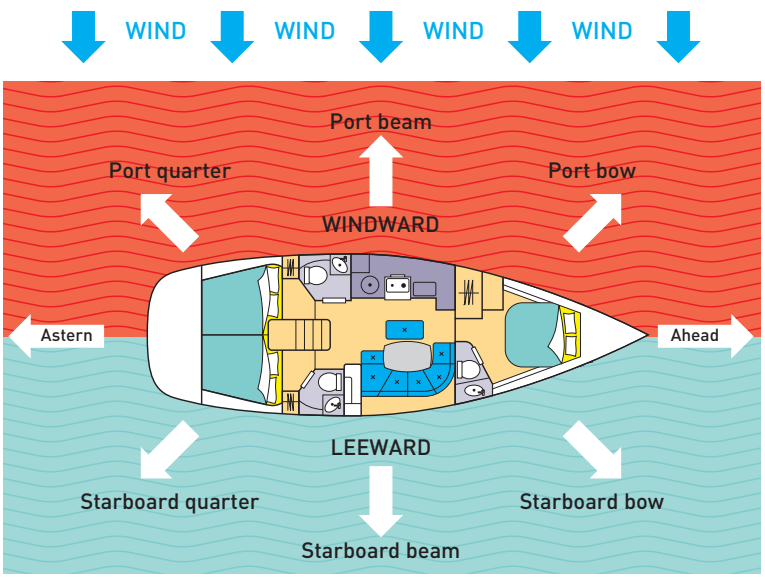

FIG 1.1 An object seen behind the boat is described as being astern or aft.

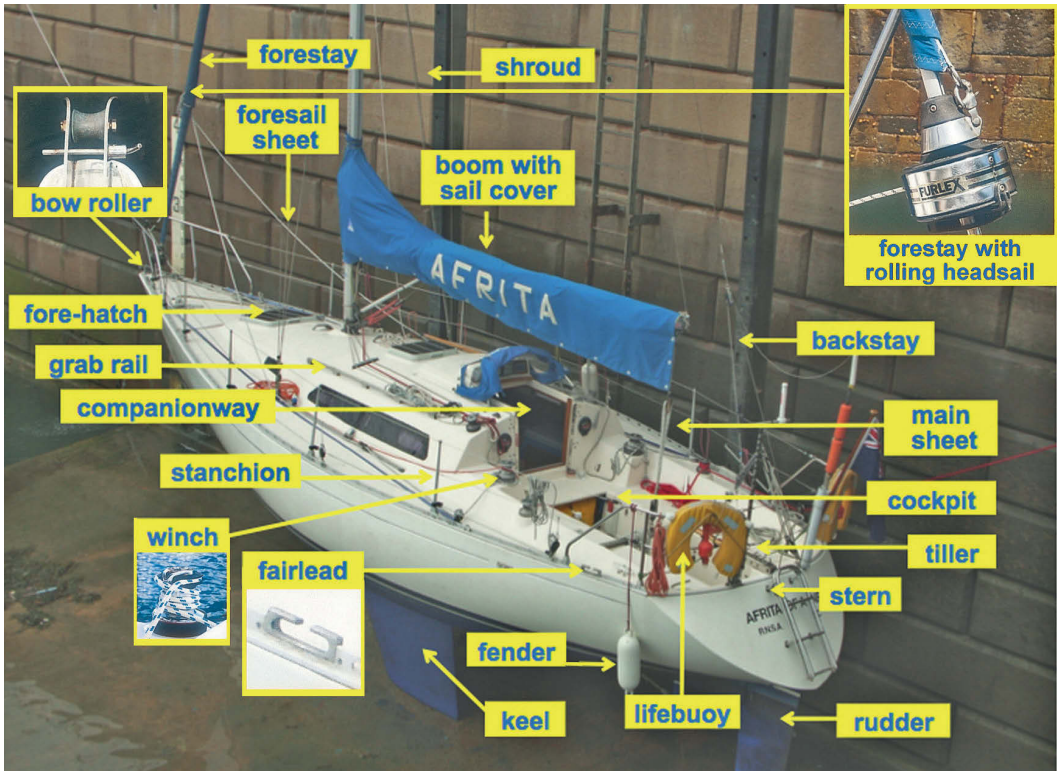

FIG 1.2 Just a few of the more important boat parts.

Parts of a Sailing Yacht

Foresail furling system In Figure 1.2 the inset photograph shows that the foresail is furled around the wire that supports the mast at the bow (the forestay). The line used for furling and unfurling the sail is rolled around the black metal drum on the bow and is controlled from the safety of the cockpit, making it convenient for cruising and shorthanded sailing.

Fairlead Ropes which secure the yacht to the shore are led through the fairlead (inset in Figure 1.2) so that the ropes are not chafed by sharp metal edges.

Bow roller The bow roller is used to lead the anchor chain or anchor rope (called a warp) safely into the boat over the bow. The metal bar on the roller slides sideways to allow the chain to be laid on the roller, and is then slid back above the chain to prevent the chain jumping off the bracket.

Winches See Chapter 2, pages 17–18.

Parts of a sail

These are shown in Figure 1.3.

Both the mainsail and the foresail are hoisted by halyards. The mainsail is hoisted by the main halyard and the foresail by the genoa or jib halyard.

The reefing pennants, which are used to decrease the size of the sail when the wind is strong, pass through small metal rings set into the sail. These rings are called cringles.

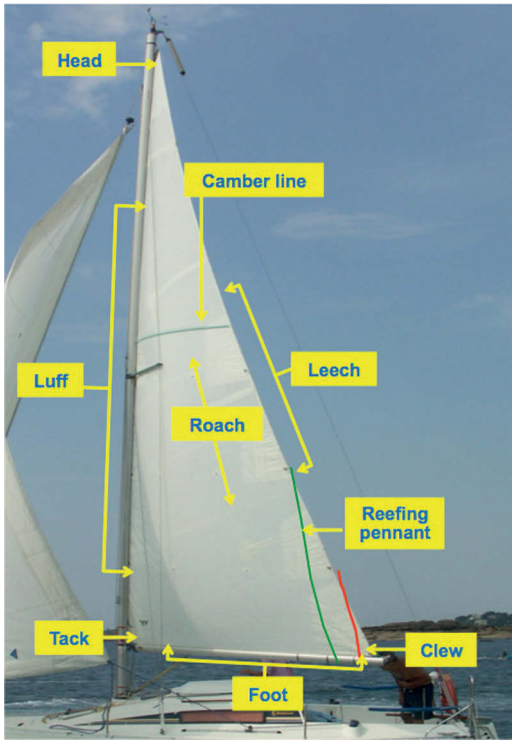

FIG 1.3 Parts of a sail.

FIG 1.4 A long-keeled yacht. The rudder is attached to the keel along its full length.

FIG 1.5 A yacht with a rudder supported by a skeg and a medium-length keel.

The sails are hoisted when the boat is heading into – or almost into – wind, so that they are empty of wind and therefore easy to manage.

Types of Hull and Keel for Sailboats

Short keel and balanced rudder

The 10-metre cruiser-racer in Figure 1.2 has a short-fin keel with a relatively deep draught (measurement from the waterline to the bottom of the keel) and a large rudder which is unsupported at the bottom. This keel and rudder configuration produces a boat that is lively, responsive and fast, but makes hard work for the crew, who will need to trim the sails frequently to keep her in check. The short keel will give a tight turning circle and allow her to go astern under power easily, but she will be difficult to berth in a marina in any sort of blow as she will get blown off line easily. A fun boat, but probably not the one to choose if going into Southern Ocean weather.

Traditional long keel

Yachts with long keels (Figure 1.4) are generally heavier and narrower than the modern short-keeled boat and are favoured by blue water sailors for their stability and seakindliness in a blow. The narrow beam reduces living space down below and the long keel means that the turning circle is greater than for shorter-keeled boats. It will be difficult to take her astern in a straight line under power, so berthing stern first is not a good option. However, many famous circumnavigators such as *Lively Lady* and *Gypsy Moth* are this type of boat.

Mid-length keel and rudder with skeg

'Moderation in all things' is often a good philosophy; those who want a good working compromise will choose a hull with a medium-length keel and a rudder that is supported over its full length with a skeg (Figure 1.5). This type of yacht will handle tolerably well under power and

has a large enough keel area to limit the amount of leeway she makes. Many production cruising boats are of this design and have sufficient beam to satisfy the demand for separate cabins and spacious saloons.

None of the fin keel boats are really suitable for mooring in a shallow creek that dries out at low water. It is very unkind to lay a boat down on its side at every low water and there is a risk of swamping if she lies with her cockpit downhill on a sloping seabed.

FIG 1.6 A yacht with bilge keels.

Twin bilge keels

A boat with bilge keels (Figure 1.6) would be the better bet as this type will sit down on both keels if the seabed is even and not tip its owners out of bed in the middle of the night as it takes to the ground! Many cruising folk like to keep berthing costs down and to enjoy quiet corners away from marinas and bustle, and this is made possible by the shallow draught of a bilge keeler when upright. The downside is that performance upwind can be affected by the water flow around the uppermost keel.

FIG 1.7 A French production yacht with a lifting keel.

Lifting or swing keel

A lifting keel may be the perfect answer for a berth with restricted water, and the one in Figure 1.7 has a very shallow draught. There usually has to be some compromise for convenience: space will be taken up in the cabin by the keel housing, which is often heavily disguised as part of the saloon table. Early models of swing and lifting keels made a lot of noise down below when the boat was sailing downwind.

FIG 1.8 This cruising catamaran is used for charter in the Caribbean.

Catamaran

Twin-hulled yachts (Figure 1.8) are favoured by those chartering in exotic places because their boat remains flat while sailing and accommodation is spacious. Sailing performance when running downwind is good, but their windward performance is generally poor and the bow turns through the wind slowly. Berthing in a marina can be difficult as many visitors' berths are not wide enough for the two hulls, but when lying to a mooring with plenty of swinging room, there should be no problem. Marinas often charge double to berth a 'cat'.

Wing keels

Short fin keels are sometimes given 'wings' to reduce the draught without decreasing the weight of the ballast (Figure 1.9). Sailing performance is not affected, but if the boat accidentally runs aground, any attempt to re-float her by heeling just digs one of the wings even deeper into the mud!

FIG 1.9 A wing keel.

Types of Rig

Sloop

A sloop is designed to have one mast and one foresail and will be described as a 'masthead sloop' or as having a 'fractional rig'.

A masthead sloop has the forestay attached to the top of the mast, which in turn means that the largest foresail is also hoisted to the top (Figure 1.10).

The fractional rig has a taller mast in comparison, but the forestay is attached to a lower point on the mast, which can be between three-quarters and seven-eighths of the total mast length from the deck (Figure 1.11).

Cutter rig

A cutter is very similar to the masthead sloop but has a second foresail and the mast is stepped slightly further aft. Blue water cruising yachtsmen often buy cutter-rigged yachts as it gives them greater flexibility to vary the sail pattern either downwind or in a blow. The yacht shown in Figure 1.12 is an Island Packet, a popular cruiser.

FIG 1.10 A masthead-rigged sloop.

FIG 1.11 A fractional-rigged boat has a tall rig with a bendy mast for higher speeds.

FIG 1.12 A cutter-rigged yacht.

FIG 1.13 A ketch-rigged cruising yacht.

FIG 1.14 A schooner moving fast under power.

Two-masted craft

Yachts with two masts can be rigged as any of the following:

Ketch The ketch (Figure 1.13) has the main mast taller than the smaller mizzen mast. To be classified as a ketch the rudder post has to be positioned aft of the mizzen. This rig is considered versatile for the cruising sailor and in strong winds the mizzen and foresail can be used alone without the mainsail to give a balanced boat with reduced sail.

Yawl This is similar to the ketch rig except that the after mast is shorter and the rudder post is forward of the mizzen mast. Very few yawls are built nowadays – the ketch rig is more popular.

Schooner The schooner rig (Figure 1.14) has the after mast taller than the foremast and is mostly used on larger craft and sail training vessels. The aftermost sail is the largest sail and this is often used with one of the foresails in stronger winds.

Points of Sail

When the boat is head-to-wind the sails act as flags and have little or no drive. The boat has to alter course by about 45° in order for the sails to fill; this point of sailing is close-hauled.

When the wind is blowing broad-side-on the boat will move well – the beam reach is the fastest point of sailing. The boat in Figure 1.15 that is on a beam reach has the wind blowing onto the starboard side of the boat; this is on the starboard tack. The vessel on a close reach in Figure 1.15 is on the port tack.

The wind will appear to get lighter as the boat runs downwind – 'running' is the term used here.

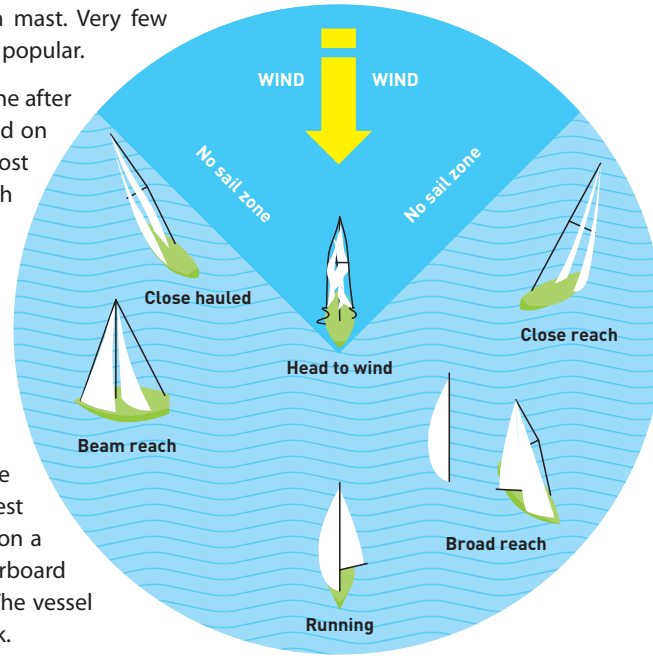

FIG 1.15 Points of sail.

When the bow turns through the eye of the wind to put the wind on the other side, the manoeuvre is called tacking or going about. Turning the stern through the eye of the wind is called gybing.

Parts of a Motor Yacht

There are also different types of powered craft. We will run through the three main types and then describe some of the controls that improve handling at speed and manoeuvrability. (Note: trim tabs and bow thrusters are explained later in the chapter.)

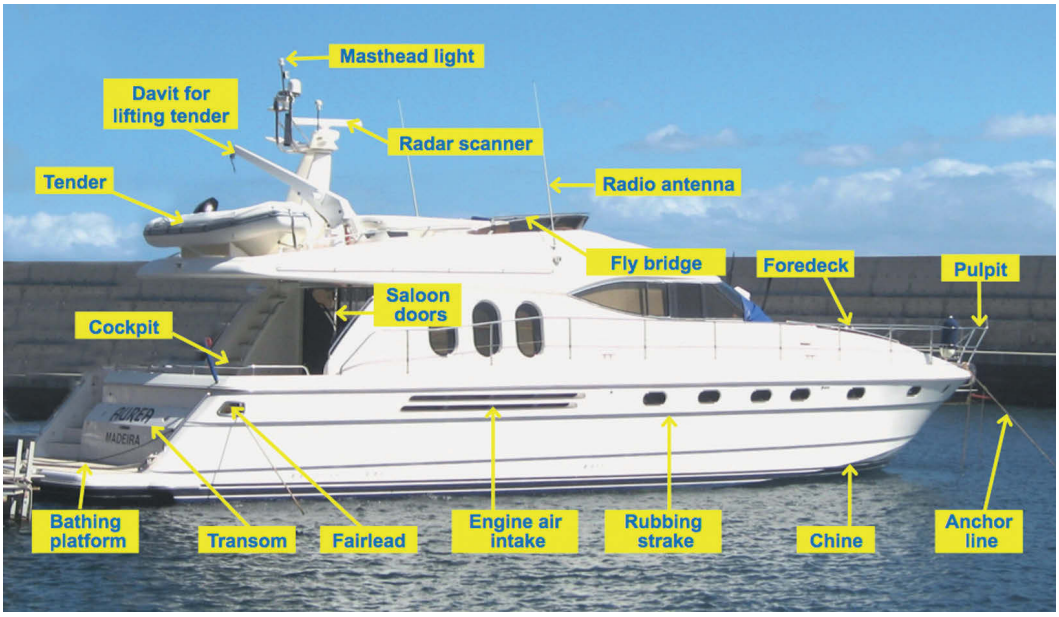

FIG 1.16 Some of the more important parts of a motor yacht.

FIG 1.17 More features of power boats.

Motor Vessels

Fly-bridge cruiser

These high-performance craft skim across the surface of the water once they have achieved enough speed to 'plane'. They are most commonly powered by twin inboard diesel engines or twin outdrives, but now some use water jets. Speeds of over 30 knots are possible with some craft in calm or moderate conditions. In rough seas the boat may have to slow to a speed where the whole hull is in the water – this is being in 'displacement mode' – rather than slamming onto the waves, which puts both the interior fittings and the crew under stress. The boat in Figure 1.18 has two steering positions, one in the warmth and protection of the saloon, and the other on the fly bridge; in contrast, the craft in Figure 1.17 has one control position and is known as 'a sports bridge cruiser'. Many boats are fitted with bow thrusters (inset in Figure 1.17), which give added control when berthing alongside, and with trim tabs (also shown in 1.17) to keep the vessel on an even keel.

Semi-displacement

The semi-displacement (Figure 1.19) hull is used for many working boats, such as pilot and police launches, which have to keep working in all weathers. At speed the forward part of this tough boat rises onto the plane, making it far more comfortable for the crew heading into a rough sea. It will usually have twin diesels with propeller shafts, rudders, trim tabs and a bow thruster – not outdrives.

FIG 1.18 A large planing craft in calm seas.

FIG 1.19 A Ministry of Defence launch in Portsmouth harbour.

Displacement craft

The displacement boat cuts through the water rather than skimming over it. This makes it much slower than the planing hull, but craft such as the one in Figure 1.20 will show their good seakeeping performance while trawling in foul weather. It may have a single screw (propeller) instead of twin engines, and older boats rarely have bow thrusters.

Rigid inflatable (RIB)

Boats such as the one in Figure 1.21 are currently very popular because they are fast, fun and unsinkable due to the separate inflatable compartments. Most are fitted with twin petrol outboards, but inboard diesels and outdrives are now quite common in the larger boats. They may be stored at home and trailed to a launching slipway so berthing costs are minimal and distant harbours can be explored.

FIG 1.20 This fishing boat is a displacement craft.

FIG 1.21 (above) A rigid inflatable boat alongside a pontoon.

FIG 1.22 (left) A sportsboat in a calm sea. The helmsman should be wearing a lifejacket, and the boat equipped with flares and a handheld VHF radio.

Sportsboat

The small sportsboat in Figure 1.22 has a single engine and is very definitely a fair-weather dayboat. It can be trailed from area to area and is often used as a water-ski boat.

Most harbour authorities have very strict rules about water-skiing close to a beach frequented by swimmers, so you need to consult the local guide book and harbourmaster's noticeboard to find out whether there is a specific water-skiing area before opening up the throttles. These boats are very liable to swamp if the sea kicks up rough, so always wear a lifejacket even if the weather is calm when you first launch.

A major safety feature with sportsboats and RIBs is the ability to cut the engines quickly in the event of an emergency. A stretchy plastic kill cord that joins to the cut-off switch is worn round the helmsman's wrist so that if he goes overboard the engines will cut out immediately. You would never forget the sight of a sportsboat with a 100hp outboard engine going flat out with no one to control it – I certainly haven't.

FIG 1.23 Kill cord.