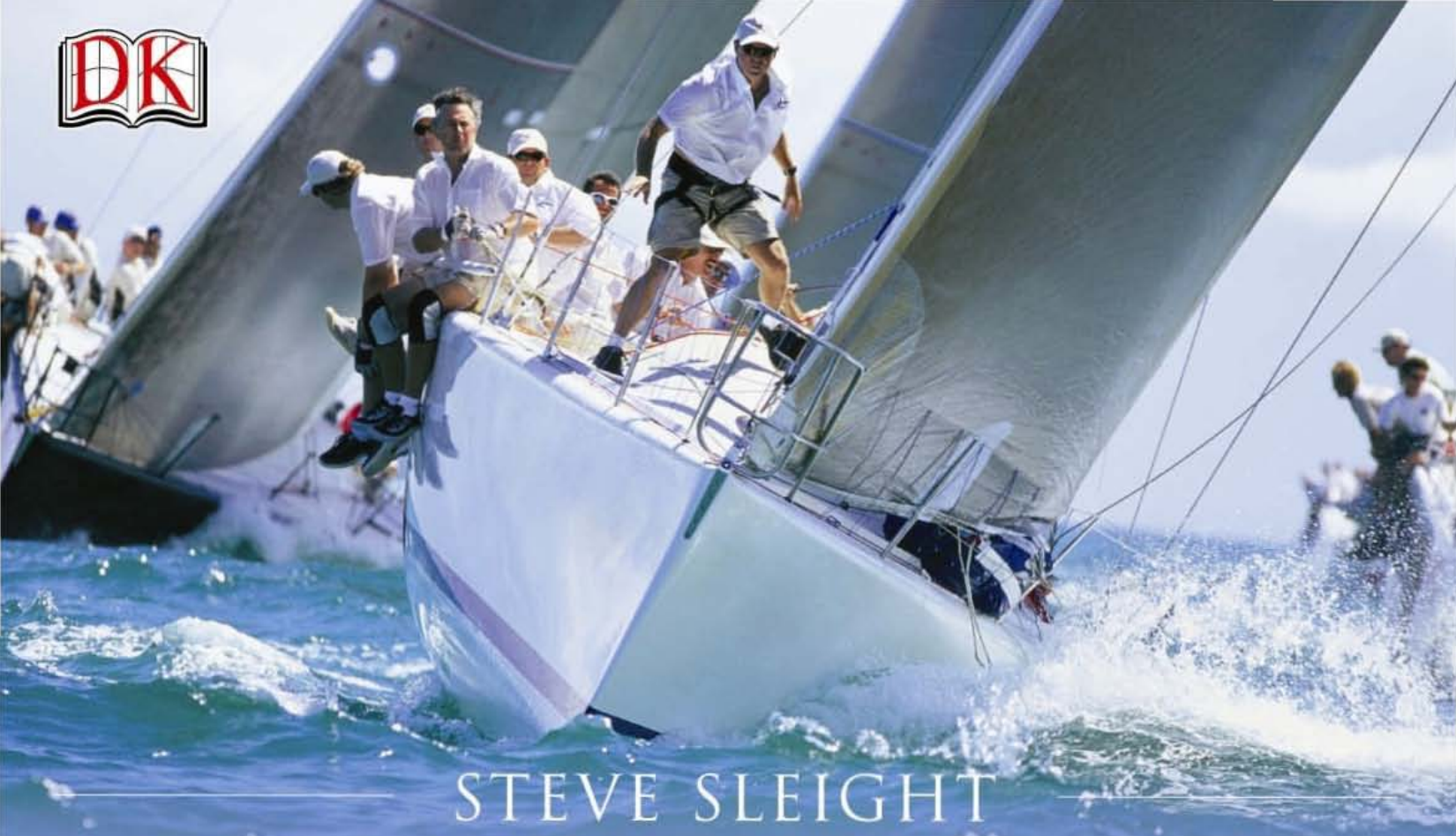

STEVE SLEIGHT

THE NEW COMPLETE SAILING MANUAL





FOREWORD BY ELLEN MACARTHUR

NEW COMPLETE SAILING MANUAL

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STEVE SLEIGHT

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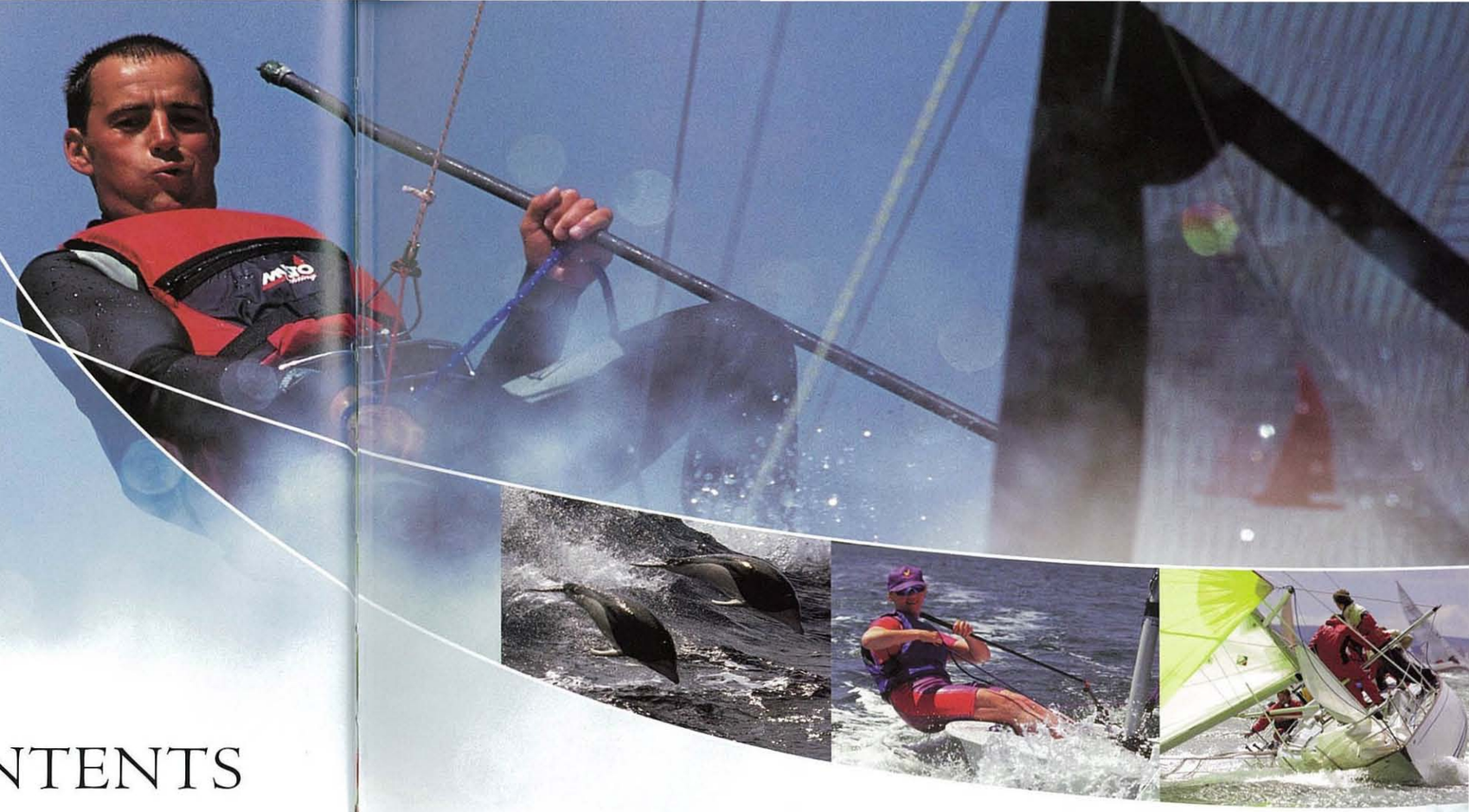
KEY

THE FOLLOWING SYMBOLS APPEAR THROUGHOUT THE BOOK

WIND DIRECTION | TIDE DIRECTION | BOAT DIRECTION

Sailing enjoyment is equally available to men and women. In this book the masculine gender is commonly referred to, but this is for clarity only.



CONTENTS


MUSTO
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FOREWORD

MY SAILING CAREER has developed like the plot of a romantic novel: it is a childhood dream that has become a reality; an intrigue that has become my life.

As a child, I loved to sit on the floor of the school library – with my jacket to serve as a cushion and a radiator warming my back – completely lost in the world of sailing (especially enjoying the novels of Arthur Ransome). I started to sail by tacking around the school playground in my imaginary boat, and spending my spare time dinghy racing on the local reservoir or pottering around the creeks on the east coast of England. The water held a special magic for me, and still does. I loved every aspect of it, so much so that I saved up my school dinner money for ten years to buy my first boat, *Threp'ny Bit,* an eight-foot dinghy.

Things have changed little for me since then. Time and ambition have stretched me, however, and I have already travelled further afield and experienced more than I ever dreamt I would. I never tire of the water, whether I'm in a 60-foot race boat, or with kids in a dinghy.

True to form, my first meeting with Steve Sleight was on the water. I was fascinated by his passion for sailing, so similar to my own. For many people, sailing is a hobby, a pastime, or even a means of escape, but for Steve it is a way of life. From J-class to national champion, he has captured it all. In *The New Complete Sailing Manual*, Steve has something to offer all sailors, from those who sense that initial tingle of excitement the first time they take to the water, to those with years of experience. If in doubt, always refer to the manual!

ELLEN MACARTHUR

THE JOY OF SAILING

"There is *nothing* – absolutely nothing – half so much worth doing as simply messing about in boats". With those words in *The Wind in the Willows*, Kenneth Grahame summed up the lure of sailing. Unlike any other sport, sailing offers a sense of freedom and independence that, once experienced, often leads to life-long addiction. This book is intended as a practical guide to a wonderful sport, and I hope it also reflects the joy of being afloat. It is dedicated to my mother, Irene.

INTRODUCTION

FOR THOSE WHO CATCH THE SAILING BUG, there is rarely any cure. Sailing is far more than a competitive sport; it is enjoyed by millions who sail for relaxation and – for the truly hooked – it quickly becomes a way of life. It was not always that way, of course. The idea of sailing for recreation would have seemed preposterous to the seafarers who explored the seas that cover two-thirds of the earth's surface, and who helped to develop nations through world trade and conquest. Today, however, sailing offers relaxation, competition, or adrenaline-surging excitement, depending on how you choose to enjoy it and the type of boat you sail.

FROM TRADE TO RECREATION

Trade, exploration, and conquest were the driving forces that made the great seafaring nations prosperous and powerful, and which helped to develop their empires. Key to their expansion was the domination of the sea and the ability of their naval designers, builders, and sailors to produce and handle the huge variety of sailing ships on which their power depended.

SAILING AND TRADE

For thousands of years, the world depended exclusively on sail power for long-distance travel across water. Whether on great rivers, such as the Nile or the Amazon, or on seas and oceans, such as the Mediterranean, Atlantic, or Pacific, sail power was the only alternative to muscle power applied to oars and paddles. In every part of the world, local populations devised

ROYAL YACHT

The Royal Yacht Mary *firing a gun salute. The* Mary *was presented to King Charles II in 1660 and introduced the concept of yachting as sport in England.*

their own solutions to the challenge of harnessing the wind and building boats capable of carrying people and cargo long distances. These local solutions created unique craft, some of which still survive. Viking longboats travelled thousands of miles under oars and their simple square sails. The square-sail rig became common in most European countries, although it was really only suitable for sailing on downwind courses.

Arabian dhows developed their characteristic huge lateen (triangular) sails as an efficient sailing solution. A dhow could sail upwind well and was fast compared to square-rigged ships. Its disadvantage – the large crew that was needed to handle it – was not a problem in an area where cheap and compliant labour was plentiful.

The Chinese solution to sail power was the Chinese lugsail, commonly referred to as a junk rig, with its short mast and woven sails supported by long bamboo battens. They were quite efficient, simple to handle, easy to repair, and required only a small crew.

AT THE LIMIT

Racing brings the challenge of competition and the thrill of pushing your boat hard, whatever the conditions.

In the Pacific Ocean, the Polynesian islanders developed the proa – their unique multihulled craft – using hollowed-out tree trunks for the main canoe, with a stabilizing outrigger to help keep it upright. Paddles and a lateen-type sail were used for motive power. These fragile craft made many long ocean passages, with the navigator using only the natural signs from the sky, wind, and sea as his guides to making a distant landfall.

Wood was the natural choice of building material for ships of all types and sizes, but, if wood was lacking, human ingenuity still allowed boats to be built – often using woven reeds. It was not until the development of iron and steel, which allowed builders to produce cheaper and stronger hulls, that wood began to be replaced as the main boat-building material.

Designs for warships, merchant ships, and fishing vessels all evolved to suit their function, resulting in many types of boats, each with special strengths and advantages. The famous Thames barges, for instance, evolved as the best design solution for carrying cargo in the shallow waters of the Thames Estuary and on the East Coast. They were sailed by a crew of two, usually a man and a boy.

Hundreds, if not thousands, of boat designs evolved, each with its own specific characteristics to suit local needs. Perhaps the design pinnacle of cargo-carrying sailing ships was the magnificent clipper ships of the 19th century, so-called because they clipped short the time required for a given passage. Designed and built for speed, they raced across oceans to be first to market and capture the best prices for their precious cargoes of wool and tea.

CLIPPER SHIPS

The Cutty Sark *is perhaps the most famous clipper ship of all. The clippers raced across oceans to be the first to bring goods to Western markets.*

EARLY DAYS OF YACHTING

The terms "yacht" and "yachting" are derived from the Dutch word *jaghen*, which means to pursue or chase. By the end of the 16th century, the word *jaght* was in use to denote any light and swift ship used for trade, war, or enjoyment.

It is appropriate that the idea of sailing for pleasure originated in the Netherlands, because the country was the world's leading maritime power in the 16th and 17th centuries. Its large maritime fleet supported the most prosperous economy in Europe, and its trade links extended to Africa, India, and the Far East.

The earliest yachts were used occasionally for pleasure, but they served mostly for transportation and communication, being very practical in the Netherlands' sheltered waters.

While in exile in the Netherlands, the English king, Charles II, learnt of the Dutch habit for using small yachts for transport. On his return to England in 1660, Charles received the gift of a 15.8m (52ft) Dutch yacht called the *Mary*, which

naturally stimulated English shipbuilders to attempt to improve on the design.

THE FIRST RACES

By 1661, two yachts had been built by the Pett brothers: the *Catherine* for King Charles, and the *Anne* for the King's brother, the Duke of York. These yachts staged the first recorded race between two pleasure vessels when the King beat his brother on a course from Greenwich to Gravesend and back along the Thames.

The world's first yacht club, The Water Club of Cork, was formed in Ireland around 1720. Records for the club disappear in the late 18th century, but it was re-established as The Cork Yacht Club in 1828, and it became The Royal Cork Yacht Club in 1830.

In 1815, a group of English gentlemen formed The Yacht Club, which became The Royal Yacht Club in 1820 when the Prince Regent, who was already a member, became King George IV. The club acquired its clubhouse in Cowes in 1824, and, in 1833, it changed its name by royal request to the Royal Yacht Squadron. Its first official race took place on 10 August 1826, with fireworks on Cowes Parade on the following night. Apart from during the two World Wars, an annual Cowes Week regatta with fireworks has taken place in early August ever since.

By 1830, there were three royal clubs: The Royal Yacht Squadron, The Royal Cork Yacht Club, and The Royal Thames Yacht Club. The seeds of organized yachting were sown and were to flourish quickly at home and abroad. The first yacht club outside the British Empire was founded in Sweden in 1830. In 1844, the New York Yacht Club became the first American club of its kind when it was inaugurated by nine yachtsmen who met aboard James Cox Stevens' schooner *Gimcrack*.

J-CLASS YACHTS

Two British J-class yachts, Velsheda *and* Endeavour. *J-class yachts raced for the America's Cup in the 1930s, when they were the pinnacle of yacht design.*

MODERN SAILING

The early part of the 20th century was perhaps a golden era for gentlemen's yachting. The huge J-class yachts, however, represented the final chapter in a style of racing that had become prohibitively expensive, and sailing as we know it today originated shortly after the Second World War.

DINGHY SAILING

The development of plywood was quickly seized upon by boat designers as an ideal building material for the production of strong, lightweight dinghies, many of which were suitable for home construction. Increasing leisure time and disposable income provided the desire and the means for many people to indulge in sport and recreation, and a new type of sailing developed that was more accessible than ever before.

Dinghy sailing developed rapidly during and after the 1960s as dozens of new, cheap and exciting designs appeared on the market. Home boat-building became popular because of the new, easy-to-use materials, and many hundreds of small boat-building companies were formed to meet the demands of the developing sport.

CRUISER RACING

Racing takes place in all types of boats. Cruiser racing is popular, and the largest regattas can attract hundreds of yachts.

Millions of people worldwide discovered the pleasures to be had from dinghy sailing, and, while many preferred to potter in local waters – or even to cruise longer distances in the larger dinghies – even more chose to race. Dinghy racing provided a relatively cheap and accessible entry to competitive sailing, with events available for all levels of ability. From standard

club racing, through class open meetings, to National, World, and Olympic championships, dinghy racing could be enjoyed at any level to suit the experience and aspirations of the competitors. Glassfibre appeared as a flexible and convenient boat-building material in the late 1960s, and, more recently, other high-performance materials have led to the development of lighter boats and more powerful rigs. These technical developments have created another revolution in performance by facilitating the design of enormously fast boats, such as the 49er, that are exciting and challenging to sail.

CRUISING

While racing offers many attractions and rewards for the competitively inclined, the joy of sailing is no better illustrated than in the pleasures to be had from cruising under sail.

To be at sea aboard a cruising boat, out of sight of land, and solely responsible for your own destiny, is regarded by devotees as the epitome of pleasure, while the joy of a safe landfall on a new coastline is the ultimate in satisfaction.

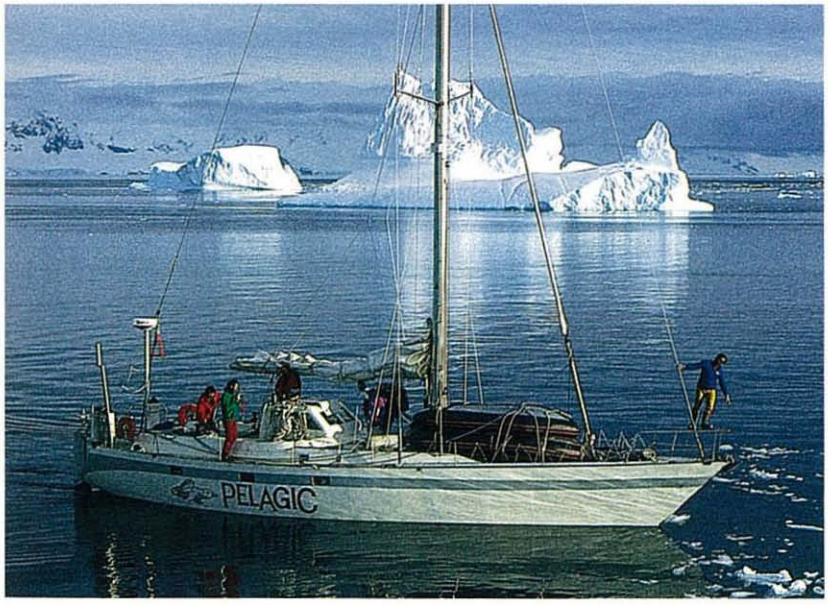
Offshore cruising aboard small sailing boats dates back to the mid-19th century, a time when the large racing yachts of the day were sailed almost exclusively by professional crews. To them, the idea of cruising offshore in a small yacht bordered on madness, yet a few individuals, most notably British sailor Richard Tyrrell McMullen, pioneered yacht cruising and inspired thousands of others through their example. McMullen sailed thousands of miles around the British Isles from 1850. He died at the helm of his yacht in the English Channel in 1891.

Other pioneers include London barrister John Macgregor, who cruised in a small sailing canoe and, of course, American Joshua Slocum, who, in 1898, aboard the 10.1m (36ft) *Spray*, became the first person to complete a single-handed circumnavigation of the globe.

Many influential cruising sailors followed over the next few decades, but few popularized ocean cruising more than the English couple, Eric and Susan Hiscock, who completed three circumnavigations between 1952 and 1976 in a series of yachts, all named *Wanderer*. Today, more and more people are discovering the joys of cruising, whether on coastal or offshore passages, or ocean voyages.

CRUISER RACING

The heyday of cruiser racing was the 1970s, when yacht racing became extremely popular. Since then, problems with handicapping rules, escalating costs, and increasing professionalism have reduced the numbers participating, although the standard of racing has risen considerably among the grand-prix fleets. At club level, cruiser racing is still accessible and great fun, and the latest types of day-racing sportsboats have brought increasing numbers back to keelboat racing.



CRUISING PLEASURES

Cruising yachts give their crews the unique ability to explore the loneliest parts of the planet. Here, the purpose-designed Pelagic *cruises Antarctica.*

SAILING FOR EVERYONE

The popular perception of yachting is that it is a sport that is exclusive, very expensive, and accessible only to the rich or well connected. Alternatively, it is assumed that it takes place aboard super yachts with professional crews doing the work while the owner and his guests sip cocktails in the sunshine on the after deck.

The reality (for most of us) is that sailing sometimes involves getting wet and cold, occasionally scares the hell out of us, and usually costs more than we will admit to our nearest and dearest. Why do we do it? Because more than most other activities, it offers a reward that, if it could be bottled, would be worth a fortune. Satisfaction at learning new skills (and you never stop learning aboard boats), and being responsible for ourselves in a potentially hostile environment are just part of the reward.

The sea attracts many of us to its ever-changing face, its echo of a less-developed past, and its direct connection to our planet's pulse. For those of us lucky or determined enough to sail, we can experience these things first-hand, in a way that a landsman will never know or even begin to understand.

It does not matter how or what you sail. If you are at home on the sea, and in tune with it, you will be happy in any boat – although you will no doubt soon begin to dream about acquiring your ideal boat.

The best thing about sailing is that it offers you these rewards whatever your age, gender, status, colour, religion, or physical ability. There are no restrictions to experiencing the joys of sailing for yourself. Of course, at some levels the sport can be exclusive, expensive, and even cliquey, but you can avoid all these things by choosing carefully the type of sailing you do, the people you sail with, and the clubs you join. The sea is a great leveller. It is no respecter of status, and teaches humility, caution, and self-reliance.

YOUNG AND OLD

There is no doubt that it is best to start sailing young – not because it is difficult to learn to sail at a later stage, but because you waste less time missing out on the joys of sailing. Children learn to sail easily, as long as they choose to do it and are not pushed into it by their parents. If your children show an interest in sailing, encourage them as much as possible, because nothing develops confidence, independence, and self-reliance as effectively as sailing. Sailing has the advantage of being an extremely healthy

FUN FOR ALL

There are no real barriers to getting afloat and you do not need a modern or fast boat to experience the joy of sailing.

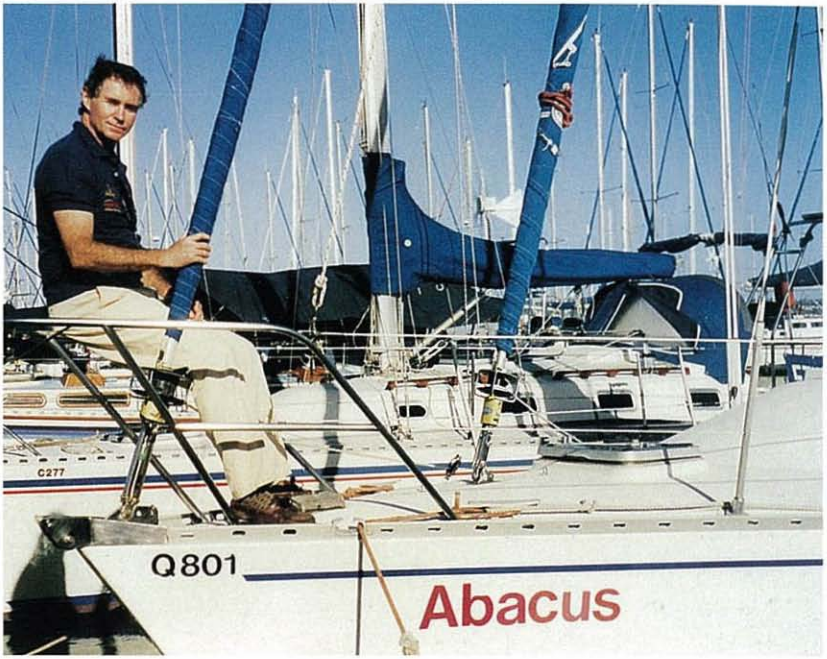
sport, developing physical fitness, and it is sufficiently complex to introduce applied science as the novice learns something of the theory of sailing and finds out how it works in practice.

It is no surprise that sailing is often used in adventure-training schemes to help underprivileged or antisocial young people learn about themselves and appropriate ways to relate to others. Sailing aboard larger boats as part of a crew builds interpersonal skills and teaches the importance of being able to rely on others and contribute to a team.

Children as young as five can learn to sail in a small dinghy, but if you did not have the opportunity to start young, don't despair. Sailing is almost unique among sports in that it can be enjoyed, even in competitive racing, at virtually any age. Even if you are aged 80 years or more, you can still sail – all that is needed is the desire. There really are no obstructions if you have set your heart on sailing.

SAILING FOR THE DISABLED

The proof that there are no obstacles to sailing is amply demonstrated by the increasing opportunities available to disabled people who wish to sail. Many marinas and sailing clubs now provide appropriate facilities for the disabled, including wheelchair access to pontoons.

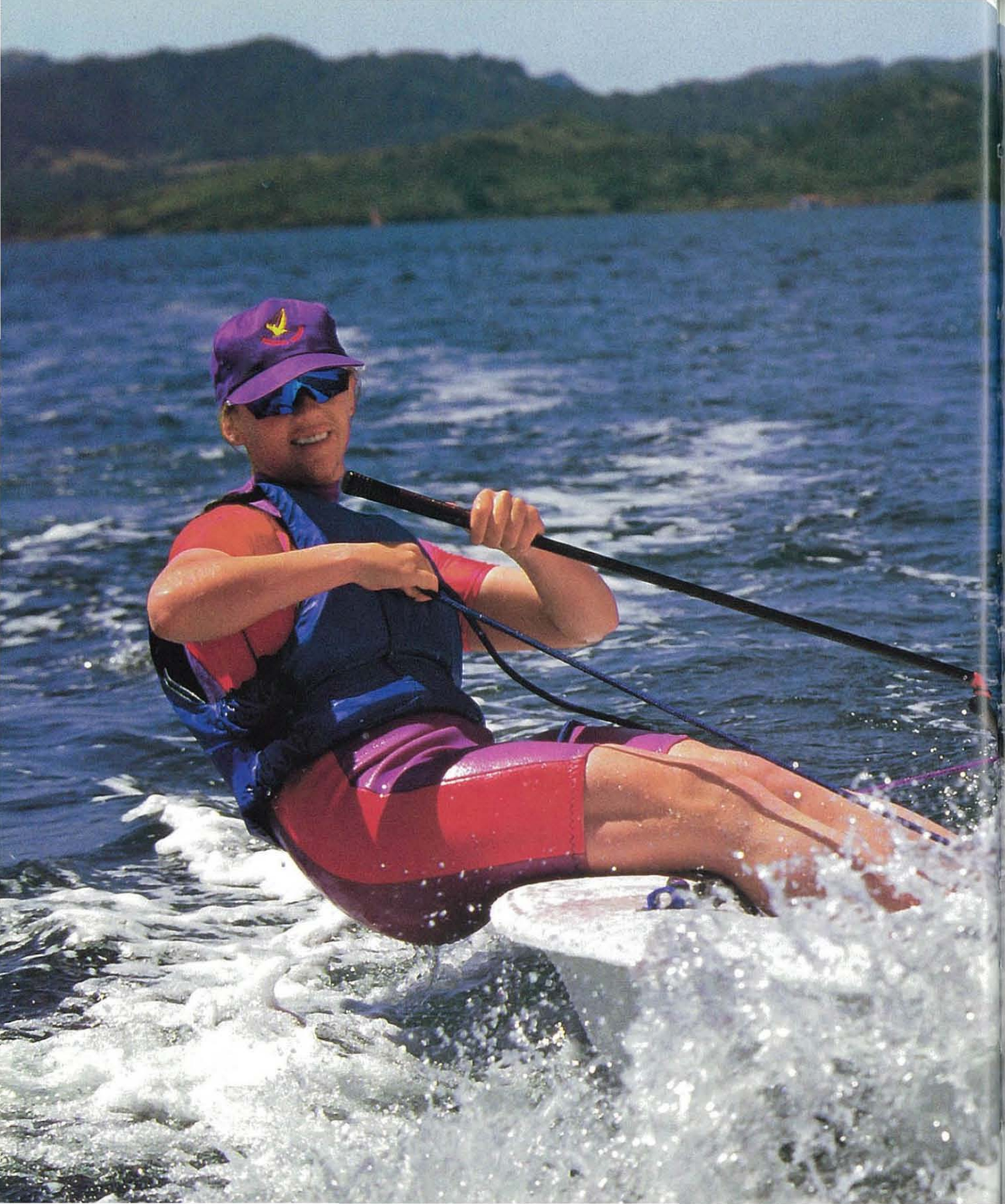


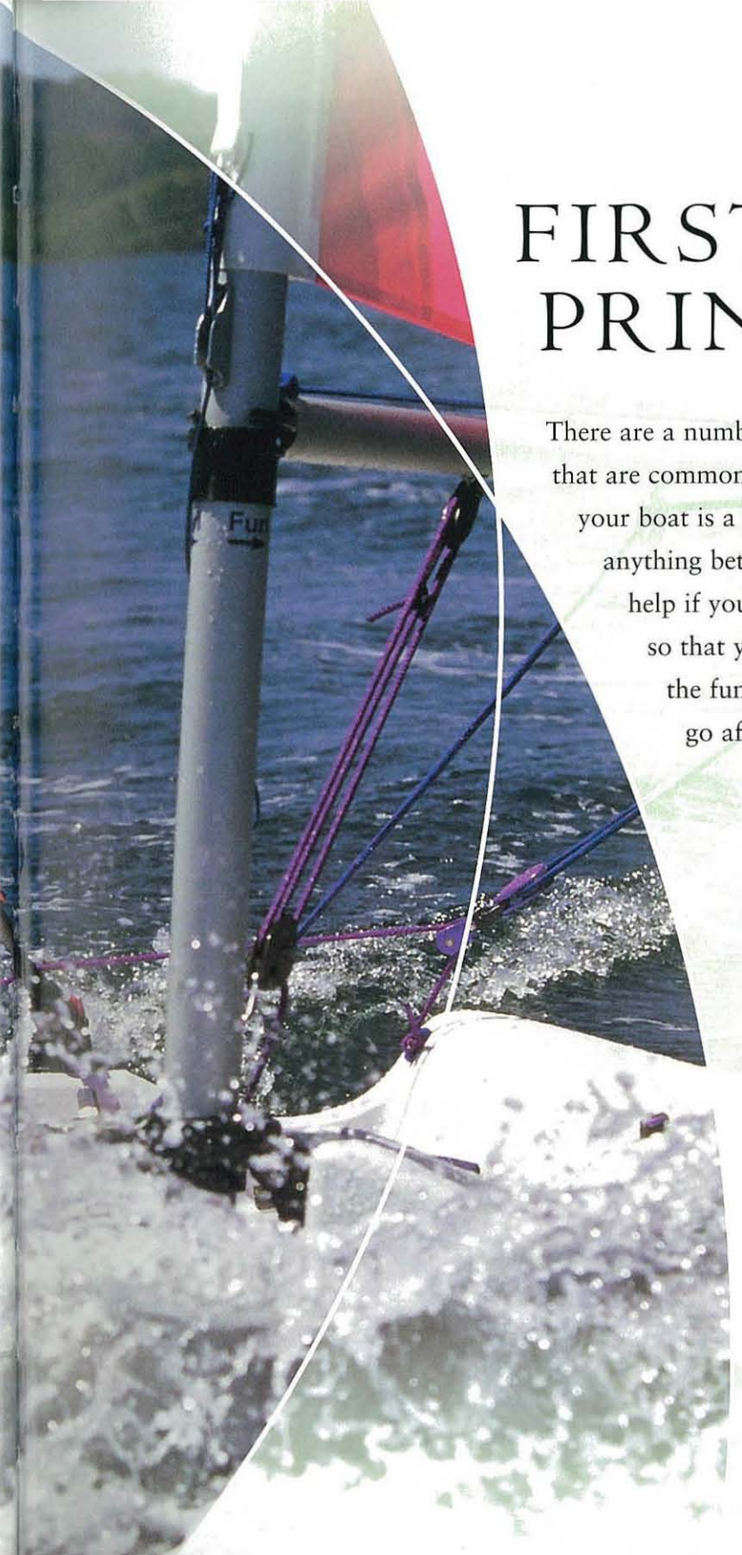
Unlike many other sports, sailing offers opportunities for people with all types of disabilities. Individuals with physical, visual, hearing, or learning impairments can all participate in sailing aboard a wide variety of boats, including tall ships, multihulls, dinghies, and keelboats, many of which have been specially adapted. Organizations exist in many parts of the world, providing opportunities for beginners as well as promoting international events such as the Paralympics and the Blind Sailing World Championships, which provide competitive sailing to the highest level. Disabled crews have competed very successfully against professional racing crews in prestigious events, including high-profile, round-the-world races, and many disabled sailors race smaller boats or cruise offshore – in fact, they can enjoy the whole range of sailing experiences.

BLIND PASSION

Geoffrey Hilton-Barber achieved the seemingly impossible when, in 1998, he became the first blind yachtsman to sail single-handedly across an ocean.

Nothing better demonstrates that sailing is accessible, and offers the same level of challenges, rewards, and satisfaction to all, than the incredible achievement of blind yachtsman Geoffrey Hilton-Barber who, in 1998, became the first blind sailor to sail across an ocean single-handedly – sailing the Indian Ocean from Durban, South Africa, to Fremantle, Western Australia. His achievement is a lesson to all of us who dream of the joys of sailing – don't wait, just do it.





FIRST PRINCIPLES

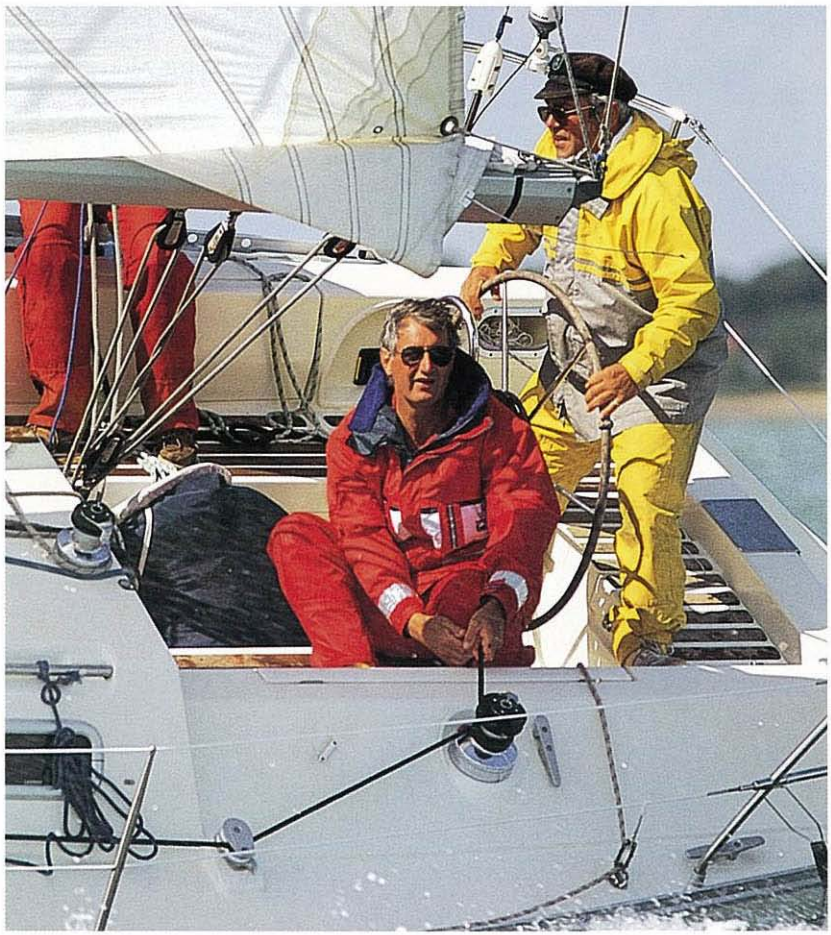
There are a number of basic principles and terms that are common to all types of sailing – whether your boat is a small dinghy, an ocean-going yacht, or anything between. If you are new to the sport, it will help if you acquaint yourself with these principles so that you have a thorough understanding of the fundamentals of good sailing before you go afloat for the first time.

SAFETY AFLOAT

WATER IS A POTENTIALLY HOSTILE ENVIRONMENT, so safety is an important consideration whenever you go afloat. Sailing is not a particularly dangerous sport as long as a few sensible guidelines are followed, including wearing suitable clothing and using appropriate buoyancy gear. You should aim to develop a healthy respect for the water and only sail within the limits of your experience. This will minimize any risks and help to ensure that your sailing is not marred by accidents.

CHOOSING CLOTHING

There is a huge variety of modern clothing and safety gear now available to cater for all types of sailing, from windsurfing to offshore cruising. Do not be tempted to rush out and buy a whole new wardrobe of expensive gear as soon as you decide to try sailing. Gain some experience in a boat first. This will help you to decide what sort of sailing attracts you most and, from this, you can choose the sort of gear that will be most appropriate for your needs. What you wear when sailing will also depend on the weather and the air and water temperatures. Some boats are wetter than others but, whatever boat you are sailing, there is always a chance that you will get wet, if only from spray, so choose your clothing accordingly.



WEARING THE RIGHT GEAR
When offshore cruising, a waterproof jacket with a pair of chest-high trousers is ideal gear. Jacket and trousers can be worn separately or together as conditions dictate.

STAYING WARM

The key to comfort on the water is to stay warm. As a general rule, it is wise to wear one more layer than you think you will need. Do not go sailing in only swimming gear. It is never as hot afloat as you think unless there is no wind and baking sunshine, in which case you risk severe sunburn.

For your first few sailing trips you can make do with comfortable trousers and jumpers; avoid jeans and cotton tops as these become cold when wet. Wool is the best natural material, but most effective of all are garments made from synthetic pile, which are very light and warm. They wick water away from the skin and dry extremely quickly.

Heat loss is one of the biggest dangers that you face when sailing. Prolonged exposure to cold will quickly lead to exhaustion, and the speed with which this occurs always surprises the inexperienced. If immersed in water at 17°C (62°F), even a fit person, clothed normally and not exerting himself, will lose consciousness in two to three hours. If the water is colder or rough, survival time will be considerably reduced. Even aboard the boat, energy levels quickly deteriorate if you allow yourself to get wet and cold.

CONTROLLING HEAT

Wear several thin layers rather than one thick one. Layers increase insulation by trapping air; heat control is simply a matter of removing or adding a layer.

KEEPING DRY

As a general rule, to stay warm while sailing you need to keep as dry as possible. This is achieved by wearing a waterproof layer over your warm clothing. Multi-purpose windcheaters and overtrousers will see you through your first few sails, but eventually you will want to buy sailing clothing suited to your specific requirements.

The alternative to keeping warm by staying dry is to wear a close-fitting neoprene wetsuit, which is designed to trap a thin layer of water between the material and the skin (*pp.64–67*). The water is quickly warmed to near body temperature by your body heat. Sailors in high-performance dinghies commonly wear wetsuits, but if you are sailing for recreation rather than racing, then you may choose to wear waterproofs. A wetsuit is not appropriate aboard a larger boat where you can more easily stay dry, so choose waterproof trousers and jacket.

AVOIDING SUNBURN

Protection from the sun is important when sailing because reflection from the water, even in overcast weather, quickly produces sunburn. Remember to apply a sunscreen of at least factor 15 to all exposed skin before you go afloat, and re-apply it at intervals.

Sunglasses that filter out the sun's ultraviolet rays are essential to protect your eyes while sailing, and it is often worth wearing a hat to keep direct sunlight off your head. Use a suitable retainer, such as a length of cord, to keep your hat and sunglasses secure.

PERSONAL BUOYANCY

Personal buoyancy is essential for anyone using a small boat, whether rowing a tender to a larger yacht, dinghy sailing, or windsurfing.

Do not go afloat in a dinghy unless you are wearing either a buoyancy aid or a lifejacket, and make sure that it is properly fastened.

TYPES OF PERSONAL BUOYANCY

A buoyancy aid is designed to provide some support when you are in the water with the minimum amount of physical restriction. A lifejacket is more cumbersome to wear, but it provides total support. It is designed to turn an unconscious person face upwards to facilitate breathing.

BUOYANCY AIDS

Buoyancy aids (*p.67*) use closed-cell foam in a vest or waistcoat-type jacket that is comfortable to wear, which makes them the usual choice for racing-dinghy sailors or inland sailors. They are often worn over a wetsuit (which also provides a degree of buoyancy).

LIFEJACKETS

Sea sailors may choose the additional security of a lifejacket (*p.216*). These are available in a variety of styles to suit all shapes and sizes, but you must ensure that you buy a size that is suitable for your body weight. Some lifejackets use closed-cell foam to provide all the buoyancy but most use manual or automatic gas inflation and are worn deflated until required.

SAILING ACCESSORIES

When sailing, it is important to consider protection for your head, hands, and feet. You will probably be able to make do with what you already own until you gain some experience, then you can buy extra gear as necessary to suit your needs.

HEADGEAR

One-third of body heat is lost through the head, so a warm hat or balaclava will make a significant contribution to your comfort on colder days. On sunny days, a hat will help to prevent sunburn and sunstroke. Tie long hair back or secure it under a hat. This prevents it blowing about and getting in your eyes or being caught in the rigging – which can be painful.

GLOVES

Wear gloves to protect your hands and keep them warm. Specialized sailing gloves – which have non-slip, reinforced palms and fingers to help your grip – will resist wear from ropes. Open-fingered sailing gloves, which allow you to deal with more intricate tasks, are also available. Fleece-lined mittens can be used on cruisers when sailing in cold weather, but they are too restrictive for use in a dinghy.

FOOTWEAR

Correct footwear will protect your feet and provide the grip you need to stay upright and on the boat. Shoes and boots for sailing should have flat, non-slip soles without a heel. Do not sail in bare feet as you will risk injury from deck gear.

SAILING KNIFE

A stainless-steel sailing knife with retractable blade and shackle key can be attached to a length of line and tied to your waist. Keep the blade sharp for cutting rope and use the key to fasten and undo shackles.

PARTS OF A BOAT

KNOWING AND UNDERSTANDING THE NAMES used for the different parts of a boat are important first steps in learning to sail. These names, along with the terms used to describe the various manoeuvres, are part of the language of sailing, which has developed over centuries to define all aspects of seamanship. All sailing boats have a number of parts in common, and, while it is not necessary to memorize the contents of the nautical dictionary, it will help if you are familiar with the basic terms.

THE HULL AND FOILS

The hull is the body of the boat, which provides the buoyancy to float itself, equipment, and crew. In most dinghies, and in many larger boats, the hull is commonly constructed in glassfibre (GRP), but dinghies may also be built of wood or moulded plastic. Cruiser hulls can also be made of aluminium, steel, or ferro-cement.

To reduce sideways drift (leeway), the hull of a sailing boat has a foil underneath called a keel. Dinghies usually have a movable keel called a centreboard or a daggerboard. Larger boats have keels that are usually fixed permanently under the boat and which, unlike movable keels, provide stability through their weight.

A centreboard is adjusted by pivoting it within its case. It is brought up out of the way when launching or recovering a dinghy, and it is rarely removed from its case. A daggerboard moves vertically. It is lifted out of its case when the boat is not in use, and it is often stored in a protective bag.

THE RUDDER

A rudder is used to steer the boat. In a dinghy, it is controlled with the tiller, which usually has an extension that allows the helmsman to sit on the side of the boat. Dinghy rudders can either have a lifting or a fixed blade. A lifting blade is useful as it can be raised when sailing to and from the shore. A fixed blade is common in racing dinghies as it is lighter and potentially stronger, but it makes the boat harder to sail in shallow water. In larger yachts, the rudder is often controlled by a wheel mounted on a pedestal in the cockpit.

THE RIG AND FITTINGS

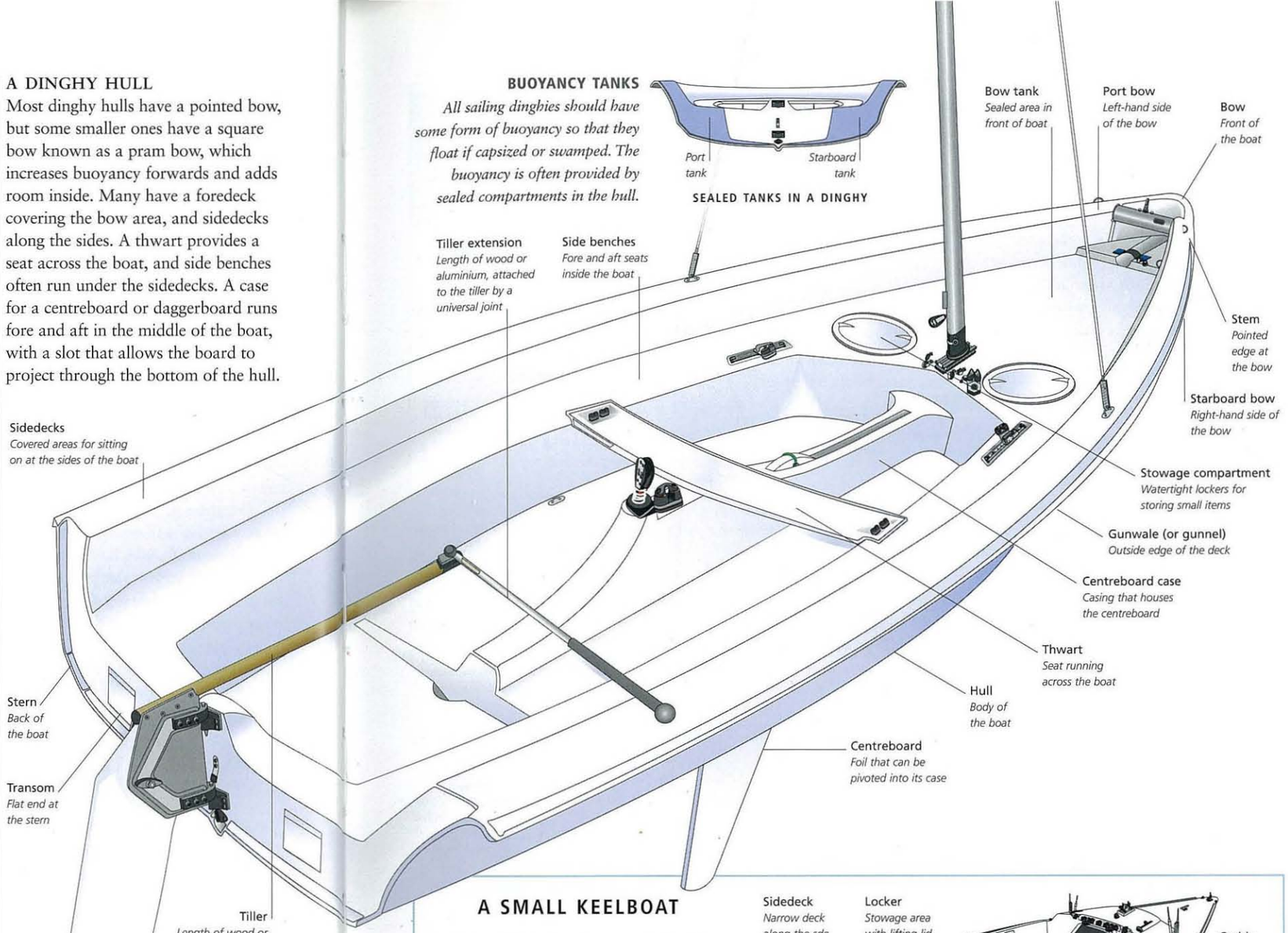
The rig (*p.26*) – comprising a mast, boom, and sail or sails – harnesses the wind and converts its force into drive to push the boat forwards. Details of rigs depend on whether the boat is a dinghy or a larger cruiser, and will also vary between individual models.

In most boats, the mast is supported by a system of wires called the standing rigging. However, single-handed dinghies often have a free-standing mast without any of the standing rigging found on other boats.

Sails are hoisted and controlled by ropes collectively known as the running rigging. Blocks (pulleys) and tackles (pulley systems) help to adjust and control the running rigging, while cleats are used to secure ropes. Control systems range from very simple on basic dinghies to highly complex on high-performance dinghies and cruiser-racers, on which the crew can adjust sail shape and mast bend to maximize performance.

A DINGHY HULL

Most dinghy hulls have a pointed bow, but some smaller ones have a square bow known as a pram bow, which increases buoyancy forwards and adds room inside. Many have a foredeck covering the bow area, and sidedecks along the sides. A thwart provides a seat across the boat, and side benches often run under the sidedecks. A case for a centreboard or daggerboard runs fore and aft in the middle of the boat, with a slot that allows the board to project through the bottom of the hull.

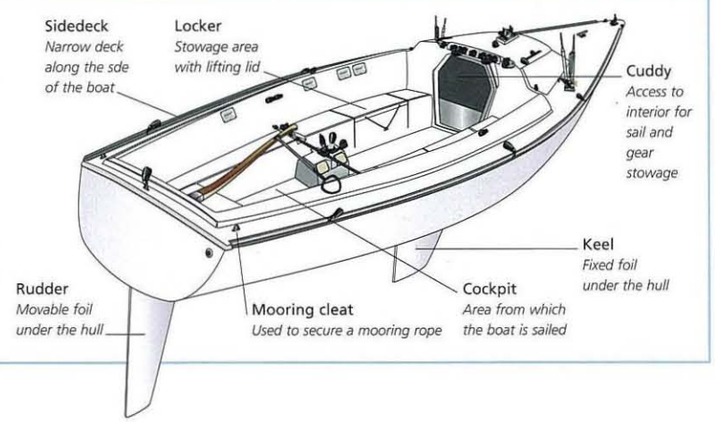


A SMALL KEELBOAT

Larger and heavier than most dinghies, small keelboats are often used for racing or daysailing at coastal venues.

FEATURES

A weighted keel, which may be fixed (as here) or retractable, gives a small keelboat greater stability than a dinghy and minimizes the risk of the boat capsizing. The large cockpit provides room for several crew.



THE RIG

Many sailing dinghies are rigged as a Bermudan sloop with a mainsail and a jib, both of which are triangular in shape. The jib, which is set on the forestay, adds drive and makes the mainsail more efficient than it would be alone. In addition, many dinghies carry a spinnaker (*pp.144-155*) for increased speed when sailing downwind. Standing rigging includes all the wires and ropes that support the mast and boom, while running rigging is used to hoist and control the sails.

WIND INDICATOR
Small vane at the masthead to indicate wind direction. A burgee (small pennant) may be hoisted instead.

Mainsail
Large, triangular sail set behind the mast

Battens
Strips of wood or fibreglass that slip into pockets on the sail to support its leech (curved outer edge). Battens can be short, as in the lower two here, or full-length as in the upper two

Jib
Triangular sail at the front of the boat, attached to the bow and hoisted in front of the mast

Forestay
Some small boats have a wire that runs from the mast to the bow to support the mast. Others (as here), use a thin rope which is removable when the jib is hoisted

Gooseneck
Universal joint that attaches the boom to the mast

Spreaders
Aluminium or wooden tubes between the mast and shrouds for additional mast support

Mast
Upright pole, usually aluminium, that supports the sails, and which may be stepped on the deck or the bottom of the hull

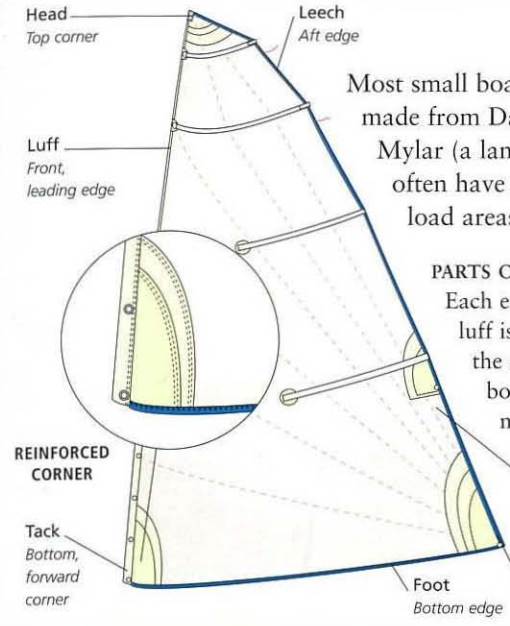
Boom
Horizontal pole, usually aluminium, to which the foot of the mainsail is attached

Shrouds
Wires on port and starboard sides that support the mast

Mast step
Socket in which the heel of the mast sits

SAILS

Most small boat sails are triangular and made from Dacron (a woven cloth) or Mylar (a laminated film material). They often have reinforced patches in high-load areas such as the three corners.



PARTS OF A SAIL

Each edge of a sail has a name: the luff is the leading edge; the leech is the aft edge; and the foot is the bottom edge. The corners are also named; the head, tack and clew.

Roach
Additional curved area on the leech outside a straight line from head to clew

RUNNING RIGGING

Halyards hoist the sails, and sheets control them. The mainsheet controls the mainsail, and it usually has a tackle system that employs a combination of blocks to increase the power of the helmsman's pull on the sheet. The jib is a smaller sail so the jib sheets, which control it, do not usually require a tackle system.

Cunningham control
Rope for adjusting tension in the mainsail luff (and sometimes the jib)

Outhaul
Rope that adjusts tension in the mainsail foot

Mainsheet tackle
A system of blocks used to increase the power that the helmsman can apply to the mainsheet

Mainsheet
Rope used to pull in or let out the mainsail

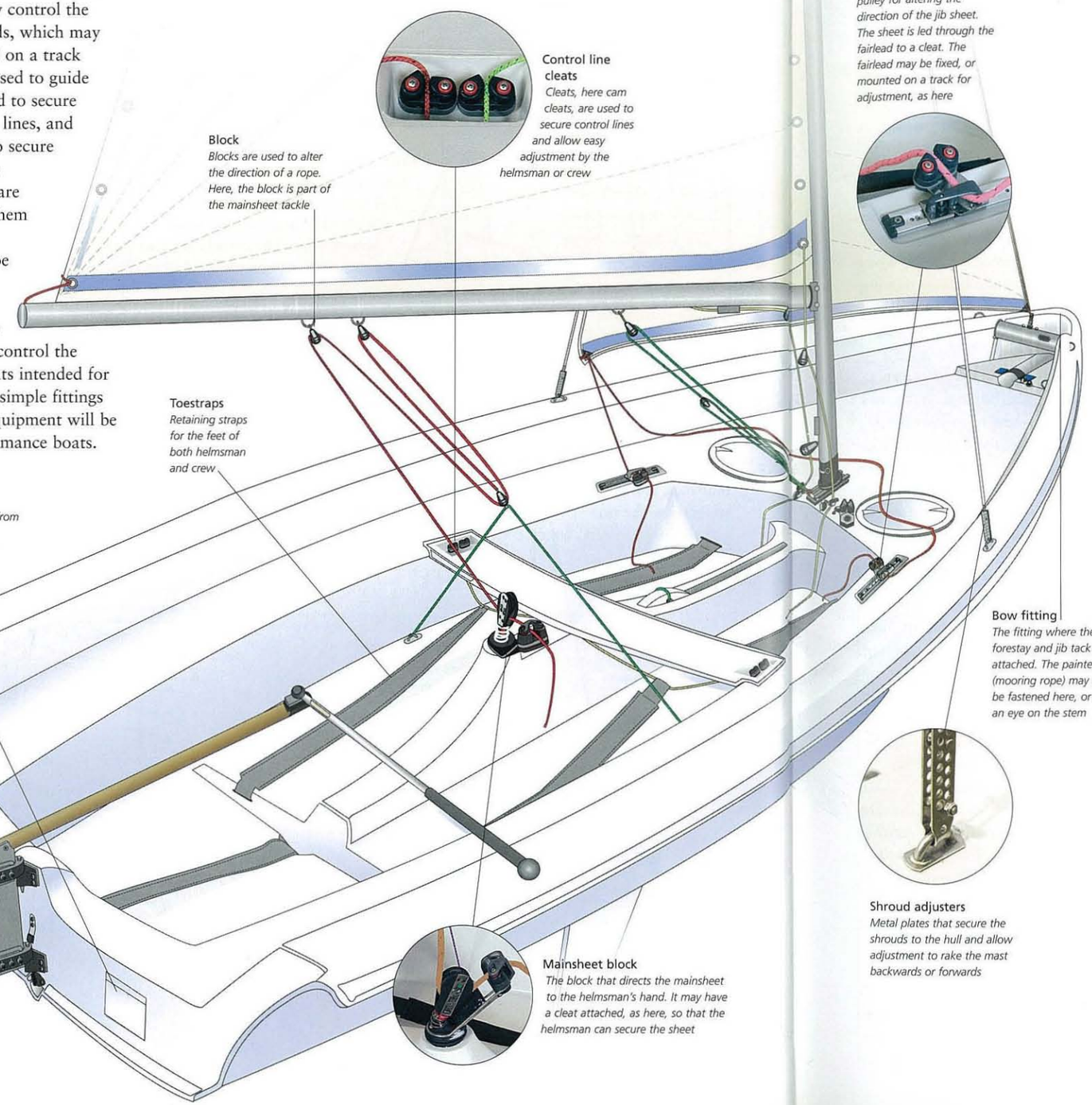
Jib sheets
Ropes attached to the jib clew and used for pulling in or letting out the jib – one each side

Halyards
Used to hoist the sails, they exit the mast near the bottom

Boom vang (or kicking strap)
Rope (or wire) and block system attached under the boom and to the mast foot to control the amount the boom can lift

SMALL-BOAT FITTINGS

Various fittings are attached to the boat to help the crew control the rig and sails. Fairleads, which may be fixed, or mounted on a track for adjustment, are used to guide ropes. Cleats are used to secure halyards and control lines, and are also often used to secure the sheets so that the helmsman and crew are not obliged to hold them continuously. Other fittings include the toe straps, which allow the crew to sit out, and block-and-tackle systems that help to control the running rigging. Boats intended for novices usually have simple fittings but more complex equipment will be found on high-performance boats.



Control line cleats
Cleats, here cam cleats, are used to secure control lines and allow easy adjustment by the helmsman or crew

Block
Blocks are used to alter the direction of a rope. Here, the block is part of the mainsheet tackle

Toestraps
Retaining straps for the feet of both helmsman and crew

Transom flaps
Flaps that open to drain water from the cockpit after a capsize or swamping. They are closed for normal sailing and when stationary

Mainsheet block
The block that directs the mainsheet to the helmsman's hand. It may have a cleat attached, as here, so that the helmsman can secure the sheet

Jib fairlead
Smooth eye or rotating pulley for altering the direction of the jib sheet. The sheet is led through the fairlead to a cleat. The fairlead may be fixed, or mounted on a track for adjustment, as here

Bow fitting
The fitting where the forestay and jib tack are attached. The painter (mooring rope) may also be fastened here, or to an eye on the stem

Shroud adjusters
Metal plates that secure the shrouds to the hull and allow adjustment to rake the mast backwards or forwards

RELATIVE TERMS

On shore, we usually describe the position of things in relation to ourselves – "left", "right", "in front", or "behind". On the water, they are always described in relation to the boat or the wind.

THE BOAT

The terms "port" and "starboard" relate to the boat. Facing the bow, the port side is to the left and the starboard side is to the right.

THE WIND

Windward and leeward relate to the wind. The windward side of the boat is the side towards the wind; the leeward side is the side away from the wind.

ESSENTIAL EQUIPMENT

AS WELL AS ANY REMOVABLE RIGGING, there are several other items that should be aboard when you go afloat. In particular, there has to be some means of propelling the boat if you cannot sail. There must also be adequate buoyancy to keep the boat afloat in the event of a capsize, and bailing equipment to remove any shipped water. An anchor and warp (anchor line) are also important if you sail on the sea. All equipment must be stowed safely so that it stays in place if the boat heels or capsizes.

PADDLES OR OARS

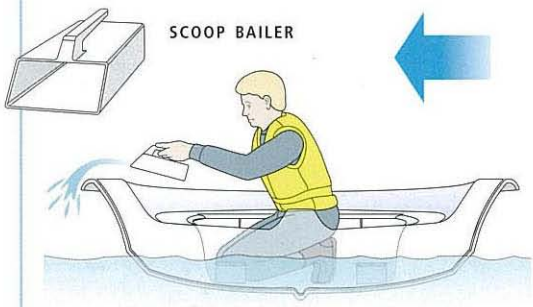
You must always carry at least one paddle so that you can move the boat in a calm. A pair of oars is useful if you sail on the sea and have a larger, general-purpose dinghy with the space to stow them. They are more efficient than a paddle but you will need a pair of rowlocks mounted in sockets on the gunwales. Some oars are jointed in the middle for easier stowage.

BUOYANCY

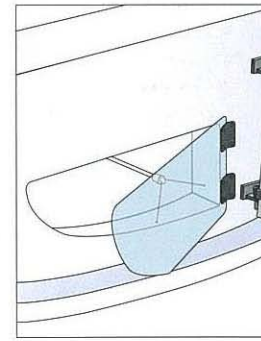
Buoyancy must be sufficient but not excessive, and it must be distributed so that the boat floats level when capsized. Buoyancy is usually provided either by tanks that are permanently built into the structure, as is the case with most modern dinghies, or by removable buoyant materials, such as inflatable airbags, which must be securely attached to the hull.

HOW TO BAIL

Automatic self-bailers fitted in the bottom can be opened to let the water out when you are sailing fast. Some boats have transom flaps which allow the water to flow out after a capsize. Alternatively, you can bail by hand using a scoop bailer.



BAILING BY HAND
Always bail over the leeward side of the boat or else the water may be blown back on board (or into your face). A bucket is best for removing a large amount of water after a capsize; a scoop bailer is useful for smaller quantities. Get rid of the last few drops with a sponge.



TRANSOM FLAP
Hinged flaps in the transom get rid of water quickly after a capsize or swamping.

BAILERS

All dinghies will get water in them even if they do not capsize, and it is important to be able to remove it easily. Apart from making you wetter than necessary, water that is allowed to build up in the bottom of the boat will slop from side to side and make the boat heel more.

Bailing may be done automatically through retractable self-bailers, which are lowered when the boat is moving. The flow of water under the hull and past the bailer sucks the water out from inside the boat. Most have a non-return valve to prevent water from entering the boat when it slows down, but it is best to raise them if you stop, and, to avoid damage, you should remember to retract them when taking the boat out of the water. Some racing dinghies have open transoms that allow any water in the boat to flow straight out through the stern.

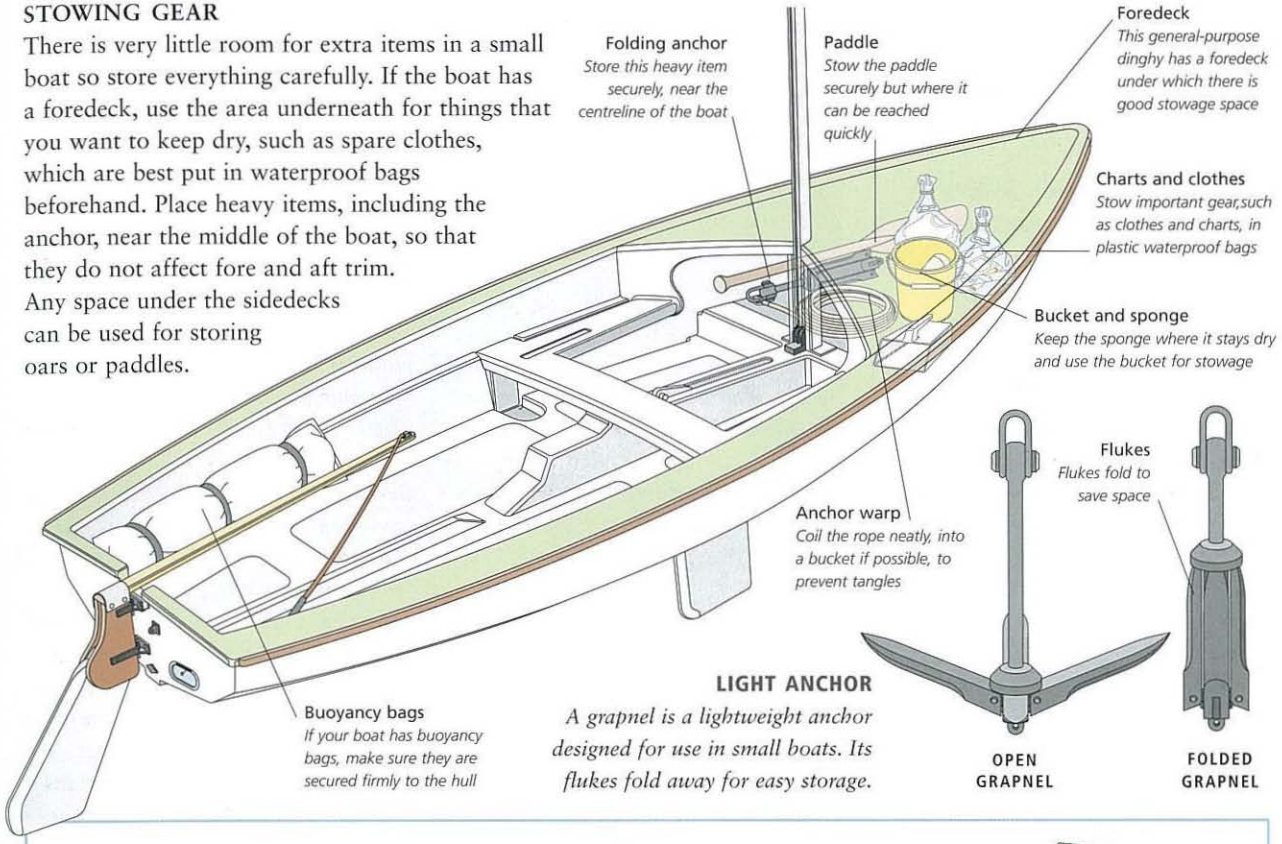
ANCHOR AND WARP

An anchor can be an important piece of equipment, particularly for sailing at sea without safety cover. In the event of an accident, a foul tide, calm weather, or even if you are simply in need of a rest, an anchor allows you to stop the boat in shallow water without drifting on the wind or tide.

A small, folding anchor (*opposite*) can be a good compromise because it takes up little space, but for serious anchoring – perhaps when cruising in a dinghy – a small burying anchor should be used. A burying anchor digs into the seabed and provides more security than a folding anchor. You will also need an anchor warp, which can also be used if your boat needs to be towed. Make sure that the anchor and warp are stowed securely.

STOWING GEAR

There is very little room for extra items in a small boat so store everything carefully. If the boat has a foredeck, use the area underneath for things that you want to keep dry, such as spare clothes, which are best put in waterproof bags beforehand. Place heavy items, including the anchor, near the middle of the boat, so that they do not affect fore and aft trim. Any space under the sidedecks can be used for storing oars or paddles.



LIGHT ANCHOR

A grapnel is a lightweight anchor designed for use in small boats. Its flukes fold away for easy storage.

EFFICIENT BOAT BUOYANCY

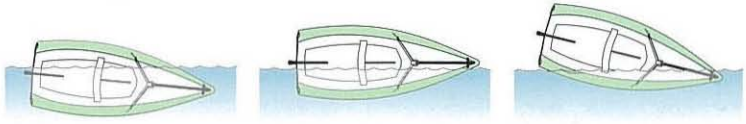
The ideal amount of buoyancy will allow the boat to float level on its side when capsized, with the centreboard within reach. The boat will have relatively little water in it when righted.

CHECKING BUILT-IN TANKS

Most built-in tanks have removable bungs that should be taken out when the boat is not being used, to allow trapped water to drain away. Any inspection hatches should also be removed when the boat is not afloat.

CHECKING BUOYANCY BAGS

Check buoyancy bags to ensure that there are no leaks and that the fastenings are firm – there should be at least three straps on each bag. When the boat is capsized or full of water, the fastenings take an enormous load. It is vital that they do not break, as the boat could then sink or be impossible to right.



TOO LITTLE

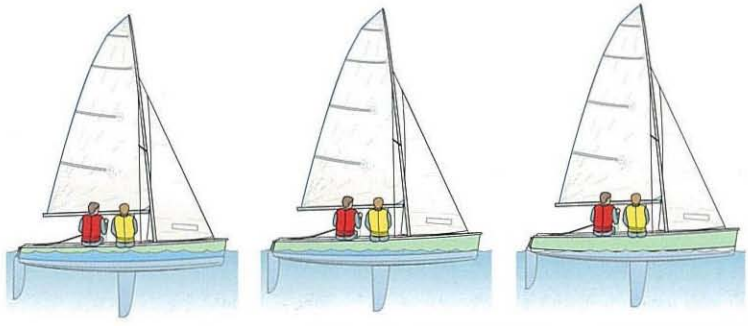
With too little buoyancy, the boat floats low in the water. It is difficult to right when capsized because of the weight of water and comes up with a lot of water on board (below).

CORRECT

With the correct buoyancy in the hull, the boat floats level when capsized, and is fairly easy to right. When righted (below), the boat comes up with relatively little water on board.

TOO MUCH

With too much buoyancy, the boat sits high in the water and is likely to invert, which makes recovery harder. When righted (below), there will be little water on board.

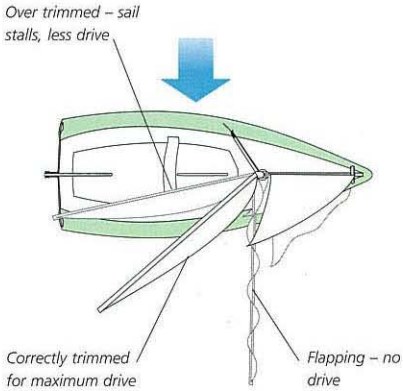


HOW BOATS SAIL

WHEN YOU BEGIN SAILING, it is not essential to know any of the theory of sailing but it is a great aid to learning if you have some understanding of how sails work to drive the boat. By studying some of the theory before going afloat, you will spend less time learning by trial and error on the water.

DRIVING FORCE

Sailing boats derive their power from the wind flowing across the curved surfaces of the sails. This is very similar to the way an aeroplane wing produces lift to keep the plane in the air. A sail, like an aeroplane wing, works at its best at one small angle to the wind. Therefore, efficient sailing requires constant sail adjustment (trimming) to keep the sails at the correct angle to the wind. If a sail is let out too far, it will simply flap like a flag and produce no forward drive. If it is pulled in too much, the airflow over the sail's surface will break down and the sail will stall – just like an aircraft that tries to fly too slowly.



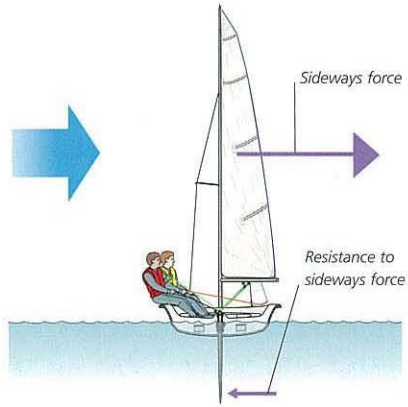
THE CORRECT TRIM

To find the correct trim for a sail, let it out until it begins to flap at the luff, then pull it in until the shaking just stops. Repeat regularly to check the trim.

SIDEWAYS FORCE

Not all of the force produced by the sails pushes the boat forwards except when the boat is on a run with the wind directly behind it. At other times, the total force produced by the sail has a sideways element that attempts to push the boat sideways. The strength of the sideways force depends on the point of sailing the boat is on. The sideways force is at its greatest when the boat is close-hauled, and diminishes as the boat bears away from the wind (*p.35*).

On all points of sailing, if a sail is pulled in too far so that it stalls, the driving force drops rapidly while the sideways force increases. The boat slows down and heels more.



SIDEWAYS FORCE

Part of the total force produced by the sails pushes the boat sideways. The sideways force is resisted underwater by the centreboard or keel.

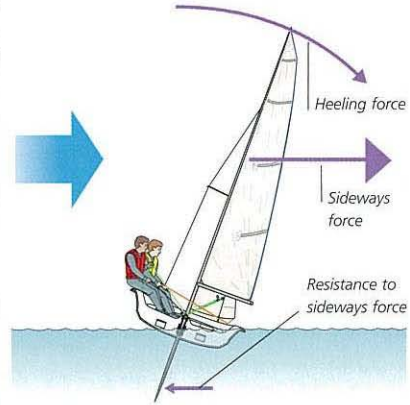
ROLE OF THE KEEL

A keel, centreboard or daggerboard is used to resist the sideways force. The keel's area must be sufficient to resist the sideways force created when close-hauled. In dinghies, the keel's area can be varied by raising the centreboard, but a keelboat has a fixed amount of keel underwater.

Although the keel resists the sideways force it is not completely eliminated and on upwind courses a sailing boat always slips sideways slightly. The difference between the course steered and the course actually sailed is called leeway (*right*).

HEELING FORCE

Because the sideways force generated by the sails acts some distance above the waterline it has the effect of trying to heel the boat. The keel resists the sideways force but acts under the water, so the sideways resistance provided by the keel increases the heeling effect. The heeling force has to be counter-balanced by a dinghy crew's weight or by the weight of the keel in a keelboat.

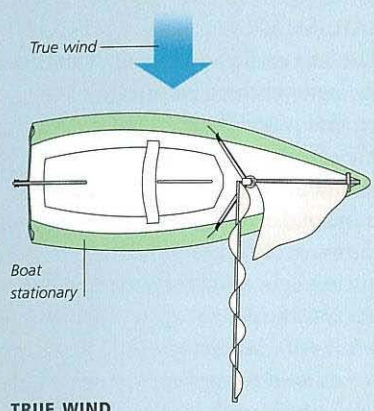


HEELING FORCE

The vertical separation between the sideways force from the sails and the resistance from the keel causes a force that acts to heel the boat.

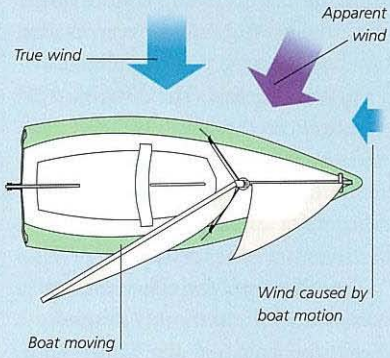
TRUE AND APPARENT WIND

True wind is the wind which we feel when stationary. When we sail we feel apparent wind which is a combination of the true wind plus the wind produced by our motion. Wind indicators on moving boats show apparent wind while wind indicators ashore show true wind.



TRUE WIND

The only time you feel the true wind afloat is when the boat is stationary. Check the true wind direction by using flags ashore or on moored boats, or by smoke from chimneys ashore.



APPARENT WIND

When the boat moves, it creates its own wind which combines with the true wind to form the apparent wind. Apparent wind is always further ahead than the true wind direction except on a dead run.

CLOSE-HAULED

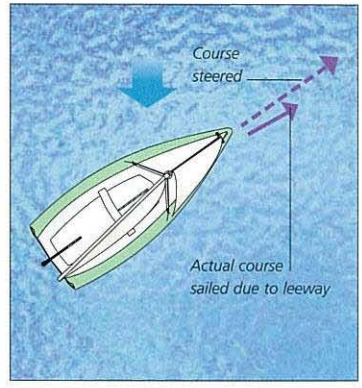
This small keelboat has a keel to resist the sideways force and to help prevent heeling, but for efficient sailing the crew must still sit on the sidedeck to help balance the heeling force when close-hauled.

UNDERSTANDING LEEWAY

As you sail on upwind courses, you will notice that your boat slips sideways to some extent. Called leeway, this sideways drift is at its greatest when you are sailing close-hauled.

MINIMIZING LEEWAY

Make sure that your centreboard or daggerboard is fully down when sailing close-hauled and is set correctly on other points of sailing. Leeway is most noticeable when you are sailing slowly because the keel cannot work at maximum efficiency so maintain speed to minimize leeway. When sailing close-hauled, do not try to steer further to windward to counteract leeway as the boat will simply slow down and leeway will increase.



THE EFFECT OF LEEWAY

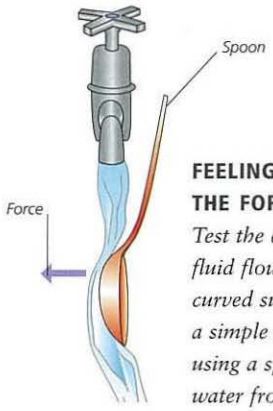
Leeway is the difference between the course steered and the course that the boat achieves, which is to leeward of the course steered.

THE DYNAMICS OF SAILING

SAIL FORCE

A properly trimmed sail deflects the airflow, which splits at the leading edge of the sail. The airflow moving across the convex (leeward) surface has to travel further than that moving across the concave (windward) side and speeds up accordingly. When the airflow moves faster its pressure drops and so the pressure on the convex side of the sail is lower than the pressure on the concave side. The difference in pressure sucks the sail to leeward and creates a force at right angles to the sail at all points on its surface. The sum of these individual forces on the sail drives the boat forwards.

To understand the effect when air flows around a sail try this simple experiment: hold a spoon lightly, with its back to the stream of water from a tap. Rather than being pushed away from the stream, as you might expect, the spoon will be sucked into the stream by the water flowing past the spoon's convex surface.

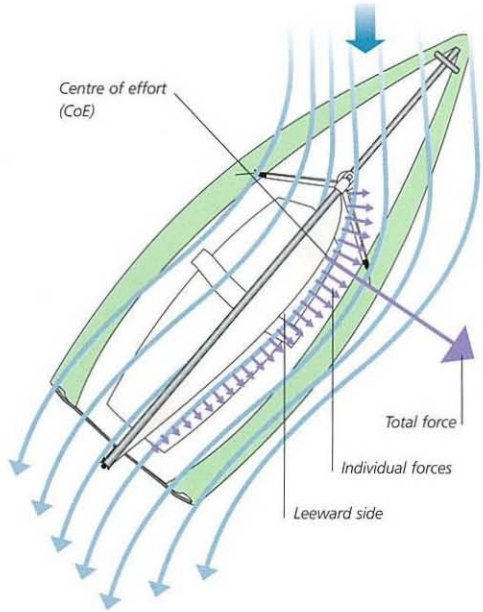


FEELING THE FORCE

Test the effect of a fluid flowing past a curved surface with a simple experiment using a spoon and water from a tap.

SAIL SHAPE

The curved shape of a sail determines the amount the wind must bend around it and the force it produces. The shape of a sail can be adjusted, within limits, by tensioning the outhaul, halyard or cunningham, and the sheet. Sails are adjusted to be flat in very light winds (when the wind has insufficient energy to bend around a full sail), full in light to moderate winds, and flat again in strong winds when the boat is over-powered.

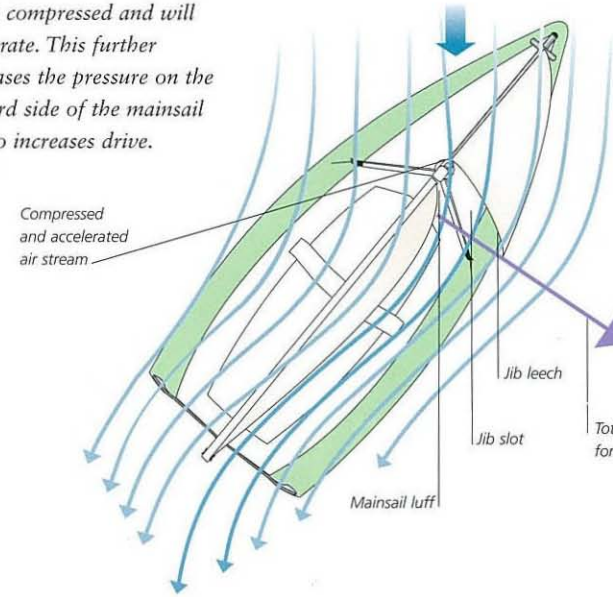


AIRFLOW WITH ONE SAIL

As the wind flows across a sail, it moves faster on the leeward (convex) side, creating low pressure, and slower on the windward side, which creates a high-pressure area. This effectively sucks the sail to leeward and produces forces acting at right angles to the sail's surface at each point on the sail. The sum of these forces acts at what is known as the sail's centre of effort (CoE).

AIRFLOW WITH TWO SAILS

When two sails are used, their interaction is critical to performance. Although the jib is much smaller than the mainsail, it is potentially a more efficient sail because it does not have a mast in front of it to disturb the airflow. The jib is trimmed so that the slot between the jib leech and the mainsail luff is parallel all the way up. The air flowing through the slot is compressed and will accelerate. This further decreases the pressure on the leeward side of the mainsail and so increases drive.



DRIVE WITH TWO SAILS

When a jib is added in front of a mainsail, it creates its own drive in the same way as any single sail, but it also has the effect of increasing the efficiency of the mainsail. It does this by directing a stream of air along the convex (leeward) side of the mainsail. As the air flows through the slot between the jib leech and the mainsail luff it is compressed between them and so it accelerates. This further reduces the pressure on the leeward side of the mainsail, and increases its drive significantly. This is the reason why most sailing boats are rigged with a mainsail and jib.

To work efficiently, the jib and mainsail must be trimmed so that the curve of the jib leech matches the curve of the mainsail luff on the leeward side. This produces a smooth slot between them and allows the air to flow smoothly and accelerate through the slot. If the jib is pulled in too much, or mainsail let out too much, the slot will be constricted and drive will be lost. If the jib is not pulled in sufficiently, or the mainsail is pulled in too much, the slot will be too wide, and drive will again be reduced.

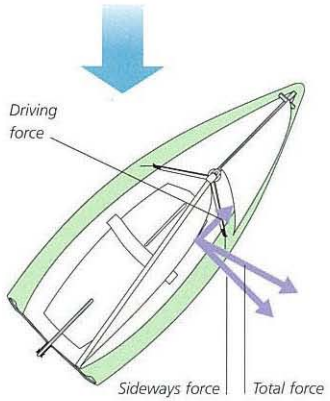
FORWARD DRIVE

All the individual forces that act on a sail's surface can be thought of as one force acting at a single point on the sail, which is known as the Centre of Effort (CoE) of the sail.

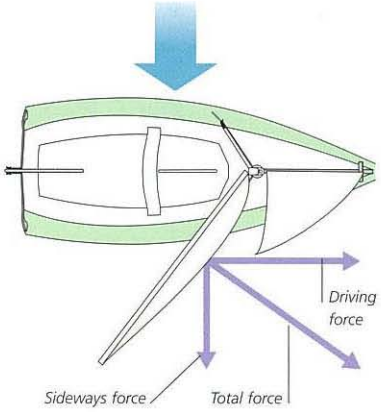
To help understand the way in which the sails' force pushes the boat sideways as well as forwards, the total force generated by the sails can be split into two elements at right angles to each other: a forward, driving force and a sideways force.

The relative sizes of the driving and sideways forces depends on the angle of the sails to the boat's centreline, which varies with the angle to the wind at which the boat is sailing. When sailing on a close-hauled course, the sails are pulled in tight, close to the centreline, and the sideways force is greater than the driving force. When the boat turns onto a reach, the sails are let out about halfway and the driving force increases, while the sideways force reduces. Turn further away from the wind, onto a run, when the sails are let out fully, and the driving force acts almost directly forwards and the sideways force is zero.

CLOSE-HAULED



REACHING



DRIVE AND SIDEWAYS FORCE

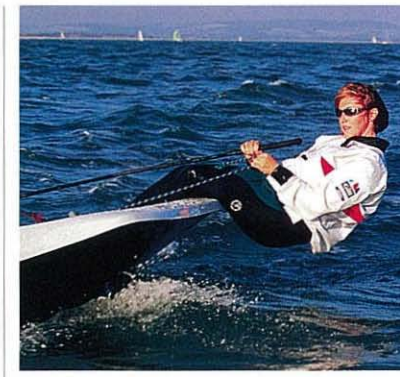
The relative strength of the driving and sideways forces depends on the angle of the sail to the boat's centreline, which varies with the point of sailing. When the boat is close-hauled (top)*, with the sails pulled in tight, drive is less than when reaching* (bottom)*, and the sideways force is greater.*

THE SLOT

For efficient sailing, the jib and mainsail must be trimmed together to keep a parallel slot between the jib leech and the mainsail luff through which the airflow can accelerate. Here the boat is sailing on a close reach with both sails correctly trimmed so that the slot is parallel.

THE MAIN CONTROLS

RUDDER, CENTREBOARD, SAILS, and crew weight are the main controls in a sailing dinghy. They need constant adjustment to keep the boat sailing efficiently, to steer, and to alter course. Knowing how to combine these controls to manage the movement of the boat is a very important aspect of learning how to sail. When sailing with a crew, the helmsman is usually responsible for the mainsail and the rudder (via the tiller and tiller extension), while the crew takes care of the centreboard and the jib.



DAGGER GRIP
Hold the end of the tiller extension in a dagger-style grip and pass the end in front of your body.

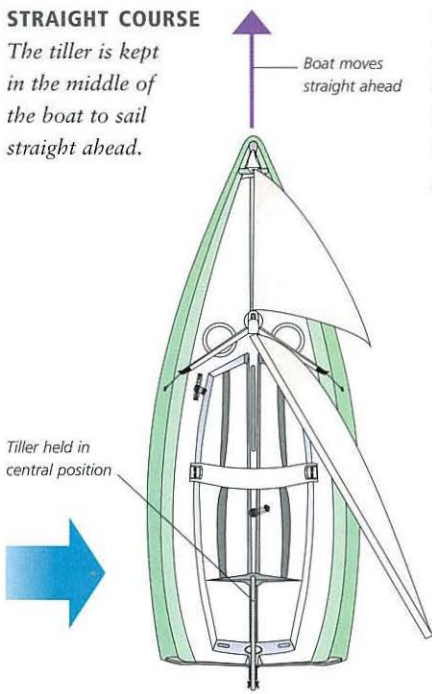
USING THE RUDDER

The rudder is moved using the tiller and the tiller extension, which the helmsman usually holds in the hand nearest the stern. The extension is best held in a dagger-style grip with the end passing in front of your body. The rudder is effective only if it has water flowing past it, so you can only steer with it when the boat is moving. The quicker you are sailing, the more effective it becomes due to the speed of the water moving across it. When the boat is moving forwards, the bow will turn in the opposite direction to the way in which the tiller is pushed. (When the boat is moving backwards, the rudder action is reversed.)

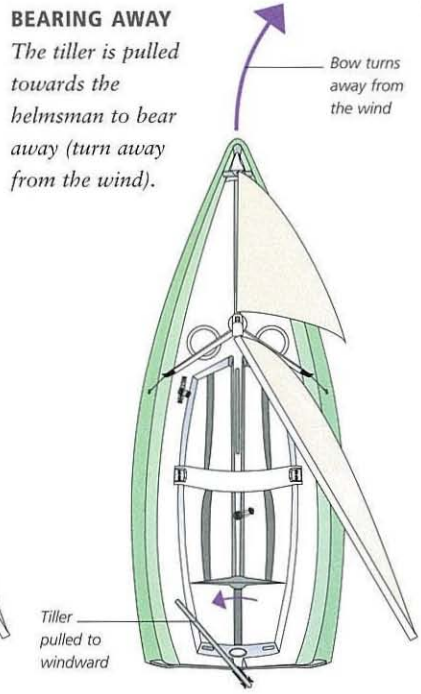
TURNING EFFECT OF THE RUDDER

The rudder is the main control used to alter course. Practise using the tiller to turn the rudder, and familiarize yourself with its effects by sitting on the side of the boat opposite the sails and watching the direction in which the bow turns as you move the tiller.

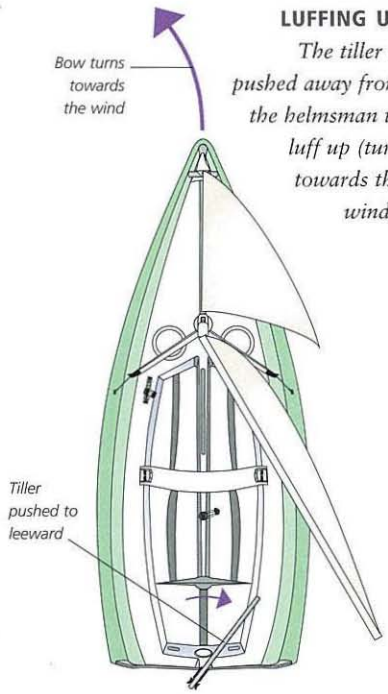
STRAIGHT COURSE
The tiller is kept in the middle of the boat to sail straight ahead.



BEARING AWAY
The tiller is pulled towards the helmsman to bear away (turn away from the wind).



LUFFING UP
The tiller is pushed away from the helmsman to luff up (turn towards the wind).



USING THE SAILS

A sail works best at a particular angle to the wind, known as the angle of attack (*p.32*), so it must be trimmed (adjusted) as you alter course and checked regularly while sailing to ensure the setting is correct. To find the optimum angle, ease the sail out until it starts to shake at the luff (*p.27*), then pull it in again just far enough to stop it shaking. Pull the sail in tight only when the boat is sailing close-hauled (*p.40*). As the boat turns away from the wind the sails are let out (*p.40*) until, on a run, the sails are nearly at right angles to the centreline.

RUN

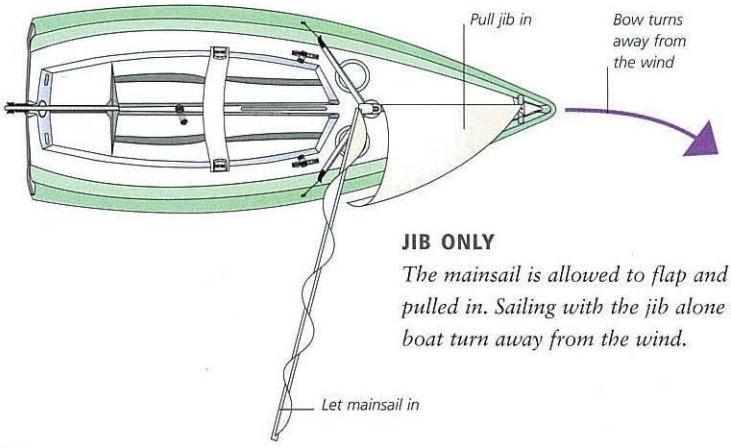
Sailing with the wind behind on a run (p.40) the sails are let out fully and the jib can be goosewinged.

CLOSE-HAULED

When sailing close-hauled the sails are pulled in tight, close to the centre-line, to achieve the correct angle to the wind.

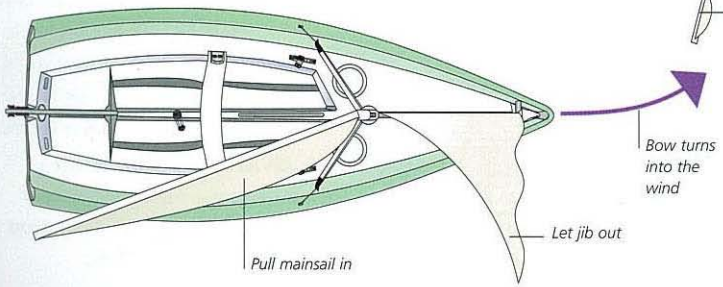
TURNING EFFECT OF THE SAILS

To learn about the turning effects of the sails, let either sail out while keeping the other filled correctly and the boat upright. Allow the tiller extension to move freely in your hand and the boat will turn - towards the wind if the mainsail is full, and away from it if the jib is full.



JIB ONLY

The mainsail is allowed to flap and the jib is pulled in. Sailing with the jib alone makes the boat turn away from the wind.



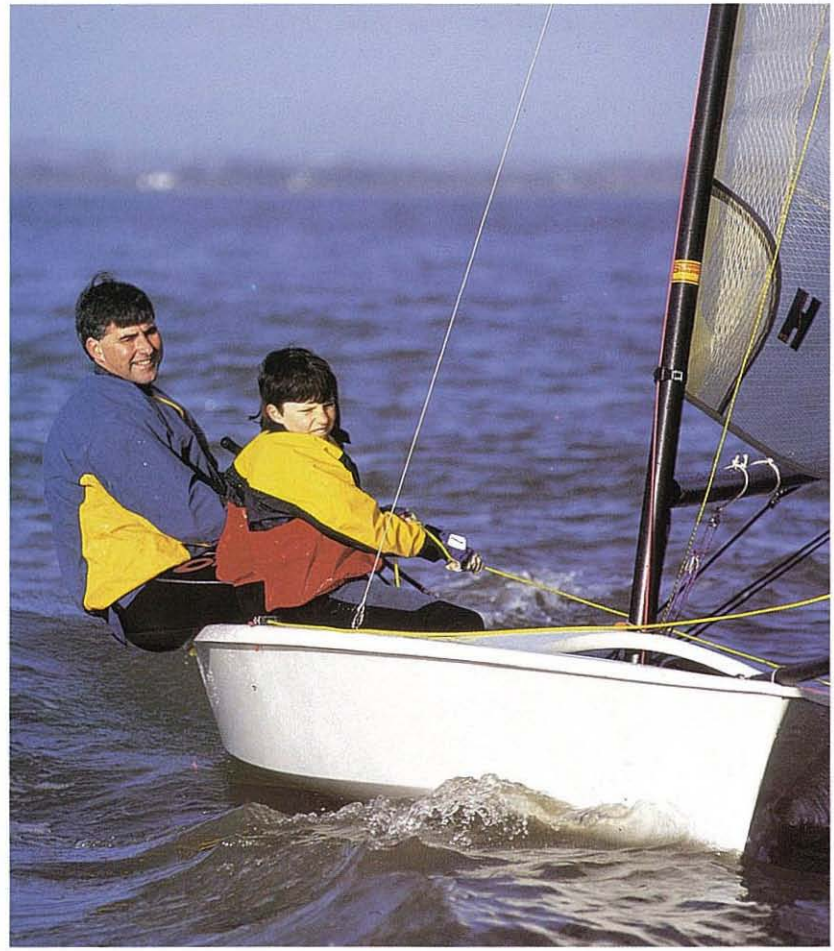
MAINSAIL ONLY

The jib is allowed to flap and the mainsail is pulled in. Sailing with just the mainsail makes the boat turn towards the wind.

USING THE CREW'S WEIGHT

A dinghy sails fastest when it is upright in the water, and when the heeling force (*p.37*) is balanced by the weight of the helmsman and crew. Their placement, fore and aft, also determines the boat's trim (how it sits in the water). The helmsman sits on the windward side, opposite the sails, so that he has a clear view of the sails and the course being steered. The crew moves his weight according to the point of sail and wind strength.

Depending on wind strength and the point of sailing the crew may move from alongside the helmsman to sitting on the opposite side to balance the helmsman's weight to windward. By adjusting the position of his weight, the crew can also heel the boat to help it alter course.



SAILING UPRIGHT

Both the helmsman and crew use their weight to keep this dinghy upright. They sit out on the sidedeck with their feet under the toestraps to balance the boat.

TURNING USING THE CREW'S WEIGHT

In addition to positioning the weight of helmsman and crew to keep the boat upright, their weight can also be used to help the boat turn when the helmsman wishes to change course. A boat will turn in the opposite direction to the way it is heeled so if the boat is heeled to windward by moving the crew's weight it will turn to leeward. Heel it to leeward and it will turn to windward. Experiment by moving around the boat to see how it changes direction when it is balanced differently. When sailing with both a helmsman and crew, it becomes the responsibility of the crew to make any major adjustments to the boat balance.

HEELING TOWARDS THE WIND

The helmsman moves his weight to heel the boat to windward so that the boat turns to leeward (away from the wind).

HEELING AWAY FROM THE WIND

The helmsman moves his weight to heel the boat to leeward so that the boat turns to windward (towards the wind).

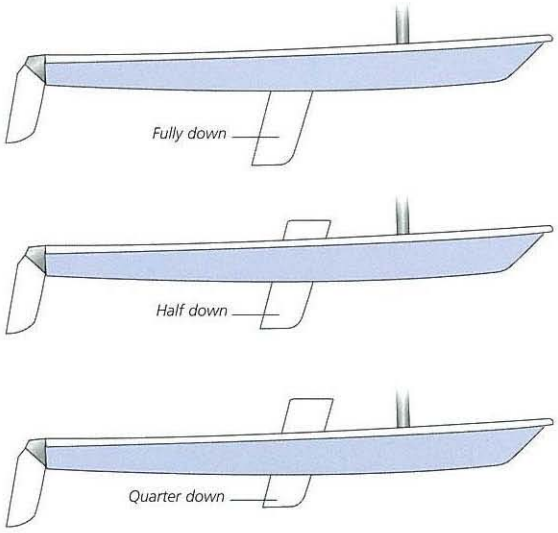
USING THE CENTREBOARD

The effect of the centreboard (or daggerboard) is altered by moving the foil to different depths in the water. It is lowered when the boat is turned towards the wind and raised when the boat is turned away from the wind. The centreboard has a significant effect on the performance of the boat. It should be raised when you are sailing away from the wind, otherwise it will make the boat slower and more difficult to control. It must be lowered when turning towards the wind, otherwise the boat will simply slip rapidly sideways as there is nothing to counteract the sideways force of the wind (*p.33*).

DAGGERBOARD

A daggerboard moves vertically through its case and protrudes above deck as it is raised. Unlike a centreboard it is not fixed in the case so it can be removed and stored in a padded bag to prevent damage when the boat is not in use. It should have a retaining cord on its top edge so it cannot be lost in a capsize.

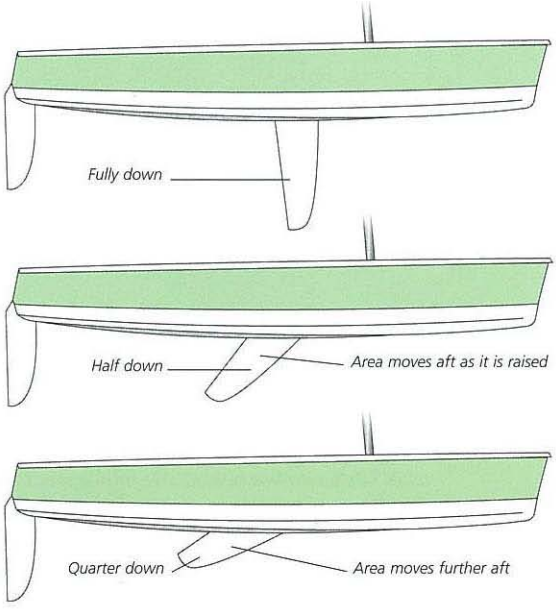
DINGHY WITH DAGGERBOARD



CENTREBOARD

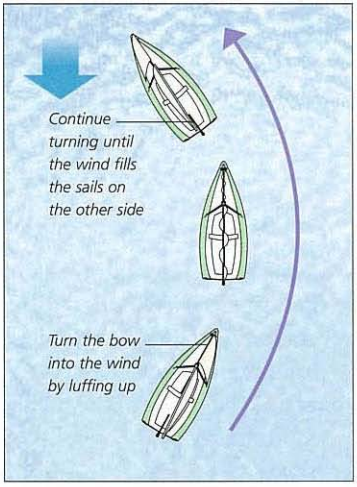
A centreboard pivots on a bolt through the centreboard case and rotates into its case as it is raised. As the centreboard is raised by pushing the top forwards in the boat, so its tip moves aft in the water. Unlike a daggerboard, a centreboard's surface area moves aft as it is raised into its case.

DINGHY WITH CENTREBOARD



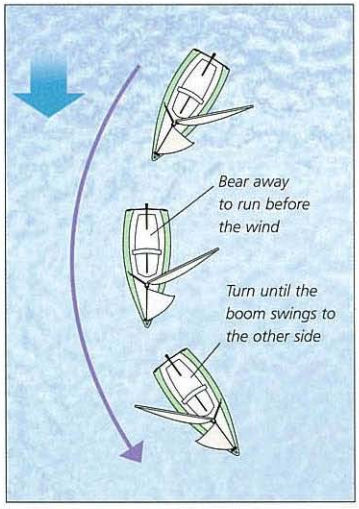
TACKING AND GYBING

The two most important manoeuvres in sailing, tacking and gybing, involve using the main controls together to make a significant course change.



TACKING

During a tack (pp.90-93) *the bow of the boat is turned through the wind using the rudder, sails, and crew weight.*



GYBING

During a gybe (pp.94-97) *the stern of the boat is turned through the wind using the rudder, sails, and crew weight.*

POINTS OF SAILING

THE DIRECTION IN WHICH A BOAT is being sailed is often described in relation to its angle to the wind. Collectively, these angles are known as the "points of sailing". When you change from one point of sailing to another, the sails, the centreboard, and the position of the crew all need to be adjusted to suit the new angle of the boat in relation to the wind.

SAILING COURSES

Various terms and phrases are used to clarify the direction and type of sailing course that you are on and to describe exactly what the boat is doing in relation to the wind.

LUFFING AND BEARING AWAY

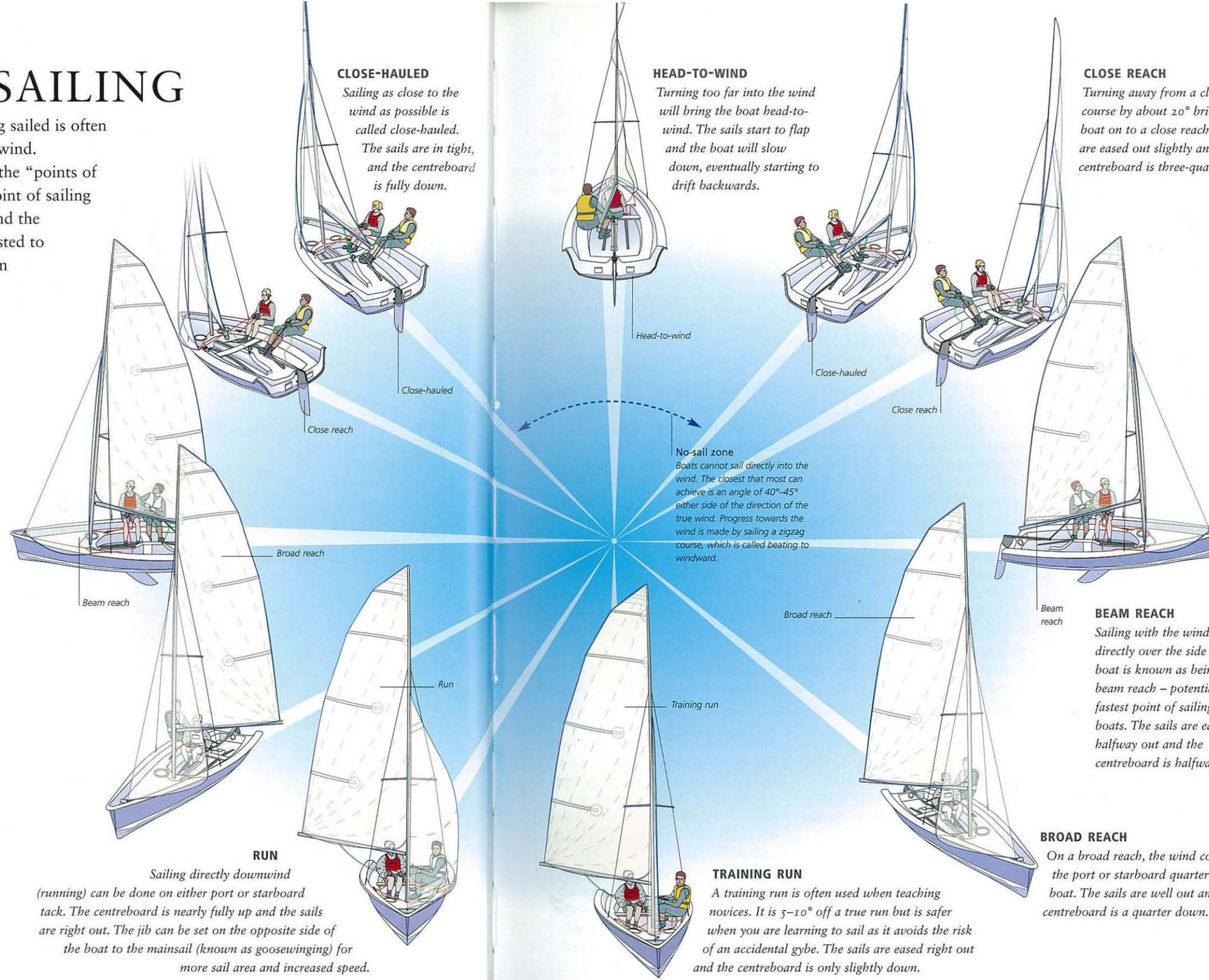
If you turn the boat towards the wind you are luffing (or luffing up), if you turn away from it you are bearing away.

UPWIND AND OFFWIND

All courses that are closer to the wind (heading more directly into it) than a beam reach are called upwind courses. Those further away from the wind than a beam reach are known as offwind, or downwind, courses.

PORT AND STARBOARD TACK

The boom's position is used to describe which tack you are on. If it is over the port side of the boat you are on starboard tack. If it is over the starboard side you are on port tack. Even on a dead run with the wind directly astern you are still on one tack or the other, depending on which side your boom is on.



CLOSE-HAULED
Sailing as close to the wind as possible is called close-hauled. The sails are in tight, and the centreboard is fully down.

HEAD-TO-WIND
Turning too far into the wind will bring the boat head-to-wind. The sails start to flap and the boat will slow down, eventually starting to drift backwards.

CLOSE REACH
Turning away from a close-hauled course by about 20° brings the boat on to a close reach. The sails are eased out slightly and the centreboard is three-quarters down.

No-sail zone
Boats cannot sail directly into the wind. The closest that most can achieve is an angle of 40°–45° either side of the direction of the true wind. Progress towards the wind is made by sailing a zigzag course, which is called beating to windward.

BEAM REACH
Sailing with the wind blowing directly over the side of the boat is known as being on a beam reach – potentially the fastest point of sailing in most boats. The sails are eased halfway out and the centreboard is halfway down.

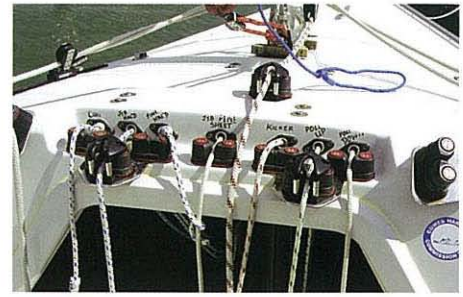
BROAD REACH
On a broad reach, the wind comes over the port or starboard quarter of the boat. The sails are well out and the centreboard is a quarter down.

RUN
Sailing directly downwind (running) can be done on either port or starboard tack. The centreboard is nearly fully up and the sails are right out. The jib can be set on the opposite side of the boat to the mainsail (known as goosewinging) for more sail area and increased speed.

TRAINING RUN
A training run is often used when teaching novices. It is 5–10° off a true run but is safer when you are learning to sail as it avoids the risk of an accidental gybe. The sails are eased right out and the centreboard is only slightly down.

ROPES AND KNOTS

USED TO SECURE THE BOAT, and to hoist, trim, and adjust the sails, ropes are an essential feature of all sailing boats. To sail safely and efficiently you need to understand how to handle rope and how to keep it tidy when not in use. Learning a little about the different properties of the various types of rope will enable you to select the most suitable rope for any particular task. It is also vital to know how to tie the small selection of knots that are most useful for sailing.



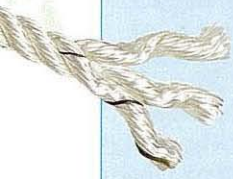
CONTROL LINES
Racing boats typically have many control lines which are often led to a central point where they are conveniently located for adjustment by the crew. It is helpful to colour code ropes and mark their cleats to avoid confusion.

TYPES OF ROPE

Rope can be made from many different fibres and in a number of ways. The material and the type of construction determine how the finished rope behaves in terms of stretch, strength, durability, and flexibility.

POLYPROPYLENE
Polypropylene is used to make low-cost, general-purpose, three-strand ropes that are light and will float.

POLYESTER
Polyester rope can be braided or three-strand. It is strong, with low stretch, and does not float.



NYLON
Nylon rope is strong and elastic. It does not float and loses strength when wet.

ARAMID AND HMP
Aramid fibre and high-modulus polyethylene ropes are very strong and light and do not float. They also have a very low stretch under load.

HANDLING ROPES

Modern sailing ropes are constructed using synthetic materials, which are lighter and much stronger than natural fibres. Modern ropes are immune to rot caused by dampness – although nylon rope loses a significant amount of strength when wet – and they are available in a range of colours for easy identification on the boat.

There are two main types of rope construction: three-strand rope, in which three sets (strands) of already twisted yarns are twisted together; and braided rope, in which the yarns and strands are plaited or braided together. Braided rope is taking over from three-strand for most uses on small boats, especially for ropes made from high-performance fibres.

The strength of a rope depends on the material, the construction method, and the diameter of the rope. High-performance ropes are exceptionally strong and have low stretch properties compared with older synthetic materials, so thinner ropes can often be used to handle the loads on sheets, control lines or halyards. Remember, however, that very thin ropes are hard to hold and it may be impossible to pull effectively on a rope if its size is too small to handle comfortably.

CHOOSING ROPE

It is important to choose the right rope, and the right size, for a particular job. Polypropylene rope makes a cheap mooring line, and, because it floats, it is ideal for safety lines. However, it is not strong and stretches a lot so it is not appropriate for sheets, halyards or control lines.

Polyester rope is strong and has fairly low stretch properties, so it is suitable for mooring lines, sheets, and halyards. Pre-stretched polyester is also available for purposes, such as halyard use, that require minimum stretch, but it is less flexible and less comfortable to use than standard polyester rope.

Nylon rope is strong but stretches a lot. This makes it inappropriate for use in halyards or sheets, but it is often used for mooring or anchoring where stretch is an advantage as it allows the rope to absorb shock loads. It does, however, lose significant strength when wet and this must be allowed for when selecting the size.

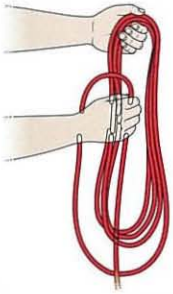
Aramid and HMP ropes are very strong, light and have minimal stretch but they are more expensive than other types. They are excellent for halyards, control lines, and some sheets aboard high-performance boats.

COILING ROPE

When ropes are not in use they should be coiled and secured so that they are out of the way but easy to use when necessary. If they are left loose they will tangle quickly and be difficult to unravel when they are needed. The way rope is coiled depends on the method of construction. Three-strand rope should be coiled in equal-sized loops (*below*), whereas braided rope is best coiled in figures-of-eight to balance the left and right twists of the plaited strands (*bottom*).

COILING THREE-STRAND ROPE

To prevent kinks, three-strand rope is coiled in the same direction in which the strands are twisted, usually clockwise. As the loops are made, the rope must also be twisted slightly in the same direction to ensure that the coils lie flat.



1 Hold the rope in your left hand and make loops with your right (reverse if you are left-handed). Twist the rope away from you between thumb and forefinger.

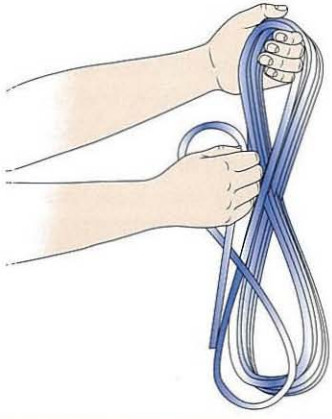
2 Finish coiling the rope leaving a long working end. Wrap this several times around the whole coil to bind the individual loops together.

3 Make a loop with the remainder of the working end and push this through the top of the coil, above the bound part.

4 Bring the loop forward over the top of the coil and down to the bound part, then pull the working end to secure it.

COILING BRAIDED ROPE

Coil braided rope in figure-of-eight coils which balance the left and right twists that are put into the rope during construction. Secure as for three-strand rope.



COILING

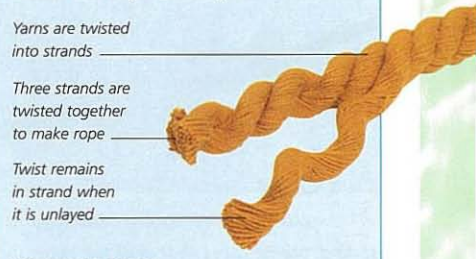
Coil the rope with your right hand, if right-handed, and make figure-of-eight coils into your left hand.

ROPE CONSTRUCTION

All rope, whether made from natural or synthetic materials is made from short fibres that are spun into yarns then collected into strands. The strands are then twisted or braided into the finished rope. The way the yarns are gathered into strands, and the way strands are formed into rope, help determine the rope's properties and how easy it is to handle, coil, splice and knot.

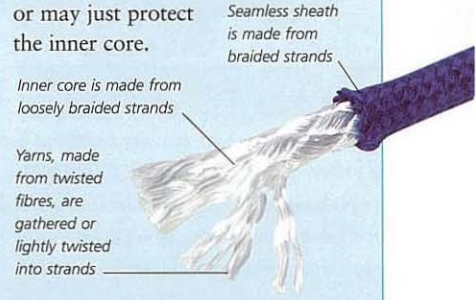
THREE STRAND (LAID) ROPE

Three strand or laid rope is made by twisting yarns together in one direction to create the three strands. The strands are then twisted together in the opposite direction to create the rope. The opposing directions of the twists give it strength and the friction within the rope construction holds the rope in shape.



BRAIDED ROPE

Most modern rope is made by a braiding or plaiting process. A core of strands, which may be braided or lightly twisted together, is covered by a braided sheath which, depending on type, can provide the strength for the rope, or may just protect the inner core.

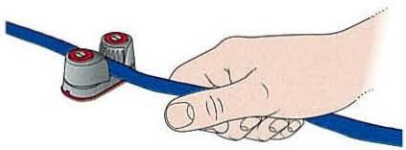


CLEATING ROPE

A cleat is used to secure a rope and prevent it slipping. Cleats may be of the cam, clam, or traditional horn variety. The clam and horn cleats have no moving parts.

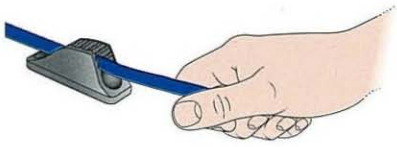
Whichever type of cleat is used, it must be the right size for the size of the rope. If a rope is too large it will not fit into a small cam or clam cleat, and there will not be enough space on a horn cleat to put on sufficient turns. If the rope is too small for the cleat it is likely to slip through a cam or clam cleat, although it can be cleated on a large horn cleat provided sufficient turns are used to create the necessary friction that holds the rope in place.

A rope is cleated in a cam cleat by pulling it down and through the spring-loaded cam jaws, which hold it in place (*below*). To uncleat the rope, pull the end upwards, out of the cleat's jaws. If the rope is heavily loaded, it may need quite a sharp pull upwards to release it.



CAM CLEAT

A cam cleat has two spring-loaded cams with grooved faces that grip the rope when it is pulled down into the jaws. The rope must be sized correctly for the cleat. To uncleat, pull the rope upwards.



CLAM CLEAT

A clam cleat has no moving parts but has a grooved, v-shaped body. The grooves grip the rope and, under load, it is forced further into the cleat. To uncleat, pull the rope upwards.

To cleat a rope in a clam cleat, simply pull it down into the V-shaped holding grooves. To uncleat, pull the rope upwards, out of the grooved body of the cleat. As with the cam cleat, uncleating a heavily loaded rope may require a sharp tug.

To secure a rope to a horn cleat, it must be wrapped around the cleat in a series of turns to create sufficient friction between the rope and the cleat (*right*). To uncleat a rope from a horn cleat, unwrap the turns.

MAINTAINING ROPE

During use, and when a boat is left unattended, rope collects dirt and salt particles which become trapped within the rope's strands. Over time, the dirt causes abrasion, weakens the rope and makes it stiffer and harder to handle. Looking after your ropes will extend their life considerably and make them more flexible and easier to handle. Small ropes can be washed in a washing machine while larger ones can be soaked in a bucket and scrubbed with a solution of warm water and mild detergent. Once they have been washed, coil the ropes and hang them to dry.

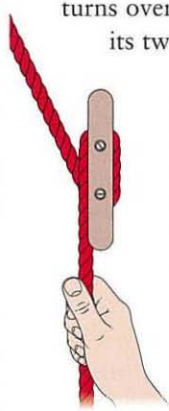
KNOTTING ROPE

Many thousands of knots have been developed over the centuries, each with its own name and practical or decorative use. Fortunately, you need to know only a few simple knots when you start sailing. In fact, the reef knot, the sheet bend, the figure-of-eight, the bowline, the round turn and two half hitches, and the clove hitch (*pp.46–47*) will take care of most of your needs throughout your sailing career.

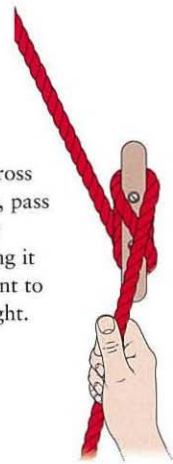
Spend some time practising tying the important knots so that your technique becomes fluent and you are able to tie and untie the important knots quickly and accurately.

CLEATING A ROPE ON A HORN CLEAT

The horn cleat is a common fixture on many sailing boats. Rope is secured on it by a round turn followed by a series of figure-of-eight turns over and around its two horns.



1 Bring the rope's working end to the back of the cleat, then make a full turn around the base of the cleat.

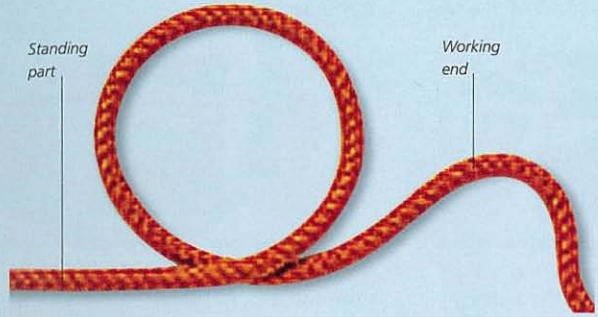


2 Take the rope across the top of the cleat, pass it behind the upper horn, and then bring it back across the front to form a figure-of-eight.

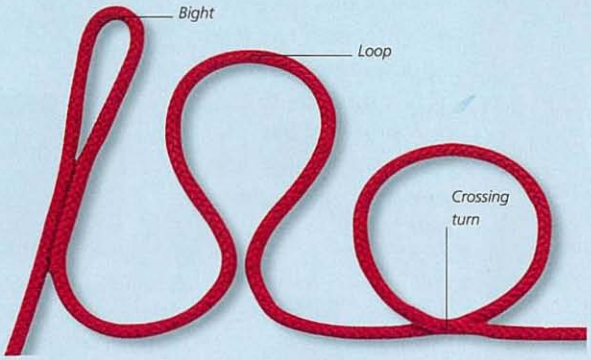
3 Add several figure-of-eight turns to ensure that the rope is secure. Finish off with another full turn around the base of the cleat.

ROPE AND KNOT TERMS

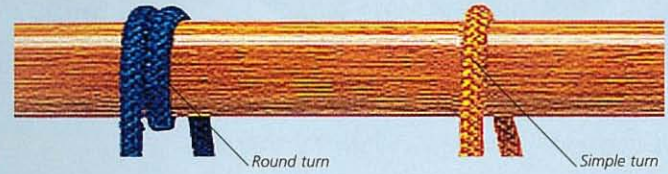
There are several terms that are used to identify the various parts of the rope during knot tying. Terms like the standing part, the working end, a bight, loop, or crossing turn, distinguish the parts and ends of a rope, and describe the different shapes that are made while knots are being tied. Learning to tie knots may seem confusing at first but the process becomes much easier once these terms are understood.



THE PARTS OF A ROPE
The part of the rope you are using to tie a knot is called the working end. The rest of the rope (that part that remains unaffected) is called the standing part.



BIGHTS, LOOPS, AND CROSSING TURNS
A bight is made by folding the rope back on itself; a loop is made by forming a circle without crossing the rope; and a crossing turn is made by crossing one part of the rope over or under another.



ROUND AND SIMPLE TURNS
A round turn takes the rope one-and-a-half times around the object, whereas a simple turn involves passing the rope around just one side of an object.

SEALING ROPE ENDS

If a rope end is left unfinished it will quickly fray. Frayed rope ends are not only untidy to look at they are also wasteful of expensive rope, will jam in blocks and fairleads, and make knotting and cleating more difficult. If not dealt with promptly, the rope will continue to fray or unravel and may become useless. The best and most permament way to seal a rope end is with a whipping (*pp.224–225*) but a quicker, if less effective seal, can be made with adhesive tape, shrink tubing and proprietary sealants. Check all your rope ends at regular intervals and repair any fraying as soon as possible to avoid permanent damage.

LIQUID WHIPPING
Proprietary liquids are available that will seal a rope's end. Simply dip the end in the liquid and leave to dry.

PLASTIC TUBING
Slide a suitably sized heat-shrink tube over the rope end and apply heat until it shrinks tightly around the rope.

GLUE
Thin ropes can be dipped into a latex-based or polyvinyl acetate adhesive and left to dry for a short period.

ADHESIVE TAPE
Wrap adhesive tape tightly around the rope end to form a temporary seal. This is useful when splicing rope.

SIX BASIC KNOTS

REEF KNOT

Used for tying the ends of rope of equal diameter, the reef knot is named after its most common use: tying the ends of a sail's reef lines when putting in a reef (p.74). It is easy to tie it properly, just remember the rule: left over right, then right over left.

1 With the rope under the object, cross the two ends of the rope with the left working end over the right working end.

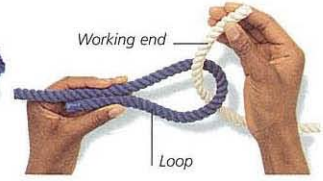
2 Now bring the left working end up, over, and pass it behind the right working end.

3 Bring both working ends up and tuck the now right working end over the left working end and through the middle.

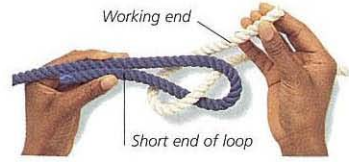
4 Tighten the knot by pulling on both the working ends, producing the distinctive square-shaped reef knot.

SHEET BEND

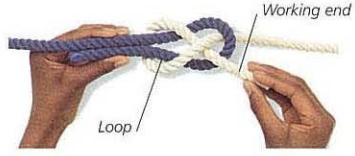
A sheet bend is one of the best ways of joining two ropes together. If they are of different diameter, make the loop in the thicker rope. For more security, tie a double sheet bend by taking an additional turn around the loop (repeat steps 2 and 3).



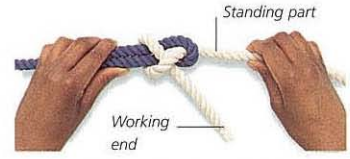
1 Make a loop in the blue rope then pass the working end of the white rope through the loop from below.



2 Pass the working end of the white rope around and under the short end of the loop in the blue rope.



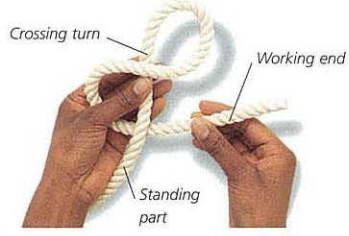
3 Bring the working end of the white rope over the long end of the loop, back to the top, and then under itself.



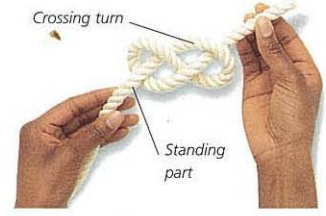
4 Finally, tighten the sheet bend by pulling on the loop and the standing part of the white rope.

FIGURE-OF-EIGHT

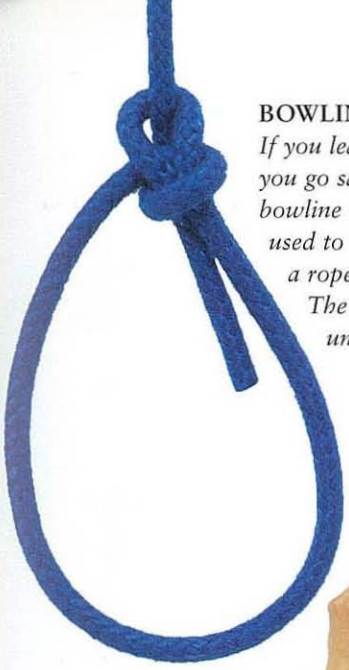
A figure-of-eight is a stopper knot used in sailing to prevent a rope end running out through a block or fairlead. It is simple to tie, does not jam, and is easily undone.



1 Make a crossing turn, bringing the working end of the rope over and then under the standing part.

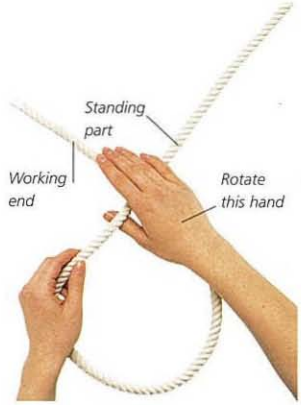


2 Bring the working end up to the top of the knot and then pass it through the centre of the crossing turn. Pull tight.



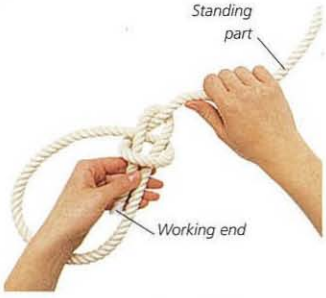
BOWLINE

If you learn only one knot before you go sailing make it this one. The bowline (pronounced bow-lynn) is used to make a loop in the end of a rope or to tie to a ring or post. The bowline cannot be untied under load.



1 With the working end of the rope held in the palm of the hand over the standing part, rotate the hand so the working end is pushed under the standing part as the palm turns face upwards.

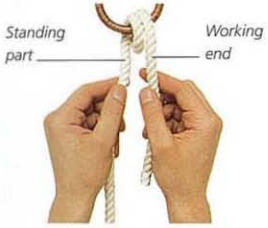
2 Turn the hand and the working end so that a crossing turn is created around the hand and the working end.



3 Finally, pass the working end behind the standing part and then down through the crossing turn. Tighten the knot by pulling on the standing part and the doubled working end.

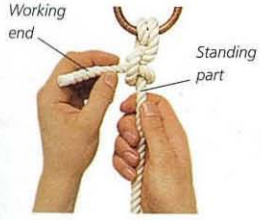
ROUND TURN AND TWO HALF-HITCHES

This knot is very useful for tying a rope to a post, rail, or ring. It is easily untied, even when under load, so it is good for moorings.



1 Form a round turn by bringing the working end of the rope up through the ring (or around a post or rail), from bottom to top, twice.

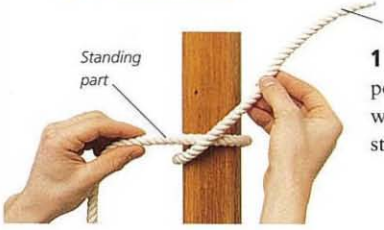
2 Take the working end over the standing part. Pass it below the standing part then bring it to the top again and tuck it under itself, making a half-hitch.



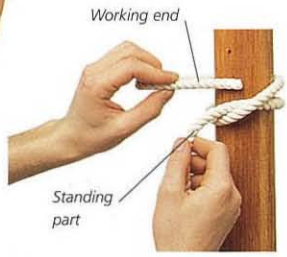
3 Pass the working end below the standing part again, then bring it to the top and tuck it under itself again, making the second half-hitch. Pull both ends to tighten.

CLOVE HITCH

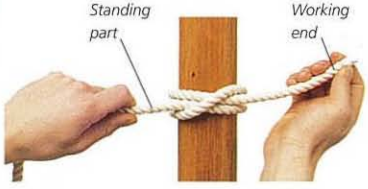
The clove hitch is used for short-term mooring to a ring or post, or for hitching fenders to a rail. Make it more secure with a long working end.



1 Make a turn around the post, bringing the working end up over the standing part.



2 Use the working end to make a second turn in the same direction, taking it behind the post and bringing it around to the front again.



3 Tuck the working end under the second turn. Pull on the working end and the standing part to tighten the knot.

OARS AND PADDLES

THE WAY IN WHICH YOU HANDLE A DINGHY under oars is one of the best indications of your seamanship skills. Rowing a dinghy that has been specifically designed for the purpose is a very satisfying exercise: good rowing boats are easy to row and move straight and well under oars. Larger rowing dinghies can also be moved with one oar, using the impressive art of sculling. However, sailing dinghies are rarely designed for rowing or sculling, and paddling may be the only viable option.

ROWING

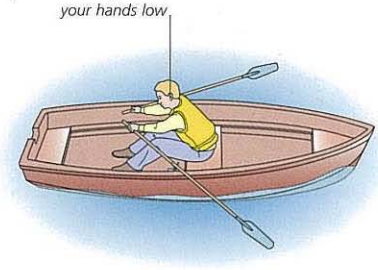
The easiest craft to row are long, relatively narrow dinghies, which are stable in the water. The worst are inflatables, which are flat bottomed and badly affected by wind. You will need the longest oars that can be used with the boat and a pair of rowlocks or crutches, which slot into plates on the gunwales and act as pivot points for the oars. Remove rowlocks when alongside a boat or pontoon, or else they may cause damage.

There are some basic points to bear in mind when rowing. To come alongside another boat or a pontoon, you must turn parallel to it and then unship the inboard oar so that it does not get trapped or broken. As soon as the boat is secured, unship the other oar.

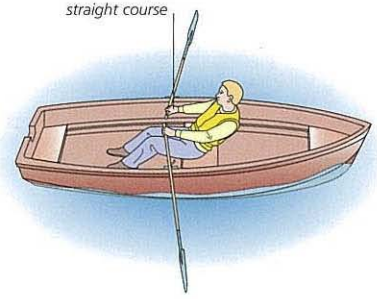
If you are rowing in choppy water, the blades may get caught by waves as you swing them forwards. To reduce this problem, feather them (turn them so that they are parallel to the water's surface) as you complete the stroke.

HOW TO ROW

Sit on the thwart in the middle of the boat facing the stern. If you have one passenger, he should sit in the stern. If you have several passengers, position them to keep the dinghy level.



1 Place your hands a shoulder-width apart and lean forwards. Then, dip the oars into the water so that the blades are at right angles to the surface.



2 Lean back, pulling on the oars and keeping your arms straight. As you lean fully back, bend your arms in to your chest to complete the stroke.

3 Push down gently on the oars to lift the blades clear of the water, then lean aft, swinging the oars forwards clear of the water, and repeat steps 1 and 2.

SCULLING

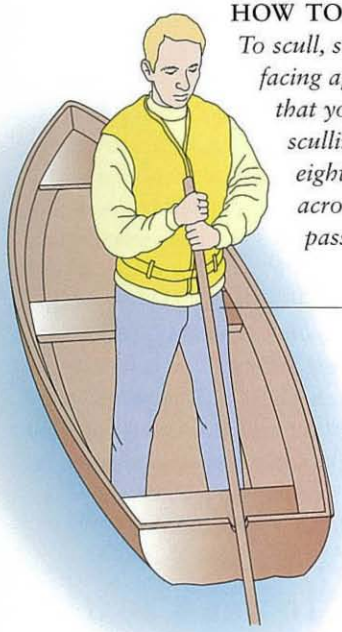
Sculling involves moving the boat by using a single oar over the transom. The sculling oar is retained in a rowlock, or in a sculling notch cut into the transom. If rowing is an art, then sculling is sublime. Little is more striking than watching an experienced boatman sculling a dinghy with casual aplomb. Sculling is best learned in a heavy dinghy when there is no wind or waves. It is one of those skills that seem to be impossible at first but which simply require some dedicated practice before you are rewarded with a great sense of achievement.

PADDLING

With many dinghies, the most convenient alternative to sailing is paddling. Paddles take up less room than oars and do not need rowlocks. Paddling requires relatively little skill, but bear the following points in mind for increased efficiency: keep your arms straight as you pull on the paddle, lean well forward to put the blade into the water, and use your torso rather than just your arms to provide the power for each stroke.

HOW TO SCULL

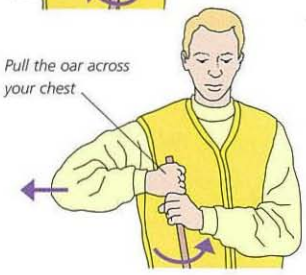
To scull, stand upright in the dinghy facing aft, with your legs apart so that you are balanced. The basic sculling stroke is a figure-of-eight made from side to side across the stern. Place passengers in the middle.



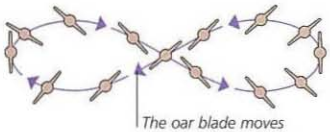
Sculler
Stand at the stern, legs apart

1 Hold the oar with both hands, thumbs underneath, at shoulder level. Make sure the blade is vertical and fully immersed; the oar should be balanced, its weight taken by the sculling notch or rowlock.

2 Twist the oar so that the blade is slanted to one side then move your hands sideways – in the opposite direction to the way the oar blade is slanted.



3 At the end of the stroke, roll your wrists to twist the blade in the opposite direction and move your hands across your chest towards the other side.



The oar blade moves through the water in a figure-of-eight motion

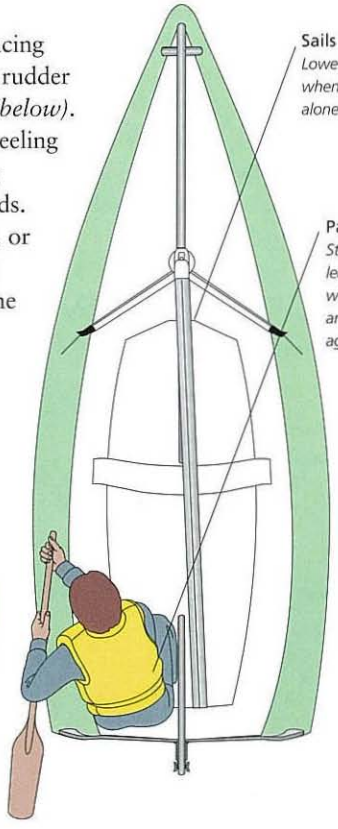
4 Repeat steps 2 and 3 to keep the boat moving forwards. The motion of the blade through the water should be smooth and steady throughout the stroke.

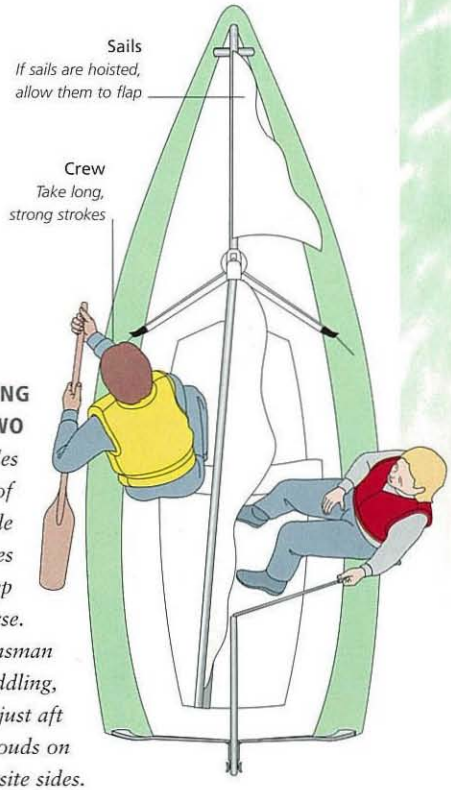
HOW TO PADDLE

If you are alone, you can paddle facing forwards, with the sails down and rudder stowed or held against your knee *(below)*. Alternatively, paddle stern first, kneeling at the transom, and make drawing strokes that pull the boat backwards. With two people, both can paddle, or else one person can steer using the rudder while the other paddles – the paddler sits forwards, on the opposite side to the helmsman.

PADDLING ALONE

Sit well aft. Move the paddle through the water turning the blade away from the side of the boat at the end of the stroke. This helps prevent the boat turning away from the paddle – an effect that can also be reduced by lowering the centreboard or daggerboard.





PADDLING WITH TWO

The crew paddles from just aft of the shrouds, while the helmsman uses the rudder to keep the boat on course. When both helmsman and crew are paddling, both should sit just aft of the shrouds on opposite sides.

MOVING SMALL BOATS

THE MAJORITY OF SMALL BOATS are kept ashore between sailing trips as they are not stable enough to be left on moorings and would be vulnerable to damage if left afloat. They are easily transported between venues on a car roof rack or a road trailer towed behind a car. However, the boat is at its most vulnerable to damage when it is on land so it is important to know how to move it safely. Learning a few basic lifting and moving techniques will also protect you from personal accidents and injuries.

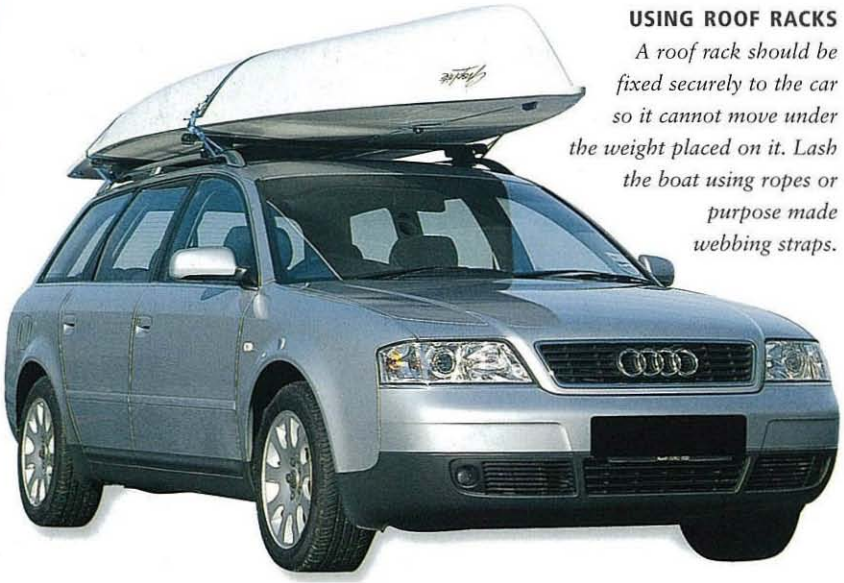
ROAD TRAILERS

The road trailer should be designed for the boat, with plenty of chocks and rollers to provide adequate support. Over-run brakes, which cut in when the car brakes, should be fitted to the trailer if it has to carry a heavy dinghy or keelboat. Always ensure that the boat is securely attached before driving off. Tie the mast and any other removable equipment to the boat or the trailer.

Some road trailers have an integral launching trolley that rides on top of the trailer when the boat is transported on the road. The boat sits on the trolley, which is loaded and unloaded by lifting the trolley handles and wheeling it onto or off the trailer from the back.

ROOF RACKS

Smaller and lighter dinghies are usually transported on a roof rack, which should be sturdy and securely attached to the vehicle. Pad the rack and ropes to prevent damage to the boat. It is usually best to carry the boat inverted on the rack with the bow facing forwards. Tie it securely to the rack, or strong points on the car, using rope or straps. Lash the mast and boom to the roof rack, alongside the boat, and stow all other removable equipment in the car.



USING ROOF RACKS

A roof rack should be fixed securely to the car so it cannot move under the weight placed on it. Lash the boat using ropes or purpose made webbing straps.

ROLLERS

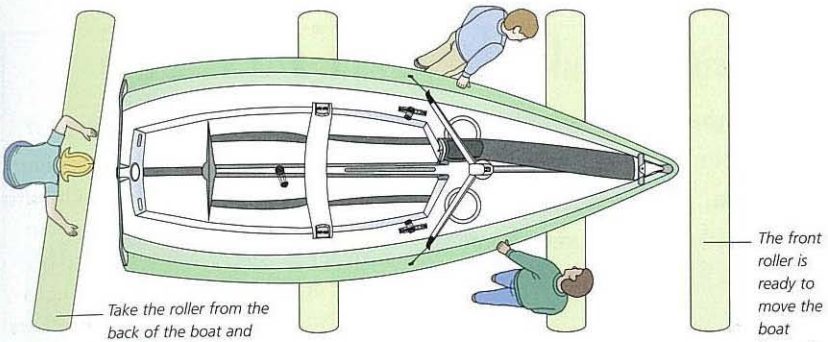
Solid or inflatable rollers are a good alternative to trolleys or trailers for short trips across beaches or up to boat parks. They are particularly useful for moving heavy boats across sand or shingle. At least three rollers are required. They are placed under the bow and the boat is pushed over them. Each roller is retrieved as it reappears behind the stern, and it is then brought around in front of the bow to continue the movement until the destination is reached.

LIFTING A BOAT

Dinghies can be heavy and awkward to lift – several pairs of willing hands make lighter work of it. Some dinghies have lifting handles, but with most you will have to grasp the inside or outside edges of the sidedecks.

1 First turn the boat over. Make sure that the bow is facing forwards before leaning the boat gently against the back of the car.

2 Slide or lift the boat onto the rack either from the side or from behind the car, depending on which is easiest with your vehicle.



USING ROLLERS

At least three people and three rollers are needed to roll a boat smoothly. Place each in turn under the bow of the boat then roll the boat forwards, removing each roller as it appears at the stern.

LAUNCHING TROLLEYS

A launching trolley is the usual means of moving a dinghy from the boat park to the water, and it is often used to store dinghies on the shore. Before moving a boat (or storing it) on its trolley ensure that it is sitting correctly on the chocks and that it is tied securely with its painter to the trolley handle. The ease with which your trolley moves depends on the type of wheels. Small solid wheels work well only on hard surfaces. If you need to launch across a sand or shingle beach, choose larger wheels, preferably with inflatable tyres.

To launch, push the trolley into the water until the boat floats off. Make sure that someone keeps hold of the painter. Take the trolley above the high-water mark, out of the way of others. Reverse this procedure to bring the boat ashore, tying the boat to the trolley handle and making sure that it is on its chocks before pulling it out of the water.

COMBI TRAILER

Some road trailers incorporate a launching trolley. Here, a small keelboat is easily launched on its trolley without immersing the road trailer and risking water damage to the wheel bearings.

AVOIDING DAMAGE

A boat is most likely to be damaged when it is being transported on land, or when it is being launched or recovered from the water. Most damage can be avoided by following a few simple rules.

WHILE LAUNCHING

When you are launching the boat using a trolley, always push the trolley into the water until you can float the boat off. Never drag the boat off the trolley as this will scratch the hull. Similarly, when recovering, float the boat onto the trolley rather than dragging it on.

WHILE ON LAND

Avoid stepping into a single-skin dinghy while it is ashore or on its launching trolley. Without the support of the water underneath it, the bottom of the boat may be deformed or holed by your weight.

WHILE CARRYING

You will need at least four people to carry an average dinghy. Most of the weight is concentrated in the front part of the boat, so, if you need to carry it over any distance, make sure you distribute the lifting power accordingly.

WHILE MOVING

Always look up before you move boats to check that your tall aluminium or carbon fibre mast is not about to become entangled with a high-voltage cable. People have been electrocuted when moving their boats, so be aware of your surroundings.

WHILE NOT IN USE

Whenever you leave the boat for any length of time, clean and dry the sails and all other equipment and stow everything neatly, then cover the boat to protect it from the elements (*pp.118–119*).

STAYING CLEAR OF OTHERS

EVERY TYPE OF CRAFT ON THE WATER, from the smallest dinghy to the biggest supertanker, is governed by the International Regulations for Preventing Collisions at Sea, often referred to as the "Col Regs" or "the rules of the road". Additional rules, set by the International Sailing Federation (ISAF), govern boats when racing, but the Col Regs always take precedence. The full rules are complex and cover every eventuality, but when you start sailing you need to know only the basic rules covered here.

KEEPING CLEAR

Keep a careful watch all around and try to anticipate the actions of others. Remember to look astern regularly – novices are often startled by unseen overtaking boats. When it is your responsibility to keep clear, it is important that you do so in plenty of time. Make a large alteration to your course so that your intentions are obvious to the other vessel, and pass astern rather than ahead of it. When you are underway, keep a safe distance from boats at anchor or on a mooring. Always give boats fishing or trawling a wide berth to avoid the possibility of becoming entangled in nets or lines.

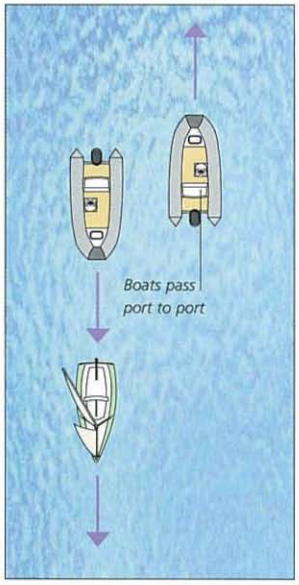
When one vessel is in the process of overtaking another, the overtaking boat must keep clear until completely passed, even if it is a sailing boat that is overtaking a powered vessel.

NEGOTIATING CHANNELS

When proceeding along a channel or fairway, all boats should stay close to the starboard side of the channel in whichever direction they are going. Avoid crossing busy channels or shipping lanes. If you must do so, always cross as nearly as possible at a right-angle to the traffic flow. Do not pass close in front of vessels that are moving along the channel and make sure that you complete the crossing as quickly as possible.

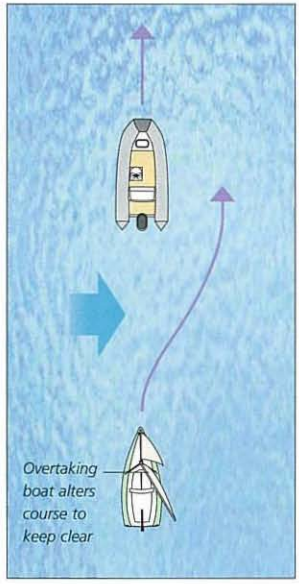
GIVING WAY

In general terms, a power vessel gives way to a sailing vessel. However, in practice, this is not always the case. For example, the rule does not apply to large ships in confined waters, which are usually restricted in their ability to manoeuvre. Fishing boats



CHANNEL RULES

All vessels, whether under sail or power, must stay close to the starboard side of channels so that they pass port to port.

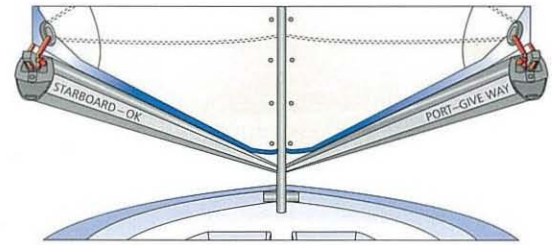


OVERTAKING RULE

An overtaking vessel must keep clear of the one being passed even if it is a sailing boat that is overtaking a power boat.

STARBOARD-TACK RULE

A sailing boat that is on starboard tack (with the boom to port) has the right of way over a boat on port tack. A boat on port tack (with the boom to starboard) must give way to a starboard-tack boat. When you first start sailing it is sometimes difficult to remember which tack you are on. Solve this problem by marking the boom as shown below.

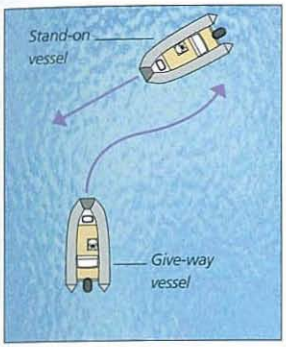


MARKING YOUR BOOM

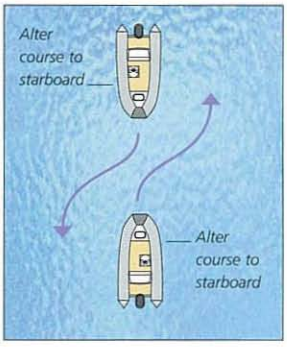
Mark your boom "Starboard – OK" on the starboard side and "Port – Give Way" on the port side. This will remind you which tack you are on and the give-way rule that applies.

AVOIDING COLLISIONS

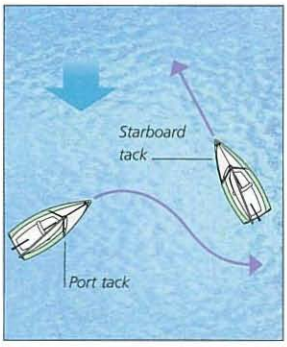
Whenever two boats – whether under sail or power – meet in a potential collision situation, there is a rule that specifies which one has right of way. The boat with right of way, known as the "stand-on" vessel, must maintain its course, while the other boat, known as the "give-way" vessel, is obliged to keep clear.



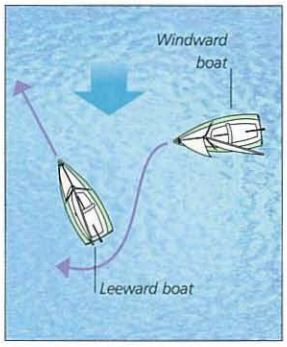
POWER BOATS CROSSING
The boat on the other vessel's starboard side has right of way, so the give-way boat alters course to pass behind it.



POWER BOATS HEAD-ON
When power boats meet head on both must give way – by steering to starboard so as to pass port to port.



SAILING BOATS ON OPPOSITE TACKS
The boat on the port tack alters its course to pass behind the boat on the starboard tack.



SAILING BOATS ON THE SAME TACK
The windward boat must keep clear and steers to pass behind the leeward boat.

are also a special case and you must keep clear of them. Large ships may have a blind spot under their bows, where a boat will be hidden. In such circumstances, it is the responsibility of the small-boat sailor to get out of the way as quickly as possible.

In a narrow channel, such as on the approach to a marina, even a small yacht under power may not have enough room to alter course, so dinghies should keep clear. In fact, unless the power vessel is about the same size as your boat, it is always best to stay out of its way. Remember, too, that a dinghy under oars is classed as a power-driven vessel and must keep clear of sailing boats.

IN A CHANNEL
In some sailing areas dinghies and yachts share the same waters as large vessels. If crossing a channel, pass behind ships and give them as wide a berth as possible.

WEATHER BASICS

THE MOST IMPORTANT FACTOR to take into consideration when you go sailing is the weather, especially the strength and direction of the wind. Once you are on the water, the complexity of the weather – how quickly it can change, and how variable the wind direction and strength can be – may surprise you if you are not used to sailing. You need to be able to recognize onshore and offshore winds because they determine the ease or difficulty of leaving and returning to shore, as well as conditions further out.

WEATHER FORECASTS

Always check the weather forecast before you sail. Although forecasts are available from many different sources, not all will give specific information on wind conditions, so it is advisable to use a sailing forecast that covers your area in as much detail as possible. In ports or harbours, the offices of the harbourmaster often display the local forecast. Sailing clubs may also provide forecasts. At clubs, you can also seek information and advice from more experienced sailors with extensive local knowledge. Always bear in mind your sailing capabilities and the limitations of your experience. If in doubt, stay ashore.

WIND DIRECTION

It is always more pleasant to sail in warm sunshine than cold drizzle, but neither temperature nor rain are critical to sailing. The wind, on the other hand, is vital, and you should constantly be aware of its direction and strength. Check it before you go afloat, and continue to monitor it once you have set sail.

WEATHERWISE

Study the strength and direction of the wind before you go afloat, and check local forecasts for any imminent changes in the weather.

WIND INDICATORS

As you gain experience, you will find that you automatically register wind direction by the feel of it on your face. Until this becomes second nature, however, you must try to estimate the wind direction and force by studying all available signs. Look at the wind indicator at the top of your mast, if fitted, or those on other boats, and study the movement of flags ashore. Smoke from chimneys will blow in the direction of the wind, and the angle of the smoke will give an indication of its strength. Moored boats will often point into the wind, but remember to take into account any tides or currents.

Bear in mind that the wind shifts very frequently, even if the weather is apparently stable, and it can be bent from its true direction by trees, tall buildings, or hills. A river valley will often affect the wind, causing it to blow up or down the river.

OFFSHORE WIND

When you are planning a sailing trip, do not underestimate the strength of a wind that is offshore (blowing from

STRONG WINDS

Wind strength can increase quickly and dramatically, and its force can easily cause damage such as torn sails. Be prepared for conditions to change when you are afloat.

WIND STRENGTH

Learn to recognize when it is safe to set sail by studying the Beaufort Scale, which indicates the strength of the wind and describes its visual effects. For initial outings, a force three is the ideal wind strength. Seven to ten knots will fill the sails but will be gentle enough to allow you to keep control of your vessel. Anything less than a force three will cause the boat to move slowly and lack responsiveness; anything more and beginners should be wary about going out. A force six is a dinghy-sailor's gale; only experienced crews should sail in winds that can reach 27 knots.

FORCE	DESCRIPTION	EFFECTS ON SEA	SIGNS ON LAND	WIND SPEED
0	Calm	Mirror-smooth water. Dinghies tend to drift rather than sail.	Smoke rises vertically and flags hang limp.	Less than 1 knot
1	Light Air	Ripples on water. Sufficient wind to maintain motion.	Smoke drifts slightly, indicating wind direction.	1–3 knots
2	Light Breeze	Small wavelets with smooth crests. Sufficient wind to sail steadily but upright. Wind is felt on the face.	Light flags and wind vanes respond with small movements. Leaves rustle.	4–6 knots
3	Gentle Breeze	Large wavelets with crests starting to break. Ideal conditions for learning to sail a dinghy.	Light flags extend fully, and leaves and small twigs are set in motion.	7–10 knots
4	Moderate Breeze	Small waves with fairly frequent white horses. The crew will be working hard. Boats plane easily. Beginners should head for shore.	Small branches move on trees, and dust and paper are lifted off the ground by the breeze.	11–15 knots
5	Fresh Breeze	Moderate waves with frequent white horses. High risk of capsize when dinghy sailing.	Small trees sway visibly and the tops of all trees are in motion.	16–21 knots
6	Strong Breeze	Large waves start to form and spray is likely. This is a dinghy-sailor's gale. Only experienced crews with good safety cover should race.	Large trees sway and the wind whistles in telephone wires. It becomes difficult to use an umbrella.	22–27 knots

the land across the shore and out over the water). Offshore winds can be quite misleading as there is likely to be a calm patch close to the shore, but beyond this the wind will be stronger and the waves much larger. If you set sail in an offshore wind and then discover that the weather conditions are more severe further out than you anticipated, you may experience difficulties returning home.

ONSHORE WIND

When the wind is onshore, you will feel its full force and waves may break on the shoreline. Onshore winds bring different sailing challenges. Attempting to launch the boat and leave the shore through breaking waves can be difficult with the wind against you. However, away from the beach the waves should calm down. You will also find that it is easier to return to base in an onshore wind.

INLAND OR SEA

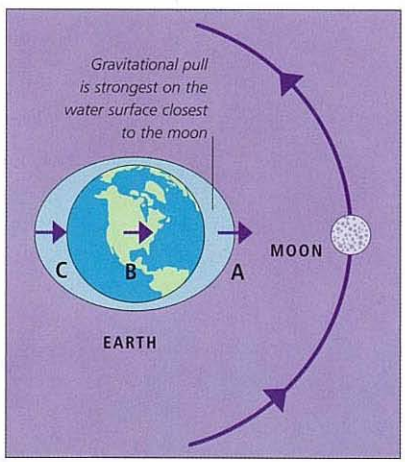
WHETHER YOU SAIL ON INLAND WATERS or on the sea depends on the type of sailing you want to do, as well as on where you live. Learning to sail is usually easier and safer on inland waters, but once you have gained some experience you will probably want to be more adventurous and try sea sailing. In many parts of the world, sailing on the sea involves dealing with tides. It is important for both your safety and enjoyment that you understand how to check tidal information and how tides affect sailing at sea.

INLAND WATERS

Inland waters vary from small lakes and reservoirs, which are often made from flooded gravel pits, to more significant stretches of water, such as large lakes and wide rivers. Remember that most inland waters are owned by someone, so, if the stretch of water is new to you, find out whether you need permission to sail there. Look out for bylaw notices on the banks and shorelines.

All types of inland waters have their own characteristics and potential hazards, so ask for advice at a local sailing club before you go afloat. If you plan to sail without safety cover on a large stretch of inland water make sure that someone knows your plans before you set sail. Look for bridges and overhead power lines that may be lower than the mast, and check for signs indicating weirs or locks.

The rules of the road (*pp.52-53*) apply wherever you are sailing. In constricted waters, such as a narrow river or small lake, you may find that the sailing conditions are congested, which will test your manoeuvring skills. When you are sailing on a river, be aware that you are likely to have to contend with a current as the water flows downstream towards the sea. On some rivers these can get very strong, especially if there has been heavy rain upstream. Some rivers, especially large ones, also have a tidal flow that may reach some way inland from the sea.



TIDES

Tides are vertical movements of the water due to the gravitational attraction of celestial bodies (primarily the moon) on the earth's surface.

GRAVITATIONAL PULL

The gravitational pull of the moon (strengthened or weakened by that of the sun) attracts the water on the near side (A), the earth itself (B), and the water on the far side (C) by decreasing amounts. This pull causes two bulges in the surface of the water on opposite sides of the earth. We experience these bulges as tides.

The horizontal movement of water produced by the tides is called a tidal stream. This flows along coasts and up and down estuaries and rivers. When the tide is rising, the stream is said to be flooding; when it is falling, the stream is said to be ebbing. Flood tides run up rivers and estuaries while ebb tides run back towards the sea. The speed of the tidal stream is affected by the difference in the height of the water surface between low tide and high tide. It runs much faster during spring tides than during neaps, and is at its strongest during the third and fourth hours of the flood or ebb.

SEA SAILING

If you are planning to sail at sea, make sure that you are conversant with all the relevant tidal information. Details about the times of high and low water can be found in a local tide table, and a tidal atlas for your area will show the direction of the stream for each hour of the tidal cycle.

Remember that when a tidal stream flows through deep channels or around headlands it is at its strongest. If it is constricted in any way, such as by a headland, an uneven bottom, or rapidly shoaling water, then you can expect tidal races, eddies, and overfalls. Stay away from these in a small boat, especially if the wind is strong or is blowing against the stream. It will be apparent when the wind blows in opposition to a tidal stream, as it will kick up waves that are bigger and steeper than you would otherwise expect. When the tide turns to run with the wind, these waves will quickly die down again.

When going sailing in tidal waters, always make sure that someone ashore knows your plans, and store an anchor aboard so that you have the option of anchoring in shallow water if the wind drops or if you get into difficulties.

THE CAUSES OF TIDES

Tides are caused by the moon's gravitational pull (and to a lesser extent that of the sun) on the surface of the water. The combined influence of these two celestial bodies determines tidal ranges.

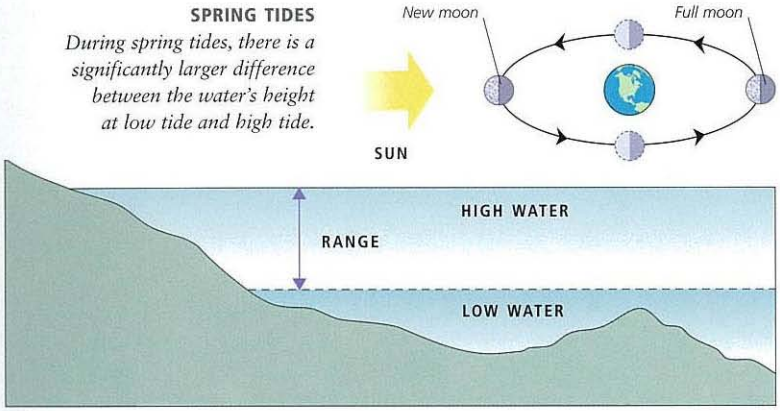
TIDAL RANGES

The gravitational pull of the moon and the sun produces two high tides and two low tides in most places every day. The difference in height between a low tide and the next high tide is called the tidal range.

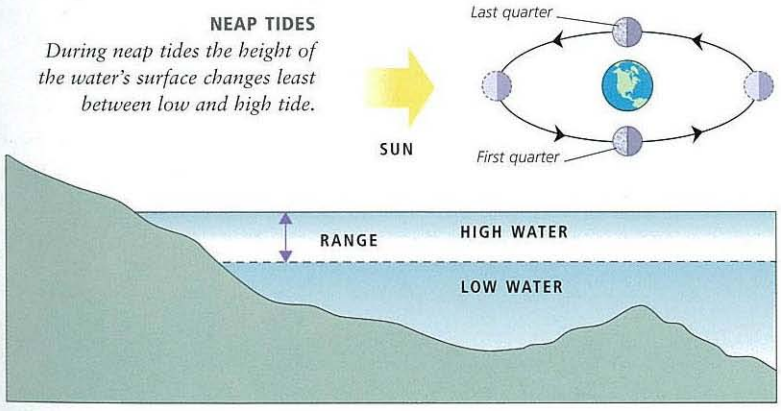
SPRING AND NEAP TIDES

The juxtaposition of the sun and moon affects the height of the tides at different times of the month. At the times of a full and new moon, when the sun, earth, and moon are in line, the gravitational pull is largest. This causes spring tides, with the largest range between high and low tides. When the moon is in its first and last quarters, the sun, earth and moon are at right angles to each other and cause neap tides, with the smallest range between high and low water. The strength of tidal streams depends on the range, so expect strong streams at spring tides and weaker ones at neaps.

SPRING TIDES
During spring tides, there is a significantly larger difference between the water's height at low tide and high tide.



NEAP TIDES
During neap tides the height of the water's surface changes least between low and high tide.



TIDE INDICATORS

When you are sailing in tidal waters it is important to know when the tide turns. When the tidal stream runs in your favour it is easy to make progress over the ground, but if it runs against you, progress may be slow or impossible until the tide turns.

CHECKING THE DIRECTION

One of the easiest ways of checking the direction of the tidal stream is to look at boats at anchor or on a mooring. They will usually point into the stream, unless they have a shallow draught (like dinghies or motor boats), in which case they are more likely to lie head-to-wind, especially if the wind is strong. Look at deep-keeled cruisers for an accurate indication of the tidal stream. The tide also flows around buoys and posts, or any other fixed object in the water, and reveals its direction and strength by the wake that streams downtide of the object.

BUOY IN A TIDAL STREAM
Buoys are very useful indicators of the direction of a tidal stream as they often lean away from the direction of a strong stream. A tidal stream also produces a wake or bow wave as the water sweeps past the buoy.

SMALL BOAT SAILING

Dinghies offer the best introduction to sailing because they are so responsive to wind and waves and to your actions on the tiller and sheets. General-purpose dinghies are ideal for learning the basics about rigging and launching, experiencing the different roles of the helmsman and crew, and becoming proficient in all the important sailing manoeuvres.

CHOOSING A SMALL BOAT

THERE ARE LITERALLY HUNDREDS of different types of dinghies and small keelboats on the market. They are available in a huge variety of designs for a wide range of sailing activities, from relaxed day-cruising to highly competitive racing. Most modern boats are built with strong, lightweight materials, and many offer tremendous performance potential while requiring little maintenance. You are bound to find one that will suit your level of skill, experience, and ambition, as well as your finances.

FIRST STEPS

General-purpose boats are usually the most appropriate type of dinghy when you are first learning to sail. These boats are relatively stable, so any mistakes are easier to rectify without mishap than they would be in a sensitive, high-performance dinghy. Most sailing clubs and schools use general-purpose dinghies for teaching because they often have enough space for an instructor and two students, but some also offer courses in single-handed dinghies. This is often the fastest way to learn but it can be hard work sailing alone while learning.

STARTER BOATS
Modern general-purpose designs are good for beginners to learn in, and are still rewarding for more experienced sailors.

EXPANDING YOUR HORIZONS

Once you have progressed and are sailing confidently, you will probably consider buying your own boat. As the choice is so vast, it is best to draw up a detailed shortlist of your specific requirements. For a start, think about where you are going to do most of your sailing and what type of sailing you want to do. High-performance racing boats (*pp.122–25*) are huge fun and very exciting to sail, but they are not suitable for family picnics or for use with oars or an outboard motor. If you want to race, make sure you choose a boat that is popular where you are going to do your sailing, and check that there is a good club fleet in which to start racing.

Do not pick a high-performance boat until you have the experience to handle it. It is certainly not necessary to choose a high-performance boat to get good racing. In fact, many general-purpose dinghies have very keen and competitive racing fleets and are a good option to start racing. If you are unsure as to whether you are ready to race your own boat, consider crewing for someone else in order to gain experience and develop skills.

If you want to day-sail or cruise, choose a strong and stable boat that is specifically designed for this type of sailing. A good cruising dinghy will have plenty of room inside a deep and stable hull, and will have space for stowing additional equipment, such as a cockpit tent and cooking gear.

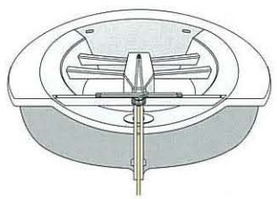
JOINING A CLUB

You will need to join a club in order to race. In fact, it is well worth joining one anyway, before buying your own boat, because this will enable you to meet more experienced sailors who will usually have sailed in a range of small boats. Crewing for club members in as wide a range of boats as possible is a very good way of adding to your sailing experience at low cost. Depending on where you live, you may find several sailing clubs in your vicinity. Some may be primarily dinghy and small keelboat clubs while others may concentrate on yacht racing and cruising. Before you join a club, visit the ones in your area and find out the sort of sailing they focus on. Check out what boats they sail and talk to as many members as possible. Pick a club that sails small boats and try and find one that has a training programme to introduce newcomers to small boat sailing and help them develop their skills.

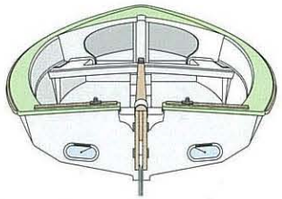
MULTI-PURPOSE BOATS
Some small multi-purpose dinghies can be sailed single-handed or with a crew (with a jib fitted), as here.

HULL SHAPE

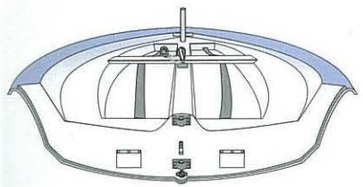
The shape and depth of a dinghy's hull when seen from behind provides a good indication of the purpose for which it is designed. A flat, shallow, usually rounded hull shape, indicates that the dinghy is intended for high-performance sailing and racing. Wider hulls are more stable than narrow ones, and deeper and heavier hulls are more often used for general-purpose boats that are ideal for beginners.



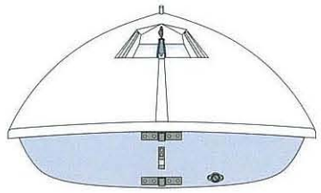
ROUND-BILGE HULL
If the hull is shallow, usually with a round bilge (curved shape), it is probably meant for racing. The shallower the hull the more likely it is to be designed for speed.



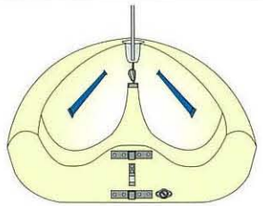
DOUBLE-CHINE HULL
If the hull is deep, the boat is likely to have been designed as a general-purpose dinghy. Also, general-purpose hulls may have one or two chines (angled, flat panels).



MODERN GENERAL-PURPOSE DINGHY
The hull is shallower, with a flatter bottom than older designs, but is quite wide so has better stability than narrower types.



SINGLE-HANDED DINGHY
The hull shape is shallow and the bottom is quite flat at the stern. The narrower hull offers less stability than wider designs but offers higher performance.



MODERN FUN BOAT
Some small, modern designs are designed for fun sailing and occasional racing. Some can be sailed by one or two people and are popular at holiday sailing centres.

BUYING A SMALL BOAT

When you first start sailing it is not necessary to buy your own boat. In fact, it is best not to consider buying until you have some experience of different boats and have decided on the type of sailing that interests you most. Before you buy a boat, try and get some experience sailing as many different dinghies or small keelboats as possible.

When you decide to buy a boat, make a shortlist of the ones that seem suitable. Read boat reviews in sailing magazines and web sites, and visit boat shows to view different boats. Try to pick boats for your shortlist that are popular and well established in the area you plan to sail, as these will maintain their value best and be easy to sell again.

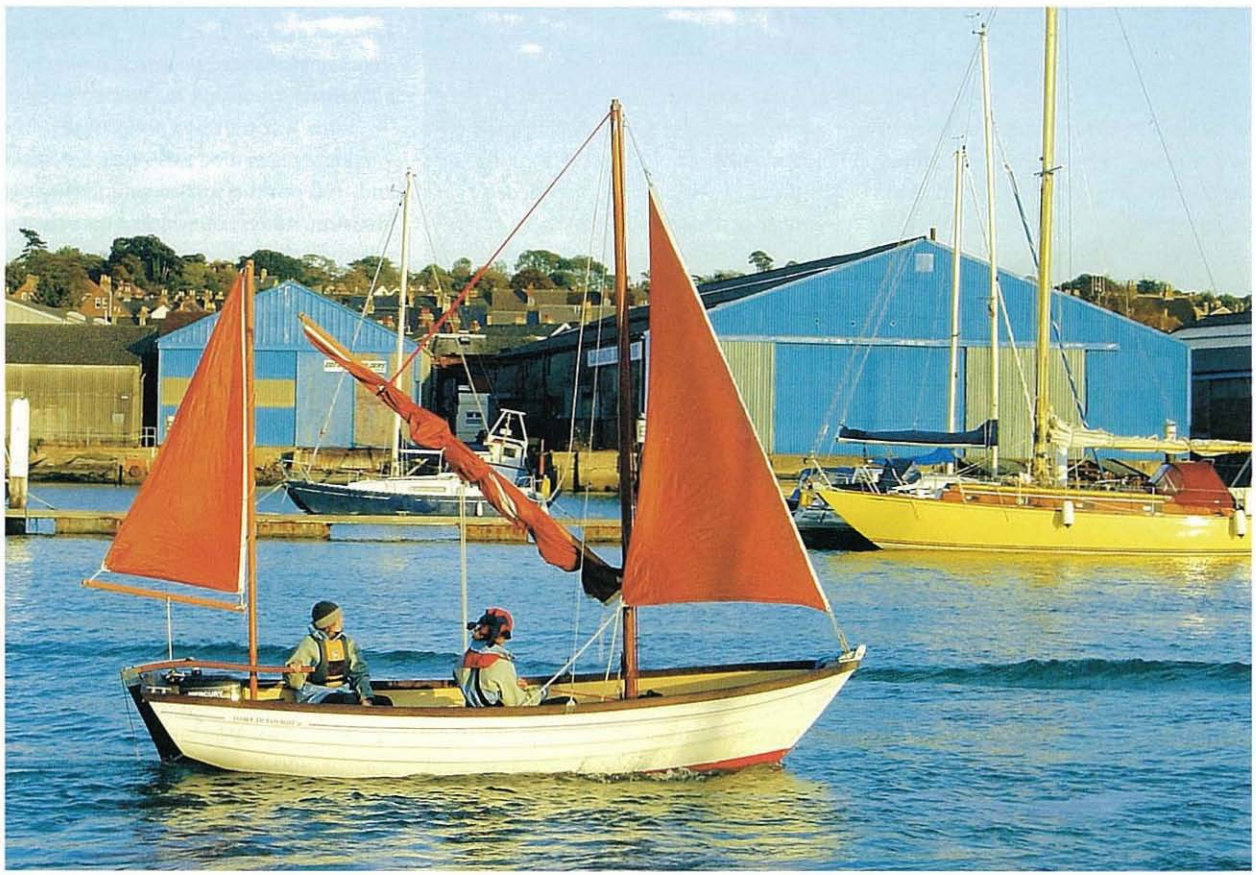
Once you have a shortlist, arrange to have a trial sail in each of the boats you are interested in. If the manufacturer cannot organize this, contact the class association who will be able to help you arrange a sail with an existing owner. Details of class associations can be found through your national sailing authority or you can search for their web sites online.

If you plan to buy a secondhand boat, which is often a very good way to get started, look in magazines and sailing web sites for boats that match your shortlist and to find the average price for the types of boats you are interested in. When you have found one or more possible boats that seem to suit your requirements, ask an experienced small boat sailor to view them with you and advise you on their condition and suitability for your experience and ambitions.

Once you have bought a boat it is a very good idea to join the class association as this will help you meet other owners, join in organized class racing, and learn tips about your particular boat. The association may also offer low-cost insurance policies and other benefits, such as organized training sessions, that make it well worth joining.

TRADITIONAL DESIGNS

Not all small boats are designed for performance sailing or racing. This modern interpretation of a traditional inshore fishing boat can be sailed, rowed, or used with an outboard for coastal cruising.



TYPES OF DINGHIES AND SMALL KEELBOATS

There is a wide range of small boats that are suitable for beginners and recreational sailing, as well as a varied selection for single-handed sailing or for children and young adults. Although not necessarily designed for racing, there is no reason why a general-purpose boat cannot be raced; indeed, many of the popular classes have strong racing fleets. Small day-sailing keelboats are not classed as dinghies as they have weighted keels. However, they do offer good performance but with a much reduced risk of capsize.

GENERAL-PURPOSE DINGHIES

WAYFARER

The Wayfarer is a classic general-purpose dinghy. A relatively heavy boat, it is large and stable enough to be kept on a mooring. There is good racing, and Wayfarers have cruised long distances.

ENTERPRISE

The popular Enterprise, with its distinctive blue sails, is smaller and lighter than the Wayfarer but is still large enough for day-sailing. The Enterprise is an international class, and it is very popular for racing.

MIRROR

The Mirror is a two-handed boat that can also be sailed single-handed, rowed, or used with an outboard motor. It is suitable for older children and adults. Its rig includes a spinnaker.

SMALL KEELBOATS

FLYING FIFTEEN

The Flying Fifteen is a popular, double-handed international class that is used mainly for racing. It has a weighted keel yet it is light enough to plane. It has a mainsail, jib, and spinnaker.

SONAR

The Sonar is a popular keelboat that is ideal for day-sailing and competitive racing. It is used for international women's, youth, and disabled racing in match, team, and fleet racing.

SQUIB

The Squib was designed as a one-design keelboat for club racing and family sailing. It offers easy handling and good performance while its ballast keel removes the risk of capsize.

BOATS FOR CHILDREN

OPTIMIST

The Optimist is a favourite for children. A small, light single-hander with a simple rig, it is ideal for starting to sail and is raced very competitively all over the world. It is an international class.

BLUE JAY

The Blue Jay is designed to be sailed by two children. It is an international class that has strong racing fleets and is an excellent youth-training boat. It is rigged with a mainsail, jib, and spinnaker.

TOPPER

The Topper is a very popular, international single-hander, which is particularly suitable for children. The Topper is built from moulded plastic, and it is virtually indestructible.

BOATS FOR YOUNG ADULTS

420

The 420 is an international class that is ideal both for beginners and for young sailors starting to race. The 420 provides a good introduction to the use of a trapeze and a spinnaker.

LASER RADIAL

Based on the same hull and equipment as the Olympic Laser (*pp.124-25*), the Radial has a smaller sail and more flexible lower mast that makes it an ideal single-hander for young adults.

FEVA

The Feva is a modern, multi-purpose dinghy that has the option of being sailed single-handed or with a crew, with just a mainsail or with the addition of a jib and gennaker.

PROTECTIVE CLOTHING

WHEN YOU SAIL IN SMALL BOATS, you are very exposed to the elements, so it is important for your comfort to wear clothing that keeps you warm. Although the choice of what to wear is very wide, there are only two basic approaches. One is to wear a drysuit or waterproofs over warm clothing, the other is to wear a wetsuit. If you sail a dinghy it is inevitable that you will sometimes find yourself in the water, so it is also vital that you have a buoyancy aid to help keep you afloat if you capsize.

STARTING OFF

If you learn to sail at a sailing club or school, you will probably be provided with waterproofs and a buoyancy aid. Normal casual or sports clothing will suffice under the waterproofs, and you can wear trainers on your feet. If you learn to sail in a small dinghy you may be provided with a wetsuit as it is inevitable that you will get wet and waterproofs will not provide sufficient protection.

Once you start to sail your own boat or to crew for others on a regular basis, you will want to invest in some specialist clothing, but you should get some experience first so that you can choose the type of clothing that will suit the sailing you wish to do. Ask experienced sailors for their recommendations and visit a chandlers to try on a range of types.

WEARING WATERPROOFS

Waterproofs are most suitable for sailing in small keelboats or stable general-purpose dinghies that are unlikely to capsize. They have the advantage over a wetsuit or drysuit that they are easier to put on and take off and it is easier to control your temperature.

If your boat is kept on a mooring or pontoon it is practical to wear waterproofs, but if you have to launch from a slipway or beach waterproofs will not keep your legs dry when you wade into the water to launch the boat. Even if you wear sailing boots it is likely that the water will come over the top of your boots during launching. If this is the type of sailing you do then consider wearing a wetsuit or drysuit or be prepared to have wet legs before you start sailing. In a warm or hot climate wet legs are no hardship, but if you sail in a cooler climate your will want to stay as dry as possible, especially at the start of your trip afloat.

You can choose from a one-piece waterproof suit or separate jacket and trousers. A one-piece suit has fewer water entry points, but separates allow you to wear the jacket or trousers alone when required and so may be more useful if you are sailing for recreation rather than racing. Waterproof jackets are available with a front zip fastening or as a smock type. A zipped jacket is easier to put on and can be worn unzipped, when you need to regulate your temperature. The smock type is more waterproof, since it has no zip, but is harder to put on or take off, as it must be pulled over the head. Waterproof trousers are available in waist-high or chest-high designs. Waist high are quicker to put on but chest-high trousers have braces that prevent them slipping down and also offer extra protection that means they can often be worn without a jacket.

MATERIALS

Waterproofs are usually made with an outer layer of nylon for extra strength, and an inner, waterproof layer that is bonded to the nylon. The waterproof layer might be PVC, which is fairly cheap, or a breathable fabric, which will be considerably more expensive. However, breathable fabrics do offer far superior performance, allowing water vapour and perspiration to escape rather than accumulate and eventually soak your clothing.

HIGH TROUSERS
High-fit waterproof trousers have braces for security and can be worn without the jacket if preferred.

WEARING A WETSUIT

When you are likely to get wet while launching or sailing, a wetsuit offers you a means of staying warm without worrying about how to stay dry.

Wetsuits are made from neoprene which is composed of numerous small cells, each of which holds a small bubble of gas. These bubbles give the material its insulation properties, making it difficult for the cold to penetrate, or the heat from your body to escape.

Wetsuits are tailored to be very close fitting to ensure that only a thin layer of water can penetrate between the neoprene and your skin. When you get wet, this thin layer of water is trapped between your skin and the layer of neoprene and is quickly warmed up by your body heat. The thin layer of warm water and the insulation of the neoprene protect you from the cold.

TYPES OF WETSUITS

Different weights of neoprene are available and suits for sailing usually range between 3mm and 5mm, although suits as thin as .5mm are available. Thicker suits are used for winter sailing while the thinner ones are adequate for sailing from spring to autumn in most climates. Some suits use thicker neoprene in the torso with thinner material in the arms and legs to allow for easier movement. Suits for small boat sailing should have reinforcing patches on the seat, shins, and knees.

Westuits are available in a variety of styles, including full length, shortie, and long-john designs. Separate jackets are also available which can be worn over a shortie or long-john for extra warmth. Full suits have a zip entry system, usually in the back of the torso, and good suits have adjustable ankle and wrists.

Most good wetsuits have thin inner and outer skins of a stretchy, nylon-based material bonded to the neoprene to protect it from damage.

It is advisable to wear a rash vest, made of lycra or thin neoprene and lycra, under a wetsuit to protect your skin from abrasion and rash. Some sailors also wear a thin windproof vest over their wetsuit to protect it from damage and to prevent wind chill when sailing.

Wet suit socks can be worn under dinghy boots to keep feet warm, or neoprene sailing boots with zips and non-slip soles are also available. Neoprene gloves will keep the hands warm and a wet suit hood will prevent heat loss through the head in the coldest weather.

FULL WETSUIT

Wetsuits are available in a variety of styles. Choose a good quality, well-fitting suit to ensure that you stay warm and comfortable.

SHORT WETSUIT

For summer sailing, a shortie wetsuit is often more appropriate than a full suit. Wetsuit boots are ideal for dinghy sailing.

WEARING A DRYSUIT

A drysuit is a type of waterproof suit that is designed to prevent any water entry, even when you are immersed in water. The drysuit prevents water entering at the wrists, ankles and neck by using seals, usually made of latex, that fit tightly to the skin. Drysuits are generally made as one-piece suits, but two-piece versions are available. In this case the trousers and smock have latex seals at the waist that are rolled together to prevent water entering between smock and trousers. One-piece suits have a zip entry system with the zip sometimes fitted diagonally across the chest or the back. Zips in the front make entry and exit to the suit easier. Good suits have reinforced seats, knees and shins to protect these high-wear areas.

To control your body temperature when wearing a drysuit, you need to take care when choosing the clothing you wear underneath. Shorts and a T-shirt often suffice in warm weather, but thin, thermal clothing is better in colder conditions. If you decide to use a drysuit choose one made from breathable fabric, which allows your perspiration to pass through the suit. It is easy to overheat when wearing a drysuit and if the material is not breathable you will quickly become wet inside the suit from the perspiration you produce when you are working hard.

HANDS AND FEET

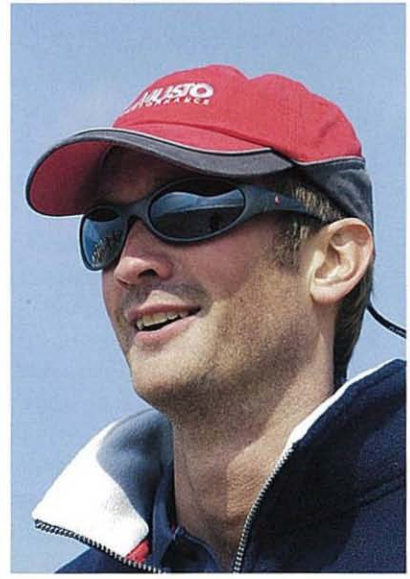
It is very important to protect the extremities from injury and cold when sailing so take care to choose good footwear, gloves, and a hat.

Footwear can consist of deck shoes, dinghy boots, or long sailing boots. Deck shoes and long sailing boots are fine for keelboat sailing but for dinghy sailing it is better to choose a pair of dinghy boots or wetsuit boots since you are likely to get your feet wet when you wade in the water to launch and recover your dinghy.

Gloves help protect the hands when handling ropes and help to keep them warm when sailing in cold conditions. Sailing gloves are available in short- or long-fingered varieties. The short finger ones allow you to handle intricate tasks such as fastening a shackle or tying a knot, but the long finger ones provide better protection for the hands. A compromise is a pair with full-length fingers on all but the index finger and thumb. Most sailing gloves are made of a supple leather or synthetic alternative with an elasticated back and loop and hook wrist closure system.

PROTECT THE HEAD

A hat is useful for protecting the head from the sun in the summer and helping to prevent heat loss in colder conditions. A baseball-type hat is often used as its brim helps protect the eyes from glare. Fit a retaining strap to prevent the hat being blown or knocked off your head while sailing. A wide-brimmed hat will provide more shade for head and shoulders in very sunny conditions, but is more vulnerable to being blown off your head in windier conditions. In winter, a thermal balaclava will help prevent heat loss from the head which otherwise can account for thirty per cent of the heat loss from your entire body.



PROTECT THE HEAD AND EYES

A peaked cap will keep sun off the head and a good pair of sunglasses will protect the eyes from glare from the water.

In sunny conditions always wear a pair of high-quality sunglasses to protect the eyes from glare from the water's surface, which can be considerable. Pick a pair that covers the eyes well to prevent light seeping in around the edges, and use a retaining strap to prevent loss. Polarized lenses are best for reducing glare and they also make it easier to see the signs that wind shifts and gusts make on the water's surface.

LOOKING AFTER YOUR EQUIPMENT

Sailing clothing can represent a considerable investment so it pays to look after your equipment. Always rinse out all your clothing thoroughly in fresh water after each sail and hang up to dry. Some clothing can be washed in a washing machine at low or medium temperature but always check the manufacturer's instructions. Most clothing should not be tumble-dried and never use solvent-based cleaners to remove stains, as these are likely to damage the fabric.

Do not leave your waterproofs, drysuit, or wetsuit in direct sunlight, as this will cause the fabric to deteriorate. Lightly lubricate zips with petroleum jelly and close zips and fold clothing neatly for storage. A light dusting of talcum powder inside a wetsuit makes it easier to put on.

DINGHY DRYSUIT

A one-piece drysuit has close-fitting latex cuffs, collar, and ankles, which are designed to form a waterproof seal, thus keeping the wearer dry.

Collar
Latex seal prevents water ingress at the neck

Loose cut
For freedom of movement

Entry Zip
A long zip on the front (or sometimes on the back) of the torso aids putting the suit on and taking it off

Wrists
Latex cuffs form seal at wrist to stop water entering

Feet
Some drysuits have built-in latex socks, as here, while others have ankle seals that are similar to wrist seals

Ankles
Velcro and fabric tabs seal the drysuit over dinghy boots

Non-slip sole
A razor-cut tread improves grip on wet surfaces

Boots
Protect latex feet seals and provide grip

Reinforced instep
Resists wear from dinghy toestraps when hiking

DINGHY BOOTS

Rubber sailing boots with moulded soles are popular for dinghy sailing because they protect the feet and give good grip.

GLOVES

Good sailing gloves have reinforced palms and fingers for gripping rope securely – even when wet – and protecting the hands.

BUOYANCY AIDS

Buoyancy aids – as opposed to lifejackets – are the usual choice for dinghy sailors, especially for racing and inland sailing. They are available in a variety of designs to suit all shapes and sizes.

CHOOSING A BUOYANCY AID

Ensure that the buoyancy aid that you choose is of a type that is approved by your national standards authority. Also, make sure that the size of the buoyancy aid is suitable for your body weight. A range of styles is available to suit all types of dinghy sailing and small-boat activity, with special sizes available for children (and even for pets). Try the buoyancy aid on before you commit to buying and check that it fits comfortably over your wetsuit, waterproofs, or drysuit. Choose a bright colour that will be clearly visible from a distance.

Closed-cell foam
Provides a minimum of 50 Newtons (5kg/11lb) buoyancy

VEST STYLE

Waist belt
Always fasten and tighten the waist belt for security

WAISTCOAT STYLE

RIGGING THE BOAT

BEFORE GOING AFLOAT you must rig the boat, which involves fully preparing it for sailing. If you sail a dinghy that is kept ashore, rigging is usually done in the dinghy park before moving the boat to the water. If your boat is stored in a dinghy park or kept afloat on a mooring, the mast is usually left in place. However, if you have transported the boat to the sailing area on a roof rack or trailer, you will need to step the mast and attach and adjust the standing rigging before the sails can be hoisted. The sails are then rigged, and all the running rigging (sheets, halyards, and control lines) are attached and checked to ensure that they are led correctly. Finally, you should collect any other gear you need to take afloat and stow it securely in the boat.

UNSTAYED MASTS

Boats that have unstayed masts (*pp.130–31*) are usually stored with the mast unstepped, particularly if the mainsail is attached to the mast via a sleeve (the sleeve slides over the mast and the sail can be fitted or removed only when the mast is unstepped).

Unstayed masts are often made in two sections that are slotted together. The sail is fitted to the mast, which is then lifted vertically and lowered into the mast step. There is normally a locking arrangement fitted in the step, which is used to secure the mast in place. Alternatively, a rope downhaul or cunningham line is used to secure the sail and mast to the boat.

STAYED MASTS

Masts with stays can be stepped either on the keel, on the foredeck, or on a bow tank. In all cases, a mast step is attached to the boat to accept the mast's heel fitting. The fore-and-aft position of the step can sometimes be adjusted to allow alterations to the mast position and rake (lean). In all cases, the mast is supported by wires, called standing rigging, which are attached to the mast at the hounds and to the boat at the chainplates. The shrouds brace the mast to port and starboard. They run through the ends of the spreaders, which are attached to the mast at about mid-height. Shroud length is adjusted with a rigging link or bottlescrew. A forestay, which runs from the hounds to the bow-fitting, prevents the mast falling backwards. On some small dinghies the forestay is removable once the jib is hoisted.

STEPPING THE MAST

Before you attempt to step the mast, make sure that it will not hit any overhead obstructions such as power cables when you lift it into place. It is quite often possible to step the mast on small dinghies on your own, but the job is much easier, and much safer, with two people. Although most dinghy masts are light in weight, their length and windage (resistance to the wind) can make them unwieldy to lift in and out of the boat. It helps to have the dinghy on its trolley in a bow-down position so that the mast will lean forwards against the support of the shrouds when it is placed in its step. Make sure that the tails of all halyards and other rope ends are tied out of the way so that they cannot be trapped under the mast heel. When lifting the mast, keep it as close to vertical as possible and position your hands quite wide apart on it to give better leverage. Check whether the design of your boat will allow you to stand in it when ashore. Modern, double-floored dinghies are usually strong enough but older designs may be damaged if you stand in them.

RAKING THE MAST

Once you have stepped the mast, you may need to adjust the shrouds and forestay to set the correct mast rake. Most boats sail best with their masts raked aft slightly but the mast must be upright in a sideways direction. For general sailing the amount of rake is not too critical but when you start racing you should set the rake according to your class's tuning guide.

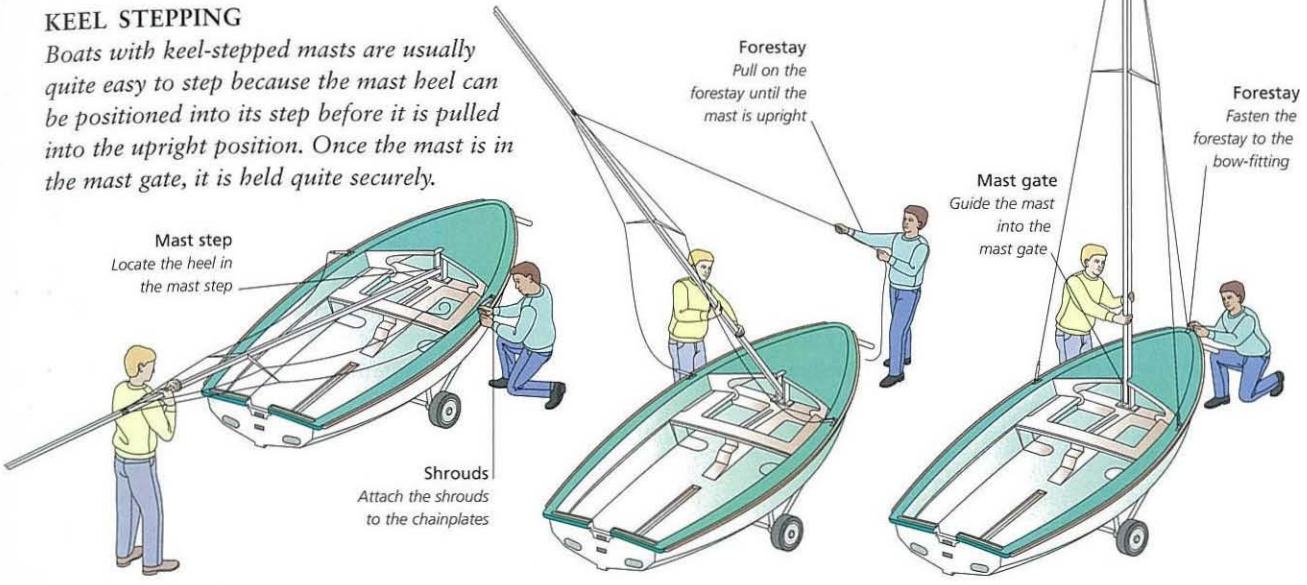
STEPPING AN UNSTAYED MAST

With the sail sleeved over the mast from the top, the mast is lifted into a vertical position and lowered into the mast step. Place your hands some distance apart on the mast to give more leverage.

STEPPING A STAYED MAST

KEEL STEPPING

Boats with keel-stepped masts are usually quite easy to step because the mast heel can be positioned into its step before it is pulled into the upright position. Once the mast is in the mast gate, it is held quite securely.



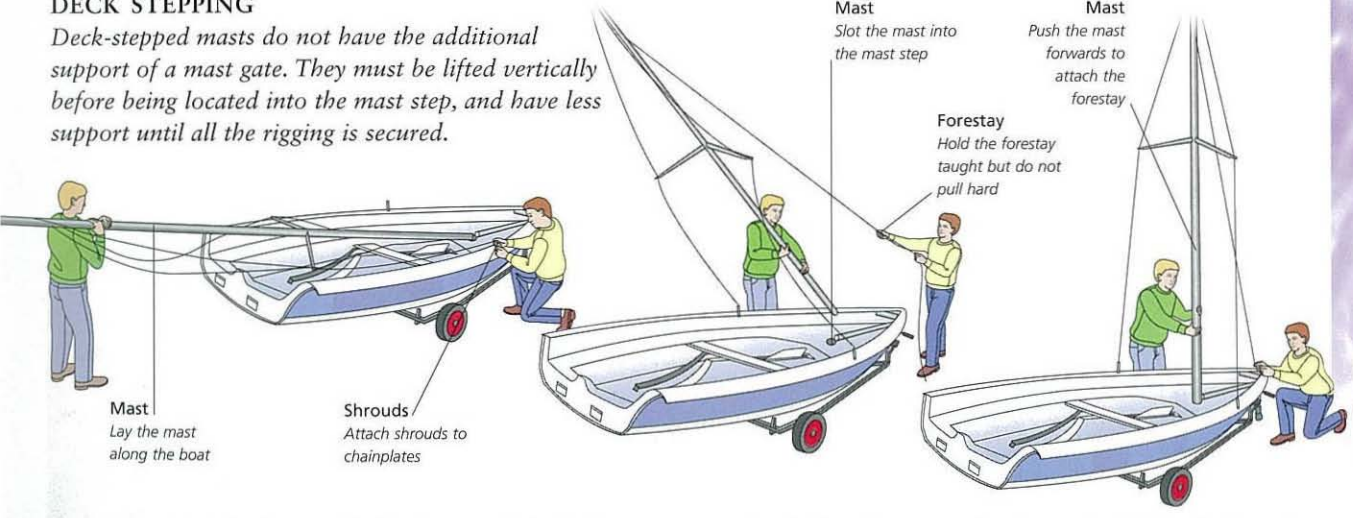
1 Lay the mast and rigging on the boat, with the mast heel resting on the mast step and with the front side of the mast uppermost. Attach the two shrouds to the chainplates on the sidedecks.

2 As one person lifts the mast and positions the heel into the mast step. The other pulls on the forestay when the mast heel is in the step. The person supporting the mast guides it into the mast gate.

3 Attach the forestay and close the deck-level mast gate. Check the mast rake. Make sure that the halyards are not twisted around the rigging, and ensure that they are led correctly to their respective cleats.

DECK STEPPING

Deck-stepped masts do not have the additional support of a mast gate. They must be lifted vertically before being located into the mast step, and have less support until all the rigging is secured.



1 Lay the mast on the boat with the fore side uppermost and the heel towards the bow. Attach the shrouds to the chainplates.

2 If the boat has a double floor, one person can get into the boat to lift the mast into position. In an older boat with a single floor, do not get into the boat when ashore. Lift the mast in from the side of the boat.

3 Allow the mast to lean forwards, held by the shrouds, and attach the forestay to the bow-fitting. Next, adjust the shrouds and forestay to get the desired rake. Finally, ensure that the halyards are not twisted and that they are led correctly to their respective cleats.

MAINSHEET SYSTEMS

The mainsheet is used to adjust the position of the boom and to help control the shape of the mainsail. When the mainsail is full of wind, there can be quite a heavy load on the mainsheet, so it is run through a system of blocks, called a mainsheet tackle, to make it easier for the helmsman to hold and adjust.

There are two main types of mainsheet system: centre and aft. On the former system, the end of the sheet leads to the helmsman's hand from a block forwards of the helmsman. In aft-mainsheet systems, the sheet is led from aft of the helmsman. Either type may have a traveller on a track, which can be used to position the mainsheet athwartships. Centre mainsheets are common on racing boats as they offer more control of the sail. Boats with aft-mainsheet systems have more room in the cockpit, which makes them the most popular design for general-purpose dinghies.

Mainsheet systems are usually left in place when the boat is not being sailed. When rigging, check that the fittings are secure and that the sheet runs correctly and smoothly through the various blocks in the tackle. Also, ensure that the mainsheet has a figure-of-eight knot (*pp. 46-47*) in the end to prevent it from running out through the mainsheet blocks.

AFT-MAINSHEET SYSTEMS

In an aft-mainsheet system, the top block of the tackle is normally attached to a swivel plate at the end of the boom. The bottom block is often attached to a traveller that runs on a track across the transom. Other, simpler designs may be found: sometimes the lower mainsheet block is attached to a rope bridle attached to the transom corners. If a traveller is used, it may have control lines to adjust its position on the track.

Aft-mainsheet systems do not usually have a jamming block for the mainsheet, but they may have a ratchet block to reduce the load that the helmsman has to hold. Because the mainsheet leads from aft, the helmsman must face aft when tacking.

CENTRE-MAINSHEET SYSTEMS

In most centre-mainsheet systems, the top block of the mainsheet tackle is attached to the middle of the boom. This means it has less leverage and more load than an aft mainsheet, so extra blocks are needed in the tackle. The lower block may be attached to an athwartships-track, which runs across the middle of the boat, or it can be fitted on the floor, on a raised hoop, or on the centreboard case. There is usually a cleat attached to the lower mainsheet block so that the sheet can be cleated when the helmsman chooses. If an athwartships track is fitted, the mainsheet tackle's lower block is attached to a traveller that runs on the track. The position of the traveller is usually controlled by lines led from the traveller to the sidedeck within easy reach of the helmsman.

CENTRE MAINSHEET TRAVELLER

This centre mainsheet has an athwartship track with a mainsheet traveller, the position of which is adjusted by control lines.

CENTRE LEAD WITH AFT TACKLE

In this Laser II, the mainsheet tackle is attached near the end of the boom with the lower block on an adjustable rope-bridle system. The sheet then leads forwards along the boom to a central block.

AFT MAINSHEET

In this conventional aft-mainsheet arrangement, the lower block is attached to a traveller running on a track mounted on the transom. The traveller position may be adjusted using control lines.

RIGGING THE JIB

Rigging the jib is a one-man job that is usually carried out by the crew, who is responsible for handling the sail. It is always good practice to check the sail for damage as you unfold it and while you are attaching it to the boat. In particular, check the corners and seams for worn or frayed stitching.

JIB FITTINGS

The details of jib fittings and the way it attaches to the boat vary according to the design and size of the boat. In all cases, the jib tack is attached to the bow fitting, usually with a shackle, and its head is attached to the jib halyard, using a shackle or by tying a knot (usually a bowline). Jib sheets are attached to the clew and led through the fairleads on each side of the boat.

On many boats the jib luff is attached to the forestay, using webbing straps, or metal or plastic clips called hanks, that are clipped around the forestay. Alternatively, the jib may not be attached to the forestay, which may be removable once the jib is hoisted. In this case the jib will usually have a wire sewn into the luff to take the high loads. In other cases, a low-stretch tape or rope reinforcement is used. Some jibs are fitted with a roller device at the tack to allow them to be rolled up around their luff when not in use.

Start rigging the jib by removing it from its bag and finding the tack, which can usually be identified by the sail maker's label. Attach the tack to the bow fitting then hank the jib luff to the forestay if this system is used in your boat. Start hanking from the tack and work upwards, making sure that the luff is not twisted between the hanks. Attach the sheets to the clew. Finally, attach the halyard to the sail when you are ready to hoist it.

ATTACHING THE JIB

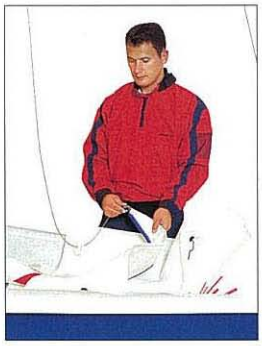
Remove the sail from its bag, and lay it on the foredeck. A wire-luffed jib will have been stowed by coiling the luff in circles to prevent the wire kinking. Uncoil it carefully, and make sure that there are no twists in the sail by running your hand along the luff from tack to head. Take care that the sail does not blow off the boat and try to keep the sail clean while you are handling it.

ROLLER FURLING

Some dinghies and small keelboats have a jib roller furling system which allows the jib to be rolled up when not required.

1 Attach the tack of the jib to the bow fitting on the dinghy, usually just behind the point where the forestay is fastened. This is usually done with a shackle or lashing. On some boats, as here, the forestay is removed once the jib has been hoisted.

2 Attach the jib sheets. If they are one-piece, as here, make a loop in the middle of the sheet, push it through the cringle, then pass the ends through the loop. Pull the rope through to tighten. If there are two sheets, tie them to the clew cringle.



3 Run a hand along the luff to make sure it is not twisted. If your jib has luff hanks, attach them to the forestay. Check the halyard is not tangled and attach it to the head of the sail.

4 Hoist the jib by pulling on the halyard. Make sure the sheets are loose so it can flap. Some small dinghies have a simple cleat for the halyard but others, as here, have an adjuster.

5 Cleat the halyard or attach it to the adjuster. Here, the adjustment tackle is hooked into a loop in the end of the wire part of the halyard. Coil up the rope tail and stow neatly.

RIGGING THE MAINSAIL

If you are sailing a boat with an unstayed mast (*p.68*) and a sleeved sail, you must fit the mainsail onto the mast before it is stepped. In most boats, however, the sails are attached only after the mast has been stepped. A mainsail is attached to the mast along its luff and to the boom at its foot. There are two methods that are used to attach the mainsail to the boom. In many boats, the mainsail is fitted by sliding its foot into a groove in the top of the boom. In this case, the sail will have a boltrope sewn in a hem at the foot. Other designs have a loose-footed mainsail, which means that the sail is attached to the boom only at the tack and clew.

MAINSAIL FITTINGS

A mainsail usually has three or more battens that support the roach (the curved shape of the leech). Without them, all the sail that is outside a direct line between head and clew would curl over and be ineffective. Some mainsails have full length battens that run from the leech to the luff while others use short battens or a combination of both. Some jibs are also fitted with battens.

Battens may differ in flexibility, depending on which batten pocket they are made for, and the inner end of the batten may be more flexible than the outer end to match the curve in the sail. If this is the case, the battens should be marked to show which pocket they belong in and the end that should be inserted first.

BOOM FITTINGS

The boom is attached to the mast via a gooseneck and a boom vang. The gooseneck locates it and allows it to pivot from side to side, while the boom vang prevents it from lifting.

BATTENS

Battens are made of wood, fibreglass, or plastic. They slot into pockets sewn into the sail and are either tied into the pocket or slipped under a flap sewn into its outer end. Battens are often made for specific pockets, so make sure that they are inserted the right way around and in the correct pocket.

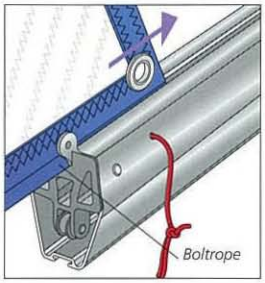
1 Insert the batten, inner end first, into the correct pocket and slide it in to its full length.

2 Push the batten firmly in and secure it in place with the fastener provided, here a Velcro strip.

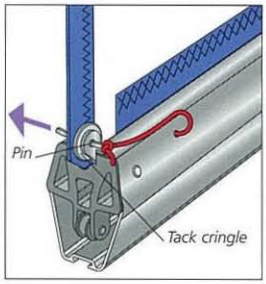
MAINSAIL BATTENS
This mainsail has two full length battens at the top and two short battens lower down the leech.

ATTACHING A CONVENTIONAL SAIL TO THE BOOM

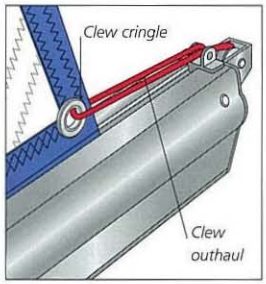
Take the mainsail out of its bag and unroll it inside the boat, with the luff nearest to the mast. Check that you have the requisite number of battens and that they are all in place (above). *Once you have fitted the mainsail to it, put the boom inside the boat until you are ready to hoist the sail. Do not put the boom onto the gooseneck until after the sail is hoisted. The boom is likely to slide off the gooseneck if it is fitted before the sail is hoisted.*



1 Holding the clew, slide the boltrope into the groove at the forward (mast) end of the boom. Make sure that none of the sail cloth gets caught in the groove with the boltrope.



2 Pull the clew until all the foot of the sail is in the groove. Fix the tack to the forward end of the boom (often by sliding a pin through the tack cringle and the boom).



3 Pull the foot of the sail so that it is taut, and fasten the clew outhaul which is used to adjust the tension in the foot of the sail. It is usually adjustable but may be fixed at the boom end.

ATTACHING A LOOSE FOOTED SAIL TO THE BOOM

Unroll the sail and check that the battens are in their pockets. Because the foot of the sail is not attached to the boom along its length you need only attach the clew and the tack. The clew is attached to the outer end of the boom with the clew outhaul, while the tack is either fastened to the gooseneck, with a pin or a lashing, or is secured with an adjustable rope called a tack downhaul. Do not put the boom onto the gooseneck until the sail is hoisted.

1 Remove the sail from its bag and unroll it on the boat. Find the two lower corners, the clew and the tack.

2 Put the metal "slug" fitted at the clew into the cut-out in the boom's groove. Slide it out to the end of the boom.

3 Pass the clew outhaul through the clew cringle and fasten its end at the end of the boom, here by hooking a knot into a slot.

4 Attach the halyard to the head. If a ball is fitted, as here, push a loop through the cringle, then put the end through the loop.

5 To hoist the sail, one person pulls on the halyard while the other feeds the sail's boltrope into the mast groove.

6 Attach the boom to the gooseneck (*below*). Pass the tack downhaul through the tack cringle and secure the end.

THE GOOSENECK

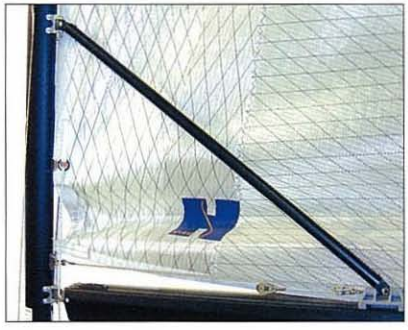
The gooseneck is a hinged fitting that attaches the boom to the mast. It can pivot to left and right and up and down, and allows the boom to move freely in these directions. When fitted into a socket in the boom end, it prevents the boom from rotating.

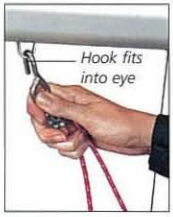
FITTING THE BOOM

The gooseneck is usually fixed in position, although some can be slid up or down to adjust the boom's height. Its pin is inserted into the socket on the boom end.

THE BOOM VANG

The boom vang, or kicking strap, usually consists of an adjustable tackle of rope (or wire) that prevents the boom rising under the pressure of wind in the mainsail. The vang is attached to the boom some way back from the gooseneck, and to the mast just above the heel, making an angle of about 45 degrees between mast and boom.





THE VANG TACKLE

The boom vang usually consists of a rope tackle attached to the boom by a hook, as here, or a key and slot system. The other end of the tackle is attached near the base of the mast, and the control line runs aft.

SOLID VANG

Some boats have a solid vang fitted above the boom, between it and the mast. The mast end is pivoted and the boom end runs on a track along the boom. The vang is adjusted by a tackle running between the lower end of the vang and the gooseneck.

REEFING A DINGHY

IF THE WIND INCREASES BEYOND FORCE 3, many sailing dinghies start to become harder to handle. Reducing the sail area, known as reefing, makes the dinghy more stable and easier to control in stronger winds. There are three main methods of reefing a mainsail: traditional slab reefing; rolling the sail around the boom; and rolling the sail around the mast. The method you use will depend on the design of your dinghy. A jib can be changed for a smaller one or rolled around the forestay.

A MAINSAIL REEFED ASHORE

WHEN TO REEF

Racing dinghies are hardly ever reefed, and races are frequently postponed in strong winds. When sailing for recreation, however, reefing allows you to sail under control in strong winds and reduces the risk of capsize. You can reef while you are afloat if your boat has slab or boom roller reefing, but it is much easier to reef ashore before you set sail. A single-handed dinghy with a sleeved sail should be reefed before sailing.

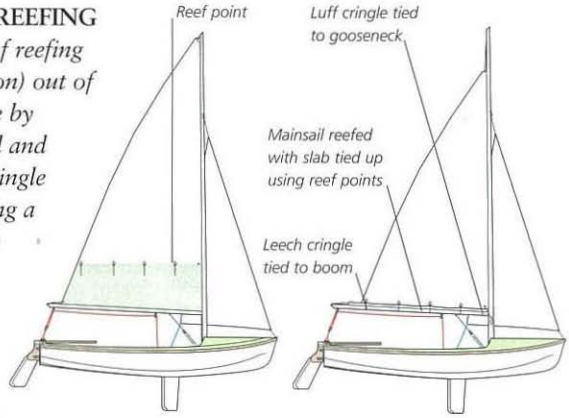
When reefing a dinghy that has a mainsail and a jib, you should change to a smaller jib if possible when you reef the main in order to keep the sail plan balanced.

METHODS OF REEFING

Slab reefing involves taking a portion out of the mainsail, and dinghies designed for this method will have one or two rows of reef points (thin ropes stitched to the sail) or cringles (reinforced eyes in the sail) for lacing a reefing line. Dinghies with unstayed masts can be reefed by rolling the sail around the mast, although this is not easy to do afloat. Dinghies with aft-mainsheet systems are most commonly reefed by rolling the sail around the boom – a method that cannot be used when the mainsheet is attached in the middle of the boom.

TRADITIONAL SLAB REEFING

The traditional method of reefing is to take a "slab" (portion) out of the mainsail. This is done by partially lowering the sail and then tying down a luff cringle and a leech cringle, leaving a fold of sail parallel to the foot, along the boom. The fold may be left hanging or it can be tied up using reef points, or laced with a line led through a row of reef cringles across the sail.

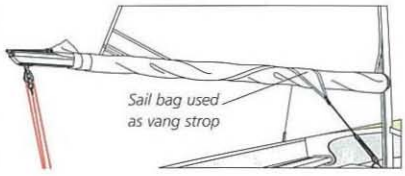


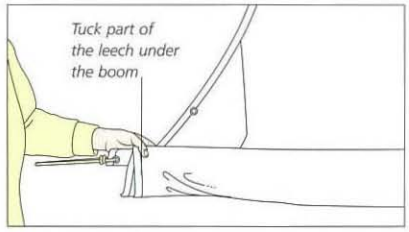
UNREEFED SAIL

SAIL WITH ONE REEF

ROLLING THE SAIL AROUND THE BOOM

Rolling the mainsail around the boom is used for aft-mainsheet systems (p.70). It requires one person at the gooseneck and one at the aft end of the boom. A tuck is put in the leech to stop the boom drooping after reefing. The rolled sail covers the boom-vang fitting so a replacement is created using a sail bag, a length of rope, or a webbing strap tucked into the sail as it is rolled.



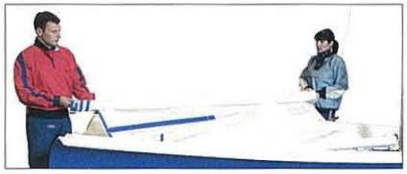


1 Slacken the halyard. Take the boom off the mast and make a 15cm (6in) tuck in the leech, pulling it tightly aft, and wrap it around the boom. Holding the tuck in place, rotate the boom, pulling the sail taut at both leech and luff as you go.

2 Three turns before you finish the reef, insert the temporary vang strop. Complete the reef, replace the boom on the gooseneck, tighten the halyard, and tie the vang to the strop.

REEFING A CENTRE MAINSHEET BOAT

Some dinghies with a centre-mainsheet system are designed to be reefed. They often have a loose-footed mainsail that attaches to the boom only at the tack and clew. To reef with this system, hoist the sail part way up the mast and, with one person at the tack and the other at the clew, tightly roll the sail up from the foot until you reach the leech and luff cringles. Slide the new clew slug into the boom and attach the clew outhaul through the leech cringle, then attach the tack downhaul through the luff cringle. Hoist the sail until the luff is taut and cleat the halyard.



1 With one person at the luff and one at the leech, roll the sail up tightly parallel to the foot, and smooth out any creases.

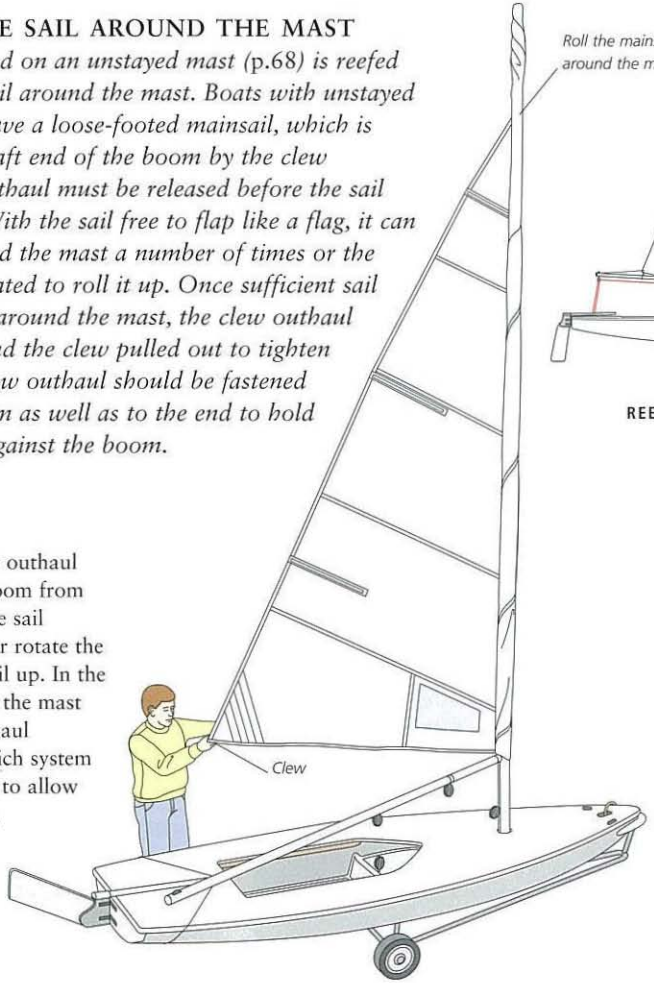
2 Holding the rolled up sail, put both the clew slug and the reefing slug into the groove in the top of the boom.

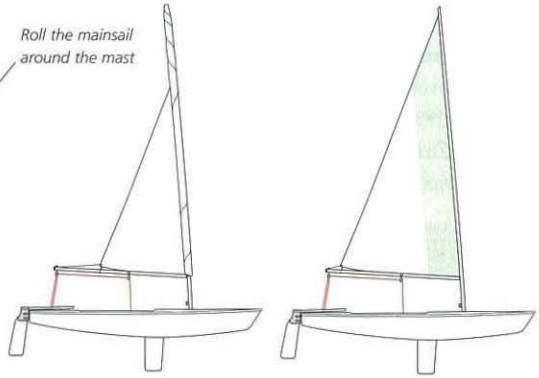
3 Pass the clew outhaul through the leech reef cringle and fasten its end back at the boom end. Pull the clew outhaul tight.

4 Pass the tack downhaul through the luff reef cringle and the old tack cringle and fasten its end under the gooseneck.

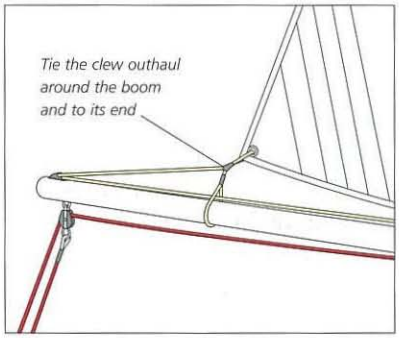
ROLLING THE SAIL AROUND THE MAST

A mainsail rigged on an unstayed mast (p.68) is reefed by rolling the sail around the mast. Boats with unstayed masts usually have a loose-footed mainsail, which is attached to the aft end of the boom by the clew outhaul. The outhaul must be released before the sail can be reefed. With the sail free to flap like a flag, it can be passed around the mast a number of times or the mast can be rotated to roll it up. Once sufficient sail has been rolled around the mast, the clew outhaul is re-attached and the clew pulled out to tighten the foot. The clew outhaul should be fastened around the boom as well as to the end to hold the clew close against the boom.





1 Release the clew outhaul and remove the boom from the mast. Wrap the sail around the mast or rotate the mast to roll the sail up. In the latter case, release the mast lock or the downhaul (depending on which system the boat employs) to allow the mast to rotate, resecuring the mast when the sail has been reefed.



2 Fit the boom back onto the mast and re-fasten the clew outhaul, making sure that you pass it around the boom to hold the clew close to the boom. Tighten the boom vang.

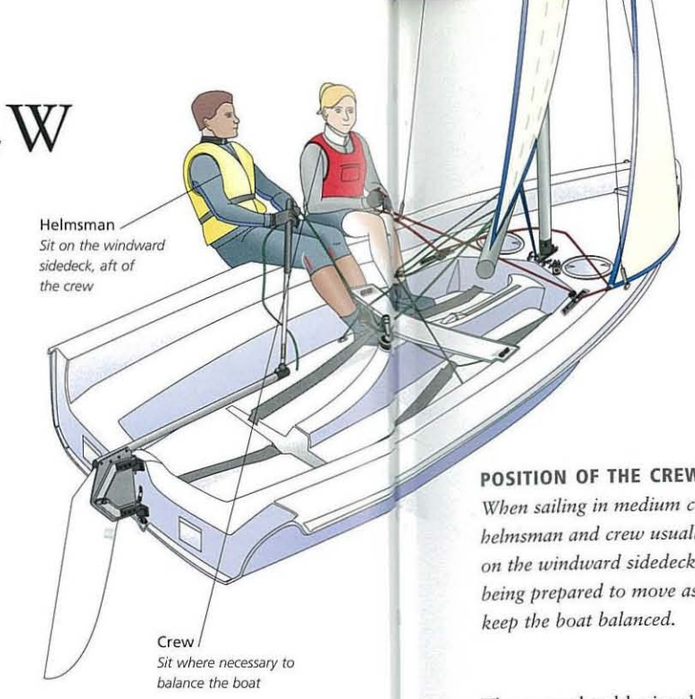
HELMSMAN AND CREW

IN A TWO-MAN BOAT, both crew members have distinct roles that must be carried out if the boat is to sail safely and efficiently. The helmsman is in overall charge of the boat. He is also responsible for steering the boat and trimming the mainsail. The crew follows the helmsman's instructions and is responsible for trimming the jib and adjusting the centreboard. Both crew members must be prepared to move their weight to keep the boat balanced and correctly trimmed, although the main balancing work is the responsibility of the crew.

THE HELMSMAN'S ROLE

The windward sidedeck is the best position for the helmsman. He should sit far enough forward to be clear of the end of the tiller, while holding the tiller extension in his aft hand and the mainsheet in his forward hand. This position allows him the clearest view of the water all around the boat, as well as affording a clear view of the sails. It is the most comfortable place from which to control the rudder and trim the mainsail. To perform his role as chief decision-maker, the helmsman must have a good knowledge of the rules of the road (*pp.52-53*) so that he knows when to keep clear of other boats and when he has right of way.

His instructions to the crew must be clear; they must be loud enough to be heard over the noise of wind and water. They must also be given early enough for the crew to be able to respond in good time. Although he is in charge of the boat, the helmsman should encourage input from his crew, and must be prepared to listen to information and advice.



THE CREW'S ROLE

The crew sits just forward of the helmsman but must be ready to move in and out of the boat to keep it upright while allowing the helmsman to stay on the windward sidedeck. He must learn to anticipate changes in the direction or strength of the wind; and should be ready to counteract their effects by altering his position quickly.

When sitting out, both the helmsman and crew tuck their feet under toestraps to allow them to lean out without overbalancing. The toestraps should be adjusted so that both can sit out comfortably.

BALANCING THE BOAT
The helmsman is sitting where he has a good view of the sails while the crew is sitting out hard to balance the boat.

POSITION OF THE CREW
When sailing in medium conditions, the helmsman and crew usually sit side by side on the windward sidedeck, with the crew being prepared to move as necessary to keep the boat balanced.

The crew should trim the jib to match any changes in wind direction or the boat's course. He should raise and lower the centreboard (or daggerboard) to suit the point of sailing. He should also keep a good look out all around the dinghy, especially to leeward where it can be difficult for the helmsman to see. He must warn the helmsman about any potential collision situations in good time. An experienced crew will also discuss sail trim with the helmsman.

CO-ORDINATION

It is important that the helmsman and crew learn to co-ordinate their movements. When the boat heels, the crew should move first to adjust the balance – the helmsman moves only if there is a large change in trim. When a course change is required, good crews move together smoothly to assist the turn and to maintain balance and speed. This teamwork becomes increasingly important when sailing in high-performance dinghies and when racing.

UNDERSTANDING HEEL AND TRIM

One of the most important factors contributing to fast, efficient, and easy sailing is the correct sideways balance, and fore-and-aft trim of the boat. Much of the effort expended by the helmsman and crew during sailing goes into maintaining the ideal balance.

CORRECTING HEEL

When sailing in light winds, upwind, or on a reach, the helmsman sits to windward and the crew corrects heel by sitting to leeward. If the wind increases, the crew moves first into the middle of the boat, then to sit out beside the helmsman. When sailing downwind, the heeling force is almost zero, so the crew sits in the middle of the boat or to leeward, opposite the helmsman.

CORRECTING TRIM

In moderate winds, the boat should be level fore and aft when the helmsman and crew sit side by side, with the crew sitting just behind the windward shroud. By sitting close together, they reduce the windage of their bodies and also keep their weight centred, which allows the bow and stern to lift easily to pass over waves. If their weight is too far forward, the bow is depressed and steering can become difficult. If their weight is too far back, the stern is depressed and the transom digs into the water, which makes the boat slow down and difficult to sail upwind.

When sailing upwind in very light winds, the helmsman moves forward to just behind the shroud, and the crew sits in the middle or to leeward. This lifts the flat, aft sections of the boat and reduces drag. When sailing downwind in strong winds, the helmsman and crew move aft to lift the bow, but not so far as to make the stern drag.

CORRECT TRIM
The helmsman and crew sit close together to minimize the windage of their bodies. They position themselves to trim the boat fore and aft so that the transom is just clear of the water. In lighter winds they would move forwards slightly to lift the stern and in stronger winds they would move aft to lift the bow.

CORRECT BALANCE
The crew moves her weight to balance the boat and allow the helmsman to sit to windward from where he has the best view of the sails and course. Here, the boat is on a run in light airs so the crew sits to leeward, under the boom, to balance the boat. From here, she can see the jib trim and hazards to leeward.

TURNING FORCES

A SAILING BOAT'S PERFORMANCE is determined by the efficient interaction of the main controls – hull balance and trim, sails, rudder, and centreboard. When used correctly, these make the boat easy to steer and sail efficiently. However, the hull, sails, and centreboard can produce powerful turning forces, which, in extreme cases, may overcome the effects of the rudder. You need to learn how to keep all these forces in balance, otherwise the boat will slow down and become more difficult to sail.

BALANCE AND TRIM

Although the sensation of speed may be greater when your dinghy is heeled well over, sailing this way is actually slower than sailing with the boat upright. A dinghy hull is designed to be at its most efficient when it sits on its natural waterline, level sideways (balance) and fore and aft (trim). When it is balanced and trimmed in this way, the boat will sail fast and will tend to move in a straight line.

Balance is achieved by the crew moving their weight in and out of the boat to port and/or starboard in order to counteract the heeling force of the sails. When the boat is upright, the shape of its underwater section is symmetrical and it will move in a straight line. However, if the boat is allowed to heel, the shape changes and it will try to turn.

The fore-and-aft trim of the boat is just as important as its sideways balance. The amount of the hull in the water – its waterline shape – can be altered by the crew moving forwards or aft and this shape will have an effect on the way the boat handles. If the crew moves forwards in the boat this will depress the bow while lifting the stern. This can be useful to reduce hull drag in very light winds but it is slow in other conditions and the boat will tend to turn towards the wind. If the crew move their weight aft, the stern will be depressed and the bow raised. This is often done when sailing downwind in strong winds or when planing *(p.126)* to prevent the bow from digging into the water. In other situations, however, it will slow the boat down and tend to make it turn away from the wind.

THE SAILS

A boat's sails are trimmed to create the force that drives the boat forward, but they can also be used to help change direction. Most small boats have two sails – a mainsail behind the mast and a jib forwards of it. When both are trimmed correctly (and the hull is upright and the centreboard in the correct position), the boat will be well balanced and will require little use of the rudder to keep it on course.

Most of the time you will trim the sails to work efficiently together and eliminate their turning effects. When you want to change course, however, the sails can be a very useful aid in making the manoeuvre as smooth and efficient as possible. By using the sails to help turn the boat you will reduce the amount you need to use the rudder *(p.81)*. The helmsman and crew must coordinate their actions in trimming the mainsail and jib in order to achieve the desired turning effect.

THE CENTREBOARD

A centreboard or daggerboard is used to resist sideways force *(pp.34–35)*. It also acts as the pivot point around which the boat turns.

Most dinghies are fitted with a centreboard that pivots inside a case. When it is raised and retracted into its case, its tip moves back and upwards. This decreases the area of centreboard under the boat and also alters its position along the fore-and-aft line. This fore-and-aft movement has an effect on the steering. When it is in its correct position, the turning forces of the jib and mainsail are balanced around the pivot point. If the centreboard is raised, the boat will turn away from the wind as the pivot point moves aft. Conversely, if the centreboard is lowered further, the pivot point moves forwards and the boat will tend to turn into the wind.

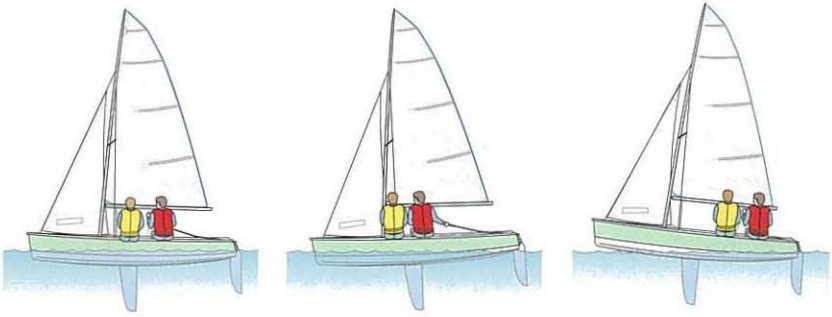
Daggerboards move vertically inside their case. When a daggerboard is raised, the area under the boat is reduced but its position along the fore-and-aft line remains the same and has no turning effect.

THE RUDDER

The primary control for changing direction is the rudder. However, it is important to remember that whenever the rudder is moved off-centre by more than four degrees it acts as a brake as well as a turning control. The further the rudder is turned, the greater the braking effect. Rudders work most efficiently when the boat is moving quickly. The braking effect is, likewise, most dramatic at speed, when careful handling is required. At slow speeds, the rudder's effect is reduced because the water moves past it more slowly, and it has no effect when the boat is stopped. Remember that the effect of the rudder is reversed when the boat moves backwards.

BOAT TRIM

The natural tendency of most beginners is to sit too far aft in the boat. In normal conditions the helmsman should sit forwards of the end of the tiller so that he can move it freely without it hitting his body. The crew should sit just forwards of the helmsman, which in most dinghies will mean he sits just aft of the shrouds. Helmsman and crew should sit close together to keep their weight centred in the boat and to reduce the wind resistance of their bodies. In light winds they should move forwards to lift the stern and reduce hull drag, especially when sailing on a windward course. In strong winds, and especially when sailing downwind, they should move aft to lift the bow.



HULL LEVEL

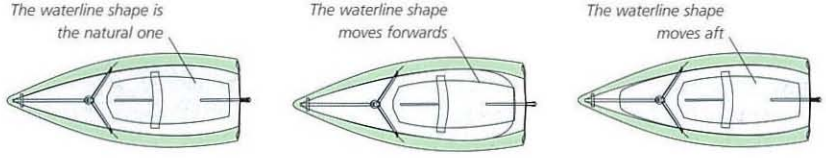
The crew trim the boat so that it sits in the water on its natural waterline. This is the best trim in most conditions.

BOW DOWN

The crew move forwards to depress the bow and lift the stern. The boat will tend to turn towards the wind.

BOW UP

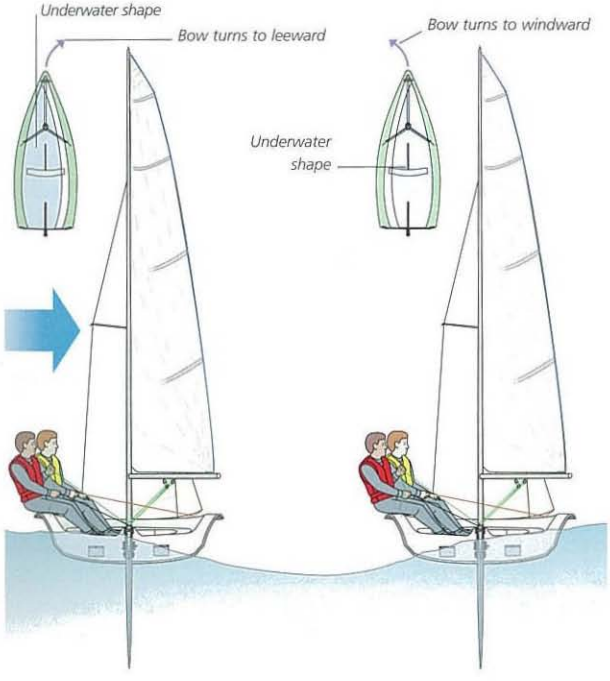
By moving aft, the crew depress the stern and raise the bow. The boat tends to turn away from the wind.

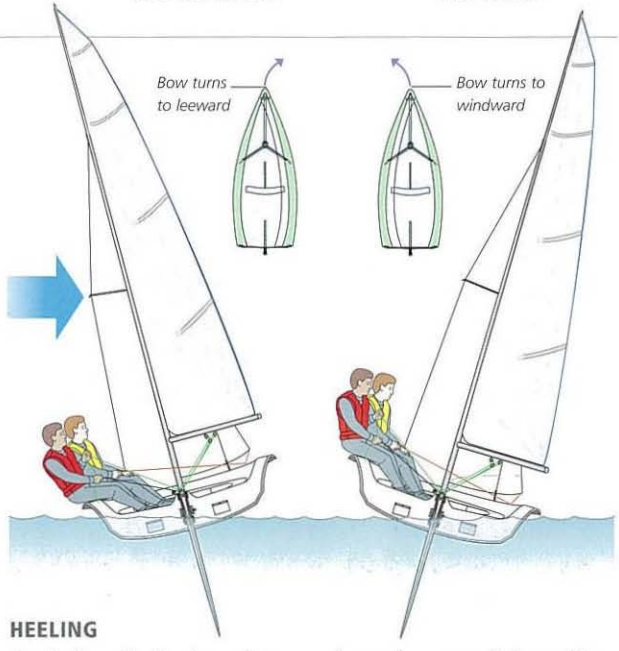


HULL LEVEL | BOW DEPRESSED | BOW LIFTED

BOAT BALANCE

When the hull is level in the water, sideways as well as fore and aft, it has a symmetrical waterline shape and will tend to sail in a straight line. However, if the boat heels to windward or to leeward, the shape of the waterline becomes asymmetrical, which makes the boat try to turn.





HEELING

As the boat heels, the underwater shape changes and the rudder and centreboard become off-centre in the underwater area, this makes the boat try to turn in the direction opposite to the heel.

WAVES ON THE BEAM

The turning effect also occurs when a wave passes under the hull from the side. First, the windward side is more immersed and the boat tries to turn away from the wind; then, the leeward side is more immersed and the boat tries to turn towards the wind.

USING THE SAILS

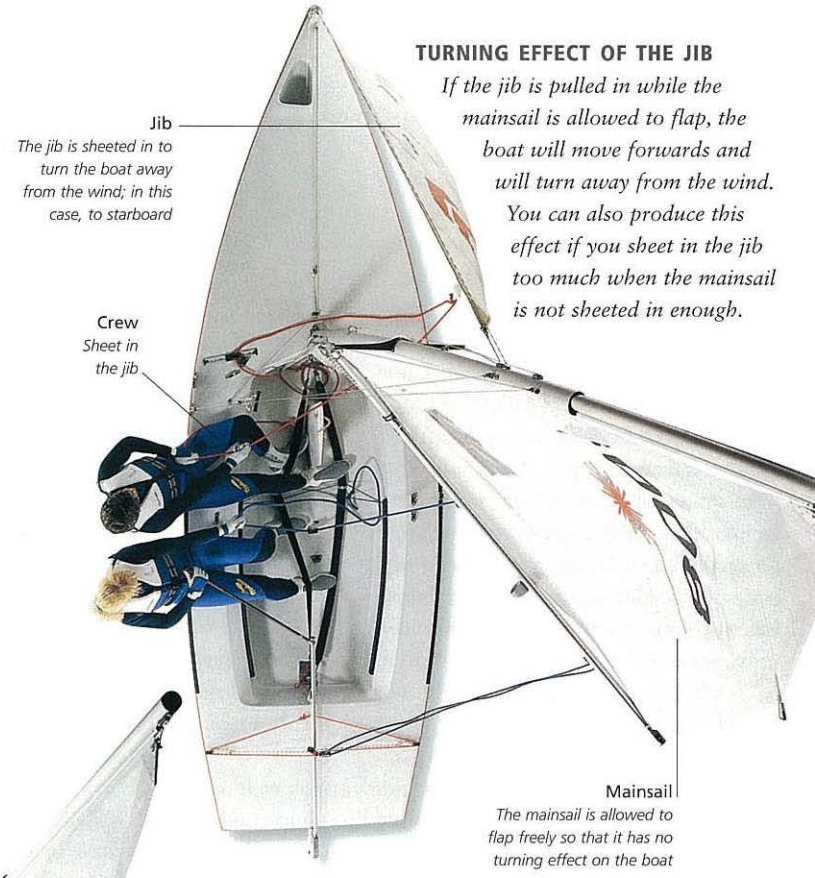
Both the mainsail and the jib can be used separately to create a force that will turn the boat. Because the jib is smaller than the mainsail, its turning effect is not quite as large as the mainsail, but it will still be significant. The jib used alone acts in front of the centreboard's pivot point, so pulls the bow away from the wind. The mainsail used alone acts behind the pivot point, so pulls the stern away from the wind and the bow towards it. The turning effect of each depends on the other sail being let out.

TURNING EFFECT OF THE MAINSAIL

If the mainsail is pulled in while the jib is allowed to flap, the boat will move forwards and turn to windward. The more quickly you pull in the mainsail, the faster the boat turns. You will also produce this effect by sheeting in the mainsail too much when the jib is not sheeted in enough.

TURNING EFFECT OF THE JIB

If the jib is pulled in while the mainsail is allowed to flap, the boat will move forwards and will turn away from the wind. You can also produce this effect if you sheet in the jib too much when the mainsail is not sheeted in enough.

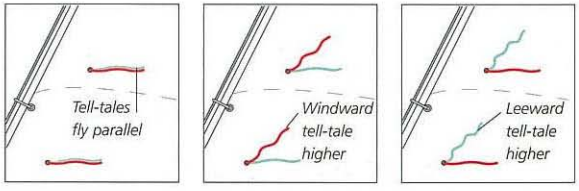


SAIL SETTING USING TELL-TALES

Tell-tales are light strips of wool or nylon, sewn or glued about 15–23cm (6–9in) in from the luff on both sides of the sails. They indicate whether the air stream at the sail surface is smooth or turbulent.

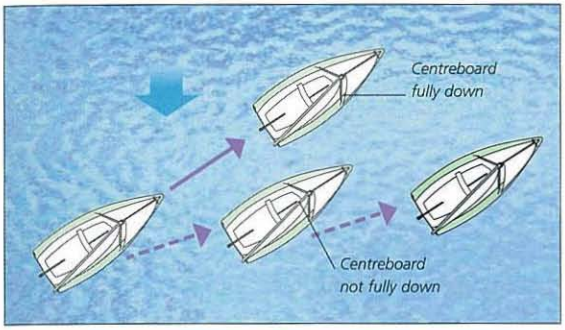
HOW TELL-TALES WORK

If the sail is trimmed correctly, the tell-tales on both sides will fly parallel. If those to windward fly higher, pull in the sheet; if those to leeward fly higher, let out the sheet.



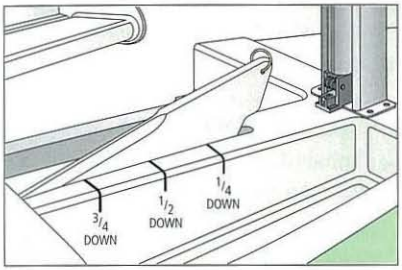
USING THE CENTREBOARD

The centreboard or daggerboard provides most of the resistance to sideways movement, so it is vital that the centreboard or daggerboard is used properly, especially if you are sailing close-hauled (when it should be fully down). Beginners often forget to lower the board when sailing away from land, or when turning onto a close-hauled course. If you try to sail close to the wind with the board up, the boat will move as fast sideways as it does forwards, resulting in a crab-like course and making it difficult for the helmsman to steer a course.



CENTREBOARD

If the centreboard is not lowered sufficiently, the sideways force will not be resisted and the boat will slide sideways. This leeward motion is most apparent when sailing upwind, when full centreboard is needed.



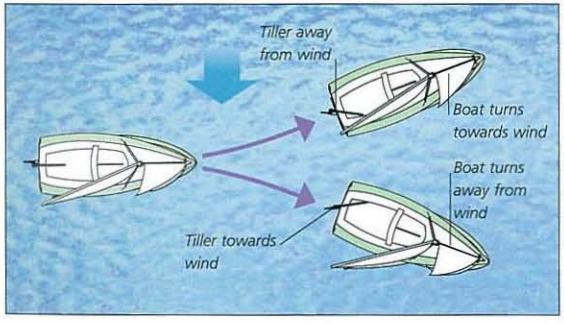
CENTREBOARD MARKING

Marking the centreboard case, quarter down, half down, etc. is a good way to indicate how much of the centreboard is protruding below the hull at any given time. Position the leading edge against the marks. If your dinghy has a daggerboard, mark the daggerboard itself, not its case.

USING THE RUDDER

Sitting in the helmsman's position on the windward side of the boat, push the tiller away to turn the boat towards the wind. As the boat turns, the sails should be trimmed for the new course. If the turn continues, the boat will reach head-to-wind and stop. To turn away from the wind, pull the tiller towards you. As the boat turns further downwind, the sails must be let out to keep them set correctly.

Keep your actions smooth. When the rudder turns, it acts as a brake as well as a turning device, so avoid jerking it backwards and forwards.



STEERING

Sit to windward opposite the sails when steering. Gently push or pull the tiller to move the rudder and turn the boat. When moving forwards, the bow always turns in the direction opposite to the way you move the tiller.

USING ALL THE TURNING CONTROLS

To understand fully how all the turning forces work in practice, try the following exercises when you go afloat. Start by sailing on a beam reach, then make sure that both sails are only partly full of wind, the centreboard is half down, and the rudder is centred. Now run through these two sequences.

TURN TOWARDS THE WIND

- Firstly, the helmsman gently pushes the tiller away from him.
- The crew lowers the centreboard.
- Next, the helmsman pulls in the mainsheet to trim the mainsail, and the crew lets out the jib.
- At the same time, heel the boat slightly away from the wind.

TURN AWAY FROM THE WIND

- The helmsman gently pulls the tiller towards him.
- The crew raises the centreboard.
- The crew pulls in the jib and the helmsman lets out the mainsail.
- At the same time, heel the boat slightly towards the wind.

UNDER CONTROL

Here, the crew are sailing fast downwind under full control by keeping the boat correctly trimmed and balanced, and using sail trim to help steer the boat as it surfs down a wave front. The boat is well balanced so it is easy to steer.

GOING AFLOAT

THE FIRST TIME YOU SET SAIL, whether it is alone or with an instructor, you will begin to appreciate the challenges, rewards, and responsibilities of sailing. When you are learning with an instructor you need concentrate only on acquiring new skills, leaving the safety aspects to him. If you sail off alone, however, you are in sole charge of your destiny. This is one of the greatest attractions of sailing, but you must be aware of the risks and take sensible precautions if you are to enjoy the experience.

BEFORE LAUNCHING

Whenever you decide to go sailing, choose a suitable location and only go afloat when the weather and water conditions are appropriate to your level of expertise. When you arrive at your chosen sailing area, be prepared to ask local sailors for their advice before you go afloat as they will have experience of the prevailing conditions. Make sure that they are aware of your level of experience.

Many people start learning to sail on inland waters as they are generally more sheltered than the sea and there are no tides to complicate matters. Help is usually close at hand, too, should you find yourself in difficulties. However, there is no reason why you should not learn how to sail on the sea, provided that you are prepared to take sensible safety precautions.

ASSESSING THE WIND

For your first trip alone, pick a day when the wind is Force 3 or less. Check the weather forecast, paying most attention to the local area sailing forecast. Do not hesitate to cancel your trip if you are not sure that the conditions will be right.

When you arrive at the sailing area, take a careful look at all the wind indicators to help you build a picture of the conditions. Check flags, both ashore and on moored boats, and the direction of any smoke from chimneys, and the way trees move in the wind. Look at waves on the water, which usually run at right angles to the wind. It is also very important that you know whether the wind is onshore or offshore as it can make a great difference to your trip.

SAILING IN ONSHORE WINDS

If the wind is onshore, it will feel stronger. If it is moderate or strong, it will cause waves to break on the beach. An onshore wind makes it harder to launch and sail off because it will tend to blow you back onto the shore. On the other hand, it is easy to return to the shore in an onshore wind, and you will not be in danger of being blown away from your base.

SAILING IN OFFSHORE WINDS

If the wind is offshore, it can be very difficult to judge its true strength while you are on land. As you sail further from the shore, its strength is likely to increase and may be more than you are happy with. In an offshore wind it is easy to launch and sail away as there are no waves on the beach and you will be blown clear of the shore. Getting back, on the other hand, could be difficult and there is a danger of being blown away from your base and unable to return.

If you are sailing on the sea, avoid going afloat in offshore winds on your first few trips. On inland waters, make sure that another boat is nearby or that a safety boat will be available if you need a tow back to base.

NO WIND

If there is no wind, wait until it rises, especially if a tidal stream is present, as shown here by the moored boats.

ONSHORE WIND

Even a Force 3 blowing onshore will cause waves to break on the lee shore. If the water is shallow a long way out, the waves will break first some distance from the beach; if the shoreline is steep, the waves will break on the shore.

OFFSHORE WIND

A Force 3 wind causes quite different conditions when blowing offshore than it does blowing onshore. Close to land, the sea is sheltered and there will be no waves. Further out, the conditions may be much rougher than they appear from the beach.

CHECKING THE TIDE

If you are sailing on a river or the sea, you may have to deal with tidal conditions (*pp.56–57*). Obtain a copy of the local tide tables and check it for the times of high and low waters. Again, experienced local sailors will be able to give you advice.

Before you go afloat, make sure that you know the state of the tide. Find out the direction of the tidal stream and at what time it will turn. Plan your trip so that you can sail back to your base with the tide when you are ready to return.

AVOIDING COLLISIONS

Before you go afloat, remind yourself of the procedures for the prevention of collisions on the water (*pp.52–53*). It is your responsibility as skipper of your own boat to be familiar with these rules of the road.

When you are learning to sail, avoid busy shipping channels. Keep to the shallower water at their edges where you will not meet larger boats. If you do have to cross a channel, remember to do so at right angles so you get across as quickly as possible.

If you think you are in a potential collision situation and you are not sure of the rules that apply, then it is safest to assume that you have to keep clear. Make a large alteration of course to pass behind the other boat so that your intentions are obvious to the other skipper.

Remember to check regularly all around the boat. Beginners often forget to look astern and are startled when another vessel suddenly appears. The area behind the jib and mainsail can be hidden from helmsman and crew when they are sitting out to windward. Check this area regularly, asking your crew to move to leeward briefly for a clearer view if necessary.

TIDAL TIPS

Verify information given in tide tables by observing the shoreline: a wet shoreline means that the tide is going out, a dry one signals that it is coming in.

FINAL PREPARATIONS

Before you go afloat there are several checks that you should run through to ensure that you have a safe, enjoyable sail and an easy return. Do not be tempted to ignore these, even if you are in a hurry – your safety may depend on them.

CONDITIONS CHECK

Before you decide to sail, ask yourself about the conditions.

- Is the wind strength suitable for your level of experience?
- Is the wind onshore or offshore?
- Is the wind strength forecast to increase or decrease?
- Do you know the state of the tide, and will you be able to return without having to fight the current?
- Are there other sailors nearby who can help you if necessary?

TELL SOMEONE YOUR PLANS

Once you have decided that it is safe to sail, you need to make sure a responsible person knows your plans – where you expect to sail and when you plan to return.

When you do get back from your sail, remember to tell them you are back safely or they may notify the rescue services unnecessarily.

EQUIPMENT CHECK

When you are at the shoreline and ready to sail, check that you are fully prepared to go afloat.

- Is your clothing adequate?
- Are all the crew wearing personal buoyancy – fastened correctly?
- Is all the sailing gear rigged properly and in good condition?
- Are all the bungs and hatches in position?
- Are the oars or paddles on board and tied securely?
- Are there an anchor and warp aboard and tied in securely?
- Is all personal equipment stowed neatly in waterproof containers and tied in securely?

LAUNCHING A DINGHY

A WELL-PLANNED ROUTINE for preparing and launching your dinghy will ensure that you rig it properly, and that all the necessary equipment is on board and in good working order. A launching trolley is the usual means of moving a dinghy to the water, and how you launch from there depends on whether it is a beach or slipway launch, or a pontoon launch. Whichever it is, work out a system with your sailing partner to build on the teamwork that will make you good sailors on the water.

USING A LAUNCH TROLLEY

Most damage is done to dinghies when they are moved while ashore, so it is important to move the dinghy and launch it in a way that prevents the hull from coming into contact with the ground (*pp.50-51*); a launching trolley is ideal for this. Dinghies are quite heavy and awkward to lift, so if it has been transported on a roof rack or road trailer, find a few people who are willing to help lift it onto its trolley to make the job easier.

Position the boat so that there is not too much weight on the front of the trolley when you lift it by the handle, and tie the painter around the trolley handle to prevent the boat from sliding off. If the trolley has a T-shaped handle, you can secure the rope with figure-of-eight turns.

PREPARING THE BOAT

Step the mast if necessary (*pp.68-69*), and check that all the bungs are in position. Collect all the equipment, incuding the sails, rudder, paddles, and any other important removable gear, before you move the boat close to the launching point.

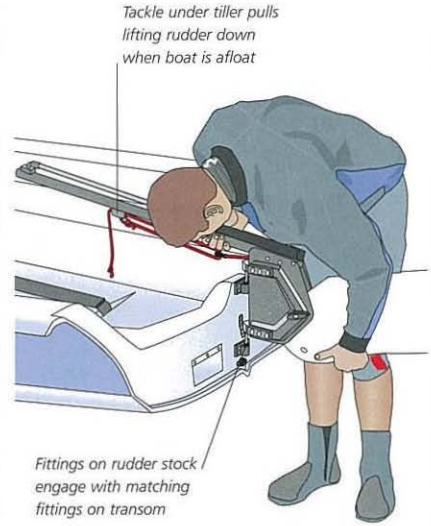
Sails are usually rigged (and lifting rudders fitted) before launching but, in some circumstances, such as launching from a pontoon, you may wish to rig them after launching.

A lifting rudder can be fitted before launching, but a fixed blade must be left until you are afloat. Only fit a fixed rudder when you have moved the boat into water deep enough to take the rudder blade without it hitting the bottom. If you put the rudder in the boat for launching put it under the boom and mainsail, otherwise it may be thrown about when the sail is hoisted. The centreboard should be up when you launch; if you have a daggerboard, lay it in the bottom of the boat, under the boom and mainsail, until you go afloat. In most situations, hoist the jib before you launch unless its flapping will be a nuisance while launching.

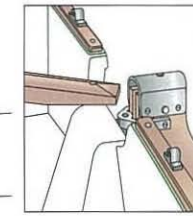
If the boat can be kept head-to-wind when launching, you can also hoist the mainsail; otherwise, it is hoisted when you are afloat. Do a final check around the boat to ensure that you have everything you need. Wheel the boat to the water, and launch, following the instructions for a beach, slipway, or pontoon (*p.102-5*).

FITTING THE RUDDER

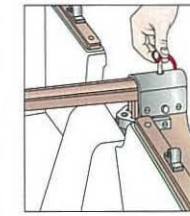
Both fixed and lifting rudders are secured to the boat by means of fittings on their stock. Fit a lifting rudder before launching. Fit a fixed rudder after launching, ensuring the water is sufficiently deep first. If your rudder has a removable tiller, fit the rudder to the boat then fit the tiller. If you fit the rudder and tiller before hoisting the mainsail, makes sure that the sail and boom do not catch under the tiller when the sail is hoisted.



1 Slide the fittings on the stock onto their counterpart fixings on the boat's transom. Make sure that the blade is held up so it cannot scrape on the ground. If you have a removable tiller, go on to steps 2 and 3.



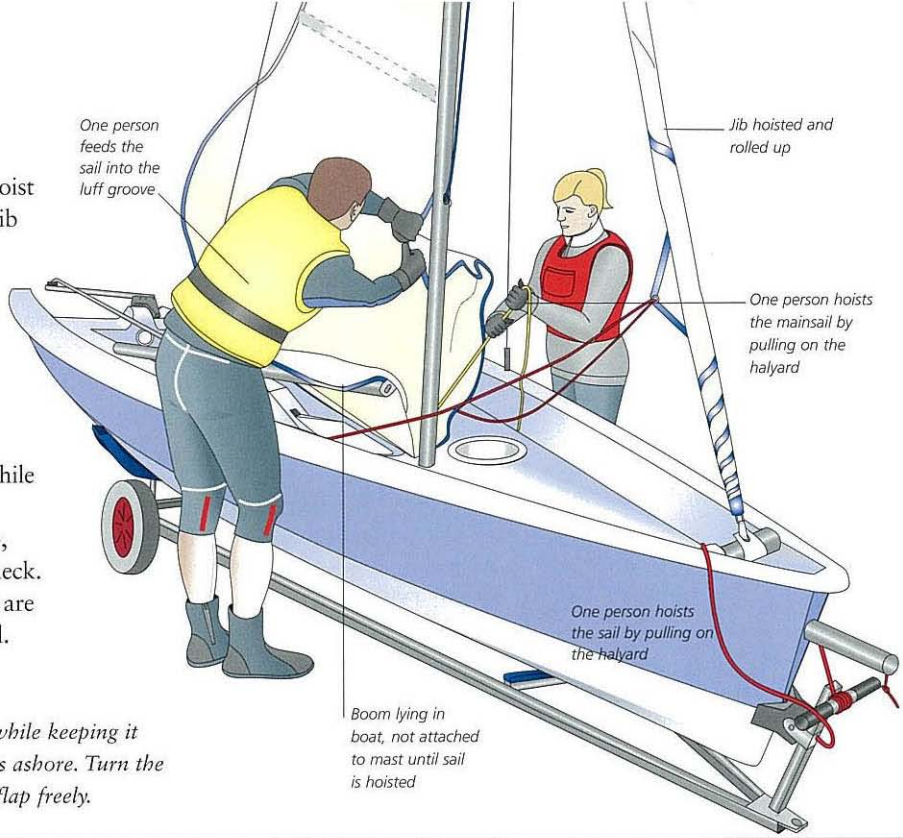
2 Slide the tiller into the fitted rudder head and make sure it is a tight fit.



3 Secure the tiller – usually with a pin that passes through the rudder head and the tiller.

HOISTING THE SAILS

With the boat head to wind, the sails can be hoisted ashore. To hoist the jib, one person pulls on the jib halyard until the sail is up and then secures it to its cleat or other fitting provided. Some boats have a jib furling system so the jib can be rolled up once it is hoisted (*right*). To hoist the mainsail, one person guides the boltrope into the mast groove while the other hoists the sail with the halyard. Once the sail is fully up, the boom is slid onto the gooseneck. Ensure both main and jib sheets are free to run so the sails do not fill.



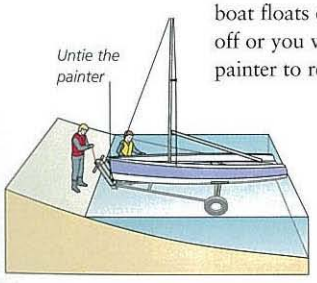
HOISTING SAILS ASHORE

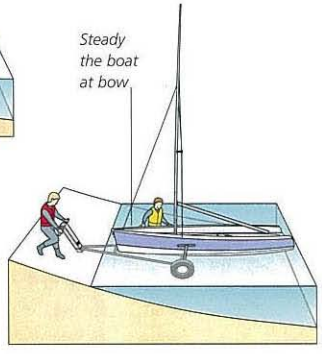
If you are able to launch the boat while keeping it head to wind you can hoist the sails ashore. Turn the boat head to wind so the sails can flap freely.

BEACH OR SLIPWAY LAUNCH

To launch from a beach or slipway, use the trolley to wheel the boat into the water. Wheel it deep enough for the boat to float clear of the trolley. As soon as the boat floats free, it will come under the influence of the wind and waves so hold it firmly by the bow. For beach launches, you will need balloon tyres on the trolley to cope with the soft surface.

1 Push the trolley into the water until the boat floats off. Never push or drag the boat off or you will scratch its hull. Untie the painter to release the boat from the trolley.



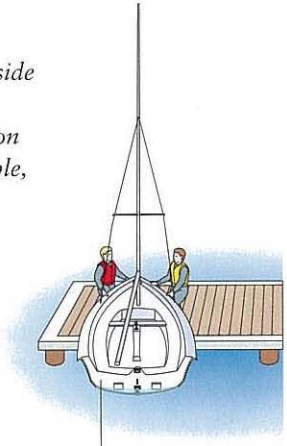


2 One person holds the boat by the bow, to one side of the slipway and clear of other users. The other takes the trolley to above high-water level and parks it clear of the slipway.

PONTOON LAUNCH

If you have to launch over the side of a pontoon, it is best to do it before hoisting the sails. Pontoon launches need at least two people, one on either side of the boat.

1 With one person holding the painter, lift the boat until its stern is over the water. Lower the stern into the water, then gently push the boat back until the bow can be lowered over the side. Launch the boat gently to avoid water flooding in over the transom



2 Lead the boat to the end of the pontoon and turn it head-to-wind. Secure the painter on the pontoon before hoisting the sails and fitting the rudder.

BASIC TECHNIQUES

IN ORDER TO BECOME PROFICIENT at handling a boat, you need to practise using the main controls *(pp.36–39)*. You must learn how the boat reacts to the wind on all points of sailing, and you must be able to change course smoothly and efficiently. You will also want to know how to stop the boat. When you start sailing, you will not yet have the skills needed to leave and return to the shore under sail, so on your first few trips afloat, row or paddle away from shore, then hoist the sails once you are in clear water.

FIRST SKILLS

As soon as you launch a dinghy, the wind will act on it and it will begin to move. There are three basic ways of stopping it from moving in the water, each of which involves making the wind work in your favour. The most controlled method, but also the most complicated, is heaving-to. Two further simple techniques for stopping a boat are the lying-to method and the head-to-wind method, both of which work by emptying the sails of wind so that they flap and lose forward drive. Lying-to is the more stable option as the boat will simply drift until you pull in the sails. In a head-to-wind position, the wind will push the boat backwards due to the windage of the flapping sails, and the bow will start to turn in one direction or the other (depending on the position of the rudder) until the sails fill and the boat starts to sail. This method is used mainly when you need to stop alongside a mooring or pontoon or other boat.

When you are confident with these two ways of stopping, you can try the more controlled heaving-to *(p.100)*.

NO-SAIL ZONE

The head-to-wind method of stopping exploits the fact that there is an area of about 45° on either side of the wind direction into which it is impossible to point the boat and keep sailing. This area is known as the no-sail zone. When the boat is close-

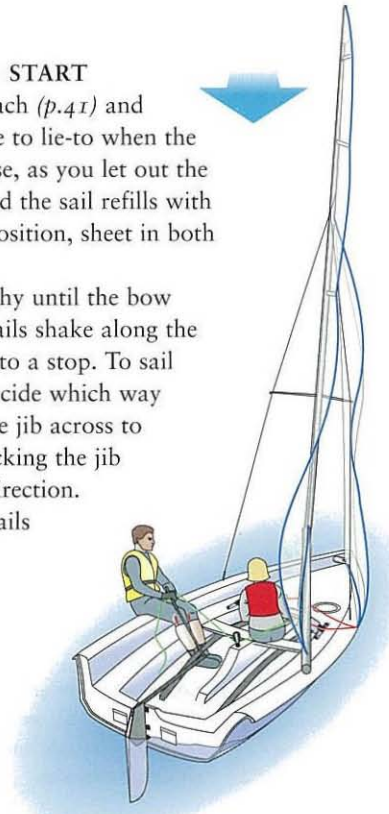
USING THE WIND TO STOP AND START

To lie-to, turn the boat onto a close reach *(p.41)* and let both sails out fully. It is not possible to lie-to when the boat is pointing further offwind because, as you let out the mainsail, the boom hits the shrouds and the sail refills with wind. To sail away from the lying-to position, sheet in both sails and the boat will move forwards.

To stop head-to-wind turn the dinghy until the bow points into the wind. This makes the sails shake along the centreline of the boat and it will come to a stop. To sail away from a head-to wind position, decide which way you want the bow to move and pull the jib across to the opposite side. This is known as backing the jib and will push the bow in the desired direction. When the boat has turned, trim both sails correctly and sail off.

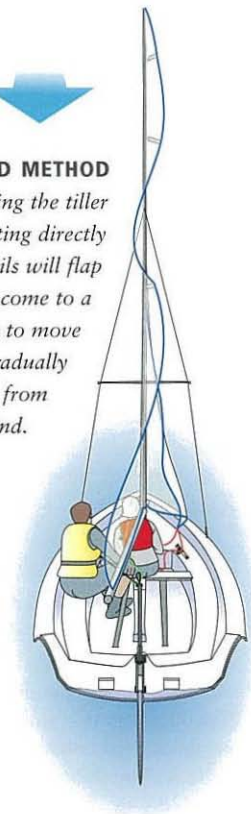
LYING-TO METHOD

Turn the boat using the tiller until the wind is blowing from a point just forwards of abeam. Let both sails out fully so that they flap. The boat will stop and drift gently until you pull in the sails.



HEAD-TO-WIND METHOD

Turn the boat using the tiller until the bow is pointing directly into the wind. The sails will flap and the boat will come to a stop before starting to move backwards and gradually turning away from the wind.



hauled, you are sailing along the edge of the no-sail zone. If you try to point closer to the wind, turning into the no-sail zone, the sails will shake, the boat will slow down and stop.

To get to a point upwind within the no-sail zone it is necessary to sail a series of zigzags, first on one tack then on the other, making progress to windward with each tack. This process is called beating to windward (*p.92*).

STARTING TO SAIL

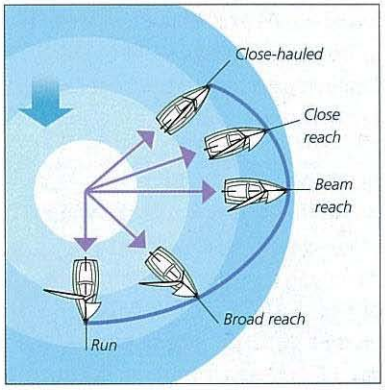
When you first start sailing, it is easiest to get accustomed to using the main controls while sailing on a beam reach. This is the fastest and easiest point of sailing. It ensures good responsiveness while not demanding very accurate steering, sail trimming, centreboard positioning, or crew balance.

BOAT SPEED

The speed at which you can sail is dependent on a number of factors, including the strength of the wind, the point of sailing you are on (*pp.40–41*), the type of boat you are sailing, and how well you are sailing it. Tidal streams and waves will also affect speed (*pp.56-57*).

SPEED VERSUS POINT OF SAIL

Potential boat speed on specific points of sailing and in a particular wind strength are shown using a polar diagram. The concentric circles represent potential boat speed. The further away from the central circle you are, the faster the boat is sailing. The precise shape of the performance curve depends on the design of boat. The diagram shows the performance curve of a typical general-purpose dinghy. It reaches its maximum speed on a beam reach and moves slowest when sailed on a run.



THE FIVE ESSENTIALS

There are five essential elements to sailing efficiently: sail trim, centreboard position, boat balance, boat trim, and the course made good. Whenever one changes, you should quickly review the other four and correct them if necessary. Remember to check the five essentials every time you make a course alteration.

SAIL TRIM

To check trim, ease the sails out until they shake along their luffs, then pull them in until the shaking just stops. Make it easier to check trim by fitting tell-tales, which show the wind flow across the sails (*p.80*).

CENTREBOARD POSITION

The centreboard is used to counteract sideways force (*p.81*), which is greatest when you sail close-hauled. So, the closer you sail towards the wind, the more you must lower the centreboard, and the further you turn away from the wind, the more you must raise the centreboard, until it is almost fully up on a run. Always keep it down at least a small amount to provide a pivot point around which the boat can turn.

BOAT BALANCE

The heeling force increases as you sail closer to the wind, so the helmsman and crew must both sit out in most wind strengths to keep the boat upright. If the wind strength or the course change, the crew should move first to balance the boat.

BOAT TRIM

Always check that the boat is trimmed correctly in a fore and aft direction. In light winds, trim the boat slightly down by the bow; in strong winds, move back slightly. Check that the wake is not very disturbed, which indicates that you are sitting too far aft. Helmsman and crew should sit close together to keep their weight concentrated in the middle of the boat. This allows the bow and stern to lift easily with the waves.

COURSE MADE GOOD

Always remember to keep an eye on your course. Your objective is to sail the fastest route to your destination. This is not necessarily the straight-line course. If your objective is to windward, for example, you will have to sail a zigzag course to reach it. This means that you must decide when to tack and you will also have to allow for leeway. Even when you are sailing on a reach, the sideways force will cause a small amount of leeway, and your actual course through the water will be slightly to leeward of the course you are steering. Allow for this by steering upwind of your objective by a small amount. Be aware, too, of any tidal stream that may push you off your intended course.

CHANGING COURSE

Learning to change course introduces you to all the different points of sailing (*pp.40-41*). The best way to go through a complete change of course – from sailing towards the wind (an upwind course) to sailing away from it (a downwind course) – is to start on a beam reach with the boat sailing directly across the wind.

STARTING TO LUFF

Turning the boat towards the wind is known as luffing (or luffing up). Whenever you want to turn onto a more upwind course you have to luff.

To luff, the helmsman pushes the tiller gently away from him and sheets in the mainsail. The crew sheets in the jib and lowers the centreboard. As the boat turns towards the wind, the apparent wind (*p.32*) will increase in strength and the heeling force (*p.32*) also increases, so the crew will need to sit out even further to keep the boat upright and sailing at is best speed. Continue to luff until the boat is on a close-hauled course.

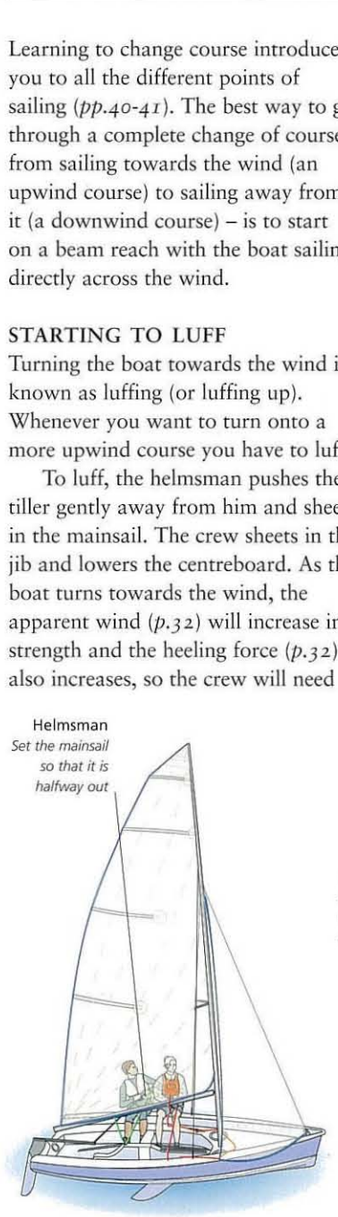
STARTING TO BEAR AWAY

Turning away from the wind is called bearing away. Whenever you want to turn onto a more downwind course you have to bear away.

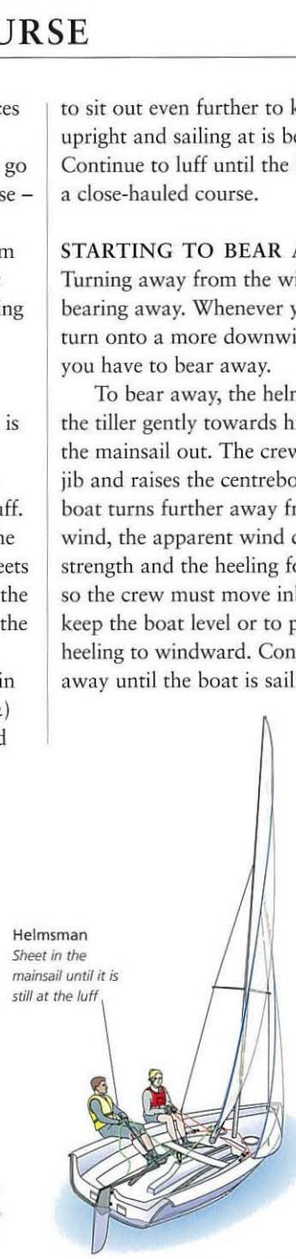
To bear away, the helmsman pulls the tiller gently towards him and lets the mainsail out. The crew lets out the jib and raises the centreboard. As the boat turns further away from the wind, the apparent wind decreases in strength and the heeling force reduces so the crew must move inboard to keep the boat level or to prevent it heeling to windward. Continue to bear away until the boat is sailing on a run.

LUFFING: TURNING TOWARDS THE WIND

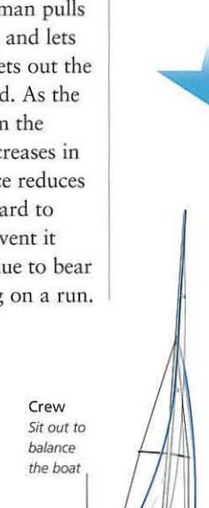
Luffing up requires co-ordinated action wth the tiller, centreboard, sail trim, and boat balance. The crew should lower the centreboard before the turn, and then concentrate on keeping the boat level and sheeting the jib in as the helmsman turns the boat and sheets in the mainsail.



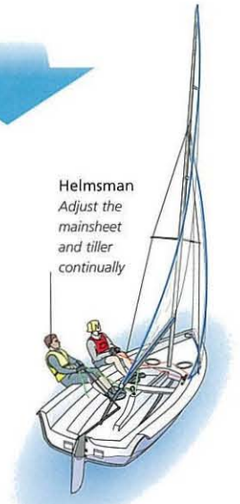
1 Sail on a beam reach with the sails set correctly (*p.41*), the tiller centred, the boat upright, and the centreboard halfway down.



2 Luff up to a close reach by pulling in the sails and pushing the tiller away from you. Lower the centreboard until it is three quarters down, and sit out more to counterbalance the increased heeling force in the sails.



3 Luff up to very nearly close-hauled, sheeting both sails in tightly. Lower the centreboard fully and sit out even further.



4 Steer along the edge of the no-sail zone by alternately luffing up and bearing away slightly. Luff up until the jib luff starts shaking, and then bear away slightly until the shaking just stops.

BEARING AWAY: TURNING AWAY FROM THE WIND

Make sure the boat is upright before the manoeuvre because any heel to leeward will make it difficult to bear away. Let the sails out as the boat turns, and raise the centreboard.

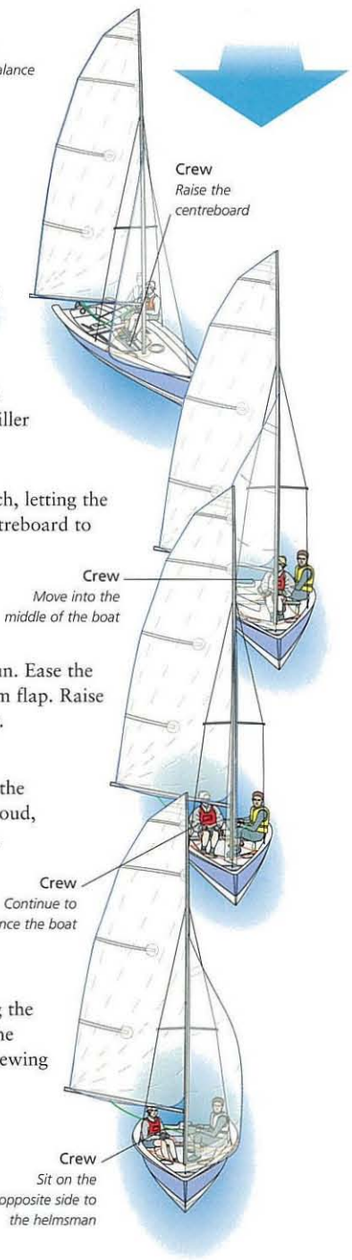
1 Sail on a beam reach with the centreboard, sails, and tiller set as for luffing.

2 Bear away to a broad reach, letting the sails out and raising the centreboard to the quarter-down position.

3 Bear away to a training run. Ease the sails out without letting them flap. Raise the centreboard almost fully.

4 Let the mainsail out until the boom is just clear of the shroud, and continue to ease the jib. Centre the tiller.

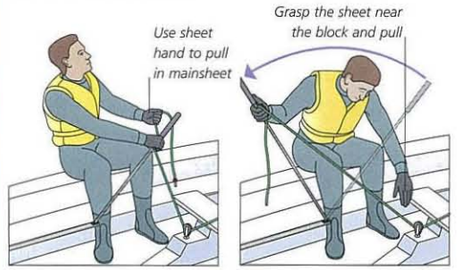
5 Continue on a run, setting the jib on the opposite side of the boat to the mainsail to goosewing for maximum speed.



TECHNIQUES FOR SHEETING THE MAINSAIL IN AND OUT

The technique for sheeting the mainsail in and out varies according to your mainsheet system. Both methods require the helmsman to make adjustments while keeping the tiller still to avoid altering course unintentionally. To ease the sheet, let it slide out through your hand.

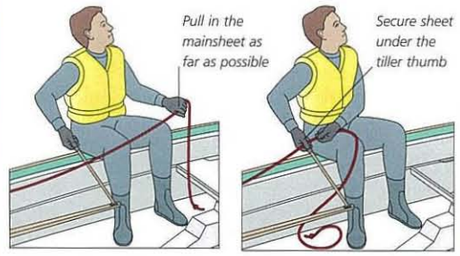
CENTRE MAINSHEET



1 Pull in the mainsheet using your sheet hand. Holding the tiller extension in your tiller hand as if it were a dart, swing the extension across your body and down to grasp the sheet.

2 With sheet and tiller extension in your tiller hand, swing the extension aft. With your sheet hand, grasp the sheet at a point near to the block and pull as far as you can. Repeat as necessary.

AFT MAINSHEET



1 Keep your tiller hand steady on the tiller extension. With your sheet hand, pull in the mainsheet as far as possible, bringing the sheet across your body from the stern.

2 Trap the sheet under the thumb of your tiller hand. Let go of it with your sheet hand, and then reach across your body to grasp the sheet and pull it again. Repeat these steps as necessary.

TACKING

ONE OF THE KEY SAILING MANOEUVRES, tacking is used to change direction by turning the bow of the boat through the eye of the wind. It requires good co-ordination between helmsman and crew. A tack can be performed from any upwind course but is most often employed to change direction from one close-hauled course to the other. When tacking an aft-mainsheet boat, the helmsman faces aft; if a centre-mainsheet is fitted, he must face forwards to handle the mainsheet. The movements of the crew remain the same.

TACKING ROLES

The helmsman decides when to tack. He and the crew must turn the boat, trim the sails, and move their weight across the boat while keeping it as upright as possible. The helmsman ensures that the new course is clear and that the crew is ready. During the tack, the helmsman must change hands on the mainsheet and the tiller while moving across the boat, manipulating both controls at the same time. After the tack, he must check sail trim, boat balance, and the new course.

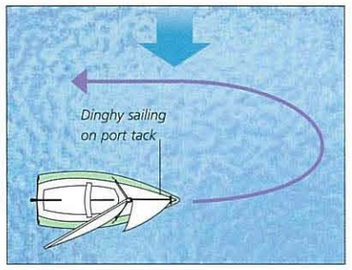
The crew is responsible for releasing the jib sheet, picking up the new jib sheet, and moving across the boat to sheet in the jib on the new side as the boat completes the turn. The crew must be alert to the instructions given by the helmsman, and he must confirm that the turning area is clear before committing to the turn.

THE TACKING MANOEUVRE

Tacking is actually a prolonged luffing manoeuvre in which the boat turns sufficiently for the sail to fill on the opposite course. The manoeuvre begins with luffing up (*p.88*). The tack itself occurs when the bow of the boat passes through the eye of the wind, and the manoeuvre is complete when you are sailing on the new course.

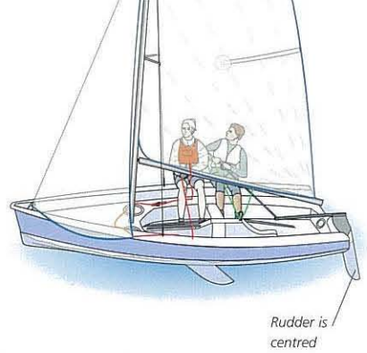
TACKING FROM A REACH TO A REACH

When you are learning to tack, you will start by sailing on a beam reach with the wind on one side of the boat, and will then tack onto the opposite beam reach with the wind on the other side.



BEAM-REACH TACK

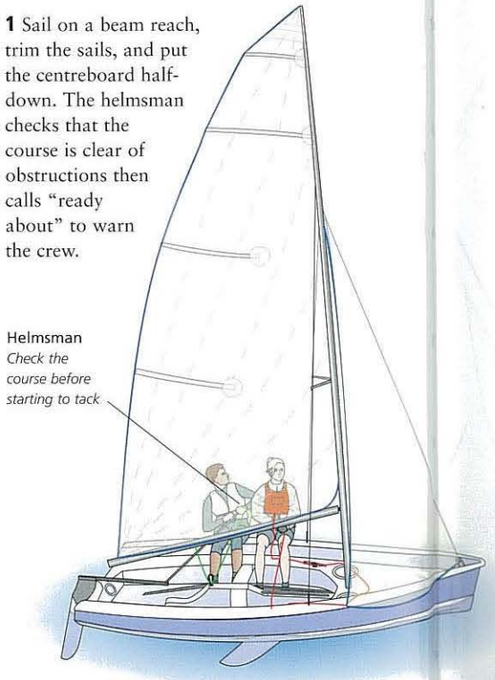
Tacking from a beam reach to the opposite beam reach involves a turn of 180°. Turning through such a large angle gives the helmsman and crew more time to cross the boat before the sails fill on the new side. It does, however, require the boat to be sailing fast before the tack so that it has sufficient momentum to complete the turn. The helmsman must ensure that the tiller is held over until the boat has passed head to wind.



7 Helmsman and crew trim the sails to suit the new course and balance the boat accordingly.

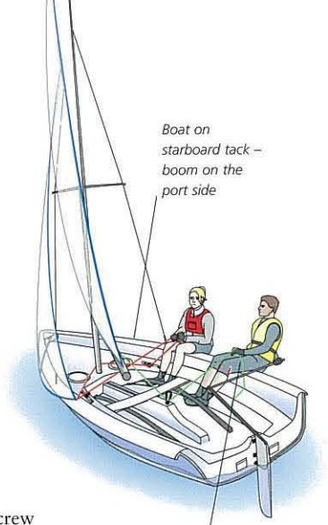
TACKING A CENTRE-MAINSHEET BOAT

This sequence shows a boat with a centre-mainsheet being tacked from a reach to a reach. The boat must be sailing fast before the tack, and you must steer it firmly through the turn, or else it may fail to complete the tack, stopping head-to-wind – a position known as being "in irons" (p.93).

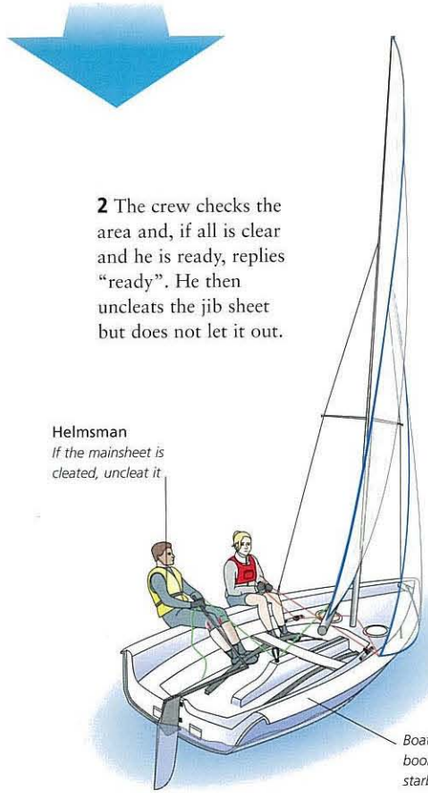


1 Sail on a beam reach, trim the sails, and put the centreboard half-down. The helmsman checks that the course is clear of obstructions then calls "ready about" to warn the crew.

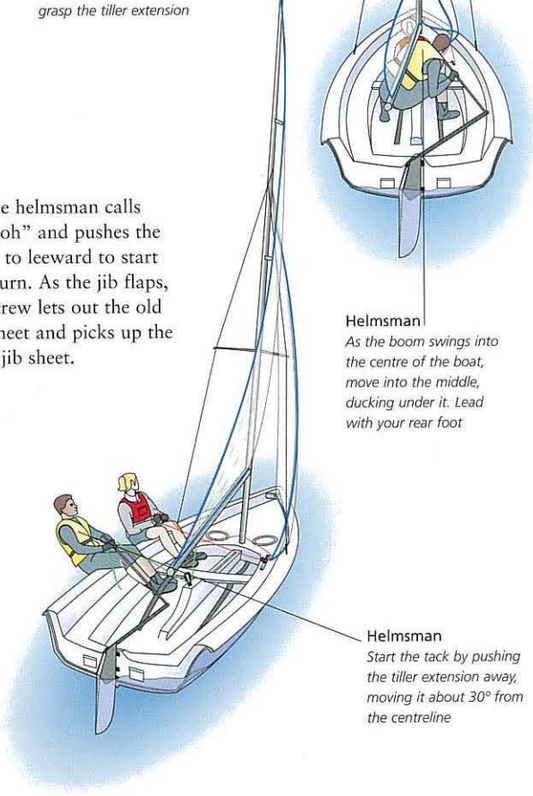
6 As the boat comes onto the new course, the helmsman changes hands on the tiller extension and mainsheet, and then centres the tiller. The crew balances the boat.



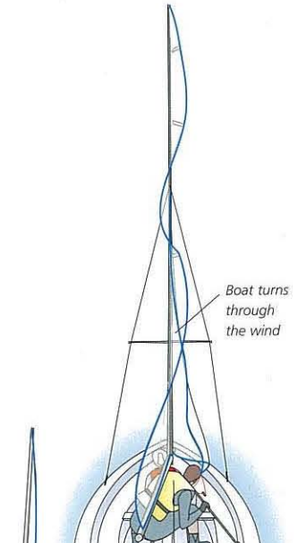
5 The bow turns through the wind and the jib blows across to the new leeward side. The crew pulls in the new jib sheet and balances the boat.



2 The crew checks the area and, if all is clear and he is ready, replies "ready". He then uncleats the jib sheet but does not let it out.



3 The helmsman calls "lee-oh" and pushes the tiller to leeward to start the turn. As the jib flaps, the crew lets out the old jib sheet and picks up the new jib sheet.

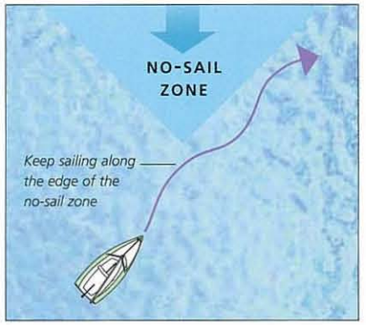


4 As the boat turns head-to-wind, the helmsman keeps the tiller pushed over and crosses the boat facing forwards. The crew moves to the middle of the boat and prepares to pull in the new jib sheet.

SAILING TO WINDWARD

Once you have learned how to tack, you can experiment with sailing to windward. Although you can sail close-hauled along the edge of the no-sail zone (*p.40*), if you turn closer to the wind, into the no-sail zone, the luffs of the sails will start to flutter and the boat will eventually stop.

Pull the tiller gently towards you to turn away from the wind and resume sailing efficiently. Do not bear away too far, however, otherwise you will give up valuable distance. To reach a point upwind, within the no-sail zone, you will need to follow a zigzag course – a process that is known as beating to windward.

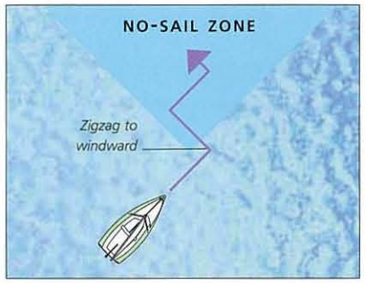


EDGE OF THE NO-SAIL ZONE

To sail as close to the wind as possible, sheet in both sails tight and luff up gently until the luff of the jib starts shaking. Bear away slightly to stop the sail shaking then repeat to sail along the edge of the zone.

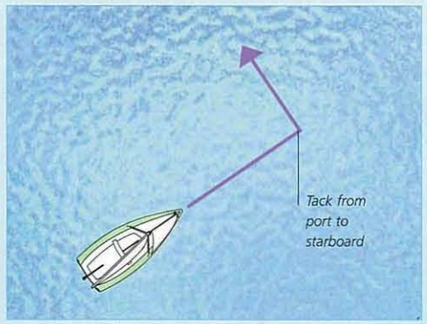
BEATING TO WINDWARD

To sail upwind or get to a point that is within the no-sail zone you have to tack and sail a zigzag course. Here, the boat starts on port tack then tacks onto starboard tack, making progress to windward with each turn. The helmsman can choose to make a series of short tacks or a smaller number of longer ones depending on the distance to his objective.



TACKING FROM CLOSE-HAULED

Tacking is most often used to turn from one close-hauled course to the other as part of the process of beating to windward. The boat turns through only ninety degrees, so the tack is relatively quick.



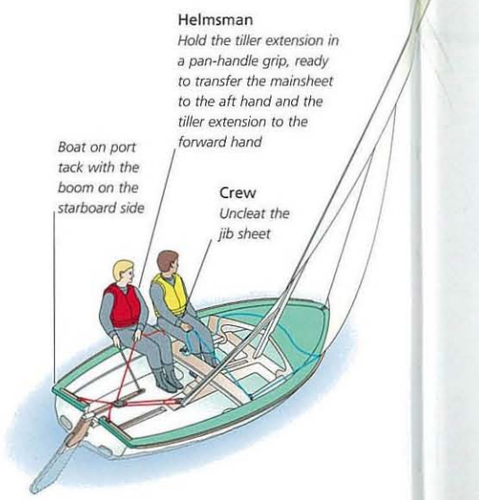
A CLOSE-HAULED TACK

Tacking from close-hauled to close-hauled involves a turn of only 90° and will happen much more quickly than when tacking from a reach to a reach. You should avoid turning too far after the tack, otherwise you will end up further off the wind than the intended close-hauled course and will sail a longer distance.

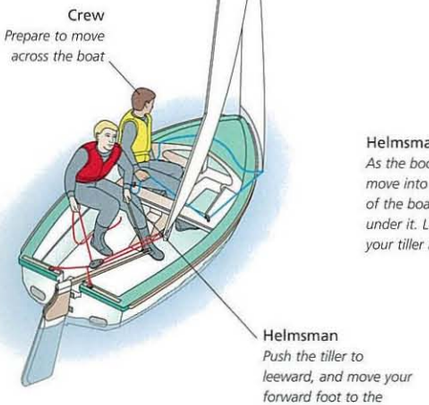
TACKING AN AFT-MAINSHEET BOAT

This sequence shows an aft-mainsheet boat tacking from close-hauled on port tack to close-hauled on starboard tack. Because it is an aft mainsheet, the helmsman must cross the boat facing aft and change hands on the tiller extension and mainsheet before the tack. The crew crosses the boat facing forwards as usual. The boat turns through only 90°, so the manoeuvre happens very quickly, compared to tacking from a beam reach to a beam reach (p.90). *The crew and helmsman must cross the boat swiftly before the sails fill.*

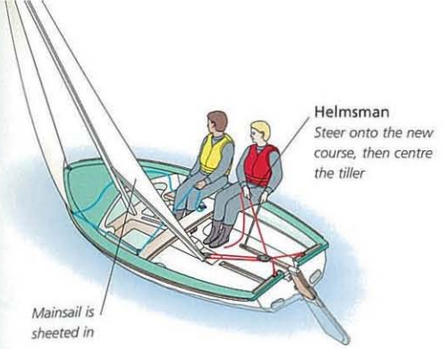
1 The helmsman prepares to tack by checking that the course is clear. If it is, he calls "ready about". The crew makes sure that the centreboard is fully down, checks for obstructions, and replies "ready". He uncleats the jib sheet, but does not let it out.



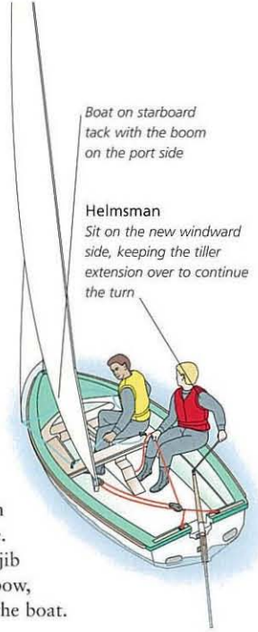
2 The helmsman changes hands on the extension and mainsheet, calls "lee-oh", and pushes the tiller to leeward. As the jib flaps, the crew releases the old jib sheet and picks up the new one.



3 As the boat turns head-to-wind, the helmsman keeps the tiller pushed over and crosses the boat facing aft. The crew moves to the middle and prepares to pull in the new jib sheet.



5 As the boat comes onto the new course, the helmsman trims the mainsail and centres the tiller. The crew pulls the jib in tight then cleats the jib sheet and balances the boat.

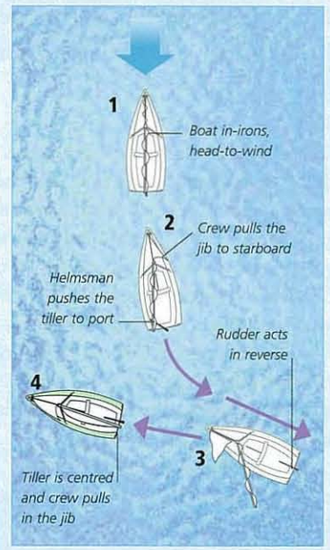


4 The bow of the boat moves through the wind, and the helmsman sits down on the new windward side. The crew sheets in the jib as it blows across the bow, and moves to balance the boat.

A FAILED TACK

When a boat fails to tack, it may end up "in-irons". There are several reasons why a tack fails: the boat is sailing too slowly, the helmsman is steering badly, or the crew has pulled in the new jib sheet too early, making it fill on the wrong side.

ESCAPING FROM "IN-IRONS"



1 To escape from being in-irons, the helmsman must push the tiller towards the side of the boat in the direction he wants the bow to go. Here, the tiller is pushed to port.

2 At the same time, the crew must pull the jib to the opposite side of the boat so that it fills with wind on its reverse side – a technique known as "backing the jib".

3 The boat will move backwards and the rudder acts in reverse. The backed jib will help to push the bow in the desired direction.

4 As soon as the boat is pointing the right way, the helmsman centres the tiller and the crew sheets in the jib on the correct side. The boat is now ready to continue its course.

GYBING

LIKE TACKING, gybing involves turning the boat to change tack and bring the wind on the other side. In gybing, however, it is the stern, rather than the bow, that turns through the wind. When you gybe, the mainsail stays full of wind throughout the manoeuvre, and its swing across the boat can be sudden and violent. This is very unlike tacking, where the sails lose drive and flap harmlessly until the turn is complete. Unless the boat is correctly balanced throughout, you may lose control or capsize.

GYBING ROLES

The helmsman decides when to gybe. He is responsible for ensuring that the new course is clear, and for making sure that the crew is ready. During the gybe, the helmsman must change hands on the mainsheet and tiller, while keeping control of both. He must also move across the boat during the turn. After the gybe, he has to steer onto the new course and check the sail trim and boat balance.

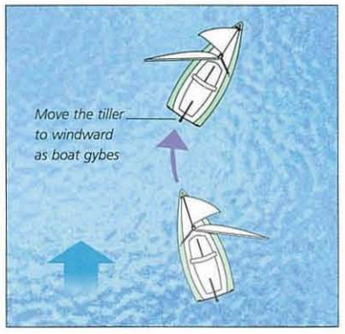
The crew is responsible for releasing the old jib sheet, picking up the new jib sheet, and moving across the boat to sheet in the jib on the new side as the boat completes the gybe. He must concentrate on balancing the boat throughout the gybe.

PREPARING TO GYBE

Gybing begins with bearing away until the jib hangs limply behind the mainsail, indicating that you are on a dead run *(p.40)*. You then luff up very slightly so that the jib just fills on the same side as the mainsail. This is a training run, which, when you are learning how to gybe, is the correct starting point for the manoeuvre.

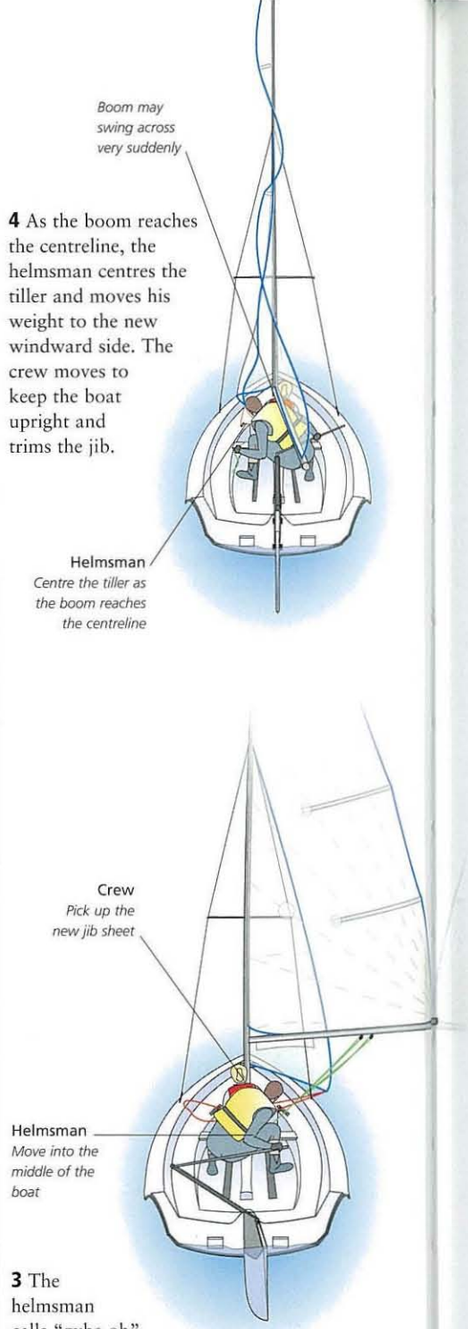
GYBING FROM A TRAINING RUN

When you are learning, you will start by sailing on a training run with the wind behind you at an angle of 5–10 degrees off a run. After the gybe, you will probably be sailing on a broad reach.



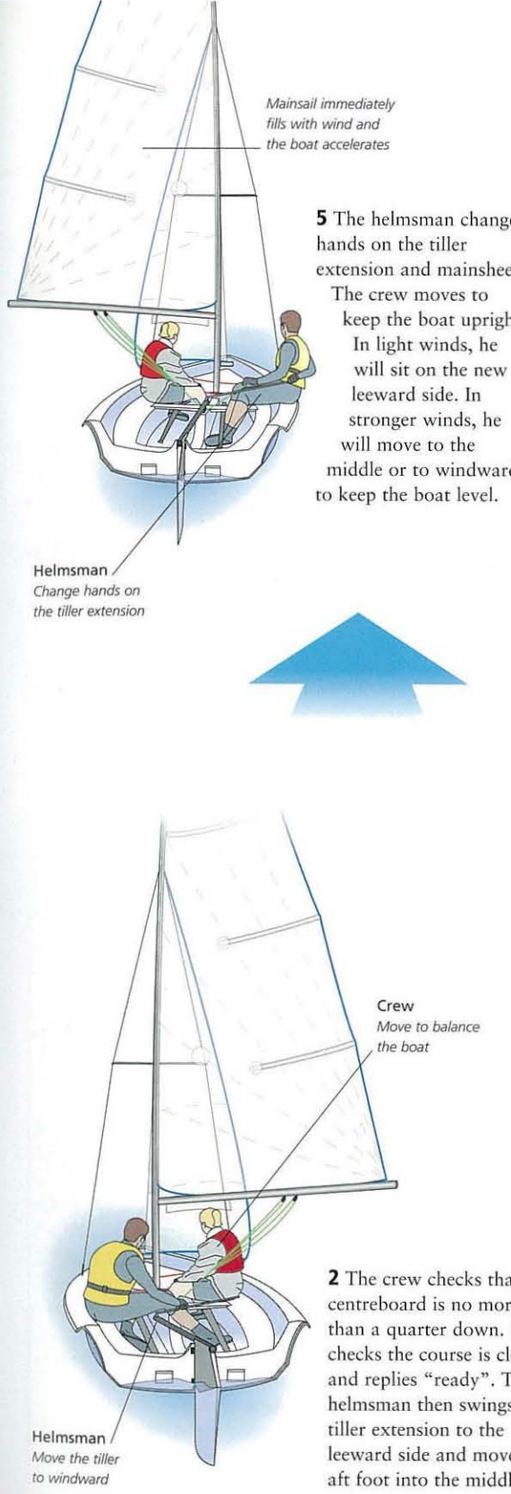
TRAINING-RUN GYBE

Learning to gybe by starting from a training run gives you more time to prepare for the manoeuvre and to adjust your weight to balance the boat. The boat will turn through quite a wide arc and, if you are not quick enough to straighten the tiller as the boom swings across, may turn onto a broad reach on the new tack. The helmsman should watch the mainsail leech carefully for signs that it is about to gybe. He should be in the middle of the boat as the boom comes across, with the tiller centred.



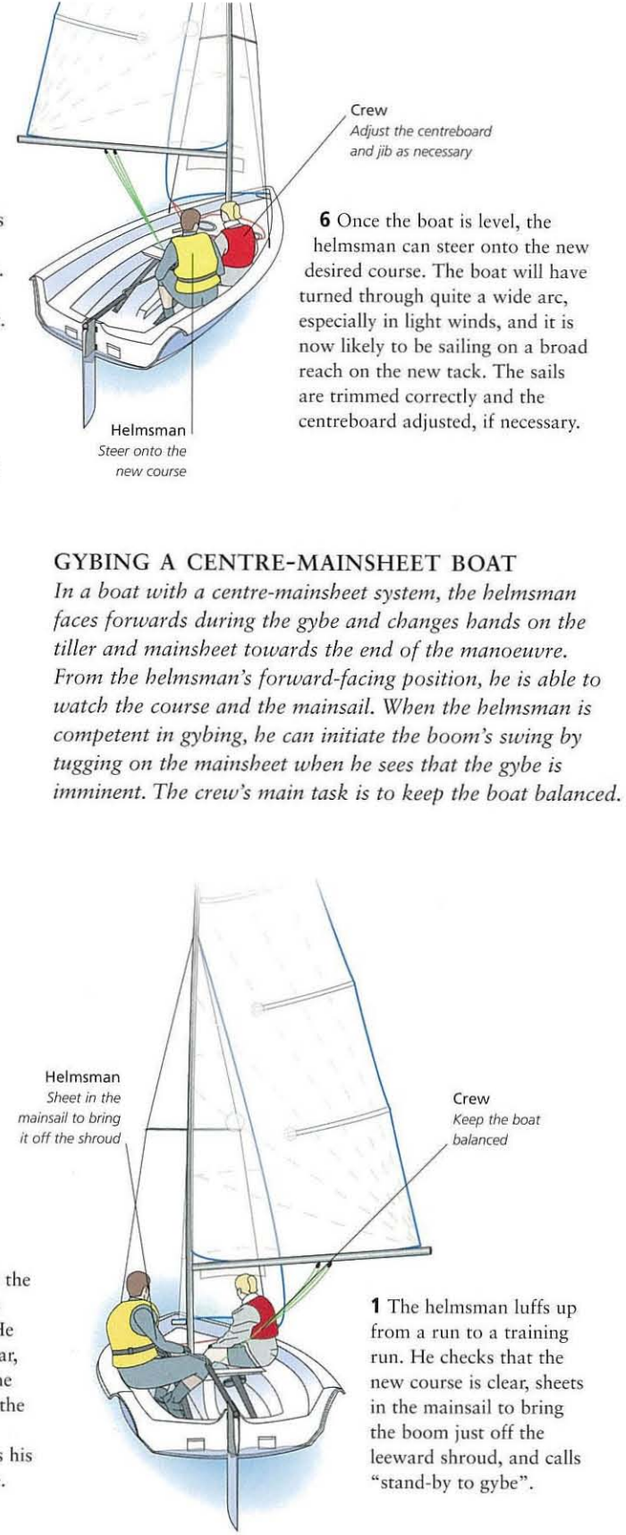
4 As the boom reaches the centreline, the helmsman centres the tiller and moves his weight to the new windward side. The crew moves to keep the boat upright and trims the jib.

3 The helmsman calls "gybe-oh" and bears away further. He moves into the middle of the boat, ducking under the boom. The crew picks up the new jib sheet, while balancing the boat.



5 The helmsman changes hands on the tiller extension and mainsheet. The crew moves to keep the boat upright. In light winds, he will sit on the new leeward side. In stronger winds, he will move to the middle or to windward to keep the boat level.

2 The crew checks that the centreboard is no more than a quarter down. He checks the course is clear, and replies "ready". The helmsman then swings the tiller extension to the leeward side and moves his aft foot into the middle.



6 Once the boat is level, the helmsman can steer onto the new desired course. The boat will have turned through quite a wide arc, especially in light winds, and it is now likely to be sailing on a broad reach on the new tack. The sails are trimmed correctly and the centreboard adjusted, if necessary.

1 The helmsman luffs up from a run to a training run. He checks that the new course is clear, sheets in the mainsail to bring the boom just off the leeward shroud, and calls "stand-by to gybe".

GYBING A CENTRE-MAINSHEET BOAT

In a boat with a centre-mainsheet system, the helmsman faces forwards during the gybe and changes hands on the tiller and mainsheet towards the end of the manoeuvre. From the helmsman's forward-facing position, he is able to watch the course and the mainsail. When the helmsman is competent in gybing, he can initiate the boom's swing by tugging on the mainsheet when he sees that the gybe is imminent. The crew's main task is to keep the boat balanced.

GYBING SAFELY

Make sure that the boat is upright before the gybe. If it heels to leeward, it will be harder to gybe as the boat will try to luff up and turn in the wrong direction.

The centreboard must be no more than a quarter down when you gybe. If it is any lower, the boat will try to luff as the boom swings across and, as a result, may trip over the centreboard and cause the boat to capsize. If your dinghy has a daggerboard make sure that it will not catch on the boom or boom vang as the mainsail swings across, otherwise you will capsize.

Gybing in strong winds can be hazardous and can be avoided by luffing up to a reach, then tacking around before bearing away to the desired course. If you choose to gybe in strong winds, do so when the boat is sailing as fast as possible. Because the boat is sailing away from the true wind, the apparent wind is reduced by the speed of the boat's movement. This reduces the forces on the sail and makes gybing easier. Pick a time when the boat is surfing down the front of a wave and gybe when the boat is at its maximum speed.

GYBING TIPS

Once you are committed to gybing, do not hesitate or change your mind. Turn the boat smoothly and be prepared to move fast as the boom comes across.

You can obtain advance warning of when the boat is about to gybe by watching the leech of the mainsail, about one-third up from the boom. When the gybe is imminent, the leech folds back to windward, showing the wind is getting behind the sail.

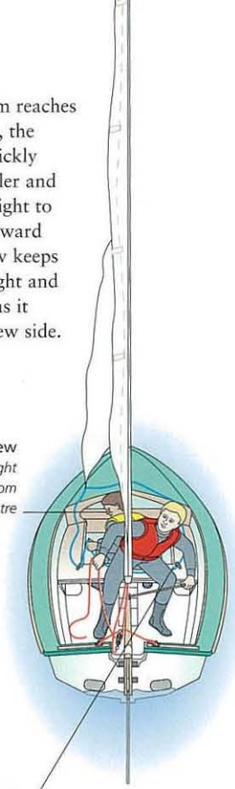
As the boat gybes and the boom swings across the centreline, it is very important that both the helmsman and the crew are in the middle of the boat, and that the tiller is centred.

It is often necessary to turn the boat through quite a wide arc before the boom starts to move across the boat, particularly in light winds. You can get around this by giving a sharp tug on the mainsheet when you see the jib blow across the bow. This will start the boom moving across the boat earlier than it would do otherwise.

ACCIDENTAL GYBES

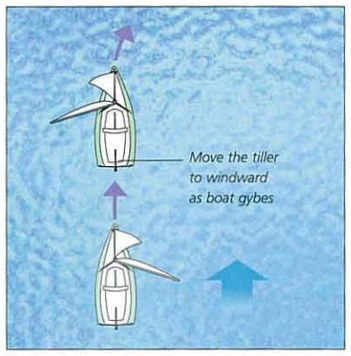
If you continue to bear away from a broad reach to a run, sailing further and further away from the wind, the boat will eventually gybe on its own as the wind swings across the stern. As this is an uncontrolled gybe, it can result in you taking an unexpected swim. Ensure that you do not gybe accidentally by continually checking the wind direction whenever you are sailing downwind. An early warning sign of an unplanned gybe is when the jib tries to blow across to the windward side of the boat. This means that you are on a dead run, so if you bear away any more, then the boat will gybe.

4 As the boom reaches the centreline, the helmsman quickly centres the tiller and moves his weight to the new windward side. The crew keeps the boat upright and trims the jib as it reaches the new side.



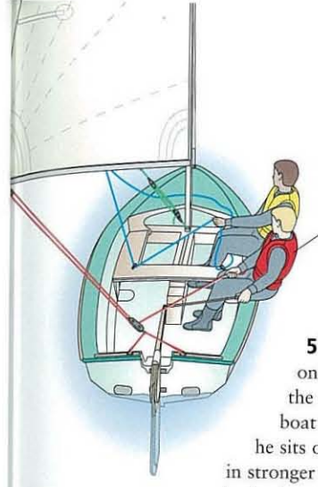
GYBING FROM A DEAD RUN

Although you will usually learn to gybe by starting on a training run and ending on a broad reach, it is possible to gybe while sailing on a dead run with no course alteration at all, or only a minor one.

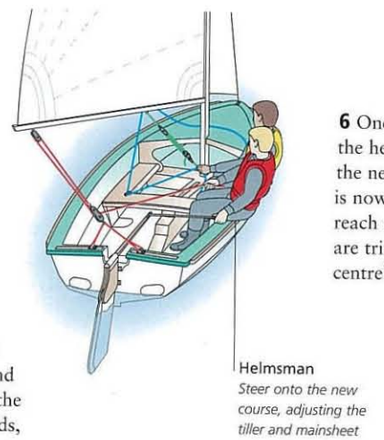


A DEAD-RUN GYBE

To gybe on a dead run with minimal course alteration, it is necessary for the crew or helmsman to pull the mainsail across to the new leeward side, rather than using the wind to move it by turning the boat during the gybe. Sail on a dead run with the helmsman in the middle of the boat and the crew balancing it as necessary. When the helmsman calls "gybe-oh", the crew grasps the boom vang and swings the boom across. In a centre-mainsheet boat, the helmsman can grasp the mainsheet tackle and use it to swing the boom over instead.



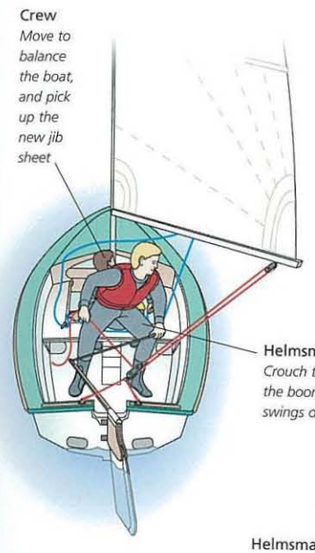
5 The mainsail fills at once on the new side and the crew moves to keep the boat upright. In light winds, he sits on the leeward side but in stronger winds he will need to be in the middle or on the windward sidedeck.



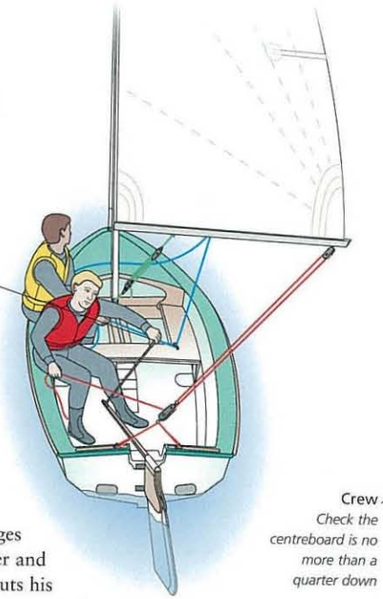
6 Once the boat is level, the helmsman can steer onto the new desired course. The boat is now likely to be on a broad reach on the new tack. The sails are trimmed correctly and the centreboard adjusted if necessary.

GYBING AN AFT-MAINSHEET BOAT

Executing a gybe in a boat with an aft mainsheet differs from gybing one with a centre-mainsheet in that the helmsman changes hands on the mainsheet and tiller before the gybe, and he faces aft during the gybe. This means that he cannot see what is in front of the boat during the manoeuvre, so it is important that the gybe is completed as quickly as possible. The crew, as in all manoeuvres, crosses the boat facing forwards.

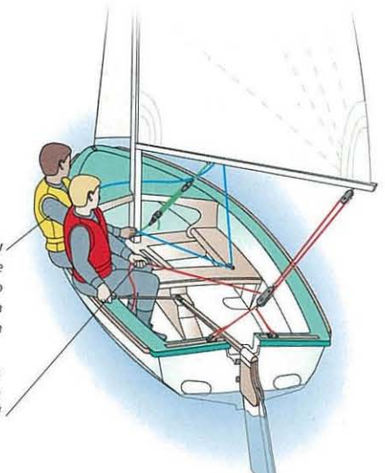


3 When the helmsman sees that the mainsail is about to swing across, he moves to the middle of the boat, pivoting on the balls of his feet to face aft.



2 The helmsman calls "gybe-oh", changes hands on the tiller and mainsheet, and puts his front foot into the centre. He swings the extension to leeward and pushes the tiller to windward.

1 The helmsman luffs up to a training run, checks the new course, sheets in to bring the boom clear of the shroud, and calls "stand-by to gybe". The crew checks the course and centreboard and calls "ready".



SAILING A COURSE

ONE OF THE BEST WAYS TO DEVELOP YOUR SKILLS is to sail a course that requires you to tack and gybe, and encompasses all the points of sailing *(pp.40-41)*. How you arrange your course depends on your sailing area. A small island would be ideal to sail around. Alternatively, you could use a few buoys as your turning points, or else simply sail an imaginary circuit to bring you back to your starting point. Whatever course you set, try to sail out of the way of other boats on your first few attempts. As you sail, concentrate on sail trim, centreboard position, and boat trim and balance.

SAILING UPWIND

Start by sailing on the upwind courses (beam reach, close reach and close-hauled). On these courses you can slow down and stop, if necessary, simply by letting out the sails until they shake and lose power.

BEAM REACH

Steer onto a beam reach with the centreboard half down. Trim the sails and move your weight to keep the boat upright. If it heels significantly even though you are sitting out fully, consider reefing *(p.74)*. Experiment with moving the tiller until you are happy with the way it alters the boat's course. Watch its effect by looking at how the bow moves in relation to the horizon. Keep checking the trim of the sails. In moderate winds, this will be the fastest point of sailing *(pp.40-41)*.

CLOSE REACH

When you have got the feel of the boat sailing on a beam reach, you can luff up to a close-reaching course. Lower the centreboard to the three-quarters-down position and sheet in the sails to keep them full. You will need to sit out harder to counter the increased heeling force. In light winds this will be the fastest point of sailing.

CLOSE-HAULED

Sailing close-hauled is difficult to get right and requires plenty of practice. Lower the centreboard fully and luff up to a close-hauled course. Ask the crew to pull the jib in tight and cleat the sheet. Next, sheet the mainsail in tight and steer the boat by watching the luff of the jib. Your aim is to sail along the edge of the no-sail zone, making as much distance to windward as possible. Gently ease the tiller away from you, luffing up slowly, and watch for the moment when the jib luff shakes. At that point, pull the tiller towards you very slightly to bear away until the luff just stops shaking. To maintain

SAILING AROUND A COURSE

Choose an area clear of other boats, ideally with something to sail around – either a small island or a series of small buoys to form turning points on your course.

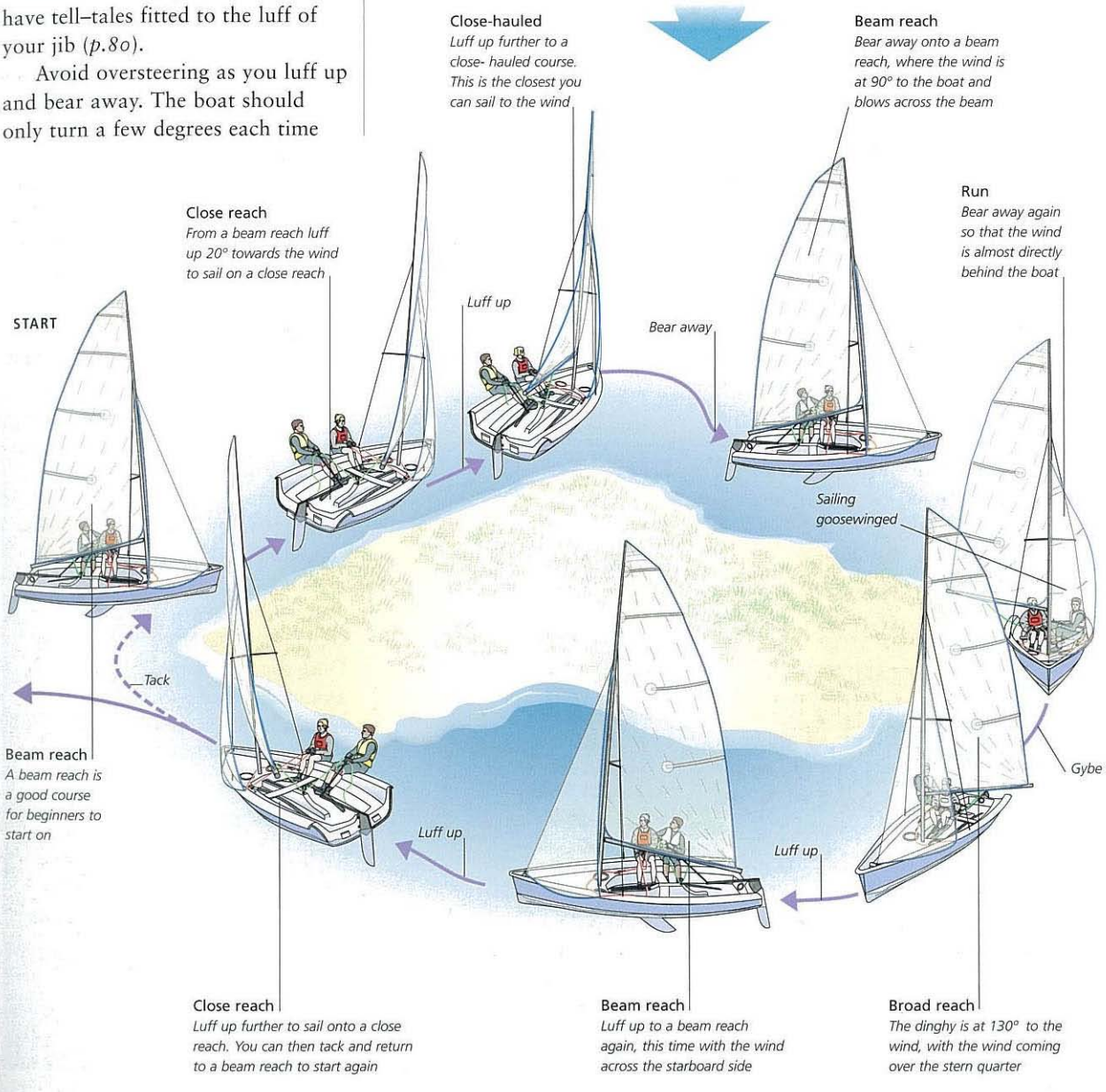
an accurate close-hauled course, you must constantly repeat this gentle luffing up and bearing away, which demands concentration when you are learning. If you lose concentration you will find that you are sailing either too close or too far off the wind. The former is obvious as the jib will shake and the boat will slow down; the latter is more difficult to spot unless you have tell–tales fitted to the luff of your jib (*p.80*).

Avoid oversteering as you luff up and bear away. The boat should only turn a few degrees each time you move the tiller so make only gentle steering movements.

If you find that the boat heels too far in gusts of wind, even though you are sitting out, reduce the heeling force by easing the mainsheet slightly to bring the boat upright again. When the gust passes, pull the sheet in again or the boat will heel to windward.

STEERING A COURSE

You will need to luff up, bear away, tack and gybe to complete this course. It is advisable to try to pick light to medium winds for your first few outings. Sailing in strong winds is obviously tricky, but very light winds can also be difficult – the boat will be slow to react and will require skillful sailing to keep it moving.



SAILING DOWNWIND

After the upwind courses, you will notice a big difference as you sail onto the downwind courses (broad reach, training run, and dead run). The difference is especially obvious in moderate to strong winds. The wind strength will seem to decrease due to the effects of apparent wind *(p.33)*. You will not have to sit out so hard to balance the boat; and you will not be pushing into the waves but sailing with them. Any spray that was flying upwind will disappear and the environment will seem warmer.

BROAD REACH

From a beam reach, bear away to sail on a broad reach. Ease out both sails until they set correctly, watching the luffs or tell-tales *(p.80)* to see when the optimum trim is achieved. Raise the centreboard so that it is a quarter-down and move inboard to keep the boat level (shift your weight back slightly to lift the bow if it seems to be burrowing into the waves). In strong winds a broad reach is likely to be the fastest point of sailing.

TRAINING RUN

From the broad reach, bear away to a training run so that the wind comes over one stern quarter, and ease the sails out as far as possible. Remember that you cannot ease the mainsail fully because the boom will hit the leeward shroud. Keep it just clear of the shroud to prevent chafe. If the boom seems to be rising too high at the outer end and the boat is rolling, tighten the boom vang to hold it down.

Unlike the mainsail, the jib is not limited in how much it can be let out. It should be set using the tell-tales or by watching for a shaking luff. If the jib collapses behind the mainsail, you have turned the boat too far from the wind, so luff up slightly until the jib fills again.

To sail efficiently on a training run, you need to raise the centreboard until little more than the tip protrudes below the dinghy. If the boat rolls and feels unstable, put a bit more of the centreboard down to help stabilize it. Depending on the strength of the wind, the crew should sit in the middle of the boat or to leeward to balance the weight of the helmsman. To have a good view of the sails and the course, the helmsman should remain seated on the windward sidedeck.

DEAD RUN

Sailing on a dead run is the trickiest point of sailing for the helmsman and crew. With the sails eased out fully and the wind blowing from straight behind the boat there is no heeling force to balance against and the boat will tend to roll from side to side. The maximum speed is obtained by pulling the centreboard almost fully up, but this will increase the tendency to roll. If rolling becomes a problem, lower the centreboard to the quarter-down position.

The helmsman should sit on the windward side, but the crew will usually have to move right across to leeward to balance the helmsman's weight. The crew must be ready to move quickly but smoothly if the boat rolls either way. The helmsman must concentrate carefully on his course to avoid an accidental gybe.

GOOSEWINGING

Once you have gained confidence on a run, you can try goosewinging by setting the jib on the opposite side of the mainsail. This will increase your speed and will also help to balance the pull of the mainsail and make the boat easier to steer on a straight course.

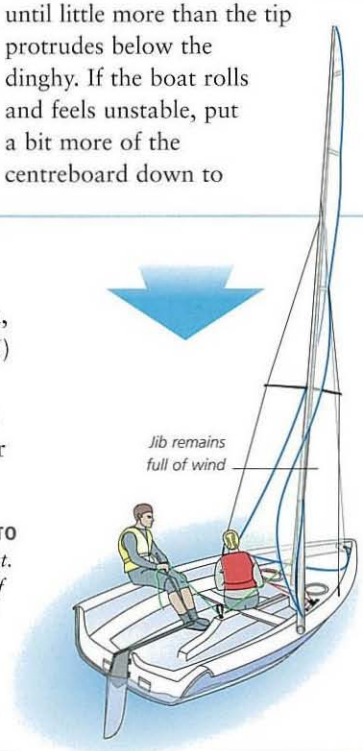
To goosewing, bear away to a dead run so that the wind is coming directly over the transom. This makes the jib collapse as it is now in the wind shadow of the mainsail. Pull it across the foredeck using the other jib sheet until it fills with wind and sets on the opposite side of the boat.

HEAVING-TO

Heaving-to, or the hove-to position, is more effective than lying-to *(p.86)* if you need to halt for anything longer than a few moments. It is a good position if you need to reef or if you want to rest.

HOW TO HEAVE-TO

Begin by tacking without freeing the jib sheet. Then let the mainsail out until the front half flaps. Push the tiller to leeward and keep it there. Raise the centreboard to about two-thirds down to prevent heeling. The force in the wind-filled jib is counteracted by the mainsail and rudder.



WHISKER POLES

Some boats that are not designed to have spinnakers *(pp.144–51)* have a pole, known as a whisker pole, that is used to boom out the jib when it is goosewinged. The whisker pole is clipped to a ring on the front of the mast and usually has a point on the other end that is pushed into the cringle at the jib clew. Tension is maintained on the jib sheet to prevent it from slipping out.

The whisker pole can be a very useful accessory if you have some distance to sail on a dead run. It keeps the jib goosewinged even if the helmsman luffs slightly to a training run. Without the help of the whisker pole, it is much harder for the crew to keep the jib set in this way. Make sure that you remove and stow the whisker pole safely before you gybe or luff up.

USING A WHISKER POLE

This Sharpie is a traditional dinghy class that does not use a spinnaker. Instead, a long whisker pole helps boost speed downwind and reduce rolling by poling out the jib on the windward side.

SAILING IN TIDES

When you sail in tidal waters, it is important to allow for a tidal stream, which will make your boat drift in relation to the seabed. It will influence how you steer to follow your course.

TIDAL EFFECTS

To get a better idea of how the tide affects your boat, imagine you are walking on a moving floor. If you walk in the same direction that the floor is moving in you will travel faster than you would if the floor was static. If you turn around and walk in the opposite direction to that in which the floor is moving, it is harder to make forward progress and will take you longer. Walk across the floor and its movement will take you sideways, away from your destination. These effects are identical to what happens to your boat when you sail in tidal waters.

TIDAL DIRECTION

If you are going to sail in tidal waters, make sure that you know the direction of the tidal stream before you go afloat. Also, find out whether the direction is due to change while you are sailing.

COPING WITH TIDES

When you find yourself in a tidal stream, the following few tips will help you to keep out of trouble.

- Remember that the strongest tidal stream is usually found in the deepest water, while the the weakest streams occur in shallow water.
- If the tide is going with you, manoeuvre into the strongest stream to maximize the benefit.
- If the tide is against you, get out of the strongest stream by heading for shallow water, but be careful not to run aground.
- If you have to sail across the current, head upstream of a straight-line course to allow for the tide sweeping you sideways.

FROM AND TO THE SHORE

SETTING OFF FOR YOUR SAILING TRIP and returning from it afterwards are usually the trickiest parts of the day. The shoreline is a solid obstacle that is a potential hazard to you and your boat if you do not know how to deal with it. Beaches, pontoons, and slipways require certain skills if you are to leave them and return to them without problems. You also need to know how to cope with onshore and offshore winds and changing tidal conditions, as well as obstacles, such as other sailing or power boats.

WEATHER SHORE

The main factor that will determine the ease or difficulty of leaving and returning to the shore is the wind direction in relation to the shoreline.

If the wind is blowing off the land, the shore is called a weather shore and the wind is called an offshore wind. In this situation, it is easy to leave the shore as not only do you have the wind blowing you off the shore, but the water will be flat, with no waves breaking close to the land. To return to the shore, beat to windward *(p.92)*. To stop the boat, simply turn head-to-wind when you reach shallow water.

LEE SHORE

When the wind blows onto the land, the shore is called a lee shore and the wind is referred to as an onshore wind. Leaving a lee shore can be difficult, especially in strong winds from a beach with breaking waves. Once launched, beat to windward to get away from the shore. To return, simply sail downwind. Landing on a lee shore can be difficult, however – especially in breaking waves – and should be avoided if possible.

LAUNCHING FROM A SLIPWAY

A slipway is an easier launching point than a beach. Once the dinghy is afloat, park the trolley, and sail or paddle off.

ALONG THE SHORE

If the wind is blowing along the shoreline, you have an easy launching situation as you can simply sail from and to the shore on a beam reach.

LEAVING A BEACH

Most dinghies can be launched from a beach, but this is not normally as easy as launching from a slipway or pontoon. To move the boat across soft sand, you will need several people to carry it or a trolley with large tyres. A stone or shingle beach is also difficult to negotiate, and you may damage the hull on the stones. Some beaches, usually sandy ones, have a shallow slope into the water, which remains shallow for a long way out, making it difficult to fit the rudder and use the centreboard or daggerboard. Stony or shingle beaches often have a steeper slope where the water depth quickly increases. However, beaches with steep slopes are more prone to large, breaking waves in an onshore wind, which make launching more difficult.

LEAVING A SLIPWAY

Using a proper slipway is easier, but be sure to examine the type of shoreline that lies to either side of it. You may discover that the slipway is just a ramp between two sections of sea wall, which will present a significant hazard when returning to shore – or even as you are leaving – should you make a mistake. Beware of slipways that end suddenly with a steep drop into deep water. If you are launching at low tide you may find yourself unexpectedly falling off the end.

Aptly named, slipways are often covered in algae and other slimy weeds, so take care not to lose your footing. Always hold on to the boat's painter so that the dinghy does not sail off without you should you slip, and be wary of losing control of the trolley.

LEAVING A PONTOON

A pontoon is usually the easiest launching point, especially if there is a slipway alongside to get the boat into and out of the water. Once your boat is in the water, you can move it to a berth alongside the pontoon and take your time leaving. When you return, you can lower and stow the sails at leisure before taking the boat out of the water. If the pontoon protrudes into deep water, consider any tidal stream effects *(right)*.

LEAVING A WEATHER SHORE

Before you decide to leave from a weather shore, check the forecast. Because the wind is blowing off the land, it will be extremely difficult to judge how strong it is further away from the shore and beyond the sheltering effects of the land. There will not be any significant waves close to the shore but as you sail further out you may get a nasty surprise as the wind increases and the waves grow in size. You sail away from a weather shore on a broad reach or run, but to return you will need to beat to windward. This may be difficult if conditions further out are worse than you anticipated. Be prudent when sailing from a weather shore, and sail only when certain that the conditions offshore are within your capabilities.

LEAVING A LEE SHORE

You will probably be fully exposed to the prevailing conditions on a lee shore. In fact, the wind and waves may seem to be more daunting when you are on the beach than they actually are when you sail further out. This is especially likely if the shore is steep, in which case waves will break onto it even in moderate winds. In this case the hardest part of the sail is getting off the beach and sailing through the surf line to calmer water.

LAUNCHING IN TIDES

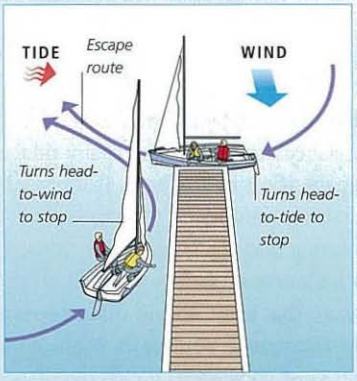
The presence of a current or tidal stream in the launching area may complicate leaving and returning manoeuvres. In some circumstances, its direction and strength will determine the way in which you should leave or approach the shore.

SHALLOW WATER

When sailing off a beach, you do not usually have to worry about the effect of a tidal stream along the shoreline because you are launching into shallow water where the stream, if any, will be minimal. Be aware, however, of the direction and strength of the stream offshore and plan your course accordingly.

DEEP WATER

In deep water, the tidal stream will affect how you sail away and return. Except when the tide is weak in relation to the wind, you should always treat it as the most significant force. If in doubt, sail away from the pontoon or slipway pointing into the tide and using just the jib if the wind is behind the beam. When you are returning, plan ahead and aim to turn into the tide to stop when you reach the pontoon or slipway. If this means that the wind will be behind the beam on your approach, lower the mainsail and sail in under the jib.



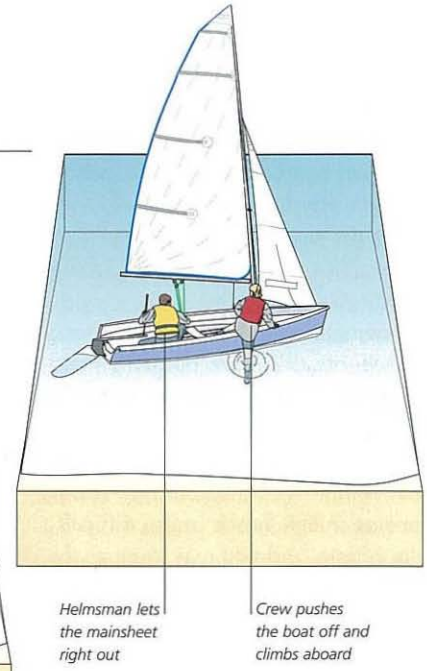
WIND AND TIDE AT A PONTOON

WEATHER SHORE

LEAVING A BEACH

When you leave a weather shore from a beach, begin with the usual launching procedure, preparing the boat and moving it to the edge of the water (pp.84-85). Turn the dinghy so that it is head-to-wind and hoist the sails (p.85). Launch the boat carefully, then, while one of you holds the boat by the painter, the other parks the trolley up the beach and out of the way. You are now ready to get on board and sail away.

1 The crew holds the boat by the bow while the helmsman gets aboard, checks that all gear is stowed, and fits the rudder. The helmsman lowers the rudder blade (if it is the lifting type) and puts the centreboard about a quarter down if the water is deep enough.

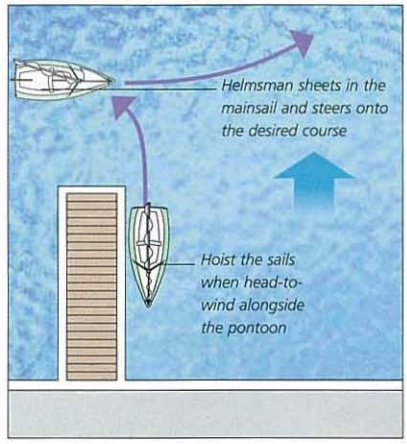


2 The crew turns the boat until he is by the windward shroud, pushes off, and climbs aboard. He then pulls in the jib to turn the boat further from the wind. The helmsman trims the mainsail and steers onto their chosen course.

LEAVING A PONTOON

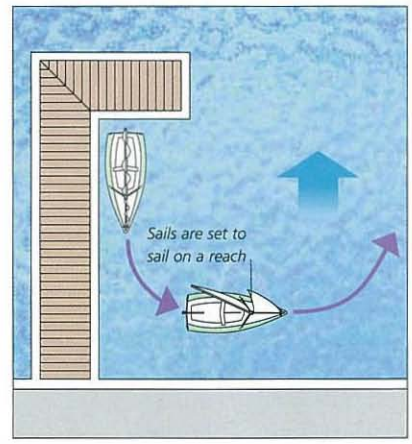
Launch the boat down a slipway, if available, or over the edge of the pontoon if necessary (*p.85*). Move the boat to the part of the pontoon from which it will be easiest to leave – usually at an end on the leeward side. The helmsman gets aboard and fits the rudder and tiller. He hoists the jib, then the mainsail, and lowers the centreboard about half way. Before the crew can untie the boat and get aboard, he and the helmsman must plan their course to open water.

Check to see if there is any tidal stream affecting the boat. If the tidal stream is significant, plan to leave pointing into the stream. Remember to look around before you sail off to ensure that there are no other boats or obstructions in your path. Make sure that your crew understands the planned manoeuvre before you cast off.



CLEAR WATER ASTERN

The crew unties the painter and steps aboard, pushing the boat backwards. The helmsman pushes the tiller in the direction he wants the bow to move (here, to port) while the crew backs the jib. The boat moves backwards and turns. Finally, the crew sheets the jib in on the leeward side of the dinghy to sail away.



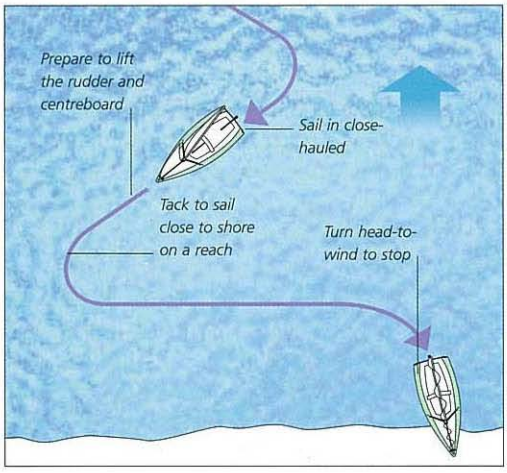
OBSTRUCTION ASTERN

The crew pushes the boat forwards and away from the pontoon. He gets aboard and then backs the jib, while the helmsman turns the boat away from the wind. As soon as the boat has turned, the crew sets the jib on the leeward side to sail away on a broad reach. The helmsman lets the mainsheet run out to help bear away.

ARRIVING AT A BEACH

When you return to a weather shore, you will need to tack in towards the beach or slipway. The way you approach will depend on whether the water close to the shore is shallow or deep. If you are going to sail into shallow water, the crew must be prepared to raise the centreboard just enough to clear the bottom and the helmsman must be ready to lift the rudder blade if necessary. After you have raised the rudder blade, make only very gentle movements with the tiller because when the blade is in the raised position it is very vulnerable to breakage. Remember, too, that once the centreboard is raised, the boat will make more leeway, so do not expect to be able to sail efficiently on a close-hauled course.

Plan your course into the beach, and discuss the plan of approach with your crew so that he understands what is required. Check that there are no other boats or obstructions in the way. If you are approaching a slipway, wait until it is clear of other users. When you reach the shore, the crew should step out on the windward side and hold the boat by the bow.

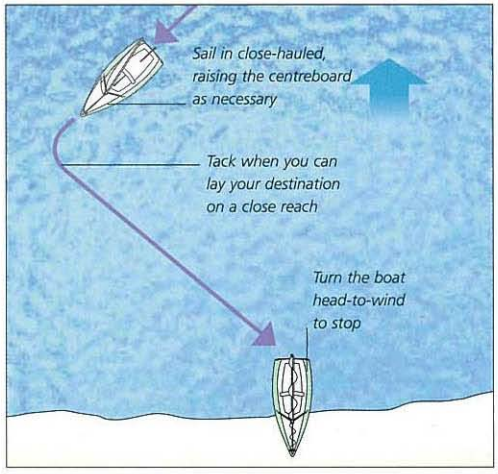


DEEP WATER

Where the water is deep at the shoreline, tack in close, then sail parallel to the land until you reach your chosen landing point. The helmsman turns the boat head-to-wind to stop. The crew gets out just behind the shroud, taking care to avoid stepping into deep water, and holds the boat while the helmsman lowers the sails, removes the rudder, and raises the centreboard fully.

SHALLOW WATER

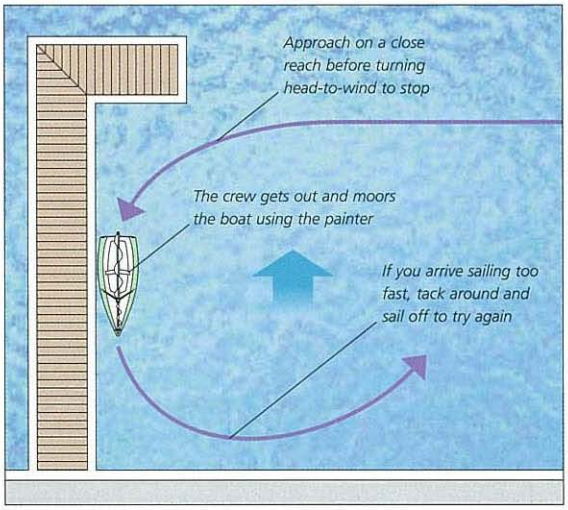
Tack in to the shore, aiming for your chosen landing spot. As the water gets shallower, the crew raises the centreboard and the helmsman lifts the rudder. Make the final approach on a close reach. At the landing point, turn head-to-wind. The crew gets out and holds the boat, while the helmsman lowers the sails, removes the rudder, and raises the centreboard fully.



ARRIVING AT A PONTOON

Approach the pontoon by sailing on a close reach. As you near the pontoon, ease out the sails to slow down, then turn head-to-wind to stop alongside. Pontoons usually have plenty of depth of water beneath them so you do not need to raise the centreboard or the rudder until you are safely alongside.

If there is a tidal stream present consider its effects on your boat and, if it is strong, plan to turn into the tide to stop. Always plan an escape route in case you arrive at the pontoon going too fast to stop. Once alongside, the crew gets out to secure the boat.



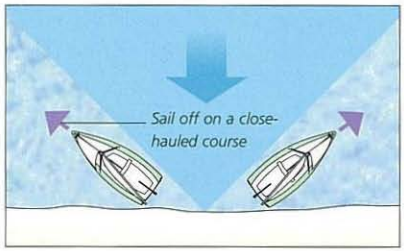
STOPPING AT A PONTOON

As you reach the pontoon, turn head-to-wind so that the boat comes to a stop alongside. The crew secures the dinghy while the helmsman deals with the sails and other equipment. It is important that you do not approach the pontoon sailing too quickly.

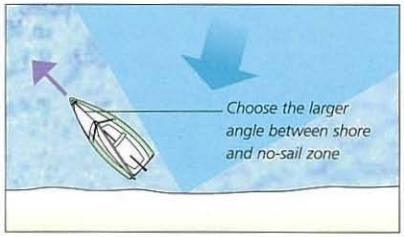
LEE SHORE

Leaving a lee shore is complicated because you are obliged to sail close-hauled or on a close reach, which is difficult, especially if you cannot lower the centreboard fully due to shallow water. If the wind is directly onshore, you have no choice but to start on a close reach until you can lower the centreboard fully and head up to a close-hauled course.

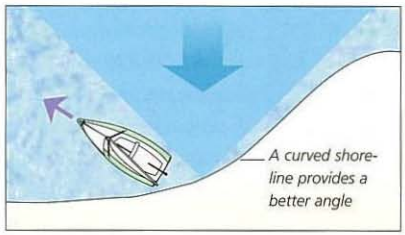
Fortunately, the wind often blows onto the shore at an angle, giving a larger angle between the shore and one edge of the no-sail zone. Choose the tack that allows you to sail in the larger angle. Curved shores usually produce the same effect by providing a greater angle to sail in on one tack.



WIND DIRECTLY ONSHORE



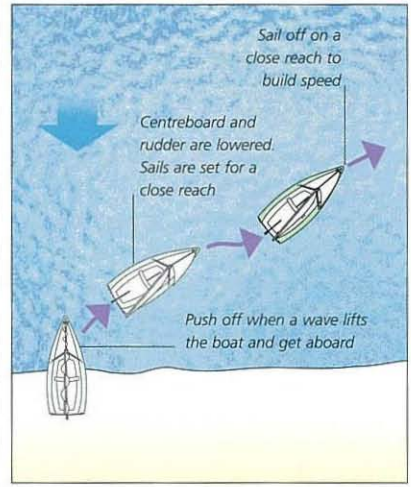
WIND AT AN OBLIQUE ANGLE

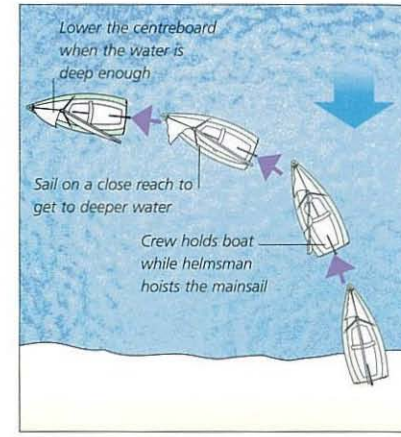


WIND ON A CURVED SHORELINE

LEAVING FROM A BEACH

When leaving from a beach in deep water, turn the boat head-to-wind and hoist both sails ashore. When you are ready to launch put the boat half in the water and wait for a suitable wave to lift the boat, then push off and sail away. In shallow water, hoist the jib before launching the boat, then hoist the mainsail. Lower the rudder and centreboard as soon as possible but be careful not to let them hit the bottom or they could break or stop the boat.





SHALLOW WATER

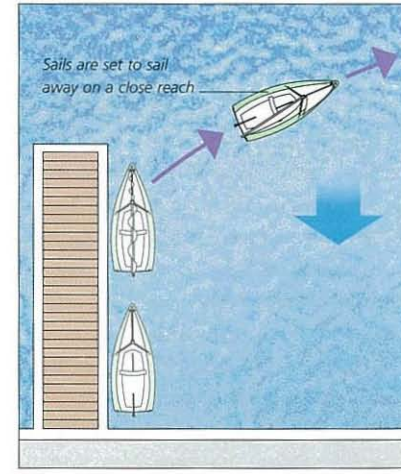
The crew holds the boat by the bow and walks the boat out until the depth is about 1m (3ft). The helmsman climbs aboard and hoists the mainsail.

DEEP WATER

Lift the boat so that its front half is in the water. Decide on your leaving direction then both stand by the side that will be to windward. Watch the waves as they approach. When one floats the boat push it into deep water and climb aboard. Sheet in both sails, and lower the centreboard and rudder blade as soon as possible. Sail fast on a close reach to get through the waves and clear of the beach. Luff up to sail over each wave crest, then bear away.

LEAVING FROM A PONTOON

Launch the boat and turn it head-to-wind. If the wind is at an angle, put the boat on the leeward side of the pontoon. The helmsman steps aboard and hoists the sails, fits the rudder, and lowers the centreboard. He tells the crew how he wants to leave.

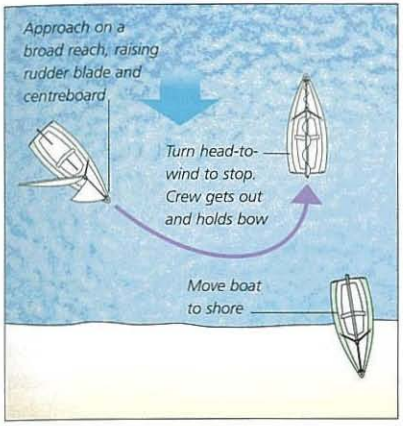


SAILING AWAY

The crew pushes the bow away from the pontoon and steps aboard. The helmsman sheets in the mainsail and the crew sheets in the jib to sail away on a close reach.

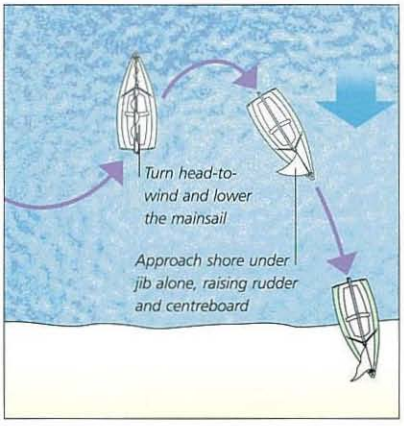
ARRIVING AT A BEACH

With the wind behind you, it is easy to approach a lee shore, but you must be careful with your stopping techniques. Arriving at a lee shore in strong winds is dangerous because the waves are likely to be steep and breaking, especially if the shore slopes sharply into deep water. Always keep to the windward side of the boat when jumping out, otherwise breaking waves or a strong gust of wind could push the boat on top of you, causing injury. Get the boat ashore quickly. In areas where a dinghy club sails from a steep beach a shore team will often be present to help crews land and lift boats out of the water quickly.



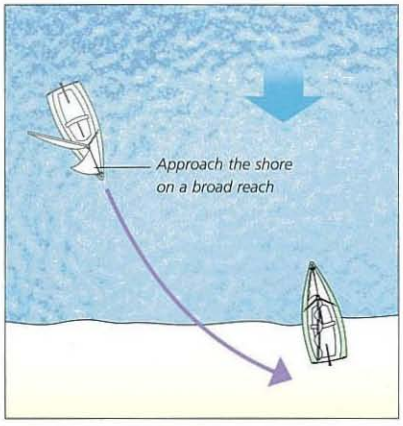
A SHALLOW WATER APPROACH

In shallow water, approach on a broad reach under full sail. When the water is about 1m (3ft) deep, turn into the wind to stop. The crew steps out on the windward side to hold the bow while the helmsman lowers the sails, and removes the rudder.



DEEP WATER SAFE APPROACH

Some way offshore, turn head-to-wind and lower the mainsail. Approach the shore under jib alone on a run or broad reach. Close to the shore, let the jib flap and drift in. Helmsman and crew jump out when the water is shallow enough.



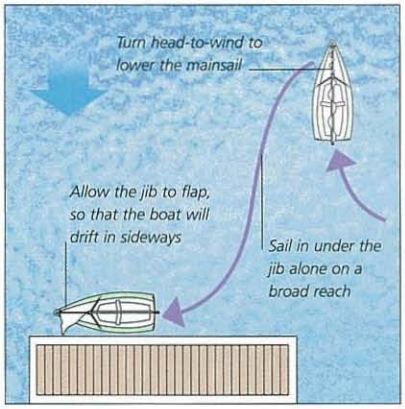
DEEP WATER FAST APPROACH

To land in large waves, approach fast on a broad reach and raise the rudder blade at the last moment. Just before the boat hits the beach, both crew jump out on the windward side, run the boat up the beach, and turn it head-to-wind to lower the sails.

ARRIVING AT A PONTOON

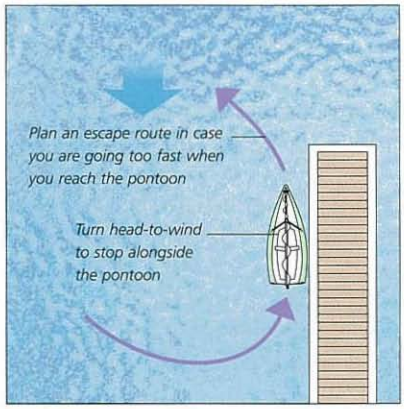
You often have a choice when approaching a pontoon on a lee shore. You can decide to lower the mainsail and approach under just the jib or, provided there is a pontoon at right angles to the shore, you can come in with both sails set. If in doubt it is safest to lower the mainsail and come in under jib alone.

If the pontoon is in tidal waters consider whether the tidal stream will affect your approach. If it is strong, plan to turn into it to stop. If possible, plan an escape route in case the boat is moving too fast to stop in the final approach, although this can be difficult when approaching a lee shore. Drop the sails and paddle in if it will be difficult to retain control under sail.



PARALLEL TO THE SHORE

Where there is nowhere to moor head-to-wind, sail upwind of your destination and lower the mainsail before approaching under the jib alone. Let the jib flap in the last stages so that you drift in slowly. Once alongside, the crew secures the boat.

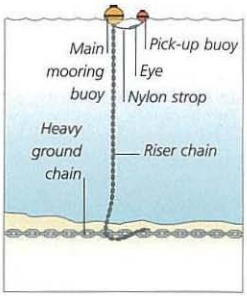


RIGHT ANGLES TO THE SHORE

Sail on a broad reach close to the shore, then turn head-to-wind to stop alongside. This requires good judgement so plan an escape route; then you can go around and try again if necessary. If in doubt, lower the mainsail and come in under the jib alone.

MOORING AND ANCHORING

SOME LARGER GENERAL-PURPOSE DINGHIES and small keelboats are kept permanently afloat on moorings, which are often laid in rows called trots. Design varies, but most moorings have heavy concrete sinkers or anchors to secure them to the seabed. Some mooring buoys have a light pick-up buoy, while others have a ring on top to which you secure the boat directly. Anchoring is an art that is rarely used in small boats nowadays, and still more rarely in high-performance boats. Nevertheless, it can be useful in emergencies, for a brief stop, or when dinghy cruising.



A MOORING

NON-TIDAL WATERS

If you are moored or anchored in non-tidal waters, the boat will always lie head-to-wind, making it simple to sail off with both sails set.

To sail away from the mooring, hoist the sails, lower the centreboard, and fit the rudder and tiller. The dinghy is turned to the desired direction for leaving by backing the jib. Once the backed jib has pushed the bow around, the helmsman can sheet in the mainsail and the crew can then sheet the jib on the leeward side.

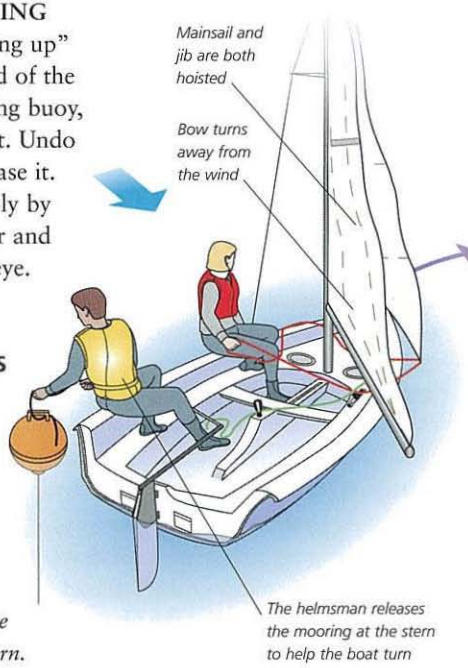
If it is important to turn sharply as soon as the mooring is dropped, the crew can help the turn by pulling the buoy aft, down the windward side. The further aft it is released, the more the boat will turn downwind.

TIDAL WATERS

In tidal waters, the direction and relative strength of the wind and tide will determine how you leave a mooring. If the boat is lying head-to-wind, you can leave in the same way that you would in non-tidal waters. However, if the wind is not clearly well ahead of the beam, it will be impossible to hoist the mainsail without it filling immediately and attempting to sail the boat around the mooring. In this case, you must leave under the jib alone.

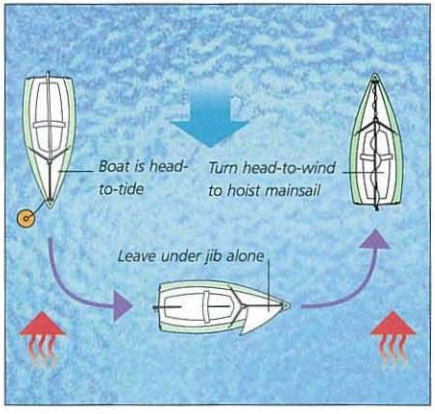
PREPARING TO LEAVE A MOORING

Prepare to leave a mooring by "singling up" the mooring line: run the working end of the painter through the eye on the mooring buoy, bring it back aboard, and make it fast. Undo the permanent mooring line, and release it. The dinghy can now be released simply by freeing the working end of the painter and pulling it back through the mooring eye.



LEAVING WITH BOTH SAILS

If the dinghy is head-to-wind, leave with both sails hoisted. The helmsman picks the direction to leave. The crew backs the jib on the other side of the boat and slips the mooring. If it is important to turn sharply away from the mooring, the crew passes the buoy along the windward side to the helmsman who then releases it at the stern.



LEAVING WITH JIB ALONE

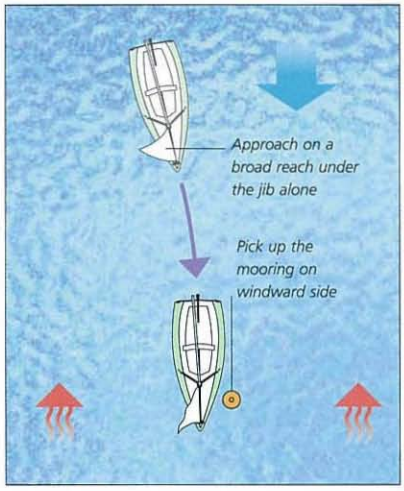
If the wind is not ahead of the beam, you must leave the mooring under the jib alone. Prepare both sails for hoisting, fit the rudder and tiller, and single up the mooring. Hoist the jib but let it flap, and lower the centreboard. The helmsman chooses the course to sail away and the crew slips the mooring and sheets in the jib. When you are clear of all obstructions, luff up so that you are head-to-wind, and then hoist the mainsail.

PICKING UP A MOORING

Before you commit to an approach to a mooring, look at other boats already on the moorings, especially those that are similar to your own, to see if they are head-to-wind or being influenced by the tide. Assume that your boat will take up a similar position, and decide where the wind will be. If it will be well ahead of the beam, you can approach under both the mainsail and jib. However, if it is further aft, you should approach under the jib alone.

Taking into account the proximity of other boats or obstacles, plan your approach to the mooring. If there is a tidal stream, make sure that you will pass other boats on their down-tide side to avoid being swept onto them.

At the mooring, pick up the buoy on the windward side, ahead of the shroud. Fasten the painter to the buoy and lower the sails. Then make fast securely with the mooring rope.

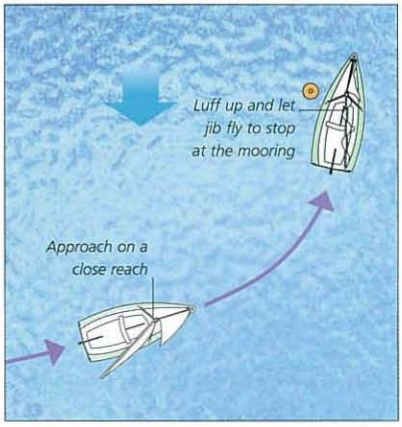


APPROACHING UPWIND

If the boat will face the wind when it is moored, approach the buoy on a close reach, easing out the sails to slow down, and then luff up so that you are head-to-wind at the mooring. If the wind and tide are together but the wind is light, it may be better to approach on a beam reach to avoid getting swept down-tide.

APPROACHING DOWNWIND

If the wind and tide are opposed or at an angle to each other so that the boat will not lie head-to-wind when it is moored, you should approach under the jib alone. Lower the mainsail while you are still in clear water, and then approach downwind under the jib, aiming to arrive at the mooring pointing into the tide. Control your speed by using the jib sheet, and let the jib flap to slow down at the mooring.



ANCHORING A DINGHY

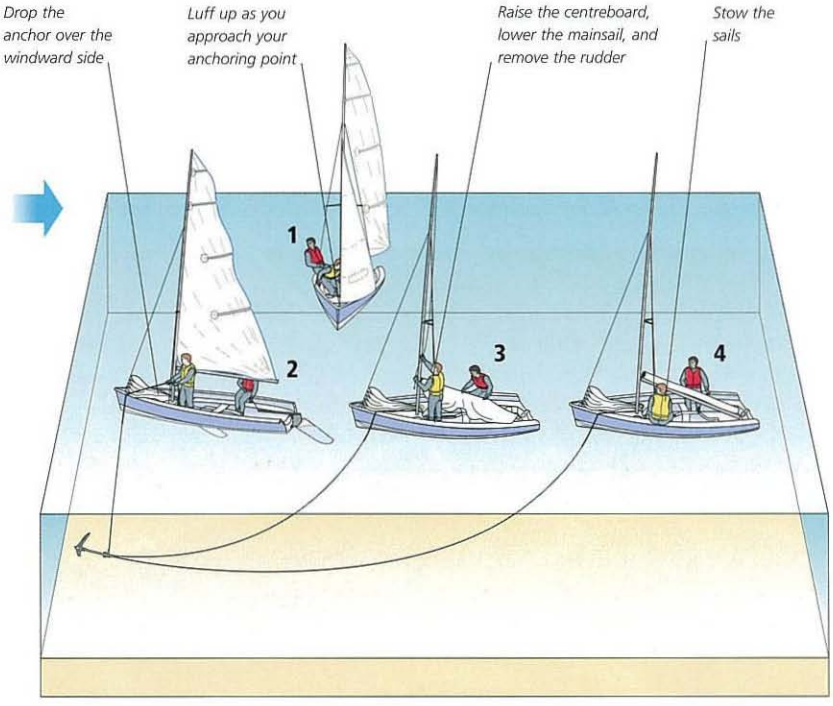
You will need an anchor warp that is 3–5 times longer than the depth of water. Tie the warp to the mast and coil the bulk of it into a bucket. Take the other end out through the bow fairlead and back in around and behind the windward shroud. Tie it to the anchor using a round turn and two half hitches (p.47).

1 Sail up to your anchorage site and stop exactly as you would at a mooring.

2 Lower the anchor over the windward side. Quickly lower the jib.

3 Lower the mainsail, paying out the anchor warp as the boat drifts back. Raise the centreboard and remove the rudder.

4 Now check that the anchor is holding by using a shore transit (*p.333*), and then stow the sails.



COPING WITH CAPSIZE

THE STABILITY OF A DINGHY DEPENDS largely on the movement of crew weight, which means that a capsize is always possible. It is a common mishap in most dinghies, so practise recovering your dinghy from a capsize until you are fully competent in the procedure. Get used to being in the water so that you feel relaxed when dealing with a capsize. If you fail to right a capsized boat, climb onto the hull, tie yourself on with the end of a sheet, and wait for rescue. Never try to swim to shore. A capsized boat is far easier for rescuers to spot than a swimmer's head.

AVOIDING A CAPSIZE

The easiest way to avoid capsizing, and the need to recover a capsized boat, is to sail a small keelboat or one of the stable general-purpose dinghies that are less prone to capsizing than most other dinghies. However, if you do sail a more responsive and hence less stable dinghy, you can reduce the chances of capsizing by always sailing within the limits of your experience and ability, and by avoiding going afloat if the wind is strong. Even then, a change in conditions while you are afloat may catch you out.

If your dinghy can be reefed (*pp.74-75*) then make sure that you know how to reef it, while afloat if possible, so that you can adjust the sail area to suit the conditions. If reefing afloat is not possible and you are caught out by rough conditions, aim to sail the boat as upright as possible, while still sailing fast, by spilling wind from the sails to reduce heeling. Flatten the sails as much as possible (*pp.180-181*) and raise the centreboard or daggerboard slightly when sailing to windward, or on a close reach or reach, to reduce the heeling effect. Do not let the boat heel and slow down, as that will make it more vulnerable to capsizing. Head for shore as quickly as possible and, if you cannot reach your base, consider landing elsewhere to reef the boat ashore, or to wait for the conditions to ease.

If, despite all your efforts, you make a handling mistake or a gust overpowers the boat and it heels to the point of a capsize, it may still be possible to recover the situation if you let go of the tiller and the sheets and quickly move your weight to the high side. There is a fair chance that, left to itself, the boat will round up rapidly into the wind and remain upright.

LEEWARD CAPSIZE

The most common type of capsize is when the boat tips over to leeward, away from the wind. This typically happens when the wind overpowers the righting effect of the crew's weight and the boat heels so far that water floods in over the leeward gunwale. A typical leeward capsize occurs when the boat gybes and the crew are not quick enough to move their weight to the new windward side, or if the helmsman allows the boat to continue turning and it is overpowered before it can accelerate on its new course. Once a leeward capsize becomes inevitable, the helmsman and crew should slip into the water between the boom and the hull. If they try to avoid getting wet, by hanging on to the side of the boat, they will probably invert the dinghy (*pp.114-115*).

LEEWARD CAPSIZE

This single-handed dinghy is about to capsize to leeward. The boat has been overpowered and the helmsman was slow to ease the mainsheet. With the boom end in the water, a capsize is almost inevitable.

WINDWARD CAPSIZE

A windward capsize is somewhat less common than a leeward capsize. It usually occurs when a dinghy is sailing on a run or broad reach and it rolls heavily towards the wind. As it rolls, the part of the hull that is in the water becomes unbalanced (*p.79*) and makes the boat turn further away from the wind. The boat continues to roll and then tips over, towards the crew. This sort of capsize is usually considerably quicker and more violent than a leeward capsize and the crew may not have time to react. A typical occurrence is just before a gybe in strong winds. As the boat capsizes on top of them, the crew will usually fall backwards into the water.

WINDWARD CAPSIZE

This single-handed dinghy is in the final stages of a windward capsize. The helmsman has let go of the tiller and dived towards the high side, but too late to prevent the capsize.

STAYING SAFE

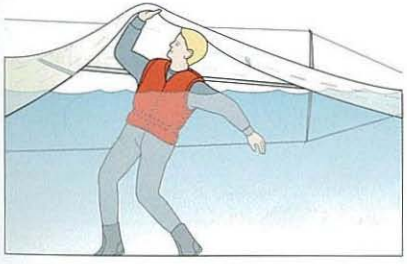
Capsizing inevitably has an element of danger because there is a small risk of being separated from the boat, trapped underneath it, or entangled in the rigging. The type of dinghy you sail will partly determine the level of risk. Many lightweight designs are prone to invert (*pp.114-115*) – turn completely upside down – and may do so quickly once they are on their side in the normal capsized position. When inverted, many high-performance boats do not have sufficient space in their shallow hulls for an air pocket in which a person caught under the boat can breathe. Older designs tend to have sufficient depth to their hulls to trap a sizable air pocket in which it is easy to breathe before making your escape from under the boat.

It is important, therefore, that you know the characteristics of the boat and brief your crew accordingly.

Another risk is the danger of entanglement in ropes or rigging. This is particularly dangerous if the boat inverts and a person is entangled underneath it. If there is an air pocket under the boat the problem is less serious as the person can breathe while he disentangles himself, but in the absence of an air pocket any entanglement could prove fatal.

This risk of entanglement is greatest in high-performance boats where trapezes are used and where there is a greater number of control lines among which a person could become trapped. Such boats are usually more prone to inverting and are unlikely to have an air pocket under the upturned hull. When sailing a boat of this type it is even more important to assess the dangers in advance, and to carry a very sharp knife that can be used to cut yourself free if you are caught among control lines (*pp.136-139*).

Whatever type of dinghy you sail, it is vital that in the event of a capsize you stay in contact with the boat. Always keep a hand on the boat as you move around it, and if you have to swim around the boat to the centreboard always take the end of the mainsheet with you to act as a safety line. Never attempt to leave a capsized boat and swim to the shore. Remember, the shore is much further away than it looks and an upturned boat is far easier to spot from a rescue boat than a swimmer's head.



CAUGHT UNDER A SAIL

To escape from under a sail, lift the sail off the water to create an air pocket. Paddle out, keeping your hand up.

IN AN AIR POCKET

When under a boat with an air pocket there is no rush, as you can breathe. Take a breath and pull yourself under the gunwale.

WITHOUT AN AIR POCKET

When under a boat without an air pocket, hold your breath, move quickly to the edge, then pull yourself under the gunwale.

CAPSIZE RECOVERY

RIGHTING A CAPSIZED DINGHY

The standard way for righting a capsized two-person dinghy uses the scoop method, so named because one person is scooped aboard as the other pulls the boat upright. The scooped person's weight in the boat helps to prevent it capsizing again once it is righted.

While the boat is capsized, both helmsman and crew must avoid putting weight on the boat, which could make it invert. During a capsize recovery, the helmsman and crew will be out of sight of each other for most of the time. They must keep talking to one another so that both know what is happening.

Always try to right the boat with the mast coming up against the wind to avoid another capsize. If you capsized to windward, wait until the boat swings around with the mast downwind. If you fail to do this and try to right the boat with the mast pointing into the wind, the wind will get under the sail as soon as the mast is lifted off the water and the boat will come upright very rapidly, and will probably capsize again on top of the person who was standing on the centreboard.

Once the boat is righted, bail out the water, if necessary, before sailing off. If you are sailing a modern boat with a high floor it will probably self-drain as soon as you start sailing, but an older design may need you to bail some of the water out by hand (*pp.30*). A high-performance boat (*pp.120–189*), with a trapeze system and a spinnaker, may require the righting system to be modified, but the same principles apply and it is always best if one person can be scooped aboard if possible.

SCOOPED ABOARD

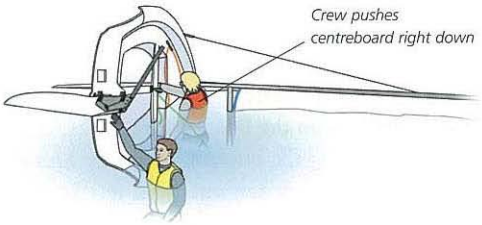
As the boat comes upright it will do so more quickly as the water drains from the mainsail. The crew in the water will be scooped aboard and their weight in the boat will help stabilize it. The helmsman can often climb aboard unaided as the boat comes upright.

RIGHTING THE BOAT

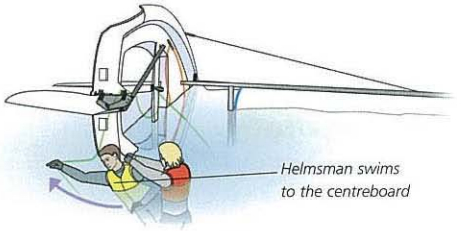
The heaviest person should right the boat by standing on the centreboard or daggerboard. The lighter person lies in the water alongside the boat, just behind the mast, holding onto a toestrap. When lying alongside the boat do not put any weight on it as this will make it much harder to right. Make sure that the mainsheet and both jib sheets are released.

USING THE SCOOP METHOD

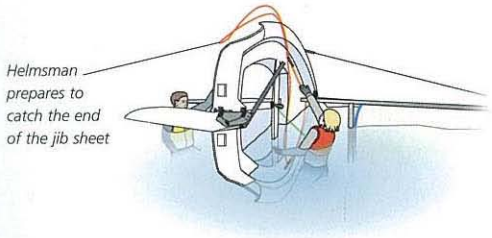
The scoop method relies on one person standing on the centreboard to pull the boat upright. Often it is the helmsman who rights the boat while the crew is scooped aboard, but if there is a significant difference in their weights the heaviest person should right the boat leaving the lighter one to be scooped aboard. If the centreboard is not fully down, the crew can push it down from inside. To avoid breaking the centreboard, the person righting the boat should stand on the part nearest the hull. While waiting to be scooped up, the other person should check that the mainsheet is free and the boom vang is released so the mainsail can flap loosely when the boat is righted.



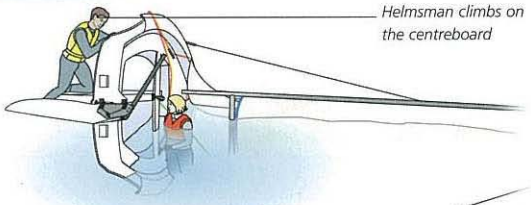
1 The crew pushes the centreboard down fully then joins the helmsman at the stern. The helmsman checks that the rudder is still in place. If it has floated off, he secures it with any available line.



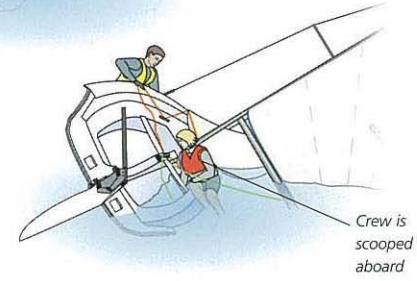
2 The crew passes the end of the mainsheet over the top of the rudder to the helmsman. Using this as a safety line, the helmsman swims around the bottom of the boat to the centreboard.



3 From inside the boat, the crew throws the end of the uppermost jib sheet over the boat to the helmsman. The crew then floats inside the hull, head towards the bow holding on to a thwart or toestrap.



4 Using the jib sheet to help him, the helmsman climbs up onto the centreboard, positioning his feet close to the hull. He then leans back with straight arms and legs, pulling steadily on the jib sheet.



5 The boat comes upright, scooping up the crew. If possible, the helmsman scrambles aboard by the windward shroud as the boat rights itself, or the crew helps him aboard, moving slowly to avoid another capsize.

RIGHTING A SINGLE-HANDED DINGHY

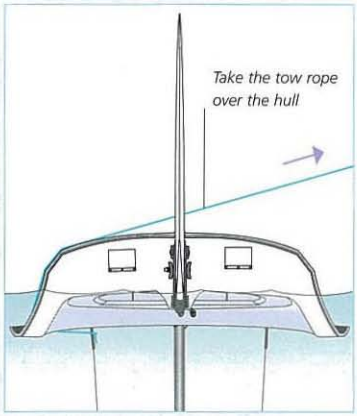
Many single-handers float quite high when capsized, so the daggerboard can be difficult to climb onto. Wrap your arms over it and hang your weight on it to make the boat come slowly upright. Alternatively, push the bow deeply into the water, which may make the boat rotate into its upright position.

1 In a leeward capsize, you may be able to avoid getting wet. As soon as a capsize appears inevitable, let go of the mainsheet and tiller and climb up over the top gunwale to reach the daggerboard.

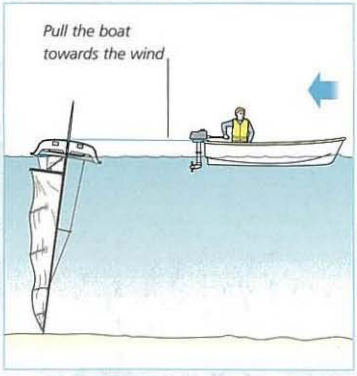
2 Step over the sidedeck and onto the daggerboard. Turn around to stand on the daggerboard and hold the gunwale. Pull the boat upright, climbing back in as it is righted.

MAST IN THE MUD

If you capsize in shallow water, there is a possibility of the mast catching on the bottom. The mast may get stuck if it hits soft mud, and you will have problems pulling it upright using only your body weight. In this case, you may have to ask for a tow. Ensure that the helmsman of the tow boat knows what he is doing, or you may damage the mast.



POSITIONING THE TOW ROPE



HOW TO TOW UPRIGHT

Take the tow line over the hull and tie it to a chainplate or other strong point that is within reach. If possible, attach the line to a leeward chainplate and prepare to pull the boat up against the wind. Motor very slowly at right angles to the boat, and towards the wind, until the boat rotates to lie on its side.

INVERSION

DEALING WITH AN INVERSION

Many modern dinghies are prone to quickly turn completely upside down when they capsize. This is because they usually have a lot of built-in buoyancy distributed along the bottom and sides of the hull. This means that they float high on their sides and easily tip (or are blown over) to the inverted position. In this position their decks often form a seal with the water. This makes it even more difficult to bring them upright, because the water seal has to be broken first. If you sail this type of dinghy it is imperative, when it capsizes, to avoid putting any weight on the hull and to get both people clear of the boat by moving to the transom. Then, if it inverts the crew will not become trapped underneath.

Dinghies differ in how they are best righted from an inversion. Some can be pulled upright by both crew standing on one gunwale or kneeling on the hull. With others, it is easier if one crew member pushes down on a corner of the transom to break the deck seal with the water while the other crew member pulls the boat upright. You should get to know the best way to right your boat by asking experienced sailors in your class.

Inversion in shallow water also brings the risk of the mast hitting the bottom. Be careful not to put any weight on the boat if the mast is touching the bottom, as it may break. Lie in the water with your feet against the hull while pulling on the jib sheet to try and right the boat, or ask a safety boat for help in towing the boat into a normal capsized position.

INVERTED

If the centreboard retracts, as here, stand on one gunwale and pull on the opposite jib sheet or fixed righting line.

LOSING THE CENTREBOARD

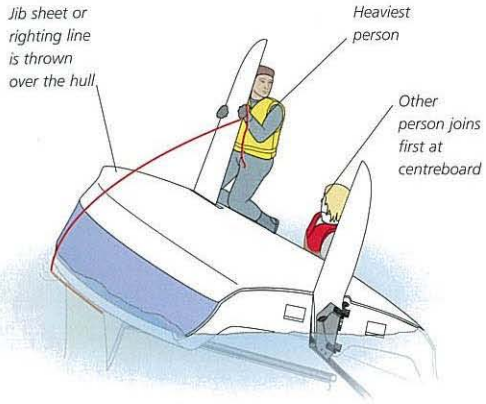
Sometimes the centreboard will retract into its case when the boat turns upside down, or a daggerboard will fall out entirely. If a centreboard retracts you will have to stand on the lip of the gunwale instead of the centreboard and pull on a jib sheet to bring the boat up to a horizontal position.

In a boat that traps an air pocket under the inverted hull it is possible for one person to dive underneath to push the centreboard out, but you should not attempt this in a boat that does not have space for an air pocket.

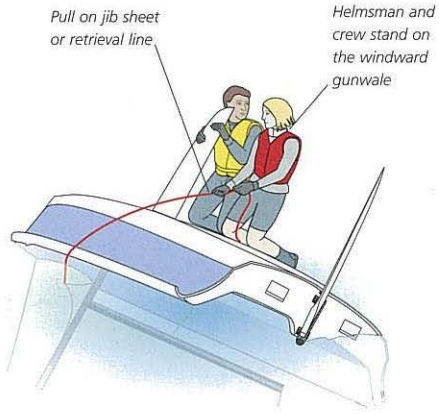
In the case of a daggerboard that is not secured and falls out during an inversion, it is possible to use it in the righting procedure if you can reach it easily. If so, climb onto the upturned hull and place the daggerboard into its slot from the bottom. Lean on it to bring the boat to the horizontal then replace it in its normal position in the case from the inside before continuing with the righting procedure. Avoid this problem in the first place by having a retaining line on the centreboard or daggerboard that prevents it fully retracting while you are sailing.

RIGHTING FROM INVERSION

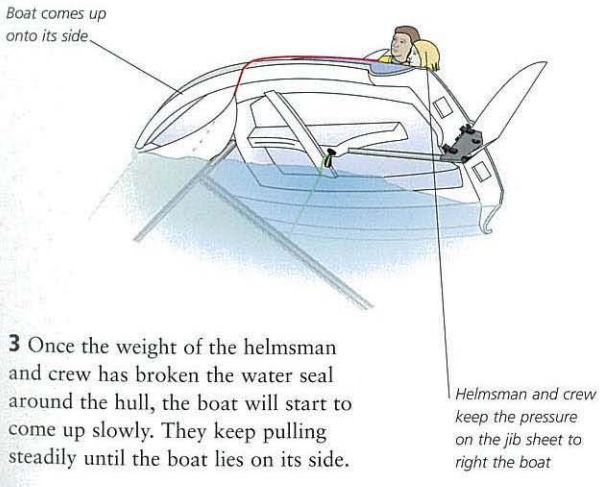
The technique for righting an inverted dinghy is to bring it up to the normal capsized position, lying on its side, before proceeding with the scoop method of recovery (pp.112-113). *When bringing the boat up to the normal capsized position, try to make sure that the mast comes up against the wind. Otherwise, the wind will get under the sails and will cause the boat to immediately capsize again on top of you. Avoid this by standing on the windward side of the inverted hull when righting it.*



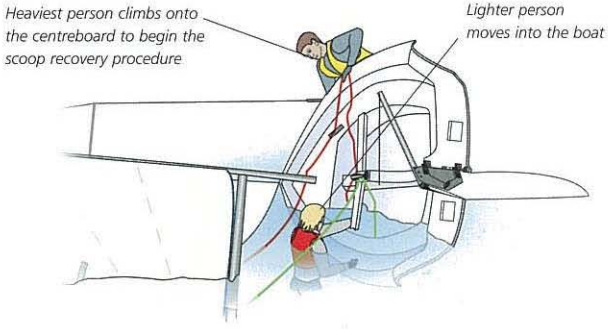
1 One person finds the jib sheet on the leeward side and throws it across the hull, near the centreboard. The helmsman grasps the end of the sheet on the other side and climbs onto the gunwale.



2 If possible, the helmsman pulls the centreboard fully down. The crew climbs up beside the helmsman. Both stand on the gunwale, or kneel on the hull, and lean back against the jib sheet.



3 Once the weight of the helmsman and crew has broken the water seal around the hull, the boat will start to come up slowly. They keep pulling steadily until the boat lies on its side.



4 The boat is now on its side. The heavier person climbs onto the centreboard and the other person paddles around the stern and moves into the boat ready for the scoop recovery. He checks that the mainsheet and jib sheet are free to run and releases the boom vang.

MAN OVERBOARD

IT IS FAIRLY RARE for someone to fall overboard from a dinghy. However, when it does happen, whoever is left in the boat needs to know how to sail it alone and how to turn around to recover the person overboard quickly and efficiently. The most common reason for falling into the water is a toestrap breaking or coming undone. To avoid accidents, check yours each time you go afloat, and practise your recovery techniques until you are confident that you could act safely in an emergency.

THE RECOVERY PROCEDURE

When someone falls overboard, it is vital that you keep him in sight at all times and get back to him, under full control, as quickly as possible. If you are the crew and your helmsman has fallen overboard, you must immediately let the jib sheet go and move aft to take control of the tiller and mainsheet. The procedure used for recovering a man overboard has the added advantage of teaching you how to sail slowly, under full control, and how to stop exactly where you want to.

THE DEPARTURE

The safest method of recovery is to put the boat on a beam reach and sail away from the person in the water. This gives you room to manoeuvre back to pick him up. Do not gybe to get back more quickly as it is too easy to capsize the dinghy, which will cause even more problems.

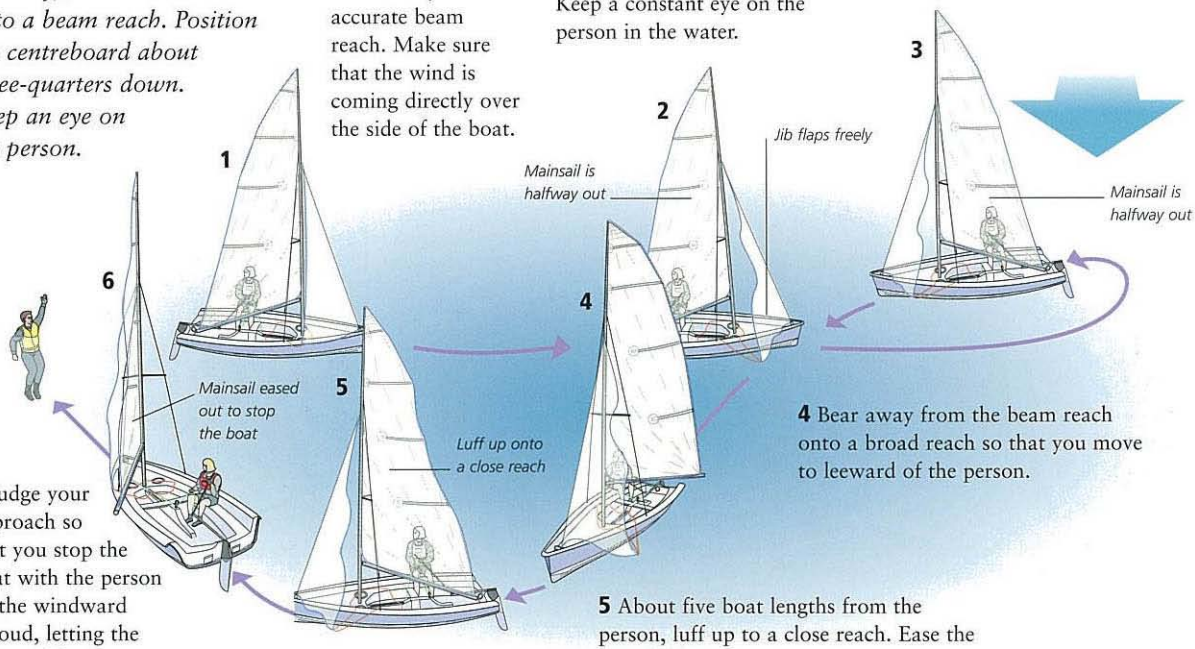
When you have some sea room between you and the man overboard, tack around and sail back towards him on the opposite beam reach.

THE APPROACH

From a beam reach, bear away onto a broad reach before luffing up onto a close reach for the final approach. This point of sailing is the only one on which you have complete control of your boat speed as you make the final approach to the person.

MAN OVERBOARD RECOVERY

Release the jib sheet so that the jib flaps (leave it loose for the entire recovery), and steer the boat onto a beam reach. Position the centreboard about three-quarters down. Keep an eye on the person.



1 Sail away on an accurate beam reach. Make sure that the wind is coming directly over the side of the boat.

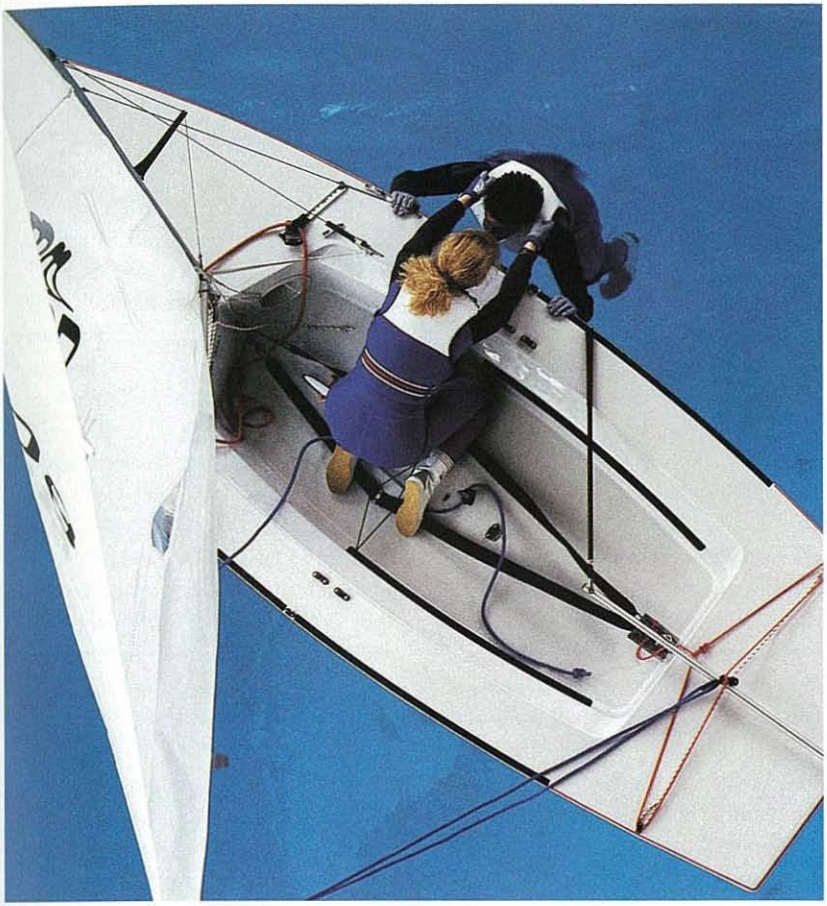
2 Sail about ten to fifteen boat lengths to give yourself room to manoeuvre during the next part of the recovery. Keep a constant eye on the person in the water.

3 With the jib flapping, tack the boat onto the opposite beam reach, making sure you still have the person in sight.

4 Bear away from the beam reach onto a broad reach so that you move to leeward of the person.

5 About five boat lengths from the person, luff up to a close reach. Ease the mainsheet to slow down if necessary.

6 Judge your approach so that you stop the boat with the person by the windward shroud, letting the mainsail flap.



As you approach the person in the water, make sure that you can stop with him on the windward side of the boat. If you try to pick him up on the leeward side, there is a real danger that the boat will drift on top of him or that you will capsize as you try to get him aboard.

COMING ALONGSIDE

Once you are alongside the man overboard, tell him to grasp the gunwale at the windward shroud. In this position you can leave the boat to lie quietly with the sails flapping as you bring him aboard. If you try to bring him in too far aft, the bow will probably blow downwind and the boat will start sailing.

When he has a firm hold of the gunwale, give the tiller a flick to windward before letting go of it and moving forward to help him aboard.

RETRIEVING CREW

Once you have returned to the person in the water, stop the boat with him at the windward shrouds. Move forwards and grasp him under the armpits. Lean back to drag him into the boat.

This flick helps to prevent the boat turning head-to-wind or even tacking around him in the water.

THE RESCUE

Move to the windward shroud and grasp the person under the armpits. Lean towards him to push the side of the boat towards the water and then lean back and pull. You should now be able to drag his upper half into the boat. From there he can be rolled into the boat. If you have trouble getting him aboard, tie a bowline (*p.47*) in the end of the jibsheet and drop the loop over the side for him to use as a step. If he is unconscious or too heavy to lift into the boat, tie him alongside and sail slowly for shore, keeping him on the windward side.

Once you have the sailor back aboard, check carefully for any injuries or signs of exposure or hypothermia (*pp.430-31*). If the person is wearing a wetsuit or drysuit, he should be no worse for the experience; otherwise, he will be wet and may be suffering from the cold. In this case, lay the person in the boat to warm up, and get to shore as quickly as possible. Seek medical help if necessary.

PRACTICE TECHNIQUES

It is important to practise man overboard recovery regularly. You will not want to use a real person for practice sessions, so make a substitute using a fender and a large water container (at least 25 litres/5½ gallons), or several smaller ones tied together. Fill them almost full with water so they drift in a similar way to a person.

LEARNING

Throw the containers overboard on each of the points of sailing until you are confident that you can return accurately on each occasion. Practise until you can bring the boat to a complete stop with the bottles alongside the windward shroud on virtually every attempt.

PRACTISING THE DRILL

Even when you are confident in your abilities, practise man-overboard recovery occasionally to keep up your skills. Run through the drill when you sail a new boat to get an idea of its characteristics. Use it to learn how to sail slowly under control – the skill that defines the expert sailor.

STOWING AFTER SAILING

ONCE YOU ARE BACK ASHORE, you will probably want to head straight for a hot shower. Before you do, however, it is a good idea to spend a few minutes making sure that the boat is clean and tidy. Make a quick inspection for any damage, and then stow the sails and other removable gear. Lastly, make sure the boat is well secured. A few minutes spent now will prevent damage and stop deterioration, and will ensure that the boat is ready to sail the next time you want to take it out.

WASHING THE DINGHY

Wash the boat down thoroughly with fresh water as soon as you bring it ashore. Pay particular attention to the blocks, as any traces of dirt or salt left on them will damage the bearings. Make sure you rinse the centreboard casing. Next, wash all the equipment, including the sails and rudder.

DE-RIGGING

De-rig the boat by going through the rigging order in reverse. First, take out the bungs in the buoyancy tanks or transom and allow any water to drain away, and open any hatches fitted to the tanks to enable air to circulate. If you have a padded rudder-stowage bag, put the rudder into it as soon as you have washed it. Never lay it down on hard surfaces or where it might be stood on. Be particularly careful with the blade as it is easily damaged. If the centreboard is removed between trips, it is also best stored in a padded bag. A daggerboard is always removed between trips and this, too, should have its own protective bag.

STOWING THE SAILS

If possible, allow the sails to dry before stowing them in the sailbag. Sails made of modern sailcloth will not be damaged if they are put away wet, but they should still be dried at the earliest opportunity to avoid mildew growth.

Remove the mainsail from the boom and unhank the jib from the forestay. Undo any shackles used to attach the sails to the halyards and re-attach them to the fittings so that they cannot be lost. Remove the jib sheets and coil them up neatly. Stow them in the sailbag or tie them in the boat. If your jib has a wire luff, coil this up, making the jib into a smooth tube, to avoid kinking the wire. Once the sail is rolled up, it can be loosely folded so that it fits into the sailbag.

If the sail has a tape luff, roll it down the leech in a neat roll that fits easily into the sail bag. Roll the mainsail and stow it in its sail bag.

STOWING THE MAINSAIL AND JIB

Because the mainsail is large, it is easier to roll if it is laid out on a clean patch of ground, such as on grass or a concrete or wooden surface. If the ground is dirty, lay the sail over the boat to roll it. Roll the jib in the same way.

1 If you roll the sail carefully the battens can be left in their pockets. Lay the sail flat and fold the head over onto the body of the sail. Then start rolling the sail, keeping the roll at right angles to the leech.

2 Continue rolling the sail, making sure to keep the roll parallel to the batten pockets if the battens are left in. If the sail creases at the luff or leech, unroll it a bit and remove the creases.

3 When the whole mainsail is rolled in a tight, neat tube, slide it into its sailbag. If the battens have been removed, stow them in the bag with the sail. Roll the jib in the same way and stow in its bag.

FITTING THE COVER

Put removable items into the dinghy, making sure that they are secure, then fit the cover over the top. Secure it under the hull at the bow and the sidedecks.

CHECKING FOR WEAR

To keep the boat in top condition, be prepared to spend a few minutes after each sail checking it over. Inspect each piece of gear for wear or damage. If you find any problems, deal with them immediately if possible. Otherwise, make a note to remind yourself of what needs to be done, and note the tools or materials for the repair. Always deal with repairs as soon as possible; otherwise, it is inevitable that the damaged item will fail at the most inopportune moment.

STORING THE DINGHY

After you have removed and stowed the gear and sails, you will need to put your boat somewhere so that it is safe until the next time you go sailing.

Many sailing clubs have dinghy parks in which you can leave your dinghy, and this is certainly more convenient than trailing the boat to and from the sailing area each time you use it. Very small boats can be stored in dinghy racks, which save space and provide good protection and support. More usually, dinghies are stored on their launching trolleys.

If you are storing your boat on a trolley, the stern should rest on a soft support, such as a car tyre, and the front of the trolley should also be supported so that the dinghy cannot tip forwards and damage its hull. This will also allow any rainwater that gets in the hull to drain out through the transom or bung holes. Tie the boat securely to the trolley with the painter, then fit the cover. All boats should have a cover that fits well, and that can be fastened tightly to provide complete protection from the elements. Even glassfibre boats can be damaged by sunlight, so a good cover is a sound investment. It will also discourage the theft of any equipment that you leave in the boat. Tie the cover firmly under the hull, and make sure that it cannot come loose in high winds. Then tie the boat down to securing points set into the ground, or to heavy blocks, which will prevent it being blown over.

HOSING DOWN

As soon as you bring the boat ashore, hose it down with fresh water. Wash all the equipment, including the sails and rudder.

ADVANCED SMALL BOAT SAILING

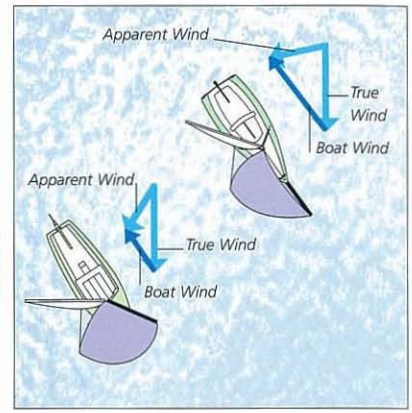
Once the basic skills of dinghy sailing have been mastered, they can be refined and new ones acquired, by moving up to a high-performance two-man or single-handed dinghy, or a small keelboat. Ability can also be tested and improved on the racecourse, where the thrust of competition will highlight any errors.

HIGH-PERFORMANCE BOATS

IF YOU HAVE LEARNT TO SAIL in a general-purpose dinghy, you will notice a tremendous difference when you first try sailing in a high-performance boat. High-performance boats are far more sensitive to changes in wind strength, accelerate faster, and require quicker reactions from helmsman and crew than general-purpose dinghies. Fast boats make more demands on your abilities and are more difficult to sail well, but they will teach you about the finer points of boat handling far more quickly than a slower boat.

DESIGN ADVANCES

The development of the planing dinghy occured in the 1930s and by the 1960s dinghy shapes and light weight had evolved sufficiently to allow some designs to plane when sailing to windward. Dinghy design then remained fairly static until the early 1990s, when modern materials and lightweight construction methods created a revolution in the small boat market. Now, there is a range of dinghies available that are capable of much higher speeds than conventional dinghies and which test helmsmen and crews to the limit of their abilities. The performance of the fastest dinghies has now entered the high-speed world previosuly shared by catamarans and windsurfers.



EFFECT OF APPARENT WIND

The extra speed (and resulting boat wind) of the faster boat (top) causes the apparent wind to increase and come from further forward than for the slower boat (bottom).

Along with these extreme dinghies has come crash-and-burn-type, short-course racing, which offers plenty of thrills and spills.

The small keelboat market has also developed thanks to new designs and the use of lightweight materials. Now there are many more small keelboats available that are designed to provide fast and competitive racing for sailors who prefer to sail fast in a boat with a keel rather than in a high-performance dinghy which is likely to capsize quite frequently.

APPARENT WIND SAILING

The biggest difference between sailing a conventional and a high-performance boat, is the effect of boat speed on the apparent wind. Because high-performance boats plane upwind and downwind even in quite light winds,

HIGH SPEED ACTION

Fast is fun, but it is also demands greater skill, concentration, and athleticism than sailing a less performance-orientated boat.

their speed has a major effect on the strength and direction of the apparent wind. Sailing upwind, their speed increases the strength of the apparent wind, while sailing downwind it reduces the apparent wind strength. Because the apparent wind is always shifted further forwards than the true wind, high-performance boats usually sail with the apparent wind coming from ahead of the beam even when sailing downwind, and have to sheet their sails in tigher than slower boats.

CREWED OR ALONE

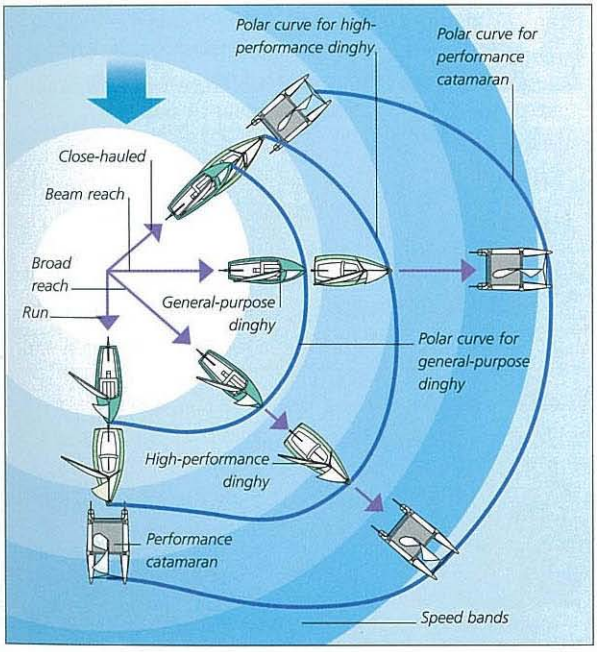
If you are considering a high-performance dinghy you have a choice between a single-hander, a two-person, or even a three-person boat. The purest form of sailing is undoubtedly single-handing and there is a range of high-performance boats available for the single-hander, including boats fitted with a trapeze and even an asymmetric spinnaker. Most dinghy designs cater for two people and you can choose between single or double trapezes, and a conventional or asymmetric spinnaker. The 18-foot Skiff is sailed by a crew of three, all on trapezes, and has a powerful rig that includes a very large asymmetric spinnaker.

SPEED COMPARISONS

A polar diagram is used to show the potential speed of a boat for a particular wind strength. For every wind strength, each design of boat will have a unique polar curve. Racing yachts use polar curves to predict the speed they should attain on any point of sailing, and to trim and tune the boat accordingly. Here, the curves illustrate the differences in performance between types of small boats.

FACTORS AFFECTING SPEED

Speed is determined by the strength of the wind, the amount of sail area, and the weight of the boat, complete with its crew. In short, the more sail area you have and the less your boat weighs, the faster you will go. High-performance boats are generally much lighter than general-purpose dinghies. They have larger, more powerful rigs, and much shallower hulls. They typically have little natural stability and rely entirely on the weight of the crew to keep them upright when they are being sailed. Their sole purpose is fast sailing, and they are used only for racing or thrill-seeking sailing.



POINTS OF SAILING

A general-purpose dinghy will be slower on all points of sailing than a high-performance dinghy. And a high-performance catamaran will generally be faster than a high-performance dinghy because it is wider and more stable, allowing the crew to make better use of the sail power available to them. All types of sailing boats will perform better on some points of sailing than others, and reaching courses are nearly always faster for most boats than close-hauled or running courses.

However, the latest generation of high-performance, skiff-type dinghies tend to be faster on a broad reach. They develop so much power on a beam reach in moderate to strong winds that it is almost impossible to sail at 90 degrees to the wind. These boats will generally capsize if you try to sail on a beam reach, so high-performance skiff sailors tend to call this point of sailing the "Crash Zone".

POLAR DIAGRAM

This polar diagram compares the potential speeds of a general-purpose dinghy, a typical high-performance dinghy, and a performance catamaran. In the diagram, the further a boat is from the centre, the faster is its speed. The catamaran is fastest on all points of sailing, with the greatest gains on beam- and broad-reaching courses. Skiff-type dinghies are closer in performance to a catamaran than to a conventional high-performance dinghy.

TYPES OF HIGH-PERFORMANCE DINGHIES

High-performance dinghies typically have shallow, narrow and lightweight hulls fitted with large rigs. They often have at least one trapeze, but the fastest boats have both helmsman and crew on trapezes. The fastest dinghies have large asymmetric spinnakers, often flown from the masthead, to increase speed downwind. High-performance boats are available to suit a range of skill levels and and physical sizes and abilities. Small keelboats offering high performance are also available (*p.161*).

DINGHIES

OLYMPIC 470

The Olympic 470 is a good introduction to high-performance sailing. It has a spinnaker and one trapeze and is ideal for lighter crews. It provides close racing with separate fleets for male and female sailors.

INTERNATIONAL 505

The International 505 is a classic high-performance boat with a large spinnaker and a trapeze for the crew. The 505 gives close racing in large, competitive fleets. It is more suitable than the 470 for heavier sailors.

B14

Developed from the 18-foot Skiff, this lightweight two-handed dinghy relies on wide wings rather than trapezes from which the crew can hike out. The B14 requires good fitness and boat handling skills.

LASER 4000

The Laser 4000 is a relatively stable, single-trapeze dinghy that provides a good introduction to using asymmetric spinnakers and fully battened mainsails. It is a good choice for mixed male and female crews.

RS800

The RS800 is arguably the easiest of the twin-trapeze boats to sail. It offers many of the thrills of higher-performance skiffs without as many spills. Like the Laser 4000, this class is particularly suited to lighter teams.

INTERNATIONAL 14

The International 14 is one of the oldest racing classes, and has been developed over the years to keep ahead of the opposition. It now has twin trapezes and is a very demanding boat to sail.

OLYMPIC 49ER

The Olympic 49er is one of the skiff-type, high-performance boats with huge rigs and twin trapezes. Inspired by the 18-foot Skiff, it uses a large asymmetrical spinnaker set on the end of a long retractable bowsprit.

18-FOOT SKIFF

The 18-foot Skiff is the classic high-performance dinghy. It has been developed over decades to the state-of-the-art boat it is today. Now sailed by three-man crews, the Skiff is the pinnacle of high-performance boats.

SINGLE-HANDERS

CONTENDER

The Contender is a long-established high-performance singlehander. With the helmsman on trapeze, this boat can achieve high speeds. Despite its speed, the Contender is a fairly stable and forgiving boat to sail.

MUSTO SKIFF

A development of the Contender concept of singlehanded sailing, with the added challenges of an asymmetric spinnaker. This type of dinghy offers one of the greatest challenges for any sailor.

MAKING A CHOICE

If you learnt in a general-purpose dinghy and want to progress to sailing faster boats, the next step is to sail in a moderately high-performance class that uses a conventional or asymmetric spinnaker (*pp.144-555*) and a trapeze (*pp.136-39*) for the crew. Crew for someone else before buying a boat, just to make sure you like this type of sailing. If you want to sail as fast as possible – and spend a lot of time capsizing in the early days – you may like to consider one of the faster classes, which are generally characterised as skiff-like, after the 18-foot Skiff which first pioneered multiple trapezes, asymmetric spinnakers, and the use of racks on the hull sides to allow the trapezing crew to create more leverage to balance the very powerful rig.

Most of these skiff-types are two person boats, like the 49er, the Olympic two-person, high-performance dinghy class, but extreme, high-speed singlehanded dinghies, like the Musto Skiff are also available. Remember though, that any of the more extreme designs will require a considerable amount of time and effort to learn to sail and will involve a lot of capsizing while you are learning. The process is made considerably easier, and more enjoyable, if you pick a class that is popular in your sailing area so that you will have plenty of similar boats to sail against and experienced sailors to ask for advice.

Another way to get high-speed sailing, with less risk of capsize, is to pick from one of the catamaran classes (*pp.166-173*) or to choose a performance-orientated small keelboat (*pp.160-165*).

HIGH-PERFORMANCE KEELBOAT

If you want the thrills of high-performance without the spills a dinghy provides you can choose a performance keelboat.

RACING

The most sensible and convenient approach to racing is to pick a class that is already being actively raced in the area that you want to sail. Most popular classes have good club-level racing and some provide world-class competition. You will also need to choose between speed and tactics. Very high-performance dinghies are great for sheer speed but not ideal for close, tactical racing because of the difficulty in handling their power. In fact, some of the best racing is often to be found in slower boats in which the racing is closer and more interesting tactically. Many of the largest racing fleets are found among the older, general-purpose dinghies that offer the closest, tactical racing.

SKIFF-STYLE DINGHIES

The fastest dinghies tend to use very narrow, lightweight hulls with large rigs. Racks or wings extend outwards from the hull sides. They allow the trapezing crew to exert the maximum righting moment to balance the power of the large rig.

IMPROVING YOUR TECHNIQUE

ONCE YOU HAVE MASTERED the basic sailing techniques, you will be able to rig and launch your boat, handle it on all points of sailing, and return safely to your starting point. When you feel that these basic techniques are second nature, it is time to consider progressing to a faster and more responsive boat. There are several techniques for performance sailing that you will need to learn. These include understanding how and when a boat planes, how to refine sail trimming for better performance, how to balance the helm, how to sail close-hauled efficiently, and how to maintain the speed of your boat while changing course. Developing these skills is challenging and takes time but is very rewarding.

PLANING

When a boat rises up on its own bow wave and and skims across the water like a speedboat it is said to be planing. A boat will plane when it is travelling fast enough to create lift under the hull, raising the boat onto its own bow wave. The shape of the hull is an important factor in planing. Boats that plane well have broad, flat sections in the aft half of the hull. It is on these that the boat rides when it is planing. Most planing boats rise out of the water when planing to the point that the hull forward of the mast is out of the water, but the fastest planing dinghies rise out of the water significantly more, often to the point that they plane on just the aftermost sections of the hull just forward of the transom with the rest of the boat clear of the water.

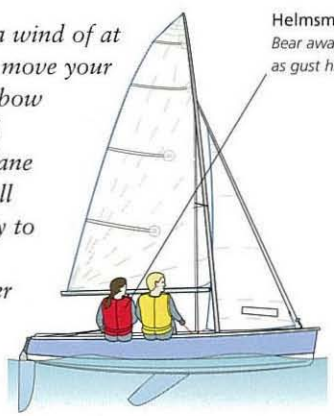
Most dinghies, even heavier general-purpose ones, will plane if there is sufficient wind and the crew understand planing techniques, but light boats with a large sail area will plane readily even in quite light winds. Although slower dinghies and most small keelboats may only plane on a beam or broad reach in strong winds, high-performance dinghies are capable of planing when sailing to windward.

PLANING TIPS

There are several techniques that you can use to encourage your boat to plane. The first is known as pumping. If the boat cannot quite rise onto the plane, wait for a gust of wind, sit out hard to keep the boat upright while rapidly trimming both sails in, then

HOW TO PLANE

Start on a beam reach in a wind of at least Force 3. Be ready to move your weight aft to help lift the bow onto the plane. Speed will increase quickly as you plane and the apparent wind will shift forwards, so be ready to sheet in both sails. Extra speed will make the rudder more efficient; small movements of the tiller will be enough to keep the boat on course. The boat will slow down quickly if it slips off the plane. Ease the sheets as the apparent wind shifts aft, and move your weight forwards again.



1 Sail on a beam reach with the centreboard no more than half down. Wait for a gust of wind and, as it hits, bear away slightly and ease both sheets a little. Keep the boat upright.

2 Move your weight aft a little as you feel the boat accelerate. The bow will lift as it begins to plane. If the boat heels when you are sitting out hard, raise the centreboard a little.

3 Remain planing as long as possible by luffing slightly to keep the apparent wind forward. This may enable you to continue planing until the next gust arrives.

out again. This produces a burst of extra power, which should help the boat to rise onto the plane.

Another way of helping the boat to plane is to use a wave to help you accelerate. Sailing downwind in waves, wait until the stern lifts on a wave, then bear away to surf down its front. As the boat accelerates, luff up slightly and sheet in the sails. It is important to keep the boat upright throughout this manoeuvre. The speed gained from surfing down the wave may create enough wind pressure to keep you on the plane as the apparent wind shifts forwards. If the boat begins to plane, the apparent wind will stay forward, and you will need to trim the sails correctly to the new apparent wind direction in order to maintain planing.

SAIL SETTING

One of the hardest things to get used to when you start sailing is having to adjust sail trim. However, as you develop your skills, trimming the sails to suit even small changes in wind direction becomes almost automatic.

When you sail fast dinghies, you will find that they are very responsive to changes in wind strength and will accelerate or slow down very quickly. As they alter their speed, the apparent wind (*p.34*) will shift forwards (accelerating) or backwards (slowing down), and sail trim must be adjusted each time this happens. The apparent wind will also shift aft when a gust hits the boat, so be ready to ease the sails as you see a gust approaching, sheeting them in again as it eases.

BALANCING THE HELM

When a boat is sailing upright, trimmed correctly fore and aft, and the sails are accurately set, there should be little or no tendency for it to turn. If you let go of the tiller, the boat will continue on a straight course. This condition is referred to as a balanced helm. If the boat turns to windward when you let go of the tiller, it has weather helm. If it turns to leeward, it has lee helm. In practice, it is easier to sail a boat that has a small amount of weather helm as this gives some feel to the steering and, in particular, it makes it easier to steer the boat accurately on a close-hauled course. When you are learning it is also a safety factor since, if the tiller is dropped by accident, the boat will turn into the wind and stop.

Lee helm is to be avoided because it makes the boat difficult to sail; if the tiller is dropped it will not turn into the wind and automatically stop.

You can alter the balance of the helm while sailing by adjusting the centreboard if your boat has one. Lift the centreboard slightly to reduce weather helm and lower it to eliminate lee helm. When you tune your boat (*pp.138–41*), you can also adjust the rake of the mast to produce the desired helm balance.

SAILING AT SPEED

Assuming that the boat is tuned correctly, the achievement of optimum speed depends on the skills of the helmsman and crew. Concentration and constant attention to sail trim, boat balance, and course steered are necessary to achieve top performance. When you first sail a high-performance boat it will take time and practice to get used to the faster reactions that are required to sail it efficiently.

Take care to avoid violent changes of course, especially when sailing offwind, because it will be hard to keep the boat balanced through sharp turns. Remember that the rudder is much more efficient when you are travelling at speed, so much smaller tiller movements are needed than when you are sailing slowly.

PLANING KEELBOATS

This lightweight sportsboat is planing well under an asymmetric spinnaker. The crew is well aft, and to windward, to keep the boat level and help the bow lift.

USING TELL-TALES

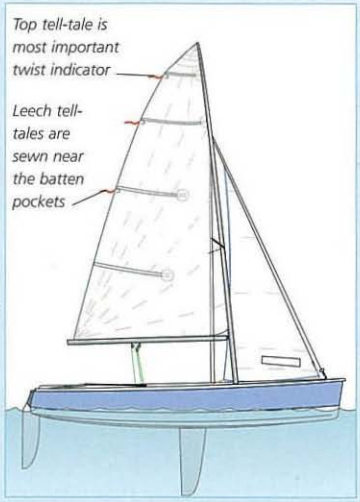
The easiest way to check that you have trimmed the sails correctly and have the right twist and leech tension is to sew tell-tales (*p.80*) onto the sails.

MAINSAIL TELL-TALES

Sew nylon tell-tales on the mainsail leech, near the end of each batten pocket. When the sail is correctly set, all the tell-tales will stream aft, with the one near the top batten periodically folding behind the sail.

JIB LUFF TELL-TALES

Twist in the jib can be checked by using the luff tell-tales. When the top, middle and lower windward tell-tales all stream aft together, the sail is set with the correct amount of twist. If the top windward tell-tale lifts before the middle and lower windward ones, the sail has too much twist, and the fairlead should be moved forwards. If the bottom or middle windward tell-tales lift before the top one, move the lead aft to increase twist.



READING LEECH TELL-TALES

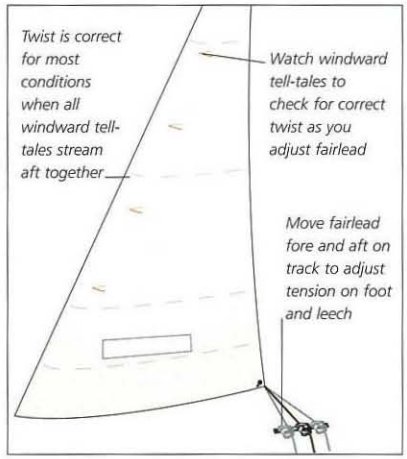
When all the tell-tales stream aft with the top one occasionally folding behind the leech, the sail is set correctly. If the top tell-tale remains folded behind the leech, ease the mainsheet or vang to increase twist and keep the tell-tale just flying.

CONTROLLING TWIST

As well as setting the sails at the correct angle to the wind using luff tell-tales (*p.80*), you also need to adjust the leech tension in each sail to control the amount of twist (the difference between the angle of the sail at the foot and the head). Adjusting twist is important for boat speed. In most conditions, twist is adjusted to maximize power, but in strong winds it is used to reduce heeling. Excessive heeling makes the boat slower and harder to steer.

Leech tell-tales (*left*) are a useful indicator of the amount of mainsail twist. The amount needed depends on the conditions and the cut of the sail. In general, you should have some twist in very light conditions, less twist in light-to-moderate winds, and more twist again in strong winds.

Mainsail twist is controlled by tension in the mainsheet or vang. The more tension there is in either, the less twist there is. Jib twist is controlled by the fore-and-aft position of the fairleads and jib-sheet tension. Move jib fairleads forwards to reduce twist, and aft to increase it.

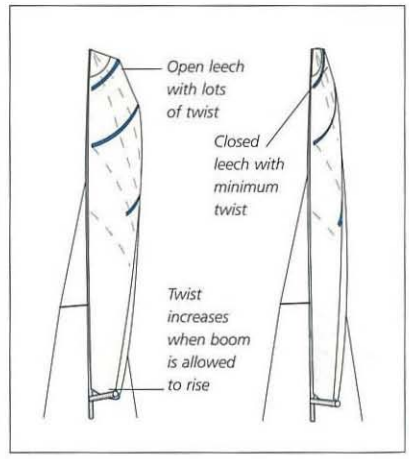


ADJUSTING JIB TWIST

Increase twist in the jib by moving the jib sheet fairlead aft. Reduce twist by moving the fairlead forward.

REDUCING HEELING WITH TWIST

These boats are racing in a fairly strong wind with their crews fully extended on the trapeze. Their sails are set with quite a lot of twist to reduce the heeling force.



MAINSAIL TWIST

Ease the mainsheet and/or the vang to allow boom to lift and increase twist (left), *and tighten them to reduce twist* (right).

TURNING THE BOAT
Bearing away around a racing mark, the helmsman eases the mainsail to start the turn while the crew prepares to come in but heels the boat to windward.

CHANGING DIRECTION

One sure sign of a skilled sailor is the ability to change course without slowing the boat unnecessarily. A good helmsman and crew will always prefer to use sail trim and boat balance to turn the boat (*pp.78–81*) and reduce the need to use the rudder. This is because each time the rudder is turned more than 4-5 degrees off the centreline it causes drag and slows the boat. Using heel and sail trim is especially important when bearing away as the rudder may prove ineffective, especially in strong winds, if the boat heels to leeward, or if the mainsail is not eased before the turn. Keep the boat upright, or heeled to windward slightly, and ease the mainsail to bear away successfully.

SAILING CLOSE-HAULED

Sailing close-hauled is usually the biggest challenge for the novice. The helmsman must keep the boat sailing as close to the wind as possible without letting speed drop by sailing too close (known as pinching). He must also avoid erring in the other direction and losing ground to windward by sailing too far off the wind. Practise sailing close-hauled using the tell-tales on the jib luff (*p.80*) to follow the best course. Both windward and leeward tell-tales should be kept streaming aft for the best balance between speed and pointing. The windward set can be allowed to rise occasionally, but the leeward ones should not lift as this indicates that the boat is sailing too far off the wind.

MAINTAINING BALANCE AND TRIM

To achieve maximum performance, it is essential that the dinghy is sailed upright and level fore and aft. Sitting out will help to maintain balance, and sitting together in a central position will keep the boat level fore and aft. By sitting together, the helmsman and crew also reduce windage and so increase their possible speed.

BALANCE
Sit out or trapeze (pp.136–137) *to keep the boat upright. If it still heels, ease the mainsheet or increase twist to spill some wind. Weight distribution and mainsail trim require constant attention to maintain balance.*

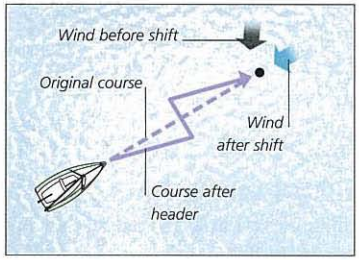
TRIM
Keep the boat level fore and aft by sitting close together. In strong winds move aft slightly to allow the bow to lift and pass over waves smoothly; in light winds move forwards to keep the transom clear of the water and reduce drag.

COPING WITH WIND SHIFTS

Spotting and using wind shifts are essential skills, particularly if you want to race. A header is when the wind moves forward; a freer (or lift) is when it moves aft. Dealing with wind shifts effectively can significantly reduce the distance sailed.

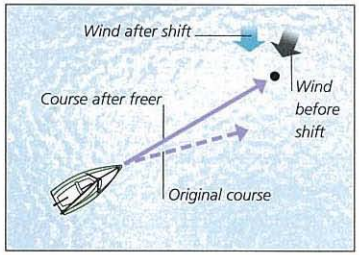
EXPLOITING WIND SHIFTS

If you have to tack upwind, you will sail the quickest course if you tack when you are headed. If the wind shifts back, it will head you again on the other tack. You can then tack again and make more ground to windward. Remember that a wind shift that is a header on port tack is a freer on starboard tack.



HEADER

A header will force you to bear away from your course in order to keep the sails full. You will then have to tack to reach your destination.



FREER

When the wind moves aft, it is a freer. To prevent your boat sailing too far off course in a freer, you should luff up as soon as the wind shifts.

UNDERSTANDING THE WIND

The wind rarely blows consistently from one direction. In fact, you will often find that the wind oscillates around a mean direction, perhaps shifting 10-20 degrees either side of the mean, and sometimes producing considerably larger shifts. In an oscillating wind, the shifts will occur at reasonably regular intervals and it is possible to time how long the wind takes to shift from one side of the mean to the other, and back again.

At other times, the wind may shift from one direction to another due to a change in the weather pattern, perhaps the passage of a front (*pp.368-369*), and then, rather than oscillating backwards and forwards, it will move from the old direction to the new one, sometimes rapidly and at other times in small, incremental movements. In some localities, the proximity and shape of the land causes the wind to bend across an area (*right*).

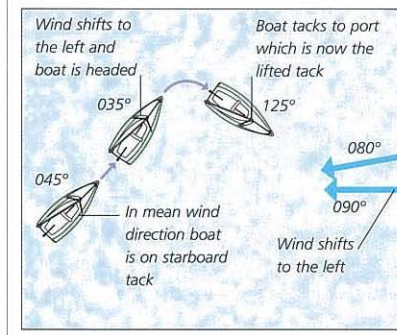
When you are sailing, and especially when racing, it is very important to work out how the wind is shifting or bending so that you can take advantage of the shifts or bend to reduce the distance you need to sail. Spotting wind shifts may be quite easy if the shift is a large one, if you know the waters on which you sail well, or if there are clear and obvious landmarks near the race course that you can use to check your heading. However, the easiest way to spot small shifts that can otherwise go unnoticed is to use a compass.

USING A COMPASS

Rather than using a compass to help with navigation, small boat sailors use a compass tactically, to spot changes in wind direction. If the wind is blowing from an average direction of 090° (an easterly direction), and your boat sails close-hauled at an angle of 45 degrees to the wind, then the boat's course on starboard tack will be 045° and 135° on port.

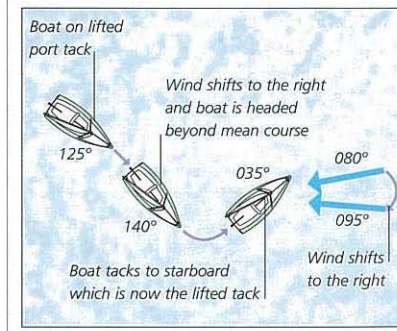
Now, if the wind shifts 10 degrees to the left, to blow from a new direction of 080°, then a sailor travelling on starboard tack will notice that his course has changed from 045° to 035°. This is a good time to tack on to port, where his heading will now be 135-10 = 125°. This is a good tack to stay on unless the number on port increases to more than the average heading of 135°.

If the wind now shifts to the right and the sailor finds himself on a new heading of 140°, the compass is now telling him that he is on a 5° header, and it is time to tack once again on to



WIND SHIFTS TO THE LEFT

Boat on starboard tack sees compass heading change from 045° to 035°, showing a 10° header, and tacks to port tack.



WIND SHIFTS TO THE RIGHT

Boat now on port tack sees compass heading change from 125° to 140°, showing a 15° header, and tacks to starboard tack.

MECHANICAL COMPASS
A mechanical compass uses a permanent magnet fixed to a pivoted compass card that is free to rotate within a sealed bowl that is filled with a damping liquid.

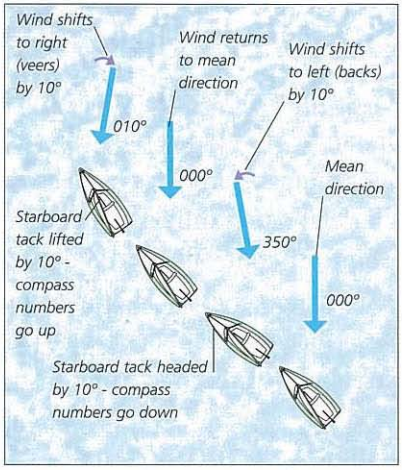
starboard, which is the new 'lifted tack'. Identifying such subtle changes in wind direction would be very difficult without the numerical precision of the compass.

TYPES OF TACTICAL COMPASS

There are two types of compass used on small boats, the conventional, mechanical compass and the electronic compass. The conventional type uses a magnet mounted under a card that is engraved with the points of the compass. The card is mounted on a pivot in an oil-filled glass or plastic chamber, which enables the card to rotate freely. Although it appears as if the card moves, it is the chamber and the rest of the boat that moves around the magnet and card, which is constantly aligned to the earth's magnetic poles. The oil-filled bowl acts as a damping mechanism to minimize the card's movement in rough seas.

One of the advantages of an electronic compass is that it does not require damping in the same way, and it is possible to read changes in heading to the nearest degree, rather than the 5° that is the practical limit of a conventional compass.

The most popular tactical electronic compass is solar-powered and weighs less than some conventional compasses, but it is also more expensive. Also, not all classes allow them to be used, so check your class rules before buying one.

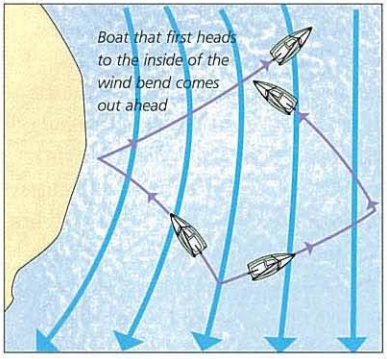


OSCILLATING WIND SHIFTS
An oscillating wind shifts either side of a mean direction. Remember the rule about compass numbers increasing or decreasing (below) *to quickly spot lifts and headers.*

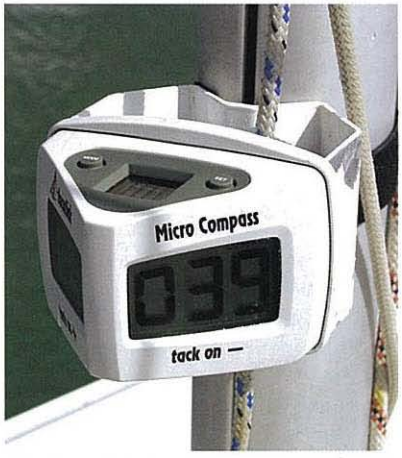
	Lift	Header
Port tack	Compass number goes down	Compass number goes up
Starboard tack	Compass number goes up	Compass number goes down

WIND BENDS

Sometimes the wind can curve across the course, particularly when it is blowing around a high headland or over a large obstacle like a hill or mountain in the vicinity of the course. In a wind bend, the shortest route upwind is achieved by sailing towards the inside of the bend on the headed tack, and then tacking onto a lift that takes you up the inside of the curve. In this case, tacking at the first sign of a header would be the wrong course of action.



USING A WIND BEND
If a wind bend is the cause of a shift in wind direction, stay on the headed tack to get to the inside of the bend before tacking onto the lifted tack.



ELECTRONIC COMPASS
An electronic compass is easier to read than a conventional compass. This unit is mounted on the mast and is self-powered by a solar cell on the top of the compass.

SAILING EXERCISES

CONFIDENT BOAT HANDLING is a sure sign of a good sailor. It can be developed only through practice on the water, preferably in a range of dinghies as this will show how different characteristics influence handling. The best way to learn the finer points of controlling a dinghy is to experiment with a few boat-handling exercises. The first time you attempt the exercises described here, choose a gentle Force 2–3 wind and sail to a clear stretch of water, free from obstructions or other boats.

SAILING WITH ONE SAIL

If you have a two-man dinghy with the standard arrangement of mainsail and jib, you will usually use both sails when sailing. The rig is designed for both sails to work together and to balance their forces around the centreboard. However, when a two-sail dinghy is sailed under a single sail its handling characteristics change considerably, and it may be difficult to complete some manoeuvres.

Try sailing on all the points of sailing (*pp.40-41*), first under mainsail alone and then only with the jib. This exercise teaches you about sail balance and how your boat reacts under a single sail. You will also find out how your boat handles at slow speeds, which will be useful when you are sailing to and from the shore or when you are in competition and manoeuvring at the start of a race.

MAINSAIL ALONE

Start by lowering the jib and sailing under mainsail alone. Without the jib in front of it, the mainsail is less efficient (*p.33*) and the boat will sail more slowly, especially on upwind courses. The boat's sail plan is designed to balance around its pivot point (at the centreboard or keel); removing the jib moves the centre of effort aft, giving the boat weather helm (*p.128*). It therefore tries to turn into the wind. The helmsman must counteract the weather helm by moving the tiller further to windward to keep the boat on course.

The boat will sail reasonably well on a beam reach, but with more weather helm than normal. If you sail a dinghy that has a centreboard, you can reduce excess weather helm by raising it more than usual to move the pivot point aft. If you sail a keelboat or a dinghy with a daggerboard, this option is not available to you.

As you turn towards the wind to a close-reaching course, the lack of a jib will impede performance even more. By the time you reach close-hauled, the boat will feel quite sluggish. When you tack, the boat will turn into the wind easily, but it will be slow to bear away on the new tack. Ease the mainsheet after the tack to bear away to a close reach. This will increase speed before you attempt to sail close-hauled on the new tack. Be careful not to let the boat slow down too much when sailing closehauled or you will not have enough speed to be able to steer with the rudder. If this happens, the boat will turn into the wind and stop. Keep the boat moving as fast as possible, sailing just off a closehauled course to make progress to windward without stalling.

IN REVERSE

A keelboat can be sailed backwards in the same way as a dinghy, but more than one person may need to hold the boom out.

The lack of the jib will not be so apparent on downwind courses, because it is the size of the mainsail that contributes most to speed and, on a run, the jib is often blanketed behind the mainsail.

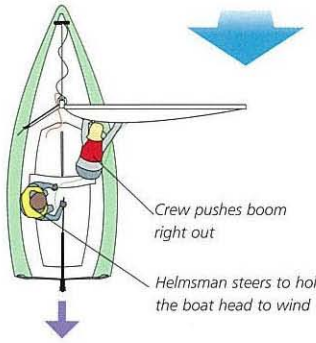
JIB ALONE

Once you have mastered sailing under mainsail alone, try the exercise under jib alone. Without the mainsail, the boat will suffer from lee helm on a beam reach or upwind courses. It will be considerably slower than usual on all points of sailing. Sailing downwind is easy but slow, but sailing upwind will be difficult. Some boats will sail upwind under jib alone, but with a considerable amount of lee helm. Sail with the centreboard or daggerboard further down than usual to help counter this. Tacking under the jib is difficult or impossible in some boats or weather conditions, such as strong winds. Experiment to see how your boat behaves in a range of conditions.

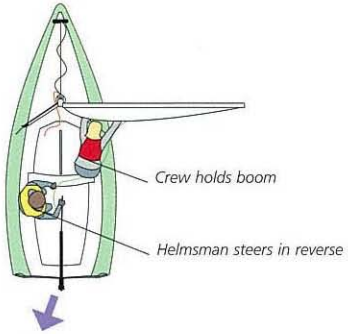
SAILING BACKWARDS

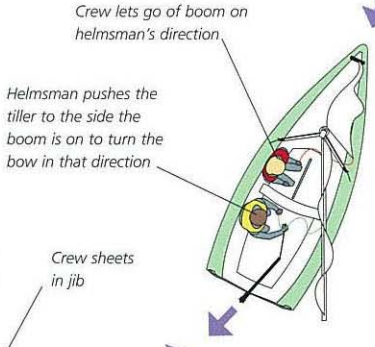
Remember that when the boat is moving backwards through the water the flow of water over the rudder is reversed, so its action is also reversed, and the bow will move in the same direction in which you move the tiller. With the rudder now leading the boat as it moves backwards, its effects are exaggerated. Make only small movements with the tiller, or the boat will swing quickly to lie at an angle to the wind. Keep the crew weight well forwards to prevent the transom digging in, which will also make the boat turn. When you want to sail forwards again, push the tiller in the direction you want the bow to move. Wait until the boat turns, then centre the tiller, sheet in the sails, and sail off.

1 Point the boat directly into the wind so that the jib flaps on the centreline and have your crew push the boom out fully on one side. Let the mainsheet run out to allow the boom to be pushed all the way out. Watch the water flowing past the boat to gauge when the boat has stopped. Until it stops the rudder will work in the normal way. Use it to hold the boat head to wind.

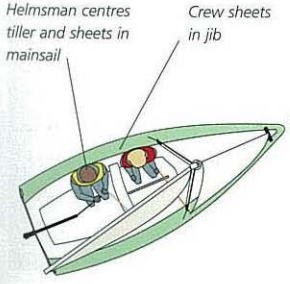


2 When the boat starts moving backwards the rudder will work in the opposite way to normal. To steer in reverse, push the tiller a small amount in the direction you wish the bow to turn. Do not make large movements with the tiller or the boat will turn violently.





3 To sail forwards again, push the tiller in the direction you want the bow to go. It is usually best to turn the bow to the side the boom is on. If you turn the other way the boom will swing rapidly across the boat when it is released. Tell your crew to let go of the boom.



4 When the boat has turned sufficiently – to a close reach or beam reach course – the helmsman moves the tiller to the centre line and he and the crew sheet in the sails to sail off forwards.

SAILING WITHOUT A CENTREBOARD

Centreboards or daggerboards rarely break (although it is possible to lose a daggerboard during a capsize if it is not secured to the boat), however it is useful to try sailing without one so that you can see just how much they influence the way a dinghy behaves under sail. Stop the boat on a close reach and raise the centreboard completely. Now sail off on a beam reach and watch the way in which the boat slides sideways, making considerable leeway (*p.69*) as it sails forwards.

Tacking is difficult or impossible without a centreboard to pivot around. Before attempting to tack, get the boat sailing as fast as possible on a close reaching course and push the tiller away further than usual to try and get the bow through the wind as quickly as possible. If, despite this, the boat fails to tack you will have to gybe round to change tack.

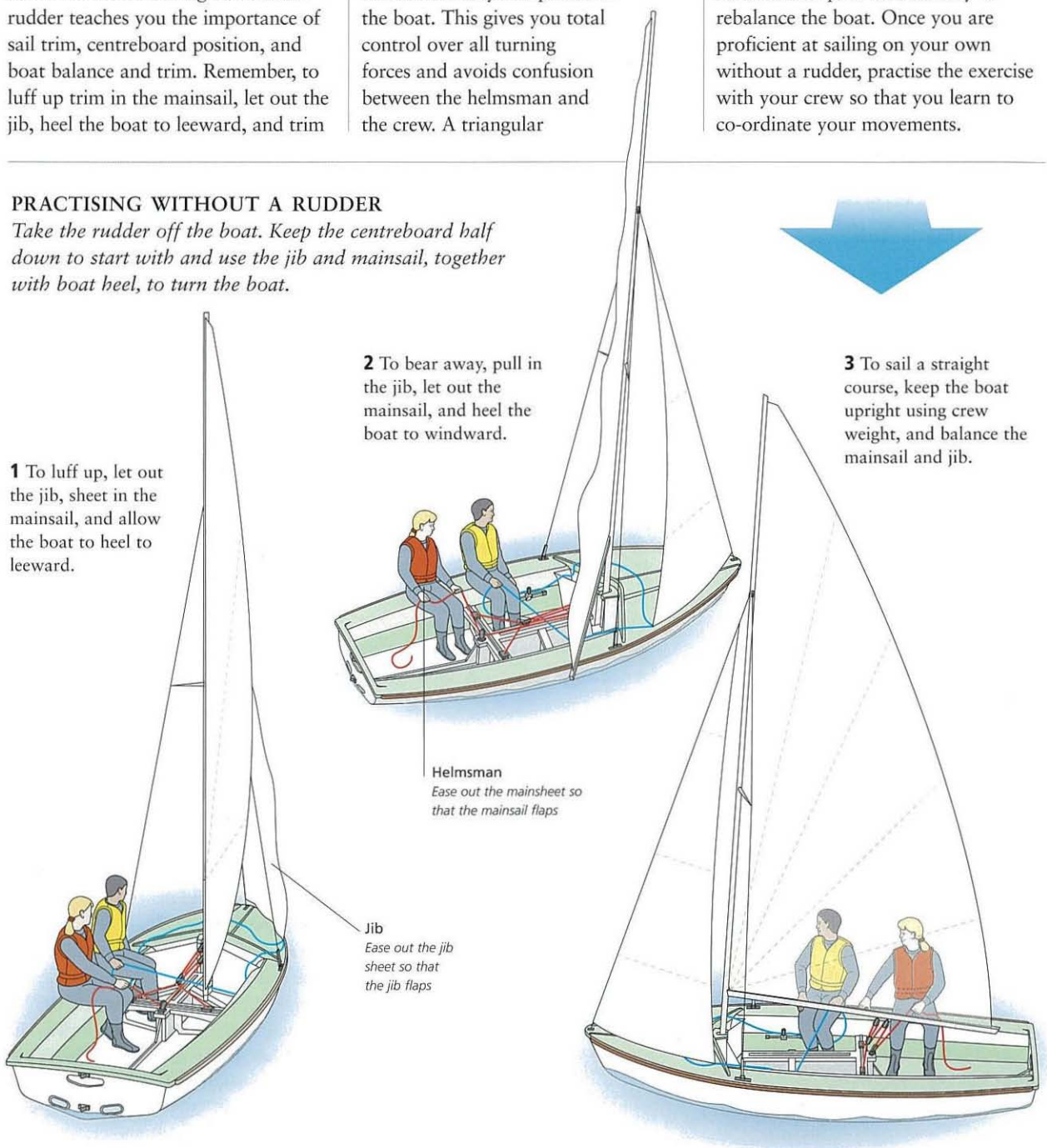
On upwind courses it is hard to make headway because the dinghy will crab sideways as fast as it goes forwards. Experiment with heeling the boat to leeward slightly and moving the crew's weight right forwards to depress the bow and the Veed sections of the front part of the hull. If you sail a deep-hulled, general-purpose type dinghy, especially one constructed with flat panels and chines (*p.60*), the shape of the hull may provide sufficient lateral resistance to allow you to make some progress to windward. If you sail a dinghy with a very shallow hull, however, it is likely to be impossible to make any progress upwind. Even on a beam reach, the boat will make considerable leeway. It is only when you are on downwind courses, when the centreboard would usually be only slightly down, that the boat will sail normally.

SAILING WITHOUT A RUDDER

Another good exercise is to sail around a triangular course without the rudder. Either remove the rudder completely or, if it is a lifting type, raise the blade out of the water. Sailing without the rudder teaches you the importance of sail trim, centreboard position, and boat balance and trim. Remember, to luff up trim in the mainsail, let out the jib, heel the boat to leeward, and trim it down by the bow. To bear away, reverse these instructions. Without the rudder, the effects of the other controls become more obvious. It is usually best to try this in light winds with only one person in the boat. This gives you total control over all turning forces and avoids confusion between the helmsman and the crew. A triangular course will seem impossible at first as you will tend to sail in circles, but with practice you should be able to achieve it in moderate conditions. You will find you will need to raise the centreboard quite considerably to rebalance the boat. Once you are proficient at sailing on your own without a rudder, practise the exercise with your crew so that you learn to co-ordinate your movements.

PRACTISING WITHOUT A RUDDER

Take the rudder off the boat. Keep the centreboard half down to start with and use the jib and mainsail, together with boat heel, to turn the boat.



FIXING THE RUDDER TO THE CENTRELINE

An alternative to sailing without the rudder, is to leave the rudder in position and to secure the tiller on the centreline by tying shockcord (elastic line) from the tiller to both gunwales or to the toestraps. Tie the shockcord fairly tightly so that it takes some force to move the tiller off the centreline. Now, practise sailing without holding the tiller. The advantage of this method is that it more accurately reflects the normal sailing situation, where the area of the rudder blade assists the centreboard in preventing leeway and influences the boat's balance. It also means that if you need to use the rudder in a hurry, it is already in place and you only need to remove the shockcord from the tiller to regain full control.

BLINDFOLD SAILING

There are some excellent blind sailors in the world who have learned to rely on their other senses for sailing. Try sailing with a blindfold and see what you can learn from touch and sound. This exercise is best tried in a double-handed boat where helm and crew can take it in turns to wear the blindfold, with the sighted sailor giving feedback to the blindfolded sailor. Try this exercise only in a clear stretch of open water, with no other boats or obstructions in your way. This exercise will assist you to develop the 'feel' necessary to sail the boat automatically while maintaining full speed, which is an essential skill when you are racing.

Although you will initially feel very disorientated when deprived of vision, try to focus on how the boat feels through the tiller, the sound of the bow wave, and the angle of heel. Get used to these sounds and sensations when the boat is sailing well and try to replicate them to achieve the same performance. This helps you get to know your boat and the way it handles in the water.

SWAPPING PLACES

Another exercise that is only relevant to boats with two or more crew, is to change places among the crew. Swapping places allows everyone to learn what it is like to do the other jobs in the boat and is equally valuable whether you sail a two-person dinghy or a keelboat with a crew of four or more. It helps give you a much greater understanding of your sailing partner's role and might help you appreciate how you can adjust your technique to make his tasks easier. Try this exercise in a Force 3 or less, when the boat is relatively easy to handle and capsizing is unlikely. If you have spent the day racing in one role, use the sail back into shore as an opportunity to swap positions.

It makes a nice change to do something different and you will become a more complete sailor if you can master both roles. Once ashore, discuss your perceptions of the tasks your partner normally undertakes, and explore ideas for making each other's jobs easier or faster.

FIXING THE RUDDER

To sail with the rudder fixed in a central position, use a length of heavy shockcord to lash the tiller on the centreline.

RUDDERLESS SAILING

If your boat has a lifting rudder you can simply lift the blade rather than remove the rudder completely.

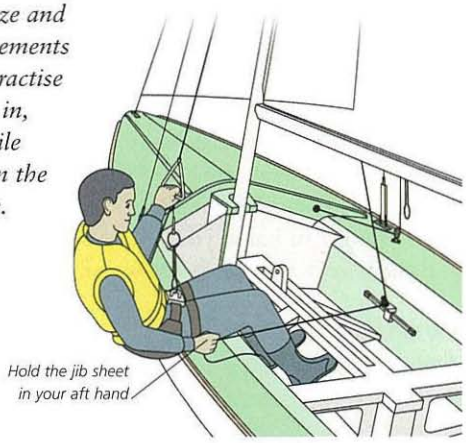
USING TRAPEZES

SAILING DINGHIES rely on the weight of their crew to keep them upright when they are being sailed. In many general-purpose dinghies, this is achieved by the helmsman and crew sitting out as far as possible with their feet under toestraps. However, high-performance dinghies usually have a much larger sail area than general-purpose dinghies and in most conditions sitting out is simply not sufficient to balance the power of the sails. Trapeze systems are used in these boats to increase the righting power.

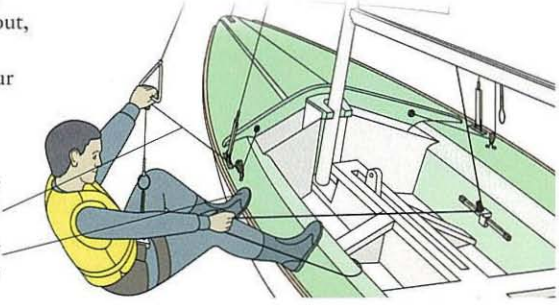
SWINGING OUT AND IN

Practise getting out onto the trapeze and back into the boat until your movements are smooth and confident. Then practise while tacking until you can swing in, unhook, move across the boat while trimming the jib, and swing out on the trapeze on the new windward side.

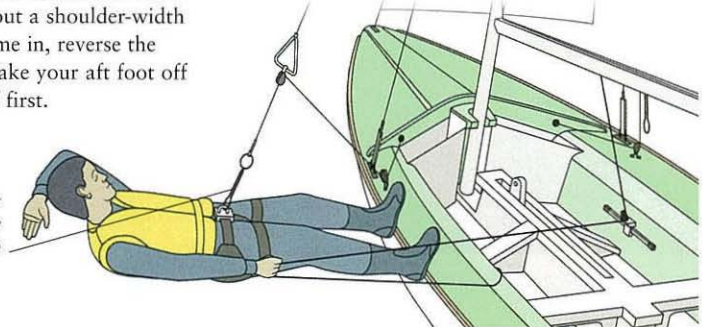
1 Hook the trapeze to the harness and sit out, allowing the trapeze wire to take your weight. Hold the handle lightly in your front hand for control and security.



2 Put your front foot on the gunwale and push yourself out, keeping your body at right angles to the boat. Bring your aft foot up so that you are standing on the gunwale.



3 Lean back at full stretch with your feet about a shoulder-width apart. To come in, reverse the procedure. Take your aft foot off the gunwalef first.



TRAPEZE SYSTEMS

A trapeze system consists of a trapeze harness attached to a trapeze wire suspended from the hounds. It enables sailors to hang out over the side of the boat, moving their weight further outboard and adding to the boat's stability. Formerly, the standard arrangement was a single trapeze for the crew only. This is still used in many dinghies, such as the 505 and the 470. With the appearance of ever larger rigs, however, twin trapezes have become common. The Olympic 49er and International 14 are examples of twin-trapeze boats.

Good communication between helmsman and crew is vital in a trapeze boat. The helmsman must give the crew plenty of warning of a tack or gybe to allow him time to come in off the trapeze. Good co-ordination is also essential as the use of a trapeze accentuates the crew's effect on the boat's balance. In particular, the helmsman must be ready to ease the mainsheet to keep the boat upright as the crew swings in and must be prepared to give the crew time to get out on the trapeze after a tack or gybe before sheeting in or altering course.

SINGLE TRAPEZE

On a single trapeze system, wires run from just above the hounds, one on each side of the mast, to suspend the crew outside the gunwale. The end of the wire comes down just aft of the shrouds. The wire has a handle and, usually, a stainless-steel ring for attachment to the trapeze harness. The trapeze ring often has an adjustment system to allow control of the height at which the trapeze is held. A length of stretchy shock cord connects the two trapeze wires and runs around the front of the mast. It keeps the leeward wire taut and tidy when the crew is on the windward trapeze.

TRAPEZING TECHNIQUES

When you are out on the trapeze, you must be ready to move your weight in and out quickly to react to gusts or lulls, and to move your weight fore or aft to keep the boat trimmed properly.

Your weight will be most effective if you trapeze as low as possible, parallel to the water when the boat is upright, but this is only practical in flat water and steady conditions. When there are big waves or if the wind is gusty and shifty, raise your position using the adjustment system on the trapeze wire, to keep your body clear of the water. Not only is the boat slowed significantly if your body hits a wave but the impact could cause you to lose your footing and be knocked off the side of the boat.

HEEL AND TRIM

Adjust to changes in heel by stretching outwards to help the boat sail through gusts and bending your knees to swing your weight inboard if the wind dies. Maintain correct fore-and-aft trim by moving your weight along the gunwale. As the boat bears away, move aft to help the bow lift. This is especially important when planing under a spinnaker (*p.145*).

BALANCE

The trapeze wire leads upwards and forwards from your body, so it will pull you forwards. Resist this tendency by keeping your front leg straight and bending your aft leg to remain balanced. If the boat slows rapidly for any reason, such as ploughing into a wave, the force trying to pull you forwards will increase quickly, so be prepared to swing your weight aft. Many boats have footstraps fitted on the gunwale towards the stern to allow the trapezing crew to secure their aft foot and avoid being pulled forwards.

HARNESSES

The secret to being relaxed on a trapeze is a comfortable harness. Choose one with a high, broad back to give good support. Many top trapeze sailors have a 'nappy' harness tailor-made to fit their body snugly. Alternatively, you can buy an adjustable harness that can be altered with buckles or laces. Some harnesses use a spreader bar arrangement for the hook, or a simpler, square metal plate. The most important thing is to select a harness that will keep you comfortable during a whole day's sailing.

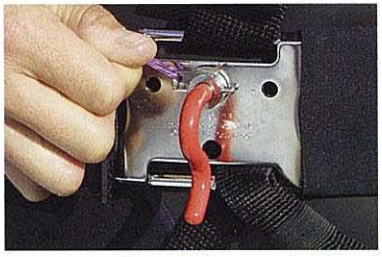
FITTING AND MAINTENANCE

Make sure that the harness fits well over your sailing gear and that it evenly spreads the load of your weight hanging from the trapeze into your back and lower body. The trapeze ring is attached to a hook on a metal plate on the harness. If possible, adjust the harness so that the hook is just below the waist, at your body's point of balance. Check the harness's stitching regularly and wash it thoroughly in fresh water after each sail.

ALTERNATIVE TYPES OF HARNESS

A potential problem when using a traditional trapeze harness is that the large metal hook fitted to the front of the harness can get caught on ropes and rigging, and in rare cases can present a serious safety problem when the hook snags on rigging during a capsize or inversion.

A safer alternative to the fixed hook is a trapeze harness fitted with a quick release system that allows the hook to be detached from the harness when needed. Although many harnesses are still sold with a fixed hook, a buckle fitted with a quick release hook can be bought separately to replace the standard buckle.



QUICK RELEASE HOOK
Some trapeze harnesses come complete with a quick release hook but the buckle can be retro-fitted to standard harnesses.

RELEASING THE HOOK
If the quick-release hook becomes snagged it can be instantly detached from the harness by pulling on the release cord.

MULTIPLE TRAPEZES

Some high-performance boats are fitted with multiple trapeze systems to enable both the helmsman and crew to trapeze. Although most high-performance dinghies sail with a crew of two, the 18-foot Skiff sails with three crew on trapezes. Some of the extreme boats, designed to sail on the Swiss or Italian lakes have as many as nine crew, all on trapezes. Sailing a boat with multiple trapezes requires great skill, co-ordination, and plenty of practice, as well as very good communication between all crew.

Boats with multiple trapeze systems often have racks or wings that extend out from each gunwale. Racks are made of aluminium or carbon fibre tubing whereas wings may be of solid construction. The crew stands on these when trapezing to move their weight even further outboard. Trapeze wires and rings are the same as on a single trapeze, although the helmsman's trapeze may not have a handle as both his hands are full with the mainsheet and tiller extension. When trapezing, the helmsman uses a very long tiller extension. He passes this aft when tacking and gybing. Some boats have two tiller extensions, one for each side of the boat, which makes it faster to run across the boat when tacking and gybing.

One noticeable difference between sailing a Skiff-type dinghy and a more traditional design is the way the crew move around the boat. In a modern design, the helmsman and crew are usually trapezing, and they rarely sit in or on the boat. During tacks and gybes they stand up, moving quickly from one side to the other, often running across the boat and out onto the rack or wing on the other side.

GOING OUT ON THE HANDLE

The safest way to go out on the trapeze is by hooking on first and then pushing off the side of the boat with your front foot (*p.136*). Once

SAILING WITH TWIN TRAPEZES

Some high-performance dinghies sail with both helmsman and crew on trapezes. The helmsman steers using a very long tiller extension. Skiff-type dinghies are usually narrow and have wings or racks fitted to increase the righting power of the trapezing crew.

you are comfortable and confident with this technique, you can try holding on to the handle and pushing out in the same way with your legs, before fitting the hook on to your harness once you are fully trapezing. This requires good arm and shoulder strength, but enables you to move out on to the trapeze more quickly. When you become confident with this technique, you can try 'handle-to-handle' tacking, the fastest method used by the top sailors. This keeps your weight out on the old tack until the last minute and gets it out on the new tack as fast as possible. However, a loss of strength or a failure in co-ordination as you tack will result in an early swim.

USING YOUR ARMS

The trapeze is a useful way of creating more righting moment and being able to harness more of the wind's power. If, as your confidence increases, you can stand on tip-toes, then you can increase your righting moment in gusts by a few more per cent. Putting one or even two arms behind your head will further increase your righting moment and help the boat go that little bit faster in strong winds. To do this requires good balance because you can no longer use the jib sheet in your hand to steady yourself in rough conditions. Rather than dropping the jib sheet altogether, however, fasten it loosely through one of the straps in your harness so that it is close to hand should you need to adjust it.

HELMING FROM THE WIRE

Helming from the trapeze is easier than it looks, but it is wise to get some experience on the trapeze by crewing for someone else first, so that you can develop good technique before combining it with helming.

FLY BY WIRE

Sailing a high-performance, single-handed trapeze dinghy that has little natural stability, requires a great deal of practice and excellent coordination.

In many boats, the helmsman holds the mainsheet in his front hand. In other boats, like the 49er or the 18-foot Skiff, the crew controls the mainsheet (it often comes straight from the boom rather than a block on the floor), leaving the helmsman free to concentrate on steering. The important thing is to anticipate any changes about to affect the boat, such as a gust, a lull, a windshift, or another boat nearby.

Think ahead, and try to spot situations before they arise. By spotting a gust or lull before it arrives you can bend your knees, ease the mainsheet, steer the boat, or do whatever else is necessary to cope with the change of situation. If you leave the decision too late, you can end up getting wet. When the boat heels to windward – typically in a lull or a heading wind shift – the crew can be dumped very rapidly into the water while still attached to their trapeze wires. Among high-performance sailors this is known as 'teabagging'.

SINGLE-HANDED TRAPEZING

Singlehanded trapezing is very similar to helming from the trapeze in a double-handed boat, except that you do not have the luxury of a crew to run around to keep the boat balanced. This means that sailing a trapezing single-hander requires extra vigilance to spot any change in the conditions and respond quickly in order to keep the boat sailing upright. Be ready to bend your knees and swing back into the boat quickly if you think you are about to sail into a lull or a heading wind shift, or to ease the mainsheet to cope with strong gusts. It helps if you adjust the length of your trapeze wire, so that you trapeze a bit higher than usual, as this enables you to respond more easily to an unexpected change in wind conditions and boat heel.

TACKING AND GYBING

WHEN YOU TACK AND GYBE in a high-performance dinghy, your balance and boat-handling skills are really put to the test. Your movements must be smooth and quick, and they must be timed carefully. A tack nearly always slows the boat, and a gybe can result in a capsize. However, in light winds, you can try roll tacking and roll gybing to ensure that you maintain speed through the manoeuvres – indeed, with a good roll tack or gybe, it is possible to gain speed through the manoeuvre.

4 The crew then swings out on the trapeze, hooks on, and sheets the jib fully home.

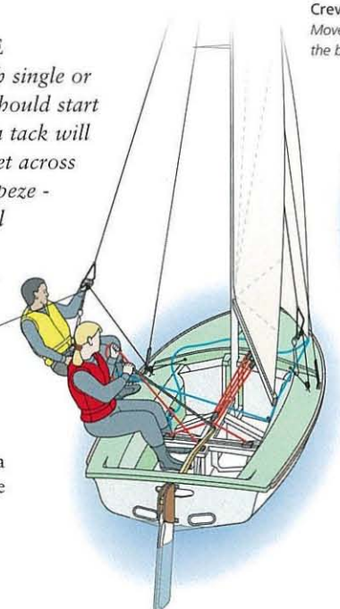
TACKING

High-performance boats are very sensitive to weight distribution and turn very quickly. The fastest dinghies are inherently unstable and are not forgiving of mistakes. They have more stability when sailing fast than when moving slowly, such as during a tack. The helmsman and crew must aim to complete each tack, and get the boat sailing fast on the new tack, as quickly as possible.

Good communication between helmsman and crew is vital. In a single-trapeze boat, the helmsman has to pace the turn to suit the speed of the crew. In a twin or multiple-trapeze boat, the helmsman may also be trapezing, and cannot tack as fast because he has to move across the boat, and out on to the new trapeze, while handling a long, single tiller extension or twin extensions.

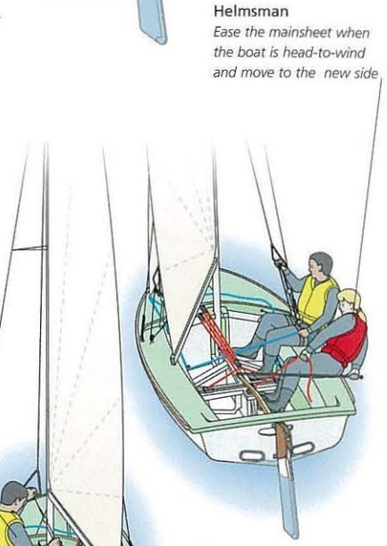
TACKING WITH A TRAPEZE

When learning to tack a boat with single or multiple trapezes, the helmsman should start by tacking fairly slowly. Too fast a tack will make it difficult for the crew to get across the boat - and out on the new trapeze - before the sails fill again. This will result in the boat heeling and slowing down considerably.



1 When the helmsman calls a tack, the crew unhooks while remaining on the trapeze using the handle.

2 As the helmsman starts the tack, the crew swings into the boat and moves into the middle, keeping the jib sheet taut.



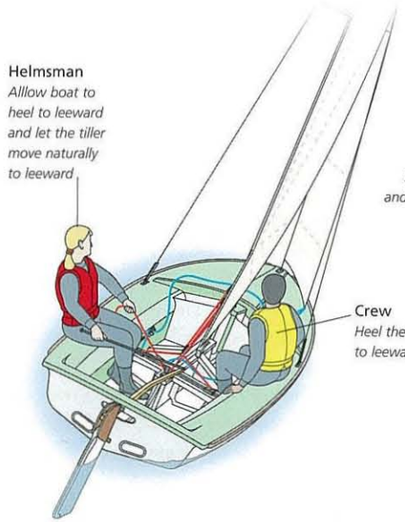
3 As the boat passes head-to-wind, the crew sheets the jib partly in on the new side.

MULTIPLE-TRAPEZE TACK

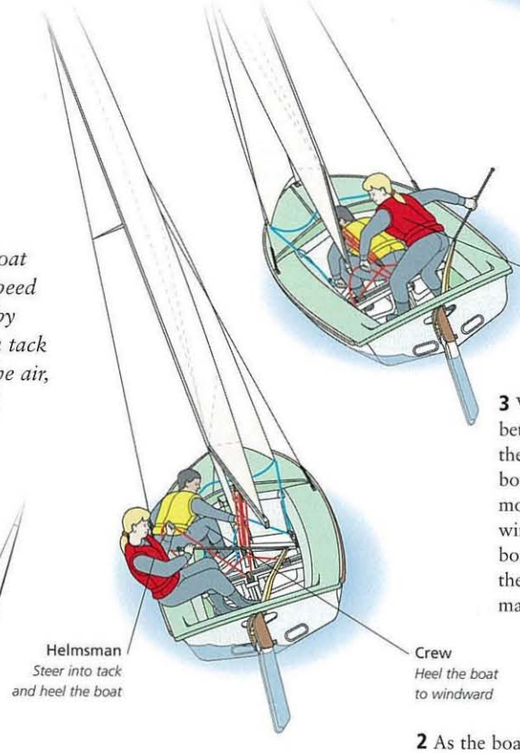
In a boat with multiple trapezes, the helmsman has to deal with a trapeze, tiller extension, and possibly the mainsheet. With a double extension, he releases the old one and picks up the other when he has crossed the boat.

ROLL TACKING

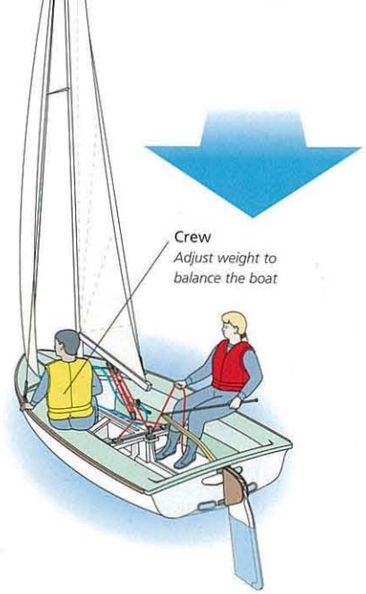
In most conditions, a tack causes the boat to slow down. However, in light airs, speed can be maintained (or even increased) by roll tacking. Rolling the boat through a tack in light winds drags the sails through the air, increasing the speed of the airflow, and accelerating the boat.



1 Just before a roll tack, bear away slightly to increase boat speed, then heel the boat to leeward and steer into the tack.



2 As the boat comes up into the wind, both helmsman and crew lean out hard on the windward side, rolling the boat towards them. As the boat passes head-to-wind, the crew sheets the jib to the new side and the helmsman eases the mainsheet.



3 When the boat is halfway between head-to-wind and the new close-hauled course, both helmsman and crew move up to the new windward side and pull the boat upright. As they do so, the helmsman sheets in the mainsail to its correct setting.

4 Once the boat is upright, the crew moves quickly back to the middle or to leeward to balance the helmsman's weight to windward.

GYBING

When you gybe a high-performance boat, the keys to completing the manoeuvre successfully are speed and boat balance before the gybe. You should also take care to check the centreboard position before you gybe. High-performance boats sail downwind under a spinnaker or asymmetric, and you need to learn how to handle these sails during a gybe (*p.94*). Twin or multiple-trapeze boats sail downwind with the crew trapezing, and require even greater skill and agility when gybing than other high-performance boats (*p.122*)

SPEED AND BALANCE

Speed before the gybe reduces the strength of the apparent wind, which makes it easier to bring the mainsail across to the new leeward side and reduces the wind pressure on the rig.

When sailing in waves, you should gybe when the boat is on the face of the wave as this is when it will be sailing at its fastest. Wait until the boat's bow drops down the face of a wave (and the boat accelerates) before turning into the gybe. Never gybe on the back of a wave, when the boat will be slowing down, causing the apparent wind to increase.

Keeping the boat balanced will help you to avoid a windward capsize before the gybe, or a leeward capsize after it. Heeling to windward too much, as you bear away into the gybe, can result in a rapid wipe-out to windward. Alternatively, if the boat is allowed to heel to leeward, it will be more difficult for the helmsman to turn into the gybe. In boats with a low boom it also risks the boom hitting the water, possibly causing a capsize.

CENTREBOARD POSITION

The risk of capsizing is increased if the centreboard or daggerboard is too far up or down. In most boats, it pays to have the board about one quarter down during the gybe. Any further down and it will be difficult to bear away into the gybe when sailing fast. There is also a risk of the boat "tripping" over the board and broaching (turning rapidly to windward) after the gybe. If the board is too far up, the boat may roll as you bear away into the gybe, making it hard for the helmsman to retain control, and risking a capsize. Experiment with your boat to find the optimum centreboard position for gybing in a range of wind strengths.

GYBING WITH A TRAPEZE

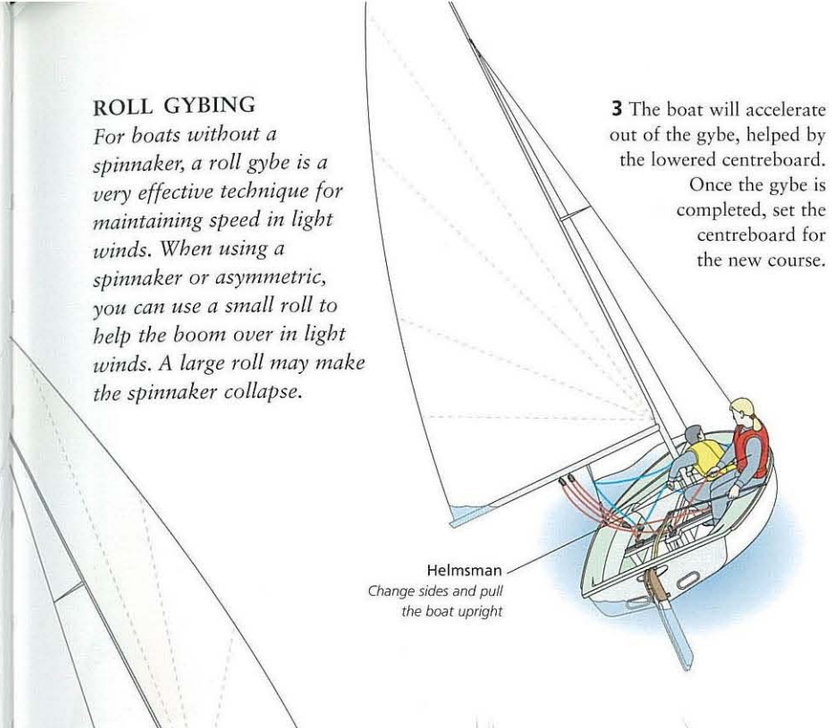
Single-trapeze boats with a spinnaker often sail downwind on broad-reaching courses, which do not require the crew to be on the trapeze except in strong winds. In this case, the helmsman and crew gybe in the standard way. Twin-, or multiple-trapeze boats, however, usually sail downwind with an asymmetric on a shallower course, with the crew trapezing. In this case, the boat must turn through a broader angle in the gybe and the crew have to move quickly to gybe, and get out on the trapezes on the new side.

TWIN-TRAPEZE GYBE

On a twin-trapeze boat, the helmsman steers onto a run and moves into the boat just after the crew. He swings the long tiller extension aft and around to the new side during the gybe. He then changes hands on the extension and mainsheet, and he hooks onto the new trapeze, ready to move out as he luffs onto the new course.

ROLL GYBING

For boats without a spinnaker, a roll gybe is a very effective technique for maintaining speed in light winds. When using a spinnaker or asymmetric, you can use a small roll to help the boom over in light winds. A large roll may make the spinnaker collapse.



3 The boat will accelerate out of the gybe, helped by the lowered centreboard. Once the gybe is completed, set the centreboard for the new course.

2 The boat should be heeled enough so that the end of the boom just touches the water after the gybe. As it does so, pause until the mainsail fills, then pull the boat upright using crew weight.

1 Before the gybe, lower the centreboard fully. With the boat on a run, the crew rolls it to windward and prepares to pull on the vang to swing the boom across.

TIPS ON ADVANCED TACKING AND GYBING

Tacking and gybing are always a good test of skill, and you can judge a dinghy or keelboat crew's teamwork by how they tack and gybe, especially in very light or very strong winds. Both these extremes demand excellent "feel", good communication, and quality boat handling.

COMMUNICATION

Tacking or gybing requires very close co-ordination between the helmsman and crew. A wrong move by either, or poor synchronization during the turn, can unbalance and slow the boat. In light airs, this will stop the boat, and in strong winds it risks a capsize. If you race a high-performance boat, you will quickly discover that quite small mistakes mean the difference between winning a race or being an also-ran. Improve your performance by good communication in the boat and by discussing manoeuvres, and your technique, when ashore.

PRACTICE

The quickest way to improve your skills is by spending lots of time practising on the water. Leading Olympic and International crews spend several hours on the water nearly every day, honing their skills. Normal club sailors cannot devote so much time, but even a few hours of serious practice will be rewarded by smoother and faster manoeuvres.

FEEL

The elusive skill you should seek is called "feel". It tells you how the boat is about to react and how to "find the groove" – the fine, ever-changing edge on which a boat sails when perfectly balanced; with a light helm, little heel, and a willingness to accelerate.

SPINNAKERS

LOVED BY ARTISTS, photographers, and spectators because of their shape and their bright colours, spinnakers often cause concern for the crews who have to trim them. In fact, if a simple routine is followed, these large, lightweight sails are not difficult to fly and they add tremendously to the sail area, providing much-increased power. A spinnaker brings a performance boat alive.

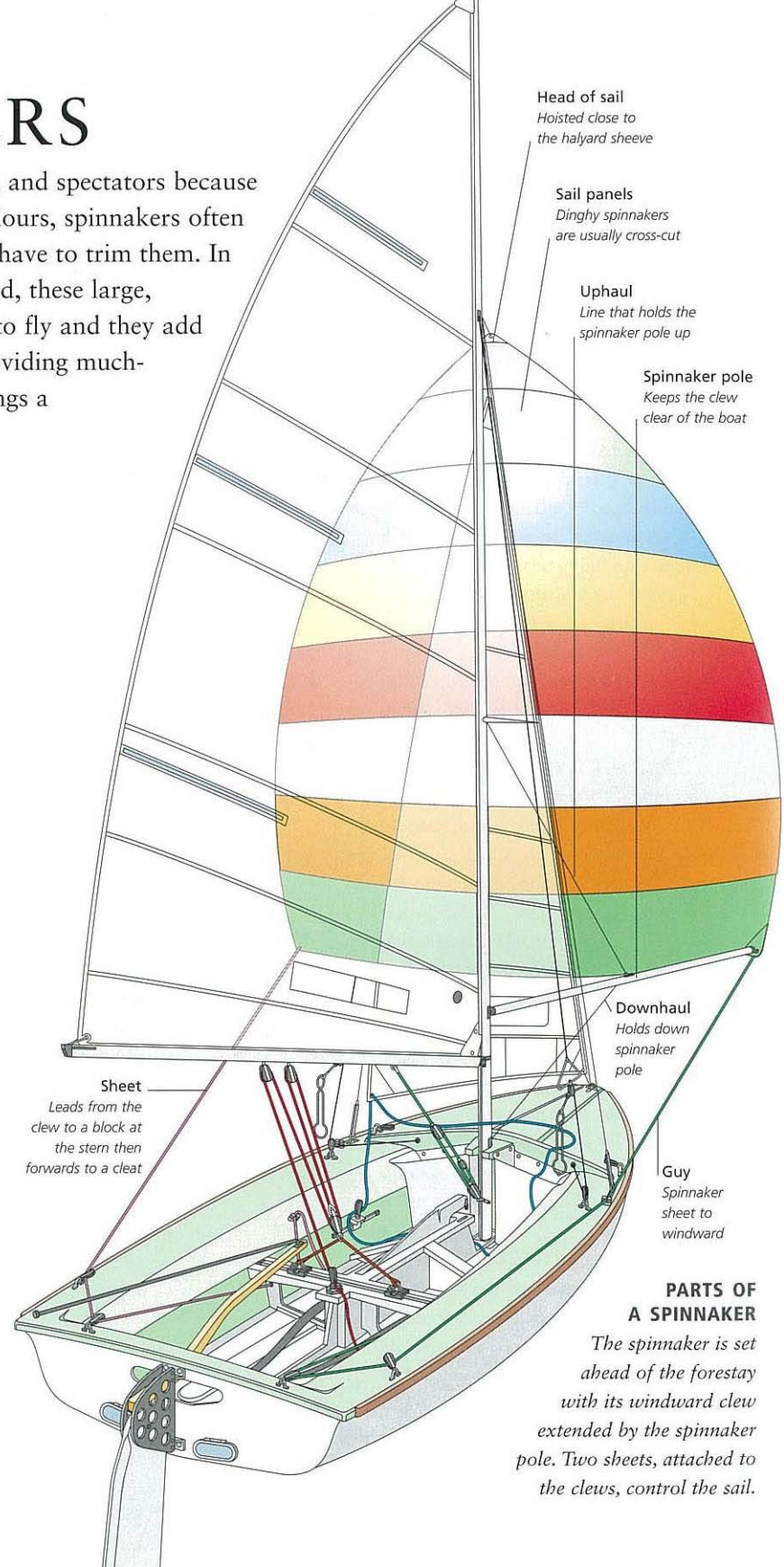
ANATOMY OF A SPINNAKER

Spinnakers were originally used only on downwind courses, but modern sailcloth and sail shapes allow high-performance boats to carry spinnakers even on a beam reach.

A variation of the conventional spinnaker, called an asymmetric spinnaker or, sometimes, a gennaker, has become popular on many high-performance boats (*pp.152-155*) but conventional spinnakers are still widely used on all types of boats.

A conventional spinnaker is attached only at its three corners, rather than to a spar or stay along any of its sides, and it relies on the force of the wind to keep it in position when hoisted. It requires skill and practice to hoist, set, and lower a spinnaker properly while avoiding twists and tangles.

Apart from the spinnaker itself, you will need a spinnaker pole, a halyard and hoisting system, and sheets. The sheets lead from each clew, outside all the rigging, to blocks and cleats on the sidedecks. The sheet on the windward side of the boat is known as the guy. When you gybe, the old sheet becomes the new guy and vice versa. Many crews use a continuous sheet system in which a single piece of rope is attached at each end to the clews.



PARTS OF A SPINNAKER

The spinnaker is set ahead of the forestay with its windward clew extended by the spinnaker pole. Two sheets, attached to the clews, control the sail.

USING A SPINNAKER
A spinnaker adds considerably to the sail area when sailing off the wind. Here, a 470 sails on a beam reach with a spinnaker set and the crew on the trapeze.

SPINNAKER DESIGN

Spinnakers are made from lightweight nylon sailcloth. Downwind spinnakers are generally cut with a full shape, a wide mid-section, and a broad head, whereas those for reaching have a flatter and narrower design. Dinghies usually have one all-round spinnaker, whereas small keelboats may have a choice of two, for running or reaching courses, and larger racing yachts may have several spinnakers for use in a range of conditions.

SPINNAKER POLE

The spinnaker pole is used to extend the spinnaker clew away from the boat. It is usually made of aluminium or carbon fibre. The pole's inner end clips onto a bracket on the front of the mast, and the outer end is clipped onto the spinnaker guy. The pole is held vertically by an uphaul and downhaul with which you can alter its angle and the height of the outer end. The fittings on the ends of the pole have retractable plungers, which are controlled by a light line that runs along the pole from one end-fitting to the other. In some boats the pole is stowed in the boat, whereas in many high-performance boats it is stowed in brackets that are fitted to the boom.

SHEET LEADS

The arrangement for the sheets varies between different boat designs but the turning blocks for the sheets are usually placed on the sidedecks near the stern. The sheet then leads forwards to the crew, often through a ratchet block to ease the load the crew must hold. The guy usually has a system to allow it to be held down near the shroud, out of the way of the crew when they are sitting out or trapezing. On some dinghies a reaching hook is used for this purpose. On others, and on small keelboats, twinning lines are used. A twinning line comprises a small block with a light line attached to it. The block runs along the spinnaker sheet, and the line leads through another block, mounted on the gunwale, near the shroud, and then to a cleat where it can be adjusted. In use, the twinning line on the guy is pulled tight to hold the guy down; the twinning line on the sheet is left slack.

MARKING THE SHEETS

Setting the spinnaker can be made simpler by marking the sheets so that you can effectively pre-set the sail for hoisting and gybing.

To mark the sheets, first hoist the spinnaker in light winds, with the boat stern-to-wind. Set the sail square across the bow, without the pole fitted, and with neither sheet under a reaching hook, then cleat the sheets. Use a permanent marker pen to mark each sheet at the point where it passes through its cleat. In future, when you prepare to gybe the spinnaker, simply cleat each sheet at its mark to set the sail correctly for the gybe.

To make it faster to set the spinnaker after hoisting, put another set of marks on the sheets. Hoist the sail and set the pole with the outboard end just off the forestay. Then mark the guy at its cleat. Before a hoist, cleat the guy at its mark and the pole will be set correctly for a reach.

STOWAGE SYSTEMS

Methods of stowing, hoisting, and lowering the spinnaker vary but a good system allows you to hoist and lower the spinnaker quickly, with the minimum chance of a foul-up, and stow it neatly without twists, ready for hoisting again. Most small boats are fitted either with a pouch stowage system on either side of the mast or with a chute system (*pp.146-147*).

SPINNAKER CHUTES

Many high-performance dinghies, as well as some catamarans and small keelboats, use a spinnnaker chute to stow a conventional or asymmetric spinnaker because a chute allows fast and easy hoisting and lowering.

CHUTE SYSTEMS

Spinnaker chutes are usually built into the boat. They have a bell-shaped mouth set into the foredeck just ahead of, or to one side of, the forestay. If there is no room ahead of the forestay for the chute mouth it is usually set on the port side, immediately behind the forestay. This means it is easier to hoist and lower the spinnaker when on starboard tack, which is usually the tack on which you round the windward mark when racing. On catamarans, the chute mouth is often mounted on the crossbeam or under a bowsprit (*pp.166-67*). A fabric sock or rigid plastic tube runs from the mouth of the chute back into the boat. This holds the spinnaker when it is stowed.

Chute systems are useful because the spinnaker cannot become twisted when it is hoisted and lowered and both manoeuvres become easier, although it is possible to drop the sail in the water under the bow when lowering if the correct procedure is not followed (*p.149*).

Spinnakers designed to be used with a chute are often given a silicone finish to reduce friction and to shed water rapidly, as a chute often funnels water over the sail when it is stowed.

USING A SPINNAKER CHUTE

A chute system allows the spinnaker to be hoisted and lowered relatively easily, even on a beam reach, but it is safest to steer onto a broad reach or run before hoisting or lowering. If the chute mouth is offset on the port side of the forestay it is easier to hoist and lower the spinnaker when on starboard tack so the chute mouth is to leeward of the forestay. It is possible to hoist and lower on port tack but if you must do so bear away to a broad reach or run before the hoist or drop to minimize friction between the sail and the forestay.

The big advantage of a spinnaker chute is that it relieves the crew of the need to help with the hoist or the drop. When hoisting, the helmsman pulls up the sail and the crew can concentrate on fitting the spinnaker pole, setting the spinnaker as soon as it is hoisted, and balancing the boat. During the drop, the spinnaker is automatically gathered into its sock so the crew is free to stow the pole and balance the boat.

CHUTE MOUTH

Here, the chute mouth is ahead of the forestay so the asymmetric spinnaker fitted to this boat can be hoisted easily on either port or starboard tack.

PACKING THE SPINNAKER IN A CHUTE

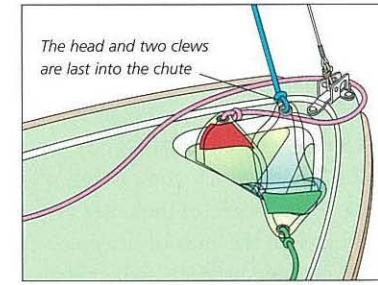
It is important that the spinnaker is packed correctly in its chute before the boat goes afloat. It must be packed without twists, or it will be difficult for the crew to set the sail when it is hoisted.

PACKING PROCEDURE

Before you go afloat, attach the halyard, sheets, and downhaul to the spinnaker and hoist the sail to ensure that it is not twisted. Pull on the downhaul as you lower the spinnaker so that the sail is drawn into the chute. Keep pulling steadily until all the spinnaker has disappeared completely into the mouth of the chute. Take all the slack out of the halyard and the sheets and cleat them.

STOWING THE SPINNAKER

When the spinnaker is stowed, by pulling it into the chute using the downhaul, the head and two clews should be the last parts of the sail to disappear into the chute mouth. When the helmsman pulls on the halyard to hoist the spinnaker, it should slip smoothly out of the chute without any twists, and will set easily as the wind fills it.



SPINNAKER POUCHES

Stowing a spinnaker in a pouch, bag, or locker requires a little more care than when using a chute system. If the spinnaker is not packed correctly it can develop a twist that becomes apparent when the sail is hoisted, preventing it being set correctly.

USING POUCHES

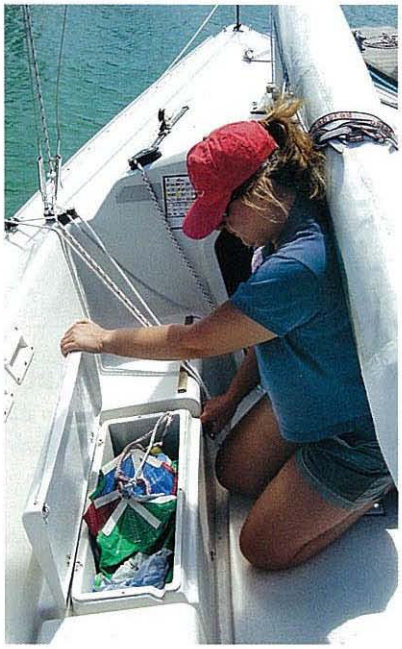
With a pouch system, the boat is fitted with light fabric pouches, one either side of the mast. The spinnaker is best stowed in the pouch that will be to leeward when hoisting, as this allows for an easier hoist. When the sail is stowed, the halyard is hooked under the reaching hook to keep it tidy.

BAGS AND LOCKERS

Some boats have a single bag behind the mast for stowage. The sail can be hoisted and dropped to leeward or windward as needed. Some small keelboats have lockers on either side of the cockpit that work like pouches. The sail is best stowed in the locker that will be to leeward when hoisting the spinnaker.

PACKING THE SPINNAKER

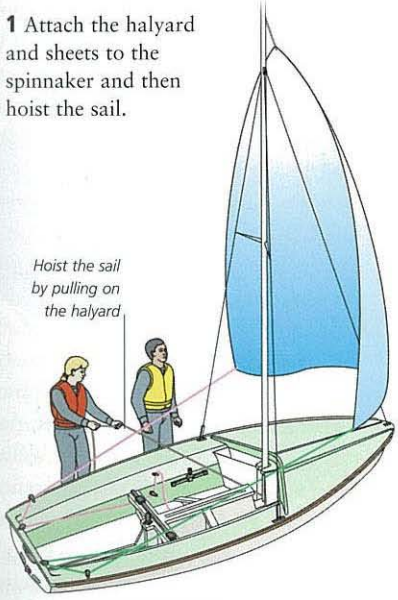
Whether a boat has a bag, pouches, or lockers, the spinnaker is stowed in exactly the same way. The middle of the spinnaker is packed first so that the three corners attached to the sheets and halyard end up on top of the packed sail.



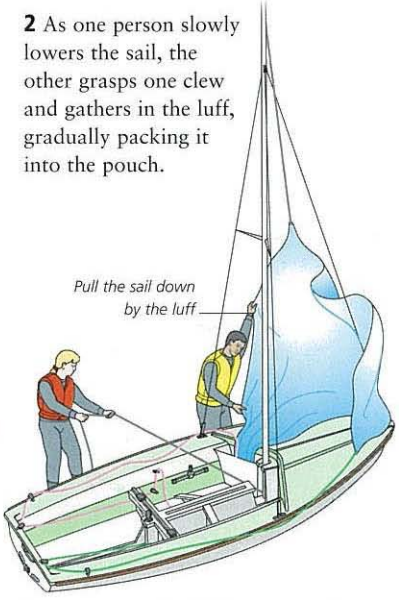
PACKING THE SPINNAKER IN A POUCH

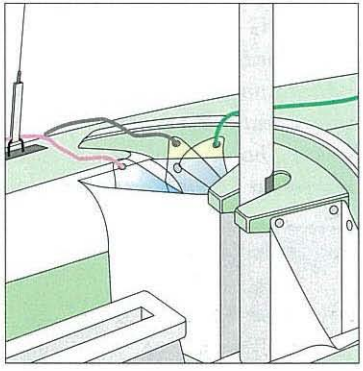
It is important to ensure that the spinnaker is correctly packed into its pouch, bag, or locker so that it can be hoisted quickly and easily. If possible, the best way to do this is to hoist the sail while the boat is ashore or moored and then lower it into the pouch or locker. To do so, pull down one luff and pack it into the pouch, then gather in the rest of the sail until the three corners lie on top of the sail bundle.

1 Attach the halyard and sheets to the spinnaker and then hoist the sail.



2 As one person slowly lowers the sail, the other grasps one clew and gathers in the luff, gradually packing it into the pouch.





3 Once the luff is stowed, gather in the rest of the spinnaker so that it ends up in the pouch with the head and both clews on top. Hook the halyard under the reaching hook to keep it out of the way, and take any slack out of the sheets before cleating.

HOISTING AND LOWERING

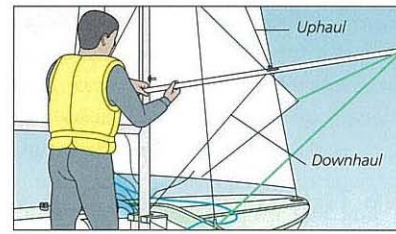
Generally, a chute makes it easier to hoist and lower a spinnaker than with a pouch system, which requires more manual dexterity from the crew, and good timing and understanding between helmsman and crew. Some boat's class rules allow only one or the other method of spinnaker stowage system, but others allow a choice. If you do have the choice of opting for either chute or pouch system, find out what the top sailors in your class are using and copy their systems first, before experimenting with alternative ideas.

POUCHES

HOISTING FROM A LEEWARD POUCH

A spinnaker is easier to hoist from a leeward pouch or locker because the helmsman can usually hoist it directly out of the pouch without help from the crew. Bear away to a run or broad reach to hoist the sail.

1 The crew releases the halyard from the reaching hook and pulls on the guy to draw the windward clew towards the forestay. As the helmsman hoists the sail, the crew clips the pole to the guy.

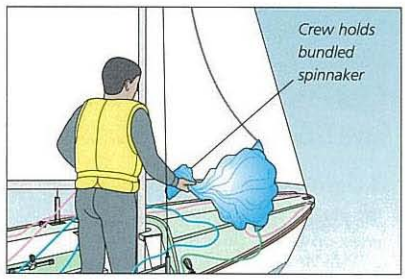


2 The crew attaches the uphaul and downhaul, and clips the inboard end of the spinnaker pole onto the mast bracket, which is positioned above the boom.

3 The helmsman controls the sheet and guy while the crew sets the pole, slips the guy under the reaching hook, or adjusts the twinning line, then trims and cleats the guy.

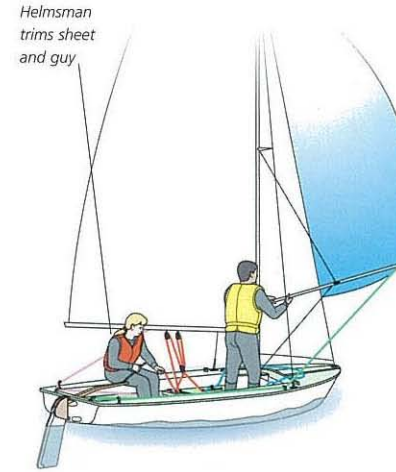
HOISTING FROM A WINDWARD POUCH

Good co-ordination and teamwork are needed when hoisting from a windward pouch. Ensure that the sheets are marked correctly (p.145)*, so that you can cleat the guy in the correct position beforehand. Bear away to a run before the hoist. The crew has to take the bundled spinnaker out of the pouch and throw it up and forwards, while the helmsman rapidly hoists it.*



1 The crew frees the halyard and cleats the guy so that the clew will clear the forestay. He removes the spinnaker from the pouch, holding it tightly.

2 The helmsman hoists rapidly as the crew throws the sail forward. The crew pulls on the sheet to bring the sail around to leeward of the forestay.



3 The helmsman controls the sheet and guy while the crew rigs the pole. The crew slips the guy under the reaching hook and cleats it, or pulls on the twinning line.

LOWERING THE SPINNAKER

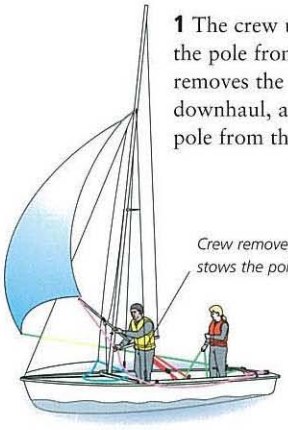
You can choose between lowering the spinnaker into either the windward or leeward pouch, although the safest and quickest method, in a dinghy, is to drop the spinnaker into the windward pouch, as this keeps the crew's weight on the windward side. In a dinghy, only drop the sail into the leeward pouch if you need it in that pouch for a later leeward hoist. For either method, the crew's job is made a lot easier if the helm steers onto a broach reach or run for the manoeuvre.

WINDWARD DROP

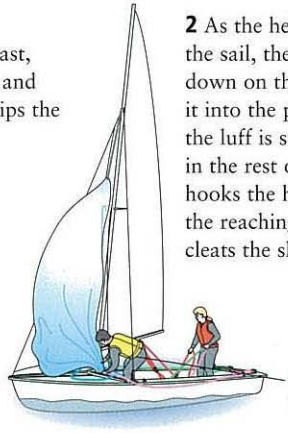
For a windward drop the crew must remove and stow the pole before lowering the sail. He then pulls on the guy until the clew is in his hand and pulls the sail down by its luff, stuffing it into the windward pouch. He stows the halyard under the reaching hook.

LEEWARD DROP

The crew pulls hard on the sheet until he can reach the clew, then releases the guy and pulls the sail under the boom and into the leeward pouch. Once all the sail is in the pouch, and the halyard is hooked under the reaching hook, the crew removes and stows the spinnaker pole.



1 The crew unclips the pole from the mast, removes the uphaul and downhaul, and unclips the pole from the guy.

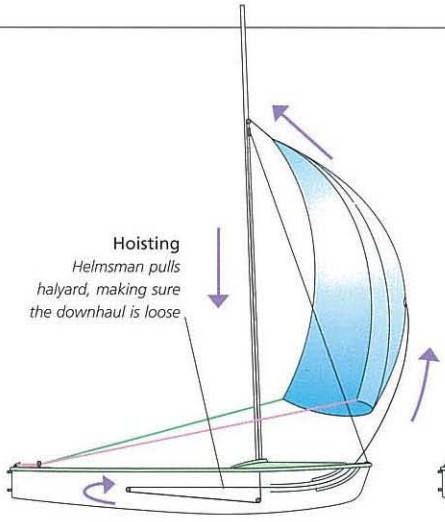


2 As the helmsman lowers the sail, the crew pulls down on the luff, stuffing it into the pouch. When the luff is stowed, he pulls in the rest of the sail, hooks the halyard under the reaching hook, and cleats the sheets.

CHUTES

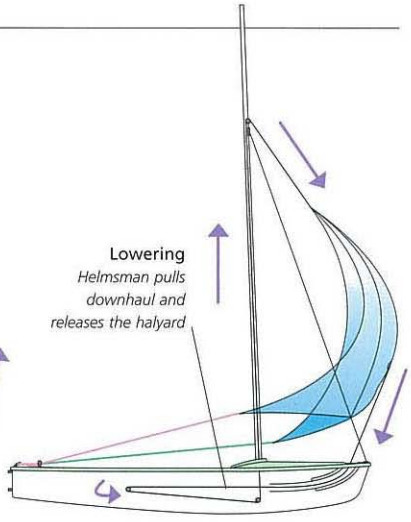
HOISTING AND LOWERING

The spinnaker is hoisted from the chute using the halyard attached to the head of the sail. This halyard, which is often operated by the helmsman in a two-person dinghy, runs down inside the mast, then to a jamming cleat within reach of the person who will hoist and lower the sail. The spinnaker is lowered using a downhaul, which is attached to a reinforced patch in the middle of the spinnaker and runs down through the chute mouth and tube. The halyard and downhaul usually consist of one continuous piece of rope. When the halyard is released and the downhaul is pulled, the sail collapses and is drawn down into the chute ready to be hoisted once again. When dropping, the crew should pull on both sheet and guy to hold the foot in and allow the middle of the sail to enter the chute first.



HOISTING FROM A CHUTE

The helmsman hoists the sail by pulling on the halyard, while the crew sets the sheet and guy to their marks and attaches the pole. The helmsman then cleats the halyard and trims the sheet and guy while the crew is dealing with the pole.



LOWERING INTO A CHUTE

The crew sheets the foot of the sail tight against the forestay. Uncleating the halyard, the helmsman pulls on the downhaul. As soon as the middle of the sail enters the chute, the crew releases the sheet and guy and removes the pole.

HANDLING A SPINNAKER

SUCCESSFUL SPINNAKER WORK demands plenty of practice and good communication between the helmsman and crew. Once set, the spinnaker has an enormous effect on the handling of a small boat, and it must be kept under control at all times. This is primarily the crew's job, and it requires great concentration.

The crew must learn to trim the spinnaker correctly and should understand how to cope with gusts. Spinnaker gybing requires slick crew work if it is to be completed without mishap.

PLAYING THE SHEET

Each spinnaker shape needs trimming in a slightly different way, but there are some general rules to help you get the best out of your boat. The most important thing is to keep the sail symmetrical about its centreline; this involves keeping the clews level, at the same height above the water. You must also encourage the spinnaker to fly as far as possible from the mainsail so that air can pass freely between the two sails. When the spinnaker is set correctly, the crew will be able to ease the sheet until the luff starts to curl back on itself about halfway up. A well-designed, stable spinnaker can be sailed with some luff curl without collapsing. The point at which the luff starts to curl is the optimum trim in any particular wind strength and point of sailing. As the boat speed changes, the apparent wind shifts forwards or backwards, and the sheet must be trimmed continually to keep the spinnaker on the edge of curling.

HANDLING GUSTS

You must know how to handle gusts, to avoid the power in the spinnaker overcoming rudder control. As a gust hits, the crew eases the spinnaker sheet to curl the luff and allows the boat to accelerate. Failure to do this will make the boat heel and develop considerable weather helm (*p.128*), making it hard for the helmsman to stay on course or bear away. The apparent wind will shift forwards as the boat accelerates and the crew must be ready to sheet in to prevent the spinnaker collapsing. When the boat slows down, the apparent wind will shift aft and the sheet must be eased.

POLE ANGLE AND HEIGHT

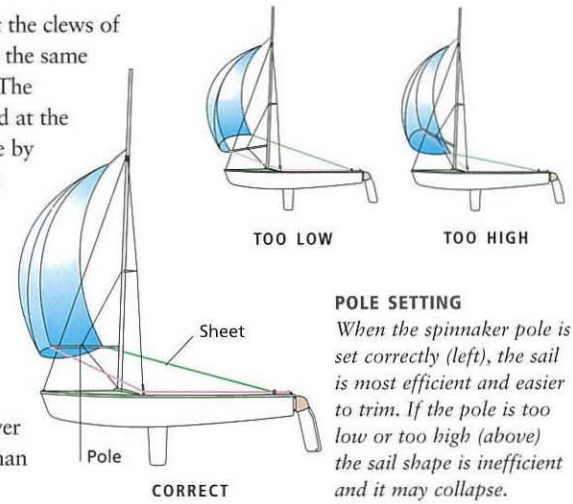
The pole angle and height must be adjusted correctly so that the sail is set at its most efficient position and can be trimmed effectively. The crew adjusts the pole angle using the guy, which is cleated once the correct angle has been set. The height of the pole is altered, usually by the crew, using the uphaul and downhaul.

POLE ANGLE

Set the angle of the pole just greater than a right angle to the apparent wind. This means bringing the pole aft as the boat sails further downwind, and easing it forwards as the boat turns on to a reach. Always keep the pole off the forestay or it may bend or break. Remember to adjust the guy after putting it under the reaching hook or tightening the twinning line.

POLE HEIGHT

When the pole is horizontal it holds the spinnaker as far away as possible from the rest of the rig, but it is even more important to ensure that the clews of the sail are kept level, at the same height above the water. The windward clew (attached at the pole end) is held in place by the pole, but the clew to which the sheet is attached is free to move up and down, depending on the strength of the wind and the boat's course. If the leeward clew is lower than the tack, lower the pole. If it is higher than the tack, raise the pole.



POLE SETTING
When the spinnaker pole is set correctly (left), the sail is most efficient and easier to trim. If the pole is too low or too high (above) the sail shape is inefficient and it may collapse.

GYBING THE SPINNAKER

Successful gybing with a spinnaker set requires a standard routine and plenty of practice. It is vital to keep the boat upright and to complete the gybe quickly to prevent the spinnaker getting out of control. To prepare for the gybe, the helmsman bears away to a run and the crew removes the guy from the reaching hook and sets the sail square across the bow. If the sheets are marked (p.145)*, they can be set at the gybing position quickly and easily. The boat is now ready to be gybed.*

GYBING

Ideally, at the point of gybing the crew weight is in the middle, the pole is being swapped across, and the sail remains full.

POLE HEIGHT

Adjust the pole height using the uphaul and downhaul to keep the clews level and the spinnaker symmetrical.

3 Removing the old guy from the pole end, the crew fits the pole onto the mast bracket. He then puts the guy under the reaching hook, cleats it in the correct position, and takes the spinnaker sheet from the helmsman.

Crew
Clip the inner end of the pole to the mast

2 Standing in the middle of the boat, the helmsman takes control of the guy and sheet to keep the spinnaker full. The crew removes the pole from the mast, clips it onto the new guy, and pushes it out to the new side.

Helmsman
Steer the boat with the tiller between your knees

1 With the boat pointing dead downwind, the mainsail and jib (if hoisted) are gybed. The crew helps the boom over by pulling on the vang, and sheets the jib to the new side.

Crew
Pull on the vang to help the boom over

ASYMMETRIC SPINNAKERS

ASYMMETRIC SPINNAKERS look like a cross between a large jib and a spinnaker. They are sometimes also known as 'gennakers', the word derived from genoa and spinnaker. They are commonly used on high-performance dinghies and catamarans, and some sportboats. An asymmetric spinnaker is set from a long bowsprit (a spar projecting from the bow) rather than a spinnaker pole, which makes it much easier to handle when hoisting, gybing, and lowering, as the crew does not need to handle a pole. The bowsprit, which is nearly always retractable, is usually made from carbon fibre for strength, stiffness, and lightness; the sail is made from lightweight nylon or polyester sailcloth.

MASTHEAD ASYMMETRIC SPINNAKER

HANDLING ASYMMETRICS

An asymmetric spinnaker is usually larger than a conventional spinnaker and is often flown from a point higher on the mast, with the halyard exiting at the masthead or slightly lower, between the hounds and the masthead. These large sails generate considerable power but in many ways are easier to handle than a conventional spinnaker because the tack is attached to the end of the bowsprit, and they do not require adjustments to a spinnaker pole. They are controlled by two sheets, both of which are attached to the clew, just like a jib.

SAIL TRIMMING

An asymmetric sail is trimmed using two sheets. The sheets lead to the aft quarters of the boat and may have twinning lines (*p.145*) to move the lead forwards when sailing on a broad reach. An asymmetric is inefficient when sailing on a dead run, so sailing

HOISTING AND LOWERING

An asymmetric spinnaker is stowed and launched from a chute or pouches, depending on the specific boat design. The bowsprit is normally retracted when the asymmetric is not being used and so it has to be extended when the sail is hoisted. To hoist, the crew pulls a line to launch the bowsprit. In many boats a single-line system extends the bowsprit and pulls the sail's tack to the outer end at the same time. In other boats, separate lines are used and the crew first launches the bowsprit, then pulls the tack to its outer end. The crew or helmsman then pulls the halyard to hoist the sail. The process is reversed to drop the sail.

HOISTING FROM A CHUTE

To hoist from a chute, the crew extends the bowsprit and pulls the tack of the sail to its end, then hoists the sail with the halyard.

LOWERING INTO A CHUTE

To lower into a chute, the crew pulls on the downhaul to pull the sail into the chute, then retracts the bowsprit.

LOWERING INTO A BAG

When the asymmetric is stowed in a bag or pouch, one crew member must gather the sail as it is lowered and stow it into its bag.

downwind is done in a series of gybes and reaches to maximize the effect of apparent wind (*pp.124-125*). The crew must avoid oversheeting the sail and try to keep it trimmed with a slight curl in the luff for top speed.

Asymmetric sails are at their most efficient when the boat is planing fast, as this is when the effect of apparent wind is at its strongest, allowing the boat to head downwind while sailing in an apparent wind that is on or ahead of the beam. To achieve this, the helmsman must first steer on a reach to build speed and bring the apparent wind forward, before bearing away to a more downwind course while maintaining the speed and apparent wind angle.

LIGHT WIND TRIMMING

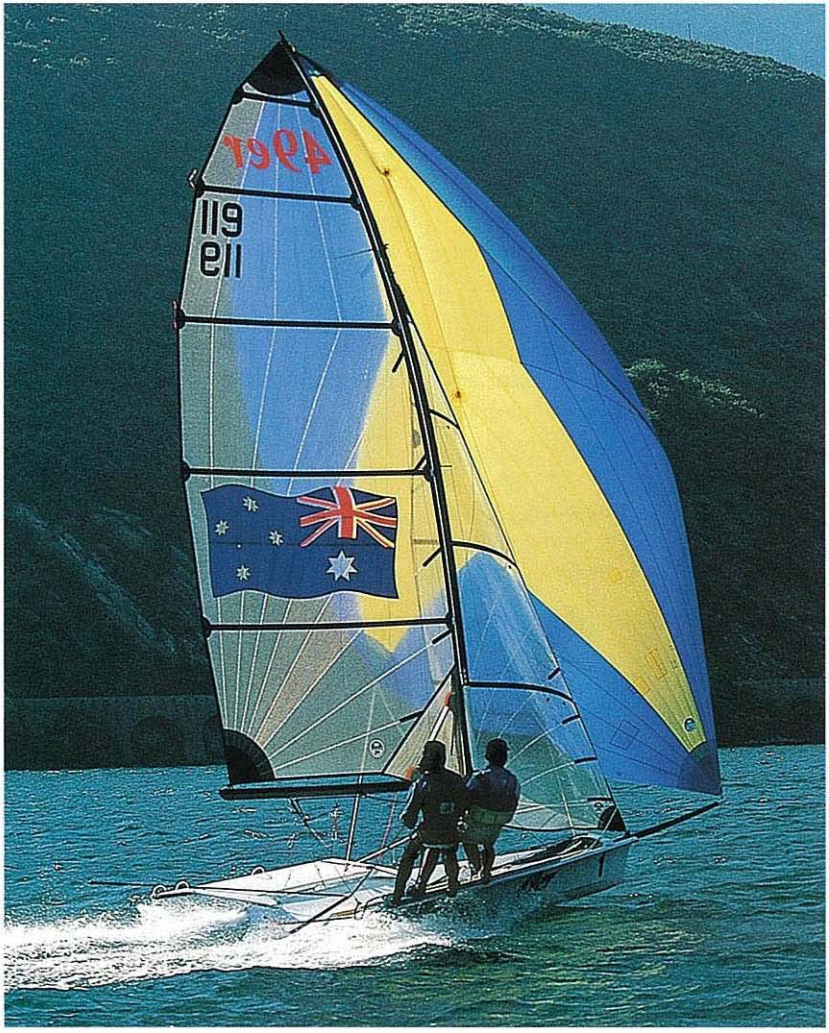
In light wind conditions, when planing is not possible, particularly in the heavier type of sportsboats, it pays to steer the boat further downwind and sail a shorter course to the next mark, without losing pressure in the asymmetric sail. This calls for good communication between helmsman and crew. The crew can feel the pressure in the sail through the tension in the sheet. When the crew says "good pressure", the helmsman knows he can continue to steer the same course. If the crew says "bad pressure", the helmsman may choose to luff up to create more apparent wind and put more pressure in the sail.

STRONG WIND TRIMMING

Normally, it is fastest to trim an asymmetric with a few centimetres of curl on the luff. Even the slightest amount of over sheeting can make the boat slower, and the helmsman will feel the difference as the rudder loads up with more lee helm. As soon as the crew eases the sheet, so that the sail's luff curls again, the helmsman will feel the rudder become less loaded and the boat will accelerate again. However, in some high-speed skiff classes, the asymmetric can develop so much power, and the boat accelerate so fast, that there is a danger of 'pitchpoling' – capsizing stern over bow. To avoid this, over-trim the asymmetric to the point where you feel comfortable with your speed once more. When you feel confident to sail faster, the crew eases the sheet a little, and the boat will accelerate once more. In strong winds, think of the asymmetric spinnaker sheet as the throttle. The more you release the sheet to the point of curl on the luff, the faster you will sail. Over-trimming the sheet is a useful technique when sailing in strong wind and waves, when there is a danger of ploughing the bow into the back of a wave. It is much safer to travel a little slower with an over-trimmed sail than to risk a pitchpole capsize.

FLYING AN ASYMMETRIC

This 49er's crew are sailing under their large asymmetric. Both sailors are trapezing high for better visibility and control, and the crew has the asymmetric trimmed with a slight curl in the luff for maximum speed.



GYBING ASYMMETRIC SPINNAKERS

Gybing an asymmetric spinnaker is a relatively simple process compared with gybing a symmetrical spinnaker, but it is still a manoeuvre that requires good timing and co-ordination between helmsman and crew.

When sailing a dinghy fitted with an asymmetric, especially a high-performance one, it is important to keep the boat upright throughout the gybe, with minimal heel to windward or leeward. The helmsman must avoid using too much rudder during the gybe, keeping the turn slow and gentle. If the helmsman steers too rapidly, the boat will turn too far after the gybe, with a high risk of a capsize. It is better to start off by turning too little than too much when you are learning to gybe an asymmetric.

From the crew's point of view, gybing an asymmetric is much simpler than a conventional spinnaker, since there is no pole to handle and the bowsprit remains fully extended. However, in order to execute an efficient gybe, timing on the sheet is critical. There are two slightly different techniques you can use depending on whether you are gybing at speed in medium or strong winds, or more slowly in light winds.

HIGH SPEED GYBES

In planing conditions, the helmsman starts the manoeuvre by warning the crew so that he has sufficient time to come in off the trapeze or, in a non-trapeze boat, to move in ready for the gybe. As the helmsman begins to bear away into the gybe, the crew should move towards the centreline and hold the old sheet where it is, or even pull in an extra handful if he has time to do so. This means that the asymmetric will be pulled quite taut to leeward which will prevent the sail from 'hourglassing' (tying itself in a twist) when the boat is pointing dead downwind in the middle of the gybe.

At the same time, the crew picks up what will become the new sheet and takes it across the boat to the new side. As the mainsail gybes, and the crew reaches the new side, he releases the old sheet and pulls in the new one. With good timing, a crew can have the asymmetric set on the new side without it collapsing.

SURVIVAL GYBING

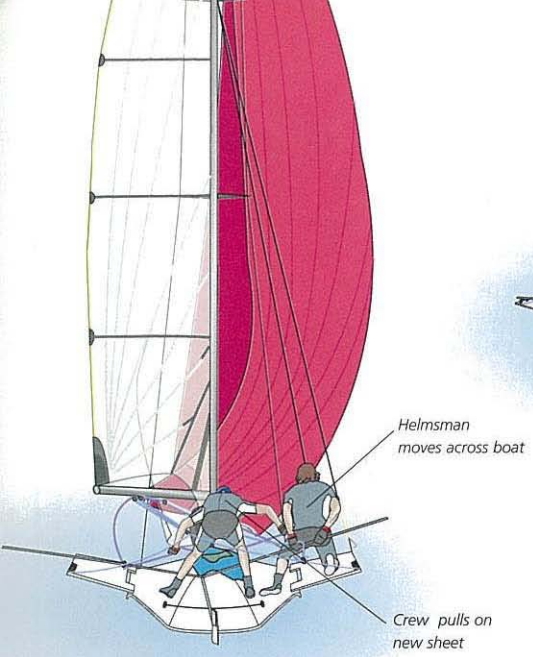
A variation to the high-speed gybing technique, which is appropriate for the most unstable high-performance dinghies, is for the crew to keep the old sheet pulled on hard as the boat turns out of the gybe, holding the sail tight on the new windward side. The wind will now blow the wrong way across the sail, from leech to luff. This keeps the boat surprisingly stable and in control, while travelling quite slowly. Only when both helmsman and crew are settled on the new gybe and ready to accelerate should the crew release the old sheet and pull on the new one. This is a highly effective technique for surviving windy gybes in high-performance dinghies.

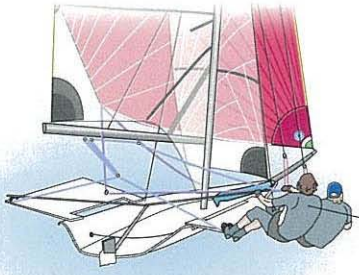
LOW SPEED GYBES

The high speed gybing technique is appropriate in all but light winds when the boat is not planing. In these lighter conditions there is a variation to the crew's gybing technique that helps the boat accelerate more quickly out of the gybe. When the helmsman warns the crew of the imminent gybe, the crew picks up the new sheet and immediately starts to pull on it, whilst releasing the old sheet. As the boat goes through the middle of the gybe, the clew of the asymmetric should already be passing the forestay, and by the time the boat exits the gybe, the crew will already have the sail set and filling on the new leeward side. It is important, for the success of this light wind gybe, that the helmsman does not start turning the boat into the gybe until he sees the crew take the first one or two pulls on the new sheet. This will ensure the sail sets properly on the new gybe.

ASYMMETRIC GYBING

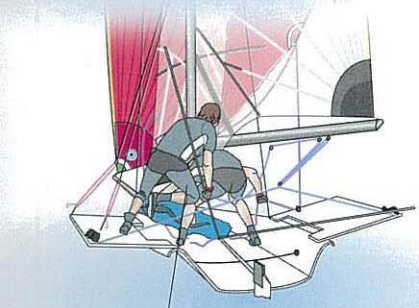
The helmsman and crew are in the middle of the boat and the crew is ready to sheet the asymmetric across to the new side.



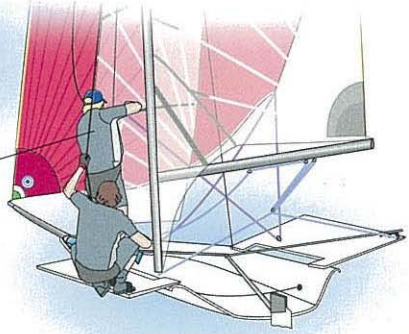


5 The crew hooks on and swings out onto his trapeze and trims the asymmetric. The helmsman also moves out on his trapeze and steers onto the new course, sheeting in the mainsail to suit the new course and apparent wind.

4 As the mainsail gybes, the crew releases the old sheets and rapidly pulls in the new sheet to move the asymmetric around the forestay to the new leeward side. The helmsman moves to the new side, picks up the new tiller extension, or swings the single extension around to the new side, and hooks on to his trapeze.

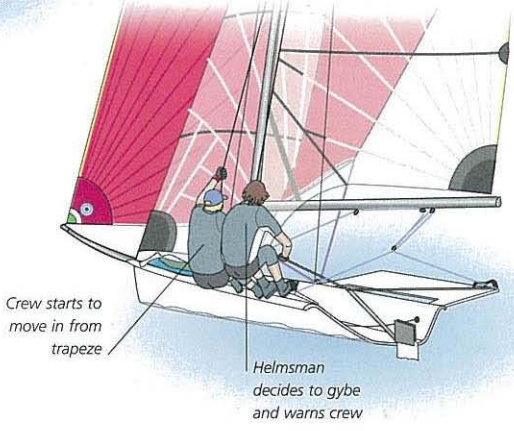


3 The helmsman moves into the boat, picks up the mainsheet and uncleats it, and continues to turn the boat in a gentle curve. The crew picks up the new sheet on his way across the boat and holds the old sheet or pulls it in slightly.



2 As the crew moves off the trapeze the helsman eases the mainsheet, cleats it and drops the end in the boat, and starts to move in off his trapeze. At the same time, he steers gently into the gybe.

1 The helsman warns the crew by calling "ready to gybe". The crew moves in to the boat first and prepares to gybe the asymmetric.



GYBING AN ASYMMETRIC

Gybing an asymmetric spinnaker is easier than gybing a conventional spinnaker as the sail is gybed just like a jib and there is no spinnaker pole to switch from side to side. Avoid a twist developing in the sail by holding the old sheet in tight until the boat has gybed, then pulling quickly on the new sheet to pull the sail around the forestay to the new leeward side. In light winds, start pulling the new sheet before the boat gybes to move the sail around the forestay more quickly so that it fills earlier on the new course.

SINGLE-HANDED SAILING

THE PUREST FORM OF SAILING IS WHEN YOU GO AFLOAT ALONE and are solely responsible for balance, trim, and handling. You learn quickly when you sail single-handed, and you can sail whenever you want to, without having to find a crew. Single-handed boats are usually cheaper and simpler than two-man dinghies. They are normally lighter and can often be transported very easily on a car roof rack. Another benefit is that they are usually quick to rig, so you can be sailing within minutes of arriving at the venue.

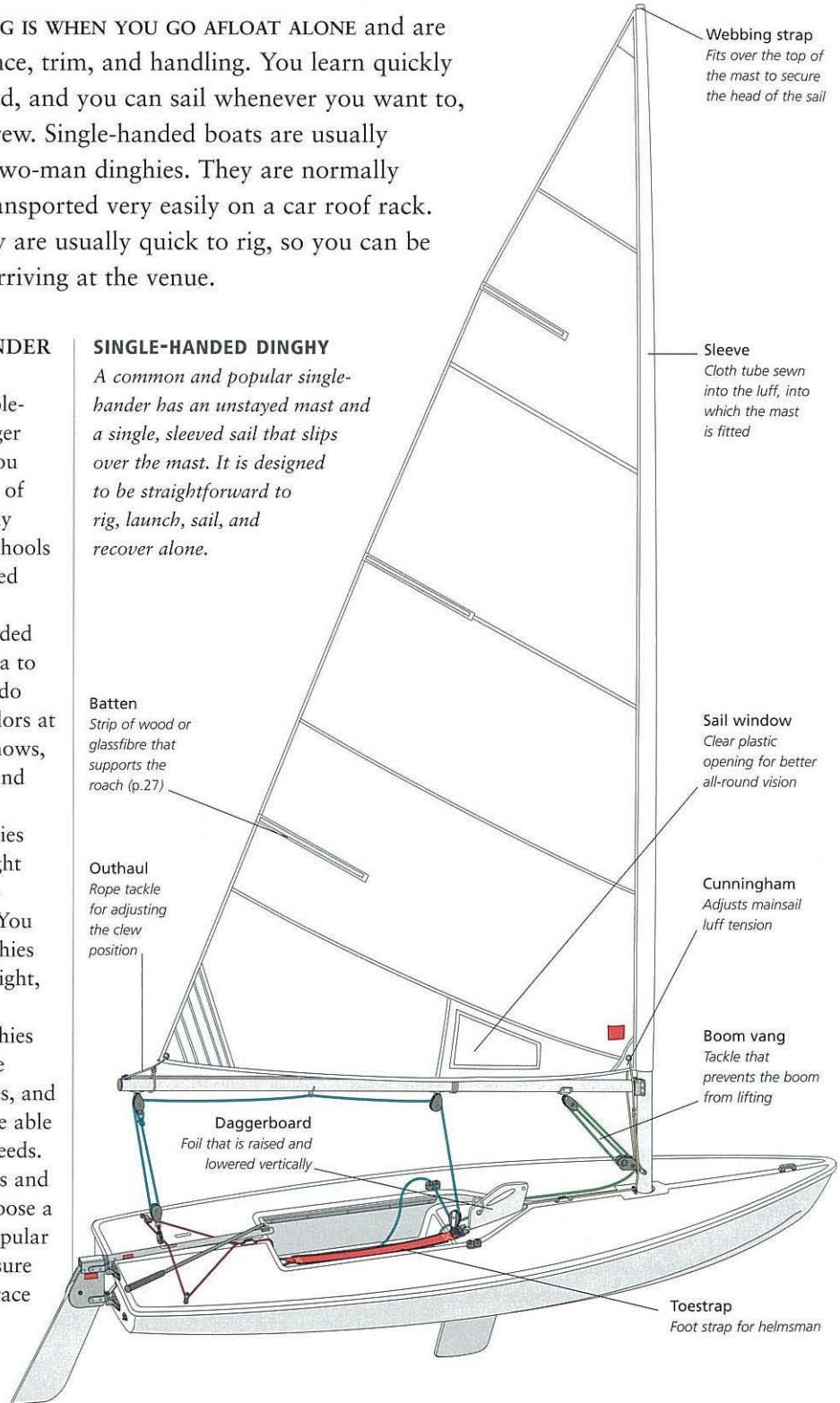
CHOOSING A SINGLE-HANDER

Sailing single-handed is quite different from sailing in a double-handed dinghy or among a larger crew in a small keelboat and you should be certain that this type of sailing is for you before you buy your own boat. Some sailing schools offer instruction in single-handed dinghies and most watersport holiday centres have single-handed boats available. It is a good idea to try as many as possible and to do some research by talking to sailors at your local club, visiting boat shows, and exploring manufacturers' and class web sites online.

Remember, that most dinghies have an optimum size and weight range for their crew and single-handed dinghies are the same. You should make a shortlist of dinghies that are appropriate to your height, weight and degree of skill and athleticism. Single-handed dinghies are available to cater for a wide range of ages, physical attributes, and levels of skill and you should be able to find a class that suits your needs. As with double-handed dinghies and small keelboats, it is best to choose a single-handed dinghy that is popular at your local club. This will ensure that there is a fleet to sail and race in without the need to travel.

SINGLE-HANDED DINGHY

A common and popular single-hander has an unstayed mast and a single, sleeved sail that slips over the mast. It is designed to be straightforward to rig, launch, sail, and recover alone.



TYPES OF SINGLE-HANDER

Most single-handed dinghies have a single sail and are designed for hiking (sitting out) rather than trapezing. However, some designs have a mainsail and jib, a mainsail and asymmetric spinnaker, or even all three sails. Some dinghies use a trapeze to increase righting power and some incorporate wings or racks to increase the righting power when the helmsman is hiking or trapezing. One of the oldest, yet most extreme designs, requires the helmsman to deal with a mainsail, jib, asymmetric spinnaker, and a sliding seat that is swung across the boat when tacking and gybing.

SINGLE-HANDED DINGHIES

LASER

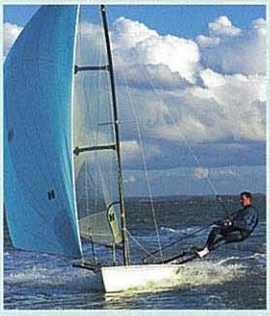
The men's Olympic single-hander, the Laser is the world's most popular single-handed dinghy. Used for all types of sailing, from beach sailing to Olympic-class competition, it requires good fitness but offers excellent competition for all levels of ability.

LASER VORTEX

This unusual tunnel-hull design creates a stable but fast platform for exciting sailing without excessive risk of capsizing. It is ideal for providing an introduction to single-handed trapezing and is suitable for a wide range of physical sizes, weights, and experience.

RS 600

The RS 600 is a good introductory boat to modern, skiff-type single-handed trapezing. It has a carbon-fibre mast with a removable mast extension and reefing system that allows the sail area to be reduced by 20 per cent when learning or for strong winds.



RS 700

The RS 700 is a demanding single-hander with skiff-style performance, a trapeze, and asymmetric spinnaker. The boat has a performance equalization system with adjustable width wings to allow equal competition for sailors of different weights.

INTERNATIONAL MOTH

The International Moth is one of the oldest single-handed designs but is also one of the most innovative. A development class since the 1920s, the Moth has led the way with design ideas and is now leading the way in the development of fully foil-borne sailing.

INTERNATIONAL CANOE

The origins of the International Canoe date back to the 1850s. It still has the distinction of being the fastest single-handed monohull dinghy in the world. It has a sliding seat arrangement, a mainsail, jib, and an asymmetric spinnaker.

RIGGING AND LAUNCHING

Most single-handed dinghies have a mainsail only. This is set on a mast that is stepped further forward than on a two-sailed dinghy.

The mast may be unstayed (*p.68*) for easy rigging, and flexible so that it can be bent to provide an efficient sail shape and to release excess power in strong winds. Whereas a stayed mast and sail arrangement allows you to hoist the sail before or after launching, as conditions dictate, an unstayed mast with a sleeved mainsail must be rigged before launching and the boat kept close to head-to-wind.

A single-hander is launched in the same way as a two-man dinghy. You usually have to do the job on your own, although it is easier to launch and recover the boat if someone else is available to deal with the trolley.

SAILING

Single-handed dinghies are usually light and thus sensitive to changes in trim and balance. The helmsman must move his weight in and out, and fore and aft, to keep the boat upright and correctly trimmed without the help of a crew. It is important that the sail is set correctly, and you must get used to adjusting its shape using the outhaul, Cunningham control (*p.177*), mainsheet, and vang.

Downwind courses reveal the biggest differences between a single-hander and a two-man boat. When there is only one sail, there is an increased weather helm and a constant tendency for the boat to turn to windward. This can be reduced by heeling the boat to windward until the helm is balanced, but skill is required to maintain this position without risking a windward capsize. Single-handers usually plane easily and are fun to sail downwind in waves, as they react instantly to the tiller and accelerate rapidly.

TACKING

Tacking a single-hander well requires good timing and smooth actions. The helmsman's movements are the same as in a two-man dinghy (*pp.90-93*). The boom is often very low so you will have to duck even lower under it. Ease the mainsheet as you turn through the wind to make it easier to avoid the boom and to reduce the chance of getting stuck in irons (*p.159*). Do not move off the windward side too early. Wait until the boom is approaching the centreline with the boat heeled towards you, then cross quickly and get your weight out over the new windward side as the boat completes the tack. Sit out hard and sheet in as the boat comes upright. Change hands on the mainsheet and tiller extension after the tack.

GYBING

Raise the daggerboard until it is just clear of the boom and vang. If the vang is tight, ease it to prevent the boom hitting the water and capsizing the boat. The helmsman's actions through the gybe are the same as they are in a two-man dinghy (*pp.94-97*). Sailing fast on a very broad reach or a run, turn into the gybe and give a sharp tug on the mainsheet to start the boom swinging across. As it does so, straighten the tiller and get your weight out on the new side. Change hands on the tiller and mainsheet.

TACKING

This skilled solo sailor is tacking. He allows the boat to heel towards him and waits for the boom to reach the centreline before he begins to move across the boat.

SAILING SKIFF-TYPE DINGHIES

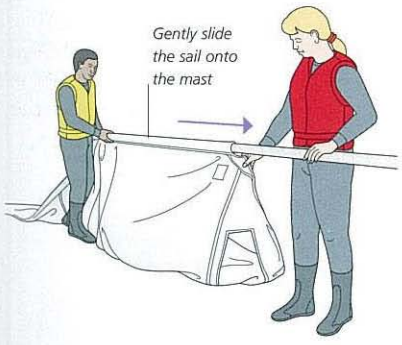
Some of the fastest single-handers have many of the characteristics of the double-handed skiff-type dinghies. They have very light, narrow, and shallow hulls with wings or racks sticking out from the hulls sides to increase the righting power of the helmsman who trapezes to keep the boat upright. This type of single-hander is extremely fast but requires extra skill and agility to sail well.

When tacking a singlehanded trapeze boat take extra care to avoid stopping in-irons (*right*) during a tack. Just before the tack, bear away on to a close reach, ease the mainsheet and cleat it, and start stepping into the boat with your back foot as you begin steering into the tack. Aim to keep the boat as flat as possible throughout the manoeuvre. Unclip from the trapeze wire and move smoothly to the new side, picking up and uncleating the mainsheet on the way. As you sit on the new side, steer on to a close reach with the mainsail well eased. When the boat is under control and moving forwards on the new course, stand up, hook on, and push out on the new side as you pull in the mainsail and start to steer up to a closehauled course again.

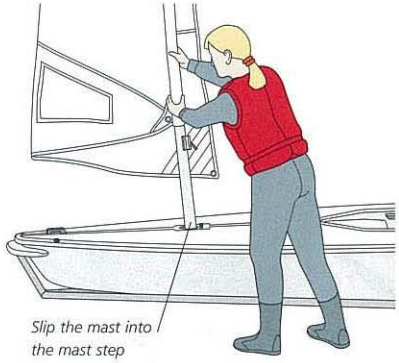
To gybe a trapeze single-hander, treat it as if it were a non-trapeze boat. Bear away to a run, swing in from the trapeze, get settled and fully prepared, and then gybe as you would any single-hander. Get settled on the new gybe, and then hook up on to the trapeze again, if required. Take your time over this manoeuvre in the beginning. As you become more proficient you can start practising wire-to-wire gybes, at which point you can call yourself an expert.

RIGGING AN UNSTAYED MAST

Some single-handed dinghies have stayed masts, and their mainsails are rigged like a two-man dinghy (pp.68-73). However, many small single-handers have unstayed masts, which are light and easy to rig, although it is helpful if someone can assist you. The mast usually comes in two pieces, for easy storage and transportation, which are slotted together before the sail is fitted. Most single-handed dinghies use a daggerboard rather than a centreboard. Make sure that this and the rudder are in the boat before you launch it.



1 Assemble the mast by slotting the two pieces together. Unfold the mainsail and find the sleeve in the mainsail luff. Slide the mast into the sleeve.



2 Step the mast and secure it in place. Attach the boom to the gooseneck and attach the mainsail's clew to the boom using the outhaul. Fit the boom vang.

GETTING OUT OF IRONS

Tacking can be difficult in some single-handers because there is no jib to help pull the bow away from the wind on to the new tack. When you tack, a single-hander can sometimes refuse to go through the eye of the wind, and instead get stuck head to wind 'in-irons' (*p.93*).

AVOIDING THE PROBLEM

Getting stuck in-irons in a single-hander can occur for a number of reasons. Lack of speed before the tack will make it difficult for the boat to complete the turn. Avoid this by bearing away slightly before the tack to build speed.

When tacking in waves, the bow may hit a wave, which will stop the boat. Minimize this risk by watching the waves and tacking when the bow is rising up the face of a wave. The boat should complete the tack before the next wave arrives. Another cause is tacking with the mainsheet too tight. This keeps the mainsail leech tight which causes the boat to try to turn into the wind. Cure this by easing the mainsheet quite a lot as you tack. If stalling out head-to-wind is still a problem in your boat, try easing the vang, increasing Cunningham tension, or pulling up the daggerboard slightly, or doing a combination of all three.

RECOVERING FROM IN-IRONS

If the boat stops head to wind, push the boom away from you so that it fills on the reverse side and pushes the boat backwards. At the same time, push the tiller away from you. The twin actions of pushing the boom and tiller will turn the boat quickly to a close-hauled course.

SMALL KEELBOATS

THE PRINCIPLES OF SAILING a small keelboat are not so different from those of a dinghy. Unlike a dinghy with a lightweight centreboard, however, the lead bulb of the keel will make it very difficult to capsize a keelboat. In many ways this makes a small keelboat a more forgiving type of boat to sail, and a good choice for learning the basic skills of sailing.

KEELBOAT DIFFERENCES

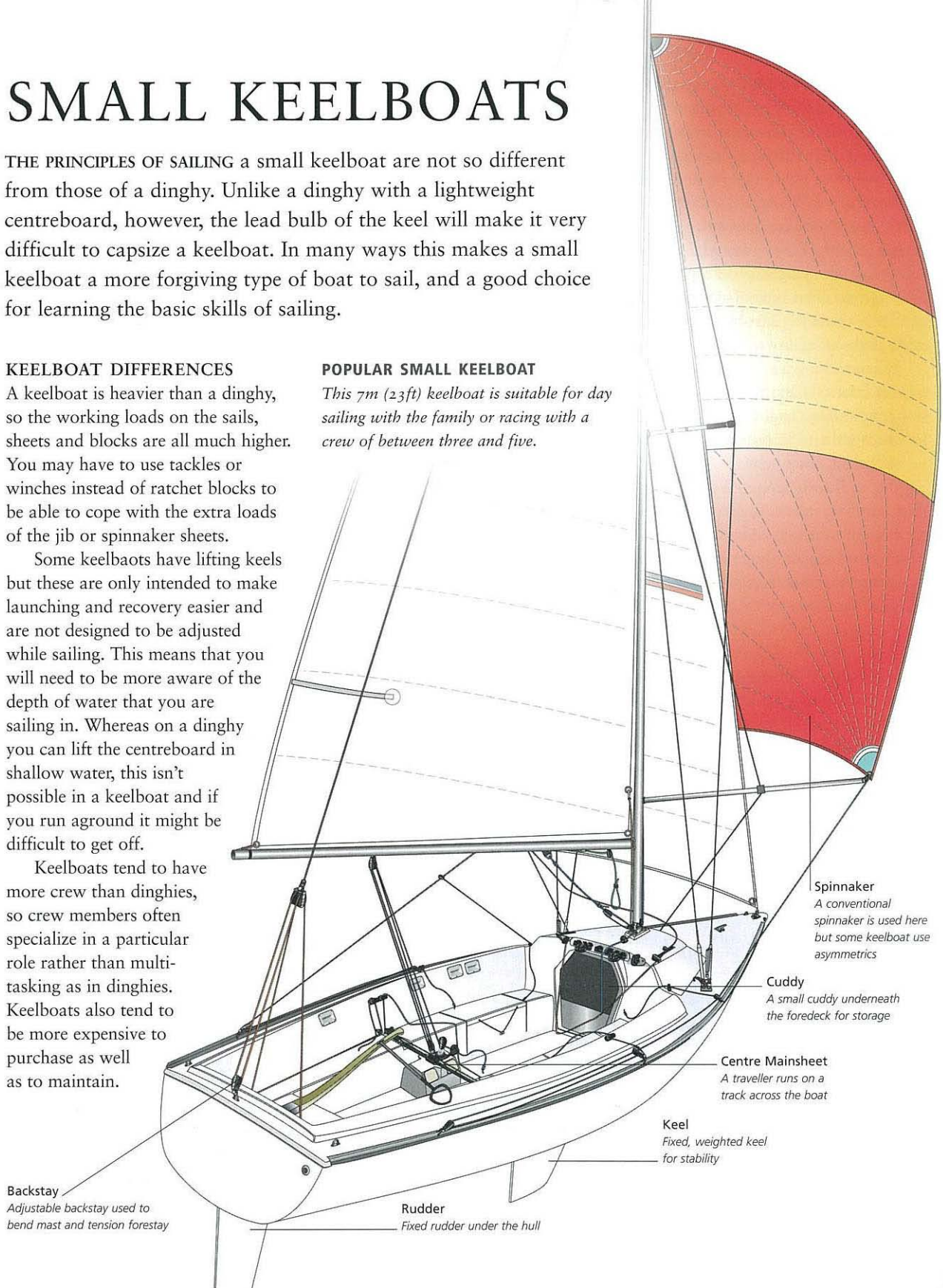
A keelboat is heavier than a dinghy, so the working loads on the sails, sheets and blocks are all much higher. You may have to use tackles or winches instead of ratchet blocks to be able to cope with the extra loads of the jib or spinnaker sheets.

Some keelbaots have lifting keels but these are only intended to make launching and recovery easier and are not designed to be adjusted while sailing. This means that you will need to be more aware of the depth of water that you are sailing in. Whereas on a dinghy you can lift the centreboard in shallow water, this isn't possible in a keelboat and if you run aground it might be difficult to get off.

Keelboats tend to have more crew than dinghies, so crew members often specialize in a particular role rather than multi-tasking as in dinghies. Keelboats also tend to be more expensive to purchase as well as to maintain.

POPULAR SMALL KEELBOAT

This 7m (23ft) keelboat is suitable for day sailing with the family or racing with a crew of between three and five.



TYPES OF SMALL KEELBOAT

CONVENTIONAL KEELBOATS

Designed for racing or day sailing, this type of keelboat generally carries between three and five crew, and has a rig that consists of mainsail, jib and a conventional spinnaker that is hoisted to hounds height. Boats range from the heavier, classic keelboats such as the Dragon, to the lighter, modern types that offer dinghy-like handling and planing performance such as the Sonar.

SONAR

Its dinghy-like performance and handling, plus great versatility, has made the Sonar very popular with all types of sailors as well as the keelboat of choice for the Paralympic Games.

DRAGON

The Dragon is a classic keelboat with a long, thin and heavy hull with a long keel. It offers excellent international competition and remains very popular.

LASER SB3

The Laser SB3 is a three-person sportsboat with a large asymmetric spinnaker for high speeds downwind. It has a no hiking rule and a weight limit.

STAR

The two-man Star is one of the oldest racing classes in the world, and yet its on-going status as the men's Olympic keelboat makes for some of the toughest sailing competition in the world.

SPORTSBOATS

Another type of keelboat, known as sportsboats, typically use asymmetric spinnakers. Although most are no faster than conventional keelboats upwind, they are designed to plane downwind under asymmetric spinnakers, often flown from the masthead. The Melges 24 was one of the first sportsboats on the market and remains among the most popular choices.

MELGES 24

With its carbon mast and very light all-up weight, the Melges 24 is one of the fastest sportsboats available and is also one of the most demanding. Teams sail with either four or five crew.

HUNTER 707

One of the few sportsboats to use a conventional spinnaker, the Hunter 707 offers good value-for-money keelboat racing. It is normally sailed with a crew of four or five.

K6

The K6 is a small modern keelboat with a lifting keel and rudder that is sailed by a crew of two or three. It has an asymmetric spinnaker and offers good performance.

ETCHELLS 22

Despite her name, the Etchells 22 measures 30 feet long, and is raced by a crew of three. The class offers some of the toughest international racing outside of the Olympic arena.

SAILING SMALL KEELBOATS

THE HEAVIER WEIGHT OF A KEELBOAT requires a different approach to sailing compared with the lighter weight of unballasted dinghies. It takes more time to accelerate and to slow down, so every time you tack, gybe or do any manoeuvre that requires a change of direction or speed, you must allow more time for things to happen and for the boat to regain speed.

SAILING UPWIND

How a keelboat performs upwind and how it should be sailed depends on its particular design characteristics. Classic keelboats, such as the International Dragon (*p.161*) tend to have long, narrow hulls and deep keels, and are designed to sail to windward at quite a large angle of heel. More modern designs such as the Sonar (*p.161*) with its dinghy-like hull shape and short keel, and all sportsboats, sail much faster if they are kept as upright as possible. This means that their crews must hike (sit out) as far as is allowed under their class rules to help keep the boat upright when sailing to windward. Some classes put no restriction on hiking while others require the crews to remain seated inside the gunwale.

Many keelboats point quite high when sailing to windward, sometimes tacking through as little as 50 degrees from tack to tack. This can make it quite hard to tell whether you are ahead or behind another yacht when racing on windward legs, and many helmsmen use sight lines drawn on the deck to help them gauge how they are doing compared with other boats.

Because sails on a keelboat are heavily loaded, and require multi-purchase blocks or winches to adjust them, it is often simpler to set the sails to a good average position and for the helmsman to steer the boat around any changes in wind or wave condition. A good helmsman can build up speed by bearing away a tiny fraction before luffing up slightly to gain ground to windward. As he does so the speed will drop and the skill lies in recognizing at what point to bear off again and get the boat up to speed once more before repeating the process.

Unlike a dinghy, easing the sails slightly and footing off (bearing away a little bit) for speed does not tend to make a keelboat sail much quicker. Because a keelboat is relatively heavy, it usually pays to point as high into the wind as possible without losing too much speed. Good helmsmen can 'feel' the boat, knowing instinctively when the boat is in 'the groove', the correct balance of speed and pointing that will move the boat at optimum speed into the wind.

SAIL SETTING

Many of the same principles of sail setting apply as in dinghies (*pp.174-183*). Adjust the sails to be full for choppy seas and/or medium wind strength conditions and flatten them for flat water and/or windy weather. The vang and Cunningham tend to be less important controls on a keelboat. Mainsheet tension and traveller position tend to be the main controls for the mainsail, along with the backstay. The tighter you pull the

SAILING UPWIND

Many modern keelboats, like this Sonar, need to be sailed as upright as possible, just like a dinghy, so it is important that all the crew sit out as far as is allowed by class rules – which vary from type to type.

backstay, the more the mast bends and at the same time tightens the forestay. This will flatten both the mainsail and the jib, and will also alter the feel of the steering. A general rule of thumb is: the windier it is, the more backstay you should pull on, although this varies considerably depending on the particular type of keelboat.

TACKING

All manoeuvres in a keelboat require good communication and some advance warning. The helmsman should keep the rest of the crew well informed about his intentions. When planning to tack, give the crew 10 to 15 seconds warning, especially when the crew are sitting out hard. This will give the jib trimmer time to get in position to release the jib sheet.

The smooth transition of the jib from one tack to the other is the most important factor in a good tack. If the jib fails to release smoothly from the old side, then when the boat tacks the jib will back and virtually stop the boat dead in its tracks. It is a good idea for the helmsman to watch the jib trimmer as he steers the boat into the tack. When he can see that the jib sheet is releasing satisfactorily, he can continue with the tack safely.

The helsman can also make the jib trimmer's job easier if he steers slowly through the tack. This will give the trimmer time to pull most of the jib sheet in, using the winch or multi-part sheet, before the sail fills with wind and becomes much harder to pull in. Once the helmsman sees that the jib is most of the way in on the new tack, he can steer fully on to his new course to get the boat back up to full speed. Easing a little mainsheet after the tack will also help accelerate the boat, gradually sheeting the mainsail back in as the boat accelerates up to full speed.

SAILING DOWNWIND

Weight is the important difference between a dinghy and a keelboat when sailing downwind. Even sportsboats, and other keelboats that are able to plane, will need more wind to get up on the plane than will a dinghy. Older designs of keelboat, most of which do not have the flat aft hull sections needed for planing, will surf in waves but are unlikely to rise up onto the plane, except perhaps, in the strongest of winds.

While a dinghy with an asymmetric spinnaker will usually sail fastest downwind if it sails a series of reaching courses, gybing downwind in a similar manner to tacking upwind, in many keelboats it pays to sail straight downwind. This is because the extra speed gained by sailing a series of reaching courses is not sufficient to make up for the extra distance sailed. However, in medium to strong wind conditions, some of the faster keelboats with asymmetric spinnakers respond well to heading up a few degrees to get them planing. The extra distance sailed is then more than offset by the large increase in speed.

Whether you sail a conventional keelboat or sportsboat, the principles of sail setting downwind are very similar to a dinghy. However, because the loads in the sails are much greater adjustments cannot be made so easily or so frequently as in a dinghy. As with upwind sailing, the helmsman may find he has to steer to suit the set of the sails rather than the sails being trimmed to suit the course he wishes to steer. If the crew is strong, fit and well practised, however, they will be able to make more rapid adjustments and will be able to follow the helmsman's course changes. If this is the case, the boat will sail much faster than others with a less able crew.

SAILING DOWNWIND

Sportsboat-type keelboats are designed to plane quickly downwind under their large asymmetric spinnakers.

GYBING

This is usually the most challenging manoeuvre in keelboat sailing. Safety is the primary consideration here, and it is vital that all the crew keep their heads down as the boom swings across during the gybe. You can minimize the risk of the boom crashing across by sheeting the boom almost to the centreline as you prepare for the gybe. As the boat gybes, and the wind fills the sail on the new side, let the mainsheet run out rapidly on the new side.

Gybing an asymmetric spinnaker is very straightforward, and very similar to the process described for dinghies (*pp.154-55*). Handling a symmetrical spinnaker is made more complicated by the need to switch the spinnaker pole from one side to the other. Although the technique used in most small keelboats is the same as used in dinghies (*pp.150-151*), it requires good understanding and timing between all the crew. In most keelboats the foredeck crew must move onto the foredeck to gybe the spinnaker pole. In strong winds do this after the mainsail is gybed.

MOVING SMALL KEELBOATS

SMALL KEELBOATS have some advantages over dinghies; they are larger and more stable and usually have more room for the crew, but their size also makes them a bit more difficult to launch and recover and to move around on shore. Some smaller keelboats minimize these disadvantages by having lifting keels and rudders so that they can be launched and recovered from a trailer only slightly larger than used by many dinghies. Larger keelboats, with fixed keels and rudders, require more substantial trailers for moving ashore and are usually launched and recovered using a small crane. Many small keelboats are kept ashore when not sailing.

DRY SAILING
Keelboats kept ashore are easily accessible for maintenance and are less vulnerable to damage than those kept on moorings.

DRY SAILING

In areas where small keelboats are popular, it is common for them to be dry sailed. This means that they are kept ashore on a trailer or trolley and are launched only when needed for racing or a day's sailing. Many can also be left afloat on a mooring in a sheltered harbour but dry sailing has some advantages.

Dry sailing is kinder on the boat than mooring it afloat as it is not subjected to pitching and rolling loads on its rig and it will not risk water absorption into the glassfibre laminate, of which most are built. Also, it is not necessary to apply antifouling paint to the hull to prevent fouling. This has particular merit for race boats, which benefit from the smoothest possible hull finish. Storage ashore allows for easy access for maintenance and race preparation. Boats that are dry sailed are usually stored ashore with their masts stepped so they only need to be lifted into the water to be ready to sail.

Many clubs and boatyards in areas where small keelboats are popular offer dry sailing facilities, and some provide a complete service that includes launching your boat in time for you to go sailing and lifting it ashore again when you return.

LAUNCHING AND RECOVERY

A keelboat with a lifting keel and rudder is relatively easy to launch and recover. It can sit ashore on a road trailer or launching trolley and can be launched from a slipway in the same way as a dinghy. Its draught will be deeper than a dinghy, even with the keel raised, so the trailer must be lowered further into the water to float it off, but the procedure is the same.

Once in the water, the boat must be manoeuvered into water deep enough to allow the keel and rudder to be lowered. If the wind is offshore the crew can paddle out, otherwise a tow, or the use of an outboard engine, may be necessary. These boats are not suitable for launching off a ramp or beach on a difficult lee shore but a sheltered slipway poses few problems. Most lifting keels are raised vertically through the hull and cockpit floor in the same way as a dinghy's daggerboard, but their weight means that a winch or tackle must be used.

USING A SLIPWAY
Keelboats that have lifting keels and rudders can be launched from a trailer. Pick a sheltered slipway with a gentle slope.

A keelboat with a fixed keel generally requires the use of a crane, although it is possible to launch some from a trailer on a suitable slipway. The boat will sit high on a trailer, which has to be lowered into the water far enough to float the boat off.

Boats that must be craned in and out often have a lifting point fitted in the hull above the keel, usually attached to the bolts that fasten it to the hull. To lift the boat, a strop is attached to the lifting eye and hooked onto the crane hook. It may be necessary to unfasten the backstay at its lower end to keep it clear of the crane jib or wire.

If the boat does not have a centre lifting point, two straps are used, led under the hull with one forward and one aft of the keel. The ends of each strap are attached to the crane hook for lifting, and the straps may need to be lashed in position to stop them slipping backwards or forwards, depending on the shape of the hull.

CRANING IN AND OUT

A centre lifting point makes craning easier. The alternative is to use webbing straps ahead of and behind the keel.

A centre point lift has the advantage of giving complete access to the hull when scrubbing or polishing the bottom but either system works well.

When ashore, a keelboat usually sits on a road trailer or wheeled cradle to allow it to be moved between the crane and its storage slot. For dry sailing, keelboats usually have their mast left stepped when they are brought ashore, but if they are to be towed on a road trailer the mast must be lowered and it, the boom, and all other loose equipment must be stowed securely for the journey, preferably in boxes fitted to the trailer. In some designs it is possible to lower the mast manually, but many require the use of a crane to lift the mast in or out.

USING A ROAD TRAILER

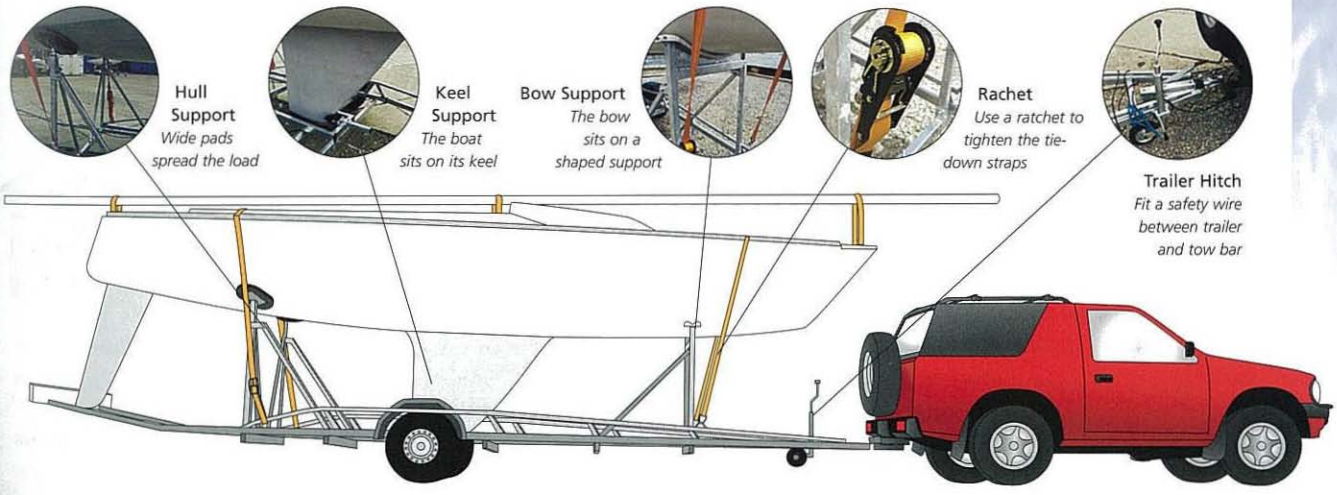
Even a small keelboat is likely to be longer than the vehicle used to tow it, and many will be significantly larger and much heavier. Towing a large boat on a long trailer is not as simple as a dinghy and the towing vehicle should be more powerful and capable of towing the combined weight of the boat and the trailer.

Boats with fixed keels sit much higher than those with lifting keels and require more substantial trailers. Double-axle trailers are needed for the larger keelboats and an over-run braking system on the trailer should be fitted. The boat must be very securely tied down with the mast stowed on deck. This will usually require mast supports at bow and stern and, preferably, in the middle. The boom and spinnaker pole must also be lashed securely, with plenty of padding to protect against movement and chafe that would otherwise damage the equipment very quickly.

Sails and loose gear are best carried in lockers fitted to the trailer, on in the towing vehicle, but if they must be stowed in the boat they should be secured so that they cannot roll around. When towing, stop and check all lashings regularly.

TOWING A KEELBOAT

Boats with fixed keels sit high on a trailer and need strong supports. They must be lashed down tightly with the mast also well secured to its supports.



CATAMARANS

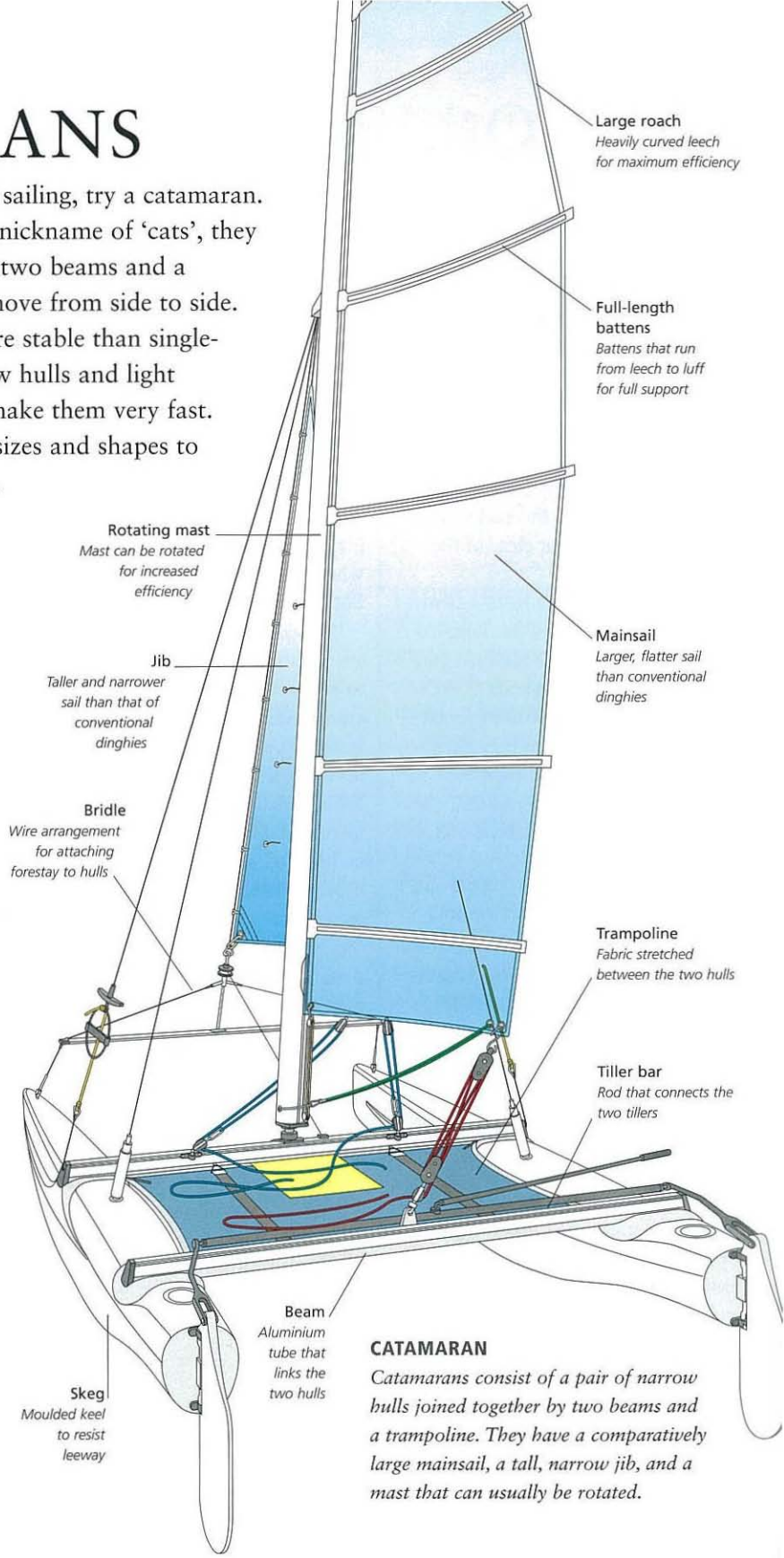
IF YOU WANT EXCITING, high-speed sailing, try a catamaran. Often referred to by their shorter nickname of 'cats', they consist of two hulls connected by two beams and a trampoline to allow the crew to move from side to side. Their wide beam makes them more stable than single-hulled dinghies, while their narrow hulls and light weight offer little resistance and make them very fast. Catamarans come in a variety of sizes and shapes to suit all ages, sizes, and skill levels.

CATAMARAN RIGS

Most catamarans have a large, fully-battened mainsail, and a much smaller jib that is usually tall and narrow. However, single-handed catamarans are usually sailed without a jib. Some use a loose-footed mainsail, set without a boom, in which case the multi-part mainsheet tackle attaches directly to the clew. The lower end of the mainsheet runs on a full-width traveller on the rear beam.

The mast is normally designed to rotate so that it can take up an efficient angle to the wind on all points of sailing. The angle of rotation is controlled by a device called a mast spanner that is adjusted by the crew.

The rotating mast arrangement makes the rig very efficient at the high speeds that catamarans can achieve. Because of these high speeds, catamaran sails tend to be cut very flat, and catamaran sailors pay a lot of attention to the stiffness of their full-length battens. Some expert sailors even change battens for different wind conditions. Softer, more flexible battens create a fuller sail, suitable for conditions where the crew wants to develop maximum



CATAMARAN

Catamarans consist of a pair of narrow hulls joined together by two beams and a trampoline. They have a comparatively large mainsail, a tall, narrow jib, and a mast that can usually be rotated.

TYPES OF CATAMARANS

There are many types of catamarans on the market, so you should be able to find one that is suitable for your particular requirements. If you want to race, choose a boat that has a good fleet near you. Before you make your decision, ask the opinion of expert sailors and have a trial sail in a few different types.

HOBIE

The Hobie range of catamarans is intended for fast, fun sailing, but there are also good racing fleets in many parts of the world. Hobies have asymmetric hulls without centreboards or daggerboards.

DART 16

The Dart 16 and its larger brother the Dart 18 are excellent boats for fast sailing and competitive racing, and are extremely popular with catamaran sailors. The Dart uses symmetrical hulls with skegs.

TORNADO

The Tornado is the Olympic catamaran class and offers extremely fast sailing. It has twin trapezes, and an asymmetric spinnaker. It has centreboards to aid upwind performance.

power from the rig. When conditions are stronger and the crew needs to take power out of the sail, they substitute the flexible battens for a stiffer set, which helps keep the sail flatter and less powerful.

Because catamarans travel at such high speeds, the strength and angle of the apparent wind means that the sails are always sheeted quite close to the centreline, even on downwind courses. This is the reason why many catamaran classes do not use a vang, or even a boom for the mainsail, as the mainsheet tension suffices for controlling the shape of the sail.

Some high-performance catamarans are fitted with asymmetric spinnakers to further increase speed downwind. These tend to be very flat compared with asymmetric spinnakers on dinghies or keelboats, because of the high speeds that catamarans achieve when sailing downwind.

HULL DESIGN

Catamaran hull shapes vary quite considerably, depending on their design purpose. Some catamarans have hulls that are identical and are symmetrical about their centreline. Symmetrical hulls are usually fitted with a centreboard or a daggerboard in each hull, to resist leeway.

Alternatively there may be a skeg (a moulded-in keel) about two-thirds of the way aft on both hulls. The skeg resists leeway without the need for a centreboard or daggerboard. Other catamarans have asymmetrical hulls with a fatter shape on the outboard side of each hull; in which case the two hulls are mirror images of each other. These do not usually need centreboards or daggerboards. The lack of centreboards or daggerboards is an advantage for catamarans designed for fun sailing, where excellent upwind performance may not be of great importance, or for boats that are likely to be sailed from a beach, where the lack of centreboards or dagggerboards makes launching and recovery easier.

Catamarans have twin rudders, one at the stern of each hull, with their tillers connected by a tiller bar. The long tiller extension is attached to the middle of the tiller bar. Many catamarans are fitted with one or two trapezes for extra power.

Most of the sailing techniques already described can be used to sail catamarans, but some aspects are different (*pp 168-173*).

RIGGING AND LAUNCHING

ASSEMBLING A CATAMARAN

Because of their width, catamarans usually have to be dismantled to be transported. Once at the sailing venue, they have to be reassembled on a flat surface. Grass is best as it will not cause damage to the hulls; otherwise, protect the hulls with something soft like a roll of old carpet.

The assembly process consists of attaching the beams to the hulls, fitting the trampoline and toestraps, stepping the mast, and attaching any removable equipment.

Two-person catamarans are best assembled by the two crew but single-handers can be assembled by one person, although it is easier with a helper. Once assembled, the catamaran is placed on its trolley ready to be rigged and moved to the water.

CATAMARANS ON LAND

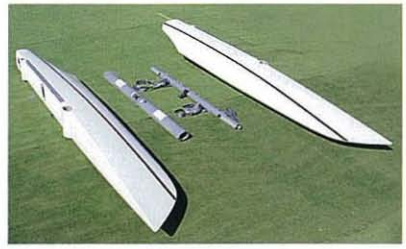
Catamarans can be unwieldy on land because of their width. However, they are very light so moving them is quite easy, even with only two people.

MOVING

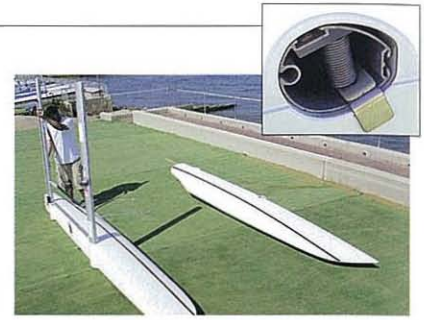
Most catamarans are moved on a purpose-built trolley with two wheels and two chocks under each transom. The trolley is placed under the hulls at the point of balance and the bows are used as the handle for pushing and pulling the cat around the boat park.

SECURING

If you leave a catamaran with the mast stepped, fasten it very securely to the ground at both shroud points, to stop it blowing over in strong winds.



1 *Lay out the hulls, preferably on a soft surface, with the inner sides uppermost and about a beam length apart.*



2 *Slide the main and rear beams into their sockets in one hull* (left). *Ensure the clips engage to fully secure the beams* (inset).

3 *Roll the hull onto its keel and fit the second hull to the other end of the beams. Check that the locking system is secure.*

4 *Fasten the trampoline to the hulls and beams and ensure that it is laced very tightly. Fit the toestraps and tie tightly.*

5 *Step the mast by lying it on the trampoline and temporarily pin the heel on to the mast support while it is raised.*

6 *Fasten the shrouds to the chainplates and lift the mast upright. Attach the forestay to the bridle and unpin the heel to let it rotate.*

7 *Attach both rudders with the blades in the raised position. Connect the tillers with the tiller bar and fit the extension.*

8 *Fit loose gear like the jib sheet fairleads and cleat, mainsheet, and downhaul then the boat is ready for sails to be rigged.*

LAUNCHING A CATAMARAN

When sailing a double-handed catamaran, decide which of you is going to hold the boat and which will take the wheels back up the beach. It usually makes sense to have the taller or heavier person hold the boat so that they can control it while standing in the water.

If you sail a single-handed catamaran, it will make launching easier if you have a helper to take the wheels ashore, or collaborate with other sailors to help each other. Before you push the boat into the water, make sure all the sheets are uncleated and the mainsheet traveller is free to run from side to side. Alternatively, leave the mainsheet disconnected from the mainsail clew, or boom if your boat is fitted with one, until you are afloat and ready to leave the beach.

Fit the rudders in their raised position and place daggerboards, if used, on the trampoline until the boat has been launched. Always launch the boat with the bows facing into the wind so that the sails can flap freely.

1 *Wheel the catamaran into the water with the jib, if fitted, rolled up or flapping, the mainsheet disconnected from the boom, and the rudders raised.*

2 *One person holds the catamaran by a bow or the bridle while the other goes between the hulls to remove the wheels and take them back up the beach.*

3 *The helmsman climbs aboard and attaches the mainsheet to the boom, positions the daggerboards, if fitted, in their slots, and partly lowers the rudders.*

4 *The crew pushes the bows in the direction they wish to sail off and climbs aboard as the helmsman lets the traveller slide to leeward to sail off slowly.*

5 *With the mainsheet traveller right down to leeward the boat sails slowly away from the beach. The helmsman lowers the rudders as the boat reaches deep water.*

LEE SHORE

The hardest launching situation is when the wind is blowing onto the shore. This means that the catamaran must be launched bows first into the waves, which may be breaking on the beach or slipway. Controlling the boat when you push off will be more difficult because it will not be possible to lower the rudders until you have sailed beyond the shallow water.

The helmsman decides which tack to leave the beach on, and pulls in the jib sheet until the jib is half full. He makes sure the mainsheet traveller is free to run all the way to leeward. As the jib fills, the catamaran will move forwards slowly, and at this point the crew can pull himself on to the trampoline. The crew then pulls in the jib sheet further, while the helmsman uses the mainsheet traveller to control the direction of the cat. He pulls the traveller to windward to luff up, or eases it to leeward to bear away. Once in deep water, he pushes the rudders fully down and cleats the traveller on the centreline.

WINDWARD SHORE

Launching from a windward shore is straightforward. Hoist the sails ashore and launch the catamaran stern first. Once the trolley has been returned to the shore, the helmsman and crew take a bow each and sit on it in front of the trampoline.

With the sails flapping and rudders raised, the catamaran will drift backwards. Once the boat has reached deeper water, move aft, lower the rudders and centreboards, and push the tiller over to turn the boat away from the wind so that you can sail off.

The same technique can be used to land on a lee shore. Turn the boat into the wind a few boat lengths from the beach, lift the rudders and centreboards, and sit on the forward sections of the hulls to reverse the boat safely to the shore.

SAILING CATAMARANS

DINGHY SAILORS who decide to sail catamarans need to learn a few new techniques; they will also have to be prepared for the much greater speed potential that is offered by a catamaran. Heading upwind is more difficult in a catamaran than it is in a conventional dinghy and requires a good deal of practice. It is when sailing on downwind courses at speed that catamarans really perform. They are more stable than dinghies and are easier to gybe, but they can still be capsized.

WIND AND SPEED

Because catamarans sail so fast, there is a much bigger difference in the direction of true and apparent wind (*p.32*) than in most dinghies. A wind indicator is usually fitted on the forestay bridle so that the helmsman can constantly check the direction of the apparent wind.

A dinghy sailor must also get used to the high speed of a catamaran, which means that you need to allow more space for manoeuvres, especially passing other boats. Be prepared for gusts, too, as the catamaran will accelerate rapidly when they hit.

SETTING SAIL

The first time you sail a catamaran, you should start on a beam reach, just as you would with a single-hulled dinghy. Put the boat beam-on to the wind and slowly sheet in both sails. The faster acceleration, and the forward shift of the apparent wind mean that the sails have to be sheeted in closer than they would be on a slower-moving dinghy. The load on the sails will also be greater than that in a dinghy. The jib sheet usually has a tackle to make it easier to trim, and the mainsheet on most catamarans requires at least a seven-to-one tackle. This makes it easier for the helmsman to handle the large loads. Use the mainsheet to control leech tension, and adjust the angle of the sail with the traveller. Set the mainsail twist by using the leech tell-tales as you would in a dinghy (*p.128*). Although the rudders are small, they are efficient at high speeds, when you will need only small movements of the tiller extension to adjust the course. When you tack or gybe, however, the boat slows down and considerable force may be needed to turn the boat.

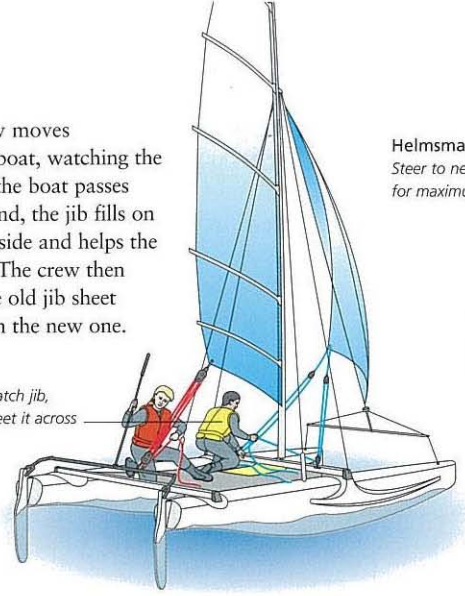
Daggerboards or centreboards (if fitted) should be lowered about halfway on a reach. The leeward board is usually lowered first and kept at a lower position than the windward board. As you turn onto a close reach, lower the boards further still and sheet in the sails, using the traveller to bring the mainsail closer to the centreline.

FLYING FOR SPEED

Catamarans sail fastest when the windward hull is kept flying, just skimming the water's surface, giving minimum resistance. However, this slight heel is difficult to maintain and needs a lot of practice. Even in medium winds, the helmsman and crew will have to sit out or trapeze hard to keep the boat balanced. Once the helmsman and crew are fully extended, heel is controlled by the helmsman trimming the mainsail with the traveller and adjusting the course. Luff to maintain heel and bear away to reduce it.

CATAMARAN IN STRONG WINDS

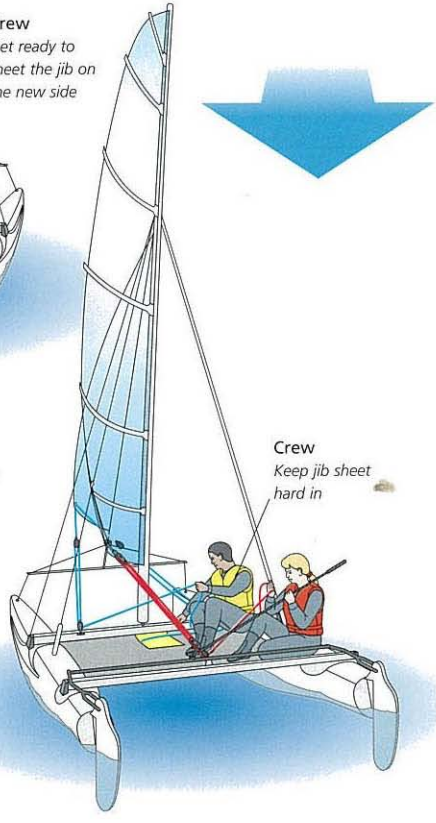
When sailing in strong winds and big waves, the speed of a catamaran means it is possible to take off on the top of a wave.



4 The crew moves across the boat, watching the jib. When the boat passes head-to-wind, the jib fills on the wrong side and helps the boat turn. The crew then releases the old jib sheet and pulls in the new one.

5 The helmsman and crew sit out or trapeze on the new side and sheet in the mainsail and jib. The helmsman centres the tillers and steers to regain speed on the new tack.

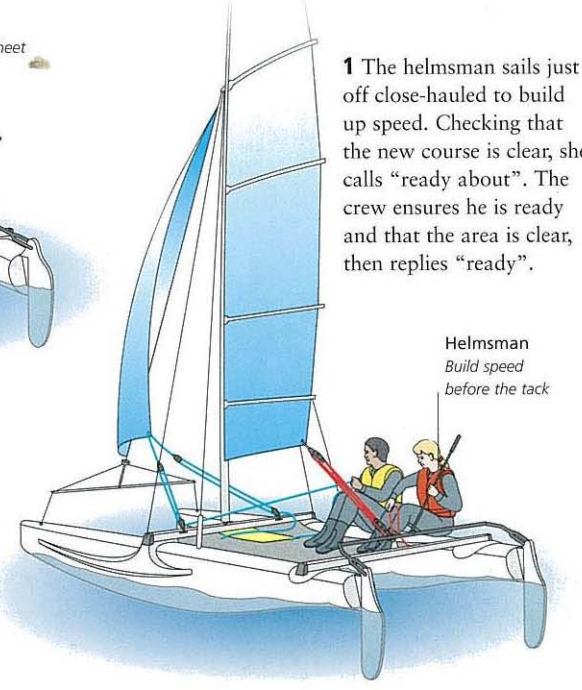
3 As the boat turns, the helmsman moves into the centre on her knees and rotates the tiller extension aft. As the mainsheet traveller moves into the centre, she passes the extension behind the mainsheet to the other side of the boat. She eases the mainsheet as the boat turns onto the new tack and changes hands on the extension and mainsheet.



2 The crew uncleats the jib sheet but keeps it hard in. The helmsman calls "lee-oh" and pushes the tiller extension away until the rudders are at an angle of 45° to the transoms. She sheets in the mainsail to help the boat turn into the wind.

TACKING

A catamaran will stop very quickly as soon as power is lost from the sails, which makes tacking relatively difficult. You cannot easily tack a catamaran from a reach to a reach, so you should always sheet in to a close-hauled course and build speed before a tack. Catamarans stop quickly when they reach head-to-wind, so it is quite common for them to end up in-irons. Use the same technique that is used for dinghies (p.93) *to escape from this situation.*



1 The helmsman sails just off close-hauled to build up speed. Checking that the new course is clear, she calls "ready about". The crew ensures he is ready and that the area is clear, then replies "ready".

UPWIND SAILING

When you turn to a close-hauled course, sheet the sails right in and steer using the tell-tales on the jib and the wind indicator. Fully lower both centreboards. Be careful not to pinch (sail too close to the wind) as this makes speed decrease rapidly.

Catamarans are sensitive to fore-and-aft trim, so the helmsman and crew must sit close together, near the middle of the boat, to keep it level. In light winds, move forwards to lift the transoms clear of the water – the crew usually lies on the trampoline in the middle of the boat. In stronger winds, move further back to help prevent the bows burying as the boat accelerates.

DOWNWIND SAILING

In light or moderate winds, fast catamarans can sail faster than the true wind speed, and this speed can be fully exploited downwind. It is more efficient to sail downwind in a series of broad reaches, much as you would tack upwind. Sailing dead downwind is slow, but, on a broad reach, the speed of the catamaran pulls the apparent wind forwards until it is on the beam, thus increasing its strength. The fastest speed downwind is usually achieved by steering to keep the apparent wind, shown by the wind indicator, blowing at right angles to the boat.

MODERATE WINDS

Downwind in moderate winds, the helmsman sets the mainsail by letting the traveller out and uses the mainsheet to adjust the twist in the mainsail. Trim the sail to keep the top leech tell-tale just streaming. The crew eases the jib out as far as possible, keeping all the tell-tales streaming. The helmsman steers to keep the apparent wind at 90 degrees to the boat. The helmsman and crew may have to sit on opposite sides of the boat to keep the weight balanced between the hulls, but the crew moves to windward if the boat starts to heel. If the wind is strong enough, the boat is sailed with the windward hull just touching the water to achieve maximum speed. Where centreboards or daggerboards are fitted, raise them as much as possible; if steering becomes difficult they can be lowered slightly. The helmsman and crew must be prepared to move around the boat to keep it level fore and aft. If the wind drops, move forward to lift the transoms; if it increases, move aft to stop the bows depressing and slowing the boat.

CATAMARAN COMFORT

Catamarans tend to be wet because they are so fast. Buy good quality waterproofs or a wetsuit to enjoy the sailing fully.

LIGHT WINDS

Downwind in light winds, both crew and helmsman sit well forward to lift the transoms and depress the bows, and the crew sits on the leeward hull to balance the helmsman on the windward side. To prevent the jib sagging under its own weight, the crew should hold its clew to keep it trimmed, rather than using the sheet.

The helmsman should steer with gentle movements and concentrate on building and maintaining boat speed. In these conditions, it is very easy for the sails to stall, which will make the boat slow dramatically. If this happens, the helmsman must luff until the apparent wind moves forwards again and boat speed increases. When the boat is moving fast again, the helmsman can bear away gently to progress further downwind while maintaining speed.

STRONG WINDS

Catamaran sailing is at its best downwind in strong winds, when the boat reaches its maximum speeds and accelerates rapidly every time a gust hits. The power in the sails depresses the bows, so it is vital that both the helmsman and crew sit out, or trapeze, at the stern of the windward hull. The bows must be prevented from diving under water or you will capsize. The high boat speed increases the apparent wind speed, so the helmsman can steer further downwind while maintaining the apparent wind at right angles to the boat. As gusts hit, the boat will accelerate and the apparent wind will move further ahead, so the helmsman should bear off to retain the constant apparent-wind angle. In lulls, he must head-up to maintain the angle. Be ready to ease the jib in serious gusts to prevent the bows digging in.

CAPSIZE RECOVERY

Catamarans are very stable, but can capsize if the crew makes a mistake. This is especially true in strong winds, when capsizes can be spectacular.

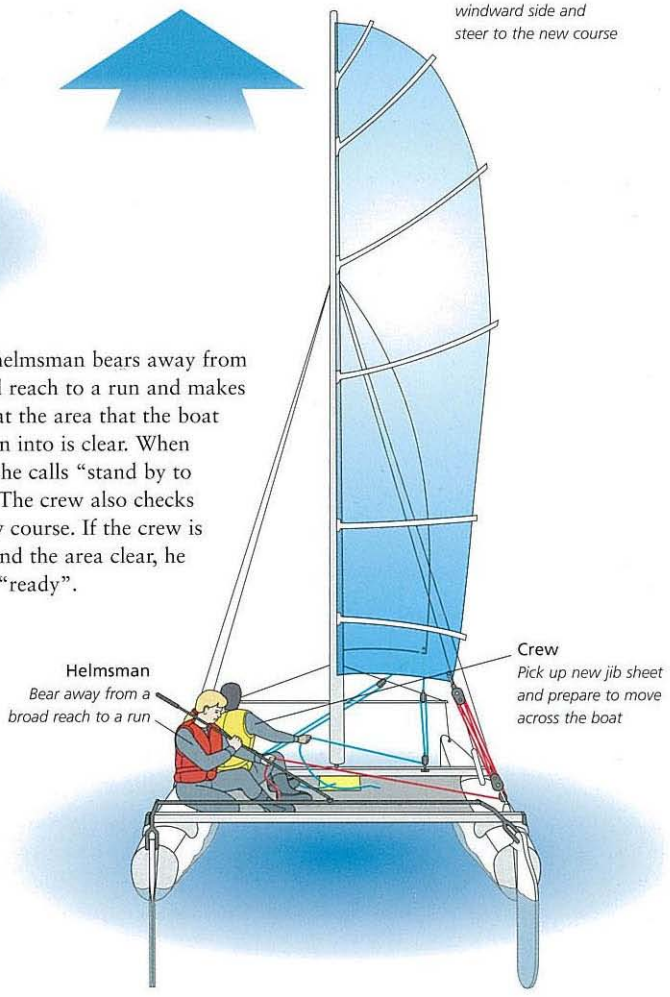
RIGHTING A CATAMARAN

You must react quickly in a capsize to prevent inversion; an inverted boat is difficult to right without outside assistance. With most larger catamarans, one crew member should stand on the lower centreboard while pulling on a jib sheet, as when righting a dinghy (*pp.112–13*). The other crew member should depress the bow or stern of the lower hull to sink it, which will assist righting. Some smaller catamarans can be righted by pushing the stern or bow under water to rotate the boat upright.

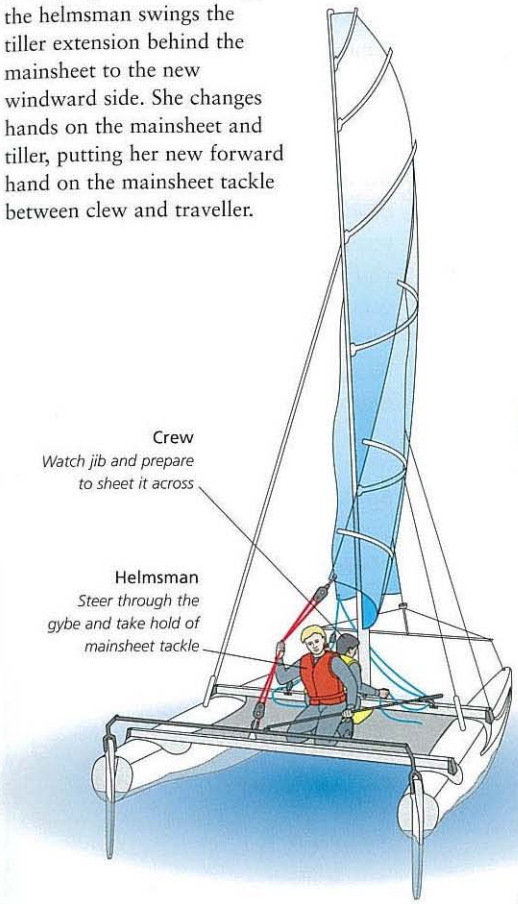
GYBING

A catamaran is easier to gybe than a dinghy because of the stability created by the two hulls, and because its speed reduces the strength of the apparent wind. The catamaran moves quickly, so you must make sure that you have plenty of room for the manoeuvre and ensure that the boat is under full control before you start the gybe. Gybe with the centreboards or daggerboards fully raised. Catamarans rarely sail dead downwind, so you will gybe through a wide angle, from one broad reach to the other.

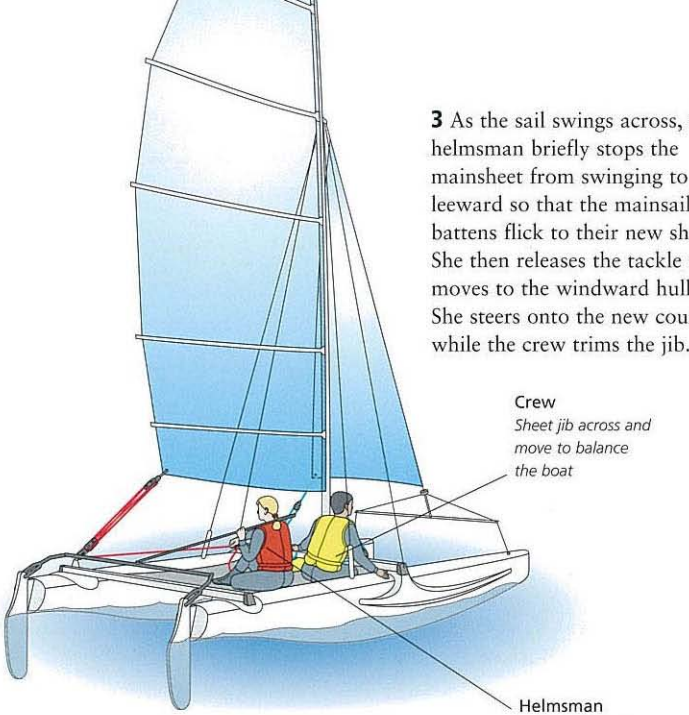
1 The helmsman bears away from a broad reach to a run and makes sure that the area that the boat will turn into is clear. When ready, she calls "stand by to gybe". The crew also checks the new course. If the crew is ready and the area clear, he replies "ready".



2 Keeping the boat turning, the helmsman swings the tiller extension behind the mainsheet to the new windward side. She changes hands on the mainsheet and tiller, putting her new forward hand on the mainsheet tackle between clew and traveller.



3 As the sail swings across, the helmsman briefly stops the mainsheet from swinging to leeward so that the mainsail battens flick to their new shape. She then releases the tackle and moves to the windward hull. She steers onto the new course while the crew trims the jib.



TUNING YOUR BOAT

IN ORDER TO GET THE BEST FROM YOUR BOAT, especially if you want to do well in racing, you have to set it up to suit your combined crew weight and the type of mast and sails you use. Many factors contribute to the way a sailing boat performs, and you need to understand each one of them – and how they work together – to tune it effectively for a wide range of conditions. Your aim is to set it up to achieve maximum speed in light, medium, and strong winds, so that you can concentrate on boat handling and tactics.

HOW TO START

Before tuning your own boat, find out how the fast sailors in your class set up theirs. Many top sailors are happy to help novices learn to tune their boats. Initially, it will be sufficient to aim to set up your boat so that it is exactly the same as the best performer in your class. This will help you achieve a good performance quickly and will prevent you from getting too confused by all the variables that combine to make a fast set-up.

Once you are more familiar with tuning techniques, try experimenting with other adjustments. Your class association may be a good source of further information, as many of them publish tuning aids to help people who are new to the subject. The main reason for varying your settings from the top sailors in your class is because your combined crew weight differs from their crew weight.

In general, if you and your crew are heavier than the average weight of the top sailors, you will want to develop more power from your rig by setting the mast up for fuller sails. If you are lighter, your boat will be over-powered earlier, and so you may want to sail with flatter sails, or adjust your rig to allow you to flatten the sails more than your competitors.

BOAT PREPARATION

Some high performance dinghies, like this 18-foot Skiff, are placed on their side to make it easier to rig and tune the mast and sails prior to a race.

TUNING FOR SPEED

This 470 is sailing fast upwind in medium to strong conditions. Mast bend, clew outhaul, and the Cunningham are being used to flatten the mainsail and allow the top to twist, thus reducing power. The jib fairleads have been moved aft to open the slot between mainsail and jib.

THE HULL AND FOILS

It is very important that all the underwater parts of the hull, including the centreboard and the rudder, have a perfect finish, free from any blemishes that would disturb the flow of water across their surfaces. Check them regularly and repair any damage immediately, lightly sanding away imperfections. In light winds and flat water, when the boat is not sailing at its maximum speed, the drag caused by underwater blemishes is a very significant part of the total drag.

While you are working on the underwater surfaces, turn the boat on its side and lower the centreboard fully. Check that it is held rigidly in its case and does not bend when you lean on its tip. If there is any give in it, replace it with a stiffer board as any deflection as it moves through the water will slow the boat. Next, turn the boat upside down, and check the alignment of the centerboard with the rudder and the centerline of the hull. If the centerboard leans one way or the other, out of line with the rudder tip, then use packing strips (toestrap webbing or thin plastic strips) to pack out one side of the the case until the centreboard is in line with the rudder.

The bottom of the centreboard case should be fitted with rubber or plastic strips, which seal the slot and prevent water turbulence – another source of drag. Check that the strips are in good condition and fit flush with the hull, moulding smoothly around the board when it is lowered. If your dinghy has a lifting rudder, check that the blade fits tightly in the stock and that there is no sideways movement that will cause drag and make it harder to steer accurately.

THE RIG

Most high-performance dinghies have large, powerful rigs with a variety of controls to enable the amount of power delivered by the sails to be adjusted to suit the conditions. Boats that are less focused on performance have fewer controls, but significant changes to the rig can still be made.

The rake (lean) and bend – fore and aft as well as sideways – of the mast is used to alter the shape, and thus the performance of the sails. Full sails deliver maximum power but as the wind increases, the crew's weight, and their ability to keep the boat level, will be overpowered. In strong conditions, the crew need to be able to flatten the sails to reduce power.

THE MAST

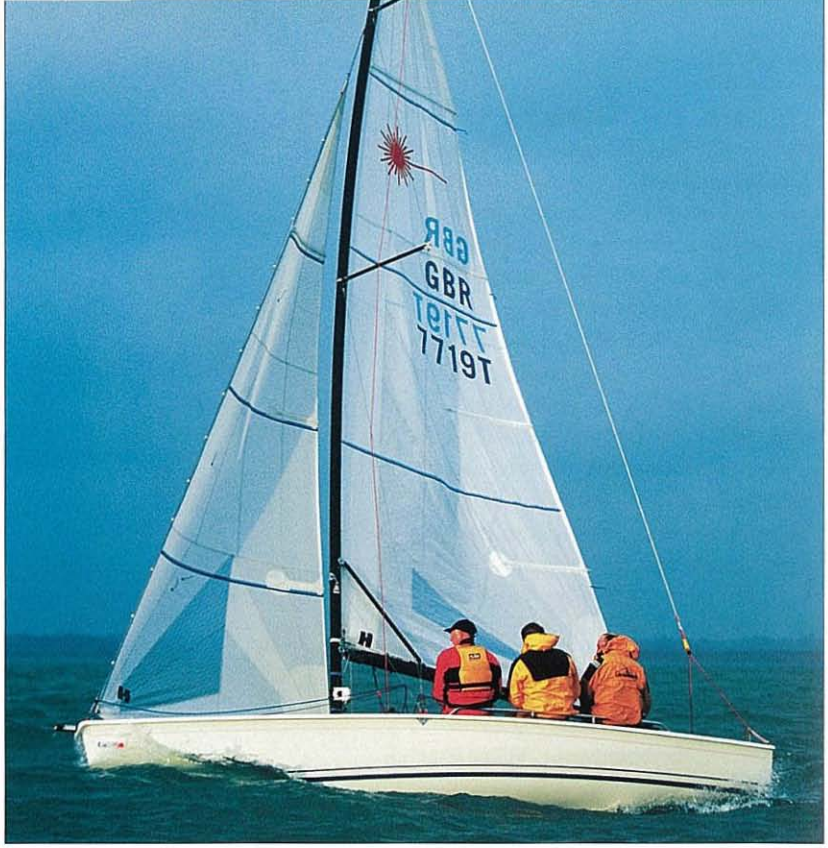
Masts are usually made from aluminium or carbon fibre, and are strong and light. They are also designed to have a certain amount of flexibility, so that they can be bent to adjust the shape of the mainsail. Masts come in a variety of cross-section shapes and weights, and each one will bend in a different way. If you have a choice, use a mast of the same type fitted in the top boats in your class. Choosing a different mast type from the experts' choice will usually be because of crew weight differences. Light crews tend to use more flexible rigs than heavier crews, so follow the example of a crew of a similar weight to your own.

MAST RAKE

It is easier to alter the rake and bend of the mast if it is keel stepped (*p.69*), as the gate at deck level usually has some form of control that can be adjusted. A mast that is stepped on deck can be adjusted only via the spreaders and the shrouds, unless it also has wires running to mast at the gooseneck that control the amount of bend at this point in a similar way to a mast gate. Before adjusting your mast's bend, you need to check its rake. This is usually measured between the top of the mast and the top of the transom on the centreline. Again, follow the example of leading sailors in your class and record the measurements for use in the future.

SAILS AND PRE-BEND

It is very important that the amount of pre-bend in your mast matches the shape your sailmaker has built into the luff of the mainsail. Pick a leading sailmaker for your class, tell him your crew weight, and ask for the fast settings for pre-bend and mast rake. Use these as a starting point for your rig set-up and only deviate from these settings when you are confident that you have explored other areas of tuning, such as sail setting.



MAST BEND

This small keelboat's mast bend flattens the mainsail to reduce power and eases leech tension by flexing in the gusts.

MAST BEND

A key part of setting up the rig for maximum performance is adjusting the pre-bend. This is the amount of bend set in the mast before you start sailing, and it directly influences the mainsail shape. Tuning the mast involves deciding how much you want it to bend and adjusting the controls accordingly.

The rigs of many dinghy classes are set up with about 75–100mm (3–4in) of pre-bend in the mast. If you have no other figure to go on, from your class association or sailmaker, use this measurement as a reasonable starting point for experimentation.

SPREADERS AND SHROUDS

The main factors that affect mast bend are the tension in the shrouds and the length and angle of the spreaders. Typically, spreaders are set up to push the shrouds out and aft of a direct line from the hounds to the chainplates. Increasing tension in the shrouds causes the spreaders to stiffen the mast sideways and push its middle forwards, thus putting more bend into the mast. Before the mast is stepped, the length or angle of the spreaders can be altered. Some boats have adjustable spreaders that allow the angle to be changed afloat. However, in the early stages, avoid getting involved in such complex adjustments. Use the same measurements as the fastest sailors.

KEEL-STEPPED MASTS

If your mast is keel stepped, it will have some form of control to adjust its fore-and-aft position in the mast gate. This might be a strut or a ram, or it may be a set of simple wooden chocks that can be removed or added as required. All these systems are designed to hold the mast back, at gate or gooseneck level, to stiffen it and limit bend, or to allow it to move forwards to increase bend.

DECK-STEPPED MASTS

Some of the newer skiff-type classes favour deck-stepped masts. In this case, the lower mast bend is controlled by an extra set of wires that run from the chainplates up to gooseneck level. These wires, most commonly referred to as the 'lowers', operate in a similar fashion to the keel-stepped mast controls acting at the mast gate. Tighten the lowers to limit lower mast bend, slacken the lowers to increase mast bend.

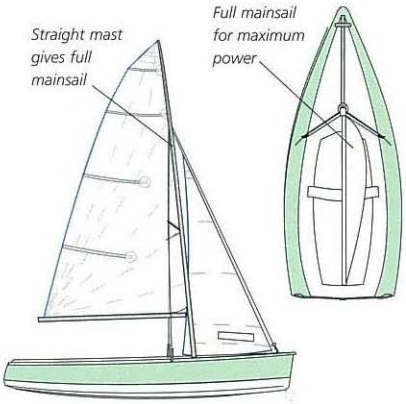
RIG MEASURING TOOLS

To be able to copy other sailors' settings and replicate them on your own boat, you will need three tools: a logbook, a measuring tape calibrated in metric and imperial units, which is at least a metre longer than your mast height, and a rig tension gauge. The latter is a simple device that uses the resistance of a strong spring, or length of metal, to measure the tension in the standing rigging. The most popular types are made by Loos and SuperSpar, and you will find that many tuning guides refer to a 'Loos' number of say, '35', rather than the actual tension in kilograms or pounds.

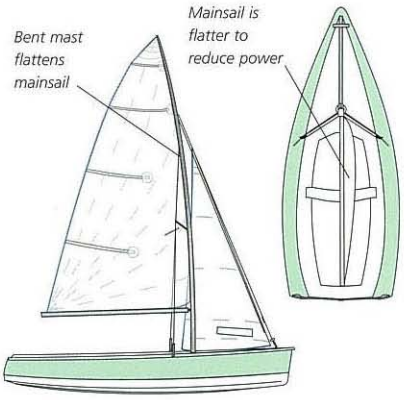
The tape measure and the tension gauge will help you find the right combination of mast rake and rig tension for your boat. If you are serious about improving your boat speed, then keep a written record in the logbook of the rig settings that you use for every racing and training session, and your impressions of how your speed compared with others.

MAST BEND

The amount of mast bend controls the fullness of the mainsail. Use a straight mast for maximum fullness and power in light to moderate winds. In very light, drifting conditions, increasing pre-bend will flatten the sail and make it easier for the wind to flow around it. As soon as there is a perceptible breeze, however, straighten the mast. In medium to strong winds, when the wind increases to the point where the crew's weight is no longer sufficient to hold the boat upright, the mast should be bent to flatten the sail and reduce power.



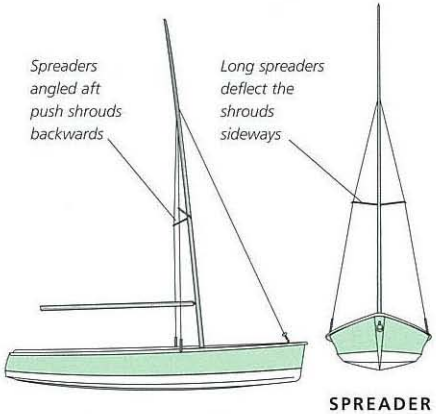
STRAIGHT MAST



MAST WITH PRE-BEND

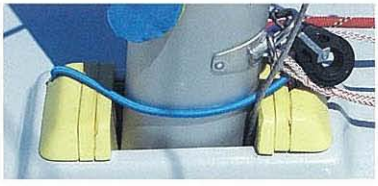
SPREADERS

The length and angle of the spreaders help control mast bend. Long spreaders push the shrouds outwards and stiffen the mast sideways. Angling the spreaders aft causes the shrouds to push the middle of the mast forwards. This increases mast bend. When the jib halyard is tightened, the shrouds are tensioned and the effect of the spreaders on the mast is increased.



SPREADER ANGLE

SPREADER LENGTH



MAST-GATE CONTROL

A keel-stepped mast usually has some form of fore-and-aft control at the mast-gate to adjust mast position and bend. In this small keelboat, plastic blocks are used. Blocks can be moved in front of the mast to push it aft, or behind it to push it fowards.

THE SAILS

Most high-performance dinghies have a number of controls that can be used while sailing to adjust the shape of the sails and thus to increase or decrease power. These controls are best rigged so that the helmsman or crew can adjust them while sitting out, or trapezing. Mark all your controls so that you can record the fast settings in your logbook for easy replication.

MAINSAIL ADJUSTMENTS

As well as holding down the boom, the boom vang pulls it forwards into the gooseneck. If this force is not resisted by chocks, a mast ram, or lowers, it will cause low-down mast bend. This flattens the mainsail in the lower half and increases twist in the upper leech, thereby reducing power in the top of the sail in strong winds.

The clew outhaul controls tension in the foot of the mainsail. Easing it increases the sail's fullness in the lower third of the sail and closes the lower leech. Tightening it flattens the sail and opens the lower leech.

Tensioning the Cunningham tightens the mainsail luff, opens the upper leech and increases twist. It also pulls the point of maximum camber forwards to counteract the effect of stronger winds which push the camber aft in the mainsail.

JIB ADJUSTMENTS

The position of the jib fairleads and the tension in the jib sheet control the jib's shape and the slot between jib and mainsail. Fairleads should be adjustable fore and aft and, ideally, sideways, so that you can alter their position to suit all wind conditions. In general, they are moved forwards and inboard to increase power and narrow the slot, and back and out to open the slot and flatten the sail. Make sure that the slot stays parallel all the way up. Jib luff tension is set by the jib halyard. In dinghies, adjusting the jib halyard also alters tension in the shrouds and effects mast bend. Adjust it to minimize luff sag when close-hauled in medium winds. Ease it in light winds and tighten it in stronger winds.

SAIL CONTROLS

Modern sailcloths are very stable, enabling sail shapes that perform well in a wide range of conditions. As wind strength increases or decreases, however, the crew need to maintain top performance by using the sail and rig controls to adjust the fullness of their sails and to control the position of maximum draft. Remember that changing one control is likely to have an effect on one or more of the others.

EQUIPMENT	ACTION	RESULT
Jib halyard	Increasing tension	Reduces sagging in jib luff. Tightens leech
Jib fairleads	Adjusting fore and aft, and sideways	Alters shape of jib, twist in leech, and adjusts slot between jib and mainsail
Cunningham	Increasing tension	Pulls maximum camber forwards in sail, opens upper leech, increases twist
Boom vang	Increasing tension	Reduces mainsail leech twist and bends mast low down
Mainsheet	Adjusting sheet tension	Controls boom angle and leech tension
Mainsheet traveller	Adjusting position	Controls boom angle
Clew outhaul	Increasing tension	Flattens lower third of mainsail and opens lower leech

TUNING SMALL KEELBOATS

Many of the same principles of tuning dinghies apply to keelboats, but the controls may vary. Many keelboats have an adjustable backstay, which is a useful tool for adjusting mast bend. In medium airs, the backstay tends to be slack with the crew using large amounts of mainsheet tension to create maximum leech tension for power. In light winds of less than 4 knots, however, the backstay can be used to flatten the mainsail, to encourage airflow over the sail. In strong winds when it is necessary to depower the rig, increasing backstay tension will help flatten the mainsail and make the boat more controllable. Remember to release backstay tension when you bear away downwind, to put power back into the mainsail and avoid excess load damaging the mast.

Most of the techniques described for dinghies also work for keelboats, although the mainsheet traveller tends to be more of a primary control in keelboats. Keep the boom on the centreline in light to medium winds but as the wind increases it usually pays to let the traveller down to leeward to help depower the mainsail. Easing the traveller on a keelboat will also help reduce weather helm. The aim of many of the tuning adjustments on a keelboat is to reduce weather helm to a minimum. A boat that is easy to steer also tends to be fast through the water.

TO INCREASE POWER

- Ease the jib sheet slightly
- Move the jib fairleads forwards
- Ease the mainsail outhaul
- Ease the Cunningham control
- Bring the boom closer to the centreline
- Stiffen the mast at deck level using the mast-gate control

MAXIMIZING PERFORMANCE IN ALL CONDITIONS

Start tuning afloat by sailing close-hauled in medium winds of about 7–16 knots, Force 3–4. In these conditions, your boat will be fully powered up, with you sitting out or trapezing as hard as possible to keep the boat level. Experiment with the controls one at a time.

LIGHT WINDS

In medium winds, the maximum fullness of the sails is used to develop power. In very light winds of 4 knots or less, however, the wind does not have enough energy to bend easily around full sails. Therefore, you need to flatten the sails.

Remove the mast chocks in the mast gate or ease off the ram to allow the mast to bend forwards at deck level and pull the clew outhaul to its maximum extent. Leave the Cunningham and vang slack and adjust the mainsheet and traveller to keep the boom close to the centreline with the top leech tell-tale on the point of stalling.

Flatten the jib by moving the jib fairleads aft and out, but ease the jib sheet slightly. If the wind strength increases, the mast will try to bend further and creases will appear from the luff of the mainsail. At this point, start restricting mast bend using the chocks or the ram to increase the power in the sail.

MEDIUM WINDS

In medium winds, aim to achieve maximum power from the rig. Set the jib fairleads in their mid position and sheet the sail so that all the windward tell-tales (*p.80*) break together. Use the mast-gate chocks or ram to prevent the mast from bending beyond the set amount of pre-bend. Ease the clew outhaul by about 2.5–5cm (1–2in) from its maximum position and leave the Cunningham slack. Sheet the mainsail using the mainsheet and leaving the vang slack. Sheet it hard enough to have the top leech tell-tale (*p.128*) on the point of stalling. If your mainsheet runs on a traveller, pull it to windward until the boom is on the centreline. The boat should now be fully powered up, with you and your crew sitting out as hard as possible, or trapezing, to keep the boat upright.

If the mainsail develops large creases running from the clew to the middle of the luff, it is an indication that your mast is bending too much and you need to adjust the spreaders or shroud tensions to reduce the bend.

STRONG WINDS

When you sail upwind in strong winds you need to reduce power to sail fast and stay in control. If you can adjust the rig before sailing, it usually helps to increase the mast rake and the shroud tension. You may also decide to alter the spreader angle to prevent excessive bend. If the boat becomes overpowered, tension the Cunningham and pull the outhaul tight. The Cunningham pulls the draft in the sail forwards and helps flatten it, while the outhaul flattens the lower part of the sail.

Use the vang to hold the boom down and increase low-down bend in the mast, and use the mainsheet to trim the sail. You can ease the vang in the lulls to increase power and tighten it in the gusts to reduce power. Move the jib-sheet fairleads aft and tighten the sheet to flatten the sail, open the slot, and allow the head to twist slightly. If you are still overpowered, it can help to pull up the centreboard or daggerboard as much as half way. This is an often overlooked method of depowering the boat.

ROUGH-WEATHER SAILING

THE DEFINITION OF ROUGH WEATHER is subjective – in conditions that are too difficult for novice sailors, an expert crew will be able to enjoy fast and exhilarating sailing. The design of the boat influences the way you experience the conditions, as does the wind direction in relation to the shore and any tidal stream. Winds of Force 5–6 can be considered as rough weather, but a Force 4 against a strong tide can kick up large waves and make sailing more difficult than a Force 6 in flat water.

GAINING EXPERIENCE

As you develop your sailing skills, it is important that you learn to handle your boat in strong winds. It is often best to gain experience while racing, because racing fleets still sail in rough weather and always have safety boats available. When you sail just for fun, however, it will be your decision whether to venture out.

Before you go afloat, check all your gear to ensure that it is in good condition and that nothing is likely to break. Rough weather imposes considerable loads on the boat, sails, and equipment, and it is vital that they are strong enough to handle the stress. Make sure that your clothing is adequate (*pp.64–65*). Sailing in these conditions can be very tiring and requires concentration, stamina, and endurance. If you find that you are getting tired or cold, come ashore immediately as your strength will decrease rapidly and you could easily find yourself in trouble.

You will notice that the boat reacts much faster and more violently in rough weather than it does in lighter winds. You will need to react quickly to changes in wind strength and direction. The heeling force will be considerable, and you will need all your strength and agility to keep the boat under control. Depending on your boat and the wind strength, you may find that you plane on many points of sailing. Speed is your ally in these conditions – when the boat is upright and moving fast, it is easier to control and requires smaller tiller movements to keep it on course.

REACHING

Start by sailing on a reach to get the feel of the conditions. The boat should be planing and the helmsman and crew should move well aft to keep the bow up and the rudder immersed. If the boat heels, ease out both sails to keep the boat upright, allowing the luffs of both sails to 'lift' – shake or backwind – if necessary. If the boat is overpowered, move the jib sheet fairleads back to allow the top of the jib to twist, and ease the vang to twist the mainsail. Watch for gusts, easing the sails and bearing away to keep the boat upright as they pass.

BROACHING

One of the hazards of rough-weather reaching, particularly when flying a spinnaker, is broaching. When a gust strikes the sails, there is often a tendency for the boat to round up into the wind without much warning. The helmsman may try to fight the weather helm by pulling hard on the tiller, but at this point it is often too late, as the boat will round up uncontrollably into the wind. Prevention is the best policy, and both helmsman and crew should look frequently over their shoulder to see when the next gust is about to strike. Just as a gust – indicated by a dark

REACHING

Reaching in strong winds, this Laser sailor eases the vang so that the mainsail twists off and heeling is reduced. This also keeps the boom end clear of waves.

patch on the water – is about to reach the boat, make sure the boat is absolutely upright and bear away slightly, with the crew ready to ease the spinnaker sheet at least an armful. If the gust is bigger than expected, bear away even more and ease even more spinnaker sheet, and the boat will accelerate rather than heel.

Easing the vang, sometimes all the way off, can also help the boat cope with a big gust on a reach. If you are sailing on a keelboat with four or more people, assign one person to be solely responsible for controlling the vang, pulling it on in the lulls and easing it rapidly in the gusts.

CLOSE-HAULED

Luff up to a close-hauled course, being careful to sheet in gently as the boat turns so that it stays upright. It is important that heeling is kept to a minimum, and the helmsman must constantly trim the mainsheet to achieve this. In the strongest gusts, the mainsail may have to be let out until it backwinds (flaps) across most of its width to spill wind and prevent the boat heeling. Keep the jib sheeted in tight except in the strongest gusts, when it should be eased out a little way until the gust passes.

High-performance dinghies will plane to windward, and the mainsail should be eased as necessary to keep the boat upright. Slower dinghies, which do not plane to windward, can use the no-sail zone as a way of decreasing power. As a gust hits, the helmsman eases the mainsheet a little and steers closer to the wind until the jib luff starts to backwind. This reduces the power in the rig, and gains ground to windward. Do not sail too close to the wind, however, or the boat will slow down and will heel more when you try to bear away to the correct course. Steer through big waves by luffing up as you climb them, then bearing away as the bow passes through the crest.

CLOSE-HAULED

This helmsman and crew are working hard to keep the boat upright and planing to windward. The mainsail is eased slightly to reduce heeling.

DOWNWIND COURSES

In strong winds, the boat will plane continuously on a broad reach – and possibly even on a run. Sailing on a run in very strong winds is difficult because there is no heeling force to balance against, and there is always the danger of an unplanned gybe. The boat will sail faster and will be more stable on a broad reach. There will be sufficient heeling force to allow both the helmsman and the crew to sit to windward (well aft to prevent the bow from digging in). When sailing in waves, you must anticipate each wave and bear away down its face as the stern lifts. The boat will accelerate and you should then luff slightly to ride the face of the wave as long as possible, avoiding digging the bow in at the bottom of the trough.

If the bow does dig in to a wave it may nosedive and suffer a pitchpole capsize. Avoid this by reducing the efficiency of the sails to slow the boat. In a singlehander, tighten the vang and oversheet the mainsail. In a boat with an asymmetric spinnaker, oversheet the sail as much as necessary to slow down to the point you feel safe. In a dinghy or keelboat with a conventional spinnaker, head up to a broad reach, so that you sail down the waves at an angle rather than straight down them.

NOSEDIVING

Sailing a high-performance boat very fast downwind in waves brings the risk of nosediving into a wave and pitchpoling.

TACKING AND GYBING IN STRONG WINDS

In rough conditions, your boat is vulnerable at slow speeds, especially when tacking and gybing. The helmsman and crew must work hard to keep the boat balanced through these manoeuvres, which must be completed as quickly as possible so that the boat can get back to full speed with minimum delay.

TACKING

Before tacking, the helmsman must ensure that the boat is moving as fast as possible and should look ahead of the boat to find a stretch of flat water in which to tack. However rough it is, the size of the waves always vary and if you look carefully you will find the occasional patch of relatively flat water among the waves.

Give the crew plenty of warning when tacking in rough weather, and time the start of the tack so that the bow passes through a wave crest as you luff into the tack. This will ensure that the boat is on the new tack and moving again before the next wave arrives. Timing of body movement is crucial. The aim is to keep the boat flat throughout the manoeuvre.

In a dinghy, as the helmsman starts to luff up slowly, both helmsman and crew should come in from their hiking or trapezing positions, but remain on the windward side, ready to move smoothly and swiftly across to the new windward side as the boat tacks.

Once the boat is through head to wind, helmsman and crew should move to the new side as quickly as possible. The mainsail and jib should be sheeted only three-quarters of the way in, with both sails luffing slightly. This will help the boat accelerate and make it less prone to capsize if a gust hits the sails. Once you are both fully hiking or trapezing and the boat has accelerated, sheet the sails back into their normal position.

Some boats sail best upwind in windy weather using a lot of tension in the boom vang but this can sometimes cause a problem when tacking. The tension in the boom vang causes the mainsail leach to be very tight during a tack and this can make the boat stall head to wind. It can also make it quite hard for the crew to get under the boom. If you have problems with getting caught in-irons, or getting under the boom during a tack, ease the vang before the tack, and pull it on again only when the boat is fully up to speed again.

This problem of getting stuck head to wind is particularly common in singlehanders which rely on large amounts of vang to flatten the sail but have no jib to help pull the bow away from the wind (*p.159*). It can help to bear off slightly on to a close reach to build speed and then tack the boat on to a close reach on the other tack, before sheeting in and luffing up to a new close-hauled course. If you still have problems, then try these solutions in order of importance: increase Cunningham tension, raise the daggerboard, and ease the vang. As you become more adept at rough-weather tacking, you should need to rely less on these techniques, but be aware that older sails are harder to tack than new ones, because the sail's centre of effort moves aft as the sail cloth ages and stretches out of shape.

GYBING

Gybing in any boat must be completed quickly and smoothly. It should be attempted only when the boat is moving at top speed – when the apparent wind is least – and never when it is slowing down – when the apparent wind pressure increases. For this reason, gybing is much easier when the boat is surfing down the front of a wave or is planing at high speed. Do not be afraid to gybe when sailing fast, it really is the safest way to handle the manoeuvre.

Take great care of the boom in rough conditions as it can fly across the boat with great force. Make sure that you and your crew have your heads well down before you gybe. Some sailors even wear protective head gear for this reason.

CREW COORDINATION

This keelboat crew are moving smoothly and in unison, waiting until the sails pass overhead to move across the boat.

ROLLING DOWNWIND

Non-planing, classic keelboats tend to roll heavily when sailing in strong winds. Beware an unintentional gybe when sailing on a run in strong winds.

CONVENTIONAL SPINNAKER

In a boat with a conventional spinnaker, which runs straight downwind, the gybing technique is very similar to lighter conditions. With the boat sailing on a run, roll the boat slightly to windward, about 5 degrees, just to help the rudder steer the boat through a gentle arc. At the same time, grasp all the parts of the mainsheet tackle and 'throw' the mainsail over to the new gybe. This allows you to avoid a large change of course to get the mainsail to gybe, and means you are less likely to broach after the gybe. At the moment the boom swings across the boat, the helmsman should reverse the helm and steer the boat back to a run. The course steered through the gybe will resemble an 'S' shape, ensuring that the boat sails dead downwind as much as possible. Once the boat is steady, the crew can move forward to change the spinnaker pole to the new side.

ASYMMETRIC SPINNAKER

Subtlety of steering is essential to gybing an asymmetric spinnaker successfully. It is surprising just how little steering a planing dinghy requires. Ensure the boat is flat or even heeled slightly to leeward throughout the manoeuvre, as any windward heel will mean that the asymmetric, pulling at the top of the mast, will capsize the boat as it exits from the gybe. This angle of heel is a very important distinction between gybing a symmetric or asymmetric spinnaker dinghy. As you steer into the gybe, move your body weight over as quickly or as slowly as is required to match the speed of the turn through the gybe. A rapid turn will require rapid movement across the boat.

Gybe the asymmetric spinnaker as normal or consider using the survival gybe technique in heavy weather (*pp.154-55*) as it is much quicker to gybe safely and remain upright than it is to deal with a capsize.

SINGLEHANDER

Gybing a singlehander with just a mainsail can be quite tricky because there is no spinnaker to keep the boat moving through the gybe. This means it is very hard to avoid the boom slamming across on the new side, which can easily lead to a broach.

The key to successful gybing in a non-trapeze single hander is to use a version of the roll gybe (*p.141*). As you steer into the gybe, heel the boat to windward and, as you feel the mainsheet tension become light (the sign that the sail is about to gybe), give it a quick tug to help it on its way. At the same time, transfer your weight rapidly to the new side to bring the boat level again, whilst steering back on to a downwind course as quickly as possible. Again, the aim is to steer an 'S' shape course to instigate the gybe then bring the boat back to a dead run immmediately after the gybe.

The added difficulty is that the helmsman must steer with the tiller extension held behind his back at this stage. Once the boat is under control on the new gybe, the helmsman can change hands on the extenstion and get settled on the new course.

KEELBOATS

Gybing a keelboat in rough weather is, in principle, the same as gybing a dinghy, but it is important to remember that all the loads are much higher. This means that all crew members must be aware of these extra loads on sails, sheets, tackles, and winches. Be particularly wary of the boom as it flies across, and ensure that everyone keeps their heads well down below its swinging arc. When sailing a keelboat with a conventional spinnaker in strong conditions, gybe the mainsail first. The foredeck crew only goes forwards to gybe the spinnaker pole once the boat is under control again. Be sure to keep steering the boat straight downwind to keep the loads on spinnaker sheet and guy to a minimum until the pole has been attached on the new side.

PHYSICAL FITNESS

Rough weather is physically demanding and quickly saps strength so it pays to ensure that you are fit for the conditions.

RACING

THERE IS NO BETTER WAY to learn to sail a boat well, and to build on your existing skills, than to race against other boats that are in the same class. Racing quickly teaches you the intricacies of good boat handling, and you will also learn how to tune your dinghy or keelboat for a wide range of wind conditions. Join a club that supports the class of boat you are interested in, or, if you already own a boat, but your club does not support its class, consider racing in a mixed, handicap fleet.

STARTING TO RACE

Racing is organized through sailing clubs at a local level, and through class associations on a national or international basis. You will need to join your class association, which will arrange for your boat to be measured and certified within the class rules.

The association will also be able to provide you with tuning data and can advise you on which clubs provide fleet racing for your type of boat.

At club level, each fleet normally has a class captain who organizes the racing calendar and who is usually an experienced sailor in the class. You will nearly always find that the class captain and other owners are welcoming to newcomers and will be pleased to help you get started.

If you do not own your own boat, you will often find that you can get a crewing position quite easily. Crews are often in short supply, and it is a great way to learn the racing skills.

MAKING A CHOICE

If you have ambitions to reach the top in dinghy racing, you should choose one of the recognized International- or Olympic-class boats and be prepared for a long, hard, and expensive route to the top. If, on the other hand, your ambitions do not extend beyond becoming a good club racer or a competitor in a national championship fleet, you will have a wider choice of boats. Narrow down your options by deciding whether you want close, tactical racing or speed, and whether you want to sail with a crew or prefer to sail a single-handed dinghy.

SAILING CLUBS

By far the best way to meet other sailors and develop your skills is to join an active sailing club.

These range from dinghy clubs to those that embrace dinghies, small keelboats, and larger yachts.

CLUBS AND RACING

To improve your dinghy sailing skills find a local club dedicated to dinghy sailing. The club will probably provide fleet racing for several classes and will also have a handicap fleet in which other less popular dinghies can race.

Dinghy clubs often have junior or cadet sections that provide training courses and racing for young members. If you have your own boat and want to race against others of the same class, make sure you join a club that has a strong fleet of your class.

SAILING IN A CLUB
Club racing forms the backbone of dinghy sailing and is the starting point for all who wish to race. Once a sailor has become proficient enough to reach the top of a good club fleet, he or she can progress to Class Open Meetings and National Championships.

TACTICAL RACING
For close, tactical racing pick a class like the Laser – the Olympic single-hander. It has large and very competitive fleets worldwide and is challenging to sail. It is also relatively cheap to buy and run. Whatever your level of skill or ambition, you will always find Laser sailors of your standard to ensure good close racing.

ULTIMATE SPEED
If speed is what you are after, consider boats like this 18-foot Skiff, the Olympic 49er, the International 14, or the RS800. These are extreme machines with multiple trapezes and huge asymmetric spinnakers. They are quite expensive to buy, and demand skill, co-ordination, and agility to sail, but offer a great adrenaline rush as ample reward.

TACTICS VERSUS SPEED

You do not need to sail the latest high-performance dinghy to enjoy very competitive racing. In fact, many of the largest and most competitive racing fleets are found in classes that were designed many decades ago and which, by modern standards, are quite slow. They may not offer the ultimate in speed, but the racing is often very close and tactically intense.

For speed, look at catamaran designs or modern monohull dinghies with multiple trapezes and large, asymmetric spinnakers. If you prefer not to sail in one of the high-performance dinghies but still want speed, you should consider a small keelboat or a sportsboat. These will provide exciting sailing without the level of physical exertion a high-performance dinghy requires.

If you do not want to have to find a crew, consider a single-handed class, which will provide the ultimate test of your individual racing skills.

COURSES AND STARTING

Racing can take place around any shape or length of course but there are a few common types of course used for Club and Championship level racing. Most courses are set to ensure that the first leg after the start is to windward. Races can start with a downwind leg, on a reach or a run, but this is far less common and is mostly restricted to yacht races.

Most courses for dinghy, small keelboat or catamaran races are set with marks rounded in a counter-clockwise direction, or with 'marks to port' as it is often described. The reason for this is because it ensures the final approach to the windward mark will be on starboard tack, which is the tack with the right of way under the racing rules. If a course is set with marks rounded to starboard, there is a higher chance of collisions.

OLD OLYMPIC COURSE

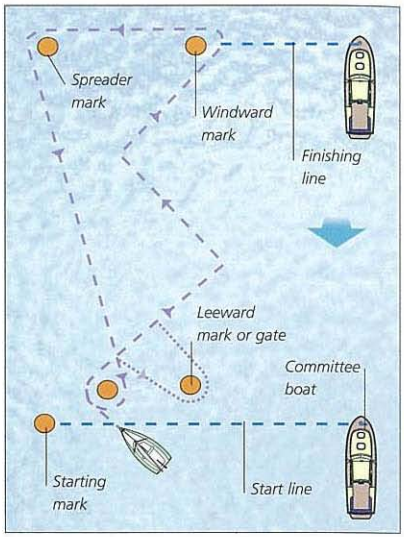
Otherwise known as a Triangle-Sausage course, this used to be the standard course for Olympic class boats, but is still very popular with some of the more traditional dinghy classes, inlcuding some singlehanders and boats with conventional spinnakers. The race starts with a windward leg, and then moves on to two reaching legs. After a second windward leg, the course then turns directly back downwind on a run.

WINDWARD LEEWARD

The simplest configuration is a windward leeward course. This has become the course of choice for the asymmetric dinghy classes, and many of the sportsboat classes. On the old Olympic course there are not many overtaking opportunities on the reaches, which can be quite processional. Instead, the windward leeward configuration offers the challenge of the windward legs plus the tactical options of gybing downwind on the run, where place changes are more common, which makes the racing more interesting.

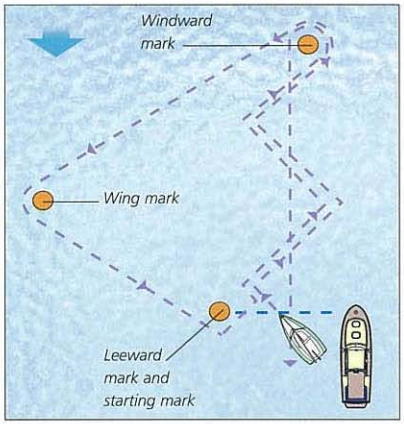
SQUARE COURSE

This has become a popular course configuration since it allows a race committee to race two separate fleets on the same course. The race officer can send the first fleet off on the 'outer loop', and the second fleet can start five minutes later and race on the 'inner loop'.



WINDWARD LEEWARD COURSE

After a beat to windward, there is a very short reach to a spreader mark, if used, then a run to the leeward mark or gate.

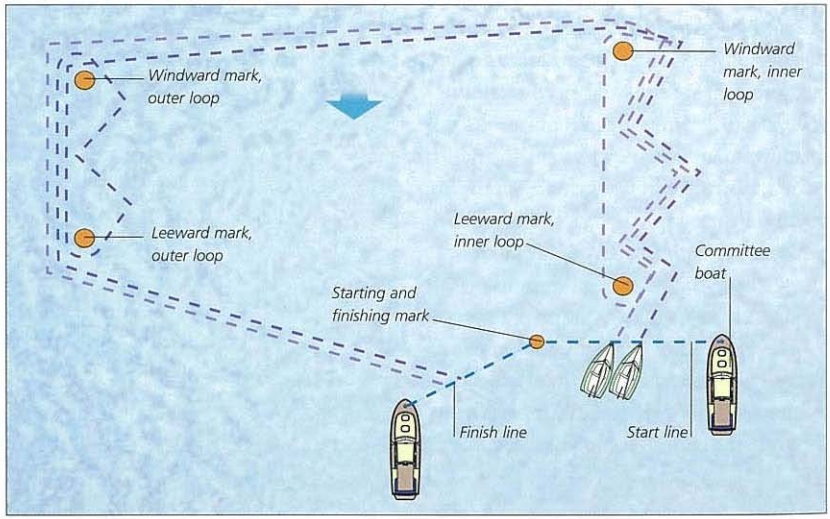


OLD OLYMPIC COURSE

The windward leg is followed by a reach to the wing mark and another reach to the leeward mark, then a beat and a run.

SQUARE COURSE

This course allows the race committee to race two fleets, using the inner and outer loops, to separate the two.



STARTING

A race committee will set a start line between two points, usually the mast on a race committee boat at the starboard end of the line, and another boat, or an inflatable buoy, at the port end of the line, which is often referred to as the 'pin end'. The race officer will usually aim to set a start line that is square – at 90 degrees – to the average wind direction. The aim of the racing sailor is to start at the favoured end of the line (*below*), as close to the line as possible, without being over the line at the start signal. The race officer will watch the line at the start time to see if any boats are over. If there are, he will sound a further signal and fly an individual recall flag, indicating that the offending boats must return to the line to start correctly. If there are many boats over the line, he may choose to have a general recall, in which case that start will be abandoned and the whole start procedure will commence once more.

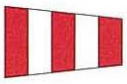
STARTING PROCEDURE

Sailors need to stay close to the race committee vessel during the minutes before the start of a race, so that they can see the flags and hear the sound signals, which will be made either by whistle, horn or shotgun. It is important to know that the flags are the definitive signal, the sound signal is only to draw attention to the flags. So if the flag movements and the sound signals do not happen at the same time, set your watch by the flag signal. The most common timing sequence is 5-4-1-Go, although others may be used.

SIGNAL	FLAG AND SOUND	MINUTES TO GO
Warning	Class flag + 1 sound	5
Preparatory	Flag P (or flag I, Z, Z with I, or black flag) + 1 sound	4
One-minute	Preparatory flag removed + 1 long sound	1
Start	Class flag removed + 1 sound	0

INDIVIDUAL RECALL

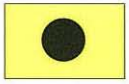
GENERAL RECALL



POSTPONEMENT

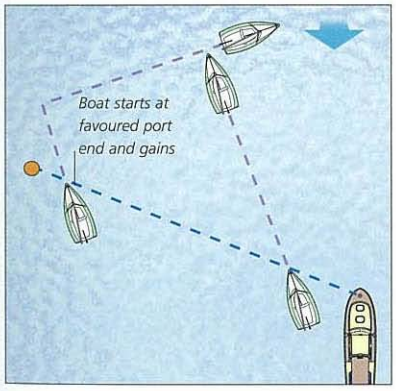
PREPARATORY (P)

DISQUALIFICATION (BLACK FLAG)



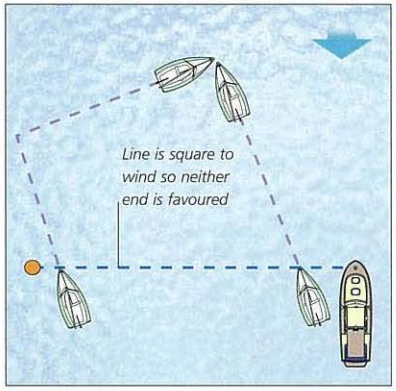
I (ONE MINUTE RULE)

Z



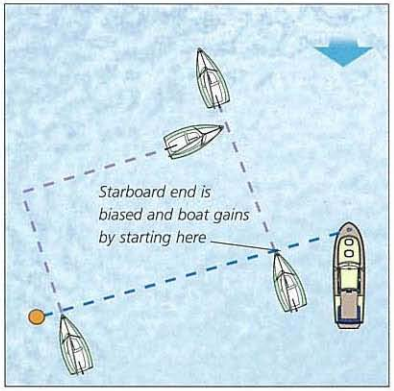
PORT END BIAS

If the port end of the line is closer to the wind, a boat starting there will be ahead of a boat starting at the other end of the line.



SQUARE LINE - NO BIAS

When the line is square to the wind, neither end is closer to the wind and there is no advantage for either end of the line.



STARBOARD END BIAS

If the starboard end of the line is closer to the wind, a boat starting there will be ahead of a boat starting at the other end of the line.

FROM START TO FINISH

The racing day begins long before the start gun sounds. Most sailors check the weather forecast the night before racing, and the times of the tide if they are racing in tidal waters. On the morning of the race, it is a good idea to read the sailing instructions very carefully, and also to find out what the wind is actually doing compared with the forecast. If you have a choice of sails for different wind conditions, then you will need to make a decision about which to use for the day.

Check how far away the race course is, and how long it is likely to take to get there. You need to arrive in the starting area at least 10 minutes before the 5-minute starting sequence begins to have time to check the line bias, and it is much better if you can arrive half an hour or more before the start. This will allow time for doing some practice tacks and gybes and to check that the boat is tuned correctly for the wind and wave conditions.

CHECK THE WIND

Use the time before the start to check the wind shifts and to plan a strategy for the first beat. From the starting area, sail off on port or starboard tack and sail as well as you can to windward. Constantly check the compass to find out how the wind is shifting. Write down (use a non-permanent marker on any handy surface) the average heading then tack and do the same on the other tack. Sail about halfway up the beat, if time allows, then head back to the start line, taking the opportunity to hoist the spinnaker, check that it is not twisted, and do a couple of practise gybes.

CHECK THE LINE BIAS

Back at the starting area, the Race Committee should have laid the starting line and now is the time to check the line bias (*p.187*). While most race committees will attempt to set a start line at 90 degrees to the wind direction, the wind is nearly always shifting one way or the other. This means that one end of the line is likely to be closer to the wind than the other. It is called the favoured end because a boat starting at this end has less distance to sail than a boat at the other end. A simple way to identify the favoured end is to sail along the start line with the bow pointing towards one end of the line. Sheet the mainsail, with the traveller cleated on the centreline, so that it is set correctly for the course. Cleat the mainsheet and tack around to sail the opposite way along the line. Look at how the mainsail is setting now. If it is oversheeted and needs to be eased , then you are pointing away from the favoured end. But if it is flapping slightly and needs to be sheeted further in, then you are pointing towards the favoured end. Use this method two or three times to make sure you are clear about which end is favoured. If you can't tell the difference between one tack and the other, it probably means the line has been set square to the wind and neither end is favoured.

CHOOSE WHERE TO START

To achieve a successful start, your aim should be to position your boat:

- just behind the line (but very close to it) at the starting signal
- travelling at full speed
- with space around you, especially close to leeward
- at the favoured end of the line

The vast majority of boats cross the line on starboard tack, as this tack has right of way. It is possible sometimes to start on port tack, but it is a high-risk manoeuvre and is best left until you are more experienced.

Starting well and consistently requires a lot of practice but by concentrating on these four priorities, in the order shown, you will make a resonable start most of the time.

Allthough starting right at the favoured end offers the most potential advantage, it is difficult to achieve in practise. Many boats will all try for the ideal spot but only one boat will make it. It is better to start just along the line from the favoured end where it will be easier to find clear space and get a clean start.