

Albert Park Yacht Club Inc

Introduction to Racing

December 2004

Introduction

Preface

These notes have been prepared to be used in conjunction with the Learn to Race course at Albert Park Yacht Club. Those undertaking this course are expected to have completed the requirements of the *Learn to Sail* course.

Aims

At the completion of this course participants should:-

- understand race management and be able to sail a racing course,
- have a working knowledge of boat handling, wind observation, boat tuning, race tactics, rules and strategy,
- be aware of spinnakers and trapezes, and
- have improved general sailing ability.

Course Organisation

On water practice is conducted in a racing environment. As a result the first couple of lessons devote time to race management. Later lessons include brief coverage of more detailed matters of race management such as protests and scoring systems.

However after the first couple of lessons there is more focus on general sailing skills, although time is spent on issues of race strategy, boat trim, tactics and rules. These are all applied in on-water practice.

Course Requirements

Participants are expected to have a boat which will be used under supervision during most lessons. A recommended purchase is a copy of the "Blue Book" - *Racing Rules of Sailing 2004-2008*. This book also has Yachting Australia's safety requirements amongst many other things.

Other material such as the current Albert Park Yacht Club Sailing Instructions will be handed out during the course.

Syllabus

Week	Preparation	Procedures	Rules and Tactics	Sailing
1	Introduction to Course	Starting and recalls	Right of way	Starts and Beats
2	Sail trim & boat tuning	Course, Courseboard	Starting tactics	Start & triangular course
3	Mental & physical fitness	Sailing Instructions	Rules at Marks	Triangular course
4	Weather	Notice of Race	Upwind tactics	Start, Beat & return

5	Spinnaker	Protests and penalties, scoring systems	Downwind tactics	Start, Windward & return
6	Revision			

The material may be covered in a different sequence if the weather proves unsuitable at any stage.

Lesson 1

After a brief introduction to the concept of the race, this lesson focuses on the start of a race.

The Race Concept

Most dinghy races involve a fleet of boats commencing together and sailing a course around a series of buoys to a finishing line. Signals before the start indicate the time of the start. The first boat that finishes is the winner. Club racing is sometimes conducted using a handicap system.

There are a range of means whereby handicapping may be introduced to allow different classes to compete on equal terms or to account for the differing abilities of the sailors.

Race Management

The details of race management are contained in:-

- Notice of Race,
- Sailing Instructions,
- International Sailing Federation's Yacht Racing Rules.

The last of these is contained in the 'Blue Book'. The contents of the first two are defined in the Blue Book. For simplicity Albert Park Yacht Club includes the most important aspects of the Notice of Race in its Sailing Instructions.

The supervision of these procedures for each race is under the control of the *Officer Of the Day* (OOD). The OOD is appointed by the club's Race Committee who has general responsibility for the club's racing program.

Protest committees may be formed from the Race Committee. (for Race Management see Blue Book Parts 3 to 7)

Championships are conducted for most classes each year at both State and National levels. Those events are organised by class associations and run by selected clubs.



Starting Procedure

The start of a yacht race is made by crossing an imaginary start line generally between the mast of the committee boat and a buoy. The line should be approximately at right angles to the wind so that all boats are evenly placed as they cross the line.

Starting is done by crossing the starting line after the starting signal. Prior to the starting signal there are signals made from the committee boat stationed at one end of the starting line. The committee boat will fly a flag, in the case of Albert Park Yacht Club, the Club Burgee, to indicate that it is the committee boat. It will also fly a **red** or **green** flag, depending on whether boats sailing the course should leave all marks to port or starboard respectively.

Signals are made with International Code Flags and by sounds. Sound signals at APYC are made by a horn. As an emergency the Albert Park Yacht Club Committee Boat carries whistles and a bell. On open water a shot gun may be used and while at some distance the noise may not be heard, the smoke will be seen.

The table sets out the start sequence in general use and defined by RRS 26.

Signal	Time before Start (mins)	Flag	Sound
Warning	3 (5)	Class •	One sound
Preparatory	2 (4)	 •	One sound
One-Minute	1	 •	One long sound
Start	0	Class • (Next Class •)	One sound

At Albert Park Yacht Club the sequence has been shortened to 3 minutes so that there is one minute between each signal.

If there are a number of starts to occur in succession the class flag of the next class to start is raised at the preceding start as the class flag of the starting class is lowered. In this manner succeeding starts are made at 3 minute intervals.

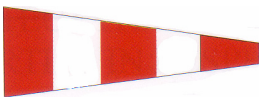


Individual Recall. When a boat or any part of it is on the course side of the starting line at its starting signal, Code Flag X will be raised with one sound signal made. These boats must return to the pre-start side of the starting line and re-start.

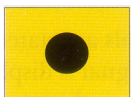


General Recall. If a number of unidentified boats are on the course side of the starting line at the time of their starting signal and a new start is necessary, the First Substitute will be raised with **two** sound signals. At APYC the Sailing Instructions describe how the new start will be made after all other starts scheduled at that time.

The procedure at many other Clubs is to restart the recalled race immediately. In this case the new Preparatory Signal will be made one minute after the First Substitute is lowered. A sound signal is made when the First Substitute is lowered.



Postponement. If there is a problem with the starting sequence, there is a large wind change, or there is not enough wind, the Answering Pendant (AP) may be raised with **two** sound signals to indicate a postponement of the start of the race. A Warning Signal will be made one minute after the lowering of the AP and a sound signal will be made when the AP is lowered.



Round-an-End Rule. To discourage boats crossing the starting line early and precipitating a General Recall, RRS 30.1 or round the ends rule may be applied. Code Flag I will be raised at the Preparatory Signal, instead of Code Flag P, and lowered one minute before the start with a long sound signal. Any boat crossing the starting line in

the minute preceding the start must return to the pre-start side of the Starting Line by going around the ends of the line. Avoiding other boats starting and sailing the extra distance can be quite disadvantageous.

The Rules also allow for other starting penalties, namely the 20% Penalty Rule and the Black Flag Rule. The former allows for a penalty to be added to the boat's score and the latter provides for automatic disqualification from the race.

Rules

The following basic rules will apply during the start and the first sail to windward. Most have been mentioned in the Learn to Sail course.

Altering Course

RRS16, Right-of-way yachts have an obligation to hold a course and not to alter course so as to collide with a yacht maneuvering to keep clear. If a right of way boat does change course she has to give the other boat room to keep clear.

Port – Starboard

RRS 10, The most universal of sailing rules, a port-tack yacht shall keep clear of a starboard-tack yacht. Sailors must therefore always know which tack that they are on.

Same Tack - Luffing

RRS 11, When boats are on the same tack, the windward boat shall keep clear of a leeward boat.

Clear Astern

RRS 12, It is not permissible to run into the stern of a boat.

Changing Tacks

RRS 13, A boat that tacks or gybes must keep clear of other boats.

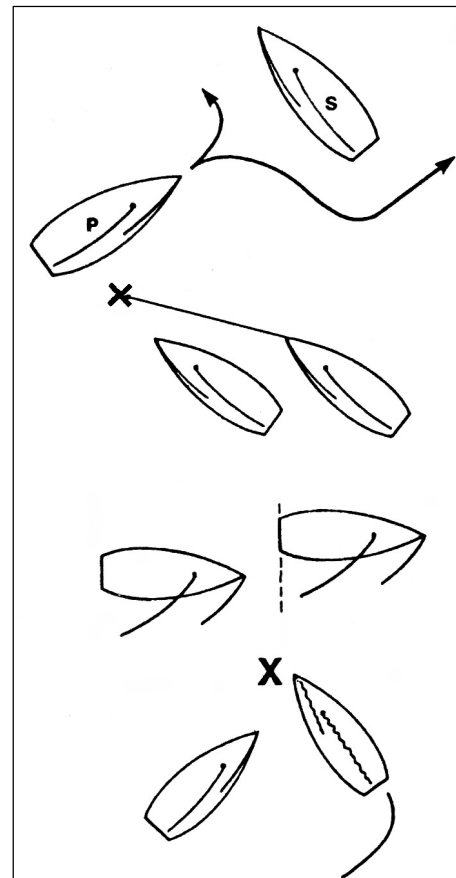
Keeping Clear

RRS 22, Boats that are not racing shall not interfere with boats that are racing. Boats are racing from the time of their Preparatory Signal (see the definition of *racing*). This implies that only those boats starting should be near the starting line and that all others should keep clear.

Tactics

The first sailing exercise consists of a start and a sail to windward, or beat, to a finish line. There are two simple aspects of tactics which will become evident.

Favoured End.



Sometimes the starting line is not exactly at right angles to the wind. In this case there is an advantage to start at the end that is nearest to the wind. It is normally advantageous to start from the end nearest the wind.

Starting on Starboard Tack

As there are many boats about the starting line it is best to start on the right-of-way, or starboard tack. If the line is very biased it may be possible to start on Port, but a tack soon after starting will probably be necessary.

Routines

Starting is often a distracting time of the race as there are many boats sailing in close proximity to each other. It is good to develop a sequence of things to do. Here is one routine.

Before Warning	<p>Check the location of the Committee Boat and the first mark. Check the wind direction.</p> <p>Sail part of the first beat, checking the wind direction</p> <p>Determine which end of the line is best to start, and wait for the Warning Signal, always checking the wind direction.</p> <p>Determine the time to sail the length of the line, and where to be at the One-minute Signal to start at the best place.</p>
Warning Signal	<p>Check the time on the watch, confirm Class Flag.</p> <p>Check boat equipment. No weed on foils etc.</p> <p>Arrange to sail a distance that will get to the starting position and the position to be one minute before that.</p> <p>Check the wind direction</p>
Preparatory Signal	<p>Confirm time of the watch,</p> <p>Check the wind direction.</p> <p>Prepare boat – lower centerboard, adjust vang, open bailer etc</p> <p>Check the location of the fleet.</p> <p>Check progress to the one-minute position.</p> <p>(Some re-planning may be necessary at this point if the wind has changed or the fleet is gathering in a place that will block the preferred approach to the line.)</p>
One-minute Signal	<p>Make way to the line keeping clear air at all costs and not allowing a boat to get immediately below</p>
10 Seconds	<p>Pull away and go flat out.</p>

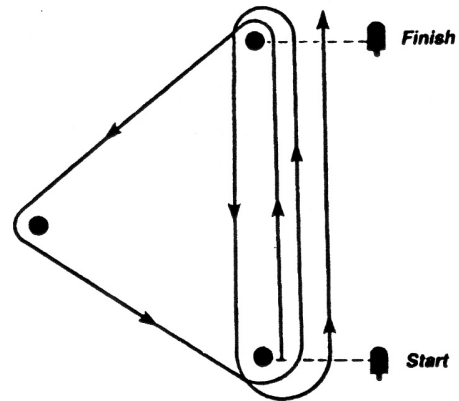
Lesson 2

This lesson focuses on the sailing of a course.

Courses.

Most yacht racing in open water is around a course comprised of triangles and windward and returns (or sausages). On occasions trapezoids or squares will be used.

Traditionally courses have been set with all marks to be rounded to the Port side of the boat. However with the introduction of RRS 18.3 in 2001, Starboard courses have become more common in international sailing. On the Lake, Starboard courses used to be common.



On confined waters such as Albert Park Lake, courses have to be constructed to suit the area available. Albert Park Yacht Club's courses are described on the course board which is generally located at the entrance to No 1 Boatshed. It is important to clarify how each race will be started and finished, not just the sequence of marks.

The use of the course board is fully addressed in the Sailing Instructions.

Marks of the course vary from club to club. Albert Park Yacht Club uses buoys on which a flag is mounted. These have the advantage that they give an indication of wind strength and direction at the mark. Some bay clubs use flags mounted on long sticks. However these have the disadvantage that in strong winds they are nearly blown flat. The most common mark used on the bay is the inflatable buoy.

Rules

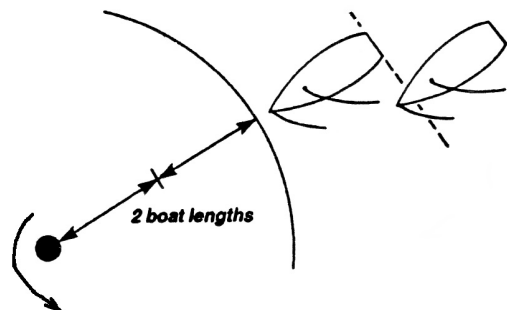
When approaching buoys and obstructions such as the edge of the lake, some modification to the right-of-way rules are required.

Rounding a Mark

Rule 18, the main aspects of this rule are given in the first couple of lines of 18.2(a) which says that an outside yacht shall give an inside yacht sufficient room to round the mark if an overlap is established when the outside yacht comes within two boat lengths of the mark.

Obstructions

Rule 19, when a close hauled yacht requires room to tack to avoid an obstruction, it may hail the yacht in the way for room. The onus is then on the hailed yacht to give sufficient room for the other yacht to



tack.

This rule is important for lake sailors as it is common for two boats to be approaching the lake wall together. The normal manner for this situation to be resolved is for the boat that is hailed to tack so as to leave the other boat room. However once both boats have tacked, the port-starboard rule applies so that a third yacht could cause the yachts to have to tack back toward the wall. The process of seeking room to tack then repeats itself.

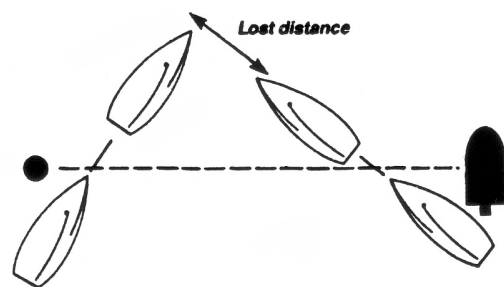
Sailing the Course

Rule 28, stipulates what is necessary to sail the course and that it is important to pass marks on the correct side and in the correct order.

Starting Strategy

There are four aims at the start:-

- to cross the line at the favoured end,
- to cross the line at full speed as soon as the starting signal goes,
- to have clear air,
- to be able to sail toward the favoured side of the course.

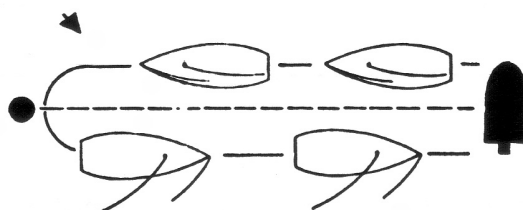


It is a good idea to be early to the start line so that the wind may be observed. It is normal for there to be slight bias in the starting line toward the flag, or pin end. Sometimes the bias is quite severe and it is in this case that a start at the end of the line closest to the wind should be sought.

The easiest way to judge bias is to sail up and down the line with the sail right out. If the sail flaps on one of these passes along the line then the boat is pointing toward the favoured end.

Dinghies accelerate quickly and so it is not necessary to charge the line to cross it with speed. It is normal to spend the last minute or so very near the line, in a position which allows quick acceleration over the line with clear wind. New skippers should practice sailing slowly near the starting line in readiness for the start.

If it is intended to start in the middle of the line, it is a good idea to sight some transits. That is to identify a fixed point which is in line with the starting line. This enables the position of the line to be identified even though the Committee Boat or the pin may be some distance away.



Lesson 3

This lesson focusses on making the boat go faster. But first, one aspect of procedure.

Race Procedure

In previous lessons the procedures for starting and sailing the course have been covered. There are a couple of minor procedural matters to complete the subject.

At Albert Park Yacht Club there is an official Race Noticeboard where all notices associated with racing are placed. These may include changes to the Sailing Instructions and changes to the racing programme. Also posted on the Race Noticeboard are the race results.

Albert Park Yacht Club tends to have two series a season, one will be a handicap and the other is a championship or scratch race. Handicaps are calculated for each skipper from previous race times and applied to the time taken to complete the last race. Improving skippers stand to do well under this system.

Faster Sailing

There are five aspects of making a boat sail faster:-

- Sail Trim
- Boat Balance
- Boat Trim
- Course made good
- Centreboard

Sail Trim

The most significant effect on boat speed is the trim of the sails. On Albert Park Lake where the wind changes constantly, sails have to be continually trimmed if the boat is to go at maximum speed.

The clearest guide to the sail setting are luff and leech telltales - that is wool or tape sewn onto the leech and both sides of the jib and mainsail.

The aim is to keep all the telltales flowing.

Upwind if the leeward telltales are not streaming it indicates that the boat is heading too low. If the windward telltales are not streaming the opposite is true or else the sail needs to be hauled in more tightly.

Most skippers sail their boats ignoring the telltales unless the boat doesn't feel right then they check them.

Telltales can also be used to assist in the adjustment of the sail. The leech telltales are especially helpful for this. If these telltales stream it is a sign that the sail is acting as a true aerofoil.

The aim is to carry as full a sail as possible with as tight a leech as possible without the streamers stalling. To do this the sail will need to be adjusted by using the vang, sheet, outhaul, fairleads etc. At this stage of the course it is sufficient for students to appreciate that if the leech streamers are

stalled, it is necessary to ease some of the tension on the leech, ie ease the vang, mainsheet, or in the case of the jib, ease the sheet or move the fairleads aft or out.

Where the mainsail is concerned, it is necessary upwind to increase the vang tension until the leech telltale is about to stall, and downwind, ease the vang to twist the sail and give it more fullness. If you watch birds in flight you will observe that they constantly change the shape of their wings. In light to moderate conditions sailors should develop similar sensitivity.

Boat Balance

As far as possible it is best to keep a boat vertical. When a boat heels over the centreboard and rudder do not work efficiently so that it increases its leeway, that is its speed side ways. Weather helm is also developed as the boat tries to head into the wind. Correction of this with the rudder which slows the boat down.

The exception is in very light winds when heeling the boat over helps keep the sail in shape.

Boat balance is maintained by sail trim and crew position. Crew positions should be comfortable, which implies that in heavy weather when it is necessary to lean over the side, or to 'hike' with toes under the straps, there is a certain level of fitness.

Boat Fore-Aft Trim

It is important that boats are properly trimmed fore and aft if they are to go at maximum speed. If the stern is dug into the water, the boat will slow down because of the additional drag. If the nose is too low in the water, waves may start to come into the boat over the bow. The boat also creates more waves when its bow is dug in and this slows the boat down.

Generally the boat should be kept level. To do this the position of crew weight will need to vary depending on wind strength. In light weather the crew weight should be forward, while in heavy weather the crew weight will need to be further aft, especially when sailing in choppy water.

Course Made Good

The shortest distance between two marks is a straight line and this will often be the quickest course to sail. However to do so will require compensating for tide and the sideways drift of the boat.

There are many other considerations including, wind gusts, waves, wind shadows, shallow water, the position of other boats.

Centreboard

The centreboard should be trimmed for the different legs of the course. It should be fully down upwind, half way down for reaching and a little less for running. In very heavy weather the centreboard is sometimes raised a little more than in light weather. This allows the boat to slip sideways in gusts and to dissipate the heeling moment.

Personal Preparation.

Issues of personal safety equipment have been addressed in earlier courses. There are a number of matters which need to be addressed to assist with racing.

Fitness is important. Sailors need to keep their boats upright in strong winds and to think clearly through out the race. If racing is done to the limit, the odd capsize may be expected and it is important that the boat can be righted quickly. Nothing tests fitness like a few capsizes.

Mental Attitude is more important in sailing than it is in many sports as sailing is done by feel and requires many strategic decisions. It therefore requires a certain relaxed disposition ie low anxiety and detachment. The mind needs to be free to focus on the race and the required strategies. Sailing must become instinctive so that the mind can concentrate on strategic decisions.

Local knowledge is also important. Wave patterns under different wind conditions, tidal variations, wind variations, are all significant. On the lake there are areas of wind shadow which have to be allowed for. When going to a new venue, always note the course sailed by the local sailors.

Lesson 4

Alternative penalty

It is unsatisfactory if after making all the necessary preparation, a boat makes a mistake and is disqualified from the race. To overcome this finality most races allow for an alternative penalty for the offending boat.

This is notified in the Notice of Race and Sailing Instructions. The most common penalty is to do two 360 degree turns. These need to be done away from other boats and as soon as possible after the incident.

Weather

Sailors should be able to read a weather map and determine expected wind direction. In the southern hemisphere wind tends to travel anti-clockwise about highs and clockwise about lows. The strength of the wind in these directions may be judged by the distance between the Isobars; the closer the isobars, the greater the pressure variation and the stronger the wind.

This general pattern is modified during the summer with the development of sea breezes along the coast. In Melbourne these have a south westerly direction, while in Sydney they are north easterly. When the pressure pattern is not strongly opposed to the sea breeze, the sea breeze may be expected.

Sailors should develop their capacity for observation, noting the wind and cloud patterns which occur as the weather map changes. There is no substitute for experience.

Boat Tuning

Tuning a boat is a skill which needs to be developed in conjunction with sailing ability.

The main indicators of a tuned boat are its light feel on the helm and its capacity to accelerate when hit by a gust of wind. Boats which have significant weather helm, ie the tiller pulls away from the skipper, or which simply heel over when a gust hits are not tuned.

Tuning a boat is done by:-

- moving the mast fore and aft,
- raking the mast fore and aft,
- moving the centreboard fore and aft.

In theory the aim is to have the Centre of Effort just behind the Centre of Lateral Resistance. No one calculates the actual position of these points and tuning is done by trail and error.

If the boat has too much weather helm, the mast may be moved or raked forward or the centreboard moved aft. If there is lee helm, the opposite applies.

Upwind strategy

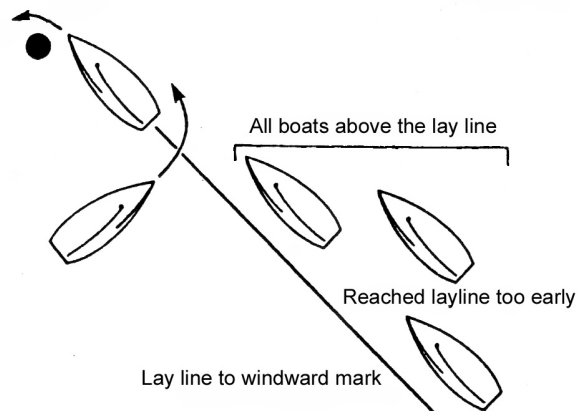
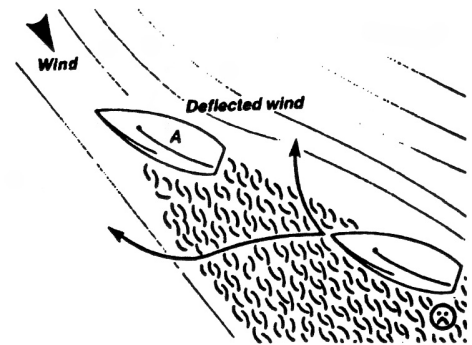
Strategy upwind has to be devised to cope with other boats in the fleet and to allow for wind shifts.

It is common for wind to oscillate in direction. This can be used to advantage by being on the tack which takes advantage of different wind direction. By tacking each time the wind "knocks" a boat is able to shorten the distance sailed to the windward mark.

The second aspect which is important toward the end of a race is to cover boats behind. This can be a tight cover which actually aims to interfere with the wind of the following boat. This type of cover can result in a tacking duel where both boats lose ground. It may therefore be counter productive.

More common is a loose cover which involves keeping approximately between the boat behind and the next mark so that any advantage from a wind change obtained by the following boat will also be experienced by the covering boat.

Lay lines must be identified if a boat is not to overshoot the windward mark and sail extra unnecessary distance. It is also a good idea to get to the layline near the windward mark. When a boat reaches the layline a long way from the mark its options in a shifting breeze are limited and the chance of misjudging the layline are greater.



Lesson 5

Protests

Protests are often unpleasant affairs. Many yachtsmen have intensely emotional memories of their experiences around the protest room. One of the reasons for this is that protest committees generally have limited experience. They are also often dealing with inadequate information.

As a result most sailors avoid the protest room where possible. However it is important to develop a confidence in handling protests as it will be necessary to visit the protest room from time to time.

Protests need to be lodged on a prescribed form, within a certain time of the end of the race. There is precise procedure of notification required starting with the immediate informing of the offending boat and displaying a protest flag.

The protest will be heard by a committee of people made up from the race committee of the club. The duty of the protest committee is to find the facts. They then make a decision on those facts. This decision is open to appeal to the State body, but the facts remain unchanged for any subsequent appeal.

It is therefore essential to get witnesses if involved in a protest. The establishing of the facts is vital - interpretations of the rules can then be argued about later.

Protests should not be held in a legal style but rather in the form of an inquiry. Rule 63 sets out the procedure for a protest. Both parties must be present as evidence is given and they have the right to question witnesses.

It should be noted that disqualification for certain infringements, notably Rules 2, 42 & 67, have to be included in a boat's final score.

Reaching and Downwind strategy

Reaching maybe considered by some to be the relaxed point of sailing, until other boats start passing. Constant trimming of the sails is essential to keep the telltales streaming and to compensate for the changes in effective wind direction as the speed of the boat varies.

After rounding the mark it is necessary to decide whether to steer a straight course to the next buoy, or whether to go high or low. In gusty conditions the high route is often selected so that it is easy to bear away during the gusts. It is also easier to keep clear air.

Sometimes the low course is better as it is possible to increase speed approaching the next mark because of the need to sail higher.

On a run it is important to keep clear wind. Move away as soon a boat comes within a couple of boat lengths astern. It will often be necessary to gybe on the run. Time this to be well before the leeward mark so as not to have too much to do at the leeward mark.

Spinnakers

Many two person boats have a third sail, a spinnaker, which is used for assistance down wind and when reaching. The use of a spinnaker adds considerably to the excitement of sailing down wind.

Most spinnakers are symmetrical. They are hoisted to a point on the mast above the stays. One of the bottom corners is held out by a pole and the other is held by a sheet. The pole is fastened to the mast and has an uphaul to keep it from sagging. The end of the pole is held by a guy rope.

The pole has clips on each end to allow it to be released easily from the ropes and the mast. There are many hoisting sequences. This is one:-

Skipper	Hoist spinnaker
Crew	Attach brace to pole
	Attach uphaul to the pole (if disconnected)
	Attach pole to mast
Skipper	Secure brace
	Adjust uphaul
Crew	Pull on sheet

To drop the spinnaker

Crew	Release sheet
Skipper	Release uphaul and brace
Crew	Remove pole from mast and spinnaker and place on boom
Skipper	Keep some tension on brace
Crew	Gather in bottom of spinnaker starting with the sheet or guy.
Skipper	Release halyard
Crew	Pull spinnaker down
	Pack spinnaker away and secure sheets.

Lesson 6

Trapezing

Trapezes are used on many classes of boat. They enable the crew to move their weight further outboard and at the same time remain comfortable.

The trapeze harness used should be comfortable and an adjustable hook height control system is preferred to one that is fixed.

To get out on trapeze it is necessary to hook up, adjust the length, slip the back side over the gunwale and put the front foot onto the gunwale, near the side stay. Then put the aft foot onto the gunwale and push out with both legs, keeping the front leg straighter than the aft leg to compensate for the forward pull of the wire.

To return to the boat the procedure is reversed.

Trapezing is difficult on the lake because of the variability of the wind. This necessitates many compensating changes by the crew. However it is one of the great sporting experiences and should be tried by all.

Glossary

OOD

Officer of the Day, responsible for running a race or series of races.