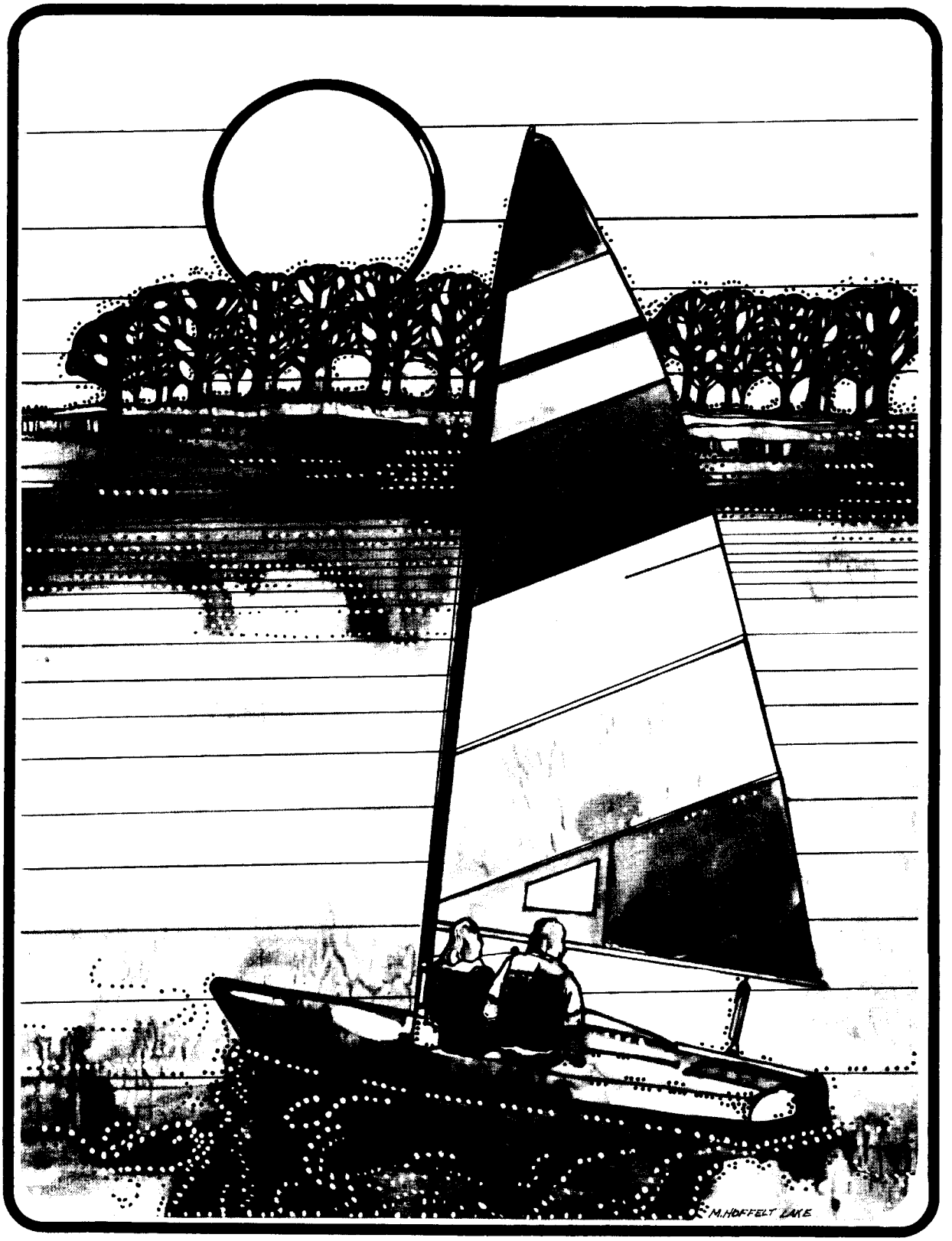
SAILING IS A BREEZE



OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF WATERCRAFT

FOREWORD

Welcome to the exciting world of sailing—one of the fastest growing participant sports in the country! The number of people enjoying some form of sailing reaches into the millions yearly.

This booklet will help you learn the basics of sailing while making you aware of safe boating practices.

The interest and personal pride the Division's District One (Columbus) staff has for this project is apparent in the pages that follow. You will find "Sailing is a Breeze" your first step to a sport which will give many years of personal satisfaction.

The Division of Watercraft
1952 Belcher Drive Bldg. C-2
Columbus, Ohio 43224

SAILING IS A BREEZE

TABLE OF CONTENTS

HOW TO BE SAFE ON THE WATER	page 1
MARLINSPIKE SEAMANSHIP, NOMENCLATURE OF A SAILBOAT, RIGGING A LASER	page 3
WHY A SAILBOAT SAILS, POINTS OF SAIL, DETERMINING WIND DIRECTION	page 12
TECHNIQUES OF SAILING, BUOYS - MARKERS ON THE WATER, RULES OF THE ROAD	page 20

Written by the
Division of Watercraft District One Staff
Columbus, Ohio

Anyone can learn to sail. It does not require years of training. By learning the basic theories from a textbook, and then getting into a boat and trying them out, many people become good sailors. A few of the many words a good sailor must learn and be familiar with are hidden below. The words are arranged horizontally, vertically and diagonally, forward and backward. How many can you find?

C O D A G G E R B O A R D S H R O U D
O L A N M A W U A C H O I O E J N U R
M G O T R S E M I A F B S L N T F O A
E D A S E S A I L B O A T S L E H O O
A E S A E O T N E E U N R E X C K G B
B A E L E R H I R A T D E C N A N S R
O L V L A D E A G M I B S A S T A I E
U A O A C A R A V E L O S T A A T H T
T K L B L G V B C T L U F F V R R M N
O R B J I B A U R H E L L O E M A S E
K E R K F R N N W O R D A S A A P R C
C S O N E D E S I G N O G I F R E G R
O I A W J H I P A C D C N H E A Z E I
L L D Y A C M I Q U E S T A E N E M H
B B R O C O O N I L A F D H I B T D G
A O E J K P K N D I D E O K D L E R T
T T A I E L L A L K R L H E L G B A F
T H C L T A C K O E D G N M E N F Y W
E T H S D T E E T R S E X L L I O L A
N O A N V E D R A W D N I W P G Y A R
E M U O L P C W O R B V F A I G O H D
T O T S H E E T U T I C D R B I J R E
F O O T B E L B F R U D D E R R S O E
A B R E L D D A P P L H C E E L O T L

LIFE JACKET
ONE DESIGN
CATAMARAN
MAINSAIL
BOOM
MAST
RUDDER
TILLER
DAGGERBOARD
CENTERBOARD
KEEL
JIB
SPINNAKER
BATTEN

BALLAST
RIGGING
WEATHER VANE
BLOCK
BURDENED
PRIVILEGED
CLOSE REACH
BROAD REACH
WINDWARD
LEEWARD
COME ABOUT
TACK
BEAT
RUN

LUFF
ABEAM
ANCHOR
PADDLE
BAILER
DISTRESS FLAG
FOOT
LEECH
SHROUD
SHEET
SPREADER
TRAPEZE
HALYARD

Thunderstorms with lightning are a hazard to sailors since their boats carry tall metal masts.

Also beware of high voltage wires when rigging your boat at the launch area, or when on the water.

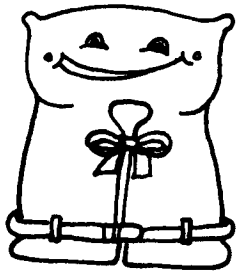
Now that you know about the equipment to help keep you safe, the next step is to learn about the boats and the techniques of sailing. Then you will be ready to enjoy this exciting sport!

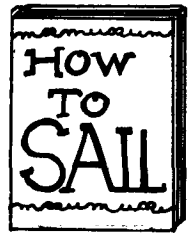
SAILING RISKS

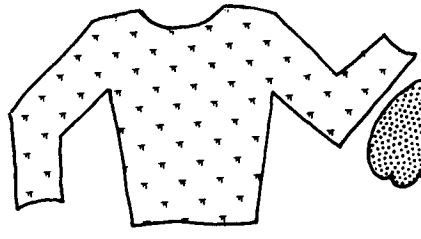
INEXPERIENCE
UNFAMILIARITY WITH BOAT
IMPROPER CLOTHING
NOT WEARING LIFE JACKET
COLD WATER
CHOPPY WATER
TOO MUCH WIND
ACCIDENTS—(CAPSIZING, FALLING OVERBOARD, BEING HIT BY THE BOOM)
STORMS/LIGHTNING
NOT MANY OTHER BOATS AROUND
HIGH VOLTAGE WIRES
COLD TEMPERATURE (AIR)
COLLISION

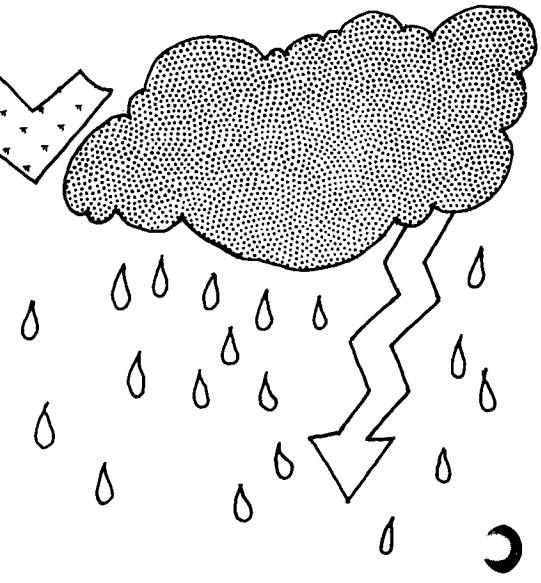
WAYS TO MINIMIZE SAILING RISKS

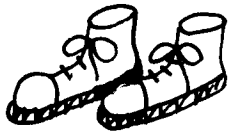
WEAR LIFE JACKET
LEARN HOW TO SAIL
WEAR WARM CLOTHES
PAY ATTENTION TO WEATHER
GO OUT WITH OTHER PEOPLE
USE COMMON SENSE

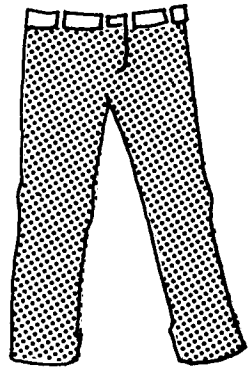








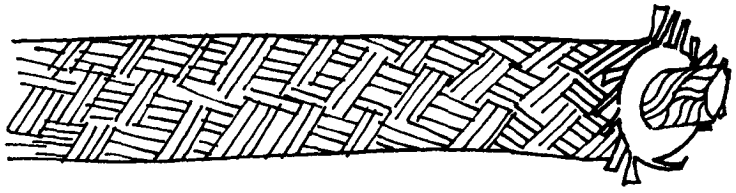




MARLINSPIKE SEAMANSHIP

"Marlinspike Seamanship" is the term used by sailors to describe the preparation and care of lines for boating. Any rope being used on a boat is referred to as "LINE." You'll be handling a variety of these lines as you rig a sailboat in preparation to get under way. Through these lines your sailing commands will be transmitted to the boat. By rigging them properly and providing them with simple care, your sailing experience should come off without a hitch.

Today's sailing lines are made from synthetics and are practically carefree, much unlike the mildew and rot-prone natural fiber lines of the past. Generally made of nylon or polypropelene, they have an abrasion resistant outer mantle over a load bearing inner core.



Their construction and the added cost of man-made fibers make sailing lines expensive. Care for the lines so they won't need to be replaced. By following these simple DO's and DON'Ts you'll keep replacement costs to a minimum.

DO

1. Take care to keep lines out of the mud and dirt found along shorelines.
2. Remove excess dirt from the lines before storage by washing them in nearby water or use a gentle hose stream. Dirt left clinging to a line will work itself between the fibers and cause damage.
3. Treat the ends of freshly severed lines so they will not unravel. Hold the end to a match until the core and mantle melt and run together. Let it cool slightly, and then twirl the end between your thumb and forefinger to produce a hard, tight taper.

DO NOT

1. Put wet lines into closed sailbags without an opportunity for them to dry in the near future. A line that remains wet will be ruined.
2. Use a cut or frayed line. If the core is exposed, the line needs to be replaced.

KNOT TYING

A knot will transform a simple line into a useful tool. As a sailor, you'll need to develop a repertoire of a few simple knots. These knots are best learned through practice. Whether tying a package or hanging a clothesline, use your sailing knots frequently and they will quickly become second nature.

Learning to tie knots is made easier when different sections of the line are assigned names. This will help you, the student, understand which portion of the line is being discussed. Follow your instructor's lead carefully, and knot tying should come easy. If you become confused, refer to the illustrations.

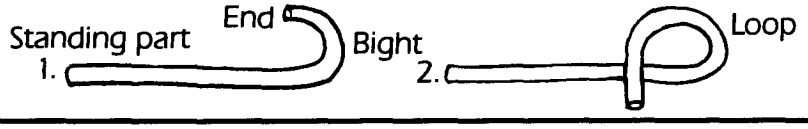
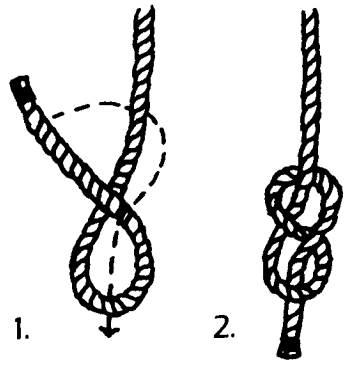


FIGURE EIGHT

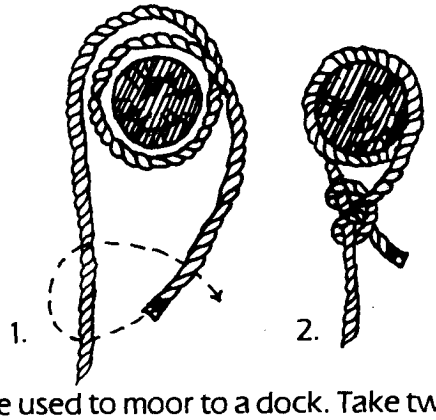


Used as a "stopper" knot, will keep lines from running through blocks or jam cleats.

SQUARE KNOT

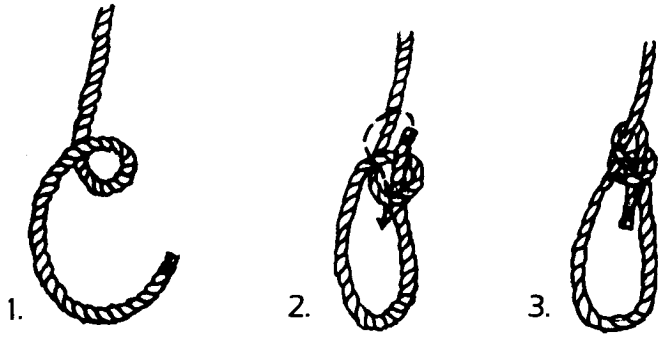
Used to join together two lines of equal size.

ROUND TURN AND TWO HALF HITCHES



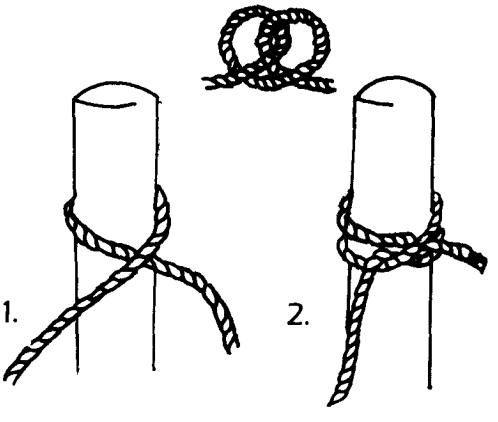
Can be used to moor to a dock. Take two round turns around the post and lock in with two half hitches.

BOWLINE



Used to make a loop that won't slip. Attach lines to the sail and tie off the mainsheet with a bowline.

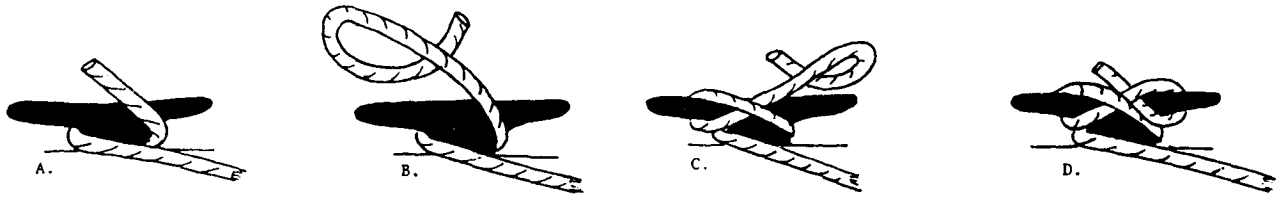
CLOVE HITCH



Used to moor to a post temporarily.

CLEATING OFF

If you spend much time around boat slips, or on board a boat, you'll soon learn to recognize the horn shaped objects called "CLEATS." They allow you to fasten off the end of a line without tying a knot. This technique will be demonstrated by your instructor and is called "CLEATING OFF." Notice during the demonstration that it requires only a few turns around the horn for the line to become secure.

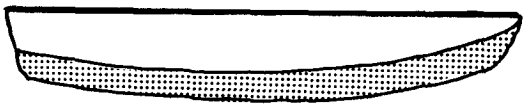


There is another type of cleat found on the deck and the boom of the boat. It is called a "JAM Cleat." To make the line fast, pull it through and press it down into a ridged groove which holds it, then tie a figure eight knot at the end for a stopper.

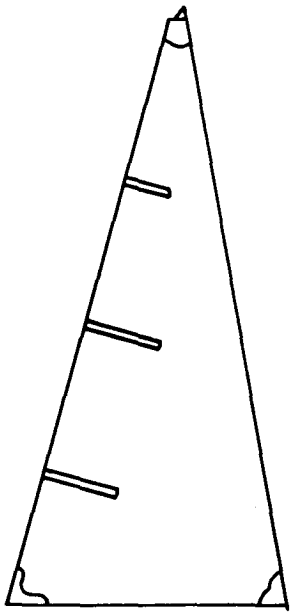
SAILBOAT NOMENCLATURE

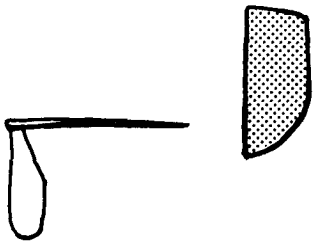
Sailboat nomenclature is important. The sailboat has many parts, and in this class we are going to teach you only the basic terms. There are many books with more detailed information available.

It will be easier to learn the nomenclature if we divide a sailboat's parts into four groups: the hull, steering assembly, standing rigging, and running rigging.

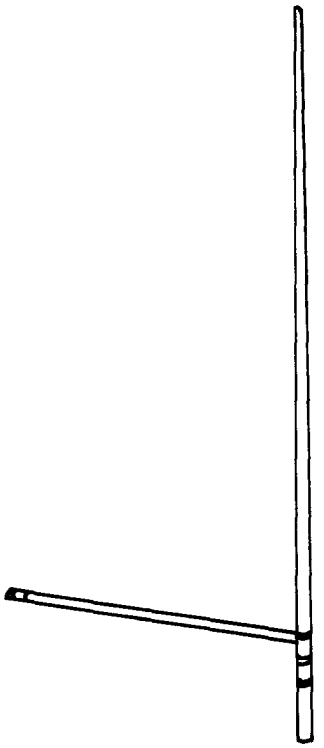


Hull





Steering

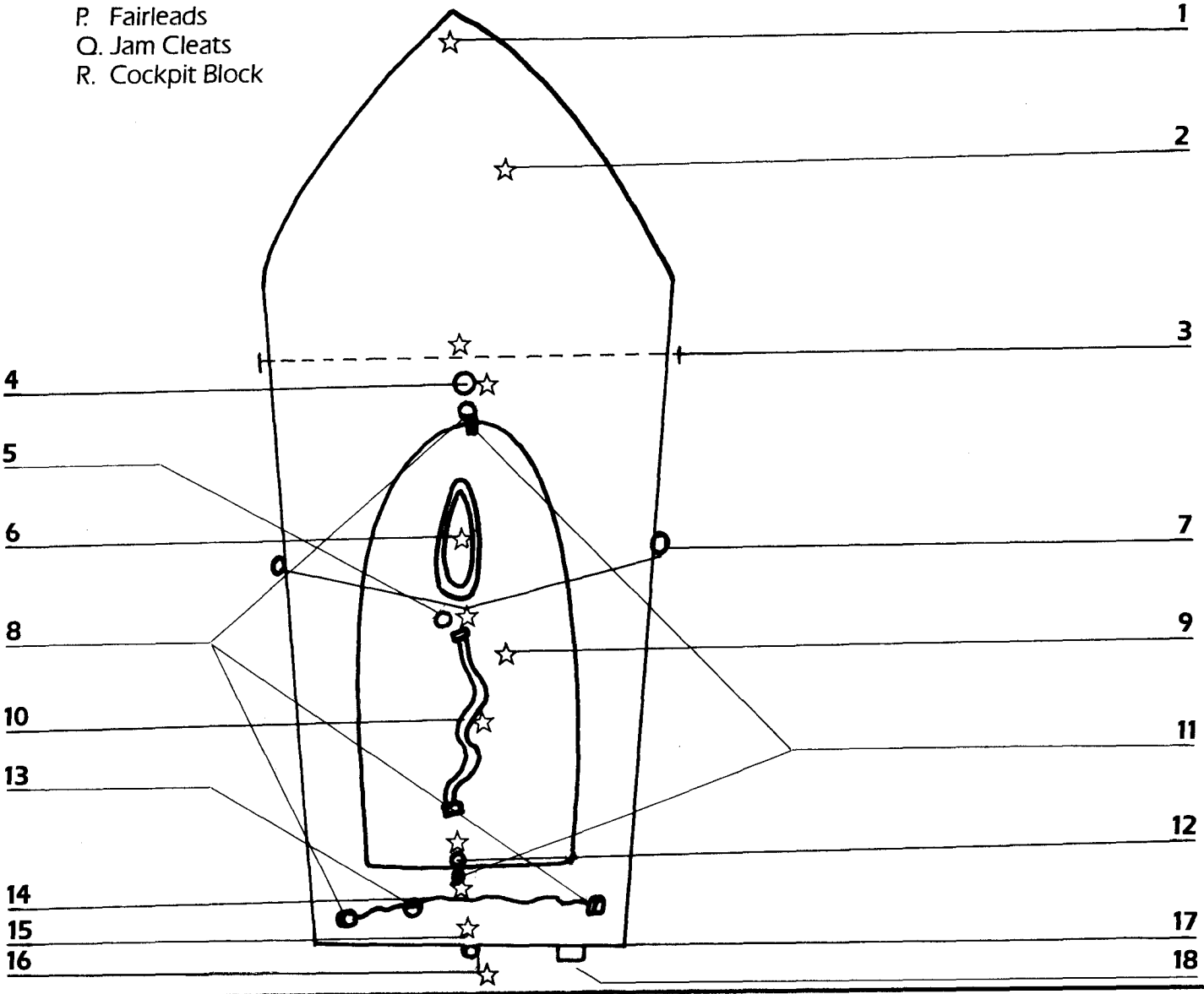


Running Rigging **Standing Rigging**

THE HULL

The parts of the hull of the Laser sailboat are lettered below. Label the parts of the hull with the appropriate letter.

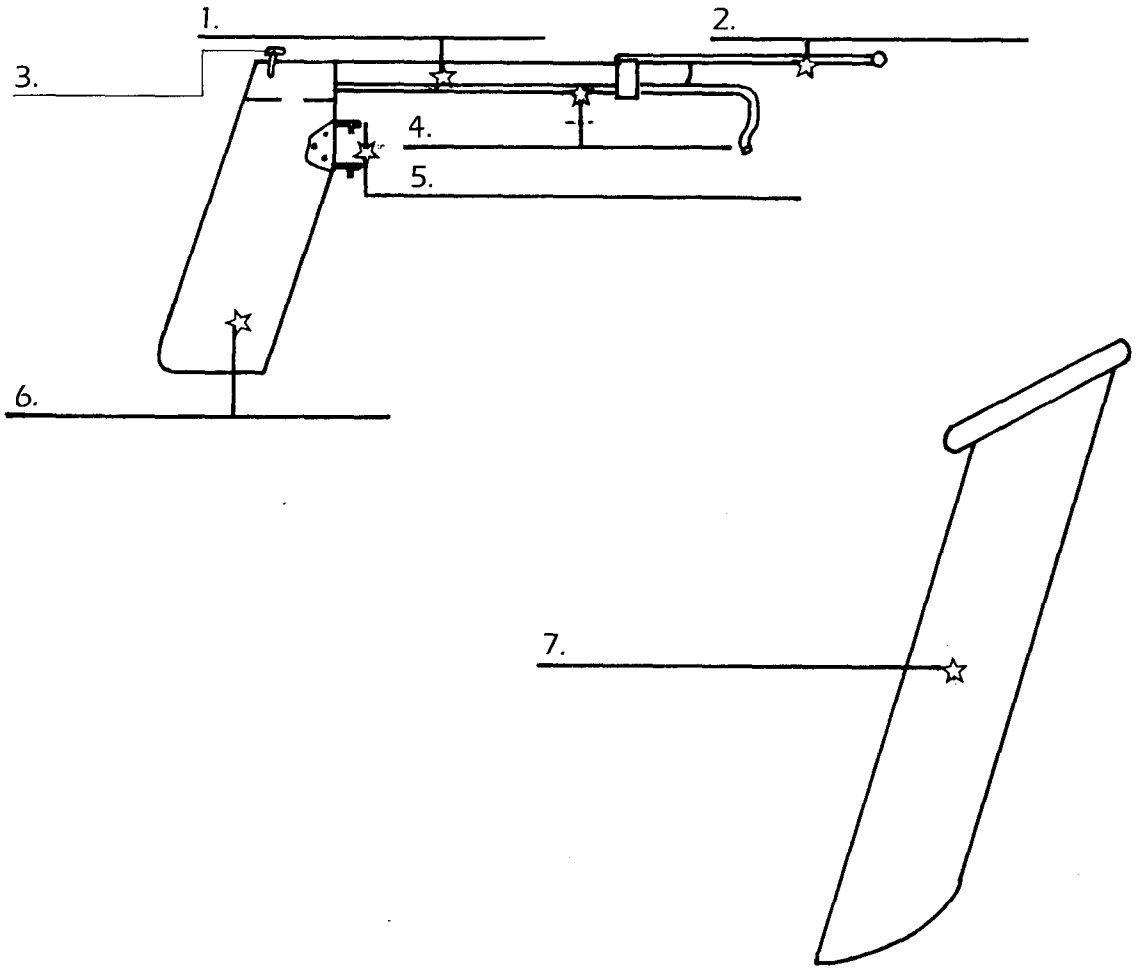
A. BOW — The front of the boat.
B. STERN — The back of the boat.
C. TRANSOM — The rear edge of the boat.
D. BEAM — The widest point of the boat.
E. COCKPIT — Sunken area where you will sit and place your feet.
F. DAGGERBOARD TRUNK — Slot where the daggerboard is inserted.
G. HIKING STRAPS — Line or webbing in the bottom of the cockpit. You can place your feet under the strap so you won't fall out of the boat.
H. DRAIN PLUG — Hole in cockpit where water can drain out of the boat.
I. DECK — The covered area toward the bow of the boat.
J. TABERNACLE — Place to mount the mast in the deck of the boat.
K. GUNWALE — The upper edge of the side of the boat. The term is from the past when ships carried guns along a wall.
L. TRAVELER — Line and blocks at the stern of the boat to which the mainsheet is attached.
M. GUDGEON — Fittings on the transom where the rudder is inserted.
N. Hull drain plug
O. Traveler Block
P. Fairleads
Q. Jam Cleats
R. Cockpit Block



THE STEERING ASSEMBLY

The parts of the steering assembly are lettered below. Label the parts of the steering assembly with the appropriate letter.

A. RUDDER — Fiberglass piece attached to the stern of the boat; used for steering.
B. PINTLES — Pins that attach the rudder to the hull.
C. TILLER — Handle which turns the rudder and steers the boat.
D. HIKING STICK — Extension on the tiller which is used to steer the boat if you want to lean out over the side.
E. RUDDER LINE — Line which you pull to lower the rudder in at least two feet of water. This line must be cleated on the tiller so that you can steer the boat.
F. DAGGERBOARD — Board which is inserted into the daggerboard trunk in at least two feet of water.
G. TILLER RETAINING PIN



THE STANDING RIGGING

These are the parts of the rigging which are permanently secured such as the wires which support the mast. On small boats such as the Laser, however, the mast will be raised and lowered each time the boat is sailed. Label the parts of the standing rigging with the appropriate letter.

A. MAST — Metal pole which is mounted vertically at the tabernacle on the Laser and supports the sail.

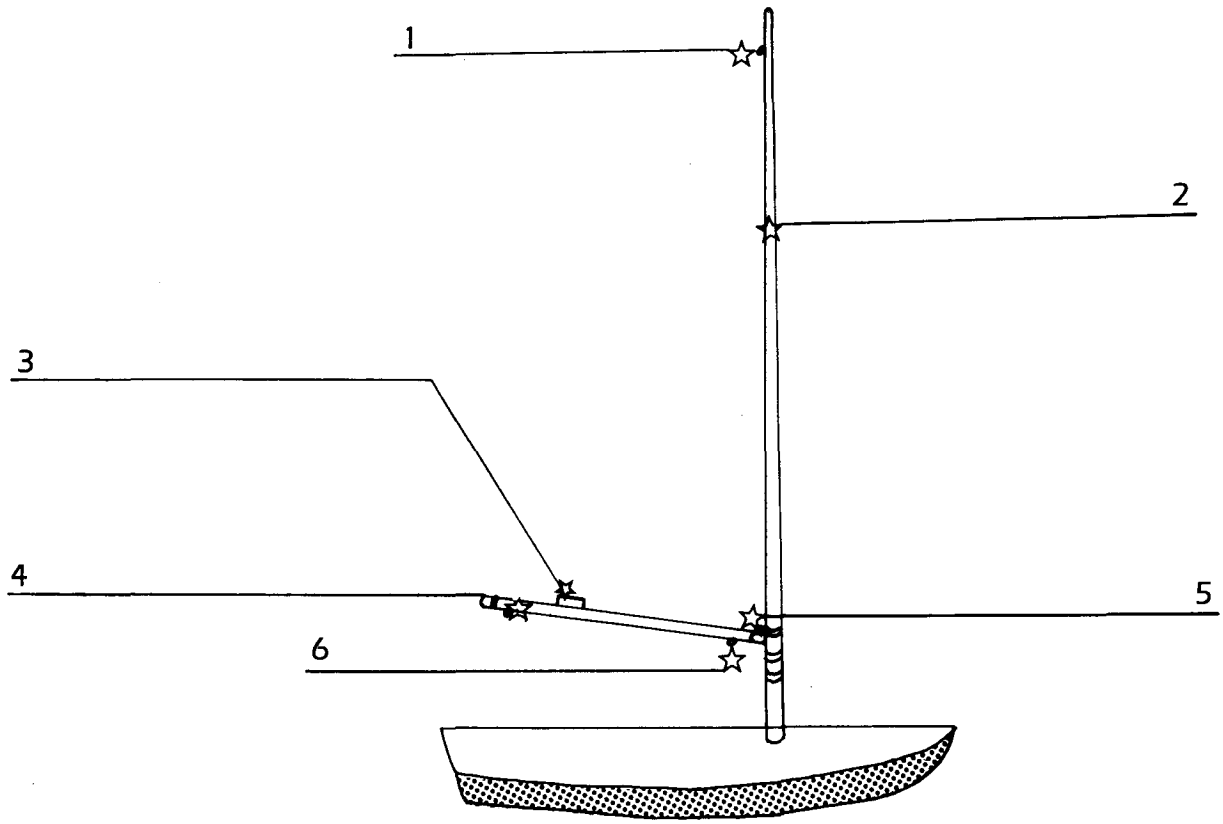
B. BOOM — Metal pole which attaches horizontally to the mast. The bottom of the sail is attached to the boom. CAUTION: This pole got its name from hitting people in the head.

C. SPARS — This term refers to both the mast and the boom.

D. FAIRLEAD — An eyelet that changes the direction of a line fed through it.

E. GOOSENECK — Place where the boom is secured to the mast.

F. BLOCKS — Pulleys on the boat through which line is fed. (Forward boom block and AFT boom block with BECKET)



THE RUNNING RIGGING

These are the parts of the rigging which are movable on the boat such as the lines which are used in setting and trimming the sails. Label the parts of the running rigging with the appropriate letter.

A. MAINSAIL—Large sail hoisted directly on the mast.

B. HEAD—The top of the sail.

C. FOOT—The bottom edge of the sail which attaches to the boom.

D. LUFF—The leading edge of the sail which attaches to the mast. When the sail flutters along this edge it is "LUFFING."

E. LEECH—The back edge of the sail which remains unattached.

F. TACK—The corner of the sail which attaches where the boom and the mast meet.

G. CLEW—The corner of the sail which attaches to the end of the boom. The "CLEW HOLDER" an elastic line with a metal clip, is fastened through the grommet and holds the sail to the boom.

H. BATTEN—Small strips of wood or fiberglass which are inserted into pockets along the leech to keep this edge of the sail from folding over.

I. HALYARD—The line used to raise the sail up the mast. The name originated from the order "Haul up the yards" given when large cotton sails had to be raised on the old ships.

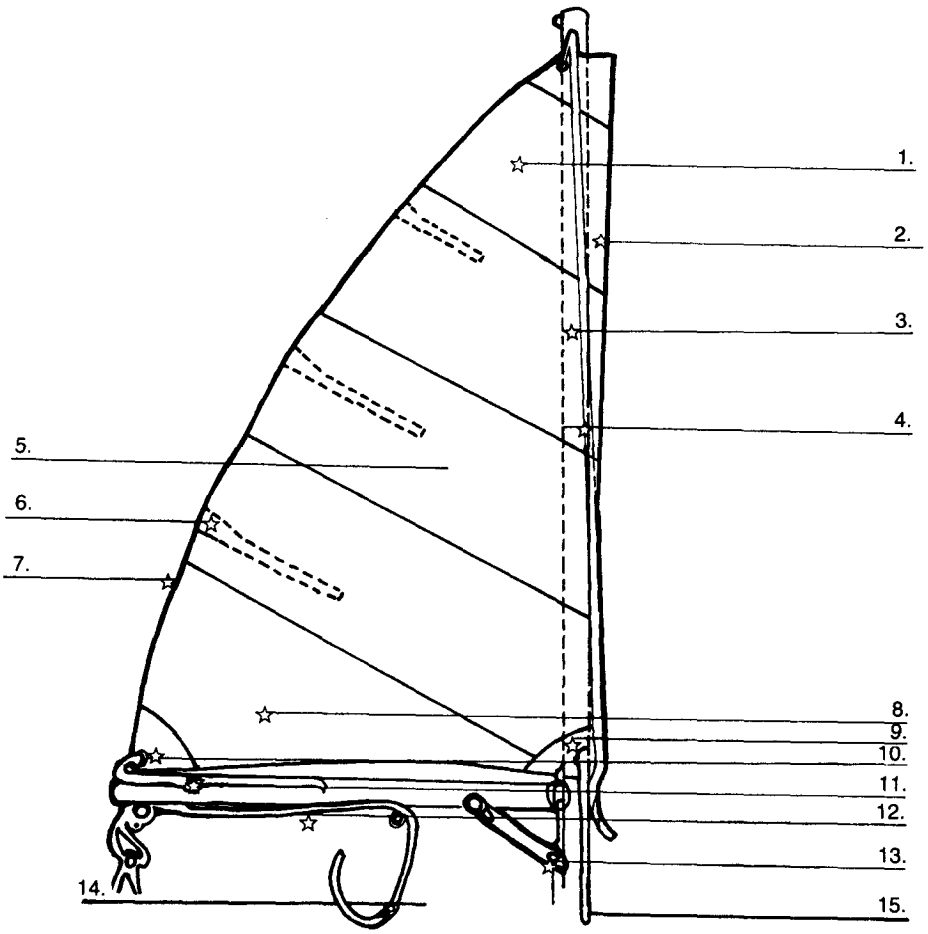
J. DOWNHAUL—Line used to adjust the luff edge tension. Passes through the tack of the sail and is cleated off on the hull.

K. OUTHAUL—Line used to adjust the foot edge tension. Passes through the clew of the sail and is cleated off on the top edge of the boom.

L. MAINSHEET—Line which controls the boom and the position of the sail.

M. SAILSOCK—The sleeve along the luff edge of the sail which slips over the mast.

N. BOOM VANG—Line system which controls tension on the boom.



DIRECTIONS ON A BOAT

The following words are used to indicate directions:

A. FORE — Forward; or the forward part of the boat.
B. AFT — Toward the rear; or near the stern of the boat.
C. STARBOARD — To the right; or the right side of the boat.
D. PORT — To the left, or the left side of the boat.

HINT: TO KEEP YOUR DIRECTIONS STRAIGHT JUST REMEMBER THAT **PORT** AND **LEFT** EACH HAVE FOUR LETTERS IN THEM.

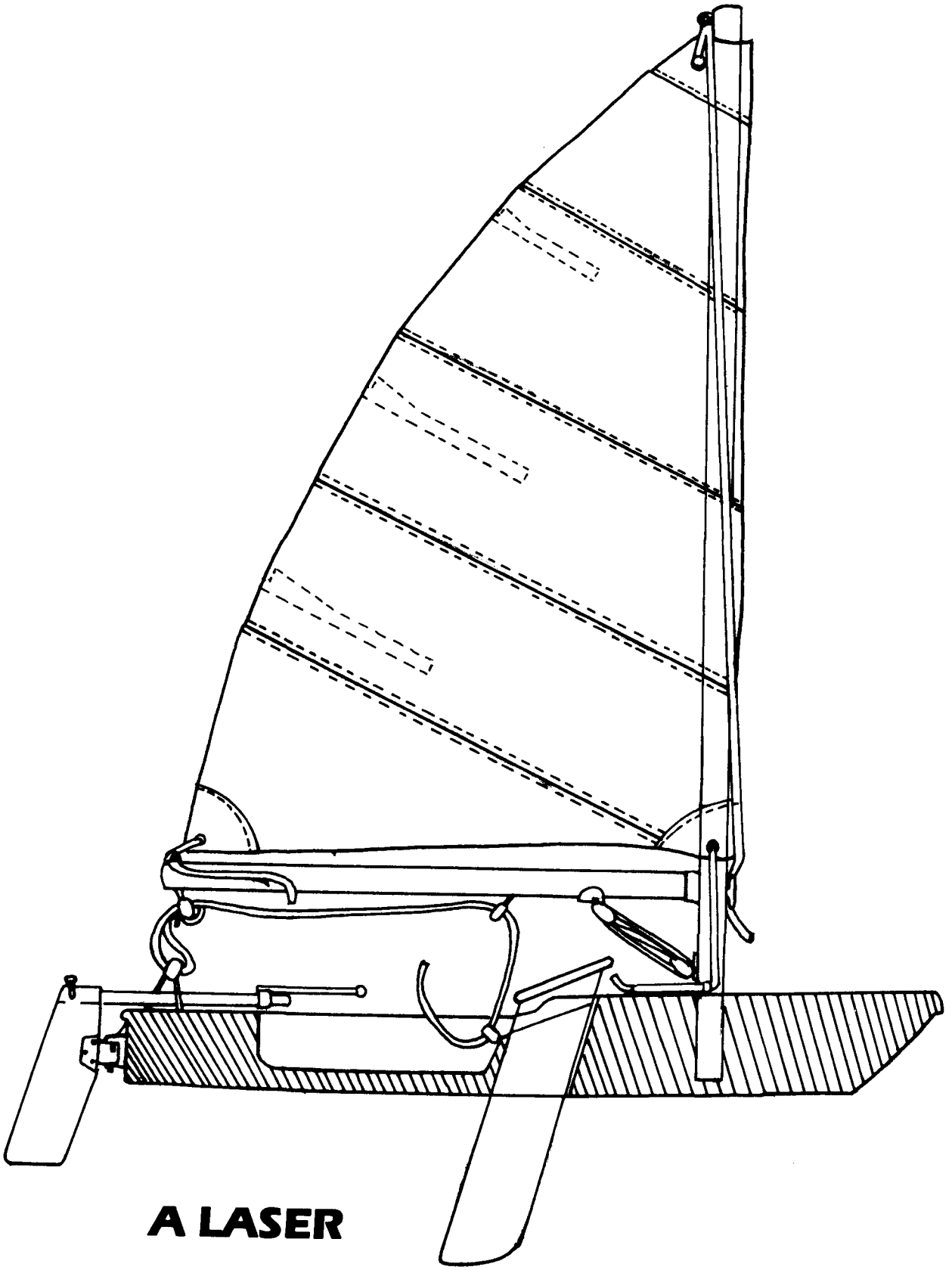
RIGGING A LASER

The Laser is one of the most complicated small boats to rig. But, after learning to successfully rig the Laser , you should be able to rig any board sailboat.

Use the following steps to rig the Laser :

1. Position the HULL so that the BOW of the boat points into the wind.
2. Put the two sections of the MAST together.
3. Unfold the MAINSAIL and insert the three BATTENS into the BATTEN POCKETS.
4. Slip the SAILSOCK over the top of the MAST and pull the MAINSAIL completely down the MAST.
5. STEP the MAST into the MAST STEP HOLE located on the HULL.
6. Allow the MAINSAIL to luff and reposition the HULL so that the MAINSAIL is luffing over the centerline of the HULL.
7. Attach the BOOM to the GOOSENECK on the MAST. Run the MAILSAIL OUTHAUL through the OUTHAUL FAIRLEAD, and through the JAM CLEAT on top of the BOOM. JAM the OUTHAUL and tie a figure eight knot at the end of the line.
8. Take the MAINSAIL DOWNHAUL through the FAIRLEAD on the boat hull running AFT then through the JAM CLEAT. JAM the DOWNHAUL and tie a figure eight knot at the end of the line.
9. Fasten the CLEW HOLDER cord around the BOOM.
10. Attach the MAINSHEET BLOCK to the TRAVELER BLOCK.
11. Rig the MAINSHEET in the following order:
    A. Take one end of the MAINSHEET and run it through the COCKPIT BLOCK in the boat's COCKPIT, running forward.
    B. Run the MAINSHEET through the FORWARD BOOM BLOCK mounted forward on the BOOM.
    C. Run the MAINSHEET through the METAL U-RING and then the AFT BOOM BLOCK mounted on the underside of the BOOM.
    D. Run MAINSHEET through the larger MAINSHEET BLOCK which is attached to the TRAVEL BLOCK.
    E. Finally, pull the MAINSHEET back through the BECKET at the end of the AFT BOOM BLOCK, and tie a figure eight or bowline with the end of the line.
    F. Tie a figure eight knot in the end of the MAINSHEET lying in the COCKPIT. Be sure there are no kinks or tangles in MAINSHEET.
12. Mount BOOM VANG: the end with the T-SHAPED clip is slipped into the HOLDER located on the underside of the BOOM. Take up the slack in the line.
13. Take the TILLER and slide it onto the RUDDER. Insert the TILLER RETAINING PIN through the RUDDER and the TILLER. Make sure the LINE from the RUDDER is clear.
14. The TILLER should be placed under the MAINSHEET TRAVELER. Insert the PINTLES (rudder pins) into the GUDGEONS (brackets located on the transom). Make sure the METAL TAB is locking the PINTLES down.

15. Place the DAGGERBOARD in the HULL'S TRUNK. (But not until the water is deep enough)
Now your Laser is fully rigged and ready to sail.
To derig a Laser just reverse the above steps, making sure that:
    1. The MAIN HALYARD, OUTHAUL, DOWNHAUL AND CLEW HOLDER remain attached to the MAINSAIL.
    2. The MAINSHEET TRAVELER is left attached to the HULL.
    3. The BOOM VANG is left attached to the MAST.

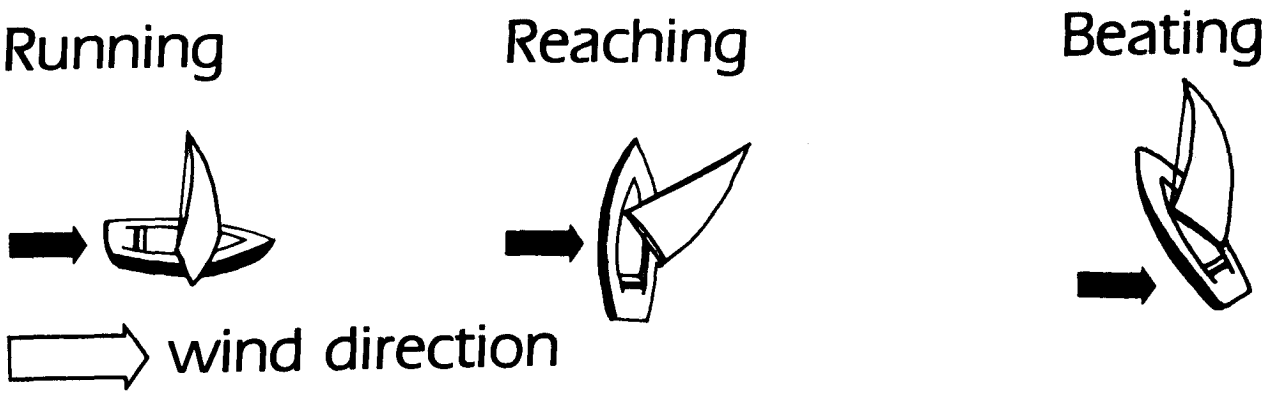


A LASER

WHY A SAILBOAT SAILS

To be a good sailor you must understand how a sailboat moves in the wind, and why it can sail only in certain directions and not others!

There are three positions a sailboat can sail using the wind: RUNNING, REACHING and BEATING. The positions are determined by which direction the wind is blowing relative to the boat's direction of travel and the position of the sail.



RUNNING

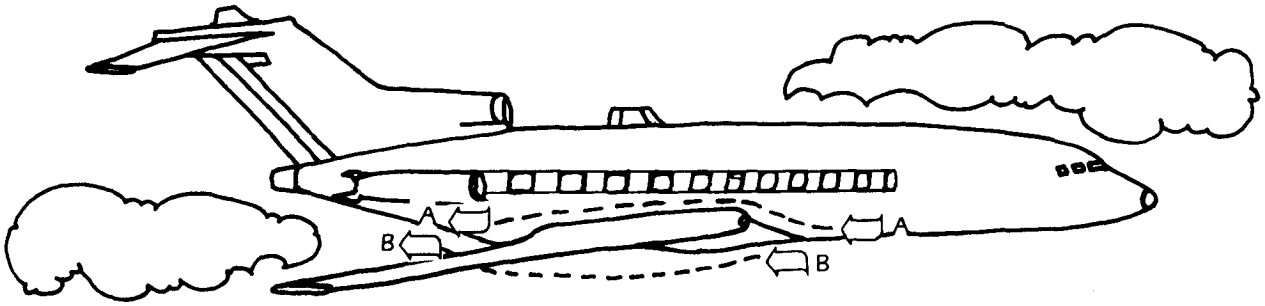
The boat sails with the wind blowing from directly over the stern of the boat. The sail is positioned at a 90° angle with the boat so the wind can push the boat forward. The speed of the boat will be slower than the wind speed due to the resistance as the boat moves through the air and water. To increase the boat speed slightly, you may raise the daggerboard to decrease the water resistance.

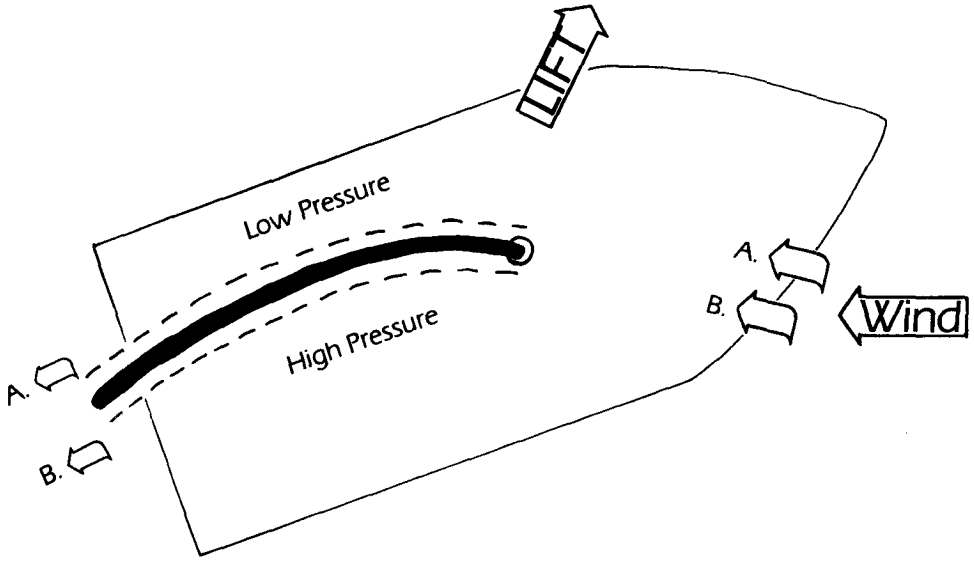
1. Why will it be impossible to sail on a run and try to turn around (180°) and come straight back?

REACHING

The boat sails across the wind. The sail is positioned at a 45° angle to the boat. To understand how a sailboat can sail with the wind blowing across the side of the boat, the aerodynamic principle of a sail and an airplane wing must be considered.

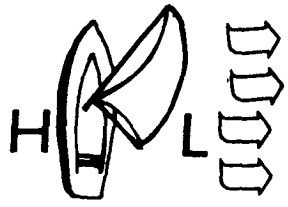
The aerodynamic principle was first explained by Swiss scientist Daniel Bernoulli in the 18th century. If air molecules "A" and "B" strike the front edge of a sail or airplane wing and one travels on each side, they will both arrive at the rear edge at the same time.





Since molecule of air "A" travels the farthest, it must go the fastest and this creates an area of low pressure. Air molecule "B" can travel the shorter distance at a slower speed, creating an area of high pressure. The lift of an airfoil is developed from an increase in pressure on one side and a decrease on the other side.

It is this low and high pressure difference that enables an airplane to fly. The low and high pressure difference causes the sailboat to move sideways.



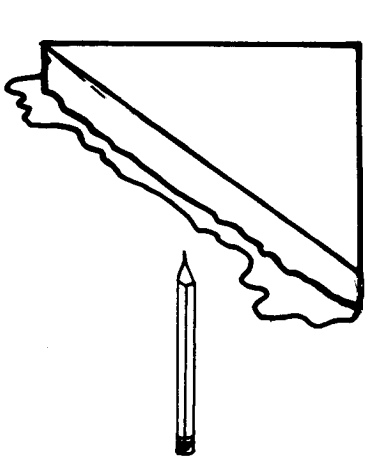
The daggerboard, rudder and side of the hull of a sailboat provide lateral resistance to this sideway motion. It is the combination of the low and high pressure on the sail and the lateral resistance of the boat that causes the sailboat to be squeezed forward. A boat on a reach may move faster than the wind because of these powerful forces.

2. To better show these different forces do this experiment.

   Equipment needed:

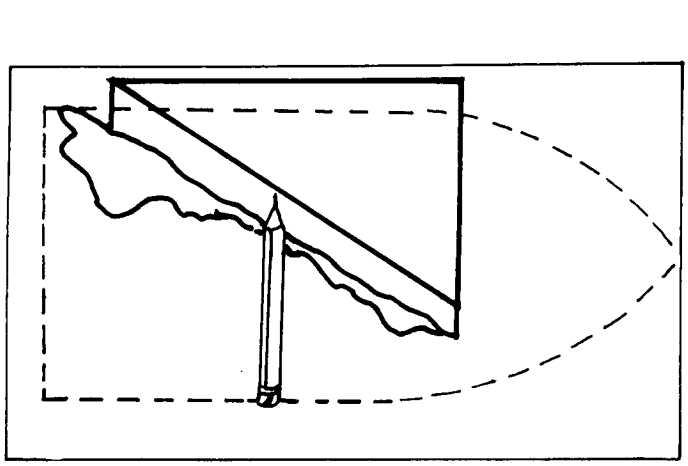
   A. Shallow tray
   B. Piece of ice (in the shape of a right triangle)
   C. Pencil

Step one: To show what happens to a sailboat sailing on a reach with no lateral resistance, PUSH the ice with a pencil. What happens to the ice and what direction does it move?



PUSH IN THIS DIRECTION

Step two: Put the ice on the tray, against the side. Now PUSH the ice toward the side of the tray. Which way does the ice move? The side provides lateral resistance to the piece of ice.



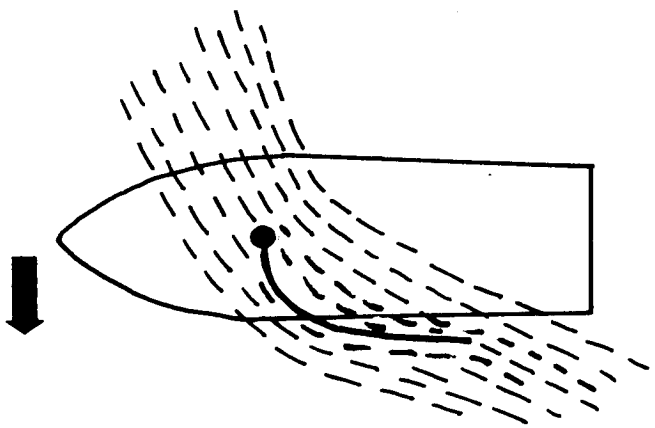
PUSH IN THIS DIRECTION

Why does the ice move in a different direction in step two? _____

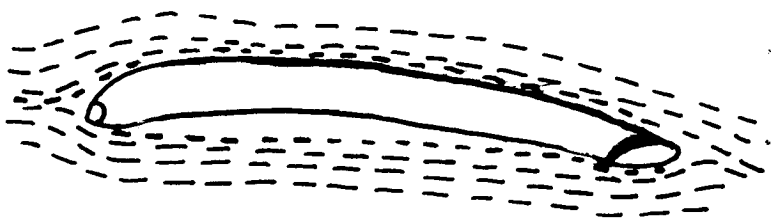
_____

_____

3. Label the low and high pressure areas of the sail and airplane wing.



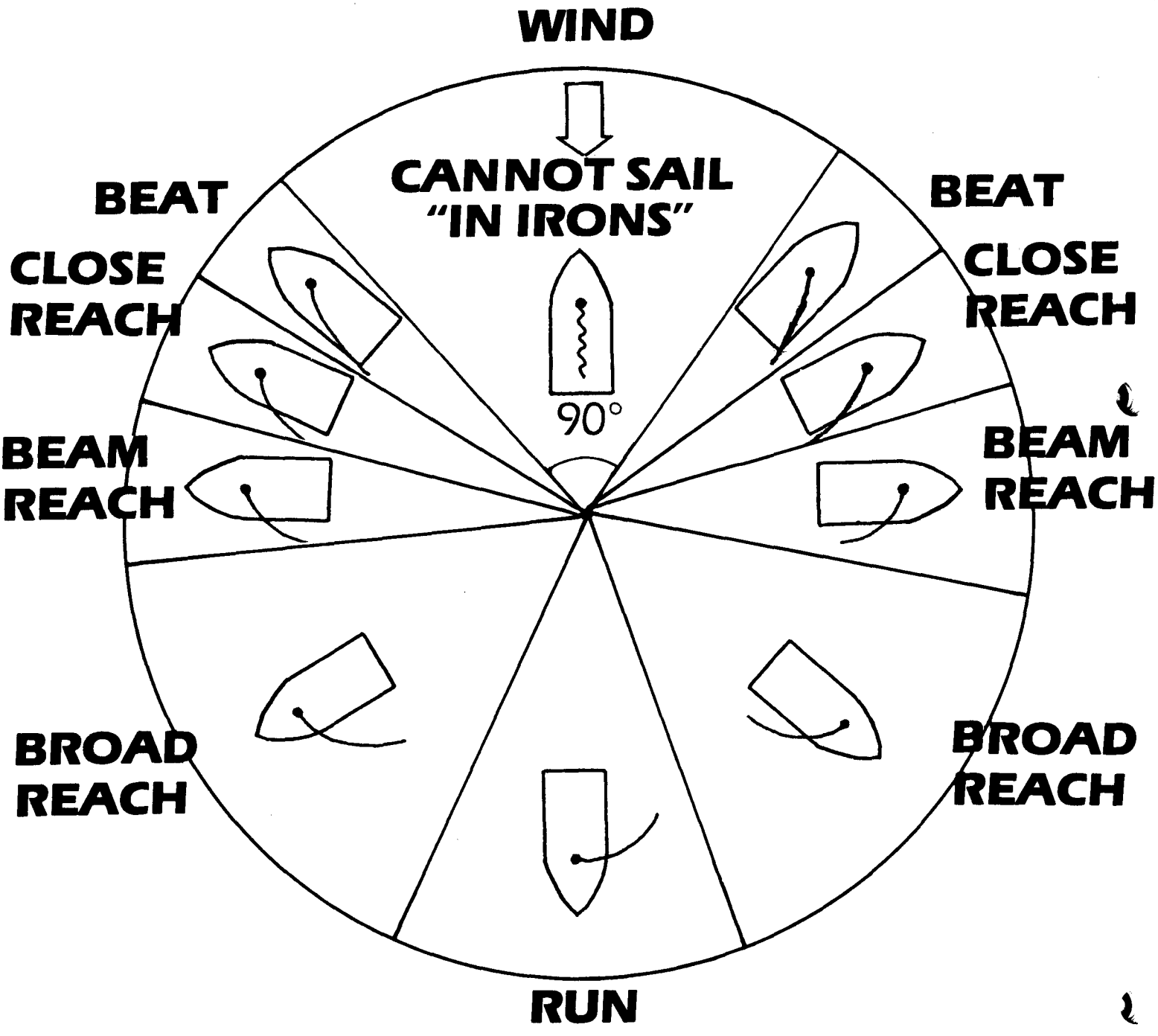
Wind Direction



Wind Direction

POINTS OF SAIL

The following diagram illustrates the points of sail. When the wind is coming from behind the boat (wind astern) the boat is running. The boat is reaching when the wind is coming over the side of the boat (wind abeam). When the wind is coming over the front corner the boat is beating. Examine the diagram to see the position of the sailboat with respect to the wind for each point of sail.



5. Label the diagram by placing an S by each sailboat that is sailing on a starboard tack and a P by each sailboat that is sailing on a port tack.

REVIEW QUESTIONS:

1. What are the three basic points of sail?

A. _____

B. _____

C. _____

2. The fastest point of sail for a Laser sailboat is _____.

3. A sailboat with the wind blowing from the port side to the starboard side is on a _____ _____ tack.

4. *How can you decide what point of sail you are on?* _____

_____

5. A sailboat cannot head closer than _____ degrees into the wind.

6. When the wind blows across a sail an area of _____ and _____ pressure is created.

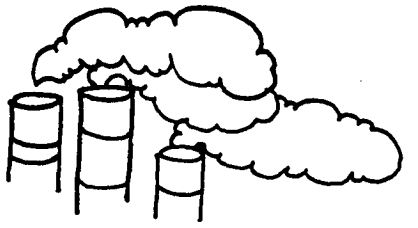
7. *What is sideways resistance called?* _____

WIND DIRECTION

The sailor must know which direction the wind is blowing in order to plan how to launch. Here are some ways to tell wind direction before leaving the shore:

Wind Direction

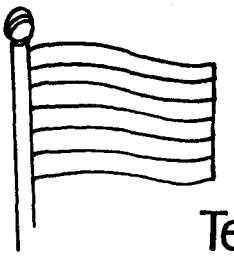
Facing the Wind
Feeling Wind
in Both Ears



Smokestacks

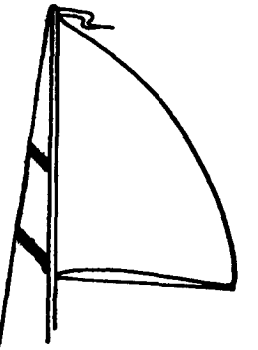
Drop Handful
of Grass

Ripples or Wave
Direction



Flag on
Flagpole

Telltales

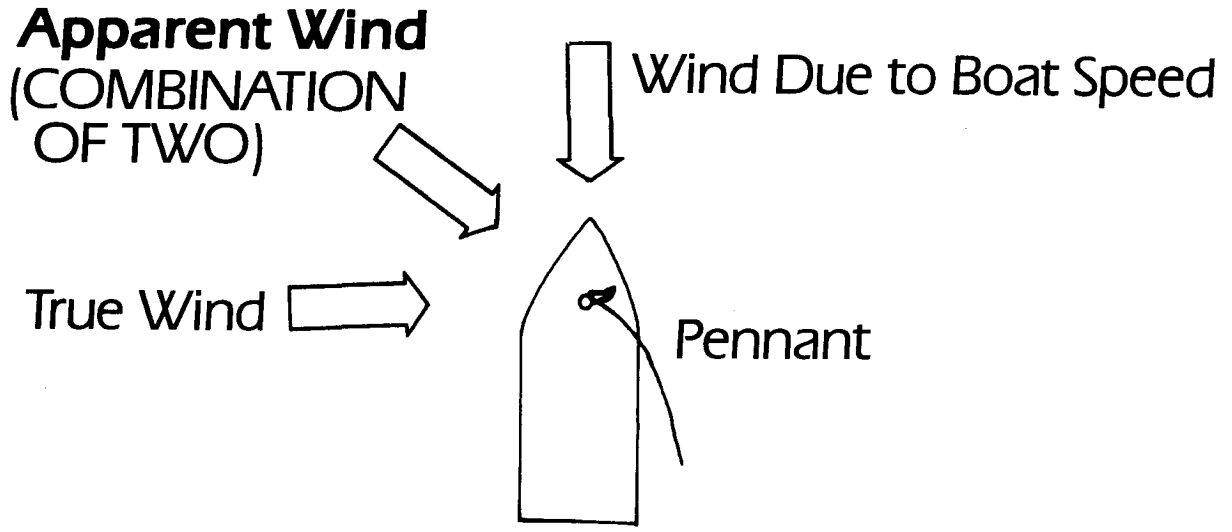


Direction Luffing
Sail Blows

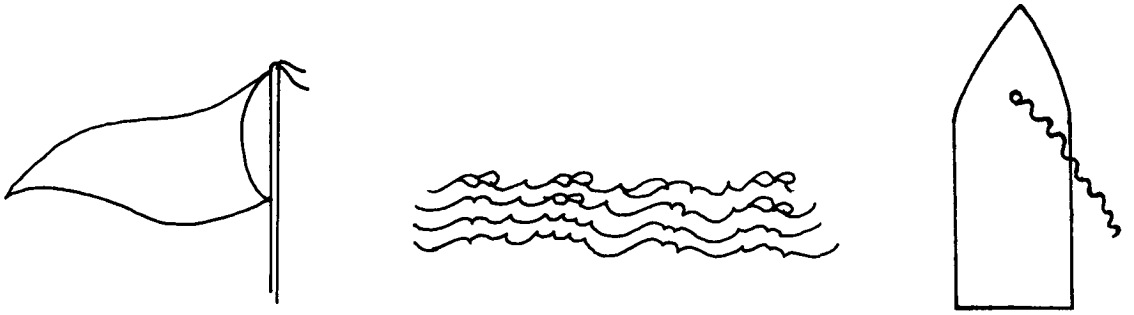
These methods will indicate the "TRUE WIND," or from which direction the wind is actually blowing.

On the water, a sailor must determine the wind direction by reading the ripples on the water (called cat's-paws). The ripples will move in the same direction that the wind is blowing.

Wind felt on a sailor's face when a sailboat is under way is called the "APPARENT WIND." Any wind indicators (pennants or telltales) on a moving boat show the direction of the apparent wind.



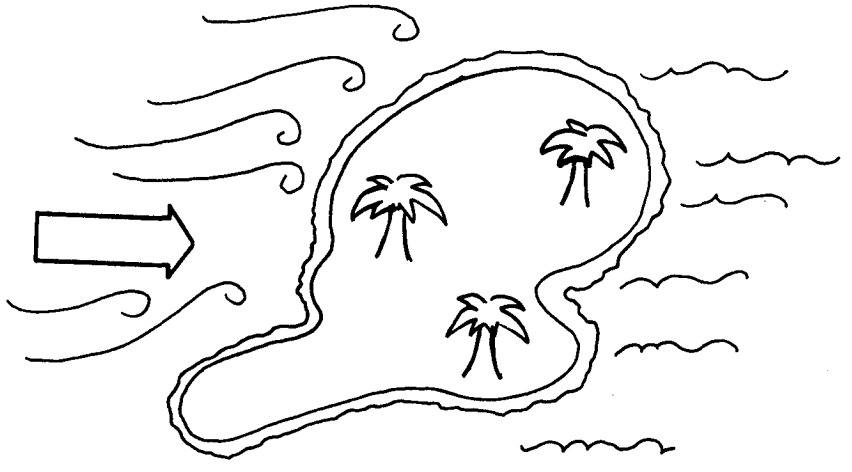
1. Draw arrows to indicate the true wind direction.



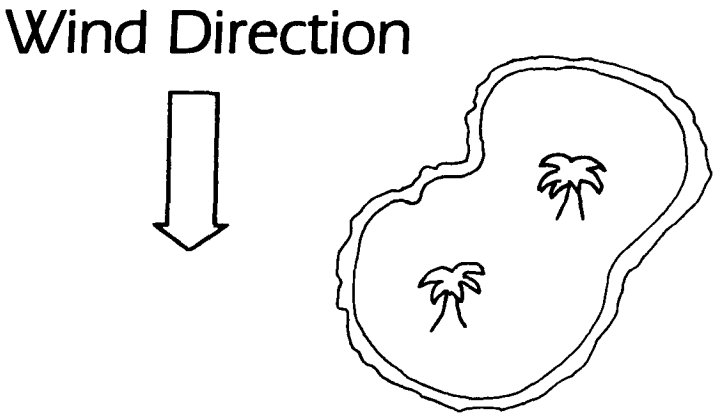
2. The direction the wind is blowing is called the _____ wind.

3. _____ wind is felt on a sailor's face once the boat starts to sail.

The direction from which the wind is blowing determines the windward and lee sides of an island. The WINDWARD side is the side where the wind first strikes the island; the LEEWARD side is where the wind leaves the island.



The terms "lee helm" and "weather helm" indicate which direction the boat will head if you let go of the tiller. Most boats have a slight weather helm. This means the sailboat will turn toward the wind and stop. If the boat has a lee helm it will continue to be blown away from the wind.

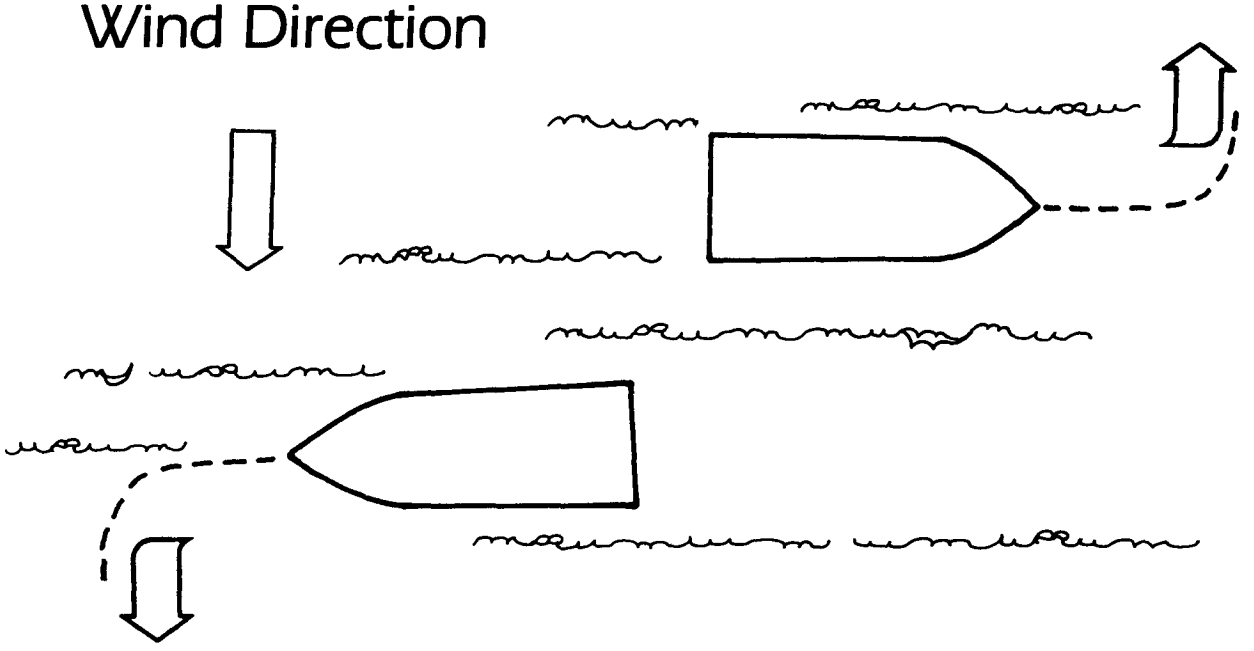


4. Label the lee and windward sides of the island.

5. Which side would you go to in a storm and why? _____

_____

6. Label the sailboats with either a lee or weather helm.



It is important to remember that you can slow down or stop a sailboat. You may let out on the mainsheet or turn your sailboat up into the wind. When the wind strikes the sail on both sides so that it flaps, the sail is luffing and the boat slows down and stops.

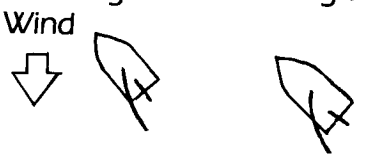
While reaching across the lake, check the setting, or trim, of your sails. Let out on the mainsheet until the sail just begins to luff. Then pull back in, just to stop the luffing.

With the sail full of air, your sailboat will have a tendency to lean to leeward. This is called "heeling." You can control this lean by letting out the mainsheet a bit, or by shifting your weight out farther on the windward side. Placing your feet under the hiking strap allows you to lean out with your upper body. You can use the hiking stick to steer the boat.

After reaching out across the lake you will want to turn around and head back to shore. There are two methods to turn your sailboat around. In both, your boat will change tack—the wind will blow across the other side of the boat causing the sail to fill and swing over to the opposite side. You can either turn your boat up into the wind, or down away from the wind. Remember, it's always safer to turn into the wind and that is what you will practice first. Turning into the wind is "COMING ABOUT."

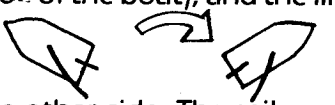
From sailing on a reach, turn your boat closer to the wind (at about a 45° angle). Haul in on the sail, bringing the boom just over the rear corner of the boat. Push the tiller toward the sail, and your boat will turn up into the wind and come about.

The captain and the linesman can easily work together in coming about by following these steps:



A. Captain says, "Prepare to come about."
This is to alert the crew.

B. Captain says, "Hard Alee."
The captain pushes the tiller toward the sail (the lee side of the boat), and the linesman pulls in on the mainsheet as the sailboat heads into the wind.

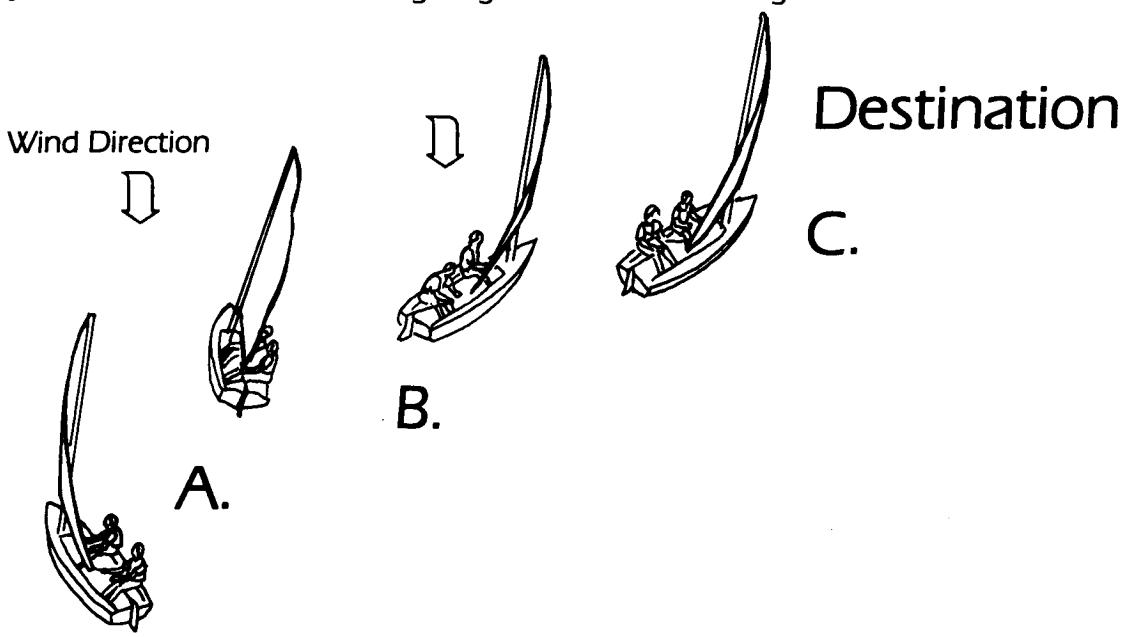


C. Sailboat comes about.
The sailboat turns and the boom swings over to the other side. The sailors will move to the other side of the boat. The captain straightens the tiller while the linesman lets out the mainsheet.

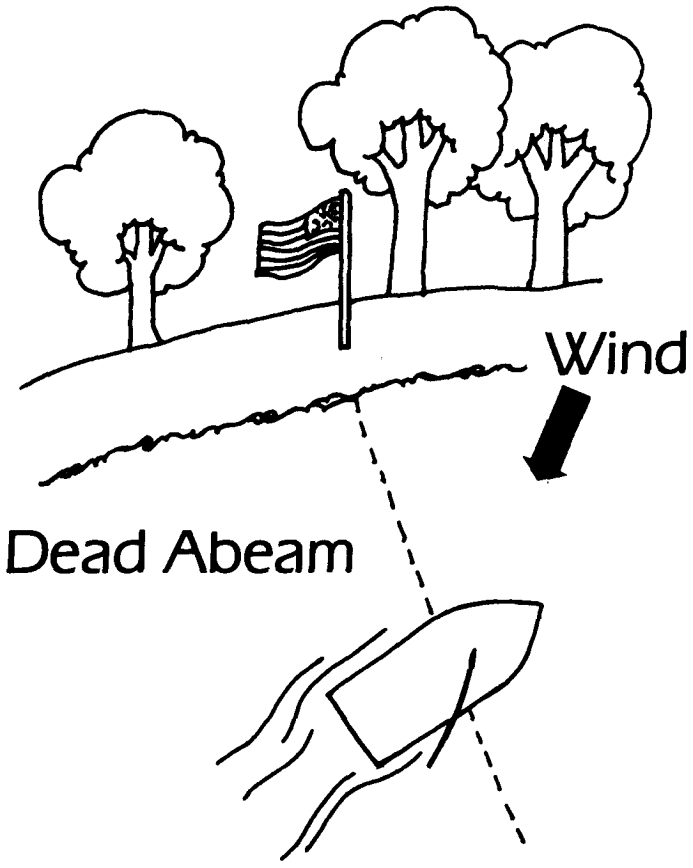
Now that you can reach across the lake and turn your boat by coming about, you should practice the other points of sail.

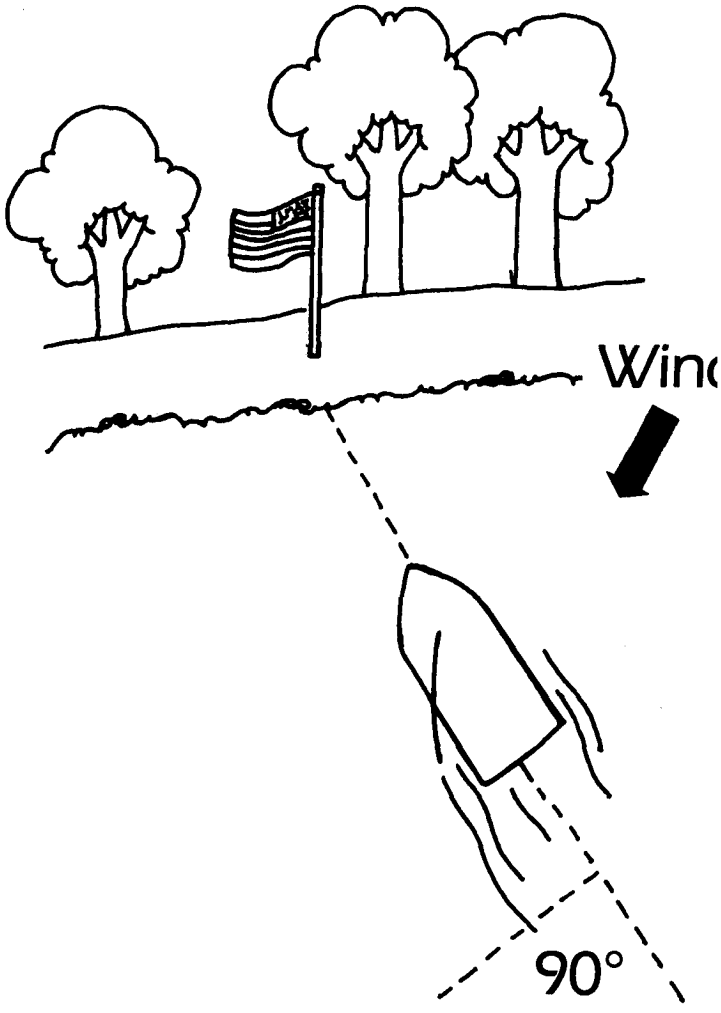
Practice beating by turning your boat into the wind and pulling your sail until the boom is over the rear corner of your boat. While on a beat you can check the wind direction by turning your boat into the wind until the sail starts to luff. Then, to sail faster, turn your boat back slightly off the wind until the luff just disappears.

Since you can't sail directly into the wind, you may have to tack, or follow a zig-zag course, to reach your destination. The following diagram illustrates tacking to a destination.



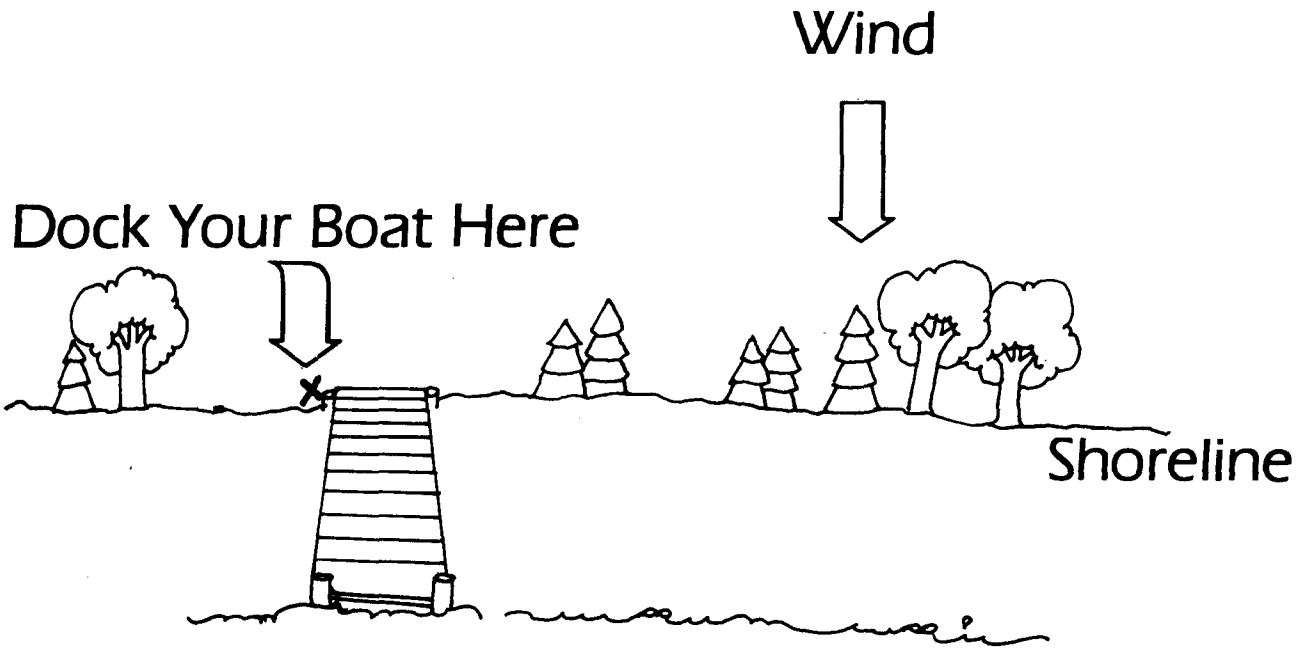
To determine what your new course will be after tacking, follow these steps:

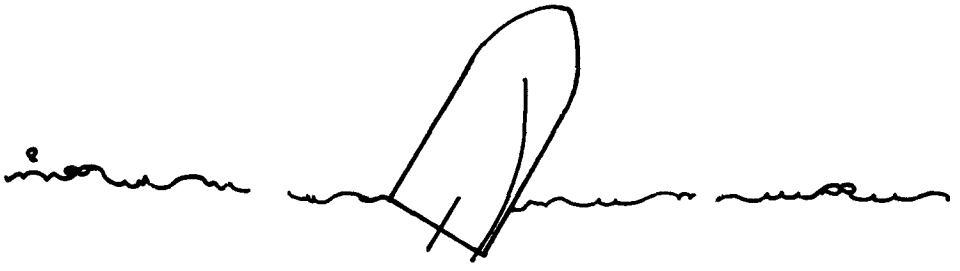




1. Skipper finds that the flagpole is at right angle to present course.
2. After coming about, new course is at right angle to old, and destination is dead ahead.

Draw the course you would sail to reach a destination located directly upwind.



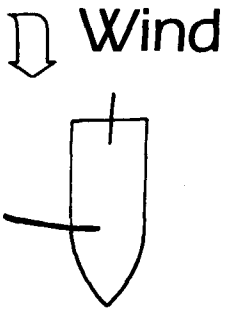


Your Boat

Practice sailing on a run if the wind is not too strong. Keep your course steady with the wind blowing from directly astern to avoid an accidental gybe. Gybing (jibing) occurs when the sailboat changes direction with the wind direction changing over the stern. It can be dangerous and should not be attempted by beginners in heavy wind. An accidental gybe is one for which you and your crew were not prepared. Use the following commands when gybing:

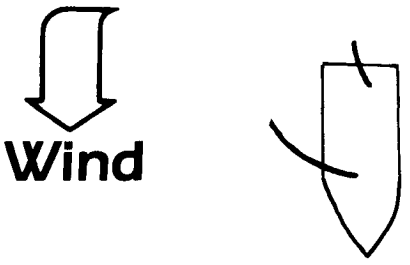
A. Captain says, "Prepare to gybe."

This is to notify the crew to get ready.



B. Captain says, "Gybe ho."

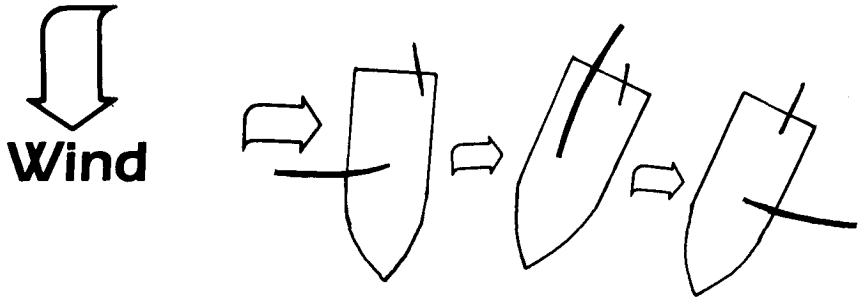
The captain pulls the tiller away from the sail and the lineman pulls the mainsheet to keep it from going slack.



C. Sailboat "GYBES."

As the boat starts to turn downwind the crew should be ready to move and duck so that the boom does not hit anyone in the head as it swings. The captain steers the new course while the linesman gradually lets out the mainsheet as the boom swings out on the other side.

Important to the completion of a successful gybe are the control of the mainsheet by the linesman and the shifting of weight to the other side of the boat as soon as the boom swings over.



When ready to head for shore, remember to pull up your daggerboard as the water gets shallow. You can slow down as you approach the shore by letting out your mainsheet, or by heading into the wind as you just reach the shoreline.

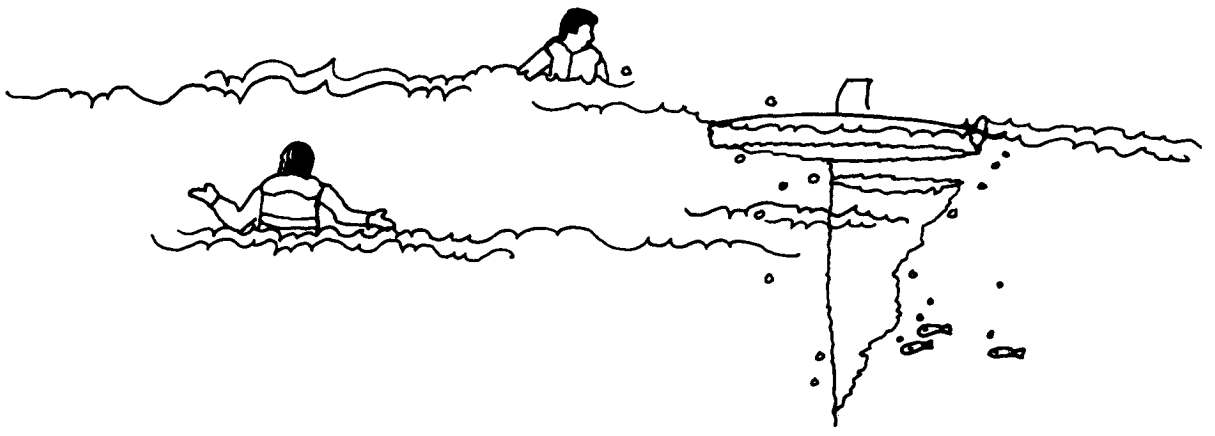
Circle the correct term.

1. Coming about/Gybing is turning your boat across the wind so that the wind changes direction over the stern of the boat. Pull/Push the tiller toward/away from the sail.

2. Coming about/Gybing is changing direction by turning the bow of your boat across the wind. Push/Pull the tiller toward/away from the sail.

Sailboats will often capsize—don't worry if it happens to you. You will only get a little wet and your pride may be hurt. Your life jacket will keep you afloat.

The boat will usually turn and lie on its side, but sometime it may "turtle," making it more difficult to right. Turtle means that the sailboat has turned completely over and is upside down in the water.

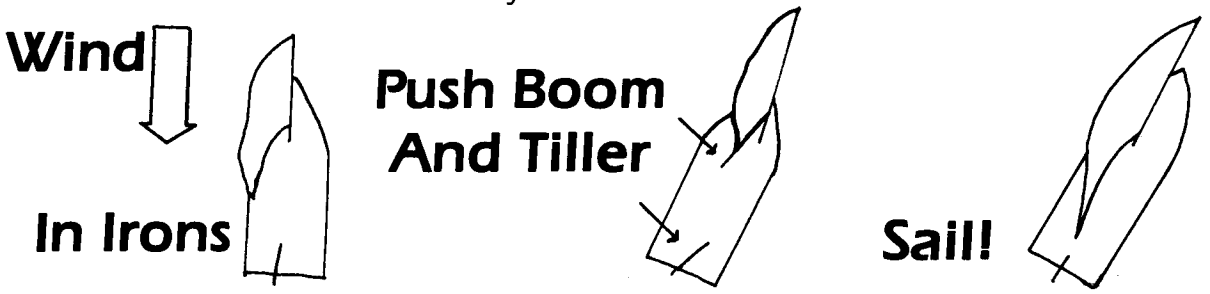


The steps you should follow in the event of a capsize are:

1. Check to make sure all crew members are OK and free of sails and that the mainsheet is not cleated or tangled.
2. Swim to the boat and hang on to it. Turn the boat so that the bow is pointing into the wind.
3. Together pull down on the daggerboard. (If the daggerboard came out you will have to reinsert it first). Put your weight on it. You may have to stand on it. This will cause the boat to right and lift the sail out of the water. If the boat has turtled, this step will take longer.
4. Take turns reentering the sailboat. Put your weight to one side, holding down the boat as your partner reenters from the other side.
5. Sail off and have fun!

A problem that most beginner sailors have on the water is that the sailboat stops moving. Three likely causes are:

1. The wind stops. Look around to see if any other sailboats are moving and try to head in the same direction that they are. If none are moving, you may have to use your daggerboard as a paddle and steer with your tiller toward your launch site.
2. The daggerboard hits the bottom. Simply pull the daggerboard up and continue sailing.
3. The sailboat is headed directly into the wind and the sail is luffing. The boat is then said to be "IN IRONS." The boat will eventually be blown backwards.



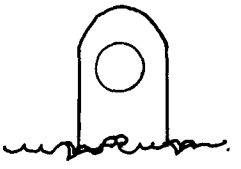
To get out of irons, "BACKWIND" the sail by holding the boom at a 90° angle to the boat. As the sailboat starts to back up, push the tiller and hold it until the boat turns off the wind. Once the bow has turned 45°, pull in the mainsheet and straighten the tiller. The sailboat will start moving forward.

When a sailboat is headed directly into the wind the sail _____ and the boat is said to be _____.

BUOYS

"BUOYS" are floating signs placed to help make sailing safer. They are divided into six basic types:

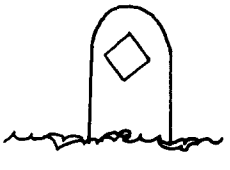
Control Buoy



Means some type of control regulation such as:

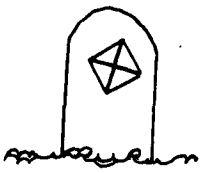
SLOW NO WAKE
OPEN ZONE
SKI ZONE
SPEED ZONE

Danger Buoy



Means danger, use precaution sailing this area.

No Boats Buoy

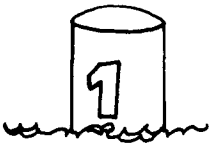


Means danger, no boats allowed in the area.

Informational Buoy

Means some type of information; for example, gas dock one mile.

Black Can Buoy



This buoy marks one side of a deep channel. Black can buoys should be kept on the right (starboard) side when leaving the harbor and on the left (port) side when entering the harbor. The buoys will have odd numbers with number 1 being the buoy found the farthest out in the lake. A way to remember this is "BPOE," black port on entry. (These cans will be green in the future.)

Red Nun Buoy

This buoy marks the other side of the deep channel. The red nun buoys should be kept on the left (port) side leaving the harbor and on the right (starboard) side when entering the harbor. The buoys are even numbered and number 2 will be found the farthest out in the lake. A way to remember what side the buoys should be on is "RRR," red right returning. Keep the red buoys on the starboard side when returning to the dock.

RULES OF THE ROAD

To help avoid collisions with other boats, remember the following rules of the road:

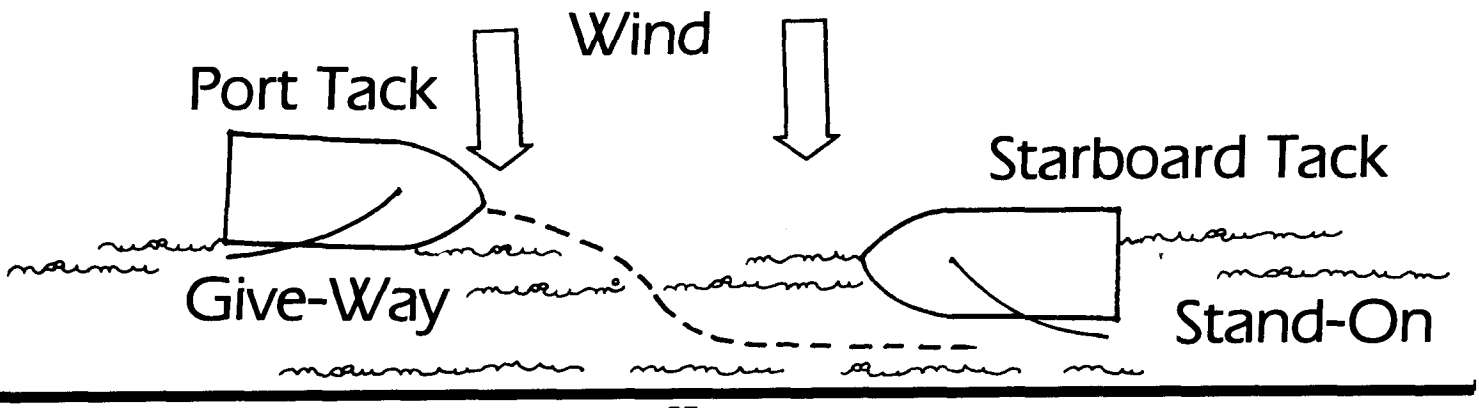
The boat that has the right-of-way may "STAND-ON" while the boat that does not have the right-of-way must "GIVE-WAY."

Sailboats have the right-of-way over all powerboats except in two situations:

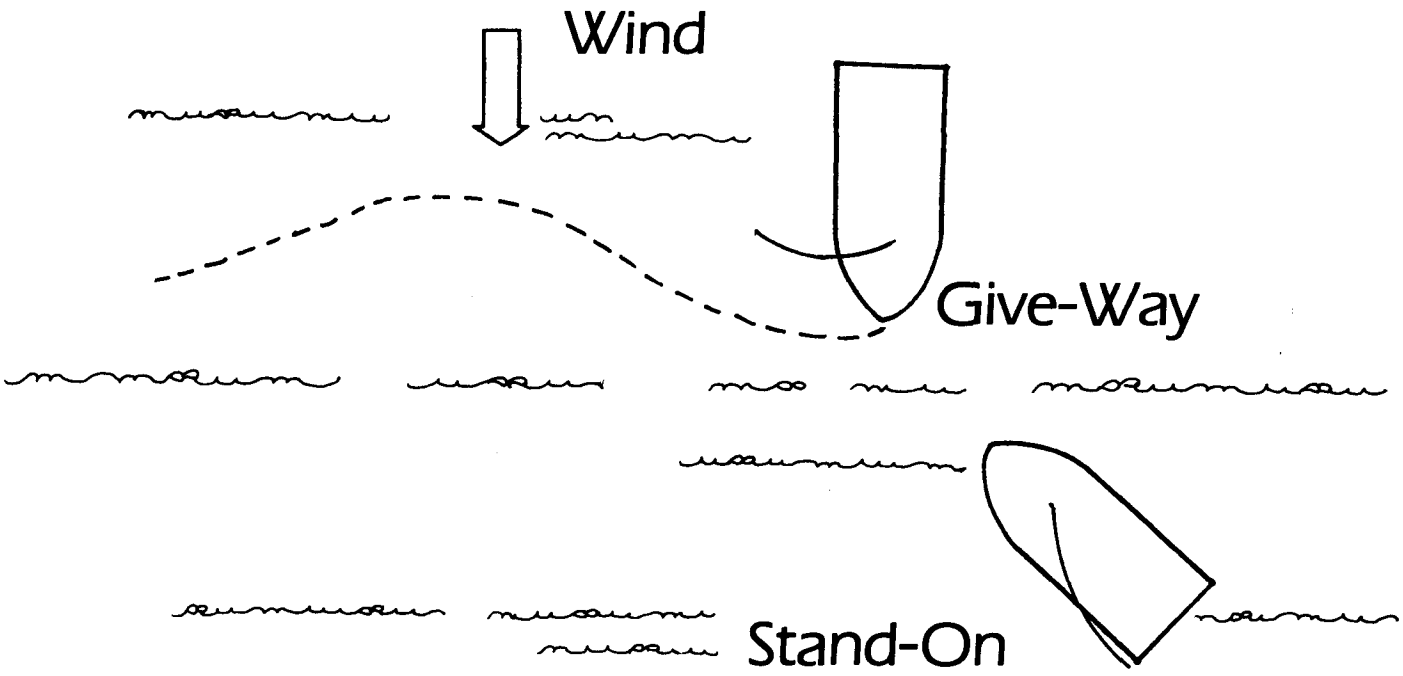
a. Sailboats must remain clear of large ships that are difficult to maneuver through narrow channels.

b. When overtaking a motorboat, the sailboat must stay clear and the motorboat should maintain its course.

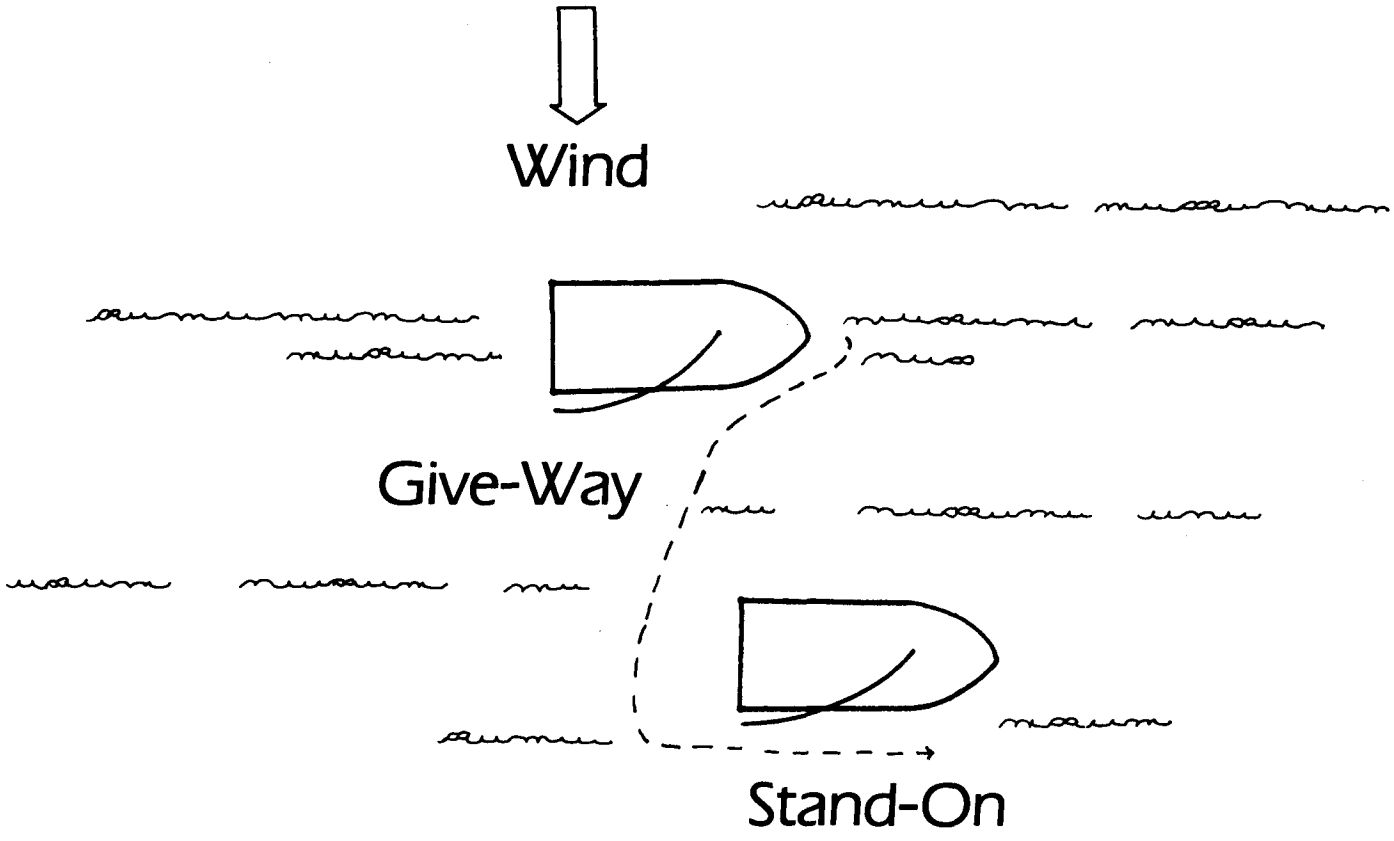
A sailboat on a starboard tack has the right-of-way over a sailboat on a port tack.



A boat sailing closer to the wind has the right-of-way over one that is running.

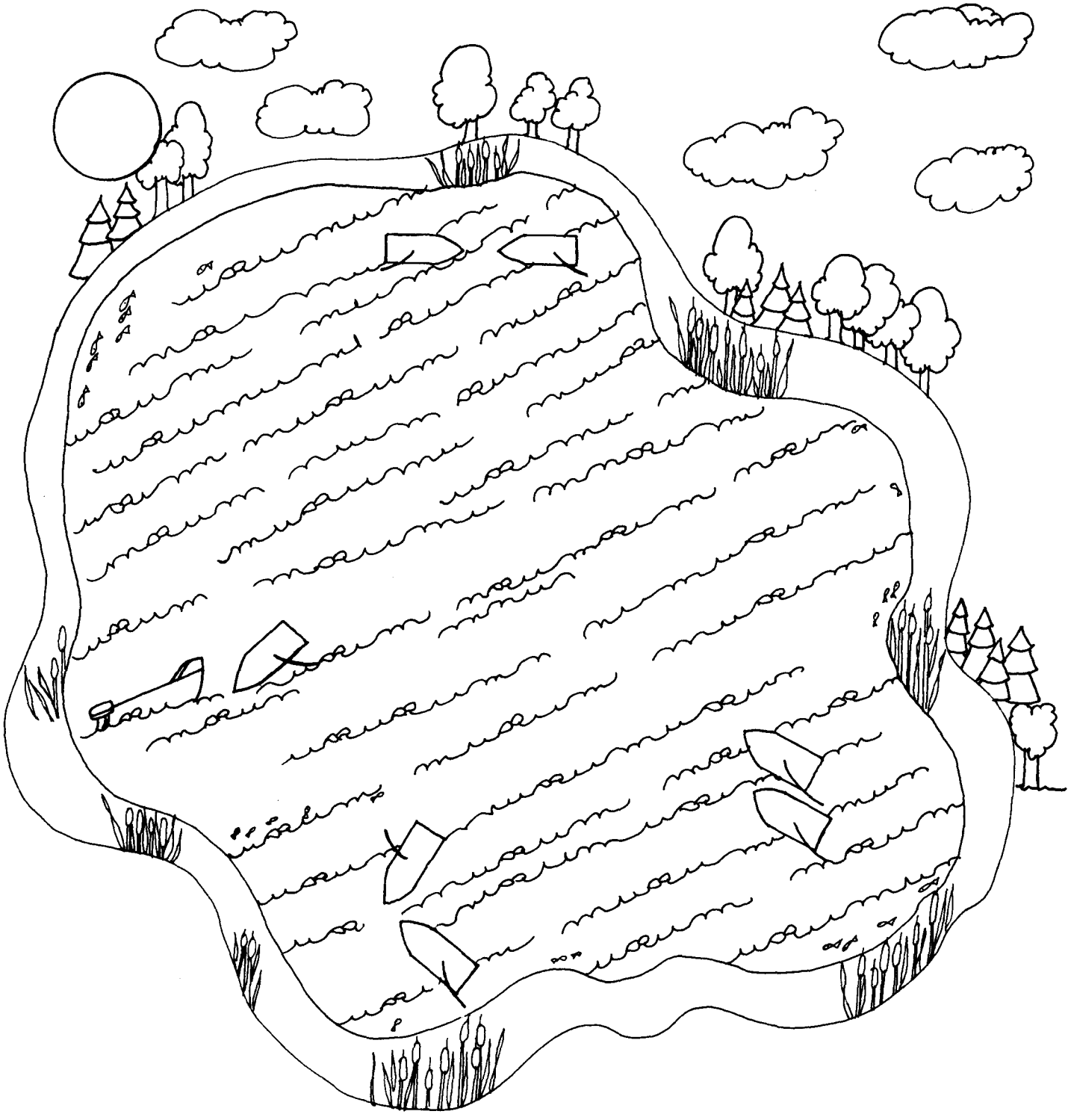


When two sailboats are sailing on the same tack, the sailboat closer to the wind must give-way and cannot steal the wind from the other when trying to pass.

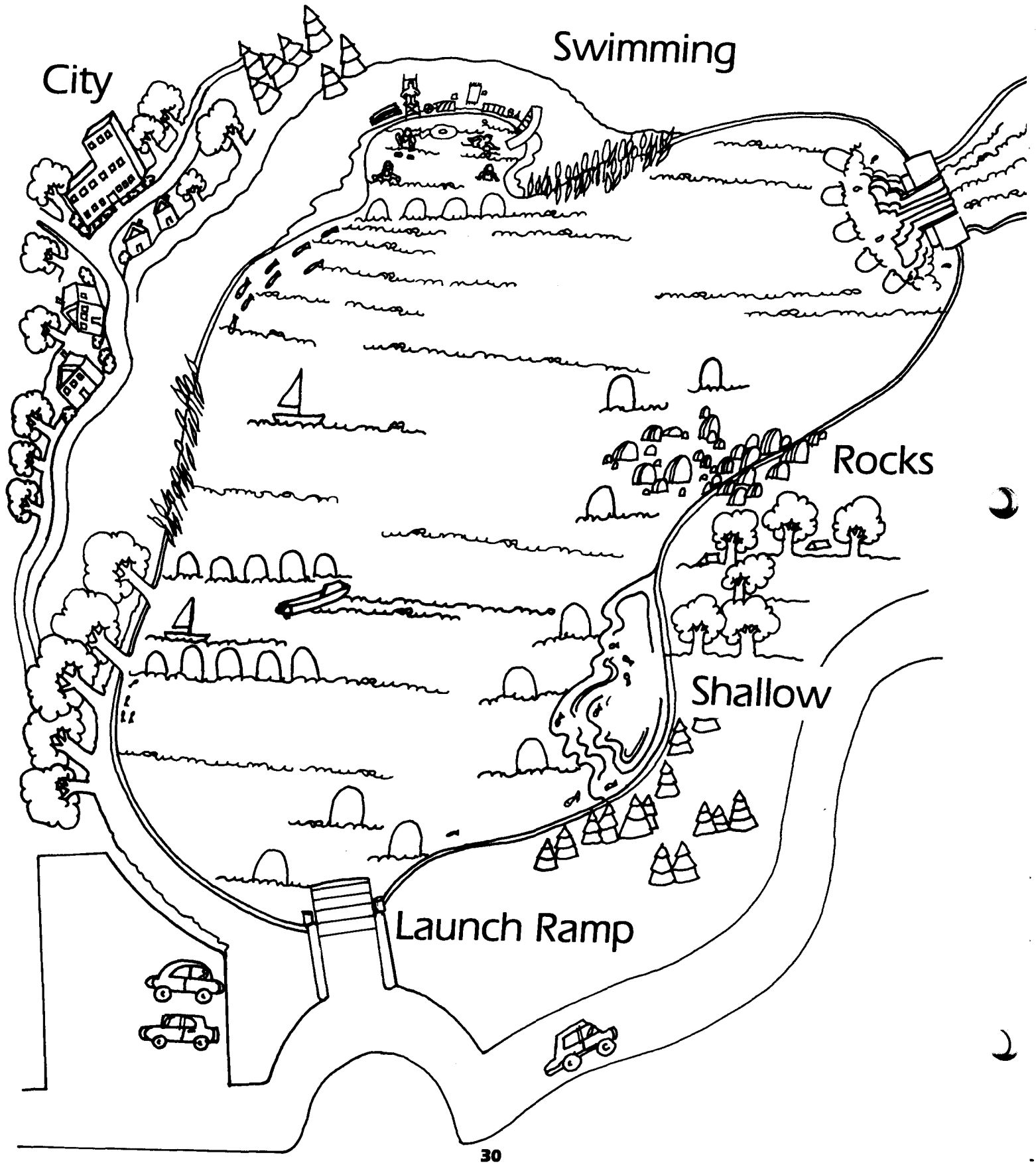


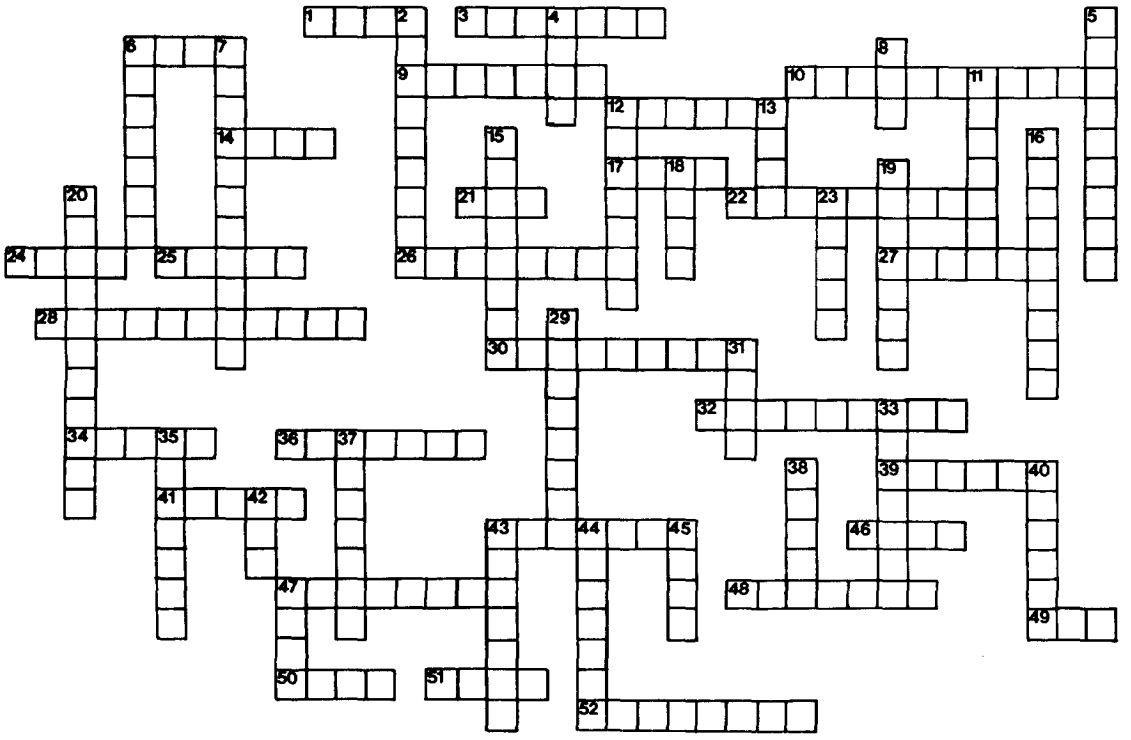
The final, prudential rule to be remembered by all boaters is do everything possible to avoid an impending collision.

LABEL THE STAND-ON BOATS WITH AN "S" AND THE "GIVE-WAY" BOATS WITH A "G."



LABEL OR NUMBER THE BUOYS



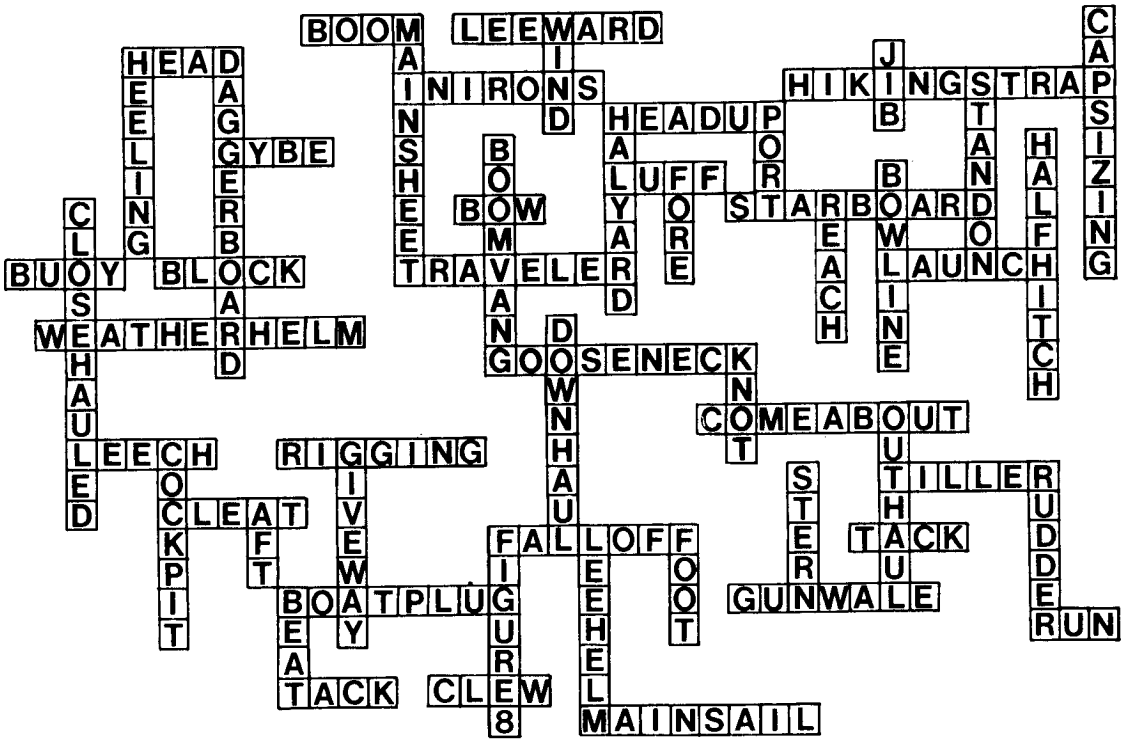


ACROSS

1. Supports the foot of the sail, swings across the boat when it comes about or gybes
3. Direction away from the wind
6. Top of the sail
9. A boat is _____ _____ when it stalls because it is headed directly into the wind
10. Webbing to hold a sailor's feet so that he can lean out of the boat
12. To turn the boat in a direction toward the wind
14. To change tacks while sailing downwind
17. The leading edge of the sail
21. The front of the boat
22. Nautical term for right
24. An aid to navigation
25. A pulley
26. The line across the stern of the boat where blocks attach
27. To push a boat out into the water
28. The tendency of a boat to turn up into the wind
30. The point where the boom connects to the mast
32. To turn a boat up into the wind and through it so that the sail swings across
34. The diagonal edge of the sail
36. The mast, boom, sail and lines
39. Sailor uses this to steer the boat
41. Horn shaped device used to secure lines
43. To turn the boat away from the direction of the wind
46. To follow a zig-zag course to reach a point directly upwind
47. Keeps the boat from filling with water
48. The upper part of the side of the boat
49. To sail with the wind coming directly astern
50. A boat with the wind blowing over the left side is on a port _____
51. The rear corner of a sail
52. The primary sail on a boat

DOWN

2. Line which can be used to control the speed of the boat
4. Supplies the power for a sailboat
5. The leading cause of boating fatalities
6. The leaning of a boat as its sails fill with wind
7. The _____ provides lateral resistance
8. Small sail raised in front of the mainsail
11. Boat which has the right-of-way and should maintain its course according to the rules of the road
12. Line used to raise a sail
13. Nautical term for left
15. Keeps the boom from lifting, especially when sailing downwind
16. Knot which can be used to lock a turn around a post
18. _____ and aft
19. Knot used for attaching lines to the sail
20. Sailing at about a 45° angle with respect to the wind with the boom pulled in over the rear corner of the boat
23. The point of sail when the wind blows over the side of the boat
27. Term for rope when it is used on a boat
29. Line used to adjust the tension on the luff of the sail
31. A proper _____ should be easy to tie and also easy to untie
33. Line which adjusts the tension on the foot of the sail
35. Area where one sits and puts his feet on the boat
37. The boat which must yield according to the rules of the road
38. The rear portion of a boat
40. Attaches to the transom; causes the boat to turn when it is held at an angle
42. Toward the rear of the boat
43. Stopper knot, looks like a number
44. The tendency of a boat to fall off the wind
45. Bottom of the sail
47. The point of sail closest to the wind


BOOM
LEEWARD
HEAD
DAGGYBE
HEELING
CLEW
BUOY
BLOCK
WEATHERHELM
HAULED
LEECH
CLEAT
COCKPIT
RIGGING
LIVEWAY
BOATPLUG
EAT
TACK
CLEW
8
INIRONS
BOOM
BOW
TRAVELER
FALLOFF
FOOT
HEADUP
HALYARD
LUFF
FORE
GOOSENECK
DOWNHAUL
HEEL
MAINSAIL
COMEABOUT
STERN
GUNWALE
HIKINGSTRAP
JIB
STANDON
STARBOARD
BOWLINE
REACH
LAUNCH
HALFHITCH
CAPSIZING
TILLER
RUDDER
TACK
RUN

NOTES: