CLIPPER MARINE OWNERS MANUAL

Models: CM21 – CM23 – CM26 – CM30 – CM32 & CM 1/4-ton

Clipper Marine Corp.
1919 East Occidental St. • P.O. Box 15063
Santa Ana, California 92705
714-835-9316

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July 1975

Dear Clipper Owner:

We are happy you have chosen to join ,one of the fastest growing fleets in the country today. We hope you will take an active part in your local Clipper Association and enjoy many years of happy sailing in your new Clipper.

In the following pages we will attempt to familiarize you with the many features of your new Clipper, suggest ways of protecting your investment and supply some basic sailing tips to help you get started on the right track.

We trust you will find this manual helpful, whether your Clipper is a fixed keel, swing keel, or any one of the models from 21 to 32 feet.

Happy Sailing,

Clipper Marine Corporation

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P.O. Box 15063
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Dear Owner:

We at Clipper want you to be completely satisfied with your sailboat that you have recently purchased. Your dealer has prepared and looked after the launching and commissioning of your boat to make certain that the boat is in fine working order. After a few initial shake-down cruises and sea trials, there may be some questions about your Clipper sailboat that the Owners Manual cannot answer. These problems can best be answered by your local dealer, and he will be more than happy to assist you in solving the problem. If you still do not get complete satisfaction from your dealer, please call me at (714) 835-9316 and tell me about them. I will do my best to answer your questions and provide you with alternative answers.

Happy Sailing,

Phil Kaufman
CLIPPER MARINE CORPORATION

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SECTION ONE

HISTORY AND INTRODUCTION OF CLIPPER MARINE CORPORATION

The essence of a good boat is design. William I. B. Crealock, N.A., has spaced no effort in his Clipper designs, as they are well balanced and exceptionally stiff. Each swing keel Clipper 21 through 26 is designed so the keel lifts up into the hull keel trunk while in the up position. This means she is much easier to launch and retrieve, and on the highway, she's much easier to trail since the Clipper is so much lower on the trailer. To raise and lower the mast, only three stays need to be disconnected (in the case of the 23, 26 and 30) and only one stay in the case of the 21 (covered in detail in rigging Section Three).

Every Clipper is built of all hand layed fiberglass and conforms to the most stringent standards. Layer after layer of mat, cloth and woven roving are added until a rigid hull and deck are obtained. Maintenance is at a minimum with your new Clipper. (Some tips are covered in Section Fifteen on Fiberglass Maintenance and Care.)

Clipper Marine was started in 1969. The original factory was located in San Clemente, but the facility was quickly outgrown as the demand for Clipper 21's was overwhelming almost from the first day of production. The plant was moved to its current location in Santa Ana, where several new models have been continuously added to the already fine line of sailboats.

In addition to the regular swing keel models, all Clippers, 23 feet and larger are available in a fixed keel version.

SECTION TWO

WARRANTY POLICY MANUAL

Dealer must make available to all purchasers and potential purchasers, prior to sale, Clipper Marine's current warranty and, upon sale, must obtain purchaser's signature on Clipper Marine's current warranty registration card, and provide purchasers with a copy of the warranty and the change of address/change of owner form. Dealer must return the completed and signed warranty registration card to Clipper Marine within 10 days from date of sale.

Whenever a warranty claim is made by any Clipper Marine boat owner, Dealer must call Clipper Marine at (714) 835-9316 to obtain approval for the necessary repairs from the manager of Clipper Marine's Products Service Department or his supervisors. If the warranty work is approved during this telephone conversation, Dealer will be assigned a repair number for the work, which number must be used by Dealer in all further correspondence relating to that claim. Upon completion of the warranty repair work, Dealer shall fill out the Clipper Marine Warranty Claim Report and shall transmit that report, fully completed and signed by the boat owner, along with all bills and repair receipts for material and labor. Such warranty claim reports must be submitted to Clipper Marine within 30/days after the completion of the repairs. NO WARRANTY CLAIMS WILL BE HONORED UNLESS DEALER FULLY COMPLIED WITH THE FOREGOING REQUIREMENTS.

Please note the following regulations before beginning warranty repair work. Clipper Marine's warranty applies only to defects discovered within one year from date of first sale or use by dealer, whichever occurs first. The warranty does not apply to any boat used for charter service or any other commercial use (or to any boat which has been materially altered or modified without Clipper Marine's consent). The warranty applies only to boats which have been given normal and reasonable maintenance and does not apply if the repair is required because the boat has been subjected to abnormal or unreasonable use. The Clipper Marine warranty does not cover normal wear and discoloration of finishes, fittings or fabrics. (Leaks around windows and pop-tops are considered normal and subject to normal maintenance.) Clipper Marine will not reimburse Dealer for any material used in warranty repair work unless Clipper Marine is first given the opportunity to supply the necessary materials to Dealer, free of charge.

Clipper Marine may require Dealer to return the boat to Clipper Marine's factory in order to effect major repairs.

Clipper Marine expects its dealers to stand behind their warranty work, and will not reimburse Dealer for the same repair twice.

We feel that if Clipper Marine's dealers handle all warranty claims as though they were bearing the expense, the Clipper Marine warranty policy will operate smoothly and to the benefit of Clipper Marine, its dealers and their customers. Clipper Marine asks each dealer to keep the Clipper Marine warranty policy manual in front of him when talking to Clipper Marine owners about warranty coverage.

SECTION THREE

SPARS AND RIGGING

The rigging on your Clipper is of the highest quality stainless steel with swedged fittings. The standing rigging consists of a headstay, backstay, two upper shrouds and four lower shrouds (two lower shrouds in the case of the Clipper 21). To raise and lower the mast, the forward lowers and the headstay need only be disconnected. The remainder may be left connected for trailering, saving time at your next stop.

The running rigging consists of two halyards, a main and a jib halyard for hoisting the sails. To simplify setting up your boat to sail, leave the halyards tied to their respective cleats at the base of the mast so they don't become tangled.

MAINSHEET: The line from the mainsheet jam cleat and the block is fastened to the lower side of the boom. The mainsheet jam cleat fastens to the traveler in the cockpit. The traveler may remain centered by use of the traveler control lines, while you are first getting use to your new Clipper. After you have become proficient in handling your Clipper and you feel like experimenting to gain more speed, you may start working with the traveler. Starting from the centered position you will gradually pull the traveler to windward (toward the direction the wind is coming from) in fairly light winds—say up to 8 or 10 knots. The 10 to 12 knot wind zone you will probably find optimum performance with the traveler centered, but as the wind increases you can let the traveler slide down to the leeward side.

JIB SHEETS: Attached to the clew (grommet at the lower trailing edge of the jib sail) and runs outside of all shrouds and lifelines and through the jib sheet blocks. Your halyards and sheets should be checked also for broken or frayed sections. Your sheets and running rigging are dacron and occasionally an end may fray. Put a piece of tape around the line several inches back from the frayed section and trim with a sharp knife. Use a candle or lighter to burn the end. When the dacron melts, it will never fray again.

SPARS: Your spar (mast) is of the highest quality anodized aluminum and requires no painting. Soap and water on the shrouds and mast along with a bronze wool pad will remove the surface dirt and oxidation. A good automotive past wax can help keep your spar looking like new for quite some time, otherwise eventually the surface will begin to break down and oxidize. Keeping the halyards tied away from the mast at rest will not only eliminate a lot of noise, but it will also keep the anodized surface from becoming marred.

It is a good idea to periodically check all nuts, bolts, cotter pins, sheaves and rivets on your mast for signs of wear. Make sure the spreader tips are well taped to protect against sail wear. All blocks, turnbuckles and sheaves should be lubricated periodically with a light oil or grease such as WD-40.

STEPPING YOUR MAST:

1. Hook up upper shrouds, aft lower shrouds and backstay. On the 21, hook up only the uppers, lowers and backstay.
2. Set mast in mast carrier and secure the base of the mast in the mast step with the bolt provided. Note: If your mast carrier has two height positions be sure it is as high as it will go.
3. Check all shrouds to see they aren't caught or tangled.

4. Standing in the cockpit or on cabin top, (pop-top down and hatch closed) walk the mast up and have someone secure the headstay. Don't let go of the mast if you go forward to attach the headstay.
5. Tighten lock nuts on turnbuckles. Depending on the type of turnbuckles on your Clipper, they should have either cotter pins in place, lock nuts tightened, or even be safety wired. If not, the turnbuckles can easily come loose, causing you to lose a mast overboard.

TUNING YOUR RIGGING: It is recommended that a qualified person be on hand while the rig on your new Clipper is tuned for the first time. Later you may follow these steps in tuning your rig and you will be surprised at the improvement in performance that will be made. Caution: Do not overtighten the standing rigging on your Clipper. It should no sound like a guitar string!

First with your boat sitting at the dock:
1. The headstay and backstay should be tightened equally. Of all the rigging on your Clipper, the headstay and backstay should be the tightest. This is so that the headstay will not sag excessively while you are sailing to weather under jib or genoa. The sailmaker has allowed for about 10" of sag in your jib so any more than this under load is reducing your performance. A simple test of headstay tension is to stand on the foredeck and tug on the headstay. With a good strong, short tug, you should be able to flex the headstay five or six inches.
2. Next, tighten up the shrouds. Both sides should be tightened equally. Both turnbuckles should have an equal number of turns, and should be good and snug, but not as tight as the headstay.
3. Now tighten all of the lower shrouds equally. These will not be as tight as the uppers, but just to the point where the mast is in column or straight. To determine this, sight up the sail groove in the aft edge of the mast. It should be in a perfectly straight line, both laterally and fore and aft.
4. If the mast is not in column, re-adjust the upper and lower shrouds until you have the mast in a straight position.
5. Now you are ready to perform the fine tuning under sail. In a breeze of 8 to 12 knots, take the boat out and alternately sail on one tack and then the other. Sight up the mast and see if it is still in column. If not, tack and adjust the turnbuckles when they are not under load. If you have adequate headstay tension to prevent excessive sag while under sail, you should never have to touch the headstay or backstay to get the mast in column. All adjustments will be made to the upper and lower shrouds. You may have to repeat this operation for five or six tacks until the mast looks perfectly straight. Now pin or tighten the safety nuts on your turnbuckles.

After you have sailed several hours in some stronger winds, you will notice that the shrouds have stretched. This is perfectly normal the first few times, and it will he necessary to re-tune your rig if you wish to obtain optimum performance from your Clipper.

ADJUSTABLE BACKSTAY: On some Clippers an adjustable backstay is supplied. It is primarily used for racing. This can be tightened prior to a race to minimize headstay sag, but should be slacked off after you return to the dock. If you find your self in exceptionally strong winds, it is a good idea to increase the tension on the backstay a little with the adjuster. This will keep the mast in compression and may prevent a rigging failure. The primary reason for rigging failure in heavy wind conditions is too much sail and too little backstay tension.

SECTION FOUR

SAILS: CARE AND MAINTENANCE, BENDING ON AND HOISTING

Your new Clipper has come equipped with a set of working sails (a main and jib). If this is your first boat and you are just learning to sail, the main and jib sails will be all that you will need, but as you become more proficient, you will probably want to add more sails. Optional sails that are available to you from Clipper Marine include a spinnaker and a 150% genoa and reacher/drifter. If you add these you will be equipped to sail in just about any conditions.

JIBS AND GENOAS: So that you will understand the difference in genoa sizes, the percentage indicated an a genoa refers to the longest perpendicular (LP) of the sail. This is the distance along an imaginary line running from the clew of the sail and intersecting the luff of the sail at a right angle. In the case of Clipper's 150% genoa, the distance is 150% of the J dimension (horizontal distance from the front side of the mast at the deck and centerline to the headstay).

SPINNAKERS: The Clipper spinnaker is of nylon and the kit includes a spinnaker pole, topping lift, halyard, sheets, foreguy, cleats and blocks.

HOISTING SAILS: You are now ready to begin bending on or attaching the sails.
1. The boat should be moved around the dock until the bow of the boat is pointing as close into the oncoming wind as possible. There is nothing as unpleasant or frustrating as trying to hoist sails with a cross wind or the wind behind you.
2. Starting with the mainsail, insert the battens in the four pockets, being careful the ends are tucked in snugly. The mainsail should be put on the boom before attempting to hoist it, and the gooseneck fitting (fitting on the boom closest to the mast) should be attached to the mast. The outhaul should be tightened just enough to take cut the wrinkles in the foot (bottom edge of sail).
3. Now you are ready to hank on or attach the jib. Starting with the tack, shackle it to the first hole behind the headstay. Working from the tack upward, attach each hank to the headstay, making sure the sail doesn't get twisted. The jib sheets should now be run aft through their respective blocks and the halyard attached.

You are now ready to hoist sails: Beginning with the main, hoist the sail so the top or head just clears the backstay. Now apply downward pressure on the boom at the gooseneck to just remove the wrinkles from the luff (leading edge of sail). The gooseneck on the boom should now be below the opening in the mast which accepts the gooseneck. Tie the down haul line off on the cleat provided.

HOIST_THE JIB: When the jib is hoisted it will probably need additional tension to remove the scallops from between the hanks. You don't want the hoist too tight, but just enough to completely remove these scallops (sags in the sail between hanks). As the wind velocity increases you may note the scallops begin to/reappear, in which case, apply additional tension. The necessary tension will either require a small winch on the mast or a simple trucker's hitch. (With the sail hoisted to the top, tie a loop in the rope section of the halyard two feet above the cleat. Take the remaining halyard down around the cleat, up through the loop and then tie off to the cleat.) You are now ready to adjust the jib sheet lead positions.

Generally speaking, the working jib will lead to the forward end of the track and the genoa to the aft part of the track. For optimum performance, the position of the fairlead is best determined by

sheeting the sail in and sailing up into the wind until the sail just begins to luff or break. If your lead is in the correct position, the entire luff of the sail from head to foot luffs or breaks at the same time. If the bottom area luffs before the top, the lead is too far forward, and vice versa if the upper area luffs first. Adjust the leads back and forth until you have an even luff of the sail.

If your Clipper is not pointing as well as you think it should, the natural tendency is to sheet the jib and main in tighter. In most cases just the opposite trim is needed. Try easing the sheets a little and see if both boat speed and pointing ability don't improve.

SAIL CARE: In order to protect the finish of your sails and add to their life we recommend they be folded or rolled up before you put them away. Folding the jib on the dock is easiest, but can be done right on the deck. The main can be rolled right on the boom, but be sure you release the outhaul tension first. If you are not planning on sailing for a couple of days, the battens should be removed from the sail and stored flat in a dry area. This is extremely important as they become warped or permanently bent and will thusly affect the performance of your mainsail. When the sails are put away they should be dry.

If you sail in salt water, salt will gradually accumulate on the sail and should periodically be washed off with fresh water. The principle source of dirt on your sails is from the rigging. Try to keep the rigging as clean as possible. Soap and water, bronze wool (steel wool leaves particles that rust) and a rag should do the trick.

There is no sure fire way to keep sails looking new indefinitely, but you can remove a lot of accumulated dirt by washing the sail with a mild detergent and cold or warm water. Scrub excessive dirty spots with a soft bristle brush and then rinse thoroughly to remove all detergent. By all means, never put your sails in the washing machine or dryer!

Spots or grease, mildew or rust won't harm the fabric, but do detract from its appearance. Try the following:
Mildew - Place the stained area in a 1% cold water solution of bleach and let it soak for two hours Wash thoroughly and rinse with fresh water.
Oil and grease - Use a cleaning solvent. If yellow stains remain after oil and grease is dissolved, try bleaching with Oxalic acid
followed by thoroughly washing and rinsing.
Rust - Soak stained area in a warm solution of two parts concentrated hydrochloric acid per 100 parts water, wash thoroughly
and rinse.

Direct sunlight will gradually break down most synthetic fibers including dacron and nylon. When they are not in use, store your sails below deck and out of extreme heat, such as in the trunk of an automobile. With just reasonable care and by following some of the tips outlined above, your sails will give you years of reliable use.

SECTION FIVE

ELECTRICAL SYSTEM AND NAVIGATIONAL LIGHTS

Basic Electrical Systems

It is important to remember that your basic single battery or dual battery electrical system with fuses in the fuse panel may be altered depending on the particular model you have, to conform to the electrical requirements of your engine, and additional optional accessories. The wiring diagrams in this manual in some cases may be changed by specific engine wiring diagrams that appears in the Engine Section of this manual. Also note that the description of any special optional electrical equipment (electric bilge pump,110 volt system, etc.) will be found in another section, more appropriately, of this manual. In the event you make any electrical modifications to your boat be sure that you follow the Wiring Diagram or contact Clipper Marine or consult a competent Marine Electrician. Boat wiring is considerably different from a normal house wiring due to the marine environment and other unique conditions not associated with houses.

Basic Fuse Breaker Electrical Systems

The master power control panel and battery switch indicator are simplified controls for your protection to permit safe and efficient operation of your boat's electrical equipment.Electrical current is directed from a twelve volt, 60 amp battery or batteries through the master battery switch panel, specifically for engine starting, battery charging, and accessory loads, The battery is similar to the one you have in your automobile, it should never be allowed to run out of water.

While the standard installation for most models in one battery, many owners do considerable cruising and like the convenience of the second battery. Two batteries are standard on most diesel installations.

Use the master battery switch in "All Position" only for emergency starting when both batteries are low or for toping off when both batteries are near full charge. When both batteries are completely charged transfer to either battery keeping one always in reserve. This is especially important when you realize there is no way to start your inboard engine with a dead battery. NEVER MOVE THE MASTER BATTER SWITCH to "OFF" while the engine is running or the alternator diodes may be burned out.

Masthead Lights

This is the white 20 point light on the mast that is only to be used when under power or motor sailing at night. it also serves as quick way of illuminating the jib at night to check its trim or in emergency cases, when recognition is important.

Running Lights

A red and green light mounted on the bow and a white light on the stern are wired to the running light switch. Under sail at night, these are the only lights that should be used except for the possible shining of a flashlight on the sails if you feel the need to be seen by another vessel. If you should replace a bulb, it is important to remember federal regulations require your lights to be visible for one mile, so the new bulb should be of equal intensity to the one it replaces.

Cabin Lights
The cabin lights have their own individual switches but must be activated by the Cabin Light Switch on the master power control panel. If the cabin lights start getting dim, this is fair warning that the battery needs a charge or is getting old.

Periodically check all wires, connectors, and terminals for loose connections which may cause electrical sparks or power loss. When leaving the boat, FIRST TURN OFF THE ENGINE THEN-THE MASTER BATTERY SWITCH TO-OFF.

Optional Electrical Accessories

LIGHTENING GROUND. If optional lightening protection has been provided, it will consist of a #8 9x21 strand wire connecting the upper headstay or backstay chain plate to a common point on one of the keel boats.

110 VOLT SHORE POWER. When optional shore power chord is plugged in, the 110 volt DC current is delivered to the duplex outlets below throughout your boat. The 110 volt toggle switch on your master control panel must be turned on in order for the 110 electricity to work for your appliances. Be sure that all 110 volt AC appliances, other than lamps, have adequate grounds or the moist atmosphere and wet feet could really increase the shock potential.

COMPASS LIGHTS, INSTRUMENT LIGHTS AND INSTRUMENT PANEL LIGHTS
Optional accessory lights in the cockpit have been wired by the plant to the master control panel. These accessories are usually either wired to the engine or the navigational light toggle switch. If you have any problems with them, please consult your Wiring Diagram for the specific model in question.

SECTION SIX

HEAD AND ICE BOX

SELF-CONTAINED HEAD: Instructions can be found packed in the head, which is optional on some models. Your self-contained marine head comes as one unit, divided into two chambers. The top chamber is the waste holding tank, with a four gallon capacity. The two chambers are separated and sealed off from each other by a seal. This seal is opened momentarily during flushing. A handle for opening this seal is found on the top rear of the unit. To flush the unit, the flushing bellows (found on the top left of the unit) are depressed once or twice. The unit is filled with fresh water by removing the cap from the large inlet and pouring in water. To evacuate the unit, carry it to any permanent toilet facility. Remove the cap which seals the holding tank chamber and pour the holding tank contents into the toilet.

No routine maintenance is required. If the bowl sealing blade does not operate freely after extended use, it may be restored to its original operating condition by applying a light film of silicone spray to the blade. To clean the unit, use any high grade, non-abrasive cleaner. Do not use highly concentrated or high acid content household cleaners. They may damage the rubber seals.

ICE BOX: (Not included on all models) Your ice box is well insulated with polyurethane foam and should maintain low temperatures over long periods of time. In order to make the ice box as large as possible, the lower portion and drain is below the waterline. For this reason it is impossible to drain the ice box into a thru hull. Thusly, a 25-pound block of ice will make about three gallons of water in the bilge and should be pumped out regularly. One suggestion is to attach an empty plastic bleach bottle to the ice box drain hose and empty this into the sink whenever it is full.

SECTION SEVEN

PLUMBING SYSTEMS

Plumbing Systems

We have attempted to keep your plumbing systems as simple as possible, expecially where thru hull fittings and plumbing hose are concerned. Wherever possible water discharge is above the water line and where two items can use a common water line thru-hull, this is accomplished. What follows then is a general description of the plumbing system with a detailed plumbing diagram of your particular model Clipper sailboat. You should become quite familiar with this system and constantly check it over to keep fresh water in your tanks and sea water outside of your boat.

In cooler regions where below freezing temperatures are anticipated, the ENTIRE PLUMBING SYSTEM MUST BE DRAINED. It is extremely important to put about one quart of permanent type antifreeze to be pumped into the entire marine toilet. This is important because of the cracking of frozen water in and about the head. The addition of antifreeze would be a good practice with any other accessories where water may set or collect during a freeze.

FRESH WATER TANKS

A standard plastic fresh water tank is located either in the bow or midship of your boat. Consult the plumbing diagram for the exact location of the water tank and its size and gallonage. Care must be taken so that the AIR VENT HOLE IN THE FILTER CAP OR THE VENT TUBE IS NOT PLUGGED OR IT WILL BE IMPOSSIBLE TO PUMP WATER FROM THE TANK.

FRESH WATER HAND PUMP AND SINK: The lever type pump in the sink on most models has a ball check valve to hold the vacuum on the return stroke. If the pump fails to operate after three or four strokes, first check water tank and the air vent hole in the filter cap. The tank should be full and the vent clear. If difficulty is still experienced, just disconnect the intake hose at the pump and blow through to the tank to clear any possible blockage, you might also check to see that the hose is not kinked or have some heavy object pressing against it to keep it closed. If the hose is clear, and the pump still does not work properly, disassemble the pump and look for particles blocking the internal check valve.

The stainless steel sink drains to a thru-hull directly below the galley area. On some models the sink may drain into a 5 gallon container to eliminate the thru-hull. In this case please check the container so that it does not overflow.

Bilge Pumps

Every boat should be equipped with at least one MANUAL BILGE PUMP, if for no other reason than to get rid of the melted ice water in the bilge. Some models the bilge pump is standard and has already been installed on your boat. If this is the case it is easily accessible and need only have a handle placed in it and pump. All factory installed bilge pumps have the pickup hose secured to the bilge. A clear plastic hose is used for the discharge line on the bilge pump.

SECTION EIGHT

PEDESTAL STEERING

The pedestal steering is standard on the CM 32 and optional on other models. The factory installed pedestal steering unit is cast from a corrosion resistant aluminum which is then painted with a gloss white urethane enamel. All other moving parts are stainless steel or manganese bronze thus removing any magnetic attraction from around the binnacle mounted compass area.

The unit is virtually maintenance free, but prior to your first sail, climb down below and check out the entire installation. With somebody turning the wheel from stop to stop make sure that the cables are leading properly and everything is tightened down, especially the sheaves mounted on the bulk heads. Next, sea trials are in order and you should check to see if there is any leaking where the quadrant goes through the transom to the rudder. Next, look for freedom of travel in the system and the cable tension, a moderate amount, enough to eliminate backlash for play is recommended. Any excessive tension creates additional friction and makes for harder steering.

Periodically check for loosened bolts and cable tension especially after the first few sails. They usually need tightening on the roller chain seated in the unit. Look for signs of wear or “fish-hooks” on the cable and replace as necessary. Three or four times a year, depending on the frequency of use of your boat, lightly oil the chain, pedestal shaft bearing, and the sheave bearings with a 3:1 oil to complete your maintenance routing.

SECTION NINE

YOUR TRAILER AND TRAILERING

Your trailer is a very important part of your new Clipper. It requires some maintenance and caution in its everyday operation. The attention you exercise in hitching, towing and maintenance will be more than offset by the peace of mind while you are traveling down the highway. On the other hand, if you are negligent in any of these areas, you will be endangering the safety of your boat, your car and yourself.

The trailer that was supplied by the factory with your new Clipper was especially designed for launching and retrieving, while still not sacrificing safety or performance on the highway. Trailer hitches come in a variety of shapes and sizes. Most trailer supply stores can install an adequate type hitch for your vehicle. Portable bumper type clamp-on hitches are definitely not recommended. It is worth the effort to invest in a good, solid hitch that is either welded or bolted to the frame. The trailer hitch itself should match the size of the ball hitch. Never use a ball hitch that is too small. Solid steel ball hitches are preferable. The coupling hitch on your trailer has a locking pin to prevent opening due to vibration. Lubricate the hitch for longer wear and quieter turns. The trailer is equipped with safety chain. This should be attached directly to the frame, not the bumper.

The total weight of your boat, including all equipment stored on board, should never exceed the recommended weight shown on the side of the trailer. Proper distribution of the load is of vital importance. Too much weight on the hitch will cause the back end of the towing vehicle to be down, causing headlights to shine up in the air. Too little or negative weight on the hitch, and the trailer will sway or fishtail. The solution to proper tongue weight is to move the forward bow stand forward or aft to correct your problem. Your trailer should already have the bow stand positioned correctly, as they are pre-set at the factory. Caution is necessary when towing any trailer. The heavier the rig, the more time required to accelerate, pass and stop. Curbs and obstructions should be given a wide clearance. While trailering your Clipper, the law requires an additional side view mirror of sufficient size so that you can see a person standing 150 feet directly behind you. Towing laws will vary from state to state, but California law requires the following:

1. Maximum speed limit of 55 m.p.h.
2. Operation only in the right hand lane except to pass a vehicle moving slower than your allowed speed. You may change lanes to pass and return to the extreme right hand lane immediately.
3. Two side view mirrors so you are able to see a point 150 feet directly behind you.
4. Brakes on any trailer with a gross weight (including boat, equipment inside and trailer) of 3,000 pounds or more.
5. Lights including two tail lights, stop lights, turn signals, license plate light and clearance lights.
6. An adequate piece of chain from the trailer to the towing vehicle.
7. License plate with current stickers and registration carried in the towing vehicle.
8. Maximum width of eight feet. Be sure side guides are moved back in, and locking bolts tightened if your guides are adjustable.

TRAILER MAINTENANCE: It is recommended that lights be removed before dunking in water, especially if it is salt water. If you are determined to launch your trailer with the lights hooked up, at least unplug the socket at the towing vehicle and thoroughly hose the trailer and lights off after use. Lights and sockets will undoubtedly corrode and will need to. be replaced if put in water. Always carry some spare bulbs and try coating the sockets well with vaseline. There are some new fixtures

just being introduced that are reported to be waterproof, but at this time, Clipper has not had an opportunity to test some of their reported claims.

Tires should always be inflated to the manufacturer's recommended pressure. It is a good idea to carry a spare wheel and jack that fits the trailer. Many of today's auto jacks are totally useless under a trailer. Your trailer comes equipped with grease fittings. These should be filled just to the point where grease begins to ooze out of the seams of the bearing housing. These should be checked periodically because if allowed to become empty, water will get into the bearing housing, damaging your wheel bearings. When traveling any distance, it is recommended that you wait 20 to 30 minutes before launching, so the bearings have a chance to cool gradually before being plunged into cold water. Usually you can be rigging and getting your boat ready while you are waiting for the bearings to cool.

Rust should not be allowed to accumulate. Remove rust and repaint with a good anti-rust paint, such as Rustoleum. Rollers should roll freely, and should not have checks, breaks or flat spots.

The cable attached to the retrieving winch located at the front of the trailer was not designed to move the boat on the trailer while it is out of the water. If you attempt to move the boat forward on the trailer after you have pulled the trailer out of the water, you will probably break the cable. Be sure the boat is all the way forward on the trailer and the cable secured and tightened before pulling the trailer out of the water.

Before moving on the highway, check the following:
1. Be sure the boat is centered on the trailer. When hauling your Clipper out of the water, have someone sit in the cockpit and hold onto one of the side guides. They will be able to adjust the distance between the hull and the side guide by pushing or pulling, while the boat is moving up the ramp. When at the top of the ramp, check and see how you did.
2. Lower the keel into the notched support provided for it on the trailer and should not be supported by the keel cable-so be sure you have done this!
3. Check the retrieving winch to see that the forward cable is tight and the winch is properly secured. This should be done before hauling out of the water, or you may find your boat sitting on the ramp 15 feet behind the trailer!
4. Check all gear aboard to see that it is properly secured and won't fall or roll around and break or damage the boat. Also distribute any heavy gear aboard so the load is balanced for easier trailering.
5. Be sure the mast and rigging are properly tied down. Collect all shrouds and rigging and stow carefully. They should be tied to the mast so they won't end up dragging in the street. Also, if the shrouds and rigging are allowed to rub on the fiberglass while trailering, they will mar the finish.

TOWING VEHICLE: Most vehicles are limited in towing capacity. If you are driving a normal sized passenger vehicle, you should have very little trouble in handling any of the Clippers up to 26 feet. However, if you notice the back end of your vehicle is squatting down, then we would recommend the addition of a towing package (a class three hitch with sway bars), available through most auto dealers. This will help distribute the tongue load into the center of your car rather than on the rear end. Another thing that you may try checking before doing this is how much gear is stored in the trunk of the car. The forward stand on the trailer can be moved back five or six inches as long as the trailer doesn't begin to sway under tow.

Tie down lines or straps, for peace of mind, can be secured to the cockpit winches and run directly down to the trailer. These will keep the boat from moving around on the trailer when going over bumps.

SECTION TEN

KEELS AND RUDDERS

There are basically two types of keels available on Clippers - fixed and swing keels.

SWING KEEL: If your new Clipper is equipped with a swing keel, there are a few procedures that you should be familiar with as well as some maintenance tips. Your keel winch has a built in clutch and is activated by attaching the handle. Merely tighten the handle on the exposed stud and the winch is ready to crank up or down. If your boat is sitting on the trailer and you are ready to launch, crank the winch until the keel is a couple of inches off of the trailer, and leave the handle in place. It is a good idea to look under the boat the first few times until you are familiar with the amount of effort necessary to raise the keel off the trailer. Note: Because of the mechanical advantage afforded by the keel winch, it is possible to overcrank the winch and break the cable. A simple way of avoiding this is to mark the cable with some paint when you have the keel at the correct height to clear the trailer. If you find the winch slipping while the handle is in place, try cleaning the internal clutch plates. This is easy to do and should remedy the situation.

After the boat is floated off the trailer, you are ready to lower the keel and insert the locking bolt. To lock the keel in place, locate the locking bolt hole. It is a 3/8 inch hole on both sides of the keel trunk, located just aft of the pivot bolt.

Sighting through the hole, you will be able to see daylight when the keel is lowered to just the exact position. Because this was designed to be a snug fit, the keel will have to be in just the right position for the bolt to go all the way through. The locking bolt is a 3/8 inch bolt with two large square washers and two rubber gaskets. The gaskets go on both sides of the keel housing with the washers on the outside of them. This needs to be tightened with a wrench as it will leak if not. Note: This locking bolt hole is located just above the waterline. If the bolt, gaskets and washers are not installed or not tightened securely, water is going to come in the holes. If you are sailing in shallow water and want the keel partially raised or don't want to lock it in position (we do not recommend this), you are going to have to plug the holes with corks or some other suitable alternative. Additionally, if you sail with the locking bolt not in place, you will have to maintain tension on the keel cable so the keel will not bang against the forward end of the keel trunk housing. Some times a humming sound will be given off by the keel cable, in which case, ease off on the keel winch and let the keel cable go slack.

To raise the keel, first remove pressure from the locking bolt by taking up on the keel cable. Be careful you don't overcrank the winch, because if you bend the locking pin, you may have trouble in removing it. With pressure off of the locking bolt, it should slip right out and the keel is ready to raise up to the hull. Again, be careful not to overcrank, as the keel begins to reach the bottom of the hull.

MAINTENANCE: Your retractable keel is cast iron and will rust. Most of this is just superficial and can be knocked off with a wire brush and painted with an anti-rust paint. If your Clipper remains in salt water for any length of time, the bottom, keel and rudder will eventually become fouled with growth. Although fresh water will take longer to foul the bottom, fouling will eventually occur. We cannot over emphasize the effect even a small amount of marine growth will have on your boat's performance. It is very significant! A protective coating of anti-fouling bottom paint (vinyl based) should be used on the entire bottom. The keel should be thoroughly covered, along with the keel cable and the inside of the keel cavity. If not, growth will collect on the inside of the keel cavity or on

the outside of the keel and it will become stuck in the cavity if you attempt to raise it. Painting the fiberglass surface requires a thorough sanding or a special etching fiberglass primer so the paint will adhere. Read and follow the directions carefully.

Note: Acetone should not be used to clear, the bottom before painting, as many of the vinyl based paints react to the chemicals in acetone and will begin to blister in a short period of time. Although marine growth will not permanently damage fiberglass, it will permanently stain or discolor the gel-coat surface. This is why it is so necessary not to leave your Clipper in the water for extended periods of time without the proper type of protection.

FIXED KEEL: If you have a fixed keel Clipper and have elected to leave it permanently in the water, you will have undoubtedly had the bottom painted as described in the section above. Although maintenance is very minimal, you will need to have the boat hauled out every six months to a year for repainting. At each haul-out, it is imperative to check the keel bolts for any signs of electrolysis (metal breakdown). If any is noted, the keel bolts should be replaced. Also, from time to time, check the tightness of the keel bolts as they may loosen, causing the keel to work.

RUDDER: If your rudder is left in the water, it should be painted, too. The upper pintle of your rudder hardware is equipped with either a clip or has a small hole drilled for a cotter pin. While sailing, this pin should always be in place. It should be noted that in steering, it isn't necessary to turn the rudder more than 25 or 30 degrees. Any more than this could put undue stress on your tiller and rudder.

SECTION ELEVEN

OUTBOARD ENGINES

Although it is not our intention to recommend one motor over another, we will attempt to make some very general recommendations. First, regardless of what make or size of motor you choose, be sure that it has a long or extended shaft. This will not only give you additional power since it will come out of the water less often in a bumpy sea, but it will also prevent the possibility of burning up the motor because of insufficient water being picked up through the lower unit.

The Clipper 21 and 23 will require an outboard from four to six horsepower. A couple of features to look for are a neutral and reverse, so that you can start the engine at the dock and give it sufficient time to warm up prior to taking off and give you more maneuverability while docking. Most motors offer portable tanks, which give you a much longer range without refueling and can be stored in the lazarette hatch while in operation. Note: Coast Guard regulations require the venting of any compartment where fuel is to be stored. This means the rear storage compartment must be vented to Coast Guard specifications if the tank is to be stored there. Some motors offer underwater exhaust systems, which not only reduce noise levels but also eliminate much of the exhaust fumes.

The Clipper 26 will require a motor of from six to ten horsepower. Again, look for the features noted above including the venting of the rear cockpit storage hatch.

The Clipper Quarter-Ton and Cruising Quarter-Ton will require from four to ten horsepower, but will be mounted on an outboard bracket. Clipper uses a special bracket that is designed to compensate for the reversed transom so the motor will sit perpendicular to the water, causing it not to lose power because of a poor entry angle.

The fuel tank can be stored in the aft section of the cockpit, requiring no ventilation. Or, if you desire, it can he stored in one of the seat hatches (be sure the tank you are looking at will fit in the opening), requiring Coast Guard approved ventilation. One suggestion would be to purchase an inexpensive rubber transom pad from any outboard dealer to mount under your motor before mounting the engine. This will prevent the motor from marring the fiberglass surface and will eliminate some of the vibrations from the motor.

The Clipper 30 and 32 will require from nine to fifteen horsepower. The engine is mounted in the outboard well provided in the hull. Venting in the outboard compartment is recommended for safety and allowing fumes to be dissipated.

SECTION TWELVE

INBOARD ENGINES

If you have a CM-30 or 32 equipped with inboard power, then we recommend you become thoroughly familiar with the engine manual supplied with your new Clipper. At the time of launching, your selling dealer should thoroughly check the shaft alignment. This was done very carefully at the factory, but loading, trucking and off loading can cause the alignment to change. This misalignment may also occur later and your engine manual should be consulted to check and re-align the engine and shaft.

PROPELLER SHAFT PACKING GLAND: The propeller shaft and packing gland nut have been left loose at the factory so water can thoroughly penetrate the packing at the time of launching. The packing nut should be tightened by your selling dealer during launching to eliminate excessive dripping and the lock nut tightened. When the engine is running and in gear, there should be a few drops of water coming from the gland, otherwise the packing nut is too tight and will burn up.

FUEL TANKS: Clipper Marine uses aluminum fuel tanks exclusively on all its installations. The tanks are mounted in two ways depending on whether it is a diesel inboard or outboard. With a diesel installation we mount the tank as near to the engine as possible, in the engine compartment. This installation conforms to recommended practices set down by the BIA (Boating Industry Associates) and ABYC (AmericanBoat and Yacht Council). On the outboard version fuel tank, we secure the tank to the hull with the use of foam. On both tank installations, we leave the fuel shutoff valve and the fuel tank label and all fittings exposed for your inspection. All fuel tanks bear an attached label in accordance with the BIA's recommendation-which states the following:

1. The manufacturers name or trade mark.
2. Year of manufacture.
3. Capacity in gallons.
4. Material specification and thickness.
5. Fuel for which tank is suitable or manufactured.
6. Maximum test pressure.
7. "G" impact level to which the tank was tested.

Each fuel tank has TWO FUEL SHUTOFF VALVES, one located directly on the fuel tank and the other located directly on the fuel filter for the diesel, and one on the hose line for the outboard.

When the valve handle is PARALLEL TO THE FUEL LINE, IT IS OPEN. When the handle is at RIGHT ANGLES it is CLOSED. When not operating the engine-BOTH OF THESE VALVES SHOULD BE CLOSED.

STARTING PROCEDURE: First check your engine manual, as there may be some minor variations between different types of engines.

1. Turn master switch to “ON POSITION.”
2. Open water intake valve.
3. Check oil and fuel levels.
4. Shift lever in neutral position.
5. Throttle advanced about one quarter.
6. Turn on ignition switch and push starter button. Check your engine manual for special cold weather starting procedures.
7. When engine starts, adjust throttle to idle.
8. If water does not begin to flow out of the transom outlet in two to three minutes, stop engine and check water intake valve.

The above procedure should be followed when STARTING A GASOLINE OUTBOARD ENGINE-EXCEPT THAT YOU WON’T HAVE TO OPEN THE WATER INTAKE VALVE, as with a diesel. In any case, check the technique explained in the specific engine manual for starting.

You will find your best cruising speed between half and three quarters throttle. In smooth water, higher speeds can be obtained with higher RPM’s, but fuel consumption will increase accordingly. Check your engine manual for the best cruising RPM. With the diesel engine, consult the manual for RPM for the specific speed for best cruising speed.

SECURING THE ENGINE:
1. Reduce the RPM to IDLE, and shift into neutral, and turn off the ignition switch. For the diesel engine, you will have to starve the engine of fuel. You can do this by placing the shift handle into neutral and pull the throttle control all the way back to STOP.
2. CLOSE the fuel shutoff valves and the water intake valves.
3. Turn off the key on the instrument panel and pull it out, and the engine has been secured and shut off for pleasurable sailing or when you leave the boat at the dock to go home for the evening.

VENTILATION: The ventilation system for both a diesel inboard and outboard well installations have been installed in accordance with the BIA and ABYC standards. In order to meet the existing safety standards as established by these associations the ventilator ducts with cows and exhaust blower have been fitted, both “for the purpose of properly and efficiently ventilating the bilges of the engine and the fuel tank compartment.” Consult your deck hardware and electrical diagrams for specific drawings concerning the installation of the ventilation system.

SECTION THIRTEEN

SAFE FUELING PRACTICES

When fueling either gas or diesel, it is a good point to keep this manual visible in the cockpit and read through each step each time until you know it by heart. More boats are lost at the fueling dock than out on the high seas.

1. Avoid fueling the boat at night or in rough water except in an extreme emergency.
2. Before reaching the fuel dock calculate the desired amount of fuel needed and order only that amount. Fuel tanks should not be filled to more than 90% of capacity to permit thermal expansion without overflow from the vent.
3. Before opening the fuel filling inlet:
* Extinguish all open flames including the galley equipment and lanterns.
* Forbid all smoking on board or on the fuel dock. Drown all butts and refrain other people from smoking in and about the fueling area.
* Turn OFF the main switch and all branch circuits, which is to be sure that there is no live electrical current on board during fueling. REMEMBER DO NOT TURN OFF THE MAIN SWITCH UNTIL THE ENGINE IS STOPPED TO AVOID DAMAGING THE ALTERNATOR.
* Tightly close all hatches, windows, doors, and ports.
4. Watch the fueling closely. Be sure that only a non automatic latch open type nozzle is used, compelling the operator's continuous hand pressure to keep fuel flowing and that only the ordered quantity of fuel is put aboard. Be sure that the operator maintains constant contact of nozzle to fill pipe.
5. When the desired quantity of fuel has been put aboard, make sure that the cap closing the inlet is tightly closed. Wash down any spills and check the vent openings to be sure that no fuel is being discharged over the side.
6. Open wide all hatches, doors, windows, and ports.
7. If your boat is equipped with electric bilge blowers, turn on the branch circuit switches which controls the circuits to this device and then turn on the main switch. Permit blower to operate for at least five minutes and check the ventilation cows for odor of gasoline vapors or diesel vapors being discharged.
8. If your boat is not blower equipped, wait at least ten minutes and check for gasoline odors in all low spaces of the boat.
9. When your personal inspection and observations assure you that there is no gasoline fumes remaining in the boat, the engine may be started and full electrical service restored as desired.

SECTION FOURTEEN

LAUNCHING AND RETRIEVING

Your swing keel Clipper was designed to be easily launched on any normal ramp. We suggest the following procedure:

1. Rigging - We have already discussed rigging. (See Section Three) It is much easier to step your mast before launching. Caution: BE SURE THERE ARE NO OVERHEAD WIRES OR OBSTRUCTIONS BETWEEN YOU AND THE LAUNCHING RAMP AFTER YOU HAVE RAISED THE MAST.
2. Tie an adequate length of line to your boat. If there is a dock in the launching area, plan to launch as close to it as possible.
3. Spread the side guides, if expandable, for lowering the boat in the water.
4. Crank the keel up just enough so that it is clear of the trailer. Be careful not to overcrank. See Section Ten on keel operation.
5. If you have a motor, it should be attached and hooked up for starting.
6. Before backing the trailer into the water, put one person in the cockpit and disconnect the cable between the trailer and the trailer eye. The tiller should be attached to the rudder and ready to be installed on the stern.
7. You should be ready to back the trailer into the water. If you have followed the above instruction, you should have very little trouble in launching your new boat. Take the line from the boat and tie it to the trailer or the dock if it is close by. Before backing the trailer up, have all passengers get out of the vehicle as a safety precaution- Now slowly back the trailer into the water until the boat is floating. It is not necessary to put your vehicle in the water to do this, as the boat can be given a shove while you are standing on the tongue of the trailer. Normally the boat will float free then the tongue of the trailer reaches the edge of the water.
8. Before shoving the boat, the person in the cockpit should attach the rudder and warm up the motor. If you don't have a motor, the line attached from the bow of the boat to the dock will come in handy. With someone holding the line on the dock, shove the boat off the trailer.
9. At the dock you are now ready to lower the keel. When the keel is down, insert the keel locking pin. (See Section Ten)
10. You are now ready to bend on and hoist the sails. (See Section Four) Happy Sailing!
11. Because you will never have your boat closer to your towing vehicle than when it is on the trailer, this is the best time to load all that extra gear in your trunk onto the boat. When backing the trailer into the water, it is a good idea to have one person stand behind and off to one side. This is a good safety tip whenever you are backing up.

RETRIEVING: You will pretty much follow the launching procedure in reverse.

1. First remove the locking pin and raise the keel (Covered under Section Ten.)
2. Tie a line to the bow of your Clipper.
3. Open up the side guides and tighten the locking bolts.
4. Back the trailer into the water until the hitch is at the edge of the water. Trailer fenders should be under water.
5. If you are able to position the trailer next to a dock, you can simply walk your boat onto the trailer with the aid of the bow line. Otherwise, you will need to use the motor and power the boat onto the trailer. In doing this, be sure you get the boat moving in a straight line before you enter the side guides of the trailer. There is nothing more difficult than attempting to approach the trailer at an angle. On the 21's it is a good idea to lower the keel two to three inches below the bottom of the boat to help give you directional stability. This will not be necessary on the 23 and 26, as the keel is always down several inches from the bottom.
6. When the bow eye is within three to four feet of the trailer winch, attach the winch cable and crank the boat to the bow pad of the trailer. Note: This should be done with the boat partially floating, or you will probably break the winch cable. Be sure the winch ratchet is securely latched and the winch cable cannot unwind, otherwise you may lose your boat on the ramp while pulling it out of the water.
7. Have someone sit in the cockpit and keep the boat centered on the trailer by holding on to one side guide when the boat is coming out of the water.
8. When you reach the top of the ramp, the keel can be lowered into the V-keel pad (located on the trailer just above the axle). If the boat isn't properly centered, the keel will not set properly on the keel pad and the boat will have to be re-centered. It is absolutely necessary to let the keel down before trailering, as it shouldn't be allowed to hang on the keel cable while riding on the highway.

SECTION FIFTEEN

FIBERGLASS MAINTENANCE AND CARE

Maintenance and care of the fiberglass finish of your new Clipper is extremely simple when compared to the care and maintenance required to keep boats of other materials in like condition. Certain basic practices must be followed if you wish to maintain the bright new finish of your new boat for years to come.

The shiny outer surface of your laminated fiberglass boat is known as gelcoat, a polyester resin into which pigment and weathering retardants have been added. It should be hosed off with fresh water after each use and routinely washed with a good detergent. Use a sponge or bristle brush to remove stubborn dirt and rinse thoroughly with fresh water. Do not use abrasive cleaners, as they will remove the glossy finish.

Once or twice a year the gelcoat surfaces should be waxed and polished with a good automotive or boat wax. A power buffer can be used, but care must be taken to prevent the buffing wheel from going through the gelcoat finish. When exposed to sunlight, the pigments in the gelcoat finish will gradually fade, (darker colors much faster than lighter colors) and will require heavier buffing to bring back the original luster. For power cleaning, use a light abrasive cleaner such as Mirro Glaze #1. A heavier rubbing compound such as Dupont #7 may be used when polishing by hand. After buffing, wash and polish all surfaces except the non-skid.

From time to time you are bound to have small scratches, gouges or even a damaged spot. It is best to discuss the proper course of action with your dealer or a professional who is skilled in fiberglass repair. An excellent book is available on this subject from Ferro Corporation, One Erieview Plaza, Cleveland, Ohio, 44114, for $3.00. Minor gelcoat touchup and patching is not difficult- It takes a little study, practice and if possible, the supervision of a knowledgeable person.

SECTION SIXTEEN

EXTERIOR TEAK TRIM

The exterior wood of your new Clipper is teak. If you follow a few simple suggestions, it is very easy to keep in a like-new condition indefinitely.

Every so often, when the wood appears to be weathering and turning grey, use a commercial cleaner such as Teak Brite. This is available in either liquid or powder form, and if the directions are followed, does a remarkable job of cleaning the old wood. If the grain begins to raise, give it a light sanding — just enough to smooth the surface. When this is done, follow with a coating of teak-oil such as Watco Teak Oil (exterior). These products are available in most marine stores and will also help protect the wood and prevent it from cracking and splitting.

One other possibility available to you is varnish. If you decide that this is how you want your teak finished, you will have to refinish it every three to four months. This is a lot of extra work, but if professionally done, will add much to the beauty of your boat.

SECTION SEVENTEEN

SAFETY EQUIPMENT

The Coast Guard requires that you maintain the following items of equipment in good operating condition. Please check with the Coast Guard as to any changes subsequent to the printing of this Owners' Manual.

1. Personal flotation devices (life jackets) for each person on board your vessel. Keep in mind the maximum number of people you could ever have on your vessel when equipping your Clipper with life jackets. The latest revision in this section excludes the use of flotation cushions. Be sure the jackets you purchase have the label "Coast Guard Approved" attached.
2. One throwing device: This can be the life saving cushion excluded above or a life ring, but it does not count as a life saving device for one of your crew members.
3. Fire Extinguisher: A Clipper 26 or smaller requires on B-I Coast Guard approved type (Carbon Dioxide, Dry Chemical or Foam), and for the Clipper 30 or 32, two of the above. Of the three types of fire extinguishers, we recommend Dry Chemical. These must be inspected and tagged at the time of purchase and re-inspected and re-tagged yearly.
4. One hand, mouth or power operated horn or whistle, audible for at least half a mile.
5. The Clipper 30 and 32 require a bell which, when struck, produces a clear, bell like tone of full round characteristics.
6. Navigational lights when operating after dark, as covered under Section Five on the electrical system.
7. Current state registration on board and proper numbers permanently affixed, as prescribed by individual state law.

The above items from a safety standpoint are actually very minimal, but are all that are required by the Coast Guard. Also, you will undoubtedly want to have at least the following additional equipment:

1. Adequate compass with a night light wired into your running lights.
2. Local navigational charts, parallel rules and dividers.
3. At least one anchor adequate for the size of your boat, 15 or 20 feet of chain (1/4"), and 150 to 200 feet of at least 3/8" nylon line.
4. Pack of safety flares.
5. A permanently fixed bilge pump.
6. First Aid kit.

SECTION EIGHTEEN

BASIC SAILING

Sailing is one of the easiest sports there is to learn and we will not attempt to make it difficult by getting too technical. After you have mastered the basic skills, you may want to study further some of the finer points of sailing, as covered in endless volumes on the subject.

We have previously covered launching and rigging your boat. Assuming you have this mastered, we will move on.

THE WIND: Before you can go anywhere, you will have to have wind and know where it is blowing from. Take three pieces of light yarn or commercial tell-tails and attach one to each of the upper shrouds about six feet off the deck, and one to the backstay. These are quite effective, but leave some extra yarn on the boat to replace them with later on.

WHERE AND HOW DO I SAIL?: We have drawn a circle and indicated the wind direction. You can sail in any direction on the circle except the shaded area, which is 45 degrees on each side of the on-coming wind. Disregard any terminology regarding different points of sail until you have mastered this basic concept.

Because your sails will luff (flap) and your boat will gradually stop dead in the water if you sail into the shaded area, you will be unable to sail closer to the wind than the approximate 45 degrees mentioned before.

HOW DO WE REACH A POINT DIRECTLY INTO THE WIND?: Tacking!
Simply sail on one tack for a while, as close to the wind as you can, tack (change course) 90 degrees, and sail on the other tack. Gradually this criss-cross course will take you to your desired point. That is all there is to “beating into the wind”.

The minute you wish to go off in any other direction, it’s simple.
Just remember one thing — your boom will be on the side opposite of the oncoming wind. As you gradually change course to the areas marked Beam and Broad Reach, you will ease your sails out until just before they begin to luff. Beginners will have a tendency to have their sails in too tight. Let them out until they luff and bring them back in until they stop. On a run you will have the sails all the way out. If the wind is coming more from one side than the other, be sure the boom is opposite the oncoming wind, otherwise you may have an unintentional gybe.

WHAT DO I DO WITH THE JIB?: Generally speaking, you will trim the jib about the same as the main. In tacking, the main will take care of itself, but you will have to release the jib sheet each time and bring it in on the other side. The jib and main should always be on the same side, except when running. You can put the jib out on the opposite side with the aid of a whisker pole when running. This is no more than an aluminum pole with fittings on each end that holds the jib out to one side (opposite the main).

GYBING: This is just the opposite of tacking, but instead of, the bow of your boat passing through the on-coming wind to change directions, the stern passes through. This can be a little more tricky and even dangerous in heavy wind. It is a good idea not to gybe in extremely heavy air. You can obtain the same results by making a 270 degree turn and tacking to get on the other course.

DOCKING: Of course the motor is the safest means of docking, but after you have gained a little experience, you may not want to use your motor. Everything depends on how the dock sits in relation to the wind. If the wind blows straight into the dock it can be pretty tough, but if the wind blows away from the dock, it's easy.

The problem with the downwind dock is hoisting/lowering the sails, except on the ends of the dock, where you can turn the boat into the wind. Coming back into the dock is going to be difficult, because you have no way of slowing the boat down.
The upwind dock is the ideal dock. You can raise the sails, push the boat off and sail away. In sailing up to the dock, slowly reduce speed by allowing your sails to luff. Keep just enough headway on so you can maneuver. Obviously, all this will take some practice. Be patient and don't rush yourself.

Try practicing around some small buoy away from other boats. See if you can sail up to the buoy and stop from different points of sail. You will quickly learn that when sailing upwind, you will be able to slow down more quickly, and that when sailing downwind, you will sail right on by. Now just imagine that the buoy is the dock. After you have tried this for a couple of hours, you will be an expert at docking under sail.

If you take your time, and apply some of the basics mentioned here, you should be doing quite well in two or three days.

Good Sailing!

SAIL SPECIFICATIONS

Model	Sail	Luff	Foot	Leach	Sq Ft. Area
CM-21	Main	21'-4"	9'-0"	22'-10"	96
	Jib	19'-9"	10'-3 1/2"	16'-10"	86.5
	Genoa 150	21'-6"	14'-7"	20'-7"	143
CM-23	Main	21'-4"	9'-0"	22'-10"	96
	Jib	22'-3"	11'-0"	19'-1"	105
	Genoa 150	24'-0"	14'-7"	23'-0"	162
CM-4	Main	23'-6"	8'-6"	24'-10"	100
	(Short JibRig)	23'-5"	12'-1"	19'-10 1/2"	120
	Genoa 150	26'-9 1/2"	16'-6 1/2"	26'-2"	208
CM-4c	Main	.	.	.	.
	Jib	.	.	.	.
	Genoa 150	.	.	.	.
CM-26	Main	23'-3"	10'-0"	25'-0"	116
	Jib	24'-5"	12'-3 1/2"	21'-1 1/2"	131
	Genoa 150	.	.	.	211
CM-30	Main	23'-11"	10'-0"	25'-2"	120
	Jib	28'-3"	10'-10"	23'-11"	126
	Genoa 150	29'-11"	21'-7"	28'-6"	216
	Spinnaker	.	.	.	.
	Reacher	28'-8"	LP 18.45	26'-8"	265
CM-32	Main	23'-11"	10'-0"	25'-2"	120
	Jib	28'-3"	10'-10"	23'-11"	126
	Genoa 150	29'-11"	21'-7"	28'-6"	.
	Genoa 125	29'-8"	18'-9"	26'-1"	.
	Lapper	28'-8"	16'-5"	23'-9"	195
	Mizzen	14'-6"	5'-8"	15'-2"	41
	Drifter	29'-11"	23'-4"	25'-10 1/2"	.
	MizzStay	19'-10"	12'-9"	15'-8"	.
	Spinnaker	.	.	.	.
	Reacher	21.95	LP 19.50	25.85	292

YANMAR DIESEL ENGINE SPECIFICATIONS

Model	**YSE-8/YSE-8G**
Type	4-cycle horizontal diesel engine
# of cylinders	One
Bore x stroke	75 x 75
Displacement	0.331
Cont. Rating	
Output HP/Rpm	5/2200 6/2600 7/3200
1-HR rating	8/3200
Reduction ratio	2/3
Direction of rotation-	
Crankshaft	Counter-clockwise (view from stern)
Propeller shaft	Counter-clockwise (view from stern)
Compression ratio	23.1
Combustion System	Special swirl precombustion chamber
Lubrication System	Enclosed full pressure lubrication w/trochoid pump
Cooling System	Water cooling w/rotary pump.
Starting System	Electric w/manual combination
Gear System	Reduction & reversing gear w/single Disc plate mech. clutch (wet type)
Dry Weight kg (lbs)	118 (260)

** Above mentioned HP indicates shaft horsepower.*

STANCHION SPECIFICATIONS

CM-21:
4 Stanchions
18 1/2” high
5 deg base

CM-21 flush deck:
2 Stanchions
10 1/2” high

2 Stanchions
18 1/2” high
8 deg base

CM-23:
4 Stanchions
24” high
9 deg base

CM-26:
4 Stanchions
24 1/2” high
9 deg base

CM-30:
4 Stanchions
20 1/2” high
10 deg base

2 Stanchions
24 1/2” high
9 deg base

CM-32:
6 Stanchions
26 1/2” high
9 deg base

1/4 Ton:
4 Stanchions
20 1/2” high
5 deg base

CM-21

STANDING RIGGING-F/D

Shroud	Wire Dia.	Tnbkl Size	Length
Headstay	1/8x1x19	1/8	21’-8 1/2”
Backstay	1/8x1x19	1/8	26’-11”
Uppers	1/8x1x19	1/8	20’-10”
Lowers	1/8x1x19	1/8	10’-3”

SHEETS & MISC- RUNNING RIGGING

Sheets & Lines	#ofLine	Wire Sz	Length	Cleat
Main	#10	5/16	32’	4”-2 hole
Jib/Genoa	#10	5/16	32’	4”-2 hole
Spinnaker	#12	3/8	36’	4”-2 hole
Spin-foreguy	#12	3/8	32’	4”-2 hole
Downhaul	#8	1/4	3’	4”-2 hole
Outhaul	#8	1/4	3’	4”-2 hole
Traveler	#8	1/4	3’	4”-2 hole

STANDING RIGGING-CABIN

Shroud	Wire Dia.	Tnbkl Size	Length
Headstay	1/8x1x19	1/8	22’-4 1/4”
Backstay	1/8x1x19	1/8	27’-3”
Uppers	1/8x1x19	1/8	21’-11”
Lowers	1/8x1x19	1/8	11’-4”

HALYARD & MISC.

Halyard	Wire Dia.	Wire Len	Line Dia.	Line Len	Block Shackle Cleat
Jib	3/32”	19’-4”	5/16”	22’	1/4” 4”-2 hole
Spinnaker	3/32”	.	5/16”	56’	1/4” 4”-2 hole
Pole Lift	.	.	.	40’	1/4” 4”-2 hole
Main	3/32”	22’-2 1/4”	5/16”	22’	1/4” 4”-2 hole

CM-23

STANDING RIGGING-CABIN

Shroud	Wire Dia.	Tnbkl Size	Line Length
Headstay	1/8x1x19	1/8	26’-1/4”
Backstay	1/8x1x19	1/8	27’-11 3/4”
Uppers	1/8x1x19	1/8	24’-6”
Fwd Lowers	1/8x1x19	1/8	12’-1”
Aft Lowers	1/8x1x19	1/8	12’-2 1/2”

SHEETS & MISC- RUNNING RIGGING

Sheets & Lines	#ofLine	Wire Sz	Length	Blk Shackle	Cleat
Main	#12	3/8	52’	1/4”	4”-2 hole
Jib/Genoa	#12	3/8	52’	1/4”	4”-2 hole
Spinnaker	#12	3/8	36’	1/4”	4”-2 hole
Spin-foreguy	#12	3/8	36’	1/4”	4”-2 hole
Downhaul	#8	1/4	3’	1/4”	4”-2 hole
Outhaul	#8	1/4	3’	1/4”	4”-2 hole
Traveler	#8	1/4	3’	1/4”	4”-2 hole

HALYARD & MISC.

Halyard	Wire Dia.	Wire Len	Line Dia.	Line Len	Block Shackle	Block Cleat
Jib	3/32”	23’-1/2”	5/16”	28’	1/4”	4”-2 hole
Spinnaker	3/32”	.	5/16”	.	1/4”	4”-2 hole
Pole Lift	3/32”	.	5/16”	.	1/4”	4”-2 hole
Main	3/32”	23’-1/2”	5/16”	28’	1/4”	4”-2 hole

CM-26

STANDING RIGGING-F/D

Shroud	Wire Dia.	Tnbkl Size	Line Length
Headstay	1/8x1x19	1/8	27’-8”
Backstay	1/8x1x19	1/8	30’-7”
Uppers	1/8x1x19	1/8	25’-9”
Fwd Lowers	1/8x1x19	1/8	12’-6 1/2”
Aft Lowers	1/8x1x19	1/8	12’-8 1/4”

STANDING RIGGING-CABIN

Shroud	Wire dia.	Tnbkl Sz	Line Length
Headstay	1/8x1x19	1/8	28’-3”
Backstay	1/8x1x19	1/8	30’-3 1/2”
Uppers	1/8x1x19	1/8	26’-8”
Fwd Lowers	1/8x1x19	1/8	13’-6”
Aft Lowers	1/8x1x19	1/8	13’-7 1/4”

SHEETS & MISC- RUNNING RIGGING

Sheets & Lines	#ofLine	Wire Sz	BlkShackle	Cleat	Length
Main	#12	3/8	52’	4”-2 hole	52’
Jib/Genoa	#12	3/8	53’	4”-2 hole	52’
Spinnaker	#12	3/8	36’	4”-2 hole	50’
Spin-foreguy	#12	3/8	??’	4”-2 hole	36’
Downhaul	#8	1/4	3’	4”-2 hole	3’
Outhaul	#8	1/4	3’	4”-2 hole	3’
Traveler	#8	1/4	3’	4”-2 hole	3’

HALYARD & MISC.

Halyard	Wire Dia.	Wire Len	Line Dia.	Line Len	Block Shackle	Block Cleat
Jib	3/32”	24’-11”	5/16”	28’	1/4”	4”-2 hole
Spinnaker	.	.	5/16”	57’	1/4”	4”-2 hole
Pole Lift		.	5/16”	40’	1/4”	4”-2 hole
Main	3/32”	25’-7 1/2”	5/16”	28’	1/4”	4”-2 hole
Foreguy	.	.	3/8”	36’	1/4”	4”-2 hole

CM-30

STANDING RIGGING-CABIN

Shroud	Wire Dia.	Tnbkl Size	Line Length
Headstay	5/32	5/32	29’7”
Backstay	5/32	5/32	32’-0”
Uppers	5/32	5/32	28’-1/2”
Fwd Lowers	5/32	5/32	14’-7 1/4”
Aft Lowers	5/32	5/32	14’-6 1/4”

SHEETS & MISC- RUNNING RIGGING

Sheets & Lines	#of Line	Wire Sz	Length
Main	#12	3/8	52’
Jib/Genoa	#12	3/8	52’
Spinnaker	.	.	.
Spin-foreguy	.	.	.
Downhaul	#8	1/4	4’-6”
Outhaul	#8	1/4	3’
Traveler	#8	1/4	4’

HALYARD & MISC.

Halyard	Wire Dia.	Wire Len	Line Dia.	Line Len
Jib	3/32”	28’-6 3/4”	5/16”	32’
Spinnaker	.	.	.	.
Pole Lift	.	.	.	.
Main	3/32”	26’-7 1/4”	5/16”	32’

CM-32

STANDING RIGGING-CABIN

Shroud	Wire Dia.	Tnbkl Size	Len Length
Headstay	5/32	5/32	29’-11”
Backstay	5/32	5/32	33’-1 1/4”
Uppers	5/32	5/32	28’-0”
Fwd Lowers	5/32	5/32	14’-2 1/2”
Aft Lowers	5/32	5/32	15’-5 3/4”
Backstay Bridle	.	.	20’-11”
Mizzen Loweraft	.	.	13’-6 1/4”
Lower Forward	.	.	13’-6 1/4”

SHEETS & MISC- RUNNING RIGGING

Sheets & Lines	#ofLine	Wire Sz	Length
Main	#12	3/8	56’
Jib/Genoa	#12	3/8	56’
Spinnaker	.	.	.
Spin-foreguy	.	.	.
Downhaul	#8	1/4	4’-6”
Outhaul	#8	1/4	3’
Traveler	#8	1/4	4’

HALYARD & MISC.

Halyard	Wire Dia.	Wire Len	Line Dia.	Line Len
Jib	3/32”	28’-6 3/4”	5/16”	32’
Spinnaker	.	.	.	.
Pole Lift	.	.	.	.
Main	3/32”	26’-7 1/4”	5/16”	32’