OWNERS MANUAL

MENGER CAT 19

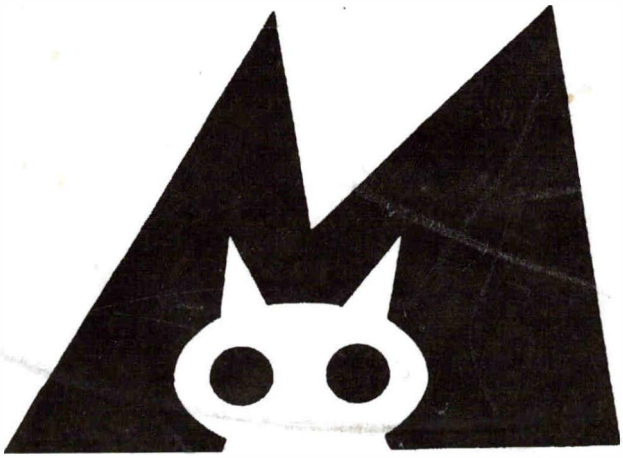

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TABLE OF CONTENTS AND INDEX

1.1 RECEIVING CHECKLIST

Before accepting delivery, visually check Cat and all equipment for any damage and/or excessive dirt from shipment. Check for any water below deck.

You should receive the following items with your Menger Cat when you pick up the boat or when it is delivered.

1.1-1 STANDARD ITEMS

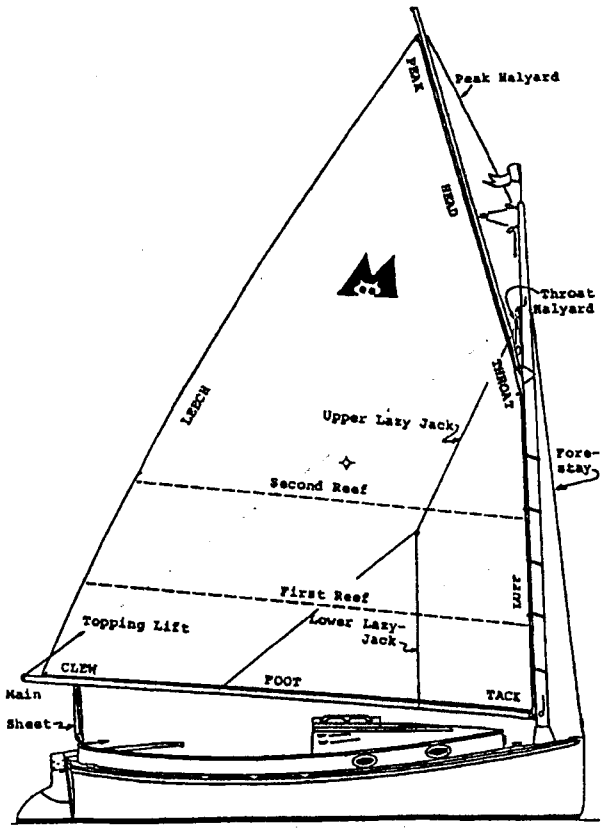
1. Sail (color choice: White, Tanbark, Egyptian cotton color) - SAIL BATTENS
2. Sail Bag
3. Sail Cover
4. All Running Rigging: Mainsheet, Peak Halyard, Throat Halyard, Topping Lift, Lower Reef line, Upper Reef Downhaul, Upper Reef Outhaul, Gaff Outhaul, Main Outhaul, Flag Halyard.
5. Lazy jacks, two upper with brass thimbles; two lower
6. Harken Blocks: Single Blocks (7), Mainsheet Jam Block, Double Block, Single Block with Becket.
7. Mast
8. Mast rings (5), with marlin
9. Forestay
10. 5/16" Turnbuckle bronze
11. 1/4" S.S.Shackle (to attach forestay to mast tang)
12. Boom
13. Boom crutch, teak
14. Two 1/4" S.S. Bolts (for goose neck and gaff saddle)
15. Gaff
16. Gaff saddle, parrel beads(5) and parrel line
17. Two net hammocks
18. Interior cushions(3)
19. Dropboard, teak plywood
20. Cockpit drain plug
21. Touch up paint for spars, white and buff gelcoat repair paste
22. Certificate of Origin
23. Bill of Sale
24. Various Warranties and Guarantees by other manufacturers
25. Builders Certificate.

RUBBER SEAL FOR SEA STRAINER
ZINCS
FUEL FILTER ELEMENTS

1.1- 2 OPTIONAL ITEMS

1. Mast-boom carrier, fits in boom crotch sockets (tabernacle boats)
2. Mast tabernacle with two 1/2"-7" S.S. bolts, one 1/4"-5" S.S. bolt
3. Bowsprit with bobstay chain 3/16", 1/4"S.S. shackle, 1/4" bronze turnbuckle
4. Cockpit tent with tie lines
5. Deck rope pipe (for anchor rode)
6. Opening forward porthole, w/ teak stick holder
9. Bronze step-on transom and/or rudder
10. Knotmeter
11. Depth finder
12. Compass
13. Double bunk filler cushion
14. Electric bilge pump
15. Hand bilge pump with handle.
16. Name and hail port on transom
17. Trailer with literature package, Certificate of Origin
18. Cruising package (ice chest, Porta Potti, slide out galley unit with two perforated cups for silver, drawer, two collapsible tanks, two hoses with four hose clamps)
19. Lighting package
20. Outboard bracket
21. Inboard diesel
22. Diesel deck fill key
23. Yanmar tool kit for diesel engine
24. Yanmar Owners Manual for diesel engine
25. Battery with case
26. Vent covers (2), diesel boats only
27. Anchor rode
28. Anchor
29. Wind indicator
30. VHF Radio (fixed)
31. Hand-held VHF
32. Anchor chocks on forward deck
33. Opening Hatch with screen
34. Cetol or Armada finish on teak
35. Winter-trailering cover

1.2 COMMISSIONING CHECKLIST



1.2 - 1 RIGGING

1. Lay mast over top of boat or nearby with forward side of mast up. If boat has a tabernacle, place mast horizontally in tabernacle and in mast-boom carrier. Eyebolts are on aft side of mast.

2. Slide mast rings over top of mast. Count the number of ring cringles, do not include rings for reef cringles. Tie rings together so they do not drop off bottom of mast as it is raised.

3. FORESTAY:Fasten forestay with a shackle to the tang on the forward side of the mast. Fully extend the 5/16" bronze turnbuckle and attach to bottom of forestay.

4. LAZYJACKS:

(a) Tie two upper lazyjacks (each 10'6" long, 1/4" nylon) to eye on each side of mast with a bowline. (Upper lazyjack has a brass eye spliced in.)

(b) Run lower lazyjacks (each 18'6" long, 1/4" nylon) through brass eye on each side. Tie together on bottom.

5. TOPPING LIFT:

(a) Attach single block for topping lift, to eye on port side of mast, just above lazyjack eye. The flat cheek of the block should be against the mast.

(b) Run the topping lift line, (52' of 5/16" Dacron), through the block and tie two ends together.

6. THROAT HALYARD:

(a) Attach block with becket to large eyebolt opposite the forestay tang. Put the flat cheek of the block against the mast.

(b) Attach throat halyard, (56' of 5/16" Dacron), to becket with a bowline. Run the line through the single block, back to block with a becket, pull to mast base starboard side, and tie the three lines together.

7. PEAK HALYARD:

(a) Attach two single blocks to small eyebolts on the mast. Orient the blocks so the flat side of the block is perpendicular to the mast.

(b) Thread one end of the peak halyard, (92' of 5/16" Dacron), up through the bottom block, through a third single block, and through the top single on the upper eyebolt. Pull these lines to mast base and tie the four lines together.

8. FLAG HALYARD: Run the 1/8" line, (40' long), through the small block on the side of the mast top. Tie the ends together.

YOU ARE NOW READY TO RAISE THE MAST: You should have the following attached: forestay, two lazyjacks (uppers and lowers), topping lift, throat halyard, peak halyard, flag halyard. Tie off all loose lines to the mast at the bottom to have better control when lifting into place. (Don't forget the mast rings!)

1.2 - 2 STEPPING THE MAST ON TABERNACLE BOATS

Place the mast aft side down into tabernacle. Put the top bolt in. Close the main hatch and walk the mast up the center of the boat until it is vertical. Put a long thin screwdriver in the bottom hole. Attach the forestay. Put the bottom bolt in. Tighten both bolts, but do not over tighten!

Check to make sure the electrical wires and antenna coming out of the mast

base are clear as the mast is raised. It also helps to have someone make sure the lines on the mast don't get snagged on cleats, tiller, etc.. Put ¼"-6" S.S. bolt in fore and aft hole through mast and tabernacle. This bolt is used to secure the mast further, but is not really necessary for boats that are not left on a mooring. When your Menger Cat is in the water the mast is 23'6" high from the waterline, so be well aware of overhead obstructions to avoid serious injury or harm to yourself or others.

1.2 - 3 STEPPING THE STANDARD MAST

Raise and place mast into mast hole. Attach forestay to chain plate, do not over tighten. Put in mast wedges. This is at least a two man job. If there is any question about doing it, it would be better to have it done professionally, with a gin pole or crane.

1.2 - 4 BENDING ON SAIL

1. Look aloft to make sure that no block or line has run up the mast and cannot be reached from deck. Don't worry, tangled lines will soon be cleared up.

2. Attach boom to gooseneck using 1/4" 1 1/2" S.S. hex head bolt with lock nut and washers.

3. Attach one end of the the topping lift to the last hole in the boom end casting with a bowline. Lead the other end through the cheek block on the port side of the tabernacle to the outside cleat on the aft end of cabin (port side).

4. Attach lazyjacks to each side of boom with stopper knot through cleats on boom (two port, two starboard).

5. Attach the mainsheet jam cleat block, to traveler. Attach double fiddle block to bale on boom. Pull mainsheet through blocks starting at jam cleat. Mainsheet is 66' of 5/16" Dacron.

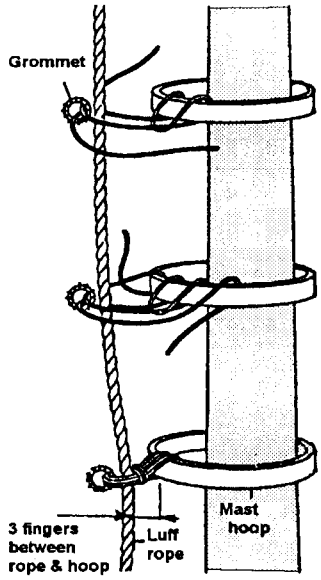
6. Attach gaff to gaff saddle with 1/4 - 1 1/2" hex-head bolt. Lay the gaff between the lazy jacks with the track down. Attach the gaff saddle to mast by tying the parrel bead line around the mast to holes in ears of gaff saddle. Use a figure-eight knot on each end, and another just inside to prevent the beads from falling off when the detaching saddle.Tie the parrel bead line tight.

7. THROAT HALYARD: Attach the throat halyard and block to the eye on top of the front of the gaff making the block flat against the mast. Run the throat halyard through the inside double cheek block to the cleat inboard starboard.

8. PEAK HALYARD: Tie the line running from the mast, peak block to the eye on top of the gaff (aft end) with a bowline. Attach the block in the middle of the peak line, to bridle on top of the gaff, making the cheek of the block lay flush with the side of the gaff. The other end of peak halyard leads through outer starboard double cheek block to the outer starboard cleat.

9. BENDING ON SAIL:
(a) Raise the gaff about 2' above boom. Slide mainsail foot into track on top of boom, fasten tack pin.
(b) Slide peak of sail into track on bottom of gaff, fasten throat pin.

10. MAST RINGS: Tie sail to mast rings, leaving three fingers distance between luff and ring, use 36" of marlin for each ring. The purpose of the rings is to keep sail from blowing backwards when lowered or raised. Luff tension is achieved by tightening of throat halyard.



In a traditional method of bending the sail to the mast (left), mast hoops are seized to grommets on the sail's luff. Using light marline, a tag hitch is taken around the hoop, and the free ends passed through the grommet (top). The ends are then passed back through the hoop (center), and several turns taken around all parts (bottom). The seizing must be just slack enough so the hoops lie at right angles to the luff rope.

12. BATTENS: Slide four battens into pockets. The thinner end of the battens should be in forward end of pocket. The battens are different lengths. It is a good practice to mark each batten to correspond to its own location on the leech.

13. MAIN OUTHAUL: Foot outhaul is 10' of 1/4" Dacron. Tie a bowline knot to the eye on the starboard aft end of the boom. Take the line forward through the clew cringle, back to the small block attached to the forward eye in the casting, and then forward to cleat on starboard side of the boom. This should give you a three part outhaul.

14. GAFF OUTHAUL: Head outhaul is 2'6" of ¼" Dacron. Tie bowline to cringle in sail, lead aft through hole in end casting, lead forward again through cringle, tighten and secure with half hitches. You should again have a three part outhaul. It is debatable whether this outhaul should be tight or loose. Try it both ways.

15. REEFING LINES:

(a) SINGLE LINE LOWER REEF: Reef line is threaded through boom at plant. The aft end goes through a cheek block and is tied to lower reef cringle on leech of sail with a bowline. The forward end goes to a block shackled to the lower reef cringle on luff, then down to a block shackled, flat side to sail, to the gooseneck plate on the mast or tabernacle, then to the inboard cleat on the aft port side of the cabin.

(b) UPPER REEF: Downhaul is 3'6" of 1/4" Dacron tied to forward upper reef cringle. Outhaul is 2'6" of 1.4" Dacron tied or spliced securely to second reef cringle on leech. This leads directly to cleat on port side of boom.

1.2 – 5 LAUNCHING PRECAUTIONS

Immediately after launching the following should be checked for leaks:-

1. Centerboard Pin.
2. Thru-hulls for fixed head.
3. Salt-water engine intake.
4. Stuffing box.
5. Speed, paddle wheel thru-hull.

1.2 – 6 LOWERING THE TABERNACLE MAST

Following are the steps to be taken to lower the mast of a tabernacle Cat:

1. Put on the sail cover on in the normal way, and replace the boom crutch with the mast-boom carrier.
2. Unclip the forward flap on the sail cover
3. Remove the parrel line from one side of the gaff saddle.
4. Pull the gaff and saddle aft toward starboard.
5. Loosen the forestay.
6. Remove the fore-and-aft bolt from mast and tabernacle.
7. Remove the lower bolt (jiggle the mast to ease removal)
8. Put a long screwdriver through the bottom hole
9. Disconnect the forestay turnbuckle from the boat
10. Close the main hatch
11. Standing on the cabin top, remove the screwdriver while holding the back of the mast.
12. Pull mast toward you and lower slowly, standing on port side.

13. Remove the forestay, coil up and stow.
14. Gather all lines, starting from mast top, and pull forward. Unclip the sail cover and tuck the lines inside.
15. Tie the mast down to the aft cleats and tighten the main sheet..
16. Using the line in the sail cover, tie the gaff to the boom and mast. That's it!

1.2 – 7 INBOARD ENGINE BREAK-IN

RUNNING FOR THE FIRST TIME: -
Diesel engines will run as long as they have clean fuel and air. They will not run if the air is in the fuel lines. Therefore the fuel line has to be bled of air. When new, air is trapped in the fuel lines and can be getting into the fuel lines through loose connections. Therefore hose clamps and fittings must be tight.

The engine has been bled before leaving MBW. (See Sect. 2.3-12) However, due to the fact that the engine will run on a small quantity of fuel for a long time, we are not sure of a complete bleed until it has run several hours. After this has been done it should not be necessary to bleed the engine again. It will need to be bled if it happens to run out of fuel. We put in about 3-5 gallons of diesel fuel before it leaves MBW.

ADJUSTING THE STUFFING BOX: -
We adjust the stuffing box as best we can before the cat leaves MBW. It has to be readjusted after being in service as it has to wear-in. (See Sect. 2.3-3)

Tie to a dock, start engine allow to warm-up for a few minutes. Remove shelf in aft locker so stuffing box can be observed. Put engine in forward gear and see if packing nut does not turn. Put engine in reverse gear and again check packing nut. If packing nut is OK then put into gear and allow to run for 15 minutes. Put into neutral, check temperature of stuffing box by touching it. If it is warm then OK, continue in gear for ½ hour. Check again to make sure it doesn't get too hot. Feel underneath for dripping water. As the packing wears-in it will be necessary to retighten the stuffing box. Ideally it will drip slowly while in gear and not leak when at rest. See Section 2.3–3 for detailed instructions.

1.3 TRAILER PROCEDURE

1.3 - 1 ON THE ROAD

1. Your tow vehicle must have enough capacity to tow 3500 to 4000 lbs. There is a lot of information in the boat press as to towing capacity of common vehicles. Check with your auto dealer. (If you add a lot of gear, weight will go up.)

2. If you are doing long distance trailering, check the regulations in the states you are traveling through. You may be required to have surge brakes depending on the weight of your total load.

3. Carry enough spare parts! You should have a least a spare wheel bearing, light bulbs, waterproof bearing grease and gun, extra wheel studs, and a spare tire and rim.

4. Make sure all lines are tied down and nothing is loose. Tie a line around the outside of the sail cover to prevent it rubbing on the non-skid on top of the main hatch. Pad all metal to metal contacts. Remember that vibration will cause wear and tear very quickly.

1.3 - 2 LAUNCHING

1. If you so desire, the mast can be raised before launching. This is much easier to do on the trailer than in the water. Be very careful of low overhead wires near the launching ramp or in the staging area. If you touch an overhead line do not make contact with the ground by stepping out of your vehicle or touching the boat or trailer! One Menger Cat owner bent his mast in two but continued on due to his four wheel drive. If he had stopped and got out-?

2. Check over your Cat to make sure you are ready to go into the water. Raise the centerboard fully. Close all sea cocks. Raise the outboard fully. Remove all tie downs from the Cat to trailer. Attach dock lines to the bow and stern long enough to reach from the Cat to dock with enough length to allow for the surge of launching.

3. Back up to the launching ramp until your trailer wheels start to touch water. Get out and determine how far you are going to go in. Remember, try not to submerge the trailer bearing as this is the weakest link in the trailer. Steep ramps are the most desirable in this respect. If you do submerge the bearings, be sure to give them a squirt of grease when you get home. Do not back up so far that the wheels of your car touch the water or slippery area. Put wood blocks on the ramp to prevent going in too far.

4. When you are in position, slowly release the pressure on the trailer winch, (be careful - the handle can spin fast enough to seriously hurt you), so that the hook becomes loose on the bow eye. Remove it. The Cat will not go flying off as the curve of the hull holds it on the trailer.

5. At this point, give the hull a push and it might start to slide off the trailer into the water, depending on the steepness of the ramp.

6. If you cannot push the hull free, pull forward slightly with your vehicle and then back up and slam on your brakes. Do not allow the rear wheels of your vehicle to enter the water.

7. At this point the boat will roll back and into the water. If this doesn't work the first time, try again. Doing this for the first time is rather traumatic, but it works on all types of ramps.

1.3 - 3 LOADING

1. Moor your boat as close to the ramp as possible.

2. Run lines from the bow and stern cleats long enough so that you are able to reach the launching ramp.

3. Back the trailer into the water until the wheels are submerged to the axle. Place wood blocks under the rear wheels of your tow vehicle to prevent the trailer from pulling it into the water.

4. Slowly position the bow so that it lines up with the center of the trailer.

5. Let the wire out until you can reach the bow eye and attach the hook to it.

6. Reverse the direction of the winch so that it is pulling in. Slowly crank the winch in. If excessive force is needed, stop winching and determine what is hanging up. The boat should roll slowly onto the trailer until the bow reaches the V-block on the winch stand.

7. You can now pull away from the ramp. Use low gear and slow speed. Again, watch for overhead wires!!

8. See Section 1.2 - 7 on lowering mast.

1.3 - 4 TRAILER LIGHTING SYSTEM

Even though your boat trailer is equipped with the best lighting system available, including submersible tail lights and a "safeguard" reflector system, you should always double check your lights to make sure they are in working order before any trip.

Twice a year it is a good idea to trace the wiring system from the towing vehicle to your tail lights and watch for bare wires, cracked insulation, or corroded terminals. Always be sure the white ground wire is connected to the trailer frame. Replace all damaged or worn parts. Waterproof grease, petroleum jelly, or WD 40 should be put on plug contacts and bulb bases to prevent rust and corrosion.

Vehicles with four wire tail light systems must use a four wire to three wire converter. Make sure your vehicle is equipped with the proper lighting package. We recommend that a professional i.e. your automotive dealer, install it for you. The trailer's wire color code is as follows:

Yellow and Brown (on trailer)_____Left

Green and Brown (on trailer)_____Right

Brown (on trailer and pig tail)_____Connect to Tail lights on car, rear marker light, front and rear side lights.

Yellow (on trailer and pig tail)_____Connect to Left stop and turn on car

Green (on trailer and pig tail)_____Connect to Right stop and turn on car

White (on trailer and pig tail)_____Ground

Even though your lights are submersible, it is always advisable to disconnect the light harness prior to submerging the trailer.

1.3-5 TRAILER BRAKE LOCKING

When you leave a trailer sitting in one location for a long time the brakes can lock. This is caused by rusting of the brake drum. The brake composition pad sticks to the inside of the brake drum. All it takes to solve this problem is to bang on the outside of the drum with a hammer. To do this it may be necessary to remove the tire and rim.

1.4 WARRANTY PROCEDURE

After commissioning your boat, it is unlikely that problems will develop with your Menger Cat. However, should you need to correct a fault, contact Menger Boatworks first. Written authorization will be required before any payment is made. An all-out effort will be made to keep you as a satisfied Menger Cat owner.

"Menger Boatworks warrants its products to be free of defects to materials and workmanship for a period of one year from delivery date."

1.5 HULL AND DECK

1.5 - 1 CONSTRUCTION:

FIBERGLASS: All hand laid up, Isophthalic gelcoat, white hull and tan deck with non skid molded-in, molded cockpit with two lockable hatches. Hull and deck five layers of mat and woven roving. Deck fiberglassed to hull all around. Molded head liner, hull liner and bunks. Centerboard and rudder solid fiberglass (not plywood).

TEAK: All exterior trim is solid teak including rubrails, handrails, brow on cabin sides, cockpit coaming cap, hatch trim, teak and holly sole in cabin, teak plywood drop board.

BRONZE: All hardware is bronze, including four mooring cleats, two halyard cleats, topping lift and reef cleats, two chocks, five fixed ports, traveler, hatch hinges, hasps, forestay tang and triple gudgeons and pintles.

SPARS: Tapered aluminum mast. Gaff and boom slotted aluminum extrusions. Gaff saddle molded fiberglass. All hand painted with Interlux Sundown Buff, #4237. Mast head painted white.

RIGGING: Stainless steel forestay. Three strand 5/16" Dacron halyards, topping lift and mainsheet. Mainsheet jam cleat. Topping lift and first reef outhaul and downhaul led to cockpit. Harken ball bearing blocks.

CABIN INTERIOR: Varnished ash wainscoting on cabin sides. Varnished ash drop leaf table on centerboard trunk. Shelf on forward and aft bulkhead. Two net hammocks. Seven lockers under bunks. 3" thick canvas covered (washable) cushions. Double bunk option is 45 inches wide and 8 feet long.. Space for ice chest and Porta Potti under cockpit floor, or head can be located on port side, shortening bunk to 6 feet.

1.5 - 2 GELCOAT REPAIR

The repair material you receive is your original gelcoat mixed with cabosil (a thickening agent) and wax (to cure gelcoat without having to seal off the surface from the air). This paste requires a catalyst to cure it. The catalyst is Methyl Ethyl Ketone Peroxide. DO NOT GET THIS IN YOUR EYES! It will cause blindness if not washed out with water within 10 seconds! The catalyst is in the small glass vial. The shelf life of the material is 1 to 2 years.

REPAIR PROCEDURE- Gouge or grind out the blister. It must be free of any dust or dirt or any contamination. Do not extend the damage-keep as small as possible.

TO ACTIVATE PASTE- Catalyze a small quantity at a time. 1 or 2 eye drops

to a tablespoon of paste. Mix thoroughly. Push paste into crack with a small putty knife. Take a clean razor blade and bridge over the crack. Clean off all excess material. Try to do this with one swipe. Let gelcoat paste cure till it is hard. It ranges from a few minutes up, depending on the amount of catalyst you add and the temperature of the day. It will shrink on curing below surface. If it does shrink excessively on curing repeat the same steps again. If you are careful and patient, little or no sanding will be required. If sanding is required use 400 to 600 wet/dry sandpaper on a block of wood. Sand carefully in the crack area only. Otherwise you will sand through the adjacent gelcoat. (Try putting masking tape around the repair so you sand only the repair.) Finally, polish with auto body rubbing compound (orange, then white). If all of the above fails give us a call.

1.5 - 3 BOTTOM PAINTS

In certain geographical areas some bottom paints work much better than others. Your bottom has been painted with Interlux Fiberglass Bottomkote (#449). When you repaint the bottom of your boat, seek the advice of your boatyard or local "expert" on what brand of bottom paint works well in your area.

CAUTION: Not all bottom paints are chemically compatible. Be sure to tell your paint dealer what brand of bottom paint is on the bottom of your boat to be sure it is compatible with yours.

1.5 - 4 HARDWARE

The deck hardware on your Menger Cat is engineered for its intended purposes. Since many deck hardware items are expected to withstand considerable strain, they are bolted through the deck, and through a backing plate, which is fiberglassed into the deck during layup. The bolts securing these cleats should be checked occasionally to make sure they are still tight. If there is not a backing plate, that area of the deck core is solid plywood, or of a substantial thickness of solid fiberglass, considered strong enough to do the job.

1.5 - 5 MAST STEP

The mast step area of your Menger Cat is fiberglassed into the hull with 10 layers of fiberglass at the waterline. It is designed to transmit the load of the mast evenly throughout the hull. The mast is set down on to a fiberglass cone which is fastened to the mast step. In tabernacle-equipped boats, the tabernacle is glassed to this step as well as to the underside of the deck.

1.5 - 6 CENTERBOARD

The centerboard is made in a two part mold with fiberglass outer skins. The core of the board is filled with a mixture of sand and resin. This serves to weight the board so it sinks. The core is so tough it cannot be drilled into. When rubbing on the bottom instead of exposing wood or steel the sand-resin mixture resists any deterioration.

The centerboard pennant is 5/16" Dacron 6' long. It passes through the fairlead hole into the trunk. It then goes over a S.S. pin, (which is fiberglassed into the trunk), down to a molded hole in the aft end of the centerboard, and is secured with a bowline.

1.5 - 7 RUDDER

The rudder is made in a two part mold with fiberglass outer skins. The core of the board is fiberglass.

1.6 SPARS AND RIGGING

1.6 –1 SPARS

Mast, booms, and gaffs on Menger Cats are fabricated of high grade extruded aluminum. The boom can cause serious injury to you or others if hit by it. Make sure you are not standing up while the boat is sailing to avoid being hit during an accidental jibe etc.. All spars are primed with a two part primer which etches itself into the aluminum. A white primer for Brightside paint is applied next followed by the finish coat of Interlux Brightside Polyurethane Sundown Buff (#4237). Sundown Buff is a deep buff color to simulate wood spars. If for any reason you need to touch up paint on the spars you will find a small quantity of it included with your Cat.

Check over your spars at the end of the season to see if there are any loose forward fittings that need to be tightened up.

Allowing the boom to swing too far will cause a levering action and pry loose the gooseneck casting. It would be worthwhile, under calm conditions, to swing the boom out while watching the gooseneck, then tying a stopper knot in the mainsheet to limit the swing to a safe angle.

1.6 – 2 STANDING RIGGING

Standing rigging for the Menger Cat consists of one forestay attached to the forestay tang with a 5/16" bronze turnbuckle. Each season inspect the forestay for any broken wires in the strand.

The forestay of your boat should not be tightened like a piano wire, but only tight enough so that it deflects with a little bit of difficulty. Over tightening the forestay causes excessive wear and tear on the forestay tang as well as the mast.

The forestay on a catboat is traditional, but due to the short distance from the mast to the chain plate, the base of the triangle formed with the mast is only a foot and a half. This results in the force exerted by the forestay being mainly downward.

On a cat equipped with a bowsprit, the forestay is attached to a tang on the end of the sprit. This increases the base of the triangle. The 1/4" turnbuckle on the bobstay should be tightened sufficiently so the sprit remains straight.

1.6 – 3 TURNBUCKLE

Check the turnbuckle on the forestay of your boat to make sure there are no cracks in the casting and that it is not bent. If necessary, call us to get a replacement. It is a good idea to install the turnbuckle so that it tightens in the

same direction as a screw (right hand thread on bottom).

1.6 – 4 RUNNING RIGGING

Swapping halyards end for end will extend their useful life after they have started to chafe. When replacements are needed, see Section 1.2 - 1 for lengths.

1.6 – 5 BOWSPRIT

On bowsprit boats, a bobstay chain that runs from the bottom of the bowsprit to the trailer eye located on the front of the hull. A 1/4" turnbuckle is used to tension the chain. Attach the turnbuckle on the upper end to keep it out of the water. Make sure the bobstay is detached when you are ready to pull the boat on a trailer, and attached again when the boat is put back in the water.

1.6 – 6 GAFF SADDLE

The Gaff saddle is made of fiberglass with a S. S. yoke coming out. This is done so the gaff does not rub on the mast. The fiberglass surface that rubs against the mast is lubricated with a spray-on lubricant. We use McLube Sailcote. This will last a season. It is available at Marine Supply stores or from us.

The five parrel beads on the gaff saddle should also be checked for wear and replaced if necessary.

1.7 SAIL

1.7-1 SAIL CARE

Inspect your sail frequently and take care of chafed stitching or small tears before they become a major problem. A small ditty bag with some thread and a few sailmaker's tools on board can come in handy and save you a few dollars.

Sails should also be protected from sunlight as much as is practical. Ultraviolet light will break down the Dacron in the sail cloth and the stitching. Mainsails that are left uncovered are susceptible to this problem. Use the sail cover supplied with your Menger Cat.

Mildew is no longer the major concern that it was in the days of natural fiber sails. However, your sails should be dry before folding, mainly to prevent the unsightly growth of this dark mold.

To maintain the shape of your mainsail it should be folded after each use. Outhaul tension should be slackened when you leave the boat for the night.

Folding the large sail take a bit of time and trouble. Stand on the seat at the aft end of the cockpit Flake the sail down on top of the boom after pulling each flake aft. When you get to the point where the gaff ends, put a sail tie around the gaff and boom. Continue to the leech, adding another sail tie. Then return and apply several sail ties along the furled sail before installing the sail cover.

After the season the sail should be inspected and if necessary should be serviced by a competent sailmaker. For appearances' sake stains should be removed and the sails gently washed with a mild soap and thoroughly rinsed.

1.7 - 2 BATTENS

Battens are thin fiberglass stiffeners inserted in the trailing edge of your sail to support the outward curved leech.They are different sizes and must go in the appropriate pocket. The thin end goes into the batten pocket first. Battens should always be removed when storing the sail for the winter.

1.7- 3 REMOVAL OF SAIL

To remove your sail at the end of the season is an easy operation. Your sail is tied to your mast rings with marlin, an oil impregnated line which is extremely strong. To remove your sail all that is needed is to cut the marlin between the mast ring and the sail with a knife. When you want to re-attach the sail just follow the mast tying procedure at 1.2 - 4 in this manual.

1.8 BILGE PUMP

1.8 - 1 ELECTRIC PUMP

Menger Boatworks equips its boats with an optional automatic electric bilge pump that is set into the hollow of the keel. It is also controlled by a switch on the electrical panel. This switch (and a charged battery) must be left on for it to function.

This pump will automatically cycle on and off. If it detects water it will stay on till it pumps dry. The amount of electricity used in the on-off cycling is minimal. In case of clogging, the pump can be disassembled while the base is still in place by depressing tabs on each side with one hand. There is a S.S. screen on the inside.

1.8-2 MANUAL PUMP

As an option some Menger Cat owners elect to take a manual bilge pump instead of an electric one. We use a Whale Subcompact 50 (BP 0350) that is mounted on the aft face of the cockpit seat wall. It is operated by a handle which is inserted into the outside part of the pump. This handle is stored on a bracket in the port locker. There is a large screen at the intake end to prevent debris from clogging the pump.

1.9 THE COMFORTS OF HOME

1.9 - 1 GALLEY

On our Menger Cat 19, the galley consists of a fiberglass galley unit that slides in and out from underneath the starboard cockpit seat. The galley unit has two collapsible water jugs that are attached to it. They can be stored under the cockpit floor in the O.B. cat or in the aft starboard locker (the hoses run through a grommet in the bulkhead) in the I.B.cat. One of the tanks feeds (feed tank) the galley unit with fresh water. An extra feed tank is supplied. The other tank (waste tank) collects the waste water. To refill the galley unit with more water just unhook the "feed tank" by unscrewing the hose clamp, and refilling it with more water. To get rid of the waste water unhook the "waste tank" the same way and dispose of it.

1.9 - 2 GALLEY STOVE

The stove used in the galley unit is not provided, however we recommend the Origo alcohol stove which seems safe and efficient. Alcohol fires can be extinguished with water, and alcohol vapor is lighter than air.

Small, inexpensive, self contained butane stoves are offered in marine stores, and are tempting to the owner of a pocket cruiser. Although they appear carefully made, butane is hazardous, being heavier than air, and can "puddle" in the bottom of a boat waiting to blow. Also, such stoves violate Coast Guard regulations.

1.9 - 3 HEAD

The head on a Menger Cat can consist of either a Porta Potti or a fixed head.

PORTA POTTI:

The Porta Potti has an upper tank for clean water. A chemical to eliminate odor is added to this water. A pint of this comes with the head. The chemical does not stop bacterial breakdown and does not smell as the earlier chemicals did. It is therefore safe to empty the lower tank into a septic system. Simply pull the lever connecting the two tanks and the lower one can be safely carried ashore.

FIXED HEAD:

You can either pump from the head over the side or to a holding tank.

TO PUMP OVER THE SIDE:- Open (handle in line with hose) the small and large ball valves, located behind the head. Move the long handle on the Y-valve in-line with the white hose running up and aft to the holding tank. Move

the valve on the head side to the "Flush" position. Pump the handle until water enters the bowl. To empty the bowl move the valve on the head side to the closed position.

TO PUMP INTO THE HOLDING TANK:- Open the small valve behind the head. Move the long handle on the Y-valve in-line with the white hose going to the large ball valve behind the head. Move the valve on the head side to the "Flush" position. Pump the handle until water enters the bowl. To empty the bowl move the valve on the head side to the closed position.

The fixed head utilizes a 22 gallon capacity holding tank to collect the waste. Emptying this tank requires a shore-side pump-out station. A deck connection for attaching the pump out is on the aft port side deck.

There are increasingly stiff regulations about dumping sewage overboard. For both concern about water quality and compliance with the law, keep acquainted with these regulations.

2.0 THRU-HULLS AND SEACOCKS

2.0 - 1 SEACOCKS

Menger Cats with diesel engines and fixed heads are equipped with bronze ball valves. Outboard boats have no sea cocks because the cockpit floor bails into the centerboard trunk. Ball valves are designed to open and close easily. When the boat is left unattended they should be closed for safety in case there is any damage to the hose.

The ball valves have a hard chrome plated ball seated in Teflon seals for smooth operation. It can be rotated with a vinyl covered S.S. handle. The closed position is when the handle is perpendicular to the hose.

Ball valves should be worked frequently to keep corrosion from forming, causing them to jam up.

2.0 - 2 SEA STRAINER

The sea strainer is used to strain the salt water intake to the diesel engine. It is equipped with a screen which requires periodic maintenance. To clear the screen simply unscrew the clear plastic bowl by hand. Be careful not to lose the rubber seal. The clear plastic bowl should be emptied before storing for the winter. **Anti-freeze can damage this plastic bowl and should not be allowed to contact it.**

2.0 - 3 COCKPIT DRAIN

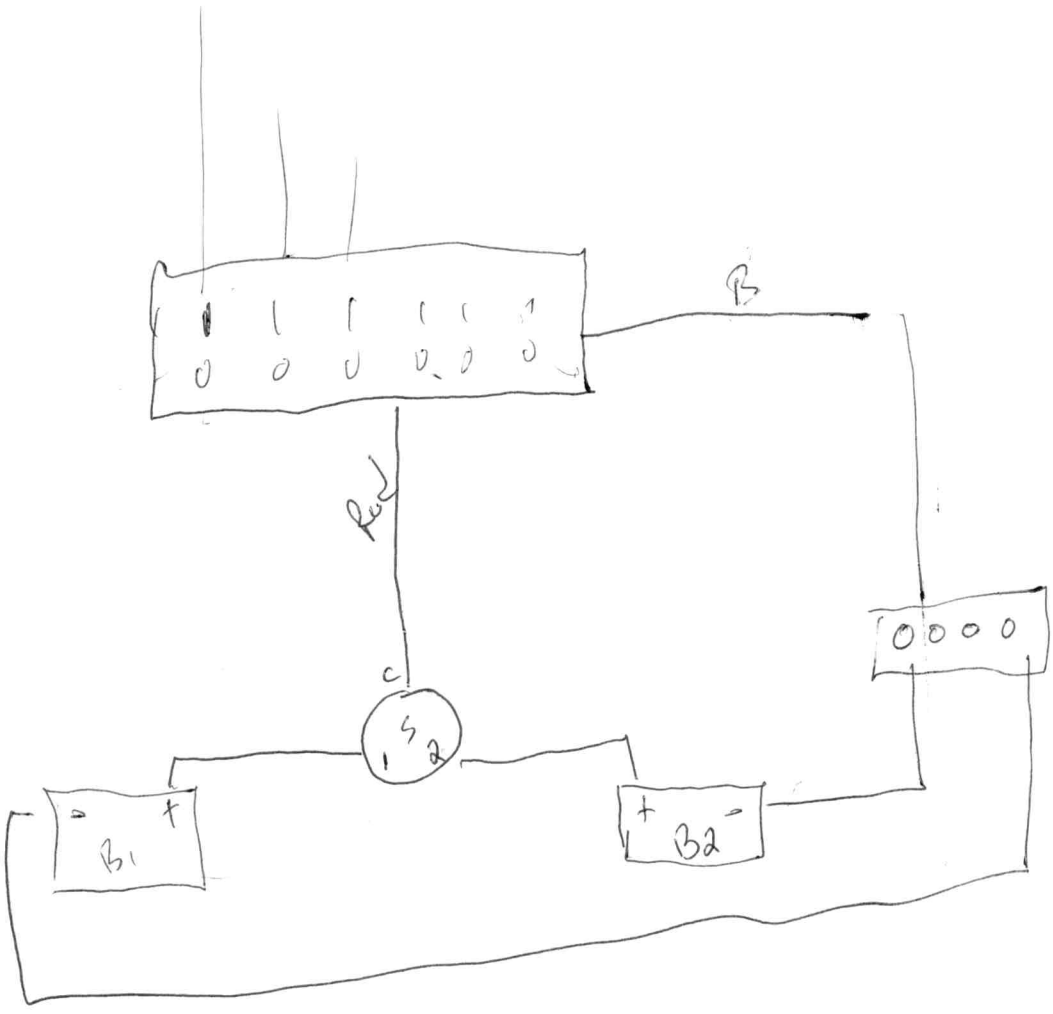
The cockpit drain is equipped with a rubber plug. This plug prevents water trapped in the centerboard trunk from spurting into the cockpit while sailing. **The plug should be removed when the Cat is not sailing.** Do not leave it in place while trailering, storing or at a mooring. Doing so may cause rainwater to overflow into the engine compartment and keel in an I.B. cat, or the cabin and keel in an O.B. cat

2.1 STEERING GEAR

Maintenance of the tiller-steered Menger Cat is simple. The tiller is mounted on top of the rudder head with a fiberglass tiller cap which is through bolted to the rudder head. After some use the tiller may develop a little play and need to be tightened down.

The tiller on your Menger Cat is varnished with several coats of protective varnish. A good winter project is to take the tiller home, rub it down with a 3M abrasive pad and give it a coat or two of Captain's varnish. Done regularly it will look new forever. But if the varnish starts to discolor and peel it must be taken off and revarnished. A tiller cover is a good accessory to get for your boat to protect the varnish from the ultraviolet light of the sun when it is not in use.

A fold-up tiller is available as an option.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2.2 ELECTRICAL SYSTEM

2.2 - 1 BATTERY

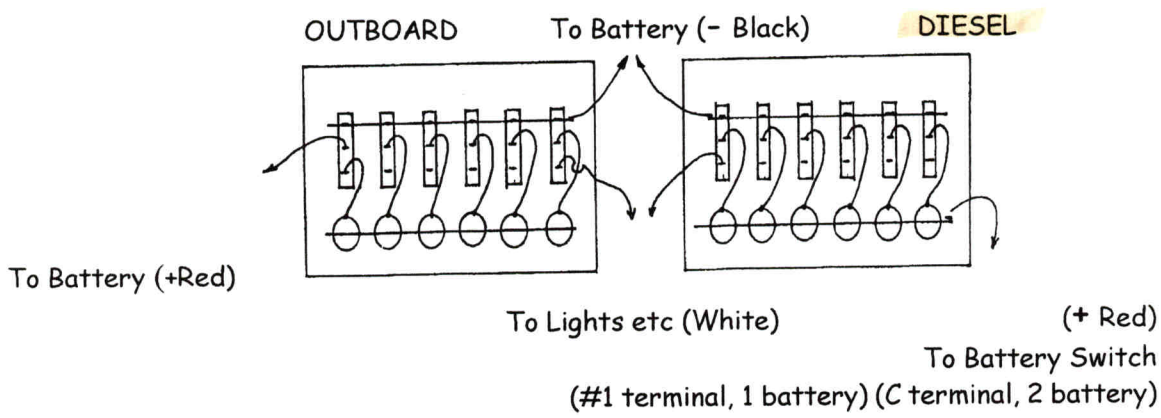
All Menger Cats that have the electrical package are equipped with at least an 85 amp hour deep-cycle marine type battery . Each battery is enclosed in its own break-resistant battery case. All Menger Cats shipped with batteries have their batteries negatively grounded. (Black wires are the ground wires.)

2.2 - 2 BATTERY SWITCH

Since many skippers of Menger Cats prefer a two battery system, we include a switch that is able to switch between two batteries and accommodate both of them. This switch is installed on boats that have the diesel option. On diesel boats, if you do carry a spare battery that battery should be reserved for emergency engine starting duty only. Once the engine is started, the alternator is allowed to fully charge the starting battery, then the switch is thrown to the "All" position for charging. Never turn the battery switch to the "Off" position while the engine is running. This can seriously damage the alternator or regulator.

2.2-3 ELECTRICAL PANEL

Every Menger Cat that comes with the electrical package is equipped with an electrical distribution panel. Each toggle switch has a fuse underneath it. (Do not use a fuse rated over 15 Amps.) Should the fuse blow you will know because the switch will not light when it is turned on. To check to see if a fuse is blown, take a small screwdriver or paper clip and press it into the space above the fuse holder. This will release the holder so it pops out and you can remove the fuse. A fuse is blown if the filament wire inside the casing is broken. The Cat is wired so that the black wire is ground. Outboard Cats are wired differently than inboards. The following sketches shows the wiring on the back of the fuse panel.



2.2 - 4 LIGHTNING GROUND

A ground plate of sintered bronze is installed on the outside of the hull (forward). Do not paint this plate with bottom paint. A bolt extends from this plate into the hull and a cable or copper tube is fastened from the bolt to the base of the mast or tabernacle. Check occasionally make sure this connection is not corroded.

2.2 - 5 LIGHTNING DISSIPATER

The purpose of this device is to allow static electricity to escape to the atmosphere. A rod with SS "brush" is attached to the top of the mast. The bottom of the aluminum mast plate is grounded to a thru-hull.

2.2 – 6 SHORE POWER

The Inlet for Shore Power is located on the aft side of the coaming. It is for 30 Amps.

A breaker switch is located on the left side of the electrical panel. This will also indicate polarity. Another switch is used to turn on off the Hot Water heater.

The wiring for Shore Power utilizes black for the "hot" side. White is ground. (This is the opposite of 12V wiring.) The first outlet in line is a Ground Fault Protector.

2.3 INBOARD ENGINE

2.3 - 1 INSTALLATION

Our diesel sits in a molded fiberglass engine bed and pan that catches any spillage from the engine from bleeding, changing oil, etc. This, in turn, keeps diesel fuel out of the bilge. If, in spite of this, fuel spills into the bilge, it will eventually grow bacteria which have a distinctive odor. Therefore, keep your bilge sweet by flushing with bilge cleaner occasionally.

2.3 - 2 SHAFT ALIGNMENT

Shaft alignment is extremely important to the performance of your diesel auxiliary. Every Menger Cat has its engine aligned on its beds so there is no vibration. We pride ourselves on the quietness of our engine.

If necessary to realign the engine, proceed as follows:-

1 Loosen 4 shaft coupling bolts at aft end of engine.

2 Force apart the couplings, slightly.

3 Insert feeler gauge on top, bottom and both sides.

4 All four sides should be within .050".

5 If the alignment is too far out the engine has to be shifted on its bed. Loosen top nuts on mounts. There is play in the hole in the bracket coming off the engine. If this is not enough then loosen engine mount bolts to bed. The forward hole in the mount is a slot, sideways. Move engine in the appropriate direction.

6 If the clearance at the top of the coupling is larger than at the bottom, then raise the engine in the front. Loosen the top nuts on the mount. Raise by adjusting the bottom nuts of the forward mounts. Adjust each side equally. (These nuts require a 15/16" wrench.)

7 If the bottom clearance is larger than the top, then lower the front of the engine in the same way.

8 Retighten all bolts on engine, then check coupling gap again. It may be necessary to do this several times.

2.3 - 3 STUFFING BOX

To access the stuffing box, open the 6" deck plate in the aft end of the cockpit floor.

The stuffing box should be loose enough to allow the shaft to lubricate itself with water while it is turning. One drop of water every 15 seconds is sufficient to lubricate the shaft while it is turning. The stuffing box should not be leaking when the boat is dormant. To tighten or loosen the stuffing box all you need is a long screwdriver and a hammer. Hit the notches on the lock nut first to loosen it. The notches on the stuffing box can then be hit (or turned by hand) to tighten or loosen it.

The packing is ¼" flax packing. There are three rings.

2.3 - 4 CUTLASS BEARING

The cutlass bearing, located at the aft end of the shaft log, is subject to wear and tear and has to be periodically replaced. The bearing is held in the fiberglass tube by four set screws, which are flush with the outside and held from turning by a stainless steel wire running around the tube. This is visible on the outside of the skeg by removing bottom paint and fiberglass from the protruding tube.

2.3 - 5 FUEL

The fuel tank on your Menger Cat has a capacity of 12 gallons. Since most owners only use 3 gallons per season, there is no point in filling the tank full. The fuel tends to loose its cetane rating and will go stale with time. It is therefore a good idea to pump out your fuel tank every three years and replace with fresh fuel. The old fuel can be consumed in your home heating oil system. (There are two fuel filters, one on the engine and a Raycor Filter near the tank. See the appropriate owners manuals.) Diesel fuel grows bacteria. This can clog your fuel filters very effectively. There are various additives to prevent this growth.

2.3 - 6 TRANSMISSION OIL

The transmission on your diesel is not filled with automobile transmission oil, but rather with the same straight 30 weight oil used in the engine itself. If you check the level of fluid in the transmission and find you need fluid, just add some engine oil. The mark on the dipstick is only ± 1/4" from the bottom.

2.3 - 7 PROPELLER

The propeller that comes with your cat is a two blade 13" diameter by 12" pitch. The shaft is bronze 1" x 59".

To align the propeller blades so they fall in line with the keel and cause no drag, align the propeller before launching (or while swimming). Put a mark on the top and bottom of the coupling. Red nail polish works well. (This is now done in building new Cats.) When you are sailing and you want the prop to line up with the keel just turn the shaft manually after disengaging the shift

lever. To keep the shaft from spinning put the engine into forward or reverse gear to lock it.

2.3 - 8 DIESEL OWNERS MANUAL

Your diesel Menger Cat comes with an Yanmar Owners Manual. It will explain how to perform all maintenance operations. In your area there are distributors of all the parts you may need. Call us to find out where they are if you don't know. We also can sell you parts. It is a good idea to carry on board a spare parts kit in case of emergency. Spare parts should include: water pump impeller, spare filter elements, and belts.

2.3 - 9 WINTERIZING DIESEL ENGINE

1. Close sea cock, remove raw water pick up hose from water pump, attach a 4' length of ½" hose to water pump and immerse in a one gallon bucket of fresh water. Start engine and run until water begins to warm up (about 3 to 5 min.) and thermostat opens. Drain crankcase and transmission and refill with fresh oil (SAE 30) as specified in the owners manual. Change oil filter.

2. Immerse hose in a one gallon bucket of 50/50 water-antifreeze solution. Start engine and let run till water and antifreeze comes out exhaust pipe. Stop engine, remove hose from water pump to bucket, attach hose from sea cock to water pump and tighten all hose clamps. Do not let antifreeze get into clear plastic water filter on sea cock. Antifreeze and water should remain in engine and exhaust system for winter.

3. Loosen water pump and alternator to lessen tension on belts during winter.

4. Drain and clean all fuel filters and change elements, gaskets, and seals. Bleed all air from fuel systems.

5. Pull compression release lever and turn engine slowly with hand crank. Slowly pour about two ounces of engine oil into the intake pipe or manifold while engine is running. Do not use starter to turn engine over or serious engine damage may result.

6. Tape the openings of the intake and exhaust manifolds with duct tape to help prevent corrosion of the upper cylinder during storage.

7. Scrape all rust or corrosion from exposed metal parts and surfaces with detergent and rinse thoroughly. Paint any bare metal.

8. Place a dust cover over engine. Do not leave the engine exposed to rain and sea breeze.

9. Disconnect the battery. Remove the battery from the boat. Clean the terminal ends and battery with a solution of baking soda and water, rinse

thoroughly with clean water. Apply a light coat of grease on the end of the terminal and on the battery and cables. Store the battery in a cool and dry place. Use a trickle charger to keep battery charged. Do not charge battery near any open flame or in a confined area.

CAUTION: WEAR SAFETY GOGGLES AND RUBBER GLOVES TO PROTECT YOUR EYES AND SKIN.

2.3 - 10 SPARE KEY

There is an extra key attached to the back of the Control Panel. The Yanmar key is the same for all engines.

2.3 - 11 BLEEDING THE ENGINE

Bleeding the engine should not be a frequent occurrence. Air in the fuel lines comes from running out of fuel or a loose fuel line connection.

After solving air leak problem proceed as follows:-

1. Follow the fuel lines from the tank to the engine.
2. On top of the engine is a filter with a metal bowl. There is a hex bolt with a Phillips slot in the middle. This is your first bleed point. This should be loosened one turn.
3. Fuel now has to be pumped up to clear air from lines. There is a pump handle on the side of the fuel pump. It is a flat 2" long handle. This can be used to pump. Better is a pump on your filter mounted on the bulkhead. The center white knob is unscrewed so it can be lifted. This is a built in pump. The engine can also be used to pump. Pull back the pressure relief handles on the top of engine. Now turn over the engine. (Be sure to put pressure relief handles back in place before trying to start engine. The engine should never have pressure relief removed while running.)
4. Whichever way is used, pumping will cause bubbles to come out from under the bolt. Continue pumping until a steady stream of fuel comes out below the bolt you have loosened. (A paper towel under the metal bowl will serve to absorb fuel.)
5. Tighten the bolt. Usually this is all that is necessary.
6. If necessary the next bleed point is further on in the fuel lines. Follow the arrows leaving the filter, to the high pressure pump. There is another bolt with Phillips slot on top. Turn this bolt one turn. Pump the engine. If bubbles come out continue to pump until a steady stream emerges. Close bolt.
7. The Yanmar has some self bleeding characteristics. Run the engine for several minutes until it is smooth.

2.4 HOUSEKEEPING

2.4 - 1 CUSHIONS

Your interior cushions on your Menger Cat are covered with a canvas which is the same type as our sailcovers, except it is softer. The cushion covers are washable. Use a mild detergent like Ivory Snow and warm water.

The advantage of these cushions is that on hot nights they breathe and are not uncomfortable to sleep on.

2.4 - 2 WOODWORK

Teak above decks on your Menger Cat has been sanded and oiled. Contrary to what you may have read or heard, teak is not a miracle wood that is totally maintenance-free. As it is exposed to sunlight and drying conditions, the wood begins to turn to a gray color that will eventually lead to surface deterioration. Teak which is ignored will eventually begin to split and the grain will lift.

Teak is easy to maintain, however. There are a number of teak cleaning and sealing preparations on the market. Two part teak cleaners will soften and deteriorate the adhesive "5200" by 3M that is used to bond your teak down, so we recommend that you do not use them. We suggest that you ask your friends who have teak on their boat that you admire, what they use.

Sikkens-Cetol makes a finish which has been used with good success. This is a microporous finish which allows the teak to breath, like an oil, yet has a varnish-like appearance. It is easy to touch-up, as it blends in very well. It is necessary to renew the finish once a year. This finish also comes in a gloss for the final coat.

Besides oiling your teak, you can also varnish it. Depending on your climate this can be a never ending task. However, varnished teak is very attractive.

2.4 - 3 PORTS

Ports may be cleaned with a good window cleaner and a soft rag. Do not use abrasive cleaners or solvents such as acetone as they may damage the Plexiglas surface of the port. If you order the opening forward port, a teak stick with a notch in each end is included with it. When you open the port the stick is placed between the glass and the bottom of the port to hold it open.

2.4 - 4 GENERAL

Dirt, hair, etc. should not be washed into the bilge during any cleaning process as these may clog the bilge pump strainer and prevent it from functioning when needed. Use a dust pan when cleaning the cabin sole.

2.4 - 5 CABIN INTERIOR

The cabin interior can be wiped down with a damp cloth. Some owners like a product called Kitchen Wax, an emulsion of wax and water which will clean lightly soiled surfaces, and can then be polished with a dry cloth, leaving a faintly pleasant odor behind.

The interior wood surfaces may treated like any finished wood with a bit of Pledge or similar product.

2.4 - 6 EXTERIOR FIBERGLASS

Fiberglass is one of the most maintenance-free materials utilized in today's boat construction. If given proper care and treatment, the gelcoat surface will look new for years. If not maintained it will slowly turn to a flat chalky surface. We recommend that you wash the exterior surface of your boat several times each season with plenty of mild soap and water. If found necessary in the non-skid area use a good quality fiberglass cleaner such as "Soft Scrub". Rinse liberally with fresh water. Apply a coat of boat wax to your hull only. If you desire to wax your deck, wax only the flat glossy portions. Do not wax the non skid areas! Do not use cleaners with abrasives as they may scratch the surface of the gelcoat.

Stubborn stains may be removed with special fiberglass cleaners. Stains such as tar can be removed with acetone (but not on painted surfaces). Acetone is an extremely flammable material and should be used with caution. Stress or spider cracks sometimes result from bumping docks or other boats. These cracks represent no structural damage and are limited to the gelcoat surface. If a blister does occur it also is not structural and can be repaired following steps in 1.5 - 2 - Gelcoat Repair

2.4 – 7 OPENING HATCH

Blue plastic wrenches are supplied to adjust the friction in the 10 x 10 Hatch.

This hatch can be left slightly opened when the cat is unattended. Rain will not enter as the hatch overlays the opening. It will aid in ventilation.

2.5 SAILING TIPS

2.5 - 1 CENTERBOARD

The centerboard on your Cat can be adjusted from time to time or left down about 24" all the time you are sailing. It should be pulled up while the boat is moored or under power. The purpose of the centerboard is to resist the boat's tendency to slide to the leeward while going into the wind. If necessary the Cat will sail to windward with board-up, but will make considerable leeway.

To see this action, have one person sail and the other raise the board all the way while going hard on the wind. Observe that the wake has an "oily" appearance. Slowly lower the board until the wake becomes normal. This position is the right amount of board for sailing to windward with this amount of wind. It will measure about 20"-25" of pennant. If this is your local area's normal wind, mark the pennant with a permanent marker..

The helmsman will note that the amount of weather helm decreased significantly when the board was raised. Lowering the board all the way will considerably increase weather helm. Perhaps the reason catboats were saddled with a reputation for heavy weather helm was not the design's fault but the lack of sailing skill of the sailor. Try reducing the weather helm in a keel boat this way!

You can sail your Cat to windward in up to about 7 knots of wind and calm seas, by only adjusting the centerboard pennant. Start out by setting a course to windward with your board set as you normally do. Let the tiller go and take the centerboard pennant in hand. Lowering it causes the Cat to go "higher"; raising it causes you to "fall-off". Somewhere in between your Cat will sail herself to windward. Fasten the pennant and sit back and relax. (DO NOT FALL OVERBOARD AT THIS TIME!)

2.5 - 2 SAIL TRIM

Very few of us have had experience in adjusting a four-sided sail. The tricks of the gaff rig have been lost by all but a few. The gaff rig of the past was burdened by the gaff being set at an angle to the mast of 30 to 45 degrees. Sailboats with this kind of gaff will not go to windward very well. The leading edge of a sail is what determines your windward ability. The Menger Cat gaff is set at an angle of about 10 degrees. In effect the gaff is an extension of the mast it is so closely in line. (Technical books term this rig a gunter rig rather than gaff.)

To raise the sail, first untie the sail ties. Pull on both the peak and throat halyards together, pulling the gaff so it raises parallel to the boom. Make sure the gaff does not go on the wrong side of the topping lift as you are pulling up. DO NOT run the halyards through the inside hole of the cleats but let them

run freely on the outside of the cleats. (The reason for tying a stopper knot through the hole in the cleat is to stop it from running up the mast.) Throw the line into the inside of the cabin. Don't worry about being neat. Keep on pulling until the throat halyard becomes taut. At that point make it fast. Keep on pulling the peak halyard up until it becomes taut.

While making sail in open water, lay the boat on the port tack. When the gaff is hoisted it will swing to starboard, preventing the sail from fowling under the topping lift

This gaff enables you make adjustments to the sail shape. Once again you can hoist the sail and leave it alone or "play" with the shape. The sail shape to go to windward should be set by increasing the tension in the peak halyard. While hoisting the sail bring the throat halyard as taut as possible. Continue raising the peak halyard until a crease extends from the peak to the tack. This crease will disappear when you haul in the mainsheet. Do not raise the peak too high as you will "double block" the peak blocks. This will prevent the saddle from rotating. An inch or two adjustment in peak halyard will drastically change the shape of the sail. When the halyards are new they will stretch shortly after being tensioned. Therefore tighten them again 15 minutes after hoisting sail. The outhauls on the boom and gaff should be stretched very taut for heavy airs, but loosened for light airs.

A leech line runs up the leech of the sail. This line stops the fluttering of the leech while going to windward. Do not adjust it in advance as you will end up with a curled leech, ruining the shape of the sail. After you've had a chance to sail the Cat a while, adjust it only if there is excessive flutter in your leech, otherwise leave it alone. Only pull in a very small amount at any one time. There is a small "clam" cleat on the side of the sail to secure it.

The mainsheet is your primary sail adjustment. The sail should never be hauled in closer than the corners of the transom (quarters) no matter how high you're trying to point, unlike the mainsheet on a sloop. Your Cat's mainsheet is like the sloop's jib sheet. For optimum adjustment while going to windward watch the aft end of the boom. While pulling it in note its travel. Keep pulling while it moves toward the center of the Cat; stop pulling when it moves in a downward direction. (The downward movement is flattening your sail and taking out the draft. You are in effect pushing the Cat sideways.)

Off the wind, you can increase your speed by slacking off peak and throat halyards. Raising the centerboard all the way will decrease your skin friction, reduce weather helm and thus increase your speed.

2.5-3 REEFING

Reefing is the most important part of learning to sail your Cat. Since the catboat has only one sail, it has to be a light weather sail. The mainsail of your cat is equivalent in area to that of a sloop with a large genoa or spinnaker and a small mainsail. However, the catboat's beamy hull fools the novice into thinking that since the Cat doesn't heel like his old sloop did, he can carry all that sail in any kind of wind. WRONG! The end result is she rounds up in the puffs, has heavy weather helm and becomes uncontrollable. In rail-down wind conditions, reefing your catboat will make it sail faster (and more comfortably) than under full sail. You wouldn't carry a number one Genoa or a spinnaker on a sloop in those wind conditions, would you? The problem really comes down to making reefing easy to do in the conditions of high winds and rough seas. We at Menger Boatworks have been striving toward that end and have developed a new single line reef system for the first reef, in which a combined downhaul and outhaul leads to the aft end of the cabin.

One of the most important things to remember when reefing is that the sail must be FLAT when reefed, with little draft. It is not enough to just shorten sail; it must also have less draft.

FIRST REEF:

1. Let go of mainsheet and raise topping lift to take weight of boom.

2. Lower peak and throat halyards so lower cringle on the luff is at the level of the boom.

3. Haul in on the first reef line (aft end of cabin, port side, inboard cleat) to set the reef downhaul and outhaul, tight!

4. Raise peak and throat halyards.

5. Release topping lift, haul in mainsheet and resume course

Reef is complete. Sail can hang below boom along foot. The modern Dacron sail is strong enough not to require the mid-sail reef points to be tied in. However the sail will have a cleaner appearance and will set better if the loose sail is gathered up and the reef points tied.puffs, has heavy weather helm and becomes uncontrollable. In rail-down wind conditions, reefing your catboat will make it sail faster (and more comfortably) than under full sail. You wouldn't carry a number one Genoa or a spinnaker on a sloop in those wind conditions, would you? The problem really comes down to making reefing easy to do in the conditions of high winds and rough seas. We at Menger Boatworks have been striving toward that end and have developed a new single line reef system for the first reef, in which a combined downhaul and outhaul is used.

SECOND REEF

1. Let go of mainsheet and raise toppinglift to take weight of boom, and let cat heave to.

2. Lower peak and throat halyards so upper reef cringle is at the level of the boom.

3. Go forward to secure 2nd reef downhaul to tack.

4. Secure reef outhaul on leech to cleat on the port side of the boom.

5. With this reef it is necessary to tie in some of the reef points to keep the sail from hanging below the boom.

6. Release toppinglift and resume course.

Note: Wind strong enough to require a second reef may also raise a considerable sea in open waters. The ability of any small boat to make progress to the windward under such conditions is limited, so keep well off a lee shore under conditions of rising wind.

2.5 - 4 HEAVING-TO

Cat boats are work boats in origin, and a typical 19th century crew consisted of one man and a boy. They had to handle the catboat while making a hard and dangerous living. Lines, traps and nets had to be pulled in all kinds of conditions while the cat took care of herself . Different wind and wave conditions will vary the way the Cat heaves to, so try practicing in various conditions beforehand.

Simply let go of the tiller and mainsheet while going to windward. Take care that the mainsheet doesn't tangle on a cleat or the tiller. The Cat will stop and lie sideways to the wind. Raise the centerboard and slowly haul in the mainsheet until the sail partly fills and she begins to point up. She is now in "park", moving very slowly forward and to the leeward, constantly adjusting herself to maintain this attitude. You can catch a fish, oil some teak, or go below to fix your lunch

In stronger wind conditions you may want to try lashing the tiller to leeward and trimming the mainsheet in a little further. She should then "scallop" up to windward, fall off and do it again and again. Trying out these tricks beforehand will help make it easy when you have to heave-to while reefing in rough conditions.

2.5- 5 RACING

The things that make one catboat faster than another are numerous. To mention a few: the skill of the skipper, the condition of the sail and hull, local knowledge, the start, having the right amount of sail up for the wind conditions, the design and others. In most of the above only you can help yourself. It's a good idea to follow the most successful skipper prior to the start to see how he aligns his catboat in relationship to the starting line.

A sailboat goes through the water with laminar flow in about the forward third of the hull. It is therefore a wise idea to clean this area prior to racing. Rough bottom paint and marine growth disturb this smooth flow and should be cleaned up. (That is the reason we do not like to put through-hulls in this area.)

The Cat will sail through a chop a lot better with an 80 pound lead ingot sitting on the forward bunk just aft of the mast. Try shifting crew weight up forward. Some of the things that work in light air don't in heavy air! Experiment; don't just sit there!

2.5 - 6 SCANDALIZING

According to the misinformation put out by the boating press, the advantage of the gaff rig is in being able to "scandalize" the gaff. Scandalizing is achieved by dropping the peak halyard and allowing the gaff to hang down. This provides a smaller, triangular sail.

The disadvantages of scandalizing are numerous and it is not recommended.

1. The gaff is swinging wildly and uncontrollably and is aiming for the top of your head.

2. The sail is being stretched on the bias and will lose its shape if this is done frequently.

3. The sail that results from scandalizing is inefficient for anything but running down wind.

It is reported that professional catboat sailors (i. e. fisherman) were never seen to do this, and rightly so.!

2.6 COCKPIT TENT

The cockpit cover is designed to go from the forward end of the Main Hatch to the aft end of the cockpit. It is 9 feet long and 8 feet wide. Following is the procedure to erect it.

1. Tie all lines to the cover so they are permanently attached. The pockets in the cover go athwartship.
2. Tie the middle aft line to the mainsheet bale so the cover goes to the boom crotch.
3. Locate the web strap or grommets in the middle, tie around the boom with a short line.
4. Tie the middle forward line to a lazyjack cleat so the cover is stretched the length of the boom.
5. If the cover is to be used as a tent over the cockpit then tie the forward lines to the eyes on the rubrail. The middle lines also go to eyes. The aft lines go to the stern cleats.
6. If the cover is to be used as a sun shade, (after step 4) insert the three 5'-6' long poles into the three pockets. This will provide a shade which has flaps coming down on each side to keep out the afternoon sun. If you do not want the flaps, simply fold them up. Tie the forward outer lines to the eyes on the handrails on the main hatch. The aft lines go to the cleats or traveler. (If you have a breeze coming sideways then it will probably be necessary to tie the flap down on that side.)

The other way to use the tent is to rig it on top of the boom rather than under it. This calls for removing the peak halyard and the after lazy jacks, but can give you more headroom for those rainy days on a cruise. All of the above instructions still apply.

2.7 SAFETY AND COAST GUARD

2.7 - 1 REFUELING

Although diesel fuel is not as explosive as gasoline, it is still highly flammable. Both fuels should be treated with great respect. Be sure that you are really getting the correct fuel for your boat. The wrong fuel will either damage the engine or refuse to work.

Before refueling, extinguish all flames and cigarettes, secure the boat properly, close up the cabin so vapors will not collect below, and get unneeded people off the boat. Check for the location of nearby fire extinguisher. Carry a bare wood yardstick or dowel to sound the tank and to determine in advance how much fuel to add. Do not carry more diesel fuel than you'll need. The diesel engine uses very little fuel, and diesel fuel kept more than a year or two will go bad and foul the injectors.

Keep the filler hose nozzle in contact with the metal filler pipe to avoid static sparking. When done fueling, open all ports and hatches to ventilate the boat.

2.7 - 2 FIRE EXTINGUISHERS

Coast Guard regulations require that you carry at least one extinguisher with a Coast Guard rating of B-1. Menger Boatworks recommends that you carry two extinguishers of this size. One should be adjacent to the companionway where it can be grabbed on the way out of the cabin, and the second in one of the after lockers. Although boat fire extinguishers appear to be identical to land based extinguishers, they must carry a Coast Guard approved label and thus would best be purchased at a marine supply dealer.

2.7 - 3 LIFE PRESERVERS

The Coast Guard requires that there be an approved life jacket for each person on board, plus one throwable device. We recommend that you purchase enough of the inexpensive Type II life jackets for the largest number of people you would ever expect to carry, plus a pair of good quality, comfortable throwable cushions. You also might want to buy one or two children's life preservers. These jackets should be stored in a cockpit locker where they are readily available.

In addition you should have a high quality life vest, such as a comfortable Type V Hybrid inflatable for each of the people that use the boat regularly. And it should go without saying that regular users of the boat should be able to swim. The Coast Guard is in the process of changing these regulations, so keep yourself informed. .

2.7 - 4 FLARES

The Coast Guard requires that you carry flares. Manufacturers make up convenient watertight kits of varying cost and size, which should be marked USCG-Approved. The choice depends on the kind of sailing you do. The flares should be carried in the same locker as the life preservers.

2.7 - 5 RUNNING AND ANCHOR LIGHTS

Coast Guard regulations permit boats under 23 feet to carry only a 360 degree lantern or flashlight, however we earnestly recommend having the Menger Cat equipped with running lights.

These consist of a combined red-green light on the forward side of the mast, a 360° white light at the mast head, and a white light on the cockpit coaming facing aft. These lights are controlled from the switch panel. The RUNNING LIGHT switch controls the forward red/green light and the white stern light on the coaming. The masthead light is on a separate switch.

Whenever the boat is underway at night the red-green combination light and the white stern light should be on. In addition, under power the masthead light should be on. You should also have a good flashlight or spotlight that can be shone on the sail to alert an approaching boat.

At anchor outside of designated anchorages, a 360° white light must be displayed. This is done by turning on the masthead light.

2.7 - 6 HORN OR WHISTLE

The pressurized gas horns are very loud. In addition you might want something more polite for close-up use, like a plastic "police whistle".

2.8 NAVIGATION

2.8 - 1 CHARTS

There is no substitute for complete and up-to-date charts. The Coast Guard is constantly making improvements on the aids to navigation, numbers, configurations, etc. These changes are reported in the responsible Coast Guard District's Local Notice To Mariners, and are on display at all NOAA chart distributors. Before embarking on any trip outside your home port, make certain that you have the latest information.

2.8 - 2 VHF RADIO

At the very least you should carry a portable VHF radio. Its performance can be greatly improved by connecting it to a masthead antenna. (Not all Handhelds have a connector for an external antenna!)

If you install a fixed VHF radio, a convenient method is to mount it on the port side. Remove two of the acorn nuts that hold the cleat bolts in place, and use them to hold the radio's mounting bracket against the overhead.

A VHF radio will allow you to contact other boats, call the Coast Guard for assistance, contact bridge tenders, marinas, etc.. These radios also receive detailed Weather Bureau broadcasts, and can be used to contact the Marine Operator who can connect you into the telephone network ashore.

2.8 - 3 GROUND TACKLE

The "Danforth" style anchors are by far the most widely used anchor type and are good for sand and mud bottoms. The Yachtsman style anchor is still a favorite for weed areas and for a second anchor. Check with local sailors to see what works best in your area..

Good all-around choices of ground tackle would be:

1. Lunch hook. 4 pound Danforth style (standard weight) anchor with four feet of 3/16" chain and 100 feet of 3/8" three strand nylon line.
2. Cruising anchor. 8 pound Danforth style (standard weight) with four feet of 1/4" chain and 150 feet of 3/8" three strand nylon line.

2.9 WINTER STORAGE

2.9 - 1 BLOCKING THE HULL

A good boatyard is, no doubt, expert at thoroughly blocking the hull. Check to make sure that the weight of the hull is resting on the keel. Two cross members are adequate. The forward one can be just forward of the centerboard slot. The aft one forward of the skeg bar on diesel cats or about 3' forward of the keel end on O.B. cats. The purpose of cradle bulkheads is to balance the boat in an upright position, not to bear the weight of the boat.

Before getting your boat hauled out, show the boatyard the profile of the hull so that they will know how to position the crane or straddle hoist straps. The longitudinal center of gravity of the 19' cat is just aft of the cabin end.

2.9 - 2 COVERING THE BOAT

It is far better to store a boat under cover than to leave it open to the elements. Teak trim will fare better during the winter and the boat will not be subjected to pressure of freezing water, a common cause of gel coat cracks. If your boat cover is durable, open a couple of ports to allow air to circulate below decks. Remove sails,cushions, preservers, etc. and store in a dry place. A nylon form fitting cover is available as an option.

3.0 BOATING ORGANIZATIONS

Every sailor was once a beginner. Very few sailors were born into sailing families and learned at their parents' knees. Therefore it is to everyone's benefit that there are several fine non-profit organizations READY to teach interested persons skills from basic seamanship and piloting to celestial navigation.

3.0 - 1 U.S. Coast Guard Auxiliary

This organization will make a courtesy safety inspection of your boat, but does not report deficiencies to the Coast Guard. You may benefit greatly from a visit by one of their knowledgeable volunteers. They also offer various courses of interest and value.

3.0 - 2 Power Squadron

The U.S. Power Squadron is a national boating organization of 75,000 power and sail boaters. Membership is by invitation after successful completion of the Basic Boating Course. The organization's main emphasis is nautical education and boating safety. Course offerings range from Seamanship and Piloting through Celestial Navigation. Also available are courses in Cruise Planning, Engine Maintenance, Marine Electronics, Sail and Weather. Squadron social activities include cruises, rendezvous, and dances. Squadron discounts on marine insurance are available to members.

3.0 - 3 Catboat Association

All Catboat owners should join the Catboat Association. It was formed in 1962 with the objectives of promoting interest in Catboats, exchanging information via a bulletin published three times a year, sponsoring catboat rendezvous and races, and conducting an Annual Meeting. If you would like to join, a membership application is included at the end of this manual.

Menger 19 Owners Manual GLOSSARY - Page 1

The definitions in this glossary are specific to the Menger Cat, and may have somewhat different meanings in other contexts.

anchor rode *n.* the line attaching the anchor to the boat.

apparent wind *n.* the wind perceived on a moving boat. It is the resultant of the actual wind and the wind generated by the boat's motion.

athwartship *adj.* crossways to the boat.

backing plate *n.* a reinforcing plate for a fitting attached to the deck or hull.

bale *n.* a u-shaped fitting on the boom or gaff to which a block or bridle is attached.

batten *n.* fiberglass or wooden strips used to stiffen the leech of a sail.

becket *n.* an attachment point on the bottom of a block for connecting a line.

block *n.* roughly, the device known to landlubbers as a pulley.

bobstay *n.* a short stay from the end of the bowsprit to the stem.

boom *n.* the spar at the foot of the sail.

boom crutch *n.* a device to support the boom when the sail is not in use.

bowline *n.* (bo'lin) one of the most useful knots; it makes an eye in the end of a rope.

bridle *n.* a short wire cable with both ends attached to the gaff, to which a halyard block is attached.

bronze *n.* a strong, corrosion-resistant alloy of tin and copper.

brow ***n.*** the strip of teak that runs along the top edge of the cabin.

bulkhead *n.* a term applied to any athwartship partition.

casting ***n.*** a cast metal object, *spec.* the parts fitted to the ends of the spars.

catboat *n.* a shallow draft, broad-beamed craft with the mast stepped far forward.

centerboard *n.* a broad fiberglass plate lowered through the hull to resist leeway.

centerboard trunk *n.* the housing into which the centerboard can be withdrawn.

Cetol *n.* brand name of a varnish-like finish.

chock *n.* the bronze castings through which the bow lines are passed.

cleat *n.* a bronze fitting with arms or horns upon which to secure lines.

close-hauled *adj.* with the sail hauled in for sailing as close to the wind as possible.

coaming *n.* the low, elevated rail around the cockpit.

cockpit *n.* an open area from which the boat is handled.

cockpit drain *n.* the drain leading into the centerboard trunk to drain water from the cockpit.

cringle *n.* a circular brass eye let into a sail for attaching a line for outhaul, reefing, etc.

Dacron *n.* tradename of a synthetic fiber used for making strong, stretch-resistant rope or saileloth.

diesel engine *n. (*after Rudolph Diesel, a German inventor). An internal combustion engine in which ignition is achieved by the heat of compression.

diesel vent *n.* on the Menger Cat, an engine compartment ventilator set in the cockpit coaming.

dock master *n.* the person in charge of a dock(s).

downhaul *n.* a line used to pull down the luff or forward edge of a sail.

draft *n.* **1.** depth of a boat below the waterline. **2.** the particular shape of a sail that enables a sailboat to go to the windward.

dropboard *n.* the board that closes off the entrance to the cabin.

eyebolt *n.* a bolt with an eye on the end, used on the mast for attaching the halyard blocks, also on the stem for attachment to a trailer.

fairlead *n.* a guide through which a line passes.

fiberglass *n.* a fabric made from fine strands of glass, *also*, a very strong composite of fiberglass and resin, widely used in boat-building.

Fiberglas *n.* tradename for a brand of fiberglass.

figure eight knot *n.* a stopper knot tied in the end of a line.

flag halyard *n.* a light line used to hoist a flag.

foot *n.* the lower edge of a sail.

forestay *n.* a wire rope from the mast to the tang on the stem or bowsprit.

gaff *n.* the spar supporting the head of a sail.

gaff saddle *n.* a curved plate at the bottom of the gaff, bearing against the mast, allowing hoisting and rotation of the gaff.

gelcoat *n.* a smooth opaque outer layer acting as finish and protection on fiberglass.

genoa *or* **genoa jib** n. a large headsail used on sloops and other non-catboats.

gooseneck *n.* the universal joint on the forward end of the boom.

gudgeon *n.* the female half of a rudder pivot. *see pintle.*

gunter rig *n.* an essentially triangular sail with a high peaked gaff almost parallel to the mast.

halyard *n.* a line used to hoist a sail. A gaff-rigged sail requires two halyards: a throat halyard and a peak halyard.

head *n.* 1. the top of a sail. 2. a ship's toilet. *This term has many other uses with the general meaning of* front *or* top.

isophthalic *adj.* a particular formulation of gelcoat.

keel *n.* orig., the main longitudinal member of a hull; now, a similar shape molded in fiberglass.

knot *n.* 1. a combination of loops and tucks that join a rope to other ropes or to objects. 2. a rate of speed of one nautical mile (6,076 feet) per hour.

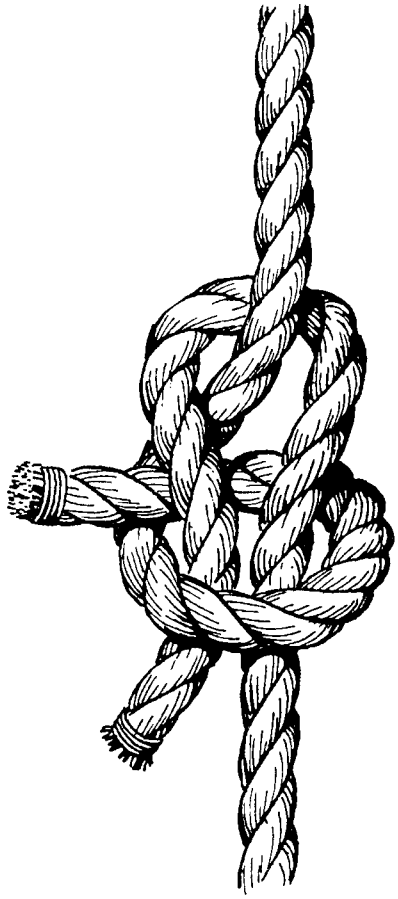
knotmeter *n.* an instrument for indicating speed through the water.

lazyjacks *n.* light lines run between mast and boom to control the gaff and sail while being lowered.

lee helm *n.* the tendency of a sailboat to fall off the wind, requiring the helm (tiller) to be pushed to leeward to maintain course. *See weather helm*

lee shore *n.* the shore on the lee side of a boat. The wind blows onto a lee shore.
leech *n.* the after edge of a sail.
leeward *adj.* in the direction of the lee side of a boat.
lift *n.* 1. the forward-acting force generated by the airfoil shape of a sail. 2. a similar force acting on the keel or centerboard 3. an advantageous shift in wind direction.
luff *n.* the forward edge of the sail. *v.* to allow the wind to strike the leeward side of the sail.
mainsheet *n. see* **sheet.**
make fast *v.* to secure, as with a halyard, outhaul or any line.
marlin *n.* a light, tarred line used to whip rope ends, secure mast hoops to sails, etc.
mast *n.* the vertical spar supporting the sail.
mast rings *or* **hoops** *n.* sliding rings attaching the sail to the mast.
mat *n.* a non-woven fiberglass fabric.
outhaul *n.* a line used to stretch the head or foot of the sail along the gaff or boom.
parrel beads *n.* revolving hardwood beads strung on the line holding the gaff saddle to the mast.
peak *n.* the top corner of a sail.
peak halyard *n.* the halyard which hoists the outer end of the gaff on a gaff-rigged sail.
pennant *n.* 1. a short line attached at one end, i.e. a centerboard pennant. 2. A long narrow flag.
pintle *n.* the male half of a rudder pivot. *See gudgeon.*
port *n.* 1. When facing forward, the side of the boat to your left Note: The terms left and right are used relative to a person; port and starboard are used relative to a vessel. 2. An opening, such as the ports in the side of a cabin. 3. The shipping outlet of a city or place, a harbor.
Porta Potti *n.* A tradename for a portable, self-contained toilet.
Quarter *n.* the after corner of a boat.
reef *v.* to shorten a sail, usually because of rising winds. *n.* a shortening of sail.
reef knot *n.* a square knot or "shoelace knot" often with only one end looped for quick release.
reef points *n.* small lines attached to cringles in the sail for gathering up excess sail when reefed.
resin *n.* a material derived from petroleum which, when mixed with a catalyst, hardens into a rigid material. A composite of resin and fiberglass yields a material of unequaled value, strength and versatility.
sail *n. everybody knows what a sail is.*
sea cock *n.* a valve to close off an opening in the hull for cooling water, etc.
shackle *n.* a U-shaped metal piece with a threaded pin across the ends, for attaching two objects such as anchor to chain, block to bail, etc.
shaft log *n.* fiberglass tube with stuffing box on one end and cutlass bearing on the other which allows the propeller shaft to pass through the hull.
sheave *n.* a wheel or disk with a grooved rim; the moving part of a block.
sheet *n.* the multi-part line from the end of the boom to the stern for controlling the angle of the sail.
shroud *n.* a wire cable from the mast to the side of a boat; not used on small catboats.
sintered *adj.* particles of metal partially melted together, resulting in a porous mass of great surface area.
skeg *n.* the extension of the keel in the after part of a boat, serving to protect the propeller, support the rudder and provide directional stability.
skeg bar *n.* the bronze bar across the bottom of the propeller opening on diesel Cats to support the rudder.
spar *n.* a mast, boom or gaff.
square knot *n.* a knot of limited value, used on a boat only for reefing. *See* **reef knot.**
standing rigging *n.* the fixed wires supporting the mast on a sailboat. Catboats normally use only a forestay.
starboard *adj.* when facing forward, the side of the boat to your right. *See* **port.**
stopper knot *n.* a knot in the end of a rope to stop it from running through a block, up the mast, etc.
stuffing box *n.* a device to admit a shaft through a hull while excluding water.
surge brakes *n.* brakes on a trailer actuated by pressure on the tongue caused by the braking of the towing vehicle.
throat *n.* the forward upper corner of the sail, where the gaff meets the mast.
throat halyard *n.* the line that hoists the inner end of the gaff. *See* **peak halyard.**
topping lift *n.* the line from the masthead to the end of the boom, supporting the boom during reefing, furling, etc.
traveler *n.* the bar across the stern on which the sheet block travels.
turnbuckle *n.* a device to powerfully shorten or lengthen rigging.
VHF *adj.* Very High Frequency; a frequency band assigned to marine communications. Also, a transceiver using these frequencies.
wainscoting *n.* decorative wood strips used to line the inside of the cabin.
weather helm *n.* the tendency of a sailboat to point up into the wind, requiring the helm (tiller) to be pulled to the weather, or windward, to maintain course. *See lee helm.*
winch *n.* a device offering mechanical assistance in hauling lines, halyards, etc.
windward *adj.* the direction from which the wind is blowing.
woven roving *n.* a form of fiberglass material having strength in two directions.

✪



A Few Useful Knots

A Few Useful Knots

Part of the enjoyment of owning a traditional boat is in learning and practicing the skills of the old-time sailor, skills that are needed on a small boat just as they were in the sailing vessels of times long past.

Your Menger Cat is rigged with traditional three-strand rope, although with a nod to modern progress. Instead of being made of plant fiber, your lines are nylon or Dacron, depending on their expected use. Both synthetics are extremely strong and long-lived, the difference being that nylon is somewhat elastic, an advantage when used for anchor rodes, lazy jacks or other uses requiring shock absorbing ability. Dacron, on the other hand, has very little stretch and is suitable for running rigging.

The Ashley Book of Knots, the authoritative book on the subject, lists over 3,900 knots; the average small boat sailor really needs only about half a dozen, but he should master those until he can tie them readily.

Some Terminology

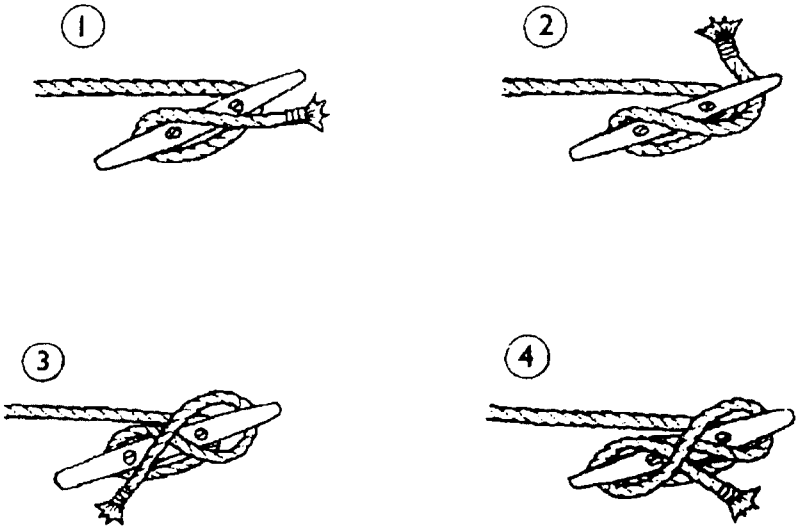
The sailor distinguishes between **rope** and **line** in the same way that a cook distinguishes between **egg** and **omelet**. Rope is the raw material, the stuff you buy when you need to make up a new line. If you point to some rope in use on a boat and ask, "What is this rope?" the answer might be, "Dacron." If you ask, "What is this line?" the answer might be "The peak halyard."

A distinction is made between the various ways rope is attached to itself or to other objects. A **knot** is the tying of rope to itself. A **bend** is the attaching together of two pieces of rope. A **hitch** is the attaching of a rope to an object. However, these distinctions are not often made in small boat handling.

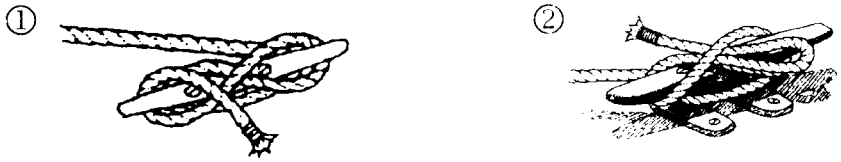
Cleating a Line

The most frequent handling of rope is the securing of a line to a cleat. A mark of the landlubber is the winding of a line endlessly around and around a cleat. The simple fastening in the illustration will pull the cleat out of the deck or break the rope before it will slip.

All you need is one turn around the cleat, one figure eight over the top, and a half hitch to hold it in place. Twist the last turn so that everything is held in place, as shown in the fourth sketch.



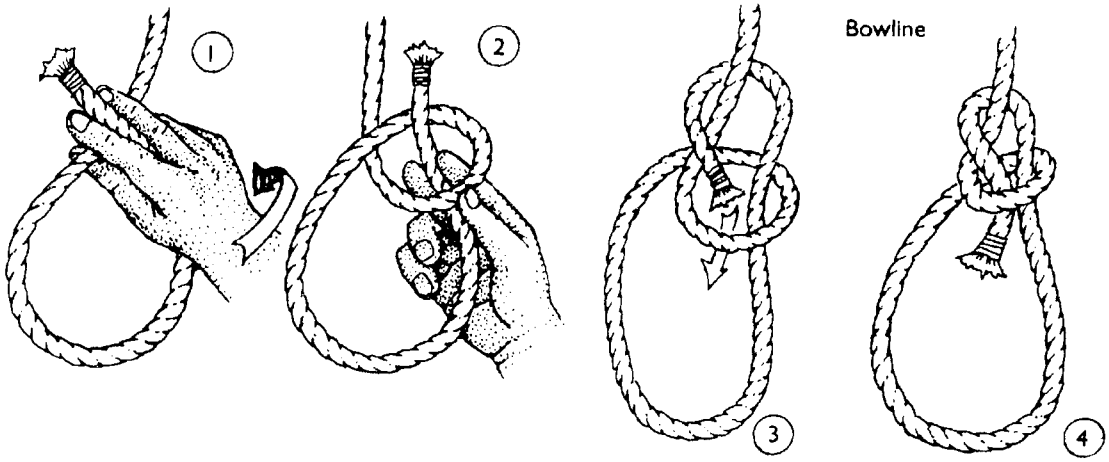
If the line is to be secured temporarily or may need to be cast off quickly, omit the twist in the last turn as shown in 1, below. A compromise is a slippery hitch - shoelace fashion - as shown in 2.



The Bowline

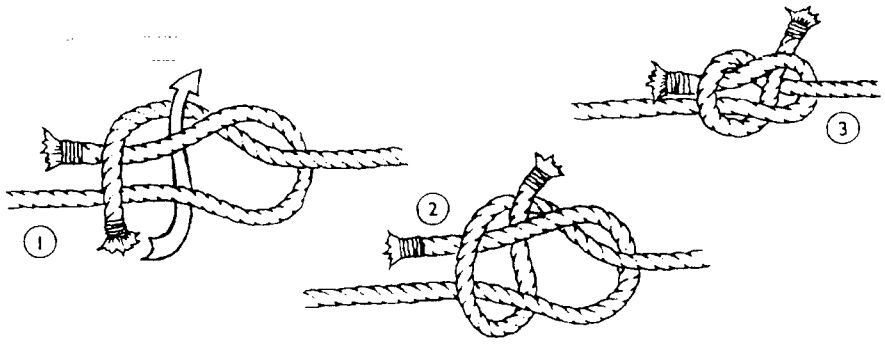
The sailor's most valuable knot is the **bowline** (*BO-lin*). It's purpose is to put a loop in the end of a line. It is very secure, yet is easily untied even after heavy loading or when wet. Learn to tie it with your eyes closed, or in the dark or underwater. The day you fall overboard and someone throws you a line, tie it around your waist with a bowline so they can haul you in.

The Boy Scouts teach an elaborate method of tying it, involving rabbits going down rabbit holes, etc., but there is a far simpler way. Hold the end in your right hand, and hit the standing part in your left hand with a downward circular motion, forming a loop. Then move your left hand up to maintain the loop and use your right hand to guide the end under the standing part and back down through the loop. Two seconds and its done!



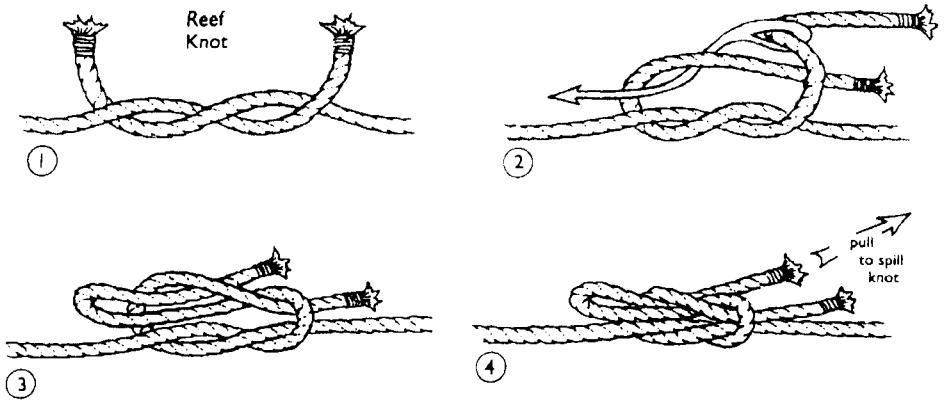
The Sheet Bend

Once the bowline is mastered, the **sheet bend** is the next easy step. Almost identical to the bowline, it is used to connect two ropes instead of connecting a rope to itself. It is tied in the same manner as a bowline.



The Reef Knot

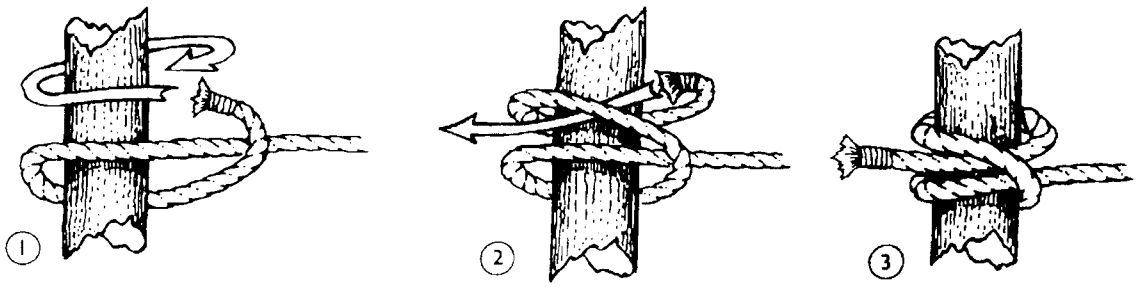
The best-known and least useful knot is the square knot, good mainly for tying up packages and parcels. The sailor knows this as the **reef knot,** because its *only* use on a boat is tying up the reef points. When using it for that purpose, leave a loop on one side, in the fashion of a shoelace, for easy untying, thus:



The Clove Hitch

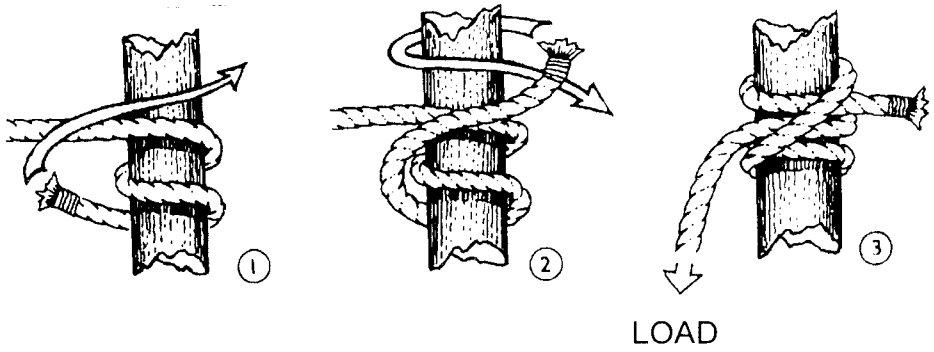
Invaluable for quickly tying up to a piling, it can be tied while there is a strain on the line. For longer term security, tie two half hitches around the standing part of the line.

If the top of the piling is within easy reach, with no strain on the line, the clove hitch can be tied very quickly. Throw a turn over the top of the piling with the standing part on top, then, using the working end, throw a second identical turn over the piling.



The Rolling Hitch

It is a challenging problem to secure a line to a spar or similar object against a lengthwise pull. Such a hitch is needed for stepping a mast, for attaching your flag halyard to the forestay, or for attaching a line to a piling for hoisting an outboard motor. The rolling hitch will do it if treated with caution and respect. Apply the load slowly until you are sure it is holding.



Whipping

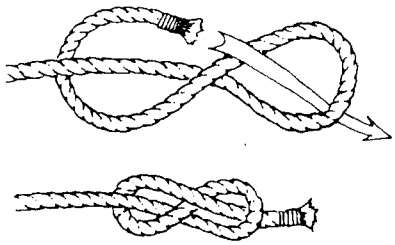
The cut end of a rope will unravel very quickly if not treated. A dealer typically wraps some masking tape around the rope before he cuts it, but this is very temporary. Some dealers cut the rope with an electrically heated knife, melting the tips of the fibers together, but this, too, is insecure for long-term use unless the hot knife is used to melt the rope some distance back from the end.

Because both nylon and Dacron melt at moderate heat, perhaps 400° , the last half inch can be converted to a solid mass that will never unravel. A way to do this at home is to wrap some aluminum foil tightly around the rope,. then trim the end with a sharp knife. Hold it an inch or so above a gas flame, watching the exposed end to see that it does not char. With a couple of trials, you can do a fairly neat job. But be careful! The melted rope stays very hot for quite a long time.

The sailorly way to solve this problem is to whip the rope end with some marline, using the clever trick illustrated below to completely conceal and secure the ends of the marline.

The Figure Eight Knot

Although there are elaborate and beautiful stopper knots to prevent the ends of lines from running away through blocks or up masts, the simple figure eight knot serves the purpose very nicely.



Going Further

For more detailed information on knots and splicing as well as every other aspect of small boat handling, we heartily recommend *The Complete Sailor* by David Seidman (previously published as *On The Wind).* Beautifully illustrated, it will answer virtually any question concerning small boats. The book is widely available in bookstores and marine suppliers, or can be ordered by mail from the Mystic Seaport Bookstore (1-800-331-2665) for less than $20.

The Bitter End

The Catboat Association
Membership Application

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John.Greene@catboats.org

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Home Port:_____

Former Names:_____

Former Owner:_____

Designer:_____

Builder:_____

Where Built:_____

Length on Deck:_____ Beam:_____ Draft:_____ Sail Area:_____

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