

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).
2. Sail Bag, Battens & Ties.
3. Sail Cover.
4. All Running Rigging: Mainsheet, Peak and Throat Halyards, Topping Lift, First Reef line, Second Reef Line, Upper Reef Downhaul, Upper Reef Outhaul, Gaff Outhaul, Main Outhaul, Flag Halyard.
5. Lazy jacks, two upper with brass thimbles; two middle with brass thimbles, two lower.
6. Harken Blocks: 6-001, 1-147, 1-008, 1-025, 3-071(springs), 2-146, 1-078, 1-002, 1-021, 1-003.
7. Mast.
8. Mast Wedges, Boot and fastening materials.
9. Mast rings (7), with marlin.
10. Forestay & shrouds.
11. 3-3/8" Turnbuckle bronze.
12. 3-5/16" SS Shackle and S.S. wire (to attach forestay & shrouds to mast tangs).
13. Boom.
14. Tack Bracket with 3/8"x 3" SS Hex Head Bolt.
15. Boom crutch, teak (None with boom gallows option).
16. One 5/16" x 3" Hex Head SS Bolt (for gaff saddle).
17. Gaff.
18. Gaff saddle, parrel beads(5) and parrel line.
19. Diesel deck fill key.
20. Yanmar tool kit for diesel engine.
21. Interior cushions (4).
22. Ice Chest
23. Stove with potholder.
24. Porta-Potti.
25. Dropboards, teak plywood.
26. Cockpit drain plugs (2).
27. Touch up paint for spars, white and buff Gelcoat repair paste.
28. Certificate of Origin.
29. Bill of Sale.
30. Builders Certificate.

31. Yanmar Owners Manual.
32. Various Warranties and Guarantees by other manufacturers.

1.1 - 2 OPTIONAL ITEMS

1. One Line reef System.
2. Bowsprit with bobstay chain 3/16", 5/16"S.S. shackle, 3/8" bronze turnbuckle.
3. Boom gallows.
4. Rope deck pipe (for anchor rode).
5. Anchor.
6. Anchor Line with Chain.
7. Anchor Chocks.
8. Opening side porthole with screen.
9. Opening forward porthole.
10. Opening forward hatch with screen.
11. Steps on transom and rudder.
12. Knotmeter.
13. Depth finder.
14. Combined Depth-Speed-Log.
15. Wind Speed Direction Indicator.
16. Compass.
17. VHF Antenna.
18. VHF Radio (fixed).
19. Electric bilge pump.
20. Hand bilge pump with handle in aft locker.
21. Name and hail port on transom.
22. Shore Power.
23. Pressure Water System.
24. Hot Water.
25. Shower in Head.
26. Shower on Coaming.
27. Recessed 2-burner stove.
28. Lightning Dissipater.
29. Grounding rod & plate.
30. Cetol or Armada finish on teak.
31. Cockpit Cushions.
32. Dodger.
33. Shade on Dodger.
34. Cockpit Tent.
35. Extra Battery with case.
36. Wind indicator.
37. Accessory Plug outlets.
38. Louvered Doors with lower dropboard.

1.2 COMMISSIONING CHECKLIST



1.2 - 1 RIGGING

1. Lay mast horizontally with aft side of mast up. Eyebolts are on aft side of mast.
2. Slide mast rings over top of mast. Count the number of ring cringles in sail (7 rings) do not include rings for reef cringles. Tie rings together so they do not drop as the mast is raised
3. FORESTAY & SHROUDS:
 - (a) Fasten forestay with a 5/16" shackle to the tang on the forward side of the mast.
 - (b) Fasten (longer) shrouds to tangs on sides with 5/16" shackles.
 - (c) Wire pins on shackle.
 - (d) Fully extend the 3/8" bronze turnbuckles and attach to bottom of

forestay and shrouds.

4. LAZYJACKS:

- (a) Tie two upper lazy jacks (each 11' long, 5/16" Dacron) to eye on each side of mast with a bowline. (Upper lazy jack has a brass eye spliced in.)
- (b) Run middle lazy jacks (each 18' long, 1/4" nylon) through brass eye on upper lazy jack. (Middle lazy jack also has a brass eye spliced in.)
- (c) Run Lower lazy jack (each 20' long, 1/4" nylon) through brass eye in middle lazy jack. Tie the lower and middle lazy jacks together on bottom.

5. TOPPING LIFT:

- (a) Attach single block (021) for topping lift, to eye on starboard side of mast, just above lazyjack eye. The flat cheek of the block should be against the mast.
- (b) Run the topping lift line, (63'3" of 3/8" Dacron), through the block and tie two ends together.

6. THROAT HALYARD:

- (a) Attach double block (003) to large eyebolt opposite the forestay tang. Put the flat cheek of the block against the mast.
- (b) Attach throat halyard, (101' of 7/16" Dacron), to becket on a single block with a bowline. Run the line through the double block, back to block with a becket, back to double block so it leads to starboard side of mast. Then tie the lines together.

7. PEAK HALYARD:

- (a) Attach two single blocks (001) to topmost 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, (129' of 7/16" Dacron), up through the bottom block, through a third single block (001), and through the top single block on the upper eyebolt. Pull these lines to mast base and tie the four lines together.

- 8. FLAG HALYARD: Run the 1/8" line, (50' long), through the small block on the side of the mast top. Tie the ends together.

- 9. DECK BLOCKS: Attach three blocks (001) to eyes on teak block on starboard side of forward deck. Use the three springs (071) so that they stand up.

YOU ARE NOW READY TO RAISE THE MAST: You should have the following attached: 7 rings, forestay, 2 shrouds, 2 sets of three lazyjacks (upper, middle and lower), 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 and the antenna and/or lightning dissipater and/or wind direction indicator!)

1.2 - 2 STEPPING THE MAST

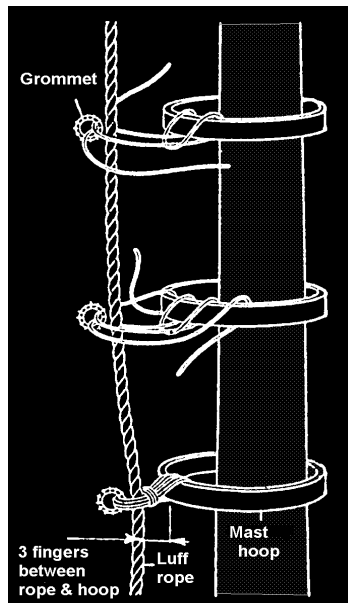
The mast requires a gin pole or crane to raise. It weighs about 150 pounds and is 33' long. Raise and place mast into mast hole. This is at least a two man job. One man stands on the forward deck and guides the wires then the mast through the hole. The second man has to be below. He makes sure the wires do not get crushed by the mast. He also advises the person on deck as to which direction the mast needs to go into the step. The mast will have to be turned to assure it engages with fore-aft cross bar. Put in mast wedges at deck level. #1 in front, #7 aft, #3 starboard & #10 to port. Attach forestay and shrouds to chain plates, do not over tighten. (If there is any question about doing this, it would be better to have it done professionally).

MAST BOOT:- Secure the canvas mast boot around the mast with the velcro tape. The seam is in the back. Secure the bottom edge around the lip with the line. The top edge should be covered with waterproof tape (Mast Boot tape).

1.2 - 3 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 tack bracket to boom end with " clevis pin, with cotter pin. (The tack bracket has 3 holes on top.)
3. Attach tack bracket to mast gooseneck plate, using 3/8"x 3" bolt with lock nut.
4. Attach one end of the topping lift to the last hole in the boom end. casting with a bowline. Lead the other end through the aft deck block on the starboard side of forward deck, to the starboard outside rope clutch to the most starboard cleat
5. Attach lower lazyjack to forward and middle eyes on each side of boom with bowline knot. Attach aft end of middle lazyjacks to 4' lazyjack cleats.

6. Attach the mainsheet jam cleat block to traveler with bronze shackle. Secure set screws on side of block so upper SS shackle does not swivel. Attach double block to bale on boom. Pull mainsheet through blocks starting at jam cleat.
7. Attach gaff to gaff saddle with 5/16" - 3" 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 loose enough to be able to put your hands between the mast and the beads.
8. THROAT HALYARD: Look aloft and twist the halyard so it runs fair. Attach the throat halyard and block (002) to the eye on top of the front of the gaff making the block flat against the mast. Run the throat halyard through the forward deck block to the inner rope clutch, then the inner cleat on starboard side aft end of cabin.
9. PEAK HALYARD: Look aloft and twist the halyard so lines run fair. Tie the line running from the top of the mast, peak block to the eye on top of the gaff (aft end) with a bowline. Attach the block (001) 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 middle deck block to middle rope clutch to middle cleat.
10. BENDING ON SAIL:
 - a. Raise the gaff about 2' above boom. Remove lazyjacks on side of boom you are working on. Slide mainsail foot into slot on top of boom, fasten tack pin.
 - b. Slide peak of sail into track on bottom of gaff, fasten throat pin
 - c. Refasten lazyjacks.
11. MAST RINGS: Tie sail to mast rings, leaving three fingers distance between luff and ring, use 3/8" of marlin for each ring. (The purpose of the rings is to keep sail from blowing backwards when being 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 are then 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:** Attach single block with becket (147) to forward eye on outhaul casting. Foot outhaul is 12' of 5/16" Dacron. Tie a bowline knot to the becket on the block. Take the line forward through the starboard side of the clew cringle, back to the block. Then forward to cleat on starboard side of boom.
14. **GAFF OUTHAUL:** Head outhaul is 4'-9" of 5/16" 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.

1.2 - 4 REEFING LINES

STANDARD REEFING SYSTEM:

FIRST REEF:

Downhaul is 4' of 3/8" Dacron. Tie to first (lowest) reef cringle on luff of sail.

Outhaul is 14'-6" of 3/8" Dacron. Tie to first (lowest) reef cringle in leech of sail. Run through outermost cheek block on starboard side of boom, forward to cleat.

SECOND REEF:

Downhaul is 21'-0" of 3/8" Dacron. Tie to second reef cringle on luff of sail. Lead down to double block (025) attached to eye on port side of mast at gooseneck, through fair lead, to rope clutch, to cleat. Tie a stopper knot in end.

Outhaul is 15'-3" of 3/8" Dacron. Tie securely to second reef cringle on leech. This leads to cheek block on port side of boom and to cleat on port side of boom.

THIRD REEF:

Downhaul is 25' of 3/8" Dacron. Tie to third reef cringle on luff of sail. Lead down to double block attached to eye on port side of mast at gooseneck, through fairlead, to rope clutch, to cleat. Tie a stopper knot in end.

Outhaul is 4' of 3/8" Dacron. This leads directly to cleat on port side of boom.

ONE-LINE SECOND & THIRD REEF (OPTIONAL):

FIRST REEF: (Same as Standard Reefing)

SECOND REEF:

Downhaul and outhaul is combined. The line is run through the boom at MBW. The outhaul end (furthest aft) is tied to the second reef cringle on the leech with a bowline. The forward end is run up to a single block (146) attached to the lower ring on the port side of the sail. (The block is flat to the sail.) The line then goes down to the double block (025) at the gooseneck on port side of mast, through fairlead, to rope clutch and cleat. Tie a stopper knot in end.

THIRD REEF:

Downhaul and outhaul is combined. The line is run through the boom at MBW. The outhaul end (further forward than second reef) is tied to the third reef cringle on the leech with a bowline. The forward end is run up to a single block (146) attached to the upper ring on the port side of the sail. (The block is flat to the sail.) The line then goes down to the double block (025) at the gooseneck on port side of mast, through fairlead, to rope clutch and cleat. Tie a stopper knot in end.

1.2-5 INBOARD ENGINE

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. 203-3)

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 _ 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.

1.2 – 6 LAUNCHING

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

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

1.3 WARRANTY PROCEDURE

After commissioning, 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 core).

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

BRONZE: All hardware is bronze, including three mooring cleats, two halyard cleats, topping lift and reef cleats, two chocks, seven fixed ports, traveler, hatch hinges, hasps, forestay and shroud tangs and triple gudgeons and pintles. All through-hulls bronze ball valves.

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

RIGGING: 3/16" Stainless steel forestay and shrouds. 3/8" bronze turnbuckles. Three strand 7/16" Dacron halyards and mainsheet. Topping lift 3/8" Dacron. Second reef and third reef downhaul led to cockpit. Outhauls from end of boom to cockpit area. (Optional one line reef system for second and third reef leads to end of cabin.) All Harken ball bearing blocks. Mainsheet jam cleat. Rope clutches on halyards, topping lift and reef lines.

CABIN INTERIOR: Varnished ash wainscoting on cabin sides. Teak and holly cabin sole with satin varnish. Ash wainscoting on forward hatch. Interior shelves with teak pinrails. All interior teak coated with Cetol. Molded fiberglass head area with sump for shower. Protected toilet paper holder. Lockers lined with insulated fabric to prevent mildew. Lifting step on port to access trash container. Sink faucet with shower spigot. Liquid soap dispenser.

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 Petit Unepoxy Plus Red. (#1618). 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 assure 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 fibreglassed into the deck during lay-up. 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 12 layers of fiberglass at the waterline. It is designed to transmit the load of the mast evenly throughout the hull. The mast plate is an aluminum base and ring which is bolted to the mast step. The mast fits inside the ring and is prevented from turning by a fore and aft bar. There are drain holes in the mast step and the mast plate.

1.5 - 6 CENTERBOARD

Care should be exercised in operating the centerboard. It weighs several hundred pounds. If the centerboard is released, without snubbing the pennant around the winch, it will swing with great force into the forward end of the trunk.

The centerboard is made in a two part mold with fiberglass outer skins. The core of the board is filled with a mixture of lead and resin. This serves to weight the board so it sinks. When rubbing on the bottom, instead of exposing wood or steel, the resin mixture resists any deterioration.

The centerboard pennant is 3/8" Dacron 10' long, secured to a bronze cleat on the threshold. Three wraps should go around the bronze centerboard winch. It goes through a fairlead block down into the trunk to a molded hole in the aft end of the centerboard, and is secured with a splice.

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 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 consists of 2 shrouds and one forestay attached to the chain plates with 3/8" bronze turnbuckles. Each season inspect the rigging for any broken wires in the strand.

1.6 - 3 TURNBUCKLE

Check the turnbuckles 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). Tighten turnbuckles after a couple of sails as the wire rigging will stretch initially. Put a cotter pin through top & bottom to prevent turning.

1.6 - 4 ADJUSTING STANDING RIGGING

The rigging 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 rigging causes excessive wear and tear on the tangs as well as the mast.

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 3/8" turnbuckle on the bobstay should be tightened sufficiently so the sprit remains straight.

1.6 - 5 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 - 6 BOWSPRIT

On bowsprit boats, a bobstay chain that runs from the bottom of the bowsprit to a S.S. eye is located on the stem. A 3/8" turnbuckle is used to tension the chain. Attach the turnbuckle on the upper end to keep it out of the water.

1.6 - 7 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 takes 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 sail gently washed with a mild soap and thoroughly rinsed. A sailmaker can clean this large sail easily.

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

1. To remove your sail at the end of the season requires two people.
2. Remove battens
3. Untie reef lines at leech that run into boom. Tie stopper knot so they don't go into boom.
4. Remove blocks and shackles that hold reef line to sail at luff.
5. Untie outhauls on boom and gaff.
6. 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.)
7. Remove and tie together lazy jacks from the side of boom, that you are standing on..
8. Remove sail from gaff.
9. Remove sail from boom.
10. At this point it is probably best to fold the sail over the top of the cabin. Flake and fold to make a neat bundle.

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 that is mounted on the side of the cockpit seat. 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 aft 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

The sink has a thru-hull on the drain. (This thru-hull also serves as the drain for shower sump). This should be closed when sailing and when at mooring.

1.9 - 2 GALLEY STOVE

The standard stove used is 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 cruising sailboat. 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 23 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 (located against the aft bulkhead in the head) in-line with the white hose running 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 starboard side deck.

A pressure relief valve is installed to prevent siphoning of sea water back into the head while heeled. A valve in its top should be installed with pointed end down.

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.

1.9 - 4 HOT WATER HEATER (OPTIONAL)

The optional water heater works from shore power or from the heat generated by the engine when running. To turn on shore power for water heating there is a switch to starboard of the main shore power switch. The engine heat function will operate automatically every time you run the engine.

2.0 THRU-HULLS AND SEACOCKS

2.0 - 1 SEACOCKS

Menger 23' is equipped with bronze ball valves. 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 cockpit bails into the centerboard trunk above the waterline. Therefore no valve is necessary.

The ball valves have a hard chrome plated ball seated in Teflon seals for smooth operation. It can be rotated with a vinyl covered SS 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. Annually, they should be disassembled, cleaned and lubricated with lithium grease.

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 when winterizing the engine..**

2.0 - 3 COCKPIT DRAIN

The cockpit drains are equipped with black rubber plugs. The plug prevents water trapped in the centerboard trunk from spurting into the cockpit while sailing. **The plugs should be removed when the Cat is not sailing.** Do not leave them in place while storing or at a mooring. Doing so will cause rainwater to overflow into the engine compartment and keel.

2.1 STEERING GEAR

Maintenance of the wheel steered Menger Cat is simple. A lubricant such as teflon is available in tubes. This should be applied to the gears each year. No lubricant should be used on the shaft brake.

2.2 ELECTRICAL SYSTEMS

2.2 - 1 BATTERY

All Menger Cats are equipped with at least a 105 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. 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 both batteries. 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

Your Menger Cat 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 12 volt system is wired so that the black wire is ground.

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 to make sure this connection is not corroded.

2.2 - 5 LIGHTNING DIFFUSER

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 (2.62-1 Gear Ratio, 55 Amp Alternator)

2.3 - 1 INSTALLATION

Our diesel sits in a molded fiberglass engine bed and pan that slopes forward, catching any spillage from the engine from bleeding, changing oil, etc. This, in turn, keeps diesel fuel out of the bilge. The bed can be cleaned by wiping the forward sump with a paper towel.

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.
- 9 Retighten all bolts when done. Check bolts after running for several hours.

2.3 - 3 STUFFING BOX

To access the stuffing box, open the aft locker, remove the plywood shelf. You can then squeeze into that area and access the stuffing box.

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.

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. The 2GM20 uses about 1 quart per hour, there is no point in filling the tank full. The fuel tends to lose 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 Yanmar Fuel Filter in the aft end of the motor box. See the appropriate owners manuals.)

A 3/16" dowel serves as a fuel gauge. Mark the dowel 8 _" up from the bottom for a full fuel tank.

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 $\pm 1/4$ " from the bottom.

2.3 - 7 PROPELLER

The propeller that comes with your cat is a two blade Right Hand 13" diameter by 13" pitch. The shaft is 1" x 58"

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. Drain crankcase and transmission and refill with fresh oil as specified in the owners manual. Change oil filter.
2. Close sea cock, remove raw water pick up hose from water pump, attach a 4' length of hose to water pump and immerse in a one gallon bucket of 50/50 water-antifreeze solution. Remove hose from engine or manifold that leads to exhaust elbow. Attach about a 4' length of hose and immerse one end in the bucket of antifreeze solution. Start engine and run until water begins to warm up (about 3 to 5 min.) and thermostat opens. Stop engine. Replace hose that leads to exhaust elbow. Start engine and let run till water 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.
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 levers and turn engine slowly by hand on belt. Slowly pour about two ounces of engine oil into the intake pipe or manifold while engine is turning. 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 clean surfaces. 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 Yanmar engines.)

2.3 - 11 FRESH WATER COOLING

The fresh water cooling system is filled with a mixture of 50% water and 50% antifreeze. This also circulates through the hot water heater. It provides hot water whenever the engine is run.

2.3 - 12 BLEEDING THE ENGINE

Bleeding the engine is rarely necessary. Air in the fuel lines comes from running out of fuel or a loose fuel line connection.

After solving the 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 2_ long pump handle on the side of the fuel pump which can be used. Better is a pump on your filter mounted in the engine compartment. 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. Tightening the bolt is usually all that is necessary. Try starting the engine.
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 filter again. 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 sail covers, 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. 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 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 or Armada 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. Clean and lightly sand then apply a coat. This finish also comes in a gloss for the final coat. A similar finish is Armada. This doesn't darken the teak with additional coats. We are using this finish now.(Optional)

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.

Screens are secured with a Allen head bolt which screws against the port side.

It is a good idea to leave the head port open as any rain water will simply fall onto the fiberglass head liner. This will aid in ventilation.

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 teak wood surfaces are coated with Armada. To touch up any blemishes simply give it a coat of Armada. It will blend in very well. (Not like varnish which shows a reapplication.)

The teak and holly sole is coated with a satin finish spar varnish.

The ash wainscoting has a gloss varnish finish.

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 3 feet (top of board at bottom of slot.) all the time you are sailing. It should be pulled up while the boat is moored or under power. Mark the pennant when the board is all the way up and at the 3 foot point. Use a permanent marker or twist open the strands and insert a colored yarn.

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. Off the wind no centerboard is necessary.

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, hoisting 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 starboard tack. When the gaff is hoisted it will swing to port, preventing the sail from fouling under the topping lift

The 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.

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 wheel and mainsheet while going to windward. Take care that the mainsheet doesn't tangle on a cleat. 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 locking the wheel top 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.)

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,

The running lights 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. 8 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. 12 pound Hi-Tensile Danforth style with 20' of 1/4" chain and 200 feet of 1/2" 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. The cradle bulkheads should be erected on each cross member 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 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.

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.