

CHAPTER 3

NORMAL PROCEDURES

3-1 VOYAGE PLANNING.

3-1.1 LOCAL OPERATIONS

The NAVY 44 is well-suited for local sorties so a full complement of stores and crew may not be required. There are however, a number of things to check and consider prior to getting underway. For extended voyaging, detailed ships bills have been prepared and are contained in the Standard Operating Procedures and Regulations Manual ("SOP").

3-1.2. DAY SAILING CONSIDERATIONS.

Short sorties in daylight conditions are often performed with a boat not as fully-equipped as for long voyages. As a minimum, ensure that there is sufficient fuel for the planned duration of engine operation, sails for planned evolutions, and sufficient crew with necessary skills for the planned sortie.

3-2 PRE-SAILING BRIEFING.

Whether embarking on local operations or for an extended passage, a pre-sailing briefing ensures that the crew is familiar with planned evolutions, required equipment is onboard, and proper skill levels are represented in the crew. The briefing guide below is the minimum information to be disseminated to the crew before sailing.

3-2.1 BRIEFING GUIDE.

1. Mission
 - Primary - be as specific as possible.
 - Secondary - be specific.
 - Operating Area - Define
 - Departure and Return times.
 - Where the boat will land.
2. Crew assignments for the sortie
3. Sail Configurations required or intended for the sortie depending on the weather.
4. Communications
 - With whom
 - Monitor Frequencies/channels
 - Time
5. Weather for the operating area - route

and for point to point sorties.

existing
forecast
destination

6. Route
 - check points
 - potential problem areas
7. Navigation
8. Emergency procedures review.
(brief at least one procedure at the beginning of each sortie).

3-3 SHORE SIDE PROCEDURES.

Shore side procedures, scheduling, maintenance records/reports, and Santee Basin operations are published separately by the Director of Naval Academy Sailing. Applicable references include:

DNASINST 3120.1A, SOP
DNAS OPORD 201, (current year).

3-4 PRE-UNDERWAY PROCEDURES.

Conduct the following pre-underway checks. The Officer-in-Charge ("OINC") or Skipper must verify that they have all been performed prior to sailing.

1. Prior to engine start:
 - Pre-Sortie "walk around" checks.
 - Hull Integrity checks.
 - Safety equipment checks.
 - Engine Pre-Start checks.
2. Checks to be accomplished prior to leaving the dock are:
 - Sail inventory to support planned evolutions.
 - Successful engine start.
 - Com/Nav checks
 - Stores quantities checks.
 - Crew brief.

3-4.1 PRE-SORTIE WALK AROUND CHECKS.

1. Check trim of boat at rest. Note any abnormalities, i.e. (bow down, list to either side, high/low in the water,

mast/ boom in proper condition, cockpit integrity).

2. Check docking lines for effectiveness and chafe. Check shore power cable for integrity.
3. Check that all lifelines, stanchions and pulpits are tight, securely fastened, pinned, and taped.
4. Check condition of standing rigging and turnbuckles.
5. Check the condition of halyards for defects on rope tails, splices, and shackles.
6. Spin all winches several turns to assure proper lubrication.
7. Check the steering wheel for free rotation and wire rope mechanisms on the steering system below the steering pedestal. (adjust wire rope tension for proper play). Ensure steering pedestal friction brake knob is in the unlocked position.

REPORT PRE-SORTIE WALK AROUND CHECKS COMPLETE TO THE OINC

3-4.2 HULL INTEGRITY CHECKS.

1. Check bilge area for dirt or debris which might clog the bilge pumps. Remove same. Check the bilge for oil. Environmental regulations prevent discharging oil in coastal waters. Both minor and major pump-out facilities are available to remove oil from the bilge. Test the RULE 3500 bilge pump by discharging any standing bilge water. Do not prolong test while in port.
2. Ensure all seacocks in the sea water system are open.
3. Check all seacocks and waterline integrity of the hull. Note signs of leakage from sea water, fresh water, and rain.
4. Check fresh water tank levels for adequate water. Fill 23 gal. day tank from one of the 70 gal tanks.

NOTE

Ensure that shut-off valves for the 70 gal tanks are closed after filling the day tank. Failure to do so may result in a loss of potable water from

plumbing leaks or an open valve.

6. Check the thru-hulls for the head and the "Y" valve for the MSD system. Set for INSHORE operation.

REPORT HULL INTEGRITY CHECKS COMPLETE TO THE OINC.

3-4.3 SAFETY CHECKS.

1. Check that inflatable life raft is stowed under the bridge deck.
2. Inspect lifejackets for serviceability. Ensure that there is at least one for each crew member onboard.
3. Determine if personal flotation/harnesses are aboard for heavy weather or night operations.
4. Check pressure levels on all fire extinguishers.
5. Check state and stowage of safety equipment on deck (e.g., MOB gear).
6. Check flare kit for complete inventory.
7. Check that the Med Kit is complete and stowed properly.
8. Inspect all compartments and stow all loose gear.

REPORT SAFETY CHECKS COMPLETE TO SKIPPER.

3-4.4 PRE-START ENGINE CHECKS.

CAUTION

SHUT DOWN ALL 120 VAC. LOADS AT THE SWITCHBOARD BEFORE DISCONNECTING SHORE POWER.

1. Ensure that the engine log is onboard and that its checklist is in-hand for completion.
2. Ensure that the following A.C. components are in the OFF position.
 - o Main A.C. circuit breaker.
 - o A.C. battery charger.
 - o A.C. refrigeration circuit breaker. (Not Applicable for NA 2, NA 8, and NA 15 thru NA 20 which have been equipped with the new

TECHNAUTICS Coastal 12
refrigeration system).

3. Disconnect the shore power cable from the pier end first, then the boat. Leave the cable on the pier for local sorties. Coil the cable and stow it below for point-to-point sorties.
4. Check and record condition of battery banks using the System Voltage Scanner at the switchboard.
5. Ensure that the T-handle shut-down lever (to starboard below the helmsman's seat) is fully depressed and in the down position.
6. Check diesel fuel tank level to ensure an adequate supply of fuel for the sortie.
7. Check fuel supply and fuel return valves in the bilge to ensure they are open.
8. Check engine lubricating oil, transmission fluid, and fresh-water coolant for correct operating levels. Fill as necessary.
9. When checking transmission fluid level, unscrew the dipstick, wipe it clean, and replace (DO NOT SCREW IN). Remove again to check level, then replace and screw down lightly by hand. The threads should run in clean. See Figure 3-1. Transmission Fluid Level.
10. Check engine surfaces for significant accumulations of fuel, oil, and coolant and associated piping, fittings, filters, strainers, and valves for leakage.
11. Check tightness of all belt drives on the engine allowing approximately 1/2-inch play. Adjust as necessary.
12. Visually inspect the Racor filter/separator and drain accumulated moisture/sediment as necessary.
13. Inspect sea water strainer. Use a flashlight. If the strainer holes can be seen it is clean. Do not open the housing if not needed. This will save the seals, and retain a positive seal. Clean if necessary.
14. Check the sea water ENGINE INTAKE seacock located aft of the engine to ensure it is open.
15. Set the MORSE control in NEUTRAL (vertical) and disengage the transmission by pulling out the single knob on the control. Move the lever

forward until resistance is felt indicating the throttle is engaged.

16. Observe engine hours from the engine hour meter on the cockpit engine panel. Record in engine log.

REPORT PRE-START ENGINE CHECKS
COMPLETE TO SKIPPER.

3-4.5 ENGINE STARTING PROCEDURES.

1. Ensure that Engine Pre-Start Checks have been accomplished and recorded in the engine log.
2. Energize the engine electrical system by placing the Engine-Start Battery selector switch to the ON position. Place the Ship's Service (SS) Battery selector switch to either the "1" or "2" position. The selector switches are located on the forward vertical panel of the battery box under the navigator's seat at the navigation station.
3. Ensure the following switches are in the ON position at the switchboard:
 - D.C. MAIN CIRCUIT BREAKER.
 - ENGINE INSTRUMENT PANEL LIGHTS (as applicable).
 - START BATTERY ALT
 - SS BATTERY ALTERNATOR
 - ENGINE ALARMS

NOTE

The low oil pressure alarm will sound until the engine has started and oil pressure is established.

NOTE

The RACOR water alarm will sound for when electrical power is turned on. If the red light remains on there is water in the sediment bowl. Use the drain cock on the bottom of the bowl to drain water out. Use pump (black push button at the top of the filter), to repressurize the filter.

4. Ensure that the clutch is not engaged, (knob below throttle lever is OUT).
5. Advance the throttle to 3/4 throttle or greater.

- CHECKING FLUID LEVEL: 1. UNSCREW HEX HEAD NUT ON DIP STICK BY HAND.**
2. REMOVE AND WIPE DIP STICK.
3. PUT DIP STICK IN TO THE THREADS.
4. REMOVE DIP STICK AND CHECK FOR FLUID IN THE GROOVE.
5. REPLACE AND TIGHTEN DIP STICK BY HAND.

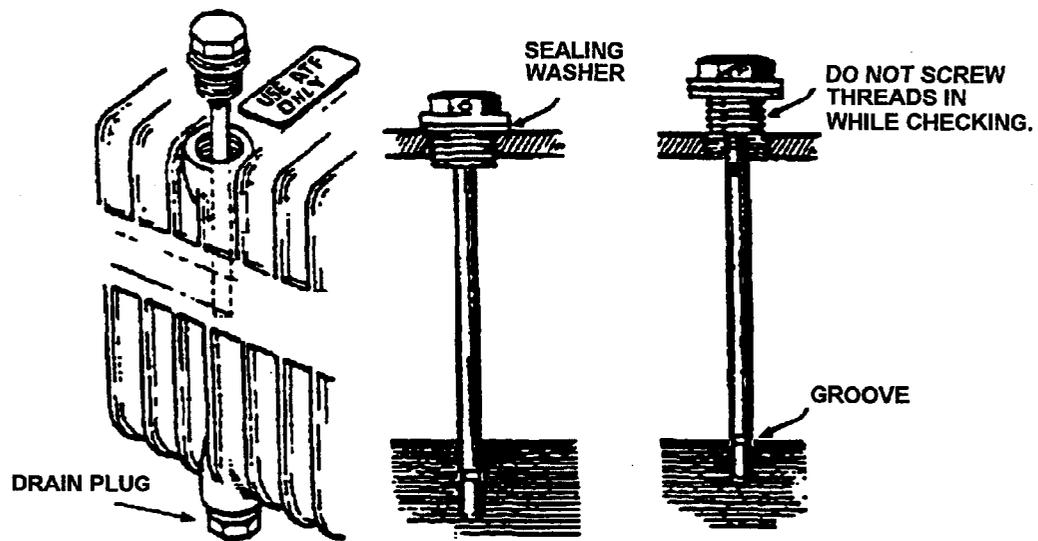


Figure 3-1. Transmission Fluid Level

- Depress the Pre-heat button on the cockpit Engine Instrument Panel for approximately 15 seconds. See Figure 1-25, Engine Instrument Panel.

CAUTION

Oil pressure indication must be seen on the Oil Pressure gauge within 30 seconds of engine start. If not, SHUT THE ENGINE DOWN IMMEDIATELY BY PULLING UP ON THE ENGINE SHUT DOWN T-HANDLE.!

CAUTION

Water discharge must be seen from the transom discharge tube within 30 seconds of engine start. If not SHUT DOWN THE ENGINE IMMEDIATELY to prevent overheating the engine and damage to seals and lubricants.

- Simultaneously depress the Pre-Heat and Start buttons until the engine starts. If the engine fails to start after 10-12 seconds of cranking, release both buttons and wait 30 seconds. Check that the engine shutdown T-handle is in the fully down position.
- If oil pressure is not indicated within 30 seconds, SHUT THE ENGINE DOWN IMMEDIATELY! Local operations, call the Cutter Shed for assistance. Away from USNA, refer to the Westerbeke manual and begin diagnostic checks.
- Check the transom exhaust outlet for discharge of water/exhaust. If water discharge is not evident within 30 seconds, SHUT THE ENGINE DOWN. Check the engine for any leaks. If no leaks are visible, the problem may be a damaged raw water pump impeller. Inspect and replace as necessary.

CAUTION

DO NOT ATTEMPT TO START THE ENGINE USING ETHER OR ANY OTHER STARTING AID FLUID.

NOTE

Do not attempt to restart engine until the starter has stopped rotating.

NOTE

Tachometer may not show RPM unless throttle is advanced above idle, increasing oil pressure so that the alternator field circuit is energized and charging to display engine RPM. Some unstable running may occur in a cold engine, but this condition should smooth out as an operating temperature of 170-190F (77-88 C) is attained.

- Set throttle for normal idle (500-700 RPM).

CAUTION

DO NOT OPERATE ENGINE OVER 2500 RPM.

- Advance the throttle to a fast idle position (1,200 to 1,500 rpm). Check instrumentation for proper engine operation.

	IDLE	FAST IDLE
Oil Pressure	20-30 psi	30-60 psi
Coolant Temp	170-190 F	170-190 F
Ammeter	+0-15 Amps	+30-50 Amps*

*Readings will vary depending on the condition of the battery and/or amperage demand. Record readings in Engine Log.

- After operating engine temperatures have been achieved, return the throttle lever to the idle position. See 3-25. Engine Instrument Panel.
- Check the operation of the prop by:
 - Retarding the throttle to idle.
 - Push the knob below the throttle IN.
 - Move the throttle forward and observe that forward propulsion occurs.
 - Retard throttle and pull into reverse to check for prop operating in reverse. Return throttle to idle.

REPORT SUCCESSFUL ENGINE START TO SKIPPER/OINC.

3-4.6 ENGINE SHUTDOWN PROCEDURE, PIER SIDE.

- MOVE the throttle control to NEUTRAL and let the engine idle for approximately one minute.

2. PULL UP on the ENGINE SHUT DOWN T-HANDLE. After engine is shut down, return the T-Handle to the down position.

NOTE

The low oil pressure alarm will continue to sound until the engine alarm is switched OFF.

3. Turn Off Engine Alarm switch at the Electrical Switchboard Panel.
4. Check and record all applicable fluid levels, and update engineering and boat logs.

REPORT ENGINE SHUT DOWN COMPLETE TO THE SKIPPER/OINC.

3-4.7 SAIL INVENTORY.

1. Ensure that the sails required to support the planned sortie are on board. See Table 3-3 Sail Management.

REPORT SAIL INVENTORY COMPLETE TO SKIPPER/OINC.

3-4.8 COM/NAV EQUIPMENT CHECKS.

NOTE

Shore power may be maintained during electrical equipment warmup when the auxiliary diesel engine is not operating to avoid drawing down the selected SS battery bank prior to getting underway.

1. Turn on COM/NAV circuit breakers at the switchboard panel and check for proper operation. This can be accomplished while on Shore Power.
2. Operation of the following COM/NAV units for day/local sorties:
 - VHF radio.
 - Sailing Instruments.
 - Depth Sounder.
3. Ensure that Charts, Pubs, Schedules required for the sortie are onboard.
4. Shut down unnecessary COM/NAV equipment.

REPORT COM/NAV CHECKS COMPLETE TO SKIPPER/OINC.

3-4.9 STOWAGE PLAN.

The NAVY 44 Stowage Plan provides for uniformity in outfitting each boat. Table 1-4 details the items in each locker. Additional stowage information is contained in Figure 1-39. Stowage Plan. (Top View).

1. Ensure that sufficient stores for the planned sortie are onboard. Stow according to STOWAGE PLAN.

3-5 UNDERWAY PROCEDURES.

This section includes procedures for underway evolutions. They are presented in the order they most often occur during a sortie. Since the normal underway procedure includes the use of the engine, it is covered first.

3-5.1 OPERATING UNDER ENGINE.

1. Never exceed 2500 RPM.
2. Optimum cruise at 1800 RPM consumes approx .8 gal per hr.
3. Pause momentarily in neutral when shifting from forward to reverse and vice-versa.
4. Use throttle bursts when getting underway in reverse to minimize effect of prop torque.
5. Normal operating oil pressure is 30-60 PSI.
6. Normal engine coolant temperature is 180 degrees Fahrenheit.
7. Lift the "Idle Detent Latch Release" to move out of the idle position for each pass through neutral.
Installed on all boats except NA 1, NA 2 NA 3, NA 4, NA 6.
8. Test reverse prior to any close maneuvering or mooring situation.

3-5.2 DEPARTURE.

These procedures will vary according to the configuration of the slip, dock, or mooring.

3-5.2.1 TYPICAL SLIP DEPARTURE.

1. Follow the A.C.disconnect procedures in 3-4.4
2. Ensure that all personnel are onboard.
3. SINGLE-UP all lines.
4. Order crew to "Take lines in hand" and bring vessel to windward side of slip if necessary.
5. Check for lines overboard.

6. At Santee Basin, request permission from Santee Basin Control via VHF 82A to exit the basin.

NOTE

Depending on number of crew, departure procedures under power call for crew to take lines in hand by leading lines outside the lifelines and preparing to cast off.

7. Selectively CAST OFF or TAKE IN LINES as necessary for departure.
8. Select REVERSE on the ENGINE, report "Backing".

NOTE

The NAVY 44 is typical of a single right hand screw vessel. It will back to port. The propeller shaft is offset to stbd to minimize this tendency.

9. Use throttle bursts, then idle down in gear to minimize twist of stern to port.
10. Hold the bow lines to control the boat orientation in the slip until no longer needed then toss them to the quay.
11. Walk the spring lines forward to the widest part of the boat to maintain control of boat orientation. Drape them on the pilings for access upon return.

3-5.2.2 TYPICAL DOCKSIDE DEPARTURE.

1. Follow the A.C. disconnect procedures found in 3-4.4.
2. Ensure that all personnel are onboard except for those required to cast off lines from the dock.
3. Single-up all lines.
4. Normal procedure is a departure under engine.
5. Make the appropriate signal.
6. Hold a spring line and operate the engine to work against this line. This will warp the boat out from the dock. (Aft spring, engine in reverse for warping the bow away from the dock. Forward spring, engine in forward to warp stern away from the dock.
7. Operate the engine in the direction required for the departure.

3-5.2.3 TYPICAL MOORING DEPARTURE.

Unless there is a strong current opposing the direction of the wind, the NAVY 44 is most likely to respond to the wind. Departing a mooring under sail is therefore an option

1. Ensure that all personnel are onboard.
2. Single-up the mooring pennant if applicable.
3. Normal procedure is a departure under engine. Hoist sails if a departure under sail is to be accomplished.
4. Make the appropriate signal.
5. Cast off the mooring.
6. Operate the engine in reverse to back off from the mooring. Back the jib to throw the bow to one side of the mooring to clear.
7. Operate the engine in forward to clear. Sheet the jib properly and sail away.

3-5.2.4 ENGINE SHUTDOWN PROCEDURE UNDER SAIL.

These procedures will ensure the MAX PROP is properly feathered..

NOTE

Ensure that the engine is operating in forward propulsion. The prop will not feather with the engine operating in reverse..

1. Operate engine to get 2 to 3 knots in forward gear.
2. Pull up on the T-handle to kill the engine while still in forward gear. Allow the engine to stop.

NOTE

If the propeller has been greased properly it will feather in a fraction of a second as soon as the shaft has stopped.

3. If the prop has feathered, go directly to step 7.
4. If the shaft is still spinning engage the transmission in reverse to stop the freewheeling.
5. Take the engine out of gear.
6. If the prop has not feathered, the shaft will continue to freewheel like with a

fixed blade propeller. In this case start the engine and repeat steps 1 through 3.

7. To align the prop so as to hide the maximum girth behind the keel, deploy a crewman to the deck plate aft of the engine.
8. He should grasp the prop shaft and call out, "Put the throttle in neutral and pull out the clutch button."
9. Helm should accomplish this action and respond, "Clutch button is out".
10. Crewman should rotate the shaft until the key way is at the 10 o'clock position and call out, "Prop aligned".
11. The engine can be left either in or out of gear.
12. Push engine shut down T-Handle down to ready engine for subsequent start.

REPORT ENGINE SHUT DOWN COMPLETE TO SKIPPER

3-5.3 LOGS AND LOG KEEPING

Refer to applicable procedures. References include:

- DNAS INST 3120.1A - Standard Operating Procedures ("SOP")
- DNAS OPORD 201- Current year OpOrder

3-5.4 RUNNING RIGGING AND DECK HARDWARE.

Running rigging is the equipment used to hoist and trim the sails. It includes halyards, running backstays, cunningham, sheets, guys, snatch blocks, footblocks, fiddleblocks, spreader blocks, preventer, and winch handles.

3-5.4.1 RUNNING BACKSTAYS.

The running backstays must be used to provide stability to the mid-mast region when the collapsible inner forestay is used for setting the storm jib or genoa staysail. They are also used with the collapsible inner forestay to minimize "mast pumping" when operating under engine in lumpy seas. They are stowed against the after lower diagonal shroud turnbuckles and tied off with shock chord. A plastic split tube is attached around the running backstay wire at the lower spreaders to eliminate wear against the back edge of the aluminum spreaders.

To use the running backstays:

1. Free up the running backstay.
2. Attach the rope tail (stowed in the line locker) with the D shackle that's on the runner tail.
3. Lead the rope tail to a snatch block rigged to the toe rail between the primary and secondary winches, then to the secondary winch.
4. Tie a stopper knot in the end of the rope tail.
5. Add reasonable tension, not heavy, to the windward running backstay with the winch and secure the line on a cleat.
6. When tacking, release the loaded running backstay as the boat comes through the wind.
7. Load the new windward running backstay before the sails fills and puts a load on the mast.

3-5.4.2 BACKSTAY CONTROL.

The NAVY 44 is equipped with one of two types of backstay tension control devices.- NA-1 thru NA-8 have Krueger tensioners while NA9 thru NA20 have the NAVTEC tensioner. Use the backstay tensioner to pull the head of the mast aft as the wind increases. The forestay will tighten to reduce forestay sag which will give the headsail better entry. The opposite force exerted at the mast is seen as a bending of the mid section of the mast forward. This will help to flatten the mid section of and control the draft in the mainsail.

3-5.4.3 KRUEGER BACKSTAY TENSIONER.

This tensioner is adjusted as follows:

1. To increase the load on the system close the load release valve (bleed valve) by turning clockwise until finger tight. The gauge is located on the top of the Krueger tensioner and reads in thousands of pounds of tension. Use the hand pump to increase pressure to the desired load.
2. To release pressure, turn the bleed valve counterclockwise approximately 1/4 turn. Close the bleed valve when the desired pressure is attained. Minimum pressure for a static system at rest is 500 pounds. See Figure 1-10.

3-5.4.4 NAVTEC BACKSTAY TENSIONER

This tensioner has a gauge that reads in pounds per square inch of cylinder pressure. Newer gauges have a double ended pointer. The reverse end of the pointer gives load on the system in thousands of pounds. In both models the gauge is located at the base of the cylinder on the stbd side.

1. To increase the load on the system turn the load release valve (bleed valve) clockwise until finger tight. The valve is located on the port side of the cylinder opposite to the pressure gauge. Use the hand pump to increase pressure to the desired load.
2. To release the load turn the bleed valve counterclockwise approximately 1/4 turn. Close the bleed valve when the desired load is attained. Minimum pressure for a static system at rest is 500 pounds. See Figure 1-11.

3-5.4.5 CUNNINGHAM.

The cunningham is a light duty block and tackle used to tension the luff of a fully hoisted mainsail. It is primarily used to keep the maximum draft of the mainsail forward as the wind increases. Increasing wind pressure in the sail tends to make the draft of the mainsail move aft. To relocate the draft to the proper position, to about the forward 1/3rd of the chord of the sail, increase tension on the cunningham.

1. Attach the hook of the cunningham to the lower cringle on the luff of the mainsail.
2. The tail of the cunningham is led aft to a cam cleat on the port side of the cabin top adjacent to the main companionway.

3-5.4.6 SNATCH BLOCKS.

Snatch blocks provide a lead block where needed. This is limited only by the imagination of the skipper and crew. Typical locations are:

1. On the toe rail two holes aft of the life line stanchion. Use as a lead block for spinnaker guys.
2. On the toe rail at the midship life line stanchion for outboard jib lead, staysail, and genoa sheet leads.
3. On the toe rail as a lead block for the spinnaker to keep the spinnaker sheet from rubbing on the boom.

4. On the padeye for the foreguy for the heavy gybe preventer.

3-5.4.7 SHEETS AND GUYS.

A sheet is a line that controls the clew of a sail. A guy is a line that is led to the spinnaker pole outboard jaw end to control the spinnaker to windward. The spinnaker guy, typically called the afterguy, is a low stretch spectra line. It includes a snap shackle attached to the sheet. A "donut" stopper is fitted to keep the snap shackle from running into and fouling on the spinnaker pole jaw.

3-5.4.8 SPREACHER BLOCKS.

Spreader blocks are attached to the toe rail below the lower rail of the stern pulpit. They are used as turning blocks for the spinnaker sheets, and for leading other lines such as the storm trysail sheet, or a changing spinnaker sheet.

3-5.4.9 WINCH HANDLES.

Winch handles are used to control the rotation of the winches. All the handles on the NAVY 44 are "locking" type. A small spring loaded lever on the handle head engages and disengages the lock device. Winch handles are stowed in a "Hernia box" milk crate in the stbd cockpit locker. There are single handed handles, (short hand grip), and double handed handles, (long handgrip).

1. Deploy winch handles to the winch handle pockets in following locations:
 - The cowls in the middle of the cabin trunk for cabin top winches forward.
 - The cowl to the port side of the main companionway for the cabin top winches aft.
 - At the forward corners of the cockpit near the life raft stowage for the main and secondary cockpit winches. These are double handed winch handles.

3-5.5 SAIL MANAGEMENT.

It is not the purpose of this document to teach an individual how to sail. Basic sailing terms and maneuvers are covered from the view point of how they can be accomplished in the NAVY 44. The procedures listed here describe the requirements to execute a maneuver and are

not offered as the ONLY way to accomplish the action, rather are the result of many hours of training novice sailors, and represent a point of departure. Organization of this section is as follows:

- Procedures for "Bending On" sails.
 - Mainsail.
 - "Hank-On" Jib.
- Basic Terminology.
- Commands.
- Maneuvering under sail.
 - Sail Trim.
 - Jib.
 - Main.
 - Hoisting Sails
 - Mainsail.
 - "Hank-On" Jibs.
 - Headsail changes - "Hank-On" jibs.
- Spinnaker
- Advanced Sail Management Headsail Changes - luff groove Heavy Weather Sails (Storm Jib and Storm Trysail) are contained in Chapter 6, Special Operations.

3-5.5.1 BENDING ON THE MAINSAIL.

The new mainsail introduced in year 2000 is loose footed. Steps 1 and 2 are not required for this sail. Since all NA 44s are not yet equipped with this sail the procedures are retained for using the older sails.

1. Place mainsail on the cabin top adjacent to the mast and remove from the sail bag. Stow the bag below.
2. Put the clew end foot slug into the boom cove at the front of the boom and unroll the sail on the deck as the clew is fed to the aft end of the boom.
3. Attach the tack cringle to the gooseneck with the clevis pin provided on the boom.

NOTE

See Figure 3-2. Outhaul, for proper attachment of the clew of the sail to the boom in steps 4 and 5.

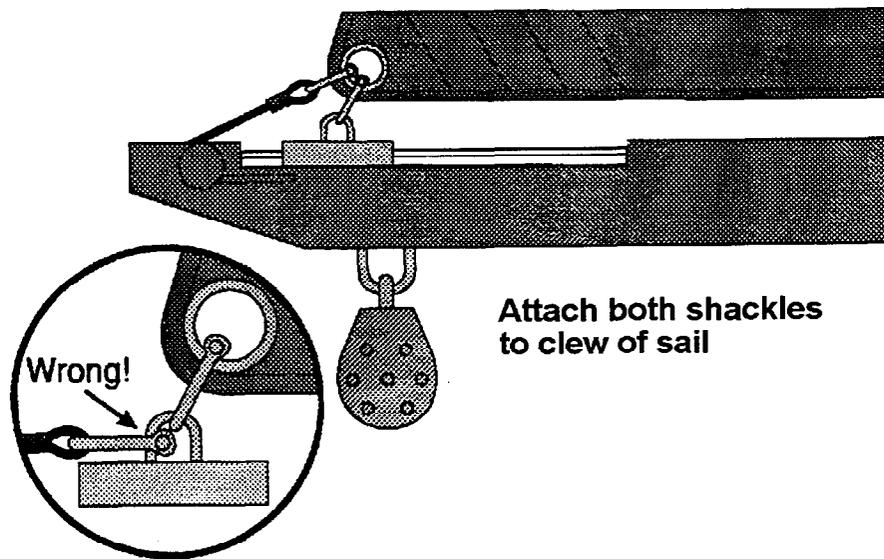
4. Attach the clew to the outhaul car with a shackle.
5. Attach the wire outhaul control line directly to the clew of the sail.

6. Remove the sail slide stop on the mast and feed the sail slides of the luff into the mast track.
7. Replace the sail slide stop.
8. Rig the "first reef" line at the end of the boom through the "first reef" cringle on the leech of the sail.
9. Bring the line straight down, pass it between the foot of the sail and the boom, then down around the boom and back up.
10. Tie the end of the line around the standing part with either a Bowline or Timber Hitch. See figure 3-3. How to tie a reef line.
11. Flake the sail on the boom, secure it in place with sail ties, and put on the acrilan sail cover.

3-5.5.2 BENDING ON A JIB/GENOA- "HANK-ON" JIB.

1. Select the desired sail depending on the wind/sea conditions. See table 3-3. Sail Management.
2. Bring the sail up on the foredeck and place near the forward lower shrouds.
3. Roll the sail toward the forestay taking care not to let the sail blossom in the wind.
4. Attach the tack to the forward most snap shackle at the stem fitting. This will leave the second one open for a sail change.
5. Hank on the luff hanks, (all pistons to the same side), to the headstay taking care not to twist the sail.
6. Attach the desired, jib halyard to the head of the sail.
7. Attach the jib sheets to the clew cringle with a bowline. Lead the sheets to the proper track fairleads and to the corresponding winches at the cockpit. Genoas lead outside the shrouds. Jib sheets lead outside the forward lower shrouds and inside the upper and aft lower shrouds.
8. Lead the jib sheet to the foot block on the cockpit combing aft of the primary and secondary winches.
9. Tie a figure eight stopper knot in the tail of the sheet.

OUTBOARD END



**Attach both shackles
to clew of sail**

Figure 3-2. Outhaul

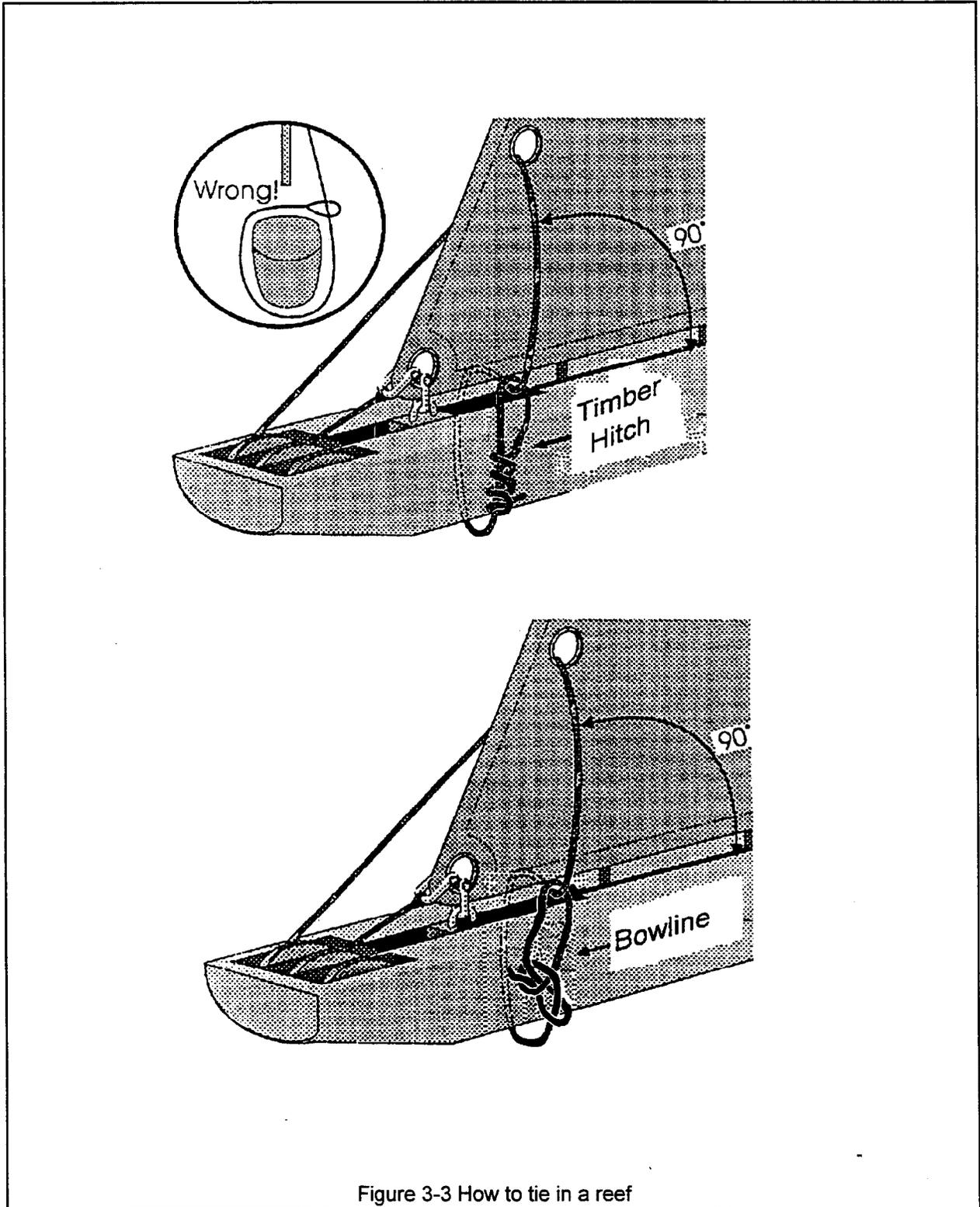


Figure 3-3 How to tie in a reef

5.5.3 BENDING ON THE GENOA STAYSAIL.

The genoa staysail is hanked on the collapsible inner forestay. The clew is secured to the swivel-snapshackle at the inner forestay location. The topping lift, (T-Lift), is used as the halyard. Sheets are led the same as for a #3 or #4 jib, outboard of the forward lower shroud, inboard of the upper shroud and the aft lower shroud.

1. Set up the collapsible inner forestay.
2. Bring the sail up on the foredeck and place near the forward lower shrouds. Remove the sail from the bag.
3. Roll the sail toward the collapsible inner forestay taking care not to let the sail blossom in the wind.
4. Attach the tack to the swivel snapshackle at the base of the collapsible inner forestay.
5. Hank on and work up the luff.
6. Attach the T-Lift to the head as the halyard. Make sure it is not wrapped around the forestay.
7. Run sheets as for a #3 headsail.
8. Hoist the sail.
9. Trim the sail.
10. Adjust the control blocks as necessary for the wind condition.

3-5.5.4 SAILING TERMINOLOGY.

TACKING. A turn moving the bow thru the wind line so that the mainsail boom passes from one side of the boat to the other.

HARDENING UP. A maneuver that moves the bow of the boat toward the wind-but does not cross the wind line.

CLOSE HAULED. Sailing the boat as close to the wind line as possible.

GYBING. A turn moving the stern thru the wind so that the mainsail boom passes from one side of the boat to the other.

BEARING AWAY. A maneuver that moves the bow away from the wind...but does not cross the wind line.

3-5.5.5 COMMANDS.

The following are "defined words" that specify a particular action. They have been chosen to avoid confusion.

TRIM- To trim a sail means to check its shape or angle to the wind and adjust as

necessary.

EASE- To let out a sail, line or halyard; also to move the boat away from the wind. Hand signal is rotating the index finger pointing down.

TAKE- To take in on a sail, line. Hand signal for a halyard is rotating the index finger up

TENSION. Load, as on a halyard, sheet or backstay. This is preferred to, "take in the slack", because if only the last part of the command is heard, an improper action will be accomplished.

HOLD- Temporarily stop what you are doing, such as grinding on a winch, also a steering command as in "Hold your course". Hand signal is a fist.

MADE- Indicating a connection has been "made", as in a shackle or halyard is secured, the connection of the new guy has been "made" to the spinnaker pole when gybing.

3-5.5.6 SAIL TRIM

In order to derive full power potential from the sails, they should be trimmed to best advantage. The following is offered as helpful hints to approach optimum trim. Note the wind velocity and check the sail inventory guide for the correct sail. See Table 3-3, Sail Management.

3-5.5.6.1 JIB TRIM

1. Check the lower set of telltales in the luff of the sail. Both the inside and outside telltales should be streaming. The inside telltale will probably be at a higher angle than the outside telltale.

- If the inside telltale is floating, you are "light", or "pinching", (not as much pressure in the sail as should be), sailing too close to the wind.

Bear off, away from the wind, until the telltale are parallel.

- If the outside telltale is floating you are "fat", (too far away from the wind for the trim of the jib). Either bring the boat up toward the wind until both telltales are streaming, or maintain heading and ease sails until the tail tales are in trim.

Table 3-1. Sail Management

SAIL	APPARENT WIND	SHEETING POSITION	MAIN SAIL
# 1 GENOA	0 - 12	AFT TRACK 3 HOLES FROM AFT END	FULL
# 2 GENOA HI CLEW	0 - 15 15 -18	SNATCH BLOCK ON TOE RAIL NEAR PRIMARY WINCH	FULL 1 ST REEF
GENOA STAYSAIL	0 - 12 12- 18	FWD TRACK 5 HOLES FROM FRONT	FULL 1 ST REEF
#3 WORKING JIB	16 - 22 22 - 25 25 - 30	FWD TRACK 5 HOLES FROM REAR	FULL 1 ST REEF 2 ND REEF
#4 HEAVY WX JIB	30 - 35	FWD TRACK 5 HOLES FROM FRONT	2 ND REEF
STORM JIB	35+	SNATCH BLOCK AT MAX GIRTH TOE RAIL AFT OF STANCHION	2 ND REEF OR STORM TRYSAIL
STORM TRYSAIL	35 +	SPREACHER BLOCKS	TRIM BOTH SHEETS SIMULTANEOUSLY

2. Check the higher set of telltales against the lower telltales. Slowly bring the boat toward the wind and note which set breaks first.
 - If the higher set breaks first, the sail needs more leech tension; (the upper portion of the sail is too loose and at a greater angle of attack than the lower portion). Move the lead block forward on the genoa track.
 - If the lower set breaks first, the sail needs more foot tension, (to close up the lower portion of the sail). Move the lead block aft on the genoa track.

3-5.5.6.2 MAINSAIL TRIM

The sail has been cut by the sailmaker to create an airfoil shape. Improper trim can effectively distort this airfoil. The most common tendency is to "over trim". Use the memory crutch - "When in doubt, let it out". This helps to ensure that the sail has not been over trimmed.

1. The two controls that are used to control the positioning of the mainsail are the sheet and the traveller. For gross adjustments the sheet is used to control all movement of the boom, (in and out, as well as up and down). When making the final fine adjustments the sheet is used to control the "up and down" movement of the boom. The boom vang can be used to "lock in" the desired position and ensure that it will be replicated when the boat is tacked. The traveller is used to control the "in and out" movement of the boom.

1. Check the luff area of the sail. It should be firm. "When in doubt, let it out". The sail should be "let out" until the sail stalls, (a distortion of the sail shape will occur just aft of the luff called "luffing"). Trim to stop the "luff".
- 2 There are telltales at the leech ends of the batten pockets. They give an indication of the wind flow where the windward and leeward airstream meet at the leech of the sail.
 - If the telltales are all falling way to leeward, the sail is over trimmed, (too close to the centerline of the boat). "When in doubt-let it out". Ease the sheet until the telltales stream straight aft from the leech.

- If the telltales are floating, or hooking to windward, the sail is too far away from the centerline of the boat.
 - Bring in the sail until the telltales stream straight aft from the leech.
 - Fine adjustments can then be made. Trim in the sail until the top telltale does not stream anymore, then ease the sail out until the top telltale just starts to stream aft.
3. Check the telltales in the draft of the sail.
 - If the inside telltale is floating, the draft is probably too far aft in the sail. Increase cunningham tension. The fattest part of the airfoil, (camber), should be between one quarter and one half of the length of the sail at that point, (chord). Check the draft stripes to observe the curvature of the airfoil.
 4. The mainsail effects the helm forces on the steering wheel. The center of effort of the mainsail is aft of the center of lateral resistance. If the mainsail is trimmed to tight this will cause the boat to heel excessively and "round up" toward the wind. This is called "weather helm". Helm will be required to steer a straight course. As the boat heels over, the center of lateral resistance moves forward due to the increased size of the leeward bow wave. The center of effort of the sail plan must also move forward to counter the shift in lateral resistance. A "heavy helm" can be trimmed out by easing the mainsail. Adjusting the mainsail in these ways can keep the boat's helm in balance.
 - Ease the mainsheet traveler control line.
 - Ease the mainsheet.
 - Ease the boom vang.
 - Reefing.

3-5.5.7 TACKING THE NAVY 44 - CLOSE HAULED TO CLOSE HAULED.

Safety Considerations:

1. Ensure jib/Genoa sheets are clear both in the cockpit and forward.
2. Ensure intended course is clear of other boats, shipping, and navigation hazards.

3. Ensure crew members are alerted to the maneuver and in "safe zones" for the maneuver.

General Situation:

Assume going upwind in moderate conditions.

Required Positions:

HELM (steers the boat).

GRINDER (grinds the winch to take in the new sheet).

TAILER (works the tail of the new sheet).

WORKING SHEET. This person can double as Grinder after casting off.

Sequence of Events:

1. HELM calls out "Ready About". Crew members take assigned positions. If known, HELM lets crew know what point of sail they should trim to on the new tack.
2. TAILER places sufficient turns for wind conditions on the windward winch, takes the slack out of the lazy sheet, and stands in the cockpit. Discusses with GRINDER whether they have all the turns needed or will be putting more on before the winch handle is inserted. Reports "Ready" to HELM.
3. GRINDER gets double handled winch handle, and stands forward of the windward winch facing aft with one foot against the toe rail and the other in the cockpit. Reports "Ready" to Helm.
4. WORKING SHEET uncleats the leeward sheet, removes excess turns from the leeward winch. Reports "Ready" to HELM.
5. After receiving "Ready" reports from crew, HELM calls out "Helm's-a-lee."
6. WORKING SHEET, as the boat comes into the wind, watches the luff of the jib or genoa and as it begins to luff, stands up on the seat and takes the turns off the winch, calling "Break". Once the turns are off, watches the sheet go through the turning block ensuring it does not foul.
7. TAILER at the call "Break" and as the old sheet is cast off, tails as hard and fast as possible, taking more turns on the winch as needed.

8. GRINDER watches to ensure TAILER has the required turns, inserts handle and commences grinding in the high speed direction. Switches to low speed when the load becomes great and completes the trim of the jib.
9. TAILER keeps tension on the sheet and once GRINDER switches to low speed, sits on the cockpit seat facing forward with outboard leg straight. Watches to see the trim of the genoa/jib and that the sail is clear of the spreader to tell GRINDER when to stop.
10. HELM communicates with Trimmers to determine exact trim and whether HELM wants to point or reach.

HELPFUL HINTS AND COORDINATION:

1. HELM can overshoot the desired new close hauled course slightly so that the boat will match the jib trim position and the jib will start to drive the boat sooner in the turn. As GRINDER brings in the jib trim, HELM can pace wheel movement to come up to new course. Calls "Course" when arrives at new course.
2. Communications is required between TAILER and HELM to determine exact trim and whether HELM wants to "point" or "foot".
3. Mainsheet trimmer trims to match the "overshoot" position and adjusts the main to "point" or "foot" as boat speed is gained on the new tack.
4. In light air it may not be necessary to put more turns on prior to grinding. TAILER and GRINDER should discuss whether all the turns required have been taken prior to inserting the winch handle.

3-5.5.8 GYBING.

WARNING

The gybe is a potentially dangerous maneuver. The mainsheet and boom can exert deadly forces. Crew coordination is vital. Mainsheet trimmer must take care, especially when gybing on to port tack because the mainsheet moves toward the mainsheet winch, and can trap him between the mainsheet and the cabin top.

Safety Considerations:

1. Ensure Jib/Genoa sheets are clear both in the cockpit and forward.
2. Ensure mainsheet tail is clear.
3. Check to ensure intended course is clear of other boats, shipping, and navigation hazards.
4. Ensure crew members are in safe zones for the maneuver. Specifically, they should stay off the "Bridge Deck" and be mindful of the mainsheet partners as the gybe is executed.
5. DO NOT allow boom to gybe without trimming to centerline, even in light wind.
6. HELM is in charge and in control of the evolution. HELM must be cognizant of the respective jobs and chronology. Specifically, that HELM should time the rate of turn. He should not cross the wind line until the mainsail is centerlined. He can slow down or speed up the gybe for a smooth, safe gybe. If the coordination is not going right, HELM should slow or stop the turn until everyone is in sync.

General Situation:

The description below starts with the boat on a broad reach aiming to arrive at a broad reach on the other tack.

Required Positions:

HELM.

GRINDER.(grinds the winch to take in the new sheet).

TAILER (works the tail of the new sheet).

WORKING SHEET This person can double as GRINDER.

MAINSHEET.

NOTE

A PREVENTER is a safety device used to guard against an accidental gybe. It will be used anytime the wind is at a greater angle than 120 degrees either side of the bow. It should be rigged prior to the gybe maneuver. For rigging procedures and crew deployment requirements see Chapter 1, 1-5.5 The Preventer System.

PREVENTER. This can be an added responsibility of GRINDER, TAILER, or WORKING SHEET. Depending on conditions, one person may be WORKING SHEET, TAILER, PREVENTER and GRINDER.

Sequence of Events:

1. HELM calls out "Prepare to gybe" and lets crew know what point of sail they should trim to upon completion of the gybe.
2. PREVENTER eases the loaded side of the preventer. and reports, "Preventer is clear" to HELM.
3. MAINSHEET takes sheet out of the self-tailing winch and removes excess turns from winch, checks the positions for the traveler, and that both ends of the traveler control line are cleared. He then reports "Ready Mainsheet" to HELM.
4. WORKING SHEET uncleats sheet, removes excess turns from the winch, ensures sheet is clear to run, stand in cockpit, and reports "Ready" to HELM.
5. TAILER places one or two turns on the winch, makes the sheet snug, and reports "Ready to HELM."
6. GRINDER gets double handled winch handle, stands by the lazy sheet winch, and reports "Ready" to HELM.
7. After receiving "Ready" reports from crew, HELM calls out "Bearing Away" and turns the stern toward the wind.
8. MAINSHEET and WORKING SHEET ease sail to maintain trim. TAILER keeps taking on the sheet to minimize slack.
9. When wind reaches 150-160 degrees apparent, MAINSHEET trims the mainsail, timing it so that the main is amidships before the boat is dead downwind. An extra crew member can sit on the cabin trunk and help with the trim by pulling down on the vertical part of the mainsheet. The designated crew for PREVENTER takes "line in hand" on the "new" side of the preventer.
10. HELM calls, "Gybe HO!" as the stern passes through the wind, and the boom is crossed to the other side of the boat.

11. WORKING SHEET eases, then casts off the sheet as the TAILER trims the new sheet to the expected point of sail.
12. MAINSHEET eases the main to the expected point of sail.
13. If sailing with wind abaft 120 degrees apparent, PREVENTER resets the preventer.

3-5.5.9 CHANGING A HEADSAIL - "HANK ON" JIB.

The "hank on" boat will be "Bald Headed" while the change is made. A change can be made by:

- Changing tacks.
- Maintaining the same point of sail.
- Bearing away to sail off the wind. (This is a smart consideration during heavy weather). There are three basic sail change situations that will vary the sequence and rapidity of the change. Each has its appropriate place.
- The "tack change" is typically used in restricted waters situations when there is an urgency to complete the evolution.
- Changing while remaining on the same tack is useful when on a long passage, when there is more time and/or, there is no room to tack.
- Finally, a change wherein the boat bears away until the wind is abaft the beam to reduce pitching and water coming on deck is best in more severe conditions at sea with plenty of sea room.

3-5.5.9.1 "HANK ON" JIB - TACK CHANGE.

Safety Considerations:

1. Depending on time of day and prevailing conditions, harnesses may be required.
2. Talk through the evolution so the crew understands each person's responsibilities.
3. Check the area for other boats, shipping, and navigation hazards which might impact the timing of the evolution.

General Situation:

Assume going upwind in moderate conditions and changing from a larger to a smaller headsail.

Required Positions:

HELM.

GENOA SHEET

FOREDECK #1 (boss of the foredeck).

FOREDECK #2

MAST

NOTE

A MAINSAIL TRIMMER may be assigned for the tack; however, it isn't imperative that the sheet and/or traveler be adjusted.

Sequence of Events:

1. HELM announces what type of change and what sail will be raised: "Standby to change to the #3, this will be a tack change". HELM also assigns crew positions and indicates whether the new sail will be brought on deck through the forward hatch (normal route), or through the companionway (taking weather into account).
2. GENOA SHEET using either the lazy sheet or a changing sheet sets the new lead position and leads the new sheet to the foredeck; reports "New Lead Made"
3. FOREDECK #1 and 2 bring new sail on deck, remove it from the bag, unroll it toward the forestay, and hank on the new sail on the weather side of the headstay below the first hank of the sail already set. Attach the new Genoa sheet ensuring it is properly led and that the sheet is clear. Report "Ready" to HELM.
4. MAST readies the working jib halyard for release by taking the halyard out of the self-tailer and checking for knots and tangles. Removes excess turns from the winch. Reports "Ready" to HELM.
5. After receiving "Ready" reports from crew, HELM calls out "Tacking, change to the #3" and turns the boat into and through the wind.
6. GENOA SHEET casts off when appropriate and stands by to trim the new sail.
7. MAST watches for the boat to come up, and for the genoa sheet to be eased, then begins to lower the halyard. Removes excess turns as the load decreases but leaves at least one turn on the winch.

8. FOREDECK #1 un-hanks the sail as it comes down the headstay. Once the sail is un-hanked, changes the halyard to the new sail and calls "Made" to MAST.
9. FOREDECK #2 gathers the sail as it comes down and pulls it aft and to weather. After sail is down, moves aft to help MAST hoist the new sail.
10. MAST when halyard is shifted to new sail, hoists the sail. When hoisted, calls "High" to GENOA SHEET. Makes up tail and secures it.
11. GENOA SHEET when "High" call is received trims to course.
12. FOREDECK 1 and 2 re-lead lazy sheet to new sail. Fold, bag, and stow old sail.

NOTE

Under most conditions it is not prudent to leave a sail on deck for a prolonged period (whether bagged, hanked, or lashed). Consider rolling smaller headsails from the "hanks to the clew" so that in heavy weather when the sail is brought on deck it can be taken out of the bag at the shrouds and unrolled forward. This becomes a single person job as opposed to a two person job.

3-5.5.9.2 CHANGING A HEADSAIL, SAME TACK - "HANK-ON" JIB.

The same procedures apply as for CHANGING ON A TACK. Omit the tack in Step 5.

3-5.5.9.3 CHANGING A HEADSAIL, BEARING AWAY - "HANK-ON" JIB.

The same procedures apply as for changing on SAME TACK. Amend step 5 to "Bear Away" to a comfortable point of sail as determined by wind and sea conditions.

3-5.5.10 REEFING THE MAINSAIL.

As the wind strength increases and the headsail is changed down to a smaller sail, the size of the mainsail can be reduced through reefing in order to keep from overpowering the boat.

Safety Considerations:

1. When wind/weather conditions require a reef, harnesses may also be required.

2. Avoid stepping in the bight of the main halyard.
3. Ensure personnel remain clear of the boom and mainsheet partners to prevent injuries from erratic movements.
4. This evolution required constant communications.

General Situation:

Assume sailing on a beam reach or closer to the wind in moderate to heavy conditions.

Required Positions:

HELM
 MAST
 MAIN HALYARD
 MAINSHEET
 REEFING LINE

Sequence of Events:

1. HELM calls out "Prepare to reef" and crew takes positions.
2. MAST checks mast ensuring sail slides are free to run and reefing hooks are free. Takes position on the windward side of the mast and reports "Ready Mast" to HELM.
3. MAIN HALYARD ensures halyard is clear to run, uncleats or removes halyard from the self tailer, removes excess turns from the winch, and reports "Ready Halyard" to HELM.

NOTE

If the second reef is being set, Ensure that the first reef rope clutch in the boom is set before the line for 1st reef is taken off the winch.

4. REEFING LINE ensures the correct reef line is led fair and places necessary wraps on winch. Ensures that the reef lines are tied in correctly at the correct places.
 Reports, "Ready" to HELM.
5. MAINSHEET ensures vang and sheet are clear to run, takes position facing the main and reports "Ready" to HELM.
6. Receiving "Ready" reports, HELM calls out "Take the reef" and maintains course, anticipating the boat's tendency to fall off once the main is eased.

7. MAINSHEET eases sheet until sail luffs and eases vang.
8. MAIN HALYARD eases halyard as the sheet is eased. DO NOT remove turns from the winch since the halyard will be tensioned again after the reef is made.
9. MAST assists sail slides down the track, puts reefing cringle onto the reefing hook, and calls out "Made".
Communication with Main Halyard about whether halyard needs easing or trimmed is critical.
10. REEFING LINE takes in on reefing line as the halyard is eased. As soon as he hears "Made" from MAST, trims the reefing line, listening to MAINSHEET for when to stop.
11. MAST ensures that the cringle stays on the reefing hook..
12. MAIN HALYARD trims halyard after hearing "Made". Works with MAST to watch luff tension as halyard is ground in.
13. MAINSHEET directs REEFING LINE to grind until the clew is snug against the boom and under tension.
14. Once halyard and reefing line are trimmed, MAINSHEET trims sheet and vang.
15. MAIN HALYARD and REEFING LINE make off and coil respective lines.
16. Excess sail cloth is pulled to windward, rolled, and tied with sail ties reeved through the reef points and between the foot and the boom. (Use a slippery reef knot).

Helpful Hints:

1. If the reef will be in place for a while, tie a sail tie through the new clew and around the boom as a safety measure.
2. If conditions are worsening and a second reef is anticipated, put the stopper on the first reefing line and rig second reefing line.
3. The reefing lines are color coded. 1st reef has a GREEN TICK, (STBD side of mast). 2nd reef has a RED TICK, (PORT side of the mast).

3-5.5.10.1 SHAKING A REEF.

Safety Considerations:

1. Avoid stepping in the bight of the main halyard.
2. Ensure personnel remain clear of the boom and mainsheet partners to prevent injuries from erratic movements.
3. This evolution required constant communications.

General Situation: Assume sailing on a beam reach or closer to the wind in moderate to heavy conditions.

Required Positions:

HELM
 MAST
 MAIN HALYARD
 MAINSHEET
 REEFING LINE

Sequence of Events:

1. HELM calls out "Prepare to shake the reef". Crew removes sail ties from reef points and clew and takes positions.
2. MAST checks mast ensuring sail slides are free to run, takes position on the windward side of the mast, and reports "Ready Mast" to HELM.
3. MAIN HALYARD ensures halyard is clear to run, uncleats or removes halyard from the self tailer, removes excess turns from winch, and reports "Ready Halyard" to HELM.
4. REEFING LINE ensures that the rope clutch on the appropriate reefing line to be eased is open, ensures that all sail-ties are removed, removes line from self tailer ensuring it is clear to run, and removes excess turns from winch.

NOTE

If "Shake Both Reefs" is commanded, ensure that both rope clutches are open, and reef lines are free to run.

If only the second reef is commanded to be shaken, REEFING LINE ensures that the first reef line is set correctly .

Reports "Ready Reef Line" to HELM.

5. MAINSHEET ensures vang and sheet are clear to run, ensures that all sail-ties are removed from the mainsail, takes position facing the main and reports "Ready MAINSHEET" to HELM.
6. After receiving "Ready" reports from crew, HELM calls out "Shake the reef" and maintains course, anticipating the boat's tendency to fall off once the main is eased.
7. MAINSHEET eases sheet until sail luffs and eases vang and is ready to trim as needed to prevent excess luffing as the reefing line is eased.
8. REEFING LINE eases reefing line simultaneously with sheet and halyard easing; continues easing as halyard is trimmed, ensuring reefing line is slack.
9. MAIN HALYARD eases halyard as the sheet is eased; halyard is eased only enough to remove the cringle from reefing hook.
10. MAST unhooks the cringle as soon as the halyard is eased then jumps halyard once the cringle is freed.
11. MAIN HALYARD trims halyard after cringle is freed, putting on extra turns as the halyard comes under tension. Works with MAST to watch luff tension as halyard is ground in; person watching sail tension calls "High".
12. Once halyard is "High", MAINSHEET trims sheet and vang.
13. MAIN HALYARD and REEFING LINE make off and coil respective lines.

3-5.5.11 ADVANCED SAIL MANAGEMENT

The primary mode of power for the NAVY 44 is sail. Harnessing the power of the wind is an esoteric endeavor. The U.S. Sailing Association has prepared performance models for the NAVY 44. As an aid to maximizing boat performance see 3-5.6.12, BOAT PERFORMANCE later in this section.

A series of the NAVY 44 are rigged with a foil headstay for more efficient sail changing, NA-9 thru NA-12). The advantage is that a new sail can be set and trimmed before the old sail is dropped, thus the need to make a "Bald Headed" change is eliminated.

3-5.5.11.1 BENDING ON A JIB/GENOA - LUFF GROOVE.

Many of these sails are in sausage bags, and a sail tie lives around the luff of the headsail in the bag.

1. Select the desired sail depending on the wind/sea conditions.
2. Bring the sail up on the foredeck and place near the headstay. Tie the bag down.
- 3.. Attach the jib sheets to the clew cringle with a bowline. Lead the sheets to the proper track fairleads and to the corresponding winches at the cockpit. Genoas lead outside the shrouds. Jibs lead outside the forward lower shroud and inside the upper and aft lower shrouds.
4. Attach the track cringle to the horn or snap shackle at the stem fitting and secure it in place with the shock cord on the stem fitting.
5. Foredeck takes off the sail tie and taking care not to twist the sail, feed luff tape into the pre-feeder on the forestay, then into the luff groove on the forestay that corresponds to the horn or shackle used for the tack, (port horn, Port groove).
6. Attach the jib halyard that corresponds to the horn/groove used.
7. Take tension on the jib halyard to keep the head in the groove.
8. Tie stopper knots in the tail of the sheets according to skipper preference.

NOTE

The run of the jib sheet from the block that determines the sheeting angle of the sail, to the winch needs to be controlled. When this distance is great the sheet will whip as it is being sheeted in and may cause a winch over ride.

10. Lead the jib sheet to a turning block near the winch that will control sheet whipping, This can be a snatch block attached to the toe rail in the vicinity of the winch, or to the foot blocks mounted on the rail. Skipper preference.

11. Control the Genoa fairlead position with the fairlead adjuster system at the forward end of the cockpit port and starboard, outboard of the cabin top .

3-5.5.11.2 CHANGING A HEADSAIL - "LUFF GROOVE".

The advantage is that with two luff grooves in the forestay a new sail can be hoisted on the second groove while the old sail is still flying and providing power. The boat does not have to be sailed "Bald Headed" while the new sail is raised. This is an important consideration while racing. The Genoa sails are usually stowed in a "Sausage" bag with a breakaway zipper to facilitate the sail change.

With the "Peel Away" system a new thought logic is introduced. Four methods can be employed depending on which side the free luff groove is located: Easiest to most difficult:

- Inside set Inside peel.
- OUTSIDE set INSIDE peel away (same tack)
- INSIDE set OUTSIDE peel away (same tack)
- OUTSIDE set OUTSIDE peel away (tack while changing) The importance of "Bearing Away" to change is diminished because sailing with a headsail continuously flying contributes to boat stability.

3-5.5.11.3 INSIDE SET, INSIDE PEEL, THE PREP and SEQUENCE.

Crew positions involved:

HELM.

FOREDECK.

FREECREW.

CAST OFF.

TAILER. (works the tail of the new sheet).

GRINDER (grinds the winch to take in the new sheet).

MAST

HALYARD WINCH(works halyard winches)

1. HELM Calls for the sail change, announces the type of change, On a Tack, While tacking, or Bearing Off. Directs FOREDECK in what headsail to use. This case- Inside tack set.

2. FOREDECK goes below and gets the new sail ready to bring up on deck. Normally the new sail is brought up on deck through the fore hatch.
3. FREECREW stands by on deck until FOREDECK gives signal that new sail ready.
 - FOREDECK opens forehatch and starts new sail up.
 - FREECREW pulls sail on deck.
 - FOREDECK comes up through the hatch and closes the hatch.
4. FOREDECK and FREECREW take the sail bag to the windward or leeward side decks with the head of the bag facing forward.
5. FOREDECK opens the front of the sausage bag and attaches the jib halyard to the head of the headsail, ensuring that it is clear of fouling other halyards or rigging.
6. FREECREW unties the lazy sheet from the working sail.
 - Re-leads the sheet through the proper turning block and ties it to the new clew.
7. HALYARD WINCH takes up slack in new halyard with one wrap on the winch drum and readies the working halyard to be eased.
8. MAST take the headsail forward while FOREDECK holds onto the halyard.
 - HALYARD WINCH eases the halyard while watching the bowman to ensure that FOREDECK can engage the feeders.
 - FOREDECK takes the sail tie off the front of the headsail, then feeds head of the sail into the pre-feeder.
 - HALYARD WINCH takes up on the halyard at each successful entry into the prefeeder and headfoil feeder.
 - FOREDECK starts the head of the sail into the free groove and calls "Ready Hoist, Ready Tack Set"
 - MAST is back at the new halyard to "Jumps" the halyard and sail up while HALYARD WINCH tails the halyard. Mast and HALYARD WINCH hesitate for final approval from HELM
 - FOREDECK watches the prefeeder to ensure that there are no snags in the lufftape.
 - FOREDECK calls "High" when sufficient halyard tension is set

9. HELM calls for the tack "Ready About" and listens for response from CAST OFF TAILER, FOREDECK/MAST and TRIMMER checks the area the boat will be sailing into after the tack.
10. CAST OFF TAILER prepares the winch for tacking and calls "Ready (port/stbd)"
11. TAILER adds two wraps of the new headsail sheet on the new winch and calls "Ready port/stbd Sheet"
12. HELM calls "Tacking" or some understood command as he turns the wheel.
13. MAST goes to the working halyard winch and eases off that halyard quickly as the boat comes about.
14. CAST OFF may just ease the old headsail sheet enough so that the sail "backs" against the wind a bit remembering that the sail is usually collected on the windward side of the boat.
15. FOREDECK pulls the luff tape down with force to expedite the old headsail to the deck, then unlashes the sail tie and secures the head of the sail.
16. TRIMMER & GRINDER take in on new sheet as the boat tacks and trims to course.
17. FOREDECK skirts the new headsail.
18. FOREDECK, MAST & FREECREW take the old headsail to windward and put it into the bag.
With practice, this method of inside tack set takes 30 seconds from the time the new headsail enters the feeder until the old sail exits the feeder.

HELPFUL HINTS AND COORDINATION:

1. Crew communication will assist in making the evolution smooth.
2. A "changing sheet" can be used. This allows for the new sheet to be run and tied to the new sail without disconnecting the lazy sheet from the loaded sail. The boat can continue to sail, AND TACK while the boat is being prepared for the sail change.
3. Under most circumstances it is not prudent to leave a headsail on deck for a prolonged period. Consider lashing the old sail to the toe rail, or bag the sail and tie the bag down.
4. Consider not releasing the old sail from the tack fitting until it has been bagged.

This will prevent losing the sail over the side.

3-5.5.11.4 OUTSIDE SET, INSIDE PEEL (STRAIGHT-AWAY)

This procedure differs from the easiest; inside set, inside take down, in the following manner:

1. The new sail must be led outside the working jib before the head is fed into the Pre-feeder and the luff groove.
2. The new halyard must be led forward and attach it to the new jib outside the working sail.
3. A changing sheet must be employed since the load will continue to be on the same side.
4. The possibility for fouled lines is increased.

3-5.5.11.5 INSIDE SET, OUTSIDE PEEL

In this procedure setting the sail is identical to the easiest case. The differences are that:

1. Care must be exercised on the take down to ensure that the sail is hauled in under the new sail that is already flying to keep it from falling overboard. Positioning FREECREW mid-way down the foot to haul in the sail from under the working jib is helpful.
2. The old halyard will have to be led aft and around to the leech of the new sail before being brought in and stowed at the base of the mast.
3. A changing sheet is required since the load will not be changed to a lazy sheet.

3-5.5.11.6 OUTSIDE SET, OUTSIDE PEEL.

This is the most difficult of the four maneuvers since both the set and peel away are on the outside. Positions involved:

HELM.
FOREDECK.
FREECREW.
CAST OFF.
TAILER. (works the tail of the new sheet).
GRINDER (grinds the winch to take in the new sheet).
MAST
HALYARD WINCH

1. HELM announces the type of change, On a Tack, While tacking, Bearing Off. Directs FOREDECK in what headsail is to be used.
2. FOREDECK goes below and gets the new sail ready to bring up on deck.
3. FREECREW stands by on deck until FOREDECK gives signal that new sail is ready.
 - FOREDECK opens foredeck hatch and starts bringing the new headsail up.
 - FOREDECK starts new sail up.
 - FREECREW pulls sail on deck to the toe rail with the head near the tack fitting.
 - FOREDECK comes up through the hatch and latches the hatch.
4. FOREDECK and FREECREW tie the bag to the toe rail.
5. FOREDECK ensures that the new halyard is clear, leads the new headsail halyard around the leech of the old headsail, pulling ample slack, brings the shackle end of the halyard below the foot of the headsail to attach the halyard to the new headsail that is on the side deck.
6. FREECREW, MAST AND FOREDECK unzip the bag. FOREDECK attaches the CHANGING SHEET (an alternate procedure is to remove the WINDWARD SHEET). Traces the path of the sheet to keep it clear, (from the appropriate lead block, around and underneath the old headsail), and attaches it to the clew of the new headsail.
7. FOREDECK calls "READY FOR CHANGE" and awaits response from HELM.
8. HELM responds with "CHANGE HEADSAIL".
9. FREECREW take the headsail forward.
10. HALYARD WINCH takes up slack as the FOREDECK works forward with the halyard as directed by FOREDECK.
11. When FOREDECK is at the headstay, he reaches around the front of the headstay and pulls up on the halyard to bring the head of the new headsail up to the feeders. FOREDECK inserts the lufftape into the feeders, pulls up the

- head to secure the lufftape into the headfoil and calls "READY HOIST"
12. HELM calls "HOIST"
13. MAST jumps the halyard as HALYARD WINCH tails.
14. As the headsail is being hoisted, FOREDECK attaches the tack of the new headsail to the appropriate tack shackle and calls "TACK MADE"
15. HALYARD WINCH takes final tension on new headsail halyard as directed by FOREDECK calls "HALYARD MADE"
16. TAILER has been taking up slack and trims new headsail when the "HALYARD MADE" call is announced, makes final adjustments with adjustable lead system (if genoa).
17. HALYARD WINCH moves to old headsail halyard winch and eases halyard down at a rate dictated by FOREDECK.
18. FOREDECK, MAST AND FREECREW take in old headsail and bring that sail to the side deck as-soon-as-possible for flaking, bagging and stowage below. FOREDECK removes old halyard and places it in the clear position secured at the mast. MAST removes the old sheet and attaches the re-lead WINDWARD SHEET to the new headsail clew.
19. FOREDECK calls "CLEAR TO TACK" as soon as this ability is ensured.

3-5.5.11.6.1 OUTSIDE SET, OUTSIDE PEEL THE SEQUENCE.

1. HELM deploys the crew for the sail change.
 - FOREDECK wedges into the pulpit to ensure that the new sail feeds fairly into the luff groove.
 - MAST takes halyard in hand and prepares to hoist the jib.
 - HALYARD WINCH takes halyard in hand and reports, "Ready Halyard", to HELM.
 - TAILER takes the lazy sheet in hand, loads two turns on the winch and reports, "Ready CLEW, to HELM.
2. HELM orders, "Set the Jib". The remainder of this step is simultaneous and coordinated.
 - MAST "Jumps" the halyard.

- FOREDECK feeds the sail out under the standing jib and to the pre-feeder.
 - HALYARD WINCH takes in the halyard.
 - When resistance is felt, HALYARD WINCH loads the tail into the self tending groove and starts grinding the winch with a winch handle.
 - FOREDECK calls the tension.
 - FOREDECK surveys the foredeck to be sure it is clear and reports, "Clear to tack", and stays in the pulpit.
3. HELM orders , "Ready About" and checks the area the boat will be sailing into after the tack to be sure it is clear.
 4. HELM orders, "Helm's a-Lee", and tacks.
 - CAST OFF takes the jib sheet of the old sail in hand and casts off the old sail sheet.
 - TAILER takes in on the new jib sheet. When resistance is met, loads two ore turns on the winch then feeds the sheet into the self tailer.
 - GRINDER puts winch handle in the winch and grinds on the winch. Changes to low gear to finishes the trim.
 - TAILER calls the trim.

3-5.5.11.6.2 THE TAKE DOWN.

1. MAST carefully removes the coils from the halyard of the old jib winch.
 - Lays them down so they can run with out fouling when the halyard is released.
 - Controls the release of the old sail halyard. Ensures that the coils do not foul.
 - HALYARD WINCH coils the tail of the new sail halyard..
 - FOREDECK wedges himself in the bow pulpit and pulls sail down and keeps it from going over the side.
 - CAST OFF releases sheet tension.
 - FOREDECK removes the halyard from the old sail and passes it to MAST.
 - MAST stows the old halyard taking care not to foul it.
 - FREECREW unties the sheet from the old sail. Ties it to the new sail,

releads it and Reports, "Ready to tack", to HELM.

2. FOREDECK surveys the foredeck and when satisfied that it is clear, reports "Foredeck is clear to tack".
3. FOREDECK directs FREECREW and MAST in the bagging of the old sail.
 - o The sail is bagged.

CAUTION

Do not release the tack of a sail from the tack fitting until it has been bagged.

4. The tack is released from the tack fitting.
5. FOREDECK, directs FREECREW, and MAST in stowing the old sail below.

HELPFUL HINTS AND COORDINATION:

1. Crew communication will assist in making the evolution smooth.
2. A changing sheet can be used. This allows for the new sheet to be run and tied to the new sail without disconnecting the lazy sheet from the loaded sail. The boat can continue to sail, AND TACK while the boat is being prepared for the sail change.
3. Under most circumstances it is not prudent to leave a headsail on deck for a prolonged period. For short periods, particularly when it is anticipated that the sail will be re-hoisted in short order. Lash old sail to the toe rail. Bag the sail and tie the bag down.
4. The old sail is not released from the tack fitting until it is in the bag. This will prevent losing the sail over the side.

3-5.5.11.7 SETTING THE GENOA STAYSAIL

A good sail combination for sailing to windward, particularly when the angle on the wind is a close reach or greater is with the new #2 Genoa (high clew for better visibility to leeward), and the Genoa Staysail. The Staysail will give back more power than what is lost from using the high clew #2 because it creates a second slot, (between the two head sails).

1. Rig the inner forestay keeping the halyards clear, and the genoa sheets forward of the forestay.

2. Set the #2 Genoa with any of the methods previously discussed.
3. Bring the Genoa staysail up on the FOREDECK and place it near the forward lower shrouds. Tie the bag down.
4. Unroll the sail toward the inner Forestay taking care not to let the sail blossom in the wind.
5. Attach the tack to the tack shackle at the base of the inner forestay.
6. Hank the staysail to the inner forestay.
7. Lead the permanently attached sheets to the sail, (with a cow hitch), outside the forward lower shrouds, and to the front car on the forward jib track, (See Table 3-3, Sail Management for initial positioning of the car). Lead the sheet aft to the foot block, (if one is available), or rig a snatch block to the toe rail in the vicinity of the secondary winch. Tie a figure eight knot in the end of the sheet.
8. Attach the Topping Lift (T-Lift) to the head of the staysail as the halyard ensuring it is not fouled on the forestay.
9. Hoist the sail on command from the Helmsman. Trim the sheet so as to create a "slot" between the #2 Genoa and the staysail. Read the tell tails on both head sails for this procedure.

3-5.5.11.7.1 TACKING WITH THE GENOA STAYSAIL.

Tack the boat as with a single headsail remembering that the lazy genoa sheet is forward of the forestay thus hindering the passing of the #2 reacher across the foredeck. The staysail in place keeping the staysail trimmed in the initial phase of the tack will give the #2 Genoa a surface upon which to slide as it crosses from one side to the other, thus alleviating the problem of sheet hangup on the forward lower shroud. When the #2 Genoa has crossed and is in the process of being trimmed, release the Genoa Staysail and tack the sail. It has been found that the use of the Genoa Staysail on close reaching or greater angle off the wind will yield an increase of at least ½ knot of boat speed.

3-5.5.11.7.2 "POORMAN'S SPINNAKER.

This #2 Genoa and Genoa Staysail combination has proven to be good as a "poorman's spinnaker" for sailing with the wind abaft the beam.

1. Lead the #2 genoa windward sheet through the end of the spinnaker pole before setting the pole.
2. Rig the spinnaker pole with an extra line attached to the pole outboard end bale as a trimming line. (see the procedure given in 3-5.5.12.3). Set Pre-set the pole height so that the pole will be horizontal and even with the clew of the staysail to weather of the boat.
3. Establish the desired course for the boat, trim the Mainsail and the #2 Genoa.
4. Control the genoa staysail with a snatch-block on the toe rail with the appropriate fair leads.
5. Trim the Genoa Staysail windward sheet, (rigged through the end of the pole), to expose it to the wind on the windward side. Trim it to blossom and to feed wind to the #2 Genoa. This will keep both the headsails full and drawing. To strike this sail combination, start by collapsing the reaching staysail against the #2 Genoa and dropping the staysail.

3-5.5.12 SPINNAKER

The Spinnaker is a special purpose sail used to augment speed when the boat is "Off the Wind".

3-5.5.12.1 RIGGING FOR SPINNAKER.

The evolution described herein is for a "BEAR-AWAY" set.

Gear required:

- Spinnaker (packed)
- Spinnaker pole
- Spinnaker foreguy
- Spinnaker halyard
- Topping Lift
- Two Spinnaker Sheets
- Two Spinnaker Guys
- Two large snatch blocks

Positions required:

HELM
GENOA TRIMMER

MAIN TRIMMER
SPINNAKER SHEET TRIMMER(COULD BE THE GENOA TRIMMER)
SPINNAKER GUY TRIMMER(trims the spinnaker guy)
GRINDER
FOREDECK
BOW (works the functions on the bow. Can be the foredeck in a simple organization, Foredeck could be a distinct position to allow for overall supervision.)
MAST(works the halyards, pole height at the mast)
PREVENTER (tends the foreguy periodically, set and tend preventer, tends the topping lift).

3-5.5.12.2 GETTING READY.

This procedure can be done ahead of time in anticipation of using the spinnaker.

1. Rig one snatch block to the port toe rail just aft of the midship lifeline stanchion.
 - Rig the other snatch block to the corresponding STBD side.
2. Attach the PORT spinnaker sheet at the port side of the bow pulpit, lead it outboard of everything to the larger sheave in the Sprecher Block attached to the base of the stern pulpit at the end of the toe rail, then to the cockpit.
 - Rig the STBD spinnaker sheet to match.

NOTE

The guy is attached to the sheet bale so that in light air it can be disconnected to reduce the weight hanging on the clew of the spinnaker and the spinnaker can be controlled with a single sheet arrangement.

3. Attach the PORT afterguy snap shackle to the port spinnaker sheet at the port side of the bow pulpit, lead the guy outside of everything to the snatch block, to the cockpit.
 - Rig the STBD afterguy to match.

NOTE

The foreguy is a continuous line that starts at a cam cleat on the outboard face of the cabin top, goes forward to a single block at a pad eye on the foredeck, to a bale on the bottom of the outboard end of the pole.

4. This is as far as GETTING READY normally goes until it is time to use the spinnaker.

3-5.5.12.3 THE SPINNAKER PREP.

The spinnaker pole is set to the windward side. Think ahead and decide which jibe the boat will be on to determine to what side the pole will be rigged.

1. Take the pole out of the deck chocks, pass the lazy jib sheet over pole and install the socket end of the pole to the "bayonet" on the track on the forward face of the mast. The outboard end the pole is on the foredeck. In this configuration the boat can continue to be tacked, the jib passing over the pole.
2. Attach the spinnaker bag (turtle) to the lower and upper lifeline on what will be the leeward side of the boat for the set. Use the snap hooks on the bag.
3. Take the windward spinnaker sheet/guy, around the forestay, then back to the spinnaker. Open the jaw, lay the GUY in the jaw and close the jaw. (Make sure the sheet stays on top of the pole. Attach the guy snap shackle to the forward clew of the spinnaker.
4. Take the leeward spinnaker sheet/guy to the spinnaker and attach it to the after clew.
5. The deck line for the preventer on what will be the leeward side can be rigged to the boom mounted pennant. Disconnect the shock cord from the pennant.
6. Attach the topping lift to the outboard end of the pole.
7. Take the spinnaker halyard corresponding to the leeward side of the boat at the set and lead it aft to the clew of the jib, pass it outboard above the trimmed headsail sheet, lead it down, under the foot of the

jib, and attach it to the swivel at the head of the spinnaker.

8. Re-check that the sheets, halyard, and topping lift are clear. Look Up. The spinnaker is ready to be hoisted.
9. This is as far as the rigging for spinnaker can go until the boat is on the last point of sail before setting the spinnaker.

3-5.5.12.4 SETTING THE POLE.

1. Helm announces what jibe the spinnaker will be set on, what kind of set, (bear away set or gybe set), and when to start rigging. Typically "Standby to set the spinnaker".
2. BOW goes forward to pulpit, lifts the outboard end of the pole while PREVENTER takes in the topping lift. Mast can "Jump" the topping lift at the mast to assist.
3. BOW Re-checks to make sure the lazy sheet is on top of the pole. Re-check that lines are clear to run without fouling, particularly on lifeline stanchions. Report "Ready forward"
4. MAST lays out the working jib halyard tail so it is free to run. Readies the spinnaker halyard for hoist.
5. MAST pre-sets a likely height for the spinnaker car on the mast track. Reports "Ready Mast".
6. SPINNAKER GUY puts appropriate number of wraps on the winch. Pre-set the foreguy for the anticipated angle of the pole and cleat the foreguy. Snug the topping lift. Report "Ready Guy".
7. SPINNAKER SHEET puts several wraps on the secondary winch in the cockpit. Make sure the lazy guy is clear. If this position is doubling as the GENOA TRIMMER, be prepared to ease the genoa slightly when the spinnaker is hoisted. Cleat the Genoa sheet. Standby to trim the spinnaker sheet when hoisted. Report "Ready Spinnaker sheet".
8. One SPINNAKER GRINDER is normally required. Two for higher wind strengths.

9. MAINSHEET TRIMMER ensure the sheet is clear, take the sheet in hand and report "Ready Mainsheet".

3-5.5.12.5 PRE-TRIM.

1. Just prior to the set, SPINNAKER GUY takes on the guy to bring the clew out of the bag and up to the pole. The spinnaker pole should be about 3 feet off the headstay for hank-on headsail boats. The after guy (primary) winch must have 4 to 6 wraps on the drum at this point.

3-5.5.12.6 THE SPINNAKER SET.

1. HELM gives command, "Set the Spinnaker".
 - HELM " bears off" to the appropriate course.
 - MAST tails while BOW hoists, hand over hand until spinnaker is all the way up. Call "HIGH" so the trimmers can begin to trim the sail. MAST moves to Jib halyard.
2. SPINNAKER GUY takes on the guy to expose the spinnaker to the apparent wind. Pole will eventually be trimmed to be perpendicular to the apparent wind.
3. SPINNAKER SHEET takes on the sheet to fill the spinnaker.
4. BOW (FOREDECK on a simple crew assignment) goes to the pulpit to take in the jib. FOREDECK (PREVENTER) can go to the mid-girth of the foot to help with the drop.
5. MAST keeps at least one turn on the winch, and lowers the jib quickly.
6. BOW disconnects the genoa halyard and leads it back to the bale at the base of the mast taking care not to foul it with the lines already attached at the bale. Depending on the length of time the spinnaker is expected to stay in the air, BOW can either bag the jib or lash it to the toe rail.
7. MAST makes up the spinnaker halyard tail.
8. MAINSAIL TRIMMER eases main to square it to the wind. Can assist with topping lift, foreguy and preventer when the apparent wind is > 120 degrees.

9. SPINNAKER GUY adjusts pole to be at right angles to the apparent wind. Respond to call from SPINNAKER SHEET for pole adjustments.
10. SPINNAKER SHEET .
 - Keep spinnaker full. Ease sheet until the spinnaker luff curls, but pops out. Calls adjustments for pole up and down at mast and at outboard end, as well as fore and aft.
11. PREVENTER works the preventer line for the appropriate side. Ensures that all lines are lead fair.

HELPFUL HINTS AND COORDINATION.

1. Communication is the key to successful spinnaker work.
2. It is sometimes helpful to say "Pole to Port [STBD]" when announcing the preparation for spinnaker.
3. Basic tenets for spinnaker trim.
 - Pole perpendicular to the apparent wind.
 - Pole parallel to the water.
 - Clew heights equal.
 - Keep position of pole as constant as possible.
 - Ease spinnaker sheet.
 - Call for course change (to include gybe) if wind shift is major.
 - Ensure that the cleats for the spinnaker pole car adjustment line are well secured.

3-5.5.12.7 GYBING THE SPINNAKER.

Safety Considerations:

1. Ensure sheets and guys are clear forward and in the cockpit.
2. Visually check that the intended course is clear of other boats, shipping, and navigation hazards.
3. Ensure crew members are in "safe zones" for the maneuver. **STAY OFF THE BRIDGE DECK. BE MINDFUL OF THE MAINSHEET PARTNERS AS THE GYBE IS EXECUTED.**

WARNING

TRIM THE BOOM TO CENTERLINE BEFORE "GYBE HO!" AN OUT OF CONTROL BOOM CAN CAUSE SERIOUS INJURY TO PERSONNEL.

4. Trim the boom to centerline before the boom is crossed to the other side of the boat.
5. HELM is in control of the maneuver.
6. Communications is the key to a safe Gybe.

General Situation:

Assume sailing on a broad reach in moderate conditions.

Positions Required:

HELM
 SPINNAKER SHEET
 SPINNAKER GUY
 GRINDER/PREVENTER
 TOPPING LIFT
 MAINSHEET
 FOREDECK
 BOW
 MAST

Sequence of Events:

1. HELM calls "Prepare to Gybe". When possible include what point of sail the boat will be on upon completion of the maneuver.
 - FOREDECK checks to see that the windward spinnaker sheet is not fouled on the spinnaker pole end. Procedure must be stopped and remedied before continuing.
2. SPINNAKER SHEET ensures both sheets are clear, places sufficient turns on the new secondary winch, stands in cockpit with back against binnacle, continues to trim, and reports "Ready Spin Sheet" to HELM.
3. SPINNAKER GUY ensures both guys are clear; places sufficient turns on the new primary winch, stands in cockpit forward of SPINNAKER SHEET, continues to

- trim, and reports, "Ready SPIN GUY" to HELM.
GRINDER breaks the preventer
4. MAINSHEET removes sheet from the self tailer, ensures sheet is clear, and reports, "Ready Main" to HELM.
 5. TOPPING LIFT ensures topping lift and foreguy are clear, takes topping lift out of self tailer, and reports, "Ready Topping Lift", to HELM.
 6. MAST ensures inboard end of pole is at the proper height for dipping outboard end and tripping line is clear. Reports, "Ready mast", to HELM.
 7. BOW (FOREDECK) takes bight of lazy guy to pulpit, positions himself forward of the headstay facing aft with lazy guy in hand, and reports, "Ready bow", to HELM.
 8. After receiving ready reports from the crew, HELM, calls "Bearing away" and turns the boat away from the wind. MAINSHEET, SPINNAKER SHEET ease, and SPINNAKER GUY trims to the apparent wind. Basically the pole should *be as far aft as possible before tripping. Care is required to avoid forcing the spinnaker pole against the forward lower shroud.
 9. When wind reaches 150-160 degrees apparent, MAINSHEET trims the mainsail, timing it so that the boom is amidships before the boat is dead down wind. An extra crew member can sit on the cabin top and help with the trim.
 10. HELM calls "Trip and Dip" with the stern to the wind. HELM should momentarily delay with the boat DOWNWIND until steps 11 through 16 are completed.
 11. At the "trip and dip" MAST trips outboard end to release the afterguy, TOPPING LIFT eases the pole smartly to pre determined position so that pole end will clear inside forestay, and above lifeline. SPINNAKER GUY casts off the old guy.
 12. As the pole dips and swings through the fore triangle, BOW/FOREDECK snaps new after guy into open jaw at the end of the pole ensuring that the shackle is on the trailing edge of the pole. Once the jaw closes, ensures pole has cleared the headstay to the new side and calls out, "Made".
 13. At the call "Made".
 - MAST jumps topping lift and adjusts inboard end as necessary.
 - TOPPING LIFT trims topping lift to proper height and stands by to adjust foreguy as necessary.
 - SPINNAKER GUY begins to trim new guy at "Made" and eases/casts off old guy. Positions pole to apparent wind.
 - SPINNAKER SHEET begins trimming on new sheet, eases off old sheet as new guy approaches the outboard pole end.
 14. TOPPING LIFT trims topping lift to proper height and stands by to adjust foreguy as necessary.
 15. SPINNAKER GUY begins to trim new guy at "Made". Positions pole to apparent wind.
 16. At the call "Made", SPINNAKER SHEET begins trimming on new sheet, eases off old sheet as new guy approaches the outboard pole end.
 17. HELM calls out "GYBE HO!" and turns the boat where the wind is about 160 degrees on the new gybe.
 18. MAINSHEET causes the boom to cross to the other side of the boat and EASES THE MAINSHEET to the expected point of sail.
 19. HELM continues the turn.
 20. GRINDER sets the new preventer line and assists as necessary. (Usually the new spinnaker Sheet winch needs grinding first).

HELPFUL HINTS:

1. Mark the topping lift with a whipping at the position where it is in contact with the winch when the pole is able to clear above the lifelines and pulpit, yet low enough to pass inside the headstay.
2. Holding the boat downwind until the spinnaker guy is "made" on the new side, and while the mainsheet is trimmed in close, places the boom on or

near the centerline of the boat. Wind is channeled from "dead aft" to the spinnaker on both sides so that it can continue to fly without the aid of the pole.

3-5.5.12.8 DOUSING THE SPINNAKER.

The genoa is usually hoisted before the spinnaker is doused. This aids in two ways:

- Maximum power is kept on the boat through the maneuver.
- The genoa creates a "LEE" for the controlled collapse of the spinnaker.

Safety Considerations:

1. Ensure sheets and halyards are clear to run and not tangled.
2. DO NOT STAND IN ANY BIGHTS!.
3. Always keep at least one turn on the spinnaker halyard winch while dousing...even in light winds.
4. Communication is the key to a safe take down.

General Situation:

Assume beam to broad reaching in moderate conditions. In order to keep two sails flying, the jib should be raised before the spinnaker is doused. This sequence of events assumes the spinnaker will be tripped with a fid. There are other methods of dousing the spinnaker.

Required Positions:

HELM
BOW
MAST
MAINSHEET
TOPPING LIFT
SPINNAKER GUY
SPINNAKER SHEET
GENOA SHEET. (this may be covered by Spinnaker Sheet).
GATHERERS

3-5.5.12.8.1 PRE- SPINNAKER DOUSING PROCEDURE.

Sequence of Events:

1. HELM calls out "Stand by to raise the Jib".

2. BOW ensures the genoa is ready to hoist on the proper side; that the genoa sheets are clear; has fid accessible, stands by to jump genoa halyard and reports "Ready to Hoist the Genoa", to HELM.
3. MAST ensures the genoa halyard is clear to hoist, reports "Ready genoa halyard" to HELM.
4. GENOA SHEET ensures at least two turns on the primary winch on the new leeward side, and report, "Ready Genoa Sheet", to HELM.
5. GATHERERS are deployed forward of the leeward shrouds, take the lazy guy in hand, and report, "Ready Gatherers", to HELM.
6. HELM calls "Numbers in the pulpit".
7. BOW jumps Genoa Halyard while MAST takes on the genoa halyard winch to get the numbers at the top of the pulpit.
8. This completes the pre-dousing procedure.

3-5.5.12.8.2 THE SPINNAKER TAKE DOWN.

1. HELM calls out, "Hoist the Genoa".
2. BOW jumps Genoa Halyard.
3. MAST tails on the genoa halyard winch.
4. BOW assists by taking winch handle and grinds for MAST.
5. MAST calls, "High", when the genoa is fully hoisted, and shifts to spinnaker halyard. Takes it from the self tailer, assumes position to be able to see gatherers and reports, "Ready spinnaker halyard", to HELM.
6. BOW goes to pulpit with fid in hand, reports ready to trip the spinnaker" to HELM.
7. GENOA SHEET trims the genoa for the expected point of sail.
8. After receiving "ready" from BOW and MAST, HELM calls out, "Douse the Spinnaker".
9. TOPPING LIFT eases so that BOW can reach the pole.
10. SPINNAKER GUY eases the guy so the pole goes forward and BOW can

reach the clew while standing within the pulpit.

NOTE

Care must be taken so to keep the spinnaker pole from hitting the headstay!

11. BOW uses the fid to trip the sheet shackle.
12. Spinnaker will fly to leeward and be hidden from the wind behind the genoa and mainsail.
13. GATHERERS take in on the lazy afterguy to gather as much of the foot as possible, then start taking in on the spinnaker itself.
14. SPINNAKER SHEET must ease the spinnaker sheet to allow the GATHERERS to bring the lazy guy clew to the foredeck.
15. MAST watches the gatherers and eases the halyard so as to feed the spinnaker to the gatherers as they are able to take it in.
16. TRY TO KEEP THE SPINNAKER OUT OF THE WATER.
17. Spinnaker can be gathered at the rail, or can be passed to MAINSHEET who sends it down the main companionway as it is doused.
18. Once the spinnaker is doused, TOPPING LIFT lowers the outboard end of the pole so that BOW can handle it.
19. MAST lowers the Inboard end.
20. All hands ensure all lines are onboard and not trailing in the water.
21. The spinnaker halyard is returned to the stowed position ensuring that it is clear of the headstay and all other halyards and rigging.
22. The spinnaker is re-packed, and all lines are either re-led for the next spinnaker hoist, or the spinnaker, lines and pole are stowed.

3-5.5.13 BOAT PERFORMANCE.

Think of the NAVY44 as a weapons system. The goal is to maximize the potential of this weapons system. Whether racing or just sailing a measure of boat performance is the speed the

boat achieves through the efforts of the crew. Factors that will affect performance are:

- Trim sails for maximum efficiency so as to harness the power of the wind.
- Fore and Aft Trim. Avoid putting heavy gear in the extremities of the boat to reduce hobby horsing.
- Lateral trim. Keep the boat on its feet. Use crew weight to windward to help control the amount of heel.
- The NAVY 44 is a masthead rig. Reef the main first to keep as large a headsail as possible, then change down to a smaller jib. A boat performance model has been prepared for the NAVY 44 by the United States Sailing Association. This provides target speeds that should be attained if conditions are optimum and crew performance is flawless. See Table 3-2, Optimum Targets; Table 3-3, Speed as a Function of Sail Performance; Figure 3-4, Polar Diagram, True Wind, and Figure 3 -5, Polar Diagram, Apparent Wind.

3-5.6 FUEL MANAGEMENT.

Past performance of the NAVY 44 has revealed an abundance of engine problems that can be traced to contaminated fuel. In an effort to arrest this source problem the fuel tanks of each boat have been purged to eliminate "dirty fuel" as a source.

To eliminate the "biological contamination" problem a "BIOBORE" type additive has been authorized for use each time the boat is fueled.

The 50 gal. diesel fuel tank is located in the bilge under the cabin sole. Due to the shape of the tank, only 45 gallons are useable. Because of its irregular shape to conform to the dimensions of the bilge area the readings from the fuel gauge will not give a true indications of fuel quantity, rather are a measurement of relative fullness bottom to top. Figure 1-20 has been prepared from usage data to give a better appreciation of fuel quantity, both from readings on the gauge, and from using a dip stick.

3-5.7 ELECTRICAL POWER MANAGEMENT

The navy 44 has A 12 vdc electrical system. It is provided through three banks of batteries. The battery banks are: Ship's Service Bank, (SS) #1, Ship's Service Bank #2. and Engine Start Bank. Both SS Banks have two batteries each. The Engine Start Bank is one battery.

Battery power is a limited resource that requires close management. While the batteries can be recharged using the engine mounted alternators, frugal management of electrical power will ensure that power is available for necessary usage. When operating under sail the batteries are not being charged, only depleted. The battery can be recharged by turning the engine ON. With the introduction of the TECHNAUTICS COASTAL 12 refrigeration system an increased charging time will be required to bring the system back to a comfortable operating level. Table 3-4 is a D.C. System Load Analysis to aid in proper management. A good rule of thumb is "If you don't need it, turn it off".

NOTE

It is recommended that the Rotary Selector Switch for the Ships Service Battery Banks, (Upper rotary switch on the face of the NAV seat), be placed in the BOTH position for normal operations. While underway under sail, engine OFF, both banks will be evenly depleted. Charging with the engine ON, will result in simultaneous, even, demand/charging of both banks. Use the System Voltage Scanner, (SVS) to monitor the condition of each bank.

3-5.7.1 ELECTRICAL SYSTEM LINEUP.

1. Place the ENGINE START bank rotary switch to the ON position. This energizes the engine starting system.
2. Place the SS battery selector switch to the BOTH position. This energizes both banks simultaneously. Depletion through use without the engine on will be balanced. Charging will be balanced when the engine is

running.

3. The NORMAL position for the alternator switches on the Electrical Switchboard is the ON position. They only need to be turned off in an emergency.
4. Ensure that the SS ALT and START BATTERY ALT circuit breakers located at the ELECTRICAL SWITCHBOARD are in the ON position.

3-5.7.2 BATTERY POWER SOURCE AND CHARGING PROCEDURE.

Battery power source and charging capability is determined by the position of the master rotary battery switch for the ENGINE START bank and the master rotary battery switch for the SS BANKS. The batteries can be charged either using shoreside 120 VAC power or by running the engine and charging with the two alternators installed. Table 3-5 contains the procedures for drawing electrical power or charging either the ENGINE START bank or the SS banks with the source as indicated. Use the System Voltage Scanner to monitor charging. See Figure 3-6. System Voltage Scanner.

3-5.8 FRESH WATER MANAGEMENT.

With only 163 gallon of fresh water this limited resource must be managed frugally on long passages. Water is stored in two 70 gal. Tanks, one under each settee berth in the main cabin, and one 23 gal tank (day tank) located beneath the floorboard in the galley.

3-5.8.1 WATER TANKS.

Ensure that the selector valves for both the PORT and STBD 70 gal tanks are in the CLOSED position. Water will now be drawn from the 23 gallon day tank. When the spigot spits air, the day tank is empty.

1. Open the gate valve for one of the 70 gallon tanks.
2. Fill the day tank.

Table 3-2, OPTIMUM TARGETS

This table has been prepared with the following variables as inputs:

VTW = TRUE WIND VELOCITY

BTW = TRUE WIND ANGLE

VAW = APPARENT WIND VELOCITY BAW = APPARENT WIND ANGLE

V = BOAT SPEED

VMG = VELOCITY MADE GOOD

HEEL = HEEL ANGLE IN DEGREES

REEF= % OF SAIL AREA REMAINING

FLAT = % OF FULL DRAFT REMAINING

CL = COEFFICIENT OF LIFT

VTW BTW VAW BAW V VMG HEEL REEF FLAT CL

8.0	45.7	12.30	26.2	5.617	3.923	12.7	1.0	1.0	1.978
	52.0	12.53	28.7	6.171	3.799	13.0	1.0	1.0	1.981
	80.0	11.15	41.7	6.974	1.211	15.5	1.0	1.0	2.344
	110.0	8.51	59.1	7.060	-2.414	8.2	1.0	1.0	3.684
	143.4	4.76	100.4	5.446	-4.375	1.6	1.0	1.0	2.109
10.0	44.9	14.72	26.3	6.300	4.461	18.7	1.0	.9370	1.853
	52.0	14.74	29.2	6.879	4.235	20.3	1.0	1.0	1.962
	80.0	13.13	45.6	7.491	1.301	13.1	1.0	1.0	1.946
	110.0	9.94	64.6	7.612	-2.603	12.4	1.0	1.0	2.665
	145.7	5.81	107.6	6.348	-5.241	2.0	1.0	1.0	1.904
12.0	42.8	16.81	25.9	6.567	4.818	21.9	1.0	.806	1.594
	52.0	16.60	30.0	7.214	4.441	24.8	1.0	.916	1.816
	80.0	14.77	48.1	7.834	1.360	17.5	1.0	1.0	1.918
	110.0	11.25	69.2	8.001	-2.736	17.0	1.0	1.0	2.641
	157.8	6.28	134.8	6.489	-6.008	1.2	1.0	1.0	1.115
14.0	41.4	18.77	25.8	6.724	5.047	24.4	1.0	.700	1.384
	52.0	18.34	30.9	7.414	4.565	27.7	1.0	.816	1.619
	80.0	16.23	49.9	8.090	1.405	22.0	1.0	1.0	1.892
	110.0	12.42	72.9	8.304	-2.840	21.7	1.0	1.0	2.614
	165.8	7.24	152.3	6.921	-6.711	.9	1.0	1.0	.664
16.0	40.5	20.65	25.8	6.829	5.194	26.5	1.0	.614	1.214
	52.0	20.00	31.6	7.549	4.647	30.1	1.0	.730	1.449
	80.0	17.50	51.2	8.284	1.439	26.5	1.0	1.0	1.870
	110.0	13.44	76.0	8.545	-2.923	26.2	1.0	1.0	2.585
	170.9	8.55	163.1	7.339	-7.246	.7	1.0	1.0	.379
20.0	39.9	24.19	26.2	6.957	5.339	30.0	.993	.495	.966
	52.0	23.21	33.1	7.707	4.745	32.4	.955	.649	1.176
	80.0	19.58	52.8	8.530	1.481	34.1	.990	1.0	1.803
	110.0	15.09	81.0	8.902	-3.045	34.0	1.0	1.0	2.521
	174.0	11.64	169.8	8.084	-8.040	.9	1.0	1.0	.205

Table 3-3. SPEED AS A FUNCTION OF SAILING CONDITIONS

VTW	OPTIMUM BEAT		VMG	HEEL	OPTIMUM RUN		
	BTW	V			BTW	V	VMG
8	46	5.617	3.923	13	143	5.448	4.375
10	45	6.300	4.461	19	146	6.348	5.241
12	43	6.567	4.818	22	158	6.489	6.008
14	41	6.724	5.047	24	166	6.921	6.711
16	40	6.829	5.194	27	171	7.339	7.246
20	40	6.957	5.339	30	174	8.084	8.084

VTW	V	REACH	REACH	REACH	RUN		
		BTW=80	BTW=110	BTW=135	BTW=180		
		HEEL	V	HEEL	V		
8	6.974	16	7.060	8	6.021	3	3.988
10	7.491	13	7.612	12	6.997	4	4.912
12	7.834	17	8.991	17	7.557	5	5.771
14	8.090	22	8.304	22	7.980	6	6.583
16	8.284	26	8.545	26	8.968	8	7.192
20	8.902	34	8.902	34	8.968	13	6.010

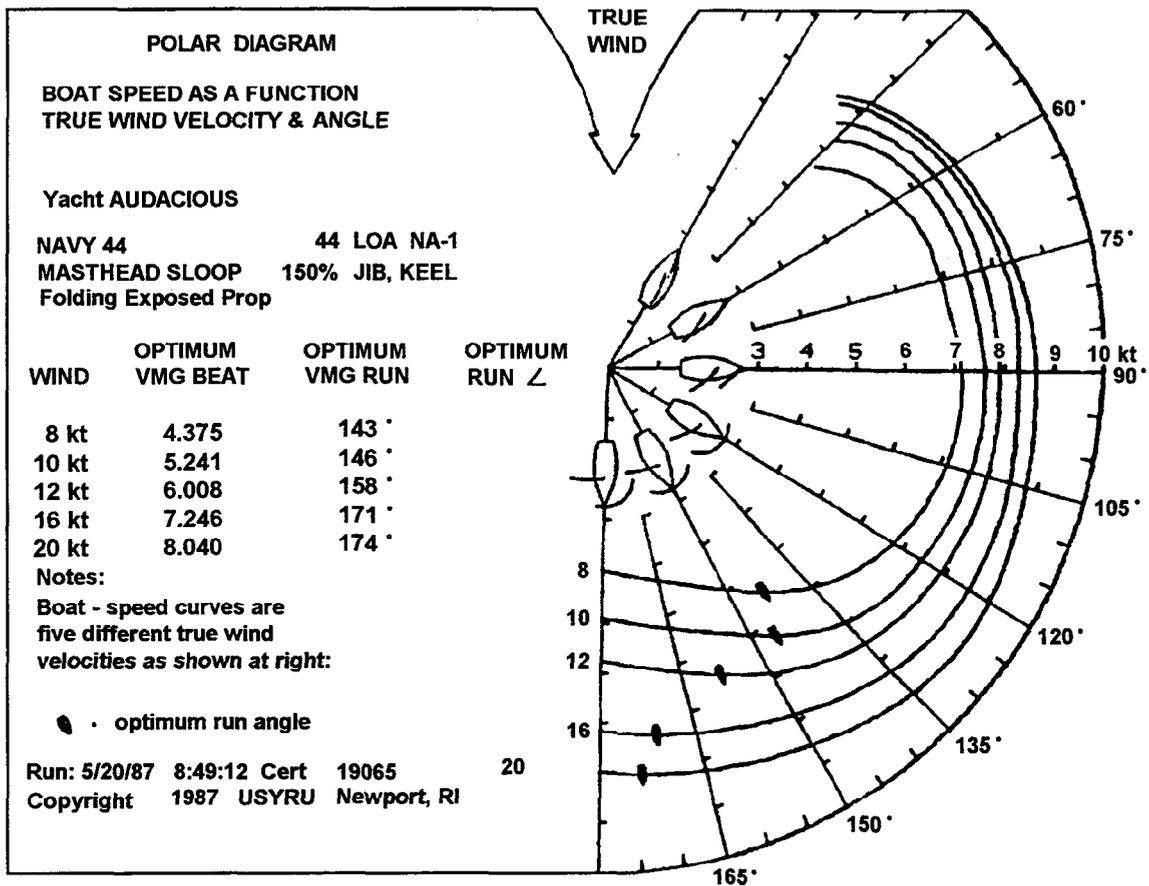


Figure 3-4. Polar Diagram - True Wind

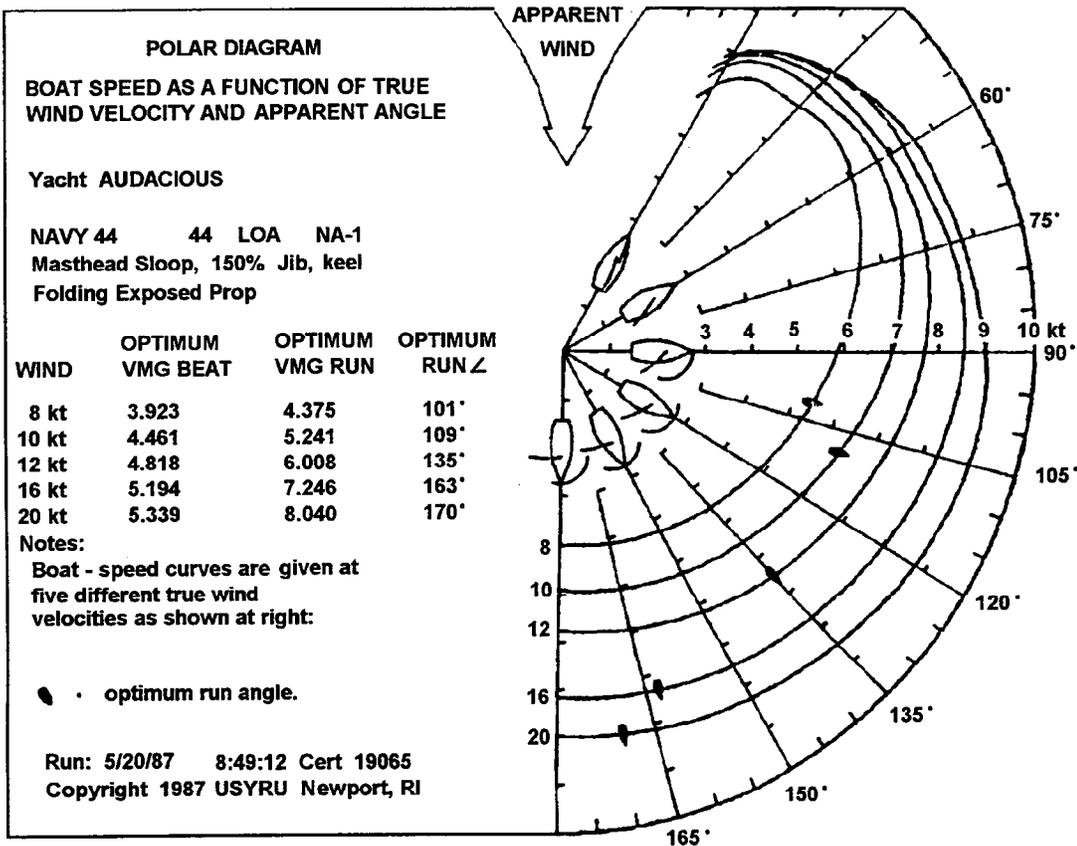


Figure 3-5. Polar Diagram - Apparent Wind

3. Close the selector valve of the tank from which the water was drawn.
4. Make a log entry that 23 gallons was transferred to the day tank. This makes it possible to know how many gallons of fresh water remain in the system.

3-5.8.2 FILLING THE TANKS.

1. Ensure that the STBD tank isolation valve is "closed".

2. Port Tank.

- Open the selector valve located behind the lower drawer of the navigation table. Remove the drawer to gain access. This will allow water to flow into the 23 gallon day tank while the port tank is filling.
- Fill the tank through the filler pipe located under the Port Settee berth, aft end. When water level reaches the top, stop filling. Do not cap off. This tank will have to be "topped off" to compensate for the water that has filled the day tank.

2. Stbd tank.

- Fill the tank through the filler pipe located under the STBD Settee Berth, aft end. Cap off the tank when full.

3. Go back and top up the port tank now that the water has had time to flow into the day tank. Cap off the tank.
4. Close the port tank selector valve.

3-5.8.3 PRESSURE WATER.

1. Ensure that the Master D.C. power switch at the ELECTRIC SWITCHBOARD is ON.
2. Turn on the FRESH WATER PUMP circuit breaker at the ELECTRIC SWITCHBOARD.
3. Operate the blue faucet at the galley sink or the vanity sink in the head to draw water, (red faucet will open the line to the manual pump for foot pump operation).
4. Turn OFF the FRESH WATER PUMP circuit breaker at the ELECTRIC SWITCHBOARD when through.

3-5.8.4 MANUAL WATER.

1. Open the red faucet at the sink. Pump the foot pump.
2. Close the red faucet. Otherwise, when the next user wants pressure water and turns on the fresh water switch at the electric switchboard, water will start to flow.

3-5.9 MARINE HEAD, SINK AND SHOWER MANAGEMENT.

The NAVY 44 head compartment has a marine head, sink, and two shower facilities, one for Fresh Water, the other for Sea water. All water drainage is routed to the shower sump.

To drain the sump:

- Ensure that the intake seacock for the head is open(the sump drain is routed to this seacock).
- Use the manual pump on the bulkhead above the head to pump the sump dry.

3-5.9.1 MARINE HEAD.

The Wilcox-Crittenden "Skipper" marine head uses raw Sea Water for flushing. A 10 gallon polypropelene holding tank makes the NAVY 44 compatible with ZERO discharge laws for environmentally protected waters. A "Y" valve selects either holding tank or overboard as the discharge path. OVERBOARD directs discharge to the 2-1/2" discharge seacock under the head compartment sink. TANK directs discharge into the holding tank.

Plumbing from the holding tank leads to a diverter valve located on the front face of the Port Forward Cockpit Locker. With the handle pointing inboard the effluent can be pumped overboard using the macerator pump. This procedure is authorized only when beyond the 3 mile limit in open ocean. With the handle pointing outboard the holding tank can be pumped out at a shoreside pumpout facility using the deck plate pumpout receptacle. For components of the head system, see Figure 1-42. MSD Schematic and Figure 1-43. Holding Tank.

The head is a standard commercially available item. Should repair/replacement of components be required See Figure 3-7. Marine Head, Parts Breakdown.

TABLE 3-4. D.C. LOAD ANALYSIS

Item	AMPS
1. NAV (lo) deck level lights with Compass light on	6*
2. Mastmounted light	
Deck light	4
Bow light	4
Tricolor	3
Anchor	3
3. Cabin lights Port - 7 lights + 1 fan	8
4. Cabin lights Stbd - 7 lights + 3 fans	11
5. Spotlight (outlet)	5
6. Instrument lights	1
7. Fresh water pump	6
8. Salt water pump	6
9. D.C. Reefer	6.8
10. LP Gas control panel	1
11. Bilge pump	15
12. Engine blower	5
13. MSD pump	20
14. Engine Alarms	.25
15. Bilge Alarm	<u>.25</u>

Total WITH NAV lo (3 bulbs, one for each nav color) 107.95

*NAV Lo and NAV Hi cannot both be used simultaneously,
therefore max load is with NAV Hi (1 bulb) = 98.15

ELECTRONICS

1. ICOM VHF Stby	1.2	TRANSMITTING	6.3
2. SEA 222 HF	2.5		17
3. FURUNO fax	1.2	RECORDING	2.2
4. NORTHSTAR LORAN			.8
5. B&G HYDRA 330 SYSTEM			.66
6. RADAR R20X			4.2
7. NORTHSTAR BPS RECEIVER			<u>.32</u>
SUB-TOTAL ELECTRONICS			31.48

ALL ELECTRIC/ELECTRONIC SYSTEMS =====

GRAND TOTAL 132.63*

* MAX CONSUMPTION

101.95+31.48=133.43

BATTERY INFORMATION

SHIP'S SERVICE BANKS
Either the - Rolls 12 V Series 4000
Part No.- T-12-136

Or the AGM (glass matt") batteries

ENGINE START BATTERY

136 Amp Hour at 20 HR rate

6-7 AMP per hour for 20 Hr.

ENGINE START BATTERY

TYPE - M-27

105 Amp Hours

150 Cranking Amps

Table 3-5. Electrical Charging Procedures

(a) **SHIPS SERVICE - Sailing** **With Out Engine Running**

1. Place the SS battery selector switch in position "BOTH".
CHARGING IS NOT POSSIBLE. Engine must be started to charge.

NOTE

Placing the SS Selector Switch in the "BOTH" position will place an equal demand on both banks when the engine is Not running. When the engine is started the SS alternator will charge both banks equally. If an unbalanced condition is displayed on the System Voltage Scanner. Attempt to determine which bank has a fault.

2. When the SS battery rotary selector switch is in BOTH or ALL, bank #1 and bank #2 are on line because they are now in parallel. **Engine must be started to charge.**
3. When the SS battery rotary selector switch is in OFF there is no power being delivered by the SS system. **Even with the engine running charging would not occur.**

(b) **SHIPS SERVICE** **With Engine Running**

1. When the SS battery switch is in the BOTH or ALL position, Both SS banks are providing power.
2. BOTH of the SS banks will be charged.
3. Using the SYSTEM VOLTAGE SCANNER feature of the Electrical Switchboard, see Fig 3-6.
 - a. Set the POWER switch to ON. This activates the SYSTEM VOLTAGE monitor panel.
 - b. Set the BANK switch to either "2" or "3". "2" monitors BOTH of the SS banks. "3" adds the Engine Start Battery to the cycle. Selecting "4" will cause fault light to illuminate, (there is no bank 4).
 - c. Note the voltage indication as the BATTERY BANK light cycles from 1 to 4. The voltage shown will be the condition of that bank.
 - d. When charging with the engine, 14.4 V(output voltage from the alternator), should be displayed when fully charged.
 - e. When charging with the a.c. charger, 13.8 (output voltage from the a.c. charger), should be displayed when fully charged.
 - f. Place the "FAULT LOCK" switch to the "ON" position. If a fault should occur, the "FAULT" light on the panel will illuminate. The "BATTERY BANK" light will cease to cycle through all banks and will lock onto the faulty bank.
 - g. When charging is terminated, a minimum of 12.6V should be indicated for the bank charged. A reading of 13.8 is max capacity.

(c) **START BATTERY - Sailing** **With Out Engine Running**

1. When the START BATTERY master rotary selector switch is in the OFF position, the ENGINE START battery is neither on line to provide power, **nor can it be charged.**
2. When the START BATTERY master rotary selector switch is in the ON position the engine can be started.

(d) **START BATTERY** **With Engine Running**

1. When the START BATTERY master rotary selector switch is in the ON position the START BATTERY is on line to provide power and be charged. Power is also available to the engine alarm circuit breaker on the switchboard panel, however, the engine alarm switch on the main switchboard must also be in the "ON" position to activate the alarm.

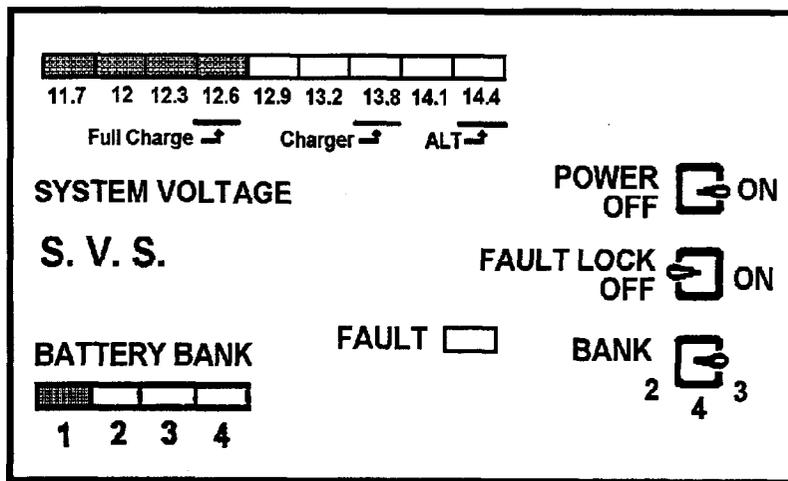


Figure 3-6. System Voltage Scanner

CAUTION

DO NOT PUT PAPER TOWELS, MATCHES, RAGS, ETC. INTO THE BOWL. THEY WILL PLUG THE VALVES - USE WASTE BASKET.

3-5.9.1.1 OPERATING THE HEAD IN U.S. TERRITORIAL WATERS.

1. Ensure that the "Y" valve selects "TANK".
2. Ensure that the Sea Water intake Sea Cock is open, (located under the floor boards just forward of the Engine Compartment. See Figure 1-43. And Table 1-5. THRU HULL FITTINGS.
3. Depress the foot lever and pump water to wet the bowl.
4. Release the foot lever and use the head as you would a conventional toilet.
5. Depress the foot lever and pump water. This will pump water into bowl to flush and will pump effluent out of the head.
6. Release the foot pump and pump until the bowl is dry.
7. Leave the lid in the down position so lid does not slam down when the boat tacks.
8. Ensure that the foot pedal is left in the full UP position to preclude the bowl from overflowing thru siphoning action when not in use. This should happen automatically, however some of the return springs are worn.

3-5.9.1.2 OPERATING THE HEAD IN OPEN OCEAN.

1. Rotate the "Y" valve for "OVBD".
2. Use the remaining procedures from 5-9.1.2
3. When the bowl has been vacated, continue pumping 10 additional strokes to clear the drain hose.

NOTE

Rotate the "Y" valve for HOLDING TANK operation when returning to U.S. Territorial Waters or restricted discharge .

3-5.9.1.3 CLEARING THE HOLDING TANK.

The holding tank can be emptied in one of two ways:

- It can be pumped overboard.
- It can be pumped out at a shoreside pump out station.

3-5.9.1.3.1 PUMPING THE HOLDING TANK OVERBOARD.

NOTE

When the holding tank is full, continued pumping will become very difficult due to over pressurization of the holding tank.

CAUTION

Continued attempts to flush the marine head when directing effluent into the HOLDING TANK can cause oozing at the hose connections AND/OR RUPTURING THE HOLDING TANK. The following procedures should be used to empty the holding tank overboard.

1. Select "Holding tank" at the "Y" valve.
2. ENSURE that the overboard discharge under the sink in the head compartment is in the OPEN position.
3. Ensure that the macerator pump handle located on the front face of the port forward cockpit locker is pointing inboard. This directs the flow to the overboard seacock.
4. Turn the engine ON. Running the macerator pump is the highest current draw of the electrical system.
5. Turn ON the MSD PUMP circuit breaker on the Switchboard panel.
6. Depress and hold the button at the macerator pump selector valve.
7. The pump will change from a high pitch whine to a lower pitch when it starts pumping effluent overboard.
8. Look over the port side of the transom for a tell tale brown trail.
9. The pump will alternately change pitch as it nears emptying the tank.
10. Look at the inspection gauge in the port cockpit line locker. When the tank is empty the discharge should be clear.

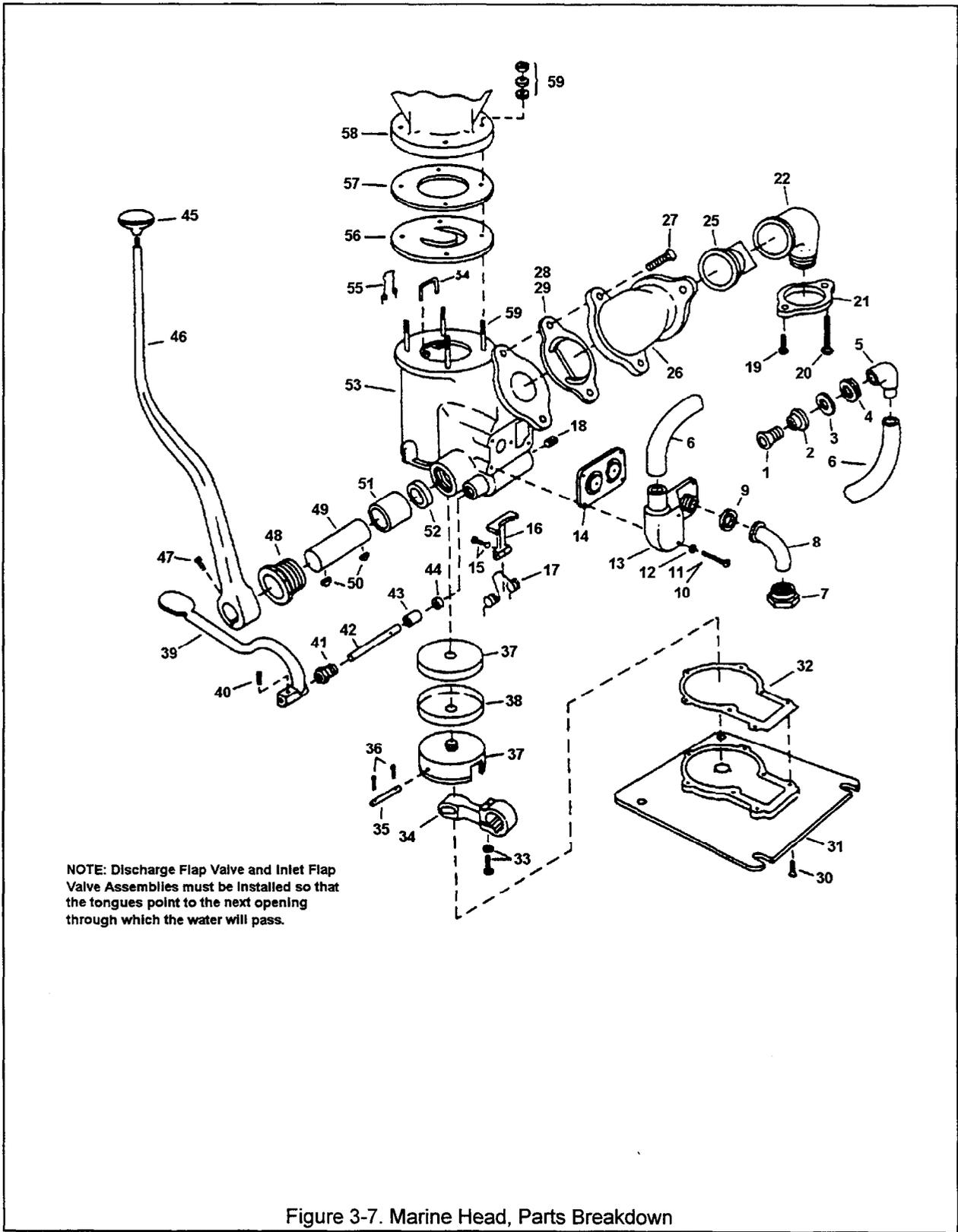


Figure 3-7. Marine Head, Parts Breakdown

Table 3-6. Head Parts List

1550 SKIPPER (TYPES 7 & 8) PARTS LIST

PART NO.	REF NO.	DESCRIPTION	QUANTITY
015016	1	Bowl Spud	1
015065	2	Bowl Spud Rubber Gasket	1
015479	3	Bowl Spud Friction Washer	1
015024	4	Bowl Spud Lock Nut	1
015032	5	Bowl Spud Elbow	1
015339	6	Inlet Flush Tubing, Vinylite	1
015883	7	Inlet Valve tailpiece Coupling Nut	1
015875	8	Inlet Valve Tailpiece, 3/4". 90-degree	1
011155	9	Inlet Valve Tailpiece Gasket*	1
017194	10	Inlet Valve Cover Screw 1/4 -20 x 1 3/4	2
		Inlet Valve Cover Screw Washer	2
017816	11	Inlet Valve Cover Screw 1/4"-20x 5/8	3
		Inlet Valve Cover Screw Washer	3
017244	12	Inlet Valve Cover Screw Washer	5
017178	13	Inlet Valve Cover	1
017251	14	Inlet Flap Valve Assembly*	1
017160	15	Inlet Control Lever Screw and Washer*	1
017152	16	Inlet Control Lever	1
017004	17	Flush Control Lever Spring	1
016535	18	Base Drain Plug	1
015842	19	Coupling Flange Bolt	2
		(used with 90-degree Tailpiece)	
017145	21	Discharge Tailpiece Coupling Flange	1
017111	22	Discharge Tailpiece, 1 1/2", 90-Degree	1
013300	25	Backwater Check Valve (Joker)	1
017129	26	Rising Main	1
015842	27	Rising Main Bolt	2
017137	28	Discharge Flap Valve Assembly*	1
		(for 90-degree Tailpiece)	
017301	30	Base Plate Screw	7
		Base Plate	1
017020	31	Base Plate Screw	7
		Base Plate Gasket	1
016899	32	Base Plate Gasket*	1
016816	33	Piston Lever Clamp Screw	1
		Clamp Screw Lock Washer	1
016840	34	Piston Lever	1
016881	35	Piston Pin	1
		Piston Pin Cotter Pins	2
016949	36	Piston Pin Cotter Pins	2
016832	37	Piston Head	1
		Piston Pin	1
		Piston Pin Cotter Pins	2
016824	38	Piston Cup Leather*	1
016857	39	Foot Pedal	1
		Foot Pedal Screw	1
016220	40	Foot Pedal Screw*	1
017319	41	Inlet Control Shaft Packing Nut	1

PART NO. REF NO. DESCRIPTION QUANTITY
 Table 3-6. 1550 Skipper (Type 7 & 8) Parts List - Continued

PART NO.	REF NO.	DESCRIPTION	QUANTITY
016873	42	Inlet Control Shaft	1
017277	43	Inlet Control Shaft Packing Gland	1
016980	44	Flush Control Shaft Packing*	1
017103	45	Pump Handle Knob	1
017053	46	Pump Handle Knob	1
		Pump Handle	1
		Pump Handle Set Screw	1
017061	47	Pump Handle Set Screw	1
017038	48	Pump Shaft Packing Cap	1
016865	49	Pump Shaft	1
016923	50	Pump Shaft Key	2
017046	51	Pump Shaft Packing Gland	1
016998	52	Pump Shaft Packing*	1
017012	53	Base Casting	1
015925	54	Waste Valve Spring Pin	1
015933	55	Waste Flap Valve Spring	1
015917	56	Waste Flap Valve Assembly	1
015909	57	Bowl Gasket	1
015453	58	Bowl Complete with Bowl Spud Assembly	1
016196	59	Bowl Hold-Down Spud	4
		Bowl Hold-Down Spud Washer, ss	4
		Bowl Hold-Down Spud Washer, Rubber	4
		Bowl Hold-Down Spud Nut	4
015305		Seat and Cover (Not Illustrated)	

*Parts supplied in Repair Kit Fig 1539

11. Depress the foot lever and use the handle at the marine head to pump clean sea water into the head to help flush out the holding tank.
12. Pump until the pump holds a steady high pitch whine, and the brown trail at the transom disappears.
13. Shut down the engine. See Figure 1-43 Holding Tank.

3-5.9.1.3.2 PUMPING OUT THE HOLDING TANK AT A SHORESIDE PUMP OUT STATION.

1. Ensure that the macerator pump handle located on the front face of the port forward cockpit locker is pointing OUTBOARD.
2. Open the DECK CAP for the pumpout fitting on the port side deck outboard of the primary winch.
3. Attach the pump out adapter from the shoreside pump out station. (Some shoreside facilities do not have this adapter, in this case, insert the pumpout hose into the pumpout outlet).
4. Start the shoreside suction pump.
 - Pump the toilet with freshwater (hose) or clean seawater while pumping out..
5. Pump until discharge is clear.
6. Disconnect the shoreside adapter or remove the hose as applicable..
7. Replace the deck cap.
8. Wash down the adjacent deck with soapy water.
9. Return the macerator pump handle to the INWARD position. See Figure 1-43. This is to set up the plumbing for self contained operations.

3-5.9.2 SINK/SHOWER.

The lavatory sink in the head compartment is fitted with two spigots. One is for Fresh Water, the other for Sea Water. Both are combination faucet/shower spigots, which are integral to the sink, but connected to a flex hose that can be extended as a telephone type shower. Both units can be operated as a pressurized water source. The Fresh Water spigot can also be operated with a foot pump.

3-5.9.2.1 PRESSURE FRESH WATER.

1. TURN ON the FRESH WATER PUMP circuit breaker at the ELECTRICAL SWITCHBOARD panel.
2. Open the Blue Fresh Water faucet. Water will be delivered in proportion to the amount the faucet is opened.
3. Use the facility as a lavatory sink, or pull the spigot from its cradle and use it as a shower.
4. Be frugal in operating this facility for two important considerations:
 - You are consuming electrical energy from the batteries.
 - You are consuming fresh water from a limited water source.

3-5.9.2.2 MANUAL FRESH WATER.

1. Open the Red water spigot.
2. Depress the foot pump and use the facility frugally.
3. Close the water spigot.
4. Frugality is encouraged to conserve the Fresh Water supply.

3-5.9.2.3 PRESSURIZED SEA WATER.

1. Open the Sea Water Intake Thru-Hull under the Galley Sink, (3/4" diameter hose), See Figure 1-45, Thru-Hull Diagram, and Table 1-5. THRU-HULL FITTINGS.
2. TURN ON the SEA WATER PUMP circuit breaker at the ELECTRICAL SWITCHBOARD.
3. Open the Sea Water faucet. Water will be delivered in proportion to the amount the faucet is opened.
4. Use the facility as a lavatory sink, or pull the spigot from its cradle and use it as a shower.
5. Frugality is encouraged to conserve Electrical Energy.
6. Close the Sea Water Intake Thru-Hull.
7. Use the Shower Sump Pump to drain the grey water from the shower sump.

3-5.10 REFRIGERATION SYSTEM MANAGEMENT.

The NA 44 is equipped with a two door, top opening, 8.1 cubic foot refrigerator located in the galley starboard side. The original refrigeration system is still on all boats except NA2, NA8, and NA15 thru NA20. This is a Grunert Refrigeration dual coil holdover plate system. It is capable of being cooled with either mechanical or electrical cooling.

For shoreside charging:

- Connect shoreside power.
- Turn on the circuit breaker for Charging on the A.C. part of SWBD.
- Set the A.C. rheostat in the reefer to #4.
- Turn on the circuit breaker for Reefer on the A.C. part of the Swbd.

For Charging using the engine:

- Turn on the Reefer Circuit Breaker on the D.C. portion of the Swbd.
- Start the engine and stabilize at idle.
- Set the D.C. rheostat in the cubby forward of the sink under the pilot berth to #4.
- Turn the reefer timer rotary switch located on the side of the pantry to 60 minutes.
- Advance throttle to obtain 1200-1500 RPM.
- Monitor cooling of the box with the thermometer on the face of the sink board, or frost on the holding plate.
- Charge as necessary, but not to exceed closer than every four hours.

The new Refrigeration system installed in NA2 NA8 and NA 15 thru NA20 is a Technautics Coastal 12 system. It is ONLY a 12 v.d.c. system.

To charge the system at shoreside:

- Connect shoreside A.C. power.
- Turn on the Reefer charging Circuit breaker on the D.C. part of the Swbd.

To charge the reefer while underway:

- Start the engine so that the alternators will be charging the batteries.
- Turn on the Reefer Circuit Breaker on the D.C. part of the Swbd.

NOTE

One rheostat located inside the reefer controls rate of charge for either shoreside or underway charging of the new system.

3-5.11 STOVE.

The Paul E. Luke Stove aboard the NAVY 44 is a three burner propane stove with an oven. The temperature of the burners are adjusted manually with the control knobs on the front face of the stove which regulate LPG flow to the burner. If the oven pilot flame goes out, the oven is shutdown completely to make it safe.

NOTE

LPG tanks have Standard Gas fittings with LEFT-HANDED THREADS. This is to preclude accidentally hooking up incorrect tanks to the Gas system. Check connections for leaks with a soap and water mixture each time a tank is connected to the system.

3-5.11.1 LIGHTING THE STOVE.

CAUTION

OPERATE BILGE BLOWER FOR 5 MINUTES PRIOR TO LIGHTING STOVE TO REMOVE ANY GAS FUMES THAT MAY HAVE SETTLED TO THE BILGE.

1. Two Propane tanks are located on deck in a compartment on the starboard quarter aft. Open the valve on the tank being used.
2. Turn the flow director to the bottle selected.
3. Turn ON the "GAS VALVE" switch at the ELECTRIC SWITCHBOARD PANEL.
4. Turn ON the Marinetic switch at the galley bulkhead.
5. Open a burner valve and apply a lighted match.

3-5.11.2 SHUTTING OFF THE STOVE.

The procedure listed below will ensure that gas in the lines will be consumed thus leaving a safe system. The stove must be secured after

each session of use in order to vacate the lines of propane.

1. Leave the stove lighted.
2. Close the valve at the tank. When the burner flame goes out all the gas in the lines has been consumed.
3. Turn OFF the Marintic switch at the galley bulkhead.
4. Turn of the GAS VALVE at the Switchboard Panel.
5. Turn OFF the burner gently to avoid damaging the needle valve.

3-5.11.3 OPERATING THE OVEN.

1. Light a burner using procedures in section 3-5-11.2 to bleed air from the system prior to lighting the oven.
2. To ignite the pilot light, turn the oven control valve counter clockwise about 90 degrees. Access the pilot by turning the stainless steel cover plate located beneath the sliding rack out of the way.
3. Hold a flame, (match or flame gun) to the pilot and press the red button below the door. Continue to hold in the red button for 15-20 seconds after the pilot has a flame to heat the pilot light thermocouple.
4. Control the oven temperature with the selector knob. The oven will cycle to maintain the selected temperature.

NOTE

If the oven pilot goes out for any reason, the thermocouple cools off and shuts off the gas to the oven.

3-5.11.4 SHUTTING DOWN THE OVEN.

1. Shut down the stove using the procedures of 3-11.3 above.
2. Rotate the Oven Temperature Selector Knob to OFF. Look to see that the oven pilot flame extinguishes.

3-6 POST OPERATIONS PROCEDURES.

After a sortie has been completed the following post operations check should be made to leave the boat ready for the next sortie.

1. Stand jib and spinnaker halyards away from the mast. The jibs to the tack fittings on the bow. The spinnaker halyards to the base of the foredeck lifeline stanchions.
2. Release outhaul tension on the mainsail. Ensure that the sail has been flaked so that the battens are on top of the boom so avoid bending them. Put on sail ties, and put on the sail cover.
3. Coil reefing lines.
4. Leave the collapsible inner forestay rigged.
5. Tighten the Steering Wheel friction knob, (not a true lock). This keeps the rudder from turning due to wave action.
6. Engine Shutdown T-Handle in the down position.
7. Backstay at 500 psi.
8. Coil topside lines. DO NOT Flemish any lines. This induces a permanent twist to the line and increases their tendency to kink.
9. Secure all communications and electronics equipment.

NOTE

All fluid levels should be topped up to ready the boat for the next sortie.

10. Check and record fluid levels on the fresh water tanks, diesel fuel tank, and engine oil.
11. Flush out water closet until bowl is clean and empty. (Pump 10 additional strokes after bowl is empty to ensure the system is flushed completely.
12. Close all seawater system seacocks (OIC discretion).
13. Close Propane valve at the tank and the burner/oven controls at the stove.
14. Secure all running rigging through designated blocks, fairleads, and cleats. Secure boom in level position, off center away from the boarding side.
15. Jibs/Genoas used during the sortie should be brought on deck, laid out flat, pleat folded along the luff, and rolled up for stowage in the corresponding sail bag.

- At the end of a series or cruise the sails should be washed and dried prior to stowing aboard.
16. Spinnakers should be dry before stowing.
 17. Hose down entire deck, cockpit, winches, coiled sheets, lines, and rigging with fresh water from dockside.
 18. Cleat and coil halyard tails. Hang sheets so they can dry.
 19. Allow all washed areas to dry prior to final lock up.
 20. Rinse all winch handles and snatch blocks with fresh water and stow in the "hernia box".
 21. Inspect winches for proper lubrication and functioning.
 22. If anchor(s) was used, put anchor, chain, and rode on deck for fresh water wash down. Stow below when dry.
 23. Turn OFF all circuit breakers on the switchboard panel except for the main D.C. breaker, Eng. Alt, SS Alt, and the bilge alarm.
 24. Connect shore power. Connect the cable to the boat. Run the cable up the port deck, pass under the lifelines on the fore deck to the piling with the shore power station. Wrap two turns of the cable around the piling to keep the cable from draping into the water. Plug into the shore receptacle.
 25. Leave the following A.C. circuit breakers-switches at the Switchboard panel in the ON position:
 - Shore power switch
 - Battery Charger
 - SS Battery rotary switch to charge the depleted battery.
 26. Secure the refrigerator.
 27. Inspect bilge after fresh water washing. If there is oil in the bilge, soak it up with "oilsorbs" or rags. Pump bilge dry.
 28. Check air vents and secure hatches.
 29. Cover the helm and other equipment provided with covers.
 30. After final lock-up, ensure mooring lines, chafing gear and fenders are secure. Report and note any boat discrepancies to maintenance.