

Sea Wings

Owner's Notes

Revised April 30, 2024

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Welcome Aboard

Sea Wings is a 2006 Navigator 51 pilothouse motor yacht. We purchased her in May 2023, we are the third owners. She has been a Pacific NW boat since day one and in the San Juan Yachting fleet since 2017. When we first saw her, we knew she was 'the one'. She sparkled at the dock and it was apparent she was cared for by a knowledgeable owner. In fact, that former owner is one of the partners at the charter company and is a consultant in helping us keep her in top shape. We're very fortunate to have found *Sea Wings* and hope that you'll take good care of her during your adventures cruising the San Juan Islands and beyond.



The vessel name *Sea Wings* is in fond memory of the days gone by and new ones to come, both by the former owner and us. We share a passion for boating and flying as private pilots, it has been a part of our lives for a very long time. Perhaps you too have had some connection to adventures in boating and flying. The name is a 'tip of the hat' to those interwoven interests.

We've provided two key resources for *Sea Wings*, this Owner's Notes manual and the Quick Start Procedures (QSP). We recommend that you use the QSP to ensure you address all the essential steps to safely operate the vessel. And please take the time to read this manual and use it as a reference for all things about the boat and its systems. Spending some time now will make your checkout a breeze and your actual cruise through the inland waters of the Salish Sea will be more enjoyable. And if you need more info, *Sea Wings* carries a comprehensive set of the manuals for the installed equipment, kept in a case in the forward part of the engine room.

Please don't be afraid to ask any question of the San Juan Yachting staff during your orientation or at any time during your cruise. You may contact the support staff at any time using the info in the emergency contact list (noted in the Chart Guest Reference Manual). No question is too insignificant.

We have enjoyed getting *Sea Wings* ready for your cruise. We hope you will sense our pride in her and enjoy your time on her as much as we do. We like to say, "Please take good care of her as we know she will take good care of you!"

May you be blessed with blue skies, gentle breezes, and calm waters.

Bon Voyage,

Roger Entekin and Family

And Just A Reminder

These notes have been prepared to give the charter captain and crew a helpful resource of information. While the goal is to summarize information from multiple sources into a single item, this document does not pretend to be the ultimate authority on the equipment and systems on board. Consult the manuals provided by the various manufacturers.

Further, the captain accepts and is the ultimate person responsible for the safety of the crew, passengers and the vessel. It is expected that he / she is qualified to operate a vessel the size, type and complexity of *Sea Wings* and has become thoroughly familiar with her prior to leaving the dock. Good judgment and following all applicable laws during operations is fundamental to a safe and successful experience on board this vessel and in the maritime environment.

No warranties are expressed or implied by this document.

Emergency / Safety Equipment

This vessel has passed an annual Coast Guard Safety Inspection (sticker on forward port window of the pilothouse). However, if you are boarded by the Coast Guard for any reason, you may be required to locate the following items:

- **Electronic Flare / Signaling Device:** Starboard cabinet in the pilothouse, forward of the electrical panel
- **Fire Extinguishers:**
 - Engine Room: one aft of the starboard engine
 - Interior: four in total; one adjacent the salon entry on the port side, one aft of the pilothouse door, one inside the master stateroom door, and one in the forward stateroom under the lip of the berth
- **Flares and Flare Gun:** Starboard cabinet in the pilothouse, forward of the electrical panel
- **Handheld Air Horn:** Starboard cabinet in the pilothouse, forward of the electrical panel
- **Lifejackets:** Six type V inflatable style lifejackets are stowed in the companionway closet and six additional vest style lifejackets are in the engine room, outboard of the starboard engine in blue stowage bags.
- **Lifesling Rescue System:** Mounted on the inboard side of the transom door
- **Whistle:** Starboard cabinet in the pilothouse, forward of the electrical panel



Other Safety Equipment:

Bilge Pumps:

There are three high-capacity bilge pumps. All are powered by a pair of dedicated breakers that should be on at all times. They have sensors to detect a modest level of water in the bilge and will pump automatically as needed. There are also override switches at each helm to force the pumps to run before the float switch triggers them. In an emergency, activate those switches at both helms.

Boat Hook: Two, one located in the transom storage locker in the cockpit and the other kept on top of the port fuel tank.

CO Detectors: Each stateroom has a carbon monoxide detector. Please keep these clear as piles of clothing, towels, etc., stashed too close to the CO detector could elicit a false alarm.

First-Aid Kit: Located in salon port cabinets, aft portion.

Flashlights:

Engine Room: kept on the top of the main toolbox forward in the engine room

Salon: credenza middle drawer, starboard side

Staterooms: a small LED flashlight is provided in each stateroom, typically stowed in a drawer

Smoke Detectors: There are two smoke detectors, one is in the aft port corner of the pilothouse and the other is in the below decks area, above the door to the master stateroom.

Spot Light: A rechargeable, portable spot light is kept at the lower helm, storage bins to the port of the helm. Please remember to recharge it if you use it.

Thru-hull Plugs: the universal foam type are provided. One is stowed between the engine seawater strainers, one is adjacent to the genset strainer, one is adjacent to the galley sink garbage disposal thru-hull and one is in the forward bilge adjacent to the holding tank and seawater washdown thru-hulls. A schematic of the thru-hulls is shown in Appendix B of these notes and in tab three of the Charter Guest Reference Manual.

Tools: A fully equipped toolbox and wrench set is located forward in the engine room, secured under the stairs of the galley hatch entrance. A small set of commonly used tools is kept in a small zipper case in the starboard cabinet in the pilothouse, forward of the electrical panel.

VHF Distress Call Using DSC (Digital Selective Calling): There are two independent VHF radios, one at each helm. Either can send DSC messages including a distress all-call.

To activate a 'Mayday' level of importance call, lift the red plastic cover and press and hold the Distress button. The radio's display will count down (3-2-1) and then transmit the distress call information. The radio will automatically switch to channel 16 and the Coast Guard will hail Sea Wings on that channel to establish contact and determine what assistance is needed. Make sure the volume and squelch are appropriately set to hear the Coast Guard calling you.

Specifications and Vessel Information

Washington State Parks Annual Permit Decal – Not applicable. *Sea Wings* is too long to use the mooring buoys (max 45'). You are permitted to use the floating docks and mooring lines in places like Stuart Island and Sucia Island. If you do, remember to register and pay the nightly fee.

U.S. Customs Re-Entry Decal – Located next to the aft entry door, starboard side.

Carbon Monoxide Warning Decal – Located on the inside frame of the aft entry doors.

Discharge of Oil Prohibited Decal – Located in the engine room on the forward bulkhead, port side, just inside the galley access hatch.

MARPOL (Marine Pollution) Decal – Located in the engine room on the forward bulkhead, port side, just inside the galley access hatch.

Vessel Official Number – 1276875 – same number as shown on the Coast Guard Certificate of Documentation found in Section 5 of the Charter Guest Reference Manual (white binder). Vessel number is physically posted on the forward portion of the lower transom, visible when standing in the lazarette. Look for 3" high, black numerals.

AIS MMSI Number – 367791490 – Programmed into the VHF radios (but not the handheld radio) and the AIS transponder. The transponder periodically transmits MMSI #, Lat/Long position, COG, SOG, vessel parameters and the vessel name.

Vessel	51' Navigator 2006, built in Perris, CA, s/n 51004
Dimensions	Length Overall (LOA): 53' without the dinghy; 56' with the dinghy Beam: 15' – 0" Draft: 4' – 6" (lowest point is the bottom of the prop rotation arc) Displacement: 48,000 lbs dry; 53,000 lbs wet
Tankage	Fuel (diesel): two tanks, 300 gallons each Fresh water: one tank, 170 gallons Hot water: one tank, 30 gallons Black water: one tank, 70 gallons
Fridge / Freezer	Fridge: 17" W x 18" D x 29" H Freezer: 17" W x 18" D x 13" H
Headroom	Salon / Galley: 6' – 8" avg Pilothouse: 6' – 0" to 6' – 8" All staterooms: 6' – 6" avg
Berths	Master: 78" tall x 60" wide Fwd Guest: 78" tall x 48" wide Upper bunk: 78" tall x 38" @ shoulders; 30" at foot Lower bunk: 78" tall x 38" @ shoulders; 20" at foot

What's New

Just a quick highlight of the most notable things about *Sea Wings* that have been done recently, you'll find details about each of these covered in the appropriate sections of this manual.

Electrical System and Battery Banks – We've made a major update to the vessel. There is now a dedicated start battery for each engine (something that *Sea Wings* didn't have when she was built). The house/inverter batteries are now a very capable bank of Lithium batteries with a total capacity of 990 amp-hours, usable capacity of 750 amp-hours (double what we had previously). The thruster batteries and genset battery have been replaced. And to top it off, new higher capacity alternators with external smart regulators have been installed. Finally, all batteries are charging whenever there is a charging source available, either engine alternator(s), genset, shore or solar.

Battery Management System – There is now a prominent color touchscreen display at the main electrical panel where you can easily monitor the house bank. It provides a pictorial view of charging and power usage. The basic rule: don't let the house bank get lower than 25% state of charge (SOC), best to have them at 60% or above before retiring for the evening.

Solar Power Charging – A 550 watt solar panel is now mounted off the aft flybridge railing, it will capture energy to charge the house batteries. We are expecting it will restore the power usage of most DC-powered items you will use at anchor and will extend your ability to reduce the usage of the genset.

Progressive Thrusters – Both bow and stern thrusters have been upgraded to allow progressive thrust activation. Now, instead of full on or off, you can use the activation paddles to control the percentage thrust that is applied. And the control panel also allows for simultaneously engaging both thrusters in the same direction in steps of 10%, 20%, etc.

Dual Captain's Chairs at the Flybridge Helm – The twin bucket seat has been replaced with a pair of LleBroc captain's chairs that slide fore / aft and can also swivel. They are mounted on a custom pedestal to enable the skipper and first mate to sit together and have a grand view while underway.

Anchor Chain Locker Access & Windlass – There are so many things we love about the Navigator design, but one that we found challenging was the relatively short height of the chain locker. The chain tends to bunch up in a "pyramid pile" and jam under the windlass during retrieval. We've added a custom access hatch on the deck to allow monitoring and corrective action while on deck at the bow. A new, heavier duty windlass that sits up on deck and improves the height situation was also part of this upgrade.

Flybridge Enclosure – The bimini top and enclosure panels are all new in 2024. We've changed the design to allow better ventilation from the front and sides. And the aft exit to the rear deck is now a sliding door design.

Side Rail Extensions – The bow railing system has been extended along both the port and starboard salon windows providing more protected access and security whenever walking along either side of the ship.

Nuances and Tips

1. Shore Shoes: Cleaned or Removed

Shore shoes can pick up lots of 'stuff' that increases the wear and tear on the interior. Help us keep her looking great by cleaning the bottom of your shoes before stepping into the salon or removing them whenever inside.



2. Damp Lifejackets Need Fresh Air

If a lifejacket, flag or canvas cover is even slightly damp, please hang it where fresh air circulates until it's completely dry. Snap straps on flybridge bimini support arms make a good hanging device. The slightest moisture in an enclosed place creates mildew quicker than one would think.



3. Wash Down the Anchor Chain

Use the saltwater washdown system with the dedicated hose to thoroughly wash mud and marine debris from the anchor chain BEFORE it goes into the chain locker. Failing to do so can result in foul odors in the chain locker!

4. Please Keep Salon Door Closed when engines are running

Diesel engines produce soot when they run and that can build up a film in the cabin. Therefore please keep the salon door closed whenever the engines are running.

5. The engines benefit from a periodic run at high speed

Sea Wings is equipped with two very reliable John Deere diesel engines. Yet, the engines can build up diesel soot in the turbochargers and exhaust ports when cruising for many hours at low speed economy cruise (less than 1300 RPM). Diesel mechanics tell us that it's helpful to run the engines at high-speed cruise (1750-1850 RPM) for at least 15 minutes every other day while cruising to help keep the buildup to a minimum. Remember to use the trim tabs at these higher speeds.

6. The salon doors

We've found that the port door will sometimes close with more of a clunk / metallic sound. It appears to happen when the door is heated by direct sunlight causing it to bow slightly. Pressing on the center of the outboard portion of the frame or shielding it from excessive heating will resolve the interference.

7. Common circuits with ON / OFF switches

There are electrical systems that are first powered by a circuit breaker and then subsequently are controlled by a switch elsewhere in the ship. In such cases, we've marked the breakers to be ON at all times (Green band on the breaker arm). A good example is the ship's lighting, the

breakers for all the lighting circuits except the engine room lights are ON at all times so that you simply need to find the dedicated switch to control the function, not also having to activate a circuit breaker.

8. Dinghy / outboard housekeeping

With the dinghy riding at the stern while underway, it will accumulate salt deposits from the churned up sea water at the stern. When arriving at a marina, please take the time to hose off the dinghy and outboard (reminder, check with the marina for their policy on boat rinsing).

9. Additional Engine Room Lighting

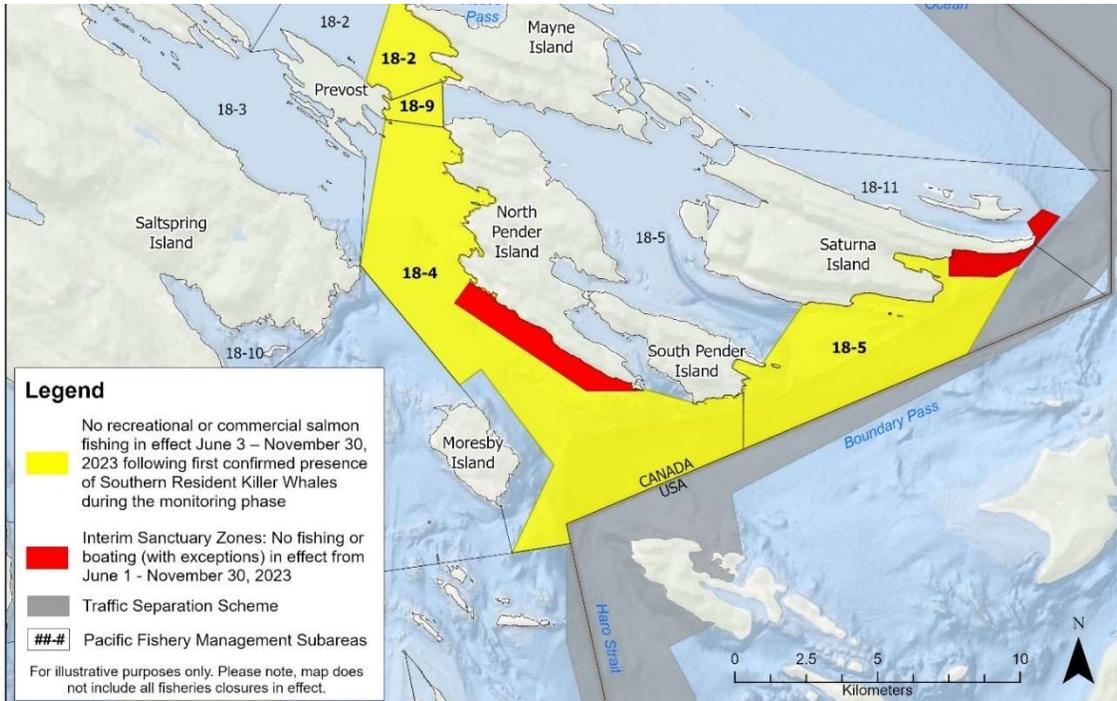
We've installed additional engine room lighting to help when doing more extensive maintenance. It is AC powered, meaning that it only works with shore / generator / inverter power active. The power switch for it is actually a power strip located on the wall aft of the port engine. Please remember to turn it off when not needed.



Being Whale Wise

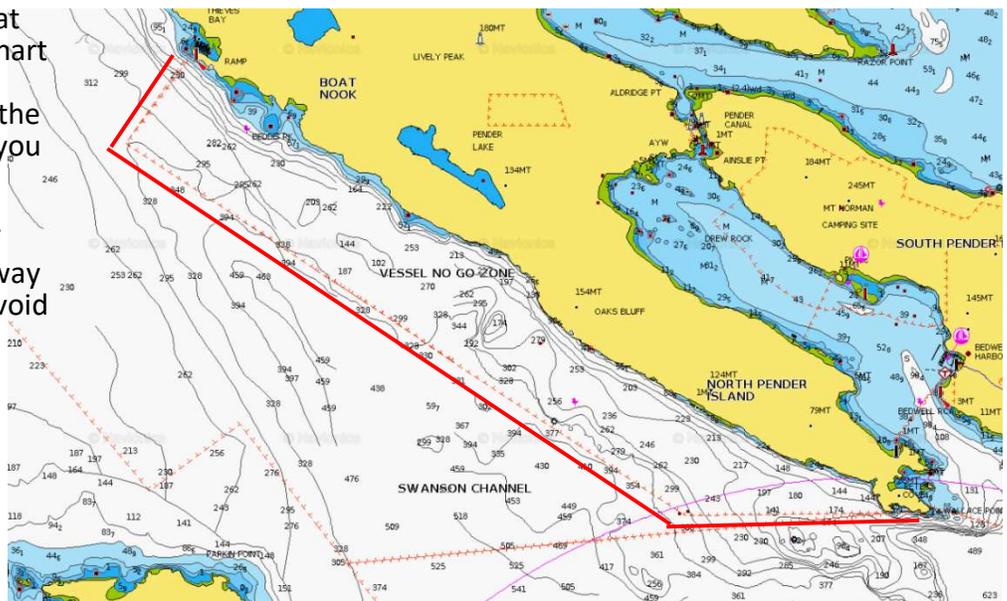
Our local Killer Whales are a wonderful part of the local family. But they are having a difficult time surviving due to declining salmon runs. These whales use echo location to find and catch their food. Therefore, noise pollution from boats and ships make it harder for them to thrive. In an effort to decrease human impact both the Canadian and US governments have implemented rules. We provided you a summary of these rules in the packet you receive when you arrived and there is more information in section 10 of the white reference book onboard Sea Wings. In general, stay at least 400 yds. away from the whales. Sometimes they come to you, if this happens shutdown the engine and turn off the instruments (assuming this is safe to do). They can hear the pings of the depth sounder – this is why we have you turn off the instruments.

In Canada they have gone a step further by creating some zones where boats are not allowed. This further improves the environment for the whales. The red areas in the diagram below show these zones.



And here is an example of what they look like on Sea Wings' chart plotter(s). The red lines have been added to help point out the dashed lines, which are what you will see on the plotter.

Note this is just to the west of Bedwell Harbour, so on your way in or out of there be sure to avoid this area.



Anchoring and Mooring Equipment

Anchors & Rodes: *Sea Wings* carries a 72# Rocna anchor in a bow pulpit and 320 feet of 3/8" high tensile chain lifted by an electric windlass. There is also secondary anchor (21# Fortress) and spare rode (15' of chain and 150' of nylon rode) located in the lazarette.

Chain markings: Yellow nylon line segments are woven into the chain at 25' increments and a double segment is woven into the chain at the 100 ft, 200 ft and 300 ft marks. **Red** nylon line marks the last 5 ft prior to the end of the chain.

After the end of the chain, there is triple braid nylon line that will deploy thru the windlass. Under normal conditions, one would never deploy the chain with any portion of the red line exposed. Always use the proper anchor rode ratio as noted below and seek appropriate anchorage water depths to achieve that goal.

In an emergency, the captain may determine that personnel or the vessel are in significant imminent danger and the only viable option is to quickly cut loose the anchor rode rather than haul it in. Hopefully that situation will never happen but if it does, the rode can be let all the way out and the triple braid line can be cut with a knife. This is an expensive, last resort option! If at all possible don't do it but if you must, attach a fender to the bitter end of the rode and note your lat/long position (use the Man Overboard, MOB, function on the chartplotter), this will allow for future retrieval of the anchor and the chain rode.

Rode Consideration for NW waters

In the Northwest, we usually do not follow *Chapman's* "7:1 scope minimum." It is common for boats with all chain rodes to use a 4:1 or 5:1 ratio (i.e., in a depth of 30 feet you let out approximately 120 to 150 feet of chain.) **In addition, we have substantial tides:** 8-10 ft. tide swing and occasional minus tides (level below the chart datum). **Do your calculations for the expected high tide level and yet be sure there will be sufficient depth in your anchorage at low tide.**

Reminder: the depth sounder is calibrated to the bottom of the vessel, not offset to account for the fact that it is already submerged in the water by approximately two feet. So, when the indicated depth is 8.5 feet, for example, you are actually in about 10.5 feet of water, a small safety margin. Yet remember that in total, the ship draws 4.5 feet and the sea bottom has uncharted rocks and man-made debris, it's not perfectly flat! **We recommend always being in at least 10' of water at a lower-low tide level as a conservative standard.**

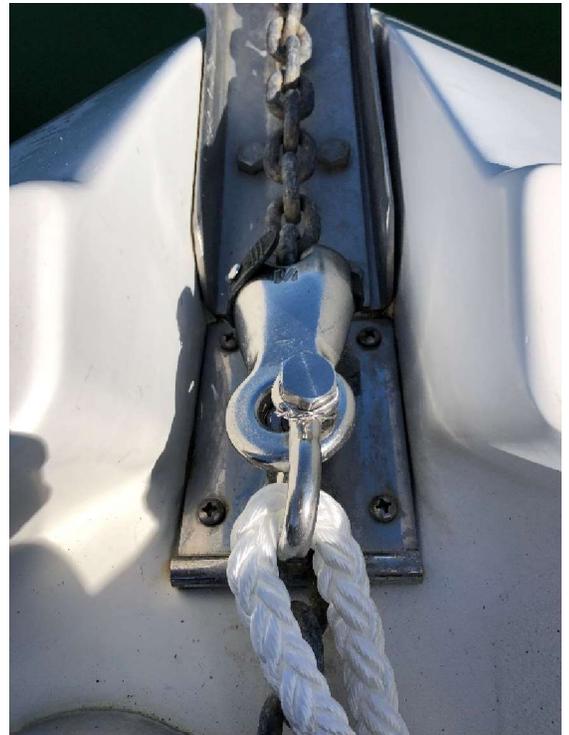
Anchoring process:

Before beginning to anchor, consider how you will judge your position and whether the anchor is dragging. In today's modern world, there's lots of choices including an app that you could use on your smartphone to monitor your position and that of the anchor. We've tried several and most recently have been impressed with the app named "Anchor Alarm Pro". It costs a few bucks however it has two great features: you can designate where your anchor is if you forgot to 'mark' it when first dropping the anchor and second, you can set separate alarms for degraded GPS position error separate from actual radius distance from the anchor.



In any event, anchoring is a process that enables you to pick your spot and establish your temporary 'home':

1. Determine the total length of anchor rode you need to deploy.
2. Turn on windlass power at the power panel; check the windlass clutch to ensure it is "tight"; release the safety line that secures the anchor.
3. Anchor is lowered with foot switches on bow deck. We don't recommend using the remote windlass controls at the helms as you cannot 'see' what's going on during windlass operations from the helms.
4. Survey the intended anchorage area paying heed to the other vessels already at anchor. If in doubt, ask a fellow boater where their anchor and rode is, it may be different than you are thinking.
5. Slowly let out the first few feet of anchor rode taking care to slowly ease the anchor over the roller and not allow it to swing wildly. Once hanging vertically past the roller, promptly deploy it to the water line or below.
6. Mate at the bow will monitor length of chain deployed and troubleshoot if it gets tangled.
7. Deploy the estimated length to initially hit the sea bottom and then continue to pay out the anchor rode while the helmsman begins to slowly back down the vessel. (Remember to activate your anchor watch app if you elect to use it.) In essence, you are laying down a line of anchor rode on the sea bottom. When the target length is deployed, stop the windlass.
8. Attach the bridle to the anchor rode: Secure the bitter ends of the bridle to the bow cleats keeping the lines outside of the bow stanchions. Attach the hook to the anchor chain just slightly above the roller (see picture). Ease further rode out as the hook passes over the roller. Continue until the anchor load is transferred to the bridle. Then deploy enough rode to form a resting loop in the chain.
9. Turn off windlass switch at the electrical panel.
10. Turn off engines, shutdown the chartplotters, turn off all unneeded circuit breakers. Time to relax and enjoy! And occasionally, check to see your position is still stable and you aren't dragging anchor.

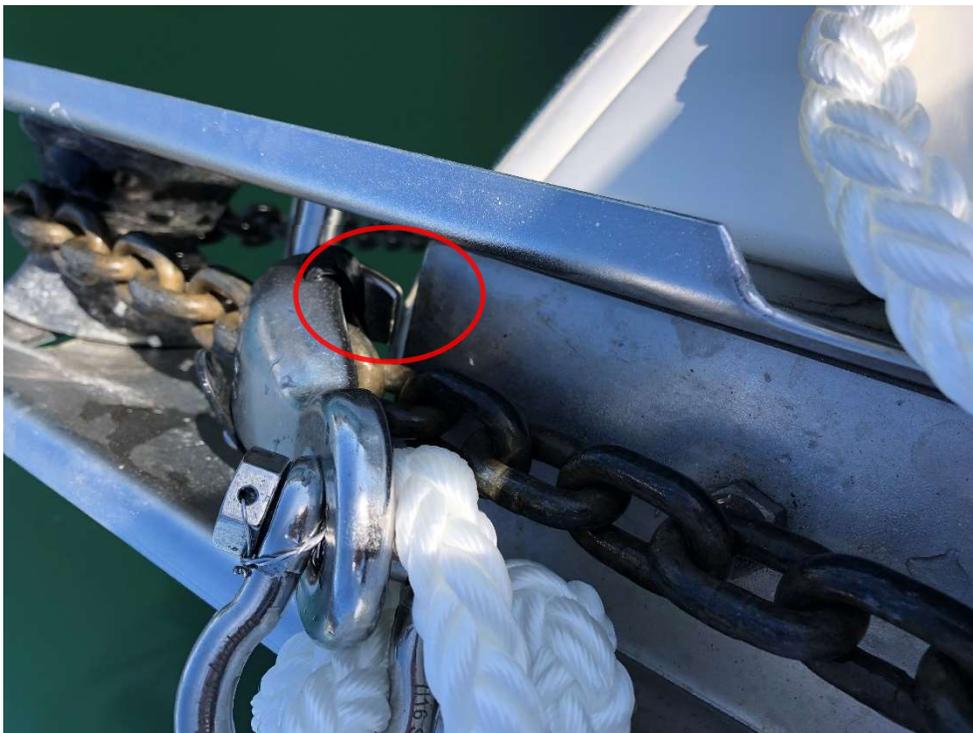


Raising the Anchor and Rode Washdown:

1. Before raising the anchor, attach washdown hose (kept in the lazarette in a bucket) to the deck connection at the bow. To connect, push and twist a quarter turn clockwise until the hose locks in place. Then turn on the anchor washdown and windlass circuit breakers.
2. Use the windlass handle from the bucket and confirm the clutch is fully tight (clockwise rotation of the capstan when viewed from the side).
3. Open the anchor locker hatch and secure the cover out of the way. Have a boat hook handy to knock down the anchor rode pile during the retrieval process.
4. Start the engines and enable the thrusters so they can be used to maneuver the boat toward the anchor and manage vessel movement once the anchor releases from the sea

bottom. Key is to recognize that the bow pulpit and windlass will be under strain as you haul the anchor rode and you don't want to use the windlass to pull the boat toward the anchor.

5. Press foot switch next to the windlass. **Wash chain and anchor thoroughly as you haul it in.** This prevents unpleasant odors from marine growth ending up in the anchor locker.
6. First, slow bursts to bring the bridle hook over the bow roller. CAREFUL: lift the hook over the bow pulpit base plate while bringing the hook closer to the windlass and allowing it to easily be removed from the rode. Remove the bridle lines from the bow cleats and stow in the bucket.
7. Please bring anchor up to the windlass carefully to protect the fiberglass around the roller from gouges. Stow the anchor in its support with no tension on the windlass and secure it with the safety line before getting underway.



- **Best practice during anchor raising:** Open the on-deck anchor locker hatch, secure the hatch and use the boat hook to knock over the anchor rode periodically. We find that monitoring the pile that builds up and then knocking it over to port or starboard to spread the chain evenly works best. The anchor locker is also accessible through the forward cabinet door at the head of the Guest VIP berth. All 320 ft of anchor rode easily sits in this space so long as the chain is layered to port and starboard sides of this space during the haul-in process.

Emergency Anchor Deployment / Retrieval:

In the event that the windlass motor fails, you can deploy the anchor and the rode manually. A handle (that looks much like a hollow bar) is kept in the same bucket with the washdown hose and bridle. Caution: To loosen the clutch, rotate the horizontal clutch wheel slowly counterclockwise, it is a friction clutch and will release the anchor and rode as you ease the tension. Moderate the release speed with the clutch wheel and the anchor chain will run freely due to gravity. Stop or slow the deployment by tightening the clutch wheel in a clockwise direction. Use care with the amount of clutch tension and you'll find it is quite easy to deploy.

However, retrieval is not near so easy. If you face this challenge, we recommend you call for help as it is an involved process and requires expertise to be successful.

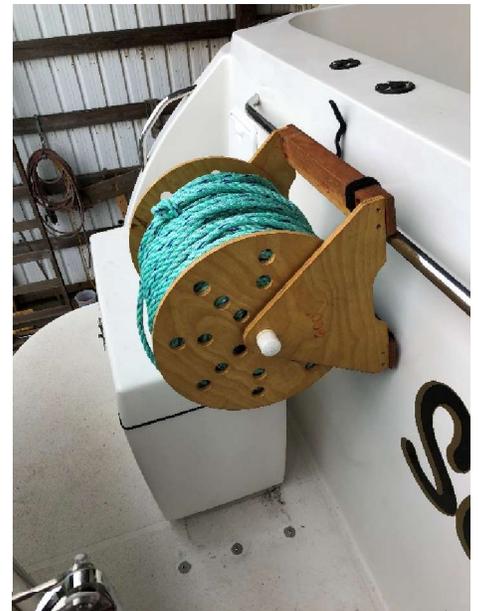
Shore Lines (Stern Tie)

Why? It is common to use a stern tie line in crowded / narrow anchorages (for example, in most Desolation Sound locations) where there simply isn't enough room to have your own "swinging space". Stern tie limits your swing and the anchorage will support more boats in close proximity.

How? Survey the intended spot to determine depths, hazards close to shore, expected tidal change, etc. Then do the math to determine the total amount of anchor rode you need to deploy. Estimate where you will drop the anchor and aim to be 50-75 ft out from shore once the total anchor rode is deployed (of course this assumes sufficient depth and no hazards this close to shore). Then a stern line is paid out, passed around a tree or a convenient steel ring in some locations. If sufficiently close, you can pass the bitter end of the stern tie line out to the point on shore and back to the boat. This practice will enable a "quick release" without having to go ashore when you're ready to untie and depart. To get to shore, you will need to have the dinghy deployed and have your mate keep the boat toward shore with short bursts of reverse gear. Sometimes a helpful boater already anchored will help you by taking your line to shore for you with her / his dinghy---a considerate "good deed" that you might reciprocate some day. We have met some nice boaters this way!

Using *Sea Wing's* Shore Line

1. The 600 feet of stern tie line is on a reel stowed on the battery boxes aft of the port engine. Retrieve the reel and hang it on the transom handrail above the propane locker.
2. Manage deployment of the line as the mate in the dinghy heads to shore.
3. Once the mate has run the line to shore and back to the boat, secure both "ends" of the line on one of the stern cleats. The goal is a firm line at high tide and no tension on the remaining line on the reel. Do not attempt to secure the line to the hand railings, they are not strong enough to withstand the potential forces on the line.



- If you were able to run the line out and back, retrieval will be a simple matter of releasing the bitter end of the line and winding the line back onto the reel. After retrieving the stern tie line, please allow the line to shed and excess water. Once dry, stow and secure the reel back in the engine room.

Mooring Equipment

Dock lines stowed in the transom storage locker or on latch straps on the rails for regular use at docks:

- Three 15-ft (marked with white tape), typically at the stern
- Three 25-ft (marked with blue tape), typically at the bow and midship spring lines

Stowed in the transom storage locker:

- Extra dock lines including two 50-ft lines (marked with red tape) that work well in transiting the Chittenden Locks

Black Fenders:

When not in use, store the smaller black fenders in racks on bow rails and stow the larger fenders in the cockpit or tied to the railing at the bow. As a general practice, we use the larger fenders, at least three of them, for the dockside of the vessel and we use the smaller fenders tied high for protection on the non-dockside of the vessel. Use the large white ball fender for the dockside protection at the point where the bow starts to curve inboard, usually attached to the railing just forward of the pilothouse door. The orange fender is to be used as a 'rover' placing it between *Sea Wings* and anything you get close to.

Boat Hook: Two telescoping boat hooks are available, one stored in the transom locker and one on top of the port fuel tank.

Dinghy Operations



Maritime law requires everyone under 12 in the dinghy to wear a lifejacket and all others to have a lifejacket readily available.

Prevent Mildew!

Please be sure lifejackets are bone-dry before stowing them.

Hanging them on the Bimini snap straps is a handy way to let them dry.

Launching:

1. Check to confirm the remote control is in place in the transom locker, starboard side. If not there, the remote control will be in the pilothouse cabinet, starboard side, forward of the electrical panel. Power is ON for the davit so long as the electrical switch for the stern thruster is enabled (down below, on inside of the transom).
2. Locate the key for the dinghy in the credenza drawer (it's on a float) and insert in the ignition.
3. Remove (if not already done) the canvas cover from the dinghy. Stow the cover in the engine room, aft and outboard of the batteries behind the port engine. Please stow it only after it is bone dry.
4. Make ready the stern and bow lines on the starboard side of the dinghy, loosely tie them to the lower cleats at the stern of *Sea Wings*.
5. Turn on the dinghy's master battery switch on the forward face of the helm seat. Assess the current position of the outboard, generally it can be trimmed all the way down and wheel centered.
6. **MAKE CERTAIN THE BILGE PLUG IS IN THE DRAIN HOLE AT THE STERN!!** It will generally be left in place as the dinghy has a bilge pump that is hot wired to the battery.



Stabilizing Lines

7. Remove the red and green stabilizing lines by first detaching the loop end at the shackles, then remove the D-clip at the dinghy attach point. Stow these lines in the transom. Ensure the shackles remain in place by closing the locking pin on the davit compression posts.
8. Carefully 'bump' the davit further UP to the point where the D-clip on the port compression post can be disconnected. Careful not to go too far or get your fingers pinched.
9. Now lower the dinghy with the DOWN command on the remote control. Lower the dinghy just to the point that it floats with a bit of slack in the lifting lines.
10. Board the dinghy using the port davit arm for support. Tweak the davit down further if needed and then disconnect the D-clips, first at the bow and then the two at the dinghy's transom.
11. Raise the davit UP to its normal full up position.
12. Adjust the mooring lines of the dinghy as needed.
13. Coil the remote control cable and stow it in the transom locker.



Starting the Outboard Motor:

1. Check the fuel line 'squeeze bulb' is firm.
2. Lower the motor to its full down position with the trim/tilt switch.
3. The Tohatsu outboard is fuel injected, no need to prime/choke. Ensure the throttle/shifter is in neutral position, turn the key and start. The engine typically starts after 2-3 seconds of cranking and will stabilize and be ready for departure in less than a minute when cold.

Retrieving and Loading:

1. To retrieve the dinghy, reverse the "Launching" procedure. **Note: Ensure there is not a lot of water in the bilge by momentarily activating the bilge pump until water no longer comes out the transom port.**
2. Trim / tilt the outboard all the way down, then bump it up for a couple seconds, cant the wheel slightly to port.
3. Position the dinghy approximately into place using the mooring lines of the dinghy.
4. Using the davit remote and managing the position of the dinghy, lower the davit arms until the lifting straps are just low enough to be attached, first at the dinghy transom and then at the dinghy bow. Adjust the UP / DOWN position of the davit to not be too low or too high.
5. Disembark all persons and all unnecessary gear from the dinghy.
6. Using the remote control, raise the dinghy to the full up position. Use caution to not bring it too far up hence preventing access to the D-clip attachment for the port compression

post. **Short bursts near the end to control the position, keeping your hands clear during this process!**

7. Attach the D-clip to the port compression post, then lower the davit just enough to approximately balance the weight being carried by the port and starboard compression posts.
8. Re-attach the red and green stabilizing lines, first with the D-clips at the dinghy end, then attach the red eyelet to the shackle on the port compression post. You may need to nudge the starboard tube of the dinghy up with your knee to have enough slack to engage the eyelet in the shackle.
9. Repeat the process for the green secondary line.
10. Ensure the chartplotter is powered OFF and the protective cover is back in place.
11. Turn OFF the battery master.
12. **VERY IMPORTANT:** Secure the dinghy painter line and mooring lines to the davit arms. Else these lines could get into the stern thruster or props.
13. Coil the remote control cable and stow it in the transom.
14. Remove the ignition key and return it to the credenza drawer.
15. When possible at the next marina stop, rinse off the dinghy and outboard with fresh water.

Outboard Fuel: Use unleaded regular (87 octane), non-ethanol if possible. **NO** oil mixture needed for the 4-stroke motor. **Please replace the fuel you use at the end of your charter.** The internal tank is eight gallons, more than most dinghies. We ask that you fill the tank to no more than 3/4th full as it will prevent 'burping' of the tank through the vent on hot, sunny days. This still means you have over 5 gallons of fuel in the built-in tank.

Dinghy Care:

- ✓ Keep the dinghy clean and firmly inflated. There is a foot air pump in the bow locker of the dinghy.
- ✓ A spare fuel filter is kept in the bin under the main seat.
- ✓ Dinghy toolkit is under the main seat of the dinghy.

If Dinghy doesn't run:

- ✓ Is the safety clip in place?
- ✓ Is there gas in the tank?
- ✓ Is the main electrical switch in the ON (Green) position?

If it still won't run or runs very rough, first suspect contaminated gas. If you can't figure it out, call the San Juan Yachting office or the owner for advice.

Trimming the Dinghy and Balancing the Weight: The dinghy is heavy aft so passengers should sit forward as much as possible and the engine should be trimmed all the way down. We've found that it rides well with the bow somewhat high in the water up to 2500 RPM and to plane the dinghy, you must raise engine RPM to 4500 or above and then can maintain on plane with engine speeds above 4000 RPM.

Anchoring the Dinghy: There is a collapsible anchor in the dinghy that can be attached to the end of the painter for anchoring the dinghy.

Going Ashore: Estimate the change in tide during your time ashore and secure the dinghy accordingly. The metal sand spike in the dinghy can be used to secure the painter on a sandy

beach. Otherwise, secure the painter to a log on the beach. And please be careful, many shores are rocky and will damage the hard bottom of the dinghy. Whenever possible, choose a soft bottom spot to land the dinghy.

Cleaning Your Shoes: Your shore shoes are likely to pick up gravel or dirt on shore. Please clean them off or remove them before boarding *Sea Wings*. A brush to help clean your shoes is stored in the transom cabinet, starboard side.

Use of Swim Ladder: The swim ladder is mounted on the swimstep and can be deployed while in the water, it provides a way to reboard the vessel once in the water. When the dinghy is properly secured, the swim ladder is also usable with the dinghy hanging in the stern davit.

Electrical Systems

The electrical systems of a vessel are its nervous system. *Sea Wings* has both AC (Alternating Current like you have in your home) and DC (direct current, much like you have in your automobile) electrical systems. All functions within the vessel that require power to operate get their power from one or more connections to the AC or DC power systems.

The electrical panel on the starboard side of the pilothouse is where you go to control the power status of nearly all the DC and AC systems using the circuit breakers. The notable exceptions are the engine start batteries which are remotely controlled via switches at the lower helm.



At the main electrical panel, the circuit breakers act like switches. White switches control 110 volt / AC systems; black switches control 12 volt / DC systems.

All circuit breaker switches have colored bands on them to indicate the typical / normal state:

Green: ON for all normal activities

Yellow: ON as needed depending on the activity, generally ON when underway

Red: OFF most of the time, activated only for select special circumstances

The **AC Main and DC Main breakers are at the bottom of the electrical panel.** The DC Main breaker should be ON during all normal operations. The AC main is actually two sets of breakers that are interlocked so that only one source of AC power can feed the ship at a time. Slide the interlock to expose the appropriate breaker source and then you can activate that source (shore power or genset power).

DC Systems: There are several systems that use DC power (from an on-board battery bank). So first, let's review just what is on board for DC power sources. There are:

- House Bank: three Lithium batteries connected in parallel, rated at 990 amp-hours combined capacity (750 amp-hours usable). This bank of batteries serves the many house functions including the frig/freezer, lighting, diesel heating, navigation electronics, and the windlass
- Port and Stbd Engine start batteries: one each per engine, group 31 AGM battery, which can also be combined in an abnormal situation
- Bow thruster: two group 31 AGM batteries in series solely for this system
- Stern thruster: two group 31 AGM batteries in series for this system; also powers the stern davit
- Genset start: one 4D AGM battery solely for this purpose; also available for backup house power in a reversionary mode

AC Systems: There are three sources of AC power for the ship: on-board generator, shore and on-board inverter. When using the generator (capable of 12,000 Watts) there is adequate power to run virtually everything on the vessel simultaneously.

But when using shore power or the on-board inverter, you will need to manage the power loads you allow to be active at any one time. Further, in the case of the inverter, there is a practical limit to the total energy that the house batteries can support before they need to be recharged. We will cover that later.

Let's just consider managing the total power draw. You will do this by using the AC circuit breakers as 'switches' to turn on and off functions. And with the knowledge of what a given function uses for power, you can estimate what the total load current will be and then select functions to turn off to stay within the available power level.

The basic formula is: power of a load (in Watts) = source voltage multiplied by the current draw (in amps). A conservative approximation is to assume the voltage is 100 (although it generally is 110-120 Volts), then the current required of any load is simply its wattage rating divided by 100. For example, a device with a 350 watt power consumption will require 3.5 amps of current to operate. Do that for each load and you can now determine when the budget will be exceeded.

Why do you have to do this? It is typical that a marina will offer power service limited at the main breaker on the dock to either 50 amps (6000 watts), 30 amps (3,600 watts), 20 amps (2,400 watts), or even as low as 15 amps (1,800 watts). Below is a table of the typical load required by various functions on board the vessel:

Coffee grinder	475 watts
Coffee maker	800 watts
House / Engine Battery Charger	3600 watts
Ice Maker	250 watts
Microwave / Convection Oven	1800 / 1400 watts
Portable Cabin Heater	750 or 1500 watts (depends on the heat setting)
Portable Hair Dryer	1200 watts
Starlink	100 watts
Toaster	650 watts
Water heater	1800 watts

Shore Power: The main power cord to feed the ship is available at the starboard lower corner of the outboard transom. The ship is designed for and the main power cable is rated for a 50 Amp, 125/250 VAC service connection. The cord itself is managed using the Glendinning Cablemaster system. Turn ON the DC breaker for the Cablemaster system and then the toggle switch on the transom above the cable outlet is used to manage deployment and retrieval of the main power cord. Depending on the service available at the shore connection point, you may need to use an adapter or power cord extension. The following are provided to accommodate the most common situations:

- 1) 50 amp ship's connection to a 30 amp shore service connection
- 2) 30 amp service extension cord (yellow)
- 3) 30 amp service connection to a 20 amp service connection

Once connected to a shore power source, enable that source to feed the ship by engaging the main AC breaker at the bottom of the electrical panel. The AC voltmeter will register the voltage of the shore power and you can then use the AC breakers to manage the total applied load.

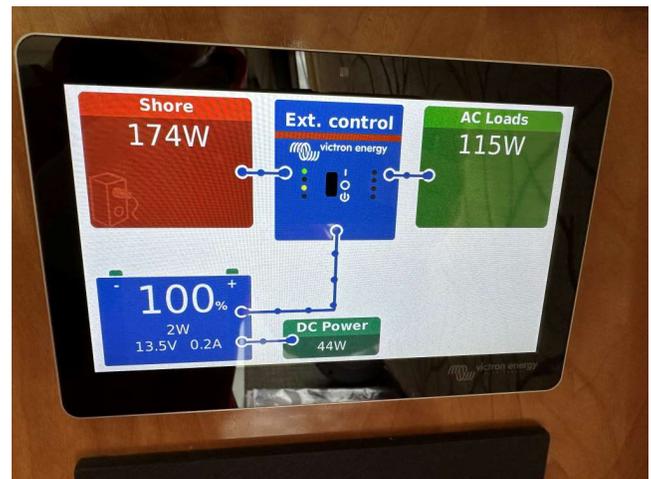


House Battery Monitor:

The ship's house batteries are an important resource. They provide the power source for many systems including navigation electronics, lighting, cabin heating, water pump, and head pumps. Without sufficient DC power, the ship gets very quiet and very dark. So, managing DC power usage and taking action to recharge when needed is an important state to manage.

Fortunately, with the switch to Lithium batteries for the house bank and the addition of a solar panel, the capacity of the house bank is huge (750 amp-hours) and the solar panel will work to replenish used capacity when the sun / sky conditions are able to generate positive charging current.

The color touchscreen monitor that is mounted on the side of electrical panel is the key interface to the battery management system. Depicted in graphical form, you can see the direction of current flow, total power usage and the house battery status (voltage, charging current in or sourcing current out and the computed State of Charge (SOC). The key parameter to monitor is SOC. 100% is completely full, below 15% will trigger a shutdown of the Lithium Battery Management System (BMS). **We ask that you avoid getting below 25% SOC; an aural alarm will sound if you reach 20% SOC.** As you would expect, the appropriate action if getting down to these levels is either to start the genset to allow the battery chargers to do their job or plug into shore power or be underway with the engine alternators providing the charging power.



We've found that on a typical overnight at anchor, starting with 100% SOC, the level will be above 70% the next morning (ie, less than 30% capacity used, depending on what systems are active). Based on that experience and depending on the solar panel contribution during daylight hours, you may find that you can be at anchor for more than 24 hours without the need to start the genset. Of course, a lot depends on what systems are used during that period, the fridge and diesel heating systems are the largest draws of DC power, and of course, use of the inverter for things like the microwave or Starlink will contribute to the total amp-hours consumed.

To boil it down to a simple recommended practice: monitor the SOC periodically throughout your trip, take appropriate action to keep it from getting below 25%. And ensure the SOC is at least 60% before retiring for the evening. Following that practice, you should be able to keep the green breakers ON at all times, use the diesel heating to the level of comfort you like and enjoy your time aboard.

As another datapoint, a 10% increase in the state of charge (SOC) of the Lithium batteries is equivalent to approximately 100 amps of charging current applied for an hour. The genset, the engines or shore power are all capable of supplying such charging currents depending on other loads that are active and the battery temperatures. The battery management system will throttle charging currents to the optimal level at all times and the best way to monitor the SOC is via the main screen at the electrical panel.

Inverter:

The inverter is a great device, it will take DC power from the house batteries and convert that energy into AC power. The circuits that can access this AC power are the two outlet breakers that control all the AC outlets throughout the ship, the microwave and the ice maker.

The inverter is controlled through the Victron Energy control panel on the aft side of the electrical control panel cabinet. The house batteries will charge automatically when either shore power or generator is connected and the toggle switch is in the "Charge Only" position. When not connected to shore power and you wish to use the inverter, move the toggle switch to the ON position.



As stated earlier, two considerations when using the inverter:

- 1) consider the total load to be drawn and manage that usage to stay below the output capacity of the inverter. It is capable of 3000 Watts of AC power generation. So, you will need to manage the loads drawing power to stay below the 3000 Watt limit. Use the same table presented earlier in making this assessment.
- 2) Monitor the SOC for the house bank and ensure you stay above 25%. A better practice if below 30% is to start the genset and let it run for a while to bring the SOC back up at least into the mid-range (60-80%). And of course, if you need to run a heavy AC load like the microwave or convection oven for an extended time, please run the genset and have it on-line to support that high energy usage and work on battery charging at the same time.

Do the various battery banks automatically recharge while cruising under engine power? Shore Power? Genset Power?

Yes! All other batteries including the engine start batteries, the thruster banks and the genset start battery all charge whenever there is a charging source available, either the engine alternators, shore power, generator power or even solar. Of course, the rate of charging will

vary with the capability of the charging source and other controlling factors for the entire battery management system.

Battery Switches: There are numerous control and disconnect switches in the electrical system, many of them on the board aft of the port engine. In general, we recommend that you not change any of the selections without consulting with a San Juan Yachting office person or the mechanics for the vessel, both of which have their contact info listing in the Charter Guest Reference Manual on board the vessel.



Engine and Thruster Systems

Access: Through a hatch in the cockpit deck or the floor hatch in the galley. Engine room lights are controlled by a breaker on the main electrical panel. The engine room lights are long life LED lights but please remember to turn them off when done in the engine room.

Electronic Shifters/Throttles: *Sea Wings* has integrated shifters / throttles. They provide smooth, easy control of each engine (rpm and gear shift) through a single lever for each engine. The system is electronic and controlled by a computer in the engine room. The commands from the controls are converted to mechanic cable actions for each engine in terms of tranny and throttle commands. The system is enabled through the "Eng Cntl" switch at the lower helm. The computer has two independent DC power sources for redundancy (the two engine start batteries).

The controls at each helm are identical. The buttons and associated LED lights provide status on the operating mode of the system, as follows:



Mode	Description
CRUISE	This is the normal mode that the system is in while in control of the engine throttles and gear shifters. While in CRUISE mode, the ACTIVE light will be illuminated, the WARM/SYNC light will be OFF. The Neutral lights will be illuminated or off as appropriate for the position of the levers. The levers have a center detent position which is Neutral for the respective tranny, then slight forward or aft movement to a second detent engages the tranny in forward or reverse, still at idle speed. Advancing a lever further away from the second detent will increase the engine rpm while in gear. RECOMMENDATION: practice moving the levers mechanically before starting the engines to get a feel for the motion.
WARM	The system will default to this mode when first powered ON and the LED will be illuminated. A single press of WARM/SYNC button will toggle the system between WARM mode and CRUISE mode, again, when the engines are in neutral. In WARM mode, the levers can be advanced out of the neutral detent and increase the engine rpm while the tranny's will remain in neutral. It facilitates engine warm-up at the dock. WE RECOMMEND YOU DO NOT USE THIS MODE, THE ENGINE COMPUTERS THAT MANAGE THE JOHN DEERE ENGINES WILL AUTOMATICALLY INCREASE ENGINE RPM'S WHEN STARTING A COLD ENGINE AND RAMP THE RPM'S DOWN TO NORMAL IDLE SPEED (600 RPM) WHEN APPROPRIATE.
SYNC	With both engines in Forward, a single press of the WARM/SYNC button will enable the control of both engine's throttle setting and keep both engines at the same rpm (plus or minus a few rpm). The starboard lever will be the master for both engines. It is best practice to keep the port lever in approximately the same physical orientation as the starboard lever. Sync can be cancelled by a single press of the WARM/SYNC or it will cancel if both levers are put into neutral.

How to transfer control between helms: The system will remember which helm was last active and power up in that same 'Active' state and in WARM mode. You can transfer control from the 'Active' helm to the 'Inactive' helm in three steps at any time (however we recommend that this process be initiated when in neutral or in forward gear at less than 800 rpm):

- 1) At the Inactive helm, the NEUTRAL and ACTIVE lights will be flashing at a slow, two second rate. Position the levers to approximately the same physical position as the currently ACTIVE helm.
- 2) Press the ACTIVE button at the currently INACTIVE helm, the lights will blink faster, once every second (indicated that transfer request is in process).
- 3) Now momentarily press the ACTIVE button a second time, transfer will be completed.

During step 2) above, if the blink rate did not change, it indicates that the levers of the currently inactive helm are not sufficiently matched to the position of the active helm. For example, the system won't allow transfer if the inactive throttle levers are above the current engine rpm setting. Simply retard the throttles a bit until the blink rate does change. Then step 3) will be possible to confirm and execute the transfer. Note that the inactive throttles could be positioned significantly less than the current rpm level and hence the vessel will slow down abruptly when you execute the transfer. Hence, we generally find it better to initiate the transfer when in neutral or the engines are running close to idle speed (less than 800 rpm).

Note as well that the above process must be completed within approximately 12 seconds, else the transfer will be invalidated and control will remain with the active helm.

How to use the Sync mode: SYNC mode provides a convenient way to match the rpms of both engines, which is a good practice and results in quieter operation (less 'beat frequency' noise from the engines). You may initiate SYNC by first satisfying the following criteria:

- 1) both engines are in forward gear
- 2) the difference in engine rpm between the two engines is less than 250 rpm

Once the criteria are true, momentarily press the WARM/SYNC button, the light will illuminate and the port engine rpm will be adjusted to match the starboard engine rpm. Now simply control both engines with just the starboard lever. It is best practice to continue to move both levers to 'match' the physical position of the starboard lever so that when SYNC is canceled, there isn't an abrupt change in the port engine rpm.

Cancel SYNC with a momentary push of the WARM/SYNC button. SYNC mode also cancels if both levers are moved to neutral.

Caution: The electronic throttle/shifter system has protective delays built into it to prevent accidental commands that could damage a transmission (ex., a fast shift from forward to reverse with no delay, that command will be delayed allowing time for the prop to spin down before engaging it in the opposite gear).

Starting: The twin 375hp, 6-cylinder turbocharged John Deere engines drive the propeller shafts directly through inline 2:1 reduction gear transmission with driplless shaft seals. The engines require no preheating during the normal seasonal conditions (see below for circumstances that warrant the use of engine block heaters). Be sure you do a visual inspection of the engine room looking for signs of something amiss. It is normal procedure to check engine oil level once per week, then conduct a daily visual check for signs of fluid seepage / loss the rest of the week. Visually check the coolant overflow reservoirs, engine / genset thru-hull valves, sea strainers and fuel filters.



Begin by setting the "Eng Cntl" switch to ON and the Port and Starboard Engine batteries to ON. The keys at the lower helm have two positions, Off and Run. Turn the key to the Run position, wait for the 'Murphy' display to power up, ensure both levers in neutral, Active control selected at the appropriate helm, engage the starter and the engine will start with ease. You may start the engines at either helm station after turning on the keys at the lower helm. We recommend you pause for 15 seconds after the first engine start before starting the second engine. Follow the quick start procedure.

In the unlikely event that either engine is sluggish to turn over, it suggests that the associated engine battery is weak. Use the combine switch at the lower helm to "combine" (ie, parallel) the two start batteries together. **Remember to turn OFF the combine function after a successful start and monitor each engine's alternator voltage,** it should be indicating 13.5 VDC or higher.

Cold weather OPS: Each engine has an AC powered block heater that can be used to warm the engines when the ambient temp is 35 F or below (not common during the charter season). They are controlled by breakers on the AC electrical panel and can be powered by shore power or the genset. Use them for 1-2 hours prior to engine start will make for quicker warmup of the engines and reduce wear / tear. Remember to turn off the block heaters prior to engine start.

Keys: The two ignition keys are interchangeable. Please keep the keys in the ignition switches at all times. A spare set of ignition keys are stowed with the spare engine parts under the forward end of the guest VIP stateroom berth.

Engine Alarms: The engines are managed by an Electronic Control Module (ECM computer). The ECM has numerous sensors for various engine parameters and uses those to create any cautionary or warning alarms. The Murphy LCD display is the visual screen for the ECM and will annunciate any abnormal conditions. In general, a caution (yellow) alarm should result in immediate action to slow the vessel, consult the Murphy display and potentially shut down the alerting engine. A warning (red) requires immediate action to slow the vessel and shutdown the alerting engine as soon as possible.



Engine Warm-up / Normal Indications: Start-up and initial running of the diesel engines is when most of the wear occurs. Allowing the engines to reach normal operating temps before putting them under heavy load is critical to ensuring long life and trouble-free performance.

- Don't plan to leave the dock until the engines have idled for a few minutes. You'll notice on a cold start, the ECM will automatically keep the idle speed at somewhere between 650-750 RPM and after a minute or so, it will lower the idle speed to 600 RPM.
- We recommend you monitor the coolant temp and depart only after the temp is 80 F or above.
- Idle out of the harbor / anchorage area.
- Keep engine speeds below 1000 RPM until temps are above 135 and below 1300 RPM until engine temp reaches 155 degrees.

Normal Readings after warm-up: Engine temp. 155-165, Oil pressure: 30-45 psi

Optimum RPM for low-speed cruise efficiency: approx. 1100 - 1250

Optimum RPM for high-speed cruise efficiency: approx. 1700-2000; **Do not run** at wide open throttle (2400 RPM) nor run above 2000 RPM for more than short durations.

Shifting: Shift gears only at idle RPM. Allow a couple seconds between shifts from forward to reverse or vice-versa. Dockside maneuvering should be performed with the engine rpm's at dead idle speed and rudder amidships.

Bow and Stern Thrusters: The thrusters are controlled from the dedicated joystick controls at each helm. The thrusters are quite capable of pushing the vessel sideways but you will notice the bow thruster seems more effective than the stern thruster. It is a good practice to make short bursts of thruster engagement and then evaluate if the vessel is making adequate progress in the desired direction. Too much input generally results if further inputs of the opposite direction to slow or reverse excessive movement. Learn to make less of an input and wait to see/evaluate the result.



The thrusters are high current, short term use devices. They will significantly drain the dedicated batteries if overused and potentially will overheat and shut down to protect the motor from damage. Both thruster battery banks will recharge whenever there is an active charging source available via a DC-DC charger. The bow thruster also has a backup dedicated charger that is normally left off.

Note that once activated, if there is no use of either thruster, the control panel will shutoff automatically after ten minutes.

Exhaust: Each engine has two exhaust ports, an idle overflow port visible just at the waterline on the aft portion of each side of the ship. Exhaust fumes and some water flow will exit these ports during very low speed operations. A second set of exhaust ports are plumbed into the bottom of the hull (underwater ports). Above 1000 RPM, most of the exhaust gas and seawater passing through the engines will exit via these ports. That's a real benefit as it keeps exhaust fumes and sooting of the stern to an absolute minimum. Nevertheless, **please keep salon door closed while engines are running** to prevent diesel exhaust film from settling on interior furnishings.

Pumps: The engines are dependent on several pumps to operate properly. Most important of these is the seawater (raw water) pump on each engine, which circulates seawater through a heat exchanger to cool the engine and transmission, then expels the sea water through the exhaust system to keep the exhaust pipes cool. If a pump fails, it could severely damage the engine. We've added temp monitors to both engine exhaust tubes and the exhaust hose of the genset. The monitor is integrated into a digital display at the lower helm adjacent to the tank monitor. Thresholds have been set for what will trigger a high temp alarm. If that happens, please



investigate at once, throttle back or shut down the alarming system and then call San Juan Sailing and Yachting for assistance.

If a pump seems to have failed, the usual causes are:

- Plugged intake. Is there plastic wrap, seaweed, jellyfish or other obstruction?
- Clogged sea strainer. Is there debris in the sea water strainer for this engine?
- Failed impeller in the pump itself?

Troubleshooting any of the above problems takes only a few minutes:

1. Turn off the seacock to the pump on the defective engine.
2. Take the top off the sea strainer. Save the gaskets!
3. Open the seacock valve to make sure it is clear (water won't gush in but will start to overflow the strainer, a plastic bag and / or towel is handy to capture the water while you are confirming water flow).
4. If the strainer is clogged, rinse in a bucket with clear water and a hose if available. You can also rinse it in the sea but don't let go, it won't float and operation without it in place will damage the engine.
5. If seacock and strainer are clear, the problem is likely the pump impeller. Time to call for help using the emergency contact list.

Fuel: Each engine has a "supply" and a "return" hose. Racor primary fuel filters are mounted inboard of the fuel tanks and do not require service unless the bowl is full of sediment and / or the disposable filter is clogged. The condition of the filter can be monitored by the vacuum gauge. The gauge has a 'memory' function where the highest vacuum measured is shown. Perfect filters will result in less than 2.5" of vacuum at high cruise speeds. If the max vacuum measured is above 5", it is time to report the condition for timely maintenance. The engines will still function acceptably but may need to be run at reduced RPMs. If the primary fuel filter must be replaced, it is relatively simple. Call for help and guidance. Spare filters are under the forward side of the Guest VIP berth.



Shaft Logs: Shaft logs are watertight fittings that prevent water from coming into the boat around the holes where the propeller shafts exit the hull. *Sea Wings* is fitted with excellent shaft seals. There should be no need to adjust these. If there is any sign of water dripping / concern, contact San Juan Sailing and Yachting.

Checking Engine and Genset Oil Levels: The oil used in the engine and genset is the same, 15W-40 weight Chevron Delo 400. Spare oil is kept in the bilge forward of the starboard engine and the containers are labeled. Check oil levels on the engines and genset once per week, then in between, conduct a daily visual inspection for new spotting. If spotting occurs, investigate or call San Juan Sailing and Yachting for advice.

For the engines, there is a dipstick midway along the inboard side of the port engine. There is a dipstick on both sides of the starboard engine. For the most reliable indication on the starboard engine, use the outboard dipstick.

Using a clean paper towel and with the engines off for at least a few minutes, pull the dipstick and wipe it clean. Then reinsert it fully and then pull it again. The oil level should be between the upper XXX mark and the lower fill mark on the dipstick. If below the lower mark, add oil to the engine via the dipstick port (its wide enough if you use care). You should also question why oil is needed if it is a sudden change during your trip as these engines use very little oil over a period of 50 hours. If the oil level is suddenly lower / low, the real question is why? Look for spotting or leakage. Call for advice if in doubt.

- **Note:** diesel engines create some residue as part of the combustion process that ends up accumulating in the oil, hence in part why the quantity of oil in a diesel engine is so much more than a gasoline engine. A by-product of this process is that the engine oil will appear very dark, almost black even after just a short time of operation. This is normal.

Similarly, the genset oil level can be checked. The oil dipstick is behind the forward cover of the enclosure. Using a clean paper towel and with the genset off for at least a few minutes, pull the dipstick and wipe it clean. Then reinsert it fully and pull it again. The oil level should be between the upper and lower marks on the dipstick.

Coolant: Engine coolant should be above the "ADD" level in the reservoirs on the forward support posts of the engine room when the engines are cold. There is spare coolant in the bilge area forward of the starboard engine. Note that the raw coolant is concentrated and must be diluted to a 50/50 mixture of coolant and distilled water before use. We keep a marked gallon container of premixed coolant that should be used.

If it becomes necessary to make more diluted coolant, use the half gallon empty container to measure out first a given portion of coolant and then an equal amount of distilled water, pouring each measured amount into the pre-mixed gallon container. Distill water is store outboard of the starboard just aft of the bow thruster battery box.

Mixing coolants is discouraged and in fact can cause harm as not all coolants are compatible. We exclusively use Cat DEAC coolant (purple in concentrate form) and spare concentrate is on board, kept in the engine room, behind the storage bins forward of the starboard engine.

Fueling Process: Port and Starboard fillers are located on the cockpit deck. A cap key (on a floating key ring) is in the storage bin just inside the lazarette. A spare can be found in the credenza drawer in the salon.

Estimating how much fuel you will need can prevent overfilling and spills:

Sea Wings carries 600 gallons of diesel (300 gallons on each side). Each tank level is shown on the tank monitor at the lower helm. These gauges are reasonably accurate but a more precise reading can be obtained by using the metal yardstick (located on top of the port fuel tank). Wipe the yardstick clean prior to using as dirt added to the tank is not a good thing! Holding the whiffle ball, lower yardstick into the tank until it touches the bottom. The level of diesel indicated on the yardstick can be easily converted to gallons in the tank. The tank is 30" high, every inch is 10 gallons. Take the yardstick measurement, multiply by ten, that's the number of gallons in the tank. That amount subtracted from 300 is what is needed to fill the tank. Either method is a good way to estimate how much fuel you need before you begin filling.

While filling, be certain to form a "doughnut" around the filler hole with paper towels or absorbent pads. As you fill, listen for a change in pitch as the air exits the tank. Another clue is that marine diesel will foam quite a bit while filling the tank so watch for that as it will start to

bubble up the fill tube as you get near the full point of the tank. When you get close to the expected amount needed for the tank, that's when to be particularly careful and reduce the flow rate. You have filled the tank sufficiently when: 1) you first see fuel / foam starting to come up the fill tube. Wait a few seconds, then slowly fill some more. 2) stop and call it good when you see the fuel/foam for a second time.

Remember: Protect the environment. Fuel spills are your responsibility and may need to be reported to the Coast Guard.

Note: there is a gravity based fuel cross-feed with shutoff valves that connect the two tanks. Normally these valves are closed. It is a good idea to confirm they are closed prior to refueling as you'll be slowly transferring fuel to the opposite tank when refueling the first tank if both valves are open. You will find the valves on the lower inboard corner of each tank.

Tip: if you are expecting to add more than 300 gallons of fuel (150 or more per tank), we recommend you fill one tank partially, then fill the other tank completely, then go back and finish the fill of the first tank. Why? Diesel fuel is 7 lbs / gal, with 150 missing on each side, if you filled one tank completely, then the other, you would have at least a 1000 pound imbalance between the tanks, Sea Wings will list noticeable in such a condition. It's better to incrementally top off fuel on each side.

Fuel consumption: *Sea Wings* uses approximately 0.66-0.8 gal/nm at a cruising speed of 7-10 knots and approximately 1.2-1.5 gal/nm running at fast cruise (14-18kts). The Murphy digital displays have a selectable screen format that will show actual measured fuel flow in real time.

As owners, we've found it most comfortable to cruise at 8-10 knots with an engine speed of 1100 – 1250 RPM. It allows time to enjoy the scenery and maintains a relatively quiet salon noise level while being able to cover reasonable distances in a day. We've also found that it's not good to baby the engines all the time, they are meant to run at high-speed cruise loads. Running at those higher speeds ensures carbon buildup is kept at a minimum. So please run at higher speeds of at least 1750-1850 RPM at least every other day for 15 minutes or more. And when running at these speeds, the trim tabs will be fully 'bow down'. After slowing down, remember to return the tabs to the full 'bow up' position.

Checking Transmission Oil Levels: The oil used in the engine transmissions is different than the primary crankcase engine oil. For the transmissions, it is straight 40W oil and spare oil can be found in the bilge forward of the starboard engine (be sure to check the label to find the correct container). The dipstick for the transmissions is found at the rear of each engine, down low and to starboard of the drive shaft. It has a rubber cap with grooves at the top which secure it in place.

Transmission oil is checked by the San Juan staff during each turnaround of *Sea Wings*. Therefore, unless there is spotting or other evidence of a leak, there is no need for a charter guest to actually check this fluid level.

If it becomes necessary to check the level, it is done without the engine running. This is best done during the morning check of the engine room. Using a clean paper towel, pull the dipstick and wipe it clean. Then reinsert it fully and then pull it again. The oil level should be between the upper and lower marks on the dipstick. If the oil level is below the lower mark, use a funnel

and the provided 40W oil. It won't take much to move the level on the dipstick, the capacity of each transmission is 3.5 quarts in total. If oil is added, please make note of it and mention it to San Juan staff during your check-in at the end of your trip as it is a potential indication of a more serious issue.

Entertainment and Connectivity

Audio Amp / Surround Sound System

The salon has a surround sound speaker system and subwoofer to provide a hi-fidelity sound experience. A Denon audio-video receiver (AVR) is the central component that manages the audio and video delivery to the TV and the speaker system. Selectable sources include broadcast radio, DVD player, Roku, Internet Radio, Bluetooth content from an external device and an external HDMI content source.

Use the provided wireless remotes to control the amplifier AVR, the Blu-ray DVD player, the Roku and the TV.

The salon TV is on a remote-controlled lift. The lift will automatically raise or lower the LCD TV once activated via the remote.

For more guidance, consult the laminated user guide for the entertainment system, stored in the forward port cabinet pictured here.



Wi-Fi On The Go Via Starlink

We have found that some guests like to stay connected to what's happening in the world. As a solution, we've added a high performance Starlink system with mobile data service coverage. It should provide more than adequate data connectivity for any of your smart devices and the entertainment systems on board. You simply connect to the Wi-Fi signal 'SW Starlink' (password is posted on the inside cover of the Charter Guest Reference Manual) and you can take advantage of this on-board service.



The system is AC powered, so either shore power, genset power or the inverter is enabled. Power consumption for full-time service averages about 100 watts; given the upgraded house battery bank and solar power, we expect that you can leave the system on 24/7. See the discussion in the Electrical section of this manual for further information on managing the house bank state of charge (SOC).

Reminder: service restores a few minutes after boot-up, as the system acquires satellite paths for internet connectivity.

Reports on performance are positive, however there's no guarantee of service, it is a best effort capability. We hope it opens a new window of capability for those that want to stay in touch while cruising the Pacific NW.

Tip: Use of the TV while underway:

The TV lift is sturdy and in mild sea conditions, it is permissible to be underway with the monitor up and operational. But if conditions are expected to be more challenging (3-ft. waves or winds above 20 kts), please refrain from using the TV and stow it in the lowered position while underway.

Flybridge Stereo Radio

There is a typical car stereo installed in the starboard side of the flybridge helm. Speakers are installed in the radar arch. This radio can also play CDs or external media from a smart device. A cable to connect to the radio is kept in the middle drawer of the salon credenza.

Flybridge and Cockpit

Flybridge

Lighting: “Arch Lights” switch on panel controls lights on flybridge. The breaker switch enables power to the circuits and individual toggle switches on the flybridge activate the lighting systems:

(1) Radar “Arch Lights” and (2) “Deck Lights” (floodlight above the dinghy).

Canvas and Strataglass Enclosure: The flybridge enclosure is normally kept in place for the cruising season as it provides additional sheltered area while cruising. On warmer days, you can create good cross ventilation by opening one or more of the following: the zippered vents at the top brow of the forward Isinglass, the sliding side windows to port and starboard, or the aft sliding door. We’ve found that opening the aft door and partially opening the forward vents or side windows provide sufficient airflow to keep the environment comfortable in all situations.

Care of the Isinglass is relatively simple. To remove saltspray, liberally hose off with fresh water. Then let air dry or carefully use a soft cloth or towel to wipe dry.

Be careful not to leave navigation electronics uncovered and exposed to weather or overnight dew if the side windows are left open.

Sliding Hatch to the Flybridge: The hatch slides to port to open and has a simple latch to secure it in the full open or full closed position. While underway, please always secure the hatch in one of the two locked positions.

Caution: We’ve found that it is possible to lock yourself out on the flybridge by inadvertently closing the hatch all the way in the closed position. The simple latch may lock into place! So take care not to fully close without having someone below to open it up!

Cockpit

Lighting is controlled with the lowermost switch adjacent to the salon door.

BBQ: See the “Galley” section.

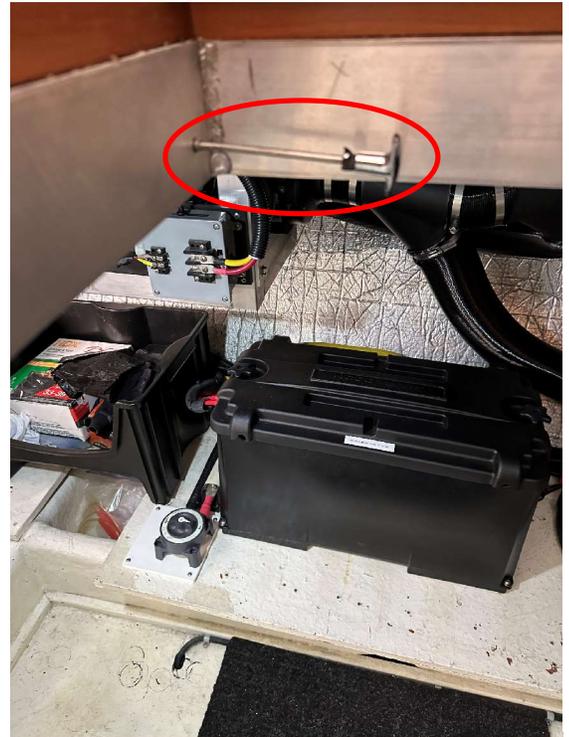
Flags: A U.S. flag on a wood flagstaff fits into the mount on the top center of the railing on the aft end of the flybridge. Use the thumbscrew to lock it securely in place. Tradition calls for this to be in place during all operations of the vessel as a declaration of the ships country of origin. An optional San Juan Yachting pennant clips on to the bow staff. While cruising in Canadian waters, fly the Canadian flag as a show of respect on the bow staff, but only after clearing Canadian customs . Please be sure flags and pennants are **completely dry before stowing** them in the pilothouse storage cabinet on the starboard side.

Cleaning Supplies: Boat soap, deck brush, etc. are stowed on the port and starboard sides of the aft bilge adjacent to the fuel tanks.

Securing the Ship

There are several things to do to ensure the ship is secured / locked prior to leaving her and your valuables inside:

- 1)** Lock the pilothouse door, the slide lock will be in the down position to be locked.
- 2)** Close the lazarette hatch and then engage the cable latch by ensuring the 'T' handle is not extended. This handle is accessed in the aft port corner of the galley hatch to the engine room.
- 3)** Lock the flybridge hatch
- 4)** Lock the salon door



Galley, BBQ, Crab Equipment, Vacuum, and Windows

Cooktop: Turn the propane on in 3 steps:

1. Open valve on propane tank that is connected (in the box on swim step). Note the box lid does not have a hinge lock but will tilt far enough to stay open. Yet, be careful as a gust of wind could blow it shut unexpectedly. Best to close it as soon as possible.
2. Turn ON the DC frig circuit breaker (it's the power source for the step 3) switch). We normally leave this switch on at all times.
3. Turn on propane solenoid switch in the galley, forward and to port of the frig.

Burners have an ignitor, simply depress the control and rotated counterclockwise to a low temp setting, then increase to a medium temp setting all while keeping the control depressed. Allow the flame to form and wait 3-5 seconds before releasing the control and adjusting for the desired flame.

Generally, the burners will light with ease unless the gas line has not been used for some extended time. In that case, it may take up to 15 seconds or so for the gas supply to fill the line and reach the burners.

Beware: Keep large kettles and pans positioned so that they don't deflect excessive heat towards the burner controls, it may melt the control knob!

Steam: If cooking creates a lot of steam, please open the pilothouse and salon doors to encourage air flow or use a fan to help circulate the steam to minimize buildup on upper cabinets and ceiling in the galley.

Crab or Shrimp Boil: We have provided an auxiliary propane cooktop and dedicated propane hose to use for boiling a large pot of water on a table in the cockpit. The amount of steam that comes from such cooking can leave a film and smell in the galley area that is hard to clean. So please use this cooktop for this purpose. It is stowed in the transom storage cabinet and can be set up on the cockpit table stowed in the lazarette.

Microwave/Convection Oven: Many of the basic controls are self-explanatory. See the instruction manual stored in the appliance garage just forward of the cooktop.

We've found the convection oven to be very productive. We've baked whole chickens and bread in it with excellent results. Note that it can be run from any AC power source, either shore power, the genset or the inverter. We would urge that if you intend to use the convection oven function or microwave for more than ten minutes total, start the genset or be using shorepower for best results and minimal drain on the DC battery systems.

Fridge / Freezer: The refrigerator / freezer runs strictly on DC power. The compressor and cooling fan are very quiet but can be heard if you listen carefully.

Inside the fridge at the top are the temp controls / indicators for the freezer and fridge. They are preset for 18 F for the freezer and 36 F for the fridge. We've found this modern unit to work extremely well. Please don't change the control settings.

Note that unlike a modern household fridge, this unit does not have an automatic method of evaporating water that forms during a defrost cycle. There is a small water collector bin in the starboard aft corner of the fridge. Please check it every 2-3 days especially during the warmer months and empty the water overboard.

Disposal: The galley sink disposal discharges waste directly into the sea (under the water line) as "gray water," which is permissible in both U.S. and Canadian waters. Run tap water while running the disposal.

Countertops: The countertops are Corian and are very durable. **Please do not cut or chop food on the Corian surfaces. Please do not put hot pans from the stove or oven directly on the countertop or table.** You will find cutting boards and heat-proof trivets stowed in the galley under the stove and in the forward galley cabinet.

Pilothouse Settee: The pilothouse settee is a distinctive element of *Sea Wings*. From this seating area you have a very broad view of the surrounding waters / landscape. Enjoy! The



tabletop is a high gloss wood finish, please exercise care so that it continues to look sharp for future charter guests. **Please do not sit or lean on the table top, it will stress the mounting of the table stand.**

Drying dishes: A dish strainer set is kept in one half of the galley sink. Please take care to dry dishes and flatware thoroughly before putting away.

Small Appliances: Using too many at a time may cause an outlet circuit breaker to 'trip'. Unplugging them when not in use helps to conserve inverter battery power while at anchor.

BBQ: The BBQ grill is mounted on the transom. Please secure the lid and keep the canvas cover on when cruising. A propane hose for connection to the grill is permanently attached and connected within the propane locker. Gas flow is enabled using the same process as for the galley cooktop with one additional step. There is also a dedicated ¼ turn gas valve that must be in the 'open' position to allow gas to flow to the grill, it is painted yellow and you will find it tucked along the forward side of the port propane tank.

The grill has an ignitor which we've found to be reasonably reliable. But if you have difficulty, use a butane lighter stowed in the galley. BBQ cooking utensils are also stowed in the galley.

Cleaning the Grill: Please keep the grill clean inside and out so that food stains won't build up and it will look good for the next charter guest. A good practice is to run the grill burner on high with the lid closed for 10-15 minutes after all grilling is done, then use a pair of tongs and a wad of aluminum foil to 'brush' the grill grates and remove the charred residue.

Crab Fishing and Cooking Equipment: A collapsing crab cage is stowed in the lazarette forward of the port fuel tank, along with line, a buoy and a bait box. The crab cooker pot is located in the galley, under the sink, aft.

Vacuum: A portable vacuum cleaner with attachments is kept in the companionway closet. Use it as appropriate to keep things clean or clean up a accidental mess.

A Note about Cleaning Windows:

Glass Windows: There is a spray bottle of vinegar based cleaning solution under the galley sink. Use that and paper towels only for touching up glass smudges. NO Ammonia-based products, please, as they destroy the UV protection built into the glass.

Plastic Windows on Flybridge: The plastic is fragile and should only be cleaned with liberal quantity of fresh water, then allowed to air dry. NO squeegee and NO abrasive material, please. If the windows have fogged up in the morning, use a soft cloth to wipe away the condensation and open some vents or windows slightly to allow air exchange.

Genset (Generator) System

The diesel-powered AC generator is installed and has a capacity of 12.5 KWatts (100 amps at 125 VAC). The ship's AC electrical system is limited to 50 Amp service so the genset can easily source the entire ship and have only a 50% load.

Starting the generator is a **10-sec. sequence**, using either the switches in the lower aft corner of the main electrical panel or the matching switches hung from the ceiling just above the genset.

- 1) Hold the PREHEAT switch ON for **5 seconds**. Continue holding it while you perform the next step.
- 2) Toggle the ENGINE CONTROL switch to START; hold **2 seconds** or until generator starts. Release START switch; continue holding PREHEAT switch **5 more seconds**, then release it.
- 3) Look over the starboard side at the generator exhaust. Water should be flowing from exhaust opening. If not, stop the generator and check strainer and the thru-hull valve.
- 4) After 1-2 minutes of the generator running under no load, bring the generator online with the ship's AC circuits by engaging the main breaker at the bottom center of the electrical panel. You will see 115-125 volts on the AC voltmeter.
- 5) Activate AC loads as necessary through the AC circuit breakers at the electrical panel. (Be aware that switching on too many AC loads at the same time could trip a breaker switch.)



To stop the generator:

- 1) Remove the electrical load from the generator by turning off the generator master breaker at the electrical panel.
- 2) Run the generator with no load for a 2-3 minutes cool-down period.
- 3) Toggle the generator toggle switch to the STOP position for a second and release, the generator will shut down on its own.

Note: The generator monitors its own operational parameters and will shut itself off if there is low oil pressure, low coolant level or high coolant temperature.

Backup house bank using the generator start battery:

The genset start battery is also capable of being used to source power to the house bank in case the Lithium BMS fails or shuts down the primary Lithium batteries. Without an active house bank, many of the ship's systems will be inoperable. Hence, if this failure situation were to happen, the genset start battery will act as an alternative source. Consult the San Juan Sailing and Yachting office or emergency contacts list for guidance on engaging this reversionary mode. And expect that you'll need to carefully manage the amount of DC power being used and run the genset more to replenish the genset battery.



Note: The Victron BMS gauge at the lower helm is used to monitor the condition of the genset battery.

Head Systems

The main cause of problems is misuse. Dealing with a stopped-up head is an unpleasant task, especially when it can easily be avoided. **The only things that should be put into the head are human waste. Under no circumstances should Kleenex® tissue, feminine hygiene products, or wads of hair be flushed down the heads.**

It is current SJS&Y practice to provide household quality toilet paper, not the ultrathin marine toilet paper and dispose of the used paper in small sandwich baggies. We keep a supply of small plastic sandwich bags (with Ziploc closure) at each head as a dedicated disposal bag for all toilet paper. Put that bag into the trash bin under the vanity sink, hence never flushing any paper down the head. One less thing to cause problems. Change the trash bin as needed to keep things fresh and the net result is no problems with clogged heads

Flushing: The Vacuflush system uses fresh water from the tank. Flush by depressing the flush pedal beside the toilet bowl. If waste matter is solid, add a little extra water to the bowl before flushing by lifting the flush pedal briefly. Flush by holding the pedal down for 2-3 seconds and then allow the pedal to bounce back up to the center, resting position. Allow the bowl to refill with a small amount of water (it will do so automatically with the pedal at its center rest position) and the pump to rebuild the vacuum pressure for the next usage.

Holding Tank: Observe the holding tank level on the tank monitor display. Holding tank gauges don't tend to be terribly accurate but we've found this one to be pretty good. As a general practice, we recommend you plan to empty the holding tank whenever it gets to 70% of full, sooner is better.

If you are boarded by the U.S. Coast Guard, and they ask to see the Y-valve, explain to them that this boat has no Y-valve. The heads pump only to the holding tank. There is no way to flush the heads directly overboard. Only the head waste goes into the holding tank; waste water from sinks and showers is legally discharged overboard as "gray water." The Thru-hull for the macerator is accessed through the floor hatch in the forward stateroom, the valve has a blue handle on the starboard side of the hull. This thru-hull valve shall remain closed except when needing to pump overboard.

Discharging the Holding Tank: In the USA cruising waters of the Salish Sea/Puget Sound area, it is illegal to dump your holding tank. Pump-out stations are the only option. Discharge of holding tank waste is permitted in Canada except in harbors, near land or in designated no-discharge zones. To discharge the holding tank under allowable conditions, open the thru-hull valve (access to the valve described above), turn ON the Macerator breaker on the DC panel and activate the rotary timer at the control panel. 5 minutes works for a quarter tank or less, 10 minutes works for a half full tank and 15 minutes should cover a $\frac{3}{4}$ full tank. Monitor the tank level until it reads empty. Remember to shut off the breaker and close the thru-hull valve after the tank is emptied. Note that discharge occurs below the water line so be underway at a modest speed while discharging the tank.



To pump out at a Pumpout Station: Pumpout access is on the starboard walkway forward of the pilothouse door. Follow instructions at the Pumpout Station. SJS&Y has provided a list of pumpout locations in the Charter Guest Resource Manual.

Occasional Vacuflush Pump Operation: We've found through experience that occasionally, we will hear one of the Vacuflush pumps run for a few seconds for no apparent reason. Invariably, the condition is caused by some waste matter that has decided to cling to the vacuum systems 'duck bill' valves.

To clear the debris, fill the head with a large volume of water and flush all at once. This heavy flow of liquid will almost always clear the debris with just a single cycle. The trick may be in determining which head's vacuum pump is running. You can determine the afflicted pump by turning off just one of the pump breakers temporarily to see if the problem continues or stops. REMEMBER TO TURN ON THE CIRCUIT BREAKER AFTER RUNNING THIS TEST!

Vacu-Flush Repair Parts are located under the forward VIP berth in a marked bin.

Heating and Cooling the Cabins

Electric Space Heaters: Three electric space heaters are stowed on-board to provide supplemental heating for the salon and staterooms. They use 750 watts on low and 1500 watts on high, so they can be used while on shore power or with generator power. Be aware that their energy draw means you may have to turn them down or off while running other heavy electrical loads such as the convection oven, water heater, toaster, etc.

ESPAR Diesel Furnace: When not on shore power, diesel heat is a comfortable option. It will take less than two minutes for the system to heat up enough to start distributing warm air throughout the ship.

There is no electrical panel switch for it however it is wired directly into the house bank via a high current breaker local to the furnace.

The thermostat forward on the starboard side of the salon cabin is the primary ON/OFF control and temperature setting for the furnace. The red and green lights mean the thermostat is turned on and the system is active. You'll hear a click when you rotate the dial clockwise and that will be the current trip point of calling for a warmer cabin temperature.

The furnace sources the entire ship including the pilothouse defogger vents. You can moderate the amount of heat delivery in each space using the vent louvers of the air vents.



Fresh Air / Cooling Fans: There are two independent blowers which will draw outside air into the ship, one in the main salon and one in the pilothouse. Both are controlled by circuit breakers on the DC panel.

Small summer fans are stowed in the closets of each stateroom (three on-board). Using these along with opening the guest VIP stateroom hatch, pilothouse door and salon doors to provide a cross-ventilation flow can make the interior spaces more comfortable on hot days.

Note as well that the forward hatch has a screen insert to keep pests out and both the pilothouse and salon doors have hide-a-screens to be used when necessary.

Defrosters: The Espar diesel furnace is also the source of defrost / defog air for the lower helm windshield. It is very effective as the furnace is very quick to source warm air. Position the vent louvers for the given conditions.

Navigation, Radar and Autopilot Systems

Sea Wings is equipped with a comprehensive set of Raymarine multi-function displays, sensors, radar, fish finder, wind vane, AIS and autopilot. All work together seamlessly to provide a wealth of navigation information during all operations.

There are four DC circuit breakers which manage the power supplied to this equipment:

- Navigation Sensors, Autopilot, Lower Helm and Upper Helm
- We recommend that the Navigation Sensors circuit breaker is left on 24/7, it uses little power and we find it useful to glance at the Apparent Wind page while at anchor as a general reference for local conditions.

MULTIFUNCTION DISPLAY (MFD)



Highlights

- *Sea Wings* is equipped with two 12" Raymarine MFDs (sometimes called chartplotters).
- Power is controlled by the Lower Helm and Upper Helm DC circuit breakers. After power is applied, the system will always power up to the Home page and requires a disclaimer acknowledgement prior to any use.
- The Home page presents a set of 'Apps', much like you find on a smartphone. There's a Chartplotter App, a Radar App, a Fishfinder App, just to name a few. There are also combination Apps that combine two or more full screen apps in a split screen arrangement, allowing the user to view multiple apps simultaneously.
- Please refrain from changing settings beyond the typical functions like chart orientation, radar overlay, AIS overlay and range.
- Commonly used chartplotter selections are detailed below. For a more complete orientation of how to operate and get the most value from the chartplotter app, we recommend referencing the user manual for the Lighthouse 4 software system. It can be downloaded from the Raymarine website or a copy of the manual is retained in the "Books" app on the lower helm iPad.

Commonly Used Chartplotter Selections

Finding the Navigational Chart:

- From the Home Page, select the Chartplotter app or a split screen app that includes the Chartplotter graphic.

Zooming in and out:

- Any app that would have the need to zoom will have a "+" or "-" touchscreen button on the display to zoom in / out or touch. And move your finger across the screen to pan the display image. The MFD also responds to multi-touch zoom and pan.

Returning the screen to the vessel's current

location: ie. Stop Panning or Clear Cursor.

- In the upper left region of the display will be a boat icon button which when touched, will shift the vessel's current position to the center of the screen and the icon will disappear.



Clearing Pre-existing Waypoints, Routes and Tracks:

- Touch the chartplotter app menu in the upper right of the display (universal three stacked lines)
- From the menu that appears, select Waypoints, Routes & Tracks
- Select the category of interest and a list will appear
- Find the item of interest, select it and then select the Delete button

Creating Waypoints or Routes: several methods to do this, easiest to do while viewing the chart:

- From the Chartplotter app, zoom and pan to the point of interest
- Tap and hold the screen until a context menu pops up
- Select the desired action, such as place a waypoint here or start a route
- Continue with the appropriate actions to complete the desire intent

Auto Guidance to a Waypoint: this function is very popular however we recommend a dose of caution, always review the autoroute created by a computer before accepting it as a safe route to follow:

- From the Chartplotter app, zoom and pan to the destination point of interest
- Tap and hold the screen until a context menu pops up
- Select More Options
- Select Autoroute to here
- Review the route to ensure it is appropriate and maintains safety margins

Tides and Currents Reference Stations:

- From the Chartplotter app, touch and hold the chart, a context menu will appear
- Select More Options
- Select Find Nearest
- Select either Tides or Currents, now scroll to find the point of interest

Chart Orientation and Vessel Position: subject to your preference, we recommend either Heading Up or North Up.

- With the chartplotter app active, select the app menu in the upper right
- Select Settings, then select the View and Motion tab
- Select the preferred Orientation

- Note as well that you can offset the Boat Position from this submenu, to show more of the chart in front of the vessel or to keep the vessel at the center of the display

Display Brightness:

- Swipe the ON/OFF button at the lower right of the display
- A context menu will appear with a slider for raising or lowering the brightness

Course over Ground (COG) Vector/Line:

- Center the vessel on the screen and zoom in so that the vessel is significant in size
- Touch and hold the vessel icon until a context menu appears
- Confirm COG is selected
- NOTE: when the vessel is stationary, the COG line is suppressed. It will appear once the vessel starts moving (> 1 knot)

For power boats - Port and Starboard Plotter Presentations:

- Underway in good visibility conditions:
 - MFD: Chartplotter app, range @ 3-6nm; have AIS overlay active, Radar optional
 - iPad: Navionics Boating or iNavX app, Chart Range 0.2-0.5nm
- Underway in poor visibility conditions:
 - MFD: Radar app active, range of 0.5-3nm; have AIS and Radar overlays active
 - iPad: Navionics Boating or iNavX app, range 3-6 nm

Displaying and using a Split Screen:

- There are split screen apps for combos like Chartplotter / Radar, Chartplotter / Fishfinder, Chartplotter / Chartplotter
- Select the desired app from the Home page
- For any split screen app, there is a highlight border around the periphery of the app that is considered "Active", and all common touchscreen controls are referenced to the Active app. Touch another screen window to make it Active when desired.

Radar Overlay and Radar Transmit / Standby:

- With the chartplotter app active, select the app menu in the upper right of the screen
- Select the Targets submenu, then select Radar Settings
- Confirm the Radar Overlay toggle button is selected ON
- Then select the Transmit toggle to ON
- Remember to return to this submenu to toggle the radar to Standby
OR
- Swipe the power button in the lower right to off, a context menu will appear
- Toggle the radar to STANDBY with the displayed button

AIS Overlay & Targets:

- With the Chartplotter app active, select the app menu in the upper right of the screen
- Select the Settings icon, then select the AIS Settings tab
- Confirm the AIS Show Targets is ON

A.I.S. (Automatic Identification System):

Highlights

- *Sea Wings* transmits her position and data via an AIS signal as well as receives AIS signals from other vessels equipped with AIS transmitters (Commercial vessels are required to have AIS, recreational vessels are optional). *Sea Wings* is transmitting her position full time.

- On *Sea Wings*, the chartplotter is tied to the AIS Unit and shows the positions of vessels with AIS as triangles whenever the AIS overlay option is selected.
- AIS information supplements marine radar, which continues to be the primary method of collision avoidance for water transport.

Details

AIS vessels appear on the chartplotter screen as triangles (must have AIS overlay turned ON – see above Quick Notes for how-to). The triangle points in the direction that the vessel is moving and if you touch the screen over the triangle the system will give you additional information (such as name, size, speed, bearing, etc.) about the vessel. The system also transmits this same type of information about *Sea Wings* to other vessels with AIS.

The AIS is an added safety feature which allows large commercial vessels to easily see you and your direction/speed. They may try to contact you via VHF channel 16 to verify your course intent. In addition AIS allows San Juan Sailing/Yachting to provide faster assistance in case of unplanned maintenance issues as well as alert San Juan Sailing/Yachting of *Sea Wings* return approach. Vessels with AIS can be viewed in real-time through mobile device apps and websites like www.marinetraffic.com that will reveal vessel name, course, speed, track, and other information.

AUTOPILOT:

Highlights

- When the autopilot is first turned on it will default to Standby which means it is ready and not engaged.
- To engage the autopilot, press AUTO (this will be magnetic heading hold)
- To disengage the autopilot, press STBY
- To follow a define Route, first press AUTO, then press the TRACK button, then YES to begin tracking the route. Go back to heading hold by pressing AUTO.
- The gyrocompass for the autopilot is located in the bilge area under the master stateroom berth. Make sure that no magnetic (ferrous metal) items are stored nearby.

VHF RADIOS:

Highlights

- Two Icom-506 VHF base units with dedicated antenna and on independent power circuits. Also a Standard Horizon handheld VHF is onboard.
- The based unit is turned on or off by pressing and holding the large tuning knob for one second.
- The handheld VHF charges using a USB cord and plugging into any available USB port.
- We recommend that you monitor Channel 16 during your cruise. It is reserved for emergencies and boat-to-boat initial contact. After contact, move to a working channel (68, 69, 72, 74 or 78). We listen to weather channels



1-10 (whichever gives the best reception, normally 4 or 7 in the San Juan Islands) before we sail in the morning and prior to anchoring for the evening. Listen for the reports identified as "Northern Inland Waters". San Juan Sailing and Yachting monitors channel 80 during office hours (closed Sundays).

- In an emergency, lift the red Distress cover and press/hold the button. The display will count down to zero and then issue an emergency alert message, then automatically tune the radio to channel 16. The Coast Guard will hail you after receiving the message.

Details

Listed below are instructions on how to use some common features:

- **Turning On and Off the radios** – the Icom radios will remember if they were off or on when the power was last removed. To toggle ON / OFF, press the large channel tuning knob for 1-2 seconds.
- **Silencing a DSC Alarm** – When another boat (or the Coast Guard) activates the DSC alert, all VHF radios within listening range sound an audio alarm. To silence this alarm, press the Clear button on the radio.
- **Changing from High to Low transmit power** – Press the HI/LO button on the microphone or use the soft menu button along the bottom of the display. It is best practice to use low power whenever possible.
- **To quickly get to channel 16** – tap the 16/9 button on the radio for immediate access to this channel. Holding it in for 1-2 seconds will take you to channel 9.
- **Accessing the weather channels (WX)** – Use the left / right arrow buttons to scroll the soft menu at the bottom of the display, find CH/WX and select it. The radio will toggle between the Weather band channels and the Communication band channels.
- **Adjusting Volume and Squelch**
 - There are separate volume and squelch knobs on this radio.
- **Changing between International & U.S. channel** – Press the MENU key, navigate the soft menu, select the Radio Set. Note the setting for CHAN Group is USA. If not, scroll with the tuning knob to highlight the CHAN Group, select ENT and change the setting to USA. In general, the VHF radios should always be left while cruising in the Pacific NW including Canadian waters.
- **How to set up and use Dual Watch**
 - Dual Watch is a common radio function to monitor two radio channels simultaneously where one of the channels is the emergency hailing channel, 16, and the other channel is any other communication channel you choose. Note that when the radio detects any radio traffic on channel 16, it prioritizes it and interrupts any on-going radio traffic on the other channel.
 - To setup Dual Watch, use the left / right arrow buttons to scroll the soft menu at the bottom of the display. Tune the radio to the desired 'secondary' channel you wish to monitor. Then select DW to activate Dual Watch functionality. Select DW again to disable the function.
- **How to set up and use Channel Scanning**
 - The Icom radio will scan all communication channels that are designated with a "*" (star symbol) when the Scan function is activated. It will pause and monitor each

starred channel when it has traffic and then continue its scan when that traffic ceases for more than five seconds. Scan will continue until it is disabled. Traffic on channel 16 will still take priority and interrupt any scan in progress.

- To setup the channels to be scanned, first review each communication channel and ensure the ones of interest are designated with a star symbol. You can toggle the star on or off using the soft menu at the bottom of the display.
- To start scanning, use the left / right arrow buttons to scroll the soft menu at the bottom of the display, press Scan soft key. Press it again to stop the Scan function.

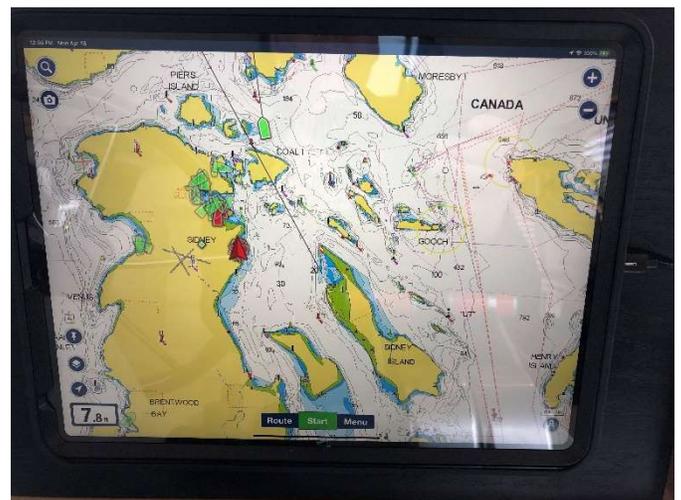
- **Hailer and Foghorn Function** (only enabled for the flybridge VHF radio)

- The flybridge radio is enabled to be used as a Hailer to broadcast announcements or commands to nearby persons and to hear their responses. It also can be enabled to issue foghorn aural tones as are required in reduced visibility. Note that when the hailer or foghorn functions are in use, the VHF radio is not monitoring any radio channels. Therefore, ensure the lower helm VHF is tuned to the appropriate channel for the operation in progress.
- Hailer:
 - Press the Menu button on the radio
 - Select Hailer
 - Use the microphone to speak, listen with the volume control
 - Use the soft EXIT key to quit
- Foghorn:
 - Press the menu button on the radio
 - Select Horn
 - Use the tuning knob to highlight Auto Foghorn, then select the soft ENT key
 - Use the tuning knob to highlight the desired mode (Underway or Stopped)
 - Select the soft key for ENT
 - The tuning knob acts as a broadcast volume control
 - Stop the function using the BACK or ENT key

Navionics App & iPad Tablet

There is an iPad Pro permanently mounted at the lower helm. It has Internet access through the SW Starlink Wi-Fi and is set up with popular apps for navigation and reference data. The primary navigation app is the Boating App by Navionics. Key tips for using the app and its primary features:

- a) Ensure the tablet is linked to the Wi-Fi signal "SW Starlink". Normally, this will be the case as it is already programmed as the known hot-spot Wi-Fi signal.
- b) Use the multi-touch capability to pan / zoom for the area of interest.



- c) If you are already familiar with Navionics, go to the next step. If not, search YouTube for a tutorial on the app and learn the features and functions of the app. What we find most people really like is the route building process using the Auto-Routing mode.
- d) If you wish to plan the route legs for your charter ahead of time, do that on your own device. Then email those routes to yourself. Open a browser on the iPad and login to your email account, find the file, save it, then import it into the Navionics app. Now you are all set and ready for your pre-planned cruise. Remember to delete your email login and the files that you saved before the end of your charter.

Nautical Charts and Tide Tables

Paper charts of San Juan Islands are kept in the pilothouse forward and to port of the helm in what is commonly called the Maptech book. Annotated paper charts of the Strait of Georgia and Gulf Islands are stored in a plastic tube stowed ahead of the lower helm. Cruising guides, current and tide tables will be found to port of the lower helm. A set of dividers, a parallel ruler and a handheld compass is kept in the center drawer of the credenza in the salon.

Washer and Dryer

Sea Wings is equipped with a Spacemaker GE washer and dryer. They are accessed through cabinet doors in the aft wall of the master stateroom. We've found that both function well although the dryer is less capable than your typical household appliance because it runs with only 110 VAC power, not 220 VAC power like at home.

A few rules of thumb:

- Don't pack the washer, layer clothes and plan on moderate size loads
- A typical load of wash will require about 25-30 gallons of water, be sure you have enough in the water tank before starting a load.
- Expect the dryer will take 2-3 times longer to get the load dry compared to a home appliance.

Water Systems

Fresh Water: The 170-gallon fresh water tank (in engine room along the centerline of the bilge) is filled through a deck plate on the port side of swim step. Please use care in filling the tank with only clean water and from a hose of known quality / cleanliness. The hot water tank is 30 gallons, so when all filled, you have approximately 200 gallons of potable water on board.

The fresh water pump is controlled by a 12 V circuit breaker. It pressurizes the entire water system and strives to maintain a constant pressure of 35-45 psi.

- **Turn off the circuit breaker switch when you are not on the boat** so that if a leak develops, you won't lose all the fresh water.
- **Water tank level is Displayed as "H2O" on the Blue Seas tank monitor at the lower helm** and is active when the Tank Monitor circuit breaker is ON. Be aware that while underway, this gauge will not give an accurate reading.

The cold water source that feeds the galley faucet is fitted with a high capacity charcoal water filter. The filter is changed prior to every cruising season. Try it, we believe you'll find the water quality is great. This same filtered water feeds the ice maker as well.

Swim Shower Washdown: There is a hot / cold swim shower in the transom, port side. Use it to wash off the saltwater after swimming (if you dare in our cold waters!). Remember to turn off the water control after usage to avoid a slow water leak of the fresh water supply.

Use of Showers at Each Head:

MUST DO's:

1. The showers drain to a sump container that periodically pumps the water overboard (outlet is on the starboard side above the water line). No need to activate a breaker for the sump pump, it is powered at all times and has an in-line fuse. The sump is in the bilge and accessed through a floor hatch just aft of the entrance to the master state room.
2. After showering, please wipe up water spills on wood areas around shower. And use the squeegee provided to wipe the walls of the shower down, it will help the remaining moisture evaporate quicker.
3. Hang wet towels so they are not left up against wood surfaces. (Moisture turns wood black and encourages mildew.)

TIPS:

1. To conserve your water supply, turn off the shower head while lathering.
2. While cruising, it is best to place the shower heads on the floor of the shower to prevent them from bouncing out of the brackets.

Water System Repair Parts (Connectors and tubing) are located with the spare parts bins stored under the forward berth.

Windshield Wipers / Washer

Sea Wings has three separately controlled windshield wipers for the pilothouse forward windows. Each has a control for OFF / Low speed / High speed. Pushing any of the control knobs will activate the washer function on all three wiper arms. The fluid is fresh water from the ship's fresh water tank.

Wireless Headsets

We have provided four Eartec wireless headsets that will allow the skipper and up to three crew members to communicate clearly and calmly during any close quarters maneuvering or other operations. Docking, anchoring, backing, all are so much easier and less stressful when the skipper and crew can communicate without seeing one another.

The headsets are kept in a soft-sided case at the credenza in the salon. We've added lanyards to them to clip onto a belt loop or life jacket clip, just in case they slip off while being used (they don't float).

Three tips:

- 1) Power ON and OFF is done by depressing the small white button between the volume buttons. Depress for several seconds to turn ON. When done, depress until the button turns red to power OFF.
- 2) No matter how many headsets are in use, one of them must always be the 'Master' headset. It is labeled and acts as the hub for all the others to communicate together.
- 3) You can use the headsets for almost a week's worth of use before needing to recharge, it really depends on total usage time. We recommend that you recharge the batteries every 3-4 days when being used each day.



EXCELLENT PERFORMANCE
Effective range up to 1/4 mile.

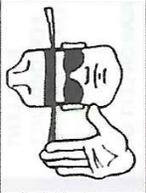
WEAR ON LEFT OR RIGHT EAR
Mic boom swivels 270 degrees.

LITHIUM BATTERIES
Provide continuous 6 hr operation and are field replaceable.

DECT TECHNOLOGY
(DIGITAL ENHANCED CORDLESS TELECOMMUNICATION)

The UltraLITE

Communicate in Total Comfort
Full Duplex Wireless System



IMPORTANT

UltraLITE systems include one headset labeled "MASTER".



This MASTER headset must be turned "ON" to link the corresponding REMOTE headsets.

Operation

Adjusting for Fit & Performance

- 1) Adjust the headband slides for size as necessary.
- 2) Position the microphone capsule at one finger's width from the corner of your mouth to ensure superior speech recognition and noise cancellation.
- 3) "TALK" identifies front of microphone; always have this indicator facing towards your mouth.



STARTUP

- 1) Turn ON the MASTER headset; switch is located below battery compartment. Flashing blue LED on earcup confirms headset is in search mode.
- 2) Turn ON the REMOTE headset(s); press the power button located above volume controls.. Flashing blue LED on earcup confirms headset is in search mode.
- 3) Flashing LEDs change to solid blue to indicate that headsets are connected.



MASTER ON/OFF



REMOTE ON/OFF

SET VOLUME

UltraLITE features 5 volume settings. Select the desired volume by slowly clicking the UP or DOWN buttons. An audible tone reflects volume level. A double tone indicates low or max volume has been reached.



SHUT DOWN

Power OFF the MASTER headset utilizing switch, then PRESS and HOLD the power button on the Remote headset(s) for 4-5 seconds to turn off.

Note: To preserve optimum charge level, remove battery from headsets when system not in use.

Battery

All UltraLITE headsets are powered by a Lithium Polymer battery that will operate 6 hours when fully charged.

Charging

- 1) Batteries are charged via the multi-charger.
- 2) Insert the batteries making sure the contacts are properly aligned.
- 3) RED: Charging; GREEN: Fully Charged.



Installation

- 1) Press the release button located on the bottom of the battery compartment.
- 2) Insert the battery into the compartment (arrow indicates proper direction) and snap door closed.



Low Indicator

A repetitive beep (every 20 seconds) indicates low power -- battery should be charged or replaced.

Battery Care

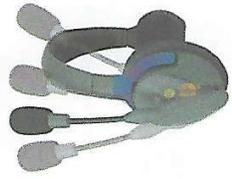
To preserve optimum charge level remove battery from headsets when system not in use.

AutoMute Function

Boom swivels over the top 270 degrees. Headset can be worn on left or right ear.



Microphone mutes automatically when boom is set to "Up" position.



Appendix A: Spare Parts Inventory

Antifreeze	Purple-ish DEAC antifreeze is used in the engines and genset: a spare gallon is kept in the bilge forward of the starboard engine. Note that the coolant must be diluted to a 50/50 mix with distilled water prior to using it. A diluted container will be marked as such.
Batteries for remotes & flashlights	Pilothouse cabinet, starboard side ahead of breaker panel, small plastic bin with a collection of batteries
Dinghy spare prop	Under guest VIP berth, in a marked box
Distilled water	Bilge, outboard and forward of the starboard engine
Engine and Genset fan belts	Under guest VIP berth, in container bin F
Filters - oil	Under guest VIP berth, in container bin E
Filters - fuel	Under guest VIP berth, in container bin F
Filters – fresh water at galley sink	Under guest VIP berth, in container bin F
Fuses – Radio/CD	Storage bins ahead of starboard engine
Head parts: Duck bill valves; Ball assembly	Under guest VIP berth, in container bin D
Helm keys, spares	Under guest VIP berth, in container bin E
Hose clamps	Storage bins ahead of starboard engine
Impellers and gaskets	Under guest VIP berth, in container bin B
Light bulbs	Storage bins ahead of starboard engine
Misc: zip-ties, hose clamps, WD-40, bungee cords, duct tape, electrical tape	Storage bins ahead of the starboard engine
Oils	Bilge ahead of the starboard engine. Note each container is marked for its intended usage.
Shower sump – spare bilge pump	Under guest VIP berth, in container bin A
Zincs – engine / tranny cooler	Under guest VIP berth, in container bin E

Appendix B: Schematic of the Thru-hulls

