

Operations Manual

Gratitude



Revised Spring 2024

Welcome to Gratitude

We are happy you have chosen Gratitude for your vacation,
and we hope you have a wonderful experience cruising the waters of the Pacific Northwest!

Contents

| | |
|---------------------------------------|----|
| List of Procedures..... | 6 |
| Gratitude Tips..... | 7 |
| Wi-Fi Details..... | 8 |
| Specifications..... | 9 |
| Propulsion Systems..... | 10 |
| Engines & Thrusters..... | 10 |
| Electronic Engine Controls..... | 10 |
| Engine Synchronization..... | 10 |
| Stabilizers..... | 11 |
| Boat Operation..... | 12 |
| Engine Inspection..... | 12 |
| Crew Briefing..... | 12 |
| Start Up..... | 13 |
| Getting Underway..... | 13 |
| Cruising..... | 13 |
| Autopilot..... | 14 |
| From Cruise to Docking/Anchoring..... | 15 |
| Anchoring..... | 15 |
| Tender..... | 16 |
| Fueling..... | 19 |
| Electrical System..... | 19 |
| Power Management..... | 20 |
| Generator..... | 20 |

| | |
|---|----|
| Inverter | 21 |
| Batteries | 21 |
| Shore Power | 22 |
| Electrical Panel Switches | 22 |
| Marine Electronics..... | 27 |
| Primary Garmin Electronics..... | 27 |
| Secondary RD30 Electronics..... | 28 |
| A Warning About Garmin’s Auto-Guidance Feature..... | 28 |
| Internet & Wi-Fi..... | 29 |
| Wi-Fi | 29 |
| Salon Stereo & TV..... | 29 |
| Salon Cabinet..... | 29 |
| Satellite Dish Antenna Controller | 29 |
| DirectTV..... | 30 |
| Troubleshooting Satellite TV..... | 30 |
| Playing a DVD | 31 |
| Casting..... | 31 |
| Stereo..... | 31 |
| Heating & Cooling..... | 32 |
| Cruisair Marine Air Conditioning..... | 32 |
| Webasto Diesel Furnace & Engine Heat..... | 33 |
| Fresh Water System..... | 34 |
| Tankage & Filling..... | 34 |
| Water Maker..... | 34 |
| Hot Water System | 35 |
| Sanitation Systems..... | 36 |
| Tankage and Monitoring..... | 36 |

Pumpouts 37

Overboard Holding Tank Discharge..... 37

Y Valve 37

Mooring Buoys..... 38

Galley & Grill..... 38

 Stovetop..... 38

 Grill..... 38

 Trash Compactor 38

 Insinkerator 38

FAQ & Common Issues..... 39

List of Procedures

| | |
|---|----|
| Procedure 1 Start Up | 13 |
| Procedure 2 Getting Underway | 13 |
| Procedure 3 Cruising | 14 |
| Procedure 4 Preparing for Docking/Anchoring..... | 15 |
| Procedure 5 Dropping Anchor..... | 15 |
| Procedure 6 Weighing Anchor..... | 16 |
| Procedure 7 Launching Tender..... | 18 |
| Procedure 8 Recovering Tender..... | 18 |
| Procedure 9 Start Generator..... | 21 |
| Procedure 10 Stop Generator..... | 21 |
| Procedure 11 Engage Cruisair..... | 33 |
| Procedure 12 Disengage Cruisair..... | 33 |
| Procedure 13 Engage Engine Heat..... | 33 |
| Procedure 14 Engage Webasto Furnace..... | 34 |
| Procedure 15 Disengage Webasto Furnace & Engine Heat..... | 34 |
| Procedure 16 Making Water..... | 35 |
| Procedure 17 Discharge Waste Overboard..... | 37 |

Gratitude Tips

For captains with experience on other boats, here are some items unique to Gratitude to quickly get you more familiar with the boat:

- When you first turn on the Electronic Engine Controls, the boat will not go into gear until you shut off Warm Mode. We recommend you leave the EEC on for your entire trip so you don't have to deal with this repeatedly.
- The Sync and Troll functions of the Electronic Engine Controls are not used. Instead, use the panel switches for Engine Sync and Slow Vessel.
- Before getting underway, check that all stateroom portholes are closed. These portholes will see water while underway in even moderate conditions.
- The anchor alarms in the navigation system are not loud enough to wake a person sleeping in the master stateroom. Instead, we recommend running an app on your phone if you would like an anchor alarm. See the section on anchoring.
- The Auto-Guidance feature of the Garmin system is not aware of all subsurface hazards and may plot a course directly over "obstruction that covers" or "exposed wreck" type obstacles. Always use Auto-Guidance carefully and constantly verify you are on a safe path.
- The electric water heater will take several hours to heat up from cold. You can tell it's working by looking at the current draw of the left 110v service when you switch it on.

Wi-Fi Details

The boat's network is on when the "Ship's Network" breaker is on. The system will automatically connect to Starlink Internet. It takes a few minutes to boot up but otherwise connects automatically.

You can connect to the ship's network and to the Internet via:

Wi-Fi SSID: Gratitude

Wi-Fi Password: salishsea

Specifications

Gratitude specifications:

| | |
|---------------------------|-------------------------|
| DRAFT | 4 FT 0 IN |
| LENGTH OVERALL | 62 FT 2 IN |
| BEAM | 17 FT 6 IN |
| WEIGHT | 69,500 POUNDS |
| FUEL CAPACITY | 1,000 GALLONS |
| FRESH WATER CAPACITY | 260 GALLONS |
| HOLDING TANK | 100 GALLONS |
| USCG DOCUMENTATION NUMBER | 1157653 |
| MAKE | OCEAN ALEXANDER |
| YEAR BUILT | 2004 |
| ENGINES | TWIN CATERPILLAR C-12 |
| TOTAL HORSEPOWER | 1400 HP |
| GENERATOR | NORTHERN LIGHTS M8442LK |
| GENERATOR POWER | 20 KW |

Tender specifications:

| | |
|--------------|------------------------------|
| HORSEPOWER | 40 HP |
| MAKE & MODEL | WALKER BAY GENERATION 12 LTE |
| YEAR BUILT | 2020 |

Propulsion Systems

Engines & Thrusters

Gratitude has two diesel engines and bow & stern thrusters.

The diesel engines idle at 700 RPM, which will drive the boat forward at about 7 knots. There is a Slow Vessel switch at both helms which will reduce their idle to 550 RPM, which provides smoother handling while docking.

The thrusters are driven by hydraulic fluid pumped by the engines. This has the advantage that you do not have to worry the thrusters may overheat like electric thrusters do. The thrusters are controlled by levers at either helm station. The system is always on and ready for use when the engines are running.

The thrusters will have less power when Slow Vessel is active because they are driven by the engines.

Electronic Engine Controls

The engines are controlled by Electronic Engine Controls. Only one station (pilothouse or flybridge) will be in control of the engines at any one time. To switch stations, the engines must be in neutral. Once in neutral, push the Select button twice to take control at a given station.

When the EEC is started, the Warm mode will be on. You must turn this off in by pressing the Warm button for several seconds to put the engines in gear. It can be quite shocking to find the engines won't go in gear, and it takes time to diagnose/remember that you have to turn off Warm Mode. For this reason, we recommend you leave the EEC on for your entire trip after turning off Warm Mode.

The Sync and Troll functions of the EEC are not used. To sync engine speed, use the panel switches.

Engine Synchronization

You will have a much smoother cruise if the engines are operated at a synchronized RPM. Engine synchronization are controlled by switches on the panel – not by the electronic engine control. There are three switches:

- A pilothouse/flybridge selector in the pilothouse. This switch has a center detent which represents off.
- A port/starboard selector in the pilothouse. This also has a center detent which represents off.

- A port/starboard selector in the flybridge.

If you wish synchronization to be off (which is not recommended), put all three switches in their center detent.

To synchronize the engines, place the station selector on “pilothouse” and the side selector on “starboard.” When in this mode, the total engine speed of both engines will be controlled by the starboard EEC lever. However, the transmission is still controlled by the EEC. It is usually not necessary to move the pilothouse/flybridge selector to flybridge when you move to that station – the engines will still sync off the starboard lever.

It’s usually best to operate in the pilothouse/starboard switch position at all times. In this position, the EEC still controls gear selection. Thus at idle speeds, the EEC levers can be used to independently put the engines in forward, neutral, and reverse for close quarter maneuvering. The only thing that cannot be done in this mode is throttle up the port engine via the EEC lever – however this is not needed in close quarters. Once in open water, the starboard lever can be advanced to increase the throttle of both engines together.

Stabilizers

Gratitude is equipped with stabilizers, which are controlled from a panel to the left of the wheel in the pilothouse or flybridge.

The stabilizer has three modes:

- **Run:** The stabilizer acts to reduce rolling of the boat
- **Stop:** The stabilizer is not active, and fins are allowed to move freely
- **Park:** The stabilizer does not reduce boat roll, and holds the fins in a fixed position

Generally, you should use Run or Park and avoid Stop.

The sensitivity setting controls how much the stabilizer works to reduce roll. The default of 50 seems to be a good choice for most conditions. If the boat is oscillating too much, reduce the sensitivity.

Always place the stabilizers in Park before docking so that they do not interfere with maneuverability of the boat.

Boat Operation

Engine Inspection

Gratitude's engines and generator do not burn or leak oil or coolant. It is not necessary to excessively monitor levels of these fluids on Gratitude.

While cruising, two cameras are available to monitor the state of the engine room.

In addition, you should personally enter the engine room before cruising and periodically while cruising to inspect:

- Are there any unusual smells indicating a problem
- Do you see any fluids or leaks
- Check the 3 sea strainers (two for the engines, one for the genset) to be sure they are free and clear of obstructions.

Crew Briefing

The activities of mooring, unmooring, and navigating narrow marina entrances will all involve the help of your crew. Even experienced crew may have become rusty since the last charter. Experienced captains know the value of giving a thorough briefing to crew while still tied to the dock or on the hook. Confusion and misunderstanding are much easier to sort out before the boat is adrift.

Before you set out to maneuver, take a moment to give a crew briefing including:

- Explain your plan and your intentions, so the crew understands what you intend to happen. Ensure each individual crew knows what you expect of them.
- Ensure you have a good system for the crew to communicate distances to you. Gratitude has obstructed rear visibility and you will need your crew's help to understand how far the stern is from hazards.
- Tell your crew not to independently do an action that you didn't command.
- Tell your crew to notify you immediately if a line or person goes in the water.
- Ensure the crew knows exactly when and under what circumstances you wish them to go from the boat to the dock (often not necessary at all).

Start Up

Gratitude's engines start easily.

Procedure 1 Start Up

1. EEC switched on.
2. Turn off Warm mode on EEC.
3. Take EEC control at helm.
4. Turn key to start one engine. Wait a few seconds for it to stabilize.
5. Turn key to start other engine. Wait a few seconds for it to stabilize.
6. Allow engines to idle for a few minutes before maneuvering.

Getting Underway

Once the engines have had a chance to get warm, you are ready to start your cruise.

Procedure 2 Getting Underway

1. Close all stateroom level portholes.
2. Close forward stateroom skylight.
3. Disconnect shore power.
4. Complete crew briefing.
5. Take EEC control at desired helm.
6. Put stabilizers in park mode.
7. Ensure all lines free from dock.
8. Maneuver as desired.

Cruising

Advance the throttles as desired. Ensure the Sync switches are on for a smooth cruise.

The standard operating range for Gratitude's engines is up to 80% of engine power. Please do not exceed 80% power for long durations.

The Garmin system has a preset for "Long Cruise" which is ideal for cruise mode. This shows a picture of the engine room along with 2 different navigation displays.

Procedure 3 Cruising

1. Turn on stabilizers.
2. Turn on engine synchronization.
3. Hold bow down switches for 5-10 seconds or as desired for pitch.
4. Arrange Garmin to monitor engine room and engine performance.
5. Periodically: Check engine room and strainers.

Autopilot

NOTE: When in Autopilot mode, you cannot steer with the wheel. Disengage Autopilot if you need to adjust course using the wheel.

NOTE: Use of Autopilot always requires a ready watch at the helm for other ships, flotsam, disengagement of autopilot or any other unknown hazard. Autopilot is a convenience feature and is not intended to replace an alert watch at the helm.

Gratitude is equipped with a Simrad Autopilot system. This system is capable of either holding a steady course or following the manual waypoints in the current route in the Garmin system.

The Autopilot will not follow a course generated automatically by the Garmin Auto-Guidance feature. This is a safety feature built in by Garmin. Garmin Auto-Guidance is already capable of plotting a course over submerged obstacles (we cover this later in this manual), and blindly following such a course on Autopilot is a terrible idea.

The Auto Pilot control at both stations by a fixed panel near the wheel. Only one station is active at a time – if you move from one station to another, you can easily take over on the new station.

Auto Pilot has three modes:

- Standby: Autopilot is disengaged.
- Auto: Autopilot will hold the current course. In this mode, you can adjust the course by turning the wheel on the Autopilot controller.
- Navigation: If there is an active manual navigation route in the Garmin system, Auto Pilot will follow it.

From Cruise to Docking/Anchoring

Procedure 4 Preparing for Docking/Anchoring

1. Put stabilizers in park mode.
2. Hold bow up switches for 10 seconds.

Anchoring

Gratitude has 350 feet of anchor chain. The ideal anchoring range for Gratitude tends to be in 30 to 50 feet of water with a muddy bottom. Use the sonar and side-scan sonar to pick an ideal place to anchor.

Gratitude is equipped with a chain counter to make it easy to calculate how much chain you have out. The reading is in feet.

In addition, the chain is painted every 50 feet.

Gratitude's windlass is always on and ready for use. It can be controlled from several stations, including foot pedals on the bow, panel switches at the helms, or from the chain counter.

The Garmin system's anchor alarm is not loud enough to wake up someone sleeping in the master stateroom. If you wish to use an anchor alarm, we suggest using an app on your phone near your bedside. On Android, we have had good results with Anchor Pro.

See the Electrical section for information on managing the battery while at anchor.

Procedure 5 Dropping Anchor

1. Empty items out of bow locker so chain can move freely.
2. Ensure chain counter is on.
3. Use switches to deploy anchor as desired.
4. Deploy snubber on anchor chain.
5. When deployment is finished, push in the dog on the windlass.
6. Configure electrical panel for Anchoring to conserve power. (see Electrical section)

When weighing anchor, it's important to manually spread the chain out in the anchor locker so it doesn't pile up. If it does, it will bring the windlass to a violent stop.

Procedure 6 Weighing Anchor

1. Engines running.
2. Empty items out of bow locker.
3. Take snubber off anchor chain.
4. Maneuver engines so chain is pointing mostly down (avoid pulling the boat around with the windlass).
5. Start to raise anchor.
6. Clear debris off anchor chain as it comes in.
7. Every 20 feet or so, use boat hook to distribute chain in anchor locker.
8. Use engines to move boat as needed to keep chain pointing mostly down.
9. As anchor comes up, land it gently in cradle.

Tender

NOTE: Avoid hitting the antenna stack when maneuvering the davit.

NOTE: Ensure the drain plug is in the tender when launching it. If it is not, the tender will fill with water and sink.

Gratitude is equipped with a Walker Bay Generation 12 tender and a Steelhead davit to launch and recover her. The Tender has its own Garmin navigation system which provides charts and sonar.

Please leave the davit's boom always extended. Unfortunately, for this model of davit, retracting the boom to make the arm shorter can cause the cable to get jammed in the mechanism. Do not pull the pin on the bottom of the arm to retract the boom.

The davit can be controlled either from a wireless or wired remote, both of which are kept in the cabinet forward of the galley.

We will use these button numbers in the instructions below.



Buttons 1 & 2: Tilt arm up / down

Buttons 3 & 4: Swing arm left / right

Buttons 5 & 6: Extend or retract line and weighted hook

Procedure 7 Launching Tender

1. Pull the plug out of the tender, then replace the plug, to empty any accumulated water in the bilge.
2. Ensure the key is on the tender.
3. Turn on the tender's battery switch.
4. Tilt up tender engine.
5. Remove the three winch straps from the tender.
6. Maneuver the crane arm to center the weighed hook over the bridle.
7. Attached weighed hook to bridle.
8. Remove slack from line and ensure the bridle is attached to tender at all 3 points.
9. Lift tender.
10. Ensure again the drain plug is in the tender.
11. Swing tender over the water and lower tender into water.
12. Release weighed hook from bridle.
13. Raise weighted hook and swing crane arm back over boat. Do not hit antenna stack with davit arm.

It's a best practice to always keep the tender tied to Gratitude until the engine is running.

Life vests and portable oars can be found in the compartments under the seats of the tender.

Procedure 8 Recovering Tender

1. Swing tender arm over water, lower weighted hook to tender.
2. Position tender under crane and attach weighted hook to bridle.
3. Take tension out of the line and ensure the bridle is attached to tender at all 3 points.
4. Lift tender out of water to be accessible from the deck.
5. Tilt the engine up so it won't impact the boat or cradle.
6. Lift tender, swing over boat, land in cradle.
7. Attach and tighten ratchet straps.
8. Adjust engine tilt to proper position.
9. Turn off battery switch on tender.
10. Attach ratchet straps to secure tender.
11. Remove drain plug to empty bilge.

Fueling

Gratitude has two fuel tanks, each holding 500 gallons of diesel. The fuel level is best checked by the sight gauges in the fore of the engine room.

Gratitude may be fueled from deck plates on either side of the boat. Conveniently, there are deck plates for both port and starboard tanks on both sides of the boat so that you can fuel both tanks from either side.

Depending on how much fuel you are taking on and the speed of the fuel dock's pumps, you may need to budget several hours to refuel Gratitude.

You do not need to fill the port and starboard tanks separately – a cross pipe will balance the tanks. However, you may find it most convenient to use two pumps at once, making use of both the port and starboard fuel fills at once (which are located right next to each other on both sides of the boat), to increase the rate of getting fuel into the boat.

The most ideal fueling procedure involves one crew member standing by the fuel hose nozzles, at the ready to stop the flow at any time as needed, and a second crew member to regularly go into the engine room to check the progress of filling the tanks.

After you have finished fueling, you can turn the fuel polisher timer in the engine room to its maximum. This will help clean out impurities stirred up by the fueling process. The idea here is it is preferable to make the polishing filter dirty and keep the engine filters cleaner, since if an engine filter plugs up it will disable the engine.

Always remember to open the valves at the top/bottom of the sight gauges when reading them, and close them when done.

Electrical System

Gratitude is equipped with a highly capable electrical system to supply your power needs while cruising. She combines a Northern Lights 20 KW generator with a 300 effective amp-hour battery bank to provide ample power while away from shore.

One of Gratitude's most welcome power features is her Magnum 4 KW inverter/charger, which continuously powers all 120 volt outlets on the boat – meaning you can count on all of your plugged-in loads to receive power regardless of power configuration.

Power Management

While on shore power, all of Gratitude's systems can be used with little regard for power management. Away from shore, however, a successful cruise will involve some power planning.

Gratitude's massive 300 amp-hour battery bank will power the boat's 120 volt loads (including the refrigerator) and 24 volt DC loads all night and into the next day.

The batteries can be recharged by running the engines, running the generator, or plugging into shore power. People are often astonished by how long it takes to bring the batteries back to full power. For example, when the engines are running the engine's alternator will supply about 80 amps to charge the batteries. If the batteries are fully discharged, it will take around 5 hours to recharge the batteries to full.

If you are planning to stay anchored for the day, you may want to plan to run the generator during the day to charge the batteries. Your anchored neighbors will be more tolerant of generator noise during the day than at night. While the generator is shielded and very quiet, it is audible during a dead-silent San Juans night in quiet bays. It is often useful to plan to do laundry or run the water maker during this period, to get the most out of your generator use time.

You may find your pattern for a day looks something like:

Morning: Start engines to cruise or start generator while anchored.

Day: Cruise or run generator for 4-5 hours. Make water and do laundry.

Night: Shut down and operate on battery power.

It can be very helpful to your battery capacity to shut off unnecessary loads while on battery. See the section on Anchoring for more detail on the best loads to turn off.

Generator

Gratitude is equipped with a Northern Lights 20 KW generator. It is located aft port in the engine room. It is shielded and has underwater exhaust for very quiet operation.

The generator can power all electrical loads on the boat at the same time.

The 220 volt loads will not operate while on battery, and to use them away from shore power you must turn on the generator. These loads include the stovetop, washer/dryer, and the Cruisair system.

The generator controls are located on the lower right of the electrical panel.

Procedure 9 Start Generator

1. Set the electrical selector to Off.
2. Press generator bypass and hold for 5-10 seconds and keep holding.
3. Press generator start until generator is running.
4. Continue to hold generator bypass for 10 seconds, then release.
5. Set the electrical selector to Generator.

Procedure 10 Stop Generator

1. Turn off 220 volt boat loads (CruisAir, Washer, Stovetop).
2. Set electrical selector to Off.
3. Press generator stop until generator stops.

Inverter

The inverter control panel is located just above the generator controls on the electrical panel.

The inverter can be always left on and does not need any adjustment or attention during your charter. It will automatically switch to inverting mode on battery power, and to charging mode when electrical power is available from shore power or the generator.

It is not a good idea to turn off the inverter at night to save battery power, since this will also turn off the refrigerator and freezers.

All 120 volt power outlets on the boat are powered by the inverter, meaning you have AC power at all outlets at all times. The stovetop, washer/dryer, and Cruisair units are all 220 volt loads and are not powered by the inverter – to use these loads you will need to turn on the generator.

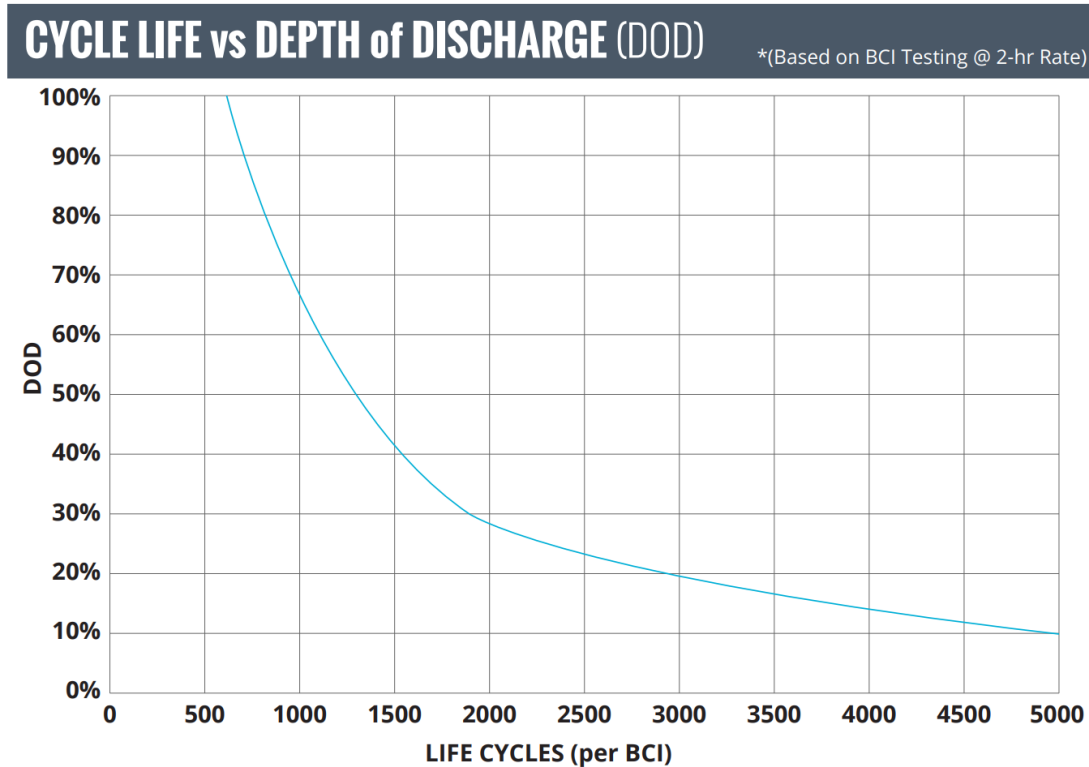
Batteries

NOTE: Due to battery chemistry, 50% capacity is considered empty. Depleting batteries below 50% will harm the batteries. The 300 amp-hour rating takes this into account.

Gratitude's battery power is provided by a bank of 8 Full River CD400 L16 AGM batteries, which are in a white chest starboard of the red toolbox in the engine room.

The best monitor for the batteries is the battery monitor that is to the right of the top of the electrical panel. This device monitors battery drain by measuring the actual amp-hours extracted from the battery.

This style of marine battery can provide a great deal of power but will last longer if the batteries are not drained to their full capacity. Below is the manufacturer's chart of the relationship between the depth of battery discharge and how long the batteries will last (how many discharge cycles).



Source: Full River Battery USA

This chart makes it clear that it is preferable to avoid seeing just how empty we can get the batteries before they give out. Instead, it is best to use what you need overnight, and then recharge to full capacity during the next day. This will help lengthen the batteries' lifetime.

Shore Power

Gratitude's shore power cable is in the stern, accessible from the swim step. A Cablemaster system makes it easier to manage the heavy cord.

Electrical Panel Switches

The general approach to power switches on Gratitude is to leave a switch on unless there is a power-saving or other reason for it to be off. This is like how you treat the electrical panel in your house. Most loads are switched at their source, rather than at the panel, which makes for more convenient boat operation.

Each switch is labeled with a colored sticker. Choices for switches are:

- Off: The circuit is not in use
- Always On: ○ The switch should always be left on
- Cruising: ● On while cruising, off while anchored (to save power)
- As Needed: ● On only when the particular item is needed

12 Volt Service

| | | |
|----------------------------|-----------|--|
| NAV/ANCHOR LTS | Always On | |
| PANEL LTS | Always On | |
| EXTERIOR LTS | Always On | |
| INTERCOM | Off | There is no intercom on the boat. |
| WIPERS / WASHER | Always On | |
| TRIM TABS | Cruising | |
| HORN | Cruising | |
| CABLE MASTER | Always On | |
| STABILIZER | Cruising | |
| BOW/STERN THRUSTER CONTROL | Always On | |
| WINDLASS CONTROL | Always On | |
| ---- | | |
| FWD. CABIN LTS | Always On | |
| PORT CABIN LTS | Always On | |
| MASTER RM LTS | Always On | |
| P/H & DINETTE LTS | Always On | |
| GALLEY LTS | Always On | |
| SALON LTS | Always On | |
| ENG RM LTS | As Needed | It's too easy to forget these are on while at anchor, creating significant current draw. |

| | | |
|---------------------------------|-----------|---|
| LAZARETTE LTS | As Needed | Same as the engine room, it's easy to forget these are on |
| OIL CHANGE PUMP | Off | There should be no need for you to change oil during your charter. |
| FUEL POLISHING PUMP | Always On | |
| ----- | | |
| SEA WATER PUMP | As Needed | This is the only switch for this pump. It charges the seawater faucets at bow and stern. |
| HOLDING TANK PUMP | As Needed | This is the only switch for this pump. Only activate it when you intend to discharge sewage. |
| HOLDING TANK IND | Always On | |
| FWD TOILET | Always On | |
| MASTER TOILET | Always On | |
| HEAD BLOWERS | Always On | |
| ENG RM BLOWERS | As Needed | There is typically no need to use these blowers, unless something has really gone wrong in the engine room. |
| WINDSHIELD DEFROSTER | As Needed | This is the only switch for the first set of defroster blowers. |
| DEFROSTER | Always On | This is a second set of blowers that are also switched in the side panel in the pilothouse. |
| ----- | | |
| GARMIN SYSTEM | Cruising | |
| AUTO PILOT | Cruising | |
| DEPTH SOUNDER / SPEED LOG | Always On | |
| EXTERIOR ANTENNA FOR SHORE WIFI | Off | This has been replaced by the Starlink system. |
| LPG ALARM | Always On | |
| AIS | Always On | |
| YACHT CONTROLLER | Off | This equipment is not available. |
| ----- | | |
| STEREO/12V OUTLETS | Always On | |

| | | |
|--------------|-----------|--|
| F/B VHF | Always On | |
| P/H VHF | Always On | |
| RD30 SYSTEM | Always On | |
| CAMERAS | Cruising | |
| NMEA 2000 | Always On | |
| USB CHARGING | Always On | |

AC Service

| | | |
|------------------------------|-----------|--|
| GUEST RMS OUTLETS | Always On | |
| MASTER RM OUTLETS | Always On | |
| P/H & DINETTE OUTLETS | Always On | |
| GALLEY OUTLETS | Always On | |
| SALON OUTLETS | Always On | |
| SALON TV/STEREO SATELLITE TV | Always On | There is an uninterruptable power supply on this circuit to protect this equipment – if you wish to turn off this equipment, please turn them off individually in the salon. |
| ENG RM & DECK OUTLETS | Always On | |
| ENG RM LTS | As Needed | It's too easy to forget these are on while at anchor, creating significant current draw. |
| SHIPS NETWORK | Always On | |
| ----- | | |
| INVERTER BATT IN | Always On | |
| INVERTER BATT CHRG IN | Always On | |
| GALLEY REFRIGERATOR | Always On | |
| F/B REFI & ICE MAKER | Always On | |
| MICROWAVE | Always On | |
| ICE MAKER | Always On | |
| FRESH WATER PUMP | Always On | |

| | | |
|----------------------|-----------|--|
| ----- | | |
| ENG PREHEATER (P) | As Needed | |
| VACUUM CLEANER | Off | The central vac is not used – please use the portable vacuum cleaner. |
| DISPOSAL | As Needed | It's easy to accidentally hit this switch, so we suggest leaving this off until needed. |
| WATERMAKER | Always On | |
| WATER HEATER | As Needed | Generally you would only use this water heating system during an extended stay on shore power. |
| INVERTER TRANSFER | Always On | |
| ----- | | |
| ENG PREHEATER (S) | As Needed | |
| TRASH COMPACTOR | Always On | |
| DISH WASHER | Always On | |
| ENG RM OUTLETS | Always On | |
| ENGINE CHARGER | Always On | |
| ----- | | |
| AIR COND PUMP #1 | Always On | |
| SALON AIR COND (P) | Always On | |
| SALON AIR COND (S) | Always On | |
| AIR COND PUMP #2 | Always On | |
| GUEST CABIN AIR COND | Always On | |
| MASTER AIR COND | Always On | |
| WASHER / DRYER | Always On | |
| P/H AIR COND | Always On | |
| COOKTOP | As Needed | This system beeps if you place anything on top of the stove when the breaker is on. |

Marine Electronics

Gratitude has two separate electronics systems:

- The primary Garmin system, which is for active use while navigating or planning, and
- The RD30 system, which is a low power system for use at anchor while on battery

Primary Garmin Electronics

For information on how to use the systems, please see Garmin's documentation here:

- How-to Videos: <https://support.garmin.com/en-US/ql/?focus=videos>
- Manuals: <https://support.garmin.com/en-US/ql/?focus=manuals>

Gratitude is equipped with the following equipment:

Pilothouse

- 8622 touch screen multi-function display (3x)
- GM120 instrument display (2x)
- Grid 20 control panel

Flybridge

- 8617 touch screen multi-function display (2x)
- GM120 instrument display (1x)
- Grid 20 control panel

Sensors

- Fantom 124 digital solid state doppler radar antenna
- GSD 25 sonar module
- GT51M-THP sonar transducer, with side-scan sonar
- Panoptix sonar transducer, with forward-scan sonar
- AIS 800 automated information system transceiver
- GWIND anemometer
- HS60 GPS compass
- GC200 camera (5x: engine room 2x, exterior 2x, tender underway)

Charts

- VCA501L vision – Puget Sound and Canada charts

Several favorite settings have been preconfigured in the Garmin system for you. For example, there is an anchoring mode which will show a full picture of the side and rear of the boat on cameras, and a cruising setting which shows the engine room, engine stats, and charts while underway.

Secondary RD30 Electronics

The Primary system provides a great deal of functionality for navigating or planning, however it also has a significant power draw. The RD30 system is intended as a low power system to monitor depth only while at anchor on battery.

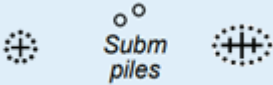
You will likely find it ideal to use the Primary system while underway or while planning. The Primary system is also very helpful while trolling around to find an ideal anchorage. However, once you are anchored and shut down, you can shut off the Primary system and use the RD30 alone to keep an eye on depth.

The RD30 has displays on the upper right of the pilothouse dash, as well as in the forward starboard wall of the master stateroom.

To use the RD30 system, the "NMEA 2000," "RD30 SYSTEM," and "DEPTH SOUNDED / SPEED LOG" on the panel must be on. These are listed as "always on" in the electrical plan.

A Warning About Garmin's Auto-Guidance Feature

NOTE: Never trust an Auto-Guidance route without manual verification and watch.

| | |
|---|--|
|  <p>Subm piles</p> | <p>Chart Symbols that will Ruin Your Cruise</p> <p>From left to right: a rock, pilings, or a wreck. Each of these symbols indicates an obstruction that is covered at high tide and exposed at low tide. All of these can put a hole in the boat.</p> |
|---|--|

The Garmin system has an Auto-Guidance feature that will automatically plot a course to any location on the map. This feature can be extremely useful for route planning as it allows quick estimation of the distance and time to a point and provides ideas for the best course to get there.

However the Auto-Guidance feature only considers average depth and not individual obstacles. Above we have listed just 3 chart symbols that will put a hole in the boat if you drive over them.

The Garmin Auto-Guidance is willing to plot a course directly over these obstacles.

For that reason, the Garmin Auto-Guidance route should always be used only as a suggestion. Plot your course manually. Watch the chart carefully. Never blindly trust the Auto-Guidance.

Internet & Wi-Fi

Gratitude has a ships network which provides Wi-Fi throughout the boat. This network is connected to a Starlink antenna on the radar arch. (The prior land-based cellular and wifi antennas are still there but not used).

Wi-Fi

The breaker for Ships Network will turn on the Wi-Fi system. This switch should always be on.

The SSID is "Gratitude" and the password is "salishsea".

Salon Stereo & TV

Gratitude has Satellite TV which will provide live television anywhere you go. It can also show DVDs or casted content. The stereo is capable of being driven by Bluetooth or it can play what's on the TV, or AM/FM radio.

Salon Cabinet

The components in the salon cabinet, from top to bottom, are:

1. Satellite Dish Antenna Controller
2. DVD Player
3. DirecTV Receiver
4. Stereo Amplifier

All these components and the TV are plugged into an Uninterruptable Power Supply at lower right. This UPS helps the components stay running when you switch from Inverter to Generator or Shore power. Without the UPS, the messy power drop during the switch would make the components reset.

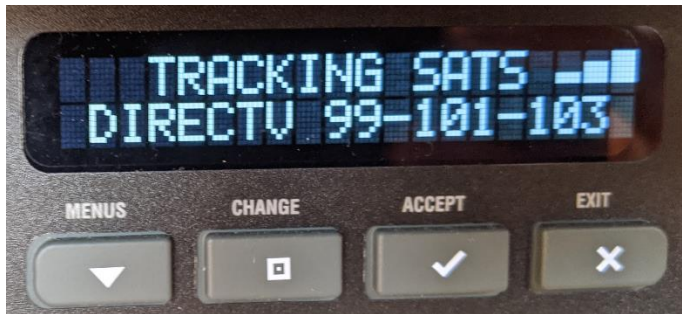
Because the UPS is here, the breaker should always be left on. If you wish to save power, please shut off the UPS by long-pressing the components one by one, instead of turning off the breaker.

Satellite Dish Antenna Controller

To activate the satellite dish antenna, turn on the controller. The satellite dish is the large dome-shaped antenna on the radar mast. When it's running, you can hear a slight whir from its gyroscope on the flybridge.

Once you turn on the power, the dish will automatically find and track all 3 DirectTV satellites at once. If you've ever been exposed to the aggravating process on other controllers of locating satellites by hand, this automation is such a welcome feature.

Once the satellites are tracked, the display will look like this:



DirectTV

The DirecTV remote controls both the television and the DirecTV Receiver. Press "TV & Power" at top right of the remote to turn both the TV and Receiver on and off.

Aim the remotes at the TV. There is an infrared relay which transmits signals from the TV area into the equipment cabinet.

To turn off the TV and Receiver, press the Off button on the DirecTV remote.

Troubleshooting Satellite TV

If the system has been on for a long time, or if you have gone back and forth between generator and inverter power several times, you may find the satellite has stopped working. DirecTV will say it has lost satellite tracking, or the satellite controller may be stuck with this display:



When this happens, to fix it:

1. Turn the Satellite Dish Antenna Controller off for a minute, then turn it back on. Wait until it successfully says "Tracking Sats"

2. Reset the DirecTV Receiver. To do this, open the panel on the right side of the DirecTV Receiver and press the small red reset button. Once it resets, TV should work fine again.

This picture shows the location of the reset button:



Playing a DVD

Turn on the DVD player. The TV will automatically switch to DVD programming. The DVD remote can be used to control the DVD player, while the DirecTV remote or Television remote controls TV volume.

Casting

To cast from your phone or computer to the TV, first ensure your device is connected to the Gratitude Wi-Fi network. With the Television on, choose Cast on your device. Choose the Samsung TV for your cast target.

The first time you do this, you will need to use the Television remote to accept the casting request.

Stereo

Turn on the Stereo in the audio cabinet. There is no remote to control the stereo volume; you must use the knob on the unit.

Use the "function" button to control the programming.

To play Bluetooth input, choose Video 1. The Bluetooth receiver is located at the bottom of the stereo cabinet. Press the button on that receiver to pair your device.

To play what is on the Television, choose Video 2.

Heating & Cooling

Gratitude is equipped with two heating & cooling systems

- A Cruisair marine air conditioning heat exchanger system. This is the more powerful of the two systems and can both heat and cool the boat. However, it requires shore power or the generator to operate. This system is controlled by the **black** thermostats.
- A Webasto diesel furnace & engine heat. This system provides heat only, but is capable of operating on battery power. The system can also provide heat taken from the engines while underway. This system is controlled by the **white** thermostats.

Cruisair Marine Air Conditioning

The Cruisair system consists of 5 independently controllable marine heat exchangers, operating in the following zones:

- Salon starboard
- Salon port
- Pilot house
- Master stateroom
- Forward and midships staterooms, with thermostat located in the forward stateroom

The Cruisair systems operate by exchanging heat or cold with sea water. When they are operating, you will see sea water being discharged from the boat port midships.

The Cruisair system is more powerful for heating than the Webasto / system heat system, however it does require electrical power to operate. You will find it's best to use while at the dock or while you have the generator running. It is not an ideal system for use while in a quiet anchorage at night due to the need to run the generator.

The Cruisair compressor units are located on the port side of the engine room. They generally will not require any maintenance or checks.

The circuit breakers for this system are located together on the bottom right of the electrical panel, in the 220V Load section. They can be left on all the time.

There are 5 black thermostats to control the system. To set the thermostat, press either Heat or Cool as desired. Then, use the Up and Down buttons to change the desired temperature. You can use the Temp button to select whether the display is the set temperature or the current measured temperature. The system can be put in both heat & cool mode by pressing the Heat and Cool buttons at the same time. To turn off the system, press Off. All 5 areas can be adjusted independently.

The two guest staterooms are both controlled by the thermostat in the forward stateroom.

Procedure 11 Engage Cruisair

1. Turn on the generator or connect shore power.
2. Turn on the 7 Cruisair circuit breakers.
3. For the 5 black thermostats, choose Heat or Cool as desired and set temperature.

Procedure 12 Disengage Cruisair

1. For all 5 thermostats, press Off.

Webasto Diesel Furnace & Engine Heat

This system consists of a heating loop which is warmed either by the engines (when running) or by a diesel furnace.

This system has lower heat output than the Cruisair system, however it has the advantage that it can run all night on battery power. It is ideal to for use at night in quiet anchorages, or while underway to keep the boat warm.

This system is controlled by the white thermostats. To set the thermostat, turn the switch to On, then set the desired heat temperature.

The system power is controlled by a switch in the pilothouse, on the panel to starboard of the wheel. The switch has three positions:

- System Heat. The system will use the diesel furnace to warm the boat.
- Off. The system is inoperative.
- Engine Heat. The system will use heat from the engines to warm the boat.

This system requires up to 30 minutes to come up to temperature before the cabin blowers operate. If needed, you can verify the diesel furnace is operating by looking at the exhaust port, which is port aft. You could also listen to the unit in the lazarette on the port side.

Procedure 13 Engage Engine Heat

1. Engines must be running.
2. Switch to Engine Heat.
3. For 5 white thermostats, choose On.
4. For 5 white thermostats, set desired temperature.
5. Wait up to 30 Minutes .

Procedure 14 Engage Webasto Furnace

- Ensure there is no fender hanging over exhaust – rearmost port side vent.
- Switch to System Heat.
- For 5 white thermostats, choose On.
- For 5 white thermostats, set desire temperature.
- Wait up to 30 Minutes.

Procedure 15 Disengage Webasto Furnace & Engine Heat

- Engine/System heat switch to middle Off position.

Fresh Water System

Tankage & Filling

Gratitude has tanks for 260 gallons of fresh water mounted in the forward side of the lazarette. The tanks are most easily checked via the sight gauges on the side of the tanks, on either side of the engine room door.

The tanks can be filled via the deck fittings, which are in the cockpit, just aft of the steps leading to the bow. Please use the provided water filter when filling the tanks, which is located with the water hose underneath the cockpit sink.

The tanks can be filled from either side, and water will flow from one tank to another via a link pipe.

On a large yacht, you will find your crew will often forget traditional boat water frugality, and will tend to use the fresh water systems like they do their household water supply. With this sort of usage, full tanks will last you 2-3 days. You should plan to monitor tank levels daily so as not to run out.

Water Maker

NOTE: Do not use the water maker while in fresh water. If you go through the locks into Lake Washington, make sure not to use the unit. The lower pressure required to force fresh water through the membrane will destroy the membrane at the unit's current high pressure settings.

NOTE: Do not use the water maker inside a marina. Excess biological matter inside marinas will clog the filters.

Gratitude is equipped with a 1,200 GPD water maker to make fresh water while at sea.

Water makers are complicated units that rely on expensive membranes and can be easy to damage. While we are happy to provide this system for your use, we ask that if you have access to clean water from a dock, that you use that water to fill the tanks instead of the water maker.

Procedure 16 Making Water

- On water maker unit in cockpit, turn pressure knob to minimum.
- Press Start.
- Increase pressure until GPH sight meter reads below maximum.
- Watch tankage level with sight gauges.
- When done, press Stop.

Hot Water System

Water can be heated by one of two systems:

- An electric water heater
- The Webasto furnace / engine heat system

There is a valve to choose between the two systems in the engine room, located just to port of the engine room door.

To use the water heater, you must be plugged into shore power. You could also use the generator, however if away from shore power it would be much more efficient to heat water with the diesel heater than running the generator to power the water heater. Turn on the water heater circuit breaker and wait for it to come up to temperature. The water heater is located under the hatch at the base of the stairs to the stateroom level.

To use the Webasto furnace / engine heat system, turn on that system and get it up to temperature (See Webasto Diesel Furnace & Engine Heat). Either the diesel heater or the running engines will provide heat for the hot water. This system has the advantage of being an ever-hot system.

Sanitation Systems

NOTE: Absolutely ensure you and your guests only flush marine toilet paper down the toilet!

Gratitude has two marine toilets – one in the master head, and one in the guest head. Both are vacu-flush toilets and require minimal maintenance or attention.

To flush the toilets, press down on the footswitch. To fill the bowl with water, lift up on the footswitch.

It is best to avoid flushing large clumps of TP down the toilet – instead, if TP needs to be used, flush often with smaller quantities of TP per flush. Gratitude's larger tanks allows you to be liberal in the flushing department.

Like all marine systems, Gratitude's black water system does not have the robustness of a home septic system. It consists of twisting plastic pipes and a macerator designed to deal with TP only. There is no easier way to ruin day on the water than to clog this system. The system has larger pipes than smaller boats and will operate with no maintenance or trouble, so long as you and your guests follow this one simple rule.

Experience says it far better to broach this uncomfortable subject with your crew in a direct way than to assume they know the right things to do. There are many stories of even "experienced" guests who have had an oops moment and clogged the system – it's still clogged. Children should be directly supervised to ensure they only flush TP. Go overboard to take steps to ensure your guests follow the TP-only rule, and Gratitude's proven black water system will give you no trouble.

Tankage and Monitoring

The black water holding tank is located under a hatch in the hallway outside the guest head.

The tank can be monitored via the Tankwatch system on the panel starboard of the wheel in the pilothouse. The tank should be emptied when it reads $\frac{3}{4}$ full, as an overflowing tank will cause expensive damage to vents and piping.

Depending on your number of guests and rate of use, we find the black water capacity may last an entire week of cruising with no need to empty it. Then, AYC includes a pumpout when you return.

Pumpouts

Gratitude's pumpout is located on a deck plate on the port bow. To pump out, simply open this plate, apply and use the pumpout vacuum, and then rinse the area and replace the plate.

Always remember to open the valve on the vacuum slowly until waste is flowing to avoid a possible disgusting blowout at the deck plate when the mass of waste hits the vacuum head.

Overboard Holding Tank Discharge

There are very few areas in the AYC cruising range where it is legal to discharge black water overboard. Be aware of your location and ensure you are operating legally.

Gratitude is equipped with a pump to discharge waste overboard. The pump, hose, and through-hull fitting are all located near the black water tank.

The macerator pump is controlled by the circuit breaker on the electrical panel labeled "Holding Tank Pump". There is a cover on this switch to prevent accidental activation. There is no other switch, and this breaker is what turns the pump on and off.

There is a through-hull fitting near the waste tank where the effluent is discharged. This fitting should always be left open. It can damage or break the pump if it is closed; there is no need to close it.

The discharge through-hull fitting exits the vessel below the waterline midships starboard, directly underneath the guest head. It is a good practice to visually verify the discharge of effluent into the water during the process, to ensure the system is working and know when it is complete.

Procedure 17 Discharge Waste Overboard

1. Ensure current boat position has legal permission to discharge waste.
2. Visually inspect through-hull fitting to ensure the valve is open. (it should always be open)
3. Turn on holding tank pump switch.
4. Observe discharge until tank empty.
5. Turn off holding tank pump switch.

Y Valve

Gratitude does not have a Y valve.

Mooring Buoys

Gratitude is too large for any state park mooring buoy. Expect to use the anchor.

Galley & Grill

Stovetop

To use the stovetop, the boat must either be on shore power or generator power. Then, turn on the stove top breaker. This is an induction stovetop and will only work with induction-compatible cookware. All of the pots and pans provided on Gratitude are induction-compatible.

Every time you turn on the stove, you must long-press the Lock button before using it. There must be nothing else at all on the stove for this to work. Yes this is super annoying – we didn't know about it when we bought that stovetop model.

Grill

The propane tank for the grill is in the cabinet beneath the grill. It is a modestly-sized tank – if you are planning a longer cruise with a good deal of grilling, you may wish to make plans to refill this tank.

Trash Compactor

To use the stovetop, the boat must either be on shore power or generator power. Then, turn on the trash compactor breaker. Refill bags for the compactor are in a compartment near the top of the compactor.

Insinkerator

The switch to the insinkerator is located rather counter-intuitively on the port side of the side of the galley counter. You may find this switch keeps getting accidentally hit and the device turned on, which is why it's best to keep the breaker for this off until you need it.

FAQ & Common Issues

Q: The engines are running but will not go into gear

A: Ensure you have turned off “Warm” mode on the EEC.

Q: I see a Yachtmaster remote engine control panel – where is the remote?

A: In the judgement of AYC, this equipment is not provided to charter operators. This equipment is not listed in the specifications of the yacht online for this reason.

Q: I turned on the diesel furnace, but the blowers are not blowing hot air. What’s wrong?

A: This system can take 30 to 45 minutes to warm up before the blowers will start blowing.

Q: The electric hot water is taking a while to heat up

A: This is normal. It takes several hours to heat water, especially from cold. You can see it’s working by the current draw on the left 110v service.

Q: I can’t get hot water no matter what I do. What’s wrong?

A: Check whether the hot water selector is using the water heater or the Webasto / engine heat loop. Then, ensure the selected system is up to temperature. See Hot Water System.

Q: The depth monitor in the master stateroom is off. How do I turn it on?

A: Use the RD30 system. See Marine Electronics.

Q: Why is the galley stovetop beeping?

A: The stovetop will alarm if any objects are placed on it other than pots & pans while cooking. Either remove what you have placed on the stovetop or turn off the stovetop breaker.

Q: The stovetop says “Locked” and won’t cook anything

A: Every time you turn the power on to the stovetop, you must long-press the Lock button before using it. For this to work, there must be nothing at all on the stove. Yes we find this super annoying!

Q: The galley stovetop won’t get hot. How do I turn it on?

A: The stovetop is a 220-volt load, and will only operate while plugged into shore power, or with the generator running. Once connected to shore power or a running generator, ensure the stovetop breaker is on.

Q: The central vac looks cool! Where are the tools?

A: We find it is far easier to use the light battery-operated vacuum than to deal with the giant hose tethered to the central vac. To save space, the central vac tools are not aboard, and we've provided an effective and compact battery-operated vacuum. Trust us, it's better.

Q: When I select single-lever mode on the Electronic Engine Controls, the indicator light keeps blinking. How do you stop it from blinking?

A: Don't use sync on the EEC. Use the panel switches for Sync instead.

Q: The Autopilot won't go into Navigation mode.

A: The Autopilot will not follow an automatically generated course created by the Garmin Auto-Guidance feature. See the section on the Autopilot.

Q: Shore power isn't working even though I'm confident everything is connected right, and all breakers are on.

A: Check the breakers in the lazarette at knee level to port of the engine room hatch. (on the aft side of the wall between the lazarette and the engine room). This breaker can trip if too much shore power is demanded.

Have fun!