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Preparation for The Great Loop

The boat looked to be in good shape, and based on the survey we thought most of the preparation work would be cosmetic and/or for comfort. But, during the first summer cruising we found several systems that either did not work (like the hot water heater), or whose performance could be improved (like the Radar), and then there were some systems that I just want to be different (like the electrical system). By the end I think we have touched every system on the boat. We ended up with 47 projects. They are presenting here in semi-consecutive order based on when the work for that system/project was completed.

Starting with the initial cleaning.

Initial Cleaning and Prep

Removed everything we could. Cleaned Topsides, Insides (Cabin, V-Berth, bathroom, etc.), and Engine room with Bleach, Simple Green and 409. Cleaned the Bilge. Found 2 inches of trash in the bilge: sand and dirt, screws, washers, misc pieces of metal, cloth, paper, insulation, ... Cleaned the bilge pump and strainer. Can almost pump the bilge dry. (Cleaning the Engine room was difficult, but it brightened up the area and we added lights in the ceiling over each area; generator, water tank, batteries, holding tank... It made working in the engine room "almost" a pleasure.)

The teak floors were a little dark and worn, but otherwise in good shape. We decided to refinished the Teak using TotalBoat's Part A and B, Sanded any real bad areas. Applied TotalBoat Danish Teak Sealer. We also painted the insides and aft deck area.

The cushions in the Salon were a little worn (there were bare spots on the "underside") and there was dog hair on all the cushions and berths. We decided to reupholstered all the cushions and berths. The original plan was to use the old cover as a pattern, but removing them caused even more damage so we use the internal foam as the pattern. And, since we had the pattern we decided to make fitted Sheets for the V Berth and the salon lounge cushion (2 sets). Sheets fitted to the V-Berth are nice. It is easier to make the bed and it sleeps better. In addition, we made pillow cases out of the same material sized to hold a lifejacket.



The Finished Reupholstered cushions. Note, the Pillows are zippered cases sized to hold a Lifejackets.

We then Rehung the Curtains. And the insides looked bright and new.

As for the Bottom. Cleaned and painted the bottom with Vivid. Cleaned and painted the prop, rudder, trim tabs, and the bow thruster. We used Rustloc as a primer then Vivid. Was not happy with the results at the end of the season. Lots of barnacles on the Metal components. So next year PropSpeed.

Replaced all the Anodes.

Airhead Composing Toilet

Replaced the Vacuflush toilet with an Airhead Composing Toilet. We no longer use a Holding tank. The waste is stored in compost inside the tank. The literature states we can use it 80 time before emptying (1 months for 2 people). I only empty it twice during the 2024 season. The first time was just to see how difficult (or in this case how easy) it is to empty. The second time was the end of the season before storage. With the sail boat I would empty the holding tank twice during a weeklong trip. A couple of notes. **No Smell**. Rated at 80 uses between emptying. No pumps, no valves, only one moving part. Maintenance is minimal. I have been very happy with this and so far, no complaints from the crew. Exhaust fan installed at the overboard. Connected to Always-On. Switch on top of exhaust line for extended absences.

Unlike a standard marine toilet which has pumps, valves, and hose that that break, leak, clough up, and smell. At least one of which requires fixing during our summer cruising every year. **The maintenance associated with the Composting toilet has been a game changer**. Only one moving part, no pumps, no valves, no hoses, no smells.



Replaced the boats grounding wires, starter, and battery.

We had an electrical problem and fire while bringing the boat to RI. I believe the battery was bad (could not get it above 9V after the event) which cause the starter to draw to much current and short out, which cause a short to the boats grounding system and burnt a large portion of the grounding wires. We tried scheduling a mechanic, but the best we could do was mid July (5-6 weeks). We decide to start the work ourselves.

We replaced almost all the boats grounding wires. Everything that was burnt or looked burnt.

Replaced one of the batteries. They are 8D batteries that weigh 167 lbs. each. They are located on a self behind the engine with only 6 in clearance above. To remove we needed to maneuver

them around the engine. Over the bilge and thru a small hatch in the front of the engine compartment. With only 6 in clearance and no way to pick them up it seemed impossible. The solution was a motorcycle jack. Placed the jack in the bilge. Jacked it to the level of the shelf. Pulled the battery on to the jack. Lowered it to get it around the engine. Then jacked it to the level of the hatch and pulled it out. The marina helped us get it from the boat to the shore. We just reversed the process to reinstall the new one.

Replaced the Starter. The starter is located on the lower port side of the Engine. Very hard to get to. Very hard to see. (we used the phone cameras to see) I held the starter in place with one hand from the front of the engine and Duane aligned and attached the bolts with one hand from the back of the engine. Note he was for the most part working by feeling.

Hot Water Heater

The boat has a hot water tank. It did not work. After many hours of troubleshooting realized it was by-passed. Everything except the cold-water inlet was connected. I believe there was a problem with the tank. We decided to replace it. The old tank had a *temperature compensation valve TCV* on the engine coolant side. I could not find a replacement. Added a Thermostatic Mixing Valve on the fresh water side instead. Note, the engine coolant circulates thru the hot water heater and the cabin heater. The cabin heater is below the Pantry. The Pantry gets hot. Added a bypass (with 3-way valve) around the cabin heater. When not in use it can be bypassed. (Left-Bypass Heater, Center-off, right-Use Heater) The bypass valve is located on the forward Engine room wall just stbd of the access hatch.



Note, the hot water outlet is not connected to anything.

Bow Rail

The Bow Rail was loose, probably because people lean on it while fill the water tanks. We decided to re-seat the Bow Rail. While reseating them noticed water in the Deck. Removed the Bow Rail, drained the water, dried it out. Did an "Epoxy Core" in the area where the Rail attaches to the deck. And, reinstalled the Bow Rail. It is solid now, see how long that last.

Anchor Rode

The anchor rode was 20 ft of chain and 120 ft of rope. Added 200 ft of rope for a total of 320 ft. Added whipped bands at 50 ft intervals to aid in determining scope (1 band = 50 ft, 2 bands = 100 ft, 3 bands = 150 ft...). I like using whipped bands so we can do it by feel. Sometimes we anchor after dark.

Anchor Washdown

Added an anchor salt water washdown connection in the bow. Shutoff valve can be reached thru the Anchor locker.

Swim platform Hot/Cold Shower

Added a hot/cold shower in the aft deck area close to the swim platform. The control head is under the “step up” steps on the stbd side of the aft deck. Note this can also be used to provide water to the clothes washing machine. (We are making space in the outside Trash cabinet for the washing machine).

Bimini

We (I) wanted a sun shade over the rear deck. The first iteration we attached a tarp to the back of the cabin and to 2 poles at the back of the deck. This worked as long as there was NO wind. Second Iteration we added a ridge pole on the centerline and a cross pole (rafter) at the rear of the deck supported by the 2 upright poles. Attached the tarp by zipper to the cross pole. This held up to the wind, but it ending up catching rain and sagging. To limit the sagging, we added 4 cross poles (rafters). It may look strange, but it works.

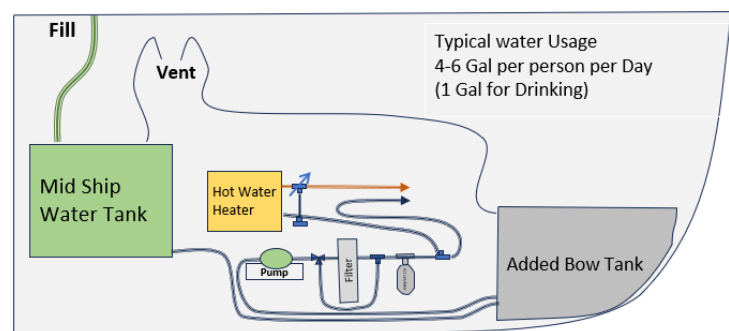


Table

Installed an Lagun Table. Attached it to the lounge seat in the Main Cabin (one mounting location midship, the second on the forward section). These are very articulate tables. Can be adjusted into almost any position. It is easy to move out of the way when not in use and to almost any place when we want to use it.

Bow Water Tank

The boat has a 35 gal water tank. The sail boat had a 12 gal water tank. For 4 people that with a 5 gal shower bag would last 2 days. (we often would stretch it to 3-4 days). We figure the per person water usage to be about 1 gal for drinking and 4-6 gal general use or approximately 5 gal per person per day. 2 people for 1 week would be 70 gal. We have space in the bow under the V-berth forward of the bow thruster and based on calculation we should be able to get 30-40 gal tank there. We decided to add a Bow Water Tank.



The Fresh water storage system. We added the Bow Tank, filter, and accumulator. We replaced the water pump and hot water heater. the only component we did not touch was the Mid-Ship water tank.

Removed the V-Birth, measure the bow area and had a polypropylene tank made to fit the shape. Note, when we received the tank from the manufacturer it was 2 inches short. I gave them the measurement on the Perpendicular. They built to the slant. It holds 30 Gal for a total of $30 + 35 = 65$ Gal of fresh water

The fill and drain are on the bottom aft side of the tank and the vent is on the top aft side of the tank. All lines are $\frac{3}{4}$ ID. Both tanks are plumbed to fill thru the original tank and drain thru the New Tank. Epoxidized in a cross bar to keep the tank in place and away from the Bow Thruster. Also, there are 2 cabinets under the berth open to the bow thruster. This limits there use. Added a divider board to separate them from the bow thruster so they can be fully utilized.

Water Filter

The water stored on boats can get a little funky at times. At the beginning of the season, before launch I normally chlorinate the tanks for a day then flush and refill. And, as the season progress, I occasionally add 1 Tsp of chlorine when filling the tanks (Recommend 1 Tsp per 50 Gal with a max of 1 Tsp per 10 gal).

To try and overcome the FUNKINESS we decided to add a whole boat water filter (5 μ ron KDF/GAC), on the output of the water pump. Also added a 3-way bypass valve in the same area as the water tank mounted on the forward side of the divider wall. (Up-Bypass Filter, Center- off, down-use Filter). Note, we are filtering after the water tanks. The reason being that the filter will remove chlorine. I want to store the water with chlorine, so filter after the tank.



Water Filter, Note By-Pass in the upper left



Fresh Water pump and Accumulator tank

Accumulator

There was no accumulator in the system. An accumulator will help steady the water pressure and prevent the water pump from cycling as often. Added an accumulator tank at the outlet of the water pump.

Added a Draw down pump

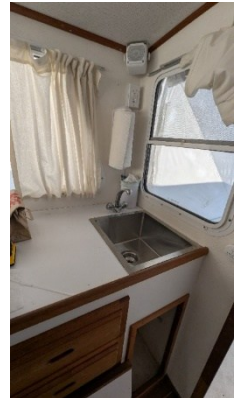
Added a pump to ease the task of drawing down the pee bucket. The switch is under the bathroom sink. The Overboard connection is a T under the Sink.

Bathroom Shower

The Shower was a pullout shower behind the toilet and the faucet for the sink was the wrong size for the sink (It made a mess ever time we used it). Replaced the faucet with a pullout shower/faucet that is the proper size for the sink. Removed the pullout out shower behind the toilet and replaced it with a recessed cabinet. Hopefully that gives us a better shower and some additional storage space.

Kitchen sink

The old kitchen sink was narrow and deep. I found it hard to use because the pans (and I) did not quite fit. I found a sink that was 3 in wider and would fit within the cabinet frame. Removed old kitchen sink and replaced with the larger kitchen sink. It is amazing the difference 3 inches makes. Also, Rerouted the drain line to improve under sink storage.

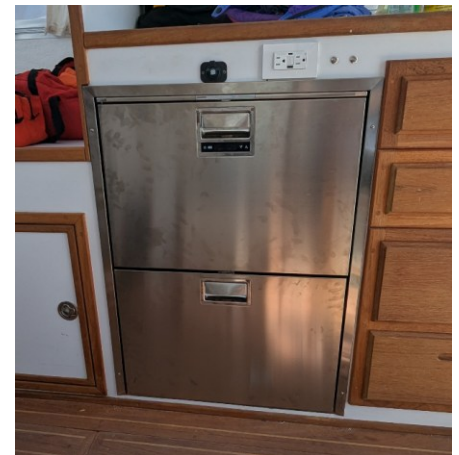


Refrigerator

Replaced the old Refrigerator (Norcold DE0051, 2.7 CuFt) with a new Vitrifrigo DRW180AIXD4-DF, 5.3 CuFt) 2 Drawer Refrigerator/Freezer. The New Refrigerator is twice the size as the old one and fills the space where it sets, just meeting the ventilation requirements as specified in the manual. Just in case I added a switch-controlled ventilation fans incase additional ventilation is needed.



The Old refrigerator fit into the upper opening. Note the Cutout for the New refrigerator.



The New Refrigerator installed

AC Unit

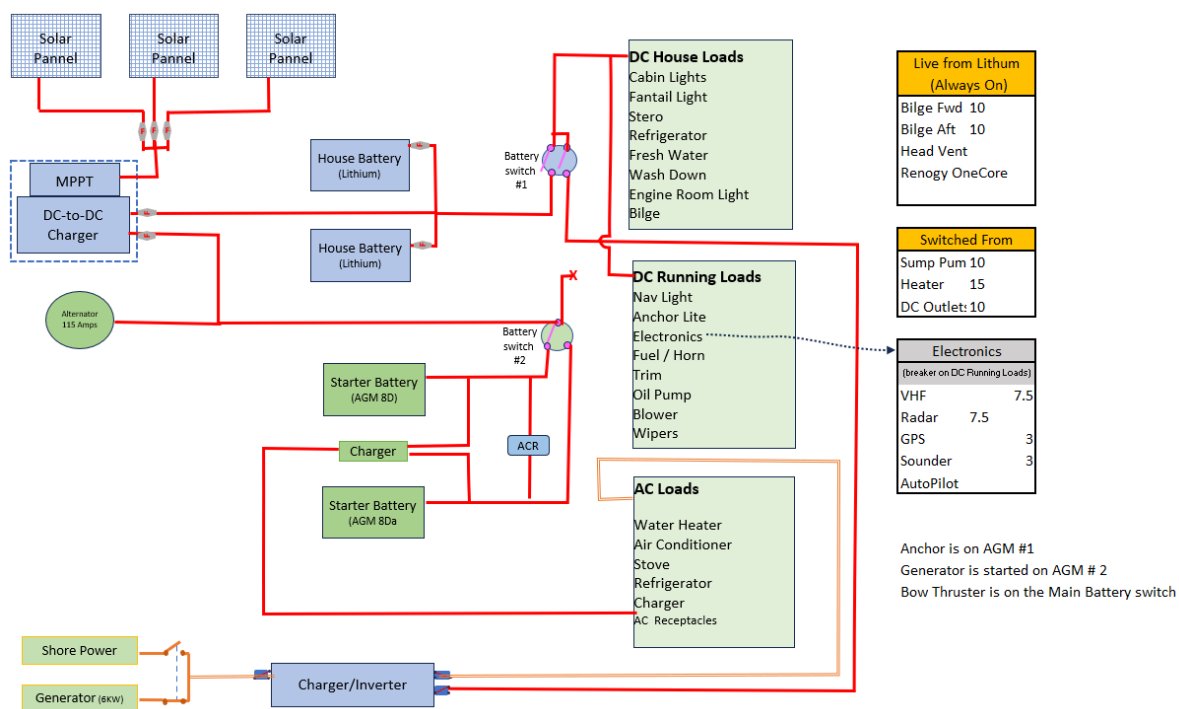
The AC keeps giving alarms for lack of cooling flow. Believe the cooling coils are dirty. Made a rig to flush the AC unit with barnacle buster. The cooling coils were not very dirty. The cooling flow was still low. The strainer was clean. The pump was good. Very low flow at the input of the

cooler. Found a kink in the input line inside the bulkhead behind the salon seat. Replaced the line. Flow looks good. The AC works. The heater works.

Electrical upgrade

Electrical Rewiring

Split out the electrical system so that all the House loads are on one panel and all the running loads are on the other. The House loads are powered by the LiFePO4 batteries and contain cabin lights, DC outlets, refrigerator, fresh water and seawater pumps, bulge pumps, etc. The running loads panel powers the Navigation components, Nav lights, Blowers, wipers, etc. Right now it is also powered by the LiFePO4 Batteries, but are set up so that they can be moved to the AGM if desired. Did not change the big loads (Main Engines, Generator, Bow Thruster, and Anchor Winch) they are still connected directly to the AGM batteries.



Battery Switches

Added a 2 Pole switch for the LiFePO4 batteries. Now have 2 Battery switches. Both on the Stbd side of the Helm station. The bottom switch (calling it Switch #1) is the Starter battery switch. Left as is selecting between AGM1 and AGM2 (the Starting Batteries). Since there is a switch between the 2 starting batteries we added an ACR to the AGM Batteries (just the AGM Batteries).

The top switch is for the LiFePO4 house batteries (calling it Switch #2). It is a 2pole switch. The batteries are on Pole #1 and the inverter/charger are on Pole #2. The Outputs are shorted

together. With this set up when closed everything is connected. When open nothing is connected.

Batteries

Added 2 x DAKOTA DL+ 12V 320Ah LiFePO4 Dual Purpose Batteries in parallel for the House loads. Dedicated the 2 x 8D AGM batteries for starting and running loads. Total battery capacity $320+320+260+260 = 1160 \text{ Ahr}$ (that is more starting battery than we need. But, they are too big to move so...).



AGM Batteries on the left, LiFeP4 on the right, Note MPPT/DC-DC charger between the batteries and the DC Shunt in the Lower Right

DC-DC Charger and MPPT Controller

Added a DC-to-DC charger to charge the LiFePO4 batteries when the engine is running. Note the starter battery side is connect to the output of the Starter battery selector switch. Note the DC-DC charger is combined with an MPPT controller to control input from the Solar panels.

Invert/Charger

Added a 3Kw Inverter charger. It is connected to the LiFePO4 batteries thru the LiFePO4 battery switch. The AC Panel can be powered by either shore power, Generator, or the Inverter. It includes the refrigerator, stove, hot water heater, Air Conditioner, AC outlets, etc. **As a note. On the DC side the Black wires are the neutral and the Red is Live, on the AC side the Black is live side and the white is the neutral.**

DC Shunt

Installed a DC shunt to monitor the LiFePO4 batteries and state of charge

Renogy Core One

Installed the Renogy Core One to monitor the Components added with/for the Lithium upgrade (DC Shunt, DC-DC Charger, MPPT, and Inverter/Charger). The Holding tank has been

disconnected and as such the Holding tank Monitor was no longer being used. Removed it and replaced it with the Core One.

Engine Room Lights

Added lights in the Engine room in the ceiling over each area; generator, water tank, batteries, holding tank. Switched from the Li Panel. Note, one is directly above the mid-ship storage tank. It helps with checking the water level in the tank.

AC Outlet

Added GFCI Tamper resistent AC outlet above the Sink for the TV. I have now broken 2 of them trying to plug into the Tamper resistant plug. What a pain.

DC Outlet

Added DC USB charging ports at the Berths, copilot seat, and the Helm seat.

Knot Meter

The paddle wheel for the knot meter was fouled. There was no blank plug so it was impossible to clean in the water. Tried pulling it after hauling. It was jammed in place. Shaped a wooden dowel rod to fit over the paddles and rest on the shoulders of the unit (not the paddles) Was then able to free it by tapping with a mallet. Bought a replacement Blank plug in order to be able to clean it while in the water.

Waste overboard Valve

We replaced the VacuFlush toilet with a Composting toilet and as such the holding tank is no longer used, Also, we were not able to close the waste overboard valve. Emptied the tank. Used a cheater bar to shut the valve. Removed the handle and left as is. One of these days I will remove it.

The Bottom

The bottom still looked good from last year, but we cleaned it, faired any small places, and painted the bottom. The Bow Thruster was also in good shape. Just touched it up with paint. However, there was no paint on the propeller, the ruder was coated in barnacles, and the Line cutter was broken. There was a ring scratched around the shaft. The yard thinks it was caused by the line cutter and is not problematic. Also showed pictures of the ring scratch to an engineer at "Luther's Welding and Fabrication". Without me mentioning the line cutter they

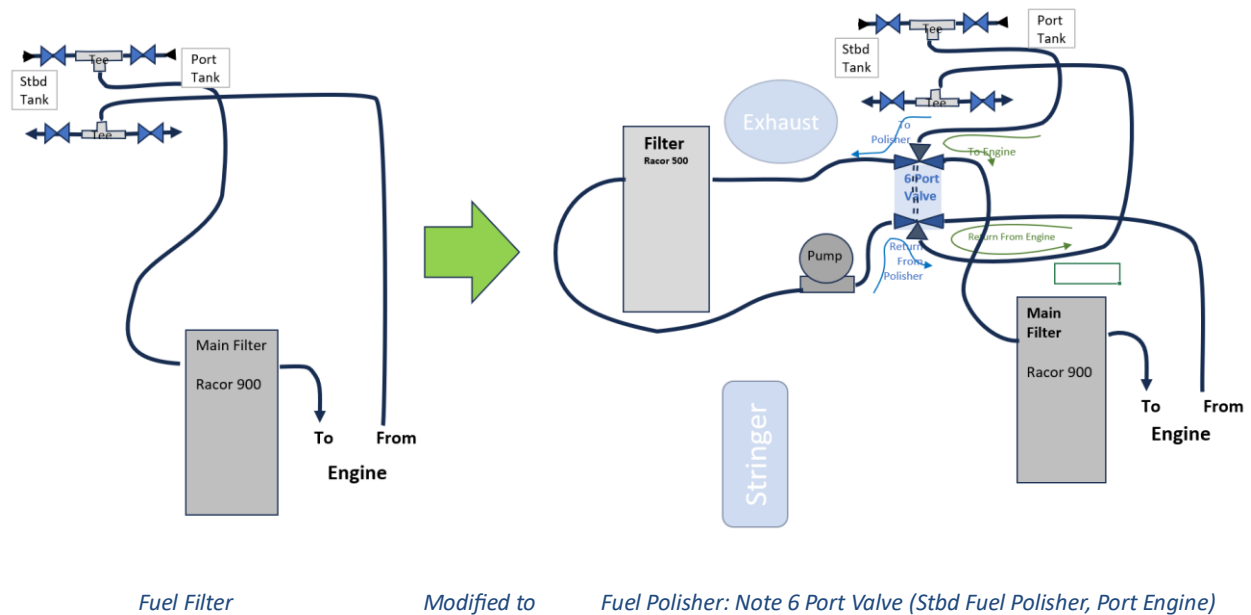
identified that as a likely cause and stated that it did not look problematic. Painted the Propeller, Rudder, and shaft with PropSpeed. It looks pretty good.

Anodes

Since this coming year we will be spending a lot of time in fresh water I decided to move from Zinc to Aluminum anodes. Replaced all the Anodes with Aluminum Anodes. Had trouble finding an Aluminum anode for the Generator. Was able to find one that fit the bolt, but was slightly large for the hole. Cut it down so it fits.

Fuel Polisher/Transfer

When the Engine died on the initial run from Maine to RI I started thinking about dirty fuel. It has a Racor 900 MA that looked to be in good shape, but the mind plays tricks. The Fuel tanks are 2 x 100 gal polyethylene tanks, one port and one stbd. No inspection plate and no way to add one. No way to clean them. Decided to add a Fuel polisher and a Transfer pump that will allow me to clean the fuel in one tank and/or clean fuel as I move it from one tank to another.



Steps

Made 2 sets of steps for stepping from the aft deck to the Side Deck. Mounted on a French Cleat. Secure and removable.



Aft Deck Cabinet

The Cabinet on the aft deck that was built to house the Trash and Washing Machine. It ended up being the longest running project of the pre-fit. It took 3½ months to build. It is on the aft deck, to the stbd of the cabin entrance between the door and the wall. The major considerations were; It is over the access to the stbd fuel tank pick up. It is in front of the stbd fresh water connection (changed to Hot/Cold for shower and washing machine connection).

Access to these location must be maintained. It cannot take up too much space. The space has no right angles with many odd shapes it must fit around. It is where you enter the boat so It must at least look half way decent. And, it has to stand up to the environment. Decided to make it using ½ plywood encased in fiberglass and gel coated. The trash is next to the door with access thru a swing flap. Access to the washing machine is on the right side. Made that door removable since it is partially blocked by the steps.

Cut all the pieces out, stapled them together (it looked good) and took it down to the boat to see how it fit. Nothing fit. No right angles. We took it apart there, re-cut everything, stapled it back together and check the fit. We gave ourselves ¼ inch clearance for the fiberglass. After fiber glassing and gel coating it was slightly more than ¼ inch. Had to recut/reshape again. It now fits nicely.



Trash is on the port side, access thru swing door. Can remove front panel to facilitate removing the trash; Latches inside. The Washing Machine is stbd side, latches on the front of the door.

Motor Box

As we were building the Aft Deck Cabinet, I realized we need to plan the outboard engine. What type of outboard and where to store it. We have been using a 2 stroke Tahatsu, a 4 stroke Mercery, and a Newport electric trolling motor. The Tahatsu is very reliable and the lighter of the gas engines. The trolling motor is lighter, easier to operate, and very reliable. It just does not have the power and range of the gas engine. Newport motors has an electric outboard. Light and more power than a trolling motor. **And, they do not restrict you to a proprietary battery**

from them like the other electric outboard manufacturers do. Being able to hookup to a battery from anybody makes this a more dependable/consistent choice. (Several years ago I bought a Torqeedo electric motor. It worked pretty good till the battery went bad. A proprietary battery I had to buy from them. Very expensive. (The expense precludes a backup battery also.) Keep it another couple years till that battery went bad. Switched to Newport electric. So much cheaper and since I can use any battery caring a spare battery became cheaper which greatly reduced my range anxiety.

For storage I decided to make a waterproof box and mount it on the swim platform. I built the outboard box using the same method as the Aft Deck Cabinet. Considerations: Low profile so it does not take away from the swim platform. Strong enough to stand on. Hold Outboard, battery, spare battery, and charger.

Swim Platform

Cleaned all the unused hardware off of the swim platform and replaced the 3 step ladder with a 5 step ladder.

Dingy and storage

We have a West Marine inflatable dingy. For storage during transit, we installed the “Weaver Snap Davits for Swim Platforms”. They worked pretty good. The only thing I did not like were the metal parts. They seemed to always be in the way and since they were metal, they are hard to ignore. We bought a Zodiac Aluminum RIB (again weight, the Aluminum RIB was lighter than any Fiberglass RIB). We were installing the Weaver Davits and noticed that Zodiac has a hand hold in the same location we wanted to install the rear davit yoke pads. Instead of removing the handle we drilled 2 holes in the handle to fit the metal yoke. That worked. Then instead of glueing on the forward Yoke pad we glued on another handhold with holes to fit that Yoke. Then one day I was trying to tie the Dingie closer to the swim platform to make boarding easier and noticed that I could replace the metal Yoke with a Soft Shackle. It works, but will not trust it in heavy seas). Now I had the Weaver davits with NO metal parts.

The Top of the Cabin

Radar, Search light, Navigation Light, GPS antenna, 2 VHF antennas, horn, and stove vent are mounted on the Cabin Top. We want to add Solar panels, Starlink, and maybe a TV antenna. The Navigation light is in the center of the cabin top. It will have to be moved. The stove vent opens into the aft stbd quarter of the cabin top. It will need to be moved. The radar is mounted Directly behind the search light. It has never performed very well. I think its location behind the search light is impacting it. I want to move the Radar.

A radar tower would allow us to centralize the Radar (and move it above the search light), Starlink, and Navigation light to the forward portion of the cabin top. Also, The GPS antenna is on a pole to the stbd of the Radar. I want to lower it so it is below the Radars beam. As a note, the GPS antenna, cable, and pole were glued to the cabin top. I destroyed the cable and connector removing it. We replaced the cable and connector. The GPS signal strength was weak and we were only able to see 3-4 satellites. We replaced the GPS antenna. Now we see 10-12 GPS satellites. Making those changes, and by closing off the vent we will free up 2/3 of the cabin top for solar panels.

We added 3 × 220 Watt Monocrystalline Solar Panels, for 660 watts of solar, just aft of the Radar tower.

With these changes, we also had room on the cabin top for the lift raft. Built a water tight box with “weak” points that will allow the raft to inflate and escape to the surface if the boat sinks. Mounted the box to the port of the tower.

Also added folding steps to the mullions port side between the windows to make access to the cabin top easy.



TV and Stereo

The aft stbd stereo speaker in the cabin was not working. Decide to replace both speakers. Since I had the ceiling cable way down, I decide to install a flip up TV above the sink and run the antenna cable thru the same cable way. Mounted the TV antenna on the cabin top close to the GPS antenna. Also replaced the Stereo with a current JVC model that has all the bells and whistles.