Magnetic compass attraction > Power voyaging power tripping

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# OCEAN VOYAGING CRUSSING THE ATLANTIC AFTER PONNO

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THE VOYAGER'S RESOURCE

### BOAT FOCUS ARCTIC EARTH NORTHERN EXPEDITION YACHT

Island Missing from Caribbean Charts



# "If there is magic on this planet it is contained in water."

— Loren Eisley



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March/April 2022



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On the cover: Anissa Talbi helming a Raven 31 on a training voyage up the East Coast of Northland, New Zealand. Amanda Swan - Great Escape Sailing photo.

For more on voyaging, follow us on: www.facebook.com/oceannavigator www.twitter.com/oceannavmag



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James Borton (Short tacks, "Classic PearsonElectra goe electric," page 17) is an environmental policy writer and senior fellow at Johns Hopkins University's Foreign Policy Institute. His latest book, is *Dispatches from the South China Sea: Navigating to Common Ground*. He remains an avid sailor aboard his Pearson Electra *Sea Gypsy* on the May River in historic Bluffton, South Carolina while wearing his *Ocean Navigator* hat.

**Peter Swanson** (Short tacks, "The lost harbor of Christopher

Columbus" page 12) worked as a newspaper reporter

and editor in New England for 20 years before run-

ning away to the Caribbean on a 30-foot ketch. He

came back and has written for boating magazines for

the past 20. Along the way, he has varnished yachts,

crewed on a schooner, delivered boats and captained

and holds a U.S. Coast Guard master's license for ves-

excursion catamarans. He lives in North Florida

sels up to 50 tons.



**Rebecca Childress** (*Ocean voyaging "The first six thousand miles without Patrick," page 20*) is a liveaboard voyager and nautical writer who voyages aboard her 1976 Valiant 40 *Brick House*. She also produces a popular cruising video blog on YouTube called "Sailing Brick House." She sailed more than 12 years on a slow westward circumnavigation with her late husband Patrick Childress and now continues on, nearing the crossing of her outbound track. She and *Brick House* are currently in the Caribbean.



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#### Chartroom Chartr



Courtesy Pacific Cup

### Pacific Cup seminars underway

A participant in the 2018 Pacific Cup outbound through the Golden Gate. Race organizers are currently offering a series of seminars to prepare racers for the 2022 race. THE PACIFIC CUP (OCEAN NAVIGATOR IS A CO-SPONSOR) WILL start on July 4, 2022, sailing from San Francisco to Kaneohe, Hawaii. The race has 80 entries at press time. One of the distinctive aspects of the race is the extent that race organizers offer participants a range of opportunities to learn as they get ready for offshore sailing. This includes a slate of seminars — dubbed "The Pacific Offshore Academy" — and an extensive series of articles, lists and tips on the Pacific Cup website called the "Knowledgebase."

The seminar series got underway on October 9 with a "Prepare Your Boat" seminar that focused on such boat-related topics as offshore rigging, communications, electrical systems, sail selection, crew selection, etc. Forty people attended in person, with another 15 online. A "Plan Your Trip" seminar with scheduled talks focused on racing performance will be offered via Zoom in four independent seminars on Feb 2 and 10 and March 16 and 23. A third seminar on "Personal Crew Preparation" is set for February 27 and will be held at Corinthian Yacht Club in Tiburon and will help ensure "...that you and your fellow crewmates are ready for the trip and have the skills and behaviors needed for a safe, fast, and pleasant crossing."

Hawkeye King, one of the organizers of the seminars, wrote in an email: "We believe there is great value in an educational program that sets up our racers for a successful race. We're 'the fun race to Hawaii,' and we get a great range from very highly competitive boats to casually competitive boats in our cruising division. We try to tailor a seminar series that covers all the bases, and from which skippers and crew at every level can benefit."

In addition, the Pacific Cup Knowledgebase (pacificcup.org/kb) is available to both racers and the general public and is grouped into 25 different topics, including communications, driving, food, emergency steering, weather, planning and more.

### Hurricane seminar from the experts

It's not often you can get a BRIEFING FROM WORLD EXPERTS on a subject, but voyagers will have an excellent chance to do just that when the National Hurricane Center in Miami hosts the 2022 Mariner's Weather Hazards Workshop on March 15 to 17. The Seven Seas Cruising Association is actively promoting the session to its members and you can find out more on its website (SSCA.org).

The virtual event will cover a wide variety of topics related to extreme weather. Subject matter scheduled for coverage includes: a 2021 Hurricane Season Recap; NHC tropical cyclone forecast products and uncertainties; 40-minute breakout sessions that will each include a Tropical Analysis and Forecast Branch (TAFB) surface analyst, TAFB marine forecaster, Hurricane Specialist Unit (HSU) hurricane specialist, and Weather Forecast Office (WFO) marine forecaster; feedback sessions on TAFB, HSU and Ocean Prediction Center product changes; a session on the NOAA Voluntary Observing Ship (VOS) program; Q&A discussions and more.

There will also be five external speakers not from the National Weather Service. "The external speakers usually have some sort of discussion regarding how they handle hurricanes," Andy Latto from NOAA wrote in an email. "The other talks include a lot of material regarding weather hazards that are related to other oceanic weather hazards, but occasionally will discuss how their respective part of the organization deals with hurricane threats."

You can register for the session here: https:// tinyurl.com/yckkm8jx.

Heavy weather, like this squall with a waterspout, will be the subject of an upcoming National Hurrican Center online seminar.



# Chartroom



Coral disease spreads in Caribbean

STONY CORAL TISSUE LOSS DISEASE (SCTLD), IS NOW SEEN in Caribbean reef areas and in nearshore reef areas. First identified in Florida in 2014, SCTLD has become prevalent across the Caribbean tropics, affecting more than 30 varieties of corals. One problem is confusion with coral bleaching, a process caused by water temperature/UV sunlight damage. The white patches on corals look similar, but one is a stress response while

the other is an infection. There are several papers to assist in coral disease identification, such as the Atlantic Gulf Rapid Reef Assessment (AGRRA) presentation at www.agrra. org (click on "Coral disease outbreak" and then scroll down to "How do I identify it?"). Or see the downloadable image cards at floridakeys.noaa. gov (click on "Stony Coral Tissue Loss Disease").

Per AGRRA, at least 20 Caribbean countries have confirmed SCTLD infections, 19 countries are being monitored, and 11 have SCTLD treatment efforts in progress. This disease has affected the pillar, brain, star, and starlet coral species; it is rapidly spreading with a high mortality rate. The disease kills coral colonies, with its hallmark signature of a "coral skeleton devoid of flesh." The diseased coral has discolored stark white patches. While there are several coral diseases,

SCTLD has become the major topic of scientific coral studies in the Caribbean. Scientists have not discovered SCTLD outside of Caribbean areas such as the Caribbean islands, Gulf of Mexico, western Caribbean and Florida, but are researching reports to their websites.

Areas with confirmed SCTLD infection include USA/Florida, Jamaica, Mexico, Sint Maarten, the US Virgin Islands, Dominican Republic, Turks & Caicos Islands, Saint Martin, Belize, Sint Eustatius, The Bahamas, Puerto Rico, British Virgin Islands, Cayman Islands, Guadeloupe, St. Lucia, Honduras, Roatan and Martinique.

To combat SCTLD, new treatment approaches have shown success utilizing a disinfection procedure for divers and an antibiotic paste, amoxicillin, manually spread on infected corals. The antibiotic treatment has shown hopeful results, stopping infection from spreading over the entire coral. As this requires professional training plus diving to treat the coral underwater, the procedure is only able to support a small subset of infected corals.

Success with antibiotics is also indicative of a potential bacterial cause. One report suggests the cause may be due to untreated sewage. The topic of sewage is a sensitive one, but there are other areas with large commercial vessels/ and or diving spots that are infected. As divers are advised to disinfect gear with a light bleach solution, bilge water could also be treated. Regarding holding tanks, no tanks should be dumped over shallow coral areas. More of an issue may be near shore, where local sewage disposal and shore runoff may drain directly into the harbors.

Coral disease research has become a major effort across the Caribbean. Researchers and organizations are trying to understand the extent of damage and are attempting to discover treatment approaches to save coral species. Some governmental and non-profit organizations participating in this research include the NOAA Coral Reef Watch program (coralreefwatch. noaa.gov), AGRRA and the Gulf and Caribbean Fisheries Institute (www. gcfi.org).

Several organizations with major research efforts have been identified below along with their various digital desktops. Cruisers will find the desktops accessible via the Internet, open to all for reporting and information on locations of concern. Some sites may allow email reports, but this is case by case. There are three sites accepting citizen scientist observations. Go to: GRRA, Florida SEAFAN, or VI\_CDAC.

By reporting to the research sites, boaters can help organizations develop maps of infections. This then leads to gaining more information on rate of spread and may assist in validating successful treatments. Organizations hope cruisers can help identify potential causes, treatments, and additional ways to alleviate this disaster occurring in our beloved tropic waters.

> Joan Conover (president of Seven Seas Cruising Association)

### Sun sets on NOAA paper charts

IN NOVEMBER 2019, NOAA ANNOUNCED A FIVE-YEAR PROgram to end paper nautical chart production and convert entirely to electronic navigational charts, or ENCs. This process, which NOAA calls sunsetting, means the big paper charts that hang on people's walls and require large chart tables on ship bridges and nav stations on cruising boats, will in another few years be unavailable from print-ondemand certified NOAA agents.

It also, and more seriously for the recreational boater, means the cancellation of its RNCs, or raster navigational charts, which are electronic images created by scanning printed paper charts and recreating them in raster picture elements or "pixels" for use in digital electronic chart viewers. When I cruised the South Pacific I used these RNC charts on MaxSea and found that they were often much easier to follow when entering a strange harbor than the vector charts, ENCs, then available. NOAA's chart viewer and non-proprietary chart programs such as OpenCPN will open RNCs. Personally, I find the uncluttered nature of the RNC picture easier to decipher at a glance than the ENC vector chart, and this bears out in an experience I recently had navigating New York's East River. Having long used paper NOAA charts, many voyagers may have the same preference.

Sadly, whatever sailors think, NOAA is not going to change its policy and the period for comments is over.

I would suggest taking time to visit the NOAA catalogue (nauticalcharts. noaa.gov/charts/noaaraster-charts.html) and download the printed chart pdfs and zipped BSB format files before the final ones are cancelled in 2025. The first charts were cancelled late in 2021NOAA maintains a list of recent and pending cancellations. I did this, and now as long as I have a chart viewer and a computer/printer I can continue to use these invaluable resources.

Ann Hoffner

# Chartroom

### **Notable New Titles**

Addicted to More Adventure: Risk is Good, Enjoy It By Bob Shepton Independently Published, 2021 265 pages, \$20, ISBN-13: 979-8521256938

How many people in their 86<sup>th</sup> year sail throughout the islands and coast of Scotland, then from England to the Canaries via Biscay and Madeira, and then make yet another cruise of Scotland in the cold and gales of autumn? And all this while also readying his latest book for publication? Of course, none other than the unstoppable polar sailor and mountaineer Bob Shepton.

The Reverend Bob Shepton, an ordained minister in the Church of England, has been traversing the high seas and making first ascents of formidable walls and peaks for more than 35 years. He was a climber first, and so it was natural that when he began sailing he would combine the

two endeavors, just like the renowned Bill Tilman, the sailing and mountaineering legend of the early 20<sup>th</sup> century. Indeed, Bob has been awarded the Royal Cruising Club's Tilman Medal twice. He has also been honored with the Ocean Cruising Club's Barton Cup (twice), and with climbing's highest accolade, the Piolet d'Or. The British yachting press named Shepton Yachtsman of the Year in 2013 and bestowed a Lifetime Achievement award on him in 2020.

In 1995 Bob received the Cruising Club of America's highest award, the Blue Water Medal, for his circumnavigation of the globe via Antarctica and Cape Horn aboard his 33foot fiberglass Westerly sloop Dodo's Delight. But his high latitude circumnavigation was in some ways only the beginning of many years of adventuresome voyaging. Most sailors

know Bob today for his many sailing-to-climb expeditions to the most isolated regions of the Arctic, often with the "Wild Bunch," a group of first-class climbers and all-around intrepid people.

A few years ago, Bob wrote an excellent book recounting many of these endeavors. Addicted to Adventure: Between Rocks and Cold Places (London: Adlard Coles, 2014) opens with a disastrous fire during his winter on board Dodo's Delight in the Greenland ice. It goes on to tell tales of pioneering routes on un-climbed cliffs, of a dismasting in Antarctica, and of a Northwest Passage transit, to name a few. But he left many stories untold. Happily, his newest book, just released on Amazon, fills the gaps. Addicted to More

Adventure: Risk is Good, Enjoy It begins with Bob's first youth, in North Africa in 1954

with the Royal Marines. Evidently not finding the desert warfare training to be enough for his level of energy, he and two fellow Marines set off on a 50mile trek across the hot desert to Tripoli. They covered those 50 miles in only one day, and even made time to drink coffee with a Bedouin in his tent along the way. Adventurers today completing something similar would probably call it an ultra-marathon and make a bit of noise about it on social media. Not Bob. It was just a "yomp," a hike, to him.

This kind of refreshing understatement characterizes the whole book. Whether he's describing the frequent gales he and his young crew encountered on the long passage from Antarctica to Easter Island or the difficulties of landing climbers onto big walls from the deck of *Dodo's Delight* in Greenland, he does so with humor, lightness, and quiet understatement.

In addition to the high latitude stories, Bob tells us about a delivery to Peru, another from the Mediterranean, and exploring regions closer to his home in Scotland. The book ends with a voyage to the Antarctic island of South Georgia aboard a friend's boat. The return trip from South Georgia to the Falkland Islands was marked by a gale strong enough to merit the use of the boat's drogue. A reader familiar with Bob's first book can't help but recall another passage Bob made, sailing nearly 1,000 miles from the former Faraday base in Antarctica to the Falklands under jury rig after the dismasting of Dodo's Delight.

Throughout *Addicted to More Adventure*, Bob includes excellent photographs that add to the stories. Having read both books now, I



marvel that one person has packed so much superb adventure into his life. If you are not already familiar with Bob, and especially if you are, I urge you to read this book. I hope you will enjoy it as much as I did.

Author's note: Bob did me the great honor of asking me to write the Afterword to Addicted to More Adventure, but that was, of course, a volunteer effort, and did not affect my review.

Contributing editor Ellen Massey Leonard is a writer, photographer and circumnavigator with 60,000 ocean miles.



C The British yachting press named Shepton Yachtsman of the Year in 2013 and bestowed a Lifetime Achievement award on him in 2020.

# Arctic Earth

**Right, the Good** Hope 56 Arctic Earth under shortenerd sail. Below, a design well suited for high latitude voyaging.

ome vessels just look the part and that's certainly the case for the 56-foot aluminum expedition sloop Arctic Earth. Based in Camden, Maine, Arctic Earth is a vessel designed and outfitted to sail to high latitudes. The boat is operated by David Conover and Compass Light Productions, a documentary film company focused on science and environmental content and specially tuned to Arctic issues. Compass Light has produced more than 600 films for outlets like Discovery Channel, Science Channel, PBS Nova and more. A few years ago Conover decided to look for a boat

that would augment Compass Light's work in the Arctic. "I was interested in a platform that would support that work going forward," Conover said. "A way to focus the stories we're producing." He looked at an older steel vessel but it didn't quite fit. Then he heard about the Good Hope 56 design drawn by naval architect Ed Joy also based in Camden. Four boats of the Good Hope design had been built by Jacobs Brothers in Cape Town, South Africa. Conover found the boat that would become Arctic Earth on the hard in Grenada. The boat had been built in 2016, sailed for two years, hauled in 2018 while its owners, a French couple who are both medical

doctors, took a break from cruising. Then

the COVID 19 pandemic hit and the boat was put up for sale. Conover made the purchase and had the boat refitted for arctic work.

An intriguing feature of this pilothouse sloop is its swing-up rudder and lifting keel. Arctic Earth captain Magnus Day explains in an interview from the Arctic Earth site: "A 56-foot aluminum monohull sailboat with a swing keel design. She's a little bit unusual, with this swing rudder and keel, which retracts right into a well. With our keel and rudder up, we have a draft of about one meter. We can sit on the beach or navigate very shallow waters. Sitting on the beach is handy to effect repairs.... We can go into shallow anchorages that only have four to five feet of water, an advantage in the

higher latitudes and being able to escape the icebergs."

*Arctic Earth* has a draft of three feet two inches with the keel raised and eight feet nine inches with the keel down. Stability is provided by 21,460 pounds of ballast.

The sails are by Ullman Sails. The main has three slab reefing points and is reefable from the cockpit. There's a trysail with a separate track, a hank-on staysail and a roller-furling 110 percent headsail. Water tankage is 264 gallons, plus a Spectra Cape Horn watermaker. Fuel supply is 573 gallons of diesel (plus day tank), providing its John Deere 4045TFM engine with a range of 2,000 nautical miles at seven knots. On the electrical systems side, Arctic Earth has 400 watts solar power, 24/240 volt engine battery bank charged by engine alternator, Sonnenshein house battery bank charged by Yanmar 2GM20 18 horsepower generator with a140 amp 24 volt Balmar alternator and a Honda 2000e spare generator.

Arctic Earth has a full suite of dive gear including an air compressor, and to advance its documentary and research roles, it has drones, an underwater ROV, various cameras, a Dolphin Hydrophone with 30 feet of cable and rock climbing and mountaineering gear. The vessel accommodates as many as six: four expeditioners plus a captain and mate. Accommodations are scheduled to be expanded this year with two additional berths.

Arctic Earth is available for full vessel charter by other media-makers, field researchers, and small private groups. Conover sees what he calls "three buckets" of



possible charterers of the boat: 1) Compass Light for its own productions; 2) scientific researchers engaged in multi-year projects in the Arctic; and 3) private groups intrigued by the issues of the far north, having a love of sailing and wanting to go on family trips, ski trips or climbing expeditions in the region. See the *Arctic Earth* website (arcticearth-charter. com) for more details.

Above, the pilothouse at sunrise. Below, the vessel's aluminum hull, lifting keel and swing up rudder aid it in dealing with northern ice.



# **Magnetic attraction**

Ricthie Navigation's Globemaster binnacle compasses make use of a precise balancing act between compass card, fluid and magets to provide reliable heading information. n a world of GPS and LCD screens that can display any navigation parameter possible, does the floating-card magnetic compass still make sense? To pose the question is in a sense to answer it, so let's look at the value a magnetic compass provides to the voyager.

In addition to the classic magnetic compass, for some time now voyagers have had electronic versions of the compass. The most common of these being the magnetic fluxgate. While fluxgates use electronic signal processing to provide a readout of direction to the user, at their heart they determine direction by sensing the earth's

magnetic field

fiel Recent

> directly. As with all things navigation, GPS changed the concept of the compass itself with something called the GPS compass. This device typically uses multiple GPS

RITCHIE

antennas in a horizontal array and determines vessel orientation by comparing the outputs from the various antennas and how they are changing over time. They are a high-tech approach to determining heading. Non-electronic magnetic compasses provide heading by sensing the earth's magnetic field, like a fluxgate. But they do so without any electricity — being driven by the interaction between magnets and the global magnetic field. This feature makes a magnetic compass a great backup device should your boat lose electrical power.

The classic, liquid-filled magnetic-card compass

> was largely invented by American instrument maker and inventor E.S. Ritchie in the 1860s. Prior to Ritchie, the dry card compass, with no liquid to dampen the

movement of the card, was the standard compass used by mariners. Ritchie, however, made substantial improvements in adding a liquid and making other tweaks. As a result, Ritch-

### BY TIM QUEENEY

ie's design became the new standard for the U.S. Navy and beyond.

The Ritchie Navigation company in Pembroke, Massachusetts still makes classic magnetic compasses that are based on E.S. Ritchie's breakthrough model. To get an idea of what goes into one of these instruments I talked to Patrick Lonergan, director of quality and engineering at Ritchie.

According to Lonergan, there's a key to making a good compass: "It's all about balance." In the case of the compass, part of the balance is making the compass card neutrally buoyant so it neither floats nor rides too hard on its pivot point.

The fluid in a compass supports the card and provides a viscous medium to support its movement. Because compasses live out in the environment. they must work properly in a range of temperatures without freezing or forming a gas bubble that affects card readability and card response. In previous decades a mixture of alcohol and water and later mineral spirits was used. Current Ritchie compasses use a paraffin-based liquid called



isopar L. As good as this material is at remaining stable, it is helped by a diaphragm system that expands and contracts with temperature changes so a bubble doesn't form. According to Lonergan, the diaphragm system will prevent bubble formation down to minus 30° F.

Riding on the underside of the card are magnets made of an alloy called alnico (iron with amounts of aluminum, nickel and cobalt). These magnets interact with the earth's magnetic field. The key to a compass is using the right magnet. "You want to match the magnet strength to the dial," Lonergan

nt to match magnet ngth to the ," Lonergan

said. "You don't want the magnet to be too strong or the card will overshoot."

Also on the underside of the card are baffles that are tuned to dampen the motion of the card through the fluid. At the center of the card is a steel pin, the point of which rests on a central post containing a piece of industrial sapphire. This man-made jewel is extremely hard and supports the steel pin with minimum wear. So the balancing act here is clear: the fluid must be of the right viscosity to slow the card without too severely limiting its reaction time; the baffles must be tuned to work with the isopar L but again not provide sluggishness or overshoot; the card must be made to rest lightly on the

**C**A magnetic compass is providing real time heading information, GPS-based systems can't do that.

> Patrick Lonergan, director of quality and engineering, Ritchie Navigation

jewel bearing but not so lightly that it floats; and the diaphragm system must compensate for temperature and pressure so that the liquid doesn't get too thick or form a bubble. Ritchie Navigation calls this set of balances its Powerdamp system and it is available on models like the Globemaster

series of compasses, well suited to voyaging sailboats and trawlers. For high speed power vessels Ritchie offers a package called Powerdamp Plus.

A classic magnetic compass not only operates without electricity, but it also senses the geomagnetic field directly without any delay. "A magnetic compass is providing real time heading information," Lonergan says. "GPS-based systems can't do that."



San Diego, CA

Boater 103: Celestial as a backup to GPS Boater 200: Diesel Engine Maintenance Boater 201: Outboard Motor Operations & Maintenance Boater 202: Marine Electrical systems Vessel Maintenance





# **Power Tripping**

While the main breaker panel, below, is important, you should also have a shore power breaker, below right, installed in close proximity to the shore power connection on deck.

eff, you would be proud of me. I was alone onboard and lost power in the middle of the night. The first thing I thought of was that maybe the onboard shore power breaker tripped. I grabbed a flashlight and looked where you showed me the breaker was located. It was a simple fix to cycle the breaker and restore power, thank you!" (Cindy C. - Selene 53). All of the comforts of

home are tures aboard trawlers. The underlying source that allows us to indulge as if we were ashore is the magic of electricity.

expected fea-



### just turn things on when you need them and they auto-

matically work. Boats are wired differently than houses; you have to connect the flow of electricity through a breaker before it will provide power to any component.

Lights, outlets, navigation and communication displays, entertainment and galley appliances are just a few ship categories that require electricity. I'm not a "sparky," but I've learned enough of the basics to be safe and respectful around electricity and try to offer simple explanations to my clients so that they understand the basics. "Power tripping," (losing shore power),

### STORY AND PHOTOS BY JEFF MERRILL



is something you should expect and be prepared to correct. It should be relatively easy to trouble shoot if you know how the links are connected in your trawler's chain of electricity.

Every trawler is different, but in general the arrangement is something like this: A bank of batteries is wired to an inverter (some inverters also serve as battery chargers). The inverter takes DC (direct current) from the batteries and turns it into AC (alternating current). The inverter is connected to your ship's electrical panel which is divided into different sections of AC and DC breakers.

When you are tied up in a marina with your shore power cord connected, your



You probably don't think about where electricity comes from at home, you inverter is receiving electricity from the dock shore power pedestal.

Your ship's electrical breaker panel should have a primary rotary select switch that enables you to choose where the panel is receiving power from – typically shore power or generator. If you have forward and aft shore power connections, they will each have a separate setting on the rotary select switch.

The key indicator to monitor on your electrical panel is the input gauge that shows AC voltage coming in (typically 120 volts from the dock). Know where this gauge is, learn how to read it and check it frequently. If your input gauge on the panel is registering zero, your power has been disrupted and you need to determine what has caused the interruption.

Let's review a scenario where you are safely secured to the dock and connected via a shore power cord. Tracing your electrical flow is as easy as connecting the dots. The dock shore power pedestal has a breaker to provide or cut off power. You attach your shore power cord to the pedestal and to your deck fitting. The deck connection should be routed through a breaker (designed to trip if there is an overload) and from the breaker continue to your inverter and then to your ship's electrical panel rotary select switch. The input gauge on your electrical panel will confirm that shore

power is connected if you have everything set up correctly.

If your input panel gauge is not showing shore power coming in, you need to retrace each connection in the sequence to re-establish power. The most likely culprit is a disconnect involving your shore power cord. There are a couple of quick things to investigate. First, confirm on the dock pedestal that the power breaker is ON (cycle ON/OFF) and your cord is firmly connected. If you share a pedestal with a slip neighbor, it's always possible that they inadvertently cut you off when they plugged in. While you are at the shore pedestal, twist and push the active end of your shore cord to confirm it is properly seated. Get back aboard to confirm the other end of the cord is secured to your on-deck connection. Then check the input gauge on the electrical panel to hopefully read that your shore cord has provided a path for electricity to come aboard.

If your input panel gauge is not registering, the next most common source of interruption is your on-board shore power breaker. By regulations, shore power breakers are required to be installed within close proximity to the shore power connection on deck. Unfortunately, these shore power breakers are often installed out of view and in locations that aren't obvious. If your onboard shore power breaker has tripped, cycle it (OFF/ON) and then go check your power status on the electrical panel input gauge. The last thing to check, while you are looking at your ship's electrical panel is the rotary select switch. If you are plugged in at the bow, it should be set for FWD Shore Power (some trawler designs have forward and aft shore power connections). Slowly turn the rotary switch to OFF and then back to the correct shore power setting.

An occasional power surge is not uncommon and should be an easy fix. Check the dock pedestal, both ends of your shore power cord, the on-board shore power breaker and the electrical panel rotary switch. Your electrical panel input gauge will tell you the story. Next time your boat goes on a power trip, you know what to do to get it back on line.

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# The lost harbor of Christopher Columbus by Peter Swanson

This satellite view of Port Jackson shows Jackson Cay at upper right with the anchorage below and to the left. The cay is clearly underwater. Sooner or later anyone who relies on navigational charts finds mistakes. The "magenta line" for the Intracoastal Waterway takes them aground. That shoal is actually 100 yards from where the chart says it should be. Or the chartplotter depicts your boat actually moving over land somewhere. Most of these cases are errors of measurement, and they usually involve underwater features.

There is, however, an exception. It is an unusual case in which the world's most prominent mapmaking agencies have failed to acknowledge the disappearance of an entire island, and, although not very big, Jackson Cay is not without historic and practical significance.

Each year, hundreds of cruisers voyage to the Caribbean the hard way. Their numbers include Canadians and Europeans, but most of these recreational mariners hail from the U.S., many of them retirees. From Florida it's a rough ride all the way to St. Martin, against wind, waves and current. And as any old sailor will tell you, the worst part of "the thorny path to windward" is the north coast of the Dominican Republic.

Christopher Columbus was the first foreign sailor to learn this lesson during his 1492 voyage to the New World. Columbus had to follow the thorny path as a necessary prelude to his return voyage to Spain. First he lost his flagship Santa Maria, wrecked on a coral reef off what is now Haiti. Then he had to find safe anchorages for his remaining two ships, Niña and Pinta, as they struggled to sail eastward against the trade winds. Harbors with good protection were often too difficult to access because of shallow entrances, and bays where it was possible to anchor were exposed to ocean swells from the north — likeliest during winter — creating possible death traps.

On Jan. 12, 1493, Columbus finally got a break. Borne by a brisk — and very rare — westerly wind Columbus's ships, were "boiling along" as they drove eastward, according to naval historian Samuel Eliot Morison.

High up the masts, while transiting the north shore of today's *Samaná Peninsula*, Columbus's lookouts spied an island near shore between two points of land and against a mountainous backdrop. The low island rose out of a field of scattered reefs indicated by breaking waves. The lookouts would also have been able to see that a channel from the east led to the deep blue basin. Columbus named it Porto Sacro, Sacred Port.

Bartolomé de las Casas, the Dominican friar who wrote a contemporary account of the voyage based on Columbus's diary, described Porto Sacro as "an immense and good port with a good entrance." An 1853 map of Samaná would describe Columbus's harbor as a porto fuerte (a strong port), recognition of the protection it afforded against ocean swells. Columbus, as it happened, never took his ships inside the harbor. The steady west wind was too good to waste.

### Port Jackson

For most of the 17th century, French pirates used the big bay on the opposite side of Samaná Peninsula as a "place of rendezvous." Later Porto Sacro acquired a new name, Port Jackson. The protective island became Jackson Cay; the headland on its east side, Point Jackson, and the high hills behind, Jackson Mountains. To this day, the half-mile-long rim of sugar sand overlooking the anchorage is called Jackson Beach. The ubiquitous, eponymous and acquisitive Mr. Jackson was likely one of 220 freed American slaves transplanted there in 1824 as part

of a social experiment.

Throughout the Age of Sail ships called on Port Jackson to take on loads of coconuts and to fill barrels with drinking water from a spring-fed pool on the beach. However, by the first half of the 20th century Jackson had fallen into disuse, rendered obsolete because overland access was nearly impossible by any conveyance other than pack animals.

On August 4, 1946 an earthquake measuring 8.1 on the Richter Scale hit Samaná, spawning a 12- to 16-foot tsunami that inundated lowlands. Quake and tsunami killed 2,550 people. Mini-tsunamis were recorded as far away as Daytona Beach and Atlantic City. The next day Jackson Cay was gone; the 52-acre island had sunk like Atlantis. A feature that had stood a few feet above the water was now a few feet underwater. Yet the mapmakers of the world paid no heed.

By the 1960s a revolution in boatbuilding — the advent of fiberglass construction made yachting affordable for the middle class. That's when more gringo sailors began transiting Dominican waters en route to Puerto Rico and the Lesser Antilles.

### **Cartographic cockup**

To be sure, an island would

form a better barrier against waves, but a shallow 52-acre reef (among scattered breaking reefs in deeper water) affords a modicum of protection from ocean swell like the atolls of the South Pacific. The problem: Over the decades nautical charts have continued to show Jackson Cay as if it hadn't sunk. Finding the Port Jackson anchorage in the absence of Jackson Cay would present a multi-level puzzle to an average mariner, particularly before the era of GPS navigation.

Bruce Van Sant has transited the waters in question possibly more than anyone





else alive. Van Sant is the author of A Gentleman's Guide to Passages South: The Thornless Path to Windward. His book contains a wealth of science-based tactics for passagemaking on the north coast of the Dominican Republic. Puerto Jackson is not mentioned in his book, but not for lack of trying.

Port Jackson was noted on government charts he carried, and Van Sant recalls that once during the 1980s he searched unsuccessfully for better anchorage if you were pushed for time, as most delivery skippers are," he said. "It would make great overnight stop if you needed a break after crossing the Mona Passage, and it would not take you very much out of your route."

The National Geospatial-Intelligence Agency calls itself the U.S. intelligence community's "go-to agency for processing and analyzing satellite imagery." Yet NGA provides charts to the U.S. Navy that still the NGA nor the Admiralty have been willing to help explain how this mistake went uncorrected for decades, let alone how it happened in the first place.

Ken Cirillo was a vice-president for C-Map, one of the top marine cartography companies in the world. Cirillo says he has no idea how the NGA failed to note the disappearance of Jackson Cay and why the Admiralty continues to describe Port Jackson as if it were an active port. In



A lone tourist excursion boat anchored off Jackson Beach while her passengers relax on shore.

the port, which, according to 1918 U.S. government sailing directions, had "depths of 5½ to 7 fathoms and affords shelter to moderately sized vessels."

Barry Terry sailed across the Atlantic to the Caribbean in the 1990s and spent the next two-and-half decades cruising his 34-foot sloop up and down the Antilles and delivering other people's boats to and from the U.S. On occasion he would use anchorages elsewhere along the north shore of *Samaná* that were less well protected from northerly conditions. "Cayo Jackson would have been a depict Jackson Cay, 76 years after it sank, even though its non-existence can be confirmed by a cursory check on Google Earth. The venerable British Admiralty also sells a chart that shows an island where no island exits, and the Admiralty's current piloting guide to the Caribbean Sea gives highly specific directions on how to enter non-existent Port Jackson using the non-existent island as a landmark.

These agencies provide the data for private cartography companies that make electronic charts for the recreational boating market. Neither general, he says, charts are updated more frequently for high-traffic waterways. Port Jackson's isolation and decades of disuse before the 1946 earthquake is probably the simplest explanation for the errors. Then, assuming no one complained, Jackson Cay's disappearance would have been like the tree that falls in the forest unwitnessed.

Peter Swanson is a lifelong sailor and journalist, specializing in the Bahamas and Greater Antilles. His birthday is January 12, the date Columbus "discovered" Port Jackson.

# Evicting four-footed stowaways by Robert Beringer

My first experience with rats onboard happened years ago when I borrowed a friend's Catalina 28 for a long-range cruise. The first night out my girlfriend heard strange clicking noises coming from the bilge and was convinced we had a rat problem. I set a trap and spent hours searching every nook and cranny — I found nothing but a rusty screwdriver and a can of beans. I told my problem to an old salt I knew and he laughed, "those were mating shrimp you were hearing, Rookie!" Though somewhat embarrassed, I was still happy there were no rats on board.

Mariners around the globe know that the only way to absolutely avoid having pests on board is to not own a boat. They also know (to the chagrin of first mates everywhere), that because boats offer food, water, and shelter, pests will come aboard on even the cleanest, most well-maintained vessels. There's nothing to do but prepare to deal with them when it happens.

Aside from man, the rat is by far the most voracious creature on earth. Each year they consume one-fifth of the world's agricultural products and cost the U.S. more than \$500 million in economic losses. They are truly opportunistic omnivores, devouring almost anything they can get their little noses into — up to 40% of their body weight every day. And what they don't eat they chew: wood, PVC, plastic, paper and electric cable are but a few of the things rats like to use for bubble gum.

Hard to believe, but the ubiquitous rat is not indigenous to North America. We have European settlers to thank for the introduction of the Norway rat in the sixteenth century, when the little stowaways boarded their ships the same way they got on mine: via dock lines. Captain John Smith complained of rats cleaning out their grain stores in Jamestown, and they quickly infested all 13 colonies and moved westward with the settlers. Since then they have had their own version of manifest destiny, sweeping the continent with the exception of Alberta, Canada, which has had a successful eradication program since the 1950s.

### Oh, rats

Being a boat owner for many years, I guess it wasn't a matter of if we would get a visit from these commensal varmints, but when. Our "when" happened recently when I went aboard for a final prep before a weekend outing and discovered

Robert Beringer used the tried and true snap trap to deal with critters coming aboard his boat.



dozens of small rice-like feces on almost every horizontal surface, and almost every piece of paper shredded. What a mess! And then I saw what amounted to the final straw: the rat had chewed through a plastic bottle that held a fifth of Mount Gay rum. I gnashed my molars and ruminated out loud: "I hope you enjoyed that cocktail my little drunken friend, it will be your last." It was now a battle to the death twixt me and Mr. Rat.

I abruptly canceled the trip with a fabricated excuse. I mean, can you imagine my family's reaction to seeing a rat on board at a secluded anchorage? Not a pretty picture. The local hardware store had rodent control products, but no one there could make a recommendation based on actual experience. I tried the humane route first: I placed a couple of glue traps on the sole, but it yielded only grey fur a day later. Great, now I had an angry rat on board. I delayed our outing again and went beating a path for a better mouse trap.

As I searched for a way to eliminate our uninvited guest, I came across the following troubling info in Robert Hendrickson's book, A Social History of Rats & Men:

- It's estimated that there is one rat for every person in North America
- Rats can swim a half-mile against the current in open water (is your boat on a mooring?)
- They can jump four feet hori-

zontally and two feet vertically

• They can get through a hole as small as a quarter

There is perhaps no more apt metaphor than to say that something, "breeds like rats." The females are almost constantly in heat and will, provided there is sufficient food and shelter, produce 30 or more offspring per year.

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A Social History of Rats & Men By Robert Hendrickson

I bought a snap trap, and just for kicks I tripped it with a pencil to see how well it would work. It snapped it cleanly in two, good. I then set it with peanut butter (much preferred over cheese) and placed it on the sole by the galley. A day later the trap was still set, the trigger mechanism licked clean. I reset it and let another day pass. When I pulled the companionway boards on the third day I discovered the largest rodent I had ever seen outside of the movie "Willard." From seven feet above I could tell the color of its eyes (black like a shark) and count its toes.

I bagged it and before locking up I thought, just in case, to reset the trap. A few days later I came on board to prepare again for a sail outing and... whoa, another dispatched rat.

Upon removing Mrs. Rat I felt that it was time to get the marina owners involved. After all, those rats had to pass about 75 boats to get to mine, there was a good chance that other boaters were having problems too. The nature of this information can instinctively put someone on the defensive, so when I phoned the manager I tried to be as delicate as possible. She gasped at the news and claimed that in 70 years I was the first slip holder to ever complain of a rat. I paused, and refrained from saying that I didn't buy that for one minute, and I let the matter drop.

Since then I have been careful to seal up the dorades before locking the companionway and we have, thankfully, remained rodent-free. But just in case, I keep my rum in a glass bottle.

Robert Beringer is a marine journalist/photographer, author of Water Power! For free sample go to: http://www.smashwords.com/books/ view/542578.

# Classic Pearson Electra goes electric by James Borton

My Pearson Electra, sleek as she is, weighs a little more than 3,000 pounds and is propelled by a three horsepower Torqeedo electric motor. I captain her along the May River in South Carolina's low country, which stretches with miles of tidal creeks and rivers from Pawleys Island to the confluence of the Savannah River at the Georgia border. I've had no problem powering through the strong tides, what are regarded as one of the Eastern seaboard's greatest differentials with surges of up to eight feet.

I fell in love with this 58-year-old boat, named Sea Gypsy, when I first spotted the online posted photos of her flag blue unblemished restored hull. Who could resist her curved bow, slender lines, forward canted transom, cozy-cuddy and full keel.

The boat market is riding a wave of renewed interest and booming sales during this health storm. The National Marine Manufacturers Association claims that sales of boats, marine products and services in the U.S. market in 2020 reached \$47 billion. Among the new boat buyers are many who are responding to the advances in the electric vehicle market. That's why my new Torqeedo Travel 1103 CS proved to be no exception. The lightweight high performance lithium battery, complete with onboard computer with GPS-based range calculation gave me confidence to step quietly into the electric revolution.

Some analysts have predicted that US sales of electric outboard motors alone may reach as much as \$120 million in 2024. This bullish forecast belies the fact that for most boaters, electric remains a nonstarter, mainly because of the limited power of the battery. Besides, American boaters want to go fast and for them,

there's no such thing as a no-wake zone.

Sailing from a friend's dock in Bluffton I'm greeted with tidal marshes, spartina grass, and an amazing array of flora and fauna with nearby nesting pelicans and egrets. Historic Old Town Bluffton emerged in the early 1800s atop its signature high banks along its beautiful James Borton aboard his Pearson Electra Sea Gypsy catching the wind on the May River in South Carolina.



May River. This coastal community offers cool southerly breezes off the scenic river. Today, this fast-moving body of water, spilling into Calibogue Sound, is interrupted only by the roar of gas-guzzling, high-powered speed and luxury boats gunning to address climate change and emissions by reducing pollution and noise. From my perspective, the Torqeedo fulfills that and more, since it eliminates any rising gas costs and messy cleanup. It helps that the motor is lightweight and easy to operate.



Borton placing his Torqeedo motor aboard the Electra.

through the water, creating a wake that easily rocks my vintage 23-foot sailboat and disturbs the gentle dolphins that swim in these tidal waters.

I have learned that there are about 30 manufacturers of outboard electric motors and there are more than 40 brands of outboard electric motors available in the market. This popular upsurge in the electric motor market is motivated by a desire Since I choose not to leave my electric engine aboard, I carry it and battery in its own stylish carrying case and it weighs less than 35 pounds. The customized bag is about the size of a golf bag and the shaft fits perfectly inside.

As a part-time islander, I have recently renewed communication with the South Carolina Yacht Club at Windmill Harbor on Hilton Head Island. It's home to many of the island's wealthiest residents, many who are retired multinational CEOs. The club also has a specialized race class of Harbor 20 sailboats.

"Yes, we have Wednesday evening regattas and have a fleet of Harbor 20s and some of them are outfitted with Torqeedo electric engines," says Mark Newman, the South Carolina Yacht Club sailing instructor and director of the club's yachting program.

He's quick to add that these older electric motors struggle against the tide and often make very little headway. But he also notes that the builder did a poor job adapting the motors for use in the well of these boats.

Other club members, like Ted Arisaka, an ardent blue water sailor, also believe that the electric motor has a mixed record. "When they work, they provide good thrust." Since the battery was placed in the starboard lazarette, the battery pod, which has a GPS does not get a good view of the sky and so some of the advanced features, like estimating remaining distance available are not functional. "The battery is set up to be recharged in the lazarette with a non-watertight charger connection."

However, there's agreement among users that the electric engine is quiet, dependable without any flammable liquids, or petroleum spills in the water and no exhaust fumes. The refrain is clear: no more changing the oil, filters and bleeding the system for those with electric motors.

There's a wide range of attitudes among sailors who are adopting the electric motor. But the science does not lie: a life cycle assessment of electric- and gasoline-powered pump-out boats reveals that electric boats have lower lifetime greenhouse gas emissions than do their gasoline-powered equivalents. This is particularly true when electric powered boats are charged using renewable resources, like a solar panel or even a wind generator. As for my situation, I decided to install a 50-watt solar panel on *Sea Gypsy* and although it's slow and drawn-out process for fully recharging the battery on board, I am able to recharge while on the water.

While range is always an issue with this setup, Lyall Burgess and his wife, Katie and their company, Sun Powered Yachts, located in sunny Hawaii make terrific solar panels. Now, it can be a bit tricky wiring a non-Torqeedo solar panel but a small adaptor cable MC4 does work since the battery has a built in MPPT controller that regulates the flow of power from the panel to the battery. I generally take my battery with me when I leave the boat and recharge it at home.

The winds of change, triggered by this electric revolution will certainly be powering me without a carbon footprint into the next stage of my sailing life.

James Borton, is an environmental policy writer, author and senior fellow at Johns Hopkins University's Foreign Policy Institute in Washington, D.C.

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# The first six thousand miles without Patrick

Crossing the Atlantic with a new captain and crew 🥌 STORY AND PHOTOS BY REBECCA CHILDRESS

ast year, my husband and captain of 17-plus years passed away from COVID-19, in South Africa. He cared greatly for our Valiant 40, *Brick House*, and left it in top shape. We were days away from leaving, fully provisioned, for a transatlantic crossing to Uruguay and on to Patagonia. We both came down with COVID-19 and 21 days later Patrick succumbed to it in South Africa. After nearly seven months at a dock while I recovered from the trauma, I chose a captain to accompany me and got ready for a crossing of the South Atlantic from Cape Town to the Caribbean.

As the new captain finished up his land life, I asked Rebecca Childress readies the wind vane self steering rig aboard her Valiant 40 Brick House. myself plenty of questions: was *Brick House* still ready for an ocean crossing? With a new captain and/or crew, this was a different ballgame than crossing with Patrick's expertise.

This challenge was about what I could do to make the boat safer and simpler for a captain or crew unfamiliar with the intricacies of *Brick*  *House*, to keep the people and this old boat safe for my longest passage on any ocean, in any boat, 6,100 miles across the Atlantic Ocean from South Africa to the Caribbean.

### Planning

The plan was to leave Cape Town in late January, the best time to make the crossing, safest and with the best winds. We would take one additional crew, sailing the notoriously stormy and foggy coast to Walvis Bay, Namibia. We would then sail to Ascension Island with a possible stop in St Helena if it was not closed due to COVID. After that, it really would depend on how the boat and relationship was holding up... and the status of COVID as we approached landfall. The ultimate destination was somewhere

Right, Rebecca with her late husband Patrick Childress who died of COVID 19 in Cape Town in 2020. Below, Brick House's route from Cape Town to Greneda. between the east coast of the USA and the southern islands of the Caribbean.

Despite my more than 20 years of experience sailing on Brick House, I needed a captain to get safely across an ocean. It wasn't a trip I wanted to do on my own. Too much can go wrong and it would be difficult to complete with a gear failure, not to mention sailing on my own for such a distance. Plus, who would share the sunsets and fun times with me? There would likely be no better captain than Patrick so I had to do everything possible to compensate for lack of experience and familiarity with Brick House by future crews/captains. I interviewed many potential captains and ultimately chose Michael Hayward, a South African licensed captain. He didn't have an abundance of



ocean crossing experience, but he did have plenty of heavy weather sailing around



the notorious capes of South Africa on his own boat and others.

Patrick was a strongwilled, old-fashioned sailor. He wanted things his way, and didn't spend money on things he didn't believe in. A new life raft was one of those things. He always had a saying, "you don't go to sea to sink." Well, as perhaps a less experienced, more nervous sailor, I was always very unhappy with this order from the captain. Over the years, through personal experiences with people I knew and respect, I had come to realize just how vulnerable we are at sea. New or old boat, experienced or inexperienced, things do fail, and



boats do sink! With a new captain in my future, I wanted to make the boat more ready for the worst that can happen. I did my research and bought a new life raft locally. It was usually me that researched and decided on equipment anyway, so this was not a new endeavor. I purchased a Viking life raft from a local company. I felt much better with it than with our old 32-year-old life raft that came with Brick House when I purchased the boat.

Years ago, I had made an executive decision to buy two personal AIS beacons to put on our life vests. As many of you know, Patrick rebelled against life jackets and harnesses — for good personal reasons I suppose, but this always bothered me. A personal AIS unit resides inside a life vest, so if he didn't wear the life vest then the personal AIS beacon would be of little use. So, I had my life vests serviced and obtained two new personal AIS transponders called MOBLink from ACR. I had just replaced the batteries and serviced my multiple EPIRBS and PLBs onboard... so I just stuck with the company most proven: ACR. Now I'd just have to make sure that the life jackets were worn!

### Preparation

I knew things would break on Brick House and that many repairs would fall to me. Patrick had a natural talent to repair things, but I am a person who needs solid clues from manuals. I suspected my crew or captain would too. I downloaded every last thing on our boat to give us some chance of repairing underway or in a remote port. I installed all the PDFs on my iPad. I wish I had a printout of every manual like I used to, but space is at a premium on a

Rebecca aloft on *Brick House* performing a pre-departure rig inspection. moderate sailboat like *Brick House*. When I'm seasick though, finding instructions on my iPad actually proves difficult; my thinking becomes impaired. I should also not be the only one who has access to instructions. But alas, I didn't find a way around this.

Crewmembers who are unfamiliar with a boat don't know how gear should operate, what battery readings are normal, how or even what to keep turned off or on. You can hold orientations, but there is no way people are likely to remember everything. So, I resorted to hanging signs all over the boat. Things like "Switch off the wind generator when wind is more than 25 knots or engine on"; or "Keep this port closed no matter what"; or "Switch the pressure water off when done using"; or "Wake up Rebecca if ...." I labeled where snacks could be found, where tools were

located, etc. I had inventory lists of what parts were in each closet, and a book at the chart table as to where to find things. I had a checklist of things to do and notice while on watch, and exactly how to call a mayday or activate the help function on the Iridium Go, if necessary.

I have these terrible recurring nightmares of Patrick hanging on to our mainsail while it falls all over the deck, trying to raise it or put it away, with reefing lines threatening to rip off the solar panels as well as our heads, and the boat rolling side to side. I didn't want to see myself or future crew suffering through this scary and chaotic procedure. So, I Below right, Rebecca and her captain for the trip Michael Hayward. Below left, the stack pack arrangement for *Brick House*'s mainsail. stellar job stowing it. The lazy jacks and the built-in cover/sail bag for the mainsail would make both dropping and reefing the sail easier and safer for all involved.

There are many stories of sailors at sea that have one seemingly minor failure, quickly leading to more complicated issues. Often the first failure is the autopilot, forcing everyone to steer. was not sure of my skills setting the wind vane properly. That went for many things onboard; I didn't know what I didn't know, things that may be vital for a 6,100-mile ocean passage.

The old autopilot was working fine, though occasionally a bit reluctantly. I ordered a new Raymarine Evolution autopilot to have in storage, along with all the





had a local sailmaker in Cape Town construct a stackpack with lazy jacks. I demanded more cloth where I've often, on other boats, seen too little material to protect the front and back of the sail. While stowed I wanted there to be no chance of any sail exposed even if we did a less than This quickly tires out the crew, leaving them unable to deal with the next breakage. Things then quickly snowball downhill, and people get hurt, boats get broken, and a bad situation gets worse.

We have a Monitor wind vane that, once we mastered it, was to do most of the steering. But our Raymarine autopilot was our backup, our plan B, and our primary steering when we are close to coasts and can't allow the self-steering vane to potentially follow a wind shift toward land. I needed to know that plan B was a strong one, since I wiring I would need to be sure I wouldn't be without an autopilot. Yes, it would be hard to install at sea. But at least I'd have the option available. I didn't want to simply install the new one, because of course a new installation is also prone to failure in the first 50 hours or so. If it ain't broke, don't fix it, right? And it wasn't broke. So I made sure all connections were tight on the existing unit, since loose or corroded connections are often what makes electronics go wacky. Wonderfully, it worked without a problem whenever we needed it, all



the way across the Atlantic. I think we have gotten our money out of that autopilot, having originally installed it in 2006 just before the start of our circumnavigation. Thank you Raymarine!

A device that I've become quite dependent on while on passages is my Iridium GO. Historically, I've employed my SSB to get weather and email, but I find the Iridium GO much easier to use. No more waiting for the perfect propagation time or listening to what other cruisers had for breakfast. But again and again I also heard of Iridium GOs failing. I often wondered if it was human error or are these little robust units really that undependable? Years ago when I heard of problems, I felt like the operator must be doing something wrong. Now I know all things happen to all cruisers. It not if, it's when. We all get our turn. Crossing an ocean with probably less experienced crew/captain necessitated having reliable communications and reliable weather reports so we could

be proactive in sail plans and weather routing to avoid problems. I've become quite reliant on Predictwind, and my Iridium GO!

So, to have a plan B in the event my GO bit the dust halfway across, I purchased a second GO. I upgraded its firmware and prepared it for service before leaving the dock. The flaw in my plan, I realized months later, was that the most vulnerable part of the setup is the fragile little connector cable that connects to the external antenna. It hasn't broken yet, but it will someday. Note to self to order another. Also, if the robust marine antenna from Predictwind were to break, reception is vastly decreased on these units. But I didn't want to carry a spare antenna as the wiring is thick and bulky. If I had to, I could take the unit outside in good weather to make my connections, so I didn't purchase a second antenna and wiring. Predictwind was installed on my laptop and on the Raymarine Axiom Pro chartplotter. I have unlimited

**G**Sailing on Brick House without my familiar captain was a daunting prospect the entire way, both in regard to sailing and my general disposition and comfort level. **)** 

data on the GO, so the more of us looking at weather, the more likely we are to pick up issues and share ideas.

I replaced all halyards and sheets, as well as standing rigging except the forestay and backstay as those were only three years old. This was all perhaps a little early, but I didn't need any fire alarms on this passage. Too soon is better than too late. Just before we left Cape Town, we did a rigging check and found the new rigging had a few missing cotter pins. If not for this check and for repeated inspections at every anchorage along the route, we may have lost the mast days after leaving Cape Town. New isn't always better unless you check the professionals' work yourself! All work, even by renowned pros, should still be checked by the owner or captain to verify all is well before a long passage.

Michael came on with plenty of ideas of his own on how to improve the safety on *Brick House*. He felt the handholds on the hard



dodger were unreliable, and after some days of repairing the rotted areas, he built an entirely new one. He installed running boards to strap the water and fuel jerry cans to so that nothing would come loose or be in the way moving up and down the deck. He removed flammables in the engine room and designed more secure stowage there. He also was more particular about the food in our ditch bag. Twenty-year-old army rations were not nourishing enough for a life raft he argued. He wanted nuts, cranberries and high-quality nutrition bars. Can't argue with not dying of mold poisoning in the event of abandoning ship. In addition to the very frequent rigging checks aloft, Michael also insisted on regular diving on the hull to make thorough inspections for cracks and other failures and cleaning off marine growth to be sure of full maneuverability.

### Outcome

Sailing on *Brick House* without my familiar captain

was a daunting prospect the entire way, both in regard to sailing and my general disposition and comfort level. I didn't know what the new captain and part time crew would know and not know, nor how safe they'd be. Patrick always felt less experienced crews would generally bring back boats with multiple breakages. Luckily, Michael turned out to be a very competent and able captain. He was safety conscious and placed plenty of emphasis on keeping us both well-nutritioned and hydrated during the long passage. No alcohol was consumed so we would always be well prepared and aware in any emergency.

We arrived with no damage to the boat short of a few chafed patches on the Genoa sun cover, and a loose latch on the wind vane. We fixed the freezer while underway with help from expert Google friends via the GO, as well as the manual. My original Iridium GO flaked out a bit but so did the second one. It turned out to be The rugged and distinctive landscape in the vicinity of Cape Town, the starting point for *Brick House's* passage to Greneda. a fuel tank we tied down on deck immediately above the GO's GPS antenna.

We wore our life jackets religiously and thankfully nobody fell overboard. Our Predictwind weather reports routed us around adverse currents and through helping currents, predicting squalls with high accuracy. Our Raymarine instruments/Navionics charts were spot on without flaw. The lazy jacks proved more problematic when raising the mainsail, but better when lowering it. Since raising the mainsail is generally in favorable weather and lowering is usually in bad weather or at the end of a tiring sail, I consider it an improvement. Lines, sails and people aren't flying everywhere during the process. The jerry cans remained in place and moving up and down the deck was easy. The signs reminded us what to do and what not to do. So, overall the trip was a boring, fairly uneventful one. Sometimes, being a bit more nervous and safety conscious, even a bit pessimistic and



having the right equipment onboard to back that up, is precisely what's needed to make sure you get across an ocean.

There was plenty of excitement on the leg from Cape Town to Namibia. A threatening storm cropped up halfway there with 45 plus knot winds. I had only seen that much wind twice in my circumnavigation and while Michael saw it regularly sailing in South Africa, it was the first time in this boat! He is a great sailor and the boat was always well under control.

After enjoying the famous Etosha National Park, and exploring the coast a bit, Michael and I left with just the two of us onboard for the 1,800-mile trip to Ascension Island with visas in place and a plan to pass St Helena Island in hopes of it opening

### A rainbow appears as a good omen for *Brick House* in the anchorage at St. Helena Island.

up from COVID lockdown. Historically, the first day of the month was when they changed their COVID rules so we tried to time our departure a week before the first of the month. That strategy actually did work and we were able to stop at St. Helena for a month, after 1,100 miles. Then we sailed downwind to Ascension Island, another 700 miles, for seven more days.

The boat held up well, no plan Bs were needed, but the strain on our relationship necessitated a direct 3,100mile run to Grenada in the Caribbean. It was simply a long boring downwind passage — the kind that circumnavigators wish for. I owe this boring passage to my late husband Patrick Childress, both for his careful maintenance of *Brick House* over the years, and all

that I learned from him, and to Michael Hayward, who was gentle with both me and Brick House. He expertly nudged the three of us over the swells to the other side of a vast ocean. Thanks to the two best guys in my world, my boat and I arrived safely in Grenada, ready to relax and enjoy some nice easy sailing and cruising on my old girl Brick House. The slow sail across and my future adventures are all documented on my You-Tube channel "Sailing Brick House." Please subscribe and share my videos with your sailing friends!

Rebecca Childress is a voyager, writer and video blogger (YouTube: Sailing Brick House) who sails aboard her 1976 Valiant 40 Brick House. She is currently in the Caribbean.



A watermaker setup like this frees the voyager from the tyrrany of searching for and then hauling fresh water at every stop on a passage.

# **Fresh water abundance**

f there is one thing that sets a yacht apart from all others in a cruiser anchorage, it is the vessel's capacity to draw saltwater directly from the ocean and transform it into fresh water. That one key ability, drawing its power from one of multiple possible sources, ensures long-term independence from the hassle of filling and carrying jerry cans with water, sometimes of dubious quality, at every anchorage encountered on an ocean cruise.

Some skippers try to solve the water availability conun-

drum by simply storing extra water, sometimes hundreds of gallons, with extra tankage below deck. This can weigh the vessel down excessively, reducing speed and taking up room that could otherwise be used for storing gear or providing extra bunk space.

In days of yore, the only way to draw fresh water from ocean brine was through distillation—boiling and then decanting the steam into liquid water via a cooling tube. This was a slow, energy-wasting and dangerous system given to the occasional explo-

### BY BILL MORRIS

Eric Sanford

sion, causing serious injury and destruction. Today, there are land-based facilities carefully designed and controlled to produce drinking and distilled water, alcohol and other liquids. On a boat, however, our best bet for constant access to fresh water is a reverse-osmosis watermaker system.

### How reverse-osmosis works

One day while I was sailing in the South Pacific during a rough storm at sea, ocean water entered through a stanchion bolt hole on

# A survey of watermakers available for voyaging boat

*Saltaire*'s foredeck, soaking a stack of clothes from the bottom up in the v-berth. Just for the heck of it, I tasted a wet t-shirt from the top of the stack and got quite a surprise. No salt! Just fresh water!

As the seawater had risen

The Schenker Zen 30 is a smaller model not much bigger than a briefcase yet it produces a respectable 8 gallons of fresh water per hour.

Courtesy Sche up through multiple layers of cloth, it had gradually shed its salt, leaving only clean, potable water at the top of the stack. The many layers of cloth had formed a semi-permeable membrane, inducing the wicking process in a manner not much different from that used in a modern desalinator, or "watermaker." Now, add an electric pump to force that water through a purpose-designed, semi-permeable membrane (not a t-shirt), and voilà, you have a modern reverse-osmosis system.

In a reverse-osmosis watermaker for offshore vessels, sea water is first drawn up from under the hull through a scoop strainer where it passes through a feed pump and then into a pre-flush chamber where large particles of debris are filtered from the water.

From the pre-flush chamber, the partially filtered water then proceeds to a secondary filter for further clearing of fine particles from the brine. At this point, the water is clear enough to be

> introduced into actual reverse osmosis, the final and most important stage of purification. In the final stage, water passes

through an ultra-fine filtering membrane, which allows only water molecules to pass through to the output hose. The pumping process forces leftover brine discharge back into the ocean via hose and through-hull fitting.

If there is one potential downfall to this system, it is the lack of essential minerals we need in order to stay healthy during our ocean cruise. As a matter of fact, purified water can actually draw minerals out of your body, making matters worse. To correct this deficiency, add mineral drops, which contain a small amount of calcium, magnesium and, ironically, salt, which are essential to your health. And as a side note, your treated water will also taste a lot better.

### Types of watermaker systems

Marine watermakers are generally categorized by the type of power they use, DC, AC or mechanical, the last of which is provided directly by the propulsion engine. Most of the smaller models of watermakers draw their power from a large battery bank as DC current or from an inverter as AC current. Larger yachts typically run their watermakers via belt drive, which is the most energy-efficient method.

DC-powered desalinators are best installed to draw current from a large 8D battery bank, which in turn can be charged by a combination of alternative energy sources, namely, a solar panel array, a wind generator for use while at anchor and a water generator to be deployed while underway.

AC-powered models draw their power from either a DC-to-AC inverter or a generator. Some larger yachts use a small generator in place of a belt-driven system for the watermaker and other onboard systems in order to save fuel and wear and tear in the main power plant.

An engine-driven water-

maker is the most efficient way to keep the water tanks topped off because there is no power lost in converting mechanical energy into electricity. Although this robust type of installation is generally seen only on yachts larger than 60 feet LOA, there are a few engine-driven units designed for smaller yachts as well.

### **Quality of construction**

Before you invest your hard-earned dollars in a watermaker, review construction details, particularly the materials used in the manufacture of each unit you are considering. Some models rely heavily on inexpensive plastic parts, even for components under high pressure during operation. Plastic does reduce weight, making installation easier than with heavier materials, but be sure to research the comparative safety records of different models before making your selection.

Watermakers using bronze and stainless components in their construction tend to be more solidly built. However, crevice corrosion in stainless parts under pressure the-

oretically can cause rupture or even an explosion after several years of exposure to saltwater. On the other hand, high-quality, marinegrade bronze parts can be expected to last trouble-free for decades.

Some literature on marine watermakers suggests a quality disparity between openand closed-frame construction. Some argue in favor of open-frame approach, which allows you to inspect the various components of a given unit at a glance so you can spot small leaks and component failure before total disaster ensues.

On the other hand, some industry experts suggest having a closed frame keeps internal parts safe from dents and puncture. Also, a closed frame permits gauges and switches to be mounted conveniently on a front panel for ease of use and monitoring. As long as panels can be removed for periodic inspection, common sense dictates they should be of little concern.

Before taking the plunge, gather all the information you can find on a given range of makes and sizes of units, and do your due diligence in researching competing models. Finally, make the decision best fitting your boat's allowable space, the available charging source and your wallet.

### Choosing the right watermaker

On a typical cruising vessel of anywhere from 35 to 60 feet LOA, a 12- or 24-volt DC watermaker system is probably the best choice. This allows a wider range of installation options, since the unit does not need to be close to the main power plant.

Sea Recovery, a subsidiary of Parker Hannifin, offers a

This Parker Marine Village LTM series AC watermaker produces up to 1,800 gallons per day and comes with an optional salinity monitor and diversion valve.

Cuter Parker Villege

wide range of watermakers capable of running on both AC and DC and covering the full gamut of yacht size. At the humblest end is the NFM model, which is housed in a small box to be mounted on a bulkhead with a pair of screws.

The smallest model in the

O AQUAMBER

0000

FCI's Aquamiser+ is available in framed and modular configurations, featuring staged priming of motors and constant monitoring of prod-

uct water.

NFM series, the AM 170, produces 7 gallons of fresh water per hour (GPH), or 170 gallons per day (GPD). At the top of the NFM range, the AM 750 produces 31 GPH, or an impressive 750 GPD. That's a lot of water from such a small device.

Sea Recovery also offers 11 ranges of watermaker models larger than the NFM line. The Aqua Whisper Pro series has a range of surface-mounted units specifically targeted to mid-size and larger offshore sailing craft. Model 450-1 produces a modest 19 GPH, or 450 GPD, while at the top of the scale, the 1800-2 yields 75 GPH, or 1,800 GPD. PowerSurvivor, a division of Katadyn in Switzerland, produces a wide range of watermakers, beginning with their humble, hand-powered Katadyn Survivor 06, which is small and light enough to fit in a cruising kayak. The Survivor 06 is Coast Guard-approved as an emergency

> device. This is a good thing to carry in your ditch bag, regard-

survival

less of the type of permanent-mount watermaker you install.

OFCI

Courtesy FCI 🤳

The entry-level PowerSurvivor system is the Spectra Ventura 150, which runs on either 12 or 24 volts DC. This unit produces 6.3 GPH (150 GPD), more than enough for the average cruising boat. Weighing 60 pounds and running on either 12 or 24 volts DC at 4.5 amps, this unit is relatively easy to install and maintain. Since the unit consists of several main components, it offers a bit of flexibility in installation.

PowerSurvivor's cruising selection of watermakers ranges from the Daily Cruiser 30 GPH Water Maker to the Spectra Newport 700 MKII Z for large power and sailing craft. The Daily Cruiser can be configured to be engine driven or powered by an AC source.

At the top end of the line, the Spectra Newport produces 41 GPH/1,000 GPD and runs on 24 volts DC or 120/240 volts AC. Though lower temperatures are known to inhibit the reverse osmosis process, PowerSurvivor boasts their watermakers are "designed to operate efficiently from the Arctic to the Equator."

The Swedish company Dometic, known for its wide range of recreational and marine appliances, offers a unique selection of high-end desalinators through its Sea Xchange product line. What sets these watermakers apart from the competition is a digital, fully automatic freshwater management system which you control by way of a color touch screen. Each model offers NMEA 2000 connectivity, allowing you to control the unit from your chartplotter.

If you have a mid-size or larger vessel, look into the Sea Xchange models, which are designed for your convenience and ease of use. If you want a completely self-tending unit, consider the XTCII series watermaker, which automatically adjusts for variable water conditions, such as salinity and temperature. This series is available in four sizes ranging from 600 to 2,200 GPD.

To save a few bucks on this investment, consider instead the SXIII watermaker series, which permits you to adjust settings manually for changes in sea water conditions. This series is available in five models with the same size range as the XTCIII — 600 to 2,200 GPD.

FCI Watermakers of West Valley City, Utah, manufactures 15 models of marine watermakers, from the small, economical 200 GPD Aqualite to their largest model, the Atlas+APC/DTS, a commercial model providing up to 150 GPH, or 3,600 GPD, enough to fill a small swimming pool.

The Aqualite runs on 120 volts AC, provides more water than most yachts can possibly use on any given day, and is surprisingly compact, measuring only 20" deep x 28" wide x 11" high, not including electrical and hose connections.

In order to get optimum performance from the Aqualite, you can install an AQ3 Remote touch pad, which allows you to receive data on water quality, temperature, pressure, flow (GPM) and run time. This handy interface also allows you to turn off the Aqualite when required for servicing the unit.

A good choice for larger yachts is FCI's Aquamiser+ Framed or Aquamiser+ Modular, both of which produce 250 to 1,800 GPD, more than enough for the demands of most yachts. The Framed version houses the entire unit inside a metal box, while the Modular version leaves major components exposed for easy access and servicing. Offered as "traditional" watermakers, both models have analog pressure and flow meters and a "fully automated programmable fresh water flush system."

If there is a manufacturer out there listening to the pleas of humble sailors for a compact, modestly priced, easy-to-use desalinator, it is Schenker Dissilatori of

Courtesy Spectra Watermake

Naples, Italy. Three design levels—Zen, Smart, and Modular—comprise Schenker's line-up, each one offering a range of units with several levels of output.

Zen, the entry-level desalinator series, covers the freshwater needs of most cruising craft, offering outputs of 8 to 40 GPH, depending on the model. The Zen 30, which produces up to 190 GPD, is sufficient for sailing vessels of 30 to 40 feet with crews of one to four members. This model consumes 110 watts of power at 12/24 volts DC, allowing it to run straight from the house battery.

The Zen 50, developed for yachts ranging from 35 to 45 feet, the bulk of the world's offshore cruising fleet, produces 50 GPH/1,200 GPD, far more than the average offshore yacht will need, even with

each crewmember The Spectra Ventura 150 runs on 12 and 24 volts DC, is rated at 6.3 gallons per hour (150 GPD) and offers flexibility in installation.

SPECTRA

taking a shower every day. The Zen 30 is very competitively priced at roughly \$5,600, and the Zen 50 at about \$6,700. For much larger vessels, Schenker's watermaker line proceeds through two higher levels of products, the Smart and Modular series.

If you are looking for a portable emergency desalinator, you need to check out the Schenker Aquatrek 30, which is capable of producing 7.9 GPH and is housed in a tough, military-style, wheeled box about the size of a medium suitcase. This small, portable device draws its power from a lithium battery and may also be connected to a 12-volt battery for operation and recharging. If you desire an economical array of high-quality watermakers, Schenker Dissilatori can definitely can produce an option that is "molto bene!"

### Notes on installation and maintenance

Among the items included with a new watermaker will be a set of instructions laying out the process of preparing the necessary space, installation platform and access to DC, AC or engine power, along with diagrams for electrical wiring and throughhull connections. Before you embark on this process, though, it would be wise to Follow a strict maintenance schedule as detailed in the product literature. undertake some of the planning and advance work in order to ensure a satisfactory installation.

If there currently is no obvious place for a watermaker in your vessel's cabin, draw a rough sketch of where you expect to install the new device. In your diagram, include paths of wiring and hoses, ensuring any new through-hulls, if needed, are well below the waterline and, in the case of the intake hose, not directly downstream from the holding tank discharge port.

Ideally, you should be able to access and remove such parts as hose connections, filters, pump assemblies and electrical components as needed for servicing, repair or replacement. Also ensure you have an unobstructed view of all gauges and indicator lights.

Another advisable detail is to place the whole installation in a waterproof tray to catch dripping water or the occasional small part falling from the desalinator assembly. If an installation platform already exists, build a 2-inch-high lip, or border, around the edges of the platform and seal it with fiberglass and epoxy resin. This will ensure loose parts are not lost and small amounts of water do not seep down onto the cabin sole.

Finally, follow a strict maintenance schedule as detailed in the product literature. There should be instructions with timelines regarding the changing of filters, inspection of hoses, testing of freshwater quality, verification of proper pressure as indicated by gauges and so on.

By following the maintenance schedule included with the product literature, your new watermaker should provide you with many years of fresh, clean water with only a modicum of regularly scheduled operator maintenance. Happy cruising!

Circumnavigator-author Bill Morris believes the best strategy for succeeding as an offshore voyager is to keep systems simple and, if possible, manual. Key to survival are a windvane self-steering system, a basic array of electronics and amenities, plus an aggressive alternative energy battery charging matrix. Bill is a frequent contributor to Ocean Navigator and the author of The Windvane Self-Steering Handbook (International Marine, 2004); Sun, Wind, & Water: The Essential Guide to the Energy-Efficient Cruising Boat (Seaworthy Publications, 2017), and The Captain's Guide to Alternative Energy Afloat (Seaworthy Publications, 2019).



# Water, water, everywhere

![](_page_38_Picture_2.jpeg)

Optional control panel for installed systems

![](_page_38_Picture_4.jpeg)

Powered by AC electric, gasoline, or 12VDC, we offer watermaker options for either portable or installed systems.

Rainman watermakers utilize a simple design and high quality components. This makes for a system with modest initial price, maximum reliability, easy serviceability, and low life cycle cost. Our strong service reputation is backed by over 70 dealers around the world.

![](_page_38_Picture_7.jpeg)

Rainman Naked - Minimum footprint installation

# rainman B

## rainmandesal.com

PETROL (GASOLINE)

![](_page_38_Picture_12.jpeg)

+ / -

12VDC

### WATERMAKERS

Ease of access often translates into ease of maintenance. Think about servicing tasks when choosing an installtion site.

![](_page_39_Picture_2.jpeg)

# O-rings and boat yoga

Fric Sanford

Voyaging watermaker installation and maintenance hints

couple years ago a friend of mine asked me to deliver his 50-foot boat from Florida to the Bahamas just before Christmas. The idea was for him to fly in with his family and spend a week cruising around without having to worry about crossing the Gulf Stream. I happily went to Florida to pick up the boat and bring it across.

When I got on board and realized that he was going to spend a week with his family of six in the islands with only 100 gallons of water, I told him he definitely needed to consider installing a watermaker. He handed me his credit card and told me to deal with it. Since we were

leaving in a couple days I only had one realistic option: the portable Rainman. Since I had heard nothing but rave reviews for the Rainman, I eagerly plopped down \$4,500 of his money on the 110 volt "compact" model and loaded it on board.

When I got to Nassau I simply plugged it in and within a couple minutes it was producing beautiful pure water. The next day when he and his family arrived I showed him how to use it (he is somewhat technologically challenged). Then I flew back to Florida to wait for the return trip.

He called me a couple days later raving about the

Rainman. "This thing is an absolute game-changer," he gushed. "My wife and both girls all took loooong showers and I didn't have to worry about water at all. That watermaker is so easy to use! I can't believe I didn't have one of these before!"

Since then he has gone on week-long cruises with his family, something he never would have considered before the watermaker. By simply adding a \$5,000 accessory to his million-dollar yacht, it became a long-range cruiser rather than a dockside cocktail vessel.

Of course, the Rainman is a portable unit, which makes it very simple to install and

repair. To use it you need to set it up (five minutes) and monitor the hoses that go into the ocean as well as into your water tank. Portable units are generally more suited for occasional use on smaller boats or as a backup on larger ones.

The obvious advantage of a portable watermaker (more properly called a desalinator), is that it can be stored virtually anywhere while most units are permanently installed. The installed units tend to be much larger and heavier, but of course they can produce much more water much faster.

### **Key questions**

The primary questions when buying a watermaker are: What kind of volume do you need (GPH)? What is your budget? What are your power options? How much space do you have?

After you have answered the above questions it's time to plan where you will mount your unit. The issues of installation and maintenance are actually quite entwined. A poor or ill-conceived installation will be more difficult to maintain and will probably need more maintenance as well.

Finding the best location for a watermaker can be a real compromise. It can't be anywhere that might freeze, or get too hot, or not have enough room around it for easy maintenance. It needs to be in a location convenient for the incoming water source, the brine discharge, and the supply line to your water tank(s). Ideally it needs to be somewhere that you can get to quickly and easily so you can monitor its operation as well as change filters, remove and rebuild pumps, and make repairs.

On a big boat this usually isn't a problem (although I have seen big, expensive watermakers installed in the worst possible places on 100foot yachts). On smaller boats (less then 50 feet), finding the proper location that fulfills the combination of criteria can be quite difficult. Many times the different parts (lift pump, pressure pump, pre-filters, membranes, pressure gauges, valves) are installed in different locations. This has the advantage of not having to find one perfect spot

for the entire unit but the wiring and high-pressure hose runs need to be carefully planned.

When planning your installation keep the following in mind:

• This is a high-pressure water system. Put it somewhere so that if there is a problem, it won't flood your boat or damage any nearby electrical components.

• If the main pressure pump is more than 12 inches above the water line you will need to install a small lift pump (and accompanying valves and raw water filter) below water level to get the water up to the system.

• You don't want your watermaker placed where the temperature will be above 120 degrees or in an unventilated, damp or humid location or the electrical components will corrode and may be damaged.

• Be sure to allow enough room to easily inspect and change the pre-filters.

• Remember that to inspect or replace the membrane(s) you will either need enough room to remove the end cap and slide out the membrane (meaning you'll The Katadyn Power Survivor 80e makes up to 3.4 gallons an hour

![](_page_40_Picture_17.jpeg)

![](_page_41_Picture_1.jpeg)

Above, watermaker pre-filters. Rlght, this Spectra Newport installation fits nicely in the space. But maintence or repair may require some disassembly.

need twice the length of the membrane case) or you'll need to remove the entire assembly (not fun to do).

• Installing a series of valves throughout the system makes it easier to do routine maintenance without disconnecting hoses and making a mess.

• If you're installing a 12 volt or 24 volt system you'll need a separate 10- or 20-amp breaker in your system; when the watermaker starts up it can pull a LOT of power.

### Some firsthand experience

My first boat came with a Pur PowerSurvivor 80E (now manufactured by Katadyn), a 12 volt unit that produced four gallons per hour. It was a compact, simple unit with one membrane that supplied just enough water to keep the tanks on my 42-foot sailing cat topped off. Instead of a salinity probe (to test the water quality), there was a two-way valve on the outflow; one way led to a small sink valve where I could taste

![](_page_41_Picture_8.jpeg)

• If it's DC, you'll want as short a power line run as possible, and be sure to use the correct (or oversized) wire size.

• When attaching the main pump to a hard surface (such as a bulkhead), use at least one-quarterinch thick rubber vibration dampening washers to reduce noise the water before turning the valve to allow the product to go into my water tank. Simple, if not precise.

The entire thing was installed under one of the bunks, so while it was out of the way and in a dry space, I had to tear the entire bed apart to check the filters, pressure and pump functions every time I used it. To change the membrane, I had to disassemble the entire unit.

In my next boat (Leopard catamaran), a Spectra Newport was installed in the forward bow locker. This was potentially a good spot except that again there was no way to remove or change the membrane without disconnecting all the parts and hoses and unbolting the entire system from the mounting plates. In addition, the system had a sophisticated circuit board that controlled the automatic flushing program (every five days), salinity probe, and remote control panel. Being installed in a very damp and warm environment meant that I had to replace the circuit board (\$1,500) twice over five years when it corroded. And finally, the bundle of hoses and connectors needed to operate, clean and flush the system was crammed into what turned into a very small space once I had performed my daily boat yoga to lower myself into the locker in order to work on the watermaker.

My latest boat has a large system made by HRO that is spread throughout the lazarette since there realistically wasn't enough room to put it all in one place. The high-pressure pump probably weighs 35 pounds by itself, and there are two fourinch-long membrane tubes attached to the forward bulkhead in the lazarette. While there is a remote panel in the pilothouse, I always prefer to run my watermaker from the unit itself where I can see and hear the system start up and run; it's easy to nip a potential problem in the bud that way.

A friend has an Ultra Whisper by Sea Recovery on his 42-foot sailboat which he claims is one of the most energy efficient watermakers made. He installed his system under a cockpit seat where he can easily get to it. Of course, there is always the temptation to pile things on top of it (life jackets, lines, fenders). Doing this can damage or break any fragile parts or connections and introduce worrisome moisture into the installation.

### Maintenance considerations

There are just a few things to keep in mind when maintaining your watermaker.

• Check the filters every time before running the system and every hour if making water in dirty or in sea water with a heavy growth of seaweed or plants.

• Flush the system with fresh water for at least five minutes after using.

• NEVER use chlorinated or tap water to flush the system; always use the fresh desalinated water. Chlorine can ruin the membrane. • If you don't have an automatic self-flushing system (usually every four to five days), be sure to run the watermaker at least once a week.

• If you won't be on the boat or using your watermaker for more than a couple weeks, be sure to pickle it according to your watermaker instructions.

• Check for leaks in the pump or hoses every time you run it.

• Be sure your intake raw water strainers are clean.

• Check your water quality periodically with a hand-held salinity meter (\$20 on Amazon) to make sure the unit is delivering quality fresh water.

• Check your electric connections periodically if the unit is located in a humid environment. Keep all connections dry and use a little dielectric grease on all connections when installing the system.

If you are heavily dependent on your watermaker you'll want to have a spare parts kit on board, consisting of filters, hoses, clamps, possibly a pump rebuild kit and a spare salinity probe. I had to rebuild my Katadyn system once when some of the O-rings started to fail. So, I got out the manual which said it was an easy chore that only needed a wrench, pliers and a couple screw drivers in addition to the \$50 rebuild kit. How hard could it be? Carefully following the instructions I removed

![](_page_42_Picture_15.jpeg)

around 20 O-rings of various sizes. That's when I discovered that the O-rings in my rebuild kit were all together. There was no way I could tell them apart; but according to the instructions, they were all different.Luckily, on the boat next to mine in the middle of the Sea of Cortez was a Katadyn tech who answered my VHF call.

If you don't have a technician nearby, following the cleaning and maintenance instructions that come with your system is the best way to keep it running efficiently. A watermaker is indeed a game-changer for a cruising boat and has likely saved several marriages as well.

Eric Sanford is an experienced voyager based in the Pacific Northwest. The control panel and cover of an installed version of a Rainman watermaker.

# OCEAN VOYAGER Annual Handbook of Offshore Sailing

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# For want of a chronometer

Dy the time George Simpson took command of the transport hospital ship, Arniston, in 1814, he was a 60-yearold, seasoned mariner. Arniston was owned by a company called Borradailes of London

![](_page_45_Picture_3.jpeg)

An illustration of the East India company ship Repulse, a vessel of similar size and rig to Arniston.

by the Royal Navy to bring invalided soldiers of the 73rd Regiment and some of their families back to England from Ceylon (modern day Sri Lanka). Arniston was

🕈 an East India merchant ship

built on the Thames in 1794. Armed with 58 guns, it was 175 feet LOA, with a 43-foot beam, drawing 17 feet. On this voyage, Arniston would be homeward bound with 378 souls, including 14 women and 25 children.

The ship was not equipped with a marine chronometer, however, and Captain Simpson did not want to sail without one. Marine chronometers were being manufactured in England by the turn of the 19th century. They cost about

£100, which at the time was equivalent to two years' wages for a skilled workman. The marine chronometer allowed the solving of longitude, taking a great deal of guess work out of finding one's position. The ship's owners refused to purchase one and threatened to fire him if he didn't depart. He was assured that other ships in the returning convoy would have chronometers.

Departing Ceylon, all was well until approaching the southern tip of Africa. A storm scattered the convoy and Simpson was on his own, beating to windward and bucking strong currents. Simpson misjudged his position, thinking that Cape Agulhas was the Cape of Good Hope. His position was to the east and north of his plotted position. Believing the ship had already rounded the southern cape, he set a northwesterly course for St. Helena. Too late he realized his error: He had run into the reefs of Cape Agulhas. He set three anchors to keep him off the reefs but the cables parted. Simpson tried to run the ship onto the beach. Arniston grounded on a reef and broke up. Only six survived — none of the women or children.

An officer from the same convoy reflected on the trage-

### **BY DAVID BERSON**

dy: "This valuable ship, and all the lives on board of her, were actually sacrificed to a piece of short-sighted economy. That they might have been saved had she been supplied with the worst chronometer that was ever sent to sea is also quite obvious."

It wasn't until 1825 and countless other maritime disasters before the Royal Navy finally began supplying its vessels with chronometers. Also, at the time of this grounding it was a misconception that the Cape of Good Hope was the most southern tip of Africa, when it is actually Cape Agulhas, 30 miles to the southeast.

Let us imagine we are with Captain Simpson, on May 26 and there is enough clear sky to take a noon sight. The DR is S 35° 20' by E 21° 10'. Captain Simpson takes a noon sight of the lower limb from a height of 20 feet. Use a declination of the sun of N 21° 12'. The Hs of the sight is 33° 22.7'. Use the 2021 Nautical Almanac for this sight.

**A.** What is the Ho? **B.** Establish the latitude.

### Answers

B. Latitude is S 35° 15' A. Ho 33° 33'.

![](_page_46_Picture_0.jpeg)

![](_page_46_Picture_1.jpeg)

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![](_page_46_Picture_8.jpeg)

![](_page_46_Picture_9.jpeg)

![](_page_46_Picture_10.jpeg)

![](_page_46_Picture_11.jpeg)

![](_page_46_Picture_12.jpeg)

![](_page_46_Picture_13.jpeg)

![](_page_47_Picture_0.jpeg)

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![](_page_47_Picture_3.jpeg)

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