

## March 2021

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# NEW & IMPROVED

Love your boat but wish it had more modern amenities? Retrofit upgrades can make an older boat feel brand-new again, while increasing your enjoyment on the water. **BY CRAIG RITCHIE**

Looking for a new boat is always a bit of a double-edged sword. On one hand, it's fun to check out the latest innovations. But on the other hand, most of us can't help but think how much we'd like to have these great things on our current boat.

The good news is that it's surprisingly easy to add all kinds of new features to the current family cruiser, including stuff we normally think of as factory options. Thanks to some truly innovative engineering, it's possible to retrofit just about anything to a boat these days, so instead of pining for a pricey new yacht, why not just update the one you already have?

## Swim platforms

Whether you yearn for a refreshing dip on a hot summer's day or need someplace to stow the dinghy, swim platforms have become essential on today's boats. But it wasn't always that way. Fortunately, it's easy to add a platform to the boat if it didn't come with one from the factory.

Swim Platforms ([SWIMPLATFORMS.COM](http://SWIMPLATFORMS.COM)) is the largest retrofit swim platform builder in the world, with nearly 750 different styles to fit a wide range of makes and models.

"Our goal is to make the platform look like it's factory-original, even if there was never one offered for that boat," says Founder Scott Samuelson. "We copy the profile of the actual transom so it properly complements the rest of the vessel."

Platforms can be shipped to the customer's local boatyard for installation, or sent directly to the customer if they prefer to install it themselves.

"About 70% of them are owner-installed," Samuelson says.

## Sun Shades

That glorious summer sunshine always feels so good after a long, cold winter — at least until you've had your fill of it, and suddenly wish your boat had a bit more shade. Retractable sun screens like the SureShade ([SURESHADE.COM](http://SURESHADE.COM)) allow boat owners to add awning-like sun protection to the cockpit, to the bow seating area, or both.

"People think that power shades are only for large yachts, but that's just not true," says SureShade Managing Director Bill Michel. "Our new PTX Power Shade is an affordable power shade option for boats under 26 feet. It's an easy DIY install, it comes in four color options and includes an innovative, integrated storage boot."

Michel says a big advantage to the company's shades is that they can be left deployed while the boat is underway, something that's impractical with canopy shades. "Enjoying the sunshine out on the boat is a great thing," he says. "But the dangers of too much sun exposure are very real. We want boaters to enjoy their time on the water safely and in comfort."

## Remote Monitoring

Remote monitoring kits like the Siren 3 Pro from Siren Marine ([SIRENMARINE.COM](http://SIRENMARINE.COM)) were originally designed as anti-theft devices, allowing you to track the boat's location on a cell phone in real time, anywhere in the world. But they're even more useful for keeping tabs on boat systems while away, allowing owners to monitor things like battery levels, bilge pump activity and shore power status, and spot potential problems before they occur.

What's really cool is many of these systems offer two-way communication, so you can use them to operate onboard systems from

your phone. Turn on the lights, crank up the AC or start chilling the fridge before you even leave the house, so everything's ready to go when you step onboard.

## Stabilizers

Stabilizer systems like Seakeeper's line of products ([SEAKEEPER.COM](http://SEAKEEPER.COM)) were developed for the open ocean, but they work so well that they've been widely adopted on the Great Lakes as well.

Seakeeper Marketing Manager Kelsey Barrett says that the company's gyroscopic stabilizers eliminate up to 95% of the roll that boats encounter on bumpy water. What's more, they're right-sized for the lakes, with the company offering a range of models designed to work with boats from 23 feet to over 85 feet in length.

"There are a lot of people who love their boat, but they don't love the rolling," Barrett says. "The Seakeeper solves that problem. We've heard people call it the 'wifekeeper,' but it makes such a difference, anyone can appreciate it."

The process of installing the Seakeeper varies from one boat to the next, based on the boat's structure and available space.

"We've put them in a huge number of different boats, of all sizes and types," Barrett says. "The installers can be pretty creative. That's especially important on smaller boats, where space is at a premium."

## Bow Pulpits

Dedicated cruisers — and especially those who like to anchor in secluded spots — consider bow pulpits essential because they provide the perfect place to stow the anchor without having to constantly haul it in and out of a storage locker. Pulpits also reduce the likelihood of the anchor bouncing off the hull on retrieval, while creating the perfect opportunity to head up front with your beloved and recreate scenes from "Titanic."

Don't have one? Not to worry, because they're also an easy retrofit on most boats.

Ohio-based PlasTeak ([PLASTEAK.COM](http://PLASTEAK.COM)) offers a variety of bow pulpits up to 5 feet in length to fit a variety of different boats.

"We have a roller system on our pulpit

that cradles the anchor underneath quite nicely," says PlasTeak President Bill Gribble. "Used with a windlass, it makes anchoring super easy while keeping any mud or weeds out of the boat."

## Sunroofs

One clear trend among boatbuilders today is installing sunroofs everywhere — on the roofs of salons, cuddy cabins, T-tops and even flybridges. It's a great feature that really lets the sun and fresh air shine through on a nice day, so it's understandable why everyone wants one. What's not so well-known is that it's comparatively easy to put a sunroof in your existing boat.

"A sunroof opens up the boat in a way that windows or hatches can't," says Kristie Carino, marketing specialist at Webasto ([WEBASTO-COMFORT.COM](http://WEBASTO-COMFORT.COM)). "It's so nice to be on the water and be able to open up the roof and have that fresh air coming in. And when you're hosting guests, it just makes the space feel so much bigger than it really is."

Carino notes that retrofit sunroofs are actually fairly easy installations. "Our Bluesky roof is an electric sliding roof that's basically plug-and-play," she says. "We have a lot of people put them on flybridges, but they also work well on a cuddy cabin as a replacement for the old pop-up hatch."

## Remote Control Docking

It's tough to be in two different places at once, and no one appreciates that more than a skipper who's coming into the dock. Dockmate remote controls ([DOCKMATE.US](http://DOCKMATE.US)) hook into the boat's existing steering equipment to give the captain full remote control of steering, throttle and thrusters from anywhere onboard, allowing them to control the boat while moving about the deck setting the mooring lines, or standing on the swim platform with boat hook in hand.

Dockmate's floating, waterproof remote controls work with inboards, outboards and even pod drives, delivering push-button or joystick control at the captain's fingertips. It can even operate the anchor, or sound the horn at the touch of a button. ★



Swim Platforms



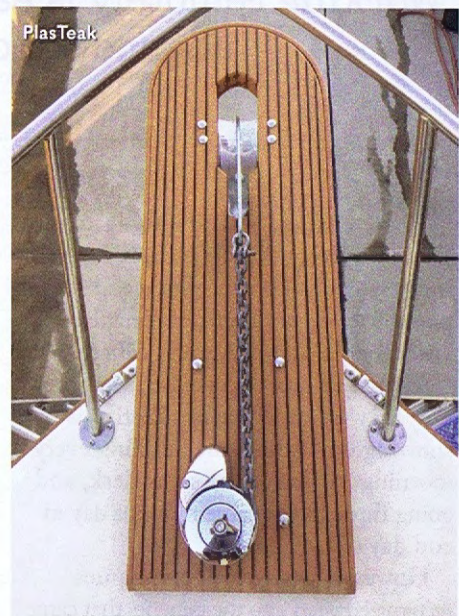
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## Joysticks: Getting smarter all the time, part 1

3/29/2021

*For most people, docking is the most stressful part of boating. However, these days joystick steering and engine control have made it much easier to dock like a pro. Joysticks have brought a great number of new boaters into the sport, increased boat sales—and saved a lot of marriages. It all began with electronically controlled engines. Writer Peter Robson crafted the article below for Marine Electronics Journal, which will conclude next week.*

**By Peter A. Robson**

As most of us know, joysticks allow a vessel's controls, which may include throttles, shifters, thrusters and steering, to be operated by a single three-axis lever/control head that allows precise maneuvering in any direction.

Volvo Penta was the first to introduce marine joysticks [to the mass market] in 2006, one year after the launch of their revolutionary **Inboard Performance System (IPS)** with steerable pods and forward-facing dual props. [Hinckley Yachts introduced joysticks to its own waterjet models in 1994.] The enabling technology behind the joystick was **Volvo Penta's Electronic Vessel Control (EVC)**, which was unveiled with their new D4 and D6 diesel engines in 2004.

Jens Bering is VP of Marine Sales for Volvo Penta of the Americas. He was with Volvo Penta during the development of IPS and EVC. "The key to all these new products," he explained, was "... a new electronic platform that we called EVC. All our engines today are operating on this electronic platform and you can think about it maybe as a Windows operating system or maybe comparable to Apple. This was a major breakthrough for us and for the marine industry in total. No one had ever done this before."

In 2008, Cummins-MerCruiser came out with their version of pod drives: **Zeus**. It wasn't much longer before joysticks were being developed for single and multiple outboards, shaft drive vessels and most recently for sailboats, jet boats and wake boats. Today, most types of vessels can be controlled by a joystick. Nearly all are installed at the boat builder level, though a few can be retrofitted.

### Mostly proprietary

The majority of joystick providers offer systems specific to their proprietary equipment. For example, Volvo Penta joysticks only work with Volvo Penta systems. Same goes for Mercury and Yamaha. Twin Disc offers their **Express Joystick System** that only works with their QuickShift transmissions. ZF Marine offers their **Joystick Maneuvering System** for vessels with ZF transmissions, as does Cummins with their **Inboard**

**Joystick**. Where thrusters are part of a shaft drive systems, third-party products are tied into joysticks.



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Other companies offer joystick controls for a variety of different outboards, inboards, transmissions and thrusters. SeaStar Solutions (now owned by Dometic) was the first company to offer joystick steering for outboards with their **Optimus 360 system** introduced in 2012. Initially it was offered for mechanically controlled shift and throttle and later for electronically controlled engines. **Yacht Controller** and **Dockmate** both offer

wireless handheld remotes that can be added to almost any existing vessel with any make of equipment. **Glendinning's ProPilot joysticks** and Yacht Controller's fixed joystick can also be installed with most brands of engine, transmission or thruster (including a model for single-engine vessels). The same goes for Italy's Xenta.

As with proprietary systems, both the Glendinning and Dometic systems are typically installed by boat builders, though these systems are retrofittable, as are the two wireless handheld remotes.

"Our joysticks are sold in conjunction with our controls systems directly to boat builders or to our dealers, and the installation happens at those locations," says Drew Orvieto, Senior Manager, Commercial Fast Craft Product Line and Engineering at ZF Marine Propulsion Systems Miramar. "Our engineers are then responsible for doing the commissioning of these applications. In the case of production boat builders, we typically commission the first model and then preload the parameters onto all subsequent systems so that the performance is consistent across a given model's production."

Companies such as Glendinning, ComfoDrive and Xenta, offer joystick steering for sailboats though none are seeing widespread use. Most sailboats owners simply use their single engine and a bow thruster. ZF, however, has a unique steerable (360-degrees) sailboat pod drive that mates with small diesel engines and a bow thruster. Beneteau offers this system on two of their sailboat models under the Dock & Go label.

Installation at the OEM level is easiest with fully electronic systems (helm and engines/transmissions). Then it's just a matter of plugging it all in. Volvo Penta offers the most comprehensive system, supplying complete packages from the props, transmissions, engines, controls, joystick, autopilot, glass cockpit and all the harnesses as a single part number.

Things get a bit more complicated when it comes to older vessels with mechanical (i.e. cable or hydraulic) controls between the helm and the engines. Yacht Controller offers a unique system called Yacht Controller Mechanically Actuated Systems (YAMAS) that ties a fixed or wireless remote joystick to fully mechanical controls between the helm and the engine. They do this by installing an electronically controlled actuator box. In other cases, Yacht Controller and other companies such as Glendinning and ZF can replace an older vessel's mechanical controls at the helm with electronic controls. Then, an electronic actuator in the engine room operates short stub cables from there to the engines.

### Networking and CAN bus

At the heart of any joystick system is a network that pieces together the component hardware and software. The challenge is to write algorithms that accurately configure thrust vectors for specific boat brands, so that when the joystick is turned the boat actually goes in that direction. In addition, the software must be configured for each model and horsepower of engine, transmission and thruster (when fitted) that will be using that particular joystick.

The backbone for joystick control systems is **CAN bus** communication protocols that allow certain **NMEA 2000** inputs.

Mercury's joystick systems work through their SmartCraft system—a collection of electronic control units (ECUs). Rob Hackbarth is Mercury's Director of Controls and Rigging. He explains: "SmartCraft is the entire backbone of our system. We use our own proprietary CAN bus protocol. Think of it like your Apple mobile devices' iOS operating system. It reads, it controls, it notifies and it is proprietary. It is based on the engine you have and the products that are installed. We are effectively able to turn on the software to make it work—enabling it on the engine and the parts that are installed on it." Hackbarth says that each joystick boat has its own profile, or personality.



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Security is a key concern for joystick manufacturers. Ry Landry is Product Education Manager for Yamaha. "We have our own firewalls installed in the system and select gateways and pathways for a limited amount of information to come from a NMEA network into our system. When specific information is requested by our system—say, what is our next waypoint?—our system will put out a call for that information. Then the chartplotter will respond with the next waypoint. Much of that done for security reasons." Landry gives the example of people hacking Tesla automobiles and driving them remotely. "The last thing we want to see happen is somebody hack a multifunction display or something else that is out of our control, and then control somebody's boat. It's a potential that we want to avoid, needless to say."



Volvo Penta's Bering agrees. "From a safety point of view, we do not allow people into our platform. We can't operate otherwise. That's too risky. We have a firewall and we do talk with an NMEA 2000 interface. We allow people to communicate with us and, if someone chooses to buy a Raymarine autopilot, for example, we can supply a NMEA 2000 interface. It's a little plug and play interface that allows them to communicate via a data link into our platform."

Brian Dudra is Vice President/General Manager of Dometic Vancouver. "Our system incorporates multiple CAN bus communications streams, including a dedicated steering CAN bus. "Steering is mission critical for boats,

so this function is always on a dedicated communications line. It's important that we eliminate interruptions or crosstalk from any NMEA devices, GPS or other electronic devices. We do, however, listen to the NMEA network so we can get engine RPM and other useful data off the vessel's network. Our system is also fault tolerant," adds Dudra, "so if you lose a wire it has back-up communication streams."

Of course, third-party joystick producers must be able to integrate with a greater range of engines, transmissions and thrusters than those specific to a single manufacturer. Yacht Controller President Gerald Berton doesn't see that as a problem. "We have strong cooperation with a number of manufacturers such as ZF, Volvo, Aventics, Garmin and more. These manufacturers share the technical information we need in order to make our system work to control their system."

Once the installation is complete, it's time to make the system work. Joystick technology is never really plug and play. For best performance, software parameters must be customized for each vessel. ZF's process is typical, says Keith Stanley, ZF Marine's Pleasure Craft Product Line Manager. "After installing a joystick system on a vessel, our application engineers execute a series of steps to fine-tune performance at the time of commissioning. They optimize the software parameters based on vessel characteristics, typical sea conditions and captain preference. The application engineers responsible for commissioning joystick systems typically have hundreds if not thousands of parameters they can use to fine tune the performance. This tuning process is particularly important for station keeping, which is typically a balance between smooth engagement and system authority to ensure optimal performance even in elevated sea conditions."



### Wireless remotes

Manufacturers of wireless handheld remotes have an additional issue to deal with—communications between the remote transmitter and the onboard receiver that control the joystick. Obviously, if that radio link is broken the remote will not function. Yacht Controller and Dockmate avoid interruptions through different protocols.



Dockmate uses frequency-hopping spread spectrum (FHSS) technology. FHSS is a method of transmitting radio signals within a single band and then rapidly changing channels within that band. This helps prevent this communication link from ever being interrupted.

Yacht Controller uses dual-band technology for most of its offerings. It involves continuously scanning two bands and numerous channels within those bands.

Should either band be interfered with, the system can function on the other band, making the system redundant and safe. Both Yacht Controller and Dockmate have alarms to alert the user if communications are lost.

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Additionally, when it comes to redundancy, Yacht Controller's Berton says, "We have four microprocessors for each and every function, whether it's the engine, thrusters or anchor. Each one of those has quad microprocessors that secure the control and confirmation into the system to prevent it from any kind of fusing of a relay, a spike or surge in power or whatever. It's impossible to lose control with our system."

*Next week: Autopilots, thrusters, electronic steering and what's ahead.*

**About the author**

Peter A. Robson is a veteran editor, author and magazine writer based in Vancouver, BC. His work regularly appears in marine and other publications in the US and Canada. He is a frequent contributor to MEJ.



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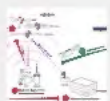
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# Mostly successful docking despite runaway bow thruster

BY BEN STEIN · PUBLISHED APRIL 2, 2021 · UPDATED APRIL 2, 2021



*New and old solenoids side by side during the replacement of the failed one*

There's probably no good time for a bow thruster to get stuck in ON mode, but it happened to me while backing into our marina slip on a windy day. Moreover, that maneuver included a 90-degree turn with numerous nice boats tied up close by and rocky shallows not far downwind. While the cause of the thruster failure turned out to be minor, the possible perils and the lessons learned were not.

After a successful weekend of [testing our new LiFePO4 batteries](#), I noticed the winds picking up and decided to head for our B Dock slip deep inside [Legacy Harbour Marina](#). By the time we'd reached the three-legged entrance channel, the southwest winds were gusting above 25 miles-per-hour, which is perpendicular to our slip and also meant we'd be pushed sideways toward a fairly close and unprotected seawall.

But no big deal, I thought; I've docked in winds like this plenty of times. While our Carver Voyager 570 *Have Another Day* may have lots of windage with little keel mitigation — see [my Seakeeper install entry](#) for more detail — she also has two 675 horsepower diesel engines plus 24-volt bow and stern thrusters.

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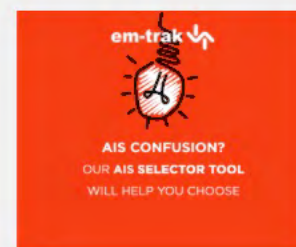
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So as we reached the end of the last fairway — seawall dead ahead — I maneuvered to starboard so the boat could be blown to port some as we did our 90-degree backing turn into the slip. I tapped the bow thruster to starboard a bit, but when I heard a thruster running without my hand on the control, I looked around wondering who else was maneuvering their boat so nearby.



*The port-side view from Have Another Day's bow in her slip. It's only about 40-feet to the mangroves and rocks*

But it was my thruster stuck to starboard even though the control stick was in the straight-up neutral position when I checked it. I also turned off power to our [Dockmate remote control system](#) in case it was the culprit, but it wasn't. At this point the boat is barely moving — the thruster helping against the wind (though I don't think I'd really processed this) — but things were quickly getting out of control. My first thought was to pull out of the marina and assess our options, and that's the plan I [communicated over our headsets](#) to Laura, who was on deck ready to handle lines with the girls.

The more I thought about it, the more it seemed like a bad idea to maneuver back through a marina full of boats with both a thruster and wind pushing the boat around. The better choice, I decided, was to immediately stuff the boat into the slip as best we could, and it was great to then realize that I could stop the thruster by pushing the control stick to port.

So I got my daughter Molly — who recently finished her [Florida boating safety course](#) — to come up and hold the stick over while I attempted to dock. But as I backed in, the wind pushed the bow towards shore and my neighbor's beautifully maintained Tollycraft, and so I tried to correct with more reverse starboard engine throttle meant to pull the bow to port. Unfortunately, the stern was already pretty close to the floating dock, so the added speed mainly meant that the swim platform hit it harder.

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