

② THIS IS HOW YOU SONIC

An intrepid cruiser looking for a bottom free of barnacles sets off to determine if an Ultrasonic sound-wave system provides true anti-fouling protection. BY WALLY MORAN

SYSTEMS

Lying in my bunk, I hear an occasional clicking from the hull below me. No, it isn't krill dining on algae, although the sound is similar. It can't be krill, because I no longer have algae growing on my hull. What I'm hearing is the boat's Ultrasonic Marine anti-fouling gear, and it tells me that any nasty growth emerging on the boat's bottom, including algae, is being destroyed before it becomes attached. Sorry, krill.

In the fall of 2014, I installed an Ultrasonic system sized for my 1975 Dufour 34, *Gypsy Wind*. The unit is comprised of a control box, two transducers, and the associated wiring connecting them. I epoxied the transducers directly to the hull per the instructions for my boat size, with one forward and another aft. The control box was placed close to the battery compartment to minimize wiring runs and reduce power loss to the transducers.

The basic wiring was quick and easy. The entire installation took no more than two hours, not including the setup time for the transducers' epoxy bedding. I mounted the transducers inside the boat, with one about 8 feet aft of the bow and the other in the engine room, slightly aft and to port of the keel. Placing one too close to the keel apparently interrupts the signal. Everything required was included—something more manufacturers need to do, as it saves on trips back to the store for the bits and pieces most of us invariably forget on any project.

On completion, the only immediate evidence I had that the Ultrasonic unit was



For close to a year, *Gypsy Wind* went without bottom paint, the only protection came from the Ultrasonic unit. Once hauled, the exposed layers of old bottom paint, offering no antifouling protection, were visible (top). The only significant area of barnacle growth after this extended period was near the skeg (bottom).



Aboard my 34-footer, *Gypsy Wind*, I installed a pair of transducers (left). Where you position them is critical to the effectiveness of the system. When installing, wriggle the unit into the epoxy to eliminate any air bubbles. The heart of the Ultrasonic system is the control box (right). Wiring is simple, with the power line clipped into the bottom of the unit, and the transducers into the top.

working was its blinking green light. Proof of its efficacy obviously would have to wait for several months, and through an unusual set of circumstances, it turned out to be a seriously tough test.

My original plan was to haul the boat in Virginia, paint the bottom, and then see how the unit functioned on a trip south down the Intracoastal Waterway. But an unfortunately timed low tide in Hampton, the marina's rather shallow lift well, and time constraints dictated that I would only be able to haul and clean the hull, not paint it.

Fine. I'd haul in Miami once I'd arrived, and in the interim, as the power wash and scraping took off the last of my ablative paint, I would see what the unit could do with no bottom paint. We were going, so to speak, bare bottom to Miami.

So how does this unit actually work? It sends out ultrasonic pulses through the transducers in the hull, which, according to Ultrasonic Marine, "create sound waves

that move water molecules over your boat's hull. Micro-organism growth is prevented because it can't survive in the environment created by the ultrasonic frequencies."

In other words, think of country music being played in a shopping mall to discourage teens from hanging out.

That's the system's first line of defense. What's also happening is that the unit creates oscillation in the same natural frequencies as that of the marine growth. This causes cellular disruption; the cells, in effect, "explode" and perish before they can attach themselves to your hull and grow into baby barnacles or seaweed.

This same technology — which in fact is not new, dating back to the 1960s — is used in other applications, including preventing growth on water lines and in tankage. The fresh interest in it reflects the demand for cleaner solutions than toxin-laden paints to eliminate bottom growth.

Obviously, if algae, the basic food source for barnacles, is eliminated, then the barnacles

won't appear. Any that does sneak through is addressed in round two.

So how did all of this work in practice?

Eight weeks later, after a great trip south to Miami, I dived to the bottom of the boat in No Name Harbor and was astounded. I expected to find some light barnacle growth along the waterline, possibly some at the front of the keel and rudder, and at the root of the skeg, all typical problem spots on my boat. But there was only one barnacle and a very light coating of slime that was easily wiped off. So far, the performance was impressive.

So I sat on the anchor for a while. Then I did a little sailing in Biscayne Bay, and then sat some more. After four months of sailing and anchoring passed, I did have visible growth along the waterline, the rudder's trailing edge and the skeg.

I called in Javier Rodriguez, a Fort Lauderdale diver, to scrub the bottom. He indicated that there was some

barnacle growth along the bottom of the keel and on the usual problem spots I noted above, but that the growth was nothing significant for a six-month period. There was also minimal growth on the running gear and propeller, also typical problem areas for most boats.

These three locations — the running gear, propeller and the bottom of the keel — are the toughest spots for ultrasonic technology to protect. With the keel, the distance from the transducers is a problem; the running gear's issue is that it tends to be isolated from the hull, where the vibrations are being induced. The use of additional transducers to reach these areas is a viable solution.

Again, these positive results were achieved with no bottom paint whatsoever; my boat's only defense against barnacle and seaweed growth for those six months was the Ultrasonic Marine anti-fouling system. In my opinion, the unit more than passed the rugged test.

Independent sources on

this topic suggest the best results would come from putting on a coat of hard bottom paint that is scrubbed occasionally. Given my experience (and a bit more sailing rather than sitting, which helps keep the hull clean), I can see this procedure resulting in minimal fouling or none at all over an extended

period of time.

I ran the boat north back up the ICW in 2015 before hauling her out. Again, there was very little growth other than at the waterline, which is essentially out of the water and exposed to air, unprotected by the Ultrasonic unit. The only potential problem I've found

is the power consumption.

While not large (about 1 amp per hour, or 20 to 25 ampere-hours daily for the two transducers), it mandates adequate recharging capacity for the batteries.

A boat at a mooring would need solar, wind or a fuel-cell setup such as the Efoy to maintain the batteries for an extended period. The Ultrasonic unit does reduce power to the transducers should your battery's voltage drop too low. Of course, you then lose the unit's anti-fouling abilities until the batteries are recharged. However, the unit can be set up to run from its own 40-watt solar panel, which means long-term usage at a mooring is easily achievable.

Dockside, there is an optional shore-power cord for 110- or 230-volt AC power. With a large-capacity battery bank or solar, wind, or other generator, there would be no battery-capacity issues.

So what will installing one of these Ultrasonic units mean for you? Essentially, between haulouts you shouldn't require a diver to clean your hull as frequently. You also won't be hauling for repainting so often — another big money-saver, on both yard fees and material. Payback time on this unit appears to be two years, after which you're looking at long-term savings on this necessary area of maintenance.

Does the Ultrasonic Marine unit mean the end of bottom painting as we know it? Unfortunately not, but as noted, it does mean fewer haulouts and longer periods before paint jobs, with a cleaner hull giving you better speed and fuel economy.

Canadian cruiser Wally Moran is the organizer of each fall's Sail to the Sun ICW Rally down the Eastern Seaboard. For more information, visit his website (bloggingtheicw.blogspot.com).

FOR MORE INFORMATION

At \$1,199 for a two-transducer setup capable of handling a boat up to 53 feet, the Ultrasonic Marine system (ultrasonicmarine.com) represents good value. The company says a single transducer will handle boats up to 33 feet, but based on my experience with two transducers on my 34-footer, I'd recommend a pair even at that length. Above 40 feet, I'd probably go with three. The additional cost of \$300 would provide better coverage of the keel, skeg, rudder and running gear, which are all high-fouling areas.

Several other companies manufacture similar systems, including NRG Marine (pyiinc.com), which is also available at West Marine. Its two-transducer system costs \$1,759. Barnacle Zapper (barnaclezapper.com) also offers a two-unit system, for \$1,999.

While researching this article, I came across a fascinating item called the Waveblade PowerShark, a waterproof tool designed to scrape barnacles off the hull using ultrasonic vibrations. Visit the company website (waveblade.com) to see it in operation.

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