

Practical Sailor

The "Real" Morgan 41

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Spring is in the wind

Anyone who goes to sea in a well-built boat is bound to believe it has a soul. For how else could an object of wood, metal, or plastic so deftly cleave a breaking sea, or hold a true course with the helm unattended? And how else could a genoa in perfect trim—nothing more than a tenuous arrangement of molecules—make our hearts beat faster?

Of course, there are those of us who more easily adopt this conviction. To believe otherwise would concede we'd lost our wits long ago, when our boat spoke to us, offered advice, and consoled us in times of despair.

Still, I don't think every boat

The Morgan 41 Hombre, owned by Charley Morgan's partner Bruce Bidwell, shows some soul.

is assured a soul. Fiberglass and metal boats, for instance, start with a minor soul deficiency, and need a little boost to become complete. This opinion was likely forged by my wooden boat years, when the mantra, "Yes, plastic boats are easy to care for . . . but so are plastic flowers," sustained me through a decade of hard labor.

Of course, to believe that boats have souls raises the second question: What is the source of this *atman*? The easiest explanation is also one of the oldest: The artist or creator is also the animator. It's easy to imagine a bit of Olin Stephens in *Stormy Weather*, but how much of Bill Shaw remains in a thoroughly rebuilt Triton?

This question, I think, leads us closer to the truth.

About five years ago, I was walking the docks at the Coral Reef Yacht Club in Coconut Grove, Fla. I had been invited to sail aboard *Comanche*, a legendary SORC racer designed by Wirth Munroe, son of the South Florida pioneer Ralph Munroe, whose adventures on Biscayne Bay inspired my childhood escapades. It was, by birthright, a soulful boat.

Oddly, the proud owners of *Comanche* were more interested in showing me another boat—a

mere production model at that. The modest sloop, a Morgan 41, was the talk of the docks it seems, and I quickly saw why. Though launched in 1968, the graceful centerboarder looked as clean and new as any show boat (and far more beautiful to my eye). Its name is *Circe III*, and its photo is on the cover.

Over the course of three years, the owners David and Susan Woolsey, with the guidance and occasional help of professionals, had gutted and rebuilt *Circe III*. This was no cosmetic makeover. A structural fiberglass grid was added along the keel. The hull-and-deck joint was fiberglass-taped to form a monocoque hull. I've seen many boats, ranging from Allied Seawinds to Block Island 40s, whose owners have undertaken bare-hull restorations, but none of them could compare to this.

It was then that I realized that with every ounce of sweat we pour into a hull—truly a reservoir for dreams—so goes a bit of our own soul, too. It is by the rub of the buffer or stroke of the brush, that our boats truly live and breathe.

At least this is what I tell myself this morning, as once again the rites of spring loom large.

Darrell Nicholson
Editor

On the cover: Circe III at home on Biscayne Bay. Photo by Billy Black

Photo courtesy of Morgan Yachts

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SOY STRIP vs. PEEL AWAY

Based on your recent ranking of Franmar Soy Strip as the top-rated antifouling stripper (“Stripper Showdown,” November 2006), I purchased two gallons of that product to remove four coats of six-year-old Interlux Micron Extra self-polishing paint that we had applied over Interlux Interprotect 2000E on our Caliber 33. I tried several methods of using the Soy Strip—from leaving it on for six hours covered with plastic wrap, to scraping it off after one hour—and I found that the Soy Strip was totally inadequate in removing this paint.

In desperation, I tried Peel Away Marine Strip II, which was easy to use and did an excellent job. It was quite easy to apply with the provided spatula, like icing a cake upside down. I applied the Peel Away stripper and paper one afternoon and went back the next morning to remove it.

It was quite easy to remove: I scraped the paste—which had dried and mostly stuck to the paper—and pulled the paper off at the same time. Quite a lot of red antifouling was left on the boat. However, when I washed it off with No. 4 wire wool and a course pad, all paint was removed back to the Interprotect coat with just a wipe, no scrubbing.

Based on this, I suggest that before anyone splashes out \$150 for two gallons of Soy Strip, they buy a quart first to see if it works satisfactorily.

Christine Newell
Oceanus, Caliber 33
Cambridge, Md.



We re-tested Peel Away II and Franmar Soy Strip on a larger section of our test boat, a Union 36 (above). Soy Strip was still more effective, although some readers have done better with Peel Away II.

SOY STRIP REPORT

I was reluctantly coming to the conclusion that the antifouling paint needed to be removed, so I eagerly read the article (“Stripper Showdown”) in the November issue.

An e-mail and a couple of phone calls to the local Soy Strip distributor were most helpful. He pointed out that since the product is sensitive to both ambient air temperature and the temperature of the hull, I should tackle the job in the fall rather than wait for the hull to warm up in the spring. He also emphasized the need to cover the product with thin plastic sheets to hold it on the surface and prevent evaporation during the “dwell time.” (This is, in fact, a big part of the job.) My 30-foot

Catalina required about 2-1/3 gallons of Soy Strip. Application by a team of two took about three hours. Scraping off the residue, an unavoidably

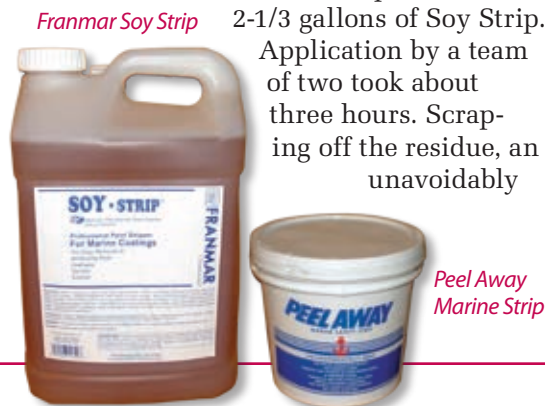
messy job, took another 3½ hours by the two-person team. (The residue should not be left on for too long.) In the end, I would estimate that 75-80 percent of the paint came off. At least I avoided the risk of inhaling sanded paint—a real plus. A little additional work in the spring and the hull will be in good shape for repainting.

Mike Gerhardt
Warren, R.I.

We repeated our stripper test on larger sections of our test boat with the same results as our initial test (see photo above). However, as mentioned in the original article, past tests lead us to believe that some paints remove easier with Peel Away than Soy Strip. Temperatures during our test were above 80 degrees, and humidity was very high. The manufacturers of Soy Strip do not recommend using their product in temperatures below 70 degrees.

TETHER ATTACHMENT

I read about tethers in “Sailing on a Short Leash” in the January 2007 issue with great interest since I





PS tester and veteran racer Skip Allan runs his safety tether under the jackline and back to his harness. This takes out the slack for use while the wearer is stationary.

have never had the occasion to use one. After reading the pros and cons of attachment devices on each end of the tether, I noticed that Skip Allan, in the photos, did not connect directly to the jackline, but looped the tether around the jackline, a method not discussed in the article. Is that a recommended attachment method? Is the tether as strong when it is attached this way?

Bob Bedell
Via e-mail

A safety harness tether should always be clipped to windward and be maintained with as little slack as possible. This prevents a tethered crew from being awkwardly launched, and possibly hurt.

In the photos to which Mr. Bedell refers, Skip Allan was wearing a 6-foot single tether. By looping the tether around the windward jackline and hooking it back to his harness, he halved its length and removed the slack in the system, reducing the chances of being launched out of the companionway, across the cockpit, or even over the lifelines. There is no practical reduction in strength to the tether when shortened in this manner. When moving around the deck in a vertical stance, tether

wearers minimize friction between the tether and jackline by clipping the “boat end” of the tether snap hook directly to the jackline, still minding to keep as much slack out of the tether as possible.

ELASTIC TETHERS

A note on tethers using elastic: My experience is that the elastic in these tethers doesn't last more than three or four years. My Wichard 3-foot/6-foot double tether is three years old, and the elastic may as well not be present. If you're planning to use your tether more than three or four years, forget about paying extra for the elastic. It's great while it lasts, but it doesn't last forever.

Of more concern to me is that your review (“Sailing On a Short Leash,” January 2007) notes the importance of being able to quickly disconnect from any tether in an emergency. When using a double tether, the unused lead must be clipped somewhere, likely on your person—it can't be left dangling. There is only one place to do this that is convenient and consistently available: the harness D-rings.

Unfortunately, carrying the unused

end of a double tether on a harness D-ring (or anything else attached to your body) renders the quick-release on the harness end of the tether ineffective. If the quick release is activated, you are still attached to the harness via the “inactive” tether which was clipped to the D-ring of the harness.

The only way around this problem is for the inactive tether to be clipped to the tether itself. Any double-ended tether should have a convenient attachment point for the unused end of the tether, such that an emergency disconnect will actually allow you to disconnect. The information supplied with the tether should note this potential danger and how to avoid it. Otherwise, you may as well use a locking carabiner on the harness end.

Gary Aitken
S/V Malakii
Via e-mail

MAHINA ON HARNESSSES

In regard to your tether article (“Sailing On a Short Leash,” January 2007) and mentioning that we (Mahina Tiare Expeditions) recommend the West Marine tether with Gibb hook, here is some additional feedback.

Mahina Expeditions has had 815 sail-training students on board over the past 17 years, covering close to 200,000 miles, much of that in high latitudes. We ask our expedition members to bring their own harnesses and tethers, so we have seen many different types.

The double tethers seem like a great idea, but everyone who has brought them has ended up taping or cutting off the short end—it just gets in the way too much.

We love the idea of (and recommend on our temperate voyages) inflatable PFD/harness combina-

The extra leg on a double harness just gets in the way, reports John Neal of Mahina Tiare Expeditions.



tions, but for passagemaking in the tropics, nearly everyone finds them heavy and sweaty behind the neck.

The Crewsaver Sovereign harness has been a favorite. The combination of fairly rigid webbing and the extra fabric section on the back make it easier to slip into than most.

We are big proponents of the Lifesling and—after 17 years of having each expedition member conduct several rescues—have developed a very fast, simple, and predictable method of singlehandedly retrieving a man overboard in less than 90 seconds. We have just documented this in our “Expedition Companion” textbook.

John Neal
Mahina Expeditions
www.mahina.com

ELECTRIFYING TALE

I recently experienced a scary mishap with my shore-power cord that should be shared with others. And I’d like to know how many others have had a similar experience.

I plugged my nine-year-old, “perfectly fine,” 30-amp cord into the boat to provide power/heat for our night at the dock. During the night, I noticed that our 1500-watt electric heater was no longer working. I first suspected something was wrong with the heater or something in the boat’s electrical system. In the morning, I discovered that two of the three receptacle terminals had burned off, and both the cord and receptacle had burned and melted.

Fortunately, the burning did not spread to the boat itself. The cord and all the boat wiring has worked fine for nine years, and everything was “properly” installed at the J-Boat factory. The boat’s 110-volt breaker did eventually trip, but the 30-amp dockside breaker did not. The cord was plugged in straight and tight. I’m assuming that I had unseen corrosion inside the plug, and it created high resistance that caused the eventual melt-down. Is this a common problem?

The marine store “experts” claim that this problem can occur with cords about 10 years old when used continuously with a 1500-watt heater load and other “heat sources” as well. They claim a 30-amp cord is designed for intermittent 30-amp loads. On the day of the failure, my heater, the boat water heater, and the battery charger were likely all on at the same time. However, the cord actually failed during the night when only a 750-watt heater was running. Also, I do not leave the cord attached to the boat during the winter. It is usually stored below.



Loose terminals on older power cords and worn receptacles are common problems—they’re also common fire hazards.

Bill Boyeson
Via e-mail

This is a common problem, most likely caused by a loose connection. On an older cord, the terminals inside the plug assembly can eventually get loose. Loose connections increase resistance in the circuit, which in turn creates heat. Often, there is enough heat to cause a fire. The electrical receptacles can also wear with age, creating a loose connection with potentially dangerous results. Scrupulous inspection of the integrity of the connections can help prevent this sort of mishap.

FILTERBOSS

Has *Practical Sailor* ever tested the FilterBOSS (www.ktisystems.com)? This system provides two fuel filters, one online and one offline. The website indicates the device allows for easy engine bleeding. It also states that if your lift pump fails, the FilterBOSS will supply fuel to the injectors. Sounds like a great system to me. Any advice?

Bill Blair
Via e-mail

Great timing, Bill. We actually just wrapped up a FilterBOSS evaluation. Look for the review in next month’s issue. You will also likely be interested in our upcoming look at fuel tanks, also looming high on the horizon.

STAINLESS STEEL

The magnet test suggested in the February 2007 issue oversimplifies the issue of applying stainless steel in saltwater applications. The most commonly available stainless steel is Type 304, which is non-magnetic, but also is notoriously susceptible to stress corrosion cracking in the presence of chlorides. This environment exists in all standing rigging on a sailboat in salt water. Type 316, which contains molybdenum and a slightly higher nickel content, does not suffer from this problem. (But, it is more expensive.) When stainless steel is used in a weldment, it can suffer from intergran-



Practical Sailor takes a look at the FilterBOSS fuel filter system, by KTI Systems Inc., in the April issue.



Crosby and Claire Roper's 16-year-old dog, Skyla, sports her West Marine PFD in San Diego, Calif.

ular corrosion in the area of the weld. For this reason, low-carbon versions of these alloys (304L, 316L) should be used. The method of thread-forming on fittings and fasteners can also be significant. Rolled threads are far superior to cut threads because of the reduction in stress concentration and the lessening of sites for the initiation of cracks.

Tom Walder
Ericson 29
Wilson, N.Y.

The magnet photo was not meant to imply that all non-magnetic hardware is good. Past issues of PS have discussed the various stainless-steel issues that Mr. Walder succinctly describes and we will delve deeper into metallurgy in our upcoming test of steel fasteners and fittings.

POOCH SAVERS

Thanks *PS* for your article on "Pooch Savers" (January 2007). Those of us who include our dogs whenever possible are always looking for sound ways to keep them safe. Our 16-year-old dog, Skyla,

has been an avid swimmer all her life. But now that she is a bit long in the tooth, her West Marine doggie PFD's extra buoyancy means the difference between swimming and sinking! Keep up the good woof!

Crosby and Claire Roper
Tethys, Catalina 320
San Diego, Calif.

DOGGIE PFDs

I own several pet PFDs, but I have found a better alternative. I solo sail with my dog, who always wants to be by my legs. It only took him poking his head between the spokes of my Lewmar folding wheel once for me to realize that his roaming free in a PFD was not an option. Plus, the modern Hunter's stern swim platform is an inviting exit point for a canine.

When underway, I outfit him with a full harness designed as a seat-belt harness for dogs (www.petsafetybelts.com). I use the Pet Keeper from Shockles (www.shockles.com) as the tether since it is elastic. I could also use a single Wichard tether, but it is a little too heavy. I clip him in where he can't reach the wheel, but can otherwise roam around the cockpit and get on the seat. At anchor, I go with a full-bellied PFD until bedtime, mostly for my piece of mind.

Glen Koch
Hobie-g, Hunter 31
Havre de Grace, Md.

BOTTOM PAINT FOR METALS

After reading the 2006 Bottom Paint Test review (February 2007 issue), it's evident that not all copper-based paints are equally compatible with aluminum saildrives. My Volvo MD 22 engine manual cautions to avoid copper-oxide bottom paints used on the hull itself because of corrosion interference with the saildrive, but "pure" copper-based antifouling paints containing "copper thiocyanate" seem OK.

I am considering an ablative paint for use in waters from New Jersey through New England for this year and the entire East Coast for next year. Only the Sea Hawk Mission Bay CSF rated better than Fair in NE waters (but only Fair in Florida).

So I am interested in looking into what copper-based paints would be compatible with my aluminum saildrive and will perform well in both NE and Florida waters. Or better rated copper-free paints in both NE and Florida waters.

I started checking the details on some of the paint sites, but gave up trying to read the MSDS sheets, individually.

CORRECTION



The *PS Advisor* in the December 2006 issue of *Practical Sailor* incorrectly stated that "...forward-facing scoop strainers should never be installed on sailboat engines and gensets, which like a little air in the cooling stream." The reason a forward-facing scoop is not recommended for sailboats is that while under sail, the scoop might force water past the impeller and flood the engine. Generally, engines and gensets do not "like" air in the cooling stream. Also, for engine intakes, *PS* recommends no external strainer and an easily accessible water strainer, pictured above. If you insist on an external strainer, it should be a 180-degree dome type or a similar, non-directional strainer.

Any idea which of the copper-based paints contain a more compatible form of copper and could work with boats with saildrives?

Charlie Kapeghian
Nelly Ruth, Bavaria 40 Ocean
Forked River, N.J.

Based on your own research and the results of our most recent antifouling test (February 2007), we'd recommend Blue Water Paints' Kolor, which was a top performer after 18 months and contains copper thiocyanate. The best performer in our last metal paints test was Pettit's Alumacoat. However, Alumacoat has since been replaced by Alumacoat SR, which rated Fair in the 2006 bottom paint tests. Look for an update to the metal antifouling test in a future issue.

SEARCH FOR 12 INCHES

In previous issues of *Practical Sailor* ("Seven Muscular Winches," June 2006, and "Mailport," September 2006), you mention the benefit of 12-inch winch handles over standard 10-inch winch handles as having 20 percent more cranking power. Having a 40-foot sailboat and using/straining with a 10-inch winch handle for years, I wanted one ASAP.

After months of research, I found out that the 12-inch winch handles are made by LVJ of Holland. I called Taylor and Snediker LLC, (800/599-0800) in Connecticut, the U.S. distributor of LVJ winches and winch handles.

The 12-inch, locking winch handle is made of a brass-aluminum alloy and is available for \$120 (discounted) plus \$6 for shipping.

It is available in a single-handle or double-handle version. They also manufacture 8-inch and 10-inch standard-brass, aluminum-alloy handles.

My 12-inch, locking winch handle was shipped the same day I ordered it. The winch handle is an impressive brass color and is very well made. I look forward to more winch cranking with less strain this spring.

Jerry Boudreau
Swansea, Mass.

Practical Sailor welcomes letters from our readers. Please include your name, home port, boat type, and boat name. Send e-mail to practicalsailor@belvoirpubs.com and mail to Practical Sailor, 7820 Holiday Dr. S., Suite 315, Sarasota, FL 34231.

WHERE CREDIT IS DUE

HARKEN SERVICE KUDOS

I have had a Harken 1600 205 IN midrange snatch block for several years. The shackle broke at one of the eyes, and thus can't be closed. I contacted Harken (www.harken.com), and at their request, I sent the block shackle to them. Without question, they sent me a new one. Great service!

John Helgerson
Via e-mail



Kenyon International's service got a thumbs-up from reader Rob Ransone after they replaced his storm-ravaged Kenyon Express II (above). Stay tuned for our small stoves update and stove/oven test results.

.....
avail. I told him that the stove was over a year old, and he informed me that the warranty was for two years. He asked me to return the stove, and in due course, I received a brand-new one. It is gratifying to work with a company that stands behind its products like Kenyon.

Rob Ransone
1976 Herreshoff 19-foot catboat
Cranes Creek, Va.

RARITAN

In January 2006, I purchased a Hold'n'treat and Electroscan unit from Raritan (www.raritan.com). During the installation process, the tank indicator gave me problems. Raritan's technical support spent a lot of time helping me troubleshoot, including shipping me new parts free of charge. After that, the unit worked perfectly—until last December, when I found the treatment unit was leaking. I contacted Raritan and within 24 hours had an RMA number to ship the unit for repair and factory refresh free of charge. The unit was shipped out shortly before Christmas and arrived in a timely fashion. It looks—and works—as good as new. I appreciate the excellent, timely, courteous, and professional help that Raritan has provided over the past year. Kudos!

Lance Ryley
S/V Bright Star, Freedom 44
Boston, Mass.



The 'Other' Morgan 41

Lovingly restored by her owners, David and Susan Woolsey, Circe III enjoys a reach up Biscayne Bay in Miami, Fla.

Balance and seaworthiness define this classic cruiser-racer.

In 1966, long before Charley Morgan's well-known Out Island 41 took the Caribbean charterboat scene by storm, the "other" Morgan 41 emerged from then-nascent Morgan Yachts in St. Petersburg, Fla. Not yet 37 years old, Morgan was well on his way to becoming one of the most recognizable names in fiberglass boat design. The cruiser/racer Morgan 41 embodied many aspects of two of Morgan's most successful custom designs at that time, *Paper Tiger*, which won back-to-back Southern Ocean Racing Conference races in 1960 and 1961, and *Sabre*, which went on to become the Columbia 40.

Morgan traces the design's heritage, particularly below the waterline, back even further, to Olin Stephens' famous *Finisterre*, and *Comanche*, a 40-foot center-

boarder built by Wirth Munroe, son of famed sharpie designer and South Florida pioneer "Commodore" Ralph Munroe.

"I had sailed on a sistership to *Finisterre*, so I knew what it could do, and I had crossed the Gulf Stream on *Comanche*," recalls Morgan, who confides that his own susceptibility to seasickness was a driving force behind his designs. "I was so impressed with the stability and

seakeeping ability of that boat that I knew this was the right direction to go with a cruiser/racer. *Finisterre* had a pie-shaped centerboard that came up into the cabin, but Wirth had it right with his jackknife centerboard. It was more efficient, and angled back so you could adjust the helm as needed.

"It didn't matter if it was blowing 7 knots or 18 knots, you could leave the helm, go get a cold drink below, come back, and find the boat just as you'd left her."

The Morgan 41 is arguably one of the best looking of many lovely cross-purpose boats that the Cruising Club of America handicap rating system engendered. One owner described his boat as "a Bermuda 40 for a regular Joe, only prettier." Morgan, who strove hard to erase sailing's elitist reputation, would no doubt be



Photo by Billy Black

**ORIGINAL INTERIOR
(ALMOST)**

The interior of Cary Capper's Morgan 41 Sea Glass reflects the factory interior. The white-painted drawer faces replaced warped, deteriorating composite faces, and are not original. Capper also pulled out the original pressure alcohol stove, replacing it with a two-burner Origo stove and an additional storage locker. (Not visible is the quarter-berth, which extends aft of the nav station table.)

**REMODELED INTERIOR**

Circe III, (also pictured on the cover and the facing page), owned by Susan and David Woolsey, was completely gutted and rebuilt with the help of professionals. The galley has shifted to port and the quarterberth is closed off. In its place is space for the boat's systems and additional stowage. The nav station is to starboard. The table folds up into the bulkhead. A workbench and tool drawer replaces the original hanging locker. A bright white finish replaces the old walnut mica.

Photos by Billy Black (top) and Loly Acuna

pleased by the analogy.

Although Morgan was already launching boats with detached rudders and skegs (in the Morgan 24), the Morgan 41's rudder is attached to a long keel—a sensible approach for Morgan's home waters of Southwest Florida. Its keel gently emerges from the curve of the stem, reaching its maximum depth of 4 feet, 2 inches just forward the well-protected rudder.

The centerboard extends another 5 feet, 3 inches, giving the boat a maximum draft of nearly 9.5 feet. Most owners said they seldom used the board, unless they wanted more stability in a cross sea, or to "spank some hotshot" to windward.

"I'm a big believer in shoal-draft boats," says Morgan. "Not only does it open up more areas to cruising,

it's very important for seeking shelter or reaching hurricane holes."

Based on a design Morgan had previously tank tested, the 41's hull has modest overhangs at the ends, adequate deadrise at the bow, and a broad bilge—but no long, flat sections, as is common today. The 30 feet of waterline quickly increases as the boat assumes sailing trim. Its well-proportioned, 11-foot, 3-inch beam was considered broad in its time.

All of the boat's 9,000 pounds of ballast is in the fixed keel, so that even with the centerboard up, the 41 is a very stable boat. The board lifts by a cable and sheaves, a design that would be the bane for future owners. (See "Construction Details," page 12.)

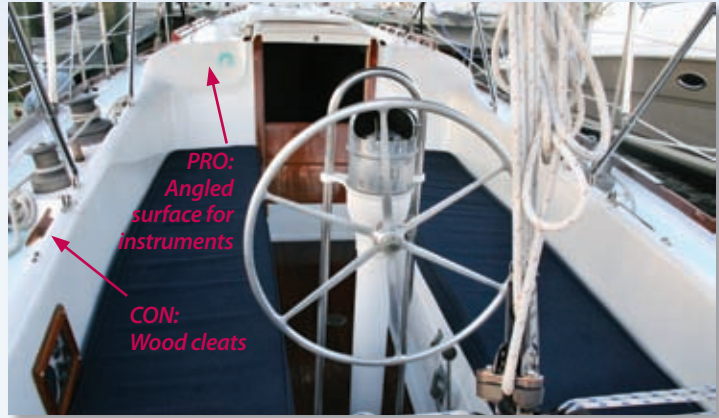
The rig is typical of the era, with

an overlapping genoa providing much of the sail area. (A 150-percent genoa is the standard headsail in South Florida.) Despite fairly conservative design ratios, the 41 is not lacking for horsepower. A couple of owners reported they had mainsails that were actually cut shorter than the original and were quite content with performance.

DECK DETAILS

A survey of the deck reveals a long, I-shaped cockpit, wide sidedecks, and an uncluttered foredeck. The cockpit suits sailing with guests or sleeping under the stars, but will keep your feet wet in a steep following sea. Several owners said they have enlarged the cockpit drains.

On the boat we sailed, the binnacle and 27-inch standard destroyer



CONS

- Tight squeeze behind the wheel.
- Poor access to throttle controls.
- Small cockpit scuppers that can back up in a following sea.
- Bimini mounting tends to interfere with winches.
- Hatches and ports prone to leaks.

PROS

- Wide side decks, handholds, and toe rail add security.
- End of boom sheeting delivers sail control to helm.
- Long cockpit makes for a fine "Bahama-berth."
- Ample cockpit storage.

wheel were so far aft that it was a tight squeeze at the helm. In fair weather, the favored helm spot is on the leeward rail, where the view is intoxicating. During tight maneuvers under power, the shin-high throttle controls give the skipper the unflattering appearance of a farm hen, hunting and pecking as he shifts.

The standard running rigging provides a good framework for improvement. Leading to a traveler just aft of the helm, the mainsheet is at the end of an antiquated roller-furling boom whose popularity, though short-lived, we are still at a loss to explain. A simple slab reefing system suffices.

The jib sheets lead aft to primary and secondary winches mounted on winch pads at the coamings, making winch upgrade a relatively simple affair. Race-ready boats have two genoa tracks, one on the rail and an optional inboard track.

There is a hawsepipe leading to the anchor locker (also accessible from below), but most boats were not originally equipped with a bow roller. Most owners have managed with some off-the-shelf varieties.

ACCOMMODATIONS

Although there were other optional layouts to the "stick-built" interior, most boats followed the plan on page 12. Aft to port is a quarter-berth/nav station, with the galley to starboard. In the main saloon, which has 6 feet, 4 inches of headroom, there's a U-shaped settee to port that converts to a double berth. Facing that is a settee/sea berth, with a pilot berth, above.

Moving forward, you'll find a separate head to port across from a very large hanging locker, which one owner neatly converted into storage and a small workbench. The V-berth is about 6 feet, 11 inches long and well-ventilated through a large forward hatch. Another hatch opens in the main saloon. Three small ports (one of them opening) and one large, fixed port allow light below. Most owners convert the small saloon deadlights to opening ports, and many have painted or covered over the standard walnut mica finish to lighten the interior.

The galley is lacking by today's standards, with a sink below the companionway and little useable counter-space for meal-making underway. A

pressure alcohol stove was standard, so a conversion to propane requires finding, or making, a safe place to store the fuel. The standard icebox is big enough to allow for additional insulation and a new inside liner.

PERFORMANCE

The boat's tight propeller aperture limits prop size, so a three-bladed prop is usual. Many boats came with a 30-horsepower Atomic 4 gas engine. Westerbeke 55As and Perkins 4-108s (our test boat had the Perkins) are common today. Under power, the boat cooperates in both forward and reverse, though some owners like to drop the board a bit for better control in tight corners or in a crosswind.

We sailed the boat in 12-15 knots on Biscayne Bay in Miami, Fla. Seas were a light chop. Winds gusted higher in two squalls that rolled through. The boat was equipped with a fairly new, 150 genoa on roller furling, but an aging mainsail handicapped windward performance. Even so, we easily tacked through 90 degrees with the board partially down and exceeded

Continued on page 12

Charley Morgan estimates that about 375 Morgan 41s were built during its production run from 1966 to 1972, though our research indicates there might be far fewer. This was a Vietnam War-era boat, so some material substitution during the production span is likely, particularly with metal components.

HULL

Like many early fiberglass boats, the Morgan 41's hand-laid, solid fiberglass hulls have outlasted many lightly built newer boats. Morgan had its own chemists to check cure rates and resin ratios at different temperatures. The company worked with fiberglass and resin manufacturers to ensure predictable results during molding.

Much of the hull's strength comes from its thick (by today's standards) layup schedule, which the CCA rule encouraged with its credits for heavy displacement and low ballast/displacement ratios. Two of the five owners we interviewed reported blister problems, though not severe. The hull skin was further supported by a "stick built" interior in which all of the joinery work is bonded to the inside of the hull, contributing to stiffness. A few bare hulls were sold as kits, and the bulkhead tabbing on these boats should be closely checked. The owner of one such boat reported that the hull flexed in heavy weather.

DECK

The main deck is plywood cored, although Morgan said balsa may have been used in the foredeck on some boats. Serious rot problems in the deck appear to be rare. The cabin top is FRP (possibly core-composite on some boats), clamped and bonded to an interior stiffening liner with a polyester filler putty. The cabin top flexes slightly when an well-fed skipper jumps on it, suggesting that some additional stiffening may be in order, particularly beneath any load-bearing hardware that may be added.

HULL-DECK JOINT

The hull-deck joint is an inward-turning flange with the deck through-bolted at 10-inch centers and bedded in a poly-

urethane sealant. The joint is capped with a teak toe rail, which is screwed in place with self-tapping screws. On the boat we inspected (Hull No. 83), some of the through-bolts showed signs of leaking, but in general, the hull-deck joint appeared in very good shape for a boat of this age. The joint was such a nuisance on one heavily raced boat that it was fiberglassed from the inside—a bear of a job.

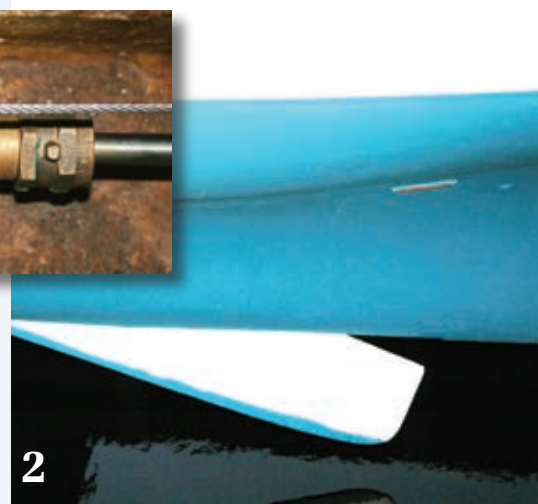
SPARS AND RIGGING

An upgrade of more than just wire is due here if it hasn't yet been carried out. The backstay chainplate fractured or broke on three of the five boats we researched. Less desirable aircraft forks are standard terminals at the mast. The original spreaders were spruce, and prone to rot. Several owners replaced the shroud chainplates as well as the horizontal mild steel I-beam to which these chainplates attach. Mild steel in the mast step is in a hidden spot beneath the head and prone to corrosion.

KEEL AND RUDDER

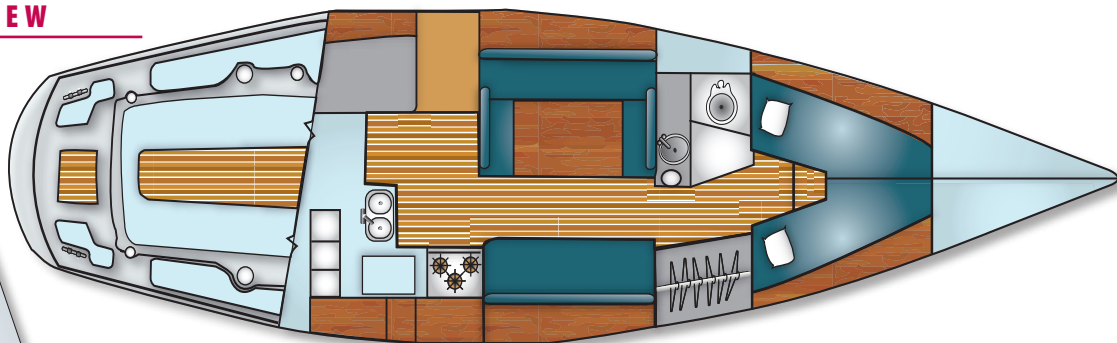
We heard of no unusual problems with Edson cable steering, which is easily accessible via cockpit lockers, or the rudder, which is supported by a formidable bronze shoe.

The centerboard is a different story. The lifting setup employs two sheaves (one of which is attached to a mild steel plate beneath the mast), two cables (one of which is continually immersed in water and notoriously prone to corrosion), and a stainless steel shaft (which passes aft through shaft log that is prone to leaking). Morgan 41 owners have come upon perfectly good solutions—one of which involves the simple substitution of Spectra SK75 for the immersed wire rope—but the improvements require the assistance of a professional. Access to the problem sheave is usually delayed until the mast is replaced, so the mast step of any boats which still have the original rig merit close inspection.



Construction details, from top:

1. A cast aluminum-alloy stemhead fitting and the stylish but nearly invisible port running light;
2. Centerboard partially lowered with an inset photo of an improved shaft and cable lifting system;
3. Hull-deck joint and stanchion fasteners (which could use a backing block) from belowdeck.



While the Morgan 41's interior volume can't match that of today's 40-footers, it can easily support a family cruise (above). The protected rudder and gently sloping keel (left) minimize the potential damage of a grounding. A comparison of three classic centerboard cruiser-racers inspired by Olin Stephens' Finisterre—the Morgan 41, Bill Tripp's Bermuda 40, and Ted Hood's Bristol 40—produces some interesting numbers (below). All three boats were offered as yawls, a nod to the CCA handicap ratings, which favored mizzen sails. With ample ballast and respectable sail area-displacement (SA/D) ratio, the Morgan shows potential for faster passages, as well as a seakindly ride, although the Bristol's higher displacement-length (D/L) ratio reflects its reputation as a comfortable passagemaker. As with many CCA-era boats, the D/L ratios here can be deceptive.

MORGAN 41 *Continued from page 10*
7 knots while reaching, always with fingertip control. Indeed, impeccable balance is the boat's hallmark.

The boat clearly hits its stride about 65 degrees off the true wind, and owners regularly speak of making double-digit speeds while reaching during long ocean races. We sailed most of the time with the board about three-quarters of the way down, and the only time we could truly notice its effect was going to windward, when it reduced the amount of leeway. The overlapping headsail makes short-tacking a pain, but the boat is surprisingly nimble when tacking in light air.

CONCLUSION

The Morgan 41 is a good upgrade candidate for someone who is handy and determined. The boats are typically well-loved, much of the essential work has usually been done (replacing gate valves with proper seacocks, for example). They are proven offshore cruisers, but key spots need careful attention.

Any boat with the original centerboard system will need revamping. To bring the boat into the 21st cen-

MORGAN 41 IN CONTEXT			
	MORGAN 41	BERMUDA 40	BRISTOL 40
LOA	41'	40' 9"	40' 2"
LWL	30'	28' 10"	27' 6"
Beam	11' 3"	11' 9"	10' 9"
Draft (board up/down)	4' 2"/9' 5"	4' 3"/8' 9"	4' / 7' 10"
Displacement	19,500 lbs.	20,000 lbs.	17,580 lbs.
Ballast	9,000 lbs.	6,500 lbs.	6,500 lbs.
Sail area	773 sq. ft.	776 sq. ft.	694 sq. ft.
Engine	30 hp.	30 hp.	25 hp.
Water	60 gal.	110 gal.	35 gal.
Fuel	39 gal.	48 gal.	20 gal.
SA/D ratio	17.07	15.22	16.7
D/L ratio	320	291	378
Price (pre-1974 model year)	\$30,000-\$60,000	\$80,000-\$300,000	\$30,000-\$60,000

tury, much of the gear belowdecks and abovedecks will need upgrading or replacement.

A well-restored Morgan 41 can shine next to some of the most highly regarded classics on the waterfront, so their owners are typically loathe

to part with them. If one does land on the market, expect to pay anywhere from \$30,000-\$60,000 or more, depending on the condition. Should you decide to part with it down the road, you should not have a hard time finding a buyer. ▲



Choosing a Life Raft

New international standards have prompted a closer look at life raft design.

Tube structure and diameter, canopy entrance configuration, handholds, and boarding aids were scrutinized during our recent test of six-man offshore life rafts (left to right: Zodiac ISAF, Elliot SOLAS, and Switlik SAR MK-II).

Since our last extensive test of life rafts in 2002, both the International Standards Organization (ISO) and the International Sailing Federation (ISAF) formal guidelines for building recreational small-craft life rafts have taken shape, and the major players are scrambling for certification under these standards. Whenever an industry reviews its own standards, *Practical Sailor* re-examines its own testing procedures and criteria.

Against the backdrop of this new regulatory landscape (see “*Life Raft Standards*,” page 14), we carried out an in-depth test of eight life rafts: DSB ISAF raft, Elliot SOLAS raft, Switlik MD-3 raft, Switlik SAR-MKII raft, Viking RescYou (UKL), Viking RescYou Pro (USKL), Winslow Ocean Rescue, and the Zodiac Class Ocean ISAF raft.

In our last life raft test (“*Life Rafts Revisited*,” Jan. 15, 2003) the Winslow Ocean Pro was our favorite, and the Viking RescYou Pro earned

Best Buy honors. This time around, we were curious to see how life rafts built or upgraded to the new standards compared to the ones we tested. We also wanted to see how Elliot, a life raft we did not test last time, would do.

Next month, we’ll take an in-depth look at the results of those tests, but before delving into the details of our findings, we present here a discussion—no less important—of the considerations that every sailor must weigh when choosing a life raft.

There is no one life raft that will suit every person or budget. However,

through our weeklong evaluation process, we were able to come up with recommendations to help clarify the differences among offshore/ocean-capable life rafts and allow you to better decide which features are most relevant to your circumstances.

RISK CHECK

Picking the right life raft for your own needs starts with an evaluation of the risks and the exposure you may encounter. In warm, inshore and coastal waters, hypothermia and the risk of being caught out in a heavy gale are less likely. Assistance is closer at hand. Consequently, a lighter-duty, less-expensive life raft may suit the needs of your crew. However, those cruising offshore (20 miles or more from the coast) and/or transiting colder waters, face shorter survival times. Their life rafts need to be capable of performing in more significant seas and lower temperatures.



SAFETY & SURVIVAL



Canopy structures get close scrutiny under the new ISAF standards.

LIFE RAFT STANDARDS

As of yet, there are no fixed standards specifically targeting life rafts for U.S. recreational cruising boats. Instead, life rafts are usually built to one or more of the following standards for commercial ships, European recreational boats, or International Sailing Federation (ISAF) events. None of these standards fully address the needs of cruising sailors.

SOLAS (Safety of Life at Sea) statutes are the “top gun” of life raft regulations. They apply to commercial vessels governed by SOLAS rules, have international standing, and are the most stringent. These regs specify that raft manufacturers use heavy-duty material and large volume inflation bottles. Even ISAF special regulations recognize that SOLAS specs trump all the rest. Sailors competing in transoceanic or high-latitude races (Cat-0) must carry SOLAS life rafts.

ISO 9650 is the International Standard Organization’s criteria aimed at the makers of recreational craft life rafts. Adopted by

the ISO in 2005, it classifies rafts as either coastal or offshore. The latter are built to carefully chosen specifications that spell out factors such as the tear strength of the tube material (800 N warp/ 750 N weft), breaking strength, and porosity. They also are parameters for stability, canopy structure, inflation system, etc.

ISAF (International Sailing Federation) regulations have recognized that most smaller and mid-sized boats competing in offshore (but not transoceanic) events need a rugged, light raft small enough to be stowed aboard a racing sailboat. Previously, racing rafts that met the size and weight criteria fell short in strength and safety features, so the ISAF generated its own set of specs that use the structural guidelines of ISO and some key design criteria all their own. Mandates include “semi-rigid boarding aid... one person righting... stable in a seaway with from 0 to a full number of occupants.”

The U.S. Coast Guard promulgates life raft regulations for domestic inspected vessels, and in many ways, these are similar to SOLAS statutes. Passenger-carrying craft must meet these specs, not just for the raft, but for how it is stowed and deployed. These regulations are oriented toward ships and larger craft, so the weight and bulkiness associated with the required ancillary gear do not transfer very well for use aboard sail and smaller power boats. However, these regulations do underscore the need for tough tube material, rugged inflation systems, and high-visibility fabric and reflective tape.

SAFETY & SURVIVAL

When you abandon ship, lives are at stake. So when you’re shopping for a life raft, what may begin as a hunt for a good bargain might quickly evolve into a sky-is-the-limit search for the best life raft money can buy. Perhaps no major gear purchase elicits more hand-wringing and reflection than that of the life raft.

In some ways, our survey was like grading graduate students at a top-notch university—all of the life rafts were quality products, but each had a slightly different approach to accomplishing the same objective. In some instances, little nuances were a very big deal. We found a few clear examples where one life raft maker would use relatively simple engineering and quality materials to achieve a particular result, while another would take a more complicated, expensive route with nothing gained.

SETTING STANDARDS

Commercial and military interests have long known the relationship between life rafts and survival at sea, and following the *Titanic* tragedy, more and more agencies regulating maritime operations set standards for the structure and design of life rafts and other life-saving devices. The International Maritime Organization’s (IMO) Safety Of Life At Sea (SOLAS) Convention set standards for commercial life rafts, and these have become the benchmark by which all other life rafts are measured.

Until recently, recreational life raft design and construction in the U.S. was a self-regulated industry, one in which manufacturers independently set design criteria that might or might not have complied with the rules of the U.S. Coast Guard, SOLAS, and other life raft regulatory bodies.

The recently completed European ISO Standard 9650 defines what a recreational life raft should be capable of enduring and how it should be built. International life raft companies and some domestic builders now manufacture their products to these standards. To further complicate the

6-MAN LIFE RAFTS

Five manufacturers provided eight, six-man life rafts for our test late last year in Annapolis, Md. Citing time constraints and concerns about the protocol, Revere rafts and Givens declined to participate. West Marine was working with Zodiac to develop a six-man ISAF raft, and has agreed to provide us with the new raft when it becomes available for testing. The rafts we tested:

- DSB 6-ISAF raft (canister)
- Elliot 6-SOLAS raft (canister)
- Switlik MD-3 Life Raft (canister)
- Switlik SAR-MKII (canister)
- Viking RescYou Raft (UKL) (canister)
- Viking RescYou Raft Pro (UKSL) (canister)
- Winslow Ocean Rescue (valise)
- Zodiac Class Ocean 6-ISAF raft (canister)



Seven of the eight rafts PS tested came in canisters. Their weights ranged from 84 pounds for the DSB ISAF (front, center) to 167 pounds for the Elliot SOLAS (back, right).

issue, the ISO standards for aviation life rafts differ from the ISO marine standards, so compliance with one standard does not mean compliance with the other. Most notably, the marine standards place a higher importance on more durable material than the ISO aviation standards.

The ISAF, the governing body of international sailboat racing, is another new player in the life raft regulatory game. To compete in an ISAF-sanctioned, Category 1 or Category 2 event, a boat must have a life raft that conforms with the new ISAF standards. It's interesting to note that ISAF mandates SOLAS rafts for Category 0 races, those held in the most extreme conditions, and, of course, accepts them for all other events. This is further endorsement of SOLAS as the gold standard of inflatable life rafts.

With prices of a good SOLAS life raft running lower than some recreational life rafts, it's surprising that SOLAS life rafts aren't seen aboard more sail and powerboats headed offshore. One reason that cruising boats don't favor these life rafts is the added weight and bulk of the canisters and extra water and survival gear stowed with the life raft. As we took a closer look at this subject, we discovered some interesting facts about the weight and bulk of SOLAS

life rafts, and how both might be reduced without compromising the life raft itself.

MATERIAL PERSPECTIVE

Within the alphabet soup of regulatory agencies is some valuable guidance. One of the most telling statements is found in ISO 9650-1 of the "International Standard for Small Craft—Inflatable life rafts." The section states that life rafts built and maintained to the ISO Type I standards should provide "a reasonably safe refuge for a shipwrecked person awaiting rescue...(be) designed for extended voyages, where high winds and significant wave heights may be experienced, but excluding abnormal conditions such as hurricanes...not (for) voyaging in extreme zones (e.g. Southern Oceans)."

A study commissioned by the Australian government after the storm-swept Sydney-Hobart Race of 1998 further clarifies the hierarchy of life rafts in the eyes of experts. The commission recommended SOLAS-grade life rafts for future races.

But not even a SOLAS life raft comes with warranties that state "will survive in all conditions." As one industry expert put it, "if the conditions are bad enough to cause your primary vessel to founder, how much can you expect from a 100-pound life

raft?" The answer is—quite a bit.

Fundamental to the integrity of any life raft is the material with which it is constructed and the quality of construction, so it is not surprising that the new ISO 9560 standard addresses material tear-test and breaking strength. These same material specs are adopted by the new ISAF standard.

Modern inflatable life rafts are made of tough nylon fabrics that have been coated or "calendared" with natural or synthetic rubber to make them air tight. The tear strength of the material and seams are engineered to withstand impact loads associated with breaking seas and abrasion from curious sea creatures. The trade-off between weight and rugged reliability is a tough balancing act and good engineering is essential.

We noted significant variation in the materials chosen for the hull tubes. At one extreme is the Winslow Ocean Rescue, which had a composite construction using six layers of neoprene coating along with biased-cut, rip-stop nylon, for a total weight of 8 ounces per square yard. The new Winslow ISAF life raft being introduced this year will be 10 ounces per square yard. At the other end of the spectrum is the SOLAS-approved, urethane-coated, 16-ounce-per-square-yard material used in the El-



Inflatable boarding platforms (left, on the Zodiac ISAF raft) made boarding the rafts much easier. The Winslow and the Elliot also had these mini-porch platforms. All the test rafts' canopies had zippers—like the Viking RescYou (above). PS would like to see a backup means of sealing the door.

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liot SOLAS life raft. Switlik also uses a heavy-duty, urethane-coated (inside and out), 16-ounce nylon for the tubes in both its life rafts we tested. Viking uses a slightly lighter denier nylon coated with natural rubber in both life rafts we tested. (Both Viking rafts meet ISO 9650 criteria.) The DSB ISAF-6 life raft was quick to enter the market with a lightweight material that meets the ISO 9650-1 tear-test and breaking strength standards. Zodiac's PVC-coated nylon also meets the ISAF spec and is orange, adding to the life raft's overall visibility. West Marine also has a new offshore design under development that's slated to be available this year.

It's hard to say what is tough enough. Survivors of shipwrecks who tout one brand of life raft or another are both fortunate and biased. Statistics regarding life raft failure are slim. Even more rare are accounts of why the life raft failed to help save people—non-inflation, destruction by the elements, or inability to board a functioning life raft are all possibilities.

Major disasters like the 1979 Fastnet Race and the 1998 Sydney-Hobart event do shed some light on the violent impact of breaking seas. Those who review these events arrive at similar conclusions as commercial life raft experts who have defined USCG and SOLAS life raft characteristics: Sailors cruising or racing in the colder, gale-swept, higher latitudes are better off with a well-made SOLAS life raft. If you have neither the room nor the ability to handle the larger canister and heavier weight, you do have another option: a valise-packed SOLAS life raft.

The SOLAS life raft we tested, the Elliot six-man (the minimum carrying capacity for a SOLAS life raft) weighed 167 pounds, with 39 pounds worth of survival equipment and a rugged, fiberglass, drop-proof canister that alone weighed 38 pounds. The same life raft packed in a valise with a more basic survival kit would weigh about 105 pounds and still offer the rugged quality of a commercial life raft. Any survival gear that you omit could be augmented via an abandon-ship bag kept in the deck locker used to house the life raft.

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With its plug removed, a large hole for the painter in the Switlik MD-3 canister (inset) can let water in, reducing buoyancy that helps a raft autoinflate. The raft inflated fine in our test.

Certainly, the life raft's toughness is only one of several key considerations. In warm, temperate, or trade-wind conditions, a lighter life raft that is easier to launch and stow may be the best alternative. Once the life raft is inflated and the crew on board, a watermaker and a 406 EPIRB will become the crew's next best friends.

ABANDONING SHIP

Prior to this test, we reviewed a small-craft survival situation and scrutinized what really goes on during an abandon-ship procedure. Typically, the event is highly chaotic, inducing reactions steeped with anxiety, and at the same time, it requires a multifaceted response. The first challenge is damage control: Efforts aimed at stemming the ingress of water or fighting a fire and saving the vessel. At the same time, a mayday message must be transmitted and other SOS signals deployed. If the damage-control effort proves to be fruitless, the crew must switch into abandon-ship mode—getting the raft launched, secured alongside, and crew and useful gear transferred into the life raft. The less time available for this scenario to unfold, the more demanding the process becomes, and the more essential it is to have a good life raft and a well-trained crew. (See "Abandon Ship," page 17.)

DEVILISH DETAILS

Every life raft in this test utilized a zipper to control the main opening(s). Should one or more of these zippers fail (not unlikely given the history of these fasteners in salt water), conditions could become unsafe in heavy weather or cold conditions. Some zippers were simply much more rugged than others. The waterproof YKK zipper on the Switlik MD-3 failed during its initial use, leaving a sizable opening in the canopy. (Switlik now has the raft and is looking into this.) Given our experience with zippers in general, we'd like to see all manufacturers sew in a set of simple loops or tabs along the perimeter of the zipper's arc that could be used



ABANDON SHIP!

All crew members should be familiar with the abandon-ship plan, which should be rehearsed prior to any extended, off-shore voyaging. The odds of survival greatly increase if you can make it through the first few minutes of the emergency evacuation. Here is a basic rundown of the sequence of actions to take:

- Fire flare(s).
- Turn on EPIRB(s).
- Call Mayday (on VHF, SSB, Satphone).
- Gather gear (ditch bag, other usable gear).
- Check/secure life raft painter.
- Launch life raft.
- Short-scope painter and inflate the life raft.
- Tie raft alongside vessel (provided this is safe).
- Transfer crew from boat to life raft.
- Cut painter and paddle clear of distressed vessel.
- Check crew and deal with any medical issues.
- Skipper should calm crew and set up structure.
- Review raft instructions.
- Bail water taken on—keep watch—inflate raft as needed—inventory gear—catch/make water
- Begin signalling for help.

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All the rafts we tested, like this Elliot SOLAS model, have lines or webbing to assist one person in righting a capsized raft.



to lash the openings closed. A few life rafts tested did have back-up ties, although in our opinion, these were insufficient for providing a secure seal.

As it turns out, the canisters account for much of the weight of these life rafts. The packed weight of the heaviest canister life raft was nearly twice that of the lightest. However, the weight gap between the lightest and heaviest life raft, on their own, was far less. While the Elliot life raft's hefty canister tipped the scales at 38 pounds, the lightest entrant in the test was the DSB-ISAF canister, which weighed just more than 12 pounds and was made of a higher-tech-laminate. Getting the life raft deployed is one of the toughest challenges for a shorthanded crew, and it's sad to see how little attention naval architects give to the canister design process, which could potentially mean life or death.

Many manufacturers offer canister-mounting brackets that can be or are equipped with a hydrostatic-release mechanism. In case of a rapid sinking, when the crew fails to manu-

ally deploy the life raft in time, the life raft automatically releases.

With a hydrostatic release, as the life raft and vessel submerge, the change in atmospheric pressure causes the release to fire, unlatching the canister from its cradle. As the uninflated life raft floats toward the surface, residual air in the canister and life raft oppose the pull of the sinking vessel to which the life raft may be tethered, creating enough tension in the painter to inflate the raft. While this auto-inflation scenario is plausible, we found that many uninflated life rafts don't have a whole lot of buoyancy, and it is not impossible that a life raft could be dragged down with a sinking boat for some time before inflating, if it did at all. (After our test, Switlik said it was enlarging the MD-3 canister, which would add more buoyancy.)

Vacuum-packed life rafts placed in small canisters and larger canisters with bottom drain holes and a larger hole where the painter line exits retain very little residual air. The tension between a slowly sinking vessel and an uninflated life raft would

have been enough to inflate the hair trigger life rafts that we tested, those that inflated with only about 10 pounds of pull. But one of the sample life rafts in our evaluation, the DSB ISAF-6, required a 40-pound-plus pull to initiate inflation.

Float-free capability is a great idea, but the lack of positive buoyancy in an uninflated life raft, and other issues—including rigging clutter, the possibility of a hydrostatic release malfunction, and simply Murphy's Law—make manual deployment the best bet.

MOUNTING

Life raft location is a challenging question to answer. A strong, fit person may be able to heft and heave a life raft of about 100 pounds. However, darkness or a slippery, submerged deck can significantly complicate the issue. You want to place the life raft where it will not be prematurely launched by a boarding sea and yet can be slid over the side. On a small sailboat, that location can be hard to find. All too often,

(continued on page 39)



Winslow's retractable ballast bags let the raft be sailed downwind.

LIFERAFTS *continued from page 17*

the best spot is high on a coach roof, and the brackets are bolted through a deck that was never intended to carry the shear loads that a breaking wave could exert on such an installation. In a worst-case scenario, the life raft and mounting bracket rip away, leaving a hole in the cabin top. Be sure that the mounting point is structurally sound enough to handle the loads imposed by breaking seas. Some makers show their life rafts clamped to a stern pulpit, a structure not intended to take these loads.

Once the life raft is launched and inflated, it can be brought alongside a sinking vessel for the crew to transfer directly into the life raft without jumping into the sea. At this point, the larger the opening, the better. However, once everyone is in the life raft, the optimum opening size changes. If the abandon-ship situation includes fire or rapid sinking, it may become necessary to enter the water before entering the life raft, and the best method is to jump in close to where the painter can be grabbed and work your way to the life raft rather than attempting to swim to it. Clothing and a PFD can make climbing into a life raft cumbersome.

Our professional yacht captain/ex-naval officer and in-the-water evaluator, Eric Naranjo, ranked boarding

SAFETY & SURVIVAL

aids as the most important safety feature on a life raft: "A life raft doesn't do you any good if you can't get in it," he said. And the inflatable, mini-porch-like platforms found on the Elliot, Zodiac, and Winslow made for the easiest boarding.

Crew weakened by cold water and encumbered by the stress of a survival situation are often exhausted when it comes time to get into a life raft. This point was driven home during our wave pool tests in 2000 (*PS* May 1, 2000 and June 1, 2000).

A good life raft not only prolongs your ability to survive, but also adds to your chance of being rescued. Despite the fact that some rafts can be trimmed up by retractable water ballast bags and actually sailed downwind at a knot or two, the real hope for rescue lies in being visible to others. In a passive sense, this may mean a ship's crew seeing your yellow, orange, or red canopy, or a spotlight hitting the reflective tape of the canopy at night. Signaling mirrors, flares, water-surface streamers, VHF radios (marine and aviation), EPIRB, SART cell, and sat phones all play a role in being visible.

Next month, we'll do our raft-by-raft evaluation. Following that, we'll compare the various survival kits and examine what belongs in an abandon-ship bag. ▲

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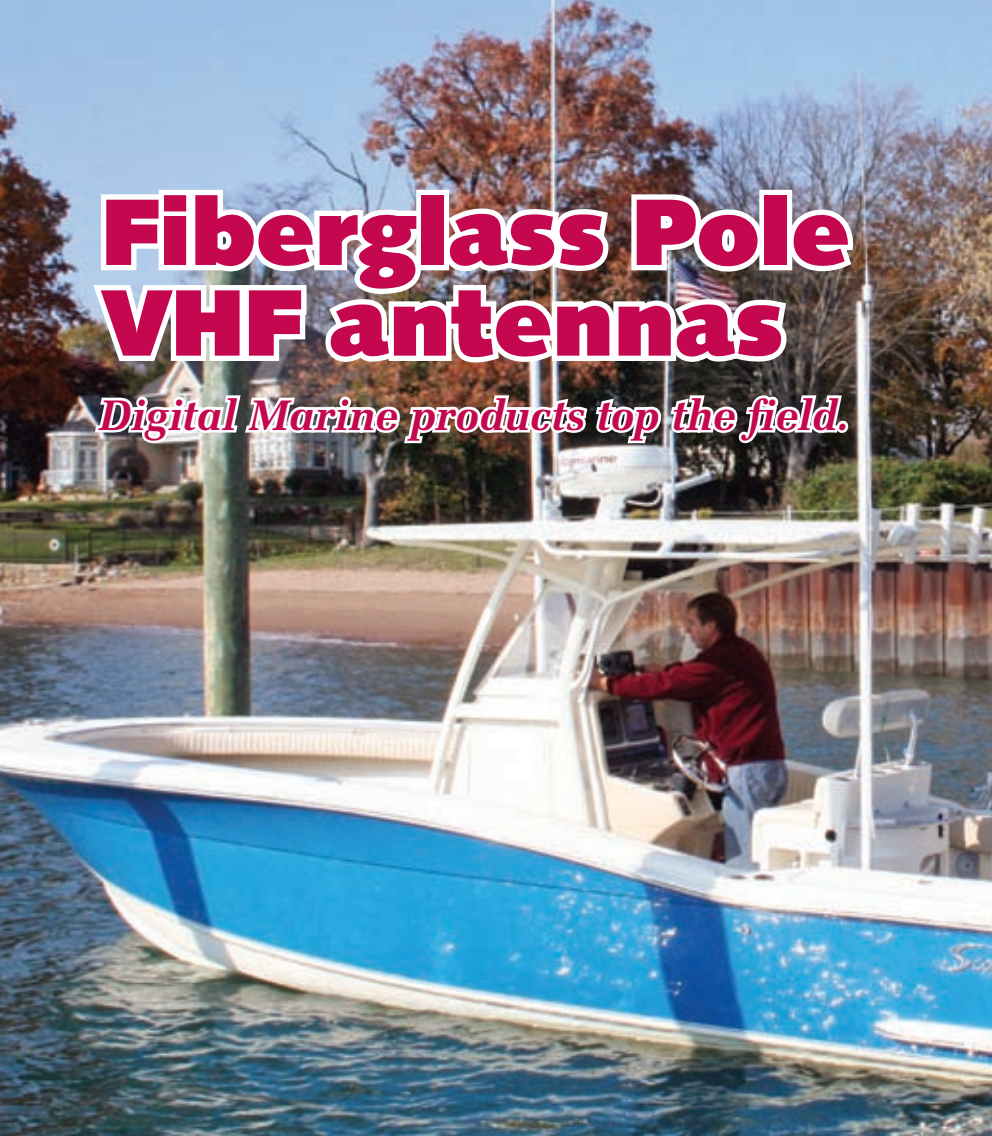
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Fiberglass Pole VHF antennas

Digital Marine products top the field.



Testers installed the seven 8-foot test antennas on the T-top of our test boat, a 26-foot Scout. The three 16-foot test antennas were mounted to a platform 5 feet above the waterline.

As we pointed out in last month's review of 3-dB VHF antennas ("VHF Antenna Face-off," February 2007), a mast-mounted 3-dB antenna's more oval radiation pattern offers sailors the best compromise between range and output when the boat is heeled. However, when the boat is at anchor or under power, you can achieve acceptable performance (though probably not better) with a high-quality, deck-mounted 8-foot or 16-foot fiberglass whip. In fact, many cruising boats carry a standard 8-foot whip to be used in an emergency such as a dismasting.

For this test of 8-foot and 16-foot antennas, *Practical Sailor* contacted the three most popular manufacturers of marine recreational antennas—Comrod, Digital Antenna,

and Shakespeare—and requested their participation in our "at-sea" evaluation. They responded by sending a total of 10 different antenna models.

Shakespeare sent us five 8-footers, ranging from \$36 to \$100. We also tested 8-foot models from Digital (529-VW) and Comrod (AV 60 BI8).



ELECTRONICS

Each of the 8-footers have a 6-dB output, which theoretically offers greater range than a 3-dB antenna of the same height. However, the narrower radiation pattern means that the 6-dB signal may be directed into the water when the boat is heeled.

The field of 16-footers was much smaller, with one antenna from each of the three manufacturers: the Shakespeare 5018 (17½ feet), the Comrod AV90312 (16 feet), and the Digital 532-VW (16 feet). The Comrod and Shakespeare are 9-dB antennas, while the Digital model is rated at 10 dB. Although these antennas have a greater potential signal strength than either a 3-dB or 6-dB unit, the relatively narrow radiation pattern is even more prone to being directed downward into the water on a boat that is heeled.

These antennas make, easy-to-service backups that would function well on a multihull or on a monohull that is under power or at anchor. They have the advantage of a shorter coaxial cable, where a surprising amount of signal strength is lost in a mast-mounted antenna. However, their directed radiation pattern makes them unacceptable as a primary antenna on a monohull, and mounting limitations make them generally inferior to a mast-mounted 3-dB antenna.

COMROD

The Comrod company designs and manufactures a complete and very high-end line of yacht and commercial marine antennas at its headquarters in Tau, Norway. Launched as a fishing pole maker in 1948, Comrod began targeting U.S. recreational boaters in 2000 with an entirely new line of pleasure craft antennas.

The Comrod antennas *PS* tested all came without attached coaxial antenna cable, which is optional. When we looked into the situation, we discovered an installation exclusive that Comrod enjoys over its competition: On the bottom of each Comrod antenna, inside the base of the mounting ferrule, is a male BNC antenna fitting where the antenna's

INSIDE AND OUT

We tested the antennas in two groups: 8-foot and 16-foot. We requested a spare from each manufacturer in case we had any performance doubts about a particular product.

Because of the many variables that can influence any test at sea, our evaluation cannot be considered a perfect evaluation of an antenna's absolute range, but rather a limited comparison of different antennas under specific, nearly identical conditions. However, the antennas were tested at the same time under virtually the same conditions, and we feel the results are useful and informative.

For the performance test, we set up a control base at a local marina that had an unobstructed line of sight to Block Island Sound in Rhode Island. At the base, we used an Icom M604 VHF radio (connected to an 8-foot, 6-dB antenna mounted about 40 feet above sea level) to send voice broadcasts to our test boat. A second VHF radio and separate Station Master commercial antenna were also installed, so base and boat could communicate.

We installed each 8-foot antenna on the oversized T-top of the test powerboat, a 26-foot Scout center-console. All three 16-foot antennas were tested on the same mounting platform 5 feet above the waterline. Only one test antenna was vertical at a time to eliminate the possibility of parasitic oscillation interference between idle antennas.

We ran the test boat on a predetermined track into open water. With each test antenna in use, we moved away from the control point until voice communications were unintelligible. The vessel route/track line was recorded, and waypoints were entered as each antenna lost communication with the base, and the entire track with antenna waypoints was saved to a flash memory card. The vessel's speed was 20 knots, except when we slowed to idle during communication periods with the base; seas were running 4 to 8 feet.

After voice communication was lost, we turned our bow into the sea and then turned again to run with the sea to minimize side-to-side roll. We were able to complete the 16-footers' test, but due to deteriorating weather conditions, testing the 8-foot antennas was postponed.

Several days later, seas were calmer and we tested the 8-foot antennas. After testing the 8-footers, we decided to retest the 16-footers. The results mirrored the outcome on the initial test. To double-check our final results, at the last waypoint location entered for each group, all antennas that were previously eliminated were connected and given one more chance to communicate with the base. This, we believed, would help rule out any channel interference that might have affected their range evaluation.



Testers found that the radiating element of the \$36 Shakespeare 5206-C is significantly thinner than that of the \$149 Digital 529-VW.

We also cut open each antenna to study the construction of the radiating element and rate the quality of materials and construction.

For the record, here are the chief concerns raised by the manufacturers regarding our range comparison:

Comrod's Vidar Bakke suggested that the Shakespeare antenna may have outdistanced the two others because it is 18 inches longer. He said Comrod has performed tests similar to PS's indicating that "only small variations of the antenna height gave relatively large variations of receive signal strength."

Digital Antenna was concerned about the "on-the-water" nature of the range tests and the installation of the 16-foot antennas, which company officials feel may have handicapped their 10-dB antenna. "An open-range test of monopole antenna must be conducted on an extremely level surface and is typically done on land," said John Jones, Digital's vice president of engineering. Jones suggested that because our results exceeded line-of-sight distances, environmental factors may have influenced our maximum range findings.

Jones also said the Digital 16-foot should have been mounted higher (at least one-wavelength, 6.25 feet above sea level), and that it should have been mounted where there would be fewer surrounding obstructions. "Our antenna provides more gain and distance; however it is more sensitive to improper installation. Our 10-dB gain antenna is designed to be mounted a minimum of 1 wavelength above water level," said Jones. (The information that was sent with the Digital antenna did not provide these details, and we did not find this information on the Digital website.)

Given our experience with Digital, we have no reason to doubt that its 16-foot antenna, had it been installed as Jones suggested, would have likely matched the top results in our range test. This is not taking away anything from the other antennas that excelled in the field, which also would have done better with the company-recommended installation.

coaxial cable would connect via a female BNC connector. The female connectors swivel 360 degrees, which means one could thread a Comrod antenna down onto a mounting base without the coaxial cable twisting up. Comrod provides a little plastic

"cable tool" with each antenna that slips over the antenna coax and helps land the female BNC connector inside the antenna's ferrule. This "no-twist" cable feature and the ability to thread and un-thread a Comrod antenna off its mount without worrying about the

attached antenna coax is especially important on VHF antenna installations where the coaxial cable needs to be longer than the standard 20 feet. Coax runs requiring more than 20 feet on a Shakespeare or Digital antenna would necessitate a cable

PS VALUE GUIDE 6-dB & 9-dB VHF ANTENNAS

	8-FOOT ANTENNAS					
MANUFACTURER	COMROD	DIGITAL ANTENNA	SHAKESPEARE			
MODEL	✓ AV 60 B18	★ 529-VW	5102	5202	5206-C	\$ 5225 XT
GAIN (dB)	6 dB	6 dB	6 dB	6 dB	6 dB	6 dB
ANTENNA DESIGN	Collinear array w/ 5/8 wave phased element	Collinear array w/ 5/8 wave phased element	Collinear array w/ 5/8 wave phased element	Collinear array w/ 5/8 wave phased element	End-fed	Collinear array w/ 5/8 wave phased element
CABLE TYPE	RG-58 Optional	20' Low Loss RG-8X	15' RG-58	20' RG-58	15' RG-58	20' Low Loss RG-8X
FERRULE TYPE	Stainless Steel	Stainless Steel	Chrome Plated Brass	Chrome Plated Brass	Chrome Plated Brass	Stainless Steel
WEIGHT	3 lbs.	2 lbs.	1.5 lbs.	2 lbs.	< 1 lb.	2 lbs.
TESTED RANGE (NM)	12.3	13.1	10.75	12.8	6.8	13.7
PRODUCT QUALITY	Excellent	Excellent	Fair	Good	Good	Excellent
WARRANTY	5 yrs.	5 yrs.	2 yrs.	2 yrs.	2 yrs.	5 yrs.
PRICE	\$159	\$149	\$59	\$79	\$36	\$82
SOURCE	pilotmarine.com	consumermarine.com	defender.com	defender.com	westmarine.com	boatfix.com

✓ Budget Buy ✓ Recommended ★ Best Choice

splice, which causes signal loss.

Comrod does offer RG-58 coaxial cable kits in 5-, 7-, and 12-meter lengths for more standard installations. However, low-loss RG-8X, which is readily available at most marine stores, would be a better choice of antenna cable, in our opinion.

In our performance tests, both the 8- and 16-foot Comrod antennas finished behind the Shakespeare and Digital antennas.

Back at our shop, when we sawed each antenna lengthwise, the Comrods gave us quite a workout—they're filled with a dense polyurethane foam, a Comrod exclusive. Filling the antenna with foam is said to lock out any condensation that would form inside the antenna due to temperature changes, subsequently corroding the antenna's copper and brass radiating elements. We think that the use of foam is a good idea and will probably keep the conductors inside of these antennas corrosion-free for life. Each Comrod 16-foot antenna also comes with a locking set screw and a tube of Loctite to insure that the antenna's two sections do not disconnect.

Bottom Line: Although the Comrod antennas came up a little short

in the range test and are expensive, their tubes are definitely overbuilt and should last a long time.

DIGITAL ANTENNA

Digital Antenna Inc., based in Sunrise, Fla., is the only manufacturer in this test that makes its antennas in the U.S.

The fit and finish of both the 8- and 16-foot antennas is impeccable, and Digital uses a custom RG-8X coaxial cable with an added layer of foil shielding beneath the tin shield. Cables provided with the Shakespeare and Comrod sticks do not have this additional shield. With the extra layer of foil, Digital's coax exhibits the lowest loss of signal per foot, according to the company.

Another nice touch: Digital uses a factory-installed, gold-plated mini-UHF connector on the end of the antenna coax. The connector is roughly the same diameter as the coax cable, which means that you don't have to cut this connector off or core out any large holes to run the cable through your boat. Connecting the coax to the back of the radio is a snap. Digital provides a slick mini-UHF to UHF male (commonly referred to as a PL-259)

adapter, which is also gold-plated and screws onto the mini connector.

In our performance tests, the Digital antennas finished third to a pair of Shakespeare antennas in the 8-foot category and second to a Shakespeare in the 16-foot group.

The 16-foot Digital has one huge brass-and-copper element that fills the entire antenna void. Not only was the Digital full of expensive materials, but its design was impressive.

When we cut open the Digital 8-footer, we observed a very well constructed, custom-looking radiating element that was similar in scale and stature to the 8-foot Comrod and the Shakespeare XT /XP products.

Bottom Line: Even though they are expensive and their range fell short of the Shakespeare test models, the Digital antennas, in our opinion, offer great value because they are built with high-grade materials. If you want an antenna that will last for the long haul, the Digital antennas are excellent choices.

SHAKESPEARE

Founded in 1897, the Shakespeare company is credited with manufacturing the first fiberglass marine

	16-FOOT-PLUS ANTENNAS		
SHAKESPEARE	COMROD	DIGITAL MARINE	SHAKESPEARE
5225 XP	AV90312	★ 532-VW	\$5018
6 dB	9 dB	10 dB	9 dB
Collinear array w/ 5/8 wave phased element	Collinear array w/ 5/8 wave phased element	Collinear array w/ 1/2 wave phased element	Collinear array w/ 1/2 wave phased element
20' Low Loss RG-8X	RG-58 Optional	20' Low Loss RG-8X	20' Low Loss RG-8X
Stainless Steel	Stainless Steel	Stainless Steel	Chrome Plated Brass
2 lbs.	9.5 lbs.	7 lbs.	6 lbs.
14.25	18.3	19.1	23.1
Excellent	Excellent	Excellent	Excellent
5 yrs.	5 yrs.	5 yrs.	5 yrs.
\$99	\$399	\$299	\$239
boatfix.com	pilotmarine.com	consumermarine.com	defender.com

antenna (a double-sideband AM antenna) in 1954.

Our test group included three antennas from Shakespeare's Galaxy lineup, the 8-foot 5225 XT and 5225 XP, and the 16-foot 5018. These antennas are coated with a high-gloss, UV-resistant polyurethane that protects the antenna's fiberglass strands from yellowing, deteriorating, and becoming fiberglass shards (as was the case with some of Shakespeare's earlier antenna models).

The Galaxy antennas have a precision-cut radiating element that is said to have an ultra-low angle of signal radiation, yielding maximum range and minimum fading when compared to most other antenna designs. Last year, Shakespeare engineers added silver-plating to the radiating element of its flagship 8-foot, 6-dB XT Galaxy antenna, creating the new "XP" model.

During the installation and dock-side check of the 8-foot Shakespeare Galaxy antennas, we noticed that the more expensive XP rattled excessively when screwed onto its four-way mounts. The backup XP antenna also rattled when we gave it a shake. Shakespeare's Don Henry said the

rattling occurs when the cable inside the element slaps against the side of the brass elements, but that this in no way impacts performance or durability of the antenna.

Shakespeare provides 20 feet of low-loss RG-8X with its Galaxy antennas. This is quality coax, but not as high-quality as Digital's double-shielded coax with the factory-installed mini connectors.

Other than being silver-plated, the radiating element inside the XP antenna was far less substantial than that of the Digital 529-VW. And the elements inside the big Galaxy were anorexic, in our opinion, joined together by RG59/75 Ohm cable and supported at the antenna tip via a small shock cord and a brass barrel swivel. "Looks can be deceiving," said Henry. "While the materials may not look that impressive, they are very well designed."

On the water, the 8-foot Shakespeare 5225XP Galaxy and the 17-foot, 6-inch Galaxy 5018 decisively outdistanced the others.

We also tested Shakespeare's 8-foot 5202 Pro, the Centennial 5102, and the Economy 5206-C. Shakespeare's 5202 is a well-respected antenna that

has a proven track record, but lacks the high-gloss finish of the Galaxy product. The Centennial is good for near-shore boating where maximum range is not a priority. The Economy 5206-C ranked dead last in our range test, with 50 percent less range than the Galaxy XT. All that is inside of the 5206-C antenna is a stripped back piece of inexpensive coax cable.

Bottom Line: Shakespeare's Galaxy antennas performed the best in our test. They are priced right, and readily available at most retailers. For someone closely watching their expenses, the 5335 XT or 5335 XP are good choices. The 5018 is our Budget Buy for the tall sticks.

CONCLUSION

In the 8-foot, 6-dB category, Shakespeare's 5225 XT and XP held a slight range advantage over the Digital 529-VW. These two Shakespeare antennas are not as rugged as the Digital, but they cost significantly less. At \$82, the 5225 XT earns Budget Buy honors. We were impressed with the price and performance of the 5225 XP, too, but we think Shakespeare's top-of-the-line antenna should not rattle—at all.

With its exceptional range and top-quality construction, the Digital 529-VW is a good choice. The Comrod is built to last, and we recommend it.

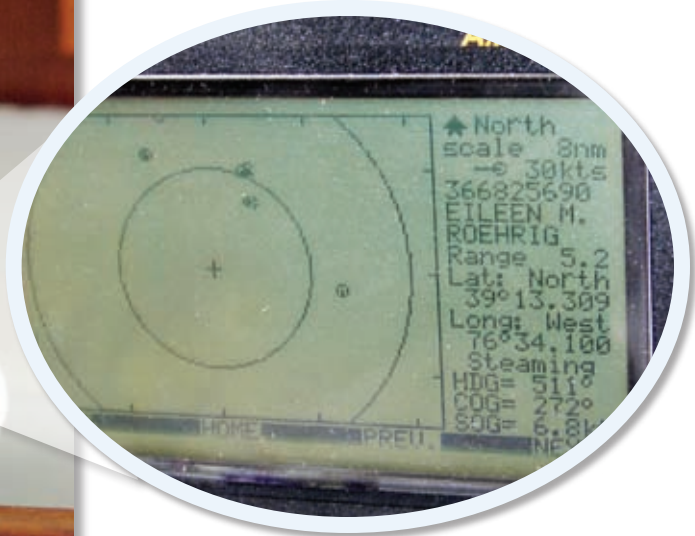
Shakespeare also led the way in the long-stick range test, with the Budget Buy 5018, which costs about \$60 less than the 16-foot runner-up, the Digital 532-VW. Shakespeare 5018's had the longest range, but it wasn't as rugged. The Digital and Comrod, based on our examinations of their innards, should withstand years of rough use. The Digital is \$100 less than the Comrod, so it would be our top choice. ▲

CONTACTS

COMROD, 850/893-5730
comrod.com

DIGITAL ANTENNA, 954/747-7022
digitalantenna.com

SHAKESPEARE, 803/227-1590
shakespeare-marine.com



Pictured at left is the installation testers used rather than cutting a hole in a bulkhead. On the top left corner of the Nasa Marine AIS Radar is an alarm circuit modification for a louder buzzer. While operating, the Nasa Marine AIS Radar shows the radar-type plot on the left and the selected ship's information on the right (pictured above). Notice the north-up orientation label on the top right and the incorrect heading (HDG=511°) displayed.

Voyage Puts Nasa AIS Radar to the Test

AIS is a great safety aid, but with caveats.

Back in 2002, we sailed our boat from Bermuda to Providenciales, Turks and Caicos. We carried a radar detector to alert us to nearby ships. However, most of the time, it didn't. We surveyed all the ships we could see during daylight hours and found that 80 percent were not spinning their radar antennas. No wonder the radar detector didn't alert us!

The notable thing about the radar detector is that it is a passive device (listens only), and therefore, doesn't take much power. We could leave it on 24/7 without worrying about battery drain. We just couldn't trust the tool since the ships were running with their radars off. We could have run our radar, but running it just at night killed our batteries. We decided

we needed a better passive system.

One solution is the Automatic Identification System (AIS) from SOLAS (Safety of Life at Sea). Starting in 2002, the SOLAS regulations (chapter V, regulation 19) required that all ships over 300 gross tons carry and operate at all times an AIS. Briefly, the shipboard AIS broadcasts ship information on a VHF radio frequency, including the vessel's name, latitude and longitude, course over ground,

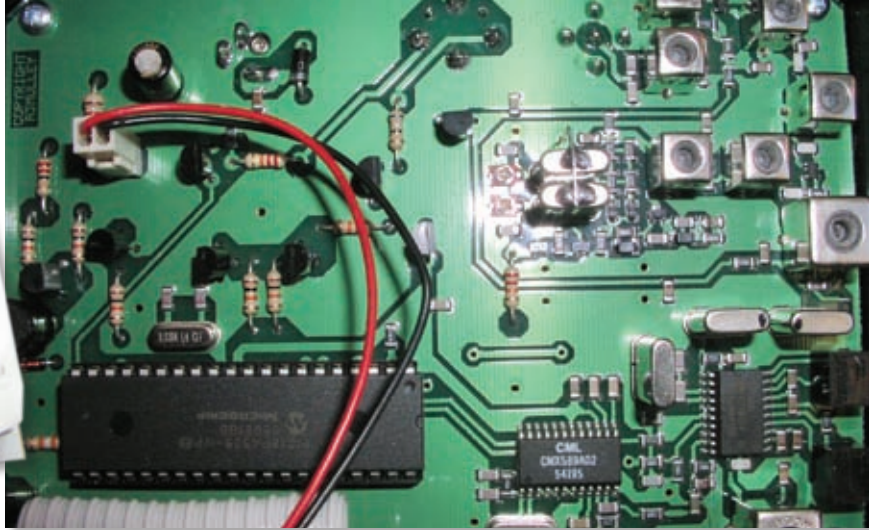
speed over ground, heading, status, and Maritime Mobile Service Identity (MMSI) number. The broadcasts happen every few seconds.

Last summer, we got a chance to try an AIS receiver on a 2,500-mile trip from Baltimore, Md., to Bermuda, Nova Scotia, Maine, and back to Baltimore. For the trip, we installed the Nasa Marine AIS Radar. In this case, Nasa Marine is not NASA (the U.S. space agency), but is instead a British company known for low-cost marine instruments.

The AIS Radar is not radar. The name comes from the way the instrument displays the received AIS data from ships. The AIS Radar plots the ship data it receives on a radar-looking screen with your boat at the center of the screen.

It also is not a replacement for radar. The AIS Radar's plotted targets will not offer as complete a picture as a conventional radar. AIS doesn't see fishing boats, buoys, or rocks; radars—and sharp lookouts—do. And remember, if you have a radar, the International COLREGS require you to use it for collision avoidance. However, our experience has shown that many radar-equipped commer-





Testers found the Nasa AIS Radar's manual (left) to be lacking needed information, specifically about the output signal's electrical characteristics. A peek into the AIS Radar's circuitry (right) shows that it does not have the

protective (conformal) coating many marine electronics have. Nasa doesn't claim the unit is waterproof, but if the AIS had a conformal coating, it could better resist corrosion and other maladies that befall marine electronics.

cial vessels do not use their radars. But in our informal survey during this voyage, every ship we saw had an AIS identifier.

The AIS Radar is 4.5x6x2.5 inches, and weighs 1.4 pounds. It is designed to mount in a bulkhead in a 4x5.5-inch hole. It is not waterproof. Installation is easy, except a separate VHF antenna is required (no antenna sharing). Rig an antenna (e.g., on the pushpit), give it 12-volt power, connect your GPS NMEA output, and connect the alarm.

The AIS has a graphics LCD screen that uses a backlight at night. The screen is adequate for use at a nav station. There are four soft key buttons along the bottom edge that change their functionality based on the screen contents.

The good news is that the Nasa AIS Radar works. When running, it takes 0.090 amps, which means that over 24 hours, it will take only a little over 2 Ah. The backlight does not significantly change the power usage.

There are two range rings on the screen that can be adjusted out to 32 nautical miles (nm). If the alarm is on, any vessel within the inner ring—that has AIS installed and running—will set off the alarm.

Each ship showing up on the screen is depicted with an informative symbol, defining the ship's status (moored, steaming, not under command, etc.). The right-hand side of the display has the ship's information.

Pressing a soft key moves the focus to the second closest ship. Once the last ship has been reached, it starts over again with the closest ship. Nasa's latest software for the AIS Radar allows it to track up to 30 vessels, and ship's names are "remembered," so as users move from ship to ship, they don't have to wait for a ship to rebroadcast its data before the AIS Radar displays it. (Anyone with an older unit can get the software upgrade from Nasa Marine for about \$20.)

We generally ran with a 16-nm range, which meant the alarm went off at 8 nm. Most of the time, the AIS Radar "saw" the ships before we did.

CONCLUSION

Even though the Nasa Marine AIS Radar worked, it did have a number of problems. The menu functionality is awkward to use and not intuitive. A ship that is selected is hard to see on the LCD screen (too tiny). Not all ships broadcast all information, so the AIS Radar might display a heading of 511° (29-1, a computer default value!). Backlight intensity is not adjustable. On is too bright at night (why a white light?), and off means that there is no way to know in the dark what button to press because the button functionality changes based on the last thing you were doing. The display works only in a north-up orientation, which is great if you're going due north.

Another improvement testers

would like to see is a way to acknowledge a ship within the alarm area so that the alarm could be reset to pick up any other ships entering the zone. As it stands, users have to wait until all ships leave the zone before turning the alarm back on.

Testers also noted the Nasa AIS Radar's skimpy manual. In our opinion, the information about the electrical characteristics of the alarm output signal needs beefing up.

Testers found Nasa's alarm too quiet, so they installed a different alarm, with a power converter circuit so as not to overload the unknown alarm signal (see photo, p. 22). Attempts to contact Nasa Marine about this have gone unanswered.

SI-TEX Marine private labels the device and offers a two-year parts/one-year labor warranty. SI-TEX-branded units are available at www.defender.com for \$520. Units purchased from Nasa Marine (\$512) likely will have to be serviced in the UK, so if warranty and less-costly repairs are important to you, we suggest buying the SI-TEX unit stateside.

AIS technology is a great safety aid. It won't replace radar, but it will cut down on at-sea collisions. ▲

CONTACT

NASA MARINE LTD., 0+143/835-4033
nasamarine.com

SI-TEX MARINE ELECTRONICS INC.,
727/576-5734, si-tex.com

The Mini Countertop Spin Dryer cuts laundry's line-drying time in half. Two pounds of laundry take about 2 to 4 minutes to spin dry, but the clothes will still have a slightly damp feel to them.

.....
 come out slightly damp.

After washing several loads of laundry in the Wonder Wash, we loaded the spin dryer with 2 pounds of clothes and set the timer for 2 minutes. Cotton shorts, T-shirts, and underwear came out of the spin-dry cycle only slightly damp and required about an hour on a clothesline in full sun to dry.

For comparison, testers hung on the same clothesline an identical pair of shorts and underwear and an identical T-shirt that were not previously dried in the spin dryer. That set of clothing took more than two hours to dry.

Towels, jeans and socks were tougher customers. The spin dryer fits only one small- to medium-sized bath towel at a time, or else the spin cylinder gets thrown out of balance. Still, towels that went through the spin cycle took half the time to "clothesline dry" next to towels that were not put in the spin dryer. Jeans were difficult to dry because they have to be evenly distributed in the spin cylinder to keep the tub balanced. Spun-dry socks took up to two hours to line dry while socks that were just air-dried took three or more.

The laundry loads spin very quietly at 1600 rpms. The machine makes almost no noise, unless the cylinder is thrown off-balance by a heavy or uneven load. The tabletop dryer weighs 11 pounds and measures 13.5 inches x 13.5 inches x 15 inches. It runs on 110-volt, uses 82 watts and costs \$70. The Laundry Alternative Inc. also makes a bigger, 12.2-pound capacity spin dryer for \$130. ▲

CONTACT

THE LAUNDRY ALTERNATIVE,
 888/813-9559,
laundry-alternative.com



Wonder Wash, Spin-drying Sidekick to the Rescue

Updated mini washer, new small dryer team up to save you from that dreaded bucket washing.

The value of space onboard a boat means that just about every piece of equipment has to have at least two uses. For the portable Wonder Wash, may we suggest colors and whites?

Reviewed in *Practical Sailor* in September 2002, the Wonder Wash has recently undergone two minor modifications. The manufacturers changed the machine's lid screw and the drain spout.

Our last review found that the compact, plastic Wonder Wash does small loads well and quickly (one to two minutes per load). It requires no electricity and no maintenance, uses less water and less detergent than washing machines, is rust-proof, costs only \$43, and sits a night watch...well, you can't have it all.

The Laundry Alternative Inc., makers of the Wonder Wash, found that the knob that goes into the lid can strip the threads inside the lid if installed improperly, and they changed the lid screw so that it cannot be screwed in past the point where it can damage the threads. The drain spout was modified to make it easier to slide in and out of the fitting at the bottom of the tub.

Weighing 5.6 pounds and measuring 12 inches x 12 inches x 16 inches, the Wonder Wash is roughly the size of a milk crate. You'll have to decide whether skipping those long mornings spent with a 5-gallon bucket are worth the space the Wonder Wash takes up.

MINI COUNTERTOP SPIN DRYER

Wonder Wash's newest partner in grime is the Mini Countertop Spin Dryer. The spin dryer cuts laundry's line-drying time in half by extracting water from the clothes during a high-speed spin cycle. Two pounds of laundry (one towel and two shirts, or a pair of wet jeans) take 2-4 minutes to dry. Because it is not a tumble dryer and does not use heat, clothes

Mini Countertop Spin Dryer



Wonder Wash



Fish Storage: It's in the Bag

Quality materials give Canyon the edge over other big fish store-&-totes.

If you like trolling while you sail, and you're good at it, you'll inevitably land some fish too big for the cooler or ice box. Here's a powerboat-oriented product that might save you the trouble of spilling blood, and guts on your nice clean deck, just so you can put that oversized striper, wahoo, or mahi on ice. Enter insulated fish bags. We looked at three bags capable of holding a fish weighing 50 pounds, plus ice.

Since getting three fish exactly the same size would have been nearly impossible, we elected to use only ice to test the bags. We placed 50 pounds in each one, then threw them on the deck of our test boat. After they sat for 10 hours in both sunlight and shade, we opened each bag and found lots of solid ice remaining. The daytime outside temperature was 80 degrees. We let the bags sit on the deck overnight, inspecting them again the following morning. This time we removed the remaining ice in each bag and weighed it. We also considered construction, design, and price.

CANYON

This 20x64-inch bag is constructed with heavy-duty, fiber-interlaced PVC skins with closed-cell foam sandwiched between two layers for insulation. The bottom and both sides are heat-sealed to supply a leak-proof seam. A smooth-operating zipper closes the top of the bag. The zipper pull is metal, not our material of choice on any piece of marine gear. Handles made from 2-inch-wide nylon webbing are attached at each end. One bottom corner has a drain. A stretch strap with Velcro-like fasteners holds the bag in a rolled-



For temporary big-fish storage, we recommend the Canyon fish bag. It holds ice well and rolls up nicely (inset) for stowing.

up position for storage. The Canyon bag performed best in our test, with 30 pounds of ice remaining after 20 hours. Canyon makes a dozen different sizes. This one is \$135.

Bottom Line: Our top pick. It performed better than the others, doesn't leak, and it is well constructed.

CE SMITH

The biggest of the three bags tested, this one measures 22x66 inches. The outside layer is white heavy-duty, marine-grade vinyl. A reflective inner liner is sewn to the outer layer with a half-inch of closed-cell foam between the two. A heavy-duty, two-pull nylon zipper (our's was a little stiff at the corners) extends around both sides and the top to make getting fish and ice in and out easier. Four handles are sewn to the top. It has sewn-on storage straps and a nylon carry bag for easy stowage. This bag had only 15 pounds of ice left after 20 hours. It is \$130.

Bottom Line: A big bag that takes up little stowage space. It did not hold ice as well as the others.

OFFSHORE ANGLER

At 17x 57 inches, this is the smallest bag in our test. It's made from two layers of fiber-interlaced plastic with a layer of foam insulation between. The side seams are sewn together with nylon webbing. The top closes with

a two-pull zipper, which operated well, but the metal zipper-pull could suffer from saltwater exposure over time. Handles are 2-inch-wide nylon webbing sewn all the way around the bag. There is no accompanying storage strap, and the provided storage bag is made from thin, clear vinyl. In our opinion, the storage bag won't last on most boats. In the ice test, this bag performed well, with 25 pounds of ice remaining. Several sizes are available; this one is \$80.

Bottom Line: A good performer, and it's \$50 less than the Canyon. It's our Budget Buy

CONCLUSION

The usefulness of a fish-storage bag depends on how much you fish for that big catch—and how little you like gutting it underway. If you're short on refrigerated storage space and big on fishing, then we suggest the Canyon bag. It has heat-sealed edges and did the best in our ice-retention test. It's our top pick. ▲

CONTACT

CANYON, 631/567-6861,
canyonproducts.com

OFFSHORE ANGLER, 800/227-7776,
basspro.com

CE SMITH, 800/334-2490,
cesmithco.com

Taming Your Toolbox

For faster fixes and fewer headaches, stow the must-haves in one portable bag.

By **EVANS STARZINGER**

The oft-repeated chestnut that world cruising is fixing your boat in a series of exotic ports is true, and it implies that a cruising boat should carry a lot of tools to do all that fixing. Over the years, my partner, Beth, and I have added more and more tools to our stash. It got to the point that I had the tools sorted by type into six large Rubbermaid tool boxes and a four-drawer tool chest. I then discovered that to do almost any project required unstrapping and opening at least half of the tool boxes. This created quite a mess, a big cleanup, and a big restowing job when my project was completed. I decided to develop one small tool bag that would cover 85 percent of the jobs by itself and most of the other 15 percent hopefully by opening only one of the larger tool boxes.

After two years of tinkering with the contents, I have settled on a small tool bag that seems to fit the bill. It has four basic categories of tools: standard mechanical tools (screwdrivers and wrenches), electrical, sewing, and consumables. The tool bag was

selected to be compact, easy to carry and stow, while just big enough to fit the necessary tools.

STANDARD MECHANICAL TOOLS

This category consists of a very conventional collection of tools. I did not want to carry a full set of both metric and standard socket wrenches, so the only real learning point was to figure out exactly which box wrenches were needed to fit the bolts on our boat, *Hawk*. Our hose clamps have 7-millimeter nuts, half-inch and 13 millimeter fit the adjustment screws on our two alternators (and also the mainsail batten tension adjustment bolts), 7/16 inch fits the Harken batt cars, and 12 millimeter fits the bleed screw on the engine. The hex wrenches are the only tools that seem to rust, so I keep them in a Ziplock bag sprayed with WD-40. The following tools

fall into this category:

- Largest flat-blade screwdriver that will fit in the bag, also used as pry bar
- Two multi-blade screwdrivers (large ratchet unit and smaller one with specialty blades)
- Three small jewelers' screwdrivers—two flat blades (small and tiny) and one Phillips
- Eight ratcheting box wrenches—two 7/16 inch, two half-inch, and one each of 9/16 inch, 7 millimeter, 12 millimeter, and 13 millimeter
- An adjustable crescent wrench
- Two vice grips (needle nose and standard)
- Two sets of hex wrenches (metric and standard)
- Pipe wrench
- Filter wrench (style with adjustable chain)
- Lineman's pliers with heavy-duty wire cutters
- Exacto knife
- Heavy-duty scissors



Boat ownership requires a bevy of tools that would make Bob Vila jealous. We suggest keeping your most-used tools in their very own "fix-it" bag. While the tools you use less frequently can be stowed out of the way, this "kitchen-drawer" toolbag will allow you access to what you need for smaller tasks without having to dig through those endless bins of DIY utensils. Pictured at left is an example of tools you should include in your standard mechanical bag.



Investing in high-quality electrical tools (at left) is well worth it, if you like trouble-free connection making. Your consumables toolkit (above) should include frequently used items like cable ties, Loctite, and tape.

ELECTRICAL TOOLS

Through our own experiences and discussions with electrical component experts, we have been convinced that a good crimp connection is the way to go rather than soldering. The key is that it must be a GOOD crimp, which is almost impossible to make with the inexpensive “auto crimper kits.” It requires a high-quality ratchet crimper that will make a perfect, watertight crimp every time. (PS’s favorite crimper is the Klein 1005, PS Aug. 15, 2003.) I also use a pair of specialty wire strippers that make a perfect strip to fit the crimp terminals. Ancor (www.ancorproducts.com) makes a quality stripper (a PS favorite in the 2003 review) and crimper. They run about \$60 each, but are worth it for perfectly trouble-free connections. I keep the multimeter in a Ziplock bag to prevent the display from being scratched by the other tools. Our electrical toolkit includes:

- Digital multimeter
- Ratchet crimper
- Wire stripper
- Wire cutters

SEWING TOOLS

The thread needs to be strong and UV resistant. The Goretex thread (available from Sailrite, www.sailrite.com) meets that bill, as does waxed dental floss, which also holds a knot better. The small needle-nose pliers and vice grips are used to put a needle through thick cloth. We carry the following for sewing needs:

- Heavy sailmaker needles
- Normal household sewing needles
- Goretex sewing thread
- Waxed dental floss
- Heavy, polyester waxed whipping twine
- Small scissors
- Needle-nosed pliers
- Small vice grips
- Lighter
- Sailing knife
- Fid set

CONSUMABLES

We use wire ties on most of our shackles to prevent the pins from vibrating loose. But on two of the shackles (mainsail tack and anchor), we found that the wire ties kept breaking, so we now use stainless wire to seize the pins on those.

Not your grandma’s sewing kit (left): Sailors’ sewing tools—including UV-resistant thread—must be able to handle heavy-duty projects.

(Some PS editors prefer monel seizing wire over stainless wire and plastic cable ties, which are affected by UV rays.) WD-40 is not much of a lubricant, but it is a terrific cleaning fluid.

While we have many special-purpose lubricants and adhesives, we use Lanocote (www.defender.com) as our general purpose stainless-fastener lubricant, blue Loctite (www.loctite.com) as the standard thread lock, and super glue and a two-part epoxy putty as the normal adhesives. In our consumables toolkit you’ll find:

- A small assortment of crimps, terminals, and heat-shrink tubing
- Wire ties
- Stainless-steel (or monel) seizing wire (to tie shackles closed)
- A small jar of Lanocote
- WD-40
- Electrical tape
- Rigging tape
- Blue Loctite
- Silicone caulk
- Super glue
- Epoxy

CONCLUSIONS

This single, small tool kit, along with a DeWalt (www.dewalt.com) or Makita (www.makita.com) cordless drill and carbide bits, allow me to do most common jobs without unpacking any of our big tool boxes. ▲



To Shine and Protect

Collinite 870 tops the list of still-glossy cleaner/waxes after three months.

PS testers ditched the buffer and applied 11 one-step cleaner/polishes to three boats, including the Hunter 25 pictured here. After three months, five products stood out for cleaning ability, gloss, and water-beading action.

Amazingly, there are still marketeers who tout fiberglass as a maintenance-free material. It is, as any sailor knows, anything but. Deterioration begins as soon as a hull emerges from the factory shadows. The blessed sunlight that makes sailing such a pleasure immediately begins gnawing away at any unprotected gelcoat, the mixture of resin and pigment that is a fiberglass boat's frontline defense against the elements.

Ultraviolet rays and oxygen speed up the oxidation process, which literally wears away the gelcoat's binding resins, leaving only pigments behind. When you drag your hand across the surface of a heavily oxidized hull, the chalky substance you're picking up is actually the remaining pigment particles.

Waxes and polishes combat oxidation by sealing out oxygen and, in some cases, inhibiting UV rays. For 30-plus years, one of the most engrossing projects here at *Practical Sailor* has been searching for the ideal armor for gelcoat—inexpensive, easy to apply, and long-lasting.

Typically, restoring and protecting an oxidized hull is a two-step process, compounding with a mild abrasive, followed by waxing. The

last time we looked at waxes ("Wax Test Results" Nov. 15, 2004), we looked at products whose primary purpose was to serve as a protective coating after any old wax, unbound pigment particles, dirt, grime, and oil had been removed by compounding and polishing. This time, we looked for the lazy-man's approach—so-called one-step cleaner/waxes that combine the compounding and waxing processes.

Although many products call themselves cleaner/waxes, the directions on most of the products we tested call for a clean and dry hull before applying. This just means you should rinse off surface dirt before applying the product to keep the grit from scratching the gelcoat. The cleaning action in a one-step cleaner/wax is primarily a mildly abrasive scrub aimed at removing oxidation, deep stains, grease, or oil that can't be removed by detergents, a sponge, or a brush.

WHAT WE TESTED

We gathered 11 one-step products for this test, all of them aimed at the "marine" market, which means we can probably find similar (if not the same) products for less money at local automotive stores or major retailers.

Once we find our best in this field, we'll jump into the non-marine world to find a worthy competitor (any suggestions from readers are welcome). These dual-purpose products combine cleaning and polishing materials (a wetting agent, mild abrasives, and surfactants to dissolve oils) and protective sealing agents (typically a carnauba wax or polymer coating), and, in most cases, a UV inhibitor. Unfortunately, nearly all of them have petroleum-based ingredients. Most of the manufacturers told us that their "one-step" products will not last as long as their premium wax or polish, but offer a good alternative for those who want to protect their boat, but could do without the exertion of a buff-and-wax routine. (In other words, these products are aimed squarely at the shirkers among us who just want to get on the water and are quite content with a less-than-perfect finish.)

Not surprisingly, our test group featured several manufacturers with a history in the automotive wax/polish market (Collinite, Simoniz, Meguiar's), or like West Marine and Interlux, are household names in marine maintenance. The one unfamiliar name was Re-Structure Marine, a company based in California

Wax On, Wax Off

Testers applied the same 11 test products to three different boats in the course of this test. For our long-term test, we applied the waxes—following each product’s instruction—to 6-inch by 6-inch, taped off sections at the sheer work of a 25-foot 1980 Hunter sailboat with moderate oxidation. For comparison, the remainder of the hull was compounded with a mild rubbing compound and then waxed with Collinite 885, the winner of the PS 2003 wax test.

To test the one-step products’ cleaning ability and ease of application over a larger area, we applied them to our 21-foot Parker powerboat, which had a healthy dose of rust stains, yellow-brown waterline stains, and even tire marks—post hurricane scars. Finally, to see whether any products were more effective on colored hulls, or a severely oxidized hull, we applied each one to 3-foot-long topside sections of a 1974 O’Day Javelin that is about one season short of a paint job. All three test boats were left to endure the Florida sun and rain, either at a dock or on a trailer.

To evaluate initial gloss, five observers, two of them professional polishers, were asked to rank the top five finishes. After three months, three PS editors evaluated each section’s glossi-



From left: Collinite 870, Meguiar’s 50, Restructure Marine Polish, Meguiar’s 67, 3M Fiberglass Cleaner Wax, 3M Clean & Shine, Interlux Premium, West Marine One Step, Star brite Cleaner Wax, and Simoniz.

ness. The hulls were sprayed and dried repeatedly with a fine mist sprayer to check for beading (oil or dirt on the surface may prevent beading of an otherwise intact wax). Each of our test products is designed to bead water, so beading—or lack thereof—is a good indicator of the wax’s integrity. However, it is interesting to note that water beading is not necessarily the mark of a good finish. Some automotive finishes deliberately inhibit beading so as to prevent watermarks.

that makes some pretty bold claims (three years of protection!) regarding its new products, which they say uses nanotechnology (science that controls matter on a scale smaller than one micrometer). Several manufacturers offer one-step clean and wax products that are more abrasive than the ones we tested, but we tried to keep the field limited and didn’t want to unduly buff off good gelcoat, an important consideration for any boat owner.

Most of our test products were thick liquids in squeeze-top bottles: 3M Marine Fiberglass Cleaner and Wax, Meguiar’s 67 One Step Compound, Meguiar’s 50 Cleaner Wax, and Re-Structure Marine Products Professional. Two were pourable liquids: Collinite’s 870 Super Heavy Duty Fleetwax and Interlux Premium Teflon Marine Wax with Cleaner. We also had one spray, 3M Clean and Shine Wax Enhancer, and one paste, Simoniz Royale Marine Cleaner/Wax. We also tested the Interlux Premium Teflon Marine Wax in combination with its UV Protectant & Teflon Wax Sealer, which is to be applied after the cleaner/wax. Technically, this makes a two-step process,

but hey, a sample of the sealer came free with the bottle of wax, and we were curious. (But after applying each product by hand to three different boats—see “How We Tested”—we were happy to keep the number of steps to a minimum.)

WHAT WE FOUND

After three months, the lazy man’s route was looking pretty good. Our top five one-step polishes were holding up just as well as a premium two-step finish (Collinite 885, which was our top pick in the wax test) that was applied to one of our test boats at the same time as the test products.

Five products that stood out for their cleaning ability, gloss, and their ability to bead water: Starbrite Cleaner Wax, Collinite Special Heavy Duty Fleetwax, Re-Structure Marine Products Professional Marine Polish, Meguiar’s 50 Cleaner Wax, and Simoniz Royale Marine Cleaner/Wax. The three-month results are summarized in the following text and chart. Stay tuned for the six-month update.

COLLINITE 870

Touted as “almost indestructible,” Collinite 870 is a runny liquid that

comes in a screw-top bottle. It was the second-most expensive product in our test, and its pour application and thin consistency made it slightly messier to work with. Testers were briefly stumped by Collinite’s instructions that suggested using a Turkish towel. (From a Turkish bath, perhaps?) We chose to use a terry-cloth towel, but a cloth diaper would work as well.

Bottom Line: This was the only one-step tested that was unanimously rated the best initial finish. It also seemed to take less effort to achieve that gloss. And the shine has held up well after three months.

INTERLUX PREMIUM

Like the Collinite, the Interlux Premium Teflon Marine Wax with Cleaner is a runny liquid that is slightly messier to apply than the pastes. This is the only product in our test that touts Teflon (a Dupont trademark that requires paying royalties to use in marketing). However, several other products (Collinite 870 among them) use the chemical equivalent, PTFE.

Our first application left a hazy swirl mark—like the kind you’d leave on a hastily washed window

PS VALUE GUIDE ONE-STEP CLEANER-WAXES

MAKER	INTERLUX	INTERLUX	★ COLLINITE	★ STAR BRITE	RE-STRUCTURE MARINE PROD.	WEST MARINE	MEGUIAR'S	MEGUIAR'S	3M	3M	SIMONIZ
PRODUCT	Premium Teflon Marine Wax & Cleaner	UV Protectant and Teflon Wax Sealer	No. 870	Heavy Duty One Step Cleaner Wax	Professional Marine Polish	One Step Fiberglass Cleaner Wax	67 One Step Compound	50 Cleaner Wax	Fiberglass Cleaner Wax	Clean and Shine Wax	Royale Boat Cleaner/Wax
PRICE (COST PER OUNCE)	\$10 (.60¢/oz.)	\$10 (.60¢/oz.)	\$16 (\$1/oz.)	\$22 (.69¢/oz.)	\$30 (\$2.50/oz.)	\$13 (.81¢/oz.)	\$22.50 (.70¢/oz.)	\$13 (.81¢/oz.)	\$15 (.94¢/oz.)	\$12 (.80¢/oz.)	\$7 (.78¢/oz.)
PRICE SOURCE	defender.com	defender.com	waxbytes.com	amazon.com	re-structuremarine.com	westmarine.com	meguiars.com	defender.com	defender.com	defender.com	jamestowndistributors.com
TYPE	Liquid paste	Liquid	Liquid	Liquid paste	Liquid paste	Liquid	Liquid paste	Liquid paste	Liquid paste	Spray	Paste
APPLICATION	Good	Poor (2-steps)	Fair	Good	Good	Fair	Good	Good	Good	Good	Excellent
CLEANING	Fair	NA	Good	Excellent	Good	Fair	Good	Excellent	Excellent	Fair	Excellent
INITIAL GLOSS	Fair	Good	Excellent	Good	Good	Good	Good	Good	Good	Fair	Good
3-MONTH GLOSS	Fair	Fair	Excellent	Good	Good	Fair	Fair	Good	Good	Fair	Good
3-MONTH WATER BEAD	Fair	Excellent	Excellent	Excellent	Excellent	Poor	Poor	Excellent	Poor	Poor	Excellent

§ Budget Buy ✓ Recommended ★ Best Choice

or mirror—visible from about 1 foot away. We reapplied the product the following day on a different section of the hull, and had the same results. On an adjacent taped-off section of the boat, we applied the UV Protectant & Teflon Wax Sealer with slightly better results. At the three-month mark, only the section with the sealer still beaded water. (See pictures, p. 31)

Bottom Line: Middle-of-the-road performance. If you are going to use this product, use the UV Protectant and Teflon Wax Sealer as well.

3M CLEAN AND SHINE

We haven't had much luck with spray-and-wipe waxes (pastes have long been a PS favorite for durability), but we figured maintenance-giant 3M might have the expertise

to pull it off with its Clean and Shine Wax Enhancer.

Carnauba wax is one of this product's listed ingredients. It was the only product that allowed application on a wet hull, which made the product even more appealing. Hose the boat down, spray, wipe and voila! Too good to be true?

Bottom Line: This was an unexceptional cleaner. It left a moderate gloss that did not last to the three-month mark. Like the Interlux wax sealer, it seems this is best used over previously waxed surfaces.

3M CLEANER AND WAX

With the thickest consistency of the flip-top bottle products, 3M Marine's Fiberglass Cleaner and Wax, required vigorous shaking to dispense easily. Combining a light

rubbing compound and a blend of carnauba and other waxes, it was one of the few products that directed us to "rub aggressively using straight, short strokes." It also told us not to let the product dry to a haze before wiping away: Just keep rubbing until the material is gone. Most of the other test products advised applying in a circular motion, letting it dry, wiping, then buffing. This product also comes in paste.

Bottom Line: This was a more vigorous cleaner than the Collinite or Interlux, and the finish rated high for initial gloss. Though it retained good gloss and still beaded water, the 3M was not among the top performers after three months. Too much work, not enough shine.

WEST MARINE ONE STEP

In a flip-top bottle very similar to those used by Star brite, West Marine's One Step Fiberglass Cleaner Wax was runnier than the other flip-top one-steps. Application was fairly easy, and the gloss stood out to one judge. But, after three months, gloss was unexceptional and water ran off the polished section in big drips.

Bottom Line: Another mediocre performer that isn't worth any pennies you might save.

.....
Whether a wax can bead water after three months of weather exposure and regular washing is a good test of its protecting ability. PS's Best Choice, the Collinite 870, beaded water excellently both on Day 1 and at three months. At the other end of the spectrum, the West Marine One Step failed to bead water after three months. Instead, the water was shed in large drops.



Collinite 870 (Day 1)



Collinite 870 (at 3 months)



West Marine One Step (at 3 months)

STAR BRITE CLEANER WAX

Star brite's Heavy Duty One Step Cleaner Wax was one of the least expensive test products, and at three months, the section polished with it was looking very good. It picked up a lot of oxidation on our rag during application and provided one of the glossiest finishes.

Bottom Line: A good cleaner that was still beading water after three months, this is hands-down our Budget Buy.

MEGUIAR'S 67 ONE STEP

Labeled as an aggressive compound cleaner plus polish, Meguiar's 67 One Step Compound clearly seemed to lean toward the "cleaning" side of the cleaner/wax continuum. The thick liquid picked up stains and oxidation, but not as aggressively as we'd anticipated. Even on the heavily oxidized Javelin, it did not stand out in the field for its cleaning ability. At three months, it was clearly not beading water.

Bottom Line: A big step behind Meguiar's 50 liquid cleaner/wax.

MEGUIAR'S 50 CLEANER WAX

Meguiar's Mirror Glaze 50 paste wax was the second-best product in our wax test, so we had high hopes for this product. It touts anti-corrosive properties to fight rust, so we also put some on our test boat's rust-prone stainless steel folding ladder. In terms of consistency, this was the best of the products tested, not so runny as to be sloppy, not so thick as to dispense in gloppy burps.

Bottom Line: Excellent cleaner, and very good initial gloss that held up well at three months. It's a Recommended product.

RE-STRUCTURE POLISH

Introduced in 2005, Re-Structure's Professional Marine Polish is effectively a marine version of what is used to protect some new cars. The bottle guarantees a three-year finish, and according to the company, the finish is advertised for five years on cars. The product's penetrating and



3M Clean & Shine

Interlux Premium without sealer

Interlux Premium with sealer

The Interlux Premium wax with cleaner we bought for this test came with a free sample packet of Interlux UV protectant and wax sealer, so we decided to test the Premium with and without the sealer. The difference is easy to see in these pictures: three-month results above; initial results at right. The Premium alone is not a top performer. The water-beading action and gloss achieved by using the sealer is a big improvement, however, applying the sealer essentially adds a step and defeats the purpose of a one-step cleaner.

Interlux Premium Teflon Marine Wax & Cleaner



Interlux Premium with protectant/sealer



cleaning agent is MBSilane, and its other ingredients seal the fiberglass to keep out dirt, grime, and UV damage.

Bottom Line: This is expensive stuff, but it works. It does not clean as well as some of the more abrasive products we tested, and its initial gloss was not quite as shiny as the Collinite. But at three months, this finish was beading water like it had just been applied. Recommended.

SIMONIZ CLEANER AND WAX

The Simoniz Royale Boat Cleaner and Wax was the only paste wax/cleaner in our test, although 3M, Star brite, and Collinite make paste versions of their cleaner/waxes. (We'll report on these in a future update.) As the results of our previous wax test bore out, pastes trump liquids when it comes to durability, and they are also less messy to apply. This paste went a long way and did a good job cleaning rust and waterline stains.

Bottom Line: Simoniz delivered an easy-to-use paste that holds up over time. Given the results of our wax test, its performance was no surprise.

CONCLUSIONS

Overall, we were surprised with our results after three months. We'd expected none of the products to still be beading water after continuous exposure to the Florida sun, when in fact, few of them weren't. Will the best gloss so far—Collinite 870—sat-

isfy the person who is looking for a shine that turn heads? We think so.

Our Best Choice, Collinite 870 is the gloss champ at three months, though the dark horse and recommended polish, Re-Structure Marine Professional Marine Polish, is beading water as well or better than the Collinite. We also recommend Star brite Heavy Duty Cleaner Wax, Meguiar's 50 Cleaner Wax, and Simoniz Royale Marine, which are all neck-and-neck at this point.

Except for Re-Structure, most manufacturers say six months of Florida sun is about the limit for these products. We'll see. ▲

CONTACTS

3M, 877/366-2746, 3m.com/US

COLLINITE, 315/732-2282, collinite.com

INTERLUX, 908/686-1300, yachtpaint.com

MEGUIAR'S, 800/347-5700, meguiars.com

RE-STRUCTURE, 310/639-7069, re-structure.com

STAR BRITE, 800/327-8583, starbrite.com

SIMONIZ, 800/227-5536, simonizusa.com

WEST MARINE, 800/262-8464, westmarine.com

A man wearing a yellow long-sleeved shirt, blue pants, and a black cap is leaning over a wooden dock. He is holding a blue bucket with a yellow handle and pouring water onto a wooden surface. The background shows a body of water and a wooden pier structure.

2006 Freshwater Paint Test

Bottom paint panels in Ohio (above) were pulled in November for inspection after four months in Lake Erie.

Pettit Premium and Hydrocoat offer affordable freshwater protection.

Temperature and salinity can affect antifouling paint performance, but in our own experience, most modern concoctions are meant to work in a variety of conditions. Those coatings that repel bottom-clingers in the briny waters of the Florida Keys or Long Island Sound (our two test sites) are usually potent enough to deter any freshwater life-form that might try to latch on.

Saltwater species exist in one of the harshest, most competitive environments on the planet, and so a great variety of tenacious, fast-reproducing species have evolved. The marine barnacle, the hermaph-

roditic master-fouler that greatly inspired Charles Darwin's larger pursuit, is marvelously well-adapted to thrive in salt water, capable of colonizing an unprotected barge bottom in a single season.

Freshwater fouling organisms are no panzies, however. One of the most notorious, the zebra mussel, introduced by the ballast water of voyaging ships, is known to wreak havoc with power-plant cooling systems. However, for sweetwater sailors who have but the summer to sail, the most common threat to the hull is algae. In fact, algae (aka slime) actually tends to grow much faster in fresh water than it

does in salt water. Nutrient loading—fertilizer runoff is a common source—in lakes like Lanier in Georgia, Okeechobee in Florida, or Texoma in Texas and Oklahoma, coupled with summer sun, create ideal conditions for algae blooms.

Fortunately, fighting slime alone doesn't require a lot of copper, a key biocide in most antifouling paints that is driving up costs. One of the best-selling bottom paints in the Midwest, Interlux VC17, has just 17 percent copper. A standout in this test, Pettit's SR-21 has just 21 percent copper. In fact, some boaters in Lake Erie, where we dropped our paint panels for the freshwater

PS VALUE GUIDE ANTIFOULING HARD PAINTS AT 4 MONTHS IN LAKE ERIE							
NAME	MAKER	PRICE (GALLON)	SOURCE	RATING	COPPER %	ANTI-SLIME	SEASONS
Sea Bowld Coastal 45	Blue Water	\$63	boatersworld.com	Fair	45%	No	One
MarPro SuperKote Hard (NEW)	Blue Water	\$70	Blue Water Marine Paint	Good	45%	No	One
Coppershield 45 Hard (NEW)	Blue Water	\$80	bluewatermarinepaint.com	Good	45%	No	One
EP 2000 ✓	E Paint	\$232	epaint.net	Fair	None	Zinc Pyrithione	One
Fiberglass Bottomkote Aqua ✓	Interlux	\$87	boatersland.com	Good	46.50%	No	One
Ultra ✓	Interlux	\$196	boatersland.com	Excellent	66.65%	Irgarol	One
Ultra-Kote	Interlux	\$176	boatersland.com	Good	76%	No	One
VC 17m (Canada only)	Interlux	\$43 (qt.)	jamestowndistributors.com	Fair	20.35%	No	One
VC 17m Extra	Interlux	\$41 (qt.)	boatersland.com	Good	20.35%	Irgarol	One
VC Offshore	Interlux	\$190	defender.com	Good	41.15%	No	One
SR-21 ✓	Pettit	\$39 (qt.)	defender.com	Good	21%	Irgarol	One
West Marine FW-21	Pettit	\$43 (qt.)	westmarine.com	Good	21%	Irgarol	One
Super Premium ★	Pettit	\$100	boatersland.com	Excellent	66.9%	No	One
Trinidad	Pettit	\$170	defender.com	Good	75.6%	No	Multiple
Unepoxy Standard \$	Pettit	\$60	jamestowndistributors.com	Good	45.70%	No	One
Vivid ✓	Pettit	\$150	defender.com	Good	25%	Zinc Omadine	Multiple
West Marine Bottom Pro Gold	Pettit	\$200	westmarine.com	Fair	70%	Irgarol	One
West Marine Bottomshield	Pettit	\$100	westmarine.com	Good	45.70%	No	One
Sharkskin	Sea Hawk	\$119	Sea Hawk	Good	45.2%	No	One

★ Best Choice ✓ Recommended \$ Budget Buy

test, said they do just fine with an annual “moustache,” a 4-foot-wide stripe painted below the waterline (where slime growth is thickest) and finish the entire hull with a multi-season paint every two to three years.

Opting for a less-potent concoction in fresh water is more than just economical, it makes environmental sense. Smaller lakes, in particular, are more fragile ecosystems than well-flushed saltwater basins.

HOW WE'RE TESTING

Our freshwater evaluation followed our usual, well-established bottom paint test routine. New fiberglass panels were prepped and painted with swatches of various bottom paints. Each panel was identified by a series of holes drilled in a simple binary code. The holes withstand the attack of marine growth better than any other marker system. The system also keeps testers impartial,

because they don't know which paints they are judging.

A selection of paints was tested in Lake Erie off Fairport, Ohio. The panels were dropped in mid-July and pulled for rating in late November after 18 weeks in the water.

Before assigning ratings, testers sluiced the panels with buckets of water. Virtually clean panels earned Excellent ratings, while Good ratings went to those paints with a minimum of soft growth. Coatings scoring Fair clearly allowed more soft growth than those rated Good. None of the panels in this round showed any hard growth, the criteria for a Poor rating.

Once we have the ratings on paper, editors identify overall winners, as well as the top paints in the various categories, such as ablative, hard, multi-season (i.e. does not lose potency when the boat is dry-stored), environmentally friendly, paints for metals, and water-based paints.

CONCLUSIONS

In general, paints that did well in salt water also did well in fresh water. However, some low-copper paints that did poorly in the salt-water test did very well in fresh water. Top honors overall go to Pettit Super Premium, a copper-loaded paint that had only a few smidgens of slime still clinging to it after being sluiced. The Interlux Ultra was equally clean, but it is more expensive.

Shown above is the breakdown for hard paints, which are generally better suited to burnishing or heavy scrubbing, trailering, and beaching. For racers, Pettit SR-21, a thin-film, low-copper paint did much better in fresh water than it did in salt.



.....
Although our panels were immersed for just 18 weeks, algae attached quickly and mussels grew on most of the unprotected areas.

PS VALUE GUIDE ABLATIVE / COPOLYMER ANTIFOULING AT 4 MONTHS IN LAKE ERIE							
NAME	MAKER	PRICE/GAL.	SOURCE	RATING	COPPER %	ANTI-SLIME	SEASONS
Copper Pro SCX 67 ✓	Blue Water	\$200	bluewatermarinepaint.com	Excellent	67%	Irgarol	Multiple
Copper Shield 45	Blue Water	\$120	bluewatermarinepaint.com	Fair	45%	No	Multiple
Copper Shield SCX 45	Blue Water	\$165	bluewatermarinepaint.com	Good	45%	Irgarol	Multiple
Kolor	Blue Water	\$170	bluewatermarinepaint.com	Fair	45%	No	Multiple
Sea Bowld Ablative 56	Blue Water	\$90	boatersworld.com	Fair	56%	Irgarol	Multiple
Sea Bowld Ablative 67 Pro ✓	Blue Water	\$145	boatersworld.com	Excellent	67%	Irgarol	Multiple
Copper Shield 45 Uno (NEW)	Blue Water	\$80	bluewatermarinepaint.com	Good	45%	No	One
EP-21	E Paint	\$125	epaint.net	Fair	None	None	One
Z0	E Paint	\$199	epaint.net	Fair	None	Zinc Pyrithione	1-2
Aquagard	Flexdel	\$95	aquagard-boatpaint.com	Fair	26.37%	No	Multiple
Micron CSC	Interlux	\$159	boatersland.com	Fair	37.20%	No	Multiple
Micron Extra	Interlux	\$185	boatersland.com	Fair	38.62%	Irgarol	Multiple
Micron Optima ✓	Interlux	\$202	boatersland.com	Excellent	28.45%	Zinc Pyrithione	Multiple
Super Ablative	Interlux	\$129	boatersland.com	Good	41.97%	Irgarol	One
Trilux 33	Interlux	\$182	boatersland.com	Fair	16.95%	Zinc Pyrithione	One
Trilux II (Canada only)	Interlux	\$233	blyachting.com	Good	22%	No	One
Epoxycop Ablative (NEW)	Interlux	\$77	boatersland.com	Good	43%	No	One
Bottomkote	Interlux	\$109	jamestowndistributors.com	Fair	42.75%	No	One
Hydrocoat ★	Pettit	\$105	defender.com	Excellent	40.34%	No	Multiple
Premium SSA \$	Pettit	\$70	boatersland.com	Good	37.50%	No	Multiple
Ultima SR	Pettit	\$190	defender.com	Good	60%	Irgarol	Multiple
West Marine CPP	Pettit	\$115	westmarine.com	Good	37.50%	No	Multiple
Alumacoat SR (NEW) ✓	Pettit	\$165	boatersland.com	Excellent	None	Zinc Pyrithione	Multiple
Cukote	Sea Hawk	\$189	Sea Hawk	Good	47.57%	No	Multiple
Cukote Biocide Plus	Sea Hawk	\$209	Sea Hawk	Good	47.57%	*	Multiple
Biocop TF (NEW)	Sea Hawk	\$228	Sea Hawk	Good	42%	*	Multiple
Monterey ✓	Sea Hawk	\$194	Sea Hawk	Excellent	54.67%	No	Multiple
Mission Bay CSF (NEW) ✓	Sea Hawk	\$224	Sea Hawk	Good	None	Zinc Omadine	One

★ Best Choice ✓ Recommended \$ Budget Buy
 * N-Cyclopropyl-N--(dimethylethyl)-6-(methylthio)1,3,5-triazine-2-diamine

Almost as effective in our test as the Super Premium (which has three times the amount of copper), SR-21 also sells under the West Marine label as FW-21. For an eco-friendly, copper-free hard paint, EP 2000 is our pick. Metal boats or outdrives are safe with Pettit Vivid, which was also our best hard multi-season paint as well as the best paint available in white or bright colors. For those wanting easy application, Bottomkote Aqua was the best performing water-based hard paint. For those who want a good hard paint for bottom dollar, Pettit Unepoxy Standard is our Budget Buy.

In the ablative paint category,

our overall winner was Pettit Hydrocoat, an affordable water-based paint that is easy to apply and can be used for multiple seasons. Bluewater, Sea Hawk, and Interlux each had relatively expensive paints that also rated Excellent and so earned our recommendation. For metal boats, Pettit Alumacoat SR is clearly the best ablative. For environmentally friendly protection in an ablative paint, the new copper-free Mission Bay CSF is our top choice. Our Budget Buy in the ablative category is the Pettit Premium SSA, which scored Excellent in our most recent salt-water test in Connecticut. ▲

CONTACTS

BLUE WATER MARINE PAINT,
 800/628-8422,
 bluewatermarinepaint.com

DONOVAN MARINE (MarPro Paints),
 800/432-4333, ext. 31

E PAINT CO.,
 800/258-5998, epaint.net

FLEXDEL CORP., 888/353-9335,
 aquagard-boatpaint.com

INTERLUX YACHT FINISHES,
 800/468-7589, yachtpaint.com

KOP-COAT (PETTIT),
 800/221-4466, pettitpaint.com

NEW NAUTICAL COATINGS,
 800/528-0997, seahawkpaints.com

WEST MARINE,
 800/262-8464, westmarine.com

BOATER'S WORLD,
 800/826-2628, boatersworld.com



Teak Caulk Update 2007

The seven teak caulks being tested are holding their own so far. Despite being subjected to chemical dousing, summer and winter weather, and the loaded-bucket test, no caulk seam has failed, or even wavered.

PS takes a look at seven caulks eight months after application.

In June of 2006, we began our evaluation of seven caulks advertised for use in teak deck seams: Simson MSR (Marine Special Range) Deck Caulk Plus, Maritime Teak Deck Caulking, Teakdecking Systems SIS 440 Teak Deck Caulking, West Marine's Multi Caulk Sealant, and three from BoatLIFE (Life-Caulk, Teak Deck Sealant, and Life-Calk Type P). The test group was a mix of polysulfide-, polyether-, Silyl Modified Polymer- (SMP), and silicone-based products, as well as both one- and two-part products.

TESTING

Tests were designed to comparatively evaluate each caulk's ease of application, durability, adhesiveness, and resistance to chemicals. We discussed the products' ease of application in the September 2006 issue, so this and future updates will deal with durability,

chemical resistance, and adhesion test results.

DURABILITY

To compare durability, we applied the products, following manufacturers' instructions, to seven 9-inch-long, 2-inch-wide, half-inch-thick teak planks that each contained a single square seam ¼-inch-wide and ¼-inch-deep running the length of the plank. After 14 days cure time, the panels were placed outdoors and fully exposed to the weather. We inspected them in January, eight months after placing them outside, to see how well each product was

holding up.

Results: Each of the seven products appears to be holding its own with no signs of deterioration or seam failure.

While all of the products have held up equally well so far, we did notice some differences. Some of the caulks seem more pliable than the others. Our softest caulk, the West Marine Multi-Caulk, had the resilience of a neoprene wetsuit, while our hardest caulk, the BoatLIFE Life Caulk, was slightly firmer than a pencil eraser. However, all had more than enough



The teak caulks are: from left, BoatLIFE Life-Calk Type P, BoatLIFE Teak Deck Sealant, BoatLIFE Life-Calk, Teakdecking Systems SIS 440, Maritime Teak Deck Caulk, West Marine Multi-Caulk, and Simson MSR Deck Caulk Plus.

PS VALUE GUIDE		TEAK CAULKS					
CAULK	TDS	MARITIME TDC	WEST MARINE MULTI-CAULK	BOATLIFE LIFE CAULK	BOATLIFE TEAK DECK SEALANT	BOATLIFE TYPE P	BOSTIK/SIMSON
TYPE	Silicone based	Silicone based	Polyether based	Polysulfide based	Polysulfide based	Polysulfide based	Silyl Modified Polymer
PRICE*	\$11	\$9.50 (Only by the case: 12 for \$114)	\$12	\$19 Cleaner: \$16 (pt.) Primer: \$18 (6 oz.)	\$16	\$68/ qt.	\$12.50 Cleaner: \$11.50 (pt.) Primer: \$39.50 (pt.)
TACK FREE	20-40 mins.	15-20 mins.	1 hour skin-over time	Tack free 1-3 days	30 mins.	1 hour	Skins over in 45 mins.
CURE TIME	48 hours	24-48 hours (full cure after 14 days)	2 days (depending on temp and humidity)	7-10 days	24 hours	24 hours	7 days
SANDABLE	After 48 hours	After 24-48 hours	After 2 days	After 7-10 days	After 24 hours	Not specified	After 7 days
TOOL CLEAN UP	Acetone/ Mineral spirits	Acetone	MEK	Life-Caulk Solvent & Cleaner	Life-Caulk Solvent & Cleaner	Life-Caulk Solvent & Cleaner	Simson Cleaner E
COMMENTS	Smooth, easy to apply	Smoother than TDS	Easy to apply; calls for Life-Caulk Primer	Comparable to WM	Application similar to Life-Caulk; no need to prime	Pourable; fairly runny; pot life 1 hour at 75 F and 50% relative humidity	Thickest; cleaner and primer have strong smell; calls for Simson Primer P
APPLICATION (1=THIN, 4=THICK)	3	2	4	4	3	1	4
PLIABILITY AFTER 8 MONTHS (1=SOFTEST, 6=HARDEST)	3	2	1	6	5	5	4

*per 10.6-oz. caulking gun cartridge, unless noted

flex to handle joint expansion, so this observation may have little bearing on our results.

CHEMICAL RESISTANCE

The goal here is to see how well each caulk holds up to chemicals one could reasonably expect a teak deck to be exposed to during its lifetime—gasoline, diesel, motor oil, ammonia, household bleach,

Cetol marine oil, acetone, Starbrite teak brightener (containing Oxalic acid), WD-40, brush cleaner, Fantastic, Murphy’s Oil soap, MEK, and a heavy-duty bilge cleaner from West Marine.

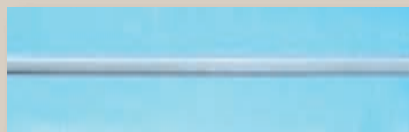
We used 16 teak panels (8 inches x 4 inches), each containing a 4-inch-long bead of each caulk tested. Of these, 14 were exposed to a single chemical, while the 15th was alter-

nately exposed to all chemicals used in the test. The 16th panel was exposed to no chemicals. After a two-week curing period, all panels were located outside (fully exposed to the weather) and given the initial dose of their respective chemicals, after which the chemicals were applied bi-monthly and in such quantity as to thoroughly saturate each caulk bead and the test panel surface.



The Finer Points of Application

Caulk is typically applied in one of two ways: The seams are taped prior to caulking (pictured here), allowing removal of excess caulk by pulling up the tape, or the seams are “flooded” and the decks sanded down afterward to remove excess caulk once cured.



Taping takes longer, but is neater—flooding the seams can be a real mess—and a lot easier on the deck. A teak deck can last the lifetime of a boat, but not if exposed to the excessive sanding that invariably results from the flooding method. Flooding and sanding can remove a lot of wood from the deck, particularly if you have grooves or weathered wood where the caulk can get into the cracks, and you have to sand it out. When taping, be sure to tape slightly outside the seams (to ensure the integrity of the seam edge when removing the tape) and remove the tape prior to the caulk skinning over, or your freshly payed seam could be damaged.

Results: So far, so good. There are no signs of damage or deterioration on any of the panels at this stage.

ADHESION

To test adhesion strength, we mounted seven 2-inch-x-2-inch squares of teak on a 2-foot-long teak plank with walnut sized gobs of each caulk tested, once again following each manufacturer's recommendations for surface preparation on new teak. The plank was then set aside for three months to ensure each caulk had plenty of time to fully cure.

Prior to being attached to the plank, each square had an eyebolt fastened through its center and secured via nut and bolt. After the three-month curing period, we braced the plank and suspended 35 pounds from each of the squares for five minutes and observed the results.

Results: Each caulk-attached square held the suspended weight with no sign of failure.

WHAT'S NEXT

We'll continue to monitor each plank and report the results in future updates. For chemical resistance testing, we plan to drench the panels in their respective chemicals. Then we'll embark on some destructive adhesiveness testing—applying pressure to each caulked square until the point of failure. Stay tuned. ▲

CONTACTS

BOATLIFE
843/566-1225
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MARITIME WOOD PRODUCTS
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maritimewoodproducts.com

TEAK DECKING SYSTEMS
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teakdecking.com

WEST MARINE
800/685-4838
westmarine.com

Common causes of seam failure

When it comes to a successful caulking job, all manufacturers echo a common theme: Seam preparation is the key. Each product tested calls for seams to be not only clean and free of old caulk (ideally taken back to new wood), but also dry and oil free. That's a particularly interesting proposition considering the oily nature of teak. Caulking uncleaned teak can mean early seam failure, even if all other product directions are followed correctly.

Sealant failure in teak deck seams can typically be classified as either adhesive failure, substrate failure (the caulk maintains its adhesiveness, but the seam sides fail due to splits or cracks in the teak), or cohesive failure (the caulk splits or tears apart).

Proper joint design is as critical as caulk selection. According to Teak Decking Systems literature, "Failure occurs when the design of the joint exceeds the ability of the sealant to function properly, or when the material is applied incorrectly or carelessly."

A teak deck seam is simply a groove cut atop the crack between each plank to provide a cavity for the caulk. Seams can vary in width, depth, and shape (V, square, round, etc.). However, to be functional, they must have enough depth and width to hold sufficient amounts of caulking material to withstand deck movement, expansion, and contraction without failure. Razor-thin seams may look professional, but they'll be nothing but trouble in the long run. They will eventually pull away from the seam sides.

A 1/8-inch seam is realistically the thinnest that should be used, and 1/4-inch is typically the widest from an aesthetic standpoint—however, this depends on deck plank size (wider planks need wider seams due to their greater expansion and contraction).

Teak, like all wood, expands when



There were no signs of seam failure during our adhesiveness test when each seam was subjected to 35 pounds of pull.

it's wet and contracts when it's dry, a factor you can use to your advantage. When caulking a deck, move the boat indoors, if possible, or at least cover the decks, letting them dry out for a few months. This not only ensures the seams are dry (a basic requirement no matter which product you use), but also allows maximum shrinkage of the teak planks. Once exposed to moisture, the planks will expand (squeezing the caulk in the seams between them) rather than shrink, which causes the seams to open, possibly pulling the caulk away from the seam sides. If caulked while the deck is completely dry, the seams will always be pushed together.

All this movement is the reason manufacturers stress the need to apply bond-breaker tape to the bottom of each seam prior to caulking (epoxy backing adhesive may also serve the same purpose in the case of glued teak overlays). Yes, it's a pain in the poop deck and adds yet another step to the project, however, it's a step you skip at your own peril.

A seam with no breaker-bond tape suffers from three-way adhesion, a situation where the caulk adheres to both the sides and the bottom of the seam. Caulk needs to be able to expand horizontally to keep up with seam expansion and contraction. Once adhered to the bottom of the seam, the caulk loses this flexibility, causing the sealant to pull away from the sides during deck movement, starting the downward spiral of failure.

Metal Cleaners

Miracle Cloth still holds the top spot.



In the last year, *Practical Sailor* tested a slew of metal polishes on stainless steel (June 2006) and bronze (January 2007). The bronze test included three newcomers that weren't available for the stainless test, so we decided to put those three to work on a grimy stainless bow railing.

The challengers: Sure Shine from Weems & Plath and Metal Polish Pros' Mirage Polish & Sealant and Prism Polish. To see whether they would unseat the reigning overall metal polish, Miracle Cloth—rated Excellent in both the stainless and bronze polish test—we taped the railing into four sections. Testers applied the products per the instructions, and evaluated how well the newcomers performed against each other and compared to the Miracle Cloth.

Sure Shine is advertised as a one-step application that cleans, polishes, and protects for three to six months. Testers rated it as Very Good.

Prism Polish is a “metal polish and fiberglass deoxidizer” formulated to clean, polish, and protect all metals. It also earned a Very Good rating.

Mirage Polish & Sealant is marketed as a wax-free cleaner and seal-

ant that's safe for all finishes. Although its label claims—in the fine print—that it cleans chrome, Mirage Polish appears to be meant primarily for “finished” surfaces (clear coat, gelcoat, paints, plastics, etc.) rather than for heavy metal cleaning. In fact, the label for Prism Polish recommends Mirage Polish & Sealant for use on fiberglass and painted surfaces. The Mirage mustered a Fair+ this round.

The Miracle Cloth lived up to its title as *Practical Sailor's* Best Choice for polishing stainless and bronze, edging out the newcomers to keep top honors for stainless cleaning.

Bottom Line: The hands-down winner: Miracle Cloth. We recommend both Sure Shine and Prism Polish for cleaning stainless.

To see how the newbies stack up to the other cleaners tested, check out the chart. Five products did not make the performance cut after two tests, and were dropped from the chart: Woody Wax CPR System spray; the liquid Mothers Chrome Polish; Nevr Dull Magic Wadding Polish, the ZEP Stainless Steel spray cleaner, and West Marine's Teflon Boat Polish. ▲

Latecomers (from left) Prism Polish, Mirage Polish, and Sure Shine, took on reigning champ Miracle Cloth (far right).

CONTACTS

- 3M MARINE**, 877/366-2746, 3M.com
- BLUE MAGIC**, 888/522-2746, cargobluemagic.com
- COLLINITE**, 315/732-2282, collinite.com
- FLITZ**, 800/558-8611, flitz.com
- MEGUIAR'S**, 800/347-5700, meguiars.com
- METAL POLISH PROS**, 877/377-5112, mppros.com
- MIRACLE CLOTH**, 727/391-3958, miraclecloth.com
- MOTHERS**, 714/891-3364, mothers.com
- NEVR-DULL**, 516/378-8100, nevr-dull.com
- NOXON 7**, 800/228-4722
- SEAPOWER**, seapowerproducts.com
- STAR BRITE**, 800/327-8583, starbrite.com
- SURE SHINE**, (Weems & Plath), 800/638-0428, weems-plath.com
- TURTLE WAX**, 800/TURTLEWAX, turtlewax.com
- WEST MARINE**, 800/BOATING, westmarine.com
- WOODY WAX**, 800/619-4363, woody-wax.com
- ZEP**, 888/805-HELP, zepcommercial.com

PS VALUE GUIDE METAL POLISH UPDATE

LATE-COMER PRODUCTS	TYPE	PRICE / SIZE	PRICE SOURCE	BRONZE RATINGS	STAINLESS RATINGS
Mirage Polish & Sealant	Liquid	\$20 / 16 oz.	mppros.com	Fair-	Fair+
Prism Polish ✓	Liquid	\$25 / 6 oz.	mppros.com	Very Good	Very Good
Sure Shine (Weems & Plath) ✓	Liquid	\$14 / 8 oz.	weems-plath.com	Very Good	Very Good
TOP PERFORMERS					
Miracle Cloth ★	Cloth	\$8	westmarine.com	Excellent	Excellent
Flitz Metal Polish ✓	Liquid	\$10 / 3.4 oz.	westmarine.com	Fair-	Very Good+
Turtle Wax Chrome Polish and Rust Remover ✓	Liquid	\$3 / 12 oz.	partsamerica.com	Fair-	Very Good+
3M Marine Metal Restorer and Polish ✓	Paste	\$23 / 18 oz.	boatersworld.com	Very Good	Good
Blue Magic Metal Polish Cream ✓	Paste	\$6 / 7 oz.	amazon.com	Very Good	Very Good
Collinite's No. 850 Metal Wax ✓	Liquid	\$15 / 16 oz.	westmarine.com	Good	Very Good
Meguiar's Mirror Glaze Professional All Metal Polish ✓	Paste	\$7 / 5 oz.	boatersworld.com	Good	Very Good
Noxon 7 Metal Polish ✓	Liquid	\$4 / 12 oz.	amazon.com	Excellent	Very Good
Seapower Metal Polish ✓	Paste	\$10 / 8 oz.	boatersworld.com	Very Good+	Good
Star brite Chrome and Stainless Polish ✓	Liquid	\$8 / 8 oz.	boatersworld.com	Good	Very Good
West Marine One Step Metal Polish ✓	Liquid	\$13 / 16 oz.	westmarine.com	Very Good	Very Good

★ Best Choice ✓ Recommended Stainless Polish ✓ Recommended Bronze Polish ✓ Recommended for Both



ON THE HORIZON
RUST INHIBITORS (ABOVE)
FUEL TANKS
WET CELL BATTERIES
SAFETY TETHER UPDATE
NMEA MULTIPLEXERS
WEATHER STATIONS

Practical Sailor

A Wet Winter?

Using a barrier coat can help reduce water intrusion.

What are the effects of keeping your sailboat in the water year-round? In Connecticut, it's cheaper to store a boat in the water than to have it hauled all winter long. Is this constant contact with the water bad for the fiberglass (blisters, water-logging, etc.)? Does "barrier coating" (applying a special protective coat under the bottom paint, after you have stripped it all off) prevent any of the damage? How long does a barrier coating last? What barrier coating would you recommend?



PS ADVISOR

The climate in many parts of the world allows boats to remain in the water year-round, and composite FRP structures hold up pretty well to year-round immersion. The benchmark would be early 1960s hulls, most of which are still going strong. It's important to note, however, that these were not cored hulls, and more often than not, were built with thicker hull skins than vessels made today.

So despite the fact that many older wet-stored boats are still blister-free, water—the universal solvent—can hydrolyze seemingly impervious resins. Many other variables affect this

process, but, yes, blister problems are more prevalent on boats that remain wet stored year-round. If left unattended, these

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Reader Bill Cavers' Ted Hood/Deiter Empacher-designed Bristol plies the waters near Darien, Conn.

blisters usually increase in depth and diameter, and prevention efforts, as well as prompt repair, make sense.

Hauling a vessel does lessen the contact with water, but in winter climates that are below freezing, the issue of expansion-caused micro cracking becomes a factor to consider. One answer is barrier coating, which at least lessens the porosity of the surface and slows, if not stops, moisture intrusion.

If the bottom is blister-free, try the Interlux approach, using a coat of Epiglass Epoxy resin and several follow-up coats of Interprotect 2000/2001-E. Such barrier coat systems seem to have a life span of about 10 years. If the bottom is badly blistered, a professional removal and laminate replacement using epoxy or vinylester resin is a costly but proven fix. Care must be taken during prep work because adhesion quality is directly correlated with surface prep.

If you consider wet storing in Connecticut, make sure that the marina has adequate ice abatement capability and their electrical system is reliable. Careful and thorough winterization includes keeping the cockpit and deck drains from freezing up and if electric lights or heat tape are used in the bilge, care must be taken to prevent shock or fire hazard. Whenever there's an extreme winter, New England marinas suffer damage from moving ice as it clears in the spring. This said, wet storing can be cost effective and certainly has you primed for an early-season sail.

Bill Cavers
 Saquish, 1984 Bristol 31.1
 Darien, Conn.

