

F By Knowles L. Pittman
or about 150 feet along Williamson Street, the central artery of Madison, Wisconsin's own Haight-Ashbury district, lies a low, undistinguished commercial building with three tenants. At one end is Star Photos, which serves professional photographers. The middle section is rented by an aikido studio, where agile young men and women hurl one another through the air in unarmed combat with feral screams and padded thuds. At the far end is a set of truck-size garage doors that may once have housed an automobile-repair garage. This is Bill Mattison's boat shop, where exquisite

craftsmanship, invention, intuitive engineering, and never-let-up drive produce more of its unique product—speed under sail—than any other shop, anywhere.

During the day, the boat shop is quiet, but most evenings, at 6:30 sharp, lights flood on and well-kept machinery hums to life. Until about 10:30 p.m. air in the shop is filled with fumes and dust that would cause an OSHA inspector to blanch. There's a room for perhaps a half-dozen boats. Along the walls is a mixture of 1940s and '50s heavy-duty planers, band saws, routers, grinders; racks of Sitka spruce, veneers, marine-grade plywood, carbon-fiber cloth and tapes; barrels of WEST System epoxy and solvents; a refrigerator, covered with carbon and wood dust, full of soft drinks; heavy-duty compressors and vacuum pumps; and the thousands of other supplies needed to build high-strength, ultralight sailing machines.

The shop and the building that houses it are owned by Mattison and supported as a nonprofit venture by him and Peter Harken and Paul

At age nine he built a model circus.

Since then Bill Mattison's creative energy has never

FAST FORWARD SINCE BIRTH

flagged. Visit the Madison, Wisconsin, garage-cum-boat shop where he and the two other members of a high-tech triumvirate create some of the fastest wind-powered craft in the world

Krueger, whose pooled funds pay for the tools and materials used to produce these craft. In addition to money, each member contributes special skills. As founders of Vanguard Boat Company, Harken and his brother Olaf used to build ultralight high-performance dinghies. The two now run the sailboat-hardware business that bears their name.

Krueger, an engineer with a background in metallurgy, operates a large stainless-steel-tank company that serves Wisconsin's dairy industry. Although very different from Mattison, Krueger operates on a 50-50 basis with him. Harken considers himself a student of the other two. "Quiet and unassum-

ing, Paul doesn't drink a lot of beer and tell a lot of lies after racing like the rest of us," Harken quips, "but he has a dry humor and pulls pranks. Paul never, never stops working. I bet he has machinery in his bathroom so he can build something while he's showering or on the toilet! Like Bill, he's unbelievably generous in helping others to build their boats or fix boats that have crashed."

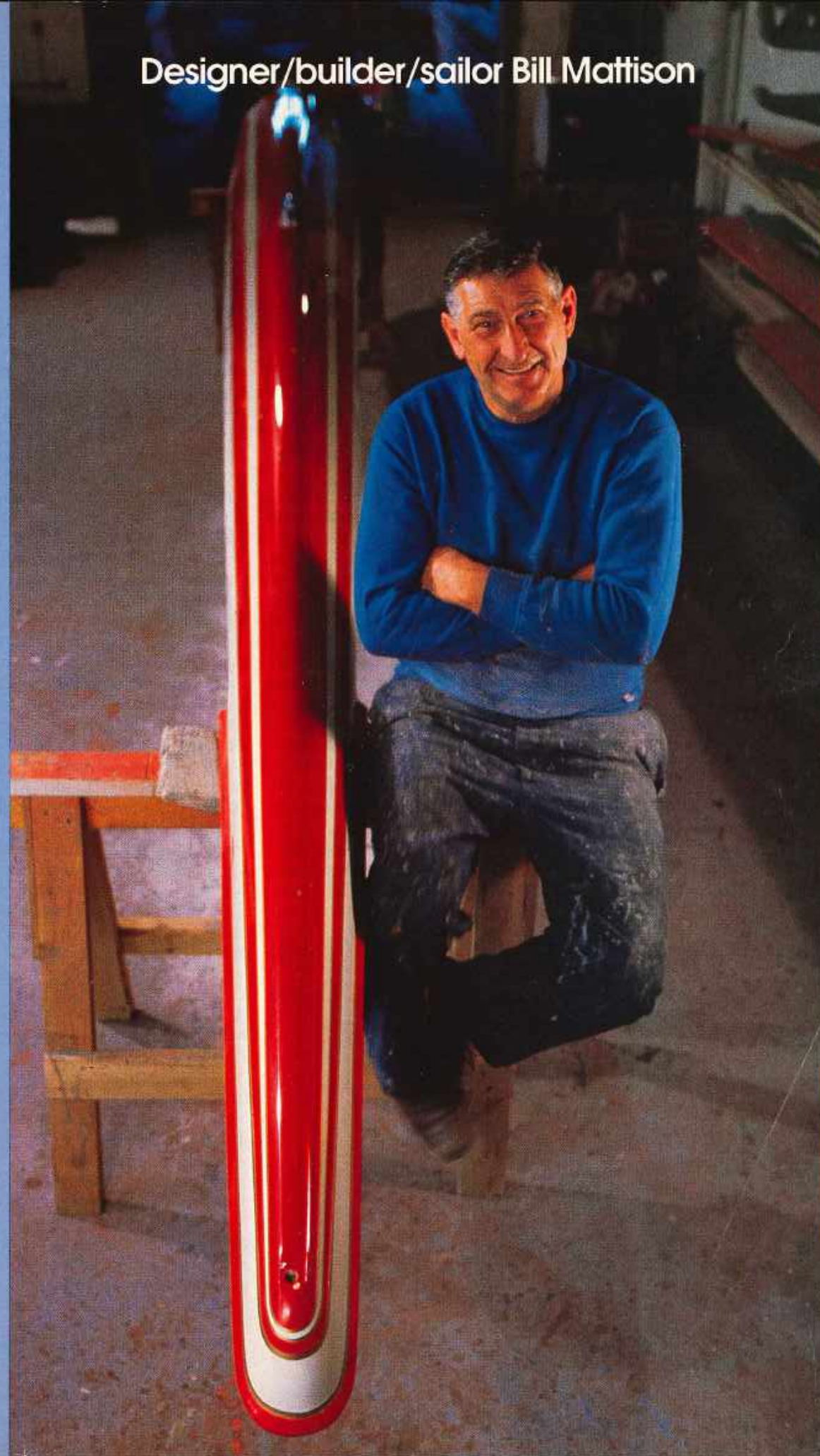
Mattison—well, his skills have nearly the range of a Leonardo Da Vinci. He's a figure of heroic reputation in the iceboat and inland-lake scow worlds—for decades as designer, builder, and winner in the E-Skeeter iceboat class and as an innovator, and frequent winner, in whatever scow class he is sailing.

"I've never known Bill to repair, rebuild, or fine-tune a boat without improving it a lot," Buddy Melges observed in conversation about his longtime rival in both iceboats and scows. "Billy is almost the only guy I

At home in his shop: Bill Mattison and an E-Skeeter hull

Billy Black

Designer/builder/sailor Bill Mattison



know to whom we'd consider selling an unfinished hull. We know his finished boat will be just as good and sometimes faster than ours."

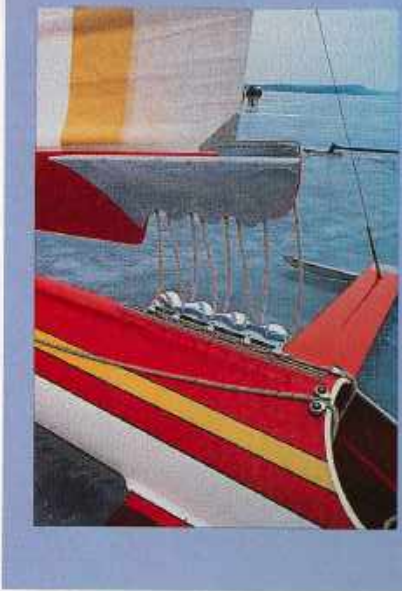
Mattison's reputation for analysis, versatility, and overall handiness with high-performance sailing machines spilled into the rarefied America's Cup world in 1986, when he was asked to join Melges's Heart of America syndicate for the trials in Fremantle, Australia. Toward the end of those trials, in a kind of last-gasp effort, it was decided to add two 1,000-pound winglets to *Heart of America's* keel to try for a little better performance on the wind. The winglets arrived on the pad, and crew and syndicate managers gathered to discuss ways of getting a ton of weight out of the boat so she would continue to rate as a 12-Meter with the winglets in place.

As the conference commenced, Mattison came out of the toolshed with hacksaw in hand, climbed into the boat, and began sawing off bolt ends, cutting out unused inches of under-deck ribs, removing any tiny piece of metal that was not essential. Soon others got hacksaws and joined him. After a long night, there were buckets of parings and shavings—a full ton of them—on the pad, and *Heart of America* stood with winglets appended, still a 12-Meter. In her next race, albeit too late to have an effect on the selection process, Melges and *Heart of America* overpowered John Koliou on *America II*.

IT'S THE INTERNATIONAL E-SKEETER Class though, where Mattison's talents are most fully expressed. He



Custom mainsheet purchase on Mattison's *Honeybucket VIII*



can design his boat, build it, and sail it himself. If he decides to tear it apart and rebuild it in some other configuration, that's okay. For E-Skeeters there is really only one limiting parameter—sail area. Nominally, these boats are limited to 75 square feet, with only a few additional definitions as to what constitutes sail area. Over five decades of intense development, this 75-square-foot limit has been fudged to average 120 to 130 square feet, as rigid headboards, full battens, and aerodynamically effective spars (semi-wing masts and deep, flexible deck-sweeping booms) have come into use.

It is probably the almost unlimited design freedom that most attracts Mattison to the E-Skeeter. He can, in effect, reinvent the wheel each time

he sits down with a pad to sketch out his next boat. There is an obsessive originality there that has been the theme of his life. He has never followed the blazed trail. When he was nine years old, he made news in the *Madison Capital-Times* in a headlined feature story with picture: "Madison Boy, 9, Builds Own Circus." He was shown with carved and fabricated circus animals, vehicles, performers, tents, tools, a complete micro-reproduction of the real circuses headquartered back in pre-World War II years around nearby Baraboo, Wisconsin. In typical fashion, he ran away with the circus when he was 15 and, for a season, helped rig and break camp and served as a prop man.

If freedom from design restraint is one magnetic pull of the E-Skeeter class for Mattison, the other is speed. On smooth ice these highly refined rockets are capable of speeds six times the speed of the wind. Harken and Krueger share with Mattison this lust for going fast (see *Shaping Course*, page 6). Krueger is a former race car and outboard hydroplane driver and remains deeply involved with officiating at car races on the oval track all summer long in the Midwest. Harken has a penchant for high-risk, high-speed ventures such as giant proas designed to break the 40-knot barrier and "dirt boats," the small land yachts that dart around the dry lakes of the West at 80 to 90 miles per hour. These land buggies owe much of their technical development to the E-Skeeter.

MATTISON DESIGNED THE BOATS HE, Harken, and Krueger built in the Williamson Street shop. As did Nathanael Herreshoff and other traditional-sailing-vessel designers before him, Mattison carved a model of the fuselage on a half-inch-to-the-foot scale. The first version of the three boats was 32 feet long in full scale. The three builders in their nearly identical boats had good racing records their first year, 1990-91, achieving a kind of standoff against futuristic boats from New Jersey.

New Jerseyites Dan Clapp, the class

Mattison and Harken repair collision damage to *Honeybucket VIII*

president, who became known as "the kid in the bubble" because he sailed in a Plexiglas dome just forward of the mast, and Chauncey Grigg, who brought a fully rigid wing rig with a movable flap, very likely provided a glimpse into the future. Clapp became the first outlander (non-Midwesterner) to win the Northwestern Ice Yachting Association championship, and he sent a lot of designers back to the drawing boards.

Mattison, Krueger, and Harken concluded that their wheelbases (the distance from the runner plank on which the two aft runners are mounted forward to the steerable bow runner) were too long. Clapp seemed to get off the starting line fast, and he had much more unmeasured sail area. The remedy the Madison triumvirate decided on was to chop 9 inches off the bow of each fuselage and 18 more off each stern. They also moved each boat's mast back 12 inches. The idea was to get more weight on the front runner and a shorter turning axis. They also built new masts, booms, and sails, which have added a lot of horsepower. Stand by for results of the 1991-92 season.

Building an E-Skeeter is no casual undertaking. First, one must be a skilled craftsman—or a very fast learner. The three boats from Mattison's shop were built by people who know how to use exotic materials, precision tools, and the like. Then one must be willing to put up \$12- to \$13,000 in out-of-pocket costs and to invest at least 400 to 500 often uncomfortable, dust-filled hours of construction time. Looking back, Peter Harken summed up E-Skeeter iceboat racing: "It's not cheap. It's not easy. And it's not fair."

To tear one of these boats apart, alter it, then reassemble it with the same structural integrity is not a simple task. The boats were vacuum-bagged in upper and lower half-shells of carbon-fiber fabric and epoxy resins over a plug. The plug was lofted in full scale from Mattison's hand-carved model. The three boats were originally built with complete "innards" installed in one half of the fuselage, or hull. These included a center truss of Sitka spruce, running longitudinally and serving as a keel, and ring ribs laminated of maple veneer. Before the top and bottom halves of the fuselage were joined together, the following



were installed: an aluminum step for the freely rotating mast, steering gear (Harken made titanium sprockets, shafts, pedals, and so on for the steering gear), backing plates for hardware and shrouds, inspection plates, and reinforcement structures for loads imposed by the rig and the athwartships runner plank.

The junction of the top and bottom halves of the fuselages was one of the critical points in construction. It took considerable planning and preparation to guard against ruining the nearly complete fuselage, which would happen if the joint was not covered evenly with adhesive or properly cured around the entire circumference of the fuselage. There was a period of approximately 30 minutes before hardening set in. The two hulls had to be perfectly aligned and held to that alignment as dozens of prefabricated H-clamps (made in-shop of hardwood and threaded 1/2-inch bar stock) were tightened into place. Spars, runner plank, and running gear—including the blades, battens, and most other components—were all made by the builders. Only the sails (made by Charlie Miller of North Sails Pewaukee), four miniature Harken camcleats on each boat's deck, raw materials such as stainless wire, rope, aircraft-grade stainless fastenings (a handful could cost \$300), and the titanium steering components were produced outside the shop. Even with the potential for variation in materials, each hull

(fuselage) came in at exactly 137 pounds. It was important, too, to Mattison that every screw and hex-nut facet be turned to exactly the same north/south alignment. Every metal part in the boat was polished to showroom luster, even those hidden inside or under the hull or plank. That's Mattison's style.

Mattison is a man whose life has been running at fast forward for almost 60 years. He requires only one or two hours of sleep a night. By age 18 he'd learned enough about photography to found Star Photos, but, because he was still a minor, he had to ask his mother to sign the articles of incorporation to comply with Wisconsin statutes. A couple of years later he was home, a decorated combat veteran from the Korean War. He had roamed the mountains of Korea alone, in winter, for weeks at a time behind North Korean and Chinese lines, gathering intelligence.

With all that, there's also a pleasing streak of the romantic. Late one night in Fremantle, he was working on the keel of *Heart of America*. Across the pad at water's edge, under the mantle of floodlights, arose a dripping, comely female, *au naturelle*. She stayed and talked to Mattison as he worked alone, then slid back down into the water. A groupie? A spy? "No," Mattison says, "she was a mermaid."

A racer turned bluewater cruiser, Knowles L. Pittman returned to his "roots" in the Midwest for this article.