

CARBONICS

Advanced Composite Engineering & Manufacturing for Marine & Industrial Applications



GOETZ MARINE TECHNOLOGY PRODUCT BULLETIN • NUMBER EIGHT 1996



Photo Courtesy of Southampton Yacht Services

GMT Carbon spars saved over 600 lbs aloft on Southampton Yacht Services latest creation, ZANNA.

ZANNA: GOETZ CARBON SPARS-STRENGTH WITH STYLE

From a dockside view the look is perfect. What better spar material than wood for a classic looking 82 foot yawl? But upon closer inspection, the "trompe" in trompe l'oeil (trick the eye) becomes apparent. The beautifully finished "wood grained" spars on ZANNA are in fact all carbon, lending lightweight strength to the beauty of Southampton Yachts Services' latest creation.

Steve Dalzell, Senior Lecturer in Naval Architecture at Southampton Institute, designed ZANNA with carbon spars as part of a master plan to give his client both a classic looking yacht and a good per-

Continued on Pg 4

CARBON SPARS AND THE PERFORMANCE CRUISER

by *Doug Zurn, Naval Architect*

Several years ago I had the pleasure of delivering a Deerfoot 60 from Northeast Harbor, Maine to Newport, Rhode Island for the fall boat show. Ulf Rogeberg and Steve Dashew were forward thinkers when they contrived this new line of sailboats. It was undoubtedly a matter of experience and form following function that steered their thoughts. As we made our way down Massachusetts Bay toward the Cape Cod canal we were experiencing speeds in excess of sixteen knots. While all 135 lbs. of me was at the helm, Ted Cooper of Able Marine was down below yelling the double digit numbers off the speedo (the repeater on deck was out). This was fun!

What made it fun was that Ulf and Steve had thought it all out; thought of every way to optimize the boat for short handed passages and make it more enjoyable to sail in all conditions. Much of the credit for the enhanced performance can be attributed to careful materials selection and weight management. With these two goals in mind carbon fiber alone combines strength and reliability with less weight. Pound for pound carbon fiber is stronger than

Continued on Pg 4



Photo: Sheila Hill

Reichel/Pugh One Design 48's charge downwind steered by carbon rudders from GMT.

GOETZ RUDDERS CONTINUE WINNING WAYS

Once again GMT carbon fiber rudders have proven their mettle on the race course. Five of John Bertrand's Reichel/Pugh designed One Design 48's, equipped with all carbon steering from Goetz Marine, made their debut at Key West Race Week, Newport, RI, and Chicago's Verve Cup. Roo Stevenson, project leader for US One Design said the GMT rudders and quadrants are "just the sort of lightweight parts these boats require." Three more 48 footers will be in racing form by the end of the year.

Goetz Custom Sailboats' thoroughbreds IDLER (N/M 45) and HIGH NOON (Tripp 40) were refitted with new rudders for the current sailing season. Newly launched from Eric's shop is SLEIGHRIDE (S&S 77) which is fitted out with GMT rudder, bow sprit, and all carbon keel. These strong, lightweight parts allowed SLEIGHRIDE to exceed 24 knots on

its second day of sailing.

J.P. Moulligne's Finot designed BOC 50 footer CCP-CRAY VALLEY sports twin rudders, mast, and boom from GMT. Launched in Portsmouth, RI the boat will make the upcoming Fall boat show circuit before making an attempt at the Newport-Bermuda record later this year.

New carbon rudders racked up some frequent flyer mile on the airways recently. FOUNDATION (Hinckley 42) received her new rudder in Japan and a 130 lb. rudder was flown to Taiwan for installation aboard a Tony Castro designed 73 foot performance cruising sloop.

JOHN GAGNON TO MANAGE GMT RACING DIVISION

GMT has named John Gagnon manager of its newly formed racing spars division. As more boats racing under IMS and PHRF select carbon spars, John will draw upon his racing experience and engineering background to help GMT expand into this growing market. When he isn't sailing ILC 40's or J130's John is an integral member of the Goetz team, designing spar layouts in addition to being a premier pre-preg laminator.

WE'VE MOVED!

Our business has grown and so have we. After a year of detailed engineering and construction, GMT is in its new 12,000 sq. ft. facility. Less than a mile from our old home for the past 13 years, the new building features a controlled climate clean room for pre-preg laminating, 200 foot bays for carbon mast assembly, and a computer driven machining center for carving complex foil shapes. David Schwartz, GMT's president, says "The guiding principle of this project was to design a first class facility which was comfortable for our staff, fit into its surroundings, and allowed room for the pattern of growth we expect to continue." Please note our new address:

Goetz Marine Technology
48 Ballou Boulevard, Bristol, RI 02809-2728

CARBONICS REPORT FROM THE TESTING LAB

At GMT, we strive to continually improve our products and service. Although mechanical testing of raw materials and completed laminates are part of our quality assurance program, we learn a tremendous amount by tracking the performance of our parts in the field. HANNAH, a five year old Hinckley 59 recently underwent a complete repainting at the Hinckley yard, including (for the first time) her GMT spar. After careful inspection, of the spar prior to re-paint, Hinckley chief engineer Peter Smith pronounced the carbon spar in tip-top shape. The 1958 Corcordia yawl CROCODILE, which shed her wood mainmast for a lighter GMT spar in 1993, finished 5th out of 68 boats in last year's Marblehead to Halifax race and 3rd of 10 Concordias in the 1996

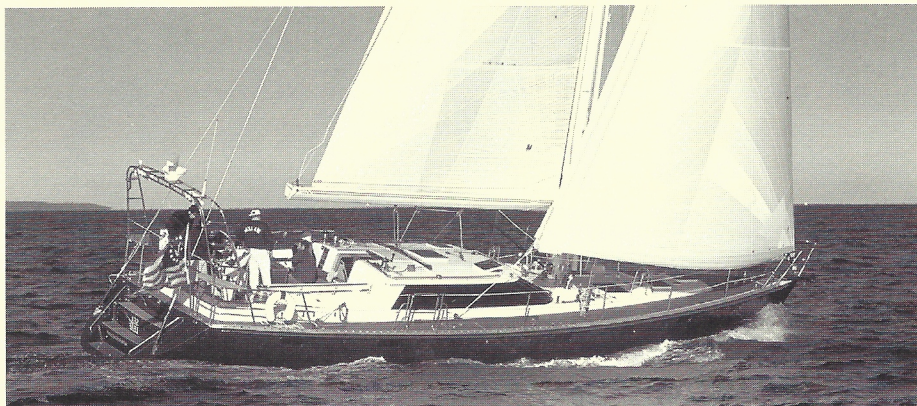


Photo: Chuck Paine

Able Custom Yachts' Apogee 58 #1 Sea Leaf designed by Chuck Paine. Recently launched Apogees are 58 #2 Tara and 50 #6 Aponivi. All are equipped with GMT carbon masts.

Eggemoggin Reach Regatta. Five GMT sparred boats competed in this year's edition of the Newport to Bermuda Race: QUADRILLE (Martin 43), FREE SPIRIT (Mariner 47), and SEA LEAF (Able Apogee 58). JACQUELINE IV (Hinckley 42) finished third in class and ARIEL (Swan 47) was fourth in class and a member of the winning US team in the Onion patch Series.

GMT is still leading the industry with the best track record. More than

100 spars have been built with zero failures. As a result our spars have earned a reputation for strength and reliability that no other spar builder can match. We begin each spar with meticulous engineering utilizing both CAD and FEA computer programs. Through years of testing we have been able to fine tune our manufacturing process resulting in the strongest and lightest parts for rugged sea conditions. Call us today for more details.

GMT NEWS

FREEDOM SPARS CONTINUE TO ROLL OUT THE DOOR

GMT is still the sole supplier of FREEDOM YACHTS' carbon fiber spars. For over two years now we've been building the world renowned free-standing rigs and we're receiving rave reviews. The Goetz spars are stiffer, deflect more uniformly, and are 15% lighter than other composite spars.

Freedom 24's, 35's and 40/40's are all fitted with GMT's lightweight high strength spars.

As word spreads, owners of older Freedoms are expressing interest in replacing their original aluminum or carbon rigs. New spars for Freedom 28, 33, and 45 foot models have all been built. For more information on this super upgrade call Dave Balfour at Freedom Yachts (401) 683-2900.

Freedom 35's Pal Joey and Star Dancer with spars by Goetz.



Photo: Billy Black

New Projects

GMT used intermediate modulus carbon in a triple spreader racing rig for Bob Foreman's new 42 footer, Jacqueline IV. The rig typifies the best results achieved by carbon spars; maximum weight savings and a stiff spar requiring minimal use of running backstays. Bob took a third place trophy home with him from Bermuda this summer. Congratulations Bob!

George Stricker commissioned Goetz Marine to build his new carbon mast for "Rapsallion" (Frers 45) for the 1996 Europe One single-handed race. The 72 foot carbon rig saved over 230 lbs. aloft, increasing the boat's stability significantly.

On the way for 1997 is the full rig package for a 73 foot custom sloop under construction in Taiwan. In addition to the 95 foot mast and all rigging, the package will include a "Park Avenue" style boom and main sheet arch made from carbon fiber. GMT has also been awarded the contract to supply spars for an Alden designed 60ft yawl, under construction at the Hinckley Co.

GMT Marketing Director Ben Sprague traveled to the Netherlands for sea trials aboard the new Trintella 47 "Morning Flame". The Ron Holland design sports a 7/8 rig with swept back stainless spreaders, a Solent jib, and a surprising amount of mainsail area for a 47 footer. After several months' cruising to Ireland, Trintella will debut the 47 in Amsterdam, Southampton, Genoa, and Dusseldorf.

ZANNA *Continued from Pg 1*

former under sail. To this end all the rig components were ordered in pre-impregnated, uni-directional carbon fiber. Goetz Maine Technology was awarded the contract to supply masts, booms, spreaders, poles, Riggarna standing rigging, and Navtec hydraulics. The weight savings of the carbon components was over 600 pounds compared to aluminum. As a final requirement before placing their order, ZANNA'S owners requested that the spars be painted to look like wood.

Months later, on a visit to GMT's Bristol shop, they got their first look at the "faux bois" (false wood) spars and were delighted.

Sea trials took place off South ampton, England and went off without a hitch, despite the weather. With wind speeds varying from 30 to 45 knots we were able to try a variety of sail configurations and fully test the rigs. Boat and spars performed flawlessly demonstrating GMT's ability to complete large projects overseas and provide the same level of service as we do for clients close to home.

ZANNA sailed south to the Caribbean where she remained for several months.

While in Antigua she credited herself quite well in The Race Week. Sailing in the Spirit of Tradition Class, she placed 3rd, besting such classic 100 plus footers as Hetairos. Plans for a New England cruise were postponed for more Caribbean cruising. Dodging hurricanes via the Venezuelan coast ZANNA will remain in the islands through the coming winter. We look forward to seeing her in Rhode Island waters in 1997!

CARBON SPARS... *Continued from Pg 1*

steel, aluminum, or fiber reinforced plastic. What this does for boats is akin to what it does for jets in the aerospace industry. The single most significant development of carbon fiber in the area of sailboat design is the introduction of carbon fiber spars.

It is of no surprise that new Deerfoots, Hinckleys, and Chuck Paine designed Apogees and Morris built boats are often now commissioned with carbon masts and rudders. As these boats demands the most in the harshest environments, the use of carbon optimizes performance without sacrificing safety.

As is usually the case, the America's Cup, BOC, and Globe Challenge race events were the proving ground for carbon masts. Since carbon spars have been in use on cruising boats since 1989 available data of how they perform has grown dramatically. The typical weight savings these boats see is 50% compared to an aluminum mast which translates into increased stability.

While increased athwart ship stability (less heeling) is undeniable, an even greater benefit is the increased fore and aft stability. Carbon

spars dampen the pitching motion which can stop a boat dead in the water. By reducing the pitching moment, a boat becomes faster, more comfortable, and safer.

Just as boatbuilding has evolved with the advent of composites, so too has the spar building component of the marine industry. We will continue to see more carbon spars in the future on an increasing range of boats and rig configurations. The evidence is there to support the contention that carbon fiber spars, like

aluminum in the early part of the century, has become the next standard from which to judge material properties for the performance cruiser.

Doug Zurn is a Naval Architect and works out of his Marblehead, MA office (617-639-0868). He is currently working on designs in sail and power from 25 to 70 feet, and has recently completed the design for a new power boat for singer Billy Joel.

GMT Response Card

Name

Address

City State Zip Code

Telephone

Please add my name to the Carbonics mailing list.
Please send me more information on the following products.

Composite rudder Carbon spinnaker pole

Carbon fiber mast

Boat type



Goetz Marine Technology

**48 Ballou Boulevard
Bristol RI 02809-2728
Tel: 401.253.8802
Fax: 401.253.9395**