

CARBONICS

Advanced Composite Engineering & Manufacturing for Marine & Industrial Applications



GOETZ MARINE TECHNOLOGY PRODUCT BULLETIN • NUMBER TEN 1998

A DECADE OF GMT CARBON FIBER SPARS

by Eric Goetz & David Schwartz

The year is 1988. Defense industry companies reeling from government cutbacks are searching for commercial markets for their non-classified technologies. Carbon fiber is cropping up in recreational sporting gear. In sailing, Dennis Conner, fresh from his 1987 retrieval of the America's Cup in Perth is preparing for an unusual defense. Kiwi Michael Fay has challenged for the Cup citing his right to dictate the size of the yacht up to a waterline length of 90 feet. This sends the Cup

into the courts starting what will become the biggest mismatch in Cup history: a 130 foot monohull racing a 60 foot catamaran. The last Twelve Meters built have been in mothballs for over a year and new materials are being used in both camps. The rest, as "they" say, is history, albeit recent.

That same year Goetz Marine Technology began its fourth year supplying composite parts to the sailing industry. GMT's carbon rudders were winning a reputation for strength, light weight and speed. While carbon rudders built by other companies were breaking, the superior engineering, materials and

manufacturing techniques going into a GMT post provided for a perfect record of reliability. Building on this success GMT moved into the development of carbon spars. Since our founding in 1984 we had been using carbon fiber pre-preg. Knowing as much as we did about the physical properties of this material, it seemed ideally suited for building masts. In the nearly ten years and two hundred pre-preg spars since, GMT's unmatched record of reliability, proves that pre-preg is the material of choice.

GMT's position as a technological leader in the use of pre-pregs

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CHIMERA: HINCKLEY/ALDEN/GMT WORK OF ART

Last summer a modern classic was launched at Southwest Harbor's Hinckley Company. Chimera, a fresh design from the drafting table of Niels Helleberg, chief designer at John G. Alden, is a 59 foot yawl built for a Chicago couple. The design brief called for a fast cruiser able to circumnavigate the globe but not require a small army to reef and stow her nearly 2,000 square feet of sail. Ease of handling being the requirement, in-mast furling became the answer. Carbon fiber spars were an integral part of the yacht specifications

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Photo: The Hinckley Company

CHIMERA, Alden/Hinckley 59 foot yawl saved 500 lbs. with her GMT carbon rig package.

Photo Billy Black



Jean-Pierre Mouligne sets his sights on September's start of the Around Alone Race.

J.P. MOULIGNE SETS SIGHTS ON CHARLESTON

After nearly two years of familiarizing himself with his Finot 50 red rocket, Jean-Pierre Mouligne is entering the final stretch of preparation to the Around Alone start in September. Following a successful summer of racing (4th place in a class of Whitbread and Open 60's in the Around Europe Race where he was dubbed the "red mosquito" for his determination and speed) and distance sailing in 1997, the 50 footer has logged more than 17000 miles.

Over the winter while CRAY VALLEY had a new bow sprit added and an engine installed to conform to new race rules, GMT performed a complete inspection and fine tuning of the spars and rigging. The aluminum masthead was replaced with a uni-directional carbon head fitting taking seven pounds out of the rig more than seventy five feet off the water. In addition, internal reef systems were incorporated to the boom with the addition of a new composite outboard end.

On April 6, 1998, in weather more suited to reading by a fire than sailing, the newly painted and graphics-covered red hull was ceremoniously lowered into the water. A crowd of friends and supporters had come to wish J.P. and his CRAY VALLEY the best as together they embark on the realization of a lifetime dream. The boat will undergo sea trials in Rhode Island waters for six weeks before sailing to England in time to start the feeder race from Falmouth to Charleston later this summer.

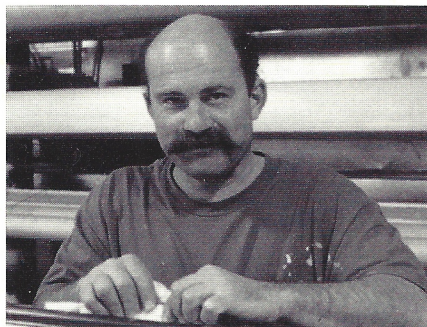
RACING RESULTS/ FROM THE WATER:

1997's summer classic TRANS-PAC featured a record breaking win by PYEWACKET (SC 70) with a five year old GMT carbon rudder. (NB: A new PYEWACKET is currently under construction at Eric Goetz Custom Sailboats and will feature another GMT custom carbon rudder).

On the East Coast Edgar Crocker's CROCODILE, (1958, GMT sparred in 1993) won the PHRF Division of the Halifax Race. Bob Gould in FREE SPIRIT (Mariner 47, GMT sparred in 1996) logged a string of five successive regatta victories in class. With two legs to go in this year's wild Whitbread Race, GMT equipped CHESSIE RACING is in fifth place with a chance to complete the race in second or third. In 1998 Key West and SORC action Goetz custom built and GMT steered BREEZE (Farr 49) earned 3rd and 2nd place in IMS, respectively.

GMT NEWS

Joining the Goetz Marine team recently was John Hugo. John, a resident of Bristol, comes to us after 13 years with Bristol Marine where he was yard manager. He did a terrific job there satisfying the needs of a wide variety of boat owners. His



GMT welcomes its newest team member, John Hugo

commitment to customer satisfaction was a natural fit with our attitude at GMT. John's range of experience and skills will be well utilized. Welcome John!

Gary Crosby and GMT Special Projects recently completed their second contract for a Dallas, TX company specializing in refitting wide body airplanes. Two composite shower assemblies were ordered for a Boeing 747 being converted to a Head of State aircraft for a Middle Eastern client. In addition to a full order book of rudders to build, Special Projects has just completed its second carbon fiber passerelle (see photo page four) with another one on order.

Current projects include the

completion of the spars for an 86 foot ketch in the UK, a spar for a 65 foot Alex Simonis designed catamaran under construction in St. Kitts, and spars for an Alden designed 63 foot sloop being built by Derecktor-Goetz Yachts. The triple spreader masthead rig will feature a carbon fiber Park Avenue style boom. Once again the refit side of our spar work continues to be strong. New rigs are in the works for a Hinckley Pilot, Alden 53 ft. yawl, 52 foot Empacher designed sloop, and Morris 36. GMT carbon spars for new boats include a furling rig for a Hinckley 42 and triple spreader fractional rig for a new 47 foot IMS yacht under construction at Morris Yachts (see sail plan drawing on page 3).

CARBON RETROFIT PROFILE: SOU'WEST- ER 50 YAWL

In what has become a string of success stories for older yachts, GMT installed a set of carbon furling spars on the Hinckley yawl BELON. The Sou'wester 50, built in 1979, was equipped with aluminum furling sections for manual main and mizzen furling. In researching the benefits of converting to carbon furling sections the owner learned he would save more than 400 lbs. by replacing his present masts with carbon. After more than a year's deliberation the decision to go ahead with the refit was made. On telephoning the owner after his first cruise with the new rig, GMT learned, "I knew I had made the right decision, but I had no idea how noticeable the difference would be! It's truly like having a new boat." He went on to add that his sail carrying capacity has increased, boat speed is better than ever and the boat has a more comfortable motion, even at anchor when the motion from a power boat wake can be disruptive. Jame Lynch, delivery captain for BELON for the past twelve years, echoed his enthusiasm. On his latest trip to the Caribbean he reported that "reducing that much weight aloft definitely has made a difference." Suffice it to say that the owner was pleased with his "new" boat, but he insisted on serving as a referral for others considering such a refit. He had his opportunity early this year and his words to the gentleman inquiring were simply, "Just do it!". GMT thanks you and congratulations on your "new" boat.

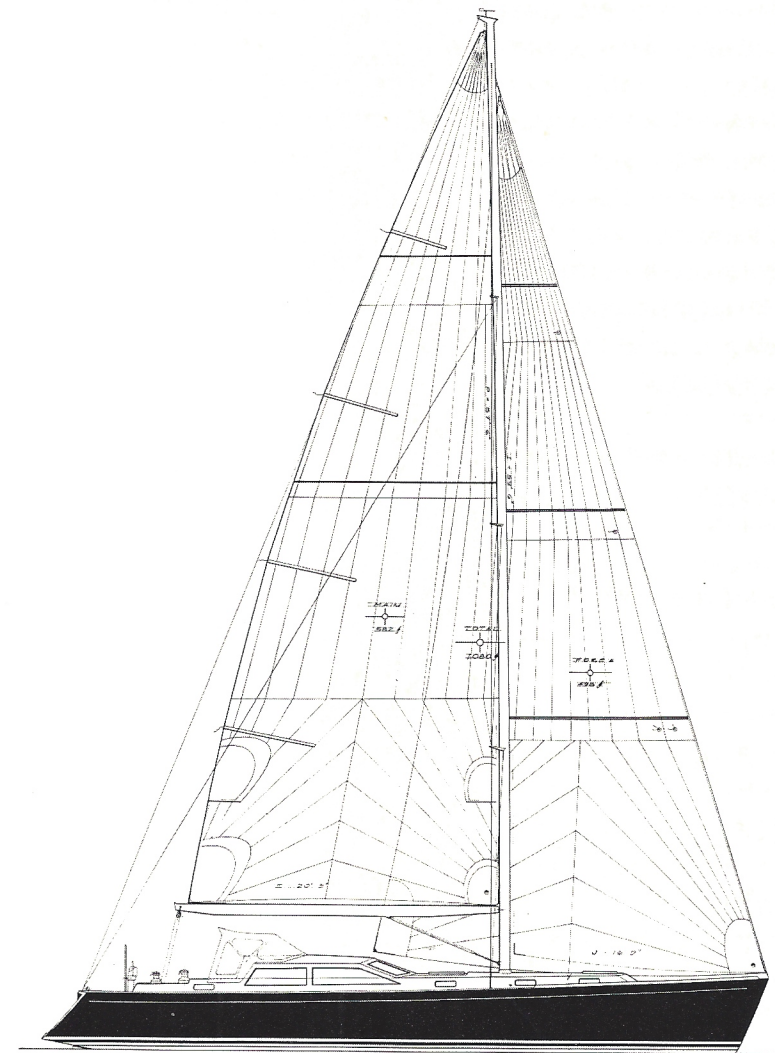
Call Ben or David for complete details on what a carbon retrofit can do for your boat.

CHIMERA: *Continued from Pg 1* because of the need to reduce weight aloft. In addition, the center of gravity of the spar package was lower further enhancing safety and comfort. In this case carbon would save more than 500 pounds compared to equivalent aluminum furling masts. Having built carbon furling spars for nearly a decade, GMT was selected to provide the complete spar package.

The uni-directional carbon pre-preg main and mizzen are equipped with electric and manual furling systems, respectively. The mizzen is reefed or stowed using a winch handle in the forward face of the spar at waist height just aft of the helm station. Completing the user-friendly

sail handling of Chimera, the Yankee and staysail are operated by Furlex hydraulic furling systems.

After sailing for much of the summer in Maine waters, Chimera was hauled at Hinckley for the winter. After an early Spring commissioning and shakedown, the boat will be off for what will no doubt be a fast trip across the Gulf Stream in the 41st Bermuda Race. After sailing the remainder of the summer in New England waters she will head south to the Caribbean in the fall. Congratulations to Barbara and Rich Dickson for a superb yacht. Congratulations to The Hinckley Company for yet another "owner's original", and... Good sailing!



Chuck Paine Yacht Design

GMT spars are under way for this Chuck Paine Morris 47 designed for IMS offshore racing and cruising

GMT *Continued from Pg 1*

has allowed us to constantly improve our product. Higher moduli carbon matrixes can now be used in applications where previously they were cost prohibitive. FEA has allowed us to fine tune our spar design programs and build even lighter racing masts. All are developments that have allowed us to continue to produce the high strength/high quality carbon spars for which we are best known.

Quite possibly one of the biggest changes we've seen over the past decade is that of market acceptance. When GMT became the first company to build a carbon mast for a cruising boat, there were many skeptics. While sailing experienced the trickle down effects of higher tech materials used at the top levels of the sport, racing rules prohibited carbon masts until 1994. As a result, many of our early spars were built for cruising boats including two new Hinckley Sou'wester 59's, a Cherubini 48 schooner, and an older Bermuda 40. Today GMT continues to help enhance older boats with carbon spars thereby reducing weight aloft and lowering the center of gravity. Now thanks to their acceptance under IMS, carbon spars continue to get a lot of notice and generate much interest.

When GMT was started fourteen years ago to build composite parts, our goal was simple: we provide the highest quality composite parts available anywhere. We remain committed to this goal. By virtue of our size we are able to work with the client at any level of involvement desired. In the burgeoning carbon fiber spars business we have seen a number of new faces emerge and fail. We believe that it is our commitment to high quality and customer service that keeps our customers happy and our business thriving.

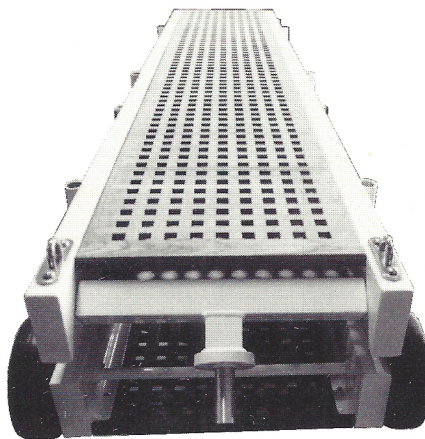
GOETZ HIGH FIBER (CARBON, THAT IS) DIET UPDATE

Carbon spars continue to make the difference for cruising and racing boats alike.

BOAT	WEIGHT SAVED	BOAT	WEIGHT SAVED
Ariel (Swan47)	282 lbs.	CCP Cray Valley (Finot 50)	228 lbs.
Vixen (Morris 46).....	226 lbs.	Cheridah (OC52)	208 lbs.
Zanna (SYS82).....	743 lbs.	Free Spirit (Mariner 47)	338 lbs.
Tara (Apogee 58)	360 lbs.	Jaquiline IV (Hinckley 42)	183 lbs.
Aponivi (Apogee 50)	274 lbs.	Xanadu (Hinckley 42).....	217 lbs.
Tony Castro 73.....	653 lbs.	Freedom 35 (10)	1000 lbs.
Double L (Bristol32)	150 lbs.	Freedom 40 (5)	900 lbs.
Rapscallion (Frers 45)	230 lbs.	Freedom 45 (2)	440 lbs.
Katie G (Martin 40)	113 lbs.		

Total weighed saved since 1990.....19,090 lbs.

Did you know? Random House French-English Dictionary defines Passerelle as a footbridge...



But to us at GMT it takes on a different meaning. Built to fold in half and still weigh less than 120 pounds, this 16 foot gangway was made for a 115 foot yacht. Beautiful as well as functional, the Passerelle is another ingenious yet practical application of carbon.

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Please add my name to the Carbonics mailing list.
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