

# GMT Carbonics

# 25

GMT Composites

Advanced composite engineering and manufacturing  
for marine and industrial applications

Product Bulletin #25  
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Stefano Pacini's *Galileo* and Chris Culver's *Cetacea* en route to Bermuda with their new GMT masts.

## Lightweight showers for Boeing jets

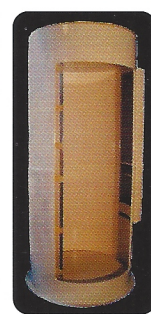
A Russian industrialist's new Boeing 767-200 jet is the latest aircraft to be fitted with two custom composite shower enclosures built by GMT Composites. We have now delivered 20 of these unusual enclosures.

Each circular shower is 40 inches (1m) in diameter and 80 inches (2m) tall; each was delivered in two pieces to facilitate installation by MAV Aircraft (Fort Worth, TX), contractor for the Russian jet's special interior.

Constructed of aramid honeycomb cored fiberglass and flame-retardant epoxy, these enclosures feature a curved transparent Lexan door plus an integral soap-niche column. This shower enclosure weighs only 160 lbs (72.6 kg), or less than half

what each shower would weigh if built of standard aircraft or marine materials.

The challenges involved in building these airborne showers included surprisingly complex shaping, the need for perfect curvatures for non-binding yet watertight door closure, an integral anti-slip floor texture with perimeter drain, scrupulous attention to weight control, and an unblemished shiny finish. Last but not least, the shower had to be in full compliance with the FAA's Form 8130 airworthiness specifications.



## Two Hinckleys get new spars

Stefano Pacini loves his Hinckley 51, *Galileo*, and now he has an ulterior reason. Just in time for the Marion-Bermuda Race, he took delivery of a new GMT carbon fiber mast. He'd wanted to improve his sailing performance and comfort and, with our help, determined that the best upgrade would be one of our spars. The

proof came in Bermuda: he beat his father and brother-in-law, who were racing a sistership.

Chris Culver faced a different situation on his Hinckley 59, *Cetacea*. His aluminum Sto-way mast had been damaged and he was considering replacing it with another. But we showed him that a GMT carbon furling spar would

be a better solution: only 20% more in initial cost but stronger and much lighter in weight, so he enjoys the additional benefit of a lower heeling moment. The finish of our carbon spar is longer lasting so lower in maintenance.

Chris has since logged many happy miles, including racing to Bermuda (second in Class B).

## Stemhead fitting carries headstay load

Hodgdon Yachts' *Scheherazade*, a Bruce King designed 154-foot ketch and one of the largest sailing yachts ever built in the US, required an anchor fitting to carry the enormous 195,000 lb headstay load generated by her

imposing rig. We built this fitting with uni-directional carbon fiber. It's another example of carbon's versatility, since conventional materials would have been impractical, especially in the narrow confines of her graceful bow.





Zanzibar before she was renamed and re-equipped with her new Pocket Boom: a magnificent charter yacht made even better.

# GMT's Pocket Boom graces 108-footer

The Gilles Vaton designed yacht *Zanzibar* (which was formerly named *Rogue*) has just had her main boom replaced with a carbon composite Pocket Boom manufactured by GMT Composites. With an E-measurement of 11.45 meters (37 feet 6.75 inches), this is the largest GMT Pocket Boom yet built.

The new Pocket Boom weighs only 326.6 kg (720 lbs) complete with rigging and wiring, which is

about half the weight of an aluminum furling boom for a yacht of this size. Besides the remarkable weight-savings in this custom foam-cored carbon fiber and epoxy Pocket Boom, *Zanzibar* has attained several other important advantages.

Most obvious is the convenience of being able to stow the entire mainsail (or the reefed portion if underway in heavy weather) within the Pocket

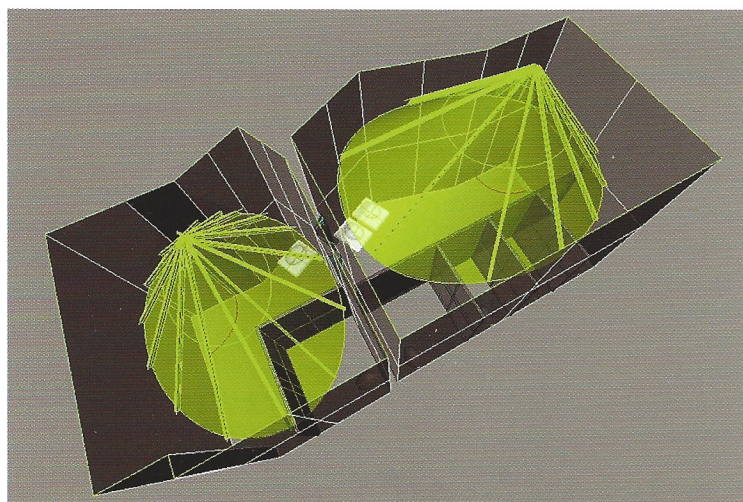
Boom's top cavity. The mainsail is guided there by simple lazy-jacks; this design avoids the weight and complexity of internal furling mechanisms while presenting the superior aesthetics of a much slimmer and more attractive profile.

The efficient design and choice of materials also affect long-term maintenance and upkeep; the GMT Pocket Boom's polyurethane paint adheres to the

structural materials far better than paint on aluminum, so maintenance costs are reduced and the aesthetics are enhanced.

*Zanzibar's* carbon composite Pocket Boom includes internal wiring and three Cantalupi deck lights, which are a helpful addition for work underway as well as entertaining in port. This is especially appropriate as *Zanzibar* has an active career in the Caribbean charter trade.

## If you can design it, we can build it!



Computer rendering: Office dA

Nearing completion in Boston is a remarkable new restaurant named *Banq*. Office dA designed the interior of this French/Asian fusion eatery. The restaurant features an undulating "rolling hills" ceiling of parallel slats, with stripes to reinforce the sense of

movement. The architects wanted the restrooms to be just as unique yet different, so they designed asymmetric conical ceilings – actually intersecting pairs of tilted ellipses. These complex shapes would be very difficult to build on-site, so GMT was contracted.

The cones are lit from behind as well as around their perimeters, and they rise, wrapped by curving walls, to nearly 14 feet above the floor. There are ellipsoid mirrors inset at the top and the ellipse theme is further reflected in the sinks, trashcans, mirrors and fixtures. Cut-outs between men's and women's rooms allow viewing of the ceilings in the adjacent restroom, so whether you're male or female, don't just eat at *Banq*; use the facilities and be sure to look up!



## Saphaedra's light ladder



Leaning out over lifelines to hang a heavy boarding ladder is awkward. Our lighter alternative combines vertical tubes of uni-directional and bi-axial twill carbon fiber pre-preg, polyurethaned to match the topsides.

For the classic yacht *Saphaedra*, shown above, the ladder treads are teak and carbon laminates. This yachty item weighs less than half the original, and can be custom made for any topside height and attachment preference.



Ragtime, a legend in TransPac racing, now faster than the day she was built!



GMT's success on Merlin led to our work on her equally famous peer.

## Two famous sleds get re-turbocharged

Who in sailing hasn't heard of *Merlin* and *Ragtime*? These were two of the break-through "sleds" in TransPac racing. Both of these ultra-lights became legendary in Pacific events and in the press. Both also share being brought back from retirement and super-charged with GMT carbon spars.

*Merlin* was first. Thirty years after her birth, *Merlin* was purchased and refitted by Tricia Steele. Just before the 2005

TransPac, she lost her aluminum mast and we were contacted to see whether GMT could design, engineer and build a new rig before the race. We did, and that success had much to do with legend #2, *Ragtime*.

"Rags" is one of the most recognizable racers, from Down Under to California. But a long period of neglect, passing through owners who failed to keep her in shape, eventually led to a sheriff's

auction. A small consortium purchased her there, did as much repair as time allowed and made it to the line for a record-setting 13th TransPac. But it was clear to the owners and to Allan Andrews, a naval architect who worked with John Spenser, *Ragtime's* designer, that she could do more.

Chris Welch, one of the consortium, then bought out his partners and began the process of putting *Ragtime* back into tiptop

shape – mindful of the obligation to avoid so altering this historic yacht that her legacy would be obliterated. One of the important improvements has been the replacement of her spars with GMT carbon composites.

*Ragtime* is back on course, a distinctive racing machine that might actually now be faster than the day she was built more than 40 years ago. Good on 'ya, Chris!

## We handle microchips

GMT builds carbon fiber "hands" for several firms, including Brooks Automation and Ade, for robotic manufacturing machines. Called end effectors, they protect expensive silicon chips they handle. The carbon fiber is lightweight, stiff and strong for minimal deflection and precision. Construction is to very tight tolerances (+ or - 0.005 inches).

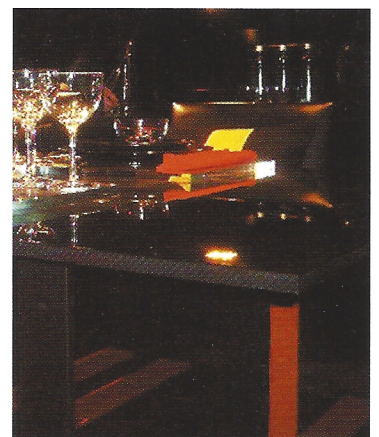
## Ralph Lauren furniture is high-tech

Ralph Lauren furniture ads bring to mind western cabins and cowboy artifacts, but Lauren also does modern. GMT has supplied carbon composite tabletops and credenza frames for his designs, which are some of the most high-tech furniture on the market.

The Polo dining table features a 102" x 42" top of cored carbon laminate that's just 5/8" thick; top and bottom faces reveal the distinctive carbon fiber twill that's a signature of high technology.

This thin tabletop can support a 300 lb load; that's a pretty heavy meal. The matching 70" long credenza features a GMT cored-carbon laminate panel in a single, continuous piece. This encloses black-painted oak cabinetry.

The coring in both is engineered for sturdy yet virtually invisible connections. The solution is unique and the overall appearance striking, a demonstration of the versatility of our materials.



## GMT Sea Stairs beat jumping ashore

Going ashore can be risky when tides change your leaping angle to the quay. Passerelle/boarding systems for big motoryachts have complex and heavy hydraulics. We've created an alternative.

Our Sea Stairs articulate to account for the tide. They're custom built, allow for wheelchairs or shopping carts, and can extend as required. The stair shown here is 109" long, 20.5" wide and

weighs just 60 lb, light enough to be suspended by halyard; no hydraulics needed. An aluminum stair would be nearly twice as heavy, hard to maneuver, and take more crew to rig.





New boom leads to new GMT mast.



The Bermuda Sloop Foundation's *Spirit of Bermuda* under sail with GMT carbon composite rudder.

Photo: John Wadson

## New boom and mast for Beneteau

Jeremy Anwyl, a well-known dot-com owner, last year switched to a GMT boom for his Beneteau 57. He liked the boom and our service so much he ordered a carbon furling mast for improved sailing performance, comfort and peace of mind. Our furling masts are great for handling large mainsails and making cruising easier, more fun and more comfortable.

## Training vessel steers right

The sail-training vessel *Spirit of Bermuda*, an 112-foot replica of an 1830's schooner, uses a carbon composite rudder and rudder post engineered and built by GMT Composites. The reasons for employing this newer technology in a replica were to take weight out of the stern and to increase the safety factor of the steering system.

The *Spirit of Bermuda* was commissioned by the Bermuda Sloop Foundation to teach both teamwork and academic and trade skills to the young people of

Bermuda. The schooner's rudder development and construction were easily accomplished. GMT has been building rudder blades

and stocks for many years, often for yachts that have required much more extreme shapes and weight-savings.

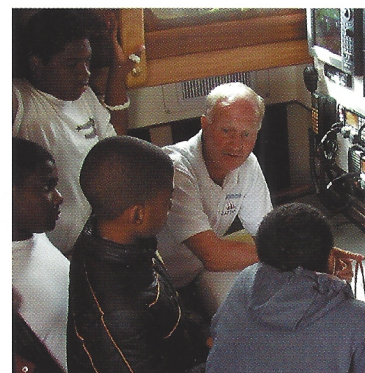


Photo: Candy Ray



Lightweight high-strength masts, booms, poles, struts, and composite structures for marine and industrial applications.

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## Asymmetric sprits for easier sailing

Owners of two J-44's, *Brown Eyed Girl* and *Maxine*, have come to us recently for bowsprits. Both wanted to carry asymmetric chutes in order to reduce the number of crew needed for racing or cruising. We expect the rest of this popular class to switch over too when they see the first two J-44's in action.

We kept the entire system clear of the bow hatch to allow for setting a regular spinnaker and using the forehatch for take-downs.

GMT did a similar job at a

larger scale for *Patient Falcon*, a 95-foot megayacht. In addition to the engineering requirements of this larger rig, our sprit's place-

ment, attachments and aesthetics all played a part in providing a workable system for using asymmetric headsails.



Photo: Billy Black