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# MULTIHULLS

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**A MULTIHULLS  
EXCLUSIVE**

# 500 Miles Under the Kite

*An Epic Voyage from St. Maarten in the Caribbean to Still Pond at the top of the Chesapeake Bay by three men on a 50-foot trimaran that had lost her mast during the first 20 minutes of the Heineken Regatta.*

By Charles K. Chiodi

*In collaboration with David Culp and Dean Jordan*

"Rex, go fly a kite!"

No, this order didn't come from a disgruntled Mrs. Conn, talking to her husband. It came from Dave Culp sitting with his partner, Dean Jordan, in the conference room at MULTIHULLS Magazine the day after their kite-flying presentation to members of the New England Multihull Association. They were lamenting the fact that Rex Conn had to leave his racing trimaran, *Alacrity*, in St. Maarten after the carbon-fiber wing mast came crushing down. The boom hit David on the back of his head, sending him to the local hospital. He was still wearing the battle scars, while we were deliberating the fate of the boat.

"I was impressed with your presentation last night,

Dave," I said with genuine enthusiasm. "If your kites are really as good as you say they are, would you stick out your neck and bring the tri home under kite power?" He looked at Dean, and his wide smile made his face light up. I knew the answer right there and then, but Dave was cautious:

"Yes, we would," indicating an unspoken agreement between the two men, "but it is really up to Rex, the owner of the boat, to decide."

"Call him. Tell him to go and fly a kite," as I handed Dave the phone.

The answer was a definite "Yes!" Rex was all for it. Now it was just a matter of waiting for the right wind



directions for this epic voyage that had never been attempted before.

David Culp's Kiteship Company has been producing kites for racing boats since the late 1970s, primarily to replace hard-to-handle spinnakers. With this new adventure, an entirely new – and much larger – market opened up: emergency power! Just think of the possibilities for sailboats that get dismasted or powerboats that lose engines, run out of, or take on, bad fuel, etc... and they are far offshore. Now the crew can unpack a bag and launch a kite that will bring the vessel home. But now, I am putting the cart before the horse, so let me go back to the beginning of this story.

Rex Conn, a Maryland businessman bought the original *Bird*, a 50-foot Newick-designed high-performance racing trimaran. A boat we classify as "very slippery." He renamed her *Alacrity* and brought her home to his private dock on Still Pond, at the northern end of the Chesapeake Bay. Being a competitive soul, he entered her in the St. Maarten Heineken Regatta, in another race in Antigua and, eventually, was planning to sail her to Plymouth, England, to enter this year's Transat. He was excited and pumped up when he called Dave Culp:

"I need a kite to replace my spinnaker and gain some advantage against my competitors." It is a known fact that kites have anywhere between 10-30% more pulling power than similar size spinnakers, and they are legal to fly. In January he bought a 2,000-square-foot "OutLeader" kite for his boat.

"What alterations do I need to make to my deck layout?" – asked Conn.

"None," was the simple answer from Culp. "As long as you have some strongly reinforced points to attach turning blocks on the deck, that's all we need." *Alacrity* had that and no alterations were needed at all.

"I'll pay your expenses," Conn said, "if you and Dean would come down to either Florida, or even better, to St. Maarten,

and tutor me in the use of the kite." What he failed to mention was that D&D (Dave and Dean) would become the crew for the Heineken Regatta, a high-caliber international competition they were not prepared for. Neither of them ever raced on a large multihull in a high-profile race, such as the Heineken. They may never want to again!

Within 20 minutes of the start, as *Alacrity* was rounding the first mark and sprinting to about 20 knots, the spreaders failed and the mast came crashing down. The boom drove Dave's face into the primary winch narrowly missing the winch handle which could have been fatal. As it turned out, the cockpit was smeared with a lot of blood and Dave was rushed to the local hospital. Rex' hopes for winning this regatta and entering the Transat came to a screeching halt as they were trying to keep the mast from banging a hole into the hulls. Finally, they had to cut away the nearly \$200,000 rig and let it sink in 60 feet of water.

In the meantime Dave Culp claimed that he was just fine, not realizing the extent of the damage to his face. He was rushed by rescue craft to the local hospital in Phillipsburg, where his face was sewn back together in a 3-hour-long operation. A full-head X-ray revealed no serious damage, no broken nose, just surface lacerations and a chipped tooth. Both eyes were still in alignment, a real concern by the medical staff. They didn't want to release him too soon, but he wanted to go back to the boat.

"We need your ID. Where is it?"

"On the boat."

"What kind of insurance do you have?"

"It's an HMO in California."

"Where do you live now?"

"On a boat in the harbor."

"A transient boat?"

"Yes."

"Wait here, please." Culp had to sign a contract (in



Disaster struck at the first mark, 20 minutes into the race



The short stub of the mast is extended by the boom, secured with lashings and duct tape.



that he will pay the bill (or give away his first-born son, if he was delirious). He just wanted to get back to the boat and lay down. His head was spinning. He asked for directions:

"How can I get back to the harbor and onto my boat?"

"You can call a taxi."

"My wallet, my ID and my money was left on the boat when I was rushed here."

"Oh, okay. You can take the bus."

"Is the bus free?"

"No, you have to pay a fare."

"Can I walk back to the harbor, then?"

"No, not in your condition. You may have suffered a concussion, and the distance is more than four miles over the hills." With a head full of white bandages, enough to scare all the children on the streets, what were the chances to hitch a ride from a stranger? Probably nil.

"OK, then, really, how can I get back to the boat?"

"You can call a taxi." Uh... huh... right!

Thanks. Eventually, a total stranger in the hospital hallway took pity on Culp and offered him a ride to the harbor. He failed to ask for the good Samaritan's name, but remembers that she was an American school teacher in her 40s whose husband is an engineer. They have a monohull.

Back at the farm... er... the yacht club, Culp became an instant hero and celebrity and won a magnum of Heineken beer as a prize for "Best Face Makeup."

The irony of it all is, that in 26 years of designing, building and sailing kite-powered sailboats – many grossly overpowered – boats falling apart, hulls flying, etc. Culp's first-ever injury – narrowly escaping a deadly outcome – happened on a sailing vessel, by a conventional rig fall-



*Dave Culp*  
(photo by Bob Grieser  
Outsidetimages.com)

ing on his head.

"In this sport, you can just never tell where the next excitement will come from."

My suggestion of jury-rigging this big trimaran as if the dismasting had happened in mid-ocean, then try to kite-sail/motor the boat home to simulate self-rescue with kites – found sympathetic ears.

The original plan was to kite-sail the boat up toward Puerto Rico, then aim for Fort Lauderdale in Florida. Rex suggested to delay the voyage until the end of April when the prevailing winds would be more favorable for a rhumb line to the eastern coast of the United States. The farther north they can sail, the closer to home they could bring the trimaran. "Still Pond, here we come!"

David Culp and Dean Jordan flew to St. Maarten on April 25 to meet up with Rex Conn and, in the course of two days, they built a jury rig from the 14' stub of the mast and the 19-foot-long boom that they lashed to it. They used duct tape and Spectra lines to hold the spars together.



*The real Dave Culp • Partner Dean Jordan • Skipper Rex Conn*  
Photos by Charles K Chiodi Photo by Dean Jordan

The "power" consisted of their 450, 1000 and 2000 sq. ft. "OutLeader" design kites.

April 28 dawned with just the right wind from the right direction for *Alacrity* to begin her epic voyage north. Sailing went well for the kites, but not the crew. They were seasick and despite their condition, had to hand-steer, because the autopilot was not just sick, but dead. The two



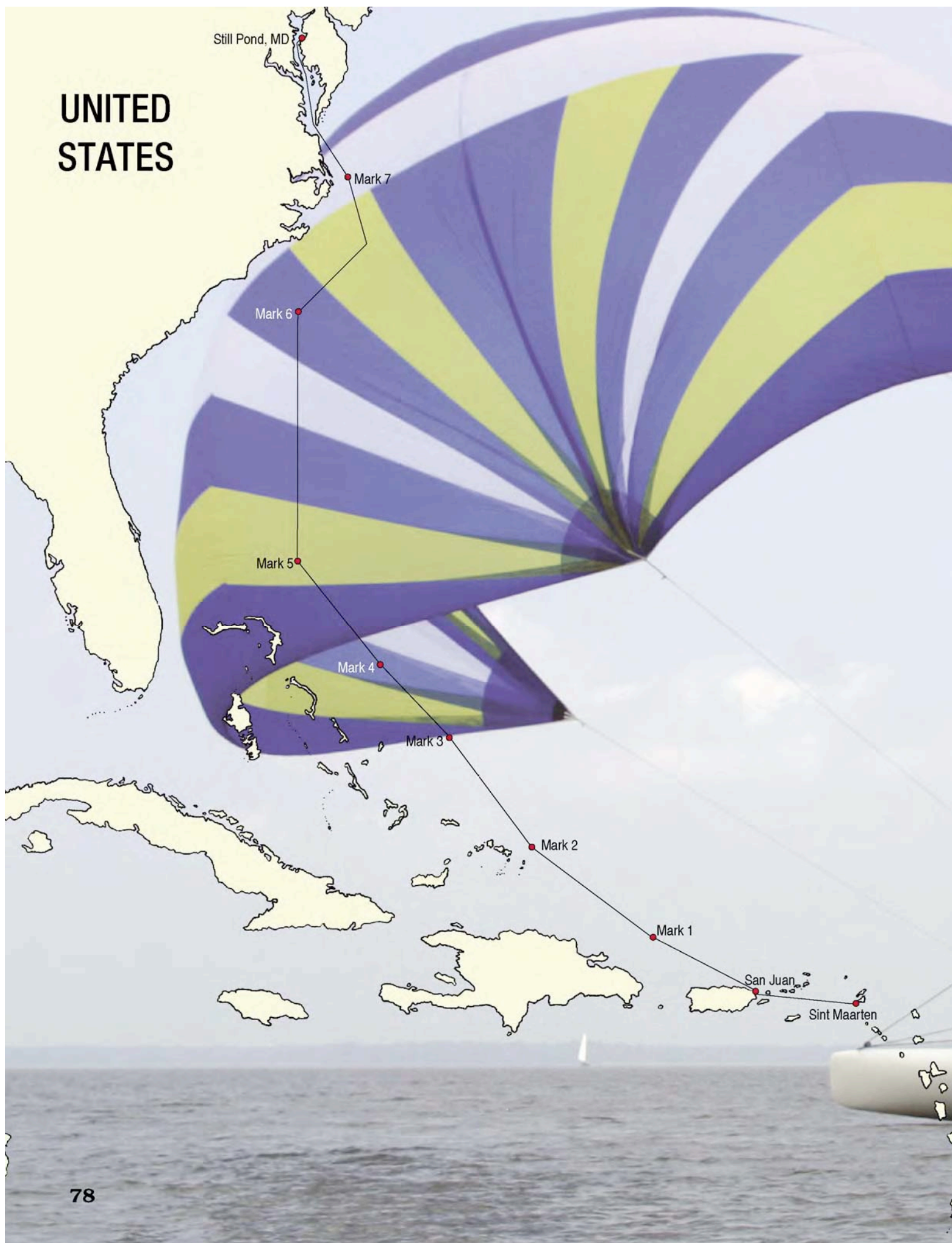
*The higher the center point  
of the kite, the easier it is to  
launch it*



*At first it looks  
like a big bra*



# UNITED STATES





### The Weather:

The crew used a weather routing service, specifically to avoid storms and adverse winds. There were no storms; most days were partly cloudy, winds were typical trades for the first few days. Two days out of Fajardo there was a low-pressure area passing to the north of Alacrity; resulting in beam- and head-winds. The last 5-6 days of the trip were typical of the mid-Atlantic states: spring weather; sunny with light winds.

### Flying a kite vs. motoring:

At times when they could not fly the kite, they were motoring. They did not motor-sail, except for short periods during kite launch/take down. Any time when there was sufficient wind to launch, they could sail faster than the highest motoring speed *Alacrity* can muster — even with the little 1000 ft<sup>2</sup> kite.

Date.....	Time .....	Location .....	Wind .....	Boat speed/Course (mag)
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4/28 .....	1630 .....	Leave Simpson Bay, St. Maarten .....	18-20 ESE .....	8.5.....W 275°
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(18° 02' N, 63° 06' W) Winds are great for kite-sailing; seas 8-10'. Crew is seasick.

4/29 .....	0630 .....	Arrive Charlotte Amalie, St. Thomas .....	10 ESE .....	8.2
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(18° 21' N, 64° 56' W) — 106 n.m. Spent entire day looking for autopilot mechanic, no luck at all. It is Carnival time, no one is working.

4/30 .....	1100 .....	Leave Charlotte Amalie, St. Thomas .....	15 ESE .....	8.2.....WSW 260°
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(18° 21' N, 64° 56' W) Great day for kite-sailing for 3-4 hours, speeds to 22-25 kts. Seas 5-6'

4/30 .....	1700 .....	Arrive Fajardo, Puerto Rico .....	15 ESE .....	8.2.....
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(17° 58' N, 65° 57' W) — 63 n.m. Try again for autopilot mechanic, again no luck on a Friday night. On Sunday they buy a new autopilot from West Marine (one of few marine businesses open on weekend), spend afternoon installing it.

5/3 .....	0730 .....	Leave Fajardo, Puerto Rico .....	12 E .....	8.2.....NW 317°
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(17° 58' N, 65° 57' W) Course is forward of abeam (apparent), no kite-sailing in the morning. Wind shifts aft later in day, acceptable for kite sailing. The 1000 ft<sup>2</sup> kite provides speeds to 12-14; little surfing. Apparent course is about 100°; heavyweight kite has hard time holding course. "Wish we'd brought a lightweight kite, were concerned about launching our 2000 sf in light, variable wind. We should have, later it flew perfectly!" — Dave Culp.

5/4 .....	0600 .....	19° 51' N, 68° 12' W — Mark 1, 171 n.m. ....	10-12 E .....	8.1 .....
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Mark 1 ..... Wind shifts forward of beam again, no kite-sailing for two days. Useful kite course would have taken them to the Bahamas or Abacos, but skipper wanted to make Cape Hatteras on minimal fuel.

5/5 .....	0600 .....	21° 56' N, 70° 57' W — Mark 2, 198 n.m. ....	10 S .....	8.3.....NW 320°
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Mark 2

5/6 .....	0600 .....	24° 24' N, 72° 33' W — Mark 3, 172 n.m. ....	8 NE .....	6.1 .....
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Mark 3 ..... Wind shifts aft again, but too light (apparent) for kite sailing. Remains either light or on nose for three days.

5/7 .....	0600 .....	25° 53' N, 74° 32' W — Mark 4, 139 n.m. ....	12 E .....	6.7 .....
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Mark 4

5/8 .....	0600 .....	28° 08' N, 75° 55' N — Mark 5, 154 n.m. ....	2-3 NE .....	6.7 .....
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Mark 5

5/9 .....	0600 .....	30° 50' N, 76° 31' W — Mark 6, 70 n.m. ....	5 SW .....	7.0 .....
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Mark 6 ..... They had a brief, 2-hour broad reaching with 10 kts of true wind in the afternoon. With the 2000 ft<sup>2</sup> kite the boat immediately accelerated to 80% of wind speed during launching. It is very difficult to kite-sail. Several launches were necessary, boat speed was up to 10 kts. Wind later went light and stayed light all the way into Beaufort, NC.

5/10 .....	0600 .....	33° 35' N, 76° 45' W — Mark 7, 67 n.m. ....	6 SW .....	6.4.....NNE 015°
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Mark 7

5/10 .....	1630 .....	Arrive Beaufort, NC .....	6 SW .....	6.2
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(35° 54' N, 76° 44' W) — 139 n.m.

5/11 .....	0930 .....	Leave Beaufort, NC .....	6 S .....	8.3.....ENE 064°
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(35° 54' N, 76° 44' W) Wind is aft, at nearly boat speed; < 2 kts wind across the deck for next two days.

5/12 .....	0600 .....	36° 16' N, 75° 30' W — Mark 8, 64 n.m. ....	6-8 SW .....	8.4.....NNW 342°
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Mark 8

5/12 .....	1700 .....	Arrive at Still Pond, Worton, MD .....	10 S .....	8.4
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(37° 37' N, 76° 09' W) — 88 n.m.

**TOTAL DISTANCE:** 1361 n.m. • **TOTAL TRAVEL TIME:** 9.5 days • **TOTAL TIME IN PORT** 4.5 days.

**TOTAL FUEL USED** 97 gallons. **KITES:** 1000 ft<sup>2</sup> and 2000 ft<sup>2</sup> used for a total of approximately 500 miles.



days spent in St. Thomas trying to find a repairman were wasted, for not much after leaving the island, the autopilot failed again.

Kite-sailing conditions to Puerto Rico were ideal: the winds were 12-15 knots from 155-165°, seas 6-7 feet occasionally breaking. Normally, under the same conditions, *Alacrity* would be sailing with a 1,000 ft<sup>2</sup> mainsail and a 2,000 ft<sup>2</sup> asymmetrical spinnaker. The 1,000 ft<sup>2</sup> OutLeader kite provided the same 12- to 15-knot boat speed until that evening, when the winds went light, and then died. In the morning they came back at 6-10 knots, directly on the nose.

Three days were wasted in Puerto Rico while trying to find an autopilot repairman, to no avail. Finally Rex drove to the local West Marine and purchased a smaller, tiller-mounted unit that seemed adequate for the rest of the voyage.

May 3. Decision is made to sail ENE with the 1,000 ft<sup>2</sup> kite aiming for Cape Hatteras. The distance to home port is a thousand miles shorter. On that course the boat was sailing on a beam reach, the apparent wind, about 10-12 knots well forward of the beam. The weather forecasters promised that the wind would clock aft within 12-18 hours. It did, and increased to 12-15 knots. Under the kite, *Alacrity* was doing about wind speed and often surfed to 20-22 knots, and once to 25.

According to Rex, the kite-sailing average speed with this \$3,800 unit was a knot, maybe a knot-and-a-half below what he could achieve – under same weather and sea conditions – with his full rig that cost nearly \$200,000 and nearly three times the sail area. However, sailing with the conventional rig was easier because a fast, “slippery” boat like *Alacrity*, requires close coordination between helmsman and kite trimmers. The priority is to maintain

apparent wind velocity, not direction. A slower, or a less performance-oriented boat would not be as sensitive and demanding on the helmsman.

Every good thing comes to an end, sooner or later. For two days the winds were light, and on the nose. Correcting course for kite sailing would lead to the Abacos. Wrong destination. Even when the wind clocked aft, it stayed below 6 knots, not enough for sustaining the kite.

Three days of motoring depleted the fuel supply and it became evident that the diesel fuel will not be enough to reach North Carolina, or any mainland port where refueling could be done. The closest port would be the Abacos, 400 miles in the wrong direction. The trio decided to press on and hope for wind.

Finally, the wind came up at 160°, albeit at less than 10 knots. Launching the 2,000 ft<sup>2</sup> kite is difficult on a short stick, but it flew well and the boat was moving again – silently!

This was the first time this kite had seen wind... fresh out of the bag. This pure racing trimaran is so slippery, that it accelerates to 70-80% of the wind speed while deploying the kite, even before the kite is filled with air. That makes the maneuver rather tricky and precise coordination between the trimmers and helmsman is needed.

The marginal, but successful launching in 3 knots of apparent wind pleased everyone on board. Flying it on short lines, it generated 7-8 knots of boat speed.

The marginal condition causes the kite to “squid” – a condition where it collapses and streams, even if dropped into the water – as a squid. It won’t hold water, and is easy to recover even if it ends up under the boat.

*all photographs by Charles K Chiodi, unless otherwise indicated*

*Even if the kite hits the water during launching, it is not a problem*



*As soon as the kite is airborne, it starts pulling the boat.*





After eight days of non-stop kite-sailing and motoring, *Alacrity* arrived in Beaufort, North Carolina. The infamous Cape Hatteras was never so calm and was dubbed Lake Hatteras as they rounded the point and aimed the bows toward Still Pond, at the northernmost end of the Chesapeake Bay. It would take another 30 hours to tie *Alacrity* to her dock.

It was not only a drastic measure to bring home this wounded bird (she looks like a bird which, by the way, was her original name), but a challenge for her crew as well. It has now been proven that kite-sailing is not just for the racing skippers anymore. It can be a serious emergency power that lives in a bag in some locker until needed. Or, it can work as a powerful spinnaker replacement – without the spinnaker problems – that cruising sailors all try to avoid.

One advantage comes to my mind immediately: while spinnakers were blamed in a few diagonal capsizes/pitch-polings, it could never happen when flying a kite, for it does not cause a heeling or a pitching moment, rather a lifting power which can be very positive help in certain sea conditions. By attaching control lines at different points, the bows can be kept up and high, preventing possible tripping in waves.

Speculating even further, I could see the day when a fishing boat or a trawler runs out of fuel, or encounters mechanical trouble well offshore, and will come back to shore under kite power. With constantly rising fuel prices I can envision a powerboat that has no mast, yet still takes advantage of the wind if it comes from the right direction and deploys a kite to save fuel and/or increase boat speed. It may be an odd sight to see a Hatteras or a Maryland or a Prowler on the end of a rope being pulled by a kite, but we can get used to it if it leaves a few hundred dollars (or even a thousand) in our pocket rather than at the gas dock.

It took old sailors years to get used to the sight of “pregnant sails” but now they accept the spinnakers. Marconi rigs were very unusual looking without the gaff sticking out from the top of the mast, but we got used to it. So, why not kites?

Indeed? Why not?

The following are some facts about kites and their manufacturer:

KiteShip

Dave Culp, President

[www.kiteship.com](http://www.kiteship.com)

#### **SIZES:**

**OutLeader Kites** are made to order any size from 40 m<sup>2</sup> - 500 m<sup>2</sup> (440 ft<sup>2</sup> - 5500 ft<sup>2</sup>) or are available from stock of

53 m<sup>2</sup> / 600 ft<sup>2</sup> • 72 m<sup>2</sup> / 780 ft<sup>2</sup>

92 m<sup>2</sup> / 1000 ft<sup>2</sup> • 186 m<sup>2</sup> / 2,000 ft<sup>2</sup>

Currently under bidding is a 13,000 ft<sup>2</sup> kite to power a 300-foot, 2500-ton ship.

#### **MATERIAL:**

**OutLeader Kites** are built of AirX nylon spinnaker fabric, made by Bainbridge. The weights used are from AirX 500 (3.8 oz) to AirX 900 (1.5 oz).

#### **ALTITUDES:**

**OutLeader Kites** are normally flown between 50-150 feet up in the air where the “average” wind speed is 115-130% higher than at the surface. As wind power varies with the square of velocity, this means that there is 23-70% more energy available where these kites fly than for conventional spinnakers of identical size.

#### **TACTICS:**

**OutLeader Kites** are often “swooped,” or flown in zig-zag patterns through the air. This causes them to fly often at 150-200% of boat speed. This multiplies the apparent wind at the kite leading to 200-400% increase in available energy. This is like a windmill's blade extracting energy proportionate to its swept area rather than its blade area.

#### **THE PROOF:**

**OutLeader Kites** will yield 10-30% greater boat speed, depending on conditions and the “slipperiness” of the boat. It is very difficult to compare loads between spinnakers and kites as there is very little data available regarding specific loads at specific wind speeds at the mounting points of conventional spinnakers.

#### **AMERICA'S CUP**

**OutLeader Kites** were carefully tested in a two-boat comparison sailing, conducted by Oracle BMW Racing when evaluating these kites for the America's Cup challenge. It was determined that a kite with 30% less area than the stock spinnaker on identical J-105 monohulls yielded 3-4 second/mile advantage over a wide range of wind speeds.



OutLeader Kites are attached to the deck, there is no flying load taken to the mast or the rigging at all. Because of this, there is no heeling moment imparted to the boat and, perhaps more importantly, no pitching moment. When over-powered, kites offer no "bow burying" or diving force of any sort. They do not promote broaching, rounding up (or down) or spin-out. The kite's lines can be taken to any point on the boat's structure, for instance to promote bow-up, bow-down or dead level sailing, even in extreme conditions. The attachment points can be readily adjusted when underway, at any time.

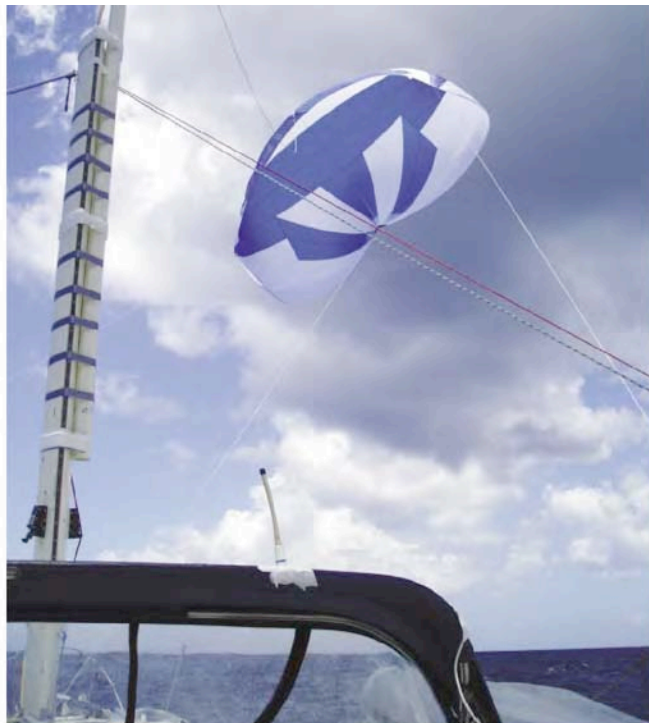
OutLeader kites were scrupulously developed under the guidance of official America's Cup measurers to be rule-legal "spinnakers" under ISAF regulations and definitions. The kites have the same number of control lines attached in the same manner, and are designed and built to specifications and ratios necessary to be spinnakers, even though they fly free from the boat's spars and structure, as free-flying kites, and not sails at all. OutLeader kites are the first kites ever. They have no spars, no battens, no inflated or ram air chambers, no holes or apertures, no foam or rigid, or semi-rigid parts of any kind. They are built of standard spinnaker nylon, weigh no more than standard spinnakers, and require nothing on the boat in order to fly, beyond typically existing winches, sheets and turning blocks. Kites fly best with lightweight sheets, of over-long lengths. They can be easily repaired, if needed, by any sailmaker to ordinary spinnaker standards.

OutLeader kites need no "commitment" from adopting boat owners beyond the price of one sail. They require no alteration to the boat, little specialized training by the crew and have no additional or "hidden" costs. There is no comparable way to achieve the kinds of performance gains possible with these kites, without major alterations to the boat.

To date, one PHRF board has officially rated OutLeader kites for the Single- and Double-handed Farallones races, and offered to rate the kite for the Single-handed TransPac race. KiteShip is working with customers to gain ratings from ORCA, additional PHRF and other ratings bodies.

*Renowned multihull designer, Ian Farrier, has this to say: "Having looked at the kites, and heard the favorable reports, I am happy to endorse them for use on my designs at the owners discretion. I think they may have potential, particularly for longer offshore passages, and even possibly for righting a boat, and the time to experiment is now."*

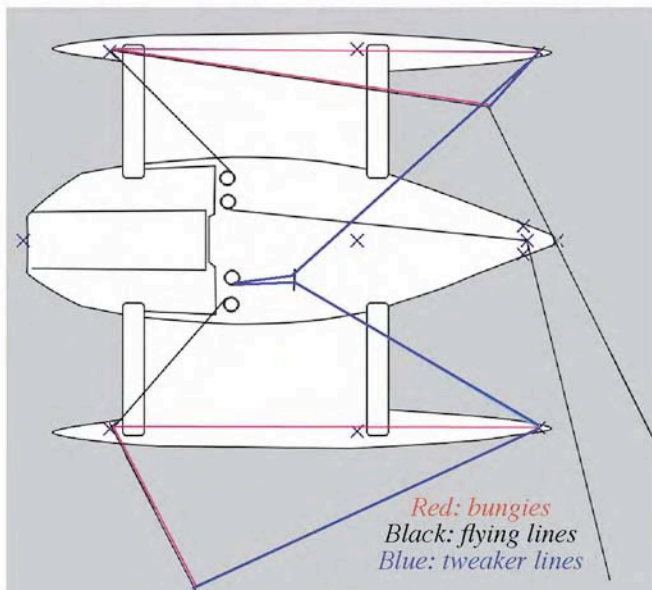
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*The 1,000 ft<sup>2</sup> kite pulling Alacrity nicely*



*Life at sea: Rex Conn and David Culp in the cockpit*



*Lines on a typical Farrier trimaran*