

## No Stone Unturned

**Refits:** Before embarking on a non-stop record attempt for a solo circumnavigation, the 40-foot *GryphonSolo2* got the once over from the top of the mast to the tip of the ballast bulb.

By Joe Harris



I purchased my Akilaria RC2, *GryphonSolo2*, in spring 2011 with the intent of racing it around the world in the Global Ocean Race. Unfortunately, the GOR, which ran twice, will not run again, so I was left in fall 2014 with no race to enter and a boat for the most part ready to go. I decided to take matters into my own hands and race around the world solo against the clock, in an attempt to better the World Sailing Speed Record Council benchmark for an unassisted nonstop solo passage

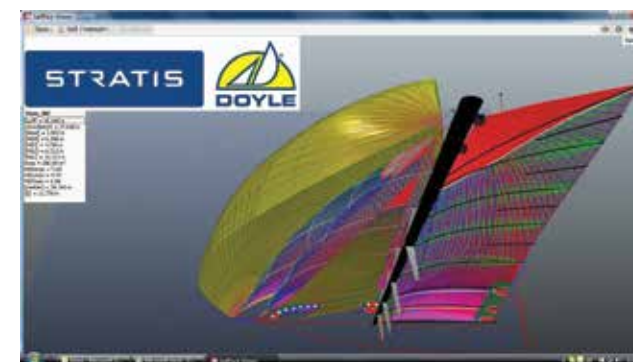
*The Class 40 yacht GryphonSolo2 was designed and built to be sailed by a solo sailor in big wind and boisterous seas.*

aboard a yacht 40 feet or shorter (see “Men of Moxie,” November 2015). The current record of 137 days was set in 2013 by Chinese sailor Guo Chuan in an exact sister ship to my Class 40 racer, so it will be interesting to see if I can better his mark sailing virtually the same boat on a voyage of roughly 27,000 nautical miles.

While I had a relatively new boat, it had amassed four seasons of hard racing; it was time for a serious look at every part and component to be sure it was up to the challenge of the round-the-world passage, particularly in the punishing Southern Ocean. I began

with the keel and the mast. *GS2* came out of the water in October 2015 at the Maine Yacht Center in Portland, Maine, and was moved inside, next to three other Class 40s and an Open 60. (We were in good company.) Brian Harris, MYC’s general manager, is a former Open 60 *preparateur* (French for “project manager”) and worked with me on my previous boat, an Open 50 called *GryphonSolo*. Brian is well-versed in the needs of these ocean thoroughbreds and is the go-to guy in America in the French-dominated world of open boats and Class 40s.

First up was the keel. The keel fin is



*The first and probably most important part of the refit was making sure the 10-foot-long fin keel was strong and secure. The fin is attached to the boat with a mortise-and-tenon joint that goes up into the center of the boat, with an accompanying flange that’s affixed to the hull with a series of keel bolts (top left). At the other end of the fin is the substantial ballast bulb, which adds a lot of torque when we’re underway (top right). It took two tries to make everything right, but once it was, it was time for the bottom paint (left). Doyle Sails built my new sail inventory, and this computer rendering shows the quiver of headsails and the powerful, square-top mainsail (bottom right).*

attached to the boat with a mortise-and-tenon joint going up into the center of the boat, as well as a flange that’s affixed to the bottom of the hull with eight large bolts. The fin also has a substantial ballast bulb and a draft of 10 feet, so there is considerable torque on the keel and the hull under sail. The top of the fin inserts into an opening that’s a near-perfect fit but has enough room to pour in an epoxylike material called Chockfast, which is designed to fill any open space in the keel box so there’s no wiggle room for the top of the fin.

If this operation is not done perfectly,

the keel can begin to move around and eventually come loose — not good! So we needed to remove the keel from the boat, clean up the keel box, inspect for any issues, reinstall the keel in perfect fore-and-aft alignment athwartships, and insure against any movement in the keel box with the Chockfast. Because of chilly weather that prevented the easy flow of the Chockfast, it took two tries to get it right, but the keel is now secure.

The next project was the mast, a black carbon-fiber rig built by Lorima, in France, that was finished with a clear coat that had been diminished by the sun’s rays. The spar was unstepped;

all the rod rigging and fittings were removed, thoroughly sanded and inspected; and then it was repainted with a flat black paint that had more UV protection in it. We ordered new Navtec standing rod rigging, as well as a new composite forestay and running backstays and checkstays from Future Fibres. We also removed all the Harken winches and Spinlock jammers for service and/or replacement.

Next came the sails. The boat had its original inventory of about 10 sails built by North Sails France, which does a lot of work with the mostly French-based Class 40s. As I required

BILLY BLACK

COURTESY OF JOE HARRIS, DOYLE SAILS



Plentiful fresh water is a necessity for every offshore sailor, including solo ones. With that in mind, I replaced my old water tank with a new 12-gallon tank, and installed a Katadyn watermaker as well (left). This tank may seem small for most cruisers, but was based on the premise that it will be replenished daily. My carbon-fiber rig was also given a complete overhaul (right). The mast was unstepped, all its hardware and rod rigging were removed and either replaced or serviced, and then it was painted with a flat-black paint with plenty of UV protection.

an entirely new suite of sails purpose-built for a nonstop circumnavigation, I turned to Doyle Sailmakers, which had supplied sails for my previous boats. Doyle had made inroads with the U.S. Class 40 fleet, and Mark Washeim from Doyle Sails Long Island was keen on the challenge of building sails that would be strong, fast and durable.

Working with Mark and his design

storm jib. The mainsail, with four reefs, negates the need for a storm trysail. All the sails came out very well, although the solent and staysail were a bit big initially and had to be re-cut. The Stratis carbon/Technora fabric used in the primary sails is very strong, and the leeches have been reinforced to prevent damage from flogging when reefing or striking over the long haul.

### I DECIDED TO TAKE MATTERS INTO MY OWN HANDS AND RACE AROUND THE WORLD SOLO AGAINST THE CLOCK. THE BOAT WAS RELATIVELY NEW BUT HAD AMASSED FOUR SEASONS OF HARD RACING; IT WAS TIME FOR A SERIOUS LOOK AT EVERY PART AND COMPONENT TO BE SURE IT WAS UP TO THE CHALLENGE OF A 27,000-NAUTICAL-MILE PASSAGE, PARTICULARLY IN THE SOUTHERN OCEAN.

team in New Zealand, we came up with the following package: a Stratis square-top mainsail, solent and staysail; an A2 asymmetric running kite in a sock; a masthead furling code zero; and a furling A5 asymmetric multipurpose reaching sail. I kept my old A6 heavy-air kite, No. 4 heavy-weather jib and

The next goals were to upgrade the fuel- and water-tank capacity for the expected 130-day journey, so we removed the old tanks and installed a 22-gallon diesel tank and a 12-gallon water tank. These probably seem small to most offshore sailors, but their size was based on the premise that the

water tank will be replenished daily with a Katadyn watermaker. Also, the batteries won't require frequent charging via the engine alternator thanks to the addition of alternative energy sources, including two Watt & Sea hydro-generators hung off the transom and an array of solar panels mounted on the cabin top.

On a sunny day, the solar panels will generate around 10 amps and the hydro-generator can supply over 20 amps when the boat is sailing at better than 8 knots. Between these two power sources, as long as it's either sunny or the wind is fresh and we're going reasonably fast, the boat can be run without fossil fuels almost indefinitely. If it's cloudy and windless, I'll have to start the three-cylinder, 27-horsepower Nanni engine and charge the batteries at 1,500 rpm for at least two hours daily; I'll also conserve energy by shutting off all inessential appliances, like the computer. Hopefully my 22-gallon tank (plus a pair of five-gallon jerry jugs lashed on deck) will provide about 64 hours of charging time at a half-gallon of fuel per hour. Three new 105-amp-hour batteries

COURTESY OF JOE HARRIS



The sailmakers at Doyle Sails Long Island were kept busy building a new inventory that included five new headsails and kites along with a new mainsail (left). The steering system was the last big job to tackle. First, the twin rudders (right) and bearings were removed, cleaned and serviced. A laser was used for the reinstallation to make sure they were lined up and matched perfectly. The correct rudder angles are critical for a high-performance boat like GryphonSolo2, as they make all the difference in how the boat steers and reacts.

and a backup watermaker will increase the reliability and redundancy of the energy and water systems.

Next we addressed the B&G autopilots and instruments, which are critical to a solo sailor. I purchased a new autopilot ram and had one rebuilt, and added a second KVH gyrocompass to the one I already own. I now have two identical, redundant autopilot systems so if one goes down, I can easily switch to the other. I also worked with MYC to design and build an emergency stern wind wand in the event that the two wind instruments at the masthead are blown off or no longer functioning. Roughly 90 percent of the time, the autopilots are set to steer to a wind angle rather than a compass course, so having reliable, working wind instruments is critical to efficient self-steering.

For improved communications while offshore, I added an Iridium Open Port satellite communications system interfaced with two new Lenovo laptop computers. We installed the antenna dome below deck to reduce windage and wear and tear, and it seems to be working well despite having to transmit and receive through the fiberglass

COURTESY OF JOE HARRIS

deck. The new system will work side by side with my older, smaller Iridium satellite voice and data communication system in my ongoing effort to achieve redundancy and reliability over a very long passage. I also upgraded my Adrena navigation and routing software, which allows me to download weather GRIB files and calculate the most advantageous routing course around the world. This system will work in conjunction with my B&G Zeus GPS and chart plotter, which is my core navigation system. My email service provider is UUPlus, which has worked well for me on past voyages.

I also have a new Sat-C unit for weather and shipping bulletins and emergency communications, a Sea-Me radar enhancer to allow other ships to better see my boat, and a YB tracker that will transmit my position every six hours so my family and others can follow the voyage on their computer screens back home.

Finally, for the steering system, MYC removed the twin rudders and bearings, cleaned and serviced everything, then reinstalled the blades using a laser to get them lined up and matched

perfectly. Having the rudder angle set properly makes a huge difference in how the boat steers and performs, so getting this right was a critical task.

We launched the boat last May, and I sailed extensively last summer in order to test all the new equipment and systems. Before setting forth — at press time, I was scheduled to leave in mid-November — I worked with Phip Hallowell and Brian Fisher at Rig Pro in Portsmouth, Rhode Island, to replace nearly all the lines on the boat and reduce chafe wherever possible. In my preparations, I tried hard to leave no stone unturned to give myself the best possible chance of making it around the world without a breakdown or major problem. But, of course, you never know what might happen offshore. Hopefully I will have the necessary spare parts and tools to fix any problems and stay in the record hunt. Wish me luck. I could use it!

*Joe Harris is an experienced offshore sailor and businessman based on Massachusetts' North Shore. To follow his round-the-world record attempt, visit his website ([gryphonsolo2.com](http://gryphonsolo2.com)).*