UBC SailBot team takes on the Atlantic Ocean

Having received a perfect score for their efforts in the 2013 International Robotic Sailing Regatta, members of the UBC SailBot team have set their sights on the Microtransat Challenge — a transatlantic race of fully autonomous sailing boats. The fact that not one entrant has yet completed the trip has only serves to strengthen the team's resolve. *BC Shipping News* caught up with Team Captain Kristoffer Vik Hansen to learn more about the challenge, more about the team, and most importantly, more about the need for your support.

The challenge

The idea of robotic sailboat challenges originated with UBC engineering student Erik Berzins in 2004 who invited students from a few engineering schools to Vancouver to demonstrate their newly built robotic boat. By 2006, the International Robotic Sailing Regatta (IRSR or SailBot) had been formed and teams from universities and colleges around the U.S. and Canada were stepping up to the challenge.

With rules in place to govern construction and operation, the basic concept is to build a two-metre long boat which can sail robotically by making its own onboard decisions about sail trim and course direction without human assistance. Teams are judged in five parts of the competition: Fleet Racing, Station Keeping, Navigation Contest, Presentation Challenge and Long Distance Race.

Photo courtesy UBC SailBot team

The International Robotic Sailing Regatta 2013 awards ceremony with the UBC SailBot competition team.

The UBC Sailbot Team has the smarts, the passion and the drive to meet the challenge of the Microtransat...However, they need your support...to fully realize the dream.

In 2012, the UBC Team took first place with a total score of 47 out of a possible 50, losing three marks during the fleet racing. In 2013, the UBC team earned a perfect score at the competition in Gloucester, Massachusetts — something never done in the history of the Sailbot Challenge. This June, the team will again compete in San Francisco at the California Maritime Academy.

About the same time SailBot was being established, Dr. Mark Neal of Aberystwyth University and Dr. Yves Briere of the Institut Supérieure de l'Aéronautique et de l'Espace in Tolouse, France, were developing the concept for the Microtransat Challenge. The challenge is a transatlantic race of fully autonomous sail boats. Since 2010, not one of the six teams who have tried the challenge has successfully completed the race. Indeed, none have made it even halfway and few have gone beyond four or five days of sailing before failing.

The rules are fairly straight-forward: no source of propulsion other than wind is permitted; the sailboat must not exceed four metres in waterline length; and must be fully and energetically autonomous (no operator control and must carry on board any required power). Launch sites are within prescribed longitude lines and teams are judged on how quickly the boat crosses the Atlantic. Teams can launch their boat at any time during a calendar year.

The team and the plan

Traditionally, all teams have launched their boats from Europe but the UBC SailBot team are planning to launch their boat from Newfoundland in the summer of 2015, estimating that it will take about two weeks to cross the Atlantic and land somewhere along the West Coast of Ireland.

With a team of about 45 students, mentor Don Martin (renown inventor of the Sip and Puff Sailboat used by Sam Sullivan and the Disabled Sailing Association) and advisors from engineering and design firms such as Robert Allan Ltd., STX Canada Marine, and Seaspan Shipyards, the UBC team began developing the plan for the 2015 race in 2013. Students fall into one of a number of sub-teams — mechanical, electronics, power, software and administration — and can spend anywhere between six and 15 hours per week depending on their responsibilities. Their goal is to finish the construction of the boat and the software program by December with trials and refinements done through the spring of 2015.

The boat

The design of the boat has a waterline of 3.9 metres with a 5.46-metre length overall and a 1.8-metre draft. The cedar hull is being built using a "cold molded" construction method which involves building a skeletal mould to define the shape, then bending thin layers of cedar strips over the mould and laminating them together, followed by a carbon fibre laminate to make a very stiff, light and strong hull structure.

While the Mechanical Team works on the hull, the Software team has been designing a path-finding algorithm prototype that navigates around simple obstacles to get to a destination. The software will have two main systems — the first is the low level control system which allows the boat to get from one point "on earth" to another; the second — key for crossing the Atlantic Ocean — is the route making system which will plan the route taking into account changing obstacles.

The boat will be equipped with such navigation aids as GPS and AIS as well as electronics for collecting weather data, wind sensors, and the ability to send information back to the team to allow for online tracking.

The need

The UBC Sailbot team has the smarts, the passion and the drive to meet the challenge of the Microtransat. Given their continual successes at the IRSR, it is widely recognized that they have the best chance of setting the world record as the first team to accomplish an autonomous sailing voyage across the Atlantic Ocean. However, they need your support — either through corporate sponsorships, personal donations or in-kind contributions — to fully realize the dream.

While labour may be free, materials and manufacturing are not. Tasked with developing an "innovative composite boat structure, a low power consumption electronics package, efficient software logic that includes obstacle avoidance, and a high-energy density battery system coupled with solar energy regeneration", sponsorships are key to ensuring the team has appropriate funding to make this venture a success.

The most compelling reason to sponsor? Think of how your company will benefit by being associated with the future of the marine engineering profession. This high-calibre bunch are setting global standards for research and innovation in fields like marine robotics, energy efficiency and composite materials – concepts that could potentially benefit government, military and industrial interests. And your name will be associated with them. Enough said.

For more information about sponsorships, check out the team's website at www.ubcsailbot.org or email Kristoffer Vik Hansen at captain@ubcsailbot.org to discuss your participation.

Go Team Go!

On behalf of* BC Shipping News, *best of luck to the UBC SailBot team...

Co-Captain Admin	Kristoffer Vik Hansen
Co-Captain Technical	Karry Ocean
Team Mentor	Don Martin
Mechanical	David Tiessen (Mechanical Lead) • Neil Dobie (Mechanical Lead / Keel) • Gabriel Lessard-Kragen (Deck and Hardware) • Alexander Kroitzsch (Rig) • Robert Gage (Rudder and Skeg) • Jian Lik Ng (Hull Interior) • Eric Wang (Hull Interior) •Jordan Wong (Hull Interior) • Madie Melcer (Keel) • Jacob Soleway (Hull Interior) • Matt Sullivan (Impact Mitigation) • Corey Monteith (Impact Mitigation) • Adrian Granchelli (Hull Shell) • Josh Hung (Rudder and Skeg) • Michael Schnetzler • Chris Bandy • Oleksiy Serdyuk • Brendan Sexton • Joakim Frimann-Dahl • Jeremy Wollin
Electronics	Tyler Jones (Electronics Lead) • Carley Schwartz (Sensor) • Ellinor Crux (Sensor) • Jamie Lee (Communication) • Rajat Dixit (Motor) • Tobias Kreykenbohm (Motor) • Tu Anh Le (Power)
Software	Josh Andrews (Software Lead) • Yasmeen Akbari (Route Making) • Rodrigo Blaustein (Route Making) • Arek Sredzki (GUI, Sailor) • Josh Baker (Control) • Daniel Kim (IO/Hardware) • Andrew Hollister (Control) • Bryan Luu (TB2013) • Eleanor Wong (GUI) • Alexey Indeev (Control) • Andrew Bowers (Control) • Kurtis Harms (GUI) • Gabriel Uribe (Route Making)
Health and Safety	Serena Ramley
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Treasurer	Alex Beacham
Social Media	Ivana Litaveez