WINGS
ACROSS THE WATER

Part I - Beginnings

GUILAIN GRENIER/HYDROPTÈRE

L'Hydroptère set the speed record for one nautical mile in November near Hyères, France.

DEVELOPMENT | From prototype to record-setting craft

A tale of imagination and engineering

The story of L'Hydroptère, a hydrofoil trimaran that is the fastest boat in the world, unfolds like a Hollywood blockbuster scripted by Frank Capra, directed by James Cameron, starring Jeremy Renner and studded with special effects by Industrial Light and Magic.

Alain Thébault had been dreaming of a boat that could fly since his childhood in Brittany. Capra was known for films in which people pursued implausible dreams and achieved them through dedication and hard work. Thébault fantasized about soaring from the sea to the clouds to escape his unhappy family situation. When he was a teenager, he was inspired by the exploits of the famed French seaman Eric Tabarly, who in 1980 had set a speed record for a trans-Atlantic crossing in a trimaran, the Paul Ricard. Thébault became Tabarly's attaché in the French Navy and later his protégé for what was to become the Hydroptère project.

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The filmmaker James Cameron conceived his record-breaking "Avatar" in the mid-1990s, but had to wait until technology was advanced enough to transform his vision into reality before he could make the movie. L'Hydroptère first "flew" in late 1994, but technology wasn't advanced enough for the boat to sustain the stresses of high-speed fly-sailing. Thébault also had to wait for more sophisticated computer simulations and the development of stronger composite materials to achieve his goal.

Like Thébault, the Oscar-nominated actor Jeremy Renner, looks younger than his years (Thébault is 48). Both are tough, tenacious, stubborn and self-confident. Both had been refining their craft (literal or figurative) for years before the limelight beckoned.

Industrial Light and Magic works its wonders in Hollywood. A long line of luminaries in French industry — Aérospatiale, Alstom, Dassault, EADS/Airbus, Matra, DCNS — have offered their assistance to the Hydroptère project over the years, and their insights have produced special effects that are all the more startling because there is no "magic" involved. A 6.5-ton boat actually does sail faster than the wind with only the tips of the foils, the rear tail unit and the rudder in contact with the water — a total area of two square meters, or 21.5 square feet.

Nevertheless, Thébault likes to call his creation a "flying carpet" rather than a boat. The name evokes the magical comebacks that he and the project have made over the years, in spite of technical, financial, personal and political setbacks.

The first prototype of L'Hydroptère, one-third the size of the current trimaran, capsized 12 times over the course of its development. L'Hydroptère was redesigned countless times and had three major structural breaks in which, fortunately, no one was injured. There have also been a number of capsizes due to traditional sailing incidents — and one caused by a collision with a sea turtle in 2005 (injuries to the turtle unknown).

L'Hydroptère's early sponsors dropped out for various reasons — changes in company strategy, economic retrenchment or simply a lack of patience in the face of early disappointments. Thierry Lombard, a managing partner of Lombard Odier Darier Hentsch & Cie, a Swiss private bank, stepped in to save the day in 2005. A lover of sailing, speed and challenge, he supported the project not only financially, but also intellectually by introducing it to the Ecole Polytechnique Fédérale de Lausanne. EPFL is today the "official scientific adviser" for Hydroptère and provides significant technological support to Thébault and his team.

Audemars Piguet, a Swiss watchmaker with a long connection with sailing, became a second principal partner in 2009. Today, Hydroptère maintains offices in Lausanne for research, Paris for management and La Trinité-sur-Mer on the Brittany coast for sea trials. For the moment, Hollywood will have to wait. ■

Milestones

1994: The first prototype of L'Hydroptère sails for the first time on Oct. 1
2005: On Feb. 9, L'Hydroptère crosses the English Channel in 34 minutes and 24 seconds, faster than did Louis Blériot's airplane in 1909
2006: Studies begin on two new boats, L'Hydroptère.ch and L'Hydroptère Maxi
2009: On Nov. 8, L'Hydroptère sets a new speed record: 50.17 knots average speed over one nautical mile

Faster than the wind, more like flying than sailing

The fastest sailboat in the world isn't a sailboat at all in the conventional sense of the word. L'Hydroptère doesn't look like a sailboat, doesn't move like one and doesn't have the same limitations of a water-bound vessel. It was named L'Hydroptère — which comes from the Greek words *hudor*, which means water, and *pteron*, or wing — because it doesn't skim through the water; it flies over it at speeds surpassing 50 knots per hour.

When L'Hydroptère broke the 50-knot barrier in September 2009, averaging 51.36 knots over 500 meters — or 59 miles per hour over 547 yards — off the coast of France, the event was akin to breaking the sound barrier in aviation or the four-minute mile for a runner.

The feat was no fluke; the boat did it again in November 2009, averaging 50.17 knots over one nautical mile (1.15 statute miles) and achieving a top speed of 55.5 knots. To put the November record in perspective, the craft was moving about twice as fast as the wind that propelled it.

Four years earlier, in February 2005, L'Hydroptère had beaten Louis Blériot's long-standing record for crossing the English Channel. His airplane had flown the distance in 37 minutes back in 1909; the trimaran did it in 34 minutes and 24 seconds.

Nothing about L'Hydroptère or its achievements is conventional or commonplace, starting with the man who named it back in 1987, a then-25-year-old Breton named Alain Thébault. Thébault is neither a trained engineer nor a naval architect, but for more than a quarter century he has led an international group of aeronautical engineers and technicians in the development of the flying trimaran.

The craft itself has been designed with the criteria and tools of an aircraft as much as a sailboat: aerodynamic lines, the use of sophisticated composite materials, state-of-the-art measurement systems and video imaging. The result is a 6.5-ton hydrofoil trimaran, 18 meters — or 59 feet — in length, with a 28-meter mast positioned on the central hull and two side floats attached by 24-meter carbon crossbeams. The "wings" are carbon and titanium foils that lift the floats right out of the water when the "bird" is in flight.

The Hydroptère enterprise employs several dozen engineers, technicians, designers and sailors in Switzerland and France.

This summer, the project's second boat, the 10.3-meter L'Hydroptère.ch, will be launched on Lake Geneva. Conceived as a laboratory craft, it is a floating and flying experimental platform for the planned L'Hydroptère Maxi, a massive 30-meter multihull craft that will be designed to carry a crew of 10 around the world in 40 days. If successful, the Maxi would better the existing round-the-world record by more than six days.

PROFILE | Alain Thébault

'I designed my boat for a dream, not to break a record'

HYDROPTÈRE

Alain Thébault, father of the L'Hydroptère.

Alain Thébault favors the color orange: it is bright, brash, passionate and decisive, like the man himself. Through the force of his orange-tinged determination, he has made the dream of a flying trimaran come true — and he did it without family wealth or connections or the access that a certain kind of formal education can facilitate in France.

Thébault was born in September 1962 in Le Guilvinec, a small seaside town in Brittany. His childhood would have been good fodder for a Dickens novel: an absentee father, a mother in and out of mental hospitals, a series of uncaring relatives who eventually left him in a boarding school and did not come to visit. Thébault recalls that he used to look out the window of his small institutional room and dream of escaping into the clouds framed by the casement.

Although he was a good student in math, Thébault left school at the age of 15. One of his teachers had described him as "very intelligent but unmanageable," Thébault recounts in his autobiography, "Pilote d'un rêve" ("Pilot of a Dream").

While at school, the restless student became a devoted windsurfer; he credits this passion with having kept him away from drugs. He decided to enroll in the National Sailing School at Quiberon, with the idea of becoming a sailing instructor. To pay for his sailing lessons, he took work where he could find it, including a job aboard the Pen-Duick III, a boat belonging to Eric Tabarly, a record-setting distance sailor.

Tabarly was already a mythic name for Thébault, and the young man hoped that he might meet the legend through his boat. Despite more than 27,000 nautical miles sailing on the Pen-Duick III, he never had the opportunity, but he vowed to himself that he would one day sail beside Tabarly.

That happened in 1984. Four years earlier, Eric Tabarly had broken a trans-Atlantic speed record with his trimaran, the Paul Ricard, and Thébault became obsessed with the idea of designing a trimaran that could fly over the waves — a fusion of the freedoms he found in air and water.

Thébault is the kind of person who needs a daunting goal to channel his restless energy

He wasn't interested in breaking a speed record at that point. "I designed my boat for a dream, not to break a record," he emphasizes. He got in touch with Alain de Bergh, the designer of the Paul Ricard. The Dassault engineer was impressed by the young sailor's passion and conviction and decided to introduce him to Tabarly. The rest is history. Tabarly, a fellow Breton, became a father figure to the young man and opened the doors to his friends — engineers, designers, financiers, politicians, people in France who were in a position to help Thébault realize his dream. Eight of them are still part of the project. They are called the *papés* ("pappies" or "elders"), and they provide counsel to L'Hydroptère's creator and his team.

In 1987 Thébault obtained his pilot's license; he realized that all his sailing experience was not sufficient preparation for the demands of skippering a new breed of flying trimaran. He also made a concession to fund-raising etiquette by wearing conservative business attire to meetings. He still does, but only when absolutely necessary.

Thébault prefers to dream across oceans. Having broken several short-distance speed records with the L'Hydroptère, he is planning to build a larger, more sophisticated model and attempt a round-the-world crossing to beat the record for the Jules Verne Trophy. Part of the reason may be that Tabarly, his mentor, had this goal in mind, but Thébault is the kind of person who needs a daunting goal to channel his restless energy. "I like to keep things simple," he insists — as simple as a boat that flies over the water and leaves records in its wake. ■

A shared thirst for adventure and will for innovation

At first glance, the differences between the Hydroptère team and its sponsor Audemars Piguet seem more striking than their similarities. The former is not quite a quarter-century old; the latter has been around for 135 years. One began in French Brittany by the sea; the other began in Le Brassus, a village in landlocked Switzerland. But a first glance does not tell the full story. Both companies were started by strong-willed individuals following a dream.

Alain Thébault wanted to build a boat that could fly. Jules-Louis Audemars and Edward-Auguste Piguet wanted to create watches that were different from — and better than — other high-end timepieces back in 1875.

So the adventurous spirit that Audemars Piguet shared with the sailing community led it to become involved in sailing sponsorships, and it has done so since 1986, including the Whitbread Around the World Race, three America's Cups with the Swiss team and the Ladycat. "Sailing is a prestigious, international sport, and our customers can identify with it easily," says Philippe Merk, chief executive of Audemars Piguet.

Merk recalls the first meeting between the watchmaking and the sailing teams in January 2010: "They could relate to each other immediately," he says. "Their insistence on precision and technical innovation was similar."

The Audemars Piguet Escapement may be as innovative in the watch world as L'Hydroptère is for sailboats. "It is a true pioneering achievement," notes Merk proudly. "With the higher frequency we have attained, we can ensure greater accuracy and improved shock resistance."

AUDEMARS PIGUET

Chronometer Jules Audemars with Audemars Piguet Escapement.

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