

THE SNAPSHOT

The Monthly Newsletter of Project Torpedalo

“Only by setting distant and difficult goals do we truly succeed.”

PROJECT TORPEDALO

Number 8 - August 2010

www.torpedalo.com



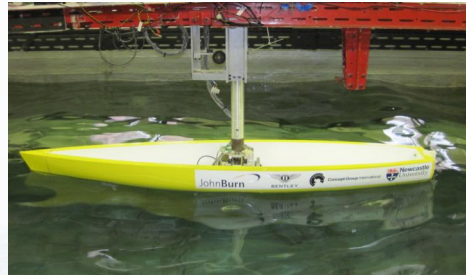
HYDRODYNAMIC ANALYSIS COMPLETED

We recently had the pleasure of visiting Newcastle University's MAST towing tank for the third and final time, concluding our research in to the hydrodynamic efficiency of Mark's hull design. With the shape of the "wetted surfaces" and beam (boat width) now frozen, the test was to establish the resistance curve of the design and then evaluate the appendage drag of our drivetrain and carry out an investigation in to optimal rudder size.

As ever, we received incredible support from sponsors John Burn Ltd, Concept Group International and Bentley Motors in preparing the test model. Peter Bowes and his team at the tank were ready and waiting when Mark arrived, with Mike joining a day later. We ran the boat through the tank 40 times, both on flat water and with the wavemaker active. Running the boat down the tank at various speeds and angles of yaw provided the data needed to evaluate the hydrodynamic resistance of the hull, before we then added scale models of the drivetrain and rudder assembly.

We were joined on the final day by cameraman Russ from Lion Eyes TV, to capture the work on film for the pilot film that will shortly go to commissioning

editors at a number of television channels. We also took our own videos, including some underwater footage using our waterproof recording equipment provided by ABC Solutions Group. A short compilation of some of the footage we took is available on our YouTube channel. Photos are available on flickr, facebook and our website.



With the towing tank work now completed, Mark moves on to the final design and analysis of the upper surfaces of the boat. More about that on the next page...

Our heartfelt thanks go to all of the companies and individuals who have made our hydrodynamic work a success. Our sponsors and the technicians at the tank have all been unfalteringly supportive, and we couldn't have done it without you all!

NEW DRIVETRAIN PARTNER ANNOUNCED

During the engineering process, it can be easy to get so far in to the detail of a particular system that you miss an obvious solution to a problem. From the outset, we had decided to use a shaft drive with a pair of right-angled gearboxes to transmit our pedal power to the propeller - chiefly because this design had been used before. However, we recently realised that a much simpler, lighter and lower-maintenance solution existed; a belt drive, including a 90-degree twist, that would replace both the steel shaft and the gearboxes. After some research, we discovered Gates, the world's leading



manufacture of belt drives. We are proud to announce that Gates are now our official Drivetrain Partner, and are helping Ivo with the design and integration of the system. This new drivetrain will be extremely light and require minimal maintenance - and the only spares we'll need are extra belts! We are extremely grateful to Gates for their phenomenal support.

TORPEDALO AT UPCOMING BOAT SHOWS

Mark and Mike will be at the Southampton Boat Show from Friday 10th until Sunday 12th September to see existing sponsors and hopefully meet some new ones! If you see us, do come and say hello - we'll be easy to spot, just look for the Torpedalo

logo! We'll also be at the London Boat Show in January, exhibiting for the duration of the event with our own stand. More details on that closer to the time, but we have some interesting plans and we should hopefully be worth a visit!

Design Debrief

Aerodynamics

With the completion of the hydrodynamic study into the shape of the water-facing hull we must now move on and complete the design of the exterior of the boat by optimising the upper surfaces to be as aerodynamic as possible. While it seems futile to carry out such work on a boat that will only travel at 3-4 knots, in a typical Atlantic breeze the relative speed between the boat and the air will be around 25 knots. In a strong gusting storm wind, that number could double or treble.

In order to ensure that the boat stays stable and upright, and doesn't get blown backwards too severely in a head wind, the upper surfaces that make up the deck, cockpit and cabin must be as aerodynamically efficient as possible. Through streamlining and careful angling of surfaces, we'll not only be able to keep aerodynamic resistance to a minimum but also influence how the boat behaves in cross-winds - in particular, whether the boat turns upwind or downwind and how much the boat heels (lists to one side).



As with the hydrodynamic work, the analysis of the shape of the boat will be carried out both via computer-based simulation and scale-model testing. Computational Fluid Dynamics (CFD) can show how air will flow around the boat and predict surface pressures and forces. We are most fortunate to recently have agreed a sponsorship deal with MIRA, whose extensive vehicle testing facility at Nuneaton includes a large wind tunnel that they've agreed to let us use. In a similar process to the towing tank testing, we'll machine models of the upper surfaces of the boat in to



high-density foam which we can then mount in the wind tunnel at various angles and subject to different wind speeds. From this, we'll be able to record measurements of the force on the model, and visualise the flow pattern around the boat using fine lines of smoke emitted from a specialised wand. While the wind tunnel is usually used for developing the shape of racing cars (as below), all manner of shapes have been honed in MIRA's facilities, even downhill skiers!



Another aspect of the aerodynamic design is controlling how much assistance the boat receives when pedalling *with* the wind. We're designing the stern of the boat so that the surface area provides no more wind assistance than the standard rowing boats. In recent years, some boats have been designed that feature extremely large cabins that act as sails for easterly winds. While these tend to cross the ocean very quickly, they are met with widespread disapproval. We want to ensure that our boat puts us on a level playing field with the rowers, but with no more wind advantage.

Sponsor Update

Peli Products, Cadbury and Thermos

In addition to the fantastic sponsorship deal agreed with Gates this month, we've also agreed product supplies from three new sponsors.



Peli Products UK, the UK arm of Pelican, make the most respected and best-performing waterproof storage cases in the world. They also design and manufacture a range of durable and waterproof equipment. We are most fortunate that they have agreed to help source waterproof hand torches and head torches, and a storage case to protect our portable electronics.



When trying to consume 7500 calories a day, as we both will be, chocolate plays a important (and delicious!) part. Our food calculations showed a need for a total of 600 bars of high-calorie chocolate, and for this reason we're delighted that Cadbury have agreed to supply us with what we need direct from the Bournville factory at no cost.



Another market-leading company is Thermos, whose vacuum flasks are globally recognised as being the best. Thermos are supporting the project by supplying five of their top-of-the-range Ultimate flasks, which we'll use to store the hot water we'll boil every day for rehydrating our meals. As an added bonus, the flasks come in Torpedalo colours as standard!

Help Needed

The kit and services still to find

Despite great success with securing sponsorship deals for the project to help us design, build and equip our boat, there are still areas where we need help. Every month we'll show a brief list of the most important goods or services we've yet to source. If any readers know of anyone who might be interested in being part of the project, please let us know at mike@torpedalo.com!

- Carbon fibre lay-up
- Marine GPS and instruments
- AIS radar transponder
- Life raft
- Satellite phone
- Marine flares

TORPEDALO.COM

Contact Us

We'd love to hear from you

If you'd like to know more about the project, think you might be able to help or generally just want to say hello, please do get in touch!

Mike Sayer: mike@torpedalo.com
07828 918221

Mark Byass: mark@torpedalo.com
07738 423304


PROJECT TORPEDALO

Fundraising in aid of:


motor neurone disease
association



Our thanks go to everyone who has supported the project so far. We couldn't be doing it without you!





HENRI LLOYD
Est. MCMLXIII



holovis
International
www.holovis.com



BENTLEY



Concept Group International

MACTRA
Marine Equipment



BREITLING
1884

JohnBurn



 cyclesolutions
the cycle to work scheme

LEWMAR®

SHARP

 MASTERVOLT



LION EYES
AWARD WINNING PRODUCTION FOR SCREEN

MIRA



CREATIVE

globalbeach...o









 Newcastle
University

 SOG
Specialty Knives & Tools

 JETBOIL

 PELI™

 THERMOS
SINCE 1904