

AeroMarine Research TBPNews - Performance Report

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TBPNews #138 - March 6, 2011  
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>>>> Tunnel Boat Performance News >>>>> (over 5000 members!)
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***** TBPNews *****

Check out [review of Jimboat's 13th Ed. "Secrets of Tunnel Boat Design" book in the last HotBoat magazine printed!](#)

1) Battle of the XCats



The UIM XCat Series (short for Xtreme Catamaran Series Powerboat Championship) defines one of the most challenging events in powerboat racing.

The event provides an extravaganza of motor sport with an interesting entertainment experience and the XCat Series in the UAE is heading for a dramatic climax.

The boats reach speeds approaching 180kph on a track as rough as any off-road motorsport challenge. The seas are unpredictable, one moment smooth

and the next a wild ride over the wave tops propelled by V6 outboard engines attached to state of the art advanced carbon technology boats with a sleek custom paint finish which would be the envy of any car owner. One interesting thing about XCats is that rules stipulate that the boats are equal and it is the pilots who achieve success. So, it's not like a big budget could easily convert into success.

The XCat Series has been developed in the Middle East under the guidance and vision of Saeed Hareb, the CEO of the Dubai International Marine Club, with the support of Abu Dhabi. Originally held under the rules of the World Professional Powerboat Association (WPPA) it is now run under the international governing body the UIM and the WPPA is the promoter.

The UIM XCat Middle East Championships 2011 started in Abu Dhabi on January 28, then was held in Dubai on February 3, it will return to Abu Dhabi on March 19 and the final round will be held in Dubai on March 26.

For more info on XCats go to dimc.ae

Check out more at: sport360.com

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2) Jay Price wins UIM F1 in Doha Qatar



DOHA, Qatar – Qatar Team drivers Jay Price and Alex Carella couldn't have dreamed up a better conclusion as the American driver hounded defending World Champion Sami Selio of Finland for 29 of the 35 laps and slid past him with less than six laps to go, to capture his second straight win at his team's home Grand Prix and his 10th of his career at the opening round of the 2011 UIM F1 H2O World Championship on Doha Bay in Qatar.

Selio, who's propeller shaft failed, took off from the pole position and managed to stay in front of

Price by a margin of one to two seconds until he came to an immediate stop ending his day.

For the young Carella, it was a satisfying afternoon finishing 6.62 seconds behind his teammate while holding off third place finisher Philippe Chiappe of the CTIC China Team who reached the podium in Doha for the second time in the last three seasons. Mad Croc Team driver Sami couldn't believe his bad luck, "I was coming into the third corner with less than six laps to run and suddenly stopped and I didn't know why. When we pulled the boat out of the water the propeller and the shaft it is attached to was gone."

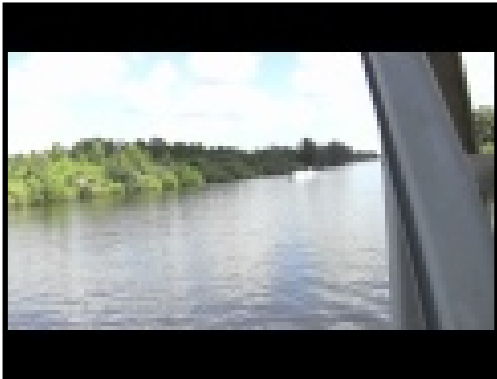
Taking a fine fourth was rookie Shaun Torrente driving the Peters & May sponsored DAC for Team Sweden to a fourth and fifth place finish two seconds in front of his teammate Jonas Andersson. Torrente was pushing for a podium finish in his very first race when his propeller broke with 15 laps to go settling for fourth 16.20 seconds behind his fellow American. Torrente is the two time defending North American title holder, and is mentored by his close friend Ted Gryguc of Canada.

Next stop on the UIM F1 H2O World Championship tour on the weekend of the 22nd of May in Portimao and the Grand Prix of Portugal.

check out more at F1H2O.com

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3) Great Powerboat Videos



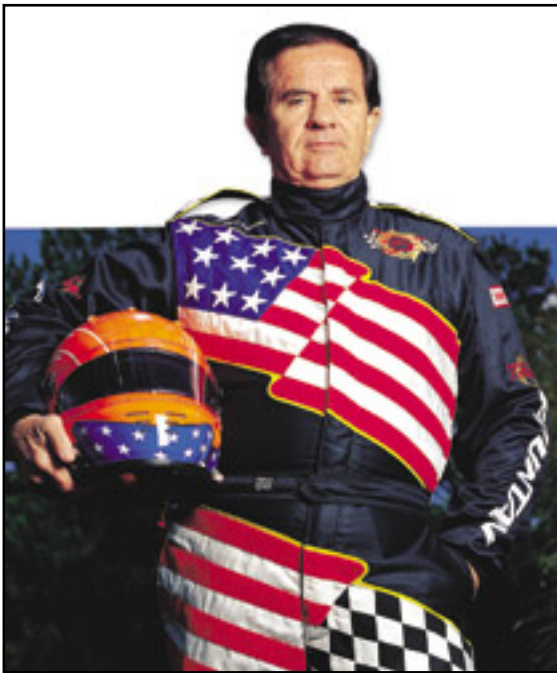
Check out these great videos....

Interview with Reggie Fountain [Reggie](#)

Great Driver's view [105 MPH Extreme Performance Tunnel Boat Video](#)

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4) New venture for Reggie Fountain



Reggie Fountain is back. Less than two months after announcing his departure from Fountain Powerboats, the company he founded 30 years ago and eventually sold after a Chapter 11 bankruptcy filing, Fountain is back in the boating business with a new company called RF, or Real Fast Powerboats.

Fountain said he plans to start with two boats - a 39 center console, open and closed bow with a cabin on it - and a 43. He's already had orders and deposits from former Fountain customers, he said.

Fountain will lease space at Brooks Boatworks in Washington, N. C., to build his boats and he plans to use space at his home, also in Washington, for research, testing and development. His home also will serve as a center for VIP service that RF customers can expect. Boats will be sold factory-direct, as well as through a few

select dealers. He hopes to build 25 boats in the first year, with the first expected out in five months or so.

Many former Fountain employees are interested in working with him, Fountain added, as well as his

two sons.

See more at: tradeonlytoday.com

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5) FEATURE: "Flight Path" - "Lift – where does it come from?"

Aerodynamics in Powerboat design.....by Jim Russell



When is a boat really an airplane? High performance powerboats are getting more benefit than ever before from aerodynamics. A tunnel hull counts on its sponsons for some of the lift for the hull. A vee-bottom boat depends on its narrow running surface (pad) to support its weight. Both have the ability to benefit from additional aero lift - an even greater advantage to further reduce the water drag drastically by supplying lift from its aerodynamic surfaces.

"Ground Effect?" – I thought we were in the water?

A properly designed tunnel hull is considered, at high speeds, as a wing in what is known as 'ground effect', even though it's water that it is 'flying' over. There are more similarities that you'd think!

Figure 1 - Formula 1 tunnel race boat

Every pound of lift that can be generated by this "wing" is one less pound of lift that doesn't have to be supplied by the sponsons. So, the trick becomes to squeeze as much lift out of the tunnel (for tunnel boats) and deck surfaces (for vee bottoms) as we can so that we can take some of the load off the sponsons or running pads.



The 'air-lift' of the Tunnel Hull is what sets this type of hull off from all the rest. Although the many factors affecting the aerodynamic forces generated make this a complicated matter at times, the effort is clearly worth it. So, let us look at what factors are involved in creating the lift generated by the tunnel and the deck surfaces, or the 'wing'. The main ones can be summarized as follows:

- (a) Airspeed
- (b) Angle of attack
- (c) Surface Area of Tunnel
- (d) Aspect Ratio of Tunnel
- (e) Height of mean camber line above the water

surface
 (f) Aerofoil shape of tunnel cross section

Figure 2 – “Ground effect airplane”

Let's have a closer look at each of those seven main factors influencing aerodynamic lift. Some of the



references and pictures I've used are based on a typical racing tunnel boat as an example, but the principles and formulae are 100% applicable to all types of tunnel hulls or modified vee-hulls – from recreational tunnels to ocean catamarans; from small radio-controlled boats to F1 racers.

2. Airspeed - Hull speed is not usually the same as the air speed - due to the ever-present wind. True air speed' is approximately the hull speed plus relative wind speed. The lift generated increases just about as the velocity squared, so this is the most important factor to consider in the design of the aerodynamic hull configuration. It is important to design the boat for the speed that it is desired to

go. Since the velocity has such significance on the air-lift forces generated, we must know what this velocity will be. Too much lift, and we're airborne! Too little – and we cause more water-drag.

Figure 3 – All performance powerboats can benefit from aerodynamic design



3. Angle of Attack - is the angle between the surface of the water and the 'mean camber line' of the aerofoil. This is often slightly more than the running attitude (the angle between the water



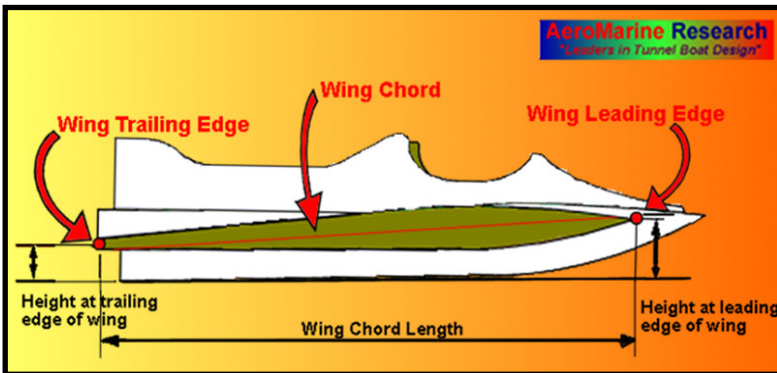
surface and the sponson or pad bottoms). Figure 5 illustrates the part of a typical tunnel boat that we are considering to represent the aerofoil section. The chord line is an imaginary line joining the leading edge of the aerofoil to the trailing edge.

The lift of the tunnel hull will increase as the angle of attack increases. Although the drag of the 'wing'

will increase with the angle of attack also, the change is not as rapid. The final effect of all this is an increase in the lift/drag ratio as the angle of attack increases. An increased L/D ratio is, of course, good. It means

Figure 4 - Unstable flight

we have a more efficient 'wing' or aerofoil, and that we are getting more good lift, without paying as big a penalty in drag.



4. Surface Area - of a conventional tunnel can be approximated by multiplying the distance between the sponsons times the length of the tunnel. In a vee-bottom, it is the effective deck area. The more area - the more lift. The location of this surface area is an important design consideration also, as seen when a close examination of dynamic stability is made (see the detailed discussion of this topic in the "Secrets of Tunnel Boat Design©"

book), so often there are trade offs to be made between lift efficiency and desired stability.

Figure 5 - Typical tunnel hull 'aerofoil'

...there's lot's more...but that's enough for now!

/Jimboat

[Ed. Note: Do you have any of your own questions on performance hull design? Send your question or story to Jimboat@aeromarineresearch.com]

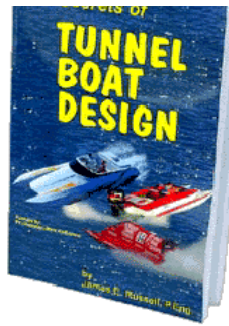
See more Performance Articles at: aeromarineresearch.com/articles.html **

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6) FREE "Secrets of Tunnel Boat Design" book with TBDP/VBDP V7.13 software!



FREE 13th edition "[Secrets of Tunnel Boat Design](#)" book with purchase of



NEW TBDP/VBDP software -....only until March 31 2011

TBDP/VBDP© - BIG NEW FEATURES...YOU ASKED FOR IT...NOW TBDP© HAS IT!....

*** Full Vee Hull and Vee-Pad hull performance analysis - one-button click that changes inputs to simulate a vee bottom hull.

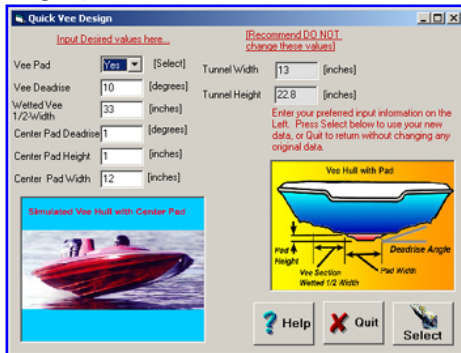
*** New aerodynamic algorithms.

*** Porpoise Analysis - We have developed a new analysis tool! XPorpoise is an engineering tool developed by AR that predicts your hull's inherent susceptibility to porpoising...and shows how to fix it!

*** User Picture import - right onto your TBDP© data input screen!

*** OEM Motor database, with over 960+ OEM engine specs!

*** Centerpod Wangle input - now you have the ability to represent a special angle of attack (trim angle) of the hull CenterPod that is different than the angle of the Sponsons.



*** NEW USER picture import feature.

*** New CG import feature.

*** Dozens of NEW features - including VEE HULL DESIGN software INCLUDED.

*** NEW (June 2010) - Now can select Inside Spray Rails or Outer Spray Rails or BOTH. NOW input measured Static CG of boat hull if desired (otherwise TBDP© will calculate for you).

*** NEW (March 2010) - 'Rate-of-Change' performance analysis!

*** Free Expert Analysis Reports (4) included shows how you can apply

expertise to your design/setup.

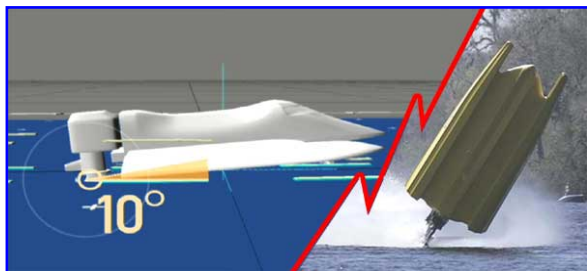
...AND Lots more new great Features in V7.13 TBDP© software!

...check out the new TBDP© software V7.13 at: aeromarineresearch.com

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7) Powerboat Racing on TV

*** "**Thrill Zone: Extreme Powerboats**" - National Geographic powerboat show.



Author **Jim Russell** (Jimboat) is powerboat design technical consultant on a new National Geographic special for "Thrill Zone" series...

Details at: (channel.nationalgeographic.com)

check out more at AR's website! aeromarineresearch.com/

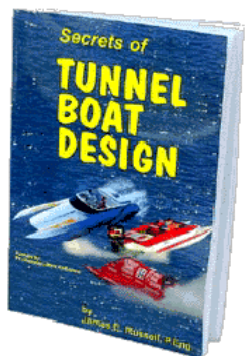
[NatGeo_thrill-zone.html](#)

*** "**Powerboat SuperLeague**" Series - Check out show schedule at AmericaOne.com

*** "**IHBA Lucas Oil Drag Boat Racing**" Series on SPEED TV - Check next show at speedtv.com

*** "**War On Water**" TV Show" on The Water Channel - Check it out at: www.waterchannel.com;

Let us know ideas you have, requests for articles, questions or comments on TBPNews. Send comments to TBPNews@aeromarineresearch.com



Get your full, illustrated, 13th edition copy of the world acclaimed "[Secrets of Tunnel Boat Design](#)" book;
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for tunnel and high-performance Vee-hull design, and "[PropWorks2](#)" software for
speed prediction and propeller
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