

AeroMarine Research

TBPNews - Performance Report

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**TBPNews #152 - July 9 2012**  
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>>>> **Tunnel Boat Performance News** >>>>> (over 5000 members!)  

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

1) Dave Villwock and U-1 Spirit of Qatar win Madison Unlimited Hydroplane Race



Dave Villwock got his 2012 season off on the right foot by winning the H1 Unlimited Air National Guard season opener, the Madison Regatta in Madison, Ind.

At the start-up bouy, it was Steve David grabbing lane one. At the start line, however, it was Dave Villwock in lane two getting across the line first. Villwock hit a hole in the first turn and lost some speed, but managed to hold off David.

At the end of lap one, Villwock had nearly a roostertail lead on David. Meanwhile, Kip Brown's U-17 died in the first turn, but managed to restart. JW Myers was penalized a lap for hitting a buoy.

A 5-lap final on a 2-mile course means some really rough water after a couple of times around the course and there was lots of bouncing, especially with the winds at the front of a second wave of bad weather on the horizon.

By lap three, Villwock opened up a huge lead.

Read more here: hydroinsider.com

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2) Carella Holds Off Al Hameli for Second F1H2O Win in Kazan, Russia



KAZAN, Russia - 23rd of June, 2012 - Italian Alex Carella proved why he is the defending World Champion as the Qatar Team driver held off points leader Ahmed Al Hameli of Team Abu Dhabi by 4.73 seconds to capture the second race of the UIM F1 H2O World Championship in front of tens of thousands of fans at the Grand Prix of Tatarstan in Russia.

The 27 year-old driver from Piacenza, Italy took the lead on the second lap after his teammate Shaun Torrente who had pole position and leading the field of 18 drivers from 11 different nations suddenly, slowed with intermittent power in his

engine and the American from Miami pulled off the course giving Alex the green light in hopes of his second straight victory on Nizny Kaban Lake which he would never surrender.

For Al Hameli, his second place marks the seventh race that he's finished he's in either first or second place on the podium while now holding down 35 points. He has an eight point edge ahead of Alex and French driver Philippe Chiappe of the CTIC China Team who earned his second podium in a row in 2012 after finishing 2nd in Doha back in March. Taking fourth was two-time World Champion Sami Selio of the Mad Croc Team settling for a fourth place finish after starting a disappointing seventh off the start pontoon and up in the top four of the championship with 21 points.

Eight different boats failed to finish the event with young Finnish teenager Filip Roms failing to start the race after crashing out in practice on Friday morning.

The next round of the UIM F1 H2O World Championship will take place in Kiev, Ukraine on the 20th and 21st of July as the third race of the season will mark the end of the European legs of the Championship.

Check out more at f1h2o.com

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3) Solar Splash World Championship 2012



CEDAR FALLS, Iowa --- The University of Northern Iowa hosted the 2012 Solar Splash World Championship of Intercollegiate Solar Boat Racing for the second time, through June 17 at George Wyth State Park.

According to Reg Pecan, UNI professor of industrial technology, Solar Splash began in Milwaukee in 1994 and is a hands-on educational experience that develops teamwork and interdisciplinary skills.

The 2012 event was won by Istanbul Technical University, with 2nd spot going to Cedarville University and 3rd place to University of Northern Iowa.

The event is one of UNI's many efforts on promoting science, technology, engineering and mathematics education among young Iowans. Points are earned in 7 categories with on-the-water events including a Sprint and a Maneuverability qualifier. This is followed by an event called the Solar Slalom, which is a combination of speed and maneuverability. The final days are spent in the Sprint and Endurance events. Competitors are mostly from U.S. colleges; there are also international teams from Turkey, England and Mexico.

For more information, go to: wcfcourier.com

OR at: solarsplash.com

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4) Great Powerboat Videos



Check out these great videos....

.....[SST60 blowover](#)

.....[Australian F1 Crash](#)

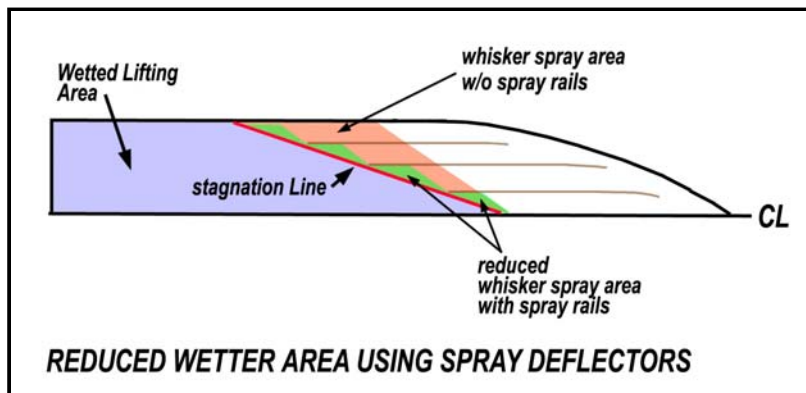
.....and [more](#)

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5) FEATURE: "Don't Spray! - Spray Rail Design for Performance Boats"

Many performance hull designs – on both tunnels and vee hulls - have functioning spray rails incorporated to reduce drag from exaggerated wetted surfaces. Some of the spray rails can be seen to do an excellent job of this, and others just don't seem to perform their intended function very well at all.

Then there are Lifting strakes – these are different from spray rails in that, besides deflecting some water and spray from the hull, they are also intended to provide dynamic lift to help lift the hull higher out of the water. That is not the intention of spray rails, which are only designed to deflect spray - not to provide any dynamic lift. [More on lifting strakes another day.] Spray rails are also called 'whisker spray deflectors', and are shown to reduce hydrodynamic drag.



It is worth having a quick look at the technical keys to spray rail design that we have available to us – if we want to implement a spray rail function to our performance planing hull design, we may as well try to do it as efficiently as possible.

Whisker Spray Drag - The hydrodynamic drag of any design of planing hull includes mostly viscous (friction) drag and pressure drag components of the planing bottom surfaces. These drag components are mostly from the primary lifting area of the hull, aft of what's called the "stagnation line". There is also another type of drag in the "whisker spray region" which is located forward of the stagnation line. We

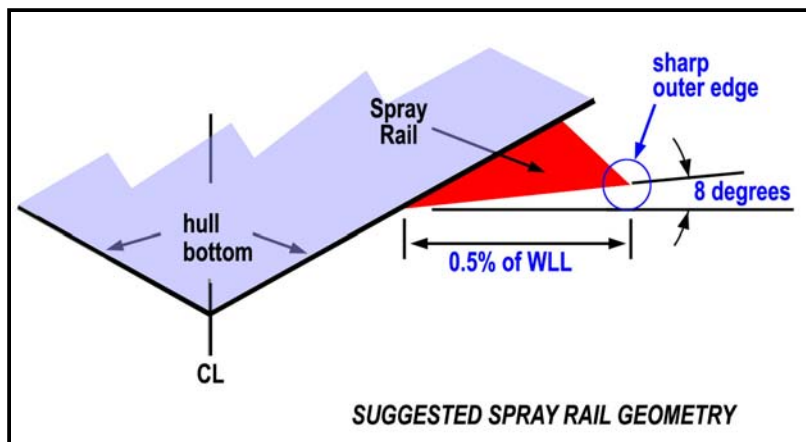
know that for high-speed planing hulls, the whisker spray drag component can be as much as 15% of the total drag. So it is sometimes worth minimizing.

There are engineering methods that can calculate the contribution of whisker spray drag, but for our purposes today, it's valuable to know that it's a function of deadrise angle, trim angle, and speed. It's also valuable to know that we can reduce its effect by properly designed and located Spray Rails.

Location of Spray Rails - E.P. Clement, well-known hydrodynamics expert, has shown that three relatively short, longitudinally staggered deflectors mounted on each side of the planing (bottom) surfaces will effectively deflect approximately 88% of the spray away from the bottom. The transverse locations of the spray strips are approximately 1/4, 1/2, and 3/4 of the half beam outboard of the (center) keel. The longitudinal location is such that the aft ends of each strip extend somewhat aft of the stagnation line at each transverse location of the strips.

Since the spray location and orientation always depends on the speed and hull loading, the spray rails will function best at the speed that they're designed for. So, the designer needs to decide where the best 'compromise' location of the spray deflectors will be at the high-speed range of operation. (The spray rail functionality will be different at different speeds of the hull – so location is a compromise, like most all decisions in performance powerboat design!)

The research shows that spray deflectors should be relatively short. If they are so long that they extend aft into the pressure (main hydrodynamic Lifting region) this extra length will have no effect on the spray but will add to the total drag of the hull.



Spray Rail Shape - Other engineering research (Muller-Graf) shows that the best spray rail shape is triangular cross-sectional shape. This 'optimized' shape includes a sharp outer edge, which is necessary to facilitate the separation of spray from the hull. Other design features of the spray rail include a bottom angle 8 degrees and a spray rail width 0.5% of the water line length (so an 18ft hull might have a spray deflector width of 1 inch)

So, there are some proven design guidelines for designing effective spray rails. It seems best to try to follow these engineering tips. For example, the spray deflector should not angle "down" – some think to 'capture' more water spray. Also, the recommended

sharpness of the outer edge of the deflector is important. It has been shown that even a slight rounding of the edge may completely negate the effectiveness of the spray rail. Of course, this desired sharp edge can be tricky to achieve in a hull mould design with integral spray rails. I suppose we can simply add this design 'compromise' to all of the decisions that

must be considered by designers and builders of high-performance hulls!

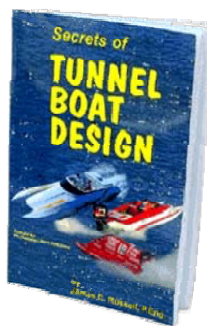
See more Performance Articles at: aeromarineresearch.com/articles.html

Read more about Vee Hull & Tunnel Boat design and setup in the world acclaimed "[Secrets of Tunnel Boat Design](#)" book

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

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6) NEW! 13th Edition "Secrets of Tunnel Boat Design" book



13th Edition "Secrets of Tunnel Boat Design" (ISBN# 1-894933-30-3) - By well-known powerboat design author and race-driver, Jim Russell.

Learn how to design and setup your own tunnel boat, power cat, or modified vee hull for all Recreation, Performance Family hulls, UIM & APBA racing or even RC models. (not just for racing applications!) This new edition has lots of new information; now with over 200 pages, and well over 150 photographs!

Get the most from your tunnel hull or vee-bottom boat setup.

The new edition includes an added 'History of Modified Tunnel Hull (Mod VP) Design'; an added 'History & Design of Propellers'; and an added 'History & Design of 'Wing in Ground Effect' (WIG) concepts, and the Ten Steps To Performance Powerboat Design. All outlining how they have impacted high performance powerboat and tunnel boat designs.

These new segments are added to the original STBD book features: The developments of the tunnel and V bottoms are interestingly chronicled, with detailed explanations of hull design, function, potential and characteristics. This unique book also details ten design steps for analysis of hull performance and stability showing how the calculations are accurately performed, as well as providing detailed information about their relation to hull performance. The ten steps range from layout design and dimensions, calculating aerodynamic and hydrodynamic lift and drag, power calculations, and stability, acceleration, etc.

STBD book now includes:

- History of Tunnel Boat Design
- Design of Propellers
- Design of Lower Unit/Drive Units
- History of the Modified Vee hull
- History of the WIG (Wing in Ground Effect)
- 10 Steps to performance powerboat design



Also..check out the new TBDP© software V7.14 at: aeromarineresearch.com

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7) Powerboat Racing on TV

- *** **"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;
- *** **"Boats on TV"** - See at: www.boatson.tv
- *** **"American Powerboat Television"** on The Water Channel - See: americanpowerboat.tv
- *** **"Honda Formula 4-Stroke Powerboat Series"** - Check it out at: www.f4sa.co.uk

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8) Jimboat's Feature Articles



NEW Jimboat Article Announcement! - Author Jim Russell writes in POWERBOAT & RIB magazine!

Jimboat outlines secrets for 'Successful Propeller Testing for Performance'

Jimboat details the speed secrets of "Vee pad design", vee hull design and performance powerboat design

Jimboat explains 'Gearcase & Propeller BlowOut' (RIB magazine April 2011 issue)



Jimboat explains 'Chine Walking' (RIB magazine Dec 2010 issue)

Jimboat explains 'How Trim Angle and engine height affects performance' (RIB magazine Jan 2011 issue)

Jimboat interviews in RaceBoat International magazine, the newest up-and-coming star of [F1 H2O World Championship circuit, Shaun Torrente](#) together with his Crew Chief Ted Gryguc.

[Jimboat writes Feature articles in PowerBoat & RIB magazine, HotBoat, Family&Performance Boating, Performance Powerboat, RIB magazine, World of Powerboats, RaceBoat International, SEA Yachting, Extreme Boats magazines].

- [Tunnel Vision - 'How Do Tunnel Boats Fly?' - HB Nov/Dec 2008](#)
- ['Why Do Boats Create Rooster Tails?' - HB-August 2008](#)
- ['What a Blow Out!' - "Gearcase & Propeller Blowout- Why it Happens & How to Fix it" - HB-June 2008](#)
- ['Walk on the Wild Side' - 'Chine Walk - Why it happens & How to Fix it" - HB-Jan 2008](#)
- ['Hump Zone' - "Why does your Boat Porpoise?" - HB-April 2007](#)
- ['The Bottom Line'- 'Why does a Pad make a Vee Hull faster?' - F&PB-Sept 2005](#)
- ['10 Smokin' Speed Secrets Revealed..." - HB-Feb2005](#)
- ['Winterizing your Performance Outboard" - F&PB-Jan2005](#)
- ['What a Drag" - 'Trim Angle & Engine Height Can Reduce Drag and Increase Speed' - HB-Sept2004](#)
- ['10 Safety Tips" - 'Ten Safety Ideas for High Performance Go-Fast Boats' - HB-Aug2004](#)
- ['Flight Path" - 'Where does Lift Come From?' - HB-April2004](#)
- ['Rocket Science" - 'How To Increase Your Hull's Design Speed With Aerodynamics' - World of Powerboats-Winter2004](#)
- ['Tunnel Vision" - 'What Factors Influence Tunnel Hull Performance' - Extreme Boats-April2003](#)
- ['Step-by-Step" - 'Step Design in Powerboats' - TBPNews #88, October 2005](#)

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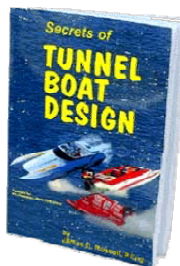
See you next time!

/Jimboat

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

TBPNews@aeromarineresearch.com

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Get your full, illustrated, *13th edition* copy of the world acclaimed "[Secrets of Tunnel Boat Design](#)" book; "[History of Tunnel Boat Design](#)" book, "[Secrets of Propeller Design](#)" book, the "[Tunnel Boat Design](#)" [software](#) for tunnel and high-performance Vee-hull design, and "[PropWorks2](#)" [software](#) for speed prediction and propeller selection at the AeroMarine Research web site: <http://www.aeromarineresearch.com>