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Creating a New Concept in Performance-Built Sport Catamarans

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A technical paper will be submitted : Yes

The High Performance boat building industry has forever been focused on hydrodynamics in hull design. Yet, new light weight, outboard powered catamarans have created a new kind of vessel. One which flies as much as it floats during its operation. As speeds approach 100 MPH, the shape of the tunnel captures air and provides lift making the boat essentially lighter and faster while in water. Sea conditions, head winds and turbulent wave structures launch the high speed catamaran and make it airborne often 50% of its operational duty cycle. Once the vessel launches, all hydrodynamic design becomes null and void. Hydraulic lift created on the hull is removed. With engines mounted at the far stern of the boat, effective center of gravity shifts rearward. That said, the stern drops, the bow rises and the boat becomes like an airplane without wings in stall mode. Aerodynamics has never been of much interest to most boat designers. This program is designed to advance aerodynamics as an integral part of boat design thus creating a faster, safer, more fuel efficient and stable vessel for the marine industry.

The Porta Performance Technologies' Outboard Catamaran 3D Measurement/Scan, CFD, 3D Print, Wind Tunnel Program is designed to create a new concept in performance-built sport catamarans. This boat will set a new high-performance tone for the marine industry: Hydrodynamic and Aerodynamic Engineering.

An existing Championship hull been scanned using portable articulating arms located within a common reference coordinate system by a Laser Tracker. This point cloud data will be used for creation of a variety of aerodynamic treatments that can be tested and refined. The point cloud data was used to create a CAD model which represents the existing boat conditions. This CAD data will be used for CFD analysis as well as 3D printing a scaled model for wind tunnel testing. Results of these tests are expected to impact future hull designs and enhancements. To bring the new performance hull to completion, several requirements must be met: (1) Employ the latest hydrodynamic hull design for speed, safety and maneuverability. (2) Employ the latest and most advanced aerodynamic hull and top-side deck designs for reduced drag and safety. (3) Build a transferable matrix for all learnings to be used.