

## Bihrlle Shows 'Right the First Flight' Aircraft Development System



Bihrlle Applied Research Inc. of Hampton, Va., says it has developed a proven way for builders of unmanned aircraft to develop viable configurations and successfully demonstrate their designs on the first flight, a key attribute as the cost of developing and building airframes and subsystem components continues to rise.

Bihrlle's approach consists of three phases: test, simulate and fly. This approach is in contrast with the historical approach of build-assess-modify approach or even the build-crash-modify approach, which can rapidly bring to the end an otherwise promising development program.

With Bihrlle's method, the test phase consists of conducting a wind tunnel test entry or using computational methods to develop the aerodynamic data set that characterizes the vehicle configuration. This is followed by the simulation phase in

which the aero data set is combined with propulsion, mass properties, and control system models developed from design data to formulate a six degree-of-freedom simulation flight model of the UAS.

With a simulation flight model at hand, the flying qualities of the vehicle can readily be assessed. Using the simulation as an iterative design tool, aero data associated with configurational variants as well as any changes to the control laws, auto-pilot modes, or propulsion system can quickly be assessed. With the flying qualities of the vehicle adequately assessed through testing and simulation, the final UAV configuration can be manufactured and demonstrated in the flight phase.

Bihrlle has proven this approach using a UAV configuration consisting of a swept-forward wing and canard combination. A wind tunnel test entry was conducted at Bihrlle's Large-Amplitude Multi-Purpose (LAMP) wind tunnel to gather the aero data. A simulation flight model was then developed and the flight dynamics of the vehicle were assessed. The result was a successful first flight of a novel configuration and the demonstration of a vehicle with excellent flying qualities.

**See Bihrlle at Booth # 2315**

## Quatro Composites Aims for Expansion

Quatro Composites of Orange City, Iowa, and Poway, Calif., says it will rapidly expand its position in the aerospace, medical and industrial markets by becoming a complete engineering and manufacturing composites producer.

The company designs and produces component parts for original equipment suppliers, focusing

mainly on carbon composite products, although it can provide parts from a variety of materials.

The company was recently awarded ISO 9001:2000 and AS9100:2004 Certification of Registration for both of its facilities.

**See Quatro Composites at Booth # 1433**

## New Exhibitor **SPOTLIGHT**

**HARBOR WING TECHNOLOGIES** of Seattle, Wash., is showing its innovative unmanned surface vehicle, which uses the company's WingSail assembly, which can be rotated a full 360 degrees. Harbor Wing plans to offer two production models: a larger open-ocean vessel suited for long-duration, long-range missions and a smaller, medium-duration version for coastal waters.

**See Harbor Wing Technologies at Booth # 122**

**NEPTEC DESIGN GROUP** of Kanata, Ontario, Canada, is displaying its 3D intelligent machine vision systems, including ones that generate 3D information from a sequence of 2D images, an autonomous rendezvous and docking sensor, LIDAR that can see through obscurants and a suite of products for intelligence, surveillance and reconnaissance applications.

**See Neptec Design Group at Booth # 1930**

**MICROINFINITY** of Seoul, Korea is displaying its CruizCore XG1000, a self-contained MEMS digital gyroscope based on the CruizCore R1001E platform. It uses USB and RS232 communication interfaces and has an adjustable output and baud rate.

**See Microinfinity at Booth # 2532**

**TENCATE ADVANCED COMPOSITES** of Morgan Hill, Calif., is showing its composite materials for the aerospace market, a product line strengthened by the recent acquisition of composite materials makers YLA Inc. and CSS Composites, LLC.

**See TenCate Advanced Composites at Booth # 939**

**ORBIT LOGIC** of Greenbelt, Md., is showing its advanced planning and mission software, which includes UAV Planner, which provides optimized task scheduling and resource allocation for all types of unmanned aerial vehicles.

**See Orbit Logic at Booth # 740**



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