



PART THREE ONES TO WATCH

We continue our look at the developments, refinements and breakthroughs at the AUVERSI conference here in Denver, Colorado. Part four tomorrow

Ion Tiger



The Ion Tiger achieved a breakthrough in powered flight by UAVs last October, flying 23h and 17min powered by only a 550W (0.75hp) hydrogen fuel cell. The experimen-

tal, all-electric UAV offers proof that the fuel cell-powered engine can be adapted to a long-endurance aircraft. The Ion Tiger is powered at four times the efficiency of a comparable internal combustion engine.

Wingspan	~1.5 meters
Length	~1.8 meters
Weight	16.8kg
Endurance	>24h
Cruise speed	Not disclosed
Maximum altitude	Not disclosed
Payload capacity	2.7kg

iRobot Seaglider



iRobot's Seaglider got a very high-profile opportunity to swim around the Gulf of Mexico oil spill this year, detecting oil and helping to map the affected area. The deep-diving autonomous underwater vehicle can go on missions for months at a time and set an endurance record last September, operating for nine months and five days in the Pacific Ocean as part of a University of Washington (UW) project. Known more for its unmanned ground vehicles and helpful household robots, iRobot jumped into the maritime domain in 2008 by purchasing the rights to the Seaglider from UW.

Length	3.3 meters
Width	1 meter
Height	40cm
Weight	52kg
Maximum Depth	1km
Endurance (nominal load)	5,114h

iRobot Small Unmanned Ground Vehicle (SUGV)

The Small Unmanned Ground Vehicle (top left), a smaller, lighter variant of the company's venerable PackBot developed in conjunction with Boeing, comes in two variants: the 310, which has a standard manipulator arm, and the 320, which carries a thermal camera and laser rangefinder (but can use the arm as well). Part of the Army's Brigade Combat Team Modernization effort, SUGV and other BCTM components wrapped up technical tests in July and are moving to the final stages of evaluation. If all goes well, the production version of the small robot should make its combat debut in Afghanistan in 2012 as part of the BCTM.

Weight (310)	13kg
Height	23cm with manipulator stowed
Width	35cm
Length	28cm with flippers stowed
Maximum Speed	10kph
Endurance	6h+

ONES TO WATCH

Kairos Autonomi Pronto4 Agnostic Autonomy System



Part of a series of products under the Pronto4 moniker, the Agnostic Autonomy System makes any manned vehicle into an optionally manned ground system through a steering wheel-based attachment. The universal retrofit kit allows any manned vehicle, including the Humvee, to become unmanned in about four hours. Once installed, the vehicle is capable of drive-by-wire tele-operation or semi-autonomy. Much like cruise control, the vehicle can be switched back to manned mode simply by tapping the brake.

Weight	22.7kg
JAUS	Interoperable
Power Source	12 or 14vdc
Operating speed	145kph
Processing	2.0 Ghz, Core2Duo, 1 GB RAM Windows XP

L-3 Communications Viking 400



L-3 Communications has quietly amassed a diverse portfolio of unmanned aircraft systems. None has proven more successful so far than the Viking 400, currently in production for the US Special Operations Command under a contract announced last August. The all-composite Viking 400 can be operated over a 75nm-wide area using a line-of-sight data link.

Wingspan	6 meters
Length	4.5 meters
Weight	240kg

Endurance	8-12hr
Cruise speed	60kt
Maximum altitude	Mid-altitude
Payload capacity	34-45kg

Lockheed Martin Squad Mission Support System (SMSS)

This year, Lockheed Martin showed off one of its robotic mule concepts, the Squad Mission Support System, for the US military at a series of demonstrations held at the company's Lit-

Images courtesy of Propulsive Wing www.propulsivewing.com

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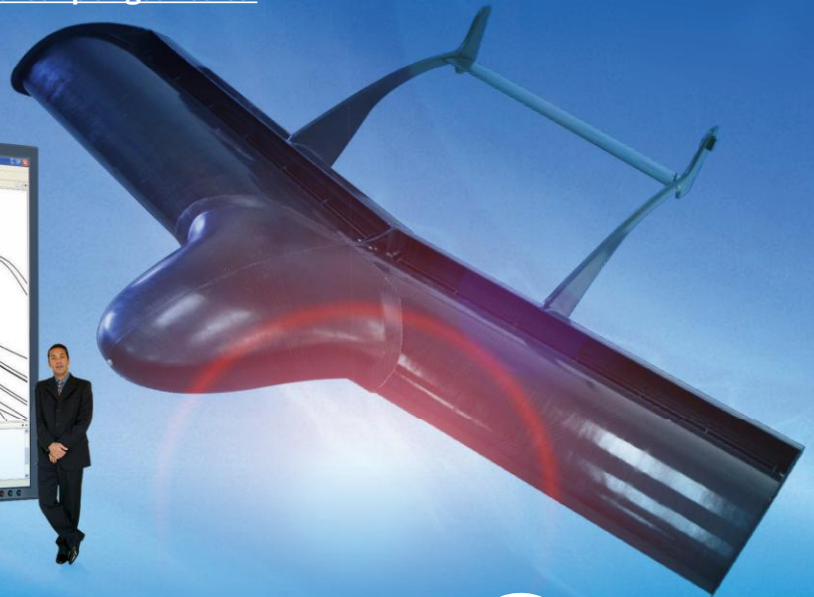
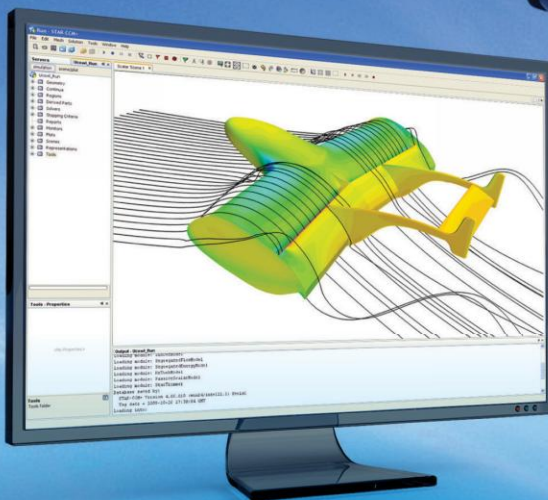
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tleton, Colorado, facility. The SMSS autonomously followed a road network, maneuvered through a building complex, avoided obstacles in its path (including mannequins standing in as humans), followed a person through optical tracking technology and navigating toward a person after they issued a “come-to-me” command. Initially developed to lighten the load from nine to 13 soldiers or Marines, the SMSS can be carried into theater sling-loaded under a UH-60L helicopter or carried inside a CH-47/53 helicopter.

Weight	1,814kg
Payload	453+ kg
Vertical Step	56cm
Range	483km on road, 322km cross country
Gap	69cm



Northrop Grumman/ Hybrid Air Vehicles LEMV



Military airships are enjoying a strong revival since falling out of favor shortly after World War II. The Northrop Grumman/Hybrid Air Vehicles venture is the first major beneficiary of this change in fortune. The long-endurance multi-intelligence vehicle (LEMV) will deploy to Afghanistan in early 2012, perhaps proving whether airships are a passing fad or long-term need.

Wingspan	N/A
Length	91.4 meters
Weight	Not available
Endurance	21 days
Cruise speed	30kt
Payload capacity	1,134kg

Ocular Robotics RobotEye RE02

This short-range two-axis laser range scanner continuously varies its velocity-controlled scan pattern to scan any situation or path area. The sensor pointing technology integrates into ground systems for uses in multiple environments. Currently, the company is developing variants, the RE03, which will include an integral coaxial camera for high frame rates, and the RE04 for UAVs, which will have a hemispherical field of view through an integral zoom camera and optional laser marker.



Maximum Acceleration	50,000 degrees+/s2
Maximum Velocity	10,000 degrees/s2



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