

# HELICOPTERS

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## Canada: New Capabilities, New Missions in Afghanistan

By DAVID PUGLIESE

**VICTORIA, British Columbia** — Canadian Air Force Griffon helicopters will be outfitted with additional surveillance equipment as well as new weapons for escort missions and sent to Afghanistan this fall, Air Force officers said.

In the meantime, the Air Force has already deployed eight Griffon helicopters, outfitted with 7.62mm miniguns, to Kandahar. Those helicopters began arriving in December and started conducting operations in January. The helicopters have a standard sensor capability with an L-3 Wescam forward-looking infrared system.

But the first of the helicopters carrying the new Interoperable Griffon Reconnaissance Escort Surveillance System (INGRESS), which will provide additional capabilities, will arrive in the fall, said Air Force Lt. Col. Duart Townsend, of the directorate of aerospace requirements section that deals with tactical aviation.

INGRESS involves installing specialized mission kits on 19 helicopters, producing two variants of Griffons — an escort variant to accompany and protect Canadian Chinook helicopters in Afghanistan, and one for domestic operations. Both would use a similar electro-optical/infrared sensor

system package.

The CH-146 Griffon, bought by Canada in the mid-1990s, is considered a utility tactical helicopter and has been used for search-and-rescue missions, tactical transport and humanitarian relief operations. The Griffon is a version of the Bell 412 civilian helicopter made by Bell Helicopter Textron of Mirabel, Quebec. The Canadian Air Force has about 85 Griffons.

The INGRESS helicopters to deploy to Afghanistan will be different from those Griffons already there in that they will carry more sensors as well as a heavier

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## Italy: As U.S. Sales Slip Away, AW101 Closes On Italian CSAR Order

By TOM KINGTON

**ROME** — U.S. President Barack Obama may not get to ride in one, and the U.S. Air Force may not pick it for combat-search-and-rescue missions, but on the other side of the Atlantic, the AgustaWestland AW101 may pick up its first CSAR customer.

The Italian Air Force is set by year's end to sign for two helicopters, part of an eventual €30 million euro (\$816 million) acquisition of 12 AW101s, plus three options, to replace aging

HH-3F helicopters, with the first delivery in 2014 and the final delivery around 2015.

The Air Force will acquire the recently beefed-up version of the EH101, now being marketed as AW101 and boasting a takeoff weight of at least 15,600 kilograms, up from 14,600. Of three engines now on offer with the AW101, the Air Force has selected the CT-7 engine. The helicopters may also boast new BERP IV rotors, which would push takeoff weight to 16,000 kilos.

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## Israel: Unmanned Rotorcraft for Urban Operations

By BARBARA OPALL-ROME

**YAVNE, Israel** — Israel's Urban Aeronautics is readying for the first flight of its multimission MULE, an unmanned vertical takeoff-and-landing (VTOL) aircraft tailored for urban operations.

Now in final assembly at company facilities here, some 15 miles south of Tel Aviv, the midsize MULE demonstrator

is scheduled to take to the sky by June, following full-power ground tests planned for next month.

If extensive flight testing validates the MULE's hidden-rotor, internal-lift design — as it has thus far in wind tunnel tests and in the company's scaled-down Panda UAV, flying since late 2007 — Urban Aeronautics can claim a significant aerospace milestone: the world's first Federal Aviation Administration (FAA)-certifiable "rotorless" VTOL capable of ferrying cargo and passengers in and out of constricted areas.

Built around company-patented Fancraft propulsion, flight con-

**In Operation:** Concept of MULE unmanned helicopter in battle scenario.

trol and aerodynamic technologies, the internally powered and controlled MULE is designed to take off and land like a helicopter, but without the safety hazards, flight restrictions and noise of large rotors and exposed rotor blades. With a maximum gross takeoff weight of 2,400 pounds, the midsize system is designed to carry a 500-pound payload nearly 300 miles — about two hours worth of flight time — while traveling at speeds of up to 100 knots.

Under the firm's preliminary concept of operations, MULEs would be loaded with logistics supplies, fly via GPS satellite coordinates to designated offload areas, and land at locations selected by beacon-bearing ground

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## ISRAEL

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spotters. The rotorless external configuration renders approach on landing and offloading of supplies much safer and faster than with conventional aircraft, company executives here say. Once emptied, each MULE can evacuate two wounded on its return flight to forward or rear bases.

"Everything's inside the body of the aircraft; there are no exposed rotors, and this opens up a world of operational possibilities for military and civil use," said UrbanAero President Rafi Yoeli. According to Yoeli, the unmanned MULE as well as the company's X-Hawk, a larger, twin-rotor, 11-passenger manned demonstrator now in development, are designed to fly with precision and relative stealth in urban, forested and other areas now off-limits to conventional tactical aircraft.

"The tips of the rotors are protected inside the ducts, and deliberately turn slowly, so MULE will be very stealthy," Yoeli said. He added that infrared and radar signatures have been kept very low to ensure survivability.

In an interview at UrbanAero's headquarters here, Yoeli noted that the basic concept driving the firm's internal rotor Fancraft design has been around for decades, yet never proved practical due to inherent instability and aerodynamic inefficiencies. However, thanks to new lightweight composite materials, high-thrust engines, powerful micro-processors, quadruple fly-by-wire flight controls and company-patented aerodynamic innovations, "what was once a mere design curiosity is now a reality."

Yoeli said MULE relies on existing and proven technologies, is built in accordance with FAA specifications and has passed a U.S. Navy-funded risk reduction and safety assessment program conducted jointly with Bell Helicopter and Penn State University.

"We're building an air vehicle that is as safe or safer than anything flying today," he said.

### Hand-Crafted on the Cheap

OVADIA HARARI, a nationally recognized aerospace pioneer who agreed to serve as UrbanAero's chairman after nearly 40 years at state-owned Israel Aerospace Industries, credited Yoeli for designing and essentially hand-crafting the MULE prototype and the unmanned Panda — a tactical surveillance system that doubles as a flying test bed — in a fraction of the time and cost required of conventional aerospace firms.

"He raised nearly \$10 million until now from good people who believe in his maverick ideas and practical concepts. In an industry

averse, Yoeli inspires others to invest in his dream," said Harari.

Aside from a 2008 agreement with Tata Advanced Systems to jointly market and produce MULE for the Indian market, UrbanAero is discussing a potential strategic partnership with a major European aerospace firm, he said.

"Once MULE starts flying, the interest in this system will increase substantially," Harari said.

### Data Prove Promising

Data culled from flight testing of the firm's scaled-down, 35-pound Panda and ground subsystem tests indicate that the 2,400-pound MULE demonstrator will be highly stable, drag-resistant at sustained forward speeds of up to 100 knots and able to withstand gusts of up to 50 knots. Yoeli attributed performance breakthroughs mostly to the company's Vane Control System, a row of vanes on the inlet and outlet of the fan ducts that provide maximum maneuverability without having to tilt the body of the aircraft.

"Vanes mounted at the outlet of the ducts are an old idea, but for some reason, nobody ever put vanes on the inlet side. But we found they are as effective as the lower set of vanes and when all are moved in coordination, they act as a sum of tens of individual lifting surfaces, capable of generating a multitude of overall force and movement combinations," explained Janina Frankel-Yoeli, UrbanAero's vice president for marketing.

"For the first time, we have a vehicle that can move sideways without the need to roll, and vice versa," Frankel-Yoeli said.

She added that aerodynamic tailoring between the lift rotors and fuselage allows the fuselage to provide about 70 percent of the lift it needs when operating at high speeds, with the remaining 30 percent of lift provided from the internal rotor.

UrbanAero was exploring development of two additional MULE versions: a two- to four-seater manned vehicle and a faster, unmanned aircraft capable of flying upward of 250 knots, Frankel-Yoeli said.

"We've done wind-tunnel tests of the high-speed variant and have gotten excellent results and our existing MULE demonstrator can be adapted quite easily to hold up to four people," she said.

First flights will be very brief, low-altitude hovers, with the MULE vehicle tethered to the tarmac by safety wires. Later this summer, the firm plans to transition to high-altitude, untethered flight, after which the MULE vehicle will be ready for demonstrations for prospective customers, company executives said. ■

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