

[Click here to return to original page](#)



July 2006

Archives

[Year 2006](#)

[Year 2005](#)

[Year 2004](#)

[Year 2003](#)

[Army Looks To Counter Small Arms, RPGs](#)
[New Armed Reconnaissance Helicopter Flies](#)
[Bell Team Proposes Fancraft For City Combat](#)
[US Army Buys European LUH](#)
[Unmanned Little Bird Flies Unmanned](#)

Army Looks To Counter Small Arms, RPGs

The US Army Aviation Applied Technology Directorate at Fort Eustis, Virginia, has awarded Lockheed Martin Systems Integration a contract to develop, integrate and fly two systems to reduce helicopter vulnerability to small arms and Rocket Propelled Grenades (RPGs). The Hostile Fire Indicator (HFI) will sense muzzle flashes from small arms fire and RPGs and compute the bearing to the threat location. With enhanced situational awareness, the pilot can choose to avoid or engage the threat with running or diving fire. The Visual Acquisition Disruptor (VAD) is meanwhile meant to inhibit the ability of enemy combatants to acquire an accurate targeting solution on the aircraft.

Under the broader Active / Passive Aircraft Survivability (APAS) program, the systems are scheduled to fly on a Sikorsky UH-60L Black Hawk in 2008. Lockheed Martin will integrate the HFI and VAD with another processor that provides crewmembers with audio alerts and shows threat location symbology on helmet-mounted or heads-down displays. The processor also maintains VAD coverage as the aircraft transits the threat zone. Subcontractors on the Lockheed Martin APAS team include Ball Aerospace, Goodrich Sensor Systems, and Raytheon.

APAS includes several technology initiatives. It aims to achieve a 90% probability of detecting small arms, RPGs, and MANPADS with less than 5 degree threat cuing error in a Helmet Mounted Display. APAS also includes lightweight infrared insulation, advanced multi-spectral coatings, an adaptive engine infrared exhaust suppressor, and the Survivability Planner Associate Re-router -- SPAR -- with Cognitive Decision Aids to avoid or engage threats. The APAS and SPAR initiatives will migrate to the IDAS -- Intelligent Decision Aiding for Aircraft Survivability -- program to go aboard the Boeing Block III AH-64D and Sikorsky UH-60M Block Upgrade around Fiscal 2012.

New Armed
Reconnaissance
Helicopter Flies



The first Bell ARH-

70A Army Armed Reconnaissance Helicopter (ARH) made its first flight on July 20 at the company's XworX facility in Arlington, Texas. The Army plans to replace its OH-58D Kiowa Warriors with 368 new ARH-70s and expects a First Unit Equipped with 30 aircraft in the fourth quarter of Fiscal 2008. On the approximately 1.5-hour first flight, the first of four ARH-70 test aircraft reached 80 knots and 500 ft, and banked up to 30 degrees. Bell test pilot Jim McCollough and Army pilot Chief Warrant Officer Alan Davis crewed the first flight.

The new Armed Reconnaissance Helicopter blends the rotor and drivetrain of the commercial Bell 407 with a Honeywell HTS-900-2 turboshaft. The Mission Equipment Package integrates the FLIR Systems BriteStar II electro-optical chin turret with a two-screen integrated cockpit built around the Rockwell Collins Common Avionics Architecture System (CAAS). The ARH-70A will provide Level 2 UAV control to download UAV imagery. It will also be able to transmit streaming imagery from its own sensor and receive digital messages.

Bell Helicopter won the ARH System Development and Demonstration contract in July 2005. Limited User Testing (LUT) starts at Yuma Proving Grounds this August or September 2006. With a favorable LUT, Bell will launch Low Rate Initial Production for the first 38 ARH-70s. Initial Operational Test and Evaluation in 2008 precedes a full-rate production decision.

Bell Team Proposes Fancraft For City Combat

Bell Helicopter and Israeli design house Urban Aeronautics Ltd. Bell and Urban Aero have signed a Proof of Concept Collaboration Agreement to explore ducted Fancraft™ technology and hope to fly a demonstrator around 2010. With twin LHTEC T800 engines, a conceptual 6,700 lb X-Hawk Urban Warfighter would use fore and aft lift fans with top and bottom control vanes to attain altitudes to 12,000 ft. Reversible thrusters promise forward speeds to 140 kt and wheels driven by electric torque motors will enable the vehicle to drive through streets at 10 to 12 mph. The Fancraft concept is applicable to a variety of vehicles, including a 4,200 lb X-Hawk. According to Jon Tatro, Bell director of advanced concept development, "We see it as more evolution than breakthrough. We don't see any show stoppers."

The X-Hawk builds upon the Piasecki Air Jeep experience with advances in fly-by-wire controls, turboshaft engines, and control actuators. The lift fans vary collective blade pitch only and work in conjunction with moving inlet and exhaust vanes. Combined fan pitch changes control climb and descent. Differential fan pitch controls vehicle pitch and yaw. In contrast to the Air Jeep, vanes above and below the fans meanwhile provide twice the roll control power available with exhaust vanes alone. Also unlike the original Air Jeep, the X-Hawk also introduces fan louvers for and aft to reduce momentum drag and increase lift. Computer-based Fly-By-Wire flight controls will blend motions throughout the flight envelope to maintain generally horizontal flight and low pilot workload.

Urban Aeronautics flew a scaled Fancraft in 2003 to validate the vane controls and performed wind tunnel tests in August 2005. It leads the design effort with Bell providing material and program support. Under a generic Fancraft study funded by the Office of

Naval Research, Penn State University will work with Bell and Urban on Fancraft mathematical models. Purdy Corp. has designed an X-Hawk drive system with split torque gearboxes and cross-shafting for single-engined safety.

X-Hawk Urban Warfighter disk loading would be about 40 lb/sq ft, twice that of the V-22 tilt rotor. The designers are considering a fixed wing to offload the fans and Looking at flying wing – cabin lift and wings to offload the fans and supplement cabin lift. Skirts are also a possibility for a hovercraft able to skim the surface at speeds to 70 kt.

Inspired by events in Mogadishu in 1993 where trapped US soldiers were denied helicopter extraction, the notional X-Hawk Urban Warfighter would be flown by a single pilot and carry 11 troops above city streets. It could deliver troops to rooftops or window level with half the noise of a helicopter. While helicopters may be denied rooftop landing zones by towers, TV antennas and other obstructions, the ducted fans are protected from contact and provide an aircraft for the complex urban environment. Computer simulations show the Fancraft twice as effective as a Bell 212 in urban entry scenarios, and Bell and Urban believe an acoustic signature half that of a helicopter will give the Fancraft a less predictable approach. The Fancraft also generates no downwash at altitudes greater than 60 ft and maintain a lower boundary layer than that created by a helicopter.

Unmanned Little Bird Flies Unmanned



Boeing Mesa flew its Unmanned Little Bird (ULB) demonstrator for the first time without a safety pilot June 30 at the U.S. Army's Yuma Proving Grounds in Arizona. The modified MD 530F helicopter lifted off from a helipad, hovered briefly, and flew a programmed 20-minute armed intelligence,

surveillance and reconnaissance mission. It returned to the helipad and landed within six inches of the planned recovery location.

The ULB demonstrator made its first hands-off flight in October 2004, and before the first fully unmanned mission had flown more than 450 hours of engineering flight test time as a rapid prototyping platform for UAV sensors and systems. Not including fuel, the ULB mission payload for the first unmanned flight weighed more than 740 pounds. The five-blade MD-530F lifted off at 3,000 pounds, but could have carried an additional 550 pounds of payload. The six-bladed A/MH-6X helicopter expected to make its first flight later this

summer offers another 800 pounds of payload.

Boeing Advanced Systems is funding research and development of the ULB to demonstrate Level 5 UAV control with the unmanned vehicle redirected and the payload or sensor controlled guided from a remote site or another platform. The autonomous flight control system is designed to be applicable to other manned and unmanned aircraft.

US Army Buys European LUH

The US Army has selected the UH-145/EC-145 from European Aeronautics Defense and Space (EADS) as its new Light Utility Helicopter (LUH). The Army plans to buy 322 UH-145s and has a requirement for up to 352 aircraft. EADS now expects to have the first two helicopters



ready for delivery before the end of 2006 and will ship early aircraft from the EC145 production line in Donauworth, Germany. Formal deliveries to the US Army will come from the American Eurocopter facility in Columbus, Mississippi. The Mississippi site will expand in two phases, first for partial assembly of UH-145s from Germany and then for full assembly on a new line beginning in August 2007.

The 7,900 lb UH-145 is a derivative of the BK117 with a VEMD (Vehicle and Engine Management Display) “glass” cockpit compatible with night vision goggles. It will give the US Army an FAA-certified helicopter to fly in the Continental United States and non-combat theaters overseas. The Light Utility Helicopter can carry eight passengers and a crew of two and will perform general support, civil search-and-rescue, RAID anti-drug patrol, medical evacuation, and Homeland Security missions. The initial \$43.1 contract includes MEDVAC and hoist kits along with pilot transition and maintainer training. The First Unit Equipped is planned for the second quarter of 2007.

The LUH selection makes EADS North American Defense for the first time prime contractor in a major US Department of Defense program and gives Eurocopter its largest order ever from a single customer. Total program value is placed around \$3 billion. EADS promises more than 200 assembly jobs at the American Eurocopter facility in Columbus, Mississippi and another 20 to 40 jobs at American Eurocopter in Grand Prairie, Texas for program support, including fleet maintenance, parts and service, and training. Turbomeca USA will add 35 to 45 new jobs to assemble French Ariel 1E2 engines for the UH145. Thales USA is to transfer production of its Meghas avionics suite from Europe to a new facility in Irvine, California for the UH-145 and several other Eurocopter models.

Systems integrated WestWind Technologies in Huntsville, Alabama will add US Army mission equipment packages and perform UH-145 modifications. Sikorsky subsidiary Helicopter Support Inc. will meanwhile provide contractor logistics support for the LUH fleet. CAE USA in Tampa, Florida, will develop the UH-145 cockpit procedures trainer.

EADS also claims a network of US subcontractors for the LUH program including Aerolite, Armor Holdings, the NORDAM Group, Keith Products, and Wulfsberg Electronics.

[TOP](#)