

TECHNOLOGY

DEMONSTRATION GRAHAM WARWICK / WASHINGTON DC

DARPA takes over control of X-37

NASA decides programme does not support its goals, although it will remain involved as technical consultant

Boeing's X-37 programme to demonstrate technology for a reusable spaceplane has been passed from NASA to the US Defense Advanced Research Projects Agency (DARPA). The future unmanned demonstrator has been under review since NASA reorganised around space exploration earlier this year.

The new Office of Exploration Systems determined that the X-37 "did not directly support NASA's goals" for exploration and it was "reprioritised", says the US space agency. "We found a partner inter-

ested in the technology. It is taking over the programme." NASA will continue to be involved as a technical consultant.

DARPA is taking over the approach and landing test vehicle (ALTV) nearing completion at Boeing Phantom Works. Completion of a second X-37, the planned long-duration orbital vehicle (LDOV), is on hold, but NASA says it will continue technology work. The ALTV is designed to demonstrate autonomous landings.

NASA had planned a series of five

drop tests of the unpowered ALTV from its Boeing B-52 next year. The space agency says Scaled Composites has been selected to perform the drop tests early next year, but cannot confirm reports that Scaled's White Knight aircraft, mother ship for the SpaceShipOne manned sub-orbital vehicle, will be used.

Boeing signed a \$173 million co-operative agreement with NASA and the US Air Force in 1999 to develop the first X-vehicle capable of on-orbit operation. The USAF pulled out of the X-37 programme

and a revised, \$301 million agreement was signed with NASA in 2001 covering atmospheric flight tests. The contract also initiated design of the orbital vehicle, then scheduled for launch in 2006.

The powered LDOV was to be launched by a Delta II rocket, and then operate in orbit for up to 270 days before re-entering and landing autonomously. The orbital vehicle was intended to demonstrate technology for thermal protection, propulsion, avionics and other systems on a reusable spaceplane.

CONCEPT ARIE EGOZI / TEL AVIV

X-Hawk developers to build policing model

Urban Aeronautics, which is developing the X-Hawk vertical take-off and landing (VTOL) vehicle, has added a new model intended for operation by law enforcement agencies.

The X-Hawk LE is a more powerful version of the vehicle designed primarily for operation in urban and other confined environments. Presented at the recent Airborne Law Enforcement Association (ALEA) conference in Charlotte, North Carolina, the vehicle is designed to carry a pilot and three fully equipped police officers and cruise for 3h plus reserves at speeds of up to 140kt (259km/h).

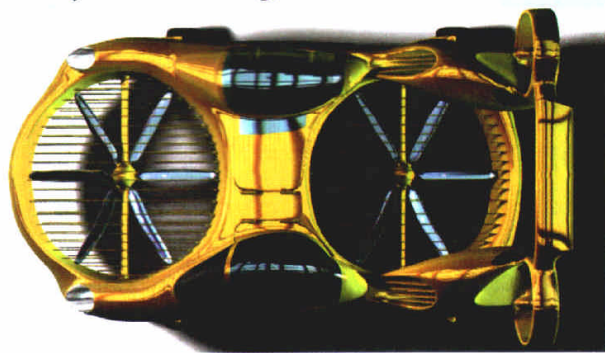
The Israeli company is also developing an emergency medical service (EMS) version for which it is

collaborating with design partner The Center for Emergency Medicine/STATMedEvac based in Pittsburgh, Pennsylvania.

In its final US Federal Aviation Administration-certificated version, the X-Hawk is expected to cost some 15% less than a similarly equipped twin-engine helicopter due to the absence of a complex rotor system, says Urban Aeronautics.

The need for articulated rotor heads is eliminated by Urban's patented vane control system. Two internally mounted variable-pitch rotors provide the lift the vehicle needs to support its useful load plus fuel.

The control system relies on two rows of movable vanes, positioned



Lift fans enable X-Hawks to operate within urban and confined areas

at the entrance and exit of each of the two ducted lift-fans. By rotating the vanes in the same direction, the incoming flow through the ducts creates side forces without rolling. Alternatively, rotating the upper

and lower vanes in opposite directions produces rolling moments without side forces.

Combining these two basic modes through a fly-by-wire system and sensor suite should enable the X-Hawk to operate in urban areas even in adverse weather conditions.

Urban Aeronautics has signed an agreement with Israeli engine company Bet Shemesh for the supply of turbine engines for its two planned X-Hawk prototypes.

The company's CityHawk proof-of-concept vehicle recently completed hover testing near Ben Gurion Airport in Israel.

Dr Rafi Yoeli, Urban Aeronautics president, says the tests demonstrated that the vane control system provided "more control than we expected".



Ducted props lift UAV vertically

TESTING GRAHAM WARWICK / WASHINGTON DC

First flights for Cyber Scout

A prototype lightweight vertical take-off and landing (VTOL) unmanned air vehicle has made its first hover flights at developer Cyber Aerospace. The Cyber Scout, with a 3.6kg (8lb) empty weight and cruise speed goal of 100kt (185km/h), is designed to be hand-carried. It is powered by three ducted-fan piston engines, one mounted vertically in the forward fuselage and two at the rear in swivelling nacelles.

In vertical flight mode, the aft nacelles are tilted down and all three engines are running, says Cyber president Jim Alman. In forward flight, the nacelles would be horizontal and all but one of the rear engines would be shut down. The private-venture Cyber Scout is designed to carry interchangeable payloads in a conformal pod under the fuselage. Payload capacity is in the 0.45-0.9kg class and endurance is expected to be around 2h. "But customers want 4h," Alman says. "It will depend on the engines."