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ScanEagle® Unmanned Aircraft System

Description and Purpose:

ScanEagle® is a product of Insitu, a wholly owned subsidiary of Boeing. ScanEagle was developed as a low-cost, long endurance autonomous unmanned aircraft system (UAS) to provide persistent intelligence, surveillance, and reconnaissance (ISR) as well as flexible, rapid deployment for a variety of government and civilian applications.



Background:

ScanEagle is a low altitude, long endurance autonomous aircraft designed, manufactured and operated by Insitu. It draws on Boeing's communications and payload technology and systems integration experience.

The vehicle is mounted with either an electro-optic or infrared camera onboard. The camera's gyro-stabilized turret allows the operator to track stationary or moving targets autonomously – without having to re-maneuver the aircraft. ScanEagle is capable of stealthily flying missions undetected, and routinely flies in adverse weather.

The unmanned aircraft (UA) is launched autonomously via a pneumatic wedge catapult launcher and flies pre-programmed or operator-initiated missions guided by global positioning system and an onboard flight computer. It is retrieved using Insitu's SkyHook® system that uses a rope hanging from a 50-foot-high boom to catch the aircraft by a wingtip.

ScanEagle's portability and runway-independence enable it to be launched, operated, and retrieved from close-support locations, mobile vehicles, and small ships. The UAV is 4.5 feet long with a 10-foot wingspan and can remain on station for more than 24 hours.

The aircraft is comprised of interchangeable modules that permit the operator to change a payload camera or even a wing within a few minutes. This makes maintenance very easy, which in turn enhances system reliability.

In November 2006, the ScanEagle team logged the longest continuous flight by flying a ScanEagle with a heavy fuel engine for 28 hours and 44 minutes, completing the flight with a 4-hour fuel reserve.

The ScanEagle system continues to evolve. Newer configurations incorporate enhancements such as higher resolution infrared and electro-optic cameras; a heavy fuel engine to meet system safety and logistics required aboard maritime vessels; a custom, ultra-light Mode C transponder to deconflict airspace with other air traffic; improved video transmitter systems; Rover remote video terminal interoperability; improved in-flight fuel measurement systems; automatic identification system (AIS) data reception capabilities; compliance with NATO Standardization Agreement (STANAG) 4586 specifications; as well as many other improvements that enhance the system's already impressive reliability and modularity.

Program History:

2010

Insitu's ScanEagle unmanned aircraft system is selected by U.S. Air Force Academy to train cadets. *(June)*

Two ScanEagle unmanned aircraft and associated ground equipment are donated as part of Insitu's cooperative research and development agreement with the FAA's William J. Hughes Technical Center and the New Jersey Air National Guard to study unmanned aircraft systems and address their integration into the national airspace system. *(June)*

ScanEagle logs 17,000 combat flight hours with Canadian Forces *(May)*

ScanEagle logs 300,000 combat flight hours. *(April)*

ScanEagle conducts damage assessment and aids in relief efforts as part of U.S. Northern Command, Joint Task Force Alaska's Arctic Edge 2010 earthquake scenario training exercise at the University of Alaska's Poker Flat Research Range. *(April)*

Insitu successfully demonstrates interoperability between ScanEagle video with metadata and the U.S. Army's One System Remote Video Terminal (OSRVT). The demonstration to U.S. Army personnel is conducted at Fort Rucker, Ala. in conjunction with the Joint Systems Integration Laboratory (JSIL). It is the first UAS demonstration at Fort Rucker in six years. *(March)*

ScanEagle accounts for 22 percent of the total 550,000 hours that the Office of the Secretary of Defense estimates unmanned aircraft fly annually supporting combat missions for the U.S. armed services. *(March)*

ScanEagle conducts aerial flood plain surveillance of the Red River along the North Dakota/Minnesota border. The effort, which included an FAA certificate of authorization to operate, is part of research into the effectiveness of using unmanned aircraft in U.S. airspace. *(March)*

The NanoSAR payload module is released for the dual bay configuration of ScanEagle. This small, synthetic-aperture radar payload provides high-resolution imagery that can penetrate adverse weather conditions, battlefield obscurants, camouflage and light foliage, allowing radar-enabled area searches over land and sea. *(February)*

Electronic fuel injection is successfully flight-tested on the heavy fuel engine equipped ScanEagle, providing overall improvements—especially in extreme temperatures and at high altitudes, including mountainous terrain. *(January)*

2009

ScanEagle surpasses 250,000 operational flight hours. *(December)*

The Insitu ScanEagle UAS wins the 2nd Annual C4ISR Journal Top 5 Award in the platform category. The award is a coveted distinction within the ISR industry and intelligence community conferred by the *C4ISR Journal*, a publication of the Army Times Publishing Company. *(October)*

ScanEagle is provided to the University of North Dakota (UND) for use in the nation's first program to offer a Bachelor of Science in Aeronautics Unmanned Aircraft Systems Operations. *(October)*

The heavy fuel engine (HFE) equipped ScanEagle surpasses 2,500 combat flight hours and 300 shipboard sorties flying aboard U.S. Navy ships more than 11 hours daily. *(August)*

In Alaska, intelligence from ScanEagle is used to track the progression of fires and hot spots of a 440,000-acre complex of fires. Infrared sensors identify the edge of the fires, improving the accuracy of fire maps. *(August)*

ScanEagle operated by the University of Alaska receives an emergency certificate of authority (COA) from the Federal Aviation Administration to fly in civil airspace with an unmanned aircraft beyond line-of-sight. Insitu's ScanEagle is the first entity other than NASA or the Department of Defense to receive this COA. *(August)*

ScanEagle participates in the U.S. Navy's Talisman Saber 2009 exercise, demonstrating that a submarine can control a ScanEagle UAS launched from land. *(July)*

Insitu delivers 1,000th ScanEagle UA. *(July)*

Month-long ScanEagle operations are conducted by University of Alaska Fairbanks for NOAA Fisheries Service to search for ice seals at the southern edge of the Bering Sea. The imagery is used to estimate the abundance and distribution of ice seals. *(May)*

Boeing receives a contract from U.S. Special Operations Command (SOCOM) for ISR services using the ScanEagle UAS. The contract has a potential value of \$250 million. Under the new agreement, Boeing and Insitu will operate, maintain, and support ScanEagle systems for the Special Operations Forces Mid-Endurance Unmanned Aircraft System (MEUAS) program for the next five years. *(May)*

The Canadian Government awards Insitu a US \$30 million contract to continue providing small unmanned aerial vehicle (SUAV) services to support the Canadian Forces' ISR operations in Afghanistan. The award comes after

ScanEagle successfully proves itself on the battlefield in support of Canadian troops in Afghanistan under the interim contract. The new contract includes in-theater flight operations, on-demand payload reconfiguration and aircraft maintenance. *(April)*

2008

Canada awards Boeing a \$14 million interim contract to provide ScanEagle services including launch, recovery, maintenance, service support, and training. *(August)*

2007

Boeing is awarded a 3.5-year, \$18 million U.S. Marine Corps contract to provide additional ScanEagle ISR support services to the Marine Expeditionary Forces. The contract, awarded by the Marine Corps Systems Command in Quantico, Va., includes options for additional support that could increase the contract value to \$381.5 million. *(July)*

Boeing Defence Australia is awarded \$20 million to provide ISR services to the Australian Army in Afghanistan. Throughout the six-month agreement, Boeing Defence Australia works closely with the Australian Army to provide vital surveillance and reconnaissance capabilities for Australian and coalition forces in Afghanistan. The level of ScanEagle services provides a significantly higher operational tempo than those previously provided for the Army's Overwatch Battle Group in Iraq. *(June)*

Boeing announces its first contract with the U.S. Air Force for a ground situational awareness toolkit integrated with ScanEagle and a ShotSpotter[®] gunfire detection and location system to support anti-sniper missions. *(January)*

Boeing Defence Australia is awarded a contract to provide ISR services to the Australia Army using ScanEagle in Iraq. The services provided by ScanEagle are used in southern Iraq by Australian soldiers operating with the Overwatch Battle Group (West) -2 in Operation Catalyst. *(January)*

2005

U.S. Navy awards Boeing a \$13 million contract modification for ScanEagle system support of high-speed vessels and an afloat staging base.

ScanEagle supports the U.K. Ministry of Defence's Joint UAS Experimentation Programme. Controlled from a Royal Navy ship off the coast of Scotland, ScanEagle is launched from land then handed over to the ship-based control station operator. *(September)*

Boeing receives a \$14.5 million service contract from the U.S. Navy for UAS services in support of Operation Iraqi Freedom and the Global War on Terror. Boeing provides ScanEagle unmanned aircraft, communication links, and ground

equipment for Naval Expeditionary Strike Group and oil platform security in the Persian Gulf. *(April)*

2004

Boeing signs a service contract with the U.S. Marine Corps for two ScanEagle mobile deployment units for the First Marine Expeditionary Force in Iraq. *(June)*

General Characteristics:

Length	4.5 ft	1.37 m
Wing Span	10.2 ft	3.11 m
Empty Structure Weight	28.8 lbs	13.1 kg
Max Takeoff Weight	44.0 lbs	20.0 kg
Max Horizontal Speed	80 knots	41 m/sec
Cruise Speed	48 knots	25 m/sec
Service Ceiling	19,500 ft	5,944 m
Endurance		24+ hours
Launch	Pneumatic Catapult	
Recovery	Skyhook Wingtip Capture	

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