

Insitu  
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## Integrator™

### Description and Purpose:

The Integrator™ unmanned aircraft (UA) is a product of Insitu, a wholly owned subsidiary of The Boeing Company. Integrator is a multi-mission, long-endurance UA that carries custom payloads for intelligence, surveillance and reconnaissance. The payload-centric design allows for easy integration with external systems.



### General Characteristics:

The Integrator system can carry a 25-pound payload for greater than 15 hours; it can carry payloads totaling up to 37.5 pounds, providing up to 350 watts of power.. Integrator has reconfigurable payload bays and maintains the same long endurance, modular construction and small system footprint of the ScanEagle unmanned aircraft system (UAS). Integrator has line-of-sight communications range of over 55 nautical miles (nm). That range can be extended to 100 nm with a communications relay payload and to 550 nm with configuration for beyond line-of-sight operations.

Data link commands control the Integrator UA, reconnaissance sensors and payloads. Missions can be pre-programmed and executed autonomously. Integrator ground control systems allow for seamless integration and expandability, multi-vehicle control, remote and mobile operations and NATO-standard interfaces.

Insitu's Multiple UAV Software Environment (IMUSE) is a graphical user interface used for flight planning, monitoring and operation. IMUSE provides operators with comprehensive, easy-to-use tools for all phases of flight. Operators use the IMUSE map to indicate waypoints, targets, and aircraft tracks. The interface is designed such that the operator essentially draws lines for flight paths and target paths, and specifies which path to follow.

## STANDARD SENSOR PACKAGE

Electro-optic (EO)  
Long-wave infrared (LWIR)  
Mid-wave infrared (MWIR)  
IR marker  
Laser rangefinder

## DIMENSIONS

Wing Span	16 ft	4.8 m
Length	7.2 ft	2.2 m

## WEIGHTS

Empty Weight	75 lb	34.0 kg
Fuel Limit	41 lb	18.6 kg
Payload Bay Limits (combined)	37.5 lb	17 kg
▪ Payload Bay	35 lb	15.9 kg
▪ Nose Bay	15 lb	6.8 kg
▪ Hardpoint (each)	15 lb	6.8 kg
▪ Outboard Wing (each)	3 lb	1.4 kg
Max Takeoff Weight	135 lb	61.2 kg

## PERFORMANCE

Max Horizontal Speed	80+ knots	41.2+ m/s
Cruise Speed	55 knots	28.3 m/s
Ceiling	>15,000 ft	4,573 m
Endurance	24 hours	

## SYSTEM FEATURES

Propulsion	8 hp, advanced reciprocating engine
Fuel	Gasoline or heavy fuel
Navigation	Differential GPS/Athena Guidestar
Launch	Pneumatic catapult
Recovery	SkyHook wingtip capture

## Background:

Integrator is based on concepts proven in ScanEagle and matured through ongoing research and development. It retains key ScanEagle features – small system footprint, long endurance, autonomy, stabilized imagery, shipboard launch and recovery, low observable signature, and hub and spoke operation – but has the capacity to employ a mix of larger payloads, for longer periods, in equally austere environments.

Insitu's unmanned aircraft systems were originally designed to track fish populations. Engineered to withstand the extreme environmental stresses of a maritime environment, the small, durable system design translated well to the needs of today's warfighter. Needs of coalition forces drove numerous advances and operational improvements to the system to bring ScanEagle to the warfighter in Afghanistan and Iraq. As part of the Insitu family of UAS, Integrator uses the same interoperable launch and recovery system designs that have been used since 2004 in combat and other extreme environments and attained nearly 100 percent mission availability.

## Program History:

Integrator became a U.S. Navy program of record in July 2010 when it won the Small Tactical Unmanned Air System (STUAS) / Tier II competition. Under the \$43.7 million contract, Integrator will support two operational assessments: the first will determine if an early operational capability option will be exercised leading to the fielding of up to five systems in fiscal 2011; and the second will support low-rate initial production of two systems, one each for the U.S. Navy and U.S. Marine Corps. Initial operating capability is expected in fourth quarter fiscal 2013. Integrator is then expected to move to full-rate production of up to 56 systems.

Four Integrator air vehicles are scheduled for delivery in 2010. Integrator has not entered rate-production.

Major customers of Insitu include the United States Marine Corps, the United States Navy, the United States Army, Special Operations, Australian Defence Force and Canadian Forces.

## **2010**

U.S. Naval Air Warfare Center Aircraft Division awards a \$43.7 million contract to Insitu to begin full-scale development of the Integrator UAV. (July)

The NanoSAR payload module is released for Integrator. 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 Integrator, providing overall improvements—especially in extreme temperatures and at high altitudes, including mountainous terrain. (*January*)

## **2009**

Integrator demonstrates improved operations security with advanced encryption standard (AES) capable digital data link. (*December*)

The Insitu Integrator UAS successfully demonstrates single-channel ground-to-air radio system (SINCGARS) capabilities during a communications relay payload test flight in eastern Oregon. Communications relay supported by an airborne asset is essential in situations where line-of-sight obstructions exist. (*October*)

Insitu completes Integrator flight demonstrations as part of the competition for the small tactical unmanned aircraft system (STUAS / Tier II) contract by the United States government. (*June*)

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