

Lockheed Martin Completes JSF Avionics Development And Integration, Proves Capabilities On Flying Test Bed

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The Lockheed Martin Joint Strike Fighter (JSF) team has completed the development and integration of the aircraft's avionics systems, further validating the LM design's unprecedented combination of capability and affordability.

"These tests prove our JSF avionics are now low-risk and ready to move forward to the Engineering and Manufacturing Development (EMD) phase," said Frank J. Cappuccio, vice president and program manager for the Lockheed Martin JSF. "This team has produced a highly evolved, integrated avionics package that ensures our JSF is lethal and supportable, yet still affordable."

The team conducted the tests aboard Northrop Grumman's BAC 1-11 cooperative avionics test bed (CATB). As a key partner on the LM JSF team, Northrop Grumman has played a central role in developing the aircraft's mission systems.

The CATB enables prototype multi-sensor JSF avionics to be flown under real-world conditions, generating data that is impossible to reproduce in ground testing and allowing the team to validate simulation and modeling tools. CATB has logged more than 100 hours of flight time testing Lockheed Martin JSF mission systems.

Three scenarios defined the test environment: air interdiction, close air support and strategic attack. The avionics package showed effective warnings against multiple threats while simultaneously attacking designated targets. The tests also emphasized how the fusion of data from the integrated mission system enhances JSF survivability and lethality.

The JSF mission system demonstrated precision engagement and identification of challenging targets in urban areas. The fusion of on-board and off-board imagery enhanced target acquisition, identification and precise location.

"In current and past fighters, the pilot has had to read many separate displays and process a lot of information while trying to attack a target and evade enemy fire," said Harry Blot, vice president and deputy program manager for the Lockheed Martin JSF. "Our JSF assimilates that information automatically and gives the pilot only decision-quality data, freeing him to be a tactician."

Integrated into the system is a helmet-mounted display (HMD) that provides the pilot with through-the-cockpit situation awareness. Among the HMD's key technologies is the Distributed Aperture System (DAS), which uses multiple external sensors that provide missile warning and enable the pilot to "see" through the bottom and sides of the aircraft. DAS produced a seamless day- and-night infrared imagery scene over a wide field of view.

"These demonstrations provide high confidence for all-weather, real-time target acquisition, identification and weapons employment," said Peter Shaw, mission systems product director for the Lockheed Martin JSF.

Among the integrated systems demonstrated:

- Automatic Target Cueing (ATC) -- Directs sensors to acquire targets rapidly and automatically
- Electro-optical targeting system (EOTS) -- Incorporates advanced infrared camera technology and other innovations to extend the range from which pilots can identify targets day or night, and through smoke
- Electronic warfare (EW) suite -- Detects and locates radio frequency (RF) threats (such as a lock-on from enemy radar); reduces risk by integrating new technologies into existing, proven capabilities
- Electronically scanned radar -- Achieves radar's typical scanning function with no moving parts

Avionics team members include Northrop Grumman Electronic Sensors and Systems Sector, Litton Advanced Systems, Kaiser Electronics, Harris Corp., LM Sanders, and LM Missiles and Fire Control.

Lockheed Martin received one of two JSF Concept Demonstration contracts awarded by the Department of Defense in November 1996. The Lockheed Martin JSF team includes Northrop Grumman and BAE SYSTEMS. Flight evaluation of the demonstrator aircraft is scheduled to take place in 2000, with government selection of a single contractor for the EMD phase set for 2001.

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