Lockheed Martin F-35 Marks 20th Flight, 'CATBird' Takes Final Steps Toward Airborne Avionics Testing

On its 20th flight, the first F-35 Lightning II successfully tested engine performance and aircraft handling qualities at up to 20,000 feet as pilots and crew prepare for air refueling in the coming weeks. Shortly afterward, a dedicated test-bed aircraft began final check-out flights for airborne testing of the Lightning II's Communication-Navigation-Identification system, initiating a test program that will ultimately integrate and fly the complete F-35 avionics package.

(Photo: http://www.newscom.com/cgi-bin/prnh/20071207/LAF069A-a)
(Photo: http://www.newscom.com/cgi-bin/prnh/20071207/LAF069A-b)

"We are poised for a long run of testing on both of these aircraft," said Dan Crowley, Lockheed Martin executive vice president and F-35 program general manager. "For the F-35, those tests include refueling from an airborne tanker in the short term and supersonic flights next year. At the same time, we are putting the finishing touches on our first short takeoff/vertical landing F-35 aircraft, which will roll out of the factory this month and initiate flight testing in the spring. By the end of 2008, we expect to have at least three F-35s in the air and numerous aircraft on the assembly line."

The Lightning II's flight began at 1:30 p.m. CST when Chief Test Pilot Jon Beesley executed a military-power (full power without afterburner) takeoff, ran the engine at various power settings and checked flying qualities at 6,000, 17,500 and 20,000 feet, and performed a fuel-dump test at 250 knots. Landing was at 2:15 p.m. CST. Beesley reported that the tests were successful and the jet was a pleasure to fly.

"The Lightning II embodies a long list of advancements that will make it better, smarter and more reliable than anything that's come before it, and those technologies are extraordinarily mature in this first-ever F-35," Beesley said. "When you project ahead to the F-35s that will be entering the fleet in 2010, you see fighters that benefit from the testing we're doing now -- fighters that will set new standards for combat-readiness right out of the box."

At 3:30 p.m. CST, the Cooperative Avionics Test Bed -- "CATBird" -- took off on a two-hour functional check flight, one of its final sorties before aerial F-35 mission systems testing begins. CATBird is a highly modified 737 airliner designed to test, integrate and validate the full F-35 mission systems suite in a dynamic, airborne environment before the system ever flies in an F-35 aircraft.

CATBird flights with the CNI system operating will be the first in a series of airborne tests that will methodically add constituent elements of the F-35 mission systems suite until the entire Lightning II avionics package is onboard the CATBird. The mission systems will be fully integrated and operating as they would on an F-35 aircraft -- a first for a fighter test program.

"The F-35 will have the most powerful and comprehensive avionics ever flown on a fighter aircraft, and it represents a phenomenal capability," said Doug Pearson, Lockheed Martin vice president of the F-35 Integrated Test Force. "Our goal is to get the system perfected on the CATBird so that it works exactly as advertised when we put it in the Lightning II fighter."

Other parts of the F-35's mission systems suite include a powerful Active Electronically Scanned Array radar with the ability to track multiple ground and air targets as well as provide Synthetic Aperture Radar mapping and electronic attack; an Electro-Optical Distributed Aperture System to provide spherical threat detection around the aircraft and supply the pilot with synthetic vision, in daytime or total darkness, that can be projected onto the helmet visor; an Electro-Optical Targeting System with search and track functions for ground or airborne targets; and an electronic warfare suite with emitter-locating capability. The F-35 mission systems suite is entirely internal to the aircraft, with no external pods or sensors, a configuration that preserves the Lightning II's stealth profile.

The first mission-systems equipped F-35 will fly in 2009. The F-35 mission systems suite is already operating in ground-based laboratories, and individual components like the AESA radar, EOTS and EO-DAS already are undergoing preliminary airborne testing in aircraft other than the CATBird. The F-35 Lightning II is a supersonic, multi-role, 5th generation stealth fighter designed to replace a wide range of existing aircraft, including AV-8Bs, A-10s, F-16s, F/A-18 Hornets and United Kingdom Harrier GR.7s and Sea Harriers.

Lockheed Martin is developing the F-35 with its principal industrial partners, Northrop Grumman and BAE Systems.

Two separate, interchangeable F-35 engines are under development: the Pratt & Whitney F135 and the GE Rolls-Royce Fighter Engine Team F136.

Headquartered in Bethesda, Md., Lockheed Martin employs about 140,000 people worldwide and is principally engaged in the research, design, development, manufacture, integration and sustainment of advanced technology systems, products and services. The corporation reported 2006 sales of $39.6 billion.

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