



## F-35 Lightning II Program Update & Fast Facts

### Development Updates

- First F-35B STOVL variant, BF-1, engaged its STOVL propulsion system in flight for the first time on Jan. 7, 2010.
- Second F-35B STOVL variant, BF-2, flew to NAS Patuxent River, Md., on Dec. 29, 2009.
- First F-35B STOVL variant, BF-1, flew to NAS Patuxent River, Md., on Nov. 15, 2009, where it will begin STOVL flight operations leading to vertical landing.
- First optimized CTOL variant, AF-1, completed its successful first flight on Nov. 14, 2009.
- Second F-35B STOVL variant, BF-2, completed program's first aerial refueling test using the Navy- and Marine Corps-style probe-and-drogue refueling system on Aug. 13, 2009.
- First F-35C carrier variant unveiled July 28, 2009.
- F-35 flight test program accomplished its 100<sup>th</sup> flight on June 23, 2009.
- Software development is on schedule, more than 70 percent complete.
- First Flight Readiness Review shows F-35B is ready to proceed with STOVL flight testing.
- Second F-35B STOVL variant, BF-2, completed first flight on Feb. 25, 2009.
- First F-35 variant equipped with mission systems, BF-4, rolled out of the factory Jan. 21, 2009; will lead to the first avionics testing on board an F-35 aircraft.
- Software development more than 80 percent complete.

### F-35 AA-1 Flight Testing

- On Dec. 17, 2009, AA-1 conducted its 91st and final flight and is now preparing for live-fire testing at Naval Air Weapons Station China Lake, Calif.
- In Fall 2009, AA-1 deployed to Edwards AFB, Calif., for continued testing. On Oct. 6, 2009, AA-1 conducted testing to evaluate the aircraft's hook system, with the test results so far matching what design models predicted.
- First deployment to Eglin AFB, Fla., on April 22, 2009.
- First U.S. Marine pilots the F-35 on March 19, 2009.
- In-flight opening of weapons-bay doors completed on Feb. 24, 2009.
- First supersonic flight completed on Nov. 13, 2008; Mach 1.05.
- Ninety-one flights completed.
- Engine-out air-start testing completed at Edwards AFB, Calif.
- In-flight refueling system qualifications complete.
- Flight Test Update 3.0 installation complete.
- First military pilot to fly the F-35 (Jan. 30, 2008) described handling as "phenomenal."
- Speed of Mach 0.9 achieved on Jan. 10, 2008.
- Ascent to 38,000 feet on May 3, 2007.
- Helmet-Mounted Display System flown for first time on April 4, 2007.
- F-35 AA-1 successfully completed its first flight on Dec. 15, 2006.
- Aircraft incorporates content from all nine F-35 participant countries.

### The second F-35A (AF-1) is in flight test.

- First flight completed on Nov. 14, 2009.
- Three flights completed.

Current as of Jan. 14, 2010

Produced by F-35 Communications Team

- Following third flight, aircraft began ground vibration testing (completed) and entered the calibration lab (in process).

#### **The first F-35B (BF-1), short takeoff/vertical landing (STOVL) variant, is in flight test.**

- On Jan. 7, 2010, BF-1 engaged its STOVL propulsion system in flight for the first time near NAS Patuxent River, Md.
- On Nov. 15, 2009, BF-1 arrived at NAS Patuxent River, Md., in preparation for hovers and the first vertical landing.
- On Oct. 17, 2009, BF-1 completes first non-tethered test of STOVL system during taxi tests.
- BF-1 exceeds F-35B vertical thrust requirement for all missions.
- Hover pit ground tests validated the propulsion system and aircraft response.
- Thirty flights completed.
- Final modification period for STOVL-mode flight complete.
- First flight successfully completed on June 11, 2008.
- All ground tests completed on June 9, 2008.
- Successful ground test of STOVL propulsion system conducted on May 25, 2008.
- Successful afterburner engine runs on May 16, 2008.
- Aircraft moved from production line to flight line on Dec.18, 2007.

#### **The second F-35B (BF-2) is in flight test.**

- Arrived at NAS Patuxent River, Md., on Dec. 29, 2009, following a nonstop flight from Lockheed Martin's Fort Worth, Texas, plant.
- Began probe/drogue refueling tests on Aug. 13, 2009.
- Sixteen flights completed.
- First flight completed on Feb. 25, 2009.

#### **All System Development and Demonstration aircraft are in production or on the flight line; first four production-model F-35s started.**

- Manufacturing pace is increasing; all test aircraft are in flight testing or production.
- The first Low Rate Initial Production aircraft are also in the manufacturing flow.

#### **The F-35 Cooperative Avionics Test Bed (CATBird) has begun airborne avionics testing.**

- CATBird produced first synthetic aperture radar (SAR) maps, first multi-sensor fusion tracks, in November 2009.
- CATBird completed a two-week flight test deployment at Edwards AFB, Calif., in April 2009, conducting successful airborne testing of F-35 radar, electronic warfare and communications/navigation/identification systems.
- On Nov. 25, 2008, CATBird began in-flight integration of F-35 avionics. The entire sensor suite will progress toward full in-flight integration in 2009.
- CATBird, a highly modified 737, will be used to validate the F-35's massively powerful integrated avionics suite in flight before the avionics are flown on the F-35 aircraft.
- CATBird will fly and proof-test the complete, integrated F-35 mission systems package before it flies in an F-35 aircraft.

- Aerial testing of F-35 Communications-Navigation-Identification system completed in half the time planned on CATBird.

### **The F-35 Autonomic Logistics and Global Sustainment (ALGS) system is active and supporting Manufacturing and Flight Testing**

- F-35 Autonomic Logistics System Operations Center is now operational and supporting flight test aircraft.

### **Funding**

- Long-lead funding approved for Low Rate Initial Production (LRIP) lot 4 (32 aircraft)
- Full funding approved for LRIP lot 3 (17 aircraft)
- Full funding approved for LRIP lot 2 (12 aircraft).
- All aircraft in LRIP 1 and 2 are in assembly; assembly has begun on LRIP 3 aircraft.

### **International Partners**

- All F-35 participant countries have joined the F-35 program's next phase. Those countries are the United Kingdom, Italy, the Netherlands, Turkey, Canada, Australia, Denmark and Norway.

### **Variant First Flights Remaining**

- Carrier variant (CV) F-35C first flight in 1<sup>st</sup> quarter of 2010.

### **Initial Operational Capability (IOC) dates**

- 2012 for USMC
- 2013 for USAF
- 2014 for US Navy

### **Quantities (planned)**

- USAF 1,763
- USN/USMC 680
- RAF/RN 138
- Italy 131
- Netherlands 85
- Turkey 100
- Australia 100
- Norway 56
- Denmark 48
- Canada 80

### **Average Unit Recurring Flyaway Cost (in FY 2002 dollars – the most recent comprehensive estimate)**

- F-35A upper-\$40 million

- F-35B mid-\$60 million
- F-35C mid-\$60 million

### Recent Decisions

- The Joint Combat Aircraft program announced that the United Kingdom has received financial approval to purchase its third F-35B operational test aircraft. (Dec. 2009)
- The Australian government made the decision to purchase 14 F-35 aircraft. (Nov. 2009)
- The Norwegian Parliament has decided to support the government's recent decision to replace its F-16 aircraft with 56 F-35 aircraft. The quantity is higher than the 48 aircraft originally planned. (June 2009)
- The U.S. Department of Defense released the President's FY '10 budget request for military programs that accelerates the F-35 program to 513 aircraft in the five year budget plan (an increase of 28 aircraft). (May 2009)
- Australia released its Defence White Paper with a commitment to maintaining a strong national defence for Australia, including the purchase the 100 F-35 Joint Strike Fighters. (May 2009)
- Dutch parliament made a decision and agreed to procure one test F-35 Netherlands aircraft for inclusion in the test and evaluation phase of SDD. (Apr. 2009)
- The Italian Parliament approved the Ministry of Defence plan to enter into the next phase of their involvement in the program, including the purchase of 131 F-35 aircraft and construction of a final assembly facility at Cameri Air Base. (Apr. 2009)
- The United Kingdom committed to the purchase of three F-35 Lightning II test aircraft to be constructed in LRIP 3 and 4 (for delivery in 2011 & 2012). (Mar. 2009)
- Lockheed Martin received a \$265 million contract to prepare for the production of 28 additional F-35 Lightning II fighters in the fourth lot of low-rate initial production (LRIP), along with a separate \$320 million contract modification for tooling and test equipment beginning with LRIP 3. The LRIP 4 contract is designated for long-lead materials for 12 U.S. Air Force conventional takeoff and landing (CTOL) variants, 14 U.S. Marine Corps short takeoff/ vertical landing variants, one U.S. Navy carrier variant and one CTOL variant for the Netherlands. The contract also provides for other mission equipment, sustainment support, special tooling and test equipment. (Mar. 2009)
- The Netherlands reaffirmed an earlier decision for the F-35 to be its next generation fighter. A final decision by Parliament to purchase F-35 aircraft for IOT&E will occur in 2009. (Dec. 2008)
- Norwegian Prime Minister formally recommended to the Parliament that Lockheed Martin's F-35 Lightning II be selected to fulfill Norway's future air-combat capability requirements. (Nov. 2008)