First Short Takeoff/Vertical Landing Stealth Fighter Unveiled At Lockheed Martin

The Lockheed Martin F-35B Lightning II, the first fighter to combine stealth with short takeoff/vertical landing (STOVL) capability and supersonic speed, made its debut today amid customers from the United States Marine Corps, the United Kingdom's Royal Navy and Royal Air Force, and the Italian Air Force and Navy.

Attendees at the rollout ceremony in Lockheed Martin's Fort Worth assembly plant included Marine Corps Commandant Gen. James Conway. "The flexibility that the STOVL variant of the F-35 will add to the contemporary Marine Air Ground Task Force is amazing," Conway said. "This generational leap in technology will enable us to operate a fleet of fighter/attack aircraft from the decks of ships, existing runways or from unimproved surfaces at austere bases. We find that capability extremely valuable."

The F-35B, designed to replace Marine Corps AV-8Bs and F/A-18s, is one of three variants of the Lightning II. Its first flight is planned for mid-2008, following a series of extensive ground tests. The F-35A conventional takeoff and landing version began its flight test program in December of 2006. The F-35C, designed for catapult launches and arrested recoveries aboard large U.S. Navy carriers, will make its inaugural flight in 2009.

"Think F/A-18 speed and maneuverability, AV-8B forward deployment, F-22 stealth, and astonishing avionics," said Dan Crowley, Lockheed Martin executive vice president and F-35 program general manager. "It's a combination of technologies that may seem like science fiction, but our abundantly-talented international team has made it science fact."

The heart of the F-35B is a STOVL propulsion system comprising the most powerful engine ever flown in a jet fighter, a shaft-driven counter-rotating lift fan situated behind the cockpit, a roll duct under each wing for lateral stability, and a rear 3-bearing swivel nozzle that vectors engine exhaust in the desired direction.

During vertical or short takeoffs, or vertical landings, doors above and below the lift fan open, and a clutch connecting the lift fan to the engine drive shaft engages. A dorsal auxiliary engine inlet opens to increase airflow to the engine. At the same time, doors beneath the 3-bearing swivel nozzle open and the rear nozzle pivots downward, deflecting engine thrust toward the ground. Roll ducts under each wing also are engaged, keeping the aircraft laterally stable. In this configuration, the F-35B can hover, land vertically, take off in a few hundred feet fully loaded, or take off vertically with a light load. When the aircraft transitions from jet-borne to conventional wing-borne flight, the doors close and the pilot can then accelerate to supersonic speeds. The system is completely automatic.

The Lockheed Martin X-35B successfully demonstrated the shaft-driven lift fan propulsion system in 2001, becoming the only aircraft in history to execute a short takeoff, level supersonic dash and vertical landing in a single flight.

The Pratt & Whitney F135 engine will power the first series of F-35Bs. The F136, an interchangeable engine under development by the GE Rolls-Royce Fighter Engine Team, will make its first F-35 flight in 2010. Rolls-Royce produces the shaft-driven lift fan, 3-bearing swivel nozzle and roll duct systems.

An additional six development STOVL F-35s are now in production across the worldwide F-35 supply chain. In 2007, long-lead procurement funds for the first six production STOVL aircraft were authorized, with the first Marine Corps training jets planned for a 2011 delivery.

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 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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