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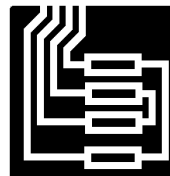
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Lockheed F-117A - Archived 10/2008

Outlook

- F-117 retirement has been accelerated and no future funding is planned
- **Note:** Icons indicate area(s) of current and potential retrofit/modernization activity



Orientation

Description. Single-seat, twin-turbofan-powered, all-weather/night attack/strike aircraft.

Current Status. Production ended in 1990.

Total Produced. Lockheed produced and delivered 59 production-standard aircraft. 36 remain in service.

Application. Armed reconnaissance, all-weather/night precision tactical strike, defense suppression.

Price Range. Program unit cost, \$111 million; unit flyaway cost, \$42.6 million.

Contractors

Prime

Lockheed Martin Corp	http://www.lockheedmartin.com , 6801 Rockledge Dr, Bethesda, MD 20817 United States, Tel: + 1 (301) 897-6000, Fax: + 1 (301) 897-6704, Prime
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Technical Data

<u>Dimensions</u>	<u>Metric</u>	<u>U.S.</u>
Length	20.09 m	65.91 ft
Height	3.78 m	12.42 ft
Wingspan	13.21 m	43.33 ft

Lockheed F-117A

Weight

Max takeoff weight	23,814 kg	52,500 lb
Useful load (est)	6,804 kg	15,000 lb
Typical load(a)	1,800 kg	3,968 lb

Performance

Max level speed	Mach 0.95	Mach 0.95
Combat radius with full payload, full fuel (est)	806 km	500 nm
Takeoff speed	266 kmph	165 kt
Landing speed	242 kmph	150 kt

Propulsion

F-117A: (2) GE Aircraft Engines F404-GE-F1D2 two-spool, non-afterburning turbofan engines rated approximately 48.93 kN (11,000 lbst) each.

(a) Two GBU-15 glide bombs.

Armament. Combination of IR- and TV-guided Mavericks, Paveway II and III bombs, GBU-15 glide bomb, conventional 500- and 2,000-pound “iron bombs,” a specially designed and guided GBU-27 2,000-pound bomb, a B61 free-fall nuclear weapon, and HARM anti-radiation missiles.



F-117A

Source: U.S. Air Force

Program Review

Background. The so-called stealth, or low observable technology, F-117A evolved from Lockheed’s work on an Experimental Stealth Technology (XST) demon-

strator that reportedly first flew in late 1977 or early 1978. This program is also known as Have Blue, and was funded entirely by the Defense Advanced Research

Lockheed F-117A

Projects Agency (DARPA). Two proof-of-concept XST prototypes were built, both of which crashed – one in 1978 and the other in 1980. Both pilots, one from Lockheed and the other from the Air Force, survived the accidents. The Have Blue prototypes were about the size of a T-38, and were powered by J85 turbojets.

Out of the Black. According to information officially released in November 1988, Lockheed began developing the definitive F-117A aircraft in December 1978 under an Air Force program dubbed Senior Trend. All earlier development was funded by DARPA under Project Harvey and, later, Have Blue. Until 1988, the “stealth fighter” was generally assumed to have been assigned the designation F-19, but USAF repeatedly refused to confirm the existence of any aircraft bearing that designation.

And Into the Blue

The F-117A flew for the first time in June 1981 and entered service in October 1983. The veil of secrecy finally came off the project when USAF revealed photographs of the aircraft in the fall of 1988. Subsequently, USAF began daytime operations of the aircraft at Tonopah, Nevada, and at Edwards Air Force Base in southern California.

Lockheed produced 59 units, with the last aircraft delivered in 1990. Three aircraft have been lost in night operations, one reason USAF opened the program to public view. Daytime flying and transition to full operational status were necessities.

Missions. The F-117A aircraft are intended for specialized missions such as armed reconnaissance, electronic intelligence (ELINT), defense suppression to clear corridors for conventional strike/attack aircraft, and attack of strategic command, control and communications facilities. These aircraft were initially considered for use in the April 1986 U.S. air strike on Tripoli, Libya. However, their deployment was ruled out prior to that action. Since the aircraft has no weapon system radar, it operates with infrared and visual equipment only.

Performance. The mission requirements of the F-117A dictated its unusual shape and material composition. Aircraft design experts and the Air Force acknowledge certain performance trade-offs were made to get the maximum stealth benefits from the aircraft. Induced drag at low speeds and low installed thrust are two of the characteristics.

Variants

F-117X. Following a previously proposed F-117N naval variant, which received little official interest in 1993, Lockheed Martin subsequently offered the X model as a technology demonstrator. If funded, this model would evolve into a complement to the F/A-18E/F as a high-end strike aircraft. The X would retain the current aircraft’s engines and systems, but would incorporate several major aerodynamic modifications. These would include a new folding wing with reduced sweep angle and a 6.6-meter span increase, and horizontal tails added to either side of the current V-shaped vertical stabilizer. Company

spokespersons had said that a demonstrator would begin carrier flight tests by mid-to-late 1997, although conceding that the project remained unfunded.

F-117B. In mid-1995, Lockheed Martin was studying this deep-strike stealth aircraft as a replacement for the Royal Air Force’s Tornado GR.4, while also promoting it to the U.S. Air Force. The variant for the RAF would feature Eurojet EJ200 engines and an avionics suite primarily supplied by GEC-Marconi. It is possible that British Aerospace would provide some airframe structure.

Funding

U.S. FUNDING

	FY06 QTY	FY06 AMT	FY07 QTY	FY07 AMT	FY08 QTY	FY08 AMT	FY09 (Req) QTY	FY09 (Req) AMT
F-117A Mods	-	7.7	-	2.0	-	-	-	-

All \$ are in millions.

Lockheed F-117A

Milestones

<u>Month</u>	<u>Year</u>	<u>Major Development</u>
	1973	Concept/feasibility studies begun
	1977	Subscale flight demonstrations begun
Dec	1978	Lockheed awarded Stealth fighter development contract
Jun	1981	F-117A prototype first flight
Oct	1983	F-117A Initial Operational Capability
Jun	1988	50th aircraft produced
Early	1990	Deliveries completed
	2008	Planned retirement date

Worldwide Distribution/Inventories

The U.S. Air Force operates 36 F-117A aircraft, but this number is steadily declining as the aircraft approaches retirement.

Significant News

U.S. Air Force May Slow Retirement of F-117s – The U.S. Air Force may be moving away from plans to quickly retire the F-117 Stealth Fighter. The aircraft has had little to do since the initial invasion of Iraq, and Air Force leaders had suggested until now that they would like to retire the aircraft by FY08 and use the funds dedicated to maintaining the 52-aircraft fleet for other projects. But the plan has been unpopular with New Mexico's two senators, who have constituents who work at Holloman Air Force Base, home to the F-117. (KOAT.com, 9/06)

Stealth Fighter Fleet Logs 250,000 Flight Hours – Twenty-five years after the first stealth fighter rolled off the line, the fleet of fighters completed 250,000 hours in the air. (Associated Press, 7/06)

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Opportunities

Since the F-117's retirement date has been pushed up, over \$60 million worth of new programs have been canceled, including the "Brooklyn Bridge" structural upgrade and numerous avionics improvements.

The Golden Years

Now that stealth technology has matured and other programs with the same mission as the F-117 are coming to fruition, the aircraft is to be retired. Anti-stealth technology continues to improve as well, and the F-117's role is threatened by stealth unmanned air vehicles (UAVs), the F-22 Raptor and the F-35 Lightning II. Additionally, in asymmetric battle zones such as Iraq and Afghanistan, an F-15 or F-16 is just about as survivable while carrying a larger payload and radar capabilities.

For years, the United States government has debated whether to mothball the F-117 and use the savings for other programs, such as the F-22 Raptor, or pay to modernize and maintain the stealth fleet to shoulder some of the F-22's workload. However, the B-2 stealth bomber remains available for this mission type as well.

Although a retirement year of 2018, then more recently 2008, had been expected for some time now, the actual date will likely fall somewhere between 2008 and 2012.

Airframe

Brooklyn Bridge. USAF initiated this estimated \$45.7 million upgrade with FY05 funds. The Brooklyn Bridge is an I-beam structure that transfers loads between the aircraft's elevon hydraulic actuator to the

Lockheed F-117A

ribs, and it must be removed each time an integrated servo actuator is replaced. This places undue stress and wear on the I-beam, as the actuator is replaced fairly often.

Only 16 kits were produced and six installed before the program was canceled. Funding has not been allocated for the installation of the remaining 10 kits.

FI's Opportunity Outlook

No future modification programs are planned at this time.

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