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Introduction

The Lockheed Advanced Development Projects (ADP), better known by its nickname - the Skunk Works, has over the years built an aerospace design team capable of achieving what can truly be called incredible feats of aircraft design and development.

When Kelly Johnson first conceived the U-2, nobody thought that it was possible to build a jet powered glider that could reach and maintain 80,000 feet. When the original Blackbird (the A-12/YF-12/SR-71) was conceived during 1958/59, an aircraft that could fly at Mach 3.2 at or above 90,000 feet was totally unheard of.

One of the major problem areas faced by the Air Force during Viet Nam was the loss of a large number of aircraft to radar-guided guns and surface-to-air missiles. One way to reduce these losses was to reduce the radar cross section of the attack aircraft itself. Current designs did not allow stealth technology to be applied, with the exception of the B-1 bomber. The B-1A had a radar cross section (RCS) of approximately 10 square meters; the B-1B has a radar cross section of approximately 1 square meter. That reduction primarily dealt with the air intakes and other external features on the aircraft.

Stealth technology was identified as one potential solution to the problems associated with a high threat environment. If the radar cross section (RCS) of the aircraft could be reduced dramatically, the performance and capability of all radar-guided defensive systems would be degraded. In other words, the Soviet Union's two hundred billion dollar air defense system would become useless.

Stealth technology had been developed in many experimental programs, most of them classified, since the late 1940s. Lockheed has been dealing with low observables in operational aircraft since the late 1950s. The most notable success in this field was the A12/YF-12/SR-71. The SR-71 is 107 feet long, 56 feet wide and cruises at speeds above Mach 3. But what is really amazing is that this was the first generation production Stealth type aircraft. The Blackbird has a radar cross section of some 22 square inches making it a relatively small radar target. This, along with its speed and altitude capabilities, is the Blackbird's main defense against interception.

During 1975 SkunkWorks engineers began working on a computerized program that would allow reduced radar cross section techniques to be coupled with aerodynamics to come up with a flyable aircraft design. One of the technologies that evolved was a process known as faceting, a design process by which the aircraft surface radiates 99.9% of the reflected radar energy from a radar source away from its receiver. If they could produce such a surface and still allow the airplane to fly aerodynamically, they would have a true low observable aircraft.

A number of companies were studying Stealth technology, including Northrop, Boeing, and General Dynamics. They all realized that the process of faceting, building an airplane with physical characteristics that would reduce the radar cross section, offered the best chance to produce a workable Stealth aircraft in the shortest possible time and make it

operational.

In early 1977, Lockheed received a contract from the Defense Advanced Research Projects Agency, better known as DARPA, to build and test two subscale (about 60% of the size of an operational aircraft) Stealth Strike Fighters, using faceting, under the code name Have Blue.

Have Blue

Shortly after the contract was let, the DARPA Have Blue program was transferred to Air Force control and became a "Black" (highly classified/compartimentalized) program. As of early 1991, the Have Blue program was still so classified that even people within the SkunkWorks who have access to the F-117 program had no access to the Have Blue project.

There were two aircraft built and both were destroyed in accidents. Reportedly, there are photos of the aircraft, but they are highly classified and according to Pete Eames (USAF security manager), they will never be released to the public. The criteria for declassification of information under his control is, "a program will be declassified if there is a direct benefit of declassification to the United States Government and for no other reason."

The Have Blue prototypes were manufactured at Lockheed's Burbank, California facility in just a matter of months. Lockheed built the two aircraft using a large number of off-the-shelf components: General Electric J85 engines, A-10 landing gear for the main gear and fly-by-wire components from the F- 16. This allowed Lockheed to build two prototypes in record time and under budget (37 million dollars for both aircraft). The prototypes were disassembled, and shipped to the Groom Lake Test Facility for testing. Because of a strike at Lockheed, management and supervisory personnel reassembled the Have Blue aircraft...

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