

# **Design & Development of the Blackbird**

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**Library of Flight**

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During my childhood, there were two aspects which are pertinent to this book review. Firstly, I lived near the Royal Aircraft Establishment in Farnborough and every autumn, would cycle over to the airfield and lean my bicycle against the fence and watch practice for the forthcoming Farnborough Air Show. This fuelled a close interest in aircraft and every Wednesday this was increased by buying a copy of the Eagle comic with its adventures of Dan Dare, his sidekick Digby and his spaceship Anastasia. This was futuristic and in the late 1950's was dreamlike for me. Little did I know that, at that moment, in California, Clarence "Kelly" Johnson's drawing board had designs on it, equally futuristic, only this time they would be flying in a matter of a few years.

The Lockheed Blackbird aircraft is unlike anything else and over the years has caused many a jaw to drop. In beginning to read this book, I imagined that I was going to be submerged in a story of high speed flying where the aircraft, whilst serving top secret requirements would be almost a playboy's ultimate toy - Soon I realised that I was very misguided. Yes the aircraft did achieve many records, flew at speeds in excess of 2000 mph and altitudes above 90000 feet. It flew from Los Angeles to Washington DC in 64 minutes but it also advanced the knowledge of aeronautics in many areas this was a very serious project. Because it was so advanced, secrecy was essential and this provided some fascinating stories of interaction between engine and airframe designers, and any interactions with politics produced some difficult moments, to say the least. When President Johnson declared that it would be breaking the World Speed Record in 1964, the Lockheed Company, along with the CIA and the Air Force, was faced with the knotty problem of fulfilling the President's statement of intent, but also not giving away vital secrets.

The book provides a very detailed story of the Blackbird over its various types, from the early days of preliminary design, through the necessary development of engine design, production techniques, material development and the eventual integration within the airframe. The story takes the reader through the initial phases though to its eventual use by NASA for research. This is the part of the story which I found the most illuminating. It was a workhorse providing NASA with the test platform to conduct research at flight speeds of Mach 3 for an extended time, which the X15 only permitted for short time periods. This research was not only to understand the problems of the Blackbird airframe itself but also to perform fundamental work in the subjects of aerodynamics, dynamics,

aeroelastics, flight behaviour and flight control of which the engine must form a large part. These had to work over a large range of flight speeds and use of bypass routes, exhaust ejectors, inlet design and operation and extensive use of the afterburner formed strong influences on the overall engine configuration and installation on the airframe. In addition, the Blackbird conducted tests which were to influence the Space Shuttle and future projects such as the supersonic transport concepts.

To discuss in detail the topics covered would be to rewrite the book here. This is not the place so let me conclude that it is a very good read and whilst it forms a storyline, it is a book that will have the interested reader dipping into it to glean specific items – for there is a lot there.

The book is published by the AIAA which puts it in the serious category. As an example of aircraft design and integration it covers the whole story very concisely. Perhaps the only drawback is that this aircraft was not of any common type but was a one-off.

There are a few typographical errors but nothing the reader cannot put right. There is a production summary, a timeline, a very good set of references and a useful index. Personally I would have preferred a higher quality paper for the book to show the images with a greater resolution. It is soft bound with a striking jacket.

Finally there is a CD which gives videos, handbooks, images and other technical material - there is considerable content. I thoroughly enjoyed reading this book and learnt a great deal. There is still some content to go through again when I hope to learn some more.

If you want a glimpse behind the closed doors of the legendary Skunk Works and an understanding of what makes it tick, then this a very good introduction.