

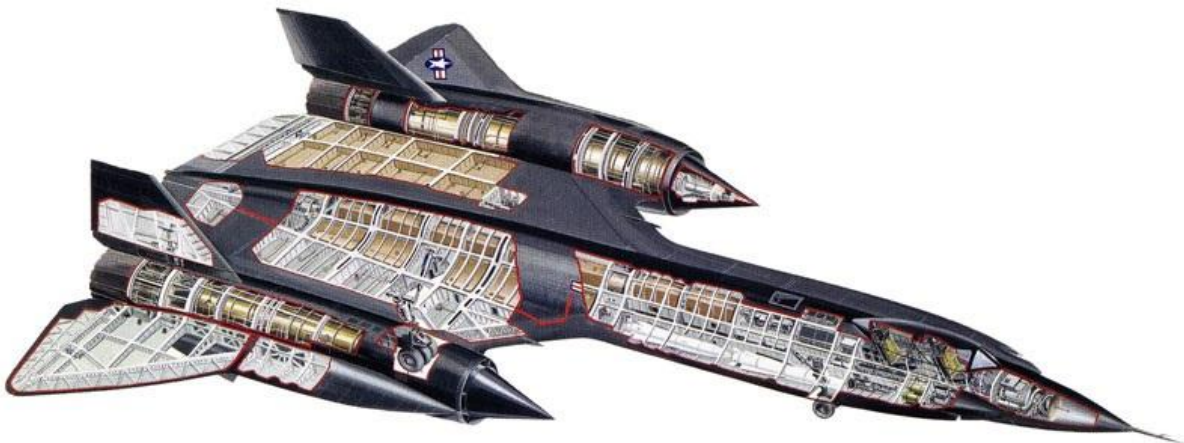
Flying the Lockheed SR-71 "Blackbird" Strategic Reconnaissance Aircraft by Col. Richard Graham USAF Retd.

This well-published author has produced 4 books on the SR-71 and he emphasised that this is an aircraft "different to any other." His wide-ranging presentation started with the evolution of the aircraft between 1958-62, design have been led by Clarence 'Kelly' Johnson in the Lockheed 'Skunk Works.' He was to finish with a tribute video to the engineer. In between he kept everyone well informed of the roles undertaken by the aircraft, the operational history of USAF units with the type, and clear and authoritative accounts of his experiences as a pilot, instructor and unit commander on the type.

The 'Archangel' project evolved over 12 months in 1958-59, and it was configuration 12 (or A-12) that was adopted. It was planned as a Mach 3 (2,000-2,100mph) successor to the subsonic U-2. When a U-2 (piloted by Gary Powers) was shot down over the Soviet Union on 1 May, 1960, the awaiting A-12 project was launched into a break-neck two-year development programme that led to the first flight on 26 April 1962. The type was to have a short-lived deployment as US politicians curtailed operations. By now they were afraid of repeating the U-2 experience, and forced the adoption of a Mach 3.6 'drone' (the D-21). This was to be launched from atop a modified A-12 (designated M-21) for penetration of hostile regions. On the fourth test flight the D-21 unit collided with the M-21, disabled it, and led to a crash that was fatal for one crew member. The project was abandoned.

There soon emerged the YF-12 high-altitude interceptor derivative, but this again was to be short-lived. Only 3 examples were built, and they never entered service. However, the aircraft's systems and missile technology subsequently was used in the US Navy operated Grumman F-14 Tomcat, and the airframe was re-configured as the strategic reconnaissance project 71 (SR-71), for the USAF.

The SR-71 was the ultimate success story, first flying on 22 December 1964, and by the time of its retirement this type had flown 17,294 sorties, completed 53,275 hours flying (11,675 hours at Mach 3 +), and had been flown by 89 operational commanders, and it was his experience as one of this elite group that Col Graham based much of his presentation.



He explored the aircraft's unique features in much detail. The major topics deserve to be headlined:

- The widespread use of composite materials on a largely Titanium structure.
- Ferrous Oxide paint to absorb radar energy.
- The use of JP-7 high-flashpoint fuel.
- The consequent need to have unique starting systems which involved a 1,000hp or so twin-Buick powered direct-drive starter cart and chemical ignition using Triethylborane (TED) cartridges.
- The inter-changeable sensor arrangement contained within 8 long and narrow bays, 4 of which were built into each side of the underside of the aircraft. There was also a nose section which could carry radar or optical technology sensors.
- a specific-to-type ejection seat.
- 100% oxygen supply for the crew.

- Full body suits/helmets and food and drink arrangements with four tube cartridges for each of the two crew members. The food was supplied by a well-known US manufacturer of baby foods, and its palatability did not live up to expectations, but the speaker described how a short period of holding each tube near the windscreen, heated by air friction to 660°F in cruise, soon remedied the deficiency.

The speaker's ability to rationalise and to keep light-hearted made the 1-hour presentation both informative and wide-ranging. Having condensed technicalities, there was an almost seamless transition into operations. He described how working from the two main bases, Kadena, Japan, and Mildenhall, UK, and using air-to-air refuelling, the aircraft could cover the whole northern hemisphere. The aircraft tended to conduct approximately 1-hour cruise stages at Mach 3 and above 70,000ft, They used an astro-navigation system and relied upon KC-135 Stratotankers for almost all operations. In the high-speed cruise phase the aircraft was too sensitive to take stick-based inputs, so flight commands were entered through the autopilot trim wheels.

The main base in the USA was Beale, California, and all crews conducted training and received operational support from there. Each pilot was teamed with a Reconnaissance Systems Officer (RSO) and they flew all missions together. On every flight there was a back-up crew, and an unacceptable result from a medical check immediately before any flight could trigger the back-up crew being substituted. Crews often flew only one mission per month, and would maintain flight proficiency using T-38 aircraft. (There were 14 T38 and 35 KC-135 allocated to support the USAF SR-71 operation.)

To conclude his presentation Col Graham showed a video titled "Letter to Kelly Johnson," which took the form of a short open letter from one of the cameramen (Devin Hawker) who worked on "Blackbird - The Movie." This was completed a few months before Kelly Johnson died, just as the last SR-71 was 'officially' retired in 1990. There were revivals of the type, largely for research operations in the 1990s, but these were small-scale operations.



There were numerous questions at the end of the lecture which confirmed the audience's interest in the topic. The lecture attracted an audience of 225 who confirmed their appreciation by a rousing round of applause. The vote of thanks was given by Daniel Nutt, RAeS Loughborough Committee Member.

After the lecture, Col. Graham welcomed SR-71 adherents, and fostered more friendships through further conversation and the selling and signing of copies of his 4 books.

Lecture notes by Mike Hirst.