Aircraft Factsheets

Lockheed A-12 / SR-71

By Gostar den Daas | January 2016

In-depth review on America's mach3+ spy plane.

Lockheed's SR-71 Blackbird first flew in 1964 and was decommissioned in 1999. Not known until the mid nineties is that the SR-71 was developed from the top secret Lockheed A-12. The A-12, project Oxcart, was build for the CIA as high speed and high altitude reconnaissance aircraft as replacement for the U-2.

Skunk Works | Blackbird | Military | USAF

Project Oxcart

The US Central Intelligence Agency (CIA) started project Oxcart to develop a follow-on aircraft to the U-2. Clarence "Kelly" Johnson was given the task by Lockheed's Skunk Works to come up with a high speed, high altitude reconnaissance aircraft, that could penetrate a hostile airspace, without being noticed. The A-12 was the 12th and final design in a series called "Archangel". That's how the name A-12 came up.

The CIA also asked Convair to come up with a design. Lockheed's A-11 was chosen over Convair's Kingfish design with some modifications. This resulted in the final A-12 design. On January 1960 12 A-12 were ordered.

60-6932, A-12

> *Design, development, testing and it's complete operational life were done in high secrecy. Details about project Oxcart and the A-12 were only revealed to the general public in the mid nineties. More that 30 years after the project started!*

The A-12 was way ahead of its time with many new technologies and shifted boundaries when it comes to altitude and speed. To cope with the required Mach 3 speed requirement the aircraft was made of Titanium, a first at that time. The shape of the design was also a radical new design as the aim was to make it as stealthy as possible by reducing its radar footprint.

Testing at Area 51

The radar footprint was tested by mounting an A-12 model on a pole at the secret test facility of Groom Lake, better known as Area-51. Although the A-12s were produced at Lockheed's Burbank facility, they were shipped in secrecy to the even more secret test base where flight-testing commenced over years to come.

A new engine was developed by Pratt & Whitney, especially build to obtain speeds of Mach 3+. The J58 engine as they were called flew first in October 1962. The A-12 flew first on 26 April 1962, fitted with older J57 engines.

60-6925, A-12

60-6925, A-12

60-6925, A-12

15 A-12's were build of which one was a dual seat trainer. Also two A-12 were designated M-21 with the purpose of caring the D-21 drone. The training aircraft, named "Titanium Goose" had a raised second cockpit and unlike the other A-12's it was fitted with the older J57 engines.

During testing five aircraft were lost (one M-21), which is a high number considering 15 were build. Off course this was a result of the innovative nature of the program. (see airframes section)

Operational history

During their complete operational career the A-12's operated out of Groom Lake with deployments to Kadena Air Base on Okinawa. During operation Black Shield (1967), the A-12 was used to overfly North Vietnam and locate SAM missile sites. Again in 1968 the A-12 was used to fly over North Korea to locate the captured USS Pueblo, later called the Pueblo Crisis.

Strange thing is that these missions were flown after retirement of the A-12 was announced and should be completed in favor of the SR-71. Just two week before final retirement an aircraft was lost over the Pacific Ocean. This was the last A-12 crash, with the remaining aircraft stored at Palmdale from 21 June 1968.

> *The aircraft remained in storage for nearly 20 years! Before there were send out to various museums around the country.*

M-21

The M-21 was an A-12 variant modified to carry and launch the Lockheed D-21 drone. There was a pylon mounted on the back of the M-21, and a second cockpit installed to house the Launch Control Operator (LCO). After the launch the D-21 would fly on it's own, record mission data, eject the data package and self-destruct. The data package would be catched in mid-air (!) by a modified C-130.

After a drone collided with the M-21 after launch in 1966, the program was cancelled. The D-21 was modified in a B model, which was carried by a B-52. This drone flew actual missions over China before it was cancelled in 1971.


U.S.AIR FORC

D-21

YF-12

The Air Force became interested in the A-12, not as a reconnaissance aircraft at first, but as a interceptor. Lockheed build three prototypes designated YF-12A.

The A-12 was modified to house an extra cockpit for a fire control officer (FCO). Most visible change was the changed nose, with a more traditional nosecone fitted to accommodate the Hughes AN/ASG-18 radar. The sensor bays were modified so the YF-12 could carry 3 AIM-47 Falcon missiles. One bay was used for the fire control equipment.

> *The AIM-47 missile was later developed into the legendary AIM-54 Phoenix carried on the F-14 Tomcat.*

60-6935, YF-12A

First flight was on 7 August 1963. President Johnson publicly announced the YF-12, which was tested at Edwards AFB, so the A-12 could remain hidden.

The Air Force ordered 93 F-12Bs, the proposed production version of the YF-12. Although during the Vietnam War there was no funding, and with defence needs changing, the program (and order) was cancelled January 1968.

A fourth YF-12 (YF-12C) was actually a SR-71 (61-7951) with a fake designation, so the SR-71 could remain secret. The aircraft also had a fake registration 60-6937. The aircraft was used by NASA until 1978 when it was returned to the Air Force.

YF-12 and SR-71 video was produced in 1985 by Lockheed Aircraft Company (10 min)

SR-71 Blackbird

The CIA had it's A-12, but the Air Force wanted a reconnaissance aircraft of it's own. So Lockheed developed the RS-71 from the A-12 design. Unlike the secret A-12, president Johnson publicly announced the RS-71's existence. General LeMay preferred the designation SR-71 (Strategic Reconnaissance), so it was changed.

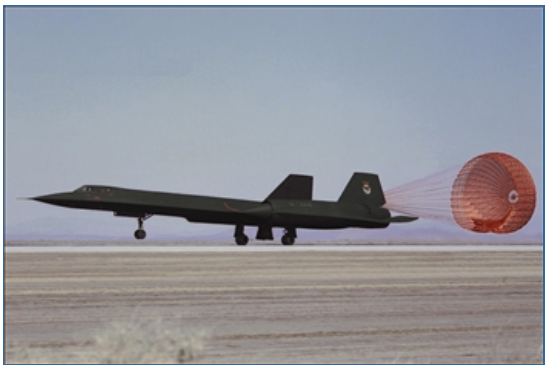
A-12, SR-71 in back

Most obvious change was the nose section. To accommodate a camera in the nose section, the wing chines were widened which resulted in the well known flat nose. Also a second cockpit was added for a Reconnaissance Systems Officer (RSO). The sensor load was enlarged which had some consequence on performance. The SR-71 was also covered in a black stealth paint, which resulted in it's nickname. (The A-12 had originally a grey titanium colour)

The SR-71 named Blackbird or Habu was build in Lockheed's Palmdale facility, were it made it's first flight on 23 December 1964.

61-7956, SR-71B

61-7956, SR-71B



61-7980, SR-71A

61-7974, SR-71A

To coop with the extreme heat and altitude a special fuel was developed. JP-7 (Jet Propellant 7) has a high flashpoint which made it ideal for supersonic aircraft. Especially for the SR-71 a fleet of KC-135s designated KC-135Q were modified to refuel the SR-71 with JP-7. To make refuelling possible, the tanker had to fly at it's maximum speed, while the Blackbird needed to slow down to it's minimum speed. The tankers boom was also modified for this purpose.

Operational service

During operational service all SR-71s were assigned to the 9th SRW. The aircraft operated out of Beale AFB in the US and RAF Mildenhall in the UK. There was also a detachment in Kadena, Okinawa to cover Asia.

First missions were flown during the Vietnam War out of Kadena. The North Vietnamese fired 800 SAM missiles at the SR-71, none reached it's target. Later-on typical missions were flown in the Baltic, near the Russian Border. Also China was overflown on several occasions.

The Pentagon decided the SR-71 was to be retired end of 1989. Aircraft were distributed to museums and some were placed in storage. 1993 congress investigated the reactivation of the Blackbird. 3 aircraft were returned to service with some modifications, including a near real-time data-link. The aircraft again flew with the 9th reconnaissance wing out of Beale AFB.

There was much resistance against the reinstated SR-71, and in 1998 the Air Force permanently retired the aircraft.

61-7975, SR-71A

61-7975, SR-71A

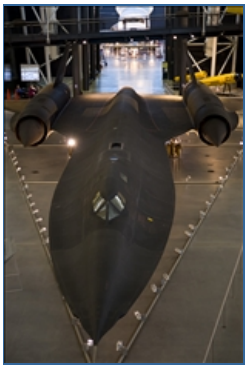
61-7975, SR-71A

61-7975, SR-71A

61-7972, SR-71A

61-7972, SR-71A

61-7972, SR-71A



61-7972, SR-71A

61-7977, SR-71A

NASA

Although the Air Force retired the SR-71, NASA still kept the last Blackbirds in the air until 9 October 1999.

SR-71A NASA 844 (61-7980) Last flight ever.
SR-71B NASA 831 (61-7956)
SR-71A NASA 832 (61-7971)

NASA conducted lots of experiments with its SR-71s out of Dryden AFB. The Blackbird was modified once again to fit the LASRE test model on its back. LASRE was half scale lifting body with an aerospike engine. The engine was never tested on the SR-71 as there were liquid oxygen leaks in the system. The engine was designated for the X-33 Space Shuttle follow-up, but the program was cancelled in 2001.

61-7980 SR-71A

"SR-72"

Although not officially announced, media is speculating about a “SR-72” flying Mach 6. New Hangers were build at Area 51, but it will take some time before we know what is happing and if a follow-up aircraft is being developed. Officially the Air Force is now using the RQ-180 UAV for reconnaissance purpose.

Variants

A-12 12th design in the “Archangel” series designed by Lockheed for the CIA. 13 were build including one trainer with a raised second cockpit.

M-21 Modified version of the A-12 to carry the D-21 drone. A second cockpit was added to house the launch operator. Two were build, but the program cancelled after 6941 was lost.

YF-12A Proposed interceptor variant of the A-12 requested by the Air Force. Three prototypes were build.

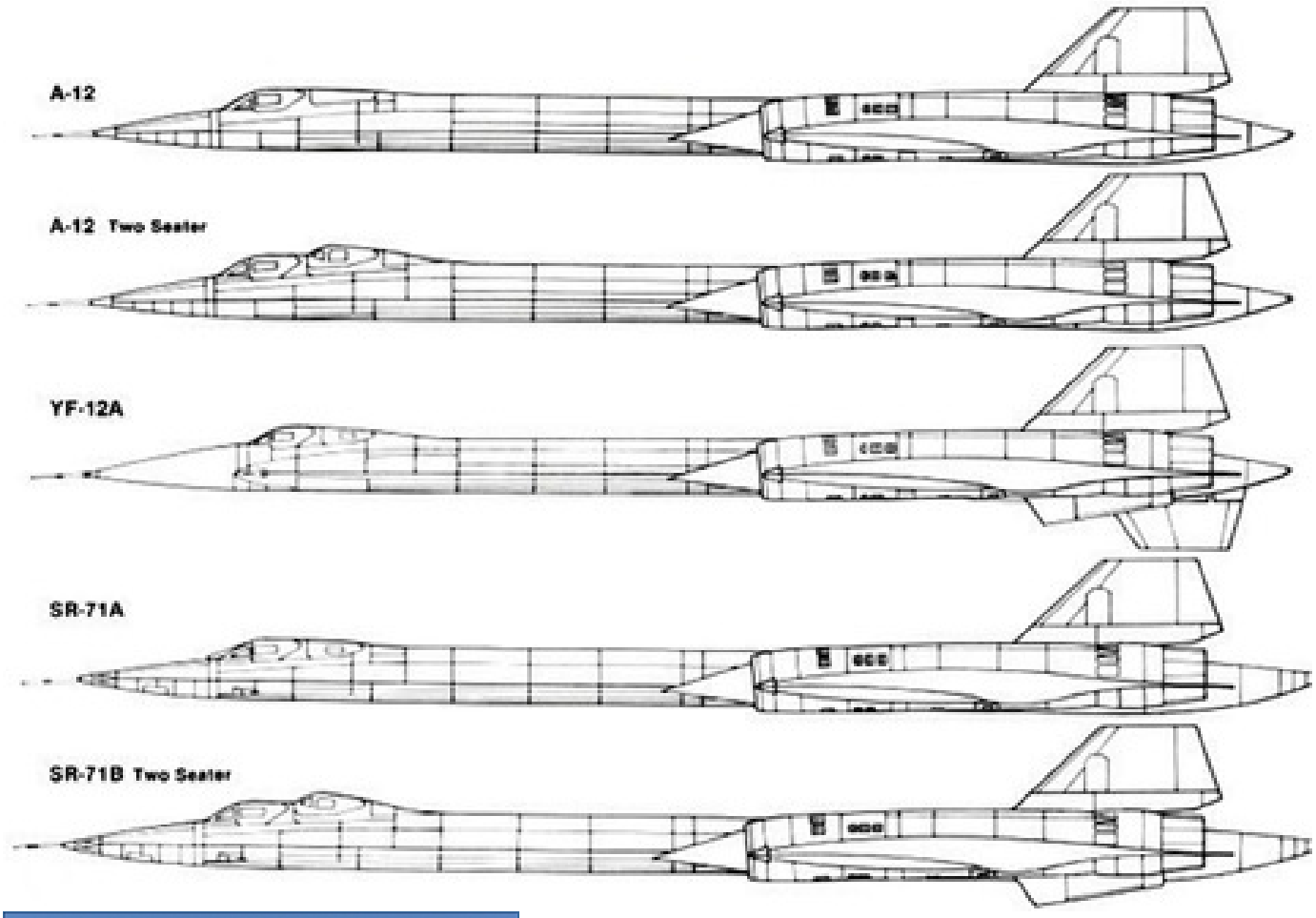
F-12B Proposed production version of the YF-12. The Air Force ordered 93, but none were build when the program was cancelled.

YF-12C Fictitious designation for SR-71 (#2002) used by NASA.

SR-71A Production version of the Blackbird of which 29 were build.

SR-71B Dual control trainer with a raised second cockpit. 2 were build.

SR-71C The rear fuselage of the YF-12 (60-6934) was combined with the forward section of a static test unit. As the YF-12 suffered a landing accident prior to being use for the only C type, the aircraft never performed as expected, resulting in it’s nickname: “The Bastard”.



61-7973, SR-71A

61-7973, SR-71A

60-6924, A-12

Specifications

	SR-71	A-12
Measurements	Length: 32.74m (107ft, 5in), Wingspan: 16.94m (55ft, 7in), Height: 5.64m (18ft)	Length: 30,97m (101.6ft), Wingspan: 16.95m (55.62ft), Height: 5.62m (18.45ft)
Powerplant	2 Pratt & Whitney J58 turbojets, providing 151 kN (34,000 lbf) trust each	2 Pratt & Whitney J58 turbojets, 144 kN (32,500 lbf) trust each
Fuel and load	63.502 kg (140,000 lbs) max. takeoff weight	54.431 kg (120,000 lbs) max. takeoff weight
Max. Speed	3501 km/h (2,176 mph) Mach 3+	3553 km/h (2,208 mph), Mach 3.2
Max altitude	25908 m (85,000 ft)	28.956m (90,000ft)
Range	5230 km (3,250 mi), unrefueled	4828km (3,000 mi), unrefueled
Crew and equipment	2, 1600 kg (3,500 lb) of sensors	1, 1100kg (2,500 lb) of sensors

Airframes

A-12 / M-21

Serial	Type	C/N	Notes
60-6924	A-12	#121	Preserved at Blackbird Air Park, Palmdale 
60-6925	A-12	#122	Preserved at USS Intrepid, New York

Serial	Type	C/N	Notes
60-6926	A-12	#123	Crashed 24 May 1963, west of Great Salt Lake after the aircraft stalled. Investigation revealed that the pitot tube iced up. CIA made up a coverup story that a F-105 crashed as A-12 was highly secret in 1963.
60-6927	A-12	#124	"Titanium Goose" Preserved at Museum of Science and Industry, Los Angeles
60-6928	A-12	#125	Crashed 5 January 1967 during a training flight near Groom Lake. The plane run out of fuel due to a faulty fuel gauge. The pilot ejected, but died when he could not separate from his seat.
60-6929	A-12	#126	Crashed 28 December 1967 on take-off from Groom Lake. Due to incorrectly fitted Stability System (SAS).
60-6930	A-12	#127	preserved at the U.S. Space and Rocket Center, Huntsville, Alabama. as "NASA 7930".
60-6931	A-12	#128	preserved at the CIA Headquarters, Langley, Virginia
60-6932	A-12	#129	Lost 5 June 1968 520 miles east of Manila, Philippines. Crash details are (still) unknown or classified. The pilot was killed.
60-6933	A-12	#130	preserved at the San Diego Air & Space Museum, San Diego
60-6937	A-12	#131	preserved at at the Southern Museum of Flight, Birmingham, Alabama.
60-6938	A-12	#132	preserved at the Battleship Memorial Park (USS Alabama), Mobile, Alabama.
60-6939	A-12	#133	Crashed 9 July 1964 on approach to Groom Lake. It suffered a complete hydraulic failure.
60-6940	M-21	#134	preserved at the Museum of Flight, Seattle, Washington together with D-21 Drone.
60-6941	M-21	#135	Lost after it collided with it's own drone after launch. Both pilots ejected, but the LCO drowned after landing in the ocean.

YF-12

Serial	Type	C/N	Notes
60-6934	YF-12A	#1001	Damaged beyond repair after a fire when landing at Edwards AFB on 14 August 1966, The rear fuselage was used for SR-71C 61-7981.
60-6935	YF-12A	#1002	Preserved at the National Museum of the U.S. Air Force, Wright-Patterson AFB, Dayton, Ohio
60-6936	YF-12A	#1003	Crashed near Edwards AFB, 24 July 1971
60-6937	YF-12C	#2002	Was in fact SR-71 61-7951 on loan to NASA after article 1003 crashed.

SR-71

Serial	Type	C/N	Notes
61-7950	SR-71A	#2001	Caught fire during a braking test at Edwards AFB, 10 January 1967.
61-7951	SR-71A	#2002	

Serial	Type	C/N	Notes
			Preserved at Pima Air & Space Museum, Tucson, Arizona. This aircraft was loaned to NASA as YF-12C 60-6937 
61-7952	SR-71A	#2003	Crashed on 25 January 1966 near Tucumcari, New Mexico. The aircraft disintegrated at high speed / high altitude. The pilot survived, but RSO was killed.
61-7953	SR-71A	#2004	Crashed on 18 December 1969 after stalling due to an in-flight explosion. Both crew members ejected safely. Reason of the explosion is still unknown.
61-7954	SR-71A	#2005	Like article #2001 brakes caused the write-off. 11 April 1969. New aluminium wheels and stronger tires were retrofitted to all SR-71s.
61-7955	SR-71A	#2006	Preserved at Air Force Flight Test Center Museum, Edwards Air Force Base.
61-7956	SR-71B	#2007	Preserved at Air Zoo, Kalamazoo, Michigan.
61-7957	SR-71B	#2008	Crashed on approach to Beale AFB 11 January 1968. Both pilots ejected after double generator failure and double flameout.
61-7958	SR-71A	#2009	Preserved at Museum of Aviation, Robins Air Force Base, Georgia
61-7959	SR-71A	#2010	Preserved at Air Force Armament Museum, Eglin Air Force Base, Florida
61-7960	SR-71A	#2011	Preserved at Castle Air Museum, Atwater, California
61-7961	SR-71A	#2012	Preserved at Kansas Cosmosphere and Space Center, Hutchinson, Kansas.
61-7962	SR-71A	#2013	Preserved at American Air Museum in Britain, Imperial War Museum Duxford, England.
61-7963	SR-71A	#2014	Preserved at Beale Air Force Base, Marysville, California
61-7964	SR-71A	#2015	Preserved at Strategic Air and Space Museum, Ashland, Nebraska
61-7965	SR-71A	#2016	Crashed 25 October 1967 near Lovelock, Nevada. Due to incorrect altitude information the aircraft wend into a steep dive. Both pilots ejected safely.
61-7966	SR-71A	#2017	Crashed 13 April 1967 after a high speed stall. Both pilots ejected safely.
61-7967 / BB	SR-71A	#2018	Preserved at Barksdale Air Force Base, Louisiana.
61-7968	SR-71A	#2019	Preserved at Virginia Aviation Museum, Richmond, Virginia.
61-7969	SR-71A	#2020	Crashed 10 May 1970 near Korat, Thailand during an operational mission against North Vietnam. Both engines flamed out in bad weather. The pilots ejected after being unable to restart the engines.
61-7970	SR-71A	#2021	17 June 1970 this Blackbird collided with KC-135Q (59-1474) after in-flight refuelling. The aircraft crashed near El Paso, Texas. The KC-135 landed safely. One of two ejected crew got injured after ejection.

Serial	Type	C/N	Notes
61-7971 / BB	SR-71A	#2022	Preserved at Evergreen Aviation Museum, McMinnville, Oregon.
61-7972	SR-71A	#2023	Preserved at Steven F. Udvar-Hazy Center, Washington Dulles International Airport, Virginia.
61-7973	SR-71A	#2024	Preserved at Blackbird Airpark, Palmdale, California.
61-7974	SR-71A	#2025	Last SR-71 to crash. Engine blow-up over the China Sea on 21 April 1989. The crew ejected over the ocean and were rescued by fishermen.
61-7975	SR-71A	#2026	Preserved at March Field Air Museum, Riverside, California 
61-7976	SR-71A	#2027	Preserved at National Museum of the United States Air Force, Wright-Patterson Air Force Base, Dayton, Ohio
61-7977	SR-71A	#2028	Destroyed on 10 October 1968 after an aborted takeoff at Beale AFB. The Blackbird burned while skidding off runway 14. A wheel assembly failed, both crew survived. The cockpit section of this aircraft is located at the Museum of Flight in Seattle.
61-7978	SR-71A	#2029	Written-off after landing at Kadena AB, Japan on 20 July 1972. As the brake chute was jettisoned during an previous landing, the plane skidded off the runway on final landing. The aircraft was damaged beyond repair and scrapped. Both crew survived.
61-7979	SR-71A	#2030	Preserved at Lackland Air Force Base, San Antonio, Texas
61-7980	SR-71A	#2031	Preserved at Dryden Flight Research Center, Edwards Air Force Base, California. As “NASA 844”
61-7981	SR-71C	#2000	Preserved at Hill Aerospace Museum, Hill Air Force Base, Utah. The rear fuselage of former YF-12A 60-6934 was used with a newly build forward section.

61-7982 till 84 were ordered but cancelled later.

Comments

To place a comment, you need be be an Aviamagazine Member. Sign up for a free membership.

Reports

Trip Reports
Show Reports
Exercise Reports
Special Reports

Factsheets

Aircraft Factsheets
Airline Profile