

The SR71

The Lockheed SR-71 strategic reconnaissance aircraft is truly remarkable. A Mach 3-plus aircraft (33 miles a minute), the SR-71 represents a quantum jump in technology. While other high-performance aircraft operate only for brief periods at their high Mach number, the SR-71 cruises at Mach 3 and at altitudes over 80,000 feet—more than 15 miles above the earth.

This revolutionary aircraft outperforms all other reconnaissance aircraft. It carries a wide variety of observation equipment and is capable of pre-attack and post-attack reconnaissance missions. Under normal conditions the SR-71 can fly from Los Angeles to Washington, D.C.—a distance of more than 2,000 miles—in just over an hour and can survey 100,000 square miles of the earth's surface during that hour.

Proven performance...

On April 26, 1971—more than five years after SAC received the first SR-71—a crew from Beale AFB flew the aircraft to new and exceptional records for duration and total distance. Cruising at three times the speed of sound (approximately 2,000 m.p.h.), the SR-71 was flown 15,000 miles—the equivalent of a non-stop trip from San Francisco to Paris and return.

The flight began and ended at Beale AFB and was conducted at 80,000 feet. During the 10 1/2-hour flight, the normal cruising speed—except for periods of refueling—was Mach 3. The average speed, including refueling, was nearly 1,500 m.p.h. For their achievement in proving the extended supersonic reconnaissance capability of the SR-71, the crew was awarded the U.S. Air Force Mackay Trophy for 1971 for the "Most Meritorious USAF Flight of the Year". For the same flight, the two crew members were jointly awarded the 1972 Harmon International Aviator's Trophy for piloting skill adjudged "worthy of international recognition and contributing to the art and science of flight."

In September 1974 an SR-71 raced from New York to London and from London to Los Angeles to set two world speed records in less than a fortnight. The first record was set Sept. 1 when Major James V. Sullivan, pilot, and Major Noel F. Widdifield, reconnaissance systems officer, flew the aircraft to London in one hour and 56 minutes for an average speed of 1,800 mph. The flight cut nearly three hours off the old record.

Then on Sept. 13, the same aircraft raced the sun from London to Los Angeles in three hours and 47 minutes, establishing a record for that route. The pilot for the return flight was Captain Harold B. Adams. Major William C. Machorek was the reconnaissance systems officer. The average ground speed was 1,480 mph.

SR-71...

The SR-71 is a twin-engine turbojet aircraft with double delta wing and a long, slim, aerodynamic fuselage. It is constructed largely of titanium which withstands the extreme temperatures and forces of high-Mach flight. It is 107.4 feet long, is 55.6 feet wide and measures 18.5 feet from the ground to the top of the twin vertical stabilizers. Each of the SR-71's two J58 power plants is housed in a wing nacelle mounted away from the pencil-shaped fuselage on either side of the aircraft. Each engine generates more than 30,000 pounds of thrust. Much of the fuselage is occupied by fuel tanks and space for a profusion of photographic and electronic sensors.

Though designed for very high supersonic speeds at high altitude, it handles well at low speeds and is extremely stable from take off through cruise speeds. Because of the speed of the SR-71, special mission planning is required which puts unique demands on navigation. To meet these demands, a computer program was developed to integrate all of the aircraft's performance factors and flight characteristics. All the aircraft's automatic equipment functions were incorporated into the computer. The computer program was then tailored to accept a

minimum of input data for each mission. Computer tapes, detailing the chronologically-sequenced analysis of the entire flight plan, were produced. This flight plan is also used to build the aircrew route map and to provide a condensed flight plan summary that is inserted in the crew checklists.

Crews...

The crew of the SR-71 consists of a pilot and a reconnaissance systems officer, or RSO. With an average age between 27 and 33 SR-71 crewmen have between 2,500 and 3,500 total flying hours. Moreover, all SR-71 pilot volunteers must have a minimum of 1,500 jet-time hours as first pilot. Those applying for jobs as crew members must be extremely well qualified for, in addition to the high standards prerequisite for consideration for the program, applicants for SR-71 training 'must undergo a stringent screening process. Their professional and medical records are thoroughly reviewed and the men are given the same exacting physical examination as originally devised to select astronaut trainees. The recommendation of a medical evaluation board and an evaluation of personnel records are given to the commander of the 9th SRW who interviews each man. Those selected for training through this screening process, are fitted with full pressure flight suits similar to the "silver tuxes" of the astronauts. The suit, weighing 40 pounds, is required because of the speed and altitude at which the SR-71 operates.

Training begins at Beale AFB in the T-38 aircraft which has flight handling characteristics similar to those of the SR-71. Ground school includes academic instruction and several rides in an SR-71 flight simulator. After five transition flights in a two-pilot trainer version of the SR-71, the pilot solos the SR-71 with his RSO on board. After five rides together, the pilot and RSO team is certified "mission ready." The RSO trains for many duties. He serves as co-pilot, flight engineer, systems operator and navigator. The heart of the system used by the RSO is an astro-inertial navigation

Training flights - a must

Supersonic missions are continually flown over part of the United States to test the aircraft, its systems and maintain crew proficiency. Missions include air refuelings over corridors approved by the Federal Aviation Administration. Care was taken in choosing these paths to avoid highly populated areas where possible. Because the SR-71 flies so high, it goes unnoticed by most residents along its routes. However, the KC-135 tanker which refuels the SR-71 cannot fly at supersonic speeds and cannot ascend to the operational altitude of the SR-71. Thus, the SR-71 must slow down and descend to approximately 30,000 feet to hook-up to the tanker. After refueling, it accelerates back to its normal altitude and speed. During ascent and descent sonic booms can occur. In preparation for a flight, each crew member is given a pre-flight physical at the physiological support division (PSD), eats a high-protein meal and receives intensive briefings on weather and special mission characteristics. After briefings, crew members are helped into the full pressure suits by PSD technicians who stay with the crew members until the crew is aboard the SR-71 and plugged into its systems.

Summary...

Introduction of the SR-71 marked a new era in aviation for the Strategic Air Command. First delivered to SAC in January 1966, it is the most sophisticated aircraft in the US. Air Force inventory today and its design characteristics make it one of the fastest and highest flying of all the world's aircraft.

SAC's SR-71s are operated by the 9th Strategic Reconnaissance Wing (SRW) at Beale Air Force Base near Marysville in California's Sacramento Valley.