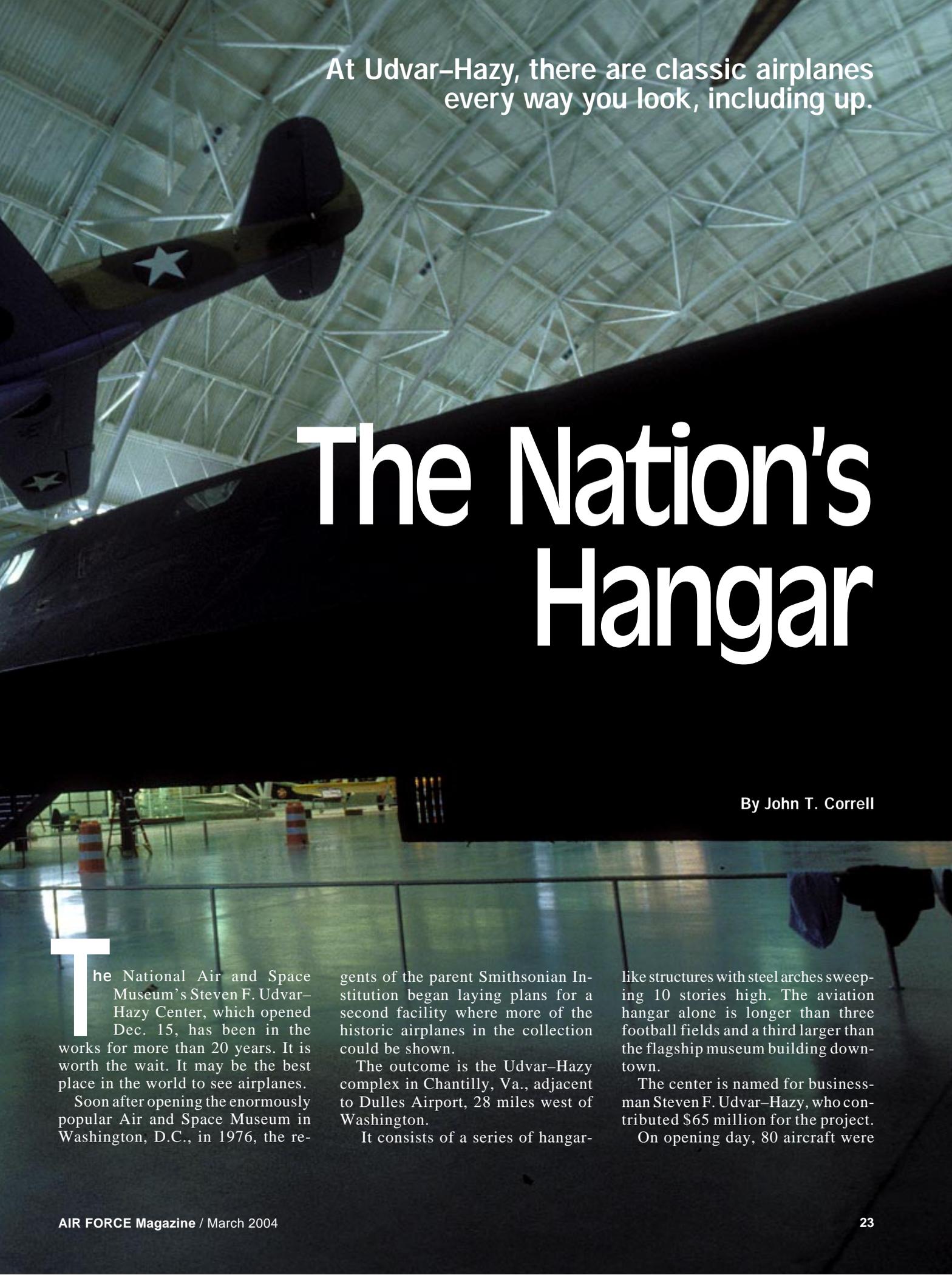




From an overlook, visitors can gaze down on a sleek SR-71 Blackbird. Also shown are an F4U Corsair (upper left corner), a Pitts Special (hanging upside down), and a P-40E Warhawk (with shark mouth insignia).



At Udvar-Hazy, there are classic airplanes every way you look, including up.

The Nation's Hangar

By John T. Correll

The National Air and Space Museum's Steven F. Udvar-Hazy Center, which opened Dec. 15, has been in the works for more than 20 years. It is worth the wait. It may be the best place in the world to see airplanes.

Soon after opening the enormously popular Air and Space Museum in Washington, D.C., in 1976, the re-

gents of the parent Smithsonian Institution began laying plans for a second facility where more of the historic airplanes in the collection could be shown.

The outcome is the Udvar-Hazy complex in Chantilly, Va., adjacent to Dulles Airport, 28 miles west of Washington.

It consists of a series of hangar-

like structures with steel arches sweeping 10 stories high. The aviation hangar alone is longer than three football fields and a third larger than the flagship museum building downtown.

The center is named for businessman Steven F. Udvar-Hazy, who contributed \$65 million for the project.

On opening day, 80 aircraft were



Warhawk. Opening day finds Don Lopez, deputy director of NASM, talking to the press as a P-40 Warhawk bearing his name “flies” through the gallery. Lopez, a World War II ace, flew a P-40 in combat.

on display, with more to come. Eventually, Udvar-Hazy will have 200 aircraft and 135 spacecraft in two main exhibition hangars.

Smaller aircraft hang from the arched trusses. Elevated walkways rise to four stories above the floor, allowing visitors to see the suspended aircraft nose to nose.

The museum entrance is on the second level of the hangar, so the first glimpse visitors get of the airplanes is from an elevated walkway, looking down on the vast exhibition floor.

The view from the walkway is framed by two fabled World War II fighters, a P-40 and an F4U Corsair, hanging at eye level to visitors and situated just out of reach.

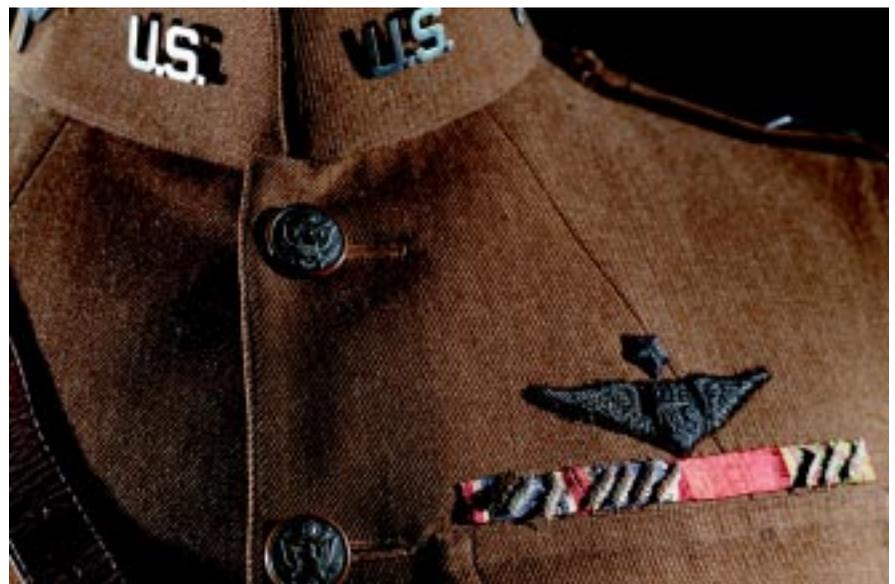
Twenty-five feet below, nose forward, is the SR-71 Blackbird, the fastest airplane ever built. It is also, just possibly, the best-looking airplane ever built.

Beyond the SR-71 is the arched opening of the unfinished space hangar, from within which the space shuttle *Enterprise* faces out toward the observation platform.

(The *Enterprise* arrived at Dulles in 1983. Refurbishing could not begin until it was moved out of a building on airport property last year. As work proceeds, visitors peer across construction barriers to see the shuttle and other artifacts, such as a Mercury capsule. Until the space hangar opens, some 60 space artifacts are on display in the aviation hangar.)

The view is spectacular in all directions. The aviation hangar stretches almost 1,000 feet from end to end, with no partitions to block the view. Modern military airplanes are on the north end of the hangar, airliners are on the south end, and aircraft from World War II and earlier are in the center.

Display cases on the ground floor have smaller artifacts: Eddie Rickenbacker’s uniform; Charles Lindbergh’s flight suit; Amelia Earhart’s flight suit and scissors used to cut her hair before her last mission; hats worn by Hap Arnold and Curtis E. LeMay.



Artifacts. Display cases contain smaller artifacts such as Eddie Rickenbacker’s uniform (shown here), Charles Lindbergh’s flight suit, and hats worn by Gen. Hap Arnold and Gen. Curtis LeMay.

For those who can tear their eyes away from the airplanes, there is a large collection of aircraft engines and propellers.

Visitors can take an elevator to the top of the Donald D. Engen Observation Tower (named for the former museum director who died in a glider accident in 1999), 164 feet high, for a “pilot’s eye” view of airplanes landing and taking off from the Dulles runway and a scenic sweep of Virginia.

Opening day drew more than 7,000 people, even though it was a Monday with snow on the ground. Museum officials believe yearly attendance will reach three million, once word of its attractions gets around.

The museum director, retired Marine Corps Gen. John R. Dailey, likes to call Udvar-Hazy “the nation’s hangar,” a variation on the Smithsonian’s familiar nickname as “the nation’s attic.”

The *Enola Gay*

At the center of the aviation hangar is the most famous of the airplanes at Udvar-Hazy, the B-29 bomber *Enola Gay*, which dropped the atomic bomb on Hiroshima in 1945.

The *Enola Gay* is raised up on an eight-foot platform with a P-38 Lightning under one wing and a P-47 Thunderbolt under the other. Other World War II airplanes are all around: a British Hawker Hurricane, a Ger-

man Focke–Wulf FW-190A-8, a Japanese Kawanishi N1K1 naval fighter, and numerous others.

Controversy about the Hiroshima mission continues elsewhere, but the aircraft is displayed as nonpolitically as possible. Director Dailey said that the basic descriptive label in front of the airplane “delivers the facts” and “allows people to understand these facts within the context of their own beliefs.”

That did not satisfy antinuclear protesters who staged a demonstration in the museum on opening day. One of the protesters hurled a bottle of red paint at the *Enola Gay*. It bounded off, denting the airplane and shattering on the floor below. (See “The Activists and the *Enola Gay*,” p. 29.)

The Smithsonian acquired the *Enola Gay* in 1949, but it was kept outdoors in various locations for years and was in bad condition when it was taken apart and put into storage at the Smithsonian’s Garber facility in Suitland, Md., in 1960.

Putting it back together was not easy.

“The *Enola Gay* was disassembled into 52 pieces for storage at the Garber facility, and none of the team that did the disassembly is still with us today,” Dailey said.

“Unfortunately, the way it was disassembled was not in accordance with the Boeing directives that describe the procedures, so they were of little value when it came time to

reassemble the aircraft. Some of the joints that had to be reconnected were intended to be done only on factory assembly jigs. This required some expert crane handling and ingenuity to accomplish the reconstruction.”

Dailey said it was “the largest re-assembly job we have ever attempted and is a source of great pride for us.”

In all, the restoration, which began in 1984, took 300,000 staff hours to complete. The aluminum skin has been polished to its original shine. The parts and systems are of World War II vintage, and many of them are original.

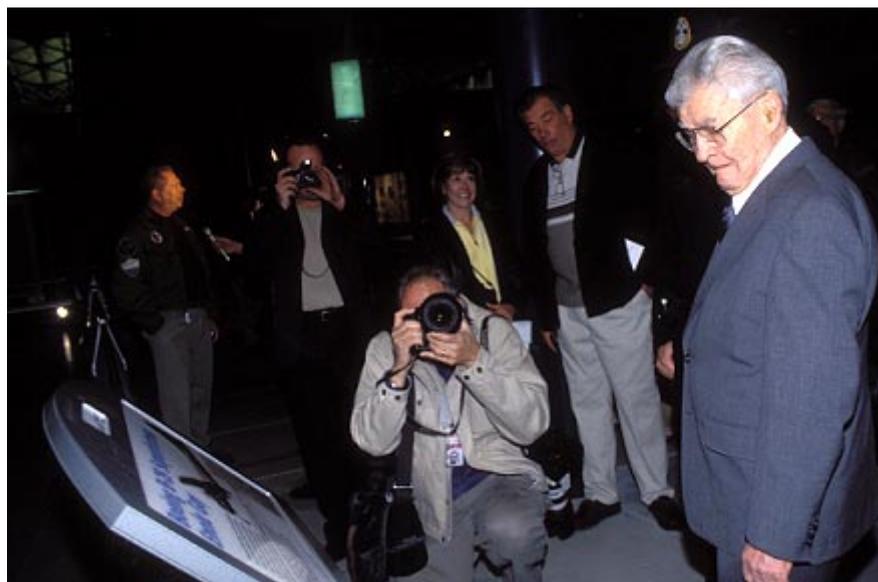
The Norden bombsight is the same one that flew on the Hiroshima mission. The tires are the ones that were on the aircraft when the Smithsonian got it in 1949. The tires have been treated with materials that help preserve the old rubber.

The aircraft has had a special visitor at Udvar–Hazy.

Retired Brig. Gen. Paul W. Tibbets Jr., 88, who flew the *Enola Gay* on its mission to Hiroshima, was there for a special Salute to Military Aviation Veterans, Dec. 9, and at the dedication of the new museum on Dec. 11. As crowds of well-wishers



Showstopper. The museum’s most famous airplane, the B-29 bomber *Enola Gay*, dwarfs smaller contemporaries, the twin-engine P-38 *Lightning* (foreground) and a Japanese N1K2 *Shiden Kai*.



Special Visitor. At the museum dedication, retired Brig. Gen. Paul Tibbets Jr., who flew the *Enola Gay* on its Hiroshima mission, posed for pictures and talked to well-wishers streaming by.

streamed by, Tibbets stood by the airplane, talking and shaking hands.

The Langley Aerodrome

The oldest aircraft at Udvar–Hazy is the Langley Aerodrome A, which hangs at the level of the second walkway, looking more like a huge butterfly than an airplane.

It was fished out of the water and restored after it crashed (twice) into the Potomac River in 1903. Museum staffers joke that the Aerodrome achieved a new altitude record when it was hoisted to its present position, 25 feet above the hangar floor.

The Langley Aerodrome was the basis for an epic feud between the Wright brothers and the Smithsonian and almost kept the museum from ever getting its hands on the Wright Flyer, which today is a centerpiece of



Ancient. The museum's oldest aircraft, the Langley Aerodrome A, predates the Wright Flyer but never actually flew until 1914. In 1903, the airplane, built by Samuel P. Langley, twice crashed into the Potomac River.

the collection at the Air and Space Museum.

In 1903, Samuel Pierpont Langley was secretary of the Smithsonian. He was also a competitor of the Wrights in the development of powered flight. His entry in the race was the Aerodrome. The wings of this improbable-looking contraption consisted of four linen-covered panels, two on each side of a tubular frame. It was launched from a catapult on top of a houseboat.

The Langley Aerodrome was all engine (52 hp vs. a dinky 12 hp engine on the Wrights' Kitty Hawk Flyer) and no aerodynamics. It went directly from the catapult into the river.

Langley died in 1906, but his successors at the Smithsonian billed the Aerodrome as the world's first airplane "capable of sustained flight." Glenn Curtiss did get the Aerodrome to fly a bit in 1914, but that was after numerous modifications and improvements.

Orville Wright was outraged. (Wilbur died in 1912.) Not until the Smithsonian said in writing in 1942 that the Wright brothers were the first to fly was Orville satisfied and the way cleared for the Smithsonian to obtain the Wright Flyer in 1948.

Lope's Hope

The Curtiss P-40E Warhawk near the main entrance to the museum is painted with the shark's mouth in-

signia of the legendary Flying Tigers.

The name on the nose is *Lope's Hope*. As all good aviation buffs know, "Lope" is Donald S. Lopez, longtime deputy director of the National Air and Space Museum and an ace with five victories in China in World War II.

On Dec. 12, 1943, Lopez took on a Nakajima Ki-43 Oscar that was attacking another P-40. The Japanese pilot turned toward Lopez, head-on, and kept coming. The left wings of the two aircraft collided, and the Oscar got the worst of it. As the Oscar

tumbled downward, out of control, Lopez—minus three feet of wing—kept flying and finished the mission.

The museum has a Ki-43 Oscar like the one Lopez engaged that day, and it is on the list for exhibition at Udvar-Hazy.

The P-40 now on display has the same markings as the airplane assigned to Lopez in China, but those were not the markings of the P-40 he was flying when he hit the Oscar. That day, Lopez had been in China for less than a month and was on his eighth combat mission. He was still too junior to have his own airplane with his name on the nose.

Other museum officials also have personal connections with vintage airplanes at Udvar-Hazy.

Three of the airplanes on display, for example, are types that director Dailey flew when he was on active duty with the Marine Corps: the XV-15 tilt-rotor research aircraft, the Vietnam-era F-4S Phantom fighter, and the SR-71.

Tom Alison, the museum's chief of collections management, not only flew the SR-71, he flew the particular SR-71 that is on the floor at Udvar-Hazy.

Airplanes Everywhere

Among the other highlights in the aviation hangar are these:

- The Concorde supersonic airliner. British Airways and Air France retired their fleets last year. The one at Udvar-Hazy was the oldest in the



Rivals. Displayed side by side on the hangar floor are a Soviet-built MiG-15 (background) and an American F-86 Sabre. In Korean War combat, the Sabre bested the MiG by a 10-to-one margin.

The National Air and Space Museum's Steven F. Udvar-Hazy Center

- A Business Aviation
- B Cold War Aviation
- C Commercial Aviation
- D General Aviation
- E Korea and Vietnam
- F Pre-1920 Aviation
- G Modern Military Aviation
- H Reaching Into Space
- I Sport Aviation
- J World War II Aviation



- 1 B-29 *Enola Gay*
- 2 Boeing 367-80
- 3 Concorde
- 4 Space Shuttle *Enterprise*
- 5 SR-71
- 6 Boeing 307 Stratoliner
- 7 F-86 and MiG 15
- 8 P-40
- 9 X-35
- 10 Langley Aerodrome

Air France fleet and arrived at Dulles in June 2003. The Concorde, which cruised at twice the speed of sound, is the longest and heaviest airplane at Udvar-Hazy (202 feet, 174,000 pounds empty).

- The Boeing 307 Stratoliner, the last one in existence and one of only 10 ever built. It was the first airliner with a pressurized cabin. It cruised above the weather at 20,000 feet (unprecedented for airliners of that era) for a faster and smoother ride and carried 33 passengers with the comfort of sleeping berths and reclining seats.

This particular aircraft was flown by Pan American Airways, entering service in 1940 as the *Clipper Flying Cloud*. In 1954, it was bought by the Haitian Air Force and became the personal airplane of dictator "Papa Doc" Duvalier. In the 1960s, it was used as a water bomber to fight forest fires in Arizona. It was obtained by the Smithsonian in 1972.

- A Kugisho Okha 22 Kamikaze aircraft, essentially a flying bomb, flown by a pilot on a one-way mission. An Okha was brought within striking distance and air launched by a Mitsubishi G4M Betty bomber. The pilot, who had received rudimentary training, crashed himself at high speed into an Allied warship. The Okha had a range of about 80 miles. It was powered by a crude jet engine, similar to the modern afterburner.

- The Aichi Seiran, a Japanese World War II bomber built to operate from a submarine to strike at the United States or other distant targets, such as the Panama Canal. The wings folded up so the airplane would fit inside a submarine. (Japan had developed a special fleet of submarine aircraft carriers). An I-400 class submarine could carry three Seirans in waterproof compartments. Assembled, the Seiran had a 40-foot wingspan and came with two large jettisonable pontoons for operation as a seaplane.

The Seiran never saw combat. This is the last surviving example, found by Allied forces in the remains of the Aichi factory after the war. (See "Flights From the Deep," p. 68.)

- Located side by side on the hangar floor are a MiG-15 and an F-86 Sabre. In the Korean War, the MiG-15 was flown by Russians, Chinese, and North Koreans and was bested,



From the Great War. This Nieuport 28C.1 exhibits markings of the famous US 94th "Hat in the Ring" Aero Squadron. This was the first fighter type to be flown by US airmen in World War I.

by a ratio of 10 to one, by the American F-86.

- The Boeing 367-80 "Dash 80," the prototype for America's first commercial jet airliner, the Boeing 707.

- A Nieuport 28C.1 fighter, assembled from components of five different Nieuports, exhibited in the markings of the famous 94th "Hat in the Ring" Aero Squadron. This type of aircraft was the first fighter US airmen flew in World War I. Nieuports later starred in the 1938 movie, *The Dawn Patrol*.

- The X-35 demonstrator for the Joint Strike Fighter, the newest airplane at Udvar-Hazy.

One Museum, Two Sites

For all of its scope and grandeur, Udvar-Hazy is not an independent operation. It is an expansion of the National Air and Space Museum and a companion facility to the building downtown.

"Of the 265 employees of the National Air and Space Museum, only 15 are assigned to the Udvar-Hazy Center," the museum's fact sheet says. "Most administrative and curatorial operations will be based at the museum's flagship building on the National Mall. Other Smithsonian staff not directly employed by the museum, such as store employees, also work at the Udvar-Hazy Center."

The major presence at Udvar-Hazy is some 300 education docents and

other volunteers. They wear big "Ask Me" buttons and answer visitors' questions with knowledge and enthusiasm.

The downtown museum had room for only 10 percent of the collection. (Another 10 percent is on loan to other institutions.) Udvar-Hazy gives the museum space to display the 80 percent of its airplanes that had been in storage. Many of them were too large to fit into the museum downtown.

There is no intention to move the museum's best known holdings, now exhibited in the downtown facility,

to Udvar-Hazy. "Crown jewels" shown at the flagship facility include the Wright brothers' 1903 Kitty Hawk Flyer, Lindbergh's *Spirit of St. Louis*, Chuck Yeager's X-1 *Glamorous Glennis*, which broke the sound barrier in 1947, and the Apollo 11 command module *Columbia*, in which astronauts flew to the Moon and back.

Since October, the downtown museum has been the site of a spectacular exhibition, "The Wright Brothers and the Invention of the Aerial Age," commemorating the 100th anniversary of powered flight. The program is built around the Wright Flyer and features 170 artifacts.

Dailey said that, "whereas the flagship building combines large exhibit halls, such as Milestones of Flight, with the more traditional exhibitions, such as the new Wright Brothers and the Invention of the Aerial Age, in the various galleries, the Udvar-Hazy Center will feature a single, coordinated display approach—exhibits of artifacts with brief identification labels, grouped in major thematic areas featuring historical background to provide context."

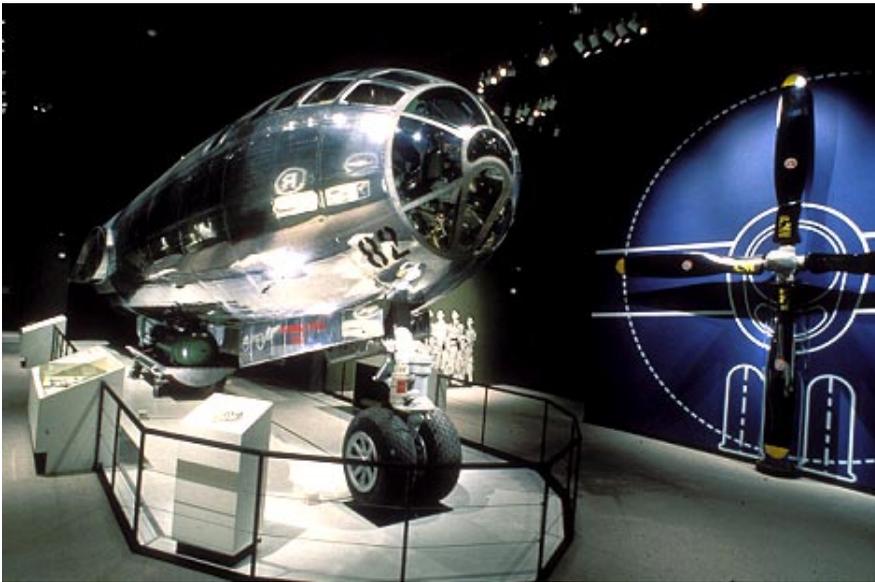
By Air and by Road

Getting the airplanes to Udvar-Hazy has been a job in itself. Some of them, including the *Enola Gay*, were trucked to Chantilly in pieces aboard a tractor-trailer called "Big Blue" and then reassembled.

Others, such as the Concorde, flew to Dulles and came to the museum



Civilian side. Among the other highlights in the aviation hangar are a Boeing 707 (foreground), a supersonic Concorde (left), and a gleaming Boeing 307 Stratoliner, one of only 10 ever built.



In its 1995-98 *Enola Gay* exhibit (above), NASM displayed only the B-29's forward fuselage, a propeller, tail fin, and a few other parts.

The Activists and the *Enola Gay*

This is the National Air and Space Museum's third shot at exhibition of the *Enola Gay*.

The first time was in 1993, when the museum, under different management, planned to display the *Enola Gay* in a political horror show that emphasized Japanese suffering and depicted Japan more as a victim than an aggressor in World War II. An article in *Air Force Magazine* brought the plan to light, and, after a raging controversy, the exhibit was canceled in early 1995.

The museum's second shot came later in 1995, a replacement for the canceled version. It took a straightforward, factual approach, built around display of the forward fuselage, a propeller, the tail fin, and other parts of the *Enola Gay*. The rest of the aircraft had not been restored yet, and, even if it had been, the 141-foot wingspan would have made it too large to show in the downtown museum. That exhibition ran for three years and drew almost four million visitors, becoming the most popular special exhibition in the museum's history.

The exhibition that opened Dec. 15 at the Udvar-Hazy Center leaves the airplane to speak for itself. The basic facts, including the fact that it dropped the atomic bomb on Hiroshima, are on the label in front of the airplane.

That has drawn the ire of protesters. Demonstrators, activists, and others—including a self-appointed committee that includes such luminaries as Oliver Stone, Daniel Ellsberg, and Noam Chomsky—are demanding that the museum rework the exhibit to emphasize Japanese death and suffering at Hiroshima.

In effect, the activists want the museum to depict the Japanese as victims, not as aggressors, in World War II. That was the line of the show that was blown away by public outrage in 1995.

The mayor of Hiroshima, Tadatashi Akiba, has written to museum director John R. Dailey to complain. The exhibition canceled in 1995, the mayor said, "would have included displays of A-bomb damage and the suffering the atomic bombs inflicted on living human beings. This balanced exhibition was stopped by a Congressional resolution at the insistence of veterans groups determined to protect their cherished belief that the atomic bombings were justified and indispensable."

Dailey said the museum does not plan to change the display of the *Enola Gay* at Udvar-Hazy.

on a direct ramp from the runway.

The first big artifact to arrive was the shuttle *Enterprise*, which rode in piggyback atop a Boeing 747 and went into long-term storage near the future site of Udvar-Hazy.

The classiest arrival was by the SR-71, which set a transcontinental speed record on its last flight, March 6, 1990. That day, the Blackbird flew from Los Angeles to Dulles in 64 minutes, 20 seconds, averaging 2,124 mph. (In operational service with the Air Force, the SR-71 could reach top speeds of Mach 3.3.) It was stored at Dulles until towed to Udvar-Hazy last September.

More aircraft continue to arrive at the aviation hangar, and the space hangar will be open sometime this year. Other attractions, such as an IMAX theater, are already in operation.

Still more lies ahead. The second phase of construction will include a huge restoration hangar, where visitors will be able to watch the preservation and restoration of historic aircraft and spacecraft.

This, however, awaits funding. The total cost of the Udvar-Hazy project was \$311 million, and the enabling legislation from Congress stipulated that no federal funds could be used for construction.

"An additional \$92 million needs to be raised," Dailey said. "This will enable us to pay off the existing debt and continue Phase 2, which consists of the restoration center and archival research center."

Visitors can reach Udvar-Hazy by car—from Interstate 66 to Route 28 north, exiting on Air and Space Museum Parkway—although a shuttle bus is available from the museum downtown. Further information is available on the museum's Web site, www.nasm.si.edu.

Air and Space was already the most popular museum in the world. It set an attendance record of nearly 11 million last year, and that was with the downtown building alone. Now that Udvar-Hazy has been added, there's no telling what altitudes the response might reach. ■

John T. Correll was editor in chief of Air Force Magazine for 18 years and is now a contributing editor. His most recent article, "European Command Looks South and East," appeared in the December 2003 issue.