

# OHIO'S AVIATION HERITAGE

## 1 Introduction

I'm Amanda Wright Lane, great-grandniece of Wilbur and Orville Wright.

Since the beginning of time, the mystery and majesty of flight have fascinated people. Many Ohioans have played a major role in the development of aviation. All challenged the course of history, and some risked their lives for that progress.

Much as we watch birds in flight, Orville Wright also watched them and studied the exact motion of their wings while they flew. He used those observations as he and his brother Wilbur designed and experimented with their flying machines.

This tour highlights several Ohioans who have played an integral role in the history of the United States Air Force and its predecessor organizations.

## *Early Years Gallery*

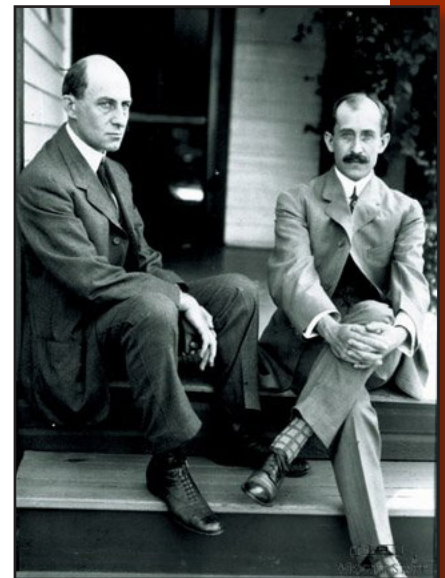
## 2 Wilbur and Orville Wright

Let's begin in the Early Years Gallery near the Wright Bicycle.

In 1893, Dayton residents Wilbur and Orville Wright opened up the first of their several bicycle shops. Three years later they began building bicycles of their own design. Their successful bicycle business funded flight experiments, and it expanded their knowledge of building machines.

The Wright brothers read everything on flying they could obtain, even though most of the material then available was based only on theory. The two brothers first worked with kites and gliders, and in the summer of 1903, they built a 40-foot, 4-inch span airplane that incorporated all their aerodynamic knowledge and incorporated the theories and ideas of German glider Otto Lilienthal. On December 17, 1903, Orville made the first successful powered, heavier-than-air flight in Kitty Hawk, North Carolina.

During 1904 and 1905, the Wrights continued researching the mysteries of flight at Huffman Prairie, which is now part of Wright-Patterson Air Force Base.<sup>1</sup>



<sup>1</sup> Fact sheet, National Museum of the U.S. Air Force, "Meeting the Challenge: The Wright Brothers."

### 3 Wright 1901 Wind Tunnel



Move to the 1901 wind tunnel.

While living in Dayton, Ohio Wilbur and Orville Wright experimented using wind tunnels like this to observe how wind moved over airplane wings. Inside the tunnel is a model of a Wright lift balance used to measure the lift of a test surface. This wind tunnel is a replica constructed under the personal supervision of Orville Wright prior to World War II.<sup>2</sup>

### 4 1909 Wright Flyer

Go to the front of the 1909 Wright Flyer.

The 1909 Military Flyer became the first military heavier-than-air flying machine when the Signal Corps purchased it from the Wright brothers on August 2, 1909. The airplane on display is an exact reproduction constructed by museum personnel in 1955. It is equipped with an engine donated by Orville Wright and chains, sprockets and propellers donated by the heirs of the Wright estate.<sup>3</sup>



### 5 Frank Lahm



Stand near the Flying Schools exhibit, located on the wall in front of the Wright Flyer.

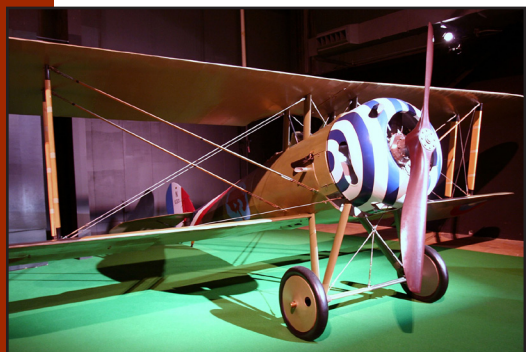
A native of Mansfield, Ohio, Frank Lahm was rated as both a balloon pilot and airplane pilot in the U.S. Army. On September 9, 1908, the Wright brothers took their 1908 Flyer to Fort Myer, Virginia, for military acceptance trials, and on its second flight Lahm accompanied Orville as a passenger on a 6 minute, 24 second flight, becoming the first U.S. military officer to fly in a powered airplane.

Following the military's acceptance of the 1909 Flyer, aviation activities moved to College Park, Maryland, where a larger flying field was available, and after taking flying lessons from Wilbur Wright, Lieutenant Lahm flew solo on October 26.

<sup>2</sup> Fact sheet, National Museum of the U.S. Air Force, "Wright 1901 Wind Tunnel."

<sup>3</sup> Fact sheet, National Museum of the U.S. Air Force, "Wright 1909 Military Flyer."

Prior to World War I, Lieutenant Lahm saw duty with the Cavalry and ran the Signal Corps aviation schools. He went to Britain with the American Expeditionary Forces in August 1917, where he oversaw balloon units. Lahm was on the First Army General Staff during the St. Mihiel and Muese-Argonne battles and later commanded the First and Second Army Air Services. After the war, he continued to serve as an active duty officer until his retirement in 1941 at the age of 64.<sup>4</sup>



## 6 Nieuport 28

Next, move to the nose of the Nieuport 28. This is the biplane with the blue and white striped nose.

Many American aces flew the Nieuport 28 during World War I, including Columbus natives Eddie Rickenbacker and Fred Norton. Norton, who flew with the 27th Aero Squadron during the Chateau-Thierry Campaign, was severely wounded by ground fire while strafing a column

of German troops. He was able to land his Nieuport behind Allied lines, but it took two days to get him to a hospital, and he contracted pneumonia. His last conscious act before he died was to scribble a note to his buddies: "Twenty-seventh, more power to you." Displayed near this exhibit are some of Norton's personal effects, including a flying jacket and his French hospital tags.<sup>5</sup>

## 7 McCook Field Wind Tunnel

Go to your left to the large McCook Field Wind Tunnel.

McCook Field, near Dayton, was an airfield and aviation experimentation station used from 1917 until the new Wright Field opened in 1927.<sup>6</sup>

This wind tunnel was designed and built at McCook Field in 1918 and was used for calibrating airspeed instruments and testing airfoils. The airfoils to be evaluated were placed in the choke-throat and viewed through the glass door as air moved over them. During operation, the air was drawn into the small end of the tunnel and exhausted from the large end where the fan was located.<sup>7</sup>



<sup>4</sup> Education Division, National Museum of the U.S. Air Force, "Ohio's Aviation Heritage Teacher Resource Guide," 2011.

<sup>5</sup> Exhibit, National Museum of the U.S. Air Force, "Lt. Fred Norton."

<sup>6</sup> "McCook Field," Wikipedia, 25 July 2013.

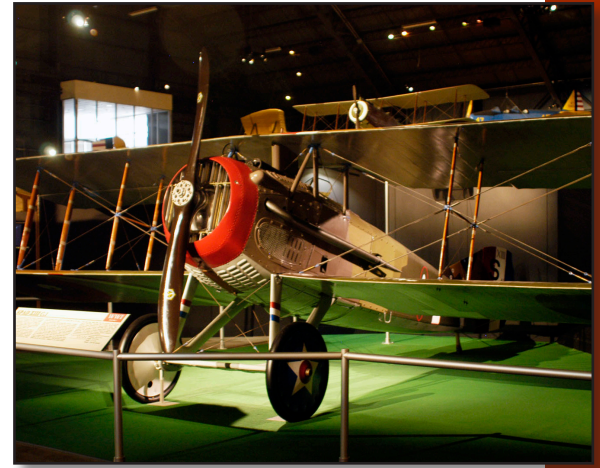
<sup>7</sup> Fact sheet, National Museum of the U.S. Air Force, "McCook Field Wind Tunnel."



## 8 SPAD XIII

Stand near the SPAD XIII, the biplane with the red nose and the famous “Hat in the Ring” insignia.

This aircraft is painted to represent the one flown by America’s “Ace of Aces” Eddie Rickenbacker, who was from Columbus, Ohio. Rickenbacker is credited with shooting down more German airplanes during World War I than any other American pilot. You’ll learn more about Rickenbacker when we reach the exhibit where his Medal of Honor is displayed.<sup>8</sup>



## 9 Kettering “Bug”

Next, move so that you are standing in front of the Kettering “Bug.”



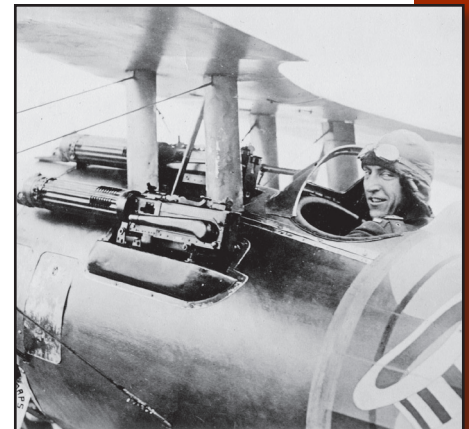
Ohioan Charles Kettering was an inventor, engineer, businessman and the holder of more than 180 patents. In addition to the spark plug and the electric cash register, one of Kettering’s many innovations was the Kettering Aerial Torpedo, like this full-size replica built by museum personnel. Developed in 1917 and nicknamed the “Bug,” this torpedo was launched from a four-wheeled dolly that ran down a portable track. The Bug’s system of internal pre-set pneumatic and electrical controls stabilized and guided it toward a target, and after a predetermined length of time, a control closed an electrical circuit, which

shut off the engine. Then, the wings were released, causing the Bug to plunge to earth — where its 180 pounds of explosives detonated on impact. The war ended before it could be tested in combat.<sup>9</sup>

## 10 Eddie Rickenbacker

Stand near the red Captain Edward V. Rickenbacker exhibit case.

Columbus, Ohio native Capt. Eddie Rickenbacker was a race car driver who entered World War I as a staff driver and emerged as the leading U.S. ace with 26 confirmed victories over the enemy. At his insistence, he was permitted to join a flight unit, first being assigned as a student at the Aviation Training School at Tours, France. In March 1918, he was assigned to the 94th Aero Squadron, the famed “Hat in the Ring” Squadron, and he was



<sup>8</sup> Fact sheet, National Museum of the U.S. Air Force, “SPAD XIII C.1.”

<sup>9</sup> Fact sheet, National Museum of the U.S. Air Force, “Kettering Aerial Torpedo ‘Bug’.”

in action the next month, flying his Nieuport fighter over the lines against the enemy. By June 1, 1918, Rickenbacker had become an ace, with five victories to his credit. He was put in command of the 94th Aero Squadron and continued as its leader until his return to the United States on January 27, 1919, where he was hailed as America's "Ace of Aces." He was awarded the nation's highest honor, the Medal of Honor, which is on display in this exhibit case.

After World War I, Rickenbacker returned to auto racing and became president of the Indianapolis Motor Speedway. He later became an aviation executive and an adviser for the U.S. Army Air Forces in World War II. He died in 1973 and is buried at Greenlawn Cemetery in Columbus.<sup>10</sup>

## 11 Don Gentile

Next to the Hawker Hurricane is the Eagle Squadrons exhibit. In front is a glass case that contains information on another Ohio aviator.

Piqua native Dominic "Don" Gentile learned to fly in high school. He tried to enlist in the Air Corps after graduation but was refused because he lacked the required two years of college. Desperate to fly, he turned to the Royal Air Force in England and by December 1941 became a pilot officer, flying with various Royal Air Force squadrons. He was assigned to combat in 1942 as a member of Number 133 Eagle Squadron and on August 1, 1942, during the Dieppe raid, he destroyed his first German planes, an Fw 190 and a Ju 88, within 10 minutes of each other. In September 1942, when the three Eagle Squadrons were transferred to the U.S. Army Air Forces, or AAF, as the 4th Fighter Group, Gentile was commissioned as a second lieutenant and began a remarkable combat career flying Spitfires, P-47s and P-51s.



By April 1944, he was the Army Air Force's leading ace with 27.8\* enemy planes destroyed in the air and on the ground. Because of Lt. Gentile's daring spirit, he was ordered back to the United States the following month as the risk he might be lost in battle was exceptionally high. Gentile agreed to take a one month rest from the rigors of combat with the understanding that he would be permitted to return to his unit. Instead, he was permanently assigned to Wright Field as a test pilot until after the war. In 1951 this great combat pilot who had survived all the enemy could muster against him was killed in the crash of a T-33 jet trainer near Andrews Air Force Base, Maryland. He was posthumously promoted to major.

Several medals that were presented to him during his career as a fighter pilot are on display in this exhibit.<sup>11</sup>

*\*Note: Don Gentile was officially credited with 21.88 aerial victories and six ground victories. He also had two victories while assigned to No. 133 Eagle Squadron.*

<sup>10</sup> Education Division, National Museum of the U.S. Air Force, "Ohio's Aviation Heritage Teacher Resource Guide," 2011.

<sup>11</sup> Ibid.

## World War II Gallery



### 12 Doolittle Tokyo Raiders

Go through the Holocaust Exhibit and into the World War II Gallery and to the nose of the B-25 Mitchell.

On April 18, 1942, 80 men achieved the unimaginable when they took off from the aircraft carrier the USS Hornet on a top secret mission to bomb Tokyo, Japan. Led by Lt. Col. Jimmy Doolittle, these men came to be known as the Doolittle Tokyo Raiders. Although the Tokyo Raid caused

only minor damage, it forced the Japanese to recall combat forces for home defense, raised fears among the Japanese civilians, and boosted morale among Americans and our Allies abroad.<sup>12</sup>

Several Raiders had ties to Ohio, including Colonel Richard Cole, co-pilot of Crew #1, who was born in Dayton; First Lieutenant Robert Meder, the co-pilot of Crew #6, who was born in Cleveland; Major Thomas Griffin, the navigator for Crew #9, who lived in Cincinnati for many years; Colonel William Bower, the pilot of Crew #12, who was born in Ravenna; and Captain George Barr, the navigator for Crew #16, who lived in Dayton.<sup>13</sup>

### 13 Mac Ross

Move to the Tuskegee Airmen exhibit.

During World War II, the U.S. military was racially segregated. Reflecting American society and law at the time, most black soldiers and sailors were restricted to labor battalions and other support positions. An experiment in the U.S. Army Air Forces, however, showed that given equal opportunity and training, African-Americans could fly in, command and support combat units. The USAAF's African-American fliers, the "Tuskegee Airmen," served with distinction in combat and directly contributed to the eventual integration of the U.S. armed services, with the U.S. Air Force leading the way.<sup>14</sup>



Lieutenant Mac Ross of Dayton was one of the first five graduates from the flying school at the Tuskegee Army Air Field. He died in 1944 after he crashed during a P-51 transitional training flight.<sup>15</sup>

Scotty Hathcock, also of Dayton, was the second Ohioan to become a Tuskegee Airmen, and a number of other Ohio natives served with the group.<sup>16</sup>

<sup>12</sup> Fact sheet, National Museum of the U.S. Air Force, "Doolittle Raid."

<sup>13</sup> "80 Brave Men," DoolittleRaider.com, 5 June 2013.

<sup>14</sup> Fact sheet, National Museum of the U.S. Air Force, "Tuskegee Airmen."

<sup>15</sup> Education Division, National Museum of the U.S. Air Force, "Ohio's Contributions to Flight Scavenger Hunt," August 2008.

<sup>16</sup> Ibid.



## 14 Curtis LeMay

Move to the front of the B-17.

Curtis LeMay has been called the “father of modern strategic bombing” and is one of America’s most famous air commanders. The Columbus native attended The Ohio State University, graduating with a bachelor’s degree in civil engineering. In 1928, he entered the Armed Services as a flying cadet.

LeMay participated in the first mass flight of B-17 Flying Fortresses to South America in 1938, and the Second Bomb Group won the Mackay Trophy for outstanding aerial achievement.

After carefully calculating the dangers, LeMay stopped maneuvering bomber formation to avoid antiaircraft fire and initiated straight-in bomb runs which improved bombing accuracy. He also devised new formations, techniques and procedures, which were eventually used by all B-17 and B-24 units throughout the European theater. He later used low-level night raids by B-29s against Japan.



In 1948, LeMay assumed command of the newly formed Strategic Air Command (SAC) and built an all-jet bomber force, manned and supported by professional Airmen dedicated to the preservation of peace. The general commanded SAC for nearly 10 years, and under his leadership and supervision, plans were laid for the development and integration of an intercontinental ballistic missile capability.

LeMay served as Chief of Staff of the United States Air Force from 1961 to 1965.<sup>17</sup>

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<sup>17</sup> Education Division, National Museum of the U.S. Air Force, “Ohio’s Aviation Heritage Teacher Resource Guide,” 2011.

## ***Southeast Asia War Gallery***

### **15 William Pitsenbarger**

Walk past the Bob Hope exhibit and through the connecting link. Turn left and go to the Combat Search and Rescue exhibit in the Southeast Asia War Gallery.

Pararescueman William H. Pitsenbarger, who was born in Piqua wanted to quit high school to join the U.S. Army Special Forces' Green Berets. His parents convinced him to stay in school, and after graduating in 1962, Pitsenbarger joined the Air Force.



Arriving in Vietnam in August 1965, Pitsenbarger completed more than 250 missions, including one in which he hung from an HH-43's cable to rescue a wounded South Vietnamese soldier from a burning minefield. This action earned him the Airman's Medal and the Republic of Vietnam's Medal of Military Merit and Gallantry Cross with Bronze Palm.

William H. Pitsenbarger was only 21 years old when he was killed in action. But in his short life and heroic Air Force career, Pitsenbarger was an example of dedication, compassion and tenacity for all those with whom he served. In his work, and especially on his final mission, Airman 1st Class Pitsenbarger embodied the pararescueman's motto: "That Others May Live."

For coordinating the successful rescues, caring for the wounded and sacrificing his life while aggressively defending his comrades, Pitsenbarger earned the Air Force Cross on June 30, 1966. After review, the original award was upgraded, and on December 8, 2000, the Medal of Honor was presented to his family in a ceremony here at the museum. Pitsenbarger is the 59th Medal of Honor recipient, and sixth enlisted recipient, from the Air Force and its predecessor organizations.<sup>18</sup>

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<sup>18</sup> Fact sheet, National Museum of the U.S. Air Force, "Airman 1st Class William H. Pitsenbarger."



## Missile & Space Gallery

### 16 Neil Armstrong

Walk through the Cold War Gallery and stand near the Apollo 15 Command Module at the entrance to the Missile and Space Gallery.

Wapakoneta native Neil Armstrong took his first airplane ride in a Ford Tri-Motor at the age of 6. As a young boy, he developed an interest in aviation and astronomy and earned his private pilot's license when he was 16, before he learned to drive an automobile. In 1949 the U.S. Navy called him to active duty, and he served during the Korean War, flying 78 combat missions in Navy Panther jets.

After earning a bachelor's degree in aeronautical engineering in 1955, he joined NASA's Lewis Research Center and later transferred to the NASA High Speed Flight Station (now NASA's Dryden Flight Research Center) at Edwards Air Force Base, California, as an aeronautical research pilot. In this capacity, he performed as an X-15 project pilot. Other flight test work included piloting the X-1, F-100, F-101, F-102, F-104, B-47 and others.



Armstrong was selected as the first civilian astronaut by NASA in September 1962. As command pilot for the Gemini XIII mission, launched on March 16, 1966. Armstrong performed the first successful docking of two vehicles in space — the Gemini spacecraft and the Agena Target Vehicle.

Armstrong was the commander for Apollo XI from July 16-24, 1969 — the first manned lunar landing mission. He holds the distinction of being the first human to walk on the moon. On July 20, 1969, a Lunar Module camera provided live television coverage of Armstrong setting foot on the lunar surface at 10:56 p.m. Just as he stepped off the Lunar Module, Armstrong proclaimed, "That's one small step for a man, one giant leap for mankind."<sup>19</sup>

### 17 John Glenn

Stand near the John Glenn exhibit.

John H. Glenn Jr. was born in Cambridge and grew up in New Concord. In his long aviation career, he flew with the U.S. Marines and the U.S. Air Force, set a speed record and shot down enemy aircraft. But he is best known as the first American to orbit the earth and, later in life, as the oldest person to fly in space.

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<sup>19</sup> Education Division, National Museum of the U.S. Air Force, "Ohio's Aviation Heritage Teacher Resource Guide," 2011.

During the Korean War, Glenn was one of a handful of Marines selected to fly USAF F-86 Sabre jets in a pilot exchange program. Glenn shot down three North Korean MiG-15 fighters and soon became known as the “MiG Mad Marine.” Following the war, Glenn was called the first “supersonic Marine” when he set a speed record flying a Chance Vought F8U Crusader coast-to-coast across the United States.

In April 1959 he was selected as one of the original seven Project Mercury astronauts. On February 20, 1962, Glenn piloted the Mercury-Atlas 6 “Friendship 7” spacecraft on the first manned orbital mission of the United States. Launched from Kennedy Space Center, Florida, he completed a successful three-orbit mission around the Earth.



On October 29, 1998, the first American to orbit the Earth made history again. Glenn became the oldest man to fly in space by serving as a payload specialist on STS-95 aboard the Space Shuttle *Discovery*. Glenn spent most of his time in space participating in investigations on the aging process. Scientists recognize several parallels between the effects of spaceflight on the human body and the natural changes that take place as a person ages.

Glenn also served as U.S. Senator from Ohio for four terms.<sup>20</sup>

## 18 Jim Lovell

Stand near the Gemini spacecraft.

Cleveland native Jim Lovell served in the U.S. Navy and as a NASA astronaut with the Gemini and Apollo programs.

On December 4, 1965, Lovell and Frank Borman were launched into space on the history-making Gemini 7 mission. The flight lasted 330 hours, 35 minutes and included the first rendezvous of two manned maneuverable spacecraft. The Gemini 12 mission, commanded by Lovell with Pilot Buzz Aldrin, began on November 11, 1966. This four-day, 59-revolution flight brought the Gemini program to a successful close.

Lovell served as command module pilot and navigator on the epic 6-day journey of Apollo 8 – man’s maiden voyage to the moon – from December 21-27, 1968. He completed his fourth mission as spacecraft commander of the Apollo 13 flight from April 11-17, 1970, and became the first man to journey twice to the moon. Apollo 13 was programmed for 10 days. However, the original flight plan was modified en route to the moon when an oxygen tank in the service module of the spacecraft exploded. Lovell and fellow crewmen, John L. Swigert and Fred W. Haise, working closely with Houston ground controllers, converted their lunar module “Aquarius” into an effective lifeboat. Their emergency



<sup>20</sup> Education Division, National Museum of the U.S. Air Force, “Ohio’s Aviation Heritage Teacher Resource Guide,” 2011.

activation and operation of lunar module systems conserved both electrical power and water in sufficient supply to assure their survival while in space and for their safe return to Earth.

Lovell held the record for time in space with a total of 715 hours, 5 minutes until surpassed by the Skylab flights.<sup>21</sup>

## 19 Conclusion

Take just a moment to reflect on your location. You are standing on what was once the landing area for Wright Field. Established in 1917, Wright Field served as an important flight test and development facility from World War I through the end of World War II. Wright Field was consolidated with nearby Patterson Field in 1948, and to this day Wright-Patterson Air Force Base remains a key resource to the nation.

Many developments in aviation history have taken place in Ohio. I hope you've enjoyed hearing about some of the people and places who have played an important role in the history of military aviation.

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<sup>21</sup> "James A. Lovell," JSC.NASA.gov, December 1994.

## Map of Podcast Locations

