# Robert Novell Year in Review 2014

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# Robert Novells' Third Dimension Blog

**February 7, 2014**

Good Morning and thanks for letting me be part of your week. Today we are going to talk about the Aviators who were the first test pilots and how their accomplishments made aviation what it is today.

I found this article on the web, while researching a different topic, and was so impressed with the facts and the writing, that I am going to present the article in it's entirety without trying to merge different elements from other sources.

Enjoy.....

## The First Test Pilots

Not long after ex-World War I aviator John Macready left his California ranch at the age of 54 to serve again in World War II, he was checked out in one of the B-17 bombers he'd soon be flying over North Africa. A young lieutenant, eager to tout the modern, high-altitude capability of the Flying Fortress, pointed out the supercharger that made such missions possible. "Know anything about these, sir?" he asked the veteran of the Great War. Today, Sally Macready Wallace chuckles at the irony: "Daddy just looked at him and said, 'Yes Lieutenant, I believe I do.' "

Twenty years earlier, as chief test pilot at McCook Field in Dayton, Ohio, John Macready had stunned the aviation world by flying a biplane fitted with the world's first operational supercharger to an astonishing altitude of 34,500 feet. At one point during the flight, nearly seven miles up, it was so cold in the open cockpit that the pilot's oxygen tube clogged with ice from his own breath. Just another day's work at America's first flight laboratory.

Variable-pitch propellers. Guided missiles. An operational rotorcraft 10 years before Sikorsky. Landing lights and radio navigation. The first nonstop transcontinental flight. The Gerhardt Cycle-plane, which collapsed in a heap. Around the world in an airplane—before anyone else. Higher, faster, farther.

Part Skunk Works and part research center, the R&D operation at McCook Field was the launch pad for much of 20th century aviation technology. More than 2,300 people worked there during the Roaring Twenties, in 70 buildings housing everything from wind tunnels to machine shops to offices. From 1917 to 1927, every pilot at McCook knew that his next experimental flight might represent a significant leap into aviation's brave, bold future—and that when he landed, the guy shaking his hand might be Orville Wright.

The Wright brothers, though, were ancient history. Aviation may have been born in Dayton, but by the start of World War I, America's early edge in flight had already slipped away. In 1912, the French had come to Chicago and walked away with the Gordon Bennett Trophy, after Jules Védrines piloted his Deperdussin racing monoplane at more than 100 mph. "No American competitor even flew against them," says former Air Force historian Richard Hallion.

On the day in 1917 when the United States entered the war, the total U.S. inventory of military aircraft numbered less than 250, and all were trainers or observation platforms. Commercial aircraft production lagged. Assumptions that airplane development would grow out of the burgeoning auto industry proved unfounded. "Aircraft production at the time of the first world war was more akin to building pianos," Hallion says. By the Armistice, the sole American-built airplane to see combat—the Dayton Wright Airplane Company's de Havilland DH.4—was actually designed Over There, constructed to British blueprints.

While war in Europe raged without American airplanes, the U.S. government fast-tracked the establishment of an Army Signal Corps aviation research and development facility in Dayton. The project was assigned national defense priority, and crews worked overtime building wooden hangars, test facilities, classrooms, and barracks. Occupying 250 acres adjacent to the business district, McCook Field—named for the Fighting McCooks, a family of Civil War heroes who owned the property—was the most urban airfield in the nation.

McCook's engineering division was charged with developing the technology to recapture American aviation's lost mojo. Though the base was run by the Signal Corps, most of the engineers and designers were civilians, and the vibe was only quasi-military. Army red tape was minimized; Colonel Thurman Bane, commandant in the early years, believed a good idea took precedence over rank. The tempestuous Brigadier General Billy Mitchell, then chief of training and operations for the Air Service in Washington, butted heads with a military establishment he accused of preparing for the last war instead of the next. The looser hierarchy at Dayton suited his temperament, and provided a laboratory for his then-controversial theories of air supremacy. "Mitchell got every foreign aircraft he could find and had them all brought to McCook," says Hallion. "Many were German, transferred to the U.S. as part of the terms of the Armistice." Dayton residents soon became accustomed to the sight of a Fokker D.VII, still emblazoned with the Kaiser's Iron Cross, wheeling alongside a British Sopwith Camel or a French-built Voisin 8 in the blue Ohio skies.


**(Airplanes like the LUSAC 11 routinely set records at McCook. (National Museum of the USAF))**

"I want tomorrow's airplane today," Mitchell told McCook engineers. Behind closed hangar doors, the German airplanes were stripped to the frame to reverse-engineer their secrets. Engineers searched for the perfect mix-and-match magic, installing American engines in European aircraft and vice versa. In the culture of experimentation Bane encouraged, any novel idea was granted at least a fair hearing, whether from a major company or a lone backyard inventor. The most

promising designs were handed off to a crew that built prototypes in the cavernous assembly building, which were then flight-tested.

Among the concepts brought to life by the engineering division was a 16-ton behemoth known as the Barling Bomber. Based on a wartime idea that gargantuan airplanes staging night bombing raids could help decide future conflicts, the enormous triplane featured a 10-wheel landing gear, five gun stations, and a 5,000-pound bomb capacity. Though it completed testing and even a promotional tour, its range, just 170 miles, combined with a maximum speed below 100 mph doomed the outsized airplane. En route to Washington, D.C., for a demo flight before legislators, the Barling failed to clear the Appalachian mountain range and had to turn back. Cost overruns, including the requirement for a $700,000 hangar, were so big the project was canceled.

McCook's greatest invention, though, may have been the professional U.S. military test pilot. No longer would aeronautical researchers rely on daredevils and barnstormers to check out their new machines. Europeans and Americans alike had started to take a more scientific approach to aviation, and for the pilots assigned to Dayton, technical training would be as important as flying skills.

One of the first of the new professionals was Eugene "Hoy" Barksdale, a Mississippian who flew for the British Exeter Cadet Squadron in World War I. Barksdale had three confirmed shoot-downs before he was downed behind enemy lines in France. After the Armistice, his aerial prowess—he set a speed record in a Curtiss biplane, for example—impressed Billy Mitchell, so in November 1923 he was transferred to the elite group of pilots in McCook's Flight Test Section. "Mitchell put together the best of the best in the Air Service at McCook," says Shawn Bohannon, a retired Air Force archivist. "And Barksdale was definitely one of them." The 26-year-old pilot quickly developed a reputation, and he took on some of the boldest assignments. When the rear stabilizer separated from an experimental metal Boeing XCO-7, Barksdale bailed out in a spin and survived—an early beneficiary of new parachutes developed at McCook.In 1925, as he made ground-skimming passes in a modified DH.4 to test wing loading, Barksdale felt a jolt. He landed the airplane to check the damage, only to discover he'd decapitated two Army surveyors riding in a flatbed truck, who had inadvertently strayed into the test area. Despite the shock, the next day Barksdale was back in the pilot's seat testing another aircraft over the same course. "I sustained no injuries and I am subject to duty," he told a Dayton newspaper reporter, adding, "Fliers must have lady luck with them sometimes if they are to keep going."

**(Buzz Aldrin's father, Edwin E. Aldrin Sr., helped establish McCook's engineering school. Like his son the astronaut, "Gene" Aldrin held degrees from MIT, where he also did his flying training. Before coming to McCook, he taught a young pilot named Leroy Grumman. A generation later, Grumman's company built the lander that took Buzz Aldrin to the moon. (San Diego Air & Space Museum))**

Many of the traits later associated with the classic test pilot psyche came together in Hoy Barksdale. “He wasn’t a terribly excitable man,” says Bohannon. “He was an incredibly professional and stoic man—a gifted pilot who had the ability to just press forward with the mission at hand.” At the time, critical observations and recordings during a test flight had to be committed to memory or written on a clipboard strapped to a leg. Not only could Barksdale keep control of his aircraft in stressful situations, “he was also a very keen observer and recorder, fantastic qualities for a test pilot,” says Bohannon. In fact, Barksdale literally wrote the book on the subject, authoring the military’s first test pilot manual in 1926. In *Flight Testing of Aircraft*, he lays out a program for testing different aircraft, one per month, with the results meticulously recorded in a standardized seven-page report. Eventually, Barksdale paid the ultimate price for his methodical approach to taking on new risks. While testing a spin-prone Douglas O-2 observation airplane in 1926, he deliberately induced a left spin. “It went into a flat spin and he couldn’t recover,” Bohannon says. As he attempted to jump free of the plane, centrifugal force slammed him into the fuselage. The cords of his parachute were severed by the wing rigging, sending him plummeting to his death in front of scores of witnesses.

The crash traumatized the Air Service. “His death became the driving force behind extensive test work conducted solely to determine the cause of flat spins,” Bohannon says. Another McCook test pilot, Harry Sutton, made it his mission to discover techniques to counter the mysterious phenomenon, beginning with theoretical work that led to wind tunnel tests and ultimately successful flight experiments. When an airfield opened in Louisiana in 1933, it was named for McCook’s pioneering aviator; today it’s called Barksdale Air Force Base.

American pilots commonly returned from World War I steeped in stick-and-rudder sense but lacking formal training in aeronautics. McCook’s Air School of Application was set up to mold the most promising candidates into disciplined pilots with an engineering mindset. Lieutenant Edwin Aldrin, who would later get a Ph.D. in aeronautical engineering from MIT, was made assistant commandant, in charge of the school’s operations. The curriculum included courses like “Economic Analysis of Dirigible and Airship Lines,” and instructors taught topics from airfoil theory to propeller design.

Edwin’s son Buzz Aldrin, who later became a NASA astronaut, connects the dots between McCook and the aerospace research that culminated with his own lunar landing in 1969. “It’s all a big circle,” he says. The school his father helped organize at McCook in 1919 evolved directly into the Air Force Institute of Technology—“the same institution that sponsored my Ph.D. in astronautics [on orbital rendezvous] in 1963.” The senior Aldrin had studied physics at Clark University under Robert Goddard, inventor of the first liquid-fueled rocket. Edwin Aldrin also knew Charles Lindbergh, who in turn had connections to philanthropist Harry Guggenheim. When Goddard came to Dayton seeking backers for his rocket experiments, Lindbergh introduced him to Guggenheim. Forty years later, a giant liquid-fuel rocket would propel Edwin Aldrin’s son to the moon. A big circle indeed.

**(Even pilots as skilled as Hoy Barksdale (standing third from left), John Macready (to his left) and Jimmy Doolittle (sitting in front of Macready) made mistakes; they awarded one another "Blunder Trophies" (foreground) like the "Flying Ass" and "Quacking Duck." (National Museum of the USAF))**

The students and staff at McCook were a Who's Who of early aerospace. The legendary Jimmy Doolittle was in the class of '23. Leigh Wade was a McCook test pilot before setting out in 1924—with seven other Army pilots—on the first round-the-world flight. Stanford-educated John Macready was chief test pilot for the Air Service from 1920 to 1926, during which time he won the Mackay Trophy for aviation achievement three times. He even designed the first aviator sunglasses, working with Bausch & Lomb to come up with a shape and tint that could protect a pilot's eyes in the thin air at high altitudes.

In her biography of her father, Sally Wallace described his first day at McCook. Escorted by the officer in charge to observe the test of an experimental vehicle, Macready watched in horror as the aircraft stalled at 700 feet and spiraled in, exploding in flames and burning the pilot beyond recognition. "As you can see," the unfazed officer next to him said, "we need replacements."

No test pilot flew as many flights as "Mac" Macready, and under conditions as strenuous. In the 1920s, the development of pressurized cockpits was still a work in progress. The McCook engineers welded an airtight steel barrel incorporating flight controls, an altimeter, and a six-inch glass porthole into the open cockpit of a de Havilland DH.9. Sealed inside, Macready, hunched in what he termed "a metal coffin," would take it aloft.

The Engineering Division was always eager to find new applications for airplanes, and when a Cleveland park system employee wondered if the job of spraying trees with insecticide couldn't be done better by a hydrogen dirigible—or even a newfangled airplane—the idea drifted through the Department of Agriculture and ended up at McCook. Soon, a hand-operated hopper with the capacity for 100 pounds of lead arsenate poison was mounted on a Curtiss JN-4. With the hopper's designer in the observer's seat, Macready flew the Jenny at 80 mph, 35 feet above a grove of catalpa trees infested with caterpillars. The insecticide was dispensed in six passes, coating the trees and killing the pests. The science of cropdusting was born. As Macready landed, ecstatic Department of Agriculture observers swarmed the airplane. Today aircraft spray 71 million acres of cropland each year.

Collaboration between the public and private aviation sectors was practically invented at McCook. When he retired in 1954, Gene Eubank was the oldest active pilot in the Air Force. Thirty years earlier, he had been a McCook test pilot assigned to bombers and large aircraft. Eubank had been flying border patrol missions against Pancho Villa's bandits when Billy Mitchell spotted him and brought him to Dayton.

**(During McCook's heyday, crashes kept the propeller shop a busy place. (NASM (Neg. WF-227))**

In an Air Force oral history interview in 1982, Eubank described the daily life of a McCook pilot. Being the first to fly airplanes made by U.S. manufacturers was considered a perk for military test

pilots, who at the time had no counterparts in private industry. While testing the XB-906, an all-metal design by McCook engineer Bill Stout that evolved into Ford's famous Trimotor, Eubank would frequently visit Detroit. "If there was anything to go to the factory to make a suggestion about...I was the one," he said. McCook pilots were treated like celebrities, the astronauts of their day. "Mr. Henry Ford had me to lunch with him," Eubank recalled. "Mr. Ford's chief engineer, Mr. Henry Mayo, came down to the train and met me, then took me to his private club and put me up, then put me back on the train when I went back to Dayton. Now, *that* was the accord that a young aviator got from the top people in this country."

Mac Macready enjoyed similar respect from industry leaders. Anthony Fokker, the Dutch-born aviation manufacturer who had moved to the United States in 1922, was a frequent house guest at Macready's Dayton residence. Sally Wallace recalls the day in 1925 when Fokker invited members of her mother's bridge club for a flight on his new T-2 transport. Many of them had never flown before, but this game group of young Jazz Age women unanimously accepted the dashing Fokker's offer and took to the sky. Macready piloted the T-2 while Fokker schmoozed with the bridge club in the cabin and passed around a box of chocolates.

World War I had shown military strategists that altitude was advantage. Pre-war maximums averaging 8,000 feet were quickly surpassed by aircraft like the Fokker D.VII, with a ceiling above 20,000 feet. The limiting factor was not human physiology but the engine. The Liberty-12, a revolutionary water-cooled, 12-cylinder powerplant developed at McCook, delivered 400 horsepower at sea level but less than 90 in the oxygen-starved environment above 25,000 feet. So McCook engineers, working with General Electric, developed a turbo-supercharger to sustain horsepower at high altitudes, and applied it to a Liberty-powered LUSAC 11 fighter. Rudolph "Shorty" Schroeder made the first few high-altitude tests. On his last attempt, his oxygen supply faltered at just over 33,000 feet. Momentarily lifting his goggles in the open cockpit to adjust the flow, his eyeballs were quick-frozen and he lost consciousness. After the airplane plunged six miles in two minutes, the sound of the nearly empty fuel tanks contracting in the higher air pressure at lower altitudes jarred Schroeder back to consciousness, and he was able to glide the airplane to a landing.

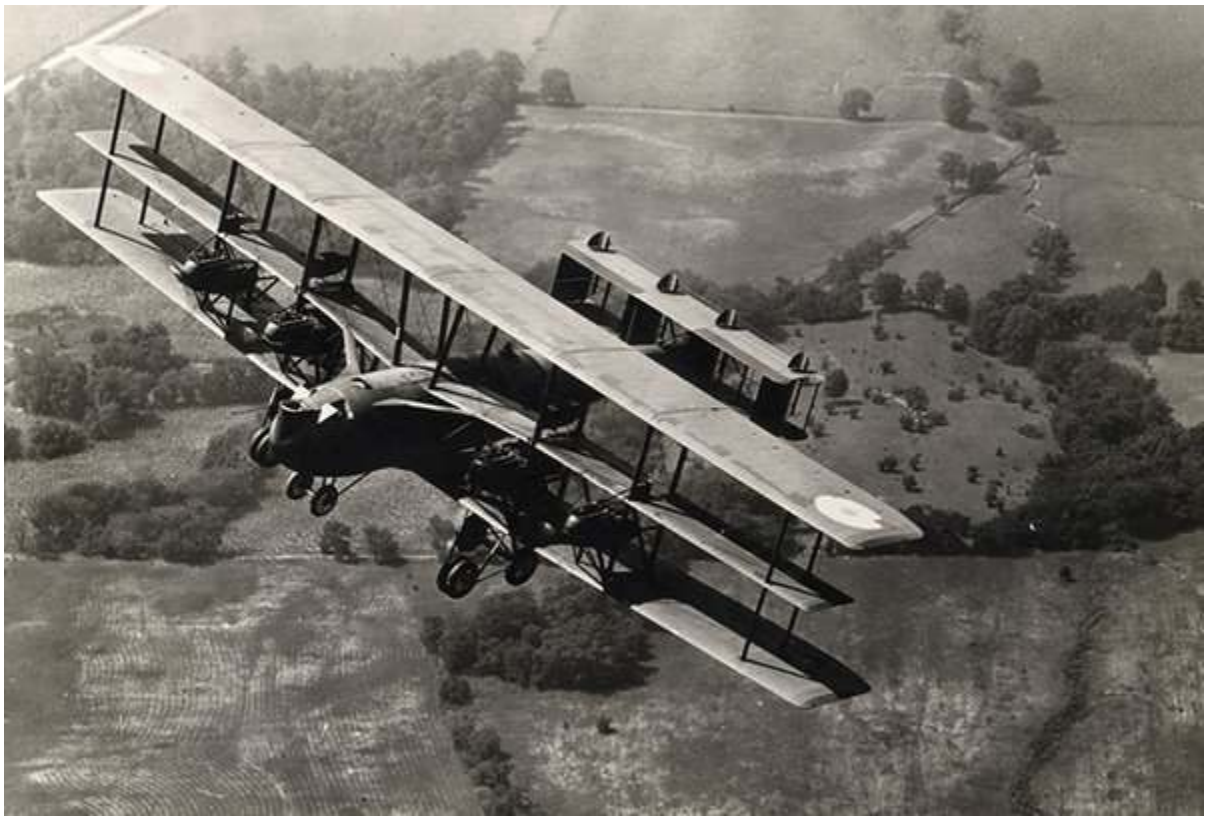
Mac Macready took over the high-altitude program and made 50 flights above 30,000 feet in the LUSAC. On September 18, 1921, he was well above that when teardrops in his eyes turned to icicles and ice formed in his oxygen flow. "At this point, his mind began to grow fuzzy," his daughter wrote. "Glancing at the airspeed indicator he was surprised to see that it read only 65 miles per hour." It took a long moment before he realized he'd been peering at the tachometer displaying 6,500 revolutions per minute. "He told himself 'I'm losing it,' " Wallace writes. Her father had enough altitude experience to know that a lagging thought process and a fizzy sense of euphoria were symptoms of deadly hypoxia. Nevertheless, he nudged the biplane up past 34,000 feet, where, in the thin air, it dangled more than flew, refusing to climb further. "Mac took a look around for the first time," Wallace writes. "The sky was a dazzling white, almost blinding in its intensity.... He was higher at that moment than any man had ever been before." Macready circled the LUSAC down to McCook in 5,000-foot increments. Although his altimeter read 41,200 feet (his daughter still has the instrument's barograph traces), post-landing calibration led the Fédération Aéronautique Internationale to downgrade the official number to 34,563 feet. It was

still a world record—witnessed by Orville Wright himself, who later came by Macready's office to congratulate him.

During the war, when bullets hit the fuel tanks in wood-and-fabric airplanes, the craft became flying crematoriums. Pilots could opt to leap to their death or ride the flaming airplane down. Balloon observers had a better choice: When they jumped from the gondola, a rudimentary parachute unfolded that they could grab onto. The balloon escape system was effective: No wartime observer ever died as a result of one failing. In an airplane, however, instantly deployed parachutes could get tangled in the wing rigging, and aviators were dragged into the spinning prop. Billy Mitchell brought the problem to McCook engineers. Floyd Smith, a former circus performer and a test pilot for Glenn Martin who later headed the Parachute Division at McCook, spearheaded intensive research, which led to the invention of the Type A free fall parachute, made of Japanese Habutai silk. The Type A's innovations included delayed ripcord opening—which allowed the pilot to fall clear of the airplane before opening the chute—and a smaller pilot chute to yank the main chute out of the pack.

Six months after the backpack-style Type A was introduced, McCook pilot Harold Harris was flying a Loening monoplane when the aircraft began to disintegrate. Harris released his harness and stood up, and was immediately blown out of the cockpit by the propeller blast. Normally that would have meant certain death, but instead, moments later he floated down beneath a billowing white canopy, landing in a backyard grape arbor without a scratch and becoming the first aviator saved by the McCook emergency freefall parachute.

A year later, when the engine in his DH.4 conked out over Dayton, Mac Macready "hit the silk" and claimed honors for the first nighttime save. Far below, at the estate of the president of the Dayton Chamber of Commerce, guests at a dinner party on the terrace were discussing the Book of Revelation when Macready's de Havilland streaked overhead like a meteor and exploded in a vacant field, illuminating the sky. Seconds later, a disembodied voice could be heard in the darkness above. "My father was yelling 'Hello! Help!' as he came down in the parachute," Sally Wallace explains. The host of the gathering, an avid Bible scholar, later likened the event to witnessing the archangel Gabriel calling down from heaven. Harold Harris and Mac Macready became, respectively, the first and second charter members of the Caterpillar Club, an organization that still records saves by parachute.



**(The NBL-1 Barling Bomber, envisioned as the first strategic bomber by the Air Service's Billy Mitchell, was tested extensively at McCook. But it was as heavy as it was costly, and when the airplane failed to make it over the Appalachian mountains during a demo flight, the project was canceled. (NASM (SI Neg. 83-15013))**

McCook did its part to assure the public that airplanes were safe by staging two record-breaking flights. In May 1923, Macready and Oakley Kelly flew a McCook-modified Fokker transport from Roosevelt Field in Long Island to San Diego, nonstop, in 26 hours. By then, research at McCook's Instrument and Navigation Branch had made "blind flying"—flying on instruments only—more precise and predictable. To get headings free of magnetic deflection errors, the pilots used a compass invented at McCook. A bank-and-turn indicator, another McCook original, kept them shiny-side-up in clouds and fog. By the time Macready flew the big T-2 over sun-drenched downtown San Diego, their instrument-guided heading deviated less than a fraction of a mile from the course marked on the map. (Today the airplane is on exhibit in the National Air and Space Museum in Washington, D.C.)

Such long-distance flights became something of a McCook trademark. In June 1927, test pilots Lester Maitland and Albert Hegenberger flew a Fokker Trimotor christened the *Bird of Paradise* across 2,425 miles of open ocean between Oakland, California, and Honolulu. The airplane was crammed with the latest and greatest from McCook's Instrument and Navigation Branch, along with an inflatable raft complete with 18-foot mast and sail. Two radio navigation beacons modeled on an experimental version at McCook were set up in San Francisco and on Maui. A navigational error of just four degrees would cause the Bird to miss Hawaii entirely and run out of fuel over the vast Pacific.

Charles Lindbergh's flight to Paris had occurred just a few weeks earlier, and was still very much in the news. But notwithstanding the other risks he faced, Lindbergh could hardly have missed spotting the European continent as long as he kept flying. That fact was not lost on Maitland and Hegenberger. Lester Maitland's grandson, David Knoop, remembers his grandfather's take. "He certainly did believe [his] was a tougher flight than Lindbergh's, and he knew Lindbergh well," Knoop says. "As Lester always told it to me, it was a lot harder to find Hawaii than it was France back in those days."

The *Bird* took off from an extended runway in Oakland on the morning of June 28, and soon after, most of its technology failed. Malfunction of the compass was followed by loss of the radio navigation signals from both California and Hawaii. Attempts to get a position via air-to-sea radio contact with a nearby Navy vessel were frustrated by poor reception. Maitland and Hegenberger navigated instead by plotting position lines from sun sightings, taking sextant fixes on stars, and observing the spume on the ocean below to estimate drift. They approached Hawaii in overcast conditions at 3:20 a.m., on the ragged edge of that four-degree margin of navigational error. They missed the Big Island entirely, and came dangerously close to bypassing the rest of the chain when the bright, flashing oil-vapor lamp of the Kilauea Lighthouse shone through the cloud cover. Maitland brought the *Bird* around and reversed course to Honolulu. While critical systems had failed, the flight of the *Bird of Paradise* is credited with revealing weak spots in navigation technology, leading to improvements that eventually established a regular air route to Hawaii. (Commercial airliners still included a sextant port in the cockpit as late as the 1960s.)Later that same year, all functions at McCook were transferred to newly constructed Wright Field, east of Dayton, and McCook began the fade into obscurity. During its 10-year tenure as aviation's R&D nerve center, a black sign with white letters large enough to read from considerable altitude had been mounted above the door of McCook's main hangar: THIS FIELD IS SMALL—USE IT ALL. The first test pilots did—every inch of it.

Source Document

Have a good weekend, protect yourself and your profession, and join me again next week when we will be talking about.....

Robert Novell

January 7, 2014

# Robert Novells' Third Dimension Blog

# March 14, 2014

Good Morning and welcome to the 3DB. This week I want to talk about a man whose name is familiar to all of us in aviation - Burt Rutan. I am certain that most of you are familiar with his long list of accomplishments so my purpose here today is to showcase the highlights of his career and then take you to the point where he, his company, and his partners have taken commercial space travel. Burt Rutan retired from his company in 2011 but is still actively involved in numerous projects and lectures extensively on the future expectations of space travel by commercial companies/private industry.

Click HERE for photos of Burt Rutan's innovative designs.

Enjoy.....

# Burt Rutan

The Man Who Kept Simplicity as a Cornerstone of His Philosophy to Challenge The Establishment and Conquer Space.

Burt Rutan was born in 1943. He received his Bachelor of Science degree in Aeronautical Engineering at California Polytechnic University in 1965. His education includes the Space Technology Institute at Cal Tech and the Aerospace Research Pilot's School at Edwards Air Force Base. Rutan holds, in addition, the honorary degree of Doctor of Science from California Polytechnic State University, San Luis Obispo, June 1987; Doctoral of Science, honoris causa, from Daniel Webster College, May 1987; Doctoral of Humanities, honoris causa, from Lewis University, May 1988 and Doctorate of Technology, honoris causa, from Delft University of Technology, January 1990.

Rutan worked for the U.S. Air Force from 1965 until 1972 as Flight Test Project Engineer at Edwards Air Force Base, California. His projects ranged from fighter spin tests to the XC-142 VSTOL transport.

In March 1972, Rutan became director of the Bede Test Center for Bede Aircraft in Newton, Kansas. In June of 1974, at Mojave, California, Rutan formed the Rutan Aircraft Factory (RAF) to develop light homebuilt aircraft. Through this company, the VariViggen, VariEze, NASA AD-1, Quickie, Defiant, Long-EZ, Grizzly, scaled NGT trainer, Solitaire, Catbird, and the world-flight Voyager aircraft were developed.

In April 1982, Rutan founded Scaled Composites (Scaled) to develop research aircraft. Since its founding, Scaled has been the world's most productive aerospace prototype development company, developing new aircraft types at a rate of one each year. Past projects include the 85% scale Starship 1 for Beech Aircraft Corporation, the Predator agricultural aircraft for ATAC, the Scarab Model 324 reconnaissance drone for Teledyne Ryan Aeronautical, the Advanced Technology Tactical Transport (ATTT) for DARPA, the 1988 America's Cup wing sail, the Triumph light executive jet for Beechcraft, the ARES close air support attack turbofan, the Pond Racer, the Pegasus Space launch vehicle flying surfaces, the Model 191 general aviation single for Toyota, a 40% scale B-2 bomber RCS model, General Motor's 1992 show car (the GM Ultralite), the Bell Eagle Eye prototype tilt rotor RPV, the Earthwinds pressurized gondola, the McDonnell Douglas DC-X single stage rocket structure, the VisionAire Vantage business jet, the Raptor and Raptor D-2 high altitude RPVs for BMDO, a 40-meter wind generator for Zond,. three NASA X-38 crew return vehicles, the Williams, International V-Jet II, the high-altitude Proteus aircraft, the Adam Model 309 business aircraft, and the Rotary Rocket Roton atmospheric test vehicle. In 2008 Rutan was named Chief Technology Officer and Chairman Emeritus of Scaled Composites in a move that would allow him to focus on the company's creative and entrepreneurial strengths.

Recent projects include the White Knight and Space Ship One, the world's first privately funded spacecraft. He made international headlines on 21 June 2004, when with Mike Melvill at the controls, SS1 flew history's-first private manned space flight. On 4 Oct 2004, SS1 won the $10M Ansari X-prize (two flights within 5 days flown by Melvill and Brian Binnie). The Virgin Atlantic GlobalFlyer designed and built at Scaled made its maiden flight in March 2004 and a record setting solo world flight in March 2005.

Two documentaries about Space Ship One, which was financed by Microsoft co-founder Paul Allen, aired on the Discovery Channel. Rutan was profiled in by 60 Minutes and featured on the covers of LIFE and TIME, which named Space Ship One "Invention of the Year" and Rutan "one of the world's 100 most influential people in 2005."

Named "Entrepreneur of the Year" by Inc. Magazine and described by Newsweek as "the man responsible for for more innovations in modern aviation than any living engineer," Mr. Rutan is a bold entrepreneur and designer with the vision and passion for the advancement of technology. "Manned space flight is not only for governments to do," says Rutan. "We proved it can be done by a small company operating with limited resources and a few dozen dedicated employees. The next 25 years will be a wild ride, one that history will note was done for everyone's benefit."

The Spaceship Company, jointly owned by Virgin and Scaled Composites, has been developing Space Ship Two for the past several years. The project, based on technology developed for Space Ship One, is a suborbital spaceplane designed to carry passengers and will be launched in 2009.

Retiring from Scaled Composites as Chief Technical Officer in April 2011, he now assumes the title of founder and Chairman Emeritus.

Rutan is currently working with Microsoft co-founder Paul Allen on a new project, the Stratolaunch - part airplane, part spaceship - scheduled to fly by 2016.

A few of the awards which Mr. Rutan has received include:

- EAA Outstanding New Design, 1975, 1976 and 1978.
- Presidential Citizen's Medal presented by Ronald Reagan, December 29, 1986.
- Grand Medal of the Aero Club of France, January 29, 1987.
- National Medal of the Aero Club of France, January 29, 1987.
- Society of Experimental Test Pilots, 1987 J.J. Doolittle Award and 2004 J.J. Doolittle Award.
- Royal Aeronautical Society, British Gold Medal for Aeronautics, December 1987.
- Design News Engineer of the Year for 1988.
- Western Reserve Aviation Hall of Fame, Meritorious Service Award, 2 September 1988.
- The International Aerospace Hall of Fame Honoree, 24 September 1988
- Member, National Academy of Engineering, 1989.
- 1987 Robert J. Collier Trophy for ingenious design and development of the Voyager 15 May 1987 and again on 19 April 2005 for Space Ship One.
- National Aviation Hall of Fame Honoree, 21 July 1995.
- EAA Freedom of Flight Award, 3 August 1996
- EAA Homebuilders Hall of Fame, 23 October 1998
- Designer of the Year, Professional Pilot Magazine, 13 March 1999
- Clarence L. "Kelly" Johnson "Skunk Works" award by the Engineers Council, February 2000
- 2000 Lindbergh Award by the Lindbergh Foundation, May 20, 2000
- Aviation Week & Space Technology magazine's "Laurel Legend" and Hall of Fame in April 2002, Current Achievement Award for first privately-funded manned space flight by Space Ship One in April 2005
- Aviation Week & Space Technology magazine's "100 Stars of Aerospace" (ranked 29th), June 2003
- Scientific American magazine's "Business Leader in Aerospace," November 2003
- TIME Magazine's "100 Most Influential People in the World," April 18, 2005

Now, let's look at how Burt Rutan challenges the establishment beginning with his joint venture with Richard Branson.

Source Document

# Virgin Galactic

As of late 2012, Virgin plans to operate its flights out of the Spaceport America complex in New Mexico, but it has also signed an agreement to develop a spaceport in Abu Dhabi. The company has more than 530 customers who have made deposits for space flights and flights may begin late in 2014.

A quick video now, to give you a break from the text, and let's hear how Richard Branson, and his team, describe the possibilities.

The X-Prize was intended to award $10 million to the first non-government organization that flew people into space, using a reusable spacecraft, twice in a two-week span. Scaled Composites safely made it to space – twice – in September and October 2004 using Space Ship One and won the X-Prize.

Richard Branson had been interested in spaceflight since the 1960s, and sponsored Burt Rutan's Scaled Composites' bid to get the prize. That same year, Virgin pledged to bring ordinary people into space with Scaled Composites technology, for the reported low price of $200,000 a flight, and also added the following to their announcement:

"*We hope to create thousands of astronauts over the next few years and bring alive their dream of seeing the majestic beauty of our planet from above, the stars in all their glory and the amazing sensation of weightlessness, thereby allowing every country in the world to have their own astronauts rather than just a privileged few."*

In July 2005, Branson and Rutan announced a joint venture between Virgin Galactic and Scaled Composites to get space flights going. The Space Ship Company would manufacture Space Ship Two, a new generation of spacecraft that built on Space Ship One's technology, as well as a launching aircraft called White Knight Two.

Space Ship Two would carry six passengers and two pilots into space with enough space "to allow for an out-of-seat zero gravity experience as well as plenty of large windows for the amazing views back to Earth."

With a spacecraft in hand, the next step was finding a launching area. In December 2005, the state of New Mexico officially offered Virgin Galactic a taxpayer-funded $225 million facility, Space Port America, where the company could put its world headquarters and send flights into space.

Construction and development occupied Virgin's attention in the coming years. A fatal explosion at Scaled Composites occurred in July 2007 during a routine test, delaying development of the rocket engine as the company searched for the cause. The next major flight milestone came in July 2008, when the company showed off the first White Knight Two air launch vehicle.

While testing continues on Space Ship Two, Virgin Galactic has been working to diversify the business. In July 2012, Branson announced the company would offer commercial satellite launches beginning in 2016. He also announced the development of Launcher One, an expendable liquid-fuelled rocket.

"It will unlock new technologies and will help fast-track the potential of space as a positive force for powerful change," Branson said during the unveiling.

At the same time, the company said it is "poised" to begin powered rocket tests on Space Ship Two. The Federal Aviation Administration granted approval in early 2012 for these tests to go forward.

However, Virgin Galactic may face a fight with the FAA for another business idea, which is to offer zero-gravity parabola flights on Earth.

Virgin Galactic's Test Flights Photos

Source Document

What is next for Virgin Galactic when they conquer suborbital flights? Where will the future take them?

# Orbital Resorts and Beyond

Although Rutan is no longer as active at Scaled, he's still involved in space exploration in other ventures. He recently joined the board of Stratolaunch Systems, an air-to-orbit launch system that is slated to have its first test flight in 2017.

The company – which also has financial backing from Allen – initially planned a system that would work with a SpaceX rocket. It aimed to bring 6,100 kilograms to low Earth orbit or 2,300 kg into geosynchronous orbit.

Scaled is involved in the project as well, as it is building a 490,000 pound (222,000 kg) "mothership" airplane able to fly up to about 1,500 miles (2,400 km) before releasing the rocket. But the system may undergo some changes amid a shakeup in late 2012. Space X announced it would pull out, and Orbital Sciences Corp. is now going to step in to try to keep the project on track.

"We have been engaging Orbital over the past few months and have them under a study contract through early next year with specific design deliverables," Stratolaunch chief executive Gary Wentz wrote in a November 2012 e-mail to SPACE.com partner Space News.

The companies provided few details about the potential pact. "They are currently evaluating several alternative configurations that appear promising," Wentz added. "We expect more information to be available in the February 2013 timeframe."

Rutan is also keeping busy with an idea for a hybrid flying car, which was revealed publicly amid a short test flight in 2011. Its advertised range is 760 miles (1223 km) in air, and 820 miles (1320 km) when skimming the ground.

The car, also a Scaled project, was unveiled to seek interest from potential customers. Company officials cautioned it was best not to get excited yet, but if it does come true, Rutan could be the architect of the long-held dream of flying cars.

Source Document

# What is the Stratolaunch System

## Paul Allen and Burt Rutan Aim for Orbit

Taking a flight into space without mortgaging the house may seem a long way off, but it just got a step closer to reality with the groundbreaking of the Stratolaunch Systems production facility and hangar at Mojave Air and Space Port in California. Microsoft co-founder Paul Allen's company could one day compete with Richard Branson's Virgin Galactic, driving down the price tag for commercial human spaceflight. The first phase of production has also just begun on the aircraft that will serve as the delivery system for Allen's spaceship: a 1.2-million-pound behemoth with a wingspan larger than a football field.

Allen has teamed up with Scaled Composites owner Burt Rutan to develop the mothership, an updated version of Rutan's WhiteKnightOne and WhiteKnightTwo designs. The aircraft will be capable of carrying a SpaceX-designed rocket ship up to 1,300 nautical miles to the launch point, where the rocket would detach and blast into the stratosphere. But this time out Rutan is going really big: The Stratolaunch aircraft would be the largest plane ever built, with a 380-foot wingspan—60 feet longer than Howard Hughes' "Spruce Goose"—and six Boeing 747 engines. In February the first of two 747s arrived at Mojave to begin disassembly of its engines, landing gear and hydraulics for use in the new plane.

"By the end of this decade," says Allen, "Stratolaunch will be putting spacecraft into orbit," helping restore America's leadership role in space. Flight-testing is scheduled to begin in 2015, and the first rocket should be launched in 2016.

Source Document

To finish up this lengthy article I have one more video, featuring Burt Rutan, that talks about why the future of space exploration is not in the hands of NASA but in the hands of people like you, your children, and your grandchildren.

Some of the information presented may be a bit dated but I believe the picture presented represents the future of commercial space travel accurately. Take some time to do a little research on your own, get connected to the future by staying informed, and remember what Burt Rutan said in the last video. "The future of space exploration is in the hands of private companies"

Have a good weekend, keep friends and family close, and don't allow the chains of Corporate America derail your dreams. Follow your passion - Life is short.

Robert Novell

March 14, 2014

# Robert Novells' Third Dimension Blog

## March 28, 2014


Good morning and Happy Friday. This past Monday I announced that I will be changing up the articles that I normally present, and begin to alternate between safety issues and aviation wisdom quotes. I recognize that many of us in aviation, and in life, are tired of having to review the same issues year after year, even if it is called something new, and it is unfortunate that we have to do this; however, experience has shown that unless we are forced to do it we will likely find a hundred reasons why we don't need to do it.

In an effort to shine a light on our needs to review the basics, as well as why we need to keep ourselves in the learning mode, I am presenting an article from last year that will bring the point home for many of us. So, sit back and enjoy the story below on how the Lone Eagle got lost trying to find his way back to Miami from Havana.

# Even Lindbergh Got Lost

In the year following his historic transatlantic flight to Paris, Charles Lindbergh, flying again in the *Spirit of St. Louis*, lost his way somewhere between Havana, Cuba, and the southwest coast of Florida. It happened in the middle of the night, and it alarmed Lindbergh enough that years later he recalled the incident in his memoir *The Autobiography of Values*:

*Over the Straits of Florida my magnetic compass rotated without stopping…. I had no notion whether I was flying north, south, east, or west. A few stars directly overhead were dimly visible through haze, but they formed no constellation I could recognize. I started climbing toward the clear sky that had to exist somewhere above me. If I could see Polaris, that northern point of light, I could navigate by it with reasonable accuracy. But haze thickened as my altitude increased….*

*Nothing on my map of Florida corresponded with the earth's features I had seen…where could I be? I unfolded my hydrographic chart [a topographic map of water with coastlines, reefs, wrecks and other structures]…. I had flown at almost a right angle to my proper heading and it…put me close to three hundred miles off route!*

Had this occurred nine months earlier, over the Atlantic, the name "Lindbergh" might today be no more than a forgotten bit of aviation trivia. His nearly tragic Caribbean trip, however, turned out to be a critical moment in time, not only for Lindbergh's understanding of navigation, but also for

the advancement of the practice for all aviators. A few months later, the newly famous pilot would meet a young Naval officer, and their collaboration would change the world of flying.

It may be hard to believe Lindbergh didn't learn to navigate until the year after his nonstop New York-to-Paris flight, but in 1927 the practice was still more art than science. Aviators had attempted to cross the Atlantic with various degrees of success since 1919, but they were still using tools and methods designed for seafaring, and those were proving unsuitable for the skies.

When Navy Commander John Rodgers attempted the first flight from California to Hawaii in 1925, the expedition ended disastrously, illustrating just how unreliable the equipment could be. Though they carried sextants, Rodgers' crew lacked confidence in the sightings they made from their PN-9 flying boat. Instead, they relied on radio navigation, finding their bearing by determining the direction of signals transmitted by support ships along the route. But the technology behind these ship-based direction finders was still subpar, and combined with operator error, led the PN-9 to miss a refueling ship. Out of fuel, the airplane was forced to land in the ocean hundreds of miles short of Hawaii. The crew spent a valiant 10 days sailing their flying boat to the Hawaiian island of Kauai, in what was perhaps the greatest feat of seamanship ever accomplished by airmen.

By the end of World War I, some pilots were using bubble sextants, which in flight substituted an artificial horizon for the actual horizon on which mariners depended, as well as radio navigation, but Lindbergh decided that for his Paris flight, the devices were both cumbersome and ineffective. The *Spirit*'s high wing obstructed his view of the sky, making star sightings nearly impossible. Even if he'd had a clear view, it would have been too big of a challenge trying to take sextant measurements with one hand while controlling the unstable *Spirit* with the other, then scribbling calculations that took a trained mariner 15 minutes, all done by a single pilot forgoing sleep on a 33-hour flight. Radio navigation, the method that sent John Rodgers sailing to Hawaii, was clearly unreliable and the equipment was heavy.

Instead, Lindbergh reasoned that his airplane's payload was better used for extra fuel that could be consumed to correct any significant deviations from the flight plan once he reached land; Western Europe was, after all, a big target. He relied entirely on dead reckoning, calculating his position from point to point by tracking his airspeed. He used a clock and compass just as he had between checkpoints while flying airmail.

In spite of all of the obstacles, Lindbergh still made landfall in Ireland within three miles of his intended site, an extraordinary feat. Did he possess some kind of superhuman sense of direction? His skill in maintaining a heading while exhausted is an indisputable achievement, but the National Aeronautic Association observer for the flight, John Heinmuller, also noted that the pressure distribution over the Atlantic on the two days of the flight was such that the net wind drift was zero—"the first time such unusual weather conditions have been recorded by weather experts."

The magnitude of Lindbergh's accomplishment led many to believe that transoceanic air navigation was simply a matter of determination. At least 15 people died in ocean-crossing attempts through the rest of 1927, leading to calls for federal regulation. While inexperience played a role in many of these accidents, inadequate navigation technology had let nearly everyone down, causing everything from inconvenience to fatalities.

Lindbergh watched in anguish as others attempting his feat disappeared at sea. After finishing his Latin American and Caribbean tour with the *Spirit of St. Louis* in early 1928, he was eager to find better equipment and procedures for future flights. Though he had dismissed celestial navigation for his trip to Paris, during his return aboard the USS *Memphis* he was enthralled with the ability of the ship's navigator to fix position with sun and star sextant sightings, and he resolved to pick up the skill, writing, "It was a lot of fun 'shooting the sun'…with the Memphis sextant. I was fortunate enough to hit it with a fair degree of accuracy."

Upon his return, Lindbergh began planning an around-the-world flight, scheduled to kick off a few months later in a Ford Tri-motor provided by Henry Ford and copiloted by his close friend, Thomas Lanphier. That April, he went to observe air operations aboard the USS Langley, where he encountered an enthusiastic Navy Lieutenant Commander, Philip Van Horn Weems, who was conducting navigation experiments for carrier-based aircraft. Weems demonstrated several of his innovations to Lindbergh, including a bubble sextant that he was helping the National Bureau of Standards to improve, and his prototype Second-Setting Watch: the first true aviator "hack" watch that could be set precisely to the second. (Later, the military realized a major benefit of this precision, and began to synchronize multiple watches for field operations, thus making famous the line "Gentleman, synchronize your watches.")

Several weeks later, after donating the *Spirit* to the Smithsonian Institution, Lindbergh decided he would set out from Washington for Detroit to finalize his plans with Ford and Lanphier. He felt the trip would be an ideal time to learn "avigation"—a popular term used in the 1920s and '30s to differentiate air navigation from maritime practice—and asked polar explorer Lincoln Ellsworth for suitable tutors. Ellsworth recommended Weems.

Shortly after Roald Amundsen's 1925 Arctic flight, in which the crew was nearly lost after a crash-landing, Ellsworth had begun looking in earnest for better aerial navigation techniques. At the time, Weems was an instructor at the Naval Academy in Annapolis, and though not a pilot, he found the problem of using celestial navigation in airplanes to be an interesting intellectual challenge. His conservative Navy superiors disagreed and rejected his request for funding to develop a simplified system. Weems' ideas so impressed Ellsworth, however, that he helped finance the research.

Lindbergh petitioned the White House for Weems to be assigned as navigation tutor, and the Navy officer received a leave of absence, to the irritation of his superiors. He told Lindbergh later, "My relations with the Navy Department [have] been rather peculiar. I get patted on the back by one crowd and kicked in the pants by another!"

Not surprisingly, most Americans assumed Lindbergh was an expert in all things aeronautic, and learning that he needed training in navigation left many reporters confused. When Lindbergh began his training with Weems, the New York Times wrote, "It will be news to…millions that Colonel Lindbergh needs to be taught navigation…. If the Colonel doesn't know how to navigate, who knows anything about anything?" But the publicity started a conversation in the aviation community, one thoroughly documented by the newspapers of the time, about the poor state of air navigation and the potential for celestial navigation to be a solution on long over-water flights.

Weems approached Lindbergh's training with items from his bag of tricks, including his hack watch. Previous chronometers could be set only to the minute; this was an acceptable error for 19th century mariners who might go weeks or more before stopping and making an adjustment, but not for 20th century pilots who could use radio broadcasts to synchronize their timepieces. A watch error of 30 seconds could throw off a position calculation as much as seven miles, so Weems' innovation was significant.

Weems used most of the lessons to teach Lindbergh how to find his position by shooting the sun with a very rare sextant. It was a 1924 Bausch & Lomb model, of which only six were made, and Weems believed it was still the best model available in the United States. Bubble sextants had been around for more than a decade, but because so little attention had been paid to aerial navigation, their design had not advanced much. During his sessions with Lindbergh, Weems carefully studied the sextant's deficiencies, later taking his notes to the National Bureau of Standards, which worked with Bausch & Lomb to produce an improved version that saw wide service in the 1930s.

Another Weems innovation used in Lindbergh's training was the *Star Altitude Curves*, a revolutionary set of charts that let a navigator find his position using two stars (one was usually the North Star, Polaris). The graphs helped cut the calculation time from 15 minutes to 40 seconds. During the day, instead of triangulating position using two stars, a navigator could use the sun to determine a line of position. By measuring the angle between the horizon and the location of the sun on its daily path, a navigator could draw a line on the globe and be assured that his position was a point somewhere on that line.

In *Line of Position*, Weems published the ultimate Cliffs Notes for this more difficult calculation. Though Lindbergh had dropped out of college to fly, he proved to be an excellent student and "toiled cheerfully for days over head-splitting mathematics," Weems noted in a letter to a friend. "Lindbergh makes a fine student. He [studies] till twelve or one o'clock and does not get 'fussed' or rushed." During a visit to New York, Weems stayed with Lindbergh to spend extra time tutoring, but found that he "didn't really do much instructing"; the pilot "was brilliant and caught on quickly. He instructed himself."

Weems and Lindbergh took a series of flights together in May 1928 in a Ryan Brougham given to the pilot by Benjamin Franklin Mahoney, owner of Ryan Airlines (the San Diego company that built the *Spirit*). The first flight was from Bolling Field in Washington, D.C., to Long Island's Curtiss Field. Even with Weems' innovations, celestially navigating while flying was a two-person job. Weems did the calculations, though he noted, "Lindbergh flew his ship with one hand and took a sextant altitude of the sun with the other! I am confident that this was the first time in history such a thing had ever been done." But Weems' system was still a work in progress: He noted that Lindbergh's accuracy in this walking-and-chewing-gum mode could be off by as much as 15 or 20 miles. Shooting the sun next to the pilot, however, Weems was eventually able to fix position to an accuracy of three miles—a margin of error unacceptable today, but the position was certainly good enough to put a pilot within sight of an island.

After stopping in New York, the pair headed to Detroit to meet Henry Ford. Although Lindbergh never made the around-the-world flight, his lessons were not in vain. He helped establish cross-country air routes for Transcontinental Air Transport (known as the "Lindbergh Line" and later as

TWA), and was also courted by Juan Trippe of Pan American Airways to establish transatlantic air routes. Because the continental United States was covered by a network of radio beacons, celestial navigation had little application there, but the method became essential for the overseas routes that Trippe was eyeing.

Lindbergh was a remarkably good sport about the publicity over his shortfall in navigational knowledge, and was willing to have Weems draw attention to it—even allowing his Paris navigation to be described as "little more than the automobile tourist" following street signs. The press coverage of Lindbergh's lessons, along with his ringing endorsement, allowed Weems to launch an aerial navigation consulting business while he was still serving at sea aboard a Navy oiler. The two men kept up a close exchange on navigational questions over the next decade, including collaborating on a variant of the Second-Setting watch, which converted time to arc, the 360 units in which the globe is marked. The improved Lindbergh Hour Angle watch, as it was marketed, helped speed up one of the many calculations with which a navigator was tasked.

With Lindbergh as its first disciple, the Weems System of Navigation quickly attracted a broad range of aviators who were eager to learn the latest techniques. Armed with a set of tools, including the bubble sextant, the Second-Setting watch, and celestial plotting forms for making calculations from the *Star Altitude Curves* and *Line of Position* books (and by the mid-1930s, an Air Almanac, Lunar Ephemeris for Aviators, and a Mark II plotter—which every student pilot still receives today), Weems' pupils now had everything they needed to find their position while in flight. One of the first clients was Australian navigator Harold Gatty, whom Weems quickly hired as chief instructor at his new school in San Diego, California, the first dedicated to air navigation. The two collaborated on numerous advances in navigation, including the Gatty Drift Meter, used to measure an aircraft's drift from a track. Gatty taught Anne Morrow Lindbergh the Weems system. When Charles Lindbergh took Trippe up on his offer and began planning overseas survey flights for Pan American in a Lockheed Sirius, he realized that his wife Anne would have to assist with navigation. Gatty proved to be an excellent instructor. Lindbergh wrote to Weems that "we used one of your sextants and a great deal from your System of Navigation on our last transcontinental trip [April 1930]. Mrs. Lindbergh took all of the sextant readings in addition to working them out and doing most of the navigation."

These flights were textbook examples of the Weems System. In fact, Weems became the Lindberghs' official chronicler for the 1933 airline survey flight and used it as a case study for his *Air Navigation* textbook. In stark contrast to what happened on the Paris flight six years earlier, on the survey flight, the Lindberghs, carrying nearly the full suite of Weems navigation products, were able, almost without exception, to find their position.

Lindbergh and Gatty spread the Weems System through much of the aviation community in the United States and elsewhere. Gatty persuaded Lindbergh to bring Pan Am on as a client for the Weems System. The military services lacked enough instructors to train cadets for World War II, so Pan Am's school served as a leading source of navigators for the Army Air Forces and Royal Air Force at the start of the war. In 1932, Gatty became chief navigation advisor to the Army Air Corps Frontier Defense Research Unit, which developed the service's first viable navigation techniques for long-range strategic bombers. (One of Gatty's first students was the architect of air power and later chief of staff of the U.S. Air Force, Curtis LeMay.) American Airlines and TWA

also adopted the Weems System in the late 1930s as they began considering transatlantic routes. About the only entity not heavily influenced by Weems was his own branch of the service, the Navy. Focused on carrier-based aviation, in which celestial navigation was of little value, the service largely ignored the needs of its long-range patrol squadrons until the late 1930s, when it had to race to catch up.

For many decades, the Weems System was the principal means of fixing position in over-water navigation for the U.S. military and airlines, along with many of the famed record setters and endurance fliers. In 1937, the astounding transpolar flights that the Soviet Union achieved in Tupolev ANT-25s were made by aviators who were using the Weems System; U.S. observers noted that the Soviet aircraft had a hand-copied version of Weems' *Star Altitude Curves* on board.

Lindbergh's training was also the model for a great number of aeronautical celebrities who sought out Weems for personal instruction and guidance, including Richard Byrd, Howard Hughes, and Amy Johnson, Britain's pioneering female aviator of the time. Weems tried to entice Amelia Earhart into training several months before departure on her ill-fated around-the-world flight with Fred Noonan, who, as Pan Am's master navigator, had been an early student. Earhart's husband, G.P. Putnam, declined, stating she was too busy.

Weems continued to be fascinated by navigational problems throughout his life. He collaborated with Ed Link to develop the Celestial Navigation Trainer, part flight simulator and part planetarium, which trained many World War II navigators. Awed, like the rest of the world, by Sputnik and the dawn of the Space Age, he began to adapt his aerial navigation techniques for the unique challenges of orbital mechanics; the adaptations were put to use in the Apollo program. Weems also founded the Institute of Navigation, which is still the leading professional society devoted to the advancement of navigation.

The mariner whose navigation pursuits started out as an annoyance to his superiors spent the rest of his career changing the way pilots fly around the world and in space. Weems created a community of aerial navigation experts and practitioners where none had existed. And if Lindbergh hadn't been a good enough pupil to absorb Weems' new techniques and a humble enough man to let his experience serve as an example to other aviators, professional standards of aerial navigation would have taken longer to develop, with a cost in lives lost and flights unmade.

Source Document

For more information about the "The Grand Old Man of Navigation" click HERE.

Have a good weekend, thanks for stopping by, and be sure you enjoy some time away from aviation/work this weekend. Life is short and tomorrow morning when we wake up our lives will be one day shorter.

Robert Novell

March 28, 2014

# Robert Novells' Third Dimension Blog

## April 25, 2014


Good Morning and Happy Friday. Today I want to go back and talk about an airplane that was an essential tool in WWII and was produced in larger numbers than any other airframe. The Piper Cub, military designation L-4, proved itself to be a wild card in the winning hand that brought victory to the U.S. Forces.

To begin I want to give you an overview of William Piper Sr. and then follow that with the specifics on the Piper L-4.

Enjoy.....

## William Piper, Sr.

(Inducted in to the Aviation Hall of Fame in 1980)

Piper realized that aircraft sales were directly related to the number of people who knew how to fly. So he set up a flying school in Lock Haven, Pennsylvania, at his manufacturing plant adjacent to the Lock Haven airport. Students who wanted to learn to fly paid their transportation, lodging and meals and Piper taught them to fly for $1 an hour which included the cost of the airplane and instructor. This low instruction cost also applied to his employees. At one time one out of every 90 persons in Lock Haven held a pilot's license. It had a positive impact on the business because as long as the kids wanted to fly, they would build a good product.

William Thomas Piper, Sr. was born in 1881 at Knapp Creek, a small village in New York. There his father dabbled both in dairy farming and in the promising crude oil business.

By the time he was eight, young Bill Piper was already cast in the mold of rural America, milking cows and walking several miles to a one-room country school. At the age of nine he introduced himself to the oil business when he assisted in the grimy task of repairing well pumps. When family finances improved, the Piper family moved to Bradford, Pennsylvania.

In 1898, when war hysteria swept the country after the sinking of the battleship Maine, Piper fibbed about his age and joined the Army during the ensuing Spanish-American War. He participated in one brief skirmish with a poorly equipped and disciplined enemy platoon. After the war, Piper enrolled in the mechanical engineering program at Harvard. There, he starred in a track meet with Yale where he threw the hammer almost 129 feet. After graduating from Harvard in 1903, with honors, he worked in the building construction field. He also sang in a church choir, where he met his eventual wife, Marie van de Water. After they were married, they returned to Bradford, where Bill took up his father's oil business, and with a partner formed the Dallas Oil Company. During World War I, Piper served as a captain in the Army Corps of Engineers. After the war he returned to the oil business, which gradually grew less profitable and presented a problem with a wife and five children to support.

Bill Piper's entry into aviation was completely unplanned. It began after C. Gilbert Taylor, a self-taught airplane designer, built a small monoplane. Taylor convinced Bradford's community leaders to pledge $50,000 toward building a facility to produce it at the town's airport. Piper's business partner, in his absence, pledged Piper to invest $400 in the new business and later told him: "Bill, you're in the airplane business." William Thomas Piper had very little knowledge about aviation when he invested $400 in the newly-created Taylor Brothers Aircraft Corporation, and was elected to its board and named treasurer. The Great Depression descended upon the nation and, when few Taylor biplanes were sold, the company went bankrupt.

In the ensuing public sale, Piper's lone bid of $761 made him sole owner of the company. Though times were hard, his company designed several low cost planes. Among them was the "Cub", a small monoplane that was destined for aviation history. It proved to be a dream to fly, and its price of $1,325 fit Piper's philosophy of giving the most airplane for the dollar. Piper also surprises nearly everyone when he learned to fly a Cub at the age of 50.

But then skidding sales in 1932 caused him to seek out prospective dealers all over the country, pushing the Cub's appealing low cost and free flying lessons. By 1935 he had brought the company well into the black, as the Cub enabled thousands to experience the thrill of flying for the first time. Piper constantly promoted Cubs with dealers and at exhibitions of all kinds. A Cub also stole the show at the air races, when "Mike" Murphy landed one atop a speeding car.

After the prettied-up J-2 Cub was introduced, increased sales in 1937 required a second production shift. Unfortunately, a fire swept the plant, causing great losses. But Piper soon had production rolling again. Later, his three sons: Thomas, Howard and William, help him convert an abandoned silk mill in Lock Haven, Pennsylvania, into an airplane factory, and reorganize the company into the Piper Aircraft Corporation. Soon the dolled-up Piper "Cub Sport" was introduced. By this time, Cubs were setting all kinds of records. One even stayed aloft 218 hours.

As the threat of war hung over Europe, President Roosevelt inaugurated a college pilot training program that used Cubs to turn out thousands of pilots. Even the First Lady Eleanor Roosevelt went aloft in a Cub to promote this most ambitious program. Meanwhile, Piper introduced the handsome J-4 "Coupe" and the more powerful J-5 "Cruiser". By then, Pipers represented a third of all civilian aircraft in the United States.

Piper's big break to demonstrate the military potential of his planes came during the 1941 Army war games. At these games, Cubs directed armored columns and artillery fire from the air, and acquired the military nickname "Grasshopper". Only hours after the Japanese attack on Pearl Harbor, Piper said of his Cubs: "They will have their place in the war." His statement proved correct, for the Army Air Forces quickly ordered 1500 Grasshoppers, and training of field artillery pilots began, giving birth to Army ground force aviation in which a single man in a tiny plane could influence the course of battle.

Improved Grasshoppers soon flowed from Piper's factory, including ambulance planes for the Navy, and glider trainers. The Grasshoppers first went into combat during the invasion of North Africa, when three took off from a carrier for reconnaissance flights. After this, they operated with the Army in every campaign and on every front of the war. In the invasions of Sicily and Italy, Grasshoppers really won their spurs directing Naval fire over the beaches, as General Mark Clark used his Grasshopper to inspect the seething battlefront at Anzio. In the drive up the Italian boot, Grasshoppers showed the way.

In the invasion of Europe, Grasshoppers directed broadsides against fortifications along the beaches of Normandy. Then, as the Allies swept inland, pilots added bazookas to their Grasshoppers to knock out tanks and entrenched artillery. Meanwhile, Eisenhower inspected the raging battle areas in his personal Grasshopper, as Patton's tanks raced into the heart of Germany.

In McArthur's struggle in the Pacific, Grasshoppers went ashore to direct artillery against Japanese strongholds and provided vital support in campaigns from New Guinea to the Philippines. In the end, Piper's planes played a vital role in winning the war, having helped train four out of five American pilots, and revolutionizing almost every aspect of land warfare.

When peace came, prospects for light planes seemed bright, as Piper's "family cruiser" is added to the pre-war "Cub" and "Cruiser", followed by the "Super Cruiser". Then, as the post war boom fade, the low-cost, stripped-down "Vagabond" was added to spur sales. Soon the Piper "Pager" was introduced to the line, as is the popular "Super Cub", which replaced the old faithful Cub after 20,000 had been built.

In the early 1950s, Piper made Grasshoppers which it produced for the Air Force and NATO countries. Also Piper's first crop duster was introduced for the agricultural market. Meanwhile, the newly-created "Tri-pacer 135″ became an instant success. In 1954, the twin engine "Apache" became the cornerstone of Piper's postwar growth, meeting the needs for an above-the-weather airplane, and amazingly, at the age of 73, Bill Piper soloed in an Apache.

In 1957 Piper opened a new plant in Florida, where the "Cherokee", the world's best selling low-wing monoplane, is produced, along with the high-styled "Comanche". Then came the "Colt"

trainer and the “Pawnee” agricultural plane, followed by the “Aztec”, one of which was purchased by the Arthur Godfrey Foundation for the African Research Foundation in Kenya. Next came the “Twin Comanche”, as well as the luxurious pressured “Navajo” for the executive market, and finally the “Seneca”, the world’s lowest-priced multi-seat twin.

In the decade of the ’60s, Piper had a third of the light plane market and new plants had been added in Pennsylvania and Florida, while engineering and administration buildings were dedicated to carry on the company’s heritage of continuing innovations and quality and building the very best airplane for the dollar. In 1968, Piper finally relinquished his presidency to his son, Bill, while he retained board chairmanship.

His death in 1970 brought to an end a career that added immeasurably to the role of the private airplane in the great transportation revolution.

Source Document

# Piper L-4 Grasshopper

(Nicknamed the ""Maytag Messerschmitts")

**(Italy, 1943. A.W. Schultz, artillery spotter plane pilot of Piper L-4 confers with an enlisted tank commander in a temporary field. Piper L-4's were wartime "Cubs," built by the thousands for liaison and artillery spotting.)**

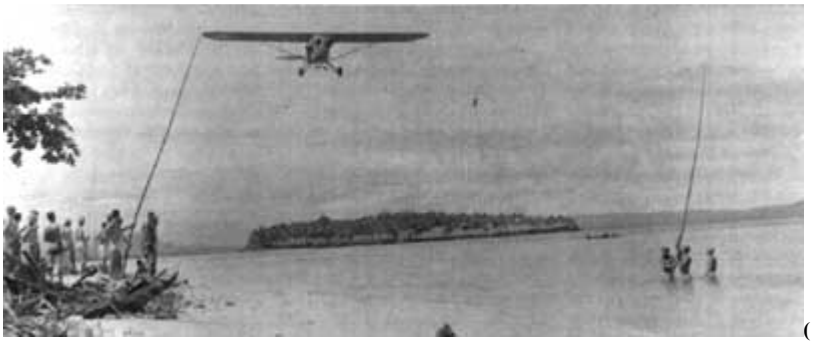
“The Piper L-4 Grasshopper of WW2 was the military version of the highly popular pre-war J3 Cub, by which name it was more widely known to service personnel. Of the 5,500 L-4 variants produced between 1942 and 1945, some went to liaison squadrons and of the USAAF, but the vast majority went to US Army Ground Forces, for use as Air Observation Posts (Air Ops) with the Field Artillery. In both air and ground forces, the L-4 was also used as a flying Jeep, among other things carrying priority mail and personnel between HQs and command posts. Its Continental engine produced only 65 hp, yet the L-4′s excellent short field performance enabled it to operate from the smallest of improvised airstrips, including roads, adjacent to command posts.

Unlike most other combat aircraft, the L-4 was unarmed and unarmored. It was one of the smallest aircraft of WW2 and, with a cruising speed of only 75 mph, it was the slowest. Nevertheless, it has been claimed that a single L-4, directing the fire power of an entire Division, could bring a greater weight of explosives to bear on a target then any other aircraft of that period. With the exception of the atomic bomb carrying B-29 Superfortress, no other single aircraft had the destructive capability of the diminutive L-4.

It was most widely used in Europe, where more than 2,700 served with the Field Artillery, and of these nearly 900 were lost through enemy action or in accidents. Of those that survived the war, about 150 were shipped back to the US, most of the remainder eventually being sold to civilian purchasers in Britain, France, Switzerland, Denmark and elsewhere in Europe. More than 60 years on many of these are still flying with, in recent years, an increasing number being restored to their original military configuration and markings.

So successful was the L-4 that it's military use continued on through to the Korean War, and as recently as Vietnam. Today, hundreds still fly on as civilian light aircraft, some as meticulously restored military aircraft and others in colorful civilian schemes

Source Document



**(A Piper Cub snags a message from a patrol on New Britain's north coast during WWII)**

Piper developed a military variant ("All we had to do," Bill Jr. is quoted as saying, "was paint the Cub olive drab to produce a military airplane"), variously designated as the O-59 (1941), **L-4** (after April 1942), and NE (U.S. Navy). The L-4 Grasshopper was mechanically identical to the J-3 civilian Cub, but was distinguishable by the use of a Plexiglas greenhouse skylight and rear windows for improved visibility, much like the Taylorcraft L-2 and Aeronca L-3 also in use with the US armed forces. Carrying a single pilot and no passenger, the L-4 had a top speed of 85 mph (137 km/h), a cruise speed of 75 mph (121 km/h), a service ceiling of 12,000 ft (3,658 m), a stall speed of 38 mph (61 km/h), an endurance of three hours, and a range of 225 mi (362 km). 5,413 L-4s were produced for U.S. forces, including 250 built for the U.S. Navy under contract as the NE-1 and NE-2.

All L-4 models, as well as similar, tandem-cockpit accommodation aircraft from Aeronca and Taylorcraft, were collectively nicknamed "Grasshoppers", though the L-4 was almost universally referred to by its civilian designation of Cub. The L-4 was used extensively in World War II for reconnaissance, transporting supplies, artillery spotting duties, and medical evacuation of

wounded soldiers. During the Allied invasion of France in June 1944, the L-4's slow cruising speed and low-level maneuverability made it an ideal observation platform for spotting hidden German tanks waiting in ambush in the hedge-rowed country south of the invasion beaches. For these operations the pilot generally carried both an observer/radio operator and a 25-pound communications radio, a load that often exceeded the plane's specified weight capacity. After the Allied breakout in France, L-4s were also sometimes equipped with improvised racks, usually in pairs or quartets, of infantry bazookas for ground attack against German armored units. The most famous of these L-4 ground attack planes was *Rosie the Rocketeer*, piloted by Maj. Charles "Bazooka Charlie" Carpenter, whose *six* bazooka rocket launchers were credited with eliminating six enemy tanks and several armored cars during its wartime service.

Source Document


**(L-4 Piper Cub, France. Nov. 1944.)**

(A Piper L-4 Grasshopper gets hand-propped to start near the front lines.)

**(Major Charles "Bazooka Charlie" Carpenter, US Army, poses with his Piper L-4 Grasshopper, "Rosie the Rocketeer". Photo Credit: Mrs. E. Carpenter)**


**(30th Infantry Division L-4 Grasshopper - January 1945)**

When allied forces were planning the invasion of Sicily they needed a way to have the L-4 Grasshoppers participate because of their effectiveness at setting up artillery strikes; however, the range of the L-4 made it impossible for them to fly from allied bases so they built an aircraft carrier just for the Grasshopper. They converted a Navy LST into a mini carrier and aboard each LST there were able to carry four aircraft. The LST was fitted with a flight deck made of timber and pierced metal runway mats and the usable length of the area for take-off was 12 feet wide and 216 feet long.

A very interesting fact about the L-4, and LST operations, was the introduction of the Brodie Device. A cable was suspended between two outriggers mounted to the side of a LST. Dangling from the setup was a harness with a loop that could slide down the cable. The plane would be suspended from the harness, the pilot would climb a rope ladder to the cockpit, apply full power, and the plane would fly down the cable. When it reached the end of the cable, the plane would detach from the harness and take flight. To "land," the pilot would fly the plane into the harness, where it would catch on a hook mounted on the top of the wing. The plane would then slide down

the cable until it hit the end and come to a swinging halt. It would then be brought onboard, serviced and be readied for another flight. The video below shows how the system worked.

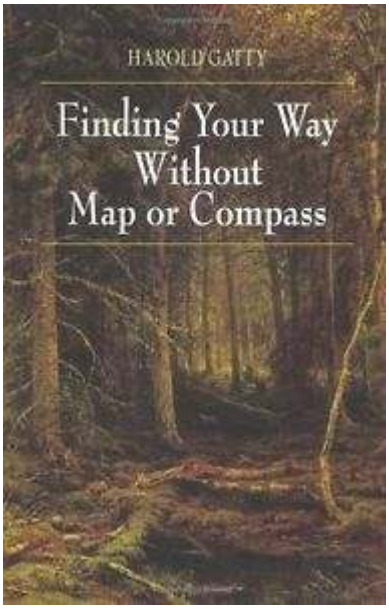
I hope everyone had a good week and the weekend will provide all of us with a little time away from work and aviation. Enjoy time with friends, and family, and remember life is short. Take some time to enjoy the world around you.

Robert Novell

April 25, 2014

# Robert Novells' Third Dimension Blog

## May 16, 2014




Good Morning and Happy Friday - time to talk aviation history. In previous articles we have talked about the science of navigation, click HERE for the most recent article, and this week I want to add another chapter to your book of knowledge. Harold Gatty was born in Australia, emigrated to the U.S. in 1927, and after making his home in California he opened a school for navigators. However, it was his ability to steer the early aviators to fame, and fortune, that we will talk about today.

Enjoy.....

# Harold Gatty

(1903 - 1957)


The year was 1930, and despite the failure of his transpacific flight, Gatty was on his way to becoming the man Charles Lindbergh called the 'Prince of Navigators.' World-circling pioneer Wiley Post and racing hero Roscoe Turner relied on Gatty's navigating brilliance to steer them into the record books. Lindbergh, Clyde Pangborne and Howard Hughes would also seek him out for assistance in preparing for pioneering flights, and when the U.S. military and Pan American Airways needed a navigation expert, they turned to the Australian Gatty.

Gatty's interest in navigation went back to 1917, when he was appointed a cadet midshipman at the Royal Australian Naval College at age 14. Surprisingly, his academic career was lackluster, particularly in navigation. When World War I ended in 1918, Gatty was discharged from the service. Bent on a career at sea, he joined the Australian merchant navy as an apprentice (cadet officer) on a steamship plying the route between Australia and New Zealand. While standing watch at night, Gatty studied the stars. In the log he kept for many years, he wrote: 'I suppose my imagination was appealed to by the stars and the moon which play such an important part in navigation. I spent many nights watching the stars. I soon reached a stage where I could tell the time by the position of the stars in the heavens. I learned the changes in their positions in the various seasons of the year.'

He eventually gained a second mate's ticket and served on several ships, including an oil tanker that sailed regularly to San Luis Obispo, Calif. Australia was plagued by recession after the war ended, and Gatty tried many jobs—skippering a cutter, working as an able seaman and running a waterborne shop in Sydney Harbor, delivering supplies to naval ships.

In 1927 he emigrated to the United States with his wife and 6-month-old son. Settling in California, he landed a five-month job navigating the 200-ton super yacht *Goodwill*, owned by sporting goods millionaire Keith Spaulding. Later on, when he decided that he wanted to spend more time with his family, he turned down a full-time position aboard *Goodwil*l and opened a school for navigators in Los Angeles.

In the early days, Gatty mostly taught marine navigation to yachtsmen. Toward the end of 1928, however, his interest focused on aerial navigation—probably spurred on by the recent, highly

publicized transpacific flight of Australian airmen Charles Kingsford-Smith and Charles Ulm in the Fokker trimotor *Southern Cross*. In Gatty's eyes, the key performer in this pioneering flight would have been Harry Lyons, the American ship's navigator, who kept the Fokker on course to its tiny island stepping stones.

Gatty perceived a promising future in devising and teaching a formal method of air navigation. His plan was to cater, in particular, to the needs of pilots making long overwater flights, where the aviator's traditional method of map reading by identifying features on the ground was no use. He realized that such training could well have saved lives in the disastrous 1927 Pacific Air Race, when three planes carrying seven fliers vanished while flying from California to Hawaii. One of his first students was Arthur 'Art' Goebel, the winner of that tragic race.

His aviation students learned the intricacies of navigating by the sun and stars, as well as how to determine and apply drift over the ocean. For many aviators at that time, it was a hand-to-mouth existence. Those who were unable to pay helped Gatty to gain flight experience, since he accepted informal flying lessons in lieu of his fees.

Gatty eventually collaborated with Lt. Cmdr. Philip Charles Weems, a brilliant U.S. naval officer who had a navigation school in San Diego that taught the use of precalculated position lines called Weems curves. That technique had been used by Lindbergh, as well as by Admiral Richard Byrd and Hubert Wilkins on their polar flights. Gatty and Weems had much in common and enjoyed working together. The system they developed led to Weems' generously declaring that Gatty 'has done more practical work on celestial navigation than any other person in the world today.'

Weems also enlisted Gatty as an instructor, so in addition to running his own school, the Australian drove regularly to San Diego to teach. When Weems was assigned as a navigation instructor at the U.S. Naval Academy at Annapolis, Gatty became manager of the San Diego school.

In addition to his teaching and navigational skills, Gatty was a prolific inventor. His first invention was an air sextant that used a spirit level to provide an artificial horizon. Next he produced an 'aerochronometer' that offset the inaccuracies that aircraft speed produced when a flier was taking a navigational observation. His most important contribution, however, was the Gatty drift sight, which he refined into a superb ground speed and drift indicator widely used by airmen during the late 1930s and eventually sold to the U.S. Army Air Corps.

In 1929 Gatty was approached by Roscoe Turner, then the operations manager for tiny Nevada Airlines, which operated Lockheed Vega monoplanes between Los Angeles, Las Vegas and Reno. To help promote the company as 'the fastest airline in the world,' Turner was planning a flight between Los Angeles and New York, intended to prove the feasibility of a fast intercontinental passenger service.

Turner asked Gatty to lay out a course for the flight and accompany him as the Vega's navigator. Also on board were three passengers, a turtle and a lucky teddy bear. Turner and Gatty made four refueling stops on the 2,520-mile flight and, despite strong headwinds on the last two legs, completed the flight in 19 hours 53 minutes. Although their time was a couple of hours outside the

existing coast-to-coast record set by Frank Hawks in a Lockheed Air Express, Turner claimed a new record for a commercial airliner.

The next would-be record breaker to approach Gatty was Canadian-born Harold Bromley, who until recently had been flying for a small Mexican airline. A former Royal Flying Corps pilot, Bromley dreamed of emulating Lindbergh. Instead of the Atlantic, however, he wanted to be the first to fly nonstop across the Pacific. Like Lindbergh, who named his plane for his St. Louis sponsors, Bromley's *City of Tacoma* recognized his backers—Tacoma, Wash., lumber tycoon John Buffelen and the city's chamber of commerce. Aware of the immense publicity generated by Lindbergh's flight, they were confident that Bromley would put their little city on the map.

Following Lindbergh's epochal Atlantic crossing, the Japanese had mounted an all-out mission to fly the Pacific in a purpose-built Kawanishi K-12 monoplane christened *Sakura* (cherry blossom). Modeled roughly on Lindbergh's Ryan *Spirit of St Louis*, but much larger, Kawanishi's flawed design was based on the theory that greater size would produce the range required for the 4,700-mile transpacific route—1,100 miles more than Lindbergh's New York–Paris flight. The Japanese attempt ended in July 1928, when test flights disclosed that, fully loaded with fuel, the K-12 exceeded its safe design weight limit, could not meet minimum climb requirements and had a range of only 3,782 miles. Kawanishi hung the expensive white elephant over its assembly shop. Attached was a sign proclaiming 'How not to design or build a special-purpose airplane.'

Bromley initially planned to fly the Pacific solo in an experimental Lockheed Explorer monoplane that had been designed for the 1928 transpolar flight made by Australian Hubert Wilkins and his gifted American pilot Carl Ben Eielson. It had languished in the factory after Wilkins had instead chosen Lockheed's new Vega monoplane. Unfortunately, the Explorer's landing gear collapsed during takeoff on Bromley's first transpacific attempt. Two more Explorers were constructed, but both crashed during flight testing. The first came down out of control after tail flutter caused its rudder to fall off in flight. The second crashed and burned while attempting a full-load takeoff test from Muroc Dry Lake, killing Lockheed test pilot Ben Catlin, who staggered from the inferno wreathed in flames.

Bromley's long-suffering Tacoma backers agreed to fund one more attempt. This time the Canadian chose an Emsco monoplane and asked Harold Gatty to be his navigator. Built by the little-known E.M. Smith and Company, the big machine was powered by a 450-hp Wasp engine and had a maximum range in still air of 4,400 statute miles, about 400 miles short of the distance between Tacoma and Tokyo. Unable to increase the Emsco's fuel load, Bromley and Gatty decided to reverse the route and start from Japan. The airmen were confident that they could make up the 400-mile shortfall by riding the eastbound tail winds that generally prevailed over the North Pacific.

In the midst of preparations for the flight, Anne Morrow Lindbergh arrived at Gatty's school. Her husband had used Weems curves on his transatlantic crossing, and on the naval officer's recommendation had sent her to Gatty for navigation training. Lindbergh was planning a transcontinental dash followed by a flight to Central America in his new Lockheed Cirrus, with his wife serving as his navigator. Lindbergh also asked Gatty to prepare route maps and Weems curves for the flights.

On Easter Sunday, 1930, the Lindberghs crossed the continent in 14 hours and 45 minutes, setting a transcontinental record. Afterward Anne Lindbergh wrote to Gatty: 'I was very much surprised at how easy it was to take the sights and how quickly and easily one could use the curve and transfer it onto the mercator chart and, finally, how increasingly good the lines of position turned out to be….Thank you very warmly for everything you did to help us (including the plotting board and your kind word of encouragement, and for our two very absorbing and interesting weeks of work).'

In August 1930, after shipping *City of Tacoma* to Tokyo, Bromley and Gatty flew it to a nearby naval aerodrome. When tests proved that the runway was too short for a full-load takeoff, the airmen searched for another site and eventually chose the beach at Sabishiro, about 200 miles north of Tokyo.

At low tide the sand stretched for 1¼ miles. Even so, with a full fuel load, the airmen still needed a ski jump–style ramp to boost the Emsco's takeoff performance. Over a period of three weeks, local villagers helped build a sand hill, which they compacted with a steamroller before laying a runway of planks leading down to the beach.

On September 15, 1930, the improvised airstrip was ready. The generous villagers, who refused to accept any payment for their labor, lined the beach to watch the takeoff. Perched at the top of the ramp, anchored to a big pile by a thick rope, the Emsco strained as Bromley checked the engine. Confident that the Wasp was delivering full power, he signaled to an axman to sever the rope. Even with the ramp's assistance, the Emsco gathered speed very slowly. Lifting off at the very end of the beach, it staggered along, just above a stall, requiring climb power just to remain airborne.

Bromley was eventually able to start a slow climb as fuel was used up and the plane's weight decreased. Four hours out, they encountered fog. Soon after that, the exhaust collector ring fractured and carbon monoxide fumes began to seep into the cockpit. Neither man realized how dangerous it was—even though Bromley found himself laughing uncontrollably and Gatty was suffering from coughing spasms.

Unable to climb above the clouds, Gatty relied throughout the flight on a few snatched sightings of the sun and moon and dead-reckoning navigation. Bromley's task of blind-flying was not helped when the Emsco's early model Sperry artificial horizon 'turned over on its back and died,' as Gatty later described it. The wind-driven fuel pump also failed, forcing Gatty to spend much of his time operating the emergency hand pump to keep the engine's main fuel tank topped off. He recalled, 'The first hour was pure hell, but after that I didn't feel anything.'

While there was a break in the clouds Gatty was able to get a positive fix, which disclosed that they had covered only 1,250 miles so far. Meanwhile, the anticipated tail wind had not materialized, and after some rapid calculations, Gatty estimated that they were still 36 hours' flying time away from Tacoma. It was clear that they had insufficient fuel left—their only option was to return to Japan. Gatty remembered being worried that Bromley continued his fits of laughter despite knowing that the enterprise had failed.

Bromley's erratic behavior worsened. At one stage he put the Emsco into a steep dive. Unable to break the pilot's grip on the controls, Gatty was forced to hit his partner with a spanner, after which Gatty took over and regained control. Bromley recovered his senses after that, and the two men took turns flying back to Japan. Gatty did not publicly disclose that episode after the flight, but he later told members of his family and his friend Weems about it.

As they headed back toward Sabishiro, leaks developed in the fuel lines, which Gatty repaired with friction tape. Bromley was again on the verge of passing out by the time Gatty's immaculate navigation brought them back to the lighthouse near Sabishiro. The Canadian wisely elected to land on the first clear stretch of beach. As the Emsco came to a stop, Bromley, apparently convinced they had ditched in the sea, grabbed the life raft and dashed toward the water with Gatty in pursuit. A few yards from the water's edge Bromley blacked out.

The airman awoke two hours later, and a doctor diagnosed that Bromley was suffering from carbon monoxide poisoning. Three days later, Gatty collapsed in the street from the delayed effects of the gas. He had to spend several weeks in a Tokyo hospital.

When Bromley and Gatty learned that there was no chance of getting further backing from America, they returned home, leaving *City of Tacoma* behind in Japan to be sold. Two years later, Bromley made a long-distance flight in a diesel-powered Lockheed Vega, and there was talk of his making another transpacific attempt. But the Canadian airman failed to find backers, and he eventually joined the Bureau of Air Commerce as an inspector and vanished from the limelight. Looking back on his former partner's career, Gatty recalled, 'He never made the big time, but he was a magnificent pilot.'

Early in 1931, Wiley Post asked the Australian to join him in an attempt to break the around-the-world record of 21 days held by the German airship *Graf Zeppelin*. The one-eyed American airman, who planned to fly his Lockheed Vega *Winnie Mae* flat out, realized that it was vitally important to have a navigator who was not only skilled in map reading but who could also handle long overwater flights. The previous year, Gatty had prepared the charts that had helped Post win the Aerial Derby from Los Angeles to Chicago, held as part of the 1930 National Air Races. Gatty also prepared charts for Art Goebel, who took second place in the race. Post was impressed by Gatty's navigation credentials as well as his calm, no-nonsense manner.

Gatty was to receive $5,000 whether or not they broke the record. More important, he was confident that the globe-circling flight would make world headlines and, if successful, would prove beyond all doubt the value of his navigation methods. For several months the two men studied all available maps, charts, airfield diagrams and weather information. Their problem was to find a route with suitable landing fields spaced within the Vega's range. A shortage of airfields near the equator forced them to settle on a 15,000-mile route across Europe, Russia and Siberia.

Gatty prepared route charts for the whole flight with headings and timing based on still-air conditions. These he would adjust with actual data gained in flight from his drift and ground-speed indicator, backed by shots of sun and stars taken with his air sextant. To help speed up his in-flight navigation fixing, Gatty also prepared pre-plotted Weems curves for every leg of the flight.

Post and Gatty took off from New York's Roosevelt Field on June 23, 1931, and flew to Harbor Grace, Newfoundland, in less than seven hours, averaging a sizzling 184 mph. As they refueled, Gatty bought lunch at the airport cafe. He had just one dollar in his pocket, which he spent on sandwiches. Post was a little better off, with $28 tucked in his wallet.

Gatty later recalled the scene as his companion ran up the Vega's 450-hp Pratt and Whitney Wasp engine prior to the transatlantic takeoff: 'Wiley let the motor roar out its defiance to the 1,900 miles or more of open water which lay beyond the tranquil harbor. He cocked his one good ear to the tune of the exhaust, and his one good eye was glued to the tachometer.'

In fact, clouds and rain forced Post to fly virtually blind for much of the Atlantic crossing. Crammed down in the back behind a huge cockpit fuel tank, Gatty pored over his charts and occasionally peered down through his drift indicator. From time to time, he called to Post through a specially installed speaking tube, saying, 'Three degrees more to the left, Wiley,' or 'a little more to the right.

They landed at Royal Air Force Base Sealand, near Liverpool, England, having crossed the Atlantic in a record time of 16 hours and 17 minutes. Later that day they reached Berlin, where a huge crowd assembled. Utterly exhausted after 35 hours without sleep, the airmen took a nine-hour break.

The flight to Moscow was made in terrible conditions, with the plane battered by head winds and their speed reduced to 100 mph. Gatty wrote in his log: 'Heavy rain, hedge-hopping. No visibility.' Minutes later he added: 'Hell! Rain and more rain. Strong headwinds. Toughest part of the flight so far.' Post later said they could have never completed that leg had they not had blind-flying instrumentation.

Moscow's October Airport was deserted when they arrived. Later that night, however, the two airmen were feted at an elaborate banquet—and managed to get only two hours' sleep. The following morning they headed toward Siberia, where, during the refueling stop at rain-soaked Khabarovsk, a team of horses was needed to pull the Vega out of the mud.

While they were crossing the Bering Sea, storms forced them down to the wave tops. When they landed on the beach at Solomon, Alaska, the Vega hit a patch of soft sand and nosed over, bending a prop. Here, Post's years of laboring on an oil rig paid off. Using a hammer, a wrench and a flat stone, he managed to straighten the blades.

There was another brush with disaster when they prepared to restart the engine. As Gatty turned the propeller to prime the engine, it backfired and the flat side of the blade caught the navigator on the shoulder. Dazed and badly bruised, Gatty clambered back on board, after which Post took off for Fairbanks, where mechanics installed a new propeller.

Arriving in pouring rain at Edmonton, Canada, they were besieged by newsmen. 'Say something,' beseeched radio reporters, shoving microphones at the exhausted airmen. 'I'm tired of sitting down,' grunted Post. 'We're tired and we're dirty and not much to look at anyway,' added Gatty. The next

morning, fearful of bogging down on Edmonton's soaked airfield, Post took off from the paved street leading into the city.

All hell broke loose when *Winnie Mae* touched down back at Roosevelt Field after a flight lasting eight days, 15 hours and 51 minutes. The pair was mobbed by a cheering crowd, and New York gave them the city's traditional hero's greeting, a ticker tape parade.

The following year, after Congress passed a special bill that allowed the government to award the Distinguished Flying Cross to civilians, President Herbert Hoover pinned the medals on Post and Gatty. The Australian was also offered immediate U.S. citizenship, so he could take up the specially created post of senior aerial navigation engineer for the U.S. Army Air Corps. When Gatty advised American officials that he wished to remain an Australian citizen, Congress passed another act that allowed a foreigner to hold the position.

Soon after that, Gatty was approached by financier Floyd Odlum, who wanted to enter a Douglas DC-2 in the 1934 MacRobertson England–Australia Air Race. Gatty had old-fashioned ideas about women pilots, however, and he refused the job of navigating the flight when he learned that his pilot was to be Odlum's girlfriend Jacqueline Cochran. During this time Gatty struck up a friendship with Donald Douglas and the two men formed the South Seas Commercial Company, with plans to use Douglas DC-2 airliners on an island-hopping transpacific air service.

When Pan American Airways, a Douglas customer, complained that the two men were interfering with its business, Gatty and Douglas sold South Seas Commercial Company to the airline. Pan Am then appointed Douglas to its board and employed Gatty to organize a similar island route to New Zealand for the carrier's seaplanes. He also collaborated with Pan Am's chief navigator, Fred Noonan, in establishing the navigation procedures to be used by the crews of the airline's transoceanic Clipper flying boats.

Gatty was in Auckland in 1937, organizing Pan Am's service to New Zealand, when he received a cable from Howard Hughes. The tycoon wanted Gatty to manage his forthcoming around-the-world record attempt and join him as navigator in his Lockheed 14. Gatty was tempted, but he decided to see through his Pan Am assignment. He did, however, suggest three of the four crewmen who eventually accompanied Hughes, including navigator Thomas Thurlow, a former Gatty student.

In March 1937, Gatty was the first to greet Pan Am's Captain Edwin Musick and his crew when their Sikorsky S-42 *Samoan Clipper* completed the first airline link between America and New Zealand. As Pan Am's man in the South Pacific, he had high hopes of extending the service to Australia when the events at Pearl Harbor on December 7, 1941, put a temporary stop to the airline's plans.

During World War II, Gatty was made an honorary Royal Australian Air Force (RAAF) group captain and worked for Lt. Gen. George H. Brett, commander of the U.S. Army Air Forces (USAAF) in the South Pacific, organizing the aerial evacuation of thousands of civilian refugees and service personnel from Java. Following the fall of the Dutch East Indies, Gatty was appointed director of Air Transport for the Allied forces, attached to General Douglas MacArthur's Australian

headquarters. Gatty coordinated the operations of RAAF and USAAF transports and a Special Transport Flight, which comprised a motley collection of aircraft that had formerly flown with Australia's domestic airlines and with KNILM in the Dutch East Indies. Their mission was to carry troops and supplies to New Guinea.

Early in 1943, after the Fifth U.S. Army Air Force took over his job, Gatty's Special Transport Flight was disbanded. At that point Gatty, who had found MacArthur extremely difficult to work with, resigned his post and returned to Washington, where he was employed by the U.S. Navy to write a book to help downed Navy airmen survive and navigate in their dinghies. Called *The Raft Book*, it was so successful that it was placed in the survival kits of all Allied airmen serving in the Pacific.

Following World War II, Gatty settled in Fiji with his Dutch-born second wife, where he served as a member of the government and formed Fiji Airways—the forerunner of Air Pacific. He also wrote a book on navigation titled *Nature Is Your Guide*, published posthumously shortly after he was suddenly struck down by a stroke in 1957. He was just 54.

Howard Hughes summed up the life of this remarkable airman in a cable he sent Gatty in July 1938, shortly after completing his record-shattering around-the-world flight in the Lockheed 14. Hughes proclaimed: 'Greetings and gratitude, trail-blazing pioneer. We only followed where you led.'

Source Document

Have a good weekend, enjoy the video, and enjoy your time with friends and family.

Robert Novell

May 16, 2014

# Robert Novells' Third Dimension Blog

## June 27, 2014

Good Morning,

I would normally say welcome back to the 3DB but considering I have been MIA (Missing in Action) for three weeks, it is probably more appropriate for me to say thank you for your patience. I posted a brief blog two weeks ago detailing some of what I was doing so hopefully you are prepared for part one, of an eight part series, on the Spruce Goose.

Before I start, I want to acknowledge the help of a close friend who lives in Medford, Oregon. Lee took the time to coordinate my visit with the curator of the Evergreen Museum, drove up to

McMinnville, Oregon to meet me and spend the day, and provided additional research material for another article I am working on. – Thanks Lee. In addition, I would also like to acknowledge the help, and consideration, given to me by Mr. Stewart (Stew) Bailey, the curator of the Evergreen Museum. Stew has agreed to contribute his expertise, and time, for these articles – Thanks Stew.

Now, time to talk about the Goose……

The HK-1 Hercules

(Spruce Goose)

Now I know that you may be a bit confused with my posting a picture of the Goose and a Liberty Ship side-by-side but there is a good reason for that. Most historians, remember this comment as we move forward, will tell you that the Goose was not the brainchild of Howard Hughes. The man who put the concept of the Goose on the table was Henry Kaiser - the man who made the "Liberty Ships" for the war effort. (I will have a few statistics on Liberty Ships and a video at the conclusion of this article.)

Now it may seem a little strange that a ship builder suddenly wanted to build airplanes but this was not his plan. Henry Kaiser was going to have Howard Hughes build his brainchild. Now, you know why the original designation of the Goose was HK-1 – H is for Hughes and K is for Kaiser;

however, the final designation of the Goose was H-4 after Kaiser pulled out of the project and Hughes put his reputation, and money, on the line to prove his critics wrong.

Now, why did Uncle Sam need the Goose……

The geographic isolation of the US was an advantage, reference keeping the war off our shores, during the Second World War, but this also led to logistic problems with ferrying men and machines to war theaters. Henry Kaiser, a civil engineer who had a habit of thinking big, was building Liberty Ships and had an idea for a large flying boat, which would avoid the U-boat menace in the North Atlantic. He approached Howard Hughes to build the huge craft, which would be called the HK-1.

The HK-1 contract was issued in 1942, as a development contract, and called for three aircraft to be constructed under a two-year deadline to be available for the war effort. The HK-1 was to have eight Pratt & Whitney 3 000 hp engines, a wingspan of 320 feet and a length of 218 feet. It was designed to be capable of carrying 750 fully equipped troops or two 30 ton Sherman tanks. Its fully loaded cargo capacity was 150,000 pounds and all cargo would be loaded through front doors.

The HK-1 would be built from wood, because of wartime restrictions on the use of aluminum and concerns about weight, and the HK-1 critics nicknamed it the "Spruce Goose" despite it being made almost entirely of birch rather than spruce. The plane was covered with duramold, which involved laminating and molding thin sheets of veneer together and one of the most amazing aspects of the construction was that the Spruce Goose had almost no nails or screws. The duramold process used layers of 1/32 inch wood veneer laid in alternating grain direction and then bonded with glue and steam-shaped. Duramold made the Goose both strong, and lightweight, for its size.

As we know the airplane suffered extensive delays. Part of the time delay was due to Hughes insistence on perfection; however, the technological problems that had to be overcome in the design were numerous and included the testing of new concepts for the large hull, flying control surfaces, and the incorporation of power boost systems for control.

Henry Kaiser pulled out of the program because of the delays and Hughes continued the program alone and redesignated the HK-1 the "H-4 Hercules." Hughes signed a new contract with Uncle Sam, which now limited production to one prototype. Work proceeded slowly, with the result that the H-4 was not completed until well after the war was over.

The airplane was shipped over the roads/highways to Pier E in Long Beach, California by a company specializing in house moving. It was moved in three large sections consisting of the fuselage and each wing, and a fourth smaller shipment containing the tail assembly parts and other smaller assemblies. After final assembly, a hangar was erected around the flying boat with a ramp to launch the H-4 into the harbor. It has been said that this new hangar was the first climate-controlled building in the United States. Imagine that……

Now that we have an overview of the project let's talk about one of the few men Howard Hughes trusted and why the history books are wrong about who conceived the idea of the HK-1.

# Glenn Odekirk

(The Man Who Built the Spruce Goose for Howard Hughes)

Glenn Odekirk, whose life and times were indelibly entwined with Howard Hughes and who designed and built the Spruce Goose, the flying boat that became more of a success on the ground than it ever was in the air, has died.

Odekirk was 81 when he died of cancer late Monday at a hospice in Las Vegas.

Over the years Odekirk, who met Hughes on a movie set nearly 60 years ago, was the eccentric billionaire's "shop superintendent," "chief mechanic" and "assistant to the president" at Hughes Aircraft Co.

What he always was in fact was one of the few people Hughes ever trusted to design the planes that the young adventurer flew to the then furthermost fringes of possibility. He was involved on two important events, when the industrialist, and flier, made an unsuccessful world record airspeed run in 1935 and a nonstop West Coast to East Coast flight in 1938.

However, Odekirk's most lasting legacy will probably be the mammoth wooden Spruce Goose seaplane with the 100-yard wingspan that has become its own museum in Long Beach Harbor, next to another memento of a Gargantuan past, the Queen Mary.

In a 1979 interview with The Times, Odekirk said he conceived of the flying boat when he heard shipbuilder Henry Kaiser complain on the radio about the huge number of vessels being lost to German submarines in World War II.

"'Well, I guess I'll have to put wings on my boat,' " Odekirk recalled Kaiser saying.

Odekirk approached Kaiser on behalf of Hughes and together the three men conceived the HK-1 (for Hughes and Kaiser), known popularly as the Spruce Goose, even though a preponderance of the wood used was birch. Odekirk was the designer in charge of the flying boat that was to carry 750 fully equipped troops across the Atlantic to fight in Europe.

However, the plane, 218 feet long and 79 feet high, made only one brief flight. That was on Nov. 2, 1947, 70 feet above the water with Hughes at the controls. It was then placed in storage until converted to a popular public attraction a few years ago.

Shortly after that, Odekirk left Hughes to start his own company and the two men saw each other infrequently, if at all, until Hughes' death in 1976.

Odekirk contended over the years that the old flying boat, with some mechanical adjustments and checks, could be flown again.

"To me it would be (as simple as) ABC," Odekirk said.

Source Document

OK, so now we know the rest of the story about the concept, and design, and the man/men responsible for bringing the Goose to life. So, let's talk about what happened after that historic flight we are all familiar with.

What happened to the Goose after the first/last flight is a story all to itself. The number of people involved maintaining the airplane, the modifications that Hughes ordered performed, and his constant expectations that he was going to fly the airplane again will be covered in pat three of the series. Stand-by for the rest of the story.

I hope you have enjoyed part one on the Goose but before I wrap it up I wanted to give you a brief overview on "Liberty Ships" which will help everyone better understand why Uncle Sam was looking for a boat with wings.

# The Liberty Ship Program

The origins of the Liberty Ship can be traced to a design proposed by the British in 1940. Seeking to replace wartime losses, the British placed contracts with US shipyards for 60 steamers of the *Ocean* class. These steamers were of a simple design and featured a single coal-fired 2,500 horsepower reciprocating steam engine. While the coal-fired reciprocating steam engine was obsolete, it was reliable and Britain possessed a large supply of coal. While the British ships were

being constructed, the US Maritime Commission examined the design and made alterations to lessen coast and speed construction.

This revised design was classified EC2-S-C1 and featured oil-fired boilers. The most significant change was to replace much of the riveting with welded seams. A new practice, the use of welding decreased labor costs and required fewer skilled workers. Due to their plain looks, the Liberty Ships initially had a poor public image. To combat this, the Maritime Commission dubbed September 27, 1941, as "Liberty Fleet Day" and launched the first 14 vessels. In his speech at the launch ceremony, Pres. Franklin Roosevelt cited Patrick Henry's famed speech and stated that the ships would bring liberty to Europe.

In early 1941, the US Maritime Commission placed an order for 260 ships of the Liberty design. Of these, 60 were for Britain. With the implementation of the Lend-Lease Program in March, orders more than doubled. To meet the demands of this construction program, new yards were established on both coasts and in the Gulf of Mexico. Over the next four years, US shipyards would produce 2,751 Liberty Ships. The majority (1,552) of these came from new yards built on the West Coast and operated by Henry J. Kaiser. Best known for building the Bay Bridge and the Hoover Dam, Kaiser pioneered new shipbuilding techniques.

Operating four yards in Richmond, CA and three in the Northwest, Kaiser developed methods for prefabricating and mass-producing Liberty Ships. Components were built all across the US and transported to shipyards where the vessels could be assembled in record time. During the war, a Liberty Ship could be built in a about two weeks at a Kaiser yard. In November 1942, one of Kaiser's Richmond yards built a Liberty Ship (*Robert E. Peary*) in 4 days, 15 hours, and 29 minutes as a publicity stunt. Nationally, the average construction time was 42 days and by 1943, three Liberty Ships were being completed each day.

The speed at which Liberty Ships could be constructed allowed the US to build cargo vessels faster than German U-boats could sink them. This, along with Allied military successes against the U-boats, ensured that Britain and Allied forces in Europe remained well supplied during World War II. Liberty Ships served in all theaters with distinction. Throughout the war, Liberty Ships were manned members of the US Merchant Marine, with gun crews provided by the US Naval Armed Guard. Among the notable achievements of the Liberty Ships was SS *Stephen Hopkins* sinking the German raider *Stier* on September 27, 1942.

Initially designed to last five years, many Liberty Ships continued to ply the seaways into the 1970s; in addition, many of the shipbuilding techniques employed in the Liberty program became standard practice across the industry and are still in use today. While not glamorous, the Liberty Ship proved vital to the Allied war effort. The ability to build merchant shipping at a rate faster than it was lost, while maintaining a steady stream of supplies to the front was one of the keys to winning the war.

Source Document

While it can be agreed that the number of large transport airplanes, like the Goose, produced would never rival the number of “Liberty Ships”, I think it is easy for everyone to see that the concept of

the Goose was the building block for what we refer to today as an “Air Bridge.” The "Air Bridge" concept was used effectively in Iraq, and Afghanistan, by the US military to support ground operations using the C-5, which looks like the Goose by the way, and the C-17.

Have a good weekend, stay close to family and friends, and remember all aviators/aviation enthusiast are “Gatekeepers of the Third Dimension.”

Robert Novell

June 27, 2014

# Robert Novells' Third Dimension Blog

## July 19, 2014

Good Morning---today I was supposed to finish up with my series on the "Goose" but I will have to delay that until next week. We are having a problem with the site right now as a result of changing servers so bear with me for a little longer while the cyber-gurus figure it out.

That having been said, I want to talk about an airplane that has a unique history that includes, the development of the Fulton Recovery System, Operation Coldfeet, and firefighting; however this week I want to introduce you to the background on the Fulton Recovery System, as provided by the CIA website, an article written by Stewart Bailey, curator at the Evergreen Museum, and then a personal story from a friend who knows the crew who flew this airplane in the James Bond movie, "Thunderball."

Enjoy.....

## Evergreen’s Mystery Lady

July 28, 2011 marks the “birthday” of one of the most iconic aircraft in history, and one of the stars of the Evergreen Aviation & Space Museum collection; the Boeing B-17 *Flying Fortress*. On that day, in 1936 the Boeing Model 299, the prototype of what was to become the B-17 first took to the air at Boeing Field in Washington with Boeing chief test pilot, Leslie Tower at the controls.

Out of the 12,731 B-17s built by Boeing, Lockheed-Vega, and Douglas, today only 58 aircraft remain in museums or private collections around the world. Of those, one of the most unique and mysterious belongs to the Evergreen Aviation & Space Museum. Although marked with the serial number 44-83785, there is some question as to whether that is its true serial or not, and many aviation historians believe the aircraft is really serial number 44-85531. Why the confusion? That’s what makes her story mysterious.

Evergreen’s B-17 was a G-model built by either Lockheed-Vega or Douglas in early 1945 and never made it into combat, but rather it served in various utility roles until the mid-1950s. At that

point, her story gets interesting as she was selected for "secret duties" and removed from the Air Force's inventory. One of a group of five black-painted *Flying Fortresses* used by the Central Intelligence Agency (CIA), it operated out of Taiwan, where it was used to drop agents into China or support guerilla operations.

Because the serial numbers painted on the tails were changed regularly to confuse the casual observer, her real one has been lost to history. However, in September 1960, she gained the civilian registration number N809Z when she was sold to Atlantic-General Enterprises; a CIA front company. From there she went to work for Intermountain Airways in Marana, Arizona in 1962.

Intermountain (also with CIA ties) was well known for modifying aircraft for use in specialized operations and the B-17G was no different. Outfitted with a special rig on the nose called a Fulton Skyhook and a special hatch in the tail, the*Fortress* was actually able to pick up people from the ground without landing! The user on the ground would release a helium balloon trailing a long cable that was attached to a special harness he wore. The aircraft would then catch the line using long, whisker-like poles on the nose, and snatch the person off the ground where they would be winched up and into the plane. In 1962, the Skyhook equipped *Fortress* was called upon to fly a mission deep into the arctic to grab vital information out from under the noses of the Soviet Union.

After her work with the Fulton Skyhook, N809Z was converted into a flying tanker used by Intermountain Airways to fight forest fires in the western US. She was acquired by Evergreen Helicopters in 1975, and given a new registration; N207EV, which she wears to this day. After 10 years of fighting fires, work began in 1985 to restore the venerable *Flying Fortress*was back to the war-time configuration with all of the gun turrets and a working bomb bay. (The story is told that her rare nose turret was found as a decoration in a bar, but the owner was unwilling to sell it, so Evergreen bought the bar, removed the turret, and then re-sold the bar.) The proudly restored B-17 took to the air again in 1990 and flew in numerous air shows until 2001 when concerns about the wing spar attachment points grounded her.

Today, the Evergreen B-17G *Flying Fortress* shares a place of honor in the museum, wearing the markings of the 490$^{th}$Bomb Group, operating out of Eye air base in England during World War II. As such, she is a fitting tribute to the men in women who built, maintained and flew the majestic *Flying Fortress.*

Stewart Bailey, Curator Evergreen Museum

Now, we have the history, as presented by Stewart Bailey, so let's see what the CIA has to say:

# Robert Fulton's Skyhook and Operation Coldfeet

## A Good Pick-Me-Up

The infiltration of agents behind enemy lines during World War II could be accomplished without undue technical difficulty, thanks to the use of parachutes. Thousands of individuals descended upon occupied Europe through "Joe holes" in Royal Air Force Halifaxes and Army Air Force B-24s, or out the side doors of C-47s. Extraction of personnel, however, proved a far more challenging task. Usually, individuals had to exfiltrate enemy territory by hazardous land routes. Sometimes they could be flown out by light aircraft, like the British Lysander, that landed at night on makeshift airstrips.

## All American System

An innovative extraction method, reportedly used by the British toward the end of the war, involved the use of a modified version of a mail pickup system that had been invented by Lytle S. Brown during the 1920s and perfected before Pearl Harbor by All American Aviation. The All American system used two steel poles, set 54 feet apart, with a transfer line strung between them. An aircraft approached the ground station in a gentle glide of 90 mph, while a flight mechanic paid out a 50-foot steel cable. As the aircraft pulled up, a four-finger grapple at the end of the cable engaged the transfer rope, shock absorbers cushioned the impact, and then the flight mechanic winched the mail pouch on board.

In July 1943, the need to rescue airmen from difficult terrain led to tests of this system by the Army Air Forces. Initial results, using instrumented containers, were not promising. The instruments recorded accelerations in excess of 17 g's following the pickup, a force far in excess of what the human body could tolerate. Changes in the transfer line and modifications in the parachute harness, however, brought this down to a more acceptable 7 g's. The first live test, with a sheep, failed when the harness twisted and strangled the animal. On subsequent tests other sheep fared better.

Lt. Alex Doster, a paratrooper, volunteered for the first human pickup, made on 5 September 1943. After a Stinson engaged the transfer rope at 125 mph, Doster was first yanked vertically off the ground, then soared off behind the aircraft. It took less than three minutes to retrieve him.

The Air Force continued to improve the system, even developing a package containing telescoping poles, transfer line, and harness that could be dropped by air. The first operational use of the system came in February 1944, when a C-47 snagged a glider in a remote location in Burma and returned it to India. Although the Air Force never used it to pick up individuals, the British apparently did use it to retrieve agents.

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## CIA Involvement

During the Korean war, CIA became interested in the All American system. In the spring and summer of 1952, CIA tried to establish a resistance network in Manchuria. Civil Air Transport (CAT), its air proprietary, dropped agents and supplies into Kirin Province as part of a project known to the pilots as Operation Tropic. The All American system seemed to answer the problem of how to bring people out of Manchuria.

In the fall of 1952, CAT pilots in Japan made a number of static pickups, then successfully retrieved mechanic Ronald E. Lewis. On the evening of 29 November 1952, a CAT C-47 with CIA officers John T. Downey and Richard G. Fecteau departed Seoul for Kirin Province, intending to pick up members of a team that had been inserted the previous July.

But a double agent had betrayed the team, and the Chinese shot down the C-47 as it came in for the pickup, killing the pilots and capturing the CIA officers. Fecteau was not released until December 1971; Downey was freed in March 1973.

## A Remarkable Inventor

Robert Edison Fulton, Jr., a talented inventor, had observed a demonstration of the All American system in London after World War II. He believed that he could do better, although at the time he was busy formulating plans for a flying automobile.

Fulton may have been a collateral descendant of the steamboat inventor, but he never bothered to check the genealogical connection. Moreover, Edison had been a family name long before it became associated with the famous inventor. Nonetheless, with Fulton and Edison as part of his name, he seemed destined for a career as an inventor.

Born in 1909, Fulton grew up in affluent circumstances in the New York area, where his father was president of the Mack Truck Company. He attended Choate and Harvard, then studied architecture in Vienna. In 1932, he embarked on a 17-month motorcycle adventure, visiting 32 countries and traveling 40,000 miles. Interested in photography, he worked for Pan American Airways in the mid-1930s, taking pictures of the development of the trans-Pacific air route.

Following the outbreak of World War II in Europe in 1939, Fulton began work on an aerial gunnery trainer. He developed a static device that used films to simulate aerial combat.

Fulton demonstrated his trainer in May 1942 to Cdr. Luis de Florez, who was in the process of establishing a Special Devices Division for the Navy. De Florez endorsed Fulton's trainer and provided developmental funds. Eventually, the Navy ordered 500 trainers at a cost of $6 million. Together with a gunnery manual written by Fulton, the trainer became the Navy's primary simulator for teaching air-to-air marksmanship.

## The Airphibian

After the war, Fulton bought 15 acres of land adjoining the airport at Danbury, Connecticut, where he built a house and workshop. He devoted most of his time and remaining funds to the development of a flying automobile.

Fulton built and tested eight versions of the "airphibian" and was about 90-percent finished when he ran out of money. He sold control of his company in order to raise funds to complete the lengthy government certification process, but the new owners decided not to continue the project.

## A New Challenge

While flight-testing the airphibian, Fulton often had wondered what might happen if he had been forced down in inaccessible terrain. A helicopter had only limited range. The All American system, he believed, was not the answer. Following the disappointment of the airphibian venture, he decided to try to create a more viable pickup system.

Experiments began in 1950. Using a weather balloon, nylon line, and 10- to 15-pound weights, Fulton made numerous pickup attempts as he sought to develop a reliable procedure. Successful at last, he had his son photograph the operation. Fulton then took the film to Admiral de Florez, who had become the first director of technical research at the CIA. Believing that the program could best be handled by the military, de Florez put Fulton in touch with the Office of Naval Research (ONR). Thanks to de Florez's interest, Fulton received a development contract from ONR's Air Programs Division.

Over the next few years, Fulton refined the air and ground equipment for the pickup system. Based at El Centro, California, he conducted numerous flights over the desert, using a Navy P2V for the pickups. He gradually increased the weight of the pickup until the line began to break. A braided nylon line with a test strength of 4,000 pounds solved the problem. More vexing were the difficulties that were experienced with the locking device, or sky anchor, that secured the line to the aircraft. Fulton eventually resolved this problem, which he considered the most demanding part of the entire developmental process.

## The Skyhook System

By 1958, the Fulton aerial retrieval system, or Skyhook, had taken its final shape. A package that easily could be dropped from an aircraft contained the necessary ground equipment for a pickup. It featured a harness, for cargo or person, that was attached to a 500-foot, high-strength, braided nylon line. A portable helium bottle inflated a dirigible-shaped balloon, raising the line to its full height.

The pickup aircraft sported two tubular steel "horns" protruding from its nose, 30 feet long and spread at a 70-degree angle. The aircraft would fly into the line, aiming at a bright mylar marker placed at the 425-foot level. As the line was caught between the forks on the nose of the aircraft, the balloon was released at the same time the spring-loaded trigger mechanism (sky anchor) secured the line to the aircraft. As the line streamlined under the fuselage, it was snared by the pickup crew, using a J-hook. It was then attached to a powered winch and pulled on board.

Fulton first used instrumented dummies as he prepared for a live pickup. He next used a pig, as pigs have nervous systems close to humans. Lifted off the ground, the pig began to spin as it flew through the air at 125 mph. It arrived on board undamaged but in a disoriented state. Once it recovered, it attacked the crew.

## Human Pickups

The first human pickup took place on 12 August 1958, when S. Sgt. Levi W. Woods, USMC, was winched on board the P2V. Because of the geometry involved, the person being picked up experienced less of a shock than during a parachute opening. After the initial contact, which was described by one individual as similar to "a kick in the pants," the person rose vertically at a slow rate to about 100 feet, then began to streamline behind the aircraft. Extension of arms and legs prevented the oscillation that plagued the pig, as the individual was winched on board. The process took about six minutes.

In August 1960, Capt. Edward A. Rodgers, commander of the Naval Air Development Unit, flew a Skyhook-equipped P2V to Point Barrow, Alaska, to conduct pickup tests under the direction of Dr. Max Brewer, head of the Navy's Arctic Research Laboratory. With Fulton on board to monitor the equipment, the P2V picked up mail from Floating Ice Island T-3, retrieved artifacts, including mastodon tusks, from an archeological party on the tundra, and secured geological samples from Peters Lake Camp. The high point of the trials came when the P2V dropped a rescue package near the icebreaker USS Burton Island. Retrieved by a ship's boat, the package was brought on deck, the balloon inflated, and the pickup accomplished.

Source Document

Next week we will talk about operation "Coldfeet," or Part Four of "The Goose, but for now take a look at the video below and then I will close with the rest of the story on the crew who was flying the airplane for the movie.

Now, the most interesting part of this article is that the crew who flew the airplane were employed by Intermountain Aviation, out of Marana, Arizona, and was flying out of Fort Lauderdale, Florida. This scene was shot off the coast of Florida, while the life raft scene was actually shot in a pool, and after getting the footage required for the film, the crew was not able to get both of the blow up dummies through the rear hatch, which was actually the rear gunners position. So, they landed with two sets of legs extending from the rear of the airplane. I was told that there were a few phone calls made to the police about people hanging from the rear of the airplane, as well as they had a welcome committee waiting for them on the ramp.

That is it for this week. Have a good weekend, keep family and friends close, and fly safe/be safe.

Robert Novell

July 19, 2014

# Robert Novells' Third Dimension Blog

## August 8, 2014

Good Morning and Welcome to the 3DB. I hope the week was not too taxing on your spirit and you are ready for a little R&R (rest and relaxation). This week I had planned to present Part Four of the Goose, which has about 25 pictures detailing the move from Long Beach to McMinnville, but the new blog is still not ready; however, it appears that next week I will be up and running so le's plan for Part Four then.

This week I want to present a blog, that I post about every 90 days, to remind people that there was a third person involved with the first powered flight and his name was Charles Taylor. I am always amazed at how many people are left behind by history so in an effort to right a wrong I continue to remind people of Charlie's story.

Enjoy.....

# Charles “Charley” Taylor

(Aviation’s First Mechanic of Powered Flight)

When we think of the first powered flight we automatically think of Wilbur and Orville Wright; however, there was a third person involved whose skills were an essential part of the Wright's success. Charles "Charley" Taylor was that man and without his help the Wright Brothers may have lost their place in history.

Charley was born in Illinois in 1868 and at the age of twelve quit school to find his place in life. He quickly learned that his hands, and tools, were almost one in the same, and America's first aviation mechanic for powered flight started down a path in life that would have him working for the Wright brothers and building the first engine for the Wright Flyer.

Charley started to work for the Wright brothers on June 15, 1901, doing routine repairs on bicycles, so that the Wright brothers could pursue their experiments with gliders which included many trips to Kitty Hawk. After one of these trips, the brothers decided they needed more accurate information and decided they needed to build a small wind tunnel. With this, they would measure the amount, and direction, of air pressures on plane and curved surfaces operating at various angles and improve their theories based on their gliding experiences.

Building the wind tunnel was the first job that Charley Taylor did for the Wright brothers that had any connection with aeronautics. The wind tunnel was a rectangular box with a fan at one end driven by a natural gas engine. The Wright brothers did many experiments in their wind tunnel and from this data they began to make their 1902 glider with Charlie machining many of the parts.

On August 13, 1902, the brothers shipped the glider to Kitty Hawk. They did several flights with the glider and on October 31, 1902, the Wrights returned to Dayton to make plans for a powered airplane. Through their experiments, the Wrights were able to accurately predict the horsepower which was needed to produce and achieve powered flight. The next problem was where to get a light engine that would produce eight horsepower. The Wrights knew that a steam engine might suit their purpose, but a gasoline engine would be safer and more efficient.

In December of 1902, the Wrights sent letters to almost a dozen automobile companies, and gasoline engine manufacturers, asking if they could produce or modify an engine that would develop eight to nine brake horsepower, weigh no more than 180 pounds, and be free from vibration. Most companies replied that they were too busy to undertake building such a special engine. Falling back on their own mechanical experience, the Wright brothers decided to design and build their own engine.

They estimated they could build a four cylinders engine, with four inch stroke and four inch bore weighing no more than 200 pounds with accessories included, and by their calculations it would develop the horsepower necessary to power the glider in flight. Now the problem was who was going to build the engine; however, that problem was quickly solved when the brothers decided to give the task to Charley.

Charley was excited about his new challenge, and from his knowledge of mechanics, and design, he knew that the engine design was basic, straight forward, and simple. Charley had very limited knowledge about gasoline engines, but he used his craftsmanship, genius, and enthusiasm to tackle the task. Without any formal drawings available it was necessary for each part to be crudely

sketched out by the Wrights, or Charlie, on a piece of paper, and after a thorough discussion with the brothers, Charley would pin the drawing above his workbench and go to work. Using these sketches, and specifications, he finished the engine in six weeks.

Now, you would think that Charley's accomplishments up to this point would be sufficient to satisfy most aviation pioneers but it wasn't to be. After the successful flight of 1903 Wilbur and Orville decided to have Charley build a more powerful engine and they started work on an improved airframe. When the new Flyer was ready they received permission to fly it at a pasture near Dayton called Huffman Prairie. The flying was more difficult there and the Wrights crashed numerous times and Charley was heard to say, "Every time one of the brothers goes up I expect it to be the last time I'll see him alive." However, because Charley devoted most of his time to maintaining the airplanes and facilities at Huffman Prairie Charley actually became the first Airport Manager in US aviation history.

There were several other major accomplishments in Charley's career, that I will list at the conclusion of my story, but for now I want tell you how this forgotten pioneer of aviation faded into obscurity and died a lonely man.

After Wilbur died in May of 1912, of Typhoid fever, the pioneering days of the Wright Brothers were finished. Charley traveled to California to look for work, during the Great Depression, and found a job as a factory mechanic. He invested what money he had in a few hundred acres of land near the Salton Sea and waited to make his fortune – nothing happened and he lost everything.

In 1937 he went to Greenfield Village and restored the Wrights' bicycle shop, and home, to their 1903 condition and built a replica of the first engine. He later returned to California during the war and at the age of 73 went to work making cartridge shells but in 1945 Charley suffered a heart attack and was never able to work again. Now, all alone, the last of the original three men who had built the first successful airplane, he was almost destitute.

In November 1955, a reporter discovered Charlie in a Los Angles General Hospital's charity ward. His income was his Social Security check and an $800 a year annuity fund belatedly established by Orville Wright before his death in 1948. The aviation community immediately started a campaign to raise funds for Charlie and he was moved to a private sanitarium where he died a few months later on January 30, 1956 at the age of 88. Having no close relatives Charles E. Taylor was buried in the Portal of Folded Wings Mausoleum dedicated to aviation pioneers, located in Valhalla Memorial Park, Los Angeles.

# Portal of the Folded Wings

The Portal of the Folded Wings is located just south of the Burbank airport in beautiful Valhalla Memorial Park. Originally built in 1924, (6 years before United Airport/Burbank was built) it was once the grand entrance to the memorial park.

On December 17, 1953 (the 50th anniversary of powered flight) the Portal was dedicated as a "Shrine to Aviation" and is now listed on the National Register of Historic Places.

## 24 Aviation Pioneers are laid to rest in the

## Portal of the Folded Wings

## Shrine to Aviation

**Bertrand B. Acosta**, co-pilot with Admiral Richard Byrd in 1927

**Walter R. Brookins**, flew for the Wright brothers.

**Mark M. Campbell**, stunt pilot and aircraft designer.

**Col. Warren S. Eaton**, early pilot who also built airplanes for Lincoln Beachy.

**W. Bertrum Kinner**, built 'Kinner' airplanes. Amelia Earhart flew a Kinner.

**A. Roy Knabenshue**, balloon and dirigible pilot who flew in the Dominguez Air Meet in 1910.

**Elizabeth L. McQueen**, one of Los Angeles's first women pilots.

**John B. Moisant,** won the Statue of Liberty Race in 1910; first to carry a passenger across the English Channel.

**Matilde J. Moisant**, the second licensed female pilot in the United States in 1911.

**J. Floyd Smith**, test pilot and instructor for Glenn Martin and manufacturer of parachutes.

**Hilder F. Smith**, aerial acrobat and parachute jumper.

**Carl B. Squier**, WWI aviator, barnstormer, test pilot, and salesman. As Vice President of Lockheed Aircraft he sold Charles and Anne Lindbergh their Sirius airplane in 1931.

**Charles E. Taylor**, machinist for the Wright brothers who helped design and build the first engine for the Wright Flyer flown at Kitty Hawk.

Source Document

So, what were Charlie's major accomplishments?

1. He was one of the three men responsible for the "First Flight."
2. He was the first aviation mechanic in powered flight.
3. He was Calbraith Perry Rodgers' mechanic on his monumental transcontinental flight in 1911.

4. He was the first man to fill the position of "Airport Manager."
5. He was one of the first men to be actively involved in accident investigation and as a result he improved his skills as well as the design of the Wright Brother's future craft.

Charlie never sought notoriety from his work with the Wrights and few ever recognized his contributions. He was never a part of aviation's inner circle nor was he ever invited to attend any of the big celebrations held in honor of the Wrights. It seems that if anyone had ever thought much about Charley they didn't take the time to find him. Gone but not forgotten – Happy Friday Charley and thanks for making my world of aviation possible.

Have a good weekend, enjoy time with friends and family, and enjoy the holiday weekend.

Robert Novell

August 8, 2014

# Robert Novells' Third Dimension Blog

**September 05, 2014**

Good Morning and Happy Friday,

Last year I posted two articles on the SST program and recently I was having a conversation with a friend who was totally unaware that it was President Kennedy who brought the SST program alive in the 60s so this week I want to revisit that subject. This week's blog will have both posts dealing with the SST so sit back, relax, and enjoy the story on "The Quest For Speed."

## President Kennedy's Quest for Speed

Boeing SST (Model 2700-200) variable-sweep wing version

The Kennedy years were troubled years, sprinkled with some major accomplishments, and President Kennedy's commitment to put a man on the moon would prove to be the crowning jewel; however, how many of us know, remember, that it was also President Kennedy who started the race to build the Super Sonic Transport?

On June 5, 1963, during a speech being given at the Air Force Academy, President Kennedy announced that the government would team up with private industry to build the world's fastest commercial airliner that would be superior to any other country. Of course what the President was saying was that the U.S. would produce a superior machine to what the Anglo-French project called the Concorde. The president later remarked off camera that "We'll beat that bastard De Gaulle."

So began the race for speed……

The Kennedy administration was confronted with many difficult situations but amid the turmoil Kennedy established several milestones that would propel the U.S. forward, technologically, in an effort to maintain our position as number one. We are all familiar with the Apollo program but Kennedy was also responsible for the SST program.

The pressure was on the administration to respond to the Anglo-French Concorde, as well as the Soviet's TU-144, in order to protect America's leadership position in aerospace as well as the balance of payments in the international arena. Pan Am had already announced that they were taking options on six Concordes as well as BOAC and Air France had announced they would be signing options as well.

The administration's response was to propose a bigger, and faster, version of the SST. Kennedy had already been briefed by a multi-agency committee, headed up by Vice President Johnson, that a larger, and faster, version of the SST was feasible. The proposal revealed that an airplane capable of 2000 MPH, three times the speed of jet liners introduced only a few years earlier, carrying 300 passengers was attainable; however, Kennedy proposed to Congress that this could be done for one billion dollars which would prove to be way off the mark.

Although the U.S. was getting in to the race behind the Concorde, and the Soviets, the airplane Kennedy envisioned would be faster and more efficient than that which had been proposed, and administration officials pointed out that the Europeans, in their haste to be first, had sacrificed the potential to grow in speed and size. Finally, after months of review by the FAA four companies were asked to submit final proposals. GE and Pratt and Whitney were to compete for the engine to power America's SST and Boeing and Lockheed would compete to be the manufacturer of the airframe.

Boeing came forward with the boldest design of all. Their concept used variable-geometry wings which was unprecedented for civil aviation. Boeing had perfected the swing wing design when they were competing for the multiservice fighter contract that was awarded to General Dynamics and their F-111 concept. In addition to the swing wing GE was proposing an updated version of the YJ-93 engine that they were using on the XB-70 (see photo below). GE designated the new engine the GE4 and their engine would develop supersonic speed by being the world's largest

afterburner. While Boeing was the ultimate winner in the competition, along with GE, there were many difficult problems to overcome. However, the one problem they could not fix was the mindset of Congress.

Lockheed would put forth a design modeled after a secret reconnaissance aircraft that would later become famous as the SR-71 Blackbird. Lockheed's design would be faster at Mach 3, as opposed to Mach 2.7 proposed by Boeing, and would also carry 300 passengers; however, their design was rejected because of the "Delta Wing." What is ironic about this rejection is that Boeing was forced to abandon the "Variable-Geometry Wing," because of weight, and adopted the "Delta Wing" in its final design much to the surprise of Lockheed and others.

The showdown on continuing the construction of the two prototypes by Boeing came in 1971 when Congress was asked for another eighty-three million dollars to continue the program. All of the supporters of the program argued it would be foolish to cancel the program considering the one billion dollars already invested but Washington was not listening. The program was canceled.

Much of the blame for the cancelation was given to the environmental groups who had lobbied hard for their cause. These groups had taken out ads declaring the SST would shatter windows in homes, stampede cattle and other range animals, and would hasten the end of the "American Wilderness." However, in the final analysis Washington concluded that the project just didn't make sense. With air travel in a slump, and fuel prices soaring, even Boeing, GE, and most airlines had doubts about the success of the airplane.

Considering the lack of success by the Concorde the decision by Congress seems to have been the right one.

Cancelling the SST program idled over 13,000 aerospace workers and years later Boeing's CEO admitted that they came very close to declaring bankruptcy; however, they did survive, as did GE who had to idle more than 1600 employees, and both companies maintained their leadership role in the industry.

That is it for this week. I hope everyone has a good weekend and will enjoy some free time away from work. Please join me next week when I will talk about commercial aviation after the SST.

**********

Lockheed went on to build the C-5 Galaxy, which was a money loser for them, and Boeing brought the 747 to life. So, let's talk about Boeing and one of my favorite airplanes.

## Boeing Rebounds From The SST Debacle

"Oh my gosh. How are we going to get an engine big enough to carry that weight?" That was Joe Sutter's, father of the Boeing 747, reaction when tasked with the challenge of building an airplane 2.5 times bigger than the 707 that could hold 350 to 400 passengers. It was the 1960s, and commercial aviation was growing. Sutter led "The Incredibles," a group of 50,000 Boeing construction workers, mechanics, engineers, secretaries and administrators, which brought the behemoth to life.

The gigantic, efficient and ubiquitous Boeing 747 transport is a symbol of the most important aspects of progress in civil aviation: the democratization and globalization of travel. At this instant, thousands of airline terminals around the world are crowded with millions of people representing every nation, all taking advantage of the availability of long-distance travel via flight.

Although modern, the Boeing 747 also symbolizes another era, when individuals like Juan Trippe of Pan American Airways and Bill Allen of Boeing could decide to undertake a venture of giant size. and great risk, and do so on their own, certain that their decisions would be approved by their boards of directors.

It was on December 22, 1965, that Trippe and Allen signed a letter of intent committing $525 million, for 25 aircraft, launching the largest airliner in history - the Boeing Model 747. The initial specifications called for a gross weight of 550,000 pounds, room for up to 400 passengers, a cruise speed of Mach .9, and a range of 5,100 miles.

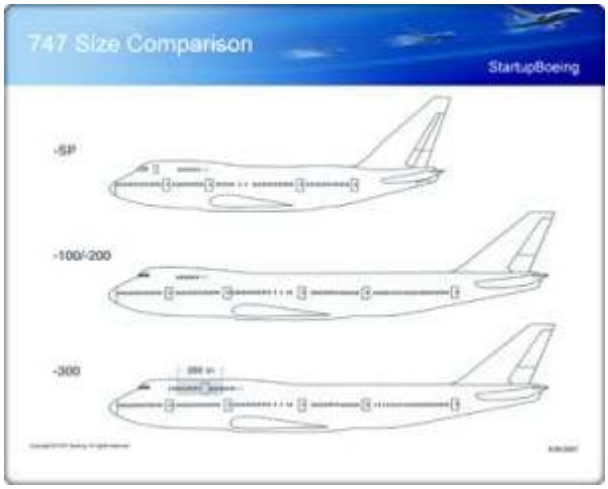
It was a fantastic challenge, one whose failure had the potential to ruin both companies. New engines had to be designed and built as did a huge new factory that would house the largest building

in the world in terms of volume. Even the world's airport runways, taxiways, and terminals had to be redesigned to handle the aircraft.

Jack Waddell was pilot on the first 747 flight, on February 9, 1969, and as all test pilots must do, he publicly called the giant new airplane "a pilot's dream." There would be delays in getting the 747 into service, primarily due to problems with the Pratt & Whitney JT9D engines, but it was soon apparent that the Boeing 747 was the new world standard in transportation.

Fast, comfortable, and reliable, Boeing 747s began racking up one record after another. By 1975, it had carried its 100 millionth passenger, signifying the beginning of the revolution in air transport. That revolution was confirmed by the year 2000, when 3.3 billion passengers had been carried, and 747s had flown over 33 billion statute miles.

Now we all know that the 747 was a success, and began the widebody revolution, but let's talk about how Boeing managed to lose a contract that made them the winner in this new era.




The old saying "Be careful what you ask for - you may get it" holds true in the highly competitive world of aviation. In 1964 Boeing, Lockheed, and Douglas were players in an intense competition to win a contract for a very large military transport. It became apparent early on that Douglas was not going to win, the Boeing entry was favored by the Air Force, but the Lockheed bid was $250 million lower in price.

Lockheed was delighted when it was awarded the contract to build the C-5A, and Boeing was furious. However, the C-5A contract was a brand-new contractual instrument termed Total Package Procurement. It was an unfair arrangement that was essentially a firm fixed-price development program. The terms of the contract were harsh enough to cause Lockheed to lose hundreds of millions of dollars. Boeing, on the other hand, used the development experience to design the 747, and went on to make billions of dollars in the process.

Now you know the rest of the story.....

Source Document

Have a good weekend, enjoy the videos below, and remember that all aviators are "Gatekeepers," and we all must protect the interest of those who will follow in our footsteps.

Robert Novell

September, 04, 2014

# Robert Novells' Third Dimension Blog

**October 24, 2014**

Good Morning and welcome to the 3DB. I hope everyone had a good week and is ready for a little R&R (rest and relaxation) this weekend. This week I want to tell you about a club that is not well known these days but among the many Caterpillars who carry, or carried, Caterpillar Club membership cards are former President George Bush, General Doolittle, and Colonel Lindbergh, to name a few.

Enjoy.....


Membership Certificate

This is to certify that

is a member of the Caterpillar Club whose life was spared the day of 19 because of an emergency parachute jump from an aircraft. This certificate is bestowed to the end that this safety medium in the art of flying may be furthered.

## The Caterpillar Club

(Switlik Chapter)

The Caterpillar Club was originated at Dayton, Ohio between October 20, 1922 and November 11, 1922 by Messrs Hutton, Verne Timmerman, J. Mumma and Milton H. St. Clair. This world-wide club is for aviators, military and commercial, who have saved their lives with a parachute in an emergency.

It all started with a young army test pilot named Harold Harris. On October 20, 1922 he was flying a Loening W-2A monoplane fighter in a mock dogfight with a friend. His plane had been equipped the day before with experimental aerodynamically balanced airlerons. After taking off from the

test center at McCook field, Dayton near where the Wright brothers tested their plane, his plane suddenly rocked violently and Harris found he could not control it. He had to bail out.

Standing in the cockpit, he was sucked out by the slipstream. After three tries he found and pulled the rip cord. This main chute opened about 500 feet above the street of Dayton. Looking up he admired the beautiful silk from which the parachute was made and marveled at how white and clean it was. He was the first American known to be saved by a manually operated parachute in an emergency jump from a disabled aircraft.

Two reporters from the Dayton Herald, discussing the event, suggested that since there would be more jumps with the chute, a club should be formed to embrace these intrepid airmen. They considered several names for the organization and selected the Caterpillar Club. The reasoning was simple - the parachute main sail and shroud lines were woven from the finest silk. The lowly caterpillar worm spins a cocoon and crawls out and flies away from certain death.

# The Caterpillar Club

(Irvin Parachute Company-Chapter)

The Irvin Air Chute Co. started the Caterpillar Club in 1922 and the practice of awarding the tiny gold Caterpillar Pin to anyone who saved his life by parachuting from a disabled or flaming aircraft. Each recipient of the Caterpillar Pin is living testimony to the life saving ability of the Irvin Type Air Chute. The Caterpillar is symbolic of the silk worm, which lets itself descend gently to earth from heights by spinning a silky thread to hang from. Parachutes in the early days were made from pure silk.

In 1919 Leslie Irvin, a 24-year-old stunt man from California, demonstrated the first "free drop" parachute. He had made the chute himself on a borrowed sewing machine. Flying safety experts were so impressed that the American Air Force and British R.A.F. promptly adopted the parachute as standard equipment. Later the same year, Irvin established his first factory for the mass production of parachutes in Buffalo, New York. In 1926 the first European factory was established in Letchworth, England.

During the height of World War II, production of parachutes at the Irvin Air Chute Co. factory in Letchworth, England reached a peak of nearly 1,500 parachutes per week. By late 1945 there were 34,000 members of the Caterpillar Club.

It is estimated that at least 100,000 peoples lives have been saved by Irvin parachutes.

# History of the Parachute

Credit for the invention of the parachute goes to Sebastien Lenormand, although it had been anticipated by Leonardo Da Vinci (1452-1519). J.P. Blanchard (1753-1809), a Frenchman is said

to have been the first to use a parachute. In 1785 he dropped a dog in a basket, to which a parachute was attached, from a balloon high in the air. Blanchard claimed to have descended from a balloon in a parachute in 1793.

Another French aeronaut, Andre J. Garnerin (1769-1823) is credited with being the first to regularly use the parachute successfully. On October 22, 1797 at Paris, France, he successfully performed an exhibition jump from an altitude of more than 2,000 feet. At a similar exhibition in England on September 21, 1802, he jumped from an altitude of approximately 8,000 feet. He used a parachute approximately 23 feet in diameter.

These were some of the early parachutists who made their jumps from large balloons.

The first successful parachute jump to be made from a moving airplane was made by Captain Berry at St. Louis, Missouri, in 1912. In spite of this the use of parachutes as an emergency egress device for military air crewmen was not used by the French, English, or Americans during World War I, although the men in observation balloons were issued parachutes. In 1917 the German pilots were issued container type chutes, and successfully used them during the last 12 months of World War I. The Allies were still debating the advisability of using parachutes as a means of escape from aircraft when the armistice was signed.

It seemed that some of the hesitancy about issuing parachutes to aircraft personnel was because of the prevailing opinion at the time regarding the ability of the man, once he had bailed out of the aircraft, in an emergency, after jumping free of the aircraft, they would not have sufficient control over their arms to manually pull the ripcord. Another concern, at the time, was the fear that, when attempting to fall free of the airplane, the parachute might foul on the plane if the ripcord was, in some manner, anchored to the aircraft. As a result of this apparent dilemma, military use of the parachute by American pilots was delayed until after World War I.

These opinions were shattered when, in conjunction with a parachute research team at McCook Field, Leslie Irvin and Floyd Smith developed a 28 foot back pack parachute. On April 28, 1919, Irvin jumped from a de Havilland biplane traveling at 100 miles per hour at an altitude of 1,500 feet.

After bailing out of the airplane and falling free, he manually reached the ripcord handle and pulled it, and the parachute was fully deployed at 1,000 feet. Thus Leslie Irvin became the first American to jump from an airplane and manually open the parachute in midair.

More than 1,500 successful experimental parachute jumps were made from airplanes before the seat pack type parachute was issued as regular equipment to the U.S. Army in 1919. In 1922, use of the parachute became mandatory by order of the Adjutant General.

Following this, the British Royal Air Force adopted the U.S. type of seat pack parachute in 1925.

On October 20, 1922, Lieutenant Harold Harris, Chief of the Flight Test Section of the Engineering Division of the U.S. Army Air Service successfully bailed out of a disabled test aircraft, landing in a small grape arbor in the backyard of 337 Troy Street, in Dayton, Ohio. His was the first life

ever saved in an emergency jump from a disabled aircraft with a manually operated parachute. Lieutenant Harris later became General Harris. His interest in flight safety continued for many years. In June, 1966 he retired from his position as Board Chairman of the Flight Safety Foundation.

During the winter of 1939-1940, the U.S.S.R., in its campaign against Finland, became the first nation to use paratroops. On April 9, 1940, the Germans first used paratroopers in their assault on Norway. On May 10, 1940, they invaded Belgium, the Netherlands, and Luxembourg with paratroops and glider troops. As a result of these successes with paratroops, the U.S. Army organized the first class for training paratroops at Fort Benning, Georgia in 1940.

Since these past developments, parachutes have been put to many uses, primarily, they have served to save lives. During the height of World War II, production of parachutes at the Irving Air Chute Company factory in Letchworth, England, reached a peak of nearly 1,500 parachutes per week. The world famed Caterpillar Club, founded by Leslie Irvin and named after the silk worm (caterpillar) that spins the silk from which parachutes were made, gained thousands of members during World War II. By late 1945, there were 34,000 members of the Caterpillar Club. The only requirement for membership in the select club is that the applicant must have bailed out under emergency conditions, and furnished written confirmation from witnesses, such as commanding officers or adjutants, that the jump was a genuine emergency bail ou**t.**

Source Document

Have a good weekend, keep friends and family close, and enjoy the world around you. Life is short.

Robert Novell

October 24, 2014

# Robert Novells' Third Dimension Blog

**November 27, 2014**

Happy Thanksgiving---it is that time of the year again to spend time with family and friends while stuffing ourselves with turkey, chicken, pork, and cranberry sauce. A good time for all even if some of the extended relatives are not on your top ten list of favorite people.

In the photo above the members of the X-1 team responsible for braking the sound barrier are depicted. They are, from left to right, flight engineer Ed Swindell, backup pilot Bob Hoover, B-29 pilot Bob Cardinas, X-1 pilot Chuck Yeager, Bell engineer Dick Frost and Air Force engineer Jack Ridley. Today I want to talk about Bob Hoover who was the original pilot chosen to fly the X-1. However, it is not his accomplishments as an **Aviator**, and an aviation pioneer, that I want to talk about but rather his accomplishments, and contributions, as a person. When Bob Hoover speaks

publicly, or privately, it is never about himself but always about others and it is this quality, this side of Bob Hoover the man, that I hope to depict in the following articles and videos.

Enjoy.....

# Robert A (Bob) Hoover

**(The annual Living Legends Gala at the Beverly Hilton – January 24, 2012)**

Robert A. "Bob" Hoover, the "greatest stick-and-rudder pilot who ever lived," according to General James Doolittle, turns 90 on January 24, 2012. Last Friday at the annual Living Legends gala at the Beverly Hilton, Hoover reflected on his life experiences with the characteristic graciousness that also distinguishes him as the consummate Tennessee gentleman.

Hoover's "infatuation with aviation" started in 1927 he learned of Charles Lindbergh's non-stop flight across the north Atlantic in the Spirit of St. Louis. He told the crowd at Living Legends that his childhood heroes were Lindbergh, Roscoe Turner [and his pet lion], Eddie Rickenbacker and especially Jimmy Doolittle.

Fast forward to the early 1950s. Hoover was signing autographs at after performing in the F-86 at an airshow in Europe when an unassuming gentleman in the crowd introduced himself as Mr. Schwartz. The man asked Hoover if he could speak with him. Hoover told Mr. Schwartz that he'd have to wait until he finished signing autographs.

Mr. Schwartz waited patiently for Hoover to attend to his fans for nearly two hours. When the two finally met, it was apparent that Mr. Schwartz actually was the reclusive Charles Lindbergh in disguise.

Hoover's jaw dropped. He had kept Charles Lindbergh waiting while he signed photos. Lindbergh wanted to discuss with Hoover the future of jets at Pan Am where he served on the board of directors. A bond between the two soon developed and Hoover helped Mr. Schwartz maintain anonymity while he explored new technologies with top aerospace companies, including North American Aircraft.

In 1969, Hoover was head of the Society of Experimental Text Pilots and he was charged with organizing SETP's big celebration dinner. A once in a blue moon opportunity arose. Hoover had a long-shot chance of orchestrating the appearance of two of America's biggest aviation heroes.

Hoover said the dinner was held in the very same ballroom at the Beverly Hilton as the Living Legends dinner. He was presiding over the ceremony at the same place on the stage behind the podium.

Seated at the head table, were the reclusive Mr. Schwartz [aka Charles Lindbergh] and Neil Armstrong, just back from the Apollo 11 mission to the moon. In the middle of the two was Hoover's wife Colleen.

When Hoover brought up the house lights and introduced Lindbergh and Armstrong to the SETP members, they were awestruck at the sight of the two air and space pioneers.

The media was just as awestruck. They assumed Lindbergh never made public appearances and that Armstrong was still in quarantine after returning to earth. When the wire services and other media saw Lindbergh and Armstrong together they snapped hundreds of photos and sent them all over the world.

The photos all showed Bob's wife Colleen, right in the middle of Lindbergh and Armstrong.

"It was the proudest moment of my life," Hoover says. "There was dear Colleen, now my wife of 65 years, together with two of my biggest heroes. Her picture with them was seen all over the world."

"To this day, I assume she is the only person to have sat with the first man to cross the Atlantic in an airplane on one side and the first man to set foot on the moon on the other," Hoover writes in his autobiography Forever Flying.

That moment, some 43 years ago, is so emblematic of Bob Hoover. He speaks infrequently of his many accomplishments as a barnstormer, World War II fighter pilot, USAF and North American Aircraft jet test pilot and air show performer during his 60+ year flying career. He'd much rather laud others for their feats and stand on the sidelines as a humble spectator.

He also calls virtually all his friends on special occasions, such as birthdays and Christmas. Imagine my shock when, out of the blue, my hero Bob Hoover first called me several years ago on December 24 to wish me a Merry Christmas while I was driving on Pacific Coast Highway. I was so awestruck, I nearly crashed my car. That tradition has continued ever since, but now I'm less likely to lose control.

But, that's Bob Hoover for you. No wonder the Living Legends gala was packed with all of his friends who were there to wish him a Happy 90th Birthday. All of us hope we'll be saluting him when he turns 100 in January 2022.

Source Document

The video above is well worth your time but what is also important is the information that follows. Most people do not realize that Bob Hoover was a POW during WWII. The article below details those events.

# It Won't Happen To Me

On Jan. 24, 1944, Hoover's twenty-second birthday, he lost his roommate and best friend. After being shot down near the coast of Calvi, Corsica, Tom Watts had successfully bailed out of his Spitfire. But high winds dragged his parachute into a reef of rocks offshore, and he drowned. It wasn't the first fatality for his band of men, but it hit Hoover the hardest.

A little over two weeks later, on Feb. 9, 1944, Hoover, who had been promoted to flight leader, took off from Calvi. He was heading a four-plane-formation of Spitfires on a mission to patrol the waters off the Italian and French coasts, between Cannes and Genoa. Hoover was flying Black 3, a Supermarine Spitfire Mk. Vc, on a harassment mission to search and destroy enemy ships and trains. After Hoover and his fellow pilots had successfully destroyed a German freighter in the harbor near Savona, Italy, they flew back to base to refuel and then returned to patrol.

When Hoover caught sight of four German Focke-Wulf 190s, he called out their position. One of the FW-190s was on the tail of James "Monty" Montgomery, a friend who had been shot down a few months earlier and had spent three days in a life raft before being rescued. Hoover frantically called for Montgomery to break left to avoid gunfire. He knew he would need all the speed he could get, so he had to get rid of his aircraft's external fuel tank. "That's high drag," he said. "It really slows the airplane down. I had only 1,100 horsepower and was capable of doing only 215 mph. The airplanes I had engaged had capability of 350 mph. It's like racing a Model T Ford with a Cadillac." But when Hoover pulled the handle that would release the external fuel tank, the handle came off in his hand. With the Spitfire's superior turning ability now his only defense, he headed straight for a German fighter. He spat out a burst of .50 caliber gunfire and then saw billows of smoke streaming through the sky.

He had his first kill of the war, but had no time to celebrate. Montgomery had been hit, and Hoover watched his aircraft burst into flames. Now, two FW-190s were after Hoover. As he dove left, he noticed that his two friends had veered off and left him to fend for himself. Not being able to release the external fuel tank seemed unlucky at the time, but now it made Hoover's Spitfire so slow that the F-190s overshot him. When two more enemy aircraft turned in toward him, Hoover fired and hit one of the FW-190s. Just when he thought he might escape, shells hit his engine cowling from underneath. An enemy fighter had hit him with a high-angle deflection shot. "I saw this airplane, 90 degrees out here, and I just ignored it," Hoover recalled. "How could you ever get an angle shot like that?" Hoover felt severe pain shoot through his lower body as another FW-190 closed in on him. The enemy pilot must've thought Hoover had no firepower, because he swooped under Hoover and pulled up in front of his nose. Hoover shot a burst of gunfire, but seconds later, the Spitfire's engine exploded, and a ball of flames engulfed the aircraft's nose. "I called and told the British patroller, 'I'm going down at sea, so alert the Dumbos (Walrus amphibian rescue planes) to start flying,'" he recalled. He opened the cockpit, released his shoulder and seat straps, rolled the plane and pulled his parachute's ripcord. The parachute didn't open until three or four hundred feet above the water. His life vest, riddled with shrapnel, wouldn't inflate, and when he hit the cold water, he felt immense pain in his lower body. As he floated in the icy water, about 20 miles off the coast of Nice, France, he saw four Spitfires approach. When a group of FW-190s swooped down on them, one Spitfire was shot down and the others turned away. After four hours in the water, Hoover was picked up by a German corvette.

# Bob Hoover - Prisoner of War

At Nice, France, German guards took Hoover to a local jail. Even though he was searched, he wasn't given medical attention for his shrapnel wounds. "Fragments of metal got into the backs of my legs and my private parts," he said. "It wasn't anything at that time; they were just flesh wounds." Hoover was transported to the Continental Hotel in Cannes, headquarters for German officers. There, to all questions, Hoover answered as he'd been taught: "Robert A. Hoover, flight officer, 20443029." After days of lengthy, futile interrogation, he was transported to the southern coast of France, near Marseilles. There, he made his first of several escape attempts. When he was caught, he was confined to a dark basement cell.

He was then herded into a train compartment, and was soon heading north, toward Switzerland. Near the border, Hoover slipped out a small bathroom window and made his way along the tracks. He heard gunshots, and guards soon surrounded him. When they arrived at the German Luftwaffe interrogation headquarters at Oberursel, north of Frankfurt, Hoover was put in solitary confinement. Over the next week, he would be questioned several times, but was still obstinate. One day, as he stood before a bullet-riddled cement wall, a frustrated German captain addressed him. "You still have a chance," the captain said, and Hoover responded, "Robert A. Hoover, flight officer, 20443029." "When they stood me against the wall, I thought, 'Well, it won't hurt for very long,'" he recalled. As Hoover waited for the end, the captain said something to the Germans, who dropped their guns. Once back inside, the captain addressed him again, asking why he continued to be stubborn, since they already had information on him and knowledge of his aircraft from gun camera film. After repeatedly giving his name, rank and serial number, Hoover was returned to his cell. The Germans eventually did learn additional information about him, and Hoover was furious to know someone wasn't able to hold his tongue.

Hoover became even more determined to escape. After one attempt, he was kicked repeatedly, resulting in head and facial injuries that left permanent scars. The Germans still hadn't offered to treat his other injuries, which were now infected. Finally, an interrogator told him to drop his trousers. His swollen testicles and red, inflamed groin led the interrogator to believe Hoover had syphilis. "I thought, 'Maybe I do!' I'd been having a lot of fun," Hoover chuckled. "But it was actually blood poisoning. They didn't treat me until I got to the main prison camp." The next day, Hoover and other POWs were stuffed into a boxcar in the marshaling yards near Frankfurt. "The British were bombing the marshaling yards," he said. "One of the British POWs had been the lead navigator on some night flights a few weeks before. He said, 'I say, old chaps, it looks like we've had it. We're the target.' Everybody was praying; bombs were bursting all over the place. The guards went to the air raid shelters and left us there to die." Although those in his boxcar were unhurt, one car exploded, killing everyone inside. The prisoners finally arrived at Stalag Luft 1 in Barth. Double 10-foot barbed-wire fences surrounded individual compounds, while a similar fence enclosed the entire camp. POWs were aware that if they crossed a "warning wire," they would be shot. Searchlights, mounted on the guard towers, illuminated the entire area.

## Bob Hoover and His Obsessive Pursuit of Freedom

Guards boasted that no one had ever escaped from Stalag 1, but Hoover and many fellow "Kriegies" continued their "obsessive pursuit of freedom." He tried to escape at least 25 times, and as a result, spent a lot of time in solitary confinement. Sometimes, while in confinement, Hoover talked through the walls to other prisoners. One was Col. Russ Spicer, who became an inspiration

to his fellow POWs. Within earshot of German officers, he had given a bold speech about Nazi atrocities and reminded the prisoners not to get friendly with their captors. “Russ was my hero,” Hoover said.

In early spring 1945, Allied Supreme Commander Gen. Dwight Eisenhower believed the war was almost over. He issued orders to POWs. “He told the soldiers that were going out on missions to pass the word: POWs were not to escape after a certain date,” Hoover recalled. By that time, 10,000 prisoners were held at Stalag I. It was a significant increase over the 1,200 who were there when he arrived. Despite Eisenhower’s directive, Hoover and others still devised ways to escape. “I had been on an escape committee,” Hoover explained. “We’d been trying for so long. We were dedicated, digging tunnels and running at the fence. I once got caught hanging on the barbed wire, with dogs nipping at my feet. I really was scared, but I’d been working so hard at it, and I wasn’t about to quit.” In April 1945, the Russians were getting closer, and German guards started deserting. Hoover had been a POW for more than 15 months. His partners in his latest escape scheme were Jerry Ennis, from the 52nd Fighter Group, and a Canadian airman named George. “We found a board underneath one of the buildings,” Hoover said. “A bunch of people who had worked on the escape committee created a diversion. They started a fight on one side of the compound, so the guards were all looking over there. We ran out with this plank, put it up over the top of the fence and climbed out.” The prison camp was located on a peninsula that jutted into the Baltic Sea. The three escapees went through the woods and gathered wood and grapevines for a raft.

“Jerry was on the raft,” Hoover recalled. “He held our clothes while we were in that cold water, pushing this thing across. We had to go about 2,000 feet, before we could get to the other side of the little inlet. When we got over there, the Canadian thought he’d be better off by himself.” Hoover and Ennis spent the night at a deserted German farmhouse, under hay in the barn. The next morning, they stole bicycles from a small village. “We kept heading west and landed in the middle of the Russian lines,” Hoover said. “They were still fighting the Germans. It was a slaughter.” As Allies, Hoover and Ennis spent the night with a group of Russian soldiers. Ennis spoke fluent French and was able to communicate with some French-speaking Russians. The next day, another group of drunk, friendly Russian soldiers stopped them at a nearby village and invited them to a local church. Later, at another German village, a distraught elderly woman with a bloody cloth wrapped around her hand asked Hoover and Ennis if they were Americans. “The Russians had cut off her finger to get her wedding ring,” Hoover recalled. The woman led them to an area where they found many victims whose throats had been slit, then another spot where hundreds more had suffered the same fate. “The Russians showed no mercy,” Hoover said.

While Hoover and Ennis traveled, they avoided revealing that they had been POWs. “The Russians believed if you were captured, you were a collaborator,” Hoover said. “We knew the Russian philosophy by then, so if they asked what had happened to us, I would say, ‘We were shot down over Berlin, and we’ve been evading ever since.’” The two men eventually ended up in a walled compound of farmhouses, where more than 50 people were staying. Most were French, who had been forced into labor camps when France fell to Germany and were now trying to flee the Russians. “These people were all trying to get back home,” he said. “Since Jerry could speak French, they opened their arms to us.” That night, as Ennis and Hoover slept in a hayloft, a tank

broke through the wall of the compound. “We could hear them speaking Russian,” Hoover remembered. “They were looking for people and anything they could take. They came into the barn, and I heard somebody scream. They were poking the hay with a pitchfork. When they finally came near us, we stood up and held up our hands. Jerry started speaking in French. Eventually, we found somebody who understood a little bit. We said we were Allies and had been evading, and we were trying to get back to our lines. They killed almost everybody else.”

# Bob Hoover Escapes his Captors in a Stolen Luftwaffe Fighter

When Hoover and Ennis left that area, they came across an abandoned Luftwaffe air base, just inside Germany’s border. The base was deserted, except for a few ground crew. As the men looked for an aircraft that might be flyable, they were surprised to be totally ignored. They discovered at least 25 Focke-Wulf 190s, but none were airworthy. “They were all shot up,” Hoover said. “I finally came to one that had a lot of holes in it, but not in any of the vital organs.” Although he had never flown a Focke-Wulf 190, Hoover had learned about the aircraft from a fellow POW, Gus Lundquist, who had gone to England to evaluate captured German airplanes. “He talked one of the lead generals into letting him fly a mission, and was shot down,” Hoover said. “One day, I told him that I wanted to go to Wright Field after I got out, and he said, ‘I’m from Wright Field!’ When we’d have an opportunity, he’d sketch in the dirt where everything was.” The men made plans to use the plane, but Ennis had decided not to fly out with Hoover. “He never wanted to fly again,” Hoover said.

When a mechanic noticed the men, Hoover motioned him closer with a gun he’d acquired during their travels. They discovered that the German could speak French. “Jerry told him that if he didn’t help me get airborne, he’d kill him,” Hoover said. “I got in the cockpit and the German helped me get the engine going. The fuel gauge was full and the engine ran up nicely.” Realizing that the Germans could shoot at him as he took off, Hoover closed the canopy, opened the throttle full power and went across the grass field to the runway. “I got airborne and pulled the gear up,” he remembered. “The stupidity of what I was doing hit me. I thought, ‘Here I am in a German airplane, without a parachute.’” Since he was flying a plane with a swastika painted on the side, the Allies might take aim as well. German aircraft designer Willy Messerschmitt pats Bob Hoover on the back. “It was overcast at about 4,000 feet,” he said. “I pulled up to the bottom of that overcast, so I wouldn’t be a target.”

Hoover headed north until he saw the North Sea.“I didn’t have any maps or charts,” he said. “I knew that if I turned west and followed the shoreline, I would be safe when I saw windmills, because the Dutch hated the Germans.” He followed the coastline to the liberated Zuider Zee in Holland. When he saw windmill, he looked for somewhere to get fuel. “I had passed over some airfields that appeared to be deserted, but I knew that deserted runways were often mined,” he said. He found a field and decided to land, but hit a ditch he hadn’t spotted from the air. “I ground-looped it and wiped the landing gear out,” he said. Hoover was disappointed. “I wanted to get the plane back to England,” he said.

As darkness approached, he remembered seeing a road past some trees. “I thought if I walked to that road, maybe a military vehicle would come along,” he said. “Just as I got ready to go into the trees, farmers with pitchforks came at me from all sides. They thought I was a German. They couldn’t speak English, so I kept pointing towards the other side of the trees, and they took me there. I stopped an English truck. I said, ‘I’m an American, but they think I’m a German!’ This fella said, ‘Get in here with us.’” Hoover grins and says that later, everybody considered him a hero. “People made it sound like a great escape, but the guards had deserted us,” he said. According to Hoover, in the two weeks before the Americans liberated the camp on April 30, 1945, about 200 POWs actually escaped. “General Eisenhower was correct,” he said. “We would’ve been safer to stay there. It was the dumbest thing I’ve ever done.” Bob and Colleen Hoover celebrate with Charles Lindbergh (second from right), the first man to fly across the Atlantic, and Neil Armstrong (left), the first man to land on the moon, shortly after Armstrong returned from space. Lindbergh was being inducted. Hoover doesn’t know of anyone else who flew an enemy plane out of Germany. He didn’t talk about the incident for many years, even though a Nashville paper had reported his story soon after his return to the U.S.

He finally talked publicly, 20 years later, at an air show performance in Redding, Penn. “A security person came up to me and said, ‘A man over here says he was in prison camp with you,’” Hoover recalled. The man was Jerry Ennis. After he took the microphone and told the story to the air show visitors, Hoover decided to tell his story and dispel exaggerations.

## The Journey Continues

After hitching a ride on that English truck in Holland, Hoover hooked up with a former fellow POW. “Nelson had gone over the fence in another direction,” he said. “We were both headed for somewhere near Le Havre, France, where the U.S. Army had established a series of camps. We were skin and bones. They’d get you back to your normal weight, give you a thorough physical examination and de-lice you.” The men hitched rides on military vehicles and trucks, but decided they could get home sooner if they skipped the U.S. camp. “We got on a train heading for Paris, because they let the military go for free,” Hoover said. A gentleman in their compartment shared his food and a plan. “He’d been in flight school training, but was now in the Merchant Marines,” Hoover said. “He said, ‘I’ll smuggle you on board my ship; we’re heading for the U.S.’ He smuggled us on, but the ship ended up going back to England!” Hoover said. They hid in a compartment, but Nelson, feeling restless, left the compartment and went to the ship’s commissary. A suspicious intelligence officer followed him back to their hiding place. The officer thought Hoover and Nelson were German spies, and they were taken to the brig. When their Merchant Marine friend found them, he assisted in their escape and helped them off the ship. With the help of Nelson’s friend in London, their luck turned. “We lived pretty high on the hog,” Hoover said.

While in England, Hoover visited his brother Leroy, and found out that their mother was gravely ill. He and Nelson returned to the ship, now headed for New York. They explained their situation, and this time, were treated differently. “They treated us royally all the way back,” Hoover recalled.

Source Document

Enjoy the rest of your holiday weekend and when you have a few extra minutes take a look at the video below - Bob Hoover talks about Bob Hoover.

Robert Novell

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