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A SPIRIT RISING: THE ORIGINS OF THE FLYING WING

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CIVIL AIR PATROL
U.S. AIR FORCE AUXILIARY

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2d Lt Struve joined Civil Air Patrol in February 2022 as a Squadron Historian. In December 2022 he became the Iowa Wing Historian. Since that time he has worked across multiple organizations and units within Civil Air Patrol and the Department of Defense to streamline and improve historical operations in the Wing, the North Central Region, and the National CAP History Program.

Historian's Update

As the weather continues its ebb and flow of winter, it is time to remember some of our yearly routines. Annual History submissions are coming due and a blitz to make sure we have everything covered is upon us. As historians, we find ourselves so often caught up in the present that we forget the other two dimensions of our profession: the past and future.

Recently, I had the opportunity to speak with a few members of Hawaii Wing. Despite our struggles in the history field here in the heartland, the struggle is real in many other wings around the country, including the state with perhaps one of the richest histories in the Nation. While CAP was founded before the Pearl Harbor attacks, here we have a wing in the state which really put the finishing touch on the need for civil defense. Back here in Iowa, we trained pilots to spot German U-boats that were prowling the coastline. We had a very different mission set.

In our wing, at present, we have over half a million documents that we are working on digitizing and cataloging. Amid that there are four separate histories, each containing their own version of events within the Iowa Wing. Slowly, but surely, we have been determining the true history and creating the final interpretations of that history. It is a daunting task, but one that many other organizations cannot even begin to do. This includes justifications for unit patches, state funding records, traces of major events, command lineage, and so much more over the last 80 plus years.

The staff is also working on education kits, staff rides, classes, and courses, and much more to provide as a learning tool for senior members, cadets, and the public. These are all new, and have never been deployed before within CAP. Such things take a large amount of time, and just like the rest of you, we are volunteers. The interns are hard at work composing content and digitizing material, while the staff is busy aggregating the information, setting priorities, and creating goalposts for the section to increase its usability in the organization. As we welcome 2024, we thank our fellow CAP members, cadets, families, and our supporters who have helped us reach a wider audience with what makes our organization one-of-a-kind.

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A SPIRIT RISING:
THE ORIGINS OF THE FLYING WING

By 2d Lt Mark J. Struve

Modern design in many things often finds itself borrowing on old, tried, and true concepts. It's no surprise either. After all, throughout history we find many instances where modern technology, strategy, design, and concepts can be traced and originated on something that already exists. Imagine, if you will, not reinventing the wheel, but improving it. That is how we observe a breakthrough today. The computer is a fine example of this, going from a system the size of a small building in the 1950s to a small handheld device the size of thousands of the same capacity in 2010. But there is another place that is all too obvious: aviation.

From the beginning, Wilbur and Orville Wright had a vision that launched man into the heavens above. Shortly after their successful flight at Kitty Hawk in 1903, interest in the airplane had expanded far beyond just a select few. While the United States Signal Corps had taken a limited interest in the new technological marvel, it still wasn't convinced of its long-lasting capabilities. The early airplane instead was kept in a reconnaissance capacity for the Signal Corps up until the late stages of World War I. But as man is known to do, it sought to improve and aim higher and more efficiently in its zeal for aviation supremacy.

In modern aviation, we consider some of the most iconic designs and aircraft in our skies as creations such as the F-22 Raptor, the F-16 Viper, and the B-52 Stratofortress (at least, for us in the United States). Elsewhere, you see the MiG-29 Fulcrum, the Su-35 Super Flanker, and the Eurofighter Typhoon. Perhaps the most interesting in design, however, belongs to the B-2 Spirit bomber, a design that is certainly distinguishable. It's flying-wing design, low radar cross-section, and quiet footprint are noteworthy characteristics that make this aircraft one of the most unique. But how unique is it? It may surprise many to know that such a design is over one-hundred years old. How did this amazing man-made marvel change from its incarnation in 1910 to now?

Northrop's X-216H was his first flying wing design concept. It utilized a box-tail design. The X-216H is shown here idle in a field during testing.

JOHN WILLIAM DUNNE

John William Dunne was born in Kildare, Ireland in 1875.[1] He became fascinated with the concept of powered flight at the age of 13, 15 years before the Wright Brothers conduct their first flight.[2] He enlisted in the British Army in 1899 but found himself confined to desk work or sick leave frequently during his early career. Dunne worked tirelessly on various aircraft designs from 1901, and by the following year was spending most of his Army career focusing on design and testing of powered flight concepts.[3] Dunne hypothesized the notion of a blended-wing or tailless design by watching seagulls near his home in 1910. The first successful flight of a tailless flying-wing was Dunne's own Model D.8 in 1912. He was able to sell his design to the U.S. Military in 1913. The Signal Corps bought one of these aircraft, while the other two were purchased by the U.S. Navy. Modifications of the design were also delivered, but these were few.[4]

JACK NORTHROP

Born in 1895, Jack Northrop was a career-long aviation engineer and designer. Born in the Newark, New Jersey, he grew up on the opposing coast in Santa Barbara, California. At the age of 21, Northrop began his career in the industry working as a drafter for Loughead Aircraft Manufacturing Company.[5] Northrop would cycle through several aviation industry giants (including Douglas and Lockheed) and launch and sell another company before breaking through to a semblance of success in the Northrop Corporation in 1939.[6] Northrop participated in the successful Douglas DWC (1923) and the Lockheed Vega (1927). The former DWC was constructed for use in the first "around-the-world" flights.[7] Northrop's first flying-wing design did have a tail and was produced in 1929 under the first iteration of the Northrop Corporation.

The X-216H was a boxed tail flying-wing that was used primarily as a technology demonstrator. The aircraft wouldn't see any restoration to fame until Northrop's subsequent redesign with the N-1M – the first true flying-wing design that was also tailless.[8] Subsequently, other nations were experimenting with flying-wing designs, including the Soviet Union and Germany. The latter's success coming largely from the Horten brothers (Walter & Reimar), who had set peacetime records for tailless flying-wing gliders as early as 1934. Northrop's mission in the N-1M was to perfect this concept with a powered flight demonstrator for the design and the vision.[9]

WORLD WAR II

By the early 1930s, the writing was on the wall of impending large-scale conflict. Japan had invaded Manchuria, the Weimar Republic had collapsed under excessive financial stress, and interest in eugenics had begun to intertwine itself in national hegemony across the continents.[10] As much as the world had forced itself to look away from the activity in Asia, it was forced to watch in horror when Germany invaded her neighbors on 1 September 1939. While the conflict had been ongoing, the world was now actively focused on what became World War II.

While World War II saw some of the most astounding figures for fatalities, it also saw some of the greatest strides in technology and tactics. This ranged from the advent of the jet engine, innovations to armor, better tanks and artillery, and the dawn of the atomic age. The world of aviation fundamentally changed during World War II. While World War I established at least some form of need for aviation, the United States resisted its adoption of aircraft for military use. It's private sector, however, saw only opportunity. Because of this, the Americans were aptly able to match in innovation with her adversaries after she was brought into the war on 7 December 1941.

The major players in American aviation during World War II were Boeing and Lockheed, providing large amounts of bombers, fighters, and transport aircraft. Aircraft had been gaining altitude, enhancing and strengthening armor, increasing payload, and increasing range. In Germany, Messerschmitt, Junkers, and the Horten Brothers were the chief manufacturers. Germany's advancement in aviation and technology seemed to outpace the American efforts early in the war. The Horten Model IV (Ho-229) was the duo's first jet-powered flying-wing design.[11] However, their efforts came four years after Jack Northrop had successfully launched his prop-powered N-1M flying-wing. Before the Horten's had even perfected the design for the Model IV, Northrop was moving onto a bigger and grander design. It was a design that would change American aviation.[12]

Northrop's First True-All-Wing

By 1934, Northrop was aware of the Horten's exploits in Germany. His arguably partial success with the X-216H had enabled him to be in a position of expertise. Northrop's end goal was for a true flying-wing, and the transition from the X-216H to the N-1M (and later the N-9) were the natural progressions from concept to functionality. The initial N-1 was a conceptual flying-wing bomber that was supposed to meet the requirements for a new medium-range bomber, but limitations and modifications needed for design resulted in a lapse of time to fulfil this order.[13]

Despite minor stability issues, the craft was largely kept on the ground by poor relationships between size, weight, and power. Certain maneuvers caused instability in an otherwise stable and controllable design. The bulk of the issues, however, came from the power plant on the aircraft. The Lycoming O-145 engines put out a total of 130 horsepower for an aircraft that weighed just shy of 4,000 lbs.[14] Northrop eventually upgraded these to Franklin 6AC engines that produced approximately 235 horsepower.[15] By the time the U.S. Army Air Force awarded the contract for a prototype medium strategic bomber with Northrop just a month ahead of the Pearl Harbor Attacks, the N-1M had made 28 successful flights. These flights provided valuable information for what would become the YB-35.[16]

With a contract award in hand, Jack Northrop and his fledgling company set out on a mission that had already been 12 years in the making. What he did not know was that it would take at least another 40 years before his dream would be a permanent stay in the skies. However, the rest of these 40 years began with only shades of difference from its eventuality.

The First Ordered Flying Wing

The steppingstone between the mockup flying wings and their eventual successors came in late 1941 when the U.S. Army Air Force awarded a contract to Northrop for what would become the XB-35. Northrop had already been collecting valuable data on the flying wings with the N-1M, but the mission set for the XB-35 would prove to be far too different to rely on that data alone. A 3:1 scale mockup of the 60-foot wing-span aircraft was created to help collate and confirm data. This model was the Northrop N-9M.[17]

Unlike its predecessor, the N-9 used a much more powerful powerplant. Northrop sourced Menasco Buccaneer engines, capable of outputting a total of 550 horsepower, over four times the power of the original powerplant. However, the aircraft also weighed three times its original weight with a gross weight approaching 13,000 lbs. In general, between the four aircraft produced, the approximately 600 horsepower powerplants pushed the aircraft to a speed of around 250 miles per hour.[18] While the aircraft was not exactly a speed demon, its intention was more for research in stability, control, maneuverability, and feasibility. The initial N-9 agreement was for three test aircraft, with a fourth included after one of the models was lost in a crash. Models 1, 2, A, and B were the four aircraft produced.[19] The N-9M1 aircraft crashed near Edwards Air Force Base in California in May of 1943. The aircraft had only been flying for six months at the time of the crash. Models 2 and A were already planned, but model B was added to that request.[20]

There were a few design differences in addition to the technological changes between the N-1M and the N-9. Chief among these was the wing slope, tips, and the profile of the engine intakes. The angle of the wing was much more dramatic, and the profile of the canopy was also better integrated. Lastly, the rear of the aircraft was made somewhat concave, creating more of a flying-wing than a delta. From here, more similarities existed rather than differences. Both aircraft utilized rear-facing, twin-prop engines and used wood construct with a metal base. Demonstration of the aircraft proved useful and successful enough that Northrop was able to move on to the full-scale model, the real-deal, and what would eventually become a mainstay in United States Strategic Air Command's arsenal.

Defining the Need

The requirement for a strategic bomber was a relatively new one to the United States in 1941. World War I had demonstrated a need for aviation, but top brass in the U.S. Military were largely skeptical of the use of the airplane as late as 1934. It had seemed that the only ally to aviation was COL Billy Mitchell, now widely accepted as the father of the U.S. Air Force.[21] In addition to opposition by the military, interwar economic struggles and budget cuts had gutted the Army and the Navy. This coupled with the renewed policy of isolation resulted in a defense budget that was built for an anemic force with little training capabilities. Tankers used jeeps with the word "tank" printed on the side, backseat gunners used cardboard cutouts of machine guns, and the inventory of artillery, armor, and aircraft remained small.[22] Up to 1941, the U.S. bombing group consisted largely of a handful of B-17's, 23's, 24's, and the freshly introduced B-25, named after Mitchell. The B-17 handled the heavy bomber mission, while the B-24's and 25's handled the medium-bomber missions.

Bombers had grown, carried heavier payloads, added additional gunners, and pushed higher than ever before. The introduction of the bombsight in 1911 had revolutionized how the bombing mission was conducted, but advanced greatly in the thirty years leading up to U.S. involvement in World War II. The greatest advancement came with accuracy, but even by the time the war ended in 1945, the bombsight was anything but perfect.

The bombers that were present in the U.S. Army Air Corps (USAAC) inventory when World War II began for the United States were tasked with handling a strategic bombing role. This ranged from the Doolittle Raid in early 1942 to the Strategic Bombing Campaign from 1942 through 1945 in Europe. Limited strategic bombing campaigns in the Pacific Theater were largely confined to areas in Micronesia and targets in Southeast Asia. Most strikes on the Japanese home islands were instead largely carpet-bombing runs,[23] while bombing runs on the islands in the Pacific itself were mostly defensive or in a close-air-support role. An exception to the rule was the Matterhorn Missions which included more precise strikes on Japanese military targets.[24]

The USAAC had established the need for strategic bombing with persuasion from Charles Lindburgh and remnant advocation from the then late MG Billy Mitchell.[25] Boeing had started to ramp up research on long-range bombers by 1939 to meet this need. The fruit of the Boeing research would see initial delay for the need of an increased amount of B-17's in late 1941 and early 1942. However, by the time the war had begun, Boeing had largely finished building its prototype XB-29 bomber. The B-29 would soon go on to serve exclusively in the Pacific Theater, the same area of operations it was built for, while the B-17 was tasked with handling more close-range affairs in the Pacific and was the mainstay with B-25's in Europe.

The need for long-range, strategic bombers increased after the Pearl Harbor attacks, and logistics with moving aircraft around was made a much more serious issue. With targets that were on the other side of the world, and with unsure shipping routes over the sea, striking ranges were initially rather limited. This progressively improved in the Atlantic, but the Pacific remained a rather precarious issue. The enemy was on a series of islands and the mainland of eastern Asia. Therefore, the striking range of any bomber group was limited by whatever was the closest, most suitable, and sanitized island. Even after the Battle of Okinawa, portions of Honshu and the northern island of Hokkaido remained outside of the B-29's range to return home safely.[26]

The B-29 nor the B-32 (the Consolidated strategic aircraft that served in a similar capacity to the B-29) were the only strategic bomber concepts on the market. Lockheed and Douglas were also in the mix with their own unique submissions. Lockheed bowed out, but later returned with their P-80 Shooting Star; the first U.S. Army Air Force (USAAF) jet-powered aircraft. All these concepts had one design concept in common, in that they stayed with the normal design schematic of larger aircraft. Jack Northrop and his team, however, were testing something that was still wildly exotic, and were doing so with quite a heap of success. Despite the success, the war had thankfully ended, and many were questioning the state of the defense budget. The biggest monkey-wrenches in a potential cut were the dawn of the Atomic Age and the newly established need for a global presence and containment. These worked in the favor of creative minds such as Northrop.

Defining the Need

The requirement defined by the USAAC in 1941 was not necessarily anything special. The requested speed of the aircraft was to be at least 450 miles per hour, with a stable cruising speed of around 270 miles per hour, a ceiling of 45,000 feet with an operating cruising -altitude of 25,000, and a range of around 5,000 miles.[27] The idea was to keep the aircraft out of effective range of any Nazi German anti-aircraft fire or defenses. When the war ended in 1945, the USAAF opted to continue the contract for research to both Consolidated (which became Convair in 1943) and Northrop.

While Northrop's submission was not selected initially by the USAAF; the funding stream did not end. The USAAF opted instead to select Convair's submission, which subsequently led to the large scale and controversial production of the B-36 Peacemaker. Nevertheless, Northrop's submission was still arguably a success…

Northrop's First Flying-Wing Bomber

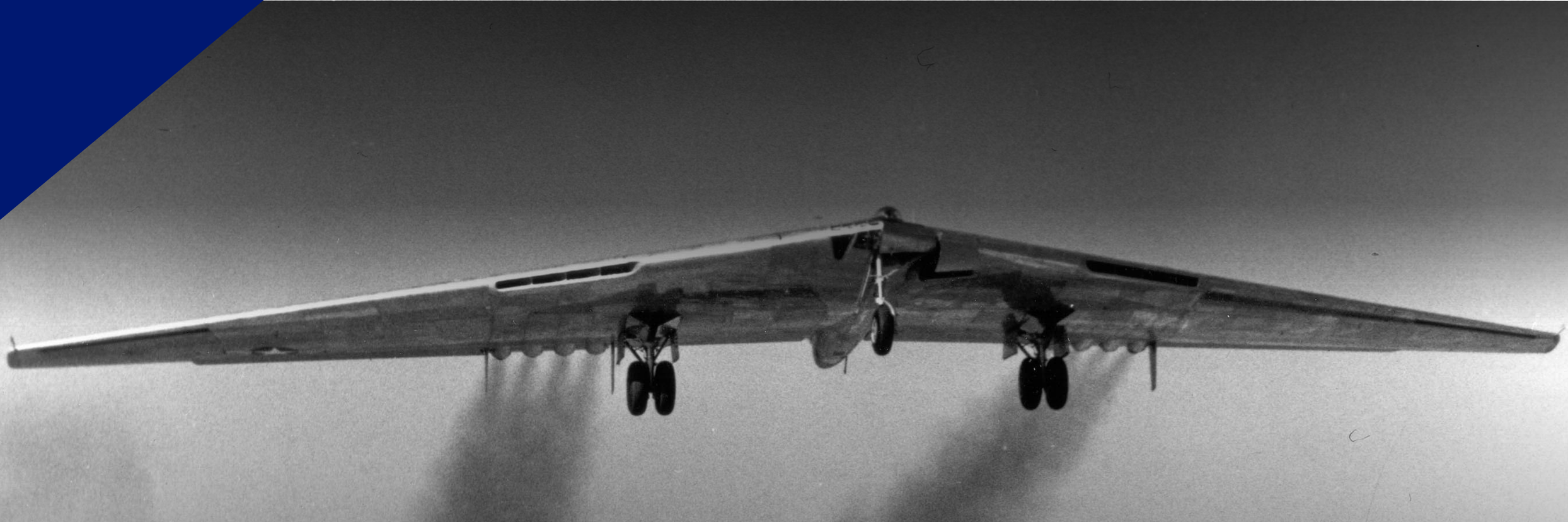
The suspense must have been palpable in late June of 1946 for a team of engineers, a flight crew, and a team of designers in Hawthorne, California. For some it was a culmination of research that had begun with the X-216H in 1929, for others it began with the USAAC order in 1941. For Jack Northrop, however, the moment of truth was close at hand. The results of the testing from the N-9M were about to come to a head. So ready, was this team, that it had installed engines in the aircraft that had not even been tested yet or given any kind of reliability check or quality assurance pass.[28] Nonetheless, 25 JUN 1946 was a day of celebration as Test Pilot Max R. Stanley along with flight engineers Dale Schroeder and Orva H Douglas, Jr. conducted the first flight of the XB-35 (42-13603). The 55-minute flight took the aircraft from Hawthorne to Muroc Army Air Field, present day Edwards Air Force Base, California.[29]

The flight was described as "smooth" despite the untested engines and poor stress test results that followed the initial flight.[30] Aside from the success, the XB-35's performance specifications were rather unremarkable having just met the requirements outlined by the USAAC. What it exceeded, however, was efficiency, payload, and defenses. Its speed was overshadowed by the concept of jet aircraft, and despite its maximum speed of 390 miles per hour with a 240 miles per hour cruising speed, many officials in the USAAF believed that the aircrafts engines made it obsolete.[31] The USAAF had already committed to multiple testbed prototypes. Coupled with the unique and new technology deployed on the aircraft, the USAAF and subsequent U.S. Air Force (USAF) were not ready to call it quits on the program. Jack Northrop and his team certainly were not either.

The design of the YB-35 was the 1:1 scale that the N-9M was based on. Internally referred to as the N-9S, the YB-35 had a 172-foot wingspan and was a true flying-wing. It had an armor complement of 20 M3 Browning .50 caliber machine guns that were in six separate pods around the aircraft, plus a tail gunner in the stinger. It was designed to have a payload of around 50,000 lbs.; however, the original design would not have accommodated the new nuclear bombs such as Fat Man. The aircraft was to have a crew of nine, with the cockpit being situated off-center of the nose. Each propeller was an eight-blade contra-rotating propeller which was designed to maximize efficiency.[32]

The YB-35's persisted in the skies even after the B-36 made its inaugural flight on 8 August 1946. The B-36 was the selected bomber for the USAAF. Issues with the propellers, proprietary tooling, and the lack of jet engines were cited as the reason for the B-36 selection.[33] While the initial B-36 design was aided by propellers, the B-36D had included four jet engines to reconcile issues with its size and weight. Perhaps, luckily, the YB-35's persisting in the skies quickly were adapted to the new jet standard with relatively little pain. The B-36 program on the other hand resulted in one of the most significant blunders in USAAF history and was the chief headache for the newly formed USAF. The fallout resulted in significant friction in the armed forces, particularly between the Navy and the Air Force, as the former was attempting to utilize funding to fleets that could deploy strategic bombers, rather than utilizing an around the world approach.[34]

While the USAF and Navy argued over whether defense budgeting favored supercarriers or superbombers, Northrop and his team were setting their sights on something a bit more reasonable. The future was clear, and that future was for jet engines to reign supreme in the skies. Three of these aircraft were to be converted for the experiment, although all the produced YB-35s were slated for the conversion. This isn't to say that the aircraft didn't have its flaws. Pressure was beginning to mount for both the B-35 and B-36 programs. Excessive budget overruns were creating a tense situation, so much so that the House Armed Services Commission launched investigations into both programs.[35] However, it would be a few years before these cuts would hit the Northrop team.



A Bomber Shrouded in Controversy

It would not be fair to talk about the B-36 in passing without examining it at least briefly.

The B-36 was, for all intents and purposes, a monster of a machine. It had a 230-foot wingspan and was the largest propeller driven aircraft to have ever existed. This was only temporary, as jet engines eventually were retroactively fitted on older models. The aircraft boasted a payload of up to 86,000 lbs and carried atomic payloads standard. It was the first bomber to be able to do so. Unlike its competitor, it featured only a single tail gun that was operated remotely and fitted with two M24A1 autocannon. The aircraft was roughly 150 percent larger than the B-29 Super Fortress and weighed over three times as much.[36]

Setbacks in development, problems with upkeep, operations costs, general repairs, along with significant problems in the research and development process resulted in the programs' high-profile controversy. So controversial was the program that it acquired the name of "the billion-dollar blunder."[37] The chief competitor in the Defense Department budget was the Navy, who was attempting to fund its next generation of supercarrier. When the newly created Department of Defense sided with the newly founded Air Force, resulted in a massive uproar, often referred to as the 1949 Revolt of Admirals.[38]

The Spiritual Predecessor

Rushing. The feeling of designers keeping up with the world around them. Rapid. The pace of the advancement in technology the world was beginning to see. Containment. The prevailing need as the Red Scare gripped the world and the Iron Curtain descended over Eastern Europe.

The precariousness of daily life after World War II was sensitive and uncertain enough. The world was tired after two wars had gripped her, and her citizenry was just as tired. However, a new sense of unease had settled in as the free West laid eyes on a new enemy: communism. The ideology that had taken over Russia in World War I saw a grand opportunity to spread during World War II to other Eastern European nations. Now, it threatened to overtake more. This is what allowed programs such as the B-36 and the YB-35 to persist.

On the other hand, technology was advancing rapidly, and the roughly perfected jet engine had established itself as the engine of the future. While Convair worked to fit new B-36D's with jet engines, and eventually retrofit back to the B-36B,[39] Northrop's unselected option remained potentially viable with the promise of fitting with jet engines. Feeling pressure exerted by the B-36 program and the setbacks from the YB-35, Northrop set out to cut corners in cost by converting existing YB-35's with jet engines while improving avionics. The result was the YB-49.[40]

Of the YB-35's produced, only three were fully converted to the YB-49 prototypes. Most of the flight testing and operations were conducted from Muroc (Edwards) Air Force Base over the course of four years. There were some design, performance, and armament changes in the YB-49 from the YB-35. These changes were implemented in large part due to cost overrun or performance modification to reconcile problems in the YB-35's original testing phase.

The initial YB-49's utilized eight Allison J35-A-15 turbojet engines that produced about 4,000 lbs. of thrust each. This gave the YB-49 a significant increase in speed relatively speaking over both the YB-35 and B-36, peaking just shy of 500 miles per hour. However, its payload was cut to a mere fraction of its previous iteration at under 20,000 lbs. In addition, the twenty Browning .50 caliber machine guns were reduced to four in the stinger alone. Because of the reduction of guns, this meant the number of crew was also reduced from nine to six.[41] Despite all of this, there was one significant factor to be considered with the YB-49 that got many in the Air Force interested in ongoing testing and research. The YB-49 exhibited a significantly reduced radar-cross section (RCS) from previous designs.[42]

The operational history of the YB-49, sadly, was not one of grand success. Two of the prototypes were lost, and the last one was scrapped. The Air Force had sought a new mission for the YB-49 due to its RCS and design specifications: reconnaissance. The current recon mission was being carried out by a handful of converted B-29's and newly retrofitted RB-47's. In 1949, the USAF formally submitted a request to order the YB-49 for its strategic reconnaissance mission with the designation RB-49. Northrop modified the YB-49 for the reconnaissance mission and began testing under the internal control numbers N-38 and N-39, and USAF designation YRB-49. The YRB-49 utilized six engines instead of eight. Four of the Allison J35-A-19's were mounted in the wing itself, while the other two were mounted on pylons under the wing.[43]

The project, however, was eventually cancelled abruptly in 1951. The USAF opted to use the converted RB-47's and convert the RB-57 for the reconnaissance mission instead. They would not revisit a dedicated reconnaissance platform until Lockheed's CL-282 (1953) proposal that eventually produced the U-2 (1955). There are several different reasons cited for the cancellation of the program. The reallocation of focus on the bomber need had since been filled by the B-36 (albeit poorly), B-47, and Boeing's Model 464 (eventually becoming the B-52). Northrop had been spreading itself thin on other experimental aviation research as well, including engines and avionics. Cost overruns within the YRB-49 program, coupled with overruns in the B-36 program may have also led lobbyists in Washington and officials in the Department of Defense to make some budgeting cutting decisions.[44] Regardless of the reason, the program was terminated in 1951, and the last aircraft was scrapped in 1953.[45]

The Future: Fighting a Cold War in the Skies

The last that was said or heard of Northrop's Flying Wing seemed to have been when the YRB-49 prototype that was left was scrapped in 1953. The Boeing B-52 was flying, and rapid-response bombers such as the B-58 were also coming on the scene by the late 1950s. High-supersonic flight seemed to be taking priority in the containment of the Soviet bloc. The future was dictated by programs such as the Valkyrie, Hustler, and smaller quick-strike aircraft. But Northrop's tale was far from over, and he will have the last word in the tale of the flying-wing. What must come first, however, is thirty years of leaps, bounds, advancements, and a change in occupation before it is realized that things were never really broken. It just was the right idea at the wrong time…

This article originally was publicized on 2d Lt Struve's personal website. It has been modified for inclusion in this Civil Air Patrol publication. 2d Lt Struve's background specializes in familial weapon systems and military logistics during the Cold War.

Getting Airborne in Medieval Times: Fire Support & Reconnaissance

By Intern Philip Whan

Over the course of the last one-hundred years, the Air Force has revolutionized warfare. Whereas before, one needed to only account for two themes of battle, land, and sea, but the advent of the airplane caused us to realize the way we must consider the skies themselves as their own domain for warfare, on a scale never realized before. That did not mean the roles adopted by the Air Force were new; however, for over two-thousand years, mankind has been using the air as its own medium to facilitate scouting, to intimidate one's enemies, and even to bombard one's foes, long before Leonardo da Vinci could conjure up dreams of a flying machine.

There are fewer tools for rapid reconnaissance older than the signal fire. In Han Dynasty China, smoke signals were employed as an early warning system for the approach of invading armies. They called it "Wolf Smoke" since it used Wolf dung as fuel so the smoke would be more visible in the daytime (whilst the luminosity of regular fire was used at night). Smoke Signals have been used in Ancient Greece and in Pre-Columbian America, and together with other innovations made communication on troop movements more rapid (and therefore reliable).[1]

After that came the kite, which legends claim originated from an Ancient Chinese practice where one tied string to an arrow whilst hunting so the archer could easily retrieve his (presumably smaller) prey. The first unambiguous date associated with a likely kite was in 3rd Century BC China, when a General named Han Hsin was recorded to have flown a kite over a besieged palace in order to judge the distance between his army and the palace walls, so that he would know the correct length for a planned tunnel to penetrate the compound. They would then be used for signaling over the course of the next thousand years, where in one instance written messages on the kites were flown past enemy lines, so that the strings could be cut and the messages would fall among the prisoners of war, inciting them to revolt as a part of a planned offensive. Scant legends even exist of 'Man-Kites' in the far east capable of lifting men high into the air, where they could gather a greater vantage point than otherwise possible; such claims remain mostly unsubstantiated.

In Medieval Europe, a key variation from the traditional kite was the Draco Windsock Banner, a device that enabled wind to pass through its center and animate the creation (often depicted like a dragon), making it seemingly come alive. This was used to great effect by the Dacians in classical times, and other pagan groups entering the medieval period. They were symbols of fear that struck terror in one's enemies and encouraged allied morale; a later innovation seen by the advent of the 11th century included the placing of a lit torch within its mouth such that it would appear to billow smoke and fire. These Dracos would similarly be used for signaling, and also by Archers to gather wind data, much like how we use wind socks today.

Fireworks are an important part of the history of rocketry and aerial assault, yet their origin remains mysteriously unclear. Some leading scholars have narrowed their widespread adoption within Chinese Society sometime between the 9th and 14th centuries, and possibly developed from either 'Fire Arrows' designed to ignite after being launched from bows or crossbows, or from a special type of firecracker called a 'Ground Rat' that uncontrollably self-propelled across the ground. Regardless, its innovation into a firework held strong appeal with an increased range for projectile weapons, incentivizing its widespread adoption once developed. These developments become the focus of interest to Arab and Mongol militaries, who would proceed to adopt the technology and use it to deliver their own incendiary and explosive charges to their enemies as "rocket-assisted arrows", fired from arbalest crossbows and in some cases known to have a range of 2500 paces (equating to approximately 2 miles or 3 kilometers), giving an idea of their power. Collectively, these developments in weaponry likely identify them as the first true long range armaments alongside if not before the proper advent of the cannon.

Later advancements in artillery devices and aerial vehicles made many of these devices obsolete, but their utilization here helped define their tactical significance within the course of warfare. In that regard, these inventions (among others) were instrumental in cultivating the basic mission focuses of the modern aerial war machine.

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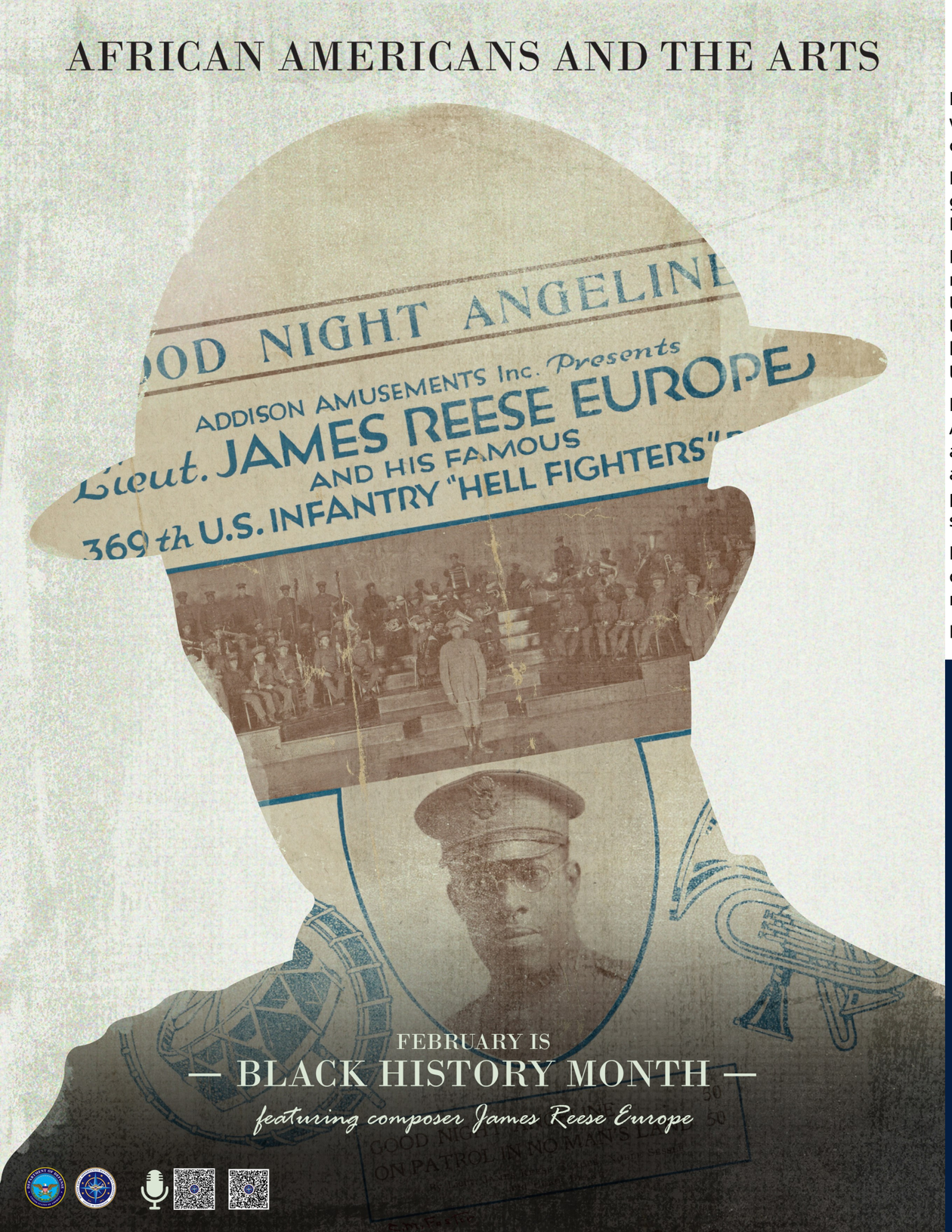

Black History Month

Each year the Department of Defense (DoD), along with the rest of the Nation, recognizes the important contributions and rich culture of African Americans.

Lt. James R. Europe brought African American music genres international while leading the 369th Infantry Regiment "Hell Fighters" band.

His Black musicians proudly played their own original music, including jazz, blues, ragtime, and patriotic tunes, amazing European audiences who were unable to replicate their unique sound. Lt. Europe and his band were celebrated as heroes upon their return at the war's end.

Europe was one of the first mainstream African American musicians. He is recognized as a composer, arranger, and American band leader and is credited as a major figure in transitioning ragtime into jazz and popularizing social dancing across the social class spectrum.

Leonora Hull Brown, a Women's Army Corps member during World War II, was crucial in creating the military's only all-Black female band.

Brown helped form the group after being denied participation in the all-White band. As the only one with musical experience, and with just 8 weeks until their first performance, Brown taught the women volunteers how to play instruments. Their first performance far exceeded expectations.

This group became recognized as the 404th Armed Service Forces band as it fought an uphill battle against discrimination and sexism. After several performances, they were defunded by the Army. However, through community activism, they were reinstated.

Horace Pippin is one of the most celebrated African American painters of the 20th century and a veteran of World War I. Being self-taught, Pippin used a linear art style with powerful design and expressive color. Pippin enlisted in what would become the Army's 369th Infantry Regiment. During his service, a sniper shot permanently disabled his right arm.

Pippin wrote a vivid account of his wartime service and experiences in a 61-page journal which contains numerous battlefield illustrations detailing his injury and which inspired his later work.

To read more, visit the DEOMI website below.

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HONOR THE PAST
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TRIVIA

What was the codename of the project that produced the B-2 Bomber?

Who was the first female fighter pilot?

What is the only aircraft to have ever shot down a satellite?

New trivia is presented every even quarter with answers every odd quarter.

THIS QUARTER IN AVIATION HISTORY

26 MAR 1954

In the Bikini Atoll, the United States sets off a TX-17 thermonuclear device, which produces far more yield than designers had planned. At 11 megatons (instead of an estimated 3-5), the *CASTLE BRAVO* test is the third largest ever conducted by the United States. The prototype used on this date becomes the Mark 17 bomb, carried by the massive B-36 "Peacemaker" bomber, and is the first mass produced and air-deployed thermonuclear weapon in the U.S. arsenal.

12 MAR 1956

The F-100 "Super Sabre" is the Air Force's first supersonic Air Force jet, and is destined to serve with the 45th Fighter Day Squadron out of Morocco. Unofficially, the Air Force secretly flew F-100s to West Germany in 1955 for high altitude photo reconnaissance over Eastern Bloc nations during Operation *SLICK CHICK*.

2 JAN 1967

Col Robin Olds' 8th Tactical Fighter Wing - the "Wolfpack" - wipes out half of North Vietnam's MiG-21 fighter fleet in Operation *BOLO*. Olds' advanced F-4C "Phantoms" tricked Communist intelligence into thinking the advanced fighters were just another easy target of F-105 "Thunderchief" fighter-bombers by flying at altitudes, speeds, routes, and using radio callsigns typical to the less maneuverable F-105s. When the MiGs flew into Olds' ambush, seven "Fishbeds" are shot down in 12 minutes. Olds scores one of the victories, making him the only Air Force ace with kills in both World War II and Vietnam.

2 JAN 1994

The F-4G "Wild Weasel V" flies its last combat mission, during a flight over Iraq. During Operation *DESERT STORM*, the Wild Weasel crews took on the dangerous role of targeting Iraqi air defense networks, destroying some 200 sites.

1 FEB 2003

The Space Shuttle *Columbia* (STS-107) disintegrates upon reentering the earth's atmosphere, killing all seven crewmembers. Aboard are Col Rick D. Husband (USAF), Cmdr William C. McCool (USN), Lt Col Michael P. Anderson (USAF), Capt David M. Brown (USN), Capt Laurel Clark (USN), Israeli Air Force Col Ilan Ramon, and Kalpana Chawla, a civilian mission specialist.

BIRD WARS

There are only two known instances of man declaring war on birds. The first was conducted by the Australians in 1932 with the Emu War. The second was part of China's "Four Pests" campaign from 1958—1962, which included Sparrows. In both cases, the desired outcome was to reduce the outcome of pest birds in the region. In both cases, the warring nation did not achieve mission objectives. The moral of this story? Don't fight the birds.

GEESE AWARENESS

The most formidable foe on the face of the Earth may not be the full might of the United States' Military. Nor is it the nuclear weapons capabilities of nations. Unbeknownst to many, the most formidable opponent is, in fact, the Canadians. More specifically, it is their fleet of autonomous AI-like feathered dinosaurs known as Canadian Geese.

Each year, thousands of geese infiltrate the United States conducting covert reconnaissance of cars and parks, perform strategic strikes on valuable objects, and strike on those who appear defenseless or otherwise minding their own business.

This leaves us with two reminders:

1. Don't fight the geese.
2. Wish geese only on your worst enemy.

NOTES & BIBLIOGRAPHIES

A SPIRIT RISING:
THE ORIGINS OF THE FLYING WING

[1] *1911 Census of St. George, London: John William Dunne*. Belgrave, London, Britain. 1911.

[2] Dunne, J. W. *An Experiment With Time*. Faber, London, Britain. 1927.

[3] *The London Gazette*. Issue 27425. London, Britain. 15 April 1902. p. 2505.

[4] Walker, Percy B. *Early Aviation at Farnborough: The First Aeroplanes.* Volume II. MacDonald & Co. Ltd, London, Britain. 1974.

[5] Hall, Nova. "Spirit and Creator." *Orbital Air Inc.* 2002. pp 61-65.

[6] Peck, Merton J.; Scherer, Frederic M. *The Weapons Acquisition Process: An Economic Analysis.* Harvard Business School, Harvard, Connecticut. 1962. p. 619.

[7] Wendell, David V. "Getting Its Wings: Chicago as the Cradle of Aviation in America." *Journal of the Illinois State Historical Society.* Volume 92, Issue 4. Winter 1999-2000. pp 339-372.

[8] Maloney, Edward T. *Northrop Flying Wings.* Corona del Mar, California. 1988. p. 1.

[9] Coleman, Ted. *Jack Northrop and the Flying Wing: The Real Story Behind the Stealth Bomber.* Paragon House, New York, New York. 1988. p. 84.

[10] Large, David Clay. *Between Two Fires: Europe's Path in the 1930s.* Revised. W. W. Norton & Company, New York, New York. 1991.

[11] Green, William. *Warplanes of the Third Reich.* MacDonald & Jane's Publishers, Limited, London, Britain. 1970. p. 247.

[12] Winchester, Jim. "Northrop XB-35/YB-49." *Concept Aircraft: Prototypes, X-Planes and Experimental Aircraft.* Grange Books, Kent, United Kingdom. 2005. p. 193.

[13] Chong, Anthony. *Flying Wings & Radical Things: Northrop's Secret Aerospace Projects & Concepts 1939-1994.* Specialty Press, Forest Lake, Minnesota. 2016.

[14] Darling, Kev. *American X&Y Planes: Volume 1: Experimental Aircraft to 1945.* First Edition. The Crowood Press, Marlborough, United Kingdom. 2009.

[15] "Northrop N1M." *National Air and Space Museum.* Smithsonian Institution. Accessed 31 July 2021.

[16] Allen, Francis. "Before the B-2: Northrop's Flying Wings, the XB-35 and the XB-49." *Air Enthusiast*. Issue 106. Key Publishing, Stamford, United Kingdom. July/August 2003. p. 5.

[17] O'Leary, Michael. "The Shape of Wings to Come." *Aeroplane*. Volume 35, Issue 6. June 2007. p. 65.

[18] Ibid.

[19] Parker, Dana T. *Building Victory: Aircraft Manufacturing in the Los Angeles Area in World War II.* Dana Parker Enterprises, Cypress, California. 2013. pp. 93, 102-106.

[20] O'Leary, 2007. p. 66.

[21] Large, 1991.

[22] Col Meilinger, Phillip S. "Billy Mitchell." *American Airpower Biography.* Maxwell AFB, Alabama. 24 September 2008.

[23] Wolk, Herman S. "The Twentieth Against Japan." *Air Force Magazine*. April 2004. p. 125.

[24] Correll, John T. "The Matterhorn Missions." Air Force Magazine. March 2009. pp. 62-63.

[25] Herman, Arthur. *Freedom's Forge: How American Business Produced Victory in World War II.* Random House, New York, New York. 2012. pp. 289-291.

[26] Loftin, L.K., Jr. *Quest for Performance: The Evolution of Modern Aircraft.* NASA SP-468. Accessed 1 August 2021.

[27] Taylor, John W.R. "Convair B-36." Combat *Aircraft of the World from 1909 to the Present.* G.P. Putnam's Sons, New York, New York. 1969. p. 465.

[28] Pape, Garry R.; Campbell, John M. *Northrop Flying Wings: A History of Jack Northrop's Visionary Aircraft.* First Edition. Schieffer Publishers, Atglen, Pennsylvania. 1995. p. 253.

[29] Ibid, pp. 116-193.

[30] Ibid.

[31] "XB-35 Project Report." *USG Microfilm A2061. in Air Force Case History Files.* Accessed 1 August 2021.

[32] Pape, 1995. p. 253.

[33] "XB-35 Project Report." *USG Microfilm A2061. in Air Force Case History Files.* Accessed 1 August 2021.

CALL FOR SUBMISSIONS

The Iowa Wing History Office is accepting submissions for articles in this newsletter. If you would like to contribute material to the newsletter, please submit an outline and proposal for research to the History Office.

Submissions must meet standards for academic writing and meet standard mission requirements of the Civil Air Patrol and the Iowa Wing. If you have questions about this, feel free to reach out to us and ask.

Submissions are accepted from Senior Members, Cadets, former members, and other individuals with an interest in history. They are then checked for accuracy prior to publication to ensure they meet the standard. Priority is given to Civil Air Patrol topics and history materials.

For more information or to submit a proposal, email the Iowa Wing History Office at:
history@iawg.cap.gov

GOT HISTORY?

You can submit your historic materials to the Iowa Wing History Office via email, messenger, or snail mail.

If you've got physical items you'd like to turn over to the Iowa Wing History Office, please feel free to reach out to us through email first before sending your items. This helps us make sure items are not overlooked when they are received and allow us to properly document the item.

For Oral Histories, please submit a request to the Iowa Wing History Office via email. We will then reach out to you to coordinate the best time and day to conduct this interview.

Got an inquiry?
You can email us your inquiry via our email address or by sending the squadron a message via Facebook. Email: history@iawg.cap.gov

For more history information, please visit our website at:
https://www.iawg-history.cap.gov

NOTES & BIBLIOGRAPHIES

A SPIRIT RISING:
THE ORIGINS OF THE FLYING WING
(CONTINUED)

[34] Barlow, Jeffery G. *Revolt of the Admirals: The Fight for Naval Aviation, 1945-1950.* Naval Historical Center, Washington D.C. 1994. p. 42.

[35] Pattillo, Donald M. *Pushing the Envelope: The American Aircraft Industry.* University of Michigan Press, Ann Arbor, Michigan. 2001. p. 153.

[36] "Convair B-36J." *National Museum of the United States Air Force.* NMoUSAF, Dayton, Ohio. Accessed 6 August 2021.

[37] Wolk, Herman S. *Fulcrum of Power: Essays on the United States Air Force and National Security.* Diane Publishing, Darby, Pennsylvania. 2003. p. 163.

[38] Barlow, 1994. p. 42.

[39] "B-36 Adds Four Jet Engines." *Popular Mechanics.* July 1949. p. 124.

[40] Pattillo, 2001. p. 158.

[41] "Fact Sheet: Northrop YRB-49." *National Museum of the United States Air Force.* NMoUSAF, Dayton, Ohio. Accessed 4 August 2021.

[42] Heppenheimer, T.A. "Stealth: First Glimpses of the Invisible Aircraft Now Under Construction." *Popular Science.* September 1986. pp. 74-77.

[43] Pattillo, 2001. p. 185.

[44] Donald, David ed. "Northrop Flying Wings." *Encyclopedia of World Aircraft.* First Edition. Prospero Books, Etobicoke, Ontario. 1997. p. 709.

[45] "Fact Sheet: Northrop YRB-49." *National Museum of the United States Air Force.* NMoUSAF, Dayton, Ohio. Accessed 4 August 2021.

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