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Corey J Beitler's

"Distelfink Airlines"

An Online Aviation Newsletter

A Classic Curtiss "Jenny" Model



Dassault Falcon 900LX

1959 RCAF Golden Hawks Aerobatic Team Brochure

1:72 Scale Matchbox Collectibles Supermarine Spitfire Mk. Ia

North American X-15

Ryan PT-22 Recruit

"Foam 331": A First Responder On September 11, 2001

This colorful model of a Curtiss "Jenny" World War I training and 1920s barnstorming aircraft was manufactured in the early 2000s by Authentic Models. The model features wonderful details, such as fabric-over-wooden-frame construction for the fuselage and wings, a detailed metal engine, a laminated wooden propeller, and metal-spoke wheels with real rubber tires.

FROM THE EDITOR'S DESK

Curtiss "Jenny" Model, PT-22 Recruit, X-15, Spitfire Model, Foam 331 Crash Truck

Greetings Everyone:

Welcome to the September edition of "Distelfink Airlines"! I hope all my readers are doing well! We are now in September, and with fall quickly approaching, so is the twilight of the airshow and aviation event season. There are still a few local airshows and aviation events on my calendar, and weather permitting, some of these events will be featured in upcoming editions of "Distelfink Airlines". I also want to announce that I plan to write the newsletter in 2027 and continue my aviation photojournalism efforts with "Distelfink Airlines". I hope you will all continue to read the newsletter and enjoy it.

The featured content of this edition is another model from Authentic Models from my personal collection. After I featured the company's desktop-sized Sopwith F.1 Camel model in the August edition of my newsletter, several people reached out to me and asked if I could also do a feature about the Curtiss "Jenny" model that was seen in one of the pictures of the Sopwith Camel. So here is a feature about the Authentic Models desktop-sized Curtiss "Jenny" model. Similar to the Camel, the "Jenny" features a wooden frame construction with fabric covering for the wings and fuselage, metal spoke wheels and rubber tires, a laminated wooden propeller, a detailed metal engine, and a colorful retro-style paint scheme. I have had this model in my collection for many years and always get positive comments about its details and color scheme. I am happy to feature it in the newsletter for those who were interested in it.

The "Aircraft of Special Interest" section features the Ryan PT-22 Recruit. The PT-22 Recruit was used as a primary training aircraft during World War II and was a development of the Ryan ST and STA series of training and sport aircraft designed and built in the mid-to-late 1930s and early 1940s.

The "Museum Aircraft Spotlight" section for September features an aircraft I have wanted to feature in the newsletter for several years: the North American X-15. The X-15 was designed and flown as part of the X-plane series of research aircraft by the U.S. Air Force and NASA. The research gained by flying the X-15 was incorporated into the design of future aircraft and spacecraft. The X-15 featured in this section hangs in the National Air and Space Museum's National Mall location in Washington, D.C.

"Aircraft Models" features a 1:72 die-cast model of a Supermarine Spitfire Mk. Ia made by Matchbox Collectibles in the early 2000s. The model is painted in the colors of the Spitfire Mk. Ia flown by Squadron Leader Brian Lane during the Battle of Britain,

Finally, "One Last Thing" features a short write-up and photos of "Foam 331". "Foam 331" is an Oshkosh T-3000 airport crash tender that was one of the first responding vehicles to the Pentagon following the terrorist attack on the building on September 11, 2001. Since this year is the 25th anniversary of the September 11 Attacks, I felt this edition was the perfect place to feature this truck and share its story.

Thank you again for supporting my aviation photojournalism efforts and "Distelfink Airlines" this year. Please feel free to share the newsletter with whoever you wish and invite them to join the newsletter's official social media pages listed below.

Regards,

-Corey

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One Last Thing:

"Foam 331": A First Responder On September 11, 2001

This airport crash tender, formerly operated by the Metropolitan Washington Airports Authority (MWAA) at the Ronald Reagan National Airport, was one of the first responders to the September 11, 2001, terrorist attack on the Pentagon.

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Dassault Falcon 900LX



A Dassault Falcon 900LX corporate aircraft arriving at the Lehigh Valley International Airport in Allentown, Pennsylvania. Introduced into service in 1986, the Dassault Falcon 900, commonly abbreviated as the F900, has been a popular aircraft with civil, government, and military operators worldwide. Introduced in 2008, the Falcon 900LX is the current production variant of the improved Falcon 900EX and features more powerful engines, blended winglets for improved fuel efficiency, and updated avionics.

The Dassault Falcon 900LX is a variant of the Dassault Falcon 900, a corporate trijet designed and produced by French aerospace manufacturer Dassault Aviation. Commonly abbreviated as the F900, the Dassault Falcon 900 has been a sales success with both corporate and military operators since its introduction into service in 1986.

The Dassault Falcon 900 has its origins in the Dassault Falcon 50. Operators of the Falcon 50 enjoyed the aircraft and its performance capabilities, and in the early 1980s, began asking Dassault Aviation about building a larger aircraft. The Falcon 900 introduced several improvements to the Falcon 50, including a larger, wider cabin with a more comfortable interior, improved amenities, and accommodations for up to 19 passengers depending on cabin seating configuration. The Falcon 900 also featured composite materials throughout its design to substantially reduce its operating weight and digital avionics. Three Garrett TFE731-5AR-1C (later Honeywell) turbofan engines powered the Falcon 900. The Falcon 900 first flew in 1984 and entered service in 1986. In 1991, the Falcon 900B was introduced, which incorporated more powerful TFE731-5BR-1C engines. The 900C variant replaced the 900B in 2000. The Falcon 900EX, a long-range variant with more powerful TFE731-60 engines and Honeywell Primus avionics, entered service in 2000. The Falcon 900EX EASy, a long-range variant built from 2004 to 2009, featured Dassault/Honeywell Primus Epic EASy avionics. The Falcon 900DX was a shorter-range production variant with TFE-731-60 engines built alongside the 900EX EASy. Introduced in 2008, the Falcon 900LX is the current production variant of the Falcon 900EX. This variant features high-Mach blended winglets and has a range of 4,750 nautical miles (5,466 mi; 8,797 km). Military and government operators have also ordered specialized variants of the Falcon 900 for use in VIP transport, command support, and maritime patrol roles. Since 1984, Dassault Aviation has built over 500 Falcon 900s for civil, government, and military operators worldwide.

The Falcon 900LX pictured here can seat 12 to 19 passengers depending on cabin configuration and is powered by three Honeywell TFE731-60 turbofan engines. The Falcon 900LX cruises at a ceiling of 51,000 feet (15,549 m) at a normal cruise speed of Mach 0.69 (528 mph; 850 km/h; 459 kn). The Falcon 900LX has a range of 4,750 nautical miles (5,466 mi; 8,797 km) and a maximum takeoff weight (MTOW) of 49,000 pounds (22,226 kg).





1959 RCAF Golden Hawks Aerobatic Team Brochure



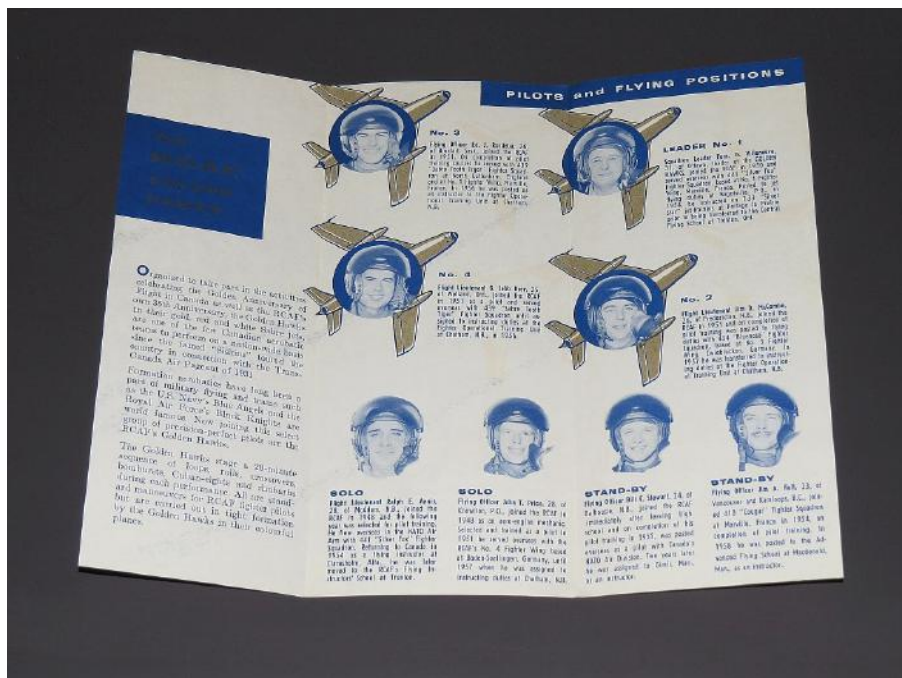
Members of the RCAF Golden Hawks aerobatic team handed out this brochure to airshow spectators during the 1959 airshow season. The Golden Hawks were formed by the Royal Canadian Air Force in 1959 to fly airshow demonstrations to celebrate the 35th anniversary of the RCAF and the 50th anniversary of the first flight in Canada. Intended to fly only one airshow season, the Golden Hawks ended up flying 317 airshows in North America over four years before being disbanded in 1964.

Airshow fans and aviation enthusiasts worldwide, especially in North America, know Canada's official military aerobatic demonstration team, the Canadian Forces Snowbirds. Officially known as the 431 Air Demonstration Squadron, the Snowbirds are famous for their red-and-white Canadair CT-114 Tutor jet trainer aircraft and their precision nine-jet formations. But long before the Snowbirds became a cultural icon in Canada, another Canadian military airshow team promoted the nation's heritage and aviation excellence across North America.

The Golden Hawks were a Royal Canadian Air Force (RCAF) aerobatic team formed in 1959 to celebrate the RCAF's 35th anniversary and the 50th, or "Golden", anniversary of Canadian flight, which began with the first flight of the AEA Silver Dart in 1909. Initially, the team was envisioned as performing only during the 1959 airshow season. The Golden Hawks were planned as a six-plane team featuring a formation flight of five aircraft and a single aircraft performing solo maneuvers. Led by Squadron Leader Fern Villeneuve and flying metallic-gold Canadair Sabre Mk.5s (a Canadian license-built version of the North American F-86 Sabre), the team was so popular during the 1959 airshow season that it was reestablished for the 1960 season. The Golden Hawks also expanded to a seven-aircraft team and added a second solo pilot. The team flew at airshows in Canada and the United States for three more seasons. In 1961, the team switched to the more powerful Sabre Mk.6, and Flight Lieutenant James McCombe became team leader after Fern Villeneuve departed the team when he got married. In February 1964, the RCAF disbanded the Golden Hawks for financial reasons after the team had flown 317 airshows throughout North America. The Golden Hawks are credited with pioneering the two-aircraft head-on coordinated solo program used by many military aerobatic demonstration teams today. The team also invented the Card 5 Maneuver, where five aircraft fly in a card formation with two in front, one in the center, and two in the rear. Today, the legacy of the Golden Hawks lives on in Canadian aviation museums, where several Sabre Mk.5 and Mk.6 aircraft used by the team are displayed, and at airshows by the Canadian Forces Snowbirds.

This informational brochure was handed out by Golden Hawks pilots and team members to airshow spectators during the 1959 season. The brochure was designed to provide airshow spectators with information about the Golden Hawks pilots and the team's flight demonstrations. The brochure is an excellent piece of aviation and airshow memorabilia and is a great look back at Canadian airshow and aviation history.





The inside of the brochure features photos and brief biographies of the Golden Hawks pilots, and their flight positions on the team. These positions changed in later years as two of the team members died in crashes and Squadron Leader Fern Villeneuve left the team in 1961.



The back of the brochure has a brief history of the RCAF. Another paragraph states that special events will be held throughout Canada to celebrate the 50th anniversary of the first flight in Canada and the RCAF's 35th anniversary. The brochure also features the special insignias created by the RCAF for these anniversaries.

1:72 Scale Matchbox Collectibles Supermarine Spitfire Mk. Ia



These excellent, value-priced, 1:72-scale die-cast model of a Supermarine Spitfire Mk. Ia World War II British fighter aircraft was made by Matchbox Collectibles in 2001 as part of a series of die-cast military aircraft models that were sold in discount retail stores, supermarkets, and drug stores during the early 2000s. This Spitfire Mk. Ia is painted in the colors of the aircraft flown by Squadron Leader Brian Lane, who commanded No. 19 Squadron during the Battle of Britain and shot down several German aircraft during the battle.

The Supermarine Spitfire is a British single-engine, single-seat fighter aircraft used by the Royal Air Force (RAF) and many other Allied countries during and immediately following World War II. Designed as an interceptor, the Spitfire proved to be a versatile design, and the aircraft was adopted for several other roles during the war. Introduced into service in 1938, the Spitfire has the distinction of being the only British fighter aircraft produced continuously through the war. The Spitfire remains one of World War II's most famous fighter aircraft and is considered one of the most revolutionary aircraft in British aviation history.

The Spitfire was the final product of several years of design development at the Supermarine Aviation Works. There, R.J. Mitchell, the company's chief designer, designed seaplane racers to compete in the Schneider Trophy Races, an international speed competition for seaplanes and flying boats. Mitchell designed every British aircraft that won the competition after World War I. On September 13, 1931, his S.6B racer permanently retired the Schneider Trophy to Great Britain

by winning the 1931 contest. The victory was the third consecutive win in the Schneider Trophy for the nation, meeting the criteria for permanent retirement of the Schneider Trophy and ending the speed contests.

Interest in international speed contests waned, but Mitchell continued his work on new designs, focusing on landplanes instead of seaplanes. By the mid-1930s, Mitchell was working on a new short-range, high-performance interceptor. The interceptor incorporated several new innovations, including an enclosed cockpit, retractable landing gear, and the new Rolls-Royce PV-12 inline engine (later named the Merlin). The new interceptor's most evolutionary feature was its new elliptical wing. Designed by Beverley Shenstone, the wing featured sunken rivets to reduce drag and the thinnest possible cross-section. The elliptical wing shape also provided space for retractable landing gear and to store armament and ammunition. The wing, along with the aircraft's slender fuselage, allowed the new interceptor to achieve a higher top speed than most contemporary fighters, including the Hawker Hurricane.



When the British government issued a specification for a new fighter, with an armament of eight machine guns, instead of the usual four, Mitchell was ready with the Supermarine Type 300. The prototype Spitfire flew on March 5, 1936, and surpassed all performance expectations issued by the Air Ministry. The Air Ministry quickly drew up production contracts for the new fighter. Sadly, R.J. Mitchell did not live to see the Spitfire reach production, as he died of cancer in 1937. Mitchell's assistant, Joseph Smith, took over and oversaw the Spitfire's continued development through several production variants. By the time war was declared on Germany, 400 Spitfires were already in service and over 2,100 were on order. Even as these first Spitfires entered service, improvements were already being made, such as the addition of a bulletproof windshield, a tailwheel instead of a tailskid, and a new propeller. In 1943 with the addition of external fuel tanks which could be jettisoned, increasing the Spitfire's range. The second weakness was that although the Spitfire was heavily armed with eight .303 in (7.7 mm) machine guns, this armament lacked stopping power. In later Spitfire variants, armament was upgraded to a pair of 20 mm (.79 in) cannons and four .303 in (7.7 mm) machine guns for increased firepower.

Throughout the war, the Spitfire received other modifications and improvements. Later versions of the Spitfire featured clipped wings, a cut-down rear fuselage with a bubble canopy for improved pilot visibility, four- and five-blade propellers for increased performance, and the addition of equipment such as reconnaissance cameras and rescue gear. Changes in engines to power the fighter were also made to improve the Spitfire's performance. Initial Spitfire variants used the Rolls-Royce Merlin engine. Later Spitfire variants used versions of the more powerful Rolls-Royce Griffon engine. Some versions of the Griffon engine developed over 2,000 horsepower. These improvements kept the Spitfire competitive throughout the war with the latest variants of German fighter aircraft such as the Focke-Wulf Fw 190 and the German Messerschmitt Bf 109.



Models in the Matchbox Collectibles series (except for the World War I aircraft) were molded in the "gear-up" configuration and therefore do not include landing gear. As a result, the models must be displayed on the included display stand. This plastic display stand is a shortcoming of the Matchbox Collectibles models; it is cheaply made, and models can easily be knocked off the stand and break.





The Matchbox Collectibles 1:72 scale Supermarine Spitfire Mk. Ia represents excellent value. The model features an accurate paint scheme with the correct squadron codes and serial number representing the Spitfire Mk. Ia flown by Brian Lane during the Battle of Britain. The model also features exhaust and gun barrel staining, an unusual paint detail for a model in the price range at which the Matchbox Collectibles product line was sold.

The Spitfire proved to be adaptable to several roles during the war. In addition to its primary role as an interceptor and air superiority fighter, the Spitfire was used as a bomber escort, fighter-bomber, search-and-rescue aircraft, naval target and gunnery spotting, and photo-reconnaissance platform. To help pilots learn to fly the Spitfire, two-seat trainer variants of the fighter were built. The Seafire, a naval version of the Spitfire, featured strengthened landing gear, an arrestor hook, and folding wings for operations off aircraft carrier decks. Spitfires served in several of these roles until the type was retired from service in the 1950s.

Although most widely known for its role during the Battle of Britain, the Spitfire was used by the RAF and British Commonwealth countries throughout World War II. During the war, large numbers of British, Belgian, Free French, Polish, Canadian, Australian, Czech, and American pilots flew Spitfires in all theaters of operation. Over 20,000 Spitfires of all variants were built during the type's production run, which lasted from 1938 to 1948. Most countries that kept the Spitfire in service after World War II retired the type by the mid-1950s. The Irish Air Corps were the last military operator of the Spitfire, retiring their last examples in 1961.

This 1:72 scale, die-cast model of a Supermarine Spitfire Mk. Ia was manufactured by Matchbox Collectibles in 2001. The Spitfire was part of a series of 1:48-scale and 1:72-scale die-cast military aircraft models produced by the company from 2000 to 2004 and often sold in the toy sections of discount retail stores, drug stores, and supermarkets. The series of models included aircraft from World War I, World War II, the Korean War, and the Vietnam War. Unfortunately, the models sold poorly at mass retailers, and the series was discontinued after only a few years. Today, these models continue to be appreciated by collectors due to the incredible value and quality they offered when they were originally sold.

The Matchbox Collectibles Supermarine Spitfire Mk. Ia model was released in three color schemes. One of the models was released in cooperation with the National Aviation Hall of Fame and was painted in the colors of a Spitfire Mk. Ia flown by William Dunn during the Battle of Britain. Dunn was a member of the Eagle Squadron, a squadron made up of American volunteers who fought for the RAF during the Battle of Britain. Another paint scheme for the model represents a Spitfire Mk. II flown by Adolf Vybiral, a pilot who served with RAF No.312 (Czech) Squadron.



The third color scheme was this model, “QV-K”, a Spitfire Mk. Ia, flown by Squadron Leader Brian Lane during the Battle of Britain in September 1940. Lane was the Squadron Commander of No. 19 Squadron and shot down several German aircraft during the battle, as well as during the evacuation of the British Expeditionary Force from Dunkirk in late May and early June 1940. Lane was awarded the Distinguished Flying Cross for his actions in combat and wrote a book titled *Spitfire!* about his exploits during the Battle of Britain. Lane went missing on a sortie to Holland in December 1942.

The Matchbox Collectibles 1:72 scale Supermarine Spitfire is an excellent model of the legendary British World War II fighter. The die-cast and plastic model features excellent details, including recessed panel lines, a pilot figure in the cockpit, and separate parts for the engine exhaust stacks, pitot tube, and radio aerial.

Lane’s Mk. Ia Spitfire’s color scheme and markings are well-known, as pictures of the aircraft exist from the Battle of Britain. Matchbox Collectibles accurately depicted all the national insignias and squadron coding found on Brian Lane’s Spitfire. An added paint detail on the model is the exhaust staining behind the engine exhaust stacks and gun barrel staining behind the gun bar-

rels on the underside of the wings. This detailing is a nice feature for a model in a more affordable price range. The green and brown camouflage colors on the top surfaces, and light gray on the lower surfaces, are well executed on the Spitfire, with minimal paint overspray and imperfections.

Unfortunately, all Matchbox Collectibles military aircraft models came with a simple plastic display stand. The display stand is made of plastic and comes in two pieces, which snap together to assemble the stand. The stand’s base features the aircraft’s name and the Matchbox Collectibles logo printed on it. The Spitfire, similar to other models in the series, does not fit tightly on the stand. The models can also fall off the stands if mishandled. The display stand was the major shortcoming of these Matchbox Collectibles models.

The 1:72-scale Supermarine Spitfire Mk. Ia die-cast model from Matchbox Collectibles is an excellent, value-priced replica of the famous British World War II fighter aircraft. All three color schemes the model was offered in are available for reasonable prices on the secondary market. The model is also the perfect size for a small display space and will delight any aviation enthusiast who enjoys World War II aircraft models.



The Supermarine Spitfire Mk. Ia and Mk. II die-cast models from Matchbox Collectibles represent incredible value for anyone looking for an affordable model of the legendary World War II British fighter aircraft to display on their desk or bookshelf. This version of the model, the Spitfire Mk. Ia, flown by Squadron Leader Brian Lane, is an excellent replica of an aircraft flown by a pilot who shot down several German aircraft during the Battle of Britain.



A Classic Curtiss "Jenny" Model



This model of the famous World War I trainer and 1920s barnstormer aircraft features classic styling, intricate details, and a colorful paint scheme that will delight aviation enthusiasts of all ages.

The Authentic Models desktop-sized Curtiss "Jenny" model included a colorful wooden display stand decorated in a style similar to a pylon from 1920s or 30s air racing events. Instead of using the stand, the model could be displayed on its landing gear or, because of its lightweight design, be hung from a ceiling with minimal difficulty.





Although over 6,000 Curtiss JN "Jennies" of all variants were built, only about three dozen survive in museums or private collections worldwide. This restored 1917 JN-4D "Jenny" is on display in the Glenn H. Curtiss Museum located in Hammondsport, New York.

The Curtiss JN "Jenny" is a series of biplane training aircraft that were built by the Glenn Curtiss Aeroplane Company of Hammondsport, New York, later the Curtiss Aeroplane and Motor Company. The JN series was originally produced as training aircraft for the U.S. Army, where it was nicknamed the "Jenny". After the war, thousands of Curtiss "Jennies" were sold as surplus to private owners, and the airplane became the backbone of American postwar aviation. Although the "Jenny" performed well as a trainer during World War I, it played a much more significant role postwar as a mail-carrying and barnstorming aircraft. The airplane's affordability, ease of operation, availability of spare parts, and versatility made the "Jenny" a signature aircraft of the 1920s barnstorming era. The barnstorming era and the Curtiss "Jenny" helped introduce civil aviation to many Americans living in rural areas of the United States throughout the 1920s.

The story of the Curtiss "Jenny" began in 1914. The U.S. Army was disgusted with its open-to-the-wind pusher training aircraft. Their performance was infe-

rior to the aircraft being built in Europe, and the accident rate was high. The U.S. Army approached Glenn Curtiss and asked him to design and build a new training aircraft with a tractor propeller and an enclosed fuselage. Curtiss hired designer B. Douglas Thomas from the Sopwith Aviation Company in England to help him build the new aircraft.

The first production version of the JN or "Jenny" series was the JN-2 in 1915. The biplane had large, equal-span wings with ailerons controlled by a shoulder yoke in the rear cockpit. The eight JN-2s built were handed over to the 1st Aero Squadron of the Aviation Section of the U.S. Signal Corps. Unfortunately, the pilots of the 1st Aero Squadron soon found that the JN-2 lacked performance and was unsafe to fly. The new airplane was overweight, lacked stability, and had an oversensitive rudder. Shortly after they began flying the JN-2s, the 1st Aero Squadron crashed two of the new aircraft. The 1st Aero Squadron and its aircraft were then grounded for safety reasons. Curtiss was ordered to make design changes to the JN-2 to improve its performance.



Curtiss redesigned the JN-2 and designated the new aircraft the JN-3. The improved JN-3 had unequal-span wings and ailerons on the top wing controlled by a wheel. A foot bar was added in the cockpit to control rudder movements. These flight control changes improved the “Jenny” enough that it could be flown safely. In March 1916, eight JN-3s were deployed to Mexico and used as an observation aircraft during the Pancho Villa Expedition.

After the success of the JN-3 variant of the “Jenny”, Curtiss once again made improvements to the design, the new “Jenny” being designated the JN-4. With World War I in full swing, both the U.S. Army and the Royal Flying Corps in Canada needed training aircraft and placed large production orders for the JN-4. In Canada, the name “Canuck” was chosen for the new aircraft. The Canadian “Canuck” also had other differences from the American “Jenny”, such as a more rounded rudder, differently shaped wings and elevators, and strut-connected ailerons on both wings. The JN-4D was the definitive production vari-

ant of the “Jenny”. Changes to this model included a control stick instead of a wheel, ailerons on the upper wing only, and curved cutouts on the inner trailing edges of all four wing panels to facilitate easier cockpit access.

The “Jenny’s” slow speed and gentle handling characteristics made it an ideal training aircraft. The tandem cockpit seating allowed a student pilot and instructor to fly together. The “Jenny’s” slow speed meant that if there was an accident, it usually was not fatal. The “Jenny” and the Canadian “Canuck” played a pivotal role in Allied pilot training programs during World War I, with an estimated 95% of pilots completing at least some primary flight training in the aircraft. This training took place even in the harsh Canadian winter weather, with the “Jennies” wheels replaced with skis to fly off snow-covered runways. In addition to its use as a trainer, the “Jenny” was also used as an air ambulance, its rear fuselage decking removed to accommodate a stretcher, one of the first times an aircraft was used in this role.



The JN-4D was the most-produced variant of the Curtiss JN “Jenny” series. The Golden Age Air Museum in Bethel, Pennsylvania, owns this restored 1917 JN-4D. This “Jenny” is maintained in airworthy condition and regularly flown during special events held at the museum. The aircraft is restored in the colors of famous barnstormer and Hollywood pilot Earl S. Daugherty from Long Beach, California.



The Old Rhinebeck Aerodrome in Red Hill, New York, has a rare JN-4H variant of the “Jenny” in their collection of antique airplanes. The JN-4H featured ailerons on both wings, and a more reliable and powerful Hispano-Suiza 8 V-8 engine replaced the troublesome OX-5, greatly improving the performance of this variant of the “Jenny”.



If there was a weak point in the “Jenny’s” design, it was the Curtiss-designed OX-5 V-8 engine that powered the aircraft. The 90-horsepower OX-5 engine was often described by “Jenny” pilots as a failure waiting to happen. The overhead valve system was open and exposed to the air, weather, bugs, and dirt. The engine was single-ignition, so one bad spark plug could cause an engine failure. The single-pushrod, arm-stirrup valve mechanism employed three springs per valve when spring manufacturing was not as exact as it is today.

The OX-5 engine’s greatest weakness was its cooling system. The engine was water-cooled and weighed in at a staggering 390 pounds (177kg). This excess weight contributed to the “Jenny” needing such a large wingspan and having a slow top speed and climb rate. The OX-5’s cooling system was prone to overheating in the summer and leaking freezing water from the carburetor in the winter, stopping up the vents and sticking the valves. The water pump, located on top of the carburetor, leaked frequently.

It was usually only a matter of time before the leaking water pump contaminated the gasoline supply.

Due to the OX-5 engine’s weight and unreliability, the U.S. Army and U.S. Navy began searching for a replacement engine that would fit the “Jenny’s” airframe with minimal modifications and provide improved horsepower and reliability. The search for a new engine resulted in a new advanced trainer variant of the “Jenny” being built, the JN-4H. The JN-4H was powered by a 150- or 180-horsepower Hispano-Suiza V-8 engine license-built by the Wright-Martin Aircraft Corporation. This engine was lighter, more reliable, and produced almost twice the horsepower of the Curtiss OX-5. The final production version of the “Jenny” was the JN-6H, a variant for the U.S. Navy also powered by a Hispano-Suiza V-8 engine. These late-production models of the “Jenny” also had ailerons on the top and bottom wings. When production ended in the mid-1920s, Curtiss and several contractors had built over 6,500 Curtiss “Jennies”. The Curtiss “Jenny” remained in service with the U.S. Army until 1927.





Similar to the original aircraft, the Authentic Models desktop-sized Curtiss "Jenny" model airplane features a full complement of struts, bracing wires, drag wires, and control cables. These lines are replicated with sturdy black thread. On the real Curtiss "Jenny", these struts and wires provided plenty of hand and foot holds for barnstormers performing wing-walking acts in flying circus airshows during the 1920s.

After the end of World War I, thousands of Curtiss "Jenny" aircraft ended up on the civilian market, being sold as surplus. In anticipation of offering surplus "Jennies" to the civilian market, Glenn Curtiss and his company bought back unneeded production aircraft from the U.S. Army and began offering them for sale at \$4,000 each, with surplus OX-5 engines offered for sale at \$1,000 each. Curtiss aggressively marketed the surplus aircraft and engines, and their applications on the civilian market. Unfortunately, the thousands of surplus "Jennies" on the market brought the price of the aircraft and engines down to as little as \$600 for a "Jenny" and \$50 for an OX-5 engine, both brand new in their shipping crates. This was a financial disaster for Curtiss, who had spent almost \$20 million buying back "Jennies" from the U.S. Army only to have to sell them at a loss when the market became flooded with surplus aircraft.

These pilots and their "Jennies" began the barnstorming era in the United States. With no civil aviation regulations in place, the pilots were free to fly

wherever and whenever they wanted. The pilots lived in their airplanes, wearing only the clothes on their backs and carrying all their possessions in their "Jennies". Many of these pilots were World War I veterans or those who had completed flight training but never served in combat.

At first, the barnstorming pilots traveled from town to town, offering rides at \$25 a hop. They marketed themselves by telling tales, often fantastical, of their exploits in the war. Farmers who allowed pilots to use their fields as landing strips were offered free rides. Kids from nearby towns who assisted the pilots by organizing the line for rides also got free rides. For many people in rural parts of the United States, a barnstorming pilot visiting their town with a Curtiss "Jenny" was the first time they saw an airplane or rode in one. In the first years of the barnstorming era, some pilots made over \$10,000 a year. By 1925, the market had become oversaturated with barnstorming pilots offering rides, and the price for a ride had stabilized to about \$5. The barnstormers were now lucky if they made \$5,000 a year.



As the ride market became more competitive, the barnstormers and their “Jennies” formed air circuses and flew in groups. These air circuses visited state, town, and county fairs and carnivals around the nation, performing air shows, often with multiple aircraft flying at once. The pilots performed various aerobatic maneuvers and stunts with their aircraft. Aerobatics and stunts included loops, rolls, landing on one wheel, and parachuting from the airplane. As the air circuses grew in popularity, the stunts grew more elaborate to include wing-walking, plane-to-automobile transfers, plane-to-plane transfers, and on occasion, deliberately crashing an airplane. The air circuses drew thousands of spectators, some coming just to see if someone was unfortunate enough to get killed during the stunts.

In many ways, the old Curtiss “Jennies” were the perfect aircraft for the barnstormers. The OX-5 engine, though unreliable and prone to failure, was easy to repair, and many automobile and marine engine parts were compatible with the OX-5 engine. If

a bracing wire was snagged landing in a farm field and snapped, wire from a farmer’s fence could serve as a temporary repair. The fabric wings could be patched with simple fabric and dope. The wings, with all those struts and bracing wires, combined with the slow speed and stable flight characteristics of the “Jenny”, made the aircraft a perfect platform for wing-walking and plane-to-plane and car-to-plane transfers during flying circus airshows. Aircraft and engines wrecked in accidents or mishaps were easily replaced with new ones bought at surplus for reasonable prices.

Unfortunately, all good things come to an end. As the barnstorming continued into the late 1920s, the number of accidents grew at an alarming rate. Many of these accidents were due to aerobatic maneuvers that were performed too low, but a troubling number were attributed to the “Jennies” experiencing structural failures. Although parachutists falling to their deaths or “Jennies” crashing sometimes thrilled the crowd at a flying circus airshow, the federal government thought otherwise.

The Authentic Models desktop-size Curtiss “Jenny” features a striking color scheme of a dark blue fuselage and golden yellow wings. The model also features early 1920s U.S. Army insignias on its wings and identification codes representing a training aircraft from Kelly Field on its fuselage. The combination of colors and markings gives the “Jenny” model an authentic appearance.



Another issue that began to plague the barnstormers was that spare parts and engines for the “Jennies” became increasingly hard to find by the late 1920s as the inventories of these items from surplus sellers ran out. Barnstormers began cannibalizing older “Jennies” for needed parts and engines. It was clear to anyone in aviation that the barnstormers and their “Jennies” were operating on borrowed time.

In 1927, the federal government published the first civil air regulations in the United States. These regulations essentially ended the barnstorming era in the United States. The pilots could no longer fly and do whatever they wished. The new regulations also established airworthiness requirements for civil aircraft. Many of the “Jennies” were so worn out that they failed to meet the new airworthiness standards. Charles Lindbergh’s “Jenny” was so worn out and tattered from barnstorming that when he joined the Army Air Service, he was ordered to remove it from the airfield. By the late 1920s, the barnstorming era was over, and most of the “Jennies” were scrapped.

Sometimes “Jennies” were abandoned in farm fields after a crash or a mechanical failure too expensive to repair. In these cases, local farmers and residents salvaged what they could from the abandoned “Jennies”, including the wood, engines, and fabric. Wood salvaged from the abandoned “Jennies” was used to make furniture and repair buildings. Engines were salvaged for parts to repair the engines of farm vehicles. Frugal farmers even used complete “Jenny” fuselages as chicken coops and storage sheds.

Of the over 6,000 “Jennies” built, about three dozen survive in aviation museums and private collections worldwide. Of these surviving aircraft, only about a dozen are maintained as airworthy and fly regularly. These surviving aircraft help tell the story of the “Jenny” and its importance to the early days of American aviation for current and future generations. The Curtiss JN “Jenny” has also been featured as a subject of numerous books, magazine articles, puzzles, artwork, and other aviation memorabilia. Today, the Curtiss JN “Jenny” remains one of the most well-known early American aircraft.



With its fabric-over-wood-frame construction for the wings and fuselage, the Authentic Models desktop-size Curtiss “Jenny” model has a realistic appearance similar to the actual aircraft. Unfortunately, models built utilizing this construction technique are also fragile, so the “Jenny” must be handled with care when moving or cleaning it.



Authentic Models used a variety of materials to capture the key design elements of the Curtiss “Jenny”. The model includes metal parts that replicate the OX-5 engine, radiator, and paneling around the engine and cockpits. Other materials used include wood for the propeller and tailskid, leather for the protective material around the cockpits, and rubber for the tires.



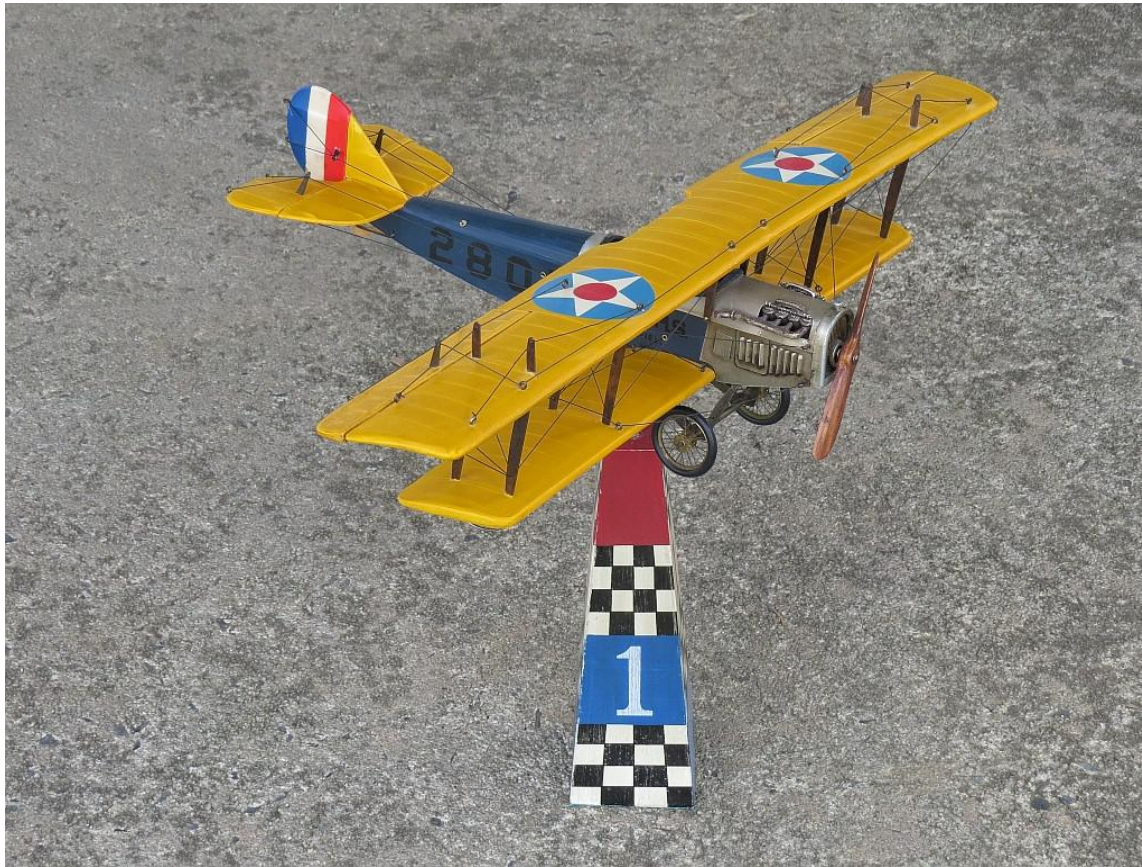
As one of World War I's most important training aircraft, several plastic and balsa model kits of the Curtiss JN “Jenny” have been produced over the years. Authentic Models manufactured this charming and interesting replica of the “Jenny” in the early 2000s. This model was sold fully assembled and decorated. A wooden display stand was included with the “Jenny” that could be used to display the model on a shelf or desk in a den or study.

Based in the Netherlands, Authentic Models manufactures a variety of furniture, lighting, home décor, and toys. The company prides itself on offering items with vintage styling and finishes that tell stories and help people connect with history and childhood memories. As part of its home décor product lines, Authentic Models has sold models of ships, automobiles, and aircraft. The models usually come in two or more sizes: a smaller desktop or shelf version and larger versions designed to hang from the ceiling. This Curtiss “Jenny” was one of many models sold in a Flight Collection product line of aviation-

themed items, which also included paperweights, mobiles, ornaments, and balance toys.

The desktop version of the Curtiss “Jenny” by Authentic Models is the perfect size for a desk or shelf in an office or study, with a 20-inch (51 cm) wingspan and a 12-inch (30 cm) length. Authentic Models also used a variety of materials in the model's construction. Like other World War I aircraft models from Authentic Models, the Curtiss “Jenny” features wings and a fuselage built using a wooden frame and covered with stretched fabric, much like the original aircraft. This construction technique gives the Curtiss “Jenny” model a realistic appearance and vintage patina. Metal parts recreate the “Jenny's” OX-5 engine, radiator, and surrounding access panels. The Curtiss “Jenny” also features a laminated wooden propeller and landing gear with metal spoke wheels and real rubber tires. Finally, the model features realistic bracing wires and control cables, with Authentic Models using thread throughout the model to simulate these wires and cables on the Curtiss “Jenny”.





The Authentic Models desktop-sized Curtiss "Jenny" model came with two display stands, one decorated in a style similar to an old air-racing pylon and a plain black stand. Both stands are made of wood and are the same size. Each stand has a piece of felt attached to the bottom of the base so it does not scratch the desk or shelf it is placed on.

Authentic Models did an excellent job replicating the Curtiss "Jenny" in miniature detail. The model captures the correct shape of the "Jenny's" fuselage, wings, and tail structure. Authentic Models also did a great job capturing some of the "Jenny's" distinctive features, such as the open OX-5 engine, louvered access panels, the wing skids mounted under the ends of the lower wings to prevent damage to the wing-tips in the event of a rough landing, and dual cockpits with protective leather around their edges. The model also features a myriad of replicated bracing wires, drag wires, and control cables, all of which the actual aircraft had. These wires are replicated with sturdy thread and are securely fastened in place using eye hooks throughout the model.

The Authentic Models also has an attractive color scheme. Although fictional, the paint scheme, which features a dark blue fuselage and golden yellow wings, is very similar to the colors some U.S. Army Curtiss "Jenny" aircraft wore during their use as training aircraft near the end of World War I. The

model's wings are also decorated with early U.S. Army insignias. The model also features an antique wash over its surfaces, giving it an incredible aged appearance.

A final positive attribute of this "Jenny" model is its wooden display stand. Authentic Models included two display stands with this "Jenny" model: a plain black stand and a stand decorated as if it were an air-racing scoring pylon. These stands are interchangeable, and either one can be used to display the model. The decorated stand is full of color and really sets off the "Jenny" when it is displayed on it. Unfortunately, both display stands included with the model are over 10 inches (25 cm) high. When the model is placed on either stand, the entire display is extremely tall and usually fits only on a desk or top shelf of a shelving unit. Depending on where the Curtiss "Jenny" model is displayed in a home or office, the using stand may not be feasible because of its height. Fortunately, this beautiful model replica of the "Jenny" can also be displayed on its landing gear or hanging from the ceiling.



The Authentic Models Curtiss “Jenny” model has a few shortcomings. One shortcoming is a few inaccuracies in certain aspects of the model. One inaccuracy is the bracing struts; Authentic Models used metal for these, most likely for strength, but on the actual “Jenny”, these struts are wood. There is also a typographical error in the identification codes on the fuselage. For a “Jenny” operating from Kelly Field, the stenciled codes should read “A.S. M.S.” On the model, they read “A.M. M.S.” instead. Finally, the colors used in the U.S. insignias on the wings are the wrong shades of blue and red.

Another shortcoming of this model is its fragility. With the materials used in its construction, the Curtiss “Jenny” model must be handled with care, as it is delicate. The fabric covering is thin and can easily tear or rip if the “Jenny” is handled incorrectly or comes into contact with a sharp surface. The bracing and drag wires are also delicate and can easily get snagged by a dust cloth or feather duster while cleaning the model. If displayed in a child’s room,

this model should be hung from the ceiling out of reach, as it has several small parts.

A final shortcoming of this model is that some parts can deteriorate over time. The glue Authentic Models used to attach the struts to the wings can dry out, causing the struts to become detached from the wings. The rubber tires on the model will also dry out and crack if exposed to extremely warm temperatures for long durations. Due to its delicate nature and fragile parts, this model is best kept in a dust-free case in a climate-controlled environment.

The Authentic Models Curtiss “Jenny” desktop model is an excellent replica of the iconic World War I training and 1920s barnstorming aircraft. The fabric-covered wings and fuselage, intricate metal parts, and colorful paint scheme make the “Jenny” an interesting conversation piece. The “Jenny” will light up and enhance the décor of any office, study, or child’s bedroom with its classic design and vintage styling. The “Jenny” is a great addition to any model airplane collection.

With its classic design, vintage styling, metal and wood accents, and attractive color scheme, the Authentic Models Curtiss “Jenny” desktop-sized model will enhance the décor of any office, den, study, or child’s bedroom. The “Jenny” is also a great addition to any model airplane collection, especially one focused on World War I and 1920s aircraft.



North American X-15



The North American X-15 hangs on display in the National Air and Space Museum's flagship location on the National Mall in Washington, D.C. The X-15 program generated valuable data for the U.S. Air Force and NASA in research areas such as hypersonic aerodynamics, spacecraft life support systems, reentry from space, and aerodynamic heating and heat transfer.

The North American X-15 is a hypersonic rocket-powered aircraft formerly operated by the U.S. Air Force and the National Aeronautics and Space Administration (NASA) as part of the X-plane series of experimental research aircraft. The X-15 program set several speed and altitude records during the 1960s. X-15 flights crossed the edge of outer space several times and returned valuable data used for designing future aircraft and spacecraft.

The X-15 program began as a concept study by Walter Dornberger for the National Advisory Committee for Aeronautics (NACA) for a hypersonic research aircraft. The proposal requests for the X-15 program were published in December 1954 for the airframe and in February 1955 for the rocket engine. Two manufacturers were awarded contracts for the project: North American Aviation for the airframe in 1955, and Reaction Motors for building the engines in 1956.

The X-15's fuselage was long and cylindrical with rear fairings that flattened its appearance. The rear of the fuselage featured thick dorsal and vertical wedge-

shaped stabilizers. Parts of the X-15's outer skin were constructed from heat-resistant nickel alloy. The X-15's thick wedge-shaped tail fins enabled it to fly smoothly at hypersonic speeds, but produced significant drag at lower speeds. The tail featured side panels which extended to increase overall surface area and stability at hypersonic speeds. These panels doubled as air brakes. The X-15's landing gear consisted of a nose-wheel and two rear skids. The skids did not extend beyond the ventral fin. Pilots were required to jettison the lower fin before landing, which was recovered by parachute.

Since the X-15 was intended as a research aircraft, it was designed to test several flight scenarios, including attachment to a launch aircraft, ballistic flight into thin air/space, re-entry into thicker air, unpowered glide to landing, and direct landing without starting the main engine. The X-15's main rocket engine burned for only a few minutes, but it boosted the X-15 to its planned operating speeds and altitudes. Without the main rocket engine's thrust, the X-15's control surfaces remained functional, but the aircraft could not hold altitude.



The X-15 operated in an environment where the air was too thin for aerodynamic flight control surfaces to operate effectively. As a result, the X-15 was designed with a reaction control system (RCS) utilizing rocket thrusters for maneuverability in thin air. Since the X-15 had multiple flight control systems, two different cockpits, one with multiple joysticks and one with a single joystick, were installed in the X-15s to test their effectiveness.

The three-joystick cockpit placed a traditional center stick between a left 3-axis joystick that sent commands to the reaction control system and a third joystick on the right used during high-G maneuvers to augment the center stick. The alternative setup used the MH-96 flight control system, which featured an advanced cockpit panel display and a single joystick, simplifying pilot input. The MH-96 flight control system was adaptive and could automatically blend aerodynamic and rocket control systems to maximize their effectiveness. Other cockpit controls included the rocket engine throttle and a control for jettisoning the ventral tail fin. In addition to pilot input, the X-15 featured a stability augmentation

system (SAS) that sent inputs to the aerodynamic controls to help the pilot maintain attitude control. The RCS system also had two modes, manual and automatic. The automatic mode featured a reaction augmentation system (RAS) which stabilized the X-15 at high altitudes during the first three minutes of flight before the rocket engine automatically shut down.

The cockpit featured an ejection seat designed to operate at speeds up to Mach 4 (2,800 mph; 4,500 km/h) at altitudes up to 120,000 feet (37,000 m). The X-15's ejection seat was never used during the program. During an ejection, the seat would have deployed stabilizing fins and telescopic booms to provide aerodynamic braking and prevent spinning until it reached a safe speed and altitude, when the main parachute would open. The pilots wore pressure suits, which could be pressurized with nitrogen gas. Above 35,000 feet (11,000 m), the cockpit was pressurized with nitrogen, and oxygen was supplied directly to the pilot. Additional cockpit design elements included heated windows to prevent icing and a forward headrest for periods of high deceleration.





Initially, a pair of Reaction Motors XLR11 liquid-propellant rocket engines powered the X-15. The XLR11 used ethyl alcohol and liquid oxygen as propellants. In November 1960, Reaction Motors delivered the more powerful XLR99 rocket engine. The XLR99 used anhydrous ammonia and liquid oxygen as propellants, and hydrogen peroxide drove the high-speed turbopump that delivered the propellants to the engine. The X-15's reaction control system thrusters used high-test peroxide (HTP) as propellant. HTP also fueled the auxiliary power units. The X-15 also carried tanks to store helium, used to purge the fuselage interior, and liquid nitrogen, used as a coolant for the pilot's pressure suit, cockpit, windshield, and other aircraft systems.

Similar to many X-plane aircraft, the X-15 was designed to be carried aloft and dropped from under the wing of a mothership aircraft. In the case of the X-15, two U.S. Air Force NB-52 aircraft, an NA-52A nicknamed "The High and Mighty One", and an NA-52B nicknamed "The Challenger", served as the mothership aircraft for all X-15 flights. The X-15 was released from the NB-52 at alti-

tudes of about 45,000 feet (13,700 m) and speeds of about 500 miles per hour (800 km/h).

Three X-15 airframes were built. The first X-15 flight, an unpowered glide and descent piloted by U.S. Navy test pilot Scott Crossfield, took place on June 8, 1959. Crossfield later piloted the first powered X-15 flight on November 15, 1960. During the X-15 program, 12 pilots flew the aircraft, including Neil Armstrong, who later became a NASA astronaut and walked on the Moon, and Joe Engle, later a Space Shuttle mission commander.

On November 9, 1962, the second X-15 built suffered a landing accident, which injured pilot John McKay. The aircraft was rebuilt with a 2.4-foot (.73 m) fuselage extension designed to carry liquid hydrogen. This X-15 was also modified to carry a pair of external fuel tanks under its wings, and a complete heat-resistant ablative coating was added to the airframe. On October 3, 1967, this X-15, flown by U.S. Air Force pilot William "Pete" Knight, set a speed record for the program, reaching a top speed of 4,520 miles per hour (7,274 km/h) at an altitude of 102,100 feet (31,120 m).



Tragedy struck the X-15 program on November 15, 1967. On Flight 191, U.S. Air Force test pilot Major Michael J. Adams was killed when the X-15 he was flying entered a hypersonic spin while descending. The airframe oscillated violently as aerodynamic forces increased after reentry. The airframe broke apart due to extreme G-forces at 60,000 feet (18,000 m). The wreckage was scattered across 50 square miles (130 km²). Control systems failure and pilot disorientation also contributed to the accident. Today, a monument stands where the cockpit landed near Johannesburg, California.

Despite the crash, the X-15 program continued, and the U.S. Air Force and NASA wanted to conduct further research flights with the two surviving aircraft. The 200th X-15 flight was scheduled for November 19, 1968. Technical problems and bad weather delayed this flight six times. In December 1968, this flight was canceled permanently, and the X-15 program ended.

The X-15 program ran from 1959 to 1968. Twelve pilots flew a combined 199 flights in the three X-15s built. Of these pilots, eight flew a combined 13 flights that met

U.S. Air Force spaceflight criteria, qualifying the pilots as astronauts. Five U.S. Air Force and three NASA pilots were awarded astronaut wings for their X-15 flights. During the X-15 program, the aircraft set several speed and altitude records. The X-15 was the first aircraft to operate above 100,000 feet (30,500 m). The speed record of 4,520 miles per hour (7,274 km/h) set by William J. Knight in October 1967 still stands as the highest speed ever recorded by a crewed, powered aircraft.

After the X-15 program ended, the two surviving X-15s were placed into storage and later donated to museums. The second X-15 built is displayed in the National Museum of the U.S. Air Force in Dayton, Ohio. The aircraft was donated to the museum in 1969 and is displayed in the *Research and Development* gallery alongside other examples of “X-planes”. The first X-15 built was put into storage by the U.S. Air Force and eventually donated to the Smithsonian Institution’s National Air and Space Museum. It is currently on display in the museum’s flagship location on the National Mall in Washington, D.C., in the *Boeing Milestones of Flight* gallery.



Ryan PT-22 Recruit

(1941)



The Ryan PT-22 Recruit is a two-seat, low-wing, single-engine primary training aircraft used by the U.S. Army Air Corps (later U.S. Army Air Forces) throughout World War II. The PT-22 Recruit was the first purpose-built monoplane training aircraft operated by the U.S. Army Air Corps, allowing the service to begin moving away from traditional biplane training aircraft. Entering service in 1941, the PT-22 Recruit was developed from the Ryan ST, a series of low-wing training and sport aircraft built by the Ryan Aeronautical Corporation in the United States during the mid-to-late 1930s and early 1940s. The PT-22 featured several design changes from the Ryan ST series, including removing the landing gear fairings and installing a more reliable Kinner radial engine. A total of 1,048 PT-22 Recruits were built during World War II.

Ryan PT-22 Recruit

Crew: 2 (Student Pilot, Flight Instructor)

Length: 22 ft 5 in (6.90 m)

Wingspan: 30 ft 1 in (9.17 m)

Height: 7 ft 2 in (2.19 m)

Wing Area: 134.25 sq ft (12.5 m²)

Powerplant: Kinner R-540-1 or R-540-3 air-cooled five-cylinder radial engine (x 1)

Range: 201 nmi (231 mi, 371 km)

Cruise Speed: 100 mph (160 km/h, 87 kn)

Maximum Speed: 125 mph (200 km/h, 109 kn)

Empty/Gross Weights: 1,308 lb/1,860 lb (593 kg/844 kg)

Service Ceiling: 15,400 ft (4,700 m)



Primary Flight Training

Fuselage

The PT-22 Recruit's fuselage was a simple monocoque structure with Alclad skin and nine aluminum-alloy internal bulkheads. The PT-22's fuselage differed from the Ryan ST and STA series, which were oval-shaped, by having a circular cross-section. This fuselage was designed to accommodate larger pilots wearing military flight gear and parachutes in the PT-22's cockpits. The fuel tank was mounted in the fuselage forward of the front cockpit. Fuel was fed by gravity from the tank to the engine's carburetor. The oil was stored in a tank located on the front side of the engine firewall in the upper section of the fuselage. The fuselage also includes a small travel compartment for personal baggage accessible by a small door on the left side just behind the rear cockpit.

Cockpit

The PT-22 Recruit featured two separate cockpits in a tandem configuration for a student pilot and flight instructor or a pilot and passenger. Each cockpit included an airspeed indicator, altimeter, oil temperature and pressure gauges, tachometer, and compass. Optional instrumentation included a climb rate indicator, a bank indicator, and a clock. The cockpit also included a wheel which operated the elevator trim tab and a lever to operate the wing flaps. Hydraulic brakes for the main landing gear wheels were controllable using the rudder pedals. In training operations, the student pilot sat in the front seat, and the flight instructor sat in the rear seat. If flown solo, the PT-22 Recruit must be flown from the rear seat to maintain the aircraft's center of gravity.

Wings

The PT-22 Recruit's wings were constructed of spruce spars, aluminum alloy ribs, and steel compression members. The externally braced wing is covered with fabric aft of the main spar to the trailing edge, and aluminum alloy sheet covering from the leading edge to the spar. The wings feature mechanically operated flaps controlled from a lever located on the left side of the cockpit. To correct for the shift of the center of gravity created by the installation of the heavier Kinner R-540 engine, the wings feature a sweep back of 4° 10'. The wings also have 3° of incidence and 4° 30' of dihedral.



Handling Characteristics

The PT-22 Recruit is docile, fully aerobatic, and has light and responsive ailerons. The PT-22's wing sweep and high wing loading make low-speed handling challenging, and aileron effectiveness drops significantly near stall speed. PT-22 pilots must carefully watch and maintain their airspeed, especially on approach to land, to avoid a stall or hard landing. The PT-22 has forgiving landing characteristics and the landing gear struts absorb hard landings, but ground handling is demanding. The fully swiveling tailwheel requires constant active footwork on the rudder pedals to maintain directional control. If pilots are not careful with the rudder, a PT-22 can easily ground loop.

Landing Gear

Unlike the Ryan ST and STA series, the PT-22 Recruit featured landing gear with no fairings or spats. This change simplified PT-22 flight operations and maintenance. The landing gear design was also different from the Ryan ST and STA series, with the wheels mounted outboard of the shock struts rather than the fork type found on the earlier aircraft. This new gear design was known as a "knuckle type" mounting. The main landing gear wheels featured hydraulic brakes. The tailwheel was steerable to 45° when it became a full swivel. The main landing gear and tailwheel utilized oleo struts.

Engines & Propeller

The PT-22 Recruit was powered by the Kinner R-540-1 or R-540-3 five-cylinder, air-cooled, radial piston engine. This engine was rated at 160 horsepower. This engine was more reliable and easier to maintain than the Menasco inline engines found in earlier variants of the Ryan ST series. Because of its unique cylinder arrangement, the Kinner R-540 engines have a distinctive "pop-pop" sound when they are running. The Kinner engine drove a wooden two-blade, fixed-pitch propeller manufactured by Sensenich.



“Foam 331”: A First Responder On September 11, 2001



This Oshkosh T-3000 airport crash tender on display at the National Air and Space Museum's Steven F. Udvar-Hazy Center was one of the emergency response vehicles sent to the Pentagon following the September 11, 2001, terrorist attack on the building. Requested by the Pentagon from the nearby Ronald Reagan National Airport, "Foam 331" spent several hours on scene using firefighting foam to suppress the large aviation fuel fire that erupted when the airliner impacted the building.

Airport crash tenders (sometimes called crash trucks) are specialized fire trucks designed for aircraft firefighting operations at airports and military air bases. These trucks are usually mounted on 4x4, 6x6, or 8x8 wheeled chassis and feature large tires to negotiate rough terrain on airport properties. On some chassis, the front and rear wheels are steerable to decrease the truck's turning radius. Heavy-duty diesel engines coupled with multi-speed transmissions give these large trucks excellent acceleration and speed for their size and weight. Airport crash tenders are equipped with water/foam cannons and can carry large amounts of water and firefighting foam. Newer airport crash tenders can inject a stream of Purple-K dry chemical into the foam stream to extinguish large jet fuel fires quickly, and carry Halotron-1 tanks for handling situations where a clean agent is needed to extinguish a fire. Newer versions of these vehicles have multiple turrets to disperse retardant, elevating extinguishing arms, and reinforced nozzles designed to pierce an airplane's fuselage and extinguish a fire in the cabin or cargo hold.

During the September 11, 2001 terrorist attack on the Pentagon that destroyed the Navy Command Center, the airliner flown into the building had nearly 20 tons (20,000 kg) of aviation fuel aboard. The Pentagon's own airport crash tender stationed at its helipad was severely damaged in the attack, leaving emergency personnel at the Pentagon with no way to extinguish the large aviation fuel fire now burning at the site. An emergency call was put out to the Ronald Reagan National Airport, and "Foam 331", an Oshkosh T-3000 airport crash tender, was dispatched to the scene. "Foam 331" was accompanied by "Engine 335", a conventional fire pumper. The vehicles were soon joined at the Pentagon by a second crash tender sent from the airport, "Foam 335". The fire was so intense that both airport crash tenders quickly ran out of firefighting foam. The airport quickly dispatched a tanker truck to the Pentagon to resupply the vehicles with firefighting foam. The efforts of these two airport crash tenders, and their crews, succeeded in suppressing the fire in the initial hours after the attack and limiting further loss of life.

"Foam 331" was retired by the Metropolitan Washington Airports Authority (MWAA) in 2016. In 2021, retired MWAA firefighter Bill Walsh and the nonprofit Airport Rescue & Fire Fighting Working Group worked to locate the truck, then collaborated with Oshkosh Airport Products to restore "Foam 331" to how it appeared on September 11, 2001. Oshkosh Airport Products then donated the airport crash tender to the Smithsonian Institution, and it is now on display at the National Air and Space Museum's Steven F. Udvar-Hazy Center.







**Distelfink
Airlines**

Est.
2013



My late grandfather, John Brey, and I at the 2007 Geneseo Airshow. This was one of the few times that we had our photo taken together at an airshow.

ABOUT

DISTELFINK AIRLINES

The story of "Distelfink Airlines" begins in the early 1990s when my late grandfather, John Brey, began building and flying remote control model aircraft in his retirement. He enjoyed the hobby and quickly amassed a large fleet of model airplanes, which filled his garage and woodworking shop. He gave a name to his fleet of aircraft, "Distelfink Airlines". For the symbol of his fleet, he chose the Pennsylvania Dutch/German hex sign featuring the "Distelfink", a colorful bird that is a symbol of good luck and happiness. This hex sign and symbol is very common on Pennsylvania Dutch/German barns in Eastern Pennsylvania and is an important part of our local culture. He had custom "Distelfink" decals made for all his airplanes and had T-shirts made with "Distelfink Airlines" printed on them. It wasn't long before curious people began asking about "Distelfink Airlines" and what it was. My grandfather told anyone who asked that "Distelfink Airlines" was a new startup airline that was going to be offering service between the Lehigh Valley International Airport and Philadelphia International Airport with more routes to come soon.

In addition to flying his model airplanes, my grandfather enjoyed attending airshows and we traveled to airshows together for almost 20 years. He also enjoyed local aviation history and was particularly fascinated by the history of the Consolidated TBY Sea Wolf, a torpedo bomber that was built locally in Allentown, Pennsylvania during World War II. He also remembered when famous aviator Amelia Earhart visited the Lehigh Valley in the early 1930s to raise funds for her failed attempt to become the first woman to fly around the world.

Established in 2013 in memory of my grandfather, "Distelfink Airlines" is an online aviation newsletter that carries on a tradition of sharing a love for aviation that my grandfather shared with me. This newsletter features photographs and writings on a variety of aviation topics. The logo that was chosen for "Distelfink Airlines" is the hex sign that my grandfather chose for his fleet of remote control model aircraft many years ago. This proud symbol of local Pennsylvania Dutch/German culture is joined by a pair of Consolidated TBY Sea Wolf torpedo bombers, the aircraft that was built locally in Allentown during World War II and is such an important part of our local aviation history. Thank you for reading "Distelfink Airlines" and sharing in the passion for aviation that my grandfather shared with me.

"Distelfink Airlines" is an online newsletter featuring the aviation photography and writings of Corey J. Beitler. Contributions from guest photographers and writers are sometimes featured and are used only with prior permission. Public domain and/or copyright free images are utilized for some articles. All text and images are copyright to the original owners and may not be reproduced or reused without permission.