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Corey J Beitler's

“Distelfink Airlines”

An Online Aviation Newsletter

The Harold F. Pitcairn Wings of Freedom Aviation Museum



Gulfstream G650ER

Bond Bread “NAVY PLANES” Matchbook Covers

Toy Zone 1/48 Scale Grumman F-14 Tomcat

Mikoyan-Gurevich MiG-15bis (Jian Ji-2)

Naval Aircraft Factory N3N

German World War II Aircraft Bookazine

A McDonnell Douglas F/A-18A Hornet on display at the Harold F. Pitcairn Wings of Freedom Aviation Museum in Horsham, Pennsylvania. The F/A-18 Hornet entered service in 1983 as a multirole combat aircraft, capable of performing a variety of missions including fleet air defense, fighter escort, close air support, interdiction, and reconnaissance.

FROM THE EDITOR'S DESK

Wings Of Freedom Aviation Museum, N3N, MiG-15bis, Bond Bread Matchbooks

Greetings Everyone:

The April edition of "Distelfink Airlines" is here. As we approach the spring and summer season, it will soon be time for airshows and aviation events to start up again in the Northeast and Mid-Atlantic regions of the United States. I am looking forward to getting to some of these events and covering them in the newsletter. The newsletter is having an excellent run right now with readership. March was the sixth consecutive month that the newsletter was read by over 2,000 readers in a month. These readers come from countries and territories worldwide. It is exciting to see the newsletter grow so much and see so many people enjoying the articles and photos in it. Thank you to all of you who read the newsletter every month, I truly appreciate it!

The "Special Feature" for this edition of the newsletter is a museum visit to the Harold F. Pitcairn Wings of Freedom Aviation Museum in Horsham, Pennsylvania. This museum is located next to the former NAS-JRB Willow Grove military installation. The museum has a small but interesting collection of aircraft and aviation artifacts. This museum is run by volunteers from the Delaware Valley Historical Aircraft Association, and they work hard with limited funding to take care of the aircraft collection and improve the museum. Unfortunately, plans for a larger facility on the site of the former military installation are delayed because of environmental issues that need to be remedied before any redevelopment on the property of the former installation can take place. The museum recently completed exterior restorations on the McDonnell F-4A Phantom fighter and the Lockheed P-3B Orion maritime patrol aircraft in their collection, and volunteers are in the process of restoring a rare Vought F7U Cutlass fighter for display. Although this is a small museum, I recommend anyone in the area to stop in and visit them. The volunteer guides are very knowledgeable, and it is a collection that can be viewed in a short amount of time. I want to thank the Harold F. Pitcairn Wings of Freedom Aviation Museum, the Delaware Valley Historical Aircraft Association, and museum volunteers Fred and John for their assistance during my visit and for allowing me to take all the photographs I needed to complete the photo feature for this newsletter. If you are interested in visiting the museum or learning more about their collection, please check out their website at www.wingsoffreedommuseum.org.

The "Aircraft Of Special Interest Section" features the Naval Aircraft Factory N3N in this edition. The N3N was used as a trainer throughout World War II, with a small number being used for training at the U.S. Naval Academy until the late 1950s. An interesting feature about the N3N was that it could be fitted with either floats or conventional landing gear.

The "Aircraft Of The National Air And Space Museum" section has the museum's MiG-15bis featured for this edition. The museum's MiG-15bis was used by the Chinese Air Force (People's Liberation Army Air Force). Unlike most aircraft in the National Air and Space Museum's collection, little is known about this MiG-15's operational history,

Finally, the "Aviation Memorabilia" section has matchbook covers issued by Bond Bread during World War II. These matchbooks featured illustrations of U.S. Navy aircraft used during the conflict. Collecting advertising matchbooks was a popular hobby during this time, and there were 12 different matchbook covers to collect in this series, each featuring a different airplane.

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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A set of advertising matchbook covers from World War II commemorates some of the most famous aircraft used by the U.S. Navy during the conflict.

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Toy Zone 1/48 Scale Grumman F-14 Tomcat

The die-cast toy company's excellent entry-level, affordable replica of one of the most powerful and iconic naval fighter aircraft ever produced.

Special Feature:

Harold F. Pitcairn Wings of Freedom Aviation Museum

Located next to the former NAS-JRB Willow Grove military installation, the Horsham, Pennsylvania, aviation museum reflects the aviation history of the Delaware Valley, aviation pioneer Harold F. Pitcairn, and aircraft operations at the former military installation.

Aircraft Of The National Air And Space Museum:

Mikoyan-Gurevich MiG-15bis (Jian Ji-2)

A surviving example of one of the first fighter jets to incorporate swept wings into its design to achieve high transonic speeds that was used by the Chinese Air Force (People's Liberation Army Air Force).

Aircraft Of Special Interest:

Naval Aircraft Factory N3N

This American tandem-seat, open-cockpit, primary training biplane was built by the Naval Aircraft Factory in Philadelphia, Pennsylvania, during the 1930s and early 1940s and saw widespread use as a training aircraft with the U.S. Navy during World War II.

One Last Thing:

German Aircraft of World War II Bookazine

Amber Books Ltd., a United Kingdom-based publisher of nonfiction and reference books, has recently published a bookazine that is an excellent quick reference guide to aircraft used by the German Luftwaffe during World War II.

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Gulfstream G650ER



A Gulfstream Aerospace G650ER on approach to the Washington Dulles International Airport in Chantilly, Virginia. Introduced into service in 2012, the G650 and extended-range G650ER are praised by aviation industry experts for strengthening business aviation through technological advancements in aircraft performance, cabin comfort, and safety. Examples of the G650ER have also set several records for distances flown nonstop by a purpose-built business jet.

The Gulfstream G650ER is an extended-range variant of the G650 large business jet produced by Gulfstream Aerospace. The G650 is designated the Gulfstream GVI in its type certificate.

The Gulfstream G650 was launched as a company project in 2005 and publicly announced in 2008. Metal construction was chosen for the fuselage and wings, with the fuselage panels being bonded together rather than riveted to reduce the parts count. The tail, winglets, rear pressure bulkhead, cabin floor structure, and other fairings were constructed from composite materials. The wing has a sweep of 36° and does not use leading-edge, high-lift devices. The leading edge of the wing was designed as a continuously changing curve, and the airfoil varies from root to tip. Winglets were incorporated into the wing for improved fuel efficiency. The G650's controls are entirely fly-by-wire, with the control surfaces moved by dual hydraulic systems. During the design phase of the G650 project, Gulfstream engineers decided to use an oval-shaped fuselage to increase available space in the cabin. The increased space accommodates seating for 11 to 18 passengers in the cabin. There is also space for passenger amenities, such as a lavatory, kitchen, bar, and in-flight entertainment systems, to be installed in the cabin of the G650. Two Rolls-Royce BR725 turbofan engines mounted on the rear fuselage power the G650.

The G650 flew for the first time in 2009 and entered service in 2012. The G650ER, which offers about 500 nautical miles (930 km) of additional range by modifying the fuel system and using space in the wings to increase the G650's fuel capacity, entered service in 2014. This fuel system upgrade can be fitted to existing G650 aircraft. The G650ER can fly 7,500 nautical miles (13,900 km) at Mach 0.85. In April 2019, a G650ER set a record for the longest nonstop flight by a purpose-built business jet when one flew 8,379 nautical miles (15,518 km) nonstop from Singapore to Tucson, Arizona. Gulfstream Aerospace built 598 G650 and G650ERs from its introduction in 2008 until late 2024 when production switched to its replacement, the improved G800.

This Gulfstream G650ER was built in 2020 and is operated by Executive Logistics Solutions LLC. It was photographed arriving at the Washington Dulles International Airport in Chantilly, Virginia, in December 2024.





Bond Bread “NAVY PLANES” Matchbook Covers



Bond Bread offered these “NAVY PLANES” matchbook covers as a promotional advertising item during World War II. The matchbook covers feature excellent illustrations of some of the aircraft used by the U.S. Navy during the war. The illustrations include famous types, such as the Vought F4U Corsair fighter, and lesser-known types, such as the Brewster SB2A Buccaneer dive bomber, which was considered a failure and saw limited service as a trainer.

During World War II, many American companies supported the war effort by producing items for American and Allied military personnel. In an effort to promote themselves as supporting the war effort and to encourage the civilian population to do the same, many of these companies produced advertising items as promotional giveaways. These giveaways were often everyday items used in a home or business, such as a pen, fly swatter, ruler, or ink blotter. The items usually advertised the business or company name supported public morale for the war effort with a patriotic message such as “BUY WAR BONDS!” or “SAVE SCRAP METAL!”

Bond Bread was a product sold by the General American Baking Company. During its existence, the company became famous for its promotional giveaway items advertising its bread. One of the promotional advertising items given away by companies during the 1940s was matchbook covers. Because of the popularity of smoking cigarettes, cigars, and pipes, matchbooks were commonly found in most homes, offices, and public buildings from the 1920s to the early 1950s. The ease of making matchbook covers and their small size made them popular as cheap promotional or advertising items. People collected matchbook covers as souvenirs from restaurants, hotels, businesses, trains, ships, and even famous buildings and landmarks. Matchbook covers began losing their popularity in the 1960s due to the rise in using disposable lighters and anti-smoking campaigns.

During World War II, Bond Bread produced this series of promotional matchbook covers to commemorate U.S. Navy aircraft that served in the conflict. The “NAVY PLANES” series included a total of 12 matchbook covers, with each matchbook cover having an illustration of a famous U.S. Navy aircraft and the stylized Bond Bread logo. The matchbook covers feature some of the most significant U.S. Navy aircraft that flew in the war, such as the Vought F4U Corsair fighter and the Consolidated PBY Catalina long-range patrol flying boat. A few obscure aircraft are also featured, such as the Curtiss SO3C Seagull, a scout and observation airplane that failed to achieve performance and reliability expectations and was withdrawn from service in 1944 before the war ended.

The Bond Bread “NAVY PLANES” matchbook covers are hard to find today in a complete set and in good condition. These were items used daily and, as such, are often subject to condition issues such as stains, rips, and fading. The matchbook covers are a great example of a World War II advertising piece featuring U.S. Navy aircraft.





Each matchbook cover includes the airplane's name and role, an illustration of the specified airplane in action, and Bond Bread advertising. The aircraft featured on the matchbook covers include famous fighters, scout bombers, torpedo bombers, and patrol/observation types used by the U.S. Navy in World War II.



An interesting aspect of the matchbook covers is that two unusual airplanes are included in the series, the Curtiss SO3C Seagull and the Brewster SB2A Buccaneer. These two aircraft suffered from developmental problems and poor performance, and most of the examples built were relegated to use as training aircraft.



Toy Zone 1/48 Scale Grumman F-14 Tomcat



Toy Zone made this excellent entry-level, affordable model of a Grumman F-14 Tomcat naval fighter in the mid-2000s. The model was sold at big box retailers such as Toys R' Us and Walmart. The model is decorated in the colorful markings of U.S. Navy Fighter Squadron VF-2 "Bounty Hunters". VF-2 flew variants of the F-14 Tomcat from 1972 to 2003. The squadron is now designated Strike Fighter Squadron 2 (VFA-2) and flies the Boeing F/A-18F Super Hornet.

The Grumman F-14 Tomcat is one of the most iconic and powerful naval fighter aircraft ever produced. During its service career in the U.S. Navy, the F-14 served in various roles, including fleet air defense, aerial reconnaissance, air superiority, and as a precision ground-attack aircraft in the twilight of its career. Although its service accolades were extensive, the F-14 became an iconic part of popular culture when it appeared extensively in aerial sequences filmed for the 1986 blockbuster film *Top Gun* starring Tom Cruise. The F-14 was so beloved by fans of the movie and aviation enthusiasts that an encore appearance of the F-14 was worked into the storyline for the 2022 sequel, *Top Gun: Maverick*.

Designed by Grumman in the late 1960s, the F-14 Tomcat was a carrier-capable, twin-engine, twin-tail, supersonic fighter capable of speeds up to two and a half times the speed of sound (Mach 2.5). One of the revolutionary aspects of the F-14's design was its variable-sweep wings. The wings could change position during flight to optimize the performance of the F-14 for either high-speed or low-speed flight. These variable-sweep

wings were controlled by the F-14's advanced computerized flight control system. The F-14 was also large by naval fighter aircraft standards, with a length of 62 feet 9 inches (13.19 m), an unswept wingspan of 64 feet 1 and a half inches (19.545 m), a gross weight of 61,000 pounds (27,669 kg), and a maximum takeoff weight (MTOW) of 74,350 pounds (33,725 kg).

The multiple tasks of navigation, target acquisition, electronic countermeasures, and weapons deployment were divided between a two-person crew consisting of a pilot and a radar intercept officer (RIO) seated in the rear cockpit. The F-14 was equipped to carry a variety of weapon systems, including the long-range AIM-54 Phoenix active radar-guided, beyond visual-visual-range air-to-air missile. This missile, combined with the F-14's powerful AN/AWG-9 guidance radar, was the first aerial weapons system capable of engaging multiple targets at once. The AIM-54 Phoenix missiles were complimented by the medium-range AIM-7 Sparrow and the short-range AIM-9 Sidewinder air-to-air missiles as the primary armament of the F-14 Tomcat.



The F-14 Tomcat flew for the first time in 1970 and entered operational service with the U.S. Navy in 1974. The first production models of the F-14, the F-14A, were designed for all-weather interception of enemy aircraft and fleet air defense. In addition to the U.S. Navy, the Islamic Republic of Iran Air Force acquired 79 F-14As before relations with the United States deteriorated following the Iranian Revolution and the Overthrow of the Shah in 1979. Despite embargos on spare parts and weapons, the new Islamic Republic of Iran Air Force (IRIAF) managed to keep their F-14 fleet operational, and these aircraft were heavily involved in the Iran-Iraq War, providing air defense for the Iranian capital, Tehran, and Iranian oil terminals.

In 1987, Grumman introduced the improved F-14B. The F-14B featured General Electric F110-400 turbofans, replacing the original Pratt & Whitney TF30 turbofans found on the A variant, which had been prone to failures and maintenance difficulties. The new F110-400 turbofans offered improved reliability and safety. The new engines were also more powerful than the earlier TF30s and launches from aircraft carrier decks could now be carried out without using afterburners. Grumman built 38 new F-14Bs, and 48 additional aircraft were remanu-

factured into B variants from F-14As airframes. The F-14B entered operational service in time to participate in Operation Desert Storm in 1991.

The final variant of the F-14 was the D. Nicknamed the "Super Tomcat", the F-14D featured new General Electric turbofan engines, improved digital avionics, a glass cockpit, and a new radar system. The F-14D was equipped with a LANTRN targeting system that allowed the delivery of various laser-guided weapons for precision strikes in air-to-ground combat missions. The F-14D also had capabilities to transmit and receive targeting/reconnaissance imagery in-flight to provide time-sensitive strike capability and tactical reconnaissance in a combat theatre. These missions were carried out using the Fast Tactical Imagery (FIT) system and the Tactical Reconnaissance Pod System (TARPS). Although the F-14D was the definitive variant of the Tomcat, only 37 new-build, and 18 rebuilt F-14s were completed by Grumman, as the F-14 fleet was becoming expensive to maintain, and the fighter was deemed old technology. The F-14's final combat missions with the U.S. Navy were during Operation Enduring Freedom and Operation Iraqi Freedom. The last F-14 missions in the U.S. Navy were flown in July 2006.



This view of the Toy Zone 1/48 scale Grumman F-14 Tomcat model illustrates the wide sweep of the F-14 Tomcat's wings when they were in the unswept position. Toy Zone did an excellent job on their F-14 model of using a combination of different shades of gray paint and decals to replicate different colored panels on the F-14 Tomcat, a feature often seen on actual F-14s as they underwent maintenance and paint touch-ups during regular flight operations.





For an entry-level model, Toy Zone's 1/48 scale Grumman F-14 Tomcat had some excellent features. The wings on the F-14 model can be transitioned to the swept and unswept positions. The model also included a sturdy display stand that holds the model securely despite its weight. Finally, the VF-2 "Bounty Hunters" squadron markings applied to the model add some color to the F-14 when it is displayed on any desk or bookshelf.

Today, several F-14s are preserved on display throughout the United States in aviation museums. A few are also displayed as gate guardians or memorials at Veteran of Foreign Wars (VFW) posts. The Islamic Republic of Iran Air Force still operates a few of their F-14 Tomcats as air superiority fighters. Despite being unable to obtain spare F-14 parts due to U.S. embargos, the IRIAF has kept a portion of its F-14 fleet flying by using the Iranian aerospace and defense industry to reverse engineer engines and other components. The IRIAF F-14s have also been adapted to use Russian and domestic weapons systems and avionics. Currently, it is estimated the IRIAF has 20-40 F-14s remaining in service out of the original 79 that were purchased.

This 1/48-scale die-cast and plastic model of a U.S. Navy Grumman F-14 Tomcat was made by the toy manufacturer Toy Zone in the early-to-mid 2000s. Toy Zone produced and distributed die-cast toy vehicles to big-box retailers and toy stores such as Toys R' Us and Walmart. When sold at Walmart, some of Toy Zone's products were packaged under the name Motorworks, the in-house, generic brand name Walmart uses for some toys sold in their stores.

This F-14 die-cast and plastic model was part of a line of

die-cast toy aircraft Toy Zone made called the "Air Power Collection". These models were designed as entry-level, affordable die-cast replicas for older children and adults. The F-14 Tomcat model was released in two color schemes, an F-14 in the colors and markings of U.S. Navy Fighter Squadron VF-111 "Sundowners", and an F-14 flown by U.S. Navy Fighter Squadron VF-2 "Bounty Hunters". The model included a display stand, which needed to be assembled using the screws provided with the model.

The Toy Zone F-14 Tomcat had some excellent features and details for a model geared toward entry-level collectors. The colorful VF-2 squadron markings, which are decals, are high quality and have not fallen off or yellowed in the 20 years since this model was released. The model also has an excellent low-visibility gray paint finish, with some panels painted a slightly different shade of gray to represent weathering. The F-14 is also equipped with an assortment of AIM-54 Phoenix, AIM-7 Sparrow, and AIM-9 Sidewinder air-to-air missiles. The model also has working swing wings, and the F-14 can be displayed with its wings in the swept or unswept configuration. The cockpit also has figures representing a pilot and a radar intercept officer in their seats.



Since this model was manufactured in the “in flight” configuration with no landing gear, a display stand needed to be included with the model and the stand is a highlight of this model’s design. The base of the stand is made of heavy-duty plastic, and the arm is made of metal. The arm attaches to the base of the stand using screws provided in the kit. These screws provide a sturdy attachment point. The stand easily supports the weight of the F-14 model, which is substantial as most of the model is made of die-cast metal.

As this F-14 model was marketed and sold as an entry-level piece, there are several areas of this model that could have been improved. The pilot figures in the cockpit have no paint detail, such as colored gloves and helmets, and are simply green plastic. The cockpit also lacks any paint detail to highlight the knobs, buttons, or switches in the cockpit. The worst element of the model’s paint finish is the missiles. Toy Zone painted these a dark gray to match the color of the airplane, which is inaccurate for most of the ordnance included as the F-14’s weapons load.

There are two other elements of Toy Zone’s F-14 Tomcat model that are suspect. Although the stand is an excellent design, the pegs are a tight fit into the holes pro-

vided on the F-14 Tomcat model. Filing down the pegs slightly to make them smaller in diameter solves this problem. The other suspect element with this model is the fit of the wings. The mechanism to move the wings to the swept and unswept position on this model does not work exceptionally well. Changing the position of the wings takes applying a bit of force to the wings and the fuselage. As a result, it is probably best to limit moving the wings on this model to prevent breakage.

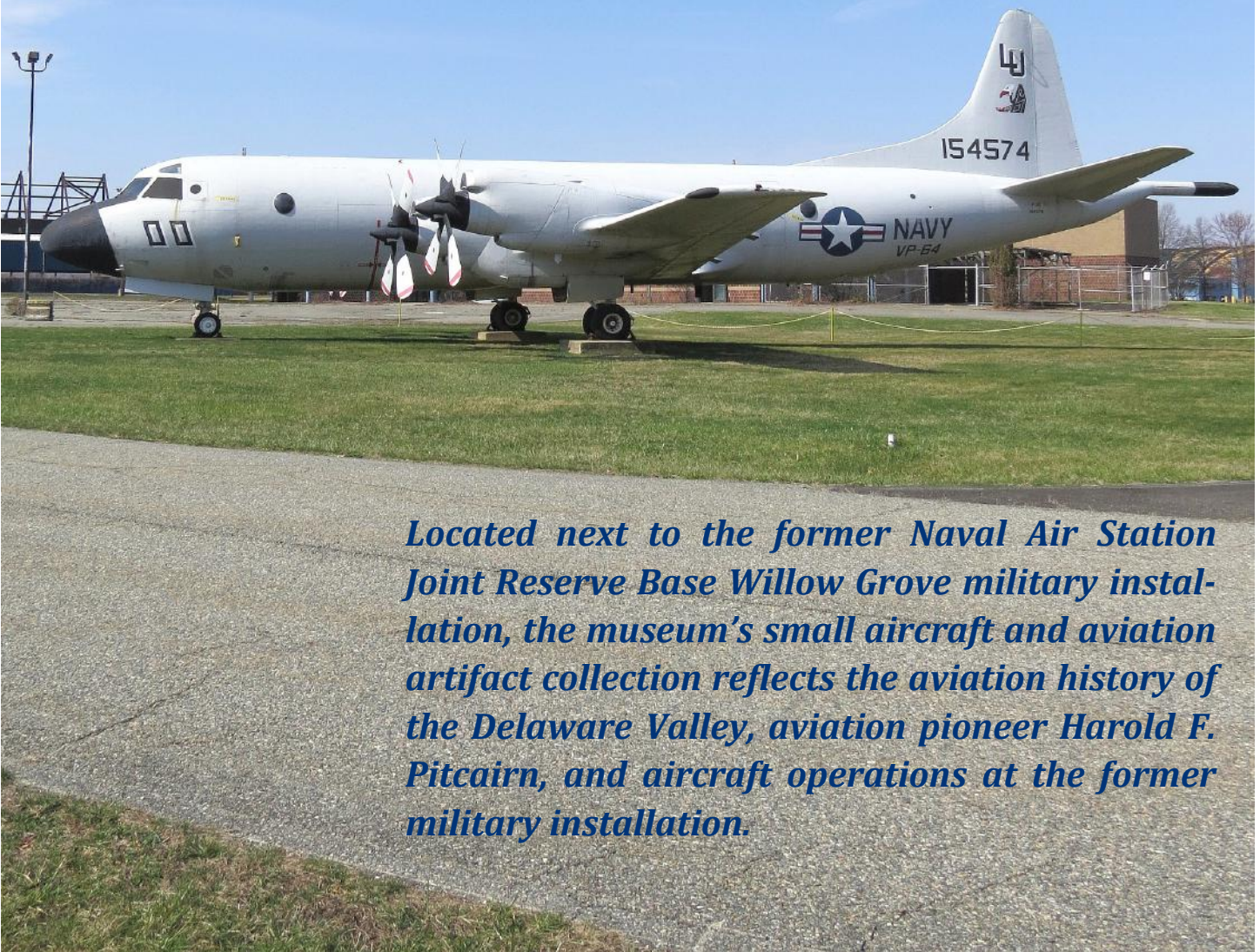
For an entry-level model offered at an affordable price for mass-market retail, the Toy Zone Grumman F-14 Tomcat is a decent model. Although this model has been discontinued for several years, mint in box or loose in good condition examples still go for decent prices in the secondhand market. The model is an excellent replica of the F-14 Tomcat and looks great displayed with Toy Zone’s McDonnell Douglas/Boeing F/A-18 Hornet model released in the same series. The model has an overall accurate shape, decent paint details and markings, a solid display stand, and colorful markings. The Toy Zone 1/48 scale F-14 Tomcat model is an excellent addition to the bookshelf or desk of any aviation enthusiast who has fond memories of one of the world’s most famous and iconic naval fighter aircraft.



The Toy Zone 1/48 scale F-14 Tomcat does have some shortcomings as a model. The weapons load is painted gray, which is incorrect for some of the missiles, which should be painted white. The pilot and radar intercept officer figures seated in the cockpit in the cockpit are molded in green plastic and have no paint detail. Finally, most of the squadron markings and stenciling on the model are decals, and the F-14 must be handled and cleaned with care to prevent the decals from coming loose or flaking off over time.



Harold F. Pitcairn Wings of Freedom Aviation Museum



Located next to the former Naval Air Station Joint Reserve Base Willow Grove military installation, the museum's small aircraft and aviation artifact collection reflects the aviation history of the Delaware Valley, aviation pioneer Harold F. Pitcairn, and aircraft operations at the former military installation.

The Harold F. Pitcairn Wings of Freedom Aviation Museum recently completed an exterior restoration of their Lockheed P-3B Orion that is on display with the museum's aircraft collection. The P-3B wears the markings of VP-64, a U.S. Navy Reserve Patrol Squadron that operated the P-3 Orion from the now-closed Naval Air Station Joint Reserve Base Willow Grove in Horsham, Pennsylvania.





I take a moment to pose for a picture with the Fairchild Republic A-10 Thunderbolt II on display at the Harold F. Pitcairn Wings of Freedom Aviation Museum, located next the former NAS-JRB Willow Grove military installation in Horsham, Pennsylvania. The A-10 Thunderbolt II attack aircraft was flown by the 111th Fighter Wing of the Pennsylvania Air National Guard at the installation from 1988 until the base's closure in 2011.

The Harold F. Pitcairn Wings of Freedom Aviation Museum is located on the property formally owned by aviation pioneer Harold F. Pitcairn in Horsham, Pennsylvania. From 1929 to 1942, Pitcairn designed, tested, and built Mailwing biplanes and Autogiros on the property. In 1942, Pitcairn sold the property to the United States Navy, and it became Naval Air Station Willow Grove. Following World War II and into the Cold War, the facility became an operational and training base for Reserve components of the United States Armed Forces, such as the United States Navy Reserve, Marine Corps Reserve, Air Force Reserve, Air National Guard, United States Army Reserve, and Pennsylvania Air National Guard. In 1994, the base was renamed Naval Air Station Joint Reserve Base (NAS-JRB) Willow Grove to reflect the joint operations on the base.

The Base Realignment and Closure Commission (BRAC) recommended the base for closure in 2005. Tenant units were either deactivated or relocated to other military installations. On March 31, 2011, the

airfield was shut down. The base officially closed on September 15, 2011. Today, the Pennsylvania Air National Guard operates a small portion of the property as the Biddle Air National Guard Base.

The Harold F. Pitcairn Wings of Freedom Aviation Museum is owned and operated by the Delaware Valley Historical Aircraft Association (DVHAA). The museum collection consists of 21 aircraft (plus one replica), two aircraft engines, and hundreds of smaller aviation artifacts. Three aircraft in the museum's collection are currently undergoing restoration at a facility off-site. The museum's aircraft and artifact collection emphasizes Delaware Valley aviation history, aviation pioneer Harold F. Pitcairn, and aircraft operations at NAS -JRB Willow Grove.

The photos in this feature highlight some of the aircraft collection and aviation artifacts that are part of the Harold F. Pitcairn Wings of Freedom Aviation Museum collection. Additional information for planning a visit to the museum, including its operating hours, can be found at www.wingsoffreedommuseum.org.



An oddity in the museum's collection is this 7/8-scale replica of a Fokker D.VIII fighter. The D.VIII was the last Fokker-designed aircraft to become operational during World War I and entered service in May 1918, only a few months before the war ended. Despite having an underpowered and obsolete engine, German pilots who flew the D.VIII stated it was agile and easy to fly. Because the wing of the D.VIII resembled a razor blade, Allied pilots nicknamed the fighter "The Flying Razor."



The museum has several artifacts on display to honor aviation pioneer Harold F. Pitcairn, who designed, tested, and built Mailwing biplanes and Autogiros on the property where the museum is now located. On display in the museum building is this Pitcairn PA-8 "Super Mailwing". Pitcairn built a series of mail and sport utility biplane aircraft from 1927 to 1931. The Mailwings were designed to carry mail for the United States Post Office Department in a fireproof compartment in front of the cockpit.



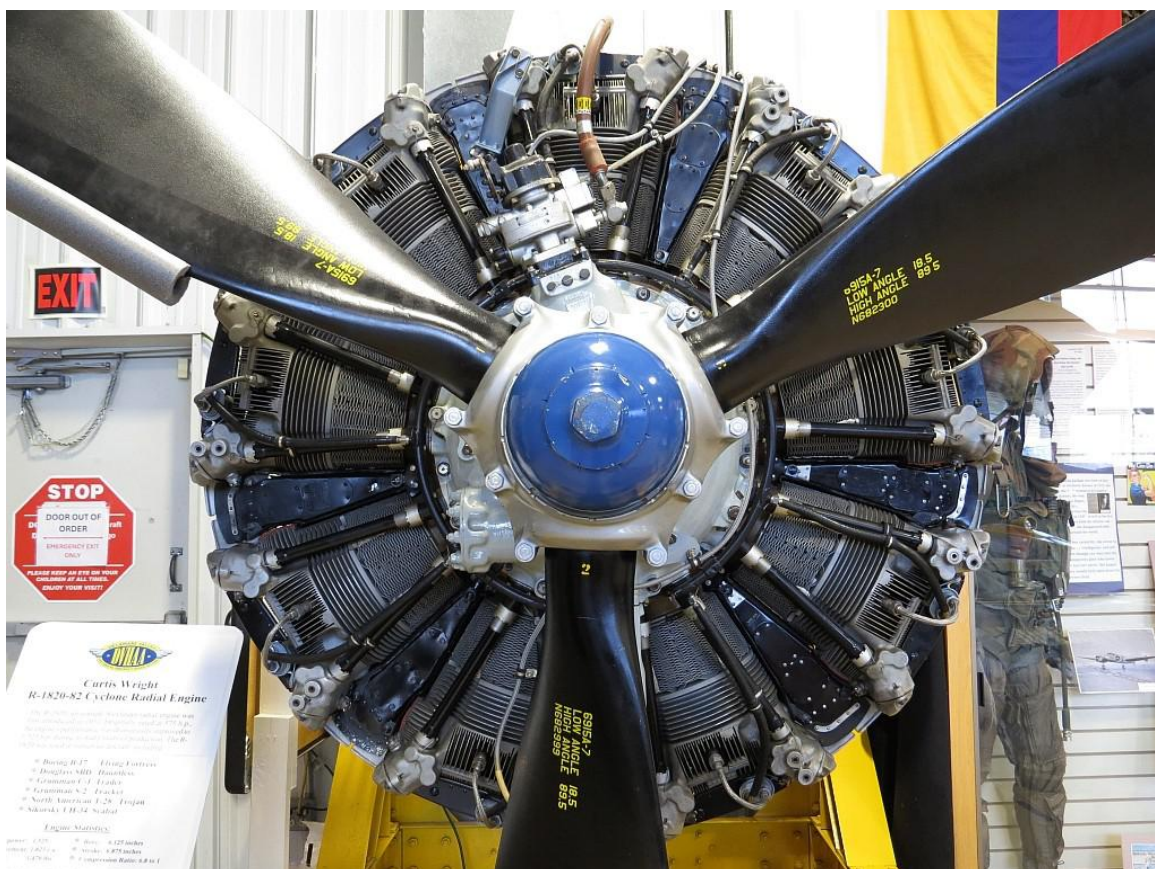


Pitcairn built Mailwings in small numbers from 1927 to 1931. A surprising number of the Mailwings survive in aviation museums throughout the United States. The museum's Pitcairn 8M "Super Mailwing" was built in 1931 and sold to Eastern Air Transport. It passed through numerous owners for 60 years before being bought by the Pitcairn family in 1992. After a full restoration in 1998 and flying it for several years, the Pitcairn family donated the airplane to the museum in 2012.

Throughout the museum building, several photographs and other artifacts honor the work Pitcairn did to design and develop autogiros. An autogiro uses an unpowered rotor in free autorotation to develop lift, while forward thrust is provided by an engine-driven propeller. For his work in the development of autogiros, Pitcairn was awarded the 1930 Collier Trophy. In this historic photograph on display, Pitcairn's chief pilot, Jim Ray, takes off from the south lawn of the White House in a PCA-2 autogiro.



Similar to other aviation museums, the Harold F. Pitcairn Wings of Freedom Aviation Museum relies on smaller artifacts and items of aviation memorabilia to tell the stories of aviation history not represented by aircraft in their collection. The museum building has multiple display cabinets featuring models, flight suits, equipment, medals, and photographs representing the history of aviation. This display cabinet holds aircraft models and other artifacts representing aviation in World War II.



This Curtiss Wright R-1820-82 Cyclone radial engine is one of two aircraft engines on display at the Harold F. Pitcairn Wings of Freedom Aviation Museum. First appearing in 1931, this nine-cylinder, air-cooled, radial engine's performance and reliability was dramatically improved during its production run. Variants of the R-1820 were used in many famous aircraft, including the Boeing B-17 Flying Fortress heavy bomber and the North American T-28 Trojan advanced trainer.





The Lockheed P-80 Shooting Star was the first jet fighter used operationally by the U.S. Army Air Forces during World War II. Powered by a turbojet engine and designed with straight wings, the P-80/F-80 saw extensive service during the Korean War but was outclassed by swept-wing fighters, such as the MiG-15 and F-86 Sabre. This P-80C/TV-1 was one of 50 transferred by the U.S. Air Force to U.S. Navy control in 1948. This airframe was stationed at the Willow Grove Naval Air Station during its service life.

Initially built as a civilian helicopter, the Bell Model 47 had such excellent performance that the U.S. Army requested a militarized version of the helicopter. The H-13 Sioux was designed as a light, three-seat observation helicopter. The H-13 was one of the principal helicopters used by the U.S. Army during the Korean War. Fitted with medical evacuation panniers, one of the primary roles of the H-13 was medevac missions. These missions were immortalized on the hit television show M*A*S*H.



A significant portion of the museum's aircraft collection is on display outside, as plans to expand into a larger building have been delayed by environmental contamination issues discovered throughout the grounds of the former military installation. The T-34 Mentor was a military training aircraft that entered service in the 1950s. After their retirement as military trainers, many T-34s were bought by flying clubs. This T-34B was flown by the Base Aero Club at NAS-JRB Willow Grove until the 1990s.



One of the more unusual and historically significant aircraft in the outdoor display area is the Convair YF2Y-1 Sea Dart. The Sea Dart was built to test the concept of a supersonic, jet-powered combat seaplane in the early 1950s. The Sea Dart flew for the first time in 1954. Flight tests determined the aircraft was unreliable, the concept was flawed, and the entire project was canceled after five prototypes were built. This Sea Dart is on loan from the National Museum of Naval Aviation in Pensacola, Florida.





The F9F Panther was Grumman's first jet fighter and the first to see air-to-air combat with the U.S. Navy. The Panther was used by the U.S. Navy and Marine Corps during the Korean War, with Panther pilots claiming seven MiG-15 fighters shot down. After its retirement from combat roles, the Panther was used for secondary roles such as training. The Panther was also the first aircraft used by the U.S. Navy "Blue Angels" Flight Demonstration Squadron, the team flying the Panther from 1949 to 1954.

The North American FJ-4 Fury is a swept-wing, carrier-capable fighter-bomber that served with the U.S. Navy and Marine Corps during the 1950s and 60s. Deliveries of the FJ-4 began in 1955, with the last examples delivered in 1958. The FJ-4B had a stronger wing for six underwing weapons stations instead of four on the FJ-4 and additional aerodynamic dive brakes for safer landing speeds. The most important feature of the FJ-4B was that it could carry a nuclear weapon on the inboard port wing station.



Introduced in 1949, the Piasecki HUP Retriever was a compact, single-radial engine, twin overlapping tandem rotor utility helicopter. Developed for the U.S. Navy, the helicopter was also used by the U.S. Army and some foreign navies. The helicopter's size and folding rotor blades for storage allowed it to operate off aircraft carriers. The U.S. Navy used the HUP Retriever for search and rescue missions. This HUP-2 Retriever is restored in markings of a search and rescue (SAR) helicopter from NAS Willow Grove.



The Republic F-84F Thunderstreak is a swept-wing turbojet-powered fighter-bomber that entered service in 1954. Intended as an upgrade from the straight-wing F-84G variant, the F-84F encountered numerous production delays and was not ready for service until 1954, by which time the North American F-86 Sabre was the U.S. Air Force's primary jet fighter. As a result, many of the production F-84Fs were allocated to NATO allies or to Air National Guard units serving stateside.





The Grumman C-1A Trader is a variant of the Grumman S-2 Tracker anti-submarine warfare aircraft designed for carrier on-board delivery (COD) of mail, personnel, and supplies. Throughout the 1960s and 70s, the C-1A Trader delivered mail and supplies to aircraft carriers on station in the Pacific Ocean during the Vietnam War. The C-1A Trader also served as a trainer for all-weather carrier operations. Four examples of the C-A were converted into EC-1A Tracers for use as electronic countermeasures aircraft.

The museum's C-1A Trader was the 64th out of a total of 87 built. This C-1A Trader became one of three operated out of NAS Willow Grove by the U.S.S. Independence carrier on-board delivery (COD) crew. The C-1A Trader had a long career with the U.S. Navy, with the last example being retired in 1998. The museum's C-1A was retired in 1987 and placed on static display on the grounds of NAS Willow Grove. In late 1987, the museum acquired the aircraft for display with its own collection.



First introduced in 1959, the Bell UH-1 Iroquois is one of the most iconic military helicopters ever built. A symbol of the Vietnam War, the "Huey" was built in several variants and used for various roles by militaries worldwide including medical evacuation, reconnaissance, air assault, cargo transport, and search and rescue. Nearly 16,000 UH-1s were built between 1956 and 1987, with many examples of the helicopter still in service worldwide. This UH-1V entered service in 1968 and served until the 1990s.



The Kaman SH-2G Super Seasprite was designed as an all-weather anti-submarine and anti-surface warfare helicopter with additional search and rescue, minesweeping, and utility capabilities. The compact size of the SH-2 allowed it to be operated from decks of smaller surface ships, such as destroyers and frigates. The SH-2G Super Seasprite was an improved variant of the earlier SH-2F Seasprite and entered service in the 1980s. The last SH-2Gs were retired from U.S. Navy service in 2001.





The Douglas A-4 Skyhawk was designed as a single-engine, carrier-capable, subsonic, light attack aircraft during the early 1950s. The Skyhawk had a compact, simple, and lightweight design. The Skyhawk's delta-configuration wing had such a short span that wing folding mechanisms for aircraft carrier operations were not needed. Five weapons hardpoints on the Skyhawk supported carrying a variety of missiles, rockets, and bombs. The Skyhawk entered service in 1956 with the U.S. Navy.

Because of its simple design and low cost, the A-4 Skyhawk had a long production run, with improved variants produced until 1979. Two-seat variants of the Skyhawk were also built for use as trainers. In addition to its use by the U.S. Navy and Marine Corps, several other nations operated A-4s as fighters and attack aircraft. The museum's A-4 Skyhawk served with Marine Attack Squadron 131 at NAS-JRB Willow Grove until 1994 when it was severely damaged by a bird strike and removed from service.



Introduced in 1962, the Lockheed P-3 Orion saw numerous design developments during its service life, most notably in the electronics packages used to hunt enemy submarines and surface warships. In addition to the U.S. Navy, several other air forces and navies worldwide have used the P-3 Orion for maritime patrol, anti-submarine warfare, anti-surface warfare, and weather reconnaissance. U.S. Navy Reserve Patrol Squadrons VP-64 and VP-66 flew the P-3 Orion from Willow Grove when the base was active.



In U.S. Navy service, the P-3 Orion has been replaced in active duty and reserve squadrons by the Boeing P-8 Poseidon. Air Test and Evaluation Squadron 30 (VX-30) operates three P-3C and one NP-3D for testing and evaluation purposes. Scientific Development Squadron 1 (VXS-1) also operates two NP-3C Orion aircraft for scientific research flights. The museum's P-3 currently sits on a part of the property that is inaccessible for close-up viewing, but the aircraft can be viewed through a perimeter fence.





The museum recently completed an exterior restoration of the McDonnell Douglas F-4A Phantom II in their collection. The F-4 Phantom II is a two-seat, twin-engine, all-weather, interceptor and fighter-bomber developed for the U.S. Navy. The F-4 Phantom entered service in 1961. A few years later, the F-4 Phantom was adopted into service with both the U.S. Marine Corps and the U.S. Air Force. The F-4 Phantom was used extensively during the Vietnam War as a fighter and ground-attack aircraft.

With 5,195 examples produced, the F-4 is the most-produced supersonic aircraft in American history. The Phantom was widely exported and served with the air forces and navies of several NATO countries, making it one of the signature military aircraft of the Cold War. The F-4 had a top speed of Mach 2.2, and the ability to carry up to 18,000 lb (8,400 kg) of missiles, bombs, and other ordnance. These capabilities made the F-4 adaptable to combat roles such as ground-attack and aerial reconnaissance.



The McDonnell Douglas F/A-18 Hornet entered service with the U.S. Marine Corps in 1983 as a multirole aircraft. The F/A-18 is capable of flying both fighter and attack missions and is capable of operating from land bases and aircraft carrier flight decks. In 1984, the F/A-18 Hornet entered service with the U.S. Navy. In addition to the U.S. Marine Corps and U.S. Navy, the F/A-18 Hornet was used by the air forces of several other nations, such as Australia, Canada, Finland, Spain, and Switzerland.



The F/A-18 Hornet was used extensively during the 1991 Gulf War and 2003 Iraq War, where it was praised for its reliability and versatility. The Hornet can fly a wide range of missions and carry a variety of weapons systems. The F/A-18 "Legacy" Hornets, such as this one, have been retired by the U.S. Navy, but remains in service with the U.S. Marine Corps. The basic design of the F/A-18 Hornet served as the basis for the F/A-18E/F Super Hornet, a larger and more capable evolutionary redesign.





It is only fitting that the museum has an example of a Fairchild Republic A-10 Thunderbolt II on display. The A-10 was flown by the 111th Fighter Wing (now 111th Attack Wing) of the Pennsylvania Air National Guard from 1988 to 2011 and based at NAS, and later NAS-JRB Willow Grove, during that time. The A-10s were a common sight at the base and in the skies of the surrounding area. Upgraded variants of the A-10 remain in service with the U.S. Air Force in the close air support role.

The A-10 Thunderbolt II (nicknamed the "Warthog") entered service in 1972. The aircraft was designed for close air support of ground infantry and to destroy Soviet tanks in a large-scale conflict in Europe. The A-10 was built around a 30 mm (1.18 in) rotary cannon that can penetrate the rounds of all existing armor. The A-10 can also carry up to 16,000 lb (7,620 kg) of bombs, rockets, and other stores. The A-10 has been used extensively in recent military conflicts in the Middle East and Afghanistan.



Mikoyan-Gurevich MiG-15bis (Jian Ji-2)



A Jian Ji-2 (Chinese Air Force (People's Liberation Army Air Force) designation of the Mikoyan-Gurevich MiG-15bis) on display in the National Air and Space Museum's Steven F. Udvar-Hazy Center. The MiG-15 was one of the first jet fighters built to incorporate swept wings into its design. The MiG-15's speed, maneuverability, and firepower shocked U.N. pilots when the fighter appeared in the skies above North Korea during the Korean War.

The Mikoyan-Gurevich MiG-15 (NATO reporting name: FAGOT) is a jet fighter developed by Mikoyan-Gurevich for the Soviet Union. The MiG-15 was one of the first jet fighters to incorporate swept wings into its design to achieve high transonic speeds. During the Korean War, the MiG-15, sometimes flown by experienced Soviet pilots, outclassed straight-wing jet fighters operated by U.N. forces and shocked military officials in the West with its performance capabilities. Over 13,000 MiG-15s were built in the Soviet Union in several variants. An additional 4,600 MiG-15s were license-built in countries such as China, Poland, and what is now the Czech Republic.

Design and development of the MiG-15 began in the late 1940s when Mikoyan-Gurevich designed the MiG-9 jet fighter. This fighter was powered by turbojet engines that were reverse-engineered German BMW 003 engines. These engines were underpowered and unreliable. The MiG-9 also suffered from control problems. In 1946, Soviet jet engine design still lagged behind the West's. Soviet aviation minister Mikhail Khrushchev and

aircraft designer A.S. Yakovlev suggested to Soviet Premier Joseph Stalin that the Soviet Union buy the reliable, fully developed Rolls-Royce Nene turbojet engine. Stalin was skeptical of the plan but consented, and Soviet officials traveled to the United Kingdom to arrange to purchase the engines. To Stalin's surprise, the British government, in the interest of improving United Kingdom-Soviet Union relations, was willing to provide technical information and a license to build the Rolls-Royce Nene engine. Sample engines were purchased, and blueprints were provided. After evaluation and some minor changes to adapt the engines to Russia's climate conditions, the Soviet Union began manufacturing these engines for their aircraft as the Klimov RD-45.

To take advantage of the new engine, the Council of Ministries ordered the Mikoyan-Gurevich OKB to design and build two prototypes of a new fighter. The purpose of this fighter would be the high-altitude interception of enemy bombers. Performance targets were a top speed of 620 miles per hour (1,000 km/h) and a range of 750 miles (1,200 km).



The prototype that emerged from Mikoyan-Gurevich had a mid-mounted swept wing and a tailplane mounted on a swept tail. Although Mikoyan-Gurevich designers had access to German research on swept-wing aircraft from World War II, the MiG-15 was entirely Russian in design. Two wing fences were fitted to each wing to improve airflow over the wing. The Klimov RD-45 engine was at the rear of the aircraft and fed air by a split-forward air intake at the nose of the fighter. Ductwork carried the air around the cockpit and brought it back together ahead of the engine.

As the MiG-15 was designed to intercept enemy bombers, the armament chosen was a pair of 23 mm (0.91 in) autocannon and a single 37 mm (1.46 in) autocannon. These weapons were powerful against enemy bombers, but their slow rate of fire limited their effectiveness against enemy fighter aircraft. The cannons were fitted into a simple pack under the bottom of the nose that was removable for servicing and reloading. These cannon packs were also preloaded and stockpiled by ground crews for quick installation on MiG-15s.

The prototype MiG-15 flew for the first time on December 30, 1947. During flight testing, the MiG-15 hit a top speed of 647 miles per hour (1,042 km/h) at 9,800 feet (3,000 m). Although a competitive design, the Lavochkin La-15, reached limited production, the MiG-15 was favored and ordered into mass production in March 1948, just three months after the first test flight. By the end of 1948, substantial numbers of MiG-15s were in service with both Soviet Air Forces, the VVS (tactical air arm) and the IA-PVO (air defense arm).

Initial operations with the MiG-15 revealed some problems. Early production examples tended to roll left or right due to manufacturing variances. Aerodynamic trimmers were fitted to correct the problem, with ground crews adjusting them until the aircraft flew correctly. Engine failures were also common. In 1950, an improved variant, the MiG-15bis, entered service. This version of the fighter used a Klimov VK-1 engine built with higher-quality metals for improved reliability. The MiG-15bis also gained horizontal upper-edge airbrakes and a headlight in the air intake separator.





The West got its first look at the MiG-15 in late 1950 when the fighter appeared in the skies over North Korea. Although denied for years afterward by the Soviet Union, it is now known that many of these MiG-15s were piloted by highly experienced Soviet pilots. To disguise the fact that the Soviet pilots were flying combat missions, the MiG-15s were painted in North Korean markings, and the Soviet pilots wore North Korean or Chinese flight suits. The MiG-15's speed, excellent maneuverability, and high ceiling shocked and stunned the U.N. pilots flying in Korea. First-generation fighter jets, such as the Lockheed F-80 Shooting Star and Republic F-84 Thunderjet, were no match for the Soviet fighter. The MiG-15s caused high losses for B-29 and B-50 bombers flying daytime bombing missions, causing U.S. Air Force officials to switch to night bombing missions instead.

To counter the MiG-15, the U.S. Air Force rushed squadrons of the new North American F-86 Sabre to Korea to reestablish air superiority. American F-86 Sabre pilots quickly realized that despite its excellent speed and ma-

neuverability, the MiG-15 was not a stable gun platform. The MiG-15 tended to roll at high speeds because of wing flexing. The Soviet fighter's cockpit instrumentation was also primitive compared to the F-86 Sabre, and its stick forces were heavy. It was also discovered through combat experience that the MiG-15 became almost impossible to control when it approached speeds reaching Mach 1, and it often entered an unrecoverable spin after it went into an aerodynamic stall. Several U.N. pilots witnessed MiG-15s entering unrecoverable spins in combat, resulting in at least 25 crashes.

Although the combat records are inconclusive, it is estimated that the MiG-15 suffered a 10:1 loss ratio against the F-86 Sabre. While most MiG-15 losses in Korea were from combat with F-86s, MiG-15s also suffered losses during or after combat with Grumman F9F Panthers, Lockheed F-80 Shooting Stars, Republic F-84 Thunderjets, Gloster Meteors, and even propeller-driven Hawker Sea Furies and Vought F4U Corsairs. By the end of the Korean War, Soviet pilots had been joined in the air by Chinese and North Korean pilots flying the MiG-15.



After the Korean War, the MiG-15 became the primary interceptor of many of the Soviet Union's Warsaw Pact allies. On several occasions in the 1950s, MiG-15s were sent to intercept NATO aircraft performing reconnaissance near or inside Warsaw Pact countries or territory. In some instances, these incidents resulted in aircraft from one side or the other being shot down. MiG-15s were also used by the Egyptian Air Force during the 1956 Suez Canal Crisis.

During its long service career, 35 countries operated the MiG-15 worldwide. The MiG-15 was built in 17 variants during its production run and license-built in China, Poland, and Czechoslovakia. Improved versions of the MiG-15 could be fitted with underwing rockets or external fuel tanks for increased combat range. To help transition pilots to the MiG-15, two-seat training versions of the aircraft were built. Today, nearly 80 years after its first flight, small numbers of MiG-15s are still operated by the Korean People's Army Air Force in the advanced training role. Several retired examples of the MiG-15, mainly F-2s from China, have been bought by private

individuals in the United States, where they can be seen in flight demonstrations at airshows.

The MiG-15 was later refined and redesigned into the more advanced MiG-17 (NATO reporting name: Fresco). The MiG-17 addressed many design flaws with the MiG-15 and introduced an improved engine and a new swept wing with a "compound sweep" configuration. The MiG-17 prototype flew in 1953, before the end of the Korean War. Later versions of the MiG-17 introduced afterburning engines, radar, and missiles to the design. The small and agile MiG-17 was used with surprising success by North Vietnamese pilots during the Vietnam War against American fighters and bombers.

This MiG-15bis is a Chinese Air Force (People's Liberation Army Air Force) Jian Ji-2 example of the fighter. The museum acquired this MiG-15 in 1985 through the now-closed Champlin Fighter Museum in Mesa, Arizona. Unfortunately, there is no record of this MiG-15's production or service history. The MiG-15bis is displayed in the National Air and Space Museum's Steven F. Udvar-Hazy Center in Chantilly, Virginia.



Naval Aircraft Factory N3N

(1936)



The Naval Aircraft Factory N3N was an American tandem-seat, open-cockpit, primary training biplane built by the Naval Aircraft Factory in Philadelphia, Pennsylvania, during the 1930s and early 1940s. The N3N was designed in the mid-1930s to replace the U.S. Navy's Consolidated NY-2 and NY-3 trainers. Unusually, the N3N could be fitted with either conventional landing gear for land operations or floats for operations off of water. The N3N was introduced into service in 1936 and widely used by the U.S. Navy as a training aircraft throughout World War II. When production of the N3N ended in 1942, 997 examples of the trainer had been built in two production variants. The last examples of the N3N in service were used by the U.S. Naval Academy in Annapolis, Maryland, for aviation familiarization training and were retired in 1959.

Naval Aircraft Factory N3N

Crew: 2 (Student Pilot, Flight Instructor)

Length: 25 ft 6 in (7.77 m)

Height: 10 ft 10 in (3.3 m)

Wingspan: 34 ft (10.36 m)

Wing Area: 305 sq ft (28.3 m²)

Powerplant: N3N-1: Wright R-790 Whirlwind (J-5) nine-cylinder air-cooled radial piston engine (x1)
N3N-3: Wright R-760-2 Whirlwind (J-6-7) nine-cylinder air-cooled radial piston engine (x1)

Range: 410 nmi (756 km)

Cruise Speed: 90 mph (144 km/h)

Maximum Speed: 126 mph (203 km/h)

Empty/Maximum Takeoff Weights: 2,090 lb/2,792 lb (948 kg/1,266 kg)

Service Ceiling: 15,200 ft (4,635 m)



Yellow Peril

Construction

Unlike most aircraft, the N3N's fuselage is constructed using Alcoa's extruded aluminum with bolts and rivets rather than the more common welded steel tubing. During the early production of the N3N, the Naval Aircraft Factory used aluminum stringers formed from material left over from canceled production orders for airships. The left side of the fuselage features removable aluminum access panels for easy airframe inspection and repairs. The top wing is made from aluminum and is all one piece. The lower wing has wingtips designed as separate pieces, so the wingtips could be quickly replaced if damaged in the event of a ground loop or wingtip ground strike during landing.

Cockpit

The N3N had a two-place cockpit with seating for a student pilot and a flight instructor. During N3N training operations, the instructor typically sat in the front seat and the student pilot in the rear seat. When the student pilot soloed the N3N, they flew it from the rear seat. The N3N could be flown solo from the front seat, but to do so, ballast needed to be installed in the rear cockpit to balance the aircraft's center of gravity.

Operators

The Naval Aircraft Factory built 997 N3Ns at their facility in Philadelphia between 1935 and 1942 in two main production variants. The company built 179 N3N-1s before production switched to the improved N3N-3 in 1938. The N3N-3 was the main production variant, with 816 examples built. The primary operators of the N3N were the U.S. Navy and the U.S. Marine Corps. Four N3Ns were also provided to the U.S. Coast Guard in 1940 to expedite pilot training in anticipation of war. Small numbers of N3Ns were also supplied to the Chilean Naval Airforce and the Cuban Naval Airforce under the Lend-Lease Program.



Flight Characteristics

The N3N developed a reputation with student pilots and flight instructors as a rugged, dependable, and generally forgiving airplane to student pilots. The N3N had well-balanced flight controls and generally good flight handling characteristics, though spins in the aircraft were often a fatal mistake for student pilots. The N3N was also fully capable of performing aerobatics. Unfortunately, the N3N was sometimes nicknamed "Yellow Bird" because of its all-yellow paint scheme, or less affectionately, "Yellow Peril" due to the numerous predicaments inexperienced student pilots often found themselves in during their flight training programs.

Landing Gear

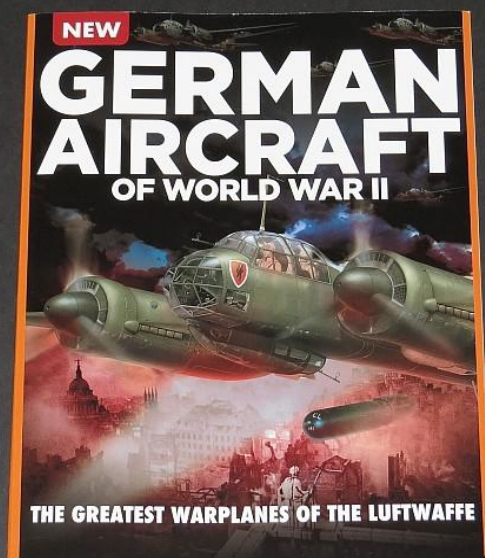
The N3N was unique in that it was successfully flown as a landplane and a seaplane and operated for training in both configurations. For water operations, the conventional landing gear was replaced with a single large float under the fuselage and two smaller floats under the outer tips of the lower wings. The conventional airplane version of the N3N used fixed landing gear. The landing gear configurations were interchangeable, and mechanics could change the landing gear on a N3N in a couple of hours. In the event of a crash, the landing gear was designed to break away from the airframe to lessen the impact.

Powerplant

The N3N-1 was powered by a Wright Whirlwind R-790 (J-5) engine that produced 220 horsepower. On the N3N-3, this engine was replaced by the improved and more powerful Wright Whirlwind R-760-2 (J-6-7), which produced 235 horsepower. Both engines were nine-cylinder, air-cooled, radial piston engines. Since the Naval Aircraft Factory was an aviation firm wholly owned and operated by the U.S. Government, the U.S. Navy bought the rights and tooling to build the R-760-2 engine from Wright, and the Naval Aircraft Factory built these engines on their own to install on the N3Ns. The two-blade metal propellers were license-built from Hamilton Standard.



German World War II Aircraft Bookazine



German Aircraft of World War II is a new title now available from publisher Amber Books Ltd. in their continuing series of aviation reference bookazines. The bookazine is an excellent quick reference guide to the major aircraft types used by the German Luftwaffe during the war. The bookazine includes performance specifications, cutaway diagrams, profile drawings, and colorful illustrations of each aircraft featured in the publication.

Amber Books Ltd. is a United Kingdom-based publisher of nonfiction illustrated reference books. The company publishes illustrated reference books for children and adults on military history, military technology, animals, pets, photography, travel, natural history, music, health, and transportation topics. The publishing company currently offers over 1,000 titles that are available in 40 different languages. In addition to publishing reference books under its branding, Amber Books Ltd. also offers book packaging services for clients, publishing materials for them with the clients paying royalty fees to use the material. Recently, Amber Books Ltd. began offering some of its military and aviation reference book titles in an affordable and concise reference bookazine format. Some aviation titles published in this series of reference bookazines have included *Japanese Aircraft of World War II*, *German Aircraft of World War I*, *Modern Russian Military Aircraft*, and *Chinese Military Aircraft*.

The latest release in the series of aviation-themed bookazines is *German World War II Aircraft*, which features aircraft used by the German Luftwaffe during World War II. The 144-page bookazine has color profile illustrations of each aircraft featured, performance specifications, and a brief operational history of each. Famous German types from the war, such as the variants of the Messerschmitt Bf 109 and Focke-Wulf 190 fighters, the Heinkel He-111 bomber, and the Junkers Ju 52 transport aircraft are all represented in *German World War II Aircraft*. The advanced jet aircraft used by the Luftwaffe late in the war, the Messerschmitt Me 262 fighter-bomber and the Arado Ar 234 bomber, are also featured in the bookazine. Also covered in *German World War II Aircraft* are some lesser-known aircraft types used by the Luftwaffe during the war, such as the Blohm & Voss BV 138 maritime reconnaissance flying boat, the Arado Ar 196 shipboard reconnaissance seaplane, and the large Messerschmitt Me 323 Gigant military transport aircraft are also featured in the publication. *German World War II Aircraft* also features an interesting section dedicated to helicopters developed by Germany during World War II.

German Aircraft of World War II is now available from booksellers and newsstands in the United Kingdom, Australia, Canada, and the United States. The bookazine has an MSRP of £10.99 in the United Kingdom, A\$25.99 in Australia, \$19.99 in the United States, and CD\$29.99 in Canada. Amber Ltd.'s *German Aircraft of World War II* is an excellent addition to the publisher's series of aviation bookazines. The title is an excellent quick reference guide for anyone interested in World War II German aircraft or aviation history.



Heinkel He 111H (1939)

Successor to the He 111P, the He 111H would become the most widely produced variant of the He 111. As well as operating as a conventional bomber, it would serve as a torpedo-bomber and cruise missile launcher and be pressed into service as a transport before the war was over.

While the He 111P introduced the glazed nose to the 111, it used the same DB 601 engines as the Bf 109 and 110. It was made to avoid a production bottleneck; the decision was made to use the 783kW (1,053hp) Junko 211 engine, which was in lower demand. The resulting He 111P entered service as a fighter-bomber in 1939 and by the time of the Invasion of Poland made up over half the operational strength of *KG 1*, which themselves made up 75 per cent of the Luftwaffe's medium bomber force. The invasion saw the He 111P along with *Bf 107* tasked with attacking airfields, logistics

Fuel tanks
The wing carries 200 lbs (150 fuel tanks). Fuel tanks are in the outer section of the wing, used for fuel tanks. (The wing section, for

Fieseler Fi 103 Flying Bomb
Also known as the V-1 Flying Bomb (Vergeltungswaffen 1), and also to the Allies, the Fi 100 was an extremely deadly weapon. It used a pulse jet for power and was launched from behind a launch rail.

This, however, would prove to be the exception rather than the rule and the crews of many of the aircraft that had been survived. With the invasion of Poland in 1939, the He 111s were relocated to support the intervention in action against France and the United Kingdom. Forbidding from attacking land targets in France during the Phoney War period, they concentrated on attacking the shipping lanes. The He 111s were also tasked

General purpose
The 140 7.62 mm G.O. is a gas-operated, belt-fed, semi-automatic rifle.

with reconnaissance missions over the North Sea, fitted with cameras on the engine bays pylons. During one such anti shipping mission, the 111Hs of HQ 28 would be involved in the sinking of two German destroyers near the Dogger Bank due to a breakdown in communication.

A Heinkel He 111H-2 (with Fieseler Fi 155G) following experiments at Peenemünde, the German secret weapons establishment, in 1942, several Heinkel 111s were modified to carry a Fieseler Fi 103 V-1 missile. The type was assigned to the newly formed II Gruppe, Kampfgeschwader (KG) 3, which became operational at Venlo and Groen-Huis in the Netherlands in July 1944. By August 1944, II KG 3 had launched 900 V-1s against the British capital, London.

Bomber

Crew
The standard crew for the mine T-11 was five: a pilot, who sat in the glazed section; a navigator/bombardier, who sat in the nose; a radio operator; a dorsal gunner; and two tail gunners, who operated machine guns in the beam and ventral gunnery, which was known to the crew as the Storkbait ("clark bait").

Helicopters (1942)

The very first helicopters proved to be difficult to master, and although an initial example was airborne in September 1907, it wasn't until Germany introduced the Flettner FI 282 *Kolibri* that a truly useful rotorcraft reached the front line. Delivered to the German Navy from 1942, it was followed by the more capable Focke-Achgelis Fa 223 *Drache*, a six-seater with options for various defensive weapons, though the helicopter as a weapon was still immature by the time World War II ended.

Focke-Achgelis Fa 223 Drache
The Focke-Achgelis company gained experience of a helicopter with an outrigger-mounted, twin-rotor arrangement with the Fa 67, which was then scaled

First flown in February 1945, the 51st prototype Fw 223 V23, received the military serial GW+PA. It was used for operational trials before it was captured by US forces.

to create the six-passenger Fa 226 Hornisse (honey). The latter was developed to meet a Deutsche Luft Hansa requirement. The prototype completed ground running and tethered-hovering trials in summer 1940 and a first free

Accommodation The crew of pilot, on the left, and observer sit in the cockpit with the four-person passenger compartment immediately behind them and in front of the galley.

...the place in August, that year. Further development ...
...under the jurisdiction of the Fiv 223 Orache ...
...with an order placed for 39 examples for evaluation ...
...including training, transport, rescue and anti- ...
...patrol. Different equipment included a 7.92mm ...
...in machine gun and two 250kg (551lb) bombs, ...
...for reconnaissance, or a jet-propelled 300 lbs (66 ...
...of the 2nd Air.

production run of 30 one-production aircraft were
planned to be planned before the factory was bombed, and
the aircraft were completed at Lärchen near Stuttgart.
The aircraft were transferred from a factory in Berlin before the war
ended. Most of those completed didn't ever fly.
The aircraft were transferred to Lufttransportabteilung 40.

Motors

Rotors
The counter-rotating rotors were constructed of wood with a steel spar. Each rotor had three blades while the outriggers held them sufficiently far apart to avoid any overlap, which would have required synchronization of their rotation.

Construction
The fuselage was constructed of steel tubes covered in dope fabric to save weight. The rotors were mounted on outriggers also constructed from steel tubing.

Transports, Reconnaissance & Seaplanes

Specifications: Fa 223

Types:	Mid carrier
Dimensions:	Length: 12.25m (40ft 0in) Height: 4.50m (14ft 9in)
Weight:	13,700kg (30,175lb) maximum
Powerplant:	1 x T500W 11,000hp turbine (100% 200% thrust) and 2 x propellers
Maximum speed:	170kph (105mph)
Range:	437km (272 miles)
Service ceiling:	4,877m (15,999ft)
Crew:	2 + 4 passengers
Armament:	1 x 7.62mm (0.311in) MG 10 machine gun, 752kg (1,650lb) bombs or 2 x 40mm cluster



**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.

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