KREIDER-REISNER AIRCRAFT COMPANY, FACTORY NO. 1
(Fairchild Aviation Corporation, Factory No. 1)
851 Pennsylvania Avenue
Hagerstown
Washington County
Maryland

HAER MD-137
MD-137

PHOTOGRAPHS

HISTORIC AMERICAN ENGINEERING RECORD
National Park Service
U.S. Department of the Interior
1849 C Street NW
Washington, DC 20240-0001

ADDENDUM TO:
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WRITTEN HISTORICAL AND DESCRIPTIVE DATA

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KREIDER-REISNER AIRCRAFT COMPANY, FACTORY NO. 1
(FAIRCHILD AVIATION CORPORATION, FACTORY NO. 1)

HAER No. MD-137

LOCATION: 881 Pennsylvania Avenue (Originally 1 Park Lane), Hagerstown, Washington County, Maryland

Fairchild Factory No. 1 is located at latitude: 39.654706, longitude: -77.719042. The coordinate represents the main entrance of the factory, on the north wall at Park Lane. This coordinate was obtained on 22 August, 2007 by plotting its location on the 1:24000 Hagerstown, MD USGS Topographic Quadrangle Map. The accuracy of the coordinate is +/- 12 meters. The coordinate's datum is North American Datum 1927. The Fairchild Factory No. 1 location has no restriction on its release to the public.

DATES OF CONSTRUCTION: 1929, 1931, 1935, 1941, 1965, 1987

BUILDER: Kreider-Reisner Aircraft Company, a subsidiary of Fairchild Aviation Corporation

PRESENT OWNER: Vincent Groh

PRESENT USE: Light industry, storage

SIGNIFICANCE: Kreider-Reisner Factory No. 1 (also known as Fairchild No. 1) was built as a result of a partnership between upstart airplane builders Ammon H. Kreider and Lewis E. Reisner and aviation industrialist Sherman Fairchild in 1929, in order to meet demand for the Challenger, a popular sport biplane. A modern open industrial structure by late 1920s standards, the factory was constructed in only four months in the former airfield behind the original Kreider-Reisner Shed. Here Kreider-Reisner Aircraft Company and Fairchild Aviation Corporation developed and mass produced several innovative commercial aircraft, including the KR-31 and KR-34 Challengers, the F-22 and F-24, and the F-91 Amphibian. Entering the defense field in 1939, Fairchild's PT-19 Primary Trainer and C-82 Packet both earned major Army contracts, leading to tremendous expansion of both the factory and the company. During World War II, Fairchild No. 1 was the center of the "Hagerstown System" of manufacturing as Fairchild subcontracted with over twenty-five businesses throughout the city to assist in the production of military aircraft for the war effort. Although Fairchild closed in the 1980s, the factory survives as a symbol of Fairchild's and Hagerstown's heyday as a major aviation manufacturing center.

HISTORIAN: Christopher H. Marston, 2007

PROJECT INFORMATION: The Kreider-Reisner Aircraft Company Factory No. 1 was recorded in conjunction with the Kreider-Reisner Aircraft Company Shed Recording Project. The Historic American Engineering Record (HAER) recorded the sites in cooperation with shed owner David Andrews and factory owner Vincent Groh. The documentation and history were prepared by Christopher H. Marston, HAER Architect. John Domingos, Montgomery College, prepared measured drawings of the shed. Jet Lowe produced large format photography of both sites. Kurtis Meyers, John Seburn, Jack Seburn, of the Hagerstown Aviation Museum, and Douglass C. Reed of Preservation Associates, Inc., assisted with the project.

RELATED DOCUMENTATION: Kreider-Reisner Aircraft Company, Shed, HAER MD-137-A

Physical History

The Kreider-Reisner Aircraft Company (KRA) constructed its new factory in four months from May to August 1929. The architect, engineer, and builder are unknown. The original building consisted of a two story office section in front, and manufacturing area in the rear, comprising 35,000 sf. The building faced north at the intersection of Park Lane and Pennsylvania Avenue (U.S. Route 11) in northwest Hagerstown. The original address was 1 Park Lane, but it is now called 881 Pennsylvania Avenue. The office section measured 120' wide by 20' deep and was constructed in steel frame with brick sheathing. Two rows of continuous horizontal windows with industrial metal sash -- five lights high on the first floor, four high on the second -- ran the length of the front wall divided by four brick pilasters. The windows continued around the corner on the side walls, ending at a brick pilaster at the back corner of the office section. There were a total of thirteen 2x2 operable windows placed along each row. A central entrance bay projected 2' from the wall, with monumental pilasters on each side. The top of the entrance bay rose above the parapet wall. It featured a decorative stepped stone cap, in the shape of an abstracted Pegasus, a reference to the Fairchild logo. There was also one pilaster on either side of the facade, about 2/3 of the distance between the entrance and the corner. All six pilasters were capped with dressed stone, with set backs and a half-round top, an Art Deco-style detail (see figure 3).

The original assembly area was 250' x 120' (30,000 sf) and was used for the production of KR-31 and KR-34 Challengers. The structure was composed of twelve bays of vertical steel beams. The walls were fully glazed with industrial windows, with three sets of windows in each bay, which sat on a 2' high brick wall. The sash in each bay was six lights high, in a five-six-five horizontal arrangement, with a two-over-three operable window in the center. The roof featured a 60' wide clerestory monitor supported by steel Warren roof trusses. Wood cross beams ran along the truss panel points, supporting wood plank sub roofing. The clerestory windows in the monitor were four lights high with two-over-two operable units. The structure allowed for open work space of 60' wide by 320' tall by 17' tall. There were one story bays on either side; some subdivided into separate work areas. The rear south end featured 12' high sliding doors to allow easy access for moving aircraft in and out. The boiler room was situated at the southeast corner of the rear, marked by a 30' tall 4' square brick chimney. "KREIDER-REISNER HAGERSTOWN, MD." was painted in white block letters on the lower roofs of the side bays, and "AIRPORT 4 MI." was painted on the monitor roof, with a north arrow pointing up Pennsylvania Avenue. There was a dirt access road from the rear of the building around the original Kreider-Reisner shed across the tracks to Pennsylvania Avenue (see figure 5).[1]

KRA documented the construction process of the building through photographs taken from May to August 1929, mostly from the north corner at present-day Burhans Avenue (see figures 1-4). By 7 May 1929, steel columns had been erected on the west half of the assembly bay, topped by horizontal beams on the side bay. Concrete block and brick were being laid around the office section, serviced by a horse-drawn cart. A workman started inserting window framing for the

[1] Aerial photos, 1931. Box 41, Fairchild Industries, Inc. Collection (Acc. 1989-0060, 1990-0047). Archives Division, National Air and Space Museum, Smithsonian Institution, Washington, DC (hereafter cited as NASM, SI).

front wall. By 14 May, the masonry continued up to the second floor in the office section, and the indentations for the pilasters had begun to take shape. Workers started erecting steel framing on the office second floor, as well as the Warren roof trusses in the assembly bay. By 21 May, the masonry continued up to the roof level, and the Art Deco concrete details sitting above the pilasters were completed. The industrial window sash was being installed on the first floor. On the assembly bay, wood plank sub roofing and window sash framing were being installed. A few days later, the entire exterior of the office was enclosed except for the front door. Sash framing, glazing, and the brickwork continued on the west wall of the assembly bay. An interior view shows plank sub roofing being installed over steel framing and a dirt floor. By 28 May, almost all sash had been installed on the first floor assembly bay, except for the bay closest to the office, which was probably kept open for access. The clerestory window work had not yet begun. No images exist for June and July, but Kreider-Reisner started to move in during this period. By 8 August, the exterior of building was basically completed. A horse-drawn cart was working in a trench in foreground, probably grading or digging a drainage ditch. The final grading and landscaping were still to be done. By September 1929, a view from the south showed the rear elevation of the newly completed factory, sheathed with corrugated siding. A square brick chimney stood in the southeast corner above the boiler room. A dozen Challenger bodies were rolled out through 12'x12' sliding doors, awaiting propellers and wings, which were to be installed at the airport hangar.[2]

Kreider-Reisner had extended the main assembly area another 70' to the south by 1931, creating an additional 8,000 sf of work space. They also built two small special purpose buildings on the west side and two in the south rear at the same time.[3] In 1935, the company completed a major 26,000 sf addition. This included a final assembly bay, built further south less than 50' from the Kreider-Reisner Shed, with a clear space of 120'x140'x17'. The original assembly bay was renamed the "sub-assembly" bay. This structure featured two wide monitor skylights running east-west, supported by subdivided Pratt steel roof trusses. Web joists supported the wood plank sub roofing in this system. KRA also built a 50'x140' dope and spray room just to the east of the new final assembly bay. A hammer room was installed along the west wall of the sub-assembly bay. Additional office space was added by installing a 40' wide second story loft above the north end of the sub-assembly bay. During this period the Kreider-Reisner division was officially renamed Fairchild Aviation Corp. This change was reflected by the painting of "Fairchild Aviation" on the roof of the factory by 1935 (see figures 5-7).[4] Hereafter the plant was known locally as Fairchild No. 1.

By 1941 Fairchild had constructed some free standing buildings 100' further south of the complex. The most distinctive were a set of three Quonset huts with interconnecting framing, forming a warehouse of 80'x 160'. A freight platform was built on the east side, which served a

[2] Fairchild No. 1 construction photos, 7 May – 8 August 1929. Box 1, Kreider-Reisner/Fairchild Collection (Acc.1988-0134). Archives Division, NASM, SI.
[3] Aerial photos, 1931. Box 41, Fairchild Collection. Archives Division, NASM, SI.
[4] "History of Fairchild Engine and Airplane Corporation, 1920-1951," p.13. Box 39; Aerial photos, 1936. Box 41; Fairchild Aviation Corp. Plant #1, Drawing #1-60-1, 11 June 1943. Box 70. All boxes found in Fairchild Collection. Archives Division, NASM, SI. Photos from *Fairchild Aviation News* No. 3 (March 1936). Box 1, Kreider-Reisner/Fairchild Collection. Archives Division, NASM, SI.

newly constructed railroad siding connecting from the Western Maryland Railway junction to the south. A 40'x60' warehouse was built on the other side of the siding from the Quonset huts. More additions were made to the treatment areas adjacent to the sub-assembly bay to the west (see figure 8).[5]

Fairchild sold its flagship plant in 1965 to Roper-Eastern. Roper purchased additional land to expand to the east, and built a series of seven gable-roof sheds of varying lengths, oriented at ninety degrees to the main factory. They backed up to the Little Green Shed property to the north, and the Western Maryland Railway tracks to the east. These sheds were supported by steel girder roof beams, with strips of translucent fiberglass panels allowing light through the roof. They were all clad in vertical metal siding. A lone gable-roof concrete block storage shed was built on the southern end of the property, and a green steel water tower stood alone in the southwest corner. When a new tenant, Modular Systems, took over the office and sub-assembly bay around 1987, they had a ramp built from the north corner of Burhans and Park Lane, connecting to a door on the side of the second floor. After extensive growth in its first forty years, the complex has essentially remained in this footprint to the present day.[6]

Historical Context

Kreider-Reisner Factory No. 1 (Fairchild No. 1) represents the evolution of the Kreider-Reisner Aircraft Company from a small partnership assembling biplanes out of a patchwork of buildings into the modern Fairchild corporation operating essentially under one roof with state of the art practices. Although forced to cut back production not long after it opened due to the effects of the stock market crash, Fairchild managed to survive the Depression by reducing production costs and building quality, affordable planes. It was poised for growth with the onset of World War II after it developed the PT-19 Primary Trainer for the military in 1939. Moving into the air transport market, Fairchild also developed the F-31, F-91 Amphibian and C-82 Packet. New wartime contracts led to further expansion of the company adjacent to the Hagerstown Airport with the construction of Fairchild No. 2, designed by Albert Kahn & Associates. During WW II, Fairchild No. 1 became the center of the "Hagerstown System" of aircraft manufacturing, in which a variety of local industrial concerns were converted to aviation subcontractors to meet the incredible demand of the U.S. Army. The company and city went into eventual decline following the Korean War, as Fairchild sold its flagship factory in 1963 and ultimately closed its remaining plants in the 1980s. Even after its conversion to miscellaneous light industrial uses, Fairchild No. 1 remains as a testament to the growth of aircraft development and construction in Hagerstown from 1929-45.

[5] "Fairchild Aircraft Corp." (Formerly Kreider-Reisner Aircraft Co. Inc.) Dwg. No. 697-1, ca. 1941. Box 41, Fairchild Collection (Acc. 1989-0060, 1990-0047). Archives Division, NASM, SI. Aerial photo of Fairchild No. 1, ca. 1960, Fairchild Folder, Western Maryland Room, Washington County Free Library, Hagerstown, MD (hereafter Western Maryland Room).
[6] Interview with Vincent Groh, 5 February 2007.

Existing Description

Vincent Groh has owned the former Fairchild Factory No. 1 since around 1984. As of 2007 only about 20 percent of the 200,000 sf is occupied. Groh leases it to light industry and storage businesses, including Nextow Towing & Recovery, a towing company that leases the office and occupies a parking lot along Pennsylvania Avenue. Air-Tech Products, specializing in manufacturing spray booths and filtering systems, utilizes the former treatment rooms. Expedited Warehousing, Inc. leases the former main assembly and sub-assembly bays for warehousing space. Hydro Glass Inc. uses the Quonset huts in the rear to build and repair fiberglass products, such as spas, whirlpool baths, and motorboats.[7]

After several expansions from 1929 to the mid-1960s, the complex has filled essentially the same footprint for the past forty years. The office building has been modified, and suffers from a lack of use in the last decade. Nextow Towing & Recovery occupies most of the first floor, but the other offices are vacant and full of debris. On the exterior, the brick wall has since been painted white, eliminating the original contrast between the red brick walls and the white concrete Art Deco details. All the original industrial windows have been removed from the office. Stucco has been used as infill on the second floor, and two replacement windows are on either side of the entrance bay. New windows run the length of the first floor, and aluminum siding is now used as infill on each side wall. A ramp installed in the late 1980s leads from a second floor door to a parking lot at the corner of Park Lane and Burhans Avenue.

In the original assembly bay, the industrial sash remains in the clerestories, but the glazing has been painted white. All the first floor windows have been replaced by aluminum siding. The final assembly areas are still intact and are occasionally used by Expedited Warehousing. On the west side, treatment rooms are boarded off by plywood on the interior and sheathed with metal siding. The 1960s sheds are mostly empty except for one the Hagerstown Aviation Museum is using to store the disassembled pieces of the Kreider-Reisner Shed (as of 2007).

History of Fairchild Companies

Sherman M. Fairchild invented the first successful aerial camera and started the Fairchild Aerial Camera Corporation in New York in 1920.[8] He developed a thriving business producing aerial cameras and aerial surveys, which transformed the mapping industry. Expanding into the nascent

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[7] Web links verifying the tenants at 881 Pennsylvania Avenue accessed on 26 Feb. 2007: Nextow Towing & Recovery, available at: http://www.switchboard.com/Towing/Hagerstown/MD/16758/Yellowpages_Results.html http://www.switchboard.com/Towing/Hagerstown/MD/16758/Yellowpages_Results.html
Air-Tech Products, available at: http://www.boothrepair.com/index.htm;
Hydro Glass Inc (851 Park Ln).: http://www.macraesbluebook.com/search/company.cfm?company=477609
Expedited Warehousing, Inc. filled the bay with Kitchenaid mop buckets awaiting shipment in Fall 2005, but in subsequent visits in 2006-07 the bay has been empty: http://www.i-esi.com/warehousing.html

[8] Sherman Fairchild was the son of Rep. George W. Fairchild, the founder of IBM. Sherman was a large stockholder in IBM, which gave him ready access to capital to develop his aviation businesses. Theron K. Rinehart, "How it all began… fifty years ago: Sherman Fairchild "Discovered" Local Airplane Company and Bought it in 1929," *The Cracker Barrel* (March 1979), p.15. Western Maryland Room.

aviation industry, Fairchild formed the Fairchild Aviation Corporation in 1925, which in addition to the aerial survey business, started developing its own airplanes and engines from a facility in Farmingdale, New York.[9] It was during this period that Sherman Fairchild met Ammon Kreider and Lewis Reisner of the upstart Kreider-Reisner Aircraft Company (KRA) of Hagerstown, most likely at one of the many air races that were popular during the 1920s. Kreider-Reisner, which started as an airplane repair and flying service out of a former wooden shoe repair shed, managed to build over 100 Challenger sport biplanes in 1927-28, working inside and outside of four buildings in north Hagerstown (see Kreider-Reisner Shed, HAER MD-137-A). Beginning in 1928, Kreider worked with Fairchild to test the Caminez engine, and only the KRA Challengers proved sturdy enough to handle the rough running engine.[10]

The C-2 Challenger was a three-place biplane powered by a Curtiss OX-5 engine. It developed a national reputation as a sturdy, well-built, low maintenance sport plane. Ammon Kreider's salesmanship and racing exploits marketed this model, along with the more powerful C-4. While building three planes a week, KRA was poised to modernize. The partners had blueprints for a new 32,000 sf factory capable of producing 500 planes a year, but needed the capital to expand. Since Fairchild and Kreider had already developed a successful working relationship, on 31 March 1929 the Fairchild Aviation Corporation officially acquired Kreider-Reisner Aircraft Company for $250,000. Sherman Fairchild was to be chairman of this new subsidiary, with Ammon Kreider president and Lewis Reisner vice-president.[11] At a dinner announcing the merger at the Detroit Air Show, Sherman Fairchild exclaimed, "The most important thing… is not the plant, but the fact that we are connecting with the Kreider-Reisner organization, one of the most efficient airplane manufacturing organizations in the United States."[12]

Tragically, four days later on 13 April 1929, Ammon Kreider was killed in a midair collision at Detroit. This setback did not slow the momentum of the new company, as the purchase of the land for the new Kreider-Reisner Aircraft Company Factory No. 1 closed on 18 April 1929. Built on the former flying field behind the Kreider-Reisner Shed, at 1 Park Lane, the factory was completed in only four months. The 35,000 sf structure tripled Kreider-Reisner's capacity, and transferred most of the assembly operations under one roof. In addition to the cluster of buildings on Pennsylvania Avenue, Kreider-Reisner also used an airfield and hangar 4 miles to the north which it built on 60 acres acquired in 1928.[13] The new plant modernized and streamlined the

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[9] "Fairchild Airplane: A Triumph in Safety Engineering,"*Fairchild Aviation News,* No. 12 (December-January, 1936-37). Box 1, Kreider-Reisner/Fairchild Collection. Archives Division, NASM, SI.; Dana Bell, editor, *The Smithsonian National Air and Space Museum Directory of Airplanes: Their Designers and Manufacturers* (London: Greenhill Books, 2002).

[10] The Fairchild Caminez Engine Corporation existed from 1925-29, and focused on developing a radial cam airplane engine invented by Harold Caminez. "History of Fairchild Engine and Airplane Corporation, 1929-1951," p.9; Rinehart, p.17.

[11] Kreider and Reisner each received a salary of $15,600 a year, plus stock. Engineer Fred E. Seiler was named secretary. "Copy" [Kreider-Reisner/Fairchild sale agreement], 12 March 1929. Box 39, Fairchild Collection. Archives Division, NASM, SI.

[12] Sherman Fairchild quoted in, "The Kreider-Reisner Company," *Fairchild Aviation News* 1, no. 2 (May 1929). Western Maryland Room.

[13] D. Webster Groh, the grandfather of the current building's owner Vincent Groh, lent the money for the land. "Airport Tract." Box 41, Fairchild Collection. Archives Division, NASM, SI; Interview with Vincent Groh, 5 February 2007; Kent A. Mitchell, "The Hagerstown Airport," *American Aviation Historical Society Journal* 48, no.

production process, with 300 employees working two shifts for a projected capacity of ten planes a week. An auto executive with experience in large scale production, John Squires, was hired to replace Kreider as president. As soon as the plant opened in September, the company authorized an 8,000 sf expansion. They also began a large scale marketing campaign to sell the newly renamed Fairchild KR-31 (formerly C-2), KR-34 (C-4, a three-place open cockpit biplane with increased power), and KR-21 (C-6, a two-place, tapered wing, open cockpit biplane) airplanes.[14]

When it opened, Kreider-Reisner proclaimed their new factory was "one of the most modernly equipped airplane plants in the world… equipped with the latest and best equipment," and offered "a wealth of new manufacturing processes."[15] Kreider-Reisner could now manufacture its biplanes in a mechanized assembly line process under one roof, with an improved capacity of eight aircraft a week. The KRA biplanes were constructed of chrome molybdenum steel fuselage frames. The steel was shaped with metal working equipment, including milling machines, punch presses, multiple spindle drill presses, tool maker's lathes, steel cutting saws, etc. All the fittings were jig-welded in a master fuselage jig to minimize distortion. The updated welding shop piped acetylene gas under the floor to stations from the generating plant. After welding, the entire fuselage was sandblasted in a separate, ventilated room, outfitted by the Pangborn Corporation of Hagerstown, a leader in sandblasting technology. The sandblasting cleaned all the welded structures, parts and fittings, providing a clean surface before being sprayed with several protective coatings of dope and lacquer.[16]

The wood-framed wings had previously been built in narrow, low-lying buildings and doped on saw horses outside of the shed. In the new woodworking department, KRA had the equipment to shape wing beams "in less than one tenth the time" by using mechanical routers, universally adaptable saws, and employing an overhead system of blowers to collect shavings and dust. The spruce wing spars were routed and connected to Pratt trussed ribs with three-ply mahogany gussets. This aerodynamic frame was then post-tensioned with molybdenum wire to create a strong but light structure. The wing was then "Lion-oiled" and covered with grade A cloth and sprayed with multiple coats of dope and lacquer. All spray painting of the assembled frames was now performed in state of the art spray tunnels, fitted with automatic sprinkler systems and self-contained exhaust blowers. The KR Challenger also featured ailerons on both the upper and lower wings, controlled by steel rod. The tail featured a horizontal stabilizer adjustable from the cockpit. A heat-treated molybdenum steel tail skid assisted landing on typically rough field conditions. The Challenger had two cockpits, a front for two passengers and rear for the pilot. There was a 24" walkway on the wing to allow access into the opening. The cowling, which covered the engine, was made of power hammered heavy sheet aluminum, and independently removable for access.

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3 (Fall 2003): p. 219. [Article online] accessed 12 March 2007, available at: http://www.flyhagerstown.com/pdf/AAHS_V48N3_2003_Hagerstown_Airport.pdf

[14] *Fairchild Aviation News* 1, no. 3 (June 1929), Western Maryland Room; Rinehart, p. 19.

[15] "Local Aircraft Plant is one of the Most Modern," *Hagerstown Daily Mail*, 8 February 1930. Box 41, Fairchild Collection. Archives Division, NASM, SI; "A Record of Achievement," *Fairchild Aviation News* 1, no. 3 **(**June 1929), WM Room.

[16] "Fairchild KR Design and Construction," *Fairchild KR Airplanes* [brochure], Hagerstown Aviation Museum Collection, ca. 1930; "Local Aircraft Plant is one of the Most Modern."

"KREIDER-REISNER AIRCRAFT CO. AIRPORT 4 MILES" was painted proudly on the roof, a reminder that testing and delivery was still accomplished at the company's airfield up Pennsylvania Avenue. The future appeared bright for Fairchild's Kreider-Reisner Aircraft Company on the brink of the opening of its new factory in September 1929.[17]

Surviving the Depression

Prior to the official purchase of Kreider-Reisner, Sherman Fairchild combined the Fairchild Aviation Corporation with a new conglomerate called the Aviation Corporation (AVCO). Although hoping to become a "General Motors of the Air," AVCO became unwieldy, with sixty-seven directors overseeing thirty-one aviation companies. Combined with the effects of the stock market crash in October 1929 and the ensuing Depression, AVCO lost up to $350,000 a month. In 1930 Kreider-Reisner stopped production altogether, cutting the workforce to fifteen and reverting to just servicing existing aircraft. Even with orders at a standstill, Fairchild encouraged development. Lewis Reisner and George Hardman designed a new, low cost aircraft, the Fairchild 22C-7, forerunner of the F-22. A parasol-shaped, open cockpit, two-seat, high-wing monoplane, the F-22 lowered production costs and sold for around $2,500. In order to save his business, Fairchild sold most of his Farmingdale holdings and intellectual property to AVCO shareholders. With only the Hagerstown facilities and the aerial survey company, Sherman Fairchild staked his reputation on the F-22, which started Fairchild's comeback. With the innovative F-22 and the cabin monoplane F-24, Fairchild led his company through a slow rebuilding period during the Depression of the 1930s.[18]

While producing the F-22s and F-24s built at Hagerstown, Fairchild attempted to expand into the air transport market, winning a contract from Pan American to build six F-91 "Baby Clippers" for its Amazon River route in South America. Needing capital and threatening a move to Florida, Fairchild sold its airport tract to the city of Hagerstown in exchange for staying in town and expanding production. Under this arrangement, Fairchild would continue to use the Hagerstown Municipal Airport for demonstrating, testing, and delivering airplanes for free. The city eventually built a larger 100'x100' brick and steel airport hangar next to the existing wooden one in 1938, which it leased back to Fairchild.[19] In 1934 Kreider-Reisner also built a 2-ton air freighter for the army, the single engine C-31, which at the time carried more payload than any aircraft ever built; this effort would eventually be rewarded with future military contracts.

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[17] "Fairchild KR Design and Construction"; "Local Aircraft Plant is one of the Most Modern"; F-24 production photos, ca. 1935. Box 70, Fairchild Collection, (Acc. 1989-0060, 1990-0047). Archives Division, NASM, SI.
[18] "History of Fairchild Engine and Airplane Corporation, 1920-1951"; Rinehart, p.20-21; Joseph P. Juptner, "A.T.C. #408 Fairchild 22, Model C-7", in *U.S. Civil Aircraft Series* Volume 5 (Blue Ridge Summit, PA: TAB Aero, a division of McGraw-Hill, Inc., 1993) p.25-27; John Seburn and Kurtis Meyers, *Hagerstown: Remembering Our Aviation Heritage* [Video], (Greencastle, PA: Vintage Video, 2004).
[19] "Airport Tract." Box 41, Fairchild Collection. Archives Division, NASM, SI; The Hagerstown Municipal Airport was run by Richard "Dick" Henson, Fairchild's chief flight tester, who had started Henson Flying Service, a business he operated until his death in 2002. He donated some of his aircraft collection to the Hagerstown Aviation Museum, including a 1928 KR-31 Challenger. Kurtis Meyers, Steve Christiano and John P. Seburn, *Hagerstown: Remembering Our Aviation Heritage* [book], Greencastle, PA: Historymania Publishing, 2004, p.54-74; "Richard A. Henson," *The New Pegasus* (2006), p.2.

Meanwhile, on 4 Dec. 1934, the names Kreider-Reisner, who had started the company in Hagerstown a decade earlier, were finally retired, as the subsidiary officially changed its name to Fairchild Aviation Corporation.[20]

On the road to recovery in 1935-36, Fairchild increased the production area at Fairchild No. 1 to 65,000 sf by adding a 140'x120' final assembly bay to the south. The new structure featured two large monitors oriented east-west, that created a light-filled production shed; the original assembly area became the sub-assembly bay. Other new rooms added along the west wall of the sub-assembly bay were devoted to anodic treating, hot and cold cleaning baths for metal and cadmium plating, steel and dural heat treating equipment, hammering, bitumastic painting, and sandblasting.[21] The 140'x 50' dope and spray room was fully ventilated. Doping fumes were sucked down through a grill in the floor, preventing the accumulation of inflammable scum and fumes.[22] After this addition was completed, the company painted over "KREIDER REISNER," and "FAIRCHILD HAGERSTOWN, MD." appeared on the roof.[23]

As military tensions increased in Europe in the late 1930s, the army began looking for a new plane to train pilots both at home and abroad. Fairchild engineer Armand Thieblot developed the M-62, a low-wing monoplane in 1938-39. Powered by the Fairchild-built Ranger engine, the M-62 was durable enough to handle the abuse of a service-type trainer. After the M-62 won a special competition, the U.S. Army Air Corps ordered 270 Model PT-19 primary trainers in April 1940. A turning point for the company, it started Fairchild on the road to becoming a major military supplier. Fairchild also became a subcontractor for the Glenn L. Martin Company of Baltimore, earning deals to produce wings for the all-metal PBM Mariner Patrol Bomber seaplane, and Martin 167 and 187 bombers.[24] As the build up for WW II started, Fairchild No. 1 continued to expand to the west and south. Western Maryland Railway built a siding leading to the south end, with connections to the Baltimore & Ohio and the Pennsylvania lines. Fairchild constructed three Quonset huts with a freight platform to the west of the track, and additional sheds to the south of the assembly bay.[25]

With Fairchild No. 1 at capacity, Fairchild started planning major expansion on land adjacent to the Hagerstown Municipal Airport in 1940. They employed Albert Kahn and Associates, Inc. of Detroit, the same firm that designed the pioneering Glenn L. Martin aviation plants near Baltimore in 1937 and 1941.[26] Originally 100,000 sf, Fairchild Factory No. 2 opened on 23

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[20] "History of Fairchild Engine and Airplane Corporation, 1929-1951," p.14; "Record of Recorded Certificates, Articles, Stock Statements, Etc.," 14 September, 1937. Box 39, Fairchild Collection. Archives Division, NASM, SI.
[21] "Fairchild Airplane Factory One of the Best Equipped in the U.S." *Fairchild Aviation News* No. 3 (March 1936). Box 1, Kreider-Reisner/Fairchild Collection. Archives Division, NASM, SI.
[22] "The Fairchild Airplane: Triumph in Safety Engineering," *Fairchild Aviation News* No. 12 (December-January, 1936-37). Box 1, Kreider-Reisner/Fairchild Collection. Archives Division, NASM, SI.
[23] Aerial photo, ca. 1935. Box 41, Fairchild Collection. Archives Division, NASM, SI.
[24] Meyers et al, *Hagerstown: Remembering Our Aviation Heritage* [book], p.85; Online citations on Martin models 160, 162, and PBM Mariner Patrol Bomber, accessed 29 March 2007, available at: http://www.marylandaviationmuseum.org/history/martin_aircraft/12_pbm.html
[25] Fairchild Aircraft Division, "Service Training Manual [C-119]," CR Report No. 14, 1 May 1951, p.1-2. WM Room; Fairchild Aircraft Corp. Dwg. No. 697-1. Box 41, Fairchild Collection. Archives Division, NASM, SI.
[26] See "Glenn L. Martin Aircraft Company, Plant No. 2," HAER No. MD-136.

August 1941 for the final assembly of PT-19s, while Fairchild No. 1 maintained a sub-assembly role.[27] Fairchild Factory No. 2B soon added another 200,000 sf, with three massive monitor roofs. The workforce increased from 163 in 1939 to over 8,000 by 1943.[28]

While undergoing phenomenal growth during the war, Fairchild required additional capacity, even with its new buildings. It subcontracted with several businesses all over Hagerstown to meet demand. These local industries suspended their regular production schedules, sacrificing for the greater good of the wartime buildup. These included furniture makers such as Moller Organ Works, which produced wooden center sections and outer panels for primary trainers; Statton Furniture, which converted to production of wooden wing parts; and Brandt Cabinet Works, which built a few mock-ups of Grumman Wildcat fighters. Machine shops such as Foltz Manufacturing, Victor Products, Maryland Metals, W.H. Reisner Manufacturing, and Kauffman Manufacturing converted to machine work, fixtures, and welding for Fairchild. Automobile dealers and repair shops were used for tool work and storage. The coordination of this extraordinary city-wide production effort became known as the "Hagerstown System." [29]

By 1944, Fairchild expanded again with an Albert Kahn Associates-designed, sawtooth-roofed 200,000 sf east addition.[30] Fairchild No. 2 was used for the assembly of PBM wings for the Martin subcontract, while Fairchild No. 1 was relegated to "detailed parts manufacture."[31] In 1943-44 Fairchild also developed the C-82 Packet as a revolutionary transport plane for the "All-Air Army" for WW II. The prototype of this twin boom-tailed cargo aircraft, the XC-82, was designed and built at Fairchild No. 1. Aluminum templates of the XC-82 fuselage and tail wing were used to sheath the original Kreider-Reisner shed when its lean-tos were removed sometime in 1943. Used to transport eighty paratroopers and cargo, the C-82 played an important role in the last year of the war in the Berlin airlift. More than 200 C-82 Packets were built before being superseded by the C-119 Flying Boxcar in 1948. Heavily used during the Korean War, Fairchild built more than 1,200 C-119s of eight variations by 1955, mostly at the airport facilities.[32]

Fairchild Corporation peaked with over 10,000 employees in Hagerstown by 1955. After the end of the Korean War, the government cancelled the contracts for the C-119 and other models. Nonetheless, Fairchild constructed a Bonding Plant near the airport in 1957. By 1961, Fairchild starting losing out on other large commercial contracts such as the F-27, and employment fell to less than 1,300 at Hagerstown. Although Fairchild managed to win a piece of the A-10 Warthog

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[27] "Welcome to Fairchild: History of the Fairchild Company" [new employees booklet], 1941, WM Room.
[28] Albert Kahn Associates, *East Addition to Manufacturing Building for Fairchild Aircraft*, 1943. Box 70, Fairchild Collection (Acc. 1989-0060, 1990-0047). Archives Division, NASM, SI. "Fairchild: From one-hop flight to aerospace mogul," *Hagerstown Herald-Mail*, 3 September 1995, WM Room.
[29] For a contextual overview of the Hagerstown System, see: Christopher Shank, "Wings Over Hagerstown: Experiencing the Second World War in Western Maryland," *Maryland Historical Magazine* 88, no.4 (Winter 1993): p. 444-461. Detailed accounting of operations is found in: "Fairchild Aircraft Division: Manufacturing, Operations, and Storage Buildings," ca. 1945, Box 70, Fairchild Collection. Archives Division, NASM, SI; Archival footage can be viewed in: Seburn and Meyers, *Hagerstown: Remembering Our Aviation Heritage* [video].
[30] Albert Kahn Associates, *East Addition*, 1943.
[31] "Fairchild Aircraft Division: Manufacturing, Operations and Storage Buildings," ca. 1945. Box 70, Fairchild Collection. Archives Division, NASM, SI.
[32] *A Collection of Fairchild Aircraft*, ca. 1970, WM Room.

contract in the 1970s, the company closed Fairchild No. 2 in 1983 and ceased all operations in Hagerstown by 1987. In 1989 Fairchild Corporation sold to Banner Industries of Ohio. Today Topflight Airpark owns the Fairchild No. 2 complex.[33]

By 1963, aircraft production ceased at Fairchild No.1, and the facility was sold to Roper-Eastern, a division of appliance manufacturer Roper Corporation.[34] Afterwards Roper expanded the building by adding a wing of seven gable roof sheds fanning out to the southeast between the siding and the Western Maryland Railway tracks. Vincent Groh bought the former Fairchild No. 1 in 1984. He leased assembly, office, and loft space to Commercial Modular Systems Inc., a modular building company, from 1987 to 1991. While a handful of light industries do use portions of the complex in 2007, only about 20 percent of the building is leased. Additionally, the building suffers from lack of maintenance. After being cited by the City of Hagerstown for broken windows and a leaking roof in 2007, Groh planned to install a translucent cement roof.[35]

Groh purchased the original Kreider-Reisner Shed and the house and barn at 851 Pennsylvania Avenue from David Andrews in 2006. Groh intends to build a driveway into the southeast end of the complex directly off of Pennsylvania Avenue. Since he had no intention of retaining the shed, Andrews agreed to give the structure to the Hagerstown Aviation Museum for free if they would remove it. Following the volunteer effort to disassemble the Little Green Shed in winter 2006, the parts of the shed were stored in one of the storage sheds in Fairchild No. 1.

Conclusion

Fairchild No. 1 remains as a symbol of a time when Hagerstown was a major manufacturing city and a leader in the development and production of innovative aircraft. After several generations of aircraft production, all that remains of Hagerstown's aviation legacy are these structures and its modern regional airport. Eventually, a variety of historic aircraft and artifacts from both the Little Green Shed and Fairchild No. 1 (along with the shed itself) will be enshrined in a new Hagerstown Aviation Museum.[36]

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[33] Bob LeMendola, "Fairchild: From one-hop flight to aerospace mogul," *The Morning Herald*, 6 September 1983; Guy Fletcher, "Fairchild," *The Morning Herald*, 3 September 1995, Western Maryland Room; "Fairchild Aviation Corporation," accessed 30 November 2005, available at: http://www.centennialofflight.gov/essay/Aerospace/Fairchild/Aero25.htm.

[34] Rinehart, "How it all began … fifty years ago: Sherman M. Fairchild "Discovered" Local Airplane Company and Bought it in 1929," *The Cracker Barrel*, March 1979, p.27. Western Maryland Room; Roper Industries company history, accessed 7 March 2007, available at: http://www.fundinguniverse.com/company-histories/Roper-Industries-Inc-Company-History.html

[35] "Board of Technical Appeals Hearings," *City of Hagerstown Status & Information Report No. 46*, 17 November 2006. Accessed 28 February 2007, available at: http://www.hagerstownmd.org/Com_Affairs/sniReports/46.2006.pdf Interview with Vincent Groh, 5 February 2007.

[36] Currently the Hagerstown Aviation Museum has a display at Discovery Station at 101 West Washington Street in downtown Hagerstown. Their collection of historic aircraft is stored at the Hagerstown Regional Airport, where they hope to construct a new building dedicated to Hagerstown's aviation heritage. The museum's website, accessed February 2007, is: http://www.hagerstownaviationmuseum.org

APPENDIX I: Airplanes built in Hagerstown[37]

Midget The first airplane designed and built by Kreider-Reisner Aircraft Co. Only 15' long, it was the first cantilever, single-spar, low wing monoplane built in U.S. Introduced in September 1926 at Philadelphia National Air Races, it used a Wright-Morehouse 29 hp engine.

C-2 Challenger (later designated the Fairchild K-31) Designed by Fred Seiler and Ammon Kreider, the three-place, open cockpit biplane ran on a Curtiss OX-5 engine. The first airplanes mass-produced by Kreider-Reisner, 111 were constructed between June 1927-October 1928 at the KR Shed and adjacent buildings. The Challenger also had the distinction of being the only airplane built by five companies: Kreider-Reisner, Fairchild, Parks, Detroit, and Ryan.[38]

C-4 Challenger (Fairchild KR-34) Three-place open cockpit biplane, with a more powerful Wright J6-5 radial engine. Kreider won a forty mile OX-5 race in its debut at Bellanca Field, Wilmington, Delaware on 6 October 1928.[39]

C-6 Challenger (Fairchild KR-21) Two-place, tapered wing, open cockpit biplane, with a Warner engine. First flight was on 31 March 1929, the day the Fairchild bought Kreider-Reisner. This was the model that Kreider was aboard when he was killed in an air collision in Detroit.

C-7 (Fairchild 22C-7) Two-place high wing, powered by an 80 HP Genet engine, developed during the slowdown of 1930 as a lightweight, inexpensive sport plane.

F-22 Two-place open cockpit, high wing "sport" monoplane of strut-braced type, with either 95-hp Cirrus or 125-hp Menasco engine. Designed in 1930, construction began in 1931. The development of this plane helped spark Fairchild's comeback.[40]

F-24 (Re-designated C-61 in 1941) Two-place cabin high-wing monoplane of strut-braced type, with a 95-hp Cirrus or 125-hp Warner engine. Introduced in 1931, it was a closed cockpit version of F-22 with basically the same components, more than 500 planes built of different versions.

F-91 Baby Clipper All-metal ten-place high-speed amphibian with single 750-hp engine. Fairchild won a contract from Pan American to build six F-91 amphibians beginning in 1933.

C-31 Single engine, 750-hp, cloth-covered, high wing cargo plane with 2-ton payload. Designed by Alfred Gassner in 1933, and first flown in 1934, only one prototype was ever built.

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[37] Except where noted, Appendix descriptions are from: *A Collection of Fairchild Aircraft*, ca.1970, WM Room; Joseph P. Juptner, *U.S. Civil Aircraft Series* Volumes 1-9. (Blue Ridge Summit, PA: Tab Aero, Division of McGraw-Hill, Inc., 1993); and Meyers et al, *Hagerstown: Remembering Our Aviation Heritage* [book].
[38] Peter M. Bowers, "One Basic Biplane Poses Unusual Recognition Problems," *AOPA Pilot* (May 1968), p.58-59. Hagerstown Aviation Museum Collection.
[39] "Interview with Mrs. Bitler." Box 40, Fairchild Collection. Archives Division, NASM, SI.
[40] Fairchild Airplane Sales Corp. brochure [on F-22 and F-24], 1933, Box 1.

F-45 Five-place low-wing cabin monoplane with 320-hp Wright engine. Introduced in 1935, it was known as the Sedan of the Air, aimed at the luxury corporate market.

F-46 Designed in 1937 by Virginius Clark, it was the first application of Fairchild's patented "Duramold" process, a revolutionary system of fabricating wood and plastic under heat and pressure.

PT-19 Primary Trainer Low-wing monoplane, military trainer designed by Armand Thieblot, introduced in 1939. Won Army Air Corps competition, which led to first contract for 270 units. Used to train pilots in both U.S. and Europe. Over 8,000 constructed, not all by Fairchild.

PT-26 Trainer Fully-enclosed cockpit version of the PT-19, powered by a Fairchild-built Ranger engine. Introduced in 1941, it was mainly used by Allies from Canada, Great Britain and Sweden.

AT-21 An all-wood, twin engine gunnery trainer, it was built for the Air Force during WWII beginning in 1941. By 1943, the "Duramold" fuselages were fabricated in Hagerstown, with final assembly completed in at a new factory in Burlington, NC.

C-82 Packet Developed in 1941-43, this twin-engine high-wing cargo plane was designed by Armand Thiebolt. Featuring rear clamshell doors for easy loading, the C-82 could fly tanks, munitions, or forty two paratroopers. Rushed into service for WW II, more than 200 were built between 1944-48.

C-119 Flying Boxcar Improved version of the Packet, introduced 1948. Made a name for itself as the standard troop and cargo carrier, used in the Korean airlift and by international forces. More than 1,200 were built by 1955, mostly at Fairchild No. 2.

XC-120 Pack Plane A variation of the C-119, it used a detachable pod. Only one prototype was built, ca. 1951. It served the Red Cross as a flying bloodmobile.

C-123 A total of 303 cargo airplanes built in Hagerstown between 1954-58, served in Korea and Vietnam. The assault transport aircraft were designed to land troops and cargo in combat areas.

F-27 Fairchild was licensed to build the Fokker F-27 beginning in 1954. More than 200 built between 1957-63, it was the first jet-powered commercial transport in U.S, popular with airlines.

A-10 Thunderbolt Built in partnership with Republic Aviation, this military aircraft was designed for close support of ground troops. Over 700 assembled in Hagerstown from 1976-1984. The A-10 Thunderbolt II Warthog was the last airplane manufactured in Hagerstown.

APPENDIX II: Historic Photographs

Figures 1 & 2. Construction process photos of Kreider-Reisner Factory No. 1, May 1929. View of front office section above and rear assembly bay below. *(Both courtesy of Fairchild via National Air and Space Museum [NASM 9A-05477 above, NASM 9A-05478 below], Smithsonian Institution).*

Figures 3 & 4. Completed Art Deco-style front elevation at 1 Park Lane in 1929, above. Note abstracted Fairchild eagle logo in center bay *(Figure 3 courtesy Western Maryland Room, Washington County Free Library, Hagerstown).* Below, newly assembled Challenger fuselages are seen parked outside of the Kreider-Reisner factory, September 1929, awaiting final assembly at the airport *(Figure 4 courtesy of Fairchild via National Air and Space Museum [NASM 9A-05479], Smithsonian Institution).*

Figure 5. ~~Low altitude oblique, facing south,~~ Aerial view of the Kreider-Reisner factory in Hagerstown, Maryland, facing south, ca. 1930. Note directional arrow pointing ~~to airport.~~north to the Hagerstown Airport. The first 8,000 sf addition can be seen to the right of the stack. The Kreider-Reisner Shed can be seen with its lean-tos next to the driveway to the rear of the factory. *(Courtesy of Fairchild via National Air and Space Museum [NASM 9A-05483], Smithsonian Institution).*

Figures 6 & 7. Two low-altitude oblique aerial views of Fairchild No. 1 after a 26,000 sf main assembly bay addition. A classic, shell-shaped Shell gas station can be seen in the foreground above, ca. 1935. Below, by 1936 “Fairchild” was finally painted on the roof. *(Both courtesy of Fairchild via National Air and Space Museum [NASM 9A-05484 above, NASM 9A-0585 below], Smithsonian Institution).*

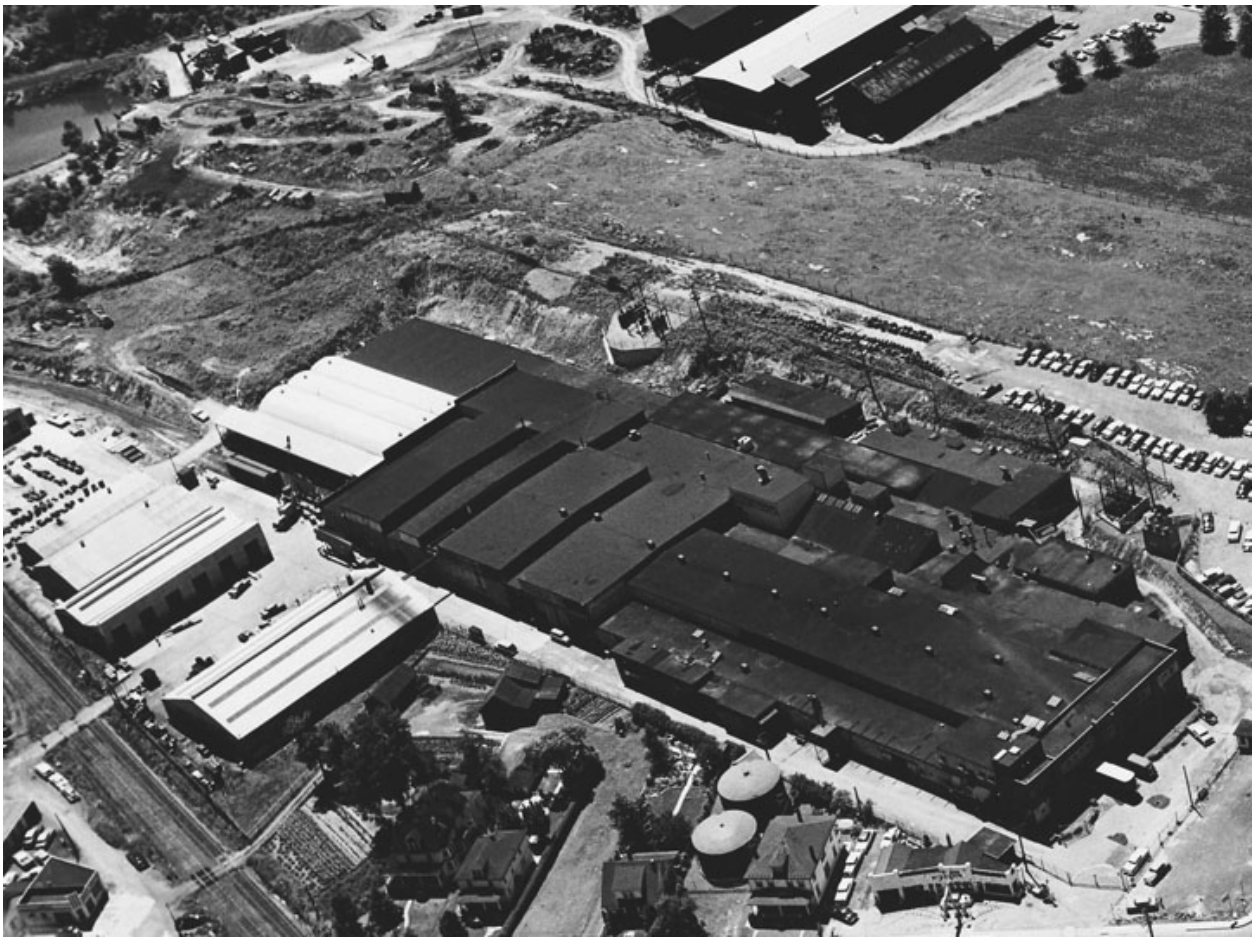
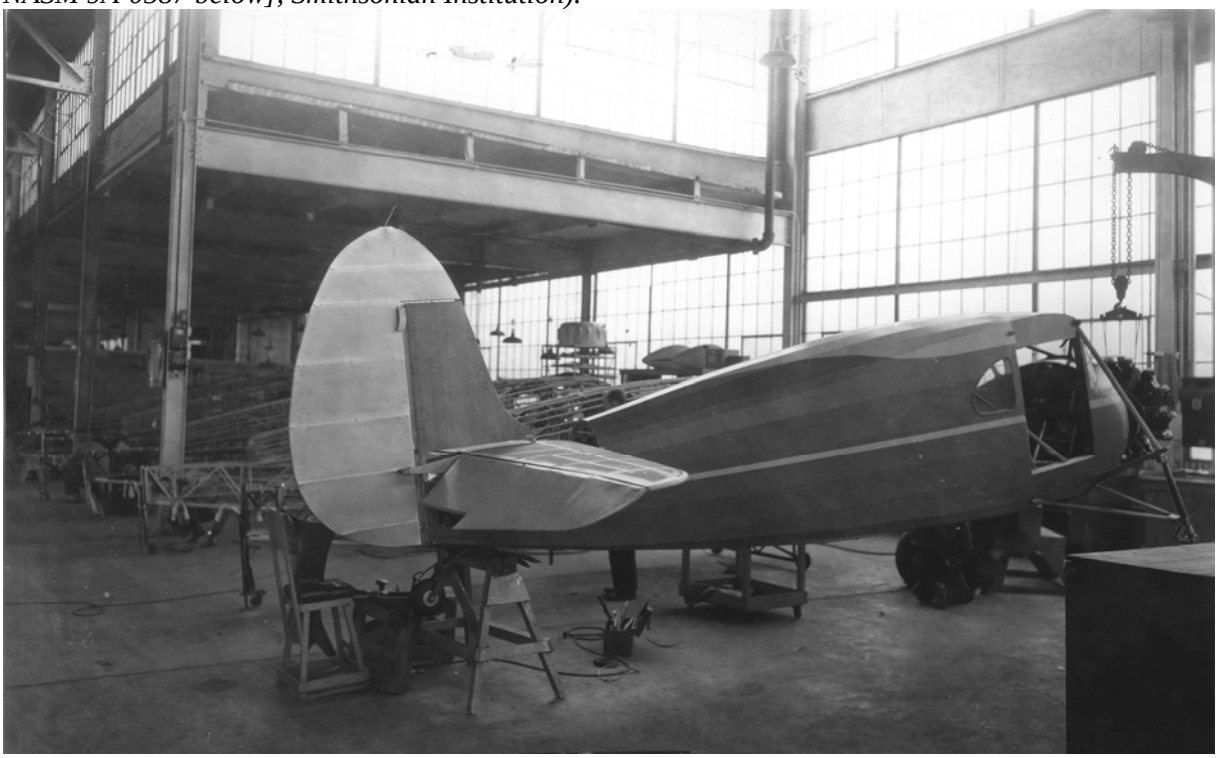


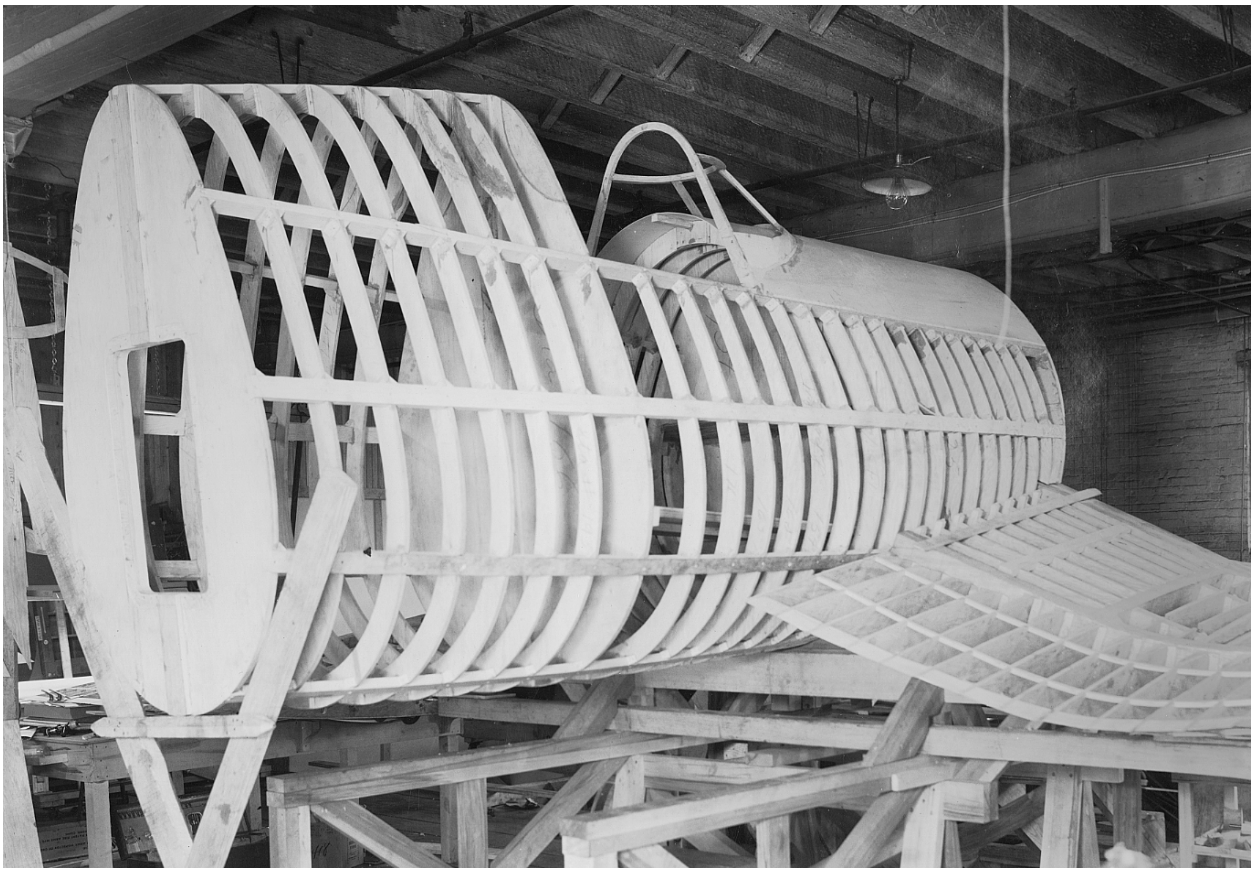
Figure 8. Fairchild No. 1 after several additions, ca. 1960. Note WW II-era Quonset huts in rear with white roofs, and 1950s sheds to the left~~.~~ by the Western Maryland Railway tracks. Roper Industries added more infill sheds after it purchased the site in 1965. *(Courtesy Western Maryland Room, Washington County Free Library, Hagerstown).*

Figures 9 & 10. F-24 fuselage frames being assembled inside Fairchild No. 1, ca. 1935. *(Both courtesy of Fairchild via National Air and Space Museum [NASM 9A-05486 above, NASM 9A-0587 below], Smithsonian Institution).*



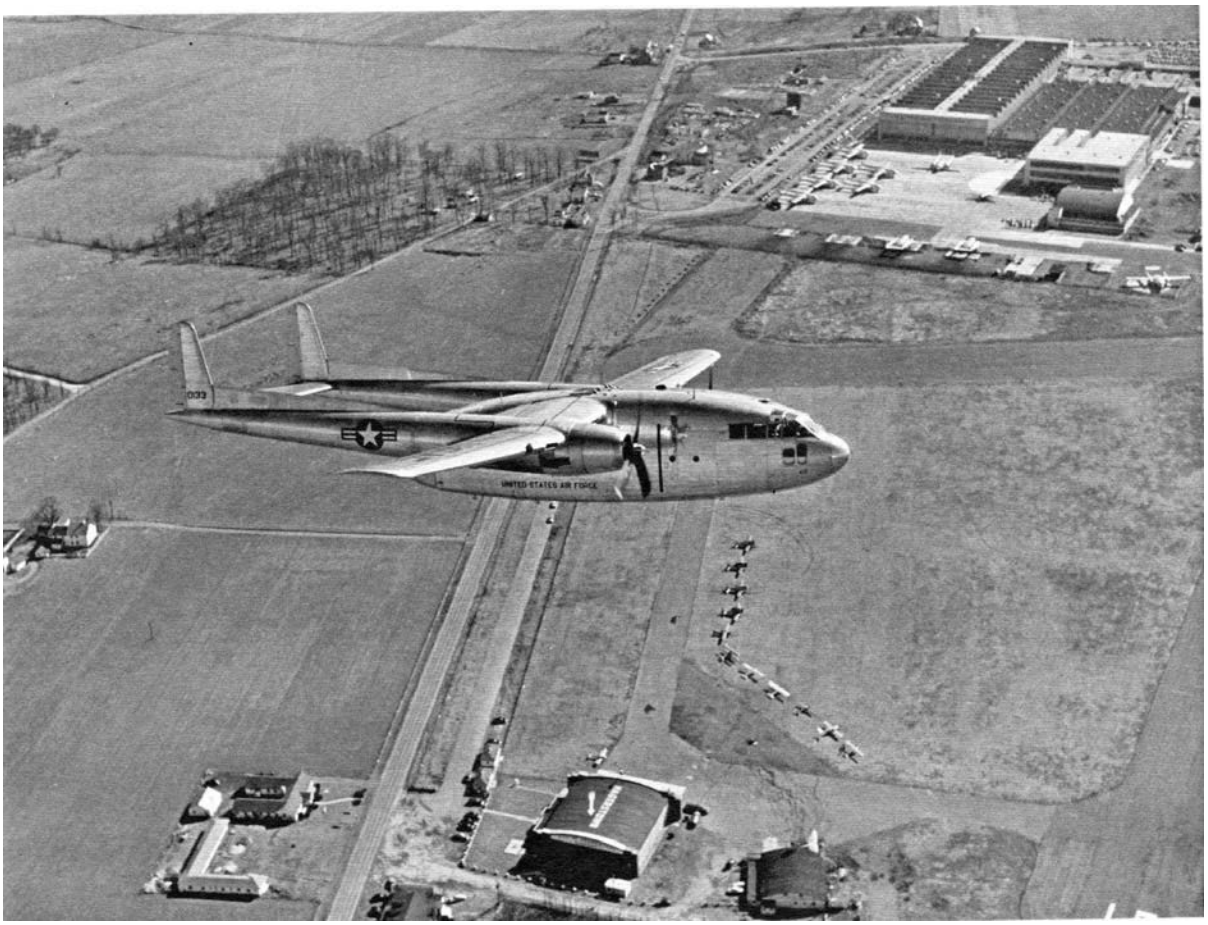
Figures 11 & 12. A completed F-24 at the renamed Fairchild hangar at the Hagerstown Airport, and one of the F-91 Amphibians below, ca. 1935 *(Fig. 11 courtesy Hagerstown Aviation Museum; Fig. 12 courtesy Western Maryland Room, Washington County Free Library, Hagerstown).*

Figures 13 & 14. The contract Fairchild won to produce the PT-19 Primary Trainer led to a surge in growth. Above, a PT-19 being used for flight instruction. Below, “Rosie the Riveters” help roll out a new PT-19 at Fairchild No. 1, ca. 1944. Female employment reached a peak of 36 percent before the end of the war *(Both courtesy Western Maryland Room, Washington County Free Library, Hagerstown).*



Figures 15 & 16. Examples of the Hagerstown System, ca. 1944: Above, a wooden mockup of a Grumman Wildcat Fighter assembled at the Brandt Cabinet Works. Statton Furniture, which subcontracted to make ailerons, elevators and rudders for wings, uses one of its trucks to demonstrate the loading capacity of a C-82 Packet. *(Fig. 15 courtesy Hagerstown Aviation Museum; Fig. 16 courtesy Western Maryland Room, Washington County Free Library, Hagerstown).*

Figures 17 & 18. The C-82 Packet, another major wartime contract, was developed at Fairchild No. 1 from 1941-43, although most production was completed at Fairchild No. 2, aka "the Boxcar Plant," below. *(Fig. 17, above by Louis Locantore, courtesy Western Maryland Room, Washington County Free Library, Hagerstown; Fig. 18 courtesy Hagerstown Aviation Museum).*



Figures 19 & 20. In 1951, a C-119 Flying Boxcar flies over the sprawling Fairchild airport complex (built 1941-55). The original wooden Kreider-Reisner Hangar (1928) is seen below right, next to the 1938 Hagerstown Municipal Airport Hangar. Below, a C-82 Packet returned to Hagerstown in 2006 after being acquired by the Hagerstown Aviation Museum at auction in Graybill, Wyoming *(Fig. 19 courtesy Hagerstown Aviation Museum; Fig. 20 by author).*

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