The "Eagle" Parachute -an Interesting Unique Personnel Parachute of the 1940s

by David Gold

The "Eagle" Personnel Parachute, one of the first successful "steerable" personnel parachutes, was introduced to the aviation world in the late 1930's. Early models included a seat pack type, a chest pack type, and a unique back type whose rotatable container was designed to orient and stabilize its user during free-fall. Rapid opening and steerability (glide and turn) were introduced into the canopy by a secondary system of short suspension lines, a flared skirt configuration, and two rearward protruding skirt "ears." The "Eagle" Parachute's initial acceptance and wide use was seen when it was employed for fire control by the U.S. Department of Agriculture's Forest Service "Smokejumpers." Manual operation (ripcord) of the parachute was changed to static line (automatic) actuation for Forest Service missions. The "Eagle" enjoyed some acceptance by professional parachutists

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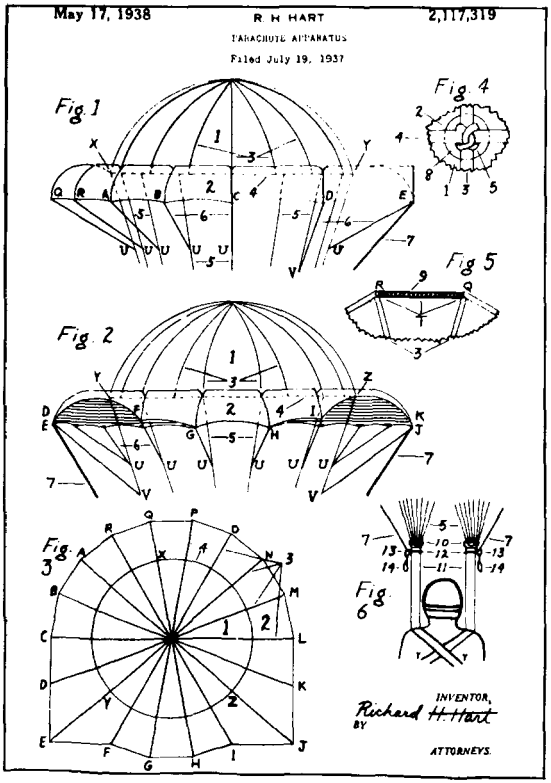
because of its steerability, but its utility for exhibition jumping was dampened by its high opening shock. It was phased out of existence when, largely due to economic reasons, the U.S. Forest Service replaced it with the less expensive and suitable Derry "Slot" Parachute.

The "Eagle" Parachute entered the aviation world in the late 1930's largely through widely spread articles in various magazines. These were rather short pieces printed in "popular" magazines. Subsequently, some promotional ads appeared in aviation magazines.

Patent information is a good source for establishing dates. The inventor of the "Eagle" Parachute, Richard H. Hart, who will be discussed in more detail later in this paper, applied on July 19, 1937 (Serial Number 154,358) for a patent on his "Parachute Apparatus." On May 17, 1938, Patent Number 2,117,319 was granted him. The drawing page of this patent is shown in Figure 1.



Drawing of Eagle Parachute Patent No. 2,117,319 granted to Richard H. Hart on 17 May 1938.

The following excerpt from Hart's patent serves as a good introduction to his "dirigible parachute apparatus":

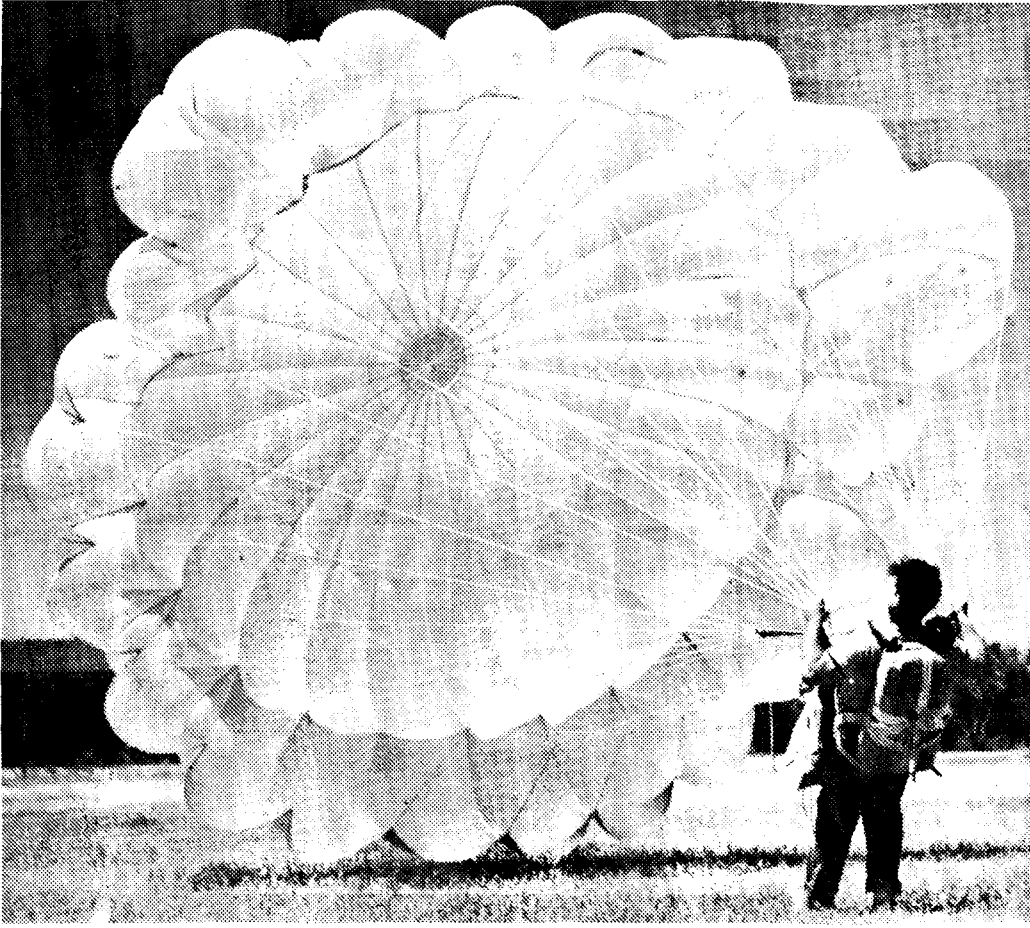
> "It is a well known fact that the venting of a substantially horizontal column of air from the canopy of a parachute will have a propulsive effect thereon, but previous designers of these vehicles would appear to have overlooked the principle by which such a column of air may be employed to effectively control the direction of travel, this principle being that such a column of air must be so vented as to be tangent to a circle circumscribing the vertical axis of the parachute, in order to exert upon the parachute the prompt, positive, and effective revolutionary force necessary for efficient steering, it following as a matter of course that the greater the diameter of the circle to which such a column of air is tangent the more effective the means of steering."

Basically, the "Eagle" canopy was flat-circular in design. However, two projecting portions extended from the circular planform, each pointed about 45 degrees rearward respective to the parachutist's shoulder positions. The suspension line system for the canopy was provided with short secondary lines, forming a "cascade" suspension line structure similar to that used on present day ram air parachutes.

One of the cascading lines was fixed to the hem portion of the canopy's skirt. The other cascading line was attached to the canopy at some distance above the skirt hem. The difference in length of these lines above the cascade point, gave the inflated canopy its unique shape (see Figure 2). When inflated, the canopy did not assume an inverted cup shape; only the upper portion of the canopy filled into a hemispherical shape. The lower periphery of the canopy flared into a semi-lobed shaped skirt portion. The two rearward facing extended portions billowed into ear-like tunnel portions which directed the captured airflow through them, thus imparting a forward motion to the descending parachute. Two control lines, one leading from each rear riser, were attached to the outermost tip of the inflated "ear". Pulling the control line allowed the parachutist to "close" the lobed extension, thus cutting off the airflow through it; air jetting from the opposing extension would then rotate the parachute.

The "Eagle" canopy had a forward glide between 5 and 8 miles per hour. Its rate of descent was 12 feet per second. A turn rate of approximately 8 seconds for a 360° revolution was recognized, although some jumpers claimed a slightly faster turn rate. Tests indicated the following performance characteristics for the "Eagle" canopy:

1. Pulling the right guideline closed the right "ear," and the asymmetrical airflow condition resulting from the airflow solely from the left "ear" caused a spiraling right turn. Pulling the left line caused a turn to the left. Releasing the line upon facing the



Inflated Eagle 27-foot diameter parachute. This one was packed in a chest reserve pack.

desired direction stopped the turn.

2. Pulling down on the front risers caused the parachute to glide forward faster; however its rate of descent also increased.
3. Pulling down on the right front riser caused the parachute to glide to the right as well as forward. Pulling down on the left front riser resulted in the same action to the forwardly left direction.
4. Pulling down on either of the rear risers caused corresponding rearward glide.
5. Pulling down lightly on both rear risers or both guidelines leading to the "ears" will stop the forward glide of the parachute. Tests also proved, through a few hard landings by jumpers, that maneuvering the Eagle Parachute should not be attempted within 100 feet of the ground.

The Eagle canopy was not fabricated in the usual "gores-joined-together" method. That is, fabric paneled gores joined by main seams did not comprise the Eagle canopy. Instead, using the method employed in making the triangle Parachute, a large blank of fabric was formed by sewing lengths of silk fabric together with a two needle, ¼ inch seam.

This blanket of silk fabric was then marked with a pattern for the skirt hem, vent hem, and radiating position marks from the vent hem marks to the skirt hem marks. Both the skirt and vent hems, using the marks, were reinforced with a silk tape 1.0 inch wide, with a tensile strength of 300 pounds. The radiating marks were also covered with this tape. Four needle sewing secured the tapes to the canopy fabric. What appears, therefore, as main or radial seams on the canopy are in reality a network of tapes. Suspension lines were continuous from riser link to skirt, across the top of the canopy, down to the opposite riser link; lines were routed through middle channel of the four needle sewing. Other constructional details, such as "V" tab suspension line reinforcements at the skirt hem, zig-zag sewing, etc., were similar to those usually used in fabricating parachute canopies.

White silk fabric was used for fabrication of the canopy. This silk met the requirements of Army/Navy Specification AN-CCC-S-371. It was 36.5 inches wide, and weighed 1.6 ounces per square yard. A minimum tensile strength of 40 pounds per inch in both warp and fill was required; a minimum tear resistance of 4 pounds, in warp and fill, was required. An air permeability of 80 to 140 cubic feet of air, per minute, per square foot of fabric, at 0.5 inch water differential pressure drop was also required. Suspension lines were made of silk fibers; these met Army Specification 7-12, and were the 450 pound minimum breaking strength type. Sewing was done with Size "E" silk thread, Federal Specification V-T-301.

The Eagle Personnel Parachute was manufactured, as most personnel parachutes are, in a choice of canopy sizes and container body positions. Two size canopies were manufactured, a standard canopy, 27 feet in diameter, and a larger 30 foot diameter canopy, for premeditated jumping. These parachutes were packed into seat, chest, or back containers. Figure 3a illustrates the Eagle Seat Pack parachute, with a 27 foot canopy in the seat container. Figure 3b shows an Eagle Chest Pack with a 27 foot canopy; illustrated is the chest pack carried as a reserve parachute for premeditated parachuting. The Eagle Back Pack type parachute is illustrated in Figure 3c; the assembly shown has a 30 foot canopy packed within the back container. The

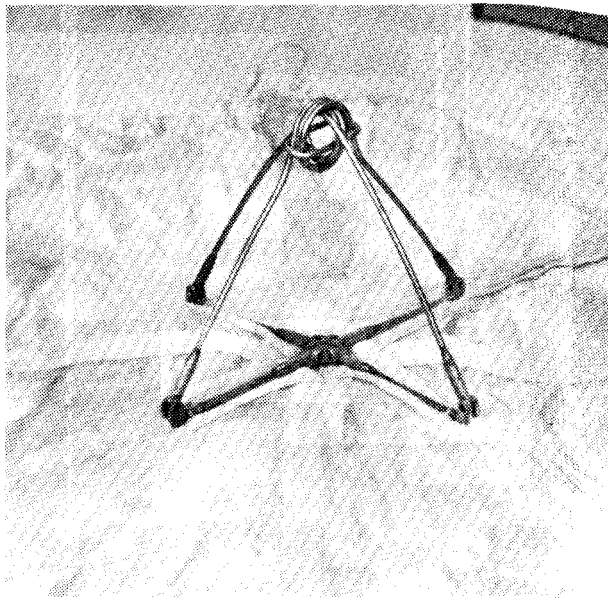
Eagle parachute seat pack type equipped with a 27-foot canopy.

Chest type chute. The one shown was carried as a reserve chute for premeditated parachuting.

Back pack parachute, manually-operated, with pocket for radio. This type was used by the U.S. Forest Service. Pictures were taken in rear of Eagle/Follmer, Clogg factory along West Mifflin Street.

pocket seen on the right side of the container was designed to hold a 2-way radio. This was an early requirement of the U.S. Forest Service; details of this are discussed later in this paper.

The containers were constructed of cotton duck fabric, and cotton



The Eagle pilot chute used an umbrella-like spider leg spring assembly to eject it from the container.

and linen tapes and light webbings. A three-flap arrangement housed the parachute canopy and suspension lines within the container. Two small flaps were positioned under the third large flap. A novel hasp/hinge combination fitting secured the smaller opposing flaps together. The pressure of the overlaying large flap on this hasp/hinge arrangement locked the smaller flaps together. This large flap was releasable through the use of a standard cone/grommet combination secured by ripcord pins. Elastic shock cords (rubber bungee cord) pulled the large flap open when the ripcord pins were pulled. As this flap was pulled back, the smaller flaps were released by the opening action of the hasp/hinge fitting.

Parachute deployment was "canopy-first." A square pilot parachute, approximately 33 inches across, deployed the parachute from its container into the airstream. A spider or umbrella-like spring/folding arms arrangement in wide use at that time, ejected the pilot chute out of the container. Figure 4 shows a spring of this type. This pilot chute was made of silk fabric and silk suspension lines; both these materials met the specifications previously mentioned in this paper, except the lines were 100 pound strength type.

The Eagle parachute harness resembled the standard Army/Navy type in use at that time. It was a 3-point attachment (two leg straps and one chest strap) type, its webbing geometry configured with the familiar seat sling/shoulder riser arrangement. Adjustment means for different sized personnel and webbing routing was somewhat different from the standard Army/Navy type. Standard forged steel snaps, "V" rings, and adjuster fittings were used. The main structural members of the harness were made of cotton webbing with a rated breaking strength of 5000 pounds.

The novel inflated geometry of the Eagle canopy, its flared skirt and cascading suspension line features, had a serious drawback. These features which made it possible to "steer" the Eagle, also provided the canopy with fast opening characteristics and resultant high opening shocks. Generally, most parachute canopies go through the familiar deployment stages of canopy/suspension line stretch out, the skirt parting to allow air into its sleeve-like shape, followed by a rapidly growing ball of entrapped air expanding the canopy through a pear shape into its inverted saucer inflated configuration. The Eagle parachute did not follow these well known deployment and fill stages. Instead, the following describes the "physics" of the Eagle canopy during its operation.

1. Upon ripcord operation, the container opened, and the pilot chute deployed the canopy and suspension lines out into the airstream.
2. Once extended into the airstream, the air entered the skirt, distending it.
3. The flared skirt configuration captured the air, and drove the peripheral portion of the opening canopy outwardly before the crown portion of the canopy could start to balloon out from the entering air mass.
4. The canopy continued to fill and spread horizontally, instead of going through a pear-shape stage, with the aerodynamic forces acting much more effectively than any mechanical spreader-gun.

Early Unique Features

When the Eagle Parachute was first introduced it had two additional unique features. One was a net-like suspension line arrangement below the cascade juncture point. This geodetic feature, which was theorized to enhance "clean" parachute openings as well as reduce opening shocks, was abandoned due to the aided complexity of manufacturing the parachute. The second feature worthy of mention was

the swingability of the back container. This container was equipped with a flap compartment at its lower base; this lower edge would not be secured to the harness. It was theorized that this flap, once the jumper was free-falling through the air, would capture the airstream and swing the pack above the jumper's head. Once in this position, it was further theorized, the container would stabilize the falling person, preventing any spinning or tumbling during the free-fall. Unfortunately, there is no technical documentation as to the successful use of this feature.

The Eagle Parachute did not receive any appreciable acceptance by the flying public as an emergency parachute. However, professional parachutists found it useful for exhibition work, especially for spot-landing contests at air shows. It was preferred by some over the steerable Triangle parachute, another favorite of exhibition jumpers of the same era, because it had a forward glide (the Triangle was rigged to glide sideways) and was easily turned by the use of guidelines instead of riser manipulation. Its high opening shock dampened the initial enthusiastic use of the Eagle by exhibition jumpers, once they experienced eyeball-rolling opening shocks when they used the Eagle for "death-defying" long free-fall show jumps before air show audiences. A famous West Coast parachutist of the 1940's, Troy Colbach, was forced to retire from his jumping career after he suffered a severe permanently disabling pelvic injury during an exhibition jump in which he made a long free-fall before opening his parachute.

A look at the Eagle Parachute would not be complete without discussing in some detail the very important role it played in the U.S. Forest Service's battle against forest fires. Interest by the Forest Service for utilizing aviation to control and combat forest fires dates back to 1919. This early recognition that aviation could be extremely useful in managing and protecting forest lands shortly led to the organization of a forest fire patrol along California's Sierra Madre Mountains. This initial endeavor was led by Major Henry A. "Hap" Arnold, who later became the commanding general of the first independent U.S. Air Force.

In the mid and late 1930's, it was realized that a parachute could serve as an important adjunct to an airplane for delivering firefighters to timber blazes. This led to an active parachute jumping program. A program was started as part of the Forest Service's Aerial Fire Control Experimental Project. This project was conducted between October 5 to November 15, 1939 at Chelan National Forest (U.S. Forest Service Region 6).

Two early U.S. Forest Service "smokejumpers" shown in this November 1939 picture prepare for a training jump at Okanogen National Forest wearing Eagle parachutes and protective clothing developed at that time. (U.S. Forest Service Photo)

The successful bidder for supplying parachutes and related equipment, as well as ancillary services, was the Eagle Parachute Company. This choice was based on a successful demonstration by Beach Gill, Eagle Parachute Company's president. He later served as collaborator for furnishing technical advice during the course of the project. A vital part of the Eagle Company services was the jumping expertise of professional parachutists Frank M. Derry (serving as Head Rigger and Jumper) and Glen Smith. An important participant in this pioneering program was David P. Godwin, assistant Chief of Fire Control of the U.S. Forest Service Washington Office Fire Control, who was a long time staunch advocate of using aviation in forest fire control and fighting.

The following project objectives were targeted:

1. Determine the feasibility of landing "smokechasers" from airplanes by parachutes in rough terrains at high altitudes and in timbered areas. (Thus the birth of the term "Smokejumpers.")

2. Develop and test protective clothing suitable for safe landings in timber, rocky areas, on steep slopes and other hazardous jumping sites.

3. Make preliminary investigation of devices and procedures for applying the method if found practicable, including communication, of reaching the ground after being lodged in the trees, retrieving the parachutes, personnel, and equipment.

A total of 58 jumps were made as part of the program. Eight of these were "first jumps" by Forest Service officers or local smokechasers, ages ranging from 22 to 47 years old. Test results indicated conclusively that "smokejumpers" could be an important asset for fighting forest and timber fires. This conclusion was based on the fact that successful jumps had been made at altitudes ranging from 2000 to 6800 feet, into varied timber terrains. The Eagle Parachute used, a 30 foot main parachute and a 27 foot reserve as previously described, was judged to meet the desired operational characteristics of slow descent, maximum maneuverability, and easy release from trees after a tree landing. The latter was possible by making both parachute risers releasable by the use of snaps. However, concern for the high opening shock was expressed.

Attempts at reducing the opening shock were made by the use of tie cords being made at points along the canopy. In order to minimize physical damage to the smokejumper by excessive parachute opening loads, a special leather and elastic abdominal belt was designed and used to guard against possible abdomen rupture or back sprain.

In 1941, a static-line for automatic parachute operation was developed for the Eagle main (back pack) parachute. Its adoption, in lieu of the manually operated ripcord, afforded a significant reduction in the intensity of the nervous reactions of tyro smokejumpers during their initial training parachute jumps. With the advent of World War II in 1942, the acquisition of parachute equipment became critical. As a result of experimentation, Frank Derry conceived and developed a double slotted configuration for the standard U.S. Army Air Corps 28 foot diameter flat circular canopy. This modification, still referred to as "Derry Slots," imparted a forward motion to the modified flat circular canopy. Stability was greatly improved, and the rate of descent was more than acceptable. Turning the gliding parachute was possible through the use of two control guidelines, one from each rear riser to the skirt of the canopy in the region of its corresponding slot. A pull on the control guideline changed the shape of the slot in such a manner that its airflow's direction was changed, thus causing the parachute canopy to rotate. Most importantly, the

slotted parachute had a lower opening shock than the Eagle parachute.

Another significant factor was cost, which was low as these modified parachutes could be, and were, made from surveyed personnel standard 28 foot canopies. Also, it was later found that the cost of even new parachutes fabricated with the "Derry Slot" feature was appreciably less than the more complex Eagle parachute. By 1944, the Eagle parachute was out of the picture. Normal operational attrition factors reduced their number and ended the use of these unique and novel personnel parachutes.

There is not too much information to be found about Richard H. Hart, the inventor of the Eagle Parachute. Obviously, this parachute designer from New Orleans, was intensely interested in steerable parachutes. In 1938, he was associated with the Autochute Company located in New Orleans. He subsequently sold his existing patent rights to the Eagle Company. He was granted at least five parachute patents, all on steerable types. In the late 1940's, a steerable, parachute design that featured a stepped skirt for glide, and a slit for turnability, was tested by the government for use as a possible troop parachute. It was designated as the T-8 Type, and was deemed unsatisfactory because of high paratrooper collision possibilities during descent.

Parachute Manufacturing in Lancaster

Manufacture of parachutes in Lancaster began with Follmer, Clogg & Company, makers of umbrellas since 1896. A brief history of that company would be in order.

Although individuals made umbrellas in their small shops early in Lancaster, the first establishment of any significance was started by Jane Rose, widow of William Rose, and her son, David, in 1882. Located at 42 South Queen Street in 1882, the shop soon was too small, and the business, known as J. Rose and Son, moved to 14 North Queen Street, at which time they advertised the firm as "umbrella and parasol manufacturers—wholesale and retail." David's sister, Mary, tended to the retail part of the sales. In 1886 the firm took in another son, James, and Herbert W. Hartman. The shop was moved to 14 East King Street, and now was known as Rose Brothers and Hartman.

The steadily expanding business required another move, and in 1894 Rose Brothers and Hartman occupied a new factory at 254-260 West King Street which embraced the southeastern corner of West King and South Mulberry streets.

In 1892 the need for increased capitalization and the current "rage" for business combinations resulted in the formation of The Umbrella Company. Local commercial bankers were attuned to the agricultural economy so Lancaster businessmen frequently sought financial investment from Philadelphia and New York investors. In Philadelphia in 1884 the umbrella manufacturing firm of Follmer, Clogg & Co. began operations. Follmer, Clogg & Co. joined with Rose Brothers and Hartman Co. and several other producers of umbrellas and parasols to form The Umbrella Company in 1892. Shortly after this combination was established a large five-story plant was added to the Rose Brothers and Hartman factory at the corner of King and Mulberry streets. Two years later The Umbrella Company went into bankruptcy and a receiver was appointed.

Late in 1894 the principal members of the firms of Rose Brothers and Hartman, Follmer, Clogg & Co., and A. Hall & Co. purchased the assets of The Umbrella Company, and incorporated under the style of Follmer, Clogg & Co. Albert C. Hall became president; Charles J. (Jack) Follmer, vice president; Edmund Wright, Jr., secretary; Herbert Weidler Hartman, treasurer; and James L. Brown, general manager. Hall lived in Stamford, Connecticut; Follmer's home was Brooklyn, New York; and Wright was a resident of Philadelphia. Actual management of the extensive plant was left in the hands of Hartman and Brown.

David and James Rose withdrew from the company and formed Rose Bros. and Co. They purchased a large old factory building occupied formerly by the Conestoga Cork Works along the north side of East Fulton Street between Lime and Shippen streets, and began manufacturing umbrellas. They continued their retail store at 14 East King Street. Business increased, and in 1910 Rose Bros. erected a large four-story factory at 221 East Chestnut Street. This structure extended north to Fulton Street where the older plant was located. Rose Bros. ceased operations in 1930, and the Farmers Supply Co. occupies part of the old building. The newer structure was used by the Domestic Tobacco Co. for many years and soon will be remodeled into offices for an architectural firm.

Rose Bros. continued to own the real estate at West King and South Mulberry streets, leasing it to Follmer, Clogg & Co. until 1902.

The Follmer, Clogg & Co. operation prospered, with additional buildings being erected for the spinning and weaving of silk fabric used in the making of umbrellas. A silk mill that had been erected in the rear of the plant along West Mifflin Street east of South

Follmer, Clogg & Co. main factory at corner of West King and South Mulberry streets in 1900. This umbrella factory was the largest plant of its kind in the world. An addition was built to the east (left side) of the factory shortly after this picture was taken.

throwing mill were erected along Manor Street at Laurel Street, and along nearby Lafayette Street. A mill was established in Columbia for making silk fabric.

The authorized capital of Follmer, Clogg & Co. was $2 million of which $1.5 million was in common stock and the remainder in preferred stock. The officers of the company continued unchanged until 1917 when Wright was replaced by Hartman who then became the corporation's secretary-treasurer. In 1923 Hartman became vice president and secretary, and his son, John Ives Hartman, was elected treasurer. The new title was belated recognition that Hartman had been the *de facto* president from the earliest days of the Lancaster plant. Herbert W. Hartman (b. 15 January 1860-d. 7 November 1939) became president in 1933, with his son assuming the posts of secretary-treasurer. John was born 5 December 1892 and died 3 September 1980. Upon the retirement of H. W. Hartman in 1937 (he was then 77) John president and treasurer, and his brother, Robert Breneman Hartman (b. 12 August 1895, d. 4 February 1970) was elected secretary. Two years later the company ceased operations, a victim of synthetic fabrics and protection offered by the extensive use of rainwear and the closed motor car. In 1939 the corporation sold its assets, closed its books, paid all its creditors, and divided the excess among the stockholders. The main plant was acquired by the J. B. Van Sciver Company, and remodeled for use as a furniture store. The distinctive tower at the corner of King and Mulberry streets was shortened to permit "modernization" of the facade. In 1983 the Van Sciver Company ceased operations, and the building is unoccupied at present. About five years ago the easternmost portion of the King Street frontage was razed to create an access to a rear parking lot.

Herbert W. Hartman built his residence at 415 North Duke Street, now the Gundel Funeral Home. John Ives Hartman's home was at 924 Marietta Avenue. These fine homes were designed by the first architectural student to be graduated from the University of Pennsylvania School of Architecture, a chap named Pritchett. He also designed the James L. Brown home at 1136 Columbia Avenue, and the Julia Straub Clark (Mrs. Hugh Clark) home at 1019 Buchanan Avenue. Mrs. Clark was a sister-in-law to John Ives Hartman, and after the death of Mr. Clark, she married Robert Breneman Hartman.

When the silk mills were erected on Manor Street in 1910, James Laird Brown became the manager. In the 1930s, these mills were a subsidiary of the Follmer, Clogg company, and were called the Manor Mills, with Brown as president. James L. Brown had four sons and a daughter: Laird, Donald, Dudley, William, and Catherine. The

Follmer, Clogg & Co. building, later J. B. Van Sciver Co., as photographed in October 1984.

family which was of Scottish origin came to Lancaster when the Follmer, Clogg company began operations here. James Laird Brown, Jr. was assistant general manager and assistant treasurer of Follmer Clogg & Co. and was manager of the Manor Mills. By 1937 he was president of the Manor Mills. William was vice president and treasurer, and Donald was secretary. After Follmer, Clogg & Co. ceased operations the Manor Mills closed, and about 1945 the Dodge Cork Company brought together its operations in the former Manor Mills buildings.

During World War I Follmer, Clogg & Co. produced large numbers of parachutes for the U.S. Army and U.S. Navy to be used for life-saving of airmen. In addition to the personnel parachutes the

Herbert Weidler Hartman (1860-1939) was the principal executive of Follmer, Clogg & Company throughout the life of the company.

company made "handkerchief" chutes and flare chutes. Follmer Clogg also started to market for the civilian flying trade a patented manually-operated parachute called the "Follmer, Clogg and Company Positive Opening Parachute." This parachute featured a large canopy whose gores were shaped with a "V" cut configuration at its base and a new type of pilot parachute. As late as the early 1930s local pilots were testing parachutes for the company, but the umbrella factory reverted generally to making its original product until it closed in 1939. No longer could Lancaster boast of the largest umbrella factory in the world although a few small companies continued to make the "rain-shedders."

When Follmer, Clogg and Co. stopped making umbrellas, Eagle Parachute Company's vice president and general manager was Charles J. (Jack) Follmer. Eagle Parachute Company had begun in New York

in 1938; its president was Beach Gill. The next year the company moved to Lancaster and occupied the old silk mill building of Follmer, Clogg and Co. at the southeastern corner of the property along West Mifflin Street east of South Mulberry Street. Soon after this move Follmer became the president of Eagle Parachute Co. In addition to the Eagle Parachute, they engaged in making standard Army/Navy parachutes of all types during World War II. Increasing work loads resulted in over 200 persons being employed during the peak production period.

The quarters at the old umbrella factory were too cramped, and the Eagle Parachute Company moved to a large warehouse building at 424 North Queen Street, next to the Penna. National Guard Armory. Additional space was leased at 252 North Queen Street. Robert E. Knoll was the secretary, assistant treasurer, office manager and purchasing agent of the corporation. J. W. VanBuskirk, Jr. was the production manager.

Nylon for producing the parachutes had top priority, and it was woven at the Frank Ix mills in New Holland, Pa. in 45 inch widths. The silk mills of the Follmer, Clogg company were equipped with narrow fabric looms. C.J. Follmer reportedly had numerous discussions

Rear of former Follmer, Clogg & Co. factory along West Mifflin Street where Eagle Parachute Company operated 1939-1942.

Eagle Parachute Co. manufacturing and assembly factory at 424 North Queen Street. The building has been converted to an apartment house.

with James K. Brown concerning acquiring some looms to weave parachute fabric, but he never was able to convince the head of the Manor Mills to invest in these looms. This was during the period of 1916-1917. Shortly afterwards Follmer left the active management of the company. During World War II Follmer returned to Lancaster to head the Eagle management, and it was in Lancaster that he was involved in a tragic motor car accident that injured him seriously, resulting in his death not long afterwards.

Among the test pilots for Eagle were Arthur E. Lamparter and Larry W. Jones, both electricians when they weren't testing parachutes. During the preparation of this article a number of former Eagle employees were located, among them Mr. and Mrs. Frank H. Tapasto (he was a licensed parachute rigger), Lemon Troop (shipping and receiving clerk), Mary Harsh (she operated a double-needle sewing machine), Elizabeth Sauer (forelady), Myrtle Klinger (worked on parachute cases), and Mary Stine. Mr. Tapasto also was a foreman in

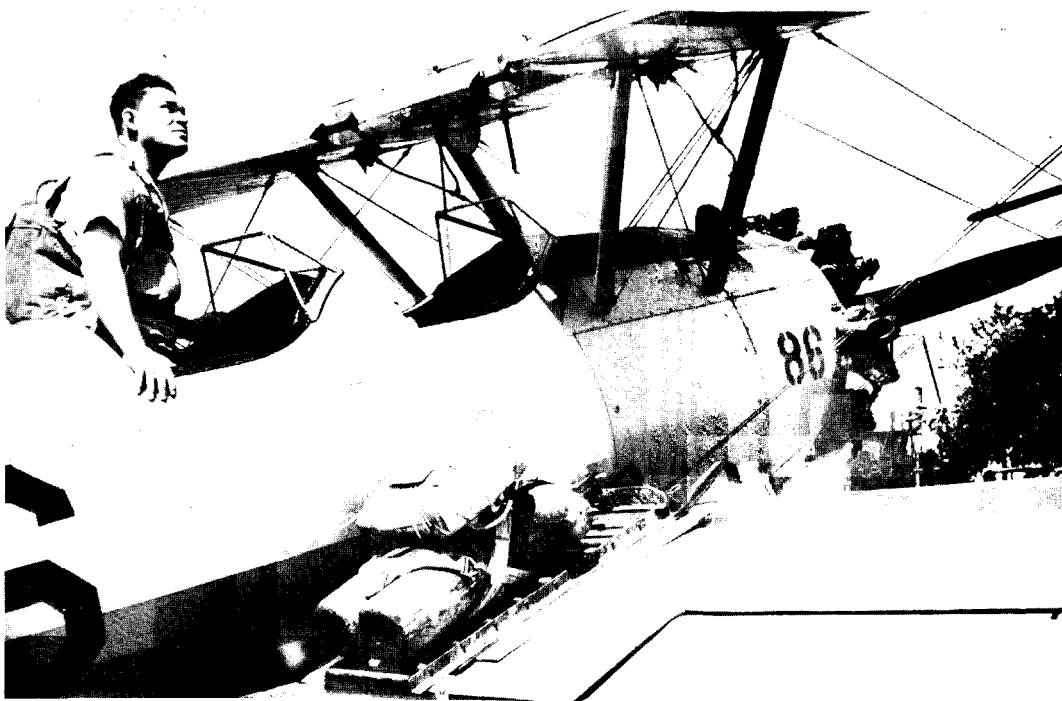
the parachute factory.

According to Larry Jones, Eagle made square parachutes for the Navy during World War II, and that he packed eight of these square chutes which were sent to the Lakehurst (New Jersey) Naval Air Station. When he last saw them stored there they still had the "Eagle" seal tied on the chutes. Jones did not care much for the square chutes because they were prone to tangle.

Arthur Lamparter tested more than 2,500 sample service parachutes during his "off" hours from his regular job as electrical crew leader at Armstrong Cork Company's floor plant (Armstrong World Industries). Lamparter did the testing of Eagle by flying to the proper altitude and then releasing the chute weighted down with a 150-pound dummy. The life of the person using a parachute depends on the reliability of the chute tester. Every parachute is tested before being made available for the live "jumper." Lamparter in 1945 said he had been testing chutes "off and on" for approximately ten years for Follmer and Eagle.

Using a 600-pound dummy Lamparter would take the chutes up in his old Ryan monoplane—like the "Spirit of St. Louis"—and drop them from several hundred feet. The dummy would bury itself six

Arthur E. Lamparter preparing to test a chute for the Eagle Parachute Company in 1945. (Photo courtesy of Armstrong World Industries, Inc. and Arthur Lamparter)



or seven feet in the earth, tearing through the heavy harness of the chute. A tow truck had to be summoned to pull the dummy out of the earth. Such tests were approved by the Civil Aeronautics Authority inspectors. Chutes used by the U.S. Forestry Service for landing men and equipment near forest fires were tested by Lamparter before World War II. After the war began, the electrician-chute tester would test as many as 20 chutes a night. His best record was 15 chutes in one hour, each requiring a separate flight.

When his old reliable Ryan monoplane's landing gear came apart during a "take off," "Art" Lamparter switched to a biplane he owned in partnership with some friends. According to a story published in the *Armstrong Reporter* (July 1945) "Art" thought someone was shooting at him after discovering what appeared to be gunshot holes in the fuselage of his plane. He was relieved to learn the holes were made by the rip cord pins striking the fuselage sharply when the chutes were released. A chute would be placed with its dummy on a rack consisting of a series of rollers similar to a short conveyor track which was attached to the lower wing's upper surface. A rope from the cockpit to the rack allowed the pilot to release the chute at the desired altitude.

With the war coming to an end in August 1945, all government contracts were cancelled, and the Eagle Parachute Company found itself without any work. The force of some 235 employees was reduced to 17. The sewing and assembly factory at 424 North Queen Street, and the packing plant at 252 North Queen Street, were given up. Eagle's management looked into other lines of production that could make use of the sewing skills of its workers, and to that end, leased a small factory at 933 East Orange Street. C. J. Follmer was the president and general manager, Mary R. Kline was assistant treasurer, and Abram M. Weaver was assistant treasurer. The plant was kept going with sub-contract work for numerous local sewing factories. Not long after this move, however, the business was sold to Valley Frocks, and all was over for the parachute business in Lancaster.

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