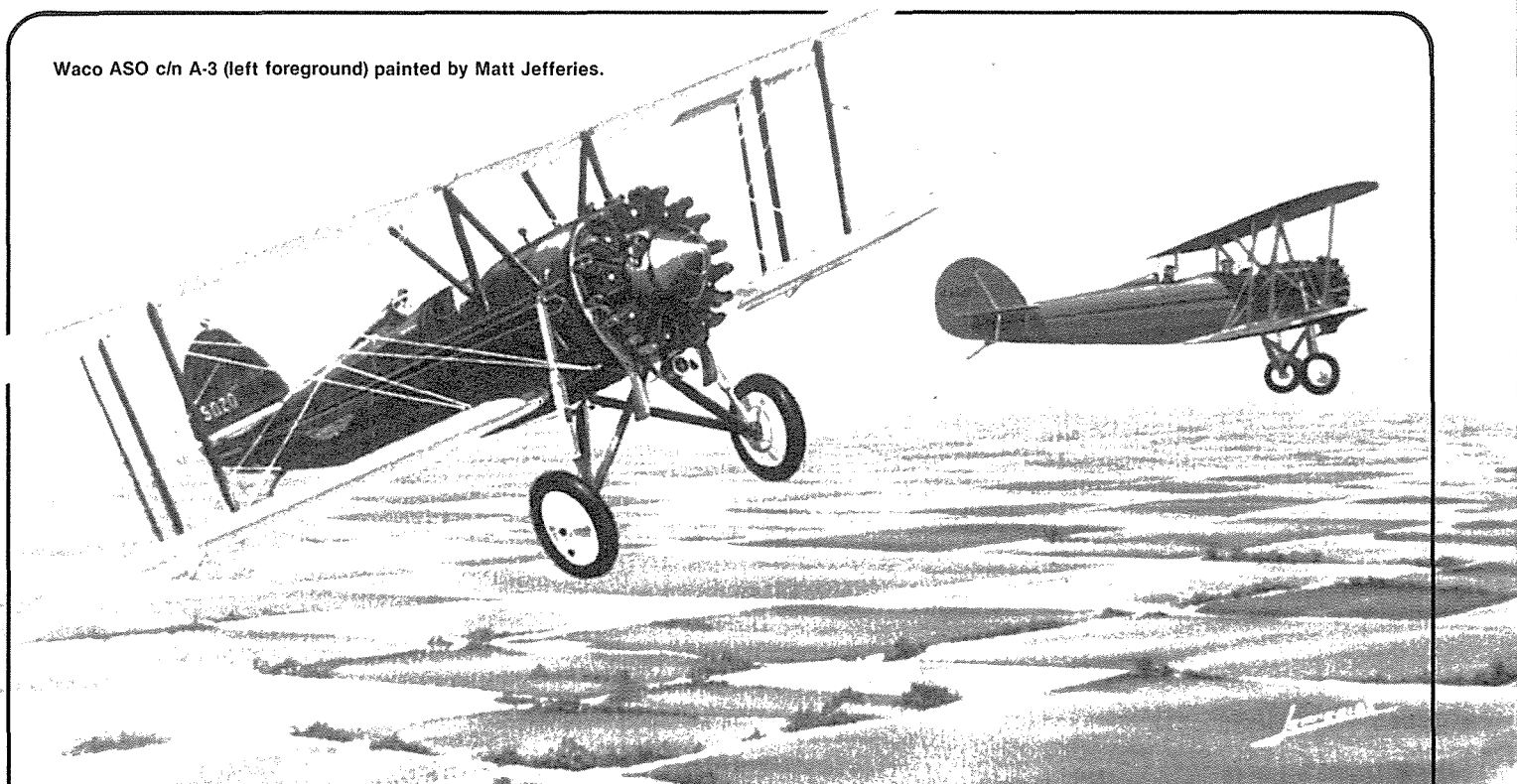


Waco ASO c/n A-3 (left foreground) painted by Matt Jefferies.



# THE WACO STORY

## Part I— Clayton Brukner & The Founding Years

by Herm Schreiner

### PROLOGUE

Patients convalescing in the \$1 million Brukner wing which opened in 1972 at Troy, Ohio's Stouder Memorial Hospital most likely are unaware that the origin of the structure's capital funds emanated from one of the world's most famous lines of civil aircraft. And the Troy citizens fortunate enough to experience the scenic isolation of the 146-acre Brukner Nature Center are possibly likewise oblivious to its existence being rooted in the success of the Advance Aircraft Company, founded in Troy in 1923 by Clayton J. Brukner and his partner Elwood "Sam" Junkin which produced "WACO," the most prolific civil aircraft of its era. As further testimony to his vision and enterprise, Clayton purchased the 146 acres for the center on Horseshoe Bend, seven miles southwest of Troy in 1934 for \$4,500.

After Waco built 1,607 of the CG-3, CG-4, CG-13 and CG-15 troop-carrying gliders plus 600 UPF-7 Primary Trainers during World War II with a peak employment of 2,100, production of civil aircraft never assumed its prewar proportions. Following the unsuccessful postwar new model introduction of a radically designed pusher Model W called the "Aristocraft,"

Brukner wisely turned to manufacturing parts and diversified into small machinery and ground transportation equipment. In 1959, he designed and manufactured the "Lickety Log Splitter" which was marketed successfully from coast to coast.

In 1963, Waco was sold to Allied Aero Industries of Syracuse. Thus the Waco name virtually disappeared as an aircraft manufacturer after 40 years of existence. However, today, headed by Ray Brandly, President of the National Waco Club, there are 567 members who are dedicated to the preservation of Waco aircraft of which there are an estimated 332 currently flying, bringing premium prices of up to \$50,000.

Clayton, who had never married, led the life of a perpetually occupied, innovative and creative inventor-entrepreneur. His penchant for privacy led to his moving from a rented room above the hardware store at 207 E. Main Street to the purchase of the Kerr farm on Swailes Road about one mile south of the Waco plant. His private life was often misunderstood as aloofness. In reality he valued time so highly that he simply could not tolerate idle chit-chat. His presence throughout the city was known by the appearance of his distinctive autos, first a robin-egg blue Cord and then a Chrysler Airflow.

Waco was Troy's connection with the world. Famous people were attracted here. Directors and actors from Hollywood, oil company tycoons as well as military leaders in uniform from such places as Cuba, South America and Nationalist China. The dignitaries were housed in the Lollis Hotel where the WFW ("Wait for Your Waco Club") scheduled delivery of their Waco based upon their time of registration. Sums of up to \$900 changed hands when someone was in a hurry for their Waco.

Waco aircraft piloted by Johnnie Livingston won 79 first places, 43 seconds and 15 thirds in 139 air races during the 1928-33 era. Richard Bach, biplane enthusiast and noted author, admired Livingston and when he wrote his book he entitled it "Jonathan Livingston Seagull."

Brukner wisely specialized in Wright powerplants in the early stages of growth, aware of worldwide parts and service availability—a factor which undoubtedly contributed to his dominance of the export and foreign market in the '30s. His policy was for no model to ever want for parts and he never compromised quality. He stated, "Our policy was never to build a plane to meet competitive prices. Why make the world's finest airplane a second-rater in order to sell it for less money."

Born in Ravenna, Nebraska, on December 18, 1896, of German-born parents, Clayton Brukner, who described himself as a "high-school engineer," has left a trail blazed with significant achievements not only in aviation but as an industrialist, and as a distinguished humanitarian with generosity and a deep concern for the fate of Troy's environment.

In 1969, Clayton received the Troy Chamber of Commerce Outstanding Citizen Award, in 1971 the Jaycees Community Service Award, and in 1974 he received the "Silver Wings" man-of-the-year award.

After 81 productive years, Clayton Brukner's "wings were folded" on December 26, 1977, at Kettering Memorial Center from a cardiac arrest following open heart surgery. An appropriate final salute was staged by the Dayton members of the "Quiet Birdmen" and "Silver Wings." On December 29, a trio of pilots in their open cockpit Wacos in a "missing man formation" were led in a flyby over the Fisher-Cheney-Cron Funeral Home by Moraine City Mayor Harold Johnson in his "one-of-a-kind" 1934 Waco UMF-3.

Despite the significance of the Waco name and the success of its founder in the civil aircraft industry, there has never been a complete account of its inception, growth and the evolution of the Waco aircraft genealogy. As a result of his close association with Clayton Brukner during the past 12 years, Ray Brandly was determined to not only write the story but in the process "set the record straight" on the misinformation about the founding of the company and the designing of the aircraft.

The author has met with Ray Brandly and had access to the original manuscript, photos and records for Ray's book, "Waco Airplanes," "Ask Any Pilot," copyright 1979 by Raymond H. Brandly. This two-part series is an attempt by the AAHS to give proper recognition to the people and the aircraft of Weaver Aircraft Co., Advance Aircraft Co., and Waco Aircraft Co., and the effect of their aircraft on the progress of civil and military aviation.

Those airplanes we built in 1923 in the back room blacksmith shop of the old Pioneer Pole & Shaft plant of Milton T. Dilts on Union Street were all manhauled and pushed across the B&O railroad tracks and south to an area large enough for a test take-off [initially flown by Brukner and Junkin]. Landings were made at no charge on the farm operated by Deb Snyder. Those first takeoffs were made from the field now occupied by the Lumbermart and we paid two dollars per takeoff. To avoid this charge, we later used the last half block of Walker Street, which enabled our 'quick-lift' Model '7' to attain sufficient speed to become airborne after a slight settle while crossing the large gravel excavation beyond."

A bizarre setting indeed for 1923 in Troy, Ohio, as it was being recalled by Waco co-founder, Clayton J. Brukner.<sup>1</sup> The sturdy appearing bi-winged aircraft were the OX-5 powered Waco Model "7", a total of 16 which were sold. They were the product of an embryonic firm to be known worldwide, the Advance Aircraft Company founded on March 16, 1923, at Troy whose youthful partners, Clayton J. Brukner and Elwood "Sam" Junkin, were just eight years out of high school. The partnership stemmed from a lifelong friendship developed dur-

ing their last two years at Central High in Battle Creek, Michigan, both graduating in 1915. The two youths had exhibited exceptional creative and mechanical aptitudes and they had expressed their great desire to build airplanes.

Clayton related, "Sam's father had taken him to see an air show in Chicago where he 'got the bug'. We both were interested in learning to fly, so we pooled our money so one of us could take a flying course. The cost was \$400. Since each of us was making the grand salary of \$14 per week, we flipped a coin to see who would get to take the course and Sam won."

After learning to fly at Fenton, Michigan, Sam qualified for a plant job at the Curtiss Aeroplane & Motor Co. in Buffalo and convinced Clayton to leave his job at the Postum Co. in Battle Creek and join him. By the time Clayton arrived Sam had since moved to New Jersey where he was employed in the plants of both Aeromarine and Standard. Despite the fact that Clayton had become an assembly foreman at Curtiss, their close bond resulted in his later joining Sam. During the summer of 1919 the inseparable pair built an "air-boat" powered by a 28-hp Lawrence. Brukner recalled, "It never did fly, for some quite obvious reasons, and we soon dismantled her, keeping the



1928—Clayton J. Brukner, President, Advance Aircraft Co., Troy, Ohio, at age 32. Later in the year the company name was officially changed to Waco Aircraft Co. Born Dec. 18, 1896; died Dec. 26, 1977. (Ray Brandy)



Circa 1926—Elwood J. "Sam" Junkin. Last photo of co-founder of Waco. As Chief Engineer he was best known for the design of the Waco "9". He died unexpectedly Nov. 1, 1926, of a heart condition. Gravesite is at Riverside Cemetery, Troy, Ohio. (Ray Brandy)

engine for some future use." In a photo presented to Jerry Meyer, Curator of the Dayton Aviation Hall of Fame, Clayton inscribed the craft as Model "1" Waco 1919, even though it was built prior to the formation of the company bearing that name. When the production of military aircraft was terminated following the 1918 armistice, the ingenious twosome decided that the time had come for them to find a way to design and build an airplane of their own. In late fall of 1919 while en route to Battle Creek, aviation history was irrevocably altered when their itinerary was unexpectedly interrupted by their encounter with two barnstormers, George E. "Buck" Weaver and his brother-in-law Charles W. Meyers who were operating at Woodruff Field five miles east of Loraine, Ohio, which was conveniently accessible on the Lake Shore Electric interurban train at Stop 74.

When "Buck" Weaver learned of the two's ambitious goal, he proposed that they start their enterprise by rebuilding his recently damaged *Canuck*. Since there was a suitable vacant building available in Lorain, it was decided they would "winter" there. That winter of 1919-20 was momentous for the soon-to-be-famous partners, as it was then that the decision was made to produce an entirely new aircraft suitable for barnstorming with two passengers. Brukner explained, "Buck was the popular local pilot and we figured his name would be persuasive in obtaining local financing." Thus in early 1920 did the partners found the first forerunner of Waco Aircraft Company, the Weaver Aircraft Company, with "Buck" Weaver negotiating the financing. Hence were the initials W-A-C-O (for Weaver Aircraft Co.) conceived which were to become an internationally renowned genre of aircraft synonymous with high performance, beautiful lines and dependability. It was purposely pronounced "Wah-co" from the beginning to attract attention as a trade name.

Few aircraft companies then were in existence exclusively for civil aircraft,<sup>2</sup> most 1920 craft being offerings from military companies diversifying, such as the Dayton-Wright *Aerial Coupe*, Curtiss *Oriole*, Thomas Morse S-7, Galludet C-3 *Liberty Tourist* and Boeing *Mount Rainier* not to mention the infinite versions of the *Jennie* and the *Standard*.

Another early entrant in this emerging industry was E.M. "Matty" Laird who had started his own company in Chicago but who was lured to the Wichita Airplane Co. in 1920 by oilman "Jake" Moellendick. In 1920 the Laird *Swallow* was produced under the reorganized company name of E.M. Laird Airplane Co.<sup>3</sup>

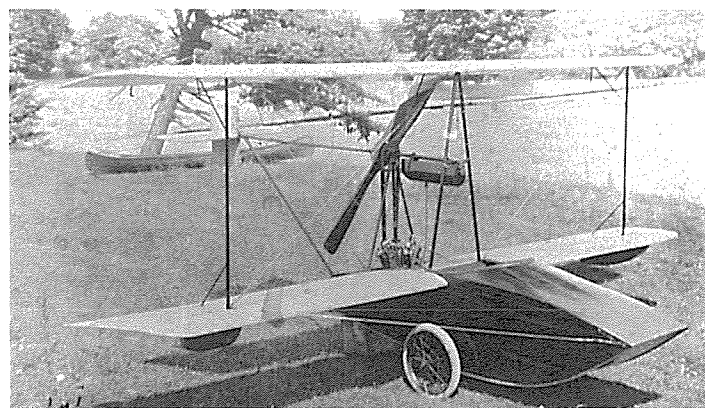
Of note, all agreements to this point within the organization of the fledgling Waco enterprise had been strictly verbal, with the understanding that all participants would be compensated upon the sale of any aircraft produced. Brukner commented, "Buck kept insisting that he was the president but other than arranging for some funds, he did nothing other than the test flying of those first airplanes built at Lorain and Medina."

While "Buck" was promoting the needed financing for materials and parts, Clayton and Sam decided to proceed with two models. Junkin's designing talent directed their efforts to produce a small single-seat, parasol monoplane suitable for their two-cylinder 28-hp Lawrence. Construction featured thin mahogany over a wood frame on this their only monoplane and which was called the COOTIE.

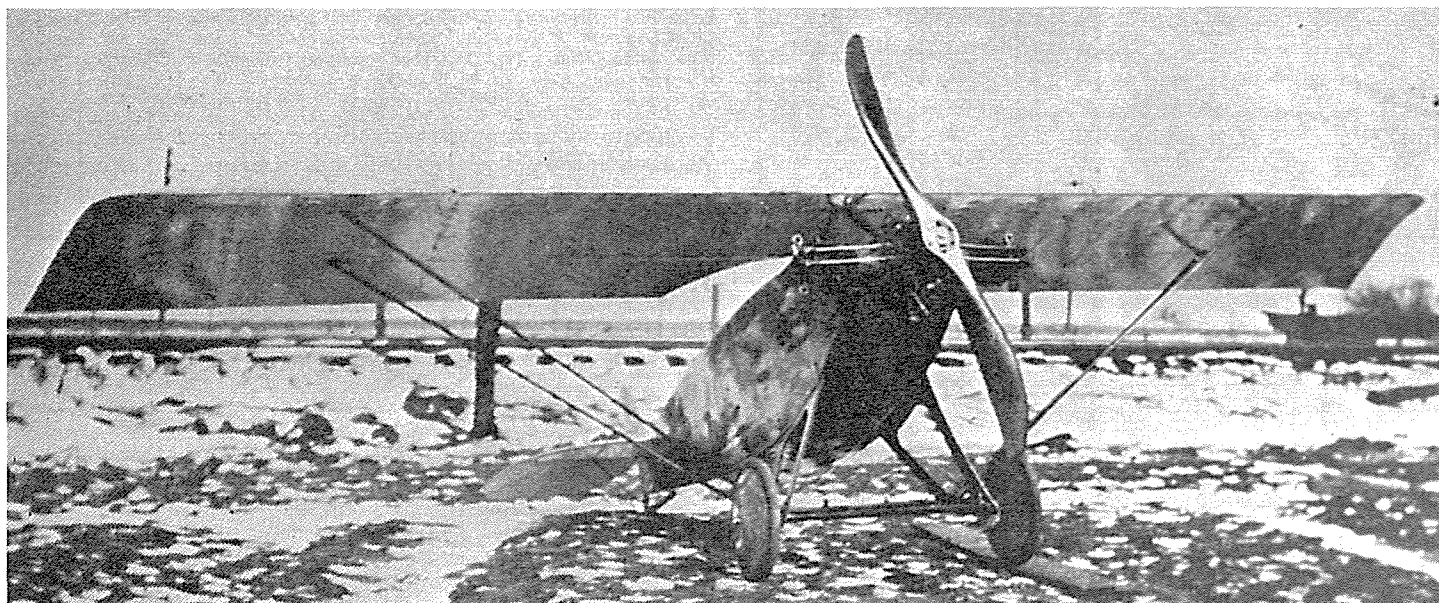
During the construction of the COOTIE, which has become Model "2" in the Waco genealogy, Brukner had gone to Buffalo to attend a sale of surplus World War I *Jenny* parts. His efforts resulted in a largess of several carloads of *Jenny* components, which included wings at \$4 each, and landing gear wheels, tail surfaces, radiators, struts and fittings all at unheard-of prices. However, the greatest "find" was a dozen OX-5 engines at a total cost of only \$350 with an equal number of copper-tipped wood props at a total cost of just \$36.

It was while the design for their own first full-size biplane was being completed that the versatile airman "Buck" Weaver's luck ran out and he cracked up the COOTIE. The pair, ever resourceful, constructed a small single-seat biplane again using the two-cylinder Lawrence about which little is known but which has assumed the role of Model "3" in the Waco genealogy.

The economics of barnstorming had dealt a severe blow to the venerable *Jenny* with its single-passenger payload and poor lift characteristics necessitating a substantial field in which to operate. To capitalize to the fullest on these market demands, their first biplane, a "one-of-a-kind," was a four-placer, with a three-place front cockpit and the pilot seated in the rear cockpit. Clayton explained, "We did some improvising such as modifying *Jenny* struts, tail parts and redesigning the wings so that we had the 'high-lift' USA #27 wing curve." The mahogany plywood-covered wood frame fuselage had a natural finish with fabric-



1919—Waco Model "1"—Air Boat. First effort of Brukner and Junkin while working for Aeromarine & Standard in the Newark-Elizabeth, N.J., area. Used 28-hp, 2-cyl. Lawrence engine. It never flew but same engine was used on Waco "2". Cootie and Waco "3" single-place biplane. Inscription is to Dr. Jerry Meyer, Curator, Dayton Aviation Hall of Fame, in which Brukner will be inducted in 1980 or 1981. (Dr. Jerry Meyer)



May 3, 1920—*Aerial Age*, Waco "2", the Cootie monoplane manufactured by the Weaver Aircraft Co., Lorain, Ohio. This is probably the only place the full specifications for this one-of-a-kind aircraft were listed. The price was listed in another publication at \$1200. (via William Lewis)

## The AIRCRAFT TRADE REVIEW

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### Aeropla

Memphis, Tenn.—The Aeroplane Dealers' Association of America was granted a charter of incorporation recently. The purpose of the organization, as stated in the charter, is to promote aerial sports. The incorporators are: Andrew J. Donelson, G. G. Garrison, John L. Day, J. S. Marriott and John D. Martin. The organization has no capital stock.

### Ship Paint from Factory by Aeroplane

Testing the practicability of the aeroplane to solve transportation problems, the Cook Paint and Varnish Company, Kansas City, recently made a rush shipment of paint and varnish by aeroplane from their factory at North Kansas City, to their branch store in Omaha, Nebraska. The trip was occasioned by the strike of the switchmen, which greatly hampered shipments of paint, varnishes and oils, and was made in the nature of an experiment.

The flight was made in less than two hours, leaving Kansas City, at 11:30 A. M., arriving at Omaha, Neb., 1:29 P. M., covering over 200 miles, at more than 100 miles an hour.

The machine, a Curtiss JN with a 90-horsepower OX-5 motor, was painted with Cook's products in gold and aluminum. Sam, Hickard an ex-army aviator, was the pilot.

### Providence Has Aerial Photographic Company

The National Aerial Photographic Survey Company has been organized in Providence, Rhode Island, and is planning to engage in the business of aerial photography, aerial mapping and surveying, advertising and transportation.

The officers of the corporation are as

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### Municipal Vehicle

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The matter is in the hands of the Supplies Committee and they are expected to decide on a type of plane soon.

### Weaver Aircraft Company's Parasol Monoplane

The Weaver Aircraft Company of Lorain, Ohio, is marketing a single-seater Parasol Monoplane which has all the qualifications of the much discussed "Ford of the Air."

The designers are Elwood J. Junkin and Clayton J. Brukner who have for several years been developing low-powered aeroplanes of both land and water types.

This Sport Plane has been designed to have a quick get-away, fast climb, and at the same time, light weight, the ability to glide at a flat angle and low landing speed. The parasol wing gives the pilot an unexcelled range of vision, a feature especially desirable in a sport plane.



The "Cootie" Monoplane manufactured by the Weaver Aircraft Co., of Lorain, Ohio. It is powered with a 2 cylinder 30 H.P. motor

Careful attention has been given to all details as dictated by the latest research and accepted good practice. The entire machine is simple in construction, which reduces the cost to the manufacturer and brings the selling price within the reach of the average sportsman. As to rigging, the machine has been designed so as to require practically no attention after leaving the factory. This has been done by replacing the usual wire bracing with quick detachable steel tubes, which add materially to the strength of the panel assembly.

The panels embody several features which simplify production and make for extreme strength and light weight. The wing curve is the U. S. A. 4. The fuselage is of ply-wood construction throughout, eliminating all wires and fittings, as well as the customary fuselage cover. The stick control is used and lateral control is obtained by warping the wings. The elevators are actuated by means of a steel tube from the control stick to a lever inside the fuselage projecting downward from the center of the member forming the elevator leading edge.

The landing chassis consists of two five-ply laminated stream-lined struts. Rubber shock absorbers bind the axle to the struts.

The empennage group is composed of a non-lifting fixed stabilizer to which are fastened the elevator flaps. The attachment of the stabilizer is such that it is easily detached. The rudder is balanced and is of sufficient area to insure complete control in handling the machine on the ground.

The power plant is a 30 H. P. two-cylinder Marble engine, the weight of which is only 128 pounds complete with a 6 foot diameter, 4.75 foot pitch propeller, which it turns at 1450 R. P. M.

The following specifications reveal the details of the little plane:

Overall span, 22 feet  
Overall length, 16 feet  
Cord, 4 feet  
Total wing area, 85 sq. feet.  
Weight empty, 280 pounds.  
Useful load, 200 pounds.  
Speed range, 35 M. P. H. to 65 M. P. H.  
Climb in ten minutes, 4,000 feet.



1920—Waco "2", the Cootie. Weaver Aircraft Co., Lorain, Ohio. The first effort of the fledgling company and the first and only single-seat parasol monoplane. It crashed with "Buck" Weaver at the controls. (Ray Brandy)

*Wings*, May 1, 1920, p. 4, official organ of the Cleveland Aviation Club. This was perhaps the first ad with the name W-A-C-O. Its low price and small size is suggestive of an early attempt in the "light plane" market. (Schreiner)

Announcing—



THE "W-A-C-O-COOTIE"  
PARASOL MONOPLANE  
\$1200

FAST      EFFICIENT      LIGHT

Prompt Deliveries—Write  
THE WEAVER AIRCRAFT COMPANY, Inc.  
LORAIN, OHIO

\*Club Member

covered surfaces clear doped and varnished. In retrospect, the high payload model was undoubtedly a significant step in their progress to success, though little more of its acceptance is recorded. The Model "4" was barnstormed from the local field at Lorain prior to its being sold to Harold Irish, a local farmer who had learned to fly with Weaver. Ray B. Vaughn, still living at Walbridge, Ohio, was associated with Weaver and Meyers at Woodruff Field, recalls how he barnstormed with Harold Irish one summer after he purchased the Waco Model "4". Vaughn is currently constructing a replica of this one-of-a-kind Waco.

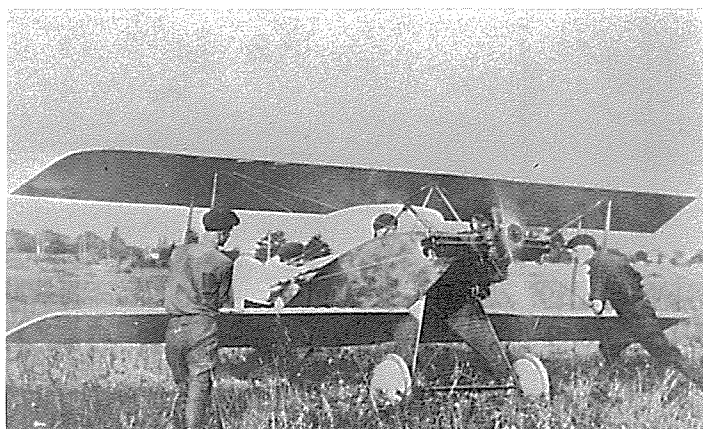
The performance of the Model "4" left its imprint on subsequent Wacos, for the name became famous for short field capability with selective airfoil designs such as the Aeromarine 2A, the M-6 used on the *Taperwing* and later the M-18 chosen for the Waco "F". However, with the introduction of the QCF and QDC Cabin series in 1931, the Clark "Y" airfoil was utilized and with minor exceptions, it became the standard design airfoil.

To illustrate the "fever" with which flying had affected Clayton, while on one of the Model "4" initial flights, he daringly performed as the "wingwalker" over Avon Amusement Park to attract customers to the airfield. Such uncharacteristic disregard for personal safety did not evidence itself in his future episodes of flight. Perhaps this single recorded incident of daredevil stunting was prophetic, for the future Waco *Taperwing* was to become world famous at the skilled touch of pilots like Freddie Lund, Art Davis and "Hap" Hazard as the peer of aerobatic machines of its era.

Early in 1920, the partners were left to their own resources when "Charlie" Meyers left to go south on another barnstorming expedition while "Buck" Weaver went to Chicago to become Charles Dickinson's personal pilot, eventually becoming associated with the talented "Matty" Laird as a mechanic and test pilot. Shortly thereafter, the partners' destiny was favorably influenced by yet another development when they met A.I. Root, founder of the nationally known Root Bee Supply Company of Medina. His son-in-law, Howard Calvert, persuaded them to move to Medina since there was an empty factory building available. Now the fall of 1921, the pair was undaunted to learn the promised building had already been rented and ensconced their meager manufacturing resources in a cement block structure, formerly a foundry. However, in taking stock of their progress at this juncture, it is noteworthy that their grand total included three employees and the production of three Model "5" Wacos.

Of even greater consequence, all three of the OX-5 powered craft were exhibited at the first Detroit Aviation Exposition held in April of 1922 at the Detroit Convention Hall. Attesting to their enterprising expertise, prior to the sale of the three Model "5"s, each had been barnstormed from a local farm field to generate funds to assist in making the payroll for the three employees. It is duly recorded and possibly as a gesture of his faith in their product that Howard Calvert purchased one of the three models.

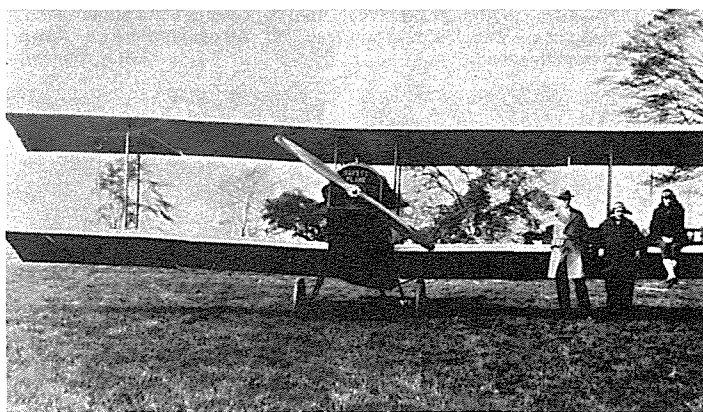
As the year 1923 dawned for the young entrepreneurs, it is unlikely that they could envision that it would mark the founding of perhaps the most successful civil aircraft manufacturer of the pre-WW II era with worldwide acceptance. Clayton had known the owners of the Pioneer Pole & Shaft Company in Troy, and when it was learned that their building would soon be available, he visited Troy to inspect the premises. During the visit, he was introduced to 21-year-old Alden Sampson II, a runaway youth from New York City then living in Tipp City, a small town south-



1920—Waco "3" Weaver Aircraft Co., Lorain, Ohio. 28-hp Lawrence, first and last single-seat biplane. Built from remains of Cootie. Brukner on right wing. "Buck" Weaver at the controls. (James C. Kessler)



1920—Waco "4". Weaver Aircraft Co., Lorain, Ohio. Color: Fuselage natural finish mahogany plywood. Fabric clear doped. No. sold: 1. OX-5 90-hp, four-place (3 in front cockpit). Utilized modified "Jenny" surplus parts. First passenger-carrying biplane. (James C. Kessler)



1921—Waco "5" Weaver Aircraft Co., Medina, Ohio. (Only model made at Medina.) OX-5 90-hp. Howard Calvert, shown wearing goggles with his wife, was son-in-law of A.I. Root, founder of the nationally known Root Bee Supply Co. Calvert purchased this one of three Model "5"s built in which he and his wife fatally crashed at Stow Field, Kent, Ohio (now Kent State Airport). Ironically, lettering on radiator reads "Safety Plane." (Ray Brandy)

east of Troy. Alden's father had died prior to his exodus, his mother had since remarried, and he was in the envious position of receiving an income from his father's \$6 million trust fund.

The prospect of an airplane manufacturing company coming to Troy sounded exciting to the young scion, so he suggested that Clayton go to New York to see his mother, now Mrs. Wilson, and the trust fund attorneys. Alden's mother and the trust administrators, though dubious of the possibility of success for such a "wild" scheme for 1923, nevertheless agreed to buy \$20,000



1925—Advance Aircraft Co., Troy, Ohio. Plant 2 final assembly and administration offices. Plant 1 consisted of fuselage welding and metal parts. Plant 3 housed wing construction and woodworking. Park Board field on Staunton Road (Judd Boak's hay field) across the Miami River from downtown Troy became known as Plant 4.  
(Ray Brandly)

1924—Waco "7". C/n 12. Color: All silver. Number sold: 16. OX-5 90-hp. Advance Aircraft Co., Troy, Ohio. Airfoil: Aeromarine 2A. Stabilizer: metal with reverse camber. Wingspan 30 ft. Top speed: 88 mph. Ldg. speed: 32 mph. Rate of climb (with full load): 465 ft./min. Site is likely Deb Snyder's farm where all test flight landings were made. The Waco "6" and Waco "7" had the same specifications and were very similar in appearance.  
(Ray Brandly)



April 23, 1926—Advance Aircraft Co., Troy, Ohio. Park Board Field along Staunton Road. Lineup of six Waco "9" and one Waco "7". All planes were test flown and delivered from this field.  
(Ray Brandly)



worth of stock in the incipient venture. The “seed money” was to be made available in three installments and the support of the effort was intended to expose young Sampson to the vagaries of the business world.

At this time, Clayton and Sam concluded that since this was now an entirely new enterprise with fresh capital and more ambitious goals it deserved to have a new name. In this manner did the newly formed firm become the Advance Aircraft Company of Troy, Ohio, being incorporated in the state of Massachusetts since young Sampson was from Pittsfield, Mass. The name was selected by Brukner from the Advance Thresher Company in Nebraska with which his father had been associated. The progressive sound of the name in 1923 appealed to the young partners. Clayton returned to Medina where he and Sam and two helpers prepared to move their assemblage of tooling, a carload of parts and the Waco name to Troy. Thus did the Weaver Aircraft Company cease to exist.

Since young millionaire Sampson soon lost interest in his mundane task of making fittings which were hacksawed from steel-plate and then hand-filed, the New York attorneys refused Brukner when he asked for the balance of the \$20,000. After a hasty conference, the partners determined that now was the time to sever the existing financial ties for the independence they so eagerly sought. So they bought back Sampson’s stock which had served as their temporary financing. Such a blow would have meant failure to almost any such enterprise of that day; however, funds had been realized from the sale of three Waco “6”s and five of the Waco “7”s for which Brukner wisely had demanded a \$2,000 advance deposit for each. Brukner’s financial resourcefulness had originated this practice early on and it was undoubtedly a major factor in Waco’s meteoric rise in the emerging aircraft industry, surpassing all competitors in their class by a wide margin.<sup>4</sup>

Presently the existence of the Waco name came to the attention of the prestigious industry magazine of the day, *Aviation*, which in its August 13, 1925’ issue referenced the first Waco Model “6” and the Waco “7” as follows: Wings: four equal-sized interchangeable panels and a center section. The wing curve was of a high lift section and allowed the employment of such light and strong beams that one bay was all that was required to adequately brace the panel assembly, ailerons were fitted to both upper and lower panels and were actuated by a very simple and direct control system. Empennage: construction followed conventional lines, the chief novelty being the use of a reversed camber stabilizer. Steel construction was used almost exclusively. Waco “6” specifications: wingspan, 30 ft.; overall length, 24 ft.; fuel cap., 22 gals.; empty weight, 1125 lbs.; useful load, 750 lbs.; max. speed, 88 mph; landing speed, 32 mph; rate of climb (with full load), 465 ft. per min.

With performance like that in 1923, it is no wonder that Waco airplanes sold so well.

Waco’s growth necessitated a takeoff field for testing larger than the last half block of Walker Street afforded, so Judd Boak offered the use of his hay field which is today, occupied by the impressive structures of the Hobart Arena and the Troy High School Stadium. Since this was city-owned property, the offer had to be approved by William Hartley and Warren Staffor, Troy Park Board officials. The Waco “7” three-seater continued to sell well; however, production requirements necessitated a long workday for the small work force. In contrast, all fair weather Sundays were



1924—Waco “8”. Color: All silver. Number sold: 1. Liberty “6” 250-hp. Advance Aircraft Co., Troy, Ohio. Cabin held six with two in cockpit. Top speed: 95 mph. Ldg. speed: 37 mph. Brukner flew this plane with six passengers to 1924 Dayton Air Races. Young Paul Westfahl is on the wing walk. (Ray Brantly)



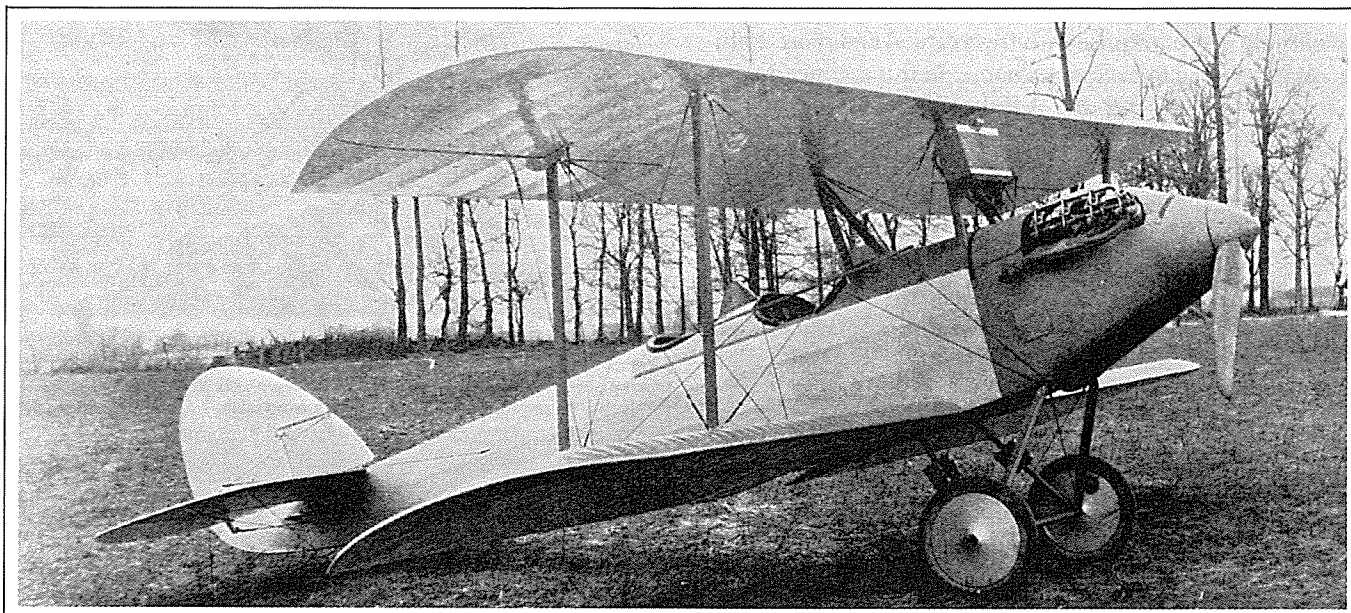
spent flying from a farm field along the main highway. The two paying passengers on each flight helped to meet the payroll and other expenses. That second paying passenger greatly enhanced the salability of the Model “7” in comparison with the war surplus *Jenny* with its lone passenger.

In 1923 it was decided to continue the production of the Model “7” for another year since demand for the utilitarian craft exceeded production. In the fall of 1923, Waco departed from their normal trend when Junkin created an experimental design engineered by Brukner to carry eight, six of whom would ride in the comparative “luxury” of an enclosed cabin with two in the rear cockpit. It was to be known as the Model “8”, only one being built and powered by the surplus available 250-hp Liberty 6. When the unusual design was test flown in the late summer of 1924, it revealed an outstanding performance. Another visionary accomplishment and a forerunner of the first production cabin Waco which was to appear in 1931. Performance included a top speed of 95 mph, landing speed of 37 mph, rate of climb (first minute 475 ft.), with a landing run of 365 ft.

The durable barnstormer and veteran aviation pioneer “Buck” Weaver, whose name will forever be synonymous with Waco, had test flown those first Model “5”s and who had survived numerous emergencies in the air, was felled in July of 1924 from blood poisoning in an infected heel. The airman had been flying with Charles Dickinson and resided in La Grange, Illinois, with his wife Hattie and son George, Jr. Hattie assumes a role later in our narrative and survives at this writing.

In recalling the Dayton Air Races of October 1924 where the Model “7” and the Model “8” were proudly exhibited, Clayton commented, “We chose to demonstrate our product for the pur-

# THE NEW STEEL WACO



STILL BETTER — STILL AHEAD IN PERFORMANCE — STILL \$2500.

✦ SHALL WE SEND YOU THE BOOKLET ? ✦

**THE ADVANCE AIRCRAFT CO.**  
TROY — OHIO

May 18, 1925 issue of *Aviation* magazine heralds the advent of the "all-steel" fuselage. Waco "9" introduced steel tube fuselage construction to the private owner field, the forward section using rigid steel tube triangulation while the bracing to the rear of the pilot cockpit was wire braced. Model "10" used rigid steel tube bracing all the way back.

pose of expanding our sales prospects for 1925 and to sign up distributors, rather than entering the racing competition." *Aviation* November 1925 issue<sup>6</sup> listing of exhibitors was illustrated with photos and captions as follows: "Brukner and six passengers in a Waco closed cabin with Liberty 6 engine" and "Sam Junkin with two passengers in a Model '7' with a Curtiss OX-5 engine."

Eventually the unique Model "8" was sold by Waco distributor Tex Lagrone to a woman in Kansas City after it had served a photographic aerial mapping service in the Ozark Mountains area. Clayton related, "Its demise came at the hands of a student pilot who was at the controls when a wingtip caught the branch of a tree." While Advance Aircraft could have booked more orders for the Model "8", it was sound management that concentrated production on the Model "7" (16 sold) for which the demand had not been able to be met.

Civil aviation was on the threshold of a great awakening as 1925 dawned. Design engineer Lloyd Stearman and the pragmatic Walter Beech had joined the E.M. Laird Co. in Wichita in 1921, then Laird left in 1923 with the company reorganized as the Swallow Airplane Manufacturing Co. In 1924 Beech and Stearman left oilman Mollendick at Swallow and along with Clyde Cessna founded Travel Air in Wichita so they could convert to the manufacture of the "all-metal" welded steel tube fuselage.<sup>7</sup>

It would appear that during the winter of 1924-25 the total resources of both Advance Aircraft in Troy and Travel Air in Wichita were committed each to produce a new model featuring the metal tubing fuselage construction. For in early 1925<sup>8</sup> both the Waco "9" and the Travel Air "1000" made their debut with each claiming to be "first" with the new steel fuselage feature.<sup>8a</sup> *Aviation* in its May 18, 1925 issue<sup>9</sup> proclaimed in a full-page Waco ad, "The New Steel Waco, still better, still ahead in performance, still \$2500."

However, there was little similarity in their respective scale of operations and sales forecast. The Waco "9" projection of 30 sales would necessitate an expansion in factory space and employees. Walter Beech contrastingly had the one Model "1000"

**WACO**  
THE PLANE YOU SHOULD OWN  
*America's Leading Commercial Airplane*

Highest Speed  
Highest Cruising Speed  
Lowest Landing Speed  
Best Speed Range  
Quickest Take Off  
Highest Angle of Climb  
Lowest in Price

Steel Fuselage  
Steel Empennage  
Oleo Type Landing Gear  
Thirty-seven Gallon Fuel Tank  
Free Air Radiator

*The Ship of Real Performance*  
SHALL WE SEND THE BOOKLET?  
**THE ADVANCE AIRCRAFT COMPANY**  
TROY, OHIO

March 30, 1925 issue of *Aviation* magazine extolling the merits of the Waco "9".

which he demonstrated constantly and sold 19 Travel Airs at \$3500 fly-a-way Wichita during 1925. At a fly-a-way price of \$2500 there were 49 Waco "9" models sold.<sup>10</sup>

To achieve Elwood Junkin's high standards of performance, engineering requirements now specified that parts be manufactured by Advance Aircraft with surplus modified parts no longer acceptable. Despite the profitability of Waco, working capital was hard to come by in 1925 so that it was again necessary to resort to Brukner's successful practice of collecting substantial deposits on orders from both individuals and distributors, a practice which apparently had no detrimental effect on sales, for units sold exceeded forecast by 19 for an increase of 63%.

Soon the Waco "9" was known universally for its rugged endurance and outstanding flight performance since it could operate out of smaller and more restricted fields than any of its competitors.<sup>11</sup> With the resultant expansion, Advance Aircraft reached another milestone in 1925 with its impressive total of 30 full-time employees. The burgeoning growth had spawned three plant locations: Plant No. 1 consisted of the fuselage welding and fabrication of other metal parts; Plant No. 2 housed the final assembly and administration areas; Plant No. 3 accommodated woodworking and wing construction. The Pearson Planing Mill was planing and shaping the spars which were then jig-drilled in Plant No. 3.

To add further disbelief to the incongruous composite of production, Wacos were being towed through downtown Troy across the Market Street bridge to the Park Board field on Staunton Road. This field, also known as Judd Boak's hay field, was located directly across the Miami River from downtown Troy. The unique and historic field, lying between Adams and Market Streets, was bordered on the north by Staunton Road and on the south by the Miami River. Wings and propellers were installed at this location and the planes were test flown and delivered from this field. It became known as Plant No. 4 of the Advance Aircraft Company.

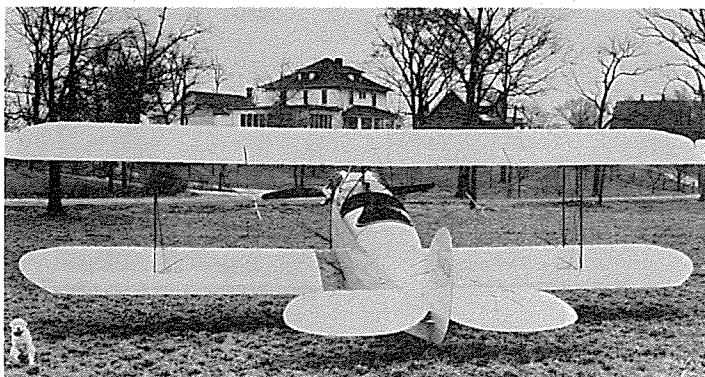
Amid this swell of product acceptance and prosperous growth, Elwood Junkin found time to marry "Buck" Weaver's widow, Hattie, with whom he had been corresponding. He returned late in 1925 with his bride from Winston-Salem, N.C., where she had been living with her brother, another future famous airman, Charlie Meyers. They resided at 508 Mulberry Street in Troy.

One of the first of many kudos garnered for Waco by the Model "9" was when Lloyd O. Yost, Waco dealer from Pinehurst, N.C., finished the first annual Commercial Airplane Reliability Tour for the Ford Touring Trophy with a perfect score during the event held from September 28–October 4, 1925. Waco popularity continued to grow faster than had been anticipated and as a result *Aviation* in its January 25 issue carried the following message to all prospective purchasers: "The present demand for Wacos is in excess of our production facilities. Future deliveries are being allotted to our distributors in strict numerical order. We suggest that you contact the Waco distributor in your territory if you wish to fly your Waco this spring."

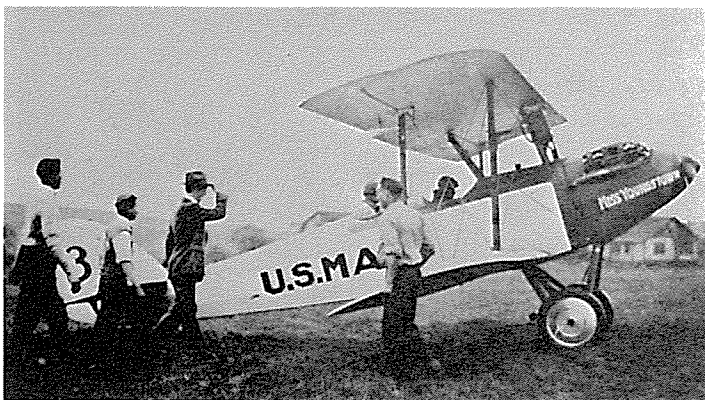
In arriving at the sales forecast for 1926, unfilled distributor demand for the Model "9" indicated that production could be expanded by over 200% which had become an annual practice and 164 aircraft were actually sold, mostly through distributors at a retail price of \$2500. By now Troy was virtually dominated by aircraft production, with manufacturing facilities located in seven different buildings. In the June 14, 1926, issue of *Aviation*



1926—Waco "9" at McCook AFB, Dayton. C/n 30. Color: All silver with maroon cowling. XP 447, Advance Aircraft Co., Troy, Ohio. One of two models purchased from Embry-Riddle by Army Air Corps (A.C. 26-206) for first stress tests to qualify for ATC#11. (Ray Brandy)



April 23, 1926—Waco "9", Advance Aircraft Co., Park Board Field, Troy, Ohio (OX-5 90-hp) showing aerodynamically clean design and compactness of 29' 6" wingspan. Combination of the Aeromarine 2A high-lift airfoil and compact size enabled it to operate out of smaller fields than most competitive designs. (Ray Brandy)



April 21, 1927—Bettis Field, Pittsburgh, Pa. Waco "9", Miss Youngstown, one of four Waco "9"s used by Cliff Ball's airline, arrives with the first airmail from Cleveland. Pilot is Merle A. Moltrap. Flying time was one hour 45 min. with 25 min. stop at Youngstown. (Ray Brandy)

Waco announced a price reduction to \$2250 for the Model "9" that had by now outsold its nearest competitor by over 250%<sup>12</sup>

Waco "9" 164 sales

Travel Air 46 sales

Price \$2250

Price \$3100

In 1973, in recognition of the 50th anniversary of the founding of Waco and for the significant role the Waco "9" played in the growth of civil aviation, the Arts & Industries Building of the Smithsonian displayed an impeccably restored specimen. This Model N452, which Brukner purchased from Marion McClure, is now on display in the Exhibition Flight (Gallery 106) of the National Air & Space Museum.



After the progression evolved from its two predecessor companies, Weaver Aircraft Co., Lorain, Ohio, and the Advance Aircraft Co., Troy, Ohio, in 1929 the identification plate bearing the name Waco Aircraft Co., Troy, Ohio, was to subsequently appear on several thousand models constituting the greatest production of commercial aircraft of its era, and to be known worldwide.

The second annual Commercial Airplane Reliability Tour for the Ford Touring Trophy was held from August 7-21, 1926. Since a Waco "9" had completed the tour with a perfect score in the previous year, it was decided to enter three Model "9"s. Two were powered by the Curtiss K-6 160-hp, and the third with the 180-hp Hisso "E". Johnny Livingston with Ross Smith as his passenger finished fourth, while John P. Riddle with Mrs. Susan Embry as passenger finished fifth, and in sixth place was Eddie Knapp with Lionel Kitchen in the front cockpit. All three Waco "9" models averaged in excess of 107 mph for the tour. A noteworthy contender, Travel Air won first place that year which

undoubtedly contributed to its jump in sales to 46 from 19 in 1925.

In the fall of 1926, Clayton Brukner's father, John, came to Troy for a visit, residing with Elwood and Hattie. Completely unexpected, John became ill and died on October 22. Regrettably, Elwood Junkin, Waco's inimitable co-founder, expired on November 1, 1926, from a heart condition attributed to rheumatic fever. His loss left a serious void in the responsibility of Chief Designer and would have seriously impaired operations had not Clayton's older brother Clemens' candidate been able to fill this critical organizational need.

Clemens, who had served in the U.S. Army Signal Corps in WWI in France with the distinction of being the telegrapher who had sent the news of the Armistice to the United States, became associated with the Postal Telegraph Co. in Cleveland. Here, Clemens knew Edward E. Green, designer and stress analysis engineer for Warner-Swayze Co. With Clemens' recommendation Clayton hired Green to assume Elwood Junkin's responsibility of Chief Designer.

Contrary to popular belief, the design for the soon-to-be-famous Waco "10", an improved version of the Waco "9" which Junkin had begun for a 1927 introduction was completed by Ed Green and not the well-known test pilot, "Charlie" Meyers, who heretofore has generally been given this credit.<sup>13</sup> Meyers was specifically hired as Chief Test Pilot and undoubtedly made significant contributions to the success of the Waco "10" and ultimately to the aerobatically famous Waco *Taperwing*.

With the passage of the Air Commerce Act of 1926 fathered by the Hon. W. P. McCracken, the "type certificate" became a regulatory measure and civil aircraft certification hence became compulsory. Rumors abounded that none but the military manufacturers with their impressive engineering and design staffs would successfully meet the requirements of the newly created Civil Aeronautics Branch of the U.S. Department of Commerce. No wonder then that Waco owners, distributors and commercial operators collectively pleaded for documentation.

Fortunately, the U.S. Army Air Corps had acquired two of the Model "9"s, which Clayton insisted they purchase from the nearest distributor, Embry-Riddle, one to be flight tested and the other to be scientifically static tested to destruction, the practical laboratory means of proving the limits of components under the strains generated during various conditions of flight. Testing done at the Air Corps Engineering Labs at McCook Field, Dayton, more than proved the efficacy of Waco "9" claims.

In the all-important High Incidence Condition—which indicates a plane's ability to withstand abusive stunting—a safety factor of 9 was sustained (6.5 required). The first formal "ATC"

in the industry was granted the Buhl-Verville *J-4 Airster* in March 1927 with the Waco "9" receiving ATC #11 in July 1927. Such gratifying stimulus of proof of merit further swelled Waco "9" sales late into 1927.

Further testimony to the rugged dependability of the Waco "9" design is evidenced by its acceptance by early airline operators. In April 1927 Clifford Ball's airline, later to become Pennsylvania Central and ultimately Capitol Airlines, utilized four Model "9"s: MISS MCKEESPORT, MISS PITTSBURGH, MISS YOUNGSTOWN and MISS WATERLOO on the Pittsburgh-Cleveland route. Embry-Riddle also used the "9" on their Louisville-Cleveland route.

As 1926 receded into the past, it became apparent that the element of competition would influence design changes in addition to the heretofore major factor of economics. In addition to newly formed Travel Air and the overwhelming acceptance of their Model 2000, such additional formidable adversaries not to be discounted were Buhl-Verville, Alexander Eaglerock, American Eagle, Kreider-Reisner, E.M. Laird Co., Swallow Airplane Co., and Stearman. For further challenging contemplation the advent of the more powerful air-cooled radial powerplant such as the Wright J-4 and J-5 types decreed that the days of the OX-5 were numbered. Henceforth, designers would need to incorporate engineering provisions for this powerplant alternative destined to become generic to the industry.

Despite the universal acceptance of the Waco "9" there was need for a more roomy and more accessible passenger cockpit, more protective windshielding, and a more shock-absorbing and greater tread-landing gear without the characteristic rebounding of the prevalent shock cord type including a less drag-inducing and easily removable engine cowling. Yet another characteristic to be given additional consideration was made more so by the sleek lines and clean design of the Travel Air—eye-pleasing appearance.<sup>14</sup>

In fulfilling the latter requirement the Model "10" was more than adequate, for its "double elliptical" designed empennage was introduced which graceful outlines were to identify the

attractive Waco configurations for decades and induced many a prospective airman to put his down payment on the line with a Waco distributor.<sup>15</sup>

A split-axle type, long-leg, "oleo-spring hydraulic type" wide tread landing gear, a "first" for civil aircraft further identified the "10" and Waco landing gear subsequently was to be among the most "cushioned" for comfort and safety as well as the most appealing in appearance of the fixed type in the industry.

To add further to the immediate acceptance of the "10", Chief Test Pilot Meyers flew the OX-5 powered WINGS OF PROGRESS from Long Island, New York, to Spokane, Washington, finishing 28 minutes ahead of his nearest competitor. This was the Class B division of the 1927 Transcontinental Air Race.

By late 1927, Waco production had reached two planes per working day with over 350 OX-5 types sold that year at a low-end price of \$2385, a prodigious feat for that era. Powerplant versatility was in evidence with the adaptation of the "Hisso" 150 and 180 on the DSO (ATC#42) and the Wright J-5 sold on 80 ASO (straight wings) and later on 63 ATO (*Taperwings*).

Throughout Waco's existence, Brukner's ability to develop adequate *private* financing and to manage prudently differentiates him from his contemporaries. During the depression years from 1929 on, when many aircraft companies were "awash in red ink" or were forced to close down due to insufficient sales or lack of capital, Waco prospered. In fact, the firm remained in the "black" throughout these years and in 1928 had earnings of \$229,000. In 1929, dividends of \$145,000 were paid on its privately held stock.<sup>16</sup>

*In June 1929, an official notice was filed that henceforth, in keeping with the practice of further development of the Waco name, that the company name would become Waco Aircraft*

1927—Waco "10", Advance Aircraft Co., Troy, Ohio. C/n 1733, NC9553, OX-5 90-hp. Number sold: 1052. Color: Insignia blue, cream wings and tail. All-steel welded fuselage, no wire bracing. After the introduction of the Model "10", Waco model designations were changed to a three-letter designation, with the first letter denoting engine type, second letter wing type and third letter type or series. Thus, Model "10" with OX-5 became GXE, with Hisso became DSO, with Wright became ATO.  
(Ray Brandy)





March 30, 1927—Waco "10" No. 3287, Park Board Field, Troy, Ohio (OX-5 90-hp). Shown with the first set of tapered wings installed on a stock Model "10" for test purposes. Outstanding results led to design of aerobatically famous Taperwing.  
(Ray Brandy)



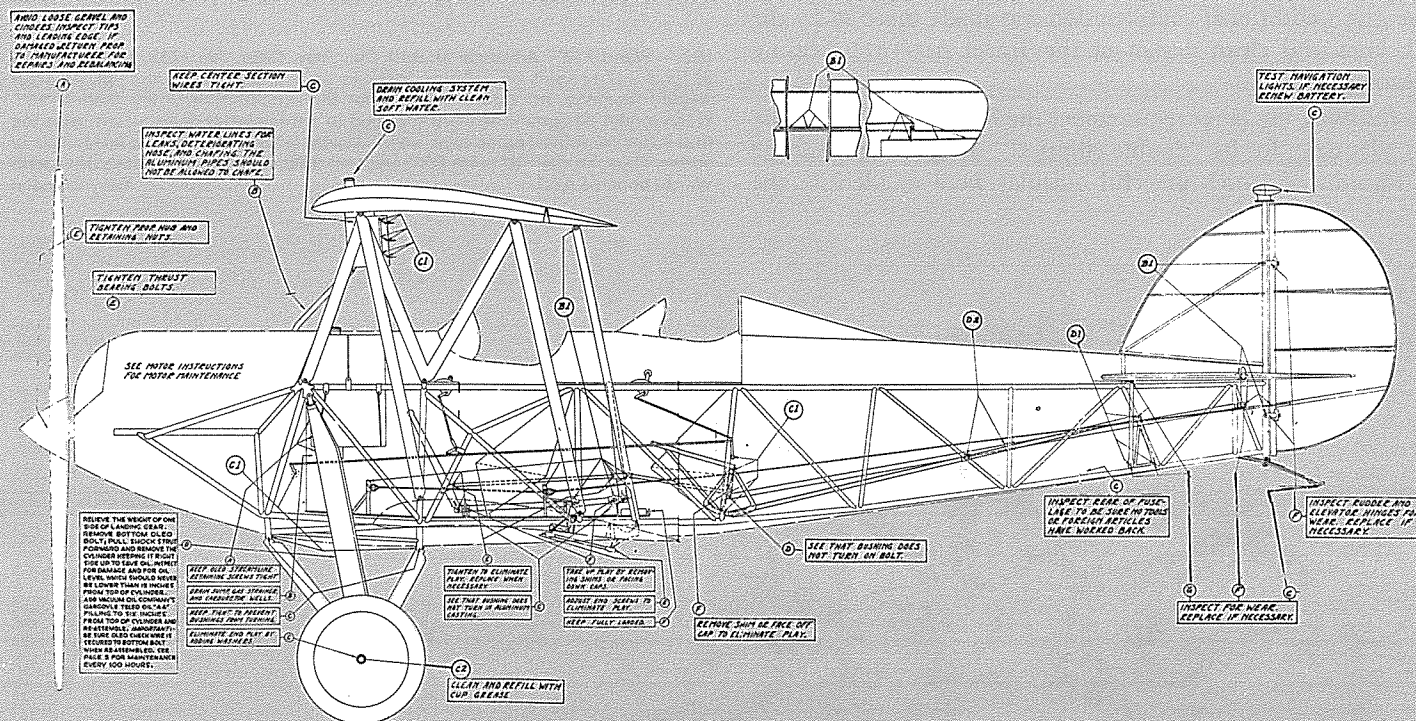
Waco "10" Park Board Field, Troy, Ohio.

(Gerry Balzer)



June 1928—Waco "10", Park Board Field, Troy, Ohio. Clayton Brukner, President of Advance Aircraft Co., shown on the right, congratulating John H. Livingston, President of Mid-West Airways, as he takes delivery of the 79th Waco from Park Board Field. Livingston had been used as a Waco test pilot as early as 1925.  
(Ray Brandy)

# WACO "10"



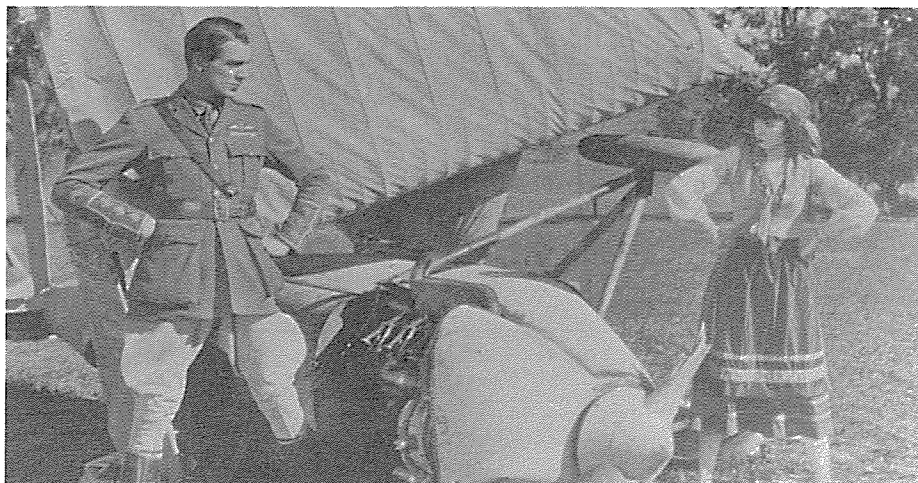
|                       |                                         |
|-----------------------|-----------------------------------------|
| 1. MOBIL OIL AERO "H" | A - ATTENTION DAILY BEFORE FIRST FLIGHT |
| SUMMER                | B - " " EVERY 10 HOURS                  |
| MOBIL OIL AERO "V"    | C - " " 25                              |
| WINTER                | D - " " 50                              |
| OIL CAN               | E - " " 100                             |
|                       | F - " " 200                             |
| 2. MOBIL LUBRICANT    | G - " " 400                             |



Dick Grace, famous movie stunt pilot with RFC roundel on Waco "10" used in *Lilac Time*. (H.L. Schreiner)

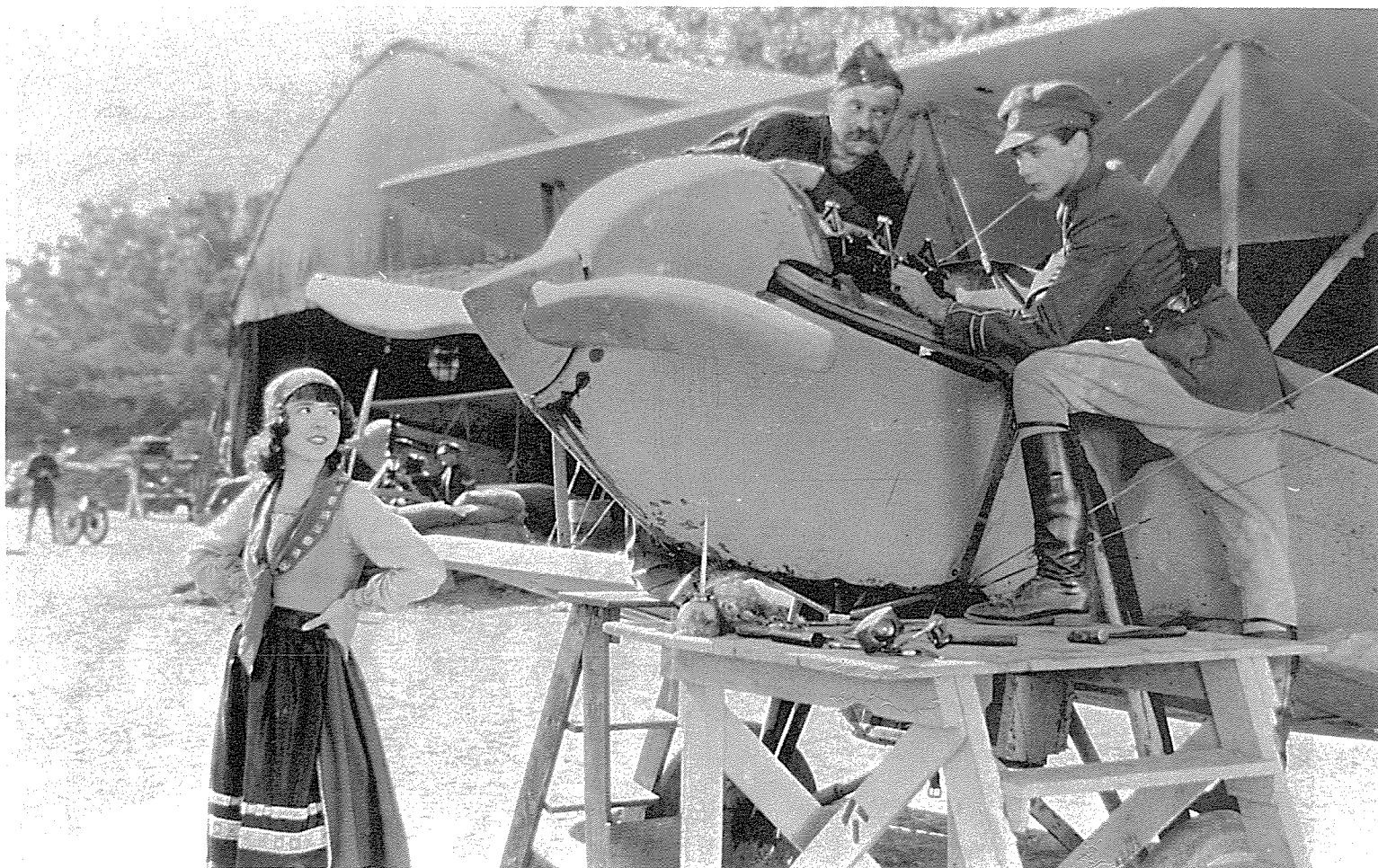


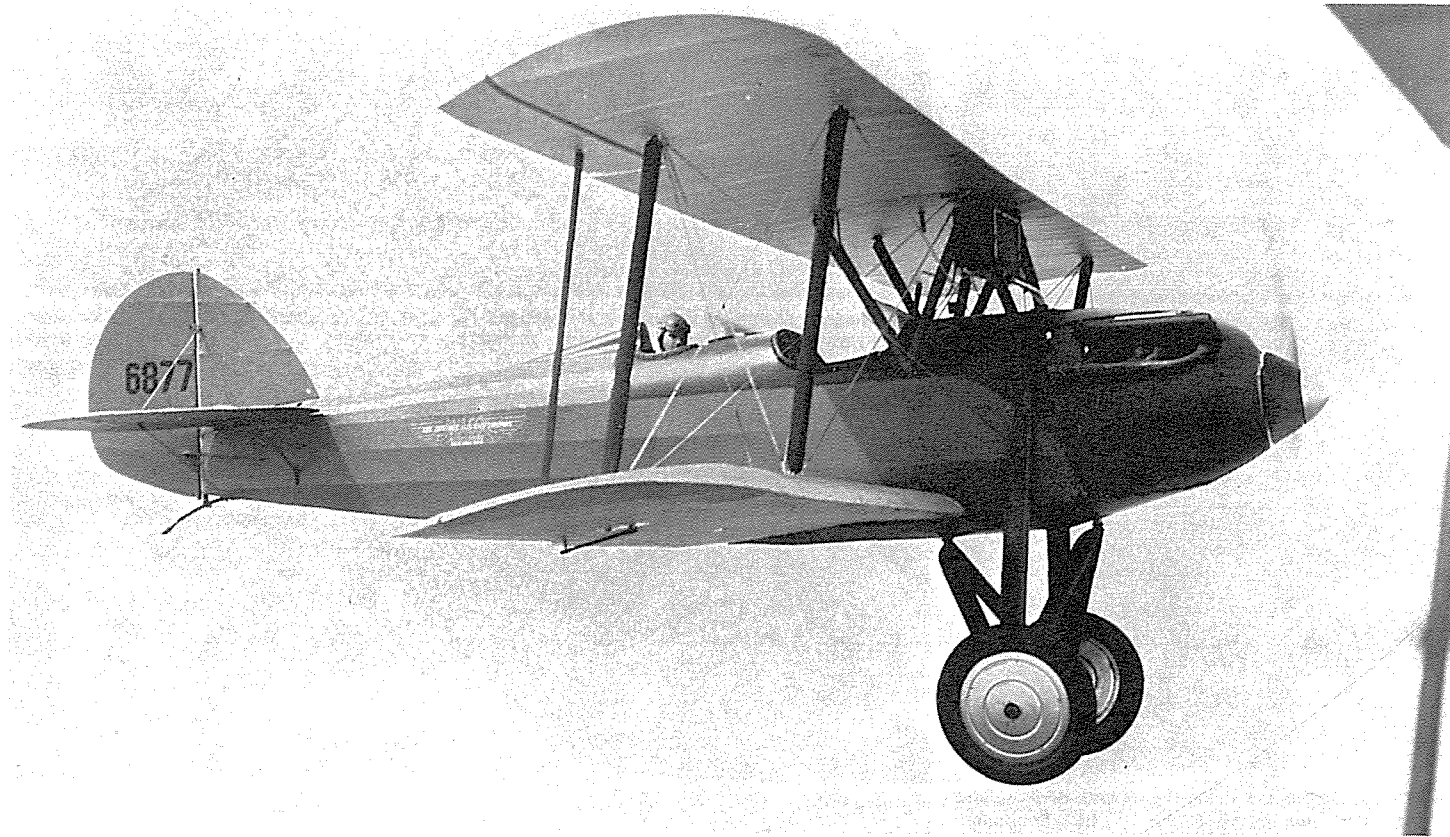
*Lilac Time* flight line of Waco "10's" stand-ins for SE-5 RFC squadron. At the rate Dick Grace, crashed Waco "10's" he must have had a special price from Waco. (H. Hugh Wynne)



1928—Waco goes to Hollywood in *Lilac Time*, First National Pictures. Colleen Moore, famous leading lady and far right, Gary Cooper. Waco "10" was simulating SE-5 mount of WWI RFC squadron. Note relocation of radiator from under top wing to beneath fuselage. (H. Hugh Wynne)

*Lilac Time* crash scene with Gary Cooper and Colleen Moore view remains of Waco "10" as decimated by R. Stoffer, one of Dick Grace's stunt pilots. (H.L. Schreiner)





1928—Waco DSO. C/n A-21, NC6877. Color: Vermilion and silver (150 "Hisso"), 8-27-28. Number sold: 40.  
(Gerry Balzer)

1928—Waco ATO *Taperwing*, 365-hp Wright. Embry-Riddle Airline, Cincinnati-Indianapolis-Chicago. Embry-Riddle was also a Waco distributor. This version of Waco "10" utilized Munk M-6 airfoil, carried two passengers, plus airmail in forward cockpit/compartment.  
(H.L. Schreiner)

January 4, 1928—Waco Distributors and officials of Advance Aircraft Co., Troy, Ohio. President Clayton J. Brukner is shown in front center (seated). T. Claude Ryan, founder of Ryan Aircraft, is fourth from right rear standing with Charlie Meyers second from right standing. John Livingston, famous Waco test and air race pilot, is at the far right seated.

Back row from left: A.N. Conrad, Dale Medley, L.N. Brutus, Clyde Shockley, Frank Clewers, R.S. Saltus, Stewart Chaddwick, M.E. Oliphant, T. Claude Ryan, Charles W. Meyers.

Center row from left: Franz Schwanke, Art Sheldon, Edward E. Green, V.C. Omlie, Dick Young, Edward G. Knapp, Kitty Barrows, John P. Wood.

Front row seated: C.F. Van Sicklen, E.M. Ronne, P.H. Spencer, Eugene Stevens, Clayton J. Brukner, President, L.M. Brown, Charles Prohinsie, H.C. Young, Tex LaGrone, and John Livingston.  
(Ray Brandly)





Waco ATO Taperwing with J-5. These five may have been for China. The pilot in the foreground is Freddie Lund. Number sold: 63.  
(Gerry Balzer)

1930—Waco Aircraft Co., Troy, Ohio., completed late 1928. Cost \$150,000, 120-acre boundaries; High Street, Peters Avenue and the N.Y. Central Railroad. It represented the finest facility in the industry devoted principally to commercial aircraft. Administration building foreground, service hangar far right.  
(Dr. Jerry Meyer)



**25,000 Shares**  
**The Waco Aircraft Company**  
(Incorporated under the laws of Ohio)  
(FORMERLY THE ADVANCE AIRCRAFT COMPANY)  
**Common Stock, No-Par-Value**

These 25,000 shares have been acquired from individual shareholders of the Company and do not constitute new financing by the Company.

**TRANSFER AGENTS**  
First National Bank of Chicago, Inc.  
 100 Wall Street, New York, New York City

**REGISTERARS**  
The Central Trust Co., Cincinnati, Ohio  
 The National City Bank of New York, New York City

**CAPITALIZATION**  
Authorized 200,000 shares 14,000 shares  
 Common Stock (no-par-value) 14,000 shares  
 The Company has no Preferred Stock outstanding nor Funded Debt

Mr. C. J. Brukner, President of the Company, summarizes his letter to the readers as follows:

**HISTORY AND BUSINESS**

Originally organized in 1922 under a Standard Certificate charter as The Advance Aircraft Company, the Company was reorganized in 1928 under the laws of the State of Ohio. In May, 1929, the name was changed to The Waco Aircraft Company.

The Company has made a specialty of 3-passenger airplanes adaptable to many phases of pleasure and commercial use and nationally known under the trade name "WACO". The business is the result of experience gained by E. J. Jeauks and myself who began the manufacture of airplanes in 1920 after seven years of study and experiment while in the employ of manufacturers of military planes. Several years were required to develop and establish the merit and high performance of the early "WACO" designs until in 1924 production reached 15 planes. Since that time production has increased to 615 in 1928 and the popularity of the "WACO" design has established the Company as a leading airplane manufacturer.

In order to economically meet the various uses and performance requirements and at the same time allow quantity production of many parts, the basic model has been so designed as to permit a range of from 90 to 225 H.P. engines with only minor changes in design. The 3-passenger model No. 10 can now be powered with any of 7 different airplane engines. Another 3-passenger model known throughout the world as the "SPORT WACO" is now being produced which, despite its low cost, has already become world famous for its high performance, speed and maneuverability.

**CONTENTS WON IN 1928**

SPORT WACO — 2 major National Transcontinental speed events from Roosevelt Field, Long Island, New York, to Los Angeles, California—classification and Free for All Victory.

STANDARD WACO No. 10—International Transcontinental Free for All, Windsor, Canada, to Los Angeles, California.

STANDARD WACO No. 10—National Reliability Tour.

**PLANT**

The plant, covering over 50,000 sq. ft. is located at Troy, Ohio, on the Company's airport of approximately 100 acres. It is served by a private siding of the "Big Four" Railroad. The buildings are right in the middle of the airport.

| Year               | Airplanes Sold | Net Earnings |
|--------------------|----------------|--------------|
| 1926               | 164            | \$ 31,733.87 |
| 1927               | 349            | 117,844.98   |
| 1928               | 659            | 384,323.45   |
| 1929 (1st quarter) | —              | 61,715.57    |

**Dividend \$1.00/year**  
**Price/share \$23.50—yield 4 1/2 %**

The plant, covering over 50,000 sq. ft. is located at Troy, Ohio, on the Company's airport of approximately 100 acres. It is served by a private siding of the "Big Four" Railroad. The buildings are right in the middle of the airport.

The Company has agreed to make application to list this stock on the Cincinnati Stock Exchange and the New York Stock Market.

**Price \$23.50 per Share**

**W. E. HUTTON & CO.**  
Established 1886  
 Members New York Stock Exchange  
 52 Wall Street, New York  
 57 West 57th Street, New York

CINCINNATI    TOLEDO    DAYTON    DETROIT    LEICESTER

June 14, 1929—New York Times. Could be the first offering of Waco Aircraft Company common stock totaling \$587,500. Of interest is that the information shown is from a letter from Clayton Brukner, President to the bankers involved. The earnings listed for the three years ended 1928 are outstanding for this period in the aviation industry. (via Alton Walker)

*Company. In such fashion did the Advance Aircraft Company cease to exist.*

Clayton Brukner's comment in recollection positioned U.S. civil aviation in proper perspective at this juncture, "Commercial aviation was capturing the public interest especially after an unassuming young man who, incidentally, had occasionally ferried new Waco airplanes from the Troy City Park to a distributor's home field, landed his Ryan monoplane at Paris, France."

## FOOTNOTES

1. Clayton Brukner's interviews with Ray Brandy were tape recorded during many confidential meetings from 1965-76, for Brukner shunned publicity. Through his dedicated efforts in perpetuating the National Waco Club which encourages authentic Waco restorations, Ray had been taken into the confidence of Brukner. In 1957 the founder had disposed of a largess of Waco parts to Brandy which became the catalyst for the development of the club. Ray has recently published a 63-page pictorial guidebook of Waco aircraft, *Waco Aircraft Production 1923-42*, copyright 1978 R.H. Brandy, as well as a 163-page history of Waco and its founders, *Waco Airplanes, Ask Any Pilot*, copyright 1979 R.H. Brandy. In 1975 Brukner had sponsored expenses from L.A. for the late Charles F. Willard, U.S. civil airman #4 when Brukner was inducted into the OX-5 Hall of Fame at Hammondsport, N.Y., where their reunion was tape recorded by Dave Fox, an associate pilot of Cole Palen of Old Rhinebeck. Brukner had idolized Willard when Charles was Chief Engineer of the "L" Motor Division and Advisory Engineer of the Airplane Division of the Aeromarine Plane & Motor Co. of Keyport, New Jersey, in 1918-19. Here Brukner had one of his first aircraft

company jobs polishing fittings for the Aeromarine 39. This association apparently had a profound effect on the way Waco aircraft were engineered and built with early models using the Aeromarine 2A airfoil.

2. Aircraft Yearbook, 1921.
3. Smith, Robert, *Staggerwing*, 1967, p. 2.
- 3a. *Aviation*, January 4, 1930, Dr. Max M. Munk, Ph.D., Director of Engineering, Alexander Industries, Colorado Springs, Colo., article on the development of M-6, M-12 airfoil wing sections.
4. Smith, Robert, *Staggerwing*, 1967, p. 3. In 1928 Walter Beech had to go to Hayden Stone, Wall Street underwriters, for an issue of Travel Air stock. In 1929 Travel Air was acquired by Curtiss Wright.
5. *loc. cit.*
6. *loc. cit.*
- 6a. Brukner interview tape recorded by Dave Fox 1975 M & R Cafe, Bath, N.Y.
7. Smith, Robert, *Staggerwing*, 1967, p. 3.
8. *Aviation*, March 30, 1925, p. 355. "On March 13 at Wichita, C.S. Seymour, president of the Wichita chapter of the NAA, congratulates L.J. Stearman on the Travel Air attaining 96 mph and reaching 1,000 feet in 1 min. 6 secs. with the pilot and one passenger." *Aviation*, April 13, 1925, p. 406, "Fuselage braced with tubing from pass. seat forward, #10 wire aft." *Aviation*, May 18, 1925, p. 542. "Waco '9' performance: 92.5 mph with 'toothpick' propeller, 99.2 mph with Hartzell propeller. Takeoff in 75 feet with pilot; takeoff in 186 feet with pilot and load of 800 lbs."
- 8a. Letter of March 18, 1960, from Brukner to Russ Brinkley, *Silver Wings Fraternity*, "The Waco '9' introduced steel tube fuselage construction to the private owner field, the forward section using rigid steel tube triangulation while the bracing to the rear pilot cockpit was wire braced . . . the Waco '10' used rigid steel tube bracing all the way back." Juptner, *U.S. Civil Aircraft*, Vol. I. "In August 1925 Alexander Eaglerock utilized a steel tubing fuselage not welded but using steel clamps. In December 1925 Buhl-Verville Airster CW-3 boasted an all-welded steel tube fuselage."
9. *Aviation*, May 18, 1925.
10. Juptner, *U.S. Civil Aircraft*, Vol. I, pp. 40-43, 46-48, 89-91.

| Waco "9" |        |         | Travel Air |       |
|----------|--------|---------|------------|-------|
|          | Price  | Sales   | Price      | Sales |
| 1925     | \$2500 | 47 (49) | \$3500     | 19    |
| 1926     | \$2250 | 164     | \$3100     | 46    |
| 1927     | \$2125 | 65      | \$2195     | —     |

(A total of 235 "9's were sold)

Janes, ATWA, 1927, p. 278b: "The Advance Aircraft Co. is the largest producer of commercial aircraft in the United States with a production greater than all other commercial aircraft manufacturers combined. Larger manufacturing space was acquired during 1926 and at the end of the year 356 Waco aircraft were in use, 200 of which were produced during the year [1926]. Their standard machine is the Waco '10' which sells for \$2385. The 1926 Waco '9' sells for \$2050."

11. Brandy, Raymond H., *Waco Airplanes*, p. 69: "4.4 secs. for unstick time." *Aviation*, May 18, 1925, p. 542: "Takeoff in 75 ft. with pilot."
12. Juptner, *U.S. Civil Aircraft*, Vol. I, pp. 40-43, 89-91. Janes, ATWA, 1927, p. 278b.
13. Shamburger and Christy, *Command the Horizon*, 1968, A.S. Barnes & Co., pp. 168, 187. "Charles W. Meyers was both designer and test pilot of three of America's best open cockpit two-wingers: the Waco 10, Taperwing and the Great Lakes Trainer." The authors interviewed Meyers in Florida in 1966.
14. The Travel Air "1000" and "2000" featured the OX-5 completely cowled in with the radiator mounted in a less drag-inducing position below the engine and thus eliminated the possibility of the pilot being in "hot water" plus greatly improved pilot visibility.
15. In 1930, Francis Arcier was to join Waco as Chief Designer to design the Waco "F" and create the appealing symmetry of the custom and standard cabin Wacos, acknowledged as the most beautiful biplanes of the era. Arcier's credentials were impressive: designer of the 1919 Handley-Page twin- and four-engine bomber and in 1924 with Fokker Atlantic Aviation and Chief Engineer/V.P. General Airplanes of Buffalo.
16. Brandy, Raymond H. *Waco Airplanes*, pp. 48, 65, 71. 105. "On June 1, 1928, a meeting was held for the purpose of incorporating the Advance Aircraft Company. Among the many minority stockholders were the owners of Auburn-Cord Auto Co. of Auburn, Ind., Capt. Eddie Rickenbacker and Talbot O. Freeman, V.P., Fairchild Aviation Corp. Brukner continued as president and maintained 53% of the stock. Sherman Fairchild offered to buy the company several times during 1929 and 1930. He was the son of the president of IBM."

"The Waco Aircraft Co. announced, in July of 1933, a net profit of \$34,310 for the first quarter ending March 31, 1933. This exceeded the net profit for the entire year of 1932."

One of the secrets of Brukner's success during the depression years was his foreign market diversification which grew in volume until 1934 when it consisted of 50% of his total sales. Some of the notable civil aircraft depression victims were Detroit Aircraft Corp., Great Lakes Aircraft Corp., Alexander Aircraft Corp., Buhl-Verville. Stearman was purchased by Boeing in 1929 and Cessna closed down to reenter the market later in the '30s. Travel Air had been acquired by Curtiss Wright, with Walter Beech becoming president of Curtiss-Wright Sales Corp. in New York City.

## ACKNOWLEDGMENTS

Raymond H. Brandy, Dayton, Ohio, National Waco Club; David Fox, Associate Pilot, Old Rhinebeck Airdrome, Rhinebeck, N.Y.; James C. Kessler, Troy, Ohio; William Lewis, Ingleswood, California; Dr. Jerry Meyer, Curator, Dayton Aviation Hall of Fame; Merrill Stickler, Curator, Glenn H. Curtiss Museum of Local History, Hammondsport, N.Y.; H. Hugh Wynne, Cross & Cockade; National Air & Space Museum (Gallery 106); Prof. David Hatfield, American Hall of Aviation History; and Walt Jefferies.



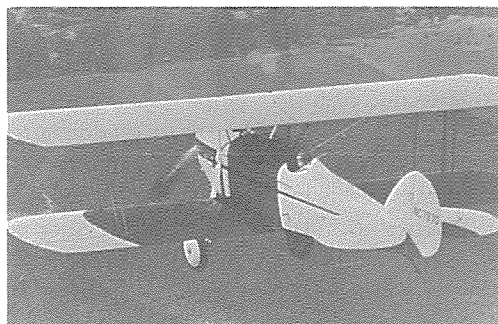
## WACO MODEL SPECIFICATIONS

| MODEL SYMBOL | ATC   |                | MOTOR         |       | HP  | WINGS—AIRFOIL                  | WT   | FUSELAGE                |
|--------------|-------|----------------|---------------|-------|-----|--------------------------------|------|-------------------------|
| ASO          | 41    | Wright         | J-4 or J-5    |       | 220 | Aero 2A                        | 2600 | LC                      |
| ATO          | 123   | Wright         | J-4 or J-5    |       | 220 | Tapered M-6                    | 2600 | LC                      |
| BSO          | 168   | Wright         | J-6           | 5 cyl | 165 | Aero 2A                        | 2600 | LC                      |
| CRG          | 362   | Wright         | J-6           | 7 cyl | 240 | M-18                           | 2600 | CM                      |
| CSO          | 240   | Wright         | J-6           | 7 cyl | 240 | Aero 2A                        | 2600 | LC                      |
| CTO          | 257   | Wright         | J-6           | 7 cyl | 240 | Tapered M-6                    | 2600 | LC                      |
| DSO          | 42    | Hisso          | A, E or I     |       |     | Aero 2A                        | 2600 | LC                      |
| ENF          |       | Chevrolet      | 333           | 4 cyl | 130 | M-18                           | 1900 | LC                      |
| FGH          |       | Continental    |               | 4 cyl | 35  | Clark Y                        | 830  | CM 2-place              |
| GXE          | 13    | Curtiss        | OX-5 or OXX-6 |       |     | Aero 2A                        | 2025 | LC                      |
| HSO          | 333   | Packard        | Diesel        |       | 225 | Aero 2A                        | 2600 | LC                      |
| HTO          |       | Packard        | Diesel        |       | 225 | Tapered M-6                    | 2600 | LC                      |
| INF          | 345   | Kinner         | B-5           |       | 125 | M-18                           | 1900 | LC                      |
| JWM          |       | Wright         | J-6           | 9 cyl | 300 | M-6                            | 3200 | LC                      |
| JYM          | 2-361 | Wright         | J-6           | 9 cyl | 300 | Tapered M-6                    | 3200 | LC                      |
| KNF          | 313   | Kinner         | K-5           |       | 100 | M-18                           | 1900 | LC                      |
| LAJ          |       | Jacobs         |               | 2 cyl | 20  | Aero 2A                        |      | LC Power Glider         |
| NAZ          |       | None           | (Glider)      |       |     | Aero 2A                        |      | LC Glider Frame         |
| QSO          | 337   | Continental    | A-70          | 7 cyl | 165 | Aero 2A                        | 2600 | LC                      |
| RNF          | 311   | Warner         | Scarab        |       | 110 | M-18                           | 1900 | LC                      |
| MNF          | 393   | Menasco        | Pirate C-4    |       | 110 | M-18                           | 1900 | LC                      |
| QNF          |       | Continental    | A-70-2        |       | 165 | M-18                           | 1900 | LC                      |
| PSO          | 339   | Jacobs         | LA-1          | 7 cyl | 140 | Aero 2A                        | 2600 | LC                      |
| QCF          | 416   | Continental    | A-70-2        |       | 165 | Clark Y                        | 2200 | CM 1931 Series          |
| QDC          | 412   | Continental    | A-70-2        | 165   |     | Clark Y                        | 2200 | CM Cabin                |
| OSO          |       | Kinner         | C-5           |       | 210 | Aero 2A                        | 2600 | LC                      |
| ODC          |       | Kinner         | C-5           |       | 210 | Clark Y                        | 2600 | CM 1931 Cabin           |
| PDC          | 2-388 | Jacobs         | LA-1          | 7 cyl | 170 | Clark Y                        | 2600 | CM Cabin                |
| PCF          | 453   | Jacobs         | LA-1          | 7 cyl | 170 | Clark Y                        | 2200 | CM 1931 Series          |
| BEC          | 472   | Wright (Ser E) | J-6           | 5 cyl | 165 | Clark Y Strut Br. 1932         | 2700 | CM 1932 Cabin           |
| SFB          |       | Wasp Jr.       |               | 9 cyl | 300 | Clark Y                        | 3300 | CM Mail or Pass.        |
| KBA          | 460   | Kinner         | K-5           | 5 cyl | 100 | Clark Y 1932                   | 2300 | CM Side-by-side         |
| IBA          | 465   | Kinner         | B-5           | 5 cyl | 125 | Clark Y 1932                   | 2300 | CM Side-by-side         |
| TBA          | 474   | Kinner         | R-5           | 5 cyl | 160 | Clark Y 1932                   | 2300 | CM Side-by-side         |
| RBA          | 466   | Warner         | Scarab        |       | 110 | Clark Y 1932                   | 2300 | CM Side-by-side         |
| UBA          | 479   | Continental    | R-670         |       | 210 | Clark Y 1932                   | 2300 | CM Side-by-side         |
| UBF          | 473   | Continental    | R-670         |       | 210 | Clark Y 1932                   | 2300 | CM 1932 Series          |
| UEC          | 467   | Continental    | R-670         |       | 210 | Clark Y Strut Br. 1932         | 2700 | CM 1932 Cabin           |
| OBF          |       | Kinner         | C-5           | 5 cyl | 210 | Clark Y 1932                   | 2300 | CM 1932 Series          |
| PFB          | 491   | Jacobs         | LA-1          | 7 cyl | 170 | Clark Y 1932                   | 2300 | CM 1932 Series          |
| TBF          |       | Kinner         | R-5           | 5 cyl | 160 | Clark Y 1932                   | 2300 | CM 1932 Series          |
| BBA          |       | Wright (Ser E) | J-6           | 5 cyl | 165 | Clark Y 1932                   | 2300 | CM Side-by-side         |
| OEC          | 468   | Kinner         | C-5           | 5 cyl | 210 | Clark Y Strut Br. 1932         | 2700 | CM 1932 Cabin           |
| PBA          | 464   | Jacobs LA-1    |               | 7 cyl | 170 | Clark Y 1932                   | 2300 | CM Side-by-side         |
| PLA          | 502   | Jacobs LA-1    |               | 7 cyl | 170 | Clark Y 1933                   | 2300 | CM Side-by-side         |
| UIC          | 499   | Continental    | R-670         |       | 210 | Clark Y Strut Br. 1933         | 2800 | CM 1933 Cabin           |
| JYO          |       | Wright         | R 975E        | 9 cyl | 330 | Tapered M-G                    | 3200 | LG (240-A)              |
| WHD-6        |       | Wright         | R 975E3       | 9 cyl | 440 | Clark Y Wire Br.               | 4200 | CM 1 or 2 P. Mil. Sport |
| S3HD-6       | 543   | S3-P. & W.     | TB            | 9 cyl | 420 | Clark Y Wire Br.               | 4200 | CM 1 or 2 P. Mil. Sport |
| UKC          | 528   | Continental    | R-670-A       | 7 cyl | 210 | Clark Y Strut Br. 1934         | 2800 | CM 1934 Cabin           |
| YKC          | 533   | Jacobs         | L-4           | 7 cyl | 225 | Clark Y Strut Br. 1934         | 2800 | CM 1934 Cabin           |
| CJC-6        | 538   | Wright         | R760E         | 7 cyl | 250 | Clark Y Strut Br. 264.3 sq.ft. | 3200 | CM 1934 Cabin           |
| UKS-6        | 528   | Continental    | R-670-A       | 7 cyl | 210 | Clark Y Strut Br. 1934         | 3200 | CM 1935 Cabin (Stand)   |
| YKS-6        | 533-  | Jacobs         | L-4           | 7 cyl | 225 | Clark Y Strut Br. 1934         | 3250 | CM 1935 Cabin (Stand)   |
| ZKS-6        | 533   | Jacobs         | L-5           | 7 cyl | 285 | Clark Y Strut Br. 1934         | 3250 | CM 1935 Cabin (Stand)   |
| UMF          | 546   | Continental    | R670A         | 7 cyl | 210 | Clark Y 1934                   | 2500 | CM 1934 Series F3       |
| YMF          | 542   | Jacobs         | L-4           | 7 cyl | 225 | Clark Y 1934                   | 2500 | CM 1934 Series F3       |
| YOC          | 569   | Jacobs         | L-4           | 7 cyl | 225 | Clark Y 1935 Sesqui            | 3350 | CM 1935 Cabin           |
| UOC          | 568   | Continental    | R670A         | 7 cyl | 210 | Clark Y 1935 Sesqui            | 3350 | CM 1935 Cabin           |
| CUC          | 575   | Wright         | R760-E        | 7 cyl | 250 | Clark Y 1935 Sesqui            | 3350 | CM 1935 Cabin           |

# WACO MODEL SPECIFICATIONS

| MODEL SYMBOL | ATC |             | MOTOR    |       | HP  | WINGS—AIRFOIL                          | WT   | FUSELAGE                  |
|--------------|-----|-------------|----------|-------|-----|----------------------------------------|------|---------------------------|
| YQC-6        | 598 | Jacobs      | L-4      |       | 225 | Clark Y 1936 Sesqui                    | 3500 | CM-LC 1936 Custom Cabin   |
| ZQC-6        | 598 | Jacobs      | L-5      |       | 285 | Clark Y 1936 Sesqui                    | 3500 | CM-LC 1936 Custom Cabin   |
| UQC-6        |     | Continental | R-670A   |       | 210 | Clark Y 1936 Sesqui                    | 3500 | CM-LC 1936 Custom Cabin   |
| VQC-6        | 631 | Continental |          |       |     | Clark Y 1936 Sesqui                    | 3500 | CM-LC 1936 Custom Cabin   |
| CQC-6        | 597 | Wright      | R-760E   |       | 250 | Clark Y 1936 Sesqui                    | 3500 | CM-LC 1936 Custom Cabin   |
| DQC-6        | 597 | Wright      | R-760E1  |       | 285 | Clark Y 1936 Sesqui                    | 3500 | CM-LC 1936 Custom Cabin   |
| EQC-6        | 597 | Wright      | R-760E2  |       | 320 | Clark Y 1936 Sesqui                    | 3500 | CM-LC 1936 Custom Cabin   |
| SQC-6        |     | P. & W. Jr. |          |       |     | Clark Y 1936 Sesqui                    | 3500 | CM-LC 1936 Custom Cabin   |
| UQC-6        |     | Wright      | R-975E   |       | 330 | Clark Y 1936 Sesqui                    | 3500 | CM-LC 1936 Custom Cabin   |
| YPF-6        | 586 | Jacobs      | L-4      |       | 225 | Clark Y 1936                           | 2650 | CM-LC 1936 F-6            |
| ZPF-6        | 586 | Jacobs      | L-5      |       | 285 | Clark Y 1936                           | 2650 | CM-LC 1936 F-6            |
| UPF-6        |     | Continental | R-670A   |       | 210 | Clark Y 1936                           | 2650 | CM-LC 1936 F-6            |
| VPF-6        |     | Continental |          |       |     | Clark Y 1936                           | 2650 | CM-LC 1936 F-6            |
| CPF-6        | 583 | Wright      | R-760E   |       | 250 | Clark Y 1936                           | 2650 | CM-LC 1936 F-6            |
| DPF-6        |     | Wright      | R-760E1  |       | 285 | Clark Y 1936                           | 2650 | CM-LC 1936 F-6            |
| EPF-6        |     | Wright      | R-760E2  |       | 320 | Clark Y 1936                           | 2650 | CM-LC 1936 F-6            |
| JHD-6        |     | Wright      | R-975E   |       | 330 | Clark Y 1935                           | 4200 | CM-LC 1936 F-6            |
| YOC-1        | 569 | Jacobs      | L-5      | 7 cyl | 285 | Clark Y 1935 Sesqui                    | 3350 | CM 1935 Cabin             |
| CUC-1        | 575 | Wright      | R-760-E1 | 7 cyl | 285 | Clark Y 1935 Sesqui                    | 3350 | CM 1935 Cabin             |
| CUC-2        | 575 | Wright      | R-760-E2 | 7 cyl | 320 | Clark Y 1935 Sesqui                    | 3350 | CM 1935 Cabin             |
| YKS-7        | 626 | Jacobs      | L-4      | 7 cyl | 225 | Clark Y Strut Br. 1934                 | 3250 | CM 1937 Cabin (Stand)     |
| ZKS-7        | 626 | Jacobs      | L-5      | 7 cyl | 285 | Clark Y Strut Br. 1934                 | 3250 | CM 1937 Cabin (Stand)     |
| UKS-7        | 648 | Continental | R-670A   | 7 cyl | 210 | Clark Y Strut Br. 1934                 | 3250 | CM 1937 Cabin (Stand)     |
| VKS-7        | 648 | Continental |          |       |     | Clark Y Strut Br. 1934                 | 3250 | CM 1937 Cabin (Stand)     |
| YGC-7        | 627 | Jacobs      | L-4      | 7 cyl | 225 | Clark Y 1937 Sesqui                    | 3500 | CM-LC 1937 Custom Cabin   |
| ZGC-7        | 627 | Jacobs      | L-5      | 7 cyl | 285 | Clark Y 1937 Sesqui                    | 3500 | CM-LC 1937 Custom Cabin   |
| UGC-7        |     | Continental | R-670A   | 7 cyl | 210 | Clark Y 1937 Sesqui                    | 3500 | CM-LC 1937 Custom Cabin   |
| VGC-7        |     | Continental |          |       |     | Clark Y 1937 Sesqui                    | 3500 | CM-LC 1937 Custom Cabin   |
| DGC-7        | 639 | Wright      | R-760E1  |       | 285 | Clark Y 1937 Sesqui                    | 3500 | CM-LC 1937 Custom Cabin   |
| EGC-7        | 639 | Wright      | R-760E2  |       | 320 | Clark Y 1937 Sesqui                    | 3500 | CM-LC 1937 Custom Cabin   |
| UPF-7        | 642 | Continental | R-670A   |       | 210 | Clark Y 1936                           | 2650 | CM-LC 1937 F-7            |
| VPF-7        | 642 | Continental |          |       |     | Clark Y 1936                           | 2650 | CM-LC 1937 F-7            |
| YPF-7        | 586 | Jacobs      | L-4      | 7 cyl | 225 | Clark Y 1936                           | 2650 | CM-LC 1937 F-7            |
| ZPF-7        | 586 | Jacobs      | L-5      | 7 cyl | 285 | Clark Y 1936                           | 2650 | CM-LC 1937 F-7            |
| DPF-7        |     | Wright      | R-760E1  | 7 cyl | 285 | Clark Y 1936                           | 2650 | CM-LC 1937 F-7            |
| LPF-7        |     | Lycoming    |          |       |     | Clark Y 1936                           | 2650 | CM-LC 1937 F-7            |
| YVN-8        | 677 | Jacobs      | L-4      | 7 cyl | 225 | Clark Y 1936 Sesqui upper & lower flap | 3650 | CM-LC 1938 Tricycle gear  |
| ZVN-8        | 677 | Jacobs      | L-5      | 7 cyl | 285 | Clark Y 1938 Sesqui upr./lwr. flap     | 3650 | CM-LC 1938 Tricycle gear  |
| AVN-8        | 677 | Jacobs      | L-6      | 7 cyl | 300 | Clark Y 1938 Sesqui upr./lwr. flap     | 3650 | CM-LC 1938 Tricycle gear  |
| YGC-8        | 664 | Jacobs      | L-4      | 7 cyl | 225 | Clark Y 1938 Sesqui upr./lwr. flap     | 3800 | CM-LC 1938 Custom Cabin   |
| ZGC-8        | 664 | Jacobs      | L-5      | 7 cyl | 285 | Clark Y 1938 Sesqui                    | 3800 | CM-LC 1938 Custom Cabin   |
| AGC-8        | 664 | Jacobs      | L-6      | 7 cyl | 300 | Clark Y 1938 Sesqui                    | 3800 | CM-LC 1938 Custom Cabin   |
| EGC-8        | 665 | Wright      | R-760E2  | 7 cyl | 320 | Clark Y 1938 Sesqui                    | 3800 | CM-LC 1938 Custom Cabin   |
| ARE          | 714 | Jacobs      | L-6      | 7 cyl | 300 | Clark Y 1939 and 1940 Sesqui           | 4200 | CM-LC 1939-40 Cust. Cabin |
| SRE          | 714 | Wasp Jr.    |          | 9 cyl | 420 | Clark Y 1939 and 1940 Sesqui           | 4200 | CM-LC 1939-40 Cust. Cabin |
| HRE          |     | Lycoming    | R-680E   | 9 cyl | 300 | Clark Y 1939 and 1940 Sesqui           | 4200 | CM-LC 1939-40 Cust. Cabin |

NOTE: Model designation: 1st letter is engine; 2nd, wing; 3rd, series. EXAMPLE: ASO = Wright engine; Straight wing, 10 Series.



Waco "10" GXE NC-7970 restoration by Max Krueger, Jr., San Antonio, Texas. Features OXX-6 powerplant 6338, Fahlin D102 prop. Fabric finished with 11

coats of Randolph butyrate dope with Miller Overhead completely rebuilt.  
(Jay Miller, Curator, History of Aviation Collection,  
The University of Texas, Austin, Texas, via Aviation Quarterly)