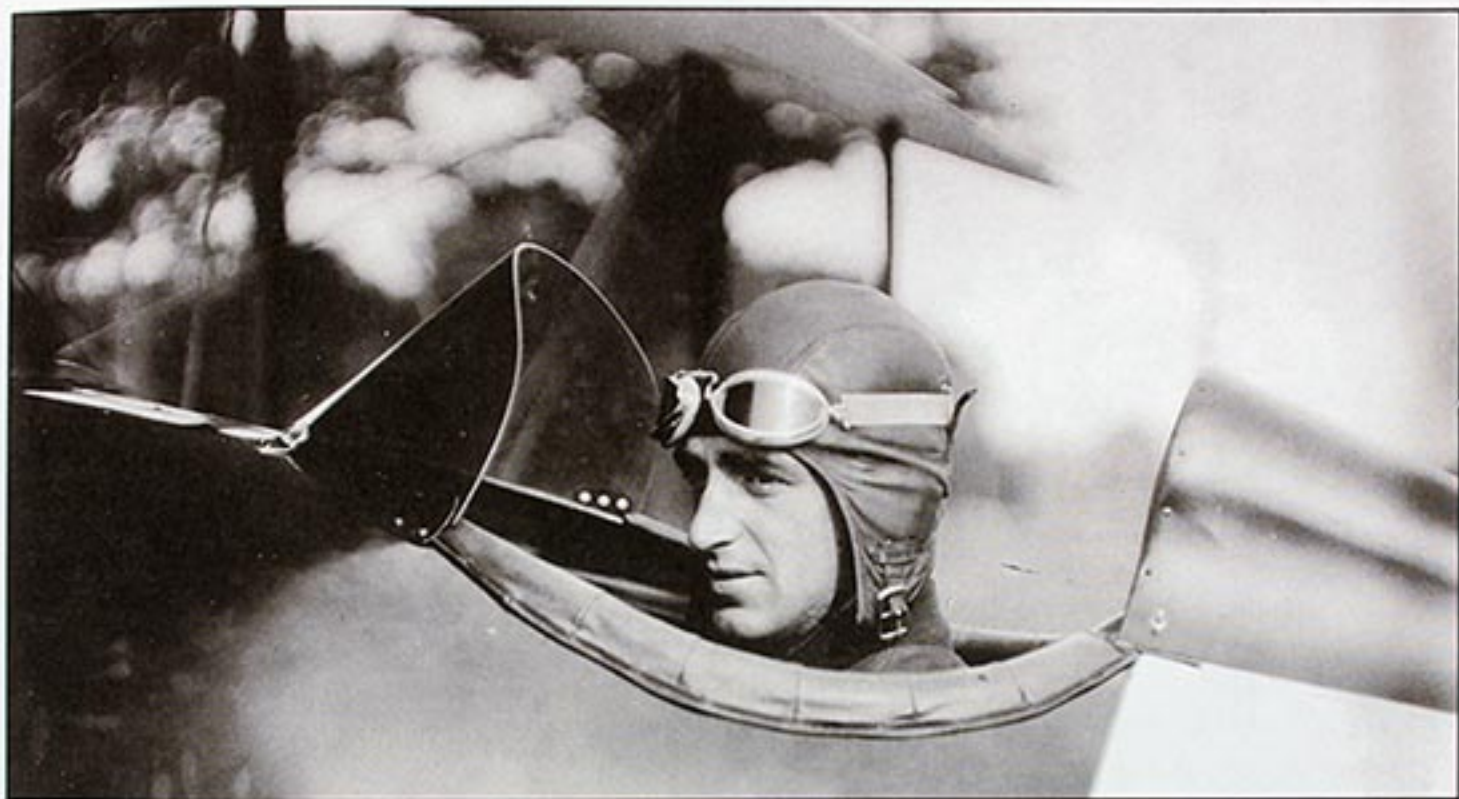


Freddie Lund

Savior of the Taperwing



C. M. MOFFITT

Fearless Freddie Lund in cockpit of a stock Waco Ten-W. Lund replaced Meyers as Chief Test Pilot of The Advanced Aircraft Company during November of 1928.

When the four taperwings burst upon the scene, those already gathered at Roosevelt Field for the start of the cross country races were stunned. The unorthodox wing planform and the special racing gear caused a few to murmur disapproval. None had been aware that a radically different Waco would make an appearance. Some, with miens showing annoyance, asked questions cynically. Hadn't Brukner just hired a brand new sales manager? And an advertising manager? How come they hadn't ballyhooed THIS ship? When a frustrated Meyers tried to calm them down by noting that the plane was no more than a standard production "Sport Waco" with a modified wing, a few took umbrage. "Why then the X registration?" The ensuing furor was sufficient to culminate in formation of a group protest which the contest committee refused to consider. The aviation press subsequently commented uncritically upon the introduction of what they described as the "hush-hush" airplane. None of this would have occurred if the stipulation for introducing these "specials" had not been restricted to their "one of a kind" application to the competitive arena.

Brukner had made it abundantly clear that he was not

about to enter series production on an aerobatic type ship. Therefore, no press notice; no ads. Of course, much to Green's and Meyers' delight, Livingston had provided the shove to get the new wings mounted on the J-5 airframe. And Brutus had graciously served as the arbitrator between Brukner and the "taperwing clique." The upset pilots at Roosevelt Field were of course unaware of the tug of war that had been going on at Troy. Nor could they know that the taperwing had been mounted as Meyers had told them on a stock Ten-W airframe stressed for 250 horsepower. In other words, the root of their ire was a Ten-W conversion and not a new production ship stressed for higher powered engines.

Even Livingston's ship, although brand new off the assembly line, used a J-5 Ten-W airframe. From a design standpoint, the situation in Laird's camp had been strikingly similar. Not identical, but similar. Two of Matty's pilots, Charlie Holman and Erv Ballough, had exercised considerable influence in modifying his earlier J-4 powered "commercial" design into what evolved as the I strutted Speedwing of 1928, the OTHER "hush-hush" entry. However, this is where the similarity ends.

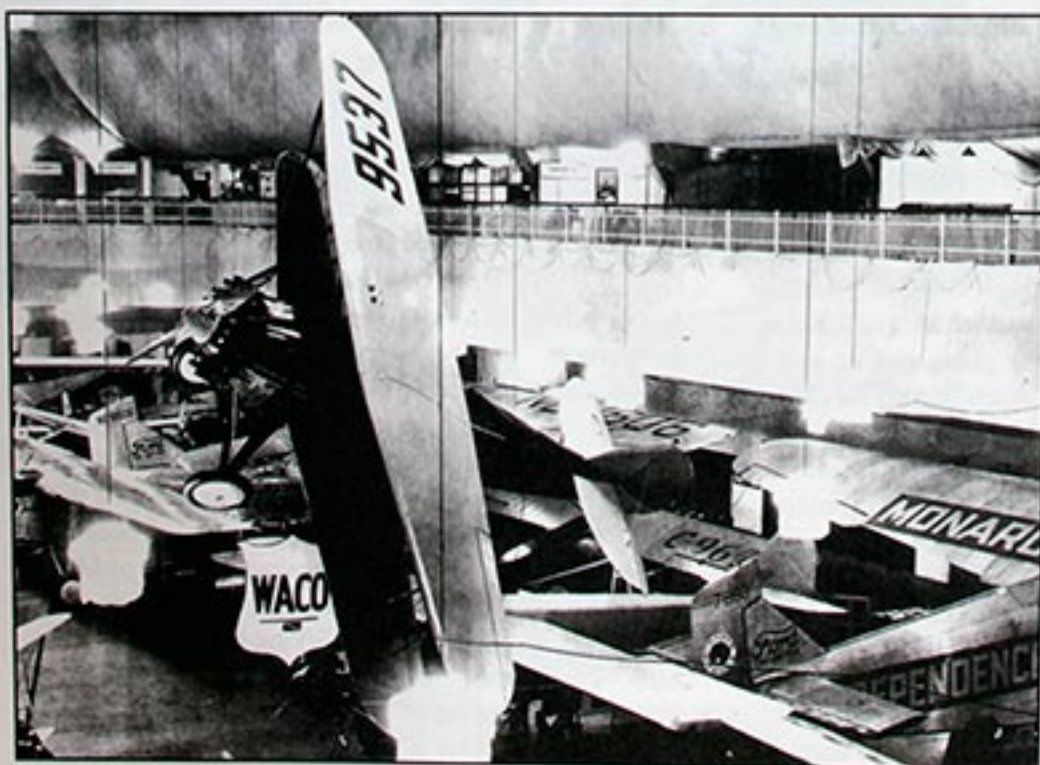
THE FIRST TEN-W CONVERSIONS & NEW TAPERWING PRODUCTION

Original Type	Original Registry No. Assigned	Roll-Out Date	Conversion Completed	Converted Type	New Production	Registry No. Assigned	Roll-Out Date	Remarks
OX-5 TEN	3287	2-29-28	3-21-28	OX-5 TEN-T	----	same	----	Taperwing Prototype
J-5 TEN-W	5533	5-26-28	7-31-28	J-5 TEN-T	----	X-5533	----	Racing Special
J-5 TEN-W	5020	3-12-28	8-15(?) -28	J-5 TEN-T	----	X-5673	----	Racing Special
				J-5 Ten-T		X-7527	9-1-28	Racing Special
J-4 TEN-W	4327	9-11-27	9-4-28	J-4 TEN-T	----	X-5694	----	Racing Special
				J-5 TEN-T		9535	1/11-28-28	Exposition Model *
				J-5 TEN-T		9537	2/11-28-28	Exposition Model *

- 1/ Sold to Arthur W. Killips, Waco dealer from Chicago (LaGrange) who also managed a Hudson-Essex agency.
- 2/ Exported to Guatemala in December, 1928.

Some of the other Ten-W craft which were converted to Ten-Ts carried registry numbers 5785, 5814, 6711, 6930, 6958, and 7446. Conversion dates for these ships seem to have been in 1929. There were one or two instances where a Ten-T was changed back to a Ten-W.

*Stressed to accept engines up to 450 horsepower. None were ever installed at the factory. See chart on page 185 for engines installed at the plant.



One of two Waco taperwings exhibited at the First International Aeronautical Exposition which was held at the Chicago Coliseum during December of 1928. It was the first time that the Waco Ten-T was placed on exhibition for sale. The two J-5 powered taperwings carried 9535 and 9537 as registration numbers while the lonely J-5 powered Ten-W had 9536 assigned to it. Taperwing hanging from ceiling has two wing center section tanks, each capable of holding 17-1/2 gallons. Fuselage tank had 65 gallon capacity. All up weight of aircraft was 2,600 pounds.

R. F. HARDY

Laird's Chicago operation was that of a custom ship and no comparison could be made to Brukner's production accomplishments. By 1928, he had truly become the Henry Ford of the air and quite a few willingly acknowledged that Brukner seemed to be solidly ensconced upon the civilian aircraft manufacturers' throne. Therefore, the general perception on that momentous day in September was to expect his latest commercial stock ship to appear for the cross country event. Although the two Laird racing entries were no less a surprise, greater heaps of displeasure were piled upon the four Waco racers simply because such a type was not really expected from the Trojan quarter. Although subsequently admired as the darling of the Los Angeles Meet, and totally vindicating the judgement of the "taperwing clique," Brukner stood firm that no series production be undertaken. His dictum was kept, but not for long.

While the taperwing design was resting on its laurels after its participation in the National Air Races, fate was working out an interlocking pattern that would serve to rouse this model from its slumber. The initial stitch in the developing pattern relates to a notable change in Meyers' attitude. His 1928 contest performance had lagged behind that of the competing Waco pilot dealers; they even outdistanced him when flying the taperwing, for whose design he was responsible. Consequently, he received some ribbing on this point. At other times, he would have grinned, puffed on his meerschaum pipe, and shot back with a light-hearted spike of his own. However, he was unable to discount their good-natured barbs this time because he fully felt that Brukner expected the company test pilot to pick up a greater share of the laurels. More than that, he was chagrined that Brukner continued to negate production of "his" taperwing, espe-

cially since other interests were mounting daily. The camaraderie among the shop crew and fellow pilots no longer seemed to sustain him and he was getting edgy.

One day, Lee Brutus had a rather surprising reaction from Charlie Meyers. It seems that Hollywood was using six OX-5 Tens for the filming of "Lilac Time." This was a tale about World War I fliers in France which starred Dick Grace, Colleen Moore, and Gary Cooper. These Tens were to be disguised as British S.E. 5A fighters. To aid in the deception, the wing radiator had to be removed. The pilots on the movie set saw no problem with relocation underneath the fuselage; other OX-5 powered ships had experienced no cooling troubles with such mounting. Nevertheless, the west coast distributor (American Aircraft Corp. of Los Angeles) called Troy, whereupon Brutus gave instructions to modify one of the Tens being assembled at the Staunton Road Field. He personally took the ship up and found neither cooling nor stability to be affected.

As Lee taxied up to the tree line near the road, Charlie came running alongside. Before Lee could cut the switch, Charlie began to harangue him, demanding to know why the modification was made, and why Lee was doing the testing. Needless to say, Charlie didn't score any points. When he cornered Brukner afterwards to voice his displeasure, he scored in the minus category.

Another stitch in the pattern was made in Los Angeles. Among the pilots gathered for the National Air Races at Mines Field was one who had worked as a movie stunt flyer out of Cecil B. DeMille's Mercury Field during 1920. At one time he even had doubled for Tom Mix. His military training had been at Brooks and Kelly Field and he had been assigned overseas to the 4th Pursuit Squadron with duty assignment to the Toul Sector of France.

Souvenir card frequently used by Freddie Lund. This one was addressed to Waco's engineering test pilot, Dick Young. The inscription reads: "Best wishes to my little friend, Dick, from Freddie Lund, Feb. 1930". Another was addressed to Emil Zophel, Waco's renowned mechanic: "With best success to my good friend, Emil, from Freddie Lund, Feb. 2/30".

J. C. KESSLER





L. N. BRUTUS

L-to-R: Freddie Lund, Chester Moon, Jack Rammell, and Lee Brutus in Waubay, South Dakota, during a hunting trip. Freddie had this snapshot cropped so that he and part of the taperwing were used later in conjunction with a view of X-5673 during inverted flight. See photo on prior page. This was used on his business card and one of his souvenir cards.



MRS. H. R. PERRY

L. N. BRUTUS

This souvenir card carries the legend: "Freddie Lund who made outside loop Sioux Falls Airfair September 1, 4, 1930." Taperwing is J-5 powered NC161Y with patriotic red, white, and blue color scheme. Note out-rigger type landing gear and fairing between the V struts.



EMIL O. ZOPHEL

Chief Test Pilot Freddie Lund with 1929 J-5 powered Taperwing (8577) posing in front of the Sales & Delivery Hangar (i.e. the "big hangar") which could house 18 to 20 ships according to Emil Zophel.

Freddie Lund had just returned to the States in August after completing eight months flying assignment in Cuba. There he had flown a Ten-W. He was no stranger to the Waco product since he had barnstormed for twenty-two months throughout the U.S. in a Standard Waco 9 prior to his Cuban adventure. But now he was at loose ends, looking for steady work. This was Freddie Lund, former daredevil of the Gates Flying Circus.

While at the Los Angeles races he managed to line up a ferrying job. Four new Ryan monoplanes were to be flown from San Diego to Pittsburgh for a new outfit known as Aircraft and Airways of America. The entrepreneurs from Pittsburgh were at the races when by sheer chance they discovered that they had to get their own pilots to ferry their newly purchased Ryans. Originally four officers from March Field were lined up for the 3,000 mile cross-country but Washington refused approval for them to fly civilian ships. However, the Chief of the Air Corps (Major General James E. Fechet) was at the races, and he gave the nod to three officers on leave status, also attending the races. The search for the fourth pilot ended when "Fearless Freddie" Lund stepped forward.

The flight was an interesting one, with several wives and girlfriends going along. The four Ryans made their way from San Diego via stops at Tucson, El Paso, San Antonio (Kelly Field), Dallas, Muskogee, Springfield, Mo., St. Louis, Cincinnati, Cleveland, and came to rest at Bettis Field (Pittsburgh). At Cincinnati's Lunken Field, the Air Commerce inspectors checked the military aviators for evidence of authority to fly civil aircraft. Complying, they produced letters of authority which they had obtained prior to leaving Los Angeles. During this stop-over, Lund had a chin-fest with the Embury-Riddle folks and they suggested that he look to Troy for a job. Thus, this formation flight of commercial aircraft served to secure Lund's future. After getting paid at Pittsburgh, he spent a few days in the area. He stopped over at Mayer's Field in Bridgeville, where he received confirmation that the "Waco people" might need another test pilot.

He wrote a letter to The Advance Aircraft Company which Brukner pitched onto Brutus' desk. The date of this fateful pitch is not known precisely, but it most likely took place during the second week of October. As it turns out, Brutus had never heard of Lund and based his decision to hire him entirely upon the background contained in Lund's letter of application. Brukner voiced no objection and Brutus believes that a letter of introduction from John Riddle may have helped things along.

A telegram to Lund in care of Mayer Aircraft Corp. had Freddie aboard the next Big Four train heading out of Pittsburgh. There is little doubt that he arrived in Troy over the weekend of the 13th of October. When Lund arrived in Troy, he found that the new factory had just initiated its production line, that the two large hangars were almost finished, and that Russ Hardy was the Chief

Engineer. Green having quit at the end of September. As Hardy told me: "Green just disappeared into the thin air about the time we moved to Peters Pike." Disgusted with the taperwing decision, he had lined up an engineering job in Washington with the Department of Commerce. And so this valuable cohort from the early days in Buffalo and Medina quietly slipped his Bruknerian moorings. With Hardy's de facto inheritance of Green's slot, another stitch in the taperwing resurrection pattern was made.

With Van Sicklen and Green gone the remnants of the inhouse "taperwing clique" were about to be scattered. Van Sicklen had kept in touch with both Meyers and Clewers and gave them an option to join a budding venture in Cleveland. Van had left his job as Sales Manager with Hamilton Metalplane Company during October and had signed up as a vice president in charge of sales with the newly established outfit. Organized by a group of bankers, this corporation had acquired the properties of the Glenn L. Martin Company in Cleveland and also the rights to build their existing military and commercial types. The situation looked very promising at the new Great Lakes Aircraft Corporation.

Push came to shove for Charlie Meyers when Freddie Lund not only appeared unannounced on the scene but a few days later took the factory's only J-5 taperwing up to put it through maneuvers. Brutus had given permission to install an inverted fuel feed system so that Freddie could establish his credentials. As the factory's chief test pilot, Meyers naturally considered X-5673 to be his ship, but on October 18 Freddie Lund up-staged him when he added to his formidable bag of tricks the first outside loop and triple vertical roll ever

successfully completed by a non-military airplane. This exuberant exhibition was in response to his having landed a permanent job with the country's prime commercial aircraft builder and as such it marked the beginnings of an ever widening hero worship for him. The exhibition also served to propel Meyers towards Great Lakes Aircraft. However, Charlie did not dictate his letter of resignation to Georgia Hollis "on the spot" but waited until November 5th, which was a little over two weeks after Lund's amazing feat.

The straw that broke Charlie's back was in the form of a berating that he received from "Ramrod" Brutus. It seems that Charlie Meyers and Frank Clewers, described as "close buddies" in this anecdote told to me by Brutus, were catching a few winks underneath the

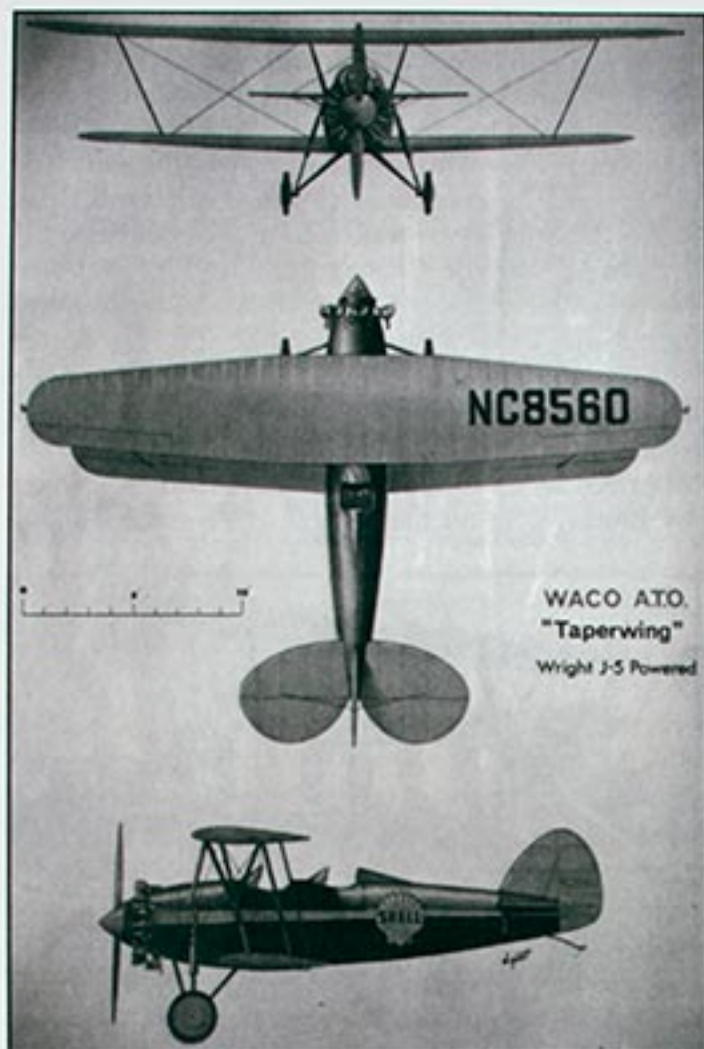


This zebra-striped Model 220-T was so ordered by James B. Hall, stockbroker from Wall Street; it could be seen often at the exclusive Aviation Country Club at Hicksville, Long Island. This ship rolled out April 27, 1929. NC8573 could have fit neatly into Richthofen's Flying Circus, eh what?

Tex LaGrone in winter coat, clutching his fedora, and Lindbergh sitting on his parachute seat pack in LaGrone's Taperwing demo ship (9580). Note that company logo is placed beneath fuselage stripe, which contrasts to usual placement above stripe. Here you get a clear view of the primitive but effective wire lacing and shoe hook locking arrangement on the pilot's baggage compartment. Sesame locks were not provided until late 1929. LaGrone, with his craggy face and marble-grey eyes, was sometimes called Kansas City's "oldest flying institution." Tex had first met Lindbergh during his barnstorming years when the famous "Lucky Lindy" was still known as "Slim" Lindbergh.

R. S. KNOWLSON, KANSAS CITY, MO.
LEE N. BRUTUS





Three-view taperwing (NC8560) as published in *Sport Flying Annual* of April, 1969. Since this ship was rolled out in the spring of 1929 (either April or May) it properly deserves to be designated as a Waco 220 T.



FACTORY PHOTO A-43

Rear view of Waco Model 220 T (C-8568) which was rolled-out on April 29, 1929 at the Peters Pike plant. Note broad front windshield coverage which completely spans fuselage. The Sales & Delivery Hangar can be seen partially in left background. Note that fin is not off-set to compensate for torque, this being handled by washing-in the lower left wing.

wing of a Waco which Brutus had ordered readied for an important customer. This means one with cash in hand. The waiting pilot complained to Brutus and . . . well, you can guess the rest. The upshot was that Clewers joined Meyers in the move to Great Lakes Aircraft. Thus, towards mid-November, the 130 pound Lund replaced the 117 pound Meyers as chief test pilot.

With Goembel, Green, Clewers, and Meyers gone, Lund was left a clear field. Only Brutus and Brukner remained as pilots, and Brukner had for all practical purposes become a "desk jockey." Brutus, on the other hand, remained active.

Of interest is the fact that Charlie's letter of resignation still reposed in Brukner's holdings after these many years. Charlie, had served as preliminary design engineer, sales engineer, and test pilot for Great Lakes until the Depression took its toll of the production line. Responsible for the design of the Great Lakes Sport-Trainer, Model 2-T-1, he made this two seater biplane into one of the most distinctive types of its day when he swept back the top wing panels nine degrees in order to "fix" a tail heavy condition. While his association with the Waco taperwing has been obscured over the years, his responsibility for the Great Lakes trainer is well established.

The diminutive Freddie Lund was an extremely affable fellow, getting along with everyone at the new plant. His enthusiasm for flying was boundless, and his praise for the taperwing unending. Discussions with the congenial Russ Hardy served to convince him that the ship should be produced as a 450 hp design. And so he approached "Ramrod" Brutus with his plea to put the taperwing into production. Here was new blood that not only reinforced the arguments of the now departed "taperwing clique," but with an expertise not available before. It seemed worth another try. This time it worked. No doubt, the quiet, unassuming, manner of both Lund and Hardy helped to dispel any lingering misgivings in Brukner's mind, but more than that, the company had suddenly been thrust into the limelight, not for its production prowess, but because it harbored within its hangars the answer to a sportsman pilot's dream. And so the flashy and notorious taperwing, this elegant bird, was given renewed life, but not with a 450 hp engine!

Once again, Brukner demonstrated the courage of his conviction that production of a highly expensive aircraft was not the rational approach to insure production growth. His pragmatic viewpoint was at the time considered to be a sign of ultra conservatism but eventually his keen foresight and good business judgement was appreciated when the after effects of the 1929 stock market debacle took their toll of the competition. So he gave his OK to produce the Ten airframe stressed for 450 horses but with the stipulation that only the J-5 was to power the production taperwing. That way, if a customer came with cash in hand for a 450 hp job, they could always roll one out. Or, if the customer had his own engine, he was all set. Hardy was told to get the

paperwork ready for an ATC application and Brutus was instructed to get a couple of taperwings ready for the upcoming exposition in the Chicago Coliseum.

This expo was known as the First International Aeronautical Exposition and it was sponsored by the Aeronautical Chamber of Commerce for the period of the first nine days in December 1928. So you see, it was this series of somewhat disconnected but auspicious events that served to keep this star performer alive and thus enabled its entry into the annals of American aviation history where it rests as one of its enshrined immortals. On March 15, 1929, some three months after the Chicago expo, and one year and one month after the Siemens-Waco had been certificated (ATC #26), the taperwing received its Approved Type Certificate (#123). Also, during March, the first ad appeared which offered the "Sport Waco" or "Ten-T" at a price of \$8,525. The ad informed that for this price one would get "faultless workmanship and rigid inspection, the 'invisibles' that have made Waco's reputation." And it was in this same taperwing ad that the infectious phrase "ASK ANY PILOT" appeared for the first time, thus becoming an indelible part of the Waco trademark from that moment onward.

During its life, several upgradings of power did take place on this exceeding robust airframe, BUT NO TAPERWING EVER CAME OFF THE PRODUCTION LINE WITH A 450 HP ENGINE INSTALLED! As of this writing, William E. Hogan of Hamilton, Ohio, has a taperwing flying that has an engine of that horsepower installed.



FACTORY PHOTO P-518

The two CSO ships (NC517M and NC604N) that were entered in the Fifth Annual Ford Air Tour (1929). Tour #8 was flown by Art Davis with Jim Blankenship as "riding mechanic." Johnny Livingston flew Tour #26 with Bob Willett in front cockpit. Due to a disagreement with Livingston, Willett was replaced by Emil Zophel during the Atlanta stop over. Livingston and Davis placed first and second, ahead of twenty-seven other contestants. The winning Livingston achieved a max speed of 135.44 mph and made good on average tour speed of 130.9 mph. Both ships carried a contest load of 972 lbs. and registered an empty weight of 1,628 pounds. Livingston's unstick time was a phenomenal 4.4 seconds and Davis's 4.7 seconds; no one came near them. Although Wiley Post's Lockheed "Vega" topped out at 160.35 mph, his best unstick time was 10.4 seconds and the contest formula was weighted in favor of "stick" and "unstuck" times. Short field capability was still regarded as the prime requisite.



FACTORY PHOTO A-105

What a beauty! Wonder who the lucky fellow in the cockpit is? NC741E was a Model 220 T rolled out of the factory during May, 1929. Air filter on carburetor underneath the J-5 engine can't be missed, nor can the left hand magneto projecting through cut out in that neat engine cowling.



LEE N. BRUTUS

According to Lee Brutus this is a view of the 2nd Chicago International Aeronautical Exposition which was held in December, 1929. The three Waco ships displayed were all powered with engines of the new Wright J-6 series. The 165 hp 5 cylinder J-6 was given the "B" designator by the Waco Aircraft Co. and the 225 hp 7 cylinder J-6 was dubbed with the letter "C". The taperwing suspended from the ceiling (515M) is a CTO. One of the straightwings on the floor is a BSO (513M) while the other is a CSO (possibly 517M which had been flown to 2nd place by Art Davis in the 1929 Ford Air Tour). None of the engines are fitted with engine cowling; all had out-rigger landing gear design. Taperwings were occasionally referred to as the "Sport Wing Waco" or the "Sport Speed Plane." In left background is Alexander "Bullet" with J-6-5 cylinder engine (X-777H) and in right background is a Bellanca "Pacemaker" on floats with J-6-9 cylinder engine (NC745K).



With wheels shocked and engine idling, "Lucky Lindy" and "Tex" LaGrone pose with LaGrone's taperwing demonstrator at Kansas City Municipal Airport on a gusty day in March, 1929. Note melting snow and ice at left, Lindbergh had been employed the previous year by Transcontinental Air Transport (TAT) and had made a number of survey flights for them. TAT became Transcontinental and Western and eventually TWA, the "Lindbergh Line." Similarly, he had become a technical advisor to Pan-American Airways in early January, 1929, and had just returned from a south of the border survey flight shortly before this picture was taken. LaGrone, one of the oldest pilots around, was well known to him, and Lindy, always helpful to fellow pilots, did not refuse the Waco distributor's request to make local demo flights. Just a few weeks before, Tex had flown 9580 in wintry weather from Troy to Kansas City. It was one of the first of the 1929 production batch of the Model 220-T; apparently this ship was rolled out on 20 February. When Tex took delivery from the factory, the ship had light grey wings and empennage, whereas the fuselage top half was red and the bottom half dark grey. These colors were divided by a black stripe edged in light grey. It would appear that a different paint job was applied in Kansas City. Note that the ship does not have center section fuel tank(s) installed, but is equipped with navigation lights. In right background is an Alexander "Eaglerock" of 1928 vintage with OX-5 installed and C-6317 on the rudder; behind it is an OX-5 Waco Ten.



This CTO show plane was rolled out of the factory on August 23, 1929, one day prior to the opening of the Cleveland Aeronautical Show. Out-rigger landing gear and navigation lights were fitted to the model at inception but the Sesame lock on the pilot's baggage compartment was a modification made in in late 1929. Chief Engineer Russ Hardy had both NACA speed ring and tail wheel installed during 1930, thus upgrading the design considerably, since addition of the anti-drag cowling ring made for a speed increase of some 20 mph. Note that the front seat also had been neatly cowled over. This 225 hp ship could attain 150 mph with these modifications.

FACTORY PHOTO B-527

WRIGHT "WHIRLWIND" ENGINES INSTALLED IN TAPERWING VARIANTS

1927 J-5 @ 220 hp; 9 cyl.; 525 lb. dry weight 1/	: installed in Ten-T/220-T/ATO series
1929 J-6-7 @ 225 hp; 7 cyl.; 425 lb. dry weight	: installed in 225TW/CTO series
1929 J-6-9 (R-975) @ 300 hp; 9 cyl.; 520 lb. dry weight 2/	: installed in 1929 JTO and JYM; also in 1930 300 T-A 3/
1930 J-6-7 (R-760) @ 240 hp; 7 cyl.; 540 lb. dry weight	: installed in 1930 240T-A; also in 1932/1933 CTO-A
1932 J-6-9 (R-975-E1) @ 365 hp; 9 cyl.; 660 lb. dry weight	: installed in 1933 JYO-A

- 1/ The Wright Aeronautical Corporation of Paterson, New Jersey, passed the last of its famous J-5 "Whirlwind" engines through its assembly line on June 29, 1929. At the same time production was started on the "New Whirlwind Seven:" of the J-6 series. The Wright Aeronautical Corporation was one of ten companies which were consolidated during 1929 in order to form a conglomerate under the umbrella of the Curtiss-Wright Corporation, a holding company.
- 2/ The 1931 J-6-9 (R-975-E) @ 330 hp powered the 1931 straightwing mail variant of the Ten series; the JWM model.
- 3/ The "A" stood for "Armed."

Note: Originally built to a Navy requirement by the Lawrance Aero Engine Corp. of New York City, the J-1(1922) through J-4 (1924) series were all nine cylinder engines in the 200 - 270 hp range. For example, the J-1 of 1922 could develop 276 hp at 1770 rpm. Bought out by the Wright interests, Charles Lawrance continued development with the J-4B (1926) and the J-5C (1927) primarily for civilian application. The J-5 series made the "Whirlwind" engine famous since it powered every American civilian and military trans-oceanic aircraft of the 1927-1928 record setting epoch. The J-6 series was the first of the "Whirlwind" series to be produced in 5, 7, and 9 cylinder versions. It was based, in part, upon prior development work done with the R-1200 "Simoon" nine cylinder engine of 1926. (300 - 340 hp; 640 lb. dry weight)

Hogan converted a J-5 ATO (s/n A-114; roll-out 6-18-19; NC 763E) by installing a Wright R-975-E3 engine, which makes this ship a WTO in accordance with the Waco designation system. "W" was the engine designator assigned by the Waco builders to the Wright R-975-E2 and -E3 series and was first applied by them

in 1933 to the E2 series (420 hp) and in 1935 to the E3 series (440-450 hp). Just to keep the record straight, the designation of "J" had been applied earlier to the R-975 (300 hp) in 1929, to the R-975-E (330 hp) in 1931, and to the R-975-E1 (365 hp) in 1932. Note that the Wright R-975 designation had succeeded the earlier J-6-9 iden-

As the short bayonet stacks bark away on the idling J 5, we see combined evidence of the old and the new. Although "The Advance Aircraft Company" logo is retained below the fuselage stripe, the legend underneath the cockpit coaming proudly announces: "Freddie Lund The Waco Aircraft Company". This photo of Freddie was taken just a few days after the new company name was adopted at the end of May 1929. Thereafter the renowned logo with its spread wings was not often applied to the airframe. This is old X5673 with new paint job and addition of the fuselage stripe that had by now become a Waco standard. Note that Freddie had taped the aileron-wing line gap in order to minimize interference drag on what was now NC5673. Also take note that an Aerol Strut shock absorber has replaced the Brukner oleo strut previously mounted on the gear.

FACTORY PHOTO A-106



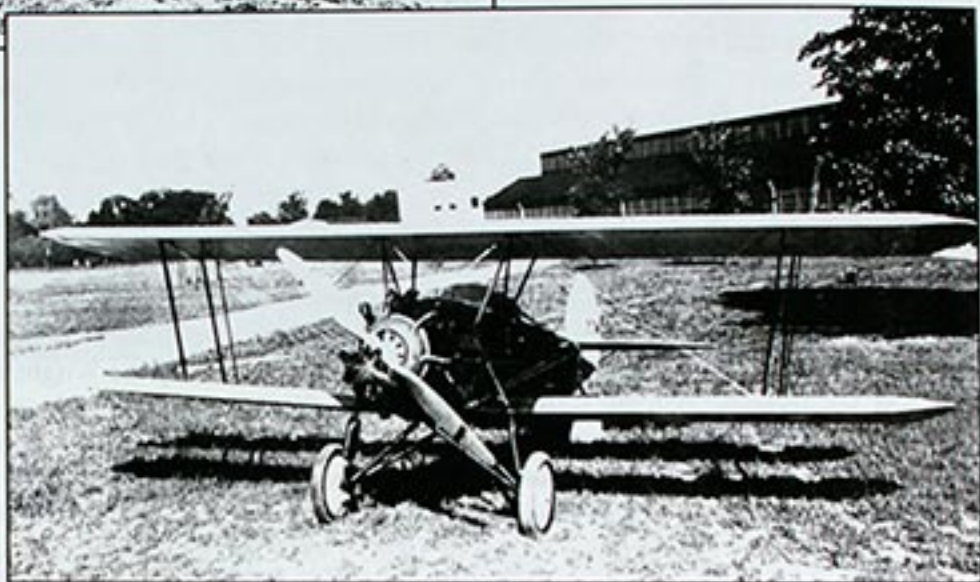


Many a business enterprise bought Wacos for executive, liaison, and advertising use. This 1929 Model 220 T (NC8584) was rolled out during May of the year. Note that the factory logo is above the fuselage stripe on this ship. The Johnson Wax Company of Racine, Wisconsin, also bought one of the first Waco cabins, a 1931 QDC. It may have carried NC1449.

FACTORY PHOTO P-491

This CSO with out-rigger gear was rolled out during August, 1929. It was later modified with very large wing root fillets, faired-in front cockpit (not closed, but smaller opening for one passenger), and low profile windshields for entry in the October Ford Air Tour of 1929. Note the frontal exhaust collector ring and cooling shutters on the J-6-7 cylinder engine. The Engineering/Administration building is directly in back of 517M with factory at right.

M. H. HAVELAAR
J. C. KESSLER



FACTORY PHOTO A-39

This dapper gentleman is Clay Saunders, son of a chain store owner in Memphis, and we see him here in the process of picking up his Taperwing at the factory. This frontal view of the ship shows how the center section root chord lies well outside the cabane strut and landing wire attachment points. Also, we should note that the Bruknerian oleo strut was gradually being replaced by the Aerol Strut designed of The Cleveland Pneumatic Tool Company. It is in evidence here on 9558 which was rolled out during February of 1929. Note that 9537, one of the first Ten-T ships of 1928, as well as Meyers' X-5673, and LaGrone's demo ship (9580) still carried Brukner's oleo strut configuration. The Aerol Strut employed air and oil pressure whereas Brukner's oleo employed oil pressure plus two coiled springs for dampening. See page 188 for shock strut advertisement of 1928.

Freddie Lund had married Bettie Elkins on June 17, 1929. He taught her to fly and after he had lost his life due to a mid-air collision on October 3, 1931, in Lexington, Kentucky, she decided to carry on in her husband's tradition and took stunting instruction from another famous taperwing pilot, Art Killips. She owned three different taperwings during her career. This is NC719E pictured below apparently at Burbank's United Airport sometime in 1932 or 1933.



A rare picture of David P. "Deed" Levy (on the left) and Ephraim W. "Pop" Cleveland standing in front of a 1929 Travel Air cabin monoplane.

"Pop" had been Buck Weaver's flight instructor at Wilbur Wright Field during late 1917 and an enthusiastic booster of the Waco product throughout the years. He was the affable flying-salesman for "Aerol Struts," having used a Ten-W for some of his first sales campaigns.

"Deed" had ferried Wacos at one time, including one for Howard Hughes, and he later test piloted for Bellanca and Stearman. He was a life long friend of Clayton Brukner.

C. J. BRUKNER



M. H. HAVELAAR

This Ten-T (NC6711) of early 1929 was at one time owned by the creator of the "Cuban 8" aerobatic maneuver, Leonard James Povey. Len Povey, organizer of Batista's Cuban Air Force during 1934, flew this red Taperwing while performing with the American Air Aces during 1933. This exhibition group included several famous taperwing pilots, such as Art Davis, Bettie Lund, and Johnny Livingston, who was the show's manager.

J. C. KESSLER