

PLANE LUCK

By ROLAND ROHLFS, as told to
BREWSTER C. REYNOLDS

In something over half a century Man has moved to the fringes of outer space. In that period the public has read of many exploits of test pilots who advanced the state of the art stage by stage. Now we read of the astronauts and of flights to the Moon, but somewhat forgotten, and even unknown, are careers of many Early Bird who contributed to the development of vehicles of the air.

Here is a segment of the career of Roland Rohlfs, experimental test pilot with the Curtiss Aeroplane Co. during the Great War and immediately afterward, as told by himself to Brewster C. Reynolds. It was the decade of growth, of experimentation, of advancement on all fronts. While the heroes of the War had become notable, he was test flying more than 70 types and versions of airplanes contracted for by the Army, Navy and our Allies.

The following narrative details some of the more exciting test flights and interesting events which he witnessed. The reader will return to test piloting as it was near the beginning of WWI when raw nerve and agility took the place of know-how. They were the days in which fingers were crossed in a gesture of hope and luck was the outstanding requisite for survival.

We are indebted to Roland Rohlfs, who worked hard to present the facts.

"The force of the wind seemed like a massive wall as I held the strut near the wingtip of the Curtiss JN-4 and prepared to jump.

"Having no previous parachute experience I was most apprehensive as to the results of this unknown leap into space. Especially so since my good friend, Floyd Smith, had only partially instructed me in the art of packing a chute, and I had folded this one all by myself!

"With a fatalistic feeling I jerked the release ring. A mighty whoosh—then a stream of cords and silk shot out from the wing with me in tow. For a few seconds the open fabric halfshell and I travelled almost horizontally across the sky, a strange experience. Suddenly, gravity took over, and after a series of oscillations, my chute and I floated confidently toward earth.

"During this happy downward flight, I knew that all was well, and I began to recall my boyhood days when this had been merely a dream".

In his middle teens, Roland Rohlfs' love of speed had turned him into an avid motorcycle fan with a yen for tinkering and inventing new parts, much as the modern teenager did with his hot-rod. Because of his efforts, although classed as an amateur, he was hired as a mechanic for the motorcycle racers at the Velodrome in Buffalo, New York.

Looking back on this job he recalled that he was given credit for being the only one who could install a double-bead racing tire without pinching the innertube, a difficulty which caused many a blowout and accident in the raceway. Soon after taking over the



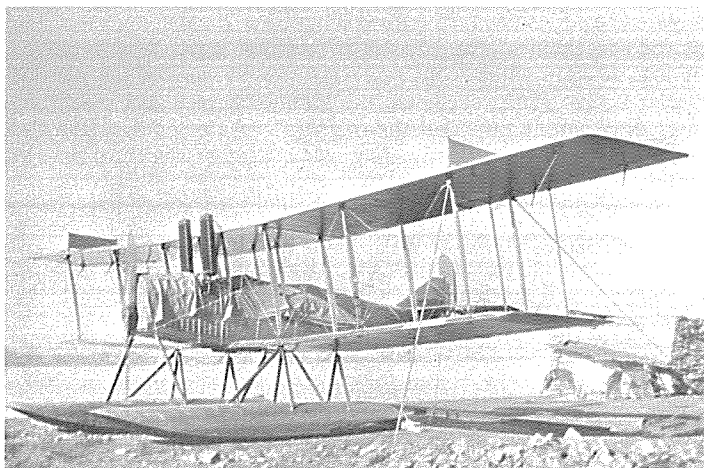
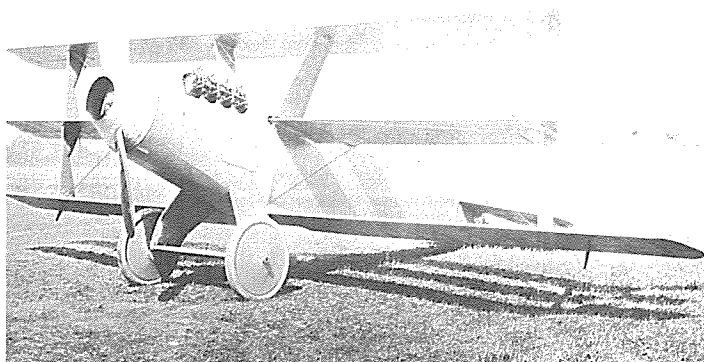
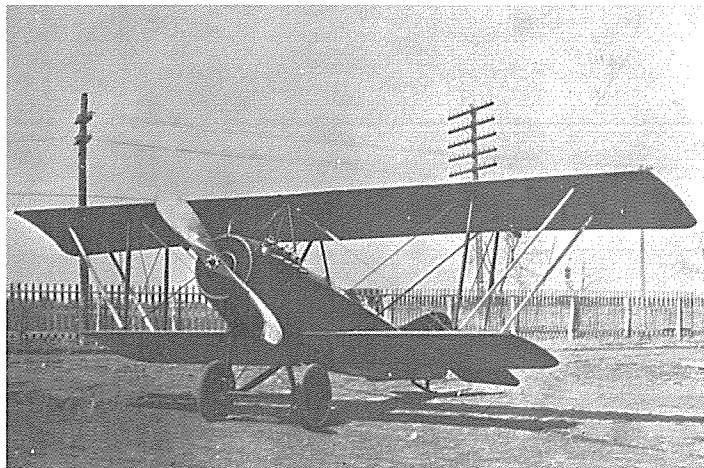
Roland Rohlfs and the Curtiss Model 18T "Wasp", 30 July 1918. (Curtiss photo No. B711, courtesy of National Air & Space Museum)

job, none of the boys would race unless Rohlfs had installed the tires on their mounts.

Although interest in the mechanical side of motorcycling was great, he was fascinated with riding and in many happy hours he and some pals explored the roads around Buffalo. During the Summer, 1914 he and Henry H. Hammond cycled as far as time would permit and were at a point 20 miles north of North Bay, Ontario when further advance was stopped by a bridge washout. They returned to North Bay for the night, and sometime in the night were awakened in their hotel room by a loud knock at the door. Upon opening it they were confronted by two of the Canadian Mounted Police. The Mounties told them war was declared, and wanted to know what was in the package that arrived for them at the express office that day. They expected explosives! But when Rohlfs and Hammond showed the cans of special Indian Motorcycle oil, the Mounties were satisfied. They advised the young men that the trip was over for the duration and under the circumstances, they were happy to return to the States.

Roland Rohlfs was born in 1892 and retired from aviation in 1953, having spent nearly forty years as test pilot, in operations for air transport, research on electrical and carburetion devices for engines, and in flight safety. He lives today in Manhasset, New York, with some good memories of a lifetime spent in making airplanes fly better, faster and safer. In reflection on how it all began, he said:

"It was about this time (1914) that I became interested in aviation. I had read in a local newspaper that the Curtiss Aeroplane Company had plans for building airplanes in



Buffalo and I decided to apply for a job. So anxious was I to be hired that I offered to sweep floors in order to work for Curtiss. Henry Kleckler, an early associate of Glenn Curtiss and at that time designer and chief engineer, assured me that I would not have to stoop so low, and instead he engaged me as an apprentice in the airframe fabrication and assembly department. I was on my way. Work began for me on the day after Christmas 1914 at Hammondsport, located at the southern end of Lake Keuka, New York, often called the "Cradle of Aviation." It was the main base of the organization, and here many a plane and Early Bird had been hatched.

I worked feverishly and with great enthusiasm and by early 1915 I was transferred to the first Curtiss Buffalo plant, then located in the old Thomas automobile factory, to work on flying boats and hydros. Later I went over to the Churchill Street plant, entrusted with making various aircraft accessories such as automatic safety switches, gasoline gauges, and starter and propeller gauges. Years later some of my propeller gauge designs were still in use.

Under the stimulus of war, the Curtiss organization which less than five years before had numbered less than 20 people, now employed well over two thousand persons. Curtiss airplanes were flying in many parts of the world and Curtiss pilots were teaching students to fly at a host of fields in America. At each one of these it was necessary to have experienced factory mechanics to assemble and spot check new airplanes. I was put in charge of the assembly and maintenance of several special airplanes, and I remember some of the missions very well. There was a trip to Toronto where I had to assemble and checkout JN hydros before they were sent on to Spain. They were test-hopped by Raymond V. Morris, a pioneer with Curtiss, who had trained many an Early Bird and had spent hours aloft over both Lake Keuka and North Island.

Newport News was the site of another Curtiss flying field (later to become the Atlantic Coast Aeronautical School) and another of my stops, under the management of pioneer aeronaut and early Curtiss associate, Capt. Thomas Baldwin. A Model H-7 flying boat had been sent to this field and was to be sent up the Potomac River for a government demonstration, piloted by T. C. Macauley.² It had been delayed by engine trouble and new parts were needed up river. Capt. Baldwin approached a fellow mechanic, Lou Krantz, and me, and held out the new parts, saying, "Here, one of you boys take these to Macauley." Krantz was nearer to him than I and managed to grab them first. I was disappointed but not until the next day did I realize how lucky that was. The H-7 crashed, killing Krantz and seriously injuring Macauley.

Fonder memories of Newport News center around Victor Carlstrom, another Curtiss experimental test pilot, who flew many a prototype and set a host of American records in the 1914-15 period. Late in the Summer 1915, it became apparent to the Curtiss organization that they were short of flying instructors to handle the increasing demand for students. I was at Newport News when Mr. Curtiss told Capt. Baldwin and Mr. Carlstrom to give me and a few others some flight time to see if any of us proved out. In my first ride with Victor, I was so anxious to show him that I could fly, I almost tore the ailerons off by the instant whip actions I made to keep the plane level. He let me go, but advised me to take it easy and let the airplane fly itself more. I watched him, and got the idea, for keeps.

Rohlfs flew the Scout, small, fast and tricky, at the Buffalo school as he was beginning his career as test pilot. It had already been flown to an altitude record of 16,225 feet by Victor Carlstrom in April 1916.

The S-1 triplane (second from top), in Curtiss photo No. 201 dated 9-27-16. This airplane was taken in by the Signal Corps in 1917 and designated No. 323 and assigned to the Aviation Mechanics School at Minneapolis, Minn. as a rigging practice airplane.

Rohlfs reported the Model L triplane (second from bottom) was as easy to fly as "pointing your finger". It was a side-by-side dual control trainer. (Curtiss photo No. 382 dated 1-18-17 courtesy NASM)

Bottom, the R-6 with Liberty 12 engine.



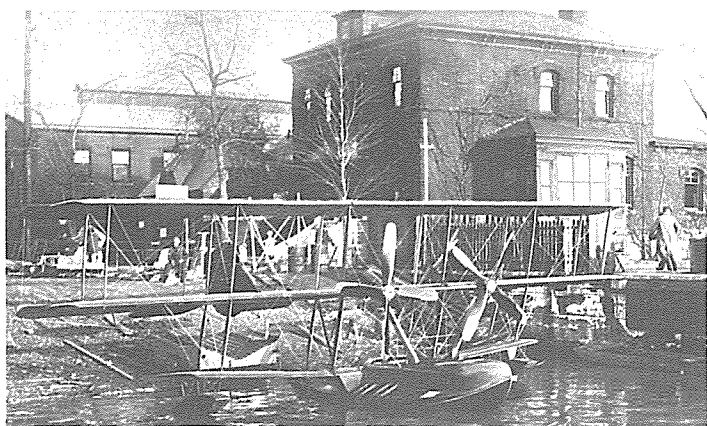
GS-1 - The Gnome Scout One - also called "The Door Knob Control", with shock absorbers in the pontoon struts. (NASM)

Months later, still serving as a mechanic, I was sent to the Curtiss field at Brights Farm, Florida (now Hialeah). Interestingly, in the early part of 1912, four Curtiss pilots—Bob Faucett, George Hallett, Tommy Simonds, and Charles Witmer—had instructed students here. I was put in charge of a JN.

This particular JN developed engine trouble but I had no difficulty. One of the rules was that, before a student could take up a newly repaired airplane, it had to be test-hopped by an instructor. This caused delays as all the instructors were very busy and someone got the idea—it could have been I—that if I would brush up a little, I would be able to test it. I had been getting a little time with Phil Rader, briefly and infrequently, but he told me to practice fast taxiing so that I could get the hang of raising the tail. This I did, and soon found myself in the air, six feet off the ground and with plenty of clear area ahead. I eased back the throttle and settled back to terra firma. I had flown! After that, it developed that the JN under my care began to need test flights very often.

Being a roving mechanic had its rewards, and one of them was taking care of Victor Carlstrom's airplanes. In the early part of 1916, he set a number of marks in a JN made for an attempt on the two-man altitude record for that category. He did succeed in reaching 11,180 feet in April 10th, breaking the existing U.S. record.

Later Carlstrom flew this same airplane to Sheepshead Bay on Long Island, to compete in an air meet. A larger gastank was constructed for the flight from Newport News to Sheepshead, and though he landed there on schedule, there was a leak in the tank. I had been sent on ahead, and because of the pressure of time before the demonstration of this airplane, I figured out a way to stop the leak without draining the tank. The leak was in



BT, the Baby T, also dubbed the "Life Boat", intended for test as a model of the later NC boats. (NASM) photo No. A43916, courtesy of Rohlf's)



GS-2, called "The Swiss Cheese" by the shop crew because of the tailpost design with lightening holes. It sat on its tail in first test. (NASM)

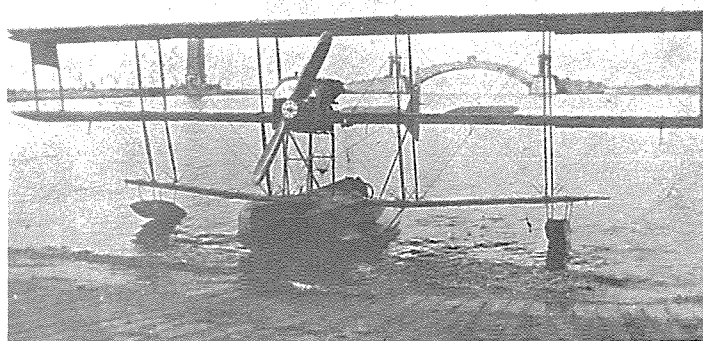
the chimb, and about two-thirds the way up the side of the tank. I was able to solder an angled strip of metal and then, with the level of gas just below the leak, I puddled in a supply of lead, enough to stop the leak. Victor made his demonstration.

At the same air meet, Ruth Law, already famous as an aviatrix, and her equally well-known brother, Rodman, performed. She came into the field at night from Mineola and landed with the aid of lanterns, a great stunt for that time. Rodman, on the next day, was to ride a balloon past the grandstand and, when opposite and in full view of the spectators, to fire a double charge of dynamite tied to the gas bag. He did, in great style. First, he was greased from head to foot. He then sat on a platform under the balloon, with a parachute tied beside him and, at elbow height, a piece of burning punk.

At the appointed spot in front of the crowd he moved his hand over to the punk and to the fuse. A double line of fire went up the sides of the bag, and an explosion shook everything. A cloud of black smoke obscured the balloon and part of the sky until, out of the bottom of it, shot Rodman on the way to the ground. Just before he hit, the parachute opened. It was a little late, and he was unconscious but otherwise all right. He received \$500 for the day's work. Asked how it felt to be in a dynamite explosion, he said, "Just like being kicked in the stomach with an elephant." He died in bed some years later.³

America's entry into the world conflict in April 1917 also brought the realization of the need for experienced fliers who could instruct. Because of my newly acquired "flying skill", I was transferred to Buffalo to take charge of instructing at the Curtiss field. It was the beginning of a series of events leading to test piloting for me.

But luck kept me from getting started too soon. Charles Wall, a



Baby T with engine relocated, at Naval Air Station Langley, April 1917. This was final configuration for model NC test. (Nasm photo A45885K)

Buffalo lad and friend of my brother, Sterling, came to the field with an inventor who claimed to have perfected a parachute flare for night photography purposes, and they wanted to try it out in a JN-4 in the daytime. R. M. Mead, one of the Curtiss school pilots was to do the flying but had not yet returned from lunch. Clarence Webster asked me to go instead if Mead did not show up in a few minutes. Fortunately for me, he did; in just five more minutes both he and Wall were dead! The flare had fired prematurely inside the airplane, and the dense fumes stifled them both. Dick Depew and I had the sad duty to break the news to Mead's wife.

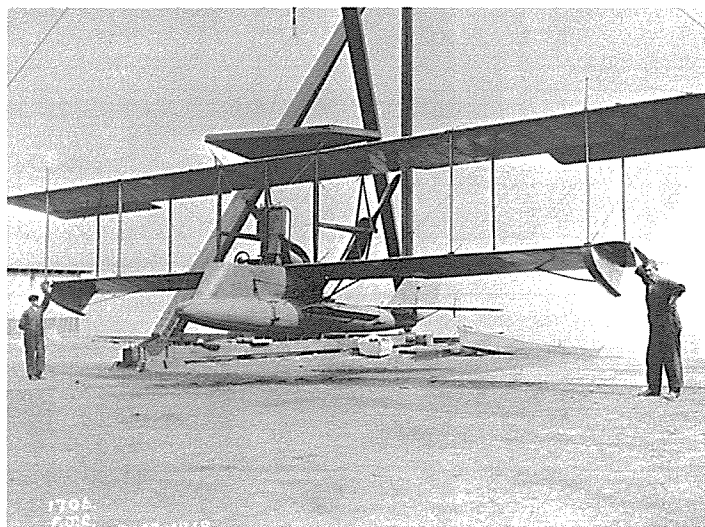
Victor Carlstrom was killed only a few days later, on May 9, 1917. He was aloft over Newport News instructing Army student Cary B. Epes when their Jenny broke up and fell 3500 feet to the ground. Both men were killed. Since JN's had not been known to break up the air an investigation was launched that determined a wing attach pin, unsafetied, had fallen out. Victor had learned to fly with Frank Stites at Griffith Park, Los Angeles, in George Barnhart's first airplane. Aviation lost a great pilot, and I, a friend.

Fred Zimmer took over a Curtiss' test pilot, but after only two days he met his death when the F-type flying boat he was in, struck the top of a telegraph pole as he glided in for a landing on the Erie Canal near Buffalo. Thus, with the tragic passing of Fred, I was installed as the next experimental pilot.

My first test was of the "Special Looper" built for Katherine Stinson. This machine featured, naturally, a built-in powder case and mirror. Henry Kleckler, creator of this special craft, was on hand for the first flight. The hop was noteworthy because it was very tail-heavy. Lady Luck, again, had a part in my landing. The wind velocity was high, and the landing ended with a swoop from fifteen feet, with touchdown at near zero speed. I gave Henry the degree of tail-heaviness I had experienced, and flying was called off for the day. Within a few days, Katherine's brother, the one and only Eddie, had flown it for his sister, and modified it to a monoplane. Eddie couldn't fly any airplane without having to resist looping it.

My first attempt to fly from water was in the Curtiss R-6 which had a Liberty 12 engine installed; I believe it was the first flight of the Liberty 12 engine. Takeoff was from the Niagara River, and I spent only a few minutes in the air—a sparkplug insulator was blown into the sky. The second hop was uneventful - until beginning to taxi into the dock. As I approached head-on I shut off the engine, expecting the hydro to coast to a normal stop. It refused because of pre-ignition. At least six of the twelve cylinders kept on firing. Helpless to turn, I yelled to the men on the pier to ward off the wings. The upper wing was about four

The "Patent Litigation Plane", intended to duplicate features of the Janin described in patent brief. (Photo 1706 F.J.C., 3-22-1918)



feet above the pier and as the steadily approaching craft drew near, the men leaned forward to grasp the wing and ease the shock. However, it never reached their outstretched hands. The long pontoon, sticking out in front, struck the dock and bounced back. The overbalanced rescuers in one long line took a dive into the water. Col. Hall, the codesigner of the Liberty engine, witnessed this hilarious performance.

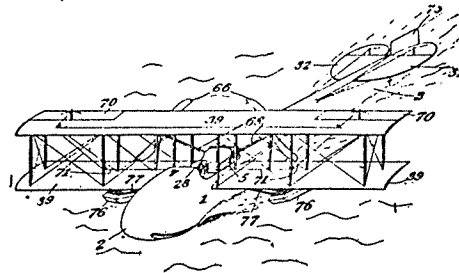
Test flights came fast in the latter part of 1917, as many as six hops a day. Though I didn't keep a log, most are well remembered. There was the Curtiss Model BTI, or "Life Boat," as it was called. It was designed by W.L. Gilmore and Commander Jerome Hunsaker as a miniature flying boat to test the concept of the later NC boats. The tail bracing — like that on the later Navy Curtiss boats — was the big question. There were other novel features such as the single Model K engine buried in the hull, with transmission shafts running to the twin four-blade propellers in the wings. The wings and tail were to be releasable as units, the idea being that if the engine failed in flight, the plane would land, the wing/tail units released, and a second, inboard motor would provide the power to proceed as a motor boat!

For several reasons I will not forget the first flight of the "Life Boat". Glenn Curtiss bet Gilmore that it wouldn't get off the water before the transmission failed. He based his opinion on the way the bevel gear housings acted on warm-up. These were located directly in the rear of the propellers and were already known as "The Wobbly Eggs". Along with the lack of faith in this craft, they chose as my takeoff location the swift waters of the Niagara River close to the Falls.

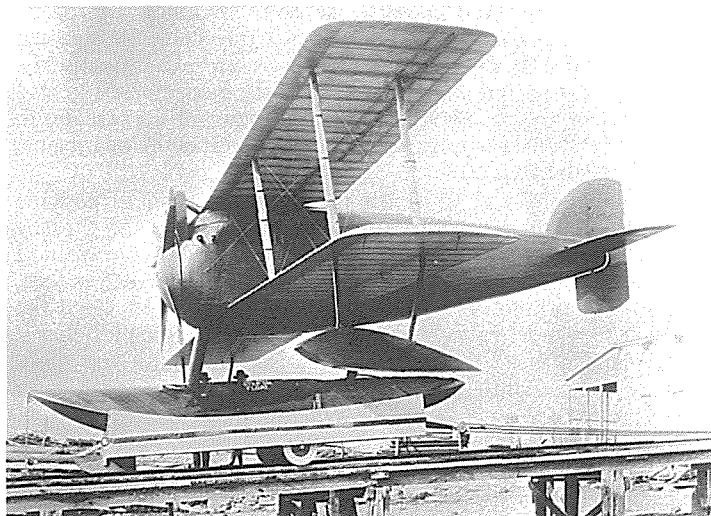
It was no joy-ride! And Gilmore got his suit because the transmission lasted just long enough for me to get to 100 feet altitude. One housing failed, and I had no choice but to head overland and, turning against the remaining operating propeller, come in to land on the River.

The "Life Boat" had further trouble. It was modified by mounting the engine between the wings and employing a single, tractor propeller. I demonstrated it from the Potomac River at Langley Field in an attempt to gain acceptance by the Navy. In spite of numerous tries, no flight lasted more than four minutes because a rocker arm support would break. It was always the same support on the same cylinder and it so got the goat of the designer, Kirkham, that he finally gave up in disgust. We never found out why that particular support constantly failed, and I believe the "Life Boat" ended as a grounded bird, used by the Navy to teach rigging.

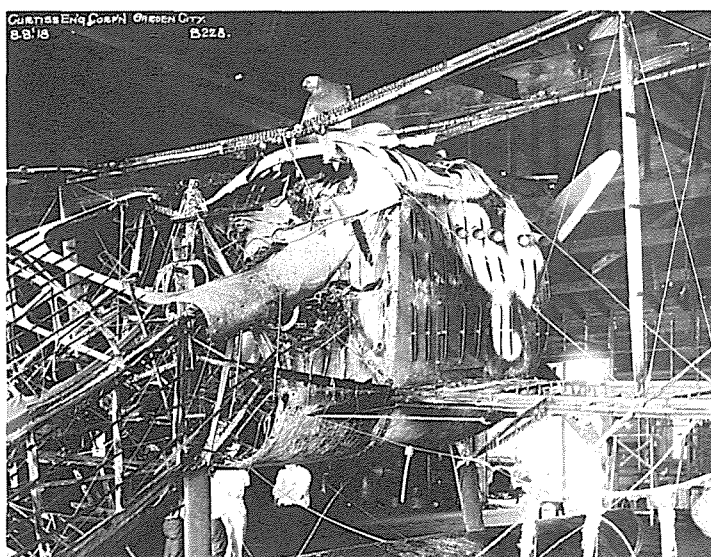
1,312,910. AEROPLANE STRUCTURE. ALBERT S. JANIN, New York, N. Y., assignor, by mesne assignments, to The Janin Co., Inc., New York, N. Y., a Corporation of New York. Filed July 31, 1913. Serial No. 782,225. 53 Claims. (Cl. 244—2.)



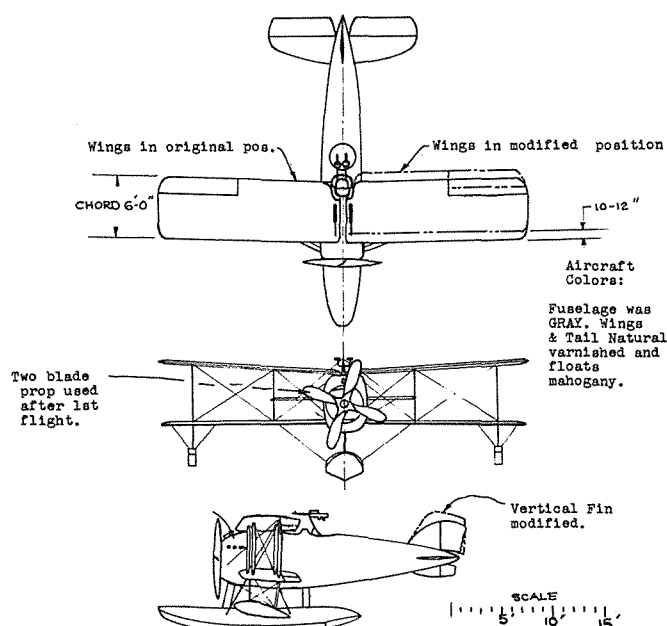
1. A device of the character described having a buoyant hull-like body portion adapted to traverse the water, and except for the aeroplane lift adapted to be substantially the entire supporting element at all speeds so long as the body portion is in contact with the water, planes extended from opposite sides of said body portion having movable parts and operable to sustain the structure during aerial flight and to assist in balancing the same during travel over the water, driven propelling means, and buoyant bodies extended at opposite sides of the body portion operable by contact with the water to assist in balancing the structure.



Original configuration (upper photo) of the Model H.A. with Liberty engine in short nose, lower rudder projection. (Paul Matt Collection)



The second H.A. was brought down by Rohlfs in the Sound with flame shooting into the cockpit. (Curtiss photo No. B228, 8-8-18)



Rohlfs' sketch of the modified H.A. (2nd prototype) indicated change in the wing position and larger tail unit, and with a two-blade propeller in place of the four-blade shown here.

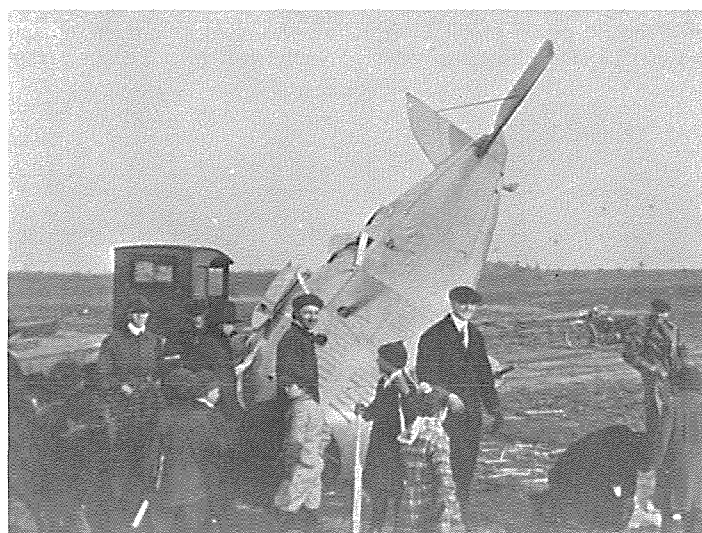
In the test flight of the S-5, a twin-float, tractor triplane, it would not leave the water, at least as other seaplanes did. This was powered by an OXX engine, and no matter what speed I tried, the pontoons wouldn't break free. Finally, at the highest possible speed I horsed back on the controls and waited. It zoomed almost into a stall and though I lost almost all the height again as it settled, I was airborne. More attempts determined that this was the only maneuver that would get it off the water and I gave up. The management didn't, however, and hired Eddie Stinson to see what he could do with it. To my amusement, of course, he had to do the same maneuver. But once he was in the air he looped it. Suffice to say, the pontoons were modified.

There were several attempted matings of the Liberty engine with European designs, and the British Bristol Fighter was one of these. Here was a headache that lasted more than a year.⁴ It had been designed for much less horsepower than the Liberty 12 and I had many flights, none of which lasted more than four minutes. These consisted of dashes once around the field and landing. On every flight something of major importance broke or went wrong, and I was lucky to get down in one piece. Phil Rader, who had a part in teaching me to fly, was killed when the fabric came off the wing of another which he was testing. The tough part of that accident was that he had been told by Dick Depew that the fabric was loose, before he left the ground. These Bristols had so many defects that my ground crew would bet how many minutes I would be up. It was not a comfortable pastime!

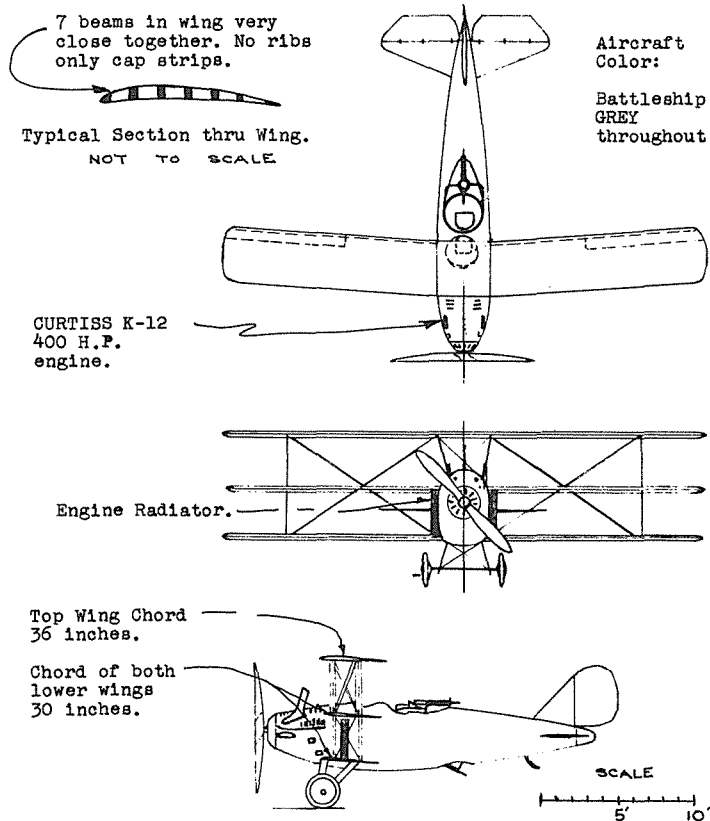
The Liberty engine contributed to the trouble. With two sets of unknown factors, airframe and engine, it was a mess. After production was finally stopped, surplus Bristols were staked, nose down, in warehouses all over the county.

There was even an airplane built to prove it would *not* fly. Albert S. Janin, another inventor, was suing Curtiss, stating that he had a design that flew from water before Curtiss did. So Glenn had a craft built, a biplane with conventional tail but with body shaped like cigar. There was no step on the bottom of the hull, only a rounded, smooth shape from stem to stern. The cockpit was at the forward end, and there were side floats, one on each side of the hull about one foot away and too small to be effective. Several times I tried to get it to plane on the surface of the water but it was impossible. As soon as power was applied, the nose went down and nothing, even full back-stick, would bring it up except stopping the power. On the last trial, I kept at it until the water came in over the front and landed on my lap. Others tried also, but with the same results. It would not even cruise through the water, let alone *fly*!

The "Dunkirk Fighter", designed by Major B. L. Smith, USMC,



In the photo above the H.A. had been modified to a landplane for use by the Post Office. It crashed off the end of Roosevelt Field in a demonstration flight by Rohlfs. (Rohlfs photo)

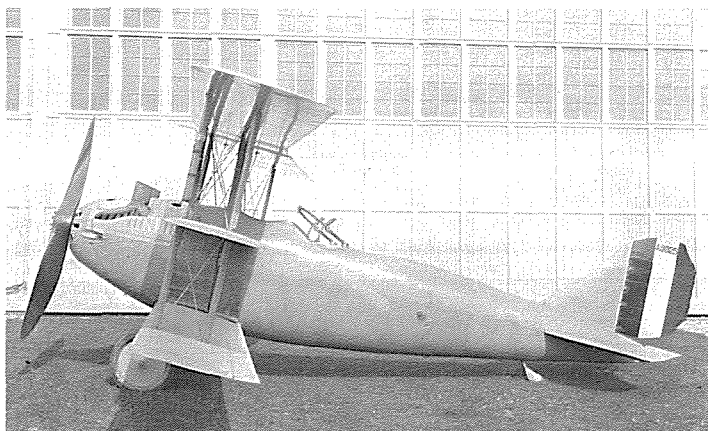


Curtiss Model 18T "Wasp", as drawn by Rohlf, showed basic dimensions and indication of wing structure. Careful attention to streamlining was given to the airplane, which included one of first American usages of swaged streamlined flying and landing wires.

and constructed by Curtiss Company, was created with the intent to regain air supremacy from the Germans in the vicinity of Dunkirk. It was a revolutionary two-place fighter, the fastest hydro at that time, and powered by the Liberty 12 engine. It became something of a joke, and in the shop was given the identifying initials, "H. A.", which provoked many a laugh as you may guess. My relations with H. A. were far from humorous.

The Curtiss management was so enthusiastic and confident about the possibilities for this machine that they broke precedent and invited all of the government officials they could to witness its first trial flights at Port Washington, on Long Island Sound. Cdr. Read was one of the spectators.

Major Smith, himself a Marine Corps pilot, was my passenger, his job being to pump gasoline. When all was set, I gave it the power and after a very short run we practically shot into the air. From



The Navy's Wasp, A3325, in this Wright Field photo No. 1600, shows the clean fuselage lines, and to the eye, the perfect balance the designers wanted. The Kirkham K-12 engine swung a massive coarse-pitch prop.

that first second after takeoff, we were in the hands of an uncertain fate, so erratically did our craft travel. Its fin area was too small, and with excessive tail-heaviness, our path resembled a line in a jigsaw pattern. Our situation could be compared to that of birdshot in a wash-boiler, so violently were we thrown about. Sense of direction was lost, and fear took hold; cold sweat came, regardless of the windblast.

My only thought was to finish the flight as soon as possible before the insane aircraft tore itself apart. I closed the throttle and the gyrations increased. I opened it and they continued. I waited for the next dive and closed the throttle more than before, when lo and behold! the plane steadied. As it gained speed the tendency to wander again returned but I was able to counteract it and we landed in a flop in Hempstead Harbor. Smith was black and blue for a month afterward, but he had done a fine job on the gas pump.

A serious miscalculation had been made—the center of pressure of the wings was twelve inches forward of where it should have been, and the tail dropped as the wings began to lift. We had found out the hard way that there was only one speed and altitude that the airplane would fly steady.

Shortly after this wild ride, the H. A. was revised to eliminate that crazy characteristic but the next hop was also not without incident. It was a hot summer day, and Joe Meade, the project engineer, and I went up for a ten-minute climb test. The engine had long exhaust pipes and most of the length was enclosed within the engine compartment. The effect of the summer heat was soon apparent, and on reaching almost 2,000 feet altitude, there was overheating for lack of ventilation. The big Liberty began to miss and there was a puff of smoke that blew back into the cockpit.

I shut off the engine and dived. The gasoline in the carburetor had boiled and a fire was started, thus, immediately into the dive long, thin jets of flame torched into the cockpit, blowing through small screw holes in the compartment wall. This situation was unbearable, and I was forced to leave the seat and sit on the cockpit rim with only my feet inside. By hooking my foot around the control stick, I could get us down. Joe (and I) welcomed a successful, if abrupt, landing on the Sound. The airplane was destroyed in the fire.

Trouble again appeared in a third flight of the H.A., now a more modified version. Lt. Al Stengle, USN, was my observer and I was just lifting off the water when the bottom of the main float came off; the drag created forced the nose downward into the water. Though I managed to break it free and get about five feet into the air, I couldn't hold it, and on contact, the plane began a slow somersault. Stengle jumped, but I played squirrel, and as the airplane nosed over and went around, I went the opposite direction, ending up on the bottom of the upside-down pontoon. It floated so that I did not even get wet, but laughed at Stengle's expense.

This battered H.A. was repaired and was further modified and eventually accepted by the Navy, but after another incident, a Lt. Bradley was sent to accompany me on a single flight before delivery. There was a last climb test to make, so it was decided to combine it with the acceptance test. After a wide circle in the air, I came close to the water before beginning the climb. Too close, for in the instant I looked at the airspeed indicator at my left shoulder, the main float struck the water, and the resultant bounce was to a hundred feet in the air.

I looked around for my passenger, not to be seen. I circled the spot where we had bounced, expecting to find at least the bottom of the pontoon; nothing was there, no sign of my companion. But as I looked, I felt a touch on my shoulder. There stood Bradley, grinning, his face covered with blood. His seat had collapsed on that bounce, and he went all the way to the bottom of the fuselage, hitting everything in the way. Nevertheless, he wanted to continue.

Foolishly falling in with his mood, I began a new climb, thinking

none the worse of the bump. Some days are poor for climbing, and though I felt something was wrong, I let it go as we reached an inferior altitude in ten minutes. As I shut off the power for the glide, Bradley suggested spinning down, but I said, no, I would loop it. I made a sloppy circle of it, and hastened to begin another. As we reached the top of the loop and held there, I could see the wings move ahead, first one side, then the other. It was sufficient to jar some sense into me, and I gingerly regained an upright condition, landing as gently as my nerves would allow. Climbing out of the plane, we were greeted with the mechanics' cries of,

"Look!"

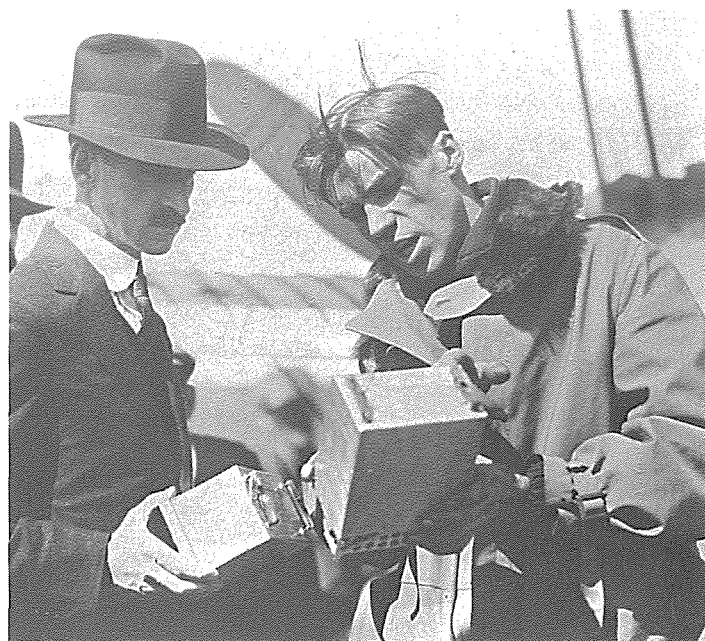
Examination showed all of the main lift wires were festooned like a clothes line. The impact of the bounce had forced the pontoon toward the fuselage, resulting in loosening of the wires between the main float and the wings. Had I chosen to spin, it would no doubt have wrenched the wings free from the fuselage. The loop, however, had been an even maneuver tending to keep the wings in normal position.

In spite of the H.A.'s misfortunes, the Curtiss management still felt there was a market for it, and decided to convert it to a landplane for the Post Office. The fuselage was exceptionally large and capable of carrying a large consignment of mail bags. Its high speed was more than any other airplane than in service with the Post Office. The Department requested a comparison test with the Curtiss R-6, of which they had several. Though high speed was much better than the R-6, I was doubtful of the low speed, one of the requirements. A special course was laid out at my direction along the old Motor Parkway on Long Island where the only obstructions would be potato fields and one cross-road. It was a mile long and I went out to practice slow flight. I felt I could maintain a speed about one mile an hour above the R-6, but when the test did come in fact, the R-6 at fifty feet altitude was several miles slower than I was at three feet using ground effect. The hare was trying to go slower than the tortoise!

In the second demonstration, held at Roosevelt Field for Postal officials, the H.A. carried in the mail compartment a passenger, Carl Adams, half brother of Glenn Curtiss. He had to sit on the floor of the mail compartment, with only the view of my face through the hole in top of the compartment. We took off and climbed toward the Curtiss factory and then back to the field. I put the plane in a down-wind power dive, the better to impress the watching officials with our speed. About opposite them, and flying low, the engine began to misfire. Not enough room to land ahead, nor altitude enough to risk a reversal. I tried, instead, to revive the dying engine which seemed to be starving for fuel by vigorously working the air pressure pump. Only a few half-hearted coughs were the result. We were now approaching the east end of the field which ended in an abrupt decline, and at the bottom, a line of very unfriendly telegraph poles. We were now so low that I could not even see the telegraph poles over the brow of the incline ahead. Change of direction was out of the question; the wings would have hit the ground, and the airplane continued to skim the surface of the ground.

The wheels touched the ground briefly, but there was the incline, and it fell away faster than the airplane would settle. I was robbed of the last chance at control so I yelled at Carl to brace as we flew directly into one of the poles at fifty miles an hour, cutting it off at the base. The H.A. was demolished, but we both escaped unhurt. The difficulty was caused by a bit of foreign matter in the pressure relief valve. So far as I was concerned, it was the end of the H.A. - I was not called to fly one again.

In early 1920, a Curtiss D-12 engine was installed in a DH-4, and I gave it the installation checkout flight. After a few minutes flight, the engine began to skip ominously, and the air pressure gauge, which registered pressure to force fuel to the carburetor, was reading low. Thinking the motor pump had failed, I reached for the hand pump and in a few strokes saw the air pressure rise. Regardless of this, the engine continued to skip all the way to a



Rohlfs and Glenn Curtiss examine barograph instrument after record-breaking altitude flight to 32,450 feet on 18 Sept. 1919. The next day a climb to 19,500 feet in 19:42:04 was made. (Rohlfs photo)

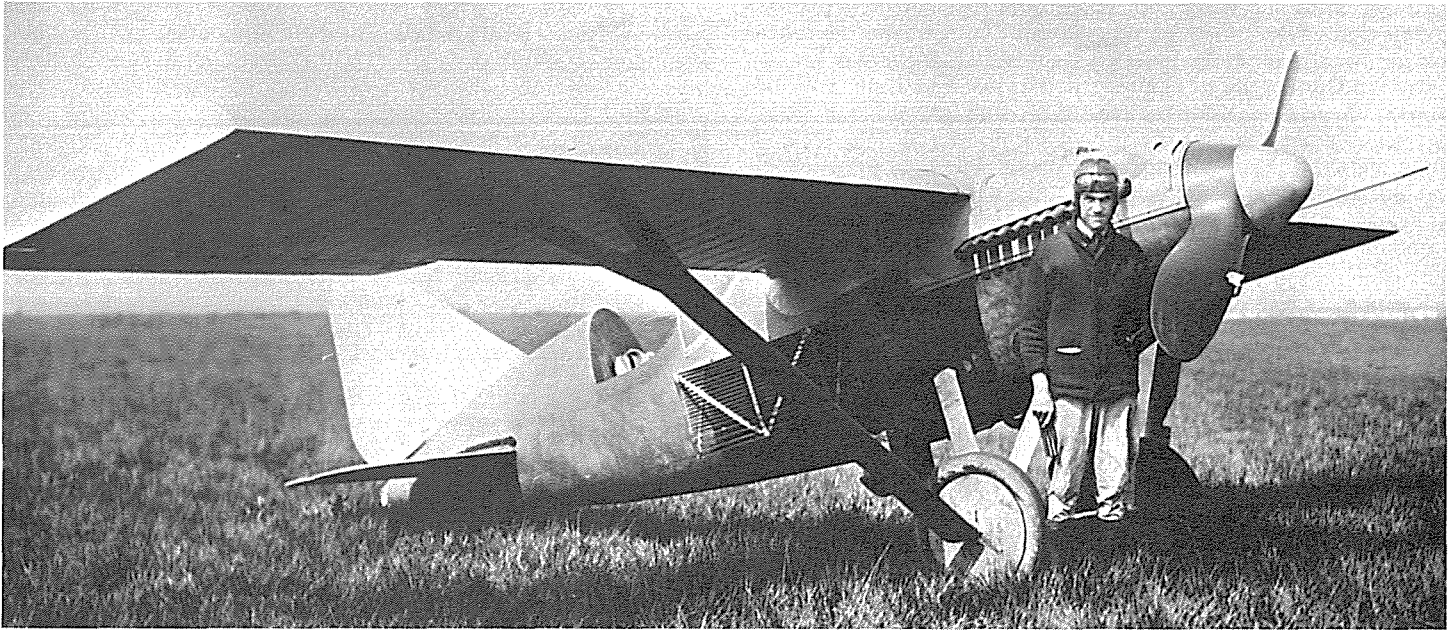
landing, after which I kept the engine running while I ran around the wing to the engine to find the trouble. Peering between the cylinders, to my horrifying astonishment, there was a stream of gasoline coming from a broken fuel line. You can imagine with what haste I shut off the switch. Using the hand pump had only caused more gasoline to shoot from the break onto the hot engine. Why the wind-torn streams of air, charged with gasoline and flame, had not caused a raging inferno remained unsolved to say the least.

Between test hops of the H.A. I had been introduced also to the "Wasp", a triplane with a K-12 engine. Its engine and airframe were the creation of Charles Kirkham, who had now been with Curtiss since before the War, and it was the first that we had seen where the airplane and its engine were made for each other. In consequence, it became a world beater, forty miles faster than any other of that day, and its rate of climb and altitude ability set new world's record.

The first test flight was made in mid-1918 at Mitchel Field. Kirkham towed the airplane over from the Garden City factory behind his Packard. After warming up the engine, I looked over my shoulder to watch Kirkham's reaction to the roar of the engine, and to my surprise, he was calmly talking to the field's commanding officer; he was so sure that everything was all right



Oriole with C-6 engine at Mayer Field, Bridgeville, Pa., owned by C.P. Mayer, in Summer 1920. It crashed and was rebuilt as racing type similar to one used by C.S. "Casey" Jones. (Kenneth M. Sumney)



Roland Rohlf with TEXAS WILDCAT at Roosevelt Field, July 1920, with thick camber wing.

(Paul Matt Collection, No. 3713)

that he was paying no attention. And he was right - to a tee.

The Wasp was in perfect balance, a real achievement as usually many adjustments had to be made to bring the airframe/engine/payload combination into balance for satisfactory flight. The engine was equally in tune, so the flight was entirely uneventful and when the ground crew towed it back over to the factory, Mike Thurston remarked that "now they knew how to balance a plane before it flew."

However, few airplanes are without flaws and the Wasp was not an exception. Six test flights were made before the assault on the altitude record could be made. In the process, a faulty oiling system which would not work at the steep climbing angle, resulted in burning out three engines.

In one of the test hops, I reached an altitude of 32,000 feet where the temperature was 40 degrees below zero! While admiring the fleecy grandeur of a giant cumulus cloud, suddenly it turned over in the sky, or so it appeared. The sky turned grey, and thinking perhaps another cloud was blocking the light, I turned to look at the sun, and all went black. The next thing I remembered was a high pitch screech, and I could see nothing. Then the world opened up before me as the Wasp emerged from a cloud in a headlong plunge. I barely regained control before landing on the field underneath.

The oxygen supply had frozen in the dispensing apparatus and I had passed out. Next day, Gilmore, then Chief Engineer, showed me the barograph chart from the instrument in the airplane. There was the vertical drop, registered in ink from 32,000 feet to 22,000 feet, an almost vertical line on the chart.

On September 18th, 1919 we, the Wasp and I, climbed to the world's record altitude, 32,450 feet. I could see nearly 200 miles away, both east and west and all around to the south between. Yet to my surprise there was no apparent curvature to the horizon. I marveled at this seemingly straight line the immensity of the circle, the mass it enclosed, and the weight. Could it be possible - I wondered - does all this float in space? With a feeling akin to awe I turned from the surrounding void and started my descent to Mother Earth.

The 1919 New York to Toronto Air Race was a wide open affair from start to finish. The contestants were divided in two groups, one starting from Mineola and the other from Toronto. I was to start from Toronto, in an Oriole, in No. 2 position.⁵

My mechanic and I, wearing innertubes as life vests, crossed Lake Erie and were the first to reach Buffalo and then Syracuse, but at Albany "Shortly" Schroeder beat us out. At Mineola we found

that the British dirigible, the R-34, was taking up most of the field. On the next day, on our way back to Toronto, Walter Buhl and I force landed, luckily in the only available spot for miles around. We fixed the radiator, which had sprung a leak, with chewing gum and went on to Toronto, where we came in third, we thought. The whole race was so poorly managed that the race officials settled by giving everyone a gold wrist watch instead of prize money.

The larger commercial airplane launched in the postwar market by the Curtiss organization was the "Eagle", a tri-motored biplane with K-6 engines. The first flight, on August 4, 1919, was again a lucky affair. Takeoff with no load was okay, and all well until the glide. As I letdown, the airplane decelerated too much and was settling fast as I leveled out. Contact was rubbery, no bounce, and I taxied to the line, but when we looked at the landing gear, all struts were bowed. They had not broken, nor sagged enough to let the propellers strike the ground. But had a load been carried the whole must surely have collapsed.

After repairs I flew the Eagle again without event, and left the same night for Buffalo, on the train, for another flight. Returning the next evening on the train with some other Curtiss men I was advised that Mr. Champion, of the Champion Spark Plug Company, had made a bet with his Pittsburgh associates that he would return the next day in the new Eagle. This was a surprise to me because the Eagle had not yet been fully tested. However Mr. Champion was a large Curtiss stockholder. And I was not familiar with the route to Pittsburgh, nor the destination landing field.

Nevertheless, Champion showed up with seven passengers and after numerous delays we left Mineola late in the afternoon. Off we went with no landing lights, no flares, and no radio. There was barely enough gasoline to reach Pittsburgh under ideal conditions. But the Lord saved us - we had gone no farther than Patterson, New Jersey, when the center radiator blew up, and forced us down in a very small field. The bet was lost but our skins and a brand new airplane were still with us. I took on another test job the next day and the fabulous Bert Acosta was sent to get the airplane out of the small field. He did.

The Eagle, with three K-6 engines, was underpowered. A modified twin-engine version with two Curtiss C-12's was made, which I flew in May 1920. The takeoff was hair-raising. I took off south from Roosevelt Field, with a line of barracks at my left which terminated with a single building sticking out toward the field. No sooner had I picked up speed than I became aware I could not hold it straight, and I was veering directly for that end

building. Since it was too late to shut down, I prayed instead, and noted that the left engine was slowed considerably. Would the remaining power get me over the building, and if it did, could I hold a course?

I made it over the building by the narrowest of margins, or so the observers said later. The weak engine was doing more poorly and I had to shut it off. With all the power on the right side I had to drop the right wing to control direction. Precariously making a circle, I landed safely on the field where we found that the water pump drive shaft had snapped, apparently on takeoff.

To represent the United States in the James Gordon Bennett Aviation Cup Race, to be held in France in 1920, Seymour E.J. Cox, a "wealthy" oil man from Texas, placed an order with the Curtiss Company for a racing airplane.⁶ Known as the TEXAS WILDCAT, it was built by Curtiss, and to bring the glory of winning the Cup to America, to the Curtiss Company, and to Mr. Cox, I was chosen as pilot!

To this time I had not worn a parachute. The circumstances in obtaining one were interesting. I had discussed it previously with Gilmore but no action had been taken. Jack Foote, test pilot for the L.W.F. Company, was testing a small single-seat monoplane at Roosevelt Field and I had become acquainted with him.

While I was looking it over, Foote came along and offered to let me fly it — quite an honor in those days for most companies were very jealously guarding their products. Though I disliked to refuse him, I did, and I know he was genuinely disappointed. Shortly afterward I heard the engine warm up, preparatory to the afternoon tests. Together with Gilmore, I watched him take off. Twice Foote passed down the length of the field, and on the second, at the east end of the field, the wings folded like playing cards. The tiny airplane and Foote were through. When the excitement was over I turned to Gilmore and inquired. "What do you say now? Do I get a parachute?" "Yes," he said.

Soon afterward Floyd Smith, of parachute fame, personally delivered one of his back-type chutes and endeavored to instruct me in the complicated art of folding and packing.⁷ As the day was cold the silk would not behave because of static, and he ended the lesson by telling me what to do and what not to do. He left town on other business. Some time later, when the weather warmed, I packed the chute from what I remembered of his instruction, and still later, jumped with it from the Jenny as I have related. It worked, and now with some confidence I was ready for the WILDCAT. As luck would have it, the parachute saved my life, but not in the expected manner.

By early August the WILDCAT was ready for its first test. I was up at 4:00 a.m. on the 2nd, to ensure still air for the first hop. The grass was wet and the heavy craft's narrow wheels cut deeply into the turf as we pushed it from Roosevelt No. 2 over to No. 1. There with the sleek plane facing east I warmed up, and gave it the gun. In spite of full throttle the Wildcat was sluggish and before I eased into the air nearly all the field was behind. Levelling off to let it accelerate, I began a right turn over Mitchel Field, and almost immediately the turn was complete the stick all but flew from my hands, threshing violently from left to right and back. What I saw in looking at the ailerons was not reassuring; they were moving up and down at such an incredible rate I wondered how much bending stress the wing was undergoing. All my strength on the stick could not stop their insane motion. I throttled back, allowing the speed to fall, and gradually stopped the wild dance, and landed much to the relief of all. Gilmore and Thurston, who had designed it, ended the nervous aileron situation by raising the trailing edge of both ailerons about an inch to get them out of a dead spot and causing positive pressure on them in the neutral in-flight position.

Late in August, Mike Thurston, Charles D. Case, T. J. Johnson, W.J. Irwin and I, with Clarence Coombs as the alternate pilot, and along with the crated TEXAS WILDCAT and CACTUS KITTEN sailed for France. America was to be well represented in the

Bennett classic. Beside our Curtiss entry there were the sleek Dayton-Wright RB-1, a full cantilever monoplane with variable camber wing and retractible landing gear, and the V.C.P., a pursuit biplane designed by Etienne Dormoy and Alfred Verville.⁸ Howard Rinehart was to pilot the RB-1 and my good friend, Shortly Schroeder, was to fly the Army V.C.P. Capt. Corliss C. Moseley was his alternate.

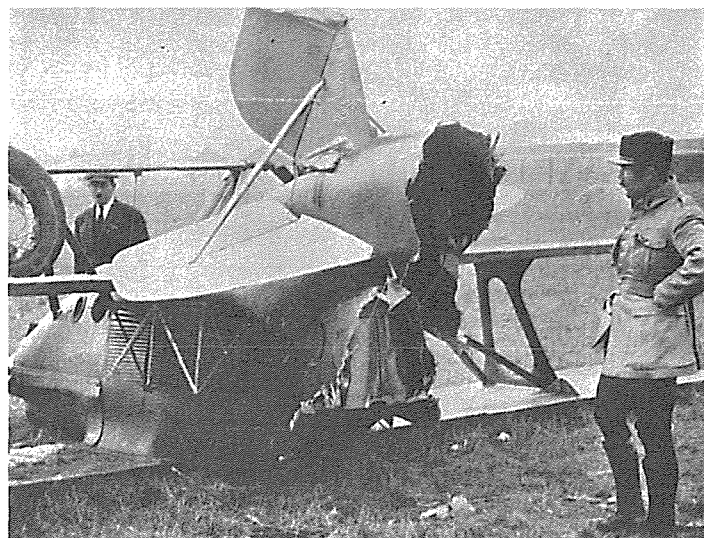
Though the French are a warm, friendly people, their customs and railroad officials did little to help expedite the movement of our crated equipment. My crew and I spent nearly two weeks battling our way from the port of entry to the Morane Saulnier field near Paris. On arrival there was a race against time, with speed classic less than two weeks away. We assembled the Texas Wildcat, leaving the Cactus Kitten to rest in the crate.

For our trial flights in America we had used a thick, and slow, monoplane wing. Now came the time to fit the Wildcat with the special racing biplane wings, which featured a double cambered surface. It became interesting to know that, because of the wings and no shock absorbers in the landing gear, nor brakes, practical takeoffs and landings would require a mythical table-like field of infinite length!

Five days after our arrival at the field by the Morane Saulnier factory, the powerful racer with the new biplane wings in place and a fiery red fuselage was ready for test. I thoroughly warmed the engine, and gave the signal to pull the chocks. The Wildcat was stubborn, and moved not an inch as I opened the throttle. Thinking the crew had failed to remove the chocks I again signalled, but was informed that the chocks were away. Mike Thurston reached the cockpit and yelled into my ear. Because, he explained, the propeller was geared to the engine crankshaft and was turning at a low speed, its blades had been cut to excessive pitch in order to pull the craft through the air at high speed. It impaired their efficiency at low speeds, and while Mike's explanation was technically correct, it didn't help me to get the Wildcat under way.

At the next try the Wildcat, aided by a push from the mechanics, finally started down the field. Slowly we gathered speed, but instead of responding to the large power being expended, it seemed to drag. I held it straight in spite of the limited forward vision because I knew all was clear for at least a half mile. Faster and faster we sped. But the Wildcat remained captive to the earth until it had consumed the entire flying and part of the adjoining open space.

Not five hundred yards ahead and directly across our path ran a deep ditch, and a row of telegraph poles. Caught in a speed trap — too slow to rise and too fast to stop — I tried to raise it. I left the ground only to sink back. Another hundred yards passed and I tried again. This time the Wildcat came up with a quiver — the



Rohlf crashed on landing at Etampes with this result. (Matt Coll.)

crucial moment. I nursed the slight advantage and gradually I was being airborne. In a quick look downward, there were the telegraph wires flashing by a bare three feet below the purring "Cat".

We picked up speed and I started to bank, circling back over the field at 900 feet. The TEXAS WILDCAT was in her element at last, slicing through the air at 190 mph. There was a sudden tremble and we began to pitch violently up and down. I slammed the throttle closed with but one thought, to end the pitching. I overshot the best part of the field and found myself well out on the farm plot, with its foreboding ditch beyond. Blurred strips of earth passed swiftly underneath, then one wheel touched, and as I strained to keep things level a wingtip scraped the ground. Another correction and both wheels contact, and I was down in a long, fast roll.

Minutes later Mike Thurston and the crew reached the spot. When the dust settled, there was that ditch not more than 100 feet away. But we were more than curious to know why the plane had bucked so hard. Four strongly secured inspection doors had been torn loose. Later study revealed that the particular wing curve — of double camber and the first that had ever been tried on a racing plane — had made the airplane unstable at high speed. Violent oscillations were the result.

Since the race was only a few days away I was pessimistic about our chances, but I had not figured on Mike's resourcefulness. That night Mike laid out plans for a new set of wings tail surfaces for the racer.⁹ The next morning found him busily engaging every available man in the Morane Saulnier plant and a completely new set of wings were built — in four days' time! The modified airplane again became a contestant just one day before the Cup Race was to be run. And the rules of the race specified that all entries had to be at the starting line one day ahead.

At 2:00 o'clock, though, on that day we were still working feverishly, but 3:00 found the crew pushing our squat biplane onto the field just as Capt. Moseley landed from Etampes. He had come to learn what was delaying us. On finding we were ready for takeoff, he left immediately, but left admonishment — be ready for anything on our arrival.

I was satisfied with the modified racer to that point, but the fact that I was to fly an untried airplane over some thirty miles of strange country gave me a feeling of misgiving and I took aboard only enough gasoline to last fifty miles. The takeoff run and acceleration were perfect. The airplane now had new wings and tail, and a special propeller.

Just as I was easing back on the stick a severe jolt indicated that the wheels had struck an obstruction hidden in the grass. With a great bounce the WILDCAT shot into the air and we were on our way to Etampes, the starting point of the great Aviation Cup Race. My rejuvenated plane was flying well, but I was having difficulty following the course on the French map. After ten minutes I wasn't sure of my position so I looped back. Picking up on the horizon the Eiffel Tower, I used this as a marker and again set course for the race field.

It came in view ahead, but I was stunned by what I saw on the ground. On the landing area, which closely resembled a farm land complete with furrows, there was a line of men near the center. I interpreted this as indicating the best direction and place to land, so, making a gentle approach I came in along the line of human markers. The Wildcat was but a few feet from the ground when the engine sputtered as it consumed the last drop of fuel. No cause for concern at this point — all set for a good landing. The wheels and tailskid touched as I felt a perfect three-pointer coming up. That was all I remembered!

I had passed out.

When the landing gear struck that hidden obstruction on takeoff, both wheels had been so damaged that when they were called upon to support the airplane in landing they collapsed. The landing gear struts drove straight into the ground and the racer

stopped, suddenly. The turnover broke the fuselage in two right behind the cockpit and now I owed my life to Floyd Smith's parachute, which had stopped a broken fuselage longeron from spearing my back. The top of my crash helmet was ripped off, and I had a dislocated shoulder. The boys dug me out of the mass of broken wood and torn fabric, the end of the career of the TEXAS WILDCAT.

To be forced out of a race is a bitter disappointment for any pilot but as I studied the situation I considered myself the most lucky person in France for two reasons: First if I had not lost my way to Etampes, there would have been enough fuel left in the tank to cause a fire. Secondly, if I had not damaged the wheels when I did, the weight of full gas tanks in a subsequent takeoff over that furrowed field would surely have collapsed the wheels. A resulting crash might also have ended in fire.

The CACTUS KITTEN was returned to America, transformed into a triplane and successful test flown by the one and only Bert Acosta. Later it was entered in the 1921 Pulitzer Trophy Race at Omaha, Nebraska, and Clarence Coombs, who had not flown it before, was the pilot and barely escaped with his life in the race.

In 1921, when test flying was transferred to the armed services and company airplane testers were not longer considered necessary, my career with Curtiss ended. Happily, I might add, for I was still alive due to a lot of — *PLANE LUCK!*

NOTES AND REFERENCES:

1. Lake Keuka is now the site of the Curtiss Museum. See *Keuka Lake Memories, 1836-1936*, by William Green Gordon, privately printed, Rochester, 1967.
2. In 1911, Macauley had written to the Wright Brothers and to Curtiss about flight training. Failing of reply from the Wrights, but on receiving reply from Glenn Curtiss he came from Chitina, Alaska to North Island and joined a group of Army Signal Corps officers then under instruction at the Curtiss school.
3. See News & Comment, this issue, "Man-Carrying Rocket", by James C. Reddig.
4. See Opdycke, et al. "The American Bristol Fighter Program, WW1", *JOURNAL*, Summer 1972, pp. 85-89.
5. See also Molson, K.M. "The First International Air Race, New York to Toronto, August 1919." *JOURNAL* Fall 1971, pp. 263-272.
6. Actually, it was Cox's wife, Millie, who made the Curtiss Company the final selection of 12 solicited for bids, and she signed the contract for the TEXAS WILDCAT. S.E.J. Cox came two months later to order the CACTUS KITTEN. Ref: Foxworth, Thomas G. "The Famous Gordon Bennet Aviation Cup Race, 1920." Address at Manhattan Beach, Calif., April 1970.
7. Floyd Smith was associated at McCook Field with Leslie Irvin who had made his first successful jump there but a few months before.
8. See Nye, Willis L. "Charles Hampson Grant", *JOURNAL*, Fall 1971, pp. 204, 205.
9. Foxworth reported these were of RAF 15 airfoil section. See above Note 6.

ABOUT THE AUTHOR and CO-AUTHOR

The accompanying article was prepared some years ago by Brewster C. Reynolds as the result of a long series of correspondence with Test Pilot Roland Rohlf. After the period described here by Mr. Rohlf, lasting from 1914 to 1921, he went on to be Operations Manager of the short-lived Aeromarine Airways, and, in 1926 to Sales Manager for Claude Neon Lights Inc. Demonstrating the need for this type of lighting on aircraft led to his becoming Vice President of Aerial Advertising Inc., and flying the aircraft displaying advertising on the lower wings. The depression hit and he became Operations Manager of Metropolitan Air Ferries, flying Ford Trimotors between North Beach (La Guardia Field), Newark, and Floyd Bennett Field. Autogiros occupied his attention from 1932 to 1938 as Operations Manager for the Heart Island Transportation Corp., and in 1938 he went with the Civil Aeronautics Administration subsequently holding the post of Chief of Technical Section, and others, from which he retired in 1953.

Brewster C. Reynolds is Archivist, Prudden Historical Library and Archives, San Diego Aerospace Museum, and also a near charter member of the AAHS. He started in the aviation industry in 1937 at the Curtiss-Wright Corp. St. Louis airplane division, moved to Southern California, and he has been associated with aviation and aerospace ever since. His work in the electro-mechanical and electro-optical fields led him to participation in both the aerospace (lunar vehicle) and deep oceanography (deep-sea vessel) fields. A lifelong interest in the history of aviation, however, enabled him to join the San Diego Aerospace Museum in the timely period when it was beginning to emerge as the largest in Western United States.