The Cunnigham-Hall PT-6 prototype, NX461E, with 300 HP Wright J-6 engine, first flown 3 April 1929. Six-place, all metal structure, fabric covered.

CUNNINGHAM-HALL AIRCRAFT CORP. STORY

By RANDOLPH F. HALL

All photographs and drawings courtesy of author.

The Cunningham-Hall Aircraft Corp. was organized by personnel from the Thomas Morse Aircraft Corp. shortly before T-M was acquired by Consolidated Aircraft, and by a group from the James Cuningham Son & Co. of Rochester, N.Y. The Cunningham company was an old firm, established in 1838, and for many years had manufactured carriages, coaches and motor cars, hearses and military vehicles, many of which were expensive custom-built conveyances ordered prior to construction. The Cunningham group was headed by F.E. Cunningham who became president of the Cunningham-Hall Aircraft Corp., incorporated in 1928.

The T-M personnel were Paul Wilson, already a well-known test pilot, W.R.R. Winans, Secretary, who had been purchasing agent for T-M and myself, as vice president and chief engineer. I had been assistant chief engineer for T-M, and partly responsible for the original Model 6B, later O-19 observation airplane. W.T. Thomas, one of the original Thomas Aeroplane Co. brothers, became a consultant and director of the C-H company. There were several others from Ithaca including P.F. Brown, in charge of airplane assembly, J.F. Newton, wing assembly, and a young lad named W.M. Smith, who later became chief scientist and now in charge of the Bell Aerosystems New Orleans air cushion vehicle facility. My brother, T.P. Hall, who had been running some wind tunnel tests at M.I.T. as part of his thesis work was engaged a little later on. He became chief development engineer of Consolidated Vultee Aircraft Corp. in San Diego during WW II.

It does not seem incongruous to mention here that the Cunninghams were a fine group of gentlemen of the old school, cautious in business but not too familiar with the problems of the aviation industry at the time. They were exceedingly interested in exploiting patented developments, more so than I, as I considered this only as a side issue.

The first airplanes produced were the Cunningham-Hall PT-6 biplanes. This was a six-place passenger transport. We had begun the basic design and analyses and completed them before the company was formed. A production line of 25 was started and the material actually purchased therefor. But only a couple were completed (the Great Depression came before we were well launched) due to retrenchment, and lack of sales partly because of the price. The original price of $16,000.00, although reduced later, may seem just a trifle today but it was considered high then.

The C-H Company was located in the old Cunningham plant that included a good machine shop, heat treating facilities, and so on; the car company had made and tested their own designed engines. Airplane assembly was on the 4th floor of the old carriage building which was not particularly suited for aircraft manufacture, especially since the larger airplanes, minus surfaces, had to be lowered to the ground by cable and winch when completed. Beside, there was the fire hazard of wooden floors and the space was broken by columns supporting a low ceiling.

The PT-6 structure was all metal, and the cabin was metal covered. The fuselage aft-end and all surfaces, and the wing except for the leading edge, were fabric covered. Cabin walls were insulated and sound proofed with balsam wool. The pilot compartment, separate from the cabin could be entered from the outside or through the cabin. A second seat in the pilot's compartment could be lowered into the floor to facilitate entry from the cabin although it was awkward to try. Dual controls were installed. There were four comfortable seats in the cabin, which was heated, and there was a generous luggage compartment aft of the cabin.

The interior of the first airplane was finished in synthetic red leather. In keeping with the tradition of Cunningham cars the interior was rather luxurious for an airplane, but by

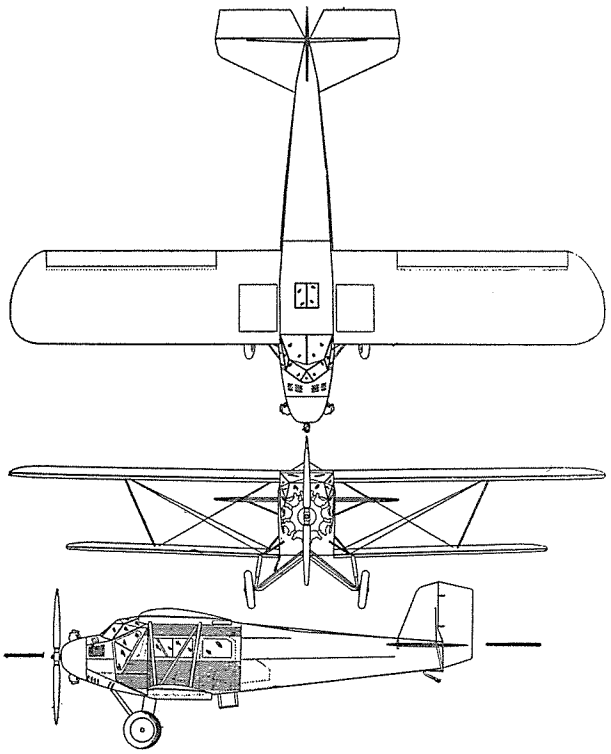
The principles of the Cunningham-Hall project by the first PT-6 just prior to its first flight. From left: The author, Randolph F. Hall, Vice-President and Chief Engineer; then Cdr. J.W. Iseman, Paul Wilson (test pilot), W.T. Thomas (consultant), F.E. Cunningham, President of the company, J.C. Dryer, Vice-President, and W.R.R. Winans, Secretary.

a struggle it was accomplished without excessive weight. The second airplane was finished in an attractive gray velure.

We designed the PT-6 to the U.S. Army's corps observation airplane strength factors which were in excess of the Dept. of Commerce requirements, and its strength was amply demonstrated during flight test maneuvers. Air Corps specifications and AN standards were fully complied with.

Work on the first airplane commenced in the Fall of 1928 and the first flight took place the following April 3rd. The initial test hop, which was made at the nearby Woodward town's LeRoy Woodward Airport by Paul Wilson, was followed by all afternoon flying of company personnel. Paul then flew it to Detroit two days later for exhibition at the Detroit aircraft show.

No changes were necessary as result of flight tests; in fact, the only change we made was replacement of the tail skid by a wheel. Approved Type Certificate No. 177 was granted soon afterwards and number NC-461E assigned to the first airplane.[1] This one was flown over 15,000 miles, including many chartered flights and non-scheduled cross country trips.



Three-view of Cunningham-Hall PT-6 Doppeldecker, from Jan. 1930 issue of *Zeitschrift fur Flugtechnic und Motorluftshciffahrt.* At left, cabin interior, well appointed in synthetic red leather.

NC-461E was eventually sold, though my records do not disclose to whom. But in the months after completion Joe Mirquet, a Rochester pilot, used the PT-6 for chartered flights and fur business in Canada. He equipped it with skis to fly to remote areas, bringing back pelts obtained from Indian traders for his father's fur business. Frozen lakes were often the landing sites for his ski-shod plane.

Paul Wilson, sometimes with Warren Brizee as relief pilot, carried passengers to football games around the Ivy League country. In addition to Rochester pilots, many well-known aviators flew the PT-6, Jimmy Doolittle, Maj. G.E. Brower (later the first U.S. casualty of WW II in Egypt), Major Edward Aldrin, Comdr. J.W. Iseman, Jimmy Taylor, Frank Burnside, Baron Montauffel, and the internationally known lady pilots, Amelia Earhart and Lady Mary Heath. George Eastman of Kodak Company made his first flight in a PT-6.

NC-461E was chartered for extensive aerial photographic surveys by the Fairchild Company, observation windows being installed in the floor and the undercowling for the purpose. For water take-offs twin Edo floats were available to replace the landing gear. Fuselage fittings were provided for attachment to the float struts.

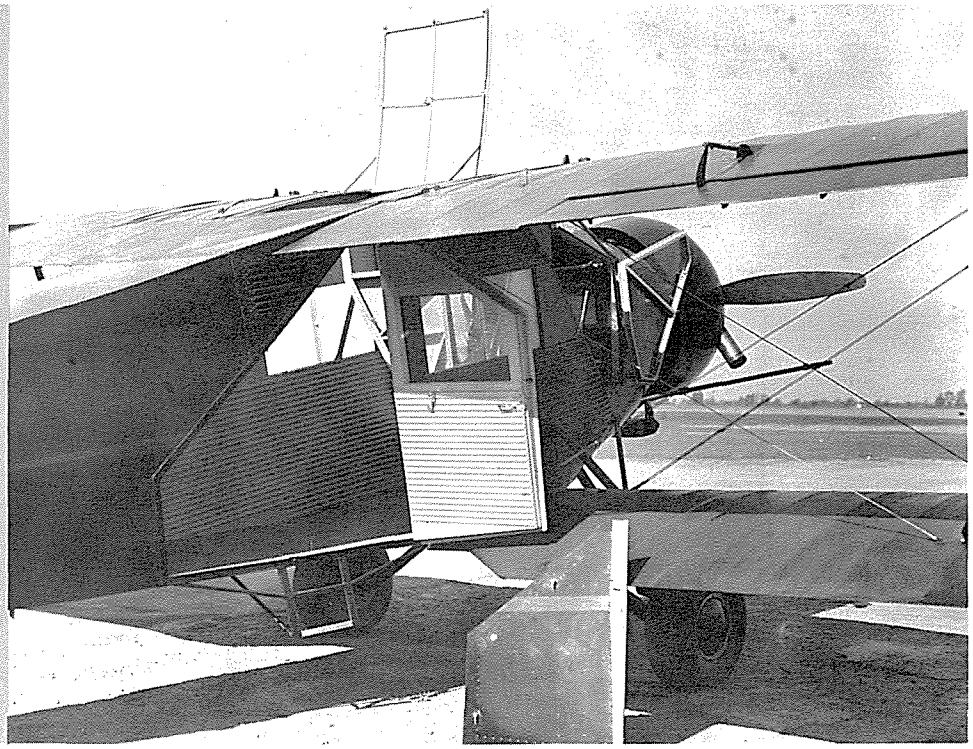
The second PT-6, NC692W, was completed for the Rochester Exposition of Summer 1929 and following that show was flown away, sold to someone on Long Island. The PT-6F for freighter) was ordered by a mining company in the Philippines Islands, which for some reason was unable to accept delivery. This model of the PT-6 came later; I had left the company and was away for a couple of years and came back to finish several airplanes, but more of that later.

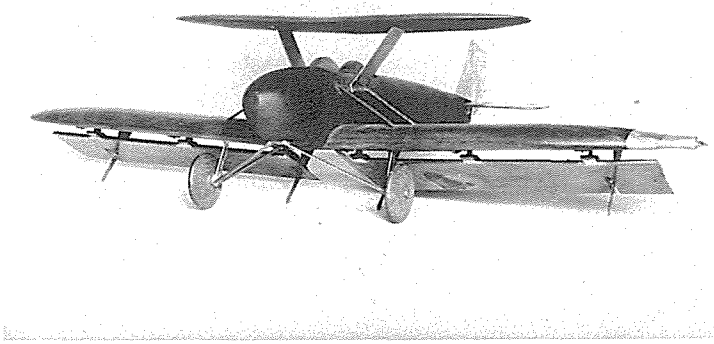
Attracted by prize money, a 1st prize of $100,000, and an option to purchase patents covering the so-called Hall high-lift wing, the Cunningham group desired to enter the Guggenheim Safe Airplane Competition to be held at Mitchell Field in 1929. I was somewhat reluctant to do so because of the short time in which to develop an airplane with any chance of winning; however, the Board decided in July to enter. There remained less than four months to design, wind tunnel test, analyze, construct and flight test an airplane before flying it to Mitchell Field prior to the competition closing date of Oct. 31st. Our high lift device was novel; it involved a wing with passageway to allow air to flow past a vane, located on the underside leading edge section, that opened to allow air to escape over the flap

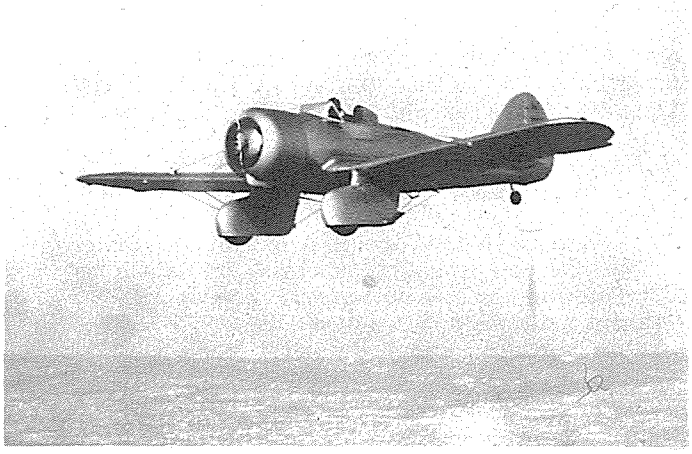
Top left, the PT-6 on skis during a period of charter flying and aerial freight service into Canada before being sold.

Right, the PT-6F, built several years later, was sturdily built for freight hauling, had wide loading door and upper hatch.

Top right, the Cunningham-Hall M-90(N), or Model X, built for the Safe Airplane Competition instituted by the Guggenheim Fund for Aeronautics, on its second flight with Wilson and Hall, 28 Oct. 1929.







when lowered.[2] Wind tunnel tests reported by Prof. E.P. Warner and others on 4x18 inch models in the M.I.T. four ft. tunnel showed some promise but the feature had never been flight tested. There was the possibility of unforeseen complications.

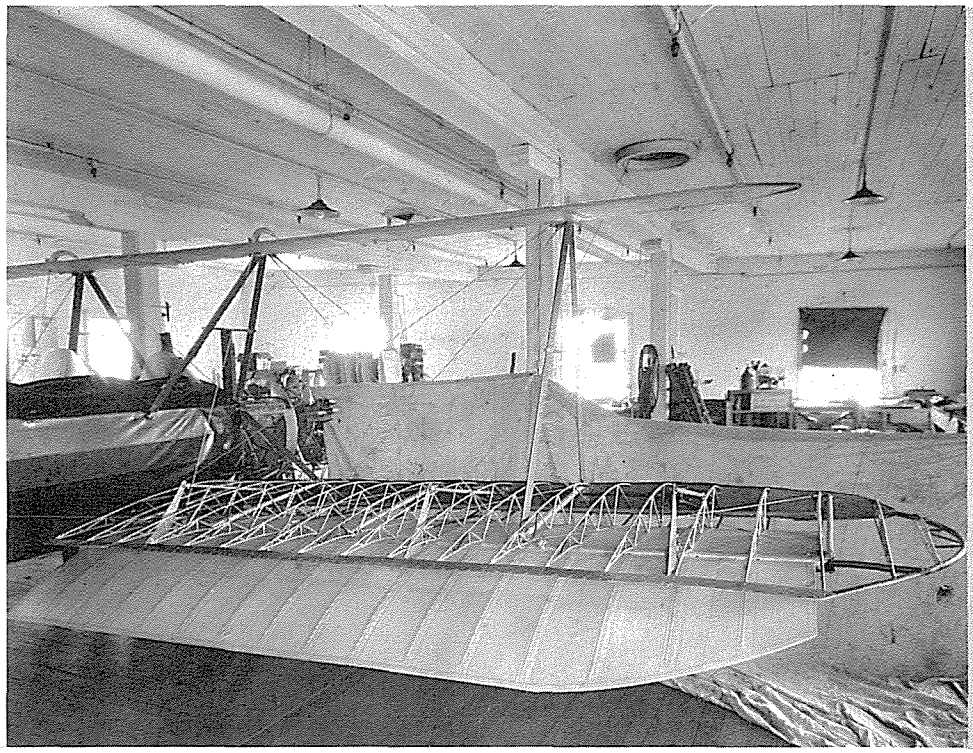
Among the competition qualifying requirements were: high speed 110 mph, low speed 35 mph, clear a 35 ft. obstacle in 500 ft. with not over 300 ft. run and a 12° glide angle (originally 16°).

Our only hope for meeting the entry date was to employ an existing airplane design, revising the wings and probably changing its power plant. Consequently, a Fairchild Model 21, less wings and engine, was selected. A Walters 7 cylinder "Venus" engine of 115 hp, made in Prague, Czechoslovakia, appeared at first to be the best bet. It was soon evident that it would be necessary to obtain the lighter weight 5 cylinder Walters "Vega" rated 85 hp, because of an apparent overweight airplane. This had been caused in part by substitution of materials and conservative structural design, in order to favor meeting the low speed condition.

It was hoped that by, shrouding the engine in a Townend ring top speed might be attained, or close to it. The Vega engine was developed from the Walters NZ60 of 75 hp and had the same bore and stroke but a lower compression ratio. The replacement engine finally installed, due to a mishap, might have been a little under power.

Wind tunnel test results of the airplane model, supervised by T.P. Hall, were none too good so it was decided to change the small upper surface that did not have ailerons to one incorporating ailerons which would depress slightly simultaneously. To further increase the lift, the flaps were connected by a unit under the fuselage.

The airplane was called Model X-90(N) but was sometimes referred to by its original designation Model X. We used a Clark Y airfoil. The upper wing span was 26 ft., the lower 30 ft., the upper wing area was 50 sq. ft., ailerons were 30 sq. ft., and the lower wing had 153 sq. ft. The flaps were fully 57 sq. ft. Our gas capacity of 21 gals. and weight, as tested in the competition representing a useful load of 470 lbs. (includes the weight of 2 persons), was 1773 lbs., about 200 lbs. over the intended gross weight. This resulted in a surface loading of 8.75 lbs/sq. ft. and 19.7 lbs./hp (based on 90 hp).



Top left, the original wind tunnel model of X-90 with the smaller upper wing without ailerons and only dual strut bracing.

At left, the structure of the lower wing of Model X-90 and showing the lower flaps covered and installed. Interplane struts now connect upper and lower wings.

Top right, the GA-21M in first version, with side-by-side seating, semi-retractible landing gear, and shock-cord operated flaps in flight over Rochester. This later became the GA-36.

X-90 was completed just before the entry date and the first flights, took place on Oct. 28th. Poor weather permitted only two hours time in the air before Paul Wilson took off for Mitchell Field on Oct. 30th. An accident occurred near Utica, N.Y. Quote from the Utica Daily Press:

> "Flying a new Cunningham-Hall experimental plane east from Rochester to New York by way of Albany, Paul Wilson, test pilot for a Rochester aircraft firm, late yesterday felt the peculiar sensation which comes when the front end of the crankshaft breaks and the propeller drops off. He was, at the time, 2500 ft. above and above a mile west of Oriskany, in sight of Utica Municipal Airport. For safety's sake, however, he made a successful landing in a field on the farm of John Munn, where he quickly formulated plans for trucking the ship to New York, where it will be entered in the Guggenheim Safety Contest. He is still looking for the propeller. Pilot Wilson praised the work of the Hall high lift slotted wing in helping him to land with ease and safety. Yesterday was the second day on which the plane had been flown."

As might have been expected, the airplane did not pass the Competition tests, but it created considerable interest due to its novel features. The Curtiss Tanager won and the Handley Page entry was runnerup. Both had Handley Page leading edge slots. The X-90 was safe to fly and control generally considered adequate except that lateral response was poor with the fully lowered mechanically operated flaps.[3]

Paul flew the X-90 back to Rochester after the Competition for adjustments and some fifty hours of flight testing during 1930. In these tests the weight was 1575 lbs., surface and power loading being 8.75 and 18.5 (based on 85 hp) respectively. The results in performance were considerably improved, but these would still not have fully complied with the Competition requirements. In the later tests the high lift wing reduced the stalling speed by 12 mph. Take-off was improved, and the landing runs, measured from where the wheels touched the ground to a point of rest using brakes, were sometimes less than 100 ft. Without braking, the distance was doubled and with flap up and no braking, averaged 444 ft. The steep glide angle was increased to 13.06°.

Experiments were also conducted on automatic lowering of the flap at slow speeds by means of shock absorber cord units. Lateral control was improved by the automatic operation. However, the airplane was eventually returned to the factory and cannibalized.

Several conventional airplane designs were underway, but the company, needing to conserve capital – it was now in the deepening depression – wished to only pursue the development of the high lift wing. I would have liked to do both. Owing to an unfortunate disagreement, later resolved, we stopped further development and the C-H Company was engaged solely in the manufacture of sand blast helmets and miscellaneous parts for a time. During this period our Assembly Dept. moved to smaller quarters on the first floor, until agreeing to continue development.

Once this was resolved, some tests were run on a 10x60-inch wing model, using NACA No. 2415 basic airfoil, in the Daniel Guggenheim School of Aeronautics at New York University. These were done by Prof. Alexander Klemin during 1934 and verified by check tests at the University of Detroit Aeronautics Dept. The results were encouraging, and were followed by construction of the GA-21M airplane. ("M" for Modified)

We had designed an all-metal structure, fabric-covered, one-piece wing with an NACA 2415 basic airfoil of 32 ft. 10 inch span and 66 inch chord. It was ordered by the Bureau of Aeronautics to be mounted on a Fairchild Model 22 airplane in place of its usual wing for tests in the NACA full-scale wind tunnel at Langley Field. During these tests and subsequent flight testing during 1935, we found that the effect of the high lift wing was to reduce the minimum speed of the airplane by 10.4 mph and its takeoff distance over a 50 ft. obstacle by 190 ft.

In other effects the horizontal distance in a gliding descent of one hundred feet was reduced by 217 ft. and the steep gliding angle increased 4.7°. The air passage of the Hall-designed wing contributed 2.3° of this with the passageway open and the flap fully down, the peak of the lift curve was flattened, delaying and making for a better stall condition. With flap partly down, as for takeoff, the passageway increased the lift approximately 23%. There was more lift with it open, flaps 10°, than with it closed, flaps 20°. The automatic operation of the flaps, which extended over only 76% of the span could not be satisfactorily flight tested because of internal friction of the mechanism; this prevented their fully lowering. The lateral control forces were high. Ailerons were in the wing upper surface above the flaps.

The general performance was inferior to the same airplane with the Fowler flap, e.g. the minimum speed with the latter was 4 mph less and its wing was 25 lbs. lighter. Here, again was an example of rushing through an experimental device, in early stage of development, for demonstration without at least preliminary flight testing and adjustments by the manufacturer, a lesson others have no doubt learned too.

Turning now to a design on the board after the X-90, which was of a small, two-place side-by-side, open-cockpit, low-wing sport job called the GA-21, for general arrangement. We soon decided to modify this design using more power, selecting the Warner Super Scarab engine with an air starter and incorporating the high lift wing. A semi-retractable landing gear and sufficient space aft of the cockpit for luggage or to carry a third person were to be incorporated, hence the GA-21M was born.

GA-21M was of all metal construction except for the fabric covered empennage, ailerons and flaps, and part of the wing upper surface. The stabilizer was adjustable and ailerons were located in the upper surface of the wing above the flaps. Except at the wing tips the flaps went full span. The ailerons lowered 4.5° when the flaps were 37.5° full down.

This also had the Hall high-lift wing. The front vane, which made the air passageway, was spring-loaded and functioned automatically to open when the flap opened. The flaps were automatically operated by a single, shock absorber cord bungee unit, and could be held raised, or set for any degree of movement by a mechanical control.

The GA-21 was first flown in Nov. 1934 and was subjected to extensive tests during the Winter and Spring of 1935 by Guy Stratton. The handling characteristics and performance were pretty good, but due to criticism of the crowded side-by-side cockpit and the fact that automatic flap operation was erratic, the airplane was returned to the factory for modification. We felt that lateral control could be improved and the flap mechanism needed work to permit full lowering of flaps.

There was the hope, too, that tandem cockpits would have more sales appeal. It was decided to eliminate the semi-retractable undercarriage, influenced by an incident in which Stratton was flying. Coming in for a landing the cockpit indicators signaled that the wheels were not locked

Bureau of Aeronautics procured this Hall high-lift wing example, mounted on a Fairchild 22 fuselage. Shield on rudder states "NACA 60."

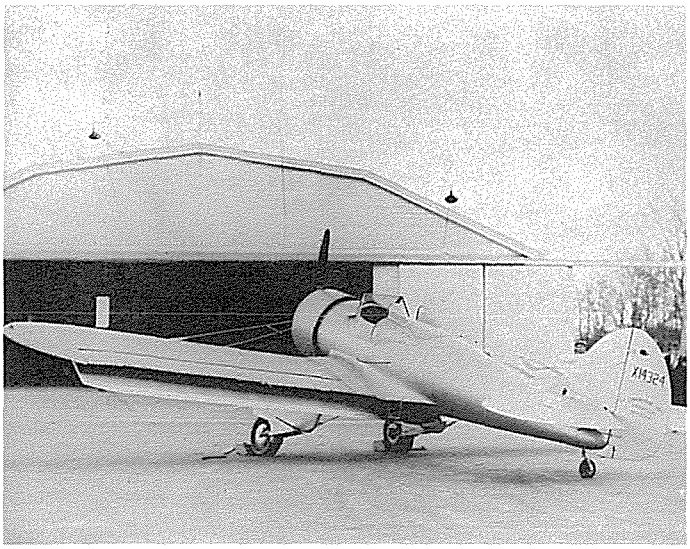
down. It looked as though the passenger might better bail out and let Guy chance a landing alone. Luckily, after a couple of dive pull-outs at considerable altitude, okay signals appeared and a normal landing was made. Afterwards, to be on the safe side, the airplane was jacked up and the gear mechanism examined. One of the down locks was defective, but a second failsafe down lock at each wheel had held. Thus the decision to change.

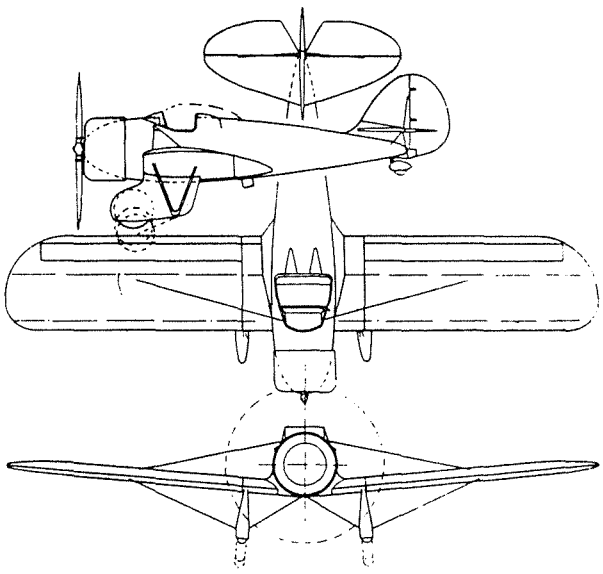
The GA-21M was continually stunted and subjected to all kinds of maneuvers, e.g. vertical banks, wingovers, inverted flight, slow rolls, snap rolls, whip stalls, loops, spins and dives by different pilots. I often went along as observer. In one vertical dive Ray Hylan descended from 8000 to 2000 ft. pushing hard on the stick to keep vertical, mentioned that he got a violent headache and a black band across his vision during pull out.[4]

The GA-36 was the designation applied to the rebuilt GA-21M. The tandem cockpits were, of necessity, close coupled, and Dual controls were provided. A sliding hatch entirely enclosed the front cockpit and sheltered the rear. The fixed landing gear was streamlined. The flap operating shock cord was replaced by a compression spring unit, applying force to a torque shaft which rigidly connected to both flaps. An upper balance was designed for the ailerons to be used in conjunction with its lower paddle balance. Lowering the flap 12.5° increased the max. lift approximately 45% and when full down to 37.5°, the increase was 82%.

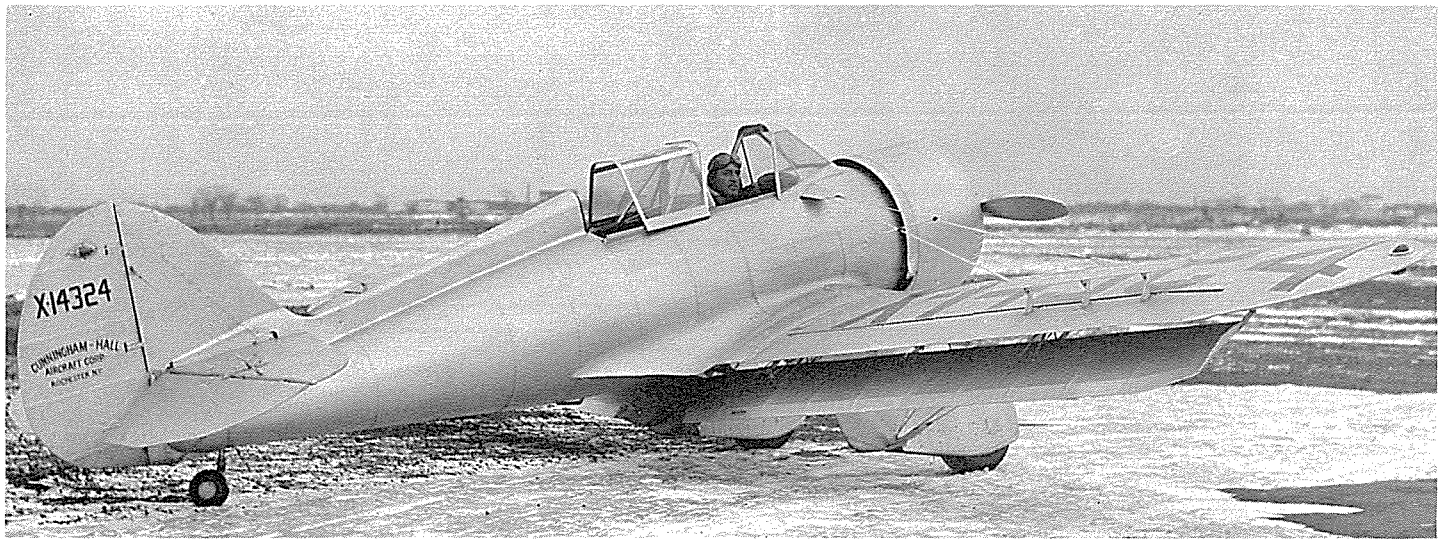
Otto Enderton was now the company test pilot on the GA-36. Merl Jenkins (now residing in Florida) or myself was the observer during most of the full-load flights. Testing of the GA-21M and GA-36 is a story in itself, extensively covered in comprehensive reports and some on 16 mm film. The airplane had a lot of flight time, including cross country trips to Langley Field, Bolling Field, Wright Field and the Cleveland Races for demonstration. Stall characteristics with the flap dowp, passageway open, were decidedly better than stalls with it closed. It was fun to do whip stalls in the former configuration holding the stick back and keeping level laterally to watch the flap automatically raise as speed picked up and then lower again as the airplane pulled up into another stall without too much loss of altitude. Good automatic flap function and lateral control was finally achieved with a full span flap. [5]

The GA-21M, X14324, with Hall high-lift wing and automatic flaps.

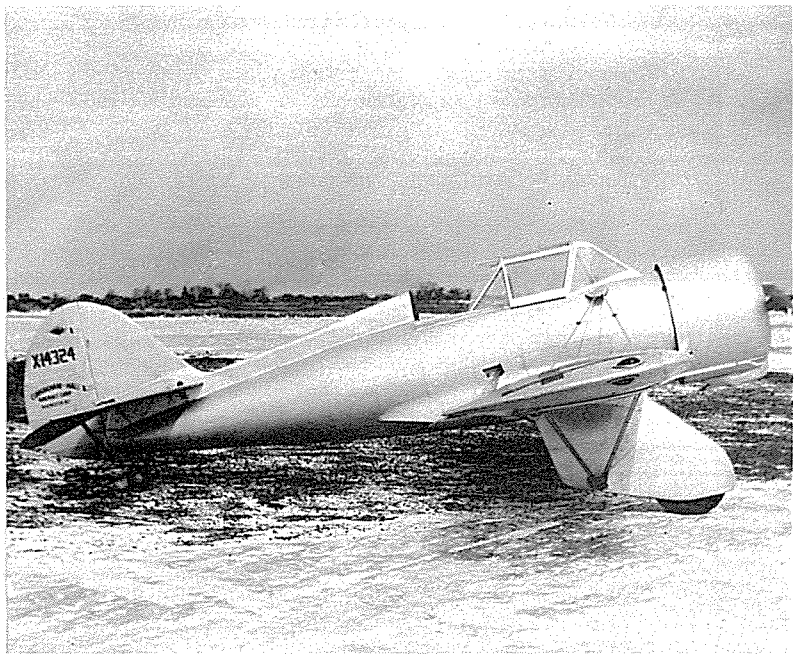


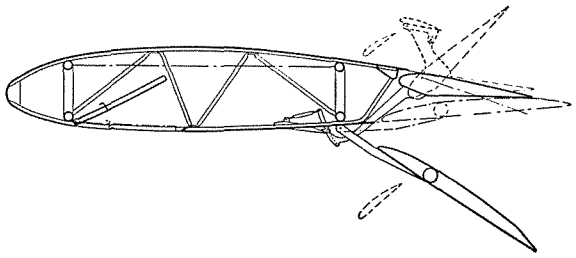


General arrangement of Model GA-21M.

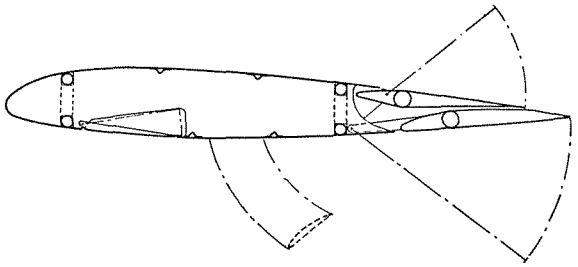


Otto Enderton in the GA-36 at Rochester, with the Hall high-lift wing and new canopy partially shielding rear cockpit.





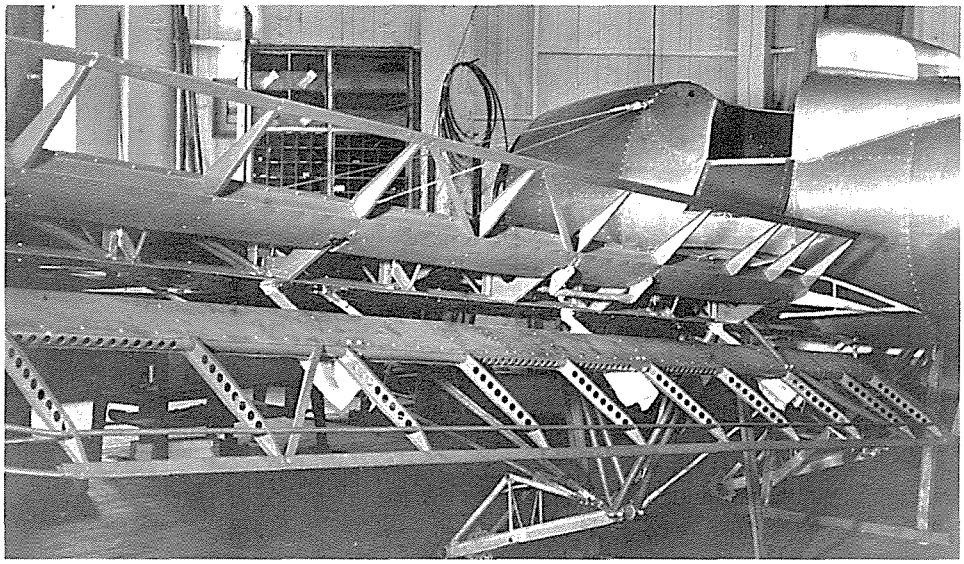
Section through GA21-M wing with GA-36 aileron upper balance indicated.



Section through semi-monocoque wing.

Below left, Jimmy Taylor with GA-36.

Right, the original GA-21M metal wing construction. Semi-retractible landing gear was hinged at rear.



To obtain independent impressions, the GA-36 was flown and stunted by many local pilots including Ray Hyland, Bill Sloan, Guy Stratton, Vic Evans and Comdr. Russell Holderman. It was well liked. There was general agreement among pilots that the high lift device improved takeoff over obstacles, stalls and landings. However, we had our shortcomings.[6] The overstrength airplane was comparatively heavy and did not out-perform some conventional two-place contemporaries in climb and high speed. A two position controllable pitch propeller was needed but never tried. With more wing area, power and possibly another basic airfoil the story might have been different.

James B. "Jimmy" Taylor, Jr. was hired to conduct check tests on company test results. He compared climb and high speed unfavorably with a couple of conventional airplanes but reported most favorably on the action of the high lift device and the lateral control:

> "The lateral control is excellent in all attitudes, particularly at and beyond the stall. It is better in this condition with flap down. There is complete absence of yaw . . . All maneuvers are quite easily made, slow roll particularly. It was noted also that the lateral control in inverted glide was very sensitive and nice." (With reference to the wing device he noted:) "With the forward vane fastened shut on one flight, the control, particularly at the stall, was definitely worse; also a good deal more altitude was lost in recovering from the stall; with the vane floating, the abruptness of the ailerons was not as noticeable . . . The landing characteristics are good, the automatic action of the flap is excellent. The ship can be brought in any desired speed and the flap remains partially closed. As soon as the speed is reduced the flap opens. It opens fully at 55 to 60 mph and closes at about 110 mph."

The last that was known of the GA-36 was that its corpse was reposing at the Tecumseh Airport, Michigan some 50 miles southwest of Detroit.[7]

PT-6F built in 1937 was test flown by Ray Hylan early in 1938. The owners were first Lonnie Brennan of Fairbanks, Alaska, then a photographer (name unknown), Al Letcher, and later Jim Larkin. The airplane was similar to the PT-6 except for cabin modifications including interior corrugated siding, a comparatively large loading left side door and hatch in the ceiling, Fig. 9, more power, a controllable pitch propeller, lower pressure tires and an N.A.C.A. engine cowl to improve performance.[8]

It was a good bush country airplane for getting in and out of small flying fields. Optional equipment such as chairs and wheel fairings were available. Instruments were manifold pressure, fuel and oil pressure and oil temperature gauges, tachometer, compass, airspeed, rate of climb, turn and bank indicators, thermocouple and fuel level gauge. Pipes of twenty feet length could be carried by loading through the removable cowl under the pilot's compartment.

There was an interesting although harrowing experience by Jim Larkin during a flight back to the States.[9] A frozen fuel valve necessitated the chopping of a hole in the floor with his machete and dribbling warm coffee over the valve to thaw it out and switch to a full tank, thereby avoiding a forced landing in the wilds of Canada.

The Cunningham-Hall Aircraft Co. bid unsuccessfully on a number of government competitive airplane contracts, and rather than expanding plant facilities and building a modern factory for aircraft production during WWII, the C-H company decided to concentrate on aircraft parts and the manufacture of gun mounts. It did not appeal to this author, and I subsequently joined Bell Aircraft Corp. I became project engineer on this country's first jet airplane, the P-59, spending some time on the Mojave desert at the secret Material Center Flight Test Base, and consequently becoming a member of the Jet Pioneers of America.

The C-H Corporation was dissolved in 1948 without loss to stockholders. In retrospect one sometimes conjectures what might have happened if . . . I would like to add that the Rochester Press, various organizations and the public were most generous in their red carpet treatment of the company. The advantages of the high-lift wing appeared to be outweighed by disadvantages. While construction was not as complicated as might seem valuable space inside a wing, often needed for other purposes, structural limitations, the possibility of icing under certain conditions and the fact that the Fowler flap produced more lift, further development was discontinued.

REFERENCES:

1. Juptner, Joseph P. *U.S. Civil Aircraft, Vol. 2.* Fallbrook, Calif: Aero Publishers, 1963.
2. Hall, Randolph F. "Experiments With Automatic Flaps." *Journal* of the Institute of the Aeronautical Sciences. August 1937, (Vol. 4, No. 10.)
3. Howard, Frederic. "Safe Airplane Competition, 1929." *JOURNAL of the AAHS,* Vol. 10, No. 1 (Spring 1965) page 28.
4. *Sportsman Pilot* Magazine, "A Son of the Revolution." Jan. 15, 1935.
5. Hall, Randolph F. "Hall Wing Characteristics." *Aero Digest,* August 1938.
6. *The Aeroplane.* "Toward the Venetian Blind," Aug. 31, 1938.
7. Pauley, Robert F. in *The Antiquer,* Feb. 1966, statement and photograph.
8. Angle, Glen D. *Aerosphere, 1939.*
9. *American Airman,* Vol. II, No. 2 (October 1958).

ABOUT THE AUTHOR

Randolph "Randy" Hall became interested in aviation as a young lad building and crashing a towed glider. He joined the Thomas Brothers in 1915, working under B.D. Thomas, and spent a short time with the Standard Aero Corp. during 1917. He was in the U.S. Army Air Service in France and was detached to service in Italy, as student and later instructor at A.E.F.U. at Beaune.

After the War Hall returned to Thomas Morse and was responsible for the structural analyses of 12 airplane designs that were satisfactorily proof tested, and became Asst. Engineer in charge of detail design. He is holder of a number of aircraft patents, and has contributed many articles to aeronautical magazines. Randy married a school teacher whom he met in Alps during WW I. They have two children, Theodore A., now a P.E. with United Aircraft Corp., and a girl, Lois. Randy retired 1959 with his wife to homestead at Wallingford, Connecticut. Beside being a Member of A.A.H.S. and the Jet Pioneers of America, he is an Associate Fellow of the American Institute of Aeronautics and Astronautics, and a member of the Society of Automotive Engineers. He is currently a Director of the Connecticut Aeronautical Historical Association, an activity he considers more fun than work.

JOURNAL OF A.A.H.S. AND NEWSLETTER COMPLEMENT EACH OTHER

The NEWSLETTER of A.A.H.S., and the JOURNAL are issued alternately, and are intended to complement each other in getting "the word" to the Members. Both are for the use of all Members — for the presentation of historical fact in the JOURNAL — and for those time-decaying news items, Wants and Disposals, and Introductions of New Members in the NEWSLETTER.

Annual dues are payable each January, but the 1st Quarterly NEWSLETTER is mailed to all Members of record at the last previous December 31st as a further reminder. Members are urged to submit information for presentation in the appropriate Society media. Share your interest in aviation history. Send correspondence to P.O. Box 996, Ojai, CA 93023.