

A-4 "Mike"

<http://www.airracinghistory.freeola.com/index.htm>



"Mike"



"Ike"

AFTER COUNTING THE trophies and money won by "Pete" in the 1930 and 1931 races, Benny Howard decided that there was money in the race game. He was also aware that "Pete" was on the way to being outclassed and if he was to remain in the winner's circle, he would have to do something about it. So early in 1932 work began on two larger racers. The end result was "Mike" and "Ike," (they look alike). The two racers were almost identical, the only difference being in the landing gears. They were both painted snowy white with shiny black lettering. "Mike" (DGA-4) drew license number NR-55Y and race number 38, (race number 7 was used, at Omaha) while "Ike" (DGA-5), carried NR-56Y and race number 39.

Both racers were low-wing, wire braced monoplanes, and like "Pete" were very small and had a minimum of frontal area. There was a slight difference in weight, "Ike" being a bit lighter of the two. Both were powered by Menasco Buccaneer engines of 485 cu. in. displacement, differing in octane ratings only. The engine in "Ike" was set for a higher octane, thus giving a little boost in horsepower. The extra horsepower and being a little lighter may have accounted for "Ike" being the faster of the two in 1932. Oddly enough, it was always a toss-up as to which of the ships would be the fastest from year to year.

Wing span of both ships was 20 ft. 1 in. and the fuselage was 17 ft. long. The cockpit in each case was hinged on the side and closed after the pilot was inside. A large hole for the pilot's head was left open. Ventilation was assured by 30 small holes drilled in the windshield. The cockpits were small and the pilot's seat was level with the rudders. A slight difference appeared in the engine cowling, with "Mike" having less cooling louvers than "Ike" but a larger rectangular opening on the left side of the cowl for cooling. "Mike" had a cowl designed for a spinner, which was never used.



The landing gears on the two ships were very different. The gear on "Mike" was similar to that used on Pete. with the rather large wheels housing an internal shock; absorbing system needed to meet CAA (then ATC' requirements (both aircraft were built to these specification-but never certified because of cancellation of ATC races . "Ike" had a novel tandem gear arrangement consisting of two small wheels spaced about 20 in. apart and covered by a single wheel fairing, one on each leg. Howard stated that this was done for a gag, but the gear did prove rather successful. However, ground handling and spotting the aircraft in the hangar presented problems since the wheels did not caster. Single wheels with spats replaced the original gears on both ships.

Ben Howard entered "Ike" in six events at the 1932 National Air Races. He flew three of them himself -taking two firsts and one second. During one of the races he was pressed closely by Roy Liggett in the Cessna CR-2 with Johnny Livingston and his short-winged Monocoupe a length behind. Bill Ong ran fourth in this event but later got "Mike" wound up and took second under same conditions.

Two major air races occurred at the same time in 1933, so Howard sent Harold Neumann to the American Air Races with "Ike". The tandem wheels had been removed and replaced with normal small panted wheels. This resulted in a weight saving and improved streamlining so a performance improvement resulted. Harold participated in only one event, placing third. He was dogged by engine trouble during the balance of the meet, so he stepped into the Folkerts SK-1 to finish the races.

Roy Minor and "Mike" were sent out to take over the Nationals. "Mike" had been modified considerably. The spinner design for the cowl had been abandoned and the large rectangular opening on the side was closed. Many of the cowl louvers were also faired in. A set of small wheels and wheel pants replaced the large un-spatted wheels of 1932.

Minor and "Mike" really took over the National Air Races of 1933, copping four firsts, two seconds, two two fifths, two thirds and one fourth. Both ships were present at the 1934 Nationals, with no apparent changes other than a recovering job on Mike," whose lettering was now in gold edged with black. Roy Hunt was in the cockpit of "Mike" and Harold Neumann in "Ike". Hunt picked up two fifths and .Neumann finished with two fourths. Best closed course speed for "Ike" this year was 211.55 mph, 30 mph faster than "Mike".

Jokingly called the 1935 "Benny Howard National Air Races", this was a banner year for Ben. His racers won the Bendix, Thompson and Greve Trophy races that year.

"Ike" was sponsored by the Chevrolet Division of General Motors and was known as "Miss Chevrolet". It was equipped with a special carburettor and now held the worlds inverted speed record. However, the ship did not participate in the races as Neumann wiped the gear off during qualifying runs. Harold came back strong winning the Thompson in "Mr. Mulligan" and three firsts in the 550 cu. in. class with "Mike". Marion McKeen had worked the bugs out of his new Brown B-2 and gave Neumann some uninvited competition by finishing less than one mile per hour behind "Mike".

The 1936 Nationals certainly were not a repeat for Howard. "Mike" was the only one to finish a race that year. Harold Neumann ran a speed dash in it, clocking 223.714 mph, which placed him fourth in the Shell event. Joe Jacobson placed fifth in the Greve and nosed over on landing. The 1936 races were not profitable to Ben Howard.

Only "Ike" appeared at the 1937 Nationals, now travelling with the Fordon-Brown Air Shows. It did not race as the Menasco was not functioning properly. Both "Ike" and "Mike" were brought by R. Rovner of Cleveland and were to participate in the 1939 races, but due to technical difficulties did not appear. The only visible change was a yellow paint job on each.

"Ike" and "Mike" are still in existence, located in Ohio where it is rumoured that they are undergoing restoration. During the racing career of these two ships the honours for top speed changed hands many times. "Mike" turned a speed dash of 241.61 mph compared to 239.63 mph for "Ike," but closed course speed honours went to "Ike" with 215.2 tnp, with 214.4 tuph for "Mike". Not much difference in speed performance, yet they differed as much as 30 mph in single events in which both performed. Could it have been piloting?

Cassutt Special



The Cassutt racer is the most prolific pylon racers in the world. The design and its derivatives dominated the Formula One world until newer concepts such as Nemesis came along.

While employed as an airline pilot, Captain Tom Cassutt of Huntington, Long Island, designed and built a small single-seat racing aircraft known as the Cassutt Special #1 in 1954. Based on Steve Wittman's "Buster" design, the Cassutt Special won the 1958 National Air Racing Championships. In 1959, Cassutt completed a smaller aircraft along the same lines known as the Cassutt Special #2. Plans of both aircraft were made available to amateur constructors and as a result many Cassutt Specials were, and are still, being built.

The Cassutt was a single-place, cantilevered mid-wing Formula One sport racer. It was a simple to construct steel-tube, wood and fabric airplane stressed for aerobatics to 12 G's. This very popular racing design is inexpensive yet it offers high performance. The fuselage, engine mount, tail and ailerons are constructed of steel tubing. The wing is all-wood with the spar a simple flat piece of spruce laminations. The 18 ribs are identical and of spruce truss construction. The wing skin is thin plywood.

Specifications:

Wingspan: 14' 11"

Length: 16'

Engine: 85hp C-85 Continental

Top Speed: 230 mph

Weight: 526 lbs

Antoinette



Hubert Latham, "gentleman of the air"

The magnificent Antoinette was perhaps the most beautiful aircraft of the day. Léon Levavasseur, an engineer and artist designed it. It's name comes from Antoinette Gastambide, the daughter of the manufacturer company director.

It's pilot, Hubert Latham and the designer were close friends and worked together to develop it at the Société Antoinette.

The plane had an unusual boat-shape fuselage; this design, combined with the elegant wings, gave the plane an outstanding look. An eight-cylinder, 50hp water-cooled Antoinette engine powered it. The 1908 version had ailerons, however the machine they have brought to Reims used wing warping, with better results.



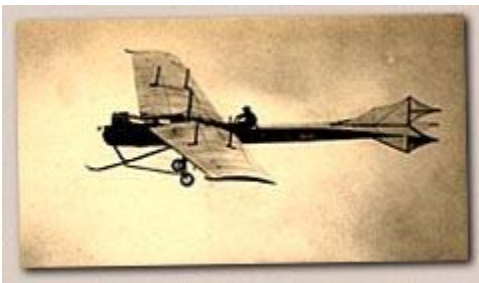
Latham set a world record for monoplanes, staying aloft for one hour and seven minutes and in July, he made two attempts to cross the English Channel.

On the 19th, he took off from Calais, on the French coast, but his engine failed after 13 km (7.6 miles) and he had to be rescued from the sea by the crew from a French destroyer.

He tried again on the 27th, just two days after Blériot's fantastic crossing. The flight was normal till he saw the English coast. However as he was approaching the shore, just 1.6 km (one mile) away, the engine failed and the plane crashed in the sea.

Latham recovered from these events and brought another aeroplane for the Reims meeting.

On Sunday, August 29, piloting his Antoinette, Latham won the prize for highest altitude, with 155m (509 ft).



Alden Brown B-1



Not related to the more famous racing designs of Lawrence W. Brown (Miles and Atwood Special, B-1, B-2, B-3), the Alden Brown Racer was a curious little machine. Of all-wood construction, Alden Brown designed his racer to be powered by a 544-cu-in Menasco C6 six-cylinder inline and the small machine spanned just 18-ft 9-in with a length of 19-ft.

Completed during 1932, the racer was registered NR71Y/Race 203. Painted overall light blue with cream and black trim, it does not appear that much flight testing was done on the aircraft before it was entered in the 1932 National Air Races.

Although photographs appear to give the aircraft's fuselage a rather fat look, it was fairly slim in cross section but larger than the Keith Riders and Howard's Pete that had appeared in 1930 and 1931. However, the plane was very clean and Alden Brown had originally designed the cantilever wing to incorporate retractable landing gear. Time did not permit the installation of the retracting units so a fixed gear was installed with cantilever struts. Very tight pants were then installed around the tires to complete the overall streamlined appearance but these pants would prove to be the racer's undoing.

Alden Brown had also designed an extremely unusual canopy for his racer. In order to ensure a very smooth fuselage line, the windscreen started immediately behind the cowl and the transparent area continued behind the small headrest. The pilot had a throw-over hatch that conformed to the flowing line on the canopy. The unit gave the appearance of plenty of visibility but, in fact, it was soon discovered that visibility on the ground was very poor and once the plane got into the air it was not much better.



For 1932, the National Air Races were held in Cleveland between 27 August and 5 September. These events were fairly complex in their structure and there were seven cross-country derbies including the famed Bendix, a staggering total of 21 closed-course races, and two speed dashes. Spectator interest was concentrated on the nine free-for-all races, seven of which were limited to engines of various displacements, the remaining two being unlimited - one for men (Thompson) and one for women (Aerol Trophy Race).

The Alden Brown Racer was trucked to Cleveland where it would be entered in the appropriate cubic-inch events. The pilot was Roy Minor. However, on its first takeoff, the racer began to rapidly accelerate but the wet field allowed mud to rapidly pack into the wheels which were surrounded by the tight pants. This locked the wheels and the racer went onto its nose then fell back hard on the tail which also collapsed the gear. The Alden Brown Racer was out of action before it even got into the air.

Trucked back home, repair work started and in early 1933 the retractable gear was installed. Alden Brown had a great deal of trouble getting the gear to perform the way he wanted so, exasperated, he switched back to the fixed gear but minus the wheel pants (a photo on race day shows that the pants had been re-added). Also, the fuselage was modified to have a higher roll-over structure which also served as a dorsal fin, extending back to the vertical tail which had increased surface area for better stability.

For 1933, the National Air Races were conducted in Los Angeles from 1 to 4 July and the events were restricted to free-for-all races by just racing aircraft of different cubic-inch groups. The derbies and races for standard category aircraft had been eliminated and this helped speed up the event. Formerly spread over a ten-day period, the National Air Races could now present in just four days all the important major speed and acrobatic events.

Once again trucked to the race, the Alden Brown Racer would be piloted by Lee Schoenhair. The craft carried the name Gilmore Special on the fuselage which indicated sponsorship from the oil company. The little racer was entered in the 1000-cu-in free-for-all but had engine troubles and Schoenhair could only average a low 137.52-mph. This was the last event we could find in which the Alden Brown Racer had been entered. Presumably, the racer was trucked back home and disassembled.



Bristol Racer



This advanced monoplane was designed in 1921 around the new 480 hp Bristol Jupiter radial. The huge, full-span ailerons nearly twisted the wings right off on it's first flight in 1922, they were reduced in size twice and external bracing wires were fitted on the wings. The Racer was abandoned after many problems with instability and the spinner, it had flown eight times. The picture above shows it before the second flight.

First Flight: July 1922

Racer: 1 - The Bristol Aeroplane Co. Ltd

Type Specification

Applies to: Bristol Racer

Type: Single seat racing monoplane

Wing: Braced mid wing monoplane. Spars steel and wood, wings are fabric covered. Wing braced with streamline wires

Fuselage: Circular streamline fuselage, rear fuselage of monocoque construction of wood and metal

Tail Unit: Cantilever tail unit with unbalanced control surfaces

Landing Gear: Main gear retracts into wing root and is hinged on the centreline. Tail skid

Power Plant: One 510 hp Bristol Jupiter air cooled engine

Accommodation: Cockpit for pilot level with trailing edge of wing

Dimensions

Span: 25 ft 2 in

Length: 21 ft 7 in

Height: 8 ft 9 in

Wing Area: Unknown

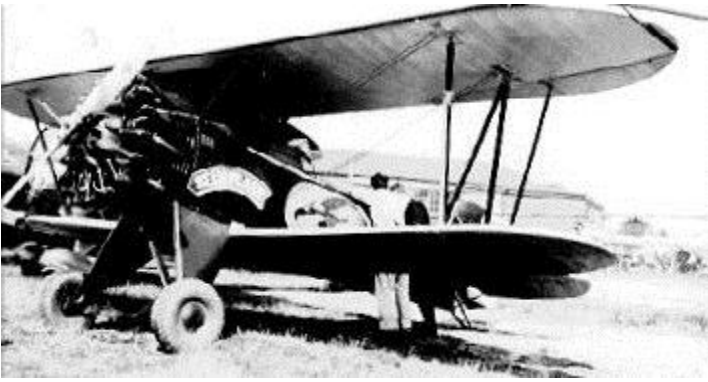
Weights

None known

Performance

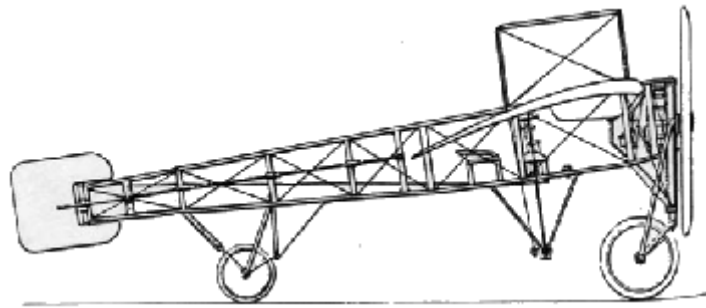
Max Speed: 220 mph (estimated)

Boeing P-12-A



Milo Burcham's "Blue Flash" was a civilian version of the Boeing P-12-A. In this craft, Burcham won the International Aerobatic Championship. The P-12 was one of the first fighters with a fuselage of light metal alloy. It was a high performance fighter used by both the Army and the Navy.

Bleriot XI



Civilian Use

Like a celebrity product endorsement of today, Louis Blériot's historic flight over the English channel made the Blériot XI the high-tech object of desire for European elite. Overnight it became the ultimate sporting aircraft of the day, and its image was elevated to the status of an icon of cutting-edge style. Like today's sports stars and their gear, the Blériot XI was featured in advertisements and posters for numerous products.

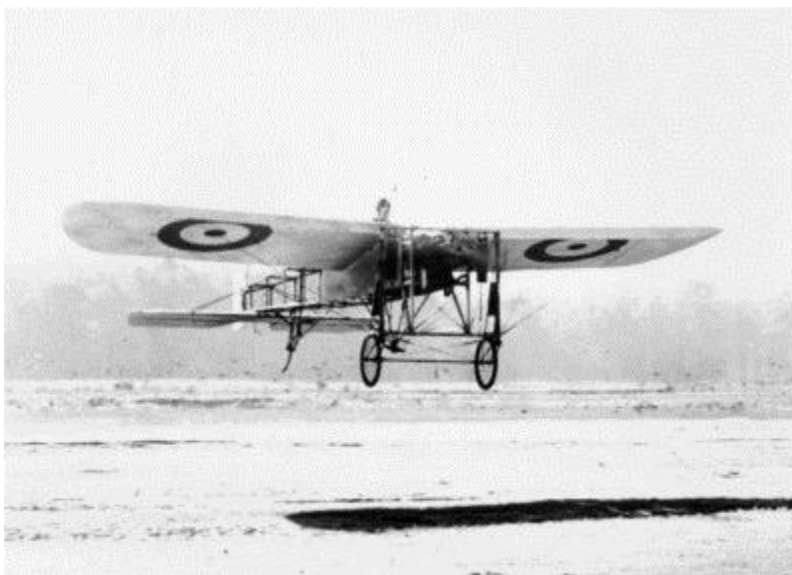
The Blériot XI, designed by Raymond Saulnier, was a distinctive design for its day, being a monoplane (single wing) as opposed to the more common biplane (two wings). With the reduced drag of only one wing, it had potential for greater speed, more manoeuvrability, and lower weight than most of its contemporaries. The basic design was modified and improved many times over the years it was in production, and it was either copied or licensed for production in many European countries and in North and South America.

Military Use

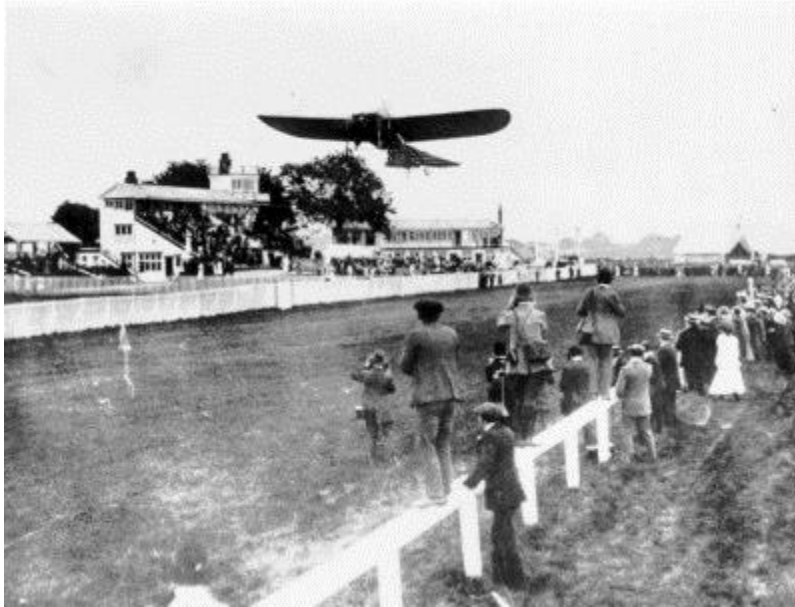
In 1910, the Blériot XI was selected for service by the French and Italian military making it the first aircraft designated for war use. A year later it was the first aircraft actually used in war when it was flown by the Italian air force during the Italo-Turkish war of 1911. At the start of World War I, the French air force contained eight squadrons of Blériots and the Royal Flying Corps flew several in France with the expeditionary force. A total of 132 Blériot XI were built in five versions.

Blériot XI Specifications:

- Country: France
- Manufacturer: Blériot
- Designation: XI
- Type: Sport
- Production Dates: 1908 to 1914
- Length: 23'-0"
- Wingspan: 25'-9"
- Height: 7'-6"
- Empty Weight: 500 lbs
- Gross Weight: 660 lbs
- Maximum Speed: 45+ mph
- Maximum Range: 50 miles
- Maximum Altitude: 5,000 ft
- Number of Crew: 1
- Engine: Anzani 25 hp, 50-horsepower Gnôme rotary engine



A plane of this type was the first aircraft to cross the English Channel. Later models of the Blériot monoplane were used for reconnaissance work early in World War I.



Bleriot monoplane flying at the airshow at Belmont Park, Long Island, NY, 1910.

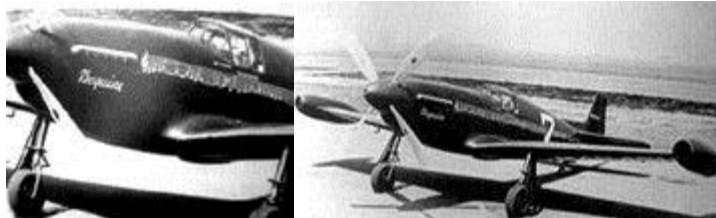
Bellanca 28-92 Trimotor



Built as a transcontinental air racer (Bendix), The wings were plywood covered over wood spars and contained extra gas tanks. The fuselage was tubular construction covered with fabric. The centre engine was a 420-hp Ranger and the wing motors, 220-hp Menascos.



Beguine



Little information exists on the history of the *Beguine* and of the people involved in the creation of this singular beautiful example and of its revolutionary concept in the air racer's desire for more speed.

More intrigue surrounds the story of *Beguine's* conception than of its performance, though it did win the 1949 SOHIO race with a speed of 388 MPH flying a much longer course than its competitors because of pilot technique it is purportedly reported.

In 1949, the presence of *Beguine* on the tarmac at Cleveland must have been an imposing sight, if nothing else it had to enhance the ego of J.D. Reed as he stood around "learnedly" and proudly answering questions of his contribution to this conceptually radical racer concurrently questioning his own wisdom for selling this airplane to Jacqueline Cochran. After all, it did make for a good conversation piece and Texans did like to talk. Yet indeed he was a vital contributor, for he was the financial enabler in building up his racing stable to three aircraft, any of which could have been a

winner in any given race. Exposure to the 1947 Miami and Cleveland air races just whetted his appetite and the addiction to father a winner was an impetus.

In 1947, a five foot two, 125-pounder of boundless energies named Paul *Penny* Penrose entered the lives of J.D. Reed and Charlie Walling, the pilot who had flown Reed's modified F-5G (P38) racer, NX25Y in Miami and the Thompson. His entrance was a high speed pass in a black P-51 named Wrath at the Miami airport during qualifications for the 1947 Miami All-American Air Races as he let the competitors know he was the one they had to contend with. Ultimately, he did win the race with Charlie Walling placing second. This P-51 (N37492) was the same aircraft flown by George Welch in the 1946 Thompson who dropped out early in the race with mechanical problems.

While at the 1947 Cleveland Air Races, Penrose made a proposition to J.D. Reed that if he bought a P-51, he, Penrose, a former North American Aviation test pilot and now an airline pilot with Western Air Lines, would deliver the airplane to North American Aviation at Inglewood, Mines Field, (now Los Angeles International Airport) for the engineers to redesign and physically modify the airplane for maximum speed -- at no charge. The engineers and mechanics to be working for gratis on their time off. Something totally unheard of then and particularly now.



P-51C Vertical



P-51D Vertical

Even more conjecture exists that with the installation of the radiator pods it was necessary to cut up to 20% (not confirmed) of effective aileron surface on each wing which would effect roll rate and recovery -- don't know! And there is another thought that lack of fillets at the radiator pod/wing juncture might be a contributor -- again, don't know! Though it isn't that clear dimension-wise it is possible some aileron authority may have been lost with the installation of the pod as noted on the right.

It was to be of a radical design change for the Mustang configuration with incorporation of the glycol coolant and oil radiators installed in pods mounted centreline off each wing tip and the removal of the traditional coolant duct at the bottom of the aircraft. Additionally, it was to incorporate the dorsal fin of the P-51D for greater directional stability. Note the difference between the "C" and "D" model verticals in the above pictures. Of course it was understood Penrose would be the pilot of this then radical aircraft. As a point of interest Lockheed had modified two separate P-80As to test different size ramjet engines (50-cm and 76 cm in diameter) and one set of these pods was used as the housing for the radiators.

The financial arrangement for this modification was intriguing and J.D., known to be the ultimate penny pincher jumped at the chance, though harbouring restraint on the precept nothing in life is for free. On the other hand, the promise this would be the fastest unlimited racer to compete in the Cleveland National Air Races and particularly the Thompson was inviting. The die was cast. And so, the celebrated portion of Beguine's life began as an abandoned P-51C languishing in Wichita Falls, Texas in the late '47 or early '48 time period, awaiting its discovery and new found life.

After the Cleveland Air Races, J.D. Reed was impressed with both Penrose's ability but as well with the P-51 (N37492) Penrose competed in the 1947 Thompson and negotiated with the owner of the aircraft and bought it, renaming it "Jay Dee". Originally, it was his intent to have two unlimited racers

in his racing stable, the P-51 and the converted F-5 (P-38) NX25Y, but now the possibility of having three racers and three competent pilots was even more enticing. Of course, ego always enters into the picture. Life for J.D. Reed could not have been better.



After J.D. found the P-51C in Wichita Falls, he called Penrose to pick it up declaring it was in tip top condition, but for those knowing J. D., they rather imagine he never saw the airplane and it most probably was in sad shape. It was. Tires flat, hydraulic, coolant, oil and perhaps even fuel leaks all over the place, and just plain filthy from non-attention. Not a very auspicious beginning for what was to be the most celebrated racer of the forties and though its notoriety span was not long, it was enduring that even today, a half a century later, the mere mention of its name evokes dialogue.

Penny ultimately delivered it to North American Aviation and one could just picture the NAA engineers elation at having a "house mouse", as in their parlance they referred to engineering test articles.

They at last had an example to verify their aerodynamic concept postulations which in all probability was proposed to the military during the war years and denied for a multitude of reasons. Exact date of completion at these writings is not known though it was believed to be a month or so before the Cleveland Air Races in 1948, but after several test flights, Penrose reported to Reed the airplane suffered from roll instability problems and should not consider participation in the 1948 Thompson.

Penrose declared he was having problems with rolls and roll rates. He said, "- - he'd crank it over and it didn't want to correct, wanted to keep rolling and he knew he had a problem."

Ever the opportunist for a bit of press and publicity, J.D. still wanted the airplane to show off in Cleveland and serve notice to all, this was the one to keep an eye on in the '49 Thompson.

Unfortunately, Paul Penrose had contracted with Art Chester to fly Sweet Pea and had to be in Cleveland right that instant and would be unable to ferry *Beguine*. With Charlie Walling present in J.D.'s hotel room as he spoke with *Penny*, J.D. was heard to emphatically say, "- - - if you can't fly the airplane back here, don't let anybody else bring it." However, Penny had other thoughts; he as well wanted to see it back in Cleveland for after all it was his baby as well. Arrangements were made with North American and it is not clear if they recommended Joe Howard to ferry it back. Joe Howard had lots of P-51 experience and was a fighter pilot and had also competed as a lieutenant in the 1947 Thompson (Jet Division) Trophy Race, placing second in a P-80A. So, despite J.D.'s declaration Joe Howard departed Los Angeles, landed in Phoenix and it is assumed he refuelled and for one reason or another somewhere over Oklahoma he ran out of gas and bellied it in.

Walling thought J.D. was going to kill Penrose when they found out about it. He was upset to say the least. J.D. set in motion its recovery and sent some people up there, they jacked it up, put the gear down, installed another prop and flew it to Houston. The airplane never returned to North American Aviation. In Charlie's words, "- - - that's when he started talking about me flying it." The Penrose/Reed relationship had indeed come to an end.

Surprisingly, damage incurred by the fuselage and wings was minimal and in a short period was structurally sound and painted a dark green, some say almost with a bluish tinge. J. D. Reed's wife, Jackie an aficionado of Artie Shaw's rendition of *Beguine*, insisted the airplane be named *Beguine* with a musical score painted on the fuselage and radiator pods.



And then it sat for months in J.D.'s Beechcraft hangar. Today, fifty years later it is difficult to resurrect what activity surrounded the life of *Beguine*. Some Superior Oil pilots who had the hangar next door say it flew infrequently. No records nor recollection exists to confirm the problems Penrose experienced with the airplane were corrected prior to the Thompson or if the North American Aviation engineers were ever consulted. Considering Penrose was now out of the picture to test fly and ramrod the necessary changes, speculation abounds after all these years that nothing was done, period. Now the prime candidate to fly the airplane, Walling was on the West Coast immersed with his flying commitments for the Superior Oil Company and was unable to maintain close contact with the mechanical status of *Beguine*.

Walling, J.D.'s primary pilot to fly *Beguine* had to withdraw from racing competition when his employer, Bill Keck, Jr., of the Superior Oil Company said, " - - - do you want to make your living flying racers, or do you want to be our corporate pilot?" Short and to the point the message got through particularly in considering the earnings realized for his effort. J.D. wouldn't even pick up the hotel or meal bills.

And so the racing alliance of Reed/Walling dissolved, though Reed stayed in the racing game through the 1949 races with pilots James Hagerstrom (later to be a jet-ace) flying P-38 NX25Y in the Tinnerman Race where he placed 5th and later flew P-51D N37492 *Jay Dee* in the 1949 Thompson where he placed 6th and Ken Cooley, who in the SOHIO, placing 5th in *Jay Dee*.

As a point of interest and further substantiation of Penrose's report of instability, Hagerstrom made a high speed pass down the runway at Houston Municipal Airport (now Hobby), pulled up and started a climbing turn to the left and the airplane kept rolling -- he reported he could not stop it so he just let it continue through a complete roll and recovered. Pictured on the right is J.D. Reed and James Hagerstrom after one of his *Beguine* test flights. Note the musical score to "Beguine" on the fuselage.



J.D. was soon to succumb to the overbearing pressures from Jacqueline Cochran to sell this airplane she fell in love with, particularly when Walling pulled out of contention as the prime pilot. On the other hand, stories abound his compensation was probably five times what the aircraft's value was at the time considering its unproven performance. And those in Houston knew J.D. was financially astute so it is with certainty he was well rewarded for his brief association with this airplane. And then of course there is much verbal criticism of the pilot selected to fly *Beguine*, Bill Odom. Indeed a noted aviator, several experienced racing pilots state he was not a fighter pilot but a bomber/transport pilot

who built up a reputation for long distance flying. It's not the purpose of this web page in hind sight to challenge Odom's capabilities but to share all the facts, unfounded or not. Charlie Walling said that Herman *Fish* Salmon, in conversing about the SOHIO race which Odom won handily said - - - *he wasn't down amongst the pylons but instead flew on the outside and over half of Ohio but still won the race. That's how fast that airplane was.*



As best as their recollections provide them, some Houston aviators of that era believe this picture was taken upon Bill Odom's acceptance of *Beguine* prior to the 1949 Thompson. Pictured in front of J.D. Reed's Beechcraft distributorship hangar in Houston are Walter Beech, J.D. Reed, and Bill Odom. Certainly Bill Odom must have flown the airplane at least once before ferrying it to Cleveland, but no verification of that fact has been established. For that matter, if he even ferried the airplane himself to Cleveland.

We'll never know the real reason for Odom's fatal crash and it's a tragedy that took a promising life and marred the racing community's reputation -- yet, Penrose's test flight prognosis states this airplane had a serious instability problem in roll which was substantiated by Hagerstrom; circumstantially signifying it to be the most probable contributor for the accident.

Of equally great interest to those technically inclined -- and what of the performance figures; all the V-speeds, oil and glycol coolant temperatures, other axes stability, and what not --- ? No indication exists that the North American Aviation engineers ever received any inclination of what the airplane's performance had been after *Beguine* departed Los Angeles prematurely, particularly with Penrose now out of the picture.

Curtiss Robin



The aircraft was designed along the lines of the strut-braced monoplane formula popularised by Lindbergh's *Spirit of St. Louis*. The aircraft was ruggedly built with a view toward operation from poorly prepared airfields or pastures. The enclosed cabin provided seating for a pilot in the front and two passengers in the rear seat. The aircraft was usually equipped with either a Curtiss Challenger six-cylinder radial engine or a Wright J6-5 five-cylinder radial engine.



The Challenger-powered Robin, had 185 horsepower and was capable of a maximum speed of 115 miles per hour. The aircraft was fitted with wheel brakes and a steer-able tail wheel or skid. The drag coefficient of the Robin was a very high 0.0585, which probably resulted from the very large cylinders of the exposed radial engine, the many sharp corners of the forward-facing windshield, and the relatively unfaired junctures between the multitude of struts supporting the wings and landing gear.



Curtiss R3C



Early in the development of aviation a spirit of sporting and competition became a major aspect of its ever-growing appeal. Air races began to enjoy a worldwide popularity, and two of the most coveted prizes were the Pulitzer Trophy and the Schneider Cup. In 1912 a wealthy French aviation enthusiast, Jacques Schneider, established a trophy to be awarded annually to the winner of a race to be flown over water in seaplanes. The Pulitzer Trophy Race, on the other hand, was sponsored by an American newspaperman, Ralph Pulitzer, to promote high speed in landplanes.

In 1925 the U.S. Army and Navy ordered from the Curtiss Aeroplane and Motor Company aircraft of basically the same design but with individual variations. These airplanes ran away with first place in both trophy races in that same year. One of them also established a straightaway speed record for seaplanes.

This airplane was the R3C-1/R3C-2 (the -1 is the landplane and the -2 the seaplane version).

The R3C-1, piloted by Lt. Cyrus Bettis, won the Pulitzer Trophy Race on October 12, 1925, at a speed of 248.9 mph. On October 25, fitted with streamlined single-step wooden floats and redesignated the R3C-2, it was piloted to victory by Army Lt. James H. Jimmy Doolittle in the Schneider Cup Race held at Bay Shore Park, Baltimore. The average speed was 232.57 mph. On the day after the Schneider Race, Doolittle flew the R3C-2 over a straight course at a world record speed of 245.7 mph. In the Schneider Cup Race of November 13, 1926, this same airplane, piloted by Lt. Christian F. Schilt, USMC, and powered by an improved engine, won second place with an average speed of 231.4 mph.

The R3C-1 was similar in dimensions and plan to the R2C-1 of 1923 but had a more powerful Curtiss V-1400 610-hp engine (665 hp in the 1926 racer).

The R3C-1 was a single-seat, single-bay, wire-braced biplane. The wings were covered with twoply spruce planking, 3/32-inch thick, forming a box structure that required no internal bracing. Among the interesting features were the low-drag wing radiators made of corrugated brass sheeting, .004-inch thick, covering much of the surface of both upper and lower wings with the corrugations running chordwise. The upper wing was flush with the top of the fuselage, permitting the pilot to see over the wing. All ribs were of spruce conforming to the Curtiss C-80 airfoil section, and the ailerons, made of metal, were fabric-covered. The cantilever vertical fin and horizontal stabilizer were of wood.



An ingeniously fabricated streamlined monocoque structure, the fuselage consisted of a shell of two layers of spruce over which fabric was doped for added strength and protection. This shell was formed over seven birch plywood bulkheads that were connected by four ash longerons, making a rigid structure.

The unbalanced movable controls were metal. Only necessary navigation and engine instruments were installed. They consisted of gauges for water temperature, oil temperature, oil pressure, and fuel quantity, as well as a tachometer and an airspeed indicator.

The fixed landing gear in the R3C-1 was a tripod configuration. A laminated hickory tail skid was added to protect the rudder. As a landplane, the R3C-1 carried only 27 gallons of fuel, which gave 48 minutes flying time at full throttle. In the R3C-2, the fuel capacity was increased to 60 gallons, enough for 1.3 hours at full throttle, by installing fuel tanks in the floats.

The wings and elevators were painted gold; the fuselage, stabilizer, fin, struts, fairings, cowling, pontoons and/or wheels were all black. Contemporary star cockades were painted on the right and left sides of the upper surface of the top wing and the lower surface of the bottom wing, outboard of the wing radiators. The rudder was painted with red, white, and blue vertical stripes, the blue stripe being next to the rudderpost. Both sides of the vertical fin were lettered "U.S. Army," in white. On both sides of the fuselage aft of the cockpit a large numeral 43 was painted in white. This was the number used in the Pulitzer Race. When flown in the 1925 Schneider Race, the aircraft carried the number 3, and in the 1926 Schneider Trophy Race it was numbered 6.

It was on loan for several years to the Air Force Museum, where it was restored by Air Force personnel. It now hangs in the Pioneers of Flight gallery at the National Air and Space Museum.



Curtiss R2C-1



The national and international air races helped stimulate and maintain public interest and support for aviation during the years immediately following World War I. The races also provided a focus for the development of new, high-performance aircraft. Many of these special aircraft were government sponsored. The Army and the Navy sponsored such developments in the United States, as did the air forces of France, Great Britain, and Italy in Europe. The most successful of these aircraft were highly developed forms of the biplane configuration. Typical of such aircraft is the 1923 Curtiss R2C-1 racer shown in figure 3.4. Standing beside the aircraft is Navy Lieutenant Alford J. Williams who flew it to first place in the 1923 Pulitzer race.

The aircraft is seen to be extremely clean aerodynamically and had a phenomenally low zero-lift drag coefficient. The aircraft achieved a maximum speed of 267 miles per hour with a liquid cooled engine of about 500 horsepower. Some of the features that accounted for the low drag coefficient and consequent high speed are the minimization of the number of wires and struts to support the wings, the smooth, highly streamlined semi-monocoque wooden construction of the fuselage, the all-metal Curtiss Reed propeller, and the very interesting skin-type radiators that were used to provide heat exchange surface for the water-cooled engine. The external surfaces of these radiators, which formed a part of the surface of the wing, were of corrugated skin with the corrugations aligned with the direction of air flow. The remainder of the wing surface was covered with plywood

Crosby CR-3

In the Thompson that year a sour engine, exposed wheel wells and an open cockpit restricted performance to just 226.075 mph and sixth place. Aircraft was demolished in a crash later that year. While recuperating from very serious injuries that included a broken back, Crosby designed a much more refined racer, the CR-4, incorporating butt joints, flush riveting and stressed skin construction. When the 420 hp Ranger V-12 engine the racer was designed for became unavailable, the Menasco C6R3 from the CR-3 was installed. First flight was April 1938. Aircraft was very clean aerodynamically and was fast.

If all systems were 'go' it could have dominated competition. Engine and gear problems surfaced continuously and Crosby had to drop out of both the Greve and Thompson in 1938. 1939 was not much better. In the Greve he was flagged down in the 13th lap averaging only 164.87 mph, but was awarded third place. He took fourth in the Thompson at 244.522 mph. Remains of the CR-4 were discovered recently in North Carolina and the racer will be restored for display at the EM Air Adventure Museum.

The 1938 Crosby CR-4 racer. The CR-4 was the brainchild of Harry V. Crosby, a barnstormer, airmail pilot, and test pilot who was killed trying to bail out of the Northrop XP-79B jet flying wing in 1945. He was also apparently an incredible fast talker, as he managed to have the CR-4 design wind-tunnel tested in the Guggenheim lab at Cal Tech for free, as well as having students at the Curtiss-Wright Technical Institute build it for free. And just for good measure, he managed to talk a Texas oilman into financing the operation.



So, while most of his competition was flying planes covered with plywood and fabric that had been designed by the eyeball method, some still sporting wire bracing on wings and tail, Crosby's sleek all-metal racer was obviously one of the most advanced and fastest planes in the world. However, this was not enough to make the plane a success, as it suffered from constant mechanical woes.

Originally designed to take a Ranger V-12 engine, which became unavailable to Crosby, he instead installed a Menasco C6S-4 from a previous racer, the Crosby C6R-3 (see pictures below). While the plane was still extremely fast with the smaller engine, that specific engine was prone to erratic performance. Another problem with the plane was its weight. As it was designed for the more powerful Ranger, its weight with the Menasco was about 600 lbs. heavier than the Folkerts SK-4, which was about the same size and used the same engine.

This extra weight, coupled with the tiny wing, made the plane very poor at pylon turns. Also a major headache was the landing gear, which was operated by a CO2 fire extinguisher. Empty extinguisher bottles and leakage made the gear prone to extending any time the airplane was turned hard. The CR-4's racing record: 1938 Greve - out; 1938 Thompson - out; 1939 Greve - flagged down on 13th lap, 164.9 mph, 3rd place; 1939 Thompson - 244.5 mph, 4th place.



Apparently, there was still some "snort" left in the design, as I have read that there were plans to install a Ranger V-12 in the CR-4 and enter it in the 1947 National Air Races. This never transpired, however, and the airplane effectively disappeared shortly thereafter. Efforts to trace the plane's whereabouts were futile until 1990, when Morton Lester heard about a lady in North Carolina selling some old aircraft parts, which had been collected by her late husband.

The first part of the collection consisted of parts for 6-cylinder Menasco engines, which were most often found under the cowls of racing aircraft. Next was a weather-beaten aluminium fuselage and wing centre section resting on the rotted remains of sawhorses in a nearby woods. While it certainly resembled the still unaccounted-for CR-4, there was no engine, cowl, outer wing panels, canopy, control surfaces, registration numbers, or any other reliable identification. Mr. Lester proceeded to search the rest of the property for more parts and found some (cowl parts, as I recall), but still nothing conclusive regarding the ID of the fuselage in the woods.

Mr. Lester took one last look at the property, making sure he hadn't missed anything, when he noticed two old bus bodies in the woods. Why put a bus in the woods? To store things, of course!



Sure enough, the control surfaces, canopy, landing gear doors, and outer wing panels were stashed in there. One of the wing panels had half of the CR-4's NX92Y registration number on it, so the identity of the airplane was confirmed. And if that story wasn't lucky enough for you, consider the fact that the lady who had the CR-4 was just days from having the "junk" cleared from her property. Just the thought makes me shudder. Since then, the CR-4 has been under restoration, first by Mr. Lester

and his crew, and more recently completed by the EAA Air Adventure Museum restoration staff. in Oshkosh, WI. Currently, the aircraft is on display in the EAA Airventure Museum.

Comet DH88



A Golden Age Racer

The DeHavilland D.H.88 Comet, GACSS, was winner of the 1934 England to Australia MacRobertson air-race. Piloted by Charles Scott and Tom Black. The aircraft was named "Grosvenor House" after its sponsor, a luxury hotel in London, financed by millionaire Australian Sir MacPherson Robertson. The 11000 mile race was part of the 100th anniversary of the founding of the Australian State of Victoria. DeHavilland delivered three Comets to the starting line. The comets were two place, all wood twins powered by special D.H. Gipsy Six R engines, capable of producing 230 h.p. each. Total fuel capacity was 213 Imperial gallons, with an economy cruise of 223 mph at 10,000 feet, they had a potential range of 2,850 miles. Top speed was 235 mph at 10,000 ft. The Comet was the first British airplane with retractable gear, flaps and controllable propellers.



The MacRobertson Trophy, won by the Comet in 1934

The Replica Comet pictured above, belongs to Tom Walthen who commissioned Bill Turner to build it. The aircraft was completed in under two years and was first flown by Bill in November of 1993 and has appeared at the EAA Fly-in at Oshkosh numerous times since. This Comet is powered by two Gipsy Queens. The original G-ACSS, has been restored and survives in England, and is a priceless, flyable artefact of Aviation's Golden Age.



October 20-23, 1934	C.W.A. Scott and T.Campwell Black went from Mildenhall, England to Melbourne, Australia (11000 miles) in 70 hrs 55 min.
November 14-16, 1937	A.E. Clouston and Mrs Kirby-Green went from London to Cape Town (7091 miles) in 45 hrs 6 min.
November 18-20, 1937	The return trip was completed in 57 hrs 23 min.
March 15-20, 1938	A.E. Clouston and V. Ricketts went from London to New Zealand (13179 miles) in 104 hrs 20 min.
March 20-26, 1938	The return trip was completed in 140 hrs 12 min. Here the times to and from Sydney, Australia en route to New Zealand were also confirmed as records.

Chester Jeep



Art Chester's "Special #1", aka "Jeep" was built in Chicago. The plane was named after Eugene the Jeep from the Popeye comics. The plane was powered by a 125hp C4-S Menasco engine, with a wingspan of 16 feet and 8 inches, and a length of 15 feet. Built strictly for racing the original small craft once held a world speed record at 237 mph. The unusual shaped wing was a scant 16'4".



Chester Goon

Art Chester sold the "Jeep" and arrived at the 1938 National Air Races with a new mid-wing speedster. The ship was named the "Goon" (Chester named his ships from characters in the "Popeye" comic strip) and it packed a six cylinder Menasco Buccaneer engine as the powerplant. The

lines were sleek and every portion of the plane was completely streamlined. It was equipped with a two position French Ratier controllable pitch propeller of the same type used by Michel Detroyat on his French Caudron in 1936. Prior to receiving the prop, Chester had mounted the engine so that it would turn clockwise. Upon delivery of the prop, he found that the French had changed the twist to conform with our engines, so the necessary changes had to be made.



The wing was cantilever in design, constructed of spruce, covered with plywood and then in turn covered with fabric. This was also true of the tail surfaces. The landing gear was fully retractable and operated manually. The wheels retracted into the fuselage, actuating the doors which enclosed the gear, thus leaving a smooth surface on the underside of the fuselage. The wing span was 18 ft. 6 in. and the length 20 ft. 6 in. The same familiar cream color as was used on the "Jeep" was used on the "Goon" and the race number 5 was added for the Nationals.



The little ship proved to be a worthy successor of the "Jeep". It placed second in the Greve Trophy Race with a speed of 250.42 mph finishing behind Tony Le Vier in his Keith-Rider with less than one mile per hour difference in the speeds. During the early laps Tony and Art fought it out, changing spots at every lap. Chester developed an oil leak which smeared his windshield, causing him to cut No. 2 pylon. As he re-circled it, he ended up a half lap behind. At this point Le Vier, thinking he had a safe lead, throttled back to save his engine for the Thompson. He was not aware of the little cream job closing in on him until it was almost too late to pour on the coal. He did spot Chester in time and went on to win the race, but by a very narrow margin.

In Thompson Trophy Race Chester didn't fare so well. He was in faster company, of course. Earl Ortman in his Marcoux-Bomberg, Roscoe Turner in his Turner-Laird, and Steve Wittman in his "Bonzo". For 20 laps Chester managed to hold fifth place, right behind Leigh Wade in the Military Pursuit, a development of Frank Hawks' racer. Then the Ratier propeller again started to throw oil and Chester had to drop out.



Pleased with the performance of the "Goon", Chester brought it again to the Nationals in 1939. The little ship looked the same but some effort must have been put forth, for the speed had been increased to 264 mph. As the flag dropped for the Greve Race, again it was LeVier and Chester as chief contenders. This time it was LeVier who had hard luck. On the 11th lap he developed mag trouble and had to drop out after being in the lead that distance. Chester roared on to the finish, setting a speed of 263.39 mph for the race. This was a new speed record for a while and certainly reduced his stability.

Cessna CR-3



Clyde Vernon Cessna had been a successful Overland automobile dealer in Enid, Oklahoma for several years until 1911 when he was struck with flying fever. Fascinated by the frail but efficient Bleriot XI monoplane that traversed the English Channel in 1909, Cessna eventually left Oklahoma for New York City, where he worked briefly for the Queen Aeroplane Company and learned about airplanes and how they were constructed.

Cessna dubbed his first airplane the "Silverwing." It was an American-built copy of the Bleriot XI, and would eventually teach Cessna the art of aviating. Powered by a two-stroke, four-cylinder Elbridge "Aero Special" engine that developed 40 hp. at 1,050 RPM, the Elbridge was a marine powerplant

that had been converted for aviation use. In Throughout 1911 Cessna made many flights in the airplane on the Great Salt Plains near Jet, Oklahoma in an effort to teach himself how to fly. He and Silverwing suffered numerous accidents, but in December 1911 Clyde made a highly successful, five-mile flight near Enid that included turns and ended with a safe landing at the departure point.

Flushed with success, Cessna severed his ties with the automobile business and devoted his time, energy, and money to exhibition flying. It was a lucrative endeavour for any pilot who could keep his airplane aloft for only a few minutes at holiday events and county fairs. During 1912-1915 he built several monoplanes, all of them powered by six-cylinder Anzani radial engines that developed 40-60 hp. Although successful, the Cessna Exhibition Company only whetted Clyde's appetite to become more involved in the fledgling aviation business. Flying was fun and profitable, but what he really wanted to do was manufacture and sell airplanes of his own design to the public .

In 1916 he set up shop in a vacant building in Wichita, Kansas and built a new airplane for the 1917 exhibition season. Cessna also established a flight school at the "factory" and enrolled five young men as students. When the United States declared war on the Central Powers in April 1917, Cessna's exhibition flying ground to halt. Instead, he returned to farming at his home near Rago, Kansas and harvested wheat to help feed the "doughboys" fighting in France.

Clyde's interest in aeronautics never faded during the war, and he dreamed of returning to Wichita and resuming the manufacture of airplanes. Cessna continued flying, however, and bought a new Laird "Swallow" biplane that he flew during the early 1920s. He used the OX-5-powered Swallow to give his favourite nephew, Dwane Wallace, an introduction to the world of aviation.

Late in 1924, Cessna was visited by Lloyd Stearman and Walter Beech, who had been key employees of the Swallow Company under leadership of the cantankerous Jacob M. "Jake" Moellendick. The two young men, in concert with a few other people, had split from Swallow and planned to form a new business to be known as the Travel Air Manufacturing Company. Stearman urged Cessna to join them, chiefly because Lloyd knew he and Beech needed Cessna's expertise in aviation as well as his money and equipment. It was a hard sell, but Cessna agreed.



In return for his participation and investment, Clyde was named president. The infant company began life in a cramped, 30x30-ft. space in the rear of a planing mill in downtown Wichita. Travel Air's first

product was an attractive, two-bay biplane designed by Stearman and was dubbed the "Model A." It made its first flight in March 1925. At a price of more than \$3,000, the OX-5-powered Model A was expensive compared with the plethora of war-surplus Curtiss JN-4 and Standard J-1 biplanes that still were available, but it outperformed them both and gradually sales increased to 19 airplanes the first year.

The company introduced the improved Model B biplane in 1926 that featured the new, 200-hp. Wright J4 air-cooled radial engine. That year Cessna convinced Walter Beech that the company should offer a monoplane with an enclosed cabin for use by small airlines. Beech agreed, and the Travel Air Type 5000 was based largely on a monoplane designed and custom-built by Cessna earlier in 1926. A slightly larger and more powerful version of the prototype airplane was ordered by National Air Transport, and 8 eventually were delivered to the airline.

Despite the success of the Type 5000, Cessna was restless. In January 1927 he sold his stock and resigned from Travel Air to build a full cantilever monoplane he named the "Phantom." It was a graceful, three-place machine powered by a 90-hp. Anzani radial engine and flew well. In 1927 Cessna and Victor Roos joined forces to found the Cessna Aircraft Company on the west side of Wichita. With help from his talented son Eldon and other company engineers, in 1927-1929 Clyde marketed a succession of 4- and 6-place monoplanes designated Model AA, Model BW, and the popular Model AW series.

With the advent of Wall Street's collapse in the autumn of 1929, Cessna and other manufacturers soon found themselves without customers for their products. To spur sales, Cessna slashed prices but to no avail. Faced with the prospect of bankruptcy, in 1931 the board of directors of the Cessna Aircraft Co. voted to oust Cessna and close the factory doors. It seemed as though Clyde's involvement in aviation was over, but he never gave up.

Undaunted, Cessna and Eldon rented vacant facilities in the abandoned Travel Air complex on East Central Ave. and created the C.V. Cessna Aircraft Co. that specialized in building diminutive, custom racing airplanes. The most successful of these was the CR-3 owned and flown by the great air-racing pilot Johnny Livingston. In the wake of losing his company to the stockholders in 1931, Cessna was dealt another blow in 1933 when his close friend Roy Liggett died in the crash of the CR-2 racer built by Clyde and Eldon. Cessna's grief ran deep. He withdrew from aviation and retreated to his farm near Rago.

In 1934 his nephew Dwane Wallace, armed with a degree in aeronautical engineering and with help from his brother Dwight Wallace, wrested control of the defunct Cessna Aircraft Company from the stockholders and introduced the classic Cessna C-34 monoplane. Clyde agreed to participate in the new venture only in a ceremonial capacity, and was not involved directly in the day-to-day operations of the company. The C-34 was a success and was named the world's most efficient airplane. Dwane Wallace went on to guide the company through the turbulent 1930s, oversaw development of the twin-engine T-50 that became the famed Cessna "Bobcat" of World War Two fame, and introduced the Model 190/195, Model 120/140 into the post-war market. Later, these airplanes were followed by the ubiquitous Model 150 and 172 Skyhawk as well as the sleek Model 310 made famous by the Sky King television series.

After more than 40 years in the aviation business and incalculable contributions to aeronautics, Clyde Cessna died in November 1954 age 74. He never held a pilot's license and had received only a rudimentary education, but his genius with airplanes coupled with an unshakable determination to succeed has made his name and legacy an icon in the history of flying.

After noting the impressive performance of Roy Liggett's little Cessna CR-2 at the 1932 National Air Races. Johnny Livingston decided he would have to try to get one of those for himself. He contacted builders Clyde and Eldon Cessna at Wichita, and within a month plans were being made for the construction of the Cessna CR-3 racer.

The new ship was to be a modified version of the CR-2 built to Livingston's specifications. The wing was raised to the shoulder position (the CR-2 was a midwing design), the engine cowl was tighter with rocker box cover bumps, and the wheels were slightly larger due to the 20 x 4 tires. The cockpit canopy was a large transparent greenhouse which allowed room for Livingston to raise the seat four inches for landing visibility. Since the airplane was very sensitive, the designers were not sure of what might happen if the pilot's head was raised into the slipstream, however, later at Chicago a smaller canopy was fitted with no change in flying characteristics. Both versions closed over the pilot's head by means of snaps. The modified canopy, however, could also be left semi-opened in flight.

The CR-3's landing gear was retracted by releasing down-locks connected to cables and then to a lever in the cockpit. After these down-locks were released, the gear was wound up by a large lever type crank. When the gear was cranked down the down-locks snapped into place. The tail-skid retracted by means of another lever located at the pilot's left. The landing gear was very soft acting. It was equipped with an internal spring positioned between the upper ends of the members in a horizontal position.

A special prop was ordered from Hamilton Standard for the new racer and arrived just in time for the test flights that took place during June of 1933. This prop proved to be very efficient and was used throughout most of the CR-3's racing career. On two occasions the prop from Livingston's famous No. 14 Short-Wing Coupe was used. This prop gave the racer some additional performance but had only four inches ground clearance, and necessitated that landings and take-offs be made from almost the three point attitude-so the use of this prop was kept to a minimum.

The Cessna CR-3 was 17 ft. long, with a wingspan of 18 1/2 ft., and was 4 1/2 ft. high. Fitted with a 145 hp Warner engine it weighed 750 lbs. It was painted bright red and yellow, with red license numbers, and later carried the black number 27 on its flanks Livingston's certificate number was 1427 which accounts for the racing number 14 on his Monocoupe and the 27 on the Cessna. The Cessna cost \$2,700 minus the engine and prop which brought it up to about \$5,000.

The oil tank was left out until the last minute, then the plane was propped up in flight attitude with Livingston in the cockpit, and the tank was used as balance to give zero degrees longitudinal stability. The knife edged horizontal stabilizer therefore carried no up or down forces in level flight.

The metal fairings that constituted the wing root filleting were left off during the first test hop. Immediately after take-off the horizontal stabilizer started to vibrate to such a degree that Livingston said it looked like it was four or five inches thick. Hoping it would stay together he returned to the field and made a safe landing. The fairings were installed and no further vibration was experienced.

During these early flights Livingston found the plane to be so sensitive longitudinally that it was almost un-flyable. First he would find himself bumping against the top of the canopy, and the next moment he would be forced down against the seat. During the second flight he attempted a fast roll but found he could not get the plane to rotate beyond the vertical position. Upon landing, a conference was held and it was decided that the special, tight fitting, engine baffle plates had set up a venturi effect that was responsible for this unusual behaviour. The cowling and baffles were removed and another flight confirmed this theory. The sensitive elevator control problem was solved by placing

a piece of slit copper tubing over the leading edge of the stabilizer distributing the airflow enough to decrease the sensitivity.

Although Livingston was never able to determine the plane's maximum performance he did attain a level flight speed of 255 mph. Stalling speed was 65 mph.

Late in August of 1933 Livingston left Detroit for a flight to Columbus, Ohio, where he was to subsequently appear in an air show. En route, he noticed that his tail skid would not retract. When he arrived over Columbus he further determined that a weld was broken on one of the main landing gear members and it would not lock down for landing.

After circling over Columbus for about 30 minutes he determined that it would be necessary to bail out. He dropped a note to that effect and flew out over some open fields where he attempted to ditch the plane. The Cessna spun twice as he tried to get clear of it, and he had to climb back in both times. Finally, on the third attempt, he dove free and the tiny ship plummeted to earth where it was completely demolished. However, during its short career and with Livingston's superb flying skill, the racer had swept the events it participated in during the American Air races in Chicago and had written its own particular page in American air racing history.

The little monoplane shuddered as its Warner Scarab radial engine coughed to life and settled into a steady, staccato rumble. The whole aircraft quivered as it sat nervously on the grass, surrounded by a small group of spectators who were anxiously awaiting its first flight. The pilot, nestled in the open cockpit, donned his leather helmet and flying goggles, nodding repeatedly as a lanky man stood behind the wing shouting last-minute instructions. After gesturing with his hands as if to drive home an important point, the man turned and walked briskly away from the silver machine. People covered their ears as the pilot thrust the throttle forward, all seven cylinders of the mighty little Warner roaring in anticipation as the airplane trundled across the prairie for takeoff. The short taxi to the end of the field was a bone-jarring experience, the pilot leaning his head first left, then right to check for obstructions ahead.

Swinging the ship into the Kansas wind, the aviator paused momentarily to check the plane's vital signs, then cast a nervous glance across the field at the crowd. Every eye was fixed upon him. Satisfied, he eased the throttle forward to the stop. The machine surged ahead, accelerating like a bullet as it pushed the pilot back against his seat. The Scarab howled in protest. A little forward movement of the stick lifted the tail up almost instantly. The pilot struggled to master his mount; full right rudder barely kept the monoplane's course straight. Using all his skill to maintain control, he eased the stick back, and the airspeed quickly passed the 80-mph mark. But the wheels stayed on terra firma, and fear began to tie knots in the pilot's stomach. At 100 mph, with the stick aft, the nose still refused to rise-the short, semi-elliptical wings strained to produce lift. The pilot's heart was pounding, his mind racing. What was wrong He watched in horror as the fenced perimeter of the field loomed ahead. In desperation he pulled back hard on the stick. Nothing happened. He was going to crash! Then, suddenly and without warning, the craft struck a small berm and was tossed into the air against its will. It staggered forward as if about to fall, but remained airborne.

The rebellious monoplane had even more surprises in store for its hapless pilot. As if the takeoff had not been exciting enough, he immediately discovered that longitudinal stability was marginal at best. The slightest movement of the stick provoked a nasty reaction that was no less offensive when opposite pitch input was applied. Fighting pilot-induced oscillations and realizing that the beast beneath him was virtually uncontrollable, the flier decided to land. Sweating profusely despite the icy January air that swirled through the cockpit, he carefully entered a slow turn back to the runway. But that manoeuvre only aggravated the pitching, and loss of control seemed imminent. The pilot fought

back his fears and managed to gradually nurse the disobedient machine around the field and onto final approach to the runway. Maintaining airspeed was crucial. Now more anxious than ever to get back on the ground, the pilot planned his approach carefully. He had to get the machine down safely or thousands of dollars and months of hard work could go up in smoke. With the airspeed nailed at 130 mph to maintain elevator effectiveness, the pilot guided his steed ever closer to the waiting grass airfield. Then, running out of patience and runway, he cut the throttle and switched off the magnetos, and the landing gear hit the ground with a hard thud.

The tiny airplane bounced precariously down the runway and finally rolled to a stop, the Scarab silent except for the crisp crackle of cooling cylinders. The crowd ran across the field and quickly surrounded the aircraft. Shaken and trembling, the aviator was helped from the cockpit, happy to have survived his baptism of fire in the air. So ended the maiden flight of the Cessna CR-1 (Cessna Racer, No. 1) with Eldon Cessna at the controls, on January 18, 1932

Clyde Cessna once said, "Speed is the only reason for flying" By the end of 1931, his never-ending quest for speed had become the foundation of the infant C.V. Cessna Aircraft Company in Wichita, Kan. The company's only reason for existence was to design, build and race a new breed of diminutive, high-performance monoplanes, of which the CR-1 was the first example. Although the CR-1 had flown successfully, it was obvious to Cessna and his son Eldon after its trial flight that it was unsafe to fly and needed modifications. It was designed specifically as a competitive racer in closed-course events, with wings that spanned a mere 16 feet and a fuselage measuring barely 12 feet long. Its gross weight was less than 1,000 pounds. But the most significant feature of the capricious CR-1 was its retractable landing gear. Operated manually with a crank, the gear retracted flush with the fuselage. The elder Cessna believed the gear's configuration "was the only way to arrange it" because the wings, the strongest part of the craft, "should not have holes in them" to stow the gear. In fact, the wings' shallow depth and thin profile were unsuitable to accommodate the gear.

The reliable Warner Scarab static, air-cooled radial engine, rated at 110 hp and surrounded by a full NACA pressure cowl, was an ideal powerplant for the CR-1, chiefly because of its small frontal area, low weight and cost compared with larger engines such as the 240-hp Wright J6-7 or the 300-hp J6-9. In addition, Cessna had already gained valuable experience with the Warner, which powered production versions of the popular Cessna Model AW. About 50 Model AWs were built between 1927 and 1930.

Although Clyde and Eldon Cessna were responsible for the overall design of the CR-1, much detail design and engineering work was completed by Garland Powell Peed, Jr., a local aeronautical engineer hired by the Cessnas to help transform their brainchild into reality. He had worked for Alexander Eaglerock in 1930 and participated in development of the Eaglerock Bullet, a low-wing monoplane equipped with retractable landing gear. Peed was also a talented pilot.

When he unveiled the speedster to the Wichita press early in January 1932, Clyde claimed it could attain 220 mph and said the airframe was being further modified to reduce drag. Cessna had intended to enter Eldon and the CR-1 in the Miami All-American Air Races scheduled for January 5, 1932, but bad weather and delays in completing the racer thwarted those plans. During the months following its initial flight, Clyde and Eldon reworked the CR-1 into the CR-2. Its wingspan was increased to 18 feet to reduce wing loading, and the fuselage was lengthened to 14 feet 10 inches to improve longitudinal stability. In addition, the overall area of both the horizontal and vertical stabilizers was increased. A useful load of 325 pounds accommodated a pilot weighing up to 200 pounds and a maximum fuel capacity of 21 gallons.

On May 18 the modified racer was ready for its second flight. Instead of Eldon, however, the pilot was Clyde Cessna's long-time friend, Roy Liggett, who had flown a Model AW in closed-course

competitions, winning a number of local and regional events.

The flight, witnessed by the same group of invited guests who had watched Eldon's ordeal nearly four months earlier, was uneventful. The ship handled well, and afterward Liggett estimated that the CR-2 should be able to hit the magic 200-mph mark. When asked how fast he had been flying, Liggett told Cessna, "Well, I'd say I was going fast, pretty fast." The airplane had reached speeds between 125 and 150 mph-far below the 200 mph Cessna had hoped for-but Liggett had not used full throttle. On subsequent flights made at maximum power, the craft easily exceeded 190 mph, with the Warner screaming at nearly 3,000 rpm in racing trim.

After additional changes to reduce drag, the CR2 broke the 200-mph barrier and was deemed ready for competition. Resplendent in a new coat of bright red paint and christened Miss Wanda in honour of Clyde's daughter, the nimble monoplane was flown to the Omaha air races on May 26.

Accompanying Liggett, in Miss Wanda, were Eldon Cessna, in his highly modified Model AW, and pilot George Harte, in his 300-hp Cessna DC-6A with Walter Beech riding shotgun in the right seat. Beech had been a member of Cessna Aircraft Company's board of directors and was a fixture at many air races in the early 1930s. The Omaha races featured many famous pilots, including Ben O. "Benny" Howard, Harold Neumann, Art Chester and John H. "Johnny" Livingston in his special Monocoupe with clipped wings. Clyde Cessna knew that Livingston was the man to beat. He had earned a well-deserved reputation as a tough, highly competitive pilot who had worked wonders with the Monocoupe and made it one of the fastest racers on the national air race circuit.

To make the CR-2's public debut a memorable one, Liggett flashed across the field at maximum speed, the Warner straining at the top of its voice as the steel propeller ripped the air asunder. After landing, Liggett and his craft were quickly surrounded by crowds intent on getting a closer look at Cessna's latest creation. In its first competitive event, the CR-2 managed only a disappointing 166.08 mph and fourth place behind Livingston's Monocoupe, which flew the course at 170.44 mph. The next day Liggett again found himself behind Livingston at the finish line, this time taking fifth place. Still, Miss Wanda had asserted herself well against more powerful aircraft such as Russell Boardman's Gee Bee Model Y, which won the event. The CR-2's final effort at Omaha proved no better. Liggett finished fifth behind Earl Ortman in the speedy Keith-Rider R-2 San Francisco, at a speed of 172.21 mph. Despite a significant horsepower disadvantage, however, the CR-2 had raced wingtip to wingtip with some serious competition and took home some hard-earned cash.

To become truly competitive, however, the airplane needed more power. After the Cessna racing team returned to Wichita, Clyde Cessna contacted the Warner engine company in Detroit about obtaining a 145-hp Warner Super Scarab powerplant to replace the 110-hp engine. He believed that with 145 hp Miss Wanda could close the performance gap between herself and the competition and place in the top three finishing spots. With more regional races on the agenda and cash in short supply, Cessna temporarily deferred ordering the Super Scarab.

But the little red racer was not idle. That summer Liggett took the airplane to the East Coast and entered it in a series of competitions, including the Niagara, N.Y., races, where it again flew in the wake of Johnny Livingston's Monocoupe. By August, Liggett and his eager mount had yet to win a major race or achieve victory over Livingston, Benny Howard or S.J. "Steve" Wittman, another flier who was making a name for himself in American air racing. For the CR-2's next outing, Cessna had his eye on the upcoming NatioHa1 Air Races (NAR) set for August 27-September 5 in Cleveland, Ohio. During a time when the nation was suffering from severe economic depression, many Americans found solace in the annual NAR, which served for many as a welcome diversion from their daily struggle to survive. In those days, daredevil pilots such as Jimmy Doolittle, Roscoe Turner, Jimmy Wedell and others were heroes to youngsters and adults alike. They were larger-than-life figures who had captured the respect and admiration of the people, and each September when they

gathered in Cleveland in an exciting clash of aerial titans, the public loved it. As for the pilots, they were attracted by the opportunity to make thousands of dollars in a few days by winning races. It was a lucrative sport for those who had the skill and the right airplane to win.

In preparation for the NAR, Clyde Cessna had hoped to install the 145-hp Warner in Miss Wanda, but it turned out that she would have to face her adversaries with the 110-hp engine. Cessna planned to enter the ship in events open to airplanes with engines up to 800-cubic-inch displacement, and the team spent many hours at the shop in Wichita preparing the scarlet monoplane to do battle around the pylons. Every inch of the airplane was carefully manicured for speed. On August 27 Liggett took off for Cleveland. Clyde and Eldon also attended the races, the latter had won second place and \$500 in the Western Division of the Cord Cup Race. The Cessna racing team was off to a good start at the 1932 NAR.

But problems soon arose with the CR-2's landing gear that cost Cessna first place in the Cincinnati Trophy Race. It was a cross-country event flown between Cleveland and Cincinnati with a landing at Cincinnati before the return leg of the race. Liggett again found himself up against his arch rival Johnny Livingston, and during the initial leg Miss Wanda showed her tail to the Monocoupe for the first time. Before landing at Cincinnati, however, Liggett failed to fully insert the downlock pins into the landing gear, and the tubing was twisted when the airplane touched down. As a result, the gear could not be retracted for the final leg of the race, and Liggett was forced to fly the distance with the gear extended. It cost him the race. He quickly fell from first to third place, flying the route in 2 hours, 32 minutes, 39 seconds and collecting \$300. Much to Liggett's disgust, Livingston won, taking home \$900, and S.J. Wittman took second, pocketing \$500.

Clyde Cessna was upset with Liggett for making such a serious mistake at a crucial time, but he also was thankful that the gear had not collapsed, putting the racer out of contention for the remainder of the NAR. Repairs were hastily made and the gear system checked out. Time was running out for the Cessna team. Anxious to make Miss Wanda pay her way, Cessna next entered the airplane in the Free-For-All race for 510-cubic-inch engines. Liggett was determined to redeem himself, and he flew the ship hard around the pylons. His efforts were rewarded with a second-place finish behind Benny Howard in his Menasco-powered racer dubbed Ike, winning \$225. But Liggett had finally beat Livingston to the chequered flag.

Sensing that things were beginning to go his way, Liggett next flew the CR-2 in the Woolaroc Trophy Race, sponsored by Oklahoma oil tycoon Frank Phillips. From start to finish the event was hotly contested by Miss Wanda, Benny Howard in Ike, and Ray Moore flying a Keith Rider machine. In the end, Moore took first place and \$1,125 at a speed of 182 mph, while Liggett managed third at 176.5 mph, winning \$375. In a hard week of racing, the CR-2 had earned \$900, and Eldon had collected another \$770 for a total of \$1,670—good wages by any measure in the Depression era. But the team already had their eyes on other prizes. After the end of the NAR, Liggett and Eldon Cessna flew their ships to nearby Sky Harbor, Mich., to compete in the American Legion Charity Air Meet on September 8. Liggett placed second in the Free-For-All race, and Eldon won the Sportsman Pilot event in his trusty Model AW.

With nearly \$2,000 in their pockets, the Cessnas and Liggett returned to Wichita and began laying plans for the 1933 racing season. Clyde and Eldon had shown the "big boys" that Kansans could build fast, competitive airplanes, and the CR-2 had struck the fear of Cessna into Messrs. Livingston, Howard, Wittman and other patriarchs of the sport. Yet one fact was inescapable: Miss Wanda still was too slow to win consistently. To do so, she would have to be capable of speeds in excess of 200 mph, and to attain that goal a more powerful engine was mandatory. With cash in hand, Cessna obtained a 145-hp Super Scarab. Unlike the 110-hp version, the Super Scarab featured a

strengthened crankshaft as well as a larger bore of 4 inches and a stroke of slightly more than 4 inches. It weighed 305 pounds compared with the Scarab's 275 pounds, but the additional power more than offset its greater weight.

Installation of the new powerplant required that some changes be made to the CR-2's slender airframe, chief among those an extension of the fuselage to maintain proper weight and balance characteristics. The Super Scarab's diameter also was larger than its Scarab sibling, and a larger cowl had to be fabricated to enclose and properly cool the engine. Finally, further work was done to reduce drag. On December 28 the aircraft made its first flight and was unofficially clocked at 225 mph, according to Clyde Cessna. To achieve that speed, the propeller blade pitch was set at an angle that allowed the engine to turn about 2,800 rpm and develop nearly 175 hp. Charged with a fresh burst of enthusiasm, Clyde and Eldon quickly completed flight testing and prepared the CR2 for the upcoming Miami All-American Air Races in January, which would kick off the 1933 air racing season. With Roy Liggett at the stick, a reborn Miss Wanda won the Colonel Green Trophy Race at an average speed of 195.74 mph, earning \$300. Liggett savoured the victory even more because his old nemesis, Johnny Livingston and his faithful Monocoupe, placed a distant second. Miss Wanda had beaten the Monocoupe with little difficulty, and it was evident to Livingston that the CR-2 was a much more serious adversary to be reckoned with in 1933 than it had been in 1932.

To a savvy, experienced pilot like Livingston, losing the race signaled that the days of his beloved Monocoupe were numbered. He soon decided to have a talk with Clyde Cessna about obtaining a new racer similar to the CR-2. Liggett went on to place second in the Unlimited Free-For-All race, trailing Jimmy Wedell and his Pratt & Whitney-powered No. 44 monoplane. Roy collected \$200, and Miss Wanda posted an average speed of 195.25 mph.

After the Miami races concluded, Liggett returned the airplane to Wichita, where it underwent a series of minor modifications during the winter months to reinforce its competitive advantage. Those changes were deemed necessary because Clyde and Eldon had by then created their own worst competition- the CR-3 they built for Johnny Livingston. The first meeting of the two Cessna racers occurred at the Chicago American Air Races in July 1933. Liggett was unavailable, and Clyde asked racing pilot Art Davis to take command of Miss Wanda. As foretold by Clyde Cessna himself, the two Wichita racers were about to go wingtip to wingtip in a fight for the big money. Livingston won first, in the Baby Ruth Trophy race at a speed of 201.42 mph, with pilot Art Davis flying the CR-2 to a second-place spot at 200.76 mph. It was evident that the two machines could not have been more evenly matched. Only the skill of their pilots ultimately decided who would cross the finish line first. The two racers fought again on July 4 in the Aero Digest Trophy race. They battled each other for the lead, with the CR-2 and the CR-3 almost neck and neck around the pylons. But as the race progressed, Livingston was able to capture precious fractions of a second during pylon turns that eventually gave him the victory over Davis. Livingston won \$2,250, with Davis collecting \$1,250. Livingston and the CR3 seemed unbeatable. A frustrated Clyde Cessna, however, had his own plans for further modifying Miss Wanda into a more aggressive contender. The airplane was returned to Cessna's shop. Thirty days later she emerged from behind closed doors sporting a new, dark-red paint scheme, a completely redesigned cockpit enclosure similar to that of the CR-3, and a set of small panels that completely enclosed the landing gear when it was retracted. A new cowling hugger1 the Super Scarab and featured prominent, tapered blisters that covered the rocker boxes above each cylinder. The leading edge of the cowl formed a smaller intake area than the previous unit had. Unfortunately, the snazzy new cowling would prove to be the airplane's Achilles' heel. Cessna dubbed the racer the CR-2A, and Roy Liggett flew a series of speed trials with the airplane on August 30, 1933. It was unofficially clocked at 250 mph on one pass across the airport, and Cessna reported to the local press that the airplane had hit 270 mph.

With no time remaining for a thorough flight-test program, later that day Cessna sent Roy Liggett off to Chicago to compete in the International Air Races being held there September 1 through September 4. Liggett and the airplane arrived without mishap, and his spirits were high. Clyde and Eldon flew to the races in Eldon's Model AW and quickly began final preparations to make Miss Wanda ready for racing. During qualifying heats Liggett and his steed easily met minimum performance requirements, clipping around the course at a leisurely 183 mph to conserve the Super Scarab for the serious battles to come. When the competition began, Liggett took second in the 550 cubic-inch displacement race with an average speed of 191.4 mph. He was confident that he would win or place well in four upcoming events that were ideally suited for the speedy CR-2A.

On September 2, high winds were blowing across the Curtiss-Reynolds Airport as Liggett took off to compete in the Shell Speed Dash event. With his airspeed approaching 200 mph, Liggett flashed across the field at an altitude of about 300 feet, fighting the turbulence. According to Clyde Cessna, who was watching the race, a section of the cowling suddenly ripped free and smashed into the right wing, separating it from the fuselage. Miss Wanda whipped into a vicious roll to the right that Liggett was powerless to oppose. In seconds, the red racer plunged into a cornfield and exploded with a thunderous boom. Liggett was killed instantly, and the racer was consumed by fire and destroyed. The impact was so great that the steel tubing of the fuselage clenched Liggett's mangled body like a closed fist. Rescue workers were forced to use special equipment to free his corpse.

Cessna was shocked and stunned by what he had seen. Not only had he lost a friend, but the loss was also made more painful because one of his own creations had taken that friend's life. Something within Clyde Cessna snapped that day. In an instant, he lost the drive and determination to build fast airplanes that had been the heart and soul of his aviation career for the past 22 years. People who knew Cessna well later agreed that, after Liggett's death, Cessna lost virtually all interest in aeronautics, air racing and flying. But true to his character, he provided financial support to Liggett's widow and children.

The CR2 and the CR-3 were a special breed of flying machine whose sole purpose was to push the limits of aviation technology. Flown by pilots who dared to force themselves and their machines to the edge of extinction, the Cessna racers wrote a key chapter in the annals of a bygone era, a time when sheer speed and nerves of steel forged the Golden Age of air racing.

Caudron C-460 Rafale



Country : France
Manufacturer : Caudron
Category : air Racer
Year : 1 934
Motor : Renault Bengali ; 6 cylinders in liner of 400 ch

Wingspan : 6,73 m
Length : 7,11 m
Height : ? m
Weight : 948 kg
Max speed : 505 km/h



Dayton Wright RB racer



A number of racing aircraft were developed that employed the monoplane configuration. Some of these aircraft had cantilever wings; others employed strut-braced wings; such advanced concepts as retractable landing gear were sometimes seen. For one reason or another, however, none of these monoplane racers was particularly successful. The Dayton Wright RB racer developed for the 1920 Gordon Bennett race was perhaps one of the most advanced concepts developed during the entire period. The pilot was entirely enclosed in the fuselage, which was of wooden semimonocoque

construction. The cantilever wing was constructed entirely of wood and employed leading- and trailing-edge flaps. These flaps in effect provided variable camber so that the airfoil section could be adjusted to its optimum shape for both high-speed and low-speed flight. This extremely advanced feature did not appear on production aircraft until the development of the jet transport in the 1950's. The landing gear on the Dayton Wright racer retracted into the fuselage in very much the same way as that used in later Grumman fighters of the thirties and forties.



Although highly advanced for its time, the Dayton Wright racer was not successful in the 1920 Gordon Bennett race. The aircraft was somewhat underpowered and during the race had to withdraw because of a broken rudder cable. Unfortunately, the type was not further developed.

GeeBee R1

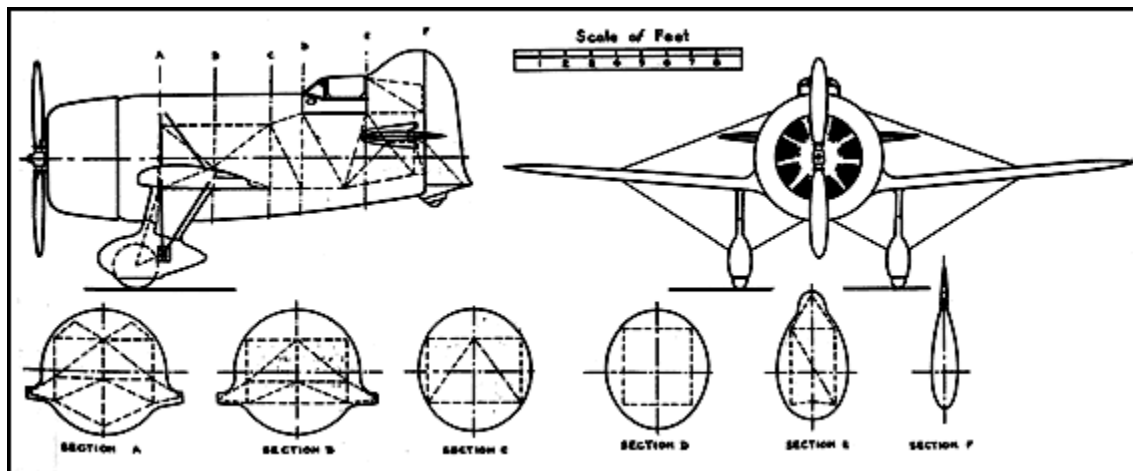


With the success of the Model X under their belts, the Granville brothers set out to produce and market a new line of aircraft in the Sportster series. They were billed as "The fastest and most

manoeuvrable licensed airplane for its horsepower in the United States" - and they were all that and more. The Gee Bee Sportsters were frequently shown off at airshows by their owners, attracting much attention wherever they appeared.

The prototype models for the D and E were retained by the Granville brothers for a time, and were very successful in production class racing. The Model Y, known as the Senior Sportster (a two seat version) was also very successful in competition - said to have won more money and races than the purpose built, better known Gee Bee's. However, the marketing of these aircraft could not have happened at a worse time. The Great Depression was entering its dismal peak and the sales of personal aircraft were almost non-existent. There were only a handful of these aircraft ever produced; Only two Model X's, one Model C (later converted to a Model D), one other Model D, four Model E's and two Model Y's.

With the Great Depression taking its toll on sales, the only true venue of hope left to the Granville brothers was racing. An amazingly large sum of prize money was being offered at the Cleveland National Air Races and the Granvilles were convinced to build a racer that could win the Thompson Trophy Race. The Gee Bee Model Z was created - and in 1931 won the Thompson Trophy race in Cleveland, Ohio, showing the world that the Granville Brothers could build the fastest airplanes in America. That same year, during a speed dash attempt, the Model Z shed a wing and rolled into the ground, killing pilot Lowell Bayles. This was the beginning of a run of bad luck that would plague the Granville's racing aircraft.



With the 1932 races just a half year away, Granville Brothers Aircraft hired a new engineer, Howell W. "Pete" Miller, a performance specialist fresh out of school and brimming with innovative ideas. Led by the elder Granville Brother, Zantford "Granny" Granville, the four brothers and Miller set out to build two new planes for the upcoming races. The racers would be designated the Model R-1 and R-2 and powered by engines on loan from Pratt & Whitney. The R-1 was designed and built around the new R-1340 ci nine-cylinder, supercharged engine which produced 800 hp.

Built for the Thompson Trophy race, a pylon course, it would be a short-range airplane built for all-out speed. The R-2, on the other hand, was built for the Bendix Trophy race, where long-range and speed were needed. Consequently, the R-2 was powered by the R-985ci Pratt & Whitney engine developing 535 hp. Burning less fuel than its bigger brother, the R-2 could fly the race with fewer stops, giving it a better overall speed. The main difference between the two airplanes, other than engines, was that the R-2 held 302 gallons of fuel versus the 160 gallons of the R-1. There were other slight differences as well, such as the shapes of the vertical fin rudder, and the R-2's fixed tailwheel versus the R-1's steerable tailwheel.



In the hands of Jimmy Doolittle, the R-1 won the 1932 Thompson Trophy race. At that time Doolittle also set a new world landplane speed record of 296 mph in the Shell Speed Dash, a straight line course. Lee Gehlbach, flying the R-2, finished fourth in the Bendix due to oil leak problems and fifth in the Thompson. Once again, the Granville Brothers brought home the trophies. They were on top of the world. Then in 1933, in the hands of pilot Russell Thaw, the R-2 stalled on landing approach at Indianapolis, rolled, and hit the wingtip.

Although he recovered with only wing and landing gear damage, the R-2 was out of that race. Russ Boardman, pilot of the R-1, was shaken by Thaw's accident and, pulling the R-1 off prematurely, stalled and caught a wingtip, flipping the plane onto its back. Boardman died from the injuries. The R-2 was repaired and while landing at Springfield in 1933, James Haizlip found himself floating too far down the 2,000 ft runway. As was done with most airplanes of that period, he kicked the rudder to sideslip and kill the speed. This caused one wing to stall, and once again the R-2 found itself rolled into a ball. Haizlip escaped without serious injuries, barring his pride.



Granville Brothers Aircraft used parts from both crashed airplanes to build the R-1/R-2, a hybrid model initially flown by Roy Minor. During a test flight out of Springfield, he made thirteen landing attempts before finally getting it on the deck; whereupon he slid off the end of the runway with the brakes locked.

The airplane caught its wheels in a ditch, performed a complete somersault, and landed upright on the road. After another trip through the shop, the R-1/R-2 ended up with Cecil Allen. Despite warnings from Miller and Zantford Granville, Allen Granville installed a large fuel tank well aft of the center of gravity (cg). The two designers feared the cg would be moved so far back that the plane would be impossible to fly. Ignoring their warnings, Allen took off with the tank full, lost control, crashed, and was killed. Thus ended the R-1 and R-2 racers, as well as the Gee Bee line of aircraft.

The Granville Brothers Aircraft, Inc., liquidated in the fall of 1933. They built a total of 22 aircraft - including 9 biplanes, 8 Sportsters, 2 Senior Sportsters, 3 Super Sportsters, and one long-tailed racer. They had a large, cantilever monoplane under construction that disappeared into history. After liquidation, the workforce went on to build the QED for the 1934 England-to-Australia race and Time Flies, a racer for Frank Hawks.

Even though none of the original Gee Bee Sportster Series aircraft survive today, they were without doubt some of the most unique and beautiful aircraft ever to grace the skies. At least two replicas have been built and flown.

Gee Bee Model X Sportster

www.airminded.net



Model X

NR49V (Model X)

The Model X was the first of the Sportsters. Painted Black & White separated by an Orange Pin Stripe. An "8 Ball" adorned the side, consisting of an orange background with a large black number 8.

Lowell Bayles flew the model X to Second place in the All American Air Derby. Sponsored by

American Cirrus, the contest required the use of a Cirrus engine. The winner was the aircraft/pilot with the lowest accumulated time for the 12 legs. The course stretched roughly from Detroit to New York to Texas to Los Angeles and back to Detroit. The route resulted in 5,635 sm of flying, with 12 days of flying and a 1 day layover in Los Angeles. 18 aircraft started out on July 21, 1930. 10 aircraft completed the race, arriving back in Detroit on August 1, 1930. The Model X was forced down three times between Utah and Nebraska by engine trouble. Lowell Bayles was able to complete the race by temporarily securing a loose rocker arm bracket using bailing wire. 1st place: Lee Gehlback in Command-aire "Little Rocket" 43 hr, 35 min, 30 sec elapsed (127.1 mph) \$15,000 prize plus \$5000 in segment wins. 2nd place: Lowell Bayles in the Gee Bee Model X: 47 hours, 36 min, 8 secs, (116.4 mph avg speed) \$7000 prize. 3rd Place- Charles Meyers in a Great Lakes - 51 hours 34 min 31 secs (107.3 mph average speed) \$3000 prize.

Lowel Bayles purchased the model X after the race with his share of the purse.

In early 1931 Lowell Bayles flew his model X as the main attraction for the "Brinton's Flying Circus" which consisted of 4 planes, 6 pilots, 1 truck driver and a truck with a speaker system. The circus toured from North Carolina southward.

This aircraft was later converted to the model F configuration by installing a 135 hp Fairchild 6-390. NR49V was lost while stunting at the dedication of Cromwell Field (Burlington, Vermont) in September of 1931. Roscoe Brinton, the pilot successfully bailed out.

NR854Y, Model B, c/n X-2



model B

Harold Moon of Philadelphia purchased this ship for \$4980. The model B featured a new landing gear with shocks and fairings. The cowling was also different than that of the X. It was painted two tones of brown that were separated by a 1/2 inch red stripe, a paint scheme featured on the 1930 Packard. The aircraft was monogrammed with "Myodine" which was the name of his company. On 11-15-1932 Mr. Moon sold the aircraft to Edith Bernson. Edith had the engine upgraded to a 125 HP Cirrus

Ensign, at which time the fuel capacity was reduced to 30.5 gallons for weight considerations. The last report of the aircraft was a 6-3-1933 inspection report that cites 152 hours of flight time. It is rumoured that airplane was sold to an overseas customer in Spain.

NR855Y/NC855Y (Model C)

George Rand of New York purchased this airplane. It was painted coca-cola red and white. A running pirate (the Menasco logo) was featured on the airplanes side. After delivery, the aircraft was returned to the factory and the larger fin and rudder developed for the Model D was installed. It is clear that the airplane was not upgraded to the Model D configuration (the 95 hp Menasco B-4 was retained and wheel pants were omitted), however the airplane was placed in the standard category on a 'on-time basis' with ATC404 as the supporting data. The aircrafts identification number was changed to NC855Y.

On 10-1-1931, Mr Rand sold the airplane to Harry Hall of New York, NY for \$800 and a J-5 Waco Taperwing. The airplane was destroyed in a fatal accident at Jersey City, New Jersey on 10-25-31.

NC11043, Model D, c/n D-1



model D

Zantford (Granny) Granville flew NC11043 to air shows and races in the spring of 1931. Skywriting equipment controlled by a trigger on the joystick was installed and "Gee Bee" was scrawled across the sky over Manhattan. The paint scheme was Blue & Cream separated by a red pin stripe. A panther was painted on the aft fuselage and a pirate on the cowl. The model D featured a larger vertical fin and rudder than it's predecessors and also had a fully faired landing gear. ATC404 was cancelled after the Granvilles went out of business.

Bob Hall flew "the cat" to 1st place in event #4 of the 1931 National Air Races. This was a 25sm race for certified aircraft with a 400 cubic inch or smaller engine.

Mrs Mae Haizlip placed 2nd in two events of the 1931 National Air Races.

Bill Rausch raced this airplane in the 1932 Nationals.

NC11043 was lost in 1935.

NC856Y, Model E, c/n #4

Al Nott flew this model E to Miami, Florida in January 1932 to participate in the All American Air Races. He earned 6th place in the green trophy race and 1st place in the Cuban Trophy race (132.58 mph). In February 1932, when returning to Springfield, Mass the airplane nosed over resulting in minor damage and no significant injuries. Mud packed into the wheel wells had frozen in flight, locking the wheels in position.

NC856Y with Zantford Granville piloting was lost in 1934 on landing at Spatanburg SC, while manoeuvring to miss men and equipment that were working on the runway.

NC11044, Model E, c/n #6

The model E was completed for the Harris/Tibert company of Los Angeles. The Harris/Tibert company intended to become a Gee Bee distributor. Enroute to the west coast they attended a February 14, 1931 airshow at Chandler Field Atlanta. While performing in the show the model E spun into the ground.

NC46V, Model E, c/n #7

This Green and White model E, originally built for Bill Sloan was returned to the factory for use in the Ford Air Tour. She wore race #14 and the Granville twin geese logo. It was flown in the 1931 Air Tour by Lowell Bayles. A mid race engine change cost the team a 5% penalty. Lowell Bayles and the Model E finished 4th in points and was declared the winner because the two Fords that finished ahead were ineligible and Schneider who also finished ahead had failed to complete two legs. Lowell Bayles also flew this aircraft to the eastern states expo in 1931.

Zantford flew NC46V to Santa Monica, CA to participate in the 1931 on-to-Cleveland Derby, a 2,400 sm race. Kidney stones forced Zantford to drop out of the race.

Maude Tait placed 3rd in two events of the 1931 National Air Races while flying a Model E.

NC46V was lost shortly after takeoff on August 20, 1932. The pilot was Russell Boardman who had no prior experience in the E, although he had flown the more powerful model Y. Witnesses said the pilot tried to pull the airplane up into a loop from takeoff. He didn't make it and crashed in the brush on the airport.

NC72V, Model E, c/n #8

Completed in August of 1931, this ship was delivered to Sloan to replace NC46V which was borrowed for the air tour. NC72V was painted yellow and green. Sloan flew her 990 hours in 4 years before the lingering depression forced a sale.

Don Walters then flew this airplane in Bell Sweet's Air Shows. He hit a truck on the runway while landing. The Granvilles then rebuilt the airplane. It later crashed again when the engine quit and the plane hit a fence during rollout. Walters who was piloting the airplane survived. The wing of this

airplane is on display in the EAA museum. That wing wears the coca-cola red and white Gee Bee colours.

Gloster IIIA / IIIB



Between 1924 and 1929 a complete series of racing seaplanes were designed and built to compete in the world famous Schneider Trophy. The Gloster III A was second in the Trophy in 1925. The Gloster VI named the “Golden Arrow” was the first Gloster monoplane and broke the World speed record at 336.31mph on September 10th 1929.



GeeBee Z



SEPTEMBER 7, 1931. Eight racing aircraft, some of the fastest land planes in the world, were lined up for the start of the Thompson trophy race at Cleveland, Ohio. The field consisted of Lowell Bayles in a Gee Bee Model Z, Jimmy Doolittle in his Laird "Super Solution", Jim Wedell in a Wedell-Williams Special, Ben O. Howard in his Howard "Pete", Dale Jackson in a Laird "Solution", Bill Ong in a Laird Speedwing, Ira Eaker in a Lockheed Altair, and Bob Hall in a Gee Bee Model Y. The Thompson was a ten lap race of 100 miles and was the climax of the National air races.

As the starter's flag dropped, all conversation was lost in the roar of the eight powerful engines as the entries blasted toward the first pylon one mile away. Doolittle was the first pilot to make the turn but soon his "Super Solution" began trailing black smoke from a broken piston. Gamely he tried to hold his position. On the second lap, Bayles in his Gee Bee Z, "City of Springfield", took the lead. Dale Jackson had a narrow escape from tragedy as he brushed a tree, but he continued to race. Bayles continued to extend his lead. On the seventh lap, Doolittle was forced to retire. Bayles roared across the finish line at an average speed of 236.2 mph, culminating a week of triumphs for the Gee Bee team. Bob Hall finished fourth in the Model Y at a speed of 201 mph. The Gee Bees had nearly dominated the 1931 National air races and the Model Z had won every contest in which it was entered. The Granville brothers, the guiding spirits of the Gee Bees, returned to Springfield, Massachusetts, at one of the high points of their careers, unaware of the rocky road that lay before them in the years to come.

Mention the Gee Bee racers and most people recall only the many accidents that befell these aircraft and their pilots. Over the years, various articles have pictured these craft as "killers", "the most dangerous aircraft ever built", etc., and the inaccurate impression has been given that the Granville brothers were "backyard builders", simply adding more and more horsepower to inherently unstable airframes. Actually several competent engineers were always on their staff, wind tunnel research was utilized and their construction methods were always of the highest calibre. Some crashes did occur through human error or on aircraft that had passed from the influence of the Granvilles. Unfortunately, it seemed that the Granvilles bore the brunt of criticism for factors beyond their control. Irresponsible members of the press equated the name "Gee Bee" with spectacular crashes.

The children of Wilfred and Belle Granville, Zantford (Granny), Robert, Tom, Edward, Slark and sisters Pearl and Gladys, were originally from Madison, New Hampshire. Granny, the oldest child, was a self-taught automobile mechanic with an eighth-grade education who had an affinity for

anything mechanical and thrived on hard work. When Granny was 17 he moved to the Boston area where he took a job selling Chevrolets. A year later he established an auto repair business in Arlington where he sold Chevrolets and did service work. At the age of 20, he appeared at the East Boston airport where he exchanged his services as a mechanic for flight instruction.

Leaning more and more toward aviation, in 1922 Granny summoned his brother, Tom, to run the auto repair business while he went to work as a mechanic with the Boston Airport Corporation. Deciding to go into business for himself, he established Granville Brothers Aircraft and was joined shortly thereafter by his three remaining brothers. Granny's mechanical sense told him that he could improve upon the designs of many of the craft on which he was working. He and his brothers spent their spare time building a side-by-side biplane powered by a 55 hp engine that they had bought for \$500. Known as the Model A, it had its first flight at 5:30 a.m. on May 3, 1929.

Searching for adequate facilities to manufacture their biplane, the Granvilles contacted the chamber of commerce of Springfield, Massachusetts, on May 17, 1929, and on July 6 finalized plans to locate at the airport there. Hoping to attract backers to finance production of their Gee Bees, they entered their first air meet at Springfield on July 10. Here they met the four Tait brothers, James, Harry, Frank and George, owners of Springfield's biggest ice cream and dairy business, as well as developers of the Springfield airport. George Tait handed Granny a check for \$1,000 and told him to come back after he had put "a real engine" in their plane. Returning to Boston, they purchased an Armstrong Siddeley "Genet" engine of 85 hp which greatly enhanced the performance of their prototype. A few weeks later, Granville Brothers was incorporated, building planes in an abandoned dance pavilion formerly named the Venetian Gardens at the Springfield airport

Among the first workers on their staff were Albert Axtman, Austin Savary and Harry Jones. A secretary was hired and three college educated engineers were added to the rolls. These were the "Three Bobs", Bob Hall, Bob Ayre, and Bob Dexter, all of whom went on to successful careers in aviation. Fitted with a Kinner K-5 engine, nine of the Model A's were built and sold before the depression-plagued market dried up.

Hard times descended on the Granvilles. Ed and Mark rented an attic room and lived on beans which they purchased by the case. In the fall of 1929, few men had the money to purchase anything as frivolous as a personal airplane and the new corporation was on the verge of collapse when the All America Flying Derby was organized and sponsored by American Cirrus Engines, Inc. This was to be the longest air race held in the world at the time—a 5,541-mile course that took the contestants from Detroit to Texas, west to California, and back to Detroit. All the entries were powered by one of the engines manufactured by the sponsor, either the Cirrus or Ensign engine. Eighteen entries competed in this event and the Granvilles were among them. The engineering team, spearheaded by Bob Hall, had produced the Model X, a trim little low-wing monoplane finished in black and white, powered by an American Cirrus engine supercharged by a Roots blower (positive displacement) to develop 110 hp at 2100 rpm. The Model X was flown by Lowell Bayles, a quiet, slim bachelor who was flying as copilot on the Fords the Tait's owned and operated between Boston, Springfield and Albany



Bayles was born in Mason, Illinois. He had studied to be a mining engineer but, after taking some flying lessons, was bitten hard by "the flying bug". He bought a war surplus Jenny and joined the legion of barnstormers who were attempting to eke out an existence by "hopping" passengers from the pastures of America. In Leesburg, Florida, Bayles had met Roscoe Brinton and, together, they had returned to Springfield where both became involved in aviation activities, later teaming to form Brinton-Bayles Flying Service.

On July 21, 1930, the All America Derby began in Detroit. Ten of the entries completed the course and Bayles finished second, averaging 116.4 mph. The Gee Bee had demonstrated its dependability, although at one point Bayles had landed in a farmer's pasture and procured a piece of bailing wire to make some quick engine repairs. Lee Gehlbach won this event and later played a prominent role in the Gee Bee story, flying the larger and more famous racers.

Bayles later bought the Gee Bee X, NR49V, and used it for his personal transportation. Unfortunately, it was lost when Roscoe Brinton was forced to bail out of it during an air show in New Hampshire. Always the showman, upon being trucked back to the field, Brinton mounted the platform and told the crowd, "You wouldn't get a show like that in the National air races for what you paid here."

A total of nine of these Sportsters were built with a number of different powerplants. Eventually those with in-line engines were referred to as Model D's, while those with radial engines were called Model E's. The official CAA report on the Menasco powered Sportster gave it the highest ratings in every respect. During certification tests it took off in nine seconds after a run of only 360 feet. Its rate of climb was 1,100 feet per minute. Prices ranged from approximately \$4,800 to \$5,500 depending on the powerplant selected.

Later in 1930, a larger version of this Sportster evolved, known as the Senior Sportster and designated as the Model Y. Only two of these were built and a number of power options were available. The Model Y was a two-place ship that could be converted to a "oneholer" by removing the front windshield and placing a metal fairing over the front cockpit. Licensed as NR11049 (or X11049), and NR718Y, they had a span of 30 feet and a length of 21 feet. Both were eventually lost in crashes.

The depression continued to plague the nation and Granville brothers was not exempt from the difficult times. It was a constant battle to keep their heads above water. In mid-1931, Bob Hall, the chief engineer of the fledgling corporation, mentioned the money to be made in racing contests such as the Thompson race. Hall was convinced that he could design a plane that could capture such a rich prize and work was begun on this project in the middle of July. Meanwhile, financial backing

continued to be a problem. Hall pounded the streets by day seeking backers and toiled by night on the design and construction of the new racer. Finally, with sufficient funds, they formed the Springfield Air Racing Association with James Tait as president. One of their chief backers was Lowell Bayles, who had invested \$500 for the privilege of flying the Model Z, as the racer would be designated. Actually the Granvilles had very little money invested in this ship. In these difficult times practically everything was furnished by the manufacturers. Tubing, dope, fabric, wheels, tires, and instruments were donated for advertising purposes.

On August 22, 1931, Bob Hall's 26th birthday, the black and yellow Model Z was rolled out of its hangar. Shorter and stubbier than earlier models, it was already taking on the classic Gee Bee appearance. Only 15 feet 1 inch in length, it was powered by a Pratt & Whitney Wasp Jr., supercharged to 535 hp at 2400 rpm. The engine was loaned to the Granville brothers by Pratt & Whitney. Bob Hall demonstrated his confidence in his design by flying the first test flights despite his limited experience. Christened "City of Springfield", the Model Z was flown by Bob Hall to the National air races at Cleveland where they would learn the results of their labours.

On September 1, Lowell Bayles, flying without shoes to improve his feel of the rudder, raced over the Shell qualifying course at an average speed of 267.342 mph. On one run he attained an unofficial world record speed of 286 mph while 100,000 spectators gasped in wide-eyed wonder. The next day Bayles won the 50 mile Goodyear trophy race at a relaxed speed of 205.001 mph. Bob Hall, in Model Y, NR11049, had a close brush with death when he hit a water tank and clipped a few feet off a wing tip while turning on a pylon too close to the ground. This didn't phase him as he switched to the Model Z on September 5 to win the General Tire and Rubber trophy as Bayles rested for the upcoming Thompson trophy contest.



On September 6, Hall and the Model Z gained another first place for the Gee Bee team in a free-for-all race. Maude Tait, daughter of James Tait, captured the Cleveland Pneumatic Aero Trophy for Women in the Model Y at the speed of 187.57 mph, a closed course record for women. All of this led up to Bayles' triumph in the stellar attraction of the meet, the Thompson trophy race. The Gee Bees had cleaned up at Cleveland and shares in their venture that had originally sold for \$100 were now worth five times that. The Granvilles returned to a victory parade and banquet in Springfield with cash in their pockets and a determination to go after the world's speed record and to ready themselves for the 1932 campaign.

First, the "City of Springfield" was fitted with a new 750 hp Wasp Sr. R-1340 engine. Arrangements had been made with the authorities at Detroit's Wayne County airport to set up the speed course and Maude Tait would also make an attempt at the women's record in the Model Y while at Detroit. On November 6, Bayles took off from Springfield to fly to Buffalo where an 8 foot 2 inch fixed pitch

propeller was installed at the Curtiss Reed plant. After the arrival at Detroit, Bayles made three attempts at the speed record that were aborted as engine troubles plagued the "City of Springfield". On one trial run he had attained a speed of 314 mph and prospects of a record performance appeared good. Only the average of four runs could be given record consideration, so the speed mark continued to elude them. Maude Tait was equally unsuccessful and returned to Springfield for her marriage to Attorney James P. Moriarty.

On November 30, Bayles was ready for another assault on the record. This time it was the failure of the timing cameras that stymied Bayles despite the fact that he attained a speed of 284.5 mph on one of his runs.

On the afternoon of December 1, 1931, Bayles again went after the elusive speed record, making four runs over the F.A.I. 1.8 mile (3 km) course. The existing world's record was 278.4 mph and it was necessary to surpass this by 4.97 mph to claim a record. For a while it appeared that he had achieved 284.7 mph, but a recheck on December 2 showed an average of 281.75, so once more the record slipped from their grasp.

On December 5, the 31 year old Bayles was ready again. Shortly after 1 p.m. he took off and climbed to 1,000 feet to start his dive for the run which had to be made below 162 feet. Roaring into the three-kilometer course at approximately 150 feet above the ground, the Gee Bee was travelling at tremendous speed when the plane suddenly pitched up sharply and the outer half of the right wing folded back. The aircraft did two and a half fantastically fast snap rolls and crashed in a ball of flames. The wreckage was scattered over 600 feet and the shy, slim Bayles was killed instantly. Ironically Bayles was to have been married on December 13 to Miss Gertrude St. Marie of Newton, Illinois. His death was a terrible shock to all involved since he was like one of the brothers and had exhibited great faith in the aircraft.

A motion picture of the crash was examined frame by frame and the final conclusion was that a loose gas cap had caused all the trouble. Apparently it had vibrated loose, crashed through the windshield and incapacitated Bayles, at least breaking his goggles and possibly rendering him unconscious. It was here that the sudden change of attitude occurred. According to designer Hall, the plane was sensitive longitudinally and the sudden change of pitch caused the wing to fail. Pieces of the canopy, part of Bayles' goggles and the gas cap found along the flight path seemed to support these findings.

It must be re-emphasized that the Granvilles were not amateur experimenters who simply threw together a succession of aircraft with bigger and bigger engines. Granny always knew enough to attract highly skilled workers to their organization and on their staff were such competent aeronautical engineers as Bob Hall and Howell Miller. Although construction methods were of the highest order it seemed that the Gee Bees were often plagued by human errors, material defects or careless maintenance that brought these high-performance aircraft to grief.

It was only a slight consolation when an exception was made to the regulations to posthumously award the U.S. national land plane speed record of 281.75 mph to Lowell Bayles on January 14, 1932, for his flights of December 1, 1931. Although an air of gloom descended on the organization at their first loss, plans went ahead for the 1932 campaign.

Engineer Bob Hall had left the Granville camp at the end of November 1931. Russell Boardman, famed long-distance flyer, bought a controlling interest in the Springfield Air Racing Association and planned to pilot one of the two planes that the Granvilles were planning for the 1932 races which would be held at Cleveland from August 27 to September 5. For these races the Granvilles, along with their new chief engineer Howell W. Miller, built two planes, the R-1, begun in May of 1932, wore

racing Number 11, and the R-2 wore Number 7. Number 11 was powered by an 800-hp Wasp Sr. T3D1, while Number 7, designed for longer races such as the Bendix transcontinental, had a larger gas tank and a 550-hp Wasp Jr. Both had controllable pitch propellers, among the first used in racing. Russell Boardman was chosen to fly Number 11, and eventually Lee Gehlbach would pilot Number 7.

Boardman was born near Middletown, Connecticut, on January 22, 1898, and had purchased his first plane in 1921. For a while he took over the Hyannis, Massachusetts, airport and had operated a seaplane line from Boston to Hyannis. On July 28, 1931, along with John Polando of Lynn, Massachusetts, he had flown a Bellanca from Floyd Bennett field in New York to Istanbul, Turkey, to establish a distance record of 5,011 miles. At the Omaha air races in May of 1932, he won a free-for-all race in the Gee Bee Model Y that Maude Tait had raced in 1931. The following day he demonstrated his versatility by winning the Charles Holman acrobatic trophy.

Demonstrating the scientific nature of their research, the Granvilles constructed a wind tunnel model of their barrel-fuselaged racer and had it subjected to tests in the New York University wind tunnel. A year later, on May 18, 1933, Granny and his chief engineer, Howell W. Miller, presented a paper to the Society of Automotive Engineers in New York City describing the design and construction of their now-famous racers. Obviously they felt that they had two sound, viable contenders for the prizes offered in the upcoming races.

On August 10, painter George Agnoli finished the fancy scalloped red and white paint job on the R-1. On the 12th it was rolled out of its hangar to sit gleaming in the sunshine. Final adjustments postponed the first flight until the following day. On August 13, shortly after nine o'clock, Russ Boardman took off his coat, slipped on a parachute and flew the R-1 to the Bowles Agawam field across the Connecticut river. The performance figures were exhilarating. The R-1 had hit 240 mph without half trying and Boardman felt confident that 300 mph was well within reach.



Robert and Granny Granville were at Bowles when Boardman landed from the first test flight. As they opened the door of the plane, Boardman looked up at them, grinned and said, "You boys sure build airplanes." His only complaint was that the ship fishtailed during landing approach and apparently did not have enough fin area. Work was immediately begun to rectify that problem by adding two square feet of fin area and an increase in rudder area to match the added fin.

On Tuesday, August 16, Boardman was severely injured as he spun a Model E Sportster into the trees on the Carew street side of the Springfield airport as he was flying to Agawam to complete the tests on the revamped R-1. With two weeks remaining before the start of the races, neither aircraft had a pilot. Applications flooded the Granvilles from every pilot in the country who had any ambitions of appearing in the Cleveland races. Finally, on August 22, Lee Gehlbach was chosen to fly the R-2. He would ferry the R-2 to Burbank to fly the Bendix race from there to Cleveland. Oil temperature problems were already starting to show up which would plague the R-2 over the next few weeks.

A stroke of fate interjected a new name into the Gee Bee saga. At Wichita, Kansas, Jimmy Doolittle was test flying his Laird "Super Solution", which had been extensively modified for the 1932 races. When he found that he couldn't get the wheels down, he was forced to belly his aircraft in, eliminating it from further competition, but emerging unhurt. On August 27, when it was apparent that Russ Boardman would be unable to compete in the National air races, Granny made telephone arrangements with Doolittle for him to fly the R-1. On August 28, Doolittle arrived at Springfield. While everyone expected him to take a turn or two around the field to familiarize himself with the new aircraft, dubbed by the press as "The Flying Silo", he simply climbed in, headed west and never altered his course. Less than two hours later the Granvilles received a telegram stating simply, "Landed in Cleveland O.K., Jim."

Lee Gehlbach indicated his confidence in Number 7 when he told members of the press, "Number 7 is the most wonderful handling ship I've ever flown. Doolittle added his praise of Number 11 by stating, "She's got plenty of stuff. I gave her the gun for just a few seconds and she hit 260 like a bullet without any change for momentum and without diving for speed and she had plenty of reserve miles in her when I shut her down."

Only four planes were entered in the Bendix race from Burbank to Cleveland and Gehlbach had to be considered as one of the pre-race favourites, but engine troubles plagued him all across the country. Robert Granville recalls that "The Gee Bee was throwing oil so badly that Gehlbach landed in Illinois and removed the oil splattered canopy so that he could see." He finished a disappointing fourth, an hour and twenty minutes behind the winner, Jimmy Haizlip, who was flying the Wedell-Williams Special No. 92.

Doolittle fared better in the Thompson trophy race. On September 5, nursing a hay fever attack, he blazed around the pylons at a winning speed of 252.686 mph. Among those who witnessed his victory were his two sons, ten year old John and James Jr. Lee Gehlbach finished fifth, and Bob Hall, the former Granville engineer, was sixth in the field of eight in his Springfield "Bulldog" racer.

While at Cleveland, Doolittle set a world's land plane speed mark over the regulation F.A.I. three kilometre course that had been set up for a series of speed dashes sponsored by the Shell Oil Co. On August 31, the 35-year-old Doolittle averaged 293.193 mph on four runs over the speed course but this did not qualify as an official record since he didn't have a barograph in the plane to confirm that he was below the required 162 feet (50 meters) during his runs. He subsequently made four more runs on September 1, averaging 282.672 mph, just .77 mph short of that required to claim a new record. On his final run it appeared to the horrified spectators that he was about to brush some trees just north of the field. Later Jimmy said, "I was nowhere near them. I must have been at least four feet over them."

At the Eastern States Exposition in September of 1932, Jimmy, in speaking of Z. D. Granville, said, "He builds a most excellent airplane and it was the airplane that did the job." Finally, in a letter dated September 7, 1932, and addressed to Granville Brothers Aircraft, Doolittle commented, "Just a note

to tell you that the big Gee Bee functioned perfectly in both the Thompson trophy race and the Shell speed dashes. With sincere wishes for your continued success, I am, as ever, Jim.

Preparations were immediately started for the 1933 races. Number 11 was fitted with a P&W Hornet and a rudder with increased area. Number 7 had the Wasp Jr. replaced with a new Wasp Sr. and the old engine cowl from the R-1. A new wing with greater span and chord was installed as well as a larger rudder, identical to the new R-1 rudder. ALSO in 1933, work was begun on the design of a two place, long range racer to be built for Jacqueline Cochran and designed to compete for the \$48,000 purse offered in a London-to-Melbourne race scheduled for 1934. This plane was called the Q.E.D., from the Latin phrase, "quod erat demonstrandum", meaning that the solution of a given problem has been demonstrated. However, it would be tragically demonstrated that all the problems associated with high speed flight had indeed not been solved.

The 1933 National air races were to be held in Los Angeles from July 1 through July 4, with the finish of the transcontinental Bendix race from New York as one of the highlights. After being received at City Hall on June 6 by Mayor O'Brien of New York, Boardman, now recovered from his earlier injuries, and 22-year-old Russell Thaw, in the re-engined R-1, and the modified R-2, left Floyd Bennett field on the morning of July 1, 1933 along with Roscoe Turner, Lee Gehlbach, Jim Wedeli and Amelia Earhart. Thaw took off at 5:52 a.m. and Boardman followed, being the last to depart. Thaw used almost the entire length of the field, dragging his tail wheel as he struggled to get his heavily laden plane into the air. Boardman, with a lighter load and higher horsepower, made a perfect take-off and streaked westward.

Boardman and Turner had announced that they would refuel in Indianapolis while the others would let their fuel consumption govern their landing places. Preliminary plans called for Thaw to land at St. Louis and Amarillo, but his high rate of fuel consumption caused him to land at Indianapolis. Turner arrived at Indianapolis at 6:06 a.m. and within ten minutes he was once more winging his way westward. Thaw was the next to land. Contrary to many published reports, he made a perfect landing. On all earlier Gee Bees the Granvilles had manufactured their own shock struts. Now their racers were equipped with a commercially manufactured strut. In making a rapid 180-degree turn to get back to the refuelling area, one of these struts collapsed and the left wing tip was damaged near the outer aileron hinge as it struck the runway.

Since it looked as if the damage could be readily repaired, the plane was wheeled into a hangar and work was begun to restore it to flying condition. Boardman was the next to arrive and he chatted with Thaw as his plane was refuelled. Then he took off with 200 gallons of fuel on board. At about 40 feet in the air, he lost control of Number 11, and it flipped on its back and crashed, fatally injuring Boardman, who died on the morning of the 3rd, leaving a wife and four-year-old daughter, Jane. Thaw was so shaken that he withdrew from the race at that point.

The other entries were also plagued with misfortune. Lee Gehlbach, flying a Wedell-Williams racer, was forced to land near New Bethel, Indiana, with a clogged fuel line, crashing through a fence but emerging unhurt, and Amelia Earhart, in a Lockheed Vega, was forced down in Kansas. Roscoe Turner won the race in 11 hours and 30 minutes, picking up the \$5,050 first prize plus \$1,000 for setting a new East to West record. Wedell, who finished second, won \$2,250.

It was a horrible blow for the Granville brothers. In a few minutes they had lost both planes and one pilot. Robert Granville recalls, "I guess it was the point where our luck started to go bad."

Boardman's brother, Earle, also a pilot, was with him when he died. On July 4, he flew Russ' body east to Hartford, Connecticut, stopping to refuel at Syracuse, New York. On July 6, 1933, Russell

Boardman was laid to rest in the Miner cemetery in Middletown, Connecticut, while six planes circled overhead and dropped flowers. Among those present was John Polando of Lynn Massachusetts, with whom Boardman had made his long distance flight to Turkey.

Granny repaired Number 7, but within a few days Jim Haizlip cart-wheeled it across the Bowles Agawam field. Although he was uninjured, the plane was a total loss. One more tragedy took place in 1933 that reflected unfairly on the reputation of the Granvilles. On September 4, 1933, the newest Model Y, NR718Y, originally built for the E. L. Cord Corporation, but now owned by Arthur Knapp of Jackson, Michigan, and being flown by 26-year-old Florence Klingensmith of Minneapolis in the International air races at Chicago, crashed and was destroyed. Originally powered by a 215-hp Lycoming R-680 engine, it now sported a 450-hp Wright J6-9 Whirlwind.

Miss Klingensmith was running with the leaders in the seventh lap of the Phillips trophy free-for-all race when the fabric on the right wing split between the first and second ribs. Although Granny later insisted that this should not have affected the integrity of the aircraft, she leveled off and flew to the southeast for three miles before hitting a tree at the corner of Glenview and Shermer Roads in Glenview, Illinois.

She had evidently tried to bail out at the last minute for her chute was deployed beside her, but she had been killed instantly. Later, the remaining Model Y, NR11049, formerly flown by Maude Tait, was lost when a propeller blade broke, the engine tore loose from its mountings, and it spun into the Atlantic Ocean after a take-off from North Beach (now LaGuardia) field. Both of these planes had passed from the influence of the Granvilles and had been modified by their new owners, but the reputation of the Gee Bees suffered unfairly from their loss.

During the fall of 1933, Z. D. Granville, Howell Siller, and Donald Delackner opened a consulting engineering office in New York City in the hopes of continuing development of certain commercial projects such as four, six and eight place airplanes. As far as racers went, they were left with the shattered remains of the R-1 and R-2. From the remains of the R-1 and the R-2 the Granvilles built another racer, christening the resultant plane "Intestinal Fortitude". It was known as "International Supersportster" Model R-3. The plan was for Roy Minor to fly it in the Chicago races of 1933.

After "Intestinal Fortitude" was assembled, Granny planned to fly to San Antonio to deliver a Sportster that he still owned to a customer in that Texas City. En route, he planned to visit Florida and the Mardi Gras in New Orleans. Approaching a landing at Spartenburg, South Carolina, on February 12, Granny suddenly noticed that there was construction in progress and his only safe landing area was blocked by two workers unav. are of his approach. As he pulled up, his engine coughed and died and he spun in from 75 feet. The 35-year-old Granny died en route to the hospital leaving a wife and two children.

Shortly after Zantford's death, the Gee Bee organization was sold at a sheriffs sale. However, financial backing was found to continue work on the big Q.E.D. Wesley Smith and Jacqueline Cochran flew this plane in the MacPherson Robertson London-Melbourne race and made it as far as Bucharest, Romania. Here the aircraft was damaged in landing when the flap system failed to operate properly. Earlier in 1934, Lee Gehlbach had flown the Q.E.D. in the 1934 Bendix race. Plagued by cowl troubles, he arrived in Cleveland too late to even place in the race. As if there were not enough trouble, Roy Minor had stood the R-3, also known as the R-1/R-2, up on her nose in a drainage ditch in Springfield during some tests and that eliminated that aircraft from any of the 1934 events.

With all its power, the R-3 had a tendency to float during landing, causing Minor to overshoot on landing and touch down at mid-field. Earlier a thunderstorm had drenched the field and he found he

could not stop on the wet grass. The plane went up on its nose in the ditch, made one or two revolutions on its prop and then leaped over the fence to land upright on its gear in the adjoining street. Needless to say, Minor was thoroughly disgusted as he climbed out of the aircraft and tossed his helmet and goggles over the fence to the Granvilles, who had raced to see what remained of the aircraft. The resulting damage eliminated the ship from all competition during that year.

The Granvilles hoped to attract some military business by demonstrating the Q.E.D. throughout Europe. Although some demonstrations were arranged, no orders were forthcoming. Returning the ship to the United States, it suffered a landing accident while on a demonstration flight for some Chilean officials. Although no one was hurt, no orders resulted from that event. Indeed, with a little luck at this time and with the impending war, the Granvilles might have taken their place among the prominent aircraft manufacturers of the present era. But, unfortunately, whatever luck the Granvilles had was almost invariably bad.

The 1935 Bendix race saw two Granville entries. The Q.E.D. was flown by Royal Leonard and the composite R-3, renamed the "Spirit of Right", was to be flown by 33 year old Cecil Allen. Among Allen's backers were the Aero Educational Research Organization of Pasadena and the Religious Patrons Association. The R-3 had been modified by Allen. although the Granvilles could no longer directly exert any control upon its fate. Howell Miller had contacted Allen and offered to aid in its reconstruction. When he was ignored. he did stress to the new owner that in no case should the centre of gravity be moved aft of 22 percent of the mean aerodynamic chord.

The 1935 Bendix race was from the Union Air Terminal in Burbank, California. to Cleveland. On August 30, Allen was the last to take off. following Benny Howard, the eventual winner, and Roscoe Turner, who was to finish second by only 23 seconds The "Spirit of Right" was decorated with the cartoon character "Filaloola" bird that had adorned the earlier successful Model Y, and the motto, "Over the Fence and Out", and that's a succinct summation of its performance.

Allen's plane, 22.5 feet in length with a 30 foot span, had not performed well in tests and careened crazily at the start of the Bendix. Staggering into the sky, Allen was only two miles from the field when he lost control and crashed in an open field. Allen had cut the ignition switch so there was no fire, but the two witnesses who raced to the scene found him dead in the cockpit. Allen had added some fuel tanks and had test flown the aircraft with only the forward tank filled. With the aft tank filled for this race, it was later computed that the center of gravity was approximately 35-37 percent of the M.A.C. Again the Granville name was defiled when, in fact, it should have been reported that "they told him so". The Q.E.D. fared only slightly better, making it as far as Wichita when engine trouble arose to prevent the fans at Cleveland from getting a glimpse of the Gee Bees in 1935.

The Granvilles were now just about finished in the field of racing although Mark Granville and most of the workers at the Granville plant built a new racer for Frank Hawks. Sponsored by the Gruen Watch Company, it was called "Time Flies" and was one of the most streamlined aircraft of all time. A unique feature on "Time Flies" was that the pilot's seat could be lowered about 12 inches in flight, allowing the windshield to be retracted flush with the fuselage.



The Q.E.D. was left alone to carry the memory of the Granvilles to the leading air racing events that they had once dominated. Lee Miles flew the Q.E.D. in the 1936 Thompson trophy race, averaging over 200 miles per hour for the first 10 laps. Then engine trouble forced him to retire. The jinx of the Q.E.D. continued.

By 1938, the Q.E.D. was in the possession of Charlie Babb, a well known aircraft broker. After a complete overhaul of the plane, George Armistead, one of Babb's pilots, was named to fly it in the 1938 Bendix trophy race. Heading east from Burbank, Armistead was over Kingman, Arizona, when he noticed his oil pressure dropping rapidly and the oil temperature climbing at an alarming rate. Landing at Winslow, Arizona, he decided that there was no use in attempting to resume the race.

Charlie Babb then sold the Q.E.D. to Francisco Serabia, the president of TASCA, a Mexican airline. The plane was renamed "Conquistador del Cielo and registered as XB-AKM. Serabia called it the best plane I've ever flown". On May 24, 1939, he flew the plane from Mexico City to New York, covering 2350 miles in just 10 hours and 47 minutes. On June 7, Serabia was ready to leave Bolling field in Washington. D.C.. for the return flight to Mexico. As the plane roared out over the Potomac river, the engine missed and faltered and the plane plunged into the river. Serabia was trapped in the cockpit and drowned in 15 feet of water. Later it was determined that the cause of the accident was that a rag had been left inside the cowl and had been sucked into the carburettor air intake.

Later, the Q.E.D. was salvaged with minimal damage. For a time it sat at a Mexican Air Force Base at St. Lucia. (In the 1960's. Alberto Sarabia, a cousin of Francisco Sarabia, had the Conquistador del Cielo" restored to like new flying condition. A round, domed museum to house the restored aircraft was built in Ciudad Lerdo, Durango, Mexico and the aircraft is presently enshrined in the middle of the room, surrounded by floodlights that illuminate the aircraft night and day. The museum is open to the public.) The surviving Gee Bee Model A, N9OIK, is in the collection of the Connecticut Aeronautical Historical Association at Bradley Field in Windsor Locks.

What has become of the principals of this story? Edward Granville worked for Pratt & Whitney in Connecticut for 40 years and retired in 1976 as Chief of Experimental Construction. In 1977 Ed died at his home in Silver Lake, N.H. Robert Granville was a foreman for Vought during World War II, supervising the construction of Corsairs and Kingfishers. In 1946 he moved to Maine where he purchased a large farm near Skowhegan. Having sold most of the farm, he and his wife, Eva, were living in North Cornwall, Maine, when he passed away on 13 Nov. 1978.

Mark Granville was superintendent of the wind tunnel at Pratt & Whitney when he died of a heart attack in Somers, Connecticut, in the early 50's. Thomas Granville, who was a welding foreman at Kaman Helicopters, died in May of 1974 of heart trouble. Howell (Pete) Miller, the designer of the R-1 and R-2, is retired from Pratt & Whitney and lives in Manchester, Connecticut. Robert Hall retired from Grumman Aerospace Corporation as Vice President and now resides in Hilton Head, South Carolina. Maude Tait Moriarty still lives in Springfield, Massachusetts. Russell Thaw is reported to be a postmaster in a small Connecticut town. While Granny's wife, Alta, died in December of 1974, his son, Robert, works for Pratt & Whitney in Hartford while his daughter, Norma, is a medical doctor and blood specialist at a hospital in Hartford, Connecticut.



The old Springfield field is no longer there, having been turned into a shopping centre, but the birth of the Granville aircraft at this site has not been forgotten. A large mural in a restaurant depicts the landing of a Gee Bee at the old airport and bears portraits of the five brothers. One wonders how many busy shoppers in a nearby department store pause to read a plaque erected in honour of the Gee Bees and the Granville brothers. Indeed, the Gee Bee racers will live forever in the memories of those who witnessed the flights of these remarkable aircraft.

Gross Weight 2280 lb Empty Weight 1400 lb Useful Load 880 lb Seats 1

Length (overall) 15 ft 1 in Cowl Diameter 46 in Span 23 ft 6 in Root Chord 50.4 in Rib Spacing 5.5 in Spar Spacing 25.5 in Airfoil M-6 Incidence Angle 3 deg Dihedral Angle 4.5 deg

Wing Area 75 sq ft Aileron Area 9.5 sq ft Stabilizer Area 8.4 sq ft Elevator Area 6.9 sq ft Fin Area 2.2 sq ft Rudder Area 4.9 sq ft

Landing Gear Travel 6 in Tires 23 inch Goodrich 6.5 x 10 Wheel Tread 71.75 in Wheel Fairing Width 10.5 in

High Speed 270 mph Cruise Speed 230 mph Landing Speed 80 mph

Runway Requirement 5000 ft @ SL

Range 900 sm

Powerplant P & W Wasp Jr (Supercharged) 535 hp @ 2400 rpm Fuel 103 gal Oil 11 gal

Production 1 First Flight 8-22-1931

Construction

- Chrome Moly steel tube fuselage. - Covered with fabric

Flight Controls Rudder - Cable Actuated Ailerons - Torque tube actuated Elevator - Push pull tube and double cables

Notes: - Winner of 1931 Thompson Trophy at 236.24 mph - Qualification speed for 1931 Thompson (level flight, 1 pass each way, averaged) 267.342 mph - Larger 750 hp Wasp Sr, new prop and cowl were installed after the Thompson. - Destroyed on a speed course, December 1931, Detroit, MI Zantford Granville attributed the accident to a fuel cap coming loose, passing through the windscreen and striking the pilot.