One Classy Rearwin Cloudster

Carefully restored with character

article and photos by Sparky Barnes Sargent

In the early summer of 1940, Rearwin test pilot Billy Miller gave NC25552 (s/n 828) a thorough preflight, as sunlight glinted from its lustrous, hand-rubbed vermilion and indigo-trimmed finish. Climbing into the elegantly appointed cabin, the clean scent of new wool upholstery enveloped him, and the gracefully curved, chrome-plated control stick felt cool to his touch. He engaged the electric starter, and the seven-cylinder, 120-hp Ken-Royce radial rumbled to life. Then he taxied the three-place airplane out for takeoff, and the Cloudster quickly climbed away from the runway. Miller gained sufficient altitude above the Fairfax Airport in Kansas City, Kansas, to put the airplane through the prescribed series of test maneuvers and recorded the data from his findings in a detailed report.

A copy of that report, along with the build sheet from the factory, filtered down through seven decades and now rests in the hands of the airplane's current caretaker, Ed McKeown of Village of Lakewood, Illinois. So when Rearwin Aircraft & Engines Incorporated advertised that "the Cloudster is built to last," its statement was a bit more prophetic than it might have imagined.

A brief glance at Rearwin history reveals that, in 1937, Rearwin Aircraft acquired LeBlond Aircraft Engine Company and renamed it Ken-Royce Motors, after owner Raymond Andrew Rearwin's two sons, Ken and Royce. In 1939, Rearwin's companies came together as Rearwin Aircraft & Engines. By then Rearwin was already known for several of its airplanes, including the Speedster and Sportster—in fact, it advertised the popular Sportster model in the first issue of *Trade-A-Plane Service* in 1937. Rearwin manufactured around 125 Cloudsters under Approved Type Certificate No. 711, and today, serial number 828 is one of only 24 Rearwin Model 8135s listed on the FAA Registry. By 1942, the company was sold to Empire Ordinance, which continued manufacturing operations as Commonwealth Aircraft.

'Cloudster Is Tops!'

The Cloudster has sometimes been affectionately dubbed a "baby Howard," since its round engine and tall vertical stabilizer are similar to the larger Howard DGA of the same era. Rearwin had its own creative promotional slogans, and one was "by any yardstick you choose, the Cloudster 'measures up.'" One such "yardstick" was that of performance: "The Cloudster is powered with the time-tested, dependable Ken-Royce motor, which assures plenty of power and pep for top-notch performance under all conditions. . . . Just tap the throttle and the Cloudster is off with full load in 700 feet—up like a rocket, off like a bullet!" Another was economy: " . . . sky-high in value, yet down to earth in price . . . . And the Ken-Royce motor, with its new automatic overhead rocker box oiling system . . . eliminates hand greasing . . . ." Yet another measure was beauty: " . . . see the flashing, streamlined styling of the Cloudster. . . . Outside and in, the Cloudster has a personality of its own, for its looks are as distinctive as its performance."

Another ad touted the Rearwin's features by describing: "Thrills for Three—A real three-place airplane, with room

The 1940 Rearwin Model 8135 Cloudster taxies out for takeoff.

Owner Ed McKeown and
Roger Shadick of Noble Aviation.

to spare and power to burn… Cloudsters Go to Iran—. . . the Iranian Government picked Rearwin 120 hp Cloudsters – twenty-five of them – for its Aero Club. . . . These airplanes are being used half way around the world on fields a mile or more above sea level and over high, mountainous country. They *have* to be good . . . Service With a Smile— . . . The Cloudster's newly designed two-piece engine cowling … can be raised in three minutes for quick and easy engine servicing. There's a special opening which saves additional time in checking the oil level. . . . Appointment with Beauty— . . . Placement of sticks well forward enables women fliers to wear conventional dresses with perfect freedom . . . Inside and out, the Cloudster is tops!"

Construction and Specs

The Model 8135 measured 21 feet 6 inches from nose to tail, and its fuselage was composed of welded steel tubing with spruce fairing strips. Its wings had a span of 34 feet 1-3/4 inches and were built of spruce spars and truss-type ribs with plywood gussets, with duralumin leading and trailing edges. The ailerons were of metal construction, and the tail group was composed of welded tubular steel spars with steel channel ribs. Ball bearing control pulleys were used throughout the flight control system, which provided the pilot with smooth, fluid control. Its main gear incorporated hydraulic shocks, and its tail wheel was a combination full swivel/steerable with a hydraulic pneumatic shock absorber.

A 17-gallon fuel tank in each wing provided a 600-mile range, since the seven-cylinder, 120-hp Ken-Royce engine burned about 7 gph at a 120-mph cruise. The Cloudster weighed 1,140 pounds empty and had a useful load of 760 pounds and a gross weight of 1,900 pounds. Its maximum speed was 135 mph; its landing/stall speed was 50 mph. The price at the factory started at $4,495.

Cloudster Chronicle

Serial number 828 went through a long chain of ownership, enduring a few mishaps through the years. Following are just a few highlights gleaned from its aircraft records. The Coffeyville Airway Corporation of Coffeyville, Kansas, sold NC25552 to the Defense Plant Corporation of Washington, D.C., in March 1943. The Defense Plant Corporation was created by the Reconstruction Finance Corporation pursuant to Section 5(d) of the Reconstruction Finance Corporation Act, as amended, to aid the government of the United States in its National Defense Program. During the brief period of time it owned the Rearwin, it was badly damaged during a forced landing.

The Civil Aeronautics Administration (CAA) Inspector's Report stated that the accident occurred at South Coffeyville, Oklahoma, on July 6, 1943, at 4:45 p.m. The pilot, Jack Howard Graham of Sioux City, Iowa, was an instructor who was associated with the Coffeyville Airway

Serial number 828 came from the factory with a wind generator.

The original glove box neatly conceals a modern transponder, radio, and engine analyzer.

company. "The engine quit on the takeoff, necessitating a forced landing. Damage to aircraft: propeller broken; motor mount bent; right side landing gear buckled; right lift struts bent; vertical fin and rudder demolished." The inspector further reported: "After intensive investigation, it was determined that a cotter key was missing from the throttle arm on the carburetor and the retaining nut was loose. This would allow the butterfly to operate independent of the throttle if the nut were loose enough. The spring on the butterfly would then shut the butterfly valve, causing the engine to drop back to idling speed and be thought to be 'windmilling.' The reason the butterfly would close is because the spring is hooked up to work in this manner. The spring should be arranged in such a way as to open the butterfly instead of closing it. Since the manufacturer overhauled the complete engine and it's [sic] accessories the last time, it is assumed that they attached the spring in this manner."

The Cloudster was repaired, and the Defense Plant Corporation sold NC25552 to James Emmett Combs of Kansas City, Missouri, in April 1944. Omar Midyett of East St. Louis, Illinois, purchased the Rearwin in June 1949 and sold it in September 1950. Interestingly, Midyett was well-known for operating a flight-training school and establishing Lakeside Airport near Granite City in southwestern Illinois.

Those in the antique community may well remember NC25552 (now N4404W) as Noel and Mary Gouldsmith's airplane. Noel, of Independence, Missouri, owned the airplane in the early 1960s and restored it. He also replaced the original Goodyear 3LNBM wheels by installing 800x4 wheels and Hayes brake assemblies from a PA-12. Painted in an unmistakable Daytona white and forest green scheme, the airplane was a regular visitor to the fly-ins at Ottumwa, Iowa, where it won several awards.

William Kloek of St. Paul, Minnesota, purchased the Cloudster in May 1971, and Ed McKeown recalled, "He landed it in a tree after running out of fuel. Then Frank Hay [of Nisswa, Minnesota] bought the airplane in April 1992."

Ed first learned about the availability of the airplane from Roger Shadick, owner of Noble Aviation in Eagle River, Wisconsin. "Roger heard about this plane down in Racine, Wisconsin, and I knew what it was, so I called Frank Hay. He had it stored in a garage on his property, and all the parts scattered around there, along with the engine," said Ed. "He was just plain tired of the project, and it needed a lot of work. He also had another Cloudster, N25451, minus its prop and engine. I purchased both airplanes from him in May 2002."

Restoration

Serial number 828's restoration began in earnest when Ed and Roger moved both Rearwins to Eagle River, Wisconsin, in September 2002. Roger acquired NC2551 from Ed, and Ed and Roger started a slow-but-sure restoration on N4404W.

As sometimes happens with dormant airplanes, Ed discovered that his Cloudster's original CAA identification mark, NC25552, had been forfeited when the registration wasn't kept current. Frank Hay registered the airplane after he bought it in 1992, and thus it received N4404W as its new registration number. When Ed acquired the project, he recalled with a chuckle, "I found the original number on a Piper Cherokee in Michigan, so I called the owner, and he was willing to give me the N number—if I bought the airplane for $35,000!"

Roger fabricated all new sheet metal, which was a bit of a challenge. "The skins look relatively simple, but in fact they're really not, because one skin tucks into another one to hold it together," he described, "and the parts that Ed had were wrinkled-up masses of junk. I rolled them out flat to see if I could determine where the bend started and ended, and the general shape of them, and then we went from there."

Ed recalled, "The cowl was unbelievably destroyed. Roger reworked the original, because it was either do that or try to get a new one. I thought that if he got it as good as he could, it would look like it was original for the plane, rather than a brand new piece—and that was good; we wanted that kind of character in it. We did the same thing with the wheelpants. We wanted to maintain some authenticity and the character of the plane."

The tail wheel assembly also offered a challenge. "It's 'original,' except I made it all new, because it was corroded and rotted," declared Roger. "That's the most complex tail

wheel system I've ever seen in my life. There are cables going everywhere, an oil spring, and steel tubing."

Roger progressed steadily on the project for a while… or so they thought. "Frank had covered the fuselage and the wings while he owned it, and they looked okay, so we assumed they were. We did all the finish coats and sanding, wired in the lights, and were all set to go," Roger explained, adding, "and then we opened up the inspection holes on the wing and started seeing some really scary stuff in there. So then the wings had to be redone, and my shop didn't allow the time for us to really tear into it."

That's when they enlisted the services of Kent McMakin of Rockton, Illinois, who repaired both wings by fabricating new components. He replaced a total of 11 cracked ribs, as well as the left and right rear spars.

Roger re-covered the fuselage with Poly-Fiber and used a high-volume, low-pressure system to apply the finish coat of Poly-Tone to the entire airframe. One of his employees, Randy Block, completed the new wool headliner and upholstery, and the control sticks, rudder pedals, door handles, and other cabin hardware were freshly chromed. Roger made a new instrument panel by forming metal around a block of wood and welding it as needed; then it was sent to a company in California to receive its walnut veneer. The panel neatly conceals a transponder, radio, and engine analyzer inside the original glove box. The electric fuel gauges, Ford ashtray, and Carwil T61 wet compass also help retain the originality of the panel.

Ken-Royce

The Ken-Royce radial was overhauled by Dick Weeden of Brodhead, Wisconsin. It has a few modifications, according to Roger, including an oil recapture system in the lower rockers, which was added by a previous owner. "That works really well, and we also installed an Airwolf filter. Plus we did the conversion to use Continental valve springs, because there was a real issue with breaking valve springs," explained Roger. "This engine has an ignition booster, which is operable, but really not necessary because the engine starts really nice without it."

Another mod was the installation of a J.P. Instruments EDM-700 EGT-701 engine monitor scanner, to simultaneously display exhaust gas temperature and cylinder head temperature for all seven cylinders, as well as displaying oil temperature and system voltage. The wind generator, which was a factory option, is now in good operating condition, and is used to power the wing's retractable landing light.

Roger is pleased so far with the Ken-Royce engine's performance. "I flew down from Eagle River to Poplar Grove to Blakesburg," he said, "which was about 330 miles, and it probably used a quart of oil—so it does really well."

Flying the Cloudster

The Cloudster's initial test flight was flown by Joe Norris of Oshkosh, and it was quickly evident that the airplane wasn't rigged correctly. Then Ed and Roger received checkouts from Mike Weinfurter of Rhinelander, Wisconsin. Ed, a Stearman pilot who is no stranger to tailwheel flying, recalled his turn in the left seat: "I would say for me, during the first hour of flight, I found it to be the most squirrelly airplane I have flown. The takeoffs were every bit as exciting as the landings, without a doubt! It has minimal rudder authority at low speeds," he shared, adding with a chuckle, "so it was certainly fun to acquire the necessary skills to get more confident. Now we know that some of it was that its rigging just wasn't tweaked yet."

Roger explained, "We got a hold of Gary Van Farowe, who was the Cloudster guru, and I asked him if he had any kind of setting [for the angle of incidence] on these wings, because the build manual that I have says nothing on that. We had set it up fairly neutral, and then started adjusting the wings a little bit, trying to make the airplane climb better. Gary couldn't find any information either, but he measured a whole bunch of rear struts, and they ranged in length from 100-3/4 inches to 101 inches. At that point we felt we had a good number to go by, and we were at the high end of that length, so I adjusted it by 1/4 inch less in the back of the strut—and the airplane really flies nicely now!"

Ed said, "I fly 80 mph on downwind and 70 mph on final and across the threshold to a full three-point landing. It's really behaving beautifully now that 'all the bugs' have been worked out. At first, it was a learning experience, and right now I think we're both very comfortable with where we are and the performance of the airplane. The control pressure is as smooth as you could hope for, and you get almost 1 mile for horsepower out of this engine. I think those are two of the more impressive things for me."

Congratulations to Ed and Roger for a job well done in preserving a bit of Rearwin history for others, as well as themselves, to enjoy.