“Quite Easily Done”

Mid America Flight Museum brings the Gee Bee QED II back to life

BY JAN TEGLER | PHOTOS BY JIM BUXTON

“Gee Bee stands for Granville Brothers, a Springfield, Massachusetts airplane company which made fast, unstable, dangerous planes in the thirties. The nearly cute nickname is a sham. They were killers. There were few pilots who flew Gee Bees and then lived to talk about it. Jimmy Doolittle was one. I was another.”

The preceding thoughts are those of aviation legend, Jacqueline Cochran, in “Jackie Cochran, An Autobiography,” a chronicle of her life released seven years after her death in 1980. Cochran was one of several pilots who flew what is among the least known designs to originate from a Granville Brother, the unique R-6H.

In truth, the R-6H was not a “Gee Bee.” Though it looked like an overgrown version of the successful but dangerous Gee Bee R-1, which made headlines by winning the 1932 Thompson Trophy pylon air race in the capable hands of Jimmy Doolittle, it was actually conceived after Granville Brothers Aircraft Company went into liquidation in September 1933.

Zantford “Granny” Granville was the force behind Granville Brothers Aircraft, coaxing his brothers—Thomas, Robert, Mark and Edward—into launching the business in 1929. Between 1929 and late 1933, the brothers designed and built a succession of biplanes and low-wing monoplanes that rose to fame during the Golden Age of Air Racing.

Following the demise of his eponymous company, Granny Granville joined with his chief engineer Howell Miller, the man who'd helped him design the barrel-nosed, tear drop-shaped Gee Bee Z, R-1, and R-2 racers. The two formed an aviation consulting company with an aeronautical engineer named Don deLackner in New York City.

Known as “GMD,” the firm undertook three projects including the design of the R5 International SuperSportster, an aircraft the trio intended as an entrant for the 1934 MacRobertson Trophy Race—the richest, longest cross-country competition ever organized to that point.

A race between Mildenhall, England and Melbourne, Australia set for October, 1934, the MacRobertson would challenge racers over a whopping 11,300 miles with an overall purse of 15,000 British pounds, a literal fortune in the midst of the Great Depression.

Jackie Cochran, who had learned to fly just two years earlier, aimed to be in the race. A combination of circumstances led to her flying the redesigned R-5, now called the R-6H QED, named after the Latin phrase “quad erat demonstratum,” translated as “that which was to be demonstrated.” Cochran said the designers translated QED as “quite easily done.”

“It was not easily done, however,” she quipped. “The crazy QED violated basic rules of aerodynamics.”

The Moss QED II

In the spring of 2023, Mid America Flight Museum (MAFM) owner and founder Scott Glover purchased an airplane he'd had his eye on for years, the QED II, a modified replica of the R-6H constructed by Jim Moss, a well-known builder of replica historic aircraft from Buckley, Washington.

Moss and a dedicated team of skilled volunteers built the replica from scratch between 2002 and 2013, using the limited information available to them on its design/construction. The original QED is still extant, on display in Lerdo, Mexico.

The QED II made its first flight in late 2013, sadly, several weeks after Moss passed away. Thereafter it was flown to events in 2014 including EAA's AirVenture in Oshkosh, Wisconsin and the Reno National Championship Air Races. But that flying season would be the only time it took to the skies. For years, the airplane sat idle on display at The Historic Flight Foundation in Everett, Washington and ultimately in a T-hangar in Arlington, Washington as the Moss family searched for a buyer.

The QED II has just 66 hours of flight time in its log book, according to Doug Smith who leads MAFM's restoration facility in Urbana, Ohio. Smith and MAFM volunteer Jim Buxton traveled to Arlington once the sale was completed.

“The wings were off of it but the tail was on,” Smith recalled. “We went up to Arlington and spent three days taking the tail apart and building boxes and crates for everything to put it on a long trailer and have it trucked back to Ohio.”

It wasn't until October of 2023 that the

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MAFM restoration team began assessing the QED II's condition and re-engineering elements of the aircraft that could be improved. After speaking with members of the team that built the big monoplane Smith had two primary concerns.

"One was the landing gear," he said. "There were cracks in the landing gear system. The second concern I had was that they did not balance the ailerons. Gee Bees, with their reputation, I thought that was quite important for the ailerons to be balanced to avoid a flutter situation."

The MAFM team got to work addressing those issues beginning with the gear. The Moss replica deviated from the original QED in several ways.

"Mr. Moss spread the landing gear two feet farther apart—a foot on each side—to make the airplane more stable on the ground with today's hard-surface flying conditions," Smith explained.

But the Moss team also chose not to include the spreader-bar that braced the original aircraft's main gear. That allowed excessive flexing of the Beech 18-derived shock struts and wheels that support the 5,721-pound empty weight of the QED II.

The MAFM team had a luxury the Moss team lacked, an almost-complete set of design drawings for the original QED as well as engineering reports that deLackner and Miller composed as they were designing different aspects of the airplane Smith noted. "So we were able to kind of get into their heads and reverse engineer what they were thinking this airplane needed to withstand in an adverse landing condition and reconstruct what they had intended for the spreader-bar," Smith said.

Five-eighths-inch diameter landing gear wires were also added to help prevent flexing. To address the QED's unbalanced ailerons, Smith and the MAFM restorers added lead-mast counterweights mounted at the leading hinged-edge of the ailerons. They extend forward to counter the 30 pounds of weight each of the airplane's large ailerons carry behind their hinges and prevent destabilizing flutter.

The MAFM team also redesigned the QED II canopy system with a new arrangement that makes it harder for the canopy to jam in-place—a serious flaw that could endanger the pilot or back-seater in the event they needed to bail out.

The original QED was raced with a 675 horsepower Pratt & Whitney Hornet 9-cylinder, air-cooled radial engine enclosed in a NACA cowling, hence its R-6 "H" designation. Moss chose to upgrade the power of the QED II, fitting a 1,425 horsepower Wright 1820 radial with a two-stage supercharger—the engine that powered the T-28B Trojan trainer.

"We took the engine off the airplane and sent it out to Anderson Aeromotive and they put it in their test stand for 10 hours," Smith said. "The engine hadn't run for over 10 years!" "We took the pressure carburetor off and had it overhauled as well," he added. "That way all of our diaphragms are fresh. We feel good about the engine, prop and everything up front."

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Cochran’s conundrum

Jackie Cochran had planned to race Northrop’s sleek Gamma in the MacRobertson race, a type that had already set a transcontinental speed record between Los Angeles and New York City with pilot Frank Hawks in 1933. She purchased serial number 11 and specified that it be modified by Northrop as a two-place racer with a Wright 1570 Conqueror V-12. The aircraft was completed by the end of September 1934. But while being ferried to New York City by Jackie and copilot Royal Leonard, the airplane experienced repeated problems with its supercharger, making emergency landings in Arizona and New Mexico.

With the MacRobertson race looming, Cochran took a commercial flight to New York after the first landing. Leonard continued on in the Gamma 2G but had to land off-field in New Mexico, seriously damaging the racer. When it became clear that the Gamma would not be ready in time for the MacRobertson, Cochran fell back on the QED, an aircraft she had previously approached the GMD firm about for the race. With help from future husband, millionaire investor Floyd Odlum, she funded the build of the QED.

She had also specified a Conqueror V-12 for the QED, but Wright could not provide her one in time for the race. So the Hornet radial was installed. After a rushed effort to complete the QED was made, it was shipped across the Atlantic on a liner just in time for the start of the MacRobertson.

Cochran and copilot Wesley Smith had very little experience with the airplane and took off on the first leg of the race for Bucharest, Rumania, hoping for the best. But a unique feature of the original QED was its split-flap arrangement.

It’s speculated that Cochran and Smith failed to appreciate the effectiveness of the QED’s split-flaps, causing the airplane to drop out of the air on the last stage of its landing approach. The hard landing caused damage that could not be repaired quickly and their race was over.

The QED went on to compete in the Bendix cross country races in 1935 and 1938 and the Thompson Trophy pylon race in 1936. It failed to finish any of these events and by 1939 was in the hands of Mexican pilot Francisco Sarabia.

Sarabia set a record with the QED, flying from Mexico City to New York City in 10 hours, 47 minutes on May 24, 1939. During his return trip to Mexico, Sarabia made a stop at Bolling Airfield in Washington, D.C. for fuel and to see his family. Tragically, he crashed on takeoff from the airfield. A rag that had been used to check the aircraft’s fluids was left beneath the cowling. When it was sucked into the Hornet’s carburetor intake, the QED plummeted into the Potomac River, killing Sarabia. The Mexican government recovered the wreckage and pieced it back together.

It still sits, earthbound in Lerdo.

But on May 14, 2026, the QED II flew again. ✈