

AVIATION

NEW TECHNOLOGY

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Look, It's a Plane. No, It's a Car!

By Harry Kraemer

As man started to reach for the skies in his new craft, he also looked for names for this new craft. Often, the name given to this new craft came from modifying a name from a current and familiar mode of transportation. Was this man's way of trying to make this new form of travel sound more comforting? Perhaps less daring?

In the era when a horse and carriage was the common mode of transportation, aircraft often were referred to as "Aerial Carriages," much like the one Samuel Henson designed and patented in 1842-1843. With the invention of the automobile came many connections between the car and airplane. Car manufacturers made airplanes. In the early 1900s, the French referred to their new craft as "Aerial Automobiles."

In 1933, Boeing formed another relationship when it advertised club car comfort. Club car comfort was very familiar for those who were accustomed to traveling by train. People knew that traveling by train was very "comfortable" in the club car. Train travel was known to be very safe. When someone saw club car comfort advertised, it sounded reassuring, safe and most of all comfortable.

A connection also was made between aircraft and boats. The "new craft" sometimes was referred to as flying boats, and in 1913, the Glen L. Martin Company advertised "Aeroyahts." The names given to the early aircraft often came from another form of transportation that the public was comfortable and familiar with.

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Perhaps the biggest connection has been between the car and the airplane, which is where you will find the most similarities. By the late 1930s, most people were familiar with and had driven or ridden in a car. They could not say the same about air travel. Joseph Gwinn realized this and believed that an airplane that was more like a car would attract more people to this "still new" form of travel. He decided to give it a try and built the Aircar, whose cabin resembled an Oldsmobile. The new Aircar had a foot-actuated clutch, brake and accelerator pedals, a steering wheel, and Oldsmobile instruments. It even had rear view mirrors and a horn. In 1938, the project came to an abrupt end when the demo pilot crashed, killing himself. Due to such fate, the Aircar never came to be.

Ever since the Wright Brothers' successful flight in 1903, the aircraft owner has had to drive to the airport in his car. After landing at an airport close to your final destination in your plane, you would have to have a car for ground transportation to your final destination. But what if your car was your plane, or your plane was also your car? One vehicle was both. Glen Curtiss thought of this and, in 1917, developed the Autoplane.

During the late 1920s, Detroit engineer William B. Stout was considered the most prominent designer of flying cars. His Aerocar had detachable wings; it could do 60-70 mph on the highway and 100 mph in the air. Stout was also well known for his association with the Ford Tri-Motor.

In 1935, the Plicarim AC-35 was designed as a roadable aircraft (you could drive it to the



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airport). It was thought that this would be "the aircraft in everyone's garage." As it turned out, the Plicarim AC-35 was just another good idea whose time never came. However, a roadable aircraft was not too far away.

The 1930s added another name to the quest for a flying car or roadable aircraft. Waldo Waterman is said to have made one of the earliest serious attempts at producing a flying car. Waterman produced the Arrowbile and later the Aerobile. Studebaker initially had intended to sell Waterman's Arrowbile through selected car dealers, but backed out due to the economy. However, Waterman's work continued into the 1950s.

During the 1940s, the Consolidated Vultee Aircraft Company of San Diego, Calif., tried to produce a flying car, called the ConVAIRCAR. The ConVAIRCAR was a two-door car with a flight unit (wings and tail section) that had its own powerplant attached to the top. After a series of mishaps, this project was soon cancelled.

During the 1950s and 60s, a gentleman named Leland Bryan produced his version of a flying car. Bryan called his craft simply Roadables. The Roadables were folding wing aircraft that were certified for use on the highway. However, the project ended when Bryan was killed in a crash of one of his Roadables. In 1973, Henry Smolinski copied the ConVAIRCAR idea when he attached the air section of a Cessna Skymaster to a Ford Pinto. Smolinski and another pilot were killed on the first flight, ending another attempt at

the flying car.

It wasn't until the 1950s However, a "successful" car/plane was developed as early as the 1950s. Robert Edison Fulton Jr. flew frequently during World War II and traveled around the United States to military training centers with his new invention, the Gunairstructor. The Gunairstructor was a

combat simulator that helped American fighter pilots hone their skills. As Fulton waited (sometimes hours) at the many airports he visited for a ride to his final destination, he wondered if one vehicle could do both (which could save a lot of time). Fulton stopped wondering and started planning and designing.

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FAA Provides Additional Safety Information Via Web

WASHINGTON — The Federal Aviation Administration announced the expansion of its Internet website to include aviation safety information about all domestic and foreign airlines. The new service is part of the agency's effort to inform the public better about aviation safety.

The international aviation database contains records of 260 accidents, searchable by airline name. Each record contains a brief narrative description of the accident, as well as the date, location, aircraft type, registration number, number of passengers, fatalities and injuries. In addition, the database can be downloaded as an Excel spreadsheet.

Assistant Administrator for System Safety Christopher A. Hart said, "This database will

provide travelers and aviation officials with key safety information that previously had been difficult to find. By providing both domestic and international safety information via our website, the FAA is providing the flying public more complete information about worldwide commercial aviation."

To provide this information, the FAA signed an agreement with Airclaims Ltd., an aviation services company based in London, England. Under terms of the agreement, Airclaims will maintain a condensed summary of foreign airlines' safety information beginning with 1990 data. Previously, the website only contained domestic airline safety information. The database is available at <http://nasdac.faa.gov/main.htm>.

Plane-Car

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Construction of a prototype began in 1945 in Washington, D.C. The result was the Airphibian, a high-wing, two-seat aircraft that could be converted into a car in less than five minutes. Fulton started Continental Inc. in Danbury, Conn., to continue the development of the Airphibian. Test flights were done in privacy and sometimes at night. On Nov. 8, 1946, the prototype made its first public appearance in Danbury. Within six months later, a production model flew on May 21, 1947.

On Dec. 21, 1950, Fulton himself took off from Danbury and flew his Airphibian to Washington National Airport. After landing, he did the plane-to-car conversion and drove downtown to the Civil Aeronautics Administration (CAA) headquarters to receive a type certificate from the CAA administrator. The Airphibian became the first flying car to receive FAA (or CAA) certification. The CAA was so impressed with Fulton's Airphibian that they ordered eight to be used by their inspectors.

Fulton's Airphibian had a driving cruise speed of 50 mph and a flying cruise speed of 110 mph. It had an airborne endurance of a little more than three hours and could fly as high as 12,000 feet. With a price tag under \$10,000, the Airphibian was competitive with other general aviation aircraft of the time, but this aircraft could do more than just travel from airport to airport.

Continental Inc. was eager to recoup some of its investment, and the board of directors was trying to convince Fulton to sell out to an airplane or automobile manufacturer who could put his invention into mass production. Fulton refused, saying, "New inventions like

this require nursing and all kinds of attention." In 1953, Continental withdrew its financial support, which started the end of Fulton's Airphibian. Only eight aircraft were ever built. Five were used for testing and development, and three were production models.

However, that was not the end of flying cars. A gentleman name Moulton Taylor met Fulton in 1946 and was inspired to develop his own flying car. Like Fulton, Taylor had big plans for his flying car. He worked for years in his little shop in Longview, Wash., and finally, in 1959, his Aerocar took to the skies. Taylor's Aerocar also received certification, and he hoped to be able to sell the Aerocar for about \$10,000.

The conversion from plane to car took about 10 minutes to do manually. Taylor's plans called for most of the conversion to be done by hydraulics, with a touch of a button on the production model. Though manually, the conversion wasn't too complex. After landing, you had to pull a few pins and remove some bolts. The wings folded to form a trailer, complete with wheels. You could tow it behind you or just leave it at the airport.

The Aerocar was a very stable flying aircraft. It was at home on the highway or in the air. It could carry 500 pounds and had an empty weight of 1,500 pounds. The Aerocar cruised comfortably on the highway at 50 mph. Takeoff distance was about 650 feet, and with a climb speed of 70 mph, the Aerocar would produce an 800-fpm climb. However, like others before it, the Aerocar never saw mass production.

Other engineers and designers took a different approach at developing a flying car

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and, in the late 1950s and early 60s, introduced a different breed of flying cars, Vertical Take Off & Landing (VTOL) aircraft. Some of these new VTOL craft looked like Space Age cars. They took off vertically like a helicopter and could fly as fast, if not faster, than a plane.

Hiller Helicopters had its own idea for a flying car. Hiller's craft resembled a car with stilts or skids instead of wheels. There was to be a four-door sports model and even a light pickup model. The design used the principle of the ducted fan (for lift). Hiller had used the ducted fan on his earlier flying platform (the first practical vehicle to use the ducted fan). The U.S. military expressed an interest in Hiller's Aerial Sedan (an aerial jeep fitted for military use). Perhaps Hiller's idea was just ahead of its time because it never came to production.

However, Hiller's idea of a "tilt-rotor" VTOL aircraft would soon see production. Hiller's highly advanced "tilt-rotor" aircraft was very much like the Osprey of today (the Osprey received certification and is in production). The Osprey, a joint effort built by Boeing and Bell, combines the speed, range and fuel efficiency of a turboprop with the vertical takeoff and landing and hovering capabilities of a helicopter.

Around the same time, Hiller Helicopters was planning its flying car, a Dr. Paul Moller was doing the same. Moller (an aeronautical engineer) founded Moller International with visions of a successful VTOL craft. One of Moller's prototypes, the M200X, has flown more than 150 times. However, Moller's first VTOL craft was the XM-2. In 1962, Moller built a 1/6-scale model of the XM-2, and in 1965, a full-scale model flew (hovered in

ground effect).

Moller has designed many other VTOL craft, including the M400 Skycar, which could be the automobile of the future. Moller is working with the FAA to receive certification of his M400 Skycar, which will be under the new "powered lift normal" category. The FAA has already established a "powered lift" pilot's license.

The M400 Skycar has a planned cruise speed of 350-plus mph with 15 miles per gallon. The Skycar engines can burn almost any fuel from diesel to natural gas. With a 900-mile range and a ceiling of 30,000 feet, the Skycar will be a valuable and versatile aircraft that can be used for a wide variety of missions.

It seems as if Moller has thought of everything in the way of safety for his M400 Skycar. Just to name a few, the Skycar has eight engines; one or more could fail, and the Skycar can still operate safely. The Skycar has three (only one needed to fly) independent computer systems for flight management, stability and control. It has redundant fuel and monitoring systems that check for quantity and quality and provide appropriate warnings. It even has dual airframe parachutes.

Could a flying car replace the tradition automobile in the near future? Just think of the possibilities — no more traffic jams during rush hour, no more driving on icy or snow covered roads. It may be only a matter of time before we see personal VTOL craft or flying cars. The idea of a flying car has caught the attention of such people and organizations as Henry Ford, President Franklin Roosevelt, and NASA. NASA has asked the question, "Why isn't the sky full of flying cars?" This is an idea whose time has come.