

## Aerial Mapping, Flight Training, and Ground Support:

### Sherman M. Fairchild's Legacy to Aviation

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March 26, 2024

#### Connections

In a previous paper, we saw how young Sherman Mills Fairchild was derided by his Oneonta peers for being classified 4F by his draft board. But Sherman didn't give up his interest in furthering photography. His father George Winthrop Fairchild, Chairman of the Computing-Tabulating-Recording Company (CTR), got him in to see Captain Betts of the Army Science and Research division in Rochester, NY. Betts said that the Army needed an aerial camera with a large between-the-lens shutter. Sherman promised to meet the specifications, and by March 1919 had designed a shutter more advanced than any other, employing the help of CTR craftsmen.<sup>1</sup> But by then the war had ended and Army interest waned. Sherman resisted his father's offer of a CTR vice-presidency in a business the former considered "too well established". At that point, George offered his son \$150,000 based on the theory that "If you lose it, you'll be a damn sight smarter than if you didn't try your own business." Sherman founded the Fairchild Aerial Camera Co. to make and sell cameras. The Army relented and ordered 20. In 1921, Sherman formed Fairchild Aerial Surveys. To demonstrate its capabilities, he bought a used WW1 Fokker D.VII biplane and cut a hole in its floor to enable the camera to be aimed at the ground. His first contract was for an aerial survey of Newark, New Jersey.

#### Pioneer

In order to understand Fairchild's next major innovation, this time to benefit aviation itself, we need to digress a bit on airplanes and how they fly. The basic configuration of airplanes has not changed markedly for 100 years. Imagine yourself calmly sitting on a New York-to-Chicago flight midway along its route.

You may be reading a magazine and drinking a non-sloshing cup of coffee. With the window shade closed, you appear not to be moving at all. We call this flying straight and level. That is, following Newton's 1st Law of Motion, the total force on the airplane is zero. The total force has two components: vertical and horizontal. The downward force of gravity of the plane is balanced by the upward force of lift on the wings. The thrust of the plane's engines provides a force to the tail of the jet that is balanced out by air resistance (or drag). Ideally, neither you nor the pilots feel any wind discomfort or cold if the airplane's sealing and heating systems are operating normally.

This was not the case in WW1 aircraft, as typified in movies like Howard Hughes' *Hell's Angels*. Planes usually had a pilot and one passenger, each sitting on a bench within the airplane with their heads exposed to the wind and whatever temperature it was outside. Most planes were biplanes, where the crew sat slightly forward of two wings, one stacked on top of another. The need for two wings was because the lift of a single wing was not sufficient to cancel out gravity, while the lift of two wings was. What causes lift in a wing is its cross-sectional shape, where the air passing over the top section must travel a longer distance than that travelling over its bottom section. By the 1920's, the science of designing high-lift wings had advanced to allow enough lift for a single wing to be used. This configuration was called a monoplane. It is found in nearly all modern airplanes.

Aerial surveys had to be made at high altitude. In Canada, Fairchild observed his crews returning from the open cockpit biplane flights exhausted and freezing from the cold.<sup>ii</sup> They all agreed that a high-wing monoplane with a heated, enclosed cabin and large side windows was needed. The absence of the lower wing obviated the need to cut a hole in the floor to get a clean shot, while the benefits of the enclosed cabin to crew comfort were obvious. Since no such plane existed Sherman formed yet another company, Fairchild Airplane Manufacturing, to build it. Thus, Fairchild is credited with building the first enclosed cabin monoplane.<sup>iii</sup> The extension to the modern passenger jet goes without saying.

## Titan

On June 14, 1926, the completed FC-1 aircraft was towed out of the Farmingdale factory to Curtiss Field near Hempstead, Long Island. It reached 97 mph and on another day 9800 ft.<sup>iv</sup> In 1924 CTR had changed its name to IBM and George Fairchild had passed away that year on December 31. It can be inferred that he left his son Sherman an amount of IBM stock that by 1960 helped him become the largest individual stockholder of IBM (99,864 shares).<sup>v</sup> But Sherman was prepared to press on in his own enterprises. Sensing a market beyond that of aerial photography into general aviation, Canadian bush piloting, and national defense, Fairchild capitalized on this demand by offering the FC-2, with larger cabin, room for 3 passengers instead of 1, and a more powerful engine. Orders rushed in for this model, and by the end of 1927, Fairchild had become the second largest producer of commercial aircraft in the world.<sup>vi</sup> As the 20's evolved into the 30's, Fairchild continued making rugged, adaptable, mainly high wing monoplanes. Then a series of single engine military training planes, the PT-19/ PT-23/ PT-26, were sold in large numbers such that by 1944 more WW2 pilots had received their initial flight training from them than from any other craft.<sup>vii</sup> Post-war Fairchild made the cargo-carrying Packets and Flying Boxcars used in Korea and Vietnam.

## Last Aviation Activities

On September 29, 1965, stockholders approved a sale of the Republic Aviation Corporation to the Fairchild Hiller Corporation, and the result was called Fairchild Republic.<sup>viii</sup> Republic, also on Long Island, had a reputation for tough, fast, bulky fighter/ground attack planes ranging from the P-47 Thunderbolt of WW2 to the F-105 Thunderchief which had carried the bombing war against North Vietnam. Fairchild Republic's final production aircraft, the A-10A Thunderbolt II, was a low-level twinjet carrying a large 30mm GE rotary cannon designed to nullify massive Warsaw Pact tank formations on European battlefields. Because of this straight-forward mission, the A-10A was built with relatively primitive avionics (aviation

electronics) systems. A total of 715 were produced between 1972-1984.<sup>ix</sup> When the Warsaw Pact disappeared in 1989, so seemingly had the A-10's mission. However, the A-10 proved its capability in Desert Storm in 1991 as a low-level system for close-in protection of friendly ground troops. Its popularity soared, and during the first decade of the 21st century, Lockheed Martin took over from a by-then defunct Fairchild Republic as prime supplier to the USAF for an upgrade called the A-10C.



*Fairchild Republic A-10 Close Air Support Jet*

*U.S. Air Force photo by Senior Airman Greg L. Davis -  
<http://www.af.mil/News/Photos.aspx?igphoto=2000030347>, Public Domain, from article at  
[https://en.wikipedia.org/wiki/Fairchild\\_Republic\\_A-10\\_Thunderbolt\\_II](https://en.wikipedia.org/wiki/Fairchild_Republic_A-10_Thunderbolt_II)*

In our next discussion, we will conclude the story of Sherman Fairchild by discussing his role as founder of a company that sparked the microprocessor revolution.

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<sup>i</sup> Most of the data in this paragraph derives from Mitchell, Kent A., *Fairchild Aircraft 1926-1987*, Santa Ana (1997), p. 6.

<sup>ii</sup> Many of the facts in this paragraph are from Mitchell, p.7.

<sup>iii</sup> (author unspecified), *Multifarious Sherman Fairchild*, Fortune Magazine, May 1960, p. 171.

<sup>iv</sup> Mitchell, p. 9.

<sup>v</sup> Fortune, p. 171.

<sup>vi</sup> Mitchell, p. 14.

<sup>vii</sup> Mitchell, p. 109.

<sup>viii</sup> Mitchell, p. 168

<sup>ix</sup> Mitchell p. 175.