Wing Tips

A CAP Aerospace Education Moment

Did you know?

In the 1920's flying was very dangerous. To correct this situation, a wealthy Long Island man named Daniel Guggenheim created the Daniel Guggenheim Fund for the Promotion of Aeronautics with a grant of 2 ½ million dollars in 1926. His son, Harry Guggenheim, a former WW I Naval Aviator, became president of the Fund. To attack the problem of flying in fog, the Fund created The Full Flight Laboratory at Mitchel Field on Long Island. (Mitchel Field was named for John P. Mitchel a former Mayor of New York City who was killed in a WW I training accident, not the famous airpower advocate, Gen Billy Mitchell.) Guggenheim money provided all the facilities and equipment that were needed including two state-of-the-art, two-seat, open cockpit biplanes. One was dedicated for instrument testing and blind flying experiments. The other plane also tested instruments, but was mainly used for transportation. All sorts of people participated in the Full Flight Lab, college professors, Army personnel, and civilian experts from government and industry. US Army Lieutenant Jimmy Doolittle was put in charge of the Full Flight Lab because he was a renowned pilot and held a Master of Science Degree and a Doctor of Science Degree from MIT. Basically Doolittle's job was to do the testing and requesting while others created the things that were needed.

The situation that existed at the time was that the pilot had a magnetic compass which lags a bit when making turns and a turn-bank indicator that only shows which direction one is turning and whether one is skidding or slipping. The low frequency radio range had been developed by the Bureau of Standards and the Army but was still only in limited use for navigation, however the technology could be adapted for a "homing" beacon. Actual "blind" landings had been attempted by others using trailing weights or extra-long tail skids that indicated when they touched the ground, but neither worked well.

Jimmy Doolittle asked Elmer Sperry if he could create an instrument that was both a directional gyro and an artificial horizon. Sperry said it was possible, but it would be better to have two instruments. Doolittle agreed and Sperry put his son, Elmer, Jr., in charge of the project.

In its final configuration, the blind flight airplane had eleven flight instruments: magnetic compass, earth inductor compass (it used the earth's magnetic field to form the poles of a generator that produced enough voltage to move a needle on the instrument dial), turn-bank indicator, directional gyro (gyro compass), artificial horizon, airspeed indicator, a more precise version of the altimeter, rate of climb indicator, outside air thermometer, vibrating reed homing range indicator (pair of metal reeds that vibrate between a pair of small electromagnets), and vibrating reed marker beacon indicator. The plane also had a hood over the rear cockpit that, when closed, prevented the pilot from seeing outside. The throttle quadrant had a mark for the optimum power to use when landing.

The Full Flight Lab also tested projects not related to blind flight, but did not do development work on them. They had tested someone's idea for a fog dispersal system when Jimmy Doolittle decided to take advantage of the fog to make a real blind flight in fog. All the equipment was turned on and he took off, made a 180 degree turn, made a short flight, made another 180 degree turn, returned and landed. Then the fog began to lift. His flight was "un-official" and Doolittle wanted to do it again "under the hood" for the record but had to use a safety pilot because, with the fog gone, other planes might be flying around. Jimmy Doolittle did many impressive things, but the most important was surely the blind flight project.

That evening, Jimmy Doolittle's wife Josephine (called "Joe") held a dinner party at their quarters for all those who participated in the blind flight project. She asked all the guests to autograph her new large white table cloth. Later, she embroidered all the signatures in black thread. She continued to have dinner parties and collect the autographs of her guests.