



Phil Brown

Based on a story by Sharon Dillon

What do fighter flight operations from a carrier, NASA research flights seeking lightning strikes and DOD-sponsored flight research in an instrumented Romanian aerobatic aircraft have in common?

Phil Brown of Williamsburg has flown all these missions and many more. Born in 1940 and the youngest in a family of six sons, he was surrounded by brothers who were aviation enthusiasts. WWII aircraft identification books and flying magazines circulated in the Hampton family home. Langley AFB and NAS Norfolk air traffic could be seen from the yard. The brothers were often at Langley, either delivering Coca-Cola for their father or attending air shows. Their uncle, a Pennsylvania airport owner, occasionally flew into the Peninsula Airport on Shell Road. In all, four of brothers were to become pilots.



Brown with his parents and aviator brother, Pete, who was to receive his Navy Wings the following day, January 1953

Enthusiasm for still and motion photography was another widely shared family interest. Brown received his first camera as a gift at age seven, learned film processing and printing from his brothers and by the time he was ten did his own darkroom work. Other family hobbies to which he was exposed included airplane model building, ham radio, boat building, sailing, engineering, art and music.

Brown was especially inspired by an older brother who was first a private pilot and aircraft owner and then a Naval Aviator. In 1960 during his second year at Davidson College, he took flying lessons in nearby Mooresville, NC at Jimmy Miller's farm airfield. J-3 rental was a reasonable \$4.50 per hour. His plan had been to become a Naval Aviator through the Navcad program which only required two years of college. Since he was only 19, however, and Navcad enrollment required approval from a father who was unwilling to sign the papers, that plan was stymied. His father's reluctance to grant Navcad program approval stemmed in large part from the death of his Naval Aviator brother in a jet transition training accident at NAS Kingsville in 1953.

By late summer 1961, he had earned a private pilot license, attended two academic summer sessions, and graduated with an AB degree in economics. Though still not 21 years old and able to sign for himself, his father now gave his approval and Brown entered Navy flight training via the AOC program. He was awarded his wings in May 1963 upon completion of advanced training in F-9's and F-11's at NAS Beeville, TX. F-4B replacement air group training was conducted by VF-101 at NAS Key West, FL,



VR-101 replacement air group training at NAS Key West, July 1963

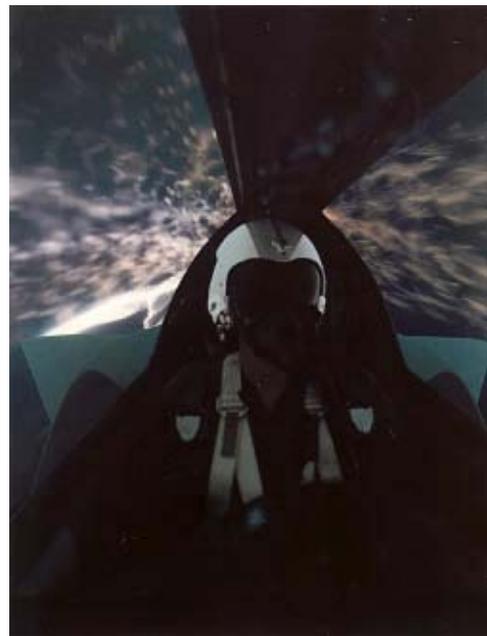
commanded at the time by VAHS's Witt Freeman. Active duty with VF-74 on the Forrestal in the Mediterranean and with VF-114 on the Kitty Hawk in the Gulf of Tonkin led to logging 485 arrested carrier landings and 93 combat missions.

Brown requested orders to the Navy's test pilot school at NAS Patuxent River, MD but was rejected due to lack of a suitable academic background. Determined to find another route into test flying and buoyed by newly discovered competence in math revealed through correspondence courses taken on cruise, Brown decided to leave active service in 1967 and earn an engineering degree.

He flew NAS Atlanta-based F-8's and A-4's with the Navy Reserves while studying engineering at Georgia Tech. After graduating from Tech with a BS in aeronautical engineering in 1971, he coped with a stagnant job market by pursuing an MS in aeronautical engineering at Princeton University. Their flight research lab was using two variable stability Navions for contract work with NASA, the Navy and the FAA. Brown's thesis work involved improving A-7E autothrottle performance for carrier approaches and landings. While completing the writing of his thesis he moved to Florida to earn a FAA mechanic license. After earning the powerplant license but before completing his airframe license he accepted a hoped-for but unanticipated take-it-or-leave-it-now job offer from the NASA-Langley Research Center.

In July of 1974 Brown began his career as a NASA fixed wing research pilot at Langley. Rotary wing training and qualification were provided shortly after his arrival. It was then standard practice for NASA centers to hire research pilots with the desired engineering and military flying backgrounds and send them to a formal test pilot training school if not already so trained. Budget constraints, however, delayed Brown's orders to the Navy's school for over a year. When training funds were finally allocated, family circumstances prevented his attendance. His flight operations branch head, Jim Patton, graciously allowed him to pursue an in-house training program with the wide variety of airplanes available at Langley. During his 27 year tenure there Brown participated in flight research which included stall and spin behavior, helicopter acoustics, storm and lightning hazards, agricultural aviation, natural laminar flow, advanced fighter aerodynamics and handling qualities, and airport traffic capacity and safety.

From 1983-85 Brown flew a lightning-hardened F-106B for the NASA Storm Hazards program run by VAHS' Norm Crabill. The pilot's mission was to penetrate electrically active thunderstorms and obtain as many lightning strikes as possible. In addition to recording detailed information on the electrical, magnetic and atmospheric conditions surrounding strikes, interest was high in determining the extent of damage to different types of non-metallic aircraft structural materials and visually observing how lightning behaved. Brown devised a very high speed, multiple exposure still camera system and improved motion camera installations which captured many of the 420 aircraft lightning strikes he experienced. These equipment development efforts provided him unique opportunities to utilize his knowledge of and interest in photography.



An aft-looking still camera behind the pilot's seat recorded this lightning strike with multiple exposures on a single film frame. A project engineer in the rear cockpit (shown in this photo) operated in-flight data acquisition and atmospheric sampling equipment.

NASA Storm Hazards program data were utilized to rewrite international standards of lightning protection for aircraft. The detailed analyses required for these new guidelines were possible because of high quality aircraft instrumentation and unique techniques developed to locate areas and altitudes with a high lightning strike probability. This work has also led to better operational understandings of the behavior, location, severity and probability of encounter of storm-produced lightning, hail, icing, heavy rain and turbulence.



The YAK-52TW research airplane at the Williamsburg-Jamestown Airport

described as a “SNJ on SlimFast”. Design features include two-place tandem seating, a low wing, a 400 HP, 9-cylinder radial engine, inverted oil and fuel systems and permissible flight loads of +7 to -5 g’s. Modifications incorporated during manufacture permit the carriage of a wide variety of research equipment, both internally and on external hardpoints. Conduits throughout the airplane allow easy routing of power and signal wiring to these locations. The airplane will operate in an Experimental-Research & Development certification status granted for each specific project.

The company is currently engaged in flight research for the Defense Advanced Research Projects Agency (DARPA) to find new methods for identifying, locating and destroying terrorist networks. Brown’s interest in imagery methods is directly applicable to this effort. Other project team members are the Carnegie Mellon Robotics Lab in Pittsburgh, PA and AVID LLC of Blacksburg and Yorktown, VA.

Basing the YAK at the Williamsburg-Jamestown airport affords close proximity to potential customers such as NASA and the luxuries of an excellent hangar, enthusiastic and innovative airport management, a good restaurant, spacious conference facilities, a location only minutes away from home and a dog-friendly atmosphere for his West Highland terrier, Caleigh. Jan, his wife, is also only a short distance away at Walsingham Academy where she works as a guidance counselor.

Brown escaped government bureaucracy when he retired from NASA in early 2001 to start Williamsburg Aeronautics, Inc., a provider of research and flight testing services. Present and former NASA employees with whom he enjoyed working in the past provide technical assistance and aircraft maintenance.

In 2002 Brown took delivery of a built-to-order YAK-52TW research airplane from its Romanian manufacturer, S.C. Aerostar S.A. The airplane’s appearance is perhaps best