



The AMA History Project Presents: Autobiography of BASIL P. COOPER, JR.



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The following was added to the AMA History Project (at the time called the AMA History Program) in July 2012, written by Basil Cooper.

How a Model Airplane Changed My Life

I was born in 1942, at the beginning of World War II. My dad was in the Army and we moved around with his assignments and my life was about as normal as any child's given the circumstances. After the war, we moved to Arlington, Virginia, a suburb of Washington D.C., where my dad worked for the Federal Communications Commission as a civil servant. My family settled into a routine and life became truly normal for me, that is, until my fifth birthday. On that day, someone gave me a model airplane as a present. It was a wooden model of a Piper Cub and it was love at first sight. I played with it like it was the only toy in the world. I would hold it over my head and run around the neighborhood making engine noises and pretending that I was flying. I did that for a whole year. At the end of a year, I had pretty much destroyed the model and it no longer looked like an airplane. Sometime later my mother and I picked out a balsa and tissue kit of a Monocoupe and she helped me to build it (i.e. she built it and I watched). After that it was all mine and I set about trying to fly it. Not knowing anything about CG location or control surface settings, I never got it to fly very far; but the failures only served to keep me trying. Needless to say, eventually this model was also destroyed. There followed a succession of plastic and wooden solid models of mostly World War II and Korean War Warbirds. There was the occasional balsa glider and catapult glider (which I could actually get to fly) and then I discovered rubber powered models at the local five and dime store.

When I was twelve, I discovered the local hobby shop and saw something which was new to me. It was called U-Control and I had to have it. In particular, I wanted an A J Walker Firebaby with an OK Cub 0.049 glow engine. I had an allowance and earned extra money doing chores so I saw no reason why I couldn't just go to the store and buy what I wanted. My father, however, saw things a little differently. He thought that a model with an engine might be too dangerous for a twelve year old. It took me about a year to convince my parents that it was safe to let me have the Firebaby; but I finally did get it. There was a large open space behind our house at that time and I was able to fly there. Since there was no one available to teach me how to fly control line or, for that matter, even to teach me how to start the engine; I had to figure out for myself what to do. I stuck with it and, after a few broken props and several repairs to the Firebaby; I was actually flying my own model. The Firebaby was followed by a few more 1/2A models and then a Ring Master with a Fox .19 for an engine. By the time I was a senior in high school I was flying a larger Ring Master powered by a Fox .35.

Needless to say, I was stuck on model airplanes and sold on aviation. I was also good in school and excelled in math and science. I had also read everything that I could find in the school

library on aviation. I knew for sure that I wanted to become an aeronautical engineer. The only question was where I was going to go to college. Early in my high school senior year, I was looking through a large catalog that the school library had which listed all of the colleges and universities in the US along with a description of the programs that each school offered. Georgia Tech caught my attention which was all the more remarkable since I had not previously even considered the school. The more that I read about the school the more I liked what I read. The clincher came when I read that the school had a co-operative program. That meant that I could alternate between periods of school and periods of work in the field that I was studying. I was accepted at Georgia Tech and, immediately after high school graduation, was enrolled as a co-operative student in the School of Aeronautical Engineering.

Georgia Tech turned out to be a good choice for me. My co-op assignment was at the US Naval Air Test Center at Patuxent River Maryland where I eventually found myself working with pilots and engineers doing flight testing and performance evaluation work on the Navy's front line attack and fighter aircraft. The co-op experience was a big help in my school work and I eventually graduated with honors with a bachelor's degree in the newly renamed field of Aerospace Engineering. I worked the following summer at the Naval Air Test Center still doing flight test and evaluation work and then I enrolled in the graduate program in Aerospace Engineering back at Georgia Tech. My graduate work included jet engine theory followed by rocket engine work including combustion theory and very high temperature gas theory and analysis work. Eventually I graduated with a Ph.D. in Aerospace Engineering. My thesis was titled "A Study of an Electrostatic Probe in a Continuum Plasma Containing Negative Ions" After my final graduation, I worked for a company called Northrop Services, which was a NASA contractor in Huntsville, Alabama. I assisted with preliminary design work on the Space Shuttle. I was responsible for analyzing the rocket exhaust plume flow for all of the rocket engines and motors on the Space Shuttle. Sometime later I was given the additional responsibility of calculating the heating, pressure, and force effects of these plumes on any solid objects that they might impinge upon.

After five and a half years in Huntsville, I moved to California to work for McDonnell Douglas Astronautics Company in Huntington Beach. I continued to work in the field of rocket exhaust plume analysis and eventually got into the field of plume contamination. Plume contamination is a complex and interesting field of study. Rocket exhaust plumes contain a number of chemicals which can adversely affect the operation of rocket payloads and even the rockets themselves. Solid motor exhaust usually contains aluminum oxide along with chlorine and other combustion products. Rocket engine exhausts contain their own sets of combustion products depending upon the propellants used. (A little bit of terminology here. It's a rocket engine if it uses liquid fuel and it's a rocket motor if it uses solid fuel.) Payloads often contain sensitive surfaces such as thermal control surfaces, mirrors, and optical lenses. Rockets themselves may contain such sensitive surfaces as the thermal control surfaces used to control internal temperatures while the rocket is coasting to its final orbit. All of these surfaces can have their performance adversely affected if combustion products condense on them and change their surface properties. As part of my work, I had to determine how much got transported to these surfaces, what condensed on these surfaces, and how badly the surfaces would be affected.

Eventually I took a job with the Aerospace Corporation in El Segundo, California. The Aerospace Corporation is a nonprofit corporation created by Congress to assist the Air Force in making technical decisions about its satellites and the launch vehicles used to launch them. I

worked on a number of exhaust plume and contamination issues involving most of the major Air Force launch vehicles and upper stages as well as a number of Air Force satellites, many of which were highly classified. The satellites included communications, weather, GPS, and communications satellites. Even today, some of these satellites are still on orbit.

In 1991, I had the opportunity to return to Huntsville, Alabama and work with the Boeing Company on the Space Station program. My Space Station work lasted for twelve years and was my last large aerospace engineering job. I did manage to work on the Boeing 787 program for a few months, a homeland security program, and some U.S. Army communications programs before I finally retired. My career in aerospace has been long and enjoyable and I wouldn't trade it for anything. It's amazing what can sometimes happen when a five year old boy is given a model airplane for his birthday.

My interest in model airplanes never waned but it did take a multi-year vacation. Once I got into college, school work began to take precedence over model building and flying. After college, work, marriage, and children all took precedence over modeling. One day, however, after I had moved back to Huntsville and started work on the Space Station program, my wife mentioned that she had seen some sort of flying field where people were flying radio controlled model airplanes. A few days later I located the field and talked to one of the men there. It turned out that the field was a brand new flying field which was being run for the city by a radio control club called the Rocket City Radio Controllers. (A point of interest might be appropriate here. Huntsville is where the Marshall Space Flight Center is located and where all of the moon rockets were developed in the 1960s. Its nickname is The Rocket City.) I was amazed by all of the advances that had been made in radio control and a few days later I was in the local hobby shop buying everything that I needed to get back into the hobby. Today, seventeen years later, I own models ranging in size from small back yard flyers all the way up to a one-third scale Sopwith Pup. I am also the Rocket City Radio Controllers vice-president with duties which include being the club safety officer and also being responsible for providing educational programs for the monthly membership meetings. That model airplane has taken me on a long trip and it looks like there is still more to come.

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