Personal Narrative Essay

Joe Munoz

Old Dominion University

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Dr. Kat LaFever

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Technological advancements have been the cornerstone of human civilizations throughout history. Inventions such as the wheel, arrows, steam engines, and jet engines all shape the world we live in today. This steady advancement has always been fascinating to me, as I constantly wonder what groundbreaking technologies will shape the world in the future. It’s this fascination with technology that has guided my personal narrative and set me on my current path. From a young age, I’ve been deeply curious about how things work—whether it was the machines my father repaired or the advanced technologies shaping the world around us. This curiosity drove me to choose a career in integrated avionics in the United States Air Force, where I've spent decades working with some of the most sophisticated technology in the world. Reflecting on this journey, key experiences with my father, my education, and my career in the Air Force have all solidified my path and profoundly shaped my future.

My technological fascination began with my father and is a thematic coherence that guided my narrative (McAdams, 2001). He was a highly skilled mechanic who could work on virtually any machine he encountered. These machines included cars, forklifts, industrial machinery, appliances, electrical systems, and much more. As I grew up, I would often be right next to him when he was working on our family cars or assisting a family member with repairs around their house. While I was helping, my father would explain the operations of the machines in detail and how to troubleshoot the problems that existed. His patience and clarity in teaching were remarkable. Usually, he was able to precisely identify the issue and perform the repair. It was this ability and his methodical approach that inspired me to want to work with technology in some form, much like him.

While gaining this practical experience with my father, I was also showing an aptitude for math and sciences in school. This allowed me to take advanced placement (AP) classes in both middle and high school that gave me a solid foundation in scientific principles like physics, chemistry, trigonometry, and calculus. With this strong foundation, I confidently entered the Air Force after high school, certain that my background in math and science would serve me well in a technical career. I was able to score high in the technological portion of the Armed Services Vocational Aptitude Battery (ASVAB), which is the entry evaluation for the armed services designed to match candidates with careers aligned with their skills. My high score in technology opened the door to a pool of highly technical career options. After careful consideration, I selected the career of integrated avionics on fighter aircraft. Fighter aircraft are the most advanced machines in the world, and their capabilities are powered by the sophisticated avionics systems they possess. This career choice aligned perfectly with my lifelong fascination and passion for working with cutting-edge technology.

Upon graduating from Basic Training, I was sent to my technical training schools, where I learned more about electronic principles such as circuit design and electronic component functions. These principles were then applied to the specific avionics systems that I would eventually worked on. Initially, I started out working on the F-15 radar, targeting, and navigation systems. As I grew in experience, I learned to work on additional systems, like the flight control computers, communications, electronic warfare, and countermeasures. All these systems have very different purposes, functionalities, and principles of operation. Radars, communications, and electronic warfare systems all deal with radio frequency generation, amplification, transmission, and reception. This is vastly different from flight control and navigation systems, which manage acceleration, velocity, and g-forces to control the aircraft's movement and stability in the air.

This wide range of fundamental principles required me to have a solid grasp on multiple scientific disciplines and how to apply them in the troubleshooting process. For example, when a pilot reported an issue with establishing a “radar lock” on a potential target, I drew on my understanding of the doppler effect, which is the stretching and shortening of energy waves as an object moves. The popular example often given is an ambulance siren as it passes by a person. As the ambulance approaches, the sound waves are pushed closer together by the vehicle's forward movement, resulting in a higher-pitched siren. Then, after it passes the person, the sound waves are “pulled” further apart by the vehicle moving away, resulting in a low-pitched siren. This principle is crucial in aircraft radars to prevent ground clutter from affecting its operation, but to work properly, there needs to be relative motion between the aircraft and its target, meaning they cannot be traveling at the same velocity. Over my career, I frequently applied this knowledge to educate pilots on their radar systems and prevent erroneous write-ups. Not only did this save me from troubleshooting a fully functional system, but it also saved the Air Force countless dollars in unnecessary repair parts, which can easily cost hundreds of thousands of dollars. This understanding served me well as I moved across the Air Force and worked on different aircraft. I was able to apply them to the F-16 and A-10 aircraft when I was assigned to those units, which allowed me to be a great contributor to the team.

Given the importance of understanding the scientific principles that underlie avionics systems, I sought a degree that would further my understanding of each principle. I eventually found the General Engineering Technology degree offered by Old Dominion University. It was also fully online, which allowed me to pursue it while working full-time in the Air Force and while stationed overseas in Italy. This degree option encompassed static forces, dynamics and energy flow, fluid mechanics, and electrical principles and applications. All these disciplines have direct connections to aircraft avionics. Aircraft experience multiple types of forces during flight, which relate to static forces. The aircraft's dynamic changes in acceleration, speed, and movement during flight all have intricate relationships to each other. Energy ultimately begins with the compression and combustion of fuel, producing thrust and heat. Powering the flight surfaces are hydraulic systems that pressurize fluids to transfer force and create movement. Finally, the avionics systems are powered by electricity and use various circuit designs to perform their specific functions. Completing this degree demonstrates my grasp of the fundamental principles of avionics and their applications to any prospective employer as I transition to the civilian workforce.

As I near the end of my Air Force career and prepare to enter the civilian workforce, I reflect on the experiences that have shaped my journey. From my father's early lessons in troubleshooting and repair to the in-depth technical knowledge I gained while working on fighter aircraft, each moment has reinforced my fascination with technology and its practical applications. Pursuing a degree in General Engineering Technology was a natural step in advancing my understanding of the scientific principles that underpin avionics systems. Now, as I look toward my next chapter, I carry with me not just the skills I have learned but also the passion for technology that has driven my career forward. I am excited to continue applying this knowledge and contributing to the ever-evolving world of technological innovation, confident that the lessons from my past will guide my future success.

Reference

McAdams, D. P. (2001). The psychology of life stories. *Review of General Psychology, 5*(2), 100-122. https://doi.org/10.1037/1089-2680.5.2.100