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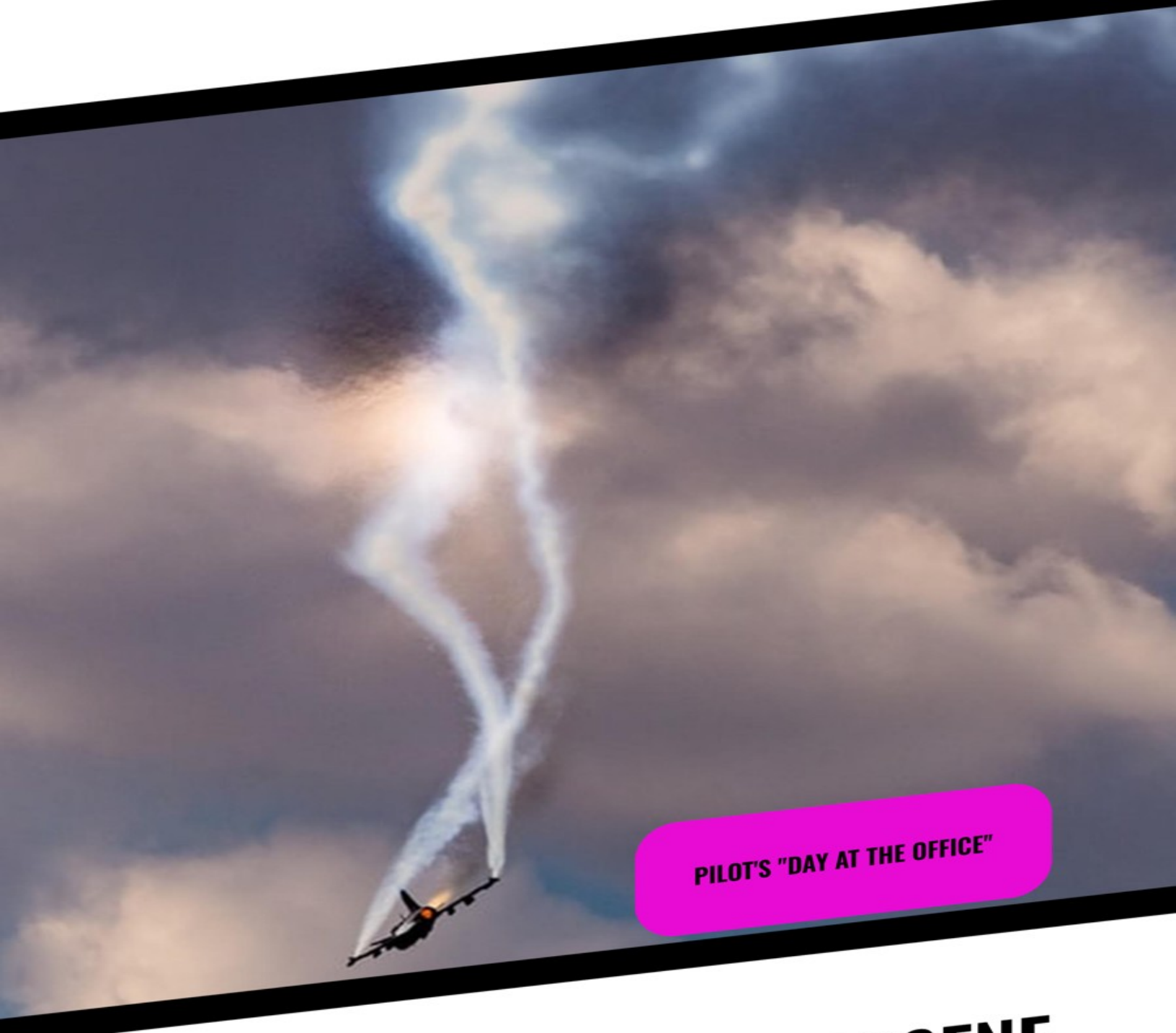
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION, DONALD L. MALLICK, PETER W. MERLIN



PILOT'S "DAY AT THE OFFICE"

THE SMELL OF KEROSENE

National Aeronautics and Space Administration, Donald L. Mallick, Peter W. Merlin

The Smell of Kerosene

Pilot's "Day at the Office"

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Dedication

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For my brother, Robert “Bob” Mallick, who taught me how to swim and whose Army Air Corps Service in World War II inspired my career in aeronautics.

Prologue
Mach 3+

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Outside the cockpit, the hush of the morning is shattered. It sounds like a cross between a chainsaw and someone battering a manhole-cover with a jackhammer. I'm glad that I'm inside the cockpit, like a titanium cocoon with quartz glass windows. My pressure suit helmet muffles the clatter of the "start cart" and allows me to hear the gentle hiss of oxygen.

I continue to run through the pre-start checklist with my backseater. The crew chief signals that the starting unit is connected. As I ignite the left engine, observers behind the aircraft see a bright green flash illuminate the exhaust duct. The engine roars to life. I repeat the procedure for the right engine. The roar outside must be deafening. I can see that the ground crew is wearing ear protectors, but a few are also holding their hands tightly to the sides of their heads.

I finish my checklist and verify that the flight controls are functioning properly. We have been in the cockpit now for nearly three-quarters of an hour. I release the brakes and ease the throttle forward. The sleek jet rolls onto the taxiway, its black skin soaking up the sunlight. I imagine that it looks like a sinister shadow slipping toward the runway.

I line up for takeoff squarely on runway centerline, with nearly three miles of concrete in front of me. As I push the throttles forward, the afterburners ignite almost simultaneously. I advance the throttles to maximum and the engines pour blue fire out through the exhaust ejectors. The

Blackbird eats up runway as I let the speed build. At 210 knots indicated airspeed, I pull back gently on the stick and separate the Blackbird and myself from Mother Earth.

Climbing through 10,000 feet, I accelerate to about 400 knots. The pale blue sky rapidly darkens as I climb through 20,000 feet at nearly the speed of sound. At about 34,000 feet, I push the nose over gently, controlling my angle of attack during transition through a critical, high-drag region of the flight envelope. Having established a constant velocity of 450 knots (about Mach 1.2 at this altitude), I begin a climb to cruise altitude.

Racing toward 70,000 feet, I notice the curvature of the Earth, rimmed in azure. My part of the sky is so dark now that it is almost black. Desert and mountains stretch out below. I can see the city of Las Vegas, the Colorado River, and myriad dry lakebeds dotting the landscape. Soon, having reached cruise altitude I watch my airspeed indicator pass Mach 3.0 (more than 2,000 miles per hour).

The air outside is freezing cold, but its friction heats the surface of my airplane to more than 400˚F. Insulation and the air conditioning system keep the cockpit a comfortable 60˚F, and I am further protected by my bulky pressure suit.

There is no more time for sightseeing. I turn north, toward the Canadian border. In a few minutes, I will begin to work my test points and gather data. Glancing once more out the window, I feel a sense of wonder. How does a small town Pennsylvania boy like me now find myself flying near the edge of space?

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Wings of Gold

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Roots – Western Pennsylvania

My roots lie deep in the steel country of America's heartland. My father was a native of western Pennsylvania and my mother had immigrated from Magedeburg, Germany, in 1904. They were married in 1922. My brother Bob was born the following year. They lived in a number of small towns in western Pennsylvania while my father completed his apprenticeship as a machinist. They eventually settled on Neville Island when my dad went to work for the Dravo Corporation. I was born on 4 October 1930 in nearby Sewickley, Pennsylvania.

Neville Island sits in the middle of the Ohio River, about 10 miles northwest of downtown Pittsburgh. Known as "The Point," this is where the Allegheny and Monongahela rivers join together to form the headwaters of the Ohio River. The eastern half of the island was dominated by the steel industry and the western half of the island, where my home was located, was primarily residential.

Living in the middle of the Ohio River provided wonderful opportunities for recreation and my family took advantage of it, especially in the summer. My brother had the honor of teaching me to swim in the Ohio. He used a very direct method of instruction. When I was nine years old, Bob supported me as he waded out to a spot where a submerged rock enabled me to stand with my head just above water. This was about fifty feet from the shore. Bob then left me and swam to the beach and waited for me to

swim to shore. I can remember treading the water with my hands to maintain my balance on the rock against the river current until I had the courage to strike out for shore. After a short time, I decided my brother was not coming back out for me so I left my rock and struggled to shore. I'm not sure if it was a dog paddle, a crawl, or a breaststroke, but there was a lot of splashing water as I made slow progress toward the beach. Finally, I made it. From there on it was fairly easy. I had gained confidence that I could keep my head above water and move from one place to another under my own power.

I look back on my early school years with fondness. My parents encouraged me to excel in my classes. I suspect this was due to the fact that when they were children, their opportunities in school were limited and they both entered the "work force" at a very young age. With their encouragement, I applied myself and did reasonably well in my studies.

When the United States entered World War II, Pittsburgh began to gear up for the war effort. Workers manned the mills and factories seven days a week for three shifts a day. The furnaces and machines in the factories operated continuously.

Everyone in our family expected my brother Bob, then a senior in high school, to enter military service. This may have weighed heavily on my dad as he contemplated his own experience in Europe as an infantryman during World War I. One of the reasons my grandmother left Germany in 1902 and immigrated to the United States was to keep her sons out of the German army. She succeeded with her sons, but her grandsons were now going to enter the U.S. military.

When Bob graduated in 1942, he enlisted in the Army Air Corps as an aviation cadet.

Like millions of Americans with loved ones in the military our family spent the next four years working and praying for victory and the end of the war. For my part, I gathered “pig iron” from slag piles along the river and sold it to a local junk dealer. I invested my profits in Savings Stamps and Bonds. I felt that this, and working hard in school, were my contributions to help the war effort.

Bob completed flight training and earned his wings and commission in the U.S. Army Air Corps. Following assignment to fly B-24 bombers in the 8th Air Force, he went to England. Our family never worried more than during the months that he flew his 25 combat missions in Europe. Crews and airplanes were shot down daily and we knew the dangers that Bob faced. Many of the blue stars that appeared in the windows of local homes signifying that a family member was in the service were replaced with gold ones signifying that the serviceman had given his life for his country. We prayed everyday that our star would stay blue. Thanks to the good Lord, Bob made it through safely. He finished his tour shortly before the end of the war in Europe. His next assignment involved transition training in B-29s. Fortunately, the war with Japan ended before Bob was sent to the Pacific.

After the war, my parents encouraged my brother to go to college, but he was married and wanted to find work. After several jobs in steel mills, he found a job with a local electric utility company. As a sophomore in high school, I had only short-term goals. I planned to get a job after graduation and make a little money. I figured that my father and brother had done very well with a limited education. The Dravo Corporation promoted my dad to Master

Machinist and my brother prospered with the power company. My parents still wanted one son to go to college, but I wasn't sure that I wanted to fill that slot. I did not send in any college applications even though my mother had a number of them around the house.

A month after graduation, I had a job in the steel industry and I was on my way to earning the "big money." For three months, I worked the midnight shift in a steel forging plant that made automobile parts. It was an extremely tough job, often leaving me with burns on my hands and arms. Soon, I realized that my parents had the right idea. It was time to send in those college applications.

Penn State

In high school I enjoyed my math and science courses the most, so I decided to study mechanical engineering in college. My dad tried to help me through the company he worked for, Dravo Corporation. A company representative reviewed my high school records and offered to advance all tuition and costs at a low-interest or no-interest loan with a guaranteed position at Dravo when I graduated. He indicated that they preferred Lehigh University. It was a good offer, but it wasn't what I wanted. I had found a new focus for my future, in aviation. The military required a minimum two-year college education for aviation cadets. I decided that I would enter military flight training when I completed the required two years of college. My dad agreed to help me attend Pennsylvania State College. The tuition at the State College was lower and the school had a fine reputation. I thanked the Director of Dravo for his offer and he wished me well.

I applied for and was accepted at a Penn State center for my freshman year. In 1948, the colleges were still loaded with World War II veterans and Penn State did not take any freshmen on the main campus. They were “farmed out” to state teachers colleges (four-year schools, primarily for teachers) and centers. The center that I attended was located on a large country estate that had been donated to the Pennsylvania State College system by a lumber baron named Behrend. The next year, when I went to the main campus at Penn State, I found the other students referred to the Behrend students as coming from “the country club.” With only 150 students on this beautiful estate, it looked like a country club setting, but it was a place of serious study. All of the courses were from the Penn State curriculum and the majority of teachers came from the main campus.

During my sophomore year, I roomed with a high school friend, Howard McCullough, in one of the dormitories. The main campus was very impressive and accommodated over 7,000 students. The regular classes had 40 to 50 students and the lecture classes sometimes had more than 300. I felt fortunate that I was rooming with Howard since we were both studying Engineering. After a month or two in this second year of college, I reaffirmed my decision that I would finish this sophomore year and then enlist in the Air Force flight training program. The Army Air Corps that my brother proudly served in had become the Air Force in 1947. The war in Korea was just beginning in the spring of 1950. Howard had joined the local Army National Guard unit with the hopes that he might be able to finish college and get his degree. He encouraged me to do the same, but I had other plans for flight training.

During the spring semester, I met a student who was a Naval Aviator, who had recently finished his four-year tour.

He was out of the Navy and back in college to get his engineering degree. We became friends and he filled me with glorious tales of naval aviation. It sounded great, although I wasn't too sure about the carrier landing operation that he described. That sounded a little tough.

Joining the Navy

When the 1950 spring semester was over, I returned home to Neville Island. I wasted no time, swiftly heading to the recruiting office in Pittsburgh. First, I went to the Air Force recruiter and tried to sign up. He asked a few questions and told me that I was too young for the U.S. Air Force. They required their cadets to be 20.5 years old and I was a year shy of that. I had hoped to serve in the same service that my brother did, but I wasn't willing to wait another year. I wanted to fly. I walked down the hall to the Navy recruiter and introduced myself. He put his arm on my shoulder and said, "Welcome, sit right here, I have a few little tests for you." As I took each test, he graded it, smiled, and handed me another. In about one hour, I had passed all the local exams and had a train ticket and schedule in my hand. I then proceeded to the Navy facility at Akron, Ohio, to take a pre-induction physical.

I passed the physical with the stipulation that I have some dental work completed before reporting to Pensacola, Florida, for basic training. This was not a problem, because my reporting date was in September. I had my summer job lined up and I planned one more summer at home, before going into the service. I did not tell my parents about my enlistment plans until I had been accepted. My brother knew that I was applying and he was pleased to learn that I had made it. Now it was time to break the news to my parents.

They really wanted me to stay in college and finish my studies. I waited until the evening, when my brother was there to give me a little moral support. When I told my folks, their faces dropped and they were obviously upset. I turned to my brother for support and he, too, started to give me hell for dropping out of college. A little later when the dust had settled, my brother joined me outside and said, “You did the right thing, I just made that scene with mom and dad to take a little heat off of you.”

I anticipated a great summer with a job, a little dating and fun, and then off to naval flight training in September. The summer job at the high school prevented me from becoming bored and it provided a little cash. The war in Korea was heating up and a number of my high school friends were in the service. One of them, Jim Wiley, came home from the Navy on two weeks leave. We “bumped around” together, drank a few beers, and saw the sights. A few days before Jim was to report back, I asked him if he wanted to set up a double date and have dinner. I offered to set him up with one of the girls I had been dating but he indicated that he knew a nice gal from Coraopolis that he would call.

I’m glad that he did. That gal, Audrey Waite, later became my wife. Audrey was attractive with a super personality and I was very impressed when I met her. Jim had to report back to duty and a few days later I called Audrey and we began seeing each other. Audrey was a great dancer and a nice person to be with. It was obvious to me that she stood out head and shoulders above the other girls that I had been dating. I was dismayed that I had not met her sooner, rather than just a few months before I left for the Navy. When I left in September, we both knew that

something serious was afloat and we were going to stay in touch and see each other again.

Pensacola – Navy Basic Training

On 8 September 1950, my mother and brother dropped me off at Penn Station in Pittsburgh to catch a train for Pensacola. On the train, I met another cadet, Burke Eakle from West Virginia. At 26 years old, Burke, was at the top end of the age bracket for cadets. He had been in pre-medical school and decided that doctoring was not for him. He had always wanted to fly and he decided that it was now or never. We talked and, occasionally, sat quietly with our own thoughts on the rail trip south. I had much on my mind. Two years of college had matured me and I was looking forward to the challenge ahead. The last few hours of the journey from Mobile, Alabama, to Pensacola, Florida, were the toughest. We were on an old “Toonerville Trolley” train and the hot, humid air of the south made the last short leg of the trip seem endless.

When we disembarked in Pensacola, Burke and I found that we were assigned to class 20-50. This was the 20th pre-flight class of the year 1950. There were a total of 65 cadets assigned to the class and classes started every two weeks. That was almost 1,700 per year, but we were told that less than two thirds would make it all the way through to graduation. There were also commissioned officers from the military academies who had been assigned to flight training at airfields in the Pensacola area. As cadets, we would not get near an airplane for four months. This phase, called pre-flight, combined academics, physical training, and military instruction. It entailed a rigorous schedule, specifically designed to get us up to speed in the military way of life

and prepare us for the upcoming flight training. It was “boot camp” for the naval aviation cadet.

The academic courses were similar to mid-level engineering and technical courses in college. The curriculum included instruction in basic aerodynamics, airframes, powerplants (engines), electrical systems, fuel systems, and hydraulic systems. We were also given a speed-reading course to help us study more efficiently. The most comprehensive course in pre-flight, air navigation, included celestial navigation and navigational trainers that simulated flying an actual mission.

The physical training was more rigorous than the academics. We took our academic courses in the morning and physical training in the afternoon. We worked out at a large gymnasium for three hours every day. This included calisthenics, wrestling, boxing, gymnastics, karate, and self-defense. Within about six weeks, everyone was in fine shape. I had lost most of my fat and gained a considerable amount of muscle.

We also received swimming and water survival training. We had swimming classes four days a week and the ultimate goal was to pass the Navy Triple-A swimming test. We swam long distances underwater to simulate swimming beneath water with burning gasoline on the surface. We also jumped from high towers into the water to simulate abandoning a sinking ship. Last, but not least, we rode the “Dilbert Dunker,” an SNJ aircraft cockpit mounted on a steeply inclined track. The track ran from near the ceiling of the two-story pool building into the deep end of the pool. It was an experience I will never forget.

I entered the cockpit from a platform at the top of the track and was strapped in with parachute and flight gear. A horn sounded and the “Dilbert Dunker” streaked down the

track at high speed and crashed into the water. It then sank to the bottom of the pool and turned upside down. At the end of this fabulous ride, I hung inverted, holding my breath with air bubbles and water turbulence around me. My heavy parachute pack, now waterlogged, was quite cumbersome. Conscious of my growing need for fresh oxygen, I released my seat belt and shoulder harness, placed my hands on the canopy bow, and pulled myself downward and away from the “Dunker” cockpit. With all my remaining strength, I swam toward the surface near the edge of the pool. This technique was important because if a cadet got excited and tried to go directly to the surface, he would strike his head on the rail superstructure that extended under the water.

The “Dunker” tested our physical and psychological abilities. Cadets who panicked had to be saved by Navy divers who were standing by. I made up my mind that I was strong enough to do it. I could swim well enough and it was just a matter of “keeping my head” and remaining calm. I thought of how my brother taught me to swim in the Ohio River years before and I decided that he would have made a good Navy swimming instructor.

In the evenings, several days a week, we had competitive sports with cadets from the other battalions. The instructors encouraged a high level of competition. I had played football in high school with “pads,” but I was hit harder and bruised more playing Navy flag football. Everyone was in great physical condition and we literally “knocked hell” out of each other. It was all part of the Navy plan. They did not want any non-aggressive fighter pilots.

As part of our military training we wore uniforms, marched to and from all classes in formation, and saluted all officers. Marine drill instructors “put us through the mill” in marching and close order drill carrying the nine-pound M-1

rifle. The instructors gave demerits and penalties for any infraction of the rules, such as a shoe not shined properly or an imperfection of the uniform. Breaches in discipline were severely punished.

As my class progressed through pre-flight, some students were subject to attrition or “washing out”. A few cadets dropped out because of academic difficulties. Some developed or discovered physical problems that disqualified them from flight training. Some were unable to cope with military discipline and others decided that it wasn’t what they expected or wanted. We began preflight training with 65 cadets, but only 53 graduated.

Graduation from pre-flight was the first step to gaining the coveted Navy “wings of gold.” I was in the best physical shape of my life. I had developed a great deal of confidence from having completed a tough preparation course for flying. As much as I looked forward to the upcoming courses, I also felt some anxiety about being able to handle flight training.

Naval Flight Training

In the early 1950s, Navy flight training consisted of two parts: basic and advanced. The basic stage was the same for all students while the advanced stage varied depending on what flying category the individual selected. Categories included fighter, dive-bomber, patrol-transport, and helicopter. The fighter and dive-bomber categories operated from aircraft carriers. The basic stage also included six carrier landings and qualification in the SNJ primary trainer. Thus, all Navy pilots had an opportunity to land aboard a carrier, even those who later went into transport aircraft and flew from land-based airfields. This was an excellent

approach to training in that it gave all Navy pilots a look at what was involved in carrier operation. If there was something about it that they did not like, they had the opportunity to select the patrol-transport category when they went into advanced training.

Basic flight training took place on various small Navy airfields around the Pensacola area. The North American SNJ (Navy designation) or AT-6 (Air Force designation) “Texan” served as primary trainer. The SNJ was a lowwing, all-metal aircraft with two main landing wheels and a tail wheel. It held two pilots in a tandem cockpit. A Pratt & Whitney R-1340 radial engine that developed 550-horsepower powered the aircraft. An outstanding trainer, the SNJ was a demanding aircraft to fly. The tail dragger configuration limited forward visibility on the ground and the engine provided enough torque to keep the novice pilot busy trying to hold a steady course on takeoff.

In many endeavors, accomplishing a task involves both art and science. This is especially true of flying. The science portion includes knowledge of machinery, functions, numbers, limitations, and boundaries. The art involves coordination of eyes, ears, mental inputs, and physical inputs to fly the aircraft. A pilot must make control inputs based on all of the available cues and information and integrate them in his mind. When this is done properly, the pilot and aircraft almost become one and the aircraft’s response is just an extension of the pilot. The science part is the easiest. An academic task, it merely requires study and memorization like other academic endeavors. The art is more difficult as it requires the student pilot to develop and hone his inborn responses and coordination to the point that he is the master of the aircraft.

Solo

No pilot ever forgets his solo flight. This was certainly true for me. It was the culmination of all my sweat and tears from learning to fly the SNJ. My training consisted of about 20 flight hours. Up to this time, I made all my flights with the instructor on board. Now I would fly alone for the first time, trusting my skill and training. My main instructor judged me qualified for solo flight, but before the Navy would let me go, another instructor had to provide a "second opinion." I was assigned a solo check instructor and I had to demonstrate my flying skills in all areas of flight including landings before he would release me to solo on my own. We took off from Whiting Field into a deep blue Florida sky dotted with scattered cumulus clouds. As we soared over the tall green pines that covered much of the countryside wind buffeted the open cockpit. Soon we arrived at Pace Field, a mile-square patch of light green grass surrounded by pines. Here I demonstrated my skill to the check instructor and he "kicked me out of the nest" to fly on my own for the first time. After he secured the rear seat and walked to the edge of the field, I taxied to the takeoff spot, went through my checklist, and pushed the throttle forward.

Without the instructor's weight in the back seat, the tail came up quickly and I was soon flying away from Mother Earth. The wind in the cockpit and the noise of the engine were all a symphony to me as I experienced the elation and thrill of being on my own and flying without any help or comment from the rear seat. Again I felt the buffet of the wind which caused my knee-board checklist to flop around a bit. The engine exhaust crackled as the pistons and valves provided power to turn the propeller. As Pace Field dropped behind my left wing, I knew that I had reached the 180-degree position and it was time to start my descent and turn

for landing. I pulled the throttle back and the crackling exhaust quieted slightly. The aircraft responded to my pitch and roll inputs and I began my turn toward final approach. I rolled the wing gently to straighten my approach and verified that I was at the correct speed and altitude.

Crossing the runway threshold, I chopped the throttle and pulled back slightly on the control stick to make my landing flare. Just as I had been trained to do, I stalled the wing just at the moment of touchdown and completed a successful landing. I repeated my performance twice more with great precision. After the third landing, I taxied back to pick up my check instructor who had been “sweating it out” from beneath a tree on the edge of the field. I took off and flew back to Whiting Field.

I had completed Stage “A” of my training, basic flight and solo. After that, I continued with increasingly more advanced training. Stages “B” through “G” consisted of Precision Flying, Acrobatics, Instrument Flying, Night Flying, Formation Flight, and Gunnery Practice. I had to complete them all to become a naval aviator

Stage CQ, Carrier Qualification

Next came the greatest challenge: Carrier Qualification.

So far, our Navy training syllabus had been fairly similar to Air Force.

training. The next stage, called “CQ,” required cadets to gain proficiency in flight operations aboard aircraft carriers. It was the stage that some said “separated the men from the boys.” I had accumulated 185 flying hours in the SNJ. I knew the aircraft well and felt very comfortable flying it. Still, I wondered if I could land it on the deck of an aircraft carrier as it pitched and tossed on the ocean. The

experience involves all of the same techniques applied in landbased flight operations except that the runway is now floating (and moving!) in the middle of the sea.

My first experience with carrier-type landing approaches took place at an airfield on dry land. The runway was marked on the ground to simulate an aircraft carrier landing deck. Here I practiced my technique on a stationary target. Airfield carrier practice flying was exhilarating. I spent many hours flying approaches to the simulated landing deck. The practice areas were small, remotely located fields carved into the Florida pine forests. They were triangular in shape so a pilot could always select an approach into the wind.

During my first simulated carrier practice, I sat in the rear seat while the instructor made the landing. The aircraft was in a “dirty” configuration, meaning that landing gear and flaps were extended. We made our approach with about 68 knots indicated airspeed, 17 knots slower than the normal approach speed for a land-based runway. We flew so low that it appeared you could reach out and touch the tops of the nearby trees. The instructor pilot described what he was doing as he flew the approach but he also watched me in his rear view mirror. He must have seen me focused on watching the airspeed indicator. “Damn it, Mallick,” he exclaimed, “quit watching that airspeed indicator!” And with that he stamped hard one rudder pedal. To my surprise the aircraft did not stall and drop into the trees as I might have expected. The instructor flew about six patterns and approaches and I became a little more comfortable each time. It was a new realm of flying, but I quickly became accustomed to it.

On the next flight, I sat in the front seat and my instructor watched from the ground. The instructor couldn’t do much

from the back seat anyway. A Landing Signal Officer (LSO) played one of the most important roles in this exercise. The LSO was a qualified aviator trained in the art of directing pilots as they made their carrier landings. The LSO spotted deviations from a normal approach even before the pilot did. He used two large paddles, one in each hand, to provide visual signals to the approaching pilot. These signals told the pilot what corrections to make to bring his approach back into alignment. These signals included: Too Fast, Too Slow, Increase Turn, Decrease Turn, Too High, Too Low, Skidding, and combinations thereof. Two other important signals were Cut Power and the Wave Off (or Go Around). The first set of signals were suggestions, the last two were orders. Cooperation between the pilot and LSO was essential for orchestrating a good carrier approach.

I usually flew with the canopy open because the Florida temperatures were pleasant, even in October. After a few flights, I became comfortable having the tall pine trees close below while my airspeed hovered around 65 knots. I pushed thoughts of engine failure and crashing into the trees to the back of my mind and concentrated on flying the approach. With wind in the cockpit, engine noise, and crackling exhaust, it was as close to true “seat of the pants” flying as one comes. I enjoyed it immensely. Even the afternoon turbulence that bounced the aircraft around could not erase the thrill of flying a good approach. My pulse raced as I watched for the Cut Power signal, chopped the throttle, and flared to a spot landing. Once again, I pushed forward on the throttle and my plane roared down the runway. Soon, the main gear lifted off the ground followed closely by the tail wheel. I pulled back on the stick, just clearing the trees at the end of the field, and re-entered the pattern for a repeat performance.

Field carrier practice lasted two weeks. I accumulated 11 flight hours and 53 field carrier landings during 15 sorties. My instructors soon deemed me qualified to land on the U.S.S. *Monterey* (CVL-26), a small carrier stationed at Pensacola and used for carrier qualification training. My instructors assured me that landing on the *Monterey* would be easier than the field carrier practice.

On my carrier qualification day, 16 October 1951, I was a "walk-aboard." A number of cadets actually walked aboard the carrier at the Pensacola Pier before it sailed. The other cadets flew out in SNJs to join the pattern once the carrier was cruising in the Gulf of Mexico. When one of these cadets completed his required six landings, he exited the aircraft on the flight deck and one of the walk-aboards climbed into the cockpit. As I waited my turn in the ready room, the U.S.S. *Monterey* wallowed in the swells of the Gulf. The ship vibrated and shook as the engines turned the screws, pushing the ship through the water to generate an adequate wind over the deck for the flight operations. The ready room was small, with limited air circulation, and I began to feel a little nausea. This concerned me and I wondered what kind of a Navy pilot I was going to make if I was susceptible to seasickness. I heard my name called over the ship's intercom and I made my way to the flight deck. The cool sea breeze revived me and I felt much better. Soon, I was strapped into the cockpit and prepared for takeoff. As my plane lifted off the deck, the airflow through the cockpit increased and I felt myself fully restored. I completed six good approaches and landings with no wave-offs or difficulties. As aviators like to say, it was "uneventful."

The instructors were right. It was easier than the field carrier training. For one thing, I didn't have to look at all those pine trees. Because I had been a walk-aboard, I flew

the aircraft back to the mainland. I can't ever recall being more pleased with my performance than I was this day. The seasickness was pushed to the back of my mind and never troubled me again.

Advanced Flight Training

When I finished basic flight training, I had approximately 200 hours flying time and I had accomplished all of the phases that would normally have been required for combat. The move to advanced training allowed me to experience flight in larger aircraft with higher performance. Otherwise, the training syllabus was generally similar to basic. During basic, I observed that there were some "natural pilots" among the cadets, those who easily and quickly adapted to flying. I would estimate that about five percent of our class fell into this category. Unfortunately, I was not one of the natural pilots. I was able to retain new capabilities with precision and consistency, but it took me longer to master my tasks

In mid October 1951, I reported to advanced flight training in Corpus Christi, Texas. Corpus Christi was a lovely, clean town. It seemed hardly large enough to be called a city, but it had a "homey" atmosphere and very friendly people. There were several training bases in the area, including Mainside and Cabiness Field. Kingsville, about 40 miles from Corpus Christi, was used for transition training to jets, something that I looked forward to. Mainside provided multi-engine training and the advanced instrument flight school. I was assigned to Cabiness for advanced training.

for fighter and attack pilots. There were three fighter squadrons flying the F6F Hellcat and one squadron flying

the high-performance F8F Bearcat. An attack squadron flew the AD Skyraider. I was assigned to an F6F Hellcat squadron.

The Hellcat had much higher performance than the SNJ. It was equipped with a 2,000-horsepower engine and could attain speeds just over 400mph. By comparison, the SNJ had a 550-horsepower engine and flew about 200mph. Operating the F6F aircraft was a greater challenge than flying the SNJ. I performed the same kinds of tasks (formation, gunnery, and acrobatics), but the demands of the high performance aircraft were greater. In advanced training, I flew single seat fighters. They had no back seat for an instructor. Usually two instructors flew “chase” in accompanying aircraft. One served as lead and another flew in trail to keep a close eye on the students.

Unfortunately, we experienced very high losses in the first few months of advanced training. It seemed like a terrible streak of bad luck. Between the middle of October and the Christmas break, we lost five cadet pilots to accidents. Four died as the result of mid-air collisions. Another crashed after suffering from carbon monoxide poisoning in his cockpit. The tragedies weighed heavily on the cadets in my class, but we continued our training until the regularly scheduled break.

I was glad to get home for Christmas. Audrey and I had announced our engagement in the summer of 1951 when she came to visit me in Pensacola. We were going to be married as soon as I received my wings and commission. I needed the break to catch my breath. Now that I was starting a family, my realization of the risks of flying really hit home. Those thoughts, previously in the back of my mind, were now brought to the forefront. The vacation break helped me get my bearings.

After the holidays, I returned to training with a refreshed body and mind. I renewed my studies with vigor. Training progressed well for a month or more and then we had another accident. Jack Cliff from Hershey, Pennsylvania was one of our best natural aviators. He was tall, athletic, handsome, and he excelled in academics and flight all through the program. Jack led his class through all stages of the training program. He was assigned to the F8F Bearcat squadron and was the top cadet in that group. I admired Jack as a person and an aviator. Perhaps, if I ever wanted to be someone else, it would have been Jack.

He completed the advanced syllabus and had his orders to report to Pensacola for advanced carrier qualification in the F8F prior to receiving his wings and commission. As he was cleaning out his flight locker, an instructor came by and asked him if he would like to fly “safety chase” for the instructor during an instrument flight. The safety chase provided a visual lookout while the instrument pilot concentrated on “hooded” flying. Jack jumped at the chance for another flight and suited up. When the instrument portion of the mission was completed, Jack led the flight of two Bearcats back to the landing field. The traffic pattern was at an altitude of 800 feet with a sharp 180-degree break for the downwind turn. In a normal fighter break, the pilot executes a near 90 degree bank turn and pulled three to four g’s as the aircraft slowed to landing speed. When Jack made the break, he pulled smartly into the turn only to experience a high-speed stall and he rolled into a spin and crashed. The aircraft hit so hard that the 20mm cannons were embedded eighteen feet into the ground. Jack was killed instantly.

I was stunned. The other students and instructors shared my grief and confusion. We couldn’t understand how this

could happen to someone as sharp as Jack. The general consensus was that Jack's exuberance over having just completed advanced training and an exhilarating flight led him to pull too many g's at the break point. How could someone as talented as Jack let this happen? A pilot must know his capabilities and live within them. Unfortunately, over years of flying, I have observed other similar accidents. An Air Force flight surgeon involved in accident investigations made the following observation concerning pilots: "The main problem is overconfidence. Pilots have difficulty saying, 'I can't.'" Excessive motivation sometimes pushes pilots beyond their limitations.

About three weeks after Jack's death, I completed advanced training and headed to Pensacola for advanced carrier qualification. I felt elated, knowing that this next phase was the final step to receiving my wings. I was also looking forward to graduation because it meant that Audrey and I would soon be married. By this time, we had known each other for over two years and were anxious to start a family.

Advanced Carrier Qualification

The preparation for advanced carrier qualification began with field carrier practice in the F6F. I made 82 practice field carrier landings before attempting to operate from an actual aircraft carrier. Once again, the U.S.S. *Monterey* served as the training carrier and it hadn't grown an inch larger since basic. Fortunately, the F6F was well suited to carrier operations. When I cut power to land, the airplane settled in for a solid landing with no tendency to bounce or float. I was required to make 12 landings to qualify. I completed seven landings my first day out and five the next day. I had no

trouble qualifying. In fact, I earned my highest flying grades during this phase of training. I completed it in 21 days with 21 flying hours, including the 12 actual carrier landings.

I qualified on 28 February 1952 and received my commission and wings on 5 March. Audrey waited patiently and we celebrated our wedding a few days later in Pittsburgh. We then headed to Corpus Christi, Texas, for my advanced instrument training.

Instrument Training

I had to complete two advanced training schools, Instruments and Jet Transition, before assignment to a fighter squadron. Instrument school served an important purpose in preparation for Jet Transition. It involved flying the twin-engine propeller-driven Beech SNB-2 Navigator. I studied hard, and the training paid off throughout my flying career.

In a little over a month, I had flown 42 hours of instrument and night flying. The SNB was a two-seat aircraft, but the instrument flights were structured with the trainee pilot flying the aircraft and managing all the systems just as he would do in a single-seat aircraft. The SNB had four fuel tanks and the student pilot was responsible for managing the fuel and switching the tanks when they reached 20 percent capacity. If the student forgot, the instructor would allow the fuel to reach 10 percent before switching the tanks for the student. If the student failed to properly manage his fuel consumption, he received a demerit or bad grade. Thanks to my highly qualified instructor, I excelled in the instrument school and enjoyed the flying.