TEN-HUT: MILITARY FLYING EXCITEMENT

Jets small and big, aircraft carriers and more…

Air Facts Journal

Richard Collins

For most people, jet airplanes are something taken for granted. Tickets to ride have been available for Boeing jets since 10/26/1958 and rare is the person who has not flown in a jet. Jets were a great mystery to those of us who were around in the days right after World War Two. We knew they existed and that the Germans had actually deployed the ME-262 twin-jet fighter in the last phase of the war. Pictures had been published of the Bell P-59, also a twin-jet, which was first in the U. S. military inventory. That airplane was quickly made obsolete by the Lockheed P-80 that became our first real jet fighter and scored the first victory while flying over Korea. The venerable T-33 trainer was soon (in August, 1947) developed from the P-80. It was wildly successful with 5,691 built before production ended in August, 1959.

The T-33 took awhile to get going, but once it did things got exciting.

Which brings me to an Arkansas Air Guard T-33, ANG 19544, early on the morning of January 1, 1956. It waited on the Guard ramp at Adams Field in Little Rock.

Norman McCreary was a rated pilot, full-time Air Force, and was assigned to the ANG as a liaison officer. We had become great buddies, having met at Central Flying Service where I had worked as a pilot. Norman wanted to moonlight as a charter pilot and I had checked him out in a Bonanza.

When I got drafted into the Army and was saying goodbyes, Norman told me to look at the bright side. When I came home on leave, he could take me flying in the T-33 because of my active military status.

He remembered. We were at a New Year's Eve party when he suggested an 8:00 a.m. hop the next morning. If you wonder about the January first timing of my first jet flight all I can say is that it sure was nice to be young.

The crew chief, remarkably cheerful, got me all plugged up, strapped in, and briefed on the ejection seat. Then the canopy was closed, the engine started, and we taxied out with Norman explaining things as we went.

I had no idea what to expect. I had talked to Norman and others about jets and I wondered if flying in it could possibly be as ethereal as described.

Acceleration on the takeoff was slow and the initial climb pretty meager. As we flew faster and put more air through that basic turbojet engine, though, things really picked up. Once it had its wind the T-33 became downright sprightly. And yes, it was as ethereal as described. To be flying like that without noise and vibration was something a piston pilot could only dream about.

We did some rolls and a loop and then Norman said we'd take the low-level scenic route back to Adams Field. That would be down the Arkansas River valley, from the northwest, with low hills on each side.

I don't think I have ever flown in an airplane with a higher redline airspeed than a T-33. Five hundred and five is a whole bunch of knots and we were indicating about four hundred of those as we followed the river home. It was a visual sensation of speed that I hadn't seen before, or since for that matter. I have flown at over 1,100 knots but that was up high where there is no visual sensation of speed.

A week later, as I tried to go to sleep in a pup tent during a snowstorm at Fort Chaffee, Arkansas, I reflected that Norman had a better government job than I. Sadly, it didn't turn out that way. He was killed in the crash of an ANG B-57.

I didn't fly in a T-33 again until almost 30 years later. This next one belonged to the Ecuadorian Air Force. Sabreliner had rebuilt the airplane and it awaited delivery when I flew it. Nothing had changed. All those years later the airplane flew in its original form and was in use by air forces around the world though it was in the process of being phased out of the U. S. inventory.

A couple of years ago there were still a few T-33s on active duty (in South America), a few are operated as civilian airplanes, and squadrons of them are on static display around the world.

The T-37 featured another approach to engine mounting: in the wing root.

Later, but still before I got into the magazine business, I got a flight in one of the first Cessna T-37s, the original VLJ. That was while I was still in the Army, in 1957, and I got the ride from a friend who was with the T-37 test unit. The Air Force, probably to appease some politician, had loaned the Army three of the first copies of the little jet but they had no intention of letting us lowly ground-pounders have such grand hardware on a permanent basis. My strongest impression of the T-37 is that it had the true potential to become a jet replacement for the Bonanza. With that in mind, Cessna did preliminary work on a four-place version but nothing came of that.

When I contemplate Cessna's remarkable success with the Citation, I always reflect that it all started with the T-37 and I flew in one of those early-on.

After I became editor-in-chief of *FLYING,* in 1977, it became apparent that the military liked exposure in that magazine. It bought ads for recruiting but also liked editorial coverage. This took me to the Jacksonville Naval Air Station on 12/04/1978. Using a military airport with a civilian airplane is up to the commanding officer of the base. Some say "y'all come," others say "no way." Jax NAS was accommodating and said they would take good care of my airplane while I was out for a visit on an aircraft carrier, the *USS Independence,* which was steaming around off the coast of Florida.

To say that this was anything other than fascinating high-adventure would be an understatement. It was the first of three aircraft carrier visits for me and while it was pretty intense and informative, it was also a whole lot of fun and the type experience that you truly savor forever.

That trip to the *Independence* was choreographed by the Navy's PR department and involved a moderate amount of red tape, some for using the military field with my airplane and some for me to ride in their airplanes and visit the ship.

A trip to a carrier is made in a carrier onboard delivery (COD) aircraft. In this case it was a Grumman C-1A, a piston twin that was clearly converted from a military role (anti-submarine) to a nine-passenger transport. It weighed roughly the same as a DC-3, was about half the size, had a lot more horsepower (1,525 a side), and wasn't much faster. To me it was a perfect example of why they called the place at Bethpage "The Grumman Iron Works."

The Navy gets up early and we met the COD before dawn. The briefing was quick and included word that the helmet was more for the ears than the noggin. The C-1A cabin is about as noisy as they get.

The cabin of the Grumman C-1A was "about as loud as they get."

I had made a request to ride in the right front seat through a landing. That was not approved but the Navy did allow me to ride up front through an approach and a go-around that begun as the airplane reached the fantail of the carrier.

Before we got our shot at the ship there was a bit of holding. Welcoming guests is not high on the priority list and the operational needs of the aircrews flying carrier qualification missions came first. They did fit us back into the landing pattern quickly after the low pass.

The Navy flies close VFR patterns and on downwind the carrier looked pretty small. As we flew the arc around to a short straightaway on final, it looked a little bigger and when the pilot, Lt (jg) Greg (Sky) King called the ball (in the visual approach slope indicator on the ship) I could readily see how this could work out. Regardless of where you are landing, if the sight picture is good and the speed is right (92 knots in this case) all is well.

After the pass, it was back to my rear-facing seat in the back for the landing, or trap as the Navy calls carrier arrivals. The windows are small but I was looking out to see what I could

see, and wham, the view went from ocean to carrier and then abruptly to still as the arresting gear cable stopped the C-1 in a short distance.

There was some manner of a “first” on this trip. We had a female on board who was going for a carrier visit. It was never explained what was happening for the first time, but I do remember that they set aside part of the sick bay to provide her with private quarters including a head.

When carriers are cruising around off the coast, it is usually for the purpose of pilot carrier training and proficiency. Crews can fly out from shore bases, do the requisite number of traps both day and night, and then go home. When I was there they were doing it in F-4 Phantoms, F-14 Tomcats and S-3A Vikings.

In watching the landings it seemed obvious to me that of the three airplanes, the F-4 was the most demanding one. It looked like the pilots flying that airplane were clearly working hardest, especially at night. The F-4 also had the highest minimum wind across the deck requirement, at 19 knots. There is almost always a breeze at sea and the speed of the ship adds to that to generally exceed minimum wind requirements. If there is no natural wind, the forward speed of the powerful carrier can easily provide more than is required.

It’s even more impressive in person.

The F-4 also had the highest approach speed, at an average 146 knots, the wind across the deck was 25, and with 121 knots groundspeed at touchdown the dynamics of the arresting gear stopping the airplane in a few hundred feet was quite impressive. I got to watch some of this from the landing signal officer’s (LSO) station right by the flight deck which happens to be where the action seems the most intense. The tail hook grabs the wire right in front of you.

There are four wires (three on newer carriers) and the best deal is to catch one that is in the middle.

Once the airplane is trapped, it is allowed to roll back a bit to take tension off the arresting cable, it taxies out of the way, and the arresting system is reset for the next arrival. There are settings for aircraft weight and speed. The deck can be made ready for the next arrival in as little as 31 or 32 seconds. The normal acceptance rate is one a minute.

At night and in IFR conditions the close approaches give way to four-mile final approaches and reduced acceptance rates just like at airports Night traps are far more demanding and there are a lot more missed wires and go-arounds at night. I don't think a Navy pilot has ever referred to a night trap as "a piece of cake." They refer to them in much more colorful terms.

One thing that was being done on the ship rather surprised me. To save time and keep things moving, they put fuel in airplanes with the engine(s) running. When I saw this, I had a flashback to a juvenile delinquent pumping avgas with a cigarette in his mouth.

When the Navy takes you on board as a guest it makes every effort enable your every wish. *FLYING*design associate (later art director) Randy Steele was with me to take photographs and they supplied two and sometimes three keepers to guide us as well as to keep us out of harm's way. When Randy was shooting on the flight deck, he always had two keepers. I got the feeling the Navy learned the hard way that photographers sometimes walk backward when concentrating on a shot. It's a long way from the side down to the sea and quite expensive to retrieve a man overboard.

They also let Randy ride in a helicopter that was orbiting the ship, ready to pluck any unfortunate crew out of the water if that became necessary. He got some really good photographs of the ship from that platform.

We were assigned a stateroom, like officers have. There were a couple of chairs, small desks, some hanging space and really comfortable bunk beds. One thing is stressed: The head is down the hall, and perhaps even on a different level, and you need to know your way there and back because there might not be anyone around to show you the way. Locations on the ship are identified sort of like lat/long coordinates only it is in reference to bow to stern and port to starboard locations as well as to the deck.

We ate with the crew. Having savored Army chow for quite a long while, I can readily say that Navy chow is better, much better. We were still occasionally enjoying C-rations from the 1940s when I was in the Army.

I was looking forward to our departure not because I wanted to leave but because a catapult launch, a cat shot, would be a new experience.

Acceleration was from zero to 112 knots in 300 feet. The seats were rear-facing so the belts needed to be tight. The big piston engines were wound up tight and boom, off we went. It was like an E-ticket ride at Disney. The acceleration was like nothing I had ever felt before as was what happened next. When that rapid acceleration stopped, it felt like the airplane stopped even though it was still accelerating though much more slowly. If you have ridden through a

noise abatement departure in a jetliner and experienced the feeling that comes when the power is reduced, the sensation as a cat shot is completed is much the same though multiplied by, say, a hundred times.

USS Carl Vinson was an impressive visit.

As we left what has to be the most active 4.5 acre airport in the world, I hoped they would ask me to come back. The Navy did, about four years later, to the then almost new *USS Carl Vinson*, a nuclear powered super carrier.

The C-1 was still the COD of choice when I visited the *Vinson* in late 1982. Those piston engines were the last operated by the Navy.

The departure for the ship was before dawn and because one of the ship's missions was sea trial work for the then-new F/A-18, there was an executive from an electronics company along to observe his equipment in action. When we gathered before boarding I could tell by his pale color, sweating, and actions that he was nervous. On maybe even terrified. I hate to see scared people in airplanes.

After takeoff, I could tell that this guy might be about to melt down. I unhooked, moved to his side and shouted (to be heard over the shaking, rattling and rolling of the C-1), "You okay?" He looked at me, pointed out the window, and stammered "fire." As best I could, I explained that it was just the exhaust flame from the piston engine.

Before I sat back down, I had a word with the crew chief to make sure he was aware that one of his passengers was a bit nervous.

When we got to the ship, the poor guy had been so tense that he had to be helped out of the C-1 and then to a location on the ship where he could calm down.

Later, a test pilot was flying an F/A-18 to determine the minimum end speed for that airplane. That would be the lowest possible cat shot speed that could still result in flying away.

One launch was memorable. I guess they were probing ever slower speeds and on this one the jet settled, nose up, almost to the sea after launch. Then the pilot lit the afterburners, the heat from which created a huge cloud of steam. Then, a moment later, the F/A-18 rose above the steam and flew away.

A lot of pilots were getting their first crack at a carrier. These pilots averaged 300 hours total time with 100 in type. They had trained on simulated carrier landings at an airport, with an outline of the deck painted on the runway. This was the real thing and for the most part it appeared that they were feeling their way but doing a good job.

"They haven't yet paid me for even the first night flight."

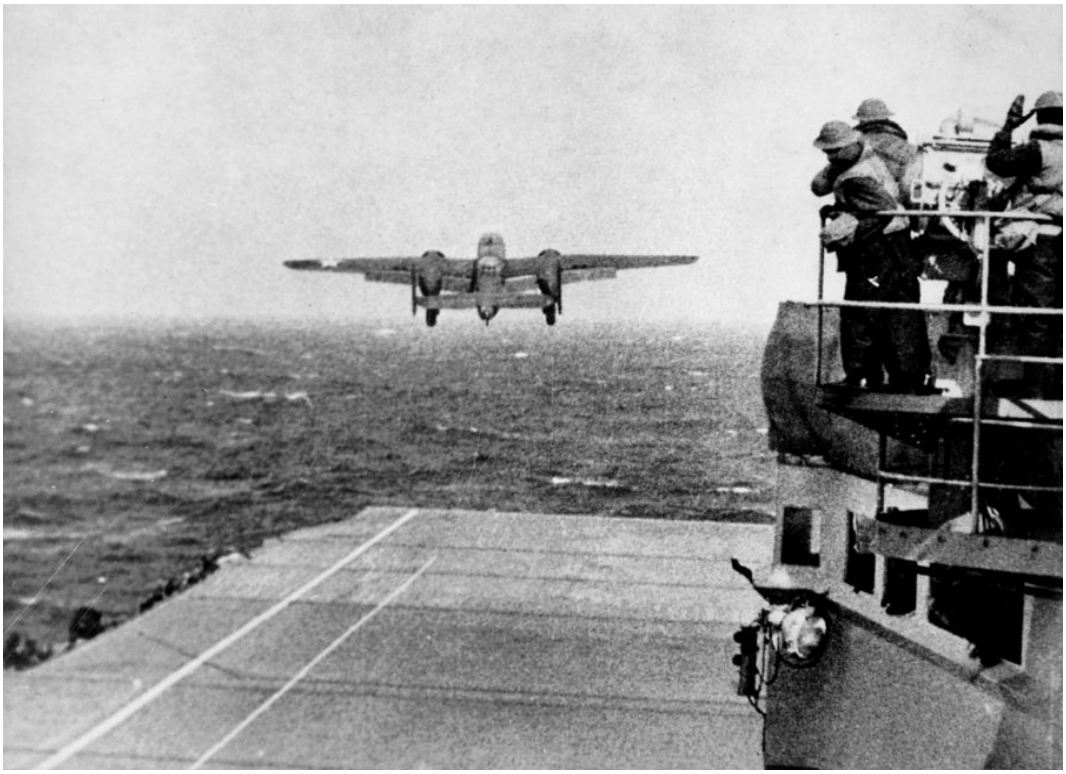
Oh, but the sun sets every single day and on a carrier the operations keep going as the light fades. The procedures change to an IFR operation and the level of tension increases dramatically. One pilot remarked that "they wouldn't have to pay me for the daytime flying, but they haven't yet paid me for even the first night flight." Not only are the traps more demanding at night, just imagine for a moment being shot into an inky black night and then handed a jet airplane to fly. As Goose said to Maverick, "It's time to do some of that flying stuff." Only he didn't say stuff. It takes a lot of concentration to handle the disorienting sensations of strong acceleration that abruptly stops and of going from an environment with lights to one with no lights.

They know that their flying is a team effort and that it is not easy and without risk. But, as one said, "It sure is fun."

When it came time to leave, three C-1s came out to take the large group of visiting firemen to shore. The captain wanted the least possible disruption of his training schedule so we weren't to get a cat shot. The three C-1s were lined up nose-to-tail pointed down the canted deck for simple takeoffs. I was in the first one so we were short the length of two airplanes in available deck length.

In the briefing, the crew chief said that we would be going off the deck well below Vmc and in case of an engine failure the pilot would have no choice but to cut the other engine and ditch. "So," he said, "if you hear a splash and see a butt disappearing through that hatch at the top of the cabin, it will be mine. Follow it."

As I contemplated this, I thought back to April 18, 1942, and the unknowns faced by the crews of the 16 B-25s that were about to make takeoff runs on the *USS Hornet* and go drop some bombs on Tokyo. I could visualize that famous photo of the B-25 climbing steeply off the deck.



If Doolittle could do it…

That made me feel better as we went off the end of the canted deck and the pilot let the airplane descend into ground (sea) effect to better enable acceleration to a safe speed. As proof that the Navy still had a few good men who could maintain piston engines, the Wright R-1820s faithfully pounded out 1,525 horses each and we were soon serenely cruising toward shore.

I had seen the fellow who was so nervous on the trip out a couple of times on the ship and he appeared calm. He probably wasn't that way when he got back to shore. He was on the

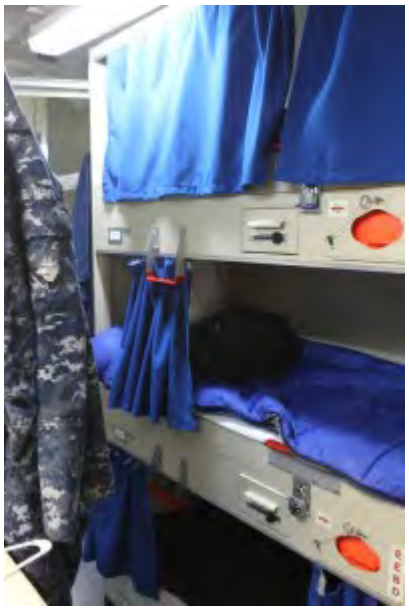
second C-1 to launch and it had an engine failure about ten minutes later and had to limp to shore on one engine. If there is a next time, he'll probably send someone in his place.

My third carrier trip was a return to the *USS Carl Vinson,* about 19 years after the first visit. There was no Washington red tape this time. The invitation came in an email from Lieutenant Commander Craig Stapleton who was a classmate of our son at Auburn. After I accepted his kind invitation to come out to the ship, the details were handled by the ship's public affairs officer. They agreed that an old friend, famous photographer Russell Munson, could come along too and they understood that no specific publicity was planned.

The arrangements consisted of a date and time to show up at NAS North Island (near San Diego) and word that we would be met by Ensign Ben Christen and Chief Chuck Rinesmith of the ship's shore detachment. They would fit us out with the appropriate equipment for the flight to the ship and then get us on board the COD which was to be a Grumman C-2A twin turboprop, a much larger airplane than the old C-1, by now retired.

The C-1 had some windows; the 28-passenger C-2 was virtually windowless. The seats were rear-facing, too, and the combination resulted in some attention to *mal de l'air* in the preflight briefing. Boarding was through a ramp at the aft end of the cabin and when all were aboard, it was retracted and we were off.

Just droning along in an airplane with no windows is okay but once we started maneuvering for a trap on the carrier, the sensations became more interesting. I was able to follow along based on sensations and sounds and was pretty sure when we rolled out on a short final.
The deck wasn't clear, though, so we got a wave off. The sounds and sensations of that were something else and I wasn't able to follow too well but I did have it straight before our eventual touchdown and anticipated that and the rapid stop.



Cozy – and noisy – sleeping accommodations.

The visit was great. I stayed up late watching night operations and might as well have stayed up until they finished at one a.m. because our sleeping quarters were not far below the flight deck and every launch, trap, and runout of the arresting gear cables was duly noted from my cozy rack.

This was in the spring of 2001. The *Vinson* had been in service for 19 years, was preparing for a deployment to the Persian Gulf, and because the nuclear fuel had never been replaced or refreshed or whatever is done to fill 'er up, the ship was due for a little downtime after that. When you consider the timing, though, it is obvious that didn't happen on schedule. Gassing up the ship had to wait until some other important business was cared for. The ship took that in stride.

Because I wasn't gathering material for an article, I had more time to look around and visit.

One pilot I chatted with on the flight deck did not hesitate when he told me he didn't like *FLYING*magazine. He said it had too much in it about things most people couldn't afford. His private flying was obviously pretty basic but then I mused over him hopping into his Tomcat and blasting off an aircraft carrier. As always, I appreciated the critique of our magazine and thanked him for his service.

The most lasting impression from that final carrier trip was of the people. They were dedicated, articulate and hard-working.

I watched a 19-year old sailor steer the ship when I was visiting on the bridge of what must be the most complex and expensive machine and system in the world. I admired the dedication the two enlisted photographers who kept us out of harm's way when we were on the flight deck during flight operations. The way they all, officers and enlisted, work to carefully manage the operations of the ship and the aircraft is, well, amazing.

A large cruise ship is about the same size as the carrier and carries as many passengers as the carrier has crew. I cherish my carrier trips but have never wanted to go on a cruise. I guess I would rather hang out with young people acting responsibly than older people, well, doing whatever they do on cruise ships.

I was a soldier once, a long time ago, and it makes me proud to see the caliber of the people who serve today. Even though I am far removed, I like to think of them as comrades in arms. They are true patriots and if I were king I'd name a super carrier the *USS Patriot* to honor all who serve.

Back to the Air Force, that also has no shortage of dedicated professionals.

I had written enough about military operating areas (MOAs) in *FLYING* to attract the attention of Lieutenant Kurt Koerner, the civil aviation liaison officer at Williams AFB in Arizona. Kurt graduated from the Air Force Academy, was serving as a T-38 instructor pilot at Williams, and also enjoyed using private aviation. He contacted me with the thought that after spending so much time flying around MOAs I might find it interesting to fly around in an MOA, in a supersonic (Mach 1.3) T-38.

It doesn't take long to accept an invitation like that. I quickly did and 30 years later I can add something to the story that I left out at the time.

Our son, Richard, was between his junior and senior year at Auburn that summer. Some of his buddies were in ROTC programs and he had developed an interest in possible military flying. I asked Kurt if I could bring him along and he said that would be fine, he could probably get him a T-38 hop as well. I had been taking Richard with me on trips since he was old enough to go (about 9) and I had never seen him quite so enthusiastic about an adventure. I didn't include him in the *FLYING*coverage because I didn't want to cause anyone a problem. Thirty years later, everyone involved has surely retired.

The Air Force doesn't just strap you in and take you for an airplane ride. The preliminaries and preflight procedures are thorough and impressive.

Formation flight in a supersonic Air Force jet? Yes please.

All the emergencies are covered including bird strikes that could incapacitate the pilot (in the front seat) and leave you solo in a T-38. One choice would be to eject using two yellow handles, one on each side of your seat. The other choice would be to land the aircraft. Three ILS approaches in what was then a really good simulator give a clue into what that would be like. After that session they told us that we could land the airplane if it became necessary,

There's an ejection simulator that gives you a kick in the pants that is estimated to be only a third or less of what the real thing feels like.

There is ground school on high-altitude flight and even a physical exam to make sure you are up for the mission.

A session in the altitude chamber is also included and is always worthwhile, especially for anyone flying turbocharged and/or pressurized airplanes. The main thing I always got from

that is the humongous difference between taking the mask off at 18,000 and at 25,000 feet. The former gives plenty of time to regroup, the latter dims and then extinguishes your lights almost instantly. My altitude chamber experience led me to seldom fly higher than FL190 in my P210 even though it was certified to 23.

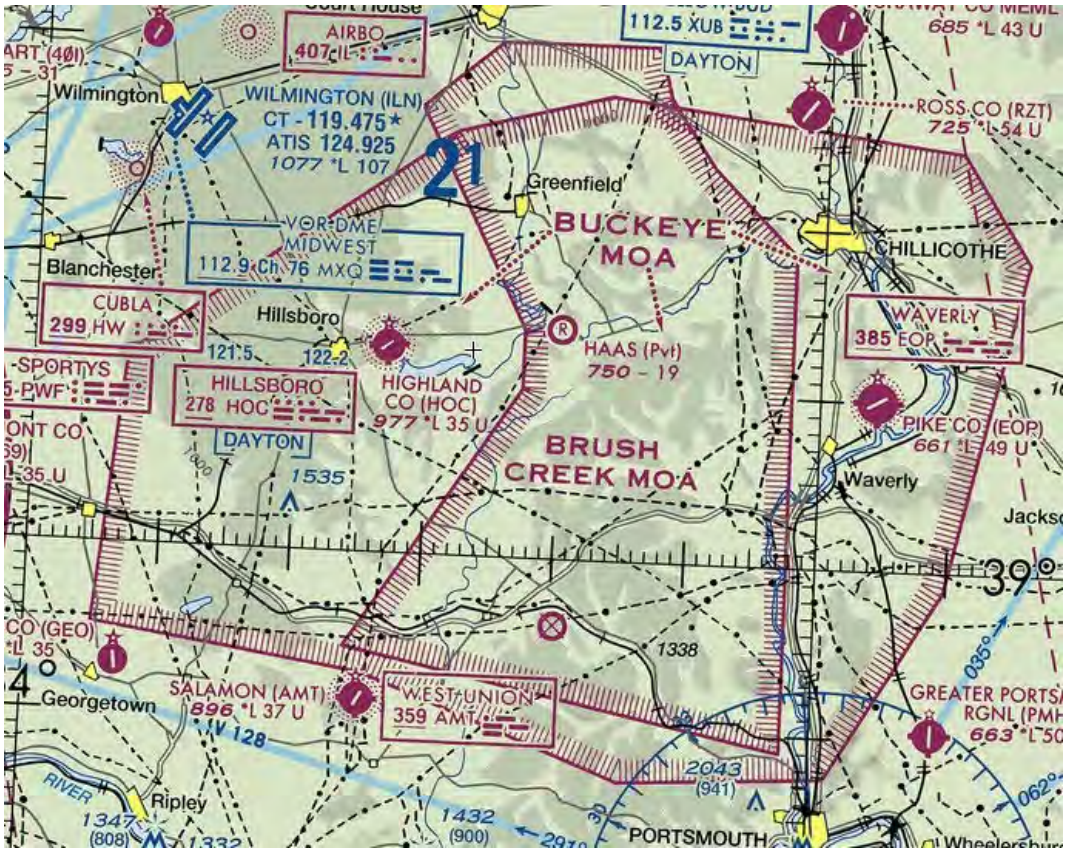
Son Richard did all that with me and when finished and on to the next step, getting all g-suited, chuted and helmeted for the ride, the question of him going flying hung quietly in the air.

I would be going off in a four-ship T-38 training flight with two of the airplanes flown by a student under the supervision of an instructor pilot. The proposal was for Richard to fly in the back seat of one of the other T-38s. The rub was that they didn't allow two members of the same family in a formation flight. Only the commanding officer could make the decision to look the other way and allow this.

Colonel John Jackson had his misgivings but when I pointed out that we had flown there in my Cessna, sitting only a few inches apart, and that surely we wouldn't be getting closer than that in the T-38s, he relented.

We maneuvered some as a four-ship and then broke off as individuals. The MOA which had always seemed so big when avoiding it, seemed small when inside it in a T-38. Air traffic control monitored the flights and called when we got close to the edge. With four T-38s in formation, indicating almost 500 knots and pulling three Gs in turns and formation maneuvers, the calls came rather frequently.

It is permissible to fly VFR through MOAs and air traffic controllers might offer varying degrees of advice and help to pilots who want to do with this but after this flying I decided that I would just stay out in my airplane. It is definitely not a "see and avoid" environment.



You can fly through an MOA under VFR, but "it's definitely not a 'see and avoid' environment."

I was flying with Captain Christopher Miller and after we broke the formation he asked me if I wanted to do a loop. He explained that it would be 5Gs for what would seem like a long time and that it took about 10,000 feet to contain the loop. I guess he talked me out of it because I settled for some rolls and steep turns. I did have on the G-suit but it was on a 52-year old body and having felt the squeeze of the suit at 3Gs, I thought that was enough.

We did some slow flight and the T-38 has fine flying qualities. It is extremely responsive and is flown with gentle control pressures. If you get a little slow or start loading the wing too much, an aerodynamic rumble tells you to let up and if you don't then control is still possible in the resulting stall though the vertical speed is more than 6,000 fpm down.

All good things must end and the low fuel light had just come on as we landed after the hour and 20 minute mission.

The air conditioning in a T-38 was no match for the Arizona sun. The ATIS gave the outside temperature as 108 degrees F. and when Miller opened the canopy after landing the outside air actually felt cool.

It was a neat experience for me. Son Richard flew with Kurt Koerner, who actually made a sale. Richard was so taken that he applied for undergraduate pilot training and was conditionally accepted but later disqualified because of his vision.

After we flew, it was time for lunch and in that they bought the gas, I bought the lunch. Six of us went to McDonald's and I saw a perfect example of command ability. Keorner was driving

and asked everyone what they wanted. Everyone wanted something different and as he pulled to the drive-in kiosk I wondered if he would remember all that. “I want six quarter pounders with cheese, six small fries, and six Cokes.” That’s what you call taking charge.

Within a year I had gotten my son a ride in a supersonic jet and got to take my wife Ann to work with me, in London, round-trip on Concorde. Tell me I didn’t have the best job in the world.

Before leaving the remarkable T-38 there are some interesting points to ponder.

The T-38 was put onto service by the USAF on March 17, 1961. In 2015 there were still 504 in use by the USAF. It replaced the T-33 as the jet trainer and when you add in the T-37, a primary trainer, there have been only three principle USAF jet trainers in my flying lifetime and I’m over 80 and have been flying since I was a kid. You don’t have to be good at math to see that the T-38 dominated that picture.

Upgrades and structural enhancements have extended the service life of the T-38 to 2029 and while there has been a potential replacement waiting in the wings for years, nobody seems in any rush to get rid of the T-38.

Like the T-33, the T-38 design was also built as a fighter, the F-5.

If the T-38 is the sleekest military airplane, the C-5 might be the unsleekest.

The C-5 may be the “unsleekest” military airplane.

I first met the C-5 at Altus AFB in Oklahoma, in 1984. Major John Scherer had invited me to come look at the operation where they were training C-5 and C-141 pilots (still operating, Altus now trains C-17 and KC-135 crews) and to fly the simulator and take a ride on one of their really great big airplanes.

The simulator was one of the older ones where your ability to fly a simulator is more important than your ability to fly an airplane. I still got a feel for the big airplane, with its nicely balanced and relatively light control forces and the view of the runway from what seemed like the decision height while sitting on the ground. The main consideration of the eye height of the cockpit was in judging speed on the ground. Groundspeed is monitored on the panel while taxiing (20 knots maximum) and on takeoff the airspeed is used. The USAF equivalent of the civilian Vr was Vgo.

As you might imagine, flying away in a C-5 involves a little more than kicking the tires and lighting the fires. When we got to the cockpit of the airplane for our flight, technical folks had been busy for a couple of hours and the C-5 was ready for the pilot part of the checklists. That didn't take long and we were soon airborne.

In flight, I was quite conscious of being in an extremely large machine that was actually flying. It did not feel much like flight in a light airplane where I always feel like I am part of the airplane.

Scherer did an ILS approach and then a missed approach followed by a VFR pattern. The tower asked for short approach, just as a tower might ask a 172 pilot for the same and as I watched Scherer maneuver the big airplane in the close pattern I could only think that it works the same in big and small airplanes. He arranged it so there was a little time to make sure things were stabilized on final and then he made one of the smoothest landings I have ever felt in any airplane. My thought was that if he can do that with hundreds of thousands of pounds of airplane, why can't I do it with 4,000 pounds?

Almost 10 years slipped by before I got another call from John Scherer, now a Lieutenant Colonel and longtime veteran of the C-5. He was at Dover AFB in Delaware and invited me to come along for a refueling mission in a C-5.

I had seen airplanes swapping fuel in flight on trips in my P210. This was usually done at close to the altitudes I most often used (high teens) and controllers were always good about calling out such an event so you could have a look. There was no way to watch without wondering how it is done and I was to find out.

The simulator at Dover was much better than the old one at Altus and I got a big kick out flying some ILS and visual approaches. Then I got to a much more humbling simulator, the air-refueling part-task trainer. In this one you get just what is used for refueling, flight and power controls plus a windshield.

I have done a lot of formation flying for the air-to-air photography featured in the pages of *FLYING*and *AOPA PILOT*. So I thought I knew at least a little bit about what I would be doing in the refueling simulator. Wrong.

There is a light system on the aft belly of the tanker that tells you to move left or right and up or down. Once you get it just right, the boom operator ("boomer") in the tanker can fly the tip of the boom into the receptacle which is just aft of the windshield on the C-5.

It almost seems impossible.

In 15 minutes of trying I was never able to get the C-5 in the right place. I was to learn why, in the actual airplane, a bit later. It has to do with the interaction between the tanker and the receiving airplane.

The mission was for air-refueling training and currency for four pilots. Scherer and Captain Trent Bigler were instructors and aircraft commanders. Captain Joey Hickox was an aircraft commander and Lieutenant Patrick May was checking out as an aircraft commander.

We would be buying gas from a Pennsylvania Air National Guard KC-135 out of Pittsburgh and would use a refueling track that runs westbound from a starting point just east of Pittsburgh.

Simple math was used for the join-up. The C-5 would be westbound at FL190 and the KC-135 would be flying in the opposite direction at FL200, on a track seven miles south of the C-5. The airplanes could “see” each other electronically and with the C-5 flying at 300 knots and the -135 at 275 a table showed that if the tanker entered a 25-degree bank left turn when 18 miles away it would roll out right on the C-5s track, three miles ahead.

The C-5 could then close to within one mile using radar at which time it had to become a visual operation though once hooked up they could fly through clouds.

The fueling was done at 252 knots and the actual mating started with the C-5 1,000 feet below the tanker and going just slightly faster. The closure rate was gradual and the final 50 feet was given up at a rate of one foot per second. This was timed, as a grade, and if a boomer calls “closure rate” that means the big airplane is getting bigger way too quickly.

Scherer was flying for the first approach and hook-up and when he judged that we were 50 feet away he called for the stop watch to begin. The distance was judged by the fact that the wingspan of the -135 filled the windshield. It did look close from the jump seat.

As we closed, the interaction between the bow wave (yes, there is such a thing) of the C-5 started interacting with the downwash from the KC-135 and the ride started getting bumpy. It was like a light to moderate chop and made this formation flying a lot different than any I had done because for photography we always sought out smooth air and none of the airplanes were big enough to generate a bow wave.

The interaction between the two airplanes actually causes the tanker to transition to a more nose-down attitude. The usual practice is for the autopilot to be used in the tanker but fueling has to be hand flown at regular intervals to maintain proficiency.

Once hooked up, the fuel flows into the regular wing tanks. That fuel is also available for use by the tanker which means he can go short and deliver a lot of fuel or go long and deliver less. This day we took 60,000 pounds. Scherer said the most he had ever taken was 100,000 pounds.

For practice, Scherer asked the tanker pilot to make 30-degree banked turns in each direction during which the relative positions of the airplanes had to remain constant.

We'd back off about 150 feet when it was time to change pilots. Then the next one up would do his thing. All four did some masterful flying and in the whole session the boomer called "closure rate" but once.

I just watched but it was easy to see that this is a most demanding form of flying. It is necessary, too, because with base closures around the world there just aren't as many places to gas up. At that time, in late '93, the goal was to have air refueling capability in all airplanes (including Air Force One) and to have all pilots qualified and proficient.

One flies the airplane, the other flies the boom.

That flight lasted three hours but was so intensely interesting that it seemed much shorter. I left Dover with a heightened appreciation for the crews of both airplanes.

You can guess what comes next. I had seen only half of the air refueling story and wondered what the other half looked like. Nine years later, in 2002, I had a look, with the Ohio Air Guard, in one of their 18 KC-135Rs, out of Rickenbacker International (former AFB) near Columbus, Ohio.

My contact was Lieutenant Colonel Ruben Padro, who called and invited me to fly with them on a mission. My hosts were Padro and the rest of the crew, Major Jeff Greenberg, Tech Sergeant Mike Bursk and Staff Sergeant Josh Hanna. The tanker is usually flown with a crew of three, two pilots and a boom operator but a guest required two boom operators as well as sidearms. I felt flattered that they were packing heat just for, or because of, me.

The number of the airplane we would be flying was 60-0367. The 60 was a reference to the year of birth but actually the airplane rolled out of the Boeing factory on May 16, 1961. If you recall, that was also the year the T-38 got its start so it had to be a banner year for the USAF, which doesn't have many active pilots who are that old.

The KC-135 was developed from the Boeing 707 airliner, long since retired in most parts of the world, but there were differences to begin and upgrades and modifications have made the KC-135R an entirely different airplane.

The tanker never flew with the flight engineer who was standard equipment on the 707. It had been retrofitted with a basic EFIS and upgraded avionics so the panel looked pretty modern. The CFM56 engines, basically the same as used on newer 737s, are the biggest difference. The engines, rated at 21,634 pounds of thrust, were hung on this airframe in 1985. The old engines put out 13,750 with water injection, so there is a big difference. With the old,

an all-up successful takeoff required all four engines do their best. With the new, they meet engine-out balanced field length requirements much like transports.

Yes, those more powerful engines are a lot larger, and no, there is not much ground clearance but this has not proven to be a problem in the airplane. One look and it goes without saying that the wing-down method of crosswind landing is a no-no in this airplane.

We were going to meet a Boeing E-8C, a spook version of the 707, on a refueling track near the Pulaski (Virginia) Vortac. We'd have 62,000 pounds of fuel on board at takeoff (maximum is 200,000 pounds) and the mission was more for the purpose of practice than the transfer of fuel. The indicated for the day's work would be 275 knots. This varies, with the F-16 fueled at 315 and the A-10 at from 200 to 210.

The altitudes and method of joining would be much the same as used on my earlier C-5 flight.

There's a boom pod at the back end of the airplane. The operator works from a center position with a right-hand control stick that is used to fly the boom and a lever for the left hand to use to extend and retract the boom. There is an observer position on each side. You are prone, on your belly, looking through a widow in the pod.

Mike Bursk said that being a "boomer" is the best job in the Air Force. Two officers drive him to work and when he gets there all he has to do is lie down and pass gas.

The E-8C looked plenty big as it closed and a slight pilot-induced pitch oscillation as it neared looked really weird. Then the pilot settled, moved in, and Mike flew the boom into place. It appeared to be a much more relaxed atmosphere in the tanker than in the airplane being refueled.

After some practice at hooking and unhooking, we parted ways with the E-8C heading toward Warner-Robbins AFB in Georgia and the tanker headed back to Rickenbacker. I moved back to the jump seat up front for the approach and landing.

That big yoke is there for a reason.

The only power to the controls of this old airplane is for the rudder which has hydraulic boost as well as a rudder bias system to help in an engine-out condition. Remember how, before power steering, cars had really big steering wheels? Same here. A big control wheel gives lots of leverage and the required deflections of the wheel to manage roll definitely mean this isn't a fingertip airplane. It's more like a strong arm airplane.

After a perfect landing, I anticipated reverse thrust but it didn't come. They left the reverse function off of the airplane to save weight.

That KC-135 might have been old but it was in near-pristine condition even though it had recently been deployed to the Middle East. It did take some effort to get the sand out of all the nooks and crannies but that had been done well.

This was my last flight in a military airplane. Like my first jet flight, in that T-33, the flight began and ended on an Air Guard ramp. Those good people are a big and important part of our national defense and they go in harm's way right alongside the full-time military and they do the same things. The crew I flew with had just returned from the Middle East and Jeff Greenberg told a good war story about hand flying an ILS approach to minimums while there. The weather? Minimums on RVR in blowing sand.

I flew in other military airplanes, including all the fixed-wing and some of the helicopters operated by the Army when I was stationed at Fort Rucker in 1956 and 1957. I flew in a USAF T-6G when working as a link instructor at a contract school in Moultrie, Georgia, and got a ride with a friend in a Navy T-28.

FLYING had coverage of Coast Guard flying but I never went along. Most of what I know about that came from The Weather Channel's *Coast Guard Alaska.* Watch that and I think you'll agree that the Coast Guard folks do indeed let it all hang out from time to time.

One of the things I treasure most about my 57 years of flying is the mental picture I have stored of every part of our country. One picture in particular stands out when I think about our military. It is of West Virginia, which I have flown across hundreds of times. I often looked and wondered what it would have been like for one of my ancestors, a military man, who made his way, on foot or horseback, from Virginia to the western part of West Virginia to die for his country just as it was coming into existence.

I stand at attention with my hand over my heart whenever *The Star-Spangled Banner* is played. I have known the words since I was a kid and sing along when appropriate. And, yes, I have been known to get a little emotional. I do this to honor all who have served, on foot and in the cockpit, including the ones I have written about here and including my six-times great grandfather, Colonel John Field of the Virginia militia. He was killed at the Battle of Point Pleasant (West Virginia) on October 10, 1774. We are deeply indebted to all of them.