

START AVIATOR TRAINING

the Old-Fashioned Way



By MAJ John Q. Bolton

I prayed that I might not be posted to a training squadron. – C.S. Lewis

The Army Aviation Center of Excellence (USAACE) has changed the aircraft used for Initial Entry Rotary Wing (IERW) training from the TH-67 to the LUH-72 Lakota. Though the LUH was not designed as a trainer, it replaced the venerable TH-67, which had been Army Aviation's primary trainer since the 1980s.¹ According to the 110th Aviation Brigade, the LUH will improve training because, "A lot of the instrumentation crosses over and systems management [in the LUH] is much better this way, as is habit transfer when they go to war-fighting helicopters."² While the LUH resembles advanced Army aircraft in terms of mechanical systems and avionics, this may not necessarily result in positive habit transfer. Airmanship does not derive solely from instrumentation or procedures. This is a trend within the American military; we often confuse technology for understanding. In doing so, we forget that thorough individual training is the basis for developing unit competence.

This article argues that while the LUH is a good place for Army Aviators to begin *rotary-wing* flight training, *the proper place for new aviators to start primary flight training is in a simple, fixed-wing trainer* like the C-172 or Diamond DA-20. In addition to saving money, requiring Army Aviators to go through a fixed-wing (FW) training program would reap training dividends in several ways. Learning basic airmanship, flight procedures, and radio operations under less demanding conditions of a basic, uncomplicated FW trainer would enhance the rotary-wing (RW) specific

training aviators receive. If a junior aviator is already comfortable with traffic avoidance, understanding radio procedures, and basic airmanship, he is more primed for advanced instruction. This is the training methodology adopted by the other services, commercial aviation, and advocated by general aviation experts like Rod Machado.

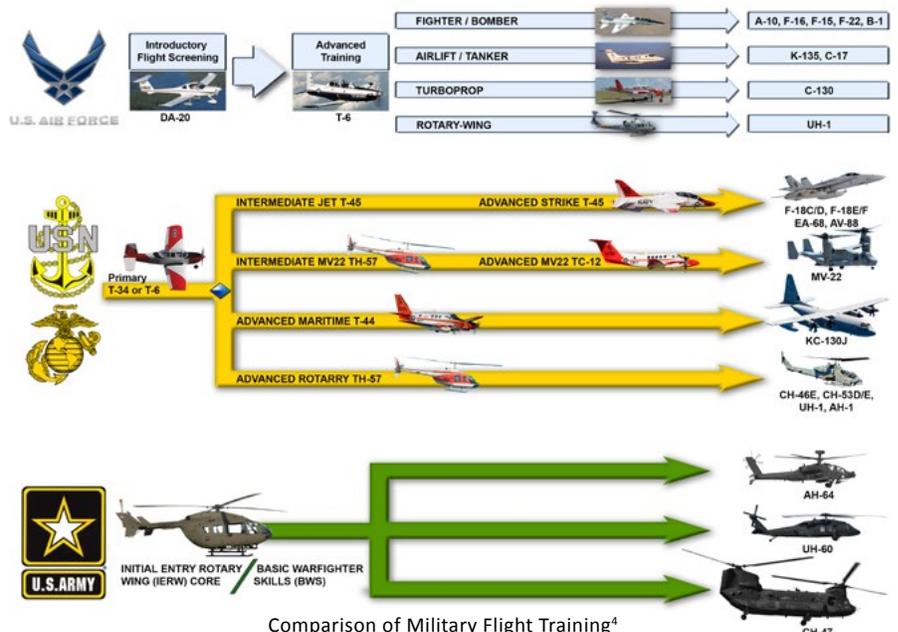
While the goal of Flight School 21 (FSXXI) is producing helicopter pilots, the methodology of starting in a complex helicopter is questionable. Army Aviators should start in a FW trainer before moving to helicopter training. While moving from FW to RW aircraft would require a transition, the challenge is exaggerated; airmanship is not platform-specific and less so if a pilot has a solid grasp of the basics. Concentrating on flying fundamentals—stick and rudder skills—creates aviators better prepared to operate complex

aircraft and, to borrow a phrase from the Army Operating Concept, "fight and win in a complex world." Focusing on skills, not aircraft, instrumentation, or technology, enabled World War II (WWII) - era Army Air Corps pilots to change aircraft with little more than a class on starting the engine.³

Flight Training in Other Services

The Army is the only military service that does not begin pilot training in a basic training aircraft. Naval Aviators begin training in the T-6 Texan for nearly a year before moving on to more advanced aircraft in accordance with their track (strike, transport, helicopter, etc.). They then fly at least one more training aircraft before their designated aircraft and earning their wings.

The Air Force goes a step further by screening candidates before flight training. USAF pilot candidates participate in a 40-day program



Comparison of Military Flight Training⁴

called Introductory Flight Screening (IFS). During IFS, civilian instructors conduct basic flight training using the Diamond DA-20, a two-seat light aircraft. This program screens upwards of 1,700 candidates annually.⁵ Only after completing 25 flight hours and a check ride can prospective pilots move on to more advanced aircraft.



Figure 2. The Air Force begins flight training using the two-seat Diamond DA-20.⁶



Figure 3. The original Army Aviation trainer, an L-19, was first used in 1950s.⁷ It was a modified Cessna 170.

The Navy and Air Force flight training programs follow historical paradigms. During WWII “the American system of training held that a fledging pilot was incapable of handling high-performance places during the early stages of his career, so he moved carefully and systematically from simpler to more demanding aircraft and maneuvers.”⁸ Army Air Force pilots started in biplanes before progressing to primary training in monoplanes, then advanced training in the P-40 and AT-11. Only then did pilots progress to final training in combat aircraft.⁹ In fact, even amid war-time pressure to produce pilots quickly, efforts to incorporate advanced aircraft into training earlier were canceled because rushed training made worse pilots.¹⁰ The Army continued using FW trainers into the 1960s. It was only after the 1968 Johnson-McConnell Agreement gave all FW aircraft to the Air Force, while giving the Army free reign over helicopters, that we adopted helicopter-only training.¹¹

We tend to think of military strength in terms of wonder weapons that are in reality mechanistic solutions ... Growing operating costs have overwhelmed the savings accrued from the significant long-term reductions in personnel and force structure.

- Chuck Spinney,
Defense Analyst

Benefits of Simple Trainers

The rationale for starting flight training in simple FW aircraft has little to do with the composition of aircraft fleets and everything to do with the quality of training. There are three benefits. First, putting prospective aviators into simpler aircraft allows instructors to determine flaws in airmanship—or suitability for further training—much earlier and much cheaper. Second, this methodology greatly reduces the opportunity cost of future flight training, particularly if a candidate does not meet criteria early. Third, learning the basics thoroughly, without the complication or distraction of advanced avionics and multiple engines, reduces stress when junior aviators transition to complex aircraft. In other words, pilots who are well-trained in basic aircraft perform better when upgrading.¹²

Cost is the most obvious benefit when comparing FW trainers to helicopters. FW trainers measure hourly rates in hundreds, not thousands of dollars. Unit cost is also substantially lower. Fixed-wing trainer avionics are comparable to modern aircraft; in fact, the Cirrus SR-22 and Cessna C172S often have digital displays, coupled autopilots, and are fully IFR.

However, simple aircraft have other advantages. Their systems and airframes are rugged. Complexity results in down time, no matter how well aircraft are maintained. In a training environment with multiple iterations of students every day, every aircraft is critical.

Training aircraft are forgiving to the new student, shallowing the learning curve. Students trained in stalls and slow flight in FW aircraft will understand the

aerodynamic processes inherent in RW flight in ways that helicopter-only students will not. Trainers teach the basics well because they are designed to do so. It is axiomatic that aircraft designed for specific purposes are better suited to that task than multi-role aircraft.¹³

Given the importance of training and the amount of money spent on it, the aircraft used should be well suited. As the best means of training pilots is actual flight hours, we must aim to give trainees the maximum amount. FW trainers accomplish this goal.

The only thing resembling a certainty about future military contingencies is that we are likely to face threats we do not now foresee ... the common-sense approach [is to] develop forces and strategies that give us the greatest possible capacity to adapt to whatever the future brings.

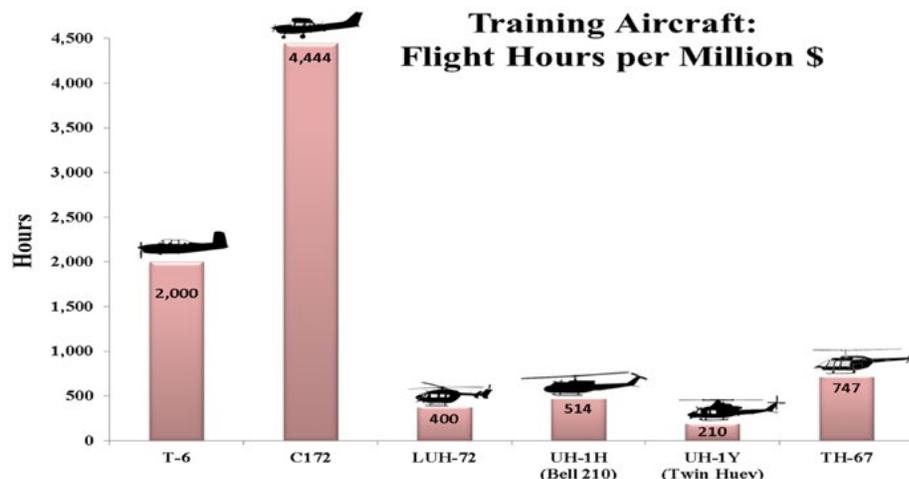
-James Fallows,

national correspondent for The Atlantic Monthly

Training at Ft. Rucker

From 2005-2007, USAACE adopted a new flight training regime. Flight School 21 increased cost between \$60k and \$200k per aviator but gave each graduate significantly more time in their primary aircraft.¹⁴ The intent of FSXXI is to produce Readiness Level (RL) 2 equivalent aviators, by having Fort Rucker, rather than operational units, bear additional training expense. Qualitatively, FSXXI meets this goal.¹⁵

Now Fort Rucker has adopted the LUH as its training platform; a move that gives junior aviators a taste of the multiengine, advanced airframes they will eventually fly. Of course, training in more advanced (more





The LUH-72 is a capable aircraft, but at \$5 million each and costs over and \$2,500 per hour, it is a better option for advanced, not primary, training.¹⁶

expensive) aircraft comes with limitations. Most noticeably for helicopter pilots is the lack of touchdown autorotations in the LUH.¹⁷ The LUH also comes with financial cost; no other service or civilian program teaches students to hover at \$3,000 per hour. Additionally, Army students will now miss perhaps the most important element of flight training: the student solo. Given the cost of the LUH and the limited helicopter experience of students, not allowing solos arguably makes sense. However, solos are critical for instilling pilot responsibility, confidence, and proficiency. Taking away the instructor in a structured environment not only helps students realize their own skills and potential, it helps them strive for the next level of aviator proficiency. The intrinsic value of solo flight is acknowledged in civilian flight training, where pre-check ride private pilots must have at least 10 solo flight hours.¹⁸ Giving junior aviators the keys to a safe, reliable, and cheap trainer is an easy way to incorporate solos into Army flight training.

Various civilian aircraft are used throughout the world as primary trainers. Aircraft like the Cessna 172, Cirrus SR-22, and others are simple, reliable, and inexpensive. The LUH-72, on the other hand, is primarily a



Figure 7 & 8. The Cessna 172 is a simple, reliable, American-made primary trainer that utilizes a glass cockpit for a fraction of the cost of helicopters.¹⁹



utility helicopter, not a trainer.²⁰ This creates several problems. The aircraft is overpriced and overly complicated for initial flight training. Two engines, advanced avionics, and intricate flight control systems intimidate a first-time user, even with experience in a simulator. However, the LUH is still a good choice for **primary RW** training because it is relatively cheap (for a helicopter) and its avionics and aircraft systems **make it a logical intermediary** between a simple, FW trainer and the AH-64D/E, UH-60M, or CH-47F.

Focus on the Basics

Technology has a place in training, but we should be careful of its limitations. A case study from the Gulf War illustrates the fiction of overwhelming technology making all the difference. Using data from engagements between VII Corps and the Republican Guard, Stephen Biddle showed that the causative factor in most engagements was the individual and collective skill of American units.²¹ In short, training, not FLIR, GPS, or communication technology, carried the day; technology only served to exacerbate the difference of competence and collective proficiency between American and Iraqi units.

Our fascination with technology often results in “expensive and delicate high-tech white elephants” that only perform better in tests unrepresentative of combat environments.²² For a contemporary example, we only need to look at the F-35’s development. Unlike this multi-role monster, simple trainers like the Cessna 172 and others are “pure expressions of function, designed to perform a limited set of tasks very well.”²³

Technology can aid training, but it is no substitute for the complex neurological functions required to simply observe and control an aircraft’s attitude. Students may benefit from including multiple engines and advanced avionics. However, during the initial stages of flight training, students should concentrate on the fundamentals of flight such as how altitude, weight, and airspeed relate to performance, and, critically, the relationship between attitude and power. They must also learn cross-country navigation through both digital and analog methods. Lastly, letting students make navigational decisions

in an aircraft without full-color moving maps will help them operate in a dynamic environment, where information is often unclear or conflicting.

The best platform to do this is a simple FW aircraft. The principles of control and airmanship apply to helicopters as well as FW aircraft. Teaching airmanship, as opposed to aircraft specific procedures and methods, develops competent aviators. This approach will pay dividends when more well-rounded pilots enter advanced aircraft. Having learned to fly airplanes after helicopters and then teaching other Army Aviators the same, I can confidently say that learning airplanes makes for better helicopter pilots. Airmanship skills, if properly understood, are transferable. The Federal Aviation Administration acknowledges this with greatly reduced flight time requirement for aviators adding ratings to existing licenses.²⁴

Focusing on the basics under simpler, less demanding conditions would allow for more focus on model-specific characteristics when aviators move to their advanced aircraft. With a better understanding of the basics of flight and operations, aviators could advance more quickly, potentially allowing instructors to include more scenario based training (SBT).²⁵ Using SBT is a proven technique for instruction used in civilian and commercial instruction; more importantly, incorporating SBT would facilitate the FSXXI goal of producing RL-2 equivalent aviators.

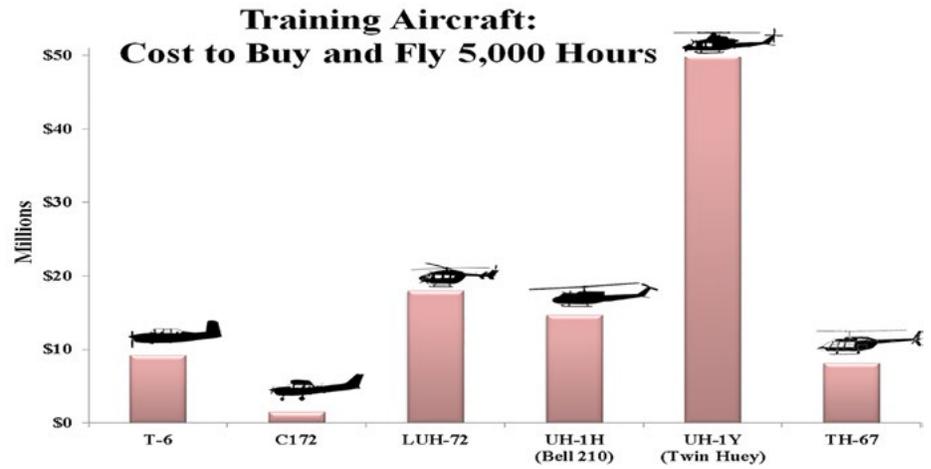
Moreover, this approach would aid the long-term goal of FSXXI by creating aviators better prepared for training at operational units, not only for RL progression but to act as pilots in command as well. Since the Army does not create pilots in command during training, as the other services do, we would be wise to utilize student solos during primary training as a means to teach planning, responsibility, and decision-making. Instilling these tenets early will help both immediately during initial training at Fort Rucker and when new aviators arrive at their units.

Though giving Aviators more time in their principal aircraft was a goal of FSXXI, we should consider their capability when undergoing this advanced training.²⁶ An



Aviator who is not ready for the major step from simple aircraft will waste aircraft and instructor time in a UH-60M or AH-64D/E to the tune of thousands of dollars per hour. We should seek to maximize the *not just the number of hours* aviator spend in advanced training but the *quality of those hours* as well.

Aviation can no longer rely on deployments to produce competent pilots in command. Though the tempo for aviation units is still high, opportunities for junior aviators to gain 500 hours in a summer are likely gone for the foreseeable future. Consequently, Fort Rucker must strive to produce the best pilots it can. Training prepares military aviators to fly and fight; it also initiates them into a warrior culture. Training should be an all-pervasive phenomenon, a constant



that occurs during war and peace.²⁷ If we understand this premise, it follows that the basics are crucial. The initial hours spent in an aircraft teach the “the foundation upon

which future flight training can build.”²⁸ Making the best use of these hours—at the right price—will improve a generation of Army Aviators.



Note on methodology: Aircraft costs are notoriously difficult to pinpoint. This article utilized the FY16 DoD Fixed Wing and Helicopter Reimbursement Rates for hourly costs. The Cessna 172 rate was derived from an average of rental rates plus 50%. Aircraft unit costs are from the average of FY 10-16 DoD budget requests, civilian websites, or historical data. All costs are displayed in 2016 dollars, adjusted by the CPI. DoD Sources: <http://comptroller.defense.gov>.

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- ⁸ Rebecca Hancock Cameron, *Training to Fly: Military Flight Training 1907-1945* (Washington: GPO, 1999), 313-360
- ⁹ *Ibid.*, 408.
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- ¹¹ Robert Futrell, *Ideas, Concepts, and Doctrine: Basic Thinking in the United States Air Force 1907-1964* (Maxwell AFB, AL: Air University, 1974).
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Acronym Reference	
DoD - Department of Defense	RL - readiness level
FSXXI - Flight School 21	RW - rotary-wing
FW - fixed-wing	SBT - scenario based training
IFS - Introductory Flight Screening	USAACE - United States Army Aviation Center of Excellence