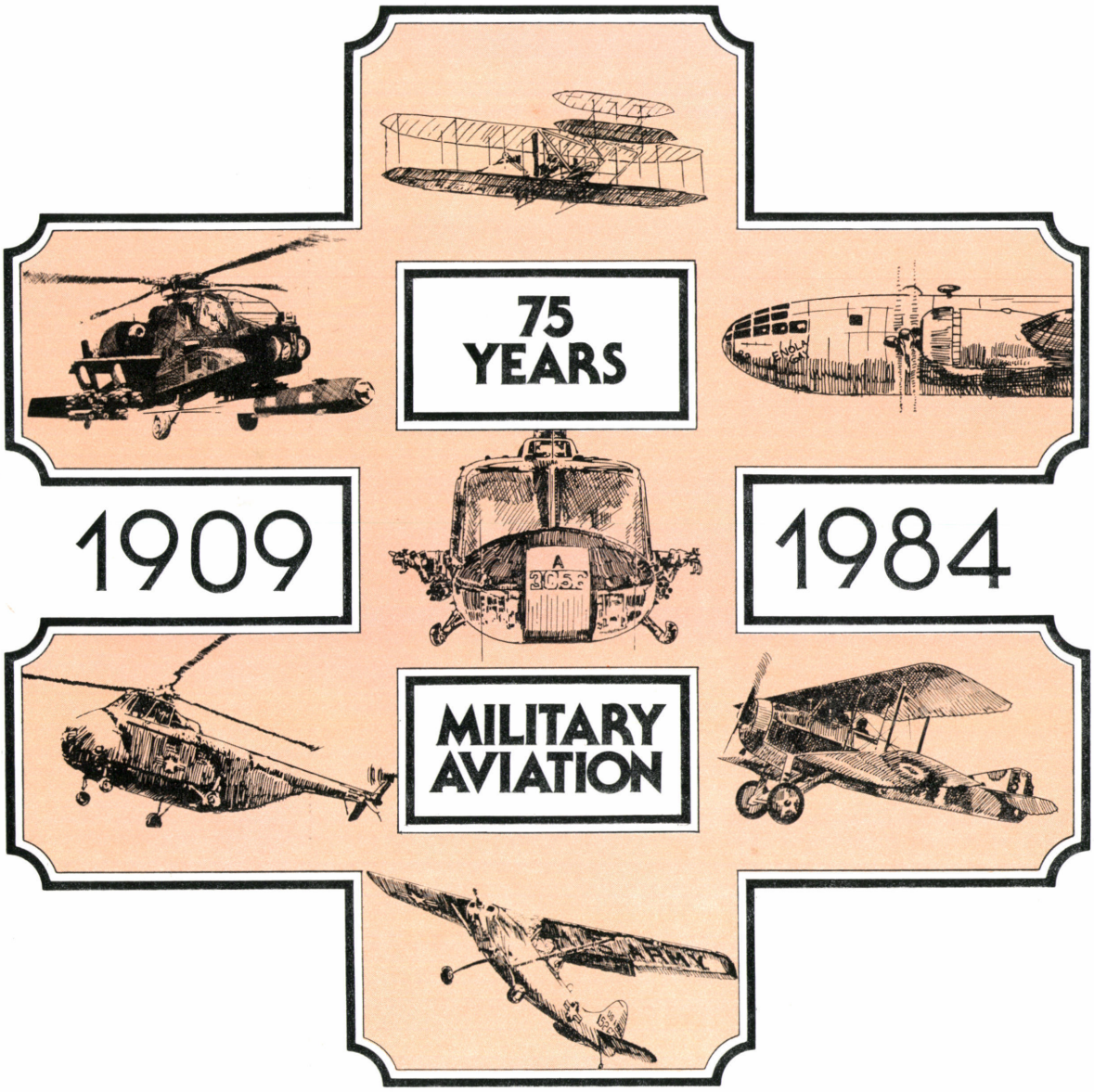
USAARL
SCI SUPPORT CENTER
P.O. BOX 620577
FORT RUCKER, AL 36362-0577

UNITED STATES ARMY
AVIATION DIGEST
JUNE 1984



75 YEARS OF U.S. MILITARY AVIATION

JUNE 1984 • VOLUME 30 • NUMBER 6

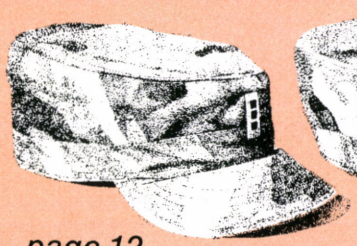
★
Brigadier General Wayne C. Knudson
Army Aviation Officer
ODCSOPS, Headquarters,
Department of the Army

★★
Major General Bobby J. Maddox
Commander
U.S. Army Aviation Center
Fort Rucker, Alabama

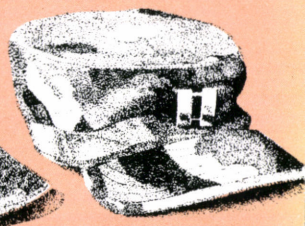
Colonel Andrew J. Miller
Assistant Commandant
U.S. Army Aviation Center
Fort Rucker, Alabama

2 **From Wood and Linen Kites to Metal Monsters,** CW4 Michael J. Novosel
11 **DES Report to the Field: Vmc: You Can't Live With It; So Why Die With It?**
12 **Aviation Warrant Officer Advanced Course,** CW2 Robert A. Johnson
14 **Aviation Officer Advanced Course,** CPT Joseph E. Faubion
16 **Summer Training Exercises**
20 **PEARL'S**
22 **Flying With the U.S. Navy,** LTC Christopher D. Calhoon
26 **Emergency Procedures,** CW2 (P) James Helton
27 **HOTLINE**
28 **Aviation Personnel Notes: The Aviation Branch—What Took Place in MILPERCEN; Career Management Field 67 Reclassification Update,** MAJ Thomas F. Stewart
30 **Threat: Soviet Combat Helicopters Today,** Mr. Edward J. Bavaro
35 **Oil Analysis Video Training Tapes Available**
36 **Views From Readers**
38 **1984 Annual Writ,** Mr. Curtis Frazier
40 **Brigade Airspace Management, Part II: AirLand Battle,** MAJ William E. Coleman
44 **Hangar Talk: FM 1-203, "Fundamentals of Flight,"** CW3 Gary R. Weiland
Inside Back Cover: **ATC Action Line: New Flight Plans**
Back Cover: **Aviation Doctrine and Training Literature**

Cover: **The cover characterizes some of the more famous aircraft of the past 75 years of military Aviation. CW4 Michael Novosel writes about these years in his lead article "From Wood and Linen Kites to Metal Monsters," page 2.**

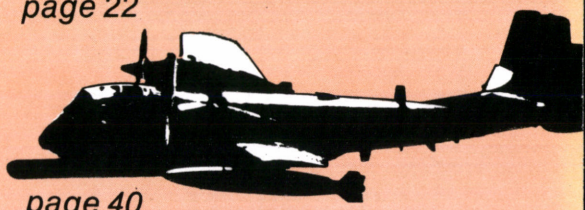


page 12



page 14

page 22



page 40

Richard K. Tierney
Editor

Honorable John O. Marsh J
Secretary of the Army

The mission of the *U.S. Army Aviation Digest* (USPS 415-350) is to provide information of an operational, functional nature concerning safety and aircraft accident prevention, training, maintenance, operations, research and development, aviation medicine and other related data.

The *Digest* is an official Department of the Army periodical published monthly under the supervision of the Commanding General, U.S. Army Aviation Center. Views expressed herein are not necessarily those of the Department of the Army nor the U.S. Army Aviation Center. Photos are U.S. Army unless otherwise specified. Use of the masculine pronoun is intended to include both genders unless otherwise stated. Material may be reprinted provided credit is given to the *Digest* and to the author unless otherwise indicated.

Articles, photos, and items of interest on Army Aviation are invited. Direct communication is authorized to Editor, *U.S. Army Aviation Digest,* P.O. Drawer P, Fort Rucker, AL 36362. Manuscripts returned upon request.

This publication has been approved by the Secretary of the Army, 6, January 1984, in accordance with Army Regulation 310-1. Second-class postage paid at Daleville, AL, and additional mailing offices.

Active Army units receive distribution under the pinpoint distribution system as outlined in AR 310-1. Complete DA Form 12-5 and send directly to CDR, AG Publications Center, 2800 Eastern Boulevard, Baltimore, MD 21220. For any change in distribution requirements, initiate revised DA Form 12-5.

National Guard and Army Reserve units under pinpoint distribution also should submit DA Form 12-5. Other National Guard units should submit requests through their state adjutant general.

Those not eligible for official distribution or who desire personal copies of the *Digest* can order the magazine from the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402.

Annual subscriptions rates are $26.00 domestic and $32.50 overseas. POSTMASTER: Send address changes to Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402.

On this 42d anniversary of Army Aviation and the 1st of the Aviation Branch, we're fortunate to have CW4 Michael Novosel, holder of the Medal of Honor who celebrates 42 years' service, as the author of our lead article, "From Wood and Linen Kites to Metal Monsters."

Mr. Novosel writes from his study of Aviation history and personal observation and analysis. Beginning with the first powered flight in 1903, the author highlights the later years of World Wars I and II and describes his flight training program of 1942, as well as the aircraft then in the combat inventory. He describes the Korean War as an Air Force pilot and the Vietnam War as an Army aviator, when during two tours he flew as a "Dustoff Pilot."

The "Des Report to the Field" is directed to fixed wing aviators; "Vmc: You Can't Live With It; So Why Die With It" describes velocity of minimum control, what to expect and how to avoid it. This article is truly worth reading, if only to have you be again aware of Vmc and its close relationship to stall speed.

One of the Aviation Branch stories this month describes the "Aviation Warrant Officer Advanced Course." CW2 Robert Johnson tells of the 15½ week instruction that "polishes" the skills and knowledge required for Aviation warrant officers to excel as leaders: This includes the role of Aviation in the missions and functions of the Army; Aviation staff functions and procedures; and, Combined Arms Team operations/tactical and technical skills.

The "Aviation Officer Advanced Course," by Captain Joseph Faubion, tells of this newly developed Aviation training in combat arms and branch specific operations. The instruction prepares Aviation commissioned officers for company level Aviation command as well as battalion, brigade and division level staff assignments.

The Army Safety Center alerts aviators to the hazards of "Summer Training Exercises," cautioning that we review standing operating procedures, do preexercise planning related to the unfamiliar environment and taxing conditions of field training. For example, the desert terrain at Ft. Irwin, CA, differs from that at Ft. Bliss, TX, in that at Ft. Irwin the terrain slopes gently upward toward the mountains; at night, with no visual cues nor ground lights, flying is difficult, even hazardous for the unaware.

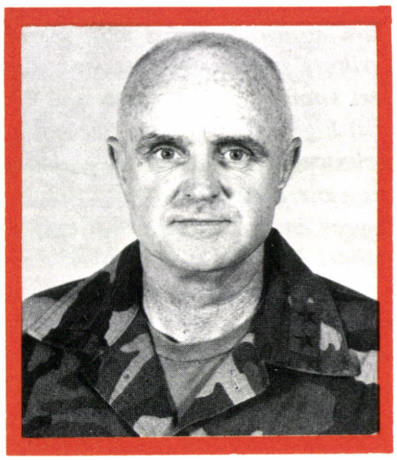
Lieutenant Colonel Christopher Calhoon reports on a unique assignment for Army aviators; "Flying With The U.S. Navy"—serving as members of a Navy tactical control squadron, they write, coordinate and monitor daily air operations for the amphibious task force.

"Emergency Procedures" by CW2 (P) James Helton reminds us through this true experience with an initial entry student that all of us will fare better the more we know of symptoms of system failures, emergencies and what we may expect.

"Soviet Combat Helicopters Today," the Threat article by Mr. Ed Bavaro, tells of the increased emphasis on use of helicopters. The Soviets prefer helicopters for immediate, time-sensitive strikes close to friendly forces. Covert maneuver for strikes and "helicopter pilots have an enhanced capability to move rapidly and correctly evaluate battlefield conditions" since they operate in a more ground oriented environment—that is why they have restructured some divisions and formed independent attack helicopter regiments.

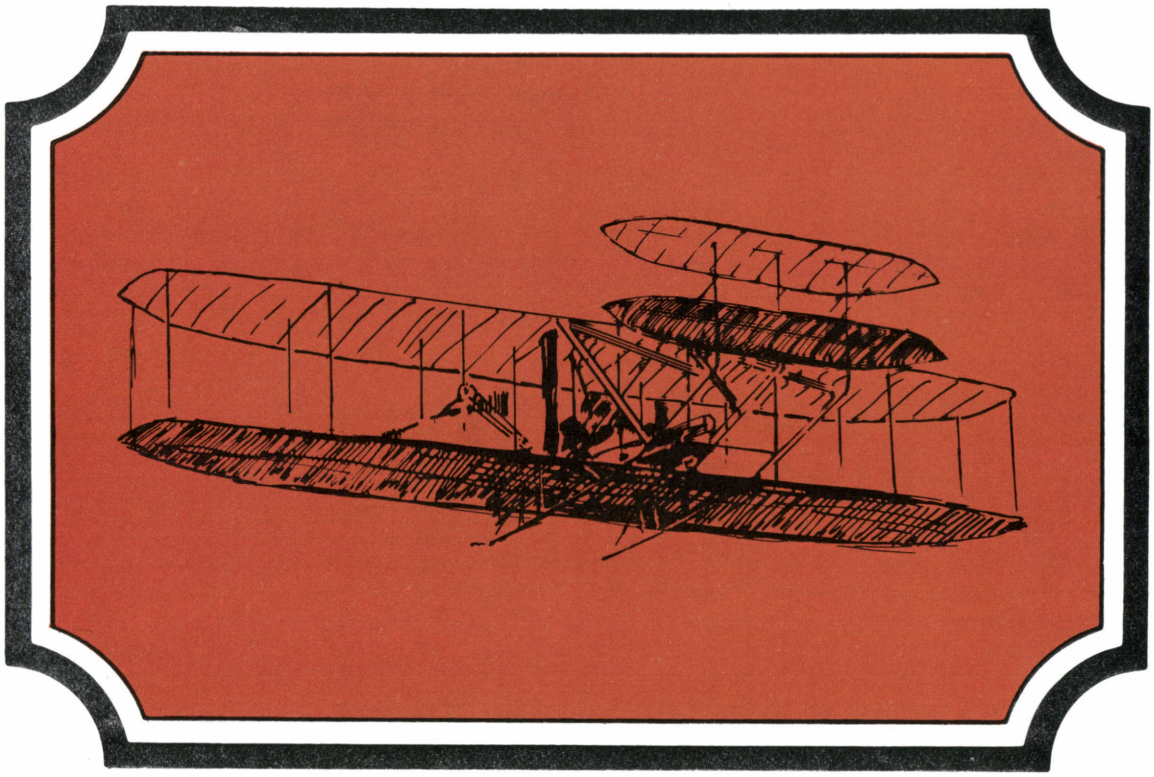
Part II of "Brigade Airspace Management" by Major William Coleman discusses the AirLand Battle and coordination among the combined arms that begins on receiving a mission and continues throughout the operation. The Aviation unit commander or S3 will go to the brigade tactical operations center to coordinate the employment of Aviation assets. Through command control and communication, effective information is combined into an effective airspace management plan in order to maximize combat power.

The foregoing and other articles in this issue once again provide a variety of subjects certain to interest us in the Aviation Branch, because they all apply to Army Aviation—historically, at present and in the future.



Major General Bobby J. Maddox
Commander, U. S. Army Aviation Center
Fort Rucker, AL

MONTHLY WRITING AWARD



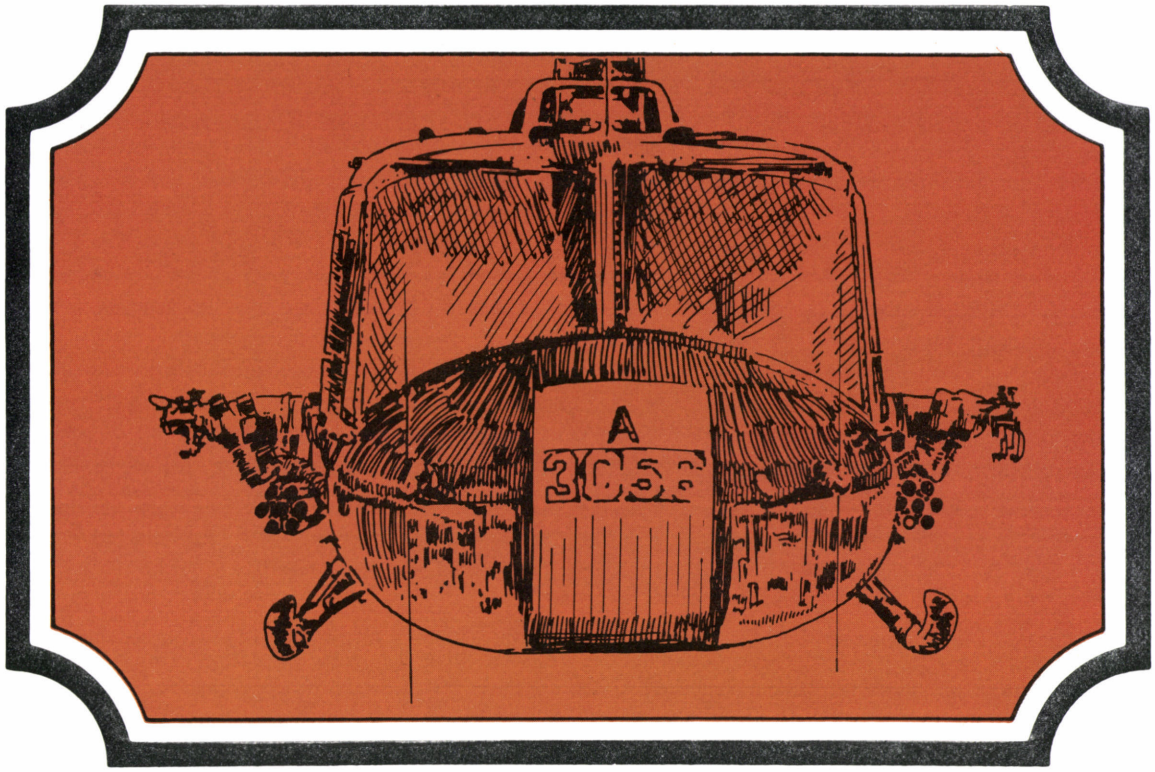
From Wood and Linen Kites

The following article keeps with the magazine's tradition of an annual tribute to military Aviation history. The style of the article differs somewhat from previous historical tributes in that portions of it highlight personal accounts of Army Aviation training, technical and tactical developments. These personal accounts are generated from the author's vivid memory of his brilliant 42-year career as an Army and Air Force aviator.

CW4 Michael Novosel is the oldest active duty member of the Army to receive the Medal of Honor for his Vietnam actions. He was on duty when the Japanese bombed Pearl Harbor and in Vietnam as a "Dustoff" pilot, he extracted more than 5,500 soldiers and Vietnam civilians. Mr. Novosel is now assigned to the Army Aviation Center, Ft. Rucker, AL, as the senior TAC (training, advising and counseling) officer for the 6th Battalion.

What better way to illustrate Army Aviation history than through the experiences of such a dedicated and courageous Army aviator as CW4 Michael Novosel!

CW4 Michael J. Novosel



to Metal Monsters

CW4 Michael J. Novosel

HISTORY HAS always been a fascinating and interesting subject for me. The philosopher Hegel stated, "The only lesson which history teaches is that history teaches no lessons." Another philosopher, Santayana remarked, "Those who have not studied history are doomed to relive it." A cursory reading of the statements arouses a degree of ambivalence, but close analysis indicates that they offer sound advice in applying historical precedent when seeking solutions to present day problems. That is to say that although history cannot be ignored, it must not be the sole determinator of cause and effect when applied to current situations.

Most aviators look upon aviation history with some degree of fascination. However, nothing holds more allure for me, a career military aviator, than the history of military aviation. My purpose in writing this article is to inform and to stimulate readers to seek out additional historical information about their proud heritage.

Military aviators are special people; endowed by their Creator with unique mental and physical attributes that set them a cut above ordinary mortals, and they know it! They all have that something extra that enables them to absorb the most intensive and demanding course of instruction conceived by man. Some are better than others, some more daring than others, but they all have the skill and determination to get the job done, no matter what that job might be! There is a common bond that ties all military aviators into one community. No matter what the service, they are attracted to one another, appreciate each others' strengths and weaknesses, tell tall tales and jokes about one another, but they will firewall the

throttle to help the other out when one of them is in jeopardy. They share similar dangers brought on by the man/machine interface and enemy action. They could never let one another down.

This article goes back to the Wright brothers' Flying Machine, and the beginning of military heavier-than-air flight. It is based on studies of aviation history and personal observations and analysis. My involvement with military aviation spans 42 years as a military aviator: A period in which I participated in three wars and a few engagements with enemy forces. I was on duty when the Japanese attacked Pearl Harbor, 7 December 1941; I was flying with the Army Air Forces on 6 June 1942, the birthday of Army Aviation; I saw the U.S. Air Force become a separate service on 17 September 1947 (the birthday of the Air Force); and still fly as an Army aviator, a member of the newest branch of the combat arms team. I have included occasional personal anecdotes and observations as I witnessed them. With Army Aviation claiming 6 June 1942 and the Air Force claiming 17 September 1947 as birthdays, it appears that neither is making its rightful claim to that long and colorful period that goes back to the time of the Wright brothers. From my perspective I can accept 1942 and 1947 as birthdates of Army Aviation and the Air Force as they exist today. However, I submit that both share a common legacy and a genesis which started with nothing more than a powered glider.

The Beginning

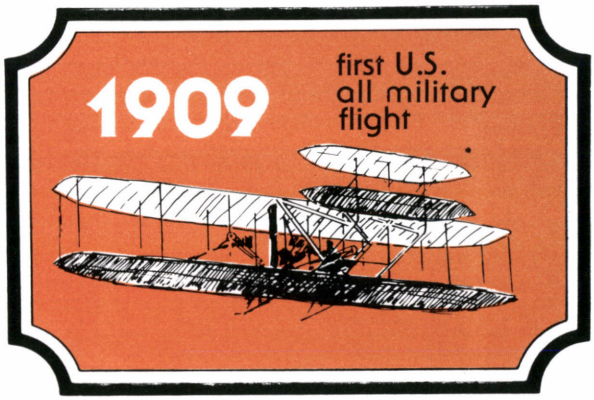
History's first flight by a heavier-than-air machine occurred on 17 December 1903 with Orville Wright at the controls. The flight lasted 12 seconds and covered 120 feet. Orville and his brother Wilbur took turns and made four flights that day; the longest by Wilbur lasting 59 seconds and covering 852 feet. This historic event was the culmination of years of scientific experimentation with gliders and the Wright's development of an efficient internal combustion engine. Army officers of rare foresight investigated the military potential of this radically new medium, and the result was the creation of the Aeronautical Division of the U.S. Army Signal Corps on 1 August 1907. The Signal Corps called for bids on a military airplane in December 1907. The Wright brothers, the only successful bidders, delivered their machine to the Army in 1909. After a series of tests at Ft. Myer, VA (Orville was the test pilot), the Army accepted U.S. Army Aeroplane No. 1 on 2 August 1909.

The contract with the Wrights called for them to train Lieutenant Frederick E. Humphreys and Lieutenant Frank P. Lahm to fly. College Park, MD, was selected as the training site and flight instruction of the "first class" began on 8 October 1909. Both students soloed on 26 October; Humphreys soloed first and thus became the first Army aviator.

Not long after completing their flight training, LT Lahm and LT Humphreys were ordered back to duty with their respective branches after 4 years of detached service with the Signal Corps. This left Lieutenant Benjamine Foulois as the only military pilot. His experience totaled 54 minutes of in-flight instruction with Wilbur and about 2 hours flying as a passenger with Humphreys. Foulois was ordered to take the plane to Ft. Sam Houston, TX, which he did in November 1909. According to the history of Ft. Sam he later flew Army Aeroplane No. 1 for 7 minutes. The history goes on to claim that this was the first flight by a military aviator in a military airplane, and apparently omitted the phrase, "at Ft. Sam Houston, TX."

Whether LT Humphreys or LT Foulois was the first military aviator to fly a military aircraft does not appear to be as significant as the fact that 1909 was the year of the first all military flight. Although the Signal Corps established an Aeronautical Division in 1907 for the "Study of the flying machine and the possibility of adapting it to military purpose," it seems proper to state that 1909 witnessed the birth of modern military aviation. The history of military aviation spans 75 years: 1909 to 1984—*a Diamond Jubilee!* It all started with "kites" made of wood and linen, and has evolved into today's sophisticated metal monsters.

Army Aeroplane No. 1



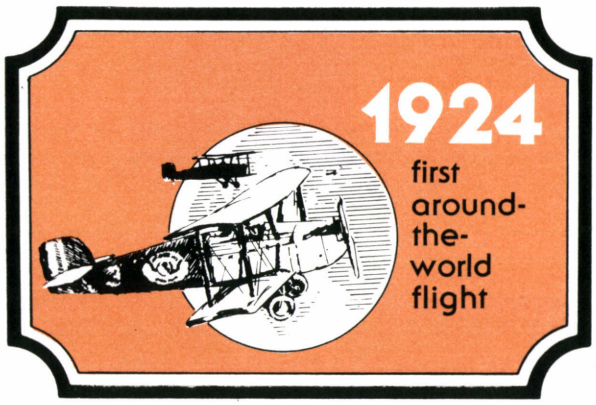
SPAD XIII

World War I

Although military aviation was first introduced in the United States, its development was aggressively pursued elsewhere. When the United States entered the World War (it was later given a number) it had no effective air arm or aircraft industry in being. The Army did an admirable job of producing the pilots for the AEF (American Expeditionary Force) and a fledgling aircraft industry was able to design and produce thousands of aircraft by the end of the hostilities. However, American airmen had to fly foreign built craft in combat because American designs were outperformed by Allied and enemy equipment. American Army pilots produced a super record in action against the enemy, and several were designated "Aces." Four Army pilots were awarded the Medal of Honor; of these, three were awarded posthumously.

After the armistice of 11 November 1918 the Air Service was drastically reduced, and advances in equipment, strategy and tactics were inordinately slower in development than the state of the art and the accomplishments of that period could realistically have justified. An example of the attitudes of the time is best illustrated by a question posed by President Calvin Coolidge while reviewing his military budgets. Noting an appropriation for the purchase of several planes for proficiency flying, he inquired if the Army could not buy *one* airplane and let the pilots take turns flying it? The 20s and 30s did however see some flashes of brilliance in the development of air power. It was an era of pioneering, record setting, barnstorming and advances in aviation more often the result of individual effort than of planned Government action. Army aviators were credited with many firsts and numerous records. For example, there was the first flight across the United States in less than 24 hours (1922, Doolittle); and the first round the world flight (1924, by four Douglas World Cruisers). Altitude records were established as the Army experimented with oxygen systems, turbo-superchargers and pressurized aircraft; there was the first flight from takeoff, cruise and landing entirely by instruments (1929, Doolittle); and many speed records.

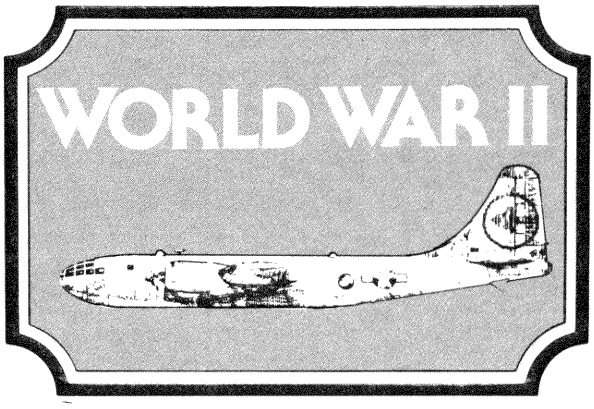
Douglas World Cruisers



To the Government's credit, series of light lines were established in the 20s which traversed the continental United States. The purpose of the light lines was to enhance safety and reliability of navigation during night operations. Of course, their use required visual meteorological flight conditions. Radio navigation was made possible with the development of the low frequency radio range in the late 20s. By the end of the 30s the federal airways system was in place. It was based entirely on the radio range; generally followed the routes of the light lines which were still in operation; and made scheduled airline operations a reality. The system served the United States well and remained in use throughout the 40s. (See "Blind Flying," June 1979, *Aviation Digest*.)

World War II

Nazi Germany invaded Poland on 1 September 1939; Great Britain and France declared war on Germany on 3 September, and the world became engulfed in World War II. The decade of the 40s was to change the world like no other comparable period in history. Technological advances would take a quatum leap, economic alignments would be in disarray and geopolitical balances undreamed of in earlier years would emerge. The Army Air Corps was tasked to organize and build a modern air arm from the meager



B-29 Superfortress

base in existence at the turn of the decade. A formidable task to be sure, but its ultimate accomplishment was assured by the vision and dedication of "A Few Great Captains."

The United States was not yet at war and the future held no guarantees; but I decided to join the Army Air Corps and took the oath of enlistment on 7 February 1941. I applied for Aviation Cadet training that summer and received notification of acceptance into the flight program in October. I was getting impatient about my status when the Japanese attacked Pearl Harbor—I soon found myself in flight school. A look back to 1942 training reveals some interesting data. My records indicate that I received a total of 215:00 hours training as an Aviation Cadet; 77:30 dual (including 9:30 pre-solo) and 137:30 solo. The flight training was divided into three phases as follows:

PHASE	AIRCRAFT	DUAL	SOLO
Primary	PT-19	37:00	23:00
Basic	BT-13	27:00	44:00
Advanced	AT-6	13:30	70:30
TOTALS		77:30	137:30

It is evident from the flying hour breakdown that after initial solo flight, I flew 2 hours solo for every hour of dual instruction. This represents a marked departure from the Army's present flight training philosophy. Some aviation related disciplines will never change, but there were a number of differences as indicated by the areas of instruction and the emphasis placed on each while undergoing training in the various phases:

Primary Training concentrated on all aspects of aircraft control, navigation by pilotage and dead reckoning, and acrobatics.

Basic Training continued and polished all that was learned in Primary, plus radio communication procedures (including Morse code), instrument flight procedures, radio navigation, night flying and formation flying.

Advanced Training fine tuned all the skills learned in Primary and Basic with emphasis on formation flying and acrobatics; plus fighter tactics and many hours of fixed wing gunnery practice.

The United States entry into World War II was late (the war was into its third year) and to a great extent unexpected. Despite the feverish build-up of our armed forces, the nation was not yet prepared for modern combat, and losses in the early stages were considerable. Our Allies were in retreat on all fronts and the enemy appeared unstoppable. It would be, and it was, a hard, drawn-out war with national survival at stake.

Military aviation was as unprepared as the rest of the military establishment. The Army Air Corps inventory of first line combat craft was shockingly low. Our pursuit planes were slow, underarmed, often aerodynamically unstable and lacked maneuverability for combat. These were the P-35, P-36, P-39, P-40 and P-43. We were still flying the B-10 and B-18 bombers, which were slow, short-ranged, carried a small bomb load and had no effective defensive armament. We had an insufficient number of the new B-25s, while our heavy bomber was the early model B-17. This model was equipped with only one gun turret; the rest of the defensive armament was hand held and hand operated, some of which was ineffective 30 caliber.

When I was graduated from flight school in 1942, all of these aircraft types were still in our inventory of combat aircraft. Newer aircraft had been introduced, but were not yet in quantity production and onhand for large scale sustained offensive operations. The pressures of war provided the stimulus for rapid advancements in aviation technology and upgrading of equipment. The prewar pursuit planes were eventually replaced by the P-38, P-47, P-51, and toward the end of the war, the P-61 and P-63. Bomber development and production concentrated on improved versions of the B-17 and B-25, plus the B-24, B-26 and finally the B-29. The latter was the most advanced bomber in the world at the time, and possessed such features as remote controlled turrets with computing gun sights, pressurized crew compartments, a range exceeding 3,000 nautical miles and a maximum bomb load of 10 tons. It was my great pleasure and

honor to have flown the B-29 in combat, and to have been one of the 462 aircraft commanders in the covering force while General of the Army Douglas MacArthur, as Supreme Allied Commander, was orchestrating the Japanese surrender on the battleship *Missouri,* 2 September 1945.

The demands of the rapid build-up during World War II, and the strategic mission as perceived by the Army Air Corps, later the Army Air Forces, produced a situation in which the ground commander's tactical requirement for direct aviation support could not be effectively fulfilled with the resources remaining. This tactical deficiency was in need of correction, and was, when the War Department approved organic aviation for U.S. Army Field Artillery units on 6 June 1942, the official birthday of Army Aviation. This was made possible through the efforts of dedicated individuals who believed in and fought for direct front line aviation support for the ground commander. The foresight and dedication of individuals like Major General Robert M. Danford, Captain Joseph McCord Watson and Major William W. Ford had paid off.

The L-4s and L-5s of World War II provided transportation about the battlefield, performed general and road reconnaissance, helped in the selection of bivouac areas, delivered messages, located enemy batteries and evacuated wounded in addition to adjusting artillery fire. These liaison aircraft flew off: aircraft carriers; improvised flight decks on LSTs (Landing Ship Tank); stretched steel cable Brodie Devices; rutted, winding dirt roads; and every imaginable clear area to include a race track and a school courtyard.

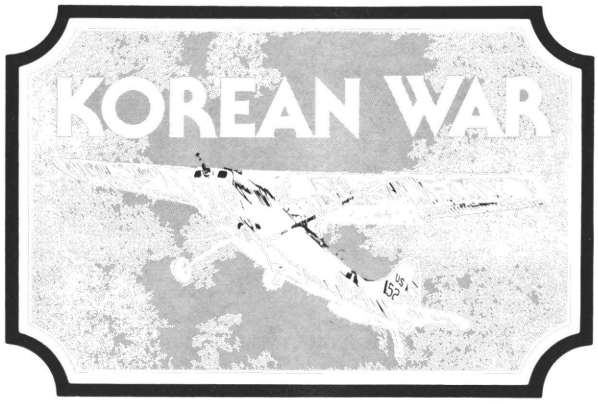
The end of World War II brought forth a completely changed world. Aside from the geopolitical transformation, there was a significant alteration of military power. The major world powers were reduced to two, each suspicious of the other, their armed forces the greatest in the world. The power of the atom had been unleashed, but its secret and its monoploy was not to last long. Air power emerged as the dominant force, and not solely because of the atom. The Army Air Forces became the United States Air Force and concentrated on its strategic mission. As for sea power, the day of the battleship and dreams of "crossing the T" had vanished. The aircraft carrier became the new "Capital Ship" of the Navy. The Army retained its organic aviation, and showed interest in its expansion. The new helicopter showed promise in this direction and its use in direct support of ground combat forces was readily accepted.

OH-13 Sioux

Korean War

The Korean War was an inevitable consequence of the tensions between the United States and the Communist powers as they maneuvered for advantage against each other throughout the world. North Korean forces surprised the unprepared South Koreans with a massive invasion force in the summer of 1950. The United States intervened on the side of the South, and the Korean War was on. With Army Aviation's involvement in the war, the proven World War II concept of direct aviation support for the ground commander was further developed and its horizons broadened. New aircraft such as the L-19 Bird Dog and the H-13 Sioux and H-19 Chickasaw helicopters were introduced. These aircraft further expanded the conceptual limits of airmobility and aeromedical evacuation of casualties. Troop lifts and forward air supply by helicopters were introduced and the procedures refined. Aeromedical evacuation of casualties by helicopter became routine, and air ambulances of the Army Medical Service Corps evacuated more than 21,000 casualties by the end of hostilities, while the other aviation elements evacuated many more.

My recollections of the Korean War are based on the Air Force point of view, as I was recalled to active duty with the Air Force. Because the Korean War was fought for limited objectives, the Air Force was pressed into a tactical application of its power, rather than a full exploitation of its vast strategic potential. The sizable inventory of its weapons systems was only partially put to use. The tactics used were generally an extension of those of World War II. Jet aircraft had made their belated debut in the waning days of that conflict, but had no great impact on the outcome. During the short interval between World War II and the Korean War, the major contenders had made



L-19 (0-1) Bird Dog

significant technological advances in jet aircraft designs and produced fighting machines of similar capabilities. Thus, the Korean air war became the first jet air war. The aircraft principally involved were the F-86 and the MiG-15. The superiority of U.S. designs, training and airmanship could not be denied, and the results were impressive and one sided. Furthermore, enemy air forces were almost completely denied operational freedom in our air space, while the interdiction campaign against enemy supply systems was a resounding success. The Air Force also conducted a heavy bombing campaign of targets in the Yalu River area. Some of these target complexes have at times been labeled as strategic objectives. However, as the aerial war developed and the ground war dragged on, these targets appeared to lose any strategic significance that they once might have enjoyed.

My contribution to the Korean War effort was a lackluster one. As stated earlier, I had been recalled to duty with the Air Force. Although qualified, with more than 1,000 hours as aircraft commander in the B-29, I did not get into combat. I did, however, graduate from the Air Command and Staff School at Maxwell AFB in 1953. I returned to civilian status shortly thereafter, and resumed my affiliation with the Air Force Reserve. My Reserve assignment was with the Air Proving Ground at Eglin AFB, FL. This position enabled me to stay abreast of the latest technological developments in aviation, and I must confess that the pace of progress appeared to me to be an ever accelerating one. I recall the many ventures into supersonic flight, the establishment of operational squadrons using supersonic aircraft and the introduction of jet aircraft to the airline industry. The skeptics declared that it was a sure road to bankruptcy; that such aircraft could never be profitable—they were too expensive, gobbled up excessive amounts of fuel and could not possibly attain the range of other types of aircraft. As usual, the skeptics were wrong; the growth of the airline industry was never so dramatic, and you and I can be thankful for that.

At about this same time, a technological leap forward by the Soviets shocked the world, and it made the United States sit up and take notice. Contrary to everything that the American public had been told and led to believe, the bald truth that emerged was that no country nor political system held a monopoly on science and technology. I refer to the launching of "SPUTNIK" in 1957—the ushering in of the Space Age; much to our dismay it was not an American initiative. NASA's early attempts at "catch-up" were almost as ridiculous as the antics of comedians in early silent movies. Just about every attempt at a space launch ended in failure; many right on the launching pad. However just as in the days when the cavalry would ride to the rescue at the last second, the U.S. Army came forth to save the day. Yes, America's first space satellite was launched by the U.S. Army after all other attempts had failed. Furthermore, NASA's first astronaut was lifted into space atop an Army rocket, the Redstone, a few years later.

These were also the years when innovative Army leaders were advocating and evaluating an expanding tactical role for Army Aviation. There were experimentations and demonstrations of helicopter armament systems by "Vanderpool's Fools," and the creation of the "Sky Cav" concept in the late 50s. The 11th Air Assault Division (Test) was organized in the early 60s. The Rogers Board and the Howze Board made recommendations and conducted tests that vastly improved airmobility and increased the combat effectiveness of our ground forces. Many of the new concepts, materiel and machines would become reality and undergo the test of battle in just a few years.

Vietnam

Meanwhile, trouble was brewing in Southeast Asia where the political and military situation in South Vietnam was deteriorating rapidly. American involvement in the troubled area was limited to an advisory capacity, but after the Tonkin Gulf Resolution that commitment underwent considerable expansion, to include combat elements. Army Aviation units were the first to arrive in South Vietnam. They participated in combat assaults as early as 1962. By 1964 the UH-1 Hueys

UH-1 Huey

were being used regularly as assault aircraft, gunships and as air ambulances.

It was at this time that I decided on a course of action that was to completely turn my life around. I decided that I had to be a part of that commitment, and more than 23 years after my enlistment as a recruit in the U.S. Army Air Corps, I returned to duty as an Army warrant officer aviator. Things happened fast after that; I was assigned to Special Forces at Ft. Bragg, NC; I reported for duty in civilian attire; I had not yet acquired an Army uniform. I learned that Special Forces personnel do not believe in wasting time; they quickly instructed me in what to buy and how to wear it. I received a local checkout in the CH-34 Choctaw and was sent to Columbia, SC, where I took part in the Air Assault experiment. I returned to Ft. Bragg, received a local checkout in the UH-1, was sent to Arabia for a short mission, and followed that up by participating in the intervention in the Dominican Republic. After flying for Special Forces for slightly better than a year, I found myself in Vietnam.

It is not possible to visualize the Vietnam War without a dominant theme that overshadows everything else. The scene that comes through vividly and clearly is one of Army helicopters appearing to be forever flying about. They were everywhere; day or night; rain or shine; good weather and bad; they were seen or heard every hour of the day. They hauled ash and trash; engaged in combat assaults; served as weapons platforms; scouted and flushed out enemy forces; transferred the wounded from forward medical aid facilities to rear area hospitals; and went into the thick of battle to evacuate the wounded to life-saving medical care. Army helicopters served as aerial artillery, and transported and repositioned whole gun crews, including the ammunition. They were used to retrieve downed aircraft, and hauled tons of materiel and supplies—even beer and frozen pizza. Army helicopters delivered the replacement to his unit; started him on his R&R; and brought him to his place of departure for the trip home—sometimes in a body bag.

Army aviators, whether rotary wing or fixed wing, were young; the majority of them fresh out of flight school. Most were lieutenants and WO1s and they were damn good at their trade. It was not in their character to say, "It can't be done," but rather, "Can do," or "Let's go, we'll give it a try." They hauled more tonnage in that long war than all the aircraft of all the other services put together. When it was discovered that the aviators' shiny white flight helmets were highly visible and targetable, they were rapidly changed to olive drab. As the war progressed, jungle fatigues and boots gave way to Nomex and leather boots for better crash survivalability. All helicopter aviators wore chest protectors while flying. This was a form of body armor, and the only frontal protection against enemy fire; they were jokingly referred to as "Chicken Plates." Black leather holsters and belts with receptacles for ammunition were all the vogue. They could be purchased from the local "Cheap Charlie" shop—you were definitely not a real combat aviator unless you were outfitted in such paraphernalia. They sang ribald, obscene and often disrespectful songs, while drinking heartily, and sometimes too heavily. They "hit the villes" when off duty, and on occasion succumbed to the call and the lure of the massage parlors for an interlude of relief and ecstasy. They constantly jogged my memory; it seemed as if I had known them all; that I had seen them somewhere in the past; they were special and wonderful people; but more importantly, I was one of them and proud of it.

Most of us flew the ubiquitous UH-1. It served as a troop lifter, a gun ship, aerial artillery, supply ship and air ambulance. I had the good and proud fortune to have served two combat tours as an aircraft commander of an air ambulance; a "Dustoff Pilot," as we were commonly called. Dustoff was the universal call sign for aeromedical evacuation in Vietnam. Dustoff units were oncall every hour of the day and night and performed heroically rescuing wounded soldiers under enemy fire and other hazardous conditions. Not that the "Grunts" needed it but the very presence of Dustoff added starch to their spines.

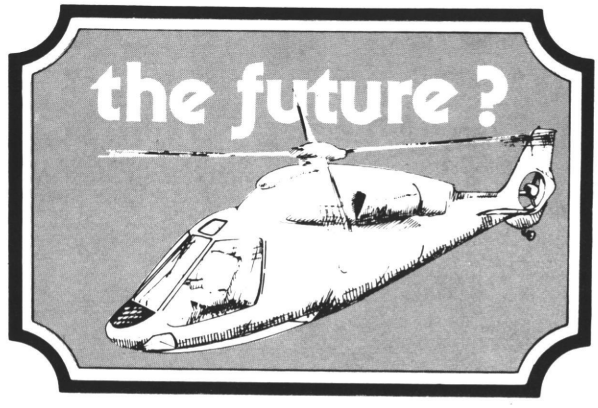
During the latter part of my second tour I was joined

by my eldest son, a fresh out of flight school aviator, and we had the distinction of being the only father and son team assigned to the same unit, and flying in combat together. In addition to the UH-1, there were the scout helicopters (OH-6 Cayuse and OH-58 Kiowa), the gun ships (AH-1 Cobra) and the heavy lifters (CH-47 Chinook). There was also a variety of fixed wing Army aircraft performing utility and specialized missions. Army rotary and fixed winged aviators produced a record of accomplishment in Vietnam unmatched in the history of any prior armed conflict. It became the basis for the bold technological and doctrinal advances that produced Army Aviation as it exists today—a full fledged branch member of the combined arms team.

Today and Tomorrow

Army aircraft and equipment now coming online display a high degree of sophistication. With the introduction of modern battlefield systems for aircraft control, Army Aviation is able to operate under meteorological conditions undreamed of during the Vietnam years. Incorporating the use of our satellite systems, the application of microcircuitry and advanced computer engineering, tomorrow's Army aviator will be able to navigate to the scene of battle; search out, acquire and destroy targets which are on the surface or airborne; in all types of weather conditions. The term "below minimums" will be made to go the way of the dinosaur when the technological capabilities of industry and Army Aviation are focused on solutions to problems of the modern battlefield.

Army aircraft structures and design will continue to improve. We have come a long way since the days of the L-4 Cubs, the L-19 Bird Dogs and the R-4s; light kites that could not have withstood the operational demands of Vietnam. The more durable Hueys, the OHs and Chinooks of Vietnam may be doubtful starters in future conflicts. New materials are coming along that will allow for structural integrity and design opportunities of unlimited potential. The new materials include metals, alloys, synthetics and composites with a strength to weight ratio several times that of materials presently used in aircraft manufacture. Metallurgical and ceramic advances and other new materials will enhance engine design. Engines will be lighter, more powerful, more dependable; and at the same time more fuel efficient. The combination of advanced aircraft and engine design, more effective offensive and defensive armament systems, together with continuous operational capability, will make the powerful, resounding throb of the new Army helicopters as fearful to enemy forces of the future, as the sound of strafing fighters was to the foot soldiers of World War II. Today's Army aviator has a very bright future—the sky is wide open—the horizon, unlimited—even the frontier of space beckons—he takes a back seat to no man—he enjoys the best of worlds with Army Aviation.



Light Helicopter Family

Directorate of Evaluation/Standardization
REPORT TO THE FIELD

Vmc: You Can't Live With It; So Why Die With It?

SOME ARMY aviators question the usefulness of existing Vmc (velocity minimum control) charts under varying conditions.

Vmc is the minimum control speed under the worst possible conditions. That is:

- Critical engine out
- Maximum sea level takeoff weight
- Extreme aft center of gravity (CG)
- Takeoff configuration with takeoff or maximum allowable power
- Critical engine windmilling, which creates the maximum drag for aircraft without automatic propeller feathering or minimum drag for aircraft with an autofeathering device
- Landing gear retracted
- Aircraft airborne and out of ground effect

Therefore, changes in aircraft configuration, i.e., change in CG, higher gross weight or reduction of power (due to higher altitude or other reasons) reduces the Vmc, and is a plus factor for aircraft control.

Vmc speeds depicted in Army aircraft manuals are predicated on flight tests using 5 degrees of bank into the operating engine with full rudder deflection. Reliable test flight data (per Army Test Flight Center, Edwards AFB, CA, in RU-21H aircraft) confirms that this method of obtaining Vmc significantly increases the rate of descent or further loss of altitude. At Vmc, the aircraft cannot maintain altitude nor accelerate to an airspeed at which the aircraft will climb without reducing the angle of attack (resulting in a descent). The speed below the minimum climb speed and Vmc is in the "area of reverse command" or behind the "power curve." The area of reverse command or behind the power curve is the airspeed at which the drag exceeds the available thrust or power output. If additional power is not available, then the drag must be reduced by changing aircraft configuration or reducing angle of attack to allow acceleration.

Vmc closely relates to stall speed, and is normally passed through during takeoff roll as rotation or lift-off speed is approached. If an engine should fail at the precise moment that lift-off occurs, then the sudden loss of available power (in some aircraft as much as 80 percent), coupled with the sudden increase is drag induced by the propeller disk before the feathering process is completed can cause a rapid decay in airspeed. Therefore, if an aircraft is at or below Vmc the only thing to do is to reduce power on the remaining engine in order to maintain aircraft control, and land the aircraft with as much control as possible. As power is reduced to regain or maintain control, then Vmc is no longer a concern, but the stall speed becomes a major factor. The pilot does not want the aircraft to stall. (Remember, at precisely Vmc or below, the aircraft is uncontrollable. Vmc and power off stall speed are very close in most light twin engine aircraft.) The pilot desires to maintain wings level and straight-ahead control which is necessary if the aircraft is to touch down on the remaining runway, overrun or terrain.

Ultimately, Vmc, like Vne (velocity of never exceed) and Vse (velocity of stall), can be figured and plotted on a chart or graph for any given aircraft configuration and therefore, the overriding concern remains: How useful are these figures (speeds) under all conditions? Because Vmc closely relates to stall speed it is an airspeed we must be aware of. All pilots are taught the varying conditions that affect stall speed, Vmc and other factors concerning aircraft control and performance.

The important thing is to *remember* these so you'll know what to expect and be in "command" of your aircraft.

DES welcomes your inquiries and requests to focus attention on an area of major importance. Write to us at: Commander, U.S. Army Aviation Center, ATTN: ATZQ-ES, Ft. Rucker, AL 36362; or call us at AUTOVON 558-3504 or commercial 205-255-3504. After duty hours call Ft. Rucker Hot Line, AUTOVON 558-6487 or 205-255-6487 and leave a message

In March the *Aviation Digest* carried the article, "Training the Aviation Warrant and Commissioned Officers." It provided an overview of the new training plan for Aviation commissioned and warrant officers that has been developed since Aviation became a branch.

In April the *Aviation Digest* took a detailed look at the "Aviation Officer Basic Course" and the "Warrant Officer Candidate Military Development Course." Then in the May issue, the *Aviation Digest* covered the "Officer/Warrant Officer Rotary Wing Aviator Course," commonly referred to as "flight school."

This month's coverage takes a detailed look at the "Aviation Officer Advanced Course," and the "Aviation Warrant Officer Advanced Course."

Next month this series concludes with articles on the "Aviation Pre-Command Course" and the "Warrant Officer Senior Course." Copies of these articles are available by writing to Editor, *Aviation Digest,* P.O. Drawer P, Ft. Rucker, AL 36362.

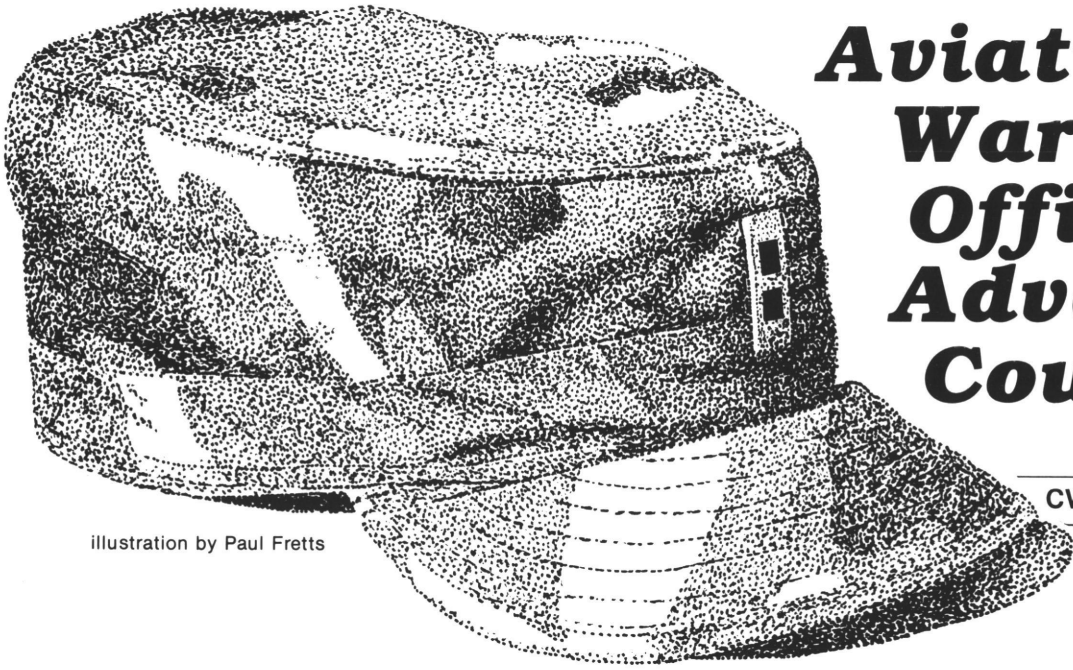


illustration by Paul Fretts

Aviation Warrant Officer Advanced Course

CW2 Robert A. Johnson

THE AVIATION Warrant Officer Advanced Course (AWOAC) provides the first formal opportunity after flight school for Aviation warrant officers (AWOs) to update and polish those skills and knowledges required to excel as leaders as well as aviators.

The AWOAC is a 15-week, 3½-day program of instruction. The course is taught in residence at the U.S. Army Aviation Center, Ft. Rucker, AL, and is also available in nonresident version through the Army Correspondence Course Program (ACCP).

The course is designed to increase the Aviation warrant officer's knowledge in such areas as:

- The role of Aviation in the missions and functions of the Army.
- Aviation staff functions and procedures.
- Combined arms operations.

This knowledge is essential to successful performance in positions of greater responsibility and authority by the Aviation warrant officer. The training presented also reinforces the fact that AWO duties encompass much more than just flying.

Resident Version

Prerequisites for the resident course require that the Active Army and Reserve Component Aviation warrant officer:

- Be current in military occupational specialties 100 B, C, D, E, R, Q, 150A or 160A.

- Have completed 3 years as a rated aviator, air traffic control technician (nonrated) or aircraft repair technician (nonrated).
- Have a secret security clearance.

Effective this month resident course starting dates will increase to 10 times a year. This means that a new class will start about every 5 weeks. The increased start dates will allow the Military Personnel Center more flexibility in coordinating TDY (temporary duty) attendance with permanent change of station moves (previously course start dates were only twice a year, in January and July).

Current Curriculum

The curriculum of the Warrant Officer Advanced Course is dynamic. Course content is continuously reviewed, and updated as necessary, to ensure technical accuracy and adherence to the latest advances in tactical and doctrinal thought. The course content may be considered to emphasize two major categories of training:

- Management and leadership skills.
- Tactical and technical skills.

The management and leadership skills subjects account for about 250 academic hours of instruction. Subjects covered are designed to enhance the Aviation warrant officers' knowledge of those skills necessary to manage and lead Aviation units. For example, the instruction provides a general knowledge of the principles of management, techniques of counseling and leadership, and personnel and financial management. Training management instruction requires each student to complete the Battalion Training Management System's, Platoon Trainer's Workshop. The communicative arts instruction enhances the students' knowledge of the principles and techniques of military writing and briefing. When combined, these subjects provide a solid base in management and leadership skills. The subjects covered under the category of tactical and technical skills provide refresher and update training in these critical areas. Tactical instruction focuses on those skills and knowledges necessary to defeat the threat on the modern battlefield. Aviation subjects include a review of aerodynamics and weather. Other subjects addressed include:

- Military law.
- The U.S. Air Force.
- Maintenance and supply management.
- Aviation safety and accident prevention.
- Guest speaker program.
- Physical readiness training.
- Introduction to microcomputers.

Nonresident Version

For those who desire to complete the Warrant Officer Advanced Course early, or who are not selected for the resident course, the nonresident version is a viable alternative. The Army Correspondence Course Program enables these Aviation warrant officers to prepare themselves for positions of increased responsibility while remaining onstation. Those who are hesitant to participate in the ACCP may be interested to know that a completed nonrresident course has the same designation on an Officer Records Brief as does the completed resident course. Prerequisites for the nonresident Aviation Warrant Officer Advanced Course require that the applicant:

- Be Aviation qualified.
- Have completed 1 year as a rated aviator, air traffic control technician (nonrated) or an aircraft repair technician (nonrated).
- Be a member of the Active Army or Reserve Component.

To apply for the AWOAC correspondence course use DA Form 145, available through unit or AG (Adjutant General) Publications. For Active Army and Reserve Component AWOs on active duty, the DA Form 145 should be submitted through the unit commander or immediate commissioned staff supervisor. For other originating sources consult Department of the Army Pamphlet 351-20 for routing of the application (unit training officers or installation education centers should be able to provide further information on the application process).

The correspondence course itself is composed of 62 individual subcourses designed to parallel those subjects taught at the resident course, and just as aptly prepare the applicant for his or her ever-increasing duties.

The emergence of the Aviation Branch will, in time, intensify the warrant officer's role in Aviation unit staff procedures and leadership. This will require the AWO to be at least as knowledgeable as his commissioned officer counterpart. So, whether completed by correspondence, or in resident, the AWOAC should be viewed as an opportunity to gain valuable knowledge, not simply as a career "ticket to punch."

ABOUT THE AUTHOR

CW2 Robert A. Johnson is a training development officer on the Officer/Warrant Officer Professional Development Team, Course Development Division, U.S. Army Aviation Center. He was previously assigned as training officer for the 3/507 Med Co (AA), Ft. Hood, TX. CW2 Johnson holds an A.S. degree in nursing from Central Florida Community College, is an Aviation Warrant Officer Advanced Course graduate and is now working towards a B.S. degree in mathematics at Troy State University.

Captain Joseph E. Faubion
Directorate of Training and Doctrine
U.S. Army Aviation Center
Fort Rucker, AL

Aviation Officer Advanced Course

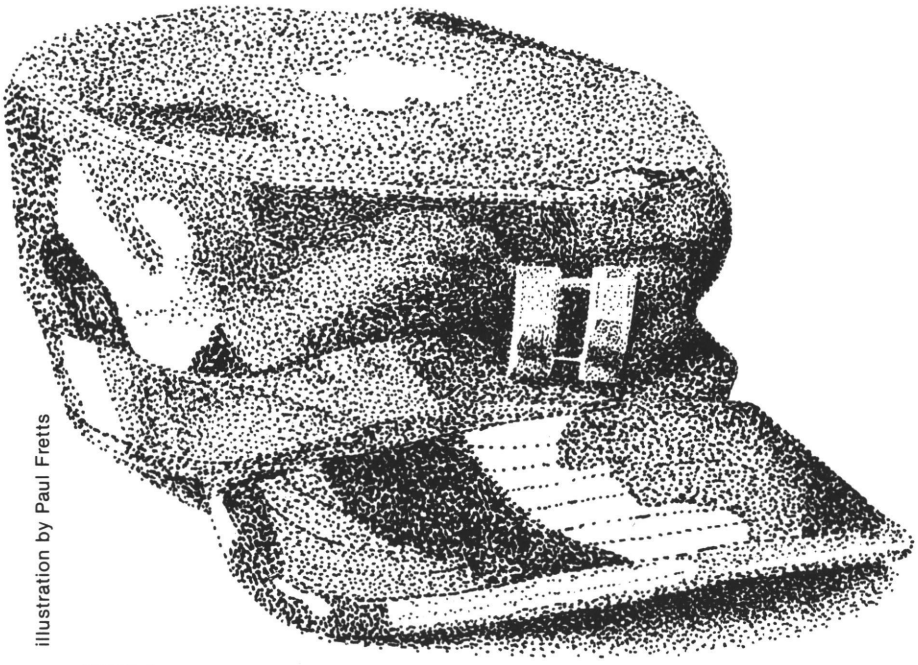


illustration by Paul Fretts

With the implementation of the Aviation Branch, the U.S. Army Aviation Center at Ft. Rucker, AL, has assumed proponency for the professional education of its commissioned officers. To meet this responsibility and fill what has long been recognized as a void in the professional development of Aviation commissioned officers (ACO) the Aviation Officer Advanced Course (AVNOAC) has been developed at Ft. Rucker. Upon completion of their initial utilization tour with an Aviation unit, ACOs can expect to return to Ft. Rucker to attend the AVNOAC.

The course provides advanced level Aviation training in combat arms and branch specific operations. It prepares the ACO for company-level Aviation command and battalion, brigade and division level staff assignments. The program of instruction emphasizes the employment of aircraft and associated weapon systems as an integrated part of the overall scheme of maneuver and plan for fire support. This knowledge, coupled with an understanding of the Threat's method of operations and training, is critical for our ACOs to fully exploit Aviation's potential as a full-fledged member of the combined arms team. Prior to Aviation's designation as a branch, officers received similar training during branch affiliated officer advanced courses; however, it was not oriented toward Aviation.

The Aviation Officer Advanced Course consists of 20 weeks of academic instruction divided into 3 functional modules and a 1-week computer assisted practical exercise. The course consists of the following academic instruction:

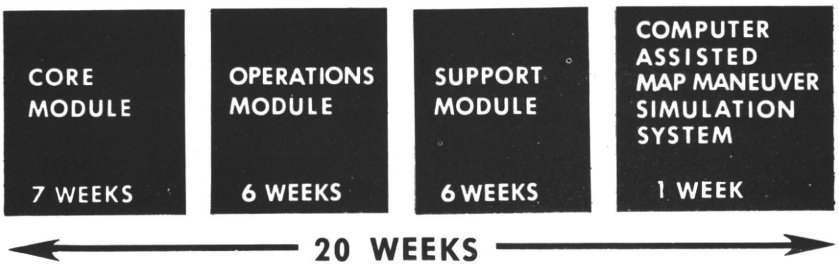
Core Module: The core module is 7 weeks in length and includes instruction on combined arms, leadership, training management and other training subjects mandated by the Department of the Army (DA). Together these subjects provide a foundation for the ACO in professional development similar to what is taught in other officer advanced courses. Toward the end of the core module the physical fitness test is administered and must be successfully completed prior to graduation.

Operations Module: The operations module looks at the employment of an Aviation unit in its pure form and as a member of a combined arms task force. This module prepares the student for S3 duties within Aviation battalions, squadrons and brigades and is 6 weeks in length. The module is subdivided into the following topics of instruction:

Intelligence: Provides a general knowledge of the Soviet, People's Liberation and North Korean Armies; the techniques of collecting combat intelligence; and the analysis of an area of operation.

Operations: Examines offensive and defensive Aviation operations and identifies the Aviation assets normally available to support these operations from battalion through division level.

Aviation Tactical Operations: Provides a general knowledge of Aviation operations to include ar-



tillery deployment, amphibious, military operations in urban terrain and air assault in support of the AirLand Battle.

Combined Arms Task Force Operations: Studies the planning sequence for combined arms offensive operations to include assault, attack, cavalry and stand-off tactical aircraft system employment.

Support Module: The support module provides instruction in company or troop sustainment. This module is 6 weeks in length and emphasizes those subject areas important to the commander of an Aviation company or troop size unit and provides a foundation for command at the Aviation battalion or squadron level. The module consists of the following topics of instruction:

Aviation Maintenance and Materiel Management: Provides an introduction to the Aviation maintenance and materiel management and maintenance process to include The Army Maintenance Management System, repair parts, quality control and recovery operations.

Preventive Maintenance Checks and Services: Presents supervisory preventive maintenance procedures to include readiness criteria, priorities and evaluation procedures.

Logistics: Provides a working knowledge of unit supply to include records, inspections, inventories, property adjustment, and materiel and unit readiness.

Personnel: Examine the functions, procedures and techniques of: personnel management, actions, records and SIDPERS (Standard Installation/Division Personnel System).

Computer Assisted Map Maneuver Simulation System: The final week of the Aviation Officer Advanced Course is devoted to a computer assisted, practical exercise in which students role play commanders and primary staff officers. It provides an opportunity to apply the skills and knowledge gained in the previous modules to a computer enhanced battle simulation.

Two classes have been scheduled for 1984. The course starting dates are 4 June and 23 July 1984, with 70 students scheduled to attend each class. Subsequent classes will have 80 students each and start every 10 weeks beginning in January 1985. Due to the number of Aviation officers projected to attend advanced courses and the limited number of slots immediately available (total of 140 for June and July 1984) numerous ACOs can expect to attend an advanced course offered by another branch (Infantry, Armor, etc.).

To fulfill the needs of the Reserve Component commissioned aviators, the Aviation Center will produce U.S. Army Reserve School and correspondence versions of the Aviation Officer Advanced Course. The Army Reserve School and correspondence course will, as nearly as possible, offer the identical instruction presented in the resident course at Ft. Rucker. Both versions will contain six phases and members of the Reserve Components may choose from a variety of options, the most convenient method of successfully completing each phase.

The Army Reserve School version involves both active and inactive duty for training. Phases I, III and V consist of the traditional branch immaterial subjects required by DA and common to all officer advanced courses. These phases will be offered during inactive duty for training periods by the various Army Reserve Schools. Phases II and VI will be taught by the Army Reserve Schools during separate 2-week active duty training periods at Ft. Rucker while phase IV is now offered exclusively through correspondence. Phases II, IV and VI are Aviation specific, covering such topics as Aviation safety, recent technical developments, aircraft employment, tactics and doctrine.

The AVNOAC correspondence course will offer all phases through the Army's Institute for Professional Development, Newport News, VA. The correspondence version of the Aviation Officer Advanced Course became available for enrollment on 5 June. Course description and prerequisites can be found in the new DA Pamphlet 351-20, "Army Correspondence Course Catalog," scheduled for publication this month.

The Aviation Officer Advanced Course fills what has long been recognized as a void in the professional development of the Aviation commissioned officer. Credit for the course may be earned through the resident course, Army Reserve School, correspondence version or any combination thereof. Armed with the knowledge presented in the course and experience gained through realistic training in field assignments, ACOs can, by virtue of their mobility and three dimensional perspective of the battlefield, significantly influence the AirLand Battle.

Summer Training Exercises

To most people summer means vacations and holidays but to the 750,000 Regular Army and 685,000 Reserve and Guard personnel, summer also means training. Before your unit goes into the field is the time to review SOPs and to do your preexercise planning. The potential for accidental injury or death to personnel and damages to equipment increases in the unfamiliar environment and taxing conditions of field training. Good planning can help lessen the chances of that happening. Remember—death takes no holiday.

IN 1963 THE ARMY was 950,000 strong, some 20 years later it is smaller by 200,000 people. The choice to maintain a diminished force of quality soldiers has been a conscious one. Escalating costs of manpower and equipment and a Congress which is pressing for smaller increases in the defense budget mean little likelihood of a much larger Army in the predictable future. If the Army is to defend the Nation's interests in an ever-expanding worldwide arena, conservation of resources, both human and materiel, is absolutely vital.

A quandary that Army leaders face is how to give soldiers, many of them without any combat experience, realistic training without sacrificing the gains made in accident prevention. The number of aviators with experience in Vietnam is shrinking—in the future, success or failure will depend more and more on the quality of training aircrewmembers receive.

The importance of training was demonstrated in Grenada in October of 1983. The 1,028 paratroopers, mechanics, and pilots of the 82d Combat Aviation Battalion were recovering from a 3-day field training exercise. They had been involved in an Army Training Evaluation Program (ARTEP) and a simultaneous Emergency Deployment Readiness Exercise (EDRE). Training was concluded at 1730 and four and one-half hours later an alert notification was initiated. Nearly 600 people and 45 aircraft from this battalion would be deployed in the invasion of Grenada.

In a speech at the Aviation Training Symposium in 1981, the commander of the Army Safety Center told attendees, "The commander who has all his assets available at the critical time will be a safety-conscious commander all of the time." Grenada is an example of just how important it is to conduct field training without losing people and machines in accidents.

How does the safety-conscious commander prepare his troops for combat and still conserve the resources he will have to have if that combat becomes a reality? In 1982, the Army Safety Center published a pamphlet entitled, "Safety Tips for Aviation Operations During Field Training Exercises." This pamphlet, developed by LTC James H. Kenton,* then in Directorate for Systems Management, USASC, is a commonsense approach to

accident prevention during field training. The information it contains is as valid today as it was in 1982.

This pamphlet covers such topics as terrain flying. There is no doubt that if Army aviators are to survive in future combat they're going to have to fly close to the ground. If they do not, the enemy threat of detection and destruction by air defense weapons is a surety. And, you can't wait for the war to start before you learn how to do this kind of flying. So how do you train your aviators in terrain flying without killing them in an accident while they're becoming proficient? LTC Kenton suggests that one way is to slow down. It is obvious that an aviator flying at slower speeds has more time to see and take action to avoid obstacles.

Another factor in terrain flying is careful planning—knowing where the obstacles are and ensuring that aircrews are briefed. A UH-1 hit two wires during takeoff from a tactical field site. The pilot made a left, descending turn to land in an open area. At an altitude of about 3 feet, control was lost. The aircraft crashed and rolled inverted. The result was a Class A mishap. This site was laid out in such a manner that aircraft were forced to take off over known wire hazards and steeply rising terrain. *The pilot was not briefed on the hazards in the area.*

Just knowing where wires are likely to be may prevent a mishap. For instance, wires are more likely to be found in the vicinity of buildings or parallel to roadways, so aircrews should be extremely vigilant where those conditions exist.

Even though an aircraft may not be severely damaged in an accident and none of the crew suffer injuries, a damaged rotor can take the aircraft out of action for enough time to lose a battle. During actual warfare you might not have as much information as you need on environmental factors but during field training there is no acceptable excuse for surprises that can subtract an aircraft from your assets.

As an example, the desert at the National Training Center, Fort Irwin, CA, is quite different from the desert found around Fort Bliss, TX. At Irwin, the desert is relatively flat with basins and mountains. The terrain, which slopes gently upward toward the mountains, requires crews to be very vigilant in order to maintain terrain clearance. At night, the absence of visual cues and lights on the ground makes flight without night vision devices very difficult. Use of constant power settings in this type of terrain should not be attempted.

Another Class A mishap in a similar setting resulted when the pilot of an OH-58 tried to hover rearward from the crest of a hill and the aircraft yawed slightly to the right. The left skid hit the ground and the aircraft rolled to the left. The main rotor blades hit the ground and the main transmission assembly separated from the aircraft which came to rest on its left side. *The pilot had misjudged the height of the helicopter over the rough, sloping terrain.* He was confident that he could hover the aircraft rearward without a clearing turn or assistance from the copilot.

Sand dunes in the Texas/New Mexico desert are often as high or higher than the rotor system of a UH-1H. From the air it is difficult to determine any terrain relief, but on landing it is not uncommon to put the aircraft down between dunes and have little or no clearance between the rotor blades and the top of the dunes. Aviators who are not aware of this fact could easily damage an aircraft while landing by blades striking the dunes.

Night training, including night vision goggles, is another area where we simply can't wait for a war to start to learn how to do the tasks. The only way to completely avoid mishaps in this admittedly difficult flight regime would be not to do it all. However, the enemy threat isn't under our control so we have to train not only to become proficient but to be able to identify the capabilities and limitations of our equipment and how its use can be improved. Following is an example of how to make a potential mishap become a sure thing.

Before beginning aviation operations in support of a field training exercise, the unit commander did not ensure that aircraft accident prevention procedures were established. Although an SOP existed for night tactical operations, *the unit had no specific procedures for night operations* or airfield operations as required by AR 385-95. A preexercise maneuver briefing was not conducted for the aviation personnel and aircraft were operating from a confined area at night without sufficient visual aids to ensure safe operations. As an AH-1 crew was preparing to take off from the confined area, the aircraft drifted right and the main rotor blades hit several trees.

A subject that inevitably comes up when field training is discussed is "crew rest." It isn't because aircraft crews get tired any more quickly than other soldiers that crew rest policies are so necessary. The reasons this subject is so important are the

demands of flying as compared to some other operations, how fatigue degrades performance, judgment and coordination and the disastrous results of mistakes. Some ground commanders mistakenly feel that realistic training means that living conditions must be as tough and as uncomfortable as possible. If this means crews do not get the rest they need, such an attitude can lead to the following type of accident.

An OH-6 pilot, taking off from a dusty LZ at night, lost visual reference. He hovered for about 20 seconds and then turned on his landing light, deteriorating his night vision. The helicopter drifted into trees and came to rest on its left side. This accident occurred at 2345. The pilot had slept only 5½ hours the night before, arising at 0330. The weather was extremely hot, much hotter than the pilot was accustomed to. The unit SOP did not address crew rest limits and *there was no crew rest policy in effect.* This led to a general lack of appreciation throughout the unit for the cumulative conditions that can lead to fatigue.

While we're on the subject of crew rest and the effects of fatigue, let's not forget that field training conditions also affect support and maintenance personnel. While it may not be a regulatory requirement to have a written rest policy for these soldiers, commanders and supervisors must provide the time and place for rest and they must take into account the effects of extreme weather on such people. Maintenance problems increase at the same time the environment deteriorates the crew's ability to perform. Under these conditions it is tempting to take short cuts instead of performing maintenance "by the book." Everything possible should be done to alleviate the harsh working conditions by providing shelters when possible, adequate liquids, and periods of rest. It will do little good to have a fresh and able aircrew if the aircraft was serviced by a maintenance crew that is suffering from fatigue, compounded by heat.

Not only must there be a crew rest policy, it must be supported by the entire chain-of-command to be effective. In addition, the aircrewmembers themselves must be convinced of its importance before they will cooperate and use rest periods for the intended purpose.

The extreme environment; heat, dust and sand, strong dry winds, or conversely high humidity, insects and wildlife that make life difficult for people during field training also takes its toll on equipment.

Whenever possible, aviation operations should be conducted where dust is not a problem. That can be well-nigh impossible in the desert but surprisingly enough some aviators seem to select their own deserts by placing their aircraft near roads or trails that have been crossed and recrossed by ground vehicles. Avoid that kind of invitation to trouble as much as possible. Where dusty conditions cannot be avoided, hovering or hesitation in landing or taking off can create brownout and result in damage to other aircraft in the vicinity, or worse, loss of visual references and a mishap.

Sand or dust not only cause brownouts for the unwary aviator, they have a severe effect on engines, bearings and rotors. Sand erodes compressor blades and inlet guide vanes and reduces engine life. The work of the maintenance crew is greatly complicated under field conditions. They must be extremely vigilant in inspecting, detecting and cleaning in order to reduce maintenance problems.

Dust covers and excluder plugs should be used on engine openings, vents, air intakes, exhaust outlets, breathers, over propeller hubs and feathering domes, cowls and all other vital components and openings. Flight controls should be checked to be sure accumulated sand has not affected their freedom of movement and control cables should be checked for specified tension. Filters will have to be checked and replaced more frequently in field conditions.

"Any fool can profit from his own experience, but I prefer to profit from the experience of others."

Constant checking is vital if maintenance personnel are to be able to combat the undesirable effects of the field environment.

How can insects and snakes affect equipment? Besides the obvious things like reduced visibility through windshields spattered with bugs, insects like to build nests in places like pitot tubes just as birds will in larger openings. So far there's been no report of anyone finding a cobra in a Cobra but that seems to be about all that hasn't happened to aircraft and aircrews in the field.

The USASC pamphlet of safety tips for airfield operations during field training exercises also contains information on the following subjects:

- Airspace management. Avoidance of midair collison of Army and Air Force aircraft during joint training exercises.
- POL operations. Hazards posed by deviations from FM

10-68 in setting up and running a rapid refueling site. Also covered are the hazards from fuel contamination, fire caused by static electricity and the need for air traffic control around large refueling sites.

- Protective equipment. It is not only important that protective equipment be worn during aviation operations, but that the equipment be in good condition in order to do what it was designed to do.

Personal responsibility is important here too and all people (not just aircrews) associated with aircraft operations should wear protective equipment if injuries are to be avoided.

It isn't just U.S. Army aviation units that find the accident rate too high during detached operations. A study of Royal Air Force accident statistics for the last three years has revealed that 33 percent of their major accidents occurred during detachment or landaways. Considering the small proportion of the RAF's flying which is conducted away from base, this figure identified an area of increased risk and concern. The study also showed 75 percent of these accidents involved aircrew error. Four common contributory factors were revealed which are particularly relevant to operations away from base:

- Change in social habits
- The element of competition and a desire to impress
- Demanding sortie profiles
- Supervision at a distance

The first two factors must be combated by aircrewmembers; detachment from base does not obviate the necessity for adequate rest nor does it reduce the effects of alcohol. Bad judgment in being overly competitive and stretching the capability of self and machine demands a price be paid—and it was.

The last two factors require not only good planning, comprehensive briefing and sound supervision but a well-designed flying program as well, tailored to the needs and abilities of the aircrew concerned. U.S. Army aviation units might well look for these factors in their own aviation accident records. If they are there, and it's pretty certain they are, the time to recognize them and take countermeasures is before the next accident happens.

Discipline, by flight crews, maintenance personnel and noncrewmembers, is vital if a training exercise is to be successfully completed without loss of resources. The repairman who takes a shortcut in maintenance can cause an aircraft to be lost and the crew killed just as surely as an aviator who fails to follow prescribed procedures and puts the aircraft and crew in jeopardy. There will always be people who refuse to exercise personal discipline and who take chances—but with the present trend toward accountability, fewer and fewer of them will be found in Army aviation units in the future.

U.S. Army Safety Center resources are available to assist units in planning and safely conducting realistic field training exercises without sacrificing the mission. In addition to lessons learned information, there are data base printouts reflecting mishaps that have occurred in exercise areas. Safety and technical publications, slides or pictures and specific mishap data or statistics may be requested from the Safety Center. Experienced personnel are also available to go to the unit or exercise area to provide assistance to the exercise planners or safety directors. Units desiring assistance should send their requests through their MACOM to the U.S. Army Safety Center, Fort Rucker, AL 36362.

Realistic training must be done and it must be done before the battle is engaged. Some risk is inherent in that training but it can be controlled and that is where the safety personnel come in. They can provide recommendations for dealing with those risks and they should be a part of the determining process on whether the training and mission justify the risk involved. If a commander really understands the value of his safety people in conserving those limited resources entrusted to his leadership, he will involve them in all phases of training exercises, not just when something goes wrong. Prince Otto von Bismarck stated it well, "*Any fool can profit from his own experience, but I prefer to profit from the experience of others.*"

Sources:

"Followups," Vol. 12, No. 18, and "Watching and Directing," Vol. 11, No. 21, *Flightfax.*

Kenton, James H., LTC, Directorate for Systems Management, U.S. Army Safety Center, "Aviation Training in the 1980s—Another View," *U.S. Army Aviation Digest,* April 1981, and *Safety Tips for Aviation Operations During Field Training Exercises.*

Seigler, Robert N., LTC, Cdr, 82d Combat Aviation Battalion, "Looking Back at Urgent Fury, Army Aviation in Grenada," *Army Aviation,* December 31, 1983.

Spry's Column, "Detached Operations," *Air Clues,* February 1984.

---

*LTC Kenton is currently assigned as commander, Lawson Army Airfield, Ft. Benning, GA

PEARL'S

Personal Equipment And Rescue/survival Lowdown

Carmen Grice photo by Reflections Studio

Falcon Pilot Undone
Reprinted from TAC Attack

Heads up for newly assigned Falcon pilots and life supporters. An F-16 pilot was dropping practice bombs on a range. During the pullout from a low angle delivery, his lap belt disconnected. He climbed to a safe altitude and reconnected the belt. While rolling in for another pass, the belt disconnected again. This time he terminated the mission and started for home. En route, he discovered that every time he applied G-loads on the aircraft the survival radio and Mark XIII flare on the front of his survival vest leaned on the Frost lap belt fitting.

Back on the ground, the life support folks strapped him in a vacant jet to see the problem firsthand. The survival radio and flare did not contact the lap belt connection—until the anti-G suit inflated; then, whenever he shifted left or right, the belt disconnected. *Turns out the survival vest was improperly fit, but subtly so.* Life support modified the vest to allow more clearance between the survival equipment and the lap belt connector.

Note: Interface problems like this are why our other services have a full time aviation life support equipment (ALSE) military occupational specialty (MOS), and so should we.

Flash—Flash—Flash

A current shortage of personnel who respond to user's questions pertaining to aviation life support equipment has caused the project officer to ask PEARL to publish the following: *"For any question or problem pertaining to the operation/maintenance of ALSE that cannot be resolved using the appropriate technical manual (TM), suggest a Department of the Army Form 2028 be forwarded to the proponent of the applicable TM. EIRs and QDRs should be submitted whenever possible. Perhaps another source of information could be through your local field maintenance technician. Reluctantly we are doing this as an interim measure. Should further assistance be needed, you can always contact PEARL, DARCOM Project Officer, ATTN: DRCPO-ALSE, U.S. Army Aviation Systems Command, 4300 Goodfellow Boulevard, St. Louis, MO 63120, AUTOVON 693-1218.*

Crash Firefighting

Confining and subduing a post crash fire, with the primary goal of rescuing the occupants and containing the conflagration, is a responsibility often borne by U.S. Army Aviation units operating in both field and garrison environments. Although the Army has a firefighter MOS (51M), there are now fewer than 300 personnel trained in this field, and they are typically not included in either Aviation unit TOE, MTOE or TDA. Therefore, the soldiers responsible for operating

your airfield, heliport or tactical site—forward area refueling equipment system operators, operations personnel, safety personnel, ground guides, et al—must receive training in crash firefighting.

Chanute Air Force Base, IL, is the triservice proponent for firefighting schools. They conduct training in the areas of crash firefighting, fire chief qualification, structural firefighting, fire inspection and rescueman's training. The crash firefighting course (number 2AFR57150-000) is 10 days long and begins every fourth working day. Course quotas and other information may be obtained through the fire protection training manager, 3330 TCHTW/TTGXW/STOP 62, Chanute AFB, IL 61868, or by contacting Donald Madden, AUTOVON 862-3904. Due to possible limits in TDY funding, it is advisable to select one person as unit trainer, and send him/her to Chanute AFB. Course materials provided to each student can be brought back, reproduced and used for your unit's training program. Properly trained personnel, coupled with a viable crash/rescue plan, can vastly improve the safety of your day-to-day operations. Note: Appreciation for this article is expressed to CW2 Charles "Chuck" Gibson, formerly the ALSE focal point with UASSB, USAREUR and to SFC Steven Murphy, HHC, 501st Avn Bn (CBT), Ansbach, West Germany, for initiating this training in USAREUR and sharing his experience with the safety/ALSE community.

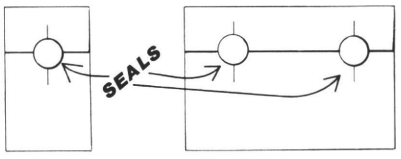
Reduction of Pilferage

Dear Pearl: *I am assigned as the ALSE officer for a TRADOC TDA unit. We have five UH-1H Huey and three U-21A Ute aircraft assigned. Due to the type of missions we have and the number of aviators (19 assigned, about 40 staff aviators), it is not practical to have assigned vests for all aviators. Therefore, I have 10 SRU-21/P vests for the UH-1H aircraft to include 2 crewchief vests. This, however, causes a problem with pilferage. The most common items found missing are normally limited to matches and distress markers. However small the items, pilferage must still be controlled.*

After giving some thought to some of the solutions I decided to try one particular method.

I took one of the SRU-21/P vests and placed first aid seals (MED) on all the pockets with the exception of the First Aid Kit and AN/PRC-90 radio pockets (since they are inspected prior to every flight). By doing this the individual who signs out the vest can check the seals. (DA Form 2062 is not used due to the time involved for 100 percent inventory of NSN, serial number of components.) If the seals are not broken, the item is there. With the seals properly placed on the pockets (figure 1), there is no way to get into the pocket without breaking the seal. Granted, this solution won't totally eliminate pilferage; however I feel that it does discourage it. The most common item found missing is the matches. To further secure the matches, paint a slippage mark on the cap and body of the container (figure 2). This provides a simple and effective means to ensure security of the container and speeds inventory procedures.

FIGURE 1: SRU-21/P survival vest pocket.



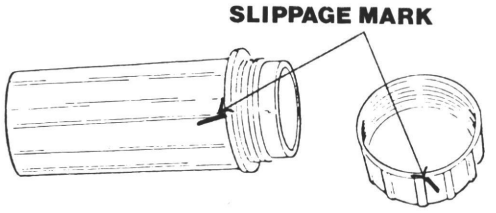
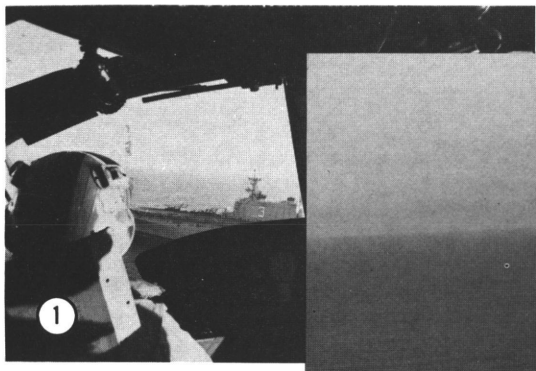


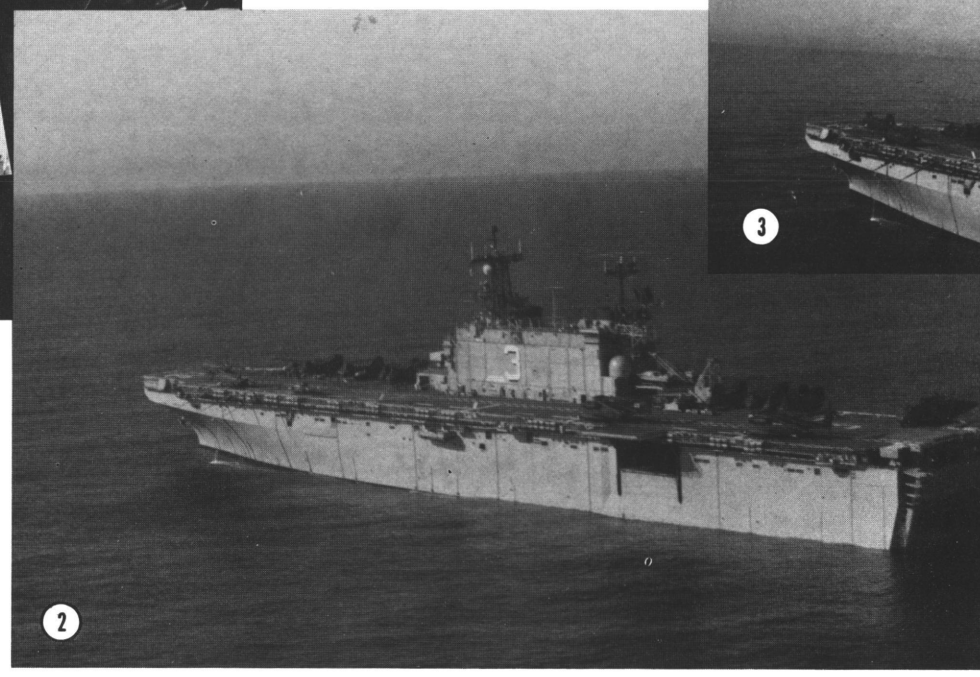
FIGURE 2: Match case.

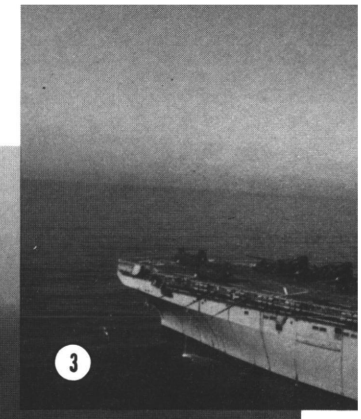
This system may not work for every unit, but it appears to be an ideal system for units with similar missions and ALSE programs. (Erik P. Feldmanis, WO1, ALSE officer, Aviation Division, DPT, Ft. Knox, KY)

Dear Mr. Feldmanis: Thank you for your suggestion. We are printing your letter in hopes it will help another individual in a situation similar to yours. Pilferage has always been a problem and will probably continue; however methods such as these you suggest will certainly help to reduce it. We really appreciate your interest and input to the ALSE program.

If you have a question about personal equipment or rescue/survival gear, write PEARL, DARCOM, ATTN: DRCPO-ALSE, 4300 Goodfellow Blvd., St. Louis, MO 63120 or call AUTOVON 693-1218/9 or Commercial 314-263-1218/9.





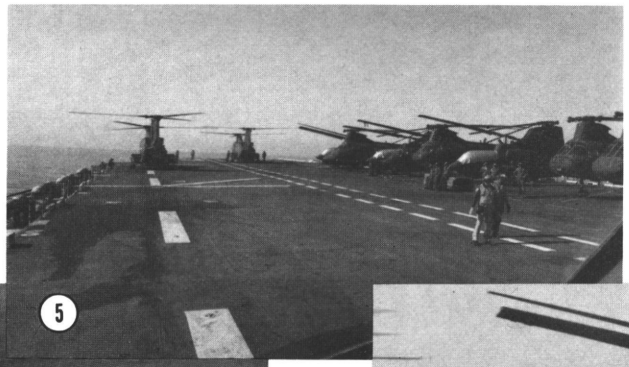


1. *Prelanding check complete. Lining up on the 45-degree angle stripe for Spot Five and looking for the LSE.*
2. *Called the break, right seat, and cleared to Spot Five aboard amphibious assault ship U.S.S. Belleau Wood.*
3. *Lining up for the final approach to the deck of the Belleau Wood.*
4. *Short final to Spot Five; closure rate good, LSE in sight.*
5. *We're in proper position to descend to the deck.*
6. *LSE signals to hold position on the deck while chains are attached to the skids and fuselage.*

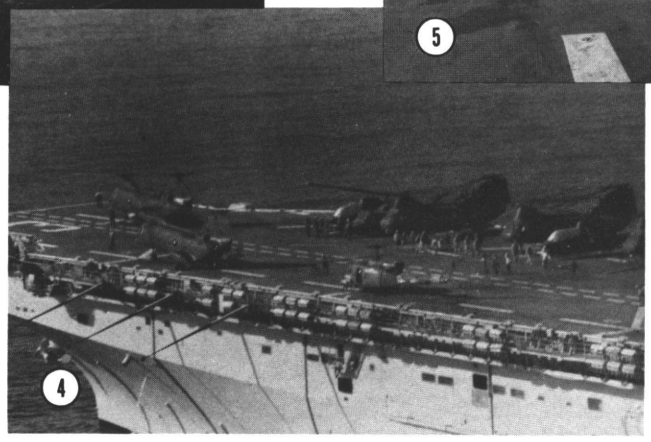
Flying with the U.S. Navy

photographs by
Major Lew Jennings

Army officers flying U.S. Navy helicopters serve as members of a Navy tactical air control squadron. Shipboard duties include writing, coordinating and monitoring daily air operations for the commander of the amphibious task force.



5



4

6

LTC Christopher D. Calhoon
Tactical Air Control Squadron Twelve
Naval Amphibious Base
Coronado, CA

MY TOUR AS AN Army aviator flying U.S. Navy helicopters is drawing to a close. Upon my departure I will have spent 10½ months at sea "haze gray and underway" in the Pacific and Indian Oceans. Ports of call have included Pearl Harbor (Hawaii), Subic Bay (Phillipines), Singapore, Hong Kong, Perth (Australia), Pusan (Korea) and Vancouver (British Columbia). I have flown and qualified as helicopter aircraft commander in the Navy's UH-1N helicopters off *USS Tripoli* (LPH-10) and *USS Tarawa* (LPH-1). Without fail, the following questions have consistently arisen: What and where is this job? How does one obtain this assignment? What is shipboard flying like? The following unveils this challenging and interesting assignment and answers many questions regarding duty with our other sea service.

While a student at Air Command and Staff College (CSC) in 1981, my assignment officer interviewed me and presented a whole series of hum drum, nonflying, career enhancing job "opportunities." I politely sidestepped them all and asked, "What about a job flying with the Navy on the west coast"? A former battalion commander had once spoken of this assignment and I had placed it in my memory bank. The assignment officer conceded there was such a billet available in Tactical Air Control Squadron Twelve, Naval Amphibious Base, Coronado, CA. The position requirements specified a major with a 15/54 specialty mix and average swimming ability to meet water survival requirements. There was competition for the job with other CSC officers voicing interest in the position. The good news, of course, was I got the job.

The bad news occurred after I received the assignment orders and discovered it was a nonflying billet. After my

hysteria subsided, I resolved not to be beaten. Upon arrival in Coronado I immediately began work at becoming placed on flight status; after 3 weeks of research, liaison visits, briefings and phone calls to DA I submitted the request packet through channels with staunch backing from my Navy chain of command. I immediately received telephonic permission to begin flying and in 3 weeks all four Army aviators assigned here on the west coast were placed on flight status. My love affair with a flexible "get the job done" Navy had begun.

Meanwhile my Navy predeployment schooling had commenced. I attended a series of courses related to amphibious operations at the amphibious school located on Coronado. After placement on flight status I attended water survival and flight physiology courses at Naval Air Station (NAS), Miramar, and deep water survival training and the helicopter instrument training school at NAS North Island. My UH-1N transition then began in "Tiger II," the *USS Tripoli's* sole assigned helicopter. Amphibious assault ships (helicopter aircraft carriers in laymen's terms), such as *Tripoli,* are assigned a Navy UH-IN for search and rescue and utility type missions. The other aircraft which deploy aboard the amphibious assault ships are U.S. Marine Corps aircraft organic to the landing force. In October 1981, just 4 months after my arrival, I completed formal schools training. The time had arrived for execution of assigned duties during our predeployment task force work-up exercises.

The Army officer's duties at sea are vital to the amphibious task force. The TOE (table of organization and equipment) job description of the Army officer's billet is "G3 air staff officer." He serves as a member of a Navy tactical air control squadron. This squadron is composed of Navy, Marine and Army aviators (predominantly 04 and above) and Navy enlisted air controllers. The squadron deploys detachments to sea aboard amphibious task force flagships for the purpose of controlling all fixed wing and rotary wing air assets. Generally, at sea the Army officer serves as helicopter coordinator responsible for control of all deployed rotary wing and AV-8 Harrier assets. Aboard ship he will work a 12- to 16-hour day writing and coordinating the daily air operations plan and monitoring daily helicopter operations for the commander of the amphibious task force. The task force will deploy with about six ships and will include one or two amphibious assault ships. The helicopter coordinator will oversee flight operations for about 22 helicopters and 4 Harrier aircraft (twice that number if 2 amphibious assault ships are in the amphibious task force).

One might ask, "Why an Army officer in such a position?" There are probably two reasons an Army officer has been assigned to Navy tactical air control squadrons. First, an Army officer becomes a valuable source of information if the task force is required to work with Army forces such as

7 *Navy CH-46 Frog landing supplies on the stern deck.*

8 *There isn't much room to maneuver on ships so aviators must be alert for LSE signals and watch for obstacles.*

9 *Air Boss, Commander Al Billings, samples fuel for contaminants. (Actually it's tea he's drinking to play a trick on this new Army guy.)*

occurs in operations off Korea. Second, an Army aviator brings with him a wealth of tactical expertise both ground and air which is unique among the various services. Even Marine Corps aviators are not normally branch qualified in a combat arm other than aviation as Army aviators have been heretofore. The ground and air qualified aviator is an ideal person to serve as the focal point for amphibious task force helicopter operations. Commander J.D. Anderson, commanding officer of Tactical Air Control Squadron Telve states: "Army aviators have been invaluable members of the squadron. The Army has always assigned topnotch officers who have brought a wealth of attack and assault helicopter expertise with them. They have a ground and air background which is ideal for the position of helicopter coordinator. Additionally, now that our Army officers are on flight status, they gain a firsthand knowledge of shipboard helicopter operating experience. They are fully qualified to provide the commander of the amphibious task force with staff recommendations on all facets of helicopter operations."

Preparation of the rotary wing air operations plan for an amphibious operation or even a day of normal flight operations is a complex task involving much coordination, launch, recovery, refuel, rearm, dearm, deck spotting of aircraft, passenger and cargo transfers, medical evacuation requirements, sling load preparation, ammo repositioning, weather and light data are some of the myriad planning considerations involved. The daily tempo of flight operations is generally rapid. Normally flight operations are conducted 8 to 12 hours a day. Shipboard life requires minor adjustment. Good meals, gray paint, tight spaces, close living quarters and long periods without mail become the norm. Happiness is drawing a flight hop and pulling pitch off the rolling deck. Normal missions at sea for the ship's utility helicopter include search and rescue, passenger, cargo and mail transfers and surface surveillance missions. Fair weather day shipboard flight operations are lighthearted fun. Foul weather night operations are a white knuckle affair. Under night no horizon conditions, the entire flight, except takeoff and short final approach, must be flown under actual instrument conditions. In heavy seas the rolling deck light of a smaller amphibious ship as an LPD, LST or LSD makes for an extremely challenging night approach and landing (cases of vertigo induced uncontrolled flight with last second recoveries are not uncommon).

Good flying, exotic liberty ports and a challenging position are the rewards of this Navy assignment. Without a doubt it is a very unique experience for an Army aviator. It has provided a firsthand education in Naval sea power and amphibious warfare, and a real world glimpse of the Soviet Navy in action. For the adventurous aviator major who disdains the desk, longs for the cockpit and yearns for faraway places, it's tough to beat a cruise with the U.S. Navy.

A COMMON THREAD that seems to run through a lot of aircraft accidents is a total disregard for safety procedures or emergency procedures. Why do aviators purposely place themselves in a situation where they're depending on luck to get them through? It seems to be the split second of indecision, having to think about what to do, that uses up the time available in coping with an emergency.

Not long ago, I remember having this conversation with one of my initial entry students. "I'll describe a situation for you," I said. "We're at the stagefield and we just turned from base to final to do a low level auto. We're still pretty far out getting set up, just as you begin to increase power to level off, the UH-1 yaws to the left and we start descending. The rpm light comes on and the audio is blaring in your headset. What do you think you'd do?"

I wasn't real sure what to expect from him; but I felt since he had been flying the Huey for some time (14 weeks), he should have some idea of what to do. While I was still waiting, I tried to decide if "scream" or "give you the controls" would be a correct answer.

"We're still descending," I said.

"I'd lower the collective," he said.

"The ground is getting real close," I said.

He never did volunteer any more ideas. I tried to explain that one day he may have to have that knowledge, along with the other emergency procedures, to be on the safe side.

Then the conversation continued. "I could have told you the emergency procedure for engine failure at low altitude if you had asked me. I have them memorized," he was sure of himself now.

"Okay," I said, "What is the emergency procedure for engine failure at low altitude?"

"Collective down and land."

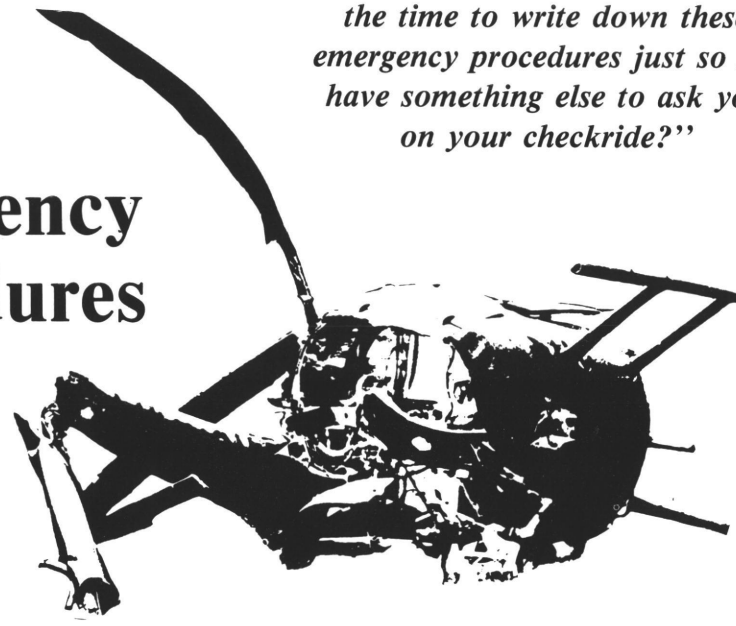
I know he could tell by the look on my face that his answer was incorrect. "Don't worry sir," he assured me, "there's a few more days before my checkride. I'll have them memorized by then."

CW2 (P) James Helton
62d Company, 6th Battalion
U.S. Army Aviation Center
Fort Rucker, AL

CW2 (P) Helton was assigned as an instructor pilot with Methods of Instruction Branch, Department of Flight Training, when he wrote this article.

Emergency Procedures

"Do you think someone took all the time to write down these emergency procedures just so I'd have something else to ask you on your checkride?"



I just put my head in my hand, I'm certain there were a few words I could say to him to make him understand how much importance he should put on knowing the emergency procedures, but I had to think about it. I decided to start from the beginning. "Remember when you first learned to talk?" He didn't, but I went on anyway. "Most of your dialogue consisted of repeating what someone told you to say. It got some laughs, but you had no idea what you were saying."

I explain how as he learned words and their meanings he was able to construct sentences and hold intelligent conversations. Because he used these words often he didn't have to stop and think about the word he wanted to use next, it just followed naturally.

"What does this have to do with emergency procedures," he asked? "I know how to talk."

I guess I could have argued that point, but we needed to get out and fly. "If you know your emergency procedures, really know them, you won't have to think about what steps there are and their proper sequence; it will come to you easily."

Another point I wanted to bring up was his motivation for learning them. "Do you think someone took all the time to write down these emergency procedures just so I'd have something else to ask you on your checkride?" I think I was finally starting to get through.

"No," he answered. "They put them in the operator's manual to give us procedures to follow in case of an emergency."

"So, if 6 months from now you're flying and have an engine failure, as long as it's not a checkride you're okay, right?"

"I see what you mean," he answered.

I only use this example because it's a good one. Initial entry students are not the only ones who study emergency procedures *just* for their checkrides. Take a look at the accidents we're having. There are a lot of other aviators who don't know enough about the machine that they're flying to save themselves, much less the unfortunate person or persons with them.

Think of it from an employment standpoint too. If a typist can't operate a typewriter, he or she probably won't keep the job long. It's probably pretty safe to say that a ribbon failure wouldn't be fatal, but the boss would probably want to hire someone who could overcome that problem.

Granted, there is no operator's manual that can cover every situation we might encounter, but wouldn't you agree, the more you knew about how to cope with an emergency, what the symptoms were, what you might expect, the better your chances?

The following Hotline numbers can be called on official business after duty hours. They will be updated and reprinted here periodically for your convenience. If your agency has a Hotline it would like included, please send it to: *Aviation Digest,* P.O. Drawer P, Ft. Rucker, AL 36362.

	AUTOVON	Commercial
Aviation **Ft. Rucker, AL**	**558-6487**	**205-255-6487**
Camouflage **Ft. Belvoir, VA—R&D Center**	**354-2654**	**703-664-2654**
Engineer **Ft. Belvoir, VA**	**354-3646**	**703-664-3646**
Field Artillery **Ft. Sill, OK—ARTEP** **Redleg**	**639-2064** **639-4020**	**405-351-5004** **405-351-4020**
Fuels and Lubricants **Ft. Belvoir, VA—R&D Center**	**354-3576**	**703-664-3576**
Health Sciences **Ft. Sam Houston, TX—Training**	**471-4785**	**512-221-4785**
Infantry **Ft. Benning, GA—ARTEP**	**835-4759**	**404-545-4759**
Intelligence **Ft. Huachuca, AZ—Training**	**879-3609**	**602-538-3609**
Maintenance and Supply **Tobyhanna Army Depot, PA**	**795-7900**	**717-894-7900**
Missiles and Munitions **Redstone Arsenal, AL**	**746-6627**	**205-876-6627**
Ordnance (Help Line) **Aberdeen Proving Gnd, MD**	**283-4357**	**301-278-4357**
Quartermaster **Ft. Lee, VA**	**687-3767**	**804-734-3767**
Signal **Ft. Gordon, GA**	**780-7777**	**404-791-7777**
Transportation **Ft. Eustis, VA**	**927-3571**	**804-878-3571**
Turbine Engines **Corpus Christi Army Depot, TX**	**861-2651**	**512-939-2651**

AVIATION PERSONNEL NOTES

Major Thomas F. Stewart
Officer Personnel Management Directorate
U.S. Army Military Personnel Center
Alexandria, VA

The Aviation Branch—What Took Place in MILPERCEN

Over the last 10 years, the commissioned officer's ability to pilot an aircraft has evolved from an additional skill to a specialty. As a result of formal studies of the field of Aviation, the decision was made by the Secretary of the Army on 12 April 1983 to form an Aviation Branch. Aviation is now a combat arm basic branch of the United States Army and is composed of commissioned, warrant officer and enlisted members of the Aviation community. The scope of this article is limited to the actions taken within the Officer Personnel Management Directorate (OPMD) of Military Personnel Center (MILPERCEN) to implement the new branch for the commissioned officer population.

Following the branching decision by the Secretary of the Army, the Chief of Staff of the Army signed the Aviation Branch Implementation Plan on 6 June 1983. This plan provided for the automatic transfer of officers who held Specialty Code (SC) 15 or 71 without an additional specialty (ADSPEC) and those possessing SC 15 or 71 in combination with a nonaccession specialty (e.g. 41, 43, 45, 46, 48, 49, 51, 52, 53, 54, 97) to the Aviation Branch.

On 26 September 1983, the Deputy Chief of Staff for Personnel (DCSPER) approved a MILPERCEN plan for transferring the existing population of commissioned aviators. Letters were sent to more than 5,200 officers involved in the automatic transfer (SC 15 and 71 with no additional specialty and with nonaccession ADSPECs). This action was completed in late December 1983.

The earlier version of the transfer plan approved by the DCSPER specified that dual combat arms (SC 15 in combination with other combat arms specialties) would not be permitted. The unpopularity of this "dual combat arms resolution" caused all dual accession letters to be held in abeyance pending final resolution by the Vice Chief of Staff of the Army (VCSA).

On 5 January 1984, the VCSA decided that dual combat arms would be permitted for the existing force and that affected officers would be allowed to hold the career branch of their choice. This decision precipitated a review of the procedures being used to transfer existing dual accession specialty holders.

At the same time, the Senate Appropriations Committee was examining the payment of Aviation Career Incentive Pay to the Aviation community. This fact, in combination with the formation of the new Aviation Branch, caused the DCSPER to seek a redefinition of Aviation service. The new definition added the requirement for an officer to be a member of the Aviation Branch to be entitled to continuous Aviation Career Incentive Pay. Officers who are not members of the Aviation Branch will draw incentive pay only while serving in operational flying positions. The existing gate system, however, remains in effect. This redefinition of Aviation service was staffed with The Judge Advocate General and approved by the VCSA on 16 March 1984.

The approval of the new Aviation service policy permitted the release of the letters to the dual accession officers and this action was completed this past April. The revised letters explained the new Aviation service policy, contained a MILPERCEN branching recommendation and solicited the officer's desires in the branch transfer action. SC 15 will be the initial specialty of all commissioned officers in the Aviation Branch. SC 15 may be held as an additional specialty by those officers who chose to remain outside the Aviation Branch. In addition, Specialty Code 71 will be a nonaccession specialty. Officers holding SC 71 in combination with an additional specialty have been transferred to the Aviation Branch with the specialty skill identifier of 15T. Specialty Code 71 officers who did not

possess an ADSPEC were transferred to the Aviation Branch as SC 15/71 officers. In the future, SC 71 will be awarded as an additional specialty to those SC 15 officers who are selected to enter the Aviation Logistics career field. This will normally take place after the officer has served in an initial Aviation assignment, attended the Aviation Officer Advanced Course at Ft. Rucker, AL, and the Aviation Logistics Officer Course at Ft. Eustis, VA.

On 2 April 1984, all the records of SC 15 and 71 officers were moved to the Aviation Branch. MAJ Hank Hostetter from the Transportation Branch was reassigned to the Aviation Branch. He is responsible for the management of all Aviation Logisticians in the grades of O1 through O5 in the Aviation Branch. As the Aviation officer in the field responded with his or her branching desires, final disposition was made of that officer's records. It is important to note that the branching decision of the officer did not interfere with pending personnel actions and every effort was made to ensure continuity of operations within the Officer Personnel Management Directorate during this period of transition.

Changes to the Officer's Record Brief have been "top-loaded" by OPMD and there was no requirement for the local military personnel office to initiate any changes to these documents.

The centralization of all commissioned officer aviators in the Aviation Branch of the Combat Arms Division of OPMD is a tremendous step forward in the management of the commissioned aviator. Here at MILPERCEN, the goal is to professionally develop the commissioned aviator through assignments and training into a fully integrated member of the combined arms team.

Career Management Field (CMF) 67 Reclassification Update

The major enlisted reclassification effort, affecting more than 3,200 soldiers in the Aviation Maintenance military occupational specialties (MOSs), has been officially delayed until 1 July 1984, in accordance with military personnel office message number 84-117 DTG 311201Z January 1984. The Aviation Maintenance (CMF 67) reclassification was to take effect 1 April 1984, per change 20 to AR 611-201, and DA Circular 611-83-1 dated 1 August 1983.

The delay is necessary because installations failed to properly document the changes in the authorization documents. Most of the problems in the documentation process involve the misapplication of the standards of grade authorizations, especially in the distribution of crewchiefs; MOS 67 and 67W series MOS technical inspectors (TI) remain in documents (these positions must be redesignated to a 66 series MOS); an apparent stacking of supervisors (i.e. four E6s with only eight subordinates) in some units.

A team comprised of members from the Aviation Branch—the Military Personnel Center and Aviation Logistics Center, Ft. Eustis, VA, conducted worldwide briefings from September 1982 through June 1983. This team visited all major installations on two separate occasions, conducting briefings to the staff and all Aviation soldiers, in addition to leaving surveys for each soldier affected by the revision to fill out. On the second visit, this team collected the surveys and conducted onsite interviews with the affected soldiers. During July 1983, this team met in Washington, DC, to analyze the surveys, the interview data and extract of personnel records. This was done to determine which MOS the grade E7 67Z and 67W soldiers should be reclassified into (predominate aircraft experience), and to determine which soldiers in grades E5 and E6 have performed extensive periods as narrow-range TIs who would most easily transition into the new 66 (Technical Inspector) MOSs.

Personnel officers are reminded that, in accordance with Appendix A (pages A-9 and A-10), DA Circular 611-83-1, each installation will be provided a by-name listing of personnel to be reclassified. Detailed reclassification instructions will be provided when the authorization documentation is determined to be adequate. No Aviation Maintenance soldier will be reclassified under this effort until the list is released from MILPERCEN.

The only exception to this delay in reclassification is for soldiers who are currently attending the 66 course at Ft. Eustis.

These soldiers will be awarded the appropriate 66 series MOS by the Army Aviation Logistics Center upon completion of training.

Until these problems are resolved, the documentation of CMF 67 will be continually reviewed by the Soldiers Support Center, as directed by the Deputy Chief of Staff for Personnel at the Department of the Army. This will allow for a smooth transition to the new structure and form a basis for accession, training and promotion of Aviation Maintenance soldiers.

THREAT

Mr. Ed Bavaro
Threat Branch
Directorate of Combat Developments
U.S. Army Aviation Center
Fort Rucker, AL

Soviet Combat Helicopters Today

THE SOVIETS' practice of providing close air support to their ground forces was polished to a fine art during World War II when the IL-2 Stormovik ground attack fighter became the scourge of the battlefield. As the primary ground support aircraft, the IL-2 was particularly feared by the Germans for its effectiveness in antiarmor roles. The ground support mission in Soviet doctrine remains as important today as it did then. An important part of the ground support mission is being performed by armed helicopters. In the 1960s and the early 1970s, an intense debate took place in the Soviet Union concerning the role of combat helicopters in their combined arms doctrine. The brain trusts of their military academies, institutes and senior staffs who were responsible for most of the study and formulation of Soviet military art rendered a positive judgment for helicopters.

The Soviets, who had previously regarded the helicopter only as a transport vehicle suitable for rear area logistical support, have since the early 1970s virtually rewritten the manual on the uses for the helicopter. The missions for their helicopter fleet have been dramatically expanded so that helicopters have become indispensible in Soviet military operations and play a major role in offensive tactics. The attack helicopter is held in high esteem because the Soviets, so preoccupied with the offense, recognize that its speed, mobility and firepower can help them to achieve their goal of deep-striking, fast-paced operations while providing commanders with exceptional flexibility. The attack helicopter that has been the backbone for this doctrinal changeover is the Mi-24 Hind. The popular Hind has so impressed senior Soviet officers with its versatility and performance that they have nicknamed it the Stormovik.

Attack helicopters are, in large measure, replacing fixed wing aircraft in providing close air support for Soviet ground forces. Soviet commanders appreciate the fact that the helicopters can operate over the battlefield in more adverse weather than fixed wing aircraft, which even in good weather may have to deal with the more pressing problem of self-preservation. The Hind helicopters' array of cannons (or machineguns), rockets and missiles permits them to readily respond to either thin-skinned or heavily armored vehicles. These "guard dogs" of the ground forces carry such an impressive ordnance load that it reminds one of the A-1E Skyraiders our Air Force flew in Vietnam.

The Soviet dictum that "the primary task of all Soviet fires at the forward edge of own troops (the Soviet version of FLOT, or forward line of own troops) is the suppression of enemy antitank systems" indicates the value they place on their tanks. They consider tanks one of their most important weapons and they intend to protect them. Their affection for the tank has carried over to the attack helicopter and why not, according to Viktor Suvorov. In his book, *Inside the Soviet Army,* Suvorov states, "Soviet generals believe that to all intent and purposes the helicopter is a tank." Their highest priority will be area suppression of ground-based antitank guided missiles (ATGMs), especially subduing the mobile ground tube-launched, optically-tracked, wire-guided (TOW) missile teams. They have trained extensively in antiarmor operations with these flying tanks since North Atlantic Treaty Organization (NATO) armor numerically poses the biggest threat to their armor.

The Soviets' current enthusiastic use of large T-72/T-64 (and now T-80) armor formations heavily supported by Mi-24Es is a flashback to the heyday of the IL-2 and the T-34 in World War II. Many recent exercises have highlighted this technique. A good example was the exercise held near the Baltic Sea during September 1981 called "ZAPAD (West) 81." It featured massed T-72s and Mi-24Es in a tactic called "bold thrust" that called for a coordinated and decisive breakthrough and deep penetration.

A growing concern that the Soviets have wrestled with for some time is the increasingly imposing threat of NATO attack helicopters. The technological advances in lethality, accuracy and speed of the ATGMs they carry amplifies the importance they will play against Soviet armor. More importantly, these elusive aerial platforms, operating with a degree of imperviousness against many Soviet air defense systems, will require the attention of Soviet attack helicopters in anti-helicopter roles. The Soviets feel that less than 40 percent of battlefield exposures of attack helicopters are

Soviet Helicopters

detected by enemy troops and less than 33 percent detected by fixed wing aircraft. MG M. Belov, the leading Russian advocate for helicopter employment, specifically detailed this problem in his 1979 article "How to Fight Helicopters" (see October 1981 *Aviation Digest*). He stated there was a need for special mobile radars with a high capability for detecting and tracking low altitude air targets. To combat unexpectedly appearing enemy helicopters, he said antiaircraft guided missile systems need to be mounted on tanks, infantry fighting vehicles and armored cars to provide air protection. And, we are seeing precisely that more and more. General Belov also talked of using antitank projectiles on helicopters that could be used against ground fighting vehicles and against helicopters. The AT-6 Spiral carried on the Hind-E, which may be the best ATGM in the world today, certainly fits the bill quite well.

The Soviets have a preference for using helicopters for immediate, time-sensitive strikes close to friendly forces. The reduced logistic requirement of combat helicopters, compared to those of fixed wing aircraft, very often allows deployment close to the main battle area, which enhances their ability to respond to on-call missions. The Soviet airspace management is an intricate and potentially fragile network. The ability of Soviet helicopters to operate under and within the constraints of the Soviet air defense system much more easily than high performance fixed wing aircraft means that their commanders can expect combat helicopters to handle a greater share of the close air support work near the FLOT.

The Soviets indicate that helicopters have other advantages over high performance aircraft, such as being better able to concentrate and maneuver covertly for a strike and, more importantly, *helicopter pilots have an enhanced capability to more rapidly and correctly evaluate battlefield conditions,* operating as they do in a more ground-oriented environment than an air environment. This is consistent with their view—helicopter survivability and effectiveness in battle depends greatly on close and well-organized coordination with ground troops.

To facilitate that close coordination, they have restructured tank and motorized rifle divisions with their own organic helicopter squadrons that include attack helicopters. Included in the Soviet expansion of rotary wing assets are an increasing number of independent attack helicopter regiments. These regiments are apparently a principal component of what the Soviets refer to as Army Aviation and they are generally subordinate to combined arms army and tank army commanders. This is a highly significant change in policy. Since 1942, aviation assets have been centralized under Air Force control. Close air support aircraft were removed from the direct control of ground commanders and placed in frontal aviation organizations. Now those blue-suiters in the divisional helicopter squadrons provide commanders a highly responsive and potent combat force which greatly reduces air-ground coordination problems.

The Soviets consider aerial delivery of ordnance close to friendly forces as one of the more complex problems of modern combat. They feel this decentralization helps reduce the complexity. We can expect this decentralization trend to continue with regard to rotary wing aircraft despite Air Force objections. Soviet ground commanders like these "flying tanks."

The powerfully armed Hind is particularly well-suited for its close air support missions. It employs state-of-the-art Soviet technology for survivability. It has exceptional armored shielding for the pilot and gunner beginning with the windshield, which reportedly affords protection against 12.7 mm caliber projectiles. Each crewmember is surrounded with an outer layer of armor that is a structural component of the airframe and an inner tub of armor serving as a backstop reinforcing the overall protection of the crew. Separating the two cockpits is an antifragment blast shield. Some armor protection is also provided for the engines, fuel tanks and the forward underside of the fuselage.

Total weight of all this armor protection, which includes some titanium, is in excess of 1 ton! The large FOD (foreign object damage) covers familiar to the

Hind-E protect the engines from ingestion of potentially damaging foreign matter and also serve to reduce the pronounced acoustical signature of the engines and to help suppress infrared radiation emissions. The Hind incorporates a camouflage motif paint scheme intended to help them blend in with the landscape of that horizontally oriented battlefield. Low flying helicopters are difficult to distinguish when flying over broken terrain with rapidly changing color patterns. If there is any haze, horizontal visibility is even further reduced. These helicopters will live in the field and be maintained in the field in closer proximity to the front than their fixed wing counterparts, and any means that will enhance survivability (such as camouflage paint) will be used.

The Hind is postulated as having a radar warning system that probably has a four-quadrant capability similar to that employed by Soviet fixed wing aircraft. The warning system will alert the pilot that his aircraft is being tracked by radar (ground-based or aerial platformed) and allow evasive maneuvering to break lock. These measures of survivability, as well as other known efforts, represent a concerted effort by the Soviets to reduce the vulnerability of their attack helicopters and by so doing increase their effectiveness as close air support assets. This is borne out by reports from Afghanistan that depict the Hind surviving small arms fire, especially in head-on engagements. These reports provide evidence that some Hinds survived hits from 12.7 mm caliber projectiles and even larger caliber systems in some instances.

The Soviets are not standing pat with the Hind. Suvorov writes, "Knowing the affection which Soviet marshals have for their helicopters...even better variants of these flying tanks will appear in the next few years." They are developing a dedicated attack helicopter devoid of the inherent limitations and handicaps of a multipurpose helicopter (like the Hind) optimized as an attack helicopter. You may be curious as to what this new aircraft will look like. They make no bones about it and flatly state it will look like our AH-64 Apache. The Soviets are convinced that the present balance of combat power is in the helicopter's favor. They have learned from the U.S. experience and from their own that the *helicopter often spells the difference between victory or defeat.* Soviet commanders are now expected to know the capabilities of fire support helicopters as well as they know the capabilities of their artillery. The Soviet Army newspaper *Red Star* in reporting on the merits of the helicopter in antitank operations, states that the correlation from exercises shows, in tank and helicopter losses, as much as 19:1 in favor of the helicopter. In our early scenario wargaming, evaluations of the HELLFIRE produced a 19:1 ratio as well. The Soviets have found the helicopter to be virtually invisible to a tank at 3,000 meters because of the slim frontal area (head-on), yet it can launch missiles from well outside the lethality range of that tank. Suppression of the defender's antitank weapons, especially aerial platform and tank weapons, is essential; otherwise, the high-speed offensive is unthinkable. General Belov suggested that helicopters are the most effective means of fighting helicopters; the Soviet hierarchy in developing a dedicated attack helicopter obviously are of the same opinion.

The Soviets have usually attempted to make up with weaponry what they lack in tactics or experience. In the combined arms area, they are earnestly striving to find out just how the helicopter best fits into their operational scheme. Practically every major exercise that they conduct addresses various rotary wing applications. At the unit level, they are refining their attack helicopter operations. The general perception is that they merely employ fixed wing style running fires from altitude. While they do practice that method, and do use it in Afghanistan, it is exercised only when opposition is light. Soviet attack helicopters will use woods and ridges for pop-up attacks.

The pop-up tactic is typically used for virtually all close air support missions. They approach the target concealed behind masking terrain features, pop-up suddenly from 5 to 10 meters or up to 20 to 100 meters as appropriate, fire at targets up to 5,000 meters away

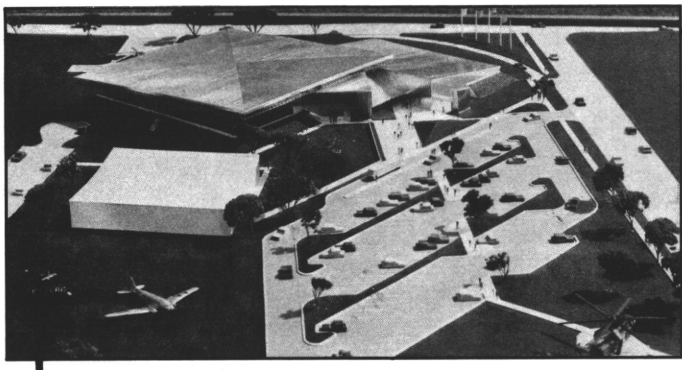
Soviet Helicopters

and then remask. With their AT-6 ATGM, they can pop-up, acquire the target and fire the missile which will travel 5,000 meters in 10 seconds. The gunner holds the crosshairs on the target until the missile impacts. Then the pilot remasks and relocates. The whole engagement should not exceed 20 to 30 seconds.

Soviet combat helicopter crews train individually, in pairs or in larger groups by attacking different kinds of targets under varying weather conditions. The basic flying unit for helicopters is a four-ship formation. The basic fighting element is a two-ship formation. They practice low-level navigation and attack runs from different positions using all weapon systems. Doppler measuring systems used in conjunction with an onboard map display greatly assist in guiding crews to a given area and, with its autopilot flight control system, the workload on the crew is reduced.

The Hind is an excellent helicopter for providing close air support to Soviet ground forces. Its variety and volume of weaponry and especially the swift and lethal AT-6, make it a particularly effective fire support and antiarmor system. As to the Hind's capability in an antihelicopter role, there are so many plus and minus considerations that an objective assessment becomes difficult. But their continued refinement of combat *helicopter tactics* has tended to dilute the one significant advantage the United States has enjoyed over the Soviet ground forces. No longer can the United States proclaim unquestioned dominance with respect to the conduct of heliborne operations.

Will the AH-64 Apache restore our preeminence based upon superior rotary wing hardware, or will it merely provide parity with the Soviet's new attack helicopter?



Army Aviation Museum Construction to Start

The Army Aviation Museum Foundation met 8 May and approved the final plans for construction of the U.S. Army Aviation Museum at Ft. Rucker, AL.

According to COL Howard E. Brown (Ret), director of development, the museum will be incrementally built in two phases. The first increment of phase I is scheduled to begin sometime in the spring of 1985, pending final plan approval by the U.S. Chief of Engineers Office in Washington, DC. Construction of the remainder of phase I, and all of phase II, will be started when resources become available.

The first increment of phase I includes the entrance, 40,000 square feet of display area, a gift shop and the parking lot. This construction is estimated to cost $1.2 million and will be located on the corner of Andrews Avenue and Headquarters Road at Ft. Rucker.

Any organizations or individuals interested in contributing to the museum fund may mail contributions or pledges to:

The Army Aviation Museum Foundation, Inc.
Post Office Box H
Ft. Rucker, AL 36362

For further information, contact COL Howard E. Brown, director of development, at (205) 598-2508.

Oil Analysis Video Training Tapes Available

THE PROGRAM MANAGER for the Army Oil Analysis Program (AOAP), U.S. Army DARCOM Materiel Readiness Support Activity, Lexington, KY, recently produced, in association with the Ft. Knox TV studio, a series of AOAP training tapes. One tape covers aeronautical Army oil analysis sampling procedures, and another depicts nonaeronautical sampling procedures. A third tape provides a tour of an AOAP laboratory, and the fourth tape features the unit and installation monitor and emphasizes the need for teamwork among all who are involved with the program.

To obtain a copy (or copies) of each program, simply follow these steps:

- For each program desired, obtain a blank tape (3/4 inch, U-MATIC, 30 minutes in length, one blank tape per copy) from your local Training Audiovisual Support Center (TASC).
- Complete a DA Form 3903, Training-Audiovisual Work Order. Specify the program authorization number (PAN) and title of each tape desired and the quantity for each (the PAN for each tape is provided in the synopsis below).
- Mail the DA Form 3903 along with the blank tape(s) to:

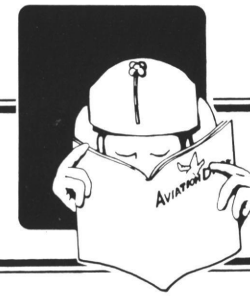
Commander
U.S. Army Armor Center & Fort Knox
ATTN: DPT-TASC-TV Branch (Mrs. Greer)
Ft. Knox, KY 40121

- Be sure to include your return address. The Ft. Knox TV studio will copy, at no charge, the desired program onto each blank tape submitted and return the tapes to you at the address provided. If you cannot obtain the required blank tapes through your local TASC, contact the Ft. Knox TV studio videotape librarian (Barbara Greer) at AUTOVON 464-3725/6745/6146 or commercial (502) 624-3725/6745/6146 for further instructions.

A synopsis of each tape is provided below:

- **Aeronautical AOAP Sampling Procedures (PAN A0515-84-0017).** Covers the oil analysis process for aeronautical equipment from sampling through the administrative details and record-keeping processes and laboratory interface to maintenance recommendations and feedback. The program features a look at the sampling supplies required for aeronautical sampling; the tube and drain method of drawing a sample from a UH-1H Huey; the proper way to complete a DD Form 2026, Oil Analysis Request; and instructions on how the soldier should respond to both normal and abnormal laboratory findings. The need for effective and timely action and response from people in the field is stressed. The importance and uses of maintenance feedback are discussed.
- **Nonaeronautical AOAP Sampling Procedures (PAN A0515-84-0011).** Covers the oil analysis process for nonaeronautical equipment enrolled in the AOAP. Highlights the same features mentioned in the paragraph above as they apply to nonaeronautical sampling.
- **A Tour AOAP Laboratory (PAN A0515-84-0028).** Provides a complete description of how the oil analysis laboratory processes and analyzes both aeronautical and nonaeronautical oil samples. Each lab test is performed and demonstrated; laboratory support of the customer in the field is highlighted. This includes how the customer is advised of test results, how maintenance recommendations are made and feedback used and how monthly management reports are prepared and used. The AOAP Standard Data System is also featured.
- **The AOAP Team (PAN A0515-84-0029).** Provides a discussion and characterization of the roles of several key people in the oil analysis program, with a feature on the unit and installation monitor. Management responsibilities at the command level are also discussed. The purpose of the videotape is to depict the different types of people involved in making the program work and to demonstrate the teamwork required to make AOAP a success. BG Ellis D. Parker, assistant division commander for operations, 101st Airborne Division (Air Assault), Ft. Campbell, KY, stresses the need for teamwork in his introductory and closing remarks.

VIEWS FROM READERS



Editor:

The Army Modernization Program involving the CH-47 medium helicopter has surfaced an old problem, the flight engineer/crewchief duties and training.

The CH-47D helicopter has been upgraded with new systems and capabilities to support the soldier in the field. Its missions can vary from routine to multiple stops with internal and external cargo. The maintenance manhours have been reduced by better designed and reliable systems. A new inspection system to be implemented in FY 1984 will further enhance availability. These new improvements have greatly aided the pilots and maintenance personnel. Transition from the current models of CH-47s to the D model is assisted by pilot and maintenance training, stressing improvements, test equipment and characteristic changes.

An individual who has not been mentioned and has been impacted most from the modernization is the flight engineer/crewchief. His in-flight responsibilities have increased to the point of monitoring the condition of hydraulic pressures, temperatures, fluid levels, chip lights, transmission pressure, overtemperature lights, hydraulic pump fault lights and filter indicators. This panel is located in the aft section of the cabin and is solely the enlisted crewmember's responsibility. The modernized Chinook has closed circuit refueling, flare dispensers and three external hooks. These are a few of the improvements that he is responsible for, but there are more than 40 additional duties that are identified as the flight engineer/crewchief responsibility on the CH-47, many being safety and emergency in nature.

Current practice is for the above duties to be learned through on-the-job training. Formal training is not available to train a crewchief as to his duties as a part of the flight crew. Tasks that 67U mechanics are trained for during formal training do not correspond to in-flight crew duties. Currently E3s, E4s and E5s with only 67 mechanic training are assigned as crewchiefs in many CH-47 units.

Unit developed training programs to prepare individuals selected for crew duties will vary from unit to unit. With no standard or guide to what is expected, some units have developed good internal programs while other units do the best they can.

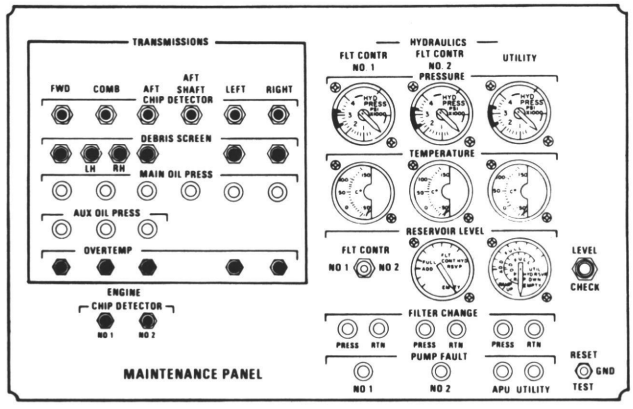
The time has come to recognize the flight engineer/crewchief for what he does as a part of the total flight crew on the CH-47D and other aircraft. Aviators are trained and checked annually to ensure their proficiency and they have a guide of tasks required of them. No such complete evaluation, task reference or job description exists for the crewchief. Statistics exist on accidents attributed to crewchiefs that may or may not be related to training or knowledge of crew duties. These statistics reflect more than 50 percent of CH-47 accidents were attributed to the enlisted crewmember, costing more than seven million dollars in the past 7 years.

A task analysis is being developed by the Aviation Logistics School and a request has been submitted by Aviation Systems Command to identify the CH-47D flight engineer/crewchief with an additional skill identifier.

The time has come to recognize this individual as a part of the total flight crew on all Army aircraft.

SGM Joseph Jordan
Materiel Introduction Division
Field Services Activity
U.S. Army Aviation Systems Command
St. Louis, MO

MAINTENANCE PANEL



INDICATES MAGNETICALLY HELD, LATCH TYPE DISPLAY. NORMAL DISPLAY IS BLACK, FAULT DISPLAY IS BLACK AND WHITE FAN.

INDICATES CONVENTIONAL LAMP DISPLAY.

Editor:

I have read parts two and three of "Soviet Air Defenses Against Attack Helicopters" by LTC Brian P. Mullady. These articles appeared in the June 1982 and August 1982 issues of the *U.S. Army Aviation Digest.*

After reading these two parts, I have a great interest to read Part I of this article. Unfortunately, I do not have access to back issues of the *Digest* and am therefore unable to locate the article.

Could you possibly assist me in locating the missing part to LTC Mullady's article? Your assistance in this effort would be most gratefully appreciated.

Arthur R. Holliday
Hephzibah, GA

Editor:

I am a 16-year-old English boy who would like to correspond with a U.S. Army aircrewmember. Please write to:

C. R. Edwards
24 Fichtenweg
4179 Weeze 1
F.R.G.

Editor:

Please send me a copy of "British Light Helicopter Operations During the Falkland Islands Campaign: Part I, The Deployment."

Thank you for your assistance.

MAJ Thomas J. Costello
Ft. Leavenworth, KS

Editor:

I would like to make a few comments on your article on Change 1 to AR 95-1 in the October 1983 edition. The paragraph on maintenance operational checks contained an error in that the person performing the MOC signs it off on DA Form 2408-13, not DA Form 2408-12. Also, the person signing off the MOC must be on written orders, signed by the commander, that specify the type or types of checks permitted. The proper entry in block 18 of DA Form 2408-13 is "MOC OK" followed by the calendar date the check was completed. If the MOC is not "OK," the faults and/or reasons will be recorded on the next open line of block 17.

I would also like to take this opportunity to compliment you on what I think is a fine and very informative magazine. Keep up the good work.

SFC Gerald L. Ruud
Quality Control Supervisor
D Trp, 4/12 Cav
Ft. Polk, LA

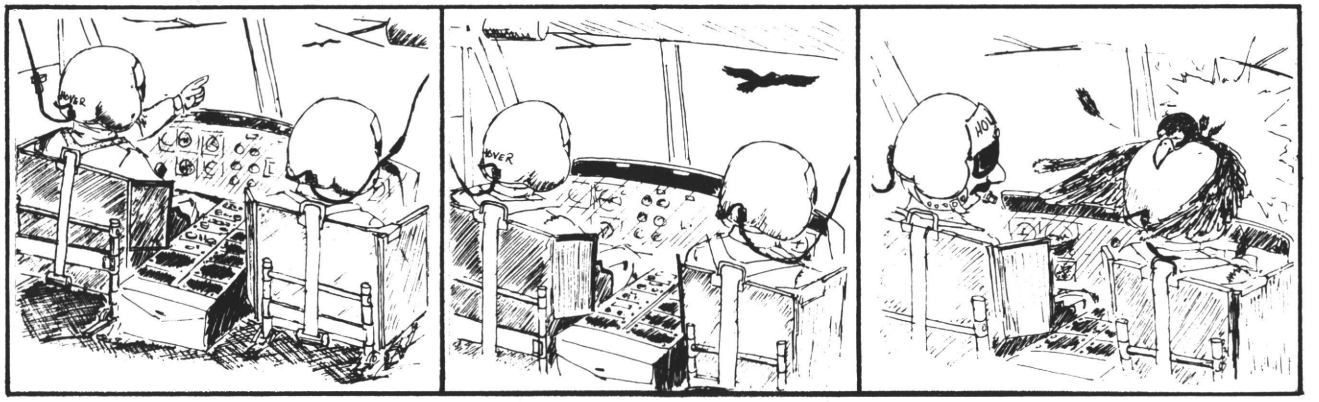
• **The *Aviation Digest* received the following response to your letter from the Directorate of Evaluation and Standardization at the Aviation Center: "You are absolutely correct in stating that the person performing the maintenance operational checks signs off on the DA Form 2408-13. Any faults found during the MOC will be recorded on the next open line of block 17. We certainly appreciate your comments. Such interest adds to the professionalism and accuracy of our *Aviation Digest*."**

Correction

In the March 1984 issue of the Aviation Digest the address for further information on cost estimates for strategic pre-positioning given in the article "Strategic and Tactical Pre-Positioning of Army Aircraft," contained an error. The correct address is: Commander, AVSCOM, Directorate for Plans and Systems Analysis DRSTS-BAR, Attention: Mr. Valentin Berger, 4300 Goodfellow Boulevard, St. Louis, MO 63120.

Articles from the *Aviation Digest* requested in these letters have been mailed. Readers can obtain copies of material printed in any issue by writing to: Editor, *U.S. Army Aviation Digest,* P.O. Drawer P, Ft. Rucker, AL 36362

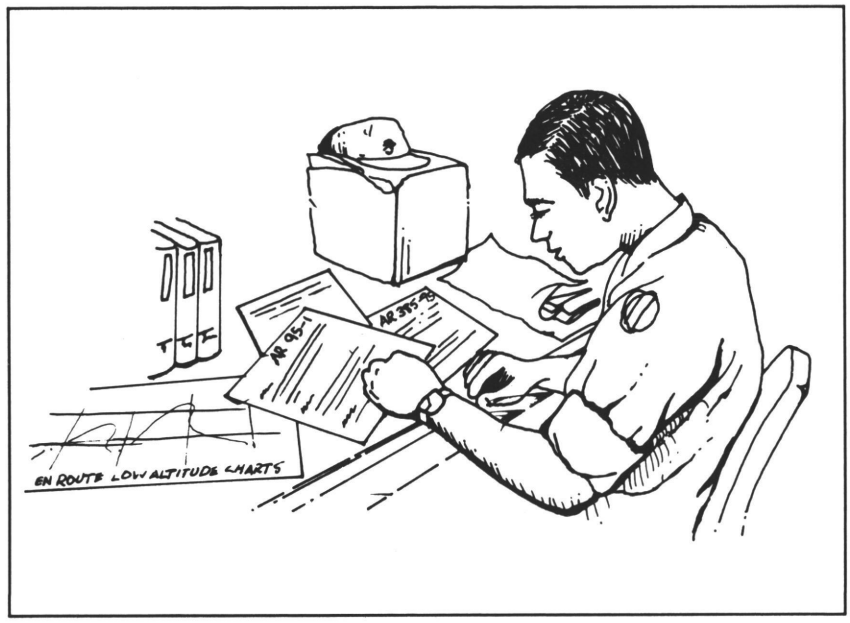
Charlie Hovee "IP"



Hey, see that buzzard over there? Head for it and I'll give you a quick demonstration on bird encounter and avoidance procedures.

In my many, many years of Aviation experience I've always said that if you keep your course straight and don't alter, the bird will realize this and move out of the way, thus avoiding a possible collision!

Well, it works most of the time anyway.



1984 ANNUAL WRIT

THROUGHOUT ITS history, Army Aviation has experienced dynamic growth, yet no year has been more significant than 1983: Aviation was designated a combat arms branch by the Chief of Staff of the Army, and the U.S. Army Aviation Center, Ft. Rucker, is now the proponent for Army Aviation. To even the most casual observer it should be obvious that Army Aviation has endured a critical phase of evolution and stands now on the brink of an era that is unparalleled in its 42-year history.

In keeping with this evolutionary trend, the 1984 Army Aviation Annual Written Examination called the "Annual Writ" has undergone scrutiny, emerging as a significant link within the unit training program. While the basic structure of the Annual Writ remains the same, aviators will discover an increased emphasis in such areas as safety, standardization and tactics. "Why the shift?" you ask.

The Annual Writ had been a subject of concern during past meetings of the Army Aviation Policy Committee. The major concern was that the examination was redundant and, therefore, of questionable value, given all of the other requirements of the Annual Aviation Proficiency and Readiness Test (AAPART). As a result of this concern, the Aviation Center was tasked to conduct an in-depth analysis of the Annual Writ to determine the objectives of the examination and to redesign it as necessary to support these objectives. A summary of this analysis was featured in the September 1983 *Aviation Digest*.

Mr. Curtis Frazier

The defined objectives of the Annual Writ were described as follows:

- To serve as an individual and unit training indicator to be used by commanders for their training plans.
- To provide a vehicle for emphasizing changes in Army Aviation information such as regulations, doctrine, flight procedures, new equipment and safety.
- To serve as a tool for the individual aviator to aid his/her preparation for other AAPART requirements.
- To provide the individual aviator an annual refresher training session.

In keeping with the guidance provided by the analysis, and under the auspices of the Annual Writ Policy Board, the 1984 Annual Writ has been redesigned to better accommodate these objectives.

Although the content of the 1984 Annual Writ differs somewhat from its predecessors, the format remains essentially the same. Each exam consists of 50 multiple-choice questions and is oriented toward the tasks and combat missions described in the respective aircrew training manual (ATM). Examinees must score at least 70 percent to meet the AAPART requirement. Army Regulation (AR) 95-1 specifies procedures for taking the exam and for retesting, in case of a failing grade.

Test control officers (TCOs) are designated within each unit to administer the Annual Writ. TCOs provide feedback to aviators when individual strengths and weaknesses are identified. They also notify commanders when *unit* strengths or weaknesses are identified. TCOs are responsible for controlling the principal components of the Annual Writ to include the exam booklets and reference data booklets (RDBs).

Exam booklets contain instructions, exam questions, performance charts, and weight and balance charts. Some versions contain weather forecasts, flight plans and notices to airmen for use in answering the applicable instrument flight questions.

The Annual Writ is actually 24 different examinations. There are four versions for each type aircraft for which an ATM is published. The list includes:

- Observation Helicopter (OH-58, OH-6)
- Utility Helicopter (UH-1, UH-60)
- Attack Helicopter (AH-1)
- Cargo Helicopter (CH-47, CH-54)
- Surveillance Airplane (OV-1)
- Utility Airplane (U-21, T-42)

Two of the four versions in each ATM category are based on the Federal Aviation Administration (FAA) regulations, and two are written on International Civil Aviation Organization (ICAO) flight rules for aviators operating in Europe. TCOs will administer either the FAA or ICAO version based on the unit's location.

Exam notices will be issued by TCOs to individual aviators as they enter their AAPART cycle. The notice describes the exam and provides insight that may help prepare for the Annual Writ. When it comes time to take the exam, *you* will receive the following material:

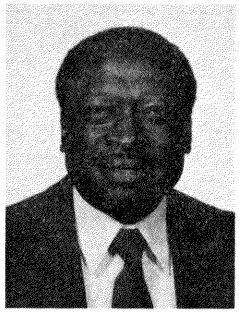
- AR 95-1
- AR 385-95
- RDB I (extracts from flight information publication)
- RDB II (extracts from appropriate field manuals and training circulars)
- En route low altitude charts

Examinees are advised to bring with them a current aircraft operator's manual, a dead reckoning computer and an electronic calculator.

With regard to *your* feeling on the need for an Annual Writ, see if this year's exam provides a comprehensive refresher drawn from a broad cross-section of subject areas. If you agree it does, then it is worthwhile. The emphasis on changes in Army Aviation to include regulations, doctrine, flight procedures, new equipment and safety should provide each aviator with a good review for the remaining AAPART requirements.

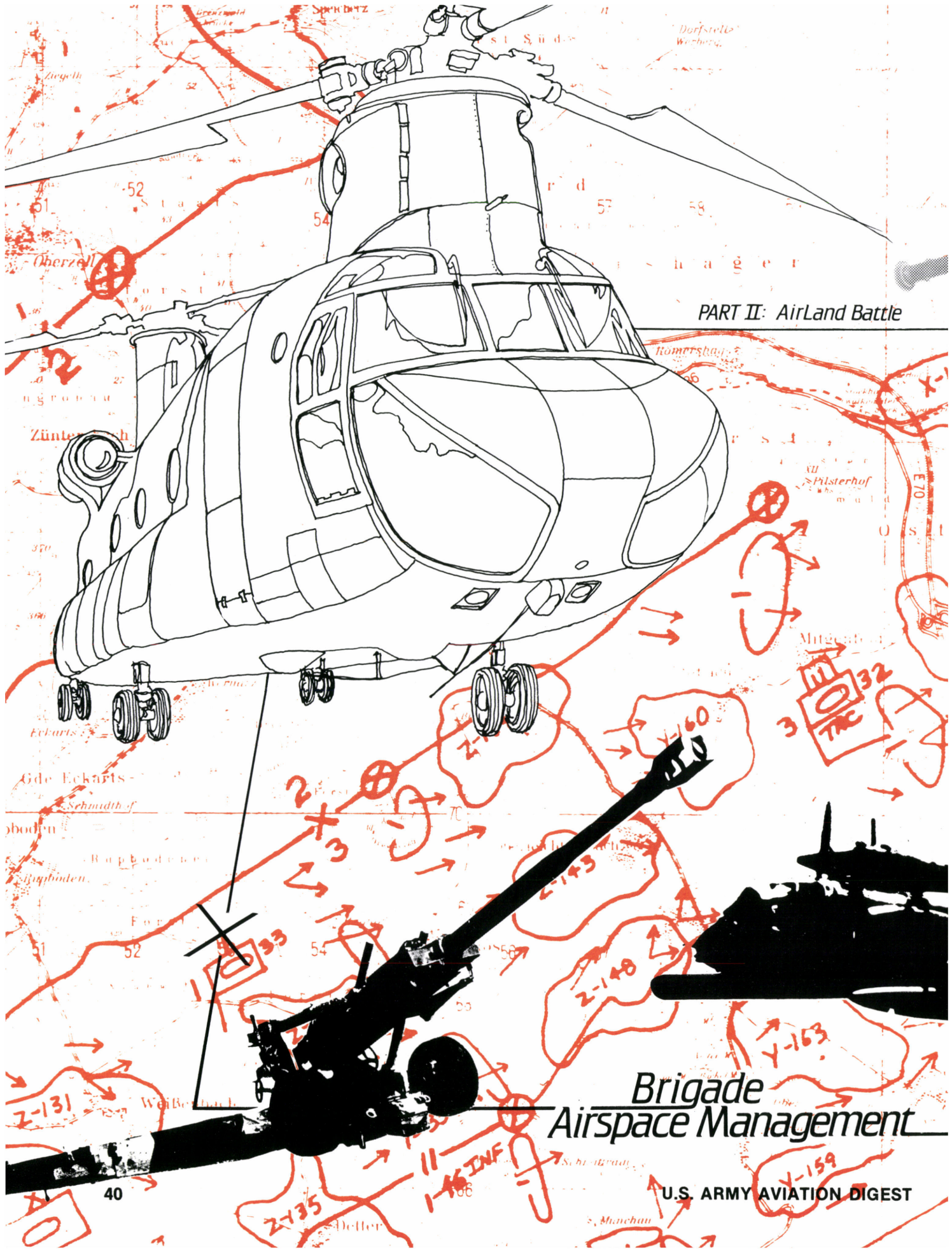
In conclusion, the Annual Writ is a valuable training indicator which will enable aviators and Aviation commanders to better assess their individual and unit training strengths and weaknesses. As Army Aviation continues to grow and mature, the units, by using this valuable training tool, will exhibit those capabilities that characterize a professionally managed, combat ready organization.

As always, the Army Aviation Center encourages your comments. Feedback should be addressed to Commander, USAAVNC, ATTN: ATZQ-TD-UT (AAAWE), Ft. Rucker, AL 36362, or call AUTOVON 558-5412/5318.



About the Author

Mr. Curtis Frazier is an education specialist for the Unit Training Division of the Directorate of Training and Doctrine at Fort Rucker, AL. He earned a bachelor of arts degree in sociology from Miles College, Birmingham, AL, and a master of science in education from Troy State University, Troy, AL. He has 35 hours of post graduate work at Auburn University, Auburn, AL, in vocational education. He is a retired Army air traffic controller and has earned the Senior and Master Instructor ratings at Fort Rucker.



PART II: AirLand Battle

Brigade Airspace Management

In April 1984, Part I of this article presented a historical background of brigade airspace management. This month Part II presents an overview of an offensive operation. Methods of employment of ground and air assets are similar and through the combining of these procedures airspace management will emerge from within the brigade and battalion area.

Major William E. Coleman
Department of Enlisted Training
U.S. Army Aviation Center
Fort Rucker, AL

The views expressed in this article are the author's and do not necessarily reflect those of any Department of Defense agency

TO BE SUCCESSFUL on today's and tomorrow's modern battlefield, the combat forces must have a firm understanding of their contributions to the overall success of the mission. One of the tools available to ground commanders to inform their forces is the maneuver plan. This plan is the commander's concept of operation. It outlines the movement of forces, determines objectives or areas to be held and assigns responsibilities for zones or sectors. The commander's plan of maneuver states the subsequent allocation of forces and provides guidance for the design of supporting plans.

Fire support, air defense priorities, electronic warfare, combat support and combat service support plans are normally developed from the commander's maneuver plan. Coordination is essential to consolidate these numerous resources into a single maneuver plan to properly execute the mission.

Coordination starts immediately after receipt of a mission and is continuous throughout the operation. The success of the operation is dependent on proper

understanding and execution of the mission by all key elements in the brigade area. It is possible that the most significant coordination to be accomplished is with the combat service support (CSS) units. During an offensive operation essential CSS must be positioned well forward of the brigade trains. Petroleum oils and lubricants (POL), and ammunition consumption will be high which will require timely coordination between the ground combat and CSS units to ensure refuel and rearm points are located and operational as planned. Timely movement of armor and mechanized infantry task forces is important to maintain the offense.

More can be gained by employment of ground forces in an offensive operation at night or during periods of limited visibility. Obstacles are cleared more easily because covering fires are less effective, long-range fire of the defender is degraded and observation of the main attack is hard to distinguish and difficult to locate. Periods of reduced visibility for offensive operations are as important as the terrain selected for offensive operations.

Terrain to be used for the main attack must allow rapid movement into the enemy's rear area. To obtain this objective, battalion task forces and company teams must move from one covered and concealed location to the next. They won't be able to sustain the movement without the subsequent relocation of the Field and Air Defense Artillery, Engineers and CSS units. Army Aviation assets can facilitate ground movements if they are integrated into the maneuver plan.

Army Aviation Forces. When the Army Aviation unit is notified of a mission it starts its planning. The Aviation commander plans for and disseminates the route(s) of flight from their location (normally in the division) to the supported brigade. These routes were previously coordinated with the division airspace management element (DAME). For more information on the DAME and the procedures, refer to Field Manual 1-103.

The Aviation unit commander, S3 or other staff representatives will go to the brigade tactical operations center to coordinate the Aviation assets employment. They must obtain, as a minimum, the scheme of maneuver, friendly locations, enemy situation, avenues of approach, expected arrival time, air defense measures, logistical support and communications to be used. The Aviation unit will then finalize its plan

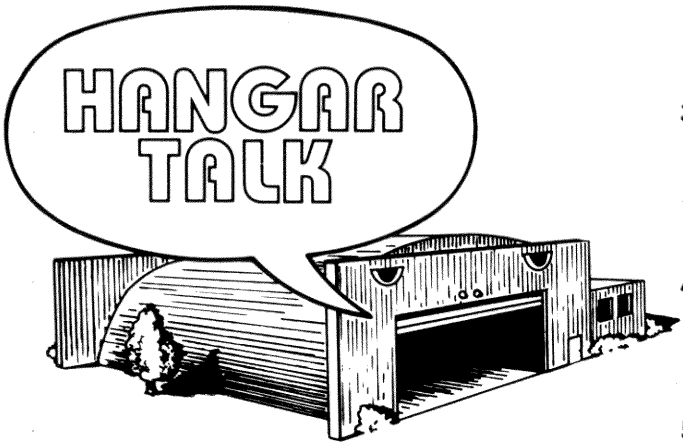
and prepare to move out. When deployed, Aviation combat service support will normally be consolidated in the Aviation plan. Aviation maintenance will be performed as far forward as possible. Limited class III (POL) and class V (ammunition) support can be provided by the Aviation unit. When required, the headquarters and headquarters company will establish a forward arming and refueling point (FARP) in the brigade area. Routes will be selected for flights into and out of the FARP(s), using the terrain for maximum protection to conceal their movement and to minimize exposure to direct fire weapons, enemy air defense radar systems and to deny them intelligence concerning locations of friendly troops. The Aviation unit will coordinate with the ground commander to determine the most suitable locations for the FARP(s) and air routes within the brigade area. These routes also should be planned for beyond the forward line of own troops as the offensive operations, OPORD (operation order), always has tentative objectives and zones established for exploitation before the attack starts.

Exploitation begins when the enemy becomes disorganized and the friendly forces mount a fierce continuation of the attack. The ground commander must provide mobile support to his forces, including air resupply to move POL and ammunition well forward. Aviation assets will continually pass from enemy

territory to friendly territory as they rearm and refuel. The probability of a friendly aircraft being engaged by the ground direct fire weapons and air defense systems is increased if timely coordination is not accomplished.

The situation becomes even more critical if the exploitation does not transition into pursuit and the enemy is able to reconstitute its forces— a counterattack is then likely. The enemy may initiate the counterattack with attack helicopters to our extended flanks or penetrate deep to disrupt the support elements. If this happens, the battalion task forces must be prepared to deny the enemy the opportunity to gain momentum by implementing the airspace management procedures established by the brigade commander.

The ground and Aviation commanders normally use the same method to plan, coordinate and employ their forces. To maximize combat power, while reducing the risk, essential information needs to be combined into an effective airspace management plan. This is accomplished through command, control and communication. Next month, Part III will address these requirements for airspace management.



"Hangar Talk" is a quiz containing questions based on publications applicable to Army Aviation. The answers are at the bottom of the page. If you did not do well, perhaps you should get out the publication and look it over.

FM 1-203

FUNDAMENTALS OF FLIGHT

CW3 Gary R. Weiland
Department of Combined Arms Tactics
U.S. Army Aviation Center
Fort Rucker, AL

1. As altitude increases, density decreases; so indicated airspeed decreases if true airspeed is held constant.
a. True b. False

2. During hovering flight, _____ causes a single rotor helicopter to drift laterally to the right.
a. translating tendency c. gyroscopic precession
b. dissymetry of lift d. compressible flow

3. The speed of a retreating rotor blade _____ as a helicopter's forward speed increases.
a. decreases
b. remains constant
c. increases

4. To obtain the maximum range on an extended flight, the aviator will have to periodically increase airspeed as fuel is consumed.
a. True b. False

5. Dynamic rollover can occur on level ground.
a. True b. False

6. The production of lift causes ____ drag.
a. parasite
b. form
c. induced

7. What is the first action a pilot should take to recover a fixed wing aircraft from a spin?
a. apply opposite rudder
b. retard power
c. apply rudder in the direction of spin
d. increase power

8. When one engine on a light-twin airplane fails, performance is reduced by at least _____ percent.
a. 50
b. 65
c. 80

9. The diffuser section of a gas-turbine (turbojet) engine provides power to drive the compressor, its accessories, and the aircraft's propeller or rotor systems.
a. True b. False

10. The _____ is the principal longitudinal structural member in an aircraft's fuselage.
a. longeron
b. empennage
c. laminar spline

ANSWERS

1. a, page 1-5
2. a, page 3-8
3. a, page 3-30
4. b, page 3-62
5. a, page 4-18
6. c, page 5-10
7. b, page 6-15
8. c, page 7-2
9. b, page 8-2
10. a, glossary-6

U.S. Army Communications Command
ATC ACTION LINE

New Flight Plans

The following Federal Aviation Administration Flight Plan format has been proposed by the National Airspace Review Flight Plan Task Group. The Aeronautical Services Office requests your comments on this format. Please send us a COMM Card with your ideas.

The Department of Defense community has also developed a replacement for the current DD 175 Flight Plan. As soon as a final copy is available, we will publish an example for your information.

OPTIONAL SLANT TO PERMIT ATD ENTRY BY FSS

I = IFR
V = VFR
D = DVFR

LOCATION ID
FIX/RADIAL/DISTANCE
LAT/LONG
FIX NAME

LOCATION ID
FIX/RADIAL
DISTANCE
LAT/LONG
FIX NAME

FLIGHT PLAN

AIRCRAFT IDENTIFICATION

AIRCRAFT TYPE/ SPECIAL EQUIPMENT

SEE FAR, PART 95 FOR REQUIREMENTS CONCERNING DVFR FLIGHT PLANS

TYPE FLT PLAN	TRUE AIRSPEED	POINT OF DEPARTURE	PROPOSED DEPARTURE TIME	ALTITUDE	ROUTE OF FLIGHT	DESTINATION	ETE

REMARKS

FUEL ON BOARD		ALTERNATE AIRPORT(S)	PILOTS NAME, ADDRESS, PHONE/AIRCRAFT HOME BASE		
HOURS	MINUTES		DESTINATION CONTACT/PHONE	AIRCRAFT COLOR(S)	PERSONS ON BOARD

FAA FORM 7233-1(A)

CLOSE FLIGHT PLAN WITH _____ FSS ON ARRIVAL

PROPOSED FLIGHT PLAN FORM

Readers are encouraged to address matters concerning air traffic control to:
Director, USAATCA Aeronautical Services Office, Cameron Station, Alexandria, VA 22314

☆ U.S. GOVERNMENT PRINTING OFFICE: 1984—746-103/11

AVIATION DOCTRINE & TRAINING Literature

THE CONTINUOUS development of doctrine and training literature affects every member of the Aviation Branch. Here, at the U.S. Army Aviation Center, the Directorate of Training and Doctrine produces literature about all Aviation related subjects. This ranges from tactical employment to general subjects including field manuals (FMs), training circulars (TCs), soldier's training publications (STPs), field circulars (FCs) and Army Training and Evaluation Programs.

These publications assure the availability of the latest tactics, doctrine and training techniques to aviators Armywide. The publications scheduled for production in 1984 are listed at right.

Some other facts of interest:

- Field manuals are no longer designated how to fight and how to support.
- All references to airmobile should be changed to air assault.
- Beginning in 1984 the aircrew training manuals are going to be produced as field circulars and should be distributed this summer.

Development of doctrinal and training literature represents a team effort. It is done by professional aviators, editors, subject matter experts and visual information specialists. All of these skills are brought together to make sure that you are kept current and fully trained with the latest information available. Your questions and comments are solicited. Contact:

LTC Thomas C. Pool
Chief, Publications Division
ATTN: ATZQ-TD-P
Ft. Rucker, AL 36362
AUTOVON 558-2635 or 3801

FM 1-100, "Combat Aviation Operations." This is the keystone manual for Army Aviation. Within the AirLand Battle doctrine it defines the Army aviator's role in combat and provides operational guidance to commanders and staff who supervise or employ Aviation assets.

FM 1-101, "Aircraft Battlefield Countermeasures and Survivability." This contains the latest changes and procedures in aircraft battlefield countermeasures and survivability techniques.

FM 1-107, "Air-to-Air Combat." This manual describes the latest in tactics necessary for Army aviators to counter the air threat on the AirLand Battlefield.

FM 1-240, "Instrument Flying for Army Aviators." This manual integrates new instrument data, procedues, techniques and improved hardware for instrument flying.

FM 1-402, "Aviator's Recognition Manual." This manual will be updated with the latest illustrations of military equipment that may be found on any battlefield today.

Air Traffic Control Tower Operator (93H)

STP 1-93H1-SM	"Soldier's Manual, Skill Level 1"
STP 1-93H24-SM-TG	"Soldier's Manual and Trainer's Guide, Skill Levels 2 through 5"
STP 1-93H-JB	"Job Book, Skill Levels 1 and 2"

Air Traffic Control Radar Controller (93J)

STP 1-93J1-SM	"Soldier's Manual, Skill Level 1"
STP 1-93J25-SM-TG	"Soldier's Manual and Trainer's Guide, Skill Levels 2 through 5"
STP 1-93J-JB	"Job Book, Skill Levels 1 and 2"