UNITED STATES ARMY

OCTOBER 1978

AVIATION DIGEST

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AVIATION DIGEST
OCTOBER 1978
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page 7

page 17

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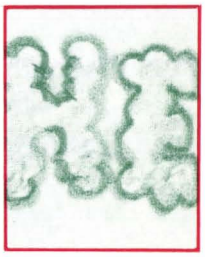
Editor

1 **The Army National Guard Aviation Program,** MG E. H. Walker
7 **The 997th—Arizona National Guard** SGT Phil Andrews
10 **Helicopter Lightning Strikes,** CW4 Phillip D. Pettit
14 **What Training Guarantees Results?** Col. Warren G. Lawson
15 **Jumping From The Crane,** SP5 Charles Drake
17 **ARNG Multi-Media Program,** CPT Kenneth O. Boley
20 **OPMS Corner: Personnel Update,** MAJ Jacob B. Couch Jr.
21 **Aircrew Training Manuals,** MAJ Paul V. Brennan
22 **Views From Readers**
24 **Fight Outnumbered! — Not Outmanned!,** LTC Jerry Hipp
26 **DES Report To The Field**
30 **20 Years Later**
36 **Reporting Final**
38 **PEARL's**
41 **Hover Power Check,** Pat Wall
45 **You Can Help Equip the ASH,** Maj Mike McClellan

Inside Back Cover: **ATC Action Line**

page 30

page 38


page 45

ABOUT THE COVER

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The mission of the *U.S. Army Aviation Digest* 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.

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the Army National Guard Aviation Program

Major General E. H. Walker
Director, Army National Guard
National Guard Bureau
Washington, DC

THE DRAMATIC expansion of Army National Guard (ARNG) aviation during the recent few years has produced one of the most dynamic and challenging programs in the total force structure of today's Army. With more than 50 percent of Forces Command's (FORSCOM's) aviation assets currently assigned to the ARNG, the part the Guard plays in the planning of national security and defense strategy becomes significantly important. Before reviewing the operations, safety and logistics aspects of the ARNG aviation program, a restatement of the dual mission assigned to the National Guard is in order.

Dual Roles. The unique dual-role nature of the National Guard is designed structurally to allow successful accomplishment of both its primary Federal mission and its secondary mission of support to the States. As stated in appropriate regulations, the dual mission of the ARNG is defined as follows:

- *Federal:* To provide trained units and qualified individuals available for active duty in time of war or national emergency in support of the Army's war plans and at such other times as the national security may require augmentation of the active forces.
- *Federal or State:* To provide units organized, equipped and trained to function efficiently at existing strength in the protection of life and property and the preservation of peace, order and public safety under competent orders of Federal or State authorities.

ARNG Aviation Operations. A brief overview of pertinent ARNG aviation statistics will serve to illustrate the magnitude of the program and provide a point of reference from which major activities of the program may be appropriately addressed.

Currently there are 106 aviation units and 184 aviation elements and sections in the ARNG force structure. Upon completion of Aviation Requirements for the Combat Structure of the Army (ARCSA III) reorganization implementation, there will be 99 aviation units and 72 aviation elements and sections assigned to the ARNG. Of 5,010 aviators authorized, 5,006 are assigned (figure 1). More than 80 percent of aviators in the Guard have combat experience and the average flying time experience for all Guard aviators is above 2,500 hours.

The ARNG has 85 aviation installations which provide for the centralized control of Army aviation assets within the States. The major segment of these assets includes the ARNG fleet of more than 2,500 aircraft and is comprised of practically every category, type and model currently in the active Army's inventory. There are however, a few instances where training to meet readiness requirements for certain unit tables of organization and equipment (TOE) missions has become extremely difficult because of some equipment shortages. Actions are being taken to resolve these problems and particularly in the aerial gunnery units. In fiscal year (FY) 1979 three of the high priority ARNG attack helicopter companies have been earmarked to each receive seven AH-1S Cobra aircraft with which to commence qualification training for aircrews and maintenance personnel. The bulk of aviation qualification and proficiency is centered around the aviation support facilities which are staffed by ARNG technicians who provide operations, training and maintenance support to assigned units and personnel. During FY 1977, the ARNG had flown 337,611 hours of 327,320 hours programed for a completion rate of 103 percent. This was possible due to funds saved as a result of a remarkably low aircraft mishap rate and a highly efficient aircraft maintenance program. In the first half of FY 78, 124,046 hours have been flown of 132,076 hours programed for a 93.9 percent completion record (figure 2).

Provided with background information on ARNG aviation program statistics, we should look at how the Guard performs its dual mission.

The State Mission. Responding rapidly to the call of the governor concerned, each state's ARNG aviation elements have amply demonstrated their outstanding capabilities to provide essential support in a timely, professional manner. In a

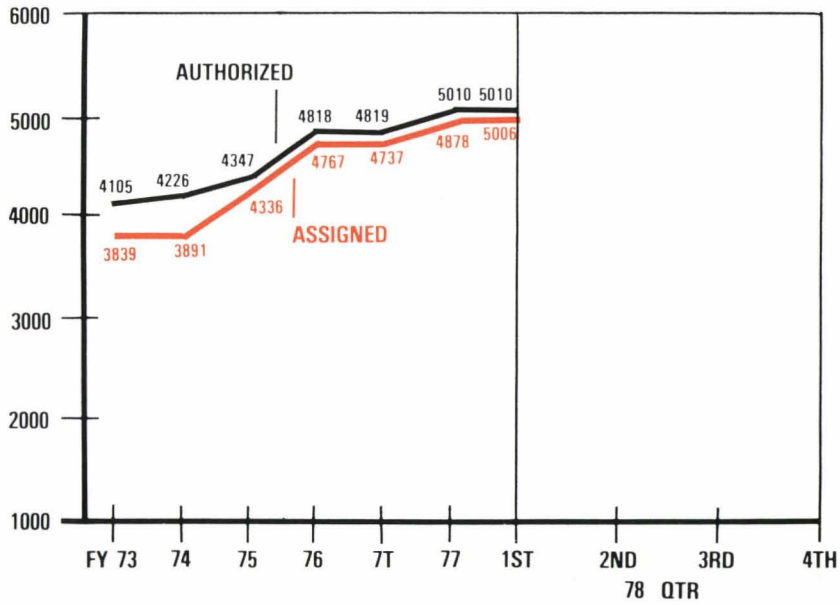
myriad of natural disasters across the Nation during FY 77, ARNG aviation accomplished in excess of 1,000 support missions while flying exceeded 10,000 hours. Throughout the first half of FY 78, at someplace in the United States, Guard troops were called up every day to cope with disasters or other critical emergency situations.

Dealing with floods, fires, strikes, tornadoes, blizzards, civil disorders and many other such natural or civil situations required relatively the same basic elements applicable to combat operations. Namely, possessing and employing a highly disciplined force with central command and control, close coordination and teamwork, and being capable of fully exercising its resources to accomplish successfully the mission. This in effect is the unique advantage enjoyed by the Guard in meeting this important facet of its dual responsibility to serve the States as well as the Federal Government.

The ability to perform the vital functions as a backup force to augment civil authorities in the States is chiefly a result of the training the ARNG undergoes to maintain readiness for its Federal mission. In measuring cost effectiveness of the Guard's dual mission capability, it is most noteworthy that no other segment of the defense establishment provides more service per dollar cost directly to the Nation's citizens than the ARNG.

The Federal Mission. Operational experience gained by ARNG aviation personnel under adverse conditions while performing missions in support of State disaster operations has proved extremely valuable in the conduct of readiness training to meet Federal mission requirements. ARNG aviators use a combination of the new Aircrew Training Manual (ATM) and the Army Training and Evaluation Program (ARTEP) as training tools to accomplish individual and unit readi-

Figure 1: Aviators authorized and assigned in ARNG



When heavy rains caused extensive flooding, Arizona's Governor Wesley Bolin called on National Guard troops to help in rescue operations. These photographs show a rescue operation on the Salt River in Phoenix by pilots CW4 Robert Delker and CW2 Ross Hill and crewchief SSGT Arthur Forsythe

ness training objectives.

FORSCOM-directed aviation training programs such as instrument, nap-of-the-earth, aerial gunnery, and night tactical operations are being accomplished by the ARNG as expeditiously as resources and time permit. Today, more than 90 percent of ARNG aviators on flight status are instrument qualified. More than 75 percent of those aviators requiring NOE qualification have completed the prescribed training and it is anticipated that this figure will surpass 95 percent during FY 79. All aviation units assigned gunnery elements have successfully fired all armament subsystems during the past 2 years. Thirty percent of the annual programed flying hours in the ARNG is being devoted to the conduct of various phases of night tactical training.

Keeping in step with the new Department of the Army (DA) directed ATM event-oriented program, the ARNG has directed its efforts toward accelerating individual training through use of a total aviation training program. Structuring individual training and measuring aviator combat readiness will enhance improvement of unit combat readiness. The ultimate goal in this building block process is to have ARNG aviation units and elements complete ARTEPs, participate in field training exercises/joint readiness exercises and undergo training in an outside Continental U.S. (OCONUS) environment (figure 3).

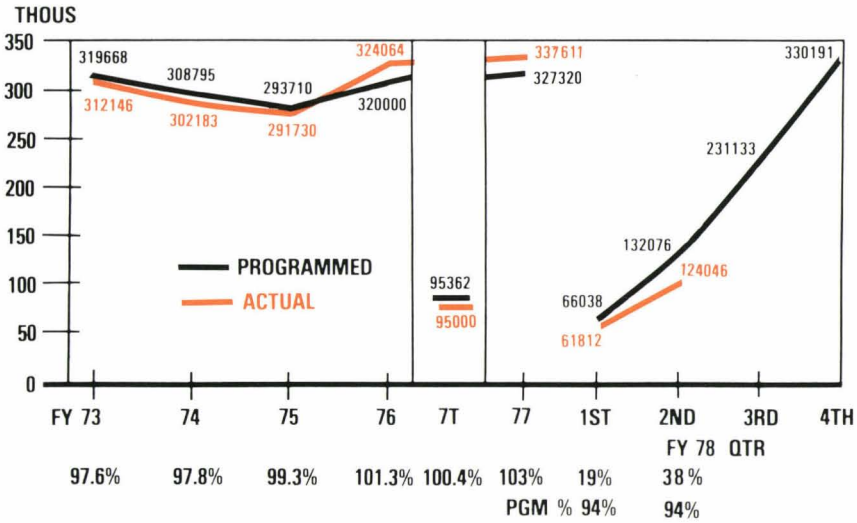


Figure 2: ARNG aviation flying hours programed and completed

Figure 3: The goal for National Guard training

Flying a wide variety of aircraft to provide support for a wide range of missions, ARNG aviation is working closer than ever before with active Army units. Whether performing MI missions throughout CONUS with OV-1 Mohawk aircraft or airlifting Infantry elements with the UH-1H Huey in support of active component exercises, Guard Aviation has consistently demonstrated its unique versatility and professional capability to perform in an outstanding manner (figure 4).

ARNG Aviation Safety. Since the implementation of an aggressive aviation safety program at all levels, the ARNG has experienced a significant reduction in aircraft accidents. To orchestrate this program the ARNG Aviation Division, and more specifically the ARNG Aviation Safety Office, was established in 1972 (in 1976 it became ARNG Safety Office to include Occupational Safety and Health Act (OSHA) and surface operations) to provide guidance and assistance to the several states to help in the achievement of a zero accident rate.

How has the ARNG fared in this endeavor? The ARNG aircraft accident rate (figure 5) is indicative of the success the program has enjoyed from FY 71 to FY 77.

The 6.45 ARNG aircraft accident rate for the first half of FY 78, (based on 8 accidents and 123,951 flying hours) still compares very favorably with the other Army components and armed services, but indicates a renewed emphasis on aviation

	FY 69	FY 70	FY 71	FY 72	FY 73	FY 74	FY 75	FY 76	FY 7T	FY 77	FY 78
AVG # OF PILOTS FOR WHICH FLY	1st QTR 1603 2d 1612 3d 1647 4th 1640	1st QTR 1639 2d 1702 3d 1774 4th 2087	1st QTR 2232 2d 2387 3d 2557 4th 2826	1st QTR 2982 2d 3163 3d 3197 4th 3617	1st QTR 3715 2d 3764 3d 3843 4th 3839	1st QTR 3903 2d 3917 3d 3967 4th 3981	1st QTR 3963 2d 4191 3d 4238 4th 4336	1st QTR 4392 2d 4596 3d 4706 4th 4767	4767	1st QTR 4724 2d 4861 3d 4946 4th 4984	1st QTR 5006 2d **5032
HRS ARE PGMD	Total 6502	Total 7202	Total 10002	Total 13259	Total 15161	Total 15768	Total 16728	Total 18461		Total 19515	
	6502 ÷ 4 = 1626	7202 ÷ 4 = 1800	10002 ÷ 4 = 2500	13259 ÷ 4 = 3315	15161 ÷ 4 = 3790	15768 ÷ 4 = 3942	16728 ÷ 4 = 4182	18461 ÷ 4 = 4615	4767	19515 ÷ 4 = 4878	10038 ÷ 2 = 5019*
AVG # OF ACFT		898 OH end	1st 891 2d 944 3d 1055 4th 1218	1st 1379 2d unk 3d 1650 4th 1690	1st 1772 2d 1749 3d 1785 4th 1925	1st 2053 2d 2154 3d 2208 4th 2230	1st 2237 2d 2269 3d 2321 4th 2423	1st 2479 2d 2558 3d 2569 4th 2599	2593	1st 2581 2d 2571 3d 2560 4th 2564	1st 2550 2d 2531 3d 2528 4th
OPERATED		4th QTR	Total 4108	Total 4719	Total 7231	Total 8645	Total 9250	Total 10205		Total 10276	
	799e	898e	4108 ÷ 4 = 1027	4719 ÷ 4 = 1573	7231 ÷ 4 = 1808	8645 ÷ 4 = 2161	9250 ÷ 4 = 2312	10205 ÷ 4 = 2551	2593	10276 ÷ 4 = 2569	5081 ÷ 2 = 2540*
# OF FLY HRS	87.2%	89.4%	100.5%	98.0%	97.6%	97.8%	99.3%	101.3%	101.3%	103%	94%*
USED	175,449	179,841	221,254	281,886	312,146	302,183	291,730	324,064	95,352	337,611	124,046*
BUDGETED	201,263	201,250	220,000	287,590	319,668	308,795	293,710	320,000	95,000	327,320	132,076*
# OF FLY HRS PER PILOT	107.9	99.9	88.5	85.0	82.4	76.7	70.9	70.2	20.2	69.2	24.7*
# OF FLY HRS PER ACFT	219.6	212.1	215.4	179.2	172.6	139.8	129.1	127.03	38.0	131.4	48.8*

Figure 4: Overall look at National Guard pilots, aircraft and flying hours for the past 10 years

*Mid-Year Totals
**Includes Temp TDA Positions

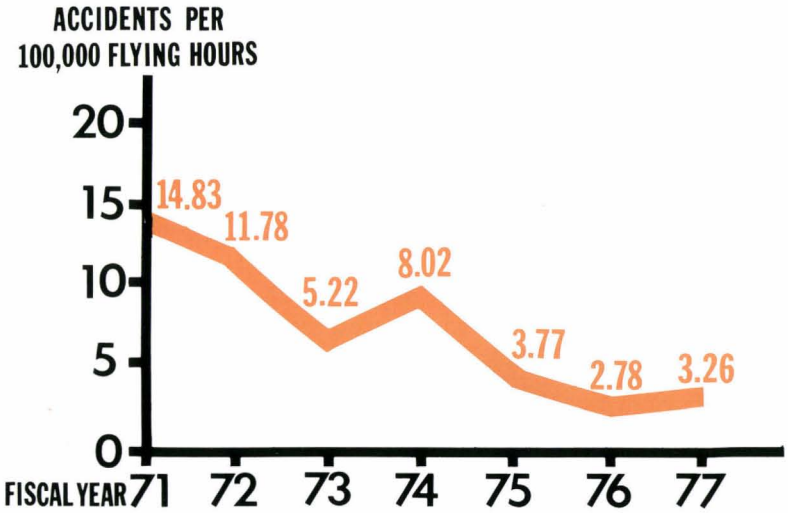


Figure 5: ARNG aircraft accident rate for fiscal years 1971 to 1977

safety at all levels must take place. Figures 6 and 7 depict the 1st and 2nd quarter, FY 78 ARNG aircraft accident statistics.

During the first half of FY 77 the ARNG met its objective of a zero accident rate! There is no mystique involved to accomplish this objective. Emphasis throughout the ARNG aviation program is placed on professionalism. This professional attitude is accomplished by the exchange of information during annual state and national safety conferences, the use of multimedia training aids, and through liaison/assistance visits, directives, newsletters, publications and relevant safety schools to establish well-trained safety personnel in every state.

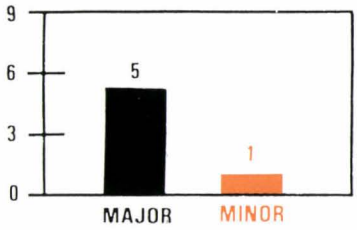
More than 90 percent of the assigned state Army aviation safety officers in each state and the instructor pilot/safety officer technician at each ARNG flight facility are school trained aviation safety officers—trained either at the University of Southern California or the Aviation Safety Officer (ASO) Course at Ft. Rucker, AL. In addition to this, most of the unit safety officers and specialists have attended at least one formal aviation safety course. An attempt also is being made again to reestablish an ARNG Senior Officer's Safety Course for battalion commanders and above. Education is considered one of the keys to establishing this professional atmosphere.

Another positive aspect of the ARNG safety program is the presentation of safety awards to deserving units and individuals. In 1977, 39 U.S. Army Aviation Accident Prevention Awards of Excellence for the completion of 72 or more consecutive months of accident free flying were awarded to major ARNG aviation units and

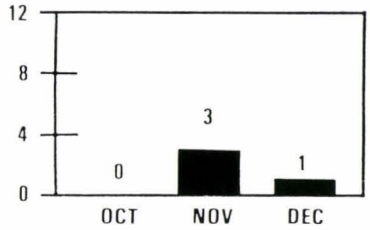
FIRST QUARTER, FY 78

AIRCRAFT ACCIDENT RATE PER 100,000 FLYING HOURS = 9.7

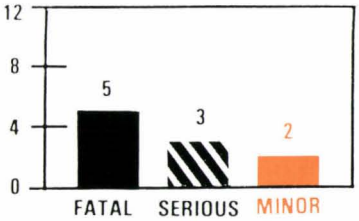
ACCIDENTS: 6



INCIDENTS: 4

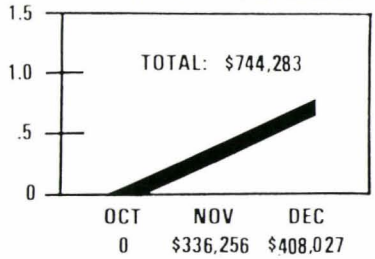


TOTAL FATALITIES AND INJURIES



DOLLAR COST IN MILLIONS

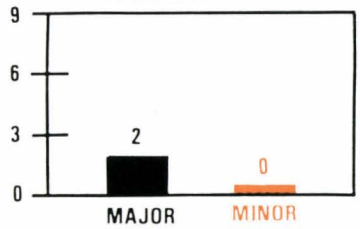
MAJOR, MINORS, INCIDENTS



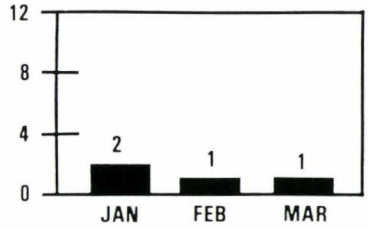
SECOND QUARTER, FY 78

AIRCRAFT ACCIDENT RATE PER 100,000 FLYING HOURS = 3.22

ACCIDENTS: 2



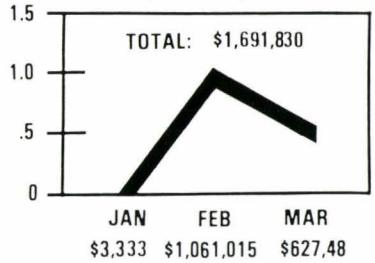
INCIDENTS: 4



TOTAL FATALITIES AND INJURIES

DOLLAR COST IN MILLIONS

MAJOR, MINORS, INCIDENTS



facilities. In addition, another 77 received the award of honor and 69 the award of merit for 36 and 12 months respectively of accident free flying. ARNG aviators also received 18 ARNG "Well Done" letters and seven Broken Wing Aviation Safety Awards for exceptional performance during inflight aircraft emergencies. Many states have likewise established individual aviation safety awards for accident free flying.

Another prevention effort initiated by the Chief, National Guard Bureau has been the policy of personally reviewing all major aircraft accidents with the Adjutant General and Army Aviation Officer of the state concerned, along with selected staff members of the ARNG Aviation Division. This policy was established as an attempt to learn from the aircraft accident in order to prevent a recurrence from the same causes.

The aviation accident prevention efforts of the ARNG are created at the top. These are the people who set the pace, establish the mood, and by example and leadership foster the attitude among all ARNG personnel that mission accomplishment and safety go hand-in-hand. It is shown in this manner that an effective accident prevention program is not predicated on luck, but on hard work by every individual involved in the ARNG aviation program.

ARNG Aviation Logistics. All aircraft maintenance on ARNG aircraft, up to and including aviation intermediate maintenance (AVIM), is the responsibility of the Army National Guard. Maintenance not performed by TOE maintenance personnel during training periods is accomplished by members of the National Guard in their technician capacities. In order to accomplish the day-to-day technician maintenance, there are 68 Army aviation support facilities (AASF), at least one in each state, which has an aviation unit maintenance (AVUM) capability plus AVIM is performed

on an area basis at the four ARNG transportation aircraft repair shops (TARS). This entire integrated aviation logistics program is managed by the ARNG Aviation Logistics Office.

The ARNG Aviation Logistics Office performs logistics management functions of aviation assets within the ARNG. As such, it provides liaison with U.S. Army Materiel Development and Readiness Command (DARCOM) and its subordinate commands, supervises the ARNG aviation maintenance general support program and maintains operational control of the four ARNG transportation aircraft repair shops.

The ARNG aircraft fleet has expanded to more than 2,500 aircraft and has presented logistical support challenges not previously experienced in the ARNG. These challenges have been met and overcome, and today, the ARNG enjoys an aircraft maintenance program that is equal to or better than any in the Army. This is dramatized by the fact that the operational readiness rate of the ARNG fleet has remained above the DA standards for 37 out of the past 38 months.

From this brief account of the Guard's dual mission, a review of ARNG aviation program statistics, and a glance at some of the operations, safety, and logistics aspects of the program, one can readily see that the current size and quality of ARNG aviation is quite impressive. Such a highly technical and expansive program as this requires professional intensive management. Responsibility for performing this mission lies at the National Guard Bureau. The ARNG Aviation Division also provides the interface between the ARNG and Department of Defense agencies that have a responsibility to support ARNG aviation training, safety and maintenance programs.

The men and women in the ARNG aviation program have proven they are more than willing and able to efficiently and safely accomplish their dual mission. Together with all the combined elements of the National Guard, they stand ready to meet whatever challenges of a military or civil nature the future may present.

Delaware ARNG evacuate stranded travelers by helicopters when traffic is immobilized on U.S. Route 301. Photograph by Kevin Scofield, courtesy of *Arizona Republic*

Arizona National Guard

Sergeant Phil Andrews
123d Public Affairs Detachment
Arizona Army National Guard
Phoenix, AZ

A UH-1 HUEY helicopter piloted by CW4 Robert Delker and CW2 Ross Hill, swung out over the raging Salt River, and came to a hover over a tiny sliver of rocky earth from which a single tree protruded. Clinging to the tree was a man, trapped there by the rising waters. Only a few remaining roots held the tree and those were giving away quickly to the muddy torrent. Just seconds before they gave away completely, crewchief Arthur Forsythe pulled the man from his dangerous perch into the Huey.

The scene was Phoenix, AZ, in early March 1978, when heavy downpours turned the normally dry Salt River into a raging flood, and the Phoenix area into a flood disaster. The rescue was the first of 39 to be performed during the next week by the aircrews of Phoenix' 997th Aviation Company of the Arizona Army National Guard (AZARNG).

The unit later evacuated 41 persons from flooded areas, and airlifted more than 21 tons of supplies in support of relief operations conducted by the Guard. Other aircrews from the unit were sent to the sprawling Navajo Indian Reservation in northeastern Arizona where they flew 100 missions delivering 14 tons of food, 1,100 bales of hay and 150 sacks of coal to Indian families stranded by the rains.

Some of the unit's rescue attempts were unsuccessful; a late night call from the sheriff's office reported a man and two children trapped in a pickup truck swept away in the flooded Agua Fria River, a tributary of the Salt. A helicopter in the air was sent, but when it arrived in the area, the truck had vanished.

A UH-1H flown by CPT David Talbot and CW3 Norm Conners, with crewchief SGT Perry McCully, rescued 20 persons stranded by flood waters on the top of a building in an industrial park between Phoenix and suburban Tempe. Flying in almost total darkness, through driving rain, the crew of the UH-1 evacuated the people off the building in two hops to police cars waiting on dry ground.

The 997th also shared credit for

saving a bridge, which was then the only land-link between Phoenix and Tempe. A 60,000-gallon industrial water tank made of quarter-inch thick steel had washed away from a plant upstream. Civil authorities feared that if the tank were allowed to float on down river, it would crash into the bridge and take away some of its supports.

CPT Steven A. Hermann of the 997th, who was an explosive ordnance demolition (EOD) officer before becoming a pilot, and another Guard officer with demolition experience, COL John L. Johnson Jr., of Headquarters, AZARNG, were set down on the tank by helicopter. They placed 16 pounds of C4, a plastique explosive, on the tank in small charges connected by fuse and detonating wire. After the charges were placed, the two Guardsmen were lifted off the tank by the helicopter, which had hovered nearby. Minutes later, the charges were detonated, punching enough large holes in the tank's sides so that it could not float.

These operations are out of the ordinary, even for the 997th, but it indicates the depth of varied experience in the unit, which observers agree makes it a top outfit. According to MAJ Frederick E. Ferguson, commander of the 997th, the unit's pilots average 3,000 hours flying experience, and 90 percent of them have been in actual combat. Nobody has yet counted the number of Air Medals worn in the 997th, but various members of the unit have been awarded 1 Medal of Honor, 2 Silver Star Medals, 32 Distinguished Flying Crosses, 44 Bronze Star Medals and 3 Purple Hearts.

"The experience wasn't just in Vietnam, either," MAJ Ferguson said, "we also have veterans of Korea, and even World War II."

CW4 John Middleton flew the Hump in C-47s in the China-Burma-India Theater in World War II, while at the same time, CW3 Mike O'Leary was flying F6Fs from a Navy carrier in the Pacific Theater. "When you have men who have been around aviation that long, it's bound to have a positive effect," commented MAJ Ferguson.

MAJ Ferguson himself wrote some of the Army aviation history during the Tet Offensive in 1968. When Hue fell to the enemy, MAJ Ferguson flew his helicopter up the Perfume River under fire from both banks and river boats to a tiny, abandoned Army of the Republic of Vietnam compound where five survivors from a crashed helicopter had taken refuge. Landing in almost zero visibility from dust and debris thrown up by a savage mortar barrage, MAJ Ferguson brought the five Americans out the way he came in, despite severe damage to his helicopter, and increased fire from the river banks. For this rescue he was awarded the Medal of Honor (see "Stay Clear of Hue," April 1970 *Digest*).

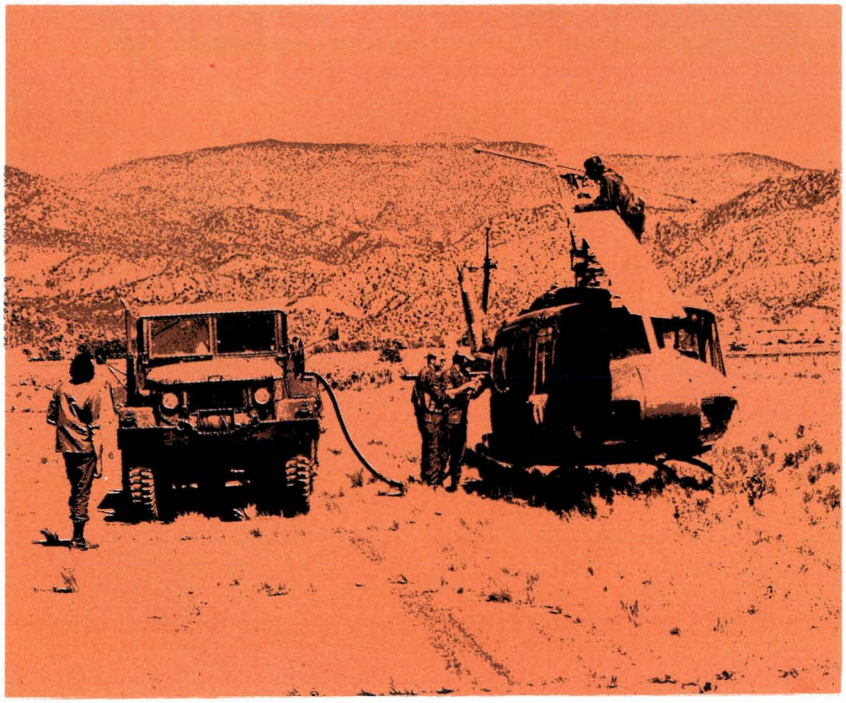
Despite their combat experience, or perhaps because of it, the aviators of the 997th do not belong to the derring-do school of flying. If one word comes to mind about them, it is "steady." The unit has the safety awards to prove it, won in more than 6 years and 35,000 hours of flying without an accident. During that time, the unit has received just about every safety award available to a Guard unit, including a special award this year from Sixth U.S. Army in recognition of its 6-year record.

"There is an intangible quality of 'esprit' in the unit," MAJ Ferguson said. "You get it from the crewchiefs, mechanics and clerks, as well as the pilots. You very seldom hear 'that's not my job' here but 'we'll do it, somehow' instead."

Typical of the ground crew is SFC Ed Collins, Armament Section Leader for the unit's gunship platoon. He has developed a test stand for the gunship's miniguns that allows them to be tested in the shop. Before, the miniguns had to be mounted, and the helicopter fired up. SFC Collins' stand is now being studied for adoption Armywide.

High morale is evident from the

Photographs by Kevin Scofield, courtesy of *Arizona Republic*



fact that the unit, as a combat support company, is authorized 243 personnel and has 269 on its roster. It also has a waiting list of veterans long enough that the better part of a second company could be formed. "It's kind of tough to have to tell a man with 700 combat hours of UH-1M and AH-1 Cobra experience as well, that you have no room for him," MAJ Ferguson said, "but that's what we've had to do."

Nowhere has the unit's morale and ability been so much in evidence as during the March floods in Phoenix, or during the countless search and rescue missions the unit has flown for local agencies as part of its state mission. But the unit has a primary Federal mission, which entails long hours of comprehensive tactical training that is approached with the same positive spirit.

This June, the 997th supported elements of the 82d Airborne Division, and the 19th Special Forces Battalion, a National Guard unit from three western states, in a counterinsurgency exercise in the high mountain country of Utah. The unit prepared for the exercise for 9 months, between floods and rescue operations (the March flood was the third for the 997th in a year, although the biggest). It was felt that combat support missions in the high elevations of the Rocky Mountains would pose special problems, so the State Army Aviation Officer, COL Russell Hall, and MAJ Ferguson worked out a four-phase night training program to prepare the unit.

The initial training phases had the pilots landing to a lighted "T" on the ground, using a glide slope. Later phases had the crews flying the same patterns with sling loads, and flying with up to 2,000 pounds of sandbags to simulate both the weight of troops and give the same effect on controls as flying at high altitude.

The final phase involved terrain flying by ambient moonlight, at heights of 50 feet in the rugged Mazatzal Mountains of central Arizona. Even the flight to Cedar City, UT, from which most of the unit's missions were flown, was conducted as part of the training exercise.

The entire exercise was conducted at night, from Phoenix to the South Rim of the Grand Canyon, where a convoy from the unit's maintenance platoon and a section from the Air Force's 63d Military Airlift Wing (MAW) combat control team from Norton AFB, CA set up a tactical airfield and refueling point. Two platoons flew to another refueling site in Utah, while the third flew directly to Cedar City to set up operations.

During the exercise, the 997th's two lift platoons flew out of Cedar City, Camp Williams and Salt Lake City in support of both guerrilla and counterinsurgency forces, operating in geographical areas with elevations extending from 3,000 to 11,000 feet. The gunship platoon, flying UH-1Ms, fired its rockets, miniguns and grenade launchers on the range located at Lakeside, UT. The lift platoons, besides hauling troops and supplies around the clock, flew missions that included rapelling, extractions using the Stabo Rig, and parachute drops.

During one of the parachute drops, a trooper's chute caught in the Huey's landing skids, but the pilot, CW3 Steve Tulley, the Arizona Guard's Outstanding Aviator for 1977, brought the man down safely. The 2-week exercise in Utah was typical of how the 997th performs its Federal mission and also illustrated the intensive planning and care the unit puts into its work.

Less typical was the mission flown by a three-helicopter detachment of the 997th last year during Operation Brave Shield at Twentynine Palms, CA. Most of the huge Marine Corps reservation at Twentynine Palms has been an artillery or bombing range at one time or another, and the detachment's job was to fly an Army EOD team into areas where some of the 25,000 troops on the Joint Readiness Command exercise might be endangered from duds.

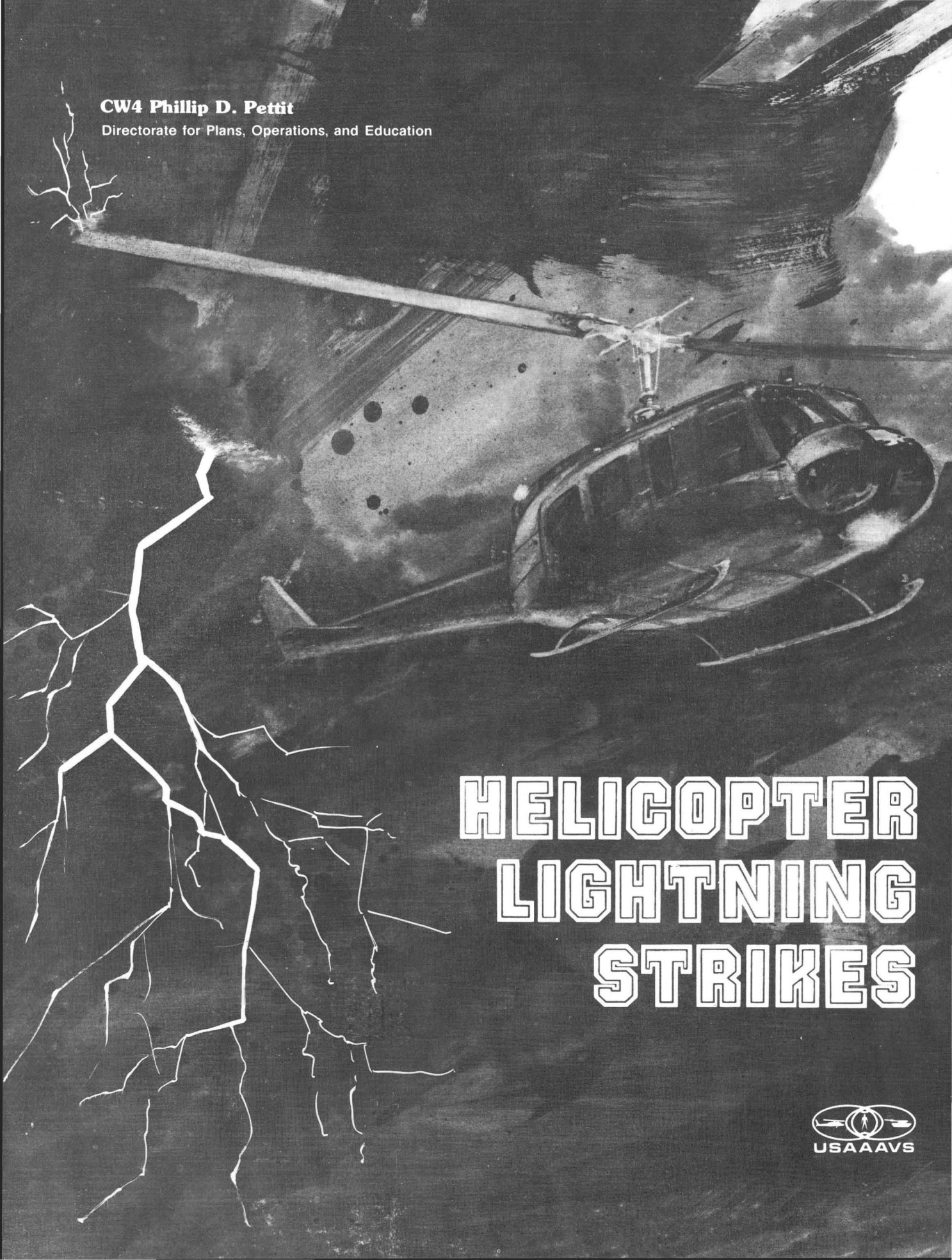
Based at Big Bear Lake, the detachment worked out of the EOD team's base camp in an isolated desert valley. According to CPT Steve Thomas, who led the detachment, the EOD team—using C4—blew up 76 live bombs or shells during the first week of the exercise. The "duds" ranged from 2,000-pound bombs to a World War I French 76 Projectile.

The helicopters were sometimes used as roadblocks near the site of a demolition, and often the helicopter would land to drop off the EOD team within 25 meters of the dud. "You'd better believe that helicopter was ready to fly out fast before the EOD people lit their fuse," CPT Thomas said, adding, "they usually didn't waste much time getting onboard after they were finished, either." The EOD team leader, CPT Gregory K. Lyle, from Ft. Lewis, WA, said the 997th gave him "the best aviation support I've ever had."

Despite the 997th's 9 years of accomplishments, the unit soon will pass out of existence. In the Army-wide Aviation Requirements for the Combat Structure of the Army (ARCSA III) reorganization of aviation assets, the 997th will be split into a combat support company and part of an attack helicopter company. While the reorganization will provide slots for many of the experienced pilots, crewchiefs, and ground crew waiting to join the Phoenix unit, "losing the designation is kind of sad," MAJ Ferguson said. "But, it just means there will be two units of 997th quality instead of one."

Adjusting to such changes is not new to the Guard and the AZ-ARNG Army aviation team stands ready to meet the challenges of its table of organization and equipment primary Federal mission of combat readiness, and additionally, perform its secondary mission of support to its State during disaster or emergencies.

CW4 Phillip D. Pettit
Directorate for Plans, Operations, and Education



HELICOPTER LIGHTNING STRIKES

USAAAVS

AN ARTICLE in the May 1978 issue of AEROSPACE SAFETY discussing lightning and aircraft generated a great deal of interest in aircraft lightning strikes. This article and many others have increased awareness of possible hazards of lightning strikes to fixed wing aircraft, but little has been published about the added hazards to helicopters. The assumption that hazards existing for fixed wing aircraft are the same as those for rotary wing aircraft is not entirely correct. Due to somewhat different operating environments and complexity of systems, the hazard of a lightning strike to a helicopter can be much greater. With helicopters composing 90 percent of the Army aircraft inventory, there is reason for serious concern.

Lightning strikes to helicopters are increasing each year because of the large numbers of helicopters in use and the vast amount of hours flown. Fortunately, the damage is usually minor and has not resulted in a major maintenance problem. Occasionally, though, damage has been severe and at least one confirmed catastrophic helicopter lightning strike has been recorded by the USAF. The potential for damage is also being increased with new nonconducting skin materials and rotor blades such as fiberglass and special materials to reduce radar and infrared signatures.

DESTRUCTIVE POTENTIAL

Lightning ranges from 1,000 feet to 100 miles in length, with the most common type about 1 mile long. The energy content of a typical stroke is about 400 million horsepower (hp). Lightning striking the earth each day generates 3,456 trillion hp—enough to lift to a height of 100 feet a weight equal to 200,000 aircraft carriers. The return stroke, the visible part of lightning, travels at 100,000 meters per second and has a temperature of 50,000° F., five times hotter than the sun's surface.

Contrary to appearances, lightning is not a simple flash, but a complex series of events. The tremendous potential (10-100 million volts) that builds up is strong enough to ionize the air and develop into a chain reaction. A zigzagging ionized path called the stepped leader is formed. The leader zigs or zags about 50 meters in each step, pausing about 50 millionths of a second as it forks at each step seeking areas of potential difference.

With each step the cloud charge is effectively lowered, increasing the strength of the electric field between the leader and the ground. This greatly intensified field causes streamers of positive ions to spring from trees or other projections and travel upwards to meet the downcoming leader. As they make contact, the leader is neutralized and the ground charge flows back to the cloud, creating a current as high as 200 million amperes. This current is called the return stroke and is responsible for the bright flash and noise associated with lightning.

WHY DOES LIGHTNING STRIKE AIRCRAFT?

This is a question which to date has not been answered to everyone's complete satisfaction. The most prevalent authoritative opinion is that aircraft are struck only when they

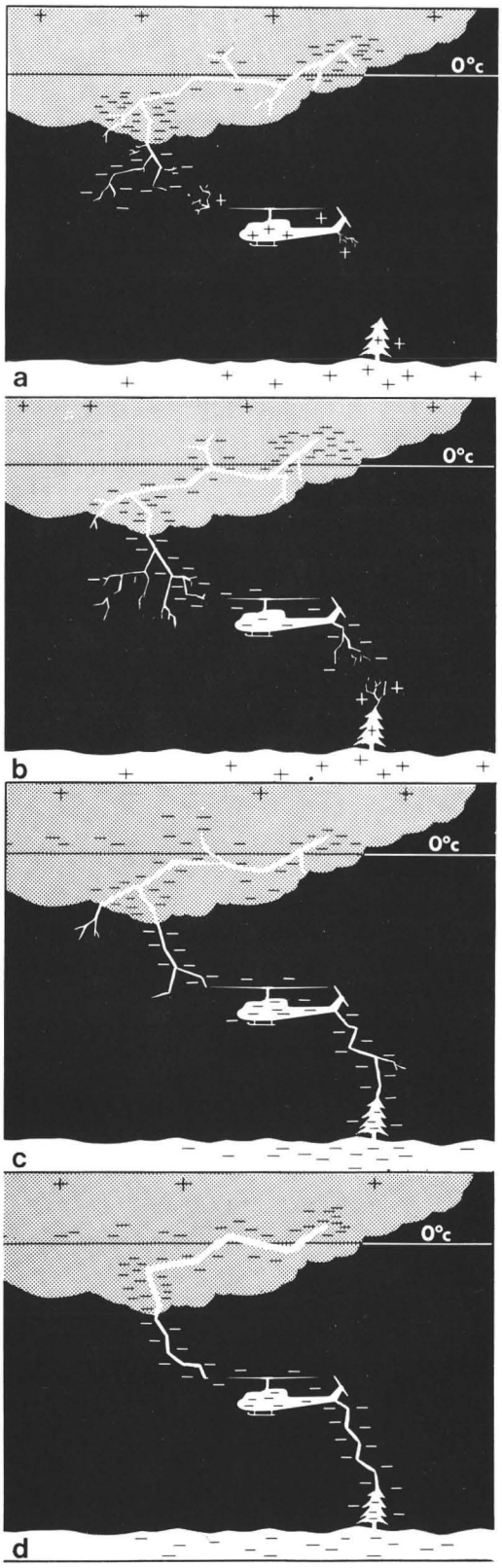


FIGURE 1.—Strike Sequence

happen to pass near the natural stroke path of lightning.

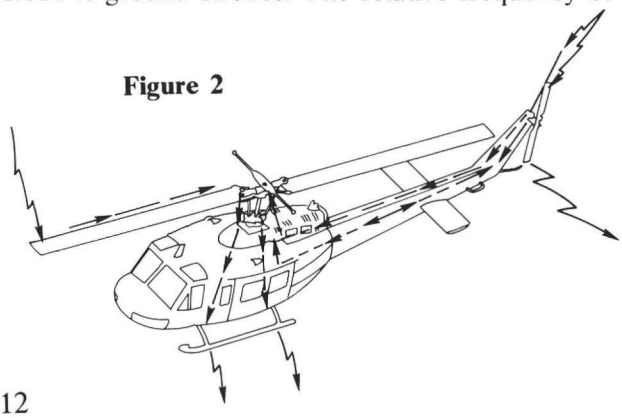
This concept, illustrated by figure 1, theorizes that as an aircraft flies near a charge center or advancing leader the electrical field induced around the aircraft may be intense enough for streamers to form and travel out toward the leader or charge center. As the aircraft field increases in intensity the leader advances toward the aircraft and joins a streamer emanating from the aircraft extremity. Since the aircraft will not absorb the charge it becomes the next step and streamers emanate from other extremities as the leader progresses to the next step. As the stroke joins the ground streamers, the aircraft becomes a link in the conductive path until the charge dissipates.

Statistics on lightning strikes seem to show that altitude plays a minor role in determining the likelihood of being struck. Recent reports show lightning strikes to fixed wing aircraft as high as 37,000 feet with most occurring below 20,000 feet. Reports on rotary wing aircraft show strikes from a height of 9,000 feet to as low as 100 feet, with the majority occurring below 6,000 feet.

Although height and temperature are naturally correlated, studies of lightning frequency as a function of temperature and height show a strong tendency for strikes to occur in the 0° C. zone. The preponderance of strikes near the freezing level must be related to the fact that the negative charge center is also found near this temperature and altitude. Another important reason for the greatest number of strokes near the freezing level is that the negative charge is not located at a single point, but is spread out with varying densities over a large volume. Indications are that lightning strokes do not follow a simple straight line vertical path from the negative region to ground or between the negative and positive areas. Instead, the discharge travels more-or-less horizontally through much of the negatively charged region before turning up or down. Thus, an aircraft flying near the freezing level would be more likely to intercept a stroke than would an aircraft operating well above or below the 0° C. isotherm.

Helicopter operations conducted at lower altitudes and below the freezing level are endangered only by cloud-to-ground strokes. The relative frequency of cloud-to-ground strokes and chances of a helicopter strike depend upon the severity of the storm and its height above the ground. Even with increased IFR operations by Army helicopters, there has been no significant increase in lightning strikes while in clouds. All of the Army helicopters hit by lightning while in flight were operating at low altitudes, below the cloud level, and in the vicinity of developing thunderstorms. Data available from other services indicate similar experiences with a few exceptions.

Figure 2



EFFECT ON AIRCRAFT

Although the effects of a helicopter lightning strike can vary, in most cases the damage will be minor. No injuries, other than the USAF fatal strike, or fatal shock to occupants of helicopters struck in the air have been recorded. In most instances, crewmembers reported a bright flash accompanied by a dull bang, with no adverse control problems or major electrical malfunctions. The greatest danger is major damage inflicted and associated with minor-appearing visible damage to structural members.

The danger of a fuel tank explosion is remote even though the JP-4 fuel-to-air explosive mixture is in the region of greatest lightning strike frequency. The primary hazard is a direct puncture of the fuel cell wall, but this is not likely since fuel cells are enclosed and protected by the metal fuselage. Hot spots developing on the fuel cell walls from the current flow would be extremely rare.

The usual approach in analyzing problems of lightning strikes is to determine the points of an aircraft which are most likely to be struck. Generally speaking, these points on a helicopter are the tip of the main rotor and the tail rotor pylon with an occasional ground strike through the landing gear. Figure 2 shows these entry points and exit paths. A typical main rotor strike originates with an attachment at the tip of the main rotor blade, then travels through the main rotor blade to the rotor head where the charge divides. Part of the charge arcs over to the pitch change links, down control linkages and supports to the airframe. The charge exits through the landing gear to the ground or through the tail boom, exiting the tail skid. The other part of the charge travels down the mast into the transmission, through transmission mounts into the airframe, and exits through the landing gear to the ground.

Further analyses indicate that strikes in the tail boom pylon area begin at the tip of the tail rotor or whip antenna and pass through the tail rotor, tail rotor gearboxes, and along the drive shaft into the transmission case. The charge travels up the mast to the main rotor, back down linkages, through the transmission case to the airframe, and exits the skids to the ground.

Lightning strike evaluations of helicopters indicate that the degree of damage depends on the magnitude

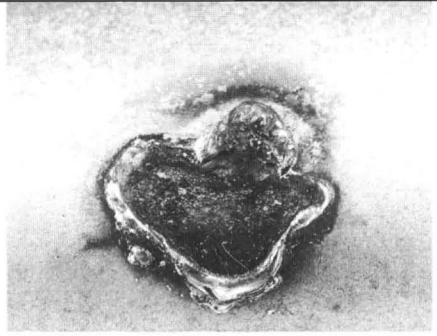


Photo 1

Photo 2

Photo 3

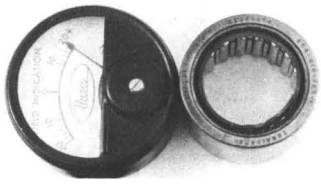


Photo 4

of the charge and point of contact. The following general observations can be made based upon the findings from 12 Army helicopter ground/air strikes and available data from other services.

• Lightning strike characteristics are different from other forms of damage since arcing erosion and pitting are easily defined from physical gouging, denting, and sand erosion normally encountered. Also, the damage caused by air strikes and the damage caused by ground strikes have the same characteristics in relation to severity and cannot usually be differentiated.

• Main rotor blade evaluations indicate that even though there is some arcing and localized skin separation, catastrophic failure is remote. Heat damage could possibly be more severe than observed due to annealing of the material surrounding the damaged areas. Most skin damage is molten pitting and skin separation is confined to the trailing edge near the blade tip. Skin separation near the blade tips may result in a deformity that would produce vibrations and possibly control problems if prolonged.

• Tail rotor assemblies that are initiating points of strikes sustain arcing and skin damage very similar to main rotors. Arcing damage frequently penetrates the leading edge but does not usually extend into the core of the blade (photo 1).

• Lightning strikes in the vicinity of whip antennas on either the top or bottom of helicopters usually result in severe damage to the antenna sections (photo 2). Antennas subjected to a strike will usually shatter, but in most cases the associated avionics equipment protected by lightning arrestors continues to function with no damaging effect.

• Bearings, bearing sleeves and races, rod ends, bolts, yokes, and parts with any type of spark gap that are in the path of the charge generally receive arc burns and pitting. These parts, when checked, usually meet only slight resistance and give no indication of seizure. Arc burns and pitting should be cause for rejection since this would constitute abnormal wear and possibly lower fatigue life due to annealing. The pitted trunnion bearing in photo 3 is characteristic of this type of lightning damage.

• A high degree of residual magnetism will be prevalent throughout the airframe and component parts. Ferrous particles attracted to bearing cages or races may cause abnormal wear and early failure. The highly magnetized tail rotor trunnion bearing shown in photo 4 also contained several needle bearings that had arc damage. Most components would be unaffected after normal degaussing procedures.

• Areas of major hidden damage are usually associated with minor-appearing visible or external damage. In most cases, no hidden damage will be found without visible damage of some kind.

SUMMARY

Lightning strikes to helicopters are usually cloud-to-ground strikes occurring at low altitudes. Because of the greater hazards of strikes at temperatures near 0° C., efforts should be made to avoid operating in the vicinity of heavy thunderstorm cells when these conditions exist. Careful planning and study of weather reports should help in circumnavigating these areas and avoiding other problems associated with thunderstorm activity.

When occasional lightning strikes do occur, usually there is little or no major structural damage or extensive arcing burns and pitting. The possibility of a catastrophic failure when main or tail rotors are struck is minimized by the design and strength of the blades. Structural integrity and control will normally not be insurmountable even though there may be partial skin separation of damaged areas and burns to the blade surfaces. Rotating controls and bearings, although subjected to pitting and burns, usually continue to perform as designed and as a rule have not presented any problem during air strikes.

The fact that lightning strike damage can be much more severe than visually observed is cause for immediate action. It is conceivable that lightning strike hidden damage could be so severe that a critical component fatigue life might be reduced to a few hours or even a few minutes. Should a strike occur or be suspected, the precautions outlined in the aircraft operator's manual and maintenance inspection procedures should be followed. Any helicopter subjected to a lightning strike must be given a close visual inspection and analysis to determine airworthiness before it is returned to flyable status.

We all know that TEC can do the job—but, TEC isn't doing the job well enough when it isn't being used to the maximum through simple ignorance of its existence

What Training GUARANTEES Results

Colonel Warren G. Lawson
Director of Training Programs
U.S. Army Training Support Center
Fort Eustis, VA

- *TEC training is more effective than conventional training!*
- *TEC trained Soldiers retain their skills better after 8 weeks than conventionally trained Soldiers do only 1 day after instruction!*
- *TEC training can raise Soldier skills by 27 percent based on a comparison with baseline trained Soldiers!*
- *TEC pretests and posttests prove that only one exposure to a TEC lesson can improve Soldier performance by 9.4 percent!*
- *TEC users score higher on their skill qualification tests (SQT) than nonusers!*

☆ ☆ ☆

These are some of the findings of the Army Research Institute (ARI) which recently completed an intensive study of the Training Extension Course Program, more popularly known as "TEC."

The purpose of the study was to determine TEC cost and training effectiveness and TEC usage. In short, does TEC really teach well and at reasonable cost; and does the Soldier use it? Soldiers from 24 combat arms battalions both active Army and reserve components participated in the TEC effectiveness study. These 660 Soldiers represented eight different military occupational specialties (MOSs) in numbers proportionate to the total number of Soldiers Armywide holding these MOSs.

11B	**Infantryman**
11C	**Indirect Fire Infantryman**
13B	**Cannon Crewman**
13E	**Cannon Fire Direction/ Fire Support Specialist**
16P	**Chaparrel Crewman**
16R	**Short Range Air Defense Artillery Crewman**
19D	**Armor Reconnaissance Specialist**
19E	**Armor Crewman**

Selected groups were given instruction in subjects related to their combat arms branch—Armor, Artillery (ADA and FA) or Infantry and one subject common to Soldiers of every branch. Some Soldiers were taught using TEC lessons and others by their normal conventional live instructors. Other Soldiers received regular routine training in order to develop a base line group against which performance could be scientifically measured, following pretesting, instruction and posttesting.

TEC came out ahead in all categories, proving conclusively that the TEC trained Soldier learns better and remembers more of what has been learned even 8 weeks later. The conventionally trained Soldier couldn't perform as well, only 1 day after receiving instruction!

Soldiers from 32 Continental United States (CONUS) active Army battalions, 61 reserve battalions and 17 Training and Doctrine Command (TRADOC) installations participated in the TEC usage study. The study of use patterns, attitudes and problems involved 27 CONUS and 13 United States Army Europe (USAREUR) active Army battalions and 26 CONUS reserve component battalions.

TEC users scored significantly higher on their skill qualification tests (SQTs) than did nonusers. Soldiers and unit trainers who used TEC regularly praised TEC and 65 percent of the Soldiers and 87 percent of the trainers wanted TEC to continue to grow and to expand.

The ARI study recommended that commanders, trainers and Soldiers make more use of TEC, to make it even more cost effective than it is today.

With the SQT and the Army Training Evaluation Program (ARTEP) so closely linked with individual and team performance, TEC use is sure to grow. We know that TEC can do the job and the ARI study proves it. However, TEC only works when it is used and the study recommended that Soldiers surveyed who had never heard of TEC should get with the program—the TEC program that is. Remember, TEC is *"Guaranteed To Teach!"*

Comments from the field on TEC usage and individual or unit performance are welcomed. Address your questions or comments to Commander U.S. Army Training Support Center, ATTN: ATTSC-TP-ATECP-TECSPT, Fort Eustis, VA 23604. The point of contact is MAJ Bullock, AV 927-2141/3728.

JUMPING from the CRANE

Parachutes of the 82nd Airborne Division (photo here and below) billow out like mushrooms after the Airborne Soldiers exited a CH-54 Skycrane over Normandy Drop Zone at Ft. Bragg, NC

Story and Photos by
SP5 Charles Drake
Public Information Office
Fort Eustis, VA

THEY ARE BIG, powerful and ugly, but according to people who crew the monsters they can do just about anything from the sky. The monsters are better known as the CH-54 Skycranes from the 355th Transportation Company (Heavy Helicopter) based at Ft. Eustis, VA.

The Skycranes are the only Army heavy lift helicopters on the Eastern Seaboard, and that means they are usually asked to do a lot of the heavy work that ground Cranes and CH-47 Chinooks can't do.

Being rare means the CH-54s attract a lot of attention wherever they fly. A week in the field at Ft. Bragg, NC proved that point once again. The Cranes landed unannounced on 29 March, in the middle of an infantry tactical operation. On 31 March about 450 airborne jumpers recorded jumps from the back door of the Crane's people pods, while 200 spectators watched.

The jump was part of a field training mission for the Crane pilots assigned to the 355th Transportation Company (Heavy Helicopter) from Ft. Eustis, VA

Soldiers from the 82nd Airborne Division load into a people pod carried by a CH-54 Skycrane at Ft. Bragg, NC

"Our main goal was to get different types of missions, which we will be required to perform in a tactical environment," said Major Emitt Wallace, 355th commander. "Fort Eustis doesn't have any artillery pieces and the marine engineer equipment at Fort Eustis' Third Port is not what we should be lifting, because some of it is delicate and not designed for sling loading.

"As an additional requirement, we accepted the mission of flying for 82nd Airborne Division jumpers." Major Wallace continued, "We have never flown jumpers, and the airborne division has never jumped from the Cranes, although the concept has been tested."

Additionally the U.S. Army Aeromedical Research Laboratory, located at Ft. Rucker, AL sent a team to test the toxic gas levels inside the people pods, when flying with doors open.

"Major General Roscoe Robinson, 82nd Airborne Division commander, turned out to inspect the Skycrane jump, then took his turn at jumping from the tail of the pod," said Major Wallace.

Chief Warrant Officer James Ross, 355th air mission commander, said, "Flying was the easy part; rigging the pods with static lines and safety clamps was probably the most important for us. We followed guidelines outlined in an 82nd Airborne Division circular." Most of the work was done by flight and maintenance platoons.

"When pilots land, they have mission briefings and flight plans to file," said Sergeant Jerry Gravile, a crewchief. "Enlisted crews stay with the bird, to pull maintenance, refuel, put on or take off people pods or other equipment."

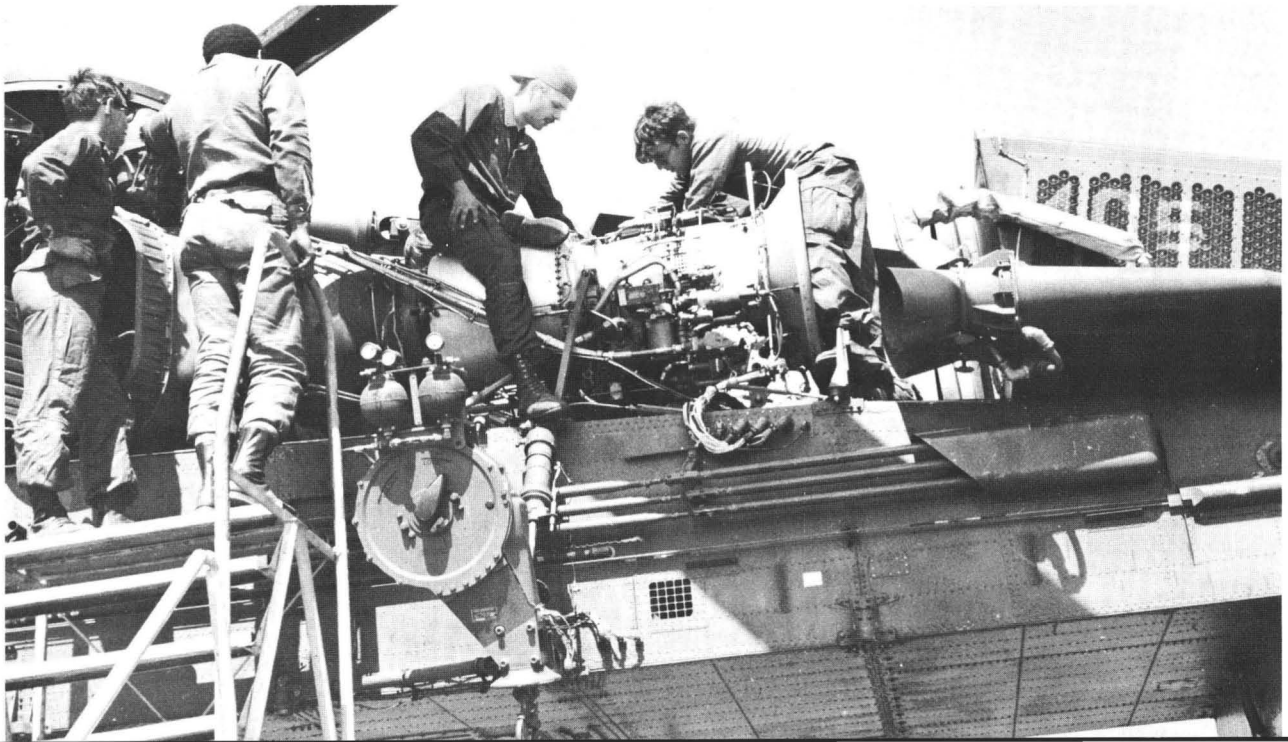
"We were putting the pods on as late as 1100 hours the night before the mission," said Staff Sergeant Jaun Bosquez, flight engineer for Crane number 468.

Most of the flying time during the first few days of the field operation was done by 468, while a second Crane sat helpless on the sandy airstrip waiting for another engine from Ft. Eustis. The turbine engine had been damaged by a foreign object passing through the intake blades.

"Changing the engine in the field was the first time in a long time that it had been done by the 355th," said SP4 John Ramsey, a senior mechanic. SP4 Ramsey was one of a half dozen mechanics swarming over the Crane trying to get the engine changed and the bird back into the air.

"From start to finish it took about 8 hours to change and make adjustments to ensure it was running right," said SP4 Ramsey. "'Workhorse in the Sky' might be painted on the front of all the Skycranes belonging to the 355th, but it is the ground crew who work like horses to keep them flying," he said.

SP4 John Ramsey, a senior mechanic for the 355th Transportation Company (Heavy Lift), leans over a turbine engine of a CH-54 Skycrane to tighten some retaining bolts, while SP4 DeWitt Tuttle lends a hand



ARNG MULTI-MEDIA PROGRAM

Captain Kenneth O. Boley
Army National Guard Aviation Division
Fort Rucker, AL

PREMOBILIZATION readiness issues a challenge for well designed, meaningful, cost effective training. The National Guard Bureau Aviation Division's Multi-Media Program is accepting this challenge by managing an audiovisual program dedicated to supporting both the Army National Guard (ARNG) Aviation and Safety Programs. This mission entails a charter to develop and distribute audiovisual packages that incorporate the latest instructional methods and techniques available in the Department of Defense (DOD) structure. The program is directed at supplementing the aviation and safety training effort throughout the 50 states, Puerto Rico, Virgin Islands and the District of Columbia.

During 1972, National Guard Bureau representatives laid the groundwork for the formation of an Army National Guard Media Group to be located at Ft. Rucker, AL. On 24 August 1973, an Intraservice Support Agreement was signed giving the ARNG Aviation Division Multi-Media Group official sanction at Fort Rucker. In addition to providing physical support arrangements, the agreement allows the group to work directly with Fort Rucker agencies in preparing instructional materials. The group is under the operational control of the Chief, Army Aviation Division, National Guard Bureau.

Staffing is provided in the form of a manager, training specialist, safety specialist, media specialist, illustrator and administrative specialist. The six individuals, all National Guard technicians, provide the needed technical knowledge and skills to acquire and produce audiovisual materials.

The heart of the Multi-Media Program has been the establishment of a close-knit network of training technicians and safety specialists that work with the media program within the States. To support this network, more than 500 different instructional presentations pertaining to aviation and safety are stocked. Users are able to order individual presentations to suit local training requirements by a reprograming, redistribution system managed by the Multi-Media Group. Emphasis has been placed on self-paced, individualized instruction that is used for proficiency oriented training.

To support this network more than 80 standardized "Mini-Learning Centers" physically were incorporated into the ARNG aviation facility structure. These small learning centers have been provided the necessary tables of distribution and allowances (TDA) audiovisual equipment to operate, with each learning center having a complete sound slide and closed circuit television capability. All adopted equipment meets Department of the Army (DA) audiovisual standards.

Lesson material is available in one of three formats: audio-cassette, sound slide or television-cassette. The material is updated continually to provide the ARNG crewmember the latest in training doctrine and technique. The group has produced several audiovisual lesson packages in support of current ARNG training programs using these various instructional formats.

For example, aviators can now practice proper air traffic control communication procedures by listening to the cassettes in conjunction with handout materials. An extension of the cassette lesson is the sound slide format of presentation. This format uses 35 millimeter slides coordinated with the cassettes to cover lesson material. U-8 Seminole training in the ARNG has been enhanced by the development of a sound slide program that covers all the aircraft's major systems. The program has been made available to states with U-8 assets. In addition to U-8 training, an exportable instrument flying refresher package consisting of 14 lessons has been mailed to the field. To improve enlisted crewmember proficiency, numerous sound slide lessons on the various maintenance requirements of ARNG aircraft have been exported and are in use.

The use of television in the training environment adds the important feature of motion to instruction. Motion enhances the learning process by allowing complicated and technical procedures to be performed in their entirety, thus reducing lengthy and complex explanations. Special television ground schools have been made available that saturate certain subject areas. These complete audiovisual programs cover the various ARNG aircraft, aerial weapon systems and safety aware-

Innovation by the media group in audiovisual aids is evidenced in the artwork developed

Photographs by SSG Jules Hobbie

The media group has the capability to produce inhouse original TV programs for ARNG special requirements

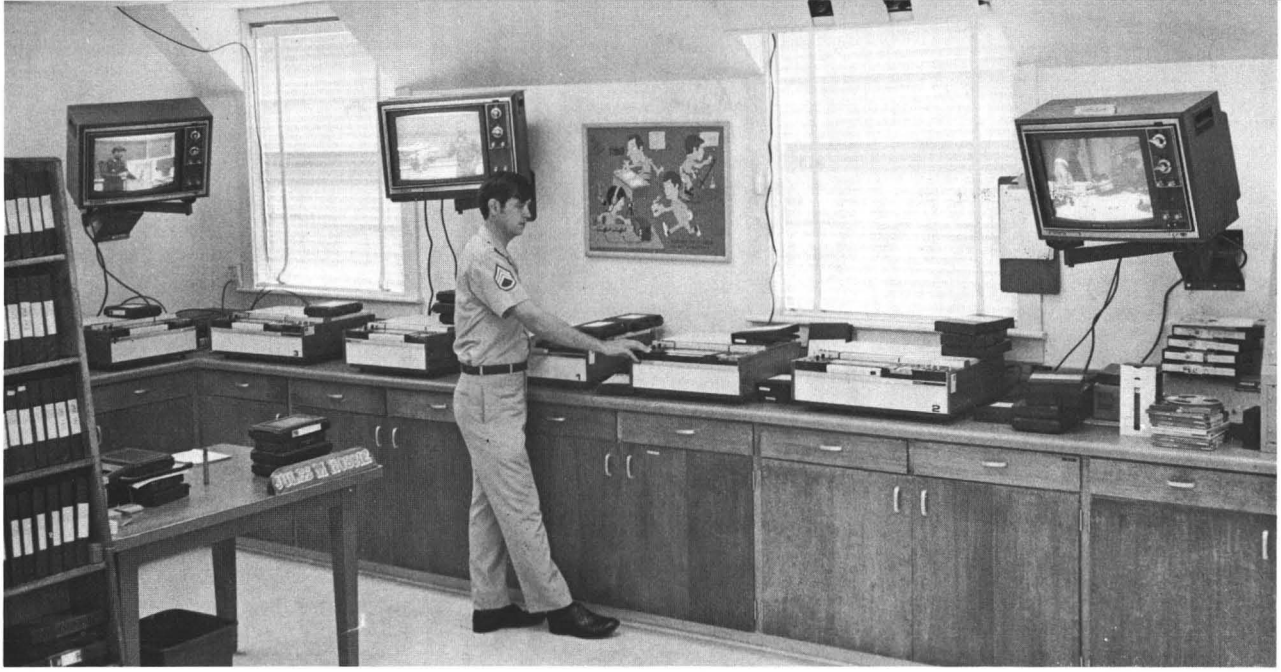
ness efforts. To date, classroom presentations have been videotaped on the CH-54 Tarhe, CH-47 Chinook and OH-6 Cayuse aircraft. Similarly, the M-5, M-21 and portions of the M-22 weapons systems have been captured on videotape and loaned to facilities to coincide with local area training programs.

Safety awareness has received emphasis in ARNG aviation training. Working in concert with U.S. Army Agency for Aviation Safety (USAAAVS) and the Directorate of Evaluation and Standardization at Fort Rucker, the group has fielded an audiovisual safety tip program.

The program consists of short safety messages, running 10 minutes or less, that are recorded on videotape and provided to the flight facilities. Tapes covering compressor stalls, engine failures and fuel control malfunctions have been developed. The content points out the emergency procedures that must be taken in each case, while stressing the dangers of instrument misinterpretation.

A spin-off safety program consists of short preflight highlights designed by the group to keep the pilot informed on proper inspection procedures. Thus far, individual components of the UH-1 Huey helicopter such as the short shaft, nicad

A media technician mass duplicates a television presentation for field users



The group has the capacity to mass-reproduce the instructional materials to ensure the needed quantity is available for the field

battery and tailrotor have been examined. The intent of the total program is that these short presentations will be incorporated into the pilot's briefing before flight.

With an eye to the immediate future, Multi-Media is gearing up to support the Aviation Requirements for the Combat Structure of the Army (ARCSA III) reorganization and implementation within ARNG aviation. Emphasis is to be placed on ARNG attack helicopter companies and the AH-1S Cobra aircraft. Night tactical training and incorporation of the new DA directed aircrew training manuals event-oriented program are targeted for special attention.

An abundance of guidance, information and instructional material has been released by the Multi-Media Group in support of Army National Guard aviation programs. Constant liaison is maintained with the field to ensure that the media program is responsive, up-to-date and effective. The overall goal of providing National Guard personnel the latest innovations in the instructional process, coupled with quality instructional material to meet the training needs of individual readiness and professionalism, is a challenge the Multi-Media Program has been meeting.

Master audio recordings are possible with the equipment and technical skills available

OPMS CORNER Officer Personnel Management System

Personnel Update

Major Jacob B. Couch Jr.
Aviation Management Branch
Officer Personnel Management Directorate
U.S. Army Military Personnel Center

Army Engineering Test Pilot Program

A Department of the Army Selection Board adjourned on 9 August 1978 after selecting 10 new members to participate in the Army Engineering Test Pilot Program. Individuals were selected on a "best qualified" basis. The number selected was based on Army requirements.

As the selectees are brought into the program they will attend the Naval Test Pilot School at Patuxent River, MD followed by a utilization tour within the Army research and development field.

Congratulations are extended to the following:

MAJ Frederick W. Dickens	CW3 Loran A. Haworth
CPT(P) David J. Anderson	CW2 Emil A. Cirone
CPT Ralph Buie	CW2 Ronald M. Dalby
CPT Randall G. Oliver	CW2 William B. Morris
CPT Edward J. Tavares	CW2 Patrick Sullivan

Aviation Career Incentive Act

Department of the Army Circular Number 600-13, "Aviation Career Incentive Act Data," dated 15 August 1978 is being distributed. The new circular reflects data that is maintained on the Officer Master File and is current through 31 May 1978. Questions concerning the circular should be directed to Commander, MILPERCEN, ATTN: DAPC-OPP-V, 200 Stovall Street, Alexandria, VA 22332.

Aviation Training

There has been a marked increase in the number of aviators arriving at Ft. Rucker, AL for Graduate Flight Training Courses who lack course prerequisites as outlined in Department of the Army Pamphlet 351-4, "U.S. Army Formal Schools Catalog."

Incidents of this nature cause difficult problems for both the student and the faculty. Experience has shown that many of these students are generally marginal and must receive additional training or end up being eliminated from the course.

The acts associated with these cases require that actions be taken to preclude students from arriving at Ft. Rucker without appropriate prerequisites. It is the responsibility of both the individual and his/her commander to ensure that prerequisites are met. Waivers for very exceptional cases may be granted on a case by case basis.

Major Brennan is the Aircrew Training Manual Program Manager at the U.S. Army Aviation Center

Aircrew Training Manuals—

Everything You Always Wanted To Know But Were Afraid To Ask!

Major Paul V. Brennan
Executive Officer
Directorate of Training Developments
U.S. Army Aviation Center

QUESTIONS, QUESTIONS, am I getting a lot of valid, interesting questions! Since the new aircrew training manuals (ATMs) are effective this month, let me list the most common questions I am receiving and the answers. This by no stretch of the imagination is meant to be a panacea for all of the implementation questions, but a short course on the most frequent queries.

If I fly a rotary (or fixed) wing aircraft in a flying activity category (FAC) 1 position, but also am required to fly the alternate category, must I also fly that as a FAC 1?

Some units may require, due to their table of organization and equipment (TOE) aircraft and personnel status, certain members to maintain proficiency in two categories of aircraft. Paragraph 1d of all ATMs states that pilots required to fly both fixed and rotary wing aircraft will have a primary aircraft in both categories and fly, as a minimum, the *FAC 2* task list and hours from both ATMs for these aircraft. For example, an aviator currently is occupyng a FAC 1 position in an assault helicopter company flying the UH-1. He is stationed at Camp Swampy which has a U-21 Ute, an aircraft he is an SIP in and has been tasked to fly. His requirements would be a minimum of 96 hours in the UH-1 and the associated FAC 1 tasks called for by his unit's mission. In the U-21 he would be required to fly, as a minimum, 48 hours annually and the FAC 2 task lists.

What are the requirements (hours and iterations) for aviators in refresher or mission training?

The requirements for both refresher and mission training are driven by the proficiency level of the aviator involved. The tasks, iterations and hours called for in chapter 5 of all ATMs only become effective after an aviator has completed either qualification or refresher training and mission training and is placed in continuation training.

How long can an aviator remain in mission training?

This question has so many variables, it is extremely sticky to answer. Common sense dictates the sooner you get a person into continuation training, the sooner that person can be counted for aviator status reporting. Conversely, available aircraft, instructors and training areas may lengthen this time. In all cases, an untrained aviator is a deficit to the unit's ability to perform its combat mission; therefore, the sooner aviators are placed into continuation training, the stronger the unit becomes.

What happens if I don't complete my semiannual flight hour requirements, but do complete my task list?

This should not happen, since the iterations of each task and the number of tasks were predicated on the number of hours required, but . . . under paragraph 5-4 of all ATMs, commanders have been given the latitude to reduce only FAC 1 *flight hour* requirements by up to 15 percent for experienced aviators. Iteration requirements for the tasks may *not* be reduced in any case.

After excluding the optional tasks that my unit does not fly, must we perform ALL the remaining tasks?

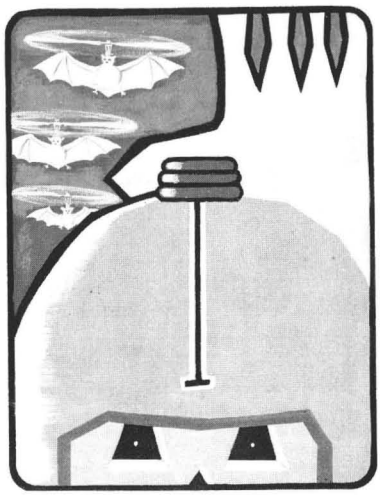
No, no, a thousand times NO! We do not expect units to perform tasks that are not dictated by the unit's mission statement. Aviator status reporting as explained in chapter 5 of TC 1-134, "The Commander's Guide," informs commanders that as a *minimum* aviators must complete 80 percent of the FAC 1 task list minus any optional tasks not flown by the unit. This does not apply to the FAC 2 task list. All aviators must complete the entire FAC 2 task list. There can be no deviation from the FAC 2 list.

Since an asterisk by a task requires instructor pilots to test annually, must instrument tasks be tested on the standardization flight evaluation?

No—instrument tasks marked with an asterisk should only be tested on the annual instrument renewal.

I hope the above will assist in solving your problems in implementing the second generation ATMs. The final copies of the ATMs will be produced in fiscal year 1979 and should be in your hands in the latter part of 1980. If more questions need answers, please write: CDR USAAVNC, ATTN: ATZQ-TD-TL, Ft. Rucker, AL 36362; or call AUTOVON 558-4619.

VIEWS FROM READERS



Editor:

The articles on the Geneva Conventions and aeromedical evacuation which appeared in the April through July 1978 issues of the *Army Aviation Digest* were very informative. They did not, however, address the *most important issue* involved. That is: If the U.S. implements the provisions of the new Geneva protocol as written, it will destroy the effectiveness of the battlefield aeromedical evacuation system for the U.S. Army.

In order to comply with the provisions of the protocol, it will be necessary to remove all machine (FM secure voice equipment) and nonmachine (CEOI) crypto systems from all aeromedical evacuation helicopters that are marked with a red cross. That means that an air ambulance will not be able to communicate with anyone except in the clear—no encoded messages (except international codes) are authorized by the protocol. To accomplish an evacuation mission under these circumstances, much information of intelligence value to the enemy would be broadcast in the clear (e.g., unit call signs, frequencies, and locations; quantities and types of injured Soldiers, etc.). An enemy listening in to air evacuation missions would be able to pinpoint in the division area the location of every maneuver battalion CP, brigade trains area and other key locations. The results are obvious. If U.S. forces were to comply with the provisions of the protocol which require notifying the enemy before a mission is flown in forward areas of the time, destination and route of flight, the enemy would not even need to listen in on our missions, we would be giving them the information directly.

Under the provisions of the current Geneva Conventions, the tactical commander may make the decision to display the red cross or to camouflage his medical assets. If camouflage is chosen, the only thing given up is the protection afforded by recognition of the red cross emblem. If captured, medical assets would still be provided certain protection under the Conventions. At worst instead of being considered retained personnel, medical personnel would be considered prisoners of war. Under the provisions of the new protocol, however, this is not the case. If an aeromedical evacuation aircraft marked with a red cross with either machine or nonmachine crypto systems onboard were to be captured, the crew would be considered *war criminals* and not prisoners of war.

If the protocol is approved, the only acceptable alternative to this problem for the tactical commander in combat is to decide to remove the red cross from aeromedical evacuation helicopters and to place machine and nonmachine crypto systems onboard so that missions can be completed effectively. This of course would eliminate whatever protection is now afforded aeromedical evacuation by the visual recognition of the red cross. Another problem with this solution is that the U.S. will have to wait until after the next conflict starts to make that decision. It is unlikely that the U.S. would allow units in peacetime to practice an art which in wartime is a crime.

The only real solution to this problem is for the U.S. to adopt the protocol with reservations which would permit the use of onboard machine and nonmachine crypto systems by air ambulances displaying the red cross without loss of the crew's protected status.

LTC Richard J. Berchin
Academy of Health Sciences
Ft. Sam Houston, TX 78234

Editor:

I was just sitting around amusing myself by burning the hairy fringes off my trusty Nomex when the July *Aviation Digest* arrived. After checking out PEARL, I accidently flipped over to Major Peterlin's "Offensive Attack Helicopter Operations" monthly winner article.

Here was an article I would have written were I sufficiently articulate rather than simply being the aging "mad dog" I've become. Major Peterlin's article is the most positive, straight-forward discourse I have read on this subject. I heartily endorse his philosophy and hope that his recommendation that we "start to think, train and develop equipment for offensive attack helicopter operations" is followed.

A few thoughts of my own for guys who are looking to the future:

- Attack helicopters, like artillery, should never be held in reserve.
- Attack helicopters are offensive weapons—not defensive weapons.
- Attack helicopters are the most responsive weapons available to a commander.
- Attack helicopters need two crews —a day crew and a night crew—so they will not be lost because of crew fatigue.
- Logistic support bright guys need to massage the formula:

$$\frac{\text{Targets to be serviced}}{\text{Attack hel available} \times \text{weapons} \times \text{expenditures}} =$$

ammunition/missiles required at the scene

- Thinking should reflect the proper priority for servicing targets. Kill the ZSU-23-4 first, then leisurely pick off the tanks.
- Modify the old "tank sweep" operation to "attack helicopter sweep" so herds of attack birds can eat up a tank regiment stripped of its ZSU-23-4s.
- The affordability of attack helicopters is an academic debate. The bottom line is simply that destruction of enemy armor forces is the key to victory whatever the cost in attack helicopters. Friendly armor held in reserve until all friendly attack helicopters are expended

can then make night attacks illuminated by burning attack helicopters *and* burning enemy armor. If the aviators do their jobs the way they should, there will not be a great deal left for the tankers to do.

Peace is hell!

LTC William W. Fraker
TRADOC Flight Detachment
Ft. Monroe, VA 23651

Editor:

A kudos to CW3 Rensvold for his article "Airline Pilots and Gunslingers"! [See June 1978 *Aviation Digest.*]

However, as a major from Fort Knox, I take some exception to the 'Roots' of the Gunslinger. All in all he is right on target in describing the two ludicrous extremes in the question of instrument proficiency. In the humorous, but sadly real, characterizations of the extremes he begs for a middle ground solution.

Part of the problem as I see it is an attempt to have "one size fit all." This is the easy, simple, but wrong approach. For the pilot whose duties require him to operate daily in the FAA environment, as much instrument training as possible may be just enough to do his mission. At the other end of the spectrum, those pilots who operate their mobile antiarmor missile platforms do not require the same amount of instrument expertise or training to adequately do their combat mission. Let me emphasize, however, that he should be capable of getting himself and his platform out of the clouds safely and without undue laundry demands.

I witnessed an attack helicopter team depart a holding area in northern Germany which had, in a very short time, been fogged in. The team departed the area without any difficulty because they: (a) knew exactly where they were and where they could go (could read 1:50,000 maps); and (b) all pilots were highly proficient in instrument (real IMC—not pretend) flight (unit had outstanding tactical oriented IFEs, a rare breed of cat). I feel this example shows a sensible balance can be reached between two skills (ILS and Killing) which many feel are contradictory. Maybe an ego trip?

Anyway, we tailor our units, our equipment, our TOEs to fit the combat mission of the specific unit, why not tailor the instrument requirements to support the combat mission and not hinder it? Thanks, CW3 Rensvold, we needed that!

MAJ William V. Chiaramonte
Ft. Knox, KY 40121

Editor:

I would like to heartily endorse the article "Think About The Unthinkable," in August's *Aviation Digest,* especially the comments on the Army's nonexistent survival training.

One solution (makeshift though it may be) is to take advantage of the Air Force's expertise in this area. By sending representatives from aviation units to their survival school, the units can develop a local "expert." He, in turn, can establish a local survival training program to pass on the material that he learned.

The 227th Aviation Battalion, 1st Cavalry Division, began this program by identifying one individual per company for an additional duty as a "survival expert." Quotas were then obtained for these individuals to attend the Air Force Survival School at Fairchild AFB, WA.

Until the Army develops its own serious survival training, this method offers a way to get a limited amount of expertise down to the unit level.

Frame J. Bowers III
U.S. Army Aviation Engineering Flight Activity
Edwards AFB, CA 93523

Editor:

I am doing a great deal of research into the raid on the Son Tay POW compound during the Vietnam conflict.

In connection with this, I was wondering if yourself, or any of your readers could provide me with any information concerning the operation. Information as to how I may be able to reach anyone who took part in the operation in any way, or was a Son Tay POW, would be especially helpful.

Thank you very much for your time and consideration of this matter.

Cadet Robert C. Morris Jr.
Box 713
Virginia Military Institute
Lexington, VA 24450

EURO/NATO Symposium At Rucker

DURING THE period 13 to 17 November the U.S. Army Aviation Center, Ft. Rucker, AL will host the fourth EURO/NATO Symposium. The EURO/NATO Training Group meets semiannually and is composed of representatives from Denmark, Germany, Netherlands, Norway and the United States. Observers from the following countries have been invited to attend: Belgium, Canada, Greece, Italy, Portugal, Turkey and the United Kingdom.

The EURO/NATO Training Group has evolved from EURO/Tng which was established in 1970. The aims of EURO/NATO Tng are:

- **To improve and expand existing and, as appropriate, initiate new bilateral and multilateral training arrangements.**
- **To develop these arrangements to a point where one nation might assume responsibility for training in specific areas on behalf of all or some of the partners.**

In 1976 The Aviation Center started training students from the member nations. At present there are 10 instructor pilots from Germany, 1 from Holland and 1 from Denmark permanently assigned to Ft. Rucker. During fiscal year 1979 about 98 EURO/NATO students will be trained as initial entry helicopter pilots.

Fight Outn
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LTC Jer
Attack Helicop
Fort Ru

EVERYONE KNOWS that the U.S. Army is preparing to *fight* outnumbered. The warning of tactical planners, senior officers and political analysts, "we must be prepared to fight outnumbered—and win," reverberates in the halls of Army training schools. It is heard at the close-in training areas and in the commanders' spirited admonition as their tank crews ready for tank crew qualification course (TCQC). Everyone knows we must *win* outnumbered. We have to make the most of what we have. We must use our weapons to maximum effectiveness.

The Army programs for fielding advanced systems (AAH, XM-1, PATRIOT, etc) are in response to the need to field the best possible equipment. The Army's number one aviation program is the AH-64 advanced attack helicopter. This aerial tank killer has been designed to survive on the battlefield through its incorporated ballistic toughness, the optimization of weapons lethality and fire control integration and application of sound battlefield tactics. Additionally, the reliability and maintainability features of the AH-64 will result in a considerably higher availability for combat missions than exists in today's helicopters.

A hard question resulting from analysis of the foregoing is whether the present system of providing one crewmember per cockpit space on tables of organization will get the job done in AH-64 units. I, along with many others, contend that it will be necessary to allot additional crewmembers per aircraft in order to reach maximum effectiveness with the AH-64. It is time that we, involved in aviation system management, get on with the business of "substantiating" a program of higher aircrew ratios within the Army, DOD and Congress.

The Army always has organized aviation units based on one pilot/one seat. This has been true even in view of nighttime requirements! There will be resistance within the Army to change this. The question then is how to show why we need additional pilots in our AH-64 units? Air Force fighter squadrons aircrew ratios range to two or more pilots per cockpit seat. How does the Air Force justify this?

An Air Force computer simulation model called LCOM (Logistics Composite Model) has been in use for several years to provide a scientific and systematic approach to the analysis of maintenance manpower requirements. LCOM has further been used effectively to determine the number of aircrews required to fly the programed wartime sortie rates. By taking into account the reliability and maintainability factors of the aircraft, as well as projected attrition rates and crew rest policies, studies have been conducted showing total aircrew requirements by weapons system in a wartime deployment environment.

The Air Force found that traditional methods of determining maintenance manning and aircrew ratios did not always result in realistic requirements. This especially was true for tactical weapons systems. Air Force maintenance manpower requirements historically had been based on reported maintenance manhours per flying hour data. Data normally was collected from relatively constant peacetime operations and was unsuitable to use in determining wartime requirements which incorporated different flying programs. For emerging systems, the Air Force and Army determine initial manning based on estimates often prepared by a contractor. These estimates called the Qualitative and Quantitative Personnel Requirements Information (QQPRI), often are based on assumptions which are inconsistent with the manner in which aircraft ultimately are used. Both methods fail to address, among other things, impacts caused by different organization sizes, spare parts levels and different mobility and flying rates. The Air Force decided to use a new approach to establish accurate maintenance and aircrew manpower requirements. The Army is using the old methods.

The Air Force considered several new approaches; the one selected was computer simulation. The foremost consideration upon deciding to determine aircraft maintenance manpower requirements by computer simulation is the selection of a simulation model.

GLO

AAH	**advanced attack helicopt**
ARMS	**Aircraft Reliability and M**
DARCOM	**Army Materiel Readiness**
DOD	**Department of Defense**
LCOM	**Logistics Composite Mod**
PATRIOT	**surface-to-air missile**
QQPRI	**Qualitative and Quantitat**
TCQC	**tank crew qualification c**
XM-1	**new main battle tank**

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Hipp
TSM Office
, AL

The model must be capable of representing the entire flying operation of an aviation unit. To accomplish this, the model needs the capability to handle the complex interrelationships that exist when using support resources (personnel, maintenance, equipment, spare parts, etc.) to accomplish an aviation mission.

The model ultimately selected by the Air Force was the LCOM. This model simulates interactions of aircraft operations and support functions at an Air Force base in a wartime deployment environment. It is designed to replicate the logistics process required to support an aircraft flying schedule.

The basic concept of LCOM is best described as follows: Maintenance, supply and operation input data for a particular weapons system is stored in a computer. The simulation process then merges these data, flies airplanes, uses and expends available resources and provides the output that projects manpower requirements. With some modification and additional programs, they also determine the weapon system's aircrew requirements.

Another major application of LCOM is in the area of logistics support requirements for emerging weapons systems (e.g., AH-64). The Air Force maintains that, if accomplished early enough, design tradeoffs can be incorporated which help minimize maintenance manhour requirements throughout the life of the weapons system without impacting on overall weapons system performance or effectiveness.

Should the Army use LCOM or something similar? I contend the Army must use such a systematic approach to system management if we are going to be successful in emerging weapon system management. A key unknown is whether or not the Army has the density and accuracy of data available to support such an endeavor. This evaluation must be made by a DARCOM agency having the expertise to make the assessment.

It has been suggested that the Army can use the Aircraft Reliability and Maintainability Simulation (ARMS) model developed by DARCOM's Applied Technology Laboratory at Ft. Eustis, VA as the basis for an Army effort to provide maintenance and aircrew manpower data. The Applied Technology Lab recently compared the LCOM and ARMS models. LCOM personnel utilization presentations are being integrated into ARMS. This will give the Army a model with all of the superior LCOM routines in addition to the ARMS compatibility with current Army owned computers. The Army can use ARMS for manpower projections with the same reliability as LCOM.

The important fact to be considered in evaluating the use of an ARMS/LCOM approach to provide manpower data is that computer simulation is a *proven* method. The Air Force already has convinced DOD and Congress on the need for higher aircrew ratios based on LCOM. The Army can do the same with its ARMS model.

No one will subscribe to Army attack helicopters sitting idly on the ground because: (1) the crews have flown to the point of exhaustion; or, (2) there are not adequate ground maintenance personnel to maintain and service aircraft designed to fly hundreds of hours between major maintenance, but which continue to need routine attention.

The Army also may determine a need for day and night crews—a double issue of pilots enhancing the effectiveness of the helicopter by special skill training in the day and night battlefield environments.

For those who would argue against more than one pilot per cockpit seat on the basis of peacetime mission flying requirements—consider the use of augmentation affiliated reserve pilots located near AH-64 units. To facilitate such an endeavor the reserve components may for the first time be provided some initial production models of a new weapons system.

The AH-64 is an all weather, day/night tank killer. It will require well trained, *multiple* crewing in order to maximize its design effectiveness and—in reality—to winning while outnumbered.

ARY

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U.S. ARMY

AVIATION STANDARDIZATION

Directorate of Evaluation/Standardization

REPORT TO THE FIELD

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 558-3617 or commercial 205—255-3617. After duty hours call AUTOVON 558-6487 or commercial 205—255-6487 and leave a message

Check, Check, Check Check This! Check That! Check Book!

CHECKLIST

OF ALL THE possible checks I can think of, none are more important to aviators than the operator's and crewmember's checklists (—CL) for the aircraft they fly.

Historically in aviation, *checklists* have provided a means of ensuring safe operation in all our activities which, to name a few, include preflight, normal emergency procedures and postflight! Most aviators don't have problems identifying the importance of proper use of *checklists* for actual flight requirements. However, many times, in our haste to "get on" with the mission, we "hurry" the preflight requirements of the *checklist,* sometimes with catastrophic results.

Are You Hurrying To An Accident?

Have you heard, "You take the top and I'll take the bottom"? The picture on the next page shows the possible results.

What Caused This Accident?

The aircrew is known to have performed the well-known, "abbreviated" preflight inspection and, subsequently, took off with the elevator gust locks in place (not removed prior to flight).

This accident, and possibly many like it, could have been prevented if the aircrew had performed a proper preflight inspection—*by the checklist.* Though accidents do occur from causes not related to aircrew performance, these potential accident-cause factors are frequently detectable during *by the checklist* preflight inspections. More simply stated, to quote an instructor pilot (IP) I know, "Self-help is better than no help."

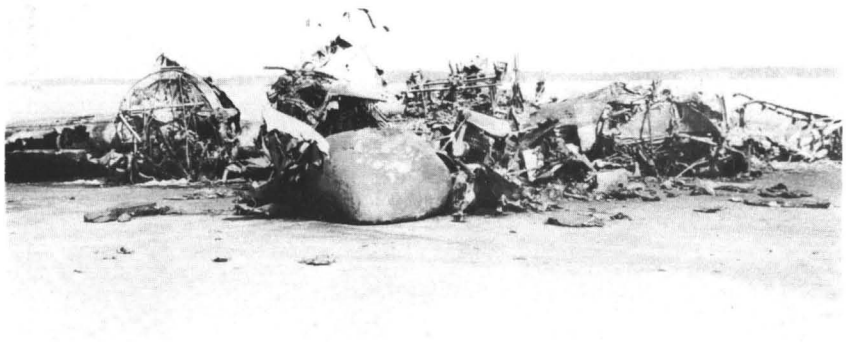
If you agree that proper preflight inspections prevent accidents, then

Can you preflight properly? Hindsight is always an easy way to evaluate a situation

ask yourself these questions. Can you, in fact, preflight properly? Do you know the name and function of the components and systems you look at? If not, you may be overlooking potential accident/incident causes or, at a minimum, a cause for needless mission abort.

Farfetched? Not at all. Consider the following example: An OH-6 Cayuse pilot with minimum UH-1 Huey experience, but with a substantial maintenance background, was assigned a mission in a UH-1. During preflight the short shaft and freewheeling unit assembly was malfunctioning and the pilot refused to fly the aircraft—a decision which was unpopular since there was not a replacement aircraft. After much discussion, another pilot determined the aircraft was flyable, accepted it, flew it and crashed it. Results? Three fatalities, total loss of the aircraft and mission not accomplished. The Accident Investigation Board subsequently determined the major cause factor of this accident to be short shaft failure. Though the *checklist* was used during preflight, the aviator apparently lacked adequate knowledge of this critical component's function and, for that reason, made a fatal decision. Lesson learned? You bet. The crewmember's —CL is only a "memory jogger," and to properly use it, the aviator must know the aircraft's systems and component functions.

"you take the top and I'll take the bottom"



And Don't Forget!

When a flight is completed—and home, happy hour or both beckon you—don't forget to postflight *by the checklist.* You may prevent needless maintenance "down time" or injury to pride and ego should some fault be discovered on your aircraft after you have departed the flight line.

In closing, I say, let's all be professionals and help *checkmate aviation* accidents through proper use of the *checklist.*

Conduct Of Army Aviation Standardization Visits

THE ARMY AVIATION Standardization Program is an important part of the daily activities of your installation: Commanders ensure the objectives of the program are accomplished; aviation standardization boards (major Army commands, subordinate commands, installation and battalion) supervise and coordinate their commands' implementation of the program; aviation standardization officers execute staff responsibilities for the program; and instructor pilots, standardization instructor pilots (SIP) and instrument flight examiners (IFE) actively conduct flight training and evaluations of pilots, IPs, SIPs and IFEs.

There is one other important Army element that frequently supports the Aviation Standardization Program at your installation. It is the Department of the Army (DA) aviation standardization team. Some will argue on the contrary that the team that visits your installation represents the U.S. Army Aviation Center (USAAVNC), at Ft. Rucker, AL and in a sense, they are correct since the teammembers are assigned to USAAVNC. However, let's see how Ft.

Rucker is involved in the worldwide aviation standardization mission and what an installation can expect when the DA aviation standardization team conducts an aviation standardization evaluation or assistance visit.

DA has designated the commander of USAAVNC as proponent agent for U.S. Army aviation standardization. As such, one of his responsibilities is to conduct, in coordination with major Army commands (MACOMs), an active assistance and evaluation program for aviation training, to include assessing the standardization and proficiency of aviators, IPs, SIPs and aircrews throughout the U.S. Army. Standardization encompasses aviator cockpit performance, aircrew teamwork, tactics, uniform publications, maintenance and safety.

Now, how does the commander of USAAVNC accomplish his aviation standardization mission? He has, as part of his staff, the Directorate of Evaluation and Standardization (DES) to which he has designated responsibility for the technical accomplishment of the Army Aviation Standardization Program. DES is responsible for writing AR 95-1 and is the user's focal point for input to the Aircraft Operators Manual (—10) and aircraft —CLs.

DES augments MACOMs with aviation standardization evaluation teams during the conduct of their assessment surveys (usually referred to as aviation resource management survey or ARMS) of the commands' aviation resources. DES also conducts independent evaluations of overseas commands and provides assistance when requested by MACOMs.

The schedule for visits by the DA aviation standardization teams is coordinated at an annual squaring conference with representatives from MACOMs; DA Deputy Chief of Staff, Operations (DCSOPS); Office of the Chief, Army Reserve (OCAR); National Guard Bureau (NGB); the numbered armies in the Continental United States (CONUSAs); and U.S. Army Communications Command (USACC) in attendance. In April 1978 the representatives met and coordinated the fiscal year 79 schedule of visits. Purpose is to combine the aviation standardization evaluation schedule with the MACOM's and CONUSA's schedules to reduce the number of visits to installations.

At this point, we wish to clear the air on a common misconception that the DES aviation standardization teams that augment the MACOM survey teams are representing Fort Rucker. As previously stated, the DES teams represent the Department of the Army by virture of the proponent agency designation.

When augmenting MACOMs DES teammembers closely coordinate with the experienced and established MACOM teammembers who possess expertise in all areas of aviation operations. Upon arrival at a unit or installation the MACOM team chief will inbrief the commander or a designated representative on the scope of the evaluation. The role of DES is to conduct flight evaluations, examine overall operation of the flight simulator when available, review individual flight record folders (IFRF) and unit aircrew training programs. Activities of the aviation standardization board also are checked. DES also monitors the MACOM's conduct of the evaluation.

What can the aviator expect when selected to take a standardization evaluation flight with a DES SIP? Initially, the DES SIP will review your IFRF and individual aircrew training folder (IATF) to obtain historical information about your past training. The DES SIP reviews those records to determine when your last standardization evaluation or training flight was conducted and, in general, looks at the training and flight time you have accrued over the past several months.

The lead-in reference in chapter 6, AR 95-1, is the framework in which flight evaluation is executed. These flights are spot check evaluations and do not constitute an annual standardization flight. Flights are conducted with the SIP at one of the controls or in the backseat when it is necessary to observe crew teamwork, cockpit coordination and IP performance. One-on-one evaluations look at "hands-on" aviator proficiency. If you belong to a tactical unit, in addition to the skills required in normal and emergency maneuvers, expect to be evaluated on terrain flight, flight planning, knowledge and execution of the vertical helicopter recovery procedures, gunnery techniques, and tactical instrument procedures.

Everyone knows that when annual aviator proficiency and readiness test (APARRT) time comes along, aviators dig into the —10 and other publications to prepare for the flight evaluation. Unfortunately, that level of knowledge is not always sustained over the current year and some pilots get "uptight" when selected for a DES standardization flight. Pilots are not expected to be center-line perfect. They are expected to be safe and possess the ability to execute those maneuvers required by their commander's training program. Total familiarity with procedures that require immediate actions are expected of the aviators. An understanding of appropriate publications and how to find the answers to questions also is required.

Aviators are selected for flight evaluations on a random basis and the selection process includes those in various assigned duty positions at the installation such as instructor pilots, line aviators and staff officers maintaining flight proficiency.

The flight evaluation is not just a check on pilots; it also provides insight into the effectiveness of unit training programs and local aviator standardization boards. The random sampling of aviators provides a

reasonable overview of the worth and impact of the installation's aviation standardization program.

Flight records are reviewed to ensure evaluations such as standardization flights, instrument renewals, etc., are documented properly and other currency and training requirements are being met. The review of aviation standardization board minutes identifies command interest as well as the board's activities in required programs such as assistance visits and random no-notice flight checks.

The evaluation terminates at an outbriefing for the installation commander, subordinate commmanders and staff officers. The briefing covers all areas of the evaluation to include major items of interest noted in the DES portion of the evaluation. The observations and recommendations presented are subsequently consolidated in the MACOM after-action report as team findings to be acted upon by the MACOM commander. DES renders an annual report to DA DCSOPS covering each MACOM's activities.

On some occasions in the past "Worldwide Standardization" had acquired a *Black Hat* syndrome. This resulted in a negative reaction in the field and was not totally undeserved. Today, the mission, as perceived by the Director of Evaluation and Standardization, is a positive tasking. Evaluating and flying with aviation units in the field should provide a realistic view of aviator performance as an operational pilot in his particular environment. DES SIPs do not conduct "Fort Rucker Stage Field" checks during the visits but rather orient their flight evaluation to local conditions.

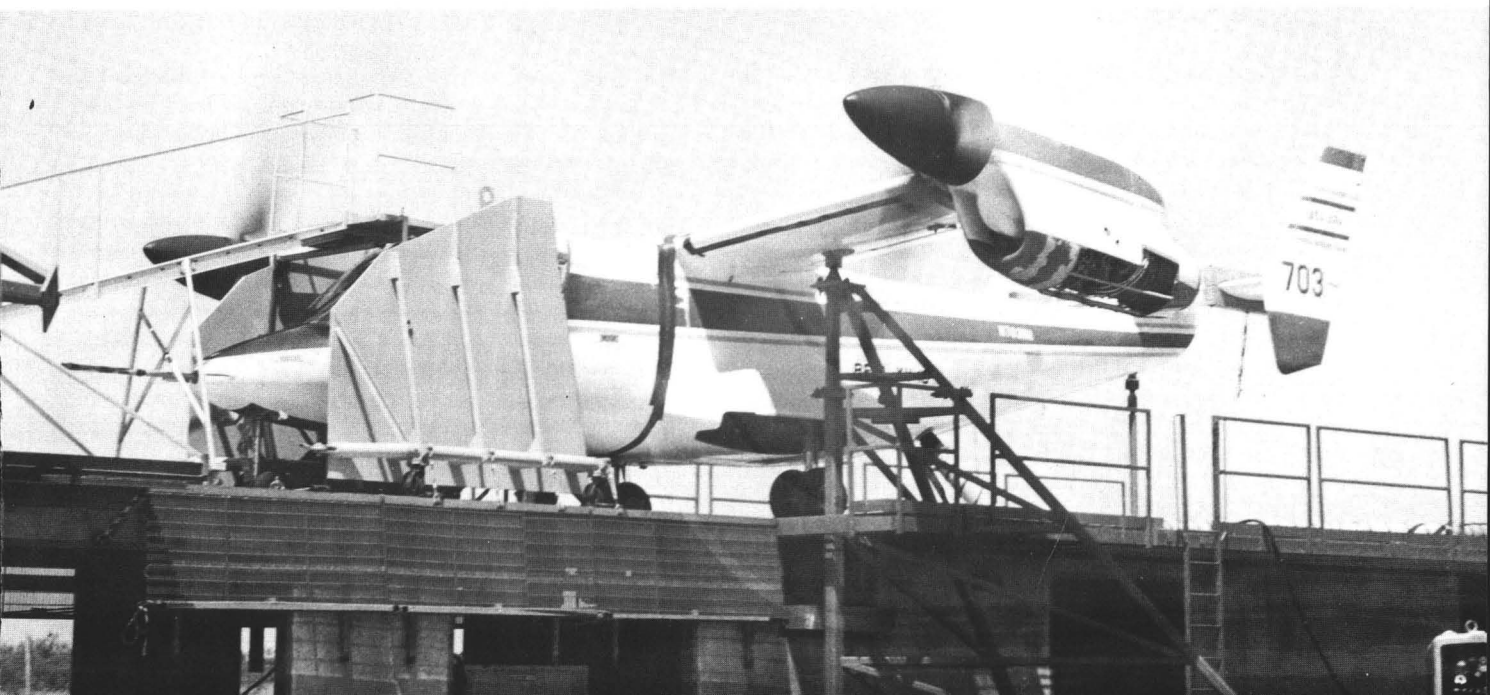
It should be obvious to the readers that DES aviation standardization teams spend a great deal of time on the road. Each trip and team is tailored to meet the needs of the installation visited. Every attempt is made to ensure that a thorough evaluation is performed (within the constraints of time and the size of the aviation standardization teams).

The thrust of aviation standardization is *readiness.* Therefore, commanders who have aviation assets as a part of their resources are thus afforded the management tools to assess the effectiveness of their aviation training programs and its interface with the Army's Aviation Standardization Program.

Bell XV-15

BELL'S XV-15 aircraft no. 2, the tilt rotor research aircraft designated to make the inflight conversion to the airplane mode later this year, has commenced ground run tests. The second XV-15's first hover flight is scheduled for this month. The full conversion from helicopter to airplane mode is slated to be demonstrated before the end of the year.

The XV-15 aircraft no. 1 recently completed successful wind tunnel tests at the Ames Research Center, Moffett Field, CA. Bell is working under a contract with National Aeronautics and Space Administration and the U.S. Army Research and Technology Laboratories (AVRADCOM) to design, manufacture and test two vertical takeoff and landing (VTOL) aircraft.



20 YEARS LATER

Captain Charles F. Nowlin, USAAAVS instructor, interviews Mr. Jerry Urban, meteorology instructor for Doss Aviation, a civilian contractor at Fort Rucker. CPT Nowlin sustained third-degree burns to 35 percent of his body when his OH-6 was downed by enemy fire in Vietnam in 1970. Mr. Urban sustained second- and third-degree burns to 30-35 percent of his body when his Air Force T-33 crashed in 1956. Although Mr. Urban's accident was 22 years ago, the lessons learned are still valid.

CPT NOWLIN: Jerry, tell us how you were injured.

MR. URBAN: I had been an instructor pilot when the Air Force came up with the idea that all rated personnel should be able to hold down desk jobs, plus fly. So I was working at a desk job and getting flying time whenever I could. At that time, each instructor had four to five students. Just like today, the students had to graduate on time so if an instructor became ill other personnel were brought in to help with the training.

My buddy got sick so he asked me if I would take one of his students on a flight and let him get some night time, plus a little formation and instrument time. I said I would and we flew down to Craig Air Force Base in a T-33 and got a bite to eat. By that time it was dark.

CPT NOWLIN: What type of aircraft was the T-33?

MR. URBAN: It was a single-engine jet trainer with tandem seating for two people. Most people would probably recognize it as the F-80 made into a tandem seat trainer. It was used for quite a few years by the Air Force as their initial jet training aircraft.

CPT NOWLIN: What was the airspeed of those aircraft?

MR. URBAN: Around 500 knots maximum.
CPT NOWLIN: Did they have ejection seats?
MR. URBAN: They had the old-type ejection seats and the harness. Some of the aircraft at that time had explosive-type seatbelts that were time-charged to blow the seatbelt after ejection and free the pilot of the seat. But many of the training aircraft were not equipped with these. The one I was flying that night was not.

When we returned to the flight line after eating, it was 8 o'clock. We checked the aircraft, filed a flight plan, and took off. About 800 feet after takeoff, the engine failed.
CPT NOWLIN: What was your airspeed?
MR. URBAN: Roughly 200 knots. Things were happening fairly fast and I really didn't notice the speed. When the engine quit we were over a trailer park that was built off the end of the runway. Further up from the trailer park was the town of Selma. Normally we took off and made a left turn in the traffic to avoid everything as far as the city was concerned. We were right over the center of the trailer park and I knew there was no way we could drop our fueled tip tanks. About all I could do was take over the aircraft. I told the student I was going to make a 180-degree turn, because continuing ahead would have put us right over Selma. I put the aircraft back down on the runway, landing downwind. I was telling the student that he could get unstrapped from his harness if he wanted to, but that if we went off the far end of the runway he could end up being fairly well battered, especially if we stopped quite suddenly.
CPT NOWLIN: You mean you had enough airspeed to do a 180-degree turn back to the runway?
MR. URBAN: Yes. I called the tower and let them know we had a flameout and we tried one air start. Later we found out that had we tried another air start, because of the nature of the problem, we would have probably blown up.
CPT NOWLIN: What happened next?
MR. URBAN: I touched the aircraft down somewhat long and the student panicked. We were porpoising down the runway and the student was trying to control the aircraft. I was not only trying to land, but I had to fight the student off the controls at the same time. We must instill into our students and pilots who is in charge of the aircraft at all times.

"I then realized that it was not the glove I was tearing off, but my skin."

We had a full fuel load, but if we had been able to drop our tip tanks, the problem would not have been as bad. With 813 gallons of jet fuel on board and wing tips flopping up and down with full tip tanks, things became a bit hairy. This was certainly not a normal situation for the student.
CPT NOWLIN: An excellent point and one that every aviator must have settled before takeoff is who will control the aircraft in an emergency. The last thing you need is to compound your problems by having to fight for the controls plus try to deal with the emer-

Mr. Jerry Urban (left) and CPT Charles Nowlin discuss their thermal injuries sustained in aircraft accidents and the importance of properly wearing life support equipment

gency. So you landed long on the runway. What happened next?

MR. URBAN: We hit 400 to 500 yards down from where we should have and then I lost quite a bit of time with the aircraft porpoising. I finally got the student off the controls and he later told me he unstrapped himself. He realized that if he unstrapped himself he might go into the instrument panel, but if he stayed strapped in he might be running into more of a problem if the aircraft caught fire.

To create more drag and slow the aircraft, I opened the canopy. We were going about 100 to 150 knots and the wind funneling into the back seat flattened me right against that seat. I was able to move my hands and feet but that was about all.

We got down to the far end of the runway and there was a 7- to 8-foot excavation ditch partly full of water. The airfield was in the process of extending the runway at that time. We had burned out all our brakes and the tires were blown, but I was still able to keep the aircraft somewhat straight. We hit the ditch and stopped immediately. At this time, the fuel tanks and tip tanks burst. The student jumped out about the time the first flames started. The fuel lines in the T-33 go from the tips and from the wings back through the rear cockpit. In addition, there is a 60- or 80-gallon fuel tank right behind the instructor's seat in the back. It burst and all that fuel was in the back seat starting to burn.

Meanwhile, the student realized I couldn't get out because the canopy was half open and I was in the back seat with a parachute on. The space was barely large enough to crawl through without a parachute. The student asked me if I was okay, if I could get out of the aircraft, or if he should come back and help me. I told him to stay out. I then found I couldn't get my seatbelt unlatched because my hands were burned. At that time, we had the old leather-type flight gloves.

CPT NOWLIN: Were your gloves on fire?

MR. URBAN: About three-fourths of them had completely burned. The gloves were a dark brown color. I remember looking down and thinking I still had my gloves on. I thought maybe my gloves were keeping me from getting a hold on the latch of the seatbelt, so I reached down to tear them off. I then realized it was not the glove I was tearing off, but my skin. The gloves had burned into the skin and in some spots the skin had started to peel.

CPT NOWLIN: Today, people still ask me why we don't have all-leather gloves. This is the exact reason why we don't. They would become soaked with fuel, oil, and perspiration, and then burn, shrinking into the hands. You can't get them off without tearing off the skin.

MR. URBAN: That's right. But, unfortunately, at that time the leather gloves were the finest thing we had. Another point I might make is that when I was in flight school, the Air Force was experimenting with an all-nylon flight suit. They looked cool, but they were hotter than putting a plastic bag over yourself, plus we quickly learned that if you dropped a cigarette ash on them, they immediately melted.

CPT NOWLIN: Often we end up reinventing the wheel with each new generation of flyers. Here we're talking about the problems the Air Force had with life support equipment in the '50s and look at today's life support equipment. We know it is not the ultimate, but we are transitioning toward the best. We keep improving it each year and more and more aviators are surviving the crashes and postcrash fires.

MR. URBAN: Definitely. If I had been wearing Nomex gloves, my hands would not have been burned nearly so bad.

CPT NOWLIN: What type of flight suit were you wearing?

MR. URBAN: We had cotton flight suits.

CPT NOWLIN: Did you have on a helmet?

MR. URBAN: Yes, with the oxygen mask on and visor down.

CPT NOWLIN: Leather boots? Zippers?

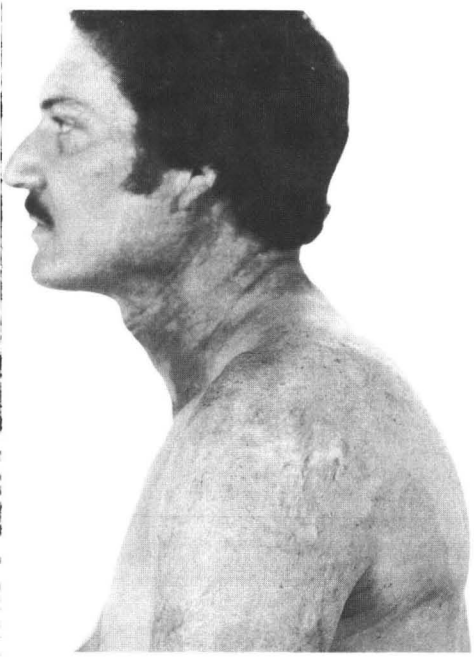
MR. URBAN: I had two pair of leather boots, one with zippers and one without. I was wearing the pair without the zippers. I was later told by a doctor that this saved my ankles from being burned. He told me that the synthetic webbing that attaches the zippers to the boots tends to melt and burn into the ankle.

CPT NOWLIN: How did you finally get out of the aircraft?

MR. URBAN: After I found I couldn't unbuckle the seatbelt, I had to sit and wait until it burned through. After the seatbelt gave way, I got up, then realized I was still connected to the aircraft by my oxygen mask hose. I was going to try to take my helmet off, but I couldn't because the oxygen mask crossed my face and my hands were burned so badly that I could not undo the clip on the oxygen mask. So I had to wait for the rubber mask to actually melt enough for me to pull it away from my face and push my helmet up over my head. This didn't take long because in heat like that rubber melts pretty fast.

"At that time no one thought of putting a collar up."

I finally got my oxygen mask and helmet off. Still having my parachute on, and not able to use my hands, I was having trouble getting out of the aircraft. Crawling between the canopy and the side of the air-



Photos left and above show severity of burns to shoulder and neck of Mr. Urban. Photo below shows third-degree burns to CPT Nowlin's neck. The neck injuries would not have been so severe if these aviators had been flying with their collars up.

craft, I finally got out and jumped off the wing, landing pretty much outside the ring of fire. By that time the parachute was burning on my back and I got it off without unbuckling it. To this day, I still don't know how I did that. The investigation team asked me if I had bothered to rebuckle my parachute after I had taken it off. I told them I could not unbuckle it, much less rebuckle it!

CPT NOWLIN: What was your student doing all this time?

MR. URBAN: He was standing outside the area of flames, of course, and had tried to come back several times. The fire unit had arrived but could not get to us because of the large ditch. The firefighters sat watching the aircraft burn on one side of the ditch and we were on the other side waiting for some water.

CPT NOWLIN: How far were the firefighters from you.

MR. URBAN: Maybe 75 to 100 feet away.

CPT NOWLIN: All the help in the world and they couldn't get to you because of the terrain. We are still faced with that problem today.

MR. URBAN: I don't remember them putting any water on the aircraft. Of course I was going into shock. They could have been pouring foam on everything for all I know. In the same manner, I don't remember any burn sensation other than heat, but that was also due to shock. The zippers were all that was left of my flight suit, so I was standing there pretty much in the buck.

CPT NOWLIN: Were you wearing a cotton T-shirt and underwear?

MR. URBAN: Definitely cotton! Back then no one was much into wearing synthetic underwear. So everything was cotton with me.

CPT NOWLIN: How did you finally get to the hospital?

MR. URBAN: To get over to the ambulance was

another story. We had to wade through the ditch, climb up the other side, and get in the ambulance. Obviously, I was conscious all this time and the student, who had sustained only a small burn on his shoulder, helped me through the ditch. Then began another problem. At Craig Air Force Base the flight line was separated from the main portion of the post by a large lake, so we had to ride around one end of the lake to get to the hospital. The ambulance driver was apparently on his first real ambulance run. He appeared to stop at every stop sign between the flight line and the hospital. The student was screaming at him to keep on going and that upset the driver even more.

CPT NOWLIN: This certainly emphasizes the importance of preaccident plans and briefings to ambulance and firetruck drivers. Time is paramount in saving lives. Drivers of rescue and firefighting vehicles should have the siren on and the lights flashing. You don't want an accident on the way to an accident scene or hospital, but by the same token you don't want to leisurely drive back to the hospital.

Hands in top photo belong to Mr. Urban. Note missing finger on right hand, caused by destruction of bone marrow. CPT Nowlin was wearing Nomex gloves (bottom photos). There was no injury to his left hand. However, injuries to his right hand were caused by exposure to the fire for a much longer period of time than the glove was designed to protect against.

MR. URBAN: That's true. Some of the numbness was beginning to wear off and I wasn't feeling too well.
CPT NOWLIN: What happened when you got to the emergency room?
MR. URBAN: The comedy continued. The staff had me laid out in the emergency room and I was asking for something to kill the pain because I was definitely hurting. But neither the nurses nor the medics could give me a shot of morphine without a doctor's orders. The doctor was not available because the flight line had notified the hospital about the accident and as soon as the doctor heard about it, he went to the flight line around one side of the lake while we came around the other side. He probably got to the flight line about the time we got to the hospital. So I had to wait until the doctor figured out where we were and got back to the hospital.
CPT NOWLIN: Again emphasizing the importance of the preaccident plan!
MR. URBAN: It would have saved a lot of time, plus some pain and frustration. The people in the emergency room were very upset. I was asking them where the doctor was and they were telling me he had gone to the flight line. This didn't make me feel too secure while lying there burned to a crisp.
CPT NOWLIN: Did the doctor finally arrive?
MR. URBAN: Yes. They sat me up on the operating table because I was still fully conscious and started taking off the burned skin, more or less just peeling it off. I was burned primarily on my hands and the back of my neck. At that time no one thought of putting a collar up. Of course, we had cotton flight suits, but still it would have been an extra layer of protection.
CPT NOWLIN: And 20 years later we still have to emphasize wearing collars up.
MR. URBAN: Right. It's a shame so many people have to learn the hard way. Another bad habit we had was to roll our sleeves up to the elbows when we flew. Fortunately for me, that night my sleeves were down.
CPT NOWLIN: You were evacuated to Brooke Army Hospital at Fort Sam Houston. How long were you there?
MR. URBAN: About 7 months. And I still had to go back for touchup work for months after that.
CPT NOWLIN: What was the extent of your burns?
MR. URBAN: Coverage wise, 30 to 35 percent, deep second- and third-degree and what they now call fourth I believe, where it actually destroys the bone marrow. That is how I lost the middle finger on the right hand. The burn was so deep that they finally had to amputate the finger. I had second-degree burns on my knees because the flight suit was tight over my knees when I was sitting.

Being a smoker, I carried a Zippo lighter in that little pocket on the left sleeve of my flight suit. When that thing got hot it started squirting out fuel and burned my arm. The plastic lighters of today will also melt. People need to think about this before carrying lighters on themselves when they fly.
CPT NOWLIN: Was your scalp injured after you took off your helmet?
MR. URBAN: Yes, the hair was burned off. They said the ear loss was caused by the injuries plus the limited circulation which we have in our ears. In addition, I had some facial burns but they weren't nearly as bad as they would have been had I not had my visor down and oxygen mask on. The visor, which will melt eventually, will protect your eyes from the initial flash burns. The oxygen mask melted, but that extra layer of protection was better than nothing.
CPT NOWLIN: Were you medically retired after your hospitalization?
MR. URBAN: Yes. I could have stayed in but it would have been behind a desk. I would not have been able to fly because jet aircraft have a lot of very small switches which I could no longer control with my hands. Many of the fingers were fused at the joints, plus when the tendons shrink up, you end up with a claw. So my fingers had to be pinned to keep them from completely drawing down.
CPT NOWLIN: What do you mean by pinned?
MR. URBAN: When the tendons start drawing up, to save the finger from completely pulling toward the palm, the doctors run stainless steel pins through the joints. After a period of time the joint will become completely immobile and they take the pins out. It sounds like a bad thing, but you are much better off having some use of your fingers rather than having a balled-up fist which you could not use.
CPT NOWLIN: You do have some use of your hands. Is that because of the pins?
MR. URBAN: Certainly. And of course extensive physical therapy.
CPT NOWLIN: Thank you for sharing your story and a bit of aviation safety history with us.

POINTS TO REMEMBER

- **To be effective, life support equipment must be used correctly.**
- **The question of who is in charge of the aircraft in case of an emergency must be answered before takeoff.**
- **Preaccident plans must be current and all individuals must know their jobs and understand the importance of their performance in the event of an accident.**

Reporting Final

Late News From Army Aviation Activities

FROM THE PENTAGON, OCTOBER 1978

Advanced Scout Helicopter (ASH). The ASH program passed a major threshold in that the FY 79 RDTE budget request for $5.5 million was recently supported by Congress. As a result HQDA initiated the concept formulation effort with an implementing letter and cost and operational effectiveness analysis (COEA) study directive. TRADOC has established an ASH Special Study Group (SSG) headed by BG James H. Patterson, Deputy Commander, USAAVNC. DARCOM and a number of other agencies are providing support for the study. COL Ivar Rundgren has been named as the Project Manager Designee. The Study Group will define the ASH missions, functions and requirements, and then conduct an analysis of the many alternative systems to determine which provide the best balance of cost and operational effectiveness. This study effort is slated for completion by August 1979. **(ODCSOPS)**

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Aviation Intensive Management Items (AIMI) Program. An important aspect of the Army's overall intensive management effort is the AIMI program. The AIMI program is a system for the intensive management of aviation items which are determined to be in critical status, either due to procurement value, cost of overhaul and/or criticality in source of supply. The objective of the AIMI program is to give special attention and management to this selected group of aviation items. The basic authority for TSARCOM to establish this program is contained in AR 710-1. The program applies to aircraft component intensive management system (ACIMS) items plus those which are in critical short supply. The latter type are put on the AIMI list at the discretion of the commodity manager or at the request of the AIMI customer. There are currently 78 AIMI items. **(ODCSLOG)**

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Host Nation Support, Depot Level Aircraft Maintenance. Host nation support in Europe has proven to be a viable supplement to the Army's aircraft depot level maintenance program. Current host nation support is being provided for the following aircraft systems:

- AH-1Q to AH-1S Modernization: HQDA is proceeding with a Product Improvement Program (PIP) for 62 each AH-1Q to AH-1S Cobra/TOW helicopters to increase the capability of Europe-based attack helicopters. A contract was awarded in April 1978 to Dornier Aircraft Corporation in Germany. This agreement is the first of its kind between the Army and a Federal Republic of Germany aircraft firm. Approximate transportation cost savings of $400K were attained by modifying the aircraft in Europe in lieu of sending them back to stateside contractors. The PIP will be completed in February 1979.
- Safety-of-Flight, OH-58 Aircraft: As a result of a worldwide safety-of-flight problem on the OH-58's T-63 engine, a host nation contract was let with Motorenund Turbine Union of Munchen, Germany. A total of 72 engines was modified (start date April 78 and completion July 78) at an approximate transportation cost savings of $80K. Authority has now been granted to have the remaining 280 T-63 engines repaired by host nation support as a result of the cost savings and readiness implications of the initial contract. Estimated completion date of this "add-on" contract in Germany is December 1979.

(ODCSLOG)

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Aviation Safety Review Council. As a result of the accident/mishap rate for Army aircraft, TSARCOM has taken a critical look at the manner in which materiel failures can be more readily identified and appropriate action taken to reduce the numbers of accidents/mishaps caused by materiel failure. Toward this goal, TSARCOM also has established a safety review council which will meet monthly. Members of the council will include directors of TSARCOM and representatives from USAAAVS, Applied Technology Laboratory, AMSSA and DALO-AV. A position, to be occupied by a dual rated (rotary wing and fixed wing) captain with a full-time assignment as secretary to the council and

responsible for coordinating all safety actions, has been approved by the commander. A black book will be prepared each month to provide all outstanding safety-of-flight modification requirements with appropriate target dates and costs. The book will be distributed to appropriate agencies within TSARCOM, USAAAVS and DALO-AV (this distribution is subject to revision). There will be a quarterly meeting of the safety review council which will be more comprehensive than the monthly meeting which will be basically inhouse TSARCOM. DALO-AV plans to participate in the quarterly review in addition to receiving the monthly book. **(ODCSLOG)**

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Special Study Group (SSG) For Career Management Field (CMF) 67. The Aviation Employment Conference held at the Aviation Center, Fort Rucker from 27 to 31 March 1978 (see September 1978 *Digest*) took a close look at a myriad of aviation personnel, training and maintenance subjects--one of which was problem areas associated with CMF 67 (enlisted aviation maintenance). Specific areas examined were:

- Imbalance of grade structure which has significantly reduced the potential for promotion.
- Flight/incentive pay entitlements for Cobra/TOW and AAH crewchiefs.
- Training and sustainability for individual ready reserve (IRR) aircraft maintenance personnel to be used as round-out for active Army units.

Review of the enlisted aviation maintenance program by AVNEC resulted in a recommendation for establishment of a SSG at DA level to examine in detail these critical areas. Final coordination for establishment of the SSG (to include membership and charter) is underway at DA. **(ODCSLOG)**

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Aviation Requirements For The Combat Structure Of The Army (ARCSA III). ARCSA III was a study specifically designed to improve the aviation force structure of the Army (see July 1977 *Digest*). HQDA recently initiated the FY 79 annual review by message to TRADOC. Of particular interest in this annual look at the aviation force structure will be an indepth examination of Armywide fixed wing indirect support aircraft authorizations and distributions. Target date for the review is November 1978. **(ODCSOPS)**

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Project Depot Roundout. In August 1977, DA sent a message to DARCOM and the National Guard Bureau (NGB) asking that a study be made to establish a concept for utilization of the four National Guard transportation aircraft repair shops (TARS) in case of mobilization or contingency. The concept study has been completed and consists of the following:

- Each of the three TOE TARS (Groton, CT, Springfield, MO and Fresno, CA) would be formed into an aviation classification repair activity depot (AVCRAD) with 336 people available to DARCOM for deployment when and where needed. Two AVCRAD are envisioned for deployment to USAREUR. The third one would be integrated into the production work at CCAD in support of the deployed AVCRADs, and would also be prepared to execute any additional OPLAN if needed. In USAREUR, these AVCRAD would interface with the theater materiel management center (TMMC) and the AVIM battalions in the field. The fourth TARS (Gulfport, MS) is TDA and would be workloaded in place by CCAD.
- Principal mission of the AVCRAD will be to provide a DARCOM interface for aviation materiel oriented on diagnostics, classification, limited depot repair and teminal point for closed loop support in and out of Europe or wherever a contingency may develop. **(ODCSLOG)**

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Aviation Maintenance (How It Works). The purpose of this contribution is to clarify DA policy for aviation maintenance. Aviation unit maintenance (AVUM) is the first level. Company/troop-sized units assigned ten or more aircraft are authorized an integrated direct support maintenance (IDSM) capability. This provides about 60 percent of the range of those tasks formerly authorized direct support maintenance units and is known as aviation unit maintenance (AVUM). Units with a lesser number of aircraft have TOE/TDA tailored to meet mission requirements. Direct support (DS) and general support (GS) units are being amalgamated into one aviation intermediate maintenance (AVIM) level. AVIM units in divisions are constituted from E Company (transportation maintenance company) and will be assigned to the combat aviation battalion (CAB). AVIM companies are tailored to meet aviation requirements of light (TOE 55-089), heavy (TOE 55-424), air assault division (TOE 55-407) and the 6th CBAC (TOE 55-417). Nondivisional AVIM units (TOE 55-459) are assigned to corps and provide support to nondivisional aircraft and some backup for Division. Depot maintenance remains essentially the same as developed during Vietnam; i.e., much overhaul/repair work originally assigned to general support, especially on major components, is now accomplished at depot level. This resulted from the realization that field maintenance units were being

continued on page 44

PEARL'S

Personal Equipment & Rescue/Survival Lowdown

If you have a question about personal equipment or rescue/survival gear, write Pearl, DARCOM, ATTN: DRCPO-ALSE, POB 209, St. Louis, MO 63166

Return To Me

If you have an SPH-4 flight helmet, NSN 8415-00-144-4985 and NSN 8415-00-144-4981 manufactured under contract number DSA 100-72-C-0143, return them to me at this address: CDR, Defense Depot, ATTN: DDMP-JQQ (Mr. Rick Neven), Mechanicsburg, PA 17055. Request an information copy of your shipping document be sent to CDR, DPSC, ATTN: DPSC-TSEI (Mr. Jim Kantner), 2800 South 20th Street, Philadelphia, PA 19101.

The above helmets have been discovered to be poor in sound attenuation, and could eventually impair your hearing if you continue to wear them.

First you will be required to requisition a new replacement of the SPH-4 flight helmet. Once you have received your new replacement helmet, return your old helmet to the above address. You will then receive credit for returning the defective helmet, which means your new improved helmet costs your unit nothing.

To receive credit for the returned helmet, be sure to tag the helmet giving your name and unit address to ensure that you receive the credit due.

Take It With You

We have all heard that you can't take it with you, but in this case I recommend that you do not go without it.

I am talking about special drugs that you may be required to take for a variety of reasons. You depart on a mission intending on being home and taking your required drugs before bedtime. However, your bed tonight may be next to your crashed aircraft. It also may be several days before you are rescued. Your mission also can be delayed away from home base due to mechanical problems or foul weather. So remember your special drugs or medication before your next mission—and take it with you.

No Best Way

You as an aircrewmember have just been advised that one of your fellow aircrewmembers is overdue and is suspected to be involved in a crash—out there somewhere.

Doris Dawkins

Photo by Jim Valentine

Of course as we know the Air Force has the mission for Search and Rescue (SAR). But in the meantime you may be requested to perform a SAR mission at a local level, because time is of the essence in getting medical care for those who may be injured.

There is no best way for you to conduct your search effort. The terrain, climate, type of search vehicle available and even the season of the year will determine the optimum search strategy. It usually is advisable to cover the search area completely at different times of the day, to take advantage of varying sun angles. At any rate, an organized, methodical, repetitious and redundant search effort stands the greatest chance for success. It's up to you to determine the best way!

Painful Burns

I don't know what it takes to make aircrewmembers aware of how painful burns can be, or of their disastrous, often deadly, effect. Whenever I see one of our aircrewmembers wearing Nomex flight clothing with the sleeves rolled up or pants legs inside of their boots, I always have a "chat" with them and point out that this is bad business.

We have spent many dollars in developing the finest flame retardant flight clothing for our aircrewmembers. Rolled up sleeves, turned down gloves and wearing of these suits inside the boots certainly may look cool in a photograph, but they have no place in our flying machines.

Unfortunately, this is all an educational process. If every aircrewmember had a tour of Brooke Army Medical Center, Burn Ward, or viewed Captain Nowlin's aviation life support equipment (ALSE) film, to see the neglect and misuse of flight gear (Captain Nowlin's knowledge and use saved his life), they would rapidly become aware of the serious consequences of fire to exposed skin. (See page 30.)

Although some aircrewmembers may feel "we don't need it," there is seldom time to cover up before the accident occurs. Few people have the presence of mind to pull out their gloves, roll down their sleeves, or pull their pants legs out as they depart the runway. We must all keep our aircrews aware of the proper use of the excellent protective gear provided. The pilots most certainly must set the example; aircrewmembers will "get the idea." Hopefully in the not too distant future, every aircrewmember will make this protective gear and ALSE a part of their "before takeoff checklist."

Where To Wear It

I have had a number of inquiries on where to wear or attach the sheathed, hunting knife, NSN 7340-00-098-4327.

There are as many recommendations as there are physical sizes of aircrewmembers, and types of aircraft that you fly. If you are flying a helicopter you may determine an ideal location for you, but this same knife location may not be advisable in an OV-1 Mohawk aircraft where you may be required to use the ejection system.

The knife should be placed in a location that gives you free arm movement for the type of aircraft that you primarily fly. The knife *should not* be placed in a location that would puncture your stomach if you are forced to bend in the middle.

The Awful Antenna

I have received many calls telling me that the 1/4 wave length antenna (NSN 5985-00-239-7572) on your AN/PRC-90 survival radio is awful (does not work, breaks easily, etc.).

Well, to every awful problem there is a solution. There is a 1/2 wave length antenna available from FPZ (CDR, San Antonio Air Materiel Area, Kelly AFB, TX 78241). The NSN 5820-00-371-6806LS will get the antenna for you. Again, this antenna must be requisitioned "off line" from FPZ since it is not listed in the Army Master Data File. The letters LS also must be placed after the NSN as above to get the antenna. If you have a question regarding this replacement antenna for your radio, you may call the Air Force item manager (Mr. Canales), AUTOVON 945-6567 at Kelly AFB, TX.

TM 11-5820-800-12 (Opr, Org Manual for the AN/PRC-90 Survival Radio) still lists the old 1/4 wave length antenna. Page 1-2 of Change 2 to TM 11-5820-800-12 lists the new 1/2 wave length antenna. However, it does not list LS at the end of the NSN, which is necessary to obtain the new antenna from the Air Force.

The new antenna is flexible and can be bent over to be stored in the SRU-21/P survival vest pocket.

Air Conditioned Face Mask II

In our PEARL column of the *Aviation Digest,* March 1978, we told you about air conditioned face masks but we did not tell you how to get them.

They are available from S9G (Defense General Supply Center, Richmond, VA 23219), NSN 4240-00-738-6245, cost is $1.52. You must submit an "off line" requisition to obtain them, because they are not listed in the Army Master Data File.

The Pocket

You squeeze and push, and then you tug and pull to get your AN/PRC-90 survival radio into and removed from the radio pocket of your SRU-21/P survival vest. "The pocket," as most of us call it, is just not big enough to accommodate the survival radio on some vests.

So PEARL to the rescue. A new and larger pocket is available by submitting an "off line" requisition for Pocket, NSN 8415-00-442-3616 to S9T (CDR, Defense Personnel Center, Director of Clothing and Textiles, 2800 South 20th Street, Philadelphia, PA 19101).

Helpful Hearing Hint

Following a recent ejection, the crewmember attempted to establish contact with his wingman. When initiating communications, the mishap pilot found the reception volume of the AN/PRC-90 radio to be very weak. He changed the battery in the radio to ensure power was not causing the poor volume situation. Installation of the spare battery did not improve the reception capability; therefore, the pilot concluded the radio might not be transmitting properly. Interviews with the wingman and rescue personnel indicated the radio was transmitting properly. The crewmember did not attempt to use the earphone.

The weak reception of the AN/PRC-90 radio did not adversely affect the rescue effort. This problem, which concerns poor fidelity of the external speaker in certain blocks of AN/PRC-90 radios, has been identified and is being corrected. However, further investigation revealed that not all aircrews were aware of this problem, and that use of the earphone would have provided the desired reception. If you're ever unfortunate enough to be in this situation, try the earphone. You'll be surprised at the improvement in reception.

MBU-5/P To You

Some of you are having a problem ordering the MBU-5/P oxygen mask because it is an Air Force item. When ordering in assembled form, the mask includes face piece, hard shell, valve assembly, delivery hose, hose clamps, cord and snap assembly, connector adapter, cable guides and dust covers. The NSN and nomenclature for the MBU-5/P oxygen mask assembly are:

NSN	Nomenclature
1660-00-810-3223LS	Oxygen Mask, MBU-5/P Size Reg Narrow
1660-00-811-5259LS	Oxygen Mask, MBU-5/P Size Reg Wide
1660-00-810-3225LS	Oxygen Mask, MBU-5/P Size Long Narrow
1660-00-810-3222LS	Oxygen Mask, MBU-5/P Size Short Narrow

The only components that must be ordered separately to complete the mask are:

NSN	Nomenclature	
1660-00-076-9962	Connector CRU-60/P	(1 ea)
1660-00-137-5106	Suspension Harness, 4 pt	(1 ea)
1660-00-066-2077	Bayonet Straight	(2 ea)
1660-00-440-5553	Receiver Assy Bayonet	(2 ea)
5965-00-854-0658	Microphone M-100 A/C	(1 ea)
5995-00-890-8614	Cord Microphone	(1 ea)
5965-00-509-9889	Mounting Bracket for Boom Microphone	(1 ea)

Ordering should be hand processed "off line" and be sure to enter LS in the two spaces following the NSN. I hope this information will be helpful.

The MBU-5/P oxygen mask should be maintained in accordance with Air Force T.O. 15X1-1 and T.O. 15X5-4-4-12.

The Washer In-Between

All of you folks already know that there is a washer that fits in-between the AN/PRC-90 survival radio and the antenna. But what you may not know is if the washer is necessary. Well, the answer to this is both *yes* and *no*.

Yes the AN/PRC-90 survival radio will operate satisfactorily without the sealing washer in-between the radio and its antenna.

No the AN/PRC-90 survival radio will not be water or dust and moisture proof without the washer in-between the radio and its antenna.

So the washer in-between is necessary and can be obtained by submitting an "off line" requisition to S9I (Defense Industrial Supply Center, Philadelphia, PA 19146) for washer NSN 5330-00-928-7079. Cost is 42¢ each. (Note: When ordering the new replacement 1/2 wave length antenna NSN 5820-00-371-6806LS from the Air Force, it *does not* come with the sealing washer.

Manometer Calibration

Some of you have test equipment required to weigh and inspect your flotation equipment cylinders and compressed air bottles. However, I am told that you do not have the data required to calibrate the test equipment such as the manometer, NSN 6685-00-526-5323 and scale, dial and beam, NSN 6670-00-255-0239.

I have made several telephone calls and researched available data. The manometer is managed by (FPZ) San Antonio Air Materiel Area, Kelly AFB, TX 78241, and it was learned that no technical data was secured, but a manufacturer's pamphlet was issued with each manometer and it did include calibration data. The manufacturer of the manometer is: Meriam Instruments, 10920 Madison Ave, Cleveland, OH 44102, telephone WATTS 216-281-1100. I have asked the manufacturer to send me a copy of their pamphlet and when received will make distribution to users of this equipment.

The scale, dial and beam is managed by the Defense General Supply Center (DGSC), Richmond, VA 23219, AUTOVON 695-3230 (Mr. Crawford). He informed me that no technical publications were included in the contract, but that a manufacturer's pamphlet was issued with each item. The DGSC informed me that over the past several years, the item was manufactured by six different contractors. If you users can provide me with the manufacturer's name and part number, I will secure the necessary data and make it available to all you ALSE specialists.

HOVER POWER CHECK

Pat Wall
Directorate of
Evaluation/Standardization
Fort Rucker, AL

THE HOVER POWER check, one of the procedures appearing in all new helicopter operators manuals and checklists, has stimulated a great deal of interest among Army aviators.

The idea for a hover power check is not new; only the method is new. The most significant points about the power check that must be considered are:

- The preparation required prior to flight.
- The actual performance of the check in the helicopter at a hover.

The power check is always performed in a standard way. This enables the aviator to compare the actual torque (power) required to hover at a specific skid/wheel height with the estimated torque required to hover as determined from performance charts during mission planning. A 360-degree left turn is advisable as it allows the crew to check power and controllability at the worst wind condition.

Because of the varieties of operating environments and missions, it is not possible to adopt one performance planning method as the standard. A number of methods must be used to allow for desired mission flexibility.

In this article two basic methods are used as guides for mission planning. Please keep in mind that they are *not* the only ways that aviators can predict aircraft performance. (OH-58A performance charts are used in the examples but the methods apply to all other helicopters.)

Method A is for a mission to be flown NOE where the free air temperature and pressure altitude remain relatively constant throughout the flight. This method also is valid at any other time hover out-of-ground effect capability is required; e.g., instrument takeoff, confined area takeoff/landing and takeoffs/landings in snow or dust.

Method B is used when the destination DA is significantly higher than the DA at the point of departure. This method should also be used when the mission begins at a light gross weight and continues to a destination (at the same DA) to pick up a load where hover out-of-ground effect is required.

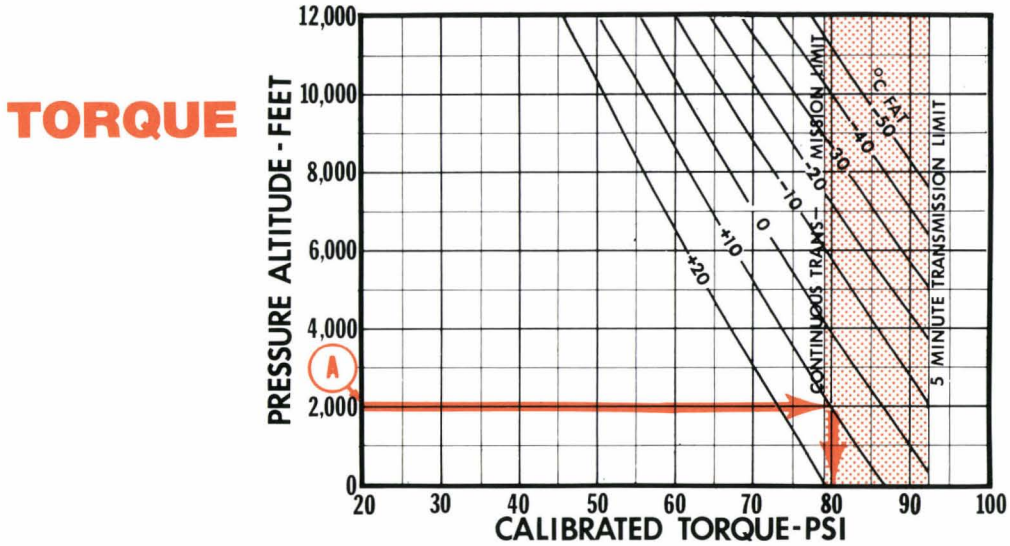
Glossary

C	Celcius	ITO	instrument takeoff
DA	density altitude	lb	pound
FAT	free air temperature	NOE	nap-of-the-earth
ft	feet	OGE	out of ground effect
IN HG	inches of mercury	psi	pounds per square inch
TOT	turbine outlet temperature		

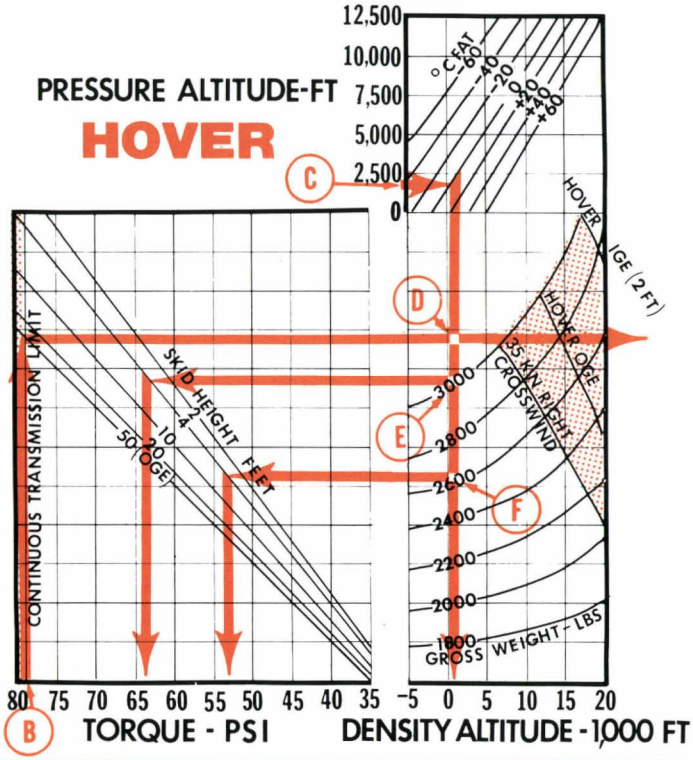
METHOD A

To Find: Maximum torque available (30 minute operation)
You Know: Pressure altitude = 2,000 ft. (NOTE: To derive pressure altitude when a weather station is not available, set 29.92 IN HG on the helicopter altimeter and read it on the altitude scale.)
FAT = +10 degrees C

Solution: Enter pressure altitude (2,000 feet) at point A and move right to the +10 degrees C FAT line. From the +10 degree C FAT line move down through the chart and read 80 psi maximum calibrated torque available. (NOTE: Because 80 psi is in the orange area (5-minute limit) 79 psi is the maximum torque available for 30-minute operation and is used to determine hover performance. The 30-minute limit is based on operating in the TOT yellow range (693 to749 degrees C.) Record the 79 psi torque value for use in estimating hover performance.



To Find: Requirements to Hover
You Know: Pressure altitude = 2,000 ft
FAT = +10 degrees C
Maximum torque available (30-minute operation) = 79 psi
Gross weight = 2,600 lb



Solution: Enter 79 psi maximum calibrated torque at point B and move up to the 50 ft OGE SKID HEIGHT line. From the 50 ft OGE line, the line is drawn across the chart.

Reenter the chart at pressure altitude (2,000 ft) at point C and move right to the +10 degrees FAT line. From the +10 degree C FAT line, move down to intersect the horizontal line (point D) and read more than 3,000 lb maximum gross weight for hover OGE. (NOTE: Because the weight exceeds maximum allowable gross weight, the estimated hover performance must be based on 3,000 lb.)

From the intersection of the vertical line and the 3,000 lb line (point E) move left to the 4-feet SKID HEIGHT then down to read 63.5 psi torque required to hover at 4 feet with a gross weight of 3,000 lb.

From the intersection of the vertical line and the 2,600 lb line (point F), move left to the 4-feet SKID HEIGHT, then down to read 53.5 psi torque required to hover at 4 feet with a gross weight of 2,600 lb.

We now have the five values that must be considered prior to NOE flight:

(1) Maximum torque available (30-minute operation) is 79 psi.

(2) Maximum torque available (5-minute limit) is 80 psi.

(3) Maximum gross weight for hover OGE is 3,000 lb. The aircraft must not be loaded above that gross weight.

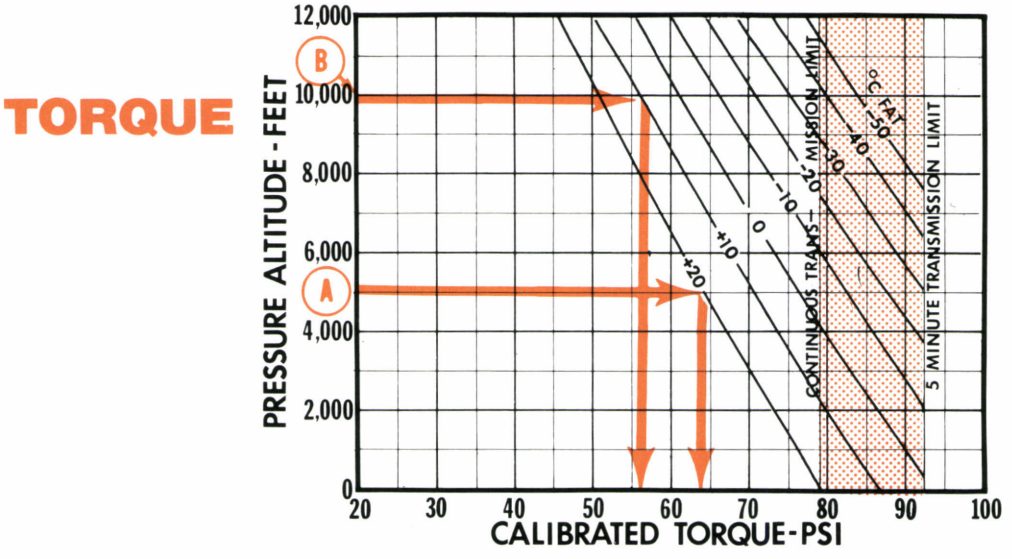
(4) Torque required to hover at 4 feet at 3,000 lb is 63.5. This is the GO-NO-GO torque. When the helicopter is hovered at 4 feet, the torque indication must be 63.5 psi or less to "GO" NOE, hover OGE, perform confined areas operations or ITO. If the torque indication at a 4-feet hover is greater than 63.5 psi, this flight is a "NO-GO."

(5) Torque required to hover at 4 feet at 2,600 lb is 53.5 psi. This torque indication may be used as a check of gross weight. If the torque indication is more than 53.5 psi while hovering at 4 feet, the helicopter performs as if gross weight is greater than 2,600 lb.

METHOD B

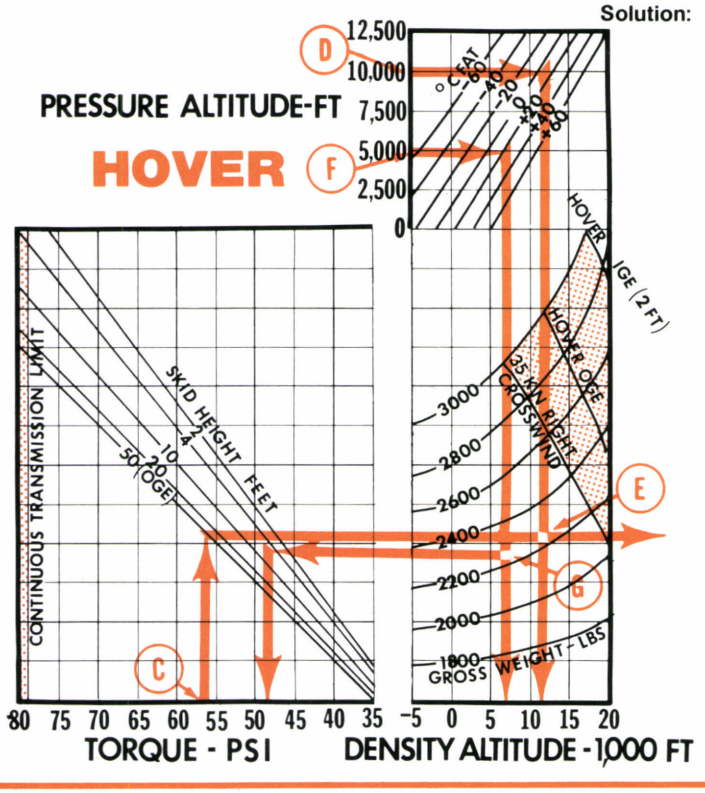
To Find: Maximum torque available
You Know: Departure pressure altitude = 5,000 ft
Arrival pressure altitude = 10,000 ft. (NOTE: Arrival pressure altitude is estimated.)
Departure FAT = +20 degrees C
Arrival FAT = +10 degrees C

Solution: Enter departure altitude (5,000 feet) at point A and move right to the +20 degrees C FAT line. From the +20 degrees C FAT line move down through the chart and read 64 psi maximum calibrated torque available at point of departure.
Enter arrival pressure altitude (10,000 feet) at point B and move right to the +10 degrees C FAT line. From the +10 degrees C FAT line move down through the chart and read 57 psi maximum calibrated torque available at arrival point.
Record these two torque values for use later.



To Find: Requirements to hover
You Know: Departure pressure altitude = 5,000 ft
Arrival pressure altitude = 10,000 ft
Departure FAT = +20 degrees C
Arrival FAT = +10 degrees C
Departure maximum torque available (30 minute operation) psi = 64
Arrival maximum torque available (30 minutes operation) = 57

Solution:



Enter arrival 57 psi maximum torque at point C and move up to the 50 ft OGE SKID HEIGHT line. From 50 OGE, the line is drawn across the chart. Reenter the chart at arrival pressure altitude (10,000 ft) at point D and move right to the +10 degrees FAT line. From the +10 degrees C FAT line move down to point E and read 2,300 lb maximum gross weight for hover OGE at arrival point. To determine the estimated torque required to hover at 2,300 lb at a 4-ft hover at point of departure, do the following:
(1) Enter the chart at departure pressure altitude (5,000 ft) at point F and move right to the +20 degrees FAT line.
(2) From the +20 degrees C FAT line move down to 2,300 lb (point G).
(3) From point G move left to 4-ft SKID HEIGHT, then down to read 48 psi torque required for hover at 4 ft with a gross weight of 2,300 lb.
We now have four values that must be considered prior to flight:
(1) Maximum torque available at departure point is 64 psi.
(2) Maximum torque available at destination is 57 psi.
(3) Maximum gross weight for hover OGE at destination is 2,300 lb.
(4) Torque required to hover at 4 ft at 2,300 lb is 48 psi. This is the GO-NO-GO torque. It is also a check of gross weight. When the helicopter is hovered at 4 ft, the torque indication must be 48 psi or less to "GO." If the torque indication is greater than 48 psi this flight is a "NO-GO." (NOTE: If the fuel to be consumed during the flight to the destination will reduce the gross weight significantly, it should be considered when estimating the maximum gross weight for the power check at point of departure.)

Reporting Final

Late News From Army Aviation Activities

continued from page 37

tasked to do more bit and piece maintenance work than could be supported or accomplished. It is important to know that the foregoing concept resulted from ten years of conflict in Vietnam with more than 4,000 Army aircraft, has been evaluated carefully for application in mid/high intensity scenarios elsewhere and has been approved by ARCSA III. The major thrust is to provide the most complete and autonomous maintenance and support capability practicable at each level, cut down on overhead, maximize the numbers of wrench turners and concentrate maintenance on mission readiness of all aircraft as a total weapons system. **(ODCSLOG)**

☆ ☆ ☆

Research, Development and Acquisition. The Aviation Systems Division in the Offices of the Deputy Chief of Staff for Research, Development and Acquisition has experienced major personnel changes this summer. COL Ivar W. Rundgren left in July to become the Project Manager-Designee for the ASH. Colonel Donald P. Wray became the new Division Chief, returning to ODCSRDA after a year at the Air War College.

Departing were:

COL William B. Dillingham PCSed to OTEA in August as Chief of Artillery and Airborne Testing. For the past 4 years he handled all airdrop, air transportability and cargo handling equipment.

LTC Robert F. Sweeney moved from Aviation Systems Division as a procurement analyst to the Office of the Assistant Secretary of the Army (RDA) as the Executive Secretary of the Army Science Board.

MAJ Don G. Fite moved to MILPERCEN after three years as the DA Systems Coordinator (DASC) for Cobra/TOW and Aircraft Weapons.

LTC Robert L. Letchworth PCSed to HQ TRADOC. He was the HELLFIRE DASC for the past two years.

LTC Kermit E. Larson Jr. returned from the Infantry Combat Vehicle Study Group in time to become the Assistant Executive to the DCSRDA.

LTC Sylvester C. Berdux Jr. became the Executive to the Director of Weapons Systems, ODCSRDA.

LTC Ralph H. Lauder departed to become the commander of 181st Trans Bn in Germany. He has been the Flight Simulators DASC.

New arrivals are as follows:

LTC Charles F. Densford Jr. (from TCATA, Ft. Hood) joined in May and is now TDY to the Attack Helicopter Operational Analysis Group (AHOAG).

MAJ Michael H. Summers (from Bell Helicopter, Ft. Worth) is the HELLFIRE DASC.

MAJ Joseph R. Kuzmick (from DARCOM) joined the budget team to handle aircraft procurement.

MAJ Kalman ("Joe") Csoka Jr. (from CDEC, Ft. Ord) is the Cobra/TOW and Aircraft Weapons DASC.

LTC William D. Taylor (from INSCOM, Arlington Hall Station) is the DASC for Special Electronic Mission Aircraft (SEMA).

LTC Howard P. Blount (from USAREUR) is resident paratrooper as DASC for airdrop, air transportability and cargo handling equipment.

Other assignments within the Aviation Systems Division include:

Mr. Richard L. Ballard, Chief, Technology & Support Team.

Mr. James R. Yamashita, Chief, Budget Team.

LTC James P. Mellin, Chief, Aircraft Team and Advanced Attack Helicopter (AAH) DASC.

LTC James J. Satterwhite, Advanced Scout Helicopter (ASH) DASC.

LTC Alexander Balberde, Black Hawk, UH-1 and Utility F/W Aircraft DASC.

LTC Roger W. Waddell, CH-47 and Aircraft Propulsion Systems DASC.

LTC James A. Burke, Aeronautical Technology DASC.

LTC William H. Bosking II, Avionics and Navigation DASC.

LTC Jay B. Bisbey, Aircraft Survivability Equipment (ASE), Aviation Life Support Equipment (ALSE), and Manufacturing Methods and Technology (MM&T) DASC.

Ms Dortha M. Winkel, RDTE Coordinator.

LTC George W. Sibert, Helicopter Icing DASC, RDTE Coordinator and Division XO.

Questions on Army Aviation Research, Development & Acquisition? Give the Aviation Systems Division a call: Aircraft Team AV 225-9571, Tech and Support Team AV 225-1362, Budget Team AV 225-9573. **(ODCSRDA)**

☆ ☆ ☆

FROM THE AVIATION CENTER

COL Robert W. Mills became the new TRADOC Systems Manager for the AAH last month. He succeeded COL John C. Bahnsen, who has assumed command of the 1st Aviation Brigade. **(USAAVNC)**

Let the ASH Special Study Group know how you feel the Army's advanced scout helicopter should be equipped. Fill in the questionnaire on page 47 according to the instructions below

YOU CAN HELP

Equip The ASH

Major Mike McClellan
TSM-ASH Office
Fort Rucker, AL

PROJECT YOURSELF into the 1985 timeframe. Assume, for a moment, that you are an aeroscout assigned to a unit in Europe. Hostilities have begun and your missions thus far have been demanding. Many have been at night and during periods of adverse weather.

You have continuously and cautiously maneuvered your helicopter at nap-of-the-earth (NOE) altitudes about the line of contact, coordinating with ground commanders, guiding attack helicopters into battle positions and adjusting artillery and employing close air support. Your stand-off capability has enabled you to gather information while minimizing the risk to yourself and the attack helicopter team.

You have acquired targets, which have been automatically passed to the attack helicopters and then designated them with laser from positions which afforded the best tactical advantage and assured a kill. You, in a highly survivable sophisticated scout helicopter, have been directly responsible for integrating the attack helicopters into the battle in the responsive manner required to ensure success.

Now return to reality, timeframe 1978. Naturally, as a professional Army aviator, you are concerned about those missions that you may be involved in at some later date. You realize that you now have only a limited capability to accomplish your mission at night and during adverse weather conditions. Currently, you do not have the stand-off acquisition and target designation systems necessary to accomplish your mission adequately and survive on the modern battlefield.

Today's scout aircraft does not have the capability to interface with the advanced attack helicopter (AAH), tactical fire (TACFIRE), fire support team (FIST) and other systems of the future. At NOE, you would be limited severely in communication and navigation. You realize that to perform the 1985-timeframe scout missions, you will need not only good training, but also an aircraft specifically designed and equipped for the mission.

The Advanced Scout Helicopter (ASH) Special Study Group (SSG) is now in session at Ft. Rucker, AL, evaluating the need and requirements for this proposed aircraft. The primary users of the scout helicopter are represented in the ASH SSG; however, the group solicits the input of the aviation force in the field as to what equipment is needed to make the ASH capable of conducting its mission on the modern battlefield.

When selecting equipment to be placed in the ASH care must be taken to ensure that only those ideas which will enhance the mission performance be included in the equipment package. Nice to have equipment which will add weight but not increase the mission performance must be avoided.

The questionnaire on page 47 has been designed to enable you to express your opinions and thoughts before the ASH package has been finalized. The data obtained from you, the user, will be used to support design concepts and equipment packages anticipated to be included on the ASH. Information in the figure, next page, is provided to acquaint you with some of the equipment with which you may not be familiar with. Additionally, the *approximate* weights of each item are given to help you equip your ASH while remaining within a specified weight constraint.

Approach this task as you would when purchasing a new automobile. You must select the engine and other options most required while remaining within your budget. Since weight is a major cost driver, be critical in the selection of "accessories" required to do your aeroscout mission.

Use the numbers in the first column of the figure to fill in Tasks A and B on the questionnaire; complete Task C; then detach page 47, fold and staple according to instructions and mail. Your replay is needed by 31 December 1978.

Figure

Number	System	Approximate Weight	Brief Description
1	7.62 Armament	320	Nonflex mounted on side of aircraft—weight includes 1,500 rounds
2	30 mm	424	Nonflex mounted on side of aircraft—weight includes 300 rounds
3	Missiles (2)	145	Has air to air and air defense suppression capabilities
4	Wheels	200	Weight shown is that weight in excess of skid weight
5	AN/APR-39	20	Radar warning device
6	AN/AVR-2	20	Laser warning receiver
7	AN/ALQ-144	41	Infrared jammer
8	AN/ALQ-136	97	Radar jammer
9	M-130	38	Chaff & flare dispenser-decoy against radar & heat seeking missiles
10	Mast Mounted Sight	385	Precision, day/night target acquisition & laser designation system. Mounted above rotor blades. Provides stand-off range
11	PNVS	121	Pilots night vision system. Nose mounted forward looking infrared. Provides night & adverse weather visibility for flying the aircraft. Requires no ambient light
12	CONUS Navigation	22	Includes VOR, ILS and marker beacon
13	Radar Altimeter	8	Precision altitude reading
14	ASN-128	28	Light weight doppler system gives UTM coordinates
15	HSI	8	Horizontal situation indicator (improved altitude indicator)
16	IACS	43	Integrated avionics control system—controls all radios from one control (communication management system which reduces pilot workload)
17	ATH	14	Automatic target handoff to attack helicopter & TACFIRE (digital message device)
18	IFF/SIF	22	Secure identification of friend or foe
19	Tactical Beacon	20	Gives glide path and glideslope, DME readout, navigation aid
20	TADS	457	Nose mounted day/night, target acquisition and laser designation system. Provides maximum stand-off range
21	Hover hold	30	Will hold aircraft stationary at a hands-off hover
22	IHADSS	55	Heads-up display (integrated helmet display allows pilot to point TADS in the vicinity of target)
23	UHF-AM ARC-164	12	UHF radio

24	HF/SSB	51	High frequency—NOE communications
25	KY-58 (3)	22	Secure voice on 2 FMs and 1 VHF
26	KY-75	34	Secure voice on HF
27	EMMADS	30	To provide instrument data—takes less room. Replaces some engine & transmission instruments & caution panel
28	IFF APX-100	12	Transponder
29	ARC-186	25	Combination FM & VHF

Questionnaire

Task #A. Using the figure, list in order of *priority* the systems you desire on the ASH (use number to left of system in the figure at left):

1. _____ 2. _____ 3. _____ 4. _____ 5. _____
6. _____ 7. _____ 8. _____ 9. _____ 10. _____
11. _____ 12. _____ 13. _____ 14. _____ 15. _____
16. _____ 17. _____ 18. _____ 19. _____ 20. _____

Task #B. Using the figure, list in order of *priority* the systems you need on the ASH; however, you are now limited to 1,000 lbs. of equipment (use number to left of system in the figure at left):

1. _____ 2. _____ 3. _____ 4. _____ 5. _____
6. _____ 7. _____ 8. _____ 9. _____ 10. _____
11. _____ 12. _____ 13. _____ 14. _____ 15. _____
16. _____ 17. _____ 18. _____ 19. _____ 20. _____

Task #C. General questions:

1. Your total flight time in observation/scout helicopters in flight hours is _____Below 200 _____200-250 _____500-800 _____800-1000 _____1000-1500 _____1500+
2. Type helicopter(s) you flew in combat (if any)_____, _____, _____.
3. Aviation unit(s) you have been assigned to: _____, _____, _____.
4. To best accomplish the mission the ASH seating should be _____tandem, _____side by side, _____single. Give reason for selection. _____
5. Should ASH be capable of seating passengers other than pilot and observer? _____No _____Yes—if yes how many _____
6. Considering the ASH's primary mission should it be armed? _____No _____Yes—if yes with what _____ _____, for what reason_____
7. Given that the scout helicopter is expected to operate at low level and NOE, is a complete instrument flight rules capability required? _____No _____Yes
8. Should the ASH have wheels or skids? _____wheels _____skids—Why_____
9. What engine configuration should the scout helicopter possess? _____single engine _____twin engine
10. Being innovative, provide some other missions/tasks that the ASH may accomplish:_____
11. Other comments that may be helpful to the ASH Special Study Group (attach additional sheet if necessary): _____

FOLD

DEPARTMENT OF THE ARMY
CDR, USAAVNC
ATTN: ATZQ-ASH-SSG-R
U.S. Army Aviation Center
Fort Rucker, AL 36362

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U.S. Army Aviation Center
Fort Rucker, AL 36362

FOLD

ATC ACTION LINE

UNITED STATES ARMY AIR TRAFFIC CONTROL ACTIVITY

I HEAR A LOT of discussion about omnidirectional approach lights. What's the big picture on future use of this relatively new approach light system?

The omnidirectional approach light system (ODALS) gained approval for use in instrument flight rules (IFR) nonprecision approach operations at U.S. civil and military airports upon adoption of the Third Edition, United States Standards for Terminal Instrument Procedure (TERPS) criteria. ODALS is essentially a combined RAIL-REIL approach lighting display that can be seen from any direction by the using pilot. It uses two runway end and five sequenced flashing lights spaced 300 feet apart on the runway centerline extended. The 1,500-foot system can be radio controlled in both service and intensity modes. A 1/4 mile visibility credit in IFR nonprecision approach/landing minima is authorized when all related aspects of TERPS criteria can be satisfied. The system is considered excellent and has been well received by Army pilots.

USAATCA-ASO is preparing to extend the use of ODALS to precision approach radar (PAR) procedures for Category A aircraft and helicopter operations. A 1/4 mile visibility credit will be granted for *Army Only* use in selected Army PAR procedures. ODALS will be installed at certain Army fixed installations having a high density helicopter stationing inventory but no requirement for large/heavy aircraft support missions. More elaborate systems will be provided at large airfields where conventional ILSs are required.

The ODALS is considered more than adequate for the relatively slow approach speeds flown by Category A airplanes and helicopters. The need for roll guidance is not considered essential. Adequate guidance in the visual mode is obtained through reference to aircraft instruments or the runway environment whichever provides the best benefit. The reduced cost of ODALS results in substantial savings. Installation, operational and maintenance cost savings also are realized. Use of ODALS in conjunction with precision microwave landing system (MLS) equipment will be considered when available and as experience is gained in this new approach system. Pilot workload and system accuracy involved with MLS will be investigated and considered at the appropriate time.

ODALS are installed at Gray AAF, Ft. Lewis, WA, to Runway 33. The nondirectional beacon (NDB) visibility minima is 3/4 of a mile based on 1/4 of a mile credit. The airport sketch presently contains a note of ODALS availability. The FLIP Terminal Lighting Legend page will be modified with a legend symbol for ODALS. When this is completed the note will be removed from the sketch and the symbol depicted. The symbol to be used is a double circle with dot. The dot represents sequenced flashers. This completes the picture.

Readers are encouraged to send questions to:

Director
USAATCA Aeronautical Services Office
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