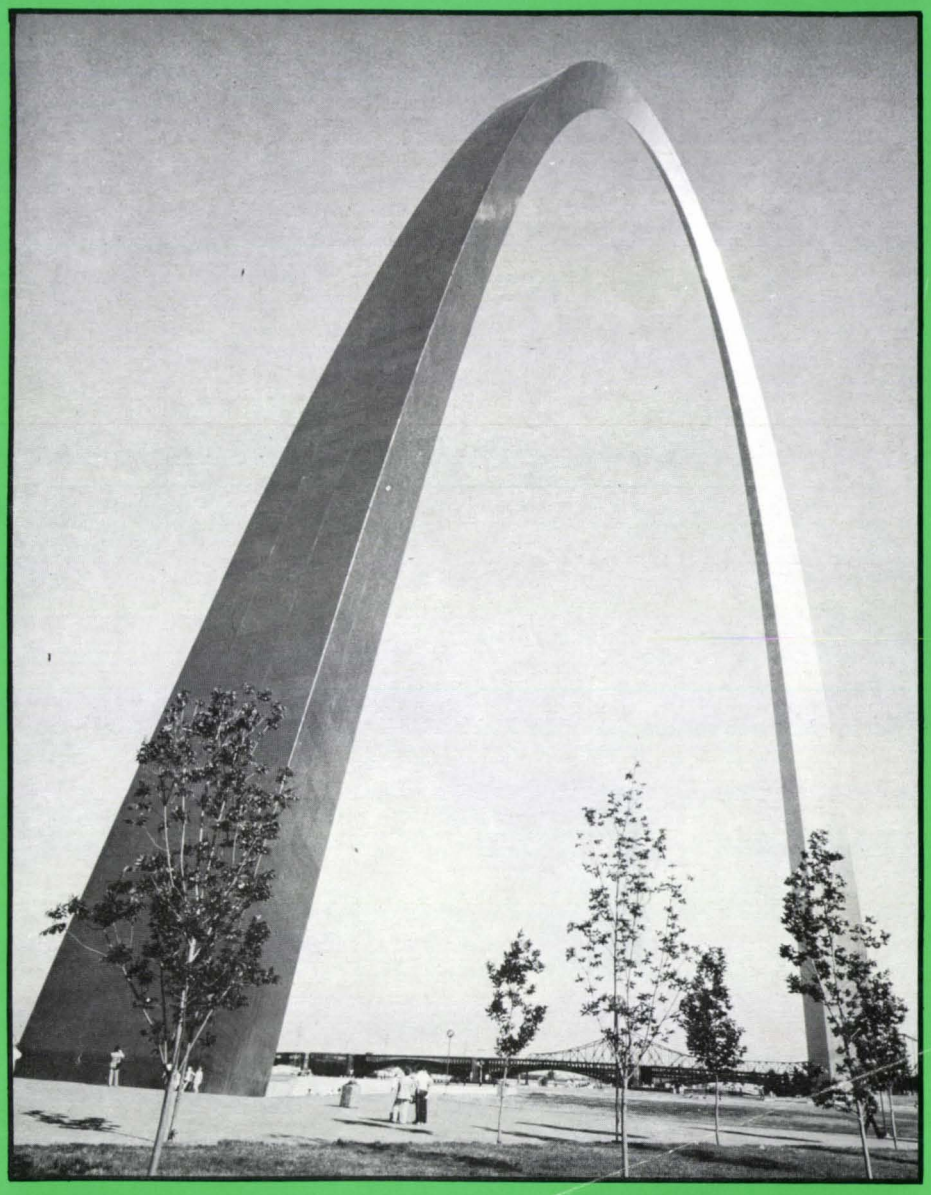
UNITED STATES ARMY

MARCH 1979

AVIATION DIGEST



TSARCOM

UNITED STATES ARMY
AVIATION DIGEST
MARCH 1979
VOLUME 25 NUMBER 3

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Richard K. Tierney
Editor

ABOUT THE COVER

In the shadow of St. Louis' famous arch TSARCOM supports Army aviation. See page 2. Photo by Laurence B. Epstein

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AVIATION GROUP COMMAND POSITIONS

LTC Matthew R. Kambrod
Commander, 7th Aviation Battalion
Fort Ord, CA

THE RECENT receipt from U.S. Army Forces Command of an approved authorization document for a combat aviation battalion in an Infantry division made me quite aware that the Army needs to modify its Modification Tables of Organization and Equipment (MTOEs). This modification will maximize combat effectiveness of commanders in tactical units.

I feel that with the implementation of the Aviation Requirements for the Combat Structure of the Army (ARCSA III) (see July 1977 *Digest*) concept, the aviation resources in personnel and aircraft will become so great within a division that one more echelon of command will need to be introduced. Specifically, attention should be directed to that level between aviation battalion/squadron commander and the assistant division commander positions—for example in an Infantry division.

Currently, aviation organizations within a division fall under two separate and distinct senior commanders: The combat aviation battalion usually is responsive to an assistant division commander for support, normally an 06 (colonel) position. The Air Cavalry squadron is responsive to the assistant division commander for maneuver, which is generally a general officer position. The rationale for this separation of command is tied directly to concepts of support and maneuver. But a strong case can be made, particularly with the assignment of attack helicopter assets to the aviation battalion, that the aviation battalion could be construed as a maneuver unit.

I recognize that in a purified form no companies other than attack are maneuvered. However, the integration of aviation with ground units almost exceeds the "support" role—for example in the sense of Artillery.

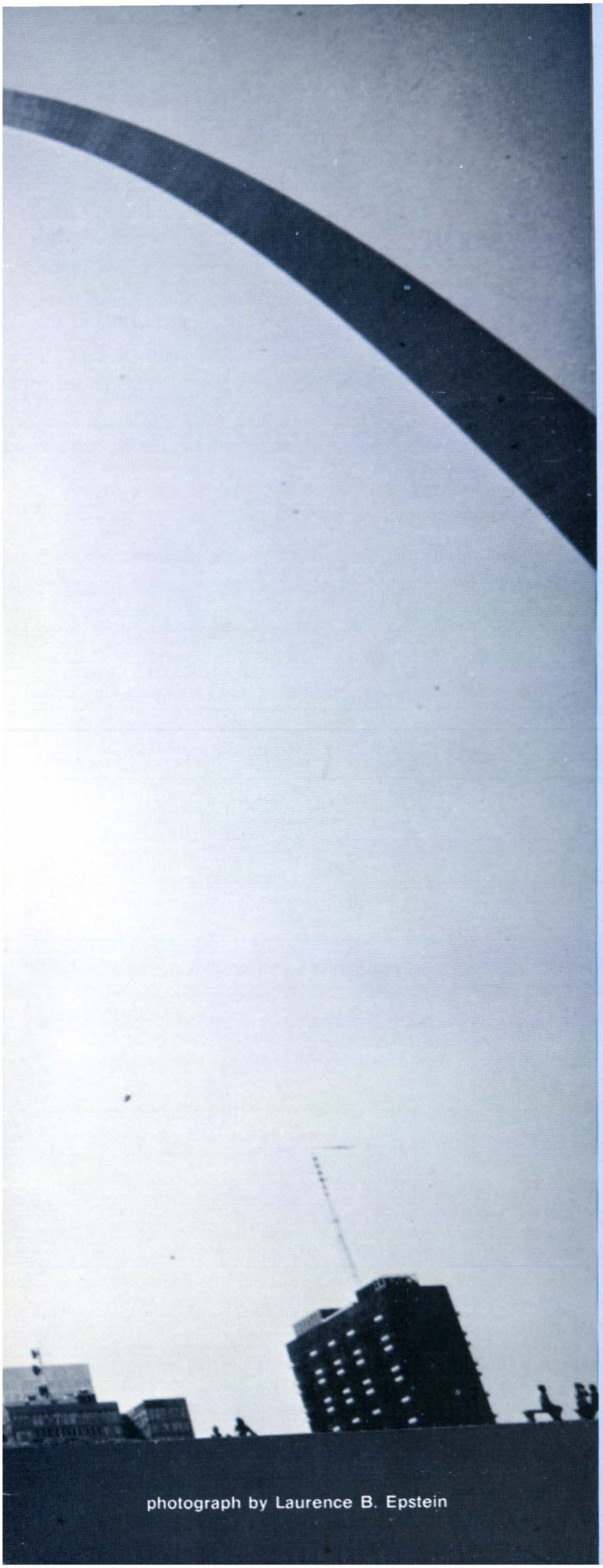
Where goes Infantry, so goes the helicopter.

In the integrated, combined arms role, aviation then becomes as much involved in maneuver as does Infantry (as we recall in Vietnam). If this premise is accepted, it is therefore logical to shift responsibility for the combat aviation battalion from the assistant division commander for support to the assistant division commander for maneuver (ADC-M). This would place command of all aviation assets within a division essentially under one commander—specifically the one responsible for mobility and firepower on the battlefield. Included as aviation resources would be about 200 helicopters (attack, scout and utility) and a 2,000 Soldier force structure operating and supporting aviation activities. Numerous tactical benefits

Continued on page 33

Major General Richard R. Thompson
Commander, TSARCOM

A wide-angle lens captures a UH-60 flying past St. Louis' famous arch near TSARCOM



photograph by Laurence B. Epstein

TSARCOM Support Of ARMY AVIATION

THE PRIMARY PURPOSE in life of the U.S. Army Troop Support and Aviation Materiel Readiness Command (TSARCOM) is the support of troops in the field. Everything we do is focused on a single objective; a high state of readiness of today's Army aviation.

Our job is to use a variety of internal and external management tools, designed to produce the best product with the least cost in terms of people, money and materiel. We provide logistics readiness support for 23 major categories of equipment, about half of which are aviation items. These include light, utility, cargo, attack and other rotary wing and fixed wing aircraft. Also included are aerial delivery and ground support equipment and aircraft shop sets. The size of this effort is tremendous. No other Army command has a larger or comparable logistics readiness mission!

The sheer magnitude and diversity of commodities managed and supported by TSARCOM is enough to strain the imagination. They present a substantial challenge to the 5,300 military and civilian personnel who work in TSARCOM headquarters in St. Louis and throughout the world, in managing support for some 12,000 aircraft from the arctics to the tropics.

To perform this task, TSARCOM is organized into functional directorates for systems management, materiel management, procurement and pro-

duction, product assurance, and maintenance, in addition to normal supporting staffs. These directorates provide support for both aviation and troop items as well as support to various project and product managers of other commands.

To effectively and efficiently fulfill the diverse responsibilities, TSARCOM uses the three level management concept; accordingly, the command coordinates operations through project and product managers, readiness project officers (RPO) and directors. The first level of management is the project/product managers who have the responsibility for specific systems requiring intensive centralized management. The second level of the management team is the readiness project officers who function much like minimanagers. There are 12 separate systems managed by the RPOs. The third level of management is the item managers who are located within the Directorate of Materiel Management and are considered the backbone of TSARCOM's wholesale supply effort.

There is a constant effort to improve the aircraft and supporting subsystems with the objective of making them more effective, durable and easier to maintain in the field. TSARCOM is constantly seeking out new and improved methods of providing logistical support to the Army aviation community.

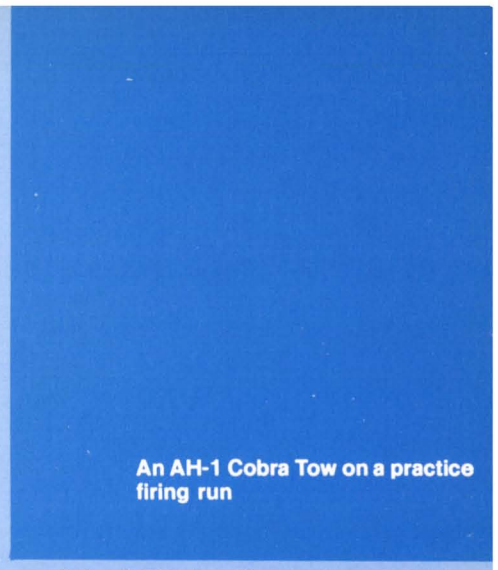
A never ending discussion always has occupied the minds of military logisticians as to whether to concentrate on quality or quantity. According to General John R. Guthrie, Commander of the U.S. Army Materiel Development and Readiness Command (DARCOM), "the truth lies somewhere in the middle." He made this point when he said, "Although our objective should always be to deliver a fully, mature, totally debugged system, the chances of doing this are small. Although each item of equipment must be as good as it is reasonably possible to make it, each system can only reach full maturity through troop use. By closely and continuously monitoring these systems, as they perform in the field, relatively minor adjustments can be made which help to make more perfect and effective weapons systems."

To this end, TSARCOM is continually developing new technical and management techniques designed to improve the systems and services the command provides to Army aviation.

The work done by the AH-1 Cobra Project Manager (COL Jay Pershing) is a fine example of this. It all began with the introduction of enemy tanks into the Vietnam war. The Army sent two tube-launched, optically-tracked, wire-guided (TOW) equipped Bell UH-1H Huey helicopters to the Republic of Vietnam. Within the first month of operation, these aircraft registered 47 confirmed kills including the destruction of 24 enemy tanks. These actions demonstrated that enemy armor could be destroyed by missile launching Army helicopters.

The current program was originated to determine if the Cobra/TOW aircraft could fight and survive in a mid-intensity combat environment anticipated on the European battlefield. Eight AH-1G Cobras were fitted with a prototype TOW missile subsystem to evaluate its aerial antiarmor capability. From this beginning, a complex variety of subprograms transformed the aircraft into a more effective weapons system, producing a first line attack helicopter destined to remain in the Army inventory.

A more powerful engine, rigid tail rotor and a new tail boom were added enabling the Cobra/TOW to better perform nap-of-the-earth flight. The modified aircraft were designated as AH-1S models. A Product Improvement Proposal undertook the development of an improved main rotor blade. Subsequent programs produced a redesigned cockpit area and a flat canopy housing reducing sun glare and distortion.



An AH-1 Cobra Tow on a practice firing run

Armament was added in the form of a universal chin turret mounting a 20 or 30 millimeter gun, and new fire control and rocket management subsystems. Other Cobra modernization programs include new radios, radar warning device and a laser designator. In addition, there are 42 other accepted TSARCOM Product Improvement Proposals.

With the new production aircraft and the conversion of the present fleet, there will be about 1,000 such aircraft in the Army inventory by the mid-1980s.

TSARCOM serves as the National Inventory Control Point and the National Maintenance Point for all Army aircraft systems and their organic components. The logistical support for the Cobra/TOW has undergone considerable expansion to keep pace with the modernization programs. Originally there were three principal contractors and 700 supporting vendors. Today there are 11 principal contractors and nearly 3,000 vendors. The Cobra/TOW modernization graphically demonstrates the extent of TSARCOM logistical support required to field a weapons system.

The Cobra/TOW is the first

Army aircraft deployed to the field under the DARCOM Project Hand-Off. This concept ensures field units are satisfied with the aircraft and familiar with its operation and maintenance. This familiarization is designed to decrease equipment down time for repairs resulting from misuse and ensures that the user is satisfied with the product before acceptance.

Project Hand-Off involves three factors; a materiel fielding plan, a statement of quality and support and a materiel fielding team. The fielding plan is developed jointly with each of the major commands receiving the weapons system. This agreement fully describes the equipment, its subsystems, training required and a logistical support plan. The statement of quality and support provides for a warranty on the equipment and, for a specified period of time, guarantees that parts which fail will be replaced at no cost to the user. The fielding teams train user pesonnel in the operation and maintenance of the aircraft.

Another important area of management is the TSARCOM approach to helicopter flight simulators. TSARCOM has an RPO that manages this system. The U.S. Army now has 24 contractor-maintained simulators used to train pilots in emergency and instrument procedures and to maintain flight efficiency. A cost effectiveness study determined that contractor support was more economical than government-support. The use of contractor-supported flight simulators resulted in about $25 million savings in each of the past two years through the reduction of personnel and materiel required to maintain actual aircraft.

One of our most important problems..and yours..is supply. In TSARCOM supply gets the personal attention of the Command Group, and those items which become problems are placed on a "hit list" and selected for intensive management. This has proven to be an effective method of management where supply problems are identified and resolved.

The computer also plays a vital role in the total management picture. TSARCOM has developed and implemented high quality data feedback systems for equipment it manages or will be supporting after transition. The reliability/availability and maintainability/logistics (RAM/LOG) data collection begins during the testing phase. Observations and significant information are recorded in a controlled environment.

The initial effort began in November 1977 with a sample data collection program using 21 AH-1S aircraft. Refinements were made on the successful methodology and a Continental United States (CONUS) wide program was instituted.

The Black Hawk and advanced attack helicopters which are in various stages of development, have been monitored since pre-government competition testing and this will continue for a year in the field on the first 15 production aircraft.

Warranty programs on the Black Hawk and advanced attack helicopters have made it essential that more than 100 items be tracked and evaluated. In addition, the Component Reliability Intensive Management System has been implemented on all production aircraft. This system will be continued in the field for three years.

RAM/LOG engine data is currently being recorded on the CH-47 Chinook for a 2-year period. Collection will then be transferred to the CH-47D to verify the effectiveness of engine modifications. The data collection system also is scheduled for the OH-58C Kiowa product improvement flight tests this month.

Not all TSARCOM logistics readiness programs are in St. Louis. TSARCOM is the "landlord" of the Stratford (CN) Army Engine Plant..a major engine facility operated by AVCO-Lycoming. The plant produces T-53 and T-55 turbine engines for Huey, Cobra and Chinook helicoptes and OV-1 Mohawk fixed-wing aircraft. The manufacturing plant consists of 1.5 million square feet of factory and office space on about 77 acres of land. It is

equipped with 2,500 machine tools and 14 production and 20 development test cells.

Another area receiving strong command support is aviation life support equipment (ALSE). While this equipment is not new, there is recent intensified emphasis to consider the equipment as part of a total system.

TSARCOM has identified ALSE in 76 national stock classes and identified and published a listing of more than 1,800 life support items for the user. This listing pinpoints, for the users, the exact title of each item, its national stock number and description; it identifies who is responsible for the item.

Recognizing the need for intensive management of these items, DARCOM chartered an RPO. In addition, TSARCOM identified a military occupational specialty (MOS) career field within the Army to ensure proper inspection, management and repair of equipment.

Each issue of the *Aviation Digest* includes an article by PEARL identifying aviation life support problems and solutions. Readers are encouraged to write directly to PEARL at TSARCOM concerning personal equipment or rescue and survival gear (see page 40).

Very strong emphasis is placed on aviation safety within TSARCOM. The Command's Aircraft System Safety of Flight Review Committee deals with hardware, support equipment and safety of flight policies and procedures. Responsibilities have been fixed to ensure timely identification of accident causes and implementation of effective corrective actions.

Working with a formal agreement, there is close cooperation between TSARCOM and the U.S. Army Safety Center located at Ft. Rucker, AL, in the preparation, exchange and use of aircraft accident data.

Safety and maintenance go hand-and-glove. People who maintain the aircraft require the tools and equipment which compliment their mechanical skills. Currently we are fielding three-level maintenance shop sets. To smooth the transition of these sets, TSARCOM has formed a fielding team to provide assistance during the changeover.

The 25 intermediate shop sets (AVIM), currently being assembled, will be completed by the close of fiscal year (FY) 1980. The 250 unit maintenance shop sets (AVUM), being assembled, will be completed by the end of FY 1981. The various shop sets include facilities to perform machine, electrical, sheet metal, hydraulic, welding, battery armament and fire control and engine repairs. These shop sets also require additional authorized major TSARCOM-provided support items such as generators and test sets.

Reliability center maintenance (RCM) is a disciplined approach to the development of maintenance programs at TSARCOM. The RCM concept is based on scheduled, periodic inspections and replacement of parts at fixed intervals. The tailored inspections are determined from statistical data including component failure rates, component life, criticality and failure analysis. Engineering analysis determines what will be inspected based on reliability, safety and economics. This TSARCOM action results in increased readiness and reduction of support costs of aviation systems in the field.

Since our command mission is closely tied to North Atlantic Treaty Organization (NATO) operations, we are becoming more and more involved with rationalization, standardization and interoperability (RSI) for aviation support and maintenance. Recently we have been aiding the United Kingdom in its commercial purchase of CH-47s. Meetings and informal dialogue between TSARCOM and the United Kingdom have helped to ensure that the United States and the United Kingdom fleets of CH-47s will be interoperable.

Other results of RSI policy have resulted in the procurement of closed circuit refueling receptacles for UH-1 helicopters, permitting interoperability with the standard NATO fuel nozzle. Installation of the refueling receptacles is scheduled for FY 1979.

Another major thrust of the command is materiel management. We are improving stock

RAM/LOG Engine data will be recorded for the OH-58 product improvement tests

availability, reducing outstanding back orders, expediting the return of repairables, and anticipating requirements and thereby eliminating procurement delays.

To expedite the return of repairables, notifications are transmitted to field service representatives, material is published in the TSARCOM Materiel Readiness Information Bulletins, and in *Army Logistician* and *PS* magazines. In addition, letters are sent to specific customers and potential returnables are intensively reviewed.

Product improvement is a big business in TSARCOM. Improved operational capability of existing weapons systems is being accomplished through product improvement as an economic tradeoff to the long term development of new systems. The AH-1S is an example of interim capability provided by product improvement and the CH-47 modernization program is an alternative to the development of a new system. The Product Improvement Program effort requires a coordinated effort within TSARCOM since all functional elements are involved in the process.

In July 1977 when TSARCOM was organized, there was an urgent need for interaction with the U.S. Army Aviation Research and Development Command (AVRADCOM), also organized the same month in St. Louis. Only by a close and continuing working relationship can the job of logistic readiness for Army aviation be accomplished. This closes the loop.

The interaction between TSARCOM's readiness mission and AVRADCOM's research and development mission is brought into focus by the Integrated Logistics Support (ILS) Office in TSARCOM. General Guthrie put it this way:

> ILS seeks to ensure that all logistics considerations necessary to field and sustain our systems—maintenance plans, test equipment, supply support, technical data, personnel and training, skill performance aids, software—are integrated into the acquisition effort from the design stage. The objective is to identify early those logistics issues which affect system design. After logistics plans have been validated during developmental testing, the effort switches to obtaining and deploying with the end item the required logistics resources to keep the equipment running in the field.

In TSARCOM, ILS requirements are set early in the acquisition process through its role in support of the development community. ILS encompasses numerous logistics functions that cut across TSARCOM functional areas in support of development commands, and project and product managers.

Adequate plans and the provision for logistics support are required for aviation systems acquisition, initial fielding and the transition of systems management responsibility from the developers to TSARCOM. Through its ILS functions TSARCOM has a centralized capability for assuming total support for each new system and for assuring that all required actions are taken.

TSARCOM's supply and maintenance missions, in some instances, are contractor supported. This type of contract is practical in the case of C-12 Huron aircraft, since this is an off-the-shelf commercial model without a contingency mission.

The TSARCOM fixed wing RPO has the responsibility for the coordination and control between the contractor and Army aviaton units. Under a total maintenance support contract, no equipment is furnished by the Government and the contractor provides qualified airframe and engine mechanics.

The Black Hawk program demonstrates another type of contract support. The contractor will provide spare parts support through 1982, although the Black Hawk system will be transitioned 2 years earlier.

Performing the missions and functions of TSARCOM is never easy; it can provide some heartburn for the command as well as for those supported. Successes are due to people—people with the devotion and will to keep the system going. At times, it may appear that TSARCOM people are unreasonable. But George Bernard Shaw put it very nicely when he said:

> The reasonable man (or woman) adapts himself to the world; the unreasonable one persists in trying to adapt the world to himself. Therefore, all progress depends on the unreasonable man.

I personally feel that TSARCOM is making progress, even if we appear unreasonable at times. But, we still have a long way to go. The command needs the help of those we support; those who can offer positive, constructive suggestions, keen imagination, ingenuity and initiative to provide even better support for Army aviation in the future. This can be accomplished only by hard work and a cooperative effort to produce minimum turbulence in the life cycle evolution of those Army aviation systems upon which American Soldiers rely.

MAINTENANCE errors pose a serious threat to flight safety. In the past, such errors have produced major accidents, some of them catastrophic.

Of prime concern is the recent rise in the number of maintenance-induced mishaps. But equally important is the nature of the errors that are causing them. Coupled, these observations strongly suggest all is not well, and a look at some of the mishap experience that has resulted from maintenance errors readily shows why.

During the period 1 January 1974 through 31 August 1978, OH-58 aircraft were involved in 146 maintenance-related mishaps. These mishaps resulted in the destruction of one aircraft, four major accidents, one incident, 21 forced landings, and 119 precautionary landings. A single cause factor—improper application of torque—was instrumental in causing 33 of these mishaps, four of which were major accidents.

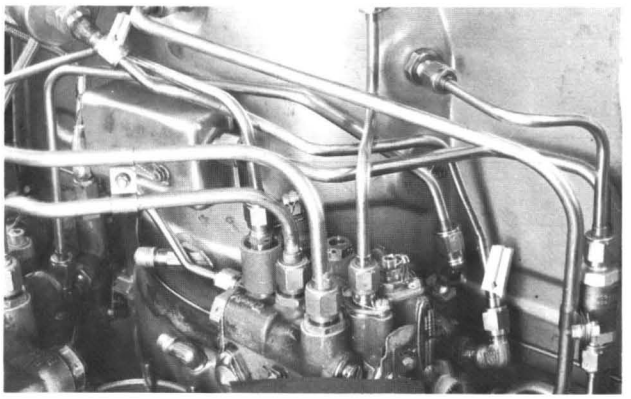
When the engine of one aircraft lost power, the pilot established an autorotative descent, turning the aircraft toward a clear area surrounded by trees. After applying collective pitch to clear the last stand of trees, he started his deceleration, but had to reapply collective early to clear a fence. He then used the remaining collective for cushion. However, because of low rpm, the aircraft lost lift at about 2 to 3 feet and settled hard, slightly nose high, causing one

main rotor blade to flex and sever the tail boom aft of the horizontal stabilizer. Loss of engine power resulted from loose fittings on the pneumatic lines between the fuel control unit and the power turbine governor.

Improperly torqued pneumatic lines have also been responsible for numerous forced and precautionary landings. In one instance, loose fittings necessitated a forced landing at night. Fortunately, with only his landing light to see by, the pilot was able to successfully land his aircraft with no damage.

In another instance, a loose connection at the double check valve caused a decrease in N_2 and resulted in the pilot's having to autorotate his aircraft. But not all of the mishaps induced by improper torque were associated with pneumatic lines.

When the crew of one aircraft smelled fuel fumes in the cockpit, the pilot made a precautionary landing. Inspection revealed a loose fuel line connected to the main fuel filter. Another pilot made a successful



Loose pneumatic line fittings such as those shown (arrows) have played a major role in causing OH-58 mishaps, including major accidents.

forced landing after his engine failed. In this instance, a mechanic had failed to properly tighten a flexible hose following installation and bleeding of a crashworthy fuel system. This allowed air to be drawn into the fuel system.

Oil and transmission systems have similarly been affected by improperly torqued fittings. In one instance, the engine oil bypass light illuminated on takeoff. Takeoff was aborted, and inspection revealed loss of engine oil was caused by a loose fitting on the torquemeter pressure line. In another instance, the oil bypass light came on while the aircraft was on final approach. Again, loss of oil occurred from an improperly torqued oil line fitting.

Failures affecting transmissions include those that occurred during approach, cruise flight, and pretakeoff checks. The pilot of one aircraft saw the transmission oil pressure light flicker on and off during approach and began an immediate landing. At about 50 feet agl, the light burned steadily. A line that had been disconnected for an oil sample had been reconnected but not properly tightened and came loose in flight.

The crew of another aircraft was making practice landings to a snow-covered field when they noticed oil on the snow. After landing, they discovered a loose transmission oil line.

The pilot of a third aircraft saw the transmission oil pressure light illuminate while he was performing pretakeoff checks. An improperly installed magnetic plug on the transmission free wheeling unit had allowed approximately 3 quarts of oil to leak out.

Improper torque has also caused a rash of hydraulic problems, including complete loss of fluid from one aircraft during NOE flight. Similarly, failure to properly connect or torque other types of hardware has also resulted in mishaps.

After a pilot completed a turbine engine analysis check, he proceeded to check autorotational rpm from approximately 3,500 feet msl. At about 2,500 feet, the throttle would not increase from flight idle and the aircraft was autorotated. Inspection revealed two bolts on the control tube to the gas producer fuel control lever were overtorqued, preventing throttle movement.

Another pilot landed his aircraft when the turbine outlet temperature rose in excess of 900 degrees C. The elbow assembly was found separated from the scroll assembly diffuser. The first three threads of the scroll assembly diffuser were worn excessively because of improper initial installation.

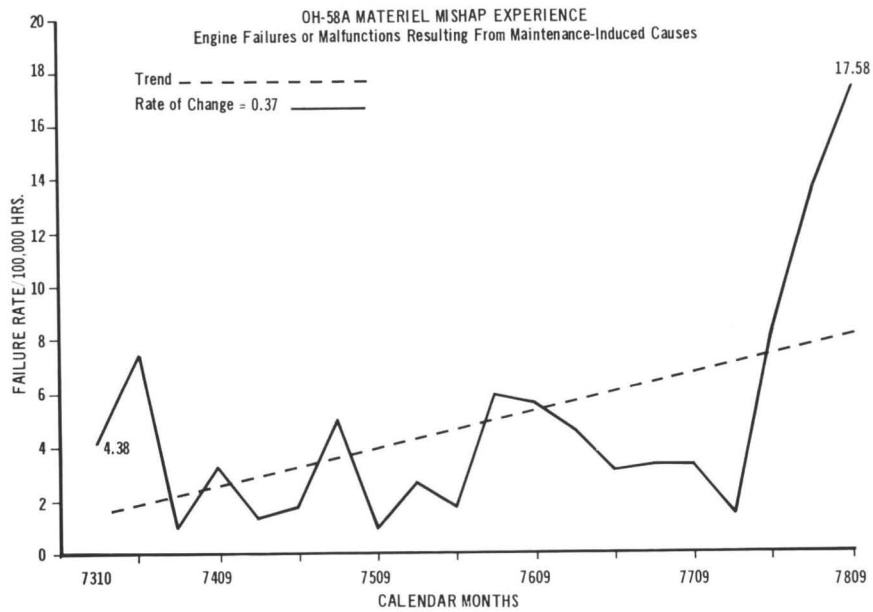
Another precautionary landing was made because an elbow assembly was not properly threaded, causing a loss of bleed air and high TOT.

An improperly torqued transmission isolation mount caused spike knock when another aircraft hit the ground during a slope landing.

While the predominant mishap cause factor was improper installation/torquing procedures, other types of maintenance errors were involved in a host of additional mishaps. One accident that destroyed the aircraft involved resulted from the combination of an extremely dirty bleed valve and a dirty compressor. During the forced landing attempt, following loss of rpm, the aircraft struck a bush, rolled to the right, and crashed. Other maintenance-related mishap cause factors, in descending order of occurrence, are:

- Improper wiring procedures that resulted in frayed and broken wires and electrical short circuits.
- Improper fuel control adjustments.
- Loose cannon plugs jamming flight controls.
- Improper inspection procedures.
- Improper installation and routing of fluid and pneumatic lines, causing chafing.
- Improper voltage regulator adjustments, causing thermal runaway.

Sudden rise in the incidence of mishaps that resulted solely from maintenance-induced engine failures during CY 1978 as compared with previous high in CY 1974 gives cause for concern.



TROUBLE WITH MAINTENANCE

- Improper adjustment of linear actuators.
- Insufficient lubrication.
- Contaminated fluids.
- Maintenance-induced FOD to engines and other components.
- Improper engine cleaning procedures.
- Incorrectly installed bearings.
- Improperly locally manufactured fluid lines.
- Incorrectly manufactured training skid shoes.

At first glance, it might seem that the situation is not really a serious one. After all, 146 maintenance-related mishaps over a period of 4 years and 7 months amounts to only a little more than two and two-thirds mishaps per month. Compared to the overall aircraft monthly mishap experience, this would appear to be of minor concern. But such is not the case. These mishaps are highly significant.

First of all, these 146 mishaps involved but a single model aircraft—the OH-58. While mishap statistics are currently being compiled for other Army aircraft, preliminary information presently gathered strongly indicates the findings will be similar to those of the OH-58.

Secondly, examination of the maintenance errors that precipitated these mishaps reveals violations of basic or elementary procedures when maintenance was performed. With few exceptions, causes can be classified in one or more of the following categories: failure to properly install lines or components; failure to properly torque fittings or hardware; and failure to refer to and follow TM procedures when performing other specific types of maintenance. Bluntly, all these errors involve basic maintenance fundamentals, and for the most part, are inexcusable.

Finally, a close examination of these mishaps reveals the seriousness of their nature. Only a combination of pilot alertness, skill, and favorable environmental factors prevented additional major accidents—perhaps catastrophic ones.

But while a computer readout can provide us with such information as numbers, types of failures, and locations of mishaps, it cannot point out the real causes of our problems. At best, it can only indicate a breakdown in our system of checks and balances—a breakdown that involves maintenance, quality control, and supervisory personnel.

Consequently, if we are to identify problem areas for corrective action, we are going to have to look at ourselves, unit by unit. And solutions may involve logistical support, the training element, or some personnel action outside our own unit. Do we have a sufficient number of mechanics for the maintenance that we must perform? Are experienced personnel being replaced with inexperienced ones? Do we have such a heavy workload that our mechanics are continuously rushed to maintain the required aircraft availability rate? Are they constantly working under the stress of fatigue? Do we have an adequate number of current TMs available for use by maintenance personnel? Do we have a sufficient number of quality control personnel? Are they school trained? Do we have a meaningful OJT program? What about our supervisors? Are they spread out too thin to be effective? These are but a few of the questions we might ask ourselves.

Once we have identified the underlying problems, we can begin to formulate and implement cures. If solutions cannot be found within our unit, then we may have to seek outside assistance. For example,

LEFT—Pilot skill and availability of paved two-lane mountain road (only clear area) resulted in successful forced landing after engine failed over 75-foot trees. Engine failure was caused by loose pneumatic lines between governor and fuel control. BOTTOM LEFT—Aircraft struck bush, rolled on side, and was destroyed during forced landing attempt following engine failure. Combination of excessively dirty bleed valve and dirty compressor caused engine failure.

some of our problems may have their origin in our basic maintenance training program. A prime question might well be: Is the initial training we provide our mechanics thorough and adequate or is it excessively rushed to be effective? It is noteworthy that many of the maintenance errors which caused mishaps occurred during the performance of work that did not require an inspector's signature to clear the related writeup.

In any event, the place to begin is in our own unit—with ourselves. And the time to start is now. Let's take a good look at our maintenance program, identify and correct deficiencies, and prevent errors that can lead to mishaps.

OXYGEN REQUIREMENTS

THE ARMY Safety Center has received many inquiries from the field concerning the oxygen requirements stated in paragraph 3-21, section IV, chapter 3, AR 95-1. Although most requirements are self-explanatory, the following are provided to clear up the most asked questions.

- **On any *planned* flight in unpressurized aircraft above 10,000 feet, such as for parachute operations, diluter-demand supplied oxygen must be available to and used by all aircrewmembers. Above 13,000 feet, diluter-demand supplied oxygen must be available to and used by all other occupants (continuous-flow supplied oxygen may be used by occupants other than aircrewmembers between 13,000 and 18,000 feet). In planned operations conducted with pressurized aircraft operating in an unpressurized mode above 10,000 feet, the aircraft must be equipped with a diluter-demand oxygen system for use by all occupants.**
- **It is highly advisable to use oxygen from ground level and up when flying night NOE. But, in all cases, oxygen should be used above 4,000 feet msl to prevent hypoxia, a condition which markedly impairs night vision and produces drowsiness, impaired efficiency, and faulty judgment. These effects are even more pronounced in persons who smoke and, therefore, it is imperative that they use oxygen at the lowest altitudes.**

If further information is needed on oxygen requirements, contact LTC Berliner, AUTOVON 558-6788/3819, or write Commander, U.S. Army Safety Center, ATTN: PESC-ZM, Fort Rucker, AL 36362.

Skydoc and Snongeldinger

Major A. T. Hadley III, M.D.
Brooks Air Force Base
San Antonio, TX

IT WAS TOWARD the end of a flight physical Skydoc was conducting on the general when he heard someone tell his secretary to go and take a flying leap. Then there was more rustling, vain protests, as an uninvited visitor burst into the Doc's office, at a moment which proved most embarrassing to the general.

It could be no one else but the immortal Jay Ryerson Snongeldinger. In about a second and a half, Jay had alienated two people—including a general officer. While this is certainly a recordable and enviable achievement, it is nowhere close to his record.

For those that are not acquainted with Snongeldinger, he was the Skydoc's roommate in college and in medical school. He had, because of his unparallel behavior, been called master and, later, having exhibited his talent maximally, "Supreme Doctor Of Tact." As a reference point, Skydoc was only called "Mister Tact."

Yet, it you could take away Snongeldinger's complete lack of finesse, the immortal JRS would have been the ideal doctor. He was brilliant, diligent, resourceful and, unfortunately, almost completely ineffective as he antagonized just about everyone he ever met. As an example, in medical school, Snongeldinger was asked by the dean how he managed to diagnose such a difficult case while other doctors, in-

Too often a piece is proclaimed a masterpiece by the critics that read it, and too often are the readers of that piece ignored. This piece will never be proclaimed a masterpiece on medical grounds alone. But it was not designed to be. Its design was to carry information to the aviator. That it has a format similar to "Doc Flighty" is not coincidental. That highly successful piece should have been emulated before. But from other standpoints this article is original. The author agrees, though, when interests and styles are the same, similarities must occur

cluding the dean, had so much trouble with it.

"All it took was someone with a *little* intelligence," JRS told the dean.

Doctors have a hard time taking a joke, and Jay spent his senior year in the morgue. There he could insult no one.

The same Snongeldinger's military career fared little better. His underground newspaper presenting general officers with the dud of the month award never assumed popularity at higher headquarters. Unexpectedly, but only to him, JRS was moved to one of the smaller, and outer, islands of the Aleutian chain. Then followed a slew of other choice assignments, such as botanist's assistant, in the Antarctic, searching during midwinter for rare plants that might have a place in medical research. Perhaps, that is why Jay Ryerson is not better known in military circles.

Of course, all these, and other, memories flashed by in the time it took the general to stand up.

"Why! You're the first general officer I've seen that's not fat. You must be an aviator." While this is certainly not true, and certainly not the most logical thing that JRS ever said, nevertheless the general beamed with pleasure, got dressed and left. Aviators are simply the best people in the world, thought Skydoc.

"Skydoc, what are you up to?" asked Jay.

"Well Jay, a group of us went touring across the United States looking at life support equipment. Very interesting."

"Don't you ever do any work, Skydoc?"

"I do get interrupted a great deal." Snongeldinger did not take the hint.

"What do you think about all that life support equipment?" asked Jay.

"I'm worried. The next war, or conflict is going to be terribly, terribly demanding physically, especially for the aviator. I don't think they know what they're up against."

Snongeldinger thought reflectively, and said, "I know what you mean. Those sophisticated electronic tools will jam our radios and take away all our communication, and no one will be able to talk to anyone. Then there is the matter of personal equipment. That Nomex can get very hot. Superimposed on this environment, there will be missiles, guided by wire, television or heat seekers looking for the helicopter kill and traveling at twice the speed of sound. Furthermore, hostile aircraft, loaded with these missiles, will be flying at mach one on the deck. The Army aviators have their hands full, that's for sure."

"That's a pretty accurate scenario, Jay, but you forget one thing—*the threat of chemical warfare.* Gas masks are being designed to exclude chemical agents at an efficiency of 1×10^6. That means that only one molecule in a million of the gas will get through the mask to the aviator. Now suppose a higher concentration of the gas does pass through the complex filtering system. The aviator then becomes incapacitated. One in a million, Jay, that is something to think about."

Here Snongeldinger rudely interrupted, ending Skydoc's lengthy pontification. "A poisonous gas doesn't have to come close to killing the aviator to be effective. A lot of people don't know that. All that gas has to do is come in contact with that marvelous structure, the eye, at a concentration of a hundred thousand (1×10^5) to paralyze the muscles of the eye. That's called ciliary spasm."

Skydoc told Snongeldinger that he indeed knew what ciliary spasm was. "It's not so much the inability to see that is incapacitating with ciliary spasm. It's the intense pain and the severe residual agony associated with these chemical agents."

The old Skydoc *is not* exaggerating about the pain. Someone in England volunteered as a human guinea pig, and was exposed to the concentration of gas that would be expected to occur, if the gas mask were improperly applied. The result was as expected; ciliary spasm and several hours of incapacitating pain.

Being near blind and in severe pain isn't how Skydoc likes to spend Sunday afternoon. Snongeldinger seemed to be fascinated by this story and wanted to go over to the out-

patient department to hustle up some volunteers, but the winged healer restrained him. Then Skydoc pointed out that laboratory results of gas mask tests always would be better than those conducted in the field where the rugged conditions of battle would disrupt tests.

Snongeldinger shot in, "And if you have any of those fat ones out there, Skydoc, and I know you do, some of those heavy neck wrinkles of flab may cause the mask to fit just a little bit off. And when this happens just enough gas passes through to cause ciliary spasm. You know, I've tried everything to get people, and especially the aviator population, to lose weight. They perform better, work better and feel better. Especially if they have combined an exercise program with their weight reduction program."

Take heed, readers, to what JRS said. In the area of weight reduction, Jay had tried everything. His campaign of placing decals of a huge fat red pig on the rear car window and on the front door of the house of every overweight person gained him notoriety (to say the least). Actually a lot of people did lose weight, but it was only that they expended so much energy looking for Snongeldinger.

"It's to your credit, Jay, that you do get people aware of the problem of obesity."

Skydoc then mused that it seemed to him that sometime people forget that Army aviation will require a lot of fighting and flying.

"Jay, to be blunt about it, not only do we need skilled people, we also need those that are *fit* to fight."

JRS nodded in agreement with the concept of diet and exercise. However, he went on to say that he wasn't going to be in a position to influence aviation since his next assignment involved becoming a sewer expert in Saudi Arabia.

A shame, Skydoc agreed.

So, before Snongeldinger and the old Skydoc go off and swap some lies, Skydoc wants to end on a serious note:

For Heaven's sake, but mostly for yours, learn your life support equipment, and *practice donning that gas mask until you get real good at it.* If you're having trouble get help from your flight surgeon. Then practice some more and get someone else as proficient as you are. This type of proficiency will:

- Keep you alive and flying longer.
- Save the Army around three quarters of a million dollars by not having one of its helicopters shot down.
- Increase the combat effectiveness of Army aviation.
- Give you one more chance to send some nails to someone extra special.

And while you're thinking of someone else, get in shape too, Fatso!

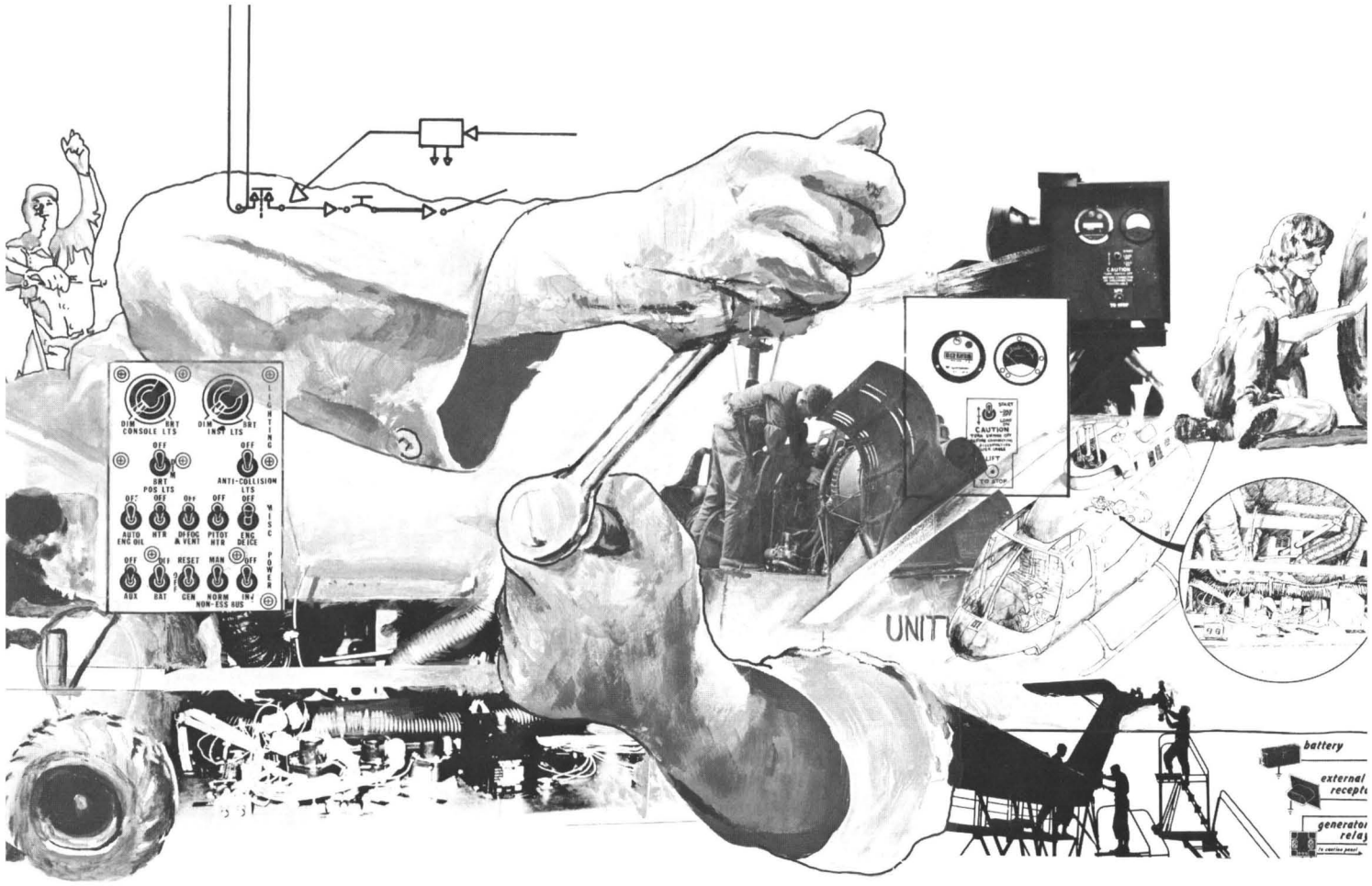
Adieu from Snongeldinger and Skydoc. Oh, yes, watch the ***Aviation Digest*** for an upcoming article called "Bingo." It's a social article—well, to be more exact it talks about social diseases. If you really can't wait to learn more about "Bingo," call the editor. Maybe he'll send you an advance copy. Thanks for sticking around through the whole article.

Limited Quantity Available — Three Part Series About

AH-1S Cobra Modernization Program

The booklet is a reproduction of the three part article published in the *Digest* beginning in January 1978. It describes and details the AH-1S features which will exist in all Cobras by 1985.

Write for your copy . . . Editor, *U.S. Army Aviation Digest,* P.O. Drawer P, Ft. Rucker, AL 36362; or call AUTOVON 558-6680.



A Picture Is Worth A Thousand Words

LTC Joe U. Moffett
Office of TSM, Attack Helicopters
Fort Rucker, AL

FOLLOWING the end of the Vietnam conflict, the attention of the U.S. Army has focused on Europe and Warsaw Pact threat. It is a fact of life that the Army must "fight outnumbered and win." In this regard, emphasis has been on readiness and what is being done to improve it.

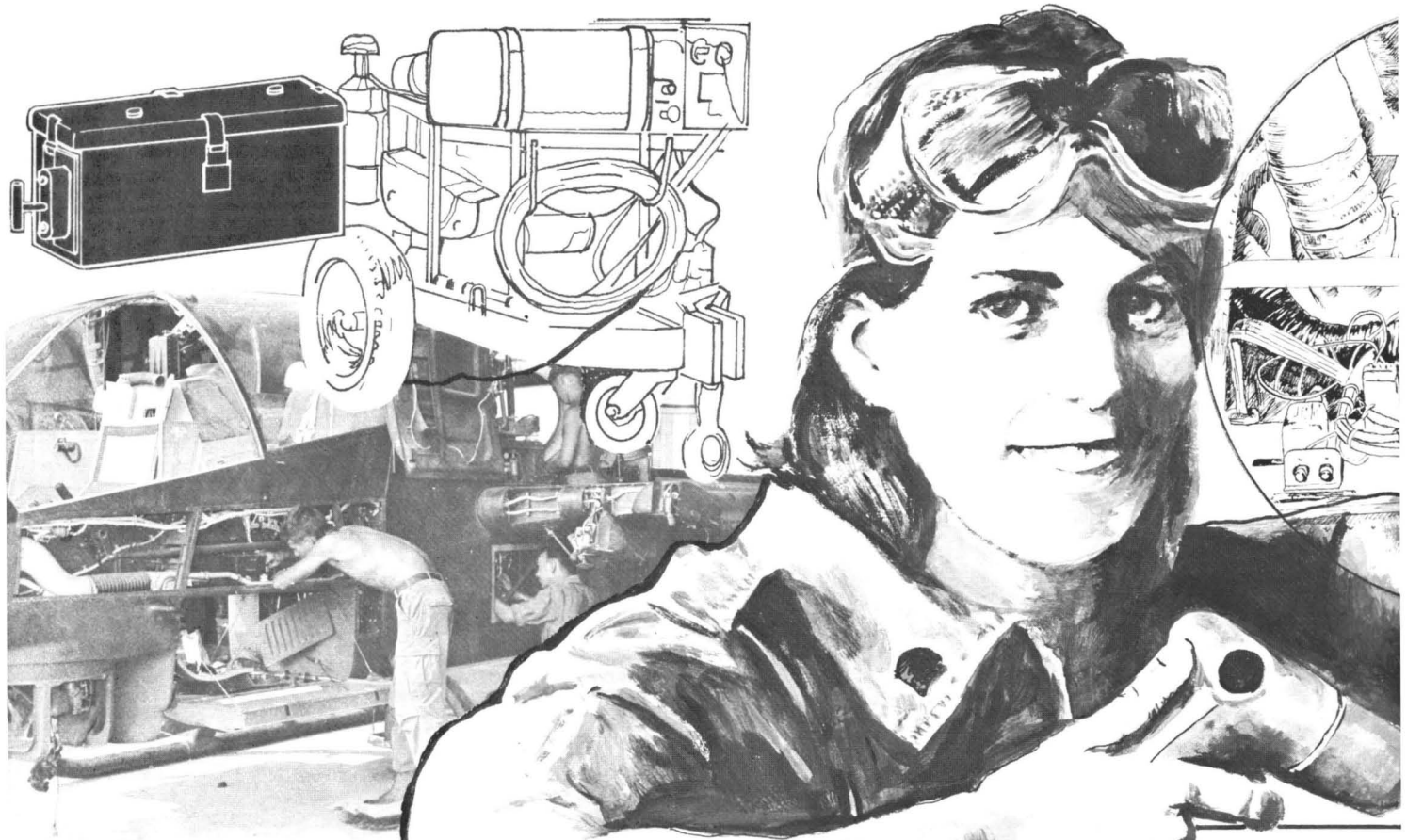
A key ingredient in improved readiness is improved maintenance. Our units are only as ready as their equipment and equipment is only as ready as the quality of maintenance provided; thus proper maintenance equals improved readiness. If we analyze hardware costs since the Korean War, we would find that in many cases the cost of annual ownership has exceeded that of initial procurement. When this situation is examined the conclusion reached is that maintenance is the culprit and our current technical documentation and training programs are contributory conspirators.

During the next 10 years the U.S. Army will acquire some 30 plus weapons systems. These systems will be more sophisticated, more complex, and more costly than their predecessors. If for no other reason than this we must have a simple system that will meet the needs and demands of Soldiers in the field. Our equipment must be repaired as far forward as is practical and in the least amount of time. *Skilled Performance Aids (SPAS)* is a significant step in making maintenance easier.

SPAS is a people-oriented package of job performance aids and job training materials tailored for the capabilities of today's Soldier. Simply stated, SPAS is pictures instead of words. SPAS combines technical documentation and training in such a manner that novices successfully and effectively can accomplish maintenance tasks and likewise those who are trained can maintain their appropriate skill level proficiencies.

SPAS is the result of numerous studies which uncovered several important facts:

- Soldiers who use technical manuals (TMs) perform maintenance tasks correctly.
- Existing TMs are theory oriented instead of repair oriented.
- Today's TMs often exceed the 12th grade reading level.



• Today's youth are visual literates who possess a median reading grade level of 9.0.

• Traditional training methods result in rapid decay of what was learned and require costly additional unit training or shadow schools to provide effective field Soldiers.

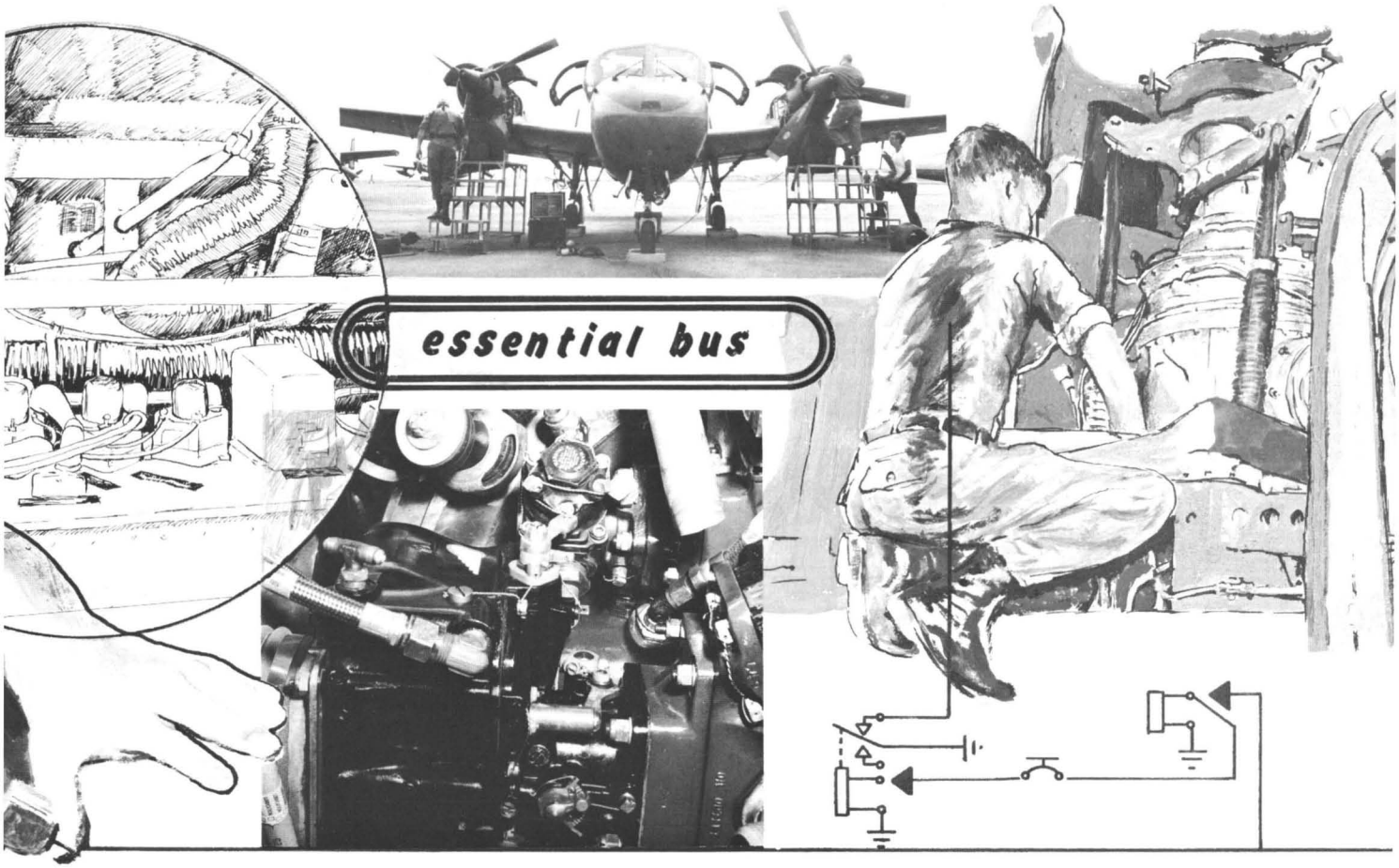
The SPAS concept differs from traditional training in that it is developed using the "system approach." That is to say an orderly process of analysis, design, development, testing, evaluation, revision and the accomplishment of interrelated activities occurs. The SPAS systems approach uses a detailed development model which identifies and plots significant activities and operations in a chronological serial and branching sequence. It can be used anywhere—the shop, the field, the school and uses the open entry, open exit method.

The SPAS package consists of TMs and Extension Training Materials (ETM). SPAS TMs convert job task data into fully illustrated proceduralized, step-by-step task performance sequences. ETMs complement and supplement the TMs.

The objective of ETM as listed in Military Specification MIL-M-63040 is to *instill within Soldiers those skills required to perform the duties of equipment operation and maintenance below the depot level. Soldiers will be trained through the use of the TM and ETM to use tools, test equipment, and technical documentation to perform tasks appropriate for assignment to positions as operators, mechanics or repair persons for a given end item. ETM ensures that all critical tasks encountered by Soldiers during their first year of assignments to their initial field units will be included to ensure that Soldiers are trained on all skills and knowledges required of apprentice mechanics or operators.*

Front end analysis (FEA) is the most critical step in the SPAS development process. FEA is composed of three components: equipment analysis, functional analysis and task analysis. Equipment analysis (EA) is the identification of all tasks involved in operation and maintenance of the hardware. It is developed from the logistic support analysis (LSA) using the repair parts and special tools list as the reference.

An example of equipment analysis would be "replace hydraulic servo" on the AH-1 Cobra or UH-1 Huey. Functional analysis (FA) breaks equipment operations into functional groups and is performed for all job tasks identified as operator or troubleshooting. In describing troubleshooting, the FA focuses on



characteristics that can be sensed (seen, heard, felt or smelled) or measured (pounds per square inch (psi), volts).

A symptom table is developed from these characteristics. We list all the defects and their effects on other parts of the system. These are the malfunctions. "Transmission oil pressure exceeds 70 psi at a hover" is an example of FA malfunctions. Functional analysis for operator tasks focus on equipment missions. If the mission requires the weapon system to track a target crossing at certain angles and speeds, the operator must be able to manipulate the controls to cause the weapon to hold track with the target.

Task analysis (TA) is the breaking down of each task into subtasks and steps, equipment required, and order in which performed. An inherent part of task analysis is the selection of tasks for training. This selection process is used to ensure adequate instruction will be provided for all critical tasks and valuable instructional resources will not be wasted on unimportant tasks. Further analysis is then required to determine where training will take place.

The second key feature of the SPAS concept is verification of the TMs and ETMs. Draft manuals and training materials are validated by a personnel representative of the intended users. A field test as verification of the complete SPAS package under "real-world" conditions will identify user problems. Green suiters use the draft manuals and training materials to verify that they can perform the required tasks without invoking "Murphy's Law." Once appropriate fixes are initiated the materials are reverified and, if acceptable, released to the field.

Because SPAS is a new concept, there is some resistance and criticism toward it. Two common complaints are:

- *SPAS costs too much, we can't afford it.* It is true that SPAS will increase initial cost of systems acquisition. The increased cost will be amortized over the lifecycle of the hardware. There will be increased readiness, no shadow schools and no money spent on "fixes" because it's done right from the beginning.
- TMs will be so bulky they can't be carried much less used. This would appear to be true based on initial SPAS efforts. As experience with SPAS increases, bulk is being decreased. One Army Materiel Readiness and Development Command reduced contractor prepared pages from three to one and still accomplished the task in an acceptable manner. ETM also will help reduce bulk of SPAS materials. Common sense must be used in developing SPAS and assist in cutting down bulk.

Few will disagree that the troops deserve better technical manuals that are relevant, technically accurate and efficiently organized. SPAS is not the ultimate but it's a step in the right direction.

DIVARTY AVIATION

An Integral Part Of The Aerial Fire Support Team

FOR 48 HOURS, the division encountered increasingly heavy pressure by the advance guard of the Opposing Force (OPFOR). At daybreak on the third day, the entire division front was hit by a 40-minute preparation with the majority of the fires directed against U.S. supporting artillery, antiarmor weapons and 2nd Brigade positions.

Closely following the preparation, the OPFOR struck hard at two locations. Although the enemy suffered heavy losses in both personnel and equipment, the assault was continued with each battered echelon being replaced from a seemingly inexhaustable source.

After 8 hours of intensive combat, the OPFOR obtained a breakthrough in the 2nd Brigade's area and began "shoving" its exploitation forces through the ever-widening gap. The division commander directed the division artillery (divarty) commander to blunt the nose and seal the base of the penetration while reserve forces prepared for the counterattack into the flank of the penetration.

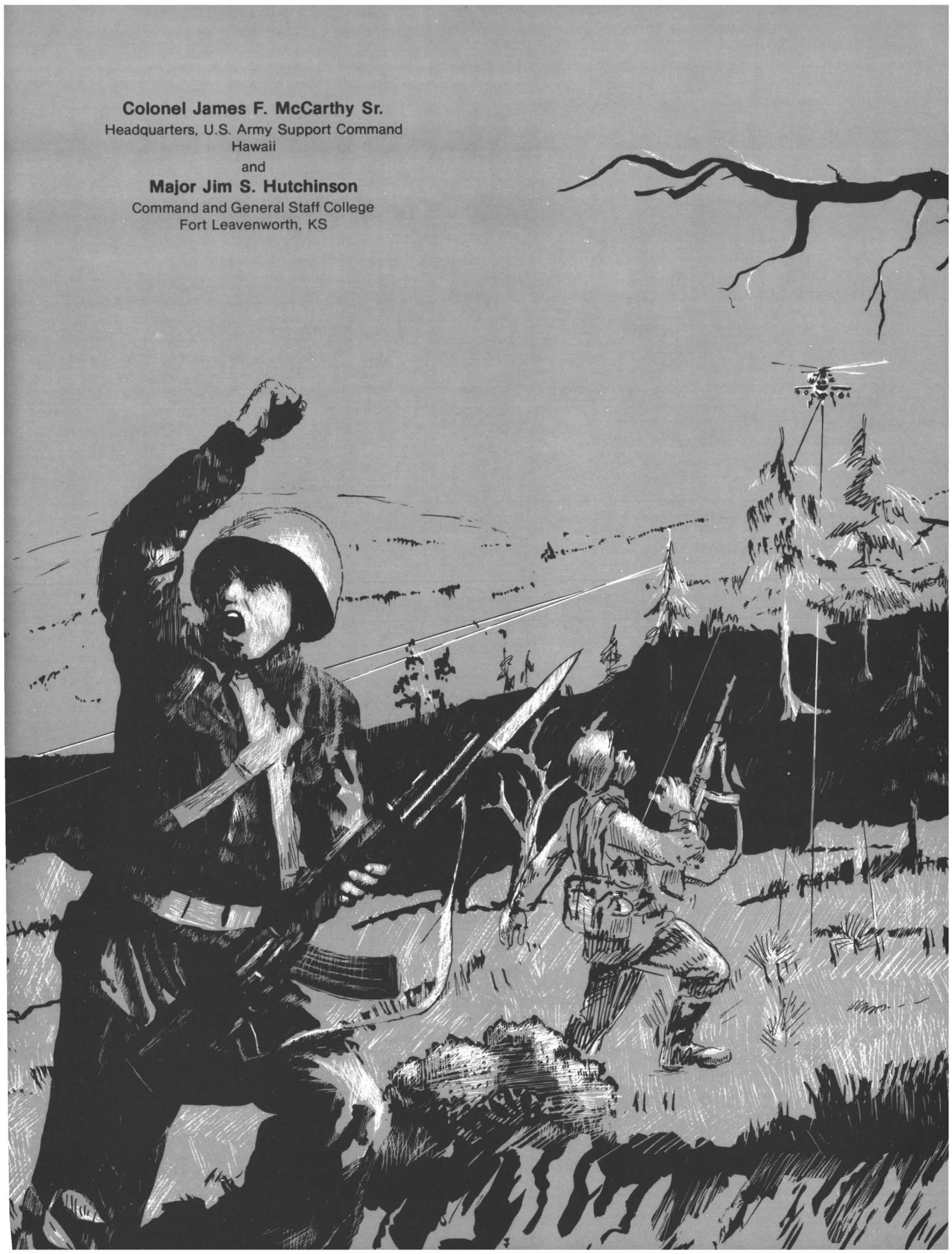
Using an observation helicopter, the divarty commander quickly briefed and dispatched a liaison officer to rendezvous with the 2nd Brigade commander and the fire support officer. Meanwhile, two other aerial fire support teams and two helicopters, which served as retransmission stations, were launched and moved into forward intercept positions. Tactical air (TACAIR) was alerted to stand by to provide continuous close air support once the OPFOR had moved into the "kill zone."

After the brief meeting between the liaison officer and the brigade commander, the control aircraft with an experienced fire support officer, forward air controller and pilot trained in fire support moved into position. Based upon the counterattack plan, two aerial fire support teams controlled the fires of four general support artillery battalions while the ground fire support teams continued to direct the fires of the direct support and reinforcing artillery.

By the time the control aircraft was in position, all fire support means were ready. The OPFOR reconnaissance elements passed through the area

Continued on page 20

Colonel James F. McCarthy Sr.
Headquarters, U.S. Army Support Command
Hawaii
and
Major Jim S. Hutchinson
Command and General Staff College
Fort Leavenworth, KS



DIVARTY AVIATION

Continued from page 18

unaware of the trap that had been set. The artillery concentrated against the lead elements, air defense weapons and armored personnel carriers. Minutes later, airstrikes began raining fire onto OPFOR air defense weapons and the leading tanks.

Having difficulty in identifying and acquiring targets because of the simultaneous fires they were receiving, the enemy's armored vehicles and air defense weapons were forced to conduct a retrograde action.

Two battalions of general support artillery were shifted to seal the base of the attack as attack helicopters and TACAIR continued to strike the armor forces along the entire flank of the penetration. After 6 hours of intense fighting, the OPFOR units were forced to disengage and shift into a defensive posture.

The preceeding account is fictional, but had this battle actually happened, one of the primary factors in the success of the friendly forces would have been the well-trained aerial fire support team (AFIST).

Because of the importance of the AFIST, concern has been expressed over the consolidation of divarty aviation assets into the division aviation battalion. This was recommended by the Aviation Requirements for the Combat Structure of the Army III study (ARCSA III) which is being implemented during fiscal years 1979 and 1980. (See July 1977 *Aviation Digest.*)

If there is not a training and working relationship between the proposed division artillery support platoon and division artillery, this change could greatly impede the flexibility and capability of divarty to accomplish its mission. The integration of the aviation section into the fire support team is an extremely complex and time-consuming process, but one that is essential to the maximization of the fire support combat power.

When combined with a well-trained crew, the OH-58 Kiowa, with its multiradio configuration and mobility, could be a decisive combat edge on tomorrow's battlefield. What may have been overlooked in the reorganization of the aviation assets in the Army is:

- The capabilities of the aerial fire support team.
- The unique training problems associated with this team.

First, the capabilities of the aviation section outlined in FM 1-15 dated 30 September 1977 states, among other capabilities, that the section provides aerial adjustment of artillery fires . . . have been very much understated. The fire support team not only calls for and directs artillery, but it simultaneously requests, coordinates and directs the entire spectrum of fire support to include close air support and naval gunfire.

On the modern battlefield, much of the conflict will be fought well forward of the main battle area with massive fire support. It is probable that between 20 and 30 artillery batteries and 2 to 3 organic attack helicopter companies will be operating in support of a division along with an allocation of 50 to 100 close air support sorties.

In many potential areas of operation this combat force could be augmented with naval fire support assets. The complexity of integrating all fire support means into one decisive combat force which is able to operate not only in the main battle area, but also well forward of it, would require a totally coordinated effort by the pilots, aerial observers, fire support officers, forward air controllers and maneuver commanders. In short, the concept that divarty aviation assets are used primarily to adjust artillery is outdated.

The expanded and complex functions of fire support from one or more OH-58s, as implied above, requires a great deal of cross-training in addition to all the other job training given. During nap-of-the-earth flight, the observer or fire support officer must monitor aircraft gauges and warning/caution lights, watch out for and clear the aircraft of obstacles, navigate and communicate both inside and outside the aircraft. The officer must know the limitations and systems of the aircraft and assist the pilot in every way possible.

Conversely, the pilot needs to know, at a minimum, how to communicate with, coordinate and direct an array of fire support assets. In critical situations, when the FIST chiefs or aerial observers are not available, the pilot may have to perform all of the fire support functions.

Certainly, the potential limiting factors to the use of helicopters in a mid- to high intensity environment are well known. Notwithstanding, the aerial fire support team remains a lethal combat tool available to the commander.

In order to maximize the effectiveness of this tool, the divarty support platoon should be placed under the training/operation control of division artillery. Maintenance, supply and administrative functions would remain under the division aviation company. In this way, the economies brought about by the ARCSA III study would still be realized without degrading the ability of the section to perform its mission.

Coming next month: "FIST Takes To The Air"

• Flight Status Orders • Medical Waivers/Suspensions • Engineering Test Pilot

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

Flight Status Orders. Army Regulation 600-106, "Aeronautical Designations and Flying Status for Army Personnel," states that current flying status orders terminate within 30 days after individuals undergo a change of status, such as active duty to inactive, or vice versa; warrant officer to commissioned officer or vice versa.

Army aviators who fall into one of the above categories must submit a request, through their personnel officer, to the U.S. Army Military Personnel Center (MILPERCEN), ATTN: DAPC-OPP-V, 200 Stovall Street, Alexandria, VA 22332, for new flight status orders. The following must be included with the request:

- A copy of their current Class II Flight Physical.
- A copy of the orders awarding their initial designation as an Army aviator.
- A copy of the order recalling them to active duty or changing their officer status.
- The current unit of assignment to include the units' Unit Identification Code.

A new Department of the Army (DA) Letter Order will be published. Pending receipt of a written order, a 30-day temporary clearance can be granted. To obtain this clearance the unit personnel officer can call MILPERCEN (AUTOVON 221-0727/0794) after the above items have been assembled.

Medical Waivers/Suspensions. Since the Aviation Management Branch is the proponent for Army Regulation 600-107, "Medical Restriction/Suspension from Flight Duty," numerous questions are received concerning indefinite suspensions for medical reasons. Following is a general discussion about this subject.

Flight physicals initially are reviewed by the administering flight surgeon. They are then forwarded to the Aeromedical Center at Ft. Rucker, AL for final review. During this review, those physicals that do not meet Class II standards are forwarded to MILPERCEN for either the granting of a waiver or the imposing of an indefinite suspension.

In the case of a waiver the individual continues on unchanged flight status. For those individuals indefinitely suspended, a DA Letter Order will be published by MILPERCEN and a pay change will be initiated to terminate Aviation Career Incentive Pay. The effective date of the indefinite suspension will be established in accordance with procedures contained in the Department of Defense Pay Manual.

Army Engineering Test Pilot Program. The tentative date for the next Army Selection Board to pick new members for participation in the Army Engineering Test Pilot Program is late this spring. The exact date will be transmitted by separate means as soon as details are finalized. As selectees are brought into the program they will attend the Naval Test Pilot School at Patuxent River, MD. This will be followed by a utilization tour within the Army research and development field. A detailed listing of the program is contained in DA Circular 351-79, "Army Aviation Engineering and Flight Testing Program."

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

Army Aviation Standardization Evaluation Feedback

THE GOAL OF the United States Army Aviation Standardization Program is to improve unit readiness, aviation safety and professionalism by using standard procedures and techniques. The program is evaluated by the Directorate of Evaluation and Standardization (DES), U.S. Army Aviation Center (USAAVNC), Ft. Rucker, AL, through the conduct of Armywide evaluation and assistance visits.

The scope of these visits is to assess the implementation of aviation standardization policies and procedures, aviator training, proficiency and associated aviation standardization board administrative requirements. During the visits aviators are selected on a random basis for administration of oral and flight evaluations by the Department of the Army (DA) standardization instructor pilots. This methodology yields indicators of the status of units' standardization training, which further identifies significant trends that provide commanders the information they need to reinforce their training programs.

For the most part, aviation units do well during these evaluations, and, as could be expected, some units do better than others. However, the random sampling methodology for aviator training has identified some *common* deficiencies outlined below that exist at varying degrees throughout the aviation units visited. The main thrust of this article is to suggest appropriate corrective actions and is not intended to imply that all deficiencies exist in any one unit.

Aviator weak in knowledge of aircraft:

Operating limitations.

- Engine/rotor overspeed.
- Velocity not to exceed (VNE).
- Penetration airspeed.
- Low revolutions per minute (rpm) warning system.
- Engine/transmission oil pressure range.
- Engine/transmission temperature range.
- Exhaust gas temperature.
- Torque range.
- Fuel pressure.
- Manifold pressure.

Recommended corrective action: Implement academic refresher classes and periodically administer tests to reinforce what has been learned.

Emergency procedures.

- Engine failure (hover, low and cruise altitudes).
- Single engine operations.
- Hydraulic system failure.
- Mechanical linkage failures.
- Transmission seizure.
- Antitorque malfunction.
- Landing gear malfunction.
- Flap malfunction.
- Governor malfunction.
- Engine fire.
- Fuselage fire.
- Emergency exits.

Recommended corrective action: Emphasize procedures during academic refresher classes and administer spot quizzes to determine acceptable frequency to continue these classes.

Weight and balance.

- Computation of DA Form 365F (Weight and Balance Form).
- Computation of aircraft center of gravity (CG).

Recommended corrective action: Present periodic academic classes which require aviators to compute aircraft weight and balance, including the CG.

Performance charts.

- Takeoff and Landing Data (TOLD).

Recommended corrective action: Require aviators to determine performance data from the aircraft Operator's Manual (−10) prior to each flight and conduct periodic training classes for this subject.

Flight regulations (AR 95-1, FAR 91).

- Military flight plans (DD Forms 175).
- Visual flight rules (VFR).
- Instrument flight rules (IFR).

Recommended corrective action: Periodically review regulations in academic training.

Tactical and standard instrument flight procedures.

- Plan a tactical instrument flight.
- Determine approach minima.
- Missed approach procedures.
- Loss of communications/NAVAID.

Recommended corrective action: Conduct periodic training classes emphasizing procedures.

Aviator flight proficiency weak in:

Standard autorotation.

- Assuming correct autorotative attitude.
- Deceleration.
- Collective application.
- Directional control.
- Touchdown.

Autorotation with turn.

- Maintaining correct attitude and trim during turn.
- Maintaining rotor rpm within prescribed, acceptable limits.
- Alignment prior to touchdown.
- Deceleration.
- Collective application.
- Directional control.
- Touchdown.

Simulated antitorque malfunctions.

- Improper ground speed prior to touchdown.
- Throttle/collective correlation.
- Touchdown.

Recommended corrective action: The commonality of these maneuvers for successful execution is the development and maintenance of motor skills proficiency. This proficiency can be attained by scheduling training flights with an instructor pilot, both day and night, on a quarterly basis. This will allow each aviator the opportunity to practice emergency procedures in both environments.

Aviation-related areas.

Installation Aviation Standardization Board. The conduct of active assistance and inspection programs, including random, no-notice flight checks of aviators and spot checks of training and facilities, is not receiving emphasis.

Recommended corrective action: The Board increase emphasis to visit each unit at least once semiannually and conduct frequent nonotice flight checks of aviators.

Maintenance Test Pilots. Test pilots are performing maintenance test flights in a number of different aircraft (type, model, series) and are not capable of maintaining acceptable proficiency level in each aircraft flown. Their ability and knowledge to perform emergency maneuvers and instrument flight and retain aircraft operating limitation data are seriously jeopardized.

Recommended corrective action: Evaluate the maintenance test pilot's capability to maintain an acceptable proficiency level in each aircraft the pilot is required to test fly and, if possible, reduce the number to be flown. Increase Aircrew Training Manual (ATM) iterations to ensure adequate training is acquired by the pilot.

Medical Recommendations for Flight Duties (DA Forms 4186). Flight Surgeons'/Medical Officers' recommendations as pertains to aviator's flight status are not being indorsed by the aviator's unit commander in accordance with AR 600-107.

Recommended corrective action: Unit commanders with aviators under their control should be familiar with the provisions of AR 600-107 as pertains to medical restrictions/suspensions. They should approve/disapprove the Medical Officer's recommendation for imposing/removing medical restrictions/suspensions from flight duties.

Individual Flight Records Folders (IFRFs). Extraneous, outdated material are contained in IFRFs.

Recommended corrective action: Purge IFRFs of nonrequired documents and return them to the individual aviator for personal filing.

Vertical Helicopter IFR Recovery Procedures (VHIRP). Some installation plans are not simplified to the extent that a pilot flying alone (without a rated copilot) can safely execute the procedures.

Recommended corrective action: Review the installation VHIRP to ensure that the procedures, including the need to change radio/NAVAID frequencies, are simplified for safe recovery.

Aviation publications. Current publications, including changes, are not being received at the user level.

Recommended corrective action: Unit commanders should ensure that pinpoint distribution accounts are established and continually updated. Commanders should periodically review their pinpoint distribution accounts to ensure requirements are kept current.

Training, Standardization and ***Safety*** equal ***Readiness.*** Toward this end, implementation of viable training programs that will enhance the capability of Army aviators to successfully accomplish their mission effectively and safely is everyone's concern.

We feel the following article, wri Force, also applies to you, the A will fly in positive control airspa tions of FAA's ATC radar. That sl actually be a severe thunderstc

Det 9 Ft. Ru

Weather Radar

There is a

The *Digest* thanks *Aerospace* for permission to reprint this article.

SINCE THE FIRST day of undergraduate flying training you were probably warned to respect thunderstorms. AFR 60-16 and MAJCOM [major command] supplements provide direction on avoidance criteria for these storms. But when the ARTCC [Air Route Traffic Control Center] relays a SIGMET [significant meteorological information] telling you a squall line blocks your airway and radar indicates it is just 10 to 15 minutes ahead, where do you turn for help?

Your first instinct is probably to ask the center controller for help. But before relying totally on the center's assistance, you should be aware of the dubious accuracy of weather information displayed on the controller's scope that would be used to provide "weather vectors."

Air Weather Service (MAC) [Military Airlift Command] recently made a study of the FAA's [Federal Aviation Administration] air traffic control (ATC) radars. Air Weather Service concluded that the capability of these radars leaves much to be desired when trying to detect and display the location and intensity of convective cells.

The intensity of weather cells is determined by the relative amount of energy reflected from the cell back to the radar. This reflected energy is expressed in terms of decibels (dBZ). A relationship between dBZ values and weather cell intensity is shown in figure 1.

One major shortcoming of ATC radars is the inability to obtain accurate dBZ measurements. These inaccuracies result from radar characteristics and controller procedures. For example, the wide beam width of FAA radars causes reflectivity losses of 8.8 dBZ at 60 NM [nautical miles] to 24.8 dBZ at 120 NM.

Echoes at different ranges from the antenna must be displayed so that echoes nearer the antenna do not appear stronger than strong echoes farther from the antenna. To do this, a normalization factor must be applied; however, this factor is not the same for aircraft and weather targets. Normalization factor used by the FAA is for aircraft targets (not weather targets), and it is not standard for all ATC radars. Further, controllers request changes in these settings from radar site to radar site. Therefore, when these radars are used to detect weather echoes, losses in weather echo intensity may occur. These losses may be as much as 36.8 dBZ at 60 NM to 52.8 dBZ at 120 NM, and no corrections are made for these losses before echoes are displayed on the controller's scope.

Figure 1

dBZ	*INTENSITY*	
55	*TRWXX*	*(Extreme)*
50	*TRWX*	*(Intense)*
44	*TRW++*	*(Very Strong)*
40	*TRW+*	*(Strong)*
30	*TRW*	*(Moderate)*
10	*TRW-*	*(Weak)*

What does all this mean to the aircrews? It means the controller may unintentionally "vector" your aircraft into thunderstorms because his radar scope does not provide him accurate weather echo information. The problem is that the apparently moderate thunderstorms (30 dBZ) on the controller's scope may actually be an intense or extreme thunderstorm (50 to 55+dBZ). Also, weak or moderate thunderstorms (10 to 30 dBZ) may exist along your route, but the controller's scope will show no activity because of echo intensity losses that occur on his radar.

Another shortcoming of ATC radars is the inability to measure storm tops. FAA radars have a fan shaped

tten for a "high flyer" in the Air rmy aviator. Some of you do or e, and need to know the limita- ower the ATC radar "sees" may rm!

5th Weather Squadron (MAC) cker, AL

ATC Radar difference

Major Duane B. Stoecklin
Headquarters, Air Weather Service
Field Support
Scott AFB, IL

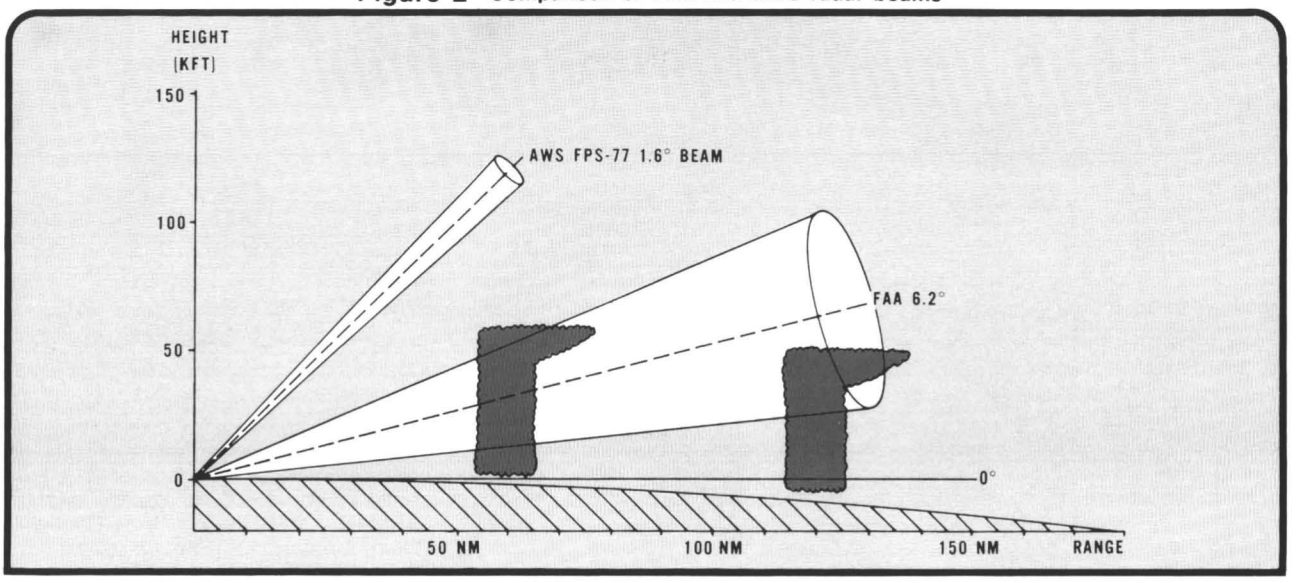
beam which rotates at a *fixed elevation angle* while weather radars employ a pencil beam and the *elevation angle can be adjusted* to measure tops of cells.

Figure 2 compares the size of the FAA radar beam width (6.2) and the FPS-77 weather radar beam (1.6). A typical FAA radar has its beam axis set at a 5-degree elevation angle as shown. Beyond 60 NM in range, it will detect less and less of large storms and may miss smaller storms completely. In contrast, the FPS-77 beam can move vertically to detect the vertical extent of storms anywhere between 5 NM and 125 NM.

Therefore, when you are flying in an area of known or suspected thunderstorms, make maximum use of Pilot to Metro Service (PMSV) provided by an AWS base weather station with a weather radar. These radars are designed to detect and accurately display weather targets. AWS forecasters can't provide aircrews with flight direction vectors, but they can provide storm tops as well as location and movement of echoes in relation to airways.

In summary, ATC radars are primarily designed and used to separate aircraft traffic. When used to display and interpret weather information they have several shortcomings. Hence, aircrews that rely totally on thunderstorm avoidance information from the center controller may find themselves actually penetrating storms the controller cannot see on his scope.

Figure 2 Comparison of FAA and AWS radar beams



AIR FORCE LIAISON

Linda Delbovo
2nd Armored Division
Public Affairs Office
Fort Hood, TX

THE 2ND ARMORED Division Air Force forward air controllers (FACs) recently conducted a pilot test program at Ft. Hood, TX involving U.S. Army aircraft, equipment and personnel. Dubbed "Heli-Fac," the program was designed to determine the credibility of using helicopters in conjunction with jeeps and armored personnel carriers (APC) for controlling and directing air strikes.

"The test also was an experiment to see if qualified Air Force fighter pilots could be trained as Army aerial scout observers," said Air Force Lieutenant Colonel Sam Ward, Air Liaison Officer (ALO), 2nd Armored Division.

In the Division there are two ALOs assigned to each brigade, and two FACs assigned to each battalion. However, the battalion complement is permanently assigned at Bergstrom AFB, TX. It is the FACs responsibility to conduct and direct air strikes, advise the commander on Air Force capabilities, and employ and assist with battle plans. According to Lt Col Ward, the battalion FACs only move out with the Army on large-scale maneuvers or if the Division were to be alerted for a wartime mission.

Prior to 1978, jeeps and APCs equipped with communications gear normally were used for controlling and directing air strikes. Lt Col Ward stated that at times this was impractical since the vehicles often had difficulty reaching observation areas because of mountains, creeks or other obstructions. "The Army OH-58 Kiowa helicopter has a definite advantage over jeeps and APCs," according to Lt Col Ward. "The helicopters can fly nap-of-the-earth, observe the enemy from a safer distance and have more flexibility in moving."

"The only problem with using helicopters is that Air Force fighter pilots are trained to navigate high speed aircraft at high altitudes instead of low speed rotary wing aircraft flying at tree-top level," Lt Col Ward said. "Getting a helicopter up in the air to conduct an air strike is a hairy maneuver," Lt Col Ward stressed. "Our pilots know enough about rotary wing aircraft to conduct a successful emergency landing if the Army pilot is not able to do so, so the emphasis of our training is getting from point A to point B. This is because our pilots must do the navigation for the aircraft," he said.

Working in conjunction with the Division's 2nd Aviation Company, the Air Force fighter pilots were trained using Army maps.

Although the ALOs are using the OH-58 Kiowa helicopter for directing and controlling air strikes, the jeeps and APCs are still necessary. Portable radio equipment such as high frequency single side-band, ultra high frequency, very high frequency, and frequency modulated radios always are available on both vehicles.

"The radio equipment can be removed from the jeep, transferred to an Army M-113 APC and be operational within 15 minutes," stated Air Force SSgt

Air Force SSgt Bruce Swehla fine tunes a high frequency radio after setting up communications gear in an Army M113 APC for an air strike operation. The HF radio has a 10,000 mile range and is used to operate the Air Force Request Communications Network (photo by Jorge Custodio)

Army-Air Force teamwork. Major Gene Bardal, Air Force Liaison Officer for the 2nd Armored Division, spots a "target of opportunity" while performing his duties as forward air controller in an Army OH-58 Kiowa helicopter. Pilot of the aircraft is CW2 Jim Watson, 2nd Aviation Company, Major Bardal's chief instructor (photo by Jorge Ramirez)

Bruce Swehla, ROMAD (radio operator, maintainer and driver) for the ALO.

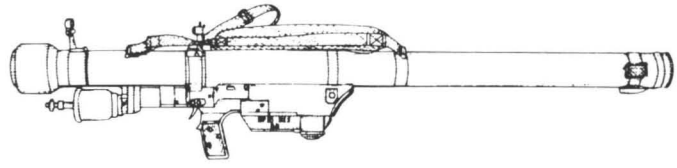
The Heli-Fac testing proved the credibility of using the OH-58 Kiowa helicopters for conducting and controlling air strikes. It also showed that Air Force fighter pilots could be trained to maneuver the OH-58s and, according to Lt Col Ward, the procedure now is an accepted operation.

"Operationally, we are the first to do this as an every day thing," Lt Col Ward stated. "We've got one heck of a combat attack concept here. We practice all the time because we are heavily tasked and in great demand.

"Using helicopters has increased our ability to provide quick, accurate air support for the Division," he noted. "This used to be an idea . . . now it's a reality."

THE THREAT

SA-7 GRAIL



THE SOVIET LOW-altitude air defense missile is the "STRELA" (Arrow), NATO designation SA-7 GRAIL. It is a tube mounted, shoulder fired, surface-to-air guided missile. This system is similar to the U.S. Army's Redeye missile.

The missile uses a passive infrared homing guidance system and has a high explosive warhead. It has a slant range of about 3.5 kilometers with a kill zone up to 11,000 feet. The SA-7's effectiveness depends on its ability to lock onto the heat source of the target. It primarily is used against low-altitude fixed wing and rotary wing aircraft.

The SA-7 gunner must have line-of-sight in order to engage targets. The system is susceptible to suppressive fires and battlefield obscurations. The effectiveness of other countermeasures, such as the use of flares or decoys, has not always been successful against the SA-7.

Basis of issue is one per platoon to all motorized rifle units and one per reconnaissance vehicle.

Reporting Final

Late News From Army Aviation Activities

FROM THE PENTAGON

Division 86 Study. Training and Doctrine Command (TRADOC) has embarked on a major study effort of concern to all Army aviation personnel. Entitled "Division 86" because it focuses on 1986, the year when most of the new Army systems will be fielded in significant quantities, the study is a major force development initiative with three thrusts.

First, it will produce a product—the conceptual heavy division of the 1980s, which will reflect an optimization of the division structure, of new systems mixes, and of doctrinal concepts for the division. Second, it will produce a process—an institutionalized methodology for future force design work, to be implemented in 10-year increments. And, third, it will provide a roadmap for getting there.

The study is being front-loaded by drawing on the results of the Division Restructuring Study and Evaluation, which began in 1976, as well as other studies, tests and analyses, to include the ARCSA III Study. It is far too early to tell what impact this effort is likely to have on the aviation look of the 1980s, but it is known that the Aviation Center, Ft. Rucker, AL is playing a big role in developing that look.

(ODCSOPS)

☆ ☆ ☆

New Helicopter Fault Isolation Equipment. A portable 20 pound device called LOGMOD (logistic model) can spot a malfunction in a helicopter system, isolate it, and then tell you how to correct it. LOGMOD can fault isolate helicopter systems such as gun turrets, flight control systems and electrical-hydraulic subsystems. This versatile unit can be operated by an untrained technician after 30 minutes of instruction. The U.S. Army Research and Technology Laboratories (AVRADCOM) has carried out research aimed at developing a concept for diagnosing and fault isolating helicopter systems. LOGMOD was seen originally as an evaluation tool to assess at the design stage such maintenance characteristics as: the minimum number of test points required for conclusive detection of system malfunctioning; frequency of usage of each test point in diagnosing all potential system malfunctions; and the best ways to track down a malfunction. It recently has been realized that this same tool could be used by maintenance personnel for easier inspection and fault isolation. **(ODCSRDA)**

☆ ☆ ☆

AR 95-33 Changes. AR 95-33, "Army Aircraft Inventory, Status and Flying Time Requirements Control Symbol DRC-130," will change soon. Revised Department of Defense (DOD) instructions change many terms which have been around for a long time. Within the next few months, Army aviation will be speaking a new language, e.g., Operational Ready will become Mission Capable and describe the materiel condition of an aircraft to indicate that it can perform at least one, and potentially all, of its designated missions as defined in FM 101-20. We also plan to revise DA Form 1352 and 1352-1 to reflect the new terminology.

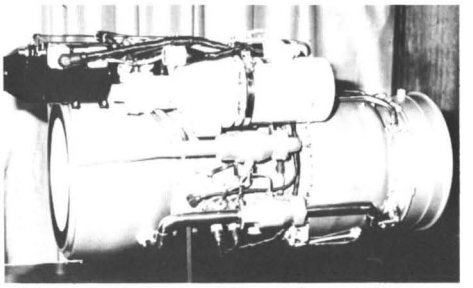
(ODCSLOG)

☆ ☆ ☆

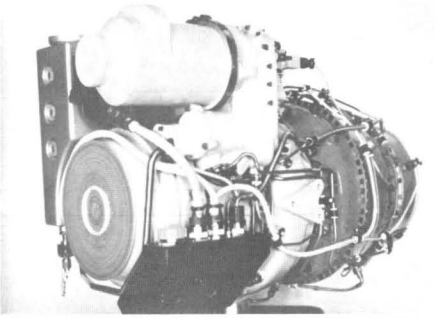
Consolidation of Training. There has been considerable publicity given to the Secretary of the Navy announcement concerning consolidation of Navy, Marine Corps and Coast Guard Undergraduate Helicopter Pilot Training at Ft. Rucker, AL. Congressional approval for consolidated training will be required and much planning by all services will be necessary within the upcoming weeks and months. The Army is preparing to operate a DOD helicopter training facility at Ft. Rucker with a primary objective being to ensure that aviators from the other services receive the same professional training which Army aviators have always received at the Aviation Center.

(ODCSOPS)

800 SHP Advanced Technology Demonstration Engine (ATDE). A milestone has been accomplished in the 800 shaft horsepower ATDE program with the release of major gas generator hardware for fabrication/procurement. The components and subsystems of two versions (see photos) are being tested to establish the level of performance and increased design credibility prior to committing the



Advanced Technology Demonstrator Engine
(Avco Lycoming PLT-34A)



Advanced Technology Demonstrator Engine
(Detroit Diesel Allison GMA500)

individual components to inclusion in a gas generator test. The gas generator tests began in January 1979 and will determine the aerodynamic performance and mechanical integrity of components in an operating engine environment.

The performance capability of the ATDE will be demonstrated to include horsepower at 4,000 feet/95 degrees Fahrenheit, engine weight, specific fuel consumption, tolerance to sand ingestion, effects of inlet temperature distortion and exhaust emissions. Also, a maintainability teardown demonstration and a cyclic durability test will be conducted in the final phase of the program. The ATDE will provide an advanced propulsion technology option for future Army aircraft (light utility helicopter, light attack helicopter, light observation helicopter, etc.) and provides a technology base from which future engineering developments may evolve at minimum risk, time and development cost. **(ODCSRDA)**

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CH-47 Self-Deployment. Recently, DA surveyed major commands concerning the desirability of self-deployment of CH-47 helicopters. The favorable comments reinforced an analysis conducted by the Transportation School, field tests accomplished by the 101st Airborne Division (AASLT) and AAPR-78 recommendations. As a result, steps have been taken to initiate FORSCOM, U.S. Army Materiel Development and Readiness Command (DARCOM) and TRADOC actions on the concept, to include milestone schedules for specific actions required to evaluate the concept and to ultimately self-deploy units and replacement aircraft to Europe. Self-deployment of the 179th Medium Helicopter Company from Fort Carson, CO to Germany is being considered. TRADOC will develop a Letter Requirement for extended range fuel kits, complete a Concept Evaluation Plan and complete an In-Process Review of the concept. FORSCOM will prepare the Operational Plan, develop a unit training program, and determine what must be done to self-deploy a medium helicopter company to Europe. DARCOM will address the hardware development and procurement, determine the navigational system required, and plan prepositioning of parts, equipment and maintenance support for the movement of units and aircraft. Ultimately, self-deployment of UH-60 and AH-64 helicopters also will be addressed.

(ODCSOPS)

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Bearingless Main Rotor Update. The Army and Boeing Vertol recently demonstrated a significant milestone in the advancement of helicopter technology—the bearingless main rotor (BMR). Developed under Army contract, the BMR has no lag dampers, and no flap, lead-lag or pitch bearings. In the BMR, the rotor blade is attached directly to the rotor shaft and the blade and the hub become a single unit. This system is a successful extension of the fiberglass rotor and hub integration technology developed for the Army by Boeing Vertol on its UTTAS main rotor and flex-strap bearingless tail rotor.

Compared to conventional rotor designs, the BMR concept is expected to result in reduced weight, fewer parts and reduced drag. Increased speeds, greater payload, greater reliability, and reduced acquisition and operating costs are other potential benefits.

The BMR program has been a joint Boeing Vertol/U.S. Army venture since June 1976.

The BMR flight test program ended in January 1979 when the Army's test pilot flew a 2½-hour qualitative evaluation.

All 398 test conditions planned for the program have been successfully completed. The results clearly demonstrate the feasibility of a bearingless main rotor hub for future helicopter designs. The BMR is perhaps the world's only successfully demonstrated bearingless main rotor. **(ODCSRDA)**

EH-1H QUICK FIX Helicopter. The QUICK FIX helicopter is a tactical electronic warfare (EW) system currently configured in the UH-1. The system provides divisions with an organic airborne EW capability. Initial production models of the EH-1H QUICK FIX system have been fielded recently at Ft. Hood, TX and with the 82d Airborne Division at Ft. Bragg. Advanced versions of this EW system will be installed in the EH-60A Black Hawk. Development of the system was through the joint effort of the

Electronics Research and Development Command and the Troop Support and Aviation Readiness Command (TSARCOM). The fielding and support for these systems is the responsibility of the Special Electronic Mission Aircraft Project Manager at TSARCOM. The photo shows the two operator positions located in the cargo area of the EH-1.

(ODCSRDA)

☆ ☆ ☆

AH-1S for National Guard. A plan to provide a limited number of AH-1S Cobra/TOW to selected Army National Guard (ARNG) attack helicopter units was approved recently at HQDA. The plan provides for transfer of 21 AH-1Ss to ARNG units (seven Cobra/TOW per year) beginning in fiscal year 1980. These helicopters are expected to be assigned to ARNG attack helicopter companies located in Utah, Maryland and Arizona, in that order.

Following AH-1S qualification, selected units will participate in outside Continental United States (OCONUS) training with U.S. Army, Europe (USAREUR) attack helicopter units. While all ARNG attack units are authorized the AH-1S, most are equipped with substitute assets (UH-1 gunships from the Vietnam era). Providing these first-line Cobra/TOW antiarmor helicopters to the ARNG will improve the readiness and deployability of the selected Guard units and is an example of HQDA's support for the "Total Army" concept. Staffing of this action involved participation from ARNG, FORSCOM, USAREUR, TRADOC, DARCOM and HQDA. **(ODCSOPS)**

Grounding and Advisory Messages. AR 95-18, "Grounding of Army Aircraft and Safety-of-Flight Messages" reporting procedures are under review as announced by Headquarters, Department of the Army (HQDA) unclassified message 311730Z JAN 79, subj: Proposed Revision to AR 95-18. The revisions stem from field interpretation of reporting procedures. It is important to remember that Safety-of-Flight messages are divided into two categories, i.e., grounding and advisory.

Grounding messages require reply within 5 days. This timeframe is only for a message report of actions accomplished and actions to be accomplished. Additionally, final reports of operational, technical or one-time inspection completion are required.

Advisory messages do not require feedback reporting. Compliance with advisory messages is mandatory even though they do not ground aircraft; commands and agencies must develop operating instructions to ensure accomplishment within a reasonable period of time. **(ODCSLOG)**

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Black Hawk Self-Deployability. On 26 December 1978, a UH-60A Black Hawk prototype helicopter, with a developmental extended range fuel kit installed, successfully completed a nonstop 880 nautical mile flight, demonstrating the potential for self-deployment to overseas areas. The flight, conducted by Army Major Rick Walker and Sikorsky test pilot Gary Kohler, took 6 hours and 50 minutes and averaged more than 127 knots airspeed. The extended range fuel kit, which completely fills the interior of the aircraft except the cockpit area, increases fuel capacity from 2,400 pounds to 7,700 pounds. **(ODCSOPS)**

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Individual Ready Reserve (IRR). The IRR has a large number of Army aviators. Last summer, at Fort Bragg, NC and Fort Stewart, GA, 28 of these IRR aviators trained with active units for 14 to 30 day periods. The Army will develop a plan to maintain the flight proficiency of IRR aviators. DA, Forces Command (FORSCOM), TRADOC and U.S. Army Reserve Components Personnel and Administration Center will be "working" this problem in an attempt to find some way to capitalize upon the aviation experience (both officer and enlisted) which exists within the IRR. **(ODCSOPS)**

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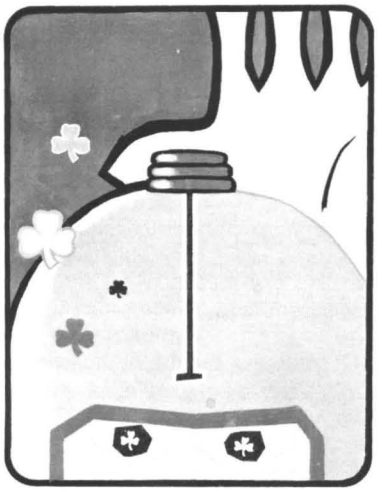
Continued on inside back cover.

VIEWS FROM READERS



Editor:

Again I have enjoyed another issue of the *Digest,* and I find it to get better with each issue. You are doing a tremendous job.

I heartily applaud General Don Starry's (TRADOC commander) comments (*Digest,* Nov 78) and concept concerning air cavalry and attack helicopters on future battlefields. Having experience in air cavalry and attack helicopter organizations, I have long felt that a single, well structured and task organized unit can perform both the air cavalry and attack helicopter missions.

I also am encouraged by Captain Gordon E. Sayre's excellent article, "Air Cavalry Attack Troop," in the same issue. He supports General Starry's concept and has developed it into an organization. Although Captain Sayre's concept may not be completely new, I have never seen it presented and articulated as well. His development of a single unit (the "ACAT"), able to perform both missions as well as, if not better than, the current air cavalry troop and attack helicopter company, should be studied and seriously evaluated by all those now in a position to do so. His organization merits study to capitalize on potential savings in both personnel and aircraft, if for no better reason.

ARCSA III was able to do some great things for Army aviation structure and organization, but it certainly is not the panacea. There is still much work to be done to improve our unit organizations. I hope that the momentum generated by the comments of General Starry and Captain Sayre will be promptly developed and will not become a victim of the long list of reasons why so many good ideas get buried, lost and forgotten. We need more of this kind of innovative thinking in our developmental community.

MAJ Lewis D. Ray
Aviation Advisor
89th U.S. Army Reserve Command
Industrial Airport, KS 66031

• **A few copies of the November 1978 *Aviation Digest* containing the interview with General Donn Starry and the ACAT article by Captain Gordon Sayre are available upon request. Write Editor, *Aviation Digest,* P.O. Drawer P, Ft. Rucker, AL 36362.**

Editor:

There are thousands of pilots in the United States and in other countries who are readers of yours and who have flown C-46s, C-47s, C-54s, C-109s, C-87s, P-40 Warhawks, P-47 Thunderbolts, P-51s, P-38s, plus other World War II aircraft; therefore, we would appreciate it if you would print the following in your publication:

• **16th national Air Force salute banquet and ball, Iron Gate Chapter—Air Force Association,** Saturday, 24 March 1979, New York Hilton Hotel, New York City. *For Information:* Dorothy L. Welker, Salute Coordinator, National Air Force Salute Foundation, Inc., 663 Fifth Avenue, Suite 340, New York, NY 10022—(212) 752-3810.

• **8th annual Bishop Wright Air Industry Awards ceremony,** Thursday, 10 May 1979, International Hotel, JFK International Airport, New York City. *For Information:* Rev. Marlin L. Bowman, JFK Protestant Chapel, Jamaica, NY 11430—(212) 656-5693.

• **18th P-47 Thunderbolt Pilots Association reunion,** 11, 12, 13 May 1979, Sheraton Universal Hotel, Hollywood/Los Angeles, CA. *For Information:* Wayne Dodds, General Reunion Chairman, P.O. Box 10428, Glendale, CA 91209—(213) 240-6868.

• **8th P-40 Warhawk Pilots Association reunion,** 20, 21, 22 July 1979, Imperial House-North, Dayton, OH. *For Information:* Lloyd "Scotty" Hathcock, General Chairman, 34 College Avenue, Dayton, OH 45407—513) 223-8432.

• **34th annual China-Burma-India Hump Pilots Association reunion,** 12 to 17 September 1979 at the Arizona Biltmore, P.O. Box 2290, Phoenix, AZ 85002. *For Information:* Mrs. Jan Thies Executive Secretary, 808 Lester Street, Poplar Bluff, MO 63901—(314) 785-2420.

Herbert O. Fisher
Director of Public Relations and Press
P-40 Warhawk Pilots Association
P-47 Thunderbolt Pilots Association
China-Burma-India Hump Pilots Association

Editor:

I am amazed at the lack of progress concerning the combat tactics of the attack helicopters and aeroscouts. The current changes in helicopter tactics seem to be in defining terms relating to the tactics and very little is written on combating the increasing number of Soviet weapons and helicopters. Having spent the last 7 years associating with the air cavalry troops and assault helicopter companies, it has become apparent that little emphasis is placed on the threat of the increasing number of Soviet helicopters.

Although studies and tests are being performed to determine the feasibility of combating Soviet air threats, what will be the real threat to the most advanced attack helicopters in the world

and to the aeroscout which leads them into battle? Many pilots will tell you that it is the enemy's air defense systems, artillery, the foot Soldiers, or the threat of other helicopters. Even in the NOE [nap-of-the-earth] environment, combating such odds definitely will require crews that are highly trained. Do we have the means of training these crews in actual simulation against the different Soviet weapon systems?

Despite the fact that the U.S. Air Force uses the Red Flag Exercises to train and evaluate pilots in actual engagements against Soviet air threats, we presently have no real means of evaluating our own helicopter tactics.

What about the aeroscout crew who probably will be one of the most valuable assets on the battlefield? It is quite apparent that the crew of the aeroscout will not only be concerned with the enemy's weapon systems but also with trying to correctly identify and locate enemy positions at distances between 2,000 and 3,000 meters during daylight. What about night operations trying to identify the enemy at the same distances? Furthermore, add the NOE environment and the possible threat of Soviet helicopters. It is surprising that we have not attempted to provide the aeroscout with a weapon system that would afford the aircraft some form of self-protection against enemy helicopers or other threats.

The addition of the A-10s will help somewhat in balancing the odds against the threat but, even then, the aircraft will have their own problems in the European environment with the hazards of wires that are associated with the low level and NOE flight. Will the A-10s be able to support our combat elements during night operations?

It is surprising to see the statistics of wire strikes in peacetime, but add the combat environment and night NOE and undoubtedly the statistics will increase. Even today, the emphasis on wire detection devices never really seems to surface as a major factor in combating the hazards of wires. However, we are willing to risk a million dollar AH-1S Cobra TOW in the wire hazard environment in Europe.

With the increasing Soviet threat it seems that we will become more dependent upon those combat elements which can provide the most maneuverability. Some of our tactics are slowly changing concerning the use of the AH-1S in offensive roles. However, what about the Soviets who have their own attack helicopters? It is hard to believe that the Soviets would not use their helicopters to protect their most valuable asset, the tank, from our AH-1Ss. For years the Soviets must have feared the tactics which we are capable of deploying with the AH-1Gs, but now with the increasing number of Soviet helicopters, the threat may slowly be changing.

Our own AH-1S Cobra TOW will be very busy once the scout has handed the target off. Who will be assigned the task of providing protection for the AH-1S engaging targets?

Perhaps it is about time to go into the line units and find experienced pilots who have ideas concerning helicopter tactics against the Soviet threat. Often, many good ideas never quite reach the drawing board because of the tunnel vision of others and we surely cannot afford that in the next confrontation.

CW2 Jon C. Tedford
228 West Harris Drive
Ft. Rucker, AL

Editor:

On 25 September 1978, the 2d Aviation Company, 2d Armored Division, Ft. Hood, TX, completed 20,000 hours of accident free flying. The period covered is from 1 July 1970 to present.

I would like to take this opportunity to congratulate all present and former members of the 2d Aviation Company for making this meritorious accomplishment possible. It is evident that the 2d Aviation Company has been and still is a unit comprised of true professionals who are striving to maintain a zero aircraft accident rate.

CW3 Frederick W. Brisbois
Aviation Safety Officer
2d Avn Co, 2 Armored Div
Ft. Hood, TX 76546

Editor:

In response to two letters in *Aviation Digest* (November 1978) "Choose Your Weapons" by CPT Sariego and "The 1911 Caliber .45 Reconsidered" by CPT Gregory, I have several comments I would like to make.

CPT Sariego says regarding the .38 revolver: "A revolver chambered for the more powerful .38 super or magnum ammunition could do the trick." The .38 super is a step down the ballistic scale, not up. Granted, it has a higher muzzle velocity, but only by virtue of its smaller bullet—130 grains versus 158—with correspondingly less stopping power. Besides, the .38 super has a rimless case, usable only in an automatic. As for going to a magnum load, i.e., a .357 magnum, even a .45's recoil pales beside a "full bore" .357 load.

CPT Gregory calls the .45 automatic an "ear-shattering, thumb-busting, bullet-gone-somewhere pistol." Let's examine this. First off: Ear-shattering: The captain should be wearing ear protection, not to mention eye protection. Thumb-busting: A proper grip would eliminate that problem. Bullet-gone-somewhere: Again, a proper two-handed grip and ear protection will cure the flinching problem.

CPT Gregory further states that the standard loading configuration in the .38 is five rounds. In a double-action revolver, it is quite safe to carry a round under the hammer. Only in some single action revolvers is it a wise idea to have an empty chamber under the hammer.

I do not claim to be a firearms expert, merely a student of small arms and ballistics. As a UH-1 crewchief, if I ever wind up in a combat situation, you can bet that in my holster will be a .45 auto.

The .45 will be loaded (as John Browning intended when he designed it) with eight rounds, carried in the cocked and locked mode.

In the event my pro .45 views are falling on deaf ears, let us look at what we can do for the .38 revolver: First, it needs a higher muzzle velocity. Second, it needs a more efficient bullet shape, either a semi-wadcutter or a hollowpoint.

Combining both of these points would result in a much more efficient man-stopping round than our current round nose design.

As far as converting to 9 mm, I cannot see Uncle Sam setting up a new weapon system for a relatively few aviators. Besides, the 9 mm is a less reliable man stopper than the .38.

I would like to see more articles and opinions on this often overlooked part of our equipment.

Thank you.

SGT Larry P. Ransom
B Co., 42nd Avn Bn
New York Army National Guard

AVIATION GROUP

Continued from page 1

would be accrued from such a change, not the least of which would be unity of command and a facilitated integration of combined arms assets.

Perhaps one of the more significant requirements of such a change of responsibility, a requirement I view as essential, is tied directly to positions. Were such a change implemented, the chain of command would flow from general officer [ADC-M] to two lieutenant colonels, each separately responsible for roughly 100 aircraft and 700 to 1,000 Soldiers. Tied to this also, by MTOE addressed in the opening comments, is the designation of the aviation battalion commander as the division aviation officer (DAO).

The MTOE provides the DAO and assistant DAO with a small staff to execute aviation administration. But, we would be making two rather significant mistakes if we do not:

- Add an 06 aviation commander (who should be a group commander) between the ADC-M and two battalion commanders.
- Require the aviation battalion commander to serve as a special staff officer.

We must finally recognize that a comparison of the capabilities of maneuver brigades and the division artillery (all commanded by 06s) to the combat power of aviation resources within a division shows a clear equivalent, if not a greater need, for 06 level experience to serve as a commander of aviation forces. In my mind there is sound justification for this approach. It would appear that a division commander would be quite satisfied to have one commander of 06 grade commanding the division's aviation elements (particularly under ARCSA III where the structures are large and complex).

Clearly, the composite aviation force structure warrants command by a senior Army executive, experienced in combat, tactically knowledgeable in employment of assault and cavalry assets and totally competent in the management of the full spectrum of aviation resources. It almost appears, in view of the scope of assets, illogical not to have one.

This leads to the issue of division aviation officer. In combat the aviation battalion commander is not necessarily, and probably will not be, colocated with the division tactical operations center. More likely the DAO will be with the battalion headquarters which is too removed to provide the best staff guidance to the division commander. It can be said that in lieu of a division aviation officer an assistant can be assigned to do the staff work while also engaging in the conduct of combat operations. But the commander of ground maneuver elements needs an experienced aviation officer located nearby as are division artillery or brigade commanders. The aviation group commander could be more directly responsive to the division commander than would a battalion commander who is involved more specifically with activities on the battlefield.

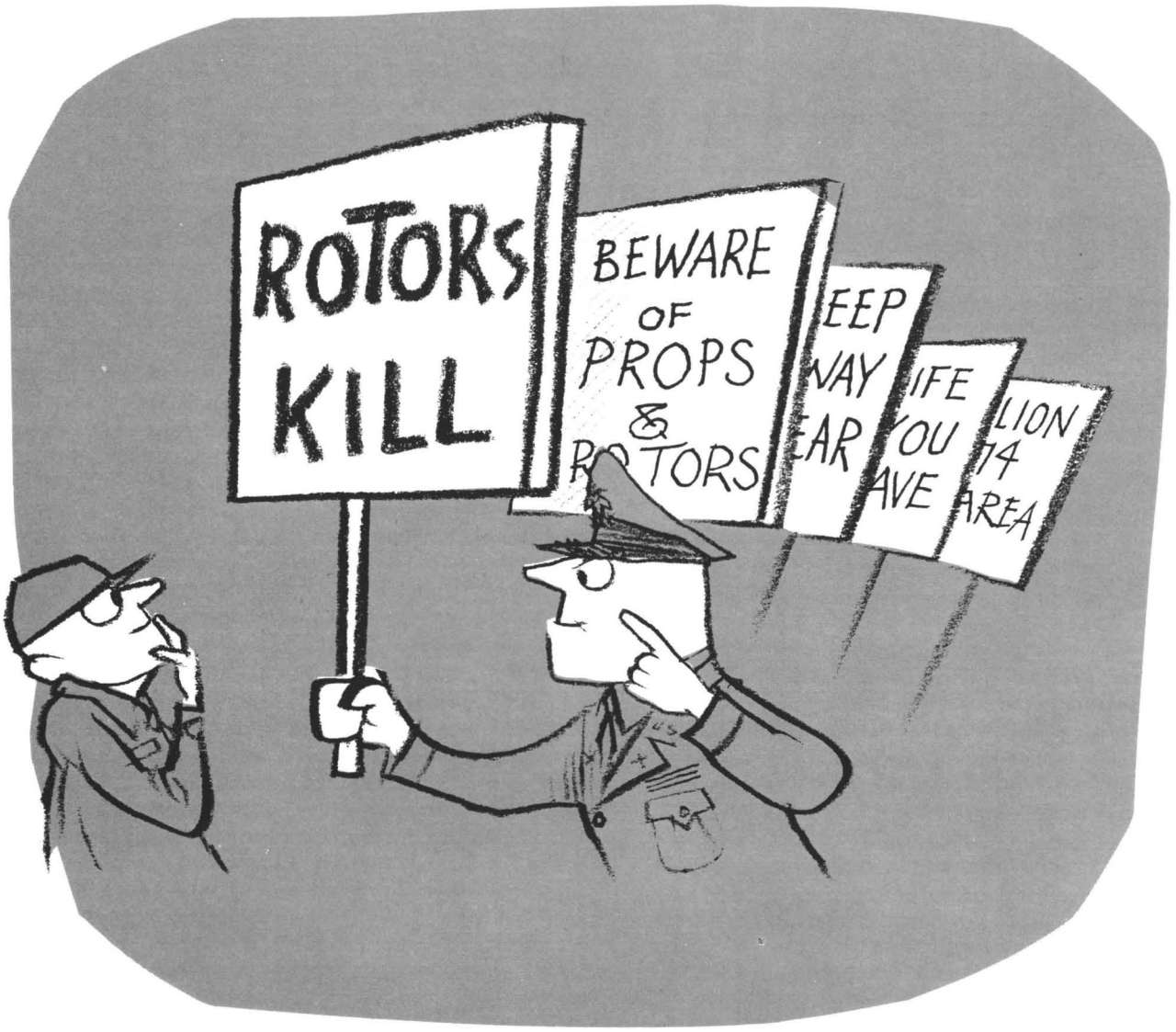
Additional benefits do exist from this approach. The establishment of an aviation group command in the division force structure will elevate aviation to its appropriate place. It would be on a par with the other combat elements of a division. It also would provide a Soldier with combat credentials and administrative management experience to speak for the aviation program and to serve as primary advisor to the division commander on the most maneuverable, expensive commodity within the division. Further, it permits the aviation battalion commander to drop the dual role of aviation officer and battalion commander and to devote full time to commanding (under ARCSA) perhaps the largest, most complex battalion in the division. Division staff actions could readily be handled by the aviation group commander's headquarters.

Another benefit derived from the aviation group concept is the creation of about 14 more aviation command positions toward which younger officers can aspire. Currently, the probability for 06 command for dedicated young, junior officers is less than remote by percentage. The Army has superior quality officer aviators who need that target, and who, once in those slots, can contribute significantly toward combat arms integration and the combat readiness of the force structure in total.

As an aside, the U.S. Air Force has one 06 for every 14 aircraft in is inventory. The Army retains a ratio of roughly one 06 for 200. While clearly the Air Force's ratio may not be applicable to the Army, it does provide food for thought with respect to the emphasis the Air Force places on responsibility for air activities.

I am convinced we can provide better service to the ground forces in the combined arms role through the establishment of group commands within the divisional force structures. The Army has a wealth of combat experience in its aviator colonels. They could be immediately applied to enhance aviation support of ground forces. With their appropriate levels of expertise, they could continue to direct the teaching of ground commanders the proper employment techniques of Army aviation commensurate with current doctrine on the modern battlefield.

U.S. ARMY SAFETY CENTER



DANGER ON THE GROUND

ARMY AVIATION safety encompasses every area of operations—not just that associated with flight. Yet, all too often, we are prone to neglect the man on the ground; and the results are often tragic.

Recently, a mechanic, while walking around an operating AH-1 to get some tools, inadvertently stepped into the path of the tail rotor blades and was struck on the head and shoulder. He died instantly. Subsequent investigation revealed he was taking a commercially procured reducing drug without having consulted a doctor. Because this drug caused severe drowsiness, he was also taking another over-the-counter drug intended to keep him alert during duty hours. Unfortunately, it didn't accomplish the job.

Going back in time, we find a somewhat similar accident that involved a fixed wing aircraft. In this instance, several student mechanics were standing forward of an aircraft that was being run up. Facing the students, the NCOIC had his back to the aircraft. During a power check, the aircraft jumped the chocks and the propeller literally hacked him to pieces. Whether this was a case of familiarity breeding contempt or simply a moment of carelessness or inattention, we don't know. But one thing is certain. This veteran mechanic violated a cardinal rule by turning his back to an operating aircraft.

However, not all rotor and propeller induced mishaps occur when aircraft are being operated. This threat exists even when equipment is in a static state. One such example concerns two mechanics who, after completing a high voltage harness check on a reciprocating engine, reinstalled the spark plug leads and then proceeded to check the magnetos for proper timing to the engine. As they rotated the propeller, the engine fired, knocking one man about 15 feet across the hangar floor, causing severe bruises to one hip and shoulder but, fortunately, no serious injuries. The second mechanic didn't fare as well. He was flung hard against the concrete floor, bleeding profusely from an almost severed arm. Approximately two years and three operations later, doctors were able to save his arm, although he did not regain full use of it. Both mechanics had forgotten to return the magneto switch to the OFF position following the ignition harness check.

While mechanics and other ground support personnel are more likely to become involved in mishaps of this nature, pilots are not immune. Barely three months ago, a T-41 pilot squatted to check the nose gear of his aircraft during preflight inspection. As he started to rise, he instinctively grabbed hold of one propeller blade as an assist. The propeller turned, the engine fired, and one blade struck him on the left side of his head, causing a compound skull fracture. The magneto switch had been left in the BOTH position.

A considerably less serious propeller-associated injury was sustained by a mechanic following maintenance underneath an aircraft. As he raised up, the back of his head struck the trailing edge of the steel-bladed propeller that was in a horizontal position. Although the propeller was not in motion, the impact nearly knocked the mechanic senseless, and left him nursing a painful lump.

But prop and rotors are not the only hazards to ground support personnel. Using wrong tools or faulty equipment, following unauthorized procedures, horseplay and just plain carelessness have all played a significant role in causing injuries.

When one mechanic was unable to budge a "frozen" landing gear trunnion nut, he obtained a length of pipe and slipped it over the wrench handle to increase the leverage. He then proceeded to apply force on the makeshift extension. The wrench slipped and his fist struck him in the eye with such force that metal slivers on his hand became imbedded in his eyeball. The result was a painful and serious infection that nearly cost him his eye.

Another mechanic wasn't as lucky. In an attempt to isolate a hydraulic leak, he pressurized the hydraulic system, then used his hand to feel along the tubing for the leak. He found it. The leak was of the "pinhole" variety, spewing out a tiny stream of fluid at extremely high velocity. When his fingers came across the leak, they were literally injected with hydraulic fluid. The result was an extremely painful and serious condition. After medical treatment proved fruitless, the affected fingers had to be amputated.

Carelessness on the part of individuals has also caused its share of mishaps. Many a fall has resulted from spilled oil that was left on a hangar floor; or from running across a freshly mopped area, particularly while carrying some heavy aircraft component; or from inattention when working on wet or icy aircraft. In one such instance, a mechanic slipped off a CH-47, severely injuring his back. But carelessness can take other forms. One example concerns two mechanics who were tasked with hauling and emptying a 50-gallon steel drum used to temporarily store discarded cleaning solvent, oil, and fuel. After loading the drum on the bed of a pickup truck, they drove to the dump area to a ledge that overlooked an excavation about 15 feet below. While one mechanic served

DANGER ON THE GROUND

as ground guide, the other backed the pickup until the rear wheels were almost even with the edge of the dropoff, allowing a portion of the truck bed to protrude beyond it. Climbing on the truck, they removed the specially designed lid from the steel drum and prepared to empty it.

Down below, they could see a heavy layer of ashes that had accumulated from repeated burnings of flammable waste. But they could see no fire or smoke. Together they tilted the drum. Suddenly as the volatile mixture spilled into the excavation, a cloud of vapor shot into the air high above their position on the ledge. Neither had to wait for further instructions. Dropping the drum, they jumped off the truck and ran, using their hands to cover their bare necks in anticipation of what they knew would follow. Sure enough, it did. The vapor cloud instantly exploded into a huge fireball that temporarily enveloped the truck. Both mechanics felt the searing heat on their backs and on their bare hands as they ran.

When the fireball disappeared, black smoke took its place, billowing into the sky as tongues of flame began to lap the aft portion of the vehicle. Somewhat shaky but unhurt, the mechanics rushed back to the truck and moved it from the excavation. The steel drum was lost, the truck nearly lost, and two persons almost burned—just because they failed to realize that underneath the visible layer of cold ashes lay glowing coals from the previous load of waste that had been dumped and burned.

Horseplay is another cause of mishaps. One individual with a sense of humor was rummaging through a novelty shop when he spotted what he thought would be a great laugh-getter—a fake stick of dynamite. Along with it came a box of fuses which could readily be replaced after each use. In operation, the fuse would be lighted and it would sparkle until it

reached the cap, then fizzle out. But it was authentic in appearance. So authentic that when the prankster lighted and threw an assembled stick among a group of mechanics on break, all pandemonium broke loose. In the process of scattering, personnel knocked over the benches in the breakroom. Unfortunately, others were sitting on the backs of these benches at the time, with their feet resting on the seats. As benches toppled, these individuals fell backwards onto the concrete floor, sustaining a variety of bumps, bruises, and skinned elbows. Needless to say, they failed to find any humor in the prank. And while they were lucky in not suffering any more serious injuries, the prankster was also lucky in that they couldn't find him until they had "cooled off."

Another prankster had a more warped sense of humor. Apparently impervious to electrical shock, he delighted in turning on the high voltage ignition harness tester, holding the "hot" lead behind him, then joining a group nearby. Eventually, some member of the group would inadvertently touch him. As can be imagined, this sudden unexpected shock evoked a variety of reactions from the different victims. However, the prankster decided to shelve his sense of humor after one victim involuntarily flung a heavy ball peen hammer he had been holding. The hammer barely missed the prankster's head. The point is simple: There is no room for horseplay around work areas, especially around aircraft; and it must never be permitted no matter how innocent it may seem.

But while the mishaps and near mishaps cited involved the actions of individuals, accidents can also result from a lack of any action on the part of individuals. For example, failure to ensure electrical equipment, such as drills, is safe to operate has resulted in electrical shock and death to personnel. Frayed electrical cords have shorted out and caused fires and explosions. On the other hand, timely precautionary measures have prevented mishaps, some of which could have been serious. A good example concerns an engine buildup shop foreman who periodically conducted spot checks of all shop equipment. During one such check, he found that welds on several links of the heavy duty overhead chain hoist had broken loose, and the links had already begun to spread. This hoist was used primarily to crate and uncrate engines and transport them to different areas of the shop. Had this condition not been noted, it would have been just a matter of time before the hoist chain would have failed.

As can be seen, mishaps involving ground support personnel stem from a variety of cause factors. But the important fact is that most of these factors result from two major causes—insufficient or inadequate training in areas involving safety, job skills, and the use of tools and special equipment; and insufficient or inadequate supervision.

Nevertheless, we can't "put the monkey on someone else's back." The individual cannot be held blameless. Consider yourself for a moment. No one knows better than you what your capabilities are. You know whether or not you are sure of yourself when you perform maintenance, use a tool, or operate sophisticated equipment. Only you know if you are taking medication that has not been prescribed and whether or not you are physically and emotionally capable of performing the duties required of you at any given time. And in the final analysis, only you can take personal precautions, avoid horseplay, and abide by established safety rules and policies. Whether you realize it or not, you have the most important responsibility of all where safety is concerned—a responsibility you should not shirk. After all, it's *your* safety we're talking about.

A Helicopter Flight In The KOREAN BUFFER ZONE (BZ)

Captain Erick L. Mitchell

EVENREACH. . . . . TORO 901 at checkpoint 20, flying east to west."

"Roger, TORO 901. . . . . Report abeam checkpoint 19". . . . "TORO 901, wilco."

Here I am, 500 meters from the South fence of the two fences. They are 150 miles long and divide North and South Korea. At 600 feet above ground level I can see everything required to ensure safe, positive navigation and identification of checkpoints. It's only 4,000 meters from the South fence to the North fence and the military demarcation line is in the middle. The two fences are the boundaries of the demilitarized zone (DMZ), a desolate area, so positive navigation is a must.

Again I ask myself, as I have so many times before, "How did I get here?"

I know how I got here. First, an assignment to U.S. Forces Korea, Eighth United States Army, and further assignment to the 117th Aviation Company (Assault Helicopter) at Camp Page, Korea. We aren't the only aviation unit that flies in the buffer zone (BZ) but we get our fair share of the missions within that airspace.

The buffer zone airspace is controlled more tightly and requires more reporting procedures, even though we are generally under radar monitor, than an instrument flight rules (IFR) flight under a nonradar environment. The BZ airspace extends from the South fence to about 5 nautical miles (NM) south. It extends from the East Coast to the West Coast. It is divided into seven sectors to facilitate positive control.

Not only am I on radar monitor with U.S. Army forces, but also with the U.S. Air Force ground control intercept radar, South Korean air defense artillery radar and most probably all their counterparts on the north side of the DMZ.

But again, how did I get here, 500 meters south of the fence? Sure I could say I was assigned the mission but it goes further back than that; not just any pilot can fly within the BZ.

First, the aviator must be designated a pilot in command (PIC) which requires a certain amount of flight time incountry and the successful completion of a PIC checkride with an instructor pilot. Second and equally, if not more important, the aviator must be BZ qualified, a qualification that tasks the skills of even the most proficient navigator. The training was tedious and exacting, but thinking back I realize it has instilled confidence and reassurance in my abilities.

"Evenreach. . . . . TORO 901 is abeam checkpoint 19 and landing is assured at field coordinates . . . estimated ground time is 15 minutes". . . "Roger. . . TORO 901 call when airborne". . . "TORO 901 Wilco."

The training was difficult at best. There is a required 12 hours of training time within the BZ plus successful completion of written, verbal and flight tests. It is necessary to memorize the requirements set forth in Eighth Army Regulation 95-3. The aviator also must identify and draw on a 1:50,000 map:

- The buffer zone line which is the southern boundary of the BZ;
- Checkpoints 1 thru 20 within the buffer zone;
- The low level flight route which connects the checkpoints;
- The authorized entry and exit points along the BZ line; and
- The radar pickup points for positive radar identification.

Once that is successfully completed you must fly the BZ line as depicted to within 50 meters either side. Then you must fly the low level route throughout all checkpoints by memory.

To get an idea of what it's like to fly the buffer zone line take a straight edge and draw several lines on a map in different directions end to end. After that, attempt to fly along your interconnected lines. If you think you've got that down, then try it without the map for 75 miles of interconnected lines. Just remember you can't deviate from your line by more than 100 meters.

By the way, that 12 hours of instruction is only a

The author holds a BS degree in Aeronautical Engineering and is a graduate of AMOC Phase I, II, III. He served 3 years at Corpus Christi Army Depot, 1 year working in the Crash Damage Analysis Section and 2 years in the Test Flight and Acceptance Division. His present assignment in the Republic of Korea is with the 117th Aviation Company (Aslt Hel) as the service platoon leader. Captain Mitchell's next assignment will be at the Transportation Officers Advance Course, Ft. Eustis, VA

minimum. Most aviators require 15 to 20 hours of training before they are ready for a checkride.

"Evenreach . . . TORO 901 is airborne from field coordinates en route to R-316 to exit the buffer zone". . . "Roger TORO 901 . . . report over checkpoint 19". . . "TORO 901 Wilco."

A lot of thought and preplanning went into devising a system to help prevent overflights of the DMZ. And even though there is tight control over every move, it has proven its worth. There hasn't been an overflight of the DMZ in sectors I thru IV since anyone now in Korea can remember. I limit it to sectors I thru IV because those are the only areas in which we receive training.

Those sectors are the responsibility of I Corps (Republic of Korea/U.S.) Group, Eighth U.S. Army. Sectors V thru VII belong to First Republic of Korea Army (FROKA) and require a Korean navigator onboard for flights within these areas.

"Evenreach . . . TORO 901 is over checkpoint 19" . . . "Roger TORO 901 report over checkpoint 20" . . . "TORO 901 Wilco."

At first, it seemed odd that we're required to know the buffer zone by memory when we're required to have our position positively identified on a 1:100,000 map at all times, but not now. I have more confidence and a certain reassurance knowing that I recognize a tree or a building that isn't necessarily on the map.

The flight route takes you above numerous trees, buildings, roads and rivers. That is how the buffer zone line is flown and within each unit everyone tries to nickname something in their honor so that they might be remembered. Such as Russ' Waterfall, or Dips Diner (Dips is the affectionate name we gave a previous 117th commander). There is also Don's Castle, Bill's Warehouse (or something like that), Ken's Baby Burner, and don't forget Mitch's Tankpad (a circular pad with a "T" in it—I figured it just had to be a tank landing pad).

"Evenreach . . . TORO 901 is at checkpoint 20 to exit the buffer zone". . . "Roger TORO 901 report exiting". . . "TORO 901 Wilco."

Well, the mission is just about over. It appears that the total flight time won't exceed 1.5 hours. It's startling to realize that it takes 4 hours of flight planning for 1.5 hours flight time. It started yesterday with receipt of the mission. After plotting the landing coordinates, I drew my flight route and had it checked by our clearance authority. Accurate flight times for each leg had to be calculated. Then a flight plan was filed indicating:

- Time and place of entry and exit into the buffer zone;
- Flight route;
- Points of landing; and
- Total time in buffer zone.

After receiving a thorough weather briefing and determining that the weather was above buffer zone minimum (500-2), as established by UNC/USFK/EA Regulation 95-3, I attained an airspace control element number from I Corps for clearance into the buffer zone.

Times for entry to and exit from the BZ must be adhered to within 3 minutes. When dealing with legs 5 to 10 minutes in duration one has to start counting seconds.

"Evenreach . . TORO 901 is exiting the buffer zone to R-316 en route to RKNC". . . "Roger 901 . . . I show you exiting at 0425Z . . . call good tally on RKNC" . . . "TORO 901 Wilco."

Now that we are out of the buffer zone, it's free cruise back to homebase. Was it all worth it? The training, the memorization, the preflight planning? Most assuredly! I've safely completed another mission to within 2 miles of North Korea with no possibility of overflying the DMZ. I have returned my aircraft, crew and passengers to homebase without an incident. And now I know how I got to within 2 miles of North Korea: I flew there.

I flew there because the United States Forces Korea has assigned a multitude of organizations the responsibility to carryout the mission safely. Two flight coordination centers (Evenreach and Warrior) are tasked with inflight control and coordination of the buffer zone missions to aid in the total mission accomplishment. There are a multitude of others that help to make this mission one without incident.

I think next time I will give my copilot the map and see if I can fly as well as navigate. I don't believe I'll ever have the opportunity to gain a more intensive navigation experience than I have here in the buffer zone of Korea.

"Evenreach . . . TORO 901 has Good Tally at RKNC (Camp Page) for termination". . . "Roger . . . TORO 901 . . . Good Day."

Yes, it has been a good day.

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

Swamp Cat

We don't think you will ever find a real swamp cat, but the swamp cattails that you find near or around swamps, lakes, ponds, etc., could provide you a valuable source of food in a survival situation.

The cattail once was labeled the "supermarket of the swamps." You will recognize the cattail by its brown sausage like head. As for the preparation, all edible parts can be eaten raw as well as cooked. Its bloom spikes make a tasty cooked vegetable; its pollen, pancake flour; its rootstock, a starchy potato substitute; its peeled stalk is similar to that of a cucumber. Even during World War II, several million pounds of the brown sauage like heads were used for making life jackets.

If you are willing to try the cattail at home, you can take the swollen sprouts in the spring, scrub, peel and add to a salad. After the long shoots (called Cossack Asparagus) begin to appear, cut them and then slip off the outer sheath. The crisp core may be eaten raw or cooked. This Cossack Asparagus should be gathered before the cattail plants are 2 feet in height above the water.

The young flowers, while still sheathed, can be cut and eaten as a vegetable. Remove the sheath, boil the spikes in salted water for 15 minutes, serve hot like corn on the cob, with butter. In early summer after pollen forms on the flower head, collect the pollen by placing a plastic bag over the heads, bending and shaking. This pollen is rich in vitamins and minerals and can be used to make beautiful golden pancakes.

In the winter season, quantities of the nutritiously starchy roots can be dug, washed and peeled while still wet. After drying, grind the roots into a meal for use in baking. This is an inexpensive flour substitute that also can be mixed with water and eaten as a paste.

Watch The Monkey

In World War II the Japanese soldiers were very successful in adapting to the jungle environments of the South Pacific. Instead of fighting the jungle, they made the jungle work for them.

While many of our allied forces were wet and hungry in the jungles, the Japanese used the bamboo sprouts and shoots as a valuable source of food.

The Japanese also had a secret to successful jungle living, which we did not learn until much later. The Japanese soldier was trained to watch for the monkeys. They knew that anything eaten by a monkey in the jungle was also an acceptable food that would not harm them.

Huddle

In football season the word "huddle" is used to gather your group around you in an attempt to win or survive the game. In cold water survival "huddle" may help save your life.

Survival in cold water depends on many things. Thin people usually are overcome by the coldness of the water before large people because the thin body cools at a much faster rate.

Swimming or treading water will cause your body to cool 35 percent faster than remaining still. The "drownproofing technique" requires putting the head into the water, and will cause a person to cool about 82 percent faster than if floating with the head out of the water.

An "average" person, wearing light clothing and a personal flotation device (life preserver) may survive 2½ to 3 hours in 50 degree water by remaining still. This survival time can be increased considerably by getting as far out of the water as possible and covering your head. Getting into a boat or anything else that floats can be a real lifesaver.

It is important to remember that cold water conducts the heat away from your body many times faster than air. Your life preserver will keep you afloat even though you may be unconscious. Remaining still and, if possible, assuming the fetal position will decrease your body heat loss and increase your survival time. About 50 percent of your body heat is lost from the head so it is important to keep the head out of the water. Other areas of high heat loss are the neck, the sides and the groin.

If several of you are in cold water together, you can "huddle" close, side by side in a circle to help preserve body heat.

Of course there comes a time of decisionmaking when you are in the water. Knowing that body movement causes you to lose body heat at a greater rate, do you leave your position and attempt to swim to an object or shore? Distance on the water is very deceptive. We recommend that you stay put, unless you are absolutely sure that you can make it to shore, or that there is no chance for rescue.

Zip Lock

There is one way to help ensure that fuel, trioxane (9110-00-263-9865), which is part of your survival kits, does not become punctured and the powdered

Kim Aguilera
Photo by Tom Greene

fuel contaminate the other foods and items of your survival kits.

During the next inspection of your survival kits, we recommend that you put the fuel trioxane into a "zip-lock" bag before repacking into your survival kits. This will help ensure that the fuel packages do not get punctured, and if they do the fuel powder will be contained in the "zip-lock" bag.

Head Thread

Body oils, sweat, dirt, etc., cause the thread of your SPH-4 flight helmet retention assembly to deteriorate. Look at your helmet to see if the retention assembly stitching is intact and strong. If you find that your helmet needs restitching, you should resew with double stitching with polyester thread NSN 8410-00-988-1298.

We Recommend PEARL

We appreciate hearing from you by letter and telephone on the problems you experience with your aviation life support equipment (ALSE). The only way we can improve on the ALSE that we now have, is for you to let someone know what your problems are. We want to help you solve these problems, but we would appreciate it if you would help us by considering this recommendation.

We have heard about many of these problems, and have written about them in the "PEARL" articles of your *Aviation Digest* with recommended solutions.

We suggest you keep all *Aviation Digest* PEARL articles or make copies of them, and index or file them by subject matter. Chances are the next time you experience a problem, you can look at your PEARL file and find the solution.

They're Here

The new one-piece CWU-27P flight suits (NSN 8415-00-491-0898 through 1037) were available for issue 1 January 1979.

Supply Information Letter (SIL) Number 4-78, U.S. Army Support Activity, Philadelphia, has published a list of sizes and national stock numbers. The basis of issue is CTA 50-900.

Line Item Number (LIN) F32055 is authorized per individual on flying status whose primary duty is flying, except sea; crewchief occupying authorized MTOE/TDA position not requiring flying status. Unit of issue is:

Active Army (Peacetime)	3 each
Active Army (Mobilization)	3 each
Army National Guard	2 each
Reserve Officers' Training Corps	1 each
U.S. Army Reserve	2 each
Department of the Army Civilian	2 each

LIN 32055 is authorized per individual on flying status in sea zones I and II whose primary duty is flying. Unit of issue is:

Active Army (Peacetime)	4 each
Active Army (Mobilization)	4 each
Department of the Army Civilian	4 each

LIN 32055 is authorized per individual on flying status where primary duty is not flying, i.e., fly for proficiency only; member of U.S. Army parchute team. Unit of issue is:

Active Army (Peacetime)	1 each
Active Army (Mobilization)	1 each

The SILs contain many items of interest. To receive distribution on the SIL, write to the Commander, U.S. Army Support Activity, Philadelphia, ATTN: STSAP-G, 2800 South 20th Street, Philadelphia, PA 19101.

A TACTICAL COMMAND POST

for use in the command and control of forward aviation assets

Major James J. Rudy
Commander, Armed Forces Examining and Entrance Station
Knoxville, TN

IN THE MID- AND high intensity European battlefield, the employment of Army aviation can be a viable part of the combined arms team. The aviation doctrine described in FM 17-47, "Air Cavalry Combat Brigade," and FM 90-1, "Employment of Army Aviation in a High Threat Environment," was developed to provide means for Army aviation to support the combined arms team on the future battlefield. These manuals, in several examples, detail how the corps or division commander uses the mobility of aviation battalions and companies to move rapidly across wide distances to respond to the enemy threat.

However, these and other Army aviation field manuals fail to *spe-*

cifically address the mechanics of how Army aviation company commanders can exercise command and control of their companies in a practical manner while maximizing employment of their tactical assets. This facet is addressed only in the broadest respect. I quote from FM 90-1:

> ". . . In selecting positions for his aviation element, the commander must consider factors such as command relationships, mutual support and security requirements, and mission, enemy, terrain, time and troops available." In addition, ". . . Because of the lucrative target presented by large aviation complexes, all aviation unit operations and training facilities should be dispersed and positioned outside the range of enemy light and medium artillery when possible."

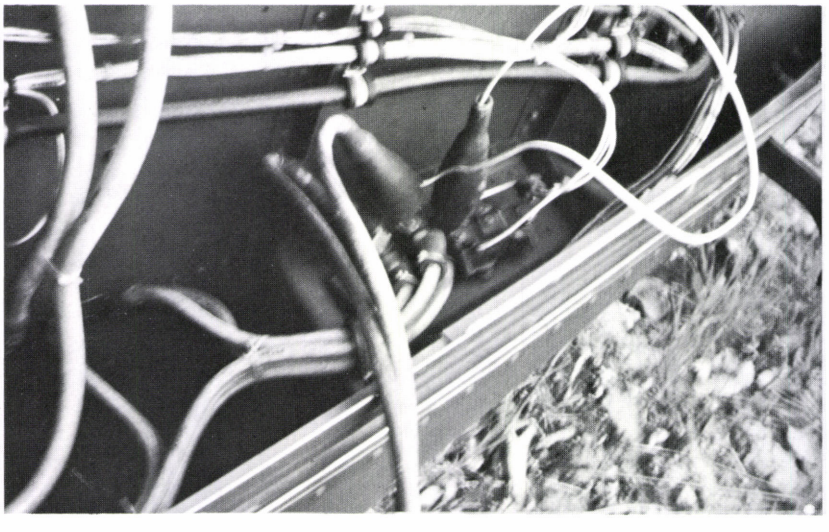
In my observations in Germany from 1973 to 1977, aviation units in field conditions rarely executed dispersion of their assets in division and larger field training exercises. I violated the concept of dispersion and operated out of a single field site with an assault helicopter company. From this "field" heliport we flew forward to support the divisions. This was the easy thing to do to provide logistical support to helicopters and aircrews.

Equipment required to establish and maintain a tactical command post includes: (from top to bottom) UH-1H; 1.5 kW generator with fuel; 10-12 gauge double insulated wire; RCC 292 antenna and camouflage net

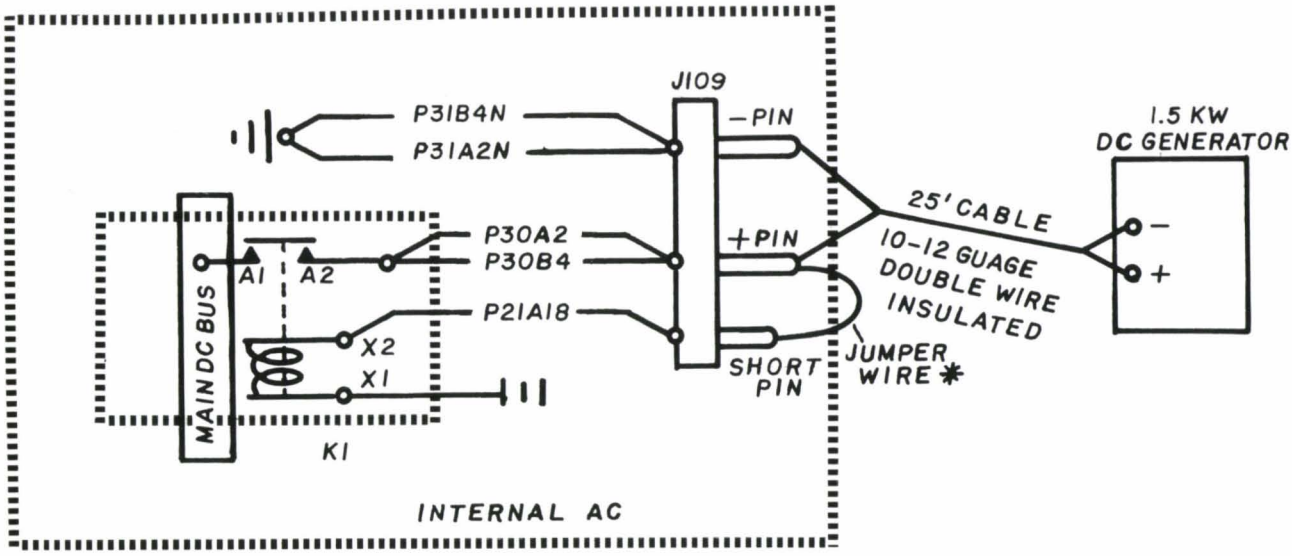
On several of our field exercises the operations officer, CPT Larry Thompson, and I discussed a better way for command and control. It was CPT Thompson who had the original idea which provided a potential for a more realistic way to train an assault helicopter company to "fight" and "survive" on the future battlefield. This concept was first employed in May 1977 in the 173rd Assault Helicopter Company in the V Corps Exercise "Certain Fighter."

The concept centers around the use of a helicopter equipped with the command console (AN/ARC-15) acting as the command and control (C&C) link in a ground mobile configuration. The equipment required, in addition to the console helicopter, consisted of: an AN/RC-292 antenna; a 1.5 kilowatt (kW) generator with 5 gallons of mogas; a 60-foot length of 10 to 12 gauge insulated double wire cable; and a camouflage net.

The console helicopter departs from the field "base" camp and selects a landing site where it can be in radio contact with the supported unit (usually a mechanized infantry or armor brigade) and in radio contact with the dispersed aviation sections or platoons. The landing site for the console helicopter should be about 8 to 10 kilometers (km) from the brigade command post and should be in a small landing area that provides natural camouflage for the helicopter. A prior terrain analysis should have been made via a map reconnaissance in order to ensure line of site for radio communications to the required ele-



10-12 gauge double insulated wire serves as transmission link to power required avionics on the helicopter. The wires connect the UH-1H with a 1.5 kW generator emplaced nearby



* THE JUMPER WIRE IS USED TO ENERGIZE RELAY K-1 ON THE AIRCRAFT TO LET 28 VOLT DC INTO THE MAIN DC BUS BAR.

ments. This console helicopter serves as the mobile company command post.

The aviation sections (or platoons if appropriate) are positioned about 5 to 7 km from the console helicopter and generally located in the brigade rear area. Prior coordination with the appropriate ground commanders should establish the ground positioning of all aviation assets. The landing site for these helicopters should have terrain mask between the aircraft and the forward edge of the battle area (FEBA) in order to prevent enemy observation.

The helicopters should be dispersed over a several hundred meter area to reduce the effects of enemy medium and long range indirect fire. They are positioned to take advantage of natural terrain and shadows. Camouflage nets are used in a hasty configuration to further reduce enemy aerial observation. The radio link between these dispersed aviation sections and the console helicopter is through use of AN/PRC-77 back pack radios.

The console helicopter, upon landing, can make a communications check with the supported unit before shutting the aircraft down. Once ground communication is verified, the aircraft systems are shut down. The 1.5 kW generator is emplaced and the 10 to 12 gauge double insulated wire serves as the transmission link to power the required avionics on the helicopter. The negative and positive wires from the cable are attached to the negative and positive terminals of the generator. Alligator clips are attached to the wires on the other end of the cable. This end of the cable attaches into the electrical compartment of the UH-1H Huey helicopter. The negative wire is connected to the negative pin on J109 of the helicopter and the positive wire is connected to the positive pin on J109.

A jumper wire is used to connect the positive terminal of the external power relay diode to the positive terminal of the external power receptacle. This jumper wire is used to energize relay K-1 on the helicopter in order for the 28 volt direct current (d.c.) power to flow to the main d.c. bus of the helicopter. The battery of the helicopter should be disconnected while using the 1.5 kW generator as an external power source. (See figure 1 for an electrical diagram describing this system.)

The AN/RC-292 is emplaced and the power cable is attached to the front of the radio console that is positioned in the passenger compartment of the helicopter. Often the 292 antenna is not required to communicate with the brigade or aviation sections. In this case the 292 antenna can be used to provide the extended range to communicate on the aviation battalion command net.

The time required from landing the console helicopter to set up the system and be in operation is 10 minutes. This included the hasty employment of camouflage netting over the helicopter. It usually takes 5 to 7 minutes to break the system down and become airborne again. Complete system setup is accom-

plished by the pilot, copilot, crewchief and doorgunner.

From the console helicopter the company commander has the capability to use one ultra high frequency (UHF), one very high frequency (VHF), and three frequency modulated (FM) secure radios. The commander normally would operate on the brigade command net FM secure, the aviation battalion command net FM secure, and in the aviation company net FM plain. The UHF can be used as a backup radio in the appropriate aviation net. Appropriate 1:50,000 tactical situation maps are set up in the passenger compartment of the "mobile command post."

Normally a mission would be assigned on the brigade command net (FM secure). The company commander would alert the appropriate aviation section on the aviation company command net (FM plain) and would tell the section commander to change to secure. The section commander merely changes from the AN/PRC-77 to the helicopter radio by flipping on the battery switch and allowing a few moments for system warmup. The section commander can receive the mission tasking information on the secure FM radio of the helicopter.

This concept allows for the dispersion of aviation assets while being completely responsive to ground commanders. The console helicopter and the aviation sections can change their hide positions based on the enemy or friendly situations. Terrain flight techniques habitually are used in order to minimize enemy observation. If appropriate, the console helicopter can be positioned at the brigade command post. This would preclude the positioning of an aviation liaison at the brigade as the company commander or the operations officer could provide that representation.

This C&C concept was extremely successful during the V Corps exercise "Certain Fighter." It is an example of how an Army aviation company can be responsive to ground commanders while maximizing the survivability of its vital assets. Additional development and use of this or similar concepts may contribute to the overall effectiveness of Army aviation as a part of the combined arms team.

Hasty camouflage provides excellent cover from potential enemy forces. (Note: With the rotor blade left *untied,* another camouflage net can be used to conceal the exposed blade pictured above)

The described concept is not a strictly innovative idea. This concept or a derivative of it is used by other aviation units. The 6th Air Cavalry Brigade (ACCB) at Ft. Hood, TX uses this configuration as a "jump toc" at the brigade headquarters level. There has been no known documentation and publicizing of the mechanics of this idea to other Army aviation units, but perhaps the information I have outlined in this article will help others to communicate better in the combat zone.

Review Comments:

From Directorate of Evaluation and Standardization, Ft. Rucker, AL. DES agrees with the concept of a forward C&C for aviation assets. However, due to the possibility of arcing, a modification of the method of connecting the cables is recommended.

The installation of a battery connector receptacle (NSN 5935-00-673-3621) in the electrical compartment, and a battery connector (NSN 5935-00-198-3971) on the cables leading from the auxiliary power unit will eliminate the possibility of an electrical arc. Connection of the wiring will be accomplished in the same manner as indicated in the wiring diagram.

Subject connectors are available through the supply system and would allow for a permanent and safe installation of required electrical wiring.

From Headquarters, U.S. Army Communications Command, Ft. Huachuca, AZ. The article is technically accurate; however, to make the system more efficient/fail safe the following is recommended:

Power cable from auxiliary generator to helicopter should be stranded wire.

Use of a dedicated termination plug/receptacle to preclude power polarity reversal with resultant battery damage. Alligator clips, if used, should be color coded to reduce possibility of reverse connection.

Use of semiconductor isolation between helicopter battery and connect point of auxiliary generator to provide battery protection and time savings in set up and tear down operations.

EPMS CORNER

Enlisted Personnel Management System

Black Hawk Update

SFC Douglas E. Allen
Aviation Career Advisor
U.S. Army Military Personnel Center
Alexandria, VA

MANY SOLDIERS in the aviation maintenance career management field have shown great interest in the UH-60 Black Hawk.

Originally, training in military occupational specialty (MOS) 67T, utility tactical transport repairer, and in related component repair MOSs such as 68B, 68D, 68F, 68G and 68H was scheduled to start last October, but complications prevented the scheduled start of training. The training devices and aircraft needed for training maintenance personnel could not be delivered on schedule.

Due to the delay in training, the number of personnel to be trained in fiscal year (FY) 1979 has been greatly reduced. During FY 79 there will be no 10 level training. Since the only personnel who will receive 67T training in FY 79 already are experienced in aviation maintenance, the basics such as care and use of handtools, lockwiring, basic use of forms and publications, etc., will not have to be taught to them.

Skill level 20 training for FY 79 has been reduced from 54 spaces on the original training schedule to 48 spaces on the revised schedule. Skill level 20 training is 8 weeks long.

Skill level 30 training, designed for personnel in supervisory and inspector positions is 9 weeks long. Training spaces for FY 79 were reduced from 41 to 26.

There is no training available for personnel at grade E7 or above. Personnel in MOS 67T will progress to 67Z, aircraft maintenance senior sergeant at grade E7 just as personnel in all other subfield 67 do with the exception of 67W.

Prerequisites for 67T school are: 10 months or more active duty remaining upon completion of the course; standard score of 100 or higher in aptitude area MM, physical profile 222211, with normal color vision; no security clearance is required; high school graduate or GED equivalency.

Duty positions available in MOS 67T are much the same as in all other subfield 67 MOSs. Tactical transport helicopter repairer in skill levels 10 and 20, tactical transport helicopter crewchief and airfield service supervisor at skill level 20, and tactical transport helicopter technical inspector and maintenance supervisor are authorized as skill level 30. These positions along with standards of grade authorization are outlined in AR 611-201.

Selected personnel in 68B, 68D, 68F, 68G and 68H will receive training on components peculiar to the UH-60 aircraft.

CH-54 Tahre To Leave Active Army

THE CH-54 helicopters are being transferred from the active Army inventory to the Army National Guard. The transfer is scheduled to be accomplished by 30 September.

As the aircraft are transferred, maintenance personnel in MOS 67X (heavy lift helicopter repairer) will be considered for reclassification into other aviation maintenance MOSs.

Personnel in MOS 67X who have specific desires to go into other aviation maintenance MOSs should consider submitting requests for reclassification or retraining.

The current status of the requested MOS must be considered when requesting a new MOS. If the requested MOS is in an overage status the request most likely will be denied.

If requests for reclassification are based on previous training, this should be documented on the request. Reclassification requests based on on-the-job training (OJT) should include records of training or if not available a statement from competent authorities verifying you completed an OJT program for the MOS.

Don't forget about all those correspondence courses you took from the U.S. Army Transportation School. They can provide a good base of knowledge for a new MOS. If you are interested in applying for correspondence courses refer to DA Pamphlet 351-20 and see the folks at your local Army education center for assistance.

Personnel who desire to leave the aviation maintenance career management field should refer to DA Pamphlet 351-4 for Army service schools which are available. Prerequisites for each service school are listed along with training location, school length and other pertinent data. School requests should be submitted as soon as practical.

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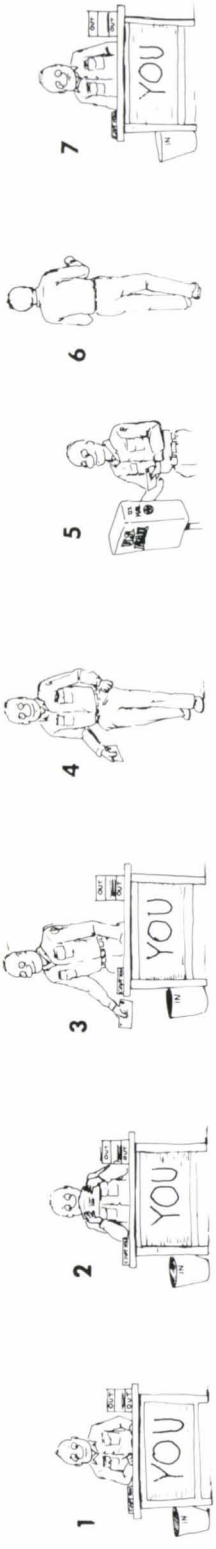

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Attention Unit Commanders

We would appreciate your distributing as many copies of this as possible (local reproduction is authorized). Copies may be returned in a franked envelope

Reporting Final

Late News From Army Aviation Activities

Continued from page 30

FROM TRADOC

Two-Year Army ROTC Scholarships. The application period for the Two-Year Army ROTC Scholarship Program for active duty Army enlisted personnel opened in January. Winners for the 1979 to 80 school year will be announced in June. These scholarships are designed to provide Army enlisted men and women an opportunity to obtain both a college degree and commission as an Army officer. The awards will pay full tuition, books and educational fees, plus provide a living allowance of up to $1,000 a year each year the scholarship is in effect. In addition, winners will be paid for attending the Advanced Camp, normally held during the summer between the junior and senior years of college. Besides the scholarship benefits, winners also may take advantage of the Veterans Administration benefits to which they would normally be entitled. Competition for scholarships is limited to enlisted personnel who have served at least one year on active duty; will be under 25 years of age on 30 June of the year they are eligible for commissioning; and have received credit for at least 2, but not more than 2 ½ years of college. Also, to be considered by the final selection committee, applicants must have been accepted by a college for next fall's enrollment, have earned a GT score of 115 or higher, and be U.S. citizens. More details on this program are contained in AR 145-1. Applications must be requested by 15 April 1979; however, applicants have until 1 May 1979 to complete their applications. For further information and applications, write Army ROTC Scholarships, Ft. Monroe, VA 23651. **(TNS)**

☆ ☆ ☆

FROM FORT RUCKER

Oil Analysis Lab Saves $2 Million. Work being done at the U.S. Army Aviation Center's Oil Analysis Lab saved the Army more than $2 million during fiscal year 1978, according to a recently published cost and operations summary. Data from the nine laboratories Armywide was compiled by the U.S. Army Materiel Development and Readiness Command (DARCOM), Materiel Readiness Support Activity.

Maintenance analysis is a process by which special diagnostic tools are used to determine mechanical systems conditions and locate failing parts without resorting to disassembly.

According to the report, the cost of operations for analyzing oil samples at the Ft. Rucker lab is most efficient when compared to the other Army labs including contracted out labs. At Ft. Rucker, the cost was $1.64 per oil sample compared to a range of $1.73 to $3.22 at other locations.

The report also shows that the Ft. Rucker lab ranks among the top in effectiveness of operations. There were 97 percent confirmed discrepancies found on oil-wet components as a result of oil analysis. Confirmed discrepancies at the other laboratories ranged from 85 to 100 percent. **(USAAVNC-PAO)**

☆ ☆ ☆

Preparing For The UH-60. Key personnel from the Aviation Center have attended a factory ground school in preparation for receiving three Black Hawk helicopters next month. The 2-week course, taught at Sikorsky Aircraft's Product Support Training Facility, Norwalk, CN, familiarized the students with the aircraft, including the electrical, hydraulic, fuel, power train, rotor and instrument systems.

Instructions were given on the way those components will operate under normal conditions and actions required to overcome any malfunction or emergency. **(USAAVNC-PAO)**

☆ ☆ ☆

On the Attack. An AH-1 Cobra gunship flies low during a mission in Phase II of J-CATCH at Ft. Rucker [September 1978 *Aviation Digest,* page 20]. The Cobra, along with UH-1 Huey gunships and

OH-58 Kiowa scout helicopters, were participants in Phase IV of J-CATCH which began last month at Hurlburt Field, FL. **(U.S. Air Force Photo)**

☆ ☆ ☆

NISA Symposium: On 21 and 22 February 1979 the United States Army Aviation Center hosted a symposium for the National Security Industrial Association.

More than 200 representatives of the Army and industry were present to discuss current and future aviation systems, capabilities, problems and technology requirements.

This productive 2-day symposium was opened by MG James Merryman, CDR USAAVNC and featured presentations from TRADOC, DARCOM, AVRADCOM and ODCSLOG. Watch the *Aviation Digest* for more on this symposium.

(DCD-USAAVNC)

ATC ACTION LINE
UNITED STATES ARMY COMMUNICATIONS COMMAND

What is an MOA?

An MOA (military operations area) is a category of special use airspace. It is defined as a volume of airspace of specified dimensions, including ground coordinates to identify its area, and altitudes to define its upper limits.

Where are MOAs located?

MOAs generally are located in conjunction with existing restricted areas.

What is the purpose of MOAs?

MOAs are established to contain aircraft operations below 10,000 feet operating in excess of 250 knots. They are designed to provide a measure of safety to the public or other users of the National Airspace System (NAS) by identifying those areas of possible hazardous operations.

What restrictions are imposed on the public or other users of the NAS?

No restrictions are placed on nonparticipating visual flight rules (VFR) aircraft. Pilots should be aware of possible operations within the MOA. They may call the Federal Aviation Administration (FAA) controlling agency to determine if the area is active; however, they are free to transit the MOA at their discretion. FAA will not clear instrument flight rules (IFR) aircraft into or through the area unless normal IFR separation can be provided between nonparticipating IFR aircraft and all participating aircraft, either IFR or VFR. Since this separation cannot always be guaranteed, IFR aircraft frequently are routed around MOAs just as they are routed around active restricted areas.

Are there special operating conditions imposed on MOAs?

Special conditions of use and procedures for each MOA are established by a Letter of Agreement between the local military commander and concerned FAA air traffic control facilities. The letter shall designate a military scheduling agency who will be responsible for scheduling military use of the area. It will specify how the area is activated and how it is released back to FAA. The letter will specify procedures to be used by various military activities who are required to operate in the MOA.

Are MOAs published?

They are published in the FLIP AP/1B and on low altitude en route charts. They may be published on VFR sectionals and local area charts, if any.

FAA the MOA proposal?

The Army is responsible for submitting those proposals for MOAs which adjoin Army designated restricted areas when the aircraft operations creating the requirement are in support of Army operations. The supporting service, at its discretion, may elect to develop and submit the proposal. When another military service is using an Army restricted area for its own purposes and it requires an MOA to contain "spill out" aircraft activity, then it is the responsibility of that military service to develop and submit the proposal.

Readers are encouraged to send questions to:

Director
USAATCA Aeronautical Services Office
Cameron Station, Alexandria, VA 22314

Sport Helicopter Group Forming

THE HELICOPTER Club of America (HCA) has mailed applications to personnel across the country urging them to join as Charter Members of the organization.

A meeting for the election of officers and adoption of a constitution and bylaws was held last January in Las Vegas, NV.

HCA will become the helicopter Division of the National Aeronautical Association (NAA), and will be responsible for preparation of the U.S. helicopter team to compete in the IVth World Championships to be held in Poland in 1981. HCA will foster and **promote professionalism and helicopter sporting events throughout the Nation.**

Additional information can be obtained by writing to: Helicopter Club of America, 2055 Hazelwood Parkway, Phoenix, AZ 85015. **From *NAA News*.**