UNITED STATES ARMY

AVIATION DIGEST

JUNE 1978

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AVIATION DIGEST
VOLUME 24 JUNE 1978 NUMBER 6

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Richard K. Tierney
Editor

ABOUT THE COVER

Young and strong at age 36, Army aviation celebrates its birthday on 6 June. The cover reflects some of the many areas in which Army aviation is involved today. See page 35 for acronym meanings. Cover art by Fred Martin

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

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AVNEC REPORT

Major General James C. Smith
Commander U.S. Army Aviation Center
Fort Rucker, AL

AS REPORTED IN the February, March and May issues of the *Digest,* an Army Aviation Employment Conference (AVNEC) was hosted by the U.S. Army Aviation Center (USAAVNC) at Ft. Rucker, AL from 28 to 31 March. There were 29 general officers and civilian equivalents together with more than 20 colonels attending the conference to discuss Army aviation employment doctrine and to prioritize aviation systems currently under development. Results of the conference will be used to develop an appropriate agenda for the Army Aviation Systems Program Review (AAPR) currently scheduled for this December.

Background presentations on the threat, the scenario, specialty 15, and rationalization, standardization and interoperability (RSI) the first morning set the stage for the discussions in the four workshops. The first afternoon and the entire second day were devoted to workshop efforts in arriving at conclusions and recommendations on the issues as well as prioritizing equipment. The workshop results were presented and discussed in joint session on the third day. A summation and discussion of the most significant results in preparation for the AAPR occupied the last morning.

Judging from the enthusiastic participation and free-flowing exchange of ideas I heard in the various workshops, all of the attendees came prepared to offer their full assistance in developing the direction to be followed in the continued advancement of Army aviation as a member of the combined arms team. Due to the intensive efforts of the participants, the goal of achieving a consensus on Army aviation doctrine, tactics and employment concepts and prioritization of equipment was realized.

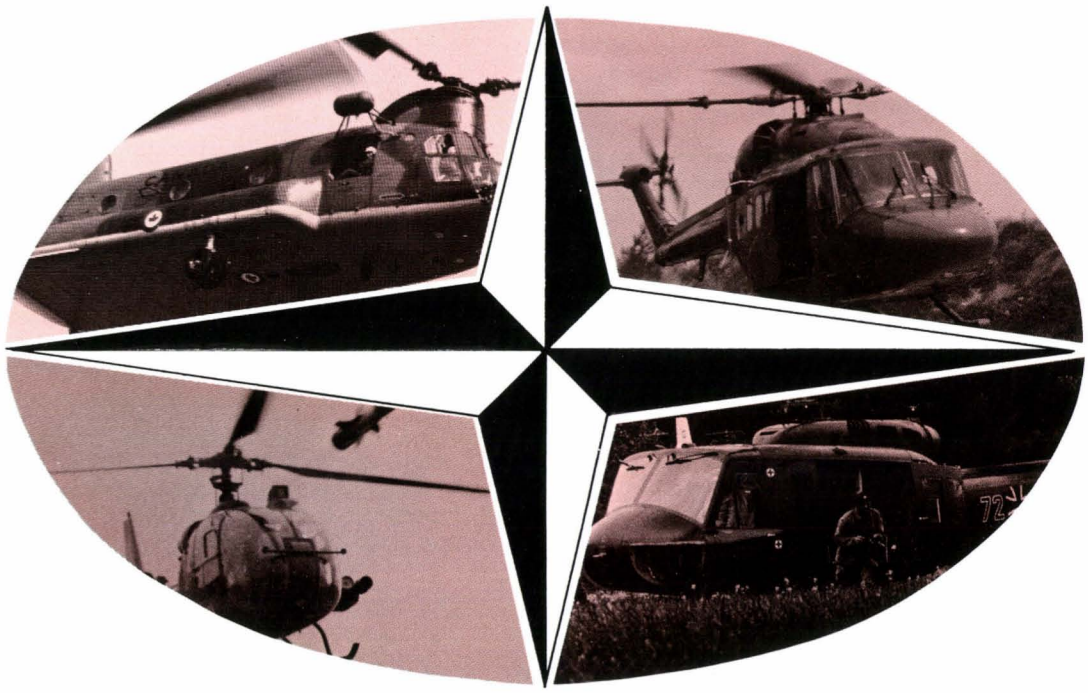
We at Fort Rucker will continue our efforts in conjunction with the other U.S. Army Training and Doctrine Command (TRADOC) proponent centers to further study those areas requiring resolution at the AAPR. In the meantime, we will move forward in acting on those recommendations from the AVNEC which can be implemented at this time.

The articles on the four study areas of the AVNEC begin on the next page with an article on standardization and interoperability. The July issue will cover "How to Fight—Offense," and future issues will contain "How to Fight—Defense" and Army aviation personnel and training problems.

The AVNEC was a valuable experience for all concerned. It was especially valuable to the Army aviation community since it provides us with a direction in which to advance the state of the art knowing that we have the full support of the Army at large.

I would like to express my appreciation to all participants who found time in their busy schedules to join us at the conference. With the aid of their guidance, we can proceed with our efforts to ensure that Army aviation is capable of fulfilling its vital role in the combined arms team of the Army today and in the future. ★★

AVNEC PART I



Standardization & Interoperability

LTC Wayne B. Lunsetter and **MAJ Ted T. Cordrey**
Directorate of Combat Developments
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ONE OF THE major areas discussed during the Army Aviation Employment Conference last March at Ft. Rucker was "Standardization and Interoperability," specifically addressing the impact on the Army aviation community of recent congressional and Department of Defense emphasis on the RSI program.

RSI—what is it and how will it affect Army aviation development programs, current equipment, concepts, doctrine, tactics and training? First, RSI is an abbreviation for *Rationalization, Standardization, and Interoperability*. Policies and procedures for Army participation in this program are outlined in Army Regulation 34-1 (Draft) dated 25 October 1977.

As defined in AR 34-1 *Rationalization* refers to any action that increases the effectiveness of alliance [North Atlantic Treaty Organization (NATO)] forces through more efficient or effective use of defense resources committed to the alliance. Rationalization also includes consolidation, reassignments of national priorities to higher alliance needs, standardization, mutual support, improved interoperability or greater cooperation and applies to both weapons/materiel resources and nonweapons military matters.

Standardization is the process by which nations achieve the closest practicable cooperation among forces, the most efficient use of research, development and production resources, and agree to adopt on the broadest possible basis the use of:

- common or compatible operational, administra-

tive and logistics procedures

• common or compatible technical procedures and criteria

• common, compatible or interchangeable supplies, components, weapons or equipment

• common or compatible tactical doctrine with corresponding organizational compatibility

Finally, *Interoperability* is defined as the ability of systems, units or forces to provide services to and accept services from other systems, units or forces and to use the services so exchanged to enable them to operate effectively together.

While the term RSI only recently has come into prominence, the program is by no means entirely new. One facet which has been ongoing within NATO for years is the preparation and ratification of Standardization Agreements (STANAGs) which are in most cases procedural in nature. The STANAGs are quite specific and are aligned in two basic categories—those dealing with operations and those dealing with materiel. The U.S. has ratified about 550 STANAGs.

A different level of understanding within NATO is achieved by development and ratification of Allied Tactical Publications (ATPs). The ATPs, which establish common doctrinal agreements, are much more broad based than STANAGs. Other more recent efforts aimed at achieving common doctrinal agreement are the Training and Doctrine Command (TRADOC)—German Army staff talks leading to development of concept papers. Concept papers (several have been signed by both nations to include one on airmobile operations) are more specific than ATPs since it is easier to achieve agreement between two nations than between all NATO nations.

A basic difference is that the concept papers are not binding for implementation whereas STANAGs and ATPs are when ratified. Nevertheless, any effort which leads toward common doctrine eases the problems of establishing common requirements and in turn facilitates equipment standardization.

The recent limelight of the RSI program is the result of two major factors. *First,* both the United States and other NATO members are becoming increasingly aware of the formidable and expanding threat of the Warsaw Pact countries. RSI is seen as a means through which the NATO alliance can further solidify its military deterrence against any Warsaw Pact aggression in Europe. *Second,* inflation and budgetary constraints on all NATO member defense programs are having major impact—impacts which are increasing each year. RSI in this case is seen as a means to reduce this effect.

A more direct impetus for increased Army participation in RSI has been the increased emphasis it has received from the Carter Administration and from Congress. The so-called Culver-Nunn Amendment to Public Law 94-361 provides that, "it is U.S. policy that equipment procured for U.S. use in Europe shall be standardized or at least interoperable with the equipment of other members of NATO."

To ensure top level mnagement of Army RSI efforts, the Under Secretary of the Army and the Vice Chief of Staff have been appointed as the NATO focal points for the Army Secretariat and the Army Staff, respectively. In August 1977, the Department of the Army International Rationalization Office (DAIRO) was established within the Office of the Deputy Chief of Staff for Operations and Plans. The DAIRO's mission is to support the Under Secretary of the Army and the Vice Chief of Staff in meeting their responsibilities for NATO matters.

The Secretary of Defense has listed the following high priority areas requiring the near future attention of the NATO RSI program for resolution. RSI progress in these areas can be expected to provide both quantitative and qualitative increases in NATO's capability to deter the Warsaw Pact threat. The areas are:

• Command, control and communications (C^3) systems.

• Cross-servicing of aircraft to include:

  * Compatible ground support equipment (GSE).

  * Compatible fuel and ammunition.

• Ammunition compatibility in all areas.

• Battlefield surveillance/target designation/acquisition systems.

• Standardization and interoperability of components and spares.

The AVNEC Standardization and Interoperability Workshop limited its discussion to six specific issues affecting the Army aviation community. Highlighted in the following paragraphs are the issues discussed and a summary of some of the conclusions/recommendations reached by the workgroup.

The first issue focused on the impact of ATP 41, **Airmobile Operations** (Final Draft) on current Army aviation employment plans and concepts for the European environment. ATP 41 outlines common, agreed-to procedures and concepts in the areas of organization, command and control, logistics, communications and training.

The workshop agreed that documents such as ATP 41 provide general doctrinal information which establishes basic understanding but that more detailed operational plans are required for each mission. The key to successful combined aviation operations in NATO in the near term was seen as development of a thorough understanding of the organization, procedures and employment concepts of other nation tactical units by aviation commanders and their staffs. This must be supported by development of detailed operational procedures. The burden falls primarily upon United States Army Europe (USAREUR) with trans-

fer of the acquired knowledge to Continental United States (CONUS) centers, schools and tactical units. Recommendations included expanded documentation of procedures which were developed, increased interoperability efforts within USAREUR, and assignment to USAREUR of the primary responsibility for establishing interoperability requirements.

The second issue addressed individual and unit training requirements that would enhance accomplishment of Army aviation missions in NATO operations, focusing primarily on operations where aviation units are committed in support of other nation forces.

Workshop consensus was that identification of Warsaw Pact tanks and tracked vehicles is a priority training requirement for all attack and scout helicopter pilots. Other agreements supported continued participation of CONUS aviation units in Reforger exercises, language qualification for key aviation liaison officers in USAREUR, continued combined exercises, publication of a handbook addressing aviation support of non-U.S. forces, and inclusion of the aviation organization and concept of combined operations in Europe in the training curriculum at TRADOC centers and schools. Recommendations included:

- practice and refinement of procedures for aviation support of non-U.S. NATO forces by USAREUR;
- an annual tactical exercise without troops (TEWT) with non-U.S. NATO forces in Europe for key CONUS-based aviation unit commanders and staff officers, with subsequent briefings of active and reserve component aviation units in CONUS.

The third issue investigated the adequacy of current management procedures designed to accomplish Army aviation's standardization and interoperability goals and procedures.

Workshop members concluded that more detailed policy and procedural guidance on RSI is required. They also saw the need for coordination with the Army of the impacts on costs, schedules and system performance prior to making high level RSI commitments. There was agreement that USAREUR participation in RSI activities is mandatory and that impacts on system performance required to reach agreement with other NATO nations must be evaluated carefully in each case.

Identification and prioritization of programs for RSI implementation together with clear policy and procedural guidance by Department of Defense/Department of the Army were recommended. Also recommended were early involvement by the Army in any RSI initiatives and a more active role for USAREUR in RSI activities affecting the NATO community.

The fourth issue reviewed procedural and equipment commonality requirements associated with cross-servicing of Army aviation assets, focusing on both

current and developmental items and programs.

One conclusion was that U.S. helicopter forces in NATO will be employed in joint and combined operations; therefore a requirement exists for cross-servicing equipment and procedures which permit use of facilities operated by other NATO nations. A need also was seen for operational testing to validate U.S./NATO forward area refueling and rearming point (FARRP) concepts and procedures.

Workshop members also felt that the Army at large needs a better understanding of RSI, STANAGs and ATPs. Recommendations included completion and ratification of a STANAG for helicopter cross-servicing, testing of the FARRP concept, Department of the Army emphasis on a STANAG/RSI education program, and that cross-servicing be stressed in USAREUR exercises.

The fifth issue focused on the commonality, standardization and interoperability requirements of Army aviation target acquisition, designation and hand-off

PAGE 4 TOP: Canada's CH-147 (CH-47C) Chinook

PAGE 4 BOTTOM: French SA 342 Gazelle fires the HOT missile

RIGHT: The Lynx is scheduled for British Army use late this year

BELOW: West German troops on maneuvers in Germany

capabilities. The group looked at both ongoing and planned development programs and also current equipment, tactics and doctrine within the NATO alliance affecting antiarmor equipment and concepts.

The workshop participants concluded that U.S. Army aviation must be prepared to operate with NATO forces which are not equipped with high technology target acquisition/designation systems (TADS). Noting doctrinal differences between nations in employment of scout and attack helicopters, workshop members saw the need to focus on the understanding and practice of tactics and procedures to overcome these differences through combined training exercises. They also agreed that NATO adoption of a common TADS package was the best solution to the target hand-off problem.

Recommendations were that NATO pursue acceptance of a common TADS, fire control, and strike package (i.e., weapons and ordnance), and that joint cooperative development of follow-on TADS be considered as technology advances.

The sixth issue investigated Army aviation command, control and communication (C^3) requirements and procedures generated by participation in NATO operations focusing primarily on cross-nation attachment of Army aviation units.

The consensus of the workshop was that C^3 is the most critical area to resolve in moving toward aviation combat operations rationalization, standardization and interoperability. Incompatibility of communications equipment and procedures must be resolved with near-term efforts concentrating on interface equipment and procedures and with mid/long-term efforts concentrating on exploitation of common specifications and development of future C^3 systems.

Members also saw the need for training in combined arms team tactics and doctrine (theirs/ours). Workshop recommendations included assignment of top priority to RSI efforts in the C^3 area with maximum emphasis on NATO resolution of near-term communications interoperability.

The standardization and interoperability issues discussed at the employment conference relate directly to the high priority items listed by the Secretary of Defense. Although a relatively new aspect within the NATO alliance, RSI rapidly is becoming an integral component of NATO operational planning. We must continue to assume that the Warsaw Pact forces will have numerical superiority in both personnel and equipment and that they will attempt to achieve the element of surprise, particularly in the opening stages of a conflict. RSI offers the NATO alliance an additional means through which this threat can be effectively combated and deterred.

TENDER LOVING CARE... SUMMER Rx FOR NICADS

USAAAVS

TRADITIONALLY, SPRING is the season for lovers. And one creature we had better start showering with lots of attention and tender loving care is none other than our nicad battery that has been so faithful all winter long.

But as changes of the seasons are a certainty, so are changes in our battery's temperament. When the weather is cold, the nicad presents us with few, if any, problems. However, as the temperature rises, its idiosyncracies begin to reveal themselves and mishaps result. During the past months of December and January, USAAAVS received no mishap reports that listed nicad-battery-related cause factors. But in February, units submitted four such reports. In March, the number rose to 11; and we can be certain these numbers will continue to climb as hot weather becomes the norm—unless we take preventive measures now.

Not a new problem. Since 1971, more than 450 mishaps involving Army aircraft occurred because of nicad battery failures of one type or another. And while most of these failures resulted in precautionary landings, some terminated in incidents and major accidents. Oddly enough, the cause factors and events leading to the mishaps of yesteryear are not much different from those of today.

In June 1971, a battery fire occurred aboard an OV-1. The fire destroyed the aluminum bulkhead, severely damaging the elevator bellcranks and forcing the pilot to eject. It was later determined that the battery vent lines were restricted and that cell deterioration had resulted in an internal short circuit which triggered the fire.

In May 1977, a battery fire occurred aboard another OV-1. Fortunately, the pilot was able to make a precautionary landing before major damage could result. In this instance, the cause was thermal runaway.

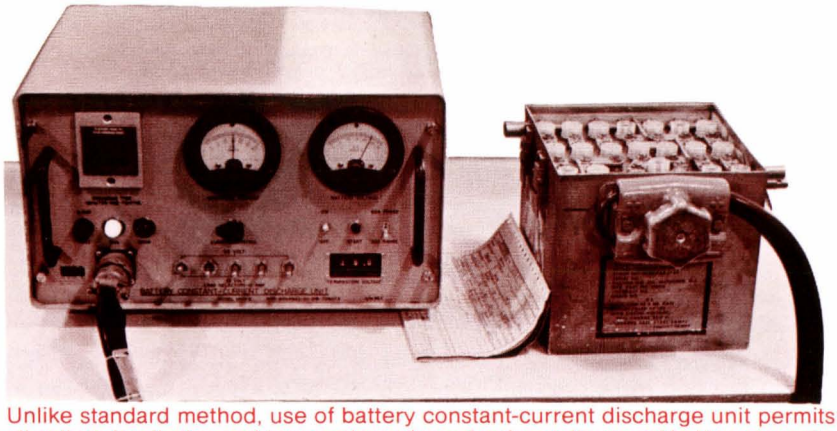
Why do we continue to have the same types of problems year after year? Partly because of the nature of the nicad battery and partly because of ourselves. While we want to reap the benefits a nicad battery provides, we seem reluctant to accept the additional responsibilities that go with it—responsibilities we did not have with the lead-acid battery. The benefits provided by a nicad battery are numerous. However, unlike the lead-acid battery, the nicad is reluctant to reveal any symptoms of impending illness. We can check cell voltage, for example, but unless a cell is virtually "dead," this action will not give us a true indication as to the battery's state of charge. In fact one of the advantages of a nicad is that it will deliver a constant voltage until it approaches its discharged state.

Similarly, we may check the specific gravity of the electrolyte, but this action will not give us any more clues to the battery's condition than the voltage check did. Unlike the specific gravity of the electrolyte in a lead-acid battery, that of the nicad remains constant regardless of the battery's state of charge. This is because the electrolyte does not participate in any chemical reaction but merely serves as a conductor. Again this is but another advantage of the nicad in that its ability to function in cold weather is not impaired by its state of charge. The fact remains that the individuals who can determine the true condition of our nicad batteries and ensure they will perform as intended are the personnel in our battery shops. While proper follow-up action is required by aircraft maintenance personnel and pilots, make no mistake about it: What happens to a battery while it is in the shop will determine, in great measure, whether it will perform as intended or whether it is likely to fail at some future time.

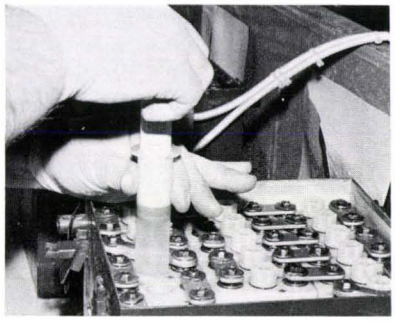
Steps to take. The initial steps include a thorough cleaning and inspection of the housing, cover, individual cells and all connectors. Any item deemed unserviceable is replaced, making certain that all connectors are torqued by the book. Next, the capacity of the battery is restored in strict accordance with specified procedures. Since the state of charge of each cell cannot be determined beforehand, an electrical load is placed on the battery until all cells are completely discharged. This action ensures every cell will be restored to its maximum capacity when charged and that none will be at a higher (or lower) state of charge than others. To know when full capacity of the battery has been restored, the charging input is monitored in current and time unitl the ampere hour capacity has been reached. This procedure balances the cells and brings the battery to full capacity. One final step remains—that of adjusting the electrolyte level.

The plates in the nicad are porous and extremely absorbent. As cells are discharged electrolyte is absorbed into the plates and the level decreases. Charging of the battery has the opposite effect, driving the

To prevent incipient battery failure all connections must be torqued by-the-book



Unlike standard method, use of battery constant-current discharge unit permits all cells to be discharged to preselected termination voltage and battery capacity determined



Electrolyte level check follows full battery charge

electrolyte out of the plates back into the cells. If water is added when the battery is not fully charged, the cells may be overfilled. Consequently, the level is checked after the battery has had time to rest and cool off following charging. If the cells should be overfilled, excess electrolyte may spew out the vents. Potassium hydroxide (KOH) electrolyte used in the nicad battery has a high affinity for carbon dioxide present in the air, and will combine with it to form potassium carbonate which can clog the vents. Should this happen to a battery installed on an aircraft, the result could be ruptured cells and fire or explosion during flight. Even if vents do not become clogged, formation of potassium carbonate within a cell will derate both battery capacity and performance. In addition, excess electrolyte that has spewed out the vents can cause a short between individual cell connectors since the electrolyte is a conductor. This can result in an imbalance in the charge of the cells and can lead to severe gassing and overheating, particularly during subsequent charging by the aircraft electrical system.

Further, battery shop technicians must constantly guard against battery contamination. Since the KOH electrolyte of the nicad is a strong alkali, it becomes imperative that no tools or equipment used to service or test lead-acid batteries should ever be used on nicads. This is an extremely critical point as the KOH electrolyte contaminates easily whether in battery cells or containers unless it is kept covered at all times. Even the fumes emitted by lead-acid batteries into the atmosphere can contaminate the nicad. Obviously, precautions to prevent contamination must be followed.

Revised inspection checklist. How closely correct procedures are followed in the battery shop will determine to a great extent the useful life of the battery, and whether or not it is going to give us trouble-free service. Again, the importance of by-the-book maintenance cannot be overemphasized. For example, while a technician can easily replace an individual cell, he must be careful to ensure the new cell is the same type, has the same rating and was manufactured by the same vendor as the defective one, and if possible, has the same general date as that of the battery. That is how critical battery shop maintenance of the nicad is. Toward this end, USAAAVS recently mailed units a revised nickel cadmium battery maintenance inspection checklist to replace the previous one published in the 7th edition of the "Guide to Aviation Resources Management for Aircraft Mishap Prevention." This new checklist will be incorporated in the 8th edition of the "Guide" when it is printed. It serves as the best insurance available for battery performance as well as personnel safety. So, let's make sure we comply with all its provisions. If you did not receive a copy of the new checklist, write Commander, USAAAVS, ATTN: IGAR-PG, Fort Rucker, AL 36362, or call AUTOVON 558-4479, commercial (205) 255-4479.

Mechanics and pilots. Although an efficiently operated battery shop is an absolute necessity for longevity and reliability of nicad batteries, the best efforts of shop technicians can be negated by the actions of mechanics and pilots. In addition to routine duties such as insuring the battery is properly installed and secured, and making certain the vents are clean and unobstructed, the mechanic has a most important responsibility—that of seeing the voltage regulator is precisely adjusted and the electrical system is operating properly. If the voltage regulator is set too high, battery overheating and loss of electrolyte may occur as well as thermal runaway that can lead to battery

failure and aircraft damage. This means BY-THE-BOOK procedures must be followed. Recently one battery failure was traced to an improperly adjusted voltage regulator. The mechanic who performed the work relied on the voltmeter installed on the aircraft to make adjustments instead of using a precision instrument. Let's follow the recipe found in our TMs and not substitute ingredients.

Finally, assuming battery shop and maintenance personnel have done their jobs properly, the fate of the battery now rests in the hands of the pilot. If he subjects the battery to frequent and unnecessary loads, such as repeated or prolonged ground starts and checking of electrical components when external power sources are authorized and available, then he is placing the battery on the road to destruction. Heat generated by battery drain is reinforced by heat generated during the charging cycle. Results can vary from battery overheating and spewing of electrolyte to clogged vents, thermal runaway and even to rupture of cells and explosion.

If he must use the battery for these purposes, the pilot should follow certain precautions such as performing a touch test before each start (if possible). This is done by touching the battery in a manner similar to that used by a housewife to check the temperature of her iron. If the battery case is too hot to hold a hand against, then the battery should be allowed to cool before another engine start is attempted.

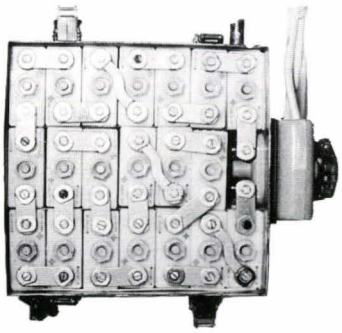
In addition, the pilot should monitor the loadmeter periodically during flight. If it begins to read 10 to 20 percent or more above the normal stabilized indication, he should suspect a battery problem. He should then turn off the battery switch and note any change in loadmeter indication. If the indicator shows a sharp decrease in load, he should leave the switch off and have the battery checked on landing.

Where do we stand? Although the responsibilities of shop technicians, mechanics and pilots have been presented in capsule form, we can readily see that the integrity of our nicad batteries depends on the multiple actions of a variety of personnel. A breakdown in performance of any of these can lead to premature battery failures. But while proper maintenance and care is our main weapon against battery problems, technology has not been sitting still. Researchers have, for some time, been evaluating different types of cell separator material. One which has been in use by a sister service is Permion. The substitution of this material for cellophane appears extremely promising as a means of extending cell life and eliminating or reducing battery failure caused by heat buildup. Test results show a cell life increase before short-circuiting failure of three to four times when cellophane separator material is replaced with Permion. Another significant observation made during battery tests was that hard shorting of cells containing cellophane separators followed quickly after the first indication of shorting. On the other hand, hard shorting of cells containing Permion did not occur for hundreds of cycles after initial shorting was noted. In actual service, this means that maintenance personnel have time to detect and replace failing cells before they short out and cause serious problems such as thermal runaway.

In abuse tests, all cellophane cells failed after 80 to 90 hours. Only random failures of Permion cells occurred, and these after 700 to 800 hours. During continuous overcharge tests, all cellophane cells failed within 15 days while Permion cells had only isolated failures after 260 days. And although Permion cells cost nearly twice as much as those containing cellophane, their use can effect an estimated annual savings to the Army of more than $200,000 in battery costs alone because of the need for less frequent cell replacement.

Perhaps the greatest drawback to the use of Permion cells is their loss of efficiency as temperatures decrease to extremely low levels approaching minus 40 degrees F. While research continues, the cellophane cells in Army aircraft batteries are currently being replaced with those containing Permion. Given proper care and maintenance, these batteries can be expected to give us increased reliability and safety.

The fate of two other proposals undergoing evalua-



Should 20-cell battery be approved, conversion would be made by adding a single cell to present battery with no modification to housing

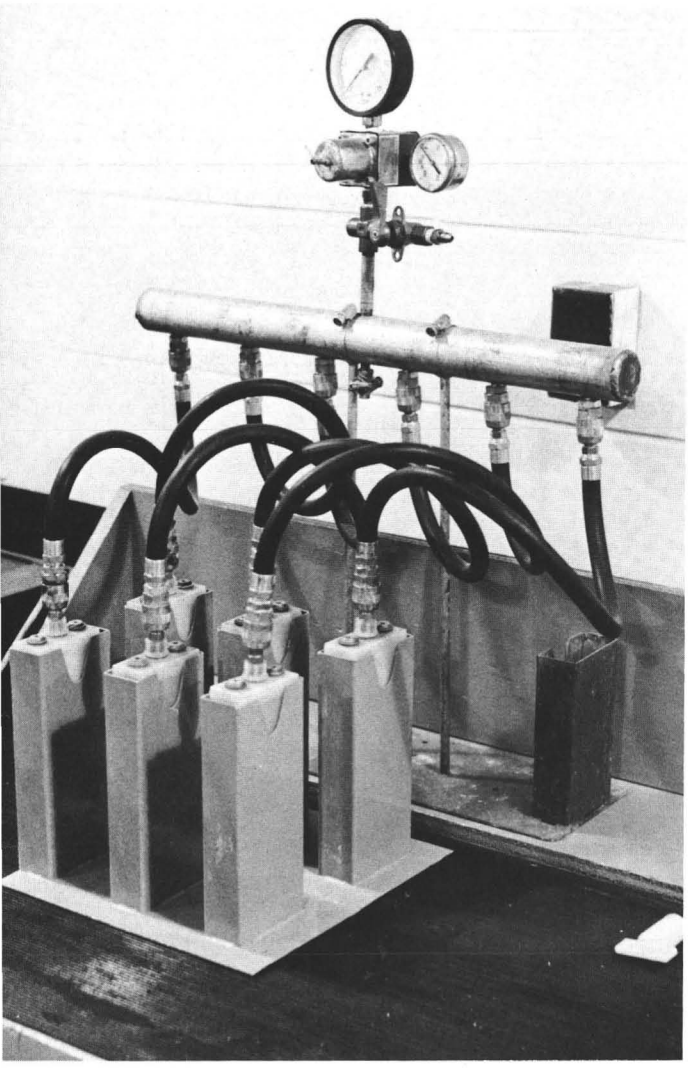
Right—Following specific gravity and electrolyte level check, technician reinstalls cell filler caps (note protective gloves, glasses and apron)

tion, as yet, remains undecided. One is the use of a battery monitor to warn the pilot of high battery temperatures and possible thermal runaway; the other is the use of a 20-cell battery.

In the case of the battery monitor, the use of Permion cells which can withstand high temperatures for extended periods of time without breakdown probably makes the need for such a warning device questionable. In addition, the device is not foolproof and false warnings can occur, particularly aboard aircraft operating in hot climates.

The proposed use of a 20-cell battery has resulted in a division of opinion. By adding a cell to the present 19-cell battery we can gain the advantage of a cooler operating battery, particularly during charging cycles when heat build-up is great, lessening the chance of cell failures and the possibility of thermal runaway. Further, modification requires no changes to the present battery housing, but simply the addition of a single cell. Tests conducted at the Army Aviation Center, Fort Rucker, have so far proved the concept to be a sound one. This is bolstered by the fact that the majority of civil aircraft are using 20-cell nicad batteries. However, the addition of an "extra" cell prevents the aircraft's generator system from charging the battery to its full capacity. While this would have little, if any, effect on batteries being used in warm or hot climates, it would decrease the efficiency of those being used in extremely cold climates. This loss of low temperature efficiency coupled with that inherent in Permion cells could pose problems to aircraft operating in Arctic areas. This is especially true for Army aircraft which, during normal operations, are subject to numerous engine starts without the use of external power sources. So, while the 20-cell concept has not yet been given approval, the Army Aviation Center has been authorized to continue tests, using the new 20-cell Permion batteries.

Suspect cells are pressure checked for leakage while submerged in water



Where do we stand? In a nutshell, we will be using the 19-cell Permion batteries which have proved their superiority to withstand high temperature without sudden failures, and which have an average life four times as long as those batteries equipped with cellophane insulators. Maintenance of these batteries by shop technicians, proper voltage regulator adjustment of aircraft electrical systems, and correct battery maintenance, care and use by mechanics and pilots are as critical as ever for battery reliability. **We should in no way relax our efforts in this vital area.**

Now, for one final bit of information. From TM 55-1520-210-10 we have the following warning: "Do not open battery compartment and attempt to disconnect or remove overheated battery. Battery fluid will cause burns and overheated battery will cause thermal burns and may explode."

This warning applies primarily to us. In short, it tells us to leave an overheated battery alone *when no fire is present.* Along with this warning comes another borrowed from a sister service. While this one pertains primarily to firefighting and rescue crews, we should all be aware of it. It reads as follows:

While CO2 is an acceptable fire extinguishing agent once a fire has developed, **in no case should CO2 be directed into a battery compartment to effect cooling or to displace explosive gases when there is no fire.** The static electricity generated by the discharge of the extinguisher(s) could explode hydrogen/oxygen gases trapped in the battery compartment.

Without a doubt the best remedy for nicad battery problems is prevention, and the prescription is readily available and easily administered: tender loving care—and lots of it. There is no danger from an overdose.

New Training Developments

At The Aviation Center

Colonel Larry J. Baughman
Director of Training Developments
U.S. Army Aviation Center
Ft. Rucker, AL

Training Literature

FM 17-40—"Helicopter Gunnery." This FM is a Fort Knox publication with Aviation Center input. The purpose was to combine material presently found in TC 1-4, "Helicopter Gunnery" and TC 17-17, "Gunnery Training For Attack Helicopters" into a single helicopter gunnery manual. The manual is designed to improve the ability of the attack helicopter crew to place "steel on target" by mastering basic aircraft manipulation skills such as NOE/navigation techniques, target detection and accurate range estimation. Draft FM 17-40 should be in the hands of field units for review by June 1978 with the final printed copy available by January 1979.

TC 17-50-3—"Joint Air Attack Team Tactics." The Joint Air Attack Team is a combination of U.S. Army attack helicopter team, AH-1 and OH-58, and U.S. Air Force close air support aircraft, A-10, operating together to locate, engage and destroy tanks and other armored vehicles. This manual describes the structure, coordination and employment considerations for the effective operation of the Joint Air Attack Team. This Tactical Air Command/Training and Doctrine Command (TAC/TRADOC) "How to Fight" publication will be available for field distribution this year, in November.

FM 1-55—"Flight Operations." This publication supersedes FM 1-55, "Guide for the Operation of Army Airfields" (1973). The scope of the revised publication was broadened to provide general guidance to commanders and flight operations personnel in the area of flight operations activities in both the tactical and nontactical environments.

Educational Television

PROGRESS CONTINUES in production of the multisubject, self-contained Training and Doctrine Command/Forces Command (TRADOC/FORSCOM) nap-of-the-earth (NOE) TV Course. As reported previously, 23 productions representing 70 percent of the NOE TV Course have been approved by TRADOC for distribution. Production has been completed on NOE Unit 5, comprising three video tape programs in the subject area, "Introduction to Terrain Flight Navigation." The three Unit 5 tapes are now at TRADOC for review. Approval for distribution is expected in the near future. Production will soon begin in the "Tactical Mission Planning and Execution" (Unit 9) and "Combat Intelligence" (Unit 6) subject areas. Preproduction planning and development is in progress on the remaining NOE TV Course productions. All tapes in the NOE TV Course are to be distributed by TRADOC to the

usual recipients of Category I (Armywide) productions.

In another subject area of concern to Army aviators, development is underway of an updated television tape demonstrating correct wear and maintenance of the SPH-4 helmet. To be produced in cooperation with the U.S. Army Aeromedical Research Laboratory, this production will replace the SPH-4 TV tape now in use. Completion of the new tape will be reported in a future issue of *Aviation Digest.*

For information on other Army Aviation Center video cassette programs, consult the Television Video Tape Catalog published by the ETV Branch. For a free copy, write: CDR, USAAVNC, ATTN: ATZQ-TD-TS-ETV, Ft. Rucker, AL 36362. If time limitations require an immediate response, please call Mrs. Mary Tomlin, AUTOVON 558-4388.

Course Developments

Black Hawk Pilot Training. Beginning in November 1978 Black Hawk pilot training will commence at USAAVNC. Training will be provided to aviators assigned to Black Hawk units and selected personnel requiring Black Hawk qualification in the performance of their duties. The Black Hawk Aviator Qualification and Instructor Pilot Courses will include operator training of the new Lightweight Doppler Navigation System (LDNS). The LDNS will be installed on all Black Hawk aircraft and is part of the Command Instrument System which gives the Black Hawk its all weather capability.

High Speed Utility Rescue Hoist. In August 1978 the Operational Test II for the new high speed utility rescue hoist will begin at USAAVNC. This hoist will be used in both UH-1 and UH-60 aircraft assigned to medical units to extract personnel and equipment from areas that preclude landing. The initial training will be confined to those personnel conducting the operation test.

NBC Defensive Training. Soon to begin additions to nuclear, biological, chemical (NBC) defensive training in advanced individual training (AIT) courses will include the M58 Decontamination Kit and the M13 Decontamination/Impregnation Kit. Necessary changes to both flight and nonflight programs of instruction (POIs) will reflect an appropriate amount of training for all personnel enabling them to perform their military occupational specialty (MOS) duties in an NBC environment.

AN/APR-39. New equipment training team scheduled to deploy to Europe to commence training in June 1978, with Korea and Continental United States units scheduled upon completion of USAREUR units.

NH/NVG. Night Hawk/Night Vision Goggle Instructor Pilot Course is presently at TRADOC pending approval. Work is continuing on an exportable training package which will be finalized upon approval of the resident course.

CH47FS. The CH-47 Aviator Qualification Course (2C-100C-B) now provides students with 8.0 hours of CH-47 flight simulator (CH47FS) time. Work is underway to increase this time based on experience data feedback from graduates.

Discontinued Courses. The following resident courses have been discontinued at Fort Rucker:

- CH-54 Instructor Pilot 2C-F22
- OH-6 Instructor Pilot 2C-F13
- M-22 Gunnery 2C-F9
- U-8 Instructor Pilot 2B-F14

MITAC II. Or, the Map Interpretation and Terrain Analysis Course in its exportable TEC format, is in the final stages of production. MITAC II is an offshoot of USAAVNC resident MITAC instruction. This course provides the aviator with the skills and knowledge to: Predict, from preflight study, which of the features shown on a map will actually be visible enroute and the probable physical appearance of those features; detect and identify planned checkpoints when enroute; judge whether or not other features that you see on the ground are likely to be portrayed on the map; and, if so, quickly locate and identify them on the map.

Distribution of MITAC II to active Army aviation units is scheduled for the latter part of the third quarter of fiscal year (FY) 78. Reserve component aviation units should be in receipt of MITAC II during the fourth quarter of fiscal year 78.

INQUIRIES

For inquiries pertaining to the above write: Commander, United States Army Aviation Center, ATZQ-TD, Ft. Rucker, AL 36362 or call Training Literature, AUTOVON 558-7120/7113; Educational Television, AUTOVON 558-5408/6787; Course Developments, AUTOVON 558-5216/2295.

EPMS CORNER Enlisted Personnel Management System

CH-47 Chinook Course

Major Thomas Johnston Jr.
and
CW2 James Wilke
U.S. Army Transportation Center
Fort Eustis, VA

Army photos by
David Byrd

RESIDENT TRAINING for the 67U10 (CH-47 Chinook) Helicopter Repair Course at the Army Transportation School, Ft. Eustis, VA, is saving as much as 15 percent in training time because of self-paced instruction.

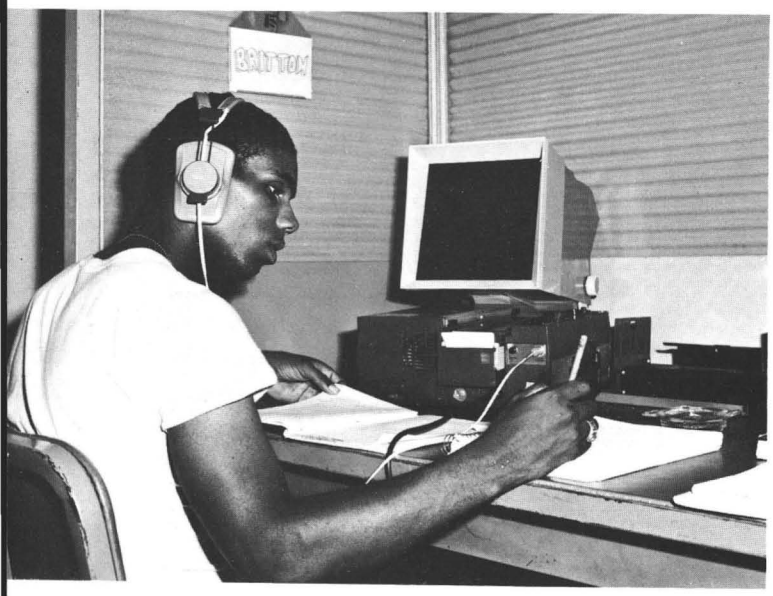
The 67U advanced individual training (AIT) utilizes the most up-to-date training concepts and doctrine. The old conventional platform instruction was converted to self-paced by the personnel of the Multiengine Helicopter Division of the school's Aircraft Repair Training Department.

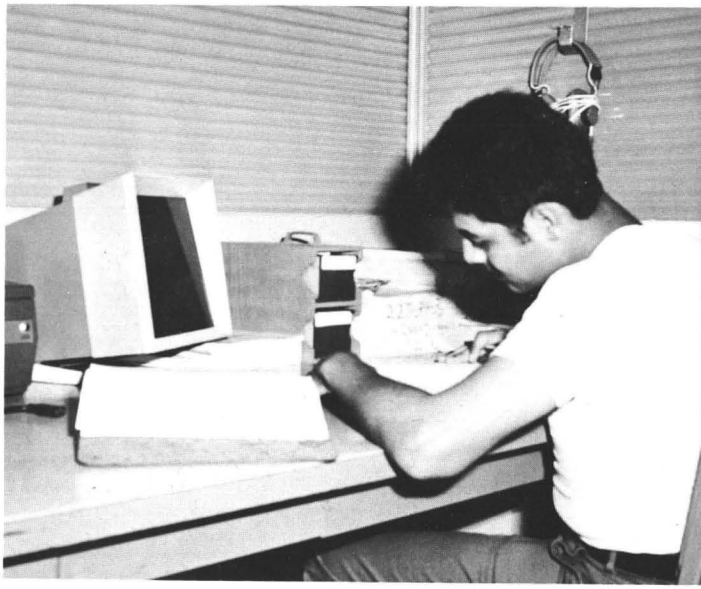
The course was first presented in the self-paced format in early 1973. Since then it has served as the model for other courses within the Training and Doctrine Command (TRADOC).

Self-paced instruction is simply designing a block of instruction so that students can proceed through that block at their own pace.

Presently the course is broken into 16 phases, which include shop and classroom work. The student's progress is measured in both a time and point value, which determines the student's overall course average and class standing.

Students of the CH-47 Chinook Helicopter Repair Course self-pace themselves using the sound-on-slide system





The classroom hours are composed of the use of programed texts, audiovisual programs and video tapes. The audiovisual programs use a sound-on-slide system which is a versatile, cost-effective unit that allows the student to view a slide and listen to recorded instruction.

Periodically, throughout each classroom portion of a phase, students are presented a self-evaluation to measure their own progress. Students also receive computer-assisted instruction with the use of an engine simulator.

All classroom work is reinforced with hands-on training in the shop portion of the course. The student is exposed to all systems and maintenance procedures. Included in the shop instruction are the course's training flights.

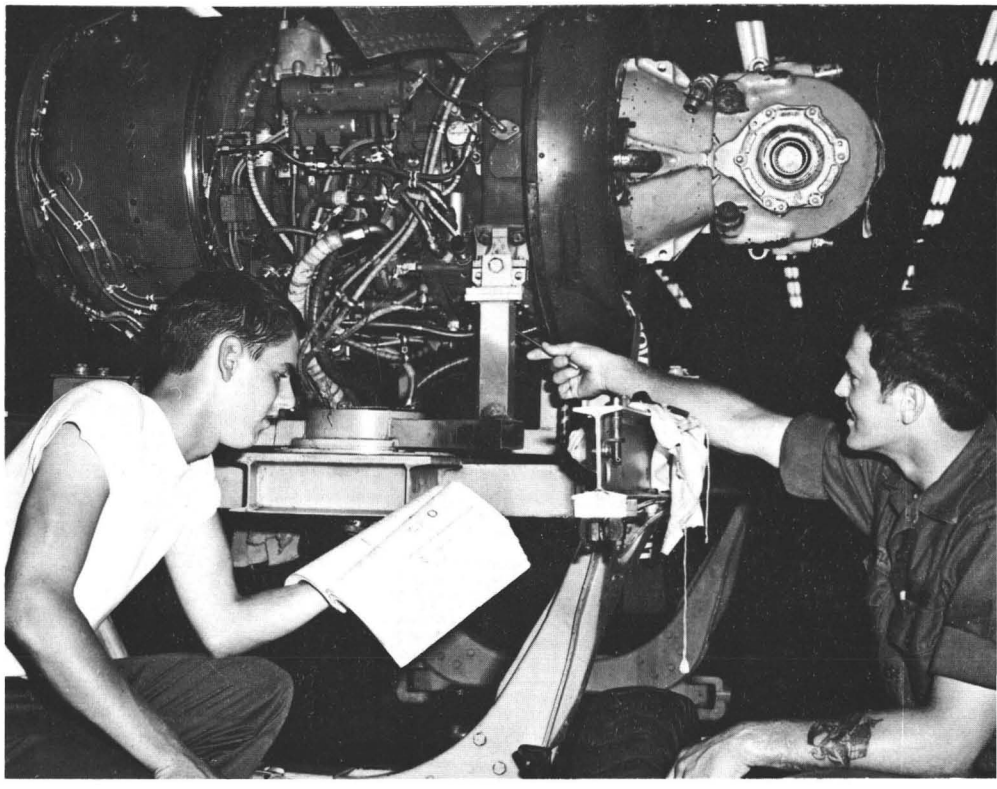
The first flight is an introduction. During this flight the student is given a brief description of the capabilities of the CH-47 and the importance of quality maintenance. The second flight gives the student the opportunity to perform as a crewmember in making all necessary inflight checks. A third flight provides instruction on transporting external loads.

Throughout the course the student will take various written and shop evaluations. These are administered on a "go-no-go" basis. The student must score 100 percent to receive a "go" with the failures required to review the material and retest.

This system has shown outstanding results. During a retention test designed and administered to a random sample of graduating students last year, students were shown to have retained a very high degree of course material.

Continual internal quality control allows supervisors to assess and recommend changes to the course as dictated by the needs in the field. Instructors with the CH-47 committee have gained an average 1,775 flying hours in 12½ years of aviation experience.

Students in the Chinook Repair Course reinforce self-paced instruction with hands-on training during shop instruction



OPMS CORNER Officer Personnel Management System

The OTHER Area— Additional Duties

CW4 Lloyd N. Washer
Assignment Branch
Warrant Officers Division
U.S. Army Military Personnel Center

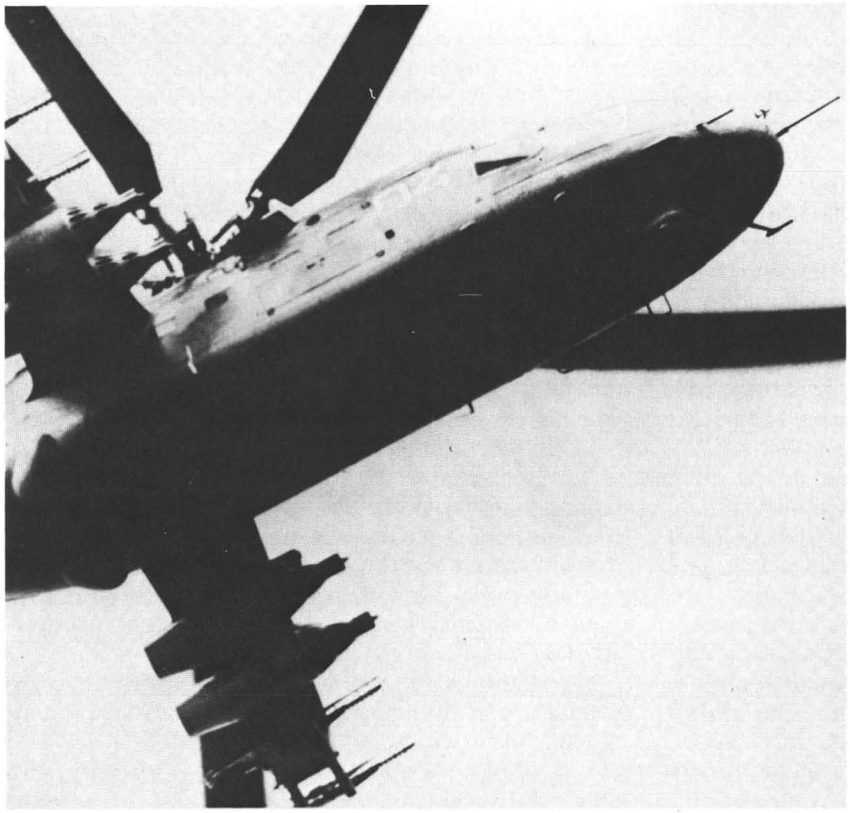
ONE SUBJECT that invariably comes up when representatives of the Warrant Officers Division visit posts around the world is that of additional duties. This article is intended to define additional duties as U.S. Army Military Personnel Center (MILPERCEN) sees them and to assure that the individuals know where their careers stand regarding additional duties.

Let's start out by defining additional duties. The easiest way to do that is by telling what they are *not.* An additional duty is not your primary duty as listed on your Officer Evaluation Report (OER). The duty position on an OER has a title and military occupational specialty (MOS) taken from the tables of organization and equipment/tables of distribution and allowances (TOE/TDA). Everybody should know where they are slotted in the organization and what their principal duty is. If all else fails, go to your rater and ask. That last statement is of course, flippant. Unfortunately, our experience shows that lack of communication within the rating chain is a common cause of "nicks" on an OER.

Based on the previous paragraph, additional duties then, become the "elsewhere" area. They are vitally important to career success. There are some additional duties assigned to aviation warrants (maintenance and safety are examples) that are warrant officer career fields and really are *full-time jobs.* Even though these type jobs leave no time for flying (normally a primary duty) they are important and must be done well. Some jobs are part-time duties and often an individual will be assigned many of them. Examples of these are voting officer, fire marshal, awards/decorations, and a hundred or more tasks that could be added here. Because they are not full time does not mean they are unimportant. You compete for promotion with *all* warrant officers, not just rated aviators.

No job in the Army is unimportant. When your boss assigns an additional duty it is because the job needs to be done and done well to make the unit function properly. If you get a job to do for which you have no training or experience, here are a few things you can do. Seek advice from warrants who are not aviators. If you get a supply job, find a supply technician (761) and seek help. A maintenance technician (630) can help and advise on motor maintenance. AR 611-112 and DA Pamphlet 611-12 list all warrant MOSs and describes the duties and areas of expertise. There is a wealth of knowledge and experience available through nonrated warrants. You also may enroll in correspondence courses related to your additional duties. The Army has literally thousands of these courses available. Go to the Education Center and seek them out. Additionally, talk to the officer who assigned the job; ask for advice and help when you start. Don't wait until the job has gone wrong or you have failed an inspection. At that point it is too late and you have hurt your unit and your own career.

In closing, remember that it makes no difference, in career terms, what job you do as long as you do it well. Your commander has a unit to run and can do it only with your help. No matter how menial the task seems or how it may eat up your time, the job is important. How well you do it is critical to your career. Seek advice, counsel with your rater, and study all the books you can get your hands on. Your additional duties may very well make the differences when you are considered by the next Department of the Army Board.



The Hind

The Soviet Mi-24 Hind armed helicopter (above and at left) can carry eight combat equipped troops into battle. But its wallop comes from its armament—a 12 mm nose machinegun; four antitank missiles and four pods, each carrying 32 57 mm rockets.

The Hind's main gun range is 2,000 meters and it flies at 333 km/hr. It has a range of 491 to 537 km.

For more information see:

- "The Threat To United States Airmobile Operations," Sep 74 *Digest*
- "Soviet Airmobile Tactics," April 77 *Digest*
- "Behind The Hind," April 77 *Digest*
- "Air Combat Engagements," May 78 *Digest*

That Common Summer Cold,

WHAT'S GOING ON?

NEXT TO stormy weather and a rough check pilot, the aviator's number 1 enemy may well be the common cold. Even if you've been lucky and have never been grounded by the sniffler, you've probably heard flight surgeons plead time after time: "Don't fly with that cold!"

There are some good reasons to heed their warning. First, the fatigue that accompanies a head cold can detract seriously from your overall efficiency. You don't work at your ground job as effectively when you have a cold and you don't fly as effectively either. Alertness, reaction time, and judgment are impaired. You wouldn't take off flying instrument flight rules (IFR) in a T-42 with rough running engines or in a UH-1 with a faulty altimeter; then why sell *yourself* short on a preflight checklist? The machine won't perform any better than the aviator who flies it and an aviator with a cold cannot perform up to top standards.

Ear block is another painful reason for not flying with a cold. Under normal conditions the pressure of the air that fills the middle ear cavity is equalized with outside atmospheric pressure. This happens because air passes freely from the outside into the nose, up the eustachian tube and then into the middle ear. If you have a cold the tissue surrounding the opening of the eustachian tube becomes swollen and inflamed and the passage of air may be blocked. The difference that results between the pressure of the air in the middle ear cavity and the atmospheric pressure of the outside air accounts for the sensation of earache that often accompanies a common cold. Nonaviators can reach for aspirin, antihistamines or nose drops, all of which act to decrease the tissue swelling and open up the eustachian tubes. Pilots do not have this option. If an ear block develops suddenly at 6,000 feet, the flight surgeon won't be of much use to you.

Most flight connected ear blocks occur on descent to landing. Although there may be a transient sensation of "pressure in the ears" on climbout, the pressure itself usually becomes sufficient to force the air out through the obstructed opening into the nasal cavity. The discomfort is then relieved quickly and automatically. Yawning or chewing gum has the added effects of stretching the tissue around the eustachian tubes and also aids in opening them.

If an ear block occurs at altitude, pain will result on descent due to the relatively low pressure within the ear compared to the increasing atmosphere the closer you get to sea level.

Under normal conditions a valsalva maneuver will provide equalization of pressure, but the amount of force you exert is limited and if the opening of the eustachian tubes is blocked by badly inflamed tissue, the valsalva will fail and ear block will result. A partial vacuum develops behind the eardrum and the pain is excruciating. Then, small vessels may burst, filling the middle ear with blood, and fluids from surrounding body tissues will pass into the middle ear (serious otitis).

Trying to land an aircraft under such circumstances, even with optimum weather and traffic, can be hazardous. Concentration is difficult. Communication may be jeopardized because of ringing in the ears. Vertigo can result because of the closeness of the organs of equilibrium which are located in the inner ear. Even if fortune smiles, and you get the aircraft back safely on the ground, you still face several visits to the flight surgeon's office for treatment, and you run the additional risk of infection in the middle ear.

You can see that the common cold can spell uncommon, noisy problems for pilots. The warning of the flight surgeon regarding the hazard of flying when you have a cold should not go unheeded.

If, on the other hand, you choose to ignore these warnings, and one day you feel that sudden, sharp pain in your ear as you let down to land, here is a little trick that may save the day, fuel permitting. Climb so that trapped air in the middle ear is the same as the ambient pressure. This should relieve the pain. Get your bearings and try a very gradual let down, constantly "valsalvaing" all the way down.

If you're lucky enough to get out of it without complication, you just might find yourself someday reminding the other pilots, as they blow their noses and cough their way out the flight line—don't fly with that cold!

Maintenance of the SRU-21/P Survival Vest

CW2 David P. Klindt
Fort Rucker, AL

DURING THE afternoon launch, on the way to the stagefield, the TH-55 Osage crashed into a wooded area. Both men were shaken. The student was trapped in the aircraft, but the instructor was able to free himself. Since neither of the crewmembers had survival vests or proper signaling devices, the freed crewmember had to walk out to get aid.

The instructor pilot had a sprained ankle, a sprained knee and a puncture wound in the right thigh. Nevertheless, he walked a mile and a half over hilly, wooded terrain to get aid for his injured partner.

During this time the remaining crewmember was trapped in the wreckage by the antitorque pedals, waiting for help to arrive. The trapped crewmember had to endure fuel dripping from the fuel cell onto his helmet and shoulders, which caused severe petroleum burns to 10 percent of his body. To compound the problems, the student was forced to breathe the fumes of dripping fuel for 1 hour. The student passed out from asphyxiation, but recovered after 4 hours of medical attention.

The instructor had a duty time loss of 40 to 50 days, while the student lost 9 weeks of duty time. The length of time for the instructor to recover was caused not only by the injuries of the accident, but also because he had to walk on his injured legs for such a long distance. The extended recovery time for the student was due to the amount of time he was forced to breathe the toxic fumes.

The locating of the wreckage and freeing of the student took just under 1 hour and transporting him to the hospital took only 7 minutes. If the crew had been issued survival vests with the proper signaling devices, they could have signaled their position and would have been rescued sooner. This in turn would have reduced the injuries suffered by both crewmembers. The question is, were the additional injuries and suffering necessary?

Most crewmembers realize the importance of the survival vest as well as other pieces of survival equipment. Few realize the importance of proper maintenance for this equipment. This information is set forth by TM 55-1680-317-23&P, *"Army Aviation Survival Kits,"* and TM 11-5820-800-12, *"Operator, Organization Manual for the AN/PRC-90."*

The following information is to illustrate what the U.S. Army Aviation Center at Ft. Rucker, AL has done to solve the problems with survival vests. Before the accident I described there was a shortage of not only survival vests, but of the components to put in them. Vests were issued to crewmembers who were lucky enough to receive them and that was the end of it. As a whole, no preventive maintenance was performed on the vests as required by the TMs.

Because of this unfortunate accident, along with others, the need for survival vests with proper signaling devices was recognized and a policy was issued by the commander. The commander's first indorsement to USAAVNC Standardization Board minutes of 9 December 1976 states, "Survival vests should be worn by at least one aviator on all single engine aircraft during all tactical, nap-of-the-earth (NOE) or instrument flights."

The minimum components to be installed in each vest are: strobe light, signaling mirror and PRC-90 survival radio. In addition, I would recommend that a first aid kit, a survival knife and a pen gun also be included in the vest as minimum equipment. This policy is in compliance with paragraph 3-34, AR 95-1, which states, "Crewmembers will wear survival vests with components when appropriate to the missions flown."

TM 55-1680-317-23&P requires preventive maintenance and inspections to be performed on the SRU-21/P by qualified personnel every 90 days, with the only exception being the survival radio, which has an inspection required every 30 days. Required inspections and methods to perform these inspections are given below. (NOTE: The personnel to perform this maintenance can perform any level of

SRU-21/P

maintenance as long as the commander is satisfied with the skill level of the personnel performing the work. This skill level can be achieved from reading the TMs to interservice schools/training. The Army may in the future have its own formal schooling for life support equipment.)

The survival vest, cloth portion, is inspected for, "holes, cuts, tears, broken or loose stitching, defective slide and snap fasteners, torn or missing fastener tape, loops missing from loop adjustment webbing, loop tape cord broken or missing, edge and seam binding torn or cut, broken or missing thong on slide fastener." The vest also is inspected for cleanliness and evidence of exposure to petroleum products.

The first aid kit has a maximum service life of 5 years, which is computed from the date of the first inspection. Inspections will be every 90 days, and all items in the kit must not expire before the next scheduled maintenance period. The kit will be inspected for, "case damaged, kit issue or inspection date, individual medical items containers seal broken, crushed doxcycline hyclate capsules, eye ointment leaking, broken case or face on compass."

The SDU-5E strobe light is inspected for cleanliness and operation. The battery is checked for power level and to ensure the service life of 2 years will not be exceeded before the next scheduled maintenance period. The power check is performed with the use of the TS-2530/UR battery tester. The next portion of the check is a functional check of the strobe light with the battery installed. This is done in a dark room to check maximum power of the strobe light. The strobe light should be stored in the vest bulb down and will be secured to the vest with the cord provided.

The PRC-90 survival radio is tested every 30 days as required by TM 11-5820-800-12. This check includes checking of one radio to another through the use of a radio test set AN/PRM-32. The radio is checked for both transmitting and receiving capabilities. The battery, which has a shelf life of 2 years from the date stamped on its side, must be tested for power, expected life and to ensure that the shelf life will not be exceeded before the next scheduled inspection. The TS-2530/UR with the battery test adapter MX-8801 will be used to check the PRC-90 battery.

The signaling mirror will be inspected for "scratches, chips, cracks, distortion, illegible operating instructions and broken or missing lanyard." This device will be secured to the vest by the use of the lanyard provided.

The survival knife will be inspected for, "rust or corrosion, missing rivets, loose clevis, burrs on blades, cutting edge dull, punch blade dull and point is blunt." Also the knife should be secured to the vest by means of a thin nylon cord. This not only reduces the chance of loss in a survival situation, but also reduces accidental misplacement in day-to-day use of the vest.

The distress flares for the survival vest do not have any shelf life. Contrary to TM 55-1680-317-23&P this information will show up on the next change to the manual. There are two types of flares in the inventory. The first being "the old type," which can be identified because they are the screw in type of projectile. The newer flares are the jungle penetrating type. These projectiles are the press in type. The only additional caution that must be used when dealing with different types of flares is that the firing pin must be cocked before loading the screw in type projectile.

About 471 survival vests are being used at Ft. Rucker. With the shortage of vests and the lack of funds to purchase more, the vests were recalled from personal issue and consolidated at the three major training airfields. Because the vests were now at Cairns, Hanchey and Lowe, it was recommended that a life support shop be established at each airfield to provide the proper maintenance for the survival vests. The up-to-date vests could then be issued along with the aircraft keys when the flight manifests are submitted. This solution for ensuring that vests were available and issued to all flights was put into effect 9 months after the policy was established by the commander.

The burden of aircraft and crew/passenger safety rests on the shoul-

SRU-21/P Vest And Components

1. DA Technical Manual 55-8465-215-10, "Operator's Manual for Vest, Survival, SRU-21/P."
2. Survival Kit, Individual (SRU-21/P), Vest Type.
3. Survival Kit, Individual, Tropical.
4. Tourniquet.
5. Net, gill, fishing.
6. Bag, Water (Size B).
*7. Revolver, .38 caliber.
*8,9. Cartridge, caliber .38, Special Ball M-41.
10. Compass, magnetic, card, pocket.
11. Mirror, Emergency, Signaling.
12,13. Signal Kit, Foliage Penetrating.
14. Fire Starter, Butane Lighter.
15. Knife, Pocket.
16. Flash Guard.
17. Light, Marker Distress, SDU-5/E.
*18. Radio, Receiver—Transmitter, AN/PRC-90.

*Items are not supplied with the vest. They are procured in accordance with TOE/MTOE/TDA/MTDA.

ders of the pilot in charge. The pilot is directly responsible for the pre-mission planning, preflight, and complying with all regulations and directives. This includes having survival equipment on board the aircraft for all personnel.

The commander of each installation is responsible for the welfare of aircrews. This can be accomplished by:

- Formulating and providing effective aviation policies.
- Making the necessary survival equipment available to the crews.
- Ensuring that the survival equipment is maintained in the best condition at all times.

The proper care and maintenance of the survival vest would not have changed the problems of the TH-55 up to the point of the accident. However, if the survival vests were available, it might have shortened the time required to rescue the trapped crewmember and reduced the pain and suffering of both crewmembers.

Only one piece of survival equipment has been discussed; it is only the tip of the iceburg. There are many more pieces of life support/survival equipment available to crews and passengers which require mainenance. If the equipment is cared for and is used as designed, its cost will be returned many fold by the return and reduction of injury of downed crews.

I feel that more stringent regulations should be adopted at installation level to ensure life support equipment is worn/used and that required maintenance is performed. Ft. Rucker, as the center of Army aviation, is a classic example of what can be done to enhance safety if only the higher commanders are made aware of the problems and then command emphasis is applied. During the time the life support program is established, education for the users and maintenance personnel is required. Also, a comprehensive quality control and inspection of the maintenance facility is needed.

The importance of life support equipment is shown by the accident described earlier. Ft. Rucker has a tremendous volume of aircraft flying at any given time, and yet no one spotted the downed crew of the TH-55. If this isn't proof enough for the need for life support equipment, talk to someone who has gone down without the proper survival equipment.

CH-47 Mobile Training Team LESSONS LEARNED

CW2 William R. Steele
Directorate of Training
U.S. Army Aviation Center
Fort Rucker, AL

WHEN BUDGETS are being trimmed, and in some cases eliminated, it is obvious that reductions in expenditures become a matter of paramount importance. But every cloud has its silver lining. A training concept has emerged as a result of limited funds and manpower availability for Reserve and National Guard units.

For the first time in the history of the U.S. Army Reserve, the CH-47 Aviator Qualification Course (AQC) has been condensed from 7 weeks and 2 days to 4 weeks. In addition to the reduction of course duration, it has been conducted within the unit, using unit assets. This concept of "course condensation" and newly added mobilization has been tested within the 97th Army Reserve Command, Fort George G. Meade, MD. The training concept has proven cost effective. However, as concepts develop, new and sometimes unique problems emerge.

The accelerated version of the CH-47 transition course is indeed shorter. Nevertheless, it contains every unit of instruction given in the standard CH-47 AQC conducted at the Aviation Center. But, when students complete the accelerated course, they possess the *minimum* knowledge and skills required to conduct safe operations in the CH-47 qualification course. This particular problem area is due primarily to the compression of the training syllabus, and the subsequent reduction in text information assimilation.

A great increase in the student fatigue factor, due to course compression, is an additional contributor to the reduction in information retention. Based on student's written tests and flight examination results, the accelerated course graduate obtains a comparable standard to the Ft. Rucker course graduate after about 6 additional weeks and 15 additional flight hours of unit training. The additional training normally can be acquired easily since Reserve and National Guard units are primarily in a training status. But this training should not be considered as a replacement for the present 7-week, 2-day course.

To ensure proper coordination and preparation, standardization instructor pilots (SIPs) should be available at the unit at least 30 days prior to the start of student training. These are the individuals who provide fulltime assistance, supervision and technical expertise to the unit that will be conducting the accelerated course.

Refresher training of the unit's instructor pilots is the key factor to successful completion of the mobile training team's mission. Instructor pilots must meet all requirements found in AR 95-1 and AR 95-63. If Aviation Center instructors are used exclusively, no additional training other than a local area orientation is required. If unit instructor pilots are used, refresher training should consist of no less than 15 flight hours per instructor conducted over a time span of 10 training days (1.5 hour syllabus per day), and 2 hours of ground school instruction per flight training day. Each training maneuver and concept will be practiced and reviewed. Upon completion of the refresher training program, a flight evaluation would be administered by the Aviation Center SIP.

An important shortcoming of this mobile, accelerated training program is the standardization training of flight engineers and crewmembers. While the majority of crewmembers in the various field units are well standardized within their respective unit requirements, they normally are not qualified instructors as are the CH-47 flight engineers at the Aviation Center.

The unique situation creates a twofold mission to the flight instructor. Besides conducting student training, the IP also must conduct

The author was responsible for conducting the initial course of accelerated training of pilots in the CH-47 Chinook helicopter conducted for the U.S. Army Reserve. He currently is assigned to the U.S. Army Aviation Center, Fort Rucker, AL as the CH-47 Standardization Instructor Pilot, Department of Flight Training.

intensive crewmember training. A minimum of 10 days prior to the start of student training, a coordination/standardization seminar should be held with the attendance of all personnel that may be required to perform crew duties during the transition course. During the conduct of student training, crewmembers should be encouraged to attend all aviator ground school classes as invaluable refresher training may be gained at this time.

Requirements for the CH-47 AQC—as outlined in Training Circular 1-34—should not be waived. It is of paramount importance that students attending the accelerated qualification course meet both the requirements of TC 1-34, and also the appropriate pilot currency requirements per AR 95-1 and the Aircrew Training Manual. Additionally, qualification students should have flown 180 hours within the previous 12 months.

If a student lacks the required prerequisites and recommended currency requirements, marginal student progression through the accelerated course results. In most cases, it is not possible to have a marginal student administratively set back to another class. Because of a maximum instructor-to-student load, additional flight training for marginal students is extremely difficult, if not impossible. If additional training were possible, marginal students would be required to fly, or receive additional ground school instruction, during time periods not already

Routes and areas for external load operations should be reconnoitered thoroughly for suitability and safety. Training areas should be located away from populated areas to minimize the environmental impact

scheduled for transition training. This additional training would consume critical student study time.

The student in the accelerated training course is amassed with a large amount of technical information in an extremely short period of time. Any additional time available to the student must be used for study and assimilation of text material. Also, it usually is not possible for students to acquire additional time off from their respective civilian occupations should a course extension be required. Due to these factors, unique to the Reserve components, marginal students may be confronted with course elimination. This results in a subsequent degradation of mission accomplishment and cost effectiveness.

Because the accelerated qualification student is required to undergo about 90 percent more flight training time per day (based on the average daily training syllabus) than the Aviation Center student, aircraft servicing delays must not be allowed to become a factor in the reduction of training time. Even the slightest delay causes an increase in the following flight training day's syllabus. The increase adversely affects student progression because of additional fatigue.

Any increase in an already heavily scheduled duty day for the student hampers, or at least limits, the effectiveness of the mobile training team. Aircraft involved in the transition training program must have the highest priority for servicing requirements. The training unit also must ensure that air traffic control and crash rescue facilities are operational during the conduct of transition training.

Another disadvantage of this accelerated training course within the unit is the difficulty in obtaining suitable training aids and training areas. A hard surface landing area must be able to handle the maximum number of aircraft that will be conducting training at any given time. If this area is to be an established airfield, priority must be given to AQC aircraft. Crash rescue equipment must be immediately available so that all training maneuvers may be conducted. An adequate water landing area needs to be established. This requires extensive efforts to ensure that the water is free from any contaminants which could damage the aircraft.

A minimum of one confined landing area is required for each aircraft conducting student training at a given time. This requirement ensures that student training during the advanced training (AT) stage is not hampered or delayed. Confined areas should be located at such a distance as to prevent interference between flight patterns required to conduct a reconnaissance, landing or takeoff from each area. Additionally, there is a need for an adequate pinnacle training area.

Operational areas for external load operations, including routes to and from confined and pinnacle training areas, must be established. All landing areas not at established airfields should be reconnoitered thoroughly from both air and ground. Considerations for suitability and safety are of prime importance. Training areas, whenever possible, should be established away from populated areas to minimize the environmental impact due to increased aviation activity.

A classroom is required for the conduct of ground school instruction and daily flight briefings. It should have proper lights and ventilation. It should be located so that outside interferences are kept at a minimum. Required equipment in the classroom consists of the standard audiovisual equipment package used at the Aviation Center.

The student does not have the benefit of the elaborate training devices used during the Aviation Center course. This increases the burden on the student to gain the needed insights into system operations and functioning characteristics.

A variety of external loads also is required during the conduct of the advanced training stage. These loads must include as a minimum, one high density load (concrete block), one low density load (conex container) and one aerodynamic load (a salvaged fixed wing or rotary wing aircraft suitable for external air transport). External loads should include a 2½ ton truck, a 5/4 ton truck and a 105 mm howitzer.

Internal loads also are needed for training. They should consist of vehicle type loads to facilitate ease of loading and unloading. The number of internal loads and external loads should be a minimum of one for each aircraft expected to be flying in any training period.

Because of the course's compression the flight training syllabus must be conducted over a 6-day training week. The addition of the extra training day provides the flexibility needed to meet the training syllabus and contend with a limited number of no-fly days due to weather or maintenance.

I feel that it is important to note that during the conduct of this type of training program within a unit, the unit's mission capability is severely affected. Without maximum aircraft availability required during the course of instruction the syllabus cannot be completed within the allotted time period, thus drastically reducing its cost effectiveness.

The CH-47 accelerated qualification course should only be considered as an alternative in extreme cases of inadequate manpower availability under the needed military occupational specialty. Even under these conditions, the accelerated course should be used as a means to facilitate Reserve and National Guard units in accommodating members with civilian employment absences, and as an aid in recruiting efforts. With the continuing reduction in the number of experienced CH-47 pilots in active Army units, it is imperative that the CH-47 Aviator Qualification Course, conducted at the Aviation Center, be considered the standard method of training CH-47 pilots.

IN LAST month's *Digest,* Major General James C. Smith, Aviation Center commander, responded to the first "You Wanna Hear From Me?" comments (See the *Digest,* November 1977). Below are additional comments and MG Smith's replies to them. (Future issues will contain more comments and responses.)

Dear General Smith:

I believe that training could be enhanced if aviation maintenance was accomplished by a military maintenance force according to procedures outlined in the appropriate technical manuals.

• **You make a good point. We recognize the value of on-the-job training at the Aviation Center. However, time and money restraints do not allow all the maintenance skills needed on the job to be taught here. The Aviation Center uses a civilian contractor to maintain the fleet of training aircraft and a great deal of this maintenance is accomplished at night. The use of student aviation maintenance personnel to maintain this fleet of aircraft is not considered desirable. The contract maintenance is accomplished under pertinent technical manuals. If your comment pertains to the new C-12 fixed wing aircraft, the situation is altogether different. The recent procurement of C-12 aircraft places factory personnel on site to provide maintenance support as part of the procurement contract. The Aviation Center does train the 67N and 67V aircraft maintenance personnel. The Transportation School at Fort Eustis, VA is responsible for that career field. In all cases, the basis of maintenance training is the appropriate technical manual.**

Thank you for responding,
General Smith

Dear General Smith:

The U.S. Army Aviation Center is very knowledgeable on the provisions of ARs, DA forms and other paperwork which are needed for the successful operation of an aviation unit. However, it is my opinion that the training program for the 71P (Flight Operations Coordinator) category does not allow ample time to complete all portions of the program.

• **We are faced with the old problem of not enough time in a single course to teach everything we'd like. Therefore, all job tasks selected for training Soldiers in MOS 71P are not taught in resident courses at the Aviation Center. In AIT, for example, only those tasks which can best be taught at the Aviation Center and those required by higher authority are taught. Those tasks that can be taught adequately through self-teaching exportable training or formal on-the-job training programs are not taught in resident courses. The Aviation Center provides extension training programs which contain instructional material for training both those tasks taught in the resident courses and those selected for training in the field. Details on what is available and how it can be acquired are covered in the MOS 71P Soldier's Manual and the Commander's Manual for MOS 71P. The Commander's Manual also gives specific information on where each task of each skill level of the MOS is to be taught. I would like to add that as a result of recent comments from the field such as yours, the Aviation Center has implemented tactical environment training for the 71P. This includes installationof radios and associated equipment in ground vehicles.**

Thank you for responding,
General Smith

The ideas expressed in this article are the author's and do not necessarily represent those of any Department of Defense Agency.

The "L-Plane Plan,"

CW2 Jon F. Langione
82d Aviation Battalion
Fort Bragg, NC

IT WAS MARCH 1945. The Bulge had been flattened and the Spa Horseshoe straightened. Nazi Germany was breathing its last as the Allies pushed from all sides.

In the Third Army sector one great obstacle stood in the path of its lightning attack; the Rhine River. Fortune had put the Seventh Army across, as the 9th Armored Division captured the Ludendorff railway bridge at Remagen, but no such luck for 'Lucky' [code name for Third Army].

Third Army would have to assault across the river, secure the banks, bridge the river to bring supplies and armor forward, and continue the fight. These were the orders, from General George Patton, to the XIIth and XXth Corps' commanders.

Four historic crossings were accomplished by Third Army. XXth Corps' 76th, 87th and 89th Infantry Divisions would cross at Boppard and St. Goar. Farther south the 80th Infantry Division of XIIth Corps would cross at Mainz. South of Mainz the 5th and 90th Infantry Divisions were poised to assault the east bank and the plan to do so would involve the first planned airmobile assault in the history of warfare.

The 5th Infantry Division was selected to make the initial river crossing; the 90th Infantry Division would follow. However, one battalion of the 5th Infantry Division was to be airlifted across to secure the east bank against a reported buildup of Nazi forces near Oppenheim, the location of the assault.

General Patton's Artillery Chief, Brigadier General Edward T. (Molly) Williams, conceived the idea of using 90 L-4 light observation planes to perform an air assault on the east bank with an Infantry battalion. Time to close on the objective was estimated to be 3 hours. The plan was further developed to the point of a fighter squadron from XIXth Tactical Air Command being tasked to fly cover—the first "gun cover" assembled for an air assault operation.

The 5th Infantry Division's river assault commenced at night and

Air Assault I/II, and the Long Wait

went so well and advanced so rapidly that the "L-plane Plan" was scratched. The battalion designated to perform the air assault was tasked to cross by boat. Thus ended the first airmobile operation. And the concept died with the Operations Plan (OPLAN).

Had the "L-plane Plan" taken place the operation would have been another first for Third Army as well as a first in the field of vertical envelopment. However, the air assault was cancelled and the idea shelved. Indeed, shelved for a long time.

Eighteen years later, Air Assault I tested concepts (similar to those of General "Molly" Williams) which were recommended by General Hamilton H. Howze's Army Tactical Mobility Requirements Board. The Howze Board's proposals resulted in the 1st Cavalry Division (Airmobile) which was the first deployed to Vietnam; the 101st Airborne Division (Airmobile), currently the Army's only airmobile division; and the 6th Air Cavalry Combat Brigade (ACCB) which still is active.

Mid-intensity now is the byword, as unconventional—formerly a familiar byword—has all but been erased. History has proven time and again that U.S. Army forces can overcome any obstacle, even themselves.

General Howze, who often is called the father of air assault, recently has questioned the aviation community for its lack of direction. General Howze stated, in another aviation periodical, that not since Air Assault II has the U.S. Army commissioned a board or test panel on the scope of the Howze Board, Air Assault I or Air Assault II to seek a standard mission and direct the aviation community as those tests did.

The fact remains that many lessons were learned from the Vietnam years and from post Vietnam maneuvers and tests.

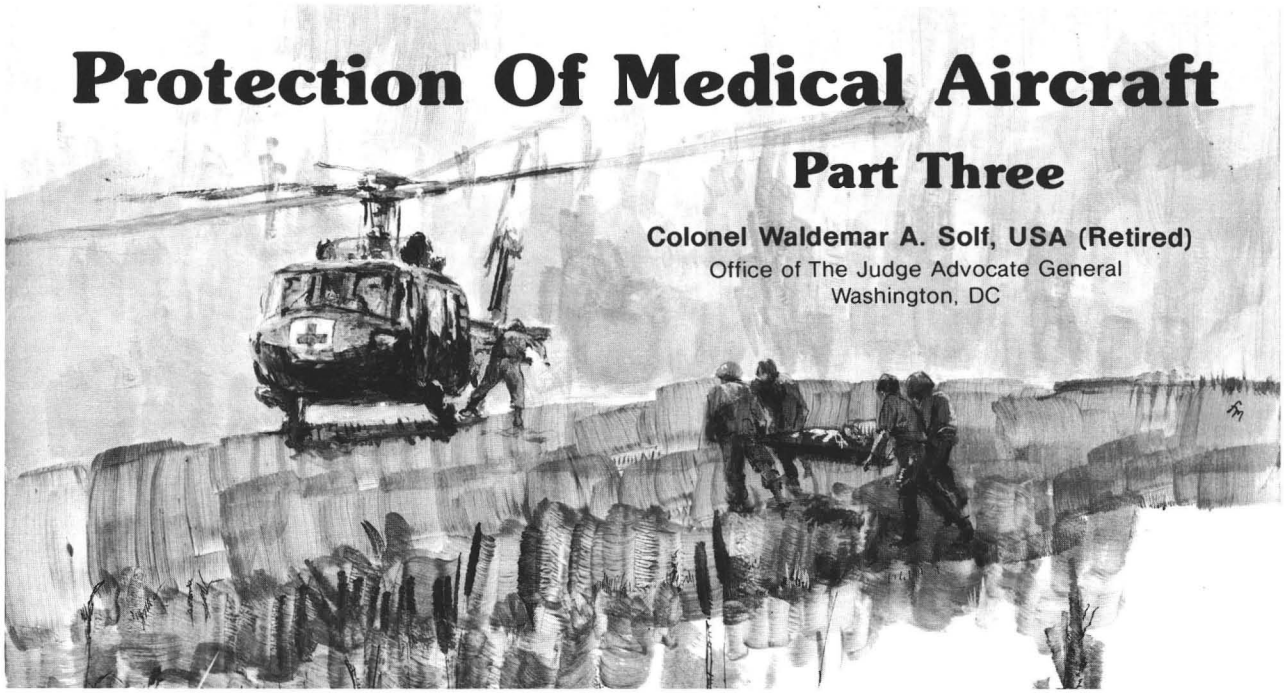
Therefore, as we celebrate the 36th Birthday of Army Aviation this month, should not a board be formed to have a relook at the unconventional mission, as well as the conventional, mid-intensity role?

It has been 18 years since the Howze Board—coincidentally the same amount of time between the "L-plane Plan" and Air Assault II. Eighteen years between concept and adoption is a very long time—too long!

Protection Of Medical Aircraft

Part Three

Colonel Waldemar A. Solf, USA (Retired)
Office of The Judge Advocate General
Washington, DC



Article 27—Medical aircraft in areas controlled by an adverse Party

1. The medical aircraft of a Party to the conflict shall continue to be protected while flying over land or sea areas physically controlled by an adverse Party, provided that prior agreement to such flights has been obtained from the competent authority of that adverse Party.

2. A medical aircraft which flies over an area physically controlled by an adverse Party without, or in deviation from the terms of, an agreement provided for in paragraph 1, either through navigational error or because of an emergency affecting the safety of the flight, shall make every effort to identify itself and to inform the adverse Party of the circumstances. As soon as such medical aircraft has been recognized by the adverse Party, that Party shall make all reasonable efforts to give the order to land or to alight on water, referred to in Article 30, paragraph 1, or to take other measures to safeguard its own interests, and, in either case, to allow the aircraft time for compliance, before resorting to an attack against the aircraft.

COMMENT: Article 36 of the First 1949 Convention prohibits "flights over enemy or enemy occupied territory," thus making such overflight a breach of the Convention. Under Article 27 such an unpermitted overflight results in loss of protection. Before taking the extreme measures of attacking an intruding medical aircraft, the parties are required to order it to land or take other less drastic measures. The disposition of offending medical aircraft, their crews and patients is elaborated in Article 30.

The principal utility of the prior agreement procedure prescribed in Paragraph 1 involves encircled areas, beachheads and established airheads. In such situations, scheduled medevac flights through prescribed air corridors occasionally have been arranged in past wars.

Article 28—Restrictions on operations of medical aircraft

1. The Parties to the conflict are prohibited from using their medical aircraft to attempt to acquire any military advantage over an adverse Party. The presence of medical aircraft shall not be used in an attempt to render military objectives immune from attack.

2. Medical aircraft shall not be used to collect or transmit intelligence data and shall not carry any equipment intended for such purposes. They are prohibited from carrying any persons or cargo not included within the definition in Article 8 (f). The carrying on board of the personal effects of the occupants or of equipment intended solely to facilitate navigation, communication or identification shall not be considered as prohibited.

3. Medical aircraft shall not carry any armament except small arms and ammunition taken from the wounded, sick and shipwrecked on board and not yet handed to the proper service, and such light individual weapons as may be necessary to enable the medical personnel on board to defend themselves

and the wounded, sick and shipwrecked in their charge.

4. While carrying out the flights referred to in Articles 26 and 27, medical aircraft shall not, except by prior agreement with the adverse Party, be used to search for the wounded, sick and shipwrecked.

COMMENT:

a. Apart from the fear that the safety of medical aircraft could not be assured against attack from distances which exceed the capability to recognize the distinctive emblem, an important factor for the limitations on protection of medical aircraft under present law was concern over the security threat posed by abuses of protected status. This same concern was evidenced during the debate on medical aircraft in the 1972 Conference.

b. The pattern of measures in the Conventions intended to insure against abuse of medical protected status are:

(1) Loss of protection when the threat to security is moderate. Thus, Articles 21, 22 and 35 of the First Convention simply provide for loss of protection if medical units "are used to commit, outside their humanitarian duties, acts harmful to the enemy."

(2) With respect to extremely dangerous threats to security, however, the Conventions impose explicit prohibitions. Because of the threat to security of warships, Article 34 of the Second Convention prohibits the possession of secret codes by hospital ships. Articles 35 of the First Convention and 39 of the Second Convention prohibit overflight of enemy or enemy occupied territory. These explicit prohibitions imply that their violation is a breach of the Conventions, not merely a condition entailing loss of protection.

c. Agreements on the basic protection of medical aircraft without the inflexible necessity of an agreed flight plan was achieved only by strengthening the conditions intended to insure that medical aircraft will not be used for acts harmful to the enemy and to minimize its capability to perform such acts. These conditions as they appeared in the 1972 Commission I text are listed below:

(1) Prohibiting parties to use their medical aircraft in order to acquire any military advantage.

(2) A statement that medical aircraft may not be used to shield military objectives, based on Article 23 (l), Third Convention, and Article 28, Fourth Convention.

(3) Prohibition against carrying intelligence gathering equipment.

(4) Prohibition against carrying persons, supplies, or equipment not necessary to the performance of the medical mission. Thus, their passengers were limited to medical personnel and the sick and wounded. Their supplies and equipment are limited to those necessary for collection, transport and care of the wounded and sick. (The term "medical personnel" as defined in Article 8*c* include transport crews.)

(5) Prohibition against carrying arms other than those belonging to the wounded and sick or necessary for the defense of the medical personnel and the wounded and sick.

(6) Exclusion of search as a part of the medical air mission on land unless agreed to by the adverse Party was intended to preclude the flying of a search pattern in the battle area which would undoubtedly be considered by the enemy to be a reconnaissance flight.

d. The restrictions of this article are prohibitory in nature. It follows that effective command action and frequent inspection are required in order to prevent violations.

e. The foregoing is particularly important with respect to temporary medical aircraft. General purpose aircraft used for medical evacuation frequently carry mixed loads of both patients and other personnel. Some equipment not associated with medical mission is not removable. Such aircraft may continue to be used to carry the wounded and sick, medical personnel and equipment, but it may not be designated or marked as a medical aircraft. To the extent that long haul medical evacuation cannot comply with the requirement of this article, they cannot be protected as medical aircraft.

Article 29—Notifications and agreements concerning medical aircraft

1. Notifications under Article 25, or requests for prior agreement under Articles 26, 27, 28, paragraph 4, or 31 shall state the proposed number of medical aircraft, their flight plans and means of identification, and shall be understood to mean that every flight will be carried out in compliance with Article 28.

2. A Party which receives a notification given under Article 25 shall at once acknowledge receipt of such notification.

3. A Party which receives a request for prior agreement under Articles 26, 27, 28, paragraph 4, or 31 shall, as rapidly as possible, notify the requesting Party:

(a) that the request is agreed to;

(b) that the request is denied; or

(c) of reasonable alternative proposals to the request. It may also propose a prohibition or restriction of other flights in the area during the time involved. If the Party which submitted the request accepts the alternative proposals, it shall notify the other Party of such acceptance.

4. The Parties shall take the necessary measures to ensure that notifications and agreements can be made rapidly.

5. The Parties shall also take the necessary measures to disseminate rapidly the substance of any such notifications and agreements to the military units concerned and shall instruct those units regarding the means of identification that will be used by the medical aircraft in question.

COMMENT: This article emphasizes the importance of communications between adversaries to the effectiveness of the regime developed for medical air transport in battle situations. The development of a feasible system for such communications by radio, as contemplated in Articles 7 and 9 of Annex I, is very significant.

Established distress frequencies have limited application. They can be used only under the emergency circumstances provided in ITU Regulations. It does not appear feasible, in the foreseeable future, to provide a family of internationally designated frequencies for this type of communications. The only feasible presently available system is for each side to designate and publish the frequencies which they have designated for this purpose. The Parties can then communicate on the frequencies each has designated unless they agree to a common frequency.

Doctrine will have to be developed as to who will guard the frequencies. Will it be the air defense organization or the medical aircraft dispatcher? The Command and Control System must also be capable of alerting all units which can engage protected medical aircraft.

The rudimentary communications system will probably be improved as experience and coordination with the International Telecommunications Union improves. Article 98, Revision of Annex I, provides for the necessary periodic review of the system and makes the adoption of needed amendments to the annex relatively easy.

Article 30—Landing and inspection of medical aircraft

1. Medical aircraft flying over areas which are physically controlled by an adverse Party, or over areas the physical control of which is not clearly established, may be ordered to land or to alight on water, as appropriate, to permit inspection in accordance with the following paragraphs. Medical aircraft shall obey any such order.

2. If such an aircraft lands or alights on water, whether ordered to do so or for other reasons, it may be subjected to inspection solely to determine the matters referred to in paragraphs 3 and 4. Any such inspection shall be commenced without delay and shall be conducted expeditiously. The inspecting Party shall not require the wounded and sick to be removed from the aircraft unless their removal is essential for the inspection. That Party shall in any event ensure that the condition of the wounded and sick is not adversely affected by the inspection or by the removal.

3. If the inspection discloses that the aircraft:

(a) is a medical aircraft within the meaning of Article 8 (j),

(b) is not in violation of the conditions prescribed in Article 28, and

(c) has not flown without or in breach of a prior agreement where such agreement is required, the aircraft and those of its occupants who belong to the adverse Party or to a neutral or other State not a Party to the conflict shall be authorized to continue the flight without delay.

4. If the inspection discloses that the aircraft:

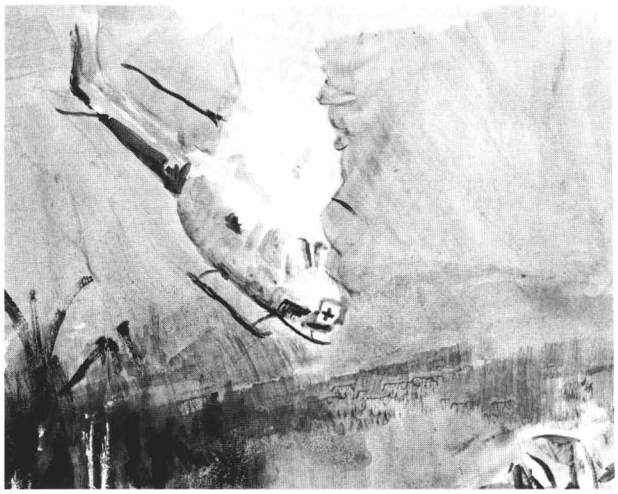
(a) is not a medical aircraft within the meaning of Article 8 (j),

(b) is in violation of the conditions prescribed in Article 28, or

(c) has flown without or in breach of a prior agreement where such agreement is required, the aircraft may be seized. Its occupants shall be treated in conformity with the relevant provisions of the Conventions and of this Protocol. Any aircraft seized which had been assigned as a permanent medical aircraft may be used thereafter only as a medical aircraft.

COMMENT: The important check against abuse of protection by medical aircraft under present law is a requirement that medical aircraft obey a summons to land for inspection.

This procedure is continued, but under paragraph 1, an order to land for inspection is limited to a situation when a medical aircraft flies over land or waters under the physical control of the adverse Party or over land areas the control of



which is not clearly established. This article does not authorize ordering the landing of a medical aircraft flying in that part of the Contact Zone which is controlled by friendly forces.

Because this article will have to be implemented by inspecting parties in remote airfields it was considered necessary to provide detailed guidance, almost in check sheet form as to the circumstances in which medical aircraft must be permitted to continue their journey and when they may be seized because of a violation of the rules.

The negotiating record shows that it was the view of the Committee that formulated this article that the right of seizure should not be exercised unless the Party which has ordered the inspection is capable of providing the standard of medical care for the wounded and sick aboard prescribed by Article 10 of the protocol, namely "the medical care and attention required by their condition."

Article 31—Neutral or other States not Parties to the conflict

1. Except by prior agreement, medical aircraft shall not fly over or land in the territory of a neutral or other State not a Party to the conflict. However, with such an agreement, they shall be respected throughout their flight and also for the duration of any calls in the territory. Nevertheless they shall obey any summons to land or to alight on water, as appropriate.

2. Should a medical aircraft, in the absence of an agreement or in deviation from the terms of an agreement, fly over the territory of a neutral or other State not a Party to the conflict, either through navigational error or because of an emergency affecting the safety of the flight, it shall make every effort to give notice of the flight and to identify itself. As soon as such medical aircraft is recognized, that State shall make all reasonable efforts to give the order to land or to alight on water, referred to in Article 30, paragraph 1, or to take other measures to safeguard its own interests, and, in either case, to allow the aircraft time for compliance, before resorting to an attack against the aircraft.

3. If a medical aircraft, either by agreement or in the circumstances mentioned in paragraph 2, lands or alights on water in the territory of a neutral or other State not Party to the conflict, whether ordered to do so or for other reasons, the aircraft shall be subject to inspection for the purposes of determining whether it is in fact a medical aircraft. The inspection shall be commenced without delay and shall be conducted expeditiously. The inspecting Party shall not require the wounded and sick of the Party operating the aircraft to be removed from it unless their removal is essential for the inspection. The inspecting Party shall in any event ensure that the condition of the wounded and sick is not adversely affected by the inspection or the removal. If the inspection discloses that the aircraft is in fact a medical aircraft, the aircraft with its occupants, shall be allowed to resume its flight, and reasonable facilities shall be given for the continuation of the flight. If the inspection discloses that the aircraft is not a medical aircraft, it shall be seized and the occupants treated in accordance with paragraph 4.

4. The wounded, sick and shipwrecked disembarked, otherwise than temporarily, from a medical aircraft with the consent of the local authorities in the territory of a neutral or other State not a Party to the conflict shall, unless agreed otherwise between that State and the Parties to the conflict, be detained by that State where so required by the rules of international law applicable in armed conflict, in such a manner that they cannot again take part in the hostilities. The cost of hospital treatment and internment shall be borne by the State to which those persons belong.

5. Neutral or other States not Parties to the conflict shall apply any conditions and restrictions on the passage of medical aircraft over, or on the landing of medical aircraft in, their territory equally to all Parties to the conflict.

COMMENT: This article reaffirms Article 34 of the First Convention and Article 40 of the Second but conforms it to the procedures prescribed in Article 27, 29 and 30.

The requirement for seizure of aircraft shown not to be medical aircraft is consistent with neutral obligation under Hague Convention No. V of 1907 not to permit material of war to pass through its territory. An aircraft which carries persons or cargo not encompassed within the definition of medical transportation in Article 21 (a) is not a medical aircraft.

It is made clear in paragraph 4 that the provision requiring interment of wounded and sick persons under the provisions of Article 14, Hague Convention No. V, does not apply to those temporarily removed from a medical aircraft in connection with the inspection. The requirement applies only to those who are hospitalized in the Neutral State and are not able to depart with the medical aircraft.

It should be noted, however, that wounded and sick prisoners of war carried aboard the transport passing through neutral territory must be interned (FM 27-10, paragraph 543).

* * *

The *Digest* will present the fourth and final part of "Protection Of Medical Aircraft" in next month's issue

USAAAVS

Simulated Antitorque Training Proven Effective

SIMULATED FIXED-PITCH antitorque training for Initial Entry Rotary Wing (IERW) students was discontinued in 1975. The high frequency of mishaps occurring during this training brought about the question of whether the solution—antitorque training—was worse than the problem—maintaining aviator skill and confidence to cope with this type of emergency.

Consequently, the U.S. Army Aviation Center (USAAVNC) discontinued this training as a graded maneuver for IERW students to minimize risks to personnel and equipment. This maneuver was only to be demonstrated by instructor pilots. However, Training Circulars (TCs) 1-35 and 1-36 required field units to grade antitorque emergency procedures during annual flight

standardization checks. This created a problem. Since IERW students were not being graded in this maneuver at the Aviation Center, field units were forced to provide initial training. Therefore, in February 1977, USAAVNC recommended that the TCs be revised to require field units to also limit simulated antitorque failure maneuvers to demonstration only to provide consistency between IERW and unit training. However, several major commands disagreed with this, stating that antitorque emergency procedure training was a valid requirement and should be reinstated as a graded maneuver for IERW students. To resolve this difference, the Deputy Chief of Staff, Operations and Plans requested that the U.S. Army Agency for Aviation Safety (USAAAVS) evaluate the effectiveness of fixed-pitch antitorque training for providing skills and confidence to aviators to cope with actual in-flight antitorque failures and malfunctions.

In addition to this issue, USAAAVS evaluated three others. One, do the skills attained through IERW and unit training effectively transfer across different types of antitorque system malfunctions? Two, does the mishap data show any trend that would indicate a procedure for dealing with antitorque failure which may reduce probability and severity of materiel damage, injuries, and fatalities? And, third, is the mishap experience for antitorque emergency training more disproportionate than that of other types of in-flight emergency training?

To determine the effectiveness of training, certain criteria were established to eliminate instances in which the crew did not have an opportunity to use in-flight emergency procedures, such as a malfunction occurring during aircraft runup. Criteria used were (1) an antitorque system malfunctioned or failed during flight, (2) crew could have taken some emergency corrective action to minimize the severity of the mishap, (3) crew must have experienced some impairment of antitorque system control, and (4) crew must have exhibited poor technique in performing a simulated maneuver.

All mishap experience involving actual and simulated malfunctions and failures of the antitorque system in UH-1 series, T/AH-1G, OH-58 and OH-6 aircraft from 1 July 1972 to 30 September 1976 were collected and assembled for analysis. This particular time frame was used because it represented the operations and setting that provoked the question in issue and also because the quality of mishap data for this period improved over other periods. Of the 8,679 total mishaps for this time frame, 610 were antitorque associated. Of these 610 mishaps, 489 were attributed to FOD, tree or ground strikes, etc., and did not meet the evaluation criteria. Of the remaining 121 mishaps, 108 involved actual antitorque malfunctions or failures, whereas the other 13 occurred during simulated antitorque training. Other than to determine whether mishaps involving antitorque emergency training were more disproportionate than those of other types of in-flight emergency training, the evaluation was based solely on the 108 actual in-flight emergencies.

The 108 mishaps were evaluated to determine whether antitorque failure or malfunction was due to loss of component, loss of thrust, or loss of or impaired control. Also evaluated was whether or not the action taken by the crew during the emergency brought about a satisfactory or unsatisfactory result. A satisfactory result was when action by the crew reduced aircraft damage and/or personnel injury in the specific mishap situation. An unsatisfactory result was when crew action had not reduced aircraft damage, injuries, and fatalities in the specific mishap situation.

A comparison of the number and types of mishaps was then made by type of failure or malfunction to determine the effectiveness of simulated antitorque training. This comparison revealed that loss of component and loss of thrust resulted in greater losses in aircraft damage and personnel injuries than did loss of or impaired control (the emergency primarily addressed during training). This is attributed to the majority of these emergencies

TABLE 1.–Continued Flight vs. Autorotation Mishap Information

	Continued Flight	Autorotation
1. Number of mishaps	12	17
2. Aircraft damage*	$2,277,302.97	$1,630,644.00
3. Mean damage per accident/incident	$227,730.30	$108,709.60
4. Injuries	29	9
5. Fatalities	5	1
6. Terrain		
a. Suitable	6	15
b. Unsuitable	6	2

*Aircraft damage does not include strikes or hits (damage always incurred). Two strikes occurred and pilots elected to continue flight. Two other strikes occurred and pilots elected to autorotate. Aircraft damage does not include autorotations made to hostile terrain.

SIMULATED ANTITORQUE TRAINING PROVEN EFFECTIVE

usually terminating in forced or precautionary landings with no subsequent effects. Loss of component emergencies were not handled as well as those occurring from loss of or impaired control. The chances of getting the aircraft down safely in an emergency appeared to be affected by type of failure or malfunction.

The type of aircraft flown did not affect the chances of satisfactorily terminating emergencies caused by loss of component or loss of or impaired control. Conversely, the type of aircraft had a direct bearing on the success of the maneuver when loss of thrust was experienced. That is, Cobra pilots were more successful in coping with loss of thrust malfunctions than UH-1 or OH-58 pilots. The most logical reason for this appeared to be that AH-1 aviators are required by emergency procedures to autorotate immediately whereas UH-1 and OH-58 aviators are required to continue flight to a suitable landing area. However, another reason could have been that the element of decisiveness among AH-1 aviators was removed.

It also appeared that the proper course of action for loss of component or thrust was highly dependent on the aerodynamic characteristics of the aircraft and the flight profile at the time of emergency. Although it could not be determined from mishap data which would be the best course of action to take when loss of thrust is experienced, the data did indicate that when crews continued to fly, aircraft performance deteriorated to a point where a successful autorotation was difficult to perform. This is supported in table 1 by the comparatively higher number of fatalities and injuries.

When comparing simulated antitorque mishaps with those mishaps occurring during simulated single-engine-out and simulated hydraulics-off emergencies, antitorque training mishaps were not disproportionate to these types of training mishaps. The cost of mishaps occurring during simulated antitorque training was $863,749, compared to $2,783,831 for simulated single-engine-out mishaps. A high proportion of materiel damage and injuries which did occur during antitorque training was the result of making running landings to poorly selected areas.

The AH-1 contributed a disproportionate share of mishap cost during antitorque training. This is attributed to its design features such as high center of gravity, narrow skid landing gear, and limited visibility from the aft crew station making alignment difficult during touchdown.

Aircraft damage and personnel injuries during actual in-flight emergencies were 12 times more severe than those which occurred during training.

Based on the evalution, it was concluded that training for failure or malfunction resulting in loss of or impaired control is effective in providing the skill and confidence aviators need to cope with in-flight emergencies. However, this same type of training is only minimally effective for loss of component or loss of thrust emergencies. Antitorque training mishap costs were not inordinate compared with other types of simulated training. A high proportion of materiel damage and injuries that did occur during training was caused by making running landings to poorly selected areas. T/AH-1G emergency procedures for loss of thrust appear to be more effective than those for the UH-1 and OH-58 aircraft. Though inconclusive, it appears that the best course of action for loss of component or thrust is to autorotate immediately.

As a result of these conclusions, HQDA directed that the USAAVNC and National Guard Bureau reinstate simulated antitorque training outlined in TCs 1-35 and 1-36 as a graded maneuver. DA also directed that antitorque training in T/AH-1G and OH-58 aircraft be conducted to hard surfaces only. UH-1 training may be conducted to hard surfaces or other approved training areas with emphasis on good ground recon.

Copies of USAAAVS Technical Report 78-2, "Antitorque Training: Evaluation of Effectiveness in Reducing Mishap Losses," upon which this article was based, have been mailed to the field. For additional copies of this report, call USAAAVS, AUTOVON 558-4479/5915, or write Commander, USAAAVS, ATTN: IGAR-PG, Fort Rucker, AL 36362.

VIEWS FROM READERS

Editor:

In response to your Views From Readers request in the Jan 78 *Aviation Digest* concerning simulated instrument flight systems, the tinted windshield and goggles mentioned by CW3 Wright are currently in use by some civilians and a few Navy and Marine Corps Squadrons. The "system" known colloquially as "Blue-Amber" consists of a transparent amber cellophane or plexiglass covering for the interior surfaces of the cockpit windscreen (and door windows in helicopters) and transparent blue plexiglass goggles, glasses on helmet visors. Though both the amber and the blue materials are transparent, the combined effect is opacity.

Since the amber plexiglass covers the normally clear glass surfaces of the cockpit environment, when the blue goggles are donned the world outside the cockpit appears "black" and only objects silhouetted by the sun may be visible as shadows. Since the horizon is obscured, the effect in the cockpit is similar to night instrument meteorological conditions (IMC). The advantages of this system are in the area of pilot comfort and the completeness of the IMC effect. The identified limitations are: one, the system requires one pilot in the cockpit whose vision is unobstructed by blue goggles (safety pilot) for clearance from other aircraft, and two: any red instruments, gauges, labels and lights will appear black, e.g. fire warning. The other pilot's presence alleviates the latter problem. Although there may be some other situations in which Blue-Amber may not be ideal, the fact remains that it is an excellent means with which to simulate IMC on a VFR day.

The colors utilized in the local system are identified as manufacturer's numbers 2424 Blue and 2422 Amber. The cost of the system varies significantly with the choice of materials. The amber window coating ranges from a thin cellophane film to 3/16″ plexiglass. The blue eye cover varies from 1/8″ blue plexiglass cut to fit goggles NSN 424-00-052-3776 to an expensive helmet visor which may be purchased through the manufacturers of the clear or tinted helmet visor in stock.

Major Terry M. Curtis
Marine Light Helicopter Sqdn 267
Det MAG-16, 3D MAW, FMPac
MCB Camp Pendleton, CA 92055

Editor:

We request that you print the following information in your publication.

The U.S. Army Warrant Officers Association (USAWOA) will host its sixth Annual Meeting of the Members at the Sheraton San Antonio Motor Inn, 1400 Austin Highway, San Antonio, TX 78209 during the period of 7 through 9 Aug 78. All warrant officers, active duty, reserve, NG and retired are invited to attend. For more information, please contact USAWOA, P.O. Box 2040, Reston, VA 22090.

CW4 Don Hess
Executive Vice President
Warrant Officers Association
Reston, VA 22090

Editor:

The scenario presented in your October 1977 article, "Check Six—or Checkmate," resulting in the two Cobras being shot down, deserves a great deal of serious attention from all helicopter pilots. Helicopters, by virtue of the machine and competence of the pilots, have repeatedly been directed into highly vulnerable situations that fixed wing aircraft would not be, due to machine incompatibility or high unit cost.

The principle tenet of the article was NOE and masking tactics, both for IR and visual. I can't agree more, and due to Army instruction/discussion and from reading NOE manuals and articles, I have become somewhat familiar with it.

While deployed overseas in 1973-1974 (in a middle eastern country) informal liaison with a colocated Air Force unit resulted in an F-5 versus myself in a UH-1N. The results were rather surprising. NOE in a desert environment would be difficult because of dust swirls from the rotor wash, and in some areas, flat terrain. The necessary higher altitudes resulted in less masking, at least in some of the terrain. When engaging at higher altitudes of 1,000 to 5,000 feet AGL, assuming ballistic ordnance and you shooting back, the fighter's advantage is minimal because of your maneuverability. The F-5 pilot admitted he would tend to press the target more because of the induced complacancy that it was "only" a helicopter and was an "easy" target. The helicopter crew in our experiment was swivel headed and utilized

masking techniques. When acquisition was once gained by the F-5, it was extremely difficult for him to maintain and was usually lost and not reacquired. He was surprised (the pilot had extensive fighter background, including combat) that a helicopter could evade a fighter. Familiarity with the process increasingly reduced detection.

The results: use terrain, know the topography, soil and colors of the environment you wish to patrol/transition. Use camouflage, know fighter capabilities and weapons employment. To ensure survival, we must develop some universal countertactics for helicopters and give serious thought about using heat-seeking missiles for offensive/defensive use by helicopters.

The basic tenet is, all helicopter pilots regardless of service or mission should have exposure to NOE and masking tactics. While a standardization pilot in HT-18 during the 1977 wrangle over who would train Navy/Marine/Coast Guard pilots, I attempted to insert NOE instruction in the Navy unique phase should the Army have taken over the training. IR masking and methods to present visual contact should not be constrained to enemy air, but also ground antiaircraft fire.

It is imperative, particularly in the Navy helicopter community, that tactics keep pace with the technological changes that will occur in the next war on land and sea. No attention is being paid to that vital area at this time.

LT H. T. Hinman
HSL-35
NAS North Island
San Diego, CA 92135

Editor:

Our service section has secured the April 1977 issue of your informative magazine. We find it educational and useful.

How may we receive back issues of the magazine? We are having *Aviation Digest* added to our pinpoint distribution so as to receive future issues.

Thank you for a definitive monthly.

WO1 Jonathan M. Haylock
22d Maintenance Co DS A
Service Section
APO New York 09176

• **The *Digest* has a limited surplus of back issues which are available upon request. Yours are in the mail.**

Editor:

The 49th Shock and Vibration Symposium will be held from 17 to 19 October 1978 in Washington, DC. The NASA Goddard Space Flight Center will host the meeting at the International Inn. Contributed papers relating to the many aspects of the mechanical shock and vibration technology are solicited. Limited distribution and classified papers up to and including secret are encouraged. No specific session topics have been chosen; however plans are being formed and suggestions for topics would be welcome.

Further information may be obtained from: The Shock and Vibration Information Center, Code 8404, Naval Research Laboratory, Washington, DC 20375, telephone AUTOVON 297-2220 or commercial (202) 767-2220.

Editor:

Request publication of [the following] incident. I asked the crewchief to write a short description of what happened [see below].

CPT Loren D. Hall
Aviation Safety Officer
Ft. Benning, GA

When the weather observer back at Lawson Army Airfield, Ft. Benning, GA noted that there would be a slight chance of precipitation in Jackson, MS, he wasn't kidding. In fact, the shower that I am referring to was not the type that causes flowers to bloom in the spring. Within 10 minutes time in Jackson, I found myself completely covered with JP4 (turbine engine fuel) and it didn't do wonders for my complexion either. Allow me to explain.

LIAISON PILOT ROUNDUP

Last year in the July and October issues, the *Digest* asked all former Liaison (L) pilots, both active duty and retired, to please write in. As the following list indicates, the response was good.

The *Digest* wishes to thank all the L pilots who responded to our request and if we somehow missed you please let us hear from you now.

Active Duty L Pilots:	
Major General James F. Hamlet	**Washington, DC**
Major General James C. Smith	**Ft. Rucker, AL**
Colonel L. L. Hamacher Jr	**Decatur, IL**
Colonel Walter F. Jones	**Ft. Sam Houston, TX**
Colonel Charles Morrow Jr	**Ft. Monroe, VA**
Colonel Donald E. Mulligan	**Colorado Springs, CO**
Colonel Elswick Newport	**Culver City, CA**
Colonel Donald J. O'Toole	**Topeka, KS**
Colonel George W. Shallcross	**Ft. Rucker, AL**
Colonel George E. Thayer	**St. Louis, MO**
CW4 Don E. Barnett	**APO San Francisco, CA**
Retired and Former L Pilots:	
Colonel John F. Campbell	**Spokane, WA**
Colonel Colin D. Ciley, Jr	**Enterprise, AL**
LTC Charles H. Drummond, Jr	**Monterey, CA**
LTC John D. Gillespie	**DuPont, WA**
LTC William C. Hale	**Petersburg, VA**
LTC John Sarko	**Decatur, IL**
Mr. Lauren A. Messingham	**Waterloo, IA**
Major Billy P. McPhail	**Killeen, TX**
Mr. William G. Rieger	**Monroe, MI**
Mr. William T. Taylor	**Upper Saddle River, NJ**
Major H. Edward Ziegler	**Colorado Springs, CO**

Being acting crewchief for our unit's U-21, I held the obvious responsibility of ensuring that the aircraft was properly serviced upon our arrival at Jackson. I was handed by the contractor a very large hose and nozzle that the Air National Guard uses to fill its C-130s and C-141s. I had used the hose just once previously. When I saw that I was receiving minimal pressure, I began filling the No. 1 nacelle tank. When the tank was just about full, I announced that I was shutting off the supply from my end of the hose.

Just as I made my announcement, the contract operator of the fuel truck turned the pressure way up and my tank began to overflow. Naturally, the reaction of all the people in the area was to yell at the contract operator to shut off the valve from the truck. We did, and much to everyone's surprise, the man turned the pressure up full blast (3,000 pounds per square inch), sending me, my hose and the step ladder *almost* into orbit. I hit the pavement totally soaked and not exactly smelling like a rose, either.

My first reaction was to take the operator, with clenched fist, behind his fuel truck and let him know exactly what I thought of his job performance. But even though I had my goggles on during the incident my right eye began to burn—sending me to the nearest watering hole to start flushing.

My eye is all right now but I know I wouldn't have had a chance if I hadn't been wearing those little jewels they call *goggles*. Of course, many other "what ifs" popped into our heads as the day progressed, all of which we are grateful did not occur. The plane remained intact and so did the people who were in the area at the time of the incident. We can chalk that day up to luck and experience. One thing is for certain, I will never again make the assumption that people who operate the pressure on a fueling truck always know what they are doing!

PV2 Amy Beth Ruby
DPT AVN
Ft. Benning, GA

Editor:

Since tactical instruments are going to be an integral part of the battlefield of the future, it is essential that each aviator remain proficient in planning a tac instrument flight.

As commander of an Air Ambulance Detachment, it was essential to me that my pilots remain knowledgeable in tac instrument planning—even though we would seldom use the principle on a battlefield for patient evacuation because of the amount of time required to correctly plan a tac instrument flight.

To aid in planning a tac instrument flight we at the 63rd Medical Detachment have designed a pocket size tac instrument planner. This design is inclosed. The TIP contains all the "constants" required for accurate planning.

The TIP is used as follows:

To locate the takeoff point and landing point use the coordinate scale.

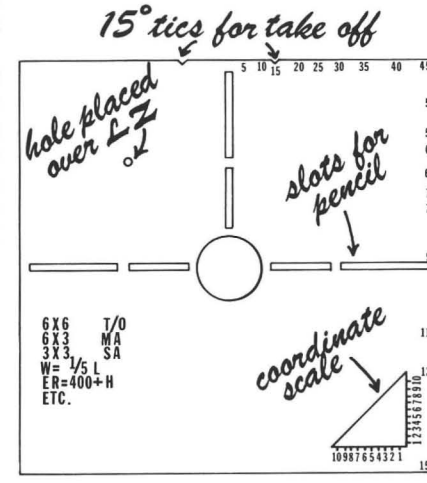
Place whole 6 × 6 km square over T/O point and draw 6 × 6 T/O zone and 30 degree T/O corridor (using 2 15-degree TIC Marks).

Construct landing zone using half square (3 × 6 km for corridor approach/missed approach) and one quarter square (3 × 3 km for spiral approach).

Constant values (i.e. T/O zone 6 × 6, T/D zone 3 × 3, en route 400 above highest terrain etc.) are located in lower left corner.

I thought that an article in ***Aviation Digest*** would enable aviators to make their own (as we have done) or get their training aids branch to produce them for the whole unit.

CPT R. Huether
Commander
63rd Medical Detachment (RA)
APO New York 09180



Editor:

I have just concluded about one year's correspondence with the DAAG Records Management Division concerning 1st Aviation Brigade, 34th General Support Group, and the U.S. Army Aviation Maintenance Management Center unit awards.

DA Pamphlet 672-3 is up-to-date only until sometime in 1971. Unit historical data cards have been updated to 1977 but according to past members in contact with me and my personal recollections the foreign and U.S. unit awards are incomplete on these cards too.

Request that you publish this letter in your Views From Readers. I will consolidate an update to DAAG records if your readers will forward any information they have about unit awards for the above units. Your publication will also receive a copy of the update.

MSG Howard A. Daniel III
HQ USAREUR & 7th Army
ODCSOPS-WWMCCSDPCE
APO New York 09403

FRONT COVER ACRONYMS KEY

AH-64	**Army's new attack helicopter**
UH-60	**Army's new utility helicopter (Black Hawk)**
ALSE	**Aviation Life Support Equipment**
ASH	**Advanced Scout Helicopter**
ATC	**Air Traffic Control**
ATM	**Aircrew Training Manual**
AVNEC	**Army Aviation Employment Conference**
HELLFIRE	**Helicopter Launched Fire and Forget**
IMC	**Instrument meteorological conditions**
MOS	**Military occupational specialty**
NATO	**North Atlantic Treaty Organization**
NOE	**Nap-of-the-earth**
TOW	**Tube-launched, optically-tracked, wire-guided**
UH-1	**Army utility helicopter (Huey)**
175/40	**Aviation training at Ft. Rucker**
2.75	**Rocket system**
AAPR	**Army Aviation Systems Program Review**
AH-1S	**Army's modernized Cobra attack helicopter**
Contour Flight	**Flying low following contour of earth**
FARRP	**Forward Area Refueling and Rearming Point**

USAAAVS **Major Peter J. Edgette**

altitude physiology training - yes or no

Students undergoing altitude physiology training in low pressure, high altitude chamber

IN THE RECENT past, diverse programs within the aviation environment have evoked raised eyebrows and pointed questions as to the relevant need for certain training. The main thrust seems to be directed at the old adage, "Is the cure worse than the disease, or is the training responsible for more injuries than the actual aviation incident/accident environment?"

Of late, two separate but necessary training vehicles have received raised eyebrows and question marks. This need for renewed justification is not harmful or bad for aviation safety. Zero base budgeting does, we've found, keep people and programs on their toes. To justify a program from the ground up may eliminate waste, but better still it clearly and distinctly brings into focus a renewed fervor concerning a program and continues the educational process. If there is no challenge to overcome, no critics to satisfy, stagnation sets in. But with renewed interest, growth is fostered and better programs are established.

One program to receive this renewed interest was antitorque training. The basic question was, "Is simulated antitorque training worse than the problem—maintaining a skill required in an emergency?" The U.S. Army Agency for Aviation Safety evaluated the effectiveness of training for antitorque system malfunctions and printed their findings in USAAAVS Technical Report 78-2, dated March 1978. This is an excellent report and should be read by all Army aviation personnel. (See "Simulated Antitorque Training Proven Effective" in this issue.)

The training in question today is altitude physiology training, including the low pressure, high altitude chamber flight. The inquiries are really directed at the chamber flight itself. Once again, is the risk incurred worth skills required in an emergency situation?

What is the low pressure, high altitude training chamber? It is a device designed as a teaching aid to provide instruction for some of the physiological stresses of flight. The objective of a chamber flight is to give the student practical experience in applying the principles and techniques learned in the classroom. The chamber simulates ascent to altitude by reducing the barometric pressure.

What is the flight profile? The flight profile used for all initial entry rotary wing aviators is divided into three phases.

- 30-minute denitrogenation
- Ear and sinus check
- Flight to 25,000 feet

The 30-minute denitrogenation period is conducted

with the chamber at sea level. All students are issued oxygen masks and breathe 100 percent oxygen during this 30-minute period. The reason behind this portion of the flight is to rid the body of as much nitrogen as possible and thereby virtually eliminate the problem of evolved gas dysbarisms (bends).

The second phase of the flight profile is the ear and sinus check. This portion of the flight, from sea level to 5,000 feet pressure altitude and return to sea level, is used to ensure that individuals will not have an ear and sinus block on the final phase of the flight. Since the greatest pressure differential occurs between sea level and 5,000 feet, most students who are susceptible to ear and sinus blocks react during the ear and sinus check. If there is a reaction, the student is removed from the chamber. This phase of the flight is very beneficial to the student as a teaching aid. Before going into the chamber, students are asked to fill out a questionnaire stating whether or not they have a cold or a sinus problem. The students who state yes are not allowed in the chamber, yet almost every student who subsequently has an ear or sinus problem relates that he did, in fact, have a slight cold but didn't mention it. I am sure these students will not fly with a cold in the future. You can tell individuals not to fly with a cold but, unfortunately, some do not believe the ramifications until it happens to them.

The final phase of the chamber flight is an ascent to 25,000 feet, remain at 25,000 feet for approximately 15 minutes, descend to 18,000 feet for approximately 10 minutes and return to sea level. This is the most valuable portion of the flight with respect to the students' learning. During this segment students have the opportunity to recognize their own symptoms of hypoxia, they can see how others react and they observe for themselves how hyperventilation can affect a healthy individual. During the 10-minute stop at 18,000 feet, the students observe their decreased night vision capability.

Why use 25,000 feet pressure altitude? The symptoms the students realize at 25,000 feet will manifest themselves at and above 5,000 feet with night vision, and at and above 10,000 feet during the day with generalized hypoxia. To demonstrate symptoms in a reasonable amount of time, 25,000 feet was selected as a profile by the FAA, the Air Force, the Navy and the Army. The 25,000 feet profile is in accordance with the STANAG 3114, "Aeromedical Training and Flight Personnel," agreement. Under special conditions rotary wing aircraft are known to exceed 10,000 feet of altitude (i.e., the highlands of RVN, terrain and hostile fire clearance, mountainous geographical areas, weather, western U.S., Europe). Since hypoxia is evident above 5,000 feet with respect to night vision and above 10,000 feet for generalized hypoxia, students must realize and become familiar with the symptoms.

Is the cure worse than the disease? The initial Army altitude chamber was installed at Fort Rucker in 1971. The following information pertains to student reactions.

CHAMBER STATISTICS

Total students	8,726
Student ear problems	567
Student sinus problems	127
Student evolved gas dysparism (bends)	4*

*1 case was not definitely diagnosed as the bends.

Of all the students who have received this valuable training, only one has been eliminated from flight school as an indirect result of this training. This case is also the one which was never definitely diagnosed as the bends. One of the three remaining cases was self-inflicted due to strenuous exercise following the flight. All students are cautioned against any strenuous exercise following a chamber flight.

Summary. The low pressure, high altitude chamber is an excellent training vehicle. Students become familiar with problems associated with hypoxia, hyperventilation and trapped gas. Student safety is the primary concern in this training. The incident rate per student input is negligible. This essential training is required to ensure that the Army aviator will be able to cope with physiological problems associated with flight.

Major Edgette is a Medical Service Corps officer, assigned to the Aeromedical Activity, Ft. Rucker, AL. He has his Masters in Hospital Administration from Baylor University and a Masters in Public Administration from the University of Northern Colorado. He is currently a Physiological Training Officer, having received his training at Brooks Air Force Base, San Antonio, TX.

Airline Pilots & Gun Slingers

CW3 Roger B. Rensvold
Cairns Division
Department of Flight Training
U.S. Army Aviation Center
Fort Rucker, AL

OLE JOE WAS a CW3 and the best ASO I've ever known. His safety survey files always were current. The safety SOP he wrote for our unit became the model for all other section-sized units in Europe and requests for Xerox copies came in regularly. Our aviation safety bulletin board, his labor of love, featured four different colors of Magic Marker. Ole Joe shined his boots, saluted lieutenants and generally was regarded as the epitome of everything military. I really thought he'd enjoy flying the new NOE course that I'd helped lay out. I was wrong.

"Well, whaddaya think, Joe?" I asked as the rotor coasted to a stop. No answer. I glanced at the rigid figure in the left seat. With his right hand Joe was gripping the inertia reel locking lever—with his left the frame of the seat. I thought his gloves were about to rip across his knuckles. Below the tinted visor of his helmet his mustache was twitching furiously.

"You're crazy," he said finally. "You expect to train like that, fly like that? You want the rest of us to fly like that? You're nuts. As the safety officer of this section, I absolutely forbid it."

I was none too pleased. "Dammit Joe, we gotta fly NOE or the enemy will eat our lunches. You should know that!"

"I know nothing of the kind. That's supposition. We don't know because we haven't fought that war yet. What I *do* know is, punk kids like you will push our accident rate out of sight with this mickey mouse stuff. Don't you have any sense of responsibility?"

Joe was sincere in his own sense of responsibility. He wrote angry letters and DFs by the score, and protested himself hoarse in staff meetings, all to no avail. Our aviation section flew NOE. Joe found himself a job flying U-21s out of Heidelberg and presumably lived happily ever after, his honor intact.

I met Joe's opposite number recently, a major from the Armor School at Ft. Knox, KY. He was visiting the Aviation Center at Fort Rucker, AL and I was detailed to show him the SFTS. The buckles on his boots and the polished helmet liner suggested that he'd seen the movie "Patton" several times. Although he'd been silent throughout the tour, I felt I knew what was coming.

"So that's the SFTS. It's tremendously helpful to us in getting the initial entry student instrument qualified. Any questions, Sir?"

"No questions, Chief. One observation. It's all nonsense."

"Sir?"

"Pointless. Doesn't address the threat. There's not a burning enemy tank anywhere in it. Waste of time and money." Below the mirror sunglasses his mustache was twitching furiously.

"I can't say I agree, Sir. We do have a requirement to operate in all weather conditions, peacetime and wartime."

"Bull. Fly NOE. Weather too bad for NOE is too bad for IFR. No approach minimums. For NOE at night, put the night vision goggles on."

"Yessir, but don't you think our accident rate would go out of sight?"

"To hell with the accident rate! Stupid pilots who have accidents would be instant casualties on the battlefield anyway! You wanna join the Army, Chief? Tear up your instrument ticket, get NOE and gun qualified. Killing tanks, Chief, that's the name of the game. Killing enemy tanks."

Both Joe and the major are, of course, fictitious, but they're based on real-life types that we've all met. They represent the two philosophical extremes that we find in Army aviation today. For the sake of discourse let's say that they represent, respectively, "airline pilots" and "gunslingers."

Airline pilots dwell on the cost of aircraft, the sanctity of human life and professional pilots' parental responsibility toward their trusting passengers. Into their philosophical bag go checkrides, instrument tickets, annual writs, FEBs, Nomex and checklists. Airline pilots lead a good, comfortably self-righteous, *safe* life. They post the FLIP changes, log any flight below 3,000 feet AGL as NOE and view the next war as a

bridge we'll cross when we come to it. They have tunnel vision and can't really see the tidal wave to enemy armor we'll have to face.

Gunslingers know that the Army exists to wage war, a process in which our assets (troops and materiel) destroy, and are destroyed by, the other side's assets. The side with the most assets left after the battle is won. We are all ammunition. Gunslingers think that any training not directed specifically toward the enemy threat is a waste. Into their bag go NOE, tactical map reading, gunnery, CEOIs and radio discipline, and a lot of TA-50 gear. But they too have tunnel vision.

A head-on collision between our two fictional characters would be painful to see. ("Sir, this TOW live-fire exercise at night is suicide. As your safety officer, I absolutely prohibit it." "Chief, it'll be a cold day in hell when you prohibit anything!") Direct conflict between two true believers may be rare, but elements of the conflict pop up constantly. They are present in the minds of the staff officers who draft training programs: caution or aggressiveness, safety or realism, airline pilots or gunslingers? The conflict should be present in the mind of every Army aviator. If you can unequivocally place yourself on the side of either Cautious Joe the ASO or Major Tankeater, you've got a problem. And you *are* a problem.

Here's a scenario for the airline pilots to ponder. You're a Huey IP, SIP and instrument flight examiner. For the past 2 years you've given renewal rides, typed SOP items and posted the aviation safety bulletin board in (say) Stuttgart. Then the balloon goes up.

Your office has turned into a pup tent and your desk into an ammo crate. The Warsaw Pact forces temporarily have been halted on the north bank of the Main River. Frankfurt is burning. Can things get any worse? You bet.

The Colonel says, "Joe, the 2nd ACR has been bled white. They need scout pilots bad. You got 200 hours of '58 time a couple of years ago, that'll have to be good enough. I'm sending you up to the air cav troop. Good luck."

Good Gosh! You're qualified in an OH-58A, but not current. You've trained in accordance with your unit SOP—in fact, you wrote it. You flew at 1,000 feet, navigating off a sectional, and called it tactical training. Higher headquarters had waived your NOE training requirement after a pitched battle. All your nighttime is "field grade" night, logged within the 30-minute periods immediately after sunset. You've lived safe—until now.

Here's a nightmare for the gunslinger. You're pilot in command of an admin flight from Ft. Campbell, KY to Ft. Benning, GA, VFR at 3,500 feet. With horrifying suddenness the scattered layer below you goes broken, then solid. The conversation goes as follows:

CP: Guess we'll need an instrument approach.

P (You): Guess so. You got an instrument ticket?

CP: Nope. Just came out of the Advanced Course and I'm still working on a renewal. You?

P: Yeah, no sweat. Don't have any FLIPs on board, but I guess we can get a GCA. (If I can keep this thing right side up. Five hundred hours of snake time in the past year, and I flew all my hood with a pencil. Took my renewal ride three times, last time with CW4 Claus. Made a 80 on the Annual Writ, too. Why me, God?)

CP: Shouldn't we call somebody? Those tops are getting higher!

P: Yeah, ah—what's the frequency for Atlanta Center? Never mind, we can call them on Guard. (Maybe declare an emergency at the same time. Save Search and Rescue some time and trouble.)

* * * * *

Moral: Nobody can be *the best* in all phases of Army aviation, all of the time. But, as a bare minimum, we can be aware of what each phase requires by way of training and proficiency. By independent reading and study, plus a disciplined approach to ATM requirements, any aviator could take a lot of the shock out of the scenarios I've described. By visualizing and trying to prepare for all possible contingencies we can break out of the philosophical bags that may become coffins.

Neither an airline pilot nor a gunslinger be. Be both—an Army aviator.

GLOSSARY

ACR	air cavalry regiment
AGL	above ground level
ASO	aviation safety officer
ATM	aircrew training manuals
CEOI	Communications-Electronics Operation Instructions
CP	copilot
DF	disposition form
FEB	flight evaluation boards
FLIP	flight information publications
GCA	ground controlled approach
IFR	instrument flight rules
IP	instructor pilot
NOE	nap-of-the-earth
P	pilot
SFTS	synthetic flight training systems
SIP	standardization instructor pilot
SOP	standing operating procedure
TOW	tube-launched, optically-tracked, wire-guided
VFR	visual flight rules

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

At Last They Had Something More Than The "180"

AS YOU ALL know, tactical terrain flight is an accepted method of operation for Army aviation in today's battlefield environment. Its purpose is to enhance aviator survivability in that environment. Therefore, to achieve and maintain the proficiency for this type of operation, continuous training is a must.

Taking into consideration all the hazards of tactical terrain flight, aviators find it relatively easy to master the art of terrain flying, day or night. It is a known fact that if aviators have adequate visual reference they can then maneuver their aircraft through the earthen nooks and crannies encountered in terrain flight.

But what happens if aviators suddenly find themselves in the "soup" while in the tactical terrain flight mode? At this low altitude they do not have too many options open. They must assess the situation quickly and accurately for time is of the essence if they are to avoid a catastrophic sequence—"vertigo—spiral—crash." At this point, they are in need of a simple and workable vertical helicopter instrument flight rules (IFR) recovery procedure.

Army aviators have been subjected to reams of written material on the subject of inadvertent instrument meteorological conditions (IMC) procedures. Some of this writing has been policy and directive in nature, some has been fictional and some has been factual, such as the discussion of IMC mishaps in the Flightfax. In the latter, the participants involved were wishing that their situation could have been fictional. Therefore, for the benefit of all who participate in tactical terrain flights, this article reviews the background of the subject and attempts to instill a sense of urgency for a strong corrective program.

The need for a viable preplanned IFR recovery procedure for helicopters engaged in tactical terrain flight became evident after Army aviation's miserable inadvertent IMC accident record for fiscal years (FY) 1975 and 1976. During this period we recorded 10 inadvertent IMC accidents which killed 22 people and injured 18. Only after Army commanders and supervisors finally recognized the dangers of crews encountering IMC conditions inadvertently, and initiated corrective actions did the situation turn around. The results were most gratifying and indicative of the effects of a positive corrective policy.

During the 15 months of FY 1977 and 1977T, Army aviation recorded only one inadvertent IMC mishap. This most recent performance is creditable, but it must not be allowed to produce improper conclusions. The need for effective countermeasures to inadvertent IMC mishaps still exists if the good record is to be continued.

Headquarters, Department of the Army has issued directives and information on inadvertent IMC procedures in the past and these have been helpful to commanders who have accepted the reality and gravity of the problem. They have been most useful tools in controlling a dangerous situation, and have served as a basis for inadvertent IMC procedures implemented by forward thinking commanders. At long last, the aviators were presented with a plan that they could follow. They had something more than that famous "180-degree turn" in attempts to regain visual flight rules (VFR) conditions.

After all, the desire to maintain VFR at all costs and the limited options and procedures then available were the producers of most of the accident statistics in the past. However, some of the proposed procedures produced conflicts between unit commanders and affected Federal Aviation Administration (FAA) representatives. The demands of the military mission and the mandate of the FAA representative often were incompatible and immediate resolution to the conflict of interests was not possible. Problems inherent in each other's operational areas were not understood, and the coordination so vital to the success of the recovery procedures was less than the situation demanded.

A reassessment of goals and positions was necessary to clarify the situation. To this end, DA representatives, including U.S. Army Communications Command, U.S. Army Aviation Center and U.S. Army Agency for Aviation Safety met with the hierarchy of the FAA in November 1977 and agreement was reached to resolve recognized problem areas. As a result of the successful meeting, a DA letter dated 6 March 1978, subject: Vertical Helicopter IFR Recovery Procedures has been dispatched to the field. This letter outlines the responsibility of all major Army, Army National Guard (ARNG), U.S. Army Reserve (USAR) commands and subordinate units to develop procedures permitting the safe recovery of Army helicopters that might encounter instrument meterological conditions while conducting tactical terrain flight training in VFR training areas. Such procedures shall be coordinated with the FAA and designed to have minimum impact upon the air traffic control (ATC) system, while accomplishing the training objectives. This DA message also provides guidelines for:

- Designation of VFR tactical terrain flight training areas.
- Development of Letters of Agreement between the user and the appropriate FAA facilities.
- Development of the vertical helicopter IFR recovery procedures.
- Establishment of aviator qualifications and aircraft criteria when involved with IFR recovery procedures.

Coordination with the other major interested agencies will be assured in that the FAA has issued an order to all appropriate FAA facilities, outlining procedures and instructions to those facilities on the development of the Army vertical helicopter IFR recovery procedures. A copy of this FAA order will be made available to all major commands, ARNG, USAR commands and subordinate units.

Commanders of units involved in developing vertical helicopter IFR recovery procedures must be aware of and comply with essential guidelines for the procedures. There must be recognition of the fact that these are not routine operating procedures, but are contingency plans to be carried out after all efforts of the aviator to remain VFR have failed.

Normal service and administrative flights will not be included in the vertical helicopter IFR recovery procedures. They will continue to be handled in accordance with accepted procedures outlined in AR 95-1 and Federal Aviation Regulations on a case-by-case basis. These procedures do not relieve commanders of their responsibilities for safe operation of aircraft under their command. Commanders are not given unlimited license to schedule flight training with complete disregard for weather conditions or forecasts, and then depending on the IFR recovery procedures to salvage a critical situation.

When developing their plans, commanders are reminded that the term "vertical helicopter IFR recovery procedures" replaces the previously used "inadvertent IMC." The terms "low level flight," "contour flight," and "nap-of-the-earth (NOE) flight" continue to be a part of "terrain flight," as specified in FM 1-1. The recovery plan will have to indicate a "recovery fix" where aviators can expect to enter the ATC system. "IFR reserved altitudes" which are free of normal IFR traffic and which over-lie the tactical terrain flight training area also must be designated.

"Preplanned routes" in cases of communication difficulties will be a necessary part of the recovery procedures as will the designation of an "intermediate holding fix" to accommodate two or more aircraft which might become involved in the recovery procedure. It is apparent that close coordination with the local FAA representative is essential for the formulation and implementation of a good recovery plan.

Aviator qualifications and equipment capabilities must also be a part of the recovery procedures. Specifically, the pilot in command must be currently instrument rated in the type aircraft being used for tactical terrain flight training. The aircraft must be equipped with communication and radio navigation equipment necessary to comply with the various facets of the recovery procedures. Aircraft normally restricted from IMC flight such as the OH-58 Kiowa and OH-6 Cayuse can be configured to meet the minimum equipment criteria of the IFR recovery procedures.

For assistance in formulating the recovery procedures, coordinating with the FAA, and acquiring procedural information other than the DA guidelines previously mentioned, the DA regional representative (DAAR) located at the respective FAA regional headquarters may be contacted. With the formulation of the vertical helicopter IFR recovery procedures and its implementation by the operational unit, aviators now have a definite course of action to enable them to train properly in the terrain environment without fear of unplanned IMC flight.

The Aviation TEC Connection

1LT Bruce G. Williamson
TEC Project Officer
Directorate of Training Developments
Fort Rucker, AL

SCENE I: Early 1970s. Service member (SM) to supervisor: "Good morning Sergeant. My MOS test is coming up soon, and I was wondering if you have the study material for it?"

Supervisor to SM: "I sure do, Specialist Jones. In fact, I got it in yesterday. Hope it will help; your scores were a little low last year."

SM to Supervisor: "Yes they were, Sergeant West. That's why I wanted to get the jump on things this time. I sure wish there was a better way to study for these *?!!* tests."

Supervisor to SM: "Well, Jones, it may happen someday; but don't stand on your head and wait."

Scene II: Late 1970s. SM to learning center clerk: "Excuse me, maybe you can help. I have an SQT coming up soon, and it's taking me forever to wade through the appropriate TMs. Do you have anything else that might help in preparation for this test?"

Clerk to SM: "Yes, I think I might have just what you're looking for. Have you ever used TEC lessons?"

SM to clerk: "No, but I do remember something in the Soldier's Manual referring to TEC lessons. Are they any good?"

Clerk to SM: "You bet they are. I had a guy come in yesterday; he said at his last unit, TEC lessons were one of the main things they used to prepare for their tests and they had some super high test scores as a result."

SM to clerk: "Wow, that sounds impressive. How about letting me have a set?"

These scenes dramatize what used to be and what is becoming commonplace in the area of readiness for

MOS(s)	Task	Tasking Objectives	Lesson Number
67N(20)	Introduction to preventive maintenance service inspection (PMD) UH-1D/H.	1. Discriminate the location and extent of areas of the helicopter	600-011-6601F
		2. Identify deficiencies and discrepancies.	
		3. Learn maintenance safety rules.	
	Perform preventive maintenance service inspection (PMD) UH-1D/H forms and records.	Given equipment logbook with 2408-12, 2408-13, 2408-14 and 2408-18, the mechanic will prepare and use these forms to perform a daily inspection.	600-011-6602F&A
	Perform preventive maintenance service inspection (PMD) UH-1D/H nose cabin, landing gear, center fuselage.	Using a programed text as a guide, perform the intermediate inspection on the nose, cabin, landing gear and center fuselage areas of the UH-1D/H.	600-011-6603A
	Perform preventive maintenance service inspection (PMD) UH-1D/H pylon and engine area.	Using a programed text as a guide, perform the intermediate inspection on the pylon and engine areas of the UH-1D/H.	600-011-6604A
	Perform preventive maintenance service inspection (PMD) UH-1D/H tailboom area and power-on.	Using a programed text as a guide, perform the intermediate inspection on the tailboom area and perform the power-on checks of the UH-1D/H.	600-011-6605A
	Perform lubrication requirements as outlined in preventive	Using a programed text as a guide, lubricate the UH-1D/H as required	600-011-6606A

skill qualification tests (SQTs) in the Army of today. All because of the advent of the training extension course (TEC) lesson, service members now know what will be covered in the SQT; and if they use the TEC lessons proponent to their military occupational specialty (MOS) to study, they will be prepared to do well on the test. But, what is TEC and what makes it so important?

The Army's TEC Porgram was instituted in the early 1970s. The program originally was designed only for the combat MOSs, but it has broadened to cover most enlisted MOSs in the Army. The main purpose of the TEC Program is to develop validated, self-paced, multimedia, instructional materials.

"Validated" is the key word. The validation process in the TEC Program is an integral part of the development cycle of each lesson. It is this validation (testing of the lesson) that guarantees the lesson will actually teach.

Before a lesson can be approved by the Army, hard statistical data must be gathered showing that a certain percentage of the target audience (the people for which the lesson is designed) taking the lesson (usually 80 percent) have gained a certain amount of knowledge between the pretest and the post-test (the tests before and after the lesson) (usually 80 percent). After this data is gathered and verified, all people taking that lesson can be sure they will learn from the lesson if they are in that target audience.

The pre/post-test is an important part of the self-paced concept in the TEC lessons. Before students take the lesson, they take a test to determine how well they meet the objectives of the lesson. If they pass the test, there is no reason for them to proceed with the lesson. If, however, they do not pass the test, they must take the lesson progressing at a pace which will allow them to understand all parts of the lesson. After they complete the les-

	maintenance service inspection (PMD) UH-1D/H.	to complete the daily inspection.	
MOS(s)	**Task**	**Tasking Objectives**	**Lesson Number**
67V20	Introduction to Preventive Maintenance Services (PMS), Daily Inspection.	1. To identify location and extent of areas of the helicopter. 2. To identify deficiencies and discrepancies. 3. To learn maintenance safety rules. 4. To prepare and use DD 2408 series forms to record the PMD.	600-011-6651F
	Perform a PMS, daily inspection on the right hand cabin, landing gear and intermediate fuselage.	Using a highly illustrated programed text covering the entire daily inspection, the mechanic will perform daily inspection on an OH-58A cabin and landing gear, right side.	600-011-6652A
	Perform a PMS, daily inspection on tailboom, avionics and left side intermediate fuselage.	Using a highly illustrated programed text as a guide, the mechanic will perform the daily inspection on an OH-58A tailboom avionics and left side fuselage.	600-011-6653A
	Perform a PMS, daily inspection on the cabin landing gear left side, nose, and make disposition of deficiencies.	Using a highly illustrated programed text as a guide, the mechanic will perform the daily inspection on the OH-58A cabin, landing gear left side, nose, and make proper disposition of recorded discrepancies.	600-011-6654A
	Remove and Inspect Hydraulic Servo Actuator.	Remove a servo actuator (collective or cyclic) servo from the aircraft IAW TM 55-1520-228-20. Determine if it meets all minimum requirements for an airworthy piece of equipment.	600-011-6655
	Install Hydraulic Servo Actuator	Install either servo actuator that was removed or a like replacement item IAW TM 55-1520-228-20.	600-011-6656

son, they take another test similar to the pretest. If they pass this test, they are furnished with the lesson. If they don't pass this test, they may retake the lesson as many times as necessary.

There are three main modes of presentation that TEC uses—audio only using a standard cassett tape, audiovisual implementing a super eight film loop and cassett tape format, and video only (this media is in programed text form). All tasks are analyzed to determine the mode of presentation that would be most effective for the content of the lesson. This multimedia approach to lesson development ensures that the most efficient mode of presentation is used for all lessons.

The U.S. Army Aviation Center (USAAVNC), Ft. Rucker, AL got into the TEC Program in the summer of 1974. Initially, USAAVNC's efforts were directed toward two enlisted MOS codes—71P and 93H. The winter of 1974-75 saw USAAVNC expand its area of concern to the 67N and 67V MOS codes. After a survey of Soldiers and commanders in the field, it was decided to hold off on work in the 93H MOS. On 7 November 1975, USAAVNC's contract was signed for development of 15 lessons in the 67N, 67V and 71P MOS codes. The survey of individuals in the aviation MOSs indicated certain tasks that were considered to be more critical than others. These tasks were developed into lessons first and are being distributed to various field units.

Presently, the USAAVNC TEC Program has 90 lessons in various stages of development. A total of 50 lessons are in the development cycle for all four of the previously mentioned MOS codes. There are 40 lessons in the initial design stages in the 67N, 67V and 93H MOSs. These 90 lessons will continue to support the initially identified critical tasks. TEC lessons have proven to be the most effective teaching vehicle the Army has seen. This vehicle will move the Army closer to proper readiness for the battles of tomorrow.

MOS(s)	Task	Tasking Objectives	Lesson Number
71P	To provide the student with knowledge and skills required to dispatch VFR flights.	1. The student will review the VFR DD Form 175 for completeness and bring all problems to the attention of the aviator. 2. The student will transmit information off the DD Form 175 to the airfield control tower. 3. The student will transmit information off the DD Form 175 to the Flight Service Station. 4. The student will transmit necessary information to close DD Form 175 to Flight Service Station.	517-011-6001
	To provide the student knowledge and skills required to dispatch IFR flight.	1. The student will review the IFR DD Form 175 for completeness and bring all problems to the attention of the aviator. 2. The student will transmit information off the DD Form 175 to the Air Route Traffic Control Center. 3. The student will transmit information off the DD Form 175 to the Airfield Control Tower. 4. The student will transmit information off the DD Form 175 to the Flight Service Station.	517-011-6002
	To provide the student with knowledge and skills required to interpret aeronautical section chart symbols.	1. The student will find geographic areas and aeronautical symbols on the chart when given aeronautical chart coordinates. 2. The student will interpret aeronautical symbols when given aeronautical chart coordinates.	517-011-6003

Brigadier General William W. Ford (Ret) examines a photograph of the "Class Before One" at the ***Aviation Digest*** *at Ft. Rucker, AL. Below, General Ford while on active duty*

General Ford Visits Rucker

One of the founders of Army aviation, Brigadier General William Wallace Ford (Ret), visited the U.S. Army Aviation Center at Ft. Rucker, AL last April to conduct research for a book he is writing. General Ford visited the Aviation Museum and the *Aviation Digest.*

A long time supporter of the concept of Army aviation, General Ford wrote "Wings For Santa Barbara," an article that appeared in the *Field Artillery Journal* and was instrumental in leading to the birth of Army aviation on 6 June 1942. [See June 1974 *Digest* for a reprint of the article.] General Ford went on to establish the Department of Air Training at the Field Artillery School, Ft. Sill, OK. That organization spawned the U.S. Army Aviation School/Center [for more information see "The Army Aviation Story," Parts I and II, June and July 1962 *Digest* and "Army Aviation Hall of Fame," November 1975 *Digest*].

Tina Crumpler

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

Want Connections?

Sorry troops, but this conversation will have to be limited to oxygen mask connections. I received a telephone call from one of our worldwide aircrewmember fans with this problem. He had requisitioned Mask, Oxygen, Disposable, NSN 1660-00-592-5497 and this is exactly what he got. But now, what is an oxygen mask without connections (to the source of oxygen)? If you have the required connections, between the oxygen mask and the aircraft source of oxygen, then you should only requisition this item.

However, if you "want connections" you should requisition Mask, Oxygen, NSN 1660-00-902-5308. This will get you the above disposable oxygen mask, with the required connections between the mask itself and the aircraft source of oxygen.

Get The Message?

The AN/PRC-90 survival radio has experienced a number of problems and/or failures. The Army Materiel Development and Readiness Command (DARCOM) project officer for aviation life support equipment (ALSE) sent out a message, DRCPO-ALSE, 071458Z February 1978, Subject: Reliability and Maintainability (RAM) Performance of AN/PRC-90 Survival Radio System (Emergency Radio) Gen 78-2, asking you to test your radios and send the results to Communications and Electronics Materiel Readiness Command (CERCOM), ATTN: DRSEL-PA-E, Ft. Monmouth, NJ 07703.

Now I hear through the grapevine that many of you did not "get the message." I am told by others that did get the message that they do not have the equipment necessary to test the radio. Also, the test equipment is not authorized on the unit Modification Table of Organization and Equipment (MTOE) so the required testing was not performed.

Action will be taken to list the radio test equipment on all unit MTOEs. In the meantime, Mr. Jim Lewis, AUTOVON 992-3987/3919, the CERCOM manager of the radio, advises that all aviation units with the AN/PRC-90 will be issued the required test equipment, once he has received your requisition.

One-Shot Sleeper

The Bag, Sleeping (SRU-15/P), NSN 8465-00-479-1792, will keep you warm and comfortable in an emergency while you have sweet dreams of PEARL. However, this sleepng bag is vacuum packed and sealed by the manufacturer.

Once the sleeping bag has been opened, and this should only be in the event of an emergency, it cannot be repacked in its original size container. I suggest that you use a sleeping bag which has been opened for training sessions or demonstrations on your ALSE. But remember, the sleeping bag is a one time emergency use only, or a—one-shot sleeper.

Cool—Clear (Survival)—Water

If your survival kits are dry and you attempt to requisition Water, Drinking, NSN 8960-00-243-2103, you will find that "your water has been cut off." However, do not despair because there is a replacement for the above stock number, which will "turn your water back on." The new replacement item is Water, Drinking, NSN 8960-00-916-4201.

My article in the January 1978 issue of the *Aviation Digest* listed the manufacturers address of the Fire Starter, NSN 9920-00-999-6753. This manufacturer has since moved on.

The new address is now: Lifesaver Products Inc., 6210 Wilshire Boulevard, Los Angeles, CA 90048. For those of you who may want to call this manufacturer regarding your fire starter or to obtain refill kits, the area code is 213 phone number 936-8296.

Story Of The Elusive Flare

Once there was a flare which was called the Signal, Illumination NSN 1370-00-490-7362. Normally you will find this flare in your SRU-21/P survival vest. This flare will provide you with a great ray of hope if you ever have an emergency.

The U.S. Air Force once provided these flares to the Army. Now this responsibility has been transferred to B14 (U.S. Army Armament Command, Rock Island, IL). The Army Master Data File (AMDF) also will advise you to send your requisitions to B14 for this flare.

However, B14 does not stock the flare at this time. Action is being taken to have B14 procure this flare for you. Be patient with us—we hope to have this one solved soon.

ALSE Quiz

Which item of aviation life support equipment has been the most instrumental in the rescue of the downed aircrewmember.

a. Survival Radio
b. Signal Mirror
c. Signal Flare
d. Strobe Light

(See bottom of next page for answer)

ATC ACTION LINE

UNITED STATES ARMY AIR TRAFFIC CONTROL ACTIVITY

OUR OPERATIONS office has received copies of the new Federal Aviation Administration (FAA) Airport/Facility Directory (A/FD). We have been using the FAA Airman's Information Manual, Parts 2 and 3, as a supplementary source to the official Department of Defense (DOD) military flight information publications (FLIP) products system. Aren't we getting some repetitious information in the form of both military and civil documents? Does this policy of using other than official FLIP documents as a secondary source still prevail?

The new FAA Directories (A/FD), seven volumes, as any other civil product, continue to be a supplementary source of airfield data to the DOD triservices FLIP system. The A/FD booklets do not carry military facilities but do convey joint use airfields where one or more military units may be tenanted. In addition, many civil fields are carried which are of occasional interest to one of the air services and, therefore, do not warrant publication (duplication) in the triservices FLIP instrument flight rules (IFR) or visual flight rules (VFR) directory.

Optimum use may be made of the new FAA A/FD series under a selective distribution criteria which permits issuance of one or more of the available seven volumes conforming to U.S. coverage. Depending on the airfield mission, a master reference set plus specific additional copies covering the primary (geographical) operating area may be ordered to ensure economy and efficiency in the use of these supplementary booklets.

To initiate the program an interim selection and quantity of A/FD documents was established for a distribution pattern based on the general geographic area of each airfield account. Review of this initial criteria will be made in accordance with actual needs. Optimum benefit from this new supplementary flight data source can be obtained with the cooperation of each ordering officer using this established criteria to achieve the most economical distribution pattern.

Readers are encouraged to send questions to:

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

C-E Maintenance Proponency At Fort Gordon

IN A RECENT U.S. Army Training and Doctrine Command (TRADOC) action the U.S. Army Signal Center, Ft. Gordon, GA, has been assigned the responsibility for development of maintenance concepts and doctrine for communications-electronics (C-E) materiel (including communications, SIGINT/EW, COMSEC, ADP, non-integrated radar, avionics, position-locating and navigation equipment and test, measurement and diagnostic equipment (TMDE). A new Directorate of C-E Maintenance Management (ATZHMM) has been established to review/coordinate maintenance support planning for developmental C-E equipment/systems and to perform combat developer actions with regard to general purpose electronic TMDE, to include automatic test equipment (ATE/ATSS).

From Adjutant General, U.S. Army Signal Center and Fort Gordon

PEARL'S Answer: b. Signal Mirror

First AH-1 User's Conference

THE TRAINING AND Doctrine Command System Manager—Attack Helicopters, hosted the first AH-1 User's Conference at Ft. Rucker, AL from 11 to 13 April. The participants reviewed the Product Improvement Program (PIP) recommended by the AH-1 Priority Subsystem Suitability Intensive Review ("PASS IN REVIEW," *Digest,* April 1975) and examined actions necessary to ensure a fleet of battle-ready Cobras to complement the AH-64, advanced attack helicopter (AAH) on the modern battlefield.

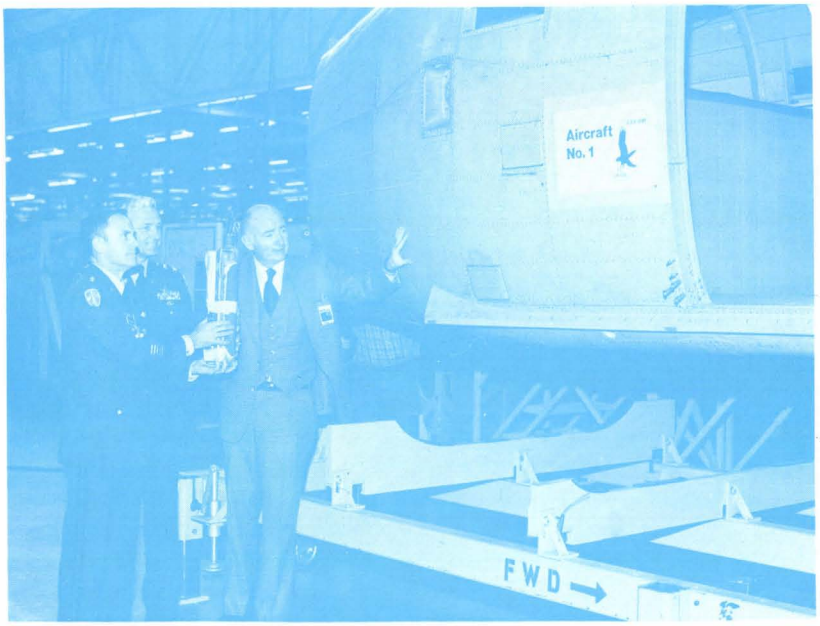
The User community identified the following as additional improvements needed to enhance the Cobra's ability to fight as a full-time member of the combined arms team.

- Night Capability which will provide the ability to engage targets with the primary weapons systems without external illumination and terrain flight at night and during adverse weather to/from the area of engagement.
- Weight Reduction which will allow the addition of the required night capability without the deletion of ordnance or fuel. Multiplexing is viewed as the best approach to achieving the desired weight reduction.
- An Aid to NOE Navigation which will reduce reliance on handheld maps, particularly at night.
- An Improved Performance Engine which will increase hot day performance if it is determined to be cost effective and affordable.

The TSM-AH intends to host user-developer conferences as often as required but at least annually to review the AH-1 program.

LTC Joe Moffett
Office of TSM-AH

Black Hawk Begins Final Assembly



Major General Story C. Stevens (L), commanding general, U.S. Army Aviation Research and Development Command, lowers the fuselage of the first UH-60A Black Hawk helicopter onto its final assembly fixture at Sikorsky's Stratford, CT plant. Colonel Richard Kenyon (C), Army program manager—Black Hawk and Mr. Eugene Buckley (R), Sikorsky Aircraft vice president—Black Hawk program, look on

MOST AVIATORS associate U.S. Army aviation with flying at altitudes that seldom exceed the tops of trees. Distances are measured in grid squares instead of miles and airspeeds often are nothing more than fast hovers.

Major Robert L. Stewart (photos) is familiar with that aspect of Army aviation, but he also knows another side that his contemporaries can only fantasize about. Soon he will train to soar at velocities many times the speed of sound through regions where distances are measured in light years. When he officially begins training in July for the 1980 space shuttle launch, he will become the first member of the U.S. Army to be selected for the National Aeronautics and Space Administration's (NASA) astronaut program.

Major Stewart, 35, is an Army test pilot assigned to the U.S. Army Aviation Engineering Flight Activity at Edwards AFB, CA. He is a graduate of the U.S. Navy Test Pilot School and holds a masters degree in aeronautical engineering from the

Army's First Astronaut

by John L. Davis, Staff Writer

University of Texas at Arlington. Major Stewart was selected as one of 35 astronaut candidates after competing with more than 8,000 military and civilian applicants for the coveted NASA assignment.

Since 1974 Major Stewart has served as an experimental test pilot on such projects as the AH-1R* Improved Cobra gunship, AH-1 and UH-1 infrared (IR) suppressor and the YUH-60A Black Hawk. He also was project officer and senior test pilot for the YAH-64 advanced attack helicopter. Now he is chief of the Flight Activitiy's Integrated Test Systems Office at Edwards AFB.

Major Stewart was commissioned in 1964 after completing the Reserve Officer Training Corps program at the University of Southern Mississippi. An Air Defense Artillery Officer, he received his flight training at Fort Wolters, TX and Fort Rucker, AL. Major Stewart served overseas tours in Vietnam and Korea.

He will report to the Johnson Space Center at Houston, TX in July.

*A specially modified AH-1G with an upgraded engine. Only one exists.