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AVIATION DIGEST

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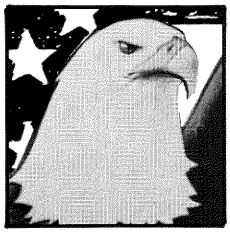

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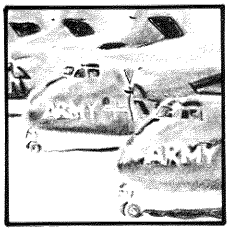

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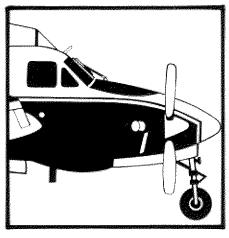
Cover: **The last two articles of the 1982 Army Aviation Systems Program Review (AASPR) series, "The Training Panel" and "The Materiel Panel," begin on pages 3 and 9**



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Honorable John O. Marsh Jr.
Secretary of the Army

Richard K. Tierney
Editor

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

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

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

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ACCIDENT FREE IN '83—As they rest here in their oversized type, the expression is meaningless, just words, a powerless collection of letters and numerals. But if we will just adopt them as our personal slogan, if each and every unit, if each and every crewmember in Army Aviation will launch their ***own*** individual crusade against accidents, then we can be free of crippling, killing, destroying ***needless*** aviation mishaps in fiscal year 1983—and all the years to come!

General John A. Wickham Jr., our vice chief of staff, shares our great concern about the FY 1982 aviation accident rate and has pointed out a number of things we should do to reverse the trend. In a recent message, he has directed that "a systematic search for safety hazards in all areas of aviation safety and at all levels of command" be conducted and that "causes of all accidents, not just Class A accidents," be examined. He points out that more than 70 percent of all aviation accidents involved human error. Eighty percent of those errors were directly attributable to the flight crews while some were traced to a commander's lack of proper supervision.

Some actions that ***can and must be taken now*** by commanders, General Wickham writes, are the separation of marginal enlisted personnel, the use of flight evaluation board procedures to police the warrants and the officers, the use of the UCMJ for flagrant violations of Army flight regulations, a crackdown on crewmembers who abuse alcohol and drugs, and an increase in aviation safety awareness to involve division and installation commanders.

General Wickham said, "I want to emphasize that our safety analysis concludes it is not, repeat, ***not*** tough training or increased NOE flying that is causing accidents . . . . Further, the cause cannot be placed at the door of inexperienced aviators. The profile of the average pilot who had an accident is 4.3 years' aviation experience and 1,300 hours.

"All of us share responsibility for the high investment in our crews, maintenance system, and costly equipment. Thus, we are all involved with aviation safety. Your active interest and solid participation is essential if we are to reverse the upward trend in aviation accidents."

While General Wickham's message is specifically addressed to the MACOM commanders, his thoughts are directly applicable to all of us because safety is a personal matter.

Safety has to be a cumulative effort made up of each person's contribution. We cannot afford to march to a different drummer! We all have to be dedicated to making ACCIDENT FREE IN '83 a living slogan, not just a group of words.

All of the foregoing is not to slight the excellent articles contained in this ***Digest.*** You'll enjoy Major General John R. Galvin's report on "The Training Panel" and Major General James P. Maloney's on "The Materiel Panel" as the last two parts of our Aviation Systems Program Review coverage. And you'll learn more about the aviation maintenance career management field in "CMF 67 Update" by Captain Charles N. Avery and about essential knowledge that will enable you to live through chemical warfare in "NBC Survival—A Matter of Attitude" by Chief Warrant Officer, CW3, Ernest D. Kingsley. Finally, we have part 5 of our Army Aviation history series by Mr. Dick Tierney, longtime editor of the ***Digest.*** This series has been quite popular with our readers and gives a splendid audit trail from 1942 to 1982. So read on, you will enjoy and learn from this issue and those of future months.

And remember to personally be **ACCIDENT FREE IN '83!**

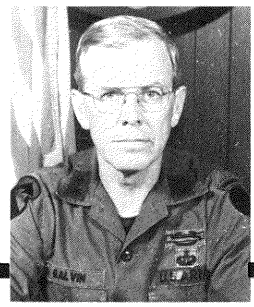
Major General Carl H. McNair Jr.
Commander, U.S. Army Aviation Center
Fort Rucker, AL

Army Aviation Systems Program Review '82

The articles on pages 3 and 9 conclude the *Aviation Digest's* coverage of the 1982 Army Aviation Systems Program Review. The first article in the series, an overview about the development of Army Aviation, appeared in the June issue. July's article covered concepts, doctrine and tactics and September's discussed organization and force structure. Copies of any of this series can be obtained by writing to Editor, P.O. Drawer P, Ft. Rucker, AL 36362.

The Training Panel

Major General John R. Galvin
Commanding General
24th Infantry Division
Fort Stewart, GA
Panel Chairman



THIS PANEL (figure 1) examined the training of U.S. Army Aviation forces in the context of the combined arms team in the AirLand Battle and discussed, investigated and evaluated deficiencies in aviation training as determined by the Army Aviation Mission Area Analysis (AAMAA). It identified 24 overall aviation training deficiencies, of which 11 major deficiencies were referred to the panel. In the course of its investigation, the panel accepted, collated, referred or rejected specific issues to arrive at five issues most in need of further resolution (figure 2).

Institutional Training Base

While addressing the training issues individually, it became clear that the deficiencies are, at least in part, the result of a much larger and more all-encompassing training problem within Army Aviation. In order to place the Training Panel issues and proposed solutions in perspective, a discussion of this larger problem is needed to understand the manner in which the panel addressed individual issues.

At any of the branch schools there is a direct tie-in between the training which takes place at the basic and advanced courses and the creation and continual evaluation of training literature. Subject matter experts who write the bulk of the training material are also instructors. In addition, they normally contribute to combat development and doctrinal matters. If, as at present, there is not an institutional base within aviation and a corps of instructors teaching tactical, materiel, logistical and administrative subjects, as well as those associated with flying, it is impossible to train and to create the training publications that are required for aviation—except by farming them out to one of the branch schools. Consequently, the quality of training suffers from a lack of complete integration of flight training, tactical unit, and individual training and training literature.

Figure 3 depicts the very important interplay which takes place between the students in the basic course (but more especially in the advanced course) and the cadre of instructors. The student comes to school bringing experience from field units and hands-on expertise. In the communication process between instructor and student, the instructor benefits from the student and the student from the instructor. This is fundamental to the very practical reasons which underlie the necessity of the long duration basic and advanced courses at any school rather than simply a series of short training experiences such as pre-command, refresher or other relatively short courses that specialize in a particular skill such as flying. This is especially true of the advanced course, which is the basis and heart of all of our branch schools. Without the branch advanced courses we would not have a well-rounded cadre or the necessary plant and facilities or the ability to plan, budget and provide the administration that is so necessary to our schools.

The rationale for any combat arm of the Army is keyed to a principal tactical system (which, in the case

FIGURE 1: TRAINING PANEL

MG GALVIN (CHAIRMAN)	CG, 24th ID, FORSCOM
MG PENDLETON	DIR, J-3, REDCOM
BG MOLINELLI	ACTING DUSD (TWP), USDRE
BG SUNELL	CG, USATSC, TRADOC
COL O'NEIL	ACTING DOT, DCSOPS, DA
COL ESTES	DTD, USAAVNC, TRADOC

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FIGURE 2: TRAINING PANEL ISSUES

- COMMISSIONED OFFICER AVIATOR TRAINING
- INTEGRATION OF ARMY AVIATION INTO COMBINED ARMS TRAINING
- TRAINING DEVICE DEVELOPMENT
- RANGE ADEQUACY FOR TRAINING
- SPECIAL ELECTRONIC MISSION AIRCRAFT TRAINING

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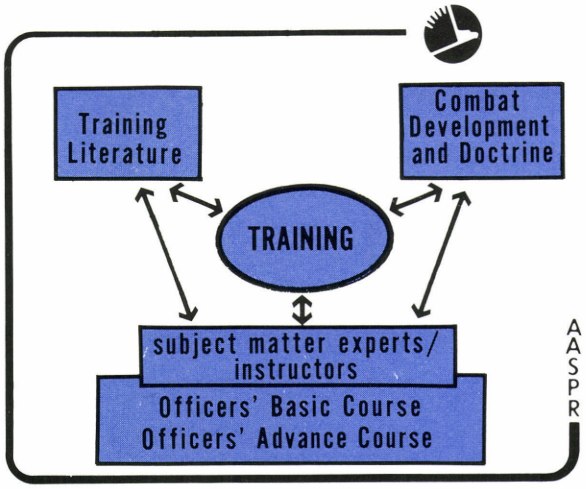


FIGURE 3: TRAINING BASE INTERPLAY

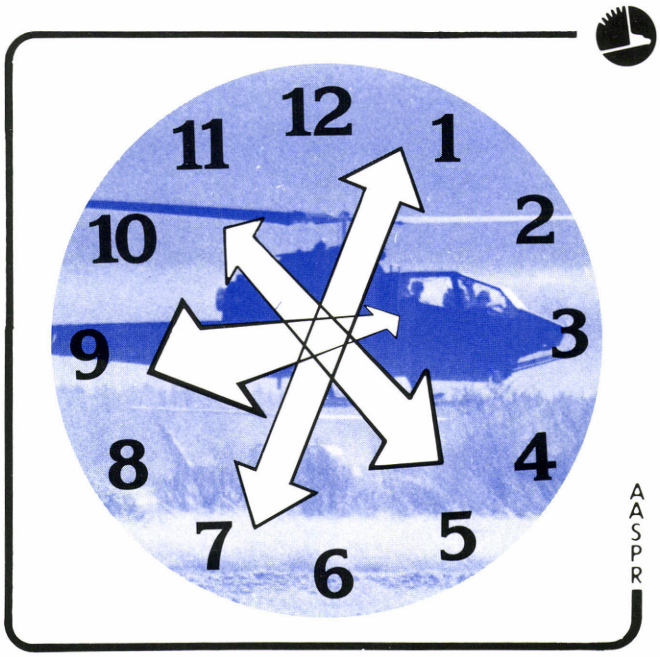


FIGURE 4: BATTLEFIELD DIMENSIONS

of Army Aviation, is the helicopter). In a broader sense, Army Aviation accentuates the dimension of vertical space and the critical aspect of time on the battlefield (figure 4). Just as the tank has required specialized skills and new tactics, weapon systems such as aeroscout, attack and assault helicopters have unique characteristics which require specialized skills and unlike the tank also require a three-dimensional (omnidirectional) tactical approach to fire *and* maneuver. To meet this need in the past we have tried to train assault helicopter unit officers—since they move infantry—at the Infantry School. Likewise, attack helicopter unit officers—since they had a cavalry relationship to begin with—continue to be trained at the Armor School and so forth. So we have fractionalized a tactical area which, by its nature, should be consolidated in a single arm. It is quite apparent today that aviation cannot be managed by any single one of the other arms. That is the primary reason it has been broken up into instruction at several places. Yet, Army Aviation is a combat arm alongside Infantry, Armor, Artillery and others. It possesses the platforms for fire and maneuver in the same kind of combination that is possessed by the other combat arms. Just as each combat arm has certain unique characteristics, aviation has the vertical dimension in which it is able to employ its purely tactical weapon systems in the same ground envelope as the other combat arms with the same principles of firepower and mobility and the same requirements for command, control, communication and training.*

Army Air Corps/Dual Qualification

Many critics of an aviation branch draw the analogy to earlier days when the Army Air Corps "drifted away" from the Army and became the Air Force. This analogy may not be as solid as it once seemed. The Air Force was created because in addition to *tactical* requirements for air support there was an overriding *strategic* requirement. Army Aviation, on the other hand, is entirely tactical and (with the exception of such actions as self-deployment for selected aircraft) it is of no strategic consequence, although it can add significantly to the internal Army strategic and deterrent capabilities. As General John W. Vessey Jr., now Chairman of the Joint Chiefs of Staff, has stated, Army Aviation trains ground troops who fly their fighting vehicles and operate in the ground environment as a combat arm of the Army alongside the ground maneuver arms. An old philosophy says that aviators, if they are good soldiers, should be able to operate in one of the other branches as well as in aviation. There are many examples today of successful officers who have done precisely that, and quite often they are the proponents of the present system which divides aviators among the carrier branches. However, the increasing technological challenge of aviation has made it more and more difficult for officers to master their professional requirements under the double burden of two, and in some cases three, branch responsibilities. Those aviator officers who have attained high rank today began their careers at a time when Army Aviation was infinitely smaller in size and much more limited in scope

*For a detailed discussion of weapons systems comparisons, watch for an upcoming article, "The Best Weapon: WISAWIS"

and when "training" was essentially commercial flight instruction. The Army of the late 1950s and early 1960s allowed officers to spend a good deal of time at company grade levels where they had the opportunity to command—and to learn—in both aviation and ground units. Careers at company grade move more quickly now, and the dual ground-aviation command pattern is rarely possible. There is also little time in officer careers to allow service and personal development both in the air and on the ground. The scope of aviation has grown in terms of technology and mission. An aviator now has to learn more—and keep learning more—in order to stay current. We all should recognize that the world of Army Aviation has changed, that what might have been valid 20 years ago is no longer necessarily so, and that biased analogies tend to break down under the scrutiny of logic. The bottom line is that an attack helicopter pilot today is performing many more complex things than did an L-19 (O-1) Bird Dog pilot or an OH-13 Sioux pilot just a few years ago.

Aviation Branch School

All of this is inextricably related to the question of aviation training. Suppose we look at what an aviation school could do. It could concentrate aviation doctrine and tactical training in one place instead of in several schools. Aviation doctrinal and training requirements can be prioritized by a single proponent (the school), and the resources necessary to produce this material can be more simply and accurately budgeted and justified. As has been pointed out, it is almost impossible to produce high quality instruction without a permanent cadre and student body that stays together long enough to constitute an appropriate environment for learning. Very few, if any, of the serious training problems of Army Aviation can be addressed until we solve the problem of the lack of a single aviation institutional base, and this seems directly related to the question of an aviation branch.

In the past, training voids have been readily identified and various Army branches and agencies moved to address them. Progress has been made to improve Army Aviation training and the closely related areas of doctrine, tactics, organizations, force structure and materiel management. The participating branches and agencies have performed as well as could be expected. Yet the sophistication of the equipment and attendant tactical employment continue to make quantum leaps. The complexity of the battlefield grows geometrically, and Army Aviation's ability to keep pace today, with the realities dictated by an extremely challenging wartime environment, falters under management by a system of diffused responsibility. With that perspective, the five training issues and opportunities follow:

The first issue addressed commissioned officer aviator training. Eighty-five percent of the commissioned aviators are accessed directly into the service. As Specialty Code 15 aviators, they attend a designated carrier branch basic course (that is, Benning, Knox, Sill or Bliss), then move to Ft. Rucker for flight training. This is followed by an assignment which is normally dependent upon the type aircraft qualification. Advanced course attendance is more than likely at the same location as the individual's basic course. What is lacking here is that aviators are not being trained by an aviation school cadre to lead and fight in aviation units. Flight training for both commissioned and warrant officers is technically or functionally oriented; that is, they learn how to fly the aircraft. The officer basic and advanced courses currently teach attendees how to operate in one of the branches.

When speaking of training commissioned aviators, a related question arises: "What about aviation warrant officers and their training?" Although issue one, as stated, deals only with the commissioned officer aviator training, a few words about the aviation warrant officer are appropriate. Aviation warrant officers also need tactics and combined arms training to some extent. Although aviation warrant officers now have an institutional base in terms of basic course (the warrant officer development phase within the Initial Entry Rotary Wing Course) and advanced course (the Aviation Warrant Officer Advanced Course), the tactics and combined arms training necessary to ensure successful employment of Army Aviation in the combined arms team are lacking in that instruction. The resolution of commissioned aviator training can reasonably be expected to have a favorable impact on resolving similar problems for the aviation warrant officer, but additional efforts to shore up this training will be required.

Figure 5 lists but a few of the things aviators are not being taught. These and other areas are currently under analysis by the U.S. Army Aviation Center at Ft. Rucker, AL, and a refined task list of what aviators should be taught is being developed to improve future aviator training. Together, the Infantry and Armor Centers are designing aviation tracks for future implementation in their respective officer basic and advanced courses. We are unsure at this juncture of the degree to which this will fill the total aviator training void, but it should help.

The Training Panel recognized a number of problems in aviation training that seem connected directly to the lack of an institutional base, or a heart—a home—for aviation individual and collective training. Therefore, the recommended solutions the panel proposed are based on the long-term assumption that the Army should establish an aviation training institution with

- LEADERSHIP TRAINING—NOT AVIATION UNIT SPECIFIC
  OFFICER & WARRANT OFFICER INTENSIVE
  ATYPICAL ENLISTED PROFILE
- AVIATION UNIT MANAGEMENT
  FLYING HOUR PROGRAM
  AVIATION UNIT TRAINING
- TACTICAL EMPLOYMENT OF AVIATION
  AN 'ADD-ON'
  NOT FULLY DEVELOPED

AASPR

FIGURE 5: VOIDS—AVIATOR TRAINING

aviation basic and advanced courses for commissioned officer aviators and appropriate parallel training for warrant officer aviators. Decisions to reach this goal need not be irreversible but should be geared to near-term and mid-term time frames. This is to say, an evolutionary rather than revolutionary approach is the desired course. In the early phases, aviation doctrine and organization proponency can be aggregated at the aviation institution. Proponency for all training can follow as the institution is prepared to accept it.

In the 1982 to 1984 time frame, review of education and training of officers to determine company grade, field grade and warrant officer aviator tasks should continue; efforts to shore up carrier branch basic and advanced courses with aviation tracks should be intensified to ensure early implementation; the Initial Entry Rotary Wing program of instruction should be realigned to teach more combined arms and aviation unit tactics and leadership subjects; and, finally, milestones and the resources required to establish an aviation basic and advanced course at the Aviation Center should be established under an aviation branch with appropriate central proponency.

COMBINED ARMS

No less far-reaching than the first issue, the second—combined arms training—involved the core of an officer's education. However, current training programs and literature have not adequately integrated aviation. Specifically, the proponent branch officer basic and advanced courses do not adequately develop the application of aviation. The Combined Arms Center at Ft. Leavenworth, KS, recognizing this need, is progressing through a 3-year curriculum modification program to ensure that the Command and General Staff Course fully addresses all elements of combat power.

As a stopgap measure, 19 aviation shared tasks (figure 6) have been developed and are being incorporated into branch basic and advanced courses. These are tasks which all officers should know how to perform. Since our original analysis of this area in 1979, training center commanders have assisted immeasurably by increasing their instruction in aviation subjects up to fourfold.

In a separate but related effort, the Combined Arms Center recently completed a combined arms sufficiency study to determine in a systematic fashion which subjects should be identified as combined arms subjects and what constitutes a sufficient level of proficiency in these subjects for company grade officers.

Among more than 160 areas evaluated in this study, Army Aviation was one of eight subject areas where the sufficiency level indicated inadequate attention was being given. Additionally, most of the other areas (figure 7) are not of the same category of importance as aviation. Although progress continues to be made to shore up this training void, the Training Panel questioned whether we are moving far enough and fast enough in training the combined arms team to fully capitalize on and employ Army Aviation. The initial lack of aviation unit training facilities at the National Training Center was symptomatic of this deficiency, and those facilities are being modified to include aviation forces (by direction of General Vessey during the AASPR-82). How we train is how we will fight; so the opportunities to solve this deficiency rest in intelligent application of aviation in combined arms scenarios and consistent employment of aviation as an integral part of the combined arms team.

TRAINING DEVICES

The third issue concerned training device development. Historically, training devices, especially flight simulators, have routinely been introduced several years after the aircraft was fielded. So development programs have not been sufficiently responsive to support the introduction of new aircraft systems. Additionally, initial design of training devices often has not accurately represented the functions of replicated aircraft systems. Although the Army's goal is to field training devices concomitantly with the prime system, we have not been able to accomplish this. But the following actions could rectify training device development deficiencies:

- Earlier interface between training developers and other life cycle management participants.
- Update and consolidate life cycle systems management model and training device publications.
- Fund training devices (less flight simulators) with the same priority as the parent aircraft and designate the prime systems project manager

responsible for their development.

- Establish a method for more intensive management of the flight simulator program.
- And, finally, fund the Aviation Training Research Simulator (ATRS) project.

TRAINING RANGES

Issue four examined range adequacy for training. Given the training the Army is required to conduct, this issue concerns the adequacy of the various kinds of training ranges. Force modernization (new combat vehicles, combined arms interface) requirements have placed new demands on commanders who must provide for the greatly increased capabilities of weapons and support systems. In aviation's case, this means new considerations must be made for the establishment of training ranges for the AH-1S fully modernized Cobra, the AH-64 Apache with its HELLFIRE missile and laser designator, and the AHIP Scout with its laser designator. Specifically, our ranges need to be more realistic in design and usage and meet these minimum requirements for a modern, well-designed range:

- The targets should realistically appear, move and respond to fire.
- The effect of exposure to enemy fire must be accurately assessed.
- Our forces should be able to maneuver and fire as they would in combat.
- Casualty assessment of both forces must be immediate.
- Weapons characteristics must be duplicated realistically on the range.

Obviously, neither an engagement simulation range nor a live-fire range alone will satisfy all of these requirements. The U.S. Air Force recognized this deficiency years ago. Its study of aircraft losses over North Vietnam reflected that 80 percent of the losses were experienced during the first 10 sorties. Therefore, a training complex was developed at Reno, NV, where the Air Force trains its pilots to get their first few realistic wartime sorties under their belts in order to be better prepared for war. This is "Red Flag."

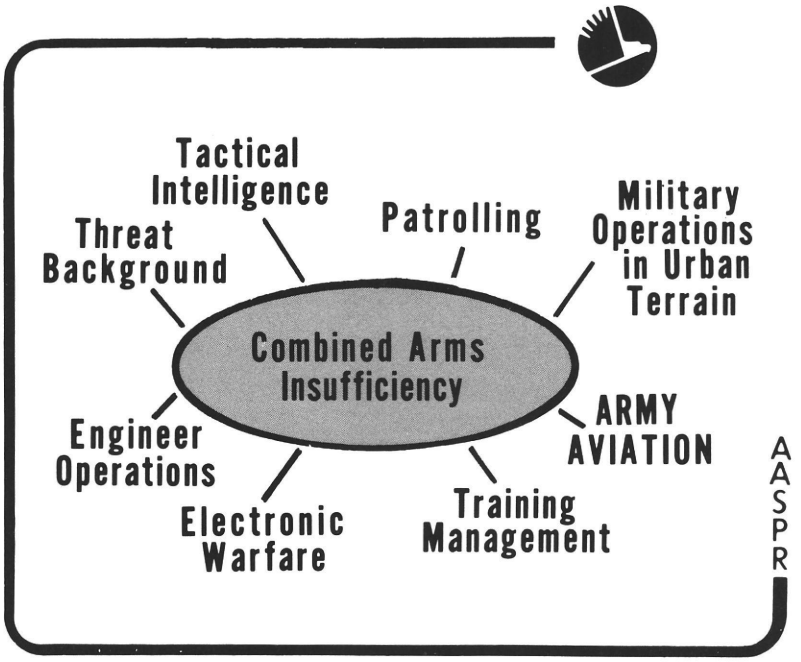


FIGURE 6

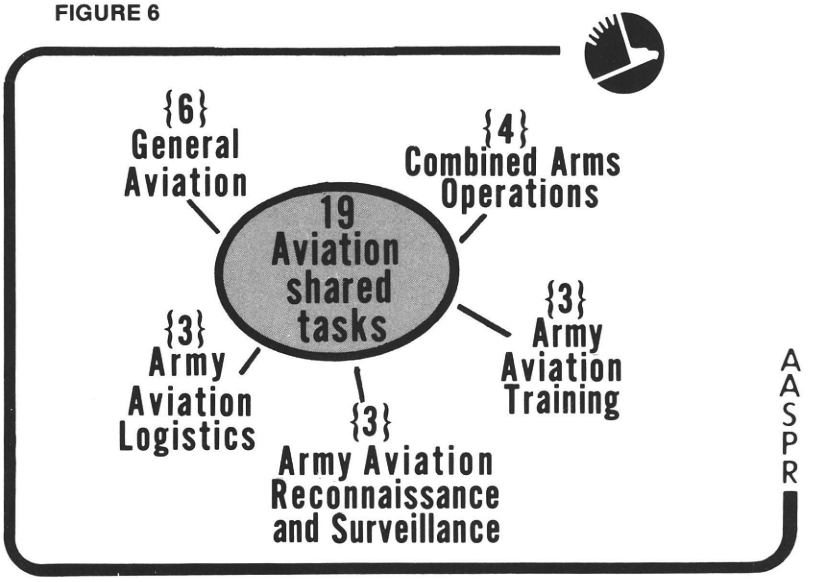


FIGURE 7

Opportunities to address this issue involve U.S. Army Training and Doctrine Command's (TRADOC's) Directorate for Army Ammunition, Ranges and Targets (DAART) which was recently formed to respond to the Army's live-fire range needs. DAART has proposed a system of multipurpose range complexes (MPRC) for simultaneous live-fire exercises for all members of the Army's combined arms team.

Additionally, an engagement simulation system is required to fill the other range requirements for real time, force on force and casualty assessment. The Multiple Integrated Laser Engagement System (MILES) technology now in the field will provide a good capability for local training, especially when the Air-to-Ground Engagement System

(AGES) is fielded next July to provide aviation simulation. However, the Aviation Center has both training and testing requirements; yet Ft. Rucker is not large enough to accommodate an MPRC. So, because of unique aviation requirements, more sophisticated options such as the technology of the Mobile Automated Field Instrumentation System should be investigated as well as MILES and the possibility of an abbreviated MPRC.

The fifth and last training issue is related to Special Electronics Mission Aircraft (SEMA) training. This issue is an illustration of the concerns expressed earlier regarding fragmentation of aviation responsibilities. Special electronic mission aircraft are unique in that they employ tactics, techniques and equipment requiring skills which currently are not taught in their entirety either in flight school or at the U.S. Army Intelligence Center, Ft. Huachuca, AZ. We are doing well with the basic pilot training and across the board in OV-1 Mohawk training but are far behind on the other SEMA systems because most of the SEMA aviators are being trained on the job by others who were also trained on the job.

The panel recommended that a training course be developed, resourced and implemented at Ft. Huachuca for SEMA aviators. The course should teach the SEMA systems and the combined arms aspects of SEMA employment, while the Aviation Center will continue to conduct basic aircraft qualification for the immediate future. Further, TRADOC's ongoing efforts to determine the degree of consolidation of special electronic mission aircraft and systems training should continue and possibly parallel the existing system for medical aviation training. We are moving in the right direction through increased communication and coordination between the two centers, TRADOC consolidation efforts and development of a generic special electronic mission aircraft.

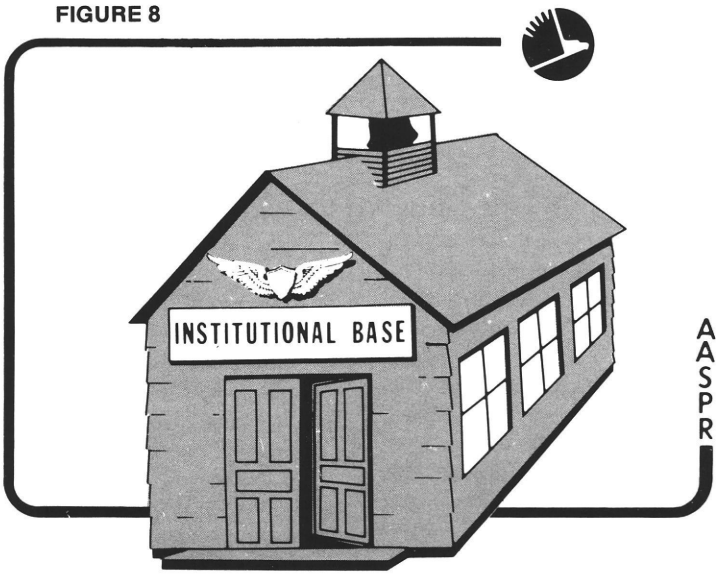
Aviation Branch Centralization

In reviewing the major training issues the panel recognized a larger problem in Army Aviation training that seems connected to a lack of an institutional base where basic and advanced courses exist to meld aviation training for aviators, much the same as is currently done for Infantry, Armor, Field Artillery, Air Defense Artillery and Engineer officers (figure 8). The panel felt that the best way to teach aviators about aviation and its combined arms application is to do it where the collective experiences of the combat arms can be brought together, where instructors can become true training and doctrinal experts in three-dimensional aspects of the AirLand Battle and pass that on to future students. We must continue to think of Army Aviation and airmobility as being all-inclusive of the three dimensions and other battlefield functions of combat; otherwise we will never develop the full possibilities of our attack helicopters and we may overlook the enormous potential of a fully rounded airmobile force.

To realize the full potential of Army Aviation, the panel felt that centralization and an institutional base for Army Aviation cannot but help improve not only Army Aviation training but also the Army's force modernization efforts, mobilization planning and overall combat readiness. The Army has been creeping up on this problem for a number of years and the Training Panel bracketed this fundamental issue. A logical approach to solve this evolutionary problem is one of continued evolution where aviation doctrine, tactics, organization and force structure, followed by training, are centralized over time. Decisions made to achieve that end are not irreversible but must be based on a commitment to a long-term assumption that a need exists for centralization of aviation branch proponency.

NOTE: My sincere appreciation to COL Frank Estes, director, Directorate of Training Developments, U.S. Army Aviation Center; LTC John Deryck; LTC Jerry Kemp; LTC Glenn Allen; MAJ Al Davis; MAJ Josef Reinsprecht; and, of course, the panel members for their contributions.

FIGURE 8



The Materiel Panel

Major General James P. Maloney
Commanding General
U.S. Army Air Defense Center
Fort Bliss, TX

During the conduct of the AASPR-82, Major General Maloney was director, Weapons Systems, Headquarters, Department of the Army

DURING THE conduct of the AASPR-82 at the U.S. Army Aviation Center, Ft. Rucker, AL, the Materiel Panel examined Army Aviation materiel systems and proposed opportunities for solutions to correct deficiencies, to the senior leadership of the Army.

The Materiel Panel (figure 1) membership comprised a thorough mixture of expertise from Headquarters, Department of the Army (HQDA), U.S. Army Materiel Development and Readiness Command (DARCOM), U.S. Army Forces Command (FORSCOM) and U.S. Army Training and Doctrine Command (TRADOC). The panel was in consensus on the issues. This is noteworthy because by far the greatest number of deficiencies (56 of 77 identified) by the Army Aviation Mission Area Analysis (AAMAA) were in the generic area of materiel and encompasses the entire realm of aviation—from high dollar major systems to those small, relatively inexpensive items of individual aircrew equipment. The panel reviewed each of the 56 AAMAA materiel deficiencies; isolated the most important; placed them in our order of priority; and presented, to the review chairman, opportunities for corrective action. Despite the need for programs such as those for the UH-60 Black Hawk, CH-47D Chinook, AH-64 Apache and AHIP Scout—the large and visible things—there are other issues equally as important. Important in the sense that they will enable our aircraft and aircrews to survive and fight again another day and to conduct sustained combat.

The panel felt six of these were critical to our aviation battlefield capability and selected them for elevation to the review forum (figure 2). We will discuss each of them in turn—the issues, their related subissues and the panel's recommended solutions oriented to the near (current to 1983), mid (1984 to 1988) and far (1989 and beyond) terms.

The panel's recommended opportunities for solution will be, except where specifically noted, couched in terms of a required capability. Therefore, costing will not be discussed, only the need for a capability will be articulated. Furthermore, it was not the panel's intention to subvert the TRADOC priorities program but rather to single out and draw attention to six generic issues critical to Army Aviation's battlefield capability. It will be up to the Army community and acquisition system to determine priorities and the best hardware item to fill the stated and approved user's need. *One further point, as we evolve to a truly concept-based requirements system, it becomes increasingly important that we have a central thrust to aviation concepts, doctrine and training so that resulting aviation materiel and user representation are not fragmented among the combined arms.* In this regard, the Materiel Panel supported LTG Jack V. Mackmull's Concepts, Doctrine and Tactics Panel (July 1982 *Aviation Digest*) and MG John R. Galvin's Training Panel initiatives (page 3 of this issue).

The first issue concerns aircraft survivability equipment (ASE). Since the early 1970s, the purpose of ASE has been to enhance our combat effectiveness by reducing or eliminating the enemy's ability to detect, hit, damage or destroy our aircraft and forcing the burden of countermeasures upon the enemy. Though the ASE program has been aggressive, funding shortfalls have limited procurement of available systems required for three categories of ASE—signature reduction, crew warning and countermeasure sys-

FIGURE 1: PANEL COMPOSITION

• MG MALONEY	ODCSRDA
• MG BAGNAL	101ST ABN DIV
• MG KONOPNICKI	TSARCOM
• MG MOORE	MICOM
• MG STEVENS	AVRADCOM
• MR. CRIBBINS	ODCSLOG
• COL BURNETT	USAAVNC

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FIGURE 2: PANEL ISSUES

- Aircraft Survivability Equipment
- Aviation Life Support Equipment
- Fleet Obsolescence
- Class IIIA and VA Sustainability
- Desert Operations
- Air-to-Air and Air Defense Suppression Weapons

AASPR

tems. Opportunities for solution to the obvious problem of signature reduction include—in the near-term, applying an infrared reducing polyurethane paint that is capable of being decontaminated; in the midterm, geographically compatible infrared paints as well as hot metal plus plume suppressors for installation on all attack, scout and utility helicopters are required; far-term developments promise infrared paints which will further enhance our nuclear, biological and chemical (NBC) decontamination process.

With regard to crew warning, current audio and visual signals require interpretation by the pilot to determine the threat type, direction, range and location and appropriate countermeasures. As a result, crew workload approaches saturation. Additionally, we need extended frequency coverage. Opportunities in crew warning start with a near-term product improvement to add a lightweight, digital processor. Midterm fixes call for extending frequency coverage for both radar and laser detection systems and a new continuous wave radar warning system fully integrated with the digital processor that would provide directional information for attack and scout aircraft. Additionally, radar frequency interferometers to provide highly accurate threat identification and location information, as well as to automatically transfer that information to the onboard weapon systems, are worthy of continued support. In the far-term, electro-optical and acoustical warning systems will provide even more accurate threat detection and location information.

The final aircraft survivability deficiency is countermeasures—that is, active measures taken to reduce our own detectability. Present radar jammers do not cover the millimeter wave spectrum, and current infrared jammers work in a limited frequency spectrum. Recent demonstrations have shown chaff may be effective against new radar threats, but aircraft optimization studies are continuing. There is no countermeasure for enemy antitank guided missiles directed at Army helicopters and no laser protection for sensors and optics. Opportunities include installation of available radar and infrared jammers on all aircraft that can be expected to be employed in, and forward of, the main battle area. Beyond that, install "HAVE QUICK" on all Army aircraft and product improvement jammers and missile detectors to extend their frequency band coverage. See figure 3 for the panel's ASE findings.

- DARCOM LONG-RANGE RDA PLAN
- NEEDS RECOGNIZED
- RESEARCH PROGRESSING
- MORE FUNDING AND HIGHER PRIORITY NEEDS TO BE APPLIED TO ASE, ESPECIALLY TO LASER PROTECTION FOR ONBOARD SENSORS AND OPTICS

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FIGURE 3: AIRCRAFT SURVIVABILITY EQUIPMENT

ALSE

The second major issue dealt with by the Materiel Panel was aviation life support equipment (ALSE). A great deal of our current ALSE is either not designed specifically for aircrew use or for use with our current aircraft and, thus, is not compatible with aircrew task performance. To effectively deal with those shortcomings, the panel had to address these major subissues.

First, *protection of the eyes from high intensity light sources* such as lasers and nuclear bursts exists in industry and other services, but the challenge is to provide protection to Army aircrews and then only when needed. Solutions endorsed by the panel are incremental and progressive—in the near-term, we must use those items currently available from industry and the Air Force despite the limitations involved; midterm efforts should be directed toward compatibility among the various devices; with far-term development of both laser and nuclear flashblindness protection into a single device worn by the aircrew. Ultimately, we should transition this protection into an integral part of the aircraft that protects the aircrew as well as sensors and optics worn by the aircrew.

The chemical protective equipment subissue is very much related. Overboots all but eliminate pedal feedback and become easily entangled on aircraft parts; gloves are bulky and reduce tactility; and the overgarment contributes to heat stress, hampers movement and is flammable. The current protective mask, the M-24, has many deficiencies. Its replacement, the XM-33, was expected to be a great improvement, but testing by the Infantry and Aviation Boards indicate it is not. As a result, procurement of the XM-33 is uncertain. Solutions involve a series of product improvements through the midterm, culminating in an advanced technology aircrew ensemble.

A general shortcoming of all current equipment is its incompatibility among ALSE components and with aircrew tasks. This shortcoming is even more dramatic when NBC protective clothing is used. This is due, in large part, to the fact that there are more than 1,800 ALSE line items with life cycle management fragmented among 22 commands and agencies. The substance of *the third subissue is the need for a task-based, total system designed to interface with the aircraft, protect against the threat and environment and facilitate aircrew task performance.* The vehicle for de-

- DARCOM LONG-RANGE RDA PROGRAM
- HIGHER PRIORITY NEEDED
- FUNDING INADEQUATE IN NEAR-TERM HEADED IN RIGHT DIRECTION
- FUNDING ADEQUATE IN MIDTERM
- LASER PROTECTION PROGRAMS FOR SENSORS AND OPTICS WORN BY AIRCREW NOT FULLY DEFINED OR FUNDED

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FIGURE 4: AVIATION LIFE SUPPORT EQUIPMENT

velopment of this total system is soon to be an approved letter of agreement for an aircrew life support system integrated battlefield or ALSSIB. We now recognize the man/machine interface requirement and must manage both product improvements and new development of ALSE as intensively as if they were part of the aircraft systems package. In the far-term, aircrew life support systems must be integral to the airframe and, to close the loop, we must take steps to centrally manage ALSE.

The fourth ALSE subissue, again NBC-related, is critical because Army aviators are particularly susceptible to incapacitating chemical agents. Even extremely low levels of nerve agents can cause miosis and extreme pain on visual focusing. There are no fielded pretreatments in the Army and the various proposed pretreatments cause more problems than they solve. While there are no readily apparent solutions to this issue, continued efforts are worthwhile since the potential payoff is so high. The medical community sees no significant breakthrough for the next 10 years.

The fifth subissue was that of avoiding contamination. That is, current systems do not allow our aircrews to look ahead and to detect contamination before entering a given area, and we lack the means to protect our aircraft from contamination while on the ground. If fully funded in the near-term, aviation-specific solutions begin to appear in the midterm. Based on technology from evolving ground detection systems, we would eventually achieve a true airborne look-ahead capability mounted either on an airframe or remotely piloted vehicle. Addressing contamination protection while on the ground, perhaps a single, lightweight protective blanket combining contamination resistance, infrared signature reduction and camouflage would suffice.

The sixth subissue to aviation life support pertains to decontamination. Present aircraft paints, canopies, gaskets, avionics and other components absorb agents, making them virtually impossible to decontaminate. There is no system fielded that will decontaminate the interior, especially avionics, or exterior of an aircraft, nor do we have a way of determining that a surface is clean and safe to handle once it has been decontaminated. Evolving solutions are many. Basically, we must pick those generic systems which can be applied to aviation, developing as few aviation-specific systems as necessary. The key is to use chemical agent-resistant paints and coatings and, ultimately, design our future aircraft to be inherently resistant to contamination.

The seventh aviation life support subissue is search and rescue. The Army cannot, as required by current directives, conduct combat search and rescue missions in support of its own operations nor can the Air Force, as it has readily admitted, because of limited manpower and resources. Currently, downed Army aircrews can be located only by visual or voice communications because onboard avionics do not provide a direction-finding system for existing or proposed survival radios. For the near-term, opportunities necessitate continued use of present survival radios and emergency locator transmitters for aircraft operating in remote areas. Then, for the midterm, develop both a secure advanced survival radio capable of crash activation and a companion direction-finding personnel locator system with incorporation of those features and capabilities in advanced onboard avionics in the far-term. Additionally, we should examine the capability and responsiveness of airborne intelligence gathering platforms to perform in a supporting role.

The final subissue to aviation life support is flight data recorders, perhaps better known as flight and maintenance information systems. The advantage to be gained is the prevention of aircraft and crew losses through improved accident investigation and maintenance techniques. The panel recommended that flight data recorders should eventually be installed on all Army aircraft. However, priority for development should be given to advanced aircraft systems because current commercial transport flight data recorders do not meet the Army's criteria for small, lightweight units.

The panel's ALSE findings are contained in figure 4.

OLD FLEET

Referring to the Organization Force Structure Panel Issue regarding total aircraft inventory shortfalls as they affect force structure, the Materiel Panel expanded on that as its third issue, namely fleet obsolescence. Specifically, the issue is operational and tactical obsolescence, combat effectiveness, survivability, and, last but by no means least, economic and logistic supportability costs in the future for a fleet of nearly 9,000 aircraft. We are flying UH-1 Huey aircraft that reach 20 years of age this year and special electronic mission aircraft (SEMA) and CH-47s that are older

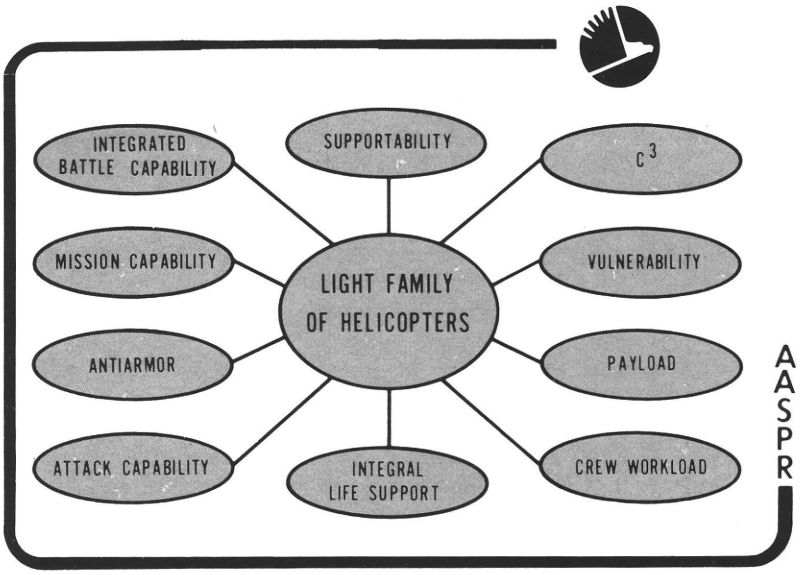

FIGURE 5: FLEET OBSOLESCENCE SOLUTION

still. Theoretically, if we began this year to develop replacement aircraft, based on a feasible production rate of 120 aircraft per system per year starting in mid-1990s, we can still expect to be flying our current fleet well past the year 2000. We must start thinking, *now,* about how we are going to replace these aircraft. The far-term solution is development of the light helicopter family (LHX) which will use common dynamic components for scout, attack, utility and light observation aircraft. This single solution will, in itself, eliminate many deficiencies associated with fleet obsolescence (figure 5).

The fleet is becoming obsolescent while, at the same time, the increasing Soviet helicopter threat, coupled with our own evolving missions such as helicopter air-to-air combat (HATAC) and across FLOT (front line of own troops) operations, aggravate this situation. One can easily see that we *must* improve our current fleet in the near-to-midterm while concurrently bringing on the LHX and SEMA-X to meet requirements of the future battlefield.

IIIA VA SUPPLY

The fourth major issue considered by the panel concerned combat availability and sustainability of aviation-specific POL (class IIIA) and aviation-specific ammunition (class VA). The deficiency was divided into the following subissues:

The first subissue is class IIIA availability and interoperability. The high consumption of aviation POL (petroleum, oils and lubricants) by the current fleet will contribute to class IIIA availability problems across the entire battlefield. Furthermore, interoperability of Army systems with Navy, Air Force and North Atlantic Treaty Organization (NATO) is lacking. Opportunities for solution include improving specific fuel consumption of current engines as well as new fuel efficient engines, multifuel engines, nonpetroleum/nonfossil fuels and modifying the AH-1 Cobra, UH-1 and OH-58 Kiowa helicopters to accept the standard NATO fuel connector.

The second subissue is class VA availability for attack helicopters—the AH-1S and AH-64. The panel's recommendations for the class VA availability problem fall into the near-to-midterm time frame. Specifically, the Concepts Analysis Agency and TRADOC should determine if more realistic firing rates for the AH-1 and AH-64 are warranted. The panel also suggested that HELLFIRE and multipurpose submunition production and procurement should be increased and that research, development and procurement for smoke and illumination warheads for the 2.75 inch rocket should be funded.

The final class IIIA/VA sustainability subissue addresses the current shortage of logistical assets to resupply aviation with class IIIA/VA on the AirLand Battlefield. The current HQDA flying-hour rate of 2.33 hours per day is too low and results in units having insufficient class IIIA and VA to meet mission needs. Experience has shown that aviation units are required to fly at a higher flying-hour rate during realistic training or field exercises, causing local commanders to improvise in order to get the job done. Local fixes such as borrowing fuel trucks from noncommitted units and stockpiling fuel in permanent field locations may not be available in wartime. The addition of ammunition increases the complexity of the problem since resupply is seldom practiced during training. To substantiate these concerns, U.S. Army, Europe has upgraded the flying-hour rate for its attack helicopters to 4 hours per aircraft per day and provides 5,000-gallon supply and transport tankers out of POMCUS (prepositioning of materiel configured to unit sets) to carry the additional fuel. Furthermore, the 1977 Bulk Petroleum Study conducted by the U.S. Army Logistics Center, Ft. Lee, VA, also recommended a 4-hour planning factor for all aircraft. Army 86 studies, specifically those for the Cavalry Brigade (Air Attack) or CBAA, have recommended 4.8 flying hours per aircraft per day for operations in a heavy division. Finally, the AAMAA recommended 4.15

hours per day. The only currently desirable or feasible way of providing sufficient class IIIA/VA is by means of ground transportation. Consequently, the CBAA's recently approved class IIIA/VA concept calls for organic ground vehicles to move class VA from corps ammunition supply points, division ammunition transfer points or brigade trains, and class IIIA from fuel system supply points to each respective battalion support area or forward arming and refueling points. Opportunities to correct the current shortage of class IIIA/VA organic resupply vehicles call, first, for validation of the concept as doctrine; implementation of the Army 86 aviation organization; and finally, acquisition of the appropriate equipment. See figure 6 for the panel's class IIIA/VA findings.

DESERT COMBAT

The fifth major issue addressed by the Materiel Panel was that of aviation's limited ability to operate, maintain and sustain in a desert environment. Following through on "Operation Bright Star" findings, HQDA tasked DARCOM, TRADOC and FORSCOM to develop ways to enhance helicopter operations and sustainability in a desert environment. U.S. Army Aviation Research and Development Command has become the lead agency in this effort and although the majority of the key deficiencies already had a product improvement program in being, or development, or will be corrected by some other program, the evolving concern is the majority of improvements are unfunded. The panel's recommendations were: product improvements should be funded while, simultaneously, better maintenance and training methods to protect equipment against sand should be developed (figure 7).

WEAPONS

The final major issue addressed by the Materiel Panel was that of air-to-air and air defense suppression weapons for installation on Army aircraft. The 20 and 30 mm weapon systems onboard attack helicopters are limited in range, accuracy and lethality. Therefore, scout and attack helicopters must rely on the already heavily burdened combined arms of Air Defense, Artillery and Air Force tactical aircraft to provide necessary enemy air defense and Hind suppression.

First, for an air-to-air weapon in the near-term, current systems must be used (despite their limitations), and to make up the difference HATAC aircrew training becomes imperative. The midterm proposal is to upgrade existing scout and attack fleet weapons systems for air-to-air use.

The second subissue is the air defense suppression weapon. The key opportunity is to develop a system based on the Stinger missile. Concurrently, exploration for far-term opportunities for specifically designed air defense suppression systems should be pursued (figure 8).

Again, as with all six issues and respective subissues, the panel's feeling was that DARCOM is proceeding in the right direction in its research efforts; however, adequate funding is missing.

These, then, are the issues whose resolution will improve the capability for Army aircraft and aircrews to survive and fight again another day. Seemingly small, they have been overshadowed by success on the larger and more visible aviation programs. However, they were felt to be so critical to the battlefield capability of our aviation forces that endorsement by the Materiel Panel was considered to be paramount for timely resolution.

NOTE: My sincere appreciation to COL Clark A. Burnett, director, Directorate of Combat Developments, U.S. Army Aviation Center; MAJ Josef Reinsprecht and the panel members for their contributions.

- DARCOM LONG-RANGE RDA PLAN
- HEADED IN RIGHT DIRECTION
- NEEDS HAVE BEEN RECOGNIZED
- FUNDING IS REQUIRED

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FIGURE 6: CLASS IIIA AND VA SUSTAINABILITY

- DARCOM LONG-RANGE RDA PLAN
- HEADED IN RIGHT DIRECTION
- BIGGEST FUNDING SHORTFALLS IN FY 84 to FY 86
- APPROVED PRODUCT IMPROVEMENTS SHOULD BE APPLIED FIRST TO RD-JTF DESIGNATED AVIATION UNITS

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FIGURE 7: DESERT OPERATIONS

- DARCOM LONG-RANGE RDA PLAN
- HEADED IN RIGHT DIRECTION
- EXPEDITE REQUIRED OPERATIONAL CAPABILITY ON
  - ☐ AIR-TO-AIR WEAPON
  - ☐ AIR DEFENSE SUPPRESSION WEAPON
- FUNDING REQUIRED

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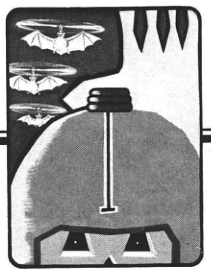
FIGURE 8: AIR-TO-AIR AND AIR DEFENSE SUPPRESSION WEAPON

VIEWS FROM READERS



Editor:

If you feel the attached "ten commandments" are of value, feel free to publish.

TEN COMMANDMENTS OF AVIATION SAFETY

1. Know your personal limits and the limitations of your crew.
2. Know your aircraft and its performance limitations.
3. Know your plan—carefully preflight, prepare performance charts, conduct hover checks—and fly your plan.
4. Know proper loading for anticipated flight conditions.
5. Know normal mission parameters and avoid marginal operations.
6. Know the wind and avoid low-level downwind operations.
7. Know your pilot in command authority and don't be pressured or rushed.
8. Know and be ever wary of weather.
9. Know and obey established directives.
10. Know the joy of professionalism—think safety and fly safely!

CW3 Ray L. Christopher
441st Medical Detachment (HEL AMB)
Kentucky National Guard

Editor:

I am Training Squadron SEVEN'S Ground Safety Petty Officer, AD1 Harley R. "FRENCHY" Boudreaux.

While clearing my department head's desk recently, I came across a few old issues of your fine magazine, *United States Army Aviation Digest,* and would like to have VT-7 Safety Office put on your distribution list. We here in VT-7 are concerned with teaching naval aviators and would like to see the Army Aviation's view of safety.

AD1 H.R. "FRENCHY" Boudreaux
Naval Air Station
Meridian, MS

• Navy and Marine units should submit requests for the *Aviation Digest* to: Director, Navy Publications and Printing Services, Building 157-3 ATTN: Distribution Branch, Washington Navy Yard, Washington, DC.

Editor:

Please send the following articles on nuclear, biological and chemical warfare that appeared in past issues of *Aviation Digest:*

"Nuclear, Biological, Chemical Training and Development" (August 1981 issue).

"Nuclear, Biological, Chemical Decontamination Problems" (October 1981 issue).

2LT Brian D. Tutt
4th Squadron, 9th Cavalry
6th Cavalry Brigade (AC)
Ft. Hood, TX

Editor:

AMO supposedly stands for aviation medical officer, but we in the business of fixing aircraft call a flight surgeon very seldom and to us an aircraft maintenance officer is an AMO.

I was breezing through my in-box and came upon an *Aviation Digest* article (Aviation Personnel Notes, November 1981, page 39) that caused me some concern. The same concern an AMO would have with a grounding safety-of-flight message handed to him as he closed the "barn" for Friday night's happy hour! I read it over and over again with greater and greater frustration. There wasn't any "typo" errors but I kept looking for one. Department of the Army (DA) has decided to give my career field a new name and some new jobs to go with it.

The "New Title for Specialty Code 71" piece explains in two hundred words or less that my career field, from henceforth, will be called Aviation Logistics. It explains that this title ". . . more appropriately describes the SC 71 in a multifaceted logistical role . . ." and, furthermore, ". . . more accurately portrays . . . my capabilities as opposed to continuing the perception that SC 71 is only aircraft maintenance." Well gentlemen, that sure *blew* my "continuing perception."

I've been an AMO for 10 years whether assigned that job or not. I've worked as a TC detachment commander (now the aviation unit maintenance (AVUM) direct support section leader), service platoon leader, direct support repair platoon leader, aviation intermediate maintenance (AVIM) production control officer and battalion AMO. That's where the "nuts and bolts" of aircraft maintenance management has been. I've also worked the "other side of the fence" as a battalion S-4. But it didn't take an S-4 job to teach me about ". . . property books, dining facility

management, procurement of all classes of supply and an expanded area of property accountability."

It has been my "continuing perception" that property book hand receipts belonging to AMOs are as large as most considering what comprises AVUM/AVIM tool sets, kits and outfits. Regarding property accountability, show me an AMO who hasn't signed a cash collection voucher, statement of charges or a report of survey and I'll show you an AMO who hasn't fixed many aircraft for very long. Also, Class IX (Air) is not the only class of supply that keeps aircraft flying. And, as far as dining facility management goes, AMOs usually have to "cut the cake" given to them and then "eat it, too." But, my point is, these are only part-time tasks of an AMO.

An AMO worth his daily status report is a professional soldier managing more resources (people, property, time and money) than anyone in any given aviation unit, less the commander. He's the production control, quality control and tech supply officer for the commander. He's the scheduled, unscheduled and preventive aircraft maintenance officer who keeps the operations officer in business. He's the "platoon daddy" to a bunch of young men and women who don't understand why they can't get an overnight pass after marching, in what they hoped was, their last "pass in review."

I have observed AMOs in my career field adapt to many changes. With the Baltimore and St. Louis Publication Centers "pumping" out constant changes (they obviously are speculating on timber futures), Force Development activities constantly modifying missions and tables of organization and equipment, and every new commander who wants to see his unit operate in the field for himself, the AMO without "contemporary technical skills" is well below the flow chart.

The AMO is responsible to his fellow aviators to stay on top of all "it." He's responsible to his professional maintenance technicians and NCOs to be the "heat shield" (General E. C. Meyer, military letter with no subject/title, 9 October 1980) for as much of "it" as he can. And now, DA says he must professionally compete with dining facility managers! Which aviation commander out there wants his next AMO to report for duty after a 3-year assignment as a battalion S-4? You'll get what you ask for!

I would like to see the AMO continue to be the specialized professional that he's trained to be. If career progression reduces 71A (fixing aircraft) opportunities, let those most "fit" survive. There are plenty of other specialty codes that have opportunities for officers as they advance. Let the 71A do his "thing" and give the property books and messhalls to the SC 92.

CPT Robert A. Caverly
AVRADCOM
St. Louis, MO

Editor:

The Office of Air Force History is preparing a comprehensive history of airpower in the United States, which will cover the 75-year period since the acquisition of the first military aircraft.

This volume will be richly illustrated with photos which will come from depositories as well as private collections.

If anyone wishes to share with the Office of Air Force History any holding which can be used in this publication, please contact:

Lawrence J. Paszek, Senior Editor
Office of Air Force History
Bldg 5681, Bolling Air Force Base
Washington, DC 20332
(Tel: (202) 767-4548)

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

CONNECTION ACTAAT

Aviation Center Training Analysis and Assistance Team

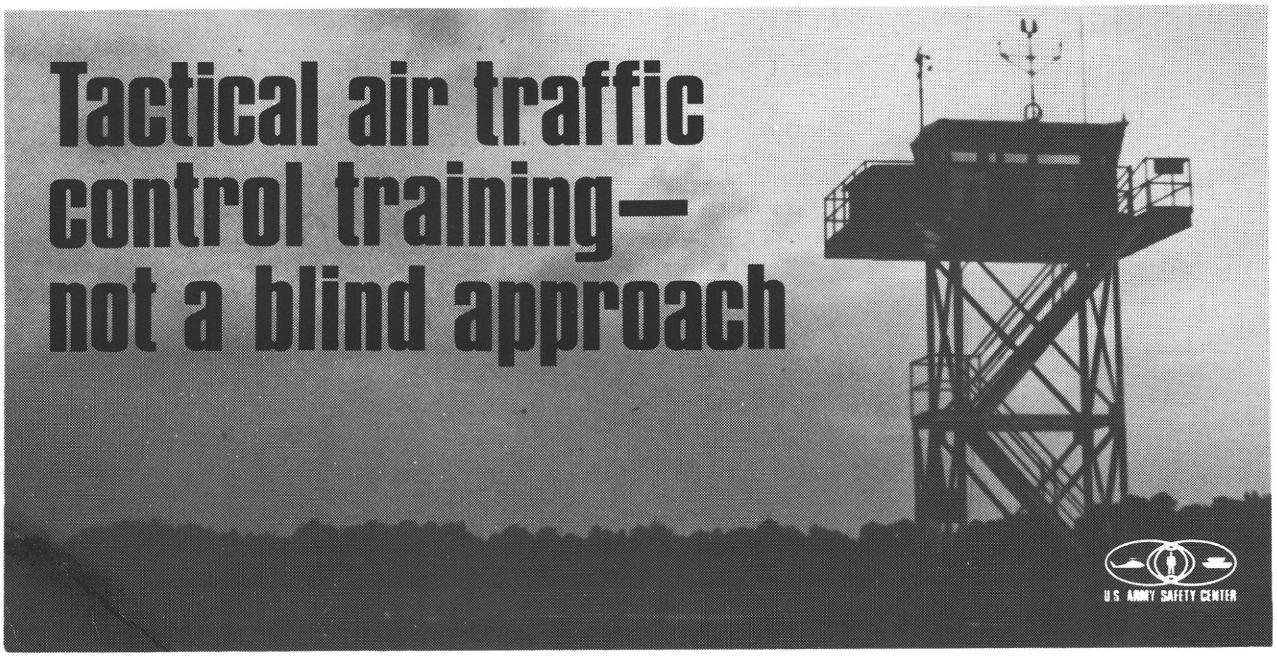
LASER HAZARDS

ISSUE: More and more combat equipment has laser capabilities. Use of this equipment in training poses serious potential safety hazards to troop vision. Where can guidance concerning safety and training policies be obtained?

COMMENT: AR 385-63 is the best reference on these safety requirements. This document is presently undergoing revision. Revision to chapters 19 and 20, which deal with laser safety, are in final coordination between TRADOC and the Environmental Health Agency.

- Other documents that may be useful concerning training with lasers are AR 40-46 and TB Med 279, 30 May 1975.
- TRADOC point of contact for these three documents is Mr. Warren Leary, Safety Officer, AUTOVON 680-3930. Environmental Health Agency POC is Mr. Wes Marshall, AUTOVON 584-3468/3932. Local guidance in USAREUR can be obtained from Mr. Bob Brown, Safety Officer at Grafenwoehr. (Directorate of Training Developments)

Tactical air traffic control training— not a blind approach



Lieutenant Colonel A. E. Hervey Jr.
National War College
Washington, DC

EFFECTIVE USE of the combat power of Army aviation—day or night and in all types of weather—is a major concern for the combined arms team on the modern battlefield. Tactical air traffic control (ATC) is an important segment of this capability, for it allows combat aviation units to move about the battlefield *rapidly* and *safely* to deliver their ordnance under marginal weather conditions.

Like most other military tasks, good training that refines ATC procedures and develops the cockpit confidence necessary to accomplish this mission is the key. But training in today's Army is expensive, especially when you are talking about large numbers of aircraft and personnel. Building ATC training into already scheduled exercises increases training opportunities without an additional expense of aviation unit resources, fuel or flying hours.

REFORGER '81's FTX "Certain Encounter," a U.S. V Corps sponsored exercise, provided an opportunity for the 5th Signal Command's 59th Air Traffic Control Battalion to put together a large-scale, realistic scenario that resulted in some effective ATC training. They learned that successful joint Army/Air Force ATC training during a major exercise requires prior planning, intense effort and more than a little salesmanship. However, it pays big dividends in the development of joint doctrine, training experience and aviator proficiency and confidence.

Elements of six aviation battalions provided the largest number of Army aircraft used in REFORGER within the past few years, and more than 70,000 ground troops provided additional realism. Nearly 5,000 square miles of airspace were temporarily restricted down to ground level for military use during the exercise. This allowed low-level instrumented approaches and landings at tactical airfields during marginal weather. Standard air routes were established, complete with deployed radio navigation beacons.

Army ATC personnel were collocated at the U.S. Air Force control and reporting post (CRP), providing face-to-face contact with the "other guy" in the sky, and resulting in even better joint training and cooperation.

For this particular exercise, Giessen Airfield was equipped by V Corps engineers with steel matting for heavier aircraft, and this area was used to simulate the deployed Corps airfield. It was a rewarding experience when the first C-130 aircraft turned final onto a ground controlled approach given by an Army radar controller. Visibility was down to one mile with light rain and fog, yet critical supplies were getting into a forward airhead. After landing, armor convoys were refueled and returned to the battle—an example of an ATC platoon in its forward mission posture.

Several other actions were taken to prepare for "Certain Encounter" and ensure that maximum training resulted:

- Standardized phrases and terms had been developed within the unit over a period of several years. This not only provided more positive control but also resulted in reduced electronic transmission signatures.
- Based on this experience, a Controllers Procedures Guide was developed as a common source from

which all controllers could execute standard ATC procedures. (Distributed to platoon level, the guide also serves as an excellent manual for individual training.)

• The aviation community was briefed on the procedures in advance through a set of locally produced video tapes and again at each prebrief prior to a mission.

Many lessons were learned as a result of organizing and executing the ATC training. Some general tips on putting together the ATC segment of a training exercise are given in the table below. Other lessons learned were:

• Access to the flight paths was not always available. That great big sky suddenly became very crowded and factors such as mission urgency and separation criteria determined who went where and when.

• During an extended exercise period equipment breaks down. A good maintenance program and spare equipment (both beacons and radars) helped keep the control system on the air.

• Existing peacetime constraints can be overcome when they are properly identified. For example, some of the available aircraft were not certified for instrument flights, and others were temporarily restricted for maintenance reasons. Identification of the fact and prior planning allowed maximum use of the limited number of aviation assets that could participate in the tactical instrument system.

• Probably the most satisfying lesson was that the system worked. Under conditions of rain and fog, Army and Air Force aircraft flew training missions in the exercise area. Tactical instruments could be flown by aircraft during the exercise on routes at 500 feet above obstacles. More than 400 of the 10,000 recorded Army movements were conducted under instrument flight rules.

The net result of the exercise was that total combined training does work. The individual and collective skills of the air traffic controllers and the pilots were greatly increased. The full power of Army and Air Force aviation was used on the training field, *safely* and *efficiently,* under adverse weather conditions. Working together, Army and Air Force aviators and airspace managers can make it happen. And when marginal weather moves in, it won't leave us all with a blind approach.

ATC EXERCISE PLANNING
"The How To"

1. Begin by establishing instrument and adverse weather flight capability as an exercise objective. (This will alert the staff to what's going on later when support is needed at corps or division level.)

2. Obtain exercise restricted airspace from local airspace authorities for the entire exercise area. This must be done months ahead usually. Use of airspace inside military prohibited areas must also be coordinated on reservations with local commanders.

3. Obtain written permission from civil aviation authorities for entry and exit points to exercise airspace which can then be operated under instrument conditions and controlled by military controllers. This will add to exercise realism and convenience.

4. Plan and design communications to support airspace coordination to make rapid aircraft handoffs under instrument conditions into and out of the exercise area and within the exercise area. Usually, communications to support this will include at least one leased line to the regional civil ATC control authority for exit and entry exercise restricted airspace (necessary for peacetime training and emergency contingencies).

5. Plan and design preferred Army air routes and tactical approaches to support the exercise, using FM 1-5, Instrument Flying for Army Aviators, FM 1-60 (now FM 1-103) and FM 100-42, covering joint airspace operations. Conduct ground and air reconnaissance of ATC sites, landing zones and approach paths.

6. Coordinate and meet with corps or division airspace management elements, air defense units, and Air Force control and reporting post personnel to work out training scenarios, letters of agreement as specified in doctrine and collocation of Army/Air Force ATC units to execute realtime airspace management operations.

7. Prepare and distribute exercise documents, to include inserts to Army and Air Force operations orders, aviator procedure guides, training audiovisual tapes, safety briefings, inserts to CEOIs (communications electronic operating instructions), and controller documents to execute earlier planned routes of approaches.

8. ATC units flight check routes, approaches and procedures, then clear the routes and approaches for instrument flight through the aviation operations officers.

9. Keep an active listening post to aviation users to correct problems that develop, upgrade the capability to flow with the changing exercise scenario (jump airfields or use supplementary instrument letdown or departure sites if needed) and provide complementary services to division/corps aviation units for conduct of airmobile operations. Tactical ATC is only useful if it is used. It must be responsive.

HOW TO GET THE

UNITED STATES ARMY
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NUCLEAR BIOLOGICAL CHEMICAL

NBC Survival—
A Matter of Attitude

WHEN A TASK is especially difficult, many of us just ignore it, hoping it will go away. Unfortunately, that too often is the attitude of Army Aviation people with regard to preparing for chemical warfare. If there is any reason to doubt that, take a survey of your unit training hours and categorize them into basic areas of emphasis: Considering that we expect to fight most of the time and fly all of the time in MOPP 4 (maximum mission oriented protective posture), there is surprisingly little training time devoted to it. We need to recognize how deadly the chemical threat is and improve our readiness to deal with it!

It is rather difficult to relate to a lethal dose of nerve agent without some description; so consider that a droplet, about 2 milligrams, can cause death if absorbed into the body. That quantity is labeled LD-50, or the lethal dose for 50 percent of the troops, though it will vary from agent to agent. To apply this to a real-life situation, consider that a 10-milligram per cubic meter (of air) concentration of agent is realistically expected over a large percentage of the battlefield. Unprotected exposure to that concentration for 6 seconds will cause miosis (contraction of the pupils) with attendant loss of depth perception and possible pain upon focusing. That is considered to be an incapacitating dose for aviators, although it may not be for ground personnel.

The current antidote is atropine which can increase your chances of surviving exposure to the agent. However, the recommended dosage of three injections of the antidote can also cause an aviator's vision to be temporarily degraded to the point that he cannot fly. Knowing that an antidote is available does not mean we can afford to be unprotected in a nuclear, biological and chemical (NBC) environment!

What can you do?—Talk it up in your unit. Set an example by being current on the latest NBC poop. The *Aviation Digest* issues of August, October and December 1981 had articles important to a basic understanding of your area of responsibility in NBC. Spend 15 minutes reading the dash 10 to the M-24 NBC protective mask (TM 3-4240-280-10). Get into the MOPP gear and fly in the entire ensemble for 2 hours, making that part of the 6-hour drill. This must be done in accordance with the safety rules given in the appropriate aircrew training manual. Talk to your NBC officer and noncommissioned officer about giving a class to bring your unit up to speed on the threat and the capability to deal with it. Another good reference source will be the new ALSE (aviation life support equipment) manual (FM 1-302) that is to be published early next year; it has a very complete NBC section. Watch for it.

There is a lot of command emphasis on the threat of chemical warfare. Research is being done, training is being modified and gear is being obtained. But all of that does not relieve you of your individual responsibility to be prepared. The following comment from the article, "Nuclear, Biological, Chemical—Chemical Agents, First Aid and Long-Term Effects," in the December 1981 *Aviation Digest* pretty well sums it all up: "After considering the symptoms of even sublethal doses of chemical agents, and some of the drastic long-term effects, it is obvious that aviators must avoid the slightest exposure to chemical agents . . . ."

That avoidance is possible—if you have the proper attitude about preparing for it.

CW3 Ernest D. Kingsley
B Company, 214th Battalion
9th Cavalry Brigade (Air Attack)
9th Infantry Division
Fort Lewis, WA

Mission Planning For Night Flight Operations

WITH THE INCREASED emphasis on training during the hours of darkness, aviators must understand the limitations and requirements for night flight operations. The success of any operation depends on the amount of training and mission planning prior to the mission, but mission planning and training are critical when the operation is to be conducted at night.

It is important to acknowledge the fact that planning for any tactical mission (day or night, training or real world) requires detailed information, extensive planning and total coordination. The details must include all available information about the mission, enemy, terrain and weather, troops available, space and time limitation. With these details, maps and aerial photos can be gathered and hazards and weather information collected. In addition, any special equipment and/or preparation of equipment can be determined. Armed with this information, planning can begin.

To assist aviators in night flight mission planning, the following excerpts are from the draft night flight manual, FM 1-204.

Mission Planning: Maps and Visual Aids

1. Maps: Assemble as many different maps of the area as possible (a minimum of three different scale maps is required).

a. 1:250,000; the best map in this scale is the joint operations graphic (JOG-A). The 1:250,000 scale map is the primary map for planning and flying the en route portion of the mission. The scale permits a relatively small map, uncluttered with extraneous information, and when prepared properly, is night vision goggle (NVG) compatible.

b. 1:500,000; recommend the tactical pilotage chart (TPC) or VFR (visual flight rules) sectionals. This map is updated more frequently than the JOGs and provides accurate information on major towers, beacons and powerlines.

c. 1:50,000; standard tactical map is used to locate and confirm unique map features and to transfer them to the JOG. It displays, in more detail, those areas which may be difficult to interpret on the JOG. Any en route landing or holding areas can be accurately plotted and studied on this map. In addition, this map is used for the objective phase of the mission. It should be used for the navigation and operation within the objective area.

2. Aerial Photos, Terrain Boards, Sand Tables: These are visual aids listed in FM 1-204 as invaluable aids for NVG operations.

General Route and Aircraft Checkpoint (ACP) Planning Considerations.

1. Route Planning: The route to and from the objective area must be tactically sound but not so difficult as to deter successful navigation. Below are general rules of NVG route selection.

a. Avoid brightly lit areas, roads and cities.

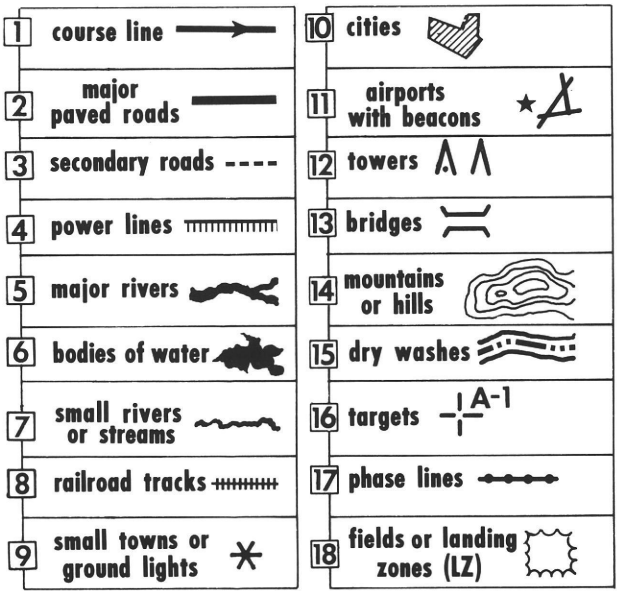
b. Avoid planning routes near navigation aids or airports due to the hazards associated with other aviation operations and to avoid detection by radar oriented on these facilities.

c. Large north-south valleys may be negotiated on the lighted side or dark (shadow) side depending on the threat and terrain.

d. Plan to negotiate narrow valleys and passes east-west so that the terrain will be lit and shadows avoided.

e. Never plan a route that heads directly into a low angle rising or descending moon. Alter course as necessary to fly a zig-zag course when left with no other choice.

FIGURE 1



f. Avoid planning route segments requiring heading changes of more than 60 degrees.

g. Always select intermediate reference points, in addition to checkpoints (CPs), along each leg of the route for course confirmation and timing. The lower the ambient light, the more reference points should be used.

h. If possible, plan to cross major roads and railroads at large angles (e.g., 90 degrees) in order to reduce exposure time.

i. If it is impossible to avoid flights near population centers or flights near major roads, plan to maintain at least cruise airspeeds in order to minimize exposure time.

j. When computing times, distances and headings for the route, always compute the same information from barriers and prominent map features. This will greatly aid in reestablishing the flight on course if a CP is missed or the flight becomes misoriented.

k. Plan the times at which you should cross prominent intersecting features (roads, rivers, railroads) to facilitate timing and navigation.

l. Always anticipate wires associated with all roads, towers and buildings in open fields.

m. Always plan alternate routes and bypasses in event the primary route is blocked due to weather, enemy compromise, etc.

2. ACP Planning: After a general route has been determined to the objective area, select ACPs and checkpoints to control movement along the route. Study the CPs carefully, using all available maps and photographs. Below are general rules for NVG checkpoint selection:

a. CPs should be unique, natural or manmade features which are detectable at a distance; not visible only when flying directly overhead.

b. CPs should contrast with surrounding terrain.

c. Avoid selecting CPs near towns as the town invariably grows and may alter or make detection of the checkpoint difficult.

d. CPs should not be in the vicinity of bright lights.

e. CPs should always be confirmed by an adjacent prominent feature along the route to alert the pilot that the CP is approaching.

f. Always consider and determine the moon angle.

g. Checkpoints should be at least 5 nautical miles (NM) apart and no more than 20 NM apart.

h. Always select prominent barriers near CPs, especially where a turn is planned.

i. The first and last checkpoints of a route are the most important. An easily identifiable feature must be used even if the flight route must be altered. Checkpoints should be about 5 kilometers (km) from the takeoff point and objective respectively to ensure absolute, positive location and timing. Final leg should be less than 8 km from the objective to preclude compromise of the mission and to ensure timing.

j. Verify MSL (mean sea level) altitude of checkpoints.

k. All contingency landing zones must have a CP associated with the final approach leg.

l. Use one map per mission—never attempt to use the same map for a different mission in the same area.

m. Mark contour lines at 500-foot intervals. Do not mark contour lines in relatively flat terrain as it leads to confusion.

Note: When the JOG is completed, prepare the tactical map in the same manner—for use in the objective area and/or when flying NOE.

These mission planning excerpts from the draft night flight manual, FM 1-204, will assist units in night flight planning. Extensive planning will *not* result in satisfactory mission accomplishment unless a complete and detailed briefing is conducted. Every person involved in the mission must know what is going to happen—including the alternate plans. Then, before starting the mission, some form of rehearsal should be conducted. Time may permit only a map and discussion rehearsal but a rehearsal should be conducted.

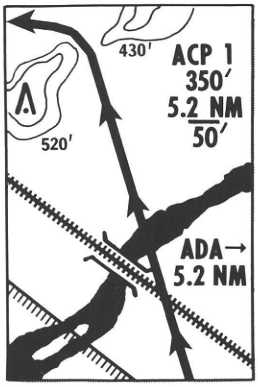
This information on mission planning and NVG map preparation has been compiled from field unit standing operating procedures and training programs and is being included in the new FM 1-204. We realize that we don't have all the information possible concerning NVG flight mission planning; therefore, if you have a useful method of map preparation or ideas on NVG navigation let us know.

Route cards are constructed with the same basic criteria as the (NVG) navigation cards and display all essential information for each particular leg of the route.

1. Route cards are constructed one for each leg of the flight and one for the objective area, FARP, holding area, takeoff point, LZ and area of operations (for air cav and attk helicopters operations).

2. Route cards must be made to scale and as accurately as possible.

3. Completed route cards should be placed in plastic envelopes of corresponding size, secured with metal rings and hung in the vicinity of the aircraft instrument panel or pilot kneeboards.



EXAMPLE 5"x8" EN ROUTE CARD (SHOULD BE TO SCALE AS MUCH AS POSSIBLE)

FIGURE 2: NIGHT VISION GOGGLES EN ROUTE CARDS

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

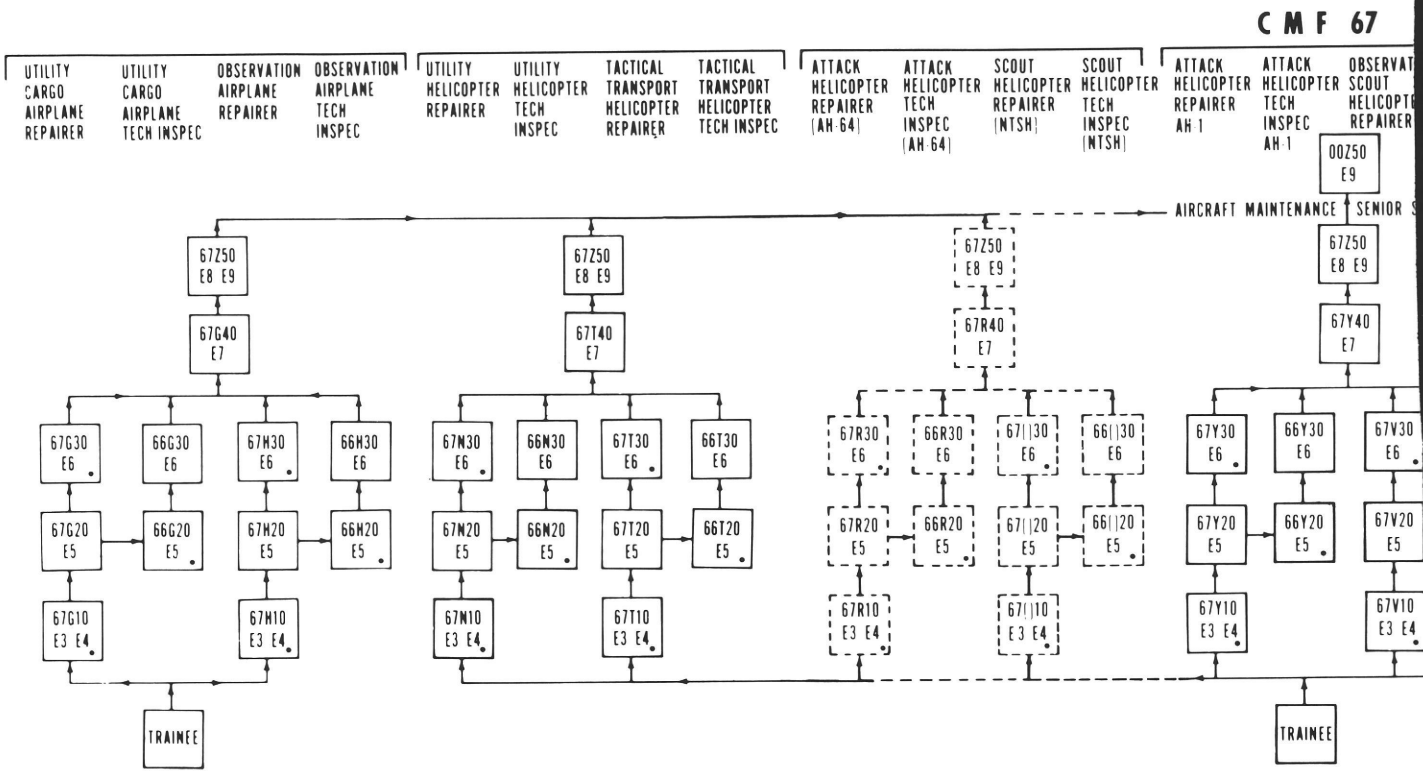
AVIATION PERSONNEL NOTES

CMF 67 UPDATE

Captain Charles N. Avery
Organization and Force Development Division
Directorate of Combat Developments
U.S. Army Transportation School
Fort Eustis, VA

THE REVISION of Career Management Field (CMF 67) Aviation Maintenance (see article "Aviation Maintenance" September 1981) is rapidly approaching fruition. Many of the long-needed solutions to the nagging problems within our training, force structure and personnel management system involving aviation maintenance are already being applied with very positive results. The revision recognizes and has or shortly will correct many problems which you are forced to deal with on a daily basis as supervisors, commanders, aviators and mechanics.

One such solution already partially applied is the improved "DOER" programs of maintenance instruction. While fully revised courses will not be taught until October 1983, the portions of the various military occupational specialty (MOS) courses which have been converted to this format have produced markedly

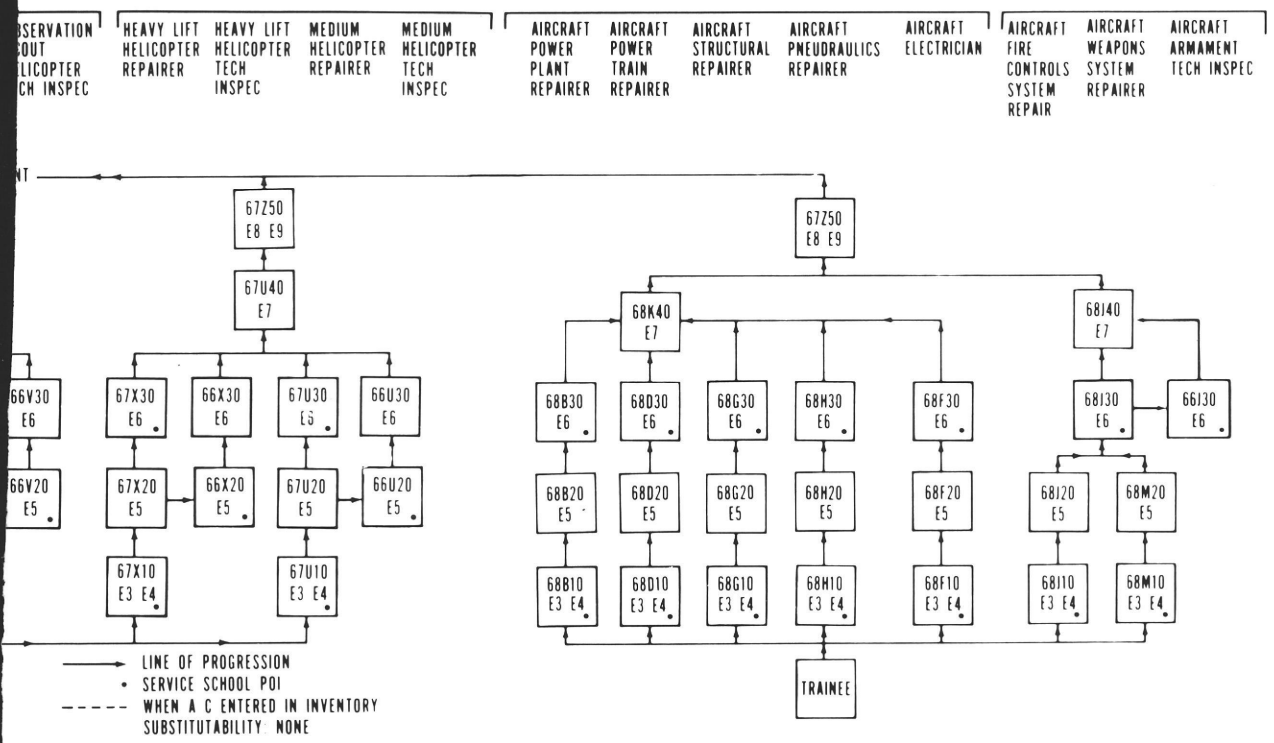


improved graduates, a fact which is borne out by the positive comments we have received from you in the field. Another example of the positive approach this revision is taking can be seen in recent actions taken by Department of the Army concerning migration of supervisory level personnel from nonaviation MOSs into CMF 67. This migration is no longer permitted and these actions will ensure that our supervisors have the prerequisite technical skills and experience to meet the challenge of their demanding and important positions.

Action to effect the transition to the MOS structure pictured below started last month. A briefing team from U.S. Army Transportation School and Military Personnel Center already has or will soon visit your area and explain the entire CMF revision to include MOS structure, promotion potential and other related items of interest. This team will also brief you on the methodologies which will be used in determining how you as an individual fit into this CMF and MOS structure. Without boring you with a great many details, this process will include the serious consideration of your experience and background, your commander's and first sergeant's recommendations and your preferences and desires. Be mindful, however, because the total needs of the Army also will be considered as part of the equation. Let me interject at this point that only about 15 percent of the 18,000 people included in CMF 67 will require reclassification to the new aviation MOS created by this revision. In the first few months of 1983, you will have the opportunity to state your opinions and desires directly to those who will accomplish the reclassification action. All personnel will be aligned with the new MOS structure before 1984.

The positive benefits of this program, to you the soldier and supervisor in the field, are substantial and include an increased promotion potential without having to leave the aviation field or a job in which you are "darn good." Training will allow you to tackle the tough job which faces you.

There are many other improvements contained in this program which will greatly enhance your daily efforts to keep Army Aviation "Above The Best." Your untiring support of the aviation mission and continuing support of this program are recognized and appreciated by all members of the aviation community.



PEARL'S

Personal Equipment And Rescue/survival Lowdown

Water Purification Iodine Tablet Serviceability Testing

Reference CDRUSAMMA, Ft. Detrick, MD, SGMMA-LOT message, the Defense Personnel Support Center advised that the following medical material was tested and found to be suitable for issue and use provided the unit has a good wax closure and shows no signs of physical deterioration. A retest date of 2 years has been established for the following material: national stock number (NSN) 6850-00-985-7166, water purification tablet, iodine, 8MG, 50S, Wisconsin Pharmacal, all lots manufactured April 1979 through and including December 1980; retest date is December 1984. Note: Cite DPSC Project Number 0820229SL as authority for extension of expiration/retest date. This information will be confirmed in DA SB-8-75 Series.

Activities will destroy the medical material identified below in accordance with paragraph 3-48, AR 40-61, under provisions of paragraph 2-10, AR 735-11, as unsuitable for issue and use: NSN 6850-00-985-7166, water purification tablet, iodine, 8MG, 50S, Van Brode Milling Company, all lots manufactured prior to and including December 1971. The medical material failed serviceability testing conducted by the Food and Drug Administration. This information will be confirmed in DA SB-8-75 Series. Action officer for this office is Mr. Ed Daughety, AUTOVON 693-3307.

Aviators' Breathing Oxygen

Know your Military Specifications, Military Standards and Federal Specifications when it comes to aviators' breathing oxygen. The following pertinent information was excerpted from the aforementioned data. This is an effort to clarify standards and container markings. Some precautions are included which may help eliminate the possibility of servicing an aircraft system with other than aviators' breathing oxygen.

Oxygen for aircraft use is stored or contained in three forms—gaseous, liquid or chemical. The liquid oxygen system is used in some military aircraft (not Army), chemical in some large aircraft (Army uses Chlorate Solid State in some instances) but most general aviation aircraft use the gaseous oxygen system as does the Army. This article relates to gaseous aviators' breathing oxygen.

Gaseous oxygen is colorless, odorless, tasteless and about 1.1 times as heavy as air. Oxygen can exist as a solid, liquid or gas, depending upon the temperature and pressure to which it has been subjected.

Oxygen is a very reactive material, combining with most of the chemical elements. The union of oxygen with another substance is known as oxidation. Extremely rapid or spontaneous oxidation is known as combustion. While oxygen is noncombustible in itself, it strongly and rapidly accelerates the combustion of all flammable materials—some to an explosive degree.

Aviators' breathing oxygen comes in cylinders painted green with a white 2 to 2-1/2 inch wide band, 9 to 11 inches below the collar and stenciled or tagged as such. Inspect to ensure there is no evidence of grease or oil on the valves or the cylinders. (Hands, clothing and tools must be free of oil, grease and dirt when working with oxygen equipment. Traces of these organic materials near compressed oxygen may result in spontaneous combustion, explosions and/or fire.)

Before servicing any aircraft, consult the specific aircraft maintenance manual to determine the proper type of servicing equipment to be used. Aircraft should not be serviced with oxygen during fueling, defueling or other maintenance work which could provide a source of ignition. Oxygen servicing of aircraft should be accomplished outside hangars.

In summary—aviators' breathing oxygen going into aircraft oxygen systems should meet the purity and moisture specifications as contained in Military Specification MIL-0-27210; purity—99.5 percent by volume (minimum); moisture—0.005 milligrams per liter of gas maximum.

DO:

- Check that only "aviators' breathing oxygen" is going into aircraft systems.
- Reject oxygen that has an abnormal odor (good oxygen is odorless).
- Follow applicable instructions regarding charging, purging and maintenance of aircraft oxygen systems.

Pam McLemore photo by Tom Greene

DO NOT:

- Use oil or grease around oxygen systems.
- Expose oxygen containers to high temperatures.
- Confuse aviators' breathing oxygen with "hospital/medical" oxygen. The latter is pure enough for breathing but the moisture content is usually higher which could freeze and plug the lines and valves of an aircraft oxygen system.)

Credit is given to Department of Transportation, Federal Aviation Administration and Flight Standards National Field Office for this article. Point of contact for further information is Mr. Tommy Vaughn, AUTOVON 693-3307.

Fitting Of Protective Masks

Presently fielded protective masks will not provide an adequate fit (protective seal) for some individuals. For personnel who cannot achieve an adequate seal, modification of the protective mask is required.

Modification of protective masks is accomplished at U.S. Army ARRCOM (Armament Materiel Readiness Command). Requests to get mask modified for hard to fit personnel should be sent to Commander, U.S. Army ARRCOM, ATTN: DRSAR-MAO-NC, Rock Island, IL 61299.

When issued, all protective masks should be inspected for serviceability per operator's technical manual (TM) and tested for adequate protective seal on individuals by means of the ISOAMYL Acetate (banana oil) test. This test will be included in the latest revisions to operator's TM for M17, M24 and M25 masks. The test is accomplished as follows:

a. Obtain a container of ISOAMYL Acetate (NSN 6810-00-123-7047), a pint bottle reagent grade and a supply of cotton tipped swabs.

b. Since ISOAMYL Acetate is highly flammable, conduct test in a well ventilated area, away from ignition sources.

c. Personnel must be masked before opening the bottle of ISOAMYL Acetate. The mask should be

PEARL'S

donned in accordance with procedure in operator's TM. If personnel detect odor just before masking, the test is worthless.

d. Dip a cotton swab into the bottle and squeeze out excess liquid by pressing swab against inside of bottleneck.

e. Ask individual if he detects an odor different from normal smell of mask.

f. While the mask is worn instruct the subject to breathe deeply, pass the swab slowly around the edge of the facepiece, the eyepieces and the voicemitter; do not touch the swab to the mask.

g. Hold the swab for a short time at the canister/filter inlets and in front of the voicemitter diaphram and outlet valve.

h. Next, instruct the individual to tilt his head back and turn his head from side to side. Pass the swab under the chin at the edge of the mask facepiece while individual is doing movement.

i. Next, instruct the individual to press his palms firmly over inlet valves, but not so hard that the facepiece is distorted causing loss of face seal. Individual must breathe in to create a vacuum and collapse the facepiece. While the wearer of mask momentarily holds the vacuum on the mask facepiece, pass the swab around the eyepieces.

j. If the ISOAMYL Acetate odor is detected by the wearer, then either the mask is defective or the mask does not have an adequate seal or does not fit. Leakage of odor around the edge of the mask indicates either a poor fit or improper adjustment of head harness straps. If the leakage is present after adjusting the straps, the mask is the improper size.

k. After the test, and if no odor was detected, allow the individual tested to unmask and smell the swab to assure that his sense of smell is not defective.

Personnel who have been issued modified protective masks should be instructed to regularly check the glued seam, where the periphery is attached to the facepiece, for signs of deterioration. A banana oil test should be used to supplement this inspection.

Points of contact for further information are: ARRCOM Maintenance, DRSAR-MAO-NC, J. Jackson, AUTOVON 793-4713; ARRCOM Safety, DRSAR-SF, J. Pessagno, AUTOVON 793-6989; and DRCPO-ALSE, Ed Daughety, AUTOVON 693-3307.

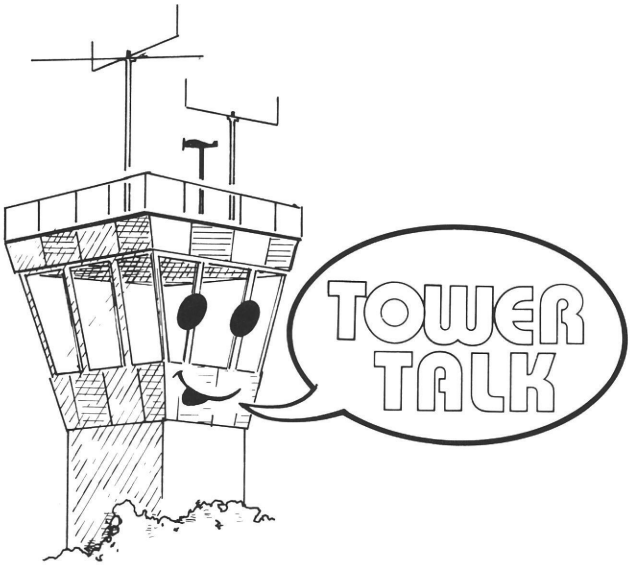
Compass Problems

The PEARL article on page 36 of the June 1982 *Aviation Digest* described problems with the MC-1 compass, NSN 6605-00-515-5637. The aforementioned compass was for interim use only and has now been replaced with the correct compass, NSN 6605-00-151-5337 (lensatic compass). We have taken action to have the SRU-21/P Supply Catalogue updated to list the correct compass. Point of contact for further information is Mr. Ed Daughety, AUTOVON 693-3307.

Fishing Kit

Fishing kit, NSN 7810-00-558-2685, managed by General Services Administration, has been replaced by fishing kit, NSN 4220-00-244-0764, managed by S9C, Defense Construction Supply Center, Columbus, OH 43215. Both of these fishing kits were procured in accordance with MIL-F-6218C (ASG). The S9C item manager of the kit is Ms. Cynthia Stokes, AUTOVON 850-3090. Action officer for this project is Mr. Ed Daughety, AUTOVON 693-3307.

If you have a question about personal equipment or rescue/survival gear, write PEARL, DARCOM, ATTN: DRCPO-ALSE, 4300 Goodfellow Blvd., St. Louis, MO 63120 or call AUTOVON 693-3307 or Commercial 314-263-3307



TOWER OPERATION

(FAAH 7110.65c)

Mr. Ronald B. Jackson
Directorate of Training Developments
U.S. Army Aviation Center
Fort Rucker, AL

1. An air traffic controller may approve a pilot's request to cross the airport traffic area (ATA) or exceed the ATA speed limit, if traffic condition permits, but may not approve a speed in excess of:

A. 200 knots
B. 150 knots
C. 250 knots
D. May not approve deviation without written approval

2. Federal Aviation Regulation 91.70 permits speeds in excess of the maximum authorized in the ATA under what conditions?

A. Required by normal military procedures
B. Required by the airplane flight manual
C. Recommended by the airplane flight manual
D. All of the above

3. If a runway is closed or unsafe and, after being told, the pilot persists in a request to use that closed/unsafe runway, what is the first action a controller would take?

A. Quote the notice to airmen applying to the runway
B. If the pilot insists allow the operation
C. Advise the operations section
D. File a Form 2696 on the pilot's action

4. When describing to traffic the location of vehicles on or near the movement area you should use:

A. A manner which will assist the pilot in recognizing them
B. The clock system
C. An understandable system
D. None of the above

5. The position of an aircraft may be determined by what means prior to issuing taxiing instructions?

A. The controller
B. The pilot
C. Airport surface detection equipment
D. All of the above

6. A local controller may use a certified tower radar display to issue radar traffic advisories.

A. True
B. False

7. Under what condition may a pilot's request to conduct an unusual maneuver be approved by the controller?

A. Only when an emergency exists which requires this maneuver
B. Essential to the performance of flight
C. Required by a local regulation
D. Special circumstances

8. Controllers are responsible for the anticipation of the presence of wake turbulence and the issuance of cautionary advisories:

A. When the aircraft is classified as "heavy"
B. When any aircraft has landed/departed from that runway within a specified time
C. Not responsible
D. None of the above

9. When describing braking action to the pilot you should include the words good, fair, poor or nil and:

A. The type of obstruction such as ice, water, snow
B. No further information required unless controller deems necessary
C. Mu-Meter reading if controller deems necessary
D. Aircraft type or vehicle that made the report

10. Descriptive terms should be used to describe a portion of the runway/taxiway that contains restriction in braking action.

A. True
B. False

ANSWERS

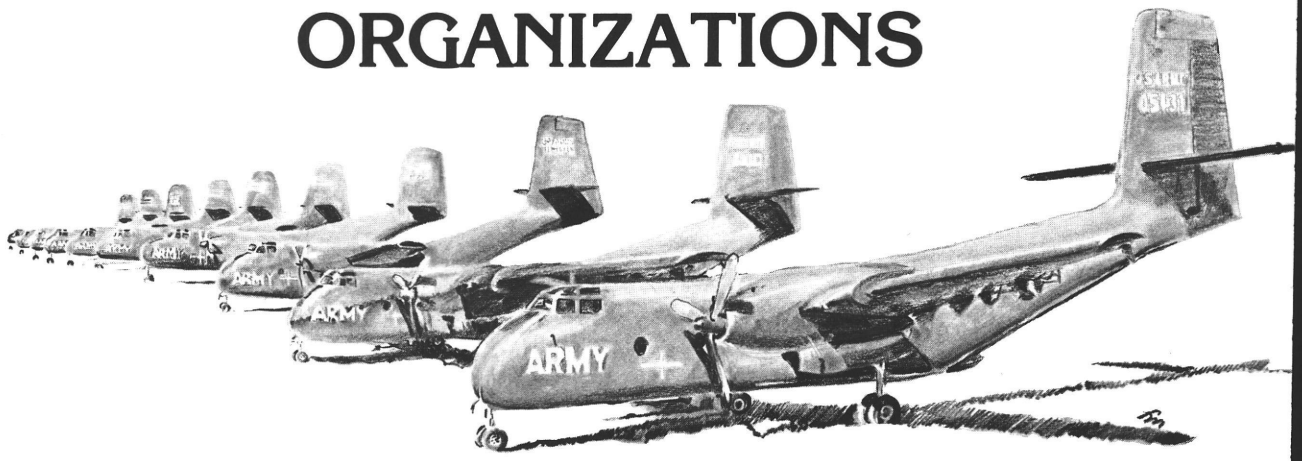
1. C, page 127, para 912a
2. D, page 127, para 912a (note)
3. A, page 126, para 910a
4. A, page 125, para 901
5. D, page 126, para 905a (note)
6. A, page 126, para 906a(2)
7. B, page 127, para 912b
8. C, page 127, para 911(note)
9. D, page 129, para 942b
10. A, page 129, para 942c(note)

This concludes the history series; copies are available on request.

FORTY YEARS OF ARMY AVIATION

Richard K. Tierney
Editor, *Aviation Digest*

Part 5: POLICIES AND ORGANIZATIONS



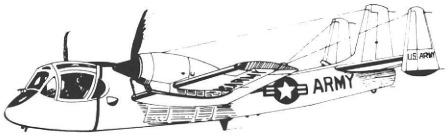
Roles and Missions

After World War II the Army Air Forces moved rapidly to develop its concepts of strategic air war, while the plea from the Army Ground Forces for aviation support was largely ignored. This resulted in open disagreements between commanders of the Army Ground Forces and those of the Army Air Forces.

Finally, on 26 July 1947, Congress passed the National Security Act of 1947 which created a separate United States Air Force. The act however allowed the Army under Title 10, U.S. Code to retain its organic aviation in the presentation of the land battle. Disputes erupted almost immediately over which missions Army aircraft could or could not perform. The Air Force wished to limit Army Aviation to its World War II status, but at the same time did not provide or move to develop the aviation support Army commanders so urgently needed. Consequently, those commanders turned to Army Aviation which had clearly demonstrated its ground support potential in World War II.

As heated, and often passionate, misunderstandings grew, the Army and Air Force representatives met in 1949 to try to iron out their differences. The two parties agreed to limit the weight of Army fixed wing aircraft to 2,500 pounds and helicopters 3,500 to 4,000 pounds.

The outbreak of the Korean War resulted in sharp differences with the Air Force over roles and missions as Army Aviation operations spread rapidly in the areas of medical evacuation and, to a lesser degree, in the



movement of supplies and troops by air in the combat zone. To head off further disputes, Secretary of the Air Force Thomas K. Finletter met with Secretary of the Army Frank Pace Jr., to clarify roles and missions. On 2 October 1951, they signed a Memorandum of Understanding, allowing Army Aviation to support Army requirements in the conduct of land operations without infringing upon the functions assigned to the Air Force. It also dropped the aircraft weight limitations that had been imposed in 1949.

While the 1951 memorandum has been called the "Magna Charta of Army Aviation," it nevertheless was not a panacea. The Air Force was to provide (among other functions) assault transport and troop carrier airlift. That brought about another impasse when the Army, contending that the Air Force was not providing sufficient airlift in the combat area, sought to organize its own helicopter transport battalions. The result was a new Memorandum of Understanding, signed 4 November 1952.

The new agreement restored the weight limitation on fixed wing (boosting it to 5,000 pounds) but not on helicopters. The bottom line of the new memorandum left the Army dependent on the Air Force for close air support, reconnaissance and tactical transport to and from the combat zone. But the Army was able to expand its horizons in the development of Army Aviation within the combat zone. (In 1956, the Department of Defense imposed a 20,000 pound weight limit on helicopters, but permitted the Army to request specific exceptions to that limitation.)

By 1960, the Army had received Department of Defense exceptions to the weight limitation on fixed wing aircraft in order to procure the OV-1 Mohawk, a twin-turbine powered reconnaissance plane, and the CV-2 Caribou, a twin-engine STOL (short takeoff and landing) transport that filled the gap between heavy cargo helicopters and the Air Force's C-130. The existence of these two airplanes was a major concern to the Air Force. Finally on 6 April 1966, the Army and Air Force agreed that the Caribou (and its follow-on CV-7A Buffalo) would be transferred to the Air Force. In turn the Air Force agreed, "To relinquish all claims for helicopters and follow-on rotary wing aircraft which are designed and operated for intratheater movement, fire support, supply, and resupply of Army forces...." Thus the Army's claim to development of the helicopter—including the armed helicopter—was clearly a matter of record.

Warrant Officer Aviators

While warrant officers have been around the Army since 1918, the Army's first aviation warrant officers did not receive their wings until December 1951. They became the first Army Aviation warrant officer aviators in combat, flying H-19s with the 6th Transportation Company (Helicopter) in Korea in 1953. Following the Korean War, momentum began to build for a stepped-up aviation warrant officer program. The Chief of Transportation in 1954 recommended using warrant officer

The Army accepts its first 3 AC-1 (CV-2) Caribou during ceremonies on 8 October 1959 at the de Havilland plant.

aviators on a larger scale and the Army began accepting applications at Fort Rucker, AL, for training enlisted soldiers as warrant officer candidates. The first of those were graduated at Fort Rucker on 30 April 1955.

Meanwhile the Continental Army Command (CONARC) completed a study of training warrant officer pilots to be used in flying positions that did not require command and leadership. The CONARC recommendation was approved, and the first class of warrant officer candidates began training at Fort Wolters, TX, in November 1956.

The warrant officer program got off to a shaky start, but it received solid support at the outset from several Army leaders in Washington, especially Major General Hamilton H. Howze, the Director of Army Aviation.

The War in Vietnam brought a rapid increase in the training of aviation warrant officers. Between July 1966 and July 1970, the Army's aviation warrant officer population jumped from 2,960 to more than 12,000.

In 1966, a career program for aviation warrant officers was developed to include an advanced course for experienced CW2s and CW3s and a senior course for CW3s and junior CW4s. But by the mid-1970s the Army was becoming alarmed over the declining retention rate of its aviation warrant officers. In 1979, the U.S. Army Research Institute at the direction of the U.S. Army Military Personnel Center (MILPERCEN), and in conjunction with the Aviation Center, conducted extensive research to discover why the retention rate was sliding and what could be done about it. By 1980, the principal factors affecting aviation warrant officer retention were isolated.

Aviation warrant officer incentive pay equalization with most of the commissioned officers was the leading dissatisfier. Quick action by MILPERCEN and the Department of the Army, in conjunction with the Department of Defense, resulted in the passage by Congress of the Jepsen-Exxon Military Pay Bill which became law in October 1981 and resolved the incentive pay imbalance which had existed for many years.

Army Aviation at DA

At the Department of the Army staff level, the first Army Aviation organization was established 21 April 1954 as the Army Aviation Branch, Organization and Training Division, in the Office of the Assistant Chief of Staff, G-3. After a comprehensive review of the Army Aviation program it was decided to upgrade the Army Aviation Branch and on 1 February 1955 a separate Army Aviation Division was created in G-3. It called for a general officer position which was not filled. But on 3 January 1956, the division was further reorganized and a Directorate of Army Aviation was established with Major General Hamilton H. Howze as the first Director of Army Aviation. The directorate continued until a major Army reorganization disestablished the office in 1974 when Brigadier General James H. Merryman was director.

Slightly more than 1 year later, however, the position of Deputy Director of Requirements and Army Aviation Officer was established in the office of the Deputy Chief of Staff for Operations and Plans (ODCSOPS) at the Department of the Army. Brigadier General Charles E. Canedy was the first to fill the position in August 1975.

In the ensuing years, high level Army Aviation offices were opened throughout the Department of the Army. In addition to the Requirements Directorate in ODCSOPS, the following staff agencies were deeply involved with Army Aviation by the start of 1982:

- The Training Directorate in ODCSOPS
- The Aviation Systems Division, Weapons Systems Directorate in the Office of the Deputy Chief of Staff for Research, Development and Acquisition (ODCSRADA)
- The Aviation Logistics Office in the Office

of the Deputy Chief of Staff for Logistics (ODCSLOG)

- ODCSPER (Office of the Deputy Chief of Staff for Personnel) which was responsible for (1) plans, policies and programs relating to Army Aviation in MILPERCEN; (2) management of Active and Reserve Component aviation policies, and (3) the Army Aviation safety and accident prevention program.
- The Army Medical Department's (AMEDD) Army Aviation program in the Office of the Surgeon General.
- And in MILPERCEN, a separate office was responsible for the career management and assignment of Army aviators.

Rogers Board

By 1960, the Army set about formulating a unified airmobile program. On 15 January 1960, the Army Chief of Staff ordered the establishment of the Army Aircraft Requirements Review Board. It was nicknamed the Rogers Board after its chairman, Lieutenant General Gordon B. Rogers, the deputy commanding general of the Continental Army Command.

The Rogers Board was tasked to recommend a course of action to meet the requirements of Army Aviation for the period 1960 to 1970. On 10 March 1960, the board's recommendations and conclusions were submitted to the Department of the Army. Some of the highlights of its recommendations were: A design competition to develop a light observation helicopter to replace the L-19 (O-1), H-13 and H-23; a priority development of the UH-1; and a phaseout of the L-20 (U-6), H-19, H-21 and H-34. It recommended the procurement of the HC-1 (CH-47) and AC-1 (CV-2) and the elimination of the U-1A and H-37. Also, the AO-1 (OV-1) would be obtained to bolster the Army's surveillance capabilities.

Prompted by a memorandum from Major General Hamilton H. Howze, the Rogers Board also recommended a study to determine the feasibility of air fighting units and their armament

The Rogers Board was followed by a Rogers Committee on Army Aviation to determine how to expand the training requirements needed to support the recommendations of the board. However, the work of the board and committee was overtaken by the swiftly changing events in Southeast Asia and the accompanying surge in the growth of Army Aviation. But, the Rogers Board and Committee together had laid the solid foundation that enabled the Army to rapidly develop its Army Aviation combat units and aviation training programs.

Directors of Army Aviation

Major General Hamilton H. Howze	*Jan 56 - Dec 57*
Brigadier General Ernest F. Easterbrook	*Dec 57 - Dec 58*
Major General Clifton F. von Kann	*Jul 59 - Oct 61*
Brigadier General Delk M. Oden	*Oct 61 - Mar 63*
Colonel Robert H. Schultz	*Apr 63 - May 63*
Brigadier General John J. Tolson III	*Jun 63 - Feb 65*
Colonel George P. Seneff Jr.	*Mar 65 - Feb 66*
Colonel Delbert L. Bristol	*Mar 66 - Apr 66*
Major General Robert R. Williams	*May 66 - Sep 67*
Brigadier General Edwin L. Powell Jr.	*Oct 67 - May 69*
Colonel Jack W. Hemingway	*Jun 69 - Jul 69*
Major General John L. Klingenhagen	*Sep 69 - Nov 69*
Colonel Jack W. Hemingway	*Dec 69 - Jan 70*
Major General Allen M. Burdett Jr.	*Feb 70 - Sep 70*
Major General William J. Maddox Jr.	*Oct 70 - Aug 73*
Brigadier General James H. Merryman	*Sep 73 - May 74*

Army Aviation Officers

Brigadier General Charles E. Canedy	*Aug 75 - Jul 78*
Brigadier General Carl H. McNair Jr.	*Jul 78 - Aug79*
Brigadier General Richard D. Kenyon	*Aug 79 - Jun 81*
Brigadier General Ellis D. Parker	*Jul 81 - Current*

Howze Board

In the early 1960s, the Department of Defense turned to Army Aviation and its heli-

copters to bolster the tactical mobility of the Army's ground forces. At the request of Secretary of Defense Robert McNamara, the Army Tactical Mobility Requirements (Howze) Board was formed in 1962. It consisted of a select group of Army officers who understood the airmobile capabilities offered by Army Aviation and was headed by General Hamilton H. Howze. Studies and tests by the board proved that Army aircraft could provide the airmobility needed to increase the combat effectiveness of the ground forces.

As a result of the Howze Board recommendations, the Army formed the 11th Air Assault Division (Test) under the command of Major General Harry W.O. Kinnard at Fort Benning, GA. It also established the 10th Air Transport Brigade to support the division. The evaluation group was headed by Brigadier General Robert R. Williams, who had been a member of the Class Before One. The Howze Board also recommended the formation of an air cavalry combat brigade, but unfortunately that was postponed.

The 11th Air Assault Division tests were extensive and an unqualified success that resulted in the establishment on 1 July 1965 of the 1st Cavalry Division (Airmobile). It was truly airmobile in that it could move one-third of its combat elements simultaneously in its own aircraft. The new division was authorized 15,787 soldiers, 434 aircraft and 1,600 ground vehicles.

Some changes were made in the 1st Cav as compared to the 11th Air Assault Division. The 1st Cav Division artillery's Little John Battalion was dropped, as was the battalion of armed OV-1 Mohawks. Six OV-1s remained for reconnaissance and surveillance missions.

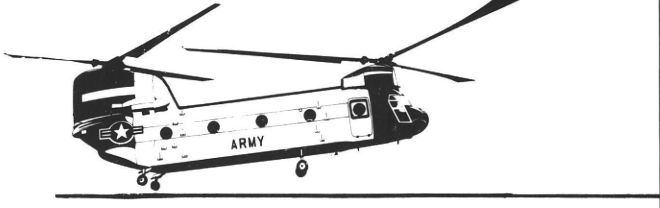
Another change was the addition of a full brigade capable of parachute operations (giving the 1st Cav two more battalions). The 10th Air Transport Brigade was deleted, however the organic aviation group was retained. The 1st Cav deployed to Vietnam in August 1965 and was soon engaged in heavy combat.

An 11th Air Assault Division (T) CH-47 Chinook during test to slingload all types of equipment to support the ground soldier.

After Vietnam

After the Vietnam War, plans were made to reorganize one of the Army's airmobile divisions in conjunction with an overall drawdown that would reduce the Army to only 13 active divisions. The future of Army Aviation looked bleak.

One of the voices raised to orient Army Aviation thinking to fighting and surviving in a heavy combat environment was that of Major General William J. Maddox Jr., from his position as Director of Army Aviation in 1970. He urgently appealed through magazine articles, speeches and personal visits to people of all ranks in Army Aviation, and to others associated with Army Aviation, that they stop thinking in terms of Vietnam tactics and start training and planning to fight in the nap-of-the-earth (NOE) in order to survive and win on the high intensity battlefield. Meanwhile, the TOW missile was used in Vietnam on UH-1C helicopters to successfully attack North Vietnamese tanks. The fact that Army helicopters had destroyed 10 enemy tanks and reversed a North Vietnamese breakthrough was made known on Capitol Hill in Washington, DC, where members of key Congressional Committees were greatly impressed.



Early in the 1970s, Army Aviation trainers and planners began working feverishly to develop NOE tactics, aircraft and support hardware that could survive and fight around-the-clock and in adverse weather on a European-type, high intensity battlefield. Numerous tests and studies were conducted. Some of the more prominent include:

- MASSTER (Modern Army Selected Systems Test, Evaluation and Review) which was organized at Fort Hood, TX, in 1971 to study and test the role and capabilities of Army Aviation, as well as other modern systems in the high threat environment of a mid-intensity war.
- 2d Air Cavalry Combat Brigade (ACCB) which was to use its helicopters, in conjunction with the combined arms team, to find and kill armor and mechanized forces. It was redesignated the 6th Cavalry Brigade (Air Combat) in February 1975. The 6th, in the role of the user, worked closely with the people of MASSTER, which was the tester that evaluated the worth of the ACCB in a mid-intensity conflict.
- Pass in Review (Priority Aircraft Subsystem Suitability Intensive Review) was a special study group established in April 1975 at Fort Rucker by the Training and Doctrine Command. Its mission was to determine the configuration of the AH-1 Cobra for the 1980s.

Another event, the Army's procurement of the SFTS (Synthetic Flight Training Systems), helped Army Aviation in the 1970s to improve the proficiency of its aviators and has resulted in large savings in training costs and time. The first UH-1 Huey prototype simulator was received at Fort Rucker in November 1971. Following a testing period it was accepted in April 1972. The UH-1FS (flight simulator) was followed by the CH-47FS Chinook, the AH-1FS Cobra and the UH-60FS Black Hawk.

MAST Operations

Although not related to tactics and training for combat on the high threat battlefield, Army Aviation's stature in the public eye was greatly enhanced in the 1970s by the MAST (Military Assistance To Safety and Traffic) program. It was born in July 1970 and by its 10th anniversary its helicopters and crews were the modern "Angels of Mercy." They have flown more than 18,500 missions and have been responsible for saving thousands of lives by quickly flying injured people to medical facilities.

In addition to the events mentioned above, the Army, in the 1960s, conducted two significant studies called ARCSA, which is an acronym meaning Aviation Requirements for the Combat Structure of the Army. The purpose was to draw on the experiences and lessons learned in Southeast Asia in order to define the justifications for building additional Army Aviation into the Army structure.

ARCSA I, which began 31 December 1964, was based on hypothesis. It cited the need to build more airmobility into the Army and was approved by the Army Chief of Staff in July 1965 and by the secretary of the Army a month later. The result was a Chief of Staff memorandum, dated 22 August 1966, that created the ARCSA II Study Group. ARCSA II, based on hard battlefield experience, was completed in March 1967 and provided revised aviation requirements for the fiscal year 1968 to 1972 timeframe.

By the mid-1970s, the people of Army Aviation had developed a confidence in their aircraft and equipment and their ability to fight and win on the high threat battlefield. All they needed was a plan for the future, and that was about to be developed by a high level study group that would be convened at Fort Rucker.

ARCSA III

In January 1976, the ARCSA III study group was formed at the Aviation Center at Fort Rucker, AL. Specifically, the ARCSA III group was charged with determining the aviation requirement to equip the Active Army and its Reserve Components to fight in a high air defense threat environment from 1977 to 1986. Lieutenant General Frank A. Camm, deputy commander of the Training and Doctrine Command, was the chairman.

The ARCSA III recommendations were briefed on 15 February 1977 to the Army Chief of Staff who approved them for implementation. Their primary thrust was to reduce the number of nondivisional separate aviation units and make the aviation units organic to division and corps structures. The rationale was that since the units fight primarily with divisions and corps, they should belong primarily to divisions and corps.

Emphasis was placed on upgrading the attack helicopters with an increase of aerial antiarmor capabilities in the divisions. The group also accented the need for air cavalry in the divisions and for the support of a scout helicopter. Since an advanced scout helicopter was not in sight, it was decided that a UH-1H Huey should be equipped with a target acquisition and designation system. The utility tactical transport aircraft system (UTTAS) would receive an increased logistical role. It was felt the UTTAS could perform some missions better than the larger CH-47D modernized Chinook.

The ARCSA III study was exceptionally comprehensive and touched all aviation areas of the Army's combat and combat support forces, as well as training base requirements. In effect, it streamlined Army Aviation and laid the groundwork to beef up mobility and firepower in the divisions and corps with aviation assets.

Army Studies 86 And The ACAB

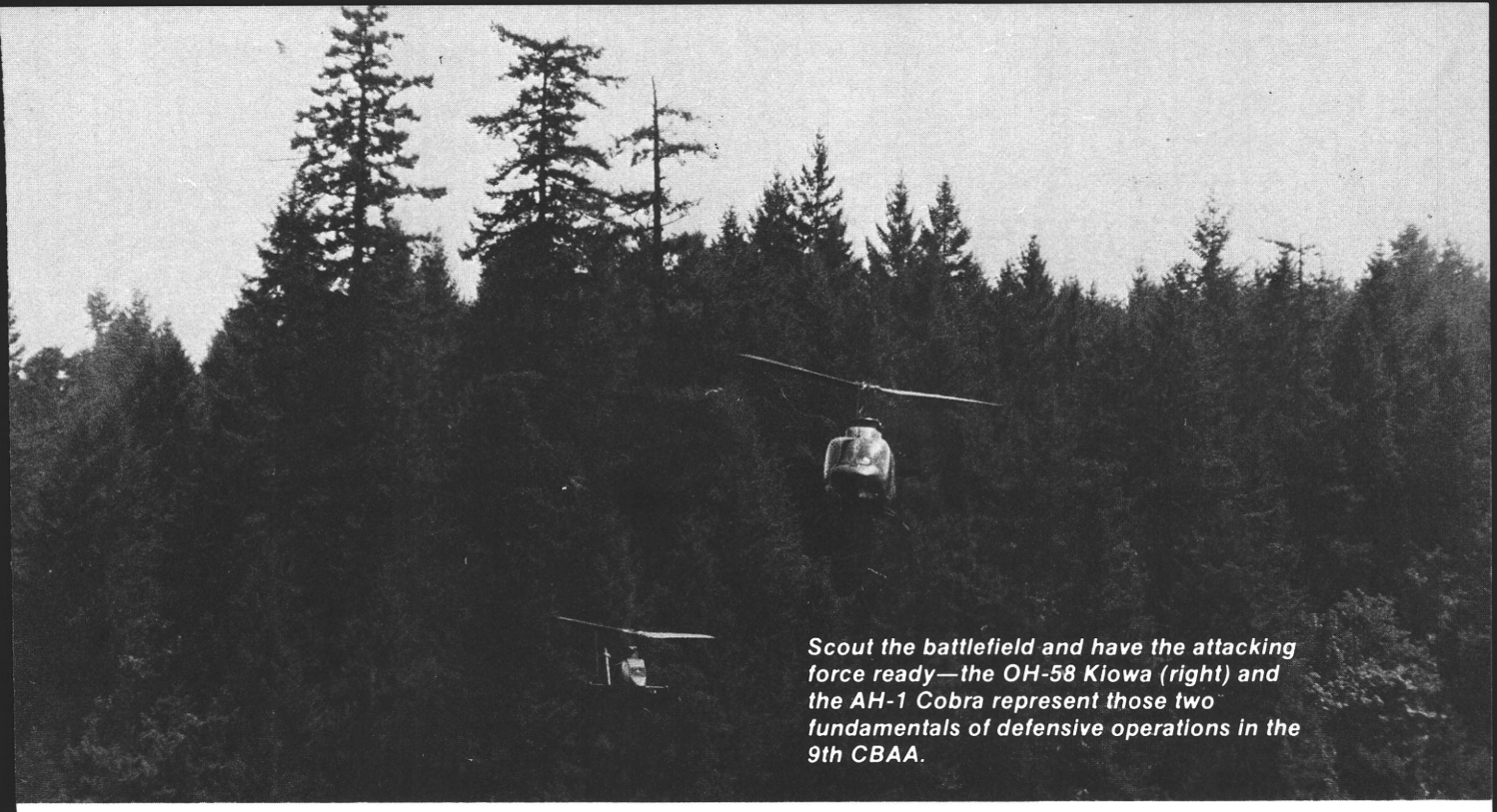
In 1978 to 1980, the Army conducted an intensive and wide-ranging analysis of its force structure in order to meet the numerically superior and increasingly sophisticated threat of the next decade. It is intended to design innovative ground and aviation tactics and organizations that could take advantage of the firepower of new advanced weapons systems and increased mobility offered by improvements to Army Aviation's fleet of aircraft.

The studies included Light Division 86 which would integrate emerging high technology into a light division that could be deployed swiftly with the increased firepower and battlefield mobility needed to successfully engage an enemy in combat anywhere in the world.

The Heavy Division 86 Study was aimed at developing an Army division that would successfully engage in heavy and sustained combat. It, too, will incorporate modern weapons systems and increased mobility provided by Army Aviation.

Army Studies 86 also includes the Corps 86 Study (started October 1979) and the Echelons Above Corps (EAC) 86 study (begun in December 1979).

Perhaps the most exciting and innovative aspect of the Army 86 Studies is the concept of organizing the "something old-something new" air cavalry attack brigade (ACAB) concept. The "something old" can be traced to the Howze Board (Army Tactical Mobility Requirements Board) which in 1960 had recommended the formation and testing of an air cavalry combat brigade (ACCB). The "something new" comes from the Army 86 Studies which substituted the word "attack" for "combat" and proposed an air cavalry attack brigade for both the light and heavy divisions. In comparison to previous aviation



Scout the battlefield and have the attacking force ready—the OH-58 Kiowa (right) and the AH-1 Cobra represent those two fundamentals of defensive operations in the 9th CBAA.

organizations, the ACAB, according to study group reports, provides the division added "combat power, improved tactical flexibility enhancements in command and control."

The ACAB sprang to life under the name of the 9th Cavalry Brigade (Air Attack) (CBAA), in March 1981 at Fort Lewis, WA, under the command of Colonel Thomas H. Harvey Jr. It is organic to the 9th Infantry Division and committed to the test plan developed by the High Technology Test Bed/Group in conjunction with the Combined Arms Test Activity of Fort Hood, TX. Operational testing of the 9th CBAA got underway in February 1982.

Combat Arms Membership

In the midst of planning and implementing Army Studies 86, another study group in 1977 began examining the personnel management of Army Aviation. Its work resulted in a revised commissioned aviation career pattern which was approved by the Army Chief of Staff and announced in 1979. It marked perhaps the most significant milestone in Army Aviation history when Specialty Code 15 (Army Aviation) was designated a combat arms specialty. Almost immediately, the Army implemented a comprehensive program to "meet Army Aviation requirements and fulfill individual career aspiration." Key to this was the organizational concept of the CBAA which offered viable career patterns for Army aviators. It contained a logical aviation grade structure from section through brigade level. Thus, Army Aviation's command structure was aligned not only with the other combat arms members, but also with the aviation elements of the other military services. It called for lieutenant colonels to command battalions/squadrons, captains to command companies, lieutenants to command platoons and warrant officers to command sections.

Today

Army Aviation career patterns are being refined and implemented. The hardware is greatly improved, and increasingly better aircraft and equipment are rapidly being developed and delivered. The training programs are viable and becoming more meaningful as Army Aviation functions as a member of the combined arms. The people of Army Aviation are continually dedicated to accomplishing their missions in a professional manner. It all spells success. Such is Army Aviation today—Above The Best.

REPORTING FINAL

Late News From Army Aviation Activities

FROM WASHINGTON

Test Pilot Selection. The next engineering test pilot selection board will be held in January, and the deadline for new applications to be received at MILPERCEN is 15 December. For information on requirements, see the Aviation Personnel Notes in next month's *Aviation Digest.* Or call the Aviation Plans and Programs Branch, MILPERCEN, AUTOVON 221-8156/8157 or commercial 202-325-8156/8157.

FROM FORT LEWIS

Smile, You're on Cobra Camera. Three AH-1 Cobras of Company A, 214th Attack Helicopter Battalion, 9th Cavalry Brigade (Air Attack), carried video camera systems during recent field exercises to test the system's value in providing a record for post-flight review of training engagements. The equipment was installed by personnel from the Combat Development Experimentation Command, Ft. Hunter-Liggett, CA.

A cable connected the video camera that was placed in the gun camera mount below the TOW sight with the recorder that was in the space normally filled by the ammunition box. The system made a video recording of everything the TOW saw, recorded radio communications in the aircraft, and provided a timer for the gunner to use in computing elapsed flight time for the TOW missile.

Results of the test proved the system's value to pilot and gunner training, according to battalion officials. The major drawbacks of the equipment's weight and bulk have since been overcome in a lighter, more compact system. It has all the recording equipment located behind the pilot's seat, and the new design also has an onboard monitor that eliminates the need for an external system to review tracking engagements.

(Barry Dowell, 9th PAO)

FROM VIRGINIA

Army to Get Confiscated Aircraft. Under a program initiated by the Fixed Wing Readiness Project Office, Army Troop Support and Aviation Materiel Readiness Command, St. Louis, MO, aircraft seized by federal law enforcement agencies because of illegal use will be given to the Army free of charge.

These non-Army aircraft are welcome because many fixed wing planes operated by the Army, Army Reserve and National Guard are long overdue for replacement, with some being nearly 30 years old. The average cost of replacing one plane exceeds $1 million.

A unit that receives a confiscated aircraft will be responsible for upgrading and maintaining it to Federal Aviation Administration and Army standards. **(DARNEWS)**

In the Sidekick VI exercise of the 59th ATC Battalion from Schwaebisch Hall, West Germany, SP5 David Christman keeps tuned to incoming traffic at the AN/TSQ-70A mobile control tower

FROM GERMANY

ATC Exercise. In May the 59th Air Traffic Control Battalion headquartered at Schwaebisch Hall, West Germany, conducted Sidekick VI, an exercise to establish an air route structure between the Grafenwoehr and Hohenfels military training areas in eastern West Germany. In connection with that, the government of the Federal Republic of Germany agreed for participating helicopters to fly "in the clouds" along a tactical route structure 400 feet above the highest obstacle. That permission was a first for any NATO (North Atlantic Treaty Organization) military and was given on a trial basis to determine the feasibility of establishing a permanent ATC/aviation training area between Grafenwoehr and Hohenfels.

The flight coordination centers and airfield towers recorded 553 aircraft movements during

photos by N. Joseph Ketterer

Captain Jessica Garfola Wright preflights a CH-54 Tarhe helicopter before taking her checkride at Ft. Indiantown Gap, PA. She is the first woman qualified to fly the free world's largest helicopter

the 8-day exercise, and there were 81 radar approaches to the two tactical airfields.

Two GRETA (Ground Radar Emitter Training for Aviators) devices from the 7th Army Training Command were used to simulate Soviet air defense radar emitters in the Hohenfels area. The combination of GRETA and the ATC route structure provided another "first" for Army ATC and added a new level of realism to the exercise for pilots and controllers.

(Mullady, 5th Signal Cmd PAO)

FROM PENNSYLVANIA

CH-54 Pilot. Captain Jessica Garfola Wright, operations officer with the Pennsylvania Army National Guard's 1028th Transportation Company, is the first woman Army aviator to become fully qualified to fly the CH-54 Tarhe helicopter.

"It's a dream I've had for several years," CPT Wright commented after she received her checkride in the world's largest helicopter in Ft. Indiantown Gap.

She is also the only woman aviator in the Army rated as a CH-47 Chinook pilot, having earned that in April 1979, and is the only woman aviator in the Pennsylvania Army National Guard.

CPT Wright was graduated from flight school in March 1978 and has sinced logged more than 500 hours in rotary winged aircraft.

(Foster, PA DEPT MIL AFFAIRS)

FROM FORT RUCKER

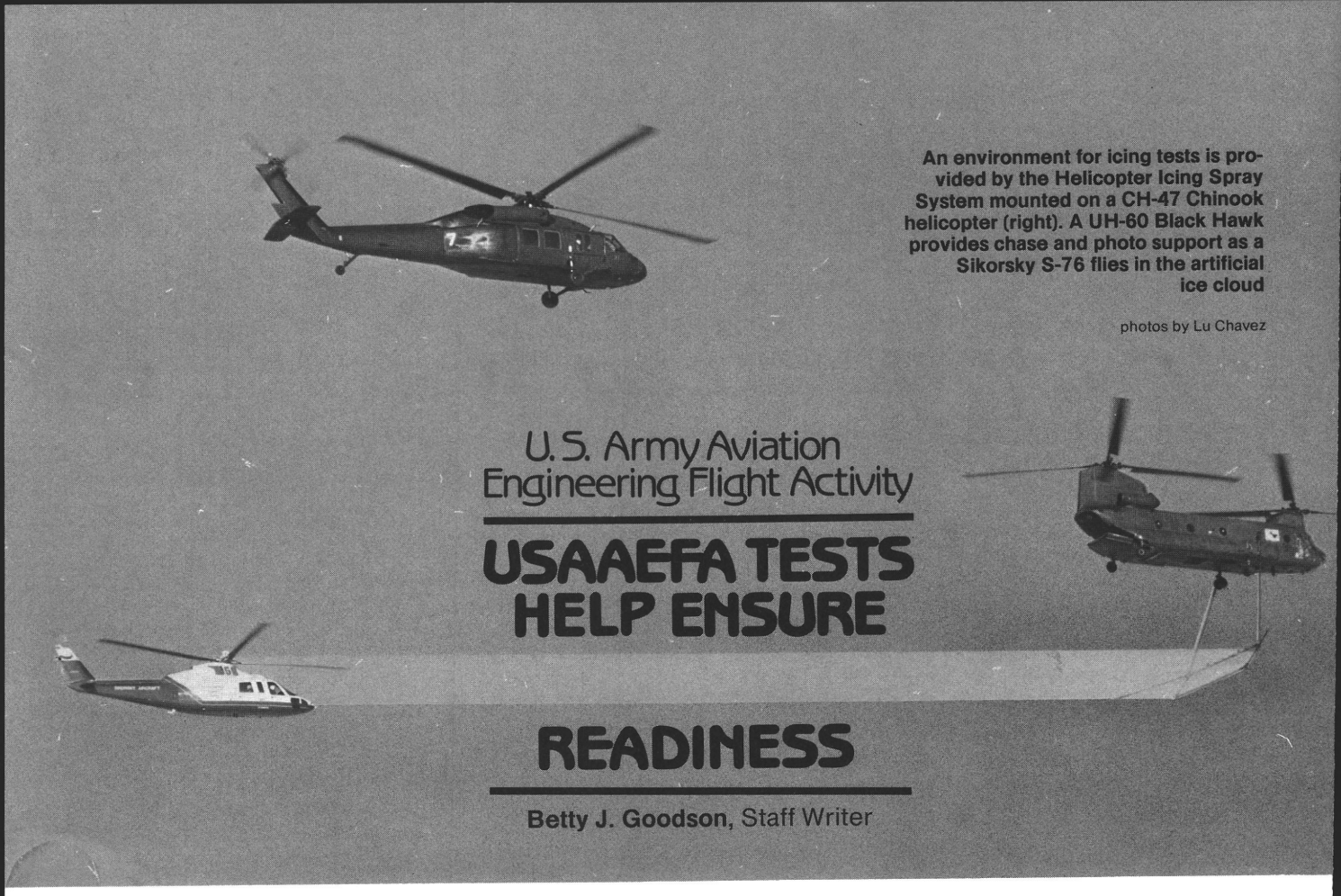
Museum News. Cash and pledges now in the Army Aviation Museum Foundation, Inc., fund drive total $856,000, marking what officials call a "slow but steady" progress toward the $2.5 million needed to begin construction on the new museum.

Of the total received, $70,407 has come from the Northrop Worldwide Aircraft Services, Inc., unions and the Northrop Management Club. Northrop is the only firm which has authorized payroll deductions as a method for employees to make pledges to the museum.

To date, letters mailed to more than 9,000 members of the Army Aviation Association of America, asking for a $40 contribution to commemorate the 40th anniversary of Army Aviation, have netted $22,000.

Tax-deductible gifts from everyone interested in the preservation of Army Aviation's history are welcomed. The Museum Foundation office is in Building 6203 at Ft. Rucker, telephone is 598-2508, and the mailing address is P.O. Box H, Ft. Rucker, AL 36362.

Ten members of the Pennsylvania Army National Guard and an active duty Army advisor who works with them are new recipients of Master Army Aviator Badges. Presentations were made in August by Major General Carl H. McNair Jr., commander, Army Aviation Center, Ft. Rucker, AL, at a ceremony in Ft. Indiantown Gap, PA, that was also attended by Colonel John J. Stanko, chief, NGB Aviation Division. Pictured are, left to right, first row: CW2 George Breslin, CW3 Harry Smith Jr., CW4 Reed Zellers and CW4 Richard Crosley; second row: CW4 David Schweinsburg, CW3 Quentin Wenrich, MAJ Marlo Meola and advisor MAJ John Pennypacker; third row: COL Stanko, CW2 Edwin Fitler, CW4 Wally Royles, MAJ Simon Miller Jr. and MG McNair



An environment for icing tests is provided by the Helicopter Icing Spray System mounted on a CH-47 Chinook helicopter (right). A UH-60 Black Hawk provides chase and photo support as a Sikorsky S-76 flies in the artificial ice cloud

photos by Lu Chavez

U.S. Army Aviation Engineering Flight Activity

USAAEFA TESTS HELP ENSURE READINESS

Betty J. Goodson, Staff Writer

ARMY AVIATORS expect their machines to perform as needed for mission accomplishment. That's a justified expectation, and its realization is due in large part to some friends those aviators may not even know about. The users' friends are the people, about 50 military and 100 civilians, who work at the U.S. Army Aviation Engineering Flight Activity (USAAEFA), Edwards Air Force Base, CA, under the command of Colonel Lewis J. McConnell, as a subordinate activity of the U.S. Army Aviation Research and Development Command (AVRADCOM), St. Louis, MO.

Their primary mission is to conduct airworthiness qualification flight tests of changes to aircraft and related equipment already in the inventory or of advanced concepts being examined for military application. Tests can be either engineering or experimental; and Lieutenant Colonel Grady W. Wilson, chief of the Flight Test Directorate (FTD),* provided the following definition of those: "An engineering flight test is a technical, quantitative test that repeats a flight condition that has already been flown by someone else.

See page 41

Facilities used by the Army Aviation Engineering Flight Test Activity at Edwards Air Force Base, CA

photo by James Culpepper

The experimental is envelope expansion; nobody has been there before." The majority of the activity's work, he noted, is within the engineering area in order "to verify contractor data."

Whatever the type of test, all of the projects are designed to provide information on how well the Army's performance requirements are met by the tested equipment. The gathering of that data is a vital part, Colonel McConnell said.

He explained: "We have just recently acquired a Real-Time Data Acquisition and Processing System (RDAPS) that gives us the latest in the state of the art of collecting, analyzing and producing the data needed for a test program. With this system, which was designed to our specifications and is one-of-a-kind, the engineer will be getting real-time readout on anything he wants to know about an aircraft in a test flight. That ensures the predetermined test profile is met, and it also increases a test's safety factor because if something is going wrong it is known immediately. Too, the RDAPS saves time. We don't have to wait for information to be run through the computer before we know whether the desired results were obtained or the test has to be reflown."

Another advantage of the RDAPS, according to Mr. T. L. Lynch who heads the Data Systems Directorate, is its transportability. It is housed in a van that can be moved to any of various USAAEFA test sites in southern California.

The sites Mr. Lynch referred to are all within 200 miles of Edwards and provide altitude variations from below sea level to 12,500 feet. The ability to check aircraft flying characteristics at such a variety of altitudes so close to home base is a primary reason for USAAEFA being located at Edwards. California conditions are not favorable, however, for one part of the activity's work, the artificial icing tests. For that, crews go north to St. Paul, MN, where they use another one-of-a-kind piece of equipment, the HISS (Helicopter Icing Spray System).

First used in 1973, the HISS is a hydraulically raised and lowered arrangement of pipes that hangs under a CH-47C Chinook helicopter. Inside the aircraft is an 1,800-gallon water tank together with lines which send that water down to nozzles on the pipes. At the nozzles, pressurized bleed air from the engines atomizes the water into minute droplets which turn into ice when the HISS is being operated in freezing conditions. The ice cloud closely approximates icing conditions found in nature. The test aircraft flies behind and below the CH-47 Chinook and in the ice cloud to determine where and how quickly the ice will accrete and how it will affect the aircraft's handling characteristics.

Improvement of the icemaker is an ongoing project, LTC Wilson noted. A second-generation boom is now being used, and the ultimate goal is to have one that will produce an ice cloud large enough to cover the entire test aircraft. The present cloud is about 8 feet thick, meaning the rotor or the fuselage can be iced, but not both at the same time.

Some other work done in the two FTD Engineering Flight Test Divisions, headed by Mr. J. N. Johnson and Mr. D. F. Macpherson Jr., also concerns icing.

One of those projects is the testing of a composition rubber boot installed on the main rotor blades of a UH-1 Huey. The concept is that if ice buildup begins, air will be blown into the boot to expand it and shed the ice, Mr. Johnson explained. The test being conducted at Edwards is to establish an operational flight envelope with the pneumatic boots installed. After that is done, the pneumatic boots will be tested behind the HISS. If proven successful, it is theorized the boot could be used on other helicopters.

The only Army helicopters with deicing equipment, according to Mr. Johnson, are the UH-60 Black Hawk and the AH-64 Apache. Tests of that equipment on the latter aircraft were done earlier this year, and he described how they were conducted:

"We used the Climatic Laboratory at Eglin Air Force Base, FL, for various temperature checks, some of which involved the deicing equipment. In sequence, the hangar temperatures were set at 70 degrees, -25 degrees, -50 degrees, 125 degrees and 70 degrees. Two simulated flights (the aircraft was bolted to the hangar floor)—encompassing engine runup, taxi, hover, climb, cruise, descent and landing—were made at each temperature. After the work at Eglin was finished, the Apache was flown in a C-5 to St. Paul for inflight tests of its deicing equipment, both behind the HISS and in the natural environment."

From those and all of its other tests, the activity will report to AVRADCOM any problems that are found. When corrections or modifications are made the testing procedure will be repeated.

"We do not check subsystem performance," Mr. Johnson said. "On a weapon system, for instance, we do not test whether it will hit what it is aimed at; we want to know the effects its firing will have on the aircraft. Does it affect the handling qualities? If it is installed externally, will it cause drag?"

Another use of data compiled by USAAEFA when it tests prototypes is to help government source selection boards choose between competitors. That is important, Mr. Macpherson said, because an aircraft isn't perfect when it is selected. Rather, the choice is based on tests of a prototype that has invariably encountered some problems; then consideration is given to the contractor's method of solving those problems.

USAAEFA also provides input for the operator's manual of a new aircraft. Mr. Macpherson commented on that use:

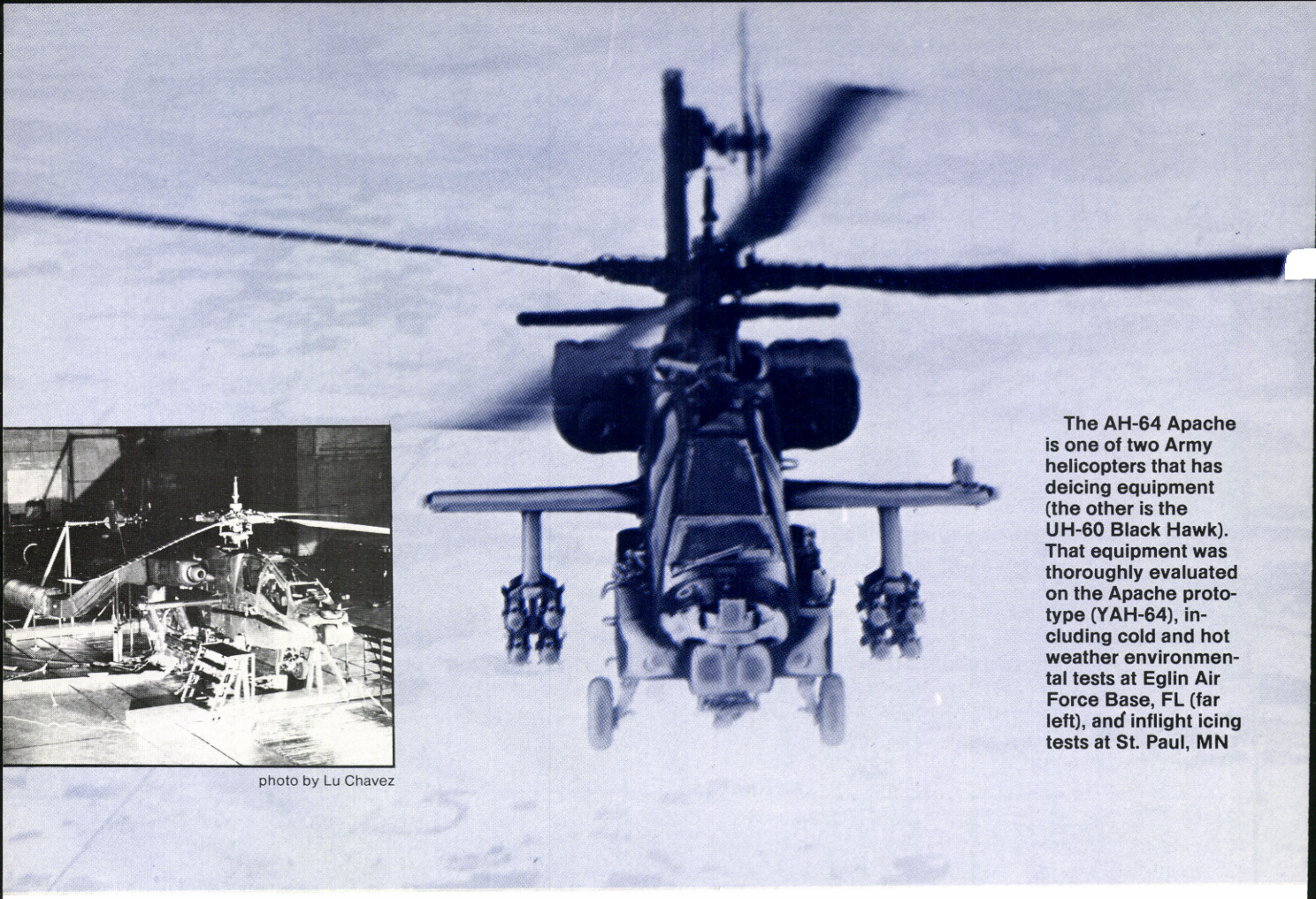


photo by Lu Chavez

The AH-64 Apache is one of two Army helicopters that has deicing equipment (the other is the UH-60 Black Hawk). That equipment was thoroughly evaluated on the Apache prototype (YAH-64), including cold and hot weather environmental tests at Eglin Air Force Base, FL (far left), and inflight icing tests at St. Paul, MN

"The preliminary manual is based on calculations from the contractor as to what the aircraft's performance will be. The data we provide, which is based on flight testing, is used to amend the operator's manual as needed.

"For instance, after the preliminary evaluation on the production fixes the contractor had made for the UH-60, we did an airworthiness and flight characteristics test. Information on the aircraft's performance and handling qualities derived from that test necessitated some changes to the operator's manual. A specific item we were involved with was an expansion of the Black Hawk's gross weight and center of gravity envelope in order to accommodate a ferry range extension kit. As a result, the gross weight was increased by 2,000 pounds and the center of gravity was moved about 5 inches farther forward. In turn, those changes called for additional testing to determine what control margins were available in the new configuration."

In all, USAAEFA test pilots flew about 400 hours to gather information on the Black Hawk. Multiply that by other aircraft and/or components being checked and the need for an outstanding maintenance shop is apparent. That's the kind Mr. T. R. Kenngott operates for the activity.

He pointed out that the Supply and Maintenance Directorate's outstanding reputation has been achieved by its personnel who have an average experience level of 19 years. They give the directorate the skills necessary to perform unit, intermediate and depot maintenance. In addition to that, their work includes making modifications, installing instruments and then maintaining those during the test program.

The supply portion of the directorate's name covers what Mr. Kenngott described as a "real logistical problem which requires the stocking of about 10,000 line items to support as many as 19 aircraft in eight different models."

One instrument that had to be positioned by the maintenance people was a stall indicator for the OV-1 Mohawk. Lieutenant Colonel Robert N. Ward,* head of the FTD's Integrated Systems Test Division, said the testing of that will be accomplished in cooperation with NASA's (National Aeronautics and Space Administration) Ames Research Center.

He described the indicator as he saw it on a Cessna 402 airplane: "It had two vertical columns, one for the indicated airspeed and the other for the predicted stall speed for that aircraft. The latter speed was arrived at by the indicator's computation of several

conditions, such as the aircraft's weight, longitudinal stick position, and acceleration. The concept is that a stall occurs if the two columns become even.

"As I flew it in the 402, it looked pretty good. There are some problems because it is a complicated system in that it has to know a lot of things about the airplane to predict a stall speed. If this system works, we think it will save lives and airplanes, particularly with the OV-1 because it has poor natural stall warning characteristics."

USAAEFA also works with NASA on other projects —for instance, the XV-15. Major (P) Ronald B. Carpenter,* an activity test pilot, is the only military aviator qualified to fly that experimental aircraft.

Major Don Underwood is another test pilot who is the only one checked out in an experimental craft that shares the tilt characteristic of the XV-15's rotor system, except in this case the whole vehicle tilts. It is the Williams Aerial System Platform II, affectionately known as WASP II.

An outgrowth of the rocket belts of the late 1950s, the WASP II is intended to meet a recognized need for a vehicle to be used by a nonaviation operator for surveillance, reconnaissance and courier missions. It is powered by a derivative of the cruise missile engine that is mounted inclined 15 degrees to the vertical with a twist-grip, motorcycle throttle for the right hand and a twist-grip, yaw or directional control handle for the left hand. It is kinesthetically controlled in pitch and roll by body motion.

"It is a very precarious type of flying," he said. "You are standing aboard a platform; and whatever nuance of motion you impart to the vehicle is immediately accepted as a commanded response, and it will automatically diverge in that direction. Operating it can be equated to standing on top of a greased marble!"

How did Major Underwood happen to be selected to work with the WASP II? ("Everybody ought to have a project like this at least once in a lifetime," he vowed.) One way is through competition with the other 16 USAAEFA test pilots, according to Major Michael V. Stratton.

Several of the tests he has participated in had to do with the OH-58 Kiowa, specifically, the composite tail boom, fuel conservation measures, and a Rockwell Mast-Mounted Sight equipped OH-58C. He also has been instrumental in coordinating the support given by Army Aviation to the space shuttle landings (see the *Digest,* January 1982, page 22, for an account of the second landing of Columbia).

Does he like his job? "Very definitely. In fact, if I could stay here until it is time for me to retire, I would. The work is interesting and challenging. I get to use my flying experience and my civilian education (master's in aeronautical engineering), and I don't believe I could do that anywhere else in the Army, at least not on something I would enjoy so much."

Major Stratton noted that getting such a position is not easy. A high degree of motivation is required to compete for a space and then to successfully complete the Navy's test pilot school at Patuxent River, MD.

Lieutenant Colonel Wilson agreed that it is an extremely competitive field, but that very fact pays off for the Army Aviation user because those named as test pilots are "the cream of the crop" (see *Digest,* April 1982, page 34, for the names of persons recently selected for the program).

He added, "There is a very tight Society of Experimental Test Pilots, only about 1,200 members worldwide. Most members are graduates of an accredited test pilot school, and there are only four such schools in the free world. In addition to the Navy's, the British and French each have one and the Air Force has one here at Edwards. The only one with a rotary wing curriculum is the Navy's, and the Army gets a quota of nine each year for it.

"The question of dual rating for Army test pilot candidates is a problem. Our rotary-wing-only aviators are somewhat behind the power curve because much of the initial portion of the course is based on fixed wing theory. They are going to have to fly some of those airplanes at the test pilot school, including a jet.

"Then, after helicopter pilots graduate they are limited because they can't fly a fixed wing chase nor a fixed wing program if one comes along. We really need potential test pilots to be dual rated."

To help prepare for the training, USAAEFA conducts an 8-week course for those selected for the test pilot program. Taught by Mr. Sean Roberts, a graduate of the Empire Test Pilot School and an experimental test pilot, the course is designed to refresh the aviators on the rigors of an academic environment, with specific attention to subjects like calculus, differential equations, aerodynamics and flight test techniques.

From all of this it is readily evident that Army Aviation users' friends who are assigned to the Army Aviation Engineering Flight Activity at Edwards Air Force Base did not get there by being slackers. That applies to every person, civilian and military, who works for the activity, Colonel McConnell said.

So a word to all Army Aviation crewmembers: The next time you fly a mission in your aircraft and it functions just as you need it to, think kind thoughts about your friends at USAAEFA. They'll appreciate it!

**USAAEFA personnel changes since this article was written are noted: LTC Ward now heads the Flight Test Directorate; Major Carpenter is chief of the FTD's Integrated Systems Test Division; and LTC Wilson has been reassigned to the Army Aeromechanics Laboratory, Ames Research Center, Moffett Field, CA.*

Army Aviation in Latin America

This is the sixth article about Army Aviation in Panama. The final article, "Dustoff Panama," will be published in November

Where's the Foreign Clearance Guide?

CW4 Thomas A. Story
Assistant Adjutant
210th Combat Aviation Battalion
193d Infantry Brigade (Panama)
Howard AFB, Panama

"WHAT'S THIS STAIN on the Foreign Clearance Guide?"

"That's just jalapeno dip."

"Huh?"

"Yeah, Mike had it laying on his coffee table when he had a party the other night. Invited a bunch of civilians and nonaviators and was trying to impress them with how international he is; spilled the same stuff on his passport, too."

"You guys were supposed to have been there but you had to RON (remain overnight) in San Jose, Costa Rica or Lima, Peru or San Juan, Puerto Rico. Can't remember."

"Rip, you and Ray would have enjoyed it. Mike really spread it on thick. I was standing behind his couch with my arm around this good-looking thing, dodging glares from my wife and listening to all those good lies. He really needed help with the lies. There was something about being stacked up over Caracas, Venezuela, at 17,000 feet while waiting for an ILS (instrument landing system) to Maiquetia International, with a British Concorde SST below and a Boeing 747 somewhere above. But my wife interrupted me and I missed most of that. I only caught part of the next lie: something about taxiing-in and being parked between Air Cubana and a Soviet Aeroflot airliner. It's hard to hear when your wife has you in a "hammerlock" with one hand and has a salad fork in the other, 'stabbing' you in the posterior. Come to think of it, that's when I kicked over the jalapeno dip."

The fixed wing section, Headquarters and Headquarters Detachment, 210th Combat Aviation Battalion, has a U-21 Ute and a C-12A Huron, with four warrant officer pilots. It also has an E-7 and four enlisted soldiers for the U-21's maintenance, service and crewchief duties. The C-12A has contract maintenance, with a Beechcraft "tech rep" assigned to Panama for that purpose. Crewchief duties and servicing come from the fixed wing section.

Fixed wing flying in Panama is unique. Nearly all missions are out-of-country international flights. Most are at least 3 hours in duration and may require overflights of numerous countries. For instance, a flight to Guatemala City requires going through the airspace of Costa Rica, Nicaragua and El Salvador; even that, however, does not make it as difficult to prepare for as one to, say, Guyana. A flight to Guatemala requires a diplomatic flight clearance from the host country for landing, and it normally takes about 3 days to obtain that. Overflight clearance is not a requirement of the other countries.

Numerous other countries' requirements make it more difficult

to obtain proper authorization. Guyana, as the example I used previously, requires 12 days, exclusive of weekends and holidays, to process the diplomatic clearance, and involves flights through Colombian and Venezuelan airspace, countries which also require overflight diplomatic clearance. Because of these restrictions, missions are sometimes scratched or delayed.

The Foreign Clearance Guide is practically our bible for initial flight planning. When we are alerted for a mission to a country we have not flown to before or in the past several months, one of the first things we check is the Foreign Clearance Guide to find out what is required to enter that country's airspace, as well as any countries we may have to overfly. Of course, checks of those countries we most often fly to are a routine part of our pre-mission planning. The preplanning also includes checking the charts for any islands along our flight route. Some islands may be several hundred miles from the country that governs them. For example, a flight to Key West, FL, takes you to San Andreas Island. This is Colombian territory. However, a diplomatic flight clearance is not required as we fly a 10 DME (distance measuring equipment) arc around Colombian airspace; but other airways may go directly over an island and require clearance.

Along these same diplomatic lines is the need to obtain visas, as required, for official passports. Many visas are good for only 30 days, or one entry, so we are constantly updating crewmembers' passports to maintain currency. Sometimes this seems to be a near impossible task as 3 duty days are required for the Adjutant General Passport and Visa Section to obtain each visa from the respective embassy. When there are back-to-back missions, day after day, we must closely monitor who is eligible to go on a particular flight. Intransit flights, as a general rule, don't require crewmembers to have visas; but immigration authorities in some host countries do not always abide by that rule. While we have not encountered any great problems other than inconvenience, experience has taught us to go prepared.

There is also a requirement for at least one crewmember to possess a Federal Aviation Administration pilot's license. Experience gained from an Air Force C-130 crew taught us this when it took U.S. ambassadorial intervention to allow the aircraft commander to file his flight plan and depart one particular country—but only after encountering several hours' delay.

Most of what I've related so far has involved some of the political and diplomatic problems encountered that are normally dealt with before departing Howard Air Force Base, Panama. Sometimes, however, there are obstacles upon arrival in a particular country or while trying to depart a visited country. Good common sense as well as a courteous and gracious attitude to the officials and citizens of the host nation usually overcome these problems. We are the guests, and we abide by their rules as long as it does not affect our flight safety.

Pre-mission planning, worldwide, is paramount to a safe and successful mission. We here in Panama are no exception. Because we take off at sea level and either fly oceanic routes or over mountainous terrain, we meticulously check our flight planning and make progressive checks during the course of the flight. Navigational aids, en route weather, communications and even approach charts are many times incorrect or nonexistent. In Central America, navigational aids and communications are fairly good. A very high frequency omnidirectional range (VOR) or nondirectional radio beacon (NDB) may not be received until you're within 25 miles or less of a station—and radar is only located in a couple of countries.

Central American Control (CENAMER) located in Honduras, is the controlling agency between Panama and Mexico for QNH (pressure type altimeter with a QNH setting indicating altitude above mean sea level) flights. CENAMER has fairly good radio equipment and repeater stations for flight following, and with Albrook Airways located at Albrook AFS, Panama, you can normally flight follow on high frequency (HF) throughout Central America, most of the Caribbean and much of the South American Pacific coast. However, once you get south of Guayaquil, Ecuador, en route to La Paz, Bolivia, or Lima, Peru, you may have to start calling different airports along the way hoping for an English speaking tower operator.

Upon departing Panama, en route weather forecasts are practically nonexistent and are usually good for only the local area. Of course, when leaving an international airport you will have a weather service, but the forecasts and weather reported en route are not always reliable. We check satellite photos and charts for en route weather if

they are available, but often we have to forecast much of our en route data. Usually our destination's weather forecast is fairly reliable, but we always plan for an alternate airport and choose the best one available.

Notices to Airmen (NOTAMs), additions, deletions or corrections to en route charts and flight information publications (FLIPs) are sometimes slow in reaching Department of Defense (DOD). A good example is Airway UA1 from Puerto Limon to San Jose, Costa Rica. The minimum en route altitude (MEA) is 14,000 feet because of a 12,000-plus-foot volcano directly on the centerline. However, the last two DOD en route charts show the MEA at 8,000 feet. CENAMER won't approve clearances for below 14,000 feet until it hands you over to El Coco Approach which, in turn, will clear you to 8,000 feet for initial approach altitude when you are only within 14 DME of the final approach fix. But mistakes can be made, even by controlling agencies; and an actual IMC (instrument meteorological condition) flight allowed to go through at or below 12,000 feet would terminate short of its destination. To counter these potential disasters, we use as many measures as possible to ensure a safe flight. We have Jeppsen charts for back up. We talk to Defense Attache Offices (DAO). Many of the U.S. Embassies in Latin America have a C-12 assigned to their DAO missions with U.S. Army, Air Force or Navy pilots who are more familiar with their particular region than we are. They are, therefore, a valuable source for en route and destination information.

Equally important, however, is that we talk to each other, keep our eyes open and ensure that information gained is passed on to each pilot. We also rotate crews for flight checks to a destination and try not to schedule two pilots on the same mission unless one of them has been to the destination airport.

Okay, about now you readers are saying to yourself, "We go into airports that none of our pilots have been into before. What's so unique about these hotshots in Panama?" Nothing, when it's an international airport. The approach plates, navigational aids and communications are all good. What if it's *not* an international airport but a foreign military airfield, or one in the middle of the jungle, or mountains with a World War II generator supplying the power to these less-than-modern facilities? That's where the problems associated with getting your airplane safely on the ground occur.

We carry some very important passengers who have to reach their destinations, and our job is to ensure they arrive there safely and on time. Getting all available information for the en route legs, destination and alternate is paramount in providing for either a successful mission or a safe, aborted landing. Believe it or not, this may include the knowledge that you'll need to make a low pass to run the cows off the grass and mud runway; and the DC-3 pilot you were talking to at your takeoff airport may be able to give you that information.

Chief Warrant Officer, CW4 Ripperda, the boss of our outfit—also the guy who pulled the chocks at Kitty Hawk and taught General Doolittle's navigators how to find Tokyo by dead reckoning—says it is about like flying in the 1930s. Fortunately, we still have guys like him around who can draw on years of vast flying experience to make sure we can handle the job of delivering our airplane and cargo safely to its destination. We have an enviable safety and mission accomplishment record. Each of us is satisfied with our job. We visit a lot of countries in an area larger than the continental United States, fly to Caribbean islands where U.S. presidents spend their vacations and British royalty honeymoon—and we also get paid to do something we really enjoy. But, just as important, we get to represent U.S. Army Aviation as true professionals and ambassadors of goodwill throughout our Latin American neighboring countries.

"Hey, Rip! What if these forecast winds to Barbados are wrong? What else can we use as an alternate?"

"Keep looking, you'll figure it out."

"Well, I could use Grenada, but they're Communist."

"Maybe Surinam? No, they just had a coup and might lock us up. I got it! We'll land in Caracas and refuel, then we can make it back to Caracas if we need to."

"You got a dip clearance for landing in Venezuela?"

"No, overflight only, why?"

"Do you want to declare an emergency so you can land to refuel?"

"No."

"Well, you better send a new message out for landing permission, or keep looking for other alternates. I don't know, Story, we might make a pilot out of you yet."

"Darned old crochety CW4s. Where's that Foreign Clearance Guide?"

U.S. Army Communications Command
ATC ACTION LINE

Parachutist vs. Aircraft

Mr. Robert Cole
U.S. Army Air Traffic Control Activity
Aeronautical Services Office
Cameron Station, Alexandria, VA

THERE ARE NUMEROUS parachutists competing with aircraft for simultaneous use of airspace yet really, there is no competition. If anyone wins it will be the aircraft.

Pilots and controllers alike have a responsibility for the safety of these lone falling objects. Regulations may vary slightly with the geographical area (Federal Aviation Administration jurisdiction vs. host country); therefore, pilots and controllers should be familiar with Federal Aviation Regulations (FARs), Part 105, U.S. Army regulations *and* host country regulations if applicable. The following is a partial extract of FAR Part 105:

Para 105.25 Information required, and notice of cancellation or postponement of jump.

(a) Each person requesting an authorization under Para 105.19 or Para 105.21, and each person submitting a notice under Para 105.23, must include the following information (on an individual or group basis) in that request or notice:

(1) The date and time jumping will begin.

(2) The size of the jump zone expressed in nautical mile radius around the target.

(3) The location of the center of the jump zone in relation to—

(i) The nearest VOR facility in terms of the VOR radial on which it is located, and its distance in nautical miles from the VOR facility when that facility is 30 nautical miles or less from the drop zone target; or

(ii) The nearest airport, town, or city depicted on the appropriate Coast and Geodetic Survey WAC or Sectional Aeronautical Chart, when the nearest VOR facility is more than 30 nautical miles from the drop zone target.

(4) The altitudes above the surface at which jumping will take place.

(5) The duration of the intended jump.

(6) The name, address, and telephone number of the person requesting the authorization or giving notice.

(7) The identification of the aircraft to be used.

(8) The radio frequencies, if any, available in the aircraft.

(b) Each person requesting an authorization under Para 105.19 or Para 105.21, and each person submitting a notice under Para 105.23, must promptly notify the FAA air traffic control facility or FAA flight service station from which it requested authorization or which it notified, if the proposed or scheduled jumping activity is canceled or postponed.

Today parachutists are descending free fall from great altitudes and the skyways are crowded with aircraft. These two conditions must be considered when piloting or clearing aircraft for a paradrop. Investigations of recent accidents found that parachutists were exiting aircraft at high altitudes (ARTCC airspace) and falling into hazardous activity within an airfield's terminal airspace.

We as pilots and controllers must assure that parachutists and aircraft are provided the highest margin of safety possible. This may best be accomplished by being certain all necessary coordinations have been accomplished and that all airspace from the sky divers' aircraft to the ground belongs to the parachutist *only*.

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

CWU-21P

Preparing for WINTER

CWU-21A/P

Captain Gregory J. Beauvais
Aviation Materiel Management Officer
and
Miss Megan Lohmann
Inventory Management Specialist
U.S. Army Troop Support and
Aviation Materiel Readiness Command
St. Louis, MO

BEFORE THE frigid blasts of winter send land and water temperatures plummeting, Army Aviation crewmembers need to ensure their wardrobe includes a Ventile Antiexposure Suit that can be obtained from Commander, TSARCOM (B17), ATTN: DRSTS-STSM, 4300 Goodfellow Blvd., St. Louis, MO 63120, AUTOVON 693-3312.

The CWU-16P is a quick-donning type, one-size-fits-all suit used primarily as an emergency life support item for aircraft passengers. The CWU-21P and its soon-to-be-available replacement, the CWU-21A/P comes in 12 sizes and is a constant-wear type made to go under standard flying clothes.

SIZE	CWU-21P	CWU-21A/P
1	8475-00-123-9090	8475-01-094-8919
2	8475-00-123-9091	8475-01-094-8921
3	8475-00-123-9094	8475-01-094-8926
4	8475-00-123-9095	8475-01-094-8927
5	8475-00-123-9096	8475-01-094-8923
6	8475-00-123-9097	8475-01-094-8924
7	8475-00-123-9098	8475-01-094-8925
8	8475-00-123-9099	8475-01-099-6892
9	8475-00-123-9100	8475-01-094-8920
10	8475-00-123-9101	8475-01-095-2394
11	8475-00-123-9102	8475-01-094-8922
12	8475-00-123-9103	8475-01-095-1823

The CWU-21P and CWU-21A/P assembly consists of an outer garment, including rubber socks, and an inner liner.

Made of a ventile fabric that is moisture vapor-permeable, the outer garment breathes without artificial circulation when it is dry. When wet, the fibers swell about 70 percent, making the garment watertight. After drying, the garment breathes again. The rubber socks are ordered in the individual user's size and then are permanently cemented to the suit by qualified ALSE personnel.

Two inner liners are available: one made of cotton fabric covered with nylon netting that is a spacer garment to be used over regulation underclothes; and one made of nylon fibers woven loosely enough to be transparent and formed into a waffle effect, providing greater air and ventilating space. The latter is lined with light cotton material to give comfort next to the skin.

Maintenance and other information on the anti-exposure suit will be published soon in the joint Air Force/Army manual, T.O. 14P3-5-81/TM 10-8475-200-12. For required use of the suit, refer to AR 95-1 (15 Nov 80), page 3-6, paragraphs 3-26b(2)(d) and 3-26c.