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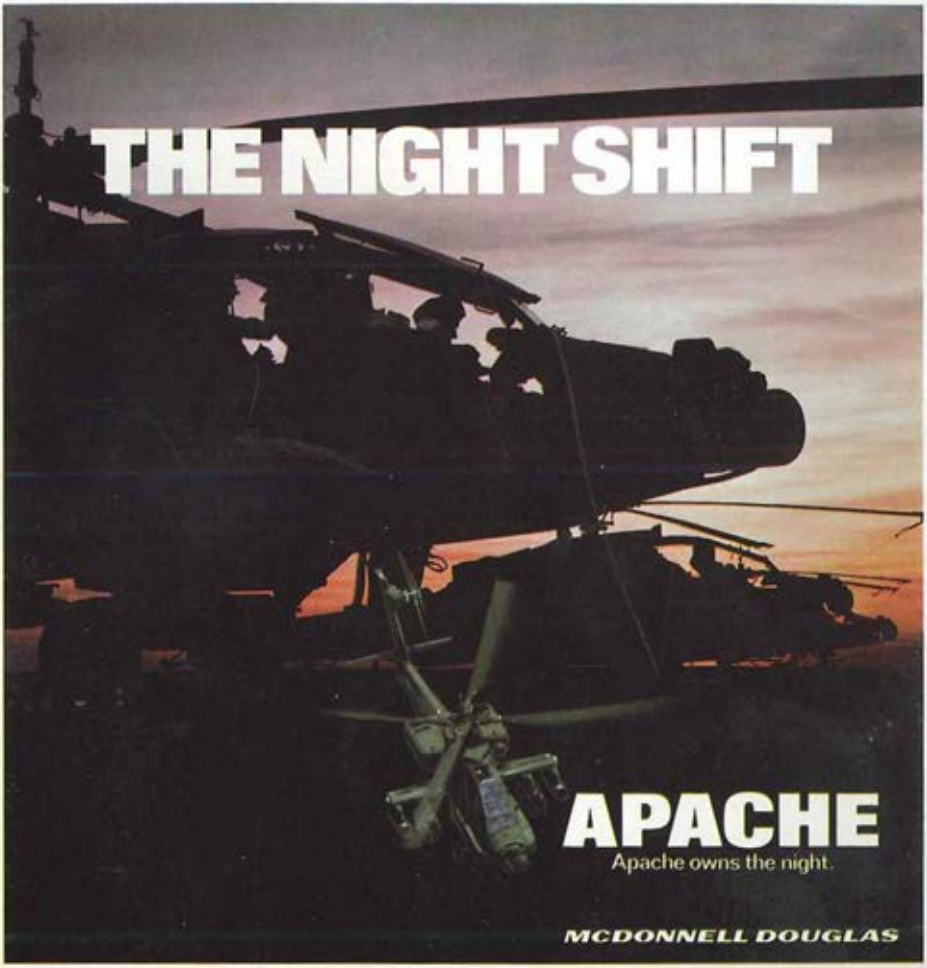

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ARMY AVIATION

VOLUME 37 **NUMBER 10**

AVIATION BRANCH UPDATE

AAAA NEWS

SPECIAL REPORT: AIRCRAFT SURVIVABILITY EQUIPMENT

FIELD REPORTS

OTHER DEPARTMENTS

ASE in Army Aviation

by Major General Ellis D. Parker, Chief, Aviation Branch and Commanding General, U.S. Army Aviation Center and Ft. Rucker, AL

I reported on the importance of and major developments in aircraft survivability equipment (ASE) in the November 1986 issue of ARMY AVIATION MAGAZINE. Other articles in that issue as well as in the current issue were written by experts in the field and deal in detail with various aspects of the subject. What I wish to do here is to provide a brief summary of ASE history, philosophy, equipment, and training, and to describe some major innovations during the last two years.

Origins in Vietnam

The origin of Army Aviation ASE as a specific philosophy and program aimed at the enhancement of aircraft survivability through a coordinated program of design, technology, training and tactics goes back to the era of the Vietnam War. More specifically, the development of quick reaction capability and the fielding of infared (IR) suppressors in 1970 marked what we may call the take-off point for ASE. Then in 1972, the program office of the U.S. Army Aviation Systems Command was chartered by the Secretary of the Army and was given responsibility for the electronic "blackbox" items of protection equipment. Since then, the Aviation Systems Command, Training and Doctrine Command systems managers, the U.S. Army Aviation Center (USAAVNC), Aviation units worldwide, and designers and contractors have worked together to effect constant development and improvement in this very important aspect of Army Aviation.

The underlying philosophy or rationale of ASE is that lives and equipment can be saved, and battles can be won by reducing aircraft vulnerability. Aircraft survivability is enhanced by what we refer to as the five-step approach — i.e. through:

(1) tactics, e.g., nap-of-the-earth flying;
(2) signature reduction, e.g., exhaust suppressors and the use of paint with low infared reflection.
(3) warning, e.g.: radar and laser warning receivers;
(4) jamming, e.g. countermeasures against guidance systems of threat weapons; and
(5) aircraft hardening, e.g., increasing ballistic tolerance.

Of course, several other types of systems have been and are being used, and still others are being developed within each of these categories.

NOE

Tactics and signature reduction are generally the two least costly approaches to aircraft survivability, but they rarely undergo dramatic change. In the area of tactics, nap-of-the-earth flying first became a standard practice around 1968 and is still one of our most effective tactical measures. Improvements in tactical survivability directly relate to the increasing awareness of threat weapons and acquisition systems. Tactical utilization of new ASE equipment, such as the AN/ALQ-136 radar jammer, allows for commanders and aircraft crew members to be involved in the decision making of threat disruption/-destruction. The AN/APR-39A (V) 1 radar warning receiver allows aircraft to maximize the intelligence gathering of the brigade. The APR-39 will also enhance tactical survivability of aircraft by rapidly identifying threat radar sources.

Signature reduction has been primarily related to IR emissions, which have been a matter of

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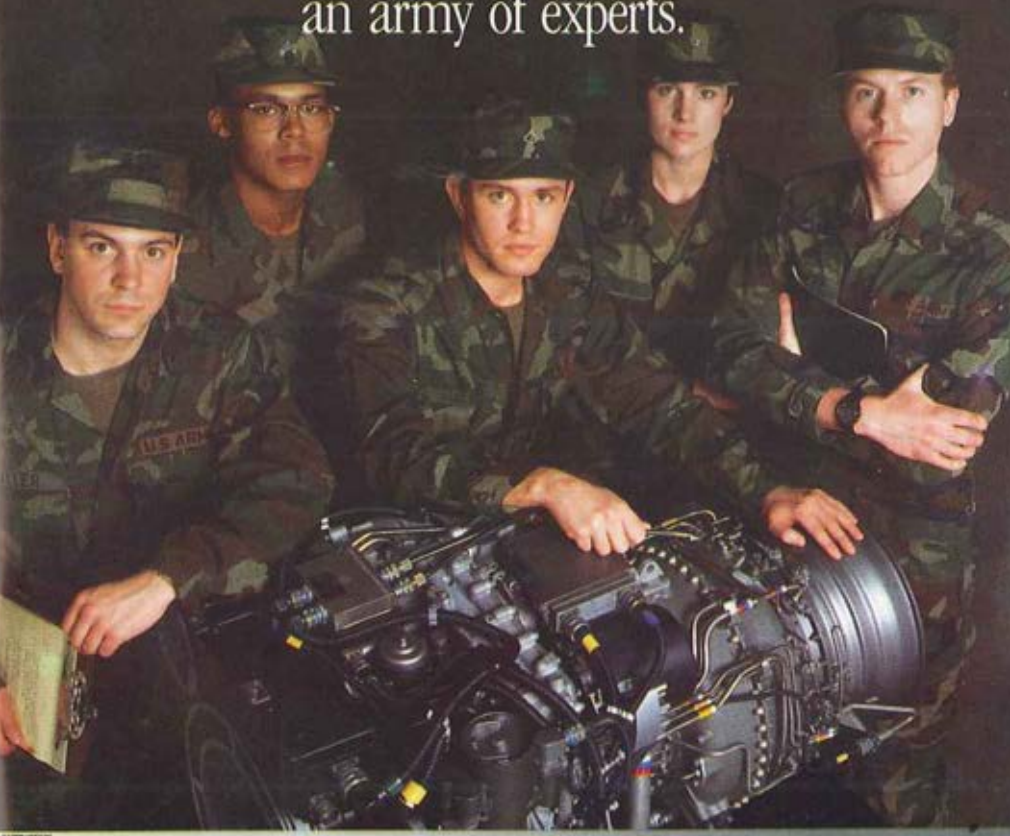

THE POWER OF LHX.

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considerable concern and study for several years. Consequently, all newer aircraft have incorporated designs that minimize the IR emission problem. From the improved shielding of hot metal ports to power controlled engine exhaust suppressors, our ability to reduce IR source energy has improved considerably in recent years.

Warning Receivers

Most of the major developments during the last two years have been in the areas of warning and jamming. There has been significant progress in the development of two radar warning receivers during that period. For the first of these, the AN/APR-39A (V) 1, a milestone III in-process review (IPR) was held on August 5, 1986. A production contract was awarded to the Dalmo-Victor Corporation in September 1986, first deliveries were due in September 1988, and the follow-on test and evaluation (FOT&E) is scheduled to begin in January 1989. The other new radar warning receiver is the AN/APR-39 (XE-2). A milestone II IPR was held for this receiver on September 19, 1986, and the IPR decision was made to proceed into full-scale engineering development. The U.S. Marine Corps has already decided to procure this receiver for all of its rotary wing aircraft. Marine Corps development testing is scheduled to begin in January 1989, and multi-service operational testing is to begin a few months later.

The development of the AN/AVR-2 laser warning receiver, designed for use on all rotary wing aircraft, was completed during the past two years. A milestone III IPR was held on November 7, 1986, and the IPR decision was to enter production with an FOT&E. Because of budget constraints, however, a production contract was not signed until May 1988. The Perkin-Elmer Corporation received the contract at that time, and production has now begun.

Jamming

In the area of jamming, four major systems have passed through one or more phases of the development stage during the last two years. For the first of these, an improved model of the AN/ALQ-144 infared jammer, development was completed in FY88, and a production IPR is scheduled for November 1988. This new model will replace the existing ALQ-144 and will provide increased reliability and operational performance. The AN/ALQ-136 (XE-3) radar jammer completed operational testing in February 1988. The milestone III IPR was scheduled for September 1988, and if a production decision should be obtained, fielding can be expected in FY91. The other two major developements in the area of jamming are still in the early stages. In September of 1987 the USAAVNC was given proponency for the APACHE Escort Jammer concept evaluation proposal (CEP). The CEP, scheduled for July 1989, will determine whether the concept of an add-on pod-mounted jammer is valid for the cross-FLOT missions of the AH-64. The CEP willl utilize a pod jammer assembled by the Communications and Electronics Command and will be tested on aircraft provided by the III Corps. Finally, the Radar Frequency Expendable Decoy is a system that is currently in the proof of principle phase of development. Developmental testing is scheduled for late fall 1988.

Hardening

ASE innovation in the area of aircraft hardening is, for the most part, an aspect of airframe design. Although some hardening has been added onto the BLACK HAWK and APACHE, recent innovation in this area has been most dramatic in the design of the LHX. In the LHX, the Army is aiming at a synergistic integration of active and passive ASE systems which will provide the highest degree of combat effectiveness. In response to our requirements, airframe designers are conducting extensive investigations to determine the optimum balance of signature level and ASE equipment. Also, the airframe is being designed with emphasis on both redundancy (i.e. backup systems) and the shielded placement of critical components. Finally, investigations are underway to determine the most damage-resistant airframe construction materials within acceptable weight constraints.

ASE Training

The best of tactical theory, electronic devices and aircraft design are of little value without adequate training. The USAAVNC has addressed this fact by the development of a comprehensive program for individuals, crews, and collective ASE tasks at the Aviation Center and in the field. Since

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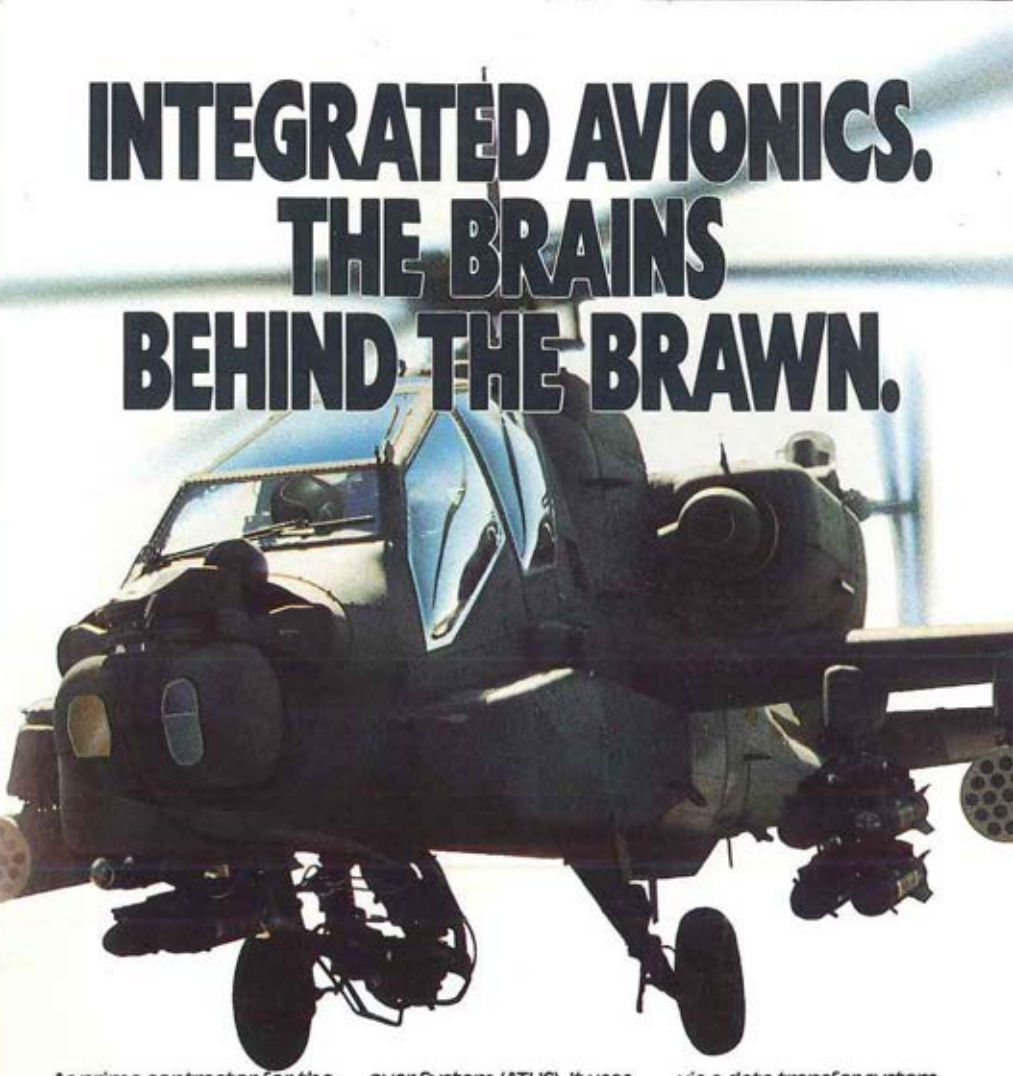
1985, the principal trainer for individual ASE training has been the classroom ASE traininer number 1 (ASET 1), of which several hundred sets of courseware are in use worldwide. Within the last two years, however, considerable progress has been made in the development of more advanced and more specialized trainers. Our long-term optimum classroom trainer, ASET II, is scheduled to be fielded in FY89. This new trainer will have much wider application in that it will be used as the individual ASE training device for all rotary wing airframes (including some that are in the development stage) as well as for all fixed wing SEMA aircraft.

Furthermore, planning for the next decade, as we must do, we have two other ASE trainers in the development stage. The ASET III, an in-flight hand-held crew trainer used to activate the aircraft's ASE, is being developed for scheduled fielding in FY92; and the ASET IV, a group of ground-based threat emitters replicating an air defense battery minus, is programmed for fielding in FY93. The ASET IV is designed to provide realistic collective training in the force-on-force environment. The tactical radar threat generator, which has been used for crew and collective ASE training since 1983, will continue to be used at locations of lower aviation density.

In summary, there are many facets to ASE, but the major points that I want to make are that it is effective in permitting us to perform our mission, it is cost-effective in saving aircraft and lives, and it is necessary in order for our aircraft to respond to the threat. Furthermore, we must continue to be constantly innovative in all aspects of ASE design, development, production, and training in order to be able to meet the continuing threat. The use of ASE equipment, either active or passive, will never be a substitute for good flight tactics, good crew preparation and a viable weapons system, but ASE will enhance the crew and aircraft survivability for the "force multiplier" effect. I wish to encourage everyone to read all of the excellent articles on ASE in this issue.IIIII

INTEGRATED AVIONICS. THE BRAINS BEHIND THE BRAWN.



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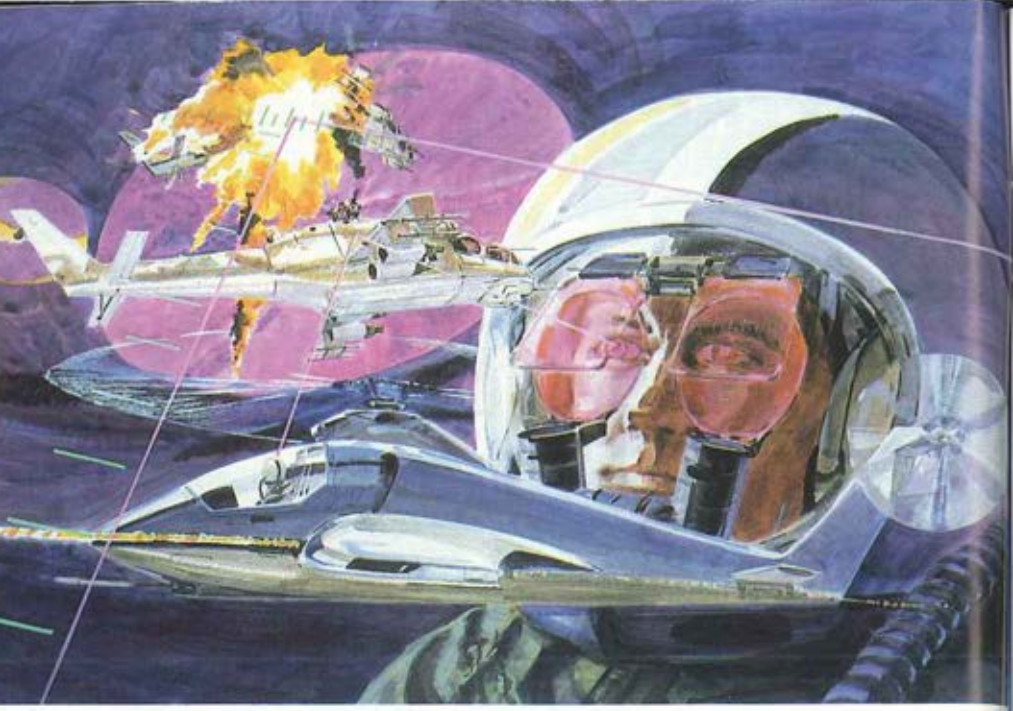

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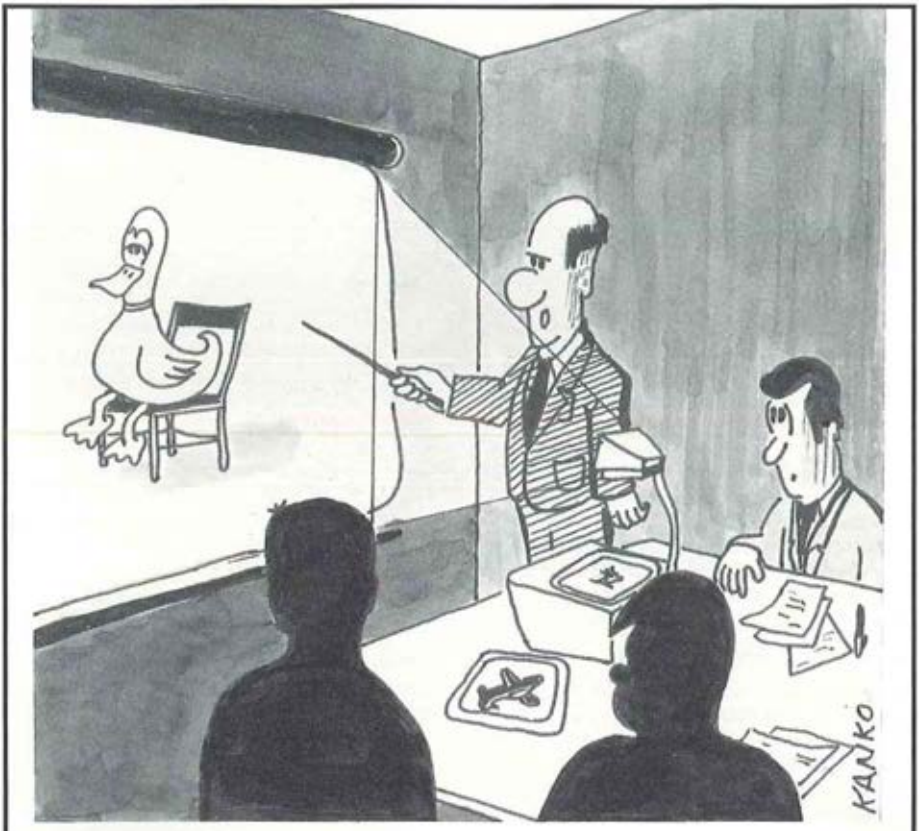
Special Report: Aircraft Survivability Equipment (ASE)



. . AND THIS IS HOW THE AIRCRAFT WILL LOOK WITHOUT SURVIVABILITY ENHANCEMENT FEATURES.

Army Aircraft Survivability Equipment Program

by Colonel James R. Holder

As a major Army objective, Aircraft Survivability Equipment (ASE) addresses the improvement of the readiness, survivability, combat effectiveness, and war fighting capability of the Army's aviation fleet. In a combat scenario, air and ground vehicles will be required to transport the attacking forces over long distances and these forces will be required to fight in any direction. The requirements to simultaneously destroy close combat, rear area, and deep strike targets have changed the characteristics of the battlefield and have increased the demand for Army Aviation. The Army Aviation fleet must be numerically sufficient, electronically robust, tolerant to battle damage, possess low observable signatures and function around the clock in adverse weather conditions.

These capabilities must be achieved in a sophisticated electronic warfare environment on a battlefield possibly contaminated biologically, chemically, or by nuclear radiation. Rapid development of a wide array of highly sophisticated threat weapon systems makes it paramount that aviation units and aircraft be equipped with adequate countermeasures to complement our aviation war fighting capability and assure success on the modern battlefield.

The Mission

Selected ASE must be applied to both the current and new aviation fleet to provide protection against all aviation threat weapon systems including conventional air defense systems and directed energy weaponry. Critical aircraft signatures must be suppressed or concealed to provide adequate survivability in the threat environment. Additional aircraft modifications may be required to protect the crew, passengers, and critical aircraft components from directed energy weapons.

The Army ASE project Manager (PM) is chartered by the Program Executive Officer, Combat Aviation, with responsibility for developing, fielding, and supporting ASE equipment for the current and developmental aircraft as necessary to accomplish the aviation mission on the modern battlefield. In this process the PM is expected to be responsive to not only current but emerging threats to Army Aviation.

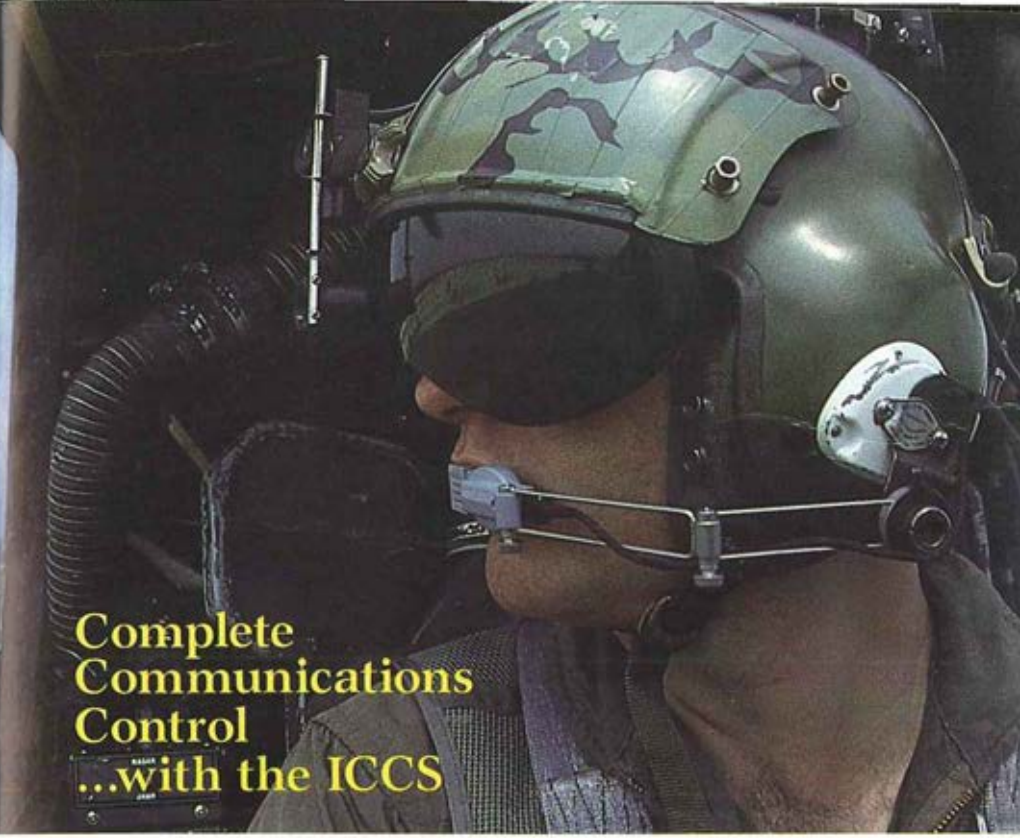
The ASE program constitutes a forward looking effort in anticipating the enemy's anti-aircraft technology in order for the Army to win the first battle of the next war. The PM organization performs a leadership role among the industries that develop, manufacture, and support Army ASE equipment. We support interoperability with foreign military sales, a joint development program with Canada, a Conventional Defense Initiative program with the United Kingdom, and information sharing with ABCA and NATO countries.

16 Separate Systems

The ASE Program encompasses over 16 separate major ASE systems having approximately 35 variations. Our program also contains the integration programs necessary for installation into over 12 major types of fielded Army airframes. The ASE Program requires the aviation survivability and electronic warfare disciplines associated with infrared, radar, laser, and electro-optics technologies.

Our recent hardware fieldings have provided

Colonel Holder is Project Manager, Aircraft Survivability Equipment, AVSCOM, St. Louis, MO.



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"Additional aircraft modifications may be required to protect the crew, passengers, and critical aircraft components against directed energy weapons."

significant upgrades in Army Aviation readiness and war fighting capabilities in Europe and Korea. For the longer term, a sound program has been established and resourced and is in the process of execution to provide ASE to leading edge units during the next five-eight years.

Complacency

We are living in a particularly volatile electronic warfare environment and I am concerned that in some cases we have become complacent to the numerous warnings of the need to meet challenging aircraft protection requirements. Sme of the recent signals that should alert us to the impacts of technology on the battlefield and our need to prepare are:

a. In the Falkland Islands, the British shot down over a hundred Argentine aircraft while losing only two of their own. The Israelis amazed the world in their move into Lebanon with an almost perfectly one sided air-to-air battle, 89 to one, and the destruction of a number of SA-6 surface-to-air missile launchers. I know of no war gamers that would ever forecast that any country could win that completely.

b. Meanwhile, across the border to the East of USAREUR the Warsaw Pact mounts the first string of anti-aircraft weapons and airborne interceptors. Magazine articles and pictures of engagements in Afghanistan indicate the Soviets are moving quickly to learn from their experiences to include the development of their own helicopter ASE.

c. Open press newspaper articles of the Iran/Iraq war have discussed helicopter air-to-air operations, use of laser aided weaponry, And even low level helicopter missile firings at targets kilometers away.

In my view, aircraft survivability aspects have graduated to be integral parts of the aircraft fighting system necessary to achieve combat success. This includes the characteristics of the aircraft, the attributes of the equipment, and the capabilities of the pilot.

The Aviator

Perhaps the most important, the pilot, has been receiving less than adequate emphasis. The initial training in aircraft operations and follow-on readiness training must be within the capability of the young Army warrant officer, the equally young Army "Battle Captain," and the capacity of the unit mission and support structure.

We have to think more about what to do and how to help the pilot do his job. We expect him to fly, observe, and shoot with the precision of an astronaut who has practiced years for a relatively short mission. We expect that all Army pilots will think with the decisiveness of the Blackjack "card counter" who has consistently displayed and capitalized on his superior knowledge of the odds. To reach those levels of proficiency Army Aviation will need tactics (kept from the enemy in secret technique books) and realistic training that raise their proficiency to the levels of experienced combat pilots. This is attempted in the Navy Top Gun, Air Force Red Flag and Marines MAWT I programs.

The U.S. Army Aviation Center in partnership with the ASE PM has begun an extensive campaign to provide necessary training to

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Army aviators. The most intense of these efforts is directed toward developing and fielding of the ASE Trainers (ASET). This family of trainers includes desktop (ASET I and II), in-flight radar warning (ASET III), and an electronic warfare range/threat emitters system (ASET IV). The ASET I is a software package that is used with the AN/UYK-71 microfix computer system as a desktop model ASE trianer. The system will provide detailed lessons on ASE aviation threats and related subjects.

The ASET II system, scheduled for production in FY 89, will be the follow-on desktop trainer to ASET I. It will provide both tutorial and flight modes of instruction and will be used solely as an in-unit training device. The ASET III system will be used to provide in-flight ASE training on an individual basis to aviators. The ASET IV family will bring all the training the pilots have received on survivability and mission accomplishment in an electronic warfare environment together.

This device or group of devices will not only provide the opportunity for the pilot to fly against threat systems (trying to avoid detection) but it will also allow him to employ his tactics/training to simulate killing the threat for Attack aircraft, or being killed if errors are made. Event recording will be provided by ASET IV for real time casaulty assessment.

The Numbers

In regard to the value of ASE, a statistical increase in survivability of two percent — that is, from 96 percent to 98 percent — for a given fleet flying a given number of sorties will produce an increase of 23 percent in aircraft remaining at the end of the period of engagement. This small increase in survivability is extremely significant to our pilots and to a country that has no aircraft war reserve. It is this payback value on the battlefield that prompted the Vice Chief of Staff of the Army to increase the ASE procurement program significantly in the FY 87-91 Program Operating Memorandum (POM) years.

The ASE protection strategy for increased combat effectivness covers the areas of tactics, signature reduction, warning, jamming, and vulnerability reduction.

a. The **Tactics** of terrain flight are used by the Scout Attack Aircraft to complicate enemy target acquisition and anti-aircraft weapon engagements. Standoff outside the effective ranges of the enemies' weapons is employed by Scout/Attack aircraft and in many Special Electronic Mission Aircraft (SEMA) mission profiles to significantly reduce vulnerability. Training is essential in developing the readines to perform tactics well.

b. In **Signature Reduction** we employ infrared paint and flat plate canopies to reduce the sun glint portion of the infrared signature. Painted unit crests and spray can lacquer touch up painting create hot spots that attract infrared missiles. The Hot Metal Plus Plume Suppressor (HMPP) on the AH-1 (all models) COBRAs and the Hover Infrared Suppressor System (HIRSS) on the UH-60 BLACK HAWK hide the hot metal sources and take the cooler outside air and mix it with the exhaust gases to lower the plume signature. These items greatly reduce the acquisition ranges of the enemies' heat seeking weapons.

c. **Warning** of the pilot with radar warning receivers, battle reports, and, in some cases, indications of remotely activated ASE is needed to make serious battle decisions to continue the mission, employ other ASE to counter enemy anti-aircraft weapons, or to evade. Warning of enemy radar acquisition and tracking is currently being accomplished by the APR-39(V)1 Scout/Attack and APR-39(V)2 SEMA Radar Warning Receivers. Production is under way on the APR-39A(V)1 Radar Warning Receiver possessing voice warning and alpha numeric display this year and should be fielded with the new AH-64 APACHEs in late 1988. The AN/APR-39(V)2 Radar Warning Receiver has been fielded on SEMA aircraft and the advanced threat SEMA Radar Warning Receiver is now in Full Scale Development.

d. **Jamming** is needed to press on in missile engagements of enemy tanks protected by stout air defenses. The ALQ-144 Infrared Jammer found on the APACHEs, BLACK HAWKs, and the COBRAs has enough jamming power to drive infrared missiles away from low signature aircraft. The ALQ-136 Radar Jammer installed on the COBRA and APACHE helicopters forces enemy radar directed weapon crews to switch to the less efficient optical mode engagement. The M-130 General Purpose Dispenser installed on APACHE, BLACK HAWK, and the CH-47 CHINOOK is used to launch chaff or flares. Chaff,

(Program — cont. on p. 31)

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BOEING

An Electronic Combat Perspective

by Mr. Anthony R. Greico

ELECTRONIC Combat (EC) reduces the number of opportunities that the enemy has to engage our aircraft; and, if engaged, reduces his probability of a kill. Everything that we do, in one way or another, can be reduced to that criteria; the number of engagements and the probability of kill. Air defense systems strive to maximize these parameters whereas, the goal of EC is to minimize them. The operative word is system. Air defense system versus EC system. Within the EC system, a major concern is how to comprehensively address the growing EO/IR threats.

Systems Approach

We need to apply a systems approach to our EC thinking. Concentrating on one part of a problem while ignoring other pertinent parts does not constitute a solution. To a degree, we have done this regarding aircraft survivability. We have concentrated on denying the enemy the use of the RF spectrum while allowing him to operate with relative impunity in other bands of the spectrum, particularly EO/IR. As an exercise, compare the number of EC operational RF systems with the number of EC operational EO/IR systems. Beyond flares, little has been done.

Twenty years ago, this situation was not as serious. Other than the RF threat, there wasn't much else; or if there was, the engagement envelope or shot opportunity was significantly reduced. The situation is not the same today. With the increased use of FLIRs, IRSTs, lasers, low light level TV, etc., the acquisition and tracking capabilities of today's non-RF devices rivals that of RF. Therefore, denial of the RF spectrum does not reduce the engagement envelope to the degree that it once did. It rolls it back only to the point where other parts of the spectrum start to prevail.

I've primarily discussed the effect of EO/IR on the n-parameter, that is, number of engagements, but the same applies to the business end of the air defense system; the missile and artillery components. In a sense, we are now experiencing problems brought about by our own success. We have been fairly successful in denying the use of the RF spectrum and have forced the enemy to seek other means to bolster his air defense capabilities. And he has. The enemy has taken a systems approach, but have we?

Priorities

I am concerned about the scarcity of EO/IR countermeasure developments. We continue to develop systems which defeat the RF threat while continuing to ignore the EO/IR spectrum. Little activity is going on in terms of concept demonstration/validation (6.3) or full-scale development (6.4) of EO/IR countermeasure systems. The biggest payoff now is to deny the enemy the use of the EO/IR spectrum; not at the expense of the RF, but rather in concert with it. The Army is in the forefront in this area with two programs. One for an airborne platform is in the proof of principle phase, and the other for land vehicles is entering full-scale development.

Being in its infancy, the EO/IR countermeasures area offers an opportunity for inter-service commonality; provided similar requirements exist and the timing is right. The Army and Marine

(EC — continued on page 30)

Mr. Greico is Asst. Director of Electronic Combat Systems for the Asst. Sec. of Defense for Command, Control, Communications & Intelligence, Washington, DC.

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Joint Army ASE

by Major Miles L. Henselman

THE Joint Technical Coordinating Group for Aircraft Survivability (JTCG/AS) was established in 1971 in response to aircraft loss rates in Vietnam. It is a Joint Office staffed full-time by active duty officers (O-5) from the Army, Navy and Air Force.

The United States lost more than 5,000 aircraft during the Vietnam conflict (2,500 rotary wing). During that period the "Test and Evaluation of Aircraft Survivability (TEAS) Program" provided a coordinated multi-service approach to reducing aircraft losses. This program focused on vulnerability reduction (harder to kill) but not susceptibility reduction (harder to acquire/engage). The TEAS program was sponsored and funded by the OSD Test and Evaluation office. TEAS was so effective in reducing losses that the services supported establishing a standing body with responsibilities including all aspects of aircraft survivability.

JTCG/AS

In 1971 the Joint Logistics Commanders (JLC) Chartered the JTCG/AS to replace TEAS. The goal was to establish an office responsible for all aspects of aircraft survivability (susceptibility/vulnerability). The office would also coordinate service aircraft survivability programs. OSD provided initial funding but directed the services to establish program elements to support JTCG/AS through their independent POM submissions. Each of the JLCs identified a "Principal Member" to represent service interests on a "JTCG/AS Steering Group". They also established permanent billets for field grade officers (O-5) to man the JTCG/AS "Central Office". The Navy was designated host command and tasked with providing office space and administrative support to the Central Office.

Within the Army, the Commander, Army Materiel Command designated the Program Manager for Aircraft Survivability Equipment (PM ASE) as his Principal Member to the JTCG/AS Steering Committee. PM ASE established a separate PE within his budget (DO 79) to fund the Army's portion of the joint program and established an O-5 position in the ASE TDA (for duty in Washington D.C.). In 1974 the PM for Aircraft Survivability Equipment assumed full responsibility for Army funding to the Joint Program. That system remained in place until FY 1988 when funding responsibility returned to OSD.

Major Henselman is the Executive Director of the Joint Technical Coordinating Group on Aircraft Survivability, Central Office Staff, Washington, D.C.

Today's Organization

Today JTCG/AS is sponsored by two OSD offices, The Deputy Under Secretary of Defense (Tactical Warfare Programs) and the Assistant Deputy Under Secretary of Defense (Live Fire Testing). The organization continues to operate under an updated Charter signed by the Joint Logistic Commanders in 1977. The office is manned by field grade officers (O-4/5) from each of the services. Funding is provided by OSD under a 6.5 program element. Oversight is shared by OSD and the JLC. JTCG/AS reports directly to OSD and indirectly to the JLC through the JTCG/AS Steering Committee and the Joint Aeronautical Commanders. As a result JTCG/AS serves many masters. Politically it provides an effective interface between the services and between the services and OSD. Programatically it provides a financial bridge between the services,

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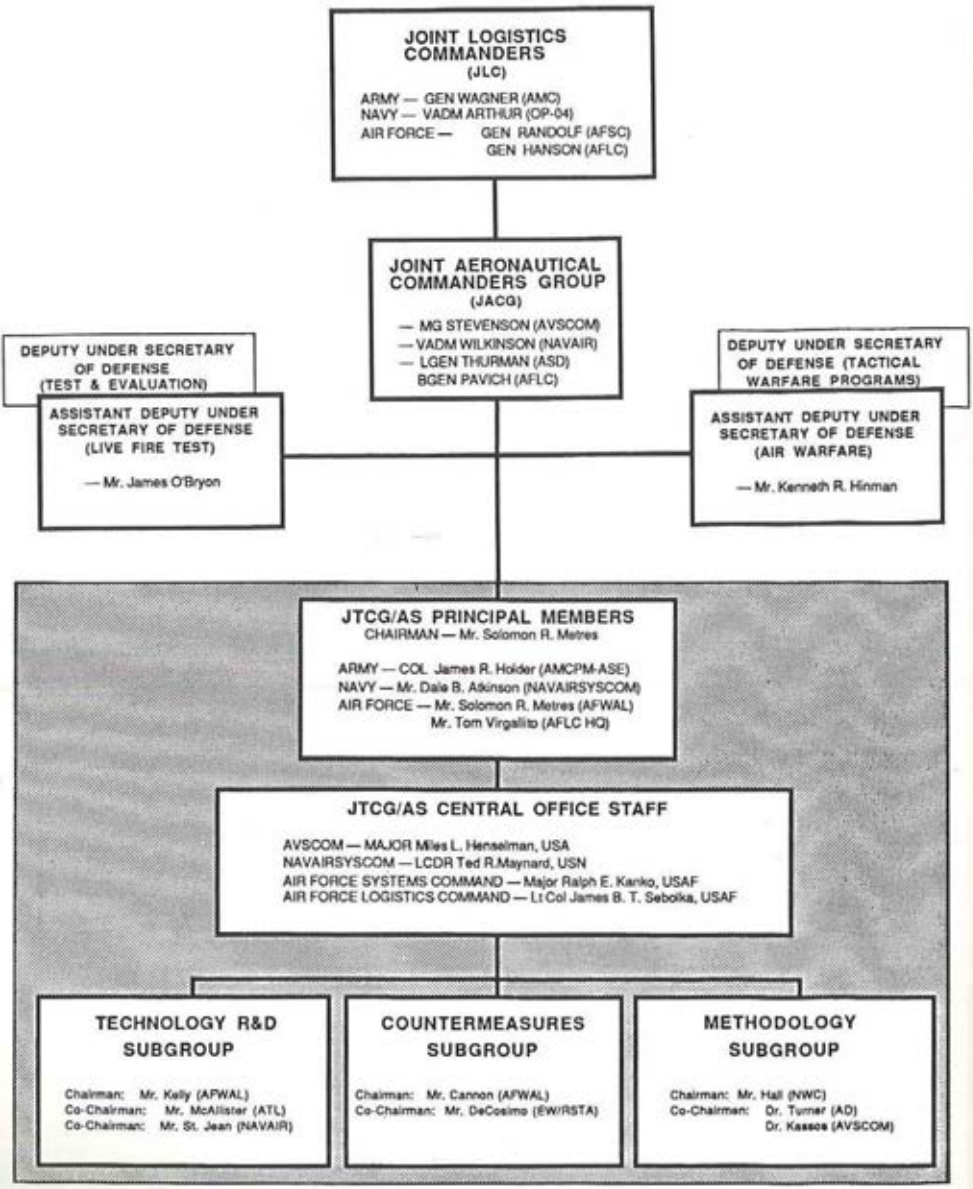
(JTCG/AS)



facilitating coordinated R&D programs.

the JTCG/AS Central Office Staff manages the Joint Aircraft Survivability program through a network of subgroups and advisory committees. The chart on the facing page illustrates the structure.

The three principal subgroups are Countermeasures, Technology and Methodology. Each of these subgroups is supervised by a Director (Central Office member) and a Chairman (service representative). Each subgroup sponsors "Special Tasks" aligned with its area of interest. These range from research efforts to defeat threat anti-aircraft missile seekers in Countermeasures, to analyzing the vulnerability of various engine components, to threat anti-aircraft projectiles in Methodology. The Central Office is funding and supervising 52 such tasks in FY88.

Current Projects

JTCG/AS is currently working a number of projects of special interest to Army Aviation. The Countermeasures subgroup is sponsoring a project to improve flare performance to protect "Low/Slow Aircraft". This project is fully coordinated between the services and the intelligence community. The U.S. Army's Armament Research and Development Center, located at Picatinny Arsenal, NJ, is designated the technical lead on a team which includes the Navy's laboratory at Crane, Indiana and Air Force Wright Aeronautical Laboratory, Dayton, OH. JTCG/AS is also funding advanced testing of the AN/AVR-2 Laser Warning Receiver and a 6.2 effort to develop a next generation fiberoptically coupled laser warning receiver. The lead activity for these projects is the Electronic Warfare, Research, Surveillance and Target Acquisition Center (EW/RSTA) at Ft. Monmouth, NJ.

Subgroups

The Technology R&D subgroup is funding engine vulnerability reduction work at the Ballistic Research Laboratory (BRL), Aberdeen, MD; development of battle damage assessment and repair techniques for composites at the Aviation Advanced Technology Directorate (AATD), Ft. Eustis, VA; development and testing of Advanced Modular Aircraft Armor at the Materials Technology Laboratory, Watertown, MA; Fire and Explosion suppression techniques at AATD; and redundant flight control development at AATD and BRL.

The Methodology Subgroup is working Advanced Threat simulation at the Army Material Systems Analysis Activity (AMSAA), Aberdeen Proving Ground, MD, and at BRL; Surface to Air Threat Simulations at the Missile and Space Intelligence Center (MISIC), Huntsville, AL; Susceptibility Assessment Methodology at the Center for Night Vision and Electro-Optics (CNVEO), Ft. Belvoir, VA and Advanced Vulnerability Assessment Models at BRL.

Under Group Tasks the Central Office is working a special analysis of the vulnerability of various candidate close air support aircraft. While this is of particular interest to the Air Force and Navy, the Army and Marines are also active participants. This project is being performed for the Deputy Undersecretary of Defense (Tactical Warfare), Mr. Donald Frederickson.

Each of these programs is closely coordinated with similar/supporting service unique programs. The goal is always to avoid duplication of effort and obtain synergy between the services.

R&D

The JTCG/AS is deeply involved in a number of R&D programs which may significantly improve the survivability of current and future Army aircraft. We are actively facilitating a flow of information between service laboratories to "keep everyone smart" on new developments. Ideally this creates a real synergy between the laboratories and between the services and those OSD offices most concerned with aircraft survivability.

Although this article has focused on the JTCG/AS-Army interface, an equal amount of staff time and resources are devoted to each of the other services. Members of the Central Office work issues based more on areas of expertise than service background. The Army member is expected to work issues associated with protecting A-10s and AV8/Bs as well as UH-60s and AH-64s. IIIII

ASE Training Programs

by Ms. Susan Sharpe

Aviation's success and survivability on the next battlefield is dependent upon the aviator's ability to identify the threat, know the capabilities and limitations of this threat, and effectively employ the aircraft's survivability equipment (ASE) suite. This is accomplished through the comprehensive threat and countermeasure training which the pilot receives.

Since the Vietnam Era, the Army's aircraft survivability program has emerged as a vital part of aviation's success story. The Aviation community has developed a five-step approach to improve survivability. The steps are: 1) tactics, 2) signature reduction, 3) warning, 4) jamming, and 5) aircraft hardening.

Employment of these steps, while increasing threat training, will enable and ensure the aviator's survivability in the next conflict. It is critical to improve the aircraft's ASE; however, it is also imperative to convince our aviators the importance of the equipment, as well, as how to employ it properly. Therefore, the U.S. Army Aviation Center and the Project Manager for ASE (PM-ASE) have designed a series of trainers to not only improve ASE awareness, but also to teach the tactical application of ASE to defeat the threat.

The first of these trainers, Aircraft Survivability Equipment Trainer I (ASET I) was fielded in 1985. It consists of a classified software package used with the AN/UYK-71 Microfix Computer System. The courseware teaches threat, tactics, and countermeasures for the AH-1 and OH-58 A&C aircraft. This training program had limited hardware fielding and only with the emphasis of the Aviation Commander has the ASET I received maximum usage.

Ms. Sharpe is an Education Specialist, ASE Equipment Training Management, Directorate of Training and Doctrine, USAAVNC, Ft. Rucker, AL.

ASET II

Our longterm, optimum desk-top trainer, ASET II, will be fielded in late FY 89. The trainer will also teach threat, ASE operation and employment, tactics, and countermeasures. It will address all rotary wing platforms: Scout, Attack, Utility, and Cargo, as well, as Special Electronics Mission Aircraft (SEMA). The highly interactive classified courseware will incorporate visuals produced by computer generated imagery and modular digital image generated (MODDIG). The ASET II will operate on the Electronic Information Delivery System (EIDS) hardware, the DA standard for interactive courseware.

ASET II is designed into three modes — tutorial, game, and management. The tutorial or information mode will address ASE operation and employment, the ASE capabilities, threat recognition and capabilities, and tactics/countermeasures to defeat the threat. It will provide the student with mission task scenarios to enhance the aviator's skills, knowledge, and confidence in ASE operation and employment.

The game mode is an intensified combat mission scenario in which the student develops, reinforces, and challenges his decision making skills while applying the total ASE philosophy.

The management mode will allow the commander/unit trainer to track each student's and unit's progress through a particular training program. This mode will assist in identification of strengths and weaknesses, thus improving the combat readiness of each individual aviator or an entire unit.

(Training — continued on page 35)

Exploiting the Value of ASE

by Lt. Colonel Charles B. Cook

The 101st Airborne Division (Air Assault) continues to train and demonstrate its potential firepower and mobility. We are capable of operating across a wide spectrum of missions in a diverse number of potential contingency areas. Key to the success of the air assault mission is the continued availability of experienced air crews and equally hard to replace aircraft. Therefore, attrition rates, survivability, and the need to protect the force are issues factored into the combat power equation:

Combat power = firepower + mobility + survivability.

Increase in Remaining Aircraft

The chart below reflects the large percentage increases of aircraft/aircrews remaining after 20 days of conflict (two engagements a day) achieved from only slight increases in baseline Aircraft Survivability Equipment (ASE) suite effectiveness. The second chart further exemplifies ASE effectiveness by showing the attrition relationship of ASE protected aircraft versus non-protected aircraft. ASE protected aircraft with correspondingly trained aircrews, utilizing proper tactics and correct mode of flight (contour/nap of the earth (NOE)) can effectively operate in the offense and take the initiative while at the same time limiting our losses. The effectiveness of our aviation assets further increases as we implement our night fighting capabilities (utilizing night vision goggles which ultimately leads to highly effective combined arms air assault operations.

In order to preserve our options to operate around the clock, we use the availability of our on-board ASE to augment our tactics and firepower. ASE and its use are addressed in terms of our daily operations, training and maintenance. This short article will reflect on how ASE is integrated into Air Assault Division operations, training, and maintenance.

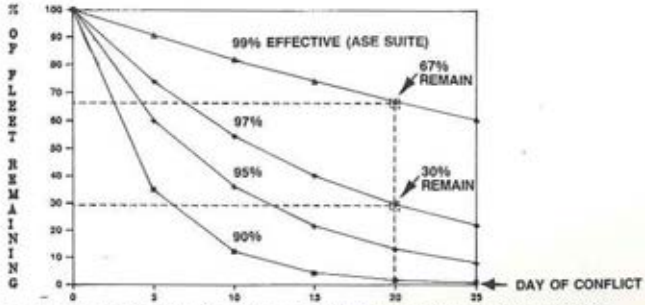
Issues

The presence of ASE tends to focus our attention on a number of officer professional development issues. We must:

- Know the technical aspects of all potential counter-helicopter threats in term of: Surveillance, Acquisition, Tracking, and Fuzing.
- Know ASE works to suppress, warn, jam and decoy.
- Know ASE works across an increasingly

(Value — continued on page 33)

Percent of Fleet Remaining (AT 2 ENGAGEMENTS/DAY)



Increasing ASE Suite effectiveness by 2% from 97% to 99% results in 37% more aircraft remaining on day 20 of the conflict.

LTC Cook is Commander 4-101 Aviation Regiment, Fort Campbell, KY.

ASE: Past and Future

by Mr. Donald Roth

AIRCRAFT Survivability Equipment (ASE) plays a vital role in raising the combat readiness posture of U.S. Army Aviation units. ASE provides protection from enemy weapon systems and thus allows the aircraft more fighting time and makes it more survivable on the modern battlefield. ASE consists of an array of tactics, warning receivers and jamming devices which is managed under the single DA charter of the Project Manager (PM) for ASE.

The ASE Project Manager's Office (ASE PMO) has been fielding systems for several years. The AN/APR-39(V)1 Radar Warning Receiver has been and still is a very reliable system and is currently installed on both rotary and fixed wing aircraft. This system is relatively easy to support in the field. It has been fielded in active Army units for about 10 years and is still going strong. This system detects and provides a warning of all pulse radars that are normally associated with surface-to-air missile airborne intercept and anti-aircraft weapons. The ASE PMO has fielded approximately 4,000 of these systems worldwide.

New Development

The APR-30 (V)1 has undergone new engineering development work which has incorporated design changes and improvements to the system which will react to new operational and changing threat environments. The APR-39A(V) 1 RWR will replace the APR-39(V) 1 beginning in FY 89.

When the heat seeking Infrared (IR) missile threat reared its ugly head, the ASE PMO was on target with an AN/ALQ-144 IR jammer for the Fully Modernized COBRA with follow-on fieldings to the BLACK HAWK and APACHE. These IR jammers were fielded, starting in FY 82, to active Army units. This system is designed to confuse threat IR missile systems. Presently, all of the fielded AH-1F COBRAs and AH-64 APACHEs have the IR jammer installed. Most of the UH-60 BLACKHAWKs have the IR jammer installed with fieldings continuing for the remaining UH-60 fleet. The ALQ-144 is a highly reliable system that needs to be turned on periodically. The old cliche applies "use it or lose it!"

Mr. Roth is the Chief, Logistics Management Division, ASE Project Manager's Office, U.S. Army Aviation Systems Command (AVSCOM), St. Louis, MO.

AN/ALQ-136 (V)

The challenge of developing countermeasures for emergency threats is never ending. Concurrent with the fielding for the IR jammer, another mean machine, which utilized a radar-guided tracking system, was staring at us. Well, not to worry, ASE went to the rescue again.

We had finished the development and testing of the AN/ALQ-136 (V) Radar Jammer and were ready to field the system to the aviation units. These jammers sure have a way of frustrating the operators of these enemy weapon systems.

In FY84 ASE PMO hit the road again and fielded this jammer to all COBRA (AH-1F) units. The ASE PMO is currently fielding this system to the Attack Helicopter Battalions and it will be installed on the APACHE. The system is a fully automatic radar jammer that analyzes and identifies incoming threat signals. It then jams the signal and causes the radar to look the other way.

We started analyzing the larger helicopter fleet to determine what type of protection would

reduce the signature of these aircraft and make them more survivable.

ASE PMO and Electronic Warfare/Reconnaissance Surveillance Target Acquisition (EW/RSTA) Center engineers came up with a device called the AN/ALQ-156 Missile Detector which would be utilized with the M-130 General Purpose Dispenser (chaff/flares). The missile detector, which is fully automatic, installed on a CH-47 CHINOOK, detects an incoming IR missile and issues a signal to the M-130 to toss out a flare to decoy the missile away from the aircraft. During testing, the system worked like a charm so ASE PMO immediately started fielding in FY 84 to the CHINOOK units. The fielding is now complete.

SEMA

After we analyzed protection packages and fielded systems to tactical aircraft units, it was time to look at the Special Electronic Mission Aircraft (SEMA). Some of the basic ASE can be effectively applied to SEMA, so all we did was improve the systems to match their threat environment.

The AN/APR-39(V)2 detects radar directed air defense threat systems while utilizing a digital processor with an alpha-numeric display. Everything looked very good in testing so we started fielding the system to active Army units in FY 85. This fielding effort is now complete.

We also needed to outfox the Bear's IR and radar guided weapon systems that SEMA pilots faced while completing their mission. This was accomplished through the use of an M-130 General Purpose Dispenser (chaff and flare). When installed on the aircraft, it interfaces with the on-board APR-39 (V) 1 RWR. During the FY 82 time frame, the AN/APR-44(V) Radar Warning System was fielded which gave the pilots the ability to detect continuous wave radar in both the upper and lower hemisphere.

That was our (ASE PMO) past and projected fielding effort over the last few years. The detectors and jammers have proven to be very reliable and also give the pilots some peace of mind. ASE has had a mixture of experiences in transitioning equipment to the field. As the complexity of the equipment increases, more risks are involved.

The Future

Although these aforementioned systems are very effective and reliable, staying "state-of-the-art" is a continuing challenge. There are new threats constantly emerging on the modern battlefield. In the near future the aviation units can expect improved IR and radar jammers. We also have ongoing programs, already in production designed to receive, process, and display laser threats (AN/AVR-2) in a split second. We are also developing a Radio Frequency Expendable Decoy which causes the "old bear" to look the other way. The pilot needed a way to look at various targets simultaneously, so we are developing the Radar Frequency Interferometer for enhanced target acquisition and hand-off capability.

We are always on the prowl looking for more efficient and better techniques to detect, receive, analyze, confuse, decoy, or jam the bad guy's signal. You might say we help the pilots play "hide and seek" with aircraft which allows them to strike and survive.

Training

We are heavily involved and committed in training the pilots through our Aircraft Survivability Equipment Training (ASET) program. We fielded the ASET 1 in record time. This system allows the pilot, through video, to train and have a little fun at the same time. Even though this is a very effective trainer, we are rapidly progressing to the point where we can put a scenario on the screen and the pilots will react to it as if they were in a flying mode.

The ASE PMO is a firm believer that electronic combat training makes the difference. The pilot/machine interface is a problem that is being faced by many programs that involve the rapid deployment of high technology equipment. ASE-PM's objective is to train the aviator in such a manner that his attention to ASE becomes one of reflex rather than studied analysis.

When the going gets tough, the tough need ASE. The ASE PMO, coupled with the EW/RSTA Center, continue to plow new ground in high technology in order to provide Army Aviation with the best survivability equipment in the world. ASE is the Army's edge against the hostile air defense environment of tomorrow. Although the Army's efforts in EW are fairly new, its arsenal of survivability is quickly maturing. ASE is truly a Force Multiplier. IIIII

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EC
(continued from page 18)

Corps have already achieved a high degree of inter-service commonality in their helicopter EC programs, and this trend will continue as they proceed in the development of EO/IR countermeasures. For specific applications, such as a laser designator, rangefinder, or personnel protection, there should exist a high degree of similar inter-service requirements.

Always Vigilant

Timing, because everyone is just getting started, should not pose the impediment to commonality as in the past. OSD will be extremely vigiliant fulfilling its program oversight role and fostering common inter-service solutions to meet common requirements. Cost and Operational Effectiveness Analysis, where various alternatives and their operational advantages and associated costs are analyzed, must be performed to provide the basis/rationale for program decisions.

Although the need exists and the payoff is high, the realities of an austere budget will curtail system new starts in general and EO/IR new starts in particular. The tendency is to apply the available resources to ongoing efforts. In austere times, that may have to be done at the expense of new starts. If there are to be EO/IR system development new starts, they most likely will have to be inter-service programs. These programs, because of multiple service advocacy, have a better chance of making it to the starting line.

If we are to improve our aircraft survivability we must expand into the realm of EO/IR countermeasure system developments. These developments must complement RF countermeasures systems if our platforms are to survive in the 1990's. The challenge lies with the Services in the area of commonality. The time is ripe to assess the EO/IR requirements for joint programs and focus the limited development funds into the areas of the highest payoffs. IIIII

AWARDS AND HONORS

The following information is provided by the U.S. Army Aviation Center at Ft. Rucker, AL:

Initial Entry Rotary Wing Aviator Course 88-3 (8/10/88): 2LT Ralph C. Thompson, III, Distinguished Graduate; 2LTs Christopher R. Shotts, James F. Yacone, Cynthia A. Roberts, Jeffrey K. Hazelwood, Honor Graduates.

Initial Entry Rotary Wing Aviator Course Class 88-3 (8/10/88): WO Dean L. Wood, Distinguished Graduate; WOs James D. Clay, William C. Ragsdale, Brian L. Wilson, Peter K. Schuessler, Honor Graduates.

Initial Entry Rotary Wing Aviator Course Class 88-4 (8/24/88): 2LT Douglas P. Kanz, Distinguished Graduate; 2LTs Michael D. Brichacek, Mica J. Imamura, Fred C. Loofbourow, Honor Graduates.

Initial Entry Rotary Wing Aviator Course Class 88-4 (8/24/88): WO Henry E. Kemp, Distinguished Graduate; WOs Jeffery F. Armistead, Duane G. Crawford, Dean M. Cole, Ronald L. Ireland, Honor Graduates.

Aviation Officer Advanced Course Class 88-3(8/30/88): CPTs William N. Cheesborough, Richard T. Knapp, Charles H. McGould, Jr., Exceeded Course Standards, Master Tactician & Communicative Skills Award; CPTs Jeryl S. Cornell, Scott M. Ferderber, Mark D. Frakes, Scott F. Netherland, Anthony S. Pelczynski, Bruce G. Smith, David E. Williams, Exceeded Course Standards and Master Tactician Award; CPT Bruce Moore, Master Tactitian Award and Communicative Skills Award; CPTs Scott B. McClellan, Sanford B. Morton III, Robert W. Oliver, Jr., George N. Prestridge, Jr., Kyle M. Riddle, Thomas P. Stall, Paul Swicord, Robert S. Wozencraft, Master Tactician Award; CPT Wayne W. Clark, Exceeded Course Standards, Master Logistician Award and Communicative Skills Award; CPTs David F. Crocker, Charles R. Reed, Exceeded Course Standards, Master Logistician Award. CPTs Pamela J. Chandler, Timothy J. Hilty, Arthur J. Hinaman, Deriel W. Romine, 1LT Richard J. Torres, Master Logistician Award.

Initial Entry Rotary Wing Aviator Course Class 88-5 (9/8/88): 2LT Richard J. Giarusso, Distinguished Graduate; Bertrand P. Finkenbeiner, Honor Graduate.

Initial Entry Rotary Wing Aviator Course Class 88-5 (9/8/88): WO Nelson W. Donovan, Distinguished Graduate; WO Errol P. Bodin, WO Kevin H. Brookins, WO Dale J. Jensen, WO Charles T. Borre, Honor Graduates.

Program (continued from page 16)

when properly used in conjunction with flight maneuvers, can achieve break locks from radar guided weapons systems. The ALQ-156 Missile Detector installed on CHINOOKs in conjunction with the M-130 dispenser, gives the large signature CH-47 outstanding protection against heat seeking missiles. When the radar gates in the doppler radar pattern around the CH-47 are triggered by an incoming missile, a decoy flare is automatically launched.

e. **Vulnerability Reduction** allows many Army aircraft to take a 20mm hit in the rotor and continue flying. The aircraft is designed to survive a hit in the fuel tank without an explosion occurring due to a self-sealing feature. The Army aircraft for the modern battlefield is designed to allow the aircraft to fly without lubricants in the engine and transmission for at least five minutes. Redundant flight control systems, armor plating of critical components and blast shields for the crew make the Army helicopter an exceedingly "hard" aircraft.

The need and requirement for integration in most of today's defense programs is driven by the anticipated intensity and technological complexity of the modern battlefield. Electronic Warfare systems which are typically stand-alone devices with varying levels of inherent performance limitations are not excluded from the requirement for functional integration. This fact has resulted in the initiation of programs such as the Advanced Self Protection Jammer (ASPJ) and the Integrated Electronic Warfare System (INEWS).

Integration

The Army ASE program is actively pursuing an ASE integration effort thru basically three levels of ASE integration as follows:

a. Level I ASE is composed of several systems that operate in a discrete manner on the aircraft.

b. Level II ASE combines the discrete ASE through a remote terminal across a MIL-STD-1553 data bus to a central controller processor and a cockpit display. This technique saves cockpit space by removing the control heads, reduces weight, allows teaming of ASE and reduces the pilot workload. Level II ASE developments are being considered for product improved aircraft and special operations aircraft.

c. level III ASE involves designing a modular integrated ASE system of components that communicate thru a high speed bus to a high speed processor. Planned courses of action include using the front ends of existing ASE without redundant processors and transmitters to save weight or to design a new system of downsized equipment taking better advantage of the technology at hand.

Our current development and production efforts in the varied technology disciplines are building a strong base of technology, experience, and industry participation for the Army ASE program. From these we are moving forward in our efforts to support the current Level II IASE effort and to provide technology input for level III LHX IASE.

JIAWG

The Army ASE Office is also participating in the Joint Integrated Avionics Working Group (JIAWG). The JIAWG has been formed as a tri-service effort to define areas of commonality for modern digital, integrated electronics, avionics and embedded communications security for the services' new aircraft. The JIAWG provides a forum to coordinate technology efforts, share data, reduce duplication and resolve commonality issues and the product will be a set of specifications for common modules, i.e., avionics building blocks and a common avionics architecture.

The JIAWG is composed of separate task groups in the areas of CNI/COMSEC, Logistics/Supportability, Sensors, Defensive Avionics, Architecture and Software. The Defensive Avionics Task Group membership from the Army includes representatives from the Electronic Warfare/Reconnaissance, Surveillance, Target Acquisition Center (EW/RSTA), the U.S. Army Communications-Electronics Command (CECOM), Lightweight Helicopter Experimental Project Manager's Office (LHX-PMO), ASE-PMO, and the U.S. Army Aviation Systems Command (AVSCOM).

The Defensive Avionics Task Group is presently investigating technologies for incorporation into its specifications and among the key technology programs supporting this effort is INEWS. The

(Program — continued on page 32)

Program (continued from page 31)

INEWS efforts include work in simulation and modeling, software, and algorithm development, hardware demonstration and other activities related to the development of this defensive avionics system. The INEWS program will produce enhanced system capabilities that will include multi-spectral capability, advanced sensors/countermeasures, new threat adaptability, and a high degree of integration.

In summary, the Army ASE program is alive and well and looking forward to the future. Many systems have been fielded and are currently supporting the readiness posture of our aviation units to include the AN/ALQ-147 SEMA Infrared Jammer, the AN/APR-39(V)2 SEMA Radar Warning Receiver the AN/APR-39(V)1 Scout/Attack and Utility Radar Warning Receiver, the AN/ALQ-156(V)1 Missile Detector System, the AN/ALQ-136(V) 1/5 Radar Jammer, the AN/ALQ-144(V)1/3 Infrared Jammer, the APR-44(V)1/5 CW Warning Receiver, the M-130 Chaff and Flare Dispensers, the Tactical Radar Threat Generator, and ASET I Training systems.

The AN/ALQ-156(V)2/3 SEMA Missile Detector is currently in production as is the Advanced Scout/Attack AN/APR-39A(V)1 Radar Warning Receiver. The Joint Army/Navy ALQ-162 CW Jammer program is also in production in preparation for the total package unit materiel fielding for the Quick-Fix aircraft.

Also in production is the AN/AVR-2 Laser Warning Receiver. Other ASE programs in the development phase are the AN/AP-48 Radar Frequency Interferometer, the SEMA AN/ALQ-136(V)2, Radar Jammer, AN/APR-39A(XE-2) Radar Warning Receiver, AN/ALQ-144A Infrared Jammer, the Radar Frequency Expendable Decoy, and the ASET II, III, and IV systems.

These programs have all been made possible by the Army technology base programs that provided the necessary risk reduction and technology to allow moving these disciplines into full scale development and fielding.

The industry IR&D programs are a key element in the Army's ability to participate with industry and our sister services in providing proven survivability equipment as a means of enhancing combat effectivness and our war fighting capability. Development, production, and fielding efforts all strive to make Army Aviation an event more efficient, effective fighting force to help win the first battle of the next war. IIIII

Training (continued from page 24)

The Aviation Center's strategy is to incorporate ASET II into the training requirement of the Aircrew Training Manual (ATM). This will assist the Aviation Commander in standardization of ASE training. Original plans were to field ASET II on a ratio of one system per 33 aviators; however, due to budget decrements in the EIDS program, ASET II will be fielded first to the Forwardly Deployed Units, then as EIDS funding improves, the original ASET II fielding plan will be implemented.

The third in the ASE trainers is ASET III, an in-flight handheld device used to activate the aircraft's ASE. The instructor pilot or unit trainer will activate the device during training flights or routine missions. The system may be programmed prior to flight with a single press of a button to activate, pause or deactivate the system. ASET III is programmed to be fielded to Aviation units, with a modified version for the institution. The ASET III program, as other Aviation programs, has incurred severe funding decrements; therefore, scheduled fielding is delayed until FY92.

The last in the series of trainers is ASET IV. This device will be a group of ground based threat emitters replicating an air defense battery minus. Additionally, it will be equipped with the MILES/AGES compatible system to provide realist kill and be killed capability. ASET IV will create an electronic warfare environment which will allow aviators to train mid-intensity, force-on-force. The ASET IV Request for Proposal (RFP) is scheduled for release 1st Quarter FY 89. Programmed fielding is FY 93.

The Aviation Center has established an ASE Hotline to answer any questions concerning ASE hardware or training devices. If you have a question and are unable to contact the ASE project officers (AV 558-4023/4110) during normal duty hours, call the hotline number, (205) 255-6487/AV 558-6487 and your question will be answered promptly.

The Aviation Center and PM-ASE are working diligently to improve training of currently fielded and future ASE. With the fielding of these four trainers, Army Aviators will be better prepared to fight and survive on the modern battlefield. IIIII

Value
(continued from page 25)

dense spectrum of technologies used by today's weapons designers:

- Optical/electro-optical,
- Infra-red/ultra-violet,
- Radio and radar frequency in all their many applications,
- Lasers now; and in the near to mid-term, other directed energy weapons.

At Ft. Campbell, we are using a number of techniques to address the individual and collective ASE training requirements generated by an analysis of our mission essential task lists. At the aircrew level, we use several in-house capabilities to address individual training: ASET 1, a personal computer system, UH-60/AH-64 Flight Simulators, Weapons and Tactics Instructors, TRTG/Technology Range.

Technology Range

A word concerning the technology range. We array around the Tactical Radar Threat Generator (TRTG) with its audio/video record capabilities several other counter helicopter capable systems (20mm Vulcan Cannon, M-60 tank, TOW, PPS-5 Ground Radar, Stinger trainer, Forward Area Alerting Radar, etc) all of which use various technologies (optical, radar, electroptical, infra-red) to search, acquire, track and/or engage helicopters. All of these systems' operators work on a common frequency with our aircraft serving as cooperative and noncooperative targets. Both air and ground crews learn quickly what they can or cannot do during these very interesting and challenging training periods. Competence and confidence levels rise significantly after these exercises.

At the collective training level we use several more techniques to employ our ASE equipped helicopters:

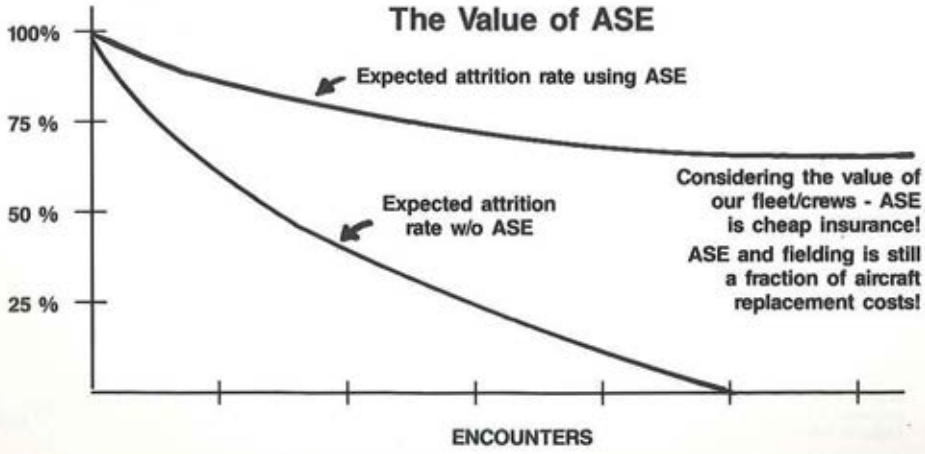
- Joint/Combined Arms Exercises
- Off post Emergency Deployment Readiness Exercises (EDRE)
- Dedicated Electronic Warfare Ranges such as the facility at Pinecastle, F1.

Unfortunately, except for the EW range of Pinecastle, FL, we get little feedback in terms of how effective our on board ASE or tactics are working.

Limitations

Training distractors exist and are primarily a lack of spares for the TRTG; the unavailability of chaff for training against the TRTG or to conduct readiness checks for the M-130 dispenser; and a total lack of a current ability to address the increasingly ominous laser threat in terms of either warning, jamming, or decoying.

As we continue to exploit the presence of Army Aviation on the AirLand Battlefield, we will seek to continue to develop and demonstrate our technical and tactical expertise; we will continue to train to be prepared to fight and win. ASE allows us to do it better. Air Assault! IIIII



Logistics:

Training to Sustain

by Major Jan E. Payne

FT. EUSTIS, VA — One of our greatest challenges at the Aviation Logistics School is to ensure that our soldiers are trained to meet the high demands of AirLand Battle. We recognize a very fundamental truth that Aviation logistics is the most critical aspect of aviation power. Inadequate logistics could very well restrict the employment of the commander's aviation assets.

Sustaining Capability

We further recognize that an essential element in the logistics formula is also the primary mission of Aviation maintenance personnel. That element is to provide a sustaining capability to the employed Aviation Brigade and its sub-elements by returning nonflyable aircraft to a flyable condition as soon as possible. Our goal is to meet this challenge by continuously enhancing the training for our enlisted, warrant officer, and officer students.

The Aviation Maintenance Officers Course was recently enhanced by combining Phase I and Phase II into one start-to-finish course titled the Maintenance Manager/Maintenance Test Pilot Course. In reality, there are eight MM/MTP courses: the UH-1, UH-60, AH-1, AH-64, OH-58A/C, OH-58D, CH-47B/C, and CH-47D.

Major Payne is Chief, Personnel Proponency Office, U.S. Army Aviation Logistics School, Ft. Eustis, VA.

Personnel who completed AMOC Phase I prior to October 1, 1987 but have not completed AMOC Phase II, are eligible to attend the aircraft track (test pilot portion) of the course until October 1, 1990. After October 1, 1990, all personnel will attend the entire MM/MTP course.

This latest change will provide field commanders with a fully qualified maintenance manager/test pilot and eliminate the requirement to return the officer to school during or after his or her initial utilization assignment.

Combined Courses

We also combined the ALSE Specialist Course with the ALSE Supervisor's Course. We call the new course the Aviation Life Support Technician course.

We now provide ALSE supervisors (NCO's and officers) with the identical hands-on and practical exercise training that the ALSE specialist receives. The new course ensures that all students graduate with an increased level of technical and managerial capability.

The success of the new MM/MTP and ALSE courses has enabled us to apply the same logic to solve other training issues. Army of Excellence force structure created voids in Aviation Tables of Organization and Equipment (TOE) in terms of school trained Technical Inspectors (TIs).

For example, there are no TIs in attack companies, and in other small aviation units there may be only one inspector authorized. Without question, the unit is in a maintenance bind when that inspector is on leave or is otherwise absent from the organization.

Additionally, the 66 series is a one grade MOS. After E-6 the soldier must return to the 67 series MOS as an E-7. Often after completing the Inspector Course many soldiers must return to the Aviation Logistics school for the Basic Non Commissioned Officers course (BNCOC). This results in additional travel and TDY cost. We believe we have found a solution.

After a thorough scrub of the Programs Of Instruction (POI), we discovered that we could integrate Technical Inspector training into the 67 MOS and 68 MOS BNCOC courses and actually realize an overall savings in training hours. When implemented, the new BNCOC course graduates will be qualified to perform duties as Technical Inspectors.

That is not to say that all graduates will be TIs but that they are qualified and could be if so designated by the commander. This will give commanders the flexibility to manage their personnel and provide the Army with much more competent soldiers.

This concept was strongly endorsed during the recently completed Department of the Army Aviation Logistics Study.

These training improvements underscore our efforts to increase the technical competence of our aviation maintainers and meet the demands of sustaining Aviation on the modern battlefield. Support and sustain is the bottom line! IIIII

Combat Developments:

Avn Combat Service Support Automation

by Lt. Colonel Thomas P. Cole

FT. EUSTIS, VA — As of the publication of this article, the stubby pencil is officially pronounced an "endangered species". As a branch, Army Aviation has seized the initiative in the field of automation and has given the automation of aviation combat service support functions a front burner status.

This commitment to the modernization of our aviation logistics support is the first step in an irreversible transition to the Star Wars capabilities of the future.

Operational Concept

The U.S. Army Aviation Logistics School, in conjunction with Centers and Schools throughout the Army, has embarked on a series of automation programs that will provide the impossible. The story begins with the development of an operational concept to provide focus for the Aviation CSS automation initiatives that will support the AirLand Battlefield.

Our operational concept for total Aviation CSS automation is currently under development. It calls for an ability to collect in-flight systems data from the aircraft, analyze the information at the aviation unit, and extract relevant maintenance and supply data for subsequent transmission and use by the Division and/or Corps Materiel Management Center and ultimately, the National Inventory Control Point in CONUS.

LTC Cole is Director of Combat Developments, U.S. Army Aviation Logstics School, Ft. Eustis, Va.

PAMS

To achieve the capabilities outlined in our operational concept, we require an onboard, and in the case of LHX embedded, capability to prognose and diagnose maintenance conditions based on the systems data collected during flight. PAMS will provide us that capability.

Currently planned as Phase III of AVSCOM's Flight Data Recorder Program, PAMS will be an automated maintenance module with a series of static and dynamic sensors collecting digital information from a majority of aircraft systems.

Cockpit displays of critical information will eventually provide the pilot early warning of a potential catastrophic failure based on the Predictive Aircraft Maintenance System's (PAMS) observation of a component exceeding performance tolerances.

LAS/ULC

Literally hundreds of thousands of bits of data will be collected by PAMS and stored in the unit's memory until the data can be downloaded at the unit for more detailed analysis. The typical aviation unit will not be without its share of computer power.

Tactical computers, down to the Section level, will run enhanced user friendly versions of the Logbook Automation System (LAS) to accomplish electronic updates of all historical records, weight and balance, and maintenance management.

Electronically transmitted supply requests will occur at lightning speed based on the outputs of PAMS, its analysis in the Unit Level Computer (ULC), and the software interface between the logbook automation system and the Unit Level Logistics System (ULLS).

This software interface will open the door for the electronic transmission of relevant supply and maintenance information from aviation units into the battlefield software of the Standard Army Maintenance System (SAMS) and the Standard Army Retail Supply System (SARSS).

The Combat Edge

The changes are coming faster than one might think. LAS, SAMS, SARSS, ULLS, Automated Weight and Balance, and the Flight Data Recorder are already operating in selected active and reserve units, or, have demonstrated their capabilities in operational tests.

The initiatives to create the system-wide electronic linkages between these programs have been in progress for the past three years and have entered the functional design stage.

Functional and technical experts throughout the Aviation community are in the process of determining the specific linkages and outputs against which communications and analysis software will be developed. Our target date for total system Army Aviation CSS automation is 1993.

(Future — cont. on p. 46)

Air Traffic Control:

Air Traffic Control Modernization Efforts

by Colonel Melvin J. McLemore

FT. RUCKER, AL — Since the U.S. Army Air Traffic Control Activity's (USAATCA) last article in February 1988, we have continued the efforts to modernize air traffic control and the airspace system to better meet the needs of the U.S. Army, Joint Services, Civil Services, and ensure integration into the National Airspace System (NAS).

The Activity is finalizing the Army's first Air Traffic Control (ATC) and Air Traffic Services (ATS) Master Plan that incorporates both fixed base and tactical. It was jointly prepared by USAATCA, the Aviation Center Team, and the MACOMs. The Master Plan is the vehicle that the Army will use to inform the user and other interested agencies of ATC near and far term plans and requirements.

Plan is Vital

The Master Plan is vital in the Planning, Programming, Budgeting, and Execution System (PPBES). Additionally, it provides the information required by all Army ATC users, managers and the people that develop other related planning documents.

Master planners from USAATCA and Director of Combat Developments (DCD), and other key staff members at the Aviation Center have consolidated the fixed and tactical requirements into one plan that will become a feeder document for the Aviation Center Long Range Plan and the Army Aviation Modernization Plan. The ATC Master Plan is a road map that delineates planning and essential funding to sustain and modernize the Army's air traffic control systems.

It identifies requirements in the near (1988-1994) and far term (1995-2004) in support of the National Airspace System Plan (NASP) and the Army Airspace Command and Control (A2C2) system for training and combat.

Impact Assessed

The impact of the Federal Aviation Administration (FAA) upgrade of the National Airspace System (NAS) is being continually assessed to determine interface requirements for Army ATC facilities. All Army Radar Approach Control (ARAC) and major CONUS control tower facilities are affected by this program.

The DOD interfaces with the NAS on a wide scale including Air Defense activities, military command and control interfaces, the sharing of system resources, common procedural requirements, and other areas on a daily basis. Recognition of these interfaces, both equipment and otherwise, are essential in the process of NAS evolution.

Our fixed base assessment indicates that while many modernization programs are ongoing, substantial requirements exist for modernization of existing systems. Flight following is an excellent example of increasing requirements. Recent interests in high density training areas, range control, and remote area flight following requirements are also currently being revisited.

Fixed base requirements are primarily intiated by MACOM request. Our requirements survey includes costing analysis to be sure we are acting cost effectively and new equipment contributes to the mission either in the area of cost savings or cost avoidance. Milestones are established to ensure logical progression in the engineering and installation process.

Economics of Scale

The U.S. Army Air Traffic Control Activity standardizes equipment configuration to the extent feasible, and procures equipment only after surveying joint acquisition candidates in order to capitalize on the economics of scale.

The Air Traffic Control Activity is the integrator for all Army air traffic control matters including fixed base and tactical. As the proponent for the ATC Master Plan, the Activity coordinates closely with the Aviation Center's directors of Combat Development, Training and Doctrine and Combined Arms Tactics.

Additionally the Activity must ensure that the Director of Enlisted Training is continually updated on new procedures and equipment that have training requirements. The tactical planners have succeeded in obtaining combined arms center approval of an interim operational concept which supports the Army's A2C2

(ATC — cont. on p. 46)

Colonel McLemore is Director, U.S. Army Air Traffic Control Activity, Ft. Rucker, AL.

Training:

Apache Training Brigade

by Colonel Malvin Handy

FT. HOOD, TX — It is my pleasure to introduce, to the Army Aviation community, the three newest members of the Attack Helicopter family.

The 4th Squadron, 6th Cavalry, 6th Cavalry Brigade (Air Combat) commanded by LTC Thomas M. Crews recently became the 7th unit to complete the Apache Training Brigade's Unit Training Program. The Army's first activating Apache squadron overcame logistical, administrative, and training hurdles to complete its ARTEP in outstanding fashion.

High Standards

High standards of achievement were set for follow on activating APACHE Battalions. During the program, the 4-6 became the first unit to fire live Hellfire missiles at Ft. Hood. The 4th Squadron, 6th Cavalry joins the 6th Cavalry Brigade, (Air Combat), stationed at Ft. Hood, TX as a combat ready AH-64 APACHE Squadron.

The 5th Squadron, 6th Calvary, commanded by LTC Michael K. Mehaffey completed the Unit Training Program on July 30, 1988. They are now preparing for deployment to Weisbaden, West Germany and V Corps. The 5-6 was the first battalion to fully qualify 100% of their AH-64 crews on our new Attack helicopter firing range. I commend LTC Mehaffey for the new standards of performance he has set.

The 1-130th, commanded by LTC Duncan Stephens, completed the battalion training phase of the Unit Training Program and evaluation on August 6, 1988. They now have the honor of being the first National Guard unit in the country to have completed the AH-64 Training Program. The unit is headquartered in Raleigh, N.C.

Col Handy was Commander, Apache Training Brigade, Ft. Hood, TX at the time this article was written.

ly trained AH-64 Battalions and those that preceeded them during my command, congratulations on jobs superbly done. To the personnel of the ATB, both military and civilian, I say thank you for all the support each and everyone of you provided me.

Lasting Impact

Indeed, the APACHE Training Brigade is, and will continue its overall mission to receive, equip, train, evaluate, and deploy all APACHE Battalions in the Army (is this sentance missing something?). In this capacity I am now convinced that this brigade will have more of a profound and lasting impact on Army Aviation than I ever dreamed as I took command two years ago. The standard for all AH-64 attack helicopter units will be set as they pass through the APACHE Training Brigade program — an awesome responsibility for whoever commands this Brigade. I am extremely thankful for the opportunity and humbled by the experience.IIIII

With the APACHE Training Brigade (ATB) change of command on August 8, 1988, in which I relinquished command to COL Robert D. Hurley, I would like to take time now to say, to the soldiers of these three new-

Underwater Egress Training

FT. RICHARDSON, AK — The Underwater Egress Training Device, or dunker, is an idea whose time has come. With budget cuts wreaking havoc, two enterprising soldiers from G Company, 123d Aviation, Ft. Richardson, AK used imagination and initiative to reduce expense and improve unit training.

Faced with the scarcity of dollars and continuous requirements to conduct overwater training, CW2 James Jarvis and SGT Mark Smith recognized the need for a low cost, low technology training aid to replace costly TDY expenses. Previously, the division had obligated thousands of dollars in TDY expenses to send crews to Navy dunker facilities from California to Florida.

Surviving underwater

"Dunker" controlled environmental training enhances crewmember survival chances following an emergency landing into water. CW2 Jarvis and SGT Smith's device has proven to be extremely safe, largely due to its simplicity. Even if a crewmember panics, it is a simple matter of rotating the "dunker" upright, thus lifting the crewmember's head out of the water.

The "dunker" demonstrates to every crewmember the importance of identifying points of reference prior to an emergency. As part of the water egress training, each crewmember is required to wear black-out goggles to simulate night flying or murky water conditions which may reduce vision.

The devices' lightweight materials aid in handling and maneuverability when submerged in water. These materials include sixty feet of one and one half inch outer diameter PVC SCH 40 tubing cut in various lengths to make up the "dunker" frame. The PVC tubing is connected by ten (10) forty-five degree fittings, four (4) ninety degree fittings, and twenty-six (26) tee fittings. A total of fifty-two PVC SCH 40 tubing pieces are required to complete the "dunker" device. The overall dimensions are a length of fifty-five inches, a height of forty-eight inches, and a width of fifty-two inches. Seat and simulated flight controls are not included in the total "dunker" cost of less than $150.00.

Year-round training

The dunker trainer is not only economical, but also easy to assemble. Units concerned with over water training no longer need to send crewmembers long distances at great expense to learn water egress techniques. The "dunker" also allows units to train emergency water egress procedures at home station swimming pools year-round. IIIII

BELOW: Black out goggles are worn in the "dunker" underwater egress trainer to simulate both night and/or murky water conditions.

Army Aviation:

MSIP: An Army Aviation PEO Perspective

by Mr. Jerry M. Pickett and Mr. James T. McDermott

ST. LOUIS, MO — We are extremely happy to report that Army Aviation is alive and well in St. Louis. The Army Aviation modernization plan has been strongly supported in all circles and the budget process is strongly supporting continued production of the APACHE and AHIP as well as threat and mission capability improvements for these aircraft.

The objective of the aviation Multi-Stage Improvement Program (MSIP) is to obtain affordable, near-term improvements to current aircraft leading to incorporation of LHX architecture and MEP, where appropriate.

The AAH and AHIP Program Management Offices awarded short term study contracts to their prime contractors, McDonnell Douglas Helicopter Company and Bell Helicopter Textron Inc. for development of a description of a Mission Equipment Package (MEP) to be incorporated into their respective MSIPs.

The MEP integration architecture and implementation plans will be compatible with both current aviation weapon system MEP enhancement needs as well as LHX MEP component requirements. The contracts were awarded on April 8, 1988 with reports due by July 6, 1988.

These contracts will result in a better definition of MSIP for the AH-64 and the OH-58D. The MSIP will be divided into two parts, Stage 1 and Stage 2.

Stage 1

Stage 1 will focus on changes necessary to improve current warfighting capabilities, improve safety, reduce operations and support costs, and identify changes that can ease the transition to use of portions of the LHX MEP. MSIP Stage 1 is envisioned as a block change to be completed in the mid 1990s.

Stage 1 for the AH-64 consists of three Phases. Phase 1 is the concept definition phase. Phase 2 is the Full Scale Engineering Development (FSED) phase. Phase 3 is the production phase.

The first production OH-58D AHIP aircraft was delivered in 1985 and, therefore incorporated more state-of-the-art mission equipment in the development effort. As a result, no Phase 1 will be required by the OH-58D because fewer mission equipment changes are anticipated.

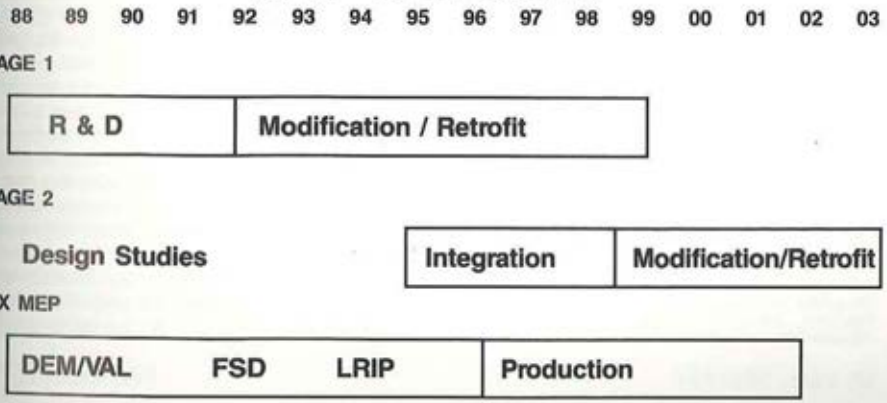
Milestones to award of these respective phases are as follows:

- AH-64: Phase 1 - July 1988,

(MSIP - continued on page 45)

Mr. Pickett is Procurement/Production Officer; Mr. McDermott is Deputy for Systems Mgmt., Army Aviation PEO, St. Louis, MO.

MSIP SCHEDULE



Readiness:

AVSCOM Update

by Mr. William Butler

ST LOUIS, MO — The success of Army Aviation is measured by its ability to fulfill its missions as an integral element of the combined arms team to engage and defeat threats posed by potential adversaries.

To meet these threats, the Army has introduced new aircraft such as the AH-64 APACHE and UH-60 BLACK HAWK, and we continue to update some of our older aircraft such as the CH-47 CHINOOK, OH-58 KIOWA, AH-1 COBRA and UH-1 IROQUOIS. All of these aircraft are currently being modernized to overcome the threats now and for the foreseeable future.

The Threats

What are the threats? To support ground operations, the Soviets are increasing and modernizing their helicopter forces. At the division level, Soviet helicopter detachments have expanded to squadrons and increased the quantity of HIND attack helicopters. At the army level, the Soviets have formed about 20 attack regiments with up to 60 HIP and HIND attack helicopters in each. More than half are deployed opposite NATO forces.

To improve survivability, many of their helicopters are now equipped with infrared jammers and suppressors, infrared decoy dispensers and more armor.

A new attack helicopter known as the HAVOC, similar to our APACHE, is expected to be deployed soon. Also, another new helicopter, the HOKUM, which has no current western counterpart, may give the Soviets significant rotary wing air-to-air combat cpability.

The HOKUM's prime NATO targets would include close combat support aircraft, including anti-tank helicopters. Soviet developments in directed energy, NBC warfare, radio electronic combat and other areas also will affect our aviation programs. All of these challenges are considered in our aviation modernization efforts.

Force Integration

Integrating our aviation force with other elements of the combined arms team is a central consideration of the Army Aviation Modernization Plan (AAMP). Aviation's role as a combat multiplier on the modern battlefield helps provide significant tactical leverage as a maneuver force.

This role stems from the four basic tenets of the AirLand Battle doctrine: initiative, agility, depth and synchronization. Experience has taught us that a relatively small but potent force, striking the enemy unexpectedly, can destroy a larger force through advantages in lethality, agility and the capacity to pursue battlefield advantages as they arise.

The AAMP balances requisite components designed to achieve not only enhanced weapons lethality, but also the capacity to concentrate firepower effectively at a specific time and place to defeat the enemy.

This drives our requirements for reconnaissance as well as attack capabilities. Flight time has been divided effectively into time for reconnaissance, command and control, and target acquisition. The Army fully recognizes this need and addresses it in aviation doctrine, tactics and organization.

Combat Effectiveness

Similarly, combat effectiveness is as much determined by how and when the enemy is engaged as it is by the type of weapons used against him. So, tactical intelligence and reconnaissance play crucial roles in combat; without them, ground and air commanders will be unable to identify enemy vulnerabilities and seize the initiative.

A prime objective in balancing the six major aircraft category capabilities in the AAMP — attack, reconnaissance, lift, cargo, intelligence and electronic warfare — is to ensure every weapon system and component procured or upgraded achieves its intended potential in combat.

In the next several years, the Army's total aviation fleet will inevitably shrink. Fleet downsizing is the result of two related imperatives. First, as new and more capable aircraft join the fleet they will displace a number of older, less capable aircraft. Second, the Army must avoid retaining a fleet size it can no longer afford to maintain or modernize. Therefore, to remain within budgetary constraints and still sustain an adequate pace of

Mr. Butler is Logistics Management Specialist, Directorate for Readiness, AVSCOM, St. Louis, MO

modernization (particularly for combat forces), the fleet size will have to be reduced logically and systematically. Aircraft determined to be incapable of defeating the enemy or surviving on the battlefield will be retired.

Fleet downsizing is primarily a byproduct of advanced technology which allows us to achieve greater warfighting capabilities with fewer aircraft. However, downsizing must be implemented and executed before the newer, high technology aircraft are produced.

Retaining aircraft beyond their useful life is detrimental in terms of overall cost and warfighting capability. Presently, the Army has a large number of older (15-25 years) aircraft approaching or having reached obsolescence, with a smaller but increasing number of new technology aircraft beginning to take their place.

Efficient Modernization

Efficient modernization of our aviation fleet requires immediate retirement of our oldest aircraft and fielding of modern and more capable replacement aircraft.

Consequently, 350 UH-1s and 100 observation aircraft will be eliminated during FY88. During the next 20 years, we plan to retire approximately 6,000 aircraft from the current fleet.

This will result in approximately 200-plus aircraft being retired each year for the period FY89-92 and additional retirements for years beyond, assuming, of course, that the Army will be funded and able to acquire replacement aircraft as forecasted.

Following is a synopsis of those aircraft that are approaching or have reached obsolescence:

The AH-1 COBRA began production in 1966. It has low survivability and limited lethality on today's battlefield and is approaching the end of its useful life. The Army intends to downsize COBRA-equipped units and replace the COBRA with LHX aircraft.

The UH-1 IROQUOIS has been in the Army's inventory since 1962. It has marginal capability, low survivability and high maintenance costs which greatly limit its contribution to the warfighting effort.

There are approximately 212 UH-1M models remaining in the fleet (in reserve components), but they are being phased out beginning in FY88. Approximately one-third of the present UH-1 fleet will be retired by FY 2007. A decision will be made in FY89 either to extend the service life of the remaining UH-1Hs or replace them with BLACK HAWKs or non-development aircraft.

Scheduled for Retirement

Reconnaissance aircraft, OH-58A/C KIOWA, will be replaced by OH-58Ds that will be product improved for use as Field Artillery Aerial Observers and as an interim scout pending LHX fieldings. Also, the remaining OH-58s will replace OH-6s in the Army National Guard.

The CH-47 CHINOOK and CH-54 TARHE are the Army's current heavy lift helicopters. The CH-47s are being upgraded to fulfill current and future needs. The CH-54s are presently in the Army National Guard, with only 72 still in service. All CH-54s are targeted for retirement by FY94 upon the completed fielding of the upgraded CH-47s.

Intelligence and electronic warfare aircraft, RC-12 HURON and OV-1 MOHAWK, are also aging. The Army plans to retire approximately 59 OV-Cs and replace them with upgraded OV-1s and new, modified RC-12s. The target date for this program is FY98.

Contemplating Retirement

The Army is also contemplating retirement of the following aircraft:

234 TH-55 Osage
Six U-8 SEMINOLE
Four U-3 CESSNA 310
One CY-7A DeHavilland Caribou

We are now faced with how best to accomplish these retirements. The Army has DoD-directed methods for retirements; however, we will continually welcome ideas and suggestions from the Army Aviation community. If you have any thoughts about these aircraft retirement plans, please write to William Butler, Directorate for Readiness, AMSAV-LR, U.S. Army Aviation Systems Command, 4300 Goodfellow Blvd., St. Louis, MO 63120-1798 or call AUTOVON 693-1268 or commercial (314) 263-1268.

As AVSCOM Commander MG Richard Stephenson often says, readiness is our number one priority. Through our modernization efforts, logically planned aircraft retirements and introduction of new weapons systems, AVSCOM will help our combined arms team meet and beat any threats.IIIII

Logistics:

FSP for Joint Task Force Bravo

by Mr. Don L. Hamblin

FT McPHERSON, GA — While the 82d Airborne Division was building headlines in 1983, the 101st Airborne Division (Air Assault) was building the foundation for what is now called the Joint Task Force Bravo (JTF-B), Forward Support Package, or FSP.

Camp "Black Jack"

When the 101st arrived for A Haus Tara II, Palmerola Air Base was the training base for the Honduran Air Force. Located about eight miles from the village of Comayagua, it looked very little like the back drop it has since become for the news media in Central America.

A tent city sprang up for flight crews and support personnel. Life was three Meals, Ready to Eat (MRE) daily, and phase maintenance in a cloud of volcanic dust. Water and fuel were trucked in to wash and "feed" the aircraft, while repair parts were flown in via Air Line of Communication (ALOC) to replenish the deployment package. That was life at "Camp Black Jack."

The requirement to continue providing rotary wing support for the region did not end with the redeployment of the 101st. What did end was the ability to commit the assets of an entire Air Assault Division to a temporary, "ash and trash" administrative mission. International diplomacy decided both the amount of available "real estate" and the maximum number of soldiers who could provide the services. The question became, "How can we do the jobs of a Corps Support Command (COSCOM), a non-divisional Aviation Intermediate Maintenance (AVIM) company, a "lift" company, a CH-47 company, an Air Ambulance detachment, a Supply Support Activity Authorized Stockage List (ASL), Prescribed Load Lists (PLL), and an Aviation Bn Headquarters with only a couple hundred soldiers?"

"Pushed to the wall, we had to earn our keep."

No Easy Answer

The FORSCOM Aircraft Logistics office dug into all the available "lessons learned" and "after action reports" to try to find the easy answer. It didn't work. For once we couldn't copy what somebody else had done. FORSCOM Headquarters had to become "innovative" to get the job done. The first step was to let the operators task III Corps to develop the perfect task force to do the job. It seemed easy at the time, but another question came up, "What do you guys do around here anyway?" Pushed to the wall, we had to earn our keep.

Midway through the first JTF-B rotation, on-site visits to Palmerola started. That means civilians living and working with the soldiers, to learn the "real story" of what was needed. Actions started to design a truly task organized, aviation logistics support structure which was anything but "business as usual." Business as usual could no longer apply as we no longer had a "doctrinal" organization or mission.

Having an AVIM company, installation aircraft maintenance activity, and a UH-1 and CH-47 Aviation Unit Maintenance (AVUM) platoon works just fine when you're not far from home, but that support just couldn't be afforded with the new "non-standard" restrictions.

A Creative "Menu"

A Chinese restaurant approach, of one from column A, one from column B, etc., was taken. A slice of AVIM, AVUM, PLL, ASL, Shop Stock, and the FORSCOM Aviation Intensive Management Item (AIMI) account was mixed into a "JTF-B lo-mein" called the Forward Support Package, or FSP.

The rules of logistics support had to be modified. Concepts

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of "we've always done it this way" had to change. Some responsibilities grew while some shrank. Talk to the troops, talk to the wholesale, and above all make sure that what is done is smart.

Procedures and policy were developed on the ground and coordinated for approval by telephone or message. More than once the FORSCOM DCSLOG came to Palmerola to approve innovative procedures "in the trenches."

Nothing Extra

All these pieces had to come from somewhere. It is a well known fact that the Army doesn't have any "extra" equipment or repair parts. So back to the menu and take a little from here, a little from there, and beg everything possible from the wholesale system. The idea here was to actually save our commitment in parts and equipment by not having our assets pass each other in the transportation system. Consolidating any "fat" in a forward deployed location seemed better than always keeping two divisions short of their "lean."

Significant Action

The first significant action was to consolidate some of the FORSCOM Operational Readiness Float (ORF) UH-1 aircraft at Palmerola. No longer were CONUS Divisions "wasting" aircraft in the transportation system. With the same aircraft always pulling the mission, repair parts could then be forecasted and requisitioned prior to their need. Ground support equipment and tools have started to grow. "Don't strip the Divisions" has become the rule rather than the hollow promise felt all too often.

The largest savings came in personnel. Much of the necessary "overhead" in Corps aviation logistics management just wasn't needed to support the fewer number of aircraft. The consolidation of AVIM and AVUM, along with PLL and ASL, cut the number of required people dramatically.

Consolidation

No longer did we have AVIM or AVUM tasks, now we just "fixed broken aircraft." No longer was there a need to have an ASL with only one customer; a consolidated repair parts stockage could be better tailored to support the "new" organization. Reducing layers of stockage reduces the requirements for storage, materiel handling equipment, record keeping, and personnel. When you develop personal computer based programs to perform "arithmetic" functions, you reduce the requirement for supply clerks.

Stockage List

Building the FSP repair parts stockage list became an important challenge. For this we started with a PLL for UH-1 from the 1st Infantry Division, along with a specialized "slice" of their ASL, and a PLL for CH-47 from the 210th Aviation Brigade.

Then came more "modification." Provisions had to be made for the requisition transmission link with CONUS item managers possibly being cut during a "surge" in missions. This required more on-site visits with deployed maintenance personnel and wholesale item managers, to determine levels for the "one's and two's" of "nuts and bolts" which can hold an aircraft just as close to the ground as a half million dollar engine.

The FSP stockage list became more nonstandard from "business as usual" PLL/ASL management.

Introduction of the UH-60 BLACK HAWKs into the task force called for even more high level coordination. An agreement was made with the UH-60 Program Manager Office to provide a standard "push package" of BLACK HAWK parts for the FSP. Aviation Systems Command (AVSCOM) support was impressive.

AVSCOM CG, MG Richard Stephenson, personally accompanied the package to Palmerola. Soldiers on the ground were again reminded of their importance.

Procedure Developed

The same "modification" process began again. But by this time a procedure had been developed to handle it. Each rotation would be required to review the entire FSP to insure stockage still remained consistent with supported aircraft and mission requirements.

Any changes to the stockage had to be approved by the task force maintenance officer, supply officer, and commander. The list would then be reviewed by FORSCOM aviation supply representative for the FORSCOM Aviation Resource Management Survey (ARMS) team, staff assistance visit each rotation.

Basic guidelines included stocking only smallest quantities of any item, and watching

(FSP — cont. on p. 45)

Combat Developments:

Unmanned Aerial Vehicles

by Colonel Theodore T. Sendak

FT. RUCKER, AL — The Army has an urgent requirement for Near-Real Time (NRT) battlefield information at brigade and battalion levels. This NRT information is essential to fight successfully on the AirLand battlefield of the future.

UAV Program

The United States Army Intelligence Center and School is responsible for the development of the Army's Unmanned Aerial Vehicle (UAV) program with the assistance of all TRADOC schools and centers. The UAV program will provide a family of UAVs that allow the maneuver commander to see the battlefield with sufficient clarity to concentrate combat power where and when it is most decisive.

UAVs will provide the maneuver commander (for the first time) focused, timely, and accurate information to meet the changing requirements of tactical decision making.

There are three UAV systems currently under study to meet our NRT information needs. They are:

- Close UAV - Close UAVs are a low cost, low force structure, easily deployable means of providing maneuver brigades/battalions with near-real time combat reconnaissance and battlefield imagery information.

- Deep UAV — Deep UAVs are a corps level UAV that will satisfy the long range intelligence requirements of the corps commander out beyond Joint Surveillance Target Attack Radar System (J-STARS) and Special Electronic Mission Aircraft (SEMA).

- Expendable UAV (Lethal and ECM) — Initial expendable lethal UAVs would respond to instructions from manned aircraft and combat vehicles.

The Benefits of UAVs

These lethal UAVs, using terminally-guided submunitions, would kill high value targets such as helicopters, air defense weapons, armored vehicles, and command, control, and communication systems. Expendable electronic-counter measure (ECM) UAVs will have the capability to provide jamming at any depth of the battlefield.

Commanders can use the UAV systems to conduct reconnaissance, assist intelligence preparation of the battlefield, gather immediate intelligence information, minimize risk to manned systems, gain and maintain contact with the enemy, confirm other intelligence sources in a high risk environment, provide surveillance of named areas of interest (NAI) and target areas of interest (TAI), and complement army aircraft anti-armor capabilities.

Aviation commanders can utilize the close, deep, and expendable UAV systems to successfully accomplish any mission throughout the depth of the battlefield.

Great Potential

I believe unmanned aerial vehicles will provide a cost-effective means to further tap the advantages of sensor/weapon systems mobility. The ability of UAVs to exploit altitudes and airspace where manned aircraft are extremely vulnerable is the key to UAV effectiveness and coexistence with manned platforms flying either much lower or higher.

Therefore, the creation of manned/unmanned weapon teams within Aviation offers a potential means of greatly multiplying combat capability within force structure constraints.

We will employ UAVs with the manned fighting systems as the nucleus. UAVs operating with aviation forces will provide security against air defense radars and air-to-air helicopter threats, allowing manned aircraft more freedom to maneuver and effectively engage critical targets.

Firepower Increase

UAVs offer a "leap-ahead" means of augmenting Army aircraft anti-armor capabilities without any corresponding weight or space penalty. This prepackaged expendable UAV will increase firepower without additional workloads on the ammunition distribution systems or increased rearming and refueling time.

Corps would launch lethal UAVs directly from its rear area. Aircrews would call these lethal UAVs, loitering at a designated

(UAVs — cont. on p. 46)

Colonel Sendak is Director, Directorate of Combat Developments, USAAVNC, Ft. Rucker, AL.

MSIP – cont. from p. 39

Phase 2 - March 1989, and Phase 3 in 1990.

• OH-58D: Phase 2 - Mid-1990 and Phase 3 - 1993.

Stage 2

Stage 2 consists of long-term, second generation improvements for increased mission capability, threat counter, lower operational support cost, improved safety changes, and advanced material changes. Stage 2 will be structured to exploit LHX MEP technology, components and architecture, tailoring to the needs of the AH-64A and the OH-58D. Stage 2 will be a block improvement scheduled to occur after the LHX MEP has completed FSD in the mid-1990s.

Mission Equipment

Mission equipment improvements are expected in the following areas:

- Communications
- Aircraft Survivability Equipment areas
- Navigation
- Very High Speed Integrated Circuit (VHSIC) Processors
- Night Pilotage
- Cockpit workload improvements
- Target Acquisition and Designation System
- Flight data recorder incorporation
- Improved EMI/EMP protection.

Program Oversight

An Executive Steering Group (ESG) has been established to insure consistency between the LHX technology and the AH-64A, and the OH-58D, and other aircraft. The ESG is chaired by MG Richard E. Stephenson, Commander of AVSCOM with MG Ellis Parker, Commanding General, U.S. Army Aviation Center and Ft. Rucker, as deputy chairman. Membership consists of MG David Maddox, Deputy Chief of Staff for Combat Development, HQ, TRADOC; MG Ronald K. Andreson, LHX Program Manager; BG David L. Funk, Army Aviation Program Executive Officer.

Functions of the ESG are as follows:

• Prevent unnecessary duplication of development of multiple mission equipment packages and architecture for LHX and MSIP Aircraft.

• Coordinate MSIP Stage 1 (Near term, warfighting) aircraft improvements with LHX MEP development

• Facilitate application of LHX MEP to MSIP Stage 2 aircraft improvement programs with minimum RDTE funding for integration.

• Report to the AAE, VCSA, CG AMC, and CG TRADOC on program status and/or gain approval of management direction as required or directed.

In addition, a technical management group, chaired by the LHX Technical Division Chief is responsible for all the technical aspects of the program. The MSIP will provide combat aircraft the ability to fight and survive on the battlefield beyond the year 2000. IIIII

FSP – cont. from p. 43

for that one "nickle-dime" item that holds the eight million dollar aircraft on the ground.

All this "reduction" sounds good on paper. But to make it work requires something that can't be measured or requisitioned. Soldiers in the field have to work closely with the Logistics Assistance Representatives provided from the Army Materiel Command, Logistics Assistance Office. The FORSCOM aircraft logistics office has to maintain a proactive attitude and a responsive communication line, so that an "honest broker" is always available. The on-site visits still go on once during each rotation when the troops change over, and once with the FORSCOM ARMS team staff assistance visit, at the midpoint of each rotation. Innovations at each level of logistics and command must be documented and consolidated during these visits. There is no free lunch.

A true operational test of the FSP concept was something nobody ever wanted. But during the JTF-B support to Exercise Golden Pheasant, it happened. Systems problems in the communications link with the wholesale community stopped the requisition flow to the National Inventory Control Points (NICP) for almost 60 days. The supply pipe line almost emptied, and task force maintenance operations were required to depend on the FSP support base. The bottom line was that while flying more than four times CONUS flying hours, Not Mission Capable Supply (NMCS) rates were within a couple of percentage points of the published Department of the Army goals. It wasn't a pleasant way to test the concept, but forward stockage of critical repair parts proved to be the buffer needed to maintain operations.

Camp Black Jack no longer looks like it did back in 1983. While there are still no perman-

ent structures there, the temporary assets are much better suited to good logistics support. Once in a while a "tourist" comes through who remembers "the way it used to be" the first time. There is some value in nostalgia, but he should be thinking "what can we do to make it better for the next rotation?" War stories are only good when we can learn from our mistakes.

What good is all this? It's not the way we plan to fight many wars. Defense doctrine was never designed for "taxi and rental car" operations. But we have proven that the American soldier can find a way to "make it happen" and is not satisfied with always "doing it the hard way."

Future – cont. from p. 35

Electronic linkage of selected software programs and organizations into coherent networks will begin second Quarter of 1989 and will continue through 1993. Design parameters for the LHX will take into account the Army's Automation Architecture for the future and will incorporate the software and hardware compatibility necessary to ensure electronic acceptance of the LHX in 1995.

Real times, i.e., 3-5 minutes, transmission of maintenance and supply management to CONUS, keenly accurate management of time change components, fleet-wide trending, onboard prognostics/diagnostics, and an unparalleled responsiveness in the management of the Aviation Commander's maintenance and supply requirements will be the eventual product. These automation capabilities will give Army Aviation the logistics management edge necessary to fight and win on the AirLand Battlefield. IIIII

ATC – cont. from p. 36

system. Organization and Operational Plans for a Precision Approach and Surveillance System (PASS) and the Tactical Terminal Control System (TTCS) are being staffed.

The PASS will replace the existing ground control approach radar. NDI candidates must have improved performance and survivability features over the current radar system. Requirements include simultaneously providing a surveillance radar, precision radar, and an air picture. Also, it must be virtually undetectable. The Tactical Terminal Control System (TTCS) will replace the existing manportable tower system. Organization and Operational plans are one of the first steps in acquiring new tactical equipment and personnel required to meet the future tactical mission.

Force Design Objectives

The force design objectives are to satisfy operational and tactical requirements while maintaining standard organizations to the maximum extent possible. Design characteristics include a closer link between tactical and fixed base operations. Conversion of TDA positions to TOE will allow for improved individual training and tactical controller proficiency.

The goal of USAATCA, as the integrator of air space and ATC for both tactical and fixed base, is to maximize effectiveness of highly skilled personnel and costly equipment to support the ground and air forces both joint and combined. The approved interim Operational Concept and Master Plan are the framework for making this goal a reality. IIIII

UAVs – cont. from p. 44

point, forward when needed.

We have a need for near-real time battlefield information in order to deploy aviation assets at the decisive place and time. UAVs can provide video imagery directly to the brigade and battalion Tactical Operations Centers (TOC). UAV imagery can also be made available to every aircraft. This near-real time information will increase aircraft survivability, mission success, and battle damage assessment.

UAVs now offer us NRT information on the enemy and friendly disposition which will increase command and control effectiveness. It can augment our organic firepower without imposing a significant weight or logistic restriction. Battle staff officers at brigade and battalion can conduct detailed planning with the NRT information.

Unmanned aerial vehicles will enhance Army Aviation's capabilities to operate across the spectrum of the battlefield and add a new dimension to the AirLand battlefield. IIIII

BRIEFINGS

The 1989 World Helicopter Championship is on! The U.S. National Championship will be held at Ft. Rucker in the second week in December. The *selected* crews will return to Ft. Rucker on January 4 for extensive training. The U.S. Precision Helicopter team will deploy to Germany on or about April 15 and continue training there. The Team will then deploy to the World Helicopter Championship site in Paris on May 1, 1989.

For further information contact: LTC Robert Harry at (205) 255-5600/5481/5308.

William W. (Bill) Walls has been named Boeing Helicopters vice president, LHX Joint Program Office. Mr. Walls is a 29-year Boeing Helicopters employee who has headed the company's LHX program activities since the formation of the Boeing Sikorsky team in 1985.

A prototype for a new generation of **Cayuse** scouts is doing some serious flying with Army National Guard units on the East Coast — a quarter century after the durable workhorse was introduced for service in Vietnam.

OVL #1, or the Super Cayuse, the prototype OH-6B is temporarily assigned for evaluation purposes to the Maryland National Guard. Changes upgrading the OH-6A's power maneuverability, maintainability, and navigations/communications capability enable the OVL #1 to work harmoniously on the battlefield with the latest model COBRAs. Just two months ago, OVL #1 emerged from an 18-month capability upgrade metamorphosis at the Mississippi National Guard's Aviation Classification Repair Activity Depot (AVCRAD). The Army could authorize a program to upgrade as many as 250 of the Guard's 360 OH-6As.

Link **Flight Simulation Corp.**, a CAE Industries subsidiary, announced receipt of a contract from the Army for an MH-47E Combat Mission Simulator. The contract marks the first simulator procured for the Army for Special Operations Forces.

The first **Joint Tactical Information Distribution System (JTIDS)** Class 2M terminal produced for the U.S. Army has been formally accepted by the Army. The developers of the Class 2M terminal, **Plessey Electronic Systems Corporation** and the **Collins Government Avionics Division of Rockwell International Corporation**, jointly delivered the terminal.

According to a press release, a long-range aerial camera from the CAI Division of **RECON/OPTICAL, Inc.** has capabilities on a single surveillance pass to transmit images in real time to a ground station and/or record them on film.

This advanced real-time recon camera provides high-resolution imagery from nonintrusive, survivable standoff ranges of more than 100 miles. It also images 400 square miles of the Earth's surface every six seconds. And identifies military tanks as light, medium, or heavy from a standoff range of 85 miles and aircraft insignia and markings from 30 miles away.

ABOVE: The **Bell-Boeing Pointer UAV** has begun wind-tunnel testing in Philadelphia. The world's first tilt-rotor Unmanned Air Vehicle (UAV), it meets the DoD short-range RPV needs (150-300 km range). The Pointer's first flight is expected to occur later this year at Bell's facilities in Texas.

AAAA offers $60,000 aid in 1989 for college-entry Freshmen

■■BACKGROUND:
The AAAA Scholarship Foundation, a separate non-profit educational activity created to provide scholarship aid to the sons and daughters of AAAA members and deceased members, announces the availability of $60,000 in assistance funds for the 1989 college-entry year.

■■SCHOLARSHIP AWARDS:
Twenty three scholarships will be presented — One $10,000 four year scholarship ($2,500 a year); and one $8,000 four year scholarship ($2,000 a year); and others ranging from $1,000 to $5,000 given out as one, two or four year scholarships.

■■AWARD PHILOSOPHY:
Operating on the premise that ample scholarship assistance is available to those in need, the AAAA National Scholarships are awarded primarily on the basis of academic merit and personal achievement. The AAAA seeks to honor those outstanding students whose well-rounded secondary school activities indicate solid career potential.

■■APPLICATION PROCEDURE:
To apply, please request a Scholarship Application and Personal Data Form and return it to the AAAA Scholarship Foundation, 49 Richmondville Avenue, Westport, CT 06880-2000 on or before December 1 (postmark will govern). On our receipt of the completed application, you will be mailed additional forms with further instructions and assigned an AAAA interviewer. These additional forms, together with other supporting data, must be returned to the Foundation on or before January 15 for consideration by the AAAA Awards Committee (postmark will govern). NOTE: If your address is different from that of your parent, who is the AAAA member, please be sure to provide this information on the application.

■■ELIGIBILITY CRITERIA:
An AAAA applicant must be unmarried, a citizen of the United States, and a high school senior who has applied to an accredited college or university for Fall 1989 entry as a freshman. Program participation is limited to the sons or daughters of members with an effective date of membership on or before March 31, 1988.

■■SELECTION AND NOTIFICATION:
Selection of winners will be made by the 22-member AAAA National Awards Committee during the February 1-15 period with each applicant to receive a list of the winners not later than April 1.

Maj. Generals

MACMILLAN, RICHARD H.
3840 COURTYARD DRIVE
ATLANTA, GA 30339

Brig. Generals

MYE, EDWARD F.
2850 OCEANSHORE BLVD.
APT. 6
ORMOND BEACH, FL 32074

Colonels

CAMIA, DANTE A.
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P.O. BOX 8579
GREENSBORO, NC 27419
EASTON, JACK E.
HHC, 12TH AVN BDE
APO NY 09457
GRIDER, ROBERT J.
1903 ENCINO BELLE
SAN ANTONIO, TX 78259
HANDY, MALVIN L.
50 RED COULD ROAD
FORT RUCKER, AL 36362
IDOL, TONY G.
105-B FORBES AVENUE
CARLISLE, PA 17013
LOFTIN, WILLIAM D.
1564 COLE PARK
FORT CAMPBELL, KY 42223
MILLS, JAMES J.
3108 MCGEORGE TERRACE
ALEXANDRIA, VA 22309
MOWERY, JAMES L.
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Lt. Colonels

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22 4TH ARTILLERY ROAD
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LEAVENWORTH, KS 66048
PACK, JOHN E.
5/6 CAV
12TH AVN BDE
APO NY 09457
PAWLEY, JEREL E.
2023-C MIAMI STREET
LEAVENWORTH, KS 66048
PECK, TERRY M.
52 3RD INFANTRY ROAD
FT. LEAVENWORTH, KS 66027
PETERSON, KEVIN C.
1716 MIAMI STREET
LEAVENWORTH, KS 66048
PORTER, THOMAS B.
BOX 316, HHC, 7-159TH AVN
APO NY 09061
POWELL, RICHARD W.
1500 PINE RIDGE ROAD
MONTGOMERY, AL 36109
REINEMER, RNO P.
17TH AVN BDE
APO SF 96301

SAWAGE, RICHARD T.
100 FREEMAN TURN
HAMPTON, VA 23666
SHIVERS, JAMES F.
207 HANCOCK
FT. LEAVENWORTH, KS 66027
SLICK, DOUGLAS S.
612 CAHABA MANOR LANE
PELHAM, AL 35124
SMITH, LUTHER J.
HAWLEY ARMY COM. HOSP.
FT. BEN. HARRISON, IN 46216
SOWELL, LEONARD W.
1700 POSSUM TRAIL
HARKER HEIGHTS, TX 76543
STRIPLIN, MICHAEL C.
91 5TH ARTILLERY ROAD
FT. LEAVENWORTH, KS 66027
STUDNICKA, DONALD F.
526 FOREST GLEN
LANSING, KS 66043
TEETER, TERRY W.
110 SHULSEN DRIVE
OZARK, AL 36362
THOMAS, PATRICK A.
13 BASSETT STREET
FORT BRAGG, NC 28307
THOMPSON, LEE A.
128 STONEWALL DRIVE
SAVANNAH, GA 31419
TURPIN, TERRY S.
5703 SHADWELL DR., NO.20
ALEXANDRIA, VA 22309
WALKER, SAM S.
75 3RD INFANTRY ROAD
FT. LEAVENWORTH, KS 66027
WELCH, RICHARD S.
HHC 7TH ENG BDE
APO NY 09279
WILLIAMS, MICHAEL E.
C/O JAMES E. WILLIAMS
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WOODWARD, JOHN P.
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Captains

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ST. CHARLES, MO 63303
ARTMAN, SPENCER O.
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PLANT CITY, FL 33566
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TIOGA, PA 16946
BERTHA, RONALD
72 5TH ARTY ROAD
FT. LEAVENWORTH, KS 66027
BLAKE, SAMUEL E.JR
HHC, USADAC
FORT BELVOIR, VA 22060
BLANEY, SCOTT A.
11 HOWARD STREET
FORT RUCKER, AL 36362
BONNER, MICHAEL J.
2945-B SUMMERALL CIRCLE
FORT EUSTIS, VA 23604
BRESLIN, CHARLES B.
17TH ASG CM
BOX 3158
APO SF 96504
BURK, JAMES E.
5905 FISHER
FORT HOOD, TX 76544
CAMPBELL, BRYAN E.
5/6 CAV
12TH AVN BDE
APO NY 09457
CONTARINO, JOSEPH III
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DANAHEY, TIMOTHY J.
SOUTHEAST FED'L CENTER
NIS BLDG 159, RM 327
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5/6 CAV
12TH AVN BDE
APO NY 09457
DECKER, JOHN E.
TASKFORCE SKYHAWK
4TH AVN REGT
APO NY 09185
DUMOULIN, JOHN E.
1001 TWIN CREEK DRIVE
APT. 902
KILLEEN, TX 76543
FAIN, JOHN R.
5/6 CAV
12TH AVN BDE
APO NY 09457
FINCH, MARY M.
3050A PUTNAM PLACE
WEST POINT, NY 10996
FINLEY, HENRY
P.O. BOX V
MOUNT BERRY, GA 30149
GARCIA, MARIO, JR.
10 CLIFF ROAD
RAMEY, PR 00604
HALE, BRETT M.
2738 FOSTER RIDGE ROAD
ATLANTA, GA 30345
HARDY, KIRT
222-E OCEAN VIEW
FORT HAMILTON, NY 11209
HAYDEN, JOSEPH T.
5/6 CAV
12TH AVN BDE
APO NY 09457
HODGE, GEORGE
22 GALT LANE
FORT RUCKER, AL 36362
JACKSON, WILLIAM J.
3436-A THOMPSON CIRCLE
SCHOFIELD BKS, HI 96857
JOHNSON, ROBERT L.
7009 KING'S LYNN LOOP
FAYETTEVILLE, NC 28304
JOHNSON, THOMAS W.
1545 HYVIEW DRIVE
CASPER, WY 82604
JONES, PHILIP D.
C/O GA URY
16016 BECKETT LANE
OLATHE, KS 66062
KUSILKA, LARRY D.
ROUTE 1, BOX 122
DALEVILLE, AL 36322
LAGEMAN, WENDY RAE
HHC, 52D AVN BN
APO SF 96301
LEFTWICH, DAVID L.
P.O. BOX 4413
MCAS
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LEWIS, STEVE A.
5/6 CAV
12TH AVN BDE
APO NY 09457
MAJOR, RICHARD K.
BOX 275, 4/2 ACR
APO NY 09092
MALLORY, ROBERT P.
9097 BLARNEY STONE DRIVE
SPRINGFIELD, VA 22152
MAPLES, DAVID L.
53 LOGAN STREET
FORT RUCKER, AL 36362
MISNER, JEFFREY L.
511E ALEXANDER PLACE
WEST POINT, NY 10996
MONAGLE, JAMES P.
3320 LONGMEADE DRIVE
DALLAS, TX 75234
OCHOCKI, MARK J.
506 SOUTHVIEW DRIVE
MARSHALL, MN 56258
OLIVER, TERENCE B.
925 APPLEWOOD LANE
FAYETTEVILLE, NC 28303
PETTY, FRANK S.
3519 TOMLINSON COURT
ARLINGTON, TX 76017
POULAKIDAS, TED N.
195 THUNDERWOOD DRIVE
PITTSBURGH, PA 15102
QUINCEY, DENNIS E.
3405-A KANELL LOOP
WAHIAWA, HI 96786
REED, CHARLES R.
790 OLD FARM ROAD
COLUMBUS, OH 43213
RINEHART, MARCUS
29 FORT MISSOULA
MISSOULA, MT 59801
RUSSELL, REX A.
1540 N. MILFORD CREEK LA.
MARIETTA, GA 30060
SCHWANEVELDT, KENT N.
67 NAVAJO DRIVE
SALINAS, CA 93906
SEYMOUR, KENNETH H.
3618 SWEETHORN COURT
FAIRFAX, VA 22033
SKOWRONSKI, STEPHEN
417 THRUSH DRIVE
SATELLITE BCH, FL 32937
SMITH, JAY W.
S TRP, 2D CAS, 2D ACR
APO NY 09092
SOVEREIGN, SCOTT W.
P.O. BOX 121
FORT RUCKER, AL 36362
TAUBER, ERIC S.
HSC TFP, BOX 1921
APO NY 09250
WALLER, HENRY H,III
1111 TYLER DRIVE
COPPERAS COVE, TX 76522
WATERS, ROGER
B CO, 2/4 AVN REGT
APO NY 09185
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FORT BENNING, GA 31905
WOOLERY, RAY C.
12159 EL CAMARA
FLORISSANT, MO 63033

1st Lieutenants

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D TRP, 2/1 CAV,
BOX 69
2 AD /FWD/
APO NY 09355
CARPENTER, FORREST L.
5/6 CAV
12TH AVN BDE
APO NY 09457
FISHER, RUSSELL E.
5/6 CAV
12TH AVN BDE
APO NY 09457
HELLER, KENNETH E.
5730-1 BAILEY STREET
FORT HOOD, TX 76544
LUKE, KIRBY E.
ROUTE 1
MARYVILLE, MO 64468
MATHERS, THOMAS P.
808 ALBERTA STREET
ENTERPRISE, AL 36330
RADOVICH, RORY R.
8920 WEST MISSION LANE
PEORIA, AZ 85345
STOVER, RUSSELL C.
5/6 CAV
12TH AVN BDE
APO NY 09457
TOMASEVICH, KERRY J.
2113 LAKEVIEW DRIVE
APT. 167
YPSILANTI, MI 48198
WENNESON, THOMAS H.
5/6 CAV
12TH AVN BDE
APO NY 09457
WORMAN, STEPHEN L.
5/6 CAV
12TH AVN BDE
APO NY 09457

2nd Lieutenants

AREY, HOWARD E.
132 BRIAN COURT
DALEVILLE, AL 36322
BANGERTER, J. CHRIS
RT.3, 102 VALLEY VIEW DR.
ENTERPRISE, AL 36330
BLATZ, MICHAEL J.
100 WINDHAM DRIVE
APT. 600
DALEVILLE, AL 36322
BLUE, RONALD A.
3204 TIMBER OAK DRIVE
KILLEEN, TX 76542
BROWN, JAMES E.
2222 WEST MAIN STREET
APT. 149
DOTHAN, AL 36303
CAIN, JACQUELINE
LAVETA WOODS APT. D-3
298 DIXIE DRIVE
ENTERPRISE, AL 36330
EBBRECHT, DAVID R.
200 NATCHEZ
ENTERPRISE, AL 36330
ABERHARD, ANDREW W.
505 BRIARWOOD DRIVE
APT. H2
ENTERPRISE, AL 36330
EGAN, JOHN F.
808 ALBERTA STREET
ENTERPRISE, AL 36330
FABRIZZIO, ROBERT P.
505 BRIARWOOD DRIVE
APT. I-6
ENTERPRISE, AL 36330
FORMOSA, LYNNE A.
989 SOUTH RIVERSIDE DR.
NO. D31
CLARKSVILLE, TN 37040
HAACK, GREGORY J.
132 BRIAN COURT
DALEVILLE, AL 36322
HADEL, THOMAS J.
808 ALBERTA STREET
ENTERPRISE, AL 36330
HARWIG, JOHN M.
5/6 CAV
12TH AVN BDE
APO NY 09457
IOOSS, STEVEN P.
12 OLSEN LANE
FORT RUCKER, AL 36362
KAISER, EUGENE T.
13 SIMPSON DRIVE
DALEVILLE, AL 36322
KIVI, RICHARD M.
201 DIXIE DRIVE, NO.15
ENTERPRISE, AL 36330
KLUTZ, KEVIN P.
CMR2, BOX 13365
FORT RUCKER, AL 36362
LAMB, TRENT E.
G CO, 4TH AVN REGT
APO NY 09111
LARSON, RORIK W.
100 A.M. WINDHAM DRIVE
APT. 404
DALEVILLE, AL 36322
MAGNESS, JOHN M.
R TRP, 4/2 ACR,
BOX 148
APO NY 09092
MAKS, JOSEPH D.
5406A FOURNET COURT
FORT POLK, LA 71459
MANOR, ROD C.
214A APACHE
ENTERPRISE, AL 36330
MASTERSON, PEGGY A.
25TH AVN CO
BOX 7
APO NY 09061
MCMILLEN, JOE L.J.
505 BRIARWOOD,
APT. H-8
ENTERPRISE, AL 36330
MENGES, JOHN W.
505 BRIARWOOD
APT. B-2
ENTERPRISE, AL 36330

MILLS, DOUGLAS W.
38 OLSON DRIVE
FORT RUCKER, AL 36362
NOEGEL, DAVID E.
104D WOODVIEW DRIVE
OZARK, AL 36360
PARKER, DENNIS M.
10700 SILVERPHEASANT DR.
CHARLOTTE, NC 28226
PENCZAR, DAVID W.
505 BRIARWOOD DR., #H3
ENTERPRISE, AL 36330
RATH, PAUL H.
3720 CHEYENNE ROAD
RICHMOND, VA 23235
RATLIFF, ABE R.
60 RED CLOUD ROAD
FORT RUCKER, AL 36362
RICE, FREDERICK L
505 BRIARWOOD DR., #H3
ENTERPRISE, AL 36330
SCHUSTER, ERIC K.
102 WILDWOOD DRIVE
ENTERPRISE, AL 36330
SUMTER, DARREN J.
208 SEMINOLE DRIVE
ENTERPRISE, AL 36330
TISDALE, VALEN S.
4350 PEBBLE RIDGE CIRCLE
APT. #153
COLORADO SPGS, CO 80906

CW4s

ANTHONY, DARRELL R.
814 CLARIDGE PARK DRIVE
MORROW, GA 30260
BRUNSTING, CLIFFORD D.
5314 EAST HANNIBAL ROAD
MESA, AZ 85205
COLEMAN, GEORGE L.
A CO, 224TH MI BN (AE/
HUNTER AAF, GA 31409
DUPREY, ROGER W.
602 LAUREL DRIVE
CLARKSVILLE, TN 37043
HADLEY, JAMES A.
4250 EAST FOOTHILLS DRIVE
APT. 1101-H
SIERRA VISTA, AZ 85635
HOOPER, CLAUDE L.JR
5/6 CAV, 12TH AVN BDE
APO NY 09457
JOHNSTON, CLAY W.
5/6 CAV, 12TH AVN BDE
APO NY 09457
PETERSON, JOHN L.
5/6 CAV, 12TH AVN BDE
APO NY 09457
SIFFORD, JOHN T.
P.O. BOX 394
FORT KNOX, KY 40121
STOKES, JOSEPH B.
P.O. BOX 2524
FORT RILEY, KS 66442
STRICKLAND, JOHN E.
7608 NORTH 101 PLAZA
OMAHA, NE 68122
TAYLOR, DAVID M.
1034 B DRENNAN PARK
FORT CAMPBELL, KY 42223
VAN KEUREN, NATHAN B.
2103 NIMITZ DRIVE
KILLEEN, TX 76543
WATSON, WILLIAM D.
5210 ZAKON ROAD
TORRANCE, CA 90505
WIGINGTON, DOUGLAS D.
323 CHICKASAW ROAD
ENTERPRISE, AL 36330

CW3s

ALLEN, DAVID S.
A 2/4 AVN REGT
APO NY 09185
BARNETT, MICHAEL A.
C CO, 3/227TH AVN, BOX 229
APO NY 09165
BRANTLEY, DOUGLAS K.
HHT, 4/11 ACR
APO NY 09146
BREWER, CASTO L.
RT 3, SUNNY ACRES
303 CIRCLE DRIVE
CROSSVILLE, TN 38555
CHURCH, WILLIAM A.
108 SAN FERNANDO BLVD
SAVANNAH, GA 31419
DOHERTY, GILBERT S.
5911 EDSALL ROAD, #910
ALEXANDRIA, VA 22304
SAN GIL, ROLAND S.N.
55 ENDL AVENUE
FORT RUCKER, AL 36362
SEDLACEK, JOSEPH F.
H CO, 1ST AVN REGT, 1AD
BOX 1762
APO NY 09250
SIMS, JOHN E.
2911 NICOLE ROAD
CLARKSVILLE, TN 37040
THOMAS, EARNEST, JR
1626B SHENANDOAH ROAD
FORT BELVOIR, VA 22060

CW2s

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8000 WATERS AVE., #30
SAVANNAH, GA 31406
BRAMAN, GARY D.
5/6TH AVN CO, BOX 337
APO NY 09028
BROWN, CLARK W,JR
271ST AVN CO (ASH/
APO SF 96271
EDDY, DAVID L.
AVUM TRP, 4TH SQDN
11TH ACR
APO NY 09146
ELLIOTT, JOSEPH P.
1/159TH AVN REGT, BOX 77
APO NY 09061
FELL, RICHARD R.
619 SOUTH PUGH ST., #28
STATE COLLEGE, PA 16801
FREMMING, ERIC D.
5/6 CAV, 12TH AVN BDE
APO NY 09457
LINDGREN, DALE C.
G CO, 71ST BN, 8TH TB
FORT EUSTIS, VA 23604
MACE, MICAEL S.
G CO, 3RD AVN RGT, BOX 107
APO NY 09182
PRIETO, JOSE E.
PSC BOX 4881
APO MIA 34001
TROXELL, RICHARD B.
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VANDENBERG, JOHN E.
Q TRP, 4/2 ACR
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5407 FREELARK PLACE
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594-103 CHINKAPIN TRAIL
NEWPORT NEWS, VA 23602

WO1s

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KILLEEN, TX 76542
EATON, KEVIN W.
147 CEDAR GROVE LOOP
COPPERAS COVE, TX 76522
LEJEUNE, WALTER R.
1201-A WERNER PARK
FORT CAMPBELL, KY 42223
MOCZYNSKI, DALE P.
R TRP, 4/2 ACR, BOX 119
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SMITH, GORDON P.
201ST AHC
APO SF 96271
VEDDER, BRENTON J.
5/6 CAV, 12TH AVN BDE
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Enlisted

GALLAGHER, GEORGE D. SFC
RT.2 WESTON'S TRL. PK.
MONTPELIER, VT 05602
HORNE, SHAWN N. PFC
8544 VAMO ROAD
SARASOTA, FL 34231
MOORE, EDWARD J. SFC
465 WYN DRIVE
NEWPORT NEWS, VA 23602
OGLE, GRADY C. SGT
41302 EXECUTIVE DRIVE
MOUNT CLEMENS, MI 48645
PERRY, CALVIN W. CSM
101 TWIN CREEK DR., #602
KILLEEN, TX 76543
SHORTER, ROYAL B. 1SG
1015 NORTH 4TH STREET
COPPERAS COVE, TX 76522
SICCAMA, RICHARD B. SGM
754 HEDGELAWN WAY
FAYETTEVILLE, NC 28301
SPILLERS, DAVID L. SSG
1793 43RD DRIVE, RT.23
TERRE HAUTE, IN 47802
WOODS, NAPOLEON SFC
428 OLD OAK DR., #101
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Civilian

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11974 GIST ROAD
BRIDGETON, MO 63044
BASSEL, MICHAEL E.
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BATON ROUGE, LA 70816
BUCKWALTER, JERRY E.
SANDERS ASSOC.
POO868 NHQ1-474
NASHUA, NH 03061
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SINGER CO, LINK FSD
328B TWIST RUN ROAD
ENDWELL, NY 13760
CLARK, CHRISTOPHER
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4100 THE WOODS DRIVE
APT. C-316
SAN JOSE, CA 95136
DANFORTH, DOUGLAS R.
90 NEWENT ROAD
LISBON, CT 06351
DIECKMANN, TONY J.
4117 JOYFUL COURT
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ENGLING, TIMOTHY J.
35700 BENNETT
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ST. LOUIS, MO 63136
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LANE, ALBERT
ROME RESEARCH CORP.
138 GERMANY ROAD
VERONA, NY 13478
LEE, JAMES P.
90 IDLEBROOK DRIVE
COLLINSVILLE, IL 62234
MCNAUGHTON, BRIAN S.
14552 EAST 12TH AVENUE
AURORA, CO 80011
MOORE, C.W.
KEYSTONE HELICOPTER
901 BIRMINGHAM ROAD
WEST CHESTER, PA 19380
MORGAN, DANNY E.
CMR 2, BOX 13121
FORT RUCKER, AL 36362
POLLMANN, SUSAN R.
12973 WEATHERFIELD DRIVE
ST LOUIS, MO 63146
RYAN, JOSEPH
35 EDGEWATER DRIVE
TUCKERTON, NJ 08087
STRIPLIN, ARLYNNE R.
91 5TH ARTILLERY ROAD
FT. LEAVENWORTH, KS 66027
SZABO, SANDRA M.
ANACAPA SCIENCES CORP
1928 BAXTER RIDGE DRIVE
CHESTERFIELD, MO 63017
WHALEY, LINDELL E.
5211 SIR BORS DR., APT. 4
ST LOUIS, MO 63129
WOLFF, WARREN
WARREN WOLFF ASSOC.
122 HIBERNIA WAY
FREEHOLD, NJ 07728

Retired

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C/O RHODES & FULLAWAY
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4201 HARBOR WOODS RD N.
JACKSONVILLE, FL 32225
DENSFORD, CHARLES F. COL
RT.1, BOX 137
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FRAKER, WILLIAM W. COL
ROUTE 2, BOX 2442
GLOUCESTER, VA 23061
KAMBROD, MATTHEW R. COL
5927 INNISVALE DRIVE
FAIRFAX STATION, VA 22039
KANE, RAY J. LTC
3047 EAST LESLIE DRIVE
MERIDIAN, ID 83642
NASCHE, JOHN MAJ
BELL LEARNING CENTER
9801 TRINITY BLVD
FORT WORTH, TX 76053
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MARTIN MARIETTA CORP.
6801 ROCKLEDGE DRIVE
MP323
BETHESDA, MD 20817
THOMSON, DONALD B. LTC
1660 MONTEREY ROAD,
APT. 9-I
SEAL BEACH, CA 90740
TIDEY, CHUCK CW4
1600 NORTH OAK STREET,
226
ARLINGTON, VA 22209
TODD, ALAN R. COL
1120 SOTOGRANDE BLVD.
APT. 141
EULESS, TX 76040
TRAGH, BRIAN L. MAJ
103 SILVERTON CIRCLE
MADISON, AL 35758
TRAGESSER, JOHN N. COL
740 BRITTANY LANE.
ST. LOUIS, MO 63130
WALSH, JOHN A. CW4
ROUTE 3,
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MONTROSS, VA 22520
WILSON, DONALD E. COL
9421 ZIRCON DRIVE SW
TACOMA, WA 98498

NEW MEMBERS

AIR ASSAULT CHAPTER FORT CAMPBELL, KY

1LT Henry Beaulieu
WO1 Terry Nelms
2LT Brenda Thompson

ALOHA CHAPTER HONOLULU, HI

CW2 Dean S. Balmforth
CW4 Thomas P. Blanton
CW4 Thomas A. Bobbitt
1LT Jeffery D. Brown
CW2 Harry D. Byrd
CW3 Gregory A. Demoss
CW2 Jeffrey P. Dominick
1LT James M. Harp
1LT Jeffrey P. Hatt
1SG John A. Herron
SGT William L. Isaac
CW2 Thomas D. Lawson
CW2 Roy A. Phillips
SP4 Marc C. Schumacher
CW2 Maurice E. Zeigler

ARIZONA CHAPTER MESA, AZ

Mr. David N. Boyer

ARMY AVN CENTER CHAPTER FORT RUCKER, AL

2LT Richard M. Alonso Holtorf
2LT Albert Armstead, Jr.
WOC Mark W. Auer
2LT Bruce H. Bahr
CPT Andrew E. Baldwin
WOC Shannon K. Barnhill
1LT Richard A. Bechtel
WOC Gregg A. Beck
WOC Darren C. Benson
WOC George M. Berken
1LT Wayne B. Borstad
2LT Kurt R. Bruggemeyer
WOC Robert T. Caldwell, III
WOC James F. Canupp, Jr.
WOC Thomas D. Chappell
2LT Franklin T. Charles
WOC Gregory E. Childs
Mr. William F. Cole
2LT Garth Conner
WOC Kevin G. Cook
2LT Mark W. Coplen
WOC Lee J. Couch
1LT Ethan T. Crist
WOC Matthew M. Davenport
2LT Richard N. David
WOC Richard M. Dee
2LT Thomas J. Desperito
WOC Franklin Diaz-Martinez
2LT Gerald R. Diotte, Jr.
WOC Peter J. Donlevy
2LT Michael O. East
WOC Andrew P. Fairfax
SPC Thelma J. Fields
WOC Rex A. Finley
2LT Charles A. Fish
WOC Scott J. Forney
WOC Brent S. Fox
WOC Samuel D. Gentsch
WOC Vincent C. Gibson
WOC Allen R. Godfrey
WOC Alan J. Gollmyer
2LT Christian B. Grinsell
2LT Michael W. Hamm
2LT L. Wesley Hedges
WOC James M. Heer
2LT Jeffery J. Heer
WOC Earnest L. Hicks
WOC John K. Hoffman
2LT Scott T. Hurst
2LT James D. Hutton
1LT Joseph L. Ingignoli
2LT Lawrence M. Iwanski
CPT Shawn P. Johnson
2LT Barry L. Jones
LTC Charles B. Jones
WOC James B. Joyner
SGT Gerald R. Keplinger, Jr.
2LT John A. Klosky
2LT Cecilia A. Knecht
WOC John A. Kolkman
2LT Jeffrey C. Kordenbrock
WOC David L. Lacks
WOC Michael C. Land
2LT James Scott Landers
WOC Todd A. Larson
WOC George M. Lattof
2LT John J. Lindsay
2LT Zachary E. Maner
2LT Hector L. Mares
2LT Brent R. Matthews
WOC Mark A. McClure
CPT Karen E. McManus
1LT Johnny D. Messer
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Mr. William L. Moseley
2LT Phillip J. Napolitano
2LT Pamela S. Norwood
WOC Michael T. Nutt
2LT James E. Oxer
WOC Jeffrey M. Parker
2LT Kim D. Payne
2LT Scott H. Pearce
WOC Todd L. Pryby
2LT Brian R. Pulford
2LT Richard S. Redman
SPC Grisel G. Rosario
WOC Steven J. Rotering
SFC Julio Santiago
2LT James R. Schenck
WOC Joseph G. Sharp
2LT Christopher R. Shotts
2LT Geraldine E. Shutt
WOC Christopher D. Smith
2LT Stephen T. Smith
2LT Philip J. Sobiesk
2LT Jeffrey L. Sponsler
SSG Russell O. Stark
2LT Nicholas T. Steele
SPC J. Christopher Steinhauer
2LT Benjamin J. Storms
Ms. Sarah H. Stoutamire
WOC Jeff A. Sumners
WOC George R. Swartzendruber
CW3 Donald F. Tabron
1LT John B. Tannehill
CPT Martin L. Tittle
2LT Joseph E. Touchet
Mr. Daniel G. Van Ravesteyn
WOC Robert M. Vetscher
SSG Wendell R. Walding
WOC Paul A. White
WOC Bryan J. Wiggins
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2LT Anthony J. Wisely
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MAJ Charles F. Odom

CHECKPOINT CHARLIE CHAPTER GERMANY

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MAJ Craig D. Gardner

CHESAPEAKE BAY CHAPTER FORT MEADE, MD

LTC Glenn A. Brown, Ret.

COASTAL EMPIRE CHAPTER FT STEWART/HUNTER AAF, GA

MAJ Paul V. Richardson

COLONIAL VIRGINIA CHAPTER FORT EUSTIS, VA

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SSG Daniel R. Autrey
SSG William H. Barrentine
SGT Robert L. Basso
Mr. Alvin L. Brittingham
SPC Craig S. Bronk
Ms. Donna M. Ciolkosz
E8 James D. Curtin, Ret.
Ms. Cindy H. Emanuel
MSG Frederick R. Ewer
PV2 Lucretia D. Fanning
PFC Mary D. Hall
Ms. Paula K. Jones
PV1 Lisa Jordan
E7 Larry W. Mitchell
SSG Martin G. Peterson
E7 Gerald W. Rustin
PV2 Robert E. Sanchez
PV1 Tracy L. Scheffler
Ms. Rachel L. Serio
PV2 Martin D. Woollard

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CW4 Frederick W. Brisbois

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Mr. Robert G. Cassiano
LTC Darrell M. Chancellor
Mr. Jim Chewault
Ms. Francoise Cymes
Ms. Debra K. Doyle
Mr. Roland Flores
Mr. Hector C. Gonzalez
Mr. Rene Hernandez
Ms. Cyndy L. Husbands
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Ms. Sandra R. Langberg
Mr. Royce E. Martin
Dr. Thomas Moloney, MD
Dr. Larry H. Penick, MD
Mr. Joseph C. Ruszczyk
Ms. Phyllis P. Ruszczyk
Ms. Mary Ann Stockton
Ms. June B. Stone
Mr. Charles E. Voekel
Mr. Jerry Voelcker
Mr. Thomas L. York, Md

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LTC Robert Ryan Wilkins

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Mr. F. J. Florenza

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CPT T.J. Creamer
LTC William J. Elder
E9 Winston H. Mackey
MAJ Robert D. Mallicoat
CPT William T. Rice

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MAJ Robert A. Dickerson

LEAVENWORTH CHAPTER FORT LEAVENWORTH, KS

MAJ Dennis R. Crain
MAJ Milton R. Cross
MAJ Stephen J. Ferrell
MAJ Michael J. Gough
MAJ Richard M. Johnson
MAJ James L. Laughlin
MAJ Carroll R. Null
MAJ Edward E. Reed
MAJ Jackie C. Smith

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SPC Kai Abram
Mr. Charles M. Green
Mr. Arlen L. Krabbenhoft
Mr. Robert A. Matthews
Mr. Frank M. Smith
Mr. Ivy A. Smith
SSG Raymond E. Wathan

MAINZ CHAPTER MAINZ, GERMANY

PFC Bryan K. Broussard

MONMOUTH CHAPTER FORT MONMOUTH, NJ

MAJ James M. Klina Jr, Ret.
CPT (P) Tommy L. Marks

MORNING CALM CHAPTER SEOUL, KOREA

MAJ Robert E. Townsend
CPT Marilee D. Wilson

MOUNT RAINIER CHAPTER FORT LEWIS, WA

2LT Guy M. Zero

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Mr. Vincent M. Coutoumanos
Mr. Kenneth F. Delozier
Mr. Scott D. Livingston
Mr. Ken A. Lodge
Mr. Dennis B. Nichols
Mr. Paul H. Sanderson
Mr. William B. Wilson, Jr.

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CW2 Carl J. David
CW3 Charles I. Gehring
SSG Johnnie Kennerly, Jr.
MAJ Dennis M. Skaggs

PHANTOM CORPS CHAPTER FORT HOOD, TX

PFC Gary T. Falk
SSG Johnny Reynolds

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2LT Richard K. Wright

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SGT Johnny W. Anderson
PV2 Thomas M. Belcher
SPC Glen Allen Berry
PV2 Archie B. Brace
SGT Miguel A. Canales-Bonilla
SSG David Coleman, Jr.
SGT Steven Alan Currie
CW4 Roy P. Dean
PV2 Jim F. Dunham
SPC Robert J. Edwards
SPC James E. Faurie
PVT Frederick A. Goff
SPC Wayne F. Goodkin
CPT Donald L. Hackle
SGT Kevin L. Harden
SGT Roland Jay Hedge
WO1 Tony A. Hines
SGT Karl L. Huber
WO1 Ronald D. Jackson
SGT David B. Jameson
PV2 Joseph M. Maciejewski
SPC Robert B. Melton
PV2 Karl Brian Miller
PFC Eugene Mooro
SGT David W. Proctor
PV2 Kenneth John Prowse
SPC Patrick A. Reeve
SGT Clifford D. Regan
CW2 Stephen W. Scroggs
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SPC Alfred G. Sneed
CPT William K. Sorrell, Jr.
1LT James B. Stephenson
PFC Robert J. Toynbee
SPC Donald E. Young
WO1 Kenneth J. Young

RHINE VALLEY CHAPTER GERMANY

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CPT Michael J. Schwarz

SOUTHERN CALIF. CHAP LOS ANGELES, CA

Mr. Dennis O. Freund

STUTTGART CHAPTER STUTTGART, GERMANY

PFC Larry W. Pittman
PFC Diane C. Swensen

TAUNUS CHAPTER GERMANY

WO1 Michael L. Brookins
CPT Dianna B. Childress
Mr. John K. Corathers
MAJ Harry B. Howell
SGM David W. Keller
CPT Patricia D. Ladner
SGT Thomas J. Loftus, III
WO1 Charles Mineo, Jr.
CW2 Lori Reaves

TENNESSEE VALLEY CHAPTER HUNTSVILLE, AL

CW4 Glenn E. Mettler
Ms. Debra T. Reid

THUNDERHORSE CHAPTER FULDA, GERMANY

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SGT Edward P. Antonio
PV2 Gregory J. Bailey
PFC Marvin E. Bethke, Jr.
SPC Dewey E. Bozarth, Jr.
PV2 Eric B. Ellis
SFC Terry J. Engler
PFC Mark E. Farrin
PFC Kocolis Marcos
PV2 Jose V. Medina
SPC Erwin Narvaez
PV2 Felipe J. Quezada
PV2 David C. Reaves
PFC Gary W. Sealey
PFC Gregory G. Smith
PFC Russell J. Trim
PV2 Morlee C. Watson
PFC Michael A. Watts
PFC James A. Wiebener
SPC Bryan J. Wilson

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MAJ Michael L. Snowden
PV2 Darold Whitmore

WINGS OF THE DEVIL CHAPTER FORT POLK, LA

CPT Roy C. Brock, Jr.

WINGS OF THE MARNE CHAPTER GERMANY

SGT Scott H. Foster
WO1 Martin D. Mccoy

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MSG Karl G. Bunnell
Mr. Tony Castro
2LT Edward S. Clark
Mr. Tommy G. Cross
1LT William E. Crozier
2LT Paul S. Erchinger
PFC Joseph E. Fritton
Ms. Cynthia S. Fulton
WOC Charles R. Graham
WOC Mark E. Hutchinson
Mr. Brian C. Juroff
2LT Leon E. Luck, III
Mr. William E. Lyske
Mr. R. Murphy
MSG George E. Pavlatos
Mr. Hoke Smith
1LT Calvin E. Tomomitsu
SFC James S. Trask
CW2 Matthew B. Wallace
CW2 Gary R. Wallin
LTC Russell K. Walls
Mr. Paul E. Zenchenko

AAAA OVERVIEW

ACES

The following members have recently sponsored a total of five new members during this year. Each "ACE" receives an AAAA "ACES" coffee mug in appreciation of the effort and is eligible to wins the AAAA's "**TOP GUN**" Contest.

Nancy A. Alexander
LTC Michael S. Byington
LTC Thomas P. Cole
CSM Franklin Head, Ret.
2LT Scott T. Hurst
CPT Obdulio Juarbe
CPT Keith S. Norris
LTC John Papier
MAJ Raymond C. Phillips
CPT Daniel A. Rice
MAJ Olin E. Saunders, Jr.
LTC Chris Sautter
1SG James F. Shelton
1LT Jack E. Sturgeon
COL Robert B. Terry, Jr.

TOP GUNS

The member who sponsors the greatest number of new members during the contest year ending December 31, 1988 wins an expense-paid trip to the AAAA National Convention, including airfare, hotel accomodations, registration, tickets to all social functions, and a **$300 cash award.** The winner also receives a plaque presented at the AAAA Membership Luncheon.

Ms. S Barnes, Lind	**74**
CW2 D McDonald, Thund	**61**
1SG F Oxendine, Redc	**54**
MAJ G Kaufmann, Blk Kn	**35**
Ms. J Garmon, Lind	**32**
Ms. P Caraway, Lind	**28**
Ms. V Avenoli, Lind	**27**
Ms. K Losse, Lind	**23**
CSM J Pate, Lind	**23**
Ms. M Weaks, Lind	**21**
2LT S Hurst, Avn Ctr	**20**
LTC W Robert, Blk Kn	**18**
LTC J Magrosky, Lind	**15**
LTC (P) F Edwards, Avn Ctr	**13**
Ms. T Roosman, Lind	**13**
CPT O Juarbe, Mainz	**12**
LTC M Byington, Avn Ctr	**11**
MAJ G Coleman, Blk Kn	**11**
Ms. G Crenshaw, Mont Bay	**11**
Ms. M Gordon, Lind	**11**
MAJ J Adams, Old Iron	**10**
MSG J Bae, Morn Calm	**10**
MAJ D Miller, Lind	**10**
MAJ R Phillips, Indy	**10**
LTC C Sautter, Blk Kn	**10**
Ms. D Horne, Ches Bay	**9**
Mr. F Khemchand, Check	**9**
LTC J Papier, Ches Bay	**9**
LTC L Sloan, Avn Ctr	**9**
Ms. T Cunningham, Lind	**8**
Ms. C Pippins, Lind	**8**
Mr. D Platt, Lind	**8**
CPT D Rice, Sun Bowl	**8**
SFC J Calentine, Lind	**7**

MEMBERSHIP BENEFIT

CAREER TRACK

Army Aviation Career Track, AAAA's employment referral service, is one of the many benefits and services available to active AAAA members.

What is Career Track? Active AAAA members may have a 30-word classified employment ad published in ARMY AVIATION MAGAZINE free of charge. The ad will be run in two consecutive issues.

If we receive an inquiry on your ad, we will provide you with the name, address and telephone number of the organization making the inquiry. To insure confidentiality, we will not release your name to the inquiring organization. It will be your responsibility to contact them directly.

If you want to take advantage of the Army Aviation Career Track employment referral service, write to the AAAA National Office at 49 Richmondville Avenue, Westport, CT 06880-2000. If you have any questions or require additional information, please feel free to call us at (203) 226-8184.

CAREER TRACK

If you'd like to take advantage of the Career Track employment referral service, but you're not yet a member of AAAA, the solution is simple: Just fill out a membership form and send it in along with your request for a Career Track application. Your ad will run in the next available issue.

Captain, USMA 1983, B.S. - Engineering and concentration in Organization Development. 5 yrs. active. Air Cav Trp. Cdr., Aeroscout and Spt. Platoon Ldr. 925 hrs. OH-58C. Separating Dec '88. Seeking Aviation industry mid-management or sales-related position. 8-01

Army Aviator with a B.S. in General Engineering (concentration in Aerospace Engineering) and a background in EW research, development and acquisition seeks employment in business development or project management role. 8-02

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(800) 225-6243. Telex: 42299.

Allied-Signal Aerospace Company

Allied Signal

Aviation Soldiers of the Month

PFC Kocolis Marcos, Thunderhorse Chapter (May)
PFC Michael A. Watts, Thunderhorse Chapter (June)
SP4 Erwin Narvaez, Thunhorse Chapter (July)
SPC J. C. Steinhauer, Aviation Center Chapter (Aug)
PFC Gary W. Sealey, Thunderhorse Chapter (Aug)
SPC Harold E. Christian, Aloha Chapter (Sept)
CPL April N. Howard, Aviation Center Chapter (Sept)

Honorary Members

The following have been selected by AAAA Chapters as Honorary Members. Each receives a complimentary one-year AAAA membership, citation in these pages, and a "Certificate of Honorary Membership".

ARIZONA CHAPTER

GEN Louis C. Wagner, Commanding General U.S. Army Materiel Command, Alexandria VA.

HANAU CHAPTER

BG James R. Harding, Assitant Division Commander, 3d Armored Division, APO NY.

New AAAA Officers

The following members were elected to the Executive Boards of their respective Chapters:

LTC Thomas A. Green (Treasurer), **Aviation Center Chapter.**

MAJ Douglas L. Powell (President), **CPT Thomas K. Gainey,** (VP Programming), **Checkpoint Charlie Chapter, APO NY.**

CHAPTER NEWS

ARIZONA CHAPTER, MESA, AZ — General Louis C. Wagner, Jr., Commanding General of U.S. Army Materiel Command, spoke to a dinner meeting of the Arizona AAAA Chapter on September 13, 1988 at the Mesa Holiday Inn. The turnout was excellent, with 120 attendees, representing almost all the Arizona Valley aviation industries. GEN Wagner spoke on the "Army Aviation Modernization Plan". The General stressed the importance of cooperation between government and industry which has a big impact on the success of future, as well as existing aviation programs. In recognition of General Wagner's support of Army Aviation, the Arizona Chapter presented him with an Honorary AAAA Membership.

BELOW: Arizona Chapter President Lew McConnell presents GEN Wagner with an Honorary AAAA Membership.

AVIATION CENTER CHAPTER, FT. RUCKER, AL— Retired Navy Capt. John W. Thornton delivered a speech peppered with Prisoner of War stories telling of humor, courage, conviction and coping during a General Membership meeting on August 25, 1988.

Thornton, who in 1980 authored a book titled, "Believed to Be Alive", was the first helicopter pilot to be shot down during the Korean Conflict and was a prisoner of war for two-and-a-half years.

The evening was highlighted by the presentation of six college scholarships to area students by the Officers' Wives Club, with money donated by AAAA.

NORTH TEXAS CHAPTER, FORT WORTH, TX — The North Texas Chapter reports that two of the chapter's four 1988 goals were achieved by mid-year: (1) continuous quarterly net membership growth and (2) average general membership meeting attendance of 80 or greater (104 first quarter and 111 second quarter). The two remaining goals are expected to be achieved by the end of the third quarter when the Chapter (1) contributes $1000 to the AAAA Scholarship fund and (2) presents plaques to the top scout of the 5th and 6th Cavalry in recognition of the achievements during training with the ATB at Ft. Hood.

Fourth quarter plans are underway for a combined AUSA/AAAA Meeting December 15, 1988 at the Ft. Worth Petroleum Club. There will also be entertainment. The theme will be a "Thanks to the Chapter's Sustaining members.

Laser-aided weapons: a threat to U.S. helicopter crews

U.S. Tactical Aircraft Crews Now Have Protection Against Laser-Aided Weapons. The U.S. Army And Perkin-Elmer Have Developed A Solution For Tactical Helicopters. **That Solution Is AN/AVR-2 Laser Warning Receiver.** U.S. Army And Marine Corps Testing, Has Been Successfully Completed.

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Perkin-Elmer, Government Systems Sector,
Danbury, CT (203) 797-5052

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PA 1077

New Officers Cont.

MAJ Jan E. Payne (VP Programming), **SGM Benjamin Morris** (VP Renewals), **Colonial Virginia Chapter.**

MAJ Randall Maschek (President), **CPT Leonard Leo** (Treasurer) **WO1 Bryan Branham** (VP Renewals), **CPT Kenneth Quaglio** (VP Programming), **Follow Me Chapter.**

LTC William Elder (VP Programs), **LTC Randy Timmerman** (VP Publicity), **1LT William Bass** (Secretary), **Fort Bragg Chapter.**

COL David Hicks (President), **LTC Charles Nowlin** (Senior VP), **CPT Terry Collins** (VP Renewals), **LTC Michael Mague** (VP Publicity), **CSM John Beck** (VP Enlisted Affairs), **Hanau Chapter.**

CSM Gary W. Brazil (Senior VP), **SSG James L. Budd** (VP Enlisted Affairs), **Redcatcher Chapter.**

LTC David J. Fowler (President), **Rhine Valley Chapter.**

LTC Robert Stewart (President), **CPT(P) Amparo McKissack** (Senior VP), **MAJ Richard Ledbettor** (Secretary), **1LT John Stein** (Treasurer), **1LT Robert White** (VP Programming), **CW2 Richard Allred** (VP Publicity), **Schwaebisch Hall Chapter.**

CHAPTER NEWS

PHANTOM CORPS CHAPTER, FT. HOOD, TX — An executive council meeting was held at 1300 hours on July 27, 1988 at the Phantom Corps Officers' Club. A proposal to initiate Chapter elections at a social to be held in late August/early September was approved. A proposal to formally sponsor the Athapaskan and Top Gun awards on a recurring basis was approved.

REDCATCHER CHAPTER, APO, NY — An executive board meeting was held on July 21 in the Squadron conference room. The upcoming Flugtag on 27-28 August at Feucht Army Airfield was discussed. In addition, a pig roast is scheduled to be held in conjunction with the next General Membership meeting on August 25. Two representatives will be requested from each troop for assistance in setup and clean-up. Elections were scheduled for Monday, August 1, 1988, immediately following pay-day muster.

SCHWAEBISCH HALL CHAPTER, APO NY — A general membership meeting was held June 30, 1988 at the Dolan Barracks officer and civilian club. The meeting was opened by LTC Gibson and then the secretary read the minutes of the June 17th executive board meeting and the December 14, 1987 general membership meeting. The Treasurer reported a balance of $4029.80 in the Chapter account. The report was read and approved.

LTC Clark, Deputy Sub-Community Commander, addressed the general membership meeting to solicit donations for two programs: (1) funding of the teen summer hire program and (2) purchasing of furniture for the Kontack Club. The motion made by CPT Marmaro and seconded by LTC Stewart to donate $1000 to the teen summer hire program passed unanimously. The second request by LTC Clark for a $1,000 donation for the Kontack Club created a heated debate with a vote splitting the general membership in a tie. A new motion made by MAJ Kane and seconded by WO1 McIntyre, reducing the donation to $100 was passed.

The Chapter Election followed. The new Chapter Officers are listed in the "New Officers" column.

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Signature _____

Top Chapters

The August 31 Membership Enrollment Competition standings have the following chapters ahead with four months left in the CY88 contest ending December 31. The rankings are based on **CY88 net membership gain.**

Master Chapters (271 or more members)

Rank		Net gain
1	Lindbergh	333
2	Redcatcher	48
3	Monmouth	34
4	North Texas	28
5	Washington, D.C.	12
6	Colonial Virginia	11
7	Southern California	8

(The other Master Chapters show a current net loss during Jan-Aug period.)

Senior Chapters (131-270 members)

Rank		Net gain
1	Aloha	13
2	Chesapeake Bay	10
3	Suncoast	9

(The other Senior Chapters show a current net loss during Jan-Aug period.)

AAAA Chapters (42-130 members)

Rank		Net gain
1	Leavenworth	32
2	Cedar Rapids	18
3	Tennessee Valley	7
4	Bonn Area	6
5	Checkpoint Charlie	6
6	Indiantown Gap	2

(The other AAAA Chapters show a current net loss during Jan-Aug period)

The year-end membership totals of each of AAAA's 51 chapters for CY88 contest will appear in Jan. 31 issue.

AAAA CALENDAR

September, 1988

■■ **Sept. 7.** Phantom Corps Chapter. General Elections. Speaker: COL Thomas J. Konitzer

■■ **Sept. 13.** Arizona Chapter. Professional Dinner Meeting. Speaker: GEN Louis C. Wagner.

■■ **Sept. 14.** Leavenworth Chapter. Business Social Meeting. Ft. Leavenworth Officers' Club.

■■ **Sept. 15.** Edwin A. Link Memorial Chapter. Professional Dinner Meeting. Speaker: Joseph P. Cribbins.

■■ **Sept. 15.** Old Tucson Chapter. Professional Social Meeting. Loews Ventana Canyon Resort. Speaker: COL John J. Stanko.

■■ **Sept. 16.** Fort Bragg Chapter. Annual Dinner Dance. Ft. Bragg Officers' Club.

■■ **Sept. 23.** Checkpoint Charlie Chapter. General Membership Meeting. Tempelhof Central Airport.

■■ **Sept. 24.** Black Knights Chapter. Tailgate Party. Class of 1949 Lodge and Michie Stadium.

■■ **Sept. 25.** Corpus Christi Chapter. Family Picnic. CP&L Park.

■■ **Sept. 26.** Air Assault Chapter. Professional Development Meeting. Top Six Club, upper lower ballroom. Speakers: COL Billy J. Miller, LTC Robert N. Seigle.

■■ **Sept. 26-27.** Bonn Area Chapter. Professional Social Meeting. Presentation by: MBB and MTU. Munich-Ottobrunn and Munich-Dachau.

■■ **Sept. 27.** Connecticut Chapter. Professional Dinner Meeting. Hillandale Country Club. Speaker: LTG Jimmy D. Ross.

■■ **Sept. 28.** Southern California Chapter. Professional Dinner Meeting. Joe Petrelli's. Speaker: Dr. Jim Young.

■■ **Sept. 29.** Lindbergh Chapter. Professional Luncheon Meeting. Joe Hanon's Restaurant. Speaker: Sergei I. Sikorsky.

■■ **Sept. 30.** Taunus Chapter. General Membership Meeting. Wiesbaden Air Base Club. Speaker: COL Jack Easton.

■■ **Sept. 30.** Wings of the Devil Chapter. General Membership Meeting. Ft. Polk Officers' Club. Election of Officers.

October, 1988

■■ **Oct. 4.** Washington D.C. Chapter. Professional Social Meeting. Ft. McNair Officers' Club. Speaker: Congressman Denny Smith, Oregon.

■■ **Oct. 13.** Tennessee Valley Chapter. Professional Dinner Meeting. Redstone Arsenal Officers' Club. Speaker: MG August Cianciolo.

November, 1988

■■ **Nov. 5.** USAREUR Region AAAA Ball. Dinner, Awards Ceremony, Guest Speaker: General Crosbie A. Saint, Commander-in-Chief, USAREUR. Heidelberg Officers' and Civilians' Club, Patrick Henry Village.

February, 1989

■■ **Feb. 14-16.** Joseph P. Cribbins Product Support Symposium. Stouffer Concourse Hotel, Lambert Field, St. Louis, MO. The program will include an update on the Army Aviation Modernization Plan and industry/government discussion panel. POC: Ann Canterbery (314) 731-5802. Competition Advocates Shopping List (CASL) 14 Feb., preceding symposium (POC: Roger Boeckman (314) 263-1712).

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( ) USA ACTIVE DUTY	( ) MANUFACTURING*
( ) DA CIVILIAN	( ) CONSULTANT*
( ) ARMY NAT'L GUARD*	( ) PROFESSIONAL*
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( ) ARMY RETIRED*	( ) OTHER ____ ____

*BE CERTAIN TO LIST YOUR CURRENT JOB TITLE AT THE LEFT.

PRINT NAME OF RECRUITER

Solicitation now underway for CY88 AAAA National Awards: Jan. 15, 1989 suspense date set

"Award Presentations"

Up to eight AAAA National Awards for accomplishments made during Calendar Year 1988 will be presented at the 1989 AAAA National Convention in Atlanta, GA. The individual AAAA National Awards will be made on Friday; the unit AAAA National Awards will be made on Saturday. Senior members of the U.S. Army will be invited to present the AAAA's top awards on both occasions.

"Outstanding Aviation Unit Award"

Sponsored by the McDonnell Douglas Helicopter Company, this award is presented annually by AAAA "to the Active Army aviation unit that has made an outstanding contribution to or innovation in the employment of Army Aviation over and above the normal mission assigned to the unit during the awards period encompassing the previous calendar year." Any Active Army Aviation unit that has met the foregoing criteria is eligible for consideration.

"ARNG Aviation Unit of the Year Award"

Sponsored by Textron Lycoming, this award is presented annually by the AAAA "to the Army National Guard aviation unit that has made an outstanding contribution to or innovation in the employment of Army Aviation over and above the normal mission assigned to the unit during the awards period encompassing the previous calendar year." Any Army National Guard aviation unit or organization that has met the foregoing criteria is eligible for consideration.

"USAR Aviation Unit of the Year Award"

Sponsored by Textron Lycoming, this award is presented annually by the AAAA "to the U.S. Army Reserve aviation unit that has made an outstanding contribution to or innovation in the employment of Army Aviation over and above the normal mission assigned to the unit during the awards period encompassing the previous calendar year." Any U.S. Army Reserve aviation unit or organization that has met the foregoing criteria is eligible for this award.

"The Robert M. Leich Award"

Sponsored by the Grumman Corporation, this award is named in memory of Brigadier General Robert M. Leich, USAR, the AAAA's first president (1957-1959) and its Awards Committee Chairman for 23 years. It is presented periodically to a unit or an individual for sustained contributions to Army Aviation, or for a unique, one-time outstanding performance.

"Army Aviator of the Year Award"

Sponsored by the Sikorsky Aircraft Division of United Technologies Corporation, this award is presented annually through the AAAA "to the Army Aviator who has made an outstanding individual contribution to Army Aviation during the Awards period encompassing the previous calendar year." Membership in AAAA is not a requirement for consideration. A candidate for this award must be a rated Army Aviator in the Active U.S. Army or Reserve Components, and must have made an outstanding individual achievement.

"Aviation Soldier of the Year Award"

Sponsored by Bell Helicopter Textron, this award is presented annually by AAAA "to the enlisted man serving in an Army Aviation assignment who has made an outstanding individual contribution to Army Aviation during the awards period encompassing the previous calendar year." Membership in AAAA is not a requirement. A candidate for this award must be serving in an Army Aviation assignment in the Active U.S. Army or the Reserve Components, and must have made an outstanding individual achievement.

"James H. McClellan Aviation Safety Award"

Sponsored by General Electric Aircraft Engines in memory of James H. McClellan, a former Army Aviator who was killed in a civil aviation accident in 1958, this award is presented annually to an individual who has made an outstanding individual contribution to Army Aviation safety in the previous calendar year. The award is NOT intended to be given for the accumulation of operational hours without accidents by any aviation unit.

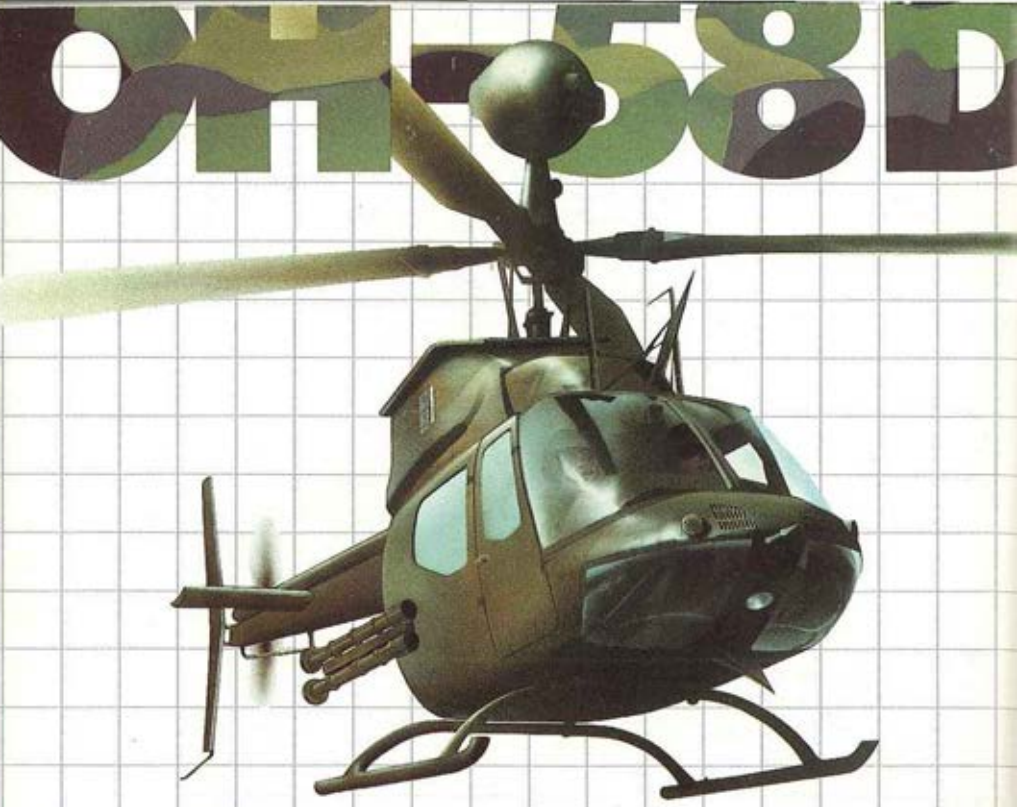
"Outstanding DAC of the Year Award"

Sponsored by the Boeing Helicopter Company, this award is presented annually by AAAA "to the DAC who has made an outstanding individual contribution to Army Aviation in the awards period encompassing the previous CY." Membership in AAAA is not a requirement. A candidate for this award must be a current Department of the Army Civilian.

Administrative Details

ACCOMPANYING DATA FOR INDIVIDUAL AWARDS: A standardized **"Nomination Form for Submission of All AAAA National Awards"** is the sole form utilized by the Awards Committee in its selection of annual AAAA National Awards Winners. Copies may be obtained directly from any Chapter Secretary or by writing to AAAA, 49 Richmondville Avenue, Westport, CT 06880-2000. The form should be accompanied by a recent photo and biographical sketch of the nominee. Photos of the commander and the senior NCO must accompany each unit nomination. The **"Nomination Form for Submission of All AAAA National Awards"** and the accompanying photo(s) should be mailed ON OR BEFORE the January 15 suspense date. Please use stiffeners to protect the photo(s) being submitted. While "nomination" material cannot be returned, photos may be returned on request. The receipt of each nomination will be acknowledged by the Awards Committee Chairman.

OH-58D



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