ARMY AVIATION

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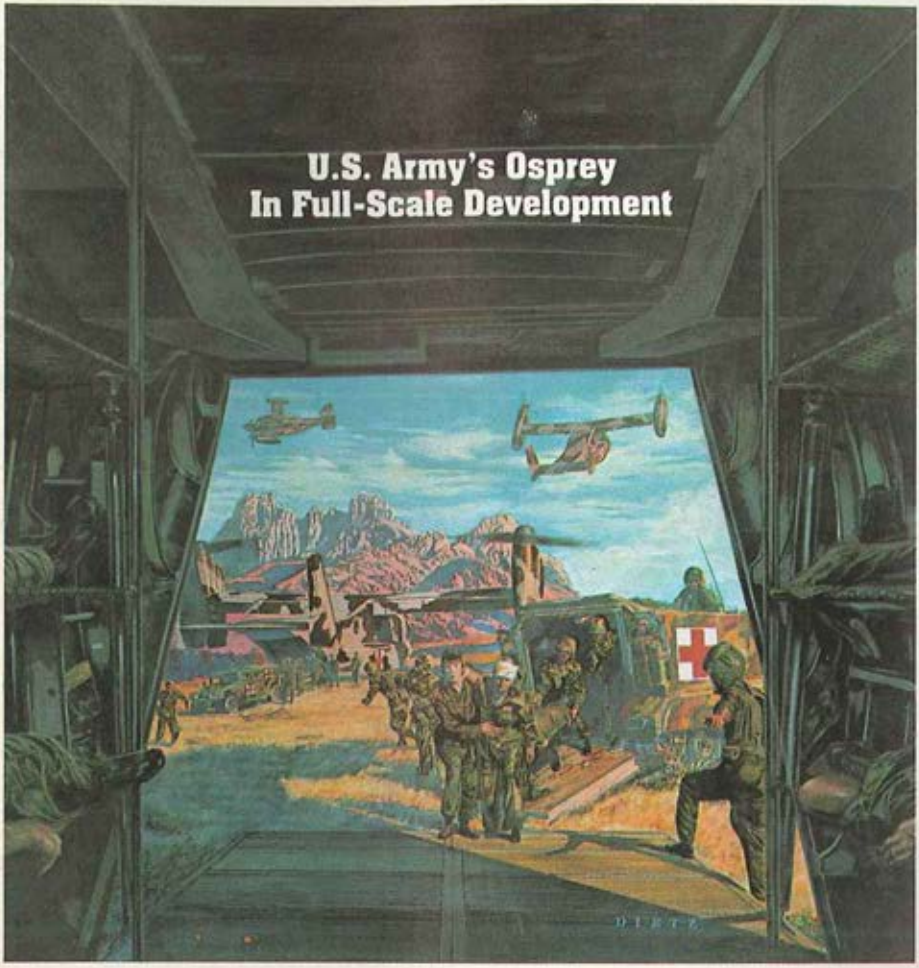


Aviation's Task: Training for the Army of Excellence

by General Joseph T. Palastra, Jr.
Commanding General,
U.S. Army Forces Command,
Fort McPherson, Georgia

ARMY Aviation has progressed greatly during its four decades of development. Twenty-seven years ago when I went through flight training, and on through most of Vietnam, aviation was used primarily as combat support and combat service support. During the latter years of that conflict, we began realizing the potential for Army Aviation as a combat arm. Now that our aviation personnel have earned the status of a combat branch, we face an even greater challenge. We must continue to develop tactical and technical expertise on the high intensity battlefield as part of the combined arms team, while reinforcing the hard-won skills critical in low-intensity conflict.

Learning how to fight and win

This is a big challenge, but our professional people, with their tremendous experience and modern equipment, can succeed. Our past experiences and "lessons learned" are a good foundation, but the future must be analyzed to determine how aviation can fight and win on the next battlefield, regardless of its intensity. This will lead to a continued redefining of aviation roles in the AirLand Battle Doctrine and the continued growth of the importance of Army Aviation.

Our planners, tacticians and combat developers must be futuristic thinkers. None of these efforts can be successful, however, unless we keep in mind the key element of all combat success — the soldiers and their training.

The Army's experts have given us state-of-the-art equipment which is rugged enough to permit us to be successful in high-intensity combat operations with heavy forces, and still remain a maneuverable asset to our light forces. The AH-64 and combat proven UH-60 both are designed to meet this twin challenge. Improved navigational aids and night-vision goggles make all-weather and night fighting a reality. The idea of Army Aviation being a fair-weather fighting force is no longer valid.

As our equipment becomes more sophisticated, our training should become more realistic and demanding. Never has flight training given us higher-quality and better-trained aviators than we currently enjoy. They need to be further melded into effective aircrews with well-developed unit tactics. This sounds basic, but it is extremely important.

Working with the team

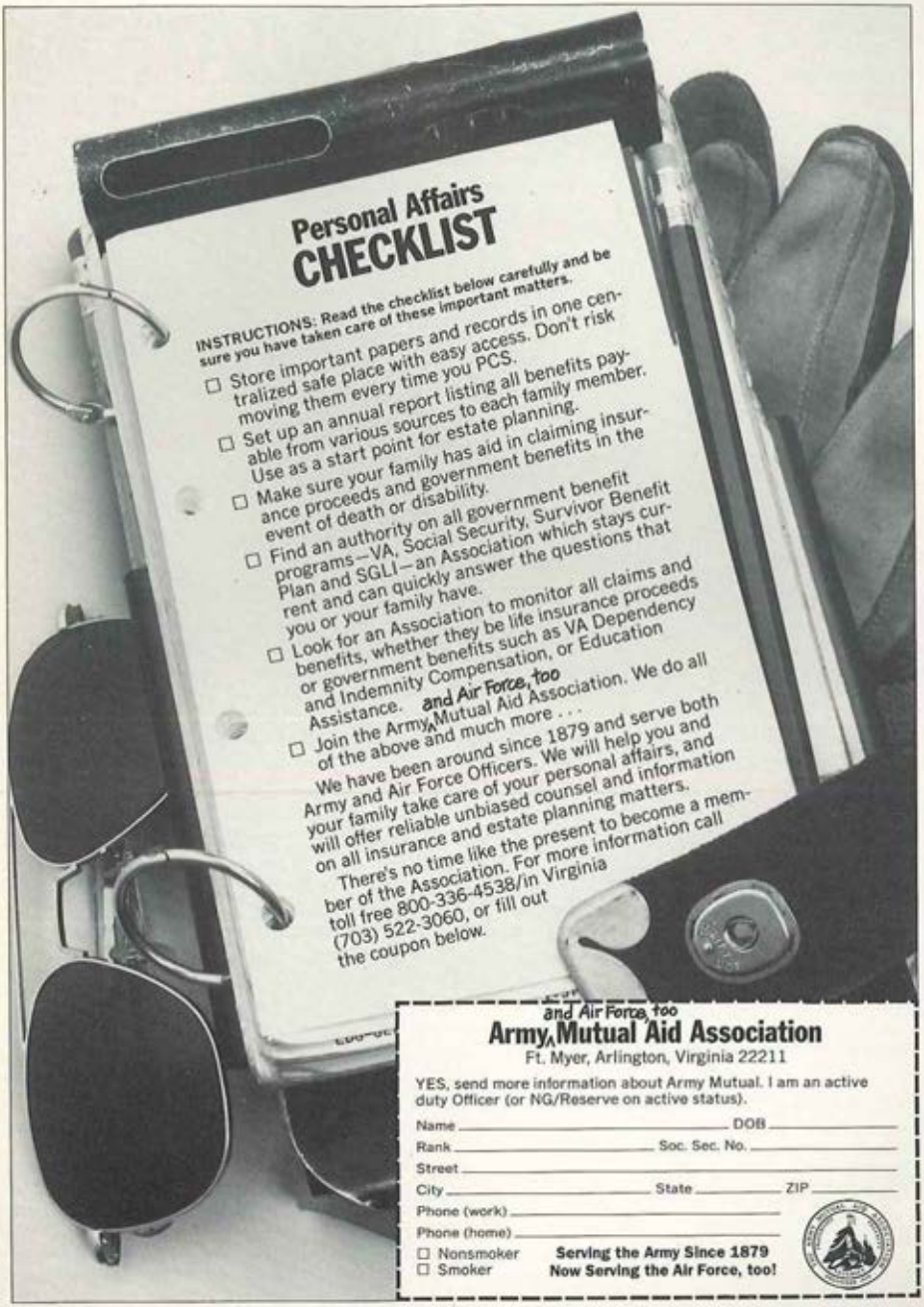
It is not enough to develop aviation expertise. We must realize aviation's full potential as a member of the combined arms team. Integrated training can do this. Aviators must know, and thoroughly understand, infantry, armor, artillery, and all combat support and service support functions.

They must do this at a level at least one rung higher than their ground combat counterparts. Ground commanders think two up and fight one down while aviation commanders will have to think and fight at least two higher as part of brigade/division and even corps operations.

We must make aviation training a challenge; it cannot be routine daytime VFR operations. We must train for the tough situations. Our aviators must be prepared to make their technology and professional experience produce the highest results under the most demanding conditions.

However, we must never go beyond the

(FORSCOM — Continued on Page 54)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☐ Make sure your family has aid in claiming insurance proceeds and government benefits in the event of death or disability.
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December 31, 1986—A General News Issue, containing field reports from Army Aviation units and agencies worldwide.

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February 28, 1987—A General News Issue, containing field reports from Army Aviation units and agencies worldwide.

FRONT COVER
An artist's conception of the MEDEVAC role of the Bell-Boeing V-22 OSPREY. The artist is James Dietz, a reknowned artist specializing in military scenes.

ARMY AVIATION

VOLUME 35 **NUMBER 11**

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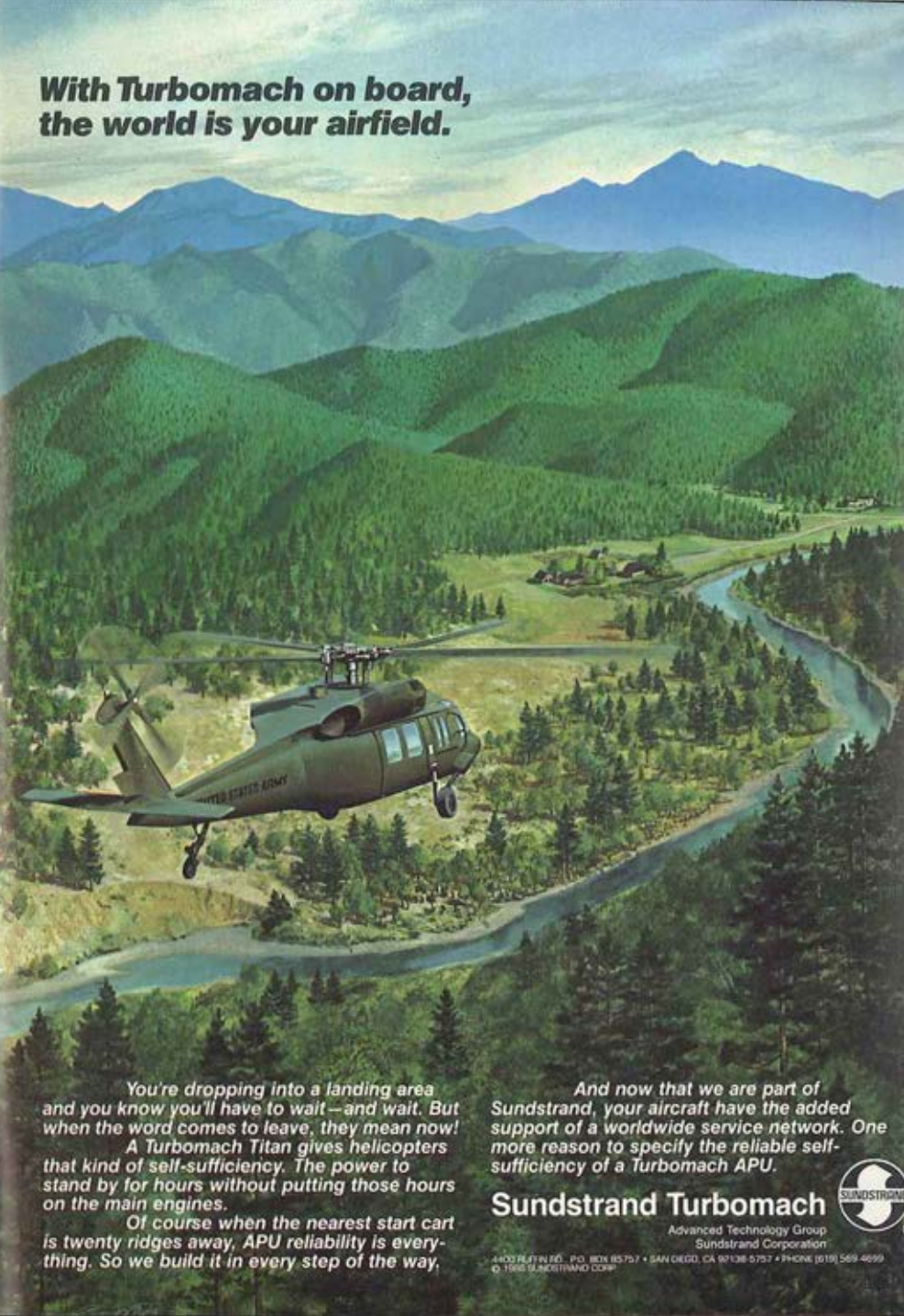

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ON the 4th and 5th of November 1986, members of the U.S. Army Aviation Systems Command (AVSCOM) and representatives from industry met at the Northrop Defense Division, Rolling Meadows, IL, to discuss Aircraft Survivability Equipment (ASE) and its application on the battlefield.

Aircraft Survivability Equipment cannot be taken lightly. Though our helicopters may be able to take evasive action against some types of enemy fire, they are not heavily armored and are vulnerable to anti-aircraft fire.

Our anti-tank helicopters pose a serious threat to Warsaw Pact armor. This has brought about a concerted effort by Soviet military strategists and industry to develop and implement a viable anti-aircraft system which will neutralize our helicopter tank-killing capability. The Soviets have sophisticated radar-guided anti-aircraft weapons in their arsenal whose primary function is to fight and destroy tank-killing helicopters. In order to counter the effectiveness of enemy anti-aircraft fire, we must reduce the enemy's ability to shoot at our helicopters.

Maximizing survivability

By utilizing techniques such as nap-of-the-earth flying, radar jamming, improved aircraft warning systems, and extended range helicopter firing systems, we can maximize our chances of survivability. At the same time, we must develop and implement aircraft hardening systems and improve upon existing systems.

We in Army Aviation must train both here at Ft. Rucker and in the field with ASE training devices. These devices must be definitive in purpose, realistic in nature, and address the combat scenarios in which the Army aviator will likely have to fly.

Relative to ASE training devices, we have the Aircraft Survivability Trainer (ASET) program which consists of: ASET I & II (interactive video disc, desk top trainers), ASET III (onboard in-flight trainer), and ASET IV (ground based, air defense simulators). The system which is currently operational is ASET I, which has been fielded Army-wide. The target dates for fielding ASET II & III will be in FY 1988, and ASET IV will be fielded in 1989. When fully implemented, the ASET program will serve the ASE training needs of Army Aviation on a worldwide basis, and will enhance greatly our capacity to fight and survive in combat.

Air-to-air combat capability

Akin to the ASE issue is the ability of our helicopters to successfully engage enemy helicopters in the air-to-air combat mode in an AirLand Battle or related scenario.

Congressman William L. Dickinson of the Alabama Second Congressional District recently told a gathering here at Ft. Rucker about his concern in regard to Soviet helicopter air-to-air combat capability.He cited the need of the Army to field a helicopter or helicopters capable of fighting and defeating Soviet helicopters such as the HIND-D. We at Ft. Rucker

The many facets of Aviator training at Fort Rucker

by Major General Ellis D. Parker, Commanding General, U.S. Army Aviation Center and Fort Rucker, Alabama

and elsewhere in the Army have addressed this issue head-on in the past and are continuing to do so.

Since 1982, when the first Army aviators took part in Marine Corps helicopter air-to-air combat training at Yuma, AZ, our branch has been in the forefront in the development, testing, and implementation of air-to-air combat doctrine. We have also utilized exportable training packages on air-to-air combat for all tactical aviation units and we continue to revise and expand our doctrine and training.

If we are to be prepared for the helicopter threat, it is imperative that our air-to-air training and tactics be superior to that of the enemy's; because no matter how good our equipment might be, it will be the aviators who ultimately will determine the outcome.

As Aviation Branch Chief, I believe that the combination of superior technology, training, and tactics will be the variables which will surmount the enemy's numerical superiority in any air-to-air engagement, and carry the day for us and our allies.

93B Aeroscout Observer

I want to take this time to acknowledge the branch's newest Military Occupational Specialty (MOS) and MOS producing course, the 93B Aeroscout Observer, which came into being on 1 October 1986.

The new MOS and course were the result of more than three years of testing and training. The Department of Enlisted Training (DOET) has assumed proponency for this 14 week, 3 day course.

The significance of the Aeroscout Observer in the OH-58A/C is that it enables the soldier to be integrated into the cockpit crew as a functional member of the scout/attack team. Here at the U.S. Army Aviation Center, DOET will work hard to maintain the high standards of the Aeroscout Course and the 93B Aeroscout Observer. The soldier training for the MOS will receive 330 academic hours in areas such as combat skills, aircraft systems, navigation, Nuclear, Biological and Chemical (NBC) warfare, and soldier skills. He will also receive 67 flight hours in emergency aircraft handling and aeroscout skills. Our branch will continue to graduate the best Aeroscout Observers, who will serve in our aviation units worldwide.

A^2P^2

Finally to be noted is the new Army Aviation Personnel Plan (A^2P^2). Its significance to Army Aviation lies in the fact that it will serve as a more effective means of analyzing and projecting aviation personnel requirements. This will be achieved by the use of standardized personnel management models to better enable the Aviation Branch to access and train personnel in the proper numbers and with the proper qualifications.

A^2P^2 will serve as a personnel management road map allowing us to know where we are and where we need to go in terms of our most valuable asset — people. IIIII

THE OFFICIAL PUBLICATION OF THE ARMY AVIATION ASSOCIATION OF AMERICA

ARMY AVIATION

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Dale Kesten, Managing Editor, introduced a new editorial format of printing brief reports covering recent developments within U.S. Army Aviation with the August/September 1985 issue of *ARMY AVIATION MAGAZINE*. These dynamic, easy-to-read field reports have proven very popular and represent an invaluable source of information from key offices, agencies, and operational units worldwide.

As the incoming Editor-in-Chief, I would like to take this opportunity to thank Dale for his efforts. He will be leaving *ARMY AVIATION MAGAZINE* on January 1st.

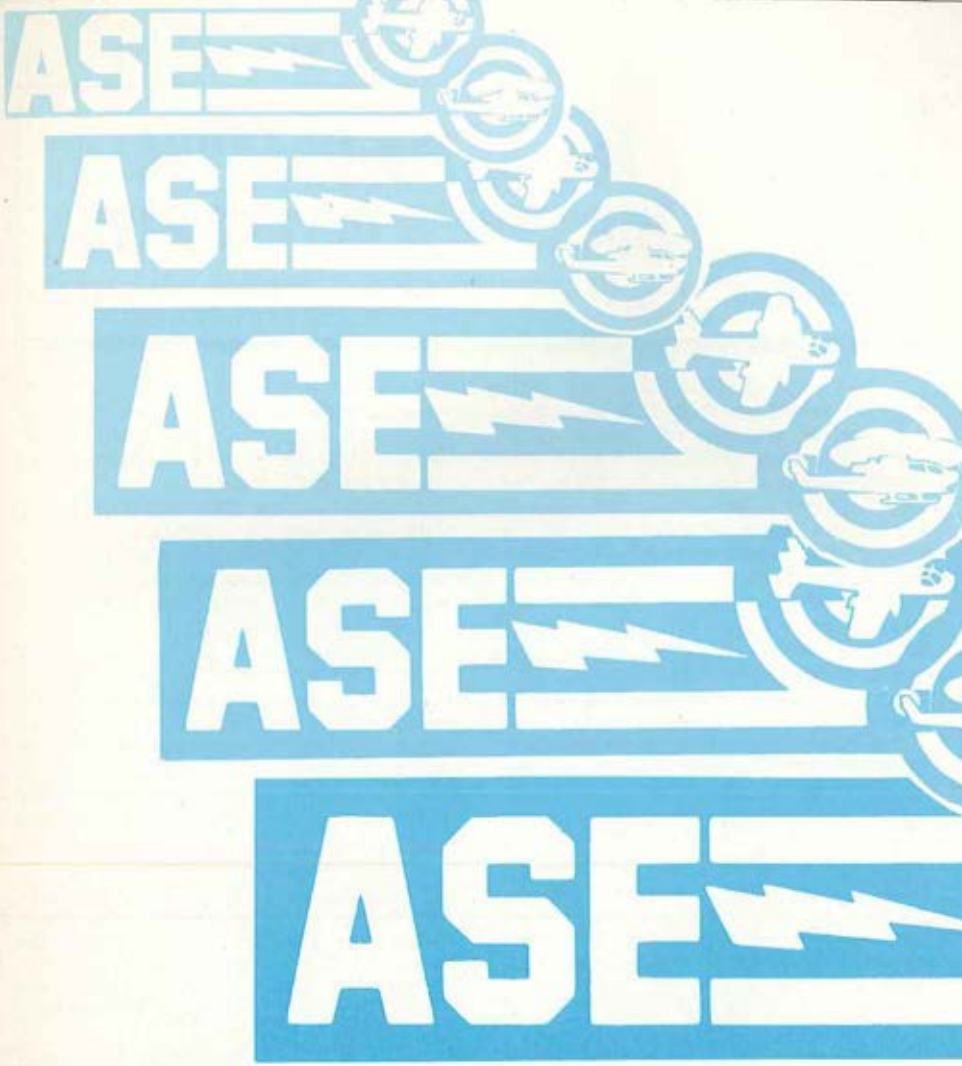
ARMY AVIATION is the only magazine published exclusively to serve the professional interests of those engaged in the U.S. Army Aviation.

Our new Managing Editor, John Kiernan, and I hope to carry on the spirit. We are already broadening our scope to include industry-written reports on major development efforts. We will also be publishing a new department, "BRIEFINGS", consisting of brief news items, product developments, and personnel changes. We would also like to publish Letters to the Editor more frequently on the problems and decisions you face daily and the aspects of your work that you would like to see treated in *YOUR* magazine.

We will also continue featuring Special Reports several times a year which cover the development, production and fielding programs for major items of aviation hardware. To quote publisher Art Kesten, "Our special issues have been, are, and always will be 'team' efforts" — as are all our issues. This November 30, 1986 ASE Special Report is no exception. We would like to make special mention of the efforts of Colonel Curtis J. Herrick, Jr., PM-ASE, and Captain (P) Michael L. Messex, Asst. PM-ASE, in developing the editorial plan for the ASE articles and coordinating with the individual authors.

I know that I can speak for John and myself when I say, "we're glad to be a part of the team".

Lynn Coakley,
Editor-in-Chief



A look at the U.S. Army's continuing efforts in fielding Aircraft Survivability Equipment (ASE)

ASE at the USAAVNC: The user's perspective

by MG Ellis D. Parker

THE advent of AirLand Battle doctrine, with its emphasis on initiative, depth, agility, and synchronization, has led to increased reliance on Army Aviation. Modern helicopters and airplanes provide commanders unprecedented mobility, ever-increasing lethality, and the ability to mass troops and equipment at the critical point on the next battlefield.

By their very nature, however, aircraft are "soft" targets — they will never be as heavily armored as tanks. Therefore, we must do everything we can to prevent the enemy from firing at us or to prevent his weapons from hitting us when he does fire.

The role of aircraft survivability equipment (ASE) is to reduce the vulnerability of our aircraft on the modern battlefield.

Five-step approach

The methodology for achieving survivability is summed up by the ASE philosophy — a five-step approach we follow in deciding how to ensure that our aircraft (and more importantly, aircrews) are able to accomplish their mission again and again. These five steps are:

Tactics — Proper tactics reduce our exposure to enemy weapons. Flight at nap-of-the-earth (NOE) altitudes puts solid earth between our aircraft and the enemy for a good portion of the mission; NOE flight makes it very hard for radar, infrared, or optically guided weapons systems to find us.

Signature Reduction — Anything we can do to the aircraft to make it hard to detect will reduce the enemy's ability to bring his weapons to bear on us. Examples of this are the use of flat-plate canopies that reduce glint (optical and infrared), exhaust suppressors, and paint with low-infrared reflectance.

Warning — The third step in the ASE philosophy is to provide warning to aircrews when they are about to be engaged, allowing them time to react. Examples of warning devices are radar warning receivers, laser warning receivers, and missile approach detectors.

Jamming — When aircrews must stay on station despite warnings (during weapons delivery, for example), we provide countermeasures that jam the fire control or guidance systems of threat weapons. In some cases, jamming prevents the enemy from firing. In other instances, it prevents him from getting a hit once he has fired. Chaff, flares, and radar and infrared jammers all provide this type of protection.

Aircraft Hardening — This step provides for ballistic tolerance, minimizing the damage to an aircraft once it has been hit by an enemy projectile. Modern fuel cells, for example, can take a direct hit without leaking or exploding. Redundant systems allow the aircraft to continue the mission even when some components have been damaged or destroyed.

These steps are applied in the order shown until acceptable survivability is achieved. Note that the items at the top of the list are typically light, inexpensive, simple, and effective against a wide variety of threats. As we work down the list, the cost, weight, and complexity increase. Since each of our aircraft has a different mission and will face a different threat, each has a unique "suite" of ASE.

The effectiveness of ASE has been proven in combat, as well as in numerous studies, war games, and analyses. A summary of typical

MG Ellis D. Parker is the Commanding General of the U.S. Army Aviation Center and Ft. Rucker, AL, and the current Aviation Branch Chief.

YOU'RE BEING WATCHED

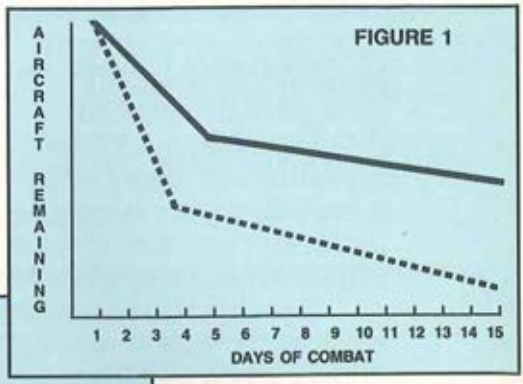
...by the crew of an Army OH-58D Aeroscout helicopter equipped with a McDonnell Douglas Mast-Mounted Sight.

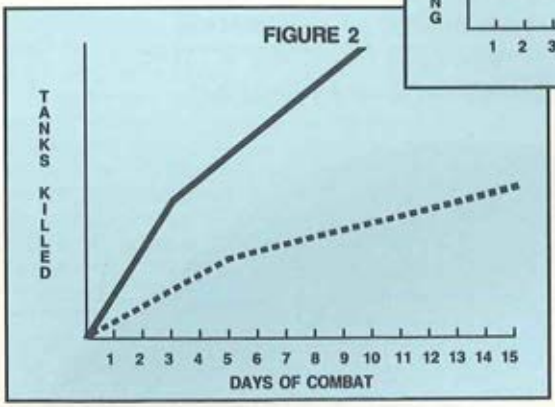
The sight is a system in itself for battle surveillance, target acquisition and handoff. It is field-supportable: Major components including sensors, electronics, and the upper shroud can all be replaced in the field.

The sight has exceeded performance specifications. It is now in production for the Army Helicopter Improvement Program.

Watch for it.

MCDONNELL DOUGLAS





WITH ASE

WITHOUT ASE

results is shown in the graphs in **Figures 1 and 2. Figure 1** shows how aircraft numbers are affected by our going to war with and without ASE. Note that in the long run over twice the number of aircraft (and aircrews) are available when ASE is employed.

Figure 2 illustrates that mission effectiveness improves dramatically as more aircraft survive daily missions. The vertical axis could just as well represent intelligence collected or tons of ammunition delivered.

All this, of course, assumes that our aircrews are knowledgeable in the use of their equipment at the start of the war. The effective employment of ASE is like any other skill — it must be trained to be learned and practiced to be remembered.

I cannot overemphasize this — lack of ASE training will result in needless losses in combat. Aircraft survivability equipment is simply another part of the aircraft; you cannot use your aircraft to its full potential unless you know all of its systems.

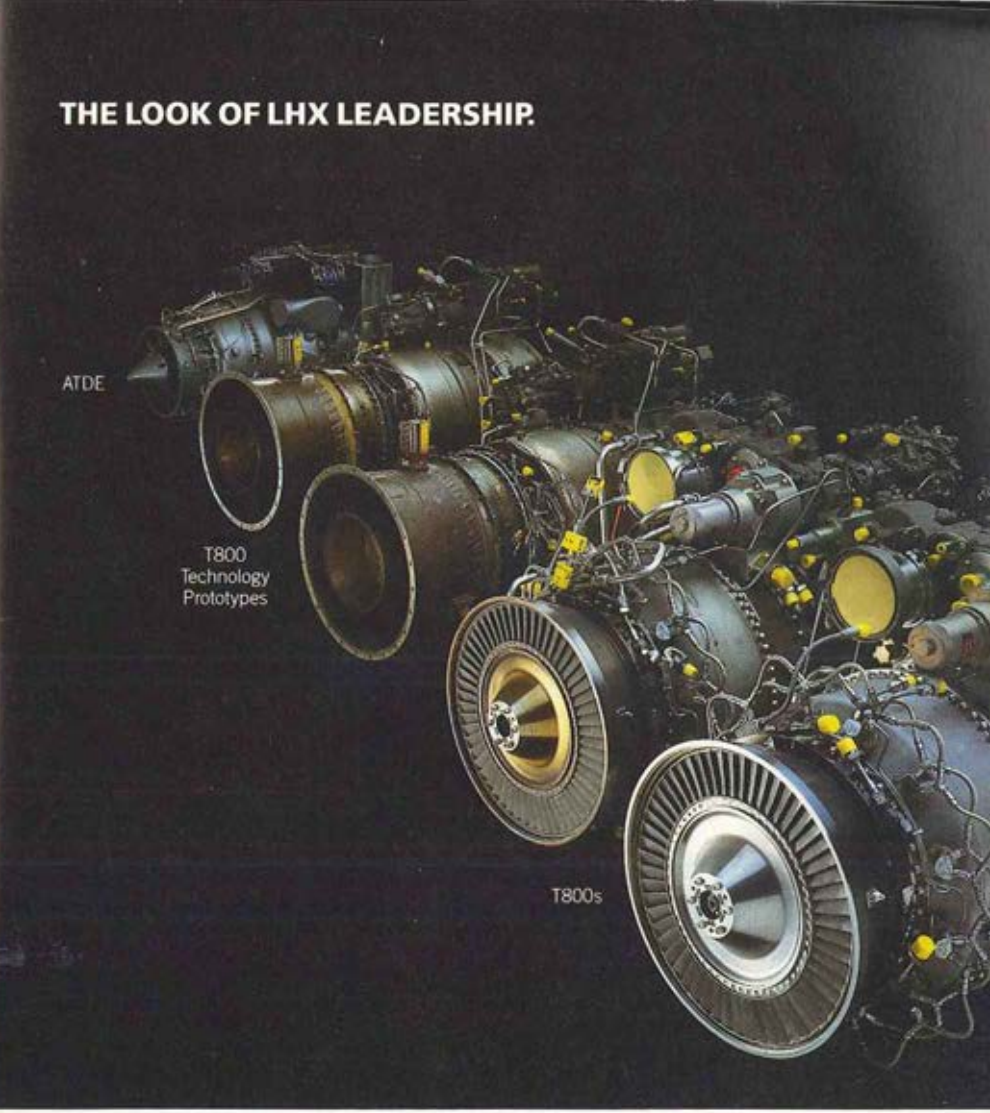
The regular use of ASE has another advantage — it exercises the logistics system. This ensures two things: Repair personnel are on hand and well trained when they are needed, and repair parts are available in sufficient quantities to fight a war.

I challenge every commander and aircrew to get out and use this equipment during all training exercises. Experience has shown that all soldiers fight as they are trained. As the Chief of the Aviation Branch, I want our units to be represented by the top lines of the Figures shown above.

I wholeheartedly recommend a careful reading of every article in this issue. The authors are all experts in their fields. Aircraft survivability equipment can be a highly technical subject; however, it is a vital part of how we do business.

What ASE is, how it works, and how we train with it are mandatory subjects for aviation professionals of all kinds and at all levels to know. I sincerely hope that you find these articles as interesting and exciting as I do. IIIII

THE LOOK OF LHX LEADERSHIP.



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ASE-PMO: Updating the programs in St. Louis

by COL Curtis J. Herrick, Jr.

THE occasion of the fourth AAAA Aircraft Survivability Equipment (ASE) Symposium provides an opportunity to review the progress and contemplate the future of Army ASE programs.

ASE earned its spurs with the Quick Reaction Capability development and fielding of infrared (IR) suppressors for our fighting aircraft in Vietnam during 1970. In 1972 the program office was given responsibility for the electronic "blackbox" items of protection equipment and was chartered by the Secretary of the Army.

The mission is to provide protection for the over 8,000 current Army aircraft and those in development, SOF, LHX and SEMA-X, so that they can accomplish their mission on the modern battlefield. Inherent in the mission is the requirement to not only catch up with the enemy threat but also to get ahead so that our aviators will win on the first fight of the next battle.

An updated ROC

Additionally, the project office is charged with the challenging task of establishing an efficient life cycle management system and ensuring that it works. The original 1974 comprehensive Required Operational Capability (ROC) document had its most recent update in December of 1984. This ROC lists the types of aircraft items of ASE and the periods (current, near and long term) that those equipments are to be developed and fielded. Priority for the accomplishment of the ROC acquisition tasks are dictated by the Materiel Acquisition Management Program decisions, preplanned product improvement priorities and the the approval of production funding.

As a comprehensive document the ROC, which is coordinated with the Army Long Range Research Development and Acquisition Plan, provides strong direction and momentum to the ASE program.

Primary studies were initiated in 1975 for Scout and Attack helicopters and in 1976 for Special Electronic Mission Aircraft (SEMA). These studies and the frequent updates have led to refinement of requirements and the acquisition of suites of ASE for the aircraft mission areas.

The tradeoffs

Numerous combinations of ASE were repeatedly examined in software models to determine the most suitable or "knee of the curve" relationship between increased survivability and ASE penalties. The penalties included factors such as weight, drag and cost. Priorities for development and production were established to counter the most serious threats pointed out in an attrition analysis.

Improved weapons capabilities and the difficulty of replacing combat losses of aircraft and pilots are making the need for improved aircraft survivability equipment more acute. Boundaries among the protection equipment for aircraft, ground vehicles and traditional ground fire electronic warfare systems are blurring.

In recognition of these dynamic technology changes, the Army Materiel Command (AMC) has formed a Survivability Management Office. This office should improve coordination between the research and development activities as well as enhance protection technology information exchange among the AMC major subordinate commands and the TRADOC branch centers. The importance of improving aircraft survivabili-

COL Curtis J. Herrick, Jr. is the Project Manager for Aircraft Survivability Equipment at the U.S. Army Aviation Systems Command at St. Louis, MO.

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ity is reflected in the chart. The ordinate represents the percent of fleet remaining after it has flown the engagements shown on the abscissa.

In this case, if the fleet flew 20 engagements, with just a two percent improvement from 96 to 98 percent, 23 percent more aircraft are expected to remain. The chart also emphasizes the importance of providing protection tactics and equipment that provide a probability of survival as near to 100 percent as possible.

Keeping the APACHE alive

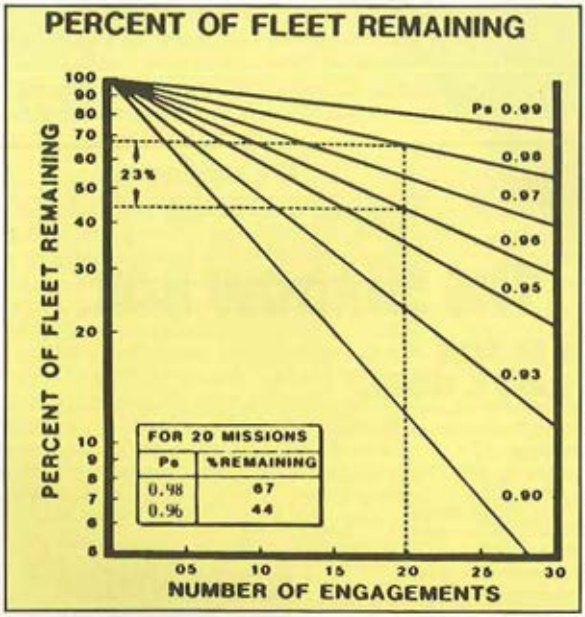
The relentless efforts of the TRADOC and AMC development team have provided the U.S. Army with the best protected Attack helicopters in the world. The full suite of ASE met at the COBRA in mid-1984 and is on the recently fielded APACHE aircraft. This increased survivability greatly extends the ability of these helicopters to accomplish their missions more quickly with less ammunition and fewer losses.

ASE protection strategies are designed from an examination of the mission profiles of Scout and Attack helicopters, SEMA and support aircraft. Actions are taken in the five areas consisting of tactics, signature reduction, warning, jamming and vulnerability reduction to degrade or defeat portions of the enemy anti-aircraft engagement cycles.

Tactics — properly executed, can make the largest contribution to survivability. Terrain flight is used by Scout and Attack helicopters to complicate enemy target acquisition and anti-aircraft weapon engagements. Standoff mission profiles outside the effective range of the enemy's weapons significantly reduce vulnerability. Training in the execution of these tactics and the use of ASE are most vital ingredients in accomplishing missions with high survivability.

Signature Reduction — efforts have greatly reduced enemy IR weapon acquisition and engagement ranges. They include IR absorbing paint, low glint flat plate canopies and suppressors that hide hot metal and lower exhaust temperatures. It is important to note that brightly painted unit crests, helicopter stingers and spray-can lacquer touch-up painting create hot spots that attract IR missiles.

Warning — from radar warning receivers, battle reports and in some cases indications of remotely activated ASE provides information to make key tactical decisions. The pilot, consistent with his place in the battle timeline, must decide whether to continue the mission in progress, perhaps with the activation of ASE, or to mask enroute to another fighting location.This combination of maintenance, training and tactics is vital to mission accomplishment and survivability.



Jamming — is used by Attack helicopters to press into suitable engagement ranges to kill the enemy tanks protected by stout air defenses. The ALQ-144 IR jammer found in the BLACK HAWK, COBRA and APACHE is very effective in defeating heat seeking missiles.

The ALQ-136 radar jammer will force enemy radar directed weapons crews to switch to less effective optical engagements. The

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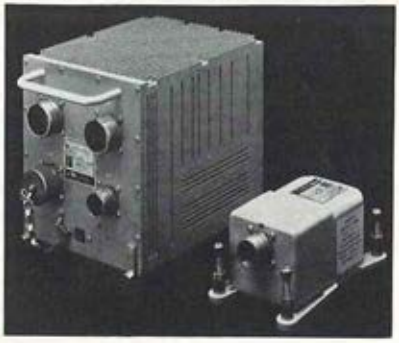

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M-130 general purpose dispensers found on Attack helicopters, BLACK HAWKS, Special Electronic Mission Aircraft (SEMA), and the Chinook are used to launch flares and chaff.

The ALQ-156 missile detector on the Chinook automatically detects incoming missiles and triggers the M-130 to fire decoy flares. Dispensing chaff provides increased survivability against radar weapons.

A suite of these items of equipment, with product improvements in some cases, is being prepared for QUICK FIX, OV-1, RV-1, RC-12 and RU-21 aircraft to provide them a high assurance of accomplishing their mission. SEMA ASE maintains a high priority because of the need for these aircraft to provide information to the corps commanders for use in fighting the close and deep battles.

Vulnerability Reduction — a continuous effort in the design of new and the modification of current aircraft is expected to have a high payoff. Desirably, good tactics and effective ASE will achieve mission accomplishment without being hit by the enemy. However, given a hit, our aircraft have a panorama of vulnerability reduction features. They include transmissions that can run dry for extended periods, higher tolerance to larger caliber enemy ammunition hits, second engines, redundant flight controls and improved crashworthy fire protection systems that include nitrogen inerting of fuel cells.

Increased funding

Survivability has high Army interest to preserve our great investment in aircraft and to protect our valuable resource of pilots. This interest resulted in nearly a one-half billion dollar increase in ASE procurement funding and the establishment of an ASE budget line.

At the present, large numbers of ASE items have been and are scheduled to be fielded to U.S. forces throughout the world. As a result, our Army Aviation battle capabilities have been markedly increased while the value of the enemies' significant investment air defense equipment has decreased.

Analysis of the conflicts in the Faulkland Islands, Lebanon, Afghanistan, Grenada, the Gulf of Sidra and the grinding Iran/Iraq War aptly points out that having ASE alone is not enough to win battles. The factors of high materiel readiness, the skilled performance of tactics and knowing the enemy are essential for success on the battlefield.

The presence of new ASE in units is placing strong demands on the Army training and maintenance system that must be addressed with continued command emphasis.

Comprehensive efforts are underway at Ft. Rucker, Ft. Huachuca, Ft. Gordon, Ft. Eustis, and other localities to properly include ASE training in resident courses, doctrinal publications, aircrew training manuals, Army training and evaluation programs.

ASE equipment fielded

Over 400 ASE Trainers Number I (ASET I) were fielded last summer for use with the intelligence computer Microfix system. ASET I helps pilots update on the threat, ASE operations and tactics. Last spring, 17 additional Microfixes were fielded to the Synthetic Flight Trainer locations to make more ASET I computer time available. Four more Tactical Radar Threat Generators (TRTG) are being fielded this fall.

Coordination continues with PM TRADE to keep the ASE in the aviation combat missions simulators current. Development continues on deskside computer programs (ASET II), an in-cockpit trainer (ASET III), and a composite air defense battery (ASET IV).

Attentive actions by company, battalion, brigade, and division commanders continue to be required to insure that the ASE is ready and that the pilots are prepared for a fly-away come as you are war. Leaning how to fight better with ASE and maintaining those skills are necessary.

For the future, the ASE Project Office is working with the Army Aviation Center to round out the ASE for the current aircraft and intensely supporting the LHX Project Manager.

Significant progress has been made with the initiation of production of an advanced threat warning receiver with a digital display and voice warning for the Scout and Attack helicopters. Full scale development has begun on the advanced threat radar warning receiver for SEMA with similar characteristics designed to fight at higher altitudes. Rapid paced development is on schedule for the radar interferometer to pinpoint

(ASE PM — Continued on Page 54)

Keeping SEMA alive: The key to winning

by LTC (P) Theodore S. Orvold

THE proven value of the Army's Special Electronic Mission Aircraft (SEMA) in providing reconnaissance, surveillance, and target acquisition (RSTA) support to unified and tactical commanders is without precedent. SEMA's potential role in locating deep, high value targets during future wars is key to any successful "early win" conventional warfighting strategy.

Changes in threat, doctrine, and weapons' technology have placed greater demands on real-time aerial intelligence systems. These demands have elevated the importance of Army Aerial Exploitation Battalions' (AEB) supporting division and corps commanders who need the "deep look" in order to efficiently manuever against or target opposing forces. Because of the increasing importance and reliance on aerial support, legitimate concerns are being expressed as to the survivability of all aerial collection platforms in combat.

Often asked questions

Typical questions most often asked include:

- Can Army Aviators survive the threats and still perform their SEMA mission in future conflicts and wars?
- Are SEMA aircrews properly trained to survive in combat?
- Are procedures, tactics, and Aircraft Survivability Equipment (ASE) properly integrated and understood?
- Have SEMA operations been properly integrated into unified and combined commands control and air defense operation and war plans?

These questions and concerns need to be addressed as long as requirements remain validated to satisfy the information needs of tactical commanders.

LTC (P) Theodore S. Orvold is currently attending the Program Manager School at Ft. Belvoir and will be assigned to HQ, AVSCOM in January 1987.

SEMA "Survivability"

To function effectively in combat, Army Aviators performing SEMA missions must operate in a totally different control and air defense environment than that used during peacetime aerial reconnaissance operations. Differences in planning, procedures, and tactics must be clearly understood and practiced by SEMA crews. Once committed, crews must be able to transition to war without any loss in mission effectiveness. Because of multiple threats, SEMA crews must understand how to use the operational environment to their advantage in order to complete missions while enhancing survivability.

It must be understood that all aerial platforms are vulnerable! SEMA, just like any other weapon system engaged in combat, are no exception. This does not imply, however, that they are not survivable. To the contrary, numerous studies and actual flight tests have found that their potential capability to "avoid" hostile threats and survive during non-nuclear combat is quite high.

To enhance survivability of these irreplacable resources, four areas need to be understood and exercised by trainers, systems developers, planners, and operators of SEMA systems. They involve equipment, training, plans and procedures, and elimination of hostile threats through direct joint actions.

1. Aircraft Survivability Equipment (ASE). ASE is integrated with other aircraft systems to aid the crew in identifying threats so they can take immediate defensive actions when necessary. To fully appreciate how ASE can aid in preserving aviation resources, two key terms need to be

understood. The first, "survivability", refers to the capability of a system to avoid and/or withstand a man-made hostile environment.

To SEMA platforms, the emphasis is on **avoid.** This is done by recognizing the threat through ASE alert systems, and taking appropriate measures by evasive tactics, maneuver, and/or activation of ASE during actual attack. Avoidance does not restrict itself to in-flight situations, but rather should begin in the mission planning phase prior to take-off. Crews must design flight profiles which avoid enemy SAM killing zones through careful, in-depth mission planning.

The second term "vulnerability", refers to the inability of an aircraft to withstand damage caused by the hostile environment. Vulnerability is determined by the aircraft's design and any survivability features that reduce the amount and effects of damage when the aircraft takes one or more hits. Because SEMA platforms are not built to withstand the killing power of most enemy air defense weapons, priority must be given to integrate programmed ASE into all SEMA systems as soon as practical. This is necessary for early notification of possible threats, thus enabling crews maximum time to avoid potential attacks!

Survivability during combat

2. Survivability Training. The training of SEMA aircrews starts at Ft. Rucker, AL, extends through mission type training at Ft. Huachuca, AZ, and comes to rest at the unit where individual skills are maintained. It is complex, fragmented, and diversified. A SEMA pilot must be able to integrate aircraft, mission, ASE, air-defense, and navigation systems and procedures concurrently during combat missions.

Planning must incorporate airspace management, mission profiles, threat factors, air defense protection, and weather. Inflight techniques, tactics, and procedures, coupled with a comprehensive understanding of the threat, C^2 system, and on-board defensive equipment are **basic** prerequisites for combat survivability. Peacetime training must be balanced with daily "real world" missions in order to maintain combat ready crews. Commanders and trainers at all levels must accept the responsibility for providing this training. They must also share the blame for not providing necessary time, ranges and **emphasis.** Many attempts have been made at all levels in regards to survivability training of SEMA crews, however: *much more is needed!*

3. Warplans and procedures. Perhaps one of the most confusing and difficult issues concerning fighting and "surviving" during the Airland Battle is understanding how to operate as a joint team. SEMA missions are planned, coordinated, and flown in airspace controlled and defended by the Air Force. SEMA crews must understand how to enter and operate in this environment to survive so they can accomplish their mission. An understanding of the philosophical differences between how the Army and Air Force operates is imperative if SEMA aviators expect to transition between the two systems.

The Army fights a highly decentralized battle calling for independent actions and initiatives from its leaders. The Air Force fights a highly centralized battle delineating specific tactics, techniques and procedures in order to maximize its weapons systems. This concept generally prevails throughout the execution phase. However, if one reviews how concepts and doctrine evolve, one sees just the opposite philosophy.

Sharing the airspace

The Army centralizes its concepts and doctrine development through TRADOC for Army-wide application, while the Air Force decentralizes development of tactics and procedures to theater commands (exception being basic pilot training). This basic difference has caused considerable confusion in planning and executing SEMA missions. Further confusion occurs when U.S. forces combine procedures with our NATO allies. SEMA missions, therefore, have to be totally integrated into the joint or combined airspace, air defense networks, and warplans.

Lack of understanding or confusion of service differences must be overcome by all players. Warplans must be reviewed routinely in detail to incorporate SEMA unique airspace and protection requirements. Once this has been done, procedures and plans should be exercised and refined during scheduled joint and combined exercises.

4. J-SEAD (Joint Suppression of Enemy Air Defenses). While contributing to the total war effort, J-SEAD is critical to the survivability of both Army and Air Force aircraft in combat. The detail

and emphasis placed on J-SEAD operations cannot be overstated. It will allow all elements of Army and Air Force to more freely operate and successfully perform their specific missions. This is especially true for SEMA operations. J-SEAD operations destroy or disrupt enemy air defenses through several different types of operations.

The most complex and massive J-SEAD operation is the J-SEAD campaign. It's primary objectives are to protect both Army and Air Force standoff RSTA, EW, C^3, and support assets. J-SEAD campaigns involve massive support, planning, and attack systems.

J-SEAD Objectives

The J-SEAD operation which SEMA operations should most routinely integrate into mission planning is the localized type. Primary objectives of localized J-SEAD operations include protection of friendly aircraft conducting air operations, ensuring freedom of operation at low and medium altitudes, and protecting friendly aircraft traversing the FLOT. These types of operations are much smaller in scale and are confined to specific geographical areas that are associated with specific ground targets. It is here that mission planning and coordination by SEMA crews takes on true significance. Knowing the enemy and neutralizing his air defense threat should be at the top of pre-flight planning.

Integrated SEMA ASE

The concerns and questions about whether SEMA systems can survive in combat are all valid. Discussions on these and all weapons systems should continue so as to better understand the risk, deficiencies and actions that can be taken to increase survivability in combat.

There is not one specific piece of ASE, no single tactic, or one specific plan that will ensure survivability of any weapons system in combat. Survivability is achieved through a combination of integrated systems which include hardware, training, planning, and joint operations. Only through these combined efforts can preservation of these irreplaceable resources be heightened.

The big question of survivability is answered only when all the elements discussed are working collectively and understood by all the players involved in SEMA operations. IIIII

COMING IN "ARMY AVIATION"

DECEMBER 31, 1986

Articles tentatively scheduled for next month's issue include reports from the:

- Aeronatical Services Office
- Avionics R & D Activity (AVRADA)
- AO - Office of the Surgeon General
- HELLFIRE Missile PMO
- TSM for Scout Helicopters
- Aviation Branch Historian
- No Tail Rotor (NOTAR) Office at MDHC
- Office of Congressional Liaison (OCLL)
- Aviation Brigade — 1st Infantry Div.
- 3rd Squadron, 6th Cavalry (Ft. Hood)
- 82d Aviation Brigade
- AO - III Corps
- 1st SOCOM/Task Force 160
- Directorate of Engineering (AVSCOM)
- Dir. of Product Assurance (AVSCOM)
- Western ARNG Aviation Training Site
- U.S. Army Safety Center
- U.S. Army Aviation Board
- U.S. Army MILPERCEN (OPMD)

JANUARY 31, 1987

A Special issue dedicated to the ongoing development and acquisition efforts of the Light Helicopter Experimental (LHX) Program. Reports will come from the Program Manager, as well from Senior Army officicals. Articles will concern various sub-systems to be incorporated in the LHX.

The issue will contain Field Reports from:

- AO - USAREUR
- 4th Squadron, 7th Cavalry (ROK)
- 6th Cavalry Brigade (Ft. Hood)
- Operational Test & Evaluation Agency
- U.S. Army Aviation in the Sinai

SEMA ASE Integration: The story continues

by CPT Thomas S. Biang

THE SEMA survivability story continues! As the Operational Test Branch Chief for aviation related tests at the U.S. Army Intelligence and Security Board at Ft. Huachuca, AZ, I am responsible for the Special Electronic Mission Aircraft Aircraft Survivability Equipment (SEMA ASE) Force Development Testing and Experimentation (FDTE) Phase III test.

The role of the test is to collect data to assess what doctrine, tactics, and ASE can be used to provide the greatest margin of survivability for SEMA aircraft.

The SEMA ASE FDTE Phase III is the first test to utilize a complete ASE Suite mounted on each of the six SEMA mission equipped aircraft. Included in the ASE Suite are the:

- **AN/APR-39 (V) 2 Radar Warning Receiver**
- **AN/APR-44 Radar Warning Receiver**
- **AN/ALQ-136 Pulse Radar Jammer**
- **AN/ALQ-144 Infrared Jammer**
- **AN/ALQ-156 Missile Detector**
- **M-130 Chaff Flare Dispenser**
- **AN/ALQ-162 Continuous Wave Jammer**

and a combination of infrared suppressors and paint.

The FDTE Phase III begins with pretest measurements, using an anechoic chamber and computer based maneuver simulation, followed by actual flight testing against radar and infrared threats. The concept is to assemble not only systems and aircraft but to develop an integrated test plan that will examine current doctrine, threats, ASE effectiveness and what we can do to increase survivability.

CPT Biang is the Operation Test Branch Chief for the U.S. Army Intelligence and Security Board at Ft. Huachuca, AZ.

To further explain the FDTE Phase III, we must explain the maneuver simulation, or pretest measurements, and its important role in developing the future world of SEMA survivability.

The integration of the maneuver simulation into the FDTE Phase III test plan requires a mission essential electromagnetic functional compatibility study which simultaneously interfaces with the digital one-on-one maneuver simulation and analysis program.

The anechoic chamber

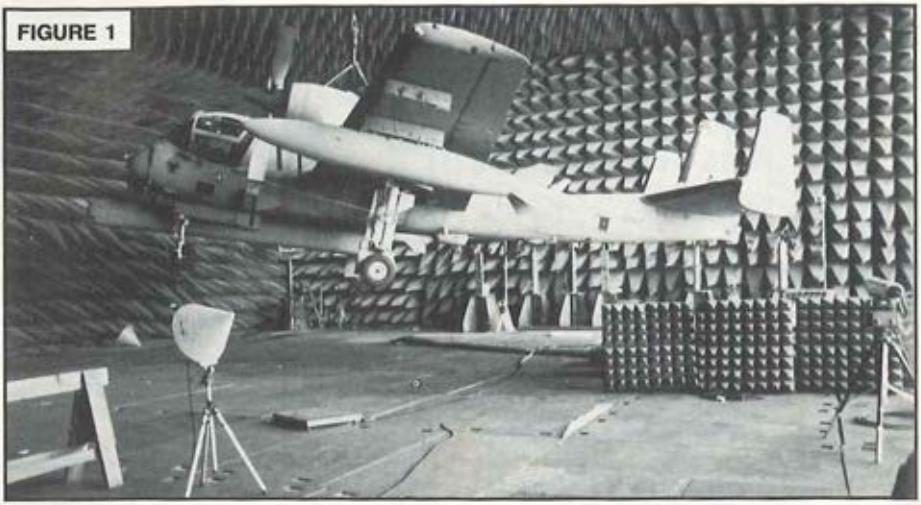
Electromagnetic compatibility testing requires a totally controlled environment which is found in an Anechoic Chamber **(See Figure 1).**

The chamber allows the tester to develop a source-victim test scenario by totally controlling the environment around the aircraft. He is then able to determine interactions between ASE, aircraft equipment, and mission equipment. Determined from chamber testing are: interactions with other aircraft equipment, extent of blockages caused by aircraft appendages, functional problems, system losses, and the degree of degradation to performance of each system.

The chamber can also be set up to portray a one-on-many threat scenario in a low, medium, or high density threat environment. In this environment, system function priorities versus mission timelines can be assessed where interactions occur. Measured electromagnetic emissions, priorities and timelines, and changes in ASE performance measured in the chamber will be a key part of the maneuver simulation. The total integration approach will help to portray true mission performance of each SEMA aircraft.

The maneuver simulation model and analysis program provide digital one-on-one maneuver simulation and analysis in a doctrinal multi-threat

FIGURE 1



environment which will also be representative of the test range configuration. A maneuver strategy of threat engagements using maneuver only, ASE only, and maneuver plus ASE will be used to assess which tactics best enhance survivability. Doctrinal maneuvers will also be flown in the simulation to assess the current degree of survivability.

Three math model considerations make the maneuver perform. They include six major areas of input. They are: missile aerodynamic characteristics, doctrinal mission profile, aircraft aerodynamic characteristics, pilot strategy (a combination of doctrine and simulation learned), ASE effectiveness data, and existing installation data provided by the anechoic chamber.

Models

The "Ideal" model is designed using production specifications and does not take into account any deficiencies found in the anechoic chamber. This model will not correlate with any threat engagement flight tests.

The "Existing" model is representative of existing aircraft installations and takes into account deficiencies of ASE as installed. With existing deficiencies, this model will correlate to the maneuver only engagement of flight testing.

The most desirable model is the "Mid-model" approach. The "Mid-model" is designed on middle ground between ideal and existing conditions. It takes into account any modifications to ASE before flight testing and provides the greatest flexibility of estimating ASE effectiveness where effectiveness data does not exist. Without a volunteer to fly against a live missile, it becomes difficult at times to document ASE effectiveness. The "Mid-model" will correlate with maneuver and ASE threat engagements of flight testing.

The "Mid-model" is used in a stochastic learning program which allows the maneuver simulation to "get smart" as it develops the optimum strategy **(see Figure 2).** The program learns in three phases.

Phase One is a batch run learning phase designed to create an optimum decision table for enhancing survivability.

Phase Two, statistics phase, uses the learned strategy from phase one and runs a threat situation through thousands of iterations in order to tabulate sufficient statistical data which will be used in studying and determining the best maneuver and electronic countermeasure to use against a particular threat.

The final phase is interactive with phase two and graphically displays the flight path of the threat and aircraft as the scenario unfolds.

The extreme flexibility of this state-of-the-art maneuver simulation allows the user to pick any starting point, use a "canned" maneuver or use the "learned" optimized strategy to search for those aerial tactics which will provide the greatest

margin of survivability.

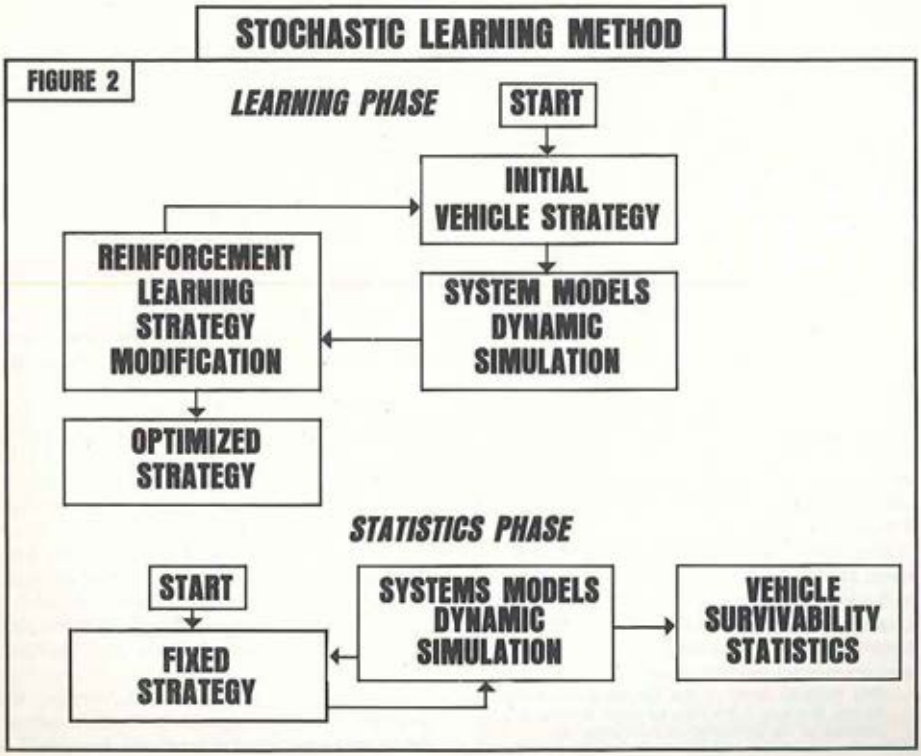
The anechoic chamber and maneuver simulation are just a small part of the integrated SEMA ASE test. It allows substantial cost savings in test range and aircraft flight time and thoroughly exploits the capabilities and limitations of the total SEMA system.

Integrate for success! A bold statement not so easily achieved. As technology of new equipment increases so does the cost of each system; consequently, a fewer number of Engineering Development Models (EDM) are purchased for testing. Monitoring EDMs to ensure all testing is completed becomes even more difficult.

The testing community is designed with checks and balances to ensure a system is completely tested before fielding. The Material Developer is somewhat removed from the Developmental Tester as the Operational Tester is removed from the Developmental Tester. Each of these activities provide critical data for the overall integration of a new system into the Army inventory and their data is critical for independent review boards who make production decisions. Anytime we circumvent this system, the potential for poor quality and integration problems exists.

With the diversity of missions in the Army today, flexibility and application become exceedingly important. We can no longer ignore what the right wing is doing when the left wing is transmitting or receiving. A comprehensive study of compatibility and integration must be completed to ensure success.

If we cannot use each system as designed in times of conflict, and survive, we might as well leave them on the shelf. When completed, the FDTE Phase III will bring the aviator closer to SEMA Survivability: The story continues!!!!!!



Aircraft Survivability Equipment Trainer

by CW4 Perry M. Smith

AVIATION success on the battlefield is equivalent to the combined quality of *aircraft* plus *equipment* plus *aviator training*.

The U.S. Government is equipping today's military with superior aircraft and highly effective Aircraft Survivability Equipment (ASE) for countermeasure purposes. The sophisticated equipment, some of which is very simple to operate, is worthless unless the aircrews employ it properly.

This goes beyond the "ON/OFF" switch. Training must include the operational characteristics, capabilities, and limitations of both the ASE and the threat that aviators expect to encounter on the battlefield. To gain and maintain this expertise requires high quality institutional and sustainment training.

The ASET Program

The systems approach is being used to accomplish training **(See Figure 1).** The Aircraft Survivability Equipment Trainer (ASET) program is a joint effort of USAAVNC and USAAVSCOM. The ASET program consists of: ASET I & II (interactive video disc, desk top trainers), ASET III (on board, inflight trainer), and ASET IV (ground based, air defense simulators).

The user community surfaced an urgent need for a means to train threat and ASE up to the SECRET level. The need was reiterated by a worldwide logistics assessment study conducted in 1984. Due to the time required for production of a system to satisfy this need, an interim solution was found in ASET I. The ASET I is courseware that utilizes the AN/UYK 71 Microfix as its delivery system.

Eighteen Microfix systems have been fielded to flight simulator facilities to support the ASET I program; however, courseware packets have been delivered Army-wide. These packets may be operated on the Military Intelligence Microfix systems on a time sharing basis.

Computerized instruction

The ASET I provides classified instruction via tutorial lessons, test, and scenarios. The program is menu driven to allow the aviator to access only the lessons he/she desires. To reduce security problems and facilitate data updates, the program is based solely on twelve floppy discs and one laser video disc. In addition, each aviator should have an individual data disc. The individual disc will be unclassified and contain only program progress data on the aviator.

Due to time constraints in development of ASET I, the emphasis was directed toward the threat, ASE, and tactics of the AH-1S and OH-58. Even so, a very large percentage of the data is generic and usable throughout the aviation fleet. Furthermore, this system is only an interim trainer; however, it is the Hot Test Bed for the ASET II. Questionnaires are provided with each packet. Shortcomings of ASET I should be pointed out to USAAVNC to be corrected on courseware updates and development of ASET II.

The ASET II program is scheduled for fielding in the fourth quarter of FY 88. It too will be an individual desk top trainer. The ASET II

CW4 Perry M. Smith is the Aircraft Survivability System Manager in the Directorate of Training and Doctrine at the USAAVNC at Ft. Rucker, AL.

will utilize the Electronics Information Delivery System (EIDS) microcomputer as its delivery vehicle. The EIDS designated for the ASET II program will be Tempest hardened.

These systems are to be fielded down to unit level with the sole purpose of supporting ASET II. This will provide greater accessibility and availability than the ASET I.

The instruction of the ASET II will address all aircraft and missions, to include SEMA. USAAVNC has conducted an Army-wide survey to determine from the user what should be incorporated in the program. As with the ASET I program, the ASET II will also be menu driven to allow for lesson tailoring by the individual.

The ASET II program promises to be a superb trainer since most of the shortcomings noted on ASET I will be corrected. The ASET II also calls for a gaming mode which will allow for more interface by the aviator. The technical capability of today's computers will be maximized to provide as near an optimum trainer as possible.

The ASET III devices will allow for individual training of threat and ASE during flight, thus implementing lessons learned from ASET I & II. This will provide the arena for task loading of the aviator by requiring him/her to perform the mission, fly the aircraft, and evade/defeat the threat.

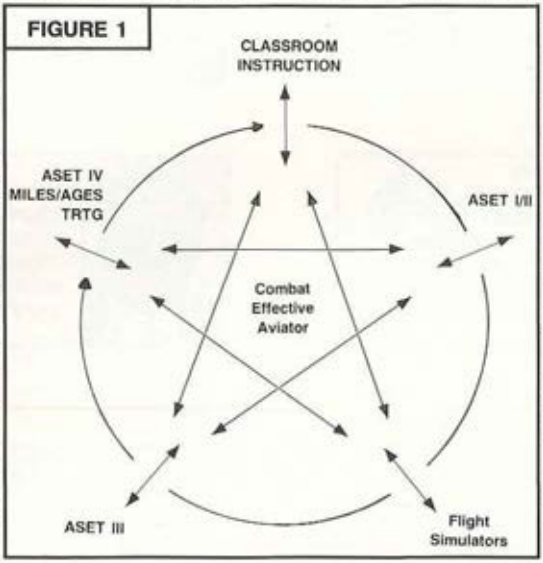
The hand held, on board ASET III will be a user friendly device. The device will interface with the actual aircraft ASE. The instructor pilot or unit trainer will be able to program the system prior to flight. During flight, activation may be initiated, held, or cancelled by pressing a single button. Fielding of the device is scheduled for third quarter FY 88.

The ground based threat devices, ASET IV, will simulate an actual radar, infrared, and ballistic threat environment. The devices will be fielded in module packages. Each module will replicate an air defense battery. The systems will activate ASE and can be realistically defeated if proper countermeasures are employed.

In addition, through the integration of MILES/AGES or compatible system, real time "kill or be killed" will be simulated. Mobility of the ASET IV will be realistic to that of the system being simulated. These capabilities will provide force-on-force, collective team training.

The materiel development of ASET IV is a joint effort between AVSCOM and the Missile and Space Intelligence Center (MSIC). Fielding is scheduled in FY 89 with modules being distributed to major training centers and installations that have a high density of aviation assets.

FIGURE 1



The Tactical Radar Threat Generator (TRTG), formerly known as GRETA, is the forerunner to the ASET IV program. Nine TRTGs have been fielded in CONUS and Europe. The TRTG is a mobile radar emitter that will activate the ASE installed on the aircraft.

These systems have video cameras boresighted with the radar to provide aircraft position and activities along with the status of the TRTG radar. This film is used to conduct After Action Reviews (AAR).

ASE training has spread beyond the ASET parameters. ASE has been integrated into most of the Army's flight simulators. In addition, the probability of hit/kill (ph/pk) is being incorporated into future MILES/AGES. All of the ASE programs should interface and complement each other. Training is currently the weakest link in the ASE arena and must be improved to produce a combat effective aviator. IIIII

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Awards and Honors

AWARDS

AAAA CHAPTER—SELECTED "AVIATION SOLDIER / NCO OF THE MONTH"

SEPTEMBER 1986 —

Aviation Center Chapter
SGT Bradley L. Seltzer (NCO)
PFC Jane M. Rawlings (Soldier)

Hanau Chapter
SP4 David W. Heitkamp

Taunus Chapter
PFC Sonia E. Thomas

Thunderhorse Chapter
PFC Philip H. Clarke

OCTOBER 1986 —

Thunderhorse Chapter
PFC Joseph R. Carapezza

HONORS

U.S. ARMY AVIATION CENTER FT. RUCKER, ALABAMA

★ Distinguished Graduate
+ Honor Graduate

SEPT. 29, 1986 — Guest Speaker: COL John P. Kennedy, TRADOC System Manager, APACHE Attack Helicopter Fort Rucker, Alabama.

Officer RW Aviator Course Class 86-12: ★ 2LT Eric H. Hauser; + 2LTs William R. Robinson, II, Michael A. Huss, Susan E. Espy, Jerry O. Perry.

Warrant Officer RW Aviator Class 86-11: ★ WO Vincent E. Rollman; + WOs David L. Oakley, Lon C. Washburn, Paul J. Melanson, Troy A. Beshears.

OCT. 10, 1986 — Guest Speaker: BG William C. Page, Jr., Dir. of Operations Plans, and Mobilization, ODCSOPS, HQ USAFORSCOM, Ft. McPherson, GA.

Officer RW Aviator Course Class 86-14: ★ 1LTs Anthony D. Shaffer, Abdullah E. Al-Tuawyyawi; + 2LTs James A. Cranmer, Barry K. Clements, Scott M. Fitzgerald, Timothy S. Damico.

Warrant Officer RW Aviator Class 86-13: ★ WO Robert S. Russell; + WO David S. Muzio.

OCT. 10, 1986 — Guest Speaker: COL Charles L. Webb, Dep. Cdr., for Admin. USA Aeromedical Ctr, Ft. Rucker, Ala.

Aviation WO Senior Course Class 86-9: ★ CW2 Richard R. Wells; + CW2 Terry P. Key.

Unit Logo not yet approved by the Institute of Heraldry

82d AVIATION BRIGADE ACTIVATION

Activation of the 82d Aviation Brigade will take place on 15 January 1987 on the Main Post Parade Field of Fort Bragg, N.C. The ceremony will include the inactivation of the 82d Combat Aviation Battalion.

Any persons previously affiliated with any aspect of the aviation units within the 82d Airborne Division are invited to participate in this event.

Additionally, the establishment of an 82d Aviation Historical Society is underway. The Society is soliciting any information, photos, and memorabilia on any 82d Aviation element.

For further information: contact action officer, MAJ Samuel Massenberg at: (919) 396-9435/6; or Autovon: 236-9435/6.

Or write: Commander, 82d Aviation Brigade ATTN: S-3, Ft. Bragg, N.C. 28307-5100.

Aviation Medicine

The School of Aviation Medicine: Aeromedical Training

FT. RUCKER, AL — The U. S. Army School of Aviation Medicine (USASAM) was established on 1 October 1984, when it became a branch school of the Academy of Health Sciences (AHS).

Prior to that time the Department of Education and Training, U.S. Army Aeromedical Activity (USAAMA) had the mission of aeromedical training.

Although the name has changed over the years, USASAM's mission has remained constant: Providing the best aviation medicine and aeromedical training programs to U.S. Army Aviation personnel.

Located in the U.S. Army Aeromedical Center (USAAMC) complex at Ft. Rucker, AL, USASAM trains approximately 5,800 students and provides in excess of 10,300 hours of classroom instruction each year.

Aeromedical subjects are contained in 23 U.S. Army Aviation Center (USAAVNC) programs-of-instruction emphasizing the vital role that aeromedical training plays in aircrew training.

USASAM facilities include three multi-media classrooms, a unique night vision room, and a chamber room containing both altitude and dive chambers. During FY 85 more than 330 Hypobaric (altitude) and Hyperbaric (dive) chamber flights were conducted familiarizing 3,035 students with the dangers and limitations of man in the aviation environment.

USASAM is also the proponent for two Army Medical Department (AMEDD) programs-of-instruction: the Army Flight Surgeon Primary Course and the Flight Medical Aidman Course.

The Flight Surgeon Primary Course is a seven week course taught three times per year for Medical Corps officers and Physician Assistants assigned to be unit level flight surgeons.

The course prepares them to deal with medical concerns unique to the aviation environment to include physiological training, preventive medicine, and clinical aviation medicine. The students also receive 15 hours of hands-on rotary wing flight training in the TH-55 helicopter. This course is also available to National Guard, Army Reserve, and allied medical officers.

A Report by Colonel Jose G. Garcia

The Flight Medical Aidman Course is a four week program designed to teach medics with divergent backgrounds how to function as an air ambulance aidman. The students receive classroom instruction as well as hands-on medical and rescue training in both the UH-1 and UH-60 helicopters. The course is offered four times per year with 39 students in each class.

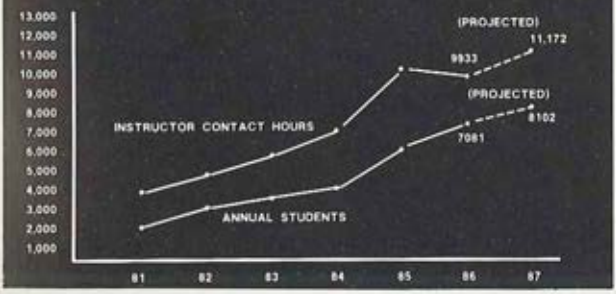
The course is open to active duty, National Guard, and Army Reserve enlisted personnel with the 91A and 91B MOS in the grades E3 through E6.

USASAM has also taken on the new and exciting mission of hyperbaric medicine. Ceremonies to dedicate the first hyperbaric (dive) chamber to be installed in an Army medical treatment facility were conducted on 3 March 1986. Initially,

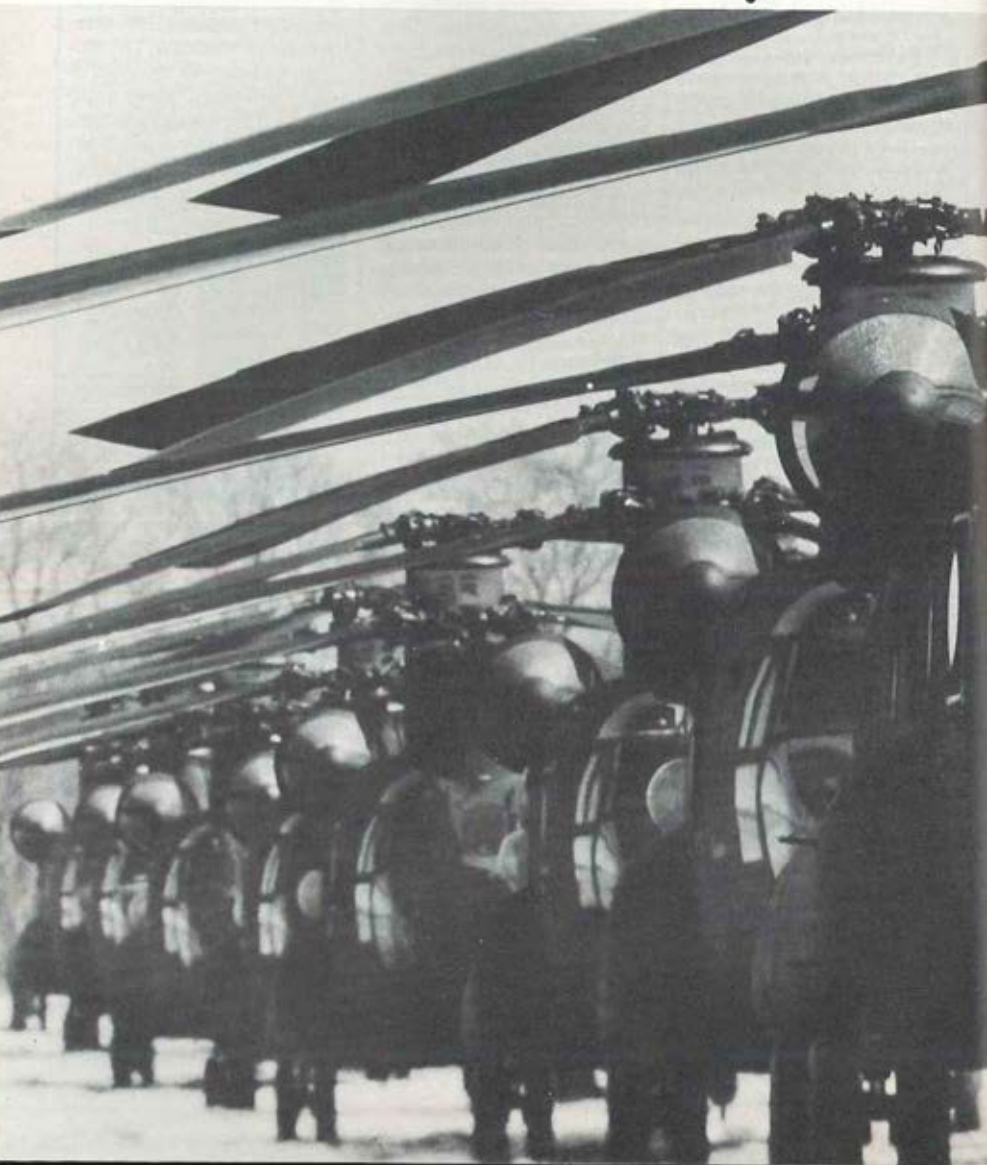
(USASAM — Cont. on P. 54)

USASAM

GROWTH OF USASAM SUPPORT TO ARMY AVIATION



BUY SEVEN, GET



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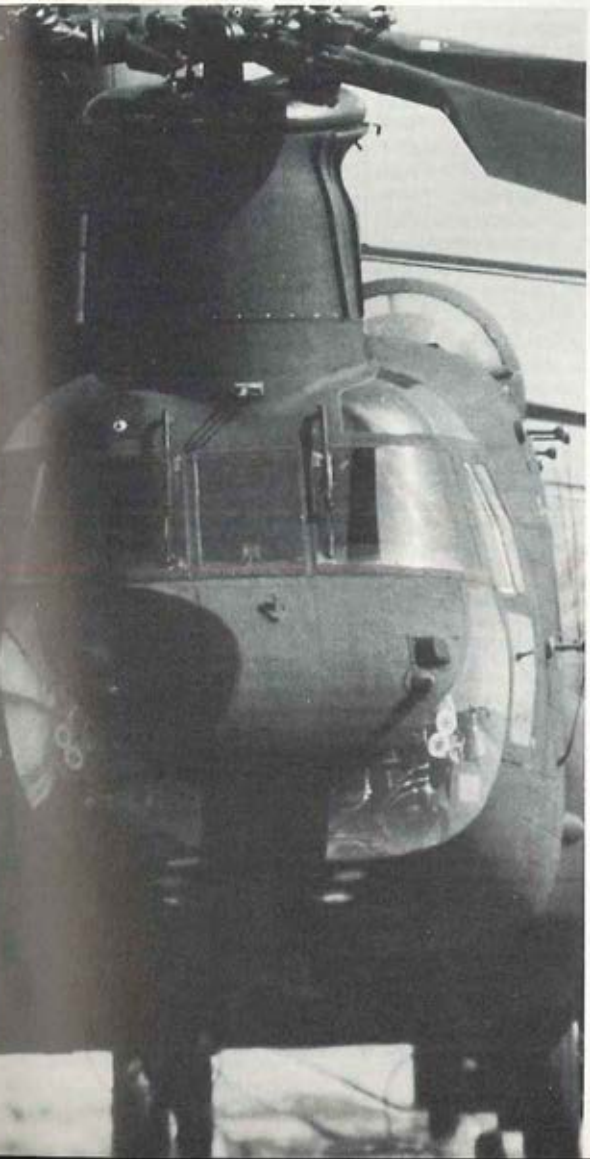


That's the kind of savings that Congress' and the U.S. Army's Multi-Year Procurement (MYP) has made possible for the U.S. taxpayer. Because the Army's five-year contract to modernize 240 CH-47D Chinooks has cut production costs by the equivalent of 32 helicopters. For every seven modernized Chinooks the Army pays for, it gets one, in effect, free.

The Army's current five-year Chinook MYP contract is saving American taxpayers more than $123,000,000. MYP has proven itself as a cost-effective way for Boeing and its nationwide network of 328 subcontractors to produce better-performing, longer-lasting helicopters.

Chinook D Multi-Year Procurement. When it comes to investing the taxpayers' dollars, it's one smart buy.

Boeing Vertol Company, P.O. Box 16858, Philadelphia, PA 19142.

BOEING

Hardware

SEMA-PMO: Putting the focus solely on the airframe

ST. LOUIS, MO — The past 18 months have brought substantial changes to the Special Electronic Mission Aircraft (SEMA) Office and for some SEMA programs.

A most significant change is the restructuring within AMC of the management of intelligence and electronic warfare. The PMO for Intelligence Electronic Warfare (PM-IEW) is now a functioning organization in the Communications Electronics Command (CECOM) with the overall mission of developing and fielding IEW systems, both ground and airborne.

The role of PM-SEMA and the Aviation Systems Command is now to provide and support the airborne platforms which carry the mission gear. This new organization is maturing into a structure that will allow PM-SEMA to do what it can do best — focus on the airframe.

A Report by Lieutenant Colonel (P) Larry D. Holcomb

We currently have major efforts ongoing for three of our many systems; the OV-1/RV-1 MOHAWK, the EH-60 QUICK FIX and the RC-12 GUARDRAIL/COMMON SENSOR.

• **OV-1/RV-1 MOHAWK:** 1986 has been a year of focusing on supportability and extended life for the MOHAWK. We will have inducted 18 MOHAWKs into the overhaul program at the Grumman depot facility in Stuart, FL, this year, and plan on 20 for 1987. These overhauls, commonly called PAR (Programmed Aircraft Restoration) are absolutely essential to assure that we are flying safe reliable aircraft.

In addition to the PAR, the Army has recently entered into a contract with Grumman Aircraft Systems (GAS) to build a prototype of a block-improved OV-1 that has such enhancements as the Sperry Control and Display System (CDS) and other improvements which will allow the MOHAWK to remain supportable from the standpoint of avionics into the 21st Century.

RC-12D

• **EH-60 QUICK FIX:** Production has begun on the EH-60 QUICK FIX aircraft with BLACK HAWKs which have been specially modified to accommodate the electronic warfare mission gear.

The aircraft are delivered to Flight Systems Incorporated (FSI) in Mojave, CA, a subsidiary of TRACOR of Austin, TX, which builds the mission package. FSI integrates the mission package and the aircraft survivability equipment (ASE) onto the airframes. Fielding is planned for Fiscal Year 1988.

• **GUARDRAIL/COMMON SENSOR:** There is presently fabrication and test work going on to produce RC-12 aircraft by the Beech Aircraft Corporation, Wichita, KS, for the GUARDRAIL Program which also incorporates the ELINT function associated with the RV-1 MOHAWK and the Communications High Accuracy Airborne Location System. This system is placed on a specially modified Beechcraft C-12 aircraft and integrated by ESL Corporation, Sunnyvale, CA. Integration of the airframe and mission equipment started in October 1986 at Moffett Field, CA. Deliveries of this system are planned for Fiscal Year 1989.

The SEMA PMO is looking to the future by participating in the requirements definition process for the SEMA follow-on aircraft. Our comments on the Draft ROC and O&O for the SEMA follow-on aircraft were submitted to the U.S. Army Aviation Center on Sept. 1, 1986. All this keeps the SEMA Team fully employed in providing our best effort to support the requirements and the readiness of the Army in the field.

—LTC (P) Larry D. Holcomb
Product Manager, Special Electronic Mission Aircraft

More news from the SEMA-PMO: MOHAWKS goin' round the world!

ST. LOUIS, MO. — Part of the Army's aging fleet of MOHAWK aircraft were recently in danger of being grounded unless they could be flown to the Grumman Aircraft Systems Division, Stuart, FL (the Army's OV-1 "Depot Facility") before October 1, 1986.

Simple? Not quite! These MOHAWKs are the "eyes and ears of the corps", and are located in all the major theatres. They are also in short supply. Since the units were actively engaged in intelligence collection, replacement aircraft had to be flown to the unit site and classified intelligence collection systems (or "Black Boxes"), had to be transferred before they could be moved.

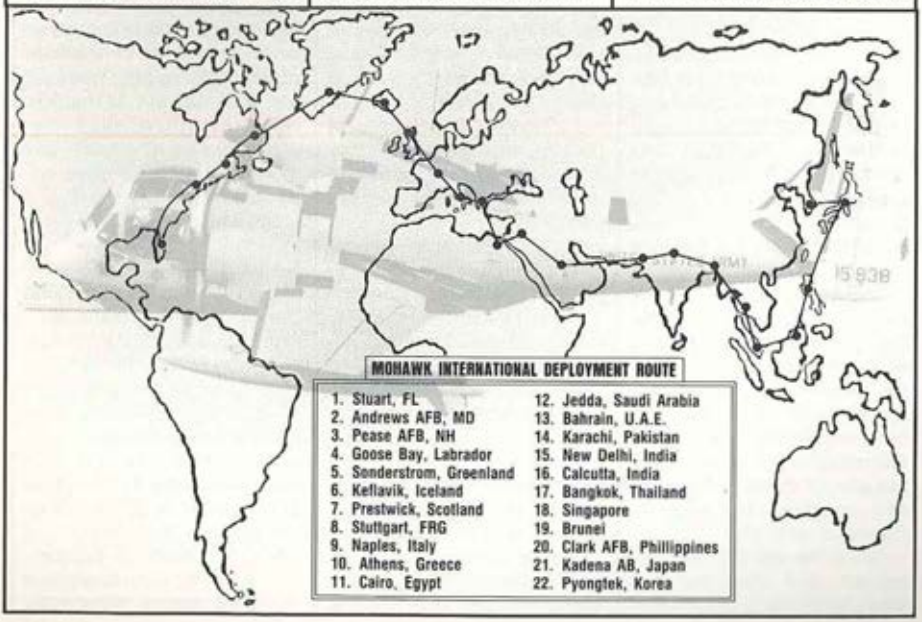
The alternative was to ground the aircraft at the unit and return them by some other means. That probably meant a major disassembly and shipboard movement at high personnel and dollar cost.

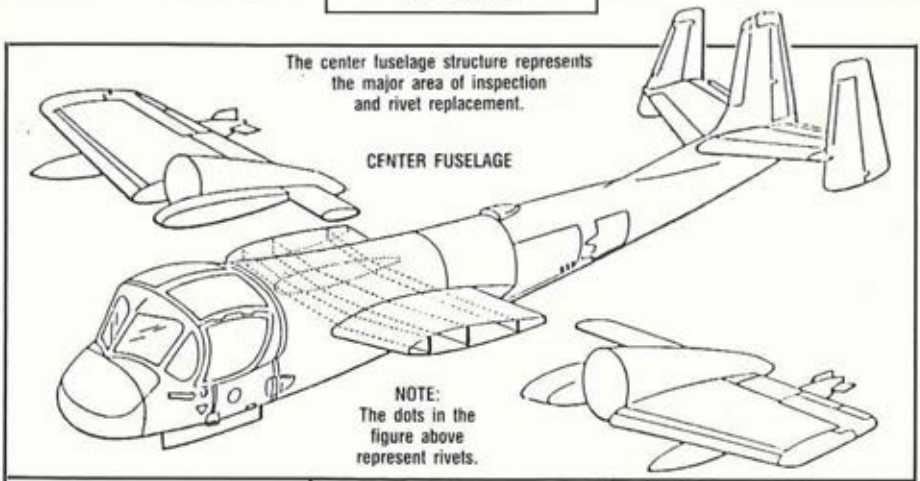
The reason for the movement was that in February of this year, as part of the Flight Safety Parts Program, the Army leadership decided that certain MOHAWK aircraft should be returned to depot for special fatigue inspectino and overhaul. They didn't waste any time in doing so because some the the improvements were considered to be safety related and safety is always a major consideration.

The MOHAWK has been around since the late 1950s. In Vietnam it was flown in support of more missions than the original design envisioned.

A Report by Lt. Colonel Joseph D. Buchheit

It was such a versatile aircraft that the Army attached various items on the wing stations (extra fuel tanks, electronic flashers for night photography and aircraft survivability equipment) in an attempt to "get more bang for the buck." Because of all these mis-





sions and various systems carried on board for many years, the Army decided to do a fatigue study as to how all that weight had affected the airframe structure.

The study was integrated into the Flight Safety Parts Program and it recommended that 18 specific aircraft be returned to the depot. The study had found, through the use of analytical models, that those specific 18 aircraft had a high probability for stress corrision in the rivet areas.

The fatigue inspection and overhaul at Grumman's Florida Depot would include a replacement of almost 1500 rivets in the center wing section with special fasteners. These new fasteners, installed using a new technological procedure, would actually put stress on the metal and compress the wing — making it stronger.

Since this airframe was designed and manufactured when handriveting was the production line method, now each rivet has to be hand removed and each individual hole electronically inspected. Quite a job, but well worth the effort considering how expensive a new airframe would be and how long it would take to design and field.

It took some fast shuffling of people and money to get the job started. And it took a lot of hard work and really complex coordination by the Special Electronic Mission Aircraft (SEMA) Product Manager's office to bring it off.

From Headquarters in St. Louis, where SEMA is an element of the U.S. Army Aviation Systems Command (AVSCOM), the clock started and personnel from aerial exploitation battalions around the world began the race that *had* to succeed.

They had seven months to do it. That may sound like a long time to someone who is not familiar with the logistics and contracting labyrinth that had to be conquered. Actually, it's a short time to round up crews, prepare aircraft for overseas transfer, get all the flight clearances through the friendly countries who grant us landing rights, let contracts to accomplish the new workload and then make it all happen. But we did it! The SEMA community moved 47 aircraft, flew more than 400,000 miles, assembled over 124 crews and made it happen by September 29, 1986.

How it was actually done will most likely be told in "War stories", after duty hours, in all of the familiar MOHAWK hangouts worldwide. The fact is a huge "Attaboy!" is deserved by all who participated in what many skeptics said was an impossible task. But obviously those people didn't know about the MOHAWK/SEMA Community! *Now they do!!*

— *LTC Joseph D. Bucheit*
Asst. PM, Communications Intell. Aircraft, SEMA-PMO

The COBRA-PMO: Bringing composite blades to the field

ST. LOUIS, MO. — In the mid-70s, an improved main rotor blade was developed for the AH-1 helicopter under the guidance of the COBRA Program Manager's Office, U.S. Army Aviation Systems Command, St. Louis, Missouri.

The new blade was designed to provide improved performance, better survivability, reduced detectability, and field repairability. Various changes to the original design have been incorporated to improve the operation and maintainability of the rotor blade in service.

Currently, there are three configurations of the blade in service: the -205, the -209, and the -303.

The -205 configuration added a retention system for the blade inertia weight. The -209 configuration replaced the leading edge erosion guard with a more durable material.

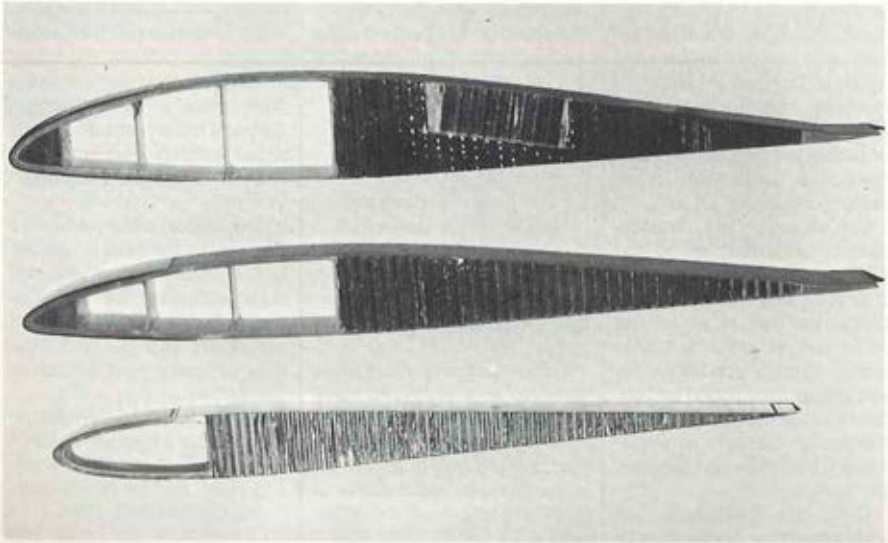
The -303 configuration was introduced to eliminate water intrusion and further improve the erosion guard by adding a removable stainless steel guard on the outboard leading edge. The -303 configuration has solved many of the problems previously detected, such as water intrusion and erosion due to sand and rain.

Field experience with all three configurations has shown improved aircraft performance, better maintainability, greatly enhanced survivabiility, and field repairability.

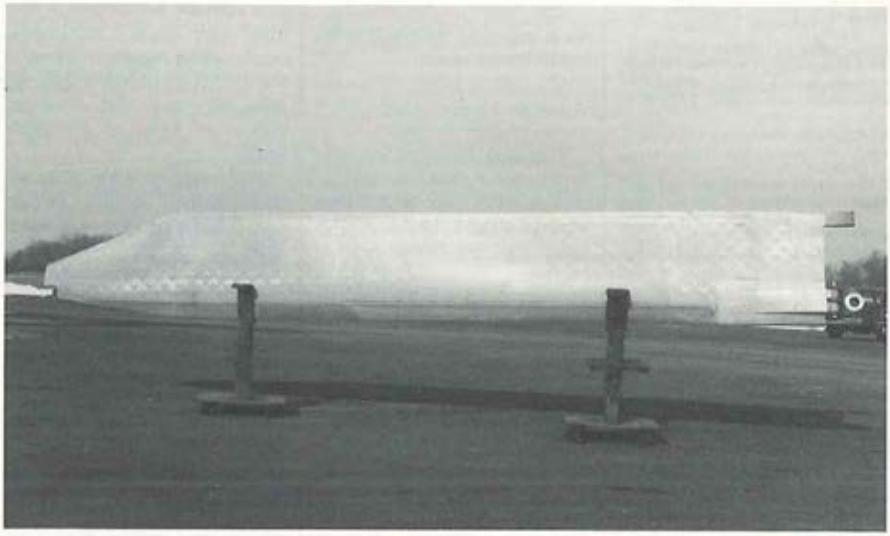
A more reliable and repairable main rotor blades has been an Army goal for years. The **Kaman Aerospace** K747 main rotor blade's composite design **(See Figure 1 below),** incorporates not only improved reliability, but also a high degree of repair at the retail level.

The leading edge erosion guard can be repaired in the field (including the stainless steel tip guard). There are repair kits for skin patches, skin/core plug patches, and the trailing edge spline can be repaired in the field.

Following repairs, the blades are rebalanced using adjustable trim weights by following detailed instructions in the manual. These features have proven invaluable in keeping the blades



BELOW: Cross sections of the K747 blade in both the 12% airfoil area (top section), the 8% airfoil section (middle), and a section of the 540 blade that the K747 replaced.



in service, in spite of field problems that have occurred.

As composite rotor blades achieve wider service use and acceptance, their true effectiveness and benefits to the user will be recognized. Inherent differences from metal blades, which are often seen as defects or problem areas, are actually composite blade advantages designed into the blade.

For example, the "basketweave" skin texture of the K747 blade, **(Figure 2, above)**, is an important factor in limiting ballistic damage. However, this same texture, which is visible under certain conditions, is sometimes questioned by field operating personnel who are trained to carefully examine metal blade skins for the smallest anomaly.

Once the differences are understood, the advantages of composite blades will become apparent.

Presently, over 2,000 blades have been manufactured for the COBRA fleet with the remaining 800 metal blades in the field to be replaced on an attrition basis.

Colonel John N. Bertlekamp

Dissemination of information, effective and continuing training, and getting the word to the people who repair blades in the field will further demonstrate advantages in repairability of the composite over the metal blade.

ABOVE: A Kaman Aerospace Corporation unpainted K747 composite main COBRA rotor blade is shown with its skin basketweave.

To disseminate such information, the COBRA PM office, in conjunction with **Kaman Aerospace**, is spearheading a damage assesment and blade repair training program worldwide. This program will begin in FY87.

The field experience to date has shown the safety, reliability and repairability benefits that the composite offer and supports the movement toward composite rotor blades for the fleet of rotary wing aircraft in the Army.

—COL John N. Bertelkamp
Project Manager, COBRA
& LTC Gerald L. Purcell,
Asst. PM for Readiness
COBRA-PMO, USA-
AVSCOM, St. Louis, MO

KAMAN Composite Rotor Blades Give Army Helicopters A Fighting Edge

With These Advantages

- HIGH PERFORMANCE
- LOW DETECTABILITY
- DURABILITY IN NOE
- FIELD REPAIRABILITY
- LOW LIFE CYCLE COST
- EXTENDED FATIGUE LIFE
- BALLISTIC SURVIVABILITY

Continuing Technology Development For Future Rotor Blade Requirements

KAMAN AEROSPACE CORPORATION

OLD WINDSOR ROAD, BLOOMFIELD, CONNECTICUT 06002

The V-22 Project Manager's Office opens at AVSCOM

ST. LOUIS, MO — The Army V-22 OSPREY Program passed a major milestone in September 1986 with the designation of **COL Michael B. Howe** as the dual Project Manager for CH-47D and Army V-22 Aircraft Programs.

COL Howe now has the additional responsibility of managing the materiel acquisition of 231 MV-22A (Marine Corps version) tiltrotor aircraft for the Army. The tri-service V-22 is under the executive service leadership of the U.S. Navy with total DOD procurement expected to be 913 aircraft.

The program entered Full Scale Development (FSD) following the successful Defense Systems Acquisition Review Council (DSARC) II milestone on April 17, 1986.

Fixed price incentive award contracts for the 7-year FSD phase were signed May 2, 1986, with Bell-Boeing, the airframe manufacturer team, and Allison Gas Turbine for the engines, for a total of $1.74 billion.

Army V-22 and CH-47 Mod PM: Colonel Michael B. Howe

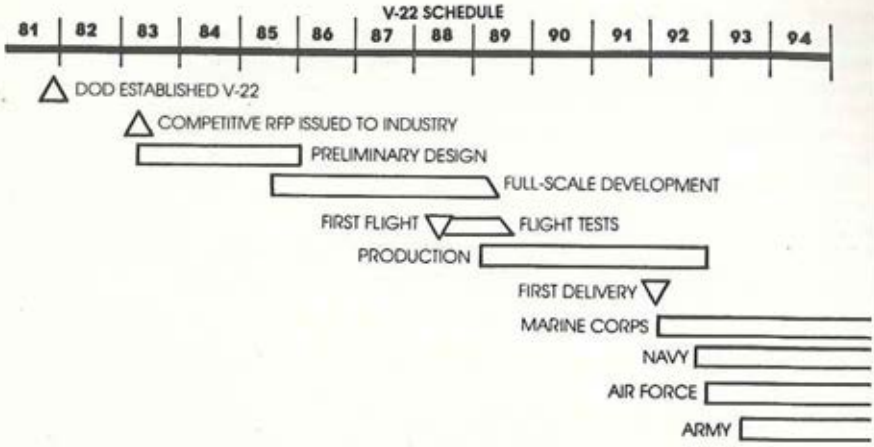
Six flight test prototypes and three nonflyable test articles are to be built.

Developmental testing will be conducted by a multiservice test team with representatives from all services. First flight of a prototype is scheduled for June 1988, followed by three years of extensive engineering and operational testing.

Army program objectives are to monitor aircraft development, qualification, jointly participate in FSD testing, and develop an integrated logistical support package.

Several significant accomplishments have been met through the combined, dedicated efforts of the U.S. Army Aviation Systems Command (AVSCOM), the U.S. Army Aviation Center (USAAVNC) and the U.S. Army Aviation Logistics School (USAALS).

BELOW: Artist's conception of the V-22 in action. OPPOSITE PAGE, TOP: The DOD established delivery schedule for the V-22. OPPOSITE, BOTTOM: The V-22 folded for storage.

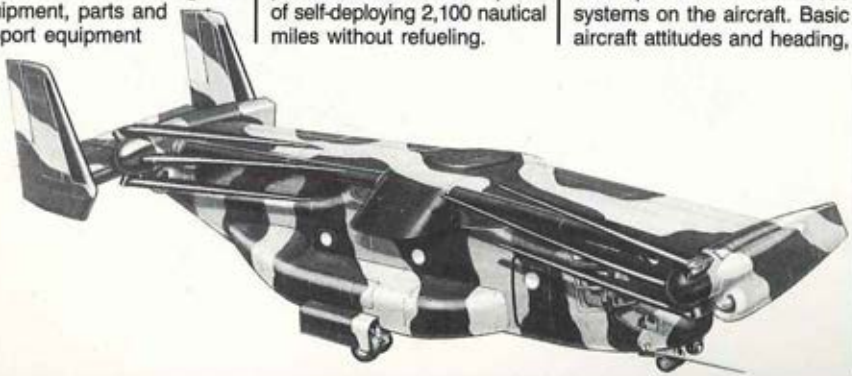


The Operational and Organizational (O&O) Plan and updated Joint Services Operational Requirement (JSOR) are expected final approval in October 1986. Supportability of the Marine V-22 within the Army is being addressed by an Army-wide Integrated Logistics Support Management Team (ILSMT). This team has the challenge of insuring that the areas of trainers, training, test equipment, parts and support equipment meets the needs of the Army.

Operationally, the V-22 will be employed at the Corps level to augment existing CH-47D and UH-60 aircraft throughout the entire battlefield. Its sustained airspeed of 250 knots, long range and internal/external cargo capability, are well suited for the missions of special operations, medical evacuation, troop (24) and logistical transport. The V-22 will be capable of self-deploying 2,100 nautical miles without refueling.

The first Army V-22 aircraft are scheduled for delivery in late 1994, with the last of the 231 buy arriving in 2001. Several new and key technologies not currently in the Army aviation inventory are incorporated in the OSPREY.

Composites are used extensively in the fuselage, empennage, and wings. Electronics play a major role in the control and operation of numerous systems on the aircraft. Basic aircraft attitudes and heading,



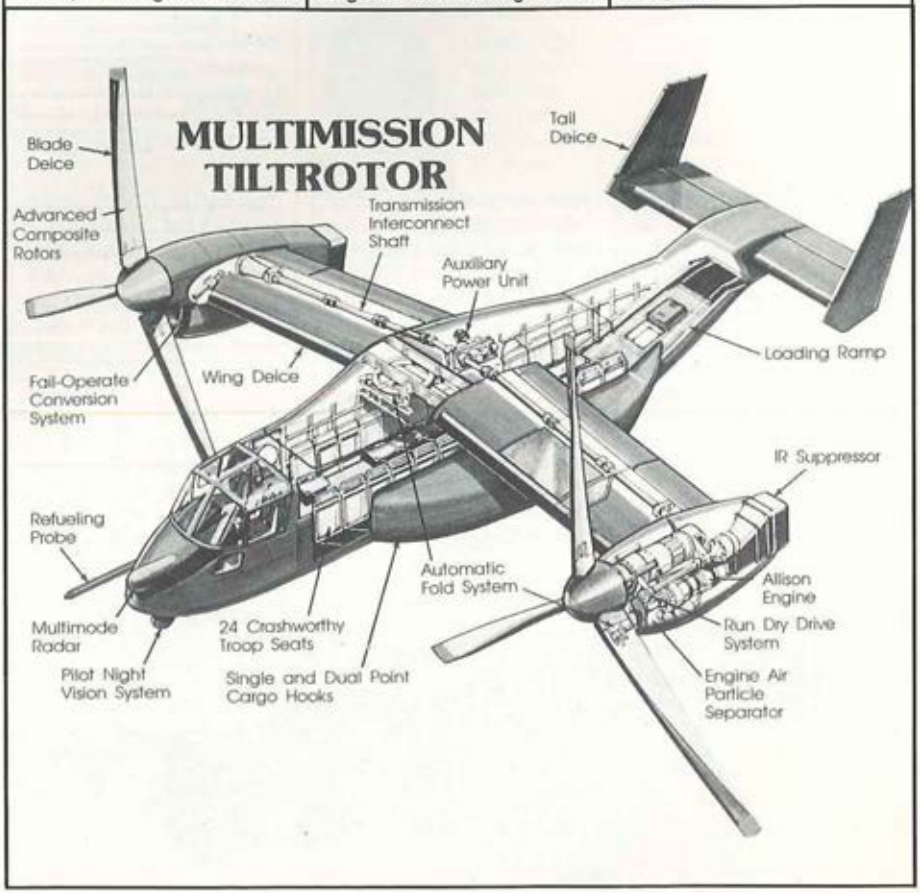
aircraft system parameters, navigational information, checklists, performance, and avionics management are all controlled and displayed to the pilots on four multifunction displays integrated into a 1553 bus.

Electronics also control engine performance through a digital fuel control. The 38-foot diameter proprotors, wing flaperons, and engine nacelle tilt are controlled through a triple redundant fly-by-wire flight control system. Mission effectiveness is enhanced by the nose mounted FLIR (Forward Looking Infrared Radar), air-to-air refueling boom, integral rescue hoist, tandem cargo hooks and helmet mounted display.

The V-22 OSPREY brings to the battlefield versatility that will augment the existing aircraft fleet in a variety of missions. The tiltrotor concept combines the best of two worlds; low speed flight of a helicopter and the speed and range of an airplane.

—MAJ James S. O'Connor
Asst. PM, V-22 Project Manager's Office

BELOW: An exploded view of the V-22 OSPREY, as well as a number of its sub-systems.



Bell-Boeing: The V-22 Team works together to produce a winner

FT. WORTH, TX — The Bell-Boeing MV-22 OSPREY Program is on contract for Full Scale Development.

In May 1986, the unique V-22 OSPREY tiltrotor aircraft passed a major milestone on its way to production when the U.S. Navy placed the team of Bell Helicopter Textron and Boeing Vertol on FSD contract.

Being developed by the Navy for Joint Service use, the OSPREY will provide the Army with a major improvement in Aero Medical Evacuation, high priority Long Range Logistics, and Special Forces Transportation.

A Report by Richard (Dick) F. Spivey

The Bell-Boeing Team has completed over 8,000 hours of wind tunnel tests on eight different models, full scale testing of major wing and fuselage composite structure, and developed flight simulation techniques to help design the state-of-the-art cockpit for night, all-weather operation.

The OSPREY is a 45,000 lb. class tiltrotor with cruise speeds expected to approach 300 knots. It is designed to carry 24 troops plus a crew of three, and to operate vertically from austere sites under combat conditions. It can maneuver rapidly in the zone, yet accelerate to 250 knots in less than 30 seconds.

The V-22 has major survivability features when compared to helicopters, allowing it to operate under combat conditions of chemical, biological, and nuclear warfare. Its tolerance to small arms fire is unsurpassed, and it has a built-in IR suppressor effective both in hover and in forward flight. That same suppressor reduces the temperature under the engine exhausts to eliminate accidental ground fires.

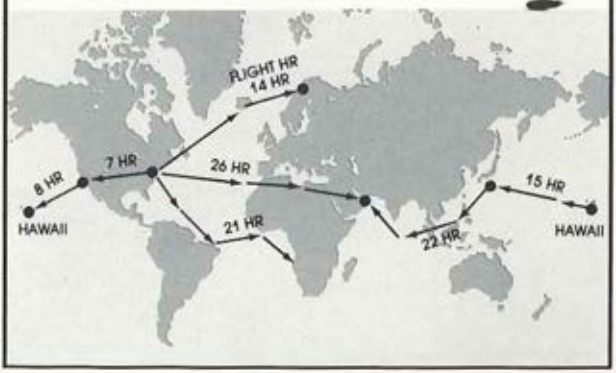
Energy absorbing landing gear and unique crashworthy seats for crew and troops are incorporated to improve survivability in high-sink-rate descents.

The OSPREY's cabin is a spacious six-foot wide, six foot tall, and is 24 feet long with a full width rear loading ramp. Twelve litters can be carried in normal conditions, and 22 in a high-density configuration. It can carry four of the Air Force half-pallets for a nominal 10,000 lb. to 12,000 lb. of payload internally. Up to 15,000 lb. of outsized cargo can be lifted on its two external hooks.

The V-22 can self-deploy to Europe, the Mid East, or Southeast Asia on its own power in a few hours so it doesn't tie up C-5A/B's or C-141 transport aircraft. Once in the theater of operation, the V-22 is ready to fight and doesn't have to be reassembled and test flown to do its job. This capability of rapid response will put our tactical forces into position quickly, minimizing time for enemy force build-up.

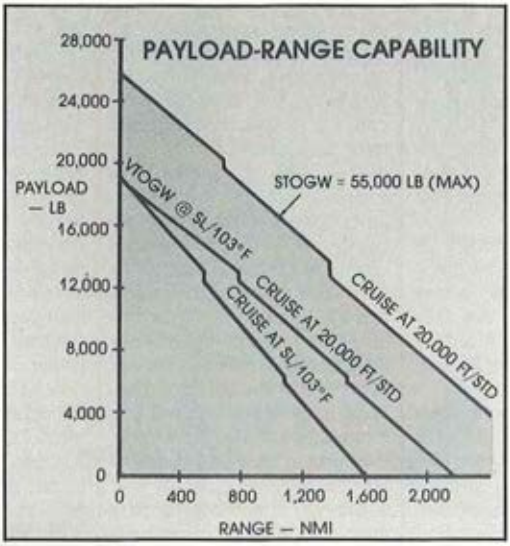
In the MEDEVAC role, the MV-22 will move wounded personnel and medical supplies

WORLDWIDE SELF-DEPLOYABILITY



twice as rapidly around the changing battlefield with smoothness and precision that will save lives, reduce complications, and save resources. The long tactical range of the V-22 (over 600 miles) allows rapid delivery of critically needed supplies from secure locations hundred of miles from the front.

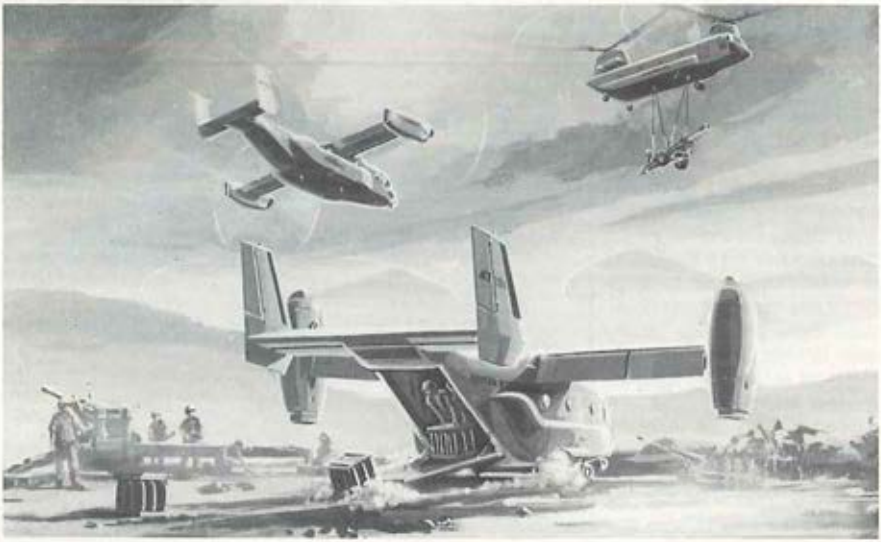
With this combat aircraft, high priority logistics of ammo, food, reinforcements, and medical supplies will be distributed at twice the rate of present systems — at night, in adverse weather, under hostile conditions, and from locations that are far enough from the battle area to allow wholesale delivery vehicles to safely operate.



The U.S. Army MV-22's quickness, readiness and availability, long range, quietness, and survivability will improve the overall effectiveness of the ground forces, allowing them to do their job.

The OSPREY will round out and complement the Army's transportation system of the mid-nineties.

—Dick Spivey, Manager, Business Development, Tilt Rotor Programs Bell Helicopter Textron



International

ALBATROSS X Tri-National Exercise: A First in Europe

STUTTGART, FRG — Multinational operations will be the key to success on the European battlefield. To this end, the 11th Aviation Group, VII Corps, annually participates in Exercise ALBATROSS.

In years past, ALBATROSS has been an interoperability exercise between German and U.S. Aviation units designed to develop standard operating procedures between the two allies. This year, for the first time, French Aviation units participated under the command and control of the 11th Aviation Group.

Participants for the exercise, conducted 2-6 June 1986, included eight units from the three nations. Operating as an Aviation Brigade, the 11th Aviation Group demonstrated its ability to operate as a Maneuver Brigade Headquarters while commanding and controlling a Tri-National Force.

Objectives — ALBATROSS objectives included:

- Develop interoperability relationships.
- Improve knowledge and procedures working in a Tri-National environment.
- Exchange ideas on tactics, equipment, capabilities, etc.
- Cross attach platoon and company elements.
- Exchange personnel to conduct liaison at brigade, battalion, and company level.
- Command and Control Brigade/Battalion tactical operations taking into account language barriers and incompatability of equipment.
- Plan and coordinate service support for all units at the Brigade level to include Class I and III support.
- Train attached infantry units, both U.S. and German, on the employment of aviation assets during airmobile, air assault, and airborne operations in cross-FLOT and rear battle area operations.
- Accomplish all objectives in a safe manner. Safety is paragraph 6 of all VII Corps Operations Orders.

A Report by Lieutenant Colonel Kenneth E. Wilson

Planning, Coordination and Control — Pre-exercise planning and coordination were done by the Group Headquarters. Pre-exercise coordination meetings were held between February and May 1986, between the U.S., German, and French units. The normal coordination required for the execution of an exercise was carried out at these meetings along with discussions of possible interoperability problem areas which might arise.

All such problems were solved with the exception of secure radio capability between the U.S., German, and French units. Due to secure equipment incompatability, all missions were conducted with radios in the unsecure mode. However, U.S. liaison teams equipped with secure FM radios were co-located with the German and French units which allowed pre-mission planning to be conducted in the secure mode.

Deployment and Safety Considerations — Units deployed on Monday, 2 June 1986, and were operational by 1200 hours. The remainder of the day consisted of assembly area preparations and exchange of Liaison officers (LNO's). German and French LNO's were co-located with the 223rd Aviation Battalion.

A key training element during the exercise was the familiarization of all infantry soldiers with the four aircraft types used to conduct tactical missions. This was conducted on day two of the exercise by locating the four types of aircraft in four separate laager areas. The infantry soldiers were then organized into four groups and a "Round Robin" exercise was conducted.

First, the infantry soldiers were given briefings on aircraft capabilities, missions, and safety procedures. Next, they practiced static loading and offloading on the aircraft. Finally, they were given an orientation flight in the aircraft to the next laager area where the process was repeated. In addition, French and German aviators were afforded the opportunity to actually fly at the controls of UH-60 and CH-47 aircraft.

Tactical Scenario — On the evening of 3 June, a U.S. infantry platoon was inserted at last light by UH-60 aircraft to secure and defend an objective area within the ALBATROSS X maneuver box.

The next morning, elements of the German Airborne Battalion performed a cross-FLOT operation utilizing both CH-47 and CH-53 aircraft under the command of the U.S. Army CH-47 company commander to seize the objective held by the U.S. Infantry Platoon.

While the weather did not cooperate to allow the German unit to paradrop as planned, they were air assaulted into the objective area.

An hour later they were reinforced by their own light anti-tank company consisting of 18 KRAKA vehicles (Mules with TOWS). This mission was also executed utilizing CH-53 and CH-47 aircraft, but commanded by the German CH-53 company commander. During this phase, the remainder of the 1-52 Infantry conducted air-mobile training in the UH-60 and French PUMA aircraft.

The final day of the exercise provided the U.S. Infantry Battalion the opportunity to counter attack by air assaulting into the objective area (now held by the Germans) using both UH-60 and PUMA helicopters under the command of the UH-60 company commander. For this mission the French Regimental commander provided one reconaissance company (Gazelle) and one anti-tank company (Gazelle armed with HOT missiles). These aircraft were detached from a French exercise taking place approximately 75 kilometers to the south of the ALBATROSS X maneuver area. These companies were placed under Operational Control (OPCON) of the Task Force 223 commander.

LEFT TOP: U.S. soldiers being briefed on the French PUMA Helicopter. LEFT BOTTOM: German Infantry preparing to load on French helicopters. RIGHT: UH-60 BLACK HAWKs departing on orientation flights. OPPOSITE PAGE: A practice loading of a CH-47.

Planning for the employment of the reconaissance and anti-tank aircraft was done one day prior to execution. It was discovered that the anti-tank companies did not have personnel who were fluent in English, so a French PUMA command and control aircraft was provided with a French LNO to relay orders from the Commander of Task Force 223.

The Gazelles arrived in the area of the landing zone (LZ) ten minutes prior to touchdown of the UH-60 and PUMA flight. They reported the enemy, provided preparatory fires in the LZ, and as the aircraft landed, the Gazelles established a screen to protect the U.S. Infantry Battalion.

Once the Infantry Battalion consolidated, they began their attack to secure the objective from the German Airborne Battalion. The Task Force 223 Commander continued to relay instructions from the Infantry Battalion Commander to the Gazelle through the French command and control aircraft.

When the U.S. Infantry Battalion came within individual weapons engagement range, the tactical portion of the exercise was terminated. The German Airborne Battalion was then transported back to their home station with a mixed flight of CH-53 and CH-47 aircraft. The U.S. Infantry Battalion was transported to their home station in a mixed flight of UH-60 and PUMA aircraft.

ALBATROSS X demonstrated that U.S., German, and French operations can be conducted successfully under combat conditions. The major lesson learned from the exercise was that the incompatability of secure FM radio equipment is a major stumbling block to conducting secure tactical operations; however, this obstacle can be overcome by equipping LNO's with secure equipment and placing them in key locations to include the air mission commanders' aircraft.

ALBATROSS X paved the way for establishing a formal partnership between elements of the 11th Aviation Group and the 2nd Regiment Helicopter de Combat. The 11th Aviation Group and subordinate units already have a formal partnership established with Heeresfliegerkommando II and its units.

It was an outstanding Tri-National exercise and one in which all objectives were met and indeed surpassed. American, German, and French Aviation units have developed a better understanding of each other's tactics, capabilities, and operating procedures.

Based on the outstanding success of ALBATROSS X, the French have agreed to participate in ALBATROSS on an annual basis and to host the exercise in 1988. This is a significant step in European aviation interoperability programs. ALBATROSS exercises have become a valuable tool in helping to establish aviation doctrine not only for U.S. Army Aviation but for Allied aviation operations as well.

—LTC Kenneth E. Wilson
Former Cdr, 223rd Avn Bn

First BLACK HAWKs come to the Corpus Christi Army Depot

CORPUS CHRISTI, TX — On 1 October 1986, a very significant event took place in the life of the Corpus Christi Army Depot (CCAD) — a new era began with the induction of the first UH-60A BLACK HAWK into the depot's overhaul/repair program. This event represented the first new aviation weapons system inducted into CCAD in over 15 years.

As stated by William A. Minter, Vice President, BLACK HAWK Program, Sikorsky Aircraft Division, UTC, and guest speaker at the induction ceremony, "Army Aviation readiness is markedly enhanced now that the Army has organic depot level support for the BLACK HAWK."

Preparing for the BLACK HAWK took three very busy and demanding years of work on the part of the depot team. Through the depot's Force Modernization Office (FMU) headed by Mr. Joe Guzman, the CCAD staff developed a strategy that coordinated the efforts of many elements.

This included the depot itself, as well as the BLACK HAWK Program Manager in AVSCOM, the Depot Maintenance Plant Equipment Office in DESCOM, and the UH-60 Program Office at Sikorsky.

Working with these key players, essential issues like special tools, training, military construction requirements, funds, and test equipment were effectively addressed and action plans formulated.

The most difficult aspect of CCAD's induction program was the pulling together of each critical element (people, training, equipment, funds, etc.). It was a well orchestrated plan that ensured that trained people with sufficient tools and equipment were properly prepared for the 1 October target date.

Obviously, this was not the time for second-guessing or prevarication when executing and reporting on the progress of the induction plan. Staying on the milestone schedule proved to be more difficult than expected. During the entire exercise the commitment to be ready by 1 October was never in question.

A Report by Colonel Thomas M. Walker

There were numerous lessons learned during the execution phase of the depot plan. Some issues developed which no one was prepared to address. Four lessons warrant special mention:

- Exact program requirements for the overhaul/repair of components, engines, and airframes must be established early on in the planning phase — then stick to them. Requirements, quite frankly, must drive the system.
- Once requirements have been determined, every effort should be made to expedite the approval of funds for use in obtaining technical data and special tools/equipment. The best laid plans will soon come unravelled if funds aren't obtained on schedule.
- Establish a well balanced personnel training program and by all means don't compromise it, even at the risk of losing ground in other important operational areas. In the case of the depot, losing ground may mean a reduction in existing workload. In layman's terms, make training a top priority.
- Keep all players informed. At best, the depot was on an unrealistic time schedule and misinformation did at times create unwanted delays.

The new era has brought with it several new facilities along with some advanced technology for the depot. This modernization will markedly upgrade CCAD's capacity and capability for both the UH-60 and older helicopter systems. CCAD is still the Army's principal facility for the overhaul of the UH-1, AH-1, and OH-58 helicopters. Some examples of the new capability are:

- Advanced Transmission Test Facility.
- Rotor Blade Repair Facility.
- Blade Whirltower Test Facility.
- Laser cutter and marker systems.
- Upgraded engine test cells.
- Advanced airframe align-

(CCAD — Cont. on Page 54)

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Operations

Task Force Phoenix: A new provisional Aviation Battalion

KATTERBACH, FRG — In a Division Ceremony on 17 April 1986, the 501st Aviation Battalion (Combat) was deactivated and provided the nucleus for the activation of the 4th Brigade, 1st Armored Division.

The companies of the 501st changed as follows: Co A to the 244th Command Aviation Company (CAC), Co B to the 501st Attack Helicopter Battalion (AHB), Co C to the 10th AHB, Co D (AVIM) to the 61st Avn Maintenance Co, and Co E to the 220th Assault Helicopter Company (AHC). In short, the 501st became an Army of Excellence (AOE) Aviation Brigade.

All of the Brigade's units are located at Ansbach Army Heliport in Katterbach, with the exception of the 10th AHB which is at Stock Barracks, Illesheim.

In order to solve the dilemma of lack of command and control for the AHC and CAC, a provisional battalion, referred to as Task Force Phoenix, has been formed. All assets which form TF Phoenix came from within the two separate companies. TF Phoenix is presently composed of a Headquarters Company with a normal battalion staff, the CAC, the AHC and a Force Aviation Maintenance Company (FAMC) created from the maintenance platoons of the two separate companies.

The aircraft assigned to the Brigade include OH-58Cs, UH-1Hs, UH-60s, and AH-1Fs (fully modernized COBRAS) with PIPs consisting of laser range finders, IR and radar jammers. Our ground support equipment is continually being upgraded and replaced.

Our COBRA fleet will be exchanged with AH-64s beginning with the 10th AHB in early 1988 and followed by the 501st AHB in early 1989.

The Ansbach Army Heliport airfield is being completely renovated, with a new four point, high pressure, hot refueling system is being added. A new hangar is being constructed next to the 501st AHB hangar on the west end of the active. It will be occupied by the 10th AHB when they return from Ft. Hood with APACHEs in 1st Qtr FY89.

A Report by Lieutenant Colonel Gregory T. Johnson

The 1st Squadron, 1st Cavalry was assigned to the Brigade on July 11, 1986. It is currently organized as a H-Series Cavalry Squadron and will begin forming as a 2 x 2 AOE Squadron when the 10th AHB stands down in February 1988. We're extremely happy to have the CAV on board and are planning some great combined arms training with them.

We're currently in the throes of reorganization,; determining relationships and responsibilities, rewriting SOPs, and trying to figure out how to make the organization function effectively. We thought it would be easy, but instead have found it to be an intellectually stimulating and challenging undertaking.

Since our activation in April we've been involved in ARTEP support, aerial gunnery, NVG training, border qualification and other ancillary things. Right now we are involved in aerial gunnery with the two attack battalions at Grafenwohr. With the ability to fire on Range 118 comes the capability to accurately and objectively evaluate the attack helicopter firing and the attack crews' interaction with their scout teams.

We are also winding up our flying hour program which consisted of 6000+ COBRA hours and almost 10,000 OH-58 hours contributing to a total program of over 24,000 accident free flying hours.

In maintenance we are working hard to reach the point where we can support our flying hour program while still meeting the DA standards for aircraft availability. The aging helicopter fleet, coupled with an unresponsive repair parts system, thin TOEs, and understrength units make reaching DA standards seem like a monumental task — but we are getting there.

All is well in the IRON EAGLE BRIGADE and we are moving at flank speed in training, maintaining, caring, and leading to keep aviation in the forefront of the 1st Tank.

—LTC Gregory T. Johnson
Commander, 501st AHB

Training

Advanced Warrant Officer Courses: The Result of Evolution

FT. RUCKER, AL — The Warrant Officer (WO) education program is keeping pace for the Army of tomorrow.

A WO is "an officer appointed by warrant by the Secretary of the Army based on a sound level of technical and tactical competence. The WO is a highly specialzed expert and trainer who, by gaining progressive levels of expertise and leadership, operates, maintains, administers, and manages the Army's equipment, support activities or technical systems for an entire career."

The role for WOs has challenged the Army to meet the educational needs of WOs for their progressive levels of expertise and leadership. The Warrant Officer Senior Course (WOSC), which began in 1973, has met the needs of the WO as the capstone course for the professional development of all WOs regardless of their MOS. Evolution has brought us to the present pre-Warrant Officer Master Course (MWOC).

As a result of the HQDA study in 1967, DA began both intermediate and advanced courses for WO specialties Army-wide. However, due to the low densities of some MOSs, the Army could not justify separate intermediate and advanced courses for each MOS.

In 1973, the Army evaluated the Aviation Warrant Officer Advanced Course (AWOAC) for the purpose of modifying the course to meet the requirements for the WOSC. The result of the evaluation was that HQDA directed Continental Army Command (CONARC) to modify the existing warrant officer courses to establish a single level warrant officer professional development course, using as a base the AWOAC, and to retitle it the Warrant Officer Senior Course.

With TRADOC and CONARC direction, in January 1974, the Aviation Center redesigned the courses and the intermediate course became the Warrant Officer Advanced Course (WOAC) and remained aviation oriented. The AWOAC lost its aviation identity and became the WOSC without aviation oriented subjects.

A Report by Colonel George C. Hollowedel

The first WOSC curriculum consisted of 856 hours on a variety of subjects. Subjects ranged from Management courses to Leadership, Military Justice, Automated Data processing, Military Arts, Medical Support in Combat Operations, Effective Speaking and Writing, CBR Operations and Nuclear Weapons. In addition, 20 hours of college credits through elective studies were conducted through a separate contract (no cost to students) with local universities.

The course changed in 1982 to a non-tested curricula and emphasized individual research and group work-study assignments. When the course was again restructured in 1984, the elective classes were dropped.

The WOSC was 22 weeks and required a PCS move to Ft. Rucker in 1974, but by June 1986 the course was shortened to a concentrated TDY study program of 10 weeks.

In 1984, resident course dates increased to 10 times per year with single section classes. A new class began approximately every five weeks. Six classes will be filled during FY 86; the projection for 1987 is seven classes.

We are now able to begin the MWOC as described by the Total Warrant Officer Study (TWOS) by making a few changes to the concentrated WOSC program. We need only minor revisions to the program of instruction (POI) to establish the MWOC.

By 1988, we project that the MWOC will be structured like CAS^3 with both a non-resident requirement done prior to arrival at Ft. Rucker, and the resident requirement. The resident requirement will be a revised WOSC concentrating on upper staff and supervision skills. Follow-on job specific training will be conducted after the resident portion.

A very small percentage (7-10%) are offered the opportunity to attend the course that provides senior WOs with an

understanding of the organization and functions of the Army, joint and combined commands, and to broaden their intellectual depth and managerial ability.

Warrant officers are usually selected to attend the WOSC between the 7th and 15th year of service. This applies to the active duty and reserve component officers Additional prerequisities are:

- the WO must be serving in the grade of CW3 and not on a promotion list to CW4;
- or he/she must be in the grade CW2 and on a promotion list for advancement to CW3.

Active duty warrant officers incur an obligated service time of two years. Selection for attendance at the WOSC is made by a selection board which meets annually. The selection system identifies the WO best qualified to attend the WOSC by virtue of his potential value to the Army and his ability to absorb and profit from the educational experience.

The Army White Paper 1986 recognizes that a universal soldier value is competence or skill. The professional Army ethic demands of its members specialized knowledge and skills. The Warrant Officer Training System is striving to provide the senior warrant officers the specialized knowledge and skills necessary to meet the challenges of their role in the Army of tomorrow.

Their competence in the myriad areas of expertise represented in each WOSC will directly relate to success on the combined arms battlefield. The increased complexity of our weapons and other systems demands a high level of proficiency on the part of our highly specialized experts and trainers.

What has not increased, however, is the time available for training. I challenge our select few senior warrant officers to accept the challenges offered by the Army of tomorrow. Use the materials taught in WOSC as seeds of knowledge to be sown and cultivated to maintain an Army of Excellence.

—COL Geo. C. Hollowedel
Dir., Dept. of Combined Arms Tactics, USAAVNC

TRADOC Aviation: It's not just a "Mom and Pop" operation anymore

FT. MONROE, VA — In the minds of some people, the thought of aviation within the Training and Doctrine Command (TRADOC) conjures up a picture of the small "mom and pop" flight operation; the place where old Army aviators go to fly the staff officers in fixed and rotary wing aircraft.

But that's only a small part of the TRADOC Aviation story. Excellence in aviation begins at TRADOC.

TRADOC aviation is multifaceted with functions which extend from the MACOM headquarters at Ft. Monroe, VA; through the aviation schools at Forts Rucker, Eustis, and Huachuca to the individual flight detachments at 14 TRADOC installations.

Within the Headquarters at Ft. Monroe, aviation staff actions are processed by the:

- Aviation Directorate and Director of Logistics, DCS for Personnel, Administration, and Logistics (DCSPAL);
- Aviation Combat Development Directorate and Test and Evaluation Directorate, DCS for Combat Development (DCSCD);
- Officer and Enlisted Training Directorates, and Program and Resource Directorate, DCS for Training (DCST);
- and the Combat Directorate, DCS for Doctrine (DOSDOC).

The Aviation Director in DCSPAL functions as the MACOM Aviation Officer and the coordinating office for aviation safety matters, flying hours, aircraft distribution, standardization, and Air Traffic Control (ATC) functions. Additionally, this office conducts the Aviation Resource Management Surveys (ARMS) for all TRADOC installations with aviation assets, and the U.S. Military Academy at West Point.

ARMS have also been accomplished for Information Systems Command and Readiness Command, at the request of these MACOMs. These surveys are conducted on a 12-18 month recurring cycle. The DCSPAL Director of Logistics manages the aviation maintenance program and supply issues. These issues include the Safety of Flight (SOF) program, Quality Deficiency Report (QDR) program, the

Aviation Intensive Management Items (AIMI) program and the Interservice Support Installation Area Coordination (AR 5-9) program.

There are two aviation offices in DCSCD that have major responsibilities for the future development and acquisition of all aviation related equipment. The Aviation Combat Development Directorate manages all current and proposed aviation equipment in the system. Additionally, they process all product improvement programs (PIPs).

An example of one major PIP managed by this office is the AHIP. The Test and Evaluation Directorate within DCSCD organizes and coordinates operational test activities to support the development of aviation material, doctrine and training.

The Officer and Enlisted Training Directorates in DCST monitor and approve all aviation training policies and procedures at the Army Aviation School at Ft. Rucker, AL, the Aviation Logistics School at Ft. Eustis, VA, and the Intelligence School at Ft. Huachuca, AZ. Aviation funding for both base operations and mission training is managed by the DCST Program and Resource Directorate.

The Aviation Office within the Combat Directorate, DCSDOC, works toward developing aviation concepts, tactics, techniques, and procedures (TTPs) which are necessary for the effective employment of Army Aviation on the Airland Battlefield. This office also interfaces with the Air Force and other services on the development of joint doctrine and TTPs which affect Army Aviation.

There are over 830 aircraft throughout TRADOC, ranging from TH-55 primary helicopter trainers to C-12 multi-engine, pressurized airplanes, to the new systems being fielded in our modernization efforts, such as the CH-47Ds, OH-58Ds, UH-60s, and AH-64s. The LHX and V-22 aircraft are being developed now and will be fielded in the mid 1990s.

Colonel J. Dave Carothers

The majority of these aircraft are located at the aviation training bases and are utilized for student training. However, there are 14 TRADOC installations which have flight detachments with the administrative mission of providing aviation support to their command group and installations. This support ranges from flying the staff to providing a rappelling platform for the Ranger training camp.

The primary aviation consideration at TRADOC is safety. The TRADOC Commander is committed to safety and has emphasized that "Safety is a Command Responsibility."

This command emphasis created the safety attitude which promulgated TRADOC's impressive aviation safety statistic. Since FY 83, through June 1986, TRADOC has flown 29% of the total Army-wide flying hours while experiencing only 7% of the Army's Class A accidents. These figures equate to 1,682,444 hours flown with only 11 Class A accidents.

So, for those who consider TRADOC aviation a "mom and pop" operation, it's time to expand your horizons.

—COL J. Dave Carothers & MAJ Ronnie R. Pruette HQ, TRADOC

Changes at AVSCOM

The U.S. Army Aviation Systems Command (AVSCOM) in St. Louis, MO, has announced that Ronald Gormont has been named the new Director of Product Assurance. The former Director, Edward Hollman, moves to the AVSCOM Safety Office.

In addition, the CH-47 Modernization Office has been redesignated the CH-47 Modernization/Army V-22 Aircraft Programs Project Manager's Office (Provisional), with COL Michael Howe as a dual PM (see Page 40).

The Weapons Systems Manager's Office for the UH-1 has been redesignated the UH-1 Product Manager's Office (Provisional), and it still headed by LTC Donald Foster.

A new office has been added, the Integrated Procurement System Office. It has been tasked with automating the acquisition process to a fully electronic environment. Its new file symbol will be AMSAV-9, and it is headed by Ms. Marcella Young.

AVSCOM has changed Secretaries of the General Staff. LTC John J. Zepko takes over for LTC Joe N. Calhoun who has been reassigned to Ft. Bragg, N.C.

FORSCOM (Continued)

capability of the aircrew or their equipment. Safety does not have to be, nor can it be, sacrificed to provide realistic challenges. Our purpose is to achieve unity and proficiency by becoming an integral part of the overall AirLand combat capability. Integrated training is essential to developing a whole-force team effort.

We must resist any drift toward seeming to become a separate air corps. Our ground battle captains must have the opportunity to work with and understand the capabilities and potential contributions of their aviation team members.

As we meet these challenges with our quality personnel and equipment, Army Aviation will truly be a full-fledged member of the combined arms team on high-intensity battlefields and a key element of the light forces in low-intensity conflicts. On the basis of these achievements, Army Aviators will enter the next century as proud, professional soldiers in the Army of Excellence. IIIII

USASAM (Continued)

the chamber will be used to treat decompression sickness. In the past, such cases were referred to the Navy in Panama City, FL for treatment.

There is a growing list of medical problems for which hyperbaric oxygen therapy is recognized as an accepted or adjunct treatment. This will eventually lead to USASAM also assuming a clinical hyperbaric treatment mission.

Any questions concerning USASAM may be directed to the Operations Division at AV 558-7460/7467.

—COL Jose G. Garcia, MC
Dean, USASAM
Ft. Rucker, Alabama

CCAD (Continued)

ment fixtures designed and constructed by CCAD personnel.

Modernization of CCAD to support the UH-60 is just the beginning of things to come. Following on the heels of the BLACK HAWK are the CH-47D, OH-58D, and AH-64, all of which will require depot level support. CCAD has already implemented plans for the CH-47D, which is scheduled for induction in late FY 88.

The new era brings with it many great challenges to the depot support structure. CCAD ushers in this era with the full belief that their role in support of these advanced systems is vital to our Army.

The BLACK HAWK is only the start of what promises to be a bright future for the Army's only aeronautical depot.

—COL Thomas M. Walker
Commander, Corpus Christi Army Depot

ASE-PM (Continued)

targets for engagement by the attack aircraft or other fire control means.

The ASE Project Office is acting as an Assistant Project Manager to **BG (P) Ronald K. Andreson,** the LHX Project Manager. Research and developmental support are being provided to support the LHX by EW/RSTA, NVL, ARDTA, AVRADA, and other activities.

In this role, the ASE Project Office is participating with writing of the Request for Proposal, the requirements documents and risk reduction efforts. Direct coordination is being made with the electronic warfare contractors working to support the two major LHX developmental teams.

Our goal is to insure that appropriate survivability features and equipment are built into the design to support operations from 1995 through 2020.

The electronic warfare firms which bring protection technology from programs such as the B-1 Bomber, the F-15, ASPJ and INEWS are to be complimented for their initiative and resourcefulness. The lead firms are rounding out their development teams and performing tradeoff analysis as they develop their proposals for LHX that emphasize contractor furnished equipment.

The ASE Project Office has grown from 1970 into a multifaceted office that has programs in practically all phases of the acquisition cycle. The fieldings of large numbers of ASE items to numerous locations are opening new areas of responsibility for commanders as well as in the training and maintenance of the ASE systems. We must figure out how to build and maintain our fighting capabilities enhanced by ASE. Meanwhile, the ASE office will continue its support of the LHX program to build the most mission capable and survivable aircraft for the future.IIIII

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SULLIVENT, Ernest E.
7 Lost Cove
Newport News, VA 23606
THOMPSON, Barry C.
P.O. Box 33348
Fort Sill, OK 73503
ULSH, Gregory J.
128th Avn Co
APO SF 96208
UZELAC, Peter J.
HHC, 158th Avn Bn
Ft Campbell, KY 42223
VAN ATTA, William D.
295-D Clemwood Parkway
Hampton, VA 23669
WELCH, Dianne E.
P.O. Box 1820
Magnolia, AR 71753
WHITE, Anthony R.
HHC, 11th Avn Bn
APO NY 09457
WIECKS, Thomas W.
106 Harrison Drive
Daleville, AL 36322
YANCEY, Hershel D.
1448-B Werner Park
Ft. Campbell, KY 42223
YURICK, Jeffrey S.
P.O. Box 5369
Fort Hood, TX 76544

1st Lieutenants

ADAMS, Lawson O.
363 Cooper Cem. Road
Leesville, LA 71446
BAKER, Melvin B.
2013 Werner Park
Fort Campbell, KY 42223
DODSON, Michael K.
338 Wooddale Droad
Clarksville, TN 37042
EAKIN, Daniel R.
946 Edgecliff Drive
Langley, WA 98260
FAILOR, James L.
630 Linda Lane
Clarksville, TN 37042
GREENWELL, James C.
145 B.W. Concord Dr.
Clarksville, TN 37040
HALE, Brett M.
B Co. 2nd Avn Bn
APO SF 96224
HINAMAN, Arthur
338 Woodale Dr
Clarksville, TN 37042

About to move? See the change of address form on Page 57 – Page 55

1st Lieutenants

HUDDLESTON, Michael
HHD, 52nd Cbt Avn Bn
APO SF 96301
HUMPHREY, David
2001-A Werner Pk
Fort Campbell, KY 42223
HUMPHREY, Michael G.
7601 Ort Way
North Highlands, CA 95660
JOHANSSON, Brian
539 Rose Hill Dr
Clarksville, TN 37043
MARASCHIELLO, Michael F.
10 Markham Street
Fort Bragg, NC 28307
MORROW, Kim M.
420 G Rico St
Salinas, CA 93970
QUINONES, Carlos
1518A Werner Pk
Ft. Campbell, KY 42223
SCHLOSSER, Andrew H.
1411-B Werner Pk
Fort Campbell, KY 42223
SCHONSHECK, Kathleen K.
16 Quail Forest Drive
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SOUSA, Thomas J. Jr.
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Fort Rucker, AL 36362
TRULL, Wesley S.
Beel Subdivision 6B
Oak Grove, KY 42262
WHITE, Howard R.
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WILLS, Michael D.
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Hopkinsville, KY 42240

2nd Lieutenants

ADAMS, Reginald
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BLACKBURN, Joseph W.
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BOLINT, Steven
219 Morningside Dr
Clarksville, TN 37040
BURKE, Paul
1312 Rice Avenue
Calonsville, MD 21228
CRANMER, James A.
3125 Brandywine Road
Wichita, KS 67210
DINGAS, Gregory E.
2115 Coach
Killeen, TX 76543
DURHAM, Kris E.
213 Marshall Drive
Clarksville, TN 37042
EVANS, Samuel S.
RD 1, Box 82
Hooversville, PA 15936
FITZGERALD, Scott M.
18 Gary Avenue
Taylors, SC 29687
HAGER, Jay
501E 4th Street
Spencerville, OH 45887
HINES, Joe M.
R Trp, 4th Sqdn, 11 ACR
APO NY 09146
LILLY, Douglas D.
660 Faw Road
Helena, MT 59601
MOORE, Chris
Rio Grande College, Box 984
Rio Grande, OH 45674
ROBERTSON, James
1341-B Werner Pk
Ft Campbell, KY 42223
WOLF, Wilbur E.
100 Dixie Drive, #3
Enterprise, AL 36330

CW4s

CAIN, Gregory L.
472 Turner Loop
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GARVEY, Philip H.
Hqs, Cmd Fll Det, SHAPE
APO NY 09055
GREENE, Lorwynn L.
N Trp, 4/11 ACR, Box 167
APO NY 09146
HARLOR, Donald R.
5426 Presidio Blvd
Presidio of SF, CA 94129
HEUBER, Robert A.
95-191 Aumea Loop
Mililani, HI 96789
MULLENIX, Michael M.
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Austin, TX 78759
STAIGLE, James E.
Route 7, Hazel Drive
Clarksville, TN 37043
STAMSCHROR, Ronald
3507 Hyannis Port Drive
Indianapolis, IN 46214
TOLBERT, Ralph V.
401 Twin Creek, No. 5A
Killeen, TX 76543
VANBRUGGEN, Johannes
437 Helton
Clarksville, TN 37043
VAN KEUREN, Nathan B.
1215 Westway Circle
Killeen, TX 76542
VOISINE, Joel J.
88 W. Harrand Creek Drive
Enterprise, AL 36330

CW3s

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7520 Hqs Loop
Fort Campbell, KY 42223
COUCH, Emmett M.
64th Company
Fort Rucker, AL 36362
DEY, Thomas R.
P.O. Box 1887
Beaverton, OR 97075
OSTBERG, Gary L.
1193 New Drennan Park
Fort Campbell, KY 42223
PETERS, Mark E.
139 Lexingtonve
Clarksville, TN 37042
PRICKETT, Rex L.
2068 A Werner Pk
Fort Campbell, KY 42223
RAWDEN, Francis A.
PSC Box 1001
APO MIA 34001
SHUGART, Ray
16011 Norsandy Ct
Woodbridge, VA 22191
VER HARR, Burtis W.
244th CAC Box 2124
APO NY 09250

CW2s

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EDMONDS, Timothy L.
7321B Gardner Hills
Ft Campbell, KY 42223
ERPS, David G.
979 Pine Tree Rd-B
Crofton, KY 42217
FLYNN, Michael J.
100 Grinnell
Colorado Springs, CO 80911
GREGORY, Daniel W.
114 Delaware Dr
Clarksville, TN 37042
HARRIS, Thomas L.
3811 Baker Ames Rd. NE
Olympia, WA 98506
HAUG, Beverly M.
5743 Heming Avenue
Springfield, VA 22151

CW2s

HEITSCH, Timothy J.
13306 Park Hills Drive
Grandview, MO 64030
HOOKER, James E.
193rd Avn Co, FA Cmd Pershing
APO NY 09454
INGRAM, James L.
W6 Cedar Village
Clarksville, TN 37040
KEITH, Melvin E.
HHT 3/8 Cav
APO NY 09028
KOESTER, Mary E.
55th Avn Co (A)
APO SF 96301
MACE, Michael S.
2009 B Werner Park
Fort Campbell, KY 42223
OROS, Robert E.
242nd Helicopter Co, Box 144
Ft Wainwright, AK 99703
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Endia, PA 17025
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Clarksville, TN 37042
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Box 275
APO NY 09111
PRINCE, Joe
BOQ, Rm 204, Bldg 1585
Fort Campbell, KY 42223
RAYSOR, Bernard I.
309 Dale Terr
Clarksville, TN 37040
SCARBROUGH, Steve A.
Rt 9 Box 450, Hinggold
Clarksville, TN 37042
TROTTER, Michael J.
1671 Ft Campbell Blvd
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VICK, Bobby N.
416 Ambrose Dr
Clarksville, TN 37043
WELLS, Allen R.
10411 Cliff Circle
Tampa, FL 33612
WILLIAMS, Jimmie L.
6209 Larue Court
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WO1s

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217 Village Green Dr
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CAPRARA, Robert A
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HARDY, James E. Jr.
2214 Glory Dr
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KAHANER, Val J.
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WO1s

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REGISTER, Anthony D.
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REYNOLDS, Randall L.
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WOC

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Enlisted

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Clarksville, TN 37042
MANGAN, Thomas J. SGT
27 Curtis Tigna Road
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MARRERO, Eduardo E5
3rd Staff and Faculty
Fort Eustis, VA 23604
MORRISON, Frederick S SP4
45th Trans Co
APO SF 96271
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OSBORN, Ronald W. PFC
FAMC, Box 1833
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RIGSBY, Terry A. SFC
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ST. HILAIRE, Michael H. SGT
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WAGNER, James A. SSG
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Killeen, TX 76543
WELLS, Miles D. SGT
5605 Carson Drive
Fayetteville, NC 28303

Civilian

BAKER, Alfred/Camlock UK Ltd
70 Hawley Lane
Farnborough Hampshire UK
BAKER, Charles C.
4260 Shoreline Drive
Earth City, MO 63045
BERNIER, Sharan A.
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Prospect, CT 06712
BORDIUK, Walter J.
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Red Bank, NJ 07701

About to move? See the change of address form on Page 57

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FALK, Charles P. Jr.
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Savannah, GA 31406
GEYER, David W./Analex Corp.
P.O. Box 9216
Englewood, CO 80111
GOLINSKY, Martin
61 Highfield Lane
Roslyn Hts, NY 11577
HONICKMAN, Stephen N.
15332 Manchester Rd, Ste 215
Ballwin, MO 63011
LEMAY, G.T./SIADS Co.
4953 Lansing St., NE
St. Petersburg, FL 33703
MARTIN, Mike J.
10132-C Manchester Road
St. Louis, MO 63122
McCANDLESS, Alan R.
3148 Blaiser Lane
Maryland Heights, MO 63043
McELROY, Kenneth
4233 Laurel Road
Alexandria, VA 22309
MESSINA, D. Richard
50 The Point
Coronado, CA 92118
MOBLEY, Etheleeen
1894 Argonne Drive
Morrow, GA 30260
MURPHY, Nancy A.
Hq. AMC Europe, Box 97
APO NY 09333
PEASE, Edward C./Avco Lycom.
652 Oliver Street
Williamsport, PA 17701
RODE, Danny L.
2930B Frontenac Ave, #104
North Chicago, IL 60064
SMITH, Gary L.
514 Fox Pointe Drive
St. Charles, MO 63303
TKACH, Thomas M.
CECOM Ft. Ord, Box 830
Marina, CA 93933
ULAKOVIC, James J.
Rt 4, Box 174K
Roanoke, TX 76262
YACKEL, Joan S.
900 2nd Street
Coronado, CA 92118

Retired

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BEDSOLE, William K. COL
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Enterprise, AL 36330
BRUNELLE, Pierre V. COL
Eastwind Cond. 1456 A1A, #409
Satellite Beach, FL 32937
CLIFTON, Chester V. MG
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Washington, DC 20016
ELIASSON, Arne H. COL
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FRASER, Harry L., LTC
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Derby, KS 67037
GUYRE, James J. CW3
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JOHNSON, Robert E. LTC
3322 S. Memorial Pkwy, 122
Huntsville, AL 35801
KIMZEY, Reed T.
2921 Escarpa Drive
El Paso, TX 79935
KUHNS, Albert W. CW4
14430 Skybird Road
Chesterfield, VA 23832
LEONARD, Daniel R. COL
321 Scott Drive
Silver Spring, MD 20904
LEUPPERT, Fred W. LTC
Route 1, Box 88
Bluemont, VA 22012
MOORE, Jimmy N. LTC
41747 Borealis Drive
Rancho, CA 92390
NOEDING, John P. LTC
P.O. Box 2361
Taos, NM 87571
PEAVY, Jack D. LTC
905 Camelot Court
Dothan, AL 36303
RAMAGE, Gary F. LTC
7409 Forest Hunt Ct
Springfield, VA 22153
SMITH, Paul H. CW4
3200 N. Willow Creek Rd
Prescott, AZ 86301
THOMPSON, James B. COL
4413 Jessamine Hollow
Austin, TX 78731
TOMPKINS, Tommy V. 1SG
P.O. Box 8443
Corpus Christi, TX 78412

General Fred K. Mahaffey

FRED K. MAHAFFEY, 52, the former Commander-in-Chief of the U.S. Readiness Command, MacDill AFB, FL, died Oct. 13 at Walter Reed Army Medical Center in Washington, after a long illness.

Born in Clovis, NM on Jan. 4, 1934, he held a number of important posts in his 31-year Army career. In addition to serving two tours in Vietnam, he was the commander of the 2d Brigade, 101st Airborne Division (Airmobile), Assistant Commandant of the Infantry School, deputy CG of the Combined Arms Development Activity and the CG of the 3d Infantry Division in Frankfurt. He served as Deputy Chief of Staff for Operations and Plans at the Pentagon. General Mahaffey was this year's main speaker at the AAAA Awards Banquet.

He is survived by his wife, Jane, and daughters Lorrie Ann, Selene, Julie Anne, and Melissa Jane.

Colonel Dan McCartney

DAN A. McCARTNEY, 67, of Albuquerque, New Mexico, died August 24, 1986. A former member of the 200th Coast Artillery, he was a prisoner of war for nearly three and a half years. He retired as a Colonel after 27 years of active duty, primarily spent in Army Aviation. He is survived by his wife, Haroldine; his mother, Mary; and a daughter, Roberta.

Oct.-Dec., 1986 Calendar of AAAA Chapter Activities

October, 1986

■■Oct. 21. Northern Lights Chapter. Late afternoon professional-business meeting. Reactivation of Chapter; elections; GEN Wickham's videotape. Ft Wainwright O-Club.

■■Oct. 21. Greater Atlanta Chapter. Professional-social dinner meeting. Sergei Sikorsky, guest speaker. "The Soviet Military Aviation Industry." Holiday Inn Powers Ferry.

■■Oct. 24. Colonial Virginia Chapter. Professional luncheon meeting. LTC Sam DeLoach, DCD, USAALS, guest speaker. "Combat Developments at USAALS." Ft. Eustis O-Club.

November, 1986

■■Nov. 1. Chesapeake Bay Chapter. After dinner prof'l-social meeting. Aberdeen PG O-Club Rathskeller.

■■Nov. 1. USAREUR Region. "7th Annual USAREUR AAAA Ball". Guest speaker TBA. Entertainment. Formal/Black Tie. Heidelberg Officers' and Civilians' Club. Members only.

■■Nov. 3. Mid-America Chapter. Professional luncheon meeting. James Kagdis, Sikorsky Aircraft, guest speaker. "The Boeing-Sikorsky LHX". Ft. Riley O-Club.

■■Nov. 6. Ft. Leavenworth Chapter. Late afternoon professional-social meeting. BG John D. Robinson, Cdr, TRAC, guest speaker. "The State of Army Aviation." Ft. L O-Club.

■■Nov. 7. Wings of the Devil Chapter. Late afternoon prof'l-business meeting. Members only. Chapter elections. Ft. Polk O-Club.

■■Nov. 8. Arizona Chapter. Prof'l dinner meeting. W.R. McDonnell, Dir, LHX Programs, McDonnell-Douglas Helicopter Co., speaker. MDHC dining facility and auditorium.

■■Nov. 8. Washington, D.C. Chapter. A.M./early afternoon "Member and Family Tour" of the Air & Space Museum's Paul E. Garber Facility. Speaker: Dr. Paul E. Garber.

■■Nov. 9. S. California Chapter. Family Open House. USAF Thunderbirds/AF Academy Jump Team performances. Edwards AFB.

■■Nov. 11. Delaware Valley Chapter. Professional dinner meeting. LTC Robert Harry, Cdr, 1986 World Helicopter Championship Team, guest speaker. Towne House, Media, PA.

■■Nov. 17. Ft. Bragg Chapter. Late afternoon prof'l-social meeting. COL Joel Hinson, Chief, WO Br, and LTC Robert Seigle, Chief, Avn Br, speakers. "Career Management and Army of Excellence." NCO/EM Club.

■■Nov. 18. Washington, D.C. Chapter. Prof'l-social dinner meeting. MG Richard E. Stephenson, CG, USAAVSCOM, speaker. "The Army Aviation Program." Ft McNair O-Club.

■■Nov. 20. Monterey Bay Chapter. Late afternoon business-social meeting. COL Billy Hall, Cdr, CAB, speaker. Chapter elections. Ski Trip planning. CAB Hqs Classroom A.

■■Nov. 22. Lindbergh Chapter. President's Dinner Dance. Park Terrace Airport Hilton.

December, 1986

■■Dec. 4. Rhine Valley Chapter. Late afternoon business-social meeting. Chapter elections. Members only. Mannheim O-Club.

■■Dec. 4. 1986 Hall of Fame Induction Ceremonies. By invitation. 3 p.m., Classroom #1, Building 5206, USAAVNC, Ft. Rucker, Ala.

■■Dec. 4. Army Aviation Center Chapter. Professional-social dinner meeting honoring the 1986 Hall of Fame inductees and the "Aviation Trainer of the Year." Formal/Black Tie. Ft. Rucker Officers' Open Mess.

■■Dec. 5. Nat'l Exec. Board. Quarterly business meeting. 1:30 p.m., Classroom #1, Building 5206. USAAVNC, Ft. Rucker, Ala.

■■Dec. 12. Checkpoint Charlie Chapter. Annual Christmas Party and Dinner. Entertainment. Checkpoint Charlie Club.

January, 1987

■■Jan. 12-13. 1987 Convention Committee. Coordination meeting of Ft. Worth principals. Tarrant County Convention Center.

■■Jan. 13 . North Texas Chapter. Professional-social dinner meeting. Arthur H. Kesten, Executive Vice President-AAAA, guest speaker; "Get ready, Ft. Worth!" Hyatt Regency, Ft. Worth, Texas.

February, 1987

■■Feb.4-5. The 13th Annual Joseph P. Crib-

(CALENDAR — Cont. on the opposite page)

Contenders!

The Oct. 1 ***Membership Enrollment Competition*** standings have the follow-Chapters ahead for substantial cash awards with 10 weeks left in the contest ending Jan. 15. Rankings are based on ***net membership gain.***

Master Chapters
(225 or more members)
(1-$400) (2-$300) (3-$200)

Rank		Net Gain
1	Monmouth	+ 64
2	Wash, D.C.	+ 34
3	S. California	+ 14
4	Colonial Va.	+ 13
5	Connecticut	+ 9
6	Ft. Hood	+ 4
7	Old Ironside	– 7
8	Thunderhorse	– 10

Senior Chapters
(112-224 members)
(1-$300) (2-$200) (3-$100)

Rank		Net Gain
1	Hanau Chapter..	+ 103
2	Stuttgart	+ 40
3	Link Memorial	+ 32
4	Taunus Chapter...	+ 31
5	Mt. Rainier	+ 26
6	Schwaebisch Hall.	+ 21
7	Greater Atlanta...	+ 20
8	Wings of Marne	+ 7

AAAA Chapters
(25-111 members)
(1-$200) (2-$100) (3-$50)

Rank		Net Gain
1	Lone Star	+ 40
2	Arizona Chapter..	+ 37
3	Leavenworth	+ 32
4	Cedar Rapids	+ 26
5	Tenn. Valley	+ 19
6	Mainz Chapter	+ 13
*7	Pikes Peak	+ 12
*7	Wings of Devil...	+ 12
*7	N. Lights	+ 12

*Tie

AAAA Overview

■■ Huachuca Major wins ASE Award

The Chief of the Aviation Division at the USA Electronic Proving Ground, Ft. Huachuca, Ariz., **Major Michael F. Blacker,** was named winner of AAAA's initial **Aircraft Survivability Equipment (ASE) Award.**

Sponsored by Loral Electronic Systems, the national award was presented to **Blacker** by **MG Story C. Stevens,** AAAA's Senior VP and M.C. at the ***Fourth Annual AAAA ASE Symposium*** held Nov. 4-5 at the Northrop Defense Systems Division in Rolling Meadows, Ill. A full Symposium report will be published in next month's issue.

■■ Black tie!

The USAREUR Region's second largest membership activity was held in Heidelberg on Nov. 1 when Regional members and their spouses gathered at the ***7th Annual USAREUR AAAA Ball.*** **COL "Mitch" Mitchiner,** Regional President, was M.C. at the formal dinner-dance. AAAA National V.P. **Bill Pollard** represented the National Board.

CALENDAR (Continued from the opp. page)

bins Product Support Symposium sponsored by the Lindbergh Chapter-AAAA. Airport Hilton Hotel, St. Louis, Missouri. Details available from AAAA National Office o/a Nov. 15.

■■Feb. 6-7. AAAA National Awards Committee. Selection of 1986 AAAA National Scholarship Winners and CY85 AAAA National Award Winners. Ft. Myer, Virginia.

March, 1987

■■Mar. 15-21. AAAA Ski Week and the 1987 USAREUR Regional Convention. Armed Forces Recreation Center and Kongresshaus, Garmisch, Germany. Details available from the AAAA National Office o/a Dec. 15.

April, 1987

■■Apr. 8-12. 1987 AAAA National Convention. Tarrant County Convention Center and five area hotels, Ft. Worth, Texas. Details available from AAAA National Office, Jan. 2.

Did you know that . . .

. . the Association has 384 **Life Members?** Of the 106 who recently provided "date of birth" information, 21 were born before 1920, 53 before 1930, 90 before 1940, and 103 before 1950? The 106 responding range in age from 31 to 78.

Briefs

New Chapter Officers: The **Checkpoint Charlie Chapter** has elected **SP4 Jeff Stickel** as its new Sr VP; the **Ft. Bragg Chapter** has **CW4 Charles Quinn** as its SrVP and **CPT Darrell Crawford** as its VP-Publ.

The new VP-Prog at the **Greater Atlanta Chapter** is **MAJ Gary L. Hall.**

New Lindbergh Chapter officeholders are **LTC Thomas Fichter** (SrVP); **Debbie Vogel** (Secr); **MAJ Jan Drabczuk** (VP-Prog); and **Roger Hoffman** (VP-Sust Memb).

Newly-elected officers at the **Nurnburg Chapter** include **1LT Richard Batten** (Trea), **CW3 Earl Moore** (VP-Prog), **1LT David Molinelli** (VP-Prog), **CW3 Gil Robertson** (VP, Publ), and **SGT Steve Gamache** (VP, Enl Aff).

CPT Robert Morgan is the new VP-Prog at the **Stuttgart Chapter** while **LTG James Neidig** (Sr VP), **CW4 Stanley Snopkowski** (Trea), **1LT Hal Jungerheld** (VP-Prog), and **1LT Marilyn Skelly** (VP-Publ) are new officers at the **Wings of the Marne Chapter.**

On Display

The AAAA's **"Outstanding ARNG Aviation Unit Award"** trophy was displayed at the Florida-ARNG State Convention in Jacksonville, Fla., Aug. 13-18.

The AAAA's CY85 winning ARNG unit, the 26th Avn Bn, arranged for its shipment from the Aviation Museum and return.

AAAA Overview

New Scholarships Announced

AAAA's **Monmouth Chapter** has established two permanently endowed $1,000 a year AAAA scholarships. One in the name of **Kenneth K. Kelly** memorializes the late Monmouth Chapter officer; the second will be awarded annually in the name of **Monmouth Chapter** itself. Both have been capitalized with $10,000 donations to the AAAA Scholarship Foundation. At the same time, the **Monmouth Chapter** joined the Foundation's new ***Chapter Matching Fund Program*** wherein Chapter $1,000 donations are matched in a CY by a $1,000 Foundation grant and set up a second **Monmouth Chapter Scholarship.**

The Lindbergh (St. Louis) Chapter recently established a **Frank S. Besson, Jr. Memorial Scholarship** of $1,000 to be awarded initially in CY87 under the ***Chapter Matching Fund Program.*** The Foundation's matching $1,000 will be set aside in a separate **Besson Fund** until such time as that Fund reaches $10,000 and the memorial scholarship is fully capitalized.

AAAA's smallest Chapter with only 39 members — the **Checkpoint Charlie Chapter** — has donated $1,000 to join the same program, as has the AAAA's largest Chapter, the 1,585-member **Aviation Center Chapter.**

The former will support a $2,000 CY87 Award, i.e. a $1,000 scholarship to one recipient for two years, while the **Aviation Center Chapter** will underwrite a $1,000 CY87 Scholarship and have the $1,000 in matching funds placed in escrow to underwrite a capitalized $1,000 scholarship.

A fifth Chapter, the **Washington, D.C. Chapter,** has also joined the ***Chapter Matching Fund Program,*** and will support a one recipient award of $1,000-a-year for two years.

The 20 Scholarship, $43,500 CY87 Scholarship Award Program also includes one $8,000 award, three to five awards of a minimum $4,000, two additional $2,000 scholarships, and five Life Member Memorial Awards of $500.00 each. An add'l ***Chapter Matching Fund*** is still possible under that program's later Oct. 31 suspense date.

Plan ahead!

The 1987 AAAA National Convention will be held in Ft. Worth, Texas, during April 8-12, 1987

Join your fellow members at this annual major gathering of Army Aviation "professionals"

The 1987 AAAA Professional Program involves over 20 Professional Presentations; four Q & A Panels; and AWO, NCO, and Family Sessions, all under the theme, " The Aviation Team"

The social program includes three luncheons, an Awards Banquet, four evening receptions, an Aviation Brunch, and 18 Chapter Receptions at which to mix and mingle

View more than 100 industry and military aerospace exhibits in the 100,000 square foot Tarrant County Convention Center exhibit hall

Full program details, a Registration Form, and a Hotel Reservation Form will be published in the Dec. 31 issue, or contact AAAA, 1 Crestwood Rd., Westport, CT 06880 — (203) 226-8184

This is the last call for nominations for CY86 AAAA National Awards; Jan. 15, 1987 suspense date set

"Award Presentations"

Seven AAAA National Awards for accomplishments made during Calendar Year 1986 will be presented at an Annual Awards Luncheon on April 9 and an Awards Banquet to be held on April 10 at the 1987 AAAA National Convention in Ft. Worth, Tex. The individual awards will be made on Friday; the unit awards will be presented on Saturday. Senior members of the U.S. Army and U.S. Army Aviation will be invited to present the AAAA's top awards on both occasions.

"Army Aviator of the Year Award"

Sponsored by the Sikorsky Aircraft Division, this award will be presented "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. 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 will be presented "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 in the Reserve Components, and must have made an outstanding individual achievement.

"Outstanding DAC of the Year Award"

Sponsored by the Boeing Vertol Company, this award will be presented "to the Department of the Army Civilian who has made an outstanding contribution to Army Aviation in 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 current Department of the Army Civilian.

"James H. McClellan Aviation Safety Award"

Sponsored by the many friends of Senator John L. McClellan in memory of his son, James H. McClellan, a former Army Aviator who was killed in a civil aviation accident in 1958. The award is presented to any individual who has made an outstanding contribution to Army Aviation safety during the awards encompassing the previous calendar period. Membership in AAAA is not a requirement; any individual, military or civilian, is eligible as a nominee for this award. The award is NOT intended to be given for competitions between units for safe flying, or for the accumulation of operational hours without accidents by any aviation unit or individual.

"Robert M. Leich Special Award"

Sponsored by the Association, the Award is named in memory of Brig. Gen. Robert M. Leich, the AAAA's first president (1957-1959) and Chairman of its Awards Committee for 23 years. Normally given to a unit for distinguished aviation-related service over an extended period, the Robert M. Leich Special Award may be presented to an individual recipient.

"Outstanding USAR Aviation Unit Award"

Sponsored by the Avco Lycoming Division, this award will be presented "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 AAAA 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 award consideration.

"Outstanding ARNG Aviation Unit Award"

Sponsored by the Avco Lycoming Division, this award will be presented "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.

"Outstanding Aviation Unit of the Year Award"

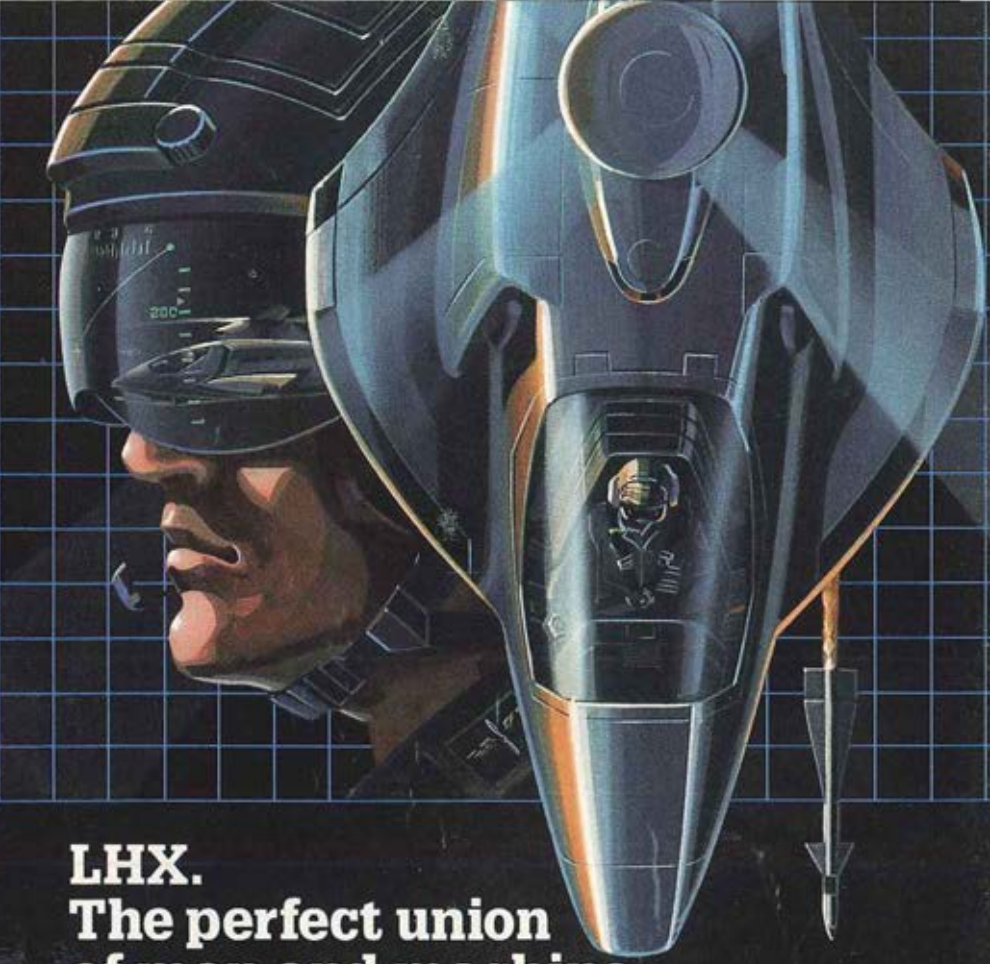
Sponsored by McDonnell Douglas Helicopters, this award will be made "to the aviation unit that has made an outstanding contribution to or innovation in the employment of Army Aviation over and above the normal mission assigned to the unit during the awards period encompassing the previous calendar year." Any Army Aviation unit or organization that has met the foregoing criteria is eligible.

Administrative Details

ACCOMPANYING DATA FOR INDIVIDUAL AWARDS: Documentation should include the nominee's name; his unit assignment, unit name, and address; and the name of his current unit and commander. A cover sheet should provide a brief outline of not more than 100 words citing the main reason(s) for the nomination. Detailed supporting information should be attached as inclosures; and be limited to 1,500 words or three pages (whichever is greater). The documentation should be typed, and must include a recent photo and the nominee's blog sketch. Winners will be asked in March to provide add'l "slides".

ACCOMPANYING DATA FOR ALL UNIT AWARDS: Documentation should include the name and address of the unit, and the name of the present commander and senior NCO. A cover sheet should provide a brief outline of not more than 100 words citing the main reason(s) for the nomination. Detailed supporting information may be attached as inclosures and is limited to 1,500 words or three pages (whichever is greater). Photos of BOTH the commander and senior NCO must accompany the nomination. Winners will be asked in March to provide add'l "slides". This form may be reproduced locally. Receipt of each nomination will be acknowledged by the National Office of the AAAA.

SUSPENSE DATE: The nomination(s) and accompanying data should be mailed before 15 Jan. to: AAAA Nat'l Awards Chairman, 1 Crestwood Road, Westport, Connecticut 06880. Please use stiffeners to protect the photo(s) being submitted.



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